CITY OF PORTLAND, MAINE
PLANNING BOARD



Sean Dundon, Chair
Brandon Mazer, Vice Chair
David Eaton
David Silk
Austin Smith
Maggie Stanley
Lisa Whited

AGENDA
PORTLAND PLANNING BOARD MEETING

The Portland Planning Board will hold a meeting on Monday, December 17, 2018, Room 209, 2nd Floor of City Hall, 389 Congress Street. **Public comments will be taken for each item on the agenda during the estimated allotted time and written comments should be submitted to planningboard@portlandmaine.gov**.

PUBLIC HEARING - 6:00 PM

1. ROLL CALL AND DECLARATION OF QUORUM

2. COMMUNICATION AND REPORTS

3. REPORT OF ATTENDANCE AT THE MEETING HELD ON DECEMBER 11, 2018

Afternoon Public Hearing Dundon, Silk, Smith and Stanley present; Mazer, Eaton and Whited absent.

Workshop Dundon, Silk, Smith and Stanley present; Mazer, Eaton and Whited absent.

4. REPORTS OF DECISIONS AT THE MEETING HELD ON DECEMBER 11, 2018

i. Map Amendment Rezoning; 250 Canco Road; City of Portland, Applicant. Stanley moved and Silk seconded a motion to find the proposed zoning amendment is consistent with the Comprehensive plan and recommends to City Council to rescind C-50 on the approximate 78,000 sf of city land. Vote: 4-0 , Eaton, Mazer and Whited absent. Stanley moved and Smith seconded a motion to find the proposed map amendment consistent with the Comprehensive Plan and recommends to City Council the adoption of the map amendment to I-M. Vote: 4-0, Eaton, Mazer and Whited absent.

ii. Conditional Use and Administrative Authorization Application for a Used Car Dealership; 965R Forest Avenue, Raceway Auto Care Inc., Applicant. Stanley moved and Smith seconded a motion to approve the conditional use and administrative authorization application for auto sales with four conditions of approval. Vote: 4-0, Eaton, Mazer and Whited absent.

iii. Amendments to the Implementation Guidelines, Regulations, and Agreements for Chapter 14, Division 30, Affordable Housing, Portland Planning and Urban Development, Applicant. Stanley moved and Smith seconded a motion to find the proposed amendments consistent with the Affordable Housing Ordinance and to adopt the proposed amendments. Vote: 4-0, Eaton, Mazer and Whited absent.

5. NEW BUSINESS

i. Level III Site Plan; 22 Bramhall Street; Maine Medical Center, Applicant. (6:00 - 7:00 p.m. estimated time) The Board will hold a public hearing to consider a proposed building expansion and new entrance off Congress Street. This is the third phase of expansion as contained in MMC's Institutional Development plan. The application includes the demolition of the existing Gilman Street garage. The proposed 265,000 sf building addition will re-orient the Bramhall medical campus to Congress Street, include 64 private patient rooms, and add 19 procedure rooms. The proposed site is within the Maine Medical Center Institutional Overlay Zone. The proposal is subject to review under Portland's Site Plan Ordinance and under deleted review for Maine's Traffic Movement Permit and Site Location of Development standards.

ii. Level III Site Plan; 100 Fore Street; 100 Fore Street, LLC., Applicant. **THIS ITEM IS BEING POSTPONED TO 1-8-19.**

iii. Hotel Inclusionary Zoning; Ordinance Amendments, City of Portland, Applicant. (7:00 p.m. estimated time) The Planning Board will hold a public hearing on a proposed ordinance to be incorporated into the Land Use Code addressing new hotel developments and affordable housing demand.

PLANNING BOARD REPORT
PORTLAND, MAINE

MMC Congress Street Hospital Building
22 Bramhall Street
Level III Site Plan
Project #000331-2018
53-D-7
Maine Medical Center, Applicant

Submitted to: Portland Planning Board Public Hearing Date: December 17, 2018	Prepared by: Nell Donaldson, Senior Planner Date: December 14, 2018

I. INTRODUCTION

Maine Medical Center (MMC) appears before the Planning Board for a final hearing on the third phase of the short-term expansion proposed in their 2017 Institutional Development Plan. This phase involves the demolition of the existing 360,000 SF Gilman Street employee parking garage and replacement with a 285,000 hospital building. As proposed, the hospital building would house 64 private patient rooms, 19 procedure rooms, and connections to both the Congress Street corridor and the interior of the Bramhall campus. The proposal is subject to the standards of the Maine Medical Center Institutional Overlay Zone (MMC IOZ) and qualifies for Level III site plan review under the city's land use code. The application also qualifies as an amendment to an existing Site Law permit under the state's Site Location of Development Act, for which the city has delegated review authority. Advertisement of this workshop appeared in the *Portland Press Herald* on December 6 and 7, 2018. In addition, 254 notices were sent to property owners within 500 feet and the interested citizens list.

The Planning Board met on October 23 and November 13, 2018 to review the preliminary plans for MMC's proposed Congress Street hospital building, focusing on urban design, transportation, and stormwater aspects of the review. This hearing provides an opportunity to review final plans submitted in response to earlier staff comments.

Applicant: Maine Medical Center
Consultants: Will Conway, Sebago Technics; Jeff Keilman, Perkins & Will; Randy Dunton, Gorrill-Palmer; Turner Construction

II. REQUIRED REVIEWS

Waiver Requests	*Applicable Standards*
Driveway width – to allow a driveway approximately 35' in width	*Technical Manual Section 1.7.2.4* – Maximum widths shall not exceed 24' for two-way access. *Supported by staff.*
Sidewalk material – to allow concrete sidewalks with granite banding on Congress and Gilman Streets	*Technical Manual Section 1.8* – The City sidewalk materials policy shall be consulted to determine the appropriate type of sidewalk construction. *Supported by staff.*
Stormwater treatment system design criteria – to allow a surface area for the subsurface system of 3,134 SF	*Technical Manual Section 5.II.D* – Redevelopment projects shall provide stormwater treatment in accordance with the General Standards of Chapter 500. (Minimum surface area of 3,883 SF to treat the proposed project and Visitor Garage.) *Supported by consulting civil engineer.*
Exterior lighting – to allow maximum and average illumination levels of 5.4 fc and 1.34 fc respectively	*Technical Manual Section 12.2.3* - Maximum illumination levels shall be 5.0 fc and average illumination levels shall be no more than 1.25 fc. *Supported by staff.*

Review	*Applicable Statute*
Institutional Overlay Zone	*Section 14-282*
Site Plan	*Section 14-526*
Site Location of Development	*Technical Manual Section 14*

III. PROJECT DATA

Existing Zoning	Institutional Overlay Zone
Existing Use	Structured parking
Proposed Use	Hospital building – 19 procedure rooms, 64 inpatient rooms
Parcel Size	12.5 acres (contiguous Bramhall campus)

	Existing	*Proposed*	*Net Change*
Building Footprint	36,000 SF	50,000 SF	14,000 SF
Building Floor Area	360,000 SF	285,000 SF	-75,000 SF
Impervious Surface Area	398,575SF	412,862SF	14,287SF
Parking Spaces	3,279 (for entire campus, including employee garage)	3,279	0
Bicycle Parking Spaces	193 (campus-wide)	193	0

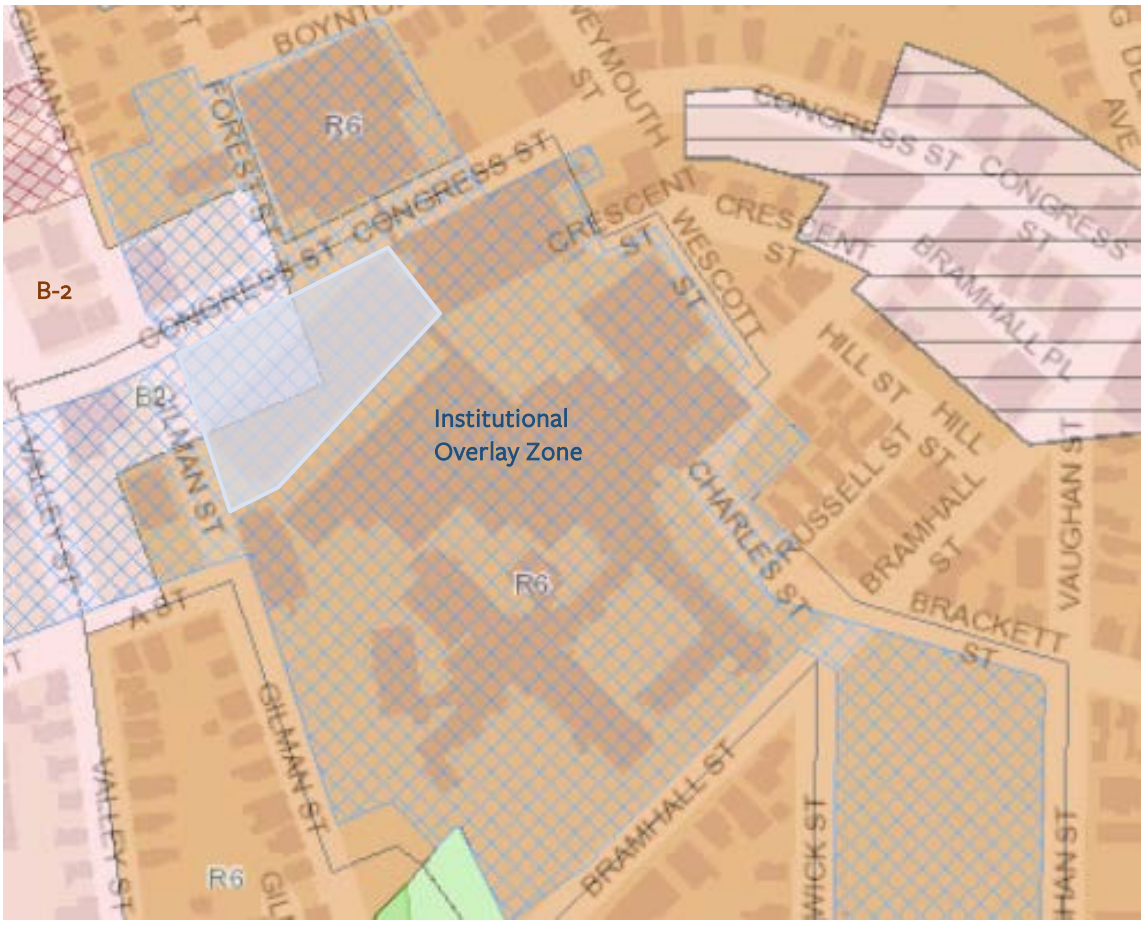
IV. CONTEXT

Maine Medical Center's Institutional Development Plan (IDP), approved by the Planning Board in the fall of 2017, laid the groundwork for a major hospital expansion over the next decade. The short- and long-term expansion plans proposed in the IDP were designed to respond to an emergent clinical need for private beds, to retire aging facilities which no longer meet the needs of patients and visitors, to reorganize the campus to address evolving best practice in health care design, and to centralize parking for employees and visitors. As of the fall of 2018, the hospital has received site plan approval for two of the three projects that comprise the hospital's short-term development plan – the vertical expansions of the East Tower and Visitor Garage and the construction of the Employee Garage at 190 St. John Street. The third project, a new 285,000 SF hospital building with a major entrance on Congress Street, is under consideration here.

The site of the proposed Congress Street hospital building lies on the northwest corner of MMC's Bramhall campus, at the intersection of Congress and Gilman Streets *(Figure 1)*. The bulk of the Bramhall campus sits up gradient behind the site. The Maine Sleep Institute lies to the west across Gilman Street, commercial properties face the site from the north across Congress Street, and MMC's Visitor Garage lies to the east. The site is currently occupied by MMC's Gilman Garage.

The site lies within the MMC Institutional Overlay Zone (IOZ), a zoning designation adopted into the land use code by the City Council in November of 2017 *(Figure 2)*. The IOZ establishes use and dimensional standards which govern proposed development by MMC within the zone, as well as a series of general development standards. Development within the IOZ which meets the criteria for site plan review is also subject to the site plan standards of the land use code.





Figures 1 & 2: Project site land use context (above) and zoning context (below)

V. PROPOSED DEVELOPMENT

The site plan application includes the demolition of the existing 360,000 SF Gilman Garage, which has stood on the site since the mid-1970s and is nearing the end of its useful life. Following demolition, significant site work is proposed, including substantial regrading, utility work, and the installation of an underground stormwater detention and treatment facility.

The new 285,000 SF building which is proposed to replace the Gilman Garage would contain circulation space and pre-operative/recovery rooms on the first floor, a second floor containing 19 procedure rooms, and inpatient rooms on the third and fourth floors. A landscaped roof garden is proposed with access from the 3rd floor. Connections to the upper campus would be provided through a vertical tower at the southeast corner of the building, with access from the fifth, sixth, and seventh floors of this tower.

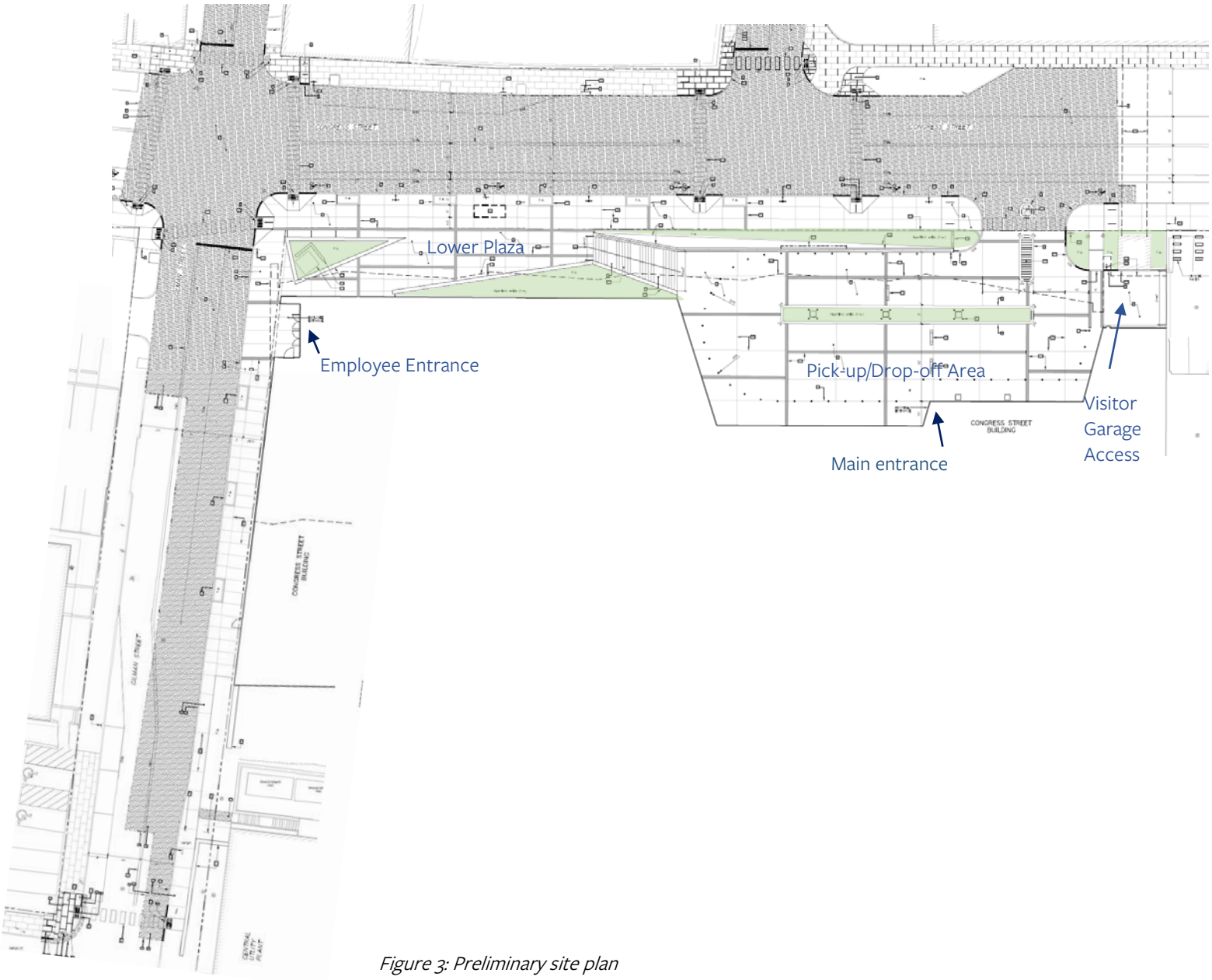
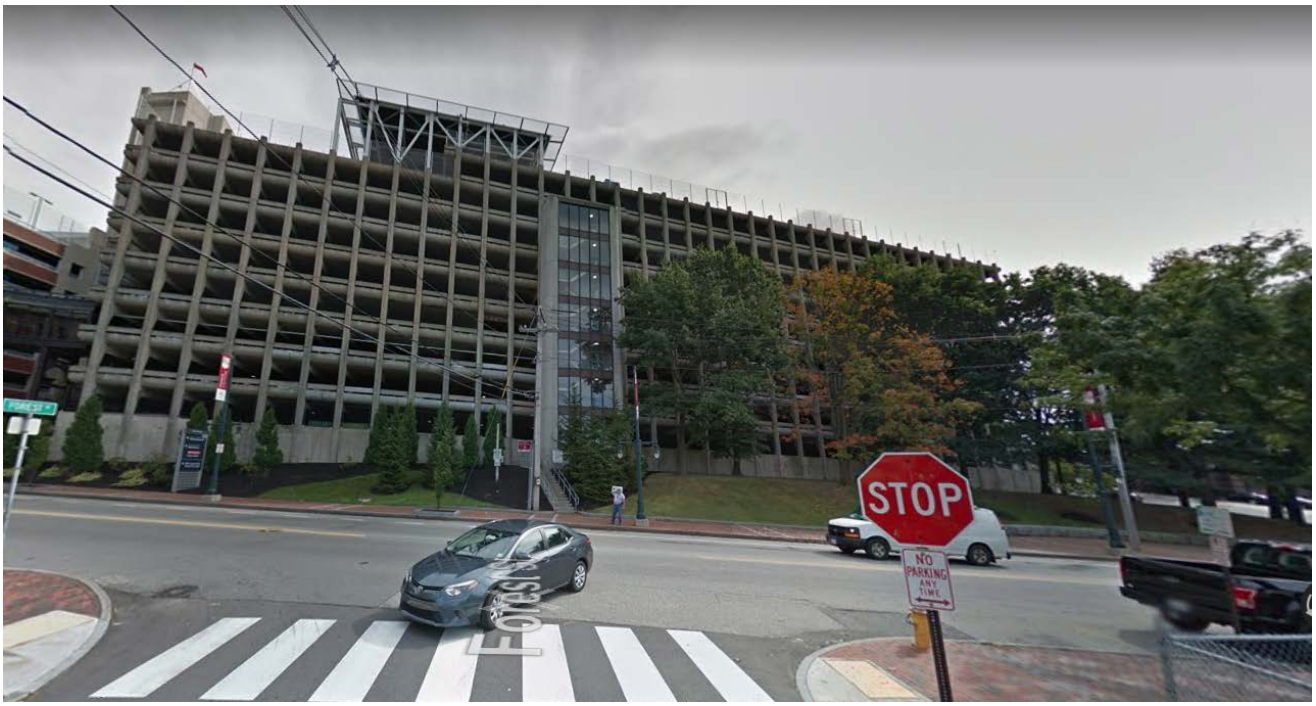


Figure 3: Preliminary site plan





Figures 4 and 5: View from Forest Street looking south across Congress Street, existing (above) and proposed (below)

The building has been designed to function as a major point of entry to the hospital, giving the campus a new face on Congress Street and a new way of engaging with the neighborhoods that surround it. The building's most active areas, including circulation and lobby spaces, are oriented towards Congress Street, where significant amounts of glass are proposed. The building would lie between 20 and 30 feet from the right-of-way line on Congress Street and directly adjacent to the right-of-way line on Gilman Street.

The site plan includes an arrival area tucked partly below the second floor at the easterly end of the building. This turnaround would provide access for vehicles, pedestrians, and bicyclists destined for the main building entrance as well as vehicles entering the visitor garage. The turnaround is proposed in hardscape, with shade-tolerant plantings in the center. This area would be held by a significant retaining wall at the Congress Street property line, one-story above a separate plaza space with plantings and low seating walls at the northwesterly corner of the site. A broad stairway is proposed to join these two exterior spaces.

VI. PUBLIC COMMENT

Two written public comments were received by the Planning Division (*Attachments PC-1 and PC-2*). These comments raised questions regarding the number of trees and tree species, plant species in general, snow ban parking arrangements, the scope of the traffic study area, traffic safety in the study area, and the Traffic Movement Permit process.

At the October 23 workshop, there was one public comment from the author of one of the written comments, which focused on the loss of existing trees and plant selection. This member of the public requested native species be used where possible, and suggested more trees in the planting areas, as well as irrigation.

At the November 13 workshop, the Planning Board considered the second public comment within the public comment period. Again, this comment raised questions regarding the Traffic Movement Permit scope, analysis, and process.

The applicant hosted a neighborhood meeting on Wednesday, October 17 *(Attachment MM)*. This meeting included discussion about the St. John employee garage as well as the Congress Street medical building. There were six attendees. Discussion covered design, construction impacts, and anticipated traffic impacts. Questions and comments included concerns about blank facades, explanation of future expansion phases, property surveys, loss of existing trees, and new tree selection.

VII. RIGHT, TITLE, & INTEREST

The MMC IOZ is only applicable to properties to which MMC has right, title, or interest. The applicant has provided evidence of right, title, and interest in the property for which the project is proposed. *(Attachment C)*.

The final plans show an encroachment into the right-of-way at the northwest corner of the building, where the third floor is proposed to overhang the property line (Plan 53). Building footings are also proposed within the right-of-way. A condition of approval has been drafted to address these encroachments. The final plans also show several areas of sidewalk on private property. As is customary in cases like these, public access easements will be required. This has also been included as a condition of approval.

VIII. FINANCIAL & TECHNICAL CAPACITY

The applicant has provided a description of the project team and a letter regarding their financial capacity *(Attachments H and I)*.

IX. ZONING ANALYSIS – INSTITUTIONAL OVERLAY ZONE REGULATORY FRAMEWORK

As noted above, the site lies within the Maine Medical Center Institutional Overlay Zone, which establishes use, dimensional, and development standards for MMC projects within its bounds. The project has been reviewed for conformance with these standards. Staff comments are below.

a. *Use*
The proposed use of the building, as a hospital, is permitted within the IOZ.

b. *Dimensional Requirements*
The applicant has submitted a zoning assessment which documents that the project meets dimensional requirements related to building height, build-to lines, and setbacks *(Attachment E)*.

c. *Design*
New buildings within the IOZ are required to adhere to the design guidelines of the IDP. These design guidelines were written to promote campus cohesion, neighborhood compatibility, pedestrian-scaled edges, the use of high quality materials, the integration of gateway features, and quality of long-views. In their final submittal, the applicant has provided elevations *(Plans 32, 33, and 34)*, renderings *(Plans 36-43)*, and a design narrative addressing these guidelines *(Attachment JJ)*.

Caitlin Cameron, the city's Urban Designer, has documented the results of the city's review of the final plans *(Attachment 1).* This review generally finds that the building design meets the design standards of the IDP. Additional discussion on the building interface with the public realm is provided under the site plan review below.

d. *Signs*
Signs within the IOZ are required to conform to a unified, campus-wide signage plan and relate in proportion and character to building facades and adjacent street typology. In their final submittal, MMC has provided a master sign plan *(Attachment II).* Generally, the sign plan proposes to replace the existing sign program with new signs in the existing locations. Staff previously commented on consistency of design throughout the Maine Medical Center campus, scale of signs in relation to the pedestrian realm, traffic sight lines and safety at driveway locations, material selection, limiting the number of signs, and placement.

The final design review by Ms. Cameron includes a discussion of the master sign plan *(Attachment 1)*. In the final master sign plan submittal, the height and number of signs were reduced where possible in response to staff comment. The material was also revised to eliminate the stone veneer component; instead the signs use metal with consistent materials, text, lighting, and colors. Some discrepancies remain within the master sign plan, showing signs that have been removed from the project or showing different types of signs for the same location. In addition, staff do not support the large graphic introduced on the back side of the signs and find this to be inappropriate in these historic streetscapes.

Staff suggest a condition of approval that the master sign plan be updated to address five outstanding comments:

Correct any errors regarding sign placement or type

Remove the "Susie's Story" graphic and text components from the back of signs

Clarify shape and type of sign at the corner of Congress Street and Gilman Street

Remove street signs as shown on pages 30 and 31. Revisions to the blue H signage will be coordinated between staff and the applicant separate from this campus sign plan.

Provide documentation showing that signs proposed on Bramhall Street and Wescott Street are to be placed on MMC-owned property.

e. Transportation

The IOZ requires the submission of a Transportation Demand Management plan. The review of this TDM plan is discussed under site plan review below.

Per the IOZ, parking requirements are to be established at the time of site plan review based on a parking study that examines campus-wide supply and demand. In their final submittal, MMC speaks to existing and projected parking demand and supply in both their traffic and parking analysis *(Attachment J)* and in their TDM plan *(Attachment R)*. The previously-reviewed Employee Garage project, as well as the Visitor Garage expansion, have been designed to accommodate parking demand generated by the Congress Street hospital building.

f. Environment

The IOZ requires that development proposed by MMC be designed to integrate with the surrounding context. Review comments related to this standard can be found under site plan review below.

g. Mitigation Measures

The IOZ requires that MMC mitigate impacts to off-premise infrastructure in a manner proportionate to those impacts. Review comments related to this standard can be found under site plan review below.

h. Neighborhood Integration & Neighborhood Engagement

The IOZ also requires that MMC engage neighbors consistently through ongoing community engagement and through periodic and more intensive engagement during construction periods. MMC continues to hold regular meetings of the Expansion Group established to communicate with surrounding neighborhoods during construction and use their website, www.mmc.org/modernization, to communicate with the public more broadly. In addition, MMC and the surrounding neighborhoods are currently working on the formation of a standing Neighborhood Advisory Committee, as required under the IOZ. A draft of the charter for this committee is attached *(Attachment RR).*

i. Construction Management

A construction management plan is required under the provisions of the IOZ. The applicant has provided a revised construction management plan in the final submittal *(Attachment KK)*. Construction is proposed on a three-year timeline, with occupation estimated for fall of 2022. Demolition is proposed over a six-month period, progressing from west to east. Demolition debris would be processed in place and hauled from the site via truck. Construction will be accomplished using a tower crane; the pad is proposed to lie entirely on MMC property.

A dust control and monitoring plan is proposed, as is a noise mitigation plan and process for addressing noise concerns. The plan includes air quality monitoring and vibration monitoring provisions. The vibration monitoring provisions include site surveys on Gilman Street, A Street, and Congress Street, pre-construction baseline monitoring, and continuous monitoring during excavation. Given general concerns regarding vibration monitoring during construction, staff is requesting additional clarity around the site survey element of this approach. In accordance with the IOZ, the construction management plan also contains a communication component, including a plan for public noticing and processing construction concerns.

With respect to traffic movement during construction, the applicant has proposed to install a construction fence 12' off the existing Congress Street curbline and 10' from the Gilman curbline. Two-way traffic would be maintained on both streets. The south-side sidewalk along Congress Street would be closed, with pedestrian detours proposed for eastbound pedestrians at the Gilman/Congress intersection and for westbound pedestrians at the mouth of the MMC Visitor Garage. The sidewalk on the east-side of Gilman Street would also be closed. Trucks would enter the site through gates at the Congress/Gilman intersection, the existing garage entrance on Gilman Street, and the Forest Street/Congress Street intersection.

In the final submittal, the applicant has responded to previous staff comments regarding the provision of temporary pedestrian and bicycle infrastructure adjacent to the site on Congress Street during construction. A temporary sidewalk is not recommended by the applicant. They have committed to providing share-the-road signs on Congress Street and Gilman Street as a means of accommodating bicycle traffic. Thomas Errico, the city's consulting traffic engineer, has reviewed the final construction management plan and writes,

It is recommended that further discussion on the duration of the Congress Street sidewalk closures be included.

Supplemental pedestrian safety devices will be required during the sidewalk closure time period (to safely cross pedestrians for the sidewalk detour).

All sidewalk detours shall be ADA compliant.

Changes to the lane configuration on Congress Street west of Gilman Street is likely and may need to be included in the plan.

A significant amount of construction activity will be required for utility and street construction work and specific plans shall be development for review and approval.

A condition of approval has been suggested to address outstanding comments on the construction management plan.

X. SITE PLAN SUBMISSION REQUIREMENTS (Section 14-527)

The application has been reviewed against the submittal requirements of the site plan ordinance. In the final site plan submittal, MMC has identified several required federal and state permits. These include FAA permits for both the crane and the building, and amended Site Location of Development (SLOD) and Traffic Movement Permits (TMP), which are issued by the city under its delegated review authority from the state. SLOD and TMP reviews are discussed below. The FAA permits are outstanding. A condition of approval has been suggested to address this requirement.

In addition, the final site plans are not stamped by a professional engineer. An engineer's stamp is also suggested as a condition of approval.

XI. SITE PLAN REVIEW *(Section 14-526)*

The proposed development has been reviewed for conformance with the relevant review standards of the City of Portland's site plan ordinance. Staff comments are below.

1. Transportation Standards

a. Impact on Surrounding Street Systems

The proposed Congress Street medical building, although not designed to increase the number of patient beds at MMC, is anticipated to add 200 employees to the MMC campus by 2023 and 324 employees by 2026. Altogether, this increase in employees is estimated to generate over 100 AM, PM, and Saturday peak hour trips. As a result, a Traffic Movement Permit (TMP) is required.

It should be noted that previous MMC site plans reviewed by the city, including the 2013 Bean 2 addition, the East Tower and Visitor Garage expansion approved in early 2018, and the Employee Garage approved in mid-2018, have not individually met the trip generation thresholds for Traffic Movement Permits. As a result, TMPs were not required for those projects. However, as required under TMP regulations, the current TMP application does include analysis of previously approved expansions by MMC, including the Bean 2 addition, in order to assess total change in trip generation on the campus over the past ten years.

The trip generation estimated in the TMP application is based on a projected employment number for 2026, approximately five years following initial occupancy of the new medical building *(Attachment J)*. These trips have been assigned to the roadway network based on both existing employee travel data and observations of the existing transportation system. The traffic study has taken projected shifts in routing into account; for example, the demolition of the existing Employee Garage and the construction of the new Employee Garage on St. John Street will affect employee trips within the immediate study area, shifting traffic away from Gilman Street and towards St. John, and the addition of an entrance on Congress Street will also shift some traffic currently destined for the Bramhall entrance. Lastly, MMC has calculated trip generation associated with the proposed shuttle service from the Employee Garage on St. John Street to both the new north entrance and the existing Bramhall entrance. Mr. Errico has reviewed this methodology and writes,

> *The results of the traffic modeling analysis for area transportation roadways is based on the assumption that most MMC employees will parking in the proposed St. John Street parking garage and not utilize other parking options, particularly on-street. It is recommended that the Applicant provide documentation that employees are parking in MMC parking facilities and identify measures, to be reviewed and approved by City staff, to be implemented to address this issue. It is recommended that this documentation be provided in conjunction with TDM reporting requirements.*

A condition of approval has been drafted to address this comment.

As is customary, the traffic analysis includes a discussion of impacts to roadway capacity, including level of service (LOS) and queue analyses at 11 nearby intersections stretching from Park Street/St. John Street east to Bramhall Street/Congress Street and south to Valley Street/Commercial Street. The level of service analysis, which assumes some imminent changes in the roadway network, such as the elimination of the Congress Street/Valley Street signal, generally shows acceptable levels of service, with some marginal negative impacts, for example to overall level of service at the Congress Street/St. John Street intersection at the AM and PM peak hours. Other intersections, such as Park Street/St. John Street, are anticipated to improve in LOS in the post-development condition. Queue lengths are anticipated to increase on many intersection approaches. However, all intersection approaches studied are anticipated to operate at LOS D or better in the post-development condition.

The traffic analysis provides an examination of existing crash data within the study area for the most recent three-year period. This data shows that there are seven high crash locations within the area studied, including four intersections and three street segments. The traffic study includes an analysis of crash patterns observed at these locations, including pedestrian and bicycle collisions, and in some cases recommends modifications to roadway design, signal timing, or signs to mitigate safety concerns. Mr. Errico has reviewed the analysis and provides the following outstanding comments,

> *The Park Avenue/Valley Street intersection is a High Crash Location…Given significant future changes to the area, the Applicant shall conduct a monitoring study following the opening of the St. John Street Parking Garage and completion of the St. John Street improvements as required by Dunkin Donuts. The methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.*
>
> *The Congress Street/Gilman Street intersection is a High Crash Location. The Applicant suggests that the future removal of the traffic signal at Congress Street/Valley Street may mitigate crashes…The Applicant shall conduct a monitoring study of the intersection following removal of the traffic signal at Valley Street and the opening of the St. John Street Parking Garage. The*

methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.

The St. John Street/A Street is a High Crash Location. The Applicant suggests that traffic volume reductions may mitigate crashes. The new employee parking garage will increase traffic volumes in the area and may negatively impact conditions…The Applicant shall conduct a monitoring study of the intersection following the opening of the St. John Street Parking Garage. The methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.

Congress Street in the vicinity of the project has been classified as a High Crash Location. The Applicant has prepared an improvement plan that considers multi-modal activity/facilities in creating a safe Complete Street. It is my professional opinion that the proposed project will significantly alter the characteristics of the corridor and thus will change motorist behavior. Accordingly, I find the improvement plan to be acceptable with the following conditions:

- *The Applicant shall improve/enhance wayfinding to the existing MOB Parking Garage and the Visitor Garage. Advance directional signage should help to mitigate sudden stops that may have been a contributing factor in crashes. A signage plan shall be provided for review and approval by City staff.*

- *The Applicant shall conduct a monitoring study following the opening of the new Medical Office Building. If crash patterns are not mitigated, the Applicant is responsible for the development of a mitigation plan for review and approval by City staff. Implementation of the approved plan will be the responsibility of the Applicant.*

A condition of approval has been drafted to address these comments. With these conditions, Mr. Errico has recommended approval of a Traffic Movement Permit for the project *(Attachment 2).*

b. Access and Circulation

In the final submittal, the applicant has provided revised site plans, as well as a diagram for the pick-up/drop off area that shows proposed circulation patterns *(Attachment K)*. The final plans include modifications to curbing and striping along Congress Street between Valley Street and Weymouth Street, and on Gilman Street between A Street and Congress Street. Bruce Hyman, the city's Transportation Program Manager, has reviewed the plans and provides the following general comments,

The Applicant is responsible for relocation of utility structures (e.g. hydrants, catch basins, etc.) in order to implement the proposed design.

Provide final details for improvements in the right-of-way, including sidewalks, crosswalks, curb ramps, driveway aprons, detectable warning panels, curbing, tree wells, bus shelter, curb extensions, etc.

Revise striping plan to retain south side parking east of the Visitor's Garage entrance/exit to just west of Bramhall where the climbing lane will transition to Shared Lane Markings (centered in the travel lane). Show (north to south) an 8′ parking lane, 11′ travel lanes, a 6′ climbing bicycle lane, and an 8′ parking lane. This section should continue to Bramhall Street to the east. Please provide plans for restriping the entirety of Congress from Valley Street to Bramhall St/Deering Ave. The outside bike lane lines are to be dashed 6″ lines for a minimum of 50′ in advance of an intersection and through the intersection.

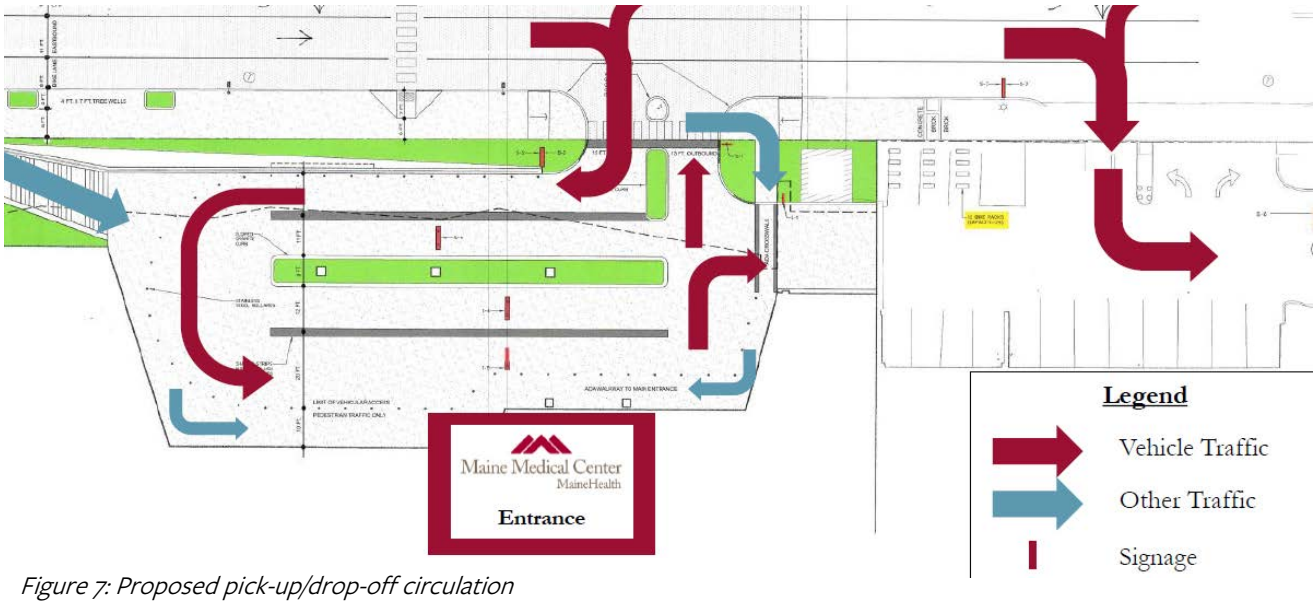


Figure 7: Proposed pick-up/drop-off circulation

> *16′ travel lanes are too wide for the WB approach to Valley Street. Retain existing westbound left turn pocket to Valley Street.*

A condition of approval has been drafted to address these comments.

Vehicle Access

Vehicles are proposed to access the site via a pick-up/drop-off loop located partially underneath the proposed building *(Figure 7)*. This turnaround is proposed with access from Congress Street through a two-way driveway with a center island, approximately 35' in width. Given the width proposed, which exceeds the technical standard, a waiver is required. This waiver is supported by staff.

The pick-up/drop-off area has been designed based on observations of MMC's existing Bramhall entrance. As proposed, the pick-up/drop-off would operate as a one-way, counterclockwise loop, with storage capacity for up to 11 vehicles. The loop would provide direct access to the front door, as well as the Visitor Garage to the east. Exiting visitors could access the loop directly from the Visitor Garage and from there exit to Congress Street.

Bicycle Access

As previously requested by staff, the final plans show a climbing eastbound bicycle lane on Congress Street. In his general comments above, Mr. Hyman has requested that this climbing bike lane be continued to Bramhall Street to the east. From the bicycle network, bicycles would enter the pick-up/drop-off loop integrated with vehicular traffic. Covered bicycle parking is proposed in the ground floor of the adjacent Visitor Garage. In his final review of the bicycle accommodations in the plan, Mr. Hyman writes,

> *Revise plans to show shared bicycle lane markings in the westbound travel lane on Congress Street from Deering Avenue to St. John Street, centered in the travel lane.*
>
> *Bike lanes are to be a minimum of 6′ adjacent to a parking lane.*

A condition of approval has been drafted to address these comments.

Pedestrian Access
The applicant's final submittal includes a Pedestrian Network Plan required as part of the approved IDP. This plan shows pedestrian connections and access points across the campus. Caitlin Cameron, the city's urban designer, has reviewed the plan and offers the following comments,

All diagrams should be updated to reflect proposed improvements not currently shown.

Future Pedestrian Network plan should include Western Promenade improvements associated with the garage site plan approval.

Sidewalk Material Plan should indicate future material rather than existing conditions.

Describe how the public circulation and access points will be indicated.

A condition of approval has been suggested to address these comments.

The final site plans include new concrete sidewalks on Congress Street and Gilman Street, which converge at an open plaza space at the northwest corner of the site. This plaza, which would lie adjacent to the employee shuttle bus pickup/drop off, is proposed in concrete as well, with granite seating walls rimming the two proposed planting areas. The plaza leads to a wide stair in granite, which provides direct pedestrian access to the main entrance via the turnaround above.

As noted previously, the applicant has proposed concrete sidewalks, although both the Congress Street and Gilman Street sidewalks are designated as brick in the City's sidewalk material policy. In their most recent submittal, MMC has clarified the need for a sidewalk material waiver within the Pedestrian Network Plan and provided a formal waiver request. Staff support the use of concrete sidewalk material in front of the new building on Congress Street and Gilman Street, given that the concrete sidewalks would provide continuity to the private plaza design. In the final plans, MMC shows granite banding within the sidewalks on Congress Street. A maintenance agreement for this granite banding has been suggested as a condition of approval. Final sidewalk details should also be provided as noted in comments above.

The applicant's final plans show sidewalk improvements not only in front of the proposed medical building on Congress Street, where a 14' sidewalk is proposed, but also west to the Valley Street intersection. Curb extensions are proposed at Congress Street and Valley Street to reduce crossing distances. In his review of the sidewalk design, Mr. Hyman writes,

Confirm that the design accounts for the fire hydrant on the northwest corner of Congress at Forest Street (the location of the proposed ramp serving the Congress St crossing)

Provide curb re-alignments, possibly to include curb extensions at southwest and northwest corners of Gilman and Congress. Further guidance will be provided.

Curb extension width should be maximum 6′ in extent (measured from curb line), using 10′ radii.

A condition of approval has been drafted to address these comments.

As requested, the applicant's final site plan also shows a sidewalk on the east side of Gilman Street extending south to A Street. A crosswalk is proposed at the A Street intersection. Of this sidewalk, Mr. Hyman writes,

Document clear sidewalk distance around remaining CMP pole and guy wire in proposed the Gilman Street sidewalk. Note that a 5' minimum sidewalk clear width is required around all obstructions in the sidewalk.

Staff has suggested a condition of approval to address this comment.

Within the proposed pick-up/drop-off area, pedestrians would access the front door via bollard-protected routes against the building face. The ADA-accessible route is proposed from the sidewalk at the northeast corner of the site.

Shuttle Access

The site plan application includes details regarding the proposed shuttle operations between the Employee Garage on St. John Street and the new medical building *(Attachment J)*. Employee access from shuttles to the medical building is proposed via card reader through doors at the northwest corner of the building. The Congress Street shuttle route would drop off and pick up employees from this door, operating on a counterclockwise loop via Valley Street, A Street, Gilman Street, Congress Street, and St. John Street. Altogether, MMC proposed to operate 13 shuttles on 15 minute headways during peak hours, seven of which would serve the Congress Street drop off area. A shuttle would also provide access from the Employee Garage to the Bramhall entrance with a route via Danforth, Vaughan, and the Western Promenade.

Staff has reviewed the shuttle drop-off design and raised some questions regarding the length of the queuing area proposed on Gilman Street, which is proposed at approximately 170' in length. Mr. Hyman writes,

The shuttle storage lane appears excessive in length. Please provide documentation on the number of shuttles likely to queue here at the same time (recognizing that the TMP application indicates that seven shuttles will run to this location on 15 minute headways.)

Final design of this area has been suggested as a condition of approval. It is assumed that, with the reduction in this queuing lane, all existing parking on the west side of Gilman Street in this location could be retained.

c. *Public Transit Access*

The site is located on several METRO routes, including METRO Route 1 with cross-peninsula service to Munjoy Hill, Route 9 with service to Deering and North Deering, the METRO Breez from the north, as well as the ShuttleBus Zoom from the south. There are existing transit stops on Congress at Gilman Street and Weymouth Street. Early in the site plan review for the Congress Street hospital building, METRO identified consolidation of these existing stops, in conjunction with their broader bus stop consolidation effort, as a priority for this stretch of Congress Street.

As requested, the final plans include a bus shelter on the south side of Congress Street, and a corresponding bus stop on the north side of Congress Street directly in front of the proposed medical building. The grading plan shows ADA accessible grades around the shelter site, with 5' of clearance in front of the shelter and 4.5' to the right-of-way line behind.

The final plans also show a stop on the north side of Congress west of Forest Street, which results in the loss of several parking spaces. METRO has confirmed that they would prefer an inline transit stop east of Forest Street in the outbound direction, which will mean that the loss of on-street parking is not necessary.

In his review of the transit facility design, Mr. Hyman writes,

Provide final details on METRO shelter, including distances to curb and property line. The shelter design may require further review.

Relocate the north side METRO stop to east of the Forest Street intersection, as METRO has indicated a preference for an inline westbound stop in this location. Show existing parking on north side in front of Salvage to remain from Forest Street to Gilman Street.

A condition of approval has been suggested to address these comments.

d. Parking

The hospital building is proposed with no on-site parking for employees. Instead, off-site parking would be provided at the Employee Garage on St. John Street, with shuttle and pedestrian access between this new facility and the employee entrance on Gilman Street. With regard to visitors, parking is proposed at the adjacent Visitor Garage. Access to this parking is proposed directly from the pick-up/drop-off loop. It should be noted that valet parking is also proposed from within the turnaround area.

On-street parking currently exists on the north side of Congress Street directly across from the proposed hospital building in the block between Gilman Street and Forest Street. As noted above, a condition of approval has been drafted to preserve this on-street parking. In addition, there is existing on-street parking on Congress Street east of the hospital building near Weymouth Street and on Gilman Street south of Congress Street, which is proposed for modification in the final plans. As noted above, staff has suggested striping changes in these areas. This will preserve on-street parking in these locations. Regarding the design of on-street parking more generally, Mr. Hyman writes,

On-street parking should generally be shown as a striped parking lane (individual spaces should not be delineated). The line may vary in off-set from the curb to define a narrower parking lane next to a bike lane (e..g., 7') or be wider (e.g., 8'-9') to reduce the width an adjacent travel lane (11'-12' through travel lanes desired, 9'-10' left turn lanes).

This comment has been addressed within the conditions of approval.

Twelve bicycle racks are proposed within the ground floor of the adjacent Visitor Garage, with access from the pick-up/drop-off turnaround. These racks would provide space for 24 bicycles. Almost 200 bicycle parking spaces are currently provided on the MMC campus.

e. Snow Storage

The submittal states that the applicant will contract with a property management company to remove snow from the site. A snow melting system is proposed within the pick-up/drop-off area.

f. Transportation Demand Management

Because MMC had not yet hired a TDM coordinator at the time of the preceding site plan review for the Visitor Garage and East Tower expansion, that site plan was approved with a condition that the applicant submit a TDM plan prior to issuance of a certificate of occupancy for the East Tower. To satisfy this condition, a TDM plan was included and reviewed under the site plan application for the Employee Garage at 222 St. John Street, then resubmitted under this application *(Attachment R)*. This most recent version of the TDM plan has been informed by MMC's TDM coordinator, and includes a summary of current employee commuting behavior, an analysis of baseline employee parking demand, and a description of existing TDM measures employed by MMC. In the short term, the plan targets a reduction in MMC's parking demand/employee ratio of 2% (or approximately 50 spaces, assuming no change in the number of employees) and in the long term, the plan targets a 5% reduction (or 114 spaces, assuming no change in the

number of employees). The plan lays out a series of strategies designed to achieve those targets, including full transit pass subsidies, implementation of a guaranteed ride home program, a reassessment of parking pricing in the mid-term, enhanced data collection, and improved education and incentives. Additionally, MMC has pledged in their TDM plan to participate in regional partnerships to improve employee travel choice. Annual monitoring reports will be provided to the city.

2. Environmental Quality Standards

a. Preservation of Significant Natural Features

The applicant has provided documentation to confirm that there are no critical habitats, conserved lands, or protected wetlands on the site *(Attachment 5)*.

b. Landscaping and Landscape Preservation

The final plans show five landscape zones, one of which is proposed to serve patients and visitors to the hospital through a roof garden, and the others of which are proposed at ground level on the Congress Street and Gilman Street frontages *(Plans 10 and 26-28)*. The applicant has shown low, evergreen plantings contained within a center island in the arrival area; evergreen climbers, evergreen groundcover, and accents of grass along Congress Street; and triangular seating areas with evergreen groundcover and accent feather reed grass in the plaza at the northwesterly corner of the site. Blueberries and bayberry are proposed along the Gilman Street sidewalk.

The final plans show five honey locust trees in raised tree wells along the Congress Street frontage and three honey locusts in raised tree wells along the Gilman Street frontage. Three serviceberries are also proposed on the Gilman Street frontage to the immediate south of the proposed building. The raised tree well design is proposed with right-angle corners, as opposed to the radius corners preferred by the city for maintenance reasons. Final staff comments include the following:

Staff has suggested a maintenance agreement surrounding the upkeep of these tree wells.

Staff has also suggested that street trees be added to the plans on the south side of Congress Street between Valley Street and Gilman Street. These trees should be specified as honey locusts, in keeping with those to the east of the Gilman Street intersection.

Staff further comments that planting areas adjacent to sidewalk should be designed to be viable and reflect urban environment and pedestrian patterns. These sidewalk-adjacent planting areas should be protected with a curb or planter wall edge to prevent wash out onto the sidewalk and protect the plantings from walking, plows. The planting areas shown on Congress Street and Gilman Street should be revised to include curb edges.

In addition, staff do not think the planting area shown adjacent to the Congress Street out-going driveway is viable and should be converted to concrete as an extended sidewalk where pedestrians will be entering the property.

Revisions to the landscape plans have been suggested as a condition of approval.

c. Water Quality/Storm Water Management/Erosion Control

Staff has also conducted a review of final stormwater management plans. It should be noted that the stormwater system for the medical building is subject to a condition of approval from the site plan review for MMC's East Tower vertical expansion. Over the course of this previous review, there was substantial discussion regarding the potential for hospital connection to separated storm drains in Gilman Street, as opposed to the existing combined system in Congress Street, which drains to the city's most active CSO.

Given existing grades and a complicated network of existing utilities, connection to the separated system was not deemed feasible. As a result, the East Tower was approved subject to a condition which requires that the stormwater system for this Congress Street building "add detention capacity in lieu of stormwater separation in order to reduce the burden of the existing and proposed development on the City's infrastructure."

In keeping with this condition, the Congress Street hospital building stormwater management plan addresses treatment standards, but also focuses on reducing the rate of runoff to the Congress Street combined sewer. The applicant's design includes a subsurface sand filter below the proposed turnaround area, which has been sized to detain and treat not only roof runoff from the proposed Congress Street building, but also the rooftop runoff from the existing Visitor Garage, which currently drains undetained to the combined sewer in Congress Street. During storm events, the subsurface sand filter would hold stormwater runoff prior to discharge to the combined sewer in Congress Street. In addition, the applicant has proposed a green roof treatment on the 2nd floor roof at the building's rear.

Mike Geuthle, of Wright-Pierce, the city's consulting civil engineer, has reviewed the plans, including the requested surface area waiver. Of this waiver, he writes,

General Standard: The applicant has provided information regarding the size and scope of the project indicating the project is subject to the Redevelopment Standard within the City of Portland.

The MaineDEP Stormwater BMP manual indicates that, "The surface area of the filter must be no less than the sum of 5% of the impervious area and 2% of the landscaped area draining to the system.". The proposed system exceeds this threshold in order to accommodate additional surface areas to meet other City goals.

The applicant has provided the following reasoning: 1. Limited sedimentation loading from impervious surfaces due to high percentage of roof areas; 2. Additional pre-treatment is provided in the form of an isolator row; 3. An additional amount of pre-treatment is provided for the garage location through an existing separator unit; 4. Through these three items, the proposed amount of nutrient loading, total suspended solids, and temperature pollution entering the system will be less than other permitted land uses entering the system.

Based on the information provided, we agree that the pollutant loading to the system is anticipated to be limited by the oversized pre-treatment devices, and by the large portion of roof surfaces which typically convey fewer pollutants than many other impervious surfaces.

One other concern is flow rate to the filter from large impervious surfaces. Materials testing during construction is recommended to confirm that the flow rate through the media will match the design permeability.

Regarding the plans in general, Mr. Geuthle writes,

Discharge to Combined Sewer Overflow (CSO) Locations: The applicant has provided information for pre-development and post-development flow rates to the combined sewer system for a 1-inch, 24-hour rain event. This storm event has been mentioned in previous discussions with the applicant and City Department of Public Works (DPW). The applicant has requested written confirmation from City DPW to ensure that all involved parties agree with evaluating this storm event for the CSO location, and has indicated that this confirmation will be provided as it becomes available. This item can be a condition of approval.

Connection to Existing System: The applicant has asked for a written or e-mail confirmation from the Department of Public Works that proposed connections to existing drainage and sewer systems are being completed in accordance with City of Portland Code of Ordinances section 14-526 (b) 3.a, subsection iii and iv. The applicant has indicated that this confirmation will be provided as it becomes available. This item can be a condition of approval.

Plan modifications:

i. *CB 13370 (NE Corner) and CB 12640 (SW corner) are existing basins that are located in proposed crosswalks. If these structures have eccentric cones, rotate them so they are outside of the crosswalk.*
ii. *Structures in ROW are proposed to have eccentric cones. A note should be added to the construction plans indicating that covers and frames should be rotated to be outside of wheel travel lane locations.*
iii. *Sheet C-11: SD-16 callout is obstructed or missing, and should be included on the construction plans.*
iv. *Sheet C-11: Existing Storm Drain Structure Data table shall be updated to include inlet from Pipe SD-13*
v. *Sheet C-11: Existing CB 13395 rim/frame/cover should be reviewed: Other CBs located in sidewalks are being raised and converted to Drainage Manholes (DMHs). Applicant shall confirm if this structure is to remain a CB or a DMH.*

A condition of approval has been suggested to address these comments.

3. Public Infrastructure and Community Safety Standards

a. *Consistency with Related Master Plans*
The site plan application is generally deemed consistent with related master plans.

b. *Public Safety and Fire Prevention*
The final plans include 8" fire service from the Gilman Street water main, as well as 8" fire service from the Congress Street main. The applicant has also provided a life safety plan which documents code compliance *(Attachment Z).* Robert Thompson, of the Fire Prevention Bureau, has reviewed the final plans *(Attachment 5).* He has noted that the address for the proposed building will be 900 Congress Street.

c. *Availability and Capacity of Public Utilities*
With respect to utilities, the applicant has proposed 6" domestic service from an existing water main in Congress Street, as well as 6" domestic service from a main in Gilman Street. A capacity letter from PWD has been provided *(Attachment AA).* Sewer service is proposed from existing 12" main in Gilman Street as well as an existing 12" main in Congress Street. Electrical service is proposed to run underground from existing above ground service on Gilman Street both the north and the south of the site. All utility poles along the Gilman and Congress frontages of the site would be removed.

Mr. Geuthle has reviewed the plans and writes,

The applicant has indicated that capacity to serve letters from utilities will be provided as they become available. [Note that the PWD capacity letter has been received.]This may be considered a condition of approval for the project. The Capacity to Serve process will require a level of coordination between the applicant and utility companies and typically includes compliance with applicable utility standards and details. Central Maine Power and Consolidated Communications should review the plan and verify the depiction of changes to primary electrical and communication lines, respectively

.

Minor modifications to utility layout and design from the capacity to serve process are anticipated, and shall be submitted to the City prior to construction.

The Applicant shall coordinate with the City should the utility layout plan include additional transformer units, pole relocations, or impacts to water or sewer infrastructure.

Sheet C-11: There appear to be conflicts with underground utilities at several structures and pipes. Applicant shall provide additional information for location of proposed utilities at the following pipes and structures: Storm Drain 9, Sanitary Sewer 9, Catch Basin 7, Catch Basin 10

A condition of approval has been suggested to address these comments.

4. Site Design Standards

a. Massing, Ventilation, and Wind Impact

The applicant has provided documentation with respect to the bulk, location, and height of the proposed building *(Attachment BB).* None of these features are deemed likely to result in ventilation or wind impacts.

b. Shadows

The applicant has also provided shadow studies from the MMC Institutional Development Plan *(Attachment CC).* These studies show that the project is not anticipated to result in shadows on publicly accessible open space.

c. Snow and Ice Loading

The applicant has provided documentation on snow and ice loading *(Attachment DD).* The project is not anticipated to result in snow or ice accumulation on public ways or adjacent properties.

d. View Corridors

The project does not abut a protected view corridor.

e. Historic Resources

The project does not lie within or adjacent to a historic district.

f. Exterior Lighting

In the final submittal, the applicant has provided lighting cut sheets for exterior lighting proposed in the plaza area and turnaround, as well as the upper level green roof and along the Gilman Street façade *(Attachment GG)*. All of these fixtures are either downlights or lights to be shielded beneath building or bench overhangs. The final plans also show new street lights on Congress Street.

The applicant has provided photometric plans that document the proposed average and maximum illumination levels. Waivers are necessary with respect to both of these standards. These waivers are supported by staff given the nature of the use involved, where 24-hour access by the public is necessary.

g. Noise and Vibration

The applicant has provided documentation stating that mechanical equipment will largely be located in the basement of the proposed building, with some HVAC units on the roof toward the interior of the campus and away from abutting properties *(Attachment HH)*.





Figures 7 and 8: View from Congress Street looking east, existing (above) and proposed (below)





Figures 9 & 10: Rendering of main entrance; Night rendering from Congress Street

i. Signage and Wayfinding

As noted above, the applicant has provided a revised campus-wide signage plan in the final submission *(Attachment II)*. New signs are proposed as part of the Congress Street medical building and are evaluated for consistency with the master sign plan. All three of these signs are proposed at Congress Street at the grade level and vary in scale for pedestrian and car wayfinding. A new sign appears at the gateway corner of Gilman Street and Congress Street is intended to both mask an existing utility box in this location and signal the main campus. The materials and design are consistent with the master plan. The CS.1 project monument sign facing Congress Street is proposed to be internally lit individual letters; other signs using punch through letters, also internally lit. Ms. Cameron has reviewed the sign plan and provides the following additional comments:

> *Justify the height of the CS.2 Building Identification sign at the driveway entrance which appears to be as tall as 14' at the sidewalk level.*
>
> *Clarify the shape and placement of CS.3 which is shown differently on different plans – will this screen the telephone box from both directions?*

These questions will be resolved through the proposed condition of approval regarding the master sign plan.

j. Zoning-Related Design Standards

The proposed building will replace the existing parking structure at Congress and Gilman Streets and occupy a dominant, gateway position on the MMC campus from the St. John Street approach from Congress Street. The overall building height, as observed in the long-view renderings, is not readily visible from most long distances. A future addition on top of this building will be more impactful on the long views of the campus.

The applicant sought preliminary staff guidance on the design approach for the building and plaza areas prior to submitting this site plan application. The resulting design provides a strong architectural statement at a prominent corner and fulfills the goals of the IOZ for a building that creates a new gateway on Congress Street with a character and material palette that is cohesive with the campus. The stated MMC vision includes integrating inside and outside – achieved here through the high level of fenestration, the entry under the building overhang, the atrium that connects to the street and the sky, the green roof, as well as a "50 year palette" that selects materials based on cues from nature to create timeless environment. This vision includes Sky, Sea, and Land as concepts for material/color selection. The building has a clear, solid base plinth on top of which is the more airy and transparent active and public spaces. The building overhang creates a contemporary form that makes a strong statement appropriate for the gateway location of the building but also gives the building a clear orientation to Congress Street. Cohesiveness is created with design elements found here and in the other recently approved Phase I projects – use of white materials and glass, vertical windows and articulation elements.

The staff design review memo provides a complete analysis of all the applicable design guidelines and staff review for the Congress Street medical building *(Attachment 1)*. This project was reviewed according to the adopted IOZ standards. Previously, staff and the board focused on the following topics:

- Building interface with the ground level and public realm, especially Gilman Street and the landscape design
- Level of activity as it relates to the IDP guidelines
- Legibility of entrance and pedestrian routes

- Building and site lighting, especially related to CPTED and safety concerns

Previously, the Board focused on the relationship of the building to the sidewalk and the legibility and accessibility of the entry. Some revisions were made to delineate pedestrian areas from vehicular areas; however, the paving pattern and banding do not reinforce or directly mark those areas. Curbing, landscape areas, and bollards are being used to direct pedestrians. No changes were made to the building entrance to address these comments.

Generally, staff find the building design to meet the standards and are comfortable with the activity and safety aspects of the building interface with the public realm.

The streetscape design uses elements already found in the existing Congress streetscape and that varies somewhat from the *Technical Manual*. The variations in street tree wells, sidewalk material, and details are acceptable since they are continuing patterns already established in this block on the MMC frontage. The bus shelter should match METRO standards for consistency with the Congress streetscape and system-wide legibility. The street lights on Congress Street will continue the downtown decorative fixture, with Gilman Street relying on cobraheads and building lighting. Gilman is not designated for decorative street fixtures.

XII. SITE LOCATION OF DEVELOPMENT REVIEW

As noted above, the Congress Street medical building is subject to review as an amendment to an existing Site Location of Development approval issued by the city under its delegated review authority. The applicant has submitted an amended Site Location application *(Attachment QQ)*. Findings of the review are summarized as follows.

1. *Financial and Technical Capacity*
   MMC has provided documentation of financial and technical capacity *(Attachment QQ)*.

2. *Traffic Movement*
   See discussion of Traffic Movement Permit under site plan review above.

3. *No Adverse Effect on Natural Environment*
   MMC has provided evidence that there will be no adverse impact on natural resources *(Attachment QQ)*.

4. *Soil Types*
   MMC has provided documentation that the proposed development will be built on soli types suitable to the nature of the project *(Attachment QQ)*.

5. *Groundwater*
   The review has found that the project meets state stormwater management standards *(Attachment 4)* and is not anticipated to impact groundwater resources.

6. *Infrastructure*
   MMC has provided evidence to indicate that they have made adequate provisions for utilities.

7. *Flooding*
   The project is not anticipated to cause flooding or an unreasonable flood hazard.

8. *Stormwater Management*
   As noted above, the review has found that the project meets state stormwater management standards *(Attachment 4)*. Third party monitoring of the installation of the stormwater system and erosion and

sedimentation control during construction shall be required.

XIII. STAFF RECOMMENDATION

Planning Division staff recommends that the Planning Board approve the proposed MMC Congress Street medical building at 900 Congress Street subject to the proposed motion and conditions of approval listed below.

XIV. PROPOSED MOTIONS FOR THE BOARD TO CONSIDER

A. WAIVERS

On the basis of the application, plans, reports and other information submitted by the applicant; findings and recommendations contained in the Planning Board report for the public hearing on December 17, 2018 for application 331-2018 relevant to Portland's technical and design standards and other regulations; and the testimony presented at the Planning Board hearing:

1. The Planning Board **finds/does not find**, based upon the consulting transportation engineer's review *(Attachment 2),* that extraordinary conditions exist or undue hardship may result from strict compliance with the *Technical Manual* standard *(Section 1.7.2.4)* which establishes a maximum driveway width of 24 feet for sites with two-way access, that substantial justice and the public interest are secured with the variation in this standard, and that the variation is consistent with the intent of the ordinance. The Planning Board **waives/does not waive** the *Technical Manual* standard *(Section 1.7.2.4)* to allow a driveway of 35 feet in width on Congress Street;

2. The Planning Board **finds/does not find,** based upon staff review, that extraordinary conditions exist or undue hardship may result from strict compliance with the *Technical Manual* standard (*Section 1.8)* which requires brick sidewalks on Congress Street and Gilman Street, that substantial justice and the public interest are secured with the variation in this standard, and that the variation is consistent with the intent of the ordinance. The Planning Board **waives/does not waive** the site plan standard (*Section 1.8)* to allow concrete sidewalks on Congress Street and Gilman Street;

3. The Planning Board **finds/does not find**, based upon the consulting civil engineer's review *(Attachment 4),* that extraordinary conditions exist or undue hardship may result from strict compliance with the *Technical Manual* standard (*Section 5.II)* which requires that redevelopment projects meet the Chapter 500 standards regarding BMP sizing requirements, that substantial justice and the public interest are secured with the variation in this standard, and that the variation is consistent with the intent of the ordinance. The Planning Board **waives/does not waive** the *Technical Manual* standard (*Section 5.II)* to allow a subsurface stormwater system with less surface area than required per the design criteria.

4. The Planning Board **finds/does not find,** based on staff review, that extraordinary conditions exist or undue hardship may result from strict compliance with the *Technical Manual* standard (*Section 12.2.3)* which establishes average and maximum illumination levels of 1.25 footcandles and 5 footcandles respectively, that substantial justice and the public interest are secured with the variation in this standard, and that the variation is consistent with the intent of the ordinance. The Planning Board **waives/does not waive** the *Technical Manual* standard *(Section 12.2.3)* to allow an average illumination level within the green roof area of 1.84 footcandles and average and maximum illumination levels on the street frontage of 1.34 and 5.4 footcandles respectively.

B. TRAFFIC MOVEMENT PERMIT

On the basis of the application, plans, reports and other information submitted by the applicant; findings and recommendations contained in the Planning Board Report for the public hearing on December 17, 2018 for application 331-2018 relevant to Portland's technical standards and other regulations; and the

testimony presented at the Planning Board hearing, the Planning Board finds that the proposed plan **is/is not** in conformance with 23 MRSA 704-A and Chapter 305 Rules and Regulations pertaining to Traffic Movement Permits, subject to the following conditions of approval, which must be met as follows:

1. In conjunction with TDM reporting requirements, the applicant shall provide documentation regarding employee parking patterns. Should this documentation show that rates of employee use of the St. John Street garage are lower than anticipated, MMC shall identify measures to be implemented to address this issue for review and approval by the Department of Public Works and Planning Authority;
2. Within three months following full occupancy of the Employee Parking Garage on St. John Street and the completion of the St. John Street improvements as required by Dunkin' Donuts, the applicant shall conduct a monitoring study of the Park Avenue/Valley Street intersection, with methods and scope to be approved by the Department of Public Works. Should the monitoring study show that safety-related improvements are necessary, the applicant shall design and implement such improvements with the review and approval of the Department of Public Works and Planning Authority;
3. Within three months of the removal of the traffic signal at Valley Street and full occupancy of the Employee Garage at St. John Street, the applicant shall conduct a monitoring study of the Congress Street/Gilman Street intersection, with methods and scope to be approved by the Department of Public Works. Should the monitoring study show that safety-related improvements are necessary, the applicant shall design and implement such improvements with the review and approval of the Department of Public Works and Planning Authority;
4. Within three months following full occupancy of the Employee Garage on St. John Street, the applicant shall conduct a monitoring study of the St. John Street/A Street intersection, with methods and scope to be approved by the Department of Public Works. Should the monitoring study show that safety-related improvements are necessary, the applicant shall design and implement such improvements with the review and approval of the Department of Public Works and Planning Authority;
5. The applicant shall submit a plan for improving wayfinding to the existing MOB Parking Garage and the Visitor Garage on Congress Street in order to help mitigate sudden stops within this section of roadway for review and approval by the Department of Public Works and the Planning Authority and Planning Authority; and
6. Within one year of certificate of occupancy, the applicant shall conduct a monitoring study. If crash patterns are not mitigated, the applicant shall develop and implement a mitigation plan with the review and approval by the Department of Public Works and Planning Authority.

C. DEVELOPMENT REVIEW and SITE LOCATION OF DEVELOPMENT

On the basis of the application, plans, reports and other information submitted by the applicant; findings and recommendations contained in the Planning Board Report for the public hearing on December 17, 2018 for application 331-2018 relevant to the site plan regulations and *Technical Manual* standards; and the testimony presented at the Planning Board hearing, the Planning Board finds that the plan **is/is not** in conformance with the site plan standards of the land use code, the MMC IOZ Regulatory Framework, and the Site Location of Development standards within the *Technical Manual,* subject to the following conditions of approval, which must be met as follows:

Prior to building permit application:

1. The applicant shall provide final, revised site plans and details, stamped by a licensed professional engineer, addressing the comments of the city's Transportation Program Manager

with respect to multi-modal access and circulation, public transit access, and on-street parking for review and approval by the Department of Public Works and the Planning Authority;

2. The applicant shall submit revised landscape plans addressing street tree and sidewalk planting area comments for review and approval by the City Arborist and the Planning Authority;
3. The applicant shall provide documentation from the Department of Public Works with respect to the storm event modeled within the stormwater management calculations and proposed connections to existing drainage and sewer systems for review and approval by the Planning Authority;
4. The applicant shall provide final, revised utility plans addressing the comments of the city's consulting civil engineer with respect to catch basin locations and conflicts, callouts, inlet information, conversion of catch basins to drainage manholes, and underground utility conflicts for review and approval by the Department of Public Works and Planning Authority;
5. The applicant shall provide evidence of sewer capacity for review by the Planning Authority, and any utility modifications post-approval shall be submitted to the Department of Public Works and Planning Authority for review and approval;

Prior to the issuance of a building permit:

1. The applicant shall provide evidence of license agreements for proposed building encroachments into the right-of-way, including proposed footings and building overhangs, for review and approval by Corporation Counsel and the Planning Authority;
2. The applicant shall provide a revised Construction Management Plan addressing comments related to vibration monitoring, maintenance of traffic, and provisions for right-of-way work for review by the Department of Public Works and the Planning Authority;
3. The applicant shall provide evidence of FAA approvals for review by the Planning Authority;

Prior to the issuance of a certificate of occupancy:

1. The applicant shall provide evidence of a public pedestrian easement for all areas of sidewalk that are proposed on private property for review and approval by Corporation Counsel and the Planning Authority;
2. The applicant shall provide a final, recorded maintenance agreement for the granite banding proposed within the Congress Street sidewalk and raised tree wells to be reviewed and approved by Corporation Counsel and the Planning Authority;
3. The applicant shall submit a revised master sign plan addressing staff comments related to sign size, design, and placement for review and approval by the Planning Authority;
4. The applicant shall provide a revised Pedestrian Network Plan, including updated diagrams, proposed Western Promenade improvements, sidewalk materials, and public circulation and access points for review and approval by the Planning Authority.
5. A licensed engineer in the state of Maine shall provide certification that the stormwater system is installed according to plan and that there are weekly reports confirming compliance with erosion and sedimentation measures during construction for review and approval by the Department of Public Works and Planning Authority;
6. The developer/contractor/subcontractor must comply with conditions of the construction storm water management plan and sediment and erosion control plan based on City standards and state guidelines. The owner/operator of the approved stormwater management system, and

all assigns. shall comply with the conditions of Chapter 32 Storm water including Article III, Post Construction Stormwater Management, which specifies the annual inspections and reporting requirements. A maintenance agreement for the stormwater drainage system shall be submitted for review by Corporation Counsel. Once approved, the document shall be signed and recorded at the Cumberland County Registry of Deeds, with copies to both the Planning Authority and the Department of Public Works.

X. ATTACHMENTS

PLANNING BOARD REPORT ATTACHMENTS

1. Urban Designer review (notes from Caitlin Cameron, 12/13/18)
2. Traffic Engineer review (memo from Thomas Errico, 12/13/18)
3. Transportation Program Manager review (memo from Bruce Hyman, 12/13/18)
4. Civil Engineer Review (memo from Mike Geuthle, 12/13/18)
5. Fire Prevention Bureau review (memo from Mike Thompson, 12/12/18)

PUBLIC COMMENT

PC1. Karen Snyder 10/24/18
PC2. Tim McNamara 11/13/18

APPLICANT'S SUBMITTALS

A. Project Description
B. Completed Application Checklist
C. Right, Title, & Interest
D. Evidence of State and Federal Approvals
E. Zoning Assessment
F. Existing and/or Proposed Easements
G. Waiver Requests
H. Financial Capacity
I. Technical Capability
J. Transportation Analysis
K. Access and Circulation
L. Loading and Servicing
M. Sidewalks
N. Public Transit
O. Off-Street Parking
P. Bicycle Parking
Q. Snow Storage
R. TDM Plan
S. Preservation of Significant Natural Features
T. Landscaping and Landscape Preservation
U. Site Landscaping
V. Parking Lot Landscaping
W. Street Trees
X. Water Quality
Y. Consistency with City Master Plans
Z. Public Safety and Fire Prevention
AA. Adequacy of Public Utilities
BB. Massing, Ventilation, and Wind Impact
CC. Shadows
DD. Snow and Ice Loading

EE. View Corridors
FF. Historic Resources
GG. Exterior Lighting
HH. Noise and Vibration
II. Signage and Wayfinding
JJ. Zoning-Related Design Standards
KK. Construction Management Plan
LL. Neighborhood Meeting Minutes 10/17/18
MM. MMC Planning Board Workshop Presentation 10/25/18
NN. Pedestrian Network Plan
OO. Response to Comments 10/30/18
PP. Response to Comments 11/27/18
QQ. SLOD Application
RR. Draft NAC Charter

PLANS

Plan 1. Boundary Survey
Plan 2. Boundary Survey
Plan 3. Boundary Survey
Plan 4. Demolition Plan
Plan 5. Overall Site Plan
Plan 6. Site Plan, Upper Congress
Plan 7. Site Plan, Mid-Congress
Plan 8. Site Plan, Lower Congress
Plan 9. Site Plan, Gilman
Plan 10. Site Plan, Green Roof
Plan 11. Utility Plan
Plan 12. Utility Plan, Main Entrance
Plan 13. Plan and Profile, Utility Corridor
Plan 14. Grading Plan, Upper Congress
Plan 15. Grading Plan, Lower Congress
Plan 16. Grading Plan, Gilman
Plan 17. Level B Foundation Drainage Plan
Plan 18. Level B Foundation Drainage Plan
Plan 19. Level 1 Foundation Drainage Plan
Plan 20. Details
Plan 21. Details, Stormwater System
Plan 22. Details, Stair Section
Plan 23. Wall Details
Plan 24. Erosion Control Plan
Plan 25. Details, Public Sewer and Storm Drain
Plan 26. Landscape Plan, Upper Congress
Plan 27. Landscape Plan, Lower Congress
Plan 28. Landscape Plan, Gilman
Plan 29. Pre-Development Campus Watershed Plan
Plan 30. Post-Development Campus Watershed Plan
Plan 31. Post-Development Watershed Plan
Plan 32. Exterior Elevation, North
Plan 33. Exterior Elevation, West
Plan 34. Exterior Elevation, South

Plan 35. Rendering
Plan 36. Rendering
Plan 37. Rendering
Plan 38. Rendering
Plan 39. Rendering
Plan 40. Rendering from 295
Plan 41. Rendering from 295
Plan 42. Congress Street Entrance Rendering
Plan 43. Level B Plan
Plan 44. Level 1 Plan
Plan 45. Level 2
Plan 46. Level 3
Plan 47. Level 4
Plan 48. Level 5 Plan
Plan 49. Level 6 Plan
Plan 50. Level 7 Plan
Plan 51. Building Section
Plan 52. Bed Floor plan- Area Overhang
Plan 53. North Façade Calculations

Planning and Urban Development Department
Planning Division

Subject: IOZ Design Review – 22 Bramhall (Maine Medical)

Written by: Caitlin Cameron, Urban Designer

Date of Review: Thursday, December 13, 2018

This memo summarizes the applicable design guidelines and staff review for the project at 22 Bramhall Street – Congress Street Medical Building. This project is reviewed according to the adopted IOZ IDP and Regulatory Framework standards.

The new hospital building will replace the existing parking structure at Congress and Gilman streets and occupies a predominant, gateway view of the MMC campus from the St. John Street approach to the city on Congress Street.

Design Review Comments (*questions/comments and unmet guidelines in red*)**:**

IDP Design Guidelines

1. New buildings will be designed to contribute to the campus vision and organizational goals identified in the Master Facility Plan and the Transportation Plan, and best practice design standards for healthcare.

The applicant sought preliminary staff guidance on the design approach for the building and plaza areas prior to submitting this Site Plan application. The resulting design provides a strong architectural statement at a prominent corner and fulfills the goals of the IOZ for a building that conveys a gateway campus edge with a character and material palette that is cohesive with the campus.

The stated MMC vision includes integrating inside and outside – achieved here through the high level of fenestration, the entry under the building overhang, the atrium that connects to the street and the sky, the green roof, as well as a "50 year palette" that selects materials based on cues from nature to create timeless environment. This vision includes Sky, Sea, and Land as concepts for material/color selection. The white metal panel and large curtain wall system intend to evoke the "sky" – light, recessive, neutral. The white material was also selected to tie into the existing metal panel as well as meet goal of a cohesive campus design seen in the other recently approved Phase I projects.

2. The overall composition and experience of the campus will be considered for cohesive identity from approaches along Congress Street and I-295.

The overall building height, as observed in the long-view renderings, is not very visible from most long distances. A future addition on top of this building will be more impactful on the long views of the campus. This proposed building is seen most immediately in the context of the red brick buildings already on campus. This building is decidedly contemporary and has a different character from the existing brick buildings – that being said, they are not found to be

incompatible and the understanding is that this and future buildings are being used to define a new vision and character for Maine Health. From Congress Street, the metal screens on the neighboring garage have some visual cohesion with its lighter, grey material, vertical articulation elements.

Approval of the East Tower design was based on an understanding that it would be visually cohesive with this Congress Street building. This proposal is consistent with the character presented in that past review. The material palette and fenestration patterns, the high transparency and bringing the outside in are intended to be a cohesive element throughout the campus and also serve the goal of best practice for healthcare in terms of internal organization and quality of spaces. Given the large scale of the building and its prominence on the corner and Congress Street, staff review this project as defining the character for the campus moving forward.

3. Building entrances will be oriented toward, located adjacent to, accessible from, a sidewalk in a public right-of-way to create a pedestrian-oriented environment.

There are two entrances for this building – a staff entrance at the corner of Gilman and Congress streets, and the more public hospital entrance for vehicles and visitors mid-block on Congress Street. For the Gilman entrance, this is turned to Gilman to signify that it is a secondary/staff entrance and not the primary entrance to the building. It is emphasized with a recess and glazing and is directly accessible from the street and where the shuttle pick-up/drop-off will be. The primary entrance, while oriented to Congress Street, is combined with a vehicular drop-off and is deeply recessed from the street. The grade change of the site and Congress Street provide additional challenges to the accessibility of this entrance – the entry floor is at the higher grade than at the Gilman corner. The design attempts to bring legibility and emphasis to this main entrance through the massing, orientation of fenestration, the building overhang, the large atrium, and lighting. The landscape elements and signage are also intended to direct visitors to this entrance including a direct stair from lower Congress up to this level. Staff suggested some revisions to improve the pedestrian safety and access in this design – using visual cues and paving to delineate pedestrian and vehicular realms, placing signage to not limit sight lines for the driveway, clear pedestrian path from sidewalk to entrance.

4. Building designs will relate to and be compatible with the existing, or – in areas of change – planned character of residential and commercial neighbors. Design elements and characteristics to consider include:

- Building placement and relationship to the street

- Overall massing and scale

- Roof forms

- Proportion, directional expression, and composition of facades

- Rhythm of solids to voids

- Rhythm and proportion of openings

- Rhythm of entries and projections

- Relationship of materials, texture, and color

The institutional use is anomalous within the streetscape and neighborhood – it is therefore appropriate for the building to convey this use and have a contemporary expression while at least being compatible, not replicating, the mixed-use and residential character of the surrounding streetscapes. The buildings on the MMC campus are larger in length and height than the surrounding context – scaling elements and sensitive relationships to the street are important for this interface with neighboring residential and low-rise mixed-use buildings.

The project sits at the corner of Gilman and Congress streets and must therefore mediate between those two contexts. Gilman is a quieter street that becomes predominantly residential on one side. This has traditionally been and continues to be a "B" street, especially given the grade change, with less active uses and façade treatments. The proposal appropriately places the active staff entrance at the corner and maintains the street wall but the building edge is a solid, inactive wall. There is some activity, visual interest, and liveliness brought through the upper floors. The building adequately conveys this as a side elevation and places emphasis on its Congress Street orientation as the main street.

The approach on Congress Street is the most critical and the building placement, massing, and overall character are successful in creating a gateway experience that is appropriately orient to Congress Street, indicates the entrances, and provides visual interest. The material palette, massing, fenestration patterns, and overall design character convey the institutional use, expresses its time, and achieve the goals of holding the corner, creating urban street walls, and setting up a gateway experience while allowing for the space at the ground level to mitigate and transition the scale impacts of this long building.

5. Façade materials of buildings will be of high quality, and contribute to an attractive public realm.

The materials are of high quality – stone veneer, metal panel, glass – and contribute overall to the public realm. The material palette is used in a way that alleviates the scale and length of the building, providing visual interest and activity while also conveying the nature of the uses inside. The palette is definitively contemporary and appropriate to the institutional use and sets itself apart from the existing context of predominantly mixed-use and residential buildings.

*6. The design process will **consider long views** of new buildings including roofs and associated structures to minimize visual impacts and **provide visual interest**. Rooftop appurtenances will be either screened from view or integrated into the building design, and will not be visible from adjacent streets, Western Promenade, or the Congress Street approach (helipad excluded).*

Staff find the building has little visibility from long views into the city. It is not anticipated this phase of the building will be readily visible from the Western Prom. The approach on Congress Street is the most critical and the building placement, massing, and overall character are successful in creating a gateway experience that is appropriately orient to Congress Street, indicates the entrances, and provides visual interest. The long façade on Congress Street is made visually interesting with the fenestration pattern, massing, and "layering" of the floors and material palette.

Some rooftop mechanicals are housed in an area setback to the interior of the lot and are adequately integrated into the building forms. However, there are some small rooftop appurtenances are not included in the rendered images – there will be some stacks that poke

through this roof. From the ground level, these will not be visible. But it is important to consider that the roof as perceived from above will not be as flat and clean as shown. There is also a green roof section of the building, but again, its height and position mean it will not be viewed from many places. The building is low and difficult to perceive from the long views – a future phase addition is also intended above this building.

7. Vibrant, contributing and sustainable active ground floors will be provided to add activity and a sense of place to the priority node identified in the City's Comprehensive Plan.

The site is at a corner with two street facades but also has significant grade changes meaning there are essentially two floors of the building that meet the street. The building also programmatically requires a whole basement level be dedicated to housing mechanical uses. These grade changes and the mechanical uses on the lower ground level of Gilman and a portion of Congress Street make it challenging to create active uses at the lower street level. See comments in Guideline 8.

The upper Congress Street ground floor is much more active because it houses the vehicular entrance to the visitors garage, vehicular drop off for the hospital and the primary hospital entrance.

8. In areas where the occurrence of limited blank facades along public rights-of-way are unavoidable due to changes in topography or building use requirements, the following strategies will be used to mitigate visual impact:

- providing elements of visual interest along any black walls facing public streets, and,

- working with the City of Portland to ensure adequate lighting of public sidewalks to create a safe pedestrian experience.

The lower level (mechanical floor) includes some blank facades. Proposed strategies to alleviate this condition include the staff entrance at the corner, the windows into the circulation area, the open, landscaped plaza, and the highly fenestrated upper floors. Some visual interest at the Gilman Street interface will come from a textured material, the recessed entrance. The site and building lighting is designed to highlight the landscape and building materials – the lighting is recessed wall lights that wash down towards the sidewalk providing some illumination of the walking surface but also a landscape feature. These light features will also highlight the stairway and entrance area directing pedestrians towards the main entry. The street lights will provide sufficient sidewalk lighting for safety.

When it comes to the inactive level facing Congress Street, the proposed strategy includes three windows into the circulation space, the plaza space, landscape buffers between the sidewalk and the blank wall, and again, some seaming and texture in the material. Staff are generally satisfied with this approach given the constraints thought the City Arborist has yet to weigh in on the plant selection.

9. Any parking structure within the IOZ will . . .: Not applicable

Building Relationship to Public Street

1. ***Urban Main Street (Congress Street)***
   MMC buildings abutting Congress St will be designed to:
   - *Provide urban-levels of density*

- *Create an urban street wall that provides a sense of enclosure to the public realm*
- *Have their primary orientation towards Congress Street*
- *Activate the public sidewalk with building entrances, lobbies, etc.*
- *To the extent possible, given programmatic needs, provide visual interest and ensure pedestrian safety with views into and out of the building along the public sidewalk*
- *To the extent possible, given programmatic needs, provide space for community-oriented uses such as services or retail that can be shared between MMC users, neighbors, and the broader Portland community*
- *Support the existence of neighborhood amenities such as restaurants and other retail uses providing services to local residents and employees both during the day and evening hours.*

The building's primary orientation is towards Congress Street. The new building is closer to the street than the existing condition, and while still setback from the property line, a strong street wall is created that is angled to create an appropriate gateway orientation to those entering the city but also allows space for a ground floor public plaza interface and buffer given the height of the building. The building is activated by the primary entrance and atrium/lobby on Congress Street. The staff entrance at the corner provides some level of activity while remaining deferential to the more public and visible entrance mid-block. That entrance is further emphasized with the fenestration, recess, lighting, and direct stairway. Where program precludes active uses and visibility, the landscape plaza provides a public amenity between the sidewalk and the building. The landscape design is intended to soften and mitigate the absence of active uses within this portion of the building. The massing of the building provides an overhang and sense of enclosure.

3. Local Residential Street (Gilman Street)

The building design appropriately places the staff entrance and shuttle pick-up/drop off at the Congress Street commercial corner. As the building turns up the street, it becomes less active – the building interface is a minimal building wall and the sidewalk ends into landscape area. This is similar to the existing condition and provides an appropriate transition to the more private, residential portion of the street – the activity, high levels of fenestration, and lighting are most appropriate close to the Congress Street commercial corridor. The sidewalk was extended here to A Street with a crosswalk as requested by staff.

Crime Prevention Through Environmental Design (CPTED)

MMC will incorporate the following design strategies that have been demonstrated to deter crime:

- *Providing a clean and aesthetically pleasing campus environment that is designed with vandal-resistant materials*
- *Providing clear and properly-sized signs in safe locations to ensure safe wayfinding*
- *Ensuring that paths from transit stops, bike storage areas, and parking areas to main pedestrian entrances are well-lit, with clear sight lines*
- *Designing street-level elevations to minimize potential hideouts*
- *To the extent possible, given clinical program demands, providing views in and out of building ground floors populated by users to serve as "eyes on the street"*
- *Generating foot traffic on public sidewalks with pedestrian entrances*

The mechanical uses on the ground level of Gilman and a portion of Congress Street create some CPTED challenges because active ground floor uses are not possible here to generate foot

traffic or provide views in and out of this level. Proposed strategies to alleviate this condition include the staff entrance at the corner, the windows into the circulation area, the open, lit plaza, and the highly fenestrated upper floors, as well as the transit shelter. These components, while not as active as commercial space, will provide some activity and "eyes on the street" in the absence of very active ground floor uses. The shuttle pick up/drop off will also be on Gilman Street, creating additional activity.

The upper level of Congress Street is much more active/public with a lobby and includes high levels of fenestration and lighting – staff are do not have CPTED concerns in this location.

It is important to provide adequate lighting and sight lines on Gilman given the inactive nature of the ground floor and that the street character is smaller and residential. The combination of street lighting and feature landscape lighting will provide sufficient light levels for safety and sense of activity while also providing some moments of visual interest by highlighting material textures, plantings, and the stairway up to the entrance level.

Mitigating Impacts Through Design

Minimizing Shadow Impacts - Shadow impacts were evaluated as part of the IDP process. The proposed project is shorter but also closer to the street than the existing garage. The impacts as shown in the IDP figures 5.17 through 5.20 show that additional shadow is created on the street year round and also for one residential building in the winter by this building.

Context-Sensitive Lighting Design – Site lighting is proposed to be a combination of building lighting and landscape strip lighting under the planter walls. The applicant provided renderings of the building at night to reflect the character of that building lighting – the lighting does put emphasis on the main entrance and large atrium space while downplaying the staff entrance. Building lighting in combination with the street lighting on Gilman will ensure adequate light levels for the sidewalk activity. Photometric plans show adequate lighting levels on the sidewalks and plaza areas. Signage will include internally illuminated letters – staff are not concerned about this approach.

Mitigating Wind Impact – No information was provided to evaluate this item.

Preserving and Enhancing Viewsheds – The building expansions do not impact Western Promenade viewsheds. This expansion does not significantly increase the visibility of the campus from long views (see application materials). In those few instances where the East Tower and new medical building are visible together, the applicant hopes that the design elements (materials, colors, window patterns) will create campus cohesion. The building's impact is most significant on Congress Street and the westerly approach. Staff consider this building design and placement to meet the intent of enhancing the viewshed by creating a more significant and active gateway to the campus and Congress Street generally.

Regulatory Framework

(c)1. Mixed Uses: . . . *healthcare facility development fronting onto Congress Street and St. John Street shall activate the public realm, to the extent able, with uses such as service and retail/restaurant, landscaping, active building entrances, pocket parks, etc., on the ground or other publicly accessible level, consistent with the design intent contained in the approved IDP. . .*

The building includes several programmatic needs fronting onto Congress and Gilman streets – the biggest challenge is accommodating the mechanicals that occupy the entire lower level of this building. The program otherwise includes "back of house" staff spaces and the more public hospital spaces. Uses such as retail are not able to be accommodated in this case.

In the IOZ, this portion of Congress Street is identified to include both "Street activation through the location of entrances, windows, etc." at the corner of Gilman and Congress and "Limited blank facades" (Figure 5.15 Frontage: Types of Activation) mid-block. Gilman Street does not have an activation designation other than at the corner.

The grade and program limit the amount of active frontage on both Gilman and Congress streets. The project meets this standard in the followings ways:

- Entrances: The Gilman Street corner (with the "Street activation" designation) is activated with the employee entrance that is scaled appropriately to the façade and includes transparency. Uphill at a different grade, Congress Street includes the main entrance into the new medical building for both pedestrians and cars. This entrance is emphasized with high levels of fenestration, signage, a direct stair from the plaza area, and building lighting.
- Fenestration – the Gillman/Congress corner includes some fenestration where staff entrance and circulation is taking place. Otherwise, these facades are not able to provide fenestration due to the mechanicals at this level.
- Landscape – Since active uses are not possible at the Gilman/Congress level, enhanced landscape and plaza space is proposed with seating height walls, plantings, lighting, paving pattern, and direct stair to the upper level, more active building entrance.

On Gilman Street, other than the staff entrance at the corner, the façade is blank. The applicant's design strategy is to treat the ground level as a solid, rock-like foundation with a stone veneer material that has a scale and texture that provides some articulation and visual interest. However, the applicant claims it is not possible, given the mechanical uses and grade changes, to add elements such as doors, windows, or active uses on this façade. The upper floors will be active day and night with staff circulation, offices, and break rooms on this end of the building.

(e) Design: *New buildings within the IOZ shall adhere to the Design Guidelines set forth in Chapter 5: Design of the IDP and the site plan standards of the City of Portland.*

See section above and Planning Board report regarding these referenced standards.

(f) Signs: . . . *a unified campus-wide Signage Plan shall be submitted for review and approval by the Planning Authority. . . . Signs shall be designed in accordance with the campus-wide Signage Plan. All signs shall be designed in proportion and character with building facades and adjacent street typology. All signs shall be coordinated with the building and landscaping design and be constructed of appropriate, permanent, high quality materials and finishes.*

- Campus-wide Signage Plan: The draft campus-wide signage plan is included in this submission. Staff had the following comments:
  - Signs will not be permitted on properties not owned by MMC – remove the proposed sign on City property at Bramhall Square on page 13. Provide evidence of permission to install sign on property on Bramhall Street not owned by applicant.
  - Sight line analysis was provided for signs adjacent to driveways – concerns have been addressed.
  - There are concerns about the height of some monument signs - sight lines and pedestrian scale are factors here. Generally, these were reduced in scale except for the sign on Congress Street adjacent to the driveway which

will be near 14' tall next to the sidewalk – provide justification for the height of that sign.
    - Generally, correct discrepancies found in the plans.
- Individual Sign Design:
    - South parking lot signage: Sign was revised – one sign only as requested.
    - CS.1: Size was reduced, lighting will be internally illuminated letters
- Materials and Finishes: The materials and finishes include painted aluminum with either plastic push through letters for monument signs or surface applied vinyl copy for signs attached to the building, fences, or walls. In some cases, the existing steel supports are being re-used which is dictating the width and proportions of the signs. These materials and finishes meet the standard. Stone veneer was removed from the palette.

Portland Maine Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

PNP comments

Caitlin Cameron <ccameron@portlandmaine.gov> Fri, Dec 14, 2018 at 11:29 AM
To: Helen Donaldson <hcd@portlandmaine.gov>

Here is what I suggest for a ped network condition of approval as a master plan document that will be reference in future phases:

Prior to issuance of building permit:
The Pedestrian Network Plan shall be revised and submitted for approval by Planning Staff in the following ways:
- All diagrams should be updated to reflect proposed improvements not currently shown
- Future Pedestrian Network plan should include Western Promenade improvements associated with the garage site plan approval
- Sidewalk Material Plan should indicate future material rather than existing conditions
- Describe how the public circulation and access points will be indicated

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Portland Maine | Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

MMC Office Building Final Traffic Comments

Tom Errico <thomas.errico@tylin.com> Thu, Dec 13, 2018 at 10:40 AM
To: Helen Donaldson <HCD@portlandmaine.gov>

Hi Nell – The following is a status update on prior comments and represent Final Traffic Comments. I have separated the comments that are associated with issuance of a Traffic Movement Permit.

Traffic Movement Permit

The following comments and Conditions of Approval are associated with issuance of a Traffic Movement Permit. The review of the project was based upon the project meeting safety and congestion standards contained in the Permit regulations. These standards include:

Unsafe conditions. Road segments, intersections, or development entrances and exits may be deemed as unsafe when traffic encounters conditions such as, inadequate turning radii , poor geometrics, limited sight distance or high accident locations. High accident locations are road segments or intersections where eight (8) or more accidents have occurred over the most recent three (3) year period, and the "critical rate factor" is greater than one (1.0). The applicant shall submit a proposal to improve or eliminate the unsafe conditions if they exist or if they are determined to be created or exacerbated by the proposed development.

Unreasonable congestion. Level of Service D, as determined from a capacity analysis, is considered the minimum level of service needed to provide safe and convenient traffic movement. Where a road, intersection, or any approach lane to the specific intersection or intersections being evaluated in the vicinity of the proposed development is determined to operate at LOS E or LOS F in the horizon year, the proposed development is considered to result in unreasonable congestion, unless: Improvements will be made to raise the level of service of the road or intersection to D or above.

- I generally find the methods used in the development of the base traffic volumes to be reasonable and acceptable. It should be noted that the volume timeframe for the analyses was the peak hour of the roadway system, which does not correspond to employee peaking in the morning (employees arrive before the peak hour). The Applicant should provide documentation noting traffic volumes on roadways during both the peak hour of the system and peak hour of traffic generation from MMC.

Status: The Applicant has provided traffic volume information for the noted time periods and I find their response and analysis time-period to be acceptable.

- The Park Avenue/Valley Street intersection is a High Crash Location. The Applicant shall provide specific recommendations with implication of such changes for review and consideration.

Status: Given significant future changes to the area, the Applicant shall conduct a monitoring study following the opening of the St. John Street Parking Garage and completion of the St. John Street improvements as required by Dunkin Donuts. The methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.

- The Congress Street/Gilman Street intersection is a High Crash Location. The Applicant suggests that the future removal of the traffic signal at Congress Street/Valley Street may mitigate crashes. I continue to review this, but a monitoring requirement post signal conditions may be suggested.

Status: The Applicant shall conduct a monitoring study of the intersection following removal of the traffic signal at Valley Street and the opening of the St. John Street Parking Garage. The methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.

- The St. John Street/A Street is a High Crash Location. The Applicant suggests that traffic volume reductions may mitigate crashes. The new employee parking garage will increase traffic volumes in the area and may negatively impact conditions. I continue to review this, but a monitoring requirement after the employee parking garage is open may be suggested.

Status: The Applicant shall conduct a monitoring study of the intersection following the opening of the St. John Street Parking Garage. The methods and scope of the Study shall be approved by City staff. Any improvements required in conjunction with the monitoring study shall be the responsibility of the Applicant.

- Park Avenue/St. John Street is a High Crash Location. The Dunkin Donuts project on St. John Street will likely be implementing improvements to the northbound St. John Street approach. The DD scope of this work is not expected to mitigate all crash patterns. The Applicant shall specifically recommend strategies for mitigating all crash patterns that are correctable by improvements.

Status: The Applicant has recommended traffic signal timing adjustments and the City can implement those changes. No further action is required of the Applicant.

- Valley Street between and A Street and C Street is a High Crash Location. The Applicant noted at the TMP Scoping Meeting that traffic volumes will be declining on Valley Street in this area and thus may reduce collisions. The Applicant shall document specific before/after traffic volumes changes on Valley Street as part of assessing mitigation of crash rates.

Status: The Applicant has provided supporting documentation noting the reduction in traffic volumes expected for Valley Street. I have no further comment.

- The Congress Street/St. John Street intersection is not a High Crash Location but experienced 25 crashes over the reported three-year period. The Applicant shall conduct a safety review of the intersection.

Status: The Applicant has provided the requested information. The changes being implemented on St. John Street (implementing a three-lane roadway) in conjunction in the Dunkin Donuts project would be expected to mitigate some crash patterns. I have no further comment.

- Traffic Movement Permit regulations requires Applicants to document incremental changes to a site over the prior 10 years to determine factors that have influenced traffic generation from the site. In my professional opinion, the Applicant has not provided documentation that adequately addresses historical changes at MMC.

Status: The Applicant has provided a summary of historical campus changes and I find the documentation to be reasonable and no changes are required for traffic study assumptions. I have no further comment.

- The Applicant shall provide specific sight distance measurements at the Congress Street/Drop-Off driveway according to Site Plan information.

Status: The Applicant has provided the requested information and I have no further comment.

- The Park Avenue/St. John Street intersection has improving levels of service and delay following project build-out. The Applicant should specifically note any traffic signal equipment modifications that are needed to accomplish the noted optimization.

Status: The Applicant assumed traffic signal timing adjustments and the City can implement those changes. No further action is required of the Applicant.

- The Commercial Street/Valley Street intersection has improving levels of service and delay following project build-out. The Applicant should specifically note any traffic signal equipment modifications that are needed to accomplish the noted optimization.

Status: The Applicant assumed traffic signal timing adjustments and the City can implement those changes. No further action is required of the Applicant.

- I continue to review traffic model output for vehicle queuing and will provide comments in the future.

Status: The SimTraffic model notes some intersections will have long vehicle queues. The proposed project does not significantly impact queue lengths and improvements associated with signal timing adjustments would be expected to mitigate project impacts. I have no further questions.

- The Congress Street/St. John Street intersection was modeled assuming existing roadway conditions. The Applicant shall also conduct an analysis assuming the Dunkin Donuts improvements on St. John Street are implemented (converting St. John Street from four lanes to three lanes).

Status: The Applicant has conducted the noted evaluation and acceptable traffic operations are predicted. I would note that in conjunction with approval of the St. John Street Parking Garage, the Applicant is required to upgrade the traffic signal equipment at this intersection, which is expected to improve efficiency. I have no further comment.

- **Congress Street in the vicinity of the project has been classified as a High Crash Location. The Applicant has prepared an improvement plan that considers multi-modal activity/facilities in creating a safe Complete Street. It is my professional opinion that the proposed project will significantly alter the characteristics of the corridor and thus will change motorist behavior. Accordingly, I find the improvement plan to be acceptable with the following conditions:**
  - **The Applicant shall improve/enhance wayfinding to the existing MOB Parking Garage and the Visitor Garage. Advance directional signage should help to mitigate sudden stops that may have been a contributing factor in crashes. A signage plan shall be provided for review and approval by City staff.**
  - **The Applicant shall conduct a monitoring study following the opening of the new Medical Office Building. If crash patterns are not mitigated, the Applicant is responsible for the development of a mitigation plan for review and approval by City staff. Implementation of the approved plan will be the responsibility of the Applicant.**

- **The results of the traffic modeling analysis for area transportation roadways is based on the assumption that most MMC employees will parking in the proposed St. John Street parking garage and not utilize other parking options, particularly on-street. It is recommended that the Applicant provide documentation that employees are parking in MMC parking facilities and identify measures, to be reviewed and approved by City staff, to be implemented to address this issue. It is recommended that this documentation be provided in conjunction with TDM reporting requirements.**

Other Non-TMP Comments

- **I have reviewed the Construction Management Plan and generally find it to be acceptable. Some specific comments:**
  - **It is recommended that further discussion on the duration of the Congress Street sidewalk closures be included.**
  - **Supplemental pedestrian safety devices will be required during the sidewalk closure time period (to safely cross pedestrians for the sidewalk detour).**
  - **All sidewalk detours shall be ADA compliant.**
  - **Changes to the lane configuration on Congress Street west of Gilman Street is likely and may need to be included in the plan.**
  - **A significant amount of construction activity will be required for utility and street construction work and specific plans shall be development for review and approval.**

If you have any questions, please contact me.

Best regards,

Thomas A. Errico, PE
Senior Associate
Traffic Engineering Director
TY LIN INTERNATIONAL
12 Northbrook Drive
Falmouth, ME 04105
+1.207.781.4721 main
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thomas.errico@tylin.com
Visit us online at www.tylin.com
Twitter | Facebook | LinkedIn | Google+

"One Vision, One Company"

Portland Maine Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

draft striping, sidewalk comments for MMC

Helen Donaldson <hcd@portlandmaine.gov> Thu, Dec 13, 2018 at 8:49 PM
To: Helen Donaldson <hcd@portlandmaine.gov>

---------- Forwarded message ---------
From: **Bruce Hyman** <bhyman@portlandmaine.gov>
Date: Thu, Dec 13, 2018 at 3:48 PM
Subject: Re: draft striping, sidewalk comments for MMC
To: Helen Donaldson <hcd@portlandmaine.gov>
Cc: Tom Errico <thomas.errico@tylin.com>, Jeremiah Bartlett <jbartlett@portlandmaine.gov>

General

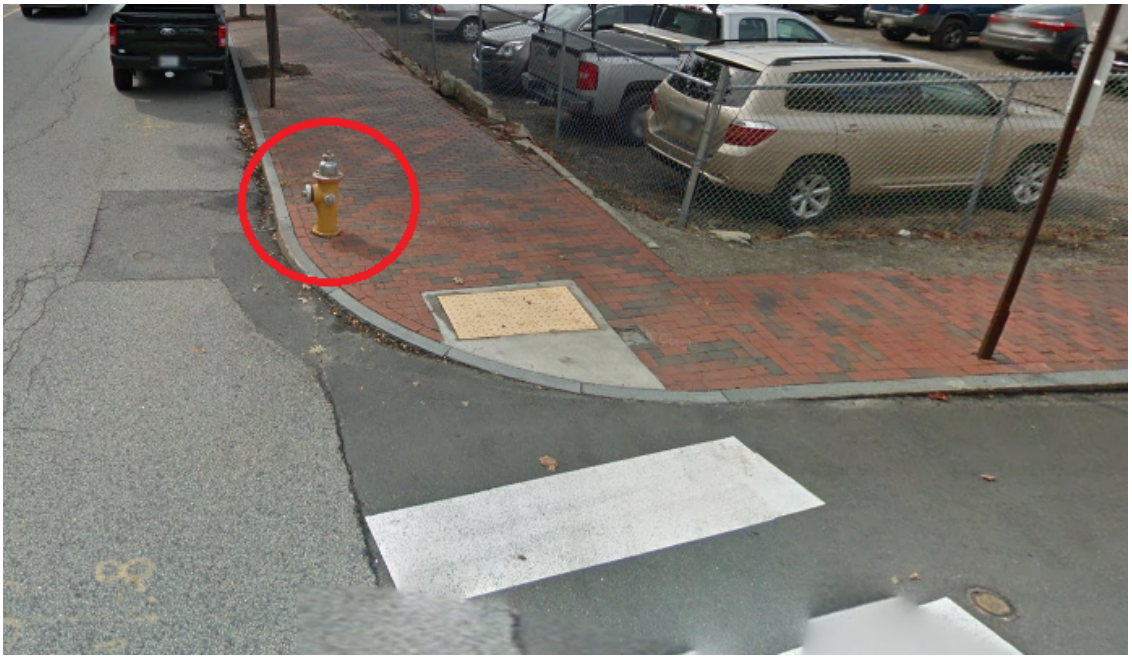
- The Applicant is responsible for relocation of utility structures (e.g. hydrants, catch basins, etc.) in order to implement the proposed design.
- On-street parking should generally be shown as a striped parking lane (individual spaces should not be delineated). The line may vary in off-set from the curb to define a narrower parking lane next to a bike lane (e..g., 7') or be wider (e.g., 8'-9') to reduce the width an adjacent travel lane (11'-12' through travel lanes desired, 9'-10' left turn lanes).
- Revise plans to show shared bicycle lane markings in the westbound travel lane on Congress Street from Deering Avenue to St. John Street, centered in the travel lane.
- Provide final details for improvements in the right-of-way, including sidewalks, crosswalks, curb ramps, driveway aprons, detectable warning panels, curbing, tree wells, bus shelter, curb extensions, etc.

C05-02 Upper Congress Street

- Revise striping plan to retain south side parking east of the Visitor's Garage entrance/exit to just west of Bramhall where the climbing lane will transition to Shared Lane Markings (centered in the travel lane). Show (north to south) an 8' parking lane, 11' travel lanes, a 6' climbing bicycle lane, and an 8' parking lane.
- This section should continue to Bramhall Street to the east. Please provide plans for restriping the entirety of Congress from Valley Street to Bramhall St/Deering Ave. The outside bike lane lines are to be dashed 6" lines for a minimum of 50' in advance of an intersection and through the intersection.

C05-03 Mid-Congress Street

- Relocate the north side METRO stop to east of the Forest Street intersection, as METRO has indicated a preference for an inline westbound stop in this location. Show existing parking on north side in front of Salvage to remain from Forest Street to Gilman Street.
- Confirm that the design accounts for the fire hydrant on the northwest corner of Congress at Forest Street (the location of the proposed ramp serving the Congress St crossing)
-



C05-04 Lower Congress Street

- Provide final details on METRO shelter, including distances to curb and property line. The shelter design may require further review.
- Provide curb re-alignments, possibly to include curb extensions at southwest and northwest corners of Gilman and Congress. Further guidance will be provided.
- Curb extension width should be maximum 6' in extent (measured from curb line), using 10' radii.
- 16' travel lanes are too wide for the WB approach to Valley Street. Retain existing westbound left turn pocket to Valley Street.
- Bike lanes are to be a minimum of 6' adjacent to a parking lane

C05-05 Gilman Street

- The shuttle storage lane appears excessive in length. Please provide documentation on the number of shuttles likely to queue here at the same time (recognizing that the TMP application indicates that seven shuttles will run to this location on 15 minute headways.)
- Retain all existing west side parking. Shorten shuttle queue lane to accommodate this.
- Document clear sidewalk distance around remaining CMP pole and guy wire in proposed the Gilman Street sidewalk. Note that a 5' minimum sidewalk clear width is required around all obstructions in the sidewalk.

--
Bruce Hyman
Transportation Program Manager
Transportation Division

Department of Planning & Urban Development
389 Congress Street
Portland, Maine 04101
(207) 874-8717 phone

bhyman@portlandmaine.gov
http://www.portlandmaine.gov/1363/Transportation-Division
Yes! Transportation's Good Here ....

WRIGHT-PIERCE
Engineering a Better Environment

MEMORANDUM

TO:	Helen Donaldson, Sr. Planner	**DATE:**	12/6/2018
FROM:	Michael Guethle, PE; Ryan Wingard, PE	**PROJECT NO.:**	13982C
SUBJECT:	Gilman St. - 22; MMC Parking Building (PL-000331-2018)		

Wright-Pierce has reviewed the Level III Site Plan Application information provided for the Congress Street Patient Care Building proposed at 22 Gilman Street. The project will include redeveloping an existing parking garage into 64 modern patient rooms and 19 procedure rooms.

Documents Reviewed by Wright-Pierce:

- Level III Site Plan application, dated (most recent) November 30, 2018.
- Engineering Permitting Plans, dated (most recent) November 28, 2018.
- Construction Management Plan, dated November 6, 2018.
- Response to Reviewer Comments #2, dated November 28, 2018.

Comments:

1) Level III Site Plan applications with the City of Portland must submit a stormwater plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules. This includes conformance with the Basic, General, and Flooding Standards (Ref: Technical Manual, Section 5. II. Applicability in Portland. C. a.; and Ref: City of Portland Code of Ordinances Sec. 14-526. Site Plan Standards, (b). 3. b.)
    a. General Standard: The applicant has provided information regarding the size and scope of the project indicating the project is subject to the Redevelopment Standard within the City of Portland.
        i. The MaineDEP Stormwater BMP manual indicates that, “The surface area of the filter must be no less than the sum of 5% of the impervious area and 2% of the landscaped area draining to the system.”. The proposed system

exceeds this threshold in order to accommodate additional surface areas to meet other City goals. The applicant has provided the following reasoning:

1. Limited sedimentation loading from impervious surfaces due to high percentage of roof areas;
2. Additional pre-treatment is provided in the form of an isolator row;
3. An additional amount of pre-treatment is provided for the garage location through an existing separator unit;
4. Through these three items, the proposed amount of nutrient loading, total suspended solids, and temperature pollution entering the system will be less than other permitted land uses entering the system.

ii. Based on the information provided, we agree that the pollutant loading to the system is anticipated to be limited by the oversized pre-treatment devices, and by the large portion of roof surfaces which typically convey fewer pollutants than many other impervious surfaces.

iii. One other concern is flow rate to the filter from large impervious surfaces. Materials testing during construction is recommended to confirm that the flow rate through the media will match the design permeability.

2) Discharge to Combined Sewer Overflow (CSO) Locations

a. The applicant has provided information for pre-development and post-development flow rates to the combined sewer system for a 1-inch, 24-hour rain event. This storm event has been mentioned in previous discussions with the applicant and City Department of Public Works (DPW). The applicant has requested written confirmation from City DPW to ensure that all involved parties agree with evaluating this storm event for the CSO location, and has indicated that this confirmation will be provided as it becomes available. This item can be a condition of approval.

3) Connection to Existing System:
    a. The applicant has asked for a written or e-mail confirmation from the Department of Public Works that proposed connections to existing drainage and sewer systems are being completed in accordance with City of Portland Code of Ordinances section 14-526 (b) 3.a, subsection iii and iv. The applicant has indicated that this confirmation will be provided as it becomes available. This item can be a condition of approval.

4) Proposed Drainage Design
    a. Additional information has been provided on Sheet C30-01, C11-01, C40-01, and C30-04 to indicate site grading and pipe information. The following shall be clarified:
        i. SD-2 pipe references have been qualified with two separate pipes; Pipe SD-2 and SD- 2.1. No further action necessary.
        ii. SD-3 pipe size has been confirmed to be 15". No further action necessary.
        iii. Data provided in the project pipe tables have been modified so that pipe slopes generally match slopes as calculated from the invert and length data. No further action necessary.
        iv. A 1% cross-slope is shown for the sidewalk locations of Congress Street. The applicant has confirmed that a longitudinal slope of 5.5% is being provided, and as such surface ponding is not anticipated. No further action necessary.
    b. Isolator row detail on C30-04 pipe size has been increased to 24", and the applicant has confirmed that a 12" or greater pipe is large enough facilitate maintenance/cleaning access to the isolator row. No further action necessary.
    c. Locations and details of granite headstone curb and gutterline "dishpan" grading at catch basins has been provided. Applicant has confirmed that headstones will only be provided in the Right-Of-Way. No further action is necessary.

5) Additional Utility Infrastructure:
    a. Electrical and Communications Infrastructure
        i. Electrical and Communications manholes, pull boxes, and duct banks are proposed. Utility duct bank details have now been provided with a level of information confirming conduit counts, minimum cover requirements, and generic information. No further action necessary.
        ii. The applicant has confirmed that the only transformer being removed is being completed by utility companies prior to the project. No further action necessary.
    b. The applicant has provided additional information regarding sewer details on Sheet C11-01 and Sheet C30-03. No further action necessary.
    c. The applicant has indicated that capacity to serve letters from utilities will be provided as they become available. This may be considered a condition of approval for the project.
        i. The Capacity to Serve process will require a level of coordination between the applicant and utility companies and typically includes compliance with applicable utility standards and details. Central Maine Power and Consolidated Communications should review the plan and verify the depiction of changes to primary electrical and communication lines, respectively.
        ii. Minor modifications to utility layout and design from the capacity to serve process are anticipated, and shall be submitted to the City prior to construction.
            1. The Applicant shall coordinate with the City should the utility layout plan include additional transformer units, pole relocations, or impacts to water or sewer infrastructure.

Portland Maine | Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

MMC Drawings

Michael Guethle <michael.guethle@wright-pierce.com> Thu, Dec 13, 2018 at 4:56 PM
To: Helen Donaldson <hcd@portlandmaine.gov>
Cc: "Ryan T. Wingard" <ryan.wingard@wright-pierce.com>

Hi Nell,

My notes for the updated plans are as follows, and includes information on other utilities in the ROW as discussed today:

-Sheet C-11: CB 13370 (NE Corner) and CB 12640 (SW corner) are existing basins that are located in proposed crosswalks. If these structures have eccentric cones, rotate them so they are outside of the crosswalk.

-General: Structures in ROW are proposed to have eccentric cones. A note should be added to the construction plans indicating that covers and frames should be rotated to be outside of wheel travel lane locations.

-Sheet C-11: SD-16 callout is obstructed or missing, and should be included on the construction plans.

-Sheet C-11: Existing Storm Drain Structure Data table shall be updated to include inlet from Pipe SD-13

-Sheet C-11: Existing CB 13395 rim/frame/cover should be reviewed: Other CBs located in sidewalks are being raised and converted to Drainage Manholes (DMHs). Applicant shall confirm if this structure is to remain a CB or a DMH.

-Sheet C-11: There appear to be conflicts at the existing storm drain and proposed tree wells. Applicant shall provide solution to minimize future root intrusion from trees, or relocate storm drain.

-Sheet C-11: There appear to be conflicts with underground utilities at several structures and pipes. Applicant shall provide additional information for location of proposed utilities at the following pipes and structures:

Storm Drain 9

Sanitary Sewer 9

Catch Basin 7

Catch Basin 10

[Quoted text hidden]

Portland Maine Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

MMC Congress Street Building

Robert Thompson <rmt@portlandmaine.gov> Thu, Dec 13, 2018 at 9:01 AM
To: Helen Donaldson <hcd@portlandmaine.gov>

Hi Nell,

The Fire Department is satisfied with the latest site plan with the proposed islands removed. I've reviewed all responses from MMC, and their contractors, and we have no additional concerns with this project, based the latest plans submitted.

Please let me know if any additional changes are proposed.

Thank you,
Mike

On Wed, Dec 12, 2018 at 2:53 PM Helen Donaldson <hcd@portlandmaine.gov> wrote:

> Thanks, Mike. Let me know if you have any further comments or if you're fine with everything as is.
>
> Nell
>
> On Wed, Dec 12, 2018 at 12:44 PM Robert Thompson <rmt@portlandmaine.gov> wrote:
>
> > Hi Nell,
> >
> > I'm just confirming the new building on Congress Street will be addressed as 900 Congress Street.
> >
> > Thanks,
> > Mike
> >
> > --
> > Robert M. Thompson
> > Division Fire Chief
> > Portland Fire Department
> > (207) 874-8400
> > rmt@portlandmaine.gov
>
> --
> Nell Donaldson
> City of Portland Planning Division
> (207) 874-8723
> hcd@portlandmaine.gov

--
Robert M. Thompson
Division Fire Chief
Portland Fire Department
(207) 874-8400
rmt@portlandmaine.gov

Portland Maine Yes. Google's good here.

Helen Donaldson <hcd@portlandmaine.gov>

10/23 Planning Board Meeting - Maine Med Proposal

Karen Snyder <karsny@yahoo.com> Wed, Oct 24, 2018 at 11:53 AM
Reply-To: Karen Snyder <karsny@yahoo.com>
To: Helen Donaldson <hcd@portlandmaine.gov>, Planning Board <planningboard@portlandmaine.gov>
Cc: Jeff Tarling <jst@portlandmaine.gov>

Hi Nell,

I think the Maine Med latest proposal is definitely more respectful and considerate to the residential neighborhood around Maine Med. Thanks to Maine Med working with the neighborhood organization representatives to address the residents concerns.

I just have three topics to address:

1) Even though the proposed Maine Med building on Congress is beautiful, it is also kind of sterile looking, especially with that 5 story shear concrete or granite wall next to the entrance. If Maine native trees could be planted in the multiple plant beds in front of the building instead of some low shrubs, this will provide a more "green", healthy, and calming experience to the people entering the new building when walking up Congress. Also, it will give visitors a cool canopy in the summer when it is hot against all that large expanse of concrete/granite plaza area in front of the building and also winter interest if conifers are planted. If the designers want to emulate Maine's granite/forest nature, why not embrace it and actually plant Maine's native trees (everyone loves the birch tree and spruce/hemlock) in the planter beds against the backdrop of this building? I think it would make the building look more beautiful and inviting.

2) Can there be a official confirmation that residents will continue to have snow ban parking privileges at the visitor Congress St parking garage or the St. John parking garage? If so, how many reserved spots and where?

3) I was surprised to hear the 12 mature oak trees that are on the Maine Med property close to the parking garage will be replaced with a 8 medium sized street trees called the Honey Locust. Also, I was surprised to see this tree on Portland's recommended tree list since it is not even native to Maine and climate zone. In fact, from the Portland's Recommended Street Tree list, only 1 of Portland's recommended medium street trees are actually a native to Maine as shown below. However, the recommended large street trees are mostly native to Maine... except for the Catalpa and that junk tree, gingko biloba from China.

Can someone explain to me why City of Portland Parks department isn't using trees from the Maine Native tree list as recommended Portland street trees shown in below from Maine.gov and UMaine websites? A good example is that the non-native ginko needs to be removed from this tree list because the gingko street trees planted on Munjoy Hill are stunted and provide no shade coverage at all.

http://www.portlandmaine.gov/DocumentCenter/View/1765/Recommended-Tree-List?bidId=

Portland, ME Recommended Tree List

	Medium Size Trees 25'-45'	Native to Maine	Native
1	River Birch	No	Southeastern quarter of USA
2	American or European Hornbeam	Yes	Minnesota to Ontario east to Maine, South to Texas
3	Katsuratree	No	China and Japan
4	American Yellowood	No	Southeast restricted range: from eastern North Carolina to Oklahoma, southern Missouri and Indiana to south to central Alabama
5	Turkish Filbert	No	Southeast Europe to Western Asia
6	HoneyLocust	No	Central states, southeastern South Dakota to New Orleans
7	Tupelo	No	eastern North America from the coastal Northeast USA and southern Ontario south to central Florida and eastern Texas, as well as Mexico
8	Korean Mountain Ash	No	Korea, Japan, and China
	Large Size Trees 45' +	**Native to Maine**	**Native**
1	Red Maple	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
	Amstrong Red Maple	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
	Karpick & Bowhall Red Maple	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
	Redpointe/& Red Sunset Red Mapl	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
2	Sugar Maple	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
3	Catalpa	No	it is native to **southern and southeastern Illinois**,
4	Beech	Yes	https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm
5	Ginkgo Biloba	No	China
6	Tuliptree	Possibly	But not on the Maine.gov Native Tree List
7	Cucumber Magnolia	Possibly	But not on the Maine.gov Native Tree List

The native Maine trees are listed on UMaine and Maine.gov websites...

https://extension.umaine.edu/publications/2500e/

https://www.maine.gov/dacf/php/pesticides/yardscaping/plants/n_trees.htm

Regards,
Karen Snyder
Gilman St Property Owner

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1K

MMC Workshop Nov 13 Questions

stjohnvalleyneighborhood <stjohnvalley@live.com> Nov 13, 2018 2:36 PM
Posted in group: **Planning Board**

Dear Planning Board Member,

Please inquire of the Planning Department at tonight's workshop why the high crash intersection (per MDOT statistics) of A and Valley Street has not been included in the traffic study that is to be included in the TMP for phase three of the MMC expansion.

Please also ask for clarification as to how the city arrived at the conclusion that the new garage (Phase II) will not "generate" new passenger vehicle trips and therefore a TMP was not required prior to the project being allowed to commence.

The lot where the new garage is being built to hold 2,400 parking spots previously provided parking for about 800 vehicles.

If the new garage isn't generating these 1,600 new spots then what is?

While I understand the city has delegated review authority pertaining to traffic movement permitting, it is also my understanding that they need to follow the MDOT standards in deciding to pursue or not pursue a TMP for a project.

Several intersections in our neighborhood that will be impacted by the new garage are considered high crash intersections by MDOT. These intersections would have been more closely scrutinized had the city sought a TMP prior to the start of construction of the new garage.

Perhaps the process of filing a TMP would have revealed the need for an automated traffic light at one of the several high crash intersection or the need to redirect the routes the shuttle buses will be taking.

At the very least, the TMP for Phase III needs to broaden the scope of review of traffic impact generated by all three Phases of expansion to a two mile radius and include all intersections classified as "high crash" by MDOT.

Thank you,

Tim McNamara

251 Valley Street

Portland

EASEMENT, ENCUMBRANCE, AND AGREEMENT REFERENCES:

A. UNDERGROUND ANCHOR SYSTEM EASEMENT RESERVED BY MMC IN CONVEYANCE TO CRESCENT HEIGHTS LLC IN DEED BOOK 26288 PAGE 49.
B. UTILITY/DRAINAGE EASEMENT FOR A DRAIN/SEWER PIPE FROM THE PROPERTY NOW OF CRESCENT HEIGHTS, LLC. FORMERLY AS DESCRIBED IN DEED BOOK 1938 PAGE 248 AND 1946 PAGE 370.
C. UTILITY EASEMENT: TO NET&T NEAR THE NORTHERLY CORNER OF THE PARKING GARAGE ON CONGRESS ST. PER DEED BOOK 8573 PAGE 121.
D. CERTIFICATE OF VARIANCE APPROVAL GRANTING RELIEF FROM SECTION 14-137(7) MAXIMUM STRUCTURE HEIGHT OF 45 FEET, DATED JUNE 25, 1996, AND RECORDED IN DEED BOOK 12629 PAGE 295.
E. SITE LOCATION OF DEVELOPMENT DEPARTMENT ORDER BY MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION FOR MAINE MEDICAL CENTER, PER DEED BOOK 13919 PAGE 114.
F. UTILITY EASEMENT: MMC TO NET&T 6' X 8' NEAR GILMAN AND CONGRESS PER DEED BOOK 13027 PAGE 207.
G. AMENDMENT TO CITY CODE SEC. 14-49 (ZONING MAP AMENDMENT) RE: CONDITIONAL REZONING FOR PROPERTY IN VICINITY OF WESTERN PROMENADE/MAINE MEDICAL CENTER. DATED MAY 24, 2005 AND RECORDED IN DEED BOOK 22671 PAGE 60.

GENERAL NOTES

1. THE RECORD OWNERS OF THE SURVEYED PROPERTIES ARE AS FOLLOWS:
MAINE MEDICAL CENTER AND MMC REALTY CORPORATION AS DESCRIBED IN DEED BOOK/PAGES:

11613/153	1250/470	1282/323	1285/450	1289/192	1290/192	1296/351	1296/352
13504/86	14026/287	1575/227	16145/275	18032/68	19986/204	2127/269	2127/320
2127/443	2133/310	2133/311	2133/317	2143/330	2147/110	2149/190	22762/45
2301/21	2308/161	2349/229	2619/499	2685/369	2901/326	2951/927	2955/722
2988/139	3075/669	3095/34	3097/244	3108/396	3183/576	3187/234	3188/710
3278/209	3310/115	3310/116	377/296	377/297	378/6	381/260	382/450
384/37	388/92	3995/53	408/457	6177/319	8309/5	8855/81	9392/344
9722/45							

* ALL RECORDED INFORMATION LISTED HEREON IS WITHIN THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CCRD).

2. THE PROPERTIES ARE SHOWN ON THE CITY OF PORTLAND TAX MAPS AS FOLLOWS:
MAP 53 BLOCK D, LOT 7,
MAP 53 BLOCK E, LOT 13
MAP 54 BLOCK H, LOT 1,
MAP 64 BLOCK C, LOT 1.

3. BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON ON GROUND SURVEY PERFORMED BY SEBAGO TECHNICS FROM 2001 THROUGH 2009 WITH RESEARCH UPDATES THROUGH FALL OF 2017.

4. THE BEARINGS SHOWN HEREON ARE BASED UPON THE MAINE STATE PLANE COORDINATE GRID, WEST ZONE 1802 ON NAD83 IN US SURVEY FEET. THE VERTICAL DATUM WAS ESTABLISHED IN 2001 BASED UPON GPS OBSERVATIONS. IN 2018 LEVEL RUNS WERE PERFORMED FROM 2 CITY BENCHMARK MONUMENTS (MF 126 AT THE NORTHEAST CORNER OF VALLEY STREET AND A STREET, AND MF 128 AT THE NORTHEAST INTERSECTION OF SAINT JOHN STREET AND C STREET). THE ORIGINAL CONTROL WAS FOUND TO BE 0.13' ABOVE THE CITY DATUM. THE ORIGINAL CONTROL HAS BEEN HELD FOR THIS PROJECT. TO CONVERT ANY ELEVATIONS SHOWN HEREON TO THE CITY DATUM SUBTRACT 0.13 FEET.

5. UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON FIELD LOCATION OF VISIBLE SURFACE FEATURES, INVERT INSPECTIONS, UTILITY MARKINGS BY DIGSMART OF MAINE, AND PLANS REFERENCED HEREON. THE INFORMATION SHOWN HEREON MAY NOT INCLUDE ALL UTILITIES. PRIOR TO ANY CONSTRUCTION DIGSAFE AND APPROPRIATE UTILITY PROVIDERS MUST BE CONTACTED.

6. THE RIGHT OF WAY LINES ON THE STREETS ABUTTING THE LOCUS PROPERTIES SHOWN HEREON WERE ESTABLISHED UTILIZING CITY PUBLIC WORKS RECORDS AND FOUND MONUMENTATION AT THE CORNERS AND ANGLE POINTS OF THE STREETS.

7. SEE DESIGN UTILITY PLANS FOR STORM DRAIN AND SEWER STRUCTURE RIM AND INVERT ELEVATIONS. ELEVATIONS ARE BASED ON DATUM DESCRIBED IN NOTE 4.

PLAN REFERENCES

1. STATE OF MAINE DEPARTMENT OF TRANSPORTATION PLAN SHOWING VALLEY, CONGRESS, AND ST. JOHN STREETS, CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS FILE NO. 726 / 16.
2. STANDARD BOUNDARY SURVEY FOR MAINE MEDICAL CENTER BY STEVENS, MORTON, ROSE, & THOMPSON, INC. DATED OCTOBER 06, 1990 RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 188, PAGE16.
3. CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS LAND SWAP WITH MAINE MEDICAL CENTER (GILMAN ST. & ARSENAL ST.) DATED JANUARY 23, 1974. DPW FILE NO. 547 / 20.
4. PLAN OF LAND OF J.M. WOOD ESQ. ELLSWORTH AND O STREETS DPW FILE NO. 361 / 3.
5. PLAN OF LAND SURVEYED FOR MOODY F. WALKER SEPTEMBER 23, 1863 BY HOWE & OSGOOD C.E. CCRD PLAN BOOK 21, PAGE 36.
6. SITE PLAN OF NEUROSCIENCE INSTITUTE CONGRESS AND GILMAN ST. PORTLAND MAINE BY GREGORY K. JOHNSON AIA DATED JULY 31, 1987 ON FILE WITH THE DPW.
7. PLAN OF PROPOSED WIDENING CONGRESS STREET AUGUST 1885, DPW FILE NO. 360 / 2.
8. CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS, B ST. WIDENING DATED NOV.4, 1937 DPW FILE NO. 569 / 9.
9. PLAN OF CITY LANDS BETWEEN GILMAN STREET AND MAINE CENTRAL RAILROAD SOUTH OF CONGRESS STREET, DPW FILE NO. 18 / 4.
10. PLAN OF CITY LAND BETWEEN CONGRESS AND "A" STS DATED 1883 DPW FILE NO. 379 / 10.
11. CITY OF PORTLAND PLAN OF "B" VALLEY ST DATED FEB. 1926 DPW FILE. NO.179.
12. CITY OF PORTLAND, DEPARTMENT OF PUBLIC WORKS ARSENAL STREET DISCONTINUANCE DATED APRIL 15, 1953 DPW FILE NO. 410 / 96.
13. MMC PARKING FACILITY PROPOSED GRADING PLAN DATED 29 MAY 1971 BY TAC, DPW FILE NO. 680 / 4.
14. CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS WESTERN PROMENADE SLOPE, CITY BOUNDARY BETWEEN GILMAN AND "B" ST. DATED JAN. 4,1933 DPW FILE NO. 462 / 32 AND 462 / 32-A.
15. PLAN OF LAND WEST OF THE BRACKETT LINE CHADWICK AND VAUGHN STREETS, DATED 12 JUNE 1833 RECORDED IN CCRD PLAN BOOK 1, PAGE 1, DPW FILE NO. 462 / 4.
16. PLAN OF CITY LANDS BETWEEN GILMAN AND "B" STREETS DATED MAY 1883, DPW FILE NO. 69 / 4R, CCRD PLAN BOOK 4, PAGE 43.
17. WESTERN PROMENADE DATED JAN. 1926 CITY OF PORTLAND DPW SHEET NO. 7 FILE NO. 142.
18. CITY OF PORTLAND WORK SHEET CONGRESS, ARSENAL, AND BRACKETT STREETS DPW FILE NO. 363 / 11.
19. CITY OF PORTLAND, PLAN SHOWING PROPOSED GILMAN STREET, CONGRESS AND ASH STREETS, DPW FILE NO. 365 / 6.
20. CITY OF PORTLAND PLAN SHOWING GILMAN STREET, CONGRESS ST. AND WESTERN PROMENADE, DPW FILE NO. 365 / 7.
21. PLAN OF CITY LAND BETWEEN GILMAN & "B" STREETS DATED MAY 1883, CCRD PLAN BOOK 4, PAGE 43, DPW FILE NO. 379 / 25.
22. PORTLAND WATER DISTRICT, MAP NO. 7 SHOWING MAINE MEDICAL CENTER AREA.
23. CITY OF P D PLAN SHOWING CONGRESS STREET SHEET NO. 3 DPW FILE NO. 150.ORTLAN
24. CITY OF PORTLAND PLAN SHOWING GILMAN STREET DATED FEB 1926 DPW FILE NO. 178.
25. CITY OF PORTLAND PROPERTY PLAN BOOK NO. 274 SHOWING PROPOSED TAKING FROM MAINE MEDICAL CENTER ON CHARLES STREET DATED NOVEMBER 29, 1973.
26. CITY OF PORTLAND PLAN OF BRAMHALL ST., VAUGHAN ST., AND BRACKETT ST. DATED OCT. 1925 DPW FILE NO. 90.
27. STANDARD BOUNDARY SURVEY AT 25-27 ELLSWORTH STREET MADE FOR MAINE MEDICAL CENTER BY OWEN HASKELL, INC. DATED OCT. 14, 2002 ON FILE WITH SEBAGO TECHNICS,INC.
28. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, CHARLES ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 7.
29. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, WESCOTT ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 6.
30. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, HILL ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 5.
31. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, HILL ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 5.
32. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, ELLSWORTH ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 2.
33. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, CRESCENT ST. AS BUILT PLAN DATED 1973 DPW FILE NO. 495 / 3.
34. STREET VACATION / ACCEPTANCE AND LAND TRANSFER PLAN OF MAINE MEDICAL CENTER BY SEBAGO TECHNICS, INC AS REVISED THROUGH JULY 5, 2005 DPW FILE NO. 992 / 3.
35. STANDARD BOUNDARY SURVEY ON CONGRESS AND ELLSWORTH STREETS, PORTLAND MAINE BY DESLAURIERS & ASSOCIATES DATED AUGUST 30, 1999.
36. STANDARD BOUNDARY SURVEY AT 26-28 ELLSWORTH STREET MADE FOR MAINE MEDICAL CENTER BY OWEN HASKELL, INC. DATED OCT. 14, 2002 ON FILE WITH SEBAGO TECHNICS, INC.
37. EXISTING CONDITIONS & STANDARD BOUNDARY SURVEY MAINE MEDICAL CENTER DATED MAY 1, 1996 BY TITCOMB ASSOCIATES.
38. PLAN OF CRESCENT STREET DATED OCT. 1886 BY PORTLAND CITY ENGINEER DPW FILE NO.10 / 02.
39. CITY OF PORTLAND PLAN OF BRAMHALL ST., ELLSWORTH ST., AND CHARLES ST. DATED OCT. 1926 DPW FILE NO. 158..
40. PLAN OF STREETS ON BRAMHALL'S HILL SEPTEMBER 1858 BY A.P. MARSHALL CITY ENGINEER DPW FILE NO. 359 / 22.
41. PLAN OF LAND OR LOTS WEST OF THE BRACKETT ESTATE DATED 1835, DPW FILE NO.134 / 2.
42. PLAN NO. 5 SHOWNG STREETS ON BRAMHALL'S HILL SURVEYED MAY 1862 BY C.R. GOODELL C.E. DPW FILE NO. / 15.
43. CITY OF PORTLAND PLAN SHOWING ARSENAL STREET DATED OCT 1925, DPW FILE NO. 95.
44. PLAN OF LAND OR LOTS WEST OF THE BRACKETT ESTATE DATED 1835, DPW FILE NO.396 / 17..
45. PLAN OF CHANGE IN LINE OF CONGRESS STREET, DPW FILE NO. 360 / 25.
46. PLAN OF CHANGE IN LINE OF CONGRESS STREET, DATED OCTOBER 1854, DPW FILE NO. 360 / 27.
47. PLAN OF J.B. BROWN'S LAND WEST OF BRAMHALL'S HILL MADE BY WM. S. EDWARDS C.E. DATED 1871ON FILE IN THE DPW OFFICE.
48. CITY OF PORTLAND MAINE DEPARTMENT OF PUBLIC WORKS, ARSENAL ST. DISCONTINUANCE PLAN DATED 12/2/41 ON FILE IN DPW OFFICE.
49. THIS PLAN OF A TOWN ON BRAMHALL'S HILL PORTLAND MAINE AT THE REQUEST OF WILLIAL VAUGHAN, THE PROPRIETOR COMPLETED IN 1813 BY PELEG WADSWORTH, SURVEYOR, DPW FILE NO. 404 / 130, CCRD PLAN BOOK 37, PAGE 12.
50. T.F. CHAPPELL C.E. PLAN OF ASH STREET, ARSENAL ST., CONGRESS ST.
51. PARKING AREA ON BRAMHALL RESERVOIR SITE CHADWICK, BRAMHALL AND VAUGHAN STS. DATED 1964 DPW FILE NO. 698 / 14.
52. MAINE MEDICAL CENTER PKG C- SITE UTILITIES EXISTING CONDITIONS PLAN DATED THROUGH 05/25/05 BY THE RICHIE ORGANIZATION.
53. MAINE MEDICAL CENTER, PORTLAND MAINE BEAN BUILDING SITE UTILITIES AT ER. BY SHEPLEY, BULFINCH, RICHARDSON, & ABBOTT, DATED THROUGH 3/28/97.
54. BOUNDARY SURVEY OF SPORTSMANS LOT FOR MAINE MEDICAL CENTER, BY SEBAGO TECHNICS, INC., DATED THROUGH 10/23/09.
55. EXISTING CONDITIONS PLAN OF EAGLES CLUB BLOCK FOR MAINE MEDICAL CENTER, BY SEBAGO TECHNICS, INC., DATED THROUGH 11/3/09.

MATTHEW W. EK PLS 2117

STATE OF MAINE · MATTHEW W. EK · 2117 · PROFESSIONAL LAND SURVEYOR

DRAWN	CHECKED
TSL	MWE

REV:	BY:	DATE:	STATUS:
C	MWE	11/27/18	RESPOND TO CITY COMMENTS
B	MWE	12/14/17	SUBMITTED FOR CITY REVIEW
A	MWE	12/23/09	SUBMITTED FOR CLIENT REVIEW

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SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

EXISTING CONDITIONS SURVEY
OF:
MAINE MEDICAL CENTER CAMPUS
GILMAN ST, CONGRESS ST, BRAMHALL ST, ET.AL
PORTLAND, MAINE

RECORD OWNER:
SEE NOTE 1, SHEET 2

MAINE MEDICAL CENTER
22 BRAMHALL ST
ADDRESS 2

PROJECT NO.	SCALE
15466	NTS

SHEET 2 OF 8

15466SC.dwg T-AB: ECO2



MATTHEW W. EK PLS 2117

STATE OF MAINE
MATTHEW W. EK
2117
PROFESSIONAL LAND SURVEYOR

DRAWN	CHECKED
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REV:	BY:	DATE:	STATUS:
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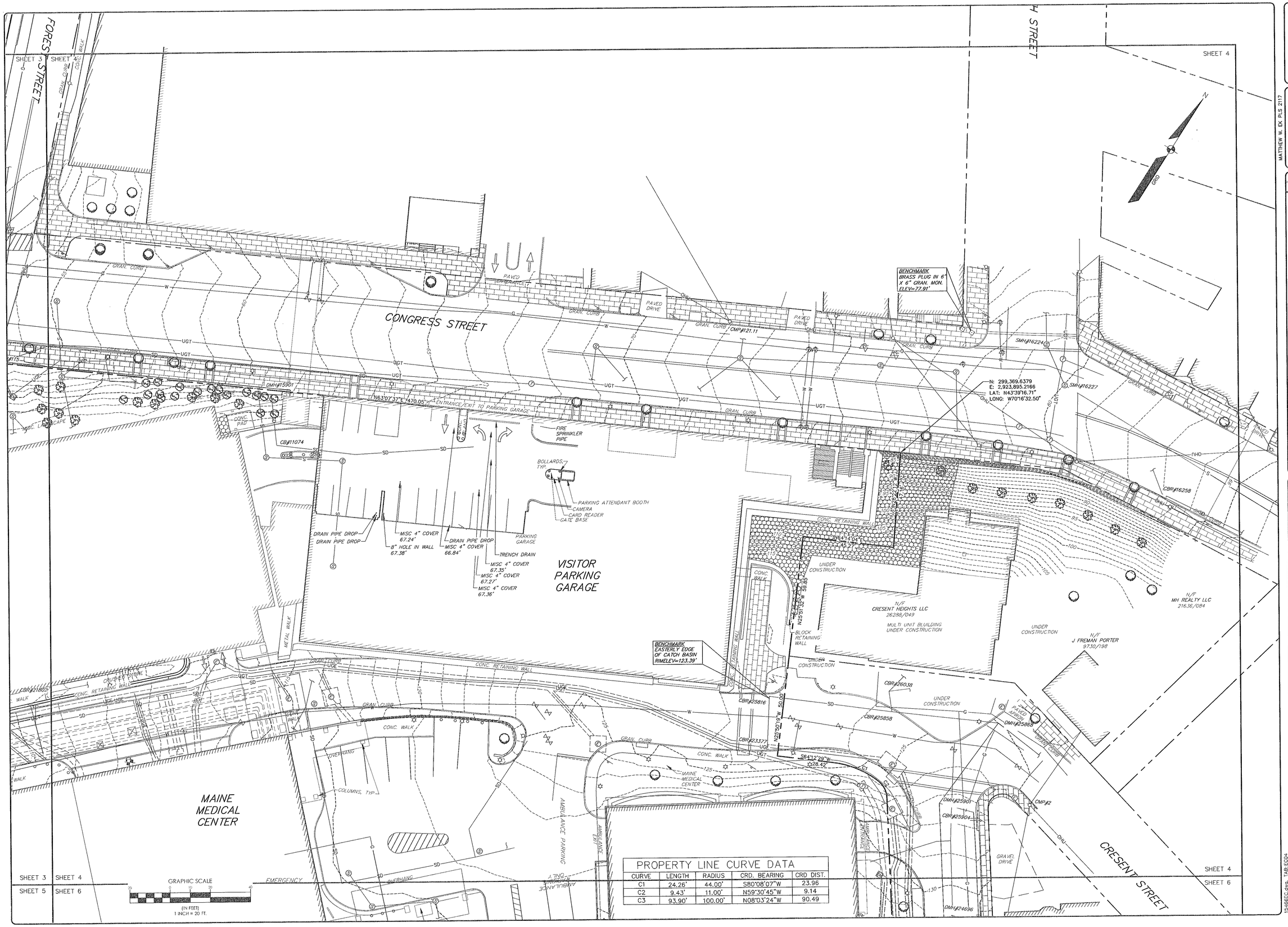
EXISTING CONDITIONS SURVEY
OF:
MAINE MEDICAL CENTER CAMPUS
GILMAN ST, CONGRESS ST, BRAMHALL ST, ET.AL
PORTLAND, MAINE
FOR:
MAINE MEDICAL CENTER
22 BRAMHALL ST
ADDRESS 2

RECORD OWNER:
SEE NOTE 1, SHEET 2

PROJECT NO.	SCALE
PROJ. NO.	1" = 20'

SHEET 3 OF 8

15466EC.dwg, TAB:EC03



PROPERTY LINE CURVE DATA

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD DIST.
C1	24.26'	44.00'	S80°08'07"W	23.96
C2	9.43'	11.00'	N59°30'45"W	9.14
C3	93.90'	100.00'	N08°03'24"W	90.49

MATTHEW W. EK PLS 2117

STATE OF MAINE
MATTHEW W. EK
2117
PROFESSIONAL LAND SURVEYOR

DRAWN	CHECKED
TSL	MWE

REV:	BY:	DATE:	STATUS:
C	MWE	11/27/18	RESPOND TO CITY COMMENTS
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EXISTING CONDITIONS SURVEY

OF:
MAINE MEDICAL CENTER CAMPUS
GILMAN ST, CONGRESS ST, BRAMHALL ST, ET.AL
PORTLAND, MAINE

FOR:
MAINE MEDICAL CENTER
22 BRAMHALL ST
ADDRESS 2

RECORD OWNER:
SEE NOTE 1, SHEET 2

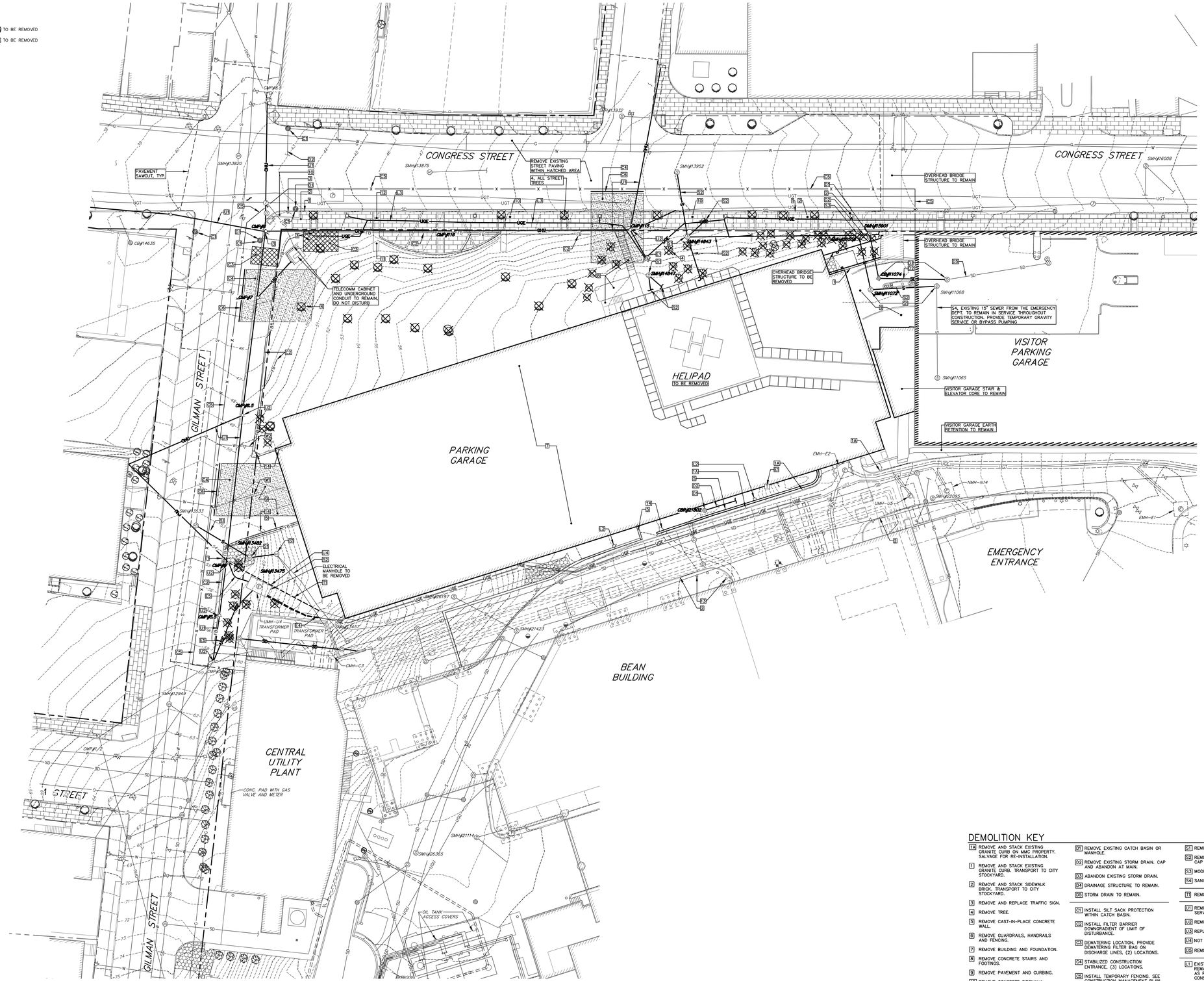
PROJECT NO.	SCALE
15466	1" = 20'

15466EC.dwg, TAB:EC04

SHEET 4 OF 8

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	PAVEMENT SAWCUT	
	EDGE CONCRETE	
	CURB LINE	
--420-- --118--	CONTOURS	
×120.00	SPOT GRADE	
	RETAINING WALL	
	DECIDUOUS TREE	TO BE REMOVED
	CONIFEROUS TREE	TO BE REMOVED
	SIGN	
G	GAS	
	GAS GATE VALVE	
	GAS METER	
G	GAS MANHOLE	
W	WATER	
	WATER GATE VALVE	
	WATER SHUT OFF	
	HYDRANT	
W	WATER MANHOLE	
S	SANITARY SEWER	
S	SANITARY MANHOLE	
SD	STORM DRAIN	
UD	UNDER DRAIN	
D	DRAINAGE MANHOLE	
	CATCH BASIN	
OHU	OVERHEAD UTILITY	
UGU	UNDERGROUND UTILITY	
T	TRANSFORMER PAD	
E	ELECTRICAL MANHOLE	
T	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	
	RIPRAP	
	INLET PROTECTION	



GRAPHIC SCALE

(IN FEET)
1 INCH = 20 FT.

DEMOLITION KEY

- 1A REMOVE AND STACK EXISTING GRANITE CURB ON MMC PROPERTY. SALVAGE FOR RE-INSTALLATION.
- 1 REMOVE AND STACK EXISTING GRANITE CURB. TRANSPORT TO CITY STOCKYARD.
- 2 REMOVE AND STACK SIDEWALK BRICK. TRANSPORT TO CITY STOCKYARD.
- 3 REMOVE AND REPLACE TRAFFIC SIGN.
- 4 REMOVE TREE.
- 5 REMOVE CAST-IN-PLACE CONCRETE WALL.
- 6 REMOVE GUARDRAILS, HANDRAILS AND FENCING.
- 7 REMOVE BUILDING AND FOUNDATION.
- 8 REMOVE CONCRETE STAIRS AND FOOTINGS.
- 9 REMOVE PAVEMENT AND CURBING.
- 10 REMOVE CONCRETE SIDEWALK.
- 11 REMOVE AND STACK GRANITE SEAT WALL BLOCKS.
- 12 REMOVE AND STACK GRANITE PAVERS AT TREE WELLS AND SIDEWALK.
- 13 REMOVE BOLLARDS.

- D1 REMOVE EXISTING CATCH BASIN OR MANHOLE.
- D2 REMOVE EXISTING STORM DRAIN. CAP AND ABANDON AT MAIN.
- D3 ABANDON EXISTING STORM DRAIN.
- D4 DRAINAGE STRUCTURE TO REMAIN.
- D5 STORM DRAIN TO REMAIN.

- C1 INSTALL SILT SACK PROTECTION WITHIN CATCH BASIN.
- C2 INSTALL FILTER BARRIER DOWNGRADIENT OF LIMIT OF DISTURBANCE.
- C3 DEWATERING LOCATION. PROVIDE DEWATERING FILTER BAG ON DISCHARGE LINES, (2) LOCATIONS.
- C4 STABILIZED CONSTRUCTION ENTRANCE, (3) LOCATIONS.
- C5 INSTALL TEMPORARY FENCING. SEE CONSTRUCTION MANAGEMENT PLAN, TYP., GILMAN AND CONGRESS ST.
- C6 30' ROLLING GATE, TYP. (3) LOCATIONS. SEE CONSTRUCTION MANAGEMENT PLAN.

- W1 RETIRE EXISTING 6" FIRE SERVICE.
- W2 RETIRE EXISTING 1" DOMESTIC SERVICE.

- S1 REMOVE SANITARY MANHOLE.
- S2 REMOVE EXISTING SANITARY SEWER. CAP AND ABANDON AT MAIN.
- S3 MODIFY SEWER MANHOLE TO REMAIN
- S4 SANITARY SEWER TO REMAIN.

- T1 REMOVE MMC TELECOMM CONDUIT.

- U1 REMOVE OVERHEAD UTILITIES AND SERVICES.
- U2 REMOVE UTILITY POLE AND GUY.
- U3 REPLACE UTILITY POLE AND GUY.
- U4 NOT USED
- U5 REMOVE A/C UNIT.

- L1 EXISTING STREET LIGHTING TO REMAIN. REMOVE, STORE AND RESET AS REQUIRED FOR NEW CONSTRUCTION.
- L2 REMOVE STREET LIGHT AND BASE.
- L3 UNDERGROUND LIGHTING CONDUIT TO REMAIN.

- E1 REMOVE & REPLACE ELECTRICAL METER AND SERVICE FOR STREET LIGHTING.
- E2 REMOVE ELECTRICAL/TELECOMM SERVICE ENTRANCES.
- E3 REMOVE ELECTRICAL MANHOLE.
- E4 REMOVE ELECTRICAL DUCT BANK TO CUT IN LOCATION. SEE SHEET C11-01.
- E5 REMOVE ELECTRICAL CONDUIT/DUCT BANK POLE #5 TO MANHOLE.

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COST ESTIMATOR
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3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

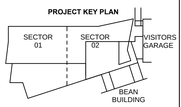
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE — DANIEL L. RILEY — No. 9999 — REGISTERED PROFESSIONAL ENGINEER — 11-27-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



TRUE NORTH

RESUBMIT TO CITY
NOVEMBER 27, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE

DEMOLITION PLAN CONGRESS STREET EXPANSION

SHEET NUMBER

C04-01

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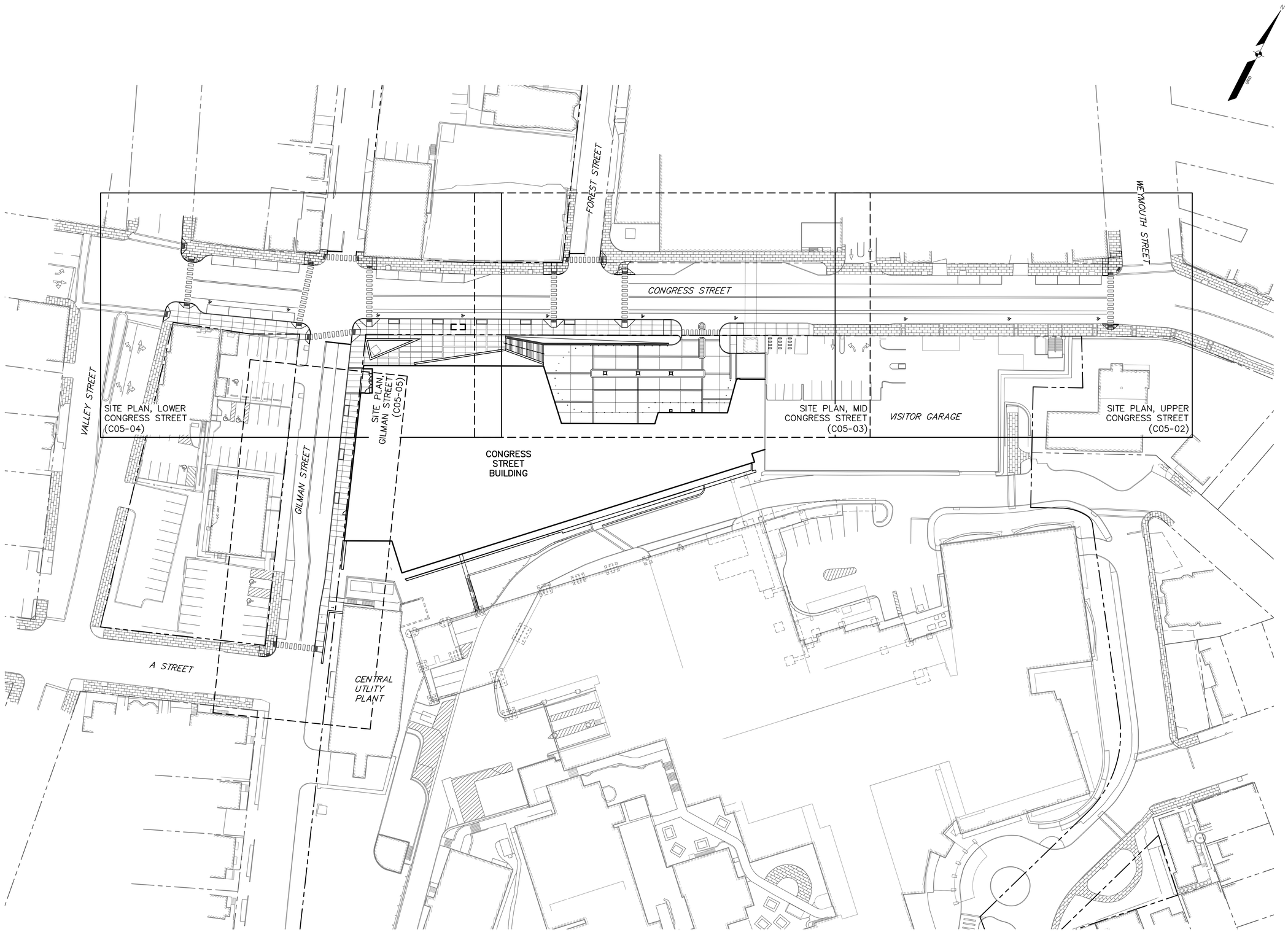

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 INCH = 30 FT.

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630 Dundee Road, Suite 340, Northbrook IL 60062

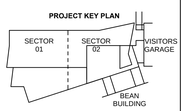
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONWAY
NO. 105
STATE OF MAINE
12-10-18

KEY PLANS

PROJECT KEY PLAN



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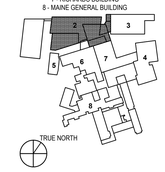

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

OVERALL SITE PLAN, CONGRESS STREET EXPANSION

SHEET NUMBER

C05-01

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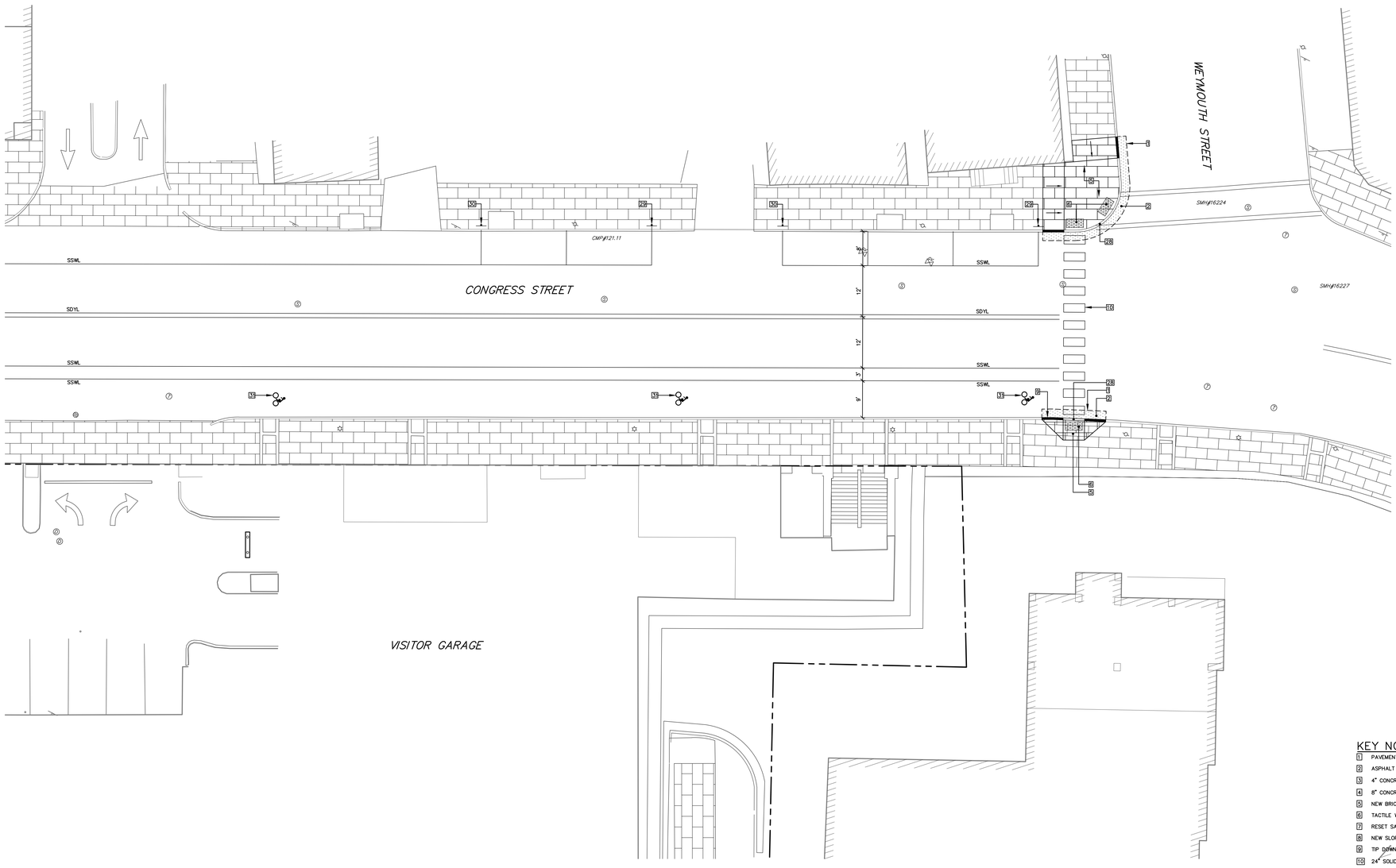
1546653.dwg, TAB: S



GRAPHIC SCALE

10 0 5 10 20

(IN FEET)
1 INCH = 10 FT.

KEY NOTES

1. PAVEMENT SAW CUT
2. ASPHALT STREET PAVING
3. 4" CONCRETE PAVING
4. 8" CONCRETE PAVING
5. NEW BRICK PAVING
6. TACTILE WARNING PLATES 2 FT. X 4 FT.
7. RESET SALVAGED GRANITE CURB
8. NEW SLOPED GRANITE CURB
9. TIP DOWN GRANITE CURB
10. 24" SOLID WHITE PAINT BARS, 5 FT. WIDE, SPACED 24" APART
11. (2) 4" SOLID YELLOW PAINT LINES
12. NEW STREET LIGHT - SEE SITE ELECTRICAL PLAN
13. 5 FT. X 10 FT. TREE WELL - GRANITE CURB SET 6" ABOVE SIDEWALK
14. METRO BUS STOP LOCATION
15. EXISTING TELEPHONE VAULT TO REMAIN
16. MMC DIRECTIONAL SIGN - SEE SIGNAGE PLAN
17. MMC PRIMARY SIGN ON BATTER WALL - SEE SIGNAGE PLAN
18. BATTER RETAINING WALL
19. 18" SEAT WALL
20. GRANITE STAIR - 5 RISERS PER FLIGHT
21. STAINLESS STEEL BOLLARD
22. STAINLESS STEEL HANDRAIL
23. NEW TYPE 1 GRANITE CURB SET 6" ABOVE PAVING
24. STOP SIGN
25. BUILDING CANOPY
26. EGRESS STAIR - SEE PERKINS + WILL PLANS
27. BRIDGE CONNECTOR - SEE PERKINS + WILL PLANS
28. RESET CURB FLUSH W/STREET
29. PARKING LEFT / NO PARKING RIGHT
30. PARKING RIGHT / NO PARKING LEFT
31. BIKE LANE SYMBOL - WHITE PAINT PER MUTCD STANDARDS
32. 2" X 12" GRANITE ACCENT BAND
33. 4" X 12" GRANITE ACCENT BAND
34. SAW CUT CONTROL JOINT
35. METRO BUS STOP SIGN
36. 12" WHITE PAINTED STOP BAR
37. CONCRETE BLOCK RETAINING WALL
38. UTILITY POLE TO REMAIN
39. POLE GUY TO REMAIN
40. CMP TO SET SIDEWALK GUY
41. BUILDING WALL EXTENSION - SEE ARCHITECTURAL PLANS

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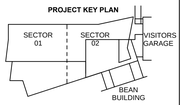
STATE OF MAINE
12-10-18

KEY PLANS

PROJECT KEY PLAN



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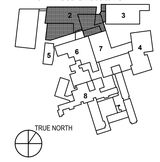
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE
SITE PLAN, UPPER CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER
C05-02

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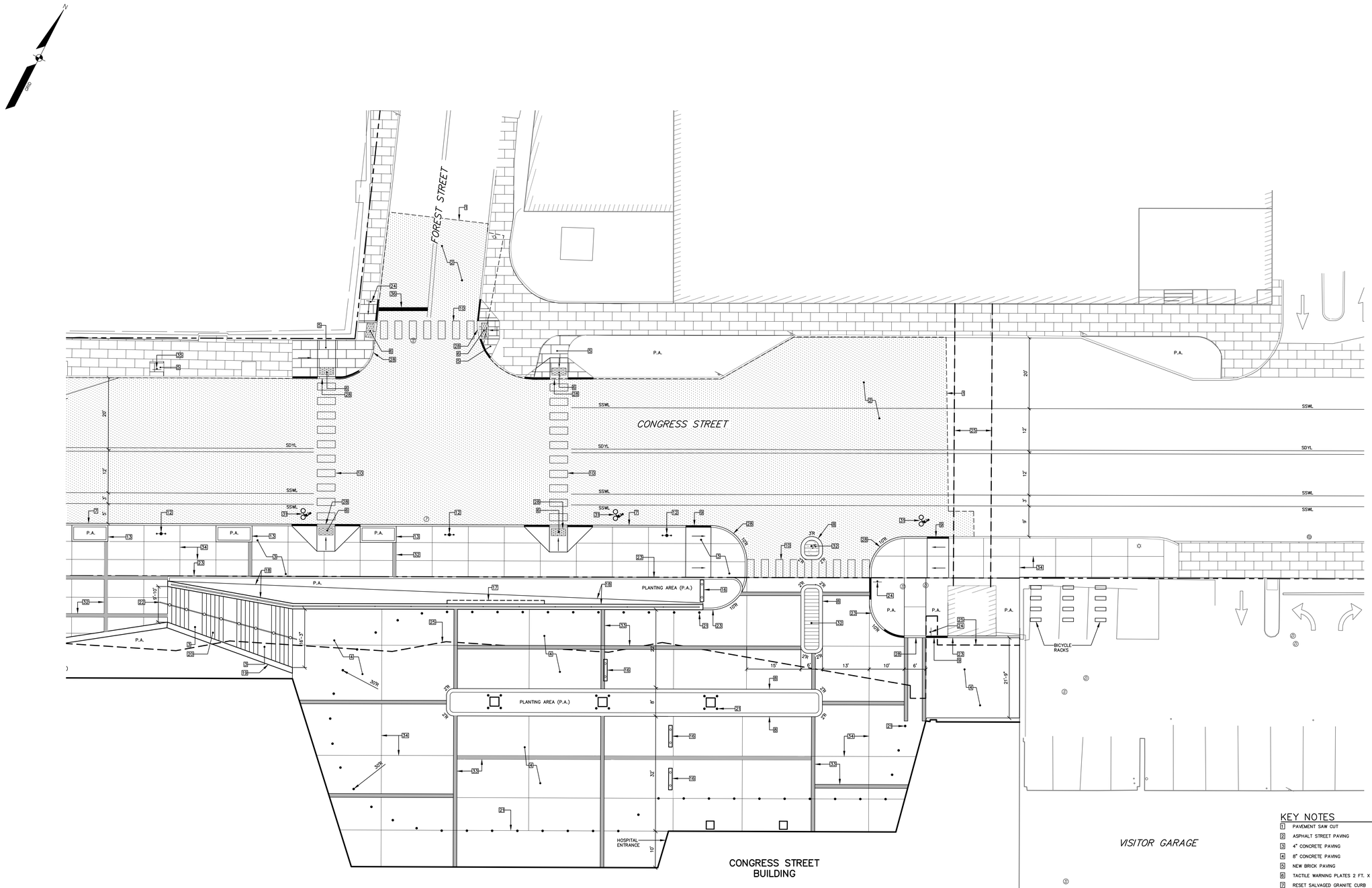
1545653-10 acad-dwg, TAB(1)



GRAPHIC SCALE

10 0 5 10 20

(IN FEET)
1 INCH = 10 FT.

KEY NOTES

1	PAVEMENT SAW CUT
2	ASPHALT STREET PAVING
3	4" CONCRETE PAVING
4	8" CONCRETE PAVING
5	NEW BRICK PAVING
6	TACTILE WARNING PLATES 2 FT. X 4 FT.
7	RESET SALVAGED GRANITE CURB
8	NEW SLOPED GRANITE CURB
9	TIP DOWN GRANITE CURB
10	24" SOLID WHITE PAINT BARS, 5 FT. WIDE, SPACED 24" APART
11	(2) 4" SOLID YELLOW PAINT LINES
12	NEW STREET LIGHT - SEE SITE ELECTRICAL PLAN
13	5 FT. X 10 FT. TREE WELL - GRANITE CURB SET 6" ABOVE SIDEWALK
14	METRO BUS STOP LOCATION
15	EXISTING TELEPHONE VAULT TO REMAIN
16	MMC DIRECTIONAL SIGN - SEE SIGNAGE PLAN
17	MMC PRIMARY SIGN ON BATTER WALL - SEE SIGNAGE PLAN
18	BATTER RETAINING WALL
19	18" SEAT WALL
20	GRANITE STAIR - 5 RISERS PER FLIGHT
21	STAINLESS STEEL BOLLARD
22	STAINLESS STEEL HANDRAIL
23	NEW TYPE 1 GRANITE CURB SET 6" ABOVE PAVING
24	STOP SIGN
25	BUILDING CANOPY
26	EGRESS STAIR - SEE PERKINS + WILL PLANS
27	BRIDGE CONNECTOR - SEE PERKINS + WILL PLANS
28	RESET CURB FLUSH W/STREET
29	PARKING LEFT / NO PARKING RIGHT
30	PARKING RIGHT / NO PARKING LEFT
31	BIKE LANE SYMBOL - WHITE PAINT PER MUTCD STANDARDS
32	2" X 12" GRANITE ACCENT BAND
33	4" X 12" GRANITE ACCENT BAND
34	SAW CUT CONTROL JOINT
35	METRO BUS STOP SIGN
36	12" WHITE PAINTED STOP BAR
37	CONCRETE BLOCK RETAINING WALL
38	UTILITY POLE TO REMAIN
39	POLE GUY TO REMAIN
40	CMP TO SET SIDEWALK GUY
41	BUILDING WALL EXTENSION - SEE ARCHITECTURAL PLANS

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3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

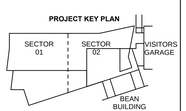
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONWAY
No. 1205
STATE OF MAINE
12-10-18

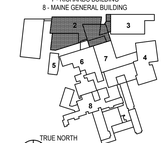
KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



TRUE NORTH

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

SITE PLAN, MID CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER

C05-03

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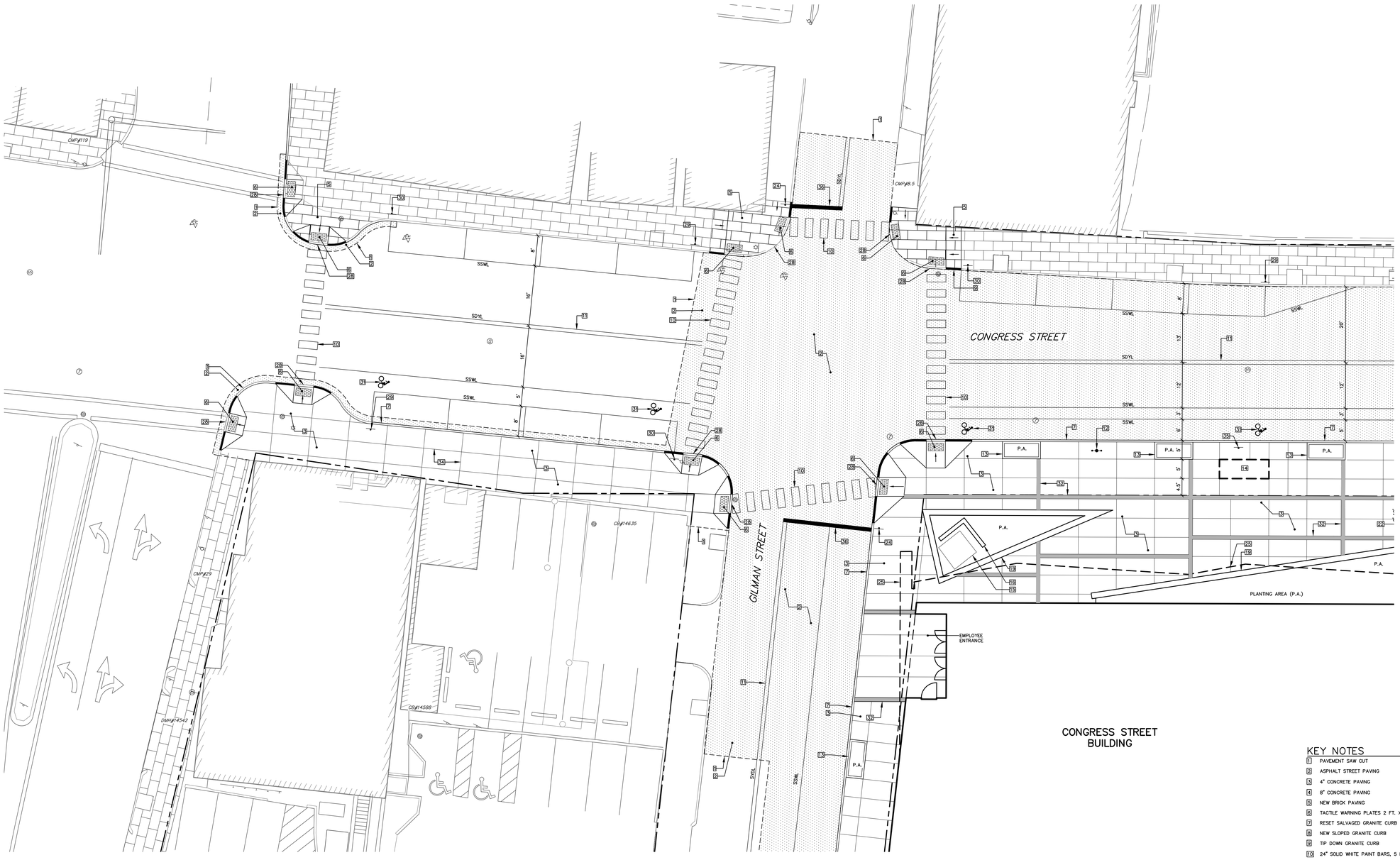
1546653-10 sht04.dwg, TAB (2)



CONGRESS STREET BUILDING

GRAPHIC SCALE
10 0 5 10 20
(IN FEET)
1 INCH = 10 FT.

KEY NOTES

1. PAVEMENT SAW CUT
2. ASPHALT STREET PAVING
3. 4" CONCRETE PAVING
4. 8" CONCRETE PAVING
5. NEW BRICK PAVING
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MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

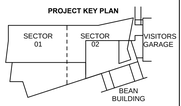
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONWAY
No. 245
STATE OF MAINE
12-10-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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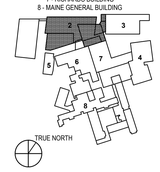

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE
SITE PLAN, LOWER CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER
C05-04

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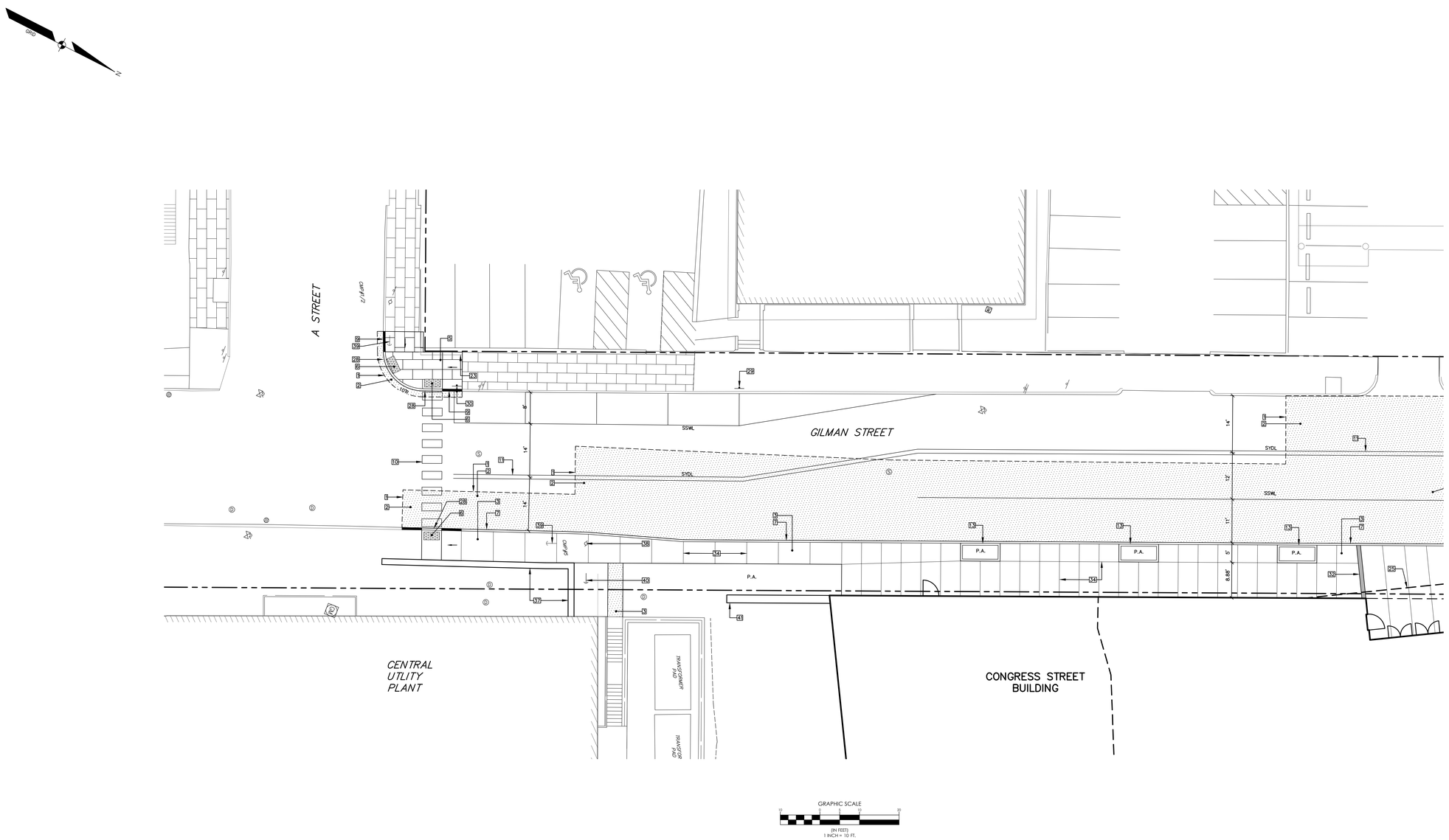

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MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

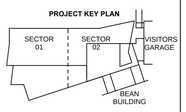
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONWAY
NA 108
STATE OF MAINE
12-10-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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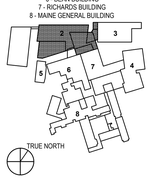

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE
SITE PLAN, GILMAN STREET, CONGRESS STREET EXPANSION

SHEET NUMBER
C05-05

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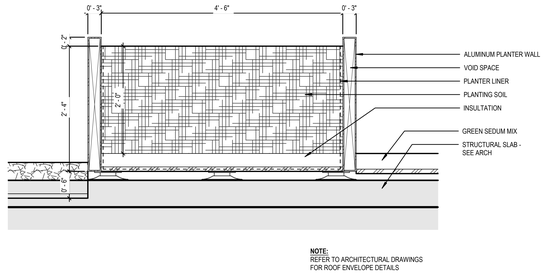
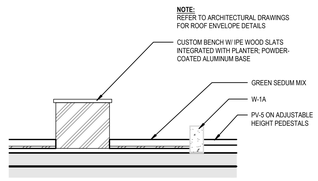
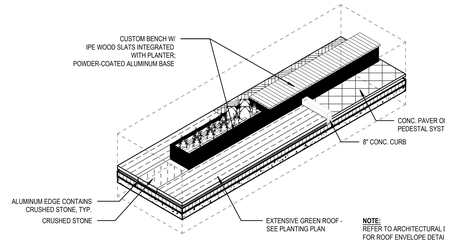
1546653-10 scale.dwg, TAB:(4)



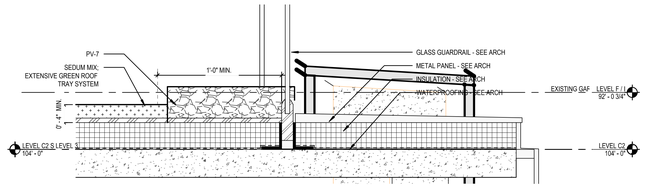
7 GREEN ROOF C2 PLANTER
1" = 1'-0"



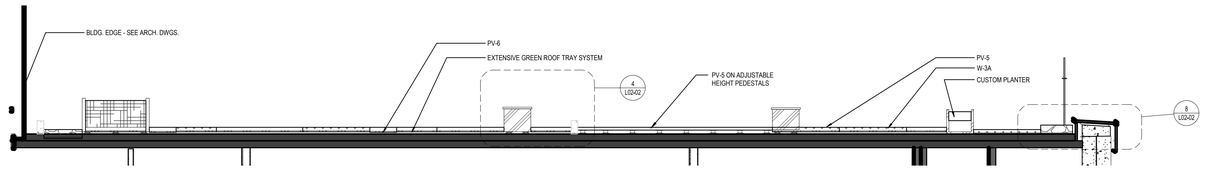
4 GREEN ROOF @ BENCH PLANTER, TYP.
1/2" = 1'-0"



6 GREEN ROOF AXON DETAIL



8 GUARDRAIL DETAIL @ ROOF C2
1" = 1'-0"



2 GREEN ROOF C2 N/S SECTION
1/4" = 1'-0"

PLANTING KEY (ROOFS)

GROUNDCOVER

DE FL	Deschamphia flexuousa	Wavy Hairgrass
LI SP	Liatris spicata	Blazing Star
PA VI	Panicum virgatum 'Northwind'	Northwind Switch grass
RU FU	Rudbeckia fulgida 'Goldstrum'	Black eyed Susan
VA AN	Vaccinium angustifolium	Lowbush Blueberry

GREEN SEDUM MIX	Sedum acre 'Golden Carpet' Sedum album 'France' Sedum floriferum 'Weihenstephaner's Gold' Sedum kamtschaticum Sedum sexangulare Sedum spurium 'Summer Glory' Sedum spurium 'John Creech' Sedum takesimensis
RED SEDUM MIX	Sedum acre 'Octoberfest' Sedum album 'Coral Carpet' Sedum floriferum 'Weihenstephaner's Gold' Sedum spurium 'Dragon's Blood' Sedum spurium 'Fuldaglut' Sedum spurium 'Voodoo'

PAVING TYPES

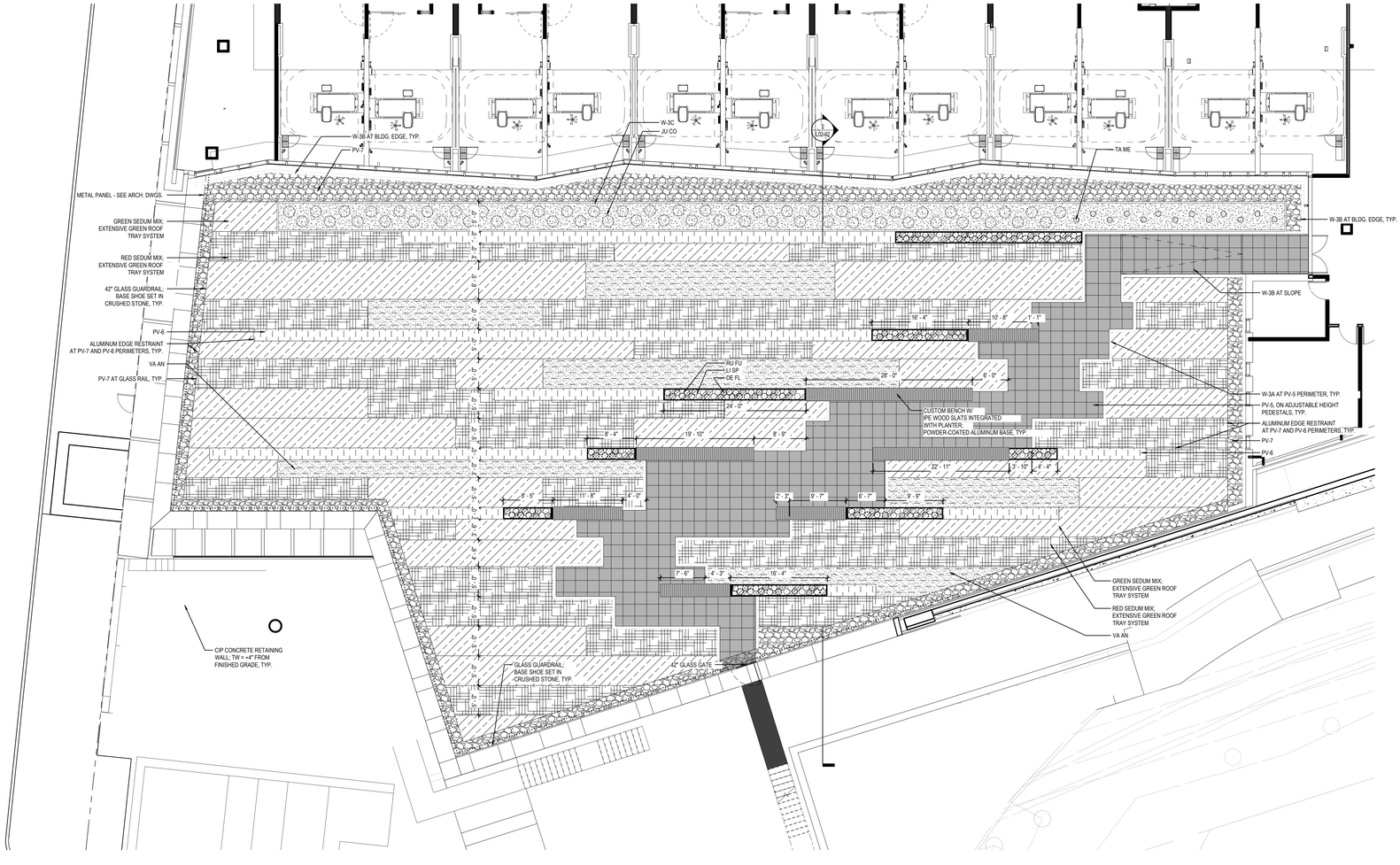
PV-1A	CONCRETE PAVEMENT - PED
PV-1B	CONCRETE PAVEMENT - VEH
PV-2	CONCRETE PAVEMENT BANDING
PV-3A	VEH STONE PAVER TYPE 1
PV-3B	VEH STONE PAVER TYPE 2
PV-4A	PED STONE PAVER TYPE 1
PV-4B	PED STONE PAVER TYPE 2
PV-5	ROOF PAVER ASSEMBLY
PV-6	CRUSHED STONE - MINI SLATE
PV-7	CRUSHED STONE - PEA STONE
PV-8	CRUSHED STONE - JUMBO SLATE

WALL TYPES

W-1	6" WIDTH GRANITE CURB
W-1R	6" WIDTH RADIAL GRANITE CURB
W-2	STONE VENEER RETAINING WALL
W-3A	PRECAST CONCRETE CURB TYPE A
W-3B	PRECAST CONCRETE CURB TYPE B
W-3C	PRECAST CONCRETE CURB TYPE C
W-4	CONCRETE EDGE RESTRAINT

*SEE GENERAL SHEET FOR MATERIAL DESCRIPTION

* MATERIAL PATTERNS IN THE DRAWINGS DO NOT REFLECT ACTUAL PAVEMENT PATTERNS.



1 ENLARGED PLAN - C2 GREEN ROOF
1/8" = 1'-0"

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630 Dundee Road, Suite 340, Northbrook IL 60062

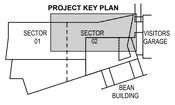
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONNAUGHTON
LA 1208
STATE OF MAINE
9/25/18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
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CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	WTC

TITLE
SITE PLAN
GREEN ROOF
CONGRESS STREET EXPANSION

SHEET NUMBER

C05-02

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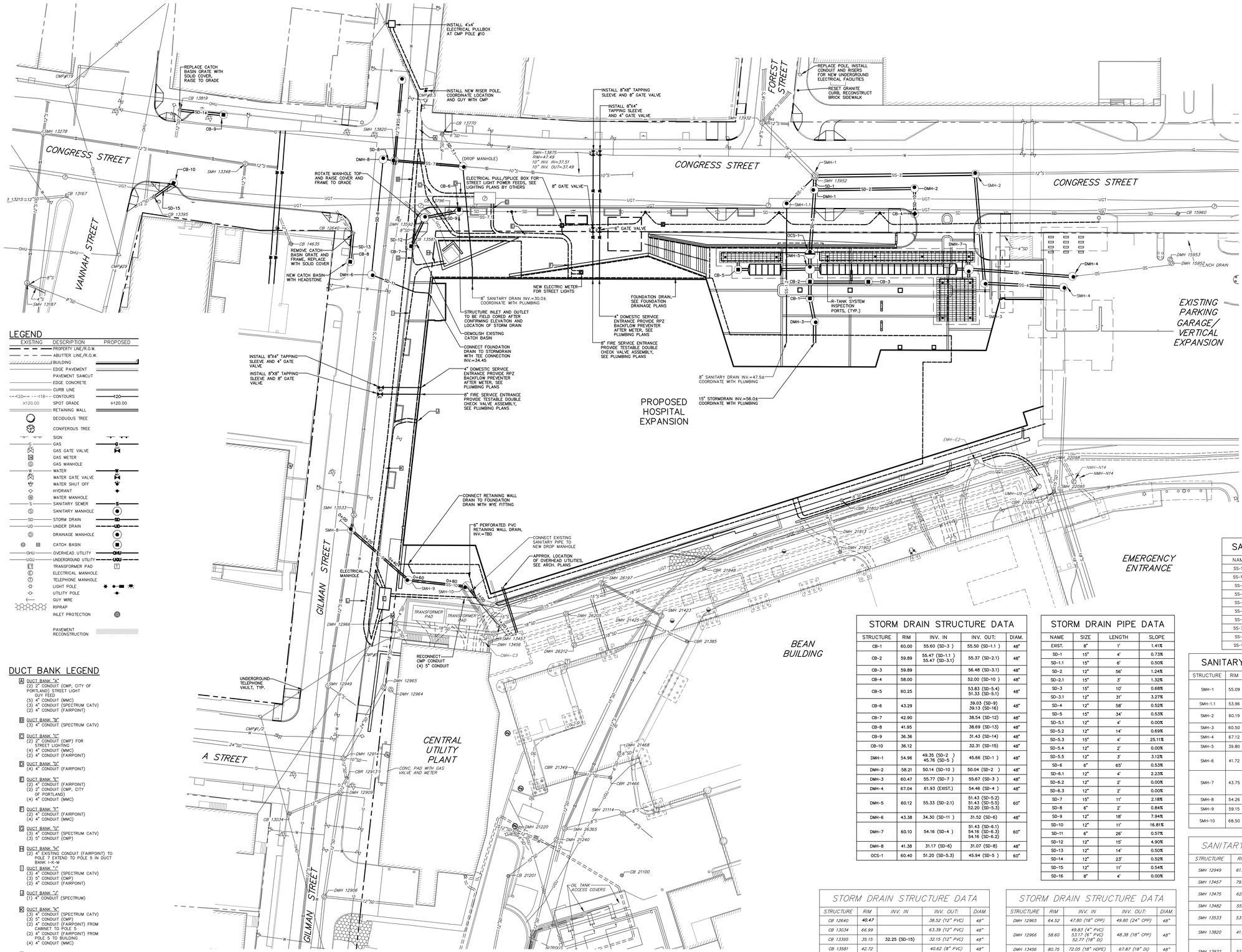
CONGRESS STREET
VANNAH STREET
GILMAN STREET
A STREET
FOREST STREET
EXISTING PARKING GARAGE/ VERTICAL EXPANSION
PROPOSED HOSPITAL EXPANSION
EMERGENCY ENTRANCE
BEAN BUILDING
CENTRAL UTILITY PLANT
INSTALL 4"x4" ELECTRICAL PULLBOX AT CMP POLE #10
REPLACE CATCH BASIN GRATE WITH SOLID COVER, RAISE TO GRADE
INSTALL NEW RISER POLE, COORDINATE LOCATION AND GUY WITH CMP
INSTALL 8"X8" TAPPING SLEEVE AND 8" GATE VALVE
INSTALL 8"X4" TAPPING SLEEVE AND 4" GATE VALVE
REPLACE POLE, INSTALL CONDUIT AND RISERS FOR NEW UNDERGROUND ELECTRICAL FACILITIES
RESET GRANITE CURB, RECONSTRUCT BRICK SIDEWALK
ROTATE MANHOLE TOP AND RAISE COVER AND FRAME TO GRADE
ELECTRICAL PULL/SPLICE BOX FOR STREET LIGHT POWER FEEDS, SEE LIGHTING PLANS BY OTHERS
8" GATE VALVE
6" GATE VALVE
REMOVE CATCH BASIN GRATE AND FRAME, REPLACE WITH SOLID COVER
NEW CATCH BASIN WITH HEADSTONE
NEW ELECTRIC METER FOR STREET LIGHTS
8" SANITARY DRAIN INV.=30.0± COORDINATE WITH PLUMBING
STRUCTURE INLET AND OUTLET TO BE FIELD CORED AFTER CONFIRMING ELEVATION AND LOCATION OF STORM DRAIN
DEMOLISH EXISTING CATCH BASIN
CONNECT FOUNDATION DRAIN TO STORMDRAIN WITH TEE CONNECTION INV.=34.45
4" DOMESTIC SERVICE ENTRANCE PROVIDE RPZ BACKFLOW PREVENTER AFTER METER, SEE PLUMBING PLANS
8" FIRE SERVICE ENTRANCE PROVIDE TESTABLE DOUBLE CHECK VALVE ASSEMBLY, SEE PLUMBING PLANS
FOUNDATION DRAIN, SEE FOUNDATION DRAINAGE PLANS
R-TANK SYSTEM INSPECTION PORTS, (TYP.)
8" SANITARY DRAIN INV.=47.5± COORDINATE WITH PLUMBING
15" STORMDRAIN INV.=56.0± COORDINATE WITH PLUMBING
INSTALL 8"X4" TAPPING SLEEVE AND 4" GATE VALVE
INSTALL 8"X8" TAPPING SLEEVE AND 8" GATE VALVE
CONNECT RETAINING WALL DRAIN TO FOUNDATION DRAIN WITH WYE FITTING
6" PERFORATED PVC RETAINING WALL DRAIN, INV.=TBD
CONNECT EXISTING SANITARY PIPE TO NEW DROP MANHOLE
APPROX. LOCATION OF OVERHEAD UTILITIES, SEE ARCH. PLANS
ELECTRICAL MANHOLE
TRANSFORMER PAD
RECONNECT CMP CONDUIT (4) 5" CONDUIT
UNDERGROUND TELEPHONE VAULT, TYP.
CONC. PAD WITH GAS VALVE AND METER
OIL TANK ACCESS COVERS
(DROP MANHOLE)
SMH-1.5875 Rim=47.49 10" INV. IN=37.51 10" INV. OUT=37.49
SMH 13278
SMH 13819
SMH 13920
SMH 13932
SMH 13348
SMH 13187
SMH 13533
SMH 12949
SMH 12906
SMH 26197
SMH 21423
SMH 22095
SMH 13457
SMH 13456
SMH 21114
SMH 26365
SMH 21240
SMH 21220
SMH 21201
SMH 21100
SMH 21468
SMH 21349
SMH 21385
SMH 21846
SMH 21802
SMH 21385
SMH 21913
SMH 21903
SMH 21425
SMH 26205
SMH 26212
SMH 12965
SMH 12964
SMH 12914
SMH 12909
SMH 12966
SMH 13952
SMH 15952
SMH 15953
SMH 15952_NCH DRAIN
SMH 13796
SMH 13592
SMH 13581
SMH 13770
SMH 13596
SMH 13596
CB 13819
CB 13770
CB 13167
CB 13395
CB 12640
CB 14635
CB 13034
CB 12966
CB 12913
CB 21201
CB 21100
CB 21385
CB 21468
CB 21466
CB 21349
CB 21802
CB 21846
CB 22087
CB 25588
CB 15960
CB 22095
DMH 12966
DMH 12965
DMH 12964
DMH 12914
DMH 12909
DMH 12906
DMH 26205
DMH 26212
DMH 21425
DMH 21913
DMH 21903
DMH 21468
DMH 21349
DMH 15953
DMH 15952
DMH 22095
UMH-U5
UMH-N14
NMH-N14
EMH-E2
OCS-1
CB-1
CB-2
CB-3
CB-4
CB-5
CB-6
CB-7
CB-8
DMH-1
DMH-2
DMH-3
DMH-4
DMH-5
DMH-6
DMH-7
DMH-8
SD-1
SD-2
SD-4
SD-7
SD-8
SD-9
SD-11
SD-12
SD-13
SD-14
SD-15
SS-1
SS-2
SS-4
SS-7
SS-7.1
SS-9
SS-10
SMH-1
SMH-1.1
SMH-2
SMH-3
SMH-4
SMH-5
SMH-8
SMH-9
SMH-10
SMH-C3
CMP#19
CMP#29
CMP#1/2
CMP#3
CMP#5
CMP#6
CMP#7
CMP#8
CMP#9
CMP#10
OHU
UGT
SD
SS
W
G
GAS
N
0+60
0+80
1+00
1+20
1+40
1+60
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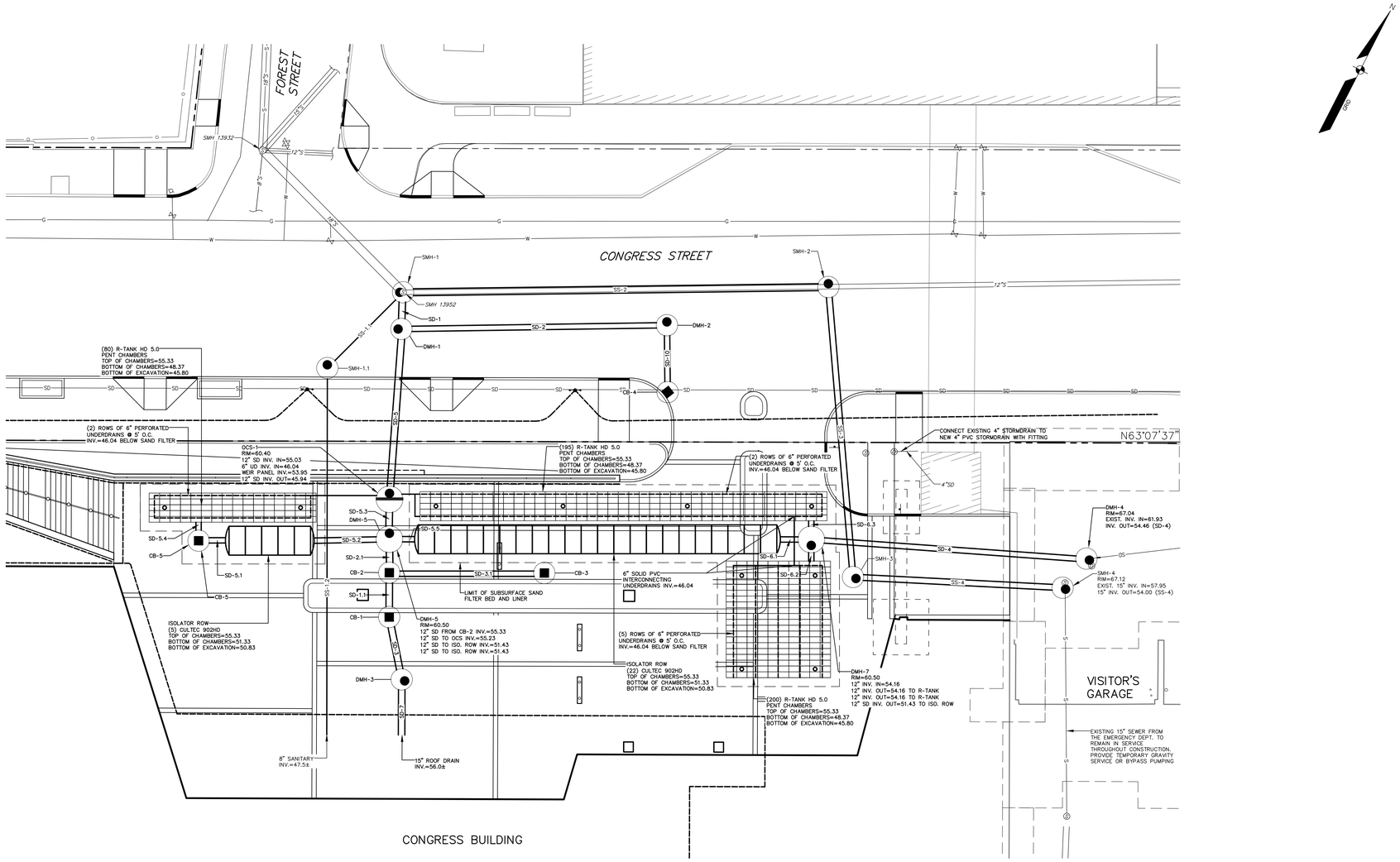
5+80
6+00
6+20
6+40
6+60
6+80
7+00
7+20
7+40
7+60
7+80
8+00
8+20
8+40

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	PAVEMENT SAWCUT	
	EDGE CONCRETE	
	CURB LINE	
--420-- --118--	CONTOURS	120
×120.00	SPOT GRADE	+120.00
	RETAINING WALL	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
	SIGN	
G	GAS	G
	GAS GATE VALVE	
GM	GAS METER	
G	GAS MANHOLE	
W	WATER	W
	WATER GATE VALVE	
	WATER SHUT OFF	
	HYDRANT	
W	WATER MANHOLE	
S	SANITARY SEWER	S
S	SANITARY MANHOLE	
SD	STORM DRAIN	SD
UD	UNDER DRAIN	UD
D	DRAINAGE MANHOLE	
	CATCH BASIN	
OHU	OVERHEAD UTILITY	OHU
UGU	UNDERGROUND UTILITY	UGU
T	TRANSFORMER PAD	T
E	ELECTRICAL MANHOLE	
T	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	
	RIPRAP	
	INLET PROTECTION	



GRAPHIC SCALE
10 0 5 10 20
(IN FEET)
1 INCH = 10 FT.

SANITARY SEWER STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
SMH 13932	52.64	43.42 (15" RCP) 44.44 (12" PVC) 41.64 (18" RCP) 44.64 (8" PVC)	40.64 (18" RCP)	48"
SMH 13952	55.09	45.89 (12" PVC)	44.61 (18" RCP)	48"

SANITARY SEWER STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
SMH-1	55.09	44.71 (SS-2) 46.87 (SS-1.1) 45.63 (SD-1)		48"
SMH-1.1	53.96	47.09 (SS-1.2)	46.99 (SS-1.1)	48"
SMH-2	60.19	51.21 (SS-3) 51.41 (SS-16008)	50.77 (SS-2)	48"
SMH-3	60.50	52.24 (SS-4)	52.14 (SS-3)	48"
SMH-4	67.12	57.95 (SS-11065)	54.00 (SS-4)	48"

SANITARY SEWER PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SS-1.1	8"	20'	0.60%
SS-1.2	8"	81'	0.51%
SS-2	18"	92'	6.60%
SS-3	15"	62'	1.51%
SS-4	15"	43'	4.07%

STORM DRAIN STRUCTURE DATA

STRUCTURE	RIM	INV. IN	INV. OUT:	DIAM.
CB-1	60.00	55.60 (SD-3)	55.50 (SD-1.1)	48"
CB-2	59.89	55.47 (SD-1.1) 55.47 (SD-3.1)	55.37 (SD-2.1)	48"
CB-3	59.89		56.48 (SD-3.1)	48"
CB-4	58.00		52.00 (SD-10)	48"
CB-5	60.25		53.83 (SD-5.4) 51.33 (SD-5.1)	48"
DMH-1	54.96	49.35 (SD-2) 45.76 (SD-5)	45.66 (SD-1)	48"
DMH-2	58.21	50.14 (SD-10)	50.04 (SD-2)	48"
DMH-3	60.47	55.77 (SD-7)	55.67 (SD-3)	48"
DMH-4	67.04	61.93 (EXIST.)	54.46 (SD-4)	48"
DMH-5	60.12	55.33 (SD-2.1)	51.43 (SD-5.2) 51.43 (SD-5.5) 52.20 (SD-5.3)	60"
DMH-7	60.10	54.16 (SD-4)	51.43 (SD-6.1) 54.16 (SD-6.3) 54.16 (SD-6.2)	60"

STORM DRAIN PIPE DATA

NAME	SIZE	LENGTH	SLOPE
EXIST.	8"	1'	1.41%
SD-1	15"	4'	0.73%
SD-1.1	15"	6'	0.50%
SD-2	12"	56'	1.24%
SD-2.1	15"	3'	1.32%
SD-3	15"	10'	0.68%
SD-3.1	12"	31'	3.27%
SD-4	12"	58'	0.52%
SD-5	15"	34'	0.53%
SD-5.1	12"	4'	0.00%
SD-5.2	12"	14'	0.69%
SD-5.3	15"	4'	25.11%
SD-5.4	12"	2'	0.00%
SD-5.5	12"	3'	3.12%
SD-6	6"	65'	0.53%
SD-6.1	12"	4'	2.23%
SD-6.2	12"	2'	0.00%
SD-6.3	12"	2'	0.00%
SD-7	15"	11'	2.18%
SD-8	6"	2'	0.84%
SD-9	12"	18'	7.94%
SD-10	12"	11'	16.81%

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COST ESTIMATOR
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MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

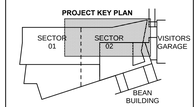
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 10111
REGISTERED PROFESSIONAL ENGINEER
12-10-18

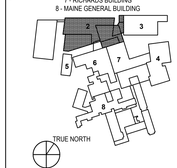
KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
UTILITY PLAN, MAIN ENTRANCE, CONGRESS STREET EXPANSION

SHEET NUMBER
C30-01

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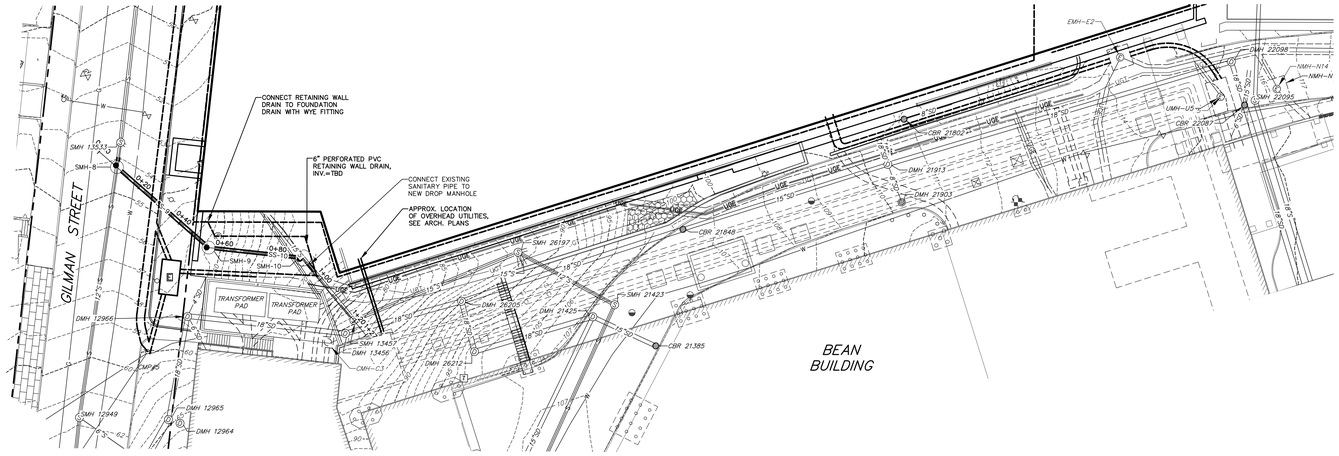
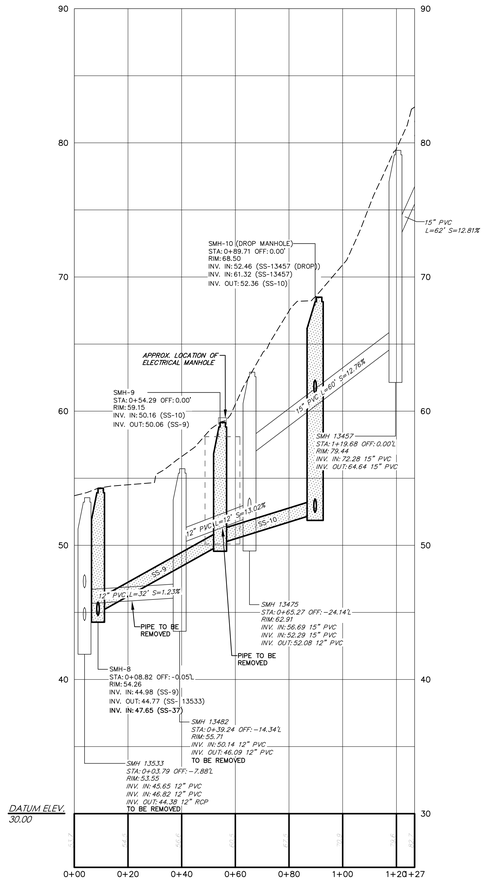


PLAN: UTILITY CORRIDOR
STA. 0+00 TO STA. 2+68
SCALE: 1"=20'

SANITARY SEWER PIPE DATA

NAME	SIZE	LENGTH	SLOPE
SS-9	12"	41'	12.25%
SS-10	12"	31'	7.12%



PROFILE: UTILITY CORRIDOR
STA. 0+00 TO STA. 2+68
SCALE: 1"=20' HORIZ.
1"=4' VERT.

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	PAVEMENT SAWCUT	
	EDGE CONCRETE	
	CURB LINE	
120 118	CONTOURS	120
×120.00	SPOT GRADE	+120.00
	RETAINING WALL	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
	SIGN	
G	GAS	G
	GAS GATE VALVE	
	GAS METER	
G	GAS MANHOLE	
W	WATER	W
	WATER GATE VALVE	
	WATER SHUT OFF	
	HYDRANT	
W	WATER MANHOLE	
S	SANITARY SEWER	S
S	SANITARY MANHOLE	
SD	STORM DRAIN	SD
UD	UNDER DRAIN	UD
D	DRAINAGE MANHOLE	
	CATCH BASIN	
OHU	OVERHEAD UTILITY	OHU
UGU	UNDERGROUND UTILITY	UGU
T	TRANSFORMER PAD	T
E	ELECTRICAL MANHOLE	
T	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	
	RIPRAP	
	INLET PROTECTION	
	PAVEMENT RECONSTRUCTION	

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MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

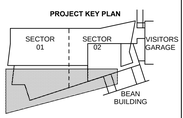
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE — DANIEL L RILEY No. 10107 — REGISTERED PROFESSIONAL ENGINEER — 11-27-18

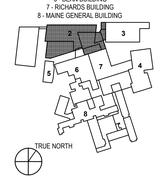
KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
NOVEMBER 27, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE

PLAN & PROFILE - UTILITY CORRIDOR CONGRESS STREET EXPANSION

SHEET NUMBER

C30-02

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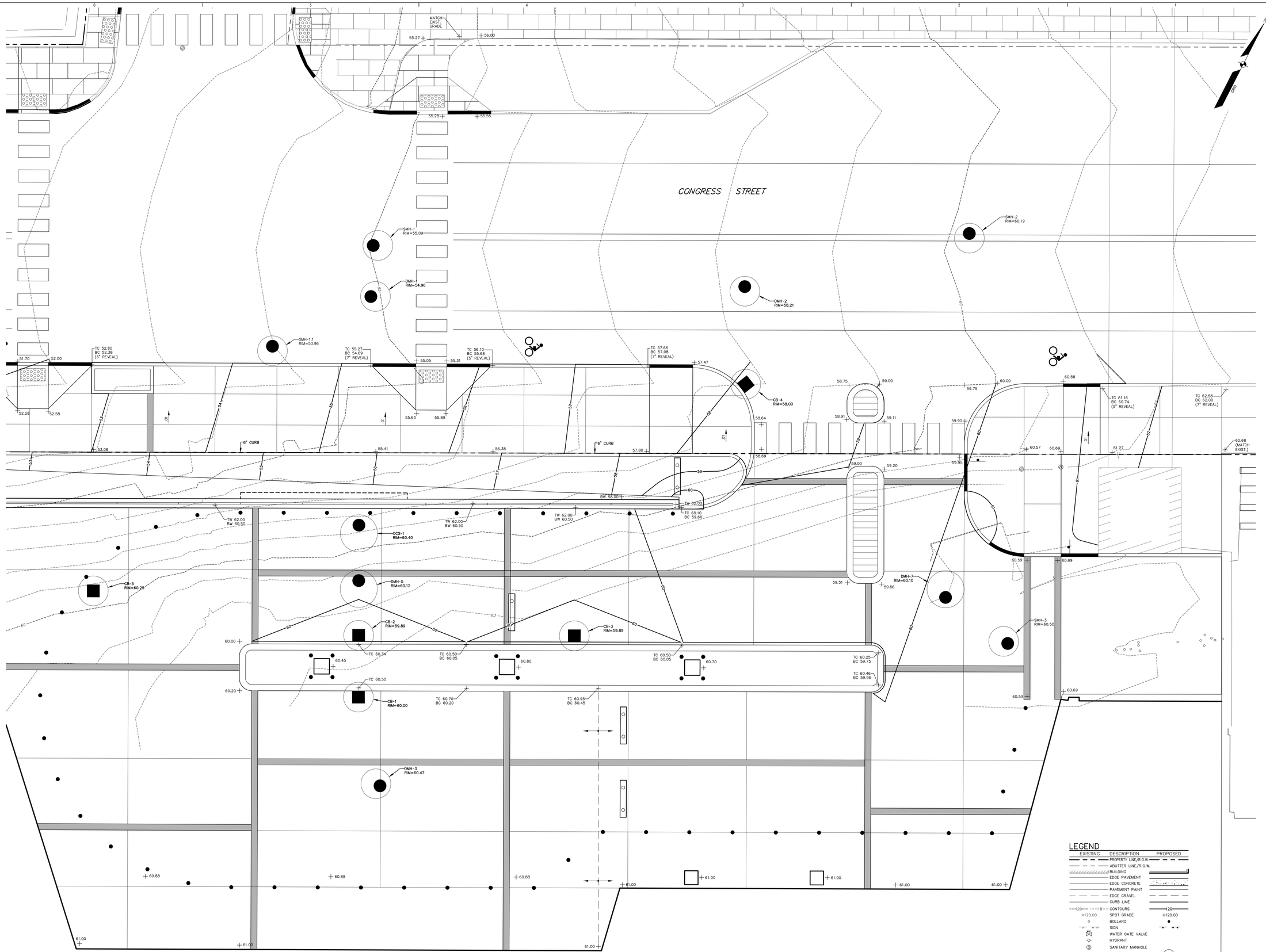

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	EDGE CONCRETE	
	PAVEMENT PAINT	
	EDGE GRAVEL	
	CURB LINE	
-120- -118-	CONTOURS	-120-
×120.00	SPOT GRADE	+120.00
	BOLLARD	
	SIGN	
	WATER GATE VALVE	
	HYDRANT	
S	SANITARY MANHOLE	
D	DRAINAGE MANHOLE	
	CATCH BASIN	
T	TRANSFORMER PAD	
E	ELECTRICAL MANHOLE	
EM	ELECTRIC METER	
H	HVAC UNIT	
T	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	

GRAPHIC SCALE
(IN FEET)
1 INCH = 5 FT.

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Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

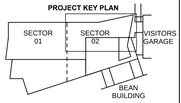
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L RILEY No. 10111
REGISTERED PROFESSIONAL ENGINEER
12-10-18

KEY PLANS

PROJECT KEY PLAN



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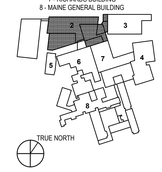

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE
GRADING PLAN UPPER CONGRESS CONGRESS STREET EXPANSION

SHEET NUMBER
C40-01

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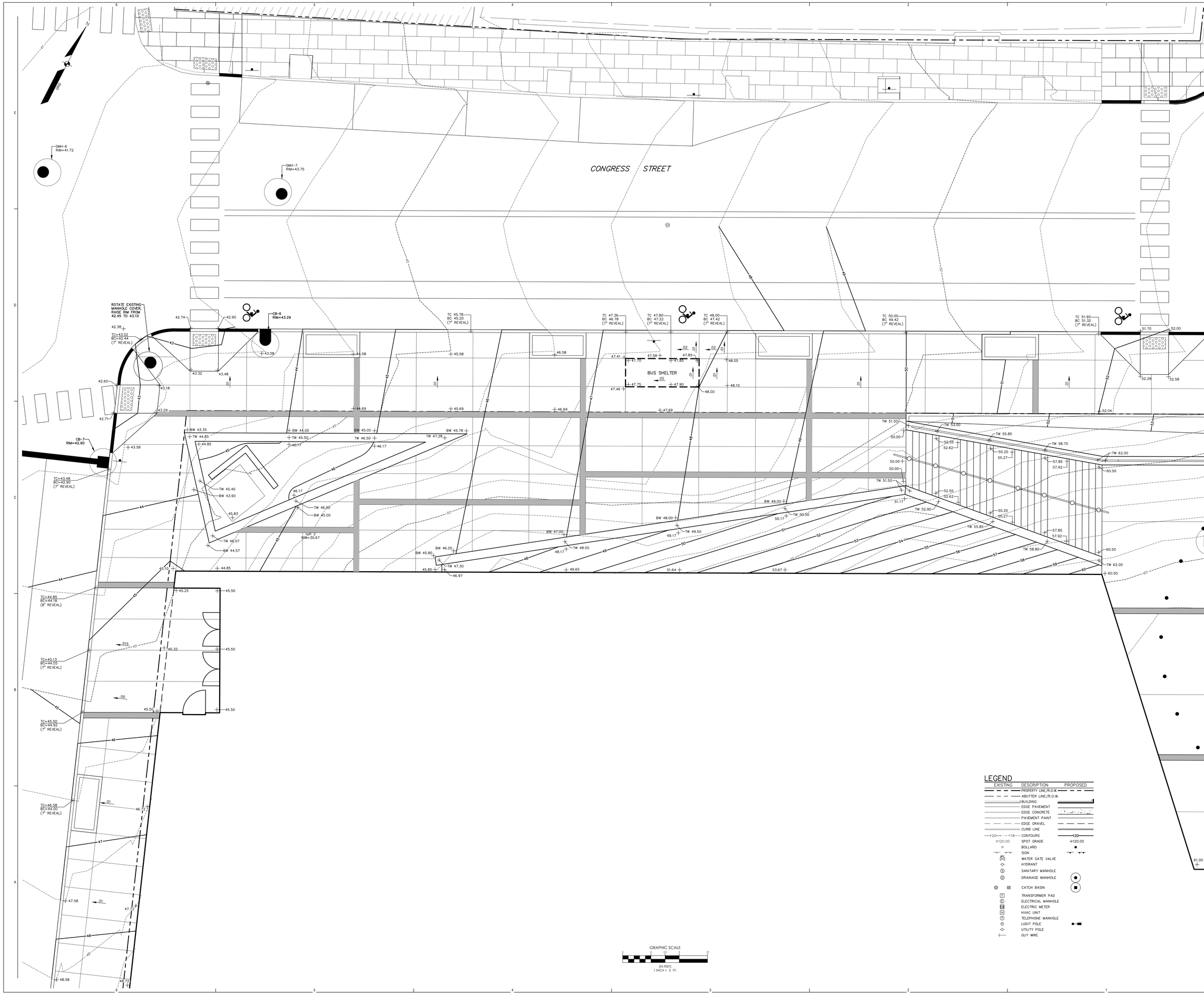
1546503.dwg, 1AB-01



LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	EDGE CONCRETE	
	PAVEMENT PAINT	
	EDGE GRAVEL	
	CURB LINE	
120 118	CONTOURS	120
×120.00	SPOT GRADE	+120.00
	BOLLARD	
	SIGN	
	WATER GATE VALVE	
	HYDRANT	
	SANITARY MANHOLE	
	DRAINAGE MANHOLE	
	CATCH BASIN	
	TRANSFORMER PAD	
	ELECTRICAL MANHOLE	
	ELECTRIC METER	
	HVAC UNIT	
	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	

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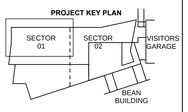
STATE OF MAINE
DANIEL L. RILEY
No. 14867
LICENSED
PROFESSIONAL ENGINEER
12-10-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
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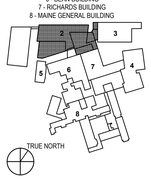
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

GRADING PLAN, LOWER CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER

C40-02

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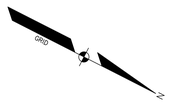
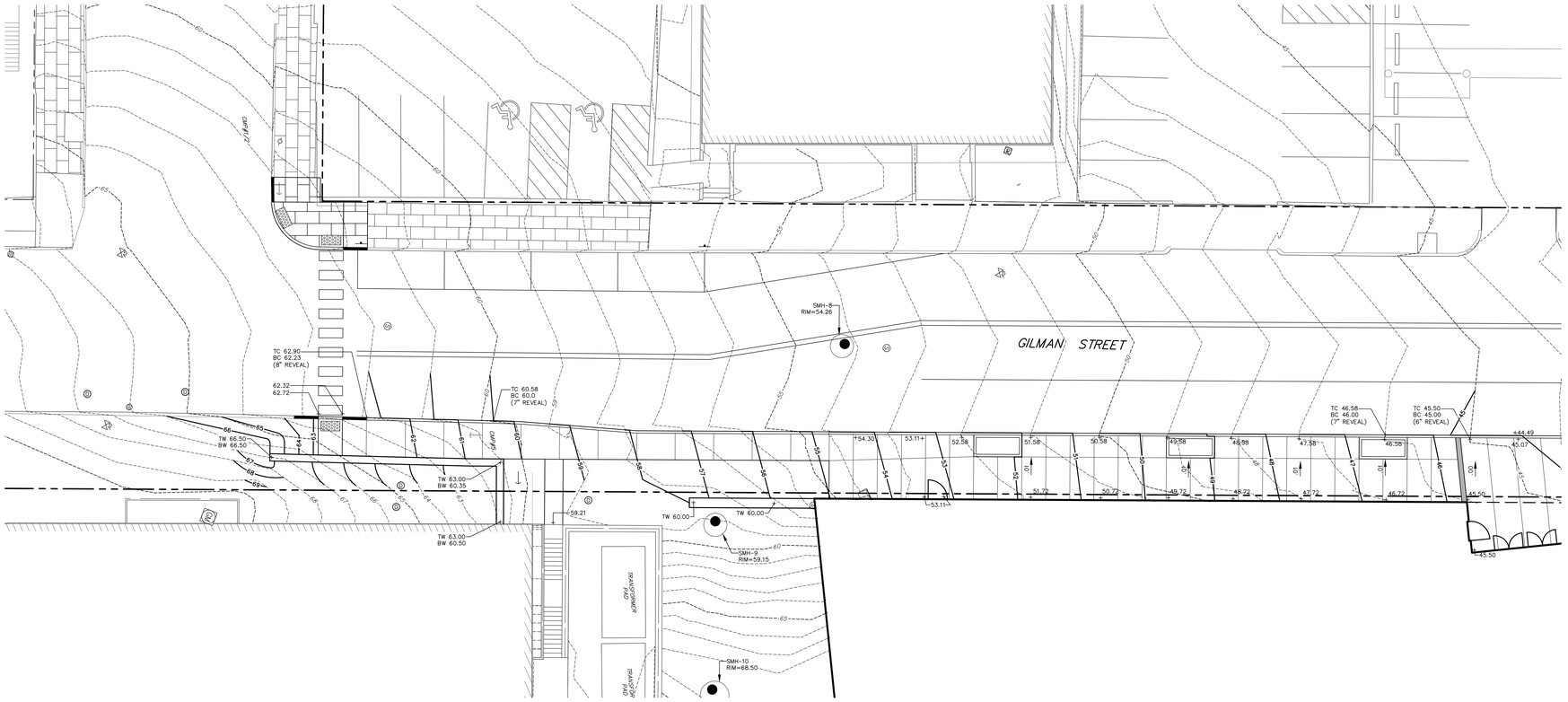
1546603.dwg, TAB:02





GRAPHIC SCALE

(IN FEET)
1 INCH = 10 FT.

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	BUILDING	
	EDGE PAVEMENT	
	EDGE CONCRETE	
	PAVEMENT PAINT	
	EDGE GRAVEL	
	CURB LINE	
120 118	CONTOURS	120
×120.00	SPOT GRADE	+120.00
	BOLLARD	
	SIGN	
	WATER GATE VALVE	
	HYDRANT	
	SANITARY MANHOLE	
	DRAINAGE MANHOLE	
	CATCH BASIN	
	TRANSFORMER PAD	
	ELECTRICAL MANHOLE	
	ELECTRIC METER	
	HVAC UNIT	
	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	

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AKF Group LLC
99 Bedford Street, 2nd Floor, Boston, MA 02111

CONSTRUCTION MANAGER
TURNER CONSTRUCTION
2 Seaport Lane, Suite 200, Boston, MA 02210

ELEVATOR CONSULTANT
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COST ESTIMATOR
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3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

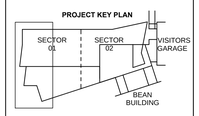
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14607
LICENSED
PROFESSIONAL ENGINEER
12-10-18

KEY PLANS

PROJECT KEY PLAN



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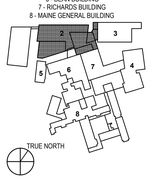

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

GRADING PLAN, GILMAN STREET, CONGRESS STREET EXPANSION

SHEET NUMBER

C40-03

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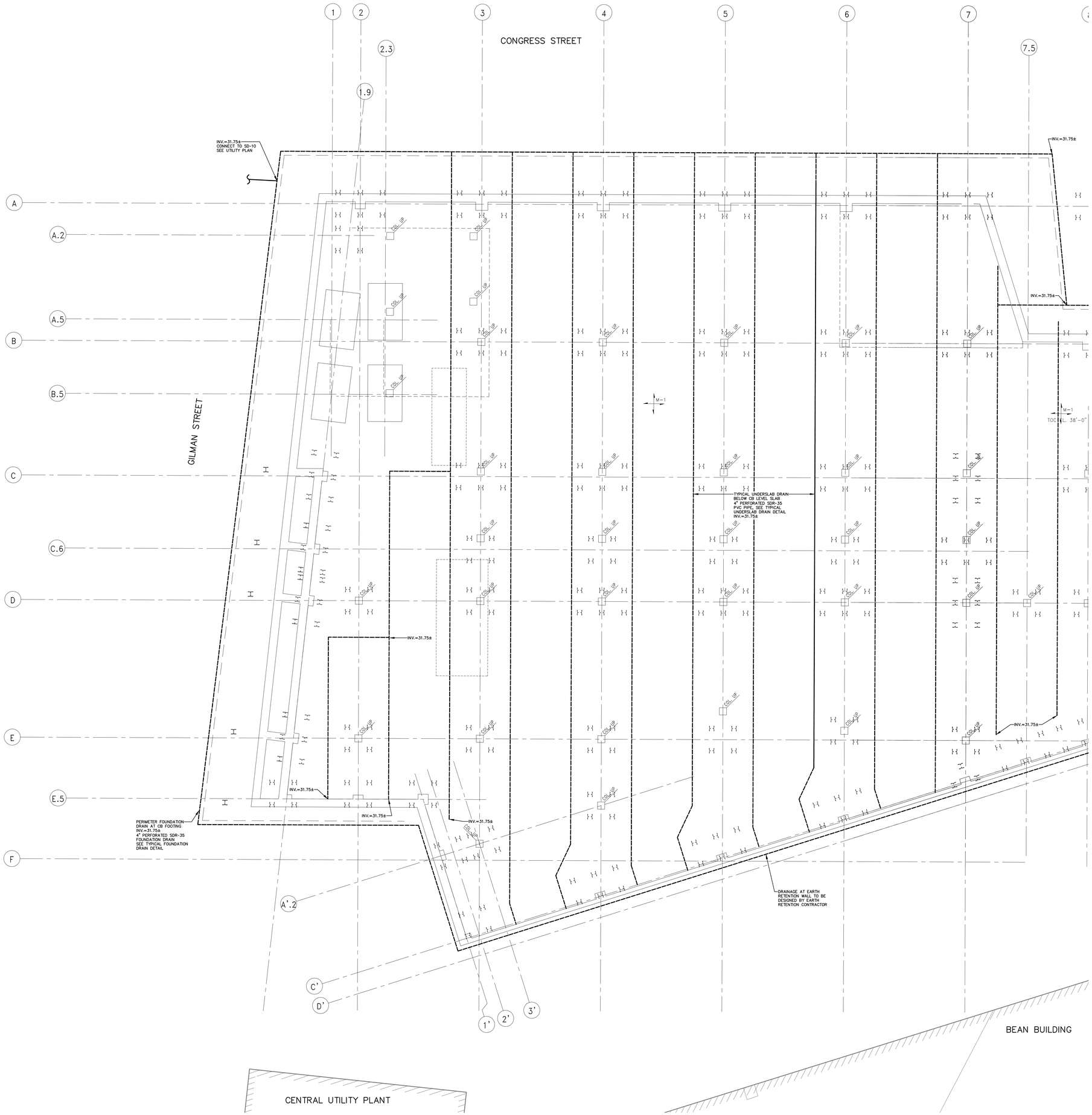
1546603.dwg, TAB:G3



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630 Dundee Road, Suite 340, Northbrook IL 60062

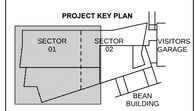
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14667
LICENSED
PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



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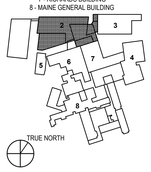

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE

LEVEL B FOUNDATION DRAINAGE PLAN, SECTOR 1 CONGRESS STREET EXPANSION

SHEET NUMBER

C10-11

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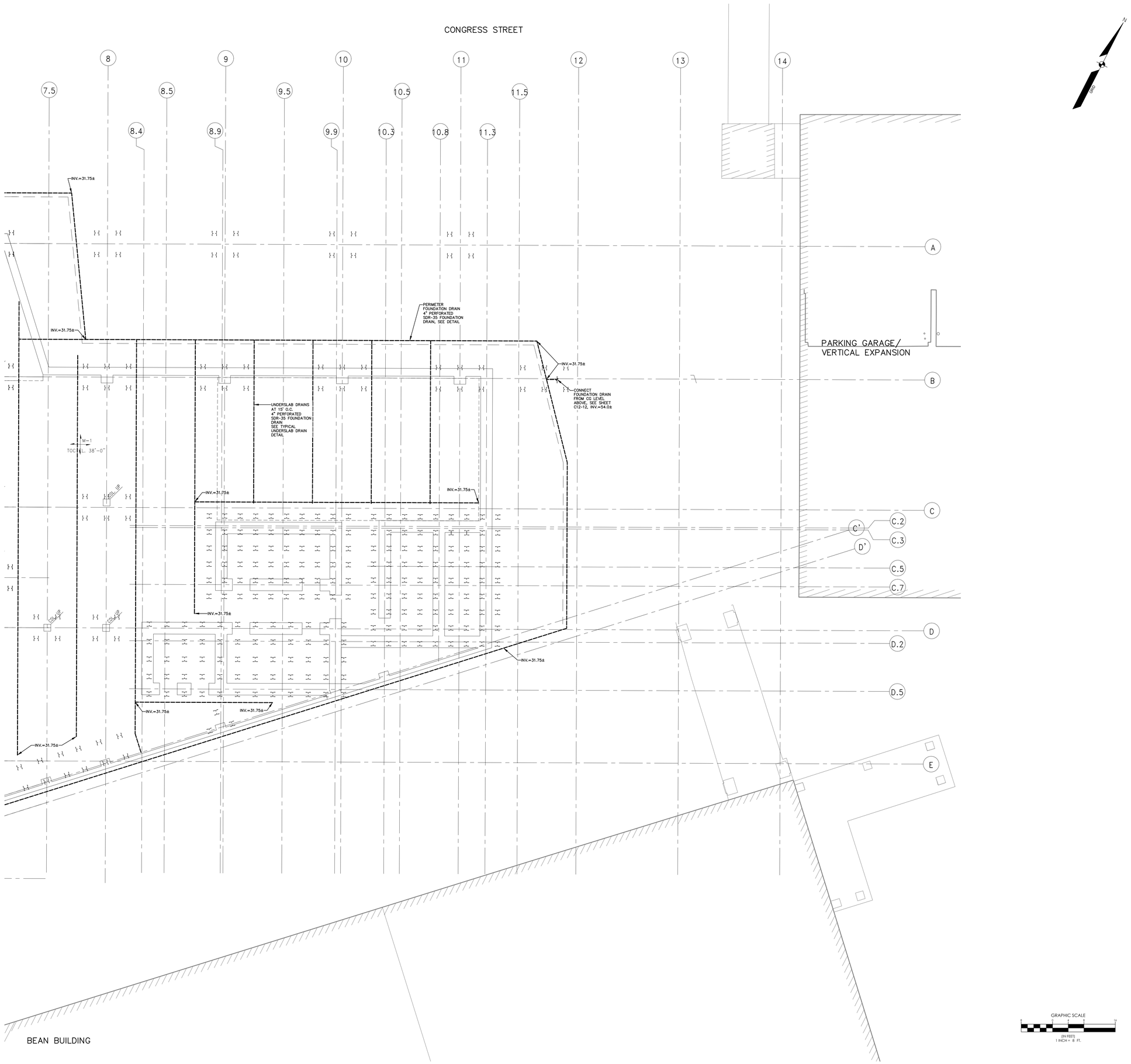

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D.G. Jones International
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MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

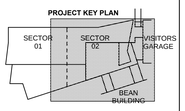
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14697
LICENSED
PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



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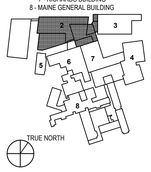

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
LEVEL B FOUNDATION DRAINAGE PLAN, SECTOR 2 CONGRESS STREET EXPANSION

SHEET NUMBER

C10-12

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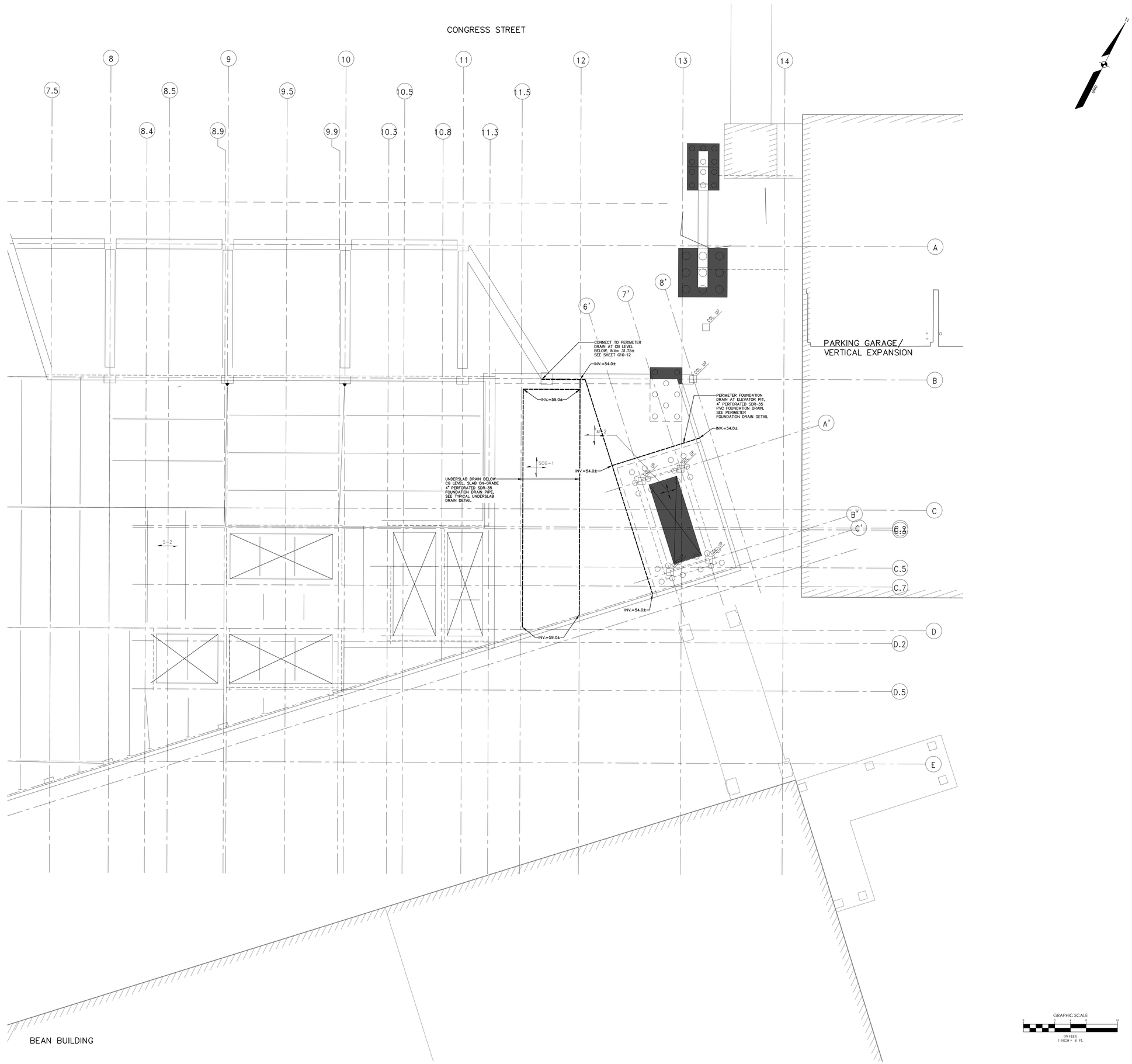

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PROJECT TITLE

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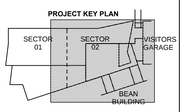
STATE OF MAINE
DANIEL L. RILEY
No. 14697
LICENSED PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



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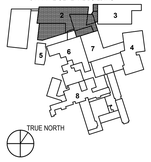

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
LEVEL 1 FOUNDATION DRAINAGE PLAN, SECTOR 2 CONGRESS STREET EXPANSION

SHEET NUMBER

C12-12

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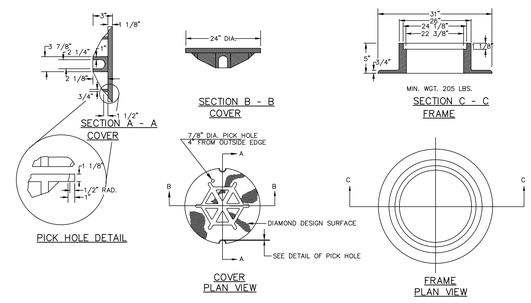
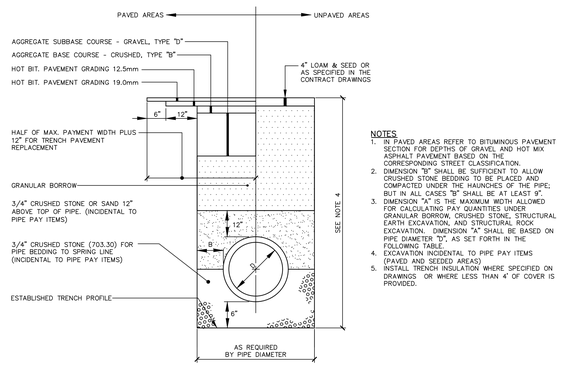
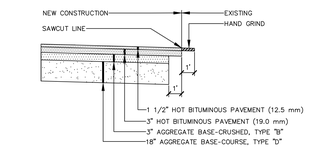


TYPICAL "A" CAST IRON MANHOLE COVER AND FRAME
NOT TO SCALE

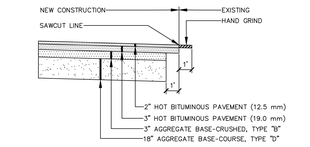


NOTES
1. IN PAVED AREAS REFER TO BITUMINOUS PAVEMENT SECTION FOR DEPTHS OF GRAVEL AND HOT MIX ASPHALT PAVEMENT BASED ON THE CORRESPONDING STREET CLASSIFICATION.
2. DIMENSION "B" SHALL BE SUFFICIENT TO ALLOW CRUSHED STONE BEDDING TO BE PLACED AND COMPACTED UNDER THE HAUNCHES OF THE PIPE; BUT IN ALL CASES "B" SHALL BE AT LEAST 9".
3. DIMENSION "A" IS THE MAXIMUM WIDTH ALLOWED FOR CALCULATING PAY QUANTITIES UNDER GRANULAR BORROW, CRUSHED STONE, STRUCTURAL EARTH EXCAVATION, AND STRUCTURAL ROCK EXCAVATION. DIMENSION "A" SHALL BE BASED ON PIPE DIAMETER "D", AS SET FORTH IN THE FOLLOWING TABLE.
4. EXCAVATION INCIDENTAL TO PIPE PAY ITEMS (PAVED AND SEEDED AREAS)
5. INSTALL TRENCH INSULATION WHERE SPECIFIED ON DRAWINGS OR WHERE LESS THAN 4' OF COVER IS PROVIDED.

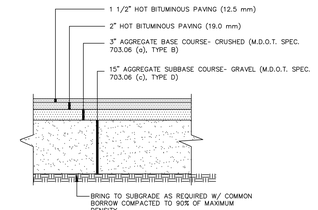
TYPICAL PIPE INSTALLATION DETAIL
NOT TO SCALE



PAVEMENT BUTT JOINT (LOCAL STREET)
NOT TO SCALE

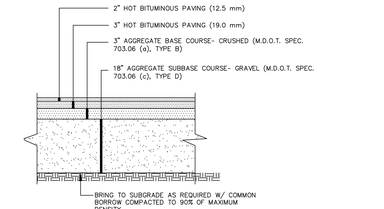


PAVEMENT BUTT JOINT (CONGRESS STREET)
NOT TO SCALE



NOTES:
1. COMPACT GRAVEL SUBBASE, BASE COURSE TO 95% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.

TYPICAL ROADWAY SECTION (LOCAL STREET)
NOT TO SCALE



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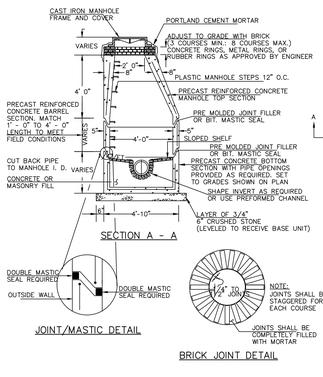
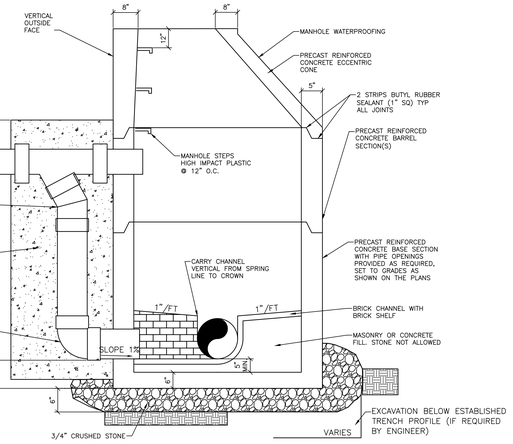
TYPICAL ROADWAY SECTION - CONGRESS STREET
NOT TO SCALE

NOTE:
MANHOLE CHANNELS REQUIRING CHANGE OF ALIGNMENT, TO BE BUILT ON SMOOTH RADIUS. CHANNEL TO BE SHAPED TO ACCEPT ADDITIONAL INLET PIPES.



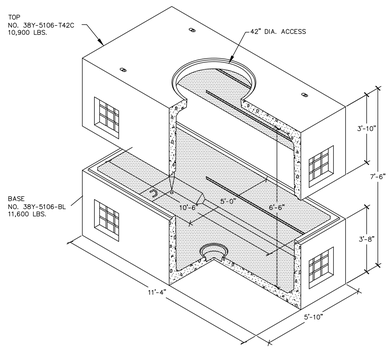
PRECAST CONCRETE MANHOLE TYPE "A"
NOT TO SCALE



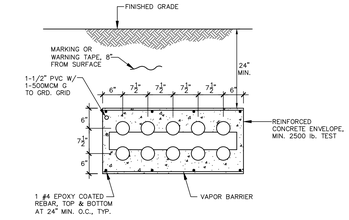
NOTES:

1. MANHOLE CHANNELS REQUIRING CHANGE IN ALIGNMENT ARE TO BE BUILT ON A SMOOTH RADIUS. IF SIDE PIPES ENTER CHANNEL, SHAPE TO RECEIVE ADDED SIDE FLOW.
2. USE FLAT SLAB TOP MANHOLE WHEN THE DIFFERENCE BETWEEN INVERT AND RIM IS LESS THAN 6'-0" AND WHEN MANHOLE DIAMETER IS GREATER THAN 4'-0".
3. ALL BACKFILL WITHIN 3 FEET OF STRUCTURE SHALL BE SELECT FILL PLACED IN 8" MAXIMUM LIFTS.

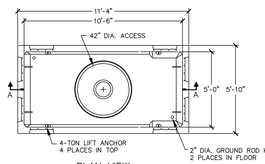
OUTSIDE DROP SANITARY MANHOLE DETAIL
NOT TO SCALE



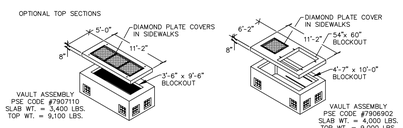
ELECTRICAL & TELECOMMUNICATIONS MANHOLE
NOT TO SCALE



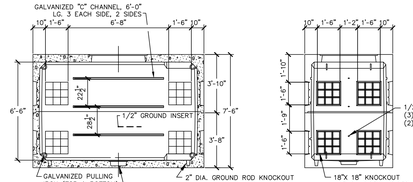
TYPICAL DUCT BANK CROSS-SECTION
NOT TO SCALE



PLAN VIEW
NOT TO SCALE



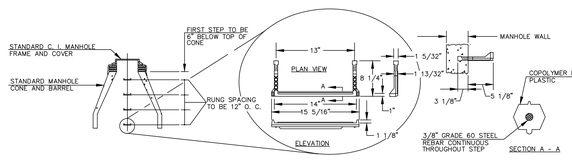
NOTE:
1. BASIS OF DESIGN IS 3GY MANHOLE BY OLD CASTLE PRECAST MANHOLES SHALL MEET UTILITY OWNERS SPECIFICATIONS.



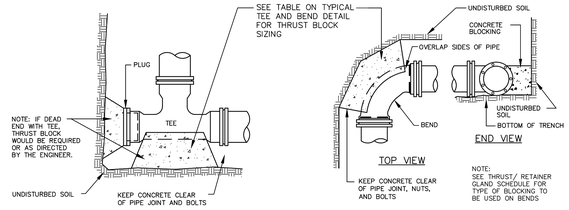
SECTION AA

END VIEW

ELECTRICAL & TELECOMMUNICATIONS MANHOLE
NOT TO SCALE



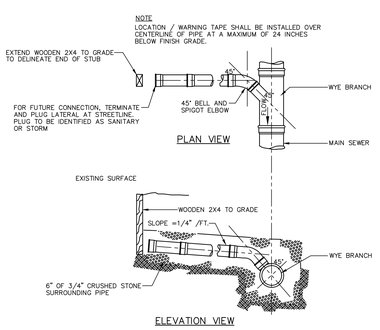
PLASTIC MANHOLE STEPS
NOT TO SCALE



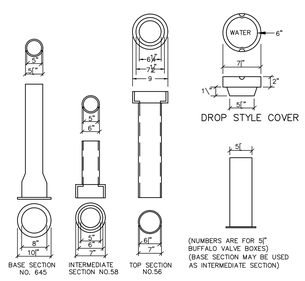
NOTE:
SEE THRUST/ RETAINER GLAND SCHEDULE FOR TYPE OF BLOCKING TO BE USED ON BENDS

TEE & BEND BLOCKING
NOT TO SCALE

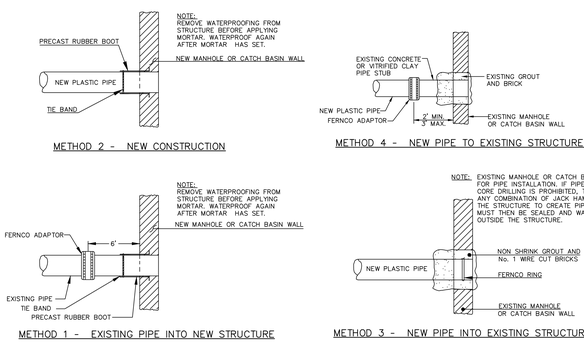
CONCRETE THRUST BLOCK SIZE REQUIREMENTS				
		SQ. FT. OF BEARING ON UNDISTURBED SOIL		
FITTINGS		90° BENDS	45° BENDS	TEES AND PLUGS
PIPE SIZE	6"	4.0	2.0	3.0
	8"	8.0	4.0	6.0
	12"	15	10	10



TYPICAL SEWER LATERAL WYE CONNECTION
NOT TO SCALE



VALVE BOX & COVER
NOT TO SCALE



PLASTIC PIPE CONNECTION
NOT TO SCALE

TABLE OF DIMENSIONS
PVC, TRUSS, CMP, & POLYETHYLENE PIPE

D	A	B	C	VOL. BASE /100' UNSHEETED O. D. SOCKET
8"	3'- 0"	1'- 1 1/2"	0'- 1'2"	7,358	10 3/8"
10"	3'- 0"	1'- 0 3/8"	0'- 0 5/8"	7,638	12 1/2"
12"	3'- 0"	0'- 11 3/8"	0'- 0 5/8"	7,932	14 1/2"
14"	3'- 0"	0'- 10 3/8"	0'- 0 5/8"	8,178	16 3/4"
16"	3'- 0"	0'- 9 1/4"	0'- 0 3/4"	8,447	19"
18"	3'- 0"	0'- 8 1/4"	0'- 0 3/4"	8,663	21 1/8"
20"	3'- 0"	0'- 7 3/8"	0'- 0 3/4"	8,815	23 3/8"
24"	3'- 1 3/4"	0'- 6"	0'- 0 7/8"	9,633	27 3/4"
27"	3'- 5 1/4"	0'- 6"	0'- 1 1/8"	10,959	31 1/8"
30"	3'- 8 1/4"	0'- 6"	0'- 1 1/8"	12,156	34 1/2"
33"	3'- 11 1/4"	0'- 6"	0'- 1 3/8"	13,513	38 1/8"
36"	4'- 2 3/4"	0'- 6"	0'- 1 3/8"	14,910	

A = WIDTH OF UNSHEETED TRENCH

TABLE OF DIMENSIONS
REINFORCED CONCRETE PIPE

D	A	B	C	VOL. BASE /100' UNSHEETED O. D. BELL
12"	3'- 0"	0'- 10"	0'- 2"	8,319	20 1/4"
15"	3'- 0"	0'- 8 1/4"	0'- 2 1/4"	8,626	24 3/8"
18"	3'- 0"	0'- 6 1/2"	0'- 2 1/4"	8,925	28"
21"	3'- 0 1/2"	0'- 6"	0'- 2 3/4"	9,266	31 7/8"
24"	3'- 6"	0'- 6"	0'- 3"	11,233	35 3/4"
27"	3'- 9 1/2"	0'- 6"	0'- 3 1/4"	12,655	
30"	4'- 1"	0'- 6"	0'- 3 1/2"	14,120	
33"	4'- 4 1/2"	0'- 6"	0'- 3 3/4"	15,722	
36"	4'- 8"	0'- 6"	0'- 4"	17,336	
42"	5'- 3"	0'- 6"	0'- 4 1/2"	20,726	
48"	5'- 10"	0'- 6"	0'- 5"	24,454	
54"	6'- 5"	0'- 6"	0'- 5 1/2"	28,404	
60"	7'- 0"	0'- 6"	0'- 6"	32,607	
66"	7'- 7"	0'- 6"	0'- 6 1/2"	37,074	
72"	8'- 2"	0'- 6"	0'- 7"	41,886	
78"	8'- 9"	0'- 6"	0'- 7 1/2"	46,881	
84"	9'- 4"	0'- 6"	0'- 8"	52,145	
90"	9'- 11"	0'- 6"	0'- 8 1/2"	57,769	
96"	10'-6"	0'- 6"	0'- 9"	63,552	

27 in. THROUGH 96 in. INCLUSIVE - TONGUE & GROOVE JOINTS

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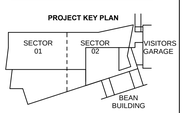
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

PROJECT TITLE
Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE — DANIEL L RILEY No. 11527 — PROFESSIONAL ENGINEER — 11-27-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN
1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
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7 - RICHARDS BUILDING
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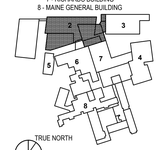

TRUE NORTH

RESUBMIT TO CITY
NOVEMBER 27, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
DETAILS CONGRESS STREET EXPANSION

SHEET NUMBER
C30-03

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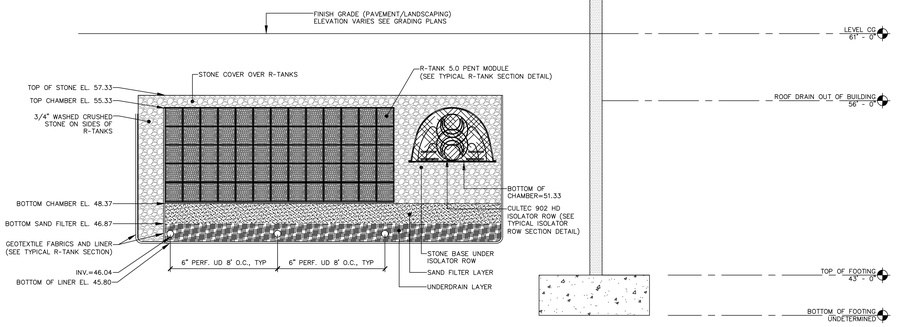
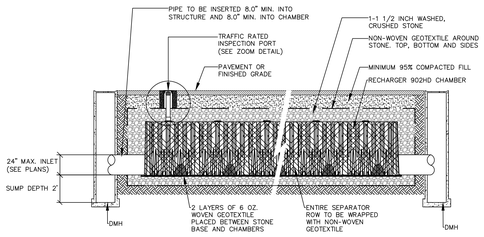
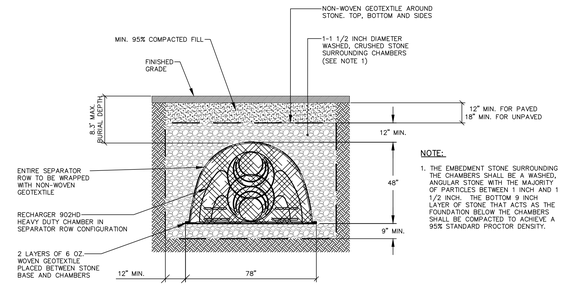
152189 - CONGRESS.dwg, 1AB.D1



SUBSURFACE SAND FILTER SECTION
NOT TO SCALE

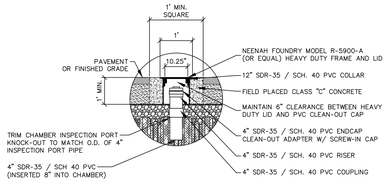


TYPICAL ISOLATOR ROW CROSS SECTION
NOT TO SCALE

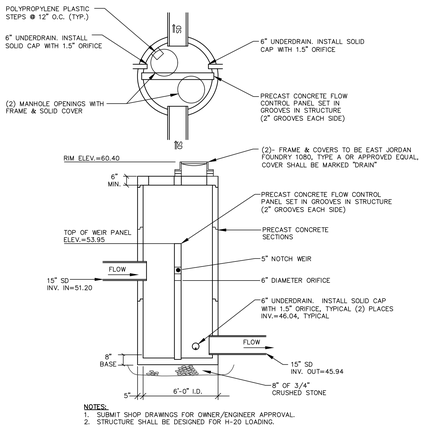


NOTE:
1. THE EMBEDMENT STONE SURROUNDING THE CHAMBERS SHALL BE A WASHED, ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN 1 INCH AND 1 1/2 INCH. THE BOTTOM 9 INCH LAYER OF STONE, THAT ACTS AS THE FOUNDATION BELOW THE CHAMBERS SHALL BE COMPACTED TO ACHIEVE A 95% STANDARD PROCTOR DENSITY.

TYPICAL ISOLATOR ROW SECTION
NOT TO SCALE

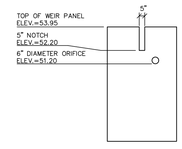


ISOLATOR ROW INSPECTION PORT
NOT TO SCALE



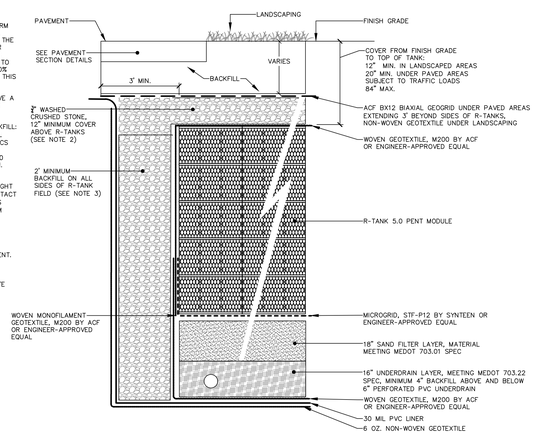
NOTES:
1. SUBMIT SHOP DRAWINGS FOR OWNER/ENGINEER APPROVAL.
2. STRUCTURE SHALL BE DESIGNED FOR H-20 LOADING.

OUTLET CONTROL STRUCTURE (OCS-1)
NOT TO SCALE

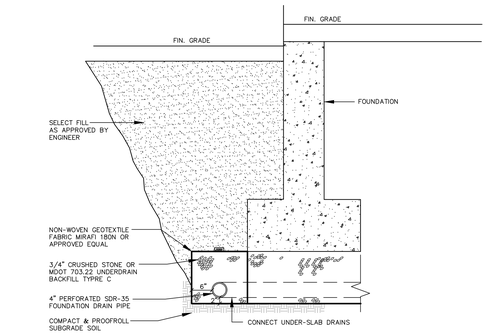


WEIR PANEL (OCS-1)
NOT TO SCALE

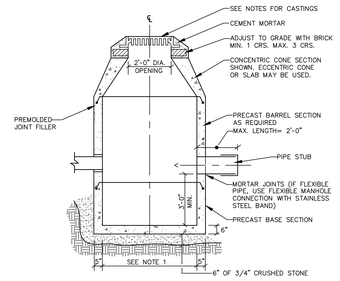
NOTES:
1. THE SAND FILTER MATERIAL SHALL BE A UNIFORM MIX, FREE OF STONES LARGER THAN 2 INCHES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS. THE MATERIAL SHALL MEET THE SPECIFICATIONS FOR MDOT AGGREGATE SAND (MDOT #703.01). THIS AGGREGATE SAND SHALL BE MIXED WITH LOAM TO ACHIEVE A MATERIAL WITH BETWEEN 8% AND 10% PASSING THE #200 SIEVE. THE LOAM USED IN THIS MIXTURE SHALL HAVE LESS THAN 2% CLAY CONTENT. THIS 18 INCH LAYER OF SAND FILTRATION MEDIA SHALL BE PLACED TO ACHIEVE A LEVEL OF COMPACTION BETWEEN 92% AND 95% STANDARD PROCTOR DENSITY.
2. FIRST 12" COVER MUST BE FREE DRAINING BACKFILL: 3/4" WASHED CRUSHED STONE. ADDITIONAL FILL MAY BE STRUCTURAL FILL: STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4, A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 7'. CONTACT ACF ENVIRONMENTAL IF MORE THAN 7' OR LESS THAN 20" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).
3. SIDE BACKFILL: 24" MIN. OF FREE DRAINING BACKFILL: STONE <1.5". MUST BE FREE FROM LUMPS, DEBRIS AND OTHER SHARP OBJECTS. SPREAD EVENLY TO PREVENT R-TANK[HD] MOVEMENT. COMPACT SIDE BACKFILL WITH POWERED MECHANICAL COMPACTOR IN 12" LIFTS.
4. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK MODULE SHEET.



TYPICAL R-TANK[HD] SECTION
NOT TO SCALE

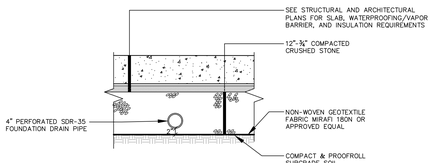


TYPICAL PERIMETER FOUNDATION DRAIN
NOT TO SCALE

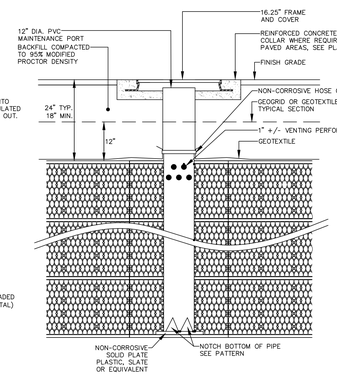


NOTES:
1. 4'-0" I.D. TYPICAL. SOME STRUCTURES MAY REQUIRE LARGER I.D. PROVIDE SHOP DRAWINGS.
2. DRAINAGE STRUCTURES TO BE DESIGNED FOR H-20 LOADING.
3. PIPE SIZES AND INVERTS AS NOTED ON PLANS.
4. CATCH BASIN FRAME AND GRATE TO BE NEENAH FOUNDRY R-2554, OR APPROVED EQUAL.

TYPICAL CATCH BASIN
NOT TO SCALE

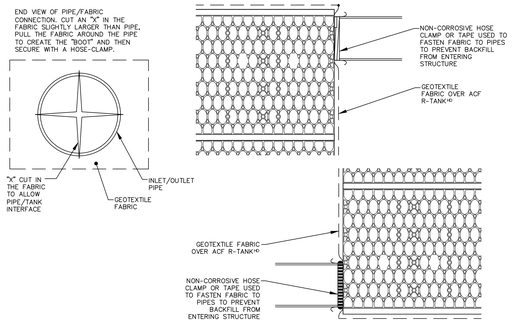


TYPICAL UNDER SLAB DRAIN
NOT TO SCALE

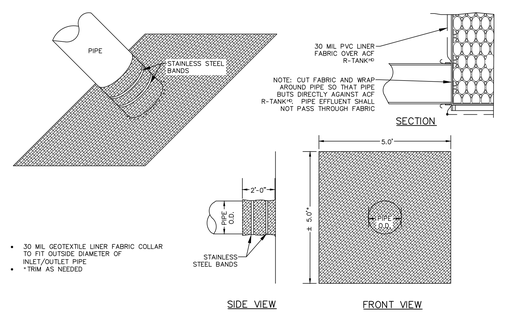


MAINTENANCE PORT
THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.

R-TANK[HD] TYPICAL MAINTENANCE PORT
NOT TO SCALE



R-TANK[HD] TYPICAL TANK INLET/OUTLET DETAIL
NOT TO SCALE



- 30 MIL GEOTEXTILE LINER FABRIC COLLAR TO FIT OUTSIDE DIAMETER OF INLET/OUTLET PIPE
- *TRIM AS NEEDED

SIDE VIEW FRONT VIEW

GEOTEXTILE PIPE BOOT FOR R-TANK[HD]
NOT TO SCALE

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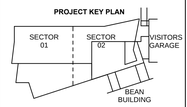
MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

PROJECT TITLE
Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 9999
PROFESSIONAL ENGINEER
11-27-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
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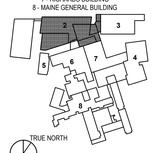

RESUBMIT TO CITY
NOVEMBER 27, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
DETAILS STORMWATER SYSTEM CONGRESS STREET EXPANSION

SHEET NUMBER
C30-04

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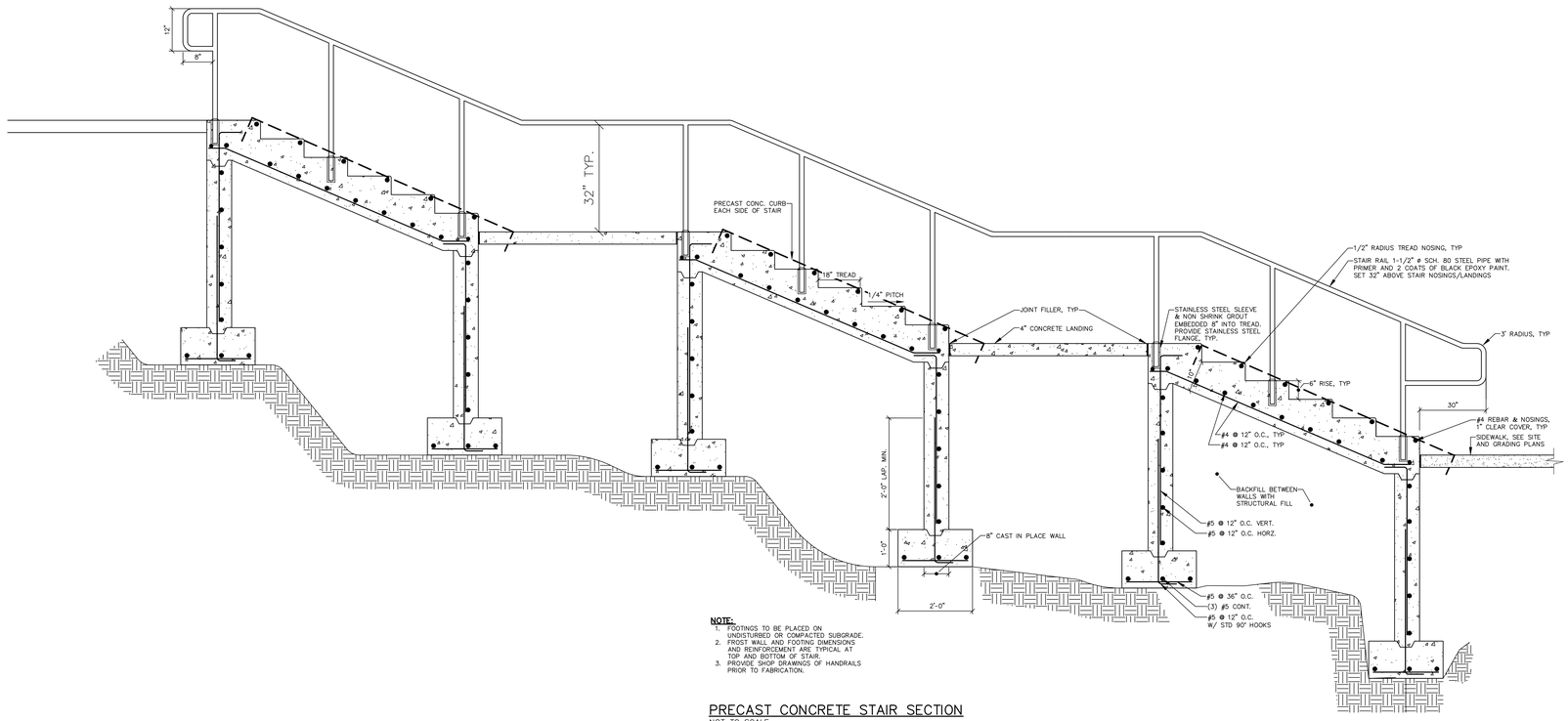

NOTE:
1. FOOTINGS TO BE PLACED ON UNDISTURBED OR COMPACTED SUBGRADE.
2. FROST WALL AND FOOTING DIMENSIONS AND REINFORCEMENT ARE TYPICAL AT TOP AND BOTTOM OF STAIR.
3. PROVIDE SHOP DRAWINGS OF HANDRAILS PRIOR TO FABRICATION.

PRECAST CONCRETE STAIR SECTION
NOT TO SCALE

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630 Dundee Road, Suite 340, Northbrook IL 60062

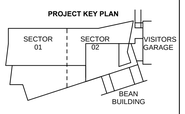
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14667
LICENSED
PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



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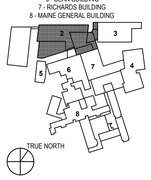

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
DETAILS
STAIR SECTION
CONGRESS STREET EXPANSION

SHEET NUMBER

C30-05

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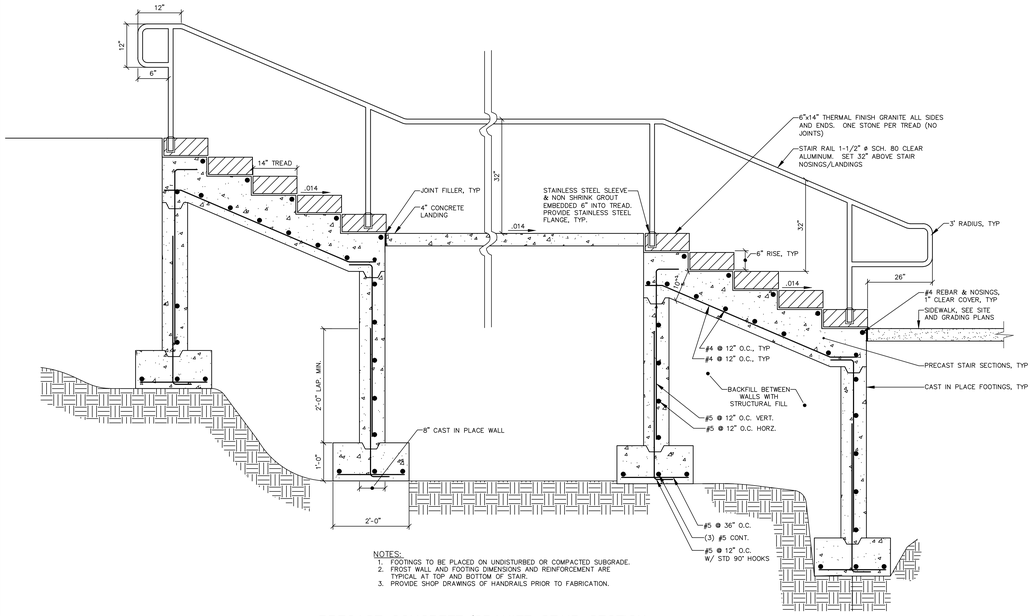
154660-CONGRESS.dwg, TAB: WALLS



NOTES:
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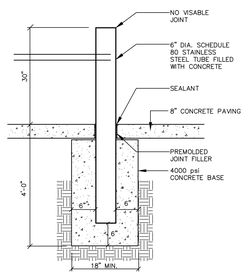
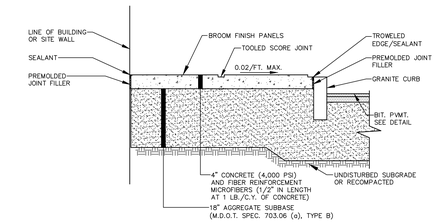
3. PROVIDE SHOP DRAWINGS OF HANDRAILS PRIOR TO FABRICATION.

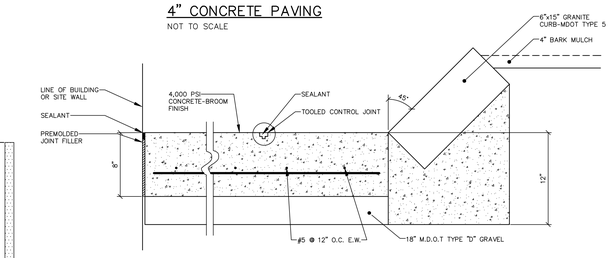
PRECAST CONCRETE/GRANITE STAIR SECTION
NOT TO SCALE



STAINLESS STEEL BOLLARD
NOT TO SCALE



4" CONCRETE PAVING
NOT TO SCALE



8" CONCRETE PAVING
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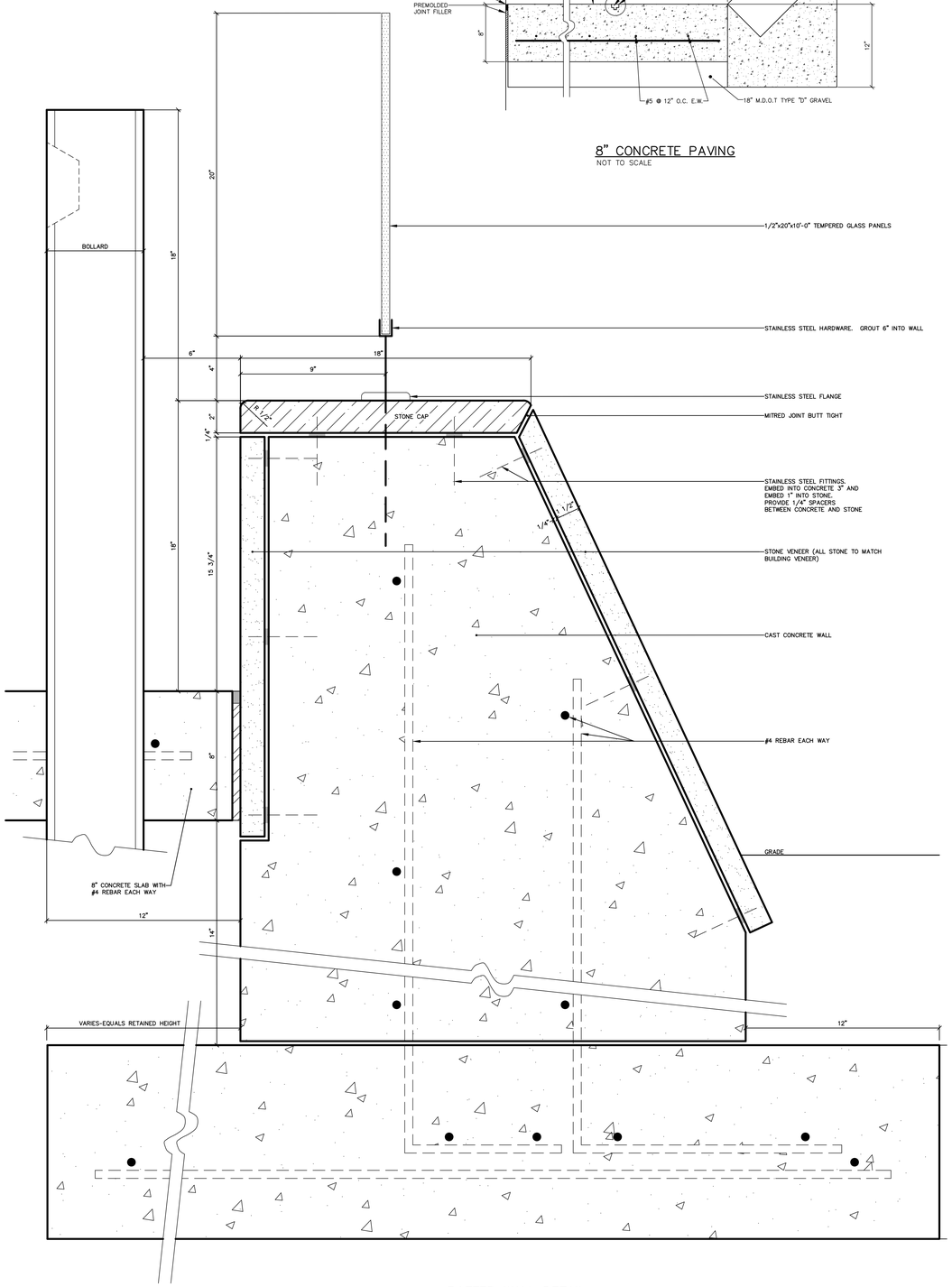

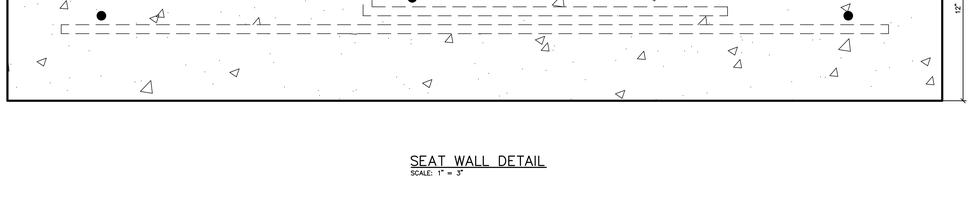

SEAT WALL DETAIL
SCALE: 1" = 3"

BATTER WALL DETAIL
SCALE: 1" = 3"

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Sebago Technics Inc.
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South Portland, ME 04106

STRUCTURAL ENG/ BUILDING ENVELOPE CONSULTANT
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Waltham, MA 02453

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COST ESTIMATOR
D.G. Jones International
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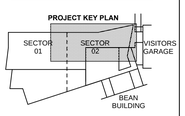
MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

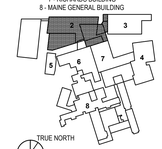
KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	JAR
Checked	WTC
Approved	DLR

TITLE

WALL DETAILS UPPER/LOWER PLAZA CONGRESS STREET EXPANSION

SHEET NUMBER

C30-06

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152465\-WALL.dwg, TAB: WALL

EROSION CONTROL MEASURES

PRE-CONSTRUCTION PHASE

PRIOR TO CONSTRUCTION, PROPERLY INSTALL SEDIMENT BARRIERS AT THE DOWNGRADIENT EDGE OF ANY AREA TO BE DISTURBED AND ADJACENT TO ANY DRAINAGE CHANNELS WITHIN THE DISTURBED AREA. SEDIMENT BARRIERS SHOULD BE INSTALLED DOWNGRADIENT OF SOIL OR SEDIMENT STOCKPILES AND STORMWATER PREVENTED FROM RUNNING ONTO THE STOCKPILE. MAINTAIN THE SEDIMENT BARRIERS BY REMOVING ACCUMULATED SEDIMENT, OR REMOVING AND REPLACING THE BARRIER, UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. WHERE A DISCHARGE TO A STORM DRAIN INLET OCCURS, IF THE STORM DRAIN CARRIES WATER DIRECTLY TO A SURFACE WATER AND YOU HAVE AUTHORITY TO ACCESS THE STORM DRAIN INLET, YOU MUST INSTALL AND MAINTAIN PROTECTION MEASURES THAT REMOVE SEDIMENT FROM THE DISCHARGE.

PRIOR TO CONSTRUCTION, PROPERLY INSTALL A STABILIZED CONSTRUCTION ENTRANCE (SCE) AT ALL POINTS OF EGRESS FROM THE SITE. THE SCE IS A STABILIZED PAD OF AGGREGATE, UNDERLAIN BY A GEOTEXTILE FILTER FABRIC, USED TO PREVENT TRAFFIC FROM TRACKING MATERIAL AWAY FROM THE SITE ONTO PUBLIC ROWS. MAINTAIN THE SCE UNTIL ALL DISTURBED AREAS ARE STABILIZED.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE A DETAILED SCHEDULE AND MARKED UP PLAN INDICATING AREAS AND COMPONENTS OF THE WORK AND KEY DATES SHOWING DATE OF DISTURBANCE AND COMPLETION OF THE WORK. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE MUNICIPAL STAFF. THREE COPIES OF THE SCHEDULE AND MARKED UP PLAN SHALL BE PROVIDED TO THE MUNICIPALITY THREE DAYS PRIOR TO THE SCHEDULED PRE-CONSTRUCTION MEETING. SPECIAL ATTENTION SHALL BE GIVEN TO THE 14 DAY LIMIT OF DISTURBANCE IN THE SCHEDULE ADDRESSING TEMPORARY AND PERMANENT VEGETATION MEASURES.

CONSTRUCTION AND POST-CONSTRUCTION PHASE

DURING CONSTRUCTION

1. INSPECTION AND CORRECTIVE ACTION:
   INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION CONTROL MEASURES, MATERIALS STORAGE AREAS THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. INSPECT THESE AREAS AT LEAST ONCE A WEEK AS WELL AS BEFORE AND WITHIN 24 HOURS AFTER A STORM EVENT (RAINFALL). AND PRIOR TO COMPLETING PERMANENT STABILIZATION MEASURES. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS AND CONDITIONS IN THE PERMIT, SHALL CONDUCT THE INSPECTIONS.
2. MAINTENANCE:
   IF BEST MANAGEMENT PRACTICES (BMPS) NEED TO BE REPAIRED, THE REPAIR WORK SHOULD BE INITIATED UPON DISCOVERY OF THE PROBLEM BUT NO LATER THAN THE END OF THE NEXT WORKDAY. IF ADDITIONAL BMPS OR SIGNIFICANT REPAIR OF BMPS ARE NECESSARY, IMPLEMENTATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED.
3. DOCUMENTATION:
   KEEP A LOG (REPORT) SUMMARIZING THE INSPECTIONS AND ANY CORRECTIVE ACTION TAKEN. THE LOG MUST INCLUDE THE NAME(S) AND QUALIFICATIONS OF THE PERSON MAKING THE INSPECTIONS, AND THE DATE(S) OF THE INSPECTIONS, AND MAJOR OBSERVATIONS ABOUT THE OPERATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS, MATERIALS STORAGE AREAS, AND VEHICLES ACCESS POINTS TO THE PARCEL. MAJOR OBSERVATIONS MUST INCLUDE BMPS THAT NEED MAINTENANCE, BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED. FOR EACH BMP REQUIRING MAINTENANCE, BMP NEEDING REPLACEMENT, AND LOCATION NEEDING ADDITIONAL BMPS, NOTE IN THE LOG THE CORRECTIVE ACTION TAKEN AND WHEN IT WAS TAKEN.

   THE LOG MUST BE MADE ACCESSIBLE TO DEPARTMENT STAFF AND A COPY MUST BE PROVIDED UPON REQUEST. THE PERMITTEE SHALL RETAIN A COPY OF THE LOG FOR A PERIOD OF AT LEAST THREE YEARS FROM THE COMPLETION OF PERMANENT STABILIZATION.

POST-CONSTRUCTION

1. PLAN:
   CARRY OUT AN APPROVED INSPECTION AND MAINTENANCE PLAN THAT IS CONSISTENT WITH THE MINIMUM REQUIREMENTS OF THIS SECTION. THE PLAN MUST ADDRESS INSPECTION AND MAINTENANCE OF THE PROJECTS PERMANENT EROSION CONTROL MEASURES AND STORMWATER MANAGEMENT SYSTEMS. THE PLAN MAY BE COMBINED WITH THE PLAN LISTED IN SECTION 2(A) OF THIS APPENDIX. SEE SECTION 7(C)(2) FOR SUBMISSION REQUIREMENTS.
2. INSPECTION AND MAINTENANCE:
   ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS AND CONDITIONS IN THE PERMIT, SHALL CONDUCT THE INSPECTIONS. THE FOLLOWING FACILITIES, AND MEASURES MUST BE INSPECTED AND IDENTIFIED DEFICIENCIES MUST BE CORRECTED: AREAS, FACILITIES, AND MEASURES OTHER THAN THOSE LISTED BELOW MAY ALSO REQUIRE INSPECTION ON A SPECIFIC SITE. INSPECTION OR MAINTENANCE TASKS OTHER THAN THOSE DISCUSSED BELOW MUST BE INCLUDED IN THE MAINTENANCE PLAN DEVELOPED FOR A SPECIFIC SITE.
3. REGULAR MAINTENANCE:
   CLEAR ACCUMULATIONS OF WINTER SAND IN PARKING LOTS AND ALONG ROADWAYS AT LEAST ONCE A YEAR, PREFERABLY IN THE SPRING. ACCUMULATIONS ON PAVEMENT MAY BE REMOVED BY PAVEMENT SWEEPING. ACCUMULATIONS OF SAND ALONG ROAD SHOULDERS MAY BE REMOVED BY GRADING EXCESS SAND TO THE PAVEMENT EDGE AND REMOVING IT MANUALLY OR WITH A FRONT-END LOADER. GRADING OF GRAVEL ROADS, OR GRADING OF THE GRAVEL SHOULDERS OF GRAVEL OR PAVED ROADS, MUST BE ROUTINELY PERFORMED TO ENSURE THAT STORMWATER DRAINS IMMEDIATELY OFF THE ROAD SURFACE TO ADJACENT BUFFER AREAS OR STABLE DITCHES, AND IS NOT IMPEDED BY ACCUMULATIONS OF GRADED MATERIAL ON THE ROAD SHOULDER OR BY EXCAVATION OF FALSE DITCHES IN THE SHOULDER. IF WATER BANS OR OPEN-TOP CULVERTS ARE USED TO DIVERT RUNOFF FROM ROAD SURFACES, CLEAN-OUT ANY SEDIMENTS WITHIN OR AT THE OUTLET OF THESE STRUCTURES TO RESTORE THEIR FUNCTION.
4. DOCUMENTATION:
   KEEP A LOG (REPORT) SUMMARIZING INSPECTIONS, MAINTENANCE, AND ANY CORRECTIVE ACTIONS TAKEN. THE LOG MUST INCLUDE THE DATE ON WHICH EACH INSPECTION OR MAINTENANCE TASK WAS PERFORMED, A DESCRIPTION OF THE INSPECTION FINDINGS OR MAINTENANCE COMPLETED, AND THE NAME OF THE INSPECTOR OR MAINTENANCE PERSONNEL PERFORMING THE TASK. IF A MAINTENANCE TASK REQUIRES THE CLEAN-OUT OF ANY SEDIMENTS OR DEBRIS, INDICATE WHERE THE SEDIMENT AND DEBRIS WAS DISPOSED AFTER REMOVAL. THE LOG MUST BE MADE ACCESSIBLE TO THE DEPARTMENT STAFF AND A COPY PROVIDED TO THE DEPARTMENT UPON REQUEST. THE PERMITTEE SHALL RETAIN A COPY OF THE LOG FOR A PERIOD OF AT LEAST FIVE YEARS FROM THE COMPLETION OF PERMANENT STABILIZATION.

EROSION CONTROL APPLICATIONS & MEASURES

THE PLACEMENT OF EROSION CONTROL MEASURES SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED WITHIN THE CURRENT MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION CHAPTER 500 RULES, THE DEPARTMENTS BEST MANAGEMENT PRACTICES AND IN ACCORDANCE WITH THE EROSION CONTROL PLAN AND DETAILS IN THE PLAN SET. EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE THE ACTIVITY BEGINS. MEASURES MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL THE SITE IS PERMANENTLY STABILIZED. ADEQUATE AND TIMELY TEMPORARY AND PERMANENT STABILIZATION MEASURES MUST BE TAKEN.

1. POLLUTION PREVENTION:
   WHENEVER PRACTICABLE; NO DISTURBANCE ACTIVITIES SHOULD TAKE PLACE WITHIN 50 FEET OF ANY PROTECTED NATURAL RESOURCE. IF DISTURBANCE ACTIVITIES TAKE PLACE BETWEEN 30 FEET AND 50 FEET OF ANY PROTECTED NATURAL RESOURCE, AND STORMWATER DISCHARGES THROUGH THE UNDISTURBED AREAS TOWARD THE PROTECTED NATURAL RESOURCE, EROSION CONTROLS MUST BE DOUBLED. IF DISTURBANCE ACTIVITIES TAKE PLACE LESS THAN 30 FEET FROM ANY PROTECTED NATURAL RESOURCE, AND STORMWATER DISCHARGES THROUGH THE UNDISTURBED AREAS TOWARD THE PROTECTED NATURAL RESOURCE, EROSION CONTROLS MUST BE DOUBLED AND DISTURBED AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 48 HOURS.
2. TEMPORARY MULCHING:
   ALL DISTURBED AREAS SHALL BE MULCHED WITH MATERIALS SPECIFIED BELOW PRIOR TO ANY STORM EVENT. ALL DISTURBED AREAS NOT FINAL GRADED WITHIN 7 DAYS SHALL BE MULCHED. ALSO, AREAS THAT HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED, SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING. EROSION CONTROL BLANKETS ARE RECOMMENDED TO BE USED AT THE BASE OF GRASSED WATERWAYS AND DITCHES GREATER THAN 5% MULCH ANCHORING SHOULD BE USED ON SLOPES GREATER THAN 5% AFTER SEPTEMBER 15TH OF THE CONSTRUCTION YEAR (SEE WINTER EROSION CONTROL NOTES).
   TYPES OF MULCH:
   HAY OR STRAW: SHALL BE APPLIED AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE).
   EROSION CONTROL MIX: SHALL BE PLACED EVENLY AND MUST PROVIDE 100% SOIL COVERAGE. EROSION CONTROL MIX SHALL BE APPLIED SUCH THAT THE THICKNESS ON SLOPES 3:1 OR LESS IS 2 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THE THICKNESS ON SLOPES BETWEEN 3:1 AND 2:1 SHALL BE 4 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THIS SHALL NOT BE USED ON SLOPES GREATER THAN 2:1.
   EROSION CONTROL BLANKET: SHALL BE INSTALLED SUCH THAT CONTINUOUS CONTACT BETWEEN THE MAT AND THE SOIL IS OBTAINED. INSTALL BLANKETS AND STAPLE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. SOIL STOCKPILES:
   STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED WITH HAY OR STRAW AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL. ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.
4. NATURAL RESOURCES PROTECTION:
   ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES, IF NOT STABILIZED WITH A MINIMUM OF 75% MATURE VEGETATION CATCH, SHALL BE STABILIZED USING TEMPORARY MULCHING (AS DESCRIBED IN PART 1. OF THIS SECTION) OR OTHER NON-ERODIBLE COVER WITHIN 48 HOURS OF EXPOSURE OR PRIOR TO ANY STORM EVENT. SEDIMENT BARRIERS (AS DESCRIBED IN PART 4. OF THIS SECTION) SHALL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA. PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE. IF DISTURBANCE TAKES PLACE LESS THAN 30 FEET FROM A PROTECTED RESOURCE AND STORMWATER DISCHARGES THROUGH THE DISTURBED AREAS TO THE RESOURCE, PERMETER EROSION CONTROLS MUST BE DOUBLED.
5. SEDIMENT BARRIERS:
   PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS SHALL BE STAKED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT PROPERTY LINE OR WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. SEDIMENT BARRIERS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 85%-90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION.

   SILT FENCE: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE EFFECTIVE HEIGHT OF THE FENCE SHALL NOT EXCEED 36 INCHES. IT IS RECOMMENDED THAT SILT FENCE BE REMOVED BY CUTTING THE FENCE MATERIALS AT GROUND LEVEL SO AS TO AVOID ADDITIONAL SOIL DISTURBANCE.

   HAY BALES: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. BALES SHALL BE WIRE-BOUND OR STRING-TIED AND THESE BINDINGS MUST REMAIN PARALLEL WITH THE GROUND SURFACE DURING INSTALLATION TO PREVENT DETERIORATION OF THE BINDINGS. BALES SHALL BE INSTALLED WITHIN A MINIMUM 4 INCH DEEP TRENCH LINE WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

   EROSION CONTROL MIX: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE MIX SHALL CONSIST PRIMARILY OF ORGANIC MATERIAL AND CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4 INCHES IN DIAMETER. THE MIX COMPOSITION SHALL MEET THE STANDARDS DESCRIBED WITHIN THE MDEP BEST MANAGEMENT PRACTICES. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER.

   CONTINUOUS CONTAINED BERM: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THIS SEDIMENT BARRIER IS EROSION CONTROL MIX PLACED WITHIN A SYNTHETIC TUBULAR NETTING AND PERFORMS AS A STURDY SEDIMENT BARRIER THAT WORKS WELL ON HARD GROUND SUCH AS FROZEN CONDITIONS, TRAVELED AREAS OR PAVEMENT. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER.
6. TEMPORARY CHECK DAMS:
   SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. CHECK DAMS ARE TO BE PLACED WITHIN DITCHES/ SWALES AS SPECIFIED ON THE DESIGN PLANS IMMEDIATELY AFTER FINAL GRADING. CHECK DAMS SHALL BE 2 FEET HIGH. TEMPORARY CHECK DAMS MAY BE REMOVED ONLY AFTER THE ROADWAYS ARE PAVED AND THE VEGETATED SWALE ARE ESTABLISHED WITH AT LEAST 85%-90% OF VIGOROUS PERENNIAL GROWTH. THE AREA BENEATH THE CHECK DAM MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER REMOVAL OF THE CHECK DAM.

STONE CHECK DAMS: SHOULD BE CONSTRUCTED OF 2 TO 3 INCH STONE AND PLACED SUCH THAT COMPLETE COVERAGE OF THE SWALE IS OBTAINED AND THAT THE CENTER OF THE DAM IS 6 INCHES LOWER THAT THE OUTER EDGES.

HAY BALE CHECK DAMS: WE DO NOT RECOMMEND THE USE OF HAY BALES AS CHECK DAMS.

MANUFACTURED CHECK DAMS: MANUFACTURED CHECK DAMS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF AUTHORIZED BY THE PROPER LOCAL, STATE OR FEDERAL REGULATING AGENCIES. THESE UNITS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS.

1. STORMDRAIN INLET PROTECTION:
   INLET PROTECTION SHALL BE PLACED AROUND A STORMDRAIN DROP INLETOR CURB INLET PRIOR TO PERMANENT STABILIZATION OF THE IMMEDIATE AND UPSTREAM DISTURBED AREAS. THEY SHALL BE CONSTRUCTED IN A MANNER THAT WILL FACILITATE CLEAN-OUT AND DISPOSAL OF TRAPPED SEDIMENTS AND MINIMIZE INTERFERENCE WITH CONSTRUCTION ACTIVITIES. ANY RESULTANT PONDING OF WATER FROM THE PROTECTION METHOD MUST NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.

   HAY BALE DROP INLET PROTECTION: WE DO NOT RECOMMEND THE USE OF HAY BALES AS INLET PROTECTION.

   CONCRETE BLOCK AND STONE INLET SEDIMENT FILTER (DROP OR CURB INLET): SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE HEIGHT OF THE CONCRETE BLOCK BARRIER CAN VARY BUT MUST BE BETWEEN 12 AND 24 INCHES TALL. A MINIMUM OF 1 INCH CRUSHED STONE SHALL BE USED.

   MANUFACTURED SEDIMENT BARRIERS AND FILTER (DROP OR CURB INLET): MANUFACTURED FILTERS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
2. STABILIZED CONSTRUCTION EXIT:
   PRIOR TO CLEARING AND/OR GRUBBING THE SITE A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED WHEREVER TRAFFIC WILL EXIT THE CONSTRUCTION SITE ONTO A PAVED ROADWAY IN ORDER TO MINIMIZE THE TRACKING OF SEDIMENT AND DEBRIS FROM THE CONSTRUCTION SITE ONTO PUBLIC ROADWAYS. THE ENTRANCES AND ADJACENT ROADWAY AREAS SHALL BE PERIODICALLY SWEPT OR WASHED TO FURTHER MINIMIZE THE TRACKING OF MUD, DUST OR DEBRIS FROM THE CONSTRUCTION AREA. STABILIZED CONSTRUCTION EXITS SHALL BE CONSTRUCTED IN AREAS SPECIFIED ON THE PLANS AND AS DETAILED ON THE PLANS.
3. DUST CONTROL:
   DUST CONTROL DURING CONSTRUCTION SHALL BE ACHIEVED BY THE USE OF A WATERING TRUCK TO PERIODICALLY SPRINKLE THE EXPOSED ROADWAY AREAS AS NECESSARY TO REDUCE DUST DURING THE DRY MONTHS. APPLYING OTHER DUST CONTROL PRODUCTS SUCH AS CALCIUM CHLORIDE OR OTHER MANUFACTURED PRODUCTS ARE ALLOWED IF AUTHORIZED BY THE PROPER LOCAL, STATE AND/OR FEDERAL REGULATING AGENCIES. HOWEVER, IT IS THE CONTRACTOR'S ULTIMATE RESPONSIBILITY TO MITIGATE DUST AND SOIL LOSS FROM THE SITE.
4. TEMPORARY VEGETATION:
   TEMPORARY VEGETATION SHALL BE APPLIED TO DISTURBED AREAS THAT WILL NOT RECEIVE FINAL GRADING FOR PERIODS UP TO 12 MONTHS. THIS PROCEDURE SHOULD BE USED EXTENSIVELY IN AREAS ADJACENT TO NATURAL RESOURCES. SEEDBED PREPARATION AND APPLICATION OF SEED SHALL BE CONDUCTED AS INDICATED IN THE PERMANENT VEGETATION SECTION OF THIS NARRATIVE. SPECIFIC SEEDS (FAST GROWING AND SHORT LIVING) SHALL BE SELECTED FROM THE MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL DATED 3/2003 OR LATER. ALTERNATIVE EROSION CONTROL MEASURES SHOULD BE USED IF SEEDING CAN NOT BE DONE BEFORE SEPTEMBER 15TH OF THE CONSTRUCTION YEAR.
5. PERMANENT VEGETATION:
   REVEGETATION MEASURES SHALL COMMENCE IMMEDIATELY UPON COMPLETION OF FINAL GRADING OF AREAS TO BE LOAMED AND SEEDED. THE APPLICATION OF SEED SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR. PLEASE REFER TO THE WINTER EROSION CONTROL NOTES FOR MORE DETAIL. REVEGETATION MEASURES SHALL CONSIST OF THE FOLLOWING:

   SEEDBED PREPARATION:
   A. FOUR (4) INCHES OF LOAM SHALL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE. LOAM SHALL BE FREE OF SUBSOIL, CLAY LUMPS, STONES AND OTHER OBJECTS OVER 2 INCHES OR LARGER IN ANY DIMENSION, AND WITHOUT WEEDS, ROOTS OR OTHER OBJECTIONABLE MATERIAL.
   B. SOILS TESTS SHALL BE TAKEN AT THE TIME OF SOIL STRIPPING TO DETERMINE FERTILIZATION REQUIREMENTS. SOILS TESTS SHALL BE TAKEN PROMPTLY AS TO NOT INTERFERE WITH THE 14-DAY LIMIT ON SOIL EXPOSURE. BASED UPON TEST RESULTS, SOIL AMENDMENTS MUST BE INCORPORATED INTO THE SOIL PRIOR TO FINAL SEEDING. IN LIEU OF SOIL TESTS, SOIL AMENDMENTS MAY BE APPLIED AS FOLLOWS:

ITEM	APPLICATION RATE
10-20-20 FERTILIZER (N-P2O5-K2O OR EQUAL)	18.4 LBS./1,000 S.F.
GROUND LIMESTONE (50% CALCIUM & MAGNESIUM OXIDE)	138 LBS./1,000 S.F.

   C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH PROPER EQUIPMENT. ROLL THE AREA TO FIRM THE SEEDBED EXCEPT ON CLAY OR SILTY SOILS OR COARSE SAND.

   APPLICATION OF SEED:
   A. SEEDING: SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR. GENERALLY A SEED MIXTURE MAY BE APPLIED AS FOLLOWS: (MDEP SEED MIX 2 IS DISPLAYED)

SEED TYPE	APPLICATION RATE
CREEPING RED FESCUE	0.46 LBS./1,000 S.F. (20 LBS./ACRE)
REDTOP	0.05 LBS./1,000 S.F. (2 LBS./ACRE)
TALL FESCUE	0.46 LBS./1,000 S.F. (20 LBS./ACRE)
TOTAL:	0.97 LBS./1,000 S.F. (42 LBS./ACRE)

   NOTE: A SPECIFIC SEED MIXTURE SHOULD BE CHOSEN TO MATCH THE SOILS CONDITION OF THE SITE. VARIOUS AGENCIES CAN RECOMMEND SEED MIXTURES. MDEP RECOMMENDED SEED MIXTURES ARE IN THE EROSION AND SEDIMENT CONTROL BMP MANUAL DATED 3/2003 OR LATER.

   B. HYDROSEEDING: SHALL BE CONDUCTED ON PREPARED AREAS WITH SLOPES LESS THAN 2:1. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. RECOMMENDED SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

   C. MULCHING: SHALL COMMENCE IMMEDIATELY AFTER SEED IS APPLIED. REFER TO THE TEMPORARY MULCHING SECTION OF THIS NARRATIVE FOR DETAILS.

SODDING:

FOLLOWING SEEDBED PREPARATION, SOD CAN BE APPLIED IN LIEU OF SEEDING IN AREAS WHERE IMMEDIATE VEGETATION IS MOST BENEFICIAL SUCH AS DITCHES, AROUND STORMWATER DROP INLETS AND AREAS OF AESTHETIC VALUE. SOD SHOULD BE LAID AT RIGHT ANGLES TO THE DIRECTION OF FLOW AT THE LOWEST ELEVATION. SOD SHOULD BE ROLLED OR TAMPED DOWN TO EVEN OUT THE JOINTS ONCE LAID DOWN. WHERE FLOW IS PREVALENT THE SOD MUST BE PROPERLY ANCHORED DOWN. IRRIGATE THE SOD IMMEDIATELY AFTER INSTALLATION. IN MOST CASES, SOD CAN BE INSTALLED DURING ANY NON-FROZEN PERIOD OF THE CONSTRUCTION YEAR, HOWEVER, REFER TO THE WINTER EROSION CONTROL NOTES FOR ANY ACTIVITIES AFTER OCTOBER 1ST.

TRENCH DEWATERING AND TEMPORARY STREAM DIVERSION:

WATER FROM CONSTRUCTION TRENCH DEWATERING OR TEMPORARY STREAM DIVERSION WILL PASS FIRST THROUGH A FILTER BAG OR SECONDARY CONTAINMENT STRUCTURE (E.G. HAY BALE LINED POOL) PRIOR TO DISCHARGE. THE DISCHARGE SITE SHALL BE SELECTED TO AVOID FLOODING AND SEDIMENT DISCHARGES TO A PROTECTED RESOURCE. IN NO CASE SHALL THE FILTER BAG OR CONTAINMENT STRUCTURE BE LOCATED WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE.

STANDARDS FOR TIMELY STABILIZATION:

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES -- THE CONTRACTOR WILL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE MDEP WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 8% (12.5H:1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.

A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS -- BY OCTOBER 1 THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX AS DESCRIBED IN ITEM 2(C.) OF THIS STANDARD OR WITH STONE RIPRAP AS DESCRIBED IN ITEM 2(D.) OF THIS STANDARD.
B. STABILIZE THE SLOPE WITH SOD -- THE CONTRACTOR WILL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY NOVEMBER 15. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT WILL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).
C. STABILIZE THE SLOPE WITH EROSION CONTROL MIX -- THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF EROSION CONTROL MIX ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE EROSION CONTROL MIX, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. DO NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GRADES GREATER THAN 1H:1V OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
D. STABILIZE THE SLOPE WITH STONE RIPRAP -- THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

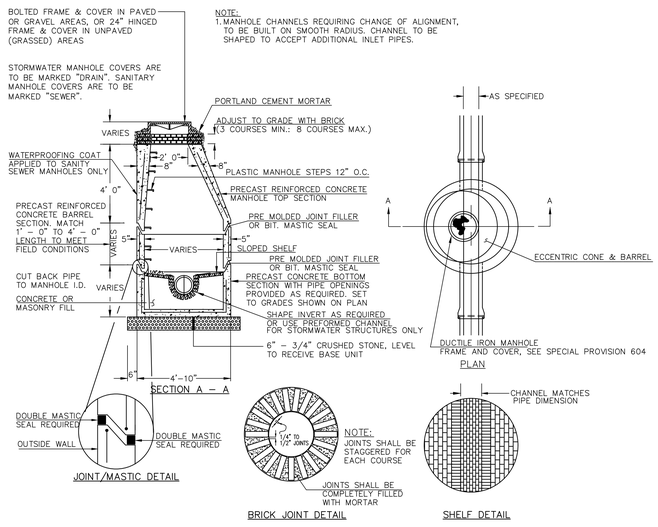
STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS -- BY SEPTEMBER 15 THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 8% IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER:

A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION -- BY OCTOBER 1 THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE APPLICANT WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM 3(C.) OF THIS STANDARD.
B. STABILIZE THE SOIL WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
C. STABILIZE THE SOIL WITH MULCH -- BY NOVEMBER 15 THE APPLICANT WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.
D. STABILIZE THE SOIL WITH EROSION CONTROL MIX -- THE CONTRACTOR WILL PLACE A MINIMUM TWO-INCH LAYER OF EROSION CONTROL MIX ON THE SOIL BY NOVEMBER 15. PRIOR TO PLACING THE EROSION CONTROL MIX, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE.

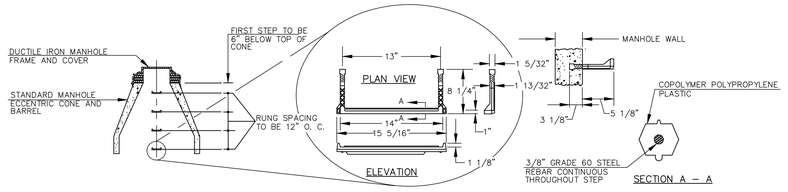
CONSTRUCTION SCHEDULE

SITE IMPROVEMENTS WILL MOST LIKELY BEGIN IN _____ DEPENDING UPON FINAL PERMIT APPROVAL. THE FOLLOWING SCHEDULE IS ANTICIPATED:

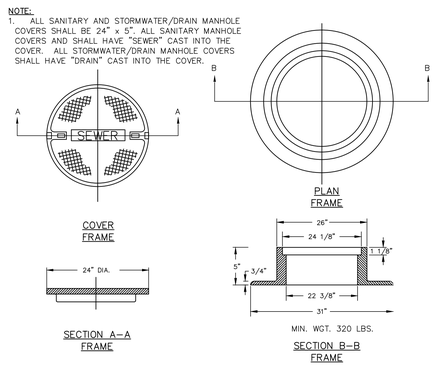
1.	ESTIMATED CONSTRUCTION TIME:	-- MONTHS
2.	EROSION CONTROL MEASURES PLACED	WEEK 1 - WEEK 2
3.	SITE CLEARING AND GRUBBING	WEEK 2 - WEEK 5
4.	CONSTRUCTION OF ROAD SUBBASE FOR ACCESS	WEEK 5 - WEEK 13
5.	STORMWATER MANAGEMENT AREA CONSTRUCTION	WEEK 7 - WEEK 9
6.	UTILITY IMPROVEMENTS AND ROADWAY CONSTRUCTION	WEEK 7 - WEEK 24
7.	MULCH SPREA



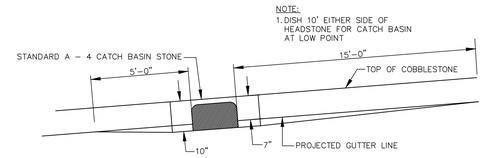
PRECAST CONCRETE MANHOLE TYPE "A"
NOT TO SCALE



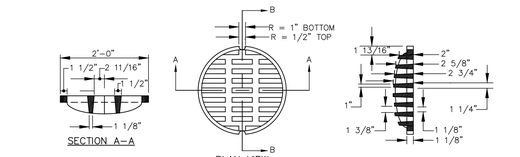
PLASTIC MANHOLE STEPS
NOT TO SCALE

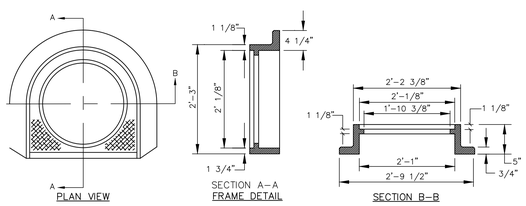


CAST IRON MANHOLE FRAME AND COVER
NOT TO SCALE

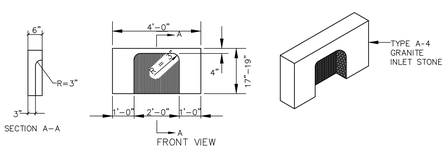


TYPICAL PAVEMENT GRADING ON SLOPES FOR CATCH BASIN & INLET
NOT TO SCALE



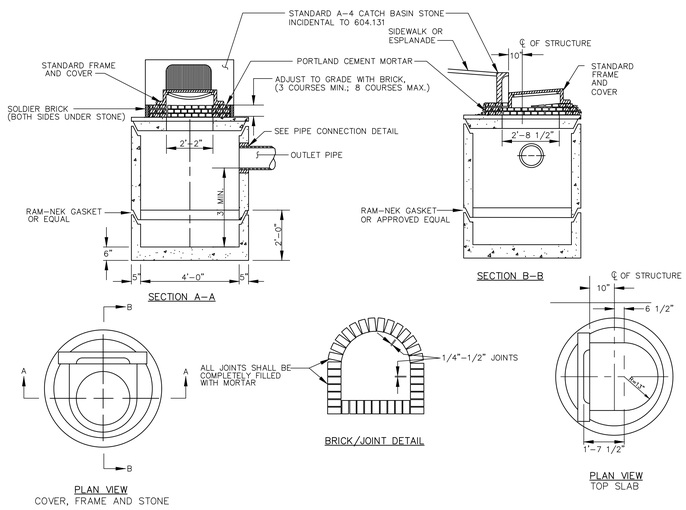


CATCH BASIN TYPE "D" - FRAME & COVER DETAIL
NOT TO SCALE



TYPE A-4 GRANITE CATCH BASIN INLET STONE DETAIL
NOT TO SCALE

NOTE:
1. TYPE D FRAME AND COVER AND TYPE A-4 GRANITE HEADSTONES ARE TO BE INSTALLED AT CATCH BASINS IN PUBLIC STREETS ONLY. SEE SHEET C30-04 FOR TYPICAL BASINS TO BE INSTALLED ON MMC PROPERTY, ENTRANCE PLAZA.



PRECAST CONCRETE CATCH BASIN - TYPE E
NOT TO SCALE

NOTE:
1. TYPE E CATCH BASINS ARE TO BE INSTALLED AT LOCATIONS IN PUBLIC STREETS ONLY. SEE SHEET C30-04 FOR TYPICAL BASINS TO BE INSTALLED ON MMC PROPERTY, ENTRANCE PLAZA.

GENERAL NOTES FOR MANHOLES & CATCH BASINS

1. ALL CONCRETE SHALL BE CLASS "A" AND HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 lbs. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C–478–67
3. SEWER BRICK SHALL CONFORM TO ASTM SPEC. DESIGNATE ON C–32–63, GRADE MA AND SA.
4. SANITARY SEWER MANHOLES SHALL HAVE A BITUMINOUS WATERPROOFING APPLIED TO THE EXTERIOR SURFACE. IF CONSTRUCTED OF BRICK MASONRY, SURFACE SHALL BE PLASTERED WITH A SMOOTH MORTAR FINISH 3/8" THICK. AFTER THE MORTAR HAS SET, THE SURFACE SHALL BE WATERPROOFED AS REQUIRED BY SUPPLEMENTAL SPECIFICATIONS SECTION 604.
5. MANHOLES MAY BE CONSTRUCTED OF MASONRY, PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
6. ALL PRECAST MANHOLES AND CATCH BASINS SHALL BE IDENTIFIED BY STATION AND OFFSET, PAINTED ON THE SIDE OF THE STRUCTURE BY THE MANUFACTURER.
7. EXISTING FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND. CONTRACTOR SHALL DELIVER TO CITY STOCKYARD AT NO COST.
8. EXISTING GRANITE COBBLE STONE AND PAVERS SHALL BE STOCKPILE BY THE CONTRACTOR, AND REUSED FOR CONSTRUCTION OF NEW COBBLE STONE GUTTER. GRANITE NOT USED SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.
9. ALL NEW CATCH BASINS IN PUBLIC STREETS SHALL RECEIVE A TYPE A–4 GRANITE INLET STONE UNLESS OTHERWISE NOTED.

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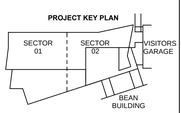
630 Dundee Road, Suite 340, Northbrook IL 60062

PROJECT TITLE
Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE — DANIEL L RILEY No. 10111 — LICENSED PROFESSIONAL ENGINEER — 11-27-18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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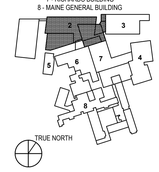
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
NOVEMBER 27, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL/MAM
Checked	DLR
Approved	DLR

TITLE
DETAILS-PUBLIC SEWER AND STORM DRAIN, CONGRESS STREET EXPANSION

SHEET NUMBER
C30-08

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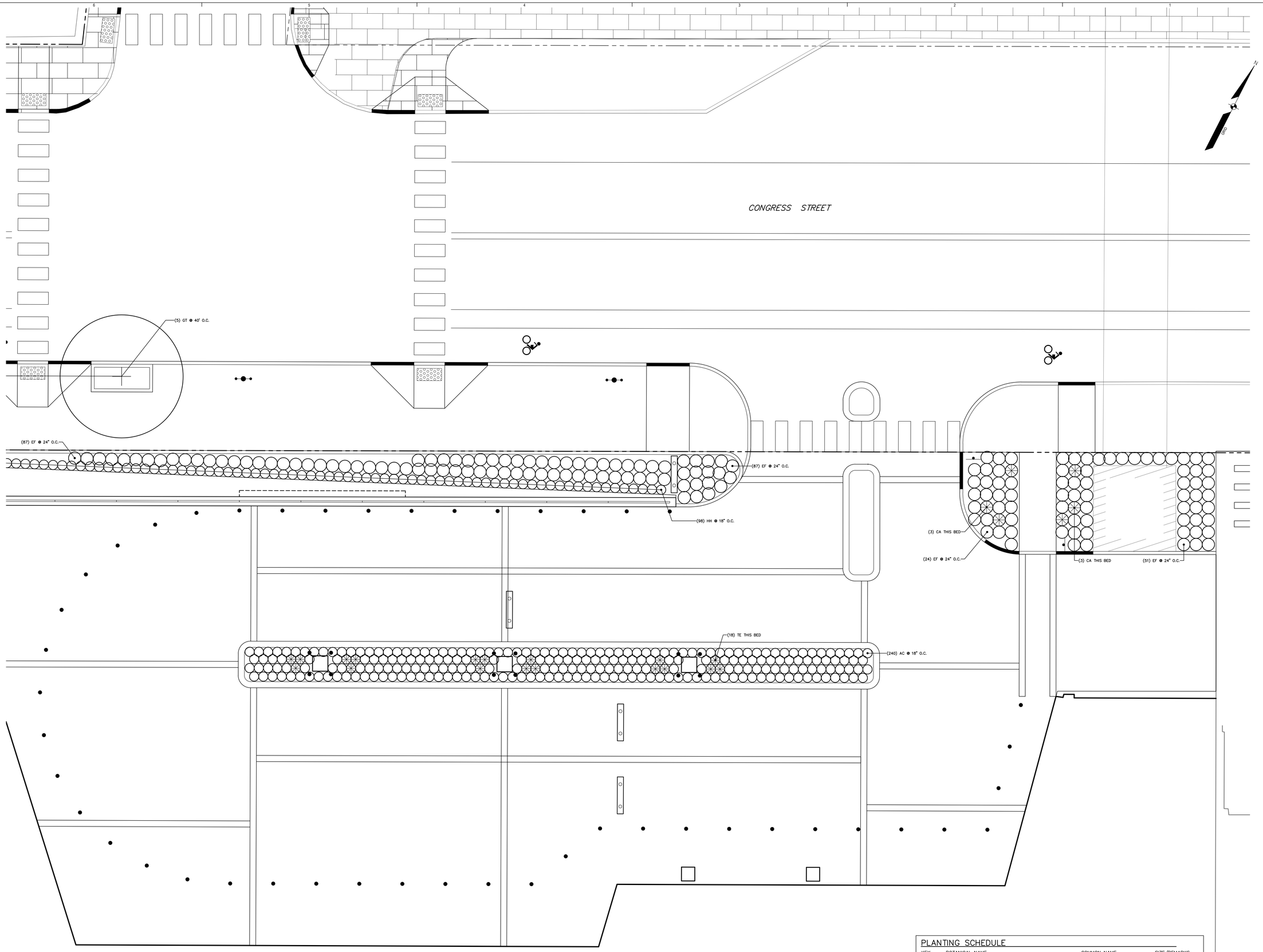
152189 - CONGRESS.dwg, 11x8.1/2



PLANTING SCHEDULE

KEY	BOTANICAL NAME	COMMON NAME	SIZE/REMARKS
GT	GLEDITSIA TRIACANTHOS INERMIS 'STREET KEEPER'	HONEYLOCUST	4 IN. CALIPER
AL	AMELANCHIER LAEVIS	ALLEGHENY SERVICEBERRY	8'-10' HGT
EF	EUONYMUS FORTUNEI 'COLORATUS'	WINTERCREEPER	NO. 3 CONTAINER
MG	MYRICA GALE	BAYBERRY	NO. 3 CONTAINER
HH	HEDERA HELIX	ENGLISH IVY	NO. 2 CONTAINER
CA	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	REED GRASS	NO. 2 CONTAINER
AC	ASARUM CANADENSE	EUOROPEAN WILD GINGER	NO. 2 CONTAINER
TE	TRILLIUM ERECTUM	WAKE ROBIN	NO. 2 CONTAINER
VA	VACCINIUM ANGUSTIFOLIUM	LOWBUSH BLUEBERRY	NO. 1 CONTAINER

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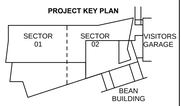
Portland ME 04102

REGISTERED LANDSCAPE ARCHITECT
WILLIAM T. CONWAY
NA 108
STATE OF MAINE
12-10-18

KEY PLANS

PROJECT KEY PLAN



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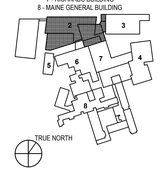

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE
LANDSCAPE PLAN, UPPER CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER
C50-01

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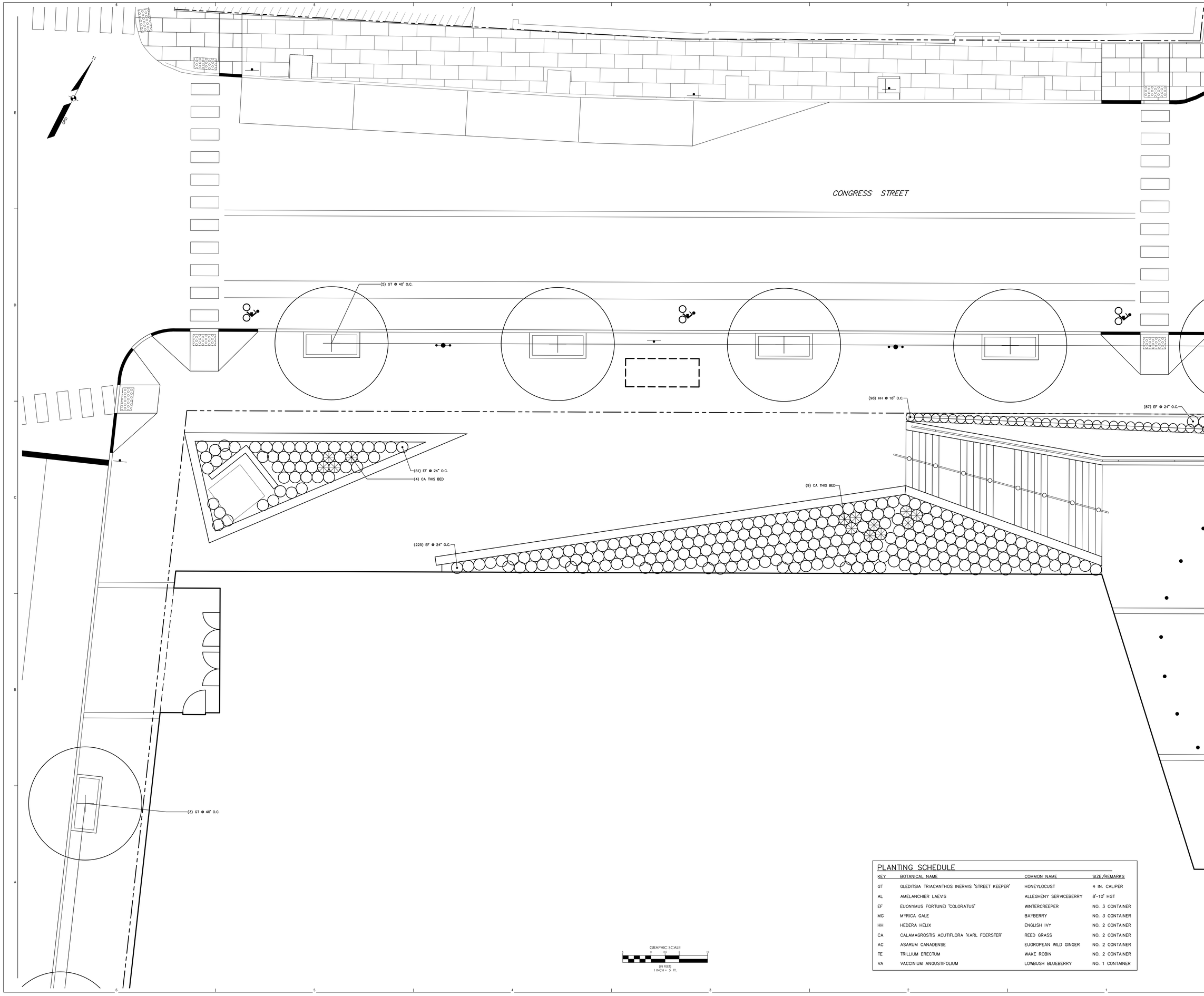

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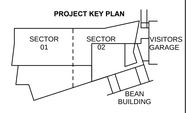
12-10-18

KEY PLANS

PROJECT KEY PLAN



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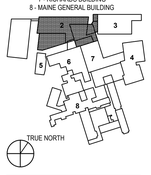

RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

LANDSCAPE PLAN, LOWER CONGRESS, CONGRESS STREET EXPANSION

SHEET NUMBER

C05-02

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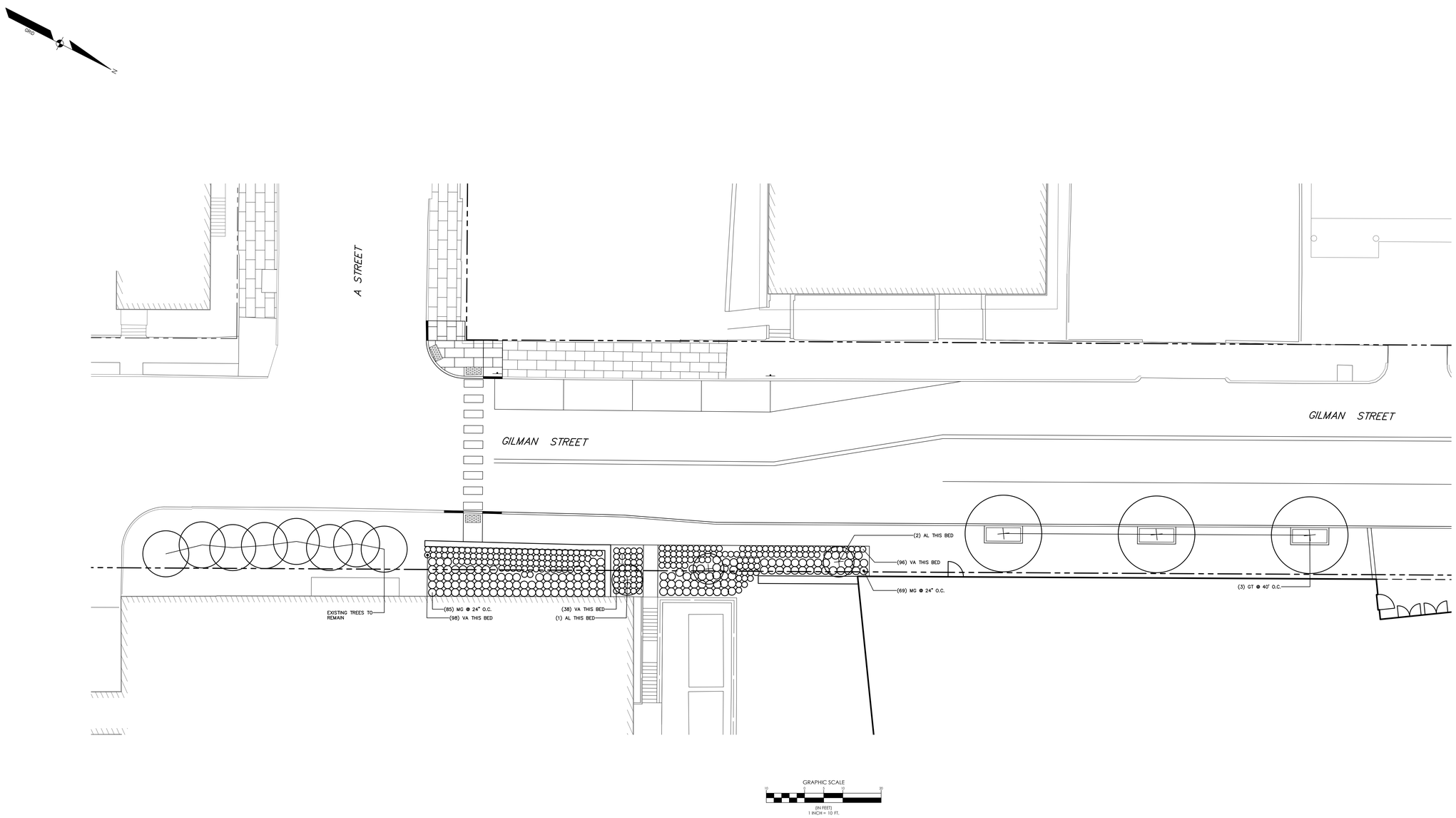

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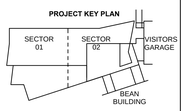
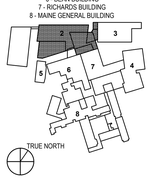
KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

1 - NOT USED
2 - CONGRESS STREET
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



RESUBMIT TO CITY
DECEMBER 10, 2018

NO	ISSUE	DATE

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

LANDSCAPE PLAN, GILMAN STREET, CONGRESS STREET EXPANSION

SHEET NUMBER

C50-03

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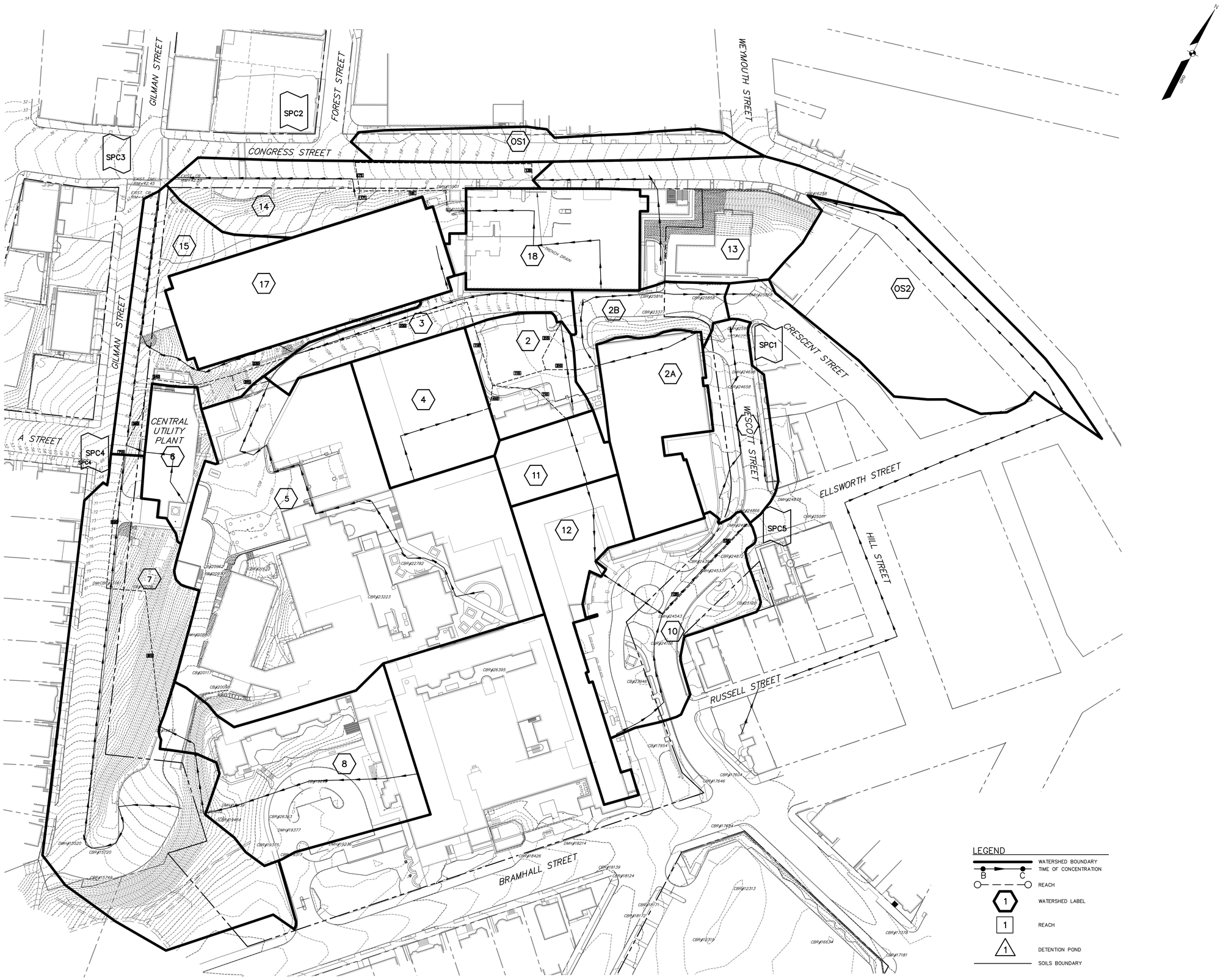

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t 617.478.0300
f 617.478.0321
www.perkinswill.com

CLIENT

Maine Medical Center
MaineHealth

Maine Medical Center

22 Bramhall Street
Portland, ME 04102

CONSULTANTS

CIVIL/ LANDSCAPE ARCHITECT
Sebago Technics Inc.
75 John Roberts Road, Suite 1A,
South Portland, ME 04106

STRUCTURAL ENG/ BUILDING ENVELOPE CONSULTANT
Simpson Gumpertz & Heger Inc.
41 Seyon Street, Building 1, Suite 500,
Waltham, MA 02453

MEPFP ENGINEER/CODE/LOW VOLTAGE
AKF Group LLC
99 Bedford Street, 2nd Floor, Boston, MA 02111

CONSTRUCTION MANAGER
TURNER CONSTRUCTION
2 Seaport Lane, Suite 200, Boston, MA 02210

ELEVATOR CONSULTANT
VDA (Van Deusen & Associates)
101 Summer Street, 4th Floor, Boston, MA 02110

COST ESTIMATOR
D.G. Jones International
3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

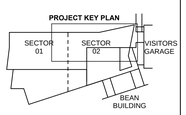
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14667
LICENSED
PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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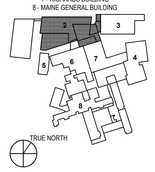

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	MAL
Checked	WTC
Approved	DLR

TITLE

PRE DEVELOPMENT CAMPUS WATERSHED PLAN, CONGRESS STREET EXPANSION

SHEET NUMBER

C60-01

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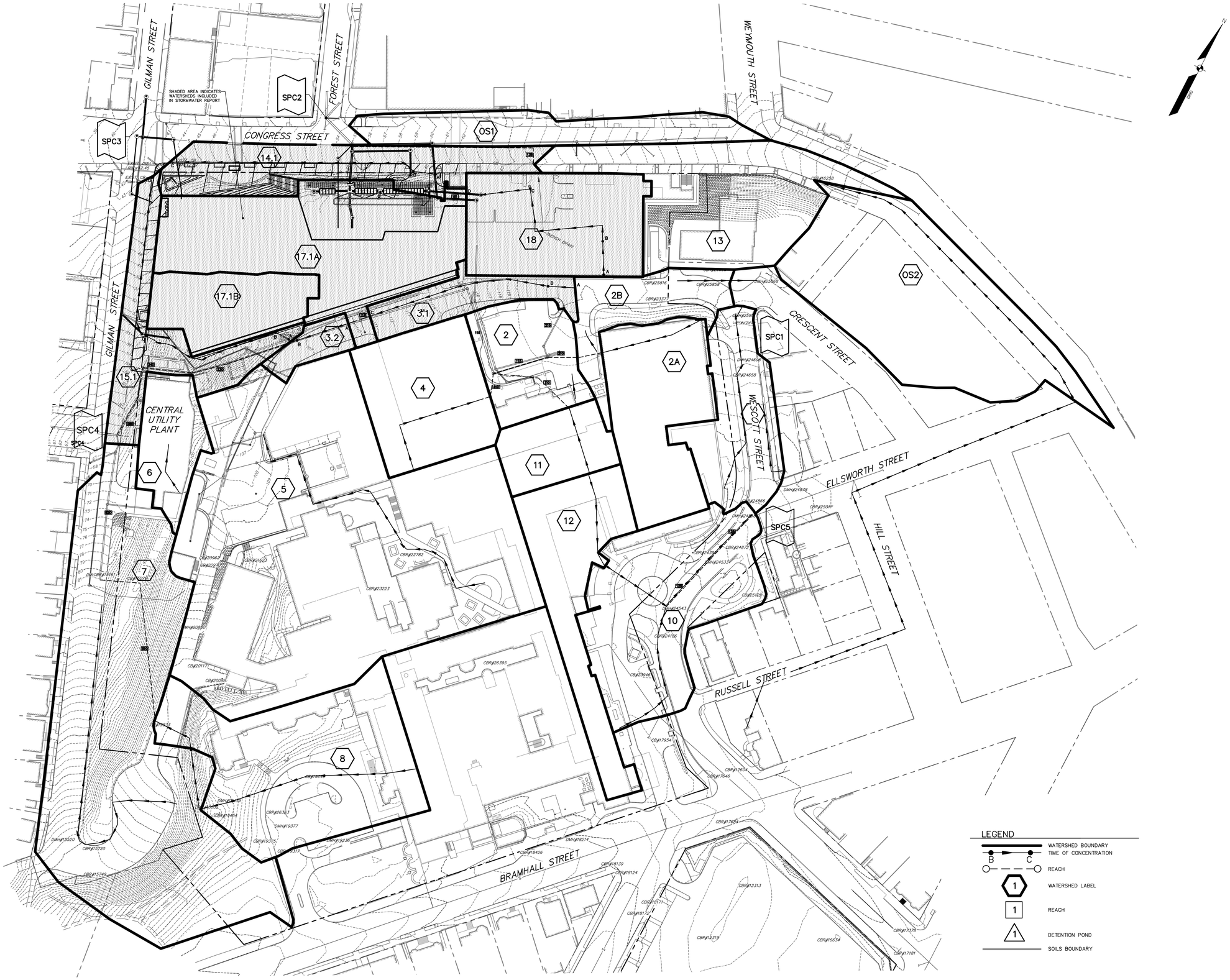
15466SWP2.dwg, TAB: OVERALL-PRE



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CLIENT

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MaineHealth

Maine Medical Center

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Waltham, MA 02453

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COST ESTIMATOR
D.G. Jones International
3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

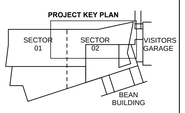
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14607
LICENSED PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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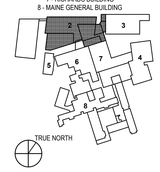

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	DJS
Checked	WTC
Approved	DLR

TITLE

POST DEVELOPMENT CAMPUS WATERSHED PLAN, CONGRESS STREET EXPANSION

SHEET NUMBER

C60-02

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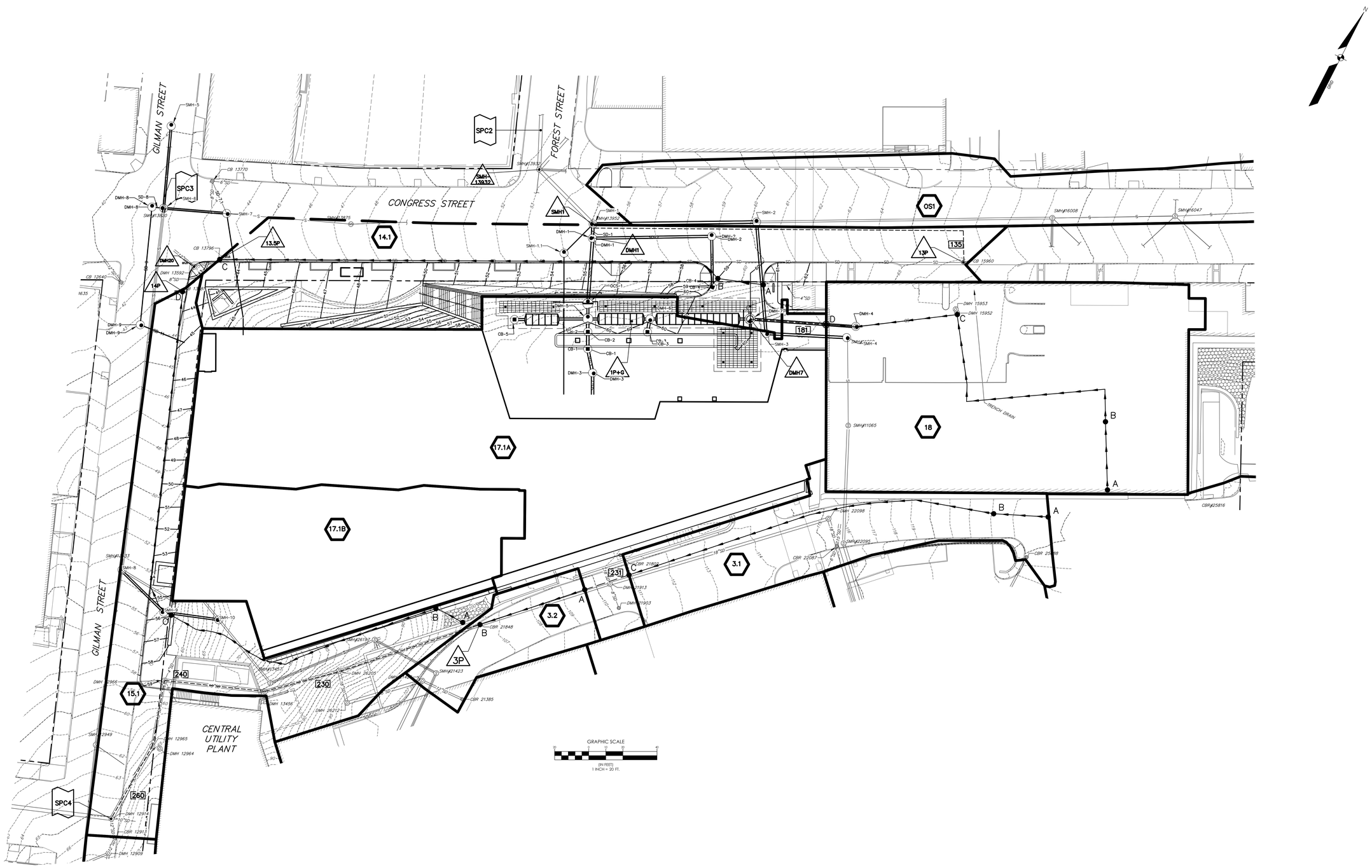

LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- REACH
- WATERSHED LABEL
- REACH
- DETENTION POND
- SOILS BOUNDARY

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CLIENT

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MaineHealth

Maine Medical Center
22 Bramhall Street
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CONSULTANTS

CIVIL/ LANDSCAPE ARCHITECT
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South Portland, ME 04106

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Waltham, MA 02453

MEPFP ENGINEER/CODE/LOW VOLTAGE
AKF Group LLC
99 Bedford Street, 2nd Floor, Boston, MA 02111

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TURNER CONSTRUCTION
2 Seaport Lane, Suite 200, Boston, MA 02210

ELEVATOR CONSULTANT
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101 Summer Street, 4th Floor, Boston, MA 02110

COST ESTIMATOR
D.G. Jones International
3 Baldwin Green Common,Suite 202, Woburn, MA 01801

MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

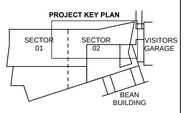
PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

STATE OF MAINE
DANIEL L. RILEY
No. 14667
LICENSED PROFESSIONAL ENGINEER
9/25/18

KEY PLANS

PROJECT KEY PLAN



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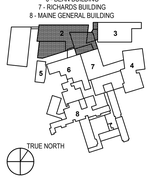

CITY SUBMISSION
SEPTEMBER 25, 2018

NO	ISSUE	DATE
1	CITY SUBMISSION	9/25/2018

Job Number	152189.000
Drawn	DJS
Checked	WTC
Approved	DLR

TITLE

POST DEVELOPMENT WATERSHED PLAN, CONGRESS STREET EXPANSION

SHEET NUMBER

C60-03

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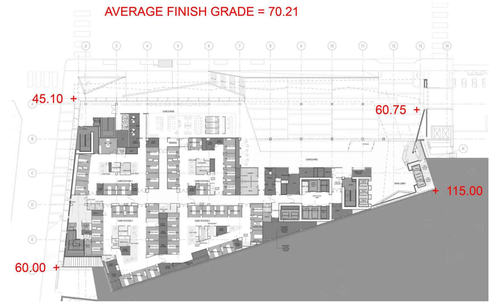
154665\WP2.dwg, TAB:POST



VISITOR'S GARAGE

CONGRESS STREET BUILDING

MAXIMUM BUILDING HEIGHT PER REGULATORY FRAMEWORK 270.21

200' -0"

CAMPUS LEVEL 2 164' - 6"

18' - 8"

LEVEL 7 145' - 10"

14' - 4"

LEVEL 6 131' - 6"

13' - 6"

34' - 3 1/2"

LEVEL 5 118' - 0"

13' - 6"

LEVEL 4 104' - 6"

13' - 6"

LEVEL 3 91' - 0"

16' - 0"

LEVEL 2 75' - 0"

4' - 9 1/2"

AVERAGE GRADE ELEVATION 70.21

9' - 2 1/2"

LEVEL 1 61' - 0"

15' - 6"

GILMAN EGRESS LEVEL 52' - 3"

GILMAN STREET EMPLOYEE ENTRANCE LEVEL 45' - 6"

ALUMINUM CURTAINWALL SYSTEM

METAL PANEL

MOB BRIDGE

Maine Medical Center MaineHealth

GRADE AT CORNER 60.75

ALUMINUM CURTAINWALL SYSTEM

LIMESTONE PANELING

EXISTING COMMUNICATION BOX ON CONC.PAD

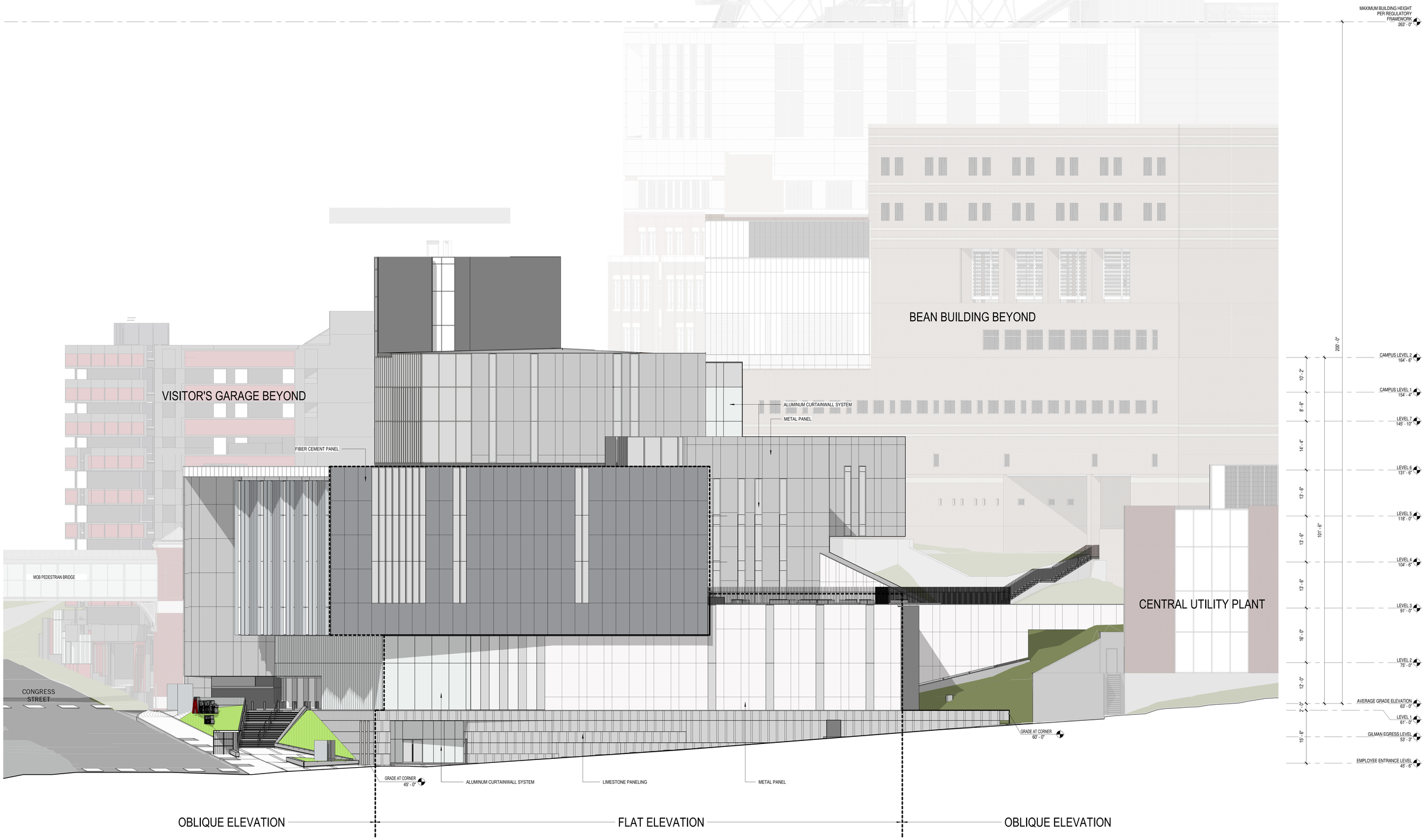
GRADE AT CORNER 45.10

Maine Medical Center MaineHealth

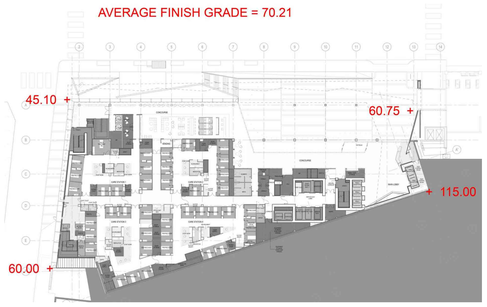
Congress Street Building

EXTERIOR ELEVATION - NORTH

PERKINS+WILL


MAXIMUM BUILDING HEIGHT PER REGULATORY FRAMEWORK 263' - 0"
BEAN BUILDING BEYOND
VISITOR'S GARAGE BEYOND
ALUMINUM CURTAINWALL SYSTEM
METAL PANEL
FIBER CEMENT PANEL
MOB PEDESTRIAN BRIDGE
CENTRAL UTILITY PLANT
CONGRESS STREET
GRADE AT CORNER 45' - 0"
ALUMINUM CURTAINWALL SYSTEM
LIMESTONE PANELING
METAL PANEL
GRADE AT CORNER 60' - 0"
OBLIQUE ELEVATION
FLAT ELEVATION
OBLIQUE ELEVATION
200' - 0"
10' - 2"
9' - 8"
14' - 4"
13' - 9"
13' - 9"
13' - 9"
13' - 9"
16' - 0"
12' - 0"
2' - 0"
9' - 1"
CAMPUS LEVEL 2 164' - 6"
CAMPUS LEVEL 1 154' - 4"
LEVEL 7 140' - 10"
LEVEL 6 131' - 6"
LEVEL 5 118' - 0"
LEVEL 4 104' - 6"
LEVEL 3 91' - 0"
LEVEL 2 75' - 0"
AVERAGE GRADE ELEVATION 63' - 0"
LEVEL 1 61' - 0"
GILMAN EGRESS LEVEL 53' - 3"
EMPLOYEE ENTRANCE LEVEL 45' - 6"

AVERAGE FINISH GRADE = 70.21



MAXIMUM BUILDING HEIGHT PER REGULATORY FRAMEWORK 70.21

OBLIQUE ELEVATION

ALUMINUM CURTAINWALL SYSTEM

LOUVERS

BEAN BRIDGE CAMPUS GROUND CONNECTOR

BEAN BRIDGE CAMPUS BASEMENT CONNECTOR

BEAN BRIDGE CONNECTOR

NEW CONC., TYP.

METAL PANEL

METAL PANEL

FLAT ELEVATION

GRADE AT CORNER 115.00

LOCATION OF PIPES FROM CENTRAL UTILITY PLANT (CUP) TO CONGRESS STREET BUILDING, PIPES COVERED WITH METAL PANELING

GRADE AT CORNER 60' - 0"

DASHED LINE INDICATES OUTLINE OF EXISTING RETAINING WALL

200' - 0"
10' - 2"
8' - 6"
14' - 4"
13' - 6"
94' - 3 1/2"
47' - 9 1/2"

CAMPUS LEVEL 2 164' - 6"
CAMPUS LEVEL 1 154' - 4"
LEVEL 7 145' - 10"
LEVEL 6 131' - 6"
LEVEL 5 118' - 0"
AVERAGE GRADE ELEVATION 70.21

Maine Medical Center
MaineHealth

Congress Street Building

EXTERIOR ELEVATION - SOUTH

PERKINS+WILL




Maine Medical Center


Saeng
Thai House
Eat In - Take Out
780 - 0900 780 - 0911
3Q

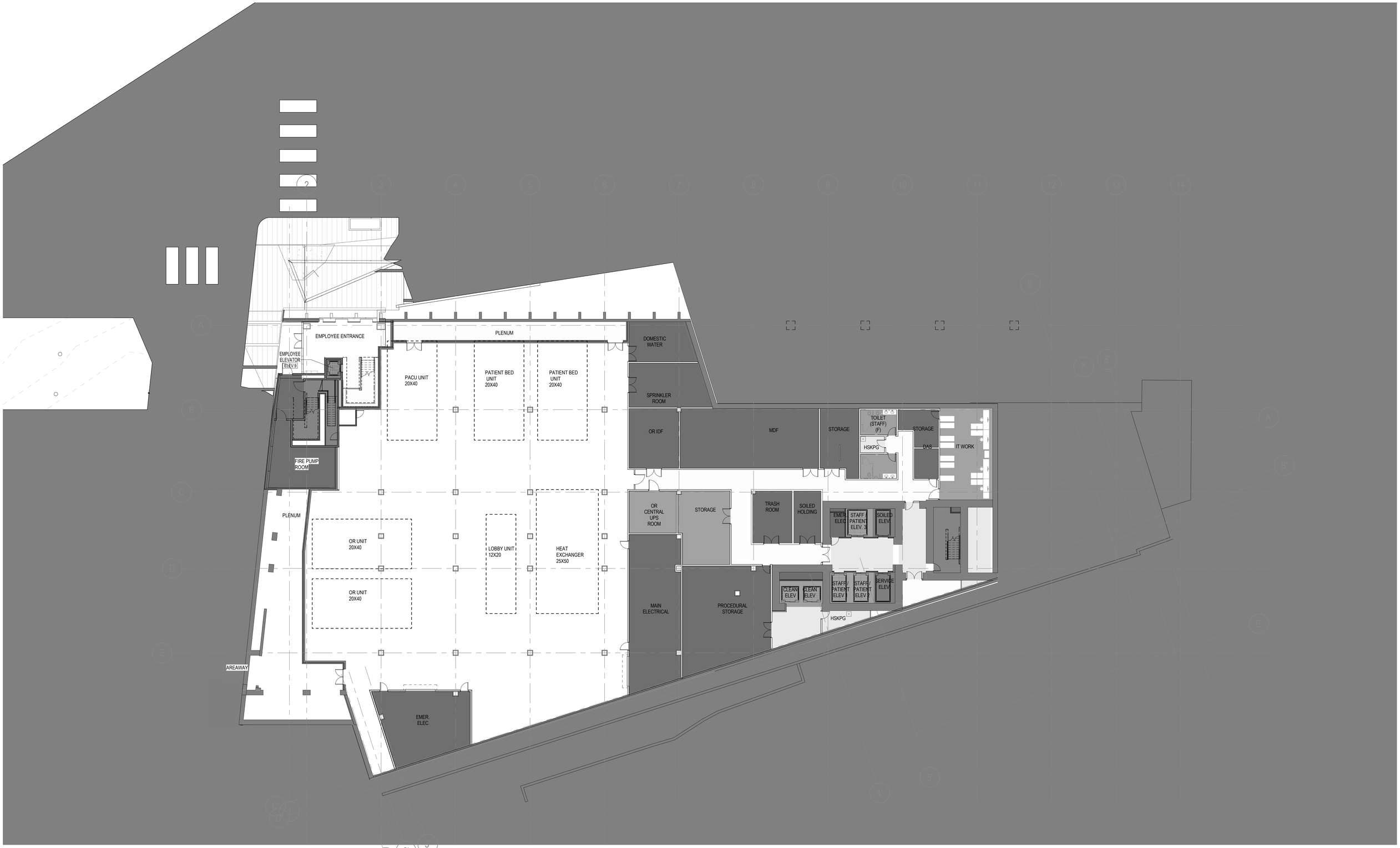












1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL B PLAN

PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:46:29 PM



1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL 1 PLAN

PERKINS+WILL

CONSTRUCTION DOCUMENTS

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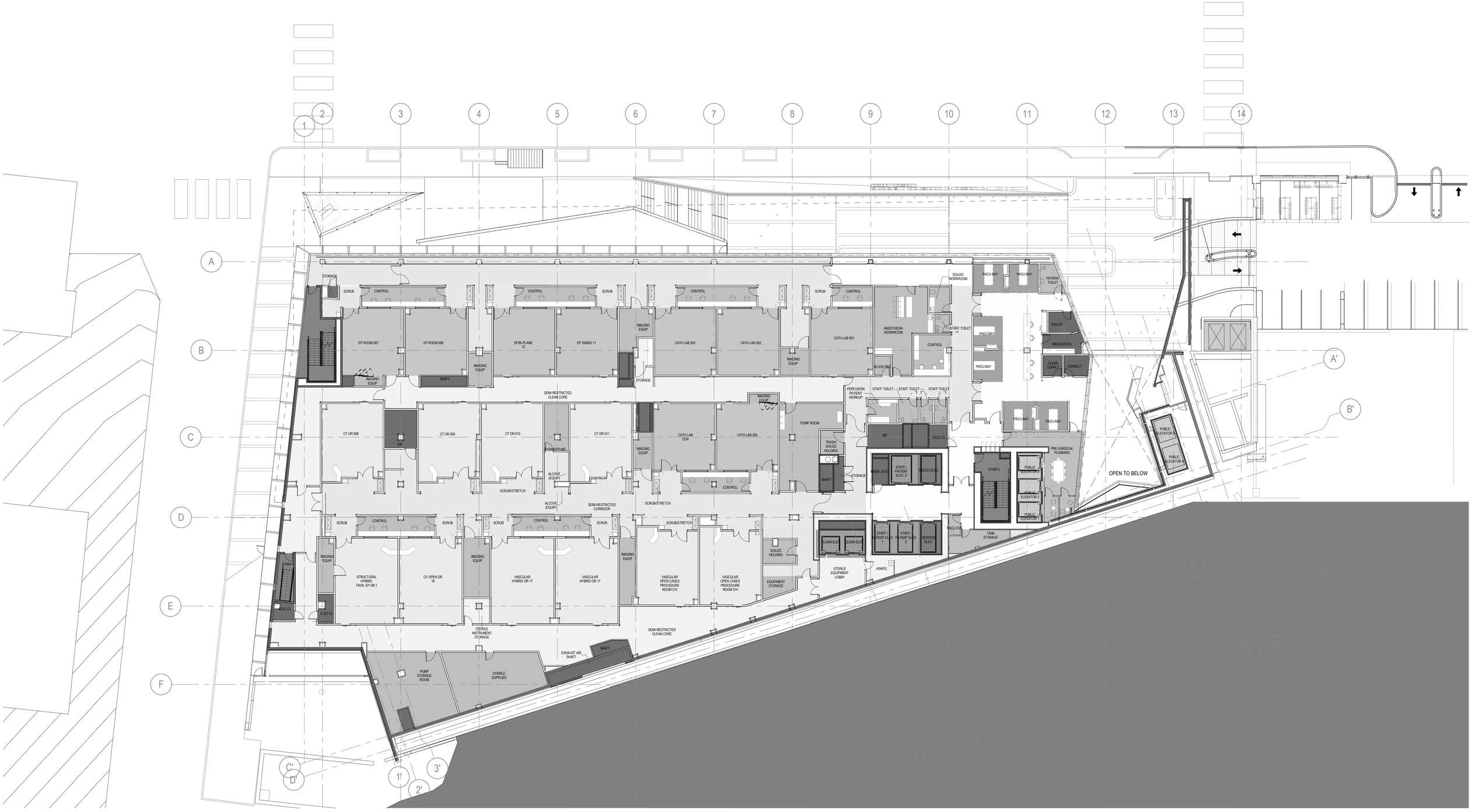


1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL 2 PLAN

PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:47:21 PM



1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL 3 PLAN

PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:48:04 PM

1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL 4 PLAN

PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:48:58 PM



1/16" = 1'-0"

Maine Medical Center
MaineHealth

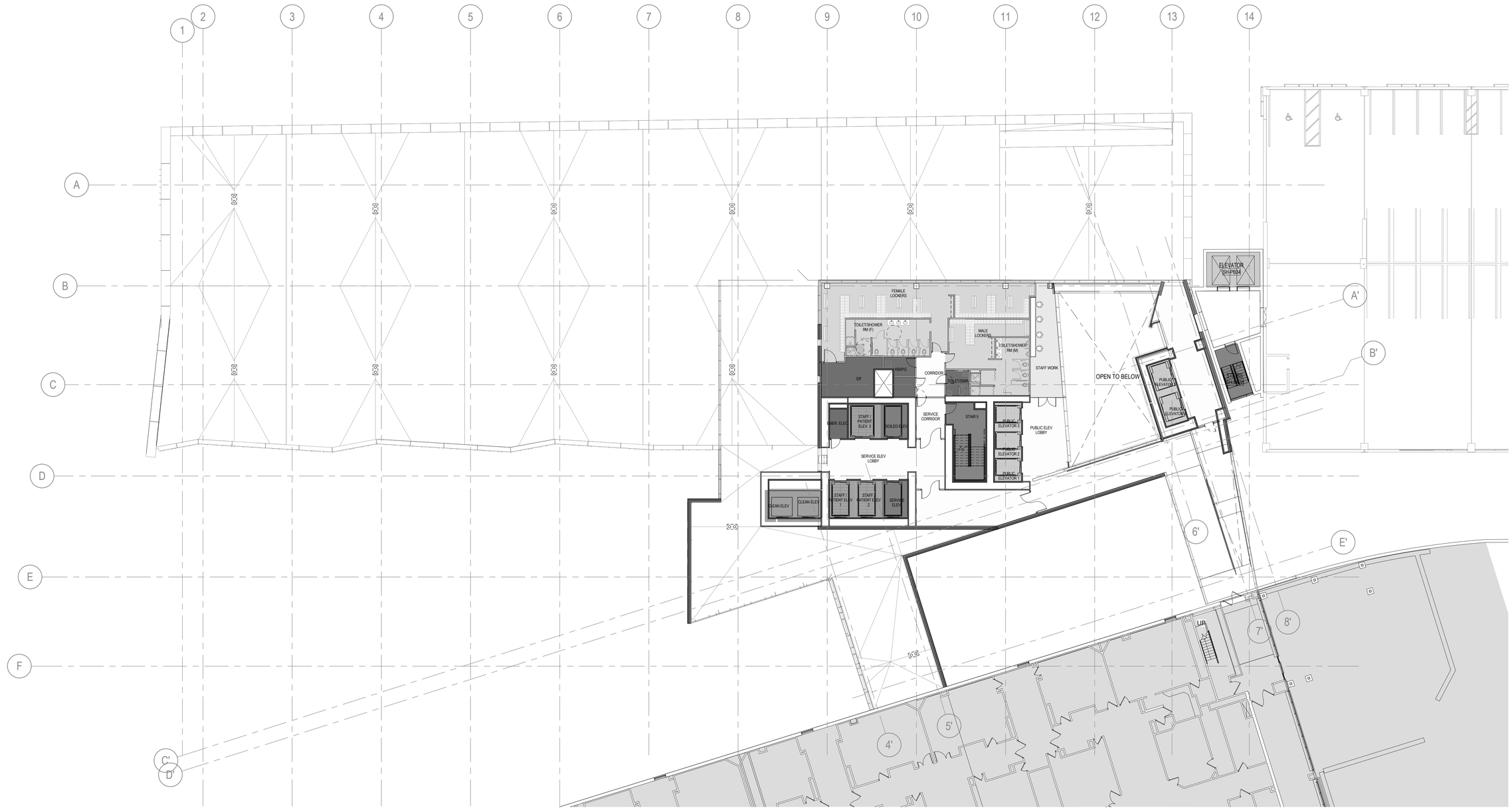
Congress Street Building
LEED DOCUMENTATION

LEVEL 5 PLAN (BRAMHALL SUB-BASEMENT LEVEL)

PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:49:16 PM



1/16" = 1'-0"

Maine Medical Center
MaineHealth

Congress Street Building
LEED DOCUMENTATION

LEVEL 6 PLAN (BRAMHALL BASEMENT LEVEL)

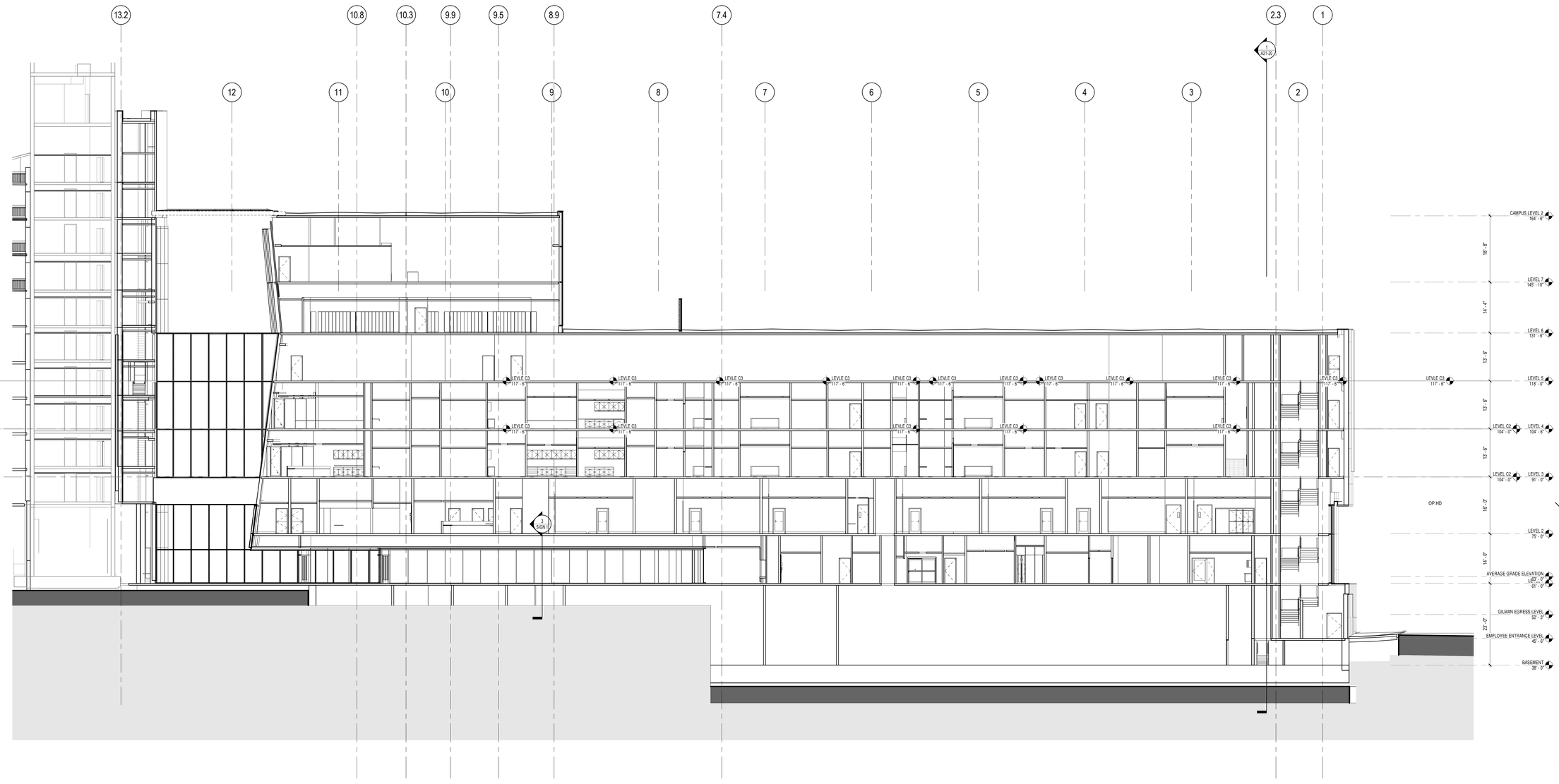
PERKINS+WILL

CONSTRUCTION DOCUMENTS

10/14/2018 1:49:32 PM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
A'
B'
C'
D'
E'
7'
8'
56 seats
PUBLIC TOILET(F)
HSKPG
IDF
ELEC CL
MECH. ACESS
STAFF TOILET
PUBLIC TOILET (M)
EMER. ELEC
STAFF / PATIENT ELEV 3
OILED ELEV
STAIR 5
SERVICE CORRIDOR
PUBLIC ELEVATOR
PUBLIC ELEVATOR
PUBLIC ELEVATOR
SERVICE ELEV LOBBY
STAFF / PATIENT ELEV
STAFF / PATIENT ELEV
SERVICE ELEV
CORRIDOR
OPEN TO BELOW
CONNECTOR
ELEVATORS (SHAFTS)
EXIST VISITOR GARAGE ELEV LOBBY
PUBLIC ELEVATOR
PUBLIC ELEVATOR
STAIRS
UP
4'
5'

1/16" = 1'-0"



1 BUILDING SECTION EAST / WEST (LOOKING SOUTH)
3/32" = 1'-0"

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Boston, MA 02110
t 617.478.0300
f 617.478.0321
www.perkinswill.com

CLIENT

Maine Medical Center
MaineHealth

LEED DOCUMENTATION

22 Bramhall Street
Portland ME 04102

CONSULTANTS

CIVIL / LANDSCAPE ARCHITECT
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COST ESTIMATOR
D. G. Jones International
3 Baldwin Green Common, Suite 202, Woburn MA 01801

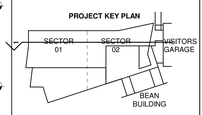
MEDICAL EQUIPMENT PLANNING
Mitchell Planning
630 Dundee Road, Suite 340, Northbrook IL 60062

PROJECT TITLE

Congress Street Building
22 Bramhall Street
Portland ME 04102

KEY PLANS

PROJECT KEY PLAN



OVERALL KEY PLAN

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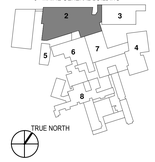
3 - VISITOR GARAGE
4 - EAST TOWER
5 - CENTRAL UTILITY PLANT
6 - BEAN BUILDING
7 - RICHARDS BUILDING
8 - MAINE GENERAL BUILDING



TRUE NORTH

CONSTRUCTION DOCUMENTS
PROGRESS SET

NO	ISSUE	DATE
1	PROGRESS SET	09/07/2018

Job Number	152189.000
Drawn	TEAM
Checked	DS/RS
Approved	JK

TITLE

E-W BUILDING SECTIONS

SHEET NUMBER

A21-10

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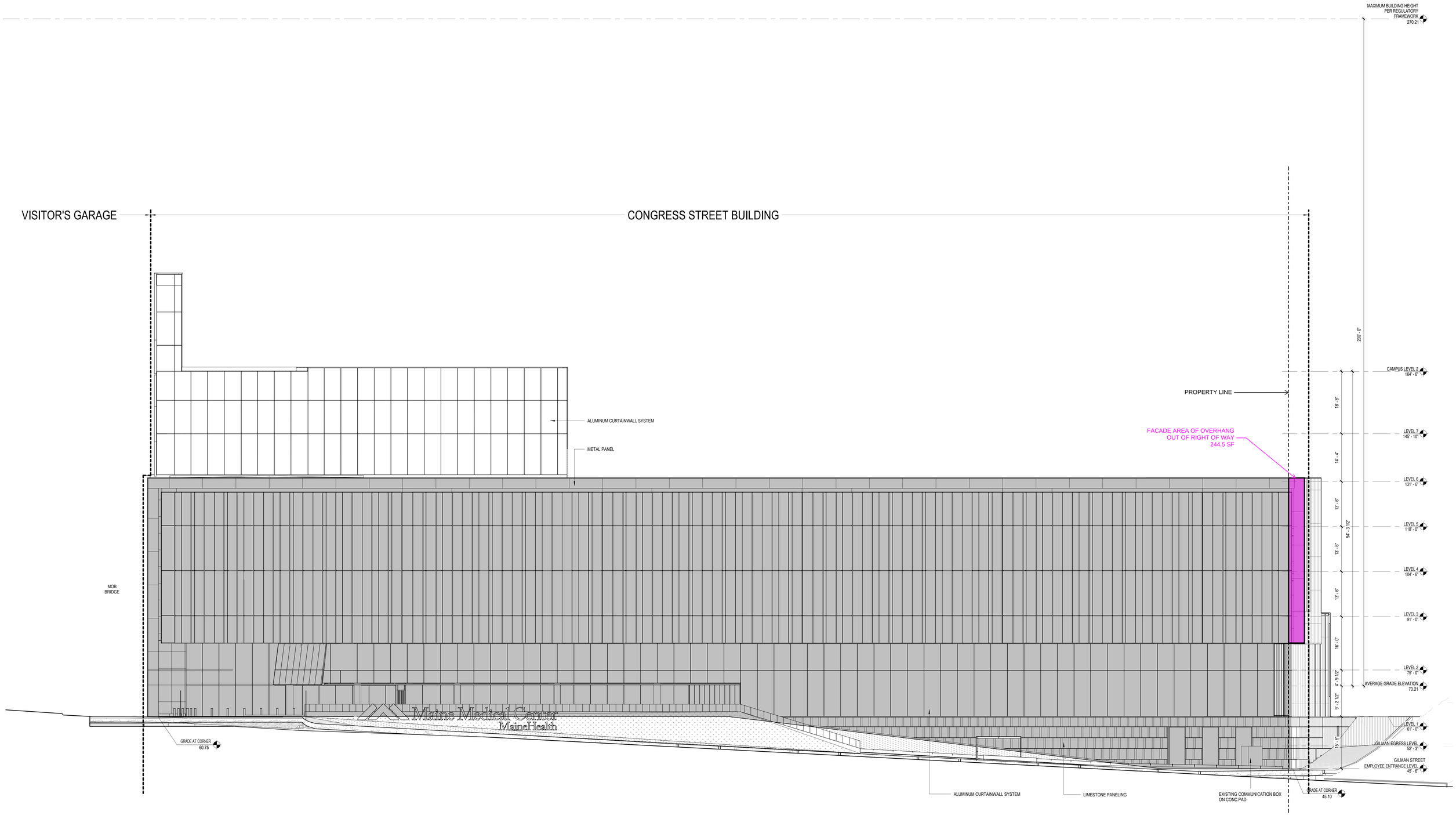
10/21/2018 6:15:17 PM
152189-MMC-Congress IS-V2017_detached.rvt


PROPERTY LINE
BUILT STRUCTURE
95.97SF
USABLE FLOOR
50.74SF
OVERHANG TOTAL
146.71SF


MAXIMUM BUILDING HEIGHT
PER REGULATORY
FRAMEWORK
270.21
VISITOR'S GARAGE
CONGRESS STREET BUILDING
ALUMINUM CURTAINWALL SYSTEM
METAL PANEL
PROPERTY LINE
FACADE AREA OF OVERHANG
OUT OF RIGHT OF WAY
244.5 SF
200' - 0"
CAMPUS LEVEL 2
164' - 6"
LEVEL 7
145' - 10"
LEVEL 6
131' - 6"
LEVEL 5
118' - 0"
LEVEL 4
104' - 6"
LEVEL 3
91' - 0"
LEVEL 2
79' - 0"
AVERAGE GRADE ELEVATION
70.21
LEVEL 1
61' - 0"
GILMAN EGRESS LEVEL
52' - 3"
GILMAN STREET
EMPLOYEE ENTRANCE LEVEL
45' - 6"
18' - 8"
14' - 4"
13' - 6"
13' - 6"
13' - 6"
15' - 6"
94' - 3 1/2"
25' 5 1/2"
9' - 2 1/2"
15' - 5"
MOB
BRIDGE
GRADE AT CORNER
60.75
GRADE AT CORNER
45.10
ALUMINUM CURTAINWALL SYSTEM
LIMESTONE PANELING
EXISTING COMMUNICATION BOX
ON CONC.PAD
Maine Medical Center
MaineHealth

Memorandum

Maine Medical Center

To:	Members of the City of Portland Planning Board
From:	Jeff Sanders, Chief Operating Officer, MMC
Date:	September 25, 2018
Re:	Site Plan Application: Congress St Patient Care Building

Maine Medical Center is pleased to submit this Level III Site Plan Application for the Congress St Patient Care building. This is the last of three site plan applications related to MMC's Short-Term Development plan outlined in the Institutional Development Plan approved by the Planning Board on September 26, 2017.

INTRODUCTION

This is the third and final site plan submission in MMC's short-term expansion and modernization plan. It completes the project's overall mission of improving the experience of patients, staff and visitors to the hospital; developing MMC's presence on the urban edge of the campus and providing convenient, safe and predictable parking for staff and the community.

The site plan includes the removal of the Gilman Street garage, MMC's staff parking facility that has reached the end of its useful life. MMC will expand into that space with a building featuring 64 modern, private patient rooms and 19 procedure rooms. Re-orienting the campus toward Congress Street will help ongoing efforts to revitalize this important gateway to the city, furthering the goals of the community and the city of Portland's Comprehensive Plan.

MMC has worked closely with city staff, neighbors, and local businesses to make improvements in accessing the Bramhall campus while reducing traffic and parking challenges on neighboring streets. Work has been undertaken to design the Congress Street entrance in order to allow easy and convenient access to MMC while minimizing impact on existing pedestrian, bicycle, transit and vehicular traffic.

This 265,000-square-foot addition allows MMC to internally reorganize cardiac services within the hospital campus, which means timely, efficient access for patients and care teams and reduction of time and effort spent traveling through the hospital corridors. The 19 procedure rooms will align with industry best practices, providing adequate space to treat patients, ultimately improving the experience at MMC.

PROJECT PURPOSE AND NEED

The entire MMC campus has grown in both size and complexity since it was built as Maine General Hospital in 1874. The growth has brought changes in both programmatic and infrastructure needs as it continues to serve patients and their families throughout the entire State of Maine and Northern New England. During the master facility planning process, MMC identified four key categories of need:

- Clinical
- Building
- Campus Reorganization
- Parking

The Congress St Patient Care building represents a significant step towards modernizing the facilities at Maine Medical Center. Over 50% of MMC's Bramhall campus is over 40 years old and 25% is 30 years old. The oldest part of campus, the East Wing of the Maine General Building, was built in 1874. The patient acuity at MMC is the highest in the State of Maine. MMC had an average Case Mix Index of 1.99 in 2017 while the average in the state was 1.23. Patient acuity and Case Mix Index are representations of how sick patients are at the hospital. Patients at MMC require advanced equipment, skilled care teams, and, most of all, private rooms to better facilitate their care and recovery.

The majority of MMC inpatient services are currently compressed into semi-private inpatient rooms. This creates a daily capacity challenge at MMC to manage the growing demand. The challenge is exacerbated by the need to close up to 60 beds per day due to patient condition, gender cohorting, maintenance, or staffing. The primary objective of the Congress St Patient Care building is to increase the number of private rooms and procedure rooms to better enable patient care.

Less than half of MMC's inpatient rooms are private today. MMC's private room ratio will be almost 80% once the expansion of the East Tower and construction of the Congress building is complete. The license bed count of 637 will remain the same. Significantly increasing the number of private rooms at MMC will improve the operational efficiency and patient and care giver experience.

CONSTRUCTION MANAGEMENT APPROACH

Turner Construction is the construction manager for this project. Turner's success working in and around highly complex environments will directly contribute to the success and safety of this project.

The purpose of the construction management plan (CMP) submitted with this application is to provide the details of the second phase of construction for MMC's Master Facility Phase IIB. The CMP outlines Turner Construction's plan for controlling impacts from noise, vibrations, ground movement, truck traffic, and other construction related factors to the surrounding neighborhoods and buildings.

Maintaining normal campus operations, mitigating impacts to surrounding residences and businesses and maintaining public safety are high priorities during the construction phase. The CMP will be presented to the appropriate City and Neighborhood representatives. The City of Portland Planning Board will approve the final plan. It has been the goal of these programs to define the construction plan before construction begins. Turner's experience on projects with similar logistic constraints has proven that pre-planning and constant communication are necessary for a smooth efficiently run, incident free project.

It is Turner Construction's full intent to follow the guidelines set by the CMP.

Turner Construction and its subcontractors shall schedule and conduct operations in a manner that will control the disturbance to the public in areas adjacent to the work and to occupants of buildings in the vicinity.

DESIGN APPROACH

The campus transformation of Maine Medical Center (MMC) draws its inspiration from its site, programmatic needs and most importantly, the desire to create a sense of place. Specifically, the Hospital will reflect its location within Portland and of Maine. Within this framework, the Hospital aims to preserve the historic character of the existing campus yet provide the opportunity for new identities to develop that represent the modern delivery of healthcare and the future of MMC.

MMC followed the Design Guidelines set in MMC's Institutional Development Plan (Pgs. 116-118). Other key design drivers and interventions envisioned for the MMC project balance the clinical needs of the hospital with the campus' place within the City of Portland. Included is a primary effort to improve the built environment of MMC's campus relationship with its urban context. This is achieved by focusing the new entrance towards Congress St to create an improved presence on the urban edge of the campus. This design improves the visitor and patient experience from arrival to the City all the way to entering the MMC buildings themselves. Providing a new entry on Congress St connects a campus entry directly to the existing and expanded visitor parking garage, simplifying the drop-off and parking sequence. This move creates a clear arrival sequence from drop-off, to parking, to movement through the MMC campus.

The inclusion of a new entry coupled with clear primary circulation along the ground level connects major interior programmatic functions with the site, further reinforcing the wayfinding and activating the building interior and exterior. Engaging Congress St with a sensitivity to human scale and experience will be the focus of the transition between exterior to interior including transitions from urban to natural environments. This approach extends to vertical connections, both physical and visual, to mitigate the large grade changes that exist on campus and with the surrounding sites. These interventions will provide a positive patient and visitor experience as well as enhance the neighborhood.

The creation of healing environments is an essential element to the design within the IOZ boundary. This will be achieved through the incorporation of access to and views of nature and natural daylight, which are proven to improve positive patient outcomes within a healthcare environment. Proper location and use of glass and transparency provides connections to the exterior to improve patient, visitor and staff experience but also to further reinforce wayfinding, and activate and energize the streetscape.

CONCLUSION

We are excited about this project and the enhancements it will provide our patients, visitors and care teams. This project will improve MMC's ability to meet the needs of patients in our community by de-coupling semi-private rooms and providing adequate parking for patients and families. We look forward to reviewing the Site Plan Application for the Congress St patient care building with you.

WRITTEN SUBMISSION 26 – AVAILABILITY AND ADEQUACY OF PUBLIC UTILITIES
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

ATTACHED ARE AN ABILITY TO SERVE CONFIRMATION FROM CENTRAL MAINE POWER REGARDING ELECTRICAL SERVICE, AND AN EMAIL TO PORTLAND WATER DISTRICT REQUESTING AN ABILITY TO SERVE CONFIRMATION. THE RESPONSE FROM PORTLAND WATER DISTRICT WILL BE SUBMITTED UPON RECEIPT.

REGARDING SOLID WASTE MANAGEMENT, THE APPLICANT HAS A CONTRACT WITH TROIANO WASTE MANAGEMENT WHO WILL CONTINUE TO PROVIDE THIS SERVICE FOR THE CONGRESS STRET BUILDING.

From:	Cough, Jamie
To:	Troidl, Adam
Subject:	CMP Three Phase Ability to Serve Request and Three Phase Service Process
Date:	Monday, September 24, 2018 8:12:00 AM
Attachments:	Easement Information Worksheet.doc Standard Easement Sample.pdf 2July 2018 EDET.XLSX

9/24/18

Adam Troidl, LEED AP
Vice President | Development & Consulting Services
Colliers International

Sent via email to: adam.troidl@colliers.com

RE: CMP Ability to Serve Letter for Maine Medical Center Expansion

Project Description: Maine Medical Center 263,000 sf clinical building at the corner of Congress & Gilman. This will be a redevelopment of an existing 1,200 car +/- parking garage site on the existing primary metered campus on Congress Street.

Dear Mr. Troidl:

CMP has the ability to serve the proposed project in accordance with our CMP Handbook (web link below). We can provide you the desired pad or pole mounted transformers per your request and city approval, in accordance with our CMP Standards Handbook. If you have any questions on the process, or need help in completion of the documents, **please contact me at 207-629-1489.**

Here is our typical process for getting your three phase or CT rated single phase service installed. If you have any questions, please let me know. The underlined links will redirect you to the appropriate site for additional information.

Service Milestones for Three Phase Services and CT Rated Single Phase Services. Please refer to CMP Installation Checklists for other installations.

- Call 1-800-S6S-3181 to establish a new account (if needed) and an SAP work order. Please provide both of these to me.
- Submit Load information. Please complete the attached EDET (excel file) using load information. . Please complete this and email back to me.
- Submit the easement information worksheet. Please complete this form and either email or fax back to me.
- Submit any electronic drawings (PDF (preferred) or DWG files) of the site layout and proposed electrical connections if you have them.

- Preliminary meetings with CMP Advisor and Engineer to determine details of job (I will need to schedule with your electrician/contractor-please let me know who this is)
- Field planner design appointment to cost out job and develop CMP invoice. The invoice is typically generated 5-6 weeks after the design appointment. This expires after 90 days from the invoice date.
- CMP submits invoice to the customer for payment (typically via email). Payment received from customer.
- Easements (based on easement information worksheet) sent out, signed and originals returned to CMP.
- Job scheduled for completion after the electrical inspection has been received.

This process can take several months, depending upon several factors including transformer or materials delivery, return of completed paperwork, and other jobs in the system that may be ahead of yours. In addition, contact with the other utilities, including telephone and cable, should be commenced as soon as practical. They may have additional work or charges in addition to the CMP work required to bring your project on line.

Please complete the attached forms (the specific instructions are on each form) and email them back to me at your earliest convenience.

For your convenience, here is a link to the CMP Website which contains our Handbook with details on most service requirements: CMP Handbook of Standard Requirements

You will be responsible for installing the customer connections, conduits, and metering in accordance with the CMP Handbook of Standard Requirements. The transformer will be sized based on your submitted load sheets.

Your deposit amount will be typically based on an estimated two month bill, calculated from your completed load sheet unless otherwise determined by CMP.

Metering:

All metering (including locations) must be preapproved by CMP.

Chapter 324 Interconnections:

Please be advised that if you plan to install solar/wind/hydro generation, you must complete an application under the MPUC mandated Chapter 324 Interconnection Standards. If you go to Chapter 324 Interconnection Standards and follow the instructions for the Small Generator Interconnection Procedures, CMP can do this work in parallel to your service request that will be handled by me. If you project is under 660 KW You will be able to have a Customer Net Energy Billing contract. Information concerning Customer Net Energy Billing can be accessed thru the Chapter 324 website or by clicking here: Net Energy Billing

Reallocation/Line Extensions:

Recently, changes were made to the three-phase construction policy, which require CMP to reallocate construction costs paid by customers. If applicable, those projects identified as "developments" do not qualify for reallocation of funds. Please see this document at our website for details about the reallocation conditions. Any reallocation charges will be specifically denoted on your invoice. The website address for this is: PolyphaseLineExtension .

This line extension will be part of Central Maine Power's distribution system. In the event the property served under this Agreement is sold or otherwise conveyed, all rights and obligations of the Agreement shall stay with the property. Please note that if you rent or lease this property to another and you want to receive the reimbursement payments, you must make special arrangements with the Central Maine Power Company. Otherwise, any reimbursement payments will be sent to the "Customer" taking service at the service location.

Electricity Supplier Information:

Central Maine Power Company (CMP) will provide your facility with electric delivery service. If you don't already have a provider, you will need to make arrangements with a competitive electricity provider in order to receive electricity supply for your facility. In the event you fail to choose a competitive electricity provider, you will receive Standard Offer service arranged by the Maine Public Utilities Commission. If you wish to be served by a competitive electricity provider immediately upon establishment of delivery service, you must arrange for this service directly through your chosen competitive electricity provider, who must enroll your account no later than 5 PM on the business day prior initiation of delivery service by CMP. An up-to-date list of competitive suppliers can be found at the:

1) Maine Public Utilities Commission (MPUC) web site- **Maine PUC**
2) By calling the MPUC at (207) 287-3831

Attachments:

Excel Load Sheet (EDET)
Easement Worksheet and Sample Standard Easement

Regards,

Jamie

Jamie Cough
Energy Services Advisor
Central Maine Power Company
162 Canco Road

Portland, ME 04103
207-842-2367 office



CENTRAL MAINE
POWER

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Will Conway

From: Dylan Stuart
Sent: Monday, September 24, 2018 11:22 AM
To: rbartels@pwd.org
Cc: Will Conway; 15466
Subject: Maine Medical Center Ability to Serve Request
Attachments: 15466U2-U-CONGRESS.pdf

Robert,

I am writing to request an ability to serve letter for the Maine Medical Center Expansion project following our meeting from last week. We have updated the locations for the domestic and fire services coming from Gilman and Congress Street. Please see the attached Utility plan as well as the most updated Peak Flow Based on Fixture Count form that was filled out by our MEP engineer.
Please let me know if you have any questions or require any additional information.

Thank you,

Dylan Stuart *Civil Engineer*
Office: 207.200.2100 | Direct: 207.200.2093
75 John Roberts Rd., Suite 4A, South Portland, ME 04106
dstuart@sebagotechnics.com | www.sebagotechnics.com
An Employee-Owned Company

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Peak Flow Based on Fixture Count

Customer	Maine Medical Center
Street Address	22 Bramhall Street
City	Portland

Fixture		Fixture Value 60 psi		No. of Fixtures		Fixture Value
Bathtub		8	x	0	=	0
Bedpan Washers		10	x	5	=	50
Bidet		2	x	0	=	0
Dental Unit		2	x	0	=	0
Drinking Fountain - Public		2	x	0	=	0
Kitchen Sink		2.2	x	95	=	209
Lavatory		1.5	x	141	=	211.5
Showerhead (Shower Only)		2.5	x	100	=	250
Service Sink		4	x	10	=	40
Toilet	-Flush Valve	35	x	142	=	4970
	-Tank Type	4	x	0	=	0
Urinal	-Pedestal Flush Valve	35	x	0	=	0
	-Wall Flush Valve	16	x	17	=	272
Wash Sink (Each Set of Faucets)		4	x	8	=	32
Dishwasher		2	x	0	=	0
Washing Machine		6	x	0	=	0
Hose (50 ft. Wash Down)	-1/2 in.	5	x	0	=	0
	-5/8 in.	9	x	0	=	0
	-3/4 in.	12	x	0	=	0

Combined Fixture Value Total: 6034.5

Customer Peak Demand From Fig. 4-2 or 4-3	175
Pressure Factor From Table 4-1	1.17

No. of Irrigation Sections (Areas of 100 sq. ft.)	0
Irrigation Factor (1.16-Spray Systems, 0.40-Rotary Systems)	

Hose Bibs for Irrigation:

Size	Fixture Value	No. of Fixtures
1/2"		
5/8"		
3/4"		

Total Fixed Demand (Peak Flow) **204.75** gpm

Table 4-1 Pressure Adjustment Factors

Working Pressure at Meter Discharge (psi)	Pressure Adjustment Factor
35	0.74
40	0.80
50	0.90
60	1.00
70	1.09
80	1.17
90	1.25
100	1.34

Adapted from AWWA Manual M22 table 4-1

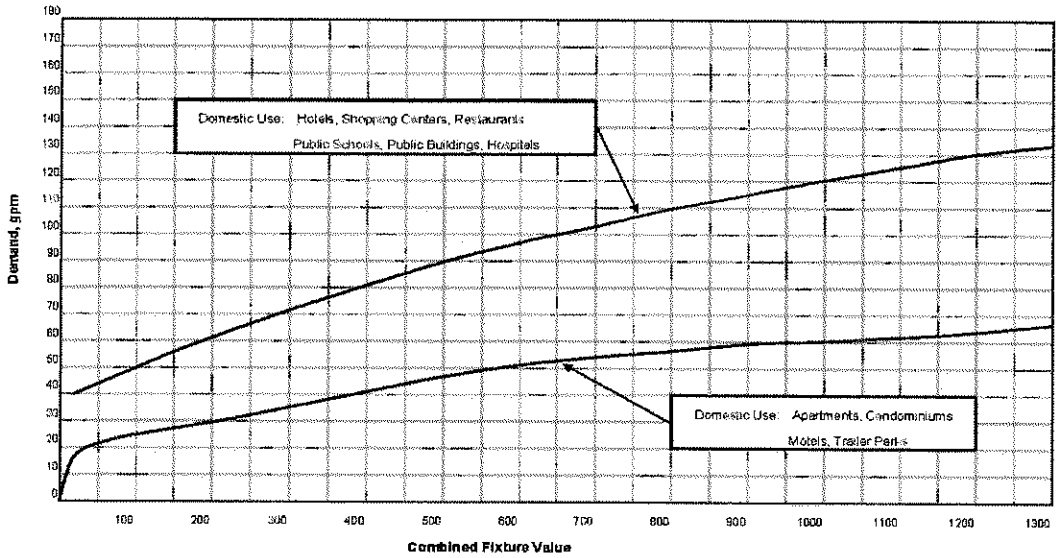

Figure 4-2 Water flow demand per fixture value - low range

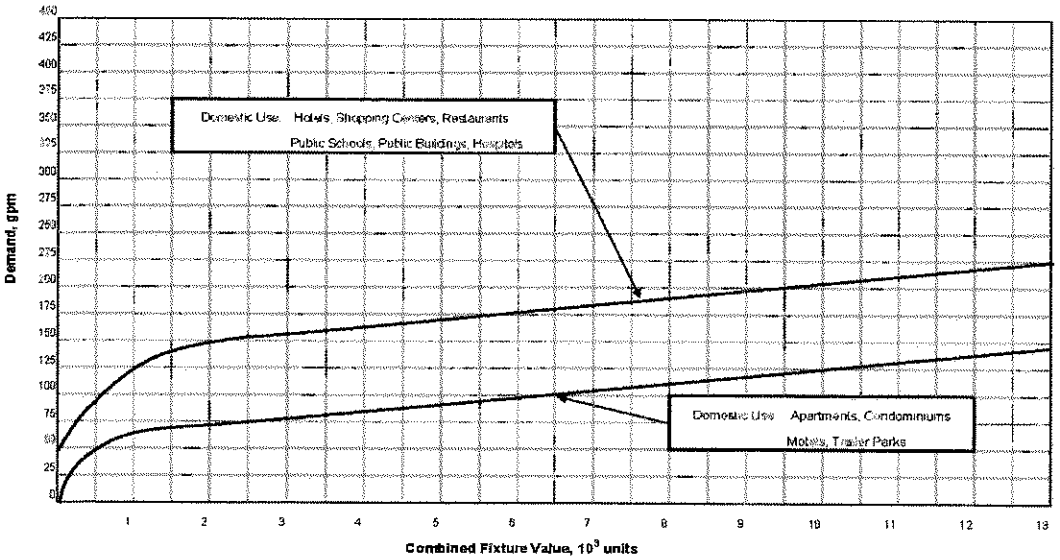

Figure 4-3 Water flow demand per fixture value - High range

Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

November 29, 2018

Dylan Stuart
75 John Roberts Rd., Suite 4A
South Portland, ME 04106

Re: 22 Bramhall Street, PO
Ability to Serve with PWD Water

Dear Mr. Stuart:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on September 24, 2018. Based on the information provided per plans dated November 29, 2018, we can confirm that the District will be able to serve the proposed project as further described in this letter. **Please note that this letter constitutes approval of the water system as currently designed. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- A new 8-inch fire service and 4-inch domestic water service may be installed from the water main in Congress Street. The service(s) should enter through the properties frontage on Congress Street at least 10-feet from any side property lines. The service(s) are approved based on connection to a renewed water main in Congress Street that is of sufficient size to supply water to the site. The existing 6" CI water main in Congress Street is insufficient to provide water to the site.
- A new 8-inch fire service and 4-inch domestic water service may be installed from the water main in Gilman Street. The service(s) should enter through the properties frontage on Gilman at least 10-feet from any side property lines.
- The existing site is currently served with a 1-inch domestic water service and a 6-inch fire service; the size of these services is undersized for the proposed use. These service must be retired per PWD standards, which includes shutting the corporation valve and cutting the pipe from the water main for the 1-inch service, and removing the valve and capping the tee for the 6-inch service.
- An approved backflow prevention device must be installed on the service line directly after the meter prior to service activation. Please refer to the PWD website for more information on cross-connection control policies.
- The Portland Water District does not have record of any other existing infrastructure in public roads and recommends a survey and test pitting be performed by the development team prior to construction. Any conflicts that arise during construction are at the risk of the developer and may result in job shutdown until new plans are submitted by the developer and reviewed and approved by PWD.

Prior to construction, the owner or contractor will need to make an appointment to complete a service application form and pay all necessary fees. The appointment shall be requested through MEANS@pwd.org or by calling 207-774-5961 ext. 3199. Please allow (3) business days to process the service application paperwork. PWD will guide the applicant through the new development process during the appointment.

Existing Site Service

According to District records, the project site does currently have existing water service. A 1-inch diameter domestic service line and 6-inch diameter fire service line provide water service to the site. Please refer to the "Conditions of Service" section of this letter for requirements related to the use of these services.

Water System Characteristics

According to District records, there is an 6-inch diameter CI water main in Congress Street, an 8-inch diameter DI water main in Gilman Street, and a public fire hydrant located approximately 50 feet from the site. Recent flow data is not available in this area. The most recent static pressure reading was 88 psi.

Public Fire Protection

The installation of new public hydrants to be accepted into the District water system will most likely not be required. It is your responsibility to contact the City of Portland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project. Based on the high water pressure in this area, we recommend that you consider the installation of pressure reducing devices that comply with state plumbing codes.

Private Fire Protection Water Needs

You have indicated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact MEANS to request a hydrant flow test and we will work with you to get more complete data.

Should you disagree with this determination, you may request a review by the District's Internal Review Team. Your request for review must be in writing and state the reason for your disagreement with the determination. The request must be sent to MEANS@PWD.org or mailed to 225 Douglass Street, Portland Maine, 04104 c/o MEANS. The Internal Review Team will undertake review as requested within 2 weeks of receipt of a request for review.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District



Robert A. Bartels, P.E.
Senior Project Engineer

B

Portland, Maine — Yes. Life's good here.

Planning & Urban Development Department

Bramhall St. - 22, MMC Congress Street Building

LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Please submit each document as a separate PDF file.
Please confirm by electronically checking the boxes to the left

General Application Documents

#	Checklist	Items to be Provided
00	Yes ✓ NA Plan	PROJECT DESCRIPTION • Cover Letter with detailed project description
01	Yes ✓ NA Plan	COMPLETED CHECKLIST – LEVEL III APPLICATION
02	Yes ✓ NA Plan	RIGHT, TITLE AND INTEREST • Deeds, leases, or purchase and sales agreements
03	Yes ✓ NA Plan	EVIDENCE OF STATE OR FEDERAL APPROVALS, if applicable • Permits or letters of non-jurisdiction, if applicable
04	Yes ✓ NA Plan	ZONING ASSESSMENT • Table listing required and proposed uses and dimensional standards Zoning Assessment Table
05	Yes ✓ NA Plan	EXISTING &/OR PROPOSED EASEMENTS OR COVENANTS, if applicable • Evidence of existing easements and any proposed easements
06	Yes ✓ NA Plan	WAIVER REQUESTS • Written request for waiver describing request and reason. Waiver Table
07	Yes ✓ NA Plan	FINANCIAL CAPABILITY • Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
08	Yes ✓ NA Plan	TECHNICAL CAPABILITY • Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN STANDARDS AND SUBMISSION CHECKLIST

Provide assessment of compliance with standards and include supplemental documentation, as applicable.
Please submit each document as a separate PDF file.

TRANSPORTATION

	Check list	Assess/Provide/Document:
09	Yes ✓ NA Plan	**Transportation Analysis- Traffic Impact (14-526 (a) 1)** • Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts • Traffic Impact Study (Technical Manual, Section 1) if applicable
10	Yes ✓ NA Plan	**Access and Circulation (14-526 (a) 2 a)** • Access and internal circulation, addressing ADA access • Access and egress impacts on traffic flows • Description and use of drive-up features, if applicable
11	Yes ✓ NA Plan	**Loading and Servicing (14-526 (a) 2 b)** • Loading and servicing needs, route and travel way geometrics for deliveries • Turning templates for delivery vehicles, if applicable
12	Yes ✓ NA Plan	**Sidewalks (14-526 (a) 2 c)** • Sidewalks and condition along street frontages and internal walkways • Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
13	Yes ✓ NA Plan	**Public Transit (14-526 (a) 3), if applicable** • Existing available transit services • Proposed site plan design details, such as easement, pad base, and shelter
14	Yes ✓ NA Plan	**Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c)** • Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements • Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
15	Yes ✓ NA Plan	**Bicycle Parking (14-526 (a) 4 b)** • Address bicycle parking requirements and identify locations on-site • Construction details for bike racks (Technical Manual, Section 1)
16	Yes ✓ NA Plan	**Snow Storage (14-526 (a) 4 d)** • Management plan for snow removal and locate snow storage areas on plan
17	Yes ✓ NA Plan	**Traffic Demand Management (TDM) (14-526 (a) 5), if applicable** • Develop TDM with Trip Reduction Targets and Strategies

ENVIRONMENTAL AND LANDSCAPE FEATURES

Check list	Assess/Provide/Document:
18 Yes ✓ NA Plan	**Preservation of Significant Natural Features (14-526 (b) 1), if applicable** • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
19 Yes ✓ NA Plan	**Landscaping and Landscape Preservation (14-526 (b) 2 a)** • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
20 Yes ✓ NA Plan	**Site Landscaping (14-526 (b) 2 b)** • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
21 Yes ✓ NA Plan	**Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable** • Landscaped islands within parking areas (Technical Manual, Section 4)
22 Yes ✓ NA Plan	**Street Trees (14-526 (b) 2 b iii)** • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable

ENVIRONMENTAL AND STORMWATER

Check list	Assess/Provide/Document:
23 Yes ✓ NA Plan	**Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a)** • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

PUBLIC INFRASTRUCTURE AND SAFETY

Check list	Assess/Provide/Document:
24 Yes ✓ NA Plan	**Consistency with City Master Plans (14-526 (c) 1)** • Identify consistency with master plans • Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
25 Yes ✓ NA Plan	**Public Safety and Fire Prevention (14-526 (c))** • Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) • Emergency vehicle access • Address consistency with public safety standards (Technical Manual, Section 3) • Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
26 Yes ✓ NA Plan	**Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual,** Sections 2 & 9) • Electrical services, including providing underground services • Identify existing and proposed connections for public utilities and required public utility upgrades • Sewer line connections are required, if there is a main within 200 feet • Proposed solid waste management facilities on-site and management for the site • Written evidence of the ability to serve from utility companies, as applicable

SITE DESIGN

Check list	Assess/Provide/Document:
27 Yes ✓ NA Plan	**Massing, Ventilations and Wind Impact (14-526 (d) 1)** • Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable • Bulk, location or height impacts on adjoining structures • Identify and locate HVAC equipment and venting away from public spaces and residential properties • Identify screening and manufacturing specifications for noise, if applicable
28 Yes ✓ NA Plan	**Shadows (14-526 (d) 2), if applicable** • Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
29 Yes ✓ NA Plan	**Snow and Ice Loading (14-526 (d) 3)** • Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
30 Yes ✓ NA Plan	**View Corridors (14-526 (d) 4), if applicable** • Protection of designated view corridors (Portland Design Manual, Appendix 1)

31	Yes ✓ NA Plan	**Historic Resources (14-526 (d) 5), if applicable** • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
32	Yes ✓ NA Plan	**Exterior Lighting (14-526 (d) 6)** • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
33	Yes ✓ NA Plan	**Noise and Vibration (14-526 (d) 7)** • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
34	Yes ✓ NA Plan	**Signage and Wayfinding (14-526 (d) 8), if applicable** • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
35	Yes ✓ NA Plan	**Zone Related Design Standards (14-526 (d) 5)** • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples
36	**Construction Management Plan**	
	Check list	
	Yes ✓ NA Plan	Construction Management Plan • Construction Management Document and Plan

Level II and Level III Site Plan Checklist

Please upload the following drawings with the listed details into e-Plan as separate pdfs.

☑ **RECENT BOUNDARY SURVEY** (stamped by Maine Licensed Surveyor)

Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

☑ **Existing Conditions**

- Approximate location of structures on abutting property
- Topography
- Locate water courses
- Delineate wetlands
- Zone lines

☑ Proposed Site Plan

- Ground floor area, and grade elevations for all buildings

☑ **Access, Circulation, and Parking**

- Streets and intersections adjacent to site , any proposed geometric modifications
- Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- Location and dimensions of proposed loading areas
- Existing and proposed transit infrastructure with dimensions/ engineering specifications
- Location of vehicle and bicycle parking with dimensions and engineering specifications

☑ **Site Considerations**

- Identify snow storage areas
- Location of fire hydrants
- Location of solid waste management facilities

☑ **UTILITY PLAN** including:

- Existing utilities on site and within public streets
- Location, sizing, and directional flows of all existing and proposed utilities
- Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- Electric utility infrastructure

☑ **GRADING and DRAINAGE PLAN** including:

- Existing grades and drainage
- Proposed grades
- Proposed stormwater management meeting Technical Manual (Section 5) standards
- Location and proposed alteration of a water course
- Preservation or alteration of wetlands

☑ **EROSION CONTROL**

- Must be in compliance with Technical Manual, Section 5

☑ **LANDSCAPE PLAN** including:

- Existing vegetation to be preserved and preservation measures
- Proposed landscaping and buffers
- Planting schedule

☐ **RECORDING PLAT**, if applicable N/A

- IF SUBDIVISION: Must be in compliance with requirements of Section 14-496 (b)

☑ **ARCHITECTURAL PLANS & RENDERINGS** including:

- Exterior building elevations, color renderings, illustrations of all sides
- Location and dimensions of all existing & proposed HVAC & mechanical equipment, all proposed screening
- Provide context drawings, if applicable (Design Manual, page 1)
- Floor plans

WRITTEN SUBMISSION 27 – MASSING, VENTILATIONS AND WIND IMPACT
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE PROPOSED BUILDING CONFORMS TO TNE MASSING OF THE CAMPUS AS SET FORTH IN THE IDP. THE TALLER SECTION OF THE CONGRESS STREET BUILDINABUTS THE TALL ELEVATOR/ STAIR TOWER PORTION OF THER VISITOR GARAGE, WHILE THE REMAINDER OF THE BUILDING STEPS DOWN TOWARD THE EDGE OF THE CAMPUS.

IN ADDITION TO THE VISUAL EFFECT OF THIS MASSING, THE BUILDING WILL NOT CREATE ANY ADVERSE EFFECTS FROM WIND PATTERNS.

THE MAJORITY OF THE HVAC EQUIPMENT WILL BE WITHIN THE BASEMENT LEVEL OF THE BUILDING, HOWEVER , THERE WILL BE LIMITED HVAC UNITYS ON THE ROOF OF THE TALL SECTION OF THE BUILDING

C

WRITTEN SUBMISSION 02 – RIGHT, TITLE AND INTEREST
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE PROPERTY DEEDS ARE ATTACHED.

Know all Men by these Presents, That

I William H. Bailey of Portland in the State of Maine

in consideration of the sum of Two Hundred and fifty Dollars paid by

The Maine General Hospital, a Corporation established by law at Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital

heirs and assigns forever,

Bailey to Maine General Hospital

U. S. I. R. 50 Cents W. H. B. June 6. 1870.

a certain lot of land situated on the northwestern slope of Bramhall's Hill in Portland, the same being lot numbered nine, on a plan made by Howe and Ogood September 1863 recorded in the Cumberland Registry of Deeds in Plan Book number two page 36. The said plan is of a tract of land extending from the rear of the State Arsenal lot to Congress street. The lot hereby conveyed is about forty feet in breadth and about sixty feet in length on the Southwest side of an unopened street laid down on said plan; the same conveyed to me by Moody F. Walker Oct. 14. 1863. Subject to the location of Ash street over any part of said lot, subject also to a mortgage for $37.50 given to Moody F. Walker which mortgage with all unpaid interest thereon, the present grantee is to assume and discharge.

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital

~~heirs~~ and assigns, to their use and behoof forever. And I do covenant with the said Grantee

~~heirs~~ and assigns, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee

to hold as aforesaid; and that I will and my heirs, shall and will warrant and defend the same to the said Grantee

~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Grantor and Elvira W. my wife ~~of the said~~ in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seals this sixth day of June in the year of our Lord one thousand eight hundred and seventy.

~~Signed, Sealed and Delivered~~ in presence of

P. Barnes to W. H. B. — William H. Bailey Seal

Joseph S. Bailey to E. W. B. — Elvira W. Bailey Seal

State of Maine
Cumberland, ss. June 6th 1870. Personally appeared the above-named William H. Bailey and acknowledged the above instrument to be his free act and deed. Before me,

P. Barnes Justice of the Peace.

Received June 6. 1870, at 12 o'clock 54 m., P. M., and recorded according to the original.

Attest, Eben Leach Register.

Know all Men by these Presents, That

I, Hugh Carney of Portland in the State of Maine

in consideration of the sum of Five Hundred Dollars paid by The Maine General Hospital, a Corporation established by law at Portland aforesaid the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital ~~heirs and assigns forever,~~

Carney to Maine General Hospital

U. S. I. R. 50 Cents H. C. June 6. 70

a certain parcel of land situated on the North-western slope of Bramhall's hill in Portland, bounded on the East by the State Arsenal lot and on the North by land of the City; the same conveyed to me by Moody F. Walker Oct. 14. 1863, in two lots about forty feet in width by about sixty feet in length, which are numbered two and four on a plan of the same and adjoining lands made by Howe and Osgood Sept. 1863, which is recorded, under date of January 20, 1864 in Plan Book number two page 36 of the Cumberland Registry of Deeds. Subject to the location of Ash street over any part of said lots.

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital ~~heirs and~~ assigns, to their use and behoof forever. And I do covenant with the said Grantee ~~heirs and~~ assigns, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I will and my heirs, shall and will warrant and defend the same to the said Grantee ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Grantor and Bridgett D. my wife ~~of the said~~ in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seals this sixth day of June in the year of our Lord one thousand eight hundred and seventy.

Signed, Sealed and Delivered in presence of

P. Barnes to H. C. — Hugh his X mark Carney Seal.

Witnessed by Edward N. Bates — Bridget Carney Seal.

State of Maine
Cumberland, ss. June 6th 1870. Personally appeared the above-named Hugh Carney and acknowledged the above instrument to be his free act and deed. Before me,

P. Barnes Justice of the Peace.

Received June 6 1870, at 12 o'clock 54 m., P. M., and recorded according to the original.

Attest, Eben Leach Register.

State of Maine Cumberland ss Portland May 19th 1870.
Then personally appeared the abovenamed Sarah M. Bridges and acknowledged the foregoing instrument to be her free act and deed.
Before me, George R. Davis, Justice of the Peace

Received May 19 1870 at 5h 20 m P.M. and recorded according to the original
Attest. Ebem Leach Register

Agreement of Joseph S Bailey with Maine Hospital

Agreement made the 27th day of April 1870 by Joseph S Bailey of Portland for the conveyance of certain land to the Maine General Hospital

For a valuable consideration the said Bailey agrees to convey by deed of warranty to the Maine General Hospital, upon the conditions hereinafter named, a certain parcel of land situated on the slope of Bramhall's Hill in Portland, being the western part of a parcel of about two acres extending from the General ground to Congress street, formerly owned by Mr. F. Walker and others, described, as divided into lots on a plan made by Rowe and Osgood in 863, through which two acre parcel a street called Oak street has recently been laid out, and being all of said two acre parcel, except the ten lots nearest the General and except the part of the street adjoining the ten lots. The conveyance hereby agreed to be made is to include the fee of the land covered by the new street west of the ten lots, but subject to the location of the street.

This agreement is to be in force for the term of forty days from and after this date.

The conditions upon which the conveyance is to be made, are, that the Hospital shall within the said forty days pay to the said Bailey, or to his written order, the sum of two thousand dollars, upon which payment the deed is to be made and delivered, and shall therefore make and deliver to the said Bailey or to his written appointment, into two several negotiable promissory notes, one for two thousand dollars payable in two years from the date of the deed, and one for one thousand dollars payable in three years from the same date, both with interest half yearly at the rate of seven and one half per annum, with liberty to pay not less than one thousand dollars on said notes at any time before maturity, together with a mortgage of the premises to secure the same, and shall assume and pay according to its tenor a mortgage now subsisting

on a part of said premises for one thousand dollars given by said Bailey in 1866 in six years, subject to which mortgage this agreement is made, interest accrued on said mortgage to the date of this conveyance to be paid by said Bailey.

In witness whereof, the said Bailey has hereunto set his hand and seal the day and year first above written.

U. S. Inter. Revenue 5 cts. J. S. B. Apl. 27. 1870.	Witness P. Barnes	Joseph S. Bailey Seal

State of Maine Cumberland St. On this 21st day of May 1870 personally appeared Joseph S. Bailey and acknowledged the foregoing instrument by him subscribed to be his free act and deed.

Before me P. Barnes Justice of the Peace.

Received May 21, 1870 at 4h 10m P.M. and recorded according to the original

Attest: Eben Leach Register

U. S. I. R. $2.00 H. S. L. May 21 1870.	Know all men by these presents that I Horatio T. Libby of Portland in the County of Cumberland and State of Maine in consideration of Six Thousand Dollars paid by John Lindsey of Scandish in the County of Cumberland and State of Maine,	Libby to Lindsey

the receipt whereof is hereby acknowledged, do hereby give grant, bargain, sell and convey unto the said John Lindsey a certain lot of land and the buildings thereon situated on the Southwesterly side of Chestnut Street in said Portland and bounded beginning at the Northerly corner of land of Benjamin Tukey formerly Leonard Crosse's land and running thence Northwesterly on said street thirty five feet; thence Southwesterly at right angles with said street sixtynine feet to a stake or stones; thence Southeasterly on a line parallel with said street thirtyfive feet to a stake or stones; thence at right angles with the last line by Mrs. A. Hay's land and said Tukey's land sixtynine feet to the bound begun at containing about two thousand and four hundred feet, being a part of the land conveyed to me by Miriam Libby sale by deed dated January 18th 1854 and recorded in Cumberland Registry of Deeds Book 252 Page 27. Subject to a mortgage to the City of Portland on which is now due about two thousand dollars.

To have and to hold the above granted premises

Portland May 7th 1874.

This mortgage having been paid and fully satisfied, is hereby cancelled and discharged.

Witness

J. Wm. Lindsey

their hands and seals this twentieth day of October A.D. 1870.

Richard D. Rice {President of Maine Central Railroad Company

Countersigned by Joshua Nye, Treas. of Maine Central R.R. Co.

William L. Putnam Seal
Artemas Libbey Seal.
James T. Patten. Seal.

Cumberland ss. Oct. 20, 1870. Then personally appeared Richard D. Rice, President of the Maine Central Railroad Company and acknowledged the foregoing instrument to be the free act and deed of said Corporation, before me,

Josiah H. Drummond Justice of the Peace.

Received Nov. 2, 1870 at 2h. 30m. P.M. and recorded according to the original.

Attest: Eben Leach Registr

City of Portland to Me. Gen. Hospital

Whereas the City Council of this City of Portland, upon the petition of the Maine General Hospital, praying that the City would grant to the Corporation certain lands for the purpose of enlarging the building site of the Hospital, and rendering the same more commodious and useful for the objects thereof, by concurrent orders of the two Branches, passed by the same respectively, on the 13d and 14th days of May 1870 and approved by the Mayor on the 31st day of the same month, ordered, that the prayer of the petition be granted, and that a deed in furtherance thereof be executed and delivered for the conveyance prayed for.

Now, know all men by these presents that the City of Portland, in pursuance of the foregoing order, and in consideration of Ten Dollars paid by the Grantee hereinafter named, the receipt whereof is hereby acknowledged, doth hereby give, grant, bargain, sell and convey to the Maine General Hospital, a Corporation established by law at Portland aforesaid, a certain parcel of land, belonging to the City, situated on the slope of Bramhall's Hill, bounded on

the Northeast by a line, as now fenced, in continuation of the Northeast side line of the Maine State Arsenal lot, and on the Southwest by lands of Joseph S. Bailey and others, and extending Westward, between those lines, from the Arsenal lot to Congress street.

Also another parcel of land belonging to the City, situated on the Southwest side of the Arsenal lot and of the lands of Bailey and others, having a front on a line in continuation of the Northwest side line of Arsenal street as far as to the Northeast side line of a contemplated street, and extending Westwardly from Arsenal street between the contemplated street on the South and the Arsenal lot and Bailey land on the North to Congress street.

The said contemplated street is laid down and designated by the name of Gilman street on a Plan made by J. F. Chappell, Engineer, May 21, 1870, to which Plan, verified as required by the Order of the City Council, by the signature of the City Treasurer, reference is made for more exact ascertainment of the position and courses of said street.

This conveyance is made upon the condition that the lands hereby granted and conveyed shall be held for the purposes of the Hospital, as a part of its building site and grounds; and that whenever the same shall cease to be so used, they shall revert to the City.

Also upon the further condition, that if the Hospital shall acquire a title to the lands of Bailey and others above mentioned, and the contemplated street shall at any time, thereafter be laid out and opened across the same, as described in said Plan, no damages or compensation shall be claimed by the Hospital therefor.

To have and to hold the premises, with the privileges and appurtenances thereof, to the said Maine General Hospital, to its use and behoof forever, subject to the conditions aforesaid.

In witness whereof, these presents are subscribed and sealed, in behalf of the City, by Henry H. Hersey, City Treasurer, duly authorized by the Order aforesaid, this fourth day of June in the year of our Lord

one thousand eight hundred and seventy.

Signed, sealed, and delivered in presence of Benj. Kingsbury Jr. } Henry W. Hersey City Treasurer.



State of Maine.

Cumberland ss. On this sixth day of August 1870, personally appeared Henry W. Hersey and acknowledged the foregoing instrument by him subscribed to be the deed of the City of Portland.

Before me,

Benj. Kingsbury Jr. Justice of the Peace.

Received Nov 14, 1870 at 1 h. P.M. and recorded according to the original.

Attest: Elsen Sacich Register

P. & O. R. R. Co to Davis et al

U. S. I. R. $800.00 P. & O. R. R. Co By S. J. A. Dwt Nov. 1, 1870

Discharge Book 702 Page 65

Know all men by these presents, that the Portland and Ogdensburg Railroad Company, a Corporation established by the Legislature of the State of Maine, and authorized and empowered by the Legislature of New Hampshire to construct and extend its Railroad across said State of New Hampshire, subject to the laws thereof relating to Railroads, and having its principal office for the transaction of business at Portland in the County of Cumberland and State of Maine, for the purpose of effecting the several trusts and securities hereinafter set forth, created and declared, designed to enable and provide for the more speedy construction and equipment of the Railroad of said Company, and in consideration of One Dollar paid by the Grantees and Trustees hereinafter named, doth hereby give, grant, bargain, sell and convey to Woodbury Davis, Samuel E. Spring, and Weston F. Milliken, all of Portland aforesaid, Gentlemen, their survivors and successors as hereinafter designated, all that part of the Railroad of said Company extending and to be extended from the terminus in Portland, in the State of Maine to Bartlett in the State of New Hampshire, located and to be located within said limits, called the Portland and Ogdensburg Railroad, including all the rights of way and lands taken and

Know all Men by these Presents, That

I Phinehas Barnes of Portland, in the County of Cumberland, State of Maine

in consideration of Four Thousand and Seventy one 37/100 Dollars paid by

The Maine General Hospital, a Corporation established by the Laws of said State

the receipt whereof I do hereby acknowledge, do hereby remise, release, bargain, sell and convey, and forever quit claim unto the said Maine General Hospital, its successors

~~heirs~~ and assigns forever, all my right, title and interest in and to Twenty several lots of land

Barnes to Maine G. Hospital

U. S. I. R.
F. 4. 50.
P. B.
July 12/71.

situated on the Northwestern slope of Bramhall's Hill in said Portland described and numbered on a plan of a tract of about ten acres, extending from the Maine State Arsenal Grounds, to Congress Street which plan was made in September 1863, by Hare and Osgood, and is recorded in the Cumberland Registry of Deeds, in Plan Book, number two, page thirty six - the lots hereby conveyed being numbered one, three, five, seven, eight, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, twenty one, twenty two, twenty three, and twenty four 1. 3. 5. 7. 8. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22, 23 & 24. together with all my right title, and interest in and to the land adjoining any of said lots, embraced within the location of Ash Street, as laid out by the City the last year: The design of this Deed being to discharge bonds mentioned in Deeds to said Barnes from Moody H. Walker & wife dated 6. June 1870. recorded in said Registry, Book 377. page 302 & from Joseph L. Bailey dated 6 June 1870. recorded in said Registry Book 377. page 301, the Mortgage obligations of said Barnes mentioned in said Deeds, having been discharged, by said Hospital.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to them the said Corporation, its successors

~~heirs~~ and assigns forever. And I do covenant with the said Corporation, its successors

~~heirs~~ and assigns, that I will warrant and forever defend the premises to them the said Corporation its successors

~~heirs~~ and assigns forever, against the lawful claims and demands of all persons, claiming by, through, or under me.

In Witness Whereof, I the said Phinehas Barnes, and Ann B. Butler wife of the said Barnes, in testimony of her relinquishment of her right of Dower in the above described Premises

have hereunto set ~~my~~ hand and seal this Eighth day of July

in the year of our Lord one thousand eight hundred and seventy one.

Signed, Sealed and Delivered in presence of
Wilfred Barnes to P. B.
Wilfred Barnes to A. B. B.

P. Barnes Seal
Ann B. Barnes. Seal

State of Maine

Cumberland, ss. 8th July 1871 Personally appeared the above-named Phinehas Barnes

and acknowledged the above instrument to be His free act and deed. Before me,

James T. McCobb. Justice of the Peace.

Received July 11 1871, at 11 o'clock A. M., and recorded according to the original.

Attest. Thos Lucas Register.

with interest, and all cost and expenses, including all sums paid by said Grantee or assigns for insurance of the premises and for taxes, paying the surplus, if any, to the said Grantors, or their assigns; and such sale shall forever bar the said Grantors, and all persons claiming under them from all right and interest in the premises at law or in equity. It being mutually agreed that the said Grantee or assigns may purchase at said sale, and that no other purchaser shall be answerable for the application of the purchase money.

In witness whereof, we the said Grantors, Emily F. Bailey and Benjamin H. Bailey have hereunto set our hands and seals this thirteenth day of January in the year of our Lord eighteen hundred and seventy one.

Signed, sealed and delivered in presence of
Benj. Kingsbury Jr.

Emily F. Bailey. Seal
Benj H. Bailey. Seal

State of Maine.
Cumberland ss Portland January 13. 1871. Then personally appeared the abovenamed Benjamin H. Bailey and Emily F. Bailey and acknowledged the foregoing instrument to be their deed.

Before me,
Benj. Kingsbury Jr. Justice of the Peace.

Received Jan 14 1871 at 12 h 29 m P. M. and recorded according to the original.
Attest: Eben Leach Register

State of Maine
to
Maine General Hospital

State of Maine.

Resolves in favor of the Maine General Hospital.

Resolved, That all the right, title and interest of this State in and to the lot of land, not including the buildings thereon, situated on Bramhall Hill, in the city of Portland and County of Cumberland, being the present site of the State Arsenal, is hereby granted to the Maine General Hospital, a corporation established by act of the Legislature, passed February twenty-fourth, one thousand eight hundred and sixtyeight, to have and to hold to

said corporation for the purpose of erecting and maintaining thereon its hospital buildings; and when such land ceases to be so used it shall revert to the State. But this grant shall not take effect until it is shown to the satisfaction of the Governor that said Corporation has raised by responsible private subscriptions or donations the sum of Twenty Thousand Dollars; nor until the Governor has certified on a copy of this resolve certified by the Secretary of State, that the aforesaid condition precedent has been complied with; but when that is done, this grant shall take effect, and the recording of such certified copy, with the Governor's certificate thereon, in the Registry of Deeds in the County of Cumberland shall be sufficient record evidence thereof.

Resolved That when said Corporation has raised, received into its treasury and actually expended towards the construction of its hospital buildings on said lot, the sum of Thirty thousand dollars and this fact is shown to the satisfaction of the Governor he may draw his warrant on the Treasurer of State for the sum of Ten thousand dollars in favor of said Corporation and payable to its Treasurer; and when said Corporation has so raised, received into its Treasury and expended in the construction of its hospital buildings the sum of Ten thousand dollars more or Fifty thousand dollars in all including the Ten thousand from the State, and this fact is shown to the satisfaction of the Governor he shall draw his warrant on the Treasurer of State for the sum of Ten thousand dollars more in favor of said Corporation and payable to its Treasurer; and the sum of Twenty thousand dollars is hereby appropriated to carry into effect the purposes of this Resolve to be paid from any money in the Treasury not otherwise appropriated.

In the House of Representatives March 18 1870.

Read and passed finally.

Reuben Foster Speaker

In Senate March 18" 1870

Read and passed finally.

Wm. H. Boloter President

March 19th 1870. Approved. Joshua L. Chamberlain Governor

State of Maine

Office of Secretary of State,

Augusta, Dec. 15. 1870

I hereby certify that the forgoing is a true copy of the original as deposited in this Office.

Franklin Mc. Donn.

Secretary of State

I, Joshua L. Chamberlain Governor of Maine in compliance with the terms of the Resolve of which the foregoing is a copy certified by the Secretary of State, hereby certify that it has been shown to my satisfaction that the Maine General Hospital the corporation within named has raised by responsible private subscriptions and donations the sum of twenty thousand dollars.

In witness whereof I have hereunto set my hand this sixteenth day of December A. D. 1870

In presence of
F. L. Chamberlain
Charlotte M. Packard

Joshua L. Chamberlain
Governor of Maine

Received Jan. 16 1871 at 2 h. 44 m. P. M. and recorded according to the original.

Attest: Eben Leady Register

U. S. I. R. Fifty cts. N. H. M. Jan. 13. 1871

Know all men by these presents, that I, Wm. H. Moreland of Stoneham, Mass. in consideration of Four Hundred Fifty Dollars to me paid by Seth Moreland of Harrison, County of Cumberland, State of Maine, the receipt whereof is hereby acknowledged, do hereby sell, remise, release, and forever quitclaim unto the said Seth Moreland, all my right, title and interest in and to a certain farm or parcel of real estate described as follows, to wit, the same deeded to me by the said Seth Moreland by his deed, said deed dated Jany. fourth 1869, said deed recorded Book 364 Page 288. being the same farm Seth Moreland now lives on in Harrison all taxes excepted.

Moreland to Moreland

To have and to hold the above released premises, with all the privileges and appurtenances to the same belonging, to the said Seth, his heirs and assigns to their use and behoof forever. And I the said

Know all Men by these Presents, That

I Bartholomew Wren of Portland in the county of Cumberland State of Maine

in consideration of five hundred dollars paid by

The Maine General Hospital a corporation doing its business in said Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital its successors its and their heirs and assigns forever, a certain lot of land on the easterly side of (what is or lately was) Ash Street in said Portland being sixty five feet in length & running back from the line of said Ash Street & forty feet in width being the same lot indicated as number six (No 6) on a certain plan of land surveyed for Moody F. Walker September 23, 1863 by Howe & Osgood Civil Engineers which plan is placed on file in the office of the Registry of Deeds for Cumberland county for the purpose of reference in the matter of conveyances that have been or may be made by said Moody F. Walker of the lots of land specified in said plan. The same property conveyed to me by said Moody F. Walker by deed dated the 11th October 1863 recorded in said Registry Book 323 page 199

Wren
To
Maine Gen Hospital

U.S.I.R.
$0.50
B.W.
Sept. 15
1871

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Corporation its successors its & their heirs and assigns, to their use and behoof forever. And I do covenant with the said Corporation its successors its & their heirs and assigns, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Corporation to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee its successors its & their heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Bartholomew Wren and Margaret wife of the said Bartholomew Wren in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seals this twenty eighth day of August in the year of our Lord one thousand eight hundred and seventy one

Signed, Sealed and Delivered
in presence of

James T. McCobb — Bartholomew Wren — Seal
Witness — Margaret her mark Wren — Seal
Michael White

Cumberland, ss. 15 September 1871 Personally appeared the above-named Bartholomew Wren and acknowledged the above instrument to be his free act and deed. Before me,

James T. McCobb Justice of the Peace

Received Sept. 18 1871 at 4 o'clock 17m. P.M. and recorded according to the original.

Attest, Register.

Know all Men by these Presents, That

The City of Portland, a corporation in the County of Cumberland, State of Maine

in consideration of One Dollar & other considerations paid by The Maine General Hospital, a corporation in said State & County & City,

the receipt whereof We do hereby acknowledge, do hereby remise, release, bargain, sell, and convey, and forever QUIT-CLAIM unto the said Maine General Hospital, its successors

~~heirs~~ and assigns forever, all our right, title, and interest in and to a lot of land, on the slope of "Bramhalls Hill", in said city, being the land which lies between the land owned by said Hospital & Gilman Street & Arsenal Street extended westerly & southerly, bounded: Beginning at the southwest corner of a lot of land conveyed to said Hospital by said city in 1870, thence southwesterly on the northerly line of Arsenal Street produced 130 feet, more or less, to Gilman Street, thence northerly by east line of Gilman Street 653 feet, more or less, to Bailey's land, thence southeasterly by Bailey's land 71 feet, more or less, to land of said Hospital, thence by said Hospital land 544 feet, more or less to point of beginning: Provided, That The Powder House now on said lot be allowed to remain, without expense to the city until such time as the city shall provide some other house for powder, or remove this one from the lot

Portland
To
M. General
Hospital

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said Grantees, their successors & assigns, their heirs & assigns forever. ~~And~~ ~~do covenant with the said~~

~~heirs and assigns, that~~ ~~will warrant and~~ ~~defend the premises to~~ ~~the said~~

~~heirs and assigns forever, against the lawful claims and demands of all persons, claiming by, through, or under~~

In Witness Whereof, We the said Grantors, by Henry W. Hersey City Treasurer, authorized thereto by vote of the City Council of said City, approved the 2 March instant have hereunto set our hand and seal this sixth day of March in the year of our Lord one thousand eight hundred and seventy-five

Signed, Sealed, and Delivered in presence of

3 printed words erased & 4 interlined before execution

S. B. Beckett

City of Portland
by H. W. Hersey, Treas.

State of Maine

Cumberland, ss. March 1874. Personally appeared the above-named Henry W. Hersey and acknowledged the above instrument to be his free act and deed, & the free act & deed of said city.

Before me S. B. Beckett, Justice of the Peace.

Received March 19 1875, at 9 o'clock, 45 m. A. M., and recorded according to the original.

Attest, Henry C. Houston Register.

Know all Men by these Presents, That

Book 1250
Page 470

I, Margaret E. L. Sherman, of Norwalk, in the County of Fairfield and State of Connecticut,

in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine, and located at Portland, in the County of Cumberland and State of Maine the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated on the northwesterly side of Arsenal Street in said Portland, bounded and described as follows: Beginning at a point on said northwesterly side of Arsenal Street where the northeasterly side line of land of said Maine General Hospital, formerly known as the Arsenal Lot, adjoins the lot hereby conveyed; thence running northeasterly by said Arsenal Street forty (40) feet to a point; and from these two points extending northwesterly, adjoining said land of Maine General Hospital and keeping a width of forty (40) feet, one hundred (100) feet more or less to Ellsworth Street.

Meaning and intending hereby to convey the same premises conveyed to William H. Bigelow by John B. Brown by deed dated March 30, 1863, recorded in Cumberland Registry of Deeds, Book 317, page 321, my title to the same having been acquired as devisee under the will of said William H. Bigelow, extract from which is recorded in said Registry of Deeds, Book 627, page 231, in which will I am designated as Margaret Eva Lena Taylor, and by deed of Joshua L. Taylor to me dated January 11, 1897, recorded in said Registry of Deeds, Book 640, page 282.

Said premises are conveyed subject to a mortgage to Portland Savings Bank upon which there is due the principal sum of $1,650, which the grantee hereby assumes and agrees to pay as a part of the consideration hereof.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors ~~heirs~~ and assigns, to its and their use and behoof forever. And I do covenant with the said grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except said mortgage; that I have good right to sell and convey the same to the said grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons. except as aforesaid.

In Witness Whereof, I, the said Margaret E. L. Sherman, and I, John C. Sherman, husband of the said Margaret E. L. Sherman joining in this deed as grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises,

have hereunto set our hand s and seal s this third day of December in the year of our Lord one thousand nine hundred and twenty-six.

Signed, Sealed and Delivered in presence of

John F. Dana to M.E.L.S. — Margaret E. L. Sherman Seal.

Geo. Davis, C. G. Hanson } as to J.C.S. — John C. Sherman Seal.

State of Maine, CUMBERLAND, ss. December 3, 1926. Personally appeared the above named Margaret E. L. Sherman and acknowledged the above instrument to be her free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received December 4, 1926, at 9 o'clock - m. A. M., and recorded according to the original.

Book 1282
Page 323

Know all Men by these Presents, That

I, Emma W. Hill of Portland in the county of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations, paid by Maine General Hospital, a corporation existing by law, with an established place of business in said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated in said Portland, and bounded and described as follows: Beginning at the intersection of the northerly side line of Arsenal street and the westerly side line of a passageway extending from Arsenal street to Ellsworth street; thence north 20° west sixty-one and five tenths (61.5) feet by the westerly side line of said passageway to a point; thence south 70° west about thirty-four and three tenths (34.3) feet to land formerly of Nathan Moses; thence southerly by said Moses land sixty-seven (67) feet to a point on the northerly side of Arsenal street; thence north 60° 58' east by the northerly side line of Arsenal street thirty-four (34) feet, more or less, to the point of beginning.

Together with the rights of the grantor in a twelve (12) foot passageway.

Meaning and intending to hereby convey the same premises conveyed to Everett L. Hill by Milcah M. Gwynn, by deed dated February 2, 1920, recorded in Cumberland Registry of Deeds, Book 1042, page 256, and the same conveyed to this grantor by said Everett L. Hill by deed dated October 15, 1924, recorded in Cumberland Registry of Deeds, Book 1168, page 351.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors ~~heirs~~ and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Emma W. Hill and Everett L. Hill, husband of the said Emma W. Hill, joining in this deed as grantor, and relinquishing and conveying his rights by descent and all other rights in the above described premises have hereunto set our hand s and seals this sixteenth day of December in the year of our Lord one thousand nine hundred and twenty-seven.

Signed, Sealed and Delivered in presence of

John B. Kehoe to both

Emma W. Hill Seal.

Everett L. Hill Seal.

State of Maine, CUMBERLAND, ss. December 16, 1927. Personally appeared the above named Emma W. Hill and acknowledged the above instrument to be her free act and deed.

Before me, John B. Kehoe, *Justice of the Peace.*

Received December 16, 1927, at 11 o'clock 10 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

Book 1285
Page 450

I, Harriet L. Stevens of Portland in the County of Cumberland and State of Maine,

in consideration of one ($1.00) dollar and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital,its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon,situated in said Portland, bounded and described as follows: Beginning on the westerly side of a twelve (12) foot passageway leading from Arsenal Street to Ellsworth Street at a point sixty-one and five-tenths (61.5) feet distant from the intersection of the northerly side line of Arsenal Street with the westerly side line of said passage-way; thence south seventy (70°) degrees west,thirty-four and three-tenths (34.3) feet,more or less, to land formerly of Nathan Moses;thence northerly by said Moses land thirty-three (33) feet, more or less, to the southerly side line of Ellsworth Street;thence easterly along the southerly side line of Ellsworth Street thirty-four (34) feet, more or less, to its intersection with the westerly side line of said passageway;thence southerly along the westerly side line of said passageway thirty-eight and five-tenths (38.5) feet, more or less, to the point of beginning.

The above described premises are in the northerly portion of the premises conveyed to Shailer G. Cushing by Seth C. Gordon by his warranty deed dated September 21, 1907, and recorded in Cumberland County Registry of Deeds,Book 814,page 37.

Being the same premises conveyed to me under the name of Hattie L. Stevens by Perley W. Stevens by warranty deed dated December 24, 1912, and recorded in said Registry of Deeds, Book 906,page 161.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital,its successors ~~heirs~~ and assigns, to their use and behoof forever. And I do covenant with the said Grantee,its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all encumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee,its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Wherenf, I, the said Harriet L. Stevens, and I, Perley W. Stevens,husband of the said Harriet L. Stevens,joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises

have hereunto set our hand s and seals this nineteenth day of February in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

R. E. Snow to both

Harriet L. Stevens Seal.

Perley W. Stevens Seal.

State of Maine, CUMBERLAND, ss. February 19, 1928. Personally appeared the above named Harriet L. Stevens and acknowledged the above instrument to be her free act and deed.

Before me, Reuben E. Snow, *Justice of the Peace.*

Received March 20, 1928, at 2 o'clock30 m. P. M., and recorded according to the original.

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Know all Men by these Presents, That

I, Eunice M. Chase (formerly Eunice Margaret Graham) of Portland, in the County of Cumberland and State of Maine,

in consideration of One dollar ($1.00) and other valuable considerations, paid by Maine General Hospital,a corporation organized and existing under the laws of said State of Maine, and located at said Portland,
the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said

Maine General Hospital,its successors and assigns forever, a certain lot or parcel of land with the buildings thereon,situated on the westerly side of a thirty foot passage way leading Northerly from Ellsworth Street,in the City of Portland, State of Maine, and now known as Charles Street,and bounded and described as follows,namely;

Beginning in the westerly side line of said Charles Street at the northeasterly corner of land now or formerly of Charles A. Donnell,thence northerly, by said Charles Street,thirty feet,thence westerly,on a line parallel with the northerly line of said Donnell's land seventy-four and two-tenths (74 2/10) feet to the Arsenal Lot,so called, now owned by said Maine General Hospital;thence southerly by said Arsenal Lot,thirty feet to said Donnell's land;thence easterly by said Donnell's land seventy-four and two tenths (74 2/10) feet to the point of beginning.

Being the same premises conveyed to me under the name of Eunice Margaret Graham Chase by William Graham by warranty deed dated July 1,1919,recorded in Cumberland Registry of Deeds,Book 1042,page 471.

Also a certain other lot or parcel of land with the buildings thereon situated in said Portland on the westerly side of Charles Street, and bounded and described as follows,to wit:

Beginning on the westerly side line of said Charles Street at a point distant seventy-three (73) feet northerly from the northeasterly corner of land now or formerly of Wiggins;thence northerly by said Charles Street forty-seven (47) feet to a stake; and from these two points extending back westerly,at right angles with said Charles Street and keeping said width of forty-seven (47) feet,about seventy-four and two-tenths (74.2) feet to the "Arsenal Lot" so called, now owned by said Maine General Hospital; and being the same premises conveyed to Mary Rich Graham,deceased,by Charles A. Donnell,by his deed dated July 1, 1895, recorded in the Cumberland Registry of Deeds,Book 604,page 124.

My title to said premises was acquired as an heir-at-law of said Mary Rich Graham, and by warranty deed from William Graham and Paul G. Graham to me under the name of Eunice Margaret Graham,dated August 2,1912,recorded in said Registry of Deeds,Book 898,page 83.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital,its successors ~~heirs and assigns~~, to its and their use and behoof forever. And I do covenant with the said grantee, its successors ~~heirs and assigns~~, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee,its successors ~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Eunice M. Chase,and I, Harold B. Chase,husband of the said Eunice M. Chase joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises have hereunto set our hands and seals this twentieth day of April in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

Eunice M. Chase Seal

John F. Dana to both

Harold B. Chase Seal

State of Maine, Cumberland, ss. April 20, 1928. Personally appeared the above named Eunice M. Chase and acknowledged the above instrument to be her free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received April 20, 1928, at 10 o'clock 50m. A. M., and recorded according to the original.

Know all Men by these Presents, That

I, Elizabeth Naylor, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital,its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon,situated in said Portland, on the northerly side of Ellsworth Street and westerly side of Charles Street,bounded and described as follows: Beginning at the corner formed by the intersection of the westerly side of Charles Street and the northerly side of Ellsworth Street, and running westerly by said Ellsworth Street to land conveyed by William R. Naylor to Samuel W. Joy by deed dated November 8,1905, and recorded in Cumberland County Registry of Deeds,Book 776,page 200;thence northerly by said Joy land to land now or formerly of Levi J. Jones;thence easterly by said Jones land to said Charles Street;thence southerly by said Charles Street to the point of beginning.

Being the same premises conveyed to William R. Naylor by John B. Brown by deed dated February 20,1872, recorded in Cumberland County Registry of Deeds,Book 393, page 105, excepting therefrom the portion thereof conveyed by William R. Naylor to Samuel W. Joy by deed aforesaid. My title to said premises having been acquired as devisee under the will of William R. Naylor, extract from which is recorded in said Registry of Deeds,Book 783,page 307.

Also hereby conveying any right,title and interest I may have in said Ellsworth Street.

Taxes for the year 1928 are to be prorated between the grantor and grantee.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital,its successors ~~heirs~~ and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee,its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee,its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Elizabeth Naylor, being unmarried,

have hereunto set my hand and seal this 3rd day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

Nathan W. Thompson

Elizabeth Naylor Seal

State of Maine, CUMBERLAND, ss. July 3, 1928. Personally appeared the above named Elizabeth Naylor and acknowledged the above instrument to be her free act and deed.

Before me, Nathan W. Thompson, *Justice of the Peace.*

Received July 7, 1928, at 10 o'clock 45 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

I, Samuel W. Joy, of Portland, in the County of Cumberland and State of Maine, Book 1206 Page 352

in consideration of one dollar and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated on the northerly side of Ellsworth Street in said Portland, being numbered forty-three (43) on said Street, and bounded and described as follows: Beginning at a point thirty-two (32) feet westerly from the intersection of the northerly side line of said Ellsworth Street with the westerly side line of Charles Street; thence westerly by said Ellsworth Street forty-four (44) feet to the Arsenal lot, so called, now owned by the Maine General Hospital; thence northerly by said Arsenal or Hospital lot eighty-seven (87) feet to land now or formerly of Levi J. Jones; thence easterly thirty (30) feet to land now or formerly of William R. Naylor; thence southerly by said Naylor land eighty-seven (87) feet more or less to the first bound.

Being the same premises conveyed to me by William R. Naylor by deed dated November 3, 1905, recorded in Cumberland County Registry of Deeds, Book 776, page 200.

Also hereby conveying any right, title and interest I may have in and to said Ellsworth Street.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Samuel W. Joy, having no wife,

have hereunto set my hand and seal this seventh day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

John F. Dana

Saml W. Joy Seal

State of Maine, CUMBERLAND, ss. July 7, 1928. Personally appeared the above named Samuel W. Joy and acknowledged the above instrument to be his free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received July 7, 1928, at 10 o'clock 46 m. A. M., and recorded according to the original.

IN WITNESS WHEREOF, the said Lessor has hereunto set his hand and seal on the day and year first above written.

Signed, Sealed and Delivered in Presence of

It is further understood that no liquor, beer, or cigarette advertising shall be displayed on any structure that might be erected.

JOHN DONNELLY & SONS ------

WEST SCARBORO M.E.CHURCH ------

By A. W. Hodgman, Treas.

State of Maine. County of Cumberland,ss. March 31, 1939.

Personally appeared the above named Lessor and acknowledged the above instrument to be his free act and deed.

Before me, F. H. Tewksbury Justice of the Peace

Received March 31, 1939, at 3h 40m P. M., and recorded according to the original

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Canal Nat'l.Bk. of Port. Tr. & to Maine General Hospital Deed

KNOW ALL MEN BY THESE PRESENTS, That

WHEREAS, The Canal National Bank of Portland as Trustee having filed its Bill of Complaint against Vaughan Hall, Incorporated and Harry M. Verrill, Conservator of Casco Mercantile Trust Company dated May 20, 1938, praying for foreclosure of a certain mortgage indenture on property described in said Bill of Complaint, said mortgage indenture being dated as of the fifteenth day of September, 1925, and recorded in the office of the Registry of Deeds for Cumberland County in Book 1219 at Page 41, the Supreme Judicial Court within and for the County of Cumberland in proceedings numbered 5830 on the docket of said Court entered its decree of foreclosure and order of sale therein decreeing and ordering the sale of the property described in said mortgage and hereinafter described, and

WHEREAS, it was, among other things, ordered, adjudged and decreed by said decree of foreclosure that said sale should be made by and under the direction of Raymond J. Callahan who was thereby appointed Special Master for that purpose and who was thereby directed to make and conduct said sale and to execute a deed of conveyance of the property sold to the purchaser thereof upon an order of Court confirming such sale and upon payment or settlement of the purchase price as therein provided, and that such sale be made in the County Court House in the City of Portland, Maine, on a day and at an hour as fixed by said decree of said Supreme Judicial Court and that notice of the time, place and terms of said sale describing briefly the property to be sold and referring to said decree should be published at least once a week for three successive weeks prior to said sale in a newspaper of general circulation published in Portland, Maine, and that upon confirmation of the sale by the Court and upon payment by any purchaser of the purchase price of the property purchased by him in accordance with the decrees of said Court the Special Master should execute a deed conveying, assigning and transferring to such purchaser the property sold to him, and

WHEREAS, the Supreme Judicial Court, pursuant to said decree, duly fixed the time for said sale as February 15, 1939, at ten o'clock in the forenoon and on said date the Special Master, pursuant to the provisions of said decree dated January 17, 1939, and pursuant to order of Court dated February 15, 1939, adjourned said sale from time to time in accordance with orders and decrees of said Court until March 28, 1939, at the time and place ordered by said decree of Court dated January 17, 1939, and orders and decrees subsequent thereto and said Special Master made due advertisement of said sale in the manner described in said decree dated January 17, 1939, and posted all of said notices as required by the orders of Court made subsequent thereto and the Special Master did at the time and place and in the manner and subject to the conditions of said decree and orders of Court subsequent thereto fairly strike off and sell said property to Maine General Hospital, a corporation duly organized and existing under the laws of the State of Maine and having a usual place of business at Portland, in the County of Cumberland and State of Maine, and

WHEREAS, The Canal National Bank of Portland thereafter duly presented to the Court for confirmation the bid so received by said Special Master and the said Special Master duly made a report of said sale to said Court, and a decree of confirmation and a certain decree amending said decree of foreclosure and sale were made and entered therein on the thirty-first day of March, 1939, confirming said bid, report and sale, and making said sale subject to taxes levied against said premises or any part thereof which are or may be chargeable upon said property and directing the Special Master, upon payment of the purchase price in the manner prescribed by said decree of confirmation, to execute and deliver to said purchaser a deed or other instrument conveying, assigning and transferring to said purchaser said property so sold as aforesaid, and

WHEREAS, said Supreme Judicial Court, in accordance with said decree of confirmation, by a decree made and entered herein on the thirty-first day of March, 1939, approved the form of this deed as required by said decree of confirmation dated March 31, 1939, and

WHEREAS, said sale has been conducted and made in all respects in accordance with law and with the provisions of said decrees and order of sale;

NOW, THEREFORE, I, the said Raymond J. Callahan, in my capacity as Special Master and in consideration of these presents and of one dollar and other valuable considerations paid by Maine General Hospital, receipt whereof is hereby acknowledged, do hereby remise, release, bargain, sell and convey and quitclaim unto the said Maine General Hospital, a corporation organized and existing under the laws of the State of Maine, its successors or assigns, all the right, title and interest which said Vaughan Hall, Incorporated and/or Harry M. Verrill, Conservator of Casco Mercantile Trust Company, and all persons claiming under it or him has or have in and to the following described real estate situated in Portland, in the County of Cumberland and State of Maine, and all future rents and profits thereof arising

therefrom, subject, however, to the equity of redemption as provided in the Statutes of the State of Maine and subject also to the terms and conditions set forth in the decree of the Supreme Judicial Court dated January 17, 1939, and certain decrees dated March 31, 1939, and to any other decree which may be hereafter made which relates to the property hereby conveyed, together with the rights and privileges pertaining to said property subject to the conditions described in the decrees of the Supreme Judicial Court dated January 17, 1939, and March 31, 1939, and any unpaid taxes, but subject, however, at all times to the exceptions and provisions particularly described and set forth in the various decrees of said Supreme Judicial Court heretofore made and any that may be hereafter made during the period of redemption:

A certain lot or parcel of land with the buildings thereon situated in said Portland, and bounded and described as follows:- Beginning on the westerly side of Vaughan Street at the southeasterly corner of land now or formerly of the Portland Water District; thence southerly on Vaughan Street sixty (60) feet, more or less, to land now or formerly of John W.Deering; thence westerly by said Deering land one hundred and forty (140) feet, more or less, to land now or formerly of Portland School for Medical Instruction; thence northerly by land of said Portland School for Medical Instruction sixty (60) feet, more or less, to said land of said Portland Water District; thence easterly by said land of said Portland Water District one hundred and forty (140) feet, more or less, to the point of beginning; said lot containing eighty-four hundred (8400) square feet, more or less. Being the same premises conveyed to Vaughan Hall, Incorporated, by Ralph N. Bryant by his warranty deed dated December 19, 1913, and recorded in Cumberland County Registry of Deeds, in Book 927, Page 26.

For title to the above described promises reference is also hereby made to a certain mortgage indenture dated September 15, 1925, securing the First Mortgage Sinking Fund 5 1/2% Gold Bonds of Vaughan Hall Incorporated, said mortgage indenture being by and between said Vaughan Hall, Incorporated and The Canal National Bank of Portland, said mortgage indenture being recorded in Cumberland County Registry of Deeds in Book 1219, Page 41.

TO HAVE AND TO HOLD and possess and enjoy said property and every part and parcel thereof free from all claims, rights, interests whatsoever in or to the same by or of the said Vaughan Hall, Incorporated, its successors and assigns, or of Harry M. Verrill as Conservator of Casco Mercantile Trust Company and by or of the creditors of the Receiver appointed by the Supreme Judicial Court in the equity proceedings hereinbefore referred to, or by or of the stockholders of said Vaughan Hall, Incorporated, and by or of all persons claiming by, through or under them or any of them, including the said Receiver of said Vaughan Hall, Incorporated, and by or of all the parties to said cause hereinbefore described, but subject, however, to any and all taxes levied against said premises or any part thereof which are or may be chargeable upon said property or premises or any portion thereof prior to the

U.S.I.R. $31.50 R.J.C. 3/31/39

lien of the mortgage foreclosed in said proceedings and subject to the right of redemption of said property granted by the Statutes of the State of Maine and subject to the terms and conditions of all decrees of said Supreme Judicial Court made and entered in the cause herein referred to and to any other decree which may be hereinafter entered by said Court which relates or pertains to the property herein conveyed.

IN WITNESS WHEREOF, Raymond J. Callahan, as Special Master, has hereunto set his hand and seal this thirty-first day of March, 1939.

Signed, Sealed and Delivered in Presence of

Porter Thompson — Raymond J. Callahan Seal

Special Master

State of Maine. Cumberland,ss. — March 31, 1939.

Personally appeared Raymond J. Callahan and acknowledged the foregoing instrument to be his free act and deed and his free act and deed in his said capacity.

Before me, Porter Thompson Justice of the Peace

APPROVED:

Guy H. Sturgis

Justice Supreme Judicial Court

Received March 31, 1939, at 4h -m P. M., and recorded according to the original

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Casco Mer. Tr. Co.,Cons. of to Maine General Hospital Deed

WHEREAS, Harry M. Verrill of Portland, in the County of Cumberland and State of Maine, was appointed Permanent Conservator of Casco Mercantile Trust Company, a banking corporation organized and existing under the laws of the State of Maine and located at said Portland, by decree of the Supreme Judicial Court in Equity in and for the County of Cumberland and State of Maine, dated April 14, 1933, in an action in equity commenced by Sanger N. Annis against Casco Mercantile Trust Company in said Court by Bill in Equity dated March 18, 1933, and

WHEREAS, upon petition of Harry M. Verrill, Conservator as aforesaid, dated March 29, 1939, a decree issued out of said Court authorizing said Conservator to sell to Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at said Portland, all the right, title and interest of said Casco Mercantile Trust Company in and to the following described real estate, which said decree is dated March 31, 1939, and

WHEREAS, said Conservator has sold, pursuant to the terms of said decree, to said Maine General Hospital all the right, title and interest of said Casco Mercantile Trust Company in and to the real estate hereinafter described.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS, That I, the said Harry M. Verrill, by virtue of the power and authority in me vested as aforesaid, and in my capacity as Conservator of Casco Mercantile Trust Company, and in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, receipt whereof is hereby acknowledged, do hereby remise, release, bargain, sell, convey and quitclaim unto the said Maine General Hospital, its successors and assigns, all the

Know all Men by these Presents, That

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Book 2127
Page 269

I, John T. Lennon of Portland in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable considerations paid by Maine Medical Center, a corporation organized and existing under the Laws of the State of Maine and located at said Portland

the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and assigns forever, certain lots or parcels of land with the buildings thereon situated in said Portland and bounded and described as follows:

First:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land now or formerly of Thomas H. Pratt, running thence westerly by said Bramhall Street fifty (50) feet to land now or formerly of Sophia M. Knight, and from these two points extending northerly towards Arsenal Street, holding to said width of fifty feet, and adjoining said Pratt premises on one side and said Knight premises on the other for a distance of sixty (60) feet to land now or formerly of Edward T. Burrowes. The said lot is the southerly portion of the premises conveyed to Albert B. Cole, Frank H. Cole and Warren W. Cole by Nettie E. Pierce by deed dated September 26, 1911 and recorded in the Registry of Deeds for said County of Cumberland in Book 882, Page 188. Said premises are numbered thirty (30) on said Bramhall Street.

Second:

A certain lot of land with the buildings thereon on the southerly side of Arsenal Street in said Portland bounded and described as follows:

Commencing at a point on the Westerly line of land of Maude E. Pratt at a point sixty (60) feet northerly from the northerly side of Bramhall Street, thence westerly on a line parallel with and sixty (60) feet from said Bramhall Street, fifty (50) feet, more or less, to land of Sophia M. Knight; thence northerly from these two points keeping a width of fifty (50) feet and bounded on the West by land of said Knight and on the East by land of said Pratt and George H. Fletcher, forty-nine (49) feet, more or less, to said Arsenal Street.

Being the same property conveyed to me by Harriet B. Foster by her warranty deed dated February 24, 1945 and recorded in the Cumberland County Registy of Deeds in Book 1771 Page 131.

Also conveying all my right, title and interest in and to Arsenal Street, recently abandoned by the City of Portland.

U.S.T.R. $16.50 J.T.L. 5/5/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors and assigns heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said John T. Lennon and Ann C. Lennon wife of the said John T. Lennon joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises,

have hereunto set our hand and seal this fifth day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

John J. Devine to both

John T. Lennon Seal
Ann C. Lennon Seal

State of Maine, CUMBERLAND, ss. May 5, 1953. Personally appeared the above named John T. Lennon and acknowledged the foregoing instrument to be his free act and deed.

Before me, John J. Devine, Justice of the Peace

Received May 5, 1953, at 2 o'clock 30 m. P. M., and recorded according to the original.

Know all Men by these Presents, That

I, Donald D. McPhee of Portland in the County of Cumberland and State of Maine,

in consideration of one dollar ($1) and other valuable considerations paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in said County and State the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland and being the premises conveyed to me by Hope K. Fletcher by deed dated November 22, 1946 and recorded in Cumberland County Registry of Deeds in Book 1848, Page 160, in which deed said premises are described as follows:

Beginning at the Northeast corner of Sophia T. Jones lot, so-called, on Arsenal Street; thence Northeasterly on Arsenal Street fifty (50) feet to land of one Raymond; thence Southeasterly by line of Raymond forty-eight (48) feet, more or less, to land of one Haskell; thence Southwesterly along line of said Haskell land thirteen (13) feet and two (2) inches to a point; thence Northwesterly parallel to land of said Raymond three (3) feet to a point; thence Southwesterly along the line of said Haskell land thirty-six (36) feet, more or less, to land of said Jones; thence Northwesterly forty-six (46) feet, more or less to point of beginning.

Also conveying all my interest in and to said Arsenal Street, recently abandoned by the City of Portland.

U.S.I.R. $14.30 D.D.McP. 5/9/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances: that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Donald D. McPhee and I, Lorraine J. McPhee wife of the said Donald D. McPhee joining in this deed as Grantor, and relinquishing and conveying my rights by descent and all other rights in the above described premises, have hereunto set our hand s and seal s this 9th day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana to both

Donald D. McPhee Seal
Lorraine J. McPhee Seal

State of Maine, Cumberland, ss. May 9, 1953. Personally appeared the above named Donald D. McPhee and acknowledged the above instrument to be his free act and deed.

Before me, Edward F. Dana, Justice of the Peace

Received May 9, 1953, at 9 o'clock 37 m. A.M., and recorded according to the original.

Know all Men by these Presents, That

Book 2127
Page 443

I, Hazel B. Therio of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations paid by Maine Medical Center, a corporation duly organized and existing under the Laws of the State of Maine and located at said Portland
the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated on the Westerly side of Bramhall Street in said Portland, being more particularly described in deed from Hazel E. Skillings to the Grantor, dated September 18, 1945 and recorded in Cumberland County Registry of Deeds in Book 1790, Page 500, in which deed said premises are described as follows:

A certain lot or parcel of land, with the buildings thereon situated in said City of Portland, on the Northwesterly side of Bramhall Street, bounded and described as follows: Beginning at the most easterly corner of land now or formerly of Sophia P. Jones; thence Northeasterly on said Bramhall Street fifty (50) feet to land now or formerly of one Raymond; thence Northwesterly by said Raymond land fifty-nine (59) feet; thence Southwesterly thirteen (13) feet two (2) inches, more or less, to a fence; thence Northwesterly by the line of the division fence three (3) feet two (2) inches; thence Southwesterly by said fence thirty-six (36) feet five (5) inches, more or less, to said Jones land; thence Southeasterly by said Jones land sixty-two (62) feet two (2) inches to the point begun at.

Also, all my right, title and interest in and to Arsenal Street recently abandoned by the City of Portland.

U.S.I.R. $9.90 H.B.T. 5/16/53

To Have and to Hold the aforegranted and bargained premises, with all ~~the~~ privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors and Assigns ~~heirs and assigns~~, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Hazel B. Therio, being unmarried, have hereunto set my hand and seal this 16th day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana — Hazel B. Therio — Seal

State of Maine, CUMBERLAND, ss. May 16, 1953 Personally appeared the above named Hazel B. Therio and acknowledged the above instrument to be her free act and deed.

Before me, Edward F. Dana Justice of the Peace

Received May 16 19 53, at 10 o'clock 35 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

We, Albert N. Tardif and M. Louise Tardif, both of Portland, County of Cumberland, State of Maine

in consideration of one dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation established by law at said Portland

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated on the northerly side of Bramhall Street in said Portland which was conveyed to the grantors by Wilhelmina M. Mantine, by deed dated September 16, 1935 and recorded in Cumberland County Registry of Deeds in Book 1478, Page 294 and therein described as follows: Beginning on the northerly side of Bramhall Street at the easterly corner of land formerly of James Miller; thence northeasterly by Bramhall Street twenty-one and seven twentieths (21 7/20) feet to a stake; thence northwesterly about one hundred eleven (111) feet to a point in the southerly side of Arsenal Street; thence southwesterly by Arsenal Street twenty-two and three quarters (22 3/4) feet to said Miller's land; thence southeasterly by said Miller's land one hundred eleven and four tenths (111 4/10) feet to the point of beginning.

Also all our right title and interest in and to Arsenal Street recently abandoned by the City of Portland.

U.S.I.R. $16.50
A.N.T.Et 6/11/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and

their use and behoof forever. And we do covenant with the said Grantee, its successors and Assigns,

~~heirs and assigns~~, that we are lawfully seized in fee of the premises; that they are free of all incumbrances:

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its successors and Assigns

~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Albert N. Tardif and M. Louise Tardif, the said Grantors, being Husband and Wife each joining in this deed as Grantors, and each relinquishing and conveying our respective rights by descent and all other rights in the above described premises,

have hereunto set our hand s and seal s this 11th day of June in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana	Albert N. Tardif	Seal
to both	M. Louise Tardif	Seal

State of Maine, CUMBERLAND, ss. June 11, 1953 Personally appeared the above named Albert N. Tardif and M. Louise Tardif and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Dana Justice of the Peace

Received June 12 1953, at 11 o'clock 5 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

Book 2133
Page 311

We, Fred A. Patterson and Ella H. Whidden both of Derry in the County of Rockingham and State of New Hampshire, Ruby E. McKenzie of Raymond in said County and State and Alzo F. Patterson of Portland in the County of Cumberland and State of Maine

in consideration of One dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation organized and existing under the laws of Maine and located at said Portland,
the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its Successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the northerly side of Bramhall Street and bounded and described as follows:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land formerly of Frederick A. Carle; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake or point, and from these two points extending northerly adjoining said Carle land, keeping a width of twenty-five (25) feet, to Arsenal Street, being the premises conveyed to Daniel W. Patterson by Maria M. Jose by deed dated September 12, 1921 and recorded in Cumberland County Registry of Deeds in Book 1085, Page 228.

The said Daniel W. Patterson died intestate on September 3, 1952 leaving no widow and as his sole heirs-at-law, the Grantors herein.

The Grantee as part of the consideration hereof assumes and agrees to pay the taxes for the taxable year of 1953.

Also conveying all our right, title and interest in and to Arsenal Street recently abandoned by the City of Portland, Maine.

U.S.I.R. $13.20 A.F.P.Et 5/20/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its Successors and Assigns to its and their use and behoof forever. And we do covenant with the said Grantee, its Successors and Assigns, ~~heirs and assigns~~, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid.

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its Successors and Assigns ~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Fred A.Patterson and Chrystine I.Patterson,wife of the said Fred A.Patterson;Ella H.Whidden and Charles F.Whidden,husband of the said Ella H.Whidden;Ruby E.McKenzie and Elmer W.McKenzie,husband of the said Ruby E.McKenzie,and Alzo F.Patterson and Bessie E.Patterson,wife of the said Alzo F.Patterson joining in this deed as Grantors,and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this twentieth day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

R.E. Jensen	Alzo F.Patterson Seal
R.E. Jensen	Bessie E. Patterson Seal
Carmela Chase	Fred A. Patterson Seal
Carmela Chase	Chrystine I. Patterson Seal
Arthur K. Smith	Ella H. Whidden Seal
Arthur K. Smith	Charles F. Whidden Seal
P. J. Campbell	Ruby E. MacKenzie Seal
P. J. Campbell	Elmer MacKenzie Seal

State of Maine. CUMBERLAND, ss. May 20, 1953 Personally appeared the above named Alzo F. Patterson and acknowledged the above instrument to be his free act and deed.

Before me, Raymond E. Jensen Justice of the Peace

Received June 12 1953, at 11 o'clock 5 m. A.M., and recorded according to the original.

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Page 317

Know all Men by these Presents, That

We, Leola J. Noyes and William H. Noyes, Jr., both of Portland, County of Cumberland, State of Maine,

in consideration of one dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation established by law in said Portland

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland between Bramhall and Arsenal Streets adjoining land formerly belonging to Sophia P. Jones and conveyed to us by Maud L. Pillsbury by deed dated October 2, 1951, recorded in Cumberland County Registry of Deeds in Book 2060, Page 419, and therein bounded and described as follows: Beginning on the northerly side of Bramhall Street at the southwesterly corner of said Jones land; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land keeping a width of twenty-five (25) feet, a distance of sixty-eight feet and two inches (68' 2"), which distances are marked by stakes and which stakes are twenty-six (26) feet distant from the southerly boundary line of Arsenal Street.

U.S.I.R.
$11.00
L.J.N.Et
6/12/53

To Have and to Hold the aforegranted and bargained premises, with all ~~the~~ privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And we do covenant with the said Grantee, its successors and Assigns, ~~heirs and assigns~~, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its successors and Assigns ~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, We, the said Leola J. Noyes and William H. Noyes, Jr., the said grantors, both being unmarried

our hand s and seals this 12th day of June have hereunto set in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana — Leola J. Noyes — Seal

to both — William H. Noyes, Jr. — Seal

State of Maine, CUMBERLAND, ss. June 12, 1953 Personally appeared the above named Leola J. Noyes and William H. Noyes, Jr. and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Dana Justice of the Peace

Received June 12 19 53, at 1 o'clock 44 m. P. M., and recorded according to the original.

Know all Men by these Presents, That

Maine Medical Center a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at said Portland

the receipt whereof it does hereby acknowledge, does hereby, give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated in said City of Portland, between Bramhall and Arsenal Streets, adjoining land formerly owned by John W. Yeaton, and bounded and described as follows:

Beginning in the northerly line of Bramhall Street at the southeasterly corner of said Yeaton land; thence running easterly by Bramhall Street forty (40) feet and from these two points extending northerly, adjoining said Yeaton land, and keeping said width of forty (40) feet to Arsenal Street, being the same premises described in deed of J. B. Brown to Leon M. Bowdoin in 1867 by deed recorded in Cumberland County Registry of Deeds, Book 351, Page 340.

Being the same premises conveyed to this Grantor by Frederick W. McCarthy by deed dated June 30, 1953 and recorded in said Registry of Deeds in Book 2140, Page 92.

U.S.I.R.
$33.55
M.M.C.
8/18/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors and assigns, to its and their use and behoof forever. And the said Grantor Corporation does hereby covenant with the said Grantee, its successors and assigns,

~~heirs and assigns~~, that it is lawfully seized in fee of the premises; that they are free of all incumbrances:

that it has ~~have~~ good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors ~~heirs~~ shall and will warrant and defend the same to the said Grantee, its successors and assigns

~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Wherof, the said Maine Medical Center has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Phillips M. Payson, its President, thereunto duly authorized,

~~hand and seal~~ this 18th day of August ~~have hereunto set~~ in the year ~~of our Lord~~ one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana

MAINE MEDICAL CENTER
CORPORATE SEAL
By Phillips M. Payson
President.

State of Maine, County of CUMBERLAND, ss. August 18, 1953.

Then Personally appeared the above named Phillips M. Payson, President of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Edward F. Dana, Justice of the Peace.

Received August 19, 1953, at 1 o'clock 40 m. P. M., and recorded according to the original.

Know all Men by these Presents, That

I, Henry H. Grant of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration paid by Maine Medical Center, a corporation organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its Successors and assigns forever, a certain lot or parcel of land with the buildings thereon situated between Bramhall and Arsenal Streets in said Portland, adjoining land now or formerly belonging to Sophia P. Jones, and more particularly bounded and described as follows:

Beginning on the northerly side line of said Bramhall Street, at the southwesterly corner of said Jones' land; thence westerly by said Bramhall Street, twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land, keeping the width of twenty-five (25) feet, to Arsenal Street.

Excepting and reserving however, a certain lot or parcel of land with the buildings thereon out of the aforesaid property, a conveyance by Westprom Realty Company to Maud L. and Janice M. Pillsbury by deed dated January 23, 1946 and recorded in Cumberland County Registry of Deeds in Book 1803, Page 444, to which reference may be had.

Meaning and intending to convey a parcel of land at the rear of 26 Bramhall Street, which parcel of land is approximately 26'x25' and contains a garage thereon.

Being the same premises conveyed to me by Westprom Realty Company by their warranty deed dated April 11, 1951 and recorded in said Registry of Deeds in Book 2040, Page 192.

U.S.I.R. $3.30
H.H.G.
9/4/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its Successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its Successors and assigns, ~~heirs and assigns~~, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its Successors and assigns ~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Henry H. Grant and I, Gladys H. Grant, wife of the said Henry H. Grant joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises, have hereunto set our hands and seals this 4th day of September in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

H. Edwin Gee

Henry H. Grant Seal
Gladys H. Grant Seal

State of Maine, CUMBERLAND, ss. September 4, 1953. Personally appeared the above named Henry H. Grant and acknowledged the above instrument to be his free act and deed.

Before me, H. Edwin Gee, Notary Public, Notarial Seal, My Commission Expires June 29, 1956

Received September 9, 1953, at 9 o'clock 50 m. A. M., and recorded according to the original. p

Know all Men by these Presents, That

I, James S. Bell of Portland, County of Cumberland and State of Maine, Executor under the Will of Ethel B. Bell, deceased, late of Portland.

having on the 24th day of November A. D. 19 53, obtained License from the Honorable Nathaniel M. Haskell Judge of Probate, within and for the County of Cumberland and State of Maine, to sell and convey at private sale the Real Estate hereinafter described of the said Ethel B. Bell for the sum of

Eleven thousand seven hundred fifty ($11750.00) dollars

the same being an advantageous offer therefor, and having agreeably to the order and decree of said Court, given due notice upon the petition for license to make such sale, and having given the bond required by law, by virtue of the power and authority with which I am as aforesaid vested, and in consideration of the aforesaid sum of Eleven thousand seven hundred fifty ($11750.00) dollars, to me paid by Maine Medical Center, a corporation duly organized and existing by law with an office and place of business at Portland, said County and State.
the receipt whereof I do hereby acknowledge, have given, granted, and sold, and by these Presents do Give, Grant, Sell and Convey to the said Maine Medical Center, its Successors ~~Heirs~~ and Assigns forever, the following described Real Estate, viz.:

A certain lot or parcel of land with the buildings thereon, situated on Arsenal and Brackett Streets in said Portland, bounded and described as follows:

Beginning at the southwesterly side of said Brackett Street at the northwesterly corner of a lot of land conveyed by Mary J. Raymond to George E. Raymond by deed dated November 3, 1897, and recorded in the Cumberland County Registry of Deeds in Book 657, Page 411; thence southwesterly by said last named lot forty seven (47) feet; thence northwesterly and at right angles with the last described course to said Arsenal Street; thence northeasterly by said Arsenal Street to said Brackett Street; thence southeasterly by said Brackett Street to the point of beginning.

Excepting and reserving from the southeasterly portion of said above described premises so much thereof, as was described and conveyed in a certain deed from Ella C. Gardner to Gemma A. Applebee et al., said deed being dated November 27, 1935 and recorded in the Cumberland County Registry of Deeds, Book 1485, Page 206, and subject also to such easements and rights as were therein granted to said Gemma A. Applebee et al; by said deed above referred to.

Being the same premises conveyed to Kathryn Ireland by deed of Mary Dyer dated August twenty eighth, A. D. 1950 recorded in said Registry of Deeds for the County of Cumberland in Book 2014, Page 62.

Being the same premises conveyed to Sarah Friedman by deed of Kathryn Ireland which deed is recorded in the Cumberland County Registry of Deeds in Book 2051, Page 193.

Being the same premises conveyed to Ethel B. Bell by Sarah Friedman which deed is recorded in said Registry of Deeds.

U.S.I.R. $13.20 E.B.B. Est. 11/25/53

To Have and to Hold the same, with all the privileges and appurtenances to the same belonging, in manner as aforesaid, to the said Maine Medical Center, its Successors ~~Heirs~~ and Assigns forever.

And I the said James S. Bell in my said capacity do Covenant to and with the said Maine Medical Center, its Successors Heirs and Assigns, that I have in all things observed the rules and directions of law relative to the selling of said Estate, and have good right and lawful authority to sell and convey the same in manner aforesaid.

In Witness Whereof, I hereunto set my hand and seal in my said capacity, this 25th day of November in the year of our Lord one thousand nine hundred and fifty three

Signed, Sealed and Delivered in presence of

Morris Greenberg

Estate of Ethel B Bell
James S. Bell Executor Seal

State of Maine, Cumberland, ss. November 25, 1953. Personally appeared the above named James S. Bell and acknowledged the ~~above~~ foregoing instrument to be his free act and deed, in said capacity.

Before me, Morris Greenberg Justice of the Peace

Received November 25 19 53, at 4 o'clock 56m., P. M., and recorded according to the original. e/

(102)

Know All Men by these Presents,

That MAINE GENERAL HOSPITAL ~~Company~~

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

Maine General Hospital to Maine Medical Center

War

in consideration of One Dollar ($1.00) and other valuable considerations (being less than $100)

paid by MAINE MEDICAL CENTER; a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

the receipt whereof it does hereby acknowledge, does hereby ~~give~~, grant, bargain, sell and convey, unto the said Maine Medical Center

its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land being a portion of Arsenal Street discontinued by the City of Portland and a small portion of land of the Grantor adjoining said discontinued land in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at a point in the center line of discontinued Arsenal Street at its easterly extremity; thence northwesterly by said easterly extremity of discontinued Arsenal Street thirty (30) feet to land of the Grantor; thence southwesterly by land of the Grantor, being the northerly sideline of the former location of Arsenal Street and at right angles to the last described course about thirty (30) feet to the easterly face of the new Maine Medical Center building; thence northwesterly at about right angles to the last described course and by the easterly face of said new building about five (5) feet to a corner of said building; thence southwesterly by the northerly face of said new building and by a line between said new building and the old building, said old building being known as the pavilion and again by the northerly face of said new building about forty-five (45) feet to a corner of said new building; thence southeasterly by the face of said new building at about right angles to the last described course about five (5) feet to the former location of the northerly sideline of said Arsenal Street; thence southwesterly by other land of the Grantor being the northerly sideline of the former location of Arsenal Street and at about right angles to the last described course and ten (10) feet to a point; thence southeasterly at right angles to the last described course thirty (30) feet to the center line of the former location of said Arsenal Street; thence northeasterly by said center line and passing through said aforementioned new building about eighty-five (85) feet to the point of beginning.

22 **To have and to hold** the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine Medical Center, its successors ~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee, its successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;

that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Maine General Hospital ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Phillips M. Payson, its Treasurer, thereunto duly authorized, this 9th day of July in the year one thousand nine hundred and fifty-six.

Signed, Sealed and Delivered in presence of

Edmund L. Dana

MAINE GENERAL HOSPITAL

~~Company~~

By Phillips M. Payson

Treasurer.

Corporate Seal

State of Maine.

County of Cumberland **ss.** July 9, 19 56

Then personally appeared the above named

Phillips M. Payson, Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation. 23

Before me,

Edward Hanson Justice of the Peace.

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE JUL 10 1956
Received at 1 H 5 M, and recorded in
BOOK 2301 PAGE 21 Robert N. Carter Register

Know All Men by These Presents,

That M. S. Hancock, Inc.

M S Hancock Inc to Gordon --- War

a Corporation organized and existing under the laws of the State of Maine and located at Casco in the County of Cumberland and State of Maine in consideration of one dollar and other valuable consideration

paid by Benjamin H. Gordon of New Britain in the County of Hartford and State of Connecticut the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey unto the said Benjamin H. Gordon, his heirs and assigns forever, [redacted]

Three certain lots or parcels of land situate in said Casco and on the southerly shore of Coffee Pond, so-known, the lots herein conveyed being Lot #13, Lot #14 and Lot #15 and delineated on a certain plan entitled "Coffee Pond Pines, Part II" as recorded in the Cumberland County Registry of Deeds, Plan Book 44, Page 40, together with a right of user in common with others who may have been or who may hereafter be granted a similar right in and to the road or right of way leading to said lots from Route #11, so-known, said road being delineated on said plan.

It shall be a condition of this conveyance and the Grantee, for himself and his heirs, administrators, executors or assigns, agrees that no dwelling shall be erected or constructed on any of said lots unless the same shall equal or exceed the sum of $1500.00 to build exclusive, however, of any necessary outbuildings or garages.

(24)

Know all Men by these Presents,

161

That the CITY OF PORTLAND, a body politic and corporate, located in the County of Cumberland and State of Maine,

Portland City of

to

Maine General Hospital

Q C

in consideration of One ($1.00) Dollar and other valuable considerations, the total of which is less than One hundred ($100.00) Dollars

paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine,

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said

Maine General Hospital, its successors and assigns forever,

A certain lot or parcel of land situated in said Portland and bounded and described as follows:

Beginning at the point of intersection of the Northwesterly side line of Ellsworth Street extended in a Southwesterly direction and the Southwesterly side line of Charles Street; thence Southwesterly along a continuation of the Northwesterly side line of Ellsworth Street extended, a distance of thirty-eight (38) feet, more or less, to a point; thence in a Southeasterly direction parallel to and fifty (50) feet measured perpendicularly Southwesterly of the Northeasterly side line of Charles Street Extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the Northerly terminus of Brackett Street as established and renamed by the City Council of the City of Portland; thence Northeasterly along the line terminating said Brackett Street a distance of thirty-eight (38) feet, more or less, to the point of intersection formed by the above-mentioned line and the Southwesterly side line of Charles Street Extension, so-called; thence Northerly along the Southwesterly side line of Charles Street extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the point of beginning.

Being the same premises conveyed to the Grantor by warranty deed of the Grantee dated April 9, 1954, recorded in Cumberland County Registry of Deeds in Book 2173, Page 412.

162

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said

Maine General Hospital, its successors

~~Heirs~~ and Assigns forever.

And the said Grantor Corporation does ~~covenant~~ with the said

Maine General Hospital, its successors

~~Heirs~~ and Assigns, that it will Warrant and ~~Forever~~ Defend the said premises to it the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said CITY OF PORTLAND

has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Edwin T. Simmons, Acting City Treasurer ~~xxxxx~~ thereunto duly authorized, this Fifteenth day of August in the year one thousand nine hundred and fifty-six.

Signed, Sealed and Delivered in presence of

M. Jane King

CITY OF PORTLAND

By Edwin T. Simmons
Acting City Treasurer

(CORPORATE SEAL)

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE AUG 21 1956
Received at 1 H — M and recorded in
BOOK 2308 PAGE 161

State of Maine. Cumberland ss. August 15, 1956.

Personally appeared the above named Edwin T. Simmons, Acting City Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me

Justice of the Peace

Know all Men by these Presents, That

223

Doak & to Maine General Hospital -- War

We, Albert E. Doak and Amelia Doak, both of Portland, County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of the State of Maine, and having its principal place of business at said Portland,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said MAINE GENERAL HOSPITAL, its successors and assigns, forever,

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Charles Street in said Portland, bounded and described as follows: Beginning at a fence post standing on the westerly side line of Charles Street and distant northerly seventy-three and eighty-four hundredths (73.84) feet from the northwesterly corner of Ellsworth and Charles Streets; thence northerly by said Charles Street forty (40) feet to land now or formerly of Frank Abbott; thence westerly by said Abbott's land seventy-four and fifty-six hundredths (74.56) feet to land of the said grantee; thence by land of said grantee southerly forty (40) feet to land now or formerly of W. R. Naylor; thence easterly by said Naylor's land seventy-four and forty-two hundredths (74.42) feet to the point of beginning.

Being the same premises conveyed to these grantors by Henry T. Orlando by deed dated May 29, 1951, and recorded in Cumberland County Registry of Deeds in Book 2044, Page 288.

The grantee corporation herein assumes and agrees to pay the 1957 real estate taxes as part consideration for this transfer.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MAINE GENERAL HOSPITAL, its successors

and assigns, to its and their use and behoof forever. And we do covenant with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we, the said Albert E. Doak and Amelia Doak, husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this third day of May in the year of our Lord one thousand nine hundred and fifty-seven.

Signed, Sealed and Delivered in presence of

Edward B. Terry
to both

Albert E Doak
Amelia Doak

State of Maine, Cumberland ss. May 3, 1957.

Personally appeared the above named Albert E. Doak

and acknowledged the foregoing instrument to be his free act and deed.

Before me, Edward B. Terry
NOTARY PUBLIC.

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received MAY 3 1957 at 2 o'clock 35 m. P. M., and recorded in BOOK 2349 PAGE 229 Attest: Martha W. S. Bailey Register

$6.05

Book 2619
Page 499

Grant
&
to
Maine
Medical
Center
--
War

Know All Men by These Presents,

499

That We, Henry H. Grant and Gladys H. Grant, both of Portland in the County of Cumberland and State of Maine,

in consideration of one ($1.00) dollar and other valuable considerations

paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof we **do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said** Maine Medical Center, its successors

and assigns forever, a certain lot or parcel of land with the buildings thereon, situated in Portland in the County of Cumberland and State of Maine, on the northwesterly side of Bramhall Street, bounded and described as follows:

Commencing at the southwesterly corner of land, now or formerly, of James Miller and Charlotte Johnson on Bramhall Street; thence northwesterly by land of said James Miller and Charlotte Johnson, sixty (60) feet to land formerly of William J. Knowlton; thence southwesterly along said Knowlton land, parallel with said street, fifty-five (55) feet to a corner of land formerly of William J. Knowlton; thence parallel with first mentioned line sixty (60) feet, more or less, to said street; thence northeasterly by said street fifty-five (55) feet to the place of beginning.

Being the same premises conveyed to us by Russell Fanning by deed recorded in Cumberland County Registry of Deeds in Book 1833, Page 415, and are conveyed subject to the conditions contained in said deed.

The Grantee herein, as part of the consideration hereof, assumes and agrees to pay taxes for the taxable year 1961.



500

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Maine Medical Center, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And we do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that we are lawfully seized in fee of the premises, that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will Warrant and Defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Henry H. Grant

and Gladys H. Grant, being husband and

wife ~~xxxxxxxxxx~~

joining in this deed as Grantor s, and relinquishing and conveying all right by descent and all other rights in the above described premises, have hereunto set our hand s and seals this thirty-first day of July in the year of our Lord one thousand nine hundred and sixty-one.

Signed, Sealed and Delivered
in presence of

Gualtiero G. Wall — Henry H. Grant

R. E. Jensen — Gladys H. Grant

State of Maine, Cumberland, ss. July 31, 1961.

Personally appeared the above named Henry H. Grant

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Raymond E. Jensen
Justice of the Peace
~~Notary Public~~

AUG 4 1961
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 28 M A M, and recorded in
BOOK 2619 PAGE 499 Edward R. Thompson Register

Know All Men by These Presents,

That Sewall M. Hobson, 2nd, of Portland, County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration

paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine with its principal office in said Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated on the northwesterly side of Bramhall Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the northwesterly side line of Bramhall Street with the easterly side line of Western Promenade; thence northeasterly by Bramhall Street One Hundred Four and one-tenth (104.1) feet to the southerly corner of land conveyed by John W. Yeaton to William J. Knowlton, by deed dated April 4, 1885, and recorded in Cumberland County Registry of Deeds, in Book 517, Page 186; thence northwesterly at right angles with Bramhall Street and by said Knowlton land Sixty (60) feet to the southeasterly side line of land conveyed by John W. Yeaton to William J. Knowlton by deed dated June 6, 1882, and recorded in said Registry of Deeds, in Book 488, Page 204; thence southwesterly by said Knowlton land Forty-one and seven tenths (41.7) feet to the easterly side line of Western Promenade at a point Seventy-seven and five tenths (77.5) feet southerly thereon from the southeasterly side line of Arsenal Street; thence southerly by Western Promenade Eighty-six and seventy-eight hundredths (86.78) feet to the point of beginning.

For Grantors title reference is made to the will of Annie H. Dana, and abstract of which is recorded in said Registry of Deeds, in Book 2423, Page 273, and to a certain deed from Saint Germain Foundation et als. dated February 1, 1960, and recorded in said Registry of Deeds in Book 2526, Page 80.

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors

~~heirs~~ and assigns, to it and their use and behoof forever.

And I do covenant with the said Grantee, its ~~heirs~~ successors and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and any heirs shall and will Warrant and Defend the same to the said Grantee, its ~~heirs~~ successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof. We the said Sewall M. Hobson, 2nd

and Anne S. Hobson

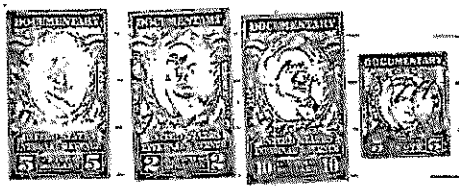
wife of the said Sewall M. Hobson, 2nd

joining in this deed as Grantor, and relinquishing and conveying her right by descent and all other rights in the above described premises, have hereunto set our hands and seals this Tenth day of July in the year of our Lord one thousand nine hundred and sixty-two.

Signed, Sealed and Delivered
in presence of

Gerald S Cope
to both

Sewall M. Hobson, 2nd
Anne S Hobson



State of Maine. Cumberland ss. July 10th 1962.

Personally appeared the above named Sewall M. Hobson, 2nd

and acknowledged the foregoing instrument to be his free act and deed.

Before me, Gerald S Cope
Justice of the Peace
~~Notary Public~~

JUL 10 1962
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 11 H 51 M A. M, and recorded in
BOOK 2686 PAGE 369 Sewall M Hobson Register

Book 2901
Page 326

326 (106)

Know all Men by these Presents,

That I, VINCENT C. NEWTON of Portland in the County of Cumberland and State of Maine

Newton to Maine General Hospita

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of Maine and located at Portland in the County of Cumberland and State of Maine,

War

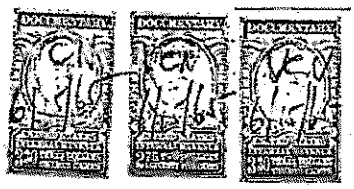
the receipt whereof I do hereby acknowledge, do hereby

give, grant, bargain, sell and convey, unto the said Maine General Hospital,

its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated on the westerly side of Charles Street in said Portland, bounded and described as follows:

Beginning on the westerly side line of said Charles Street at the northeasterly corner of land formerly of John M. Jones, now of Maine General Hospital; thence running northerly by said street thirty-eight (38) feet to land formerly occupied by one Graham, now owned by Maine General Hospital; and from these two points extending back westerly at right angles from said street keeping the width of thirty-eight (38) feet and bounded southerly by said Jones land and northerly by said Graham land about seventy-four and two tenths (74.2) feet to the Arsenal Lot, so-called, now of Maine General Hospital; being the same premises conveyed to me by Charles H. Abbott et al by deed dated February 10, 1944, recorded in Cumberland County Registry of Deeds in Book 1737, Page 278.



To Have and to Hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine General Hospital, its successors and assigns, to its and their use and behoof forever.

And I do COVENANT with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises that they are free of all encumbrances:

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will WARRANT and DEFEND the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Vincent C. Newton, being unmarried

have hereunto set my hand and seal this 15th day of June in the year of our Lord one thousand nine hundred and sixty-five.

Signed, Sealed and Delivered in presence of

Edward J. McGoldrick

Vincent C. Newton

State of Maine, Cumberland } ss. June 15, 1965.

Personally appeared the above named Vincent C. Newton and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. McGoldrick
Notary Public

MY COMMISSION EXPIRES OCTOBER 8, 1972

STATE OF MAINE
CUMBERLAND, ss. REGISTRY OF DEEDS
Received at 1 H. 26 M. P. M. on JUN 15 1965 and recorded in Book 2901 Page 326 Attest
Register

Book 2951
Page 927

(1984)
EXECUTOR'S AND TRUSTEE'S DEED
[WHEN THE WILL AUTHORIZES A SALE]

927

Know all Men by these Presents,

That I, HELEN M. GRIFFIN

of Portland in the county of Cumberland

sole acting executor of the last will and testament

of Mary Davis late of Portland

deceased, testate, by virtue of the authority to me given by

the said Mary Davis in her last will and

testament, in my capacity of executor as afore-

said, and in consideration of One Dollar ($1.00) and other

valuable considerations

to me paid by MAINE MEDICAL CENTER, a corporation organized under the laws of Maine and situated in Portland

the receipt whereof is hereby ac-

knowledged, do hereby sell and convey unto the said Maine Medical Center, its successors and assigns, the following described real estate, which was the property of the said Mary Davis.

A certain lot or parcel of land with the buildings thereon situated in Portland on the northerly side of Brackett Street, bounded and described as follows:

Beginning at the intersection of the northerly side of Brackett Street with the westerly side of Russell Street; thence running northeasterly by Russell Street thirty-seven (37) feet, more or less, to land formerly owned by Hobart W. Richardson; thence running northwesterly by said Richardson land seventy-four (74) feet, more or less, to land formerly owned or occupied by W. S. Dunn; thence southwesterly by the line of said Dunn's land forty-one (41) feet, more or less, to a lane; thence southeasterly by said lane forty-one (41) feet, more or less, to Brackett Street; thence easterly by Brackett Street thirty-seven (37) feet, more or less, to the point of beginning.

Being the same premises conveyed to Mary Davis by Harry E. Davis by deed dated March 18, 1915, recorded in Cumberland County Registry of Deeds in Book 945, Page 109.

Reference is made to Will of said Mary Davis, abstract of which is recorded in said Registry of Deeds in Book 3025, Page 28.

Davis
Est

to

Maine
Medical
Center

Exec

928

To have and to hold the above-granted premises unto the said Maine Medical Center, its successors ~~and~~ assigns forever. And I the said Helen M. Griffin, in my said capacity, do hereby covenant to and with the said Maine Medical Center, its successors ~~and~~ assigns, that I am the lawful executor of the last will and testament of the said Mary Davis ; that I have power under said will to sell as aforesaid; and that in making this conveyance, I have in all respects, acted in pursuance of the authority granted in and by the said last will and testament.



In Witness Wherent, I the said Helen M. Griffin in my said capacity of executor as aforesaid have hereunto set my hand and seal . this 31st day of March in the year of our Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered in presence of

Helen M Griffin

State of Maine, Cumberland ss. March 31 1966.

Then personally appeared the above named Helen M. Griffin and acknowledged the above instrument to be her free act and deed in her said capacity.

Before me,

Justice of the Peace.

MAR 31 1966
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 H 55 M, and recorded in
BOOK 2957 PAGE 927 Register

2081

722

Know all Men by these Presents,

J B Brown & Sons to Maine Medical Center

Q C

That J. B. BROWN & SONS, a corporation organized and existing under the laws of the State of Maine, and located at Portland in the County of Cumberland and State of Maine in consideration of one dollar and other valuable considerations, being less than $100.00 paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine, and located at said Portland, the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said MAINE MEDICAL CENTER, its successors and assigns forever,

All its right, title and interest in a strip of land, in the City of Portland, County of Cumberland and State of Maine, said strip being that portion of Charles Street lying between Brackett Street and Ellsworth Street bounded as follows: Beginning at a point on the southeasterly line of Ellsworth Street distant southwesterly One Hundred Sixty-three and seven tenths (163.7) feet from a point in said street line Fifty-seven (57) feet at right angles from a stone monument on three feet offset at the northwest corner of Ellsworth and Wescott Streets; thence running southeasterly making an included angle with the northwesterly direction of Ellsworth Street of One Hundred and One degrees and Twenty minutes (101° 20') a distance of One Hundred and Sixteen (116) feet, more or less, to the northerly line of Brackett Street near Arsenal Street. Said strip is Thirteen (13) feet wide and lies on the southerly side of the above described line.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MAINE MEDICAL CENTER, its successors ~~heirs~~ and assigns forever.

In Witness Whereof, the said J. B. BROWN & SONS has caused this instrument to be sealed with its corporate seal and signed in its corporate name by , its thereunto duly authorized, this 4th day of May in the year of our Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered in presence of

Ruth M. Dunn
to Lawrence

J. B. BROWN & SONS

By Lyman A. Cousens Jr. Treas.
Philip G. Clifford Director
(Corporate Seal)

May 4 1966

State of Maine, Cumberland ss. 19 66.

Personally appeared the above named Lyman A. Cousens Jr. & Philip G. Clifford of said Grantor Corporation, as aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Nellie H. Foster
NOTARY PUBLIC.
~~JUSTICE OF THE PEACE.~~

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS
Received MAY 4 1966 at 3 o'clock 17 m. P. M., and recorded
in BOOK 2955 PAGE 722 Attest: Samuel R. Thompson Register.

Know all Men by these Presents, That

We, FRANK S. NEUTS and DELLA J. NEUTS, both of Portland, in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration s paid by JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, both of said Portland

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said

JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, as joint tenants and not as tenants in common, their heirs and assigns forever.

A certain lot or parcel of land, with the buildings thereon, situated on Charles Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the westerly side of Charles Street at the northerly corner of land formerly owned by C. B. Saunders; thence westerly by said Saunders northerly line seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence northerly by line of said Hospital land thirty-six (36) feet to a point; thence easterly on a line parallel with Saunders northerly line seventy-five (75) feet, more or less, to the westerly side line of Charles Street; thence southerly by said Charles Street thirty-six (36) feet to the point begun at.

Being the same premises conveyed to us by Maine General Hospital by deed dated January 30, 1962 and recorded in Cumberland County Registry of Deeds in Book 2657, Page 19.

This conveyance is made subject, however, to the common passageway established by agreement between Maine General Hospital and Clarence D. Read, et al, dated October 29, 1954 and recorded in said Registry of Deeds in Book 2203, Page 413.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, as joint tenants and not as tenants in common, their

heirs and assigns, to them and their use and behoof forever. And we do covenant with the said Grantees, their heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances, except as aforesaid, that we have good right to sell and convey the same to the said Grantees to hold as aforesaid: and that we and our heirs and assigns shall and will warrant and defend the same to the said Grantees, their heirs and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, we, the said FRANK S. NEUTS and DELLA J. NEUTS, being husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our respective rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this second day of March in the year of our Lord one thousand nine hundred and sixty-seven.

Signed, Sealed and Delivered in presence of

Frank S. Neuts

Della J. Neuts

State of Maine, Cumberland, ss. March 2, 1967.

Personally appeared the above named Frank S. Neuts and Della J. Neuts and acknowledged the foregoing instrument to be their free act and deed.

Before me, [signature] Notary Public. Justice of the Peace.

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received MAR 3 1967 at 11 o'clock A. m. and recorded in BOOK 2988 PAGE 139 Attest: [signature] Register.

22AB

KNOW ALL MEN BY THESE PRESENTS

THAT OLD COLONY TRUST COMPANY a Corporation located in Boston, County of Suffolk and Commonwealth of Massachusetts, sole surviving Trustee under a Trust Agreement created by ALICE A. BURKITT late of Portland and dated March 30, 1961 by virtue of the authority to it given by said Trust Agreement in its capacity of Trustee as aforesaid, and in consideration of One Dollar ($1.00) and other valuable considerations to it paid by MAINE MEDICAL CENTER of Portland, Maine, the receipt whereof is hereby acknowledged, does hereby sell and convey unto the said Maine Medical Center its successors and assigns forever, the following described real estate, which was the property of Alice A. Burkitt late of Portland, situated in said Portland, Maine and bounded as follows:

a certain lot or parcel of land with the buildings thereon, situated in said Portland, bounded and described as follows: Beginning at a point on the easterly side of Western Promenade, which point is eighty-five (85) feet from the intersection of the northeasterly side line of said Promenade with the northwesterly side line of Bramhall Street; thence northerly by the line of said Promenade seventy-seven and five tenths (77.5) feet, more or less, to Arsenal Street; thence northeasterly by said Arsenal Street seventy-four and one tenths (74.1) feet, more or less, to land now or formerly of William J. Miller et al; thence southeasterly at right angles to Arsenal Street by said Miller land fifty-five and five tenths (55.5) feet, more or less, to land formerly of Hiram Knowlton; thence southwesterly parallel with said Arsenal Street one hundred and twenty-seven (127) feet, more or less, to the Western Promenade and point of beginning, containing fifty-six hundred (5600) square feet more or less.

Also another parcel of land adjoining the above described lot, and bounded and described as follows: Commencing at a point on the northwesterly side of Bramhall Street, which point is the northeasterly corner of land of Frederick C. Hussey et al, and ninety-eight and two tenths (98.2) feet, more or less, from the intersection of said northwesterly side line of Bramhall Street with the easterly side line of the Western Promenade; thence northeasterly on said Bramhall Street thirty-three and five tenths (33.5) feet to a point and land formerly of Hiram Knowlton, and from these two points extending northwesterly keeping a width of thirty-three and five

tenths (33.5) feet a distance of sixty (60) feet to the first parcel herein conveyed, containing two thousand and ten (2010) square feet.

Meaning and intending to convey and hereby conveying the real estate acquired by Alice A. Burkitt by Warranty Deed of Good Will Home Association dated December 11, 1930 recorded in the Cumberland County Registry of Deeds Book 1361, page 373; said real estate having been devised to the Grantor as Trustee by the Will of Alice A. Burkitt duly probated in the Cumberland County Probate Court.

TO HAVE AND TO HOLD the above-granted premises unto the said Maine Medical Center its successors and assigns forever, And the said Old Colony Trust Company in its said capacity does hereby covenant to and with the said Maine Medical Center its successors and assigns that it is the sole surviving Trustee under said Trust Agreement; that it has power under said Trust Agreement to sell as aforesaid; and that in making this conveyance it has in all respects acted in pursuance of the authority granted in and by said Trust Agreement.

IN WITNESS WHEREOF, the said Old Colony Trust Company in its said capacity as Trustee as aforesaid has caused this instrument to be signed in its corporate name and sealed with its corporate seal by S. Vincent its ~~Trust Officer~~ Vice President thereunto duly authorized this 4th day of February 1969.

Witness:

OLD COLONY TRUST COMPANY

By _____
Its ~~Trust Officer~~ Vice President

COMMONWEALTH OF MASSACHUSETTS
SUFFOLK, SS. February 4, 1969.

Then personally appeared the above-named S. Vincent who made oath that the foregoing instrument was his free act and deed and the free act and deed of the Grantor corporation in its said capacity as Trustee as aforesaid.

Before me,

_____
Notary Public

Mary F. Archoska
NOTARY PUBLIC
My commission expires May 28, 1971

CERTIFICATE OF TRUSTEE

I, JAMES R. KINGSBURY of Newton Massachusetts, Trust Officer of Old Colony Trust Company of Boston, Massachusetts, hereby certify that Old Colony Trust Company became a Co-Trustee of a certain Revocable Inter Vivos Trust created by ALICE A. BURKITT with said Old Colony Trust Company and NORMAN A. BURKITT as Co-Trustees under a Trust Agreement dated March 30, 1961;

That Norman A. Burkitt is deceased and the Old Colony Trust Company is now acting as sole surviving Trustee;

That said Trust is no longer revocable inasmuch as the Settlor who reserved the power of revocation has since died;

That among the powers given to the Trustees is the following:

> "The Trustees, in addition to and not in limitation of all common law and statutory authority, shall have power, as to any real or personal property in the trust fund or any part thereof, to mortgage, to lease with or without option to purchase and although for a term extending beyond the termination of the trust, to sell in whole or in part at public or at private sale without approval of any court and without liability upon any person dealing with the Trustees to see to the application of any money or other property delivered to them; . . ."

Dated at Boston, Massachusetts, this 4TH day of February 1969.

James R. Kingsbury

COMMONWEALTH OF MASSACHUSETTS
SUFFOLK, SS.

February 4, 1969.

Personally appeared the above named James R. Kingsbury and made oath to the truth of the foregoing certificate by him subscribed.

Before me,

Mary F. Archoska
Notary Public

Mary F. Archoska
NOTARY PUBLIC
My commission expires May 28, 1971

FEB 17 1969
REGISTRY OF DEEDS, SUFFOLK COUNTY, MASS.
Received at 11 & 35 Min. and recorded in
BOOK 3673 PAGE 269 Edward R. Finn Register

No. 181

Know All Men by these Presents,

That I, CLARA G. READ, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation having a place of business in said Portland, in said County and State,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its Successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street in said Portland, bounded and described as follows:

Beginning on said southwesterly side of Charles Street at a point thirty (30) feet northwesterly by said Street from the northeasterly corner of land formerly of Charles A. Donnell; thence northwesterly by said Street thirty (30) feet; thence southwesterly parallel with the line of said Donnell land seventy-four and two-tenths (74.2) feet to land formerly known as the Arsenal property; thence southeasterly by said Arsenal lot thirty (30) feet; thence northeasterly parallel with said Donnell land seventy-four and two-tenths (74.2) feet to the point of beginning.

Being the same premises conveyed to this Grantor and Clarence D. Read, as joint tenants, by Grace R. Loomis by deed dated September 1, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 336. The said Clarence D. Read having deceased and his estate is of record in the Registry of Probate for Cumberland County, Maine.

The Grantor herein shall have the right to occupy the premises hereby conveyed until September 15, 1969.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation
13.75

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its Successors

~~Heirs~~ and Assigns, to them and their use and behoof forever.

And I do **covenant** with the said Grantee, its/ Successors ~~Heirs~~ and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will **Warrant and Defend** the same to the said Grantee, its Successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Clara G. Read, being a widow,

~~xxxx~~ ~~xxxxxxxxxxxxxxxxxx~~

~~xxxxxxxxxxxxxxxxx

21?

No. 144

Know All Men by these Presents.

That We, WILLIAM C. GOKEY and SUZANNE E. GOKEY, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated on the southeasterly side of Ellsworth Street in said Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the northeasterly corner of a lot of land on Bramhall's Hill which John B. Brown sold to one Tuttle; thence northeasterly on said Ellsworth Street forty (40) feet; thence southeasterly about seventy-four (74) feet to land formerly of Davis; thence southwesterly by said Davis's land to land formerly of said Tuttle forty (40) feet; thence northwesterly to said Ellsworth Street, the bounds begun at, seventy-four (74) feet.

Being the same premises conveyed to William C. Gokey and Suzanne E. Gokey by Thelma A. Barter, by deed dated June 19, 1968, recorded in Cumberland County Registry of Deeds in Book 3045, Page 187.

This conveyance is made subject to taxes for the year 1969 which the Grantee assumes and agrees to pay.

D 2 0 1 3 8 STATE OF MAINE REAL ESTATE TRANSFER TAX 18.15

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And we do , **covenant** with the said Grantee , its successors ~~Heirs~~ and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will **Warrant and Defend** the same to the said Grantee , its successors

~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we the said William C. Gokey and Suzanne E. Gokey, being husband and wife

~~and~~ ~~wife of the said~~

~~joining in this deed as Grantor, and relinquishing and conveying~~

~~rights by descent and all other rights in the above~~

~~described premises~~, have hereunto set our hands and seals this 11th day of August in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

Edward F. Jones

William C. Gokey

Suzanne E. Gokey

State of Maine, Cumberland } ss.

August 11, 1969

Personally appeared the above named

William C. Gokey

and acknowledged the above instrument to be his free act and deed.

Before me, Edward F. Jones

Justice of the Peace

AUG 11 1969

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE

Received at 2 H 24 P M, and recorded in

BOOK 3097 PAGE 244 Edward R. Thompson Register

(106)

396

Know all Men by these Presents,

That JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine, and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center, its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land, with the buildings thereon, situated on Charles Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the westerly side of Charles Street at the northerly corner of land formerly owned by C. B. Saunders; thence westerly by said Saunders northerly line seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence northerly by line of said Hospital land thirty-six (36) feet to a point; thence easterly on a line parallel with Saunders northerly line seventy-five (75) feet, more or less, to the westerly side line of Charles Street; thence southerly by said Charles Street thirty-six (36) feet to the point begun at.

Being the same premises conveyed to us by Frank S. Neuts, by deed dated March 2, 1967, recorded in Cumberland County Registry of Deeds in Book 2988, Page 139.

This conveyance is made subject, however, to the common passageway established by agreement between Maine General Hospital and Clarence D. Read et al, dated October 29, 1954, recorded in said Registry of Deeds in Book 2203, Page 413.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation
$ 1.95

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine Medical Center, its successors and assigns, to its and their use and behoof forever.

And we do COVENANT with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises that they are free of all encumbrances; except as aforesaid; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will WARRANT and DEFEND the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, we the said John P. Constantine and Charlene M. Constantine, being husband and wife,

were

have hereunto set our hands and seals this 7th day of November in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

Edward J. Young

John P. Constantine

Charlene M. Constantine

State of Maine, Cumberland, ss. 19 69.

Personally appeared the above named John P. Constantine and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. Young
Justice of the Peace.

NOV 7 1969

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 11 H 18 M. and recorded in BOOK 3108 PAGE 396
Register

Book 3183
Page 576

No. 106

14804

Know All Men by these Presents,

That I, AGNES E. TWEEDIE, formerly AGNES E. BROWN, of Portland, County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and having its principal place of business at Portland, County of Cumberland and State of Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER,

its successors and Assigns forever,

the following described property: A certain lot or parcel of land, with the buildings thereon, situated in the City of Portland, County of Cumberland and State of Maine, on the corner of Brackett and Russell Streets and bounded as follows: Southwesterly by said Brackett Street; northwesterly by said Russell Street; northeasterly by land formerly of J. K. Emery and southeasterly by land now or formerly of Annie F. Chapman; containing about twenty-one hundred and fifty-one (2151) square feet.

Being the same premises conveyed to the Grantor herein and her late husband, Kenneth C. Brown, by deed dated January 22, 1962 and recorded in the Cumberland County Registry of Deeds, Book 2655, Page 344.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

03136

STATE OF MAINE
REAL ESTATE TRANSFER TAX
AUG-27 Department of Taxation
$16.50

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said

MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And I do **covenant** with the said Grantee, its successors ~~Heirs~~ and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will **Warrant and Defend** the same to the said Grantee, its successors

~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons, except as aforesaid

In Witness Whereof, I the said

AGNES E. TWEEDIE, being a widow

~~and~~ ~~wife of the said~~

~~joining in this deed as Grantor, and relinquishing and conveying rights by descent and all other rights in the above described premises,~~ have hereunto set my hand and seal this day of in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

[signature] — Agnes E. Tweedie

State of Maine, Cumberland } ss.

July 30 1971

Personally appeared the above named AGNES E. TWEEDIE

and acknowledged the above instrument to be her free act and deed.

Before me,

[signature]

~~Justice of the Peace~~

My commission [illegible]

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE AUG 2, 1971
Received at 2 H 41 M P M, and recorded in
BOOK 3183 PAGE 576 [signature] Register

234 **Know all Men by these Presents, That** 16674 Book 3187 Page 234

I, MARGUERITE M. BROOKS of Portland, County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration

paid by MAINE MEDICAL CENTER, a corporation organized under the laws of the State of Maine with a place of business at Portland, County of Cumberland and State of Maine,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said MAINE MEDICAL CENTER, its successors and assigns forever.

A certain lot or parcel of land with the buildings thereon, situated on the southeasterly side of Ellsworth Street, in the City of Portland, County of Cumberland and State of Maine, and at present numbered forty-four (44) on said street; said lot of land being bounded and described as follows:

Beginning at the northeasterly corner of Ellsworth Street and a lane running from said Ellsworth Street to the junction of Brackett and Arsenal Streets; thence northeasterly by said Ellsworth Street, twenty-six (26) feet, more or less, to land now or formerly of Neal P. Thompson; thence southeasterly by said Thompson land, seventy-four (74) feet, more or less, to land now or formerly owned by John Russell; thence southwesterly by said Russell land, forty (40) feet, more or less, to said lane; thence northwesterly by said lane, seventy-five (75) feet, more or less, to the point begun at.

Being the same premises conveyed to me by Walter E. Mangum et al by deed dated October 15, 1957 and recorded in Cumberland County Registry of Deeds in Book 2379, Page 181.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
AUG 23 '71
Bureau of Taxation
30.80

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MAINE MEDICAL CENTER, its successors

~~heirs~~ and assigns, to their use and behoof forever. And I do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances except as aforesaid, that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, I, the said MARGUERITE M. BROOKS, being single,

~~joining in this deed as Grantor and relinquishing and conveying rights by descent and all other rights in the above described premises~~, have hereunto set my hand and seal this 23rd day of August in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

Charles R. Cartwicker

Marguerite M. Brooks

State of Maine, Cumberland ss. August 23, 1971.

Personally appeared the above named MARGUERITE M. BROOKS

and acknowledged the foregoing instrument to be her free act and deed.

Before me, Charles R. Cartwicker ~~Notary Public~~ Justice of the Peace.

STATE OF MAINE, CUMBERLAND COUNTY, SS. *REGISTRY OF DEEDS*

Received AUG 23 1971 *at* 1 ~~o'clock~~ 40 *m.* ~~P.~~ *M., and recorded in BOOK* 3187 *PAGE* 234 *Attest:* [signature] *Register.*

17330

710

Book 3188
Page 710

Know all Men by these Presents, That

PORTLAND WATER DISTRICT, a quasi-municipal corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and located at said Portland in said County and State

the receipt whereof it does hereby acknowledge, do es hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said MAINE MEDICAL CENTER, its successors and assigns forever,

A certain lot or parcel of land situated in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the westerly side line of Vaughan Street with the southwesterly side line of Brackett Street; thence northwesterly by Brackett Street, two hundred forty-two and seventy-two hundredths (242.72) feet, more or less, to Bramhall Street; thence southwesterly by Bramhall Street, eighty-one and five hundredths (81.05) feet, more or less, to Chadwick Street; thence southerly by Chadwick Street, three hundred fifty-seven and forty-five hundredths (357.45) feet, more or less, to land of Chadwick Realty Corp.; thence by land of said Chadwick Realty Corp. and land of Maine General Hospital, two hundred eighty-eight and sixty-five hundredths (288.65) feet, more or less, to Vaughan Street; thence northerly by Vaughan Street, three hundred fifty-three and sixty-two hundredths (353.62) feet, more or less, to Brackett Street and the point of beginning. Containing 2.52 acres, more or less, and being known as the Bramhall Reservoir Lot.

A portion of the above-described premises, known as the J. & W. Warren Lot, was conveyed to the Portland Water Company by the following warranty deeds all dated May 1, 1869: deed of George Warren et al of a 1/3rd interest, recorded in Cumberland County Registry of Deeds, Book 368, Page 421; deed of John G. Warren of a 1/3rd interest, recorded in said Registry of Deeds, Book 368, Page 424; deed of Caroline Chadbourne et al of a 1/9th interest, recorded in said Registry of Deeds, Book 368, Page 423; and deed of Benjamin F. Chadbourne et al of a 2/9ths interest, recorded in said Registry of Deeds, Book 368, Page 425; and the remaining portion of said premises, known as the Payson Lot, was conveyed to said Portland Water Company by Henry M. Payson by warranty deed dated July 17, 1885, and recorded in said Registry of Deeds, Book 531, Page 32; all of said premises having been conveyed to said Portland Water District by Portland Water Company by quit-claim deed dated August 10, 1908, and recorded in said Registry of Deeds, Book 827, Page 147.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said

MAINE MEDICAL CENTER, its successors

~~heirs~~ and assigns forever. And it do es covenant with the said Grantee, its successors ~~heirs~~ and assigns, that it will warrant and forever defend the premises to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said PORTLAND WATER DISTRICT has caused this instrument to be sealed with its corporate seal and signed in its corporate name by William D. Monie, its Treasurer, thereunto duly authorized,

~~In witness whereof I have hereunto set my hand and seal~~ this first day of September in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

PORTLAND WATER DISTRICT

By William D. Monie
Its Treasurer

State of Maine, Cumberland ss. September 1, 1971.

Personally appeared the above named William D. Monie, Treasurer of said Grantor Corporation, as aforesaid

and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Robert B. Williamson
~~Notary Public~~ Justice of the Peace.

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received SEP 1 1971 at 12 o'clock 06 m. P M., and recorded in BOOK 3188 PAGE 710 Attest: Margaret E. Fuller Register.

17050

Know All Men by These Presents,

209

That the CITY OF PORTLAND, a body politic and corporate,

~~[illegible]~~ located at Portland

in the County of Cumberland and State of Maine

in consideration of Thirteen Thousand Five Hundred ($13,500.00) Dollars

paid by the MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine, whose address is 22 Bramhall Street, Portland, Maine

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey and Forever Quit-Claim unto the said

Maine Medical Center, its successors

and assigns forever,

a certain lot or parcel of land in the City of Portland, County of Cumberland and State of Maine, being bounded and described as follows:

Beginning at a point marking the intersection of the westerly terminus of the northerly side line of Bramhall Street and the Northerly terminus of the easterly side line of Western Promenade; thence on a course of South 61° 00' 30" West along a prolongation of the northerly side line of said Bramhall Street, a distance of eighty-six and eight hundredths (86.08) feet to a point; thence North 50° 49' 20" West, a distance of one hundred fifty-one and thirty-nine hundredths (151.39) feet to a point which point is on the southeasterly side line of Arsenal Street as it was formerly laid out; thence North 62° 24' 00" East fifty (50) feet to a point; thence North 27° 36' 00" West, a distance of forty (40) feet to a point on the northwesterly side line of Arsenal Street, as it was formerly laid out; thence North 62° 24' 00" East, a distance of two hundred seventy-two (272) feet, more or less, to a point which point is two hundred forty-eight (248) feet from the starting point hereof when measured on a course of North 16° 58' 00" East from said starting point; thence South 16° 58' 00" West, a distance of two hundred forty-eight (248) feet to said starting point.

Being a portion of the premises conveyed to the Grantor by deed of Sarah Little dated July 11, 1856, recorded in Cumberland County Registry of Deeds in Book 274, Page 6.

By acceptance of this deed, the Grantee covenants and agrees for itself, its successors and assigns:

(1) That the Grantee shall secure Planning Board review and approval of the site plan for its proposed development prior to beginning construction of any building and landscaping of the land herein conveyed.

(2) That the Grantee shall submit to the Planning Board for review and approval a grading plan within three months from the date hereof; that it will initiate actual grading work within six months from the date hereof; and that it will complete such grading work within three months from the date of completion of the proposed building.

(3) That the Grantee shall provide and forever maintain access for fire equipment satisfactory to the Fire Chief of the City of Portland to the proposed building and the remainder of the Medical Center Building Complex.

(4) That in the event of failure of the Grantee to complete or substantially complete the construction of the proposed building, landscaping, and grading in accordance with the approved site plan within three (3) years from the date hereof, the Grantee shall be required at the election of the Grantor, to reconvey to the Grantor all or such portion of the premises herein conveyed as the Grantor shall require for an amount which bears the same per square foot price as was paid for the premises herein conveyed.

(5) That if within a period of eight (8) years from the date hereof, the Grantee shall decide to sell any portion of the premises herein conveyed without selling all of its premises, it shall notify the Grantor in writing by registered mail directed to the City Manager of the City of Portland of its desire to sell such portion and thereupon the Grantor shall have the exclusive option for a period of sixty (60) days from the receipt of such notice to buy such portion for an amount which bears the same per square foot price as was paid for the premises herein conveyed.

(6) That the Grantee shall simultaneously with delivery of this deed to it, deliver to the Grantor at no cost to it a deed covering a parcel of land located at the intersection of the easterly side line of Gilman Street and the northwesterly side line of Arsenal Street for the purpose of providing a turn-around area serving Gilman Street.

(7) That the Grantee shall construct or cause to be constructed at no cost to the Grantor said turn-around area in accordance with specifications to be approved by the Director of Public Works of the City of Portland.

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said Maine Medical Center its successors and Assigns forever. And the said Grantor Corporation does covenant with the said Maine Medical Center, its successors and Assigns, that it will Warrant and Forever Defend the premises to it the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said CITY OF PORTLAND has caused this instrument to be sealed with its corporate seal and signed in its corporate name by JOHN G. DePALMA, its Director of Finance thereunto duly authorized, this 4th day of August in the year one thousand nine hundred and seventy-two.

Signed, Sealed and Delivered in presence of

CITY OF PORTLAND

By John G. DePalma
Director of Finance

(CORPORATE SEAL)

State of Maine. CUMBERLAND ss. August 4 1972.

Personally appeared the above named JOHN G. DePALMA, Director of Finance of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me,

Notary Public

AUG 4 1972

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 H 05 M Pm. and recorded in
BOOK 3278 PAGE 209 Register

23119

KNOW ALL MEN BY THESE PRESENTS that STATE OF MAINE, a body corporate and politic existing by law, in consideration of One Dollar ($1.00) and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine with its principal place of business in the City of Portland, County of Cumberland and State of Maine, the receipt whereof it does hereby acknowledge, does hereby RELEASE, GRANT and TRANSFER unto the said MAINE MEDICAL CENTER, its successors and assigns, all and any rights and interests in the former site of the State Arsenal situated on Bramhalls Hill, so-called, in the City of Portland, County of Cumberland and State of Maine, being all and the same premises described by Chapter 180 of the Resolves of the State of Maine, 1870, and Chapter 107 of the Resolves of the State of Maine, 1951, including any right of entry, reversion or other interest of the State of Maine in said premises reserved in the State of Maine by either of said Resolves and State of Maine does hereby waive as to said Maine Medical Center its successors and assigns any such rights which may now exist or which may in the future exist in State of Maine by virtue of said Resolves.

TO HAVE AND TO HOLD the aforegranted premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors and assigns, and State of Maine does hereby covenant with said Maine Medical Center, its successors and assigns that State of Maine lawfully holds rights in said premises by virtue of said Resolves; that said rights are not encumbered; that it has good right to grant the same to Maine Medical Center as aforesaid; and that State of Maine, its successors and assigns, shall and will warrant and defend the same to Maine Medical Center, its successors and assigns forever against the lawful claims and demands of all persons; provided, nevertheless, that any and all liability of State of Maine for any damage or loss to Maine Medical Center, its successors and assigns, by virtue of any breach of the foregoing covenants and warranties shall be and hereby is limited forever to the total amount of One Dollar ($1.00).

IN WITNESS WHEREOF, Kenneth M. Curtis, Governor of the State of Maine, and Edmund C. Darey, Chairman of the Executive Council of the State of Maine, acting for and with the advice and consent of the said Executive Council given this date, have caused this instrument to be executed and sealed on behalf of the State of Maine this 6th day of September, 1972.

Witness:

Peter M. Dambrog

Thea L. Stewart

STATE OF MAINE

By Kenneth M. Curtis
Its Governor

By Edmund C. Darey
Its Chairman - Executive Council

STATE OF MAINE
KENNEBEC, ss.

September 6, 1972

Personally appeared the above-named Kenneth M. Curtis, Governor of the State of Maine, and Edmund C. Darey, Chairman of the Executive Council of the State of Maine and acknowledged the foregoing to be their free act and deed in said capacity and the free act and deed of said State of Maine.

Before me,

Peter M. Dambrog
~~Notary Public~~
Justice of the Peace

Approved as to form:

Leon V. Walker Jr.
Assistant Attorney General

STATE OF MAINE

CUMBERLAND, ss. REGISTRY OF DEEDS

Received at 11 H 16 M A M on OCT 12 1972 and recorded in Book 3310 Page 115 Attest W. Keith Murphy Register

116

23120

KNOW ALL MEN BY THESE PRESENTS, that CITY OF PORTLAND, a body corporate and politic existing by law, situated at Portland, County of Cumberland and State of Maine, in consideration of One Dollar ($1.00) and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine with its principal place of business in the City of Portland, County of Cumberland and State of Maine, the receipt whereof it does hereby acknowledge, does hereby RELEASE, GRANT and TRANSFER unto the said MAINE MEDICAL CENTER, its successors and assigns, all its rights and interests in the land situated on Bramhall's Hill, so-called, in the City of Portland, County of Cumberland and State of Maine which land was conveyed by City of Portland to Maine General Hospital by deed dated June 4, 1870, which deed is duly recorded in the Cumberland County Registry of Deeds, Book 381, Pages 260, 261 and 262, to which deed reference is made for a particular description of said land, including any right of entry, possibility of reverter, reversionary or other interest of the City of Portland in said land reserved to said City in said deed and City of Portland does hereby waive as to said Maine Medical Center, its successors and assigns, said right of entry and any such other rights which may now exist or which may in the future exist in the City of Portland by virtue of said deed.

TO HAVE AND TO HOLD the aforegranted premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors and assigns, and City of Portland does hereby covenant with said Maine Medical Center, its successors and assigns that City of Portland lawfully holds rights in said land by virtue of said deed of June 4, 1870; that said rights are not encumbered; that it has good right to grant the same to Maine Medical Center as aforesaid; that City of Portland, its successors and assigns, shall and will warrant and defend the same to Maine Medical Center, its successors and assigns forever against the lawful claims and demands of all persons; provided, nevertheless, that any and all liability of City of Portland for any damage or loss to Maine Medical Center, its successors and assigns, by virtue of any breach of the foregoing covenants and warranties shall be and hereby is limited forever to the total amount of One Dollar ($1.00).

IN WITNESS WHEREOF, City of Portland has caused this deed to be sealed and executed by John G. DePalma, its Director of Finance, hereunto duly authorized, this 14th day of September, 1972.

Witness:

CITY OF PORTLAND

By _____
Its Director of Finance

STATE OF MAINE
CUMBERLAND, ss.

September 14, 1972

Personally appeared the above-named John G. DePalma, Director of Finance of said City of Portland and acknowledged the foregoing to be his free act and deed in said capacity and the free act and deed of said City of Portland.

Before me,

_____
~~Justice of the Peace~~ Notary Public

OCT 12 1972
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 11 H/7 M/4M, and recorded in
BOOK 3310 PAGE 116 _____ Register

Book 3995
Page 53

53

No. 106
6367

Know All Men by these Presents.

That We, LEROY E. APPLEBEE and ROBERTA M. APPLEBEE, both of Portland, in the County of Cumberland and State of Maine,

in consideration of One Dollar ($1) and other valuable considerations,

paid by MAINE MEDICAL CENTER, a Maine corporation with a place of business in Portland, in the County of Cumberland and State of Maine,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns forever,

~~the following described property:~~

See attached Exhibit A.

54

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns, to it and their use and behoof forever.

And we do **covenant** with the said Grantee, its/ ~~Heirs~~ Successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will **Warrant and Defend** the same to the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We, the said LEROY E. APPLEBEE

and ROBERTA M. APPLEBEE, ~~wife~~ husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our/ mutual rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 7th day of April in the year of our Lord one thousand nine hundred and seventy-seven.

Signed, Sealed and Delivered in presence of

LEROY E. APPLEBEE

ROBERTA M. APPLEBEE

State of Maine,
Cumberland, } ss. April 7 1977

Personally appeared the above named LEORY E. APPLEBEE and ROBERTA M. APPLEBEE and acknowledged the above instrument to be their free act and deed.

Before me,

Justice of the Peace

EXHIBIT A

A certain lot or parcel of land with the buildings thereon, situated on Bramhall Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at a stone monument on the westerly corner of Brackett and Bramhall Streets; thence North 57° 20' West, 70.7 feet by the westerly sideline of Brackett Street; thence South 61° 07' West, 42.3 feet by the northerly sideline of a garage on the lot under description; thence South 27° 57' East, 62-1/2 feet to a point on the northerly sideline of Bramhall Street; thence North 61° 51' East, 77.5 feet by the northerly sideline of Bramhall Street to the stone monument aforesaid and point of beginning, together with the right to have the eaves of said garage which project over land of Ella C. Gardner remain as now constructed as long as said garage is maintained in its present position.

Being the same premises conveyed to Leroy E. Applebee and Roberta M. Applebee by Edna M. Sharp by deed dated September 27, 1972, and recorded in Cumberland County Registry of Deeds in Book 3303, Page 200.

APR 7 1977
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 22 M M. and recorded in
BOOK 3995 PAGE 53. Margaret L. Fisher Register

WARRANTY DEED

319

15732

Know all Men by these Presents,

That JAMES H. SULLIVAN, Jr. of 26 Charles Street, Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation with a place of business in Portland, in the County of Cumberland and State of Maine

whose mailing address is 22 Dramhall Street, Portland, Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors

heirs and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street and the southeasterly side of Congress Street, in Portland, Maine, bounded and described as follows: Beginning at a point on the southwesterly side of said Charles Street at the northerly corner of land conveyed by Edward E. Proctor to Lulu M. Stickney by warranty deed dated May 16, 1890 and recorded in the Cumberland County Registry of Deeds in Book 567, Page 348; thence running southwesterly by said Stickney land a distance of seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence running northwesterly by said Hospital land to the southeasterly side of Congress Street; thence running northeasterly by the southeasterly side of Congress Street seventy-five (75) feet, more or less, to land conveyed by Henry A. Sargent to Lucinda B. Proctor by warranty deed dated August 14, 1896, and recorded in said Registry of Deeds in Book 639, Page 284; thence running southeasterly by said Proctor land and by the southwesterly side line of said Charles Street to said Stickney land and the point of beginning.

Being the same premises conveyed to James H. Sullivan, Jr. by deed dated August 23, 1976 and recorded in said Registry of Deeds in Book 3936, Page 282.

320

To have and to hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors ~~heirs~~ and assigns, to it and its use and behoof forever.

And I do covenant with the said Grantee, its/ successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises, that they are free of all encumbrances

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will warrant and defend the same to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said James H. Sullivan, Jr. being unmarried

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~ relinquishing and conveying all rights by descent and all other rights in the above described premises, have hereunto set my hand and seal this 25th day of the month of May, A.D. 19 83.

Signed, Sealed and Delivered in presence of

[signature] James H. Sullivan, Jr.

State of Maine, County of Cumberland ss. 25 May, 19 83.

Then personally appeared the above named James H. Sullivan, Jr.

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

[signature]

My commission expires Sept. 20, 1986

Justice of the Peace
Notary Public
Attorney at Law

MAY 26 1983

REGISTRY OF DEEDS CUMBERLAND COUNTY, MAINE
Received at 12:01 P.M., and recorded in
BOOK 6177 PAGE 319

James J. Walsh Register

024397 BK0309PG0005

Book 8309
Page 5

QUITCLAIM DEED
With Covenant

Know all Men by these Presents,

That we, JOHN J. HAMMETT and ELIZABETH B. HAMMETT, both of Portland, County of Cumberland, Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MMC REALTY CORP., a Maine corporation with a place of business at 22 Bramhall Street, in the County of Cumberland, Maine

whose mailing address is 22 Bramhall Street, Portland, Maine 04102

the receipt whereof we do hereby acknowledge, do hereby remise, release, bargain, sell and convey, and forever quitclaim unto the said MMC Realty Corp., its successors and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the northwesterly corner of Bramhall and Brackett Streets, in said Portland, and bounded and described as follows:

Beginning at the northwesterly corner of Brackett and Bramhall Streets; thence westerly on Brackett Street seventy-five (75) feet ten (10) inches, more or less, to land conveyed by William H. Chapman to Charles E. Graham by deed of April 29, 1920 and recorded in the Cumberland County Registry of Deeds in Book 1050, Page 213; thence northerly by land now or formerly of said Graham sixty-one (61) feet six (6) inches, more or less, to land conveyed by Alden J. Blethen to James K. Emery by deed dated April 30, 1880 and recorded in said Registry of Deeds in Book 467, Page 152; thence easterly by land now or formerly of said Emery sixty-six (66) feet six (6) inches to Bramhall Street; thence southerly by said Bramhall Street thirty (30) feet three (3) inches, more or less, to the point of beginning.

Being the same premises conveyed to the Grantors herein by Sumner J. Goffin by deed dated February 4, 1950 and recorded in said Registry of Deeds in Book 1985, Page 483.

MAINE REAL ESTATE TRANSFER TAX PAID

BK0309PG0006

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MMC Realty Corp., its successors

~~heirs~~ and assigns forever.

And we do covenant with the said Grantee, its/ successors ~~heirs~~ and assigns, that we shall and will warrant and defend the premises to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under us.

In Witness Whereof, we, the said John J. Hammett and Elizabeth B. Hammett

~~husband/wife of the said~~

~~having made the Grantee and acknowledging all right by the entered above the above described premises~~ have hereunto set our hands and seals this 31st day of the month of May, A.D. 19 88.

Signed, Sealed and Delivered in presence of

Lee D. Urban

Lee D. Urban

John J. Hammett

John J. Hammett

Elizabeth B. Hammett, By John J. Hammett as her Attorney in Fact pursuant to Power of Attorney dated August 16, 1984 and recorded herewith in the Cumberland County Registry of Deeds

State of Maine, County of Cumberland ss. May 31, 1988.

Then personally appeared the above named John J. Hammett

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Lee D. Urban

Notary Public
Attorney at Law

Printed Name Lee D. Urban

RECEIVED
RECORDED REGISTRY OF DEEDS
1988 JUN -1 AM 8:31
CUMBERLAND COUNTY
James J. Walsh

BK8855PG0081

036413 WARRANTY DEED

MAINE REAL ESTATE TAX PAID

KNOW ALL MEN BY THESE PRESENTS, that GILMAN STREET LAND COMPANY, a Maine corporation, and GILMAN STREET ASSOCIATES, a Maine limited partnership, for consideration paid, grant to MMC REALTY CORP., a Maine Corporation with a principal place of business in Portland, County of Cumberland, State of Maine, whose mailing address is 22 Bramhall Street, Portland, Maine 04103, with WARRANTY COVENANTS a certain lot or parcel of land, with the improvements thereon, located at 52 Gilman Street, in the City of Portland, County of Cumberland, State of Maine, all as more particularly described in Schedule A attached hereto and incorporated herein.

IN WITNESS WHEREOF, the said GILMAN STREET LAND COMPANY has caused this instrument to be sealed with its corporate seal and signed in its corporate names by William H. Webster, its President, hereunto duly authorized, this 4th day of August, 1989, and the said GILMAN STREET ASSOCIATES has caused this instrument to be signed and sealed by William H. Webster, President of its General Partner MORSE, PAYSON & NOYES PROPERTIES, hereunto duly authorized, this 4th day of August, 1989.

WITNESS:

Robert B. Patterson, Jr.

GILMAN STREET LAND COMPANY

By: _____
William H. Webster
Its President

GILMAN STREET ASSOCIATES

By: MORSE, PAYSON & NOYES PROPERTIES,
Its General Partner

Robert B. Patterson, Jr.

By: _____
William H. Webster
Its President

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

August 4, 1989

Then personally appeared before me the above named William H. Webster, President of Gilman Street Land Company, and President of Morse, Payson & Noyes Properties, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporations and partnership.

Before me,

Robert B. Patterson Jr.
~~Notary Public~~/Attorney at-Law

Robert B. Patterson, Jr.
Printed Name

~~My Commission Expires~~ _____

SCHEDULE A TO WARRANTY DEED

PARCEL ONE

A certain lot or parcel of land with the buildings thereon known as 52 Gilman Street, in Portland, County of Cumberland and State of Maine bounded and described as follows:

Beginning at a point on said street distant one hundred six and fifty-five one hundredths (106.55) feet northerly from the intersection of the westerly side of Gilman Street with the northerly side of A Street, and running thence northerly on said Gilman Street, thirty-seven and one half (37-1/2) feet to a point; thence westerly with an included angle of 91° 11' seventy and forty-two one hundredths (70.42) feet to a point; thence southerly and parallel to said Gilman Street, thirty-seven and one half (37-1/2) feet to land formerly of S. H. Jose, now of Gilman Street Land Company; thence easterly with an included angle of 91° 11' seventy and forty-two one hundredths (70.42) feet to the point of beginning.

PARCEL TWO

A certain lot or parcel of land with the buildings thereon, situated in said Portland, bounded and described as follows:

Beginning at a point in the Westerly side line of Gilman Street distant sixty-six (66) feet and one (1) inch South from the Southerly side line of Congress Street; thence running South by the side line of Gilman Street twenty-four (24) feet and eight (8) inches, more or less, to the Northerly line of land formerly of Winfield L. Smith, now of Gilman Street Land Company; thence by said line formerly of Smith and through the center of the partition wall between the house on said former Smith lot and the house on the lot herein described and by said line extended seventy and forty-two hundredths (70.42) feet and to land formerly of the City of Portland; thence North by said City of Portland land twenty-three (23) feet and eight (8) inches, more or less, to land conveyed by William B. Jordan to Willis B. Moulton et als, by deed dated May 14, 1897, and recorded in Cumberland County Registry of Deeds, Book 648, Page 450; thence in an easterly direction by said Moulton land seventy (70) feet and eight (8) inches to said Gilman Street and the point of beginning.

PARCEL THREE

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Gilman Street in said Portland and bounded as follows:

Beginning at a point on said westerly side of Gilman Street sixty-nine and five hundredths (69.05) feet northerly

from the northwesterly corner of Gilman and A Streets, and running thence northerly on Gilman Street thirty-seven and one-half (37-1/2) feet; thence westerly with an included angle of ninety-one degrees eleven minutes (91° 11') seventy and forty-two hundredths (70.42) feet to a stake; thence southerly with an included angle of eighty degrees forty-nine minutes (80° 49') thirty-seven and one half (37-1/2) feet; thence easterly with an included angle of ninety-one degrees eleven minutes (91° 11') seventy and forty-two hundredths (70.42) feet to the starting point. Being the southerly half of the lot conveyed to Samuel H. Jose by Charles F. Jose by deed dated December 6, 1886, and recorded in Cumberland County Registry of Deeds in Book 530, Page 255, to which reference is made. The premises herein conveyed are designated as No. 50 on said Gilman Street.

PARCEL FOUR

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Gilman Street in Portland, County of Cumberland and State of Maine, the house being the southerly house in a block of two houses built on this and the adjoining lot, bounded and described as follows:

Beginning on the westerly sideline of Gilman Street ninety and seventy-eight hundredths (90.78) feet from the southerly line of Congress Street; thence southerly on line of Gilman Street fifty (50) feet to land formerly of Charles F. Jose, now of Gilman Street Land Company; thence westerly by said land formerly of Jose, seventy and forty-two hundredths (70.42) feet to land formerly of City of Portland; thence northerly by said City of Portland land fifty (50) feet; thence easterly seventy and forty-two hundredths (70.42) feet passing through the center of the division wall between said two houses to the point of beginning; containing 2520 square feet.

Meaning and intending to convey and hereby conveying the same premises which were conveyed to Gilman Street Land Company by John A. Godsoe, John E. Knowles, John T. Libby, Marvin C. Adams, Thomas A. Martin, Jr., and Vincent N. Oliviero, Trustees, by Trustees Deed dated December 28, 1984 and recorded in the Cumberland County Registry of Deeds in Book 6653, Page 290.

Subject to partition wall rights and obligations as set forth in deed from Virginia R. Buckley to Helen M. Sawyer dated May 4, 1948 and recorded in Cumberland County Registry of Deeds in Book 1912, Page 424 and in deed from Judith P. Johnson to Edgar J. Murphy and Louise M. Murphy dated August 31, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 311.

RECEIVED
RECORDED REGISTRY OF DEEDS
1989 AUG -4 PM 4:02
CUMBERLAND COUNTY

056000

MAINE REAL ESTATE TAX PAID

KNOW ALL MEN BY THESE PRESENTS, That CASCO AERIE, NO. 565, FRATERNAL ORDER OF EAGLES, a/k/a CASCO AERIE FRATERNAL ORDER OF EAGLES #565, a/k/a FRATERNAL ORDER OF EAGLES CASCO AERIE NO. 565, a Maine corporation with a mailing address of 265 Valley Street, Portland, Maine 04112, and having a place of business at Portland, in the County of Cumberland and State of Maine, in consideration of $1.00 and other valuable consideration paid by MMC REALTY CORP., a Maine corporation, whose mailing address is 22 Bramhall Street, Portland, Maine 04102, the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey unto the said MMC REALTY CORP., its successors and assigns forever, certain lots or parcels of land in the City of Portland, County of Cumberland, State of Maine, with any buildings thereon, bounded and described as follows:

261-269 Valley Street

A certain lot or parcel of land with the buildings thereon, situated in Portland and described as follows:

Beginning at a point on the North side of A Street, Portland, Maine, said point being the intersection of said North side line of A Street with the East side line of B Street, the name of which was changed to Valley Street in 1939; thence Northerly and making an included angle of Eighty-two (82) degrees Fifty-nine (59) minutes with the East direction of said North side line of A Street a distance of Two hundred eighty-five (285) feet, more or less, to a point in the South side line of Congress Street, said point being thirty-five (35) feet East along said South side line of Congress Street from its intersection with the East side line of Valley Street as now laid out and accepted; thence East along said South line of Congress Street and making an included angle of Ninety-four (94) degrees 49', a distance of forty-five (45) feet, more or less, to a point in the division line between the lot of land of the Grantor under description and land now or formerly of one Charles F. Jones; thence South along the said division line between land of the Grantor and land now or formerly of Charles F. Jones and land now or formerly of Charles C. Plummer, Ellsworth W. Stuart, Charles F. Jose, Maris M. and Charles F. Jose, Trustees, and Charles F. Jose a distance of 281.17 feet, more or less, to a point in the North side line of A Street; thence West and making an included angle of 89 degrees 57' and along the North side line of A Street a distance of Eighty (80) feet more or less to the point of beginning, containing 17,570 square feet, more or less.

Excepting therefrom a portion bounded and described as follows, to wit:

Beginning at a point on the East side line of said Valley Street One Hundred Fifty (150) feet South from the intersection of said East side line of Valley Street with the South side line of Congress Street, thence North by said East line of Valley Street One Hundred Fifty (150) feet to the South side line of Congress Street; thence East along said South side line of Congress Street making an included angle of 94 degrees 49', a distance of Forty-five (45) feet more or less, to a point in the division line between the lot of land under description and land now or formerly of one Charles F. Jones; thence South along the said division line between the land under description and the land of said Charles F. Jones and others One Hundred Fifty (150) feet, to a point; thence West 63.48 feet, to the point of beginning.

42 - 46 Gilman Street

A certain lot or parcel of land with the buildings thereon situated on the northwesterly corner of Gilman and A Streets in the City of Portland, County of Cumberland, State of Maine, and bounded and described as follows:

Beginning at the intersection of the westerly side of said Gilman Street with the northerly side of said A Street, and running thence northerly on said Gilman Street, sixty-nine and five one-hundredths (69.05) feet to land formerly of S.H. Jose; thence westerly by said S. H. Jose land, seventy and forty-two one-hundredths (70.42) feet to a stake; thence southerly and parallel with said Gilman Street seventy and forty-seven one-hundredths (70.47) feet to A Street; thence easterly by said A Street, seventy and forty-one one-hundredths (70.41) feet to the place of beginning.

268 - 270 Valley Street

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Valley Street, formerly called B Street, in said Portland, bounded and described as follows:

Beginning at a point on said westerly side line of Valley Street at a point distance one hundred thirty six (136) feet northerly from the intersection of the westerly side of Valley Street and the northerly side of A Street; thence running southerly by said westerly side of Valley Street seventy-one (71) feet to a point; thence running westerly sixty (60) feet to land now or formerly of George W. Billings and Catherine A. Reed, at a point which is distant sixty-five (65) feet northerly from the northerly side line of A Street; thence running northerly by said Billings and Reed land sixty-four and seventy-six hundredths (64.76) feet to land formerly of William G. Davis and continuing northerly by said Davis land six and forty-three hundredths (6.43) feet; thence easterly approximately fifty-seven (57) feet to the point of beginning.

Being the same premises conveyed to the within grantors by the following deeds: Deed from Mid-Central Fish Company of Maine dated January 15, 1963 and recorded in Cumberland County Registry of Deeds in Book 2727, Page 347; Deed from Sebastiano Pennisi, et al dated June 25, 1963 and recorded in Cumberland County Registry of Deeds in Book 2759, Page 254; and Deed from Eugene S. Martin dated March 28, 1980 and recorded in Cumberland County Registry of Deeds in Book 4582, Page 291.

Subject to the following:

1. Taking of Valley Street as referenced in the deed from the City of Portland to the Unity Company dated October 20, 1937 and recorded in Cumberland County Registry of Deeds in Book 1527, Page 318 (261-269 Valley Street).

To have and to hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MMC REALTY CORP., its successors and assigns, to them and their use and behoof forever.

AND the said Grantor Corporation does hereby covenant with the said Grantee, its sucessors and assigns, that it is lawfully seized in fee of the premises, that they are free of all encumbrances except as aforesaid, that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, the said CASCO AERIE, NO. 565, FRATERNAL ORDER OF EAGLES has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Robert James, Richard Brichetto, Hilbert Welch, Reginald Conohan and Fred Darling,

its Trustees thereunto duly authorized, this 21ST day of November, A.D. 1990.

CASCO AERIE, NO. 565,
FRATERNAL ORDER OF EAGLES

Witness

By: Robert James
Robert James
Its Trustee

Witness

By: Richard Brichetto
Richard Brichetto
Its Trustee

Witness

By: Hilbert Welch
Hilbert Welch
Its Trustee

Witness

By: Reginald Conohan
Reginald Conohan
Its Trustee

Witness

By: Fred Darling
Fred Darling
Its Trustee

STATE OF MAINE
COUNTY OF CUMBERLAND

November 21, 1990

Then personally appeared the above named Robert James, Richard Brichetto, ~~Hilbert Welch,~~ Reginald Conohan and ~~Fred Darling,~~ Trustees of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be their free act and deed in their said capacity, and the free act and deed of said Corporation.

Before me,

Attorney at Law
Notary Public
SHERRIE LYNN FONTAINE
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES NOVEMBER 13 1996

Printed Name

SEAL

RECEIVED
RECORDED REGISTRY OF DEEDS
90 NOV 21 PM 3:54
CUMBERLAND COUNTY

17527

17527 9722 45

DEED OF SALE BY PERSONAL REPRESENTATIVE
(Testate)
Maine Statutory Short Form

Book 9722
Page 45

Know all Men by these Presents,

That Thomas F. Kane, Jr.

of Scarborough, County of Cumberland, State of Maine,

duly appointed and acting personal representative of the estate of Edna Faye Kane,

deceased (testate), as shown by the probate records of the County of Cumberland, Maine,

(and having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale) ~~(and not having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale, such notice not being required under the terms of the decedent's will)~~, by the power conferred by the Probate Code, and every other power, for consideration paid, grants to Maine Medical Center* of Portland,

*a nonprofit corporation organized and existing under the laws of the State of Maine

County of Cumberland, State of Maine,

whose mailing address is 22 Bramhall Street, Portland, ME 04102,

the real property in Portland, County of Cumberland,

State of Maine, described as follows:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the southeasterly side of Ellsworth Street, bounded and described as follows: -viz;-Beginning on the said southeasterly side of Ellsworth Street at land now or formerly of S.F. Haggett; thence southeasterly by said Haggett's land seventy-five (75) feet, more or less, to land now or formerly of J.T. Walton; thence southwesterly by said Walton's land and land now or formerly of N. Waterhouse eighty (80) feet, more or less, to land now or formerly of N.P. Thompson; thence northwesterly by said Thompson's land seventy-five (75) feet, more or less, to said Ellsworth Street; thence northeasterly by said Ellsworth Street to point begun at. Containing five thousand eight hundred forty (5,840) square feet, more or less. Said lot is numbered 34-36 and 38 as shown upon valuation plan of the City of Portland.

Being the same premises conveyed to Edna F. Kane by May Porter by her Warranty Deed, dated April 3, 1940 and recorded in Cumberland County Registry of Deeds in Book 1603, Page 134.

MAINE REAL ESTATE TAX PAID

Instr 47527 Bk 9722 Pg 46

Witness my hand and seal this 20th day of

September , 19 91 .

Signed, Sealed and Delivered
in presence of

Samuel J. Shatz

Personal Representative of the Estate of Edna Faye Kane

Thomas F. Kane, Jr.

Thomas F. Kane, Jr.

State of Maine, County of Cumberland **ss.** September 20 , 19 91 .

Then personally appeared the above named Thomas F. Kane, Jr.

in his said capacity and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Samuel J. Shatz

Samuel J. Shatz
~~Justice of the Peace~~
~~Notary Public~~
Attorney at Law

Recorded
Cumberland County
Registry of Deeds
09/20/91 03:59:12PM
Robert P. Titcomb
Register

54881

WARRANTY DEED
(Maine Statutory Short Form)

KNOW ALL BY THESE PRESENTS, that I, William H. Leschey, Jr., whose mailing address is 930 Congress Street, Portland, ME 04102, for consideration paid, GRANT to MMC Realty Corp., a Maine corporation with an established place of business at and mailing address of 22 Bramhall Street, Portland, Maine 04102, with WARRANTY covenants, the land in Portland, County of Cumberland, State of Maine, which is more particularly described as follows:

A certain lot or parcel of land, with any buildings or improvements that may be thereon, situated on the southerly side of Congress Street, bounded and described as follows: BEGINNING on the southerly sideline of Congress Street at its intersection with the westerly sideline of Gilman Street; thence southerly by the westerly sideline of Gilman Street, sixty-six feet, one inch (66' 1") to the northeasterly corner of land now or formerly of Helen M. Sawyer; thence westerly by said Sawyer land seventy feet, eight inches (70' 8") to the easterly sideline of land now or formerly of Schwartz Bros. Inc.; thence northerly by said Schwartz Bros. Inc. land, sixty-two feet, one inch (62' 1") to the southerly sideline of Congress Street; thence easterly by the southerly sideline of Congress Street, seventy feet, eight inches (70' 8") to the point of beginning.

Being the same premises conveyed to the Grantor herein by deed of Edythe D. Field, dated May 11, 1987, and recorded in the Cumberland County Registry of Deeds in Book 7784, Page 182.

MAINE REAL ESTATE TAX PAID

WITNESS my hand and seal this 1st day of September, 1994.

SIGNED, SEALED AND DELIVERED
in the presence of:

William H. Leschey, Jr.

STATE OF MAINE
COUNTY OF CUMBERLAND, ss September 1, 1994

Then personally appeared the above-named William H. Leschey, Jr. and acknowledged the foregoing instrument to be his free act and deed.

Before me,

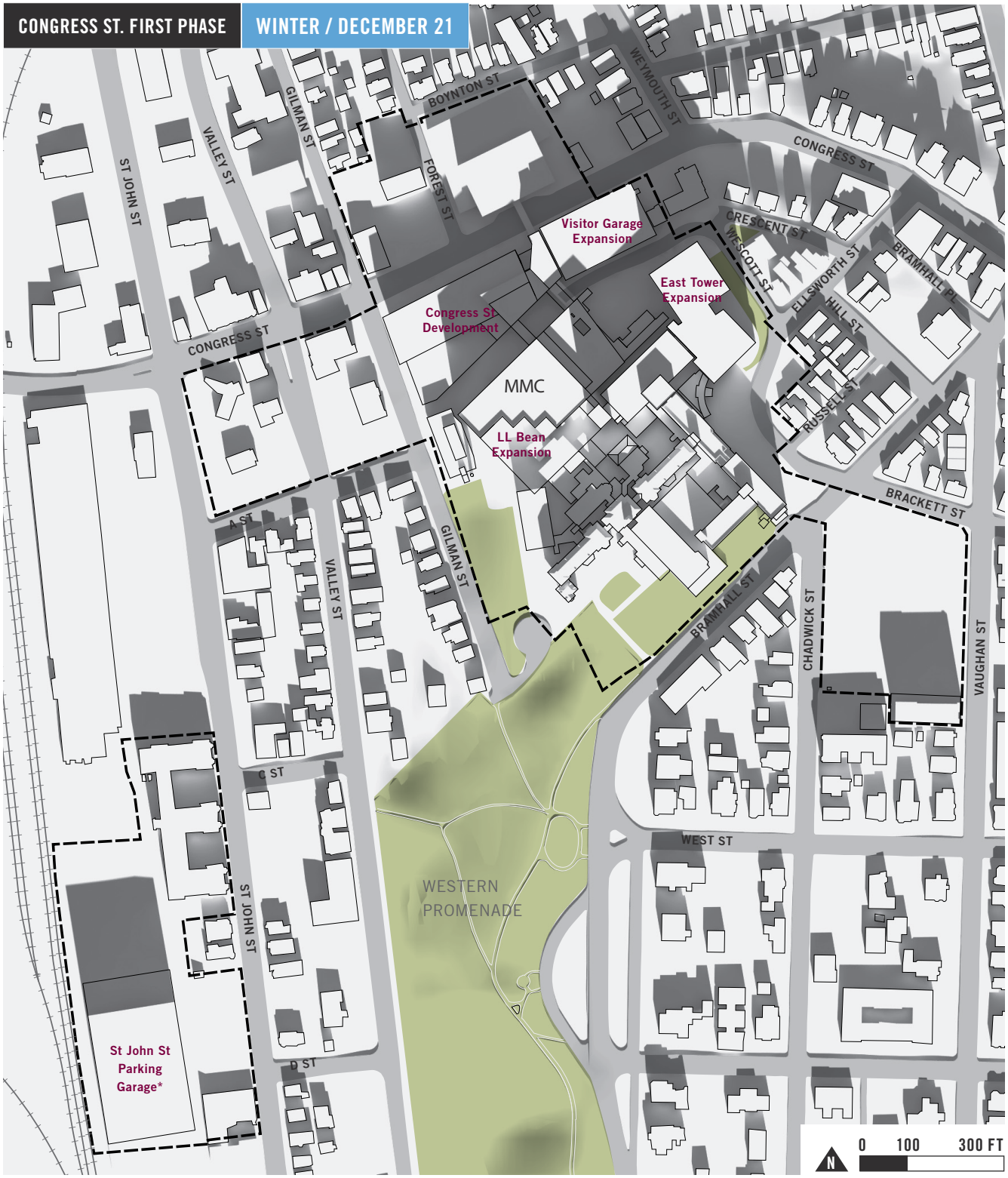
~~Notary Public~~ Attorney at Law
Printed Name: CHRISTOPHER J.W. COCCOSHALL

RECEIVED
RECORDED REGISTRY OF DEEDS
94 SEP -1 PM 3:05
CUMBERLAND COUNTY
John B O'Brien

REL/4078/AAO/DE

CC


CONGRESS ST. FIRST PHASE
SUMMER / JUNE 21
BOYNTON ST
WEYMOUTH ST
CONGRESS ST
CRESCENT ST
WESCOTT ST
ELLSWORTH ST
BRAMHALL PL
HILL ST
RUSSELL ST
BRACKETT ST
ST JOHN ST
VALLEY ST
GILMAN ST
FOREST ST
CONGRESS ST
MMC
A ST
VALLEY ST
GILMAN ST
BRAMHALL ST
CHADWICK ST
VAUGHAN ST
C ST
WEST ST
WESTERN
PROMENADE
ST JOHN ST
D ST
N
0
100
300 FT



* NOTE: Exact garage location and footprint to be determined during detailed design.

WRITTEN SUBMISSION 03 – EVIDENCE OF STATE OR FEDERAL APPROVALS
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE PROJECT WILL REQUIRE A DEP SITE LOCATION OF DEVELOPMENT PERMIT, WHICH WILL BE REVIEWED BY THE CITY UNDER ITS DELEGATED REVIEW AUTHORITY. THE PROJECT WILL ALSO REQUIRE APPROVAL FROM THE FEDERAL AVIATION ADMINISTRATION, WHICH WILL BE REVIEWED CONCURRENTLY WITH THE SITE PLAN APPLICATION. THE APPLICANT WILL PROVIDE EVIDENCE OF FAA APPROVAL UPON RECEIPT.

DD

WRITTEN SUBMISSION 29– SNOW AND ICE LOADING
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE BUILDING IS DESIGNED WITH A FLAT ROOF AND WILL BE STRUCTURALLY DESIGNED TO ACCOMMODATE THE WEIGHT OF SNOW. NO SNOW WILL FALL ONTO ADJACENT PROPERTIES NOR PUBLIC WAYS.

E

November 1, 2018

Nell Donaldson, Senior Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: MMC Congress Building| 22 Bramhall St| Level III Site Plan
Zoning Assessment

Dear Nell:

Thank you for coordinating the review of the Maine Medical Center Congress Building project located at 22 Bramhall with frontage on Congress St.. This letter provides an Assessment of Zoning Compliance for MMC's Site Plan Application for the Congress St. hospital building.

The proposed project is in alignment with the approved Maine Medical Center IDP and IOZ Regulatory Framework. The Congress St. Building is listed as a near-term project in the IDP. This project begins to address the key institutional needs identified in MMC's IDP. As outlined in the approved IDP, the goals of this project are to address MMC's multi-factorial clinical and building needs.

Compliance with the IOZ Regulatory Framework specified in the City of Portland Land Use Code (Chapter 14) and the MMC IDP is described in the following sections.

Applicability

The proposed development is within the boundaries of the MMC Institutional Overlay Zone (IOZ) specified in the IDP; therefore, the IOZ standards apply to this project.

Updates and Amendments

The proposed building is consistent with the MMC IDP approved by the Portland City Council in October 2017. No updates or amendments are proposed to the IDP as a part of this project.

Uses

Hospital is listed as a use permitted by right within the IOZ.

Dimensional Requirements

The proposed building will consist of 265,000 square feet of hospital space across six floors including a mechanical floor that is partially below grade at the Eastern edge of the building plus two partial floors required to connect the building to the rest of MMC's campus. As discussed in the IDP, MMC used a multi-part methodology to determine the appropriate height profile for potential future development within the IOZ boundary, including project definition, urban design analysis, slope analysis and visioning.

- **Building Height.** The maximum height identified in the IOZ Regulatory Framework for the location of the proposed building is 200'.

- The average building height for the proposed building is 64', considering the average proposed ground elevation of +70' at the building edge and the average roof elevation at the is 134'.

- **Building Setbacks.** A minimum of 0' is specified along the Western edge of the project area as shown in Map 4.2 of the IOZ.

    - The proposed building is located 0' from the right-of-way and has continuity with the Congress Street Build-to-Zone.

- **Congress Street Build-to-Zone.** The proposed building is located within the Congress Street Build-to-Zone as indicated on Map 4.2 in the IOZ. The Congress Street Build-to-Zone requires a minimum of 70% of the façade facing Congress Street to be located within the Congress Street Build-to-Zone which extends between 0' to 40' from the right-of-way boundary.

    - 99% of the façade facing Congress Street is within the Congress Street Build-to-Zone.

- **Transition Zone.** As identified on Map 4.1 in the IOZ, there are no transition zones associated with the project area.

Design

The IOZ regulatory framework specified that new buildings shall adhere to the design guidelines set forth in Chapter 5 of the IDP and the site plan standards of the City of Portland. Compliance with the design guidelines was detailed for the City in a memo from Perkins + Will to Al Green at MMC dated September 14, 2018 and submitted to the City as "35 Zone Related Design Standards (Design Narrative)"./ submission dated

Signs

Signage for the proposed building is outlined in the unified campus-wide Signage Master Plan submitted to the City. The Signage Plan demonstrates that signs are designed in proportion and character with building facades and adjacent street typology, and coordinated with the building and landscaping design, and will be constructed of appropriate permanent, high quality materials and finishes.

Transportation

The MMC Transportation Demand Management (TDM) Plan is discussed in the approved IDP (IDP page 74). As outlined in the IDP, MMC has considered its transportation needs holistically, factoring into its future development alternative means of transportation (IDP page 25). The City approved MMC's TDM Plan along with the Site Plan application for the St John Garage on September 11, 2018. That plan was submitted along with the Site Plan application for the Congress Building.

A parking demand analysis was conducted as part of the Transportation Plan in the IDP to determine parking needs based on supply and demand, and trip reduction efforts outlined in the TDM Plan. The analysis revealed an existing staff parking shortage of 150 to 200 spaces, with the MMC parking system typically operating at or above capacity during weekday daytime hours (IDP page 65). Approximately 500 to 600 additional staff parking spaces are required to meet projected demand based on expected staff growth. The City approved MMC's St. John St Garage site plan application on September 11, 2018 which takes steps towards addressing MMC's parking challenges.

Environment

The proposed development incorporates features that are designed to integrate with the surrounding context, including open space and pedestrian networks and infrastructure.

Mitigation Measures

MMC will mitigate site plan impacts to off-premise infrastructure in a manner proportionate to those impacts.

Neighborhood Integration and Neighborhood Engagement

In addition to the required neighborhood meeting as required by the Level III Site Plan process, MMC does the following in terms of neighborhood integration and neighborhood engagement:

- Monthly and as needed meetings with representatives of each of the neighborhood associations abutting the Bramhall Campus and Libbytown where MMC provides lunch;
- Targeted outreach to local businesses and residents;
- Open meetings where businesses and residents are invited to ask questions about the project and provide feedback;
- Provide mitigation measures (such as parking) to anyone directly impacted by temporary street parking closures or traffic detours;
- A webpage where all project information is available; and
- A project alert notification system where people can be updated via email or text of project updates.

Construction Management

A Construction Management Plan (CMP) that conforms to all IOZ requirements was provided to the City in its initial Site Plan application packet of materials on October 1, 2018. The CMP includes a construction schedule, and strategies for managing communication, noise, air quality, traffic, and parking impacts associated with the construction.

Other Requirements

- **Helipad.** This standard does not apply to the proposed project.
- **Snow Ban Parking.** In accordance with the IOZ Regulatory Framework, MMC will make parking available to neighbors within the parking garage for a set timeframe during designated snow ban parking events.
- **Healthy Communities.** This standard does not apply to the proposed project.

EE

WRITTEN SUBMISSION 30 – VIEW CORRIDORS
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THERE ARE NO DESIGNATED VIEW CORRIDORS WITHIN THE PROJECT SITE.

WRITTEN SUBMISSION 05 – EXISTING &/OR PROPOSED EASEMENTS OR COVENANTS
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

A. UNDERGROUND ANCHOR SYSTEM EASEMENT RESERVED BY MMC IN CONVEYANCE TO CRESCENT HEIGHTS LLC IN DEED BOOK 26288 PAGE 49.
B. UTILITY/DRAINAGE EASEMENT FOR A DRAIN/SEWER PIPE FROM THE PROPERTY NOW OF CRESCENT HEIGHTS, LLC. FORMERLY AS DESCRIBED IN DEED BOOK 1938 PAGE 248 AND 1946 PAGE 370.
C. UTILITY EASEMENT: TO NET&T NEAR THE NORTHERLY CORNER OF THE PARKING GARAGE ON CONGRESS ST. PER DEED BOOK 8573 PAGE 121.
D. CERTIFICATE OF VARIANCE APPROVAL GRANTING RELIEF FROM SECTION 14-137(7) MAXIMUM STRUCTURE HEIGHT OF 45 FEET, DATED JUNE 25, 1996, AND RECORDED IN DEED BOOK 12629 PAGE 295.
E. SITE LOCATION OF DEVELOPMENT DEPARTMENT ORDER BY MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION FOR MAINE MEDICAL CENTER, PER DEED BOOK 13919 PAGE 114.
F. UTILITY EASEMENT: MMC TO NET&T 6' X 8' NEAR GILMAN AND CONGRESS PER DEED BOOK 13027 PAGE 207.
G. AMENDMENT TO CITY CODE SEC. 14-49 (ZONING MAP AMENDMENT) RE: CONDITIONAL REZONING FOR PROPERTY IN VICINITY OF WESTERN PROMENADE/MAINE MEDICAL CENTER. DATED MAY 24, 2005 AND RECORDED IN DEED BOOK 22671 PAGE 60.

FF

WRITTEN SUBMISSION 31 – HISTORIC RESOURCES
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THIS SUBMISSION ITEM IS NOT APPLICABLE TO THIS APPLICATION.

WRITTEN SUBMISSION 06 – WAIVER REQUESTS
BRAMHALL ST. -22; MMC CONGRESS STREET BUILDING

1. WAIVER REQUESTS INCLUDE :
   A) REDUCTION IN DRIVE AISLE FROM 24 FEET TO 21' – 9" ON THE RAMP BETWEEN THE NEW DROP OFF PLAZA AND THE ENTRANCE TO THE VISITOR GARAGE. THIS REQUEST IS BASED ON EXISTING FOUNDATIONS AND GRADE BEAMS AT THE VISITOR GARAGE.
   B) SIDEWALK MATERIAL CHANGE FROM BRICK PAVERS TO BROOM FINISH CONCRETE WITH SAW CUT SCORE JOINTS. THIS REQUEST IS BASED ON THE SLIPPERY NATURE OF BRICK PAVERS, SMOOTHNESS OF THE WALKING SURFACE, AND AVOIDING A MATERIAL CHANGE FROM THE PUBLIC RIGHT OF WAY SIDEWALK TO THE IMMEDIATELY ADJACENT PLAZA AREA.
   C) STAFF HAS SUGGESTED ADDING A SIDEWALK ON THE EAST SIDE OF GILMAN STREET FROM THE EMPLOYEE ENTRANCE TO THE CORNER OF GILMAN STREET AND A STREET, TO FACILITATE PEDESTRIAN ACCESS TO THE ST. JOHN STREET GARAGE. MMC SUPPORTS THIS CONNECTIVITY, HOWEVER, REQUESTS A WAIVER TO CONSTRUCT THIS SECTION OF SIDEWALK.
   PER LAND USE CODE SECTION 14- 506, THE PLANNING BOARD CAN GRANT SUCH A WAIVER IF TWO OR MORE OF THE SIX CONDITIONS EXIST AS SET FORTH IN SECTION 14-506. WE BELIEVE THAT WE MEET THE FOLLOWING TWO CONDITIONS :

- A SAFE ALTERNATIVE WALKING ROUTE IS REASONABLY AND SAFELY AVAILABLE, FOR EXAMPLE, BY WAY OF A SIDEWALK ON THE OTHER SIDE OF THE STREET THAT IS LIGHTLY TRAVELLED.

  As depicted on the attached photo, there is a lightly travelled sidewalk, in good condition, on the west side of Gilman Street. Employees can easily access this sidewalk via a crosswalk in close proximity to the staff entrance.

- STRICT ADHERENCE TO THE SIDEWALK REQUIREMENT WOULD RESULT IN THE LOSS OF SIGNIFICANT SITE FEATURES RELATED TO LANDSCAPING OR TOPOGRAPHY THAT ARE DEEMED TO BE OF A GREATER PUBLIC VALUE.

  As depicted on the second photo, construction of the sidewalk along the front of the Central Utility Plant would require the removal of existing fir trees in that location. These trees were very important to the Planning Board and the residents of Gilman Street when Site Plan Approval was granted for the Central Utility Plant. MMC feels that these tress are of greater public value than a sidewalk in this location.

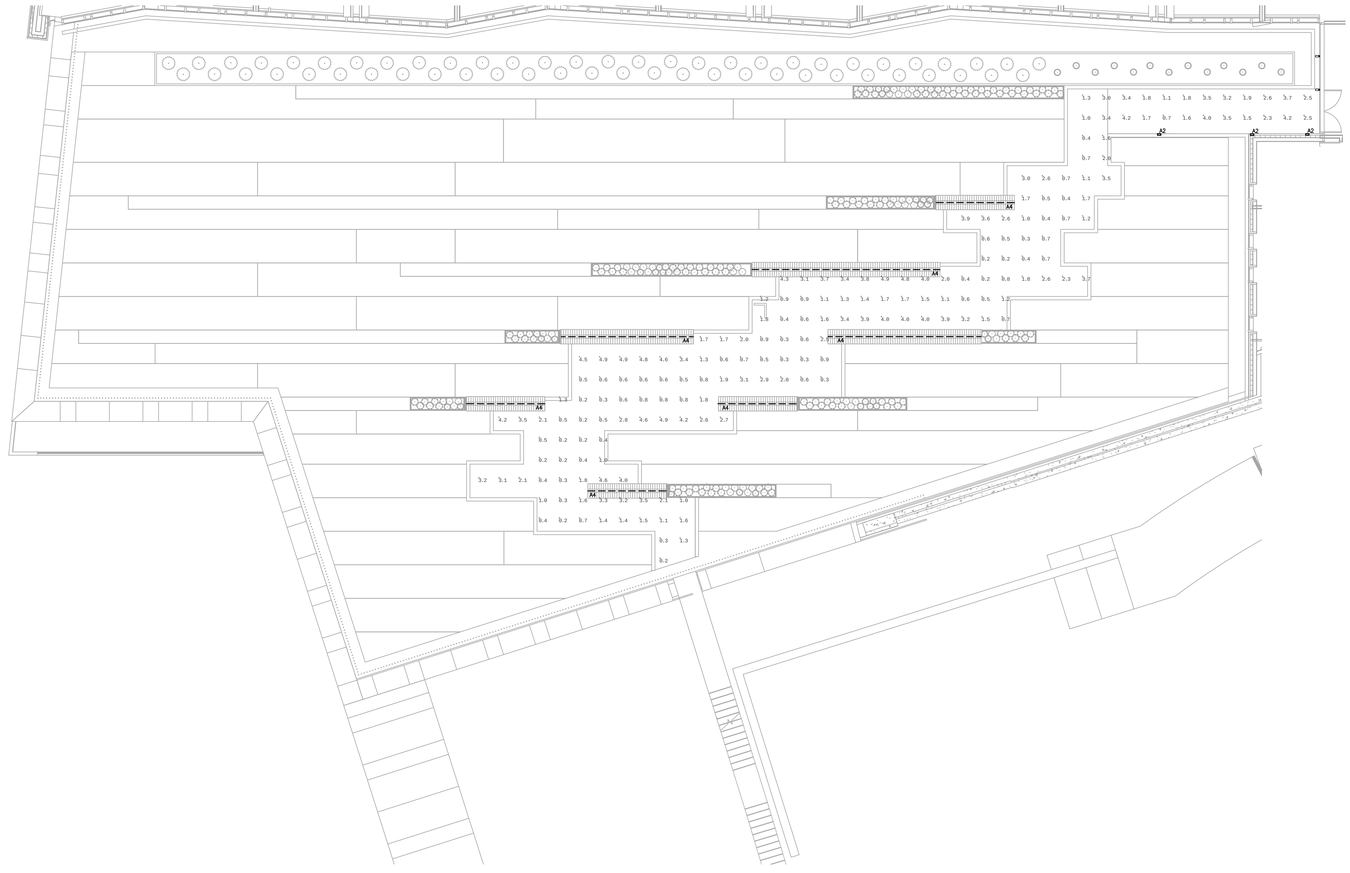

safe alternative
walking route


fir trees that would have to be removed to add a sidewalk

GG

A1	STREET PEDESTRIAN LIGHTING POLE - CITY OF PORTLAND, MAINE	HALOPHANE PEDESTRIAM ESPLANADE SERIES
A2	RECESSED LINEAR WALL MOUNTED FIXTURE	BEGA 33054
A3	LINEAR COVE MOUNTED FIXTURE IN PERFORATED CEILING	LUMENPULSE LUMENFACADE
A4	LINEAR LED TAPE LIGHT IN CHANNEL BELOW BENCH SEATING	LED LINEAR, ADONIS HYDRA WHITE

Illuminance (Fc)
Average = 1.84
Maximum = 4.9
Minimum = 0.2



1 LEVEL 3 TERRACE (GARDEN ROOF)
SCALE: 1/8"=1'-0"

PERKINS
+WILL
225 Franklin Street, Suite 1100
Boston, MA 02110
t 617.478.0300
f 617.478.0321
www.perkinswill.com

CONSULTANTS

CIVIL/ LANDSCAPE ARCHITECT
Segabo Technics
75 John Roberts Road , Suite 1A, South
Portland, ME 04106

STRUCTURAL ENGINEER/ BUILDING ENVELOPE
Simpson Gumpertz & Heger Inc.
41 Seyon Street, Building 1, Suite 500, Waltham,
Massachusetts 02453

MEP/FP ENGINEER/ CODE
AKF Group LLC
99 Bedford Street, 2nd Floor, Boston MA 02111

LIGHTING CONSULTANT
Lightcraft
99 Bedford Street, 2nd Floor, Boston MA 02111

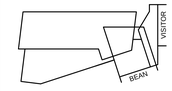
PROJECT

Congress St.
22 Bramhall St.
Portland, ME 04102

Maine Medical Center
MaineHealth

Maine Medical Center
22 Bramhall St.
Portland, ME 04102

KEYPLAN



ISSUE CHART

Exterior Photometric Submission to the City of Portland Maine
10.30.2018

ISSUE	DATE
Job Number	B160234.000
Drawn	
Checked	
Approved	

TITLE

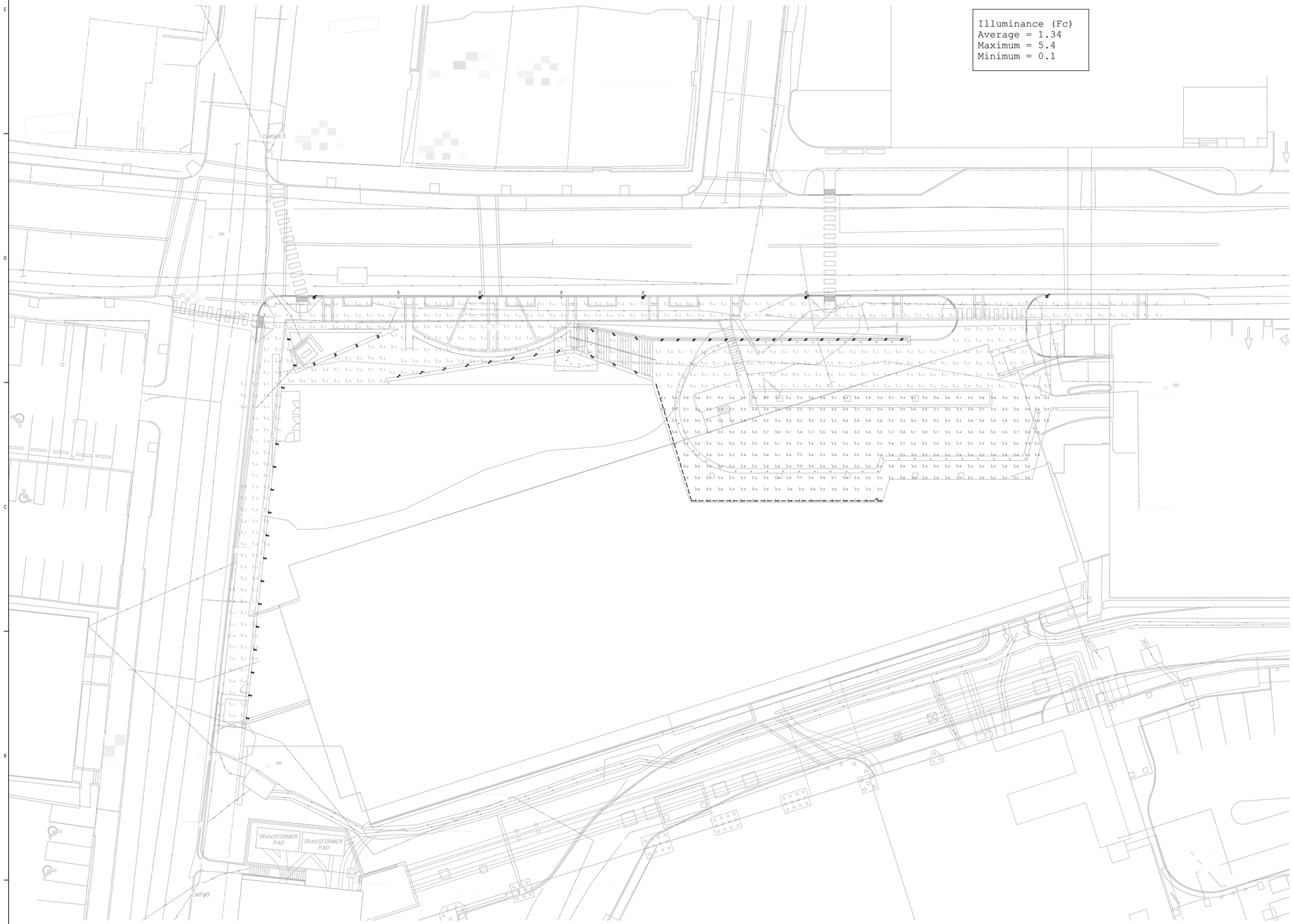
PHOTOMETRIC LEVEL 3 TERRACE ROOF GARDEN

SHEET NUMBER

L-200

A1	STREET PEDESTRIAN LIGHTING POLE - CITY OF PORTLAND, MAINE	HALOPHANE PEDESTRIAM ESPLANADE SERIES
A2	RECESSED LINEAR WALL MOUNTED FIXTURE	BEGA 33054
A3	LINEAR COVE MOUNTED FIXTURE IN PERFORATED CEILING	LUMENPULSE LUMENFACADE
A4	LINEAR LED TAPE LIGHT IN CHANNEL BELOW BENCH SEATING	LED LINEAR, ADONIS HYDRA WHITE

Illuminance (Fc)
Average = 1.34
Maximum = 5.4
Minimum = 0.1



1 EXTERIOR SITE PLAN
SCALE: 1/16"=1'-0"

PERKINS
+WILL
225 Franklin Street, Suite 1100
Boston, MA 02110
t 617.478.0300
f 617.478.0321
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CONSULTANTS

CIVIL/ LANDSCAPE ARCHITECT
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75 John Roberts Road , Suite 1A, South Portland, ME 04106

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41 Seyon Street, Building 1, Suite 500, Waltham, Massachusetts 02453

MEPFP ENGINEER/ CODE
AKF Group LLC
99 Bedford Street, 2nd Floor, Boston MA 02111

LIGHTING CONSULTANT
Lightcraft
99 Bedford Street, 2nd Floor, Boston MA 02111

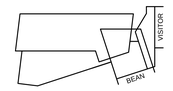
PROJECT

Congress St.
22 Bramhall St.
Portland, ME 04102

Maine Medical Center
MaineHealth

Maine Medical Center
22 Bramhall St.
Portland, ME 04102

KEYPLAN



ISSUE CHART

Exterior Photometric Submission to the City of Portland Maine
10.30.2018

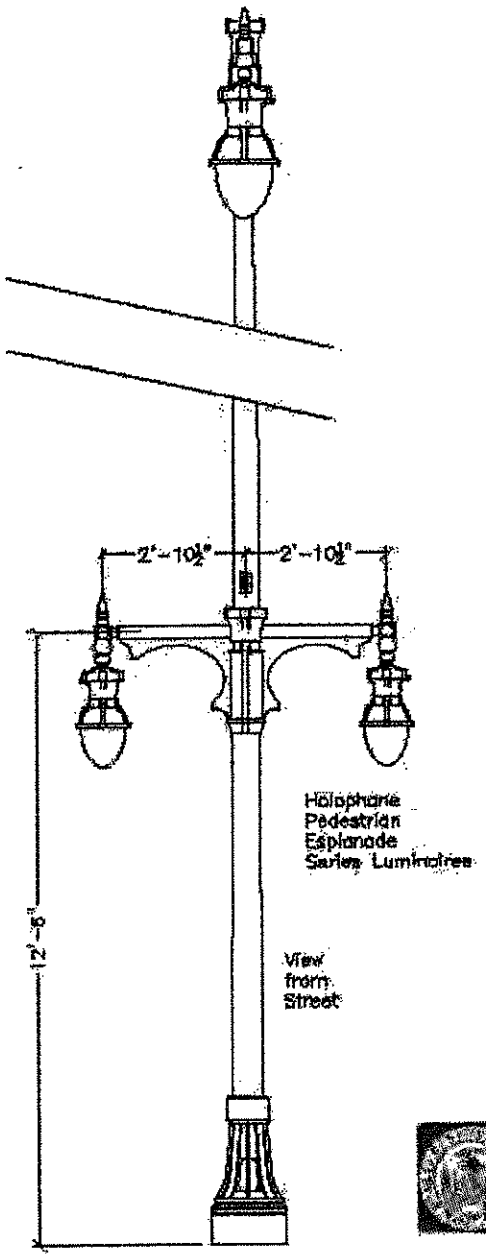
ISSUE	DATE
Job Number	B160234-000
Drawn	
Checked	
Approved	

TITLE

PHOTOMETRIC

SHEET NUMBER

L-100



APPLICATION
Street/Sidewalk lighting for two-way streets with parking on both sides.
Suggested layout:
90–100 ft on center (one side only)
175–225 ft on center (staggered pattern both sides)

72' OK as long as maximum fc is not exceeded.

City of Portland, Maine
Street & Sidewalk Lighting
CONGRESS STREET DISTRICT
Street/Pedestrian Lighting Pole
Sheet 8 of 8 08/05/97

Fixture A1

Type:
BEGA Product:
Project:
Modified: Fixture A2

Application
LED recessed wall luminaire with asymmetrical light distribution for the illumination of ground surfaces, building entrances, stairs and footpaths.

Materials
Luminaire housing and faceplate constructed of die-cast aluminum marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Clear safety glass
Silicone applied robotically to casting, plasma treated for increased adhesion
High temperature silicone gasket
Mechanically captive stainless steel fasteners
Stainless steel screw clamps
Composite installation housing

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 1.8 lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-40° C
LED module wattage	5.9W
System wattage	8.0W
Controlability	0-10V, TRIAC, and ELV dimmable
Color rendering index	Ra≥80
Luminaire lumens	342 lumens (3000K)
Lifetime at Ta=15°C	>500,000 h (L70)
Lifetime at Ta=35°C	185,000 h (L70)

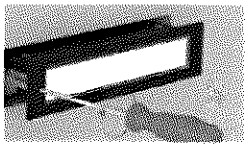
LED color temperature

2700K - Product number + **K27**
3000K - Product number + **K3**
3500K - Product number + **K35**
4000K - Product number + **K4**

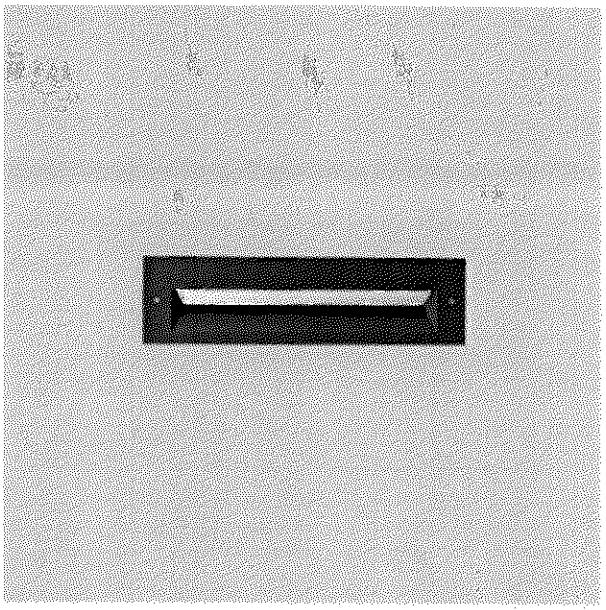
BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

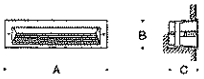
Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS:



Fully enclosed luminaire with installation housing ensures seamless integration and weathertight operation.





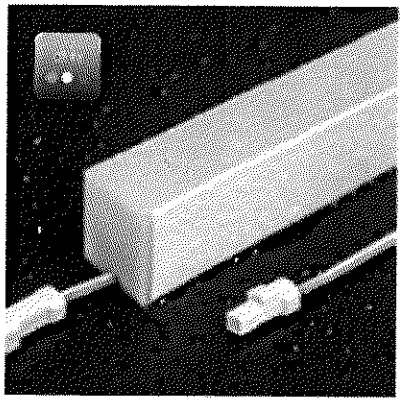
LED recessed wall luminaires asymmetrical

	LED	A	B	C
33054	5.9W	10⅛	2¾	5

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Due to the dynamic nature of lighting products and the associated technologies, luminaire data on this sheet is subject to change at the discretion of BEGA North America. For the most current technical data, please refer to bega-us.com
© copyright BEGA 2018

ADONIS HYDRA White IP67



24 V, IP67 protected and IK10 certified, linear LED luminaire with small form factor and opal encapsulation with a homogeneous light emission. "One Bin Only" within 3 MacAdam guarantees constant color temperature and high light quality with a lifetime of > 60,000 hrs (L80/B10). It is IP67 protected against water, salt water, solvents and UV radiation by an opal polyurethane encapsulation. Furthermore, it is IK10 certified and therefore particularly robust against environmental impacts. It is available in 5 standard lengths and is supplied ready to plug in with a IP67 mini-connector. Engineered in Germany.

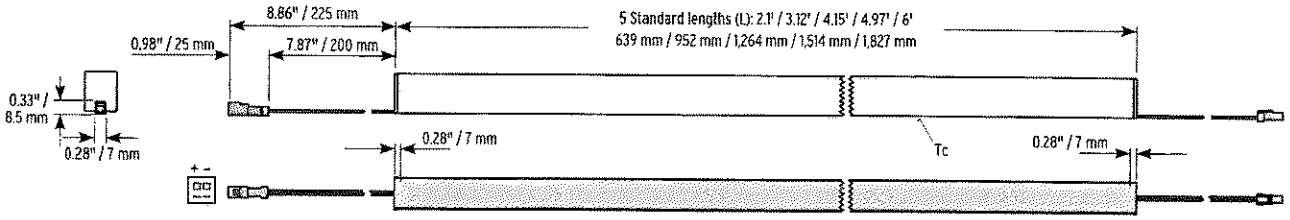
Fixture A3

Project name

Fixture type | Phase

Specifier | Date

Dimensions & available lengths



Opal encapsulated LED light line
Finish: White powder coated

Tc-point (Case temp.) on the rear side of the module

Electrical & output data

Voltage	24 Volt (23 V_{min}, 25 V_{max})
Temperature[2]	Tc_{min} = -13°F / -25°C, Tc_{max} (Table below)
Storage temperature	Ts_{min} = -22°F / -30°C, Ts_{max} = 185°F / 85°C
Ambient temperature	Ta_{min} = -13°F / -25°C, Ta_{max} = 104°F / 40°C
CRI	up to 95
R9	up to 65

ADONIS HYDRA	HD6	HD10	HD15	HD25
Power (W/ft / W/m)[1]	1.8 / 6	3.1 / 10	4.6 / 15	7.6 / 25
Efficacy (lm / W)[1] @ W850	62	62	67	65
max. serial run length (ft / m)	16.4 / 5	16.4 / 5	13.1 / 4	9.8 / 3
Temperature Tc-point (Tc_{max})[2]	158°F / 70°C	158°F / 70°C	158°F / 70°C	167°F / 75°C

Color temperature LED tape used[3]			Color temperature delivered finished fixture		HD6 low output	HD10	HD15	HD25 high output
					lumen/feet (lm/ft)[1] lumen/meter (lm/m)[1]			
W820		2000 K	2400 K		66 / 220	109 / 360	176 / 580	286 / 940
W822		2200 K	2700 K		75 / 250	124 / 410	200 / 660	325 / 1070
W825		2500 K	3000 K		84 / 280	142 / 470	228 / 750	374 / 1230
W827	W927	2700 K	3500 K	3400 K	75 / [illegible]	127 / [illegible]	243 / 800	395 / 1300
W830	W930	3000 K	3900 K	3800 K	78 / [illegible]	130 / [illegible]	258 / 850	420 / 1380
W835	W935	3500 K	4600 K	4400 K	78 / [illegible]	133 / [illegible]	270 / 890	441 / 1450
W840	W940	4000 K	5500 K	5600 K	81 / [illegible]	136 / [illegible]	276 / 910	450 / 1480
W850		5000 K	7200 K		112 / 370	188 / 620	304 / 1000	493 / 1620

ONE BIN ONLY

Lifetime
L80/B10 > 60,000 h

LM 79 compliant

LM 80 compliant

UV protected

Resistant to solvents

Saltwater resistant

Temporary immersion protection

Impact resistant (suitable for walk over)

[1] The given data are typical values. Due to tolerances of the production process and the electrical components, values for light output and electrical power can vary up to 10%.

[2] The Tc-point should be measured in thermal equilibrium according to IEC EN 60598-1.

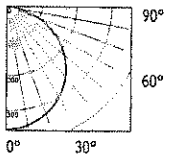
[3] In case of IP67 products, tolerances in the color temperature can occur. For further explantation, please see specification catalogue 2016/2017.

Safety and assembly information please see specification catalogue 2016/2017.

Order code

Please click here to configure your fixture online

Your order code	ADONIS HYDRA	HD__	W_	__	____	IP67
Order code example	ADONIS HYDRA	HD10	W9	27	1514	IP67



DIN 5040:A40
cd/1.000 lumen
C0/C180 ——
C90/C270 •••••••

LED tape
HYDRA HD6 ..... HD6
HYDRA HD10 ..... HD10
HYDRA HD15 ..... HD15
HYDRA HD25 ..... HD25

Color rendering
> 80 8
> 90 (only HD6, HD10) 9

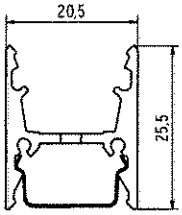
Color temperature delivered finished fixture	Color temperature LED tape used	
2400 K	2000 K	20
2700 K	2200 K	22
3000 K	2500 K	25
3500 K 3400 K	2700 K	27
3900 K 3800 K	3000 K	30
4600 K 4400 K	3500 K	35
5500 K 5600 K	4000 K	40
7200 K	5000 K	50

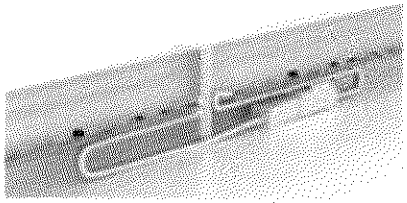
Length
2.1' (639 mm) (2 clips recommended) 0639
3.12' (952 mm) (2 clips recommended) 0952
4.15' (1,264 mm) (3 clips recommended) 1264
4.97' (1,514 mm) (3 clips recommended) 1514
6' (1,827 mm) (4 clips recommended) 1827

Ingress protection
IP67 ..... IP67

Please choose your accessories

Mounting	Art.-#
☐ Mounting clip for VarioContour 010 (required every 1.31' / 40 cm)	13000104
☐ Contour 010 Adjustable Wall Mount Set	13000165
☐ Mounting Lock[4] (for vertical mounting)	13000192





Easy and clean installation due to internal mounting clips. ADONIS / KALYPSO H-channel also acts as cable raceway. Therefore you do not see any clips or cables from the outside.

[4] The mounting lock is used to fix the sliding mounting clips, thus allowing a vertical wall mounting.

[5] Required for IP67 connector sealing at end of runs.

Extensions / Jumpers (optional)	Art.-#
☐ VarioCon Female Mini 2 x 0.0005 sqin / 0.34 mm² 6.56' / 2 m IP67	15000142
☐ VarioCon Extension Mini 2 x 0.0005 sqin / 0.34 mm² 0.33' / 0.1 m IP67	15000143
☐ VarioCon Female Mini Protection Cap Mono IP67[5]	15000218

Recommended driver

☐ MEAN WELL HLG-100H-24A

Recommended control

☐ EldoLED LINEARdrive DC 180D

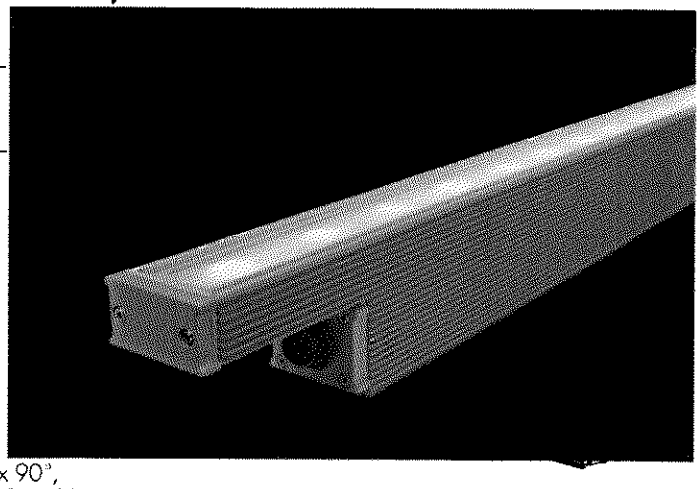
For further driver options including LUTRON click here.

Specification Sheet

lumenfacade™

WHITE & STATIC COLORS

Fixture A4



Client _____

Order#_____ **Type** _____

FEATURES AND BENEFITS

Physical :

- Low copper content extruded aluminum housing
- Available in 1', 2', 3' or 4' sections
- Electro-statically applied polyester powder coat finish
- Machined aluminum end caps and silicone gaskets
- Stainless steel hardware
- Clear tempered glass lens
- Asymmetric wallwash, 8° x 8°, 10° x 10°, 10° x 30°, 10° x 60°, 10° x 90°, 15° x 25°, 30° x 30°, 30° x 60°, 35° x 35°, 50° x 80°, 60° x 60°, 80° x 80°, or 90° x 90° optics
- IP66
- IK07 rated (asymmetric wallwash lens is IK06 rated)
- Meets 3G ANSI C136.31 Vibration standard for bridge applications
- Corrosion-resistant coating for hostile environments[2]

Performance :

- 2200K, 2700K, 3000K, 3500K, 4000K, Red, Green, Blue static colors available
- CRI value: 80+
- Minimum 1fc (10.7 lux) @ 140ft (43m) distance (HO 4000K, 4' unit, 10° x 60° optic)
- Lumen maintenance: 120,000 hrs [L70 @ 25°C]
- Lumen measurements comply with LM - 79 - 08 standard
- Resolution per foot or per fixture (configured with LumenID V3 software & DMX/RDM)
- Operating temperatures: -25° C to 50° C [-13F to 122F]

Electrical :

- Line voltage luminaire for 100 to 277V
- Power and data in 1 cable (#16-5)
- End-to-end option (ETE): 16" black input cable, no jumper cable needed
- 252ft [77m] maximum cable and fixture run length, non-dimming, 277V, RO version
- 164ft [50m] maximum cable and fixture run length, non-dimming, 277V, HO version
- 5W/ft version meets ASHRAE standards for linear lighting on building facades[3]
- 8.5W/ft Regular Output version[3]
- 15.25W/ft High Output version[3]
- Dimming options: Lumentalk, 0-10 volt, DALI, Lutron® EcoSystem® or DMX/RDM enabled

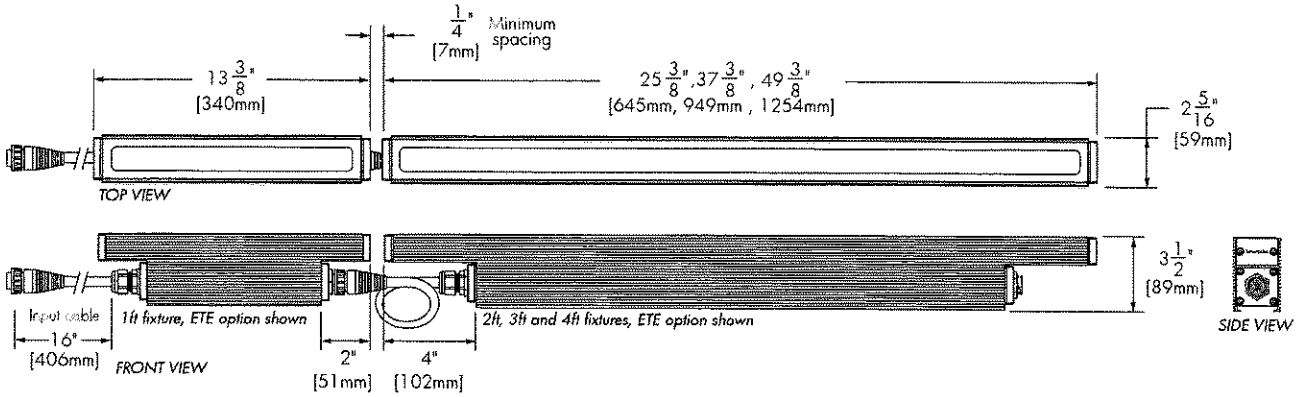
c UL us CE RoHS **IK07**[1]

lumentalk EcoSystem. Enabled

Photometric Summary

4ft HO, 4000K	Delivered Output [lm]	Intensity [peak cd]
WW	3,592	5,159
8°x8°	4,045	77,896
10°x10°	3,768*	38,346*
10°x30°	3,830	30,056
10°x60°	3,692	19,654
10°x90°	3,576	7,897
30°x30°	3,765	14,726
30°x60°	3,862*	5,119*
60°x60°	3,447*	3,015*
90°x90°	3,592	1,886

Photometric performance is measured in compliance with IESNA LM-79-08.
*Estimated. Consult Lumenpulse website for the latest IES and LDT files.



[1] Asymmetric wallwash lens is IK06 rated.
[2] Use only when exposed to salt spray and harsh chemicals. This option is not required for normal outdoor exposure!
[3] ASHRAE version not available for 1' fixture lengths. Power consumption is typically 20% higher for 1' fixture lengths.

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Specification Sheet

lumenfacade™

WHITE & STATIC COLORS

HOW TO ORDER

LOG Select:	Select:	Select:	Select:	Select:	Select:	Select:	Select:	Select:
1	2	3	4	5	6	7	8	9

1

Housing:

LOG ASHRAE - lumenfacade™, 5W/ft ASHRAE compliant[1]
LOG RO - lumenfacade™ Regular Output, 8.5W/ft
LOG HO - lumenfacade™ High Output, 15.25W/ft

2

Voltage:

100 - 100 volts
120 - 120 volts
208 - 208 volts
220 - 220 volts
240 - 240 volts
277 - 277 volts

3

Length:

12 - 13 3/8 inches (340mm) (2 kg/4.5 lbs)
24 - 25 3/8 inches (645mm) (3.17 kg/7 lbs)
36 - 37 3/8 inches (949mm) (4.75 kg/10.5 lbs)
48 - 49 3/8 inches (1254mm) (6.35 kg/14 lbs)

4

Colors and Color temperatures:

22K - 2200K
27K - 2700K
30K - 3000K
35K - 3500K
40K - 4000K
RD - Red
GR - Green
BL - Blue

Consult factory for availability of static Royal Blue, 6500K and 90+ CRI.

5

Optics:

Asymmetric

WWLF - Asymmetric Wallwash optic, left feed[2]
WWRF - Asymmetric Wallwash optic, right feed[2]

Symmetric

8x8 - 8° x 8°[3]
10x10 - 10° x 10°[3]
30x30 - 30° x 30°
35x35 - 35° x 35°
60x60 - 60° x 60°
80x80 - 80° x 80°
90x90 - 90° x 90°

Bi-symmetric

10x30 - 10° x 30°
10x60 - 10° x 60°
10x90 - 10° x 90°
15x25 - 15° x 25°
30x60 - 30° x 60°
50x80 - 50° x 80°

6

Mounting Option:

SAM - Slim Adjustable Mounting
UMP - Fixed Mounting[4]
UMAS - Universal Adjustable Mounting[4]
WAM2 - Adjustable Wall Mounting 2"
WAM6 - Adjustable Extended Arm Mounting 6"
WAM12 - Adjustable Extended Arm Mounting 12"
WAM18 - Adjustable Extended Arm Mounting 18"

7

Finish:

BK - Black Sandtex
BRZ - Bronze Sandtex
SI - Silver Sandtex
WH - Smooth white
CC - Custom color and finish (please specify RAL color)[5]

8

Control:

NO - No Dimming
LT - Lumentalk Dimming[6]
DIM - 0-10V Dimming option[7]
DALI - DALI Dimming option[8]
ES - Lutron® EcoSystem® Enabled Dimming[9]
DMX/RDM - DMX/RDM enabled[10]

9

Option:

ETE - End - to - end configuration, 16" black input cable, no jumper cable needed
CRC - Corrosion-resistant coating for hostile environments
3GV - 3G ANSI C136.31 Vibration Rating[11]
CE - CE (certification covers European Economic Area)

SPL - QUICK CONNECT

Notes:

[1] Not available for 1' [0.3m] fixture lengths. [2] Right feeding side is standard unless otherwise specified. [3] For best results use with HO fixtures at a 6-inch (15cm) setback from surface. Contact factory for application support. [4] Suitable to use when **3GV** option is specified. [5] North American RAL colors specified with RAL number only are provided with a smooth/high-gloss finish. Please consult factory for other RAL textures and glosses, or to match alternate color charts. Final color matching results may vary. [6] Lumentalk system is enabled with LDB accessory for 1' [0.3m] fixture lengths, see Typical Wiring Diagrams pages for details. 1% minimum dimming value. [7] 10% minimum dimming value. Current Sink: 3mA/fixture, Current Source: 0.5mA/fixture. [8] 1% minimum dimming value. 1 DALI address per fixture. [9] Available for 2' RO [0.6m], 3' [0.9m] and 4' [1.2m] fixture lengths only. 1% minimum dimming value. 1 EcoSystem® address per fixture length. [10] 1% minimum dimming value. Fixtures set to by fixture resolution. 1 DMX address per fixture. [11] Available with **UMP** and **UMAS** mounting options only.

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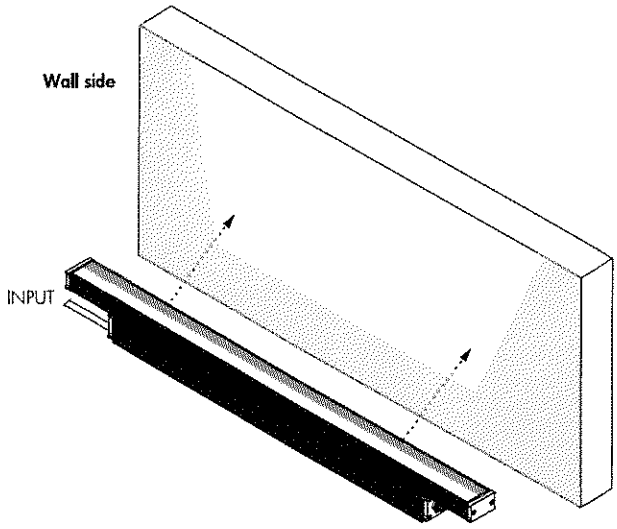
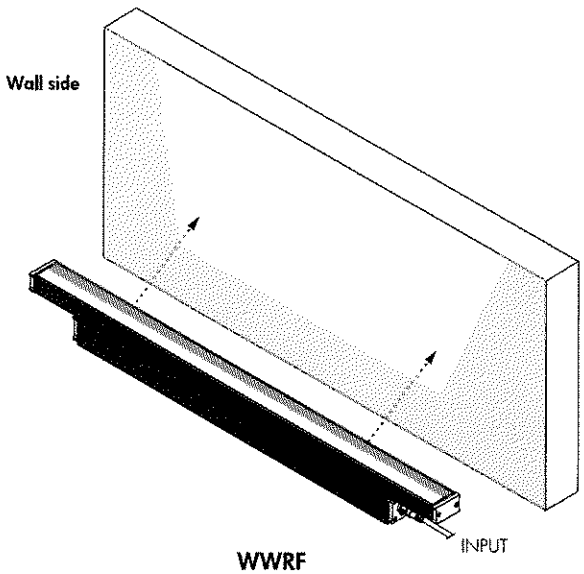
ASYMMETRIC WALLWASH OPTIC FEEDING SIDE DETAIL

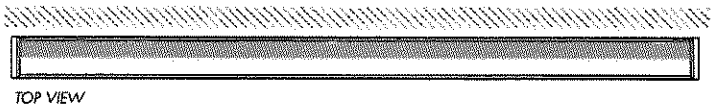


WWLF
Asymmetric Wallwash Optic, Left Feed

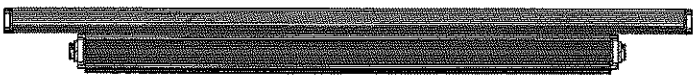


WWRF
Asymmetric Wallwash Optic, Right Feed

Always position frosted side toward the wall



TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW
(Fixture pointing upwards)

*Fixture's feeding side is based on uplight installations. Feeding sides are reversed when fixture is used in a downlight application.

Recommended setback from wall is 1/10 of the wall height.

Example: 2ft [0.6m] setback for a 20ft [6m] wall.

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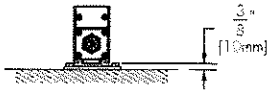
MOUNTING OPTIONS

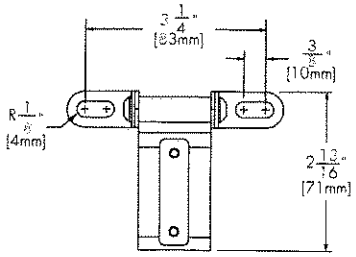
Surface Mount

SAM
Slim Adjustable Mounting



UMP
Fixed Mounting





SAM
Mounting Hole Pattern

Wall Mount

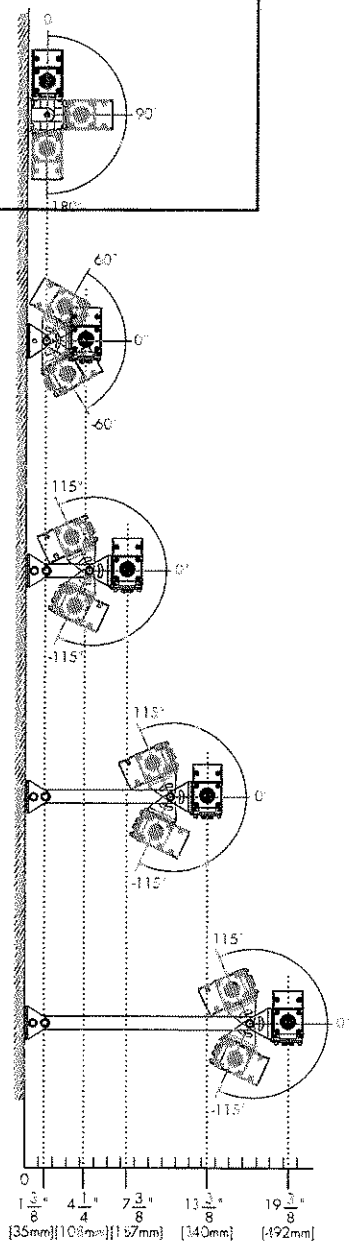
UMAS
Universal Adjustable Mounting

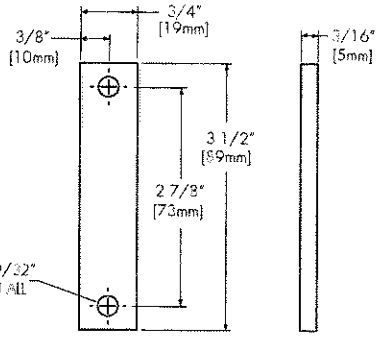
WAM2
Adjustable Wall Mounting 2"

WAM6
Adjustable Extended Arm Mounting 6"

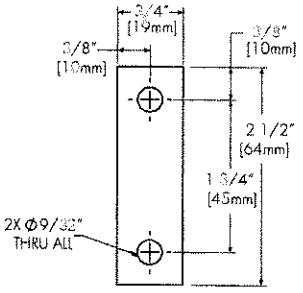
WAM12
Adjustable Extended Arm Mounting 12"

WAM18
Adjustable Extended Arm Mounting 18"

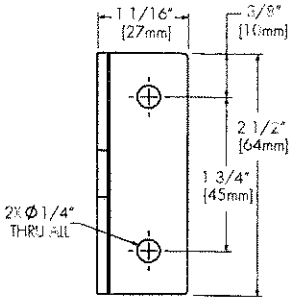




UMP
Mounting Hole Pattern



UMAS
Mounting Hole Pattern



WAM
Mounting Hole Pattern

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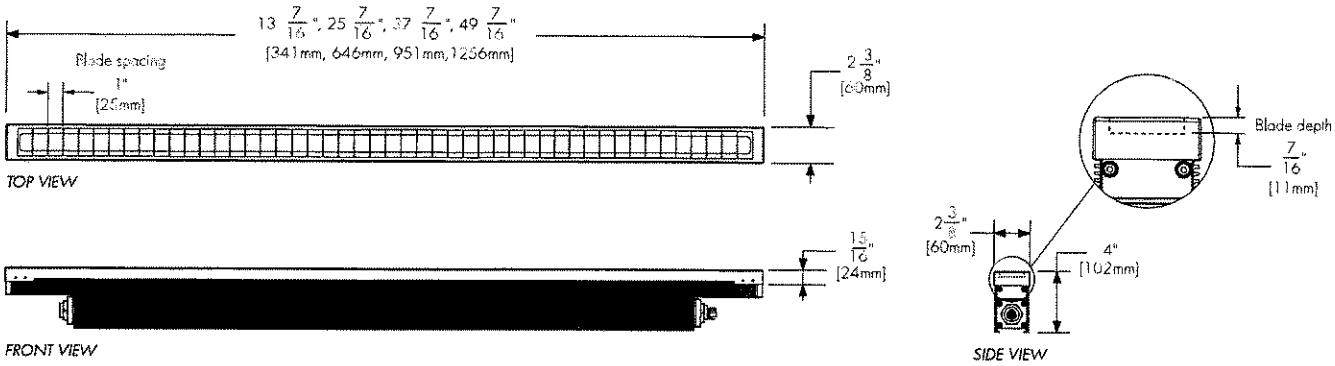
LOUVER ACCESSORY INSTALLATION DETAIL

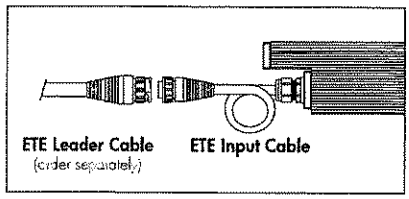
Not suitable for asymmetric wallwash optic



LOGRD
Radial Louver for Lumenfacade
(See page 6 for ordering code)

OPTION

ETE - End-to-end configuration, 16" black input cable, no jumper cable needed.



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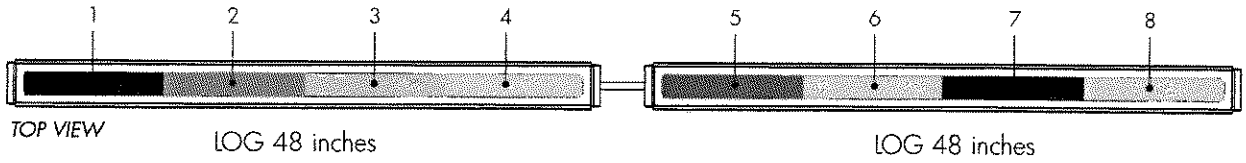
RESOLUTION DETAILS

Applicable for DMX/RDM control option only.
Fixture resolution can be configured on-site within the LumenID V3 software. A DMX/RDM enabled CBX is required.

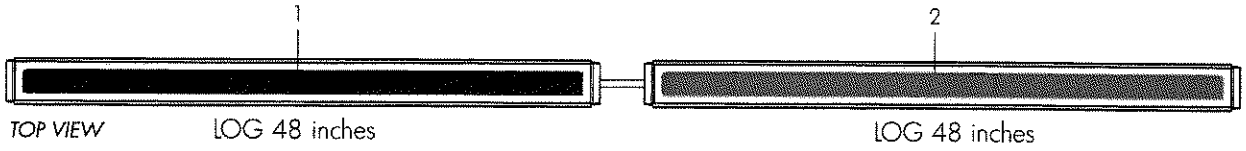
Resolution per foot: each foot is addressed independently

DMX ADDRESSES:



Resolution per fixture: each fixture is addressed independently

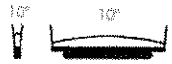
DMX ADDRESSES:



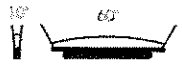
Optics:

10x10 - 10° x 10°

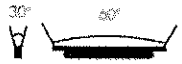
*For best results use with HO fixtures at a 6-inch (15cm) setback from surface. Contact factory for application support.



10x60 - 10° x 60°



30x60 - 30° x 60°



60x60 - 60° x 60°



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H3K 1G6

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MAINE MEDICAL CENTER LEVEL III SITE PLAN APPLICATION H

CONGRESS ST PATIENT TOWER

EVIDENCE OF FINANCIAL & TECHINICAL CAPACITY

The health care landscape has been in a state of change, particularly since the signing of the Affordable Care Act (ACA). Given the recent changes in the executive and legislative branches of the federal government and continued references to "repealing" the ACA, it is nearly impossible to anticipate the scope of future changes. Maine Medical Center's strategic financial plan assumes continued market basket increases at or near 3% annually. Additionally, the strategic financial plan assumes the following:

- Little or no increase in Medicare or Medicaid payments
- Stable payer mix
- No expansion to the Medicaid program
- Achievement of operational efficiencies based on analyses of national benchmark data
- Stable utilization of hospital services
- Continuation of provider-based billing at existing locations
- Stable levels of bad debt and charity care

Minor changes in the law or regulatory environment impacting these assumptions will likely not jeopardize the overall strategic financial plan. Substantive changes, however, will need to be monitored closely to ensure support of the project.

MMC is fully licensed and accredited, and has been providing services of this scale and scope for years.

Through multiple building projects throughout the history of the organization, MMC has demonstrated its ability to develop new and renovated facilities that meet all licensure and accreditation requirements.

The proposed project's program, and design, developed by a team of health care architects and engineers, and hospital physicians and staff, are in conformance with Guidelines for Design and Construction of Health Care Facilities, 2006 Edition, Facilities Guidelines Institute, (American Institute of Architects, Washington, DC, 2006) as required by the State of Maine Department of Health and Human Services' Division of Licensing and Regulatory Services. In addition, the guidelines for Design and Construction of Health Care Facilities, 2014 Edition, Facilities Guidelines Institute, (American Institute of Architects, Washington, DC, 2014) were also used in the proposed project's design.

HH

WRITTEN SUBMISSION 33– NOISE AND VIBRATION
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THERE ARE SMALL HVAC UNITS PROPOSED ON THE ROOF OF THE HIGH PORTION OF THE BUILDING, HOWEVER, THERE ARE NO NEARBY ADJACENT PROPERTIES . MOST OF THE MECHANICAL, EQUIPMENT WILL BE LOCATED IN THE BASEMENT, AND PROPOSED AREAWAYS ARE LOCATED AT THE REAR OF THE BUILDING.

MAINE MEDICAL CENTER LEVEL III SITE PLAN APPLICATION

I

CONGRESS ST PATIENT TOWER

EVIDENCE OF FINANCIAL & TECHINICAL CAPACITY

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Maine Medical Center
Bramhall Campus Environmental Graphics & Wayfinding Program

II

Site Submission
11.27.18

Leverage/

Response to City Comments and Recommendations

We appreciate the comments and direction offered by the City and have considered them. We believe the designs put forth the best approach for patients and families visiting MMC. Our overall design approach includes:

- Using existing sign foundations and locations (where possible)
- A 15% reduction in sign sizes from the current design
- Reduction in overall quantity of signs from the current system
- Better alignment with the MMC brand and architectural enhancements

City Comments and Recommendations (received Thursday, September 6, 2018)

- No signs will be permitted on properties not owned by MMC (e.g. 1b)
- There are concerns about sight line obstructions on several of the signs, including ST.1a, CS.2 and EG.1a.
- Please provide a sight line analysis (Included)
- There are concerns about the size of the signs in general. Could those proposed as 11' in height be brought to a more pedestrian scale (e.g 8'?) There are particular concerns about the size of 4a, which is replacing a much smaller sign and 6a. Both of these signs should be brought to a pedestrian scale
- Eliminate one of the signs marked 5.b and reduce the size of the remaining to the scale of the existing sign
- Please indicate dimensions of CS.1 and method of illumination. At first blush, this sign appears out of scale.
- The layout of EG.1a is inconsistent with the other signs of similar purpose (e.g.ST.3a). Is there a reason for this?

Masterplan Overview

01 Main Campus Signage
02 Congress Street Building Signage
03 Employee Garage Signage



Architectural Colors







50 YEAR PALETTE

Use of natural materials take clues from nature to create a timeless environment.









Brand Colors



Maine Medical Center
MaineHealth

Typeface: Humanist

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 !@#$%^&*()_+:”<>?

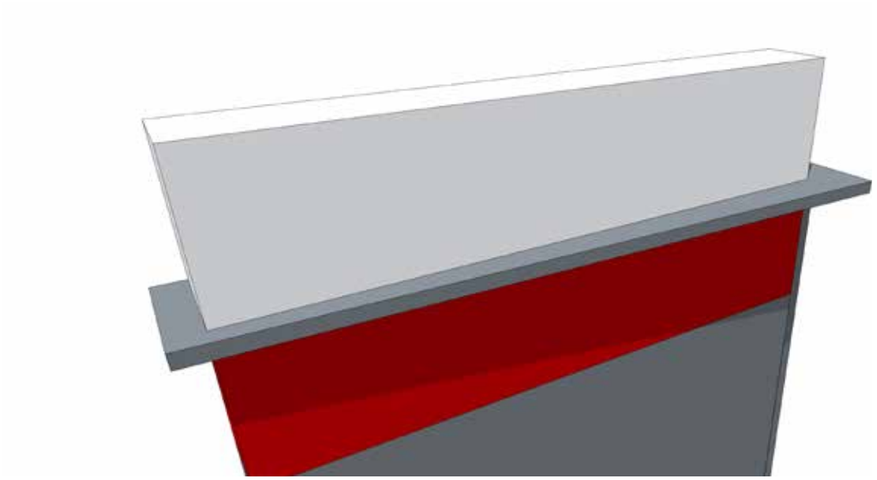
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 !@#$%^&*()_+:”<>?

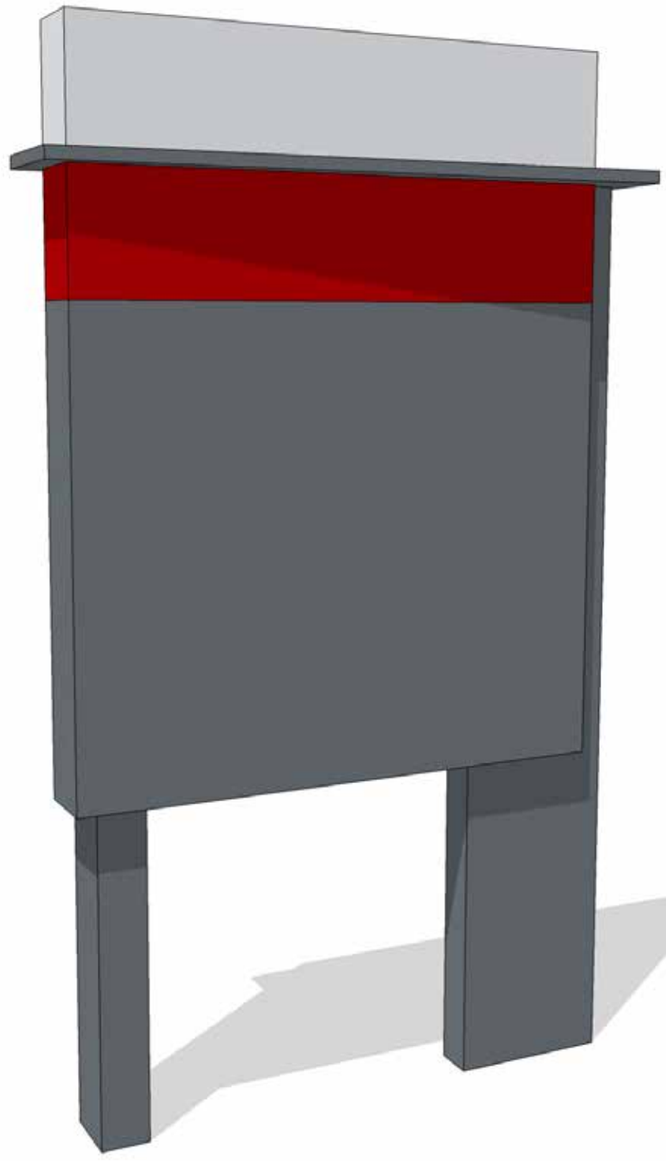
Typeface: Humanist Condensed

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A b c d e f g h i j k l m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 ! @ # $ % ^ & * ( ) _ + { } : " < > ?

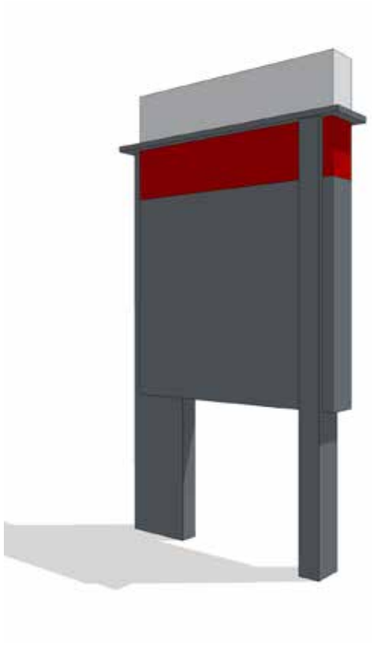
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A b c d e f g h i j k l m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 ! @ # $ % ^ & * ( ) _ + { } : " < > ?

Design Approach









01

Main Campus Signage

Existing Signage

















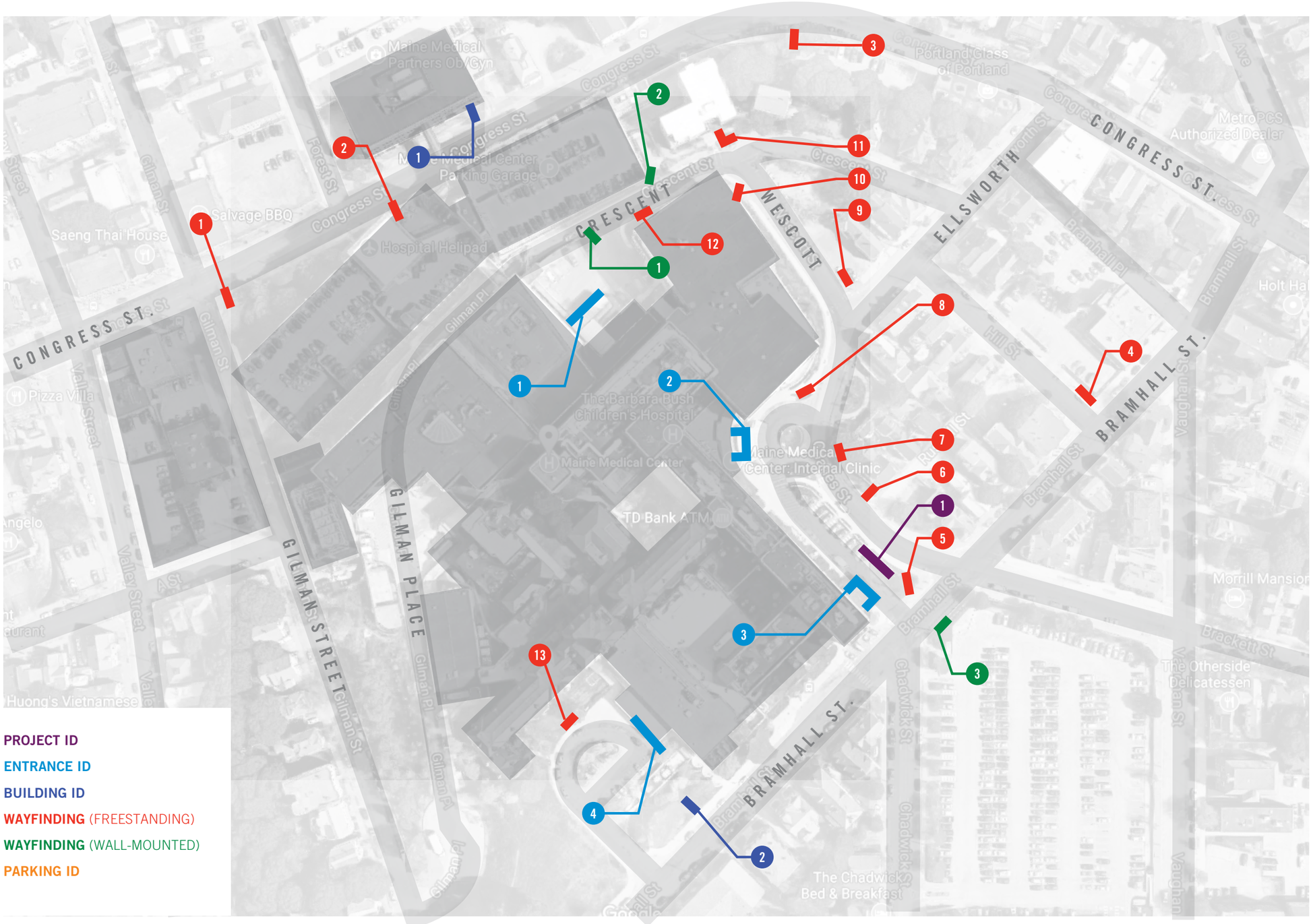




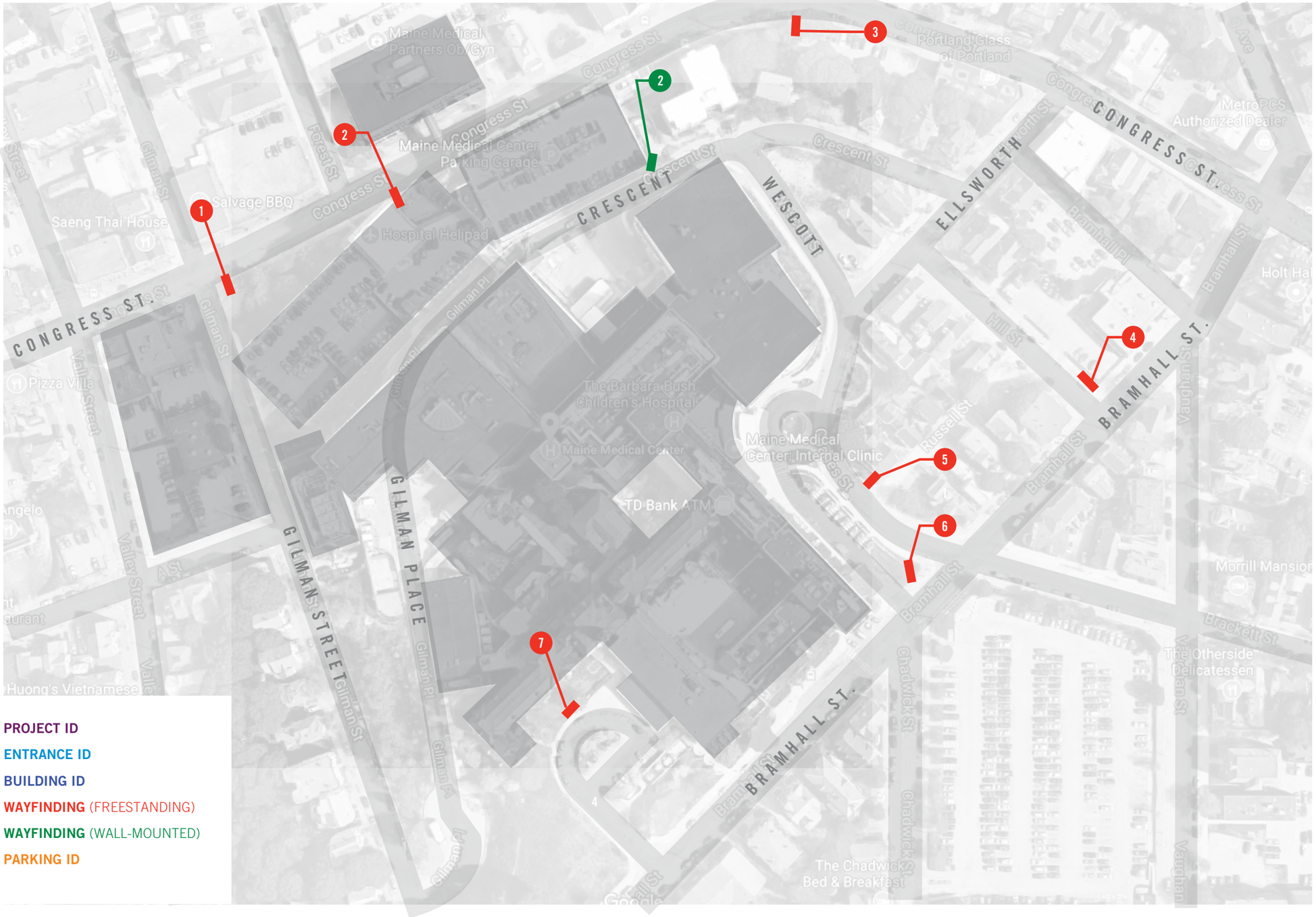




Existing Signage Location Plan



Demo Signage Elements



PROJECT ID

ENTRANCE ID

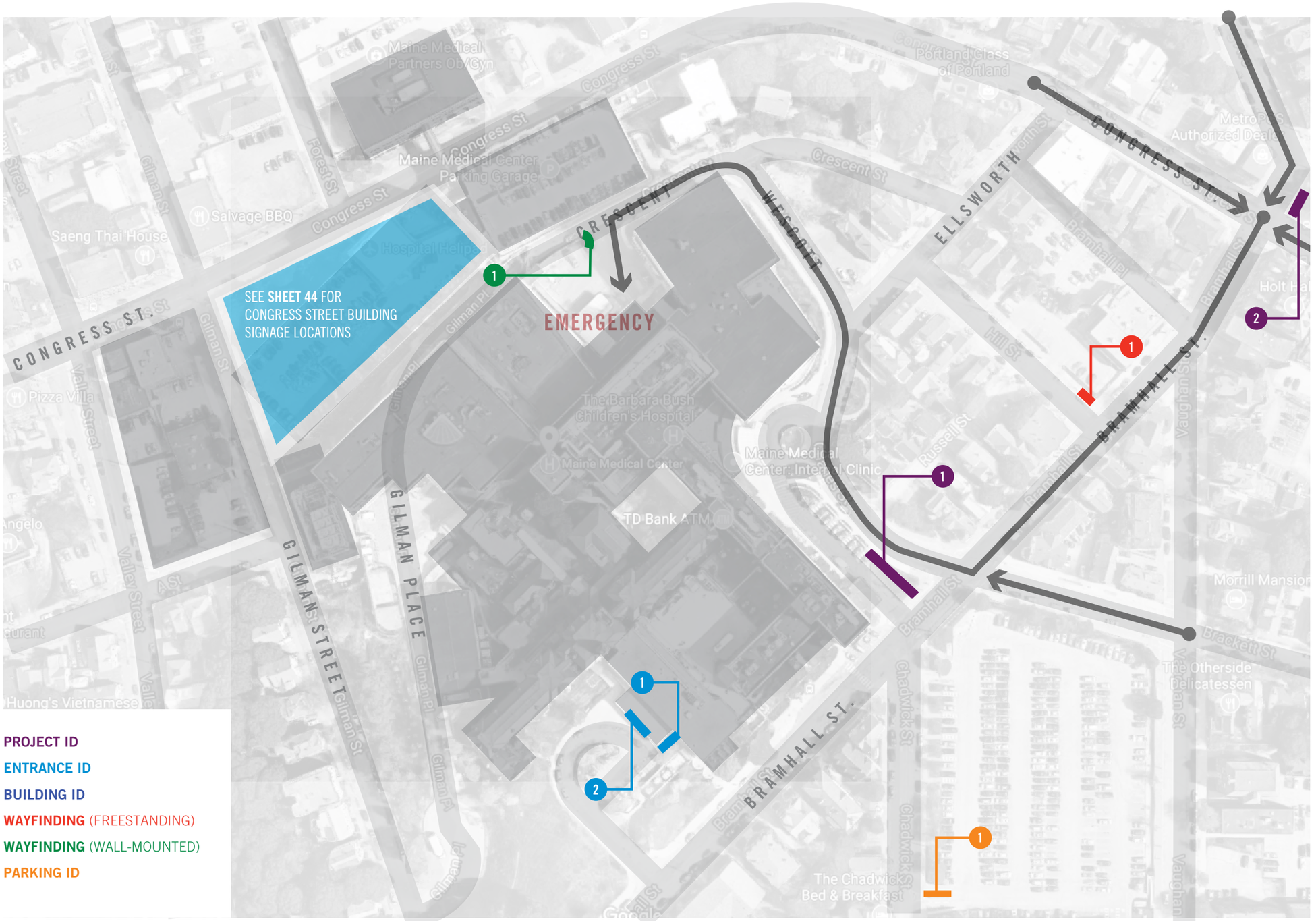
BUILDING ID

WAYFINDING (FREESTANDING)

WAYFINDING (WALL-MOUNTED)

PARKING ID

New Signage Elements



PROJECT ID

ENTRANCE ID

BUILDING ID

WAYFINDING (FREESTANDING)

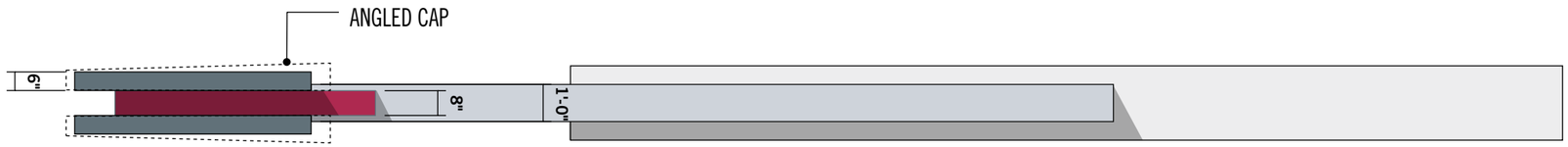
WAYFINDING (WALL-MOUNTED)

PARKING ID

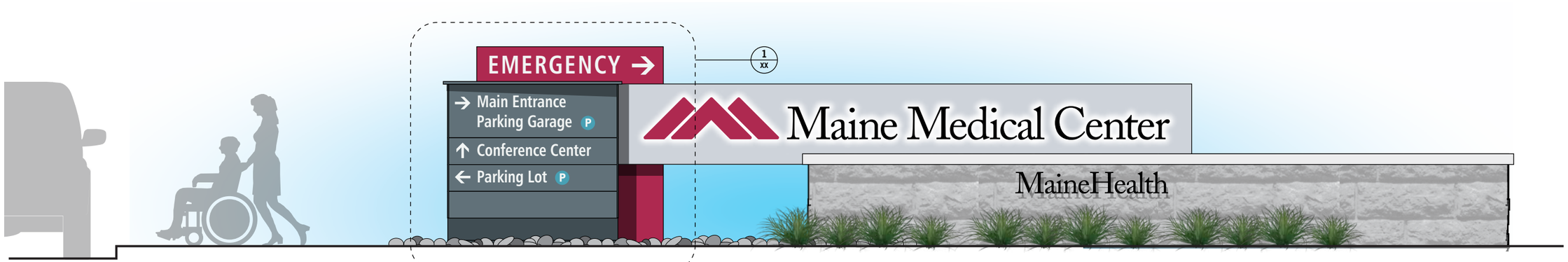
Preliminary Sign Location Plan



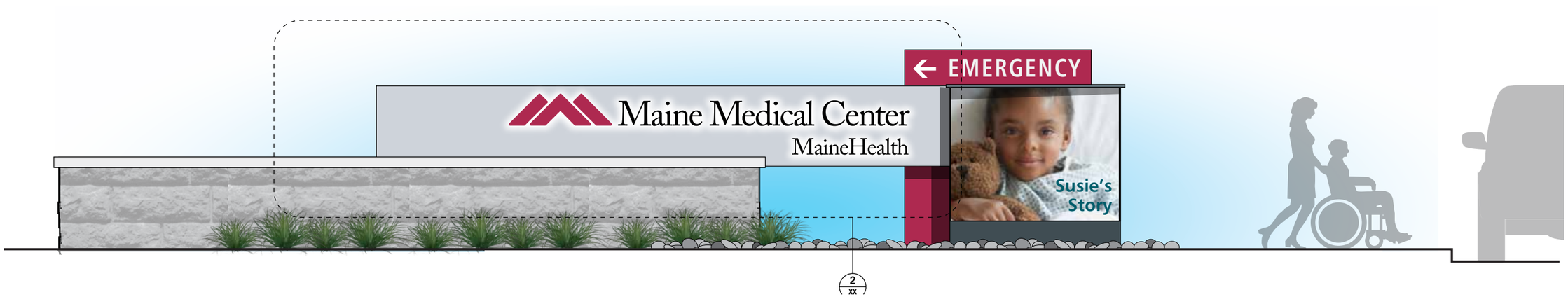
ST.1 Bramhall Gateway



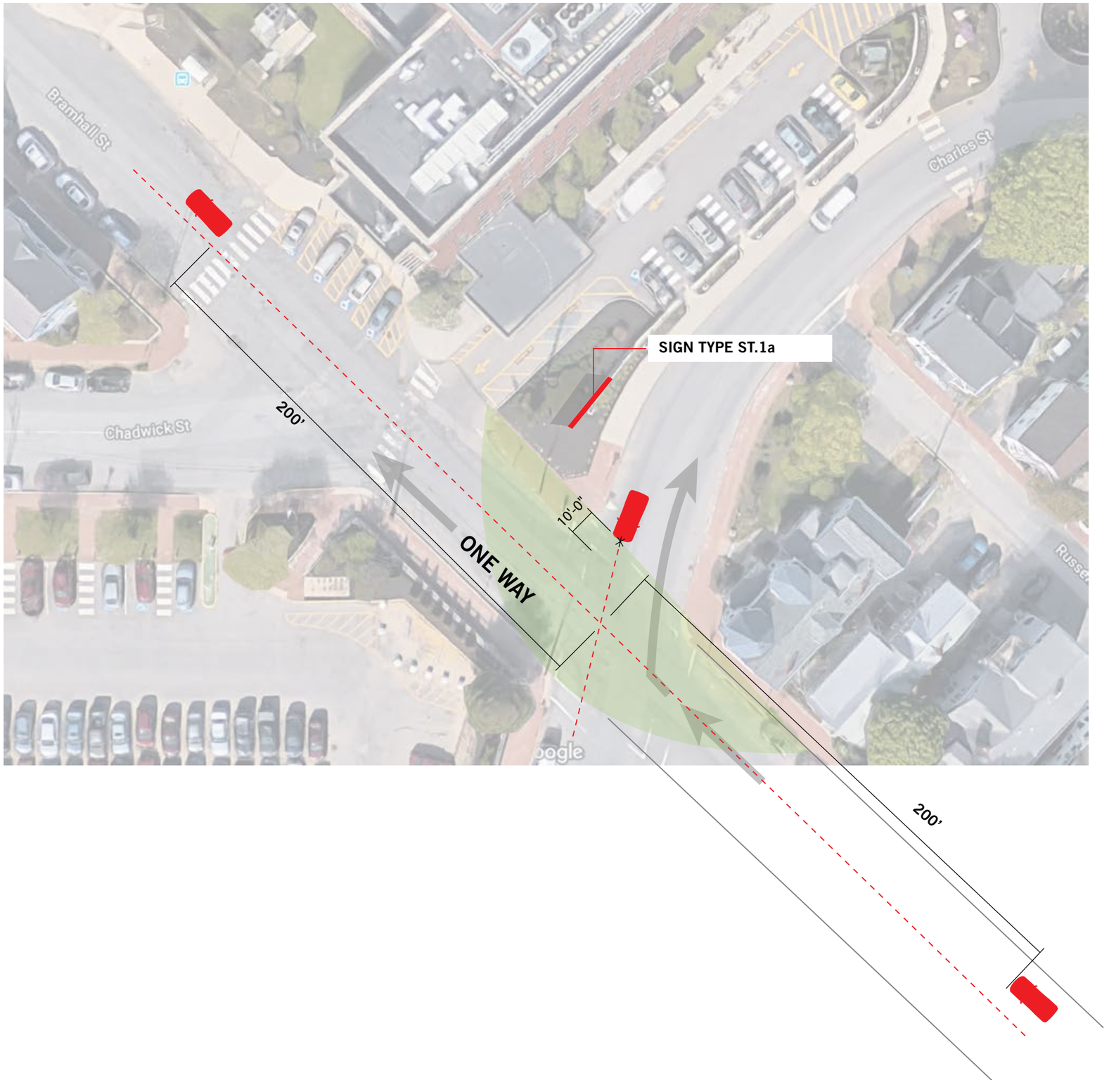
3 Plan
scale: 1/4" = 1' - 0"



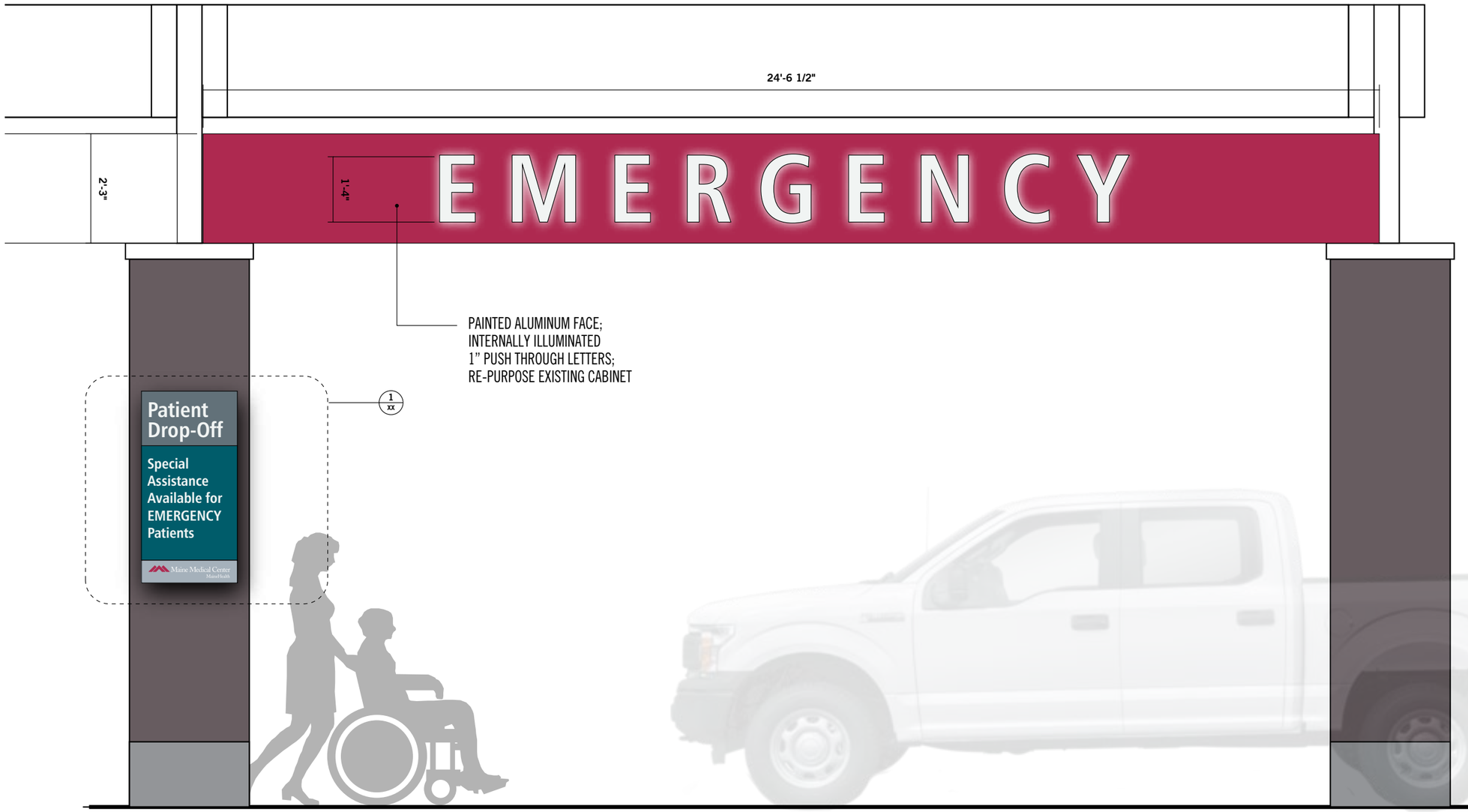
2 Elevation: Side A
scale: 1/4" = 1' - 0"



ST.1 Site Line Analysis

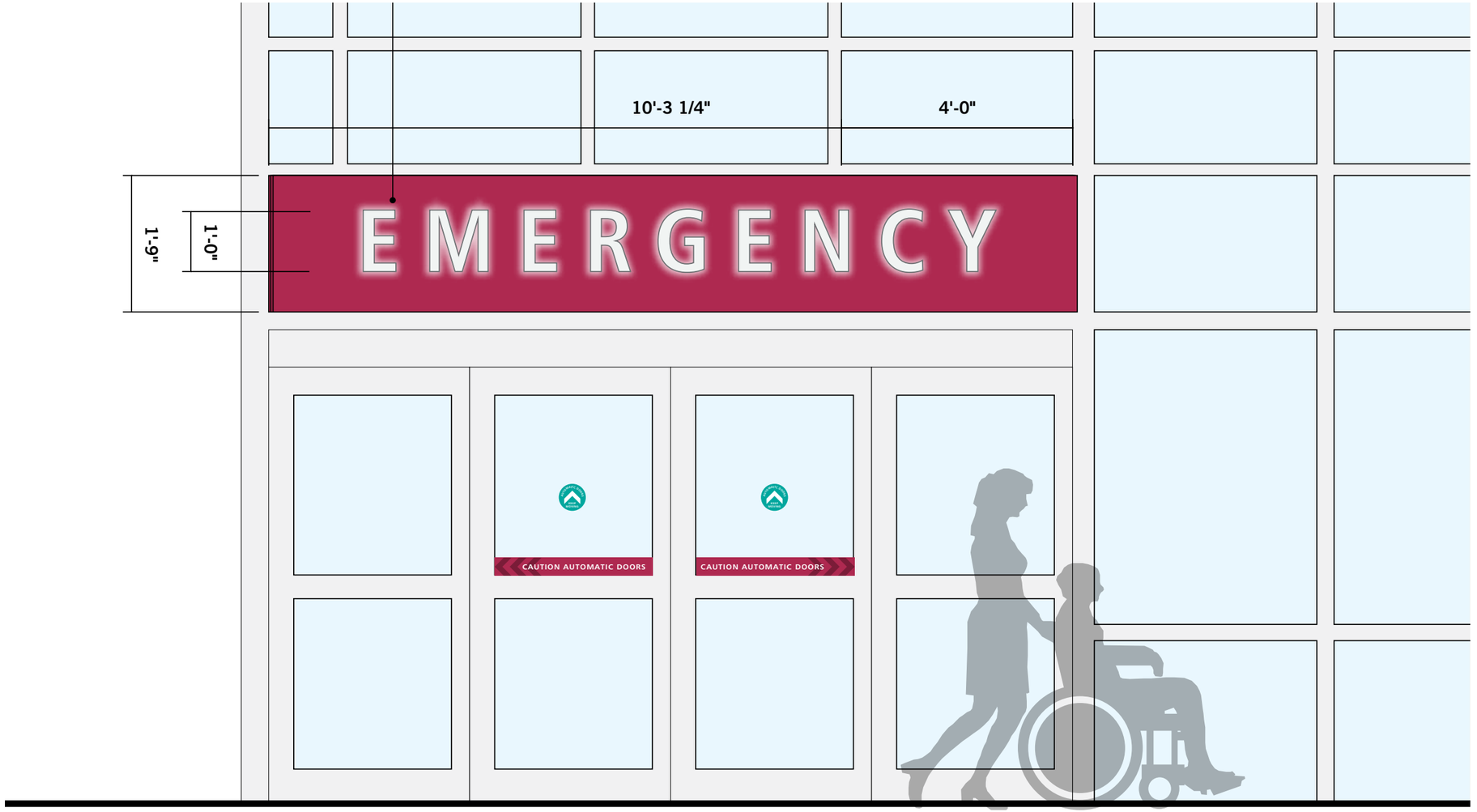


ST.2 Emergency Entry ID



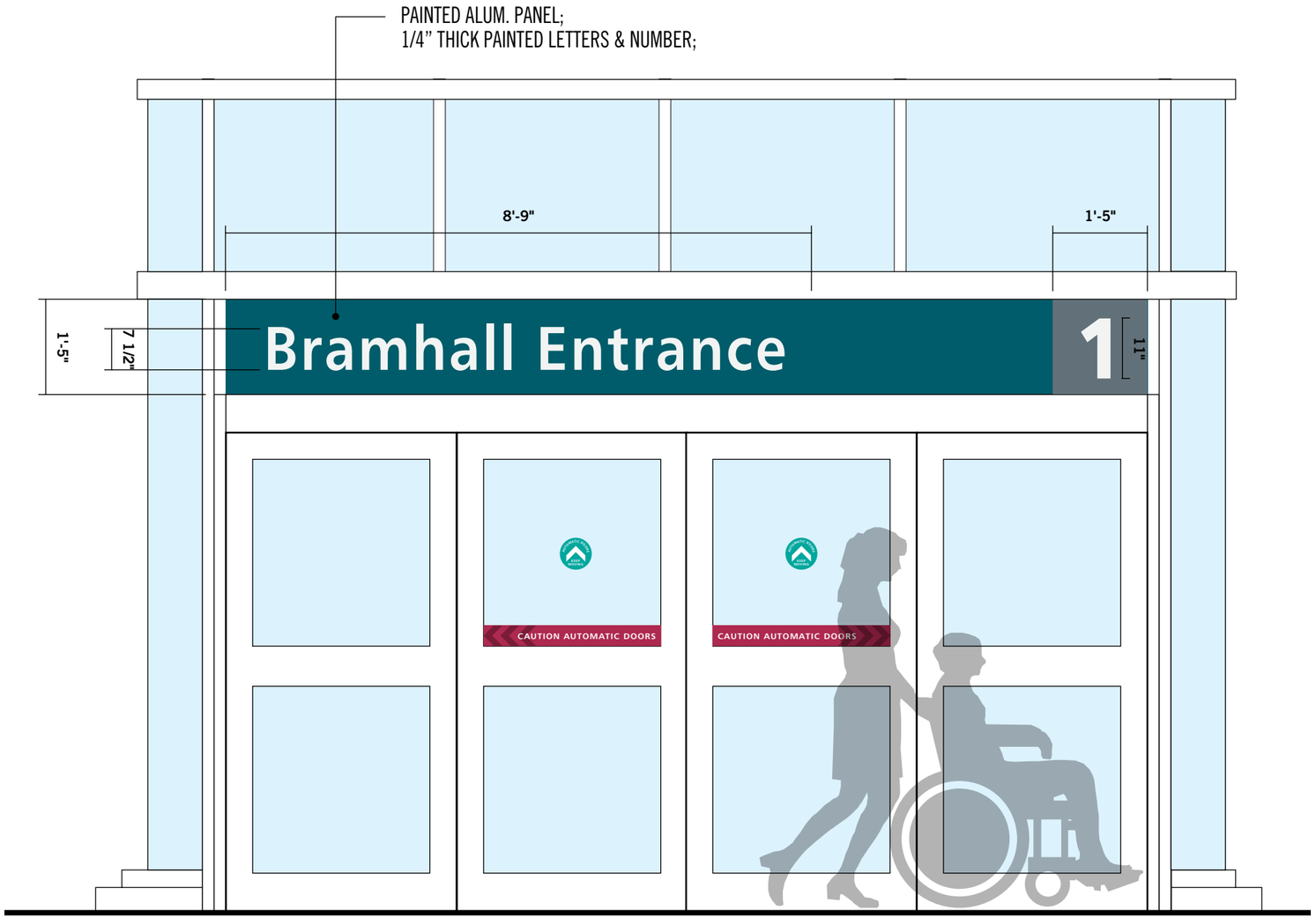
1 Elevation: ST.2b Canopy ID
scale: 1/2" = 1' - 0"

ST.2 Emergency Entry ID



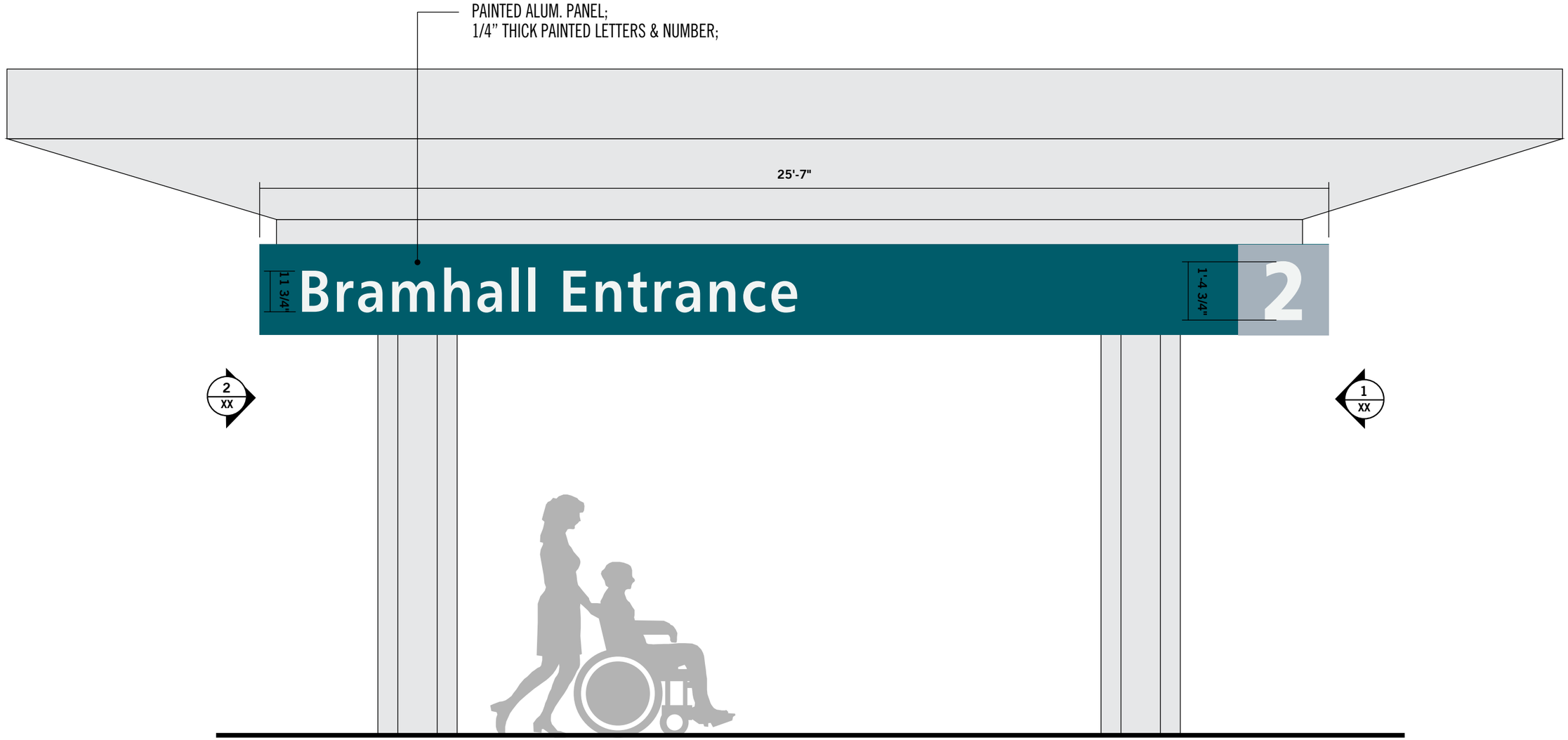
1 Elevation: ST.2a Entry ID
scale: 3/8” = 1’ - 0”

ST.3 Bramhall 1 Entry ID



1 Elevation
scale: 1/2" = 1' - 0"

ST.4 Bramhall 2 Entry ID



1 Elevation: Front
scale: 3/8" = 1' - 0"

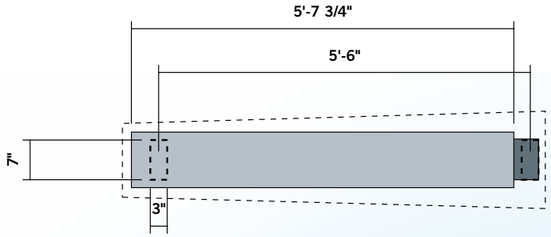
ST.5 Radiation Entry ID



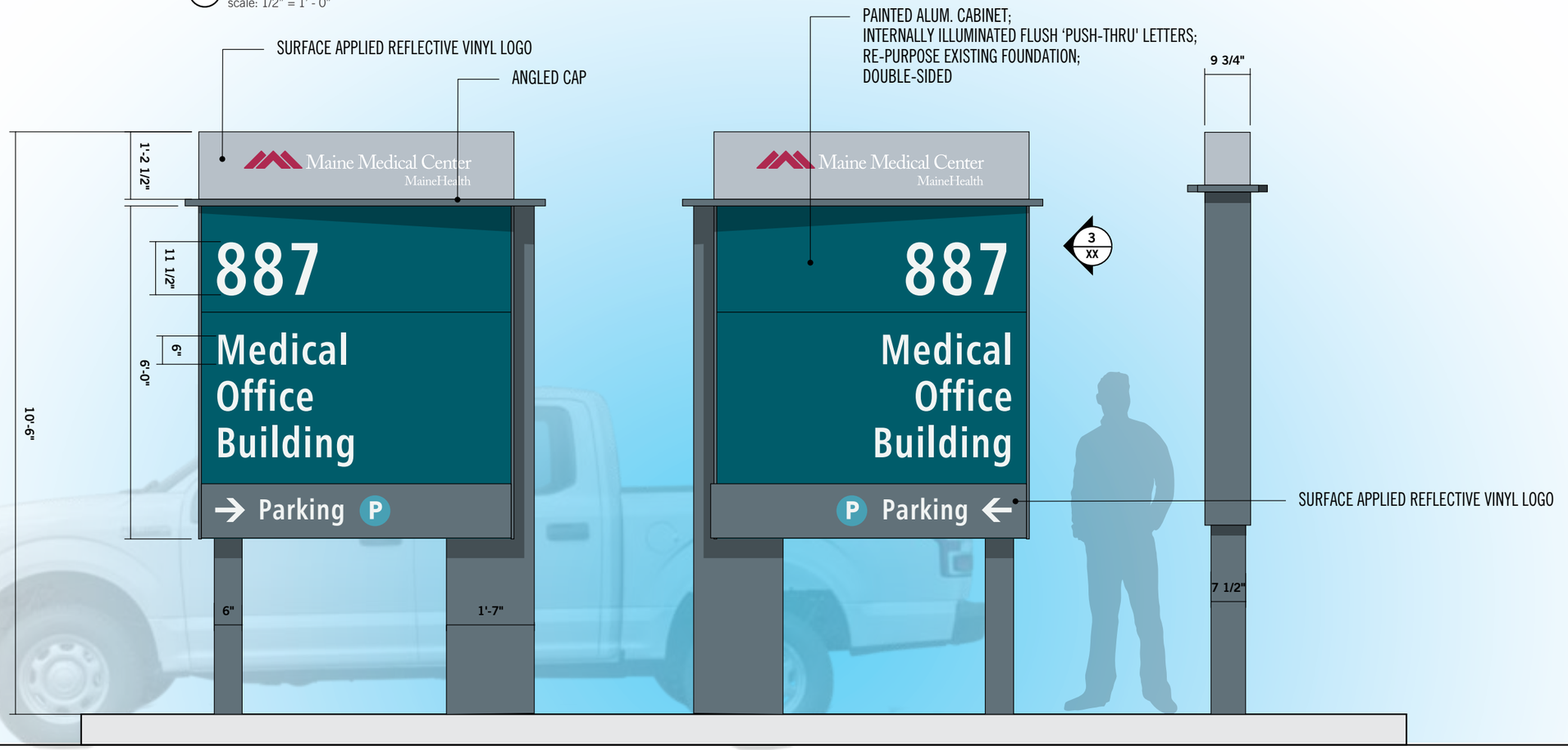
ST.6 Dana Conference Entry ID



ST.7 Vehicular Building ID



4 Plan
scale: 1/2" = 1' - 0"

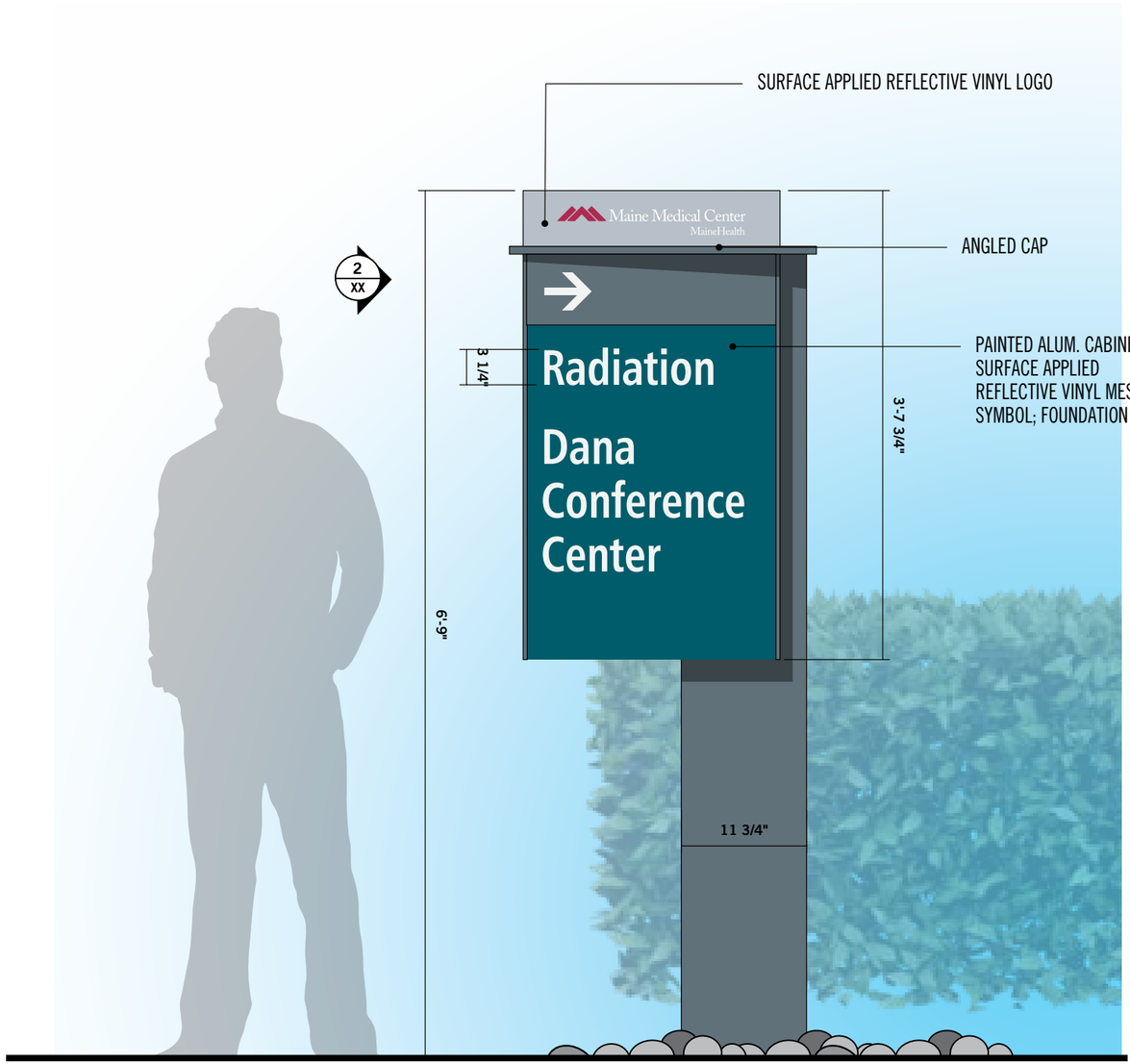


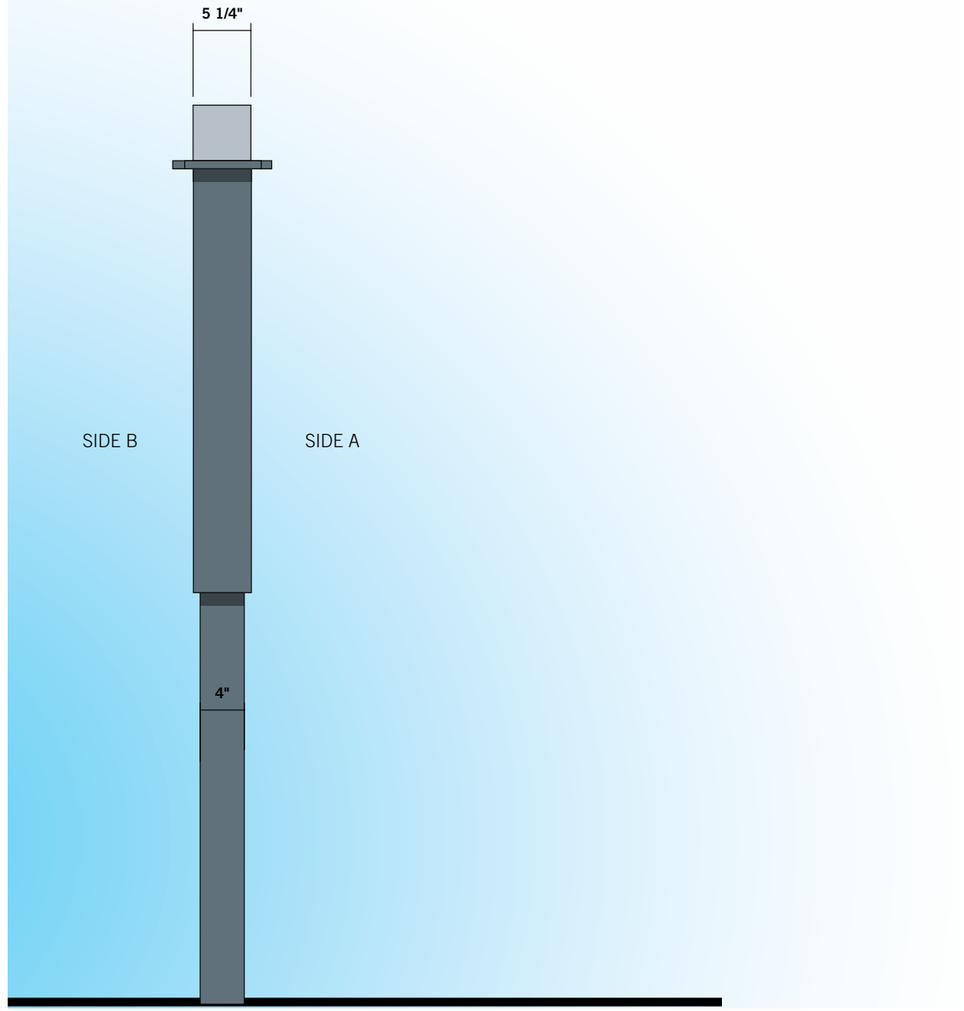
1 Elevation: Side A
scale: 1/2" = 1' - 0"

2 Elevation: Side B
scale: 1/2" = 1' - 0"

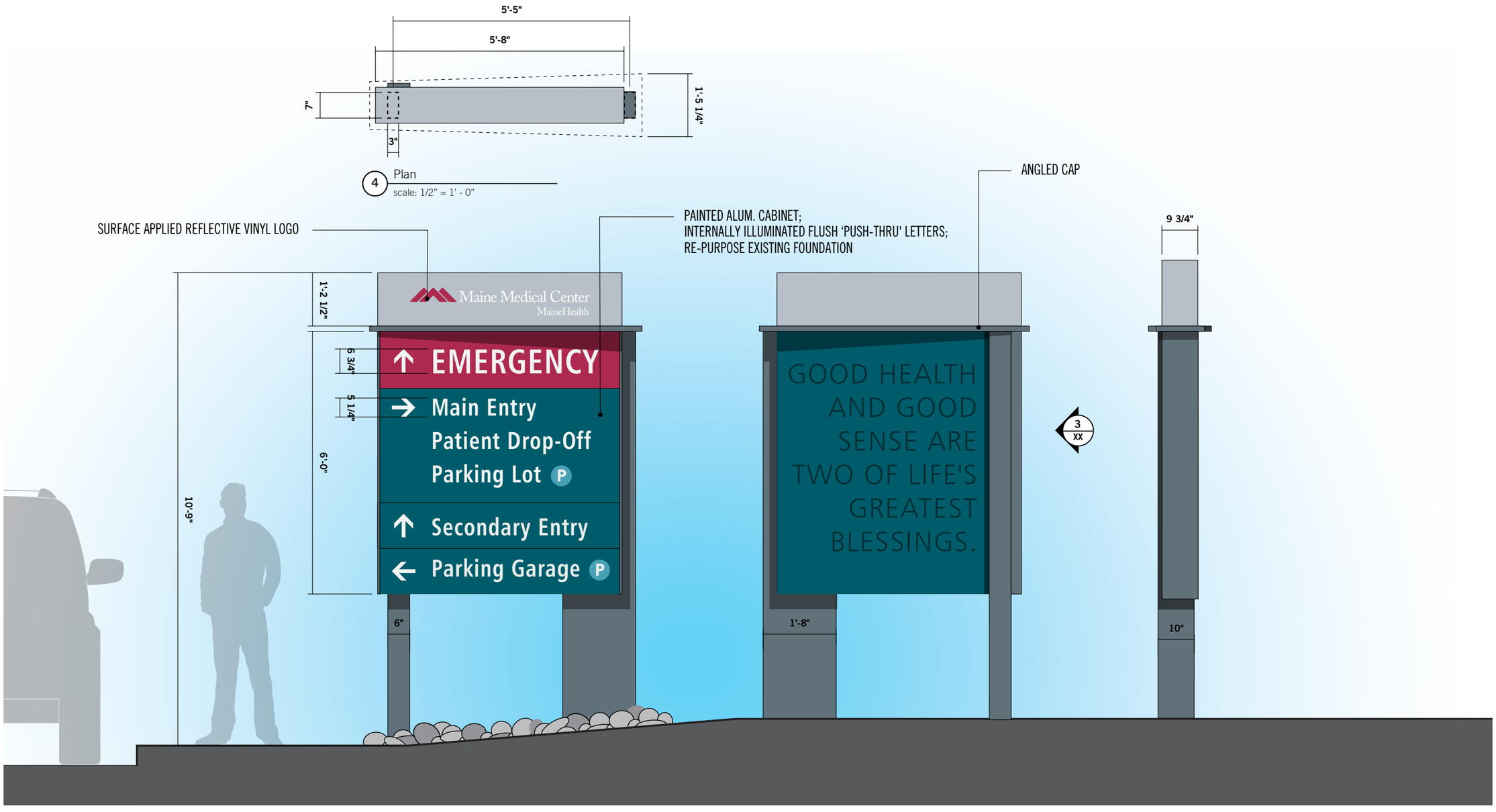
3 Elevation: Side View
scale: 1/4" = 1' - 0"

ST.8 Pedestrian Building ID





ST.9 Primary Vehicular Directional (Typical)



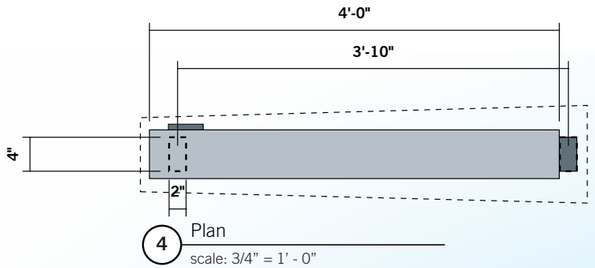
4 Plan
scale: 1/2" = 1' - 0"

1 Elevation: Front
scale: 1/2" = 1' - 0"

2 Elevation: Back
scale: 1/2" = 1' - 0"

3 Elevation: Side
scale: 1/4" = 1' - 0"

ST.10 Secondary Vehicular Directional



4 Plan
scale: 3/4" = 1' - 0"

SURFACE APPLIED REFLECTIVE VINYL LOGO

PAINTED ALUM. CABINET;
INTERNALLY ILLUMINATED FLUSH 'PUSH-THRU' LETTERS;
RE-PURPOSE EXISTING FOUNDATION

ANGLED CAP

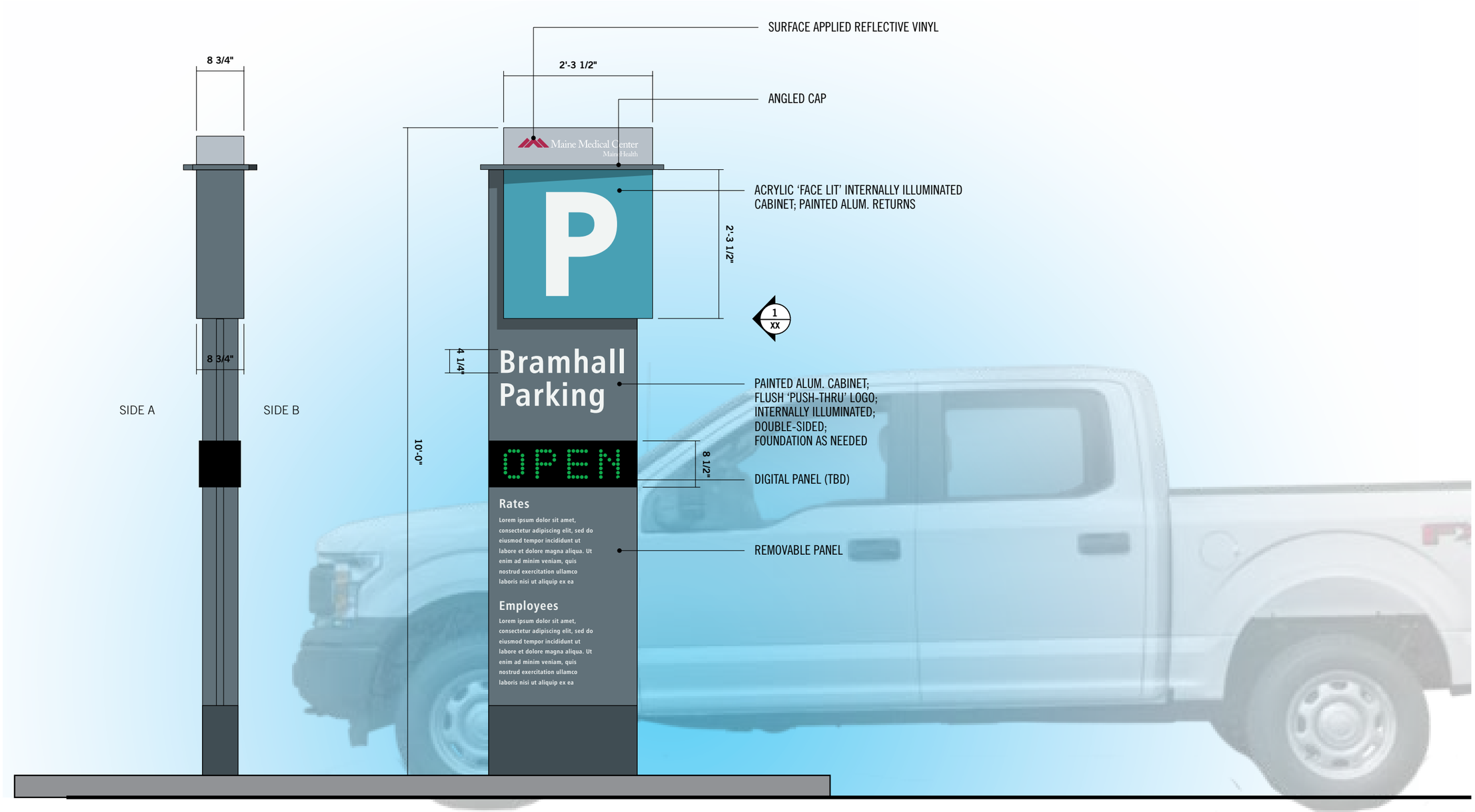


1 Elevation: Front
scale: 3/4" = 1' - 0"

2 Elevation: Back
scale: 3/4" = 1' - 0"

3 Elevation: Side
scale: 3/4" = 1' - 0"

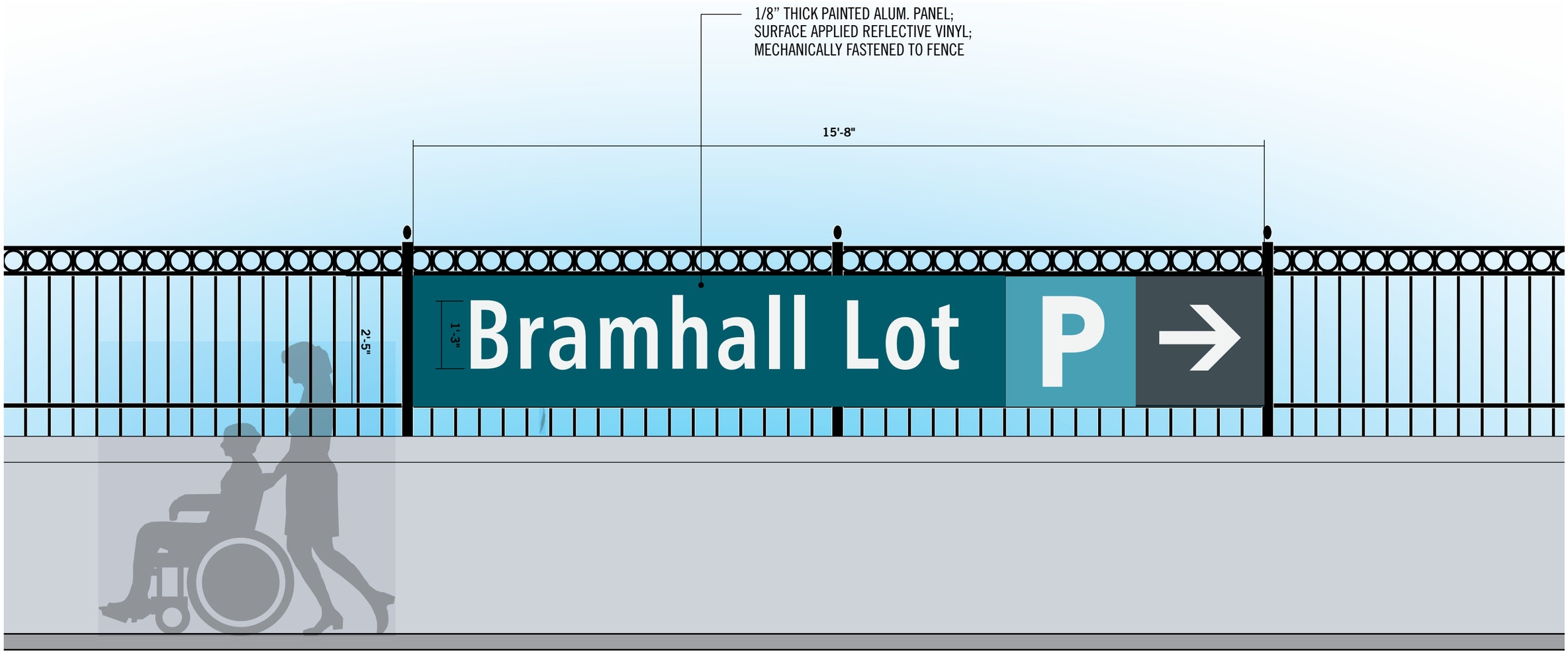
ST.11 Parking ID



1 Elevation: Side View
scale: 3/4" = 1' - 0"

2 Elevation: Side A
scale: 3/4" = 1' - 0"

ST.12 Fence Directional



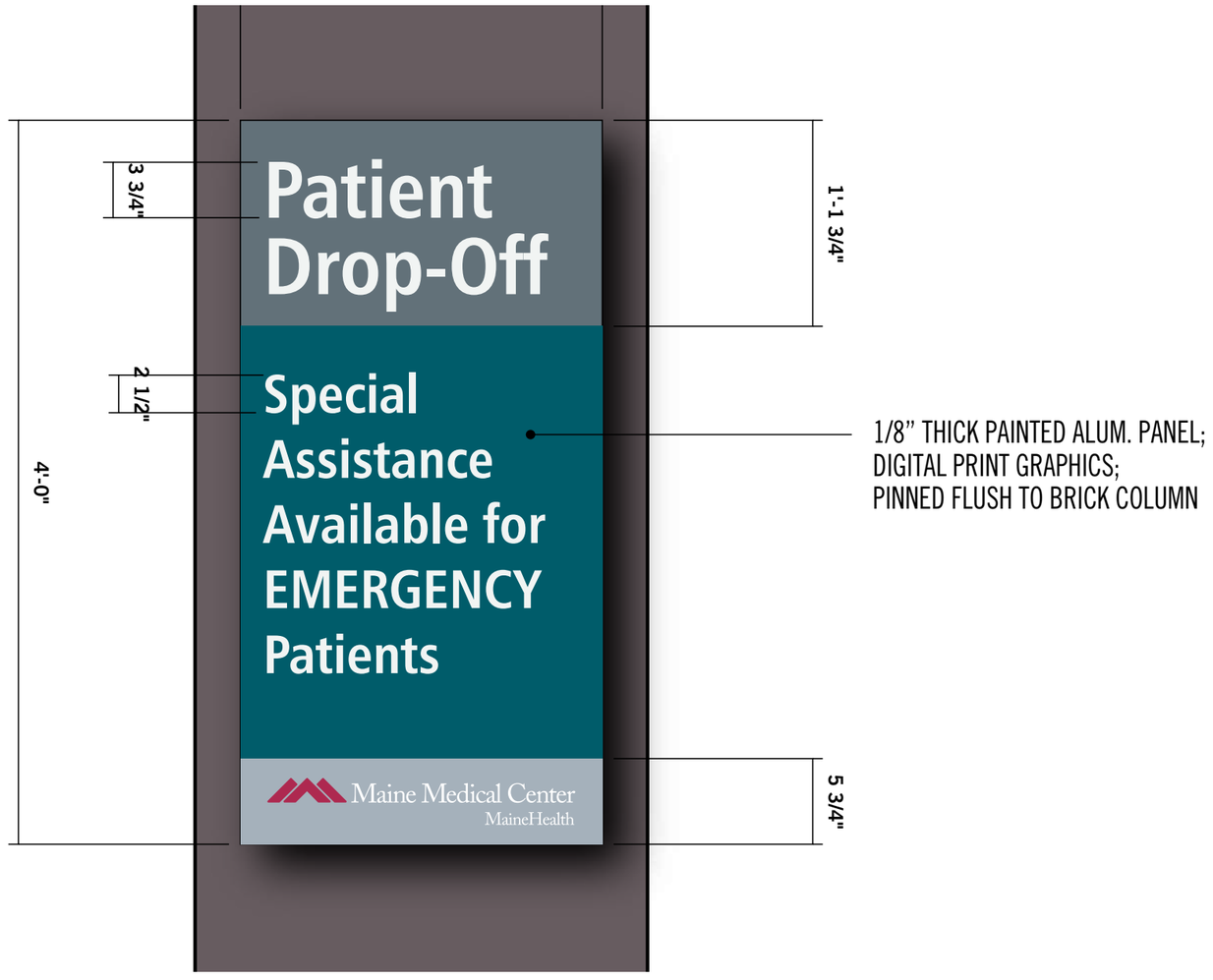
1 Elevation
scale: 1/2” = 1’ - 0”

ST.13 Column Sign



1 Elevation: Context

scale: 1/2" = 1' - 0"



2 Elevation: Detail

scale: 1" = 1' - 0"

DOT Panel

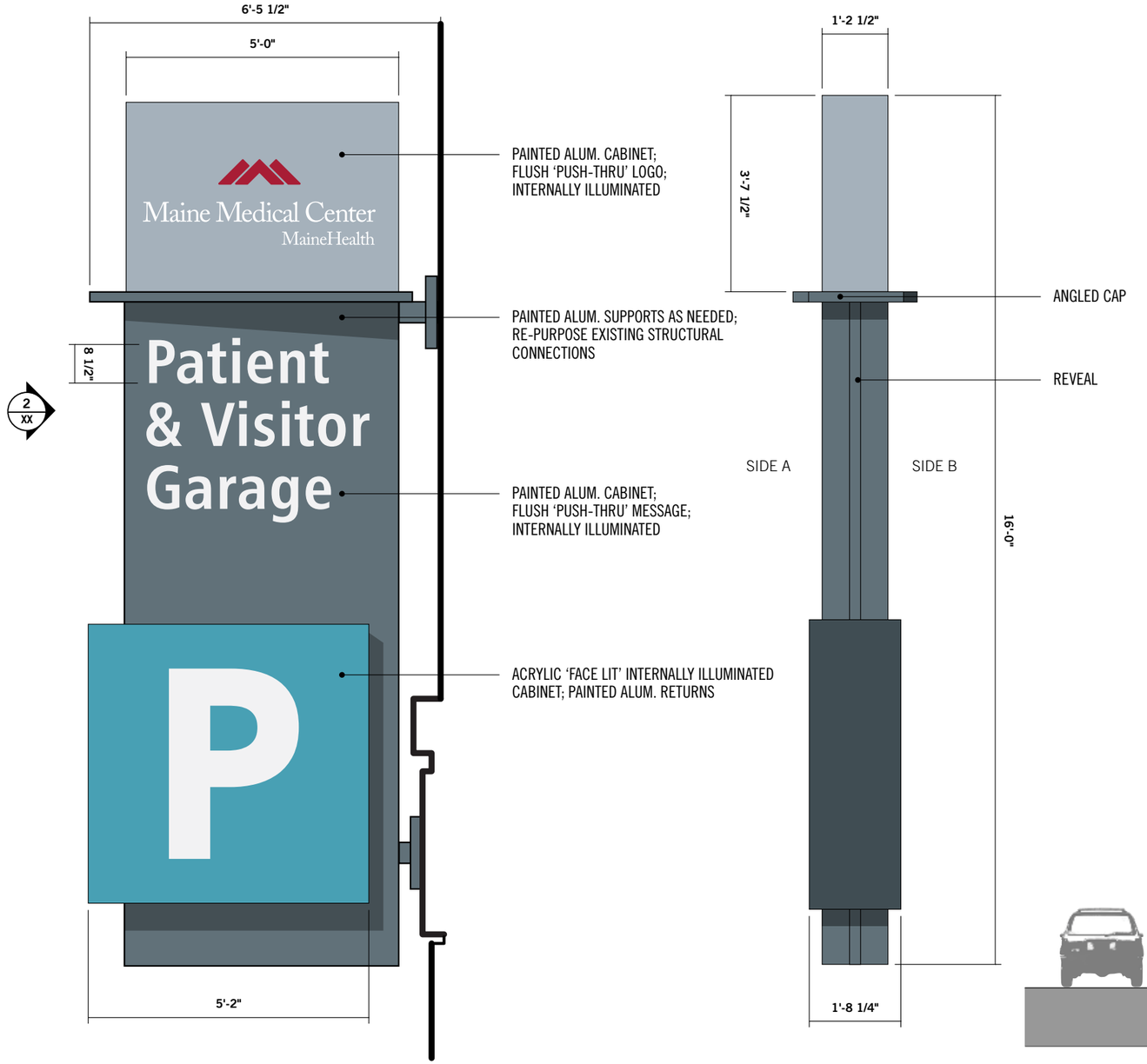



ONLY
EMERGENCY


ONLY

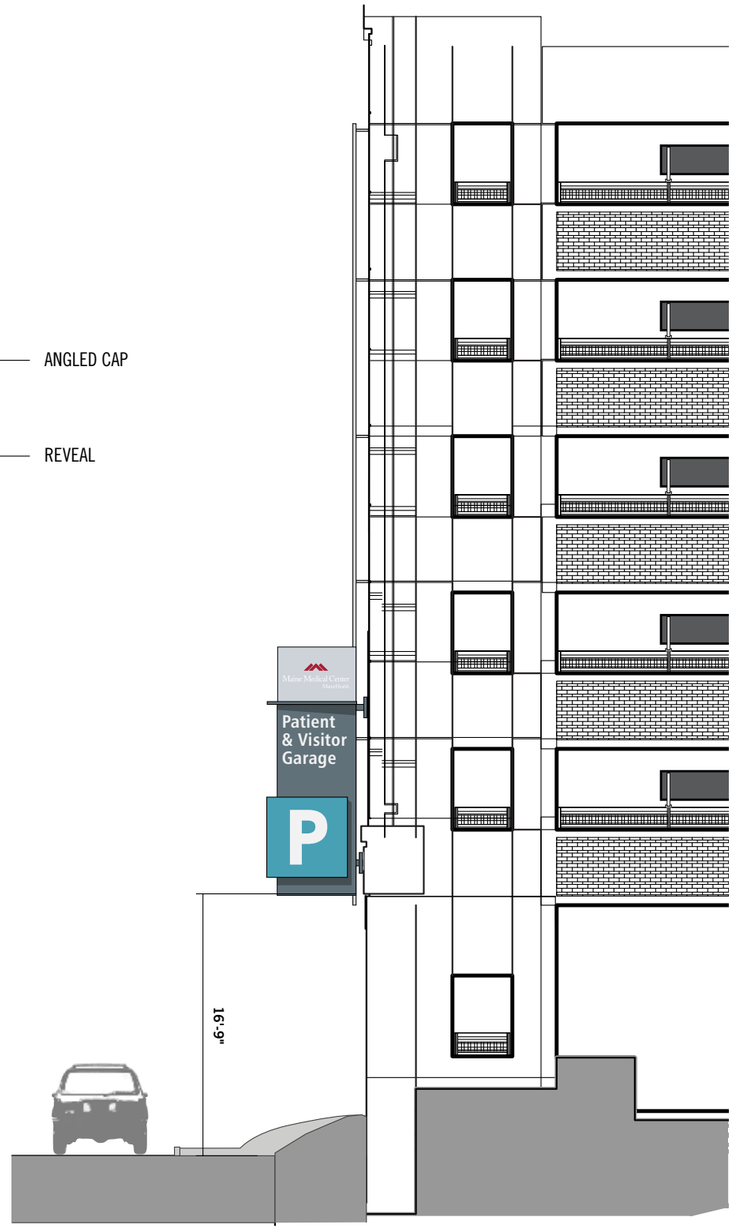

H
MERCY
MAINE MED

VG.1 Parking Blade



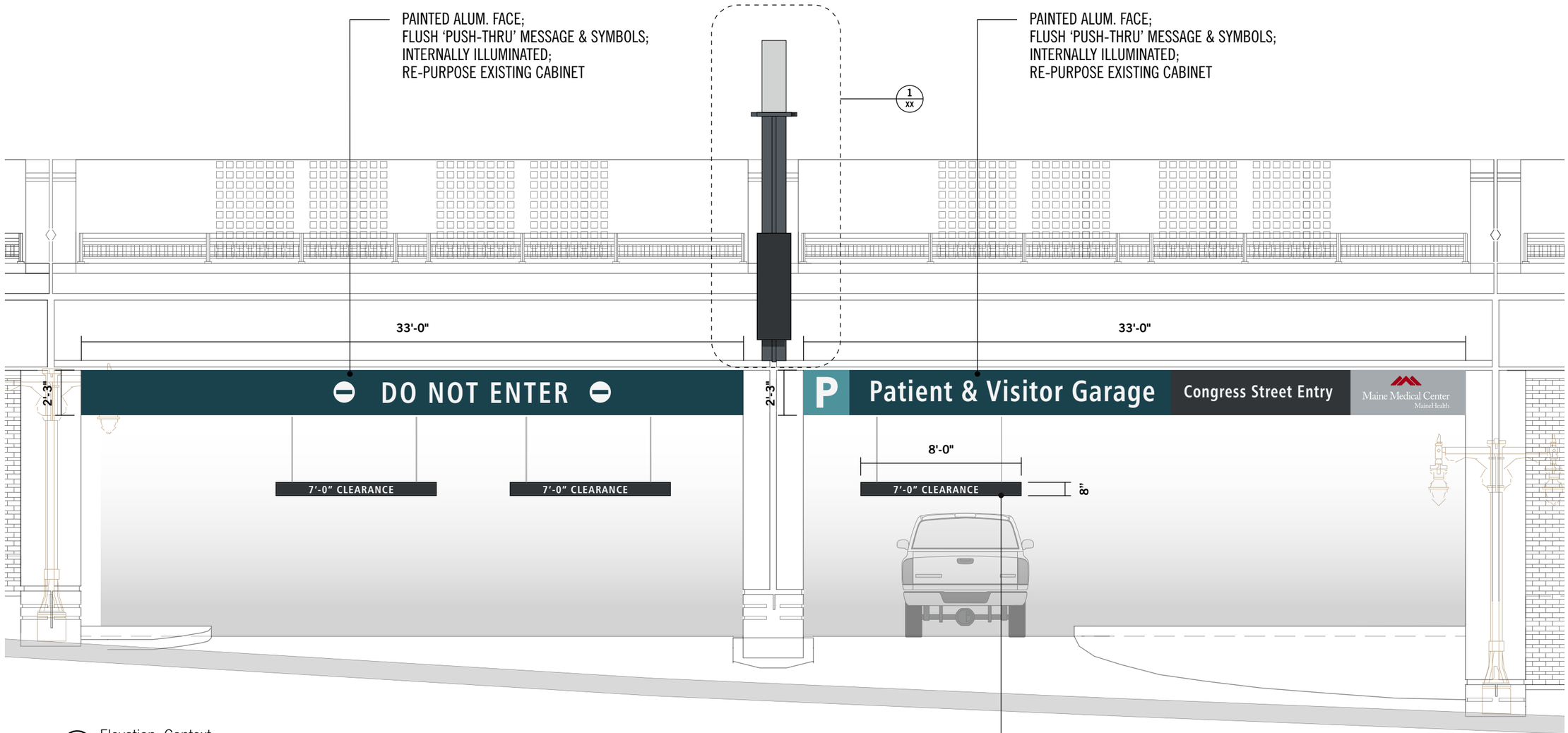
1 Elevation: Side A
scale: 1/2" = 1' - 0"

2 Elevation: Side View
scale: 1/2" = 1' - 0"



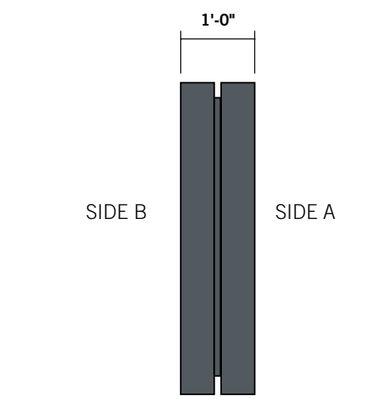
3 Elevation: Context
scale: 1/8" = 1' - 0"

VG.2 Congress Entry ID

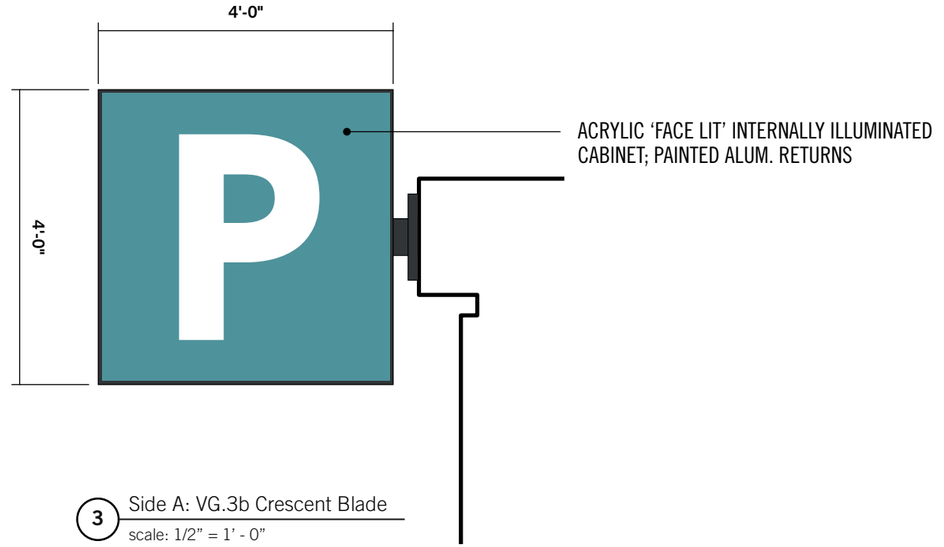


1 Elevation: Context
scale: 3/16" = 1' - 0"

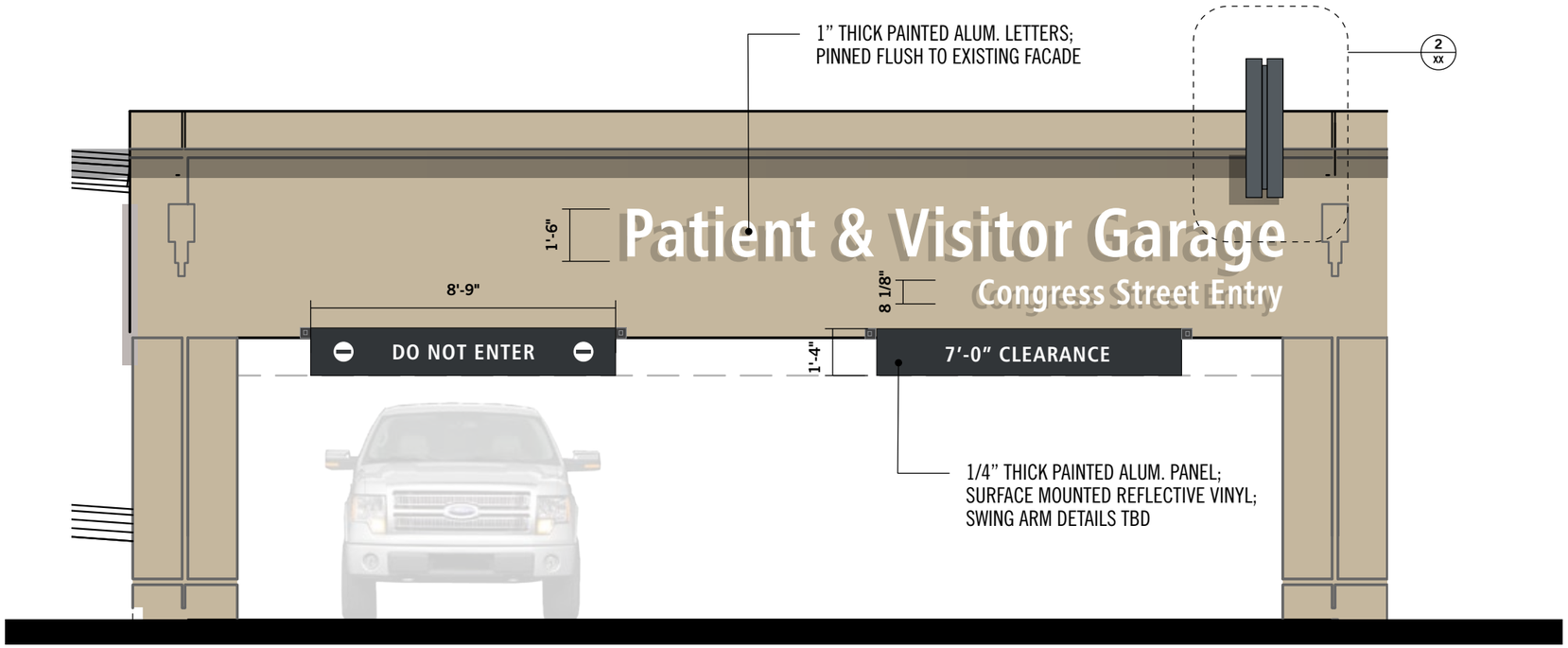
VG.3 Crescent Entry ID



2 Side View: VG.3b Crescent Blade
scale: 1/2" = 1' - 0"



3 Side A: VG.3b Crescent Blade
scale: 1/2" = 1' - 0"

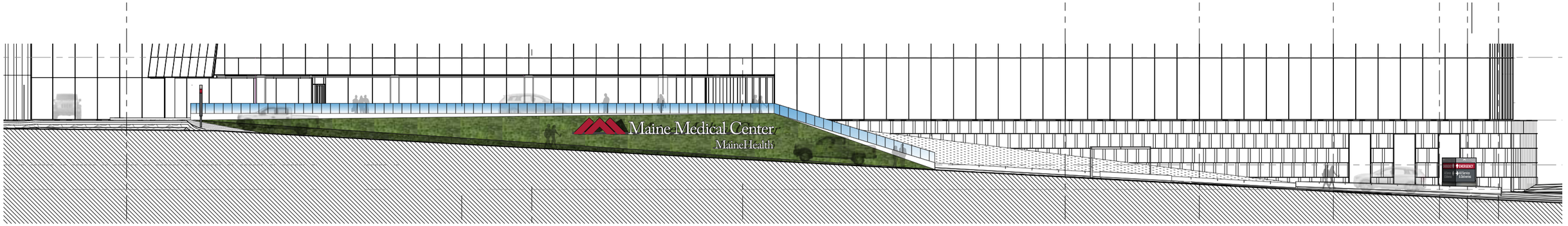


1 Elevation: VG.3a Entry ID Crescent
scale: 1/4" = 1' - 0"

02

Congress Street Building Signage

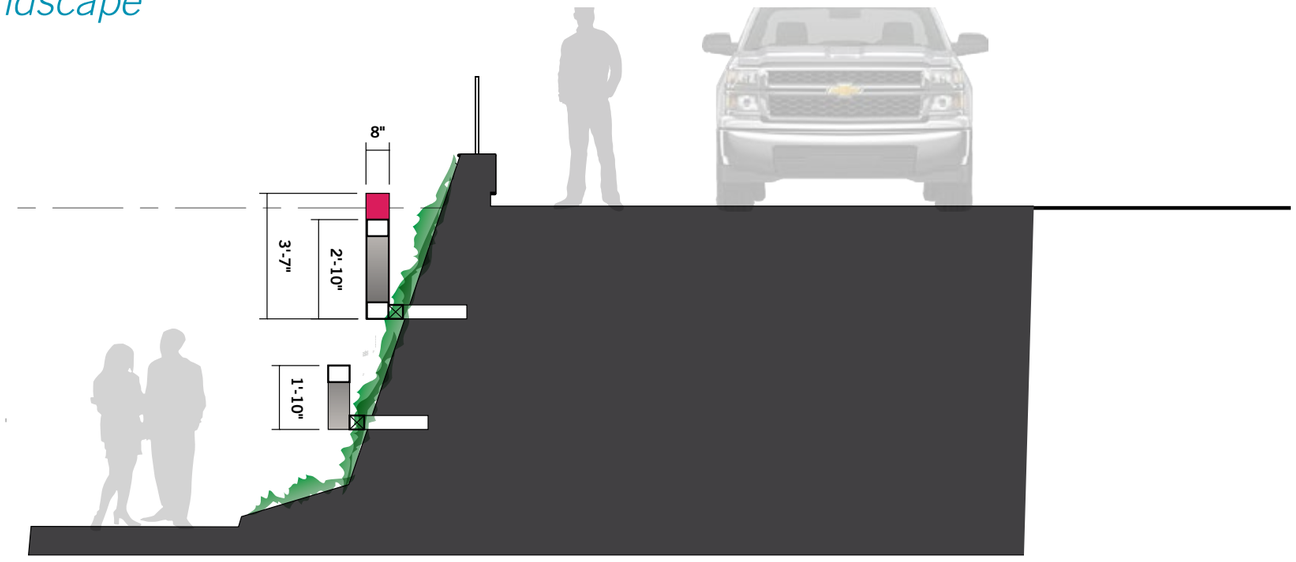
Preliminary
Sign Location
Plan

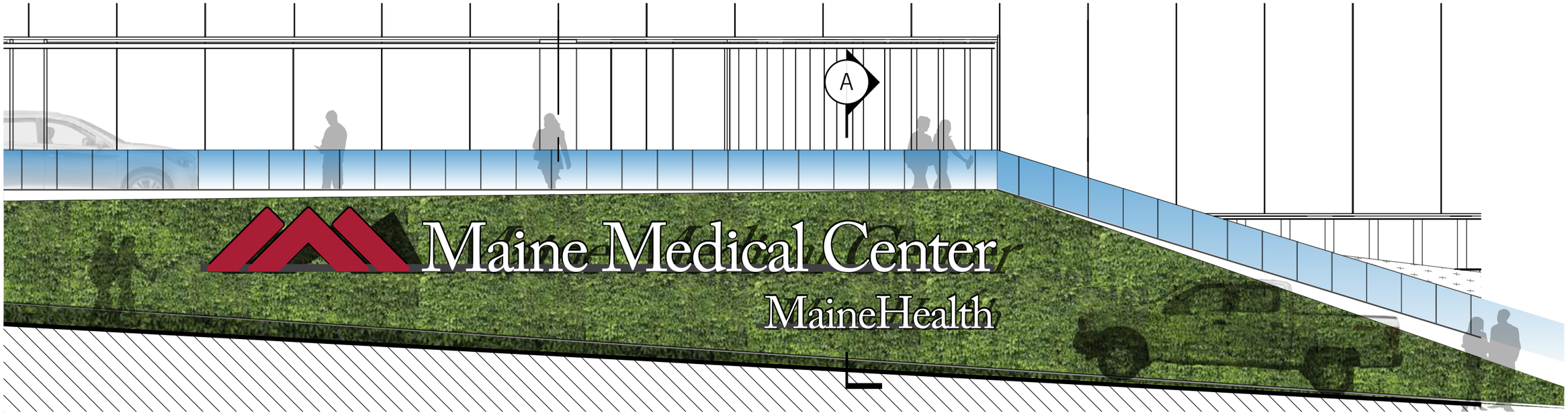




CS.1 Project Monument

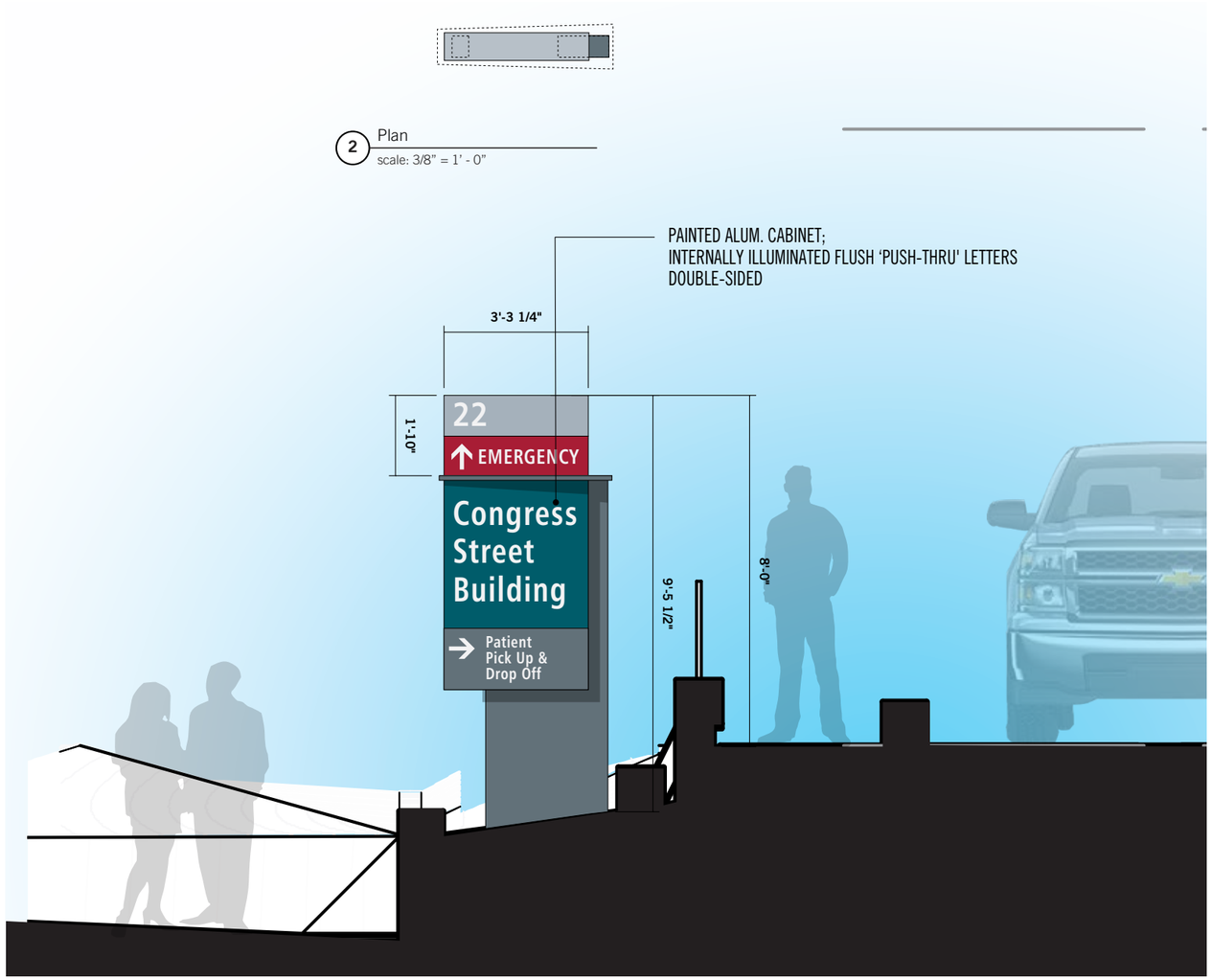
NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.





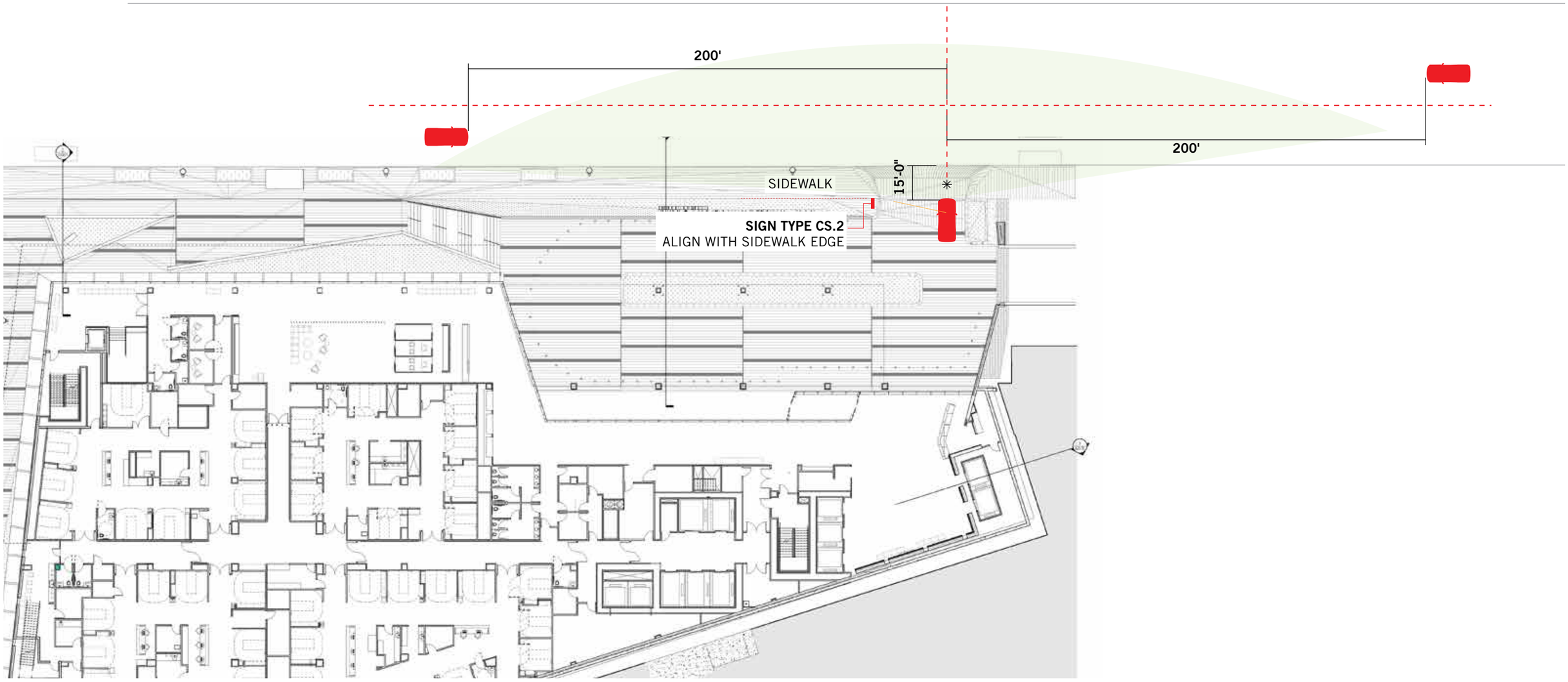
CS.2 Building Identification

NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.

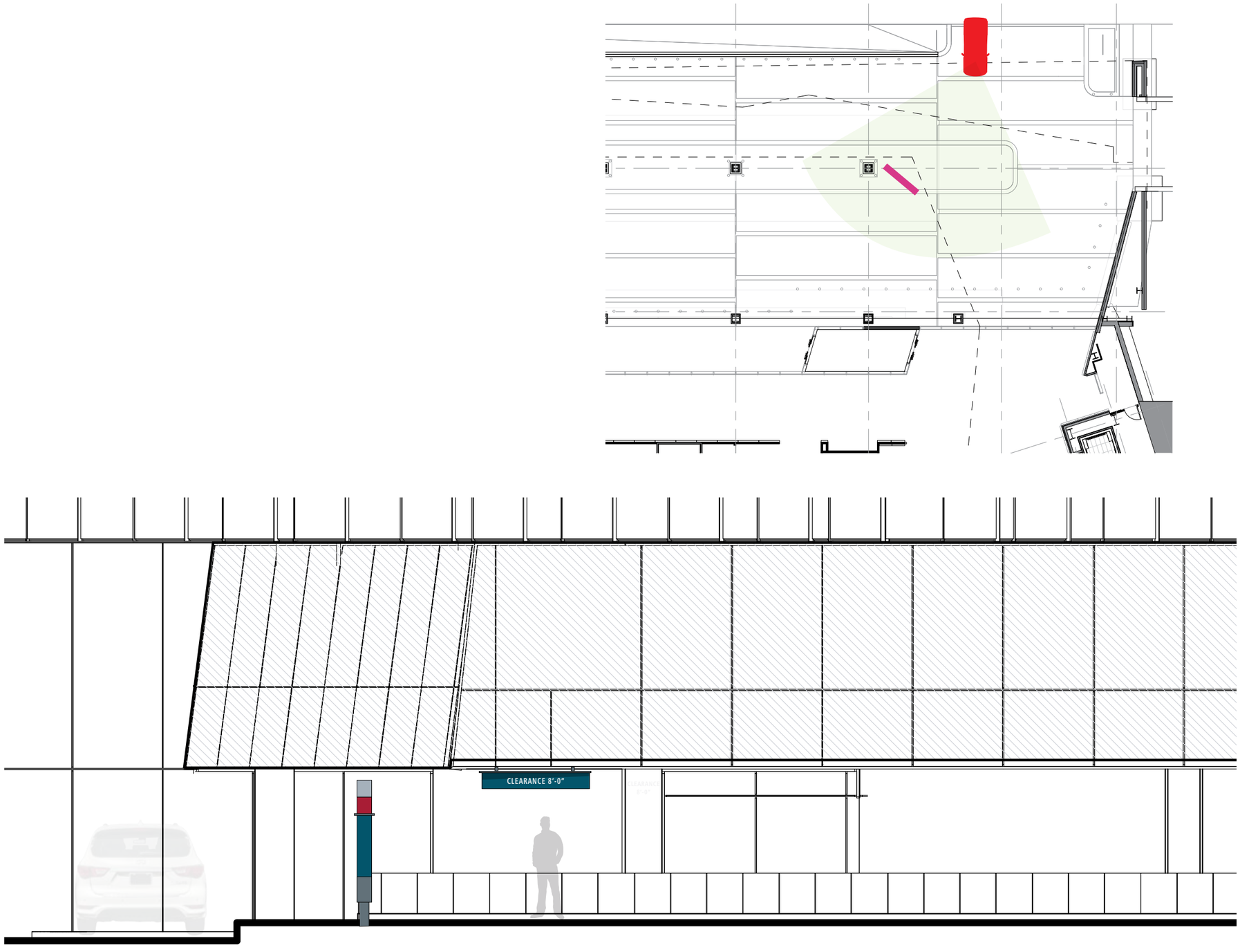


CS.2 Site Line Analysis

NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.

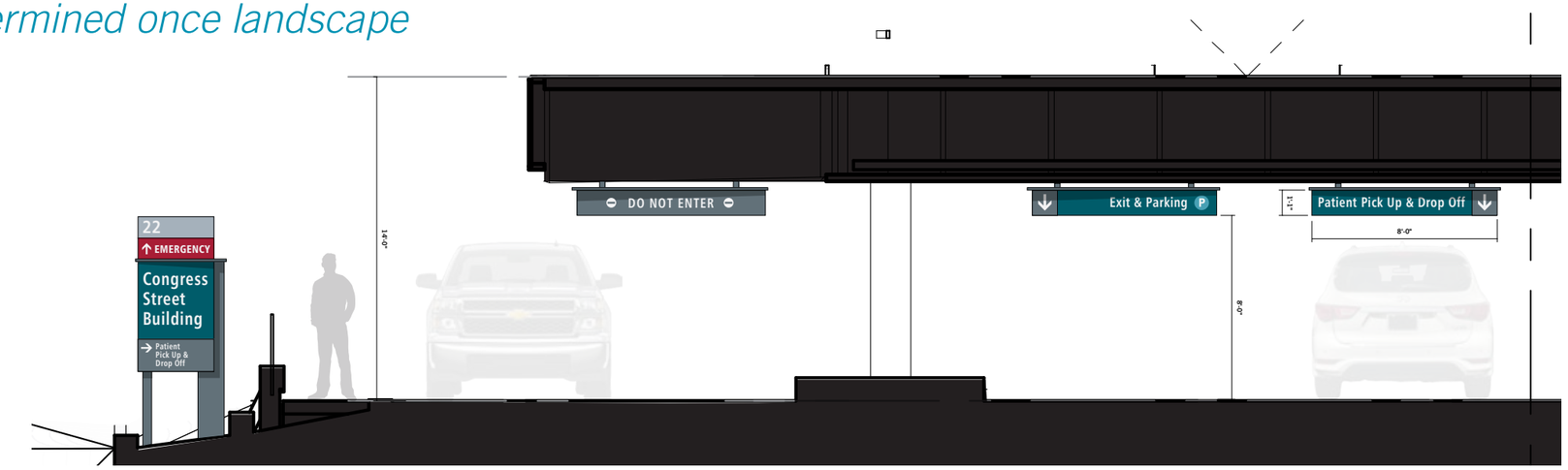


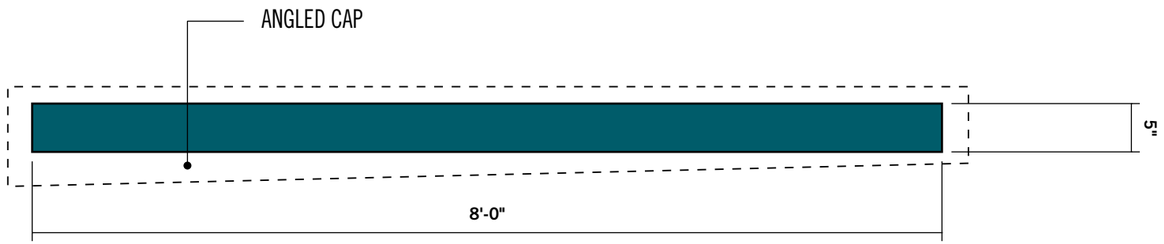
Clearance Sign



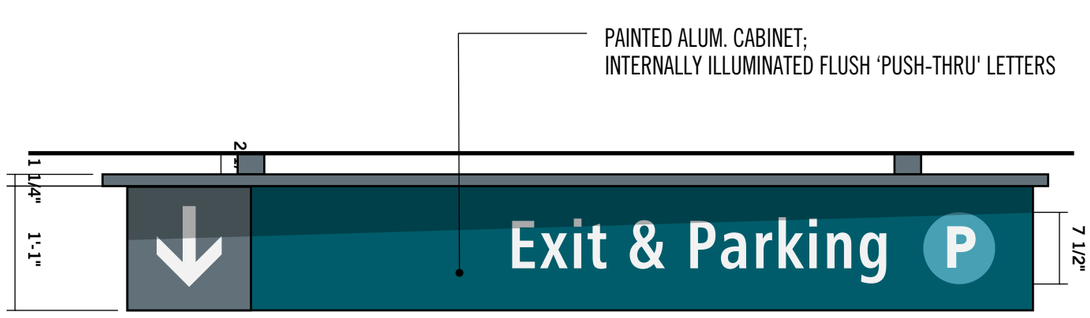
Parking Directionals

NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.

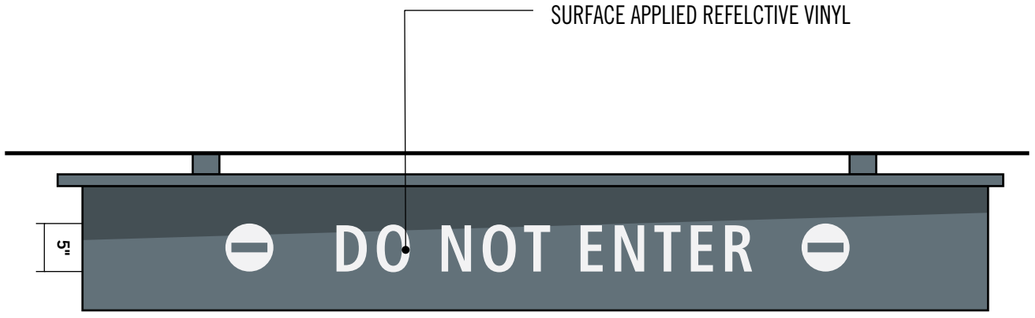




3 Plan
scale: 3/4" = 1' - 0"



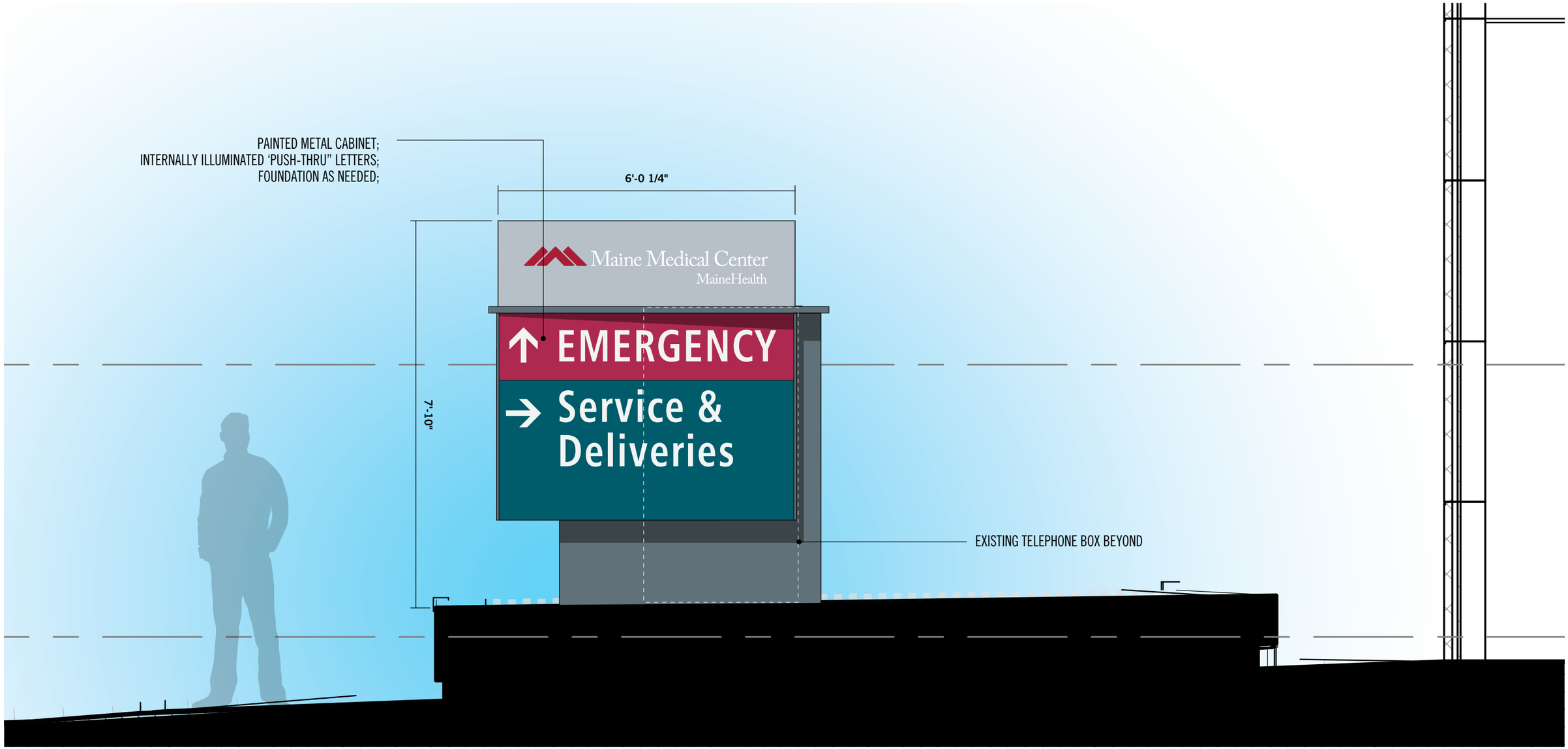
1 Elevation: Front
scale: 3/4" = 1' - 0"



1 Elevation: Back
scale: 3/4" = 1' - 0"

CS.3 Corner Sign

NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.



CS.3 Corner Sign

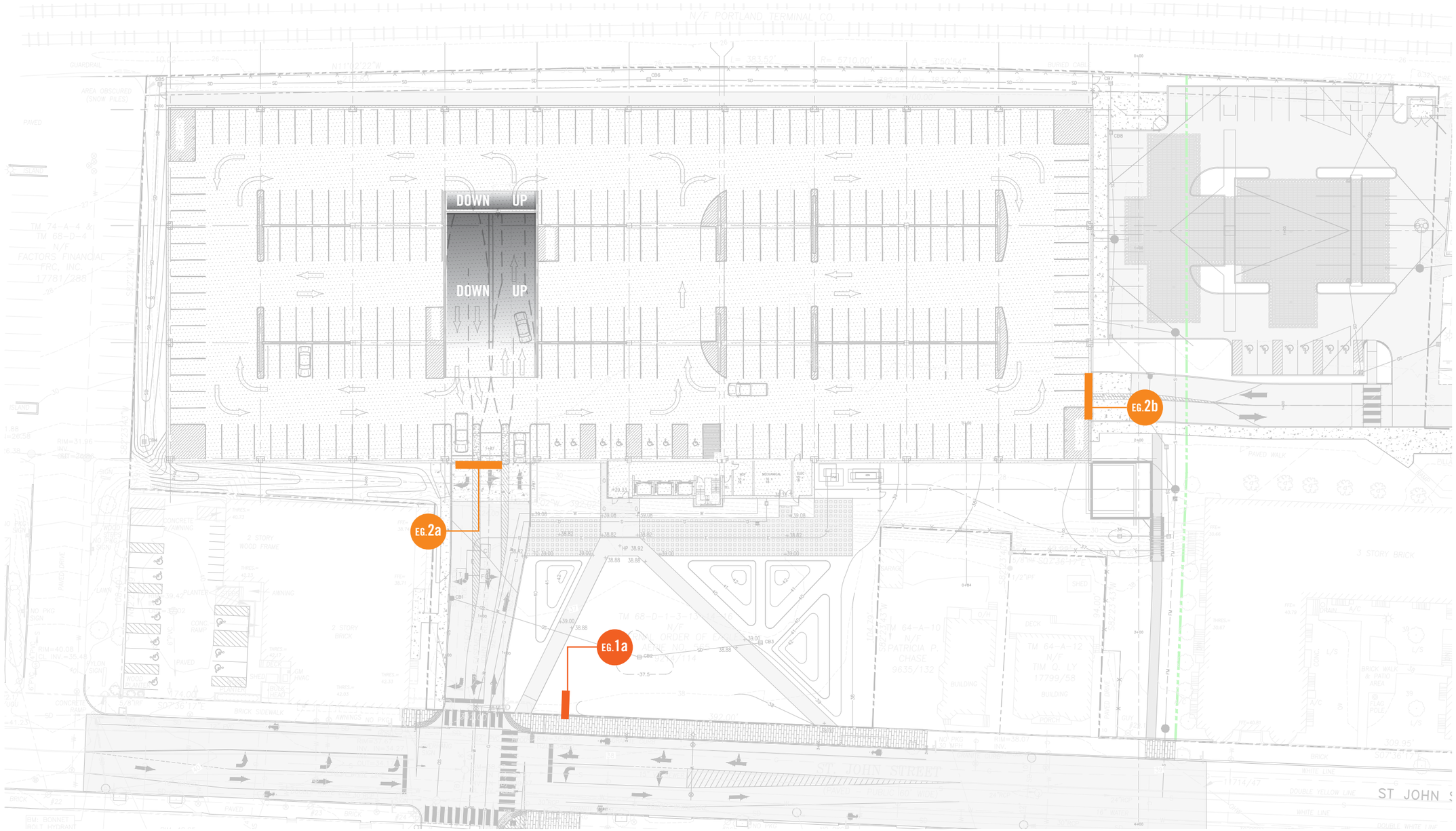
NOTE: Exact placement of signage to be determined once landscape design is finalized with the City of Portland.



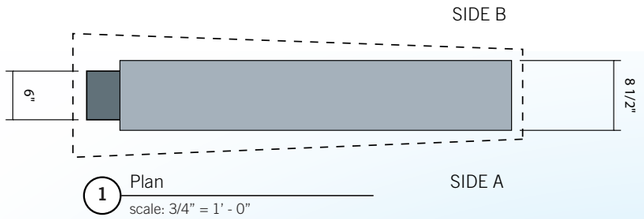
03

Employee Garage Signage

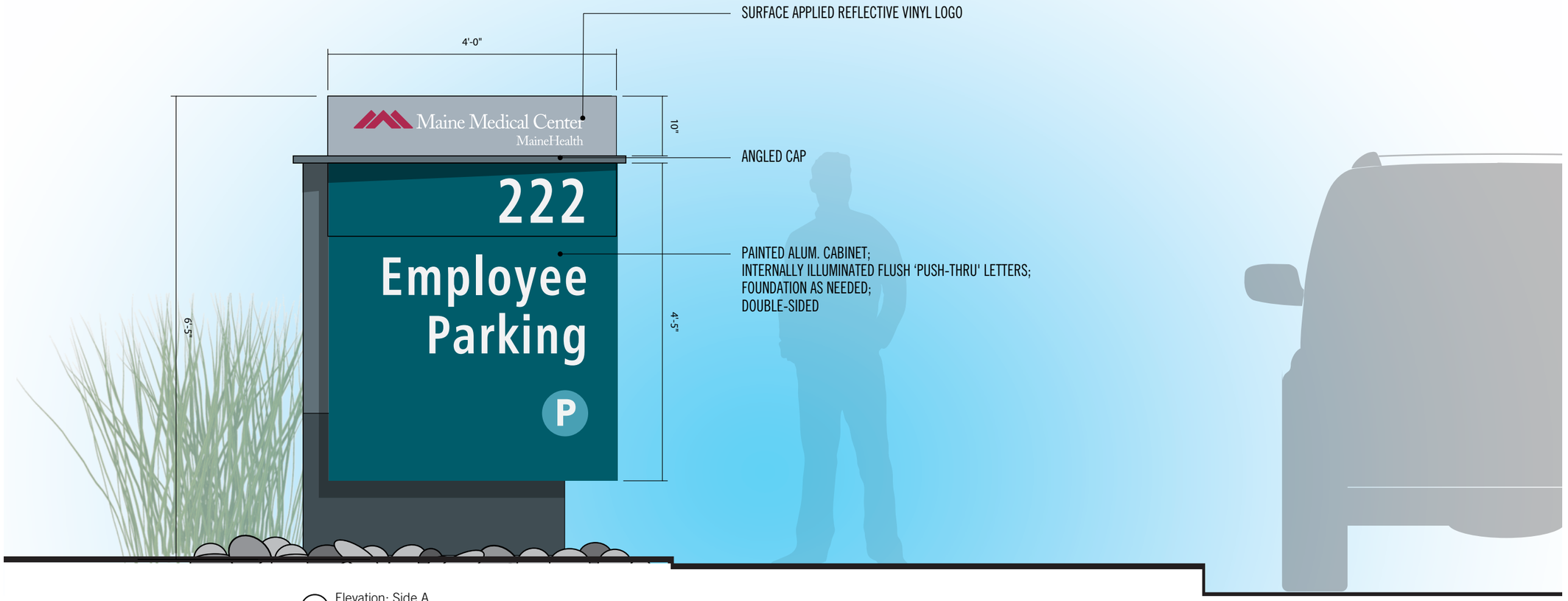
Preliminary Sign Location Plan (Level 1)



EG.1 Monument Sign

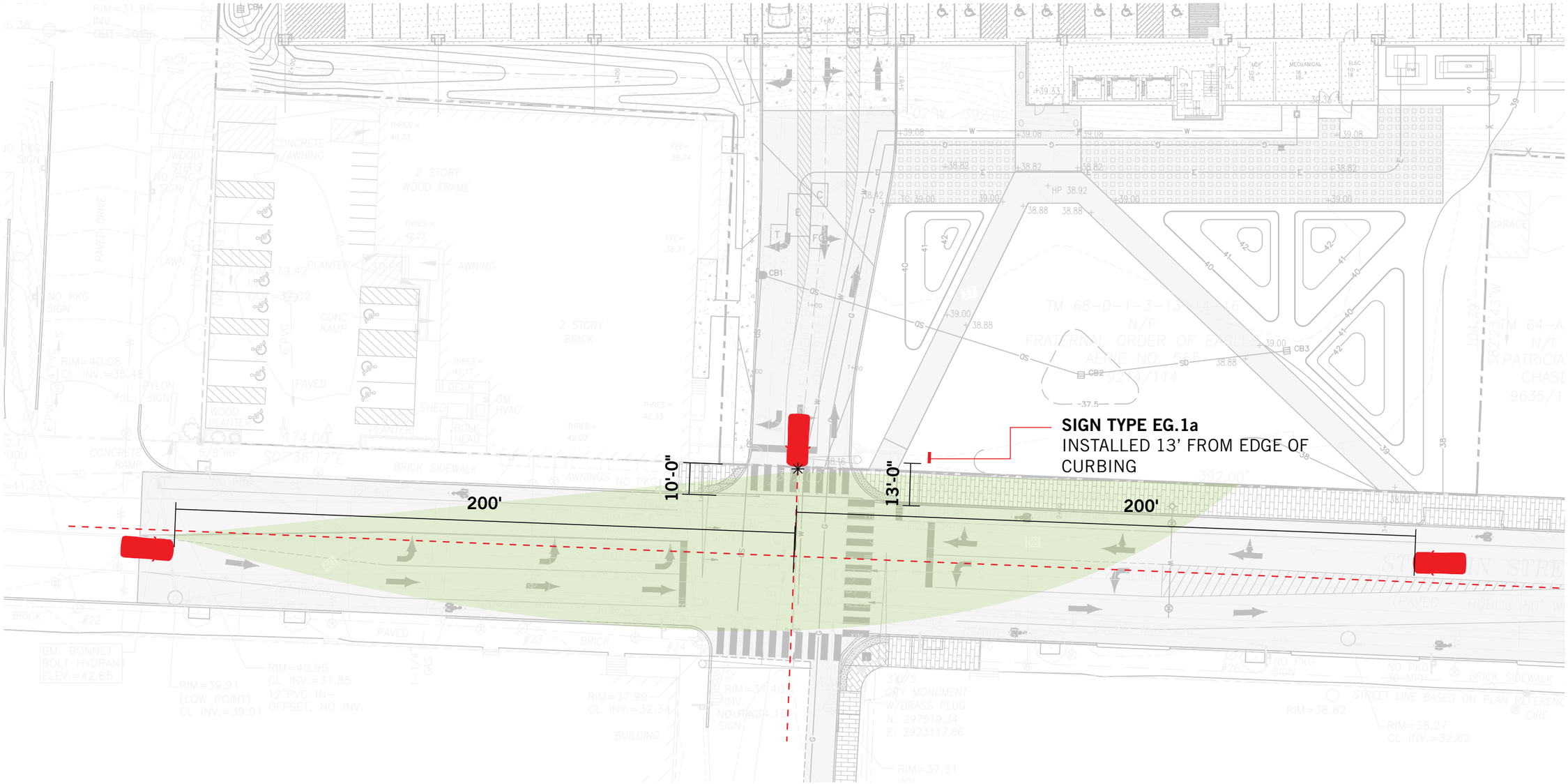


1 Plan
scale: 3/4" = 1' - 0"

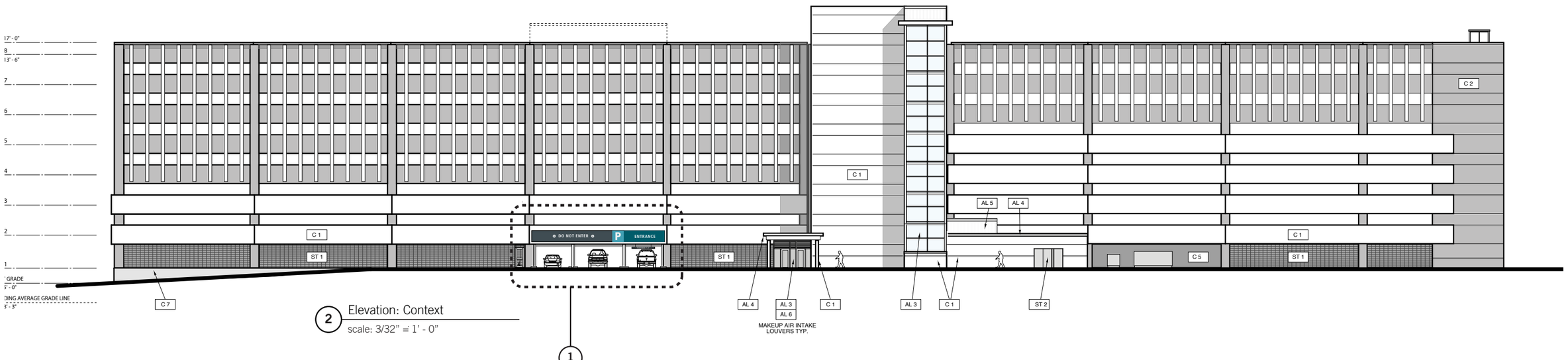


1 Elevation: Side A
scale: 3/4" = 1' - 0"

EG.1a Site Line Analysis

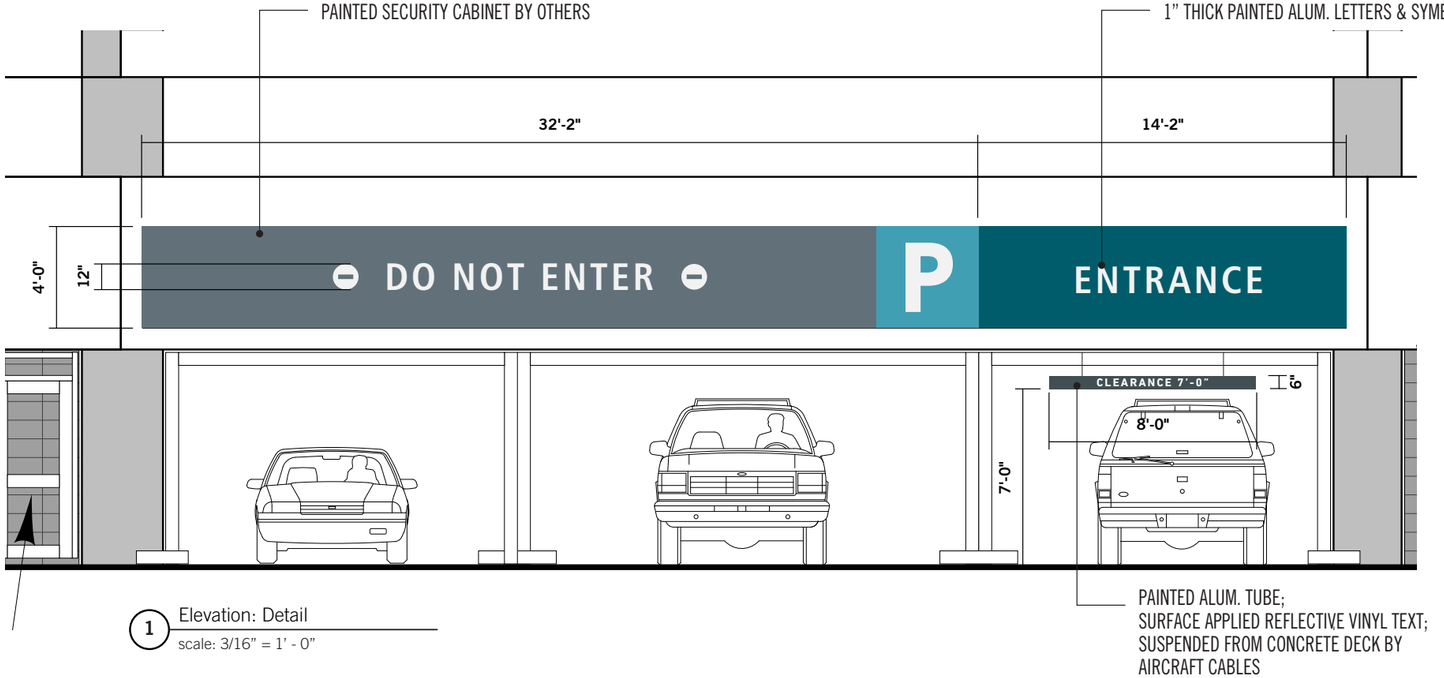


EG.2 East Garage ID



2 Elevation: Context

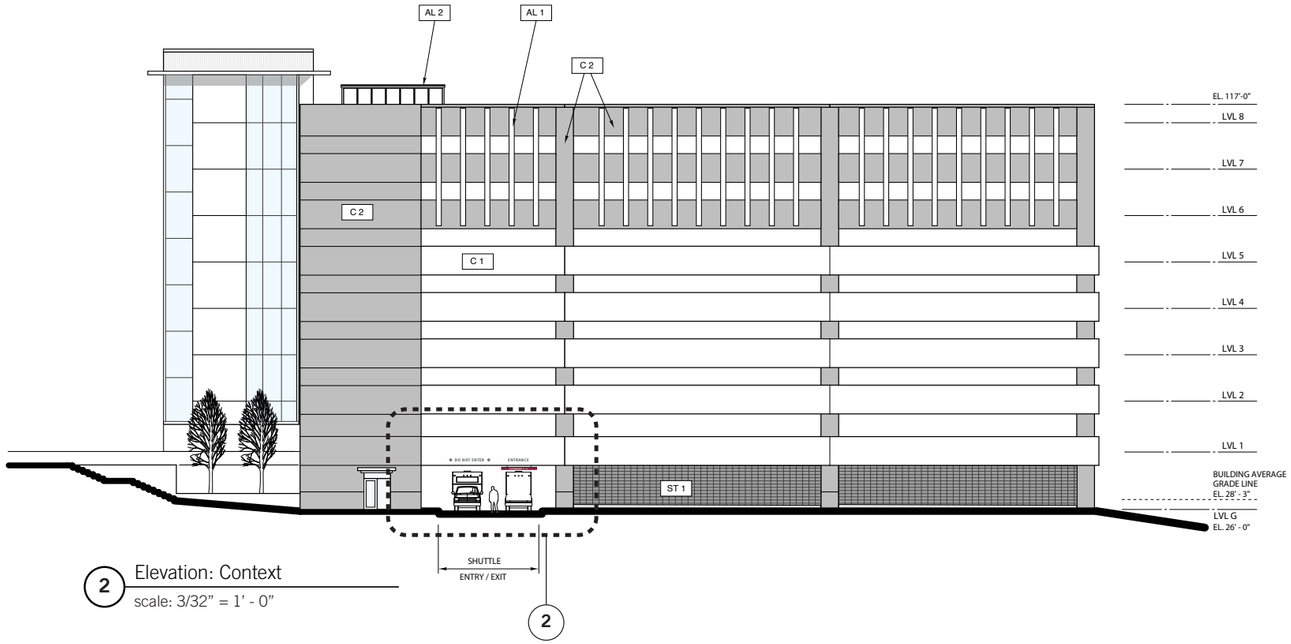
scale: 3/32" = 1' - 0"



1 Elevation: Detail

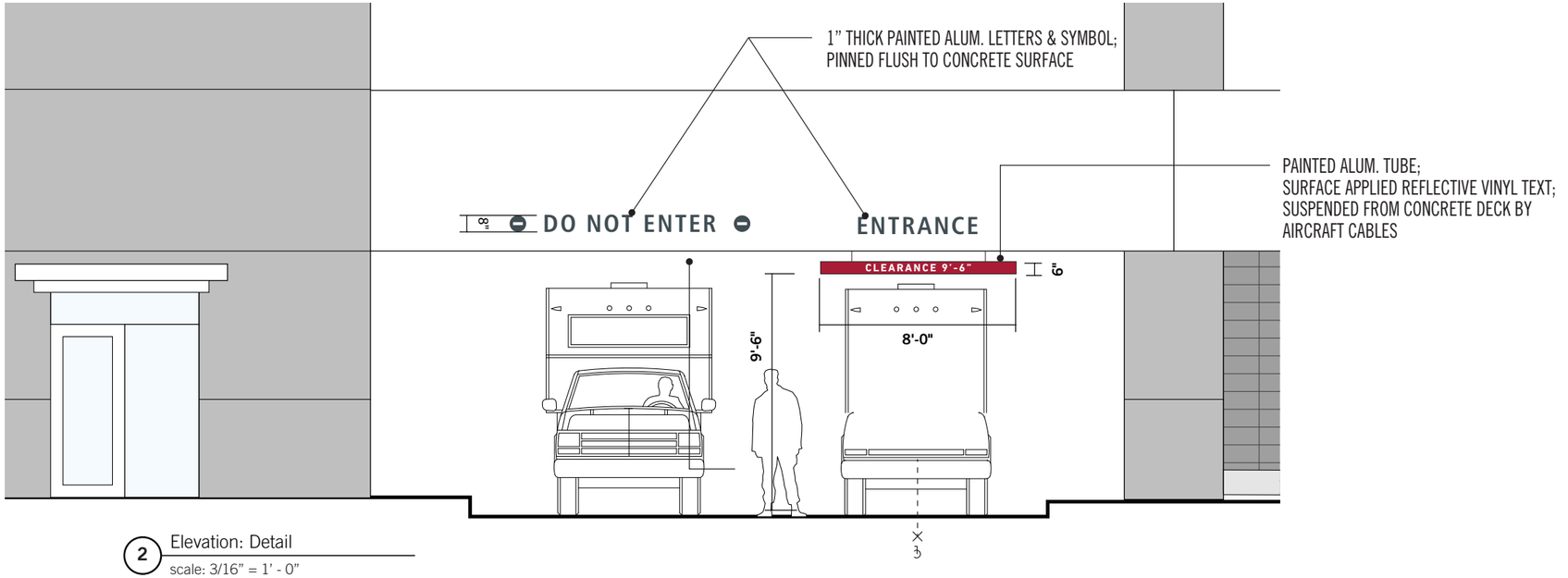
scale: 3/16" = 1' - 0"

EG.3 North Garage ID



2 Elevation: Context

scale: 3/32" = 1' - 0"



2 Elevation: Detail

scale: 3/16" = 1' - 0"

Thank You

Leverage/

Relationships.
Responsiveness.
Results.









Traffic Movement Permit Application
Bramhall Street - 22: MMC Congress Street Building
Portland, Maine

PREPARED FOR:
Maine Medical Center
22 Bramhall Street
Portland, ME 04102

September 2018

SUBMITTED BY:
Gorrill Palmer
707 Sable Oaks Drive
Suite 30
So. Portland, ME 04106
207.772.2515

GORRILL PALMER

707 Sable Oaks Drive, Suite 30
South Portland, Maine 04106
207.772.2515

September 25, 2018

Ms. Nell Donaldson
City of Portland Planning Division
389 Congress Street, 4th Floor
Portland, Maine 04101

RE: Application for Traffic Movement Permit
Maine Medical Center Expansion
Portland, Maine

Dear Ms. Donaldson,

Gorrill Palmer (GP) has been retained by Maine Medical Center to prepare this Traffic Movement Permit Application for the proposed Maine Medical Center expansion project located at the site of the existing Gilman Garage in the southeast corner of the Gilman Street / Congress Street intersection in Portland, Maine.

We have attached the following information in support of this application:

- Sections 1-7
- Signed application form
- Notice of intent to file
- List of abutters
- $1,500 application fee

Section 7 (Traffic Impact Study) of the application is also being submitted under separate cover. Please contact our office with any questions regarding this application.

Sincerely,
Gorrill Palmer

Randy Dunton, PE, PTOE
Project Manager

Copy: Alexander Green, Maine Medical Center
Randy Ilian, MaineDOT Region 1 Traffic Engineer

Department of Transportation
Traffic Engineering Division
16 State House Station
Augusta, Maine 04333
Telephone: 207-287-3775

FOR MDOT USE 12/99
ID#_____

Total Fees:_____
Date Received: _____

****

PERMIT APPLICATION – TRAFFIC
TRAFFIC MOVEMENT PERMIT, 23 M.R.S.A. §704-A

Please type or print:

This application is for (check all that apply): Traffic 100-200 PCE's ☐
Traffic 200 + PCE's ☒

Name of Applicant: Maine Medical Center; Attn: Alexander Green

Address: 22 Bramhall Street, Portland, Maine 04102 Telephone: (207) 662-3689

Name of local contact or agent: **Randy Dunton – Gorrill Palmer**

Address: **707 Sable Oaks Drive, South Portland, ME 04106** Telephone: **(207) 772-2515**

Name and type of development: The Maine Medical Center Expansion includes razing the existing employee parking garage and constructing additional hospital space including new operating rooms and patient rooms, although the total number of beds will remain the same.

Location of development including road, street, or nearest route number: **The site is located at the existing Gilman Street garage and the block bounded by Valley Street, Congress Street, Gilman Street, and A Street.**

City/~~Town~~/~~Plantation~~: **Portland** County: **Cumberland** Tax Maps: **53 & 67** Lots: D007 and H001, H002, H005, H008, and H009.

Do you want a consolidated review with DEP pursuant to 23 M.R.S.A. § 704-A (7)? **No**

Was this development started prior to obtaining a traffic permit? **No**

Is the project located in an area designated as a growth area (as defined in M.R.S.A. title 30-A, chapter 187)?
Yes_____ No _____

Is this project located within a compact area of an urban compact municipality? Yes X No_____

Is this development or any portion of the site currently subject to state or municipal enforcement action?

None Known

Existing DEP or MDOT permit number (if applicable): N/A

Name(s) DOT staff person(s) contacted concerning this application Delegated Review is to the City

Name(s) of DOT staff person(s) present at the scoping meeting for 200+ applicants:_____

Department of Transportation
Traffic Engineering Division
16 State House Station
Augusta, Maine 04333
Telephone: 207-287-3775

FOR MDOT USE 12/99
ID#_____

Total Fees:_____
Date Received: _____

CERTIFICATION

This person responsible for preparing this application and/or attaching pertinent site and traffic information hereto, by signing below, certifies that the applicant for traffic approval is complete and accurate to the best of his/her knowledge.

Signature: Randall E. Dunton Re/Cert/Lic No.: _____

Name (print): **Randall E. Dunton** Engineer: **Maine PE # 8686**

Date: Sept 24, 2018 Other: _____



If the signature below is not the applicant's signature, attach letter of agent authorization signed by applicant.

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

_____ 9/25/2018

Signature of applicant Date

Form C 7/97

NOTICE OF INTENT TO FILE

Please take notice that:

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

is intending to file a MaineDOT Traffic Permit application with the City of Portland (Delegated Review Authority) pursuant to the provisions of 23 M.R.S.A. §704 – A on or about September 25, 2018.

This application is for:

The Congress Street building expansion of Maine Medical Center on Bramhall Street in Portland, Maine. The proposed development is to include razing the existing employee parking garage and constructing additional hospital space including new operating rooms and patient rooms, although the total number of beds will remain the same. A new patient drop-off on Congress Street is also proposed. The project is forecast to generate 68 and 66 AM and PM weekday peak hour trip ends respectively. The project is expected to open in 2023.

At the following location:

The site is located in the southeast corner of the Gilman Street / Congress Street intersection at the site of the existing Gilman Garage.

A request for a public hearing must be received by the City, in writing no later than 20 days after the application is found by the department to be complete and is accepted for processing. Public comment on the application will be accepted throughout the processing of the application.

The application will be filed for public inspection at the Department of Transportation's office in Scarborough (Region 1) during normal working hours. A copy of the application may also be seen at the municipal offices in Portland, Maine.

Written public comments may be sent to the following address: Attention Nell Donaldson, Planning Division, 389 Congress Street, Portland, Maine 04101.

Randall Dunton, P.E., PTOE
Gorrill-Palmer Consulting Engineers, Inc.



ABUTTERS LIST
MMC EXPANSION
PORTLAND, ME
JN 2866.01

CBL	UNITS	PROP_LOC	OWNR_NAME1	OWNR_NAME2	MAIL_ADDR1	OWNR_CITY	WNR_STA	ZIPCODE	ProjectDesc
053 A013001	2	29 BOYNTON ST	HOLLOWAY MICAH L &	HANNAH MONACO JTS	29 BOYNTON ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A014001	3	27 BOYNTON ST	KONGO MATTHEW &	ROSE DIJIERI JTS	27 BOYNTON ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A015001	3	23 BOYNTON ST	EMPIRE REALTY LLC		17 BOYNTON ST # 1	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A017001	3	21 BOYNTON ST	MICHAUD STEPHEN J II &	TAMMY J BEAULIEU JTS	21 BOYNTON ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A018001	3	17 BOYNTON ST	EMPIRE REALTY LLC		17 BOYNTON ST # 1	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A019001	1	15 BOYNTON ST	MACCONNELL DOUGLAS F &	REBECCA MACCONNELL JTS	340 SOUTH LEMON AVE # 7427	WALNUT	CA	91789	2017002 MMC Master Facility Plan Phase IIE
053 A020001	1	11 BOYNTON ST	KURAN BARBARA LYNN		11 BOYNTON ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 A021001	2	9 BOYNTON ST	MARCISSO SAMUEL M JR		16 RUBY MAE LN	SCARBOROUGH	ME	04074	2017002 MMC Master Facility Plan Phase IIE
053 A022001	0	232 PARK AVE	HARRIS RICHARD S JR &	PEGGY HARRIS	103 LOUDEN RD	SACO	ME	04072	2017002 MMC Master Facility Plan Phase IIE
053 E003001	44	25 CRESCENT ST	CRESCENT HEIGHTS LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
053 E008001	6	19 CRESCENT ST	19 CRESCENT STREET LLC		26B BRACKETT ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 H001001	10	9 WESCOTT ST	FISK KENNETT H		43 SPINNAKER LN	FALMOUTH	MA	02540	2017002 MMC Master Facility Plan Phase IIE
053 H002001	0	25 ELLSWORTH ST	BEH REDEVELOPMENT LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
053 H003001	4	23 ELLSWORTH ST	MCCAIN MARK &	KATRINA SCHOLTZ JTS	812-6 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 H004001	2	19 ELLSWORTH ST	RAINBOW PARACHUTE LLC		19 ELLSWORTH ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053 H005001	2	2 CRESCENT ST	BOURRET ANDREW P &	EMILY M BOURRET JTS	21 TAINE MOUNTAIN RD	UNIONVILLE	CT	06085	2017002 MMC Master Facility Plan Phase IIE
053 I007001	3	14 BOYNTON ST	MCKEOWN RYAN L		1226 SUNNYMEADE DR	NASHVILLE	TN	37215	2017002 MMC Master Facility Plan Phase IIE
053 I016001	5	879 CONGRESS ST	KONTOS GREGORY C &	CAROL A KONTOS	PO BOX 1785	WINDHAM	ME	04062	2017002 MMC Master Facility Plan Phase IIE
053 I017001	0	873 CONGRESS ST	KONTOS GREGORY C	C/O GCK GROUP	PO BOX 1785	WINDHAM	ME	04062	2017002 MMC Master Facility Plan Phase IIE
053 I019001	7	8 WEYMOUTH ST	GRANTWEY APARTMENTS LIMITE	LIABILITY COMPANY	103 LOUDEN RD	SACO	ME	04072	2017002 MMC Master Facility Plan Phase IIE
053 I020001	9	871 CONGRESS ST	LASH LLC		PO BOX 4182	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
053 I021001	1	867 CONGRESS ST	PORT CITY BAPTIST CHRUCH		867 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054 B001001	3	12 ELLSWORTH ST	12 ELLSWORTH STREET LLC		PO BOX 7225	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 B002001	5	19 HILL ST	19 HILL STREET LLC		PO BOX 7225	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 B004001	8	17 HILL ST	17 HILL STREET LLC		PO BOX 7225	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 C001001	2	20 HILL ST	BEH REDEVELOPMENT LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 C005001	3	32 ELLSWORTH ST	BEH REDEVELOPMENT LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 C007001	2	7 RUSSELL ST	FERRELL RANDY D		7 RUSSELL ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054 C008001	2	9 RUSSELL ST	WILHOITE ROBERT W ETALS JTS		9 RUSSELL ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054 C009001	4	11 RUSSELL ST	STEINS KARL M &	RHIANNE STEINS JTS	2333 CAMINO DEL RIO SOUTH STE	SAN DIEGO	CA	92108	2017002 MMC Master Facility Plan Phase IIE
054 C012001	2	15 RUSSELL ST	SHIR MOHAMMAD NASIR		41 OCEAN HOUSE RD	CAPE ELIZABETH	ME	04107	2017002 MMC Master Facility Plan Phase IIE
054 D006001	0	331 BRACKETT ST	BEH REDEVELOPMENT LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
054 D007001	8	325 BRACKETT ST	BEH REDEVELOPMENT LLC		PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
063 A001001	1	31 BRAMHALL ST	PETERS ANNE GINDER		31 BRAMHALL ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063 A002001	1	25 BRAMHALL ST	CARREN JOY M ETAL &	GARY LAMSON	PO BOX 9715-327	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
063 A003001	8	23 BRAMHALL ST	PALMER DEVELOPMENT	GROUP LLC	83 SOUTH FREEPORT RD	FREEPORT	ME	04032	2017002 MMC Master Facility Plan Phase IIE
063 A004001	10	19 BRAMHALL ST	NEW EARTH ASSOCIATES LLC		PO BOX 9715-327	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
063 A005001	10	15 BRAMHALL ST	WEST COMPANY		104 GRANT ST	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
063 A006001	1	7 BRAMHALL ST	7 BRAMHALL STREET LLC		335 BRIGHTON AVE	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E001001	4	12 A ST	CUMMINGS THOMAS L HEIRS		12 A ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E014001	4	36 GILMAN ST	LAMBERT STUART C		36 GILMAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E015001	4	34 GILMAN ST	AWLARI IWANI M &	LIA BOULIS KODI JTS	34 GILMAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E016001	4	28 GILMAN ST	SABBATH NICHOLAS M		28 GILMAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E017001	3	24 GILMAN ST	SNYDER KAREN L		72 WATERVILLE ST # 3	PORTLAND	ME	04103	2017002 MMC Master Facility Plan Phase IIE
064 E018001	5	20 GILMAN ST	SS MINNOW LLC &	PUTTERS LLC	22 BARLEY LN	SCARBOROUGH	ME	04074	2017002 MMC Master Facility Plan Phase IIE
064 E019001	6	16 GILMAN ST	SEA OTTER 16G LIMITED	LIABILITY COMPANY	39 COVESIDE LN	YARMOUTH	ME	04096	2017002 MMC Master Facility Plan Phase IIE
064 E020001	8	12 GILMAN ST	12 GILMAN STREET LLC		295 BROWN ST STE 1	WESTBROOK	ME	04092	2017002 MMC Master Facility Plan Phase IIE
064 E021001	4	10 GILMAN ST	10 GILMAN STREET LLC		40 WOODFIELD DR	SCARBOROUGH	ME	04074	2017002 MMC Master Facility Plan Phase IIE
064 E022001	1	10 A ST	STICKNEY BRIAN J		10 A ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E023001	3	4 GILMAN ST	HOCHSTEDLER ANNA F &	MOISES T SABINA JTS	4 GILMAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E025001	1	8 A ST	MACKENZIE JENNIFER A &	GARRY J BOWCOTT	8 A ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E028001	1	4 GILMAN PL	FOX STEPHEN H		4 GILMAN PL	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064 E029001	3	3 GILMAN PL	FOX STEPHEN H		4 GILMAN PL	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065 D014001	1	931 CONGRESS ST	CR VENTURES LLC		302 CHANDLER'S WHARF	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
065 D016001	1	925 CONGRESS ST	WORAMALEE SAENGTONG		921 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065 D017001	2	921 CONGRESS ST	WORAMALEE SAENGTONG		921 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065 E017001	1	24 FOREST ST	CAREY MEGHAN		24 FOREST ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065 E019001	0	22 FOREST ST	EAST END DEVELOPMENT LLC		PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
065 E021001	0	18 FOREST ST	EAST END DEVELOPMENT LLC		PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
065 E023001	0	14 FOREST ST	EAST END CORP		ONE CANAL PLAZA	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
065 E025001	12	12 FOREST ST	EAST END CORP		PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
065 E028001	1	919 CONGRESS ST	EAST END CORP		PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
065 E030001	0	909 CONGRESS ST	EAST END HOLDINGS LLC		PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE

ABUTTERS LIST
MMC EXPANSION
PORTLAND, ME
JN 2866.01

065	G002001	3	942 CONGRESS ST	TPA ASSOCIATES		940 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065	G003001	0	VALLEY ST	TPA ASSOCIATES		940 CONGRESS ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
065	G004001	3	274 VALLEY ST	JORDAN ROBERT K TRUSTEE		1050 ISLAND AVE	LONG ISLAND	ME	04050	2017002 MMC Master Facility Plan Phase IIE
054	E001001	9	59 BRAMHALL ST	BJB REALTY LLC		PO BOX 6842	PORTLAND	ME	04103	2017002 MMC Master Facility Plan Phase IIE
054	E010001	4	315 BRACKETT ST	315 BRACKETT STREET LLC		55 D ST	SOUTH PORTLAND	ME	04106	2017002 MMC Master Facility Plan Phase IIE
054	E011001	5	311 BRACKETT ST	JOBI PROPERTIES LLC		16 CHARLOTTE DR	FALMOUTH	ME	04105	2017002 MMC Master Facility Plan Phase IIE
054	F033001	7	249 VAUGHAN ST	PARKER VAUGHAN STREET LLC		249 VAUGHAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054	F034001	5	303 BRACKETT ST	303 BRACKETT LLC		PO BOX 2301	SOUTH PORTLAND	ME	04116	2017002 MMC Master Facility Plan Phase IIE
063	A015001	1	146 CHADWICK ST	ISERBYT SAMUEL T		146 CHADWICK ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	A016001	5	140 CHADWICK ST	NEWFANGLED CAPITAL LLC		140 CHADWICK ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	A018001	1	132 CHADWICK ST	BOYD MARJORIE ANN		132 CHADWICK ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	B001001	36	135 CHADWICK ST	BOWDOIN REALTY LLC		131 CHADWICK ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	B009001	1	212 VAUGHAN ST	BLANK CHERYL L		212 VAUGHAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	B010001	2	208 VAUGHAN ST	210 VAUGHAN STREET LLC		81 COUSINS RD	BUXTON	ME	04093	2017002 MMC Master Facility Plan Phase IIE
063	C001001	1	304 BRACKETT ST	HENNIGAR CHRISTOPHER G		405 WESTERN AVE	SOUTH PORTLAND	ME	04106	2017002 MMC Master Facility Plan Phase IIE
063	C004001	1	233 VAUGHAN ST	VAUGHAN STREET REALTY	ASSOCIATES	233 VAUGHAN ST	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C006001	1	217 VAUGHAN ST UNIT 1	SMITH LORI L		217 VAUGHAN ST # 1	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C006002	1	217 VAUGHAN ST UNIT 2	WHORF STEVEN C &		DHL EXPRESS ASIA PACIFIC REGI	819458 SINGAPORE			2017002 MMC Master Facility Plan Phase IIE
063	C006003	1	217 VAUGHAN ST UNIT 3	TEDESCO THEODORE M &	MARILYN M TEDESCO	217 VAUGHAN ST # 3	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C006004	1	217 VAUGHAN ST UNIT 4	MAIN CHARLES D &	JUDITH Z MAIN JTS	36 LONGFELLOW W AVE	BRUNSWICK	ME	04011	2017002 MMC Master Facility Plan Phase IIE
063	C006005	1	217 VAUGHAN ST UNIT 5	GALLO JORDAN L &	JACLYN R GALLO JTS	217 VAUGHAN ST # 5	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C006006	1	217 VAUGHAN ST UNIT 6	BIBERSTEIN KATHRYN L		43 BYRAM AVE	FREEPORT	ME	04032	2017002 MMC Master Facility Plan Phase IIE

UPON REVIEW OF ABOVE ABUTTERS LIST PROVIDED BY MMC WITH CITY'S TAX MAPS; WE HAVE ADDED THE FOLLOWING ABUTTERS:

								2017002 MMC Master Facility Plan Phase IIE
053	E005	25 CRESCENT ST	CRESCENT HEIGHTS LLC	PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
053	E013	868 CONGRESS ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053	E014	25 CRESCENT ST	CRESCENT HEIGHTS LLC	PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
053	E015	25 CRESCENT ST	CRESCENT HEIGHTS LLC	PO BOX 4790	PORTLAND	ME	04112	2017002 MMC Master Facility Plan Phase IIE
053	H006	9 WESCOTT ST	KENNETT FISK	43 SPINNAKER LANE	FALMOUTH	MA	02540	2017002 MMC Master Facility Plan Phase IIE
053	I001	887 CONGRESS ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053	I002	887 CONGRESS ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053	I003	887 CONGRESS ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053	I007	14 BOYNTON ST	MCKEOWN RYAN	1226 SUNNYMEADOW DRIVE	NASHVILLE	TN	37215	2017002 MMC Master Facility Plan Phase IIE
053	I012	887 CONGRESS ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
053	X001	19 FOREST ST	MMC / CAT-WALK					2017002 MMC Master Facility Plan Phase IIE
054	C006	34 ELLSWORTH ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054	C010	40 ELLSWORTH ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
054	D005	46 BRAMHALL ST	YENTSCH CARLTON	PO BOX 254	W. BOOTHBAY HBR	ME	04575-025	2017002 MMC Master Facility Plan Phase IIE
054	E009	47 BRAMHALL ST	MMC					2017002 MMC Master Facility Plan Phase IIE
054	I001	308 BRACKETT ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	A007	7 BRAMHALL ST	7 BRAMHALL STREET LLC	160 ANN MARY BROWN DRIVE	WARWICK	RI	02888	2017002 MMC Master Facility Plan Phase IIE
063	A008	265 WESTERN PROMENAD	COPE SAMUEL & SARA	265 WEST PROMENADE	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	A017	132 CHADWICK ST	MARGERY ANN BOYD	132 CHADWICK STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	B008	214 VAUGHAN ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C005	229 VAUGHAN ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
063	C007	217 VAUGHAN ST	BIBERSTEIN KATHRYN	43 BYRAM AVENUE	FREEPORT	ME	04032	2017002 MMC Master Facility Plan Phase IIE
063	C008	217 VAUGHAN ST	BIBERSTEIN KATHRYN	43 BYRAM AVENUE	FREEPORT	ME	04032	2017002 MMC Master Facility Plan Phase IIE
064	B002	264 VALLEY ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE
064	D011	254 VALLEY ST	STICKNEY ADAM	254 VALLEY STREET	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
064	E024	51 VALLEY ST	CITY OF PORTLAND - LAND BANK	389 CONGRESS STREET	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
065	C001	939 CONGRESS ST	THE INN AT ST. JOHN	939 CONGRESS STREET	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
065	C002	947 CONGRESS ST	LI RI TENG & WEI YI WANG	PO BOX 495	MOODY	ME	04054-049	2017002 MMC Master Facility Plan Phase IIE
065	C009	937 CONGRESS ST	MARDIGAN STEPHEN	460 BAXTER BOULEVARD	PORTLAND	ME	04101	2017002 MMC Master Facility Plan Phase IIE
065	E029	909 CONGRESS ST	EAST END HOLDINGS LLC	PO BOX 10291	PORTLAND	ME	04104	2017002 MMC Master Facility Plan Phase IIE
065	G005	0 VALLEY ST	MMC	22 BRAMHALL STREET	PORTLAND	ME	04102	2017002 MMC Master Facility Plan Phase IIE

- ALL PROPERTIES OWNED BY MAINE MEDICAL CENTER - DO NOT SEND ABUTTERS NOTICES - INCLUDED FOR INFORMATION PURPOSES ONLY

Section 1
Site and Traffic Information

1.A. Site Description and Site Plan

The proposed project is located at the site of the existing Gilman Garage for Maine Medical Center employees on Congress Street and the southeast corner of the Gilman Street / Congress Street intersection. The site is identified on City Tax Map 53, Lot D007, and City Tax Map 65 Lots H001, H002, H005, H008, and H009. A proposed site plan is included in the site plan application submitted under separate cover.

1.B. Existing and Proposed Site Uses

The existing site is the Gilman parking garage for the employees of Maine Medical Center. The proposed project consists of razing the existing employee garage and constructing additional hospital space, including new private universal patient rooms, procedure rooms, a new hospital entrance, and a new drop off area with a connection to the visitor garage. Although the expansion will include new patient rooms, the project will optimize the current bed capacity, and is not proposed to add any beds. Vehicular access to the hospital expansion will be expanded to include a new entrance on Congress Street and a new patient drop-off area with a direct connection to the visitor garage. Employees who park in the existing employee parking garage will park in the larger proposed employee parking garage on St. John Street with approximately 2,400 spaces. It should be noted that of the approximately 2,400 spaces, 50 are will be reserved for the Eagles and approximately 200 are reserved for the tenants of 222 St. John Street. There will be many shuttles that run throughout the day to transport employees to and from the parking garage from Maine Medical Center. The project is proposed to increase the number of employees by 200 between 2016 and 2023.

1.C. Site Vicinity and Boundaries

The entire site is bordered by Congress Street to the north, Wescott Street to the east, the Bramhall Street to the south, and Gilman Street to the west. A site location map showing the development area is included in Attachment 1A.

1.D. Proposed Uses in the Vicinity of the Proposed Development

Approved projects that are not yet opened as well as projects for which applications have been filed are required to be included in the predevelopment volumes for this project. Based on conversations with City Staff, the traffic from these projects that is forecast to impact the Maine Medical Center Expansion study area is discussed in Section 7 (Traffic Impact Study).

1.E. Trip Generation

The trip generation for the proposed expansion was calculated using the Institute of Transportation Engineers' (ITE) publication, *Trip Generation*, Seventh Edition, Land Use Code (LUC) 610 – Hospital. The Tenth Edition is available, but has not yet been accepted by the MaineDOT. The expansion is proposed to be a total of 265,000 sf and it is anticipated to add 200 employees (including employees, students, and physicians). As approved at the October 13, 2017 Pre-Scoping meeting with the City, the trip generation for the expansion is based on the number of employees, students, and physicians. The following is a summary of the trip generation for the expansion that will need to be permitted:

- AM Peak Hour Adjacent Street: 68 trip ends
- PM Peak Hour Adjacent Street: 66 trip ends
- AM Peak Hour of Generator: 78 trip ends
- PM Peak Hour of Generator: 94 trip ends
- Saturday Peak Hour of Generator: 106 trip ends

A trip end is defined as a trip into or out of the site; thus, a round trip is equal to two trip ends. Since the forecast traffic exceeds 99 trip ends during a peak hour, a Traffic Movement Permit is required. The City of Portland has delegated review authority, so the application can be administered by the City. A copy of the trip generation calculations are included as an attachment to this section.

1.F. Trip Distribution

Based on ITE's *Trip Generation*, the following trip distribution is anticipated:

- AM Peak Hour Adjacent Street: 54 in / 14 out
- PM Peak Hour Adjacent Street: 23 in / 43 out

- AM Peak Hour of Generator: 51 in / 27 out
- PM Peak Hour of Generator: 38 in / 56 out
- Saturday Peak Hour of Generator: 58 in / 48 out

1.G. Trip Composition and Assignment

GP has assumed that all trips are primary in nature and made for the sole purpose of going to and from the site. The trips will also be comprised of both employees and patients/visitors. The portion of the trip generation that is forecast to be due to patients/visitors has been based on information provided by MMC Staff in an email dated August 8, 2018. Based on MMC's information, an additional 15,500 patient trips are anticipated annually by 2023. Based on discussions with MMC, the distribution of the patient/visitors has been based on the following assumptions:

- Patient trips are split evenly throughout the year
- 90% of patient trips occur Monday through Friday
- Patient trips are evenly split through the week
- 20% of daily trips occur during the peak hours
- 80% entering during the AM peak hour
- 80% exiting during the PM peak hour

Based on these assumptions, the following trip composition is forecast for the peak hours of the adjacent street:

- AM Peak Hour Adjacent Street (assumed 7:30AM – 8:30AM):
  - Patients/Visitors: 10 trip ends (8 in / 2 out)
  - Employees: 58 trip ends (46 in / 12 out)
- PM Peak Hour Adjacent Street (assumed 4:15PM – 5:15PM):
  - Patients/Visitors: 10 trip ends (2 in / 8 out)
  - Employees: 56 trip ends (21 in / 35 out)

The trip assignment for the employees has been based on the VHB Travelshed (attached) for employees, previously reviewed by the City. The patient/visitor trip assignment has been based on the proposed driveway locations, information from MMC in an email dated August 8, 2018, and the existing traffic patterns. The trip assignment is discussed in more detail in Section 7 of this application.

1.H. Attachments

Attachment 1A – Site Location Map, Trip Assignment Diagram, VHB Travelshed
Attachment 1B – Trip Generation Calculations

Attachment 1A

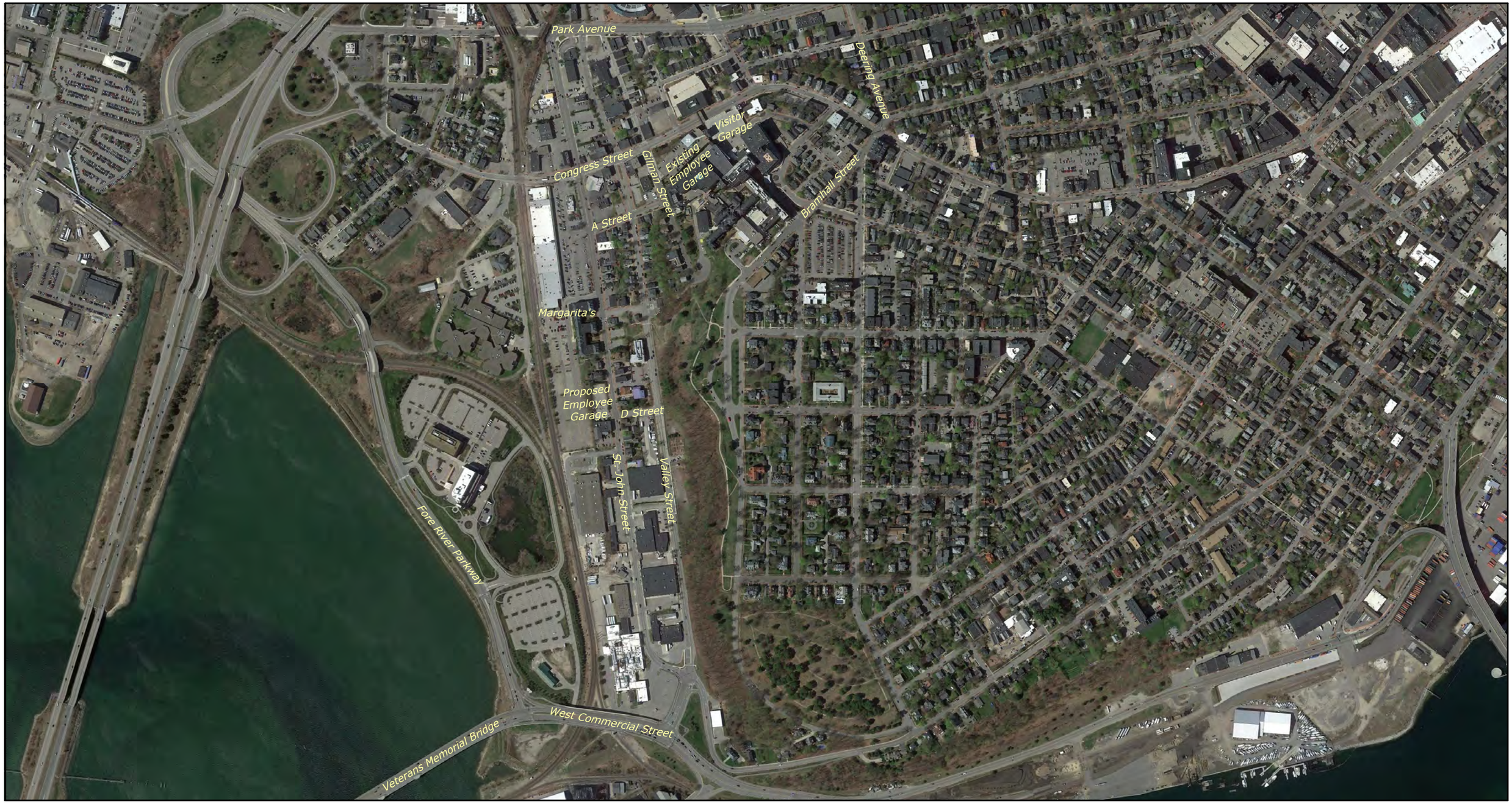
Site Location Map

Trip Assignment Diagram

VHB Travelshed

Location Map

Figure No. 1



Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design:	EAL	Scale:	NONE
Draft:		Date:	SEP 2018
Checked:	RED	File Name:	28866.01 - TIS Figures

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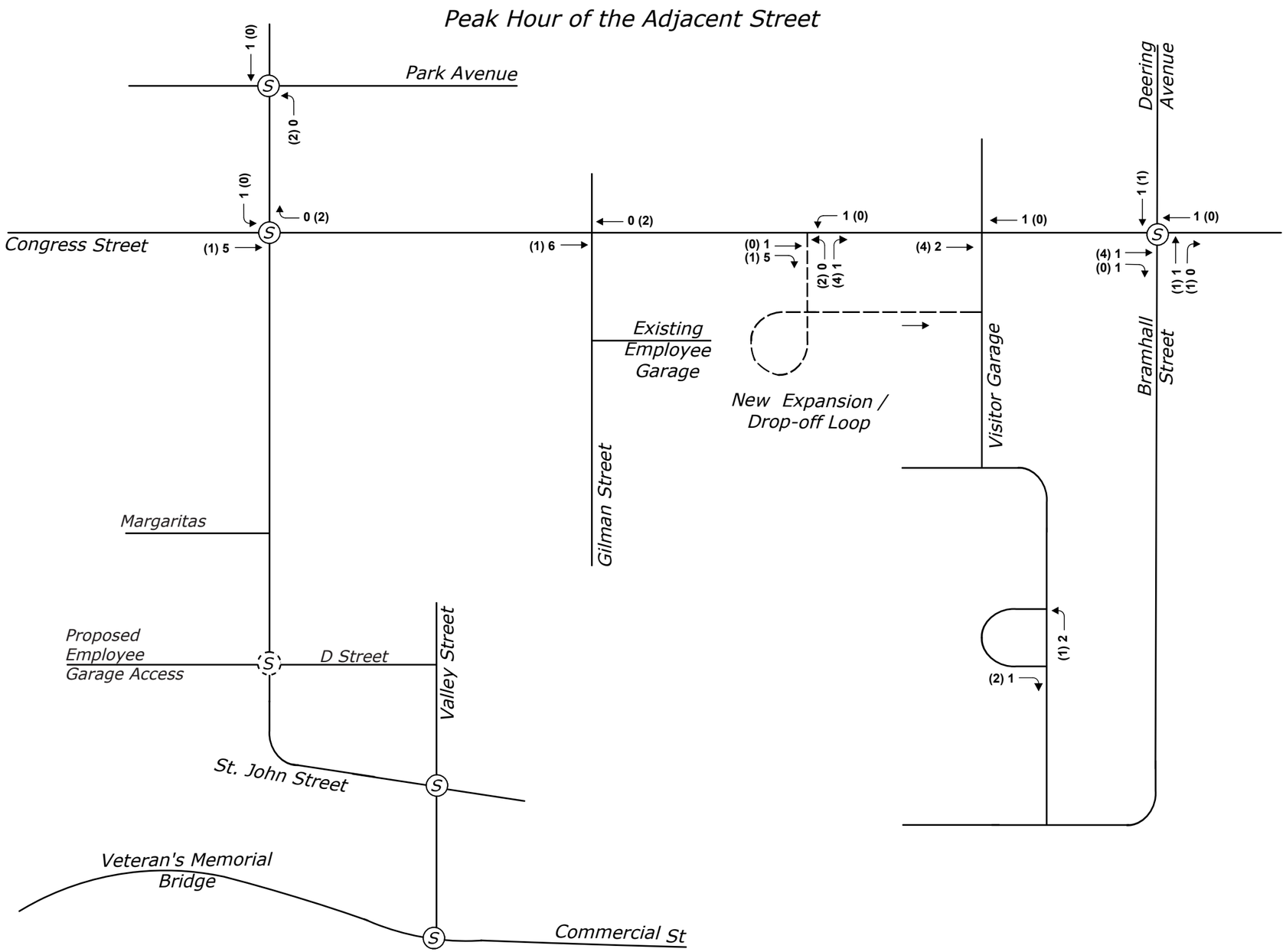
Phase 3 Patient/Visitor Assignment

Figure No. 6



Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design: EAL Scale: NONE
Draft: Date: SEP 2018
Checked: RED File Name: 28866.01 - TIS Figures

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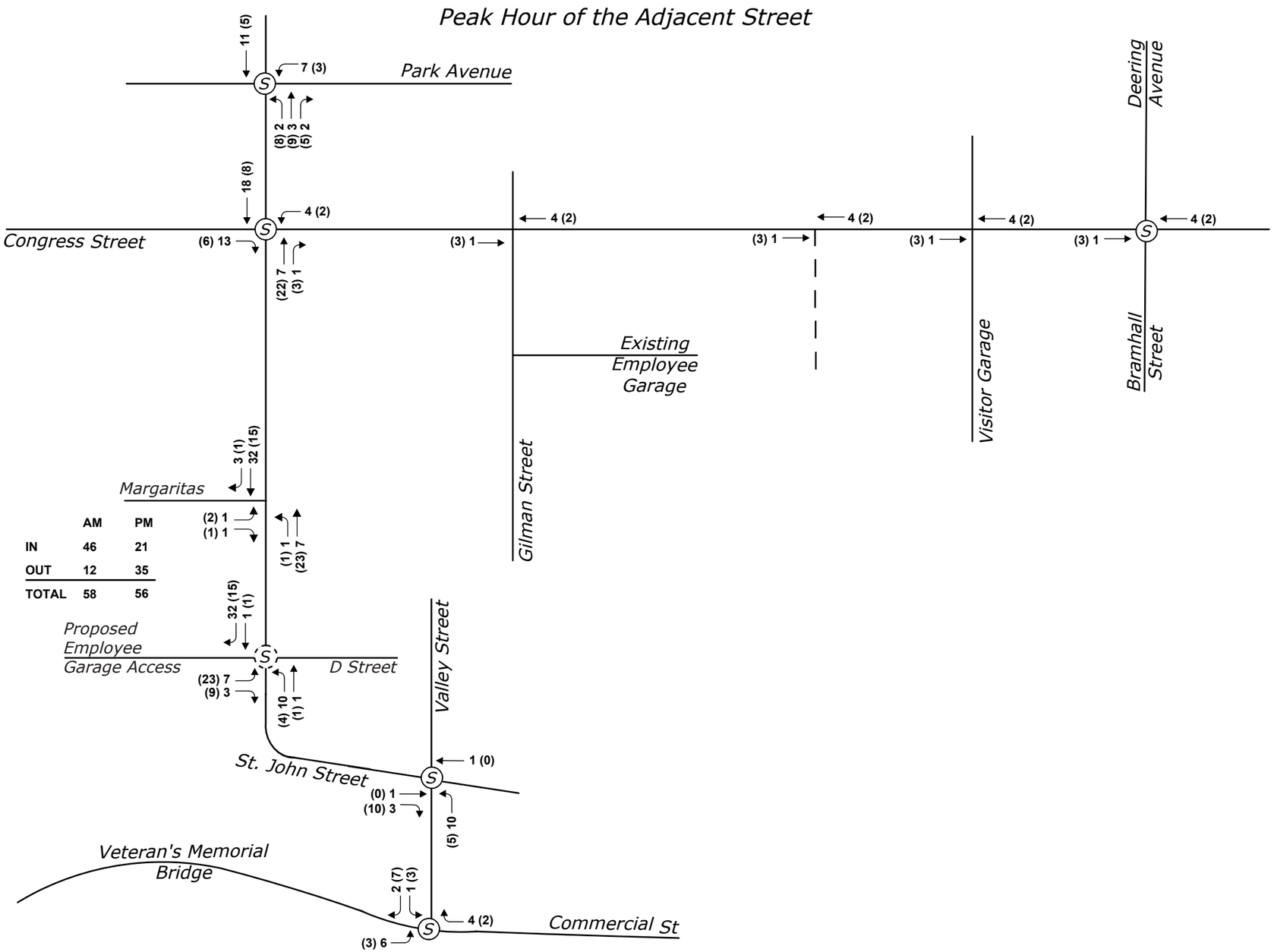
Phase 3 Employee Trip Assignment

Figure No. 7



Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design: EAL Scale: NONE
Draft: Date: SEP 2018
Checked: RED File Name: 28866.01 - TIS Figures

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LEGEND

Bramhall Employees	1 mile	Travelshed
<1 mile	3 miles	295 North
1-3 miles	5 miles	35 - 302 - 117 North
3-5 miles	10 miles	95 North
5-10 miles	20 miles	95 South
10-20 miles	30 miles	Ferries
20-30 miles	40 miles	Peninsular Surface Streets
30-40 miles	50 miles	Rt 25 - Brighton Ave
40-50 miles		South Portland Surface Streets
>50 miles		Maine Medical Center

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Bramhall Employee Address Locations and Travelsheds
Maine Medical Center

vhb

0 2.5 5 Miles

Attachment 1B

Trip Generation Calculations

JN: 2866.01
Project Description: Maine Medical Center Phase 3
Project Location: Portland, ME
Date: 08/14/18

Gorrill Palmer
707 Sable Oaks Drive
Suite 30
South Portland, Maine 04106

Hospital
Land Use Code (LUC) 610

Employees 200

Fitted Curve:

Time Period	ITE Trip Rate	Trip Ends	Directional Split* IN	Directional Split* OUT	Directional Distribution IN	Directional Distribution OUT	Sample Size/R2
Weekday	T =4.40 (X) + 711.46	1591	50%	50%	796	795	19/.77
AM Peak Adjacent Street	T =0.32 (X) + 35.15	99	80%	20%	79	20	9/.77
PM Peak Adjacent Street	T =0.28 (X) + 75.75	132	35%	65%	46	86	8/.69
AM Peak of Generator	T = 0.33 (X) +66.57	133	65%	35%	86	47	8/.83
PM Peak of Generator	T = 0..36 (X) + 97.41	169	40%	60%	68	101	15/.73
Saturday	T = 2.95 (X)+ 691.43	1281	50%	50%	641	640	15/.84
Saturday Peak of Generator	Not given	-	55%	45%	-	-	4

* Percentages rounded to nearest 5%

Average Rate:

Time Period	ITE Trip Rate	Trip Ends	Directional Split* IN	Directional Split* OUT	Directional Distribution IN	Directional Distribution OUT	Sample Size
Weekday	**T = 5.2 (X)**	**1040**	**50%**	**50%**	**520**	**520**	**19**
AM Peak Adjacent Street	**T = 0.34 (X)**	**68**	**80%**	**20%**	**54**	**14**	**9**
PM Peak Adjacent Street	**T = 0.33 (X)**	**66**	**35%**	**65%**	**23**	**43**	**8**
AM Peak of Generator	**T = 0.39 (X)**	**78**	**65%**	**35%**	**51**	**27**	**8**
PM Peak of Generator	**T = 0.47 (X)**	**94**	**40%**	**60%**	**38**	**56**	**15**
Saturday	**T = 3.78 (X)**	**756**	**50%**	**50%**	**378**	**378**	**15**
Saturday Peak of Generator	**T = 0.53 (X)**	**106**	**55%**	**45%**	**58**	**48**	**4**

* Percentages rounded to nearest 5%

Section 2
Traffic Crashes

2.A. Crash Summary Data

Gorrill Palmer obtained the crash data from MaineDOT for the period of 2015-2017, the most recent period available (Attachment 2A).

In order to evaluate whether a location has a crash problem, MaineDOT uses two criteria to define a High Crash Location (HCL). Both criteria must be met in order to be classified as an HCL.

1. A critical rate factor of 1.00 or more for a three-year period. (A Critical Rate Factor {CRF} compares the actual crash rate to the rate for similar intersections in the state. A CRF of less than 1.00 indicates a rate of less than average) **and:**

2. A minimum of eight crashes over the same three year period.

Based on the crash data provided by MaineDOT, there are eight high crash locations in the vicinity of the study area:

- Intersection of Park Avenue with Valley Street
- Intersection of Congress Street with Gilman Street
- Intersection of St. John Street with A Street
- Intersection of Park Avenue with St. John Street
- Valley Street from A Street to C Street
- Congress Street from Forest Street to Weymouth Street
- St. John Street from Congress Street to Non-Intersection (just south of Park Avenue)

To better evaluate the high crash locations and identify correctable crash patterns, the police reports for these locations were provided by MaineDOT and used to create collision diagrams, included as Attachment 2A to this section. The following discusses the high crash locations as well as pedestrian and bicycle crashes in more detail.

High Crash Locations

The following describes the HCLs in more detail.

Park Avenue / Valley Street

This intersection has a CRF of 1.80 and experienced 10 collisions during the most recent three-year period. It is an unsignalized intersection that is STOP controlled on Valley Street with free flowing traffic on Park Avenue. The northbound Valley Street approach is one-way into the intersection.

There is one crash pattern at this intersection involving vehicles turning left from northbound Valley Street onto westbound Park Avenue and colliding with vehicles traveling westbound on Park Avenue. Additionally, one collision that occurred at this intersection involved a pedestrian and one that involved a bicyclist. The traffic from the proposed MMC expansion is not expected to exacerbate this pattern.

Congress Street / Gilman Street

This intersection has a CRF of 3.26 and experienced 20 collisions during the most recent three-year period. It is an unsignalized intersection that is STOP controlled on the Gilman Street approaches with free flowing traffic on Congress Street. The southbound Gilman Street approach is one-way into the intersection. Based on a review of the collision diagram there are three crash patterns at this intersection; southbound through traffic on Gilman Street failing to yield to eastbound through traffic on Congress Street, southbound through traffic on Gilman Street failing to yield to westbound through traffic on Congress Street, and rear end collisions involving eastbound Congress Street traffic.

There were four collisions that involved southbound through traffic on Gilman Street failing to yield the right of way to the eastbound through traffic on Congress Street and three collisions that involved vehicles coming from the same direction failing to yield the right of way to westbound through traffic on Congress Street. These types of collisions may be due to the buildings along Congress Street blocking the sight distance of the southbound traffic. Because the MMC employee parking is being relocated to St. John Street, both the AM and PM total entering traffic volume for this intersection will be decreased from the Predevelopment condition to the Postdevelopment condition.

There were three rear end collisions on Congress Street eastbound. All three were caused by drivers following too closely and/or driver inattention. Additionally, all three collisions involved vehicles stopping for pedestrians in the crosswalk.

St. John Street / A Street

This intersection has a CRF of 1.82 and experienced 8 collisions during the most recent three-year period. It is an unsignalized four-leg intersection with two-way traffic on all approaches. Based on a review of the collision diagram, there were no correctable crash patterns identified at this intersection.

Park Avenue / St. John Street

This intersection has a CRF of 1.63 and experienced 36 collisions during the most recent three-year period. It is a signalized four-leg intersection with two-way traffic on all approaches, with the exception of Park Avenue to the east of St. John Street, which is one way away from the intersection. Based on a review of the collision diagram, there are four crash patterns at this intersection.

One crash pattern involved vehicles in the northbound St. John Street left turn lane attempting to go straight through the intersection from the left-most lane and colliding with left turning vehicles in the adjacent left-through lane. There were 13 such crashes at this intersection during the most recent three year period. Most of the drivers that incorrectly attempted to travel through the intersection claimed that they believed they could travel through the intersection from that lane.

Another crash pattern was northbound left turning vehicles sideswiping one another while traveling in the left turn lane and left-through lane from the northbound St. John Street approach to the intersection. Six of these crashes occurred at this intersection during the most recent three year period. There is already a skip line striping between the left turn lane and the left-through lane through the intersection. Many of the crashes involved in the two crash patterns discussed at this intersection so far occurred either during the winter or in the spring when the striping of the skip line may have faded away.

A third crash pattern at this intersection involves right angle collisions between westbound through vehicles on Park Avenue failing to yield to northbound through vehicles on St. John Street. Three of these crashes occurred at this intersection during the most recent three year period. All three collisions involved the westbound Park Avenue vehicle running the red light.

The fourth crash pattern at this intersection involved rear-end collisions involving vehicles at the northbound approach to this intersection. One potential contributing factor to rear end collisions at signalized intersections is inadequate signal clearance times.

Valley Street from A Street to C Street

This intersection has a CRF of 2.89 and experienced 8 collisions during the most recent three-year period. There were no correctable crash patterns identified, however there were five crashes involving parked vehicles. Of the five crashes involving parked vehicles, three crashes involved vehicles that were parked illegally. Stricter enforcement of the parking regulations may help reduce the number of crashes along this segment of Valley Street. It should also be noted that there was one crash involving a pedestrian at this location during the most recent three year period.

Congress Street from Forest Street to Weymouth Street

This section of Congress Street has a CRF of 1.45 and experienced 10 collisions during the most recent three-year period. Based on a review of the collision diagram there is one crash pattern of rear end collisions in the eastbound direction. Of the 10 collisions, five were rear end collisions on Congress Street eastbound. The five collisions were caused by drivers following too closely. There are multiple driveways in this roadway segment, including an entrance to the Maine Medical Center visitor parking garage.

An overall review of the collisions showed that there were 9 collisions that occurred on a weekday and of those, 2 occurred during the AM peak commuter hour and 4 occurred during the PM peak commuter hour, when traffic volumes are heaviest. Additionally, one of the collisions that occurred in this area involved a bicyclist.

Restriping of this section of Congress Street to include a center turn lane may be an alternative to be pursued to improve this section of Congress Street.

St. John Street from Congress Street to Non-Intersection (just south of Park Avenue)

This section of St. John Street has a CRF of 3.00 and experienced 30 collisions during the most recent three-year period. Based on a review of the collision diagram, there are two crash patterns.

The first crash pattern involves sideswipe crashes involving vehicles traveling northbound on St. John Street, which are caused by vehicles making lane changes.

Of the 30 collisions, 17 involved vehicles attempting to turn left onto St. John Street from various driveways. There are many driveways on this link of St. John Street including McDonald's, Amato's, Sullivan Tire, Dunkin' Donuts, Lang's Express, Salty Sally's Bare and Grille and Portland Physical Therapy. Of the 30 crashes in this roadway segment, two involved left turns into driveways from St. John Street.

In a recent Traffic Impact Study completed by Maine Traffic Resources for a Dunkin Donuts relocation project in this section of St. John Street, a "road diet" was recommended that would include a single travel lane in each direction with a center turn lane. Gorrill Palmer supports that recommendation.

Pedestrian Collisions

There were 22 collisions involving pedestrians throughout the study area. Of those, 15 occurred when the pedestrian was within the marked crosswalk, seven of which involved one vehicle rear ending another that was yielding to the pedestrian. Several of the collisions involved pedestrians crossing without the walk sign at a signalized intersection,

or abruptly entering the intersection. Others involved vehicles failing to yield to the pedestrians in the crosswalks.

Bicycle Collisions

There were 9 collisions involving bicyclists throughout the study area. One collision involved a bicyclist riding in a bike lane being struck by a turning vehicle on Park Avenue. Several of the collisions involved bicyclists riding in the roadway, but not following traffic rules.

2.B. Attachments

Attachment 2A – Crash Report, Collision Diagrams

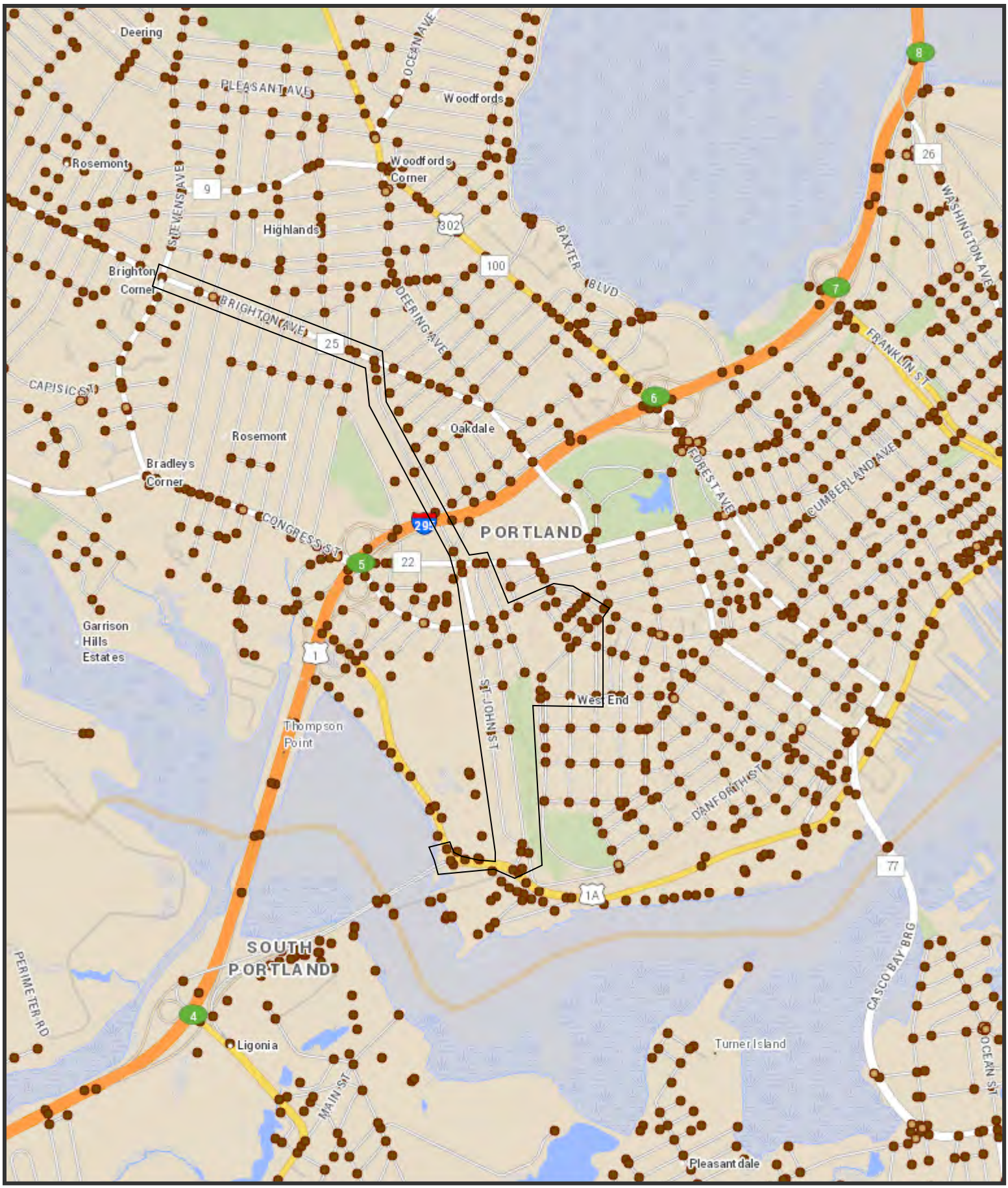
Attachment 2A

Node Map

Crash History

Collision Diagrams

PORTLAND NODE MAP PAGE 1



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0.4 Miles

1 inch = 0.45 miles

Date: 8/8/2018
Time: 4:08:26 PM

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☑ 1320 Summary

REPORT DESCRIPTION

Portland
Brighton Ave., St. John St., Congress St. Area

REPORT PARAMETERS

Year 2015, Start Month 1 through Year 2017 End Month: 12

Route: 0001A	Start Node: 66546	Start Offset: 0	☐ Exclude First Node
	End Node: 16747	End Offset: 0	☐ Exclude Last Node
Route: 001AS	Start Node: 16747	Start Offset: 0	☑ Exclude First Node
	End Node: 66542	End Offset: 0	☑ Exclude Last Node
Route: 3209586	Start Node: 66548	Start Offset: 0	☑ Exclude First Node
	End Node: 66546	End Offset: 0	☑ Exclude Last Node
Route: 3201019	Start Node: 16747	Start Offset: 0	☑ Exclude First Node
	End Node: 16753	End Offset: 0	☐ Exclude Last Node
Route: 3209776	Start Node: 16752	Start Offset: 0	☑ Exclude First Node
	End Node: 67695	End Offset: 0	☑ Exclude Last Node
Route: 0560191	Start Node: 67749	Start Offset: 0	☐ Exclude First Node
	End Node: 16748	End Offset: 0	☑ Exclude Last Node
Route: 3209812	Start Node: 67750	Start Offset: 0	☑ Exclude First Node
	End Node: 67749	End Offset: 0	☑ Exclude Last Node
Route: 0560314	Start Node: 19081	Start Offset: 0	☐ Exclude First Node
	End Node: 19079	End Offset: 0	☐ Exclude Last Node
Route: 0560001	Start Node: 19080	Start Offset: 0	☑ Exclude First Node
	End Node: 16751	End Offset: 0	☑ Exclude Last Node
Route: 0560100	Start Node: 16750	Start Offset: 0	☑ Exclude First Node
	End Node: 16763	End Offset: 0	☑ Exclude Last Node

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☑ 1320 Summary

REPORT DESCRIPTION

Portland
Brighton Ave., St. John St., Congress St. Area

REPORT PARAMETERS

Year 2015, Start Month 1 through Year 2017 End Month: 12

Route: 0560184	Start Node: 16749	Start Offset: 0	☑ Exclude First Node
	End Node: 16762	End Offset: 0	☑ Exclude Last Node
Route: 0560160	Start Node: 16825	Start Offset: 0	☐ Exclude First Node
	End Node: 18571	End Offset: 0	☑ Exclude Last Node
Route: 0560160	Start Node: 18571	Start Offset: 0	☑ Exclude First Node
	End Node: 16752	End Offset: 0	☑ Exclude Last Node
Route: 0560160	Start Node: 16752	Start Offset: 0	☑ Exclude First Node
	End Node: 16765	End Offset: 0	☑ Exclude Last Node
Route: 0560077	Start Node: 16825	Start Offset: 0	☑ Exclude First Node
	End Node: 12625	End Offset: 0	☐ Exclude Last Node
Route: 0560785	Start Node: 12751	Start Offset: 0	☑ Exclude First Node
	End Node: 12625	End Offset: 0	☑ Exclude Last Node
Route: 0560782	Start Node: 71553	Start Offset: 0	☐ Exclude First Node
	End Node: 12751	End Offset: 0	☑ Exclude Last Node
Route: 3200519	Start Node: 60369	Start Offset: 0	☑ Exclude First Node
	End Node: 71553	End Offset: 0	☑ Exclude Last Node
Route: 0560782	Start Node: 12751	Start Offset: 0	☐ Exclude First Node
	End Node: 12605	End Offset: 0	☐ Exclude Last Node
Route: 0560124	Start Node: 12602	Start Offset: 0	☑ Exclude First Node
	End Node: 12603	End Offset: 0	☑ Exclude Last Node

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☑ 1320 Summary

REPORT DESCRIPTION

Portland
Brighton Ave., St. John St., Congress St. Area

REPORT PARAMETERS

Year 2015, Start Month 1 through Year 2017 End Month: 12

Route: 0560751	Start Node: 12604	Start Offset: 0	☑ Exclude First Node
	End Node: 12605	End Offset: 0	☑ Exclude Last Node
Route: 0560071	Start Node: 19110	Start Offset: 0	☑ Exclude First Node
	End Node: 19111	End Offset: 0	☑ Exclude Last Node
Route: 0560071	Start Node: 19111	Start Offset: 0	☑ Exclude First Node
	End Node: 19112	End Offset: 0	☐ Exclude Last Node
Route: 0560128	Start Node: 19112	Start Offset: 0	☑ Exclude First Node
	End Node: 12624	End Offset: 0	☐ Exclude Last Node
Route: 0560251	Start Node: 12617	Start Offset: 0	☑ Exclude First Node
	End Node: 16826	End Offset: 0	☑ Exclude Last Node
Route: 0560633	Start Node: 12620	Start Offset: 0	☑ Exclude First Node
	End Node: 19112	End Offset: 0	☑ Exclude Last Node
Route: 0560171	Start Node: 12619	Start Offset: 0	☑ Exclude First Node
	End Node: 12624	End Offset: 0	☑ Exclude Last Node
Route: 0560780	Start Node: 12622	Start Offset: 0	☑ Exclude First Node
	End Node: 12623	End Offset: 0	☑ Exclude Last Node
Route: 0560369	Start Node: 12618	Start Offset: 0	☑ Exclude First Node
	End Node: 12621	End Offset: 0	☑ Exclude Last Node
Route: 0560076	Start Node: 18352	Start Offset: 0	☑ Exclude First Node
	End Node: 15476	End Offset: 0	☑ Exclude Last Node

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☑ 1320 Summary

REPORT DESCRIPTION

Portland
Brighton Ave., St. John St., Congress St. Area

REPORT PARAMETERS

Year 2015, Start Month 1 through Year 2017 End Month: 12

Route: 0022X	Start Node: 19079	Start Offset: 0	☑ Exclude First Node
	End Node: 16753	End Offset: 0	☑ Exclude Last Node
Route: 0022X	Start Node: 16753	Start Offset: 0	☑ Exclude First Node
	End Node: 16770	End Offset: 0	☑ Exclude Last Node
Route: 3201042	Start Node: 16748	Start Offset: 0	☑ Exclude First Node
	End Node: 16765	End Offset: 0	☐ Exclude Last Node
Route: 0022S	Start Node: 16765	Start Offset: 0	☑ Exclude First Node
	End Node: 16770	End Offset: 0	☐ Exclude Last Node
Route: 0560637	Start Node: 16770	Start Offset: 0	☑ Exclude First Node
	End Node: 12700	End Offset: 0	☑ Exclude Last Node
Route: 3210295	Start Node: 12700	Start Offset: 0	☑ Exclude First Node
	End Node: 71539	End Offset: 0	☑ Exclude Last Node
Route: 0025X	Start Node: 12700	Start Offset: 0	☐ Exclude First Node
	End Node: 12928	End Offset: 0	☐ Exclude Last Node
Route: 0560001	Start Node: 16751	Start Offset: 0	☑ Exclude First Node
	End Node: 16764	End Offset: 0	☑ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
16747	0001A - 9.88	Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST	9	26	0	0	3	4	19	26.9	10.520	0.82	1.12	0.00
											Statewide Crash Rate:	0.74		
66542	0001A - 9.72	Int of FORE RIVER PKY VETERANS BRIDGE	9	19	0	0	1	2	16	15.8	9.400	0.67	1.14	0.00
											Statewide Crash Rate:	0.74		
66546	0001A - 9.69	Int of FORE RIVER PKY RD INV 3209586	2	0	0	0	0	0	0	0.0	3.283	0.00	0.44	0.00
											Statewide Crash Rate:	0.16		
66548	001AS - 2.59	Int of FORE RIVER PKY RD INV 3209586	2	0	0	0	0	0	0	0.0	5.449	0.00	0.38	0.00
											Statewide Crash Rate:	0.16		
16753	3201019 - 0.82	Int of PARK AV VALLEY ST	2	10	0	0	1	4	5	50.0	4.639	0.72	0.40	1.80
											Statewide Crash Rate:	0.16		
16749	3201019 - 0.37	Int of D ST VALLEY ST	2	2	0	0	0	0	2	0.0	1.357	0.49	0.55	0.00
											Statewide Crash Rate:	0.16		
16751	3201019 - 0.60	Int of A ST VALLEY ST	2	5	0	0	0	2	3	40.0	1.467	1.14	0.54	2.11
											Statewide Crash Rate:	0.16		
16748	3201019 - 0.07	Int of DANFORTH ST ST JOHN ST VALLEY ST	9	11	0	0	1	2	8	27.3	3.995	0.92	1.34	0.00
											Statewide Crash Rate:	0.74		
16750	3201019 - 0.49	Int of C ST VALLEY ST	2	1	0	0	0	0	1	0.0	1.286	0.26	0.55	0.00
											Statewide Crash Rate:	0.16		
16752	3201019 - 0.66	Int of CONGRESS ST VALLEY ST	9	9	0	0	0	1	8	11.1	5.210	0.58	1.27	0.00
											Statewide Crash Rate:	0.74		
67750	3201019 - 0.05	Int of RD INV 3209812 VALLEY ST	2	0	0	0	0	0	0	0.0	2.723	0.00	0.46	0.00
											Statewide Crash Rate:	0.16		
67695	3201019 - 0.64	Non Int VALLEY ST	2	0	0	0	0	0	0	0.0	0.480	0.00	0.67	0.00
											Statewide Crash Rate:	0.16		
67749	0560191 - 1.34	Int of DANFORTH ST RD INV 3209812	2	0	0	0	0	0	0	0.0	2.670	0.00	0.44	0.00
											Statewide Crash Rate:	0.15		
18571	0560314 - 0.17	Int of CONGRESS ST GILMAN ST	2	20	0	0	0	6	14	30.0	5.274	1.26	0.39	3.26
											Statewide Crash Rate:	0.16		
19080	0560314 - 0.10	0509500 POR,GILMAN,'A' ST.	2	0	0	0	0	0	0	0.0	0.058	0.00	-0.42	0.00
											Statewide Crash Rate:	0.14		
19081	0560314 - 0	0509501 POR,GILMAN ST,END	2	0	0	0	0	0	0	0.0	0.019	0.00	-4.47	0.00
											Statewide Crash Rate:	0.14		
19079	0560314 - 0.31	Int of GILMAN ST PARK AV	2	1	0	0	1	0	0	100.0	3.841	0.09	0.42	0.00
											Statewide Crash Rate:	0.16		
16828	0560160 - 2.23	Int of CONGRESS ST FOREST ST	2	1	0	0	0	0	1	0.0	4.848	0.07	0.40	0.00
											Statewide Crash Rate:	0.16		
16827	0560160 - 2.13	Int of CONGRESS ST WEYMOUTH ST	2	3	0	0	0	1	2	33.3	4.615	0.22	0.40	0.00
											Statewide Crash Rate:	0.16		
16825	0560160 - 1.97	Int of BRAMHALL ST CONGRESS ST DEERING AV	9	17	0	1	1	4	11	35.3	7.276	0.78	1.19	0.00
											Statewide Crash Rate:	0.74		
16826	0560160 - 2.03	Int of CONGRESS ST ELLSWORTH ST	2	3	0	0	1	0	2	33.3	4.494	0.22	0.40	0.00
											Statewide Crash Rate:	0.16		
18352	0560077 - 0.01	Int of BRAMHALL PL BRAMHALL ST	2	0	0	0	0	0	0	0.0	2.944	0.00	0.41	0.00
											Statewide Crash Rate:	0.14		

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
12625	0560077 - 0.24	Int of BRAMHALL ST WESTERN PROMENADE	2	0	0	0	0	0	0	0.0	0.386	0.00	0.60	0.00
												Statewide Crash Rate:	0.14	
12603	0560077 - 0.13	0503015 POR,BRAMHALL,BRACKETT,CHADWICK	2	0	0	0	0	0	0	0.0	0.521	0.00	0.59	0.00
												Statewide Crash Rate:	0.14	
19111	0560077 - 0.11	0509531 POR,BRACKETT,BRAMHALL ST.	2	4	0	0	1	1	2	50.0	1.973	0.68	0.45	1.50
												Statewide Crash Rate:	0.14	
12621	0560077 - 0.06	0503033 POR,BRAMHALL,HILL ST.	2	1	0	0	0	0	1	0.0	1.575	0.21	0.48	0.00
												Statewide Crash Rate:	0.14	
12604	0560077 - 0.03	0503016 POR,BRAMHALL,VAUGHN ST.	2	1	0	0	0	0	1	0.0	3.051	0.11	0.40	0.00
												Statewide Crash Rate:	0.14	
60369	0560785 - 0.62	Non Int WESTERN PROMENADE	2	0	0	0	0	0	0	0.0	0.386	0.00	0.60	0.00
												Statewide Crash Rate:	0.14	
71553	0560782 - 0	Non Int WESTERN PROMENADE	2	0	0	0	0	0	0	0.0	0.214	0.00	0.56	0.00
												Statewide Crash Rate:	0.14	
12751	0560782 - 0.01	Int of WEST ST WESTERN PROMENADE	2	0	0	0	0	0	0	0.0	0.395	0.00	0.60	0.00
												Statewide Crash Rate:	0.14	
12602	0560782 - 0.07	Int of CHADWICK ST, WEST ST	2	0	0	0	0	0	0	0.0	1.295	0.00	0.50	0.00
												Statewide Crash Rate:	0.14	
12605	0560782 - 0.14	0503017 POR,VAUGHN,WEST ST.	2	0	0	0	0	0	0	0.0	1.753	0.00	0.47	0.00
												Statewide Crash Rate:	0.14	
19110	0560751 - 0.06	0509530 POR,BRACKETT,VAUGHN ST.	2	1	0	0	1	0	0	100.0	2.274	0.15	0.44	0.00
												Statewide Crash Rate:	0.14	
19112	0560071 - 0.82	0509532 POR,CHARLES,BRACKETT ST.	2	0	0	0	0	0	0	0.0	0.843	0.00	0.55	0.00
												Statewide Crash Rate:	0.14	
12617	0560128 - 0.03	0503029 POR,ELLSWORTH,CHARLES ST.	2	0	0	0	0	0	0	0.0	0.930	0.00	0.54	0.00
												Statewide Crash Rate:	0.14	
12624	0560128 - 0.09	0503036 POR,CHARLES,CRESCENT ST.	2	1	0	0	0	0	1	0.0	0.313	1.06	0.60	1.77
												Statewide Crash Rate:	0.14	
12622	0560251 - 0.03	0503034 POR,WESCOTT,ELLSWORTH ST.	2	0	0	0	0	0	0	0.0	0.542	0.00	0.59	0.00
												Statewide Crash Rate:	0.14	
12618	0560251 - 0.05	0503030 POR,ELLSWORTH,HILL ST.	2	1	0	0	0	0	1	0.0	0.871	0.38	0.54	0.00
												Statewide Crash Rate:	0.14	
15476	0560251 - 0.08	Int of BRAMHALL PL ELLSWORTH ST	2	0	0	0	0	0	0	0.0	0.525	0.00	0.59	0.00
												Statewide Crash Rate:	0.14	
12619	0560251 - 0.07	0503031 POR,CRESCENT,ELLSWORTH ST.	2	0	0	0	0	0	0	0.0	0.537	0.00	0.59	0.00
												Statewide Crash Rate:	0.14	
12623	0560171 - 0.05	0503035 POR,CRESCENT,WESCOTT ST.	2	0	0	0	0	0	0	0.0	0.096	0.00	0.20	0.00
												Statewide Crash Rate:	0.14	
12620	0560369 - 0.03	0503032 POR,HILL,RUSSELL ST.	2	1	0	0	0	0	1	0.0	0.242	1.38	0.58	2.37
												Statewide Crash Rate:	0.14	
16763	3201042 - 0.44	Int of C ST ST JOHN ST	2	3	0	0	1	0	2	33.3	2.590	0.39	0.47	0.00
												Statewide Crash Rate:	0.16	
16762	3201042 - 0.32	Int of D ST ST JOHN ST	2	0	0	0	0	0	0	0.0	2.480	0.00	0.47	0.00
												Statewide Crash Rate:	0.16	

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
16764	3201042 - 0.54	Int of A ST ST JOHN ST	2	8	0	0	0	1	7	12.5	3.383	0.79	0.43	1.82
												Statewide Crash Rate:	0.16	
16765	3201042 - 0.60	Int of CONGRESS ST ST JOHN ST	9	25	0	1	1	3	20	20.0	11.212	0.74	1.11	0.00
												Statewide Crash Rate:	0.74	
16770	0022S - 1.04	Int of PARK AV ST JOHN ST	9	36	0	0	2	4	30	16.7	5.948	2.02	1.24	1.63
												Statewide Crash Rate:	0.74	
66777	0022S - 1.02	Non Int ST JOHN ST	2	0	0	0	0	0	0	0.0	2.639	0.00	0.46	0.00
												Statewide Crash Rate:	0.16	
12629	0560637 - 0.15	Int of GRANITE ST ST JOHN ST	2	1	0	0	0	0	1	0.0	3.175	0.10	0.44	0.00
												Statewide Crash Rate:	0.16	
12692	0560637 - 0.53	Int of DARTMOUTH ST ST JOHN ST	2	1	0	0	0	0	1	0.0	2.890	0.12	0.45	0.00
												Statewide Crash Rate:	0.16	
12695	0560637 - 0.27	Int of FALMOUTH ST ST JOHN ST	2	1	0	0	0	0	1	0.0	3.223	0.10	0.44	0.00
												Statewide Crash Rate:	0.16	
12628	0560637 - 0.04	Int of ST JOHN ST WASHBURN AV	2	0	0	0	0	0	0	0.0	3.041	0.00	0.45	0.00
												Statewide Crash Rate:	0.16	
71539	0560637 - 0.56	Non Int ST JOHN ST	2	0	0	0	0	0	0	0.0	2.745	0.00	0.46	0.00
												Statewide Crash Rate:	0.16	
12878	0025X - 1.15	Int of BRIGHTON AV MASSACHUSETTS AV	2	1	0	0	0	0	1	0.0	6.452	0.05	0.33	0.00
												Statewide Crash Rate:	0.14	
A12883	0025X - 1.20	Int of BOLTON ST BRIGHTON AV	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
A12891	0025X - 1.30	Int of BRIGHTON AV FRANCES ST	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
P12776	0025X - 1.26	Int of BRIGHTON AV ORLAND ST	2	3	0	0	0	0	3	0.0	6.582	0.15	0.33	0.00
												Statewide Crash Rate:	0.14	
A12892	0025X - 1.35	Int of BRIGHTON AV EDWARDS ST	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
12877	0025X - 1.10	Int of BRIGHTON AV DOUGLASS ST	2	7	0	0	0	0	7	0.0	6.575	0.35	0.33	1.07
												Statewide Crash Rate:	0.14	
P12899	0025X - 1.47	Int of BRIGHTON AV, CALEB ST	2	3	0	0	0	1	2	33.3	6.064	0.16	0.34	0.00
												Statewide Crash Rate:	0.14	
12928	0025X - 1.63	Int of BRIGHTON AV STEVENS AV	9	54	0	0	2	9	43	20.4	8.793	2.05	1.15	1.78
												Statewide Crash Rate:	0.74	
12779	0025X - 1.12	Int of BRIGHTON AV, ST GEORGE ST	2	0	0	0	0	0	0	0.0	6.095	0.00	0.34	0.00
												Statewide Crash Rate:	0.14	
P12782	0025X - 1.18	Int of BEACON ST, BRIGHTON AV	2	4	0	0	2	0	2	50.0	6.796	0.20	0.33	0.00
												Statewide Crash Rate:	0.14	
A12884	0025X - 1.25	Int of BRIGHTON AV WHITNEY AV	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
A12904	0025X - 1.49	Int of BRIGHTON AV HOLLIS RD	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
P12775	0025X - 1.29	Int of BRIGHTON AV, DEBLOIS ST	2	1	0	0	0	0	1	0.0	6.090	0.05	0.34	0.00
												Statewide Crash Rate:	0.14	

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
P12783	0025X - 1.34	Int of BRIGHTON AV, HIGHLAND ST	2	6	0	0	0	1	5	16.7	6.056	0.33	0.34	0.00
											Statewide Crash Rate:	0.14		
12903	0025X - 1.53	Int of BRADLEY ST, BRIGHTON AV	2	3	0	0	0	2	1	66.7	5.930	0.17	0.34	0.00
											Statewide Crash Rate:	0.14		
12898	0025X - 1.41	0503311 POR,BRIGHTON AVE,CRAIGIE ST.	2	4	0	0	0	0	4	0.0	6.112	0.22	0.34	0.00
											Statewide Crash Rate:	0.14		
12700	0025X - 1.05	Int of BRIGHTON AV DEVONSHIRE ST NOYES ST ST JOH	9	21	0	1	0	7	13	38.1	7.464	0.94	1.19	0.00
											Statewide Crash Rate:	0.74		
Study Years:	3.00	NODE TOTALS:		320	0	3	19	55	243	24.1	226.905	0.47	0.39	1.21

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
66546	66542	3508657	0 - 0.03	0001A - 9.69	0.03	2	0	0	0	0	0	0	0.0	0.00064	0.00	828.15	0.00
Int of FORE RIVER PKY RD INV 3209586				US 1A											Statewide Crash Rate: 218.56		
66542	16747	3140171	0 - 0.16	0001A - 9.72	0.16	2	3	0	0	0	1	2	33.3	0.00782	127.84	445.86	0.00
Int of FORE RIVER PKY VETERANS BRIDGE				US 1A											Statewide Crash Rate: 218.56		
16747	66548	3117394	0 - 0.13	001AS - 2.46	0.13	2	4	0	0	0	1	3	25.0	0.00708	188.21	456.26	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST				US 1AS											Statewide Crash Rate: 218.56		
66548	66542	3121654	0 - 0.04	001AS - 2.59	0.04	2	0	0	0	0	0	0	0.0	0.00187	0.00	637.86	0.00
Int of FORE RIVER PKY RD INV 3209586				US 1AS											Statewide Crash Rate: 218.56		
66548	66546	3120374	0 - 0.06	3209586 - 0	0.06	2	0	0	0	0	0	0	0.0	0.00046	0.00	880.08	0.00
Int of FORE RIVER PKY RD INV 3209586				RD INV 3209586											Statewide Crash Rate: 218.56		
16747	67750	3417945	0 - 0.05	3201019 - 0	0.05	2	0	0	0	0	0	0	0.0	0.00155	0.00	669.13	0.00
Int of FORE RIVER PKY VALLEY ST W COMMERCIAL ST				RD INV 3201019											Statewide Crash Rate: 218.56		
67750	16748	3417946	0 - 0.02	3201019 - 0.05	0.02	2	0	0	0	0	0	0	0.0	0.00047	0.00	878.84	0.00
Int of RD INV 3209812 VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16748	16749	3139464	0 - 0.30	3201019 - 0.07	0.30	2	2	0	0	1	0	1	50.0	0.00383	174.05	530.31	0.00
Int of DANFORTH ST ST JOHN ST VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16749	16750	3118971	0 - 0.12	3201019 - 0.37	0.12	2	4	0	0	0	0	2	0.0	0.00148	903.57	677.99	1.33
Int of D ST VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16750	16751	3117941	0 - 0.11	3201019 - 0.49	0.11	2	8	0	0	0	2	5	28.6	0.00133	2010.83	696.66	2.89
Int of C ST VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16751	67695	3416725	0 - 0.04	3201019 - 0.60	0.04	2	1	0	0	0	0	1	0.0	0.00038	868.76	906.67	0.00
Int of A ST VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
67695	16752	3508600	0 - 0.02	3201019 - 0.64	0.02	2	0	0	0	0	0	0	0.0	0.00010	0.00	726.01	0.00
Non Int VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16752	16753	3118516	0 - 0.16	3201019 - 0.66	0.16	2	2	0	0	0	0	2	0.0	0.00134	496.76	694.56	0.00
Int of CONGRESS ST VALLEY ST				RD INV 3201019											Statewide Crash Rate: 218.56		
16752	67695	3416727	0 - 0.03	3209776 - 0	0.03	2	0	0	0	0	0	0	0.0	0.00014	0.00	893.23	0.00
Int of CONGRESS ST VALLEY ST				RD INV 3209776											Statewide Crash Rate: 218.56		
16748	67749	3417943	0 - 0.03	0560191 - 1.34	0.03	2	0	0	0	0	0	0	0.0	0.00062	0.00	696.56	0.00
Int of DANFORTH ST ST JOHN ST VALLEY ST				RD INV 05 60191											Statewide Crash Rate: 174.83		
67750	67749	3417947	0 - 0.02	3209812 - 0	0.02	2	0	0	0	0	0	0	0.0	0.00008	0.00	316.22	0.00
Int of RD INV 3209812 VALLEY ST				RD INV 3209812											Statewide Crash Rate: 174.83		
19080	19081	194795	0 - 0.10	0560314 - 0	0.10	2	5	0	0	0	0	3	0.0	0.00004	43077.45	926.59	46.49
0509500 POR,GILMAN,'A' ST.				RD INV 05 60314											Statewide Crash Rate: 407.52		
18571	19080	194101	0 - 0.07	0560314 - 0.10	0.07	2	3	0	0	0	1	2	33.3	0.00002	49542.97	-1166.96	0.00
Int of CONGRESS ST GILMAN ST				RD INV 05 60314											Statewide Crash Rate: 407.52		
18571	19079	194100	0 - 0.14	0560314 - 0.17	0.14	2	4	0	0	0	0	1	0.0	0.00023	5889.98	1666.75	3.53
Int of CONGRESS ST GILMAN ST				RD INV 05 60314											Statewide Crash Rate: 407.52		

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
16751	19080	192420	0 - 0.03	0560001 - 0	0.03	2	0	0	0	0	0	0	0.0	0.00001	0.00	-3169.30	0.00
Int of A ST VALLEY ST				RD INV 05 60001											Statewide Crash Rate: 407.52		
16750	16763	192417	0 - 0.05	0560100 - 0	0.05	2	0	0	0	0	0	0	0.0	0.00007	0.00	1603.07	0.00
Int of C ST VALLEY ST				RD INV 05 60100											Statewide Crash Rate: 407.52		
16749	16762	192415	0 - 0.04	0560184 - 0	0.04	2	0	0	0	0	0	0	0.0	0.00008	0.00	1693.39	0.00
Int of D ST VALLEY ST				RD INV 05 60184											Statewide Crash Rate: 407.52		
16825	16826	3106408	0 - 0.06	0560160 - 1.97	0.06	2	6	0	1	0	1	3	40.0	0.00285	701.52	571.89	1.23
Int of BRAMHALL ST CONGRESS ST DEERING AV				RD INV 05 60160											Statewide Crash Rate: 218.56		
16826	16827	3106410	0 - 0.10	0560160 - 2.03	0.10	2	4	0	0	0	1	3	25.0	0.00424	314.80	517.06	0.00
Int of CONGRESS ST ELLSWORTH ST				RD INV 05 60160											Statewide Crash Rate: 218.56		
16827	16828	3120728	0 - 0.10	0560160 - 2.13	0.10	2	10	0	0	0	2	8	20.0	0.00453	735.77	508.44	1.45
Int of CONGRESS ST WEYMOUTH ST				RD INV 05 60160											Statewide Crash Rate: 218.56		
16828	18571	3106411	0 - 0.04	0560160 - 2.23	0.04	2	4	0	0	0	1	3	25.0	0.00207	645.26	621.60	1.04
Int of CONGRESS ST FOREST ST				RD INV 05 60160											Statewide Crash Rate: 218.56		
16752	18571	3106395	0 - 0.04	0560160 - 2.27	0.04	2	3	0	0	0	0	3	0.0	0.00201	497.12	625.94	0.00
Int of CONGRESS ST VALLEY ST				RD INV 05 60160											Statewide Crash Rate: 218.56		
16752	16765	3106394	0 - 0.05	0560160 - 2.31	0.05	2	1	0	0	0	0	1	0.0	0.00222	150.41	610.42	0.00
Int of CONGRESS ST VALLEY ST				RD INV 05 60160											Statewide Crash Rate: 218.56		
16825	18352	192521	0 - 0.01	0560077 - 0	0.01	2	2	0	0	0	0	1	0.0	0.00029	2267.52	1591.62	1.42
Int of BRAMHALL ST CONGRESS ST DEERING AV				RD INV 05 60077											Statewide Crash Rate: 407.52		
12604	18352	186995	0 - 0.02	0560077 - 0.01	0.02	2	0	0	0	0	0	0	0.0	0.00058	0.00	1368.39	0.00
0503016 POR,BRAMHALL,VAUGHN ST.				RD INV 05 60077											Statewide Crash Rate: 407.52		
12604	12621	186994	0 - 0.03	0560077 - 0.03	0.03	2	1	0	0	0	0	1	0.0	0.00047	706.95	1436.70	0.00
0503016 POR,BRAMHALL,VAUGHN ST.				RD INV 05 60077											Statewide Crash Rate: 407.52		
12621	19111	187026	0 - 0.05	0560077 - 0.06	0.05	2	2	0	0	0	0	1	0.0	0.00069	963.34	1307.97	0.00
0503033 POR,BRAMHALL,HILL ST.				RD INV 05 60077											Statewide Crash Rate: 407.52		
12603	19111	186993	0 - 0.02	0560077 - 0.11	0.02	2	0	0	0	0	0	0	0.0	0.00021	0.00	1687.34	0.00
0503015 POR,BRAMHALL,BRACKETT,CHADWICK				RD INV 05 60077											Statewide Crash Rate: 407.52		
12603	12625	186992	0 - 0.11	0560077 - 0.13	0.11	2	0	0	0	0	0	0	0.0	0.00042	0.00	1472.20	0.00
0503015 POR,BRAMHALL,BRACKETT,CHADWICK				RD INV 05 60077											Statewide Crash Rate: 407.52		
60369	12751	3097430	0 - 0.02	0560785 - 0.60	0.02	2	0	0	0	0	0	0	0.0	0.00003	0.00	680.37	0.00
Non Int WESTERN PROMENADE				RD INV 05 60785											Statewide Crash Rate: 407.52		
12625	60369	2074703	0 - 0.03	0560785 - 0.62	0.03	2	0	0	0	0	0	0	0.0	0.00012	0.00	1758.24	0.00
Int of BRAMHALL ST WESTERN PROMENADE				RD INV 05 60785											Statewide Crash Rate: 407.52		
71553	12751	4047594	0 - 0.01	0560782 - 0	0.01	2	0	0	0	0	0	0	0.0	0.00002	0.00	-892.86	0.00
Non Int WESTERN PROMENADE				RD INV 05 60782											Statewide Crash Rate: 407.52		

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
60369	71553	4047593	0 - 0.01	3200519 - 0	0.01	2	0	0	0	0	0	0	0.0	0.00002	0.00	-892.86	0.00
Non Int WESTERN PROMENADE				RD INV 3200519											Statewide Crash Rate: 407.52		
12602	12751	3097432	0 - 0.06	0560782 - 0.01	0.06	2	0	0	0	0	0	0	0.0	0.00020	0.00	1694.97	0.00
Int of CHADWICK ST, WEST ST				RD INV 05 60782											Statewide Crash Rate: 407.52		
12602	12605	186990	0 - 0.07	0560782 - 0.07	0.07	2	0	0	0	0	0	0	0.0	0.00052	0.00	1403.49	0.00
Int of CHADWICK ST, WEST ST				RD INV 05 60782											Statewide Crash Rate: 407.52		
12602	12603	186989	0 - 0.13	0560124 - 0.27	0.13	2	2	0	0	0	0	1	0.0	0.00091	733.68	1220.10	0.00
Int of CHADWICK ST, WEST ST				RD INV 05 60124											Statewide Crash Rate: 407.52		
12604	19110	186996	0 - 0.06	0560751 - 0	0.06	2	0	0	0	0	0	0	0.0	0.00099	0.00	1194.44	0.00
0503016 POR,BRAMHALL,VAUGHN ST.				RD INV 05 60751											Statewide Crash Rate: 407.52		
12605	19110	186999	0 - 0.13	0560751 - 0.06	0.13	2	3	0	0	0	0	3	0.0	0.00167	598.89	1042.44	0.00
0503017 POR,VAUGHN,WEST ST.				RD INV 05 60751											Statewide Crash Rate: 407.52		
19110	19111	194832	0 - 0.06	0560071 - 0.72	0.06	2	0	0	0	0	0	0	0.0	0.00040	0.00	1492.48	0.00
0509530 POR,BRACKETT,VAUGHN ST.				RD INV 05 60071											Statewide Crash Rate: 407.52		
19111	19112	194833	0 - 0.04	0560071 - 0.78	0.04	2	0	0	0	0	0	0	0.0	0.00034	0.00	1544.01	0.00
0509531 POR,BRACKETT,BRAMHALL ST.				RD INV 05 60071											Statewide Crash Rate: 407.52		
12617	19112	187018	0 - 0.03	0560128 - 0	0.03	2	0	0	0	0	0	0	0.0	0.00025	0.00	1640.21	0.00
0503029 POR,ELLSWORTH,CHARLES ST.				RD INV 05 60128											Statewide Crash Rate: 407.52		
12617	12624	187017	0 - 0.06	0560128 - 0.03	0.06	2	0	0	0	0	0	0	0.0	0.00034	0.00	1541.73	0.00
0503029 POR,ELLSWORTH,CHARLES ST.				RD INV 05 60128											Statewide Crash Rate: 407.52		
12617	12622	187016	0 - 0.03	0560251 - 0	0.03	2	0	0	0	0	0	0	0.0	0.00014	0.00	1756.21	0.00
0503029 POR,ELLSWORTH,CHARLES ST.				RD INV 05 60251											Statewide Crash Rate: 407.52		
12618	12622	187021	0 - 0.02	0560251 - 0.03	0.02	2	0	0	0	0	0	0	0.0	0.00010	0.00	1739.73	0.00
0503030 POR,ELLSWORTH,HILL ST.				RD INV 05 60251											Statewide Crash Rate: 407.52		
12618	12619	187019	0 - 0.02	0560251 - 0.05	0.02	2	0	0	0	0	0	0	0.0	0.00011	0.00	1752.80	0.00
0503030 POR,ELLSWORTH,HILL ST.				RD INV 05 60251											Statewide Crash Rate: 407.52		
12619	15476	187023	0 - 0.01	0560251 - 0.07	0.01	2	0	0	0	0	0	0	0.0	0.00004	0.00	1140.14	0.00
0503031 POR,CRESCENT,ELLSWORTH ST.				RD INV 05 60251											Statewide Crash Rate: 407.52		
15476	16826	191013	0 - 0.02	0560251 - 0.08	0.02	2	0	0	0	0	0	0	0.0	0.00010	0.00	1741.07	0.00
Int of BRAMHALL PL ELLSWORTH ST				RD INV 05 60251											Statewide Crash Rate: 407.52		
12620	19112	187025	0 - 0.05	0560633 - 0	0.05	2	1	0	0	0	0	1	0.0	0.00003	11783.77	160.62	73.37
0503032 POR,HILL,RUSSELL ST.				RD INV 05 60633											Statewide Crash Rate: 407.52		
12619	12623	187022	0 - 0.05	0560171 - 0	0.05	2	1	0	0	0	0	1	0.0	0.00005	6739.79	1306.79	5.16
0503031 POR,CRESCENT,ELLSWORTH ST.				RD INV 05 60171											Statewide Crash Rate: 407.52		
12623	12624	187028	0 - 0.04	0560171 - 0.05	0.04	2	0	0	0	0	0	0	0.0	0.00002	0.00	-939.97	0.00
0503035 POR,CRESCENT,WESCOTT ST.				RD INV 05 60171											Statewide Crash Rate: 407.52		
12622	12623	187027	0 - 0.05	0560780 - 0	0.05	2	0	0	0	0	0	0	0.0	0.00007	0.00	1609.51	0.00
0503034 POR,WESCOTT,ELLSWORTH ST.				RD INV 05 60780											Statewide Crash Rate: 407.52		
12618	12620	187020	0 - 0.03	0560369 - 0	0.03	2	1	0	0	0	0	1	0.0	0.00005	6302.57	1384.61	4.55
0503030 POR,ELLSWORTH,HILL ST.				RD INV 05 60369											Statewide Crash Rate: 407.52		

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
12620	12621	187024	0 - 0.02	0560369 - 0.03	0.02	2	0	0	0	0	0	0	0.0	0.00004	0.00	933.70	0.00
0503032 POR,HILL,RUSSELL ST.				RD INV 05 60369											Statewide Crash Rate: 407.52		
15476	18352	191014	0 - 0.06	0560076 - 0	0.06	2	0	0	0	0	0	0	0.0	0.00004	0.00	863.16	0.00
Int of BRAMHALL PL ELLSWORTH ST				RD INV 05 60076											Statewide Crash Rate: 407.52		
16753	19079	3122262	0 - 0.02	0022X - 0.53	0.02	2	1	0	0	0	0	1	0.0	0.00079	420.00	789.03	0.00
Int of PARK AV VALLEY ST				ST RTE 22											Statewide Crash Rate: 218.56		
16753	16770	4338968	0 - 0.02	0022X - 0.55	0.02	2	1	0	0	0	0	1	0.0	0.00073	458.87	804.91	0.00
Int of PARK AV VALLEY ST				ST RTE 22											Statewide Crash Rate: 218.56		
16753	16770	4338968	0.02 - 0.04	0022X - 0.57	0.02	2	0	0	0	0	0	0	0.0	0.00073	0.00	804.91	0.00
Int of PARK AV VALLEY ST				ST RTE 22											Statewide Crash Rate: 218.56		
16748	16762	3944344	0 - 0.06	3201042 - 0	0.06	2	2	0	0	1	0	1	50.0	0.00139	478.71	688.07	0.00
Int of DANFORTH ST ST JOHN ST VALLEY ST				RD INV 3201042											Statewide Crash Rate: 218.56		
16748	16762	3944344	0.06 - 0.32	3201042 - 0.06	0.26	2	2	0	0	1	0	1	50.0	0.00603	110.47	473.98	0.00
Int of DANFORTH ST ST JOHN ST VALLEY ST				RD INV 3201042											Statewide Crash Rate: 218.56		
16762	16763	3120382	0 - 0.12	3201042 - 0.32	0.12	2	5	0	0	0	0	4	0.0	0.00292	571.18	568.48	1.00
Int of D ST ST JOHN ST				RD INV 3201042											Statewide Crash Rate: 218.56		
16763	16764	3119255	0 - 0.10	3201042 - 0.44	0.10	2	4	0	0	0	0	4	0.0	0.00261	510.48	584.97	0.00
Int of C ST ST JOHN ST				RD INV 3201042											Statewide Crash Rate: 218.56		
16764	16765	3106397	0 - 0.06	3201042 - 0.54	0.06	2	0	0	0	0	0	0	0.0	0.00206	0.00	622.08	0.00
Int of A ST ST JOHN ST				RD INV 3201042											Statewide Crash Rate: 218.56		
16765	66777	3155094	0 - 0.14	0022S - 0.88	0.14	2	30	0	0	0	6	23	20.7	0.00739	1353.16	451.78	3.00
Int of CONGRESS ST ST JOHN ST				ST RTE 22S											Statewide Crash Rate: 218.56		
66777	16770	3154475	0 - 0.02	0022S - 1.02	0.02	2	0	0	0	0	0	0	0.0	0.00106	0.00	737.39	0.00
Non Int ST JOHN ST				ST RTE 22S											Statewide Crash Rate: 218.56		
12628	16770	3122179	0 - 0.04	0560637 - 0	0.04	2	0	0	0	0	0	0	0.0	0.00119	0.00	715.26	0.00
Int of ST JOHN ST WASHBURN AV				RD INV 05 60637											Statewide Crash Rate: 218.56		
12628	12629	3131531	0 - 0.11	0560637 - 0.04	0.11	2	3	0	0	0	1	2	33.3	0.00338	296.12	547.57	0.00
Int of ST JOHN ST WASHBURN AV				RD INV 05 60637											Statewide Crash Rate: 218.56		
12629	12695	3120379	0 - 0.12	0560637 - 0.15	0.12	2	3	0	0	1	0	2	33.3	0.00376	265.69	532.67	0.00
Int of GRANITE ST ST JOHN ST				RD INV 05 60637											Statewide Crash Rate: 218.56		
12692	12695	3129248	0 - 0.26	0560637 - 0.27	0.26	2	6	0	0	1	1	4	33.3	0.00751	266.16	450.03	0.00
Int of DARTMOUTH ST ST JOHN ST				RD INV 05 60637											Statewide Crash Rate: 218.56		
12692	71539	4047229	0 - 0.03	0560637 - 0.53	0.03	2	0	0	0	0	0	0	0.0	0.00079	0.00	790.98	0.00
Int of DARTMOUTH ST ST JOHN ST				RD INV 05 60637											Statewide Crash Rate: 218.56		
71539	12700	4047230	0 - 0.02	0560637 - 0.56	0.02	2	0	0	0	0	0	0	0.0	0.00024	0.00	943.59	0.00
Non Int ST JOHN ST				RD INV 05 60637											Statewide Crash Rate: 218.56		
12700	71539	4047231	0 - 0.02	3210295 - 0	0.02	2	0	0	0	0	0	0	0.0	0.00029	0.00	935.64	0.00
Int of BRIGHTON AV DEVONSHIRE ST NOYES ST ST JOHN ST				RD INV 3210295											Statewide Crash Rate: 218.56		
12700	12877	3944348	0 - 0.05	0025X - 1.05	0.05	2	8	1	0	0	2	5	37.5	0.00320	833.87	525.54	1.59
Int of BRIGHTON AV DEVONSHIRE ST NOYES				ST RTE 25											Statewide Crash Rate: 202.97		

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
ST ST JOHN ST																	
12779	12877	3120098	0 - 0.02	0025X - 1.10	0.02	2	1	0	0	0	1	0	100.0	0.00121	275.34	674.27	0.00
Int of BRIGHTON AV, ST GEORGE ST				ST RTE 25											Statewide Crash Rate: 202.97		
12779	12878	3129250	0 - 0.03	0025X - 1.12	0.03	2	2	0	0	0	0	2	0.0	0.00181	368.03	608.80	0.00
Int of BRIGHTON AV, ST GEORGE ST				ST RTE 25											Statewide Crash Rate: 202.97		
12782	12878	3131537	0 - 0.03	0025X - 1.15	0.03	2	3	0	0	0	2	1	66.7	0.00200	501.20	593.80	0.00
Int of BEACON ST, BRIGHTON AV				ST RTE 25											Statewide Crash Rate: 202.97		
12782	12883	3120099	0 - 0.02	0025X - 1.18	0.02	2	0	0	0	0	0	0	0.0	0.00129	0.00	663.59	0.00
Int of BEACON ST, BRIGHTON AV				ST RTE 25											Statewide Crash Rate: 202.97		
12883	12884	3123616	0 - 0.05	0025X - 1.20	0.05	2	0	0	0	0	0	0	0.0	0.00318	0.00	526.41	0.00
Int of BOLTON ST BRIGHTON AV				ST RTE 25											Statewide Crash Rate: 202.97		
12776	12884	3122184	0 - 0.01	0025X - 1.25	0.01	2	0	0	0	0	0	0	0.0	0.00064	0.00	779.59	0.00
Int of BRIGHTON AV ORLAND ST				ST RTE 25											Statewide Crash Rate: 202.97		
12775	12776	3106212	0 - 0.03	0025X - 1.26	0.03	2	2	0	0	0	1	1	50.0	0.00191	349.34	600.67	0.00
Int of BRIGHTON AV, DEBLOIS ST				ST RTE 25											Statewide Crash Rate: 202.97		
12775	12891	3123710	0 - 0.01	0025X - 1.29	0.01	2	0	0	0	0	0	0	0.0	0.00056	0.00	799.93	0.00
Int of BRIGHTON AV, DEBLOIS ST				ST RTE 25											Statewide Crash Rate: 202.97		
12783	12891	3123925	0 - 0.04	0025X - 1.30	0.04	2	1	0	0	0	1	0	100.0	0.00224	148.49	575.94	0.00
Int of BRIGHTON AV, HIGHLAND ST				ST RTE 25											Statewide Crash Rate: 202.97		
12783	12892	3131538	0 - 0.01	0025X - 1.34	0.01	2	0	0	0	0	0	0	0.0	0.00061	0.00	788.53	0.00
Int of BRIGHTON AV, HIGHLAND ST				ST RTE 25											Statewide Crash Rate: 202.97		
12892	12898	187491	0 - 0.06	0025X - 1.35	0.06	2	2	0	0	0	0	2	0.0	0.00362	183.97	508.96	0.00
Int of BRIGHTON AV EDWARDS ST				ST RTE 25											Statewide Crash Rate: 202.97		
12898	12899	187501	0 - 0.06	0025X - 1.41	0.06	2	4	0	0	0	1	3	25.0	0.00361	369.75	509.60	0.00
0503311 POR,BRIGHTON AVE,CRAIGIE ST.				ST RTE 25											Statewide Crash Rate: 202.97		
12899	12904	3131543	0 - 0.02	0025X - 1.47	0.02	2	1	0	0	0	1	0	100.0	0.00117	285.32	680.22	0.00
Int of BRIGHTON AV, CALEB ST				ST RTE 25											Statewide Crash Rate: 202.97		
12903	12904	3106229	0 - 0.04	0025X - 1.49	0.04	2	1	1	0	0	0	0	100.0	0.00233	142.84	570.17	0.00
Int of BRADLEY ST, BRIGHTON AV				ST RTE 25											Statewide Crash Rate: 202.97		
12903	12928	3131544	0 - 0.10	0025X - 1.53	0.10	2	1	0	0	0	0	1	0.0	0.00581	57.38	452.28	0.00
Int of BRADLEY ST, BRIGHTON AV				ST RTE 25											Statewide Crash Rate: 202.97		
16751	16764	192419	0 - 0.05	0560001 - 0.03	0.05	2	5	0	0	0	0	4	0.0	0.00036	4631.04	1527.03	3.03
Int of A ST VALLEY ST				RD INV 05 60001											Statewide Crash Rate: 407.52		
Study Years: 3.00				Section Totals:	5.54		165	2	1	5	27	115	21.2	0.13524	406.69	288.24	1.41
				Grand Totals:	5.54		485	2	4	24	82	358	23.1	0.13524	1195.42	406.85	2.94

COLLISION DIAGRAM

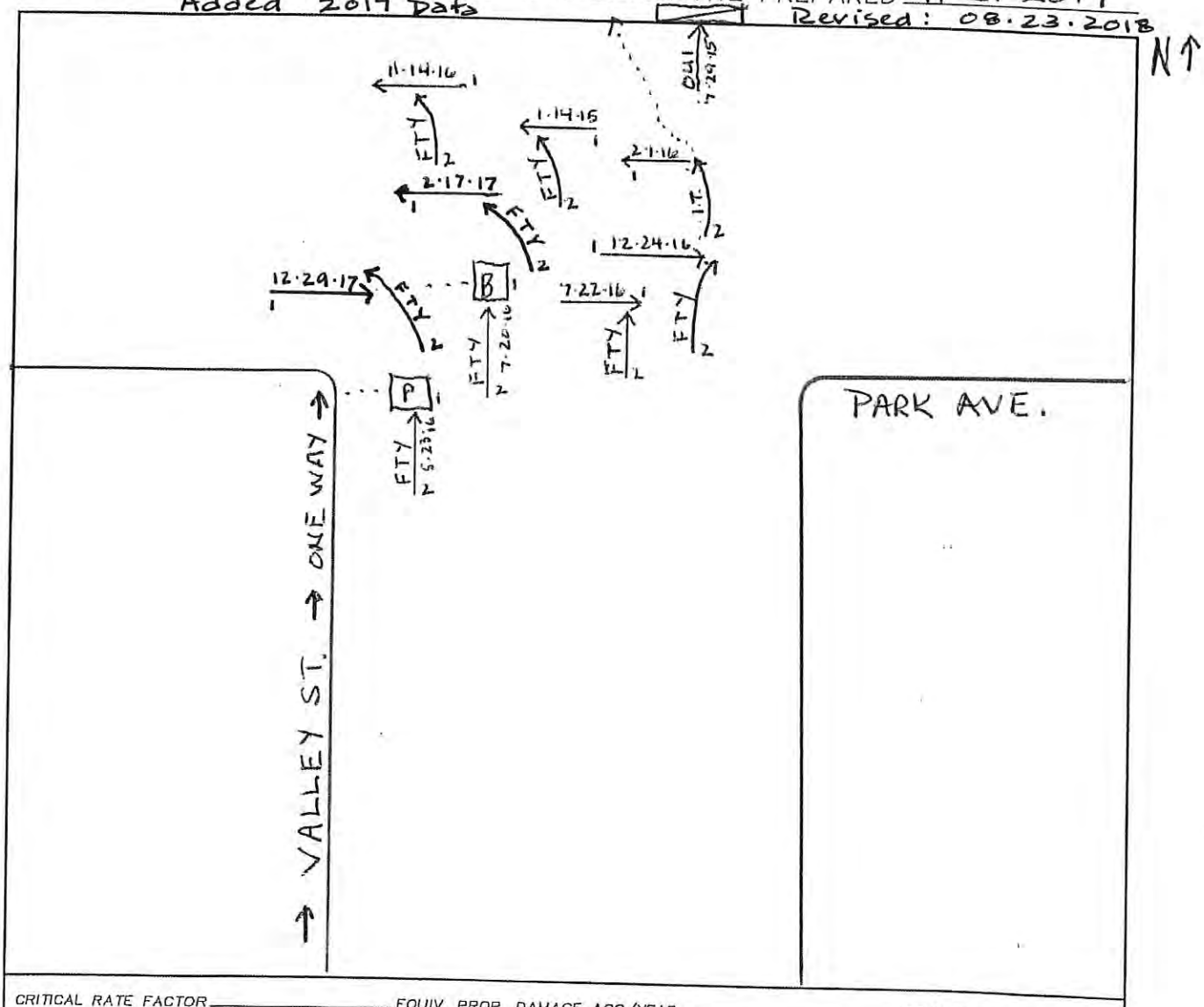
SHEET 1 OF 2

LOCATION Intersection of Park Avenue & Valley Street

TOWN Portland, Maine NODE NO(S) 16753

YEARS REVIEWED 2014 - 2016 DATE PREPARED 11.21.2017

Added 2017 Data Revised: 08.23.2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS - HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS 20. OTHER VISION OBSCUREMENT
30. OTHER HUMAN VIOLATION FACTOR 31. HIT AND RUN 51. UNKNOWN

- VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
OR FACTOR 51. UNKNOWN

SYMBOLS

ANGLE	→	PEDESTRIAN	→ P	FATAL ACCIDENT	●
BACKING	→←	REAR END	→|		
FIXED OBJECT	→□	SIDE SWIPE	⇉	VEHICLE (MOVING)	→
HEAD ON	→|←	TURNING MOVE	↱	BICYCLE	- - - B
OVERTURN	→○	CHANGE LANE	⇉	ANIMAL	- - - A
PARKED VEHICLE	▨	OUT OF CONTROL	∿→	SLED	- - - S

WEATHER
C - CLEAR
SL - SLEET
F - FOG
S - SNOW
R - RAIN
CL - CLOUDY
XW - CROSS WINDS

INJURIES
K - FATAL
A - INCAPACITATING
B - NON-INCAPACITATING
C - POSSIBLE INJURY

COLLISION DIAGRAM

SHEET 2 OF 2

LOCATION Intersection of Park Avenue & Valley Street

TOWN Portland, Maine NODE NO(S) 16753

YEARS REVIEWED 2014 - 2016 DATE PREPARED 11.21.2017

Added 2017 Data Revised: 08.23.2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
15-0190	01.14.15	12:40					2	2	2	
15.2555	07.29.15	17:30					2	1	14/17	OWI
16.0371	02.01.16	14:50					2	1	10	
16.1541	05.23.16	22:02				1	5	1	2	
16.2240	07.20.16	17:24			1		2	1	2	
16.2272	07.22.16	13:48				1	2	1	2	
16.3509	11.14.16	12:20					2	1	2	
16.3941	12.24.16	11:10				1	2	2	2	
17.0600	02.17.17	09:14					2	1	2	
17.4129	12.29.17	13:09				1	2	1	2	

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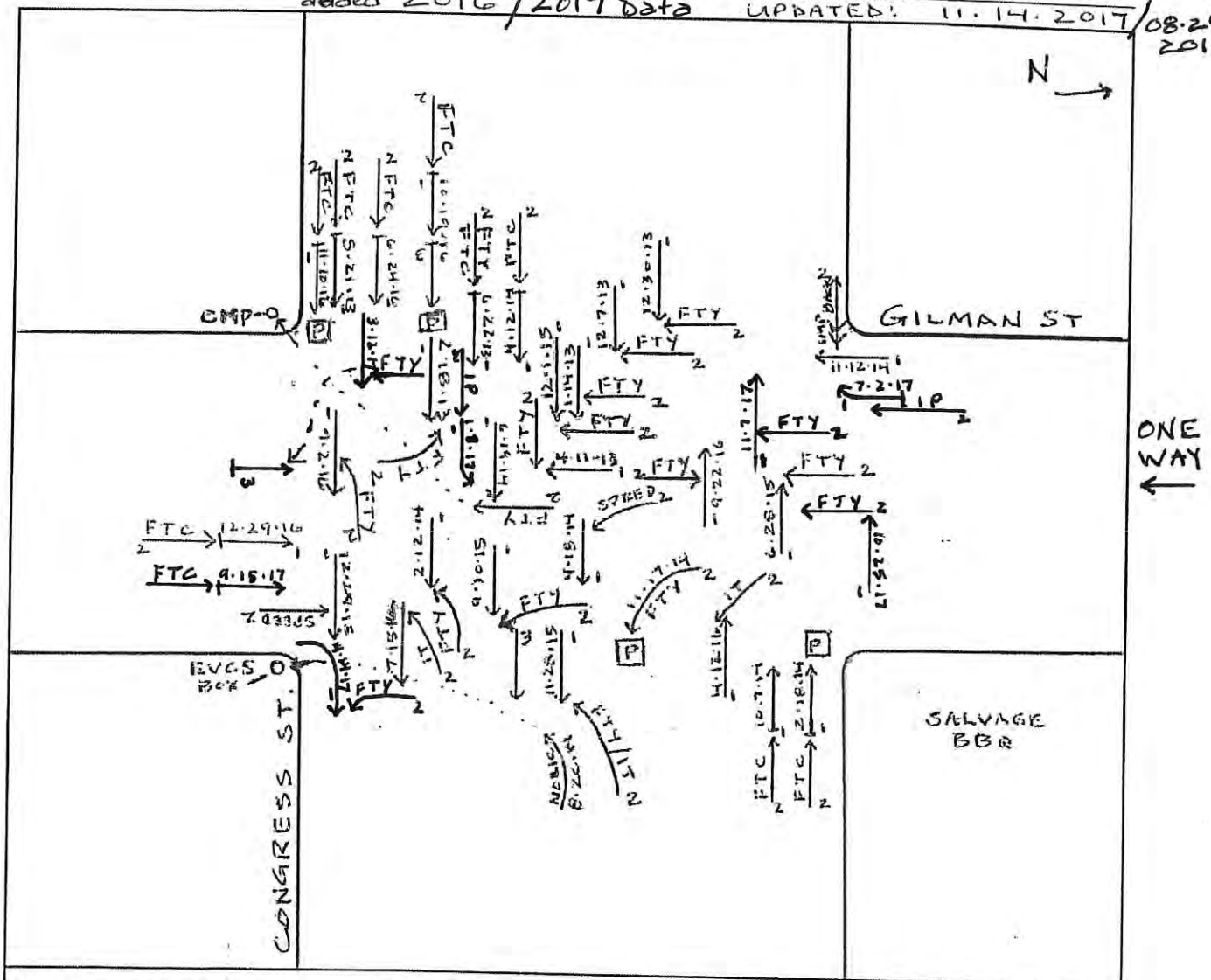
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION Intersection of Congress Street & Gilman Street

TOWN Portland, Maine NODE NO(S) 18571

YEARS REVIEWED 2013 - 2015 added 2016/2017 Data DATE PREPARED 10·24·2016 UPDATED: 11·14·2017/08·24·2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT

1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE

1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS - HUMAN

1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

- VEHICULAR

41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE	PEDESTRIAN	FATAL ACCIDENT
BACKING	REAR END	
FIXED OBJECT	SIDE SWIPE	VEHICLE (MOVING)
HEAD ON	TURNING MOVE	BICYCLE
OVERTURN	CHANGE LANE	ANIMAL
PARKED VEHICLE	OUT OF CONTROL	SLED

WEATHER

C - CLEAR
SL - SLEET
F - FOG
S - SNOW
R - RAIN
CL - CLOUDY
XW - CROSS WINDS

INJURIES

K - FATAL
A - INCAPACITATING
B - NON-INCAPACITATING
C - POSSIBLE INJURY

COLLISION DIAGRAM

SHEET 2 OF 2

LOCATION Intersection of Congress Street & Gilman Street

TOWN Portland, Maine NODE NO(S) 18571

YEARS REVIEWED 2013 - 2015 DATE PREPARED 10.24.2016
added 2016/2017 DATA UPDATED: 11.14.2017 / 08.24.2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
13.169	01.14.13	16:15					2	1	2	
13.609	02.18.13	21:00				1	4	1	2	
13.1153	04.11.13	12:40					2	1	2	
13.1780	06.22.13	12:13				1	2	1	2/4	
13.2344	08.21.13	14:08					2	1	4	
13.3531	12.07.13	10:11				1	2	2	2/19	SMV
13.3827	12.30.13	11:43					2	2	2	
14.538	02.12.14	14:50					2	1	2	
14.631	02.18.14	12:10					2	1	4	Pedestrian
14.1194	04.12.14	12:30					2	1	4/14	
14.1243	04.18.14	11:10					2	1	3	
14.1789	06.19.14	23:45					4	1	2	
14.2519	08.26.14	14:54					2	1	15/30	NO LICENSE NO INSURANCE
14.2955	10.07.14	13:14					2	1	4	
14.3344	11.12.14	18:49					4	1	11	
14.3389	11.17.14	17:15				1	5	2	2	Pedestrian
15.2214	06.28.15	13:00					2	2	2	
15.3054	09.10.15	20:16					4	1	2	
15.3961	11.28.15	12:30					2	1	2/10	
15.3994	12.01.15	16:00					2	2	2	
15.4357	12.29.15	15:00					2	3	3	
16.1134	04.12.16	14:24					2	2	10	
16.1930	06.24.16	18:38					2	1	4	
16.2178	07.15.16	12:20					2	1	10	
16.2693	09.02.16	08:43					2	1	2	No License
16.2932	09.22.16	12:59				1	2	1	2	
16.3228	10.19.16	10:51				1	2	1	4	
16.3480	11.10.16	11:35				1	2	1	4	
16.3991	12.29.16	16:41					4	3	4	
17.0081	01.08.17	17:32					4	2	12	
17.0882	03.12.17	12:00				2	2	1	2	
17.1262	04.14.17	10:30					2	1	2	
17.2092	07.02.17	18:00					2	1	12	
17.2941	09.15.17	11:15				1	2	1	4	
17.3359	10.25.17	04:42					4	2	2	
17.3493	11.07.17	08:12				1	2	1	2	

S:/SHEETS/COLLISION DIAGRAM.DWG

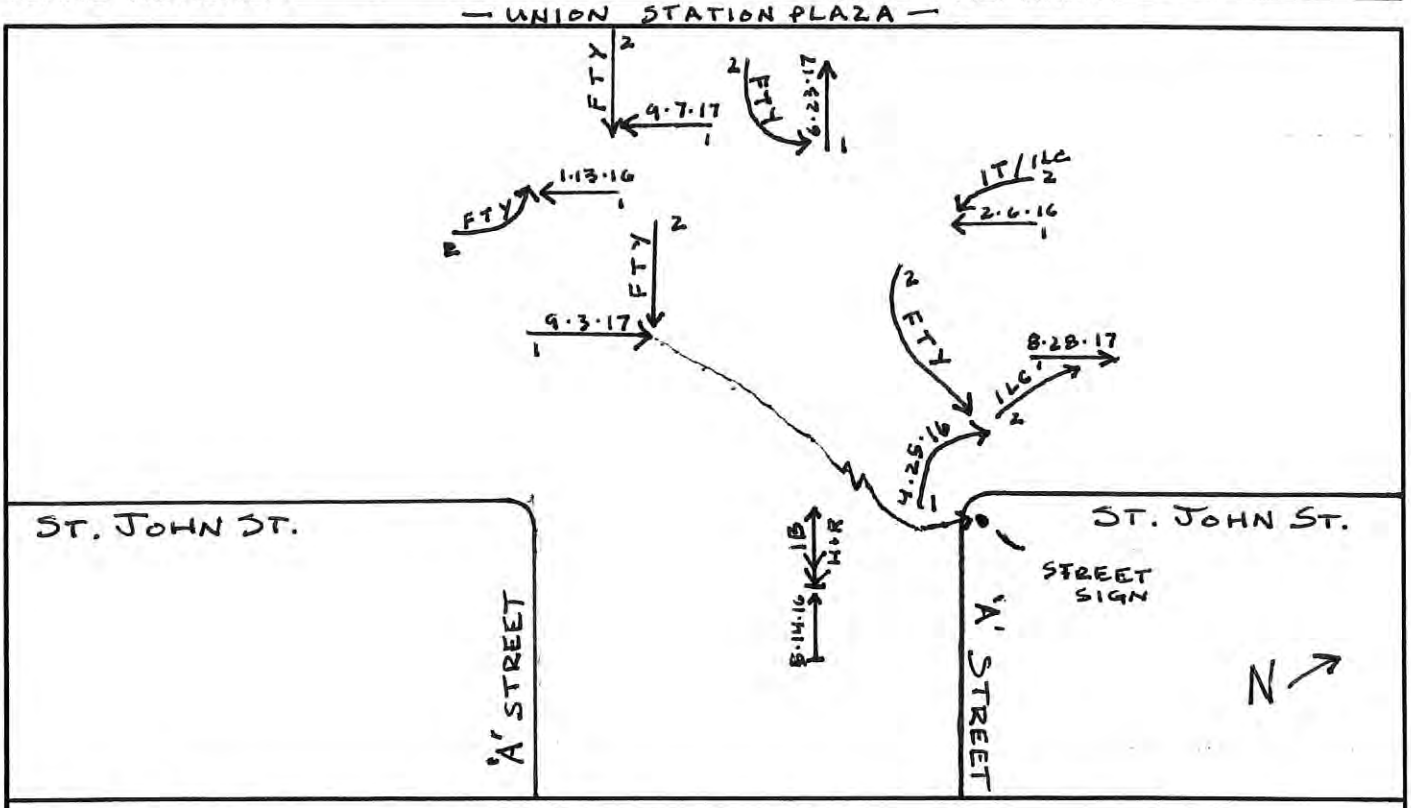
COLLISION DIAGRAM

SHEET 1 OF 1

LOCATION St. John Street / 'A' Street

TOWN Portland, Maine NODE NO(S) 16764

YEARS REVIEWED 2015 to 2017 DATE PREPARED 08·24·2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS – HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

– VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE	PEDESTRIAN [P]	FATAL ACCIDENT
BACKING	REAR END	
FIXED OBJECT	SIDE SWIPE	VEHICLE (MOVING)
HEAD ON	TURNING MOVE	BICYCLE [B]
OVERTURN	CHANGE LANE	ANIMAL [A]
PARKED VEHICLE	OUT OF CONTROL	SLED [S]

WEATHER
C = CLEAR F = FOG R = RAIN
SL = SLEET S = SNOW CL = CLOUDY
XW = CROSS WINDS

INJURIES
K = FATAL B = NON-INCAPACITATING
A = INCAPACITATING C = POSSIBLE INJURY

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
16·0134	01·13·16	07:06					2	3	2/14	
16·0455	02·06·16	16:24					2	2	8/10	
16·1232	04·25·16	17:06					2	1	2	
16·1433	05·14·16	12:25					2	1	11/31	
17·2019	06·23·17	12:06					2	1	2/14	
17·2741	08·28·17	14:26					2	1	8	
17·2808	09·03·17	18:24				3	3	2	2/3	
17·2844	09·07·17	17:58					2	1	2	

S:/SHEETS/COLLISION DIAGRAM.DWG

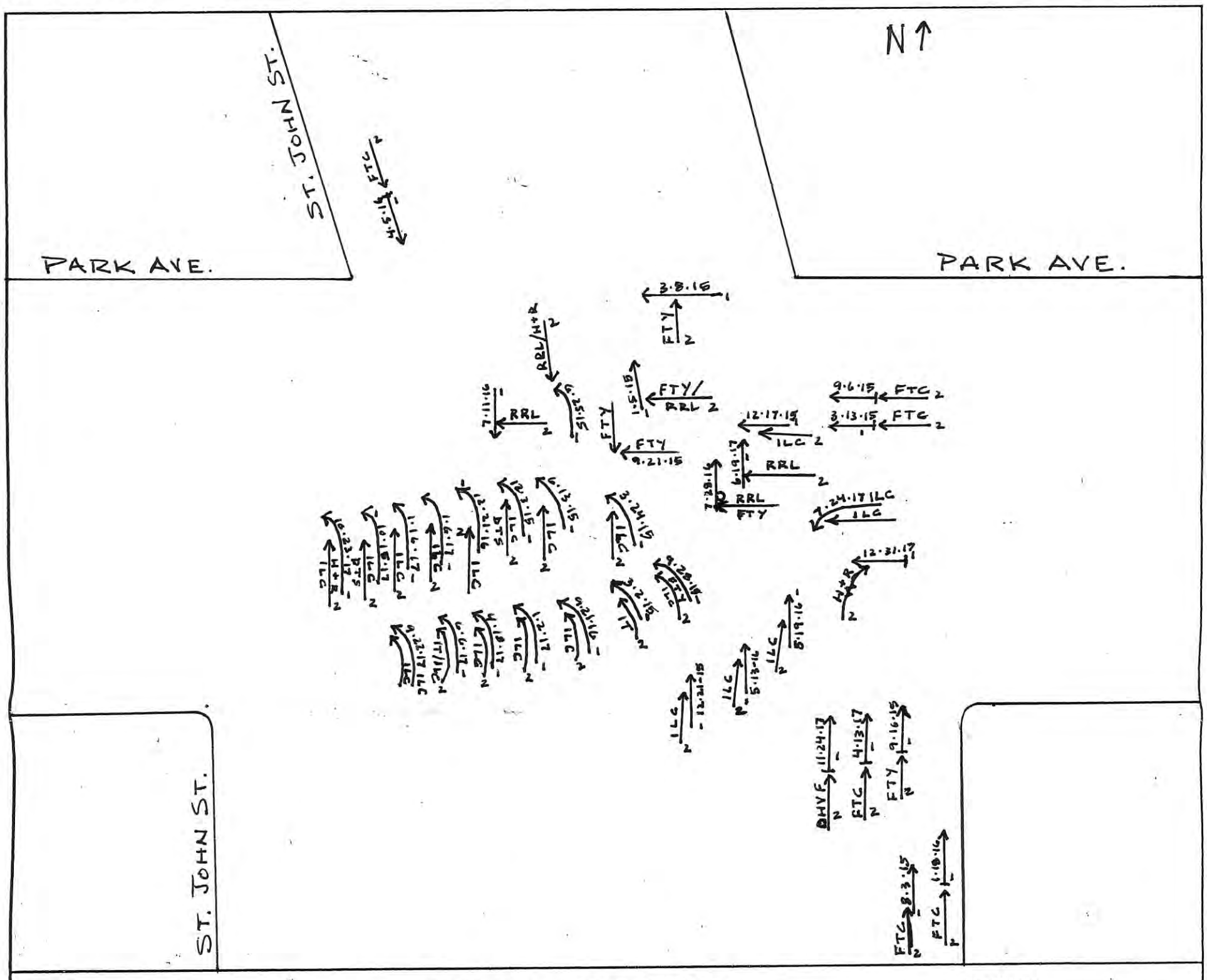
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION Park Avenue / St. John Street

TOWN Portland, Maine NODE NO(S) 16770

YEARS REVIEWED 2015 to 2017 DATE PREPARED 08.22.2018



CRITICAL RATE FACTOR EQUIV. PROP. DAMAGE ACC/YEAR ACC/MEV

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH–SANDED
4. ICE/PACKED SNOW–SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH–NOT SANDED 9. ICE–PKD. SNOW–NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS – HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER–NO PASSING 7. IMPROPER PASS–OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION–DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED–WINDSHIELD GLASS
19. VISION OBSCURED–SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

– VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE		PEDESTRIAN	P	FATAL ACCIDENT	
BACKING		REAR END			
FIXED OBJECT		SIDE SWIPE		VEHICLE (MOVING)	
HEAD ON		TURNING MOVE		BICYCLE	B
OVERTURN		CHANGE LANE		ANIMAL	A
PARKED VEHICLE		OUT OF CONTROL		SLED	S

WEATHER
C – CLEAR F – FOG R – RAIN
SL – SLEET S – SNOW CL – CLOUDY
XW – CROSS WINDS

INJURIES
K – FATAL B – NON–INCAPACITATING
A – INCAPACITATING C – POSSIBLE INJURY

S:/SHEETS/COLLISION DIAGRAM.DWG

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COLLISION DIAGRAM

LOCATION Park Avenue / St. John Street

TOWN Portland, Maine NODE NO(S) 16770

YEARS REVIEWED 2015 to 2017 DATE PREPARED 08·22·2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
15·0051	01·05·15	15:28			3		2	3	2/5	
15·1037	03·02·15	20:45					4	1	10	
15·1106	03·08·15	11:39				2	2	1	2/5	
15·1164	03·13·15	13:58				2	2	1	2/4	
15·1273	03·24·15	15:30					2	1	8	
15·2027	06·13·15	16:42					2	1	8/10	
15·2184	06·25·15	18:55					2	1	31	
15·2605	08·03·15	17:20					2	1	4	
15·3014	09·26·15	14:31					2	1	4/14	
15·3110	09·16·15	14:28				1	2	1	2/14	
15·3164	09·21·15	05:36					1	1	2	
15·3253	09·28·15	10:29					2	1	8/10	
15·4031	12·03·15	17:09					4	2	5	
15·4211	12·17·15	14:58					2	2	8	
15·4278	12·21·15	20:35					4	1	8	
16·0208	01·18·16	15:00					2	3	3/4	
16·1078	04·05·16	15:42					2	1	4	
16·1420	05·13·16	13:17					2	1	8	
16·1502	05·19·16	17:32					2	1	8	
16·2107	07·11·16	13:10					2	1	5	
16·2341	07·28·16	20:06				2	3	1	2/5/14	
16·2921	09·21·16	16:33					2	1	8	
16·3906	12·21·16	12:47					2	1	8	
17·0012	01·02·17	20:30					4	1	8	
17·0060	01·06·17	16:37					4	1	8	
17·0158	01·16·17	16:56					4	1	8	
17·1251	04·13·17	13:08					2	1	4	
17·1302	04·18·17	19:06					4	1	8	
17·1827	06·06·17	12:46					2	2	10	
17·1966	06·19·17	15:37					2	1	5	
17·2353	07·24·17	13:10					2	2	5	
17·3010	09·22·17	16:25					2	1	8	
17·3241	10·15·17	14:25					2	1	5	
17·3340	10·23·17	13:13					2	1	8/31	
17·3674	11·24·17	23:27			1	1	4	1	30	
17·4166	12·31·17	20:40					4	1	3/10/31	

S:/SHEETS/COLLISION DIAGRAM.DWG

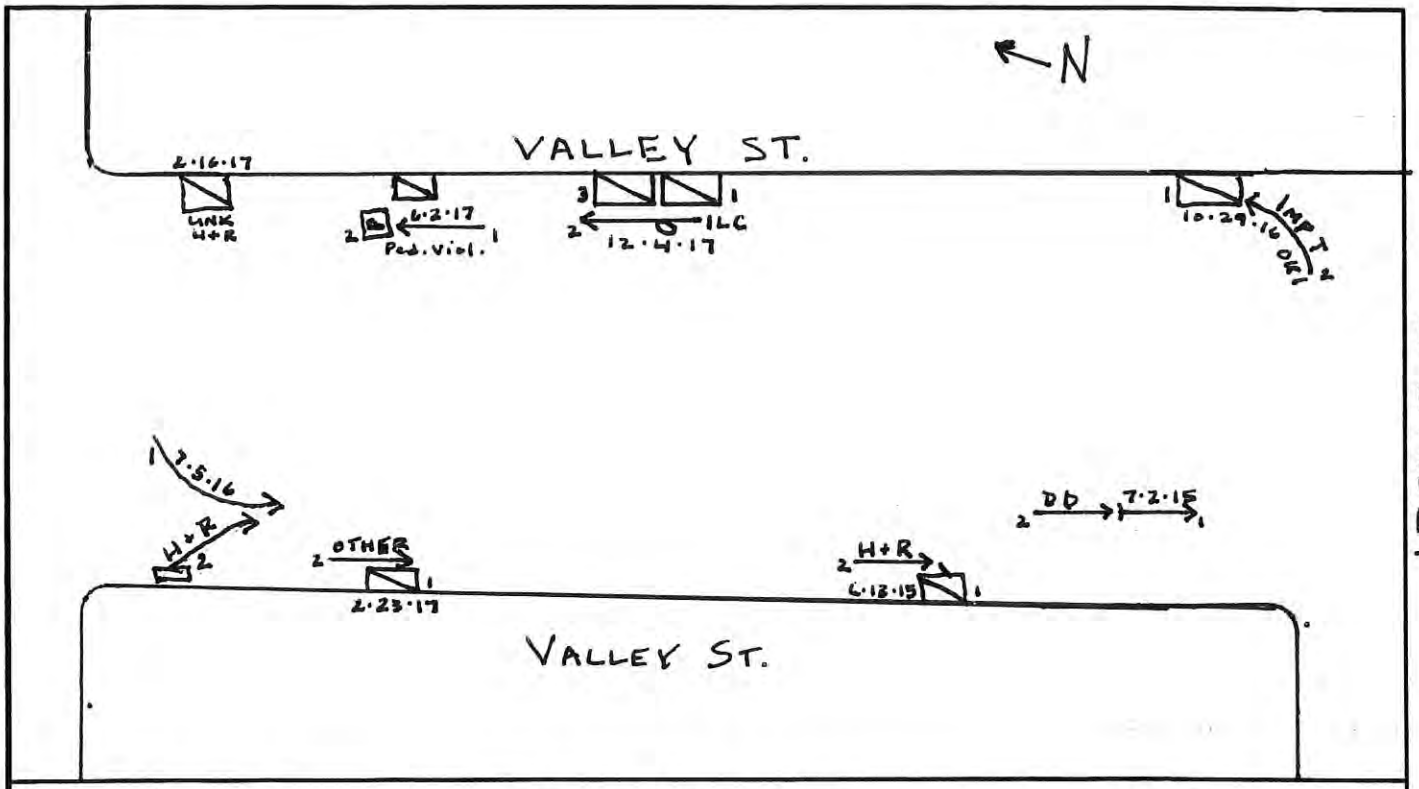
COLLISION DIAGRAM

SHEET 1 OF 1

LOCATION Valley St. from 'A' Street to 'C' Street

TOWN Portland, Maine NODE NO(S) 16750 to 16751

YEARS REVIEWED 2015 to 2017 DATE PREPARED 08.24.2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS - HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

- VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE		PEDESTRIAN	P	FATAL ACCIDENT	●
BACKING		REAR END			
FIXED OBJECT	□	SIDE SWIPE		VEHICLE (MOVING)	
HEAD ON		TURNING MOVE		BICYCLE	B
OVERTURN		CHANGE LANE		ANIMAL	A
PARKED VEHICLE		OUT OF CONTROL		SLED	S

WEATHER
C = CLEAR F = FOG R = RAIN
SL = SLEET S = SNOW CL = CLOUDY
XW = CROSS WINDS

INJURIES
K = FATAL B = NON-INCAPACITATING
A = INCAPACITATING C = POSSIBLE INJURY

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
15.2037	06.13.15	21:30				1	4	1	31	
15.2268	07.02.15	08:00					2	1	14	
16.2031	07.05.16	07:14					2	1	31	
16.3334	10.29.16	01:17					4	1	10/17	
17.0609	02.16.17	20:00					4	1	31	
17.0710	02.23.17	17:20					2	1	30	
17.1786	06.02.17	06:55					2	1	16	Pedestrian
17.3754	12.04.17	08:36					2	1	8/14	

S:/SHEETS/COLLISION DIAGRAM.DWG

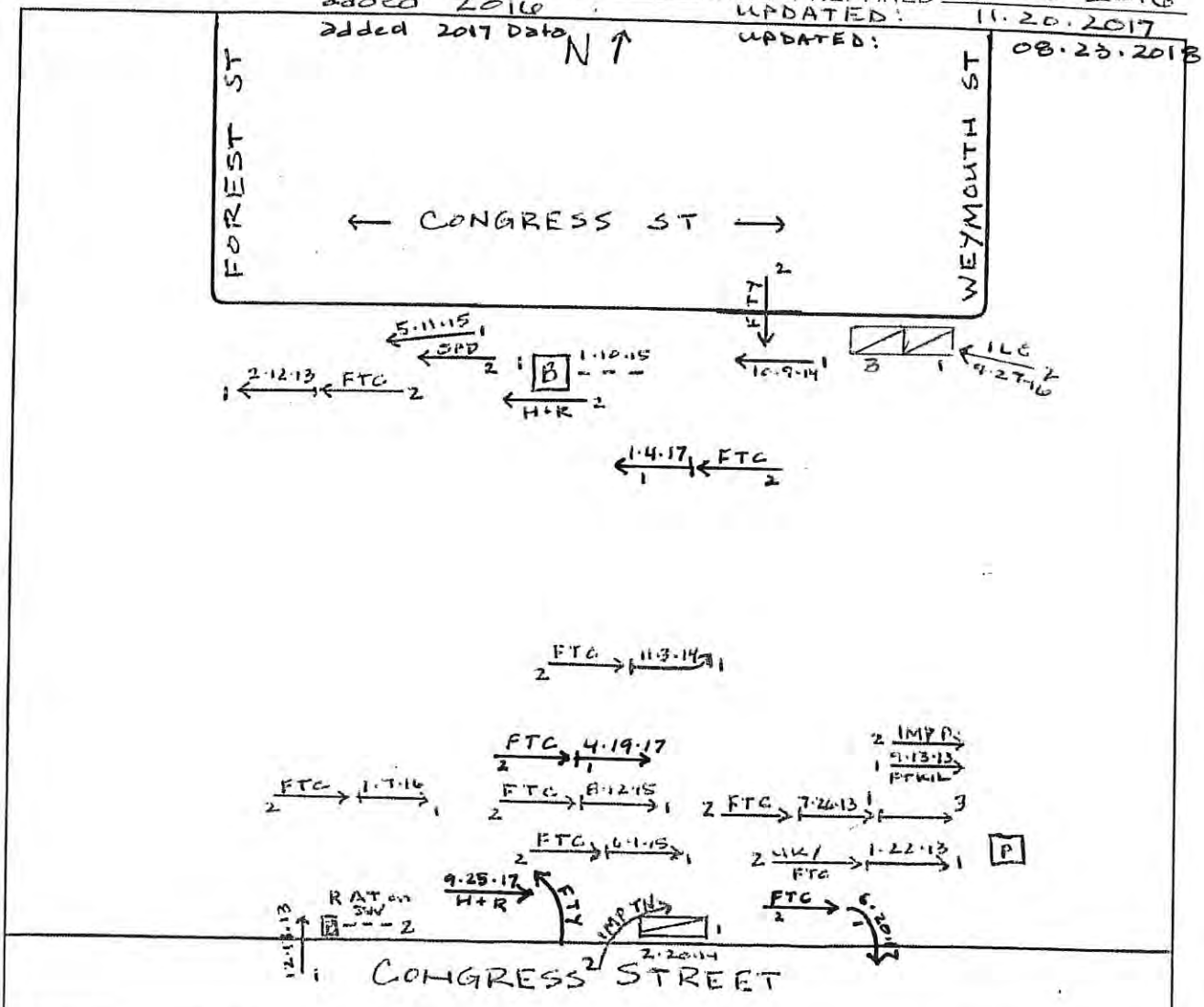
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION Congress Street - Forest to Weymouth Street

TOWN Portland, Maine — NODE NO(S) 16827 to 16828

YEARS REVIEWED 2013 - 2015 added 2016 added 2017 Data — DATE PREPARED 10.25.2016 UPDATED: 11.20.2017 UPDATED: 08.23.2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS - HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

- VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
OR FACTOR 51. UNKNOWN

SYMBOLS
ANGLE, BACKING, FIXED OBJECT, HEAD ON, OVERTURN, PARKED VEHICLE, PEDESTRIAN, REAR END, SIDE SWIPE, TURNING MOVE, CHANGE LANE, OUT OF CONTROL, FATAL ACCIDENT, VEHICLE (MOVING), BICYCLE (B), ANIMAL (A), SLED (S)

WEATHER
C - CLEAR
SL - SLEET
F - FOG
S - SNOW
R - RAIN
CL - CLOUDY
XW - CROSS WINDS

INJURIES
K - FATAL
A - INCAPACITATING
B - NON-INCAPACITATING
C - POSSIBLE INJURY

COLLISION DIAGRAM

SHEET 2 OF 2

LOCATION Congress Street - Forest to Weymouth Street

TOWN Portland, Maine NODE NO(S) 16827 to 16828

YEARS REVIEWED 2013 - 2015 DATE PREPARED 10.25.2016

added 2017 Data added 2016 UPDATED: 11.20.2017 / 08.23.2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
13.272	01.22.13	11:55					2	1	51	Pedestrian
13.525	02.12.13	11:50					2	1	4	
13.2108	07.26.13	15:35				1	2	1	4	
13.2604	09.13.13	22:03					4	2	7/8	
13.3610	12.13.13	13:33					2	1	16	Bicyclist
14.710	02.20.14	16:15					2	2	10	
14.2975	10.09.14	13:43					2	1	2	
14.3295	11.03.14	14:38					2	2	4	
15.125	01.10.15	20:40				1	4	3	31	Hit + Run Bicyclist
15.1725	05.11.15	16:35					2	1	3	
15.1925	06.01.15	14:55					2	2	4	
15.2704	08.12.15	15:02					2	1	4	
16.0071	01.07.16	16:28					4	1	4	
16.2980	09.27.16	10:36					2	1	8	
17.0029	01.04.17	13:50					2	1	4	
17.1307	04.19.17	08:01					2	1	4	
17.1971	06.20.17	08:00					2	1	4	
17.3033	09.25.17	20:20					4	1	2	

S:/SHEETS/COLLISION DIAGRAM.DWG

COLLISION DIAGRAM

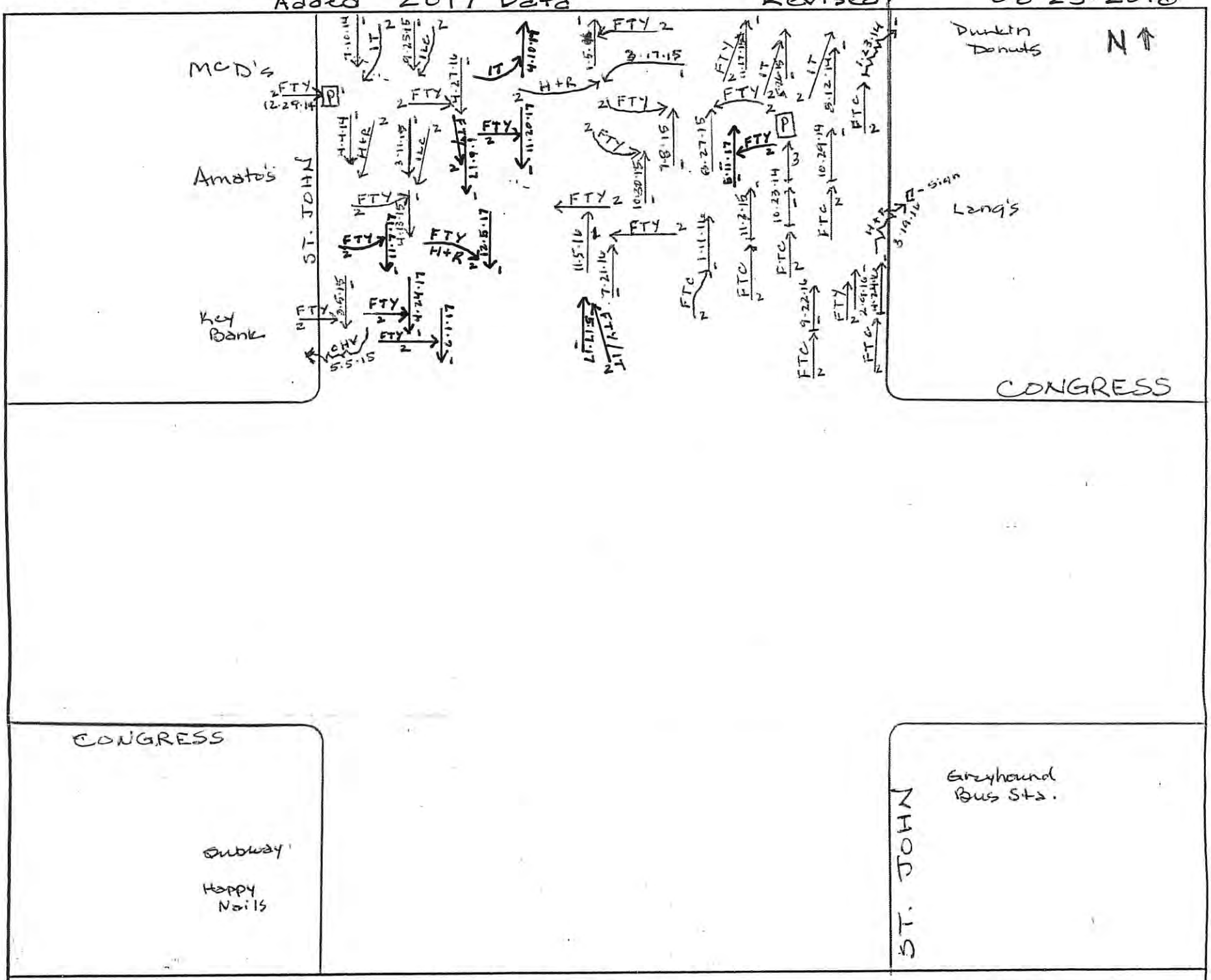
SHEET 1 OF 3

LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, Maine NODE NO(S) 16765 - 66777

YEARS REVIEWED 2014 - 2016 DATE PREPARED 11.21.2017

Added 2017 Data Revised: 08.23.2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT

1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE

1. DRY 2. WET 3. SNOW/SLUSH–SANDED
4. ICE/PACKED SNOW–SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH–NOT SANDED 9. ICE–PKD. SNOW–NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS – HUMAN

1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER–NO PASSING 7. IMPROPER PASS–OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION–DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED–WINDSHIELD GLASS
19. VISION OBSCURED–SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

– VEHICULAR

41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE, PEDESTRIAN, FATAL ACCIDENT
BACKING, REAR END
FIXED OBJECT, SIDE SWIPE, VEHICLE (MOVING)
HEAD ON, TURNING MOVE, BICYCLE
OVERTURN, CHANGE LANE, ANIMAL
PARKED VEHICLE, OUT OF CONTROL, SLED

WEATHER

C – CLEAR
F – FOG
R – RAIN
SL – SLEET
S – SNOW
CL – CLOUDY
XW – CROSS WINDS

INJURIES

K – FATAL
A – INCAPACITATING
B – NON–INCAPACITATING
C – POSSIBLE INJURY

S:/SHEETS/COLLISION DIAGRAM.DWG

COLLISION DIAGRAM

LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, ME NODE NO(S) 16765 - 66777

YEARS REVIEWED 2014 - 2016 DATE PREPARED 11.21.2017

Added 2017 Data Revised: 08.23.2017

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
14-0299	01-23-14	06:31				1	2	1	4/31	
14-1129	04-04-14	13:00					2	1	31	
14-1990	07-10-14	06:08					2	1	10	
14-2345	08-12-14	14:30			1		2	1	10	
14-3141	10-23-14	18:01					4	2	4	
14-3202	10-29-14	16:03					2	1	4	
14-3836	12-29-14	00:55			1		4	1	2	
15-1075	03-05-15	14:47					2	1	2	
15-1142	03-11-15	08:00					2	1	2/8/14	
15-1208	03-17-15	14:58					2	1	31	
15-1458	04-13-15	12:00					2	1	2	Suspended license
15-1654	05-05-15	15:24				3	2	1	30	
15-1861	05-26-15	20:18					3	1	10	
15-2343	07-08-15	19:21					2	1	2	
15-2908	08-27-15	15:49				1	2	1	2	
15-3228	09-25-15	16:04					2	1	8	
15-3635	10-30-15	10:41					2	1	2	
15-3684	11-03-15	11:50					2	1	4	
15-3841	11-17-15	12:17					2	1	2/7	
16-0030	01-05-16	15:09					2	1	2	
16-0108	01-11-16	14:15					2	1	4	Expired License
16-0489	02-09-16	16:09					2	1	2	
16-0902	03-19-16	18:45					4	1	31	
16-1219	04-24-16	16:24					2	1	4	Permited Driver only
16-1251	04-27-16	12:02					2	1	2	
16-2261	07-21-16	17:52				1	2	1	2	Suspended NH License
16-2929	09-22-16	11:08					2	1	4	
16-3415	11-05-16	10:30					2	1	2	

S:/SHEETS/COLLISION DIAGRAM.DWG

COLLISION DIAGRAM

SHEET 3 OF 3

LOCATION Congress St. / St. John St.

TOWN Portland, Maine NODE NO(S) 16765 - 66777

YEARS REVIEWED Adding 2017 Data DATE PREPARED 08.23.2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
17.0053	01.06.17	06:48					2	2	2	
17.1210	04.10.17	08:15					2	1	10	
17.1355	04.24.17	11:55					2	1	2	
17.1553	05.11.17	16:58				2	2	1	2	
17.1615	05.17.17	18:18				1	2	1	2/10	
17.1782	06.01.17	17:08				1	2	1	2	
17.3490	11.07.17	07:49					2	1	2/14	
17.3630	11.20.17	11:31					2	1	2	
17.3783	12.05.17	17:49					4	2	31	

S:/SHEETS/COLLISION DIAGRAM.DWG

Section 3
Development Entrances and Exits

3.A. Entrance and Exit Locations

Vehicular access to the specific site is currently via an access to the employee parking garage on Gilman Street and an access to the visitor parking garage on Congress Street with a second access to the visitor parking garage on Crescent Street, and a pick-up and drop-off area in front of the East Tower off Bramhall Street.

Vehicular access to the proposed MMC expansion includes a full movement access with Congress Street, primarily to the pick-up / drop-off area. The existing Congress Street access to the visitor garage will be maintained and a vehicular connection will be provided between the existing visitor garage and the pick-up / drop-off area. This new connection will eliminate the need for traffic to recirculate onto Congress Street, thus reducing off-site conflicts. All other MMC site accesses will be maintained.

3.B. Plan View

A proposed site plan is provided in the Site Plan application provided under separate cover.

- Frontage Road(s) – Congress Street and Gilman Street
- Posted Speed Limit – 25 mph
- Sight Lines – The posted speed on Congress Street is 25 mph, which requires a MaineDOT and City available sight distance of 200 feet. The sight distances at the proposed site access currently appear to meet the requirements; however, we recommend that this be reviewed throughout the review process to ensure no obstacles such as signing, vegetation, or structures restrict proper sight distances.

Section 4
Title, Right, or Interest

4.A. Evidence of Title, Right, or Interest

A copy of the deeds to the property are included in Attachment in 4A.

4.B. Attachments

Attachment 4A – Deeds

Attachment 4A

Deeds

Know All Men by These Presents,

(2)

That We, Henry H. Grant and Gladys H. Grant, both of Portland in the County of Cumberland and State of Maine,

in consideration of one ($1.00) dollar and other valuable considerations

paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine and located at said Portland,

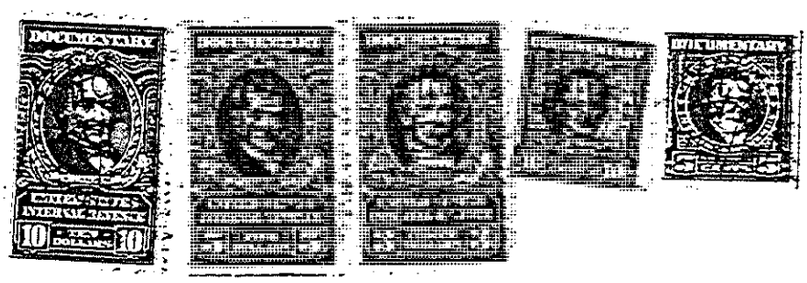
the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors

heirs and assigns forever, a certain lot or parcel of land with the buildings thereon, situated in Portland in the County of Cumberland and State of Maine, on the northwesterly side of Bramhall Street, bounded and described as follows:

Commencing at the southwesterly corner of land, now or formerly, of James Miller and Charlotte Johnson on Bramhall Street; thence northwesterly by land of said James Miller and Charlotte Johnson, sixty (60) feet to land formerly of William J. Knowlton; thence southwesterly along said Knowlton land, parallel with said street, fifty-five (55) feet to a corner of land formerly of William J. Knowlton; thence parallel with first mentioned line sixty (60) feet, more or less, to said street; thence northeasterly by said street fifty-five (55) feet to the place of beginning.

Being the same premises conveyed to us by Russell Fanning by deed recorded in Cumberland County Registry of Deeds in Book 1833, Page 415, and are conveyed subject to the conditions contained in said deed.

The Grantee herein, as part of the consideration hereof, assumes and agrees to pay taxes for the taxable year 1961.



To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Maine Medical Center, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And we do ~~covenant~~ with the said Grantee its successors, / ~~heirs~~ and assigns, that we are lawfully seized in fee of the premises, that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will ~~Warrant and Defend~~ the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

~~In Witness Whereof.~~ We the said Henry H. Grant

and Gladys H. Grant, being husband and

wife ~~xxxxxxxxxxx~~

joining in this deed as Grantor s, and relinquishing and conveying all right by descent and all other rights in the above described premises, have hereunto set our hand s and seals this thirty-first day of July in the year of our Lord one thousand nine hundred and sixty-one.

~~Signed, Sealed and Delivered~~
~~in presence of~~

R. E. Jensen	Gladys H. Grant

~~State of Maine.~~ Cumberland, ~~ss.~~ July 31, 1961.

Personally appeared the above named Henry H. Grant

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Norman E. Jensen

Justice of the Peace
~~Notary Public~~

AUG 4 1961

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE

Received at 10 H 27 M A M, and recorded in

BOOK 2619 PAGE 499 Lowell R. Thompson Register

Phillinde 1881 3/

Warranty Deed

FROM

Henry H. Grant, et al

TO

Maine Medical Center

Dated July 31, 1961

State of Maine.

_____ ss. Registry of Deeds

Received AUG 4 1961 19____

at _____ H., _____ M., _____ M., and

recorded in Book _____ Page _____

ATTEST:

_____ REGISTER

FROM THE OFFICE OF

JENSEN & BAIRD
477 Congress Street
Portland, Maine

L. L. MARTIN, PORTLAND, ME.—OFFICE FURNITURE AND SUPPLIES TYPEWRITERS, ADDING MACHINES, FILING CABINETS, SAFES, ETC.

MARTIN'S FORM NO. 1 — STANDARD REGISTRY FORM

1 - 35

(3)

(No. 106)

Know All Men by these Presents,

That I, DONALD D. McPHEE of Portland in the County of Cumberland and State of Maine,

in consideration of One Dollar ($1) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in said County and State

the receipt whereof I do hereby acknowledge, do hereby ~~give, grant, bargain, sell and convey~~ unto the said MAINE MEDICAL CENTER, its

successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland and being the premises conveyed to me by Hope K. Fletcher by deed dated November 22, 1946 and recorded in Cumberland County Registry of Deeds in Book 1848, Page 160, in which deed said premises are described as follows:

Beginning at the Northeast corner of Sophia T. Jones lot, so-called, on Arsenal Street; thence Northeasterly on Arsenal Street fifty (50) feet to land of one Raymond; thence Southeasterly by line of Raymond forty-eight (48) feet, more or less, to land of one Haskell; thence Southwesterly along line of said Haskell land thirteen (13) feet and two (2) inches to a point; thence Northwesterly parallel to land of said Raymond three (3) feet to a point; thence Southwesterly along the line of said Haskell land thirty-six (36) feet, more or less, to land of said Jones; thence Northwesterly forty-six (46) feet, more or less to point of beginning.

Also conveying all my interest in and to said Arsenal Street, recently abandoned by the City of Portland.

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors

~~Xxxxx~~ and Assigns, to its and their use and behoof forever.

And I do ~~covenant~~ with the said Grantee, its successors ~~Xxxxx~~ and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will ~~Warrant and Defend~~ the same to the said Grantee, its successors ~~Xxxxx~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said DONALD D. McPHEE

and I, Lorraine J. McPhee wife of the said Donald D. McPhee

joining in this deed as Grantor , and relinquishing and conveying my rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 9th day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered
in presence of

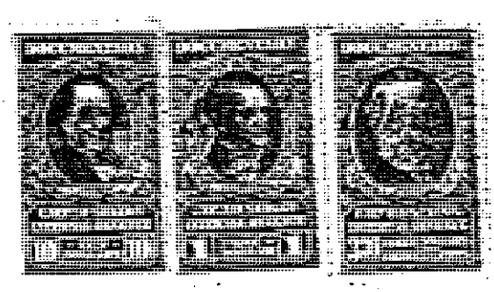
Edward F. Sams
to both

Donald D. McPhee
Lorraine J. McPhee

State of Maine.
Cumberland, ss. May 9, 1953.

Personally appeared the above named Donald D. McPhee and acknowledged the above instrument to be his free act and deed.

Before me,
Edward F. Sams
Justice of the Peace



Philbrick

320

Warranty Deed.

FROM

DONALD D. McPHEE

TO

MAINE MEDICAL CENTER

DATED May, 19 53.

State of Maine.

Cumberland ss: Registry of Deeds.

Received MAY 9 1953, 19 ,

at 2 P., 37 M., 11 M., and

recorded in Book 2127, Page 320

ATTEST:

Robert T. Crosse, REGISTER.

FROM THE OFFICE OF

VERRILL DANA WALKER PHILBRICK

& WHITEHOUSE.

No. 105. ROBERTS OFFICE SUPPLY COMPANY
Portland - Maine - Lewiston

9-37

Know all Men by these Presents, (4)

That I, Henry H. Grant of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration

paid by Maine Medical Center, a corporation organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its Successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated between Bramhall and Arsenal Streets in said Portland, adjoining land now or formerly belonging to Sophia P. Jones, and more particularly bounded and described as follows:

Beginning on the northerly side line of said Bramhall Street, at the southwesterly corner of said Jones' land; thence westerly by said Bramhall Street, twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land, keeping the width of twenty-five (25) feet, to Arsenal Street.

Excepting and reserving however, a certain lot or parcel of land with the buildings thereon out of the aforesaid property, a conveyance by Westprom Realty Company to Maud L. and Janice M. Pillsbury by deed dated January 23, 1946 and recorded in Cumberland County Registry of Deeds in Book 1803, Page 444, to which reference may be had.

Meaning and intending to convey a parcel of land at the rear of 26 Bramhall Street, which parcel of land is approximately 26'x25' and contains a garage thereon.

Being the same premises conveyed to me by Westprom Realty Company by their warranty deed dated April 11, 1951 and recorded in said Registry of Deeds in Book 2040, Page 192.

To Have and to Hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Maine Medical Center, its Successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And I do COVENANT with the said Grantee , its/Successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will WARRANT AND DEFEND the same to the said Grantee , its Successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said

Henry H. Grant

and I, Gladys H. Grant,

wife of the said

Henry H. Grant

joining in this deed as Grantor , and relinquishing and conveying my right by descent and all other rights in the above described premises, have hereunto set our hands and seals this 4th day of ~~June~~ September in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered
in presence of

H. Edwin Hall

Henry H. Grant.

Gladys H. Grant

State of Maine,
Cumberland, } ss. September 4, 1953.

Personally appeared the above named

HENRY H. GRANT

and acknowledged the above instrument to be his free act and deed.

Before me,

H. Edwin Hall

~~Justice of the Peace.~~
Notary Public
My Commission Expires June 29, 1955



Phillrick

116

Warranty Deed

From

HENRY H. GRANT

To

MAINE MEDICAL CENTER

Dated, ... *1953*

State of Maine.

Cumberland ..... ss. Registry of Deeds.

Received SEP 9 1953 at 9 h., 50 M., A M., and recorded in Book 2147 Page 110

Attest: Robert N. Crommett
Register.

FROM THE OFFICE OF

Warren E. Winslow, Esq.
443 Congress Street
Portland, Maine

LORING, SHORT & HARMON, Law Stationers
PORTLAND, MAINE

9-50

MORTGAGE AND SECURITY AGREEMENT

KNOW ALL MEN BY THESE PRESENTS, that MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine, having its principal place of business at 22 Bramhall Street, in Portland, County of Cumberland, State of Maine (hereinafter referred to as the Grantor), for and in consideration of the sum of ONE MILLION SEVEN HUNDRED NINETY-NINE THOUSAND FIVE HUNDRED SIXTY-NINE ($1,799,569) DOLLARS, paid by MAINE SAVINGS BANK, a banking corporation organized and existing under the laws of the State of Maine, having its principal office at One Maine Savings Plaza, in the said Portland, County of Cumberland and State of Maine (hereinafter called the Grantee), the receipt of which is hereby acknowledged, does give, grant, bargain, sell, and convey unto the said Grantee, its successors and assigns, forever, the following-described premises:

> A certain lot or parcel of land with the buildings and improvements thereon situated at and near Gilman Street, Congress Street, Charles Street, Brackett Street, Bramhall Street and the Western Promenade, in the City of Portland, County of Cumberland and State of Maine, more particularly described in Schedule A attached hereto, which Schedule A is hereby made a part of this Mortgage and Security Agreement by reference thereto.

Also conveying and granting hereby as part of the realty and in addition to said realty and as property mortgaged hereunder, all of the following articles now or hereafter owned or acquired by Grantor, or in which it may now or hereafter acquire an interest, and now or hereafter located on the above-described premises or used therewith as follows: All machinery, equipment, furnishings, furniture, fixtures, chattels and articles of tangible personal property, including, without limitation, all hospital and medical diagnostic, treatment and convalescent equipment, machinery and supplies, all beds and bedding, all food service and cafeteria equipment, machinery and supplies, all other machinery, equipment and chattels used or usable in the operation of a hospital and full service medical center, furnaces, boilers, oil burner, refrigeration, air conditioning and sprinkler systems, awnings, screens, window shades, motors, dynamos, incinerators, plants and shrubbery, whether now owned or hereafter from time to time acquired by the Grantor, together with all substitutions, replacements, additions, attachments, accessories, accretions thereto or thereof, now or in the future, situated or located on, or used or usable in connection with the maintenance and/or operation of hospital and medical center now constructed and any other facilities to be constructed on the premises described in said Schedule A attached hereto. If the lien of this mortgage on any fixtures or personal property be subject to a lease agreement, conditional sale agreement or chattel mortgage covering such property, then in the event of any default hereunder all the rights, title and interest of the Grantor in and to any and all deposits made thereon or therefor are hereby assigned to the Grantee, together with the benefit of any payments now or hereafter made thereon. There are also transferred, set over and assigned by Grantor to Grantee, its successors and assigns, hereby all leases and use agreements of machinery, equipment and other personal property of Grantor in the categories hereinabove set forth, under which Grantor is the lessee of, or entitled to use, such items, and Grantor agrees to execute and deliver to Grantee specific separate assignments to Grantee of such leases and agreements when requested by Grantee; and nothing herein shall obligate Grantee to perform any obligations of Grantor under such leases, or agreements, unless it so chooses, which obligations Grantor hereby covenants and agrees to well and punctually perform.

As further security for payment of the indebtedness and performance of the obligations, covenants and agreements secured hereby, Grantor hereby transfers, sets over and assigns to Grantee:

a. All rents, profits, revenues, royalties, bonuses, rights and benefits under any and all leases or tenancies now existing or hereafter created of the premises or any part thereof, with the right to receive and apply the same to said indebtedness, and Grantee may demand, sue for and recover such payments, but shall not be required to do so; provided, however, that so long as Grantor is not in default hereunder, the right to receive and retain such rents, issues and profits is reserved to Grantor. To carry out the foregoing, Grantor agrees (1) to execute and deliver to Grantee such conditional assignments of leases and rents applicable to the mortgaged premises as the Grantee may from time to time request while this mortgage and the debt secured hereby are outstanding, and further (2) not to cancel, accept a surrender of, reduce the rentals under, anticipate any rentals under, or modify any such leases or tenancies, or consent to an assignment or subletting thereof, in whole or in part, without Grantee's written consent. Nothing herein shall obligate the Grantee to perform the duties of the Grantor as landlord or lessor under any such leases or tenancies, which duties Grantor hereby covenants and agrees to well and punctually perform.

b. All judgments, awards of damages and settlements hereafter made as a result or in lieu of any taking of the premises or any interest thereon or part thereof under the power of eminent domain, or for any damage (whether caused by such taking or otherwise) to the premises or the improvements thereon or any part thereof, including any award for change of grade of streets. Grantee may apply all such sums or any part thereof so received on the indebtedness secured hereby in such manner as it elects or, at its option, the entire amount or any part thereof so received may be released. Grantor hereby irrevocably authorizes and appoints Grantee its attorney-in-fact to collect and receive any such judgments, awards, and settlements from the authorities or entities making the same, to appear in any proceeding therefor, to give receipts and acquittances therefor, and to apply the same to payment on account of the debt secured hereby, whether then matured or not; and the Grantor will execute and deliver to the Grantee on demand such assignments and other instruments as the Grantee may require for said purposes and will reimburse the Grantee for its costs (including reasonable counsel fees) in the collection of such judgments and settlements.

Receipt of rents, awards, and any other moneys or evidences thereof, pursuant to the provisions of the foregoing paragraphs a. and b. and any disposition of the same by Grantee shall not constitute a waiver of the right of foreclosure by Grantee in the event of default or failure of performance by Grantor of any covenant or agreement contained herein or any note secured hereby.

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to Grantee, its successors and assigns, to its and their use and behoof forever; PROVIDED NEVERTHELESS, that if Grantor pays to Grantee the sum of ONE MILLION SEVEN HUNDRED NINETY-NINE THOUSAND FIVE HUNDRED SIXTY-NINE ($1,799,569.00) DOLLARS, with interest and other charges, as applicable, in accordance with all the terms and conditions of a certain Mortgage Note of even date signed and given by Grantor to Grantee, and until such payment performs all of Grantor's obligations, covenants and agreements contained herein and contained in said promissory note, then this deed, as also said certain promissory note, shall be void, otherwise shall remain in full force.

Grantor covenants and agrees with Grantee as follows:

1. That Grantor is lawfully seized of an indefeasible estate in fee simple, free from encumbrances, except as may have been specifically noted herein, or in Schedule A attached hereto, and has good right and power to convey the premises to Grantee to hold as aforesaid, and that Grantor shall and will Warrant and Defend the same to Grantee forever against the claims and demands of all persons, except as aforesaid.

2. That Grantor shall pay all sums secured hereby when due.

3. That Grantor will not permit or suffer the use of any of the mortgaged property for any purposes other than hospital or medical center purposes.

4. That the Loan Guaranty Agreement between the Grantor and the Secretary of Health, Education,and Welfare, which is being executed simultaneously herewith, is incorporated herein and made a part of this mortgage.

5. That upon default hereunder Grantee shall be entitled, in addition to any other rights given by this Agreement or by law, to the appointment of a receiver by any court having jurisdiction, without notice, to take possession and protect the property described herein and operate same and collect the rents, profits, and income therefrom.

6. That the Grantor will keep the building and improvements now existing or hereafter erected on the mortgaged property insured against loss by fire and such other hazards, casualties, and contingencies, as may be stipulated by the Secretary of Health, Education, and Welfare upon the guarantee of the Note and other hazards, all as may be required from time to time by the Grantee, and all such insurance shall be evidenced by standard fire and extended coverage insurance policy or policies, in amounts not less than necessary to comply with the applicable Coinsurance Clause percentage, but in no event shall the amounts of coverage be less than eighty per centum (80%) of the insurable value and in no event less than the unpaid balance of the debt secured hereby, and in default thereof the Grantee shall have the right to obtain such insurance at the cost of Grantor, such cost to be secured hereby. Such policies shall be endorsed with standard mortgagee clause with loss payable to the Grantee and the Secretary of Health, Education, and Welfare, as their interests may appear, and shall be deposited with the Grantee; and that if the premises mortgaged hereby, or any part thereof, shall be damaged by fire or other hazard against which insurance is held as hereinabove provided, the amounts paid by any insurance company in pursuance of the contract of insurance to the extent of the indebtedness then remaining unpaid, shall be paid to the Grantee and, at the option of Grantee and the Secretary of Health, Education, and Welfare, may be applied to the debt or released for the repairing or rebuilding of the premises.

7. That at the request of Grantor with consent of Grantee, or at the option of Grantee, the principal balance secured hereby may be reamortized on terms acceptable to the Secretary of Health, Education, and Welfare if a partial prepayment results from an eminent domain or condemnation award or from a fire or casualty insurance payment where there is a resulting loss of project income.

8. That in order more fully to protect the security of this Mortgage, together with, and in addition to, such payments of interest, or of principal and interest, Grantor will pay to the Grantee, on the

dates each month that such payments are due, until the Note is fully paid, the following sums:

(a) A sum equal to the ground rents, if any, next due, plus the premiums that will next become due and payable on policies of fire and other property insurance covering the premises covered hereby, plus water rates, taxes and assessments next due on the premises covered hereby (all as estimated by the Grantee) less all sums already paid therefor divided by the number of months to elapse before one month prior to the date when such ground rents, premiums, water rates, taxes and assessments will become delinquent, such sums to be held by Grantee in escrow to pay said ground rents, premiums, water rates, taxes, and special assessments; no interest shall be due on sums so held;

(b) All payments mentioned in the preceding subsection of this paragraph and all payments to be made under the Note secured hereby shall be added together and the aggregate amount thereof shall be paid each (month) in a single payment to be applied by Grantee to the following items in the order set forth:

(I) ground rents, taxes, special assessments, water rates, fire and other property insurance premiums;

(II) interest on the Note secured hereby;

(III) amortization of the principal of said Note;

9. In the event of Grantor's failure to pay any sums provided for in this Mortgage, the Grantee, at its option, may pay the same. Any excess funds accumulated under (a) of the preceding paragraph remaining after payment of the items therein mentioned, shall be credited to subsequent periodic payments of the same nature required thereunder; but if any such items shall exceed the estimate therefor, or if the Grantor shall fail to pay any other governmental or municipal charge, the Grantor shall forthwith make good the deficiency or pay the charge before the same become delinquent or subject to interest or penalties and in default thereof the Grantee may pay the same. All sums paid by the Grantee shall be added to the principal of the debt secured hereby and shall bear interest from the date of payment at the rate specified in the Note and shall be due and payable on demand. If the property is sold under foreclosure or is otherwise acquired by the Grantee after default, any remaining balance of the accumulations under (a) of the preceding paragraph shall be credited to the principal of the Mortgage as of the date of the commencement of foreclosure proceedings or as of the date the property is otherwise acquired.

10. That Grantor will keep the premises above conveyed in good order and condition and will not commit or permit any waste thereof, reasonable wear and tear excepted, and in the event of the failure of the Grantor to keep the buildings on said premises and those to be erected on said premises, or improvements thereon, in good repair, the Grantee may make such repairs as in its discretion it may deem necessary for the proper preservation thereof, and any sums paid for such repairs shall bear interest from the date of payment at the rate specified in the Note, shall be due and payable on demand and shall be fully secured by this Mortgage.

11. That Grantor will not voluntarily create, permit or suffer

to be created against the property subject to this Mortgage any lien or liens inferior or superior to the lien of this Mortgage and further that it will keep and maintain the same free from the claim of all persons supplying labor or materials which will enter into the construction of any and all buildings and improvements now being erected or to be erected on said premises.

12. That Grantor further covenants and agrees that this mortgage shall constitute a security agreement with respect to any and all machinery, equipment, chattels, articles of personal property, and fixtures described and included in this mortgage, and all additions, accessions, substitutions, and replacements thereto and therefor, and all of which are hereinafter referred to as the collateral, and Grantor hereby grants and conveys to Grantee, its successors and assigns, a security interest therein. That upon default of any term, condition or covenant of this mortgage and acceleration of any indebtedness hereby secured, the Grantee may, at its discretion, require the Grantor to assemble the collateral and make it available to the Grantee at a place reasonably convenient to both parties to be designated by the Grantee. That the Grantee shall give the Grantor notice, by registered mail, postage prepaid, of the time and place of any public sale or other intended disposition thereof is to be made by sending notice to the Grantor at least five days before the time of the sale or other disposition, which provisions for notice the Grantor and Grantee agree are reasonable; provided, however, that nothing herein shall preclude the Grantee from proceeding as to both real and personal property in accordance with Grantee's rights and remedies in respect of the real property. Grantee shall have all of the remedies of a secured party under the Uniform Commercial Code as now in effect in the State of Maine and such further remedies as may from time to time hereafter be provided in Maine for a secured party. Grantor agrees that all rights of Grantee as to said collateral and as to said real estate, and rights and interests appurtenant thereto, may be exercised together or separately and further agrees that in exercising its power of sale as to said collateral and as to said real estate, and rights and interest appurtenant thereto, the Grantee may sell the collateral or any part thereof either separately from or together with the said real estate, rights and interests appurtenant thereto, or any part thereof, all as the Grantee may in its discretion elect.

13. That Grantor shall maintain full and correct books and records showing in detail the earnings and expenses of the mortgaged premises; will permit the Grantee and its representatives to examine said books and records and all supporting vouchers and data any time and from time to time upon request by the Grantee at the mortgaged premises or at such other place in the County in which the mortgaged premises are located as such books and records are customarily kept; and Grantor hereby agrees to furnish to Grantee within one hundred twenty (120) days after the close of each fiscal year an audited financial statement of the operation of the premises reflecting income (including sources thereof) and expenses, such statement to be prepared by a certified or other competent accountant satisfactory to the Grantee.

14. That Grantor within seven (7) days upon request in person or within ten (10) days upon request by mail shall furnish a duly acknowledged written statement setting forth the amount of the debt secured by this mortgage, and stating either that no offsets or defenses exist against the mortgage debt, or, if such offsets or defenses are alleged to exist, the nature thereof.

15. That in case of foreclosure of this Mortgage, and as often

as any proceedings shall be taken to foreclose the same, the Grantor will pay to the Grantee a reasonable attorney's fee, and the same shall be a further charge and lien upon the said premises.

16. That no sale of the premises hereby mortgaged and no forebearance on the part of the Grantee, and no extention of the time for the payments of the debt hereby secured given by the Grantee, shall operate to release, discharge, modify, change, or affect the original liability of the Grantor herein either in whole or in part.

17. That in the event of any default, as herein described, this mortgage may be foreclosed in any manner prescribed or permitted by law, appraisement being hereby waived; and out of all the monies arising from a sale to retain the amount then due or to become due according to the conditions of this instrument together with the costs and charges of making such sale, and the overplus, if any there be, shall be paid by the party or parties making such sale to the Grantor, its successors and assigns.

18. That no waiver of any covenant herein or of the Note secured hereby shall at any time thereafter be held to be a waiver of the terms hereof or of the Note secured hereby.

19. That receipt and disposition of rents, income of the premises, insurance proceeds, eminent domain awards, or any other sums under the provisions of the mortgage, the note, or other loan documentation by Grantee shall not be a waiver or release of any rights of the Grantee, including but not limited to, the right of foreclosure or acceleration of the note, whether such receipt or disposition shall be before or after exercise of any such rights.

20. That Grantee hereof, its successors and assigns, shall have The Statutory Power of Sale in addition to all other rights of a Mortgagee allowed by law and this mortgage in case of default in any term or condition contained or referred to herein.

21. That it is an additional condition of this Mortgage and Security Agreement for breach of which foreclosure may be claimed and for breach of which all indebtedness secured hereby may be declared due and payable at once, that title to the within described mortgaged premises shall not pass be deed, mortgage or other means, or operation of law, from Grantor, or from any subsequent title holder, either voluntarily or involuntarily. This condition shall continue until all indebtedness and obligations secured hereby are satisfied, and permission given, or election not to foreclose or accelerate said indebtedness by Grantee, its successors or assigns, as to any one such transfer, shall not constitute a waiver of any rights of Grantee, its successors or assigns, as to any subsequent such transfer of title as to which this condition shall remain in full force and effect. The term title as used herein shall mean the estate of the Grantor subject to the lien of this mortgage.

22. This Mortgage and Security Agreement is expressly made subject and inferior to a Mortgage (FHA Form 4125-B) and to Security Agreement both of even date herewith executed and delivered by Grantor herein to Grantee herein encumbering the real and personal property herein described and securing a Mortgage Note (FHA Form 4125-d) of even date herewith in the amount of $3,245,431.00, all of which documents are hereinafter collectively called the FHA Mortgage. Grantor herein shall perform, or cause to be performed, when due all obligations of the mortgagor under the terms

and provisions of the FHA Mortgage, specifically including prompt payment when due of all indebtedness secured and evidenced thereby. Should Grantor herein fail to comply with its obligatins set forth in this paragraph 22, such failure shall constitute a default under the terms and provisions of this Mortgage and Security Agreement and, in addition to any other rights which the Grantee may have hereunder and by operation of law, the Grantee herein shall have the right, but not the obligation, to make all payments and to do all things to render said FHA Mortgage current, and all advances made for such purpose, including interest paid thereon at the rate specified in said FHA Mortgage Note, shall be payable by Grantor herein to Grantee herein upon demand by Grantee herein and, to the extent permitted by law, all such advances shall be secured by the lien of this Mortgage and Security Agreement.

23. That in the event of default in making any payment provided for herein or in the Note secured hereby, or in the event of a breach of any other stipulation, agreement, condition or covenant of this mortgage, including any transfer of title to the mortgaged premises without permission of Grantee as set forth in paragraph 21 hereof, and if such default or breach is not cured prior to the expiration of 90 days after the Secretary of Health, Education, and Welfare, aforesaid, receives notification from the holder of the loan of such default or breach then in any such event the whole principal sum of said Note shall, at the option of the Grantee, its successors and assigns, as such holder, be deemed to have become immediately due, and the same with interest thereon and with all other costs and charges, shall thereupon be collectible by foreclosure of this mortgage; provided, however, such notice to said Secretary of Health, Education, and Welfare and such 90 day period shall not be necessary should the guaranty of this mortgage indebtedness be terminated or become void pursuant to its terms and Grantee receives written notice thereof from said Secretary.

The covenants herein contained shall bind, and the benefits and advantages shall inure to, the respective successors and assigns of the parties hereto and to the extent permitted by law shall bind any future owner of the mortgaged premises or any part thereof. Whenever used, the singular number shall include the plural and the plural the singular, and the use of any gender shall include all genders.

IN WITNESS WHEREOF, the said Grantor has caused these presents to be signed in its name by JACK R. DYSON, its Treasurer, and its corporate seal to be hereunto affixed this 14th day of February, 1975.

Signed, Sealed and Delivered in the Presence of:

Robert B. Patterson, Jr.

MAINE MEDICAL CENTER, a Maine corporation

BY _____
Its Treasurer

(CORPORATE SEAL)

STATE OF MAINE
COUNTY OF CUMBERLAND, ss. February 14, 1975

Then personally appeared the above-named Jack R. Dyson as Treasurer of Maine Medical Center, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said corporation.

Before me.

_____
Notary Public

MY COMMISSION EXPIRES
MAY 2, 1980

SCHEDULE A

GRANTOR: MAINE MEDICAL CENTER

GRANTEE: MAINE SAVINGS BANK

DATE : February 14, 1975

A certain lot or parcel of land together with the buildings and improvements thereon, located in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows: Beginning at a point at the intersection of the southeasterly side of Congress Street and the easterly side of Gilman Street, said point being marked by an iron pin; thence North 79° 44½' East, four hundred twenty and seventy-nine hundredths (420.79) feet to a point marked by an iron; thence South 18° 24' East by land now or formerly of Brophy, one hundred forty-eight and eighty-five hundredths (148.85) feet, more or less, to an iron; thence North 72° 01' East by said Brophy land, seventy-four and eight tenths (74.8) feet, more or less, to Charles Street; thence by Charles Street, South 18° 24' East, three hundred fifty-seven and twenty-three hundredths (357.23) feet to a point; thence South 18° 04½' East, ninety-eight and eighty hundredths (98.80) feet to a point on the northwesterly terminus of Brackett Street; thence South 62° 24' West by Brackett Street, thirty-eight and fifty-seven (38.57) feet to a point; thence South 33° 29' East by said Brackett Street, sixty and thirty-two hundredths (60.32) feet to a point; thence South 57° 21½' East by said Brackett Street, fifty and eighteen hundredths (50.18) feet to a point and land now or formerly of Gemma A. McKenzie et al; thence South 61° 08½' West by said McKenzie land, forty-two and ninety-six hundredths (42.96) feet to a point; thence South 27° 36' East by said McKenzie land, sixty-two and twenty-eight hundredths (62.28) feet, more or less, to the northerly side of Bramhall Street; thence South 61° 00½' West by said Bramhall Street, five hundred nine and fifty-eight hundredths (509.58) feet to a point in the Western Promenade; thence North 50° 49' 20" West, one hundred fifty-one and thirty-nine hundredths (151.39) feet to a point on the southeasterly line of Arsenal Street; thence North 62° 24' East by Arsenal Street, fifty (50) feet to a point at the easterly terminus of Arsenal Street; thence North 27° 36' West by said Arsenal Street and by land conveyed by the Maine Medical Center to the City of Portland by deed dated August 4, 1972, and recorded in Cumberland County Registry of Deeds in Book 3278, Page 212, one hundred (100) feet to a point; thence South 85° 56' West by said City of Portland land, ninety-four and two hundredths (94.02) feet, more or less, to Gilman Street; thenc North 04° 04' West by said Gilman Street, six hundred ninety-five and twenty-five hundredths (695.25) feet, more or less, to said Congress Street and the point of beginning.

Being the same premises shown on a plan entitled "Plan of Property in Portland, Maine made for Maine Medical Center", H.I. & E.C. Jordan-Surveyors, dated May 31, 1966 and updated and certified on June 13, 1966, July 7, 1966, October 26, 1972, January 24, 1975 and February 12, 1975.

COPY

such default or breach then in any such event the entire unpaid principal balance of this mortgage note plus accrued interest, at the option of the holder hereof shall become immediately due and payable; provided, however, such notice to said Secretary and such 90 day period shall not be necessary should the guaranty of this mortgage note be terminated or become void pursuant to its terms and payee receives written notice thereof from said Secretary.

The payments due hereunder shall be made to Maine Savings Bank at its office at One Maine Savings Plaza, Portland, Maine 04111, unless another holder or address be given in writing to the parties liable herefor.

All parties to this mortgage note, whether principal, surety, guarantor, or endorser, hereby waive presentment for payment, demand, protest, notice of protest, and notice of dishonor.

Signed and Sealed the day and year first above written.

WITNESS:
Thomas F. Trechette
Robert B. Patterson Jr.

MAINE MEDICAL CENTER, a Maine corporation

By [signature]
Its Treasurer

(CORPORATE SEAL)

THIS IS TO CERTIFY that this is the Note described in and secured by said Mortgage and Security Agreement of even date herewith and in the same principal amount as herein stated and secured by real estate and personal property situated in the City of Portland, Cumberland County, Maine.

Dated: February 14, 1975

Louis A. Wood
Notary Public

MY COMMISSION EXPIRES
MAY 2, 1980

COPY

3

MORTGAGE NOTE

$1,799,569.00

Portland, Maine
February 14, 1975

FOR VALUE RECEIVED, the undersigned, MAINE MEDICAL CENTER, a Maine corporation located in the City of Portland, County of Cumberland and State of Maine, promises to pay to MAINE SAVINGS BANK, a Maine banking corporation, or order, at its principal place of business at One Maine Savings Plaza in the said City of Portland, County of Cumberland and State of Maine, the principal sum of ONE MILLION SEVEN HUNDRED NINETY-NINE THOUSAND FIVE HUNDRED SIXTY-NINE ($1,799,569.00) DOLLARS, with interest from date at the rate of seven per centum (7%) per annum on the unpaid balance thereof until paid; which principal and interest shall be paid as follows: Interest only at said rate shall be paid on the first day of March, 1975; thereafter commencing on the first day of April, 1975, monthly installments of interest and principal shall be paid in the sum of Twelve Thousand Seven Hundred Eighteen and 98/100ths ($12,718.98) Dollars each; such payments shall continue to be made monthly thereafter upon the first day of each succeeding month until the entire indebtedness has been paid in full; in any event, the balance of principal, if any, remaining unpaid, plus accrued interest at said rate, shall be paid on March 1, 2000. Said monthly installments of interest and principal shall be applied first to interest at said rate per annum upon the principal sum, or so much thereof as shall from time to time remain unpaid, and the balance thereof shall be applied to principal.

In the event any installment, or part of any installment, of principal or interest becomes delinquent for more than 15 days, there shall be due, at the option of the holder hereof, an additional sum equal to two cents ($.02) for each dollar ($1.00) of each installment so delinquent; provided, nevertheless, that as long as this mortgage note shall be guaranteed by the Secretary of the Department of Health, Education, and Welfare the amount of the monthly payment upon which such delinquency charge may be imposed shall be limited to the amount actually to be paid by the maker hereof and shall not include for such purpose any amount payable as an interest subsidy by said Secretary.

This note is secured by Mortgage and Security Agreement upon real estate and personal property situated in the City of Portland, Cumberland County, State of Maine.

Privilege is reserved to pay the debt in whole or in an amount equal to one or more monthly payments on principal next due, on the first day of any month prior to maturity upon at least thirty (30) days' prior written notice to the holder.

No default shall exist by reason of nonpayment of any required installment of principal so long as the amount of optional additional prepayments of principal already made pursuant to the privilege of prepayment set forth in this mortgage note equals or exceeds the amount of such required installment of principal.

In the event of default in the making of any payment provided for herein, including any delinquency charge, or in the event of a breach of any agreement, condition or covenant of the said Mortgage and Security Agreement given by the maker hereof to Maine Savings Bank, and if such default or breach is not cured prior to the expiration of 90 days after the Secretary of Health, Education, and Welfare, aforesaid, receives notification from the holder hereof of

(6)

(No. 106)

Know All Men by these Presents,

That We, Leola J. Noyes and William H. Noyes, Jr., both of Portland, County of Cumberland, State of Maine,

in consideration of one dollar ($1.00) and other valuable considerations

paid by Maine Medical Center, a Corporation established by law in said Portland

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center

its successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland between Bramhall and Arsenal Streets adjoining land formerly belonging to Sophia P. Jones and conveyed to us by Maud L. Pillsbury by deed dated October 2, 1951, recorded in Cumberland County Registry of Deeds in Book 2060, Page 419, and therein bounded and described as follows: Beginning on the northerly side of Bramhall Street at the southwesterly corner of said Jones land; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land keeping a width of twenty-five (25) feet, a distance of sixty-eight feet and two incles (68'2"), which distances are marked by stakes and which stakes are twenty-six (26) feet distant from the southerly boundary line of Arsenal Street.

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And we do covenant with the said Grantee, its successors ~~Heirs~~ and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We, the said Leola J. Noyes and William H. Noyes, Jr., the said grantors, both being unmarried

~~and~~ ~~wife of the said~~

~~joining in this deed as grantor, and relinquishing and conveying rights by descent and all other rights in the above described premises~~ have hereunto set our hands and seals this 12th day of June in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Haus
to both

Leola J. Noyes
William H. Noyes Jr.

State of Maine.
Cumberland } ss.

June 12, 1953

Personally appeared the above named Leola J. Noyes and William H. Noyes, Jr. and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Haus
Justice of the Peace



Philbrick 1st

317

Warranty Deed.

FROM

LEOLA J. NOYES, et al

TO

MAINE MEDICAL CENTER

DATED June, 1953.

State of Maine.
Cumberland, ss: Registry of Deeds.

Received JUN 12 1953, 19, at 1 H., 47 M., 8 M., and recorded in Book 2133, Page 317.

ATTEST:

Robert V. Crommett, Register.

FROM THE OFFICE OF

Verrill Dana Walker Philbrick

& Whitehouse

No. 106. ROBERTS OFFICE SUPPLY COMPANY
Portland - Maine - Lewiston

1-114

(No. 106)

Know All Men by these Presents,

That WE, FRED A. PATTERSON and ELLA H. WHIDDEN both of Derry in the County of Rockingham and State of New Hampshire, RUBY E. McKENZIE of Raymond in said County and State and ALZO F. PATTERSON of Portland in the County of Cumberland and State of Maine

in consideration of One dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a Corporation organized and existing under the laws of Maine and located at said Portland,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center, its Successors

and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the northerly side of Bramhall Street and bounded and described as follows:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land formerly of Frederick A. Carle; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake or point, and from these two points extending northerly adjoining said Carle land, keeping a width of twenty-five (25) feet, to Arsenal Street, being the premises conveyed to Daniel W. Patterson by Maria M. Jose by deed dated September 12, 1921 and recorded in Cumberland County Registry of Deeds in Book 1085, Page 228.

The said Daniel W. Patterson died intestate on September 3, 1952 leaving no widow and as his sole heirs-at-law, the Grantors herein.

The Grantee as part of the consideration hereof assumes and agrees to pay the taxes for the taxable year of 1953.

Also conveying all our right, title and interest in and to Arsenal Street recently abandoned by the City of Portland, Maine.

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its Successors and Assigns ~~forever~~, to its and their use and behoof forever.

And we do covenant with the said Grantee, its / Successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid.

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will Warrant and Defend the same to the said Grantee, its Successors and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Fred A. Patterson and Chrystine I. Patterson, wife of the said Fred A. Patterson; Ella H. Whidden and Charles F. Whidden, husband of the said Ella H. Whidden; Ruby E. McKenzie and Elmer W. McKenzie, husband of the said Ruby E. McKenzie, and Alzo F. Patterson and Bessie E. Patterson, wife of the said Alzo F. Patterson

~~xxx~~ ~~xxxxxxxxxxxxxxxx~~

joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this twentieth day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

R. E. Jensen	Alzo F. Patterson
R. E. Jensen	Bessie E. Patterson
Pamela Chase	Fred A. Patterson
Pamela Chase	Chrystine I. Patterson
Arthur K. Smith	Ella H. Whidden
Arthur K. Smith	Charles F. Whidden
P. J. Campbell	Ruby E. McKenzie
P. J. Campbell	Elmer W. McKenzie

State of Maine.
Cumberland } ss.

May 20, 1953

Personally appeared the above named Alzo F. Patterson and acknowledged the above instrument to be his free act and deed.

Before me, Raymond E. Jensen
Justice of the Peace



Phillbrick

311

Warranty Deed.

FROM

ALZO F. PATTERSON, ET ALS.

TO

MAINE MEDICAL CENTER

DATED ....., 1953.

State of Maine.

Cumberland ss: Registry of Deeds.

Received JUN 12 1953, 19/

at 11 H., 5 M., A M., and

recorded in Book 2133, Page 311

ATTEST:

Robert L. Cross, REGISTER.

FROM THE OFFICE OF
RAYMOND E. JENSEN
415 Congress Street
Portland, Maine

No. 106. ROBERTS OFFICE SUPPLY COMPANY
Portland - Maine - Lewiston

11-5

Know All Men by These Presents.

(8)

That I, John T.Lennon of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations

paid by Maine Medical Center, a corporation organized and existing under the Laws of the State of Maine and located at said Portland

the receipt whereof I do hereby acknowledge, do hereby ~~give, grant, bargain, sell and convey~~ unto the said Maine Medical Center,its successors ~~heirs~~ and assigns forever, ~~a~~ certain lots or parcels of land with the buildings thereon situated in said Portland and bounded and described as follows:

First:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land now or formerly of Thomas H.Pratt,running thence westerly by said Bramhall Street fifty (50) feet to land now or formerly of Sophia M. Knight,and from these two points extending northerly towards Arsenal Street, holding tosaid width of fifty feet,and adjoining said Pratt premises on one side and said Knight premises on the other for a distance of sixty (60) feet to land now or formerly of Edward T.Burrowes.The said lot is the southerly portion of the premises conveyed to Albert B.Cole,Frank H.Cole and Warren W.Cole by Nettie E.Pierce by deed dated September 26,1911 and recorded in the Registry of Deeds for said County of Cumberland in Book 882,Page 188. Said premises are numbered thirty (30) on said Bramhall Street.

Second:

A certain lot of land with the buildings thereon on the southerly side of Arsenal Street in said Portland bounded and described as follows:

Commencing at a point on the Westerly line of land of Maude E.Pratt at a point sixty (60) feet northerly from the northerly side of Bramhall Street, thence westerly on a line parallel with and sixty (60) feet from said Bramhall Street, fifty (50) feet,more or less,to land of Sophia M.Knight;thence northerly from these two points keeping a width of fifty (50) feet and bounded on the West by Land of said Knight and on the East by land of said Pratt and George H.Fletcher,forty-nine (49) feet,more or less, to said Arsenal Street.

Being the same property conveyed to me by Harriet B.Foster by her warranty deed dated February 24,1945 and recorded in the Cumberland County Registry of Deeds in Book 1771 Page 131.

Also conveying all my,right, title and interest in and to Arsenal Street, recently abandoned by theCity of Portland.

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors heirs and assigns, to its and their use and behoof forever.

And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will ~~Warrant and Defend~~ the same to the said Grantee, its ~~heirs~~ successors and assigns forever, against the lawful claims and demands of all persons.

~~In Witness Whereof~~ I the said John T.Lennon

and Ann C.Lennon

wife of the said John T.Lennon

joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises, have hereunto set our hand and seal this fifth day of May in the year of our Lord one thousand nine hundred and fifty three.

~~Signed, Sealed and Delivered in presence of~~

John J. Devine
to both

John T. Lennon
Ann C. Lennon

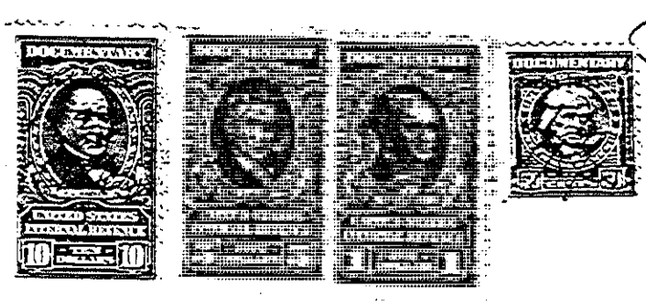
1650

~~State of Maine.~~ Cumberland ss. May 5, 19 53.

Personally appeared the above named John T.Lennon

and acknowledged the foregoing instrument to be his free act and deed.

Before me,
John J. Devine
Justice of the Peace
~~Notary Public~~



Phillbrook

269

Warranty Deed

FROM

John T.Lennon

TO

Maine Medical Center

Dated May 5th 19 53

State of Maine.
Cumberland Co. Registry of Deeds

Received MAY 5 1953 19/

at 2 H., 30 M., 0 M., and

recorded in Book 2127 Page 269

ATTEST: Robert W. Crockett Register

FROM THE OFFICE OF

Devine, Devine, Devine
102 Exchange St
Portland,Maine.

L. L. MARTIN, PORTLAND, ME.—OFFICE FURNITURE AND SUPPLIES
TYPEWRITERS, ADDING MACHINES, FILING CABINETS, SAFES, ETC.

MARTIN'S FORM NO. 1 — STANDARD REGISTRY FORM

9 3 3

(9)

(No. 106)

Know All Men by these Presents,

That I, HAZEL B. THERIO of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation duly organized and existing under the Laws of the State of Maine and located at said Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER, its

successors and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated on the Westerly side of Bramhall Street in said Portland, being more particularly described in deed from Hazel E. Skillings to the Grantor, dated September 18, 1945 and recorded in Cumberland County Registry of Deeds in Book 1790, Page 500, in which deed said premises are described as follows:

A certain lot or parcel of land, with the buildings thereon situated in said City of Portland, on the Northwesterly side of Bramhall Street, bounded and described as follows: Beginning at the most easterly corner of land now or formerly of Sophia P. Jones; thence Northeasterly on said Bramhall Street fifty (50) feet to land now or formerly of one Raymond; thence Northwesterly by said Raymond land fifty-nine (59) feet; thence Southwesterly thirteen (13) feet two (2) inches, more or less, to a fence; thence Northwesterly by the line of the division fence three (3) feet two (2) inches; thence Southwesterly by said fence thirty-six (36) feet five (5) inches, more or less, to said Jones land; thence Southeasterly by said Jones land sixty-two (62) feet two (2) inches to the point begun at.

Also, all my right, title and interest in and to Arsenal Street recently abandoned by the City of Portland.

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors

and Assigns, to its and their use and behoof forever.

And I do covenant with the said Grantee, its successors and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors

Heirs and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Hazel B. Therio,
being unmarried,

~~xxxxx~~ ~~xxxxxxxxxxxxxxx~~

~~joining in this deed as Grantor, and relinquishing and conveying~~
~~rights by descent and all other rights in the above~~
~~described premises~~, have hereunto set my hand and seal this
16th day of May in the year of our Lord
one thousand nine hundred and fifty-three.

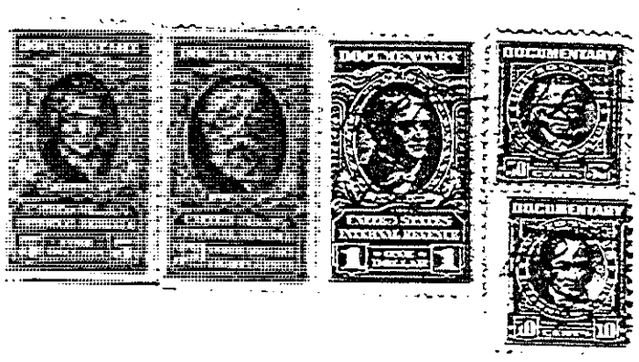
~~Signed, Sealed and Delivered~~
in presence of

Edward F. Sawyer — Hazel B. Therio

~~State of Maine.~~
Cumberland } ss. May 16, 1953.

Personally appeared the above named Hazel B. Therio
and acknowledged the above instrument to be her free act and
deed.

Before me, Edward F. Sawyer.
Justice of the Peace



Philbrick

443

Warranty Deed.

FROM

HAZEL B. THERIO

TO

MAINE MEDICAL CENTER

DATED May, 19 53.

State of Maine.

Cumberland ss: Registry of Deeds.

Received MAY 16 1953, 19 ,

at 10 H, 25 M., A M., and

recorded in Book 2127, Page 143.

ATTEST:

Robert V. Crommett, REGISTER.

FROM THE OFFICE OF

VERRILL DANA WALKER PHILBRICK

& WHITEHOUSE.

No. 100. ROBERTS OFFICE SUPPLY COMPANY
Portland - Maine - Lewiston

10-35

(No. 106)

Know All Men by these Presents,

That We, Albert N. Tardif and M. Louise Tardif, both of Portland, County of Cumberland, State of Maine

in consideration of one dollar ($1.00) and other valuable considerations

paid by Maine Medical Center, a Corporation established by law at said Portland

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center

its successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated on the northerly side of Bramhall Street in said Portland which was conveyed to the grantors by Wilhelmina M. Mantine, by deed dated September 16, 1935 and recorded in Cumberland County Registry of Deeds in Book 1478, Page 294 and therein described as follows: Beginning on the northerly side of Bramhall Street at the easterly corner of land formerly of James Miller; thence northeasterly by Bramhall Street twenty-one and seven twentieths (21-7/20) feet to a stake; thence northwesterly about one hundred eleven (111) feet to a point in the southerly side of Arsenal Street; thence southwesterly by Arsenal Street twenty-two and three quarters (22-3/4) feet to said Miller's land; thence southeasterly by said Miller's land one hundred eleven and four tenths (111-4/10) feet to the point of beginning.

Also all our right title and interest in and to Arsenal Street recently abandoned by the City of Portland.

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And we do covenant with the said Grantee, its ~~Heirs~~ successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and ~~our~~ Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors

~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Wherrof, We the said Albert N. Tardif

and M. Louise Tardif, the said Grantors, being Husband and Wife

~~and~~ ~~wife of the said~~

each joining in this deed as Grantors, and each relinquishing and conveying our respective rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 11th day of June in the year of our Lord one thousand nine hundred and fifty-three.

~~Signed, Sealed and Delivered~~
~~in presence of~~

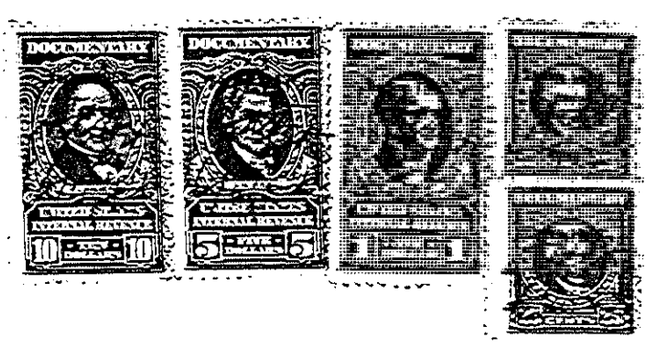
Edward F. Sawyer
to both

Albert N Tardif
M Louise Tardif

~~State of Maine.~~
Cumberland } ss. June 11, 1953.

Personally appeared the above named Albert N. Tardif and M. Louise Tardif and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Sawyer
Justice of the Peace



Philbrick

310

Warranty Deed.

FROM

ALBERT N. TARDIF, et al

TO

MAINE MEDICAL CENTER

DATED June, 1953.

State of Maine.
Cumberland ss: Registry of Deeds.

Received JUN 12 1953, 19 ,

at 11 H., 5 M., A M., and

recorded in Book 2133, Page 310

ATTEST:

Robert T. Crowell, REGISTER.

FROM THE OFFICE OF

Verrill Dana Walker Philbrick

& Whitehouse

No. 106. ROBERTS OFFICE SUPPLY COMPANY
Portland - Maine - Lewiston

11-5

(11)

No. 106

Know All Men by these Presents,

That I, CLARA G. READ, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation having a place of business in said Portland, in said County and State,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its Successors ~~Heirs~~ and Assigns forever,

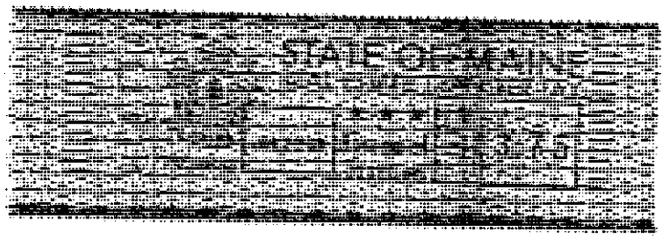
the following described property:

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street in said Portland, bounded and described as follows:

Beginning on said southwesterly side of Charles Street at a point thirty (30) feet northwesterly by said Street from the northeasterly corner of land formerly of Charles A. Donnell; thence northwesterly by said Street thirty (30) feet; thence southwesterly parallel with the line of said Donnell land seventy-four and two-tenths (74.2) feet to land formerly known as the Arsenal property; thence southeasterly by said Arsenal lot thirty (30) feet; thence northeasterly parallel with said Donnell land seventy-four and two-tenths (74.2) feet to the point of beginning.

Being the same premises conveyed to this Grantor and Clarence D. Read, as joint tenants, by Grace R. Loomis by deed dated September 1, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 336. The said Clarence D. Read having deceased and his estate is of record in the Registry of Probate for Cumberland County, Maine.

The Grantor herein shall have the right to occupy the premises hereby conveyed until September 15, 1969.



To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its Successors

~~Heirs~~ and Assigns, to them and their use and behoof forever.

And I do covenant with the said Grantee, its/ ~~Heirs~~ Successors and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will Warrant and Defend the same to the said Grantee, its Successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Clara G. Read, being a widow,

~~and~~ ~~wife of the said~~

~~joining in this deed as Grantor, and relinquishing and conveying~~

~~rights by descent and all other rights in the above~~

~~described premises,~~ have hereunto set my hand and seal this [illegible] day of July in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered
in presence of

[illegible] [illegible]

State of Maine,
CUMBERLAND } ss. July [illegible] 1969.

Personally appeared the above named

CLARA G. READ

and acknowledged the above instrument to be [illegible] free act and deed.

Before me, [illegible]

Justice of the Peace

JUL 23 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 58 M.M. and recorded in
BOOK 3695 PAGE 34 Seward R. T[illegible] Register

Phillich/40

Warranty Deed.

FROM

CLARA G. READ

TO

MAINE MEDICAL CENTER

DATED July 22, 1969.

State of Maine,

..... ss: Registry of Deeds

Received JUL 2 6 1969, 19 ,

at ..... M., ... M., ... M., and

recorded in Book....., Page.....

ATTEST:

....., REGISTER.

FROM THE OFFICE OF

JOHN W. STURGIS
415 Congress Street
Portland, Maine

No. 106. ROBERTS OFFICE SUPPLY COMPANY
Portland, Maine

10.50

(12)

No. 106

Know All Men by these Presents,

That We, WILLIAM C. GOKEY and SUZANNE E. GOKEY, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby ~~give, grant, bargain, sell and convey~~, unto the said Maine Medical Center,

its successors ~~xxxxx~~ and Assigns forever,

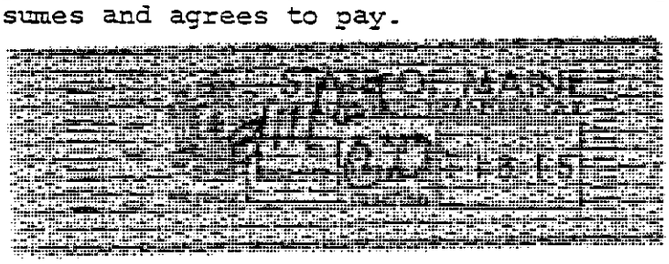
the following described property:

A certain lot or parcel of land with the buildings thereon situated on the southeasterly side of Ellsworth Street in said Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the northeasterly corner of a lot of land on Bramhall's Hill which John B. Brown sold to one Tuttle; thence northeasterly on said Ellsworth Street forty (40) feet; thence southeasterly about seventy-four (74) feet to land formerly of Davis; thence southwesterly by said Davis's land to land formerly of said Tuttle forty (40) feet; thence northwesterly to said Ellsworth Street, the bounds begun at, seventy-four (74) feet.

Being the same premises conveyed to William C. Gokey and Suzanne E. Gokey by Thelma A. Barter, by deed dated June 19, 1968, recorded in Cumberland County Registry of Deeds in Book 3045, Page 187.

This conveyance is made subject to taxes for the year 1969 which the Grantee assumes and agrees to pay.



To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And we do covenant with the said Grantee, its successors ~~Heirs~~ and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we the said William C. Gokey and Suzanne E. Gokey, being husband and wife

~~and wife of the said~~

~~joining in this deed as Grantor, and relinquishing and conveying all rights by descent and all other rights in the above described premises~~, have hereunto set our hands and seals this 11th day of August in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

State of Maine, Cumberland } ss. August 11, 1969

Personally appeared the above named William C. Gokey and acknowledged the above instrument to be his free act and deed.

Before me,

Justice of the Peace

AUG 11 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 2 E 24 M. and recorded in
BOOK 3197 PAGE 244 Register

Philbrick / EFD

Warranty Deed.

FROM

William C. Gokey et al

TO

Maine Medical Center

DATED August, 1969.

State of Maine,

..... on: Registry of Deeds

Received AUG 11 1969, 19 ,

at ..... H., ... M., ... M., and

recorded in Book....., Page.....

ATTEST:

....., REGISTER.

FROM THE OFFICE OF
Verrill Dana Philbrick Whitehouse
& Putnam
57 Exchange Street
Portland, Maine

No. 106. ROBERTS OFFICE SUPPLY COMPANY
Portland, Maine

2-28

(13)

(154)
EXECUTOR'S AND TRUSTEE'S DEED.
[WHEN THE WILL AUTHORIZES A SALE.]

927

Know all Men by these Presents,

That I, HELEN M. GRIFFIN

of Portland in the county of Cumberland

sole acting executor of the last will and testament

of Mary Davis late of Portland

deceased, testate, by virtue of the authority to me given by

the said Mary Davis in her last will and

testament, in my capacity of executor as afore-

said, and in consideration of One Dollar ($1.00) and other

valuable considerations

to me paid by MAINE MEDICAL CENTER, a corporation organized under the laws of Maine and situated in Portland

the receipt whereof is hereby ac-

knowledged, do hereby grant and convey unto the said Maine Medical Center, its successors

and assigns, the following described real estate, which was

the property of the said Mary Davis.

A certain lot or parcel of land with the buildings thereon situated in Portland on the northerly side of Brackett Street, bounded and described as follows:

Beginning at the intersection of the northerly side of Brackett Street with the westerly side of Russell Street; thence running northeasterly by Russell Street thirty-seven (37) feet, more or less, to land formerly owned by Hobart W. Richardson; thence running northwesterly by said Richardson land seventy-four (74) feet, more or less, to land formerly owned or occupied by W. S. Dunn; thence southwesterly by the line of said Dunn's land forty-one (41) feet, more or less, to a lane; thence southeasterly by said lane forty-one (41) feet, more or less, to Brackett Street; thence easterly by Brackett Street thirty-seven (37) feet, more or less, to the point of beginning.

Being the same premises conveyed to Mary Davis by Harry E. Davis by deed dated March 18, 1915, recorded in Cumberland County Registry of Deeds in Book 945, Page 109.

Reference is made to Will of said Mary Davis, abstract of which is recorded in said Registry of Deeds in Book 3025, Page 28.

928

To have and to hold the above-granted premises unto the said Maine Medical Center, its successors ~~and~~ ~~assigns~~ and assigns forever. And I the said Helen M. Griffin, in my said capacity, do hereby covenant to and with the said Maine Medical Center, its successors ~~and~~ and assigns, that I am the lawful executor of the last will and testament of the said Mary Davis ; that I have power under said will to sell as aforesaid; and that in making this conveyance, I have in all respects, acted in pursuance of the authority granted in and by the said last will and testament.




In Witness Whereof, I the said Helen M. Griffin

in my said capacity of executor

as aforesaid have hereunto set my hand and seal .

this 31st day of March in the year of our

Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered
in presence of

Helen M Griffin

March 31 1966.

State of Maine.
Cumberland } ss.

Then personally appeared the above named Helen M. Griffin

and acknowledged the above instrument to be her free act and deed

in her said capacity.

Before me,

Justice of the Peace.

MAR 31 1966
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 H 55 M P.M. and recorded in
BOOK 2951 PAGE 927 Register

Executor's and Trustee's Deed.

(WHEN THE WILL AUTHORIZES A SALE.)

Helen M. Griffin

TO

Maine Medical Center

Dated, ... 19

..... ss. **Registry of Deeds.**

Received 19

MAR 31 1966

at ..... H., ... M., ... M., and

recorded in Book ..... Page .....

Attest: ..... Register.

FROM THE OFFICE OF

Verrill Dana Walker Philbrick
& Whitehouse
57 Exchange Street
Portland, Maine

LORING, SHORT & HARMON, LAW STATIONERS
PORTLAND, MAINE

3355

(15)

KNOW ALL MEN BY THESE PRESENTS

THAT OLD COLONY TRUST COMPANY a Corporation located in Boston, County of Suffolk and Commonwealth of Massachusetts, sole surviving Trustee under a Trust Agreement created by ALICE A. BURKITT late of Portland and dated March 30, 1961 by virtue of the authority to it given by said Trust Agreement in its capacity of Trustee as aforesaid, and in consideration of One Dollar ($1.00) and other valuable considerations to it paid by MAINE MEDICAL CENTER of Portland, Maine, the receipt whereof is hereby acknowledged, does hereby sell and convey unto the said Maine Medical Center its successors and assigns forever, the following described real estate, which was the property of Alice A. Burkitt late of Portland, situated in said Portland, Maine and bounded as follows:

a certain lot or parcel of land with the buildings thereon, situated in said Portland, bounded and described as follows: Beginning at a point on the easterly side of Western Promenade, which point is eighty-five (85) feet from the intersection of the northeasterly side line of said Promenade with the northwesterly side line of Bramhall Street; thence northerly by the line of said Promenade seventy-seven and five tenths (77.5) feet, more or less, to Arsenal Street; thence northeasterly by said Arsenal Street seventy-four and one tenths (74.1) feet, more or less, to land now or formerly of William J. Miller et al; thence southeasterly at right angles to Arsenal Street by said Miller land fifty-five and five tenths (55.5) feet, more or less, to land formerly of Hiram Knowlton; thence southwesterly parallel with said Arsenal Street one hundred and twenty-seven (127) feet, more or less, to the Western Promenade and point of beginning, containing fifty-six hundred (5600) square feet more or less.

Also another parcel of land adjoining the above described lot, and bounded and described as follows: Commencing at a point on the northwesterly side of Bramhall Street, which point is the northeasterly corner of land of Frederick C. Hussey et al, and ninety-eight and two tenths (98.2) feet, more or less, from the intersection of said northwesterly side line of Bramhall Street with the easterly side line of the Western Promenade; thence northeasterly on said Bramhall Street thirty-three and five tenths (33.5) feet to a point and land formerly of Hiram Knowlton, and from these two points extending northwesterly keeping a width of thirty-three and five

tenths (33.5) feet a distance of sixty (60) feet to the first parcel herein conveyed, containing two thousand and ten (2010) square feet.

Meaning and intending to convey and hereby conveying the real estate acquired by Alice A. Burkitt by Warranty Deed of Good Will Home Association dated December 11, 1930 recorded in the Cumberland County Registry of Deeds Book 1361, page 373; said real estate having been devised to the Grantor as Trustee by the Will of Alice A. Burkitt duly probated in the Cumberland County Probate Court.

TO HAVE AND TO HOLD the above-granted premises unto the said Maine Medical Center its successors and assigns forever. And the said Old Colony Trust Company in its said capacity does hereby covenant to and with the said Maine Medical Center its successors and assigns that it is the sole surviving Trustee under said Trust Agreement; that it has power under said Trust Agreement to sell as aforesaid; and that in making this conveyance it has in all respects acted in pursuance of the authority granted in and by said Trust Agreement.

IN WITNESS WHEREOF, the said Old Colony Trust Company in its said capacity as Trustee as aforesaid has caused this instrument to be signed in its corporate name and sealed with its corporate seal by S. Vincent its ~~Trust Officer~~ Vice President thereunto duly authorized this 4th day of February 1969.

Witness:

OLD COLONY TRUST COMPANY

By _____
Its ~~Trust Officer~~ Vice President

COMMONWEALTH OF MASSACHUSETTS
SUFFOLK, SS.

February 4, 1969.

Then personally appeared the above-named S. Vincent who made oath that the foregoing instrument was his free act and deed and the free act and deed of the Grantor corporation in its said capacity as Trustee as aforesaid.

Before me,

_____
Notary Public

Mary F. Archoska
NOTARY PUBLIC
My commission expires May 23, 1971

Section 5
Public or Private Rights-of-Way

5.A. Public or Private Rights-of-Way

The existing site has four primary accesses; one on Gilman Street for the existing employee garage, one on Congress for the visitor parking garage, one onto Crescent Street for the visitor parking garage, and a pick-up and drop-off driveway off Bramhall Street. The site is proposed to have one new access on Congress Street for the proposed visitor pick-up and drop-off driveway and visitor parking garage connection. The East Tower will continue to be accessed via the existing drop-off and pick-up driveway off Bramhall Street, and the two existing visitor parking garage accesses will remain. The existing Gilman Street employee garage access will be eliminated.

Section 6
Schedule

6.A. Schedule

The proposed project is anticipated to be completed and occupied by 2023.

Relationships.
Responsiveness.
Results.









Revised Section #7 Traffic Impact Study

Bramhall Street - 22;
MMC Congress Street Building
Portland, Maine

PREPARED FOR:
Maine Medical Center
22 Bramhall Street
Portland, ME 04102

November 2018

SUBMITTED BY:
Gorrill Palmer
707 Sable Oaks Drive
Suite 30
So. Portland, ME 04106
207.772.2515

Revised - Traffic Impact Study
Bramhall St. – 22; MMC Congress St. Building
Portland, Maine
November 2018

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Attachment 7A
Site Location Map
Turning Movement Diagrams

Attachment 7B
Trip Generation Calculations
May 2013 Traffic Impact Study

Attachment 7C
Capacity and Queue Analysis Results
DD Mitigation

Attachment 7D
Pedestrian and Bicycle Collision Locations
Left Turn Lane Warrants

I. Introduction

A Scoping Meeting for this project was held on October 23, 2018 that reviewed Sections 1-6 of the Traffic Movement Permit (TMP) application. This traffic impact study is Section 7 of that application, and examines the potential traffic impact of phase three (3) of the proposed Maine Medical Center expansion in Portland, Maine. The site of the expansion is located at the site of the existing Gilman Garage in the southeast corner of the Congress Street / Gilman Street intersection. The site is identified on City Tax Map 53, Lot D007, and City Tax Map 65 Lots H001, H002, H005, H008, and H009. A proposed site plan is provided with the site plan application under separate cover. The attached Figure 1 in Attachment 7A shows the location of the site.

The existing site is the same location as the Gilman parking garage for the employees of Maine Medical Center. The proposed project consists of razing the existing employee garage and constructing additional hospital space, including new operating rooms and patient rooms, although the total number of beds will remain the same, since the new patient rooms are intended to decompress the existing hospital. A new drop off and pick up loop, with access to the visitor garage is proposed on Congress Street, to the west of the existing visitor garage. Parking will be provided for employees at the recently approved St. John Street employee parking garage and for the patients and visitors in the existing and recently expanded visitor parking garage. The expansion is proposed to be a total of 265,000 sf and is also anticipated to add 200 employees by 2023, the opening year of the project. After opening, MMC is anticipated to add an additional 124 employees, for a total increase of 324 employees.

II. Existing Traffic Volumes

Turning movement counts were completed by Accurate Counts at the following intersections from 5:00AM to 9:00AM and 2:00PM to 8:00 PM on the specified dates:

- St John Street / Valley Street: November 8, 2017
- Valley Street / Commercial Street: November 2, 2017
- Congress Street / St. John Street: November 2, 2017
- St John Street / Park Avenue: November 8, 2017

Accurate Counts also completed turning movement counts at the intersection of Valley Street with Congress Street on June 26, 2018 from 6:00AM – 6:00PM.

Turning movement counts were also completed by Gorrill Palmer at the following intersections:

- St. John Street / D Street: May 30, 2018, 6:00AM – 9:00AM and 3:00PM – 6:00PM
- Congress Street / Bramhall Street: August 23, 2018, 6:00AM – 9:00AM and 3:00PM – 6:00PM
- Congress Street / Visitor Garage: August 29, 2018, 6:00AM – 9:15AM and 3:00PM – 6:00PM
- Visitor Garage / Crescent Street: August 29, 2018, 6:00AM – 9:00 AM and 3:00PM – 6:00PM

In addition, turning movement counts were completed by Gorrill Palmer at the intersection of St. John Street with the Margarita's Driveway on May 17, 18, and 19, 2017 from 6:00AM to 8:00AM, 7:45AM to 9:00AM, 5:00PM to 8:00PM, and 3:00PM to 5:00PM. Those volumes were used as the base raw volumes for St. John Street and for Margaritas during the peak hours of the generator. This evaluation has focused on the peak hour of the adjacent street, which occurs at 7:30AM to 8:30AM and 4:15PM to 5:15PM at the intersection of Congress Street with Bramhall Street.

The results of all counts for the peak hour of the adjacent street are shown on the attached Figure 2 in Attachment 7A.

III. Other Developments in the Vicinity of the Site

Approved projects that are not yet opened as well as projects for which applications have been filed are required to be included in the predevelopment volumes for this project. Based on conversations with City Staff, traffic from the proposed Mercy Hospital expansion, the proposed Dunkin' Donuts on St. John Street, and the Thompson's Point development should be included in the background traffic. It should be noted that although portions of the Thompson's Point development have been constructed, the full build out traffic volumes from the August 2011 Traffic Impact Study have been utilized to be conservative. The traffic from this project that is forecast to impact the Maine Medical Center Expansion study area is shown on the attached Figure 4.

IV. Predevelopment Traffic Volumes

Traffic volumes that are not collected during peak summer months are typically seasonally adjusted to estimate traffic volumes that may be experienced during the peak summer months. Since the traffic counts were not collected during the peak summer months, the raw volumes shown on Figure 2 have been seasonally adjusted based on the weekly group mean factors published by MaineDOT. The following summarizes the adjustment at each intersection:

- Valley Street / Commercial Street: 8.3%
- St. John Street / Valley Street: 8.3%
- D Street / St. John Street: 2.4%
- Margaritas / St. John Street: 3.6%
- Congress Street / St. John Street: 8.3%
- Park Avenue / St. John Street: 8.3%
- Valley Street / Congress Street: 2.4%
- Gilman Street / Congress Street: 15.5% (Congress through traffic only)
- Bramhall Street / Congress Street: 0.0%

In addition to the seasonal adjustment, the adjacent roadway volumes were also increased by an annual growth rate to forecast the traffic volume that may be experienced during the build out year of the project. An annual growth rate of 0.5% per year (approved by the City and consistent with other studies in the area) has been applied to the seasonally adjusted volumes to yield the 2023 Adjusted Volumes shown on the attached Figure 3. The 2023 Adjusted Volumes have been combined with the Other Development Volumes to yield the 2023 Predevelopment traffic volumes shown on the attached Figure 5. It should be noted that the employee growth rate in the IDP is forecast to be approximately 0.63% per year, which is very similar to the growth rate approved by the City for overall on-street traffic and used on other studies in the area.

It should be noted that the traffic volumes into and out of parking areas has not been adjusted because significant seasonal or annual fluctuation is not anticipated.

V. Trip Generation

The trip generation for the Phase 3 Expansion was calculated using the Institute of Transportation Engineers' (ITE) publication, *Trip Generation*, Seventh Edition, Land Use Code (LUC) 610 – Hospital. The Tenth Edition is available, but has not yet been accepted by the MaineDOT. The expansion is proposed to be a total of 265,000 sf and is anticipated to add 200 employees by 2023 and an additional 124 employees after opening for a total of 324 employees. As approved at the October 13, 2017 Pre-Scoping meeting, the trip generation for the expansion has been based on the number of employees, students, and physicians. The following is a summary of the trip generation for the expansion based on an increase of 324 employees:

- AM Peak Hour Adjacent Street: 110 trip ends
- PM Peak Hour Adjacent Street: 107 trip ends
- AM Peak Hour of Generator: 126 trip ends
- PM Peak Hour of Generator: 152 trip ends
- Saturday Peak Hour: 172 trip ends

A trip end is defined as a trip into or out of the site; thus, a round trip is equal to two trip ends. Since the forecast traffic exceeds 99 trip ends during a peak hour, a Traffic Movement Permit is required. The City of Portland has delegated review authority, so the application can be administered by the City. A copy of the trip generation calculations are included as an attachment to this section.

Based on ITE's *Trip Generation*, the following trip distribution is anticipated:

- AM Peak Hour Adjacent Street: 88 in / 22 out
- PM Peak Hour Adjacent Street: 37 in / 70 out
- AM Peak Hour of Generator: 82 in / 44 out
- PM Peak Hour of Generator: 61 in / 91 out
- Saturday Peak Hour: 95 in / 77 out

VI. Trip Composition and Assignment

GP has assumed that all trips are primary in nature and made for the sole purpose of going to and from the site. The forecast trip generation is anticipated to be comprised of patients/visitors and employees. The portion of the trip generation that is forecast to be due to patients/visitors has been based on information provided by MMC in an email dated August 8, 2018.

Table 2.4 on page 41 of the IDP shows the forecast campus weekday volumes for 2026. The patient and visitor volumes from 2026 have been proportionally reduced based on the growth rates to estimate the number of patients and visitors in 2023. Based on the 2026 patient and visitor volumes, an increase of approximately 50 patients and visitors in an average weekday is anticipated by 2023 due to the proposed expansion. The distribution of the patient/visitors has been based on the following assumptions:

- 20% of daily trips occur during the peak hours
- 80% entering during the AM peak hour
- 80% exiting during the PM peak hour

Based on these assumptions, the following trip composition is forecast for the peak hours of the adjacent street:

- AM Peak Hour Adjacent Street (assumed 7:30AM – 8:30AM):
    - Patients/Visitors: 14 trip ends (11 in / 3 out)
    - Employees: 96 trip ends (77 in / 19 out)

- PM Peak Hour Adjacent Street (assumed 4:15PM – 5:15PM):
    - Patients/Visitors: 14 trip ends (3 in / 11 out)
    - Employees: 93 trip ends (34 in / 59 out)

It should be noted that although the patient/visitor trip generation appears to be low, it is a reasonable level of trip generation for the expansion since the expansion is proposed to decompress the existing hospital, and not significantly increase the number of patients at the hospital.

The patient/visitor trip assignment has been based on the proposed driveway locations, information from MMC in an email dated August 8, 2018, and the existing traffic patterns and is shown on Figure 6 in Attachment 7A. The trip assignment for the employees was initially based on the VHB Travelshed for employees, and adjusted per City comments. The trip assignments are shown on Figure 7 in Attachment 7A.

VII. Previously Approved Expansions

Although the currently proposed expansion is for 324 employees, there were previously approved expansions that did not trigger a Traffic Movement Permit. It is required that any development on a property that was completed within the last 10 years be included in the permitted trip generation. Based on information from the City of Portland, there were two previously approved, constructed, and occupied expansions. Based on a review of a traffic impact study completed for the second expansion, dated May 2013, the trip generation for the combined expansions was forecast to be the following:

- AM Peak Hour of the Generator: 77 trip ends
- PM Peak Hour of the Generator: 84 trip ends

It should be noted that the May 2013 traffic impact study included only the peak hours of the generator. Since the expansion projects that were forecast to generate this traffic have been completed and occupied, this traffic is assumed to be included in the existing traffic on the adjacent roadway network. However, it must be included when determining the study area for the currently proposed expansion. The forecast trip generation for the currently proposed expansion has been combined with the previous expansions to yield the following trip generation:

- AM Peak Hour: 187 trip ends
- PM Peak Hour: 191 trip ends

The proposed expansion focuses on the peak hour of the adjacent street traffic, since this is expected to be the most congested time period on the adjacent roadway network. Since the only available information for the previous studies is the peak hour of the generator, those volumes were added to the proposed traffic for the purposes of determining the overall study area. This is a conservative approach, since it overlaps the peak of the hospital that includes primarily employees and occurs off hours, with the peak of the adjacent street traffic.

The distribution between patients and visitors for the previous expansion is assumed to be the same as the currently proposed expansion. The attached Figure 17 shows the estimated trip assignment for the previous expansion and the currently proposed expansion.

VIII. Congress Street Pick-Up / Drop-Off

As part of the proposed expansion, a new patient drop-off / pick-up loop is proposed on Congress Street to the west of the existing visitor garage. The loop is proposed to have a connection to the Visitor Garage, to allow people to drop a patient off then park or pick up a patient after exiting the Visitor Garage. This prevents traffic from recirculating on Congress Street between the loop and the parking garage. There is space for approximately 11 vehicles before backing onto Congress Street, which is anticipated to be adequate based on observations completed at the existing Bramhall Street loop. It is anticipated that the new Congress Street pick-up / drop-off will draw existing traffic from the Bramhall Street drop-off loop. To estimate the traffic that may use the Congress drop-off instead of the Bramhall drop-off, counts and observations were completed by Gorrill Palmer at the Bramhall drop-off on August 28-30, 2018 from 7:00AM – 10:00AM and 3:00PM – 6:00PM. On August 29, 2018 an additional two hours, from 10:00AM – 12:00PM, was also collected. The counts were separated into six types of trips through the loop; pick-up, drop-off, pass-through, parked, valet parking (park), and valet parking (return). Using the counts collected, traffic was reassigned based on existing traffic patterns and the following assumptions:

- Valet parking and return will remain at the Bramhall drop off
- 75% of pick-ups and drop-offs will use the Congress drop off (from MMC in an email dated August 8, 2018)
- 25% of pick-ups and drop-offs will remain at the Bramhall drop off (from MMC in an email dated August 8, 2018)

The reassigned traffic volumes are shown on Figure 8 in Attachment 7A. It should be noted that the initial assumption was that valet parking would remain only at the Bramhall drop-off. Since that time, it has been identified that there will be valet parking at the

Congress Street drop-off as well as the Bramhall drop-off. This may increase traffic volumes using the Congress drop-off and right turning traffic from Congress to Bramhall. The increase in traffic due to valet parking is not forecast to significantly impact the results of this evaluation.

IX. Phase 3 Net Impact

The Phase 3 patient/visitor trip assignment on Figure 6, the Phase 3 employee trip assignment on Figure 7, and the reassigned drop-off traffic on Figure 8 were combined to yield the Phase 3 Net Impact shown on Figure 9 in Attachment 7A.

X. Existing Employee Garage

The proposed Phase 3 expansion will be located at the site of the existing employee garage in the southeast corner of the Congress Street / Gilman Street intersection. The existing employee garage is proposed to be razed and MMC will be constructing a new 2400 space employee parking garage on St. John Street. As a result, the existing employee traffic volumes will be relocated to St. John Street. The existing employee garage traffic volumes have been estimated based on the turning movement counts completed at the garage access on Gilman Street on November 2, 2017, the previously approved proposed employee garage assignment, and existing traffic patterns. Figure 10 in Attachment 7A shows the existing employee garage traffic to be removed from the adjacent roadway network.

XI. Proposed Employee Garage

MMC will construct an approximately 2,400 space employee parking garage with an adjacent surface lot with approximately 50 spaces on St. John Street. The proposed garage and adjacent surface lot are anticipated to initially accommodate the following:

- Gilman Garage: 1,274 spaces
- Sportsman Lot: 60 spaces
- 222 St. John Street Lot: 283 spaces
- Gateway Garage: 100 spaces
- Classic Lot: 97 spaces
- 321 Brackett Street Lot: 9 spaces
- MMC Employee On-Street Parking: 200 spaces (estimated)

Total Parking Spaces = 2,023

The 200 on-street parking spaces are an approximate number of spaces intended to include vehicles that may currently park on neighborhood streets. It should be noted that in the garage and surface lot 50 spaces are proposed to be reserved for the Eagles and approximately 150 are reserved for 222 St. John Street. The 50 parking spaces reserved for the Eagles are not expected to occur on a regular and frequent basis. Additionally, the Eagles and 222 St. John Street peaks are not expected to coincide with the peaks of MMC.

The Institutional Development Plan (IDP) identifies a current total of 2,027 employee parking spaces both on and off campus. The existing employee spaces that are not included in the garage spaces identified above are located in the 7 Bramhall Street lot (26 spaces). This lot is proposed to remain where it is because it serves specific programs at that location.

Existing Parking Area Traffic Volumes

Traffic counts were completed at the existing Gilman Garage access as follows:

- Accurate Counts - November 2, 2017 from 5:00AM to 9:00PM (16 hours) – The counts indicate that the peak hours of traffic entering and exiting the garage occurred from 6:45AM to 7:45AM with 448 trip ends, and 6:00PM to 7:00PM with 326 trip ends.
- GP – January 18, 2018 from 6:30AM to 8:00AM and 5:45PM to 7:15PM - The times were chosen based on the peak hours determined in the November 2, 2017 counts. The counts completed by GP confirmed the original findings from the November 2, 2017 counts.

Traffic counts were also completed at the existing 222 St. John Street surface parking as follows:

- GP - January 18, 2018 from 6:15AM to 7:45AM and from 3:30PM to 5:00PM
- GP - January 23, 2018 from 5:45PM to 7:15PM

The 222 St. John Street parking lot peak hours occurred from 6:15AM to 7:15AM and 3:30PM to 4:30PM. The entering and exiting traffic for each 15 minute period at the 222 St. John Street is shown on the attached "St. John Street Parking Garage Trip Generation" table.

The Gilman Employee Parking Garage and 222 St. John Street surface lot represent approximately 85% of the MMC employee spaces anticipated to be accommodated by the proposed St. John Street garage. As such, it is anticipated that when combined they will represent the majority of the traffic patterns that can be expected at the new garage. To

represent the traffic patterns of the remaining 15% of the satellite lots as well as the on-street parking spaces, the traffic patterns were assumed to be similar to the 222 St. John Street satellite lot. The trip generation for each 15 minute period for each satellite parking area has been estimated based on the trip generation at the 222 St. John Street parking lot and is shown on the attached "St. John Street Parking Garage Trip Generation" table.

Reassigned Parking Area Traffic Volumes

Since the employees that currently park in the Gilman garage will be shifted to the new garage, they will have to take a shuttle in the future rather than have direct access to the hospital as they do currently. Because of this shift, we would expect those employees to arrive approximately 15 minutes earlier than they typically would and that they would end up leaving the new garage approximately 15 minutes later. Therefore, the counted volumes for the Gilman Garage were adjusted by 15 minutes to estimate the traffic that would be experienced when the spaces are relocated to 222 St. John Street. The adjusted Gilman Garage volumes are shown on the attached "St. John Street Parking Garage Trip Generation" table.

The trip generation for the proposed St. John Street garage is based on adding the existing or estimated trip generation of each 15 minute period for each parking location to identify the overall AM & PM peak hours. The AM peak hour of the proposed garage is estimated to occur from 6:00AM to 7:00AM with and the PM peak hour of the garage is estimated to occur 4:15PM to 5:15PM. The peak hours of the garage were evaluated in the St. John Street Garage Memorandum dated June 19, 2018, completed by Gorrill Palmer. This evaluation focuses on the peak hours of the adjacent street which occur from 7:30AM to 8:30AM and 4:15PM to 5:15PM. It should be noted that the PM peak hour of the adjacent street occurs at the same time as the PM peak hour of the proposed garage. The trip generation for the reassigned 2,023 spaces is estimated to be **443 trip ends** during the AM peak hour of the adjacent street and **474 trip ends** during the PM peak hour of the adjacent street. Detailed data is shown on the attached spreadsheet.

Trip Distribution and Assignment

The garage is proposed to be accessed via a full movement driveway directly onto St. John Street as well as indirectly via the Margarita's driveway. During peak hours of the garage, the garage will be set up such that the ground level and first deck will be accessed via the Margarita's driveway and decks 2-8 will be accessed directly via the St. John Street access. All of the 222 St. John Street employees, the 50 Eagles spaces, and some of the MMC Campus employees will use the ground level and first deck parking spaces with decks 2 – 8 used by MMC Campus employees only. It should be noted that at the time this study was prepared, it was estimated that of the approximately All employee shuttles throughout the day (enter and exit) will access the garage via the Margarita's access.

Unused shuttles during non-peak times of the day are expected to be parked on the ground level.

The trip distribution (enter vs. exit) for the proposed St. John Street garage has been based on the counts completed at the existing 222 St. John Street surface lot and the Gilman Garage. Based on the counts, the following trip distribution is anticipated for the proposed 222 St. John Street garage:

- AM Peak Hour: 98% entering, 2% exiting
- PM Peak Hour: 14% entering, 86% exiting

The regional trip assignment has been based primarily on the VHB travelshed completed for the IDP and revised slightly per comments received from the City. For localized assignment, it is based on GP's review of the area as well as numerous discussions with the City of Portland staff and traffic consultant. The trip assignment is shown on the attached Figure 11 in Attachment 7A.

Proposed Parking Garage Trip Generation – Adjacent Street Peak Hour

The proposed St. John Street garage was evaluated for full capacity in a memorandum dated June 19, 2018. To ensure that the proposed garage can accommodate the proposed expansion, the total trip generation for the full capacity garage has been compared to the trip generation for the reassigned existing spaces. The difference between the reassigned existing spaces and the full capacity garage trip generation has been compared to the proposed expansion employee trip generation to determine if the proposed garage can accommodate the proposed expansion.

The total trip generation for the proposed St. John Street garage is based on adding the existing or estimated trip generation of each 15 minute period for each parking location to identify the overall AM & PM peak hours. Then, a ratio of the proposed number of parking spaces (2,450) to the existing combined number of parking spaces to forecast the trip generation for the proposed garage.

Based on the combined volumes for the parking areas and the proportional increase in number of parking spaces, the trip generation of the proposed garage during the peak hours of the adjacent street is forecast to be **537 trip ends** during the AM peak hour and **574 trip ends** during the PM peak hour.

The MMC employee's full garage is 94 trip ends greater than the existing reassigned volumes during the AM peak hour of the adjacent street and 100 trip ends greater than the reassigned volumes during the PM peak hour of the adjacent street. The proposed garage was previously evaluated for full capacity and was forecast to operate at acceptable levels of service. The ITE forecast trip generation for the AM and PM peak hours of the

adjacent street is forecast to be 68 trip ends and 66 trip ends respectively, which is less than the increase from the existing to full build out of the garage. Since the garage is forecast to operate at acceptable levels of service with more trip generation, the garage can accommodate the increase of 200 employees and students.

XII. Shuttle Assignment

MMC will be upgrading their current shuttle service to accommodate the new garage. In addition to employee traffic, shuttles will be used to transport employees between the parking garage and the hospital. There are proposed to be 13 shuttles during the peak hours, each with an approximate 15 minute headway. Based on this information, one shuttle can make approximately four trips to and from the proposed garage during a one hour period. With 13 shuttles, approximately 52 round (52 enter and 52 exit) trips are anticipated at the site during the peak hour. As identified previously, all entering and exiting shuttles will use the Margarita's access. These 104 trips have been added to the employee trips. The shuttle assignment has been based on the shuttle routes provided by MMC. At this time, seven of the shuttles are proposed to use the Congress Street drop off area on Gilman Street and six shuttles are proposed to use the Bramhall Street drop off. It has been assumed that the shuttles will turn right out of the Margarita's access with the Gilman Drop off shuttles entering taking a right in and the Bramhall shuttles entering taking a left in. The shuttle assignment is shown on Figure 12 in Attachment 7A.

XIII. 222 St. John Street MMC Traffic

MMC currently utilizes a satellite parking lot at 222 St. John Street for employees. This traffic currently uses the Margarita's access and will be relocated to the proposed parking garage and is included in the proposed parking garage trip generation. The existing estimated 222 St. John Street MMC traffic is shown on Figure 13 in Attachment 7A.

XIV. 222 St. John Street Cut-Through (Non-MMC Traffic)

The existing turning movement counts indicate that some traffic uses the existing Union Station access from Congress Street to the site. For the purposes of this assessment, to be conservative, it has been assumed that this cut-through will not be available and that traffic has been reassigned to the adjacent street. The attached Figure 14 shows the reassignment of the cut-through traffic (not including MMC traffic).

XV. Proposed Garage Net Impact

The net impact of the proposed St. John Street garage has been calculated by combining the Proposed Garage Reassignment on Figure 11 with the Shuttle Assignment on Figure 12 and the 222 St. John Street Cut-Through traffic on Figure 14, then subtracting the existing Gilman garage traffic on Figure 10 and the existing 222 St. John Street MMC traffic on Figure 13. This yields the Proposed Garage Net Impact traffic volumes on Figure 15 included in Attachment 7A.

XVI. Postdevelopment Traffic Volumes

The predevelopment traffic volumes shown in Figure 5 have been combined with the Phase 3 Net Impact on Figure 9 and the Proposed Employee Garage Net Impact on Figure 15 to yield the 2023 Postdevelopment volumes shown on the attached Figure 16 in Attachment 7A.

XVII. Capacity Analysis

In evaluating the time period for analysis, GP reviewed the traffic volumes during both time periods; adjacent street traffic and generator. The following table compares the total entering volumes at the key intersection of St. John Street with Congress Street during both the peak hour of adjacent street traffic and the peak hour of MMC. The traffic volumes for the adjacent street traffic are based on the 2023 Postdevelopment volumes from the TIS for Phase 3. The traffic volumes for the peak hour of MMC traffic generation are based on the 2022 Postdevelopment traffic volumes from the memo dated June 19, 2018 for the proposed St. John Street parking garage (Phase 2) that have been adjusted to the Phase 3 build out year of 2023.

Traffic Volume Comparison

Intersection	Adjacent Street		Peak Hour MMC	
	AM	PM	AM	PM
St. John / Congress	2,271	2,413	1,795	2,499

As shown in the table, the AM peak hour of the adjacent street traffic volumes (approximately 7:30-8:30 AM) are higher than the AM peak hour of the generator (approximately 6:00-7:00 AM). The PM peak hours are similar, since the PM peak hour of the generator and PM peak hour of the adjacent street occur at approximately the same time for this intersection (start time between 4:00 and 4:30 PM). Since the AM traffic is higher during the adjacent street time period and the PM traffic is approximately equal, to be conservative, the adjacent street traffic volumes were used for analysis.

GP completed capacity analyses for the intersections discussed above using the Synchro/SimTraffic computer analysis software (Version 10). Level of service rankings are similar to the academic ranking system where an 'A' is good with little control delay and an 'F' represents poor conditions. At an unsignalized intersection, if the level of service falls below a 'D', an evaluation should be made to determine if mitigation is warranted. The following tables summarize the relationship between control delay per vehicle and level of service:

Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (s)
A	Less than 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

Level of Service Criteria for Unsignalized Intersections

Level of Service	Control Delay per Vehicle (s)
A	Less than 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

The analysis has been completed assuming that the signal at the intersection of Valley Street with Congress is removed and will be unsignalized (based on a study completed by Sebago Technics, Inc.). This change is supported by the City and MaineDOT. Additionally, the intersection of St. John Street with the proposed Garage access is unsignalized in the predevelopment conditions and signalized in the postdevelopment conditions. The predevelopment conditions include timing and phasing that was provided by the City. The postdevelopment has been evaluated based on optimized signal timing. This includes converting the intersection of St. John Street / Congress Street from exclusive pedestrian phasing to concurrent pedestrian phasing. GP recommends that timing of signals at the study area intersections be field adjusted after the hospital expansion is operational. The following table summarizes the capacity analysis results. The detailed analyses are included in Attachment 7C.

Level of Service Summary

Approach	Level of Service			
	AM Pre	AM Post	PM Pre	PM Post
Park / St John (S)				
Park WB	C	C	D	D
St. John NB	C	B	D	C
St. John SB	E	C	D	C
Overall	**D**	**C**	**D**	**C**
Congress / St John (S)				
Congress EB	B	C	B	C
Congress WB	B	B	B	B
St. John NB	C	C	C	C
St. John SB	C	C	C	C
Overall	**B**	**C**	**B**	**C**
Margarita's / St. John (U)				
Margarita's EB	A	A	A	A
St. John NB	A	A	A	A
St. John SB	A	A	A	A
Garage / D / St. John (U/S)				
Garage EB	A	B	A	B
D WB	A	A	A	A
St. John NB	A	A	A	A
St. John SB	A	A	A	B
Overall	**N/A**	**A**	**N/A**	**B**
Valley / St. John (S)				
St. John EB	B	B	B	B
St. John WB	B	B	B	B
Valley NB	B	B	B	B
Valley SB	B	B	B	B
Overall	**B**	**B**	**B**	**B**
Commercial / Valley (S)				
Fore River Pkwy EB	E	C	E	D
Commercial WB	B	B	B	B
Valley SB	B	B	B	B
Overall	**D**	**C**	**D**	**C**
Valley / Congress (U)				
Congress EB	A	A	A	A
Congress WB	A	A	A	A
Valley NB	B	B	B	B
Gilman / Congress (U)				
Congress EB	A	A	A	A
Congress WB	A	A	A	A
Gilman NB	C	B	D	D
Gilman SB	A	B	B	B
Proposed Drop-Off / Congress (U)				
Congress EB	N/A	A	N/A	A
Congress WB	N/A	A	N/A	A
Drop-Off NB	N/A	C	N/A	C

Approach	Level of Service			
	AM Pre	AM Post	PM Pre	PM Post
Visitor Garage / Congress (U)				
Congress EB	A	A	A	A
Congress WB	A	A	A	A
Visitor Garage NB	C	C	B	C
MOB Garage SB	A	A	A	A
Bramhall / Congress (S)				
Congress EB	A	A	B	B
Congress WB	B	B	C	C
Bramhall NE	B	B	B	B
Deering SW	B	B	B	B
Overall	**B**	**B**	**B**	**B**

S=Signalized, U=Unsignalized

As shown in the table, all approaches to the study area intersections are forecast to operate at acceptable levels of service ('D' or better) during the AM and PM peak hours. Additionally, the operation of most intersection approaches is forecast to be maintained, while some are forecast to improve from the predevelopment conditions due to adjustments to signal timing. As stated previously, GP recommends field adjusting the timing of the intersections in the study area once the expansion is operational. Any intersection approaches that are forecast to decrease in operation are forecast to decrease by one level of service (e.g. 'B' to 'C').

It should be noted that the intersection of Valley Street with A Street was not included in the capacity analysis. However, the removal of the existing employee garage is anticipated to **reduce** the traffic volumes at this intersection by 132 trip ends during the AM peak hour and 102 trip ends during the PM peak hour, which will improve its operation.

Per the request of the City, GP has completed a capacity analysis of the St. John Street signalized intersections with Park Avenue and with Congress Street using the proposed lane uses from the Dunkin Donuts mitigation (attached). The following is a summary of that analysis.

Capacity Analysis Results Summary – Using DD Proposed Mitigation

Approach	Level of Service	
	2023 AM Post	2023 PM Post
Congress / St. John		
Congress EB	C	C
Congress WB	B	C
St. John NB	D	D
St. John SB	C	C
Overall	**C**	**C**

Park / St. John		
Park WB	C	D
St. John NB	C	C
St. John SB	C	C
Overall	**C**	**C**

As shown in the table, both intersections are forecast to operate at acceptable levels of service.

XVIII. Queue Analysis

GP completed a queue analysis using the same Synchro/SimTraffic computer analysis software that was used for the capacity analysis. The queuing analysis involves comparing the postdevelopment 95th percentile queue lengths of the site driveway and turn lanes to the available storage lengths. The queue lengths have been rounded up to the nearest five feet. The following table summarizes the postdevelopment 95th percentile queue lengths based on SimTraffic analyses. The detailed reports are included in Attachment 7C.

Queue Analysis Summary

Approach	Storage Length (ft)	95th Percentile Queue Length (ft)			
		AM Pre	AM Post	PM Pre	PM Post
Park / St John					
Park WB L	95	125	140	185	195
Park WB T	95	200	200	275	280
Park WB TR		225	230	410	525
St. John NB L		160	175	405	335
St. John NB LT		275	290	510	475
St. John NB R	110	165	165	185	175
St. John SB LT		740	330	340	260
St. John SB R	55	105	105	105	105
Congress / St John					
Congress EB L		200	245	195	230
Congress EB T		335	405	315	365
Congress EB R	290	165	295	140	205
Congress WB L	80	65	80	80	95
Congress WB R		100	95	135	140
St. John NB T		90	175	160	345
St. John NB TR	265	115	175	165	220
St. John SB L		135	110	110	110
St. John SB T		170	220	205	210

Approach	Storage Length (ft)	95th Percentile Queue Length (ft)			
		AM Pre	AM Post	PM Pre	PM Post
Margarita's / St. John					
Margarita's EB L		35	40	85	60
Margarita's EB R	125	30	55	60	60
St. John NB LT		30	100	40	100
St. John SB T		--	15	5	10
Garage / D / St. John					
Garage EB LTR		15	N/A	20	N/A
Garage EB LT		N/A	145	N/A	165
Garage EB R	150	N/A	80	N/A	100
D WB LTR		40	35	45	35
St. John NB LTR		10	N/A	20	N/A
St. John NB L	100	N/A	55	N/A	50
St. John NB TR		N/A	120	N/A	165
St. John SB LTR		20	N/A	25	N/A
St. John SB L	75	N/A	60	N/A	85
St. John SB TR		N/A	160	N/A	220
Valley / St. John					
St. John EB LT		90	120	90	140
St. John EB R	110	100	120	125	140
St. John WB L	335	245	215	25	250
St. John WB TR		50	50	60	60
Valley NB L		135	160	115	120
Valley NB TR		245	225	145	165
Valley SB LT		55	50	85	40
Valley SB TR	265	70	45	130	30
Commercial / Valley					
Fore River Pkwy EB L	430	630	395	625	465
Fore River Pkwy EB L	430	640	435	640	505
Fore River Pkwy EB T		1525	330	1225	650
Fore River Pkwy EB T		1420	265	1130	570
Commercial WB T		190	195	225	215
Commercial WB T		190	185	220	205
Commercial WB R	415	80	85	60	60
Valley SB L		105	115	115	115
Valley SB R		115	120	140	145
Valley SB R		120	130	140	155
Valley / Congress					
Congress EB L	50	10	15	15	20
Congress EB TR		5	10	10	15
Congress WB L	50	20	45	35	50
Congress WB TR		5	5	15	5
Valley NB LT		60	55	80	70
Valley NB R	170	55	60	65	55

Approach	Storage Length (ft)	95th Percentile Queue Length (ft)			
		AM Pre	AM Post	PM Pre	PM Post
Gilman / Congress					
Congress EB TR		45	30	30	30
Congress WB T		25	--	30	40
Congress WB L	65	65	45	75	65
Gilman NB LTR		100	70	200	105
Gilman SB LTR		45	50	55	60
Proposed Drop-Off / Congress					
Congress EB TR		N/A	20	N/A	--
Congress WB LT		N/A	85	N/A	115
Drop-Off NB LR		N/A	55	N/A	75
Visitor Garage / Congress					
Congress EB		100	110	30	45
Congress WB		30	35	40	55
Visitor Garage NB		55	50	70	65
MOB Garage SB		25	25	70	70
Bramhall / Congress					
Congress EB L		50	50	120	140
Congress EB TR	400	190	200	215	265
Congress WB L		135	135	180	160
Congress WB TR	65	105	105	105	105
Congress WB L		100	100	105	85
Bramhall NE TR	135	125	125	150	145
Deering SW L		105	120	235	230
Deering SW TR	50	85	85	85	90

As shown in the table, the 95th percentile queue lengths can be accommodated by the storage lengths for most approaches. Some queue lengths exceed the available storage lengths in both the predevelopment and postdevelopment conditions. The 95th percentiles are not forecast to increase by more than three vehicles for most approaches, assuming the length of a vehicle and the associated gap between vehicles is equal to 25 feet. In addition, there are several lanes which are forecast to have improved queue lengths, likely due to the redistribution of traffic in the study area and the modifications to signal timing. The 95th percentile queue length of the proposed Congress Street drop off is not forecast to exceed four vehicles during the AM or PM peak hours.

Per the request of the City, GP has completed a queue analysis of the St. John Street signalized intersections with Park Avenue and with Congress Street using the proposed lane uses from the Dunkin Donuts mitigation (attached). The following is a summary of that analysis.

Queue Analysis Results Summary – Using DD Mitigation

Approach	Storage Length (ft)	95th Percentile Queue Length	
		2023 AM Post	2023 PM Post
Congress / St. John			
Congress EB L		405	250
Congress EB T		690	405
Congress EB R	290	360	155
Congress WB L	80	90	95
Congress WB R		110	155
St. John NB T		370	675*
St. John NB R	175	150	240
St. John SB L	100	140	130
St. John SB T		220	260
Park / St. John			
Park WB L	95	135	175
Park WB T	95	180	270
Park WB TR		205	450
St. John NB L	175	200	250
St. John NB LT		295	740
St. John NB R	110	170	180
St. John SB LT		330	215
St. John SB R	55	105	100

*The queue length for this lane is forecast to extend past the adjacent intersection of St. John Street with Margarita's Driveway. Further discussion below.

As shown in the table, overall the 95th percentile queue lengths are forecast to exceed the available storage lengths by 2-3 vehicles, assuming a vehicle and the associated space between vehicles is 25 feet. The 95th percentile queue lengths of the Park Avenue westbound through lane are forecast to exceed the available storage length by 7 vehicles during the PM peak hour. Additionally, the 95th percentile queue length St. John Street northbound through lane at Congress is reported to be 675 feet during the PM peak hour. The queue was observed to extend past the intersection of St. John Street with Margaritas, which indicates that the actual 95th percentile queue length is longer than the reported 675 feet. The queue length may be reduced by adjusting the intersection timing; however, it would be at the expense of the operation of other approaches.

XIX. Sight Line Evaluation

The speed limit on Congress Street along the site frontage is 25 mph. MaineDOT and the City require an available sight distance of 200 feet. Based on a field review, the available sight distances exiting the site looking left and right exceed 300 feet in each

direction. In addition, proposed MMC sign locations have also been reviewed and will be outside of the public right of way and are not proposed within the sight triangle. When evaluating the sight distance, consideration was also given to potential roadway changes along Congress Street as described previously.

XX. Crash Summary Data

Gorrill Palmer obtained the crash data from MaineDOT for the period of 2015-2017, the most recent period available (See Section 2 of Sections 1-6, Attachment 2A).

In order to evaluate whether a location has a crash problem, MaineDOT uses two criteria to define a High Crash Location (HCL). Both criteria must be met in order to be classified as an HCL.

1. A critical rate factor (CRF) of 1.00 or more for a three year period. A CRF compares the actual crash rate to the rate for similar intersections in the state. A CRF of less than 1.00 indicates a rate of less than average **and**:

2. A minimum of eight crashes over the same three year period.

Based on the crash data provided by MaineDOT, there are seven high crash locations in the vicinity of the study area:

- Intersection of Park Avenue with Valley Street
- Intersection of Congress Street with Gilman Street
- Intersection of St. John Street with A Street
- Intersection of Park Avenue with St. John Street
- Valley Street from A Street to C Street
- Congress Street from Forest Street to Weymouth Street
- St. John Street from Congress Street to Non-Intersection (just south of Park Avenue)

To better evaluate the high crash locations and identify correctable crash patterns, the police reports for these locations were provided by MaineDOT and used to create collision diagrams, included as an attachment to this section. The following discusses the high crash locations as well as pedestrian and bicycle crashes in more detail.

Park Avenue / Valley Street

This intersection has a CRF of 1.80 and experienced 10 collisions during the most recent three-year period. It is an unsignalized intersection that is STOP controlled on Valley

Street with free flowing traffic on Park Avenue. The northbound Valley Street approach is one-way into the intersection.

There is one crash pattern at this intersection involving vehicles turning left from northbound Valley Street onto westbound Park Avenue and colliding with vehicles traveling westbound on Park Avenue. To address this pattern, we recommend restricting left turns from Valley Street. An additional review of the police reports showed that a contributing factor of one of the crash pattern collisions was limited sight distance due to a snowbank on Valley Street. Additional winter maintenance is recommended. It should be noted that the proposed expansion traffic is not expected to exacerbate the existing crash pattern.

Additionally, one collision that occurred at this intersection involved a pedestrian and one involved a bicyclist. The traffic from the proposed MMC expansion is not expected to exacerbate this pattern.

Congress Street / Gilman Street

This intersection has a CRF of 3.26 and experienced 20 collisions during the most recent three-year period. It is an unsignalized intersection that is STOP controlled on the Gilman Street approaches with free flowing traffic on Congress Street. The southbound Gilman Street approach is one-way into the intersection. Based on a review of the collision diagram there are three crash patterns at this intersection; southbound through traffic on Gilman Street failing to yield to eastbound through traffic on Congress Street, southbound through traffic on Gilman Street failing to yield to westbound through traffic on Congress Street, and rear end collisions involving eastbound Congress Street traffic.

There were four collisions that involved southbound through traffic on Gilman Street failing to yield the right of way to the eastbound through traffic on Congress Street and three collisions that involved vehicles coming from the same direction failing to yield the right of way to westbound through traffic on Congress Street. These types of collisions may be due to the buildings along Congress Street blocking the sight distance of the southbound traffic. Because the MMC employee parking is being relocated to St. John Street, both the AM and PM total entering traffic volume for this intersection will be decreased from the Predevelopment condition to the Postdevelopment condition.

There were three rear end collisions on Congress Street eastbound. All three were caused by drivers following too closely and/or driver inattention. Additionally, all three collisions involved vehicles stopping for pedestrians in the crosswalk. It is possible that the removal of the traffic signal at the intersection of Congress Street with Valley Street may improve this crash pattern. The crosswalk is located close to the currently signalized intersection. After a vehicle passes through a signalized intersection, they do not anticipate stopping again immediately, which could be a contributing factor of the rear end

collisions. If the signal is removed, drivers may be more likely to anticipate stopping. Additionally, if the signal is removed, it may reduce the time that vehicles are queued over the crosswalk, which reduces the time that pedestrians may walk between queued vehicles or be blocked from view by the queue.

St. John Street / A Street

This intersection has a CRF of 1.82 and experienced 8 collisions during the most recent three-year period. It is an unsignalized four-leg intersection with two-way traffic on all approaches. Based on a review of the collision diagram, there were no correctable crash patterns identified at this intersection. It should be noted that with the removal of the existing employee garage and the construction of the proposed employee garage, the traffic patterns at the intersection are forecast to change (decrease in traffic volume), which may reduce crashes.

Park Avenue / St. John Street

This intersection has a CRF of 1.63 and experienced 36 collisions during the most recent three-year period. It is a signalized four-leg intersection with two-way traffic on all approaches, with the exception of Park Avenue to the east of St. John Street, which is one way away from the intersection. Based on a review of the collision diagram, there are four crash patterns at this intersection. It should be noted that a local Dunkin Donuts (DD) project on St. John Street is also proposing mitigation at this intersection and this project should coordinate with what is already being proposed by Dunkin Donuts.

One crash pattern involved vehicles in the northbound St. John Street left turn lane attempting to go straight through the intersection from the left-most lane and colliding with left turning vehicles in the adjacent left-through lane. There were 13 such crashes at this intersection during the most recent three year period. Most of the drivers that incorrectly attempted to travel through the intersection claimed that they believed they could travel through the intersection from that lane. Overhead lane use signing for the northbound approach mounted next to the traffic signal heads similar to the existing signs facing the westbound and southbound approaches to this intersection are recommended. The DD project is proposing channelization striping for the dual left turn lanes.

Another crash pattern was northbound left turning vehicles sideswiping one another while traveling in the left turn lane and left-through lane from the northbound St. John Street approach to the intersection. Six of these crashes occurred at this intersection during the most recent three year period. Many of the crashes involved in the two crash patterns discussed at this intersection so far occurred either during the winter or in the spring when the striping of the skip line may have faded away. There is already a skip line striping between the left turn lane and the left-through lane through the intersection that the DD project is proposing to accentuate.

A third crash pattern at this intersection involves right angle collisions between westbound through vehicles on Park Avenue failing to yield to northbound through vehicles on St. John Street. Three of these crashes occurred at this intersection during the most recent three year period. All three collisions involved the westbound Park Avenue vehicle running the red light. To aid in potentially reducing this type of crash, GP recommends the traffic signal heads be fitted with backplates that have retroreflective boarders, and that the timing of the yellow interval be field reviewed and extended if necessary.

The fourth crash pattern at this intersection involved rear-end collisions involving vehicles at the northbound approach to this intersection. One potential contributing factor to rear end collisions at signalized intersections is inadequate signal clearance times. This crash pattern may be mitigated by reviewing the signal timings of this intersection to assure that adequate signal clearance times are provided for this approach.

Valley Street from A Street to C Street

This roadway link has a CRF of 2.89 and experienced 8 collisions during the most recent three-year period. There were no correctable crash patterns identified; however, there were five crashes involving parked vehicles. Of the five crashes involving parked vehicles, three crashes involved vehicles that were parked illegally. Stricter enforcement of the parking regulations may help reduce the number of crashes along this segment of Valley Street. It should also be noted that there was one crash involving a pedestrian at this location during the most recent three year period.

Recent counts are not available for this segment of Valley Street since it was not identified as part of the study area for in-depth analysis. However, as shown in the Traffic Impact Study on Figure 9, "Net Impact Phase 3" no impacts on this segment of Valley Street are forecast due to the proposed Phase 3 expansion. Additionally, as shown on Figure 15 in the Traffic Impact Study, "Net Impact due to Proposed Employee Garage" **there is forecast to be a decrease of traffic through that section of Valley Street of 103 trip ends during the AM peak hour and 71 trip ends during the PM peak hour.**

Congress Street from Forest Street to Weymouth Street

This section of Congress Street has a CRF of 1.45 and experienced 10 collisions during the most recent three-year period. Based on a review of the collision diagram there is one crash pattern of rear end collisions in the eastbound direction. Of the 10 collisions, five were rear end collisions on Congress Street eastbound. The five collisions were caused by drivers following too closely. There are multiple driveways in this roadway segment, including an entrance to the Maine Medical Center visitor parking garage.

An overall review of the collisions showed that there were 9 collisions that occurred on a weekday and of those, 2 occurred during the AM peak commuter hour and 4 occurred during the PM peak commuter hour, when traffic volumes are heaviest. Additionally, one of the collisions that occurred in this area involved a bicyclist.

MMC is currently working with City Staff on a new design for this section of roadway and is expected to include restriping, curb extensions, sidewalk extensions, and bicycle lanes.

St. John Street from Congress Street to Non-Intersection (just south of Park Avenue)

This section of St. John Street has a CRF of 3.00 and experienced 30 collisions during the most recent three-year period. Based on a review of the collision diagram, there are two crash patterns.

The first crash pattern involves sideswipe crashes involving vehicles traveling northbound on St. John Street, which are caused by vehicles making lane changes.

Of the 30 collisions, 17 involved vehicles attempting to turn left onto St. John Street from various driveways. There are many driveways on this link of St. John Street including McDonald's, Amato's, Sullivan Tire, Dunkin' Donuts, Lang's Express, Salty Sally's Bare and Grille and Portland Physical Therapy. Of the 30 crashes in this roadway segment, two involved left turns into driveways from St. John Street.

In a recent Traffic Impact Study completed by Maine Traffic Resources for a Dunkin Donuts relocation project in this section of St. John Street, a "road diet" was recommended that would include a single travel lane in each direction with a center turn lane. Gorrill Palmer supports that recommendation.

Congress Street / St. John Street

This intersection is NOT a high crash location, but did experience 25 crashes over the reported three-year review period. To better evaluate this location and identify correctable crash patterns, the police reports provided by MaineDOT were used to create a collision diagram (attached). Based on a review of the collision diagram, there are two crash patterns at the intersections; rear end collisions on St. John Street northbound and rear end collisions on St. John Street southbound. These may be mitigated with adjustments to the clearance times of the intersection. It should be noted that this intersection is proposed to be modified as part of the Dunkin' Donuts project mitigation, which may impact any crash patterns. It should also be noted that this intersection is converting from exclusive pedestrian phasing to concurrent pedestrian phasing which may have a positive impact on the operations of this intersection.

Pedestrian Collisions

There were 22 collisions involving pedestrians throughout the study area. Of those, 15 occurred when the pedestrian was within the marked crosswalk, seven of which involved one vehicle rear ending another that was yielding to the pedestrian. Several of the collisions involved pedestrians crossing without the walk sign at a signalized intersection, or abruptly entering the intersection. Others involved vehicles failing to yield to the pedestrians in the crosswalks. The attached Figure A in Attachment 7D shows the locations of the pedestrian collisions. Several of the pedestrian involved collisions appear to be located at or near the intersection of Congress Street with Bramhall Street. Most of these collisions occurred after dark. Although there is lighting at the intersection, additional lighting may improve pedestrian visibility. Additionally, three of the rear end collisions due to vehicles yielding to pedestrians in the crosswalk occurred on Congress Street at Gilman Street, discussed above.

Bicycle Collisions

There were 9 collisions involving bicyclists throughout the study area. One collision involved a bicyclist riding in a bike lane being struck by a turning vehicle on Park Avenue. Several of the collisions involved bicyclists riding in the roadway, but not following traffic rules. The bicycle crashes are also shown on the attached Figure A.

XXI. Left Turn Lane Evaluation

The need for a left turn lane on Congress Street at the proposed drop-off has been evaluated using two different sources. The first was Figure 8-19 from the MaineDOT Highway Design Guide, "Volume Warrants for Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (40 mph)." Although the speed limit on Congress Street is unposted and assumed to be 25 mph, the 40 mph warrant is the lowest speed chart available for reviewing left turn lanes. This yields a conservative lane warrant evaluation. Based on a review of the evaluation, a left turn lane is warranted during the AM peak hour and is not warranted in the PM peak hour. The detailed evaluation is included in Attachment 7D.

The second source was the National Cooperative Highway Research Program (NCHRP) 457, Figure 2-5 "Guideline for determining the need for a major-road left-turn bay at a two-way stop controlled intersection." This figure allows for the use of the assumed 25 mph speed limit. This evaluation supported the MaineDOT evaluation and indicated that the warrant is met in the AM peak hour but is not warranted in the PM peak hour. The detailed evaluation is included in Attachment 7D.

In addition to the two formal left turn lane warrant evaluations, the turning movements and crash history on the corridor were also considered in determining if left turn treatment should be considered. As discussed in the previous section, Congress Street in front of the proposed drop-off is a high crash location, with a crash pattern of rear end collisions. Additionally, the left turn volumes within this segment of Congress Street are shown on Figure 18 in Attachment 7A. Based on the left turn lane evaluation the crash history, and the left turn volumes, GP recommends that accommodations for left turning traffic be considered in the final design of Congress Street along the site frontage.

XXII. Executive Summary

1. The proposed development is forecast to generate 110 and126 trip ends during the AM peak hours of adjacent street and generator respectively, and 107 and 152 trip ends during the PM peak hours of adjacent street and generator respectively, and 172 trip ends during the Saturday peak hour of the generator. This level of trip generation requires a MaineDOT traffic movement permit.

2. All study area intersection approaches are forecast to operate at acceptable levels of service in the Postdevelopment conditions. Additionally, for signalized intersections, we recommend that timing and phasing of the study area intersections be field adjusted as needed upon completion of the MMC expansion.

3. Overall, the 95th percentile queue lengths are not forecast to exceed the predevelopment queue lengths by more than three vehicles for most approaches. For many approaches, the 95th percentile queue lengths are forecast to decrease from the predevelopment conditions due to both the redistribution of traffic throughout the study area and the optimization of signal timing. However, the proposed changes as a result of the mitigation associated with the proposed DD on St. John Street is forecast to lengthen queues of traffic in the immediate area.

4. The existing sight distances at the proposed Congress Street drop off exceed MaineDOT and City of Portland Standards.

5. The MaineDOT crash data indicates that there are seven high crash locations in the study area:

    - Intersection of Park Avenue with Valley Street
    - Intersection of Congress Street with Gilman Street
    - Intersection of St. John Street with A Street
    - Intersection of Park Avenue with St. John Street
    - Valley Street from A Street to C Street

- Congress Street from Forest Street to Weymouth Street
- St. John Street from Congress Street to Non-Intersection (just south of Park Avenue)

6. Based on a review of the MaineDOT and NCHRP left turn lane warrants at the proposed Congress Street drop-off / pick-up loop, as well as the crash history and the left turning volumes at adjacent intersections on Congress Street, GP recommends left turning traffic be a consideration in the final design of Congress Street from Forest Street to Weymouth Street.

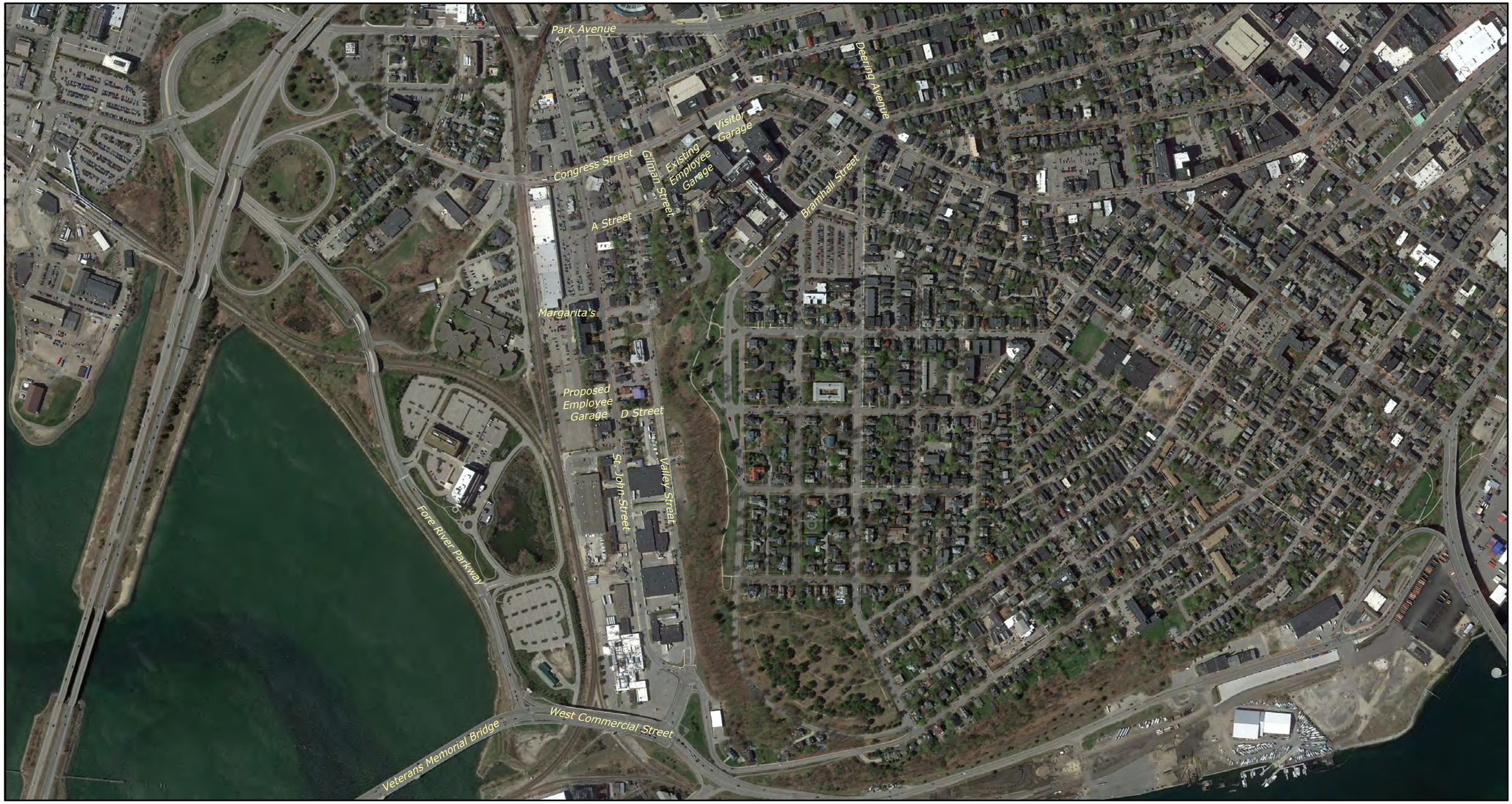
7. Overall, the proposed expansion is forecast to have a moderate impact on the surrounding roadway network; however, the surrounding roadway network has the capacity to accommodate the proposed project.

Attachment 7A

Site Location Map
Turning Movement Figures
VHB Travelshed

Location Map

Figure No. 1



Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design:	EAL	Scale:	NONE
Draft:		Date:	SEP 2018
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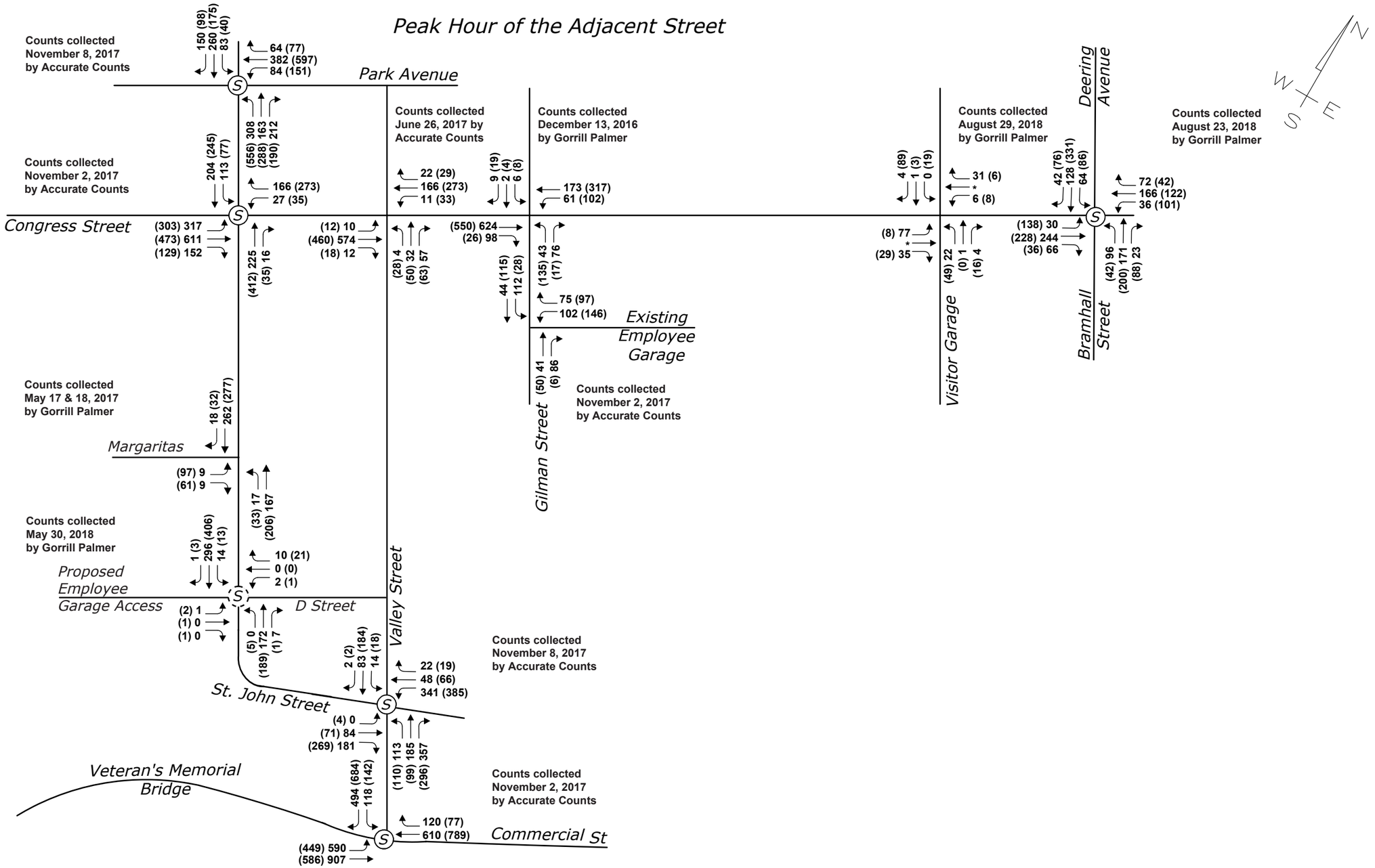

Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

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Draft: Date: OCT 2018
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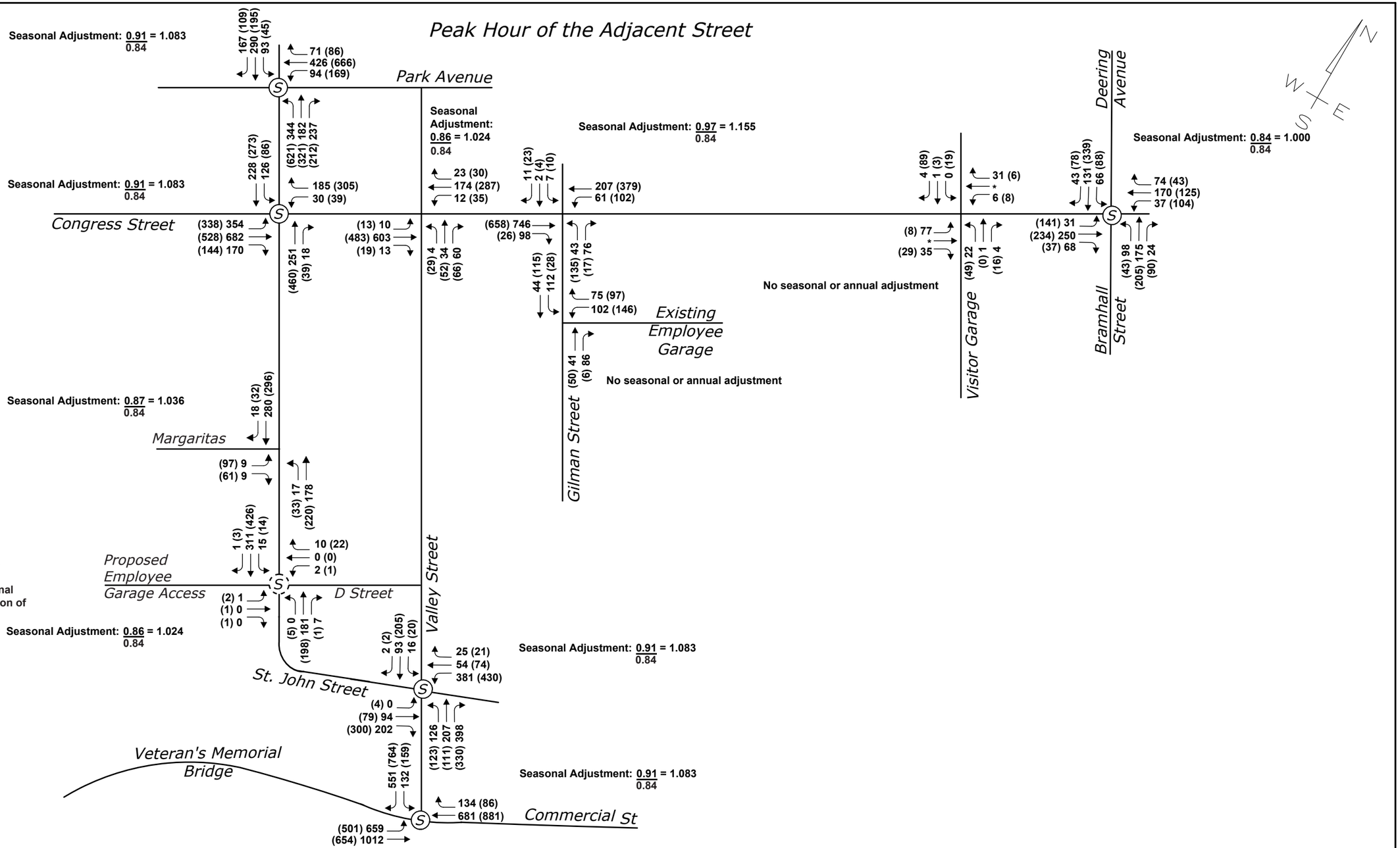
2023 Adjusted Volumes

Figure No. 3



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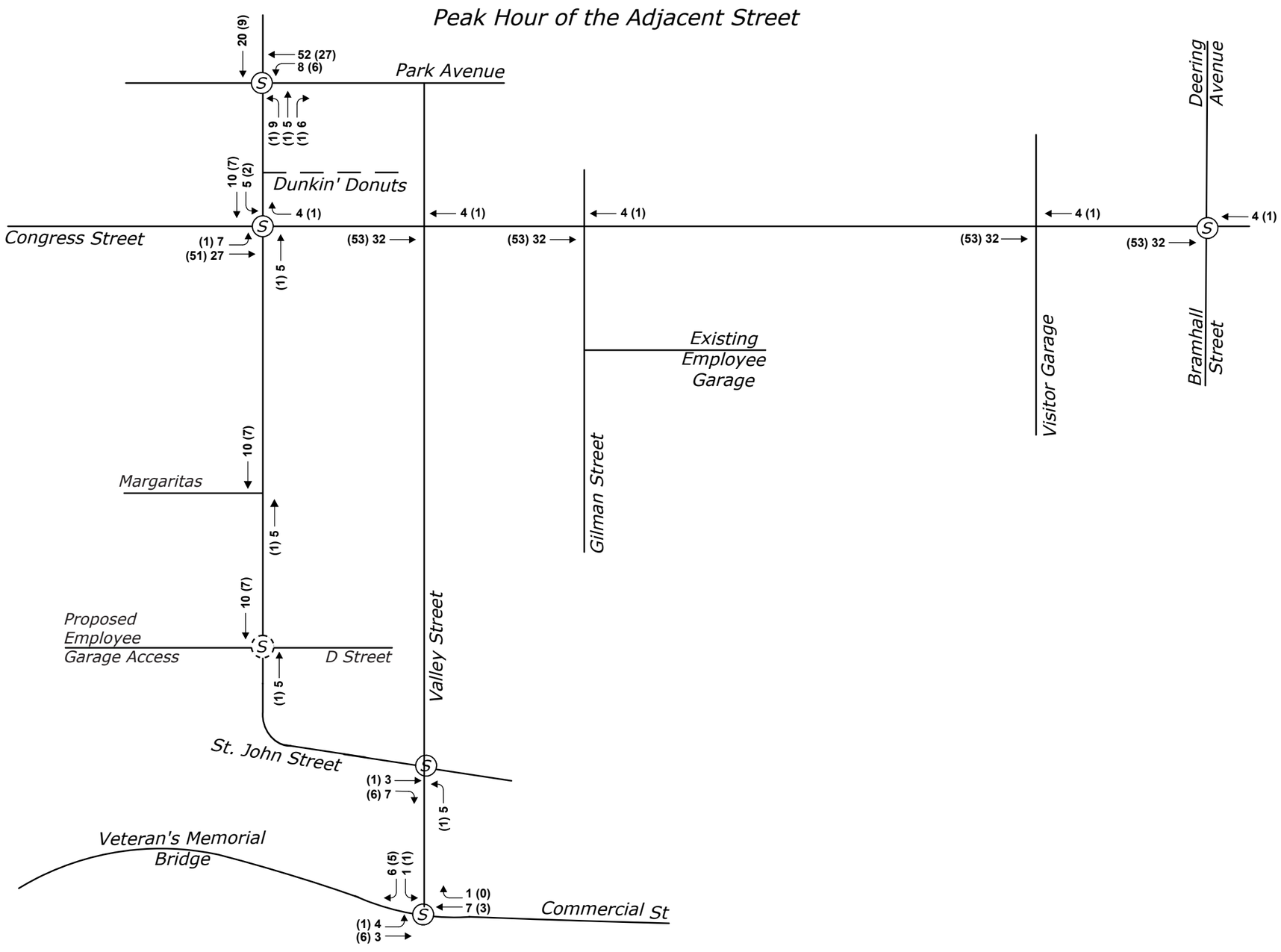
Other Development

Figure No. 4



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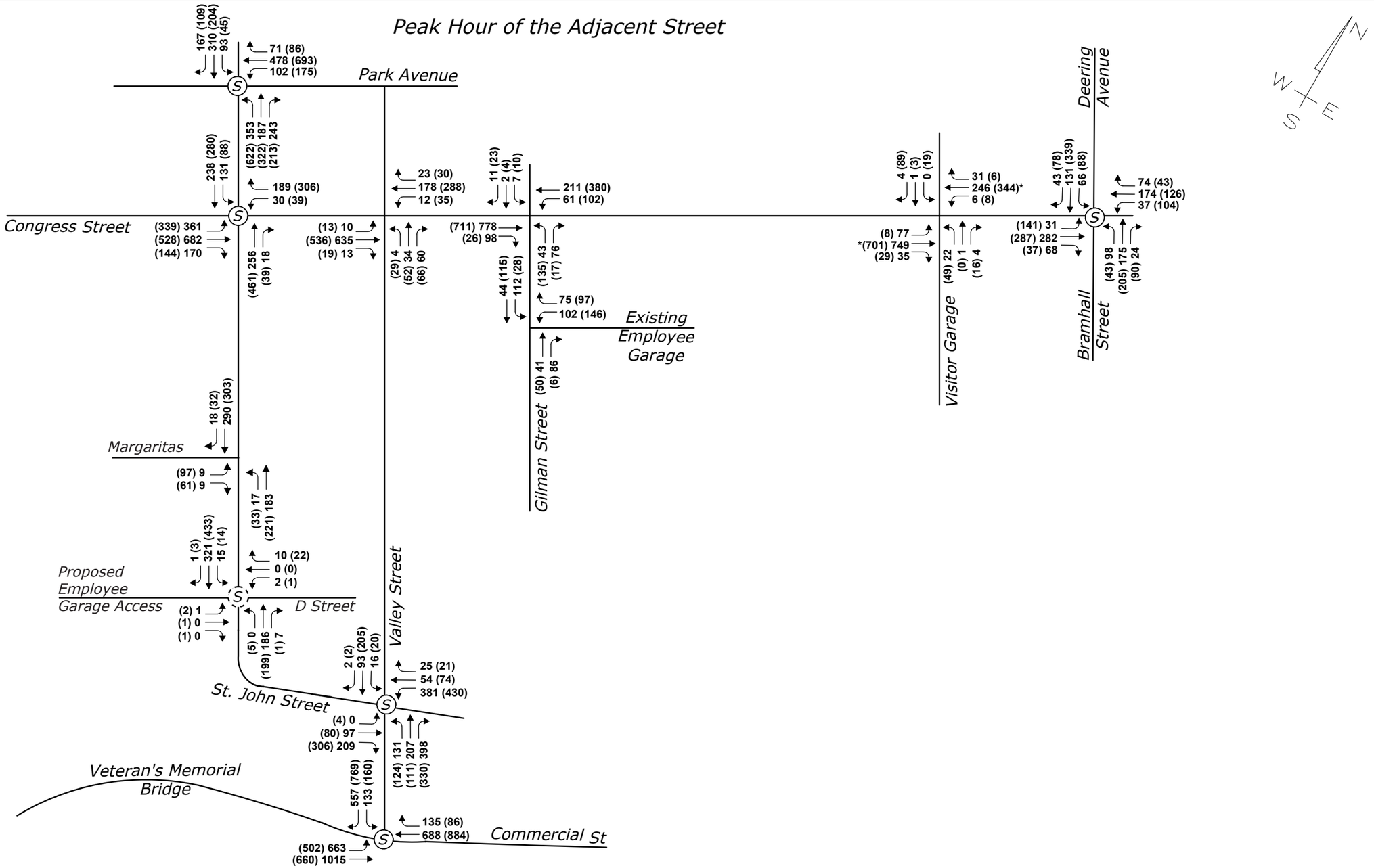
2023 Predevelopment

Figure No. 5



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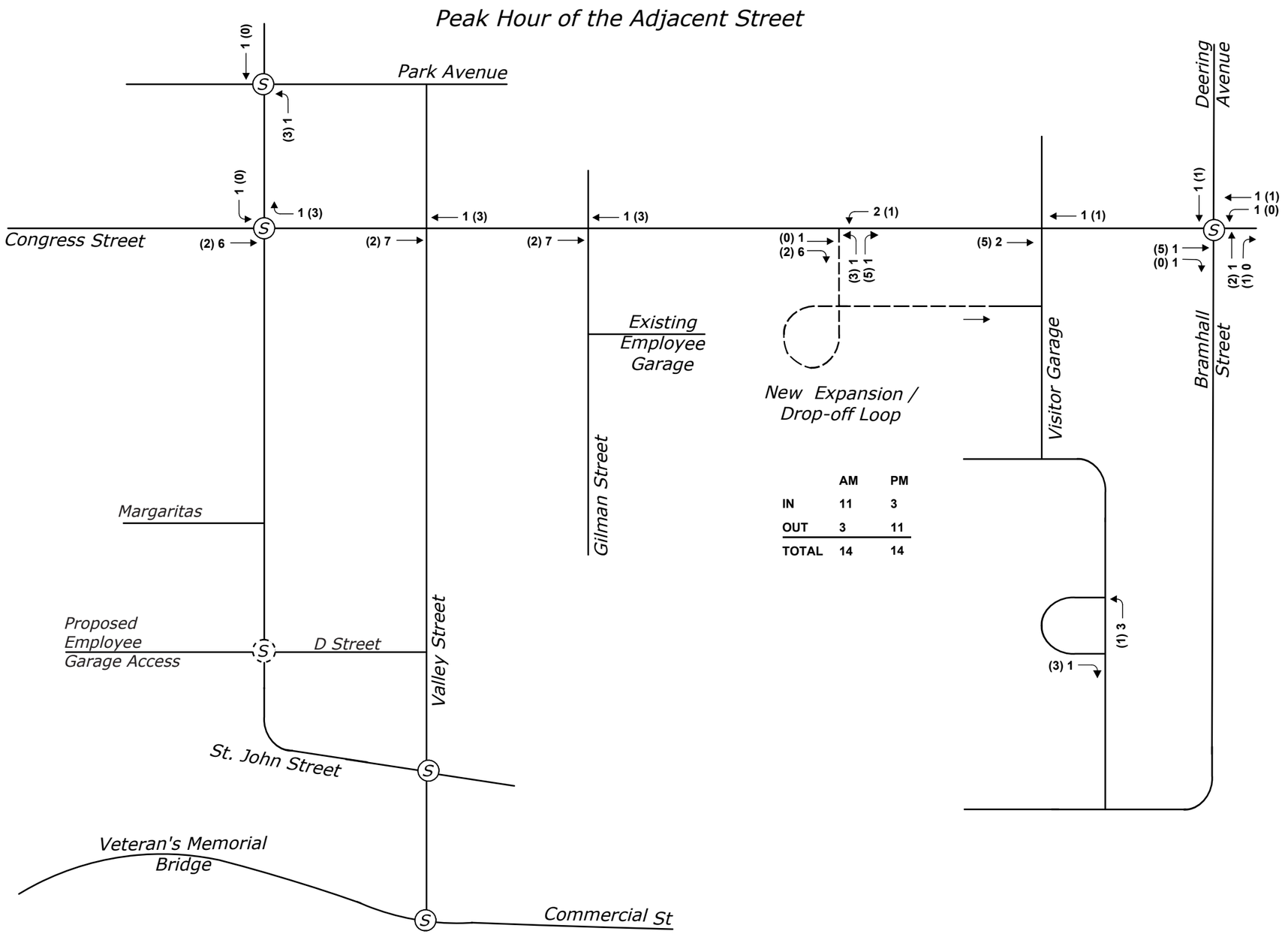
Phase 3 Patient/Visitor Assignment

Figure No. 6



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Date: OCT 2018
File Name: 2866.01 - Revised

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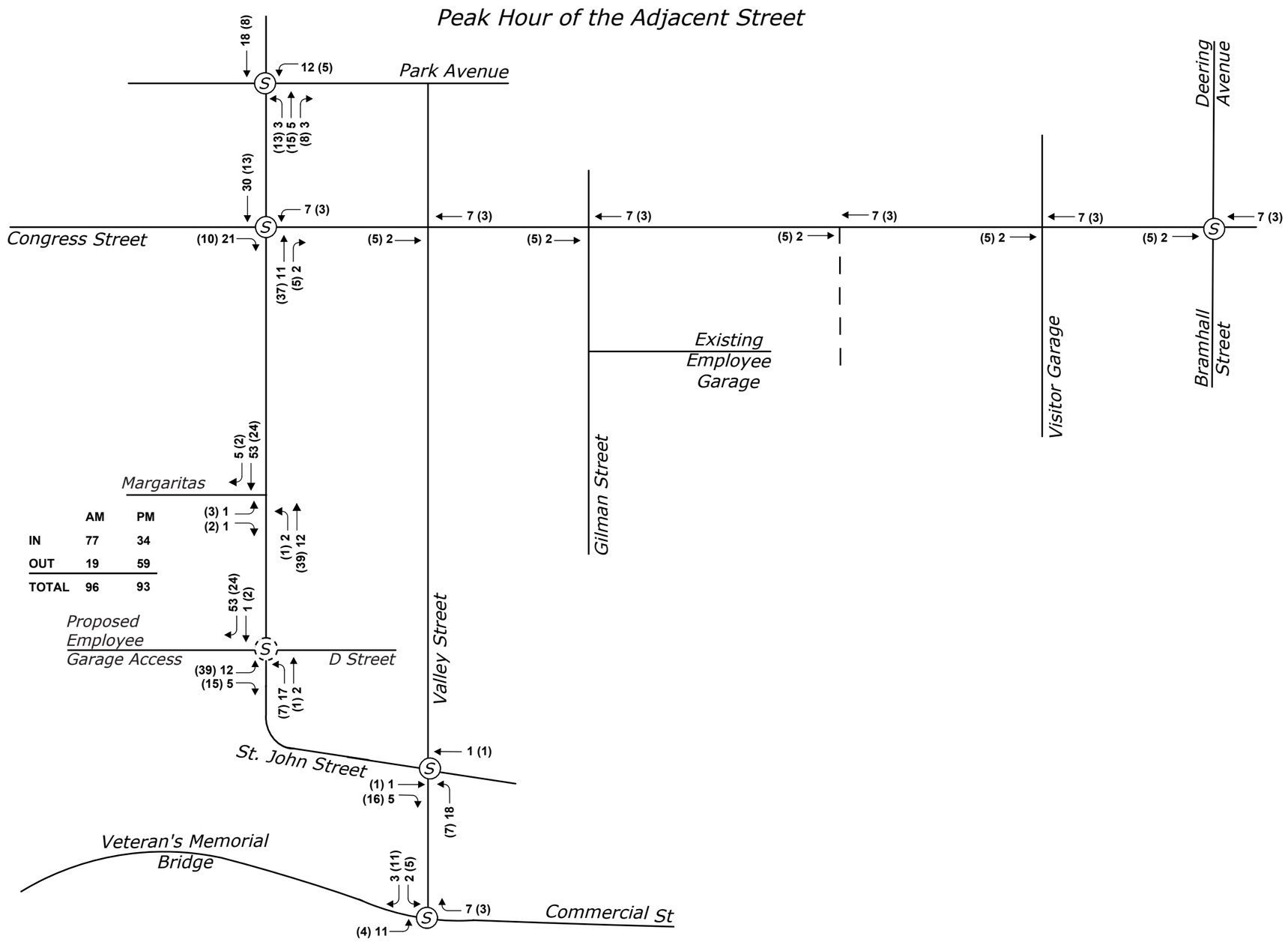
Phase 3 Employee Trip Assignment

Figure No. 7



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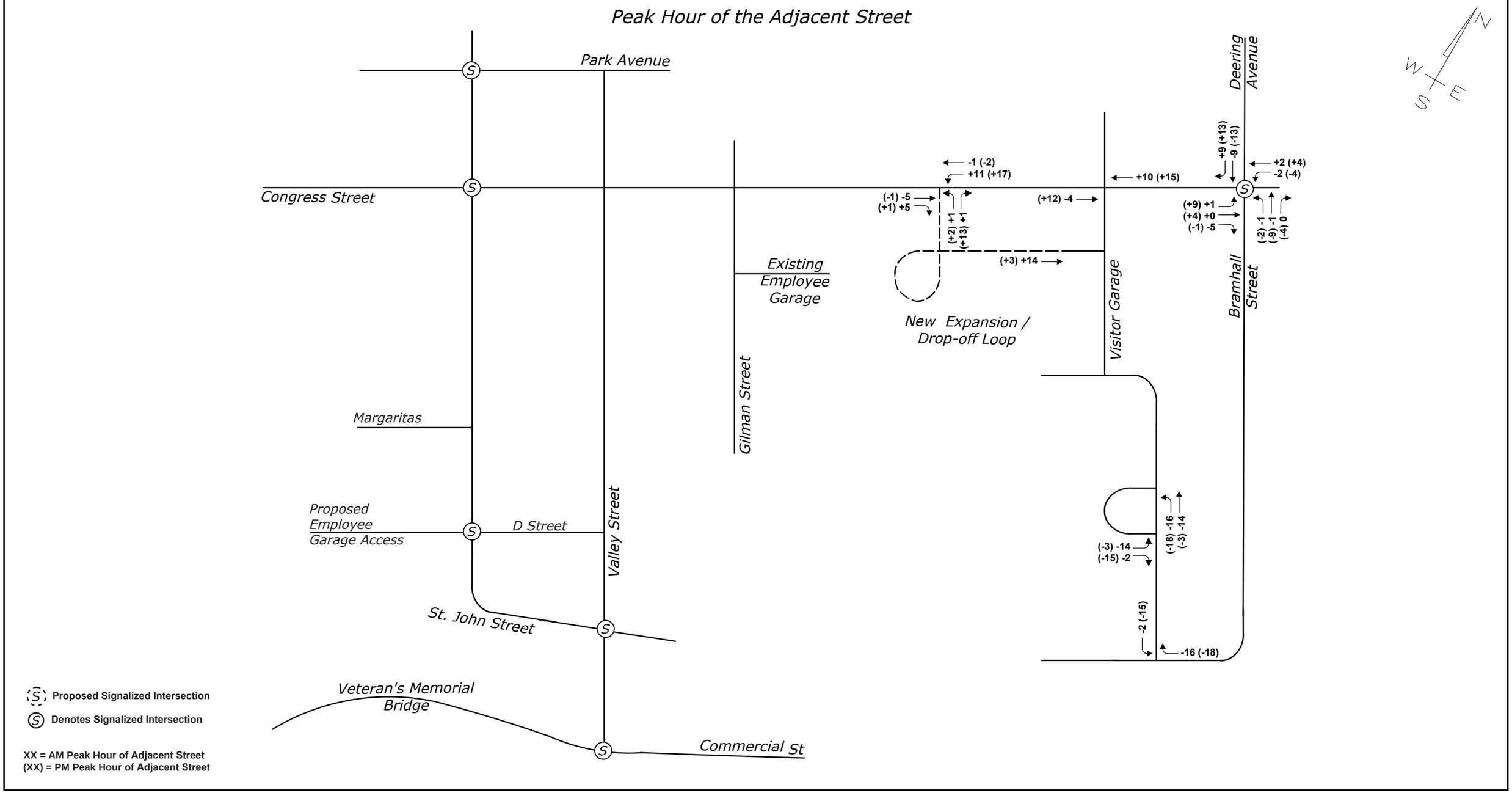
Phase 3 Drop Off Reassignment

Figure No. 8



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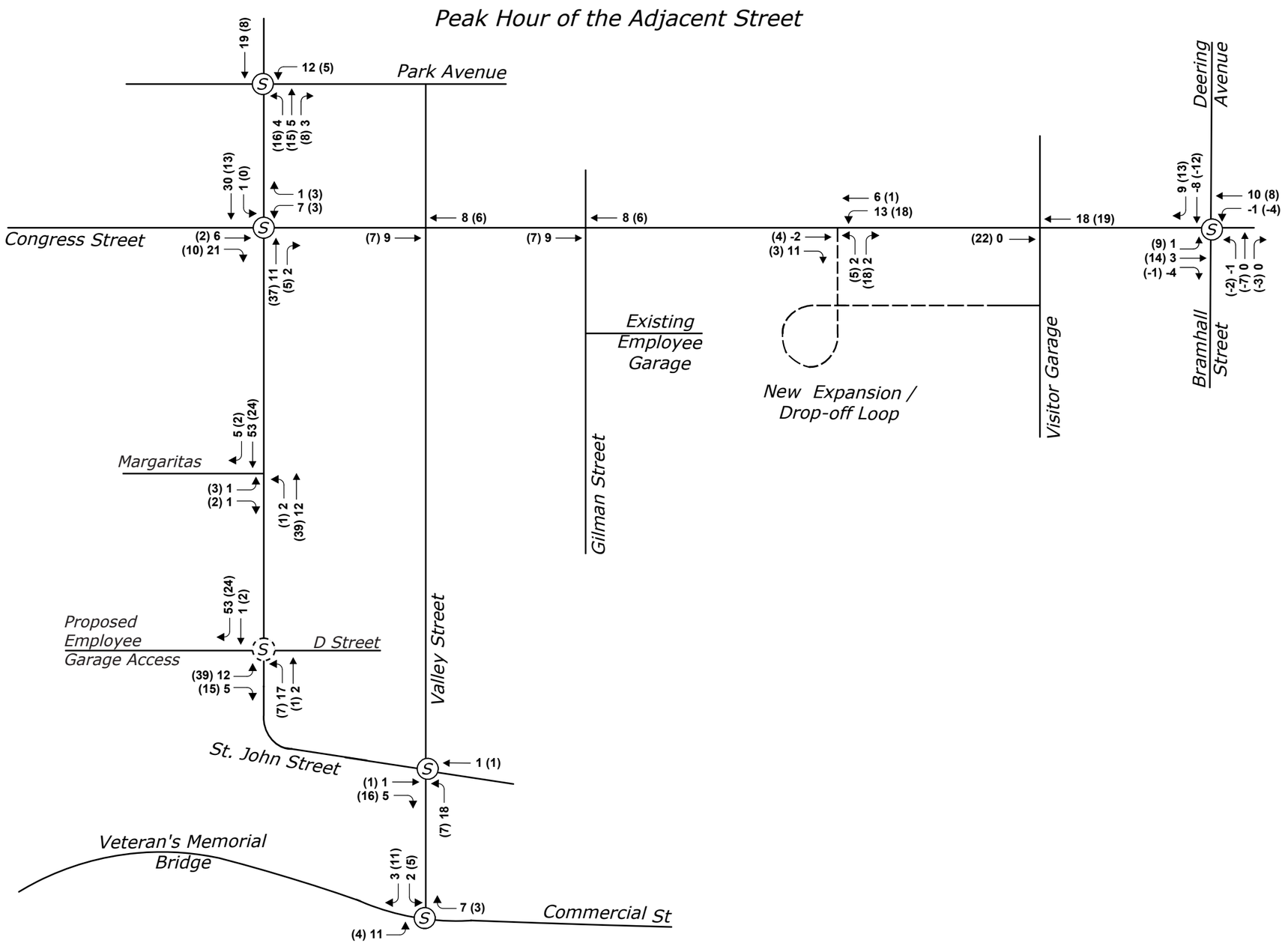

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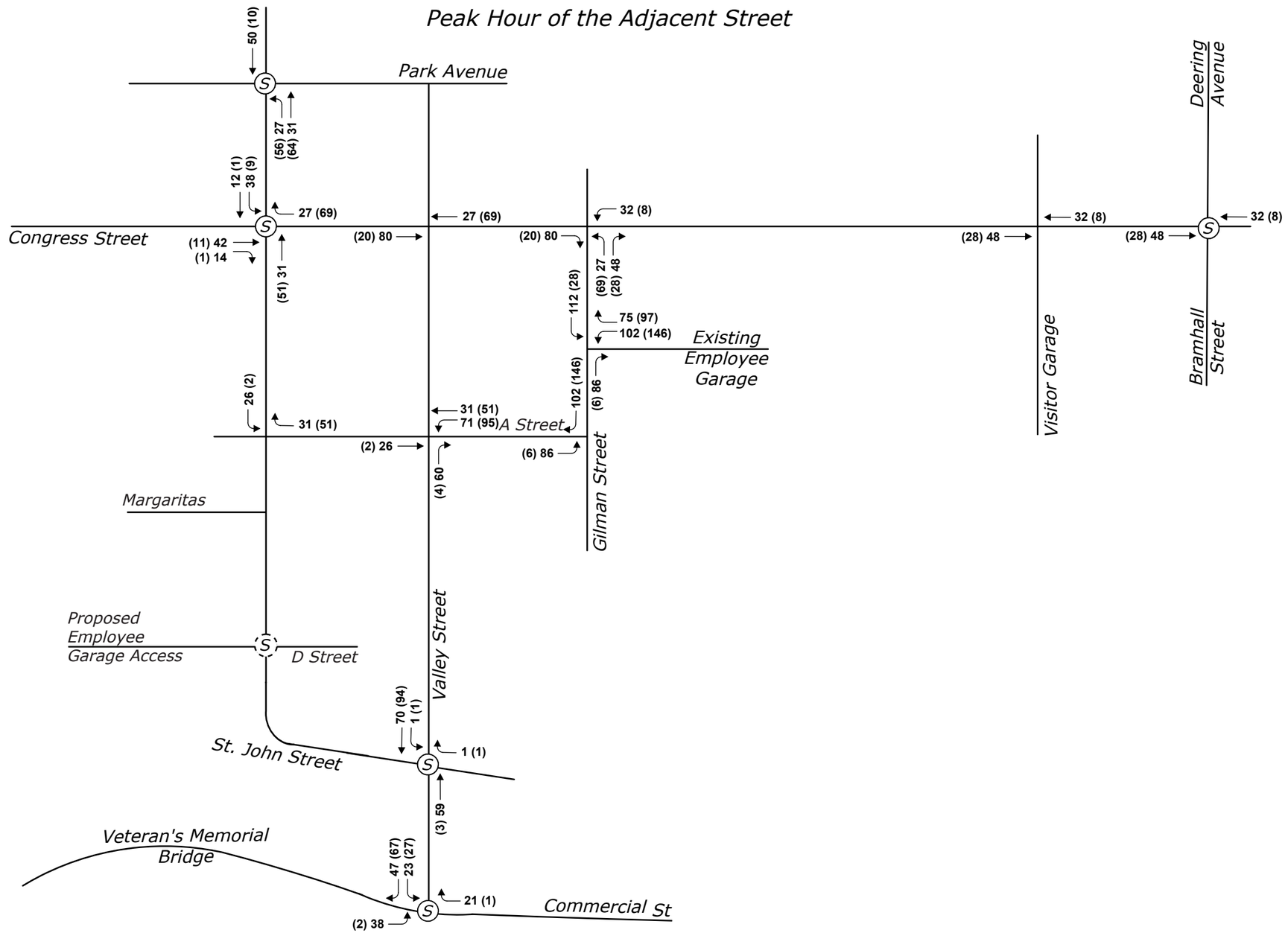
Existing Employee Garage Assignment

Figure No. 10



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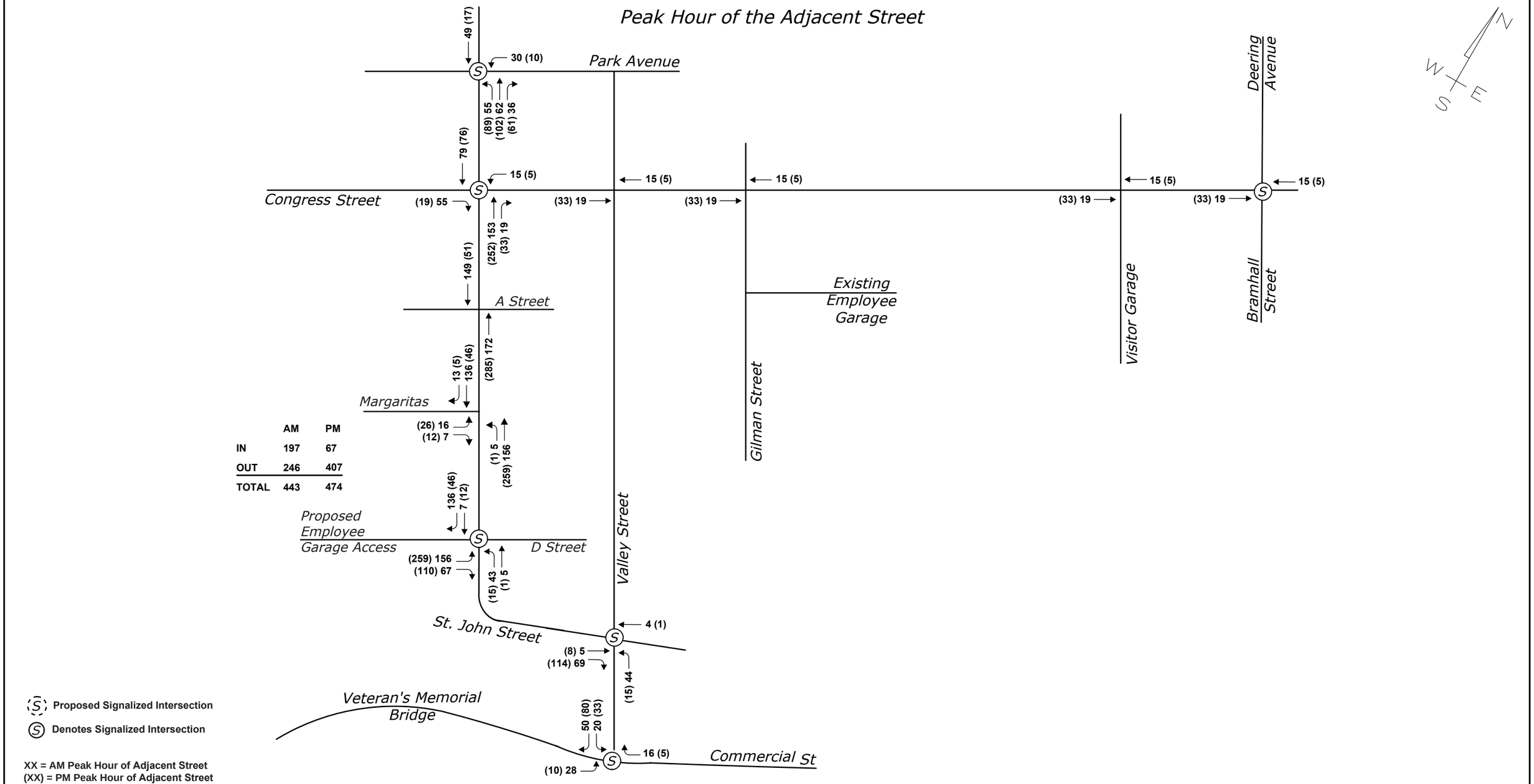
Proposed Garage Reassignment

Figure No. 11



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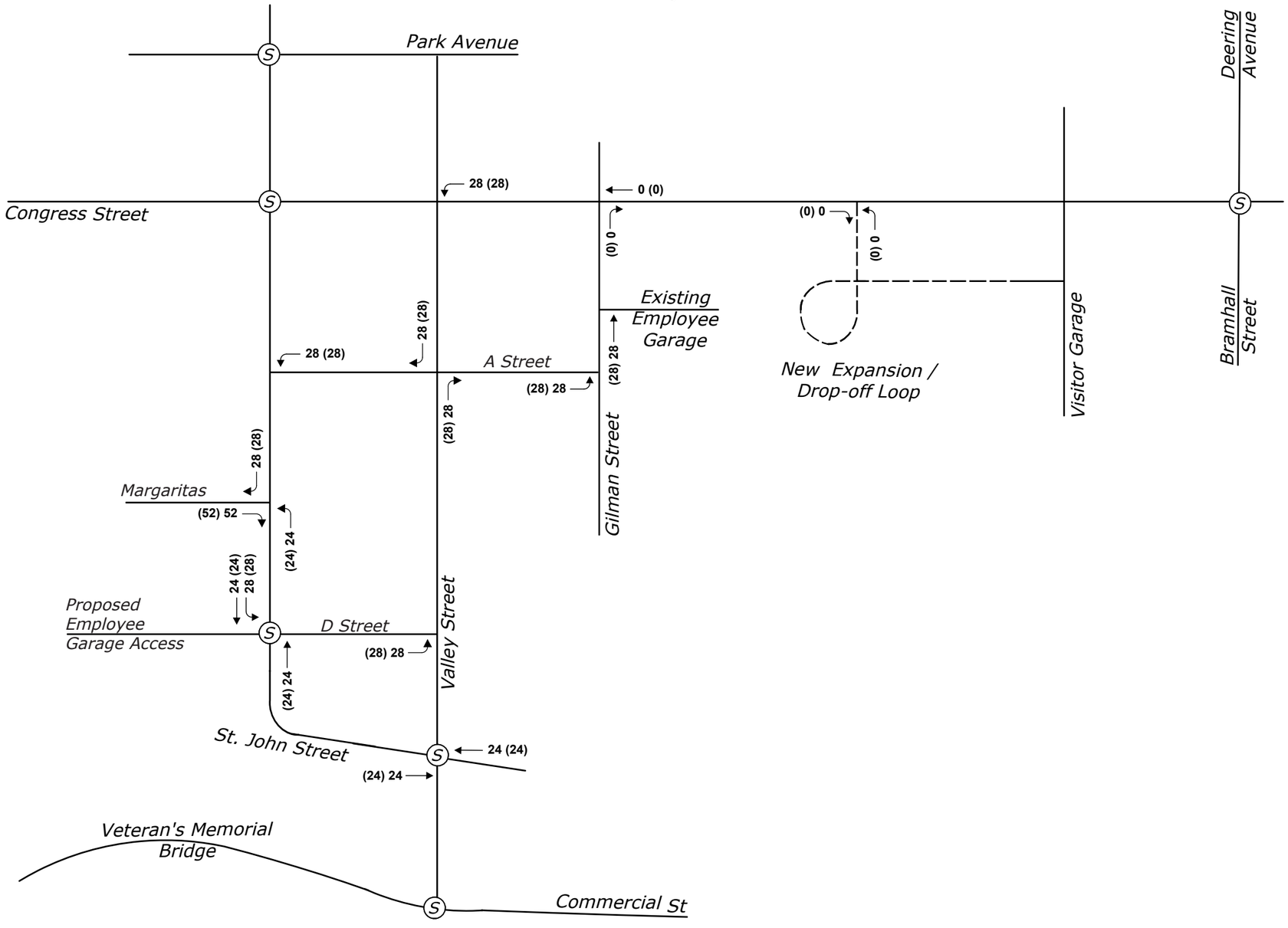
Shuttle Assignment

Figure No. 12

Peak Hour of the Adjacent Street



Bramhall St. - 22; MMC Congress Street Building
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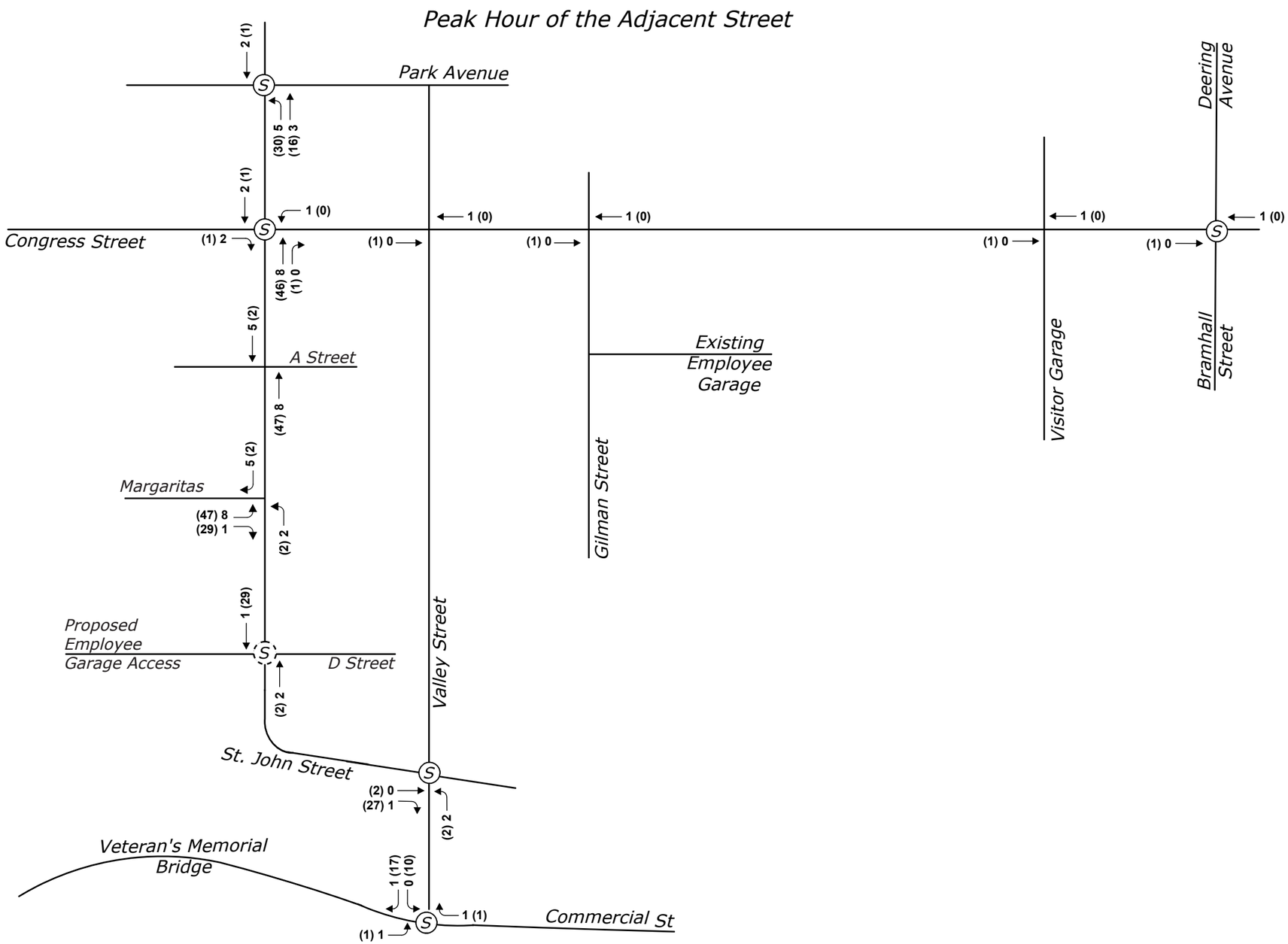
222 St. John Existing MMC Traffic

Figure No. 13



Bramhall St. - 22; MMC Congress Street Building
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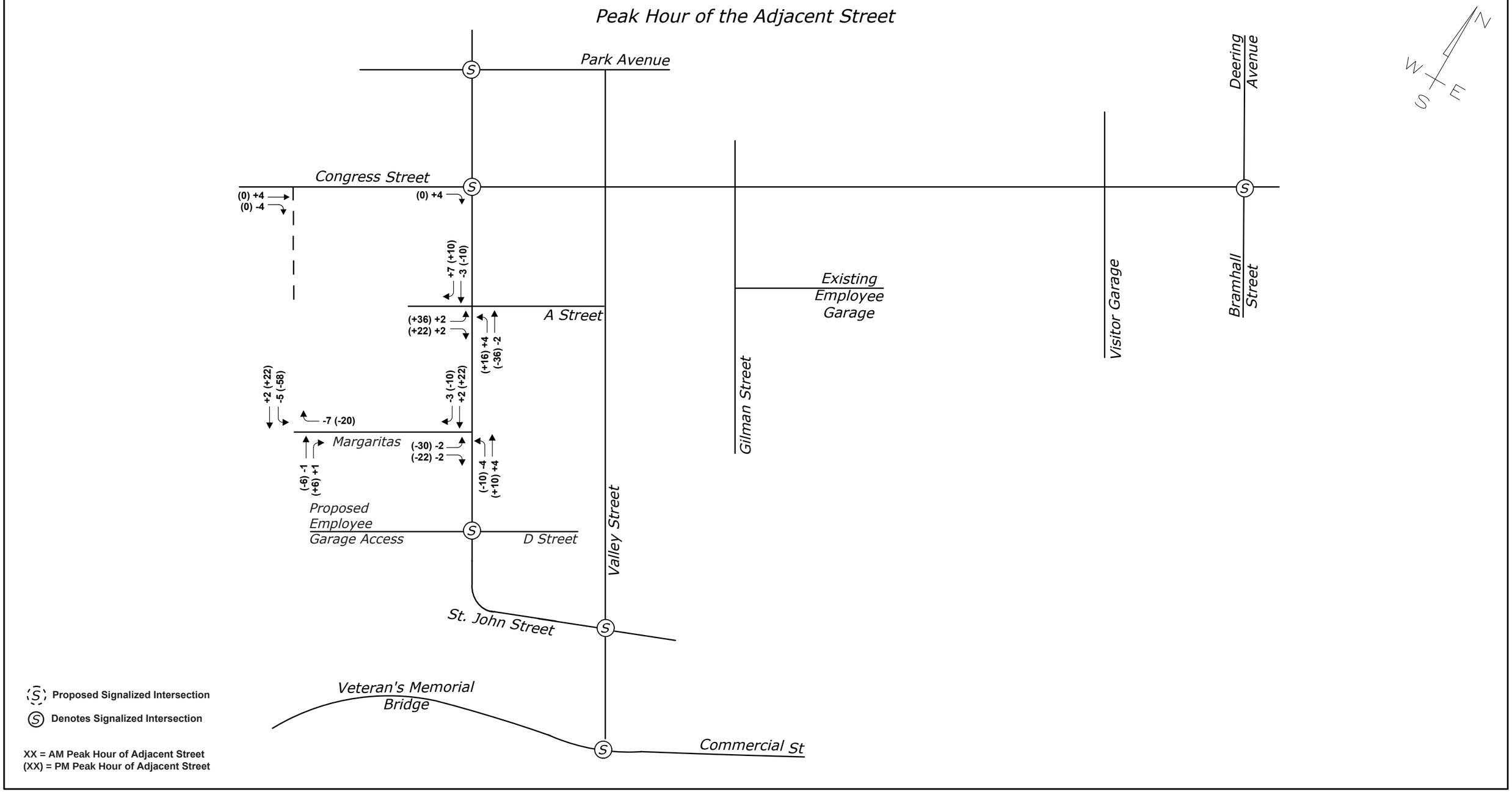
222 St. John Cut-Through (Non-MMC)

Figure No. 14



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Scale: NONE
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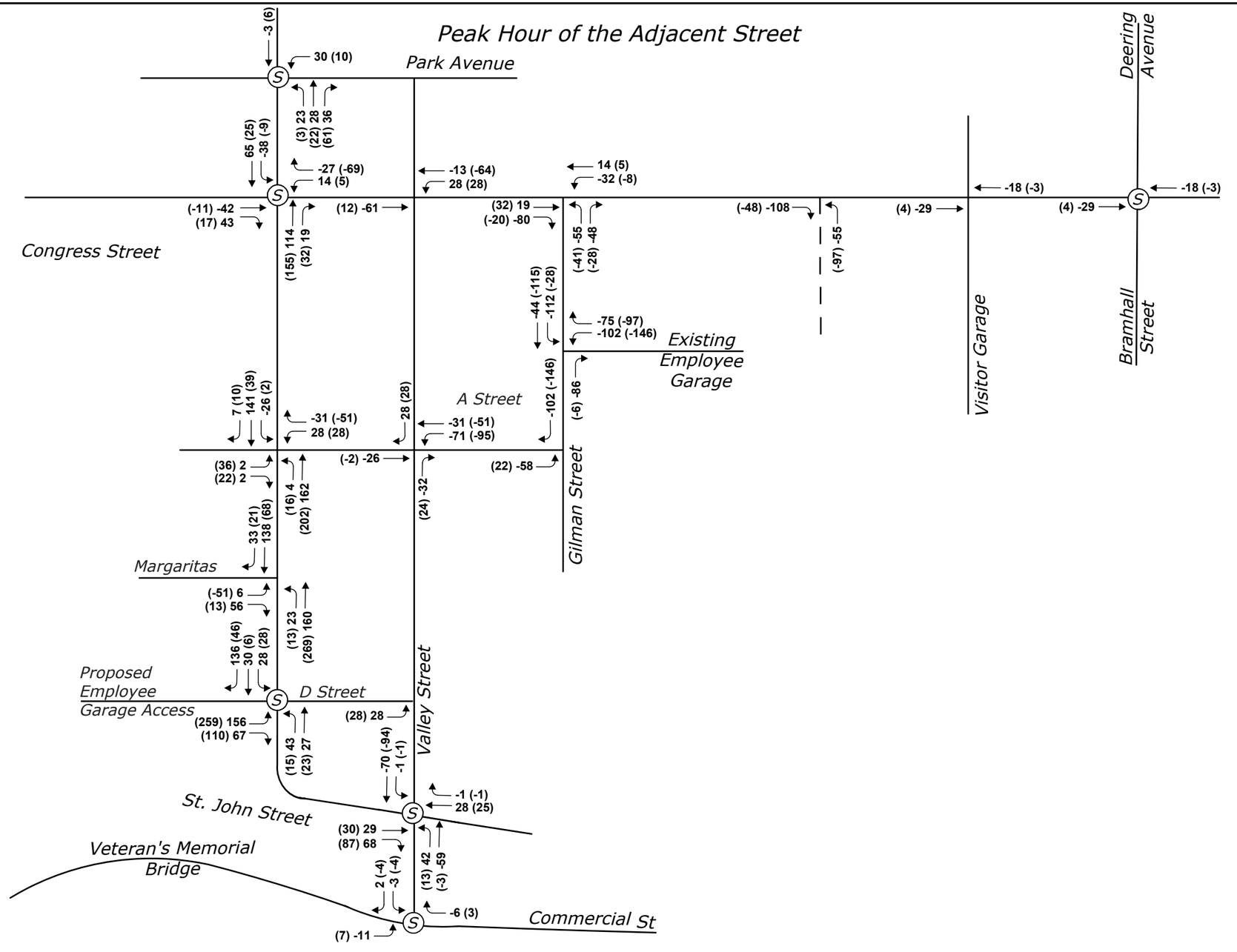
Net Impact Due to Proposed Employee Garage

Figure No. 15



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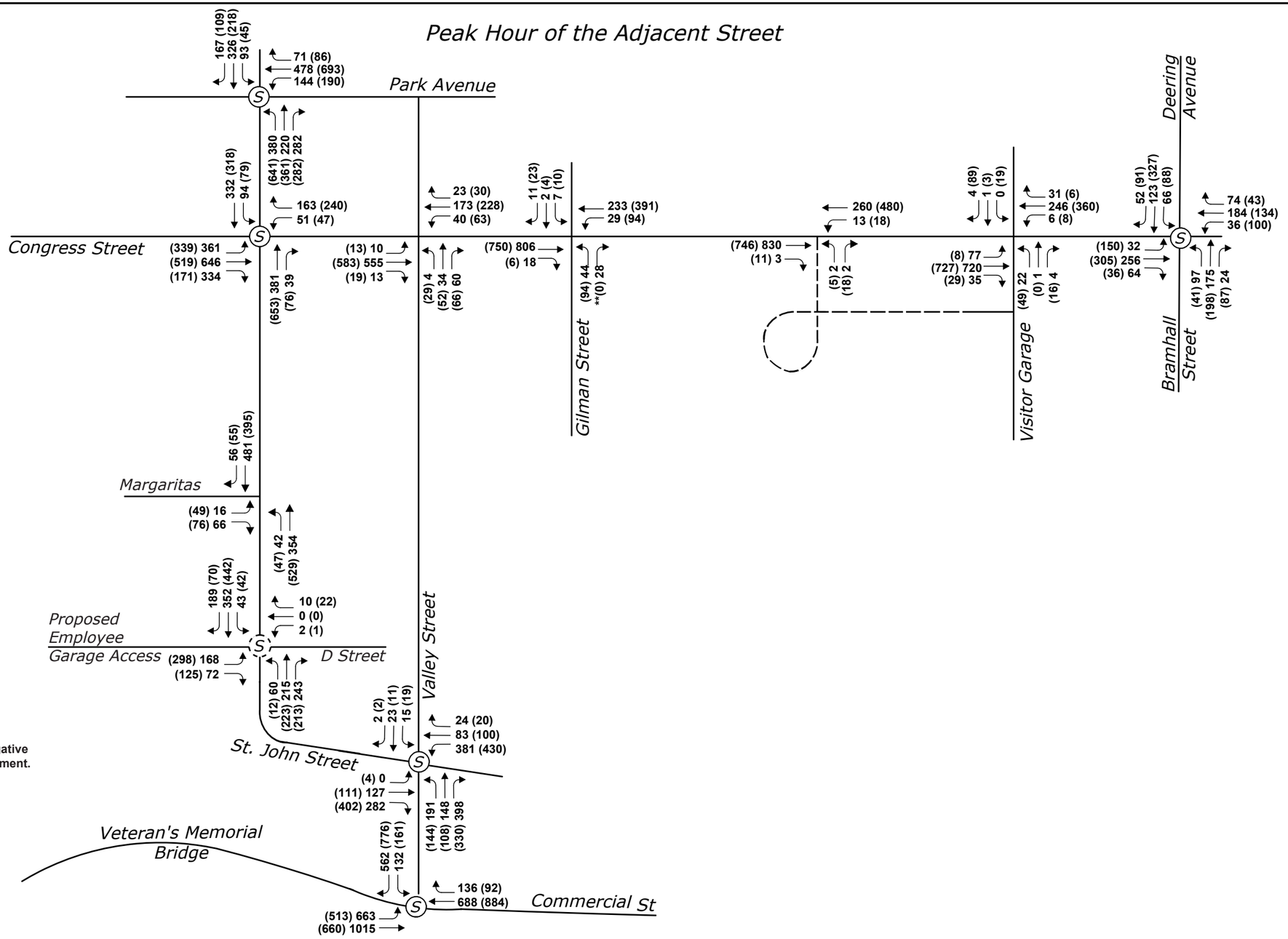

** Post development volumes forecast to be negative during the PM peak hour based on trip re-assignment.

* Through volumes based on volumes at adjacent intersections.

(S) Proposed Signalized Intersection

(S) Denotes Signalized Intersection

XX = AM Peak Hour of Adjacent Street
(XX) = PM Peak Hour of Adjacent Street

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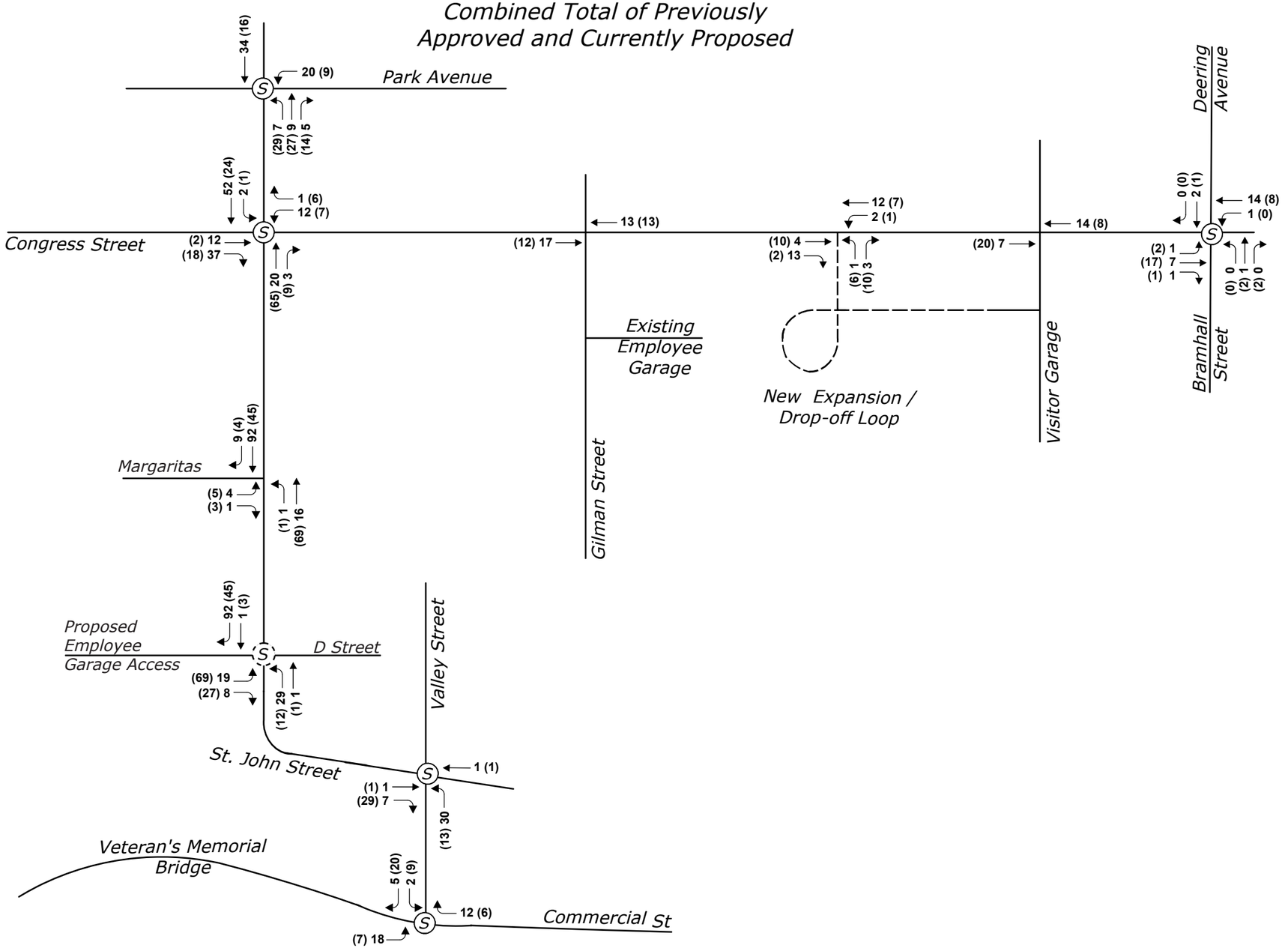
Study Area

Figure No. 17



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Design: EAL Scale: NONE
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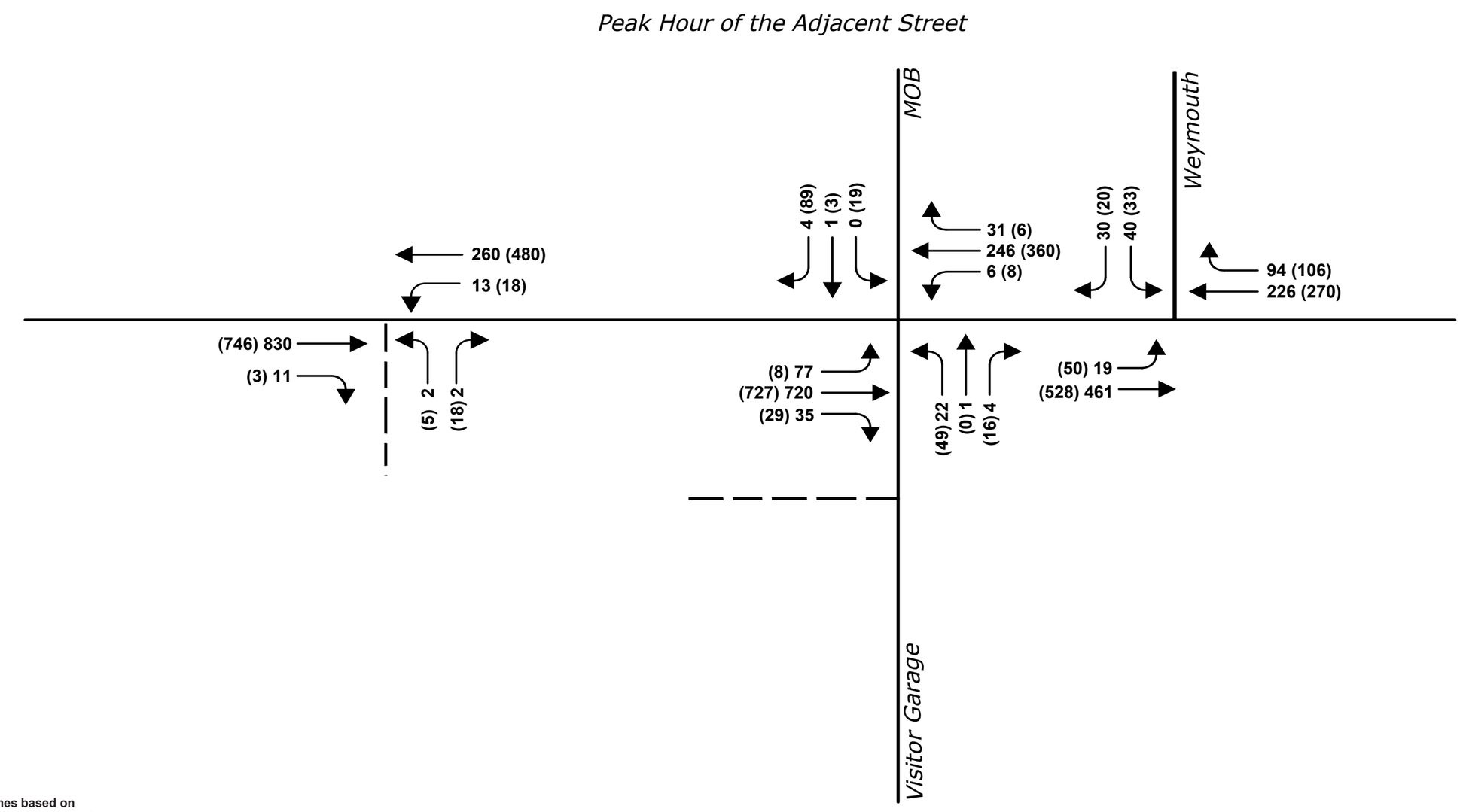
Peak Hour of the Adjacent Street



* Through volumes based on volumes at adjacent intersections.

(S) Proposed Signalized Intersection

(S) Denotes Signalized Intersection

XX = AM Peak Hour of Adjacent Street
(XX) = PM Peak Hour of Adjacent Street

Bramhall St. - 22; MMC Congress Street Building
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LEGEND

Bramhall Employees	1 mile	Travelshed
<1 mile	3 miles	295 North
1-3 miles	5 miles	35 - 302 - 117 North
3-5 miles	10 miles	95 North
5-10 miles	20 miles	95 South
10-20 miles	30 miles	Ferries
20-30 miles	40 miles	Peninsular Surface Streets
30-40 miles	50 miles	Rt 25 - Brighton Ave
40-50 miles		South Portland Surface Streets
>50 miles		Maine Medical Center

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Bramhall Employee Address Locations and Travelsheds
Maine Medical Center

vhb

0 2.5 5 Miles

Attachment 7B

Trip Generation Calculations
May 2013 Traffic Impact Study

JN:	2866.01	Gorrill Palmer
Project Description:	Maine Medical Center Phase 3	707 Sable Oaks Drive
Project Location:	Portland, ME	Suite 30
Date:	08/14/18	South Portland, Maine 04106

Hospital
Land Use Code (LUC) 610

Employees 324

Fitted Curve:

Time Period	ITE Trip Rate	Trip Ends	Directional Split*		Directional Distribution		Sample Size/R2
			IN	OUT	IN	OUT	
Weekday	T =4.40 (X) + 711.46	2137	50%	50%	1069	1068	19/.77
AM Peak Adjacent Street	T =0.32 (X) + 35.15	139	80%	20%	111	28	9/.77
PM Peak Adjacent Street	T =0.28 (X) + 75.75	166	35%	65%	58	108	8/.69
AM Peak of Generator	T = 0.33 (X) +66.57	173	65%	35%	112	61	8/.83
PM Peak of Generator	T = 0..36 (X) + 97.41	214	40%	60%	86	128	15/.73
Saturday	T = 2.95 (X)+ 691.43	1647	50%	50%	824	823	15/.84
Saturday Peak of Generator	Not given	-	55%	45%	-	-	4

* Percentages rounded to nearest 5%

Average Rate:

Time Period	ITE Trip Rate	Trip Ends	Directional Split*		Directional Distribution		Sample Size
			IN	OUT	IN	OUT	
Weekday	**T = 5.2 (X)**	**1685**	**50%**	**50%**	**843**	**842**	**19**
AM Peak Adjacent Street	**T = 0.34 (X)**	**110**	**80%**	**20%**	**88**	**22**	**9**
PM Peak Adjacent Street	**T = 0.33 (X)**	**107**	**35%**	**65%**	**37**	**70**	**8**
AM Peak of Generator	**T = 0.39 (X)**	**126**	**65%**	**35%**	**82**	**44**	**8**
PM Peak of Generator	**T = 0.47 (X)**	**152**	**40%**	**60%**	**61**	**91**	**15**
Saturday	**T = 3.78 (X)**	**1225**	**50%**	**50%**	**613**	**612**	**15**
Saturday Peak of Generator	**T = 0.53 (X)**	**172**	**55%**	**45%**	**95**	**77**	**4**

* Percentages rounded to nearest 5%

Attachment E 1

Traffic Impact Study; Parking Study and Transportation Demand Management Plan
Proposed Bean 2 Roof Addition
Maine Medical Center - Bramhall Campus
Portland, Maine

Prepared for:

Maine Medical Center
22 Bramhall Street
Portland, Maine 04102

May 2013

Prepared by:

Gorrill-Palmer Consulting Engineers, Inc.

Engineering Excellence Since 1998

PO Box 1237
15 Shaker Road
Gray, ME 04039

(207) 657-6910
Fax: (207) 657-6912
E-mail: mailbox@gorrillpalmer.com

E.2

Traffic Impact, Parking Study and Transportation Demand Management Plan
Bean 2 Roof Addition
Maine Medical Center Bramhall Campus
Portland, Maine

Index

Section	*Description*	*Page*
	Executive Summary	1
I.	Existing and Proposed Site	2
II.	Background Traffic Conditions	2-3
III.	Trip Generation	3
IV.	Crash Data	7-8
V.	Parking Evaluation	8
VI.	Transportation Demand Management Plan	9

Appendix

Maine DOT Crash Data
Trip Generation Calculations

E.3

Executive Summary

The following Executive Summary is prepared for the reader's convenience, but is not intended to be a substitute for reading the full report.

Gorrill-Palmer Consulting Engineers, Inc. was retained by Maine Medical Center (MMC) to prepare this traffic and parking assessment as well as a Transportation Demand Management Plan Review for the proposed addition to the Bean 2 building at their Bramhall campus in Portland, Maine. Proposed for the site is a 18,758 square foot addition on top of the Bean 2 building. A total of 49 staff will be added as a result of the project. Based on MMC records, a total of 184 staff have been added since the previous expansion of the Bramhall campus. The additional parking demand for the 49 employees is forecast to be 41 spaces and MMC plans to accommodate them at their parking facilities at 887 Congress Street and at 995 Congress Street.

Based on this study, our office has determined the following:

1. The proposed development is forecast to generate 28 and 30 trip ends in the weekday AM and PM peak hours respectively. The increase since the previous project is estimated to be 77 and 84 trip ends in the weekday AM and PM peak hours respectively (Note: A trip end is either a trip in or out of the site. Thus a round trip would equal two trip ends). At this level of trip generation, this project does not require a traffic permit from the Maine Department of Transportation.

2. Gorrill-Palmer Consulting Engineers, Inc. referenced the Maine DOT collision records to determine that are five high crash locations in the vicinity of the project.

3. Gorrill-Palmer Consulting Engineers, Inc. estimates that the additional 49 employees will generate a demand for 41 parking spaces. It is our understanding from MMC that this additional demand can be accommodated at 887 Congress Street and at 995 Congress Street.

4. Maine Medical Center has a comprehensive Demand Management Plan for their Bramhall campus which supports the City's transportation and environmental sustainability goals by encouraging and promoting bicycling, walking, and use of transit. MMC is planning to add two additional bike racks which will accommodate up to 36 bikes as well as a parking space for a U-Share car on the Bramhall campus.

Based on these findings, it is the opinion of Gorrill-Palmer Consulting Engineers, Inc. that the proposed project can be accommodated by the City's transportation system.

E.4

I. *Existing and Proposed Site*

The proposed project consists of an addition to the top of the existing Bean 2 building at Maine Medical Center's (MMC) Bramhall campus in Portland, Maine.

Proposed for the site is a 18,758 sf addition which is forecast by MMC to add 49 employees. MMC estimates that they have added approximately 184 employees since the last major addition to the Bramhall Campus.

II. *Background Conditions*

Gorrill-Palmer Consulting Engineers, Inc. based the study on the following information:

- A site plan, Sheet A01-01 prepared by Perkins + Will dated April 3, 2013.
- Crash data for 2009-2011 provided by the Maine Department of Transportation.

III. *Trip Generation*

Gorrill-Palmer Consulting Engineers, Inc. used the Institute of Transportation Engineers (ITE) publication *Trip Generation*, 7th Edition, to estimate the potential trip generation for the proposed expansion. Based on MMC records, a total of 184 staff have been added since the previous expansion of the Bramhall campus. With the planned staff addition of 49 employees associated with this project, the total additional staff is 233 since the previous expansion resulting in a total staff level of 4,804 following the expansion. Based on Land Use Code (LUC) 610, Hospital, Gorrill-Palmer Consulting Engineers, Inc. has estimated the difference in trip ends using the prior employee level of 4,571 and the post development level of 4804 (Note a trip end is either a trip in or out of the site; thus one round trip is equal to two trip ends):

AM Peak Hour of MMC	77 trip ends
PM Peak Hour of MMC	84 trip ends

Maine Medical received a traffic movement permit for their previous expansion. The level of forecast traffic increase associated with the employee increase since that time does not require a traffic movement permit from the MaineDOT since the peak hour traffic increase is less than 100 trip ends.

IV. *Crash Data*

In order to evaluate whether a location has a crash problem, Maine DOT uses two criteria to define High Crash Locations (HCL). Both criteria must be met in order to be classified as an HCL.

E. 5

1. A critical rate factor of 1.00 or more for a three-year period. (A Critical Rate Factor (CRF) compares the actual accident rate to the rate for similar intersections in the State. A CRF of less than 1.00 indicates a rate less than average) and:

2. A minimum of 8 crashes over a three-year period.

Our office reviewed the 2009-2011 crash data in this area and has summarized the high crash locations or areas which are close to meeting that definition below:

Intersections with Significant Collision History

Location	No. of Collisions	Critical Rate Factor
Congress/Gilman	10	1.89
Bramhall/Congress/Deering	17	0.64
Congress/Valley	28	1.31
Congress/St. John	24	0.75

Roadway Segment with Significant Collision History

Location	No. of Collisions	Critical Rate Factor
Congress between Ellsworth and Weymouth	10	1.52
Congress between Weymouth and Forest St	10	1.50
St. John between C St and A St	11	2.68

This information shows that there are five high crash locations in the vicinity of the site. The MaineDOT furnished the collision reports for these locations and our office is preparing the collision diagrams which will be furnished to the City upon completion.

A copy of the collision history is included in the appendix.

V. *Parking Demand*

Gorrill-Palmer Consulting Engineers, Inc. used the Institute of Transportation Engineers (ITE) publication *Parking Generation*, 3rd Edition, to estimate the potential parking demand for the proposed expansion. Land Use Code 610, Hospital, estimates an average demand of 0.83 spaces per employee. Based on the estimated 49 employees to be added with the planned addition, the project will create a demand for 41 additional parking spaces. It is our understanding from MMC that this additional demand can be accommodated at 887 Cougress Street and at 995 Congress Street.

It is our understanding from John Peverada of the City's parking department staff that, they have done periodic checking of MMC's parking garages at the corner of Gilman Road and Congress Street and has seen vacancies. He also observed that the parking meeting on the Eastern Promenade were underutilized.

Attachment 7C

Capacity and Queuing Analysis Results

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	6947	6977	6925	6869	6923	6930
Vehs Exited	6842	6910	6872	6820	6913	6872
Starting Vehs	232	227	223	203	228	215
Ending Vehs	337	294	276	252	238	278
Denied Entry Before	4	4	0	2	10	2
Denied Entry After	1	1	0	1	1	0
Travel Distance (mi)	5039	5044	5012	4979	5055	5026
Travel Time (hr)	288.9	279.2	270.3	260.6	263.2	272.4
Total Delay (hr)	107.6	97.5	89.6	82.0	81.0	91.5
Total Stops	8886	8728	8375	8046	8138	8433
Fuel Used (gal)	188.6	187.1	183.0	181.5	183.0	184.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	6947	6977	6925	6869	6923	6930
Vehs Exited	6842	6910	6872	6820	6913	6872
Starting Vehs	232	227	223	203	228	215
Ending Vehs	337	294	276	252	238	278
Denied Entry Before	4	4	0	2	10	2
Denied Entry After	1	1	0	1	1	0
Travel Distance (mi)	5039	5044	5012	4979	5055	5026
Travel Time (hr)	288.9	279.2	270.3	260.6	263.2	272.4
Total Delay (hr)	107.6	97.5	89.6	82.0	81.0	91.5
Total Stops	8886	8728	8375	8046	8138	8433
Fuel Used (gal)	188.6	187.1	183.0	181.5	183.0	184.6

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	2.1	0.0	0.0	0.1
Total Del/Veh (s)	5.3	1.2	1.6	1.6
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.1	0.0
Total Del/Veh (s)	6.1	4.5	1.9	0.9	1.4
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.8	0.0	2.3	0.9
Total Del/Veh (s)	11.7	17.4	14.4	14.8	14.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.2	0.8	0.0	0.4
Total Del/Veh (s)	15.9	10.9	28.9	22.2	18.3
Denied Entry Before	1	0	0	0	1
Denied Entry After	0	0	0	0	0

9: Valley Street & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.2
Total Del/Veh (s)	1.9	0.6	10.7	2.3
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.4	0.4	0.0	0.3
Total Del/Veh (s)	66.9	18.6	11.3	42.8
Denied Entry Before	1	0	0	1
Denied Entry After	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.1	0.0	0.9	0.6
Total Del/Veh (s)	28.7	20.8	69.7	37.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.0	0.2	0.1	0.3
Total Del/Veh (s)	1.7	3.2	18.7	8.6	3.7
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

29: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.9	2.3	2.9	1.2
Total Del/Veh (s)	7.8	13.3	13.2	11.7	10.4
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

35: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.8	2.0	18.7	6.3	3.0
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	45.1
Denied Entry Before	2
Denied Entry After	0

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB
Directions Served	L	R	LT
Maximum Queue (ft)	35	30	49
Average Queue (ft)	9	7	6
95th Queue (ft)	32	27	30
Link Distance (ft)	626		678
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	24	35	10	33
Average Queue (ft)	2	12	1	3
95th Queue (ft)	15	36	8	18
Link Distance (ft)	570	495	1618	678
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	123	121	282	61	170	273	62	86
Average Queue (ft)	45	58	142	18	68	150	23	32
95th Queue (ft)	90	100	242	46	132	244	55	68
Link Distance (ft)	1618			1012	268	268	937	
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						1		
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	0	0	0					
Queuing Penalty (veh)	1	0	0					

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	TR	L	T
Maximum Queue (ft)	253	374	313	75	108	111	147	150	202
Average Queue (ft)	114	209	53	27	58	49	64	74	88
95th Queue (ft)	199	335	165	64	97	89	114	133	170
Link Distance (ft)	1767	1767			170	670		794	794
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			290	80			175		
Storage Blk Time (%)		2	0	0	2		0		
Queuing Penalty (veh)		3	0	0	1		0		

Intersection: 9: Valley Street & Congress Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	TR	L	TR	LT	R
Maximum Queue (ft)	24	8	29	8	77	59
Average Queue (ft)	1	0	4	0	25	29
95th Queue (ft)	10	4	19	4	56	55
Link Distance (ft)		170		125	435	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		50			170
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	480	530	1285	1237	214	215	97	120	142	146
Average Queue (ft)	391	454	640	511	131	122	39	64	71	71
95th Queue (ft)	629	637	1521	1418	188	187	79	105	115	116
Link Distance (ft)			2719	2719	1454	1454		268	268	268
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	9	52	4							
Queuing Penalty (veh)	45	262	25							

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	158	228	281	195	349	135	772	80
Average Queue (ft)	58	116	144	96	156	92	393	65
95th Queue (ft)	123	199	221	157	274	162	740	105
Link Distance (ft)			1678	794	794		2253	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95				110		55
Storage Blk Time (%)	2	7	24		17	0	58	7
Queuing Penalty (veh)	6	22	83		41	1	97	27

Intersection: 24: Gilman Street & Congress Street

Movement	EB	WB	WB	NB	SB
Directions Served	TR	L	T	LTR	LTR
Maximum Queue (ft)	70	73	34	129	46
Average Queue (ft)	8	28	1	55	15
95th Queue (ft)	41	62	24	99	42
Link Distance (ft)	125		425	1063	624
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)		65			
Storage Blk Time (%)		1			
Queuing Penalty (veh)		3			

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	58	230	184	90	125	148	144	75
Average Queue (ft)	18	112	47	68	48	67	43	47
95th Queue (ft)	46	187	135	102	98	124	104	81
Link Distance (ft)	965		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			0	10	0	1	4	9
Queuing Penalty (veh)			1	4	0	1	7	6

Intersection: 35: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	184	52	57	30
Average Queue (ft)	28	5	23	5
95th Queue (ft)	99	27	51	23
Link Distance (ft)	425	965	508	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 635

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	34.0	23.0	18.0	34.0	46.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	14.7	16.2	9.7	14.7	27.2
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	6	8	25	6	4
Cycles @ Minimum (%)	1	0	4	1	0
Cycles Maxed Out (%)	0	23	5	0	3
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	15.3	27.2	6.7	8.0	5.0	37.5	21.5
Minimum Green (s)	8.0	8.0	3.0	8.0	5.0	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	13.2	16.1	6.9	8.5	5.7	30.4	20.2
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	NA
Cycles Skipped (%)	7	0	11	4	73	0	0
Cycles @ Minimum (%)	9	30	0	91	25	0	0
Cycles Maxed Out (%)	46	16	76	96	27	32	73
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	39.0	11.0	17.0	17.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	38.8	10.3	17.2	16.1
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	2	0	0
Cycles Maxed Out (%)	70	74	100	70
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	40.0	25.0	40.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	26.8	23.8	24.7
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	18	80	5
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	13.5	5.5	17.5	5.5	13.5	5.5	17.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.5	15.1	6.2	14.6	5.5	16.0	7.0	15.1
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	60	0	76	3	67	1	80	4
Cycles @ Minimum (%)	1	0	14	0	10	0	0	0
Cycles Maxed Out (%)	36	100	9	43	22	99	19	40
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	7632	7914	7627	7761	7867	7755
Vehs Exited	7599	7872	7612	7729	7820	7726
Starting Vehs	235	271	269	258	255	257
Ending Vehs	268	313	284	290	302	291
Denied Entry Before	4	1	2	2	1	1
Denied Entry After	1	1	1	0	0	1
Travel Distance (mi)	5439	5690	5411	5540	5602	5536
Travel Time (hr)	269.3	290.7	266.2	279.4	280.0	277.1
Total Delay (hr)	72.4	84.9	70.1	79.2	77.2	76.8
Total Stops	8933	9630	8712	9256	9263	9156
Fuel Used (gal)	196.3	206.9	194.3	201.3	201.9	200.1

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	7632	7914	7627	7761	7867	7755
Vehs Exited	7599	7872	7612	7729	7820	7726
Starting Vehs	235	271	269	258	255	257
Ending Vehs	268	313	284	290	302	291
Denied Entry Before	4	1	2	2	1	1
Denied Entry After	1	1	1	0	0	1
Travel Distance (mi)	5439	5690	5411	5540	5602	5536
Travel Time (hr)	269.3	290.7	266.2	279.4	280.0	277.1
Total Delay (hr)	72.4	84.9	70.1	79.2	77.2	76.8
Total Stops	8933	9630	8712	9256	9263	9156
Fuel Used (gal)	196.3	206.9	194.3	201.3	201.9	200.1

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	3.3	0.0	0.0	0.2
Total Del/Veh (s)	8.2	3.1	2.2	2.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.5	0.1	0.5	0.1	0.5
Total Del/Veh (s)	16.4	5.0	6.5	7.3	8.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.7	0.0	1.7	0.8
Total Del/Veh (s)	13.0	16.3	13.5	18.2	14.3
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	1	0	0	1

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	0.3	0.3	0.0	0.4
Total Del/Veh (s)	20.2	14.5	31.5	25.0	22.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

12: Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.7	23.4	1.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.4	0.4	0.0	0.3
Total Del/Veh (s)	24.7	18.1	11.9	20.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

16: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.7	0.2
Total Del/Veh (s)	1.9	1.1	10.4	2.3
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.3	0.0	0.7	0.6
Total Del/Veh (s)	33.7	18.7	24.8	25.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.2	0.1	0.2
Total Del/Veh (s)	1.2	1.2	13.1	12.3	2.0
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

29: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.9	2.3	2.9	1.3
Total Del/Veh (s)	8.2	13.4	13.8	12.0	10.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

35: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.1
Total Del/Veh (s)	2.0	2.0	16.9	7.5	2.4
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	33.4
Denied Entry Before	1
Denied Entry After	1

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	39	59	134	26
Average Queue (ft)	13	28	34	1
95th Queue (ft)	38	52	96	12
Link Distance (ft)	620		678	670
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	178	118	34	80	149	98	206
Average Queue (ft)	76	36	9	26	58	23	88
95th Queue (ft)	145	80	31	54	116	60	157
Link Distance (ft)	564		489		1605		678
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	1	0		0	1	0	6
Queuing Penalty (veh)	1	0		0	0	0	3

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	169	128	257	56	188	253	62	48
Average Queue (ft)	58	71	130	22	88	133	15	14
95th Queue (ft)	117	116	212	50	157	224	46	42
Link Distance (ft)	1605			1012	268	268	937	
Upstream Blk Time (%)					0	0		
Queuing Penalty (veh)					0	0		
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	1	1						
Queuing Penalty (veh)	2	1						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	TR	L	T
Maximum Queue (ft)	322	529	315	86	116	225	191	132	252
Average Queue (ft)	137	239	137	40	56	94	112	58	134
95th Queue (ft)	245	405	295	78	95	173	174	110	218
Link Distance (ft)	1767	1767			171	670		794	794
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			290	80			175		
Storage Blk Time (%)		4	0	1	2	1	1		
Queuing Penalty (veh)		13	0	2	1	2	1		

Intersection: 12: Congress Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	42	130	61
Average Queue (ft)	2	21	25
95th Queue (ft)	17	82	54
Link Distance (ft)	169	202	174
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	401	450	402	308	230	214	98	130	143	147
Average Queue (ft)	180	254	108	110	131	116	42	64	74	78
95th Queue (ft)	393	434	326	262	191	184	81	112	119	126
Link Distance (ft)			2719	2719	1454	1454		268	268	268
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	0	4	0							
Queuing Penalty (veh)	2	20	1							

Intersection: 16: Valley & Congress Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	TR	L	TR	LT	R
Maximum Queue (ft)	24	23	52	7	59	76
Average Queue (ft)	2	1	16	0	23	30
95th Queue (ft)	12	10	41	5	52	59
Link Distance (ft)		171		124	315	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		50			170
Storage Blk Time (%)		0	0	0		
Queuing Penalty (veh)		0	1	0		

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	163	223	299	225	341	135	386	80
Average Queue (ft)	75	117	148	96	158	103	193	64
95th Queue (ft)	140	200	229	171	288	164	330	104
Link Distance (ft)			1678	794	794		2255	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95				110		55
Storage Blk Time (%)	4	13	32		14	1	38	5
Queuing Penalty (veh)	12	39	121		40	4	63	20

Intersection: 24: Gilman Street & Congress Street

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	53	60	80	56
Average Queue (ft)	5	14	37	16
95th Queue (ft)	28	42	69	46
Link Distance (ft)	124		1063	624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	54	236	193	90	146	150	173	75
Average Queue (ft)	18	109	46	71	46	65	47	49
95th Queue (ft)	48	200	131	102	98	121	117	82
Link Distance (ft)	965		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)		0	0	12	0	1	4	10
Queuing Penalty (veh)		0	1	4	0	1	7	7

Intersection: 35: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	176	61	52	30
Average Queue (ft)	33	6	19	4
95th Queue (ft)	106	31	47	21
Link Distance (ft)	202	965	508	434
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 372

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	45.0	5.0	6.5	34.0	5.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	26.9	5.0	5.9	21.8	5.0
g/C Ratio	-0.01	-0.01	-0.01	NA	-0.01
Cycles Skipped (%)	7	7	70	0	7
Cycles @ Minimum (%)	0	93	4	1	93
Cycles Maxed Out (%)	8	93	9	19	93
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	26.0	21.0	18.0	26.0	44.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	14.2	15.8	11.3	14.2	31.4
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	9	3	9	9	4
Cycles @ Minimum (%)	0	0	3	0	0
Cycles Maxed Out (%)	4	34	15	4	10
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	15.6	24.4	5.7	11.5	5.0	35.0	24.0
Minimum Green (s)	8.0	8.0	3.0	8.0	5.0	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	13.9	19.5	5.8	12.7	5.1	33.1	23.0
g/C Ratio	-0.01	NA	-0.01	NA	-0.01	NA	NA
Cycles Skipped (%)	2	0	14	0	47	0	0
Cycles @ Minimum (%)	4	8	0	2	51	0	0
Cycles Maxed Out (%)	53	40	80	90	53	65	74
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	39.0	11.0	17.0	17.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	38.0	10.4	16.5	15.9
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	61	77	89	68
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	15.0	20.0	10.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	14.6	18.0	10.1
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	85	66	100
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	13.5	5.5	17.5	5.5	13.5	5.5	17.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.5	15.0	6.3	14.8	5.5	16.1	7.1	14.9
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	57	1	79	4	68	1	79	5
Cycles @ Minimum (%)	1	0	13	0	9	0	0	0
Cycles Maxed Out (%)	40	99	8	39	22	99	19	35
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	7682	7651	7598	7731	7600	7657
Vehs Exited	7645	7567	7573	7625	7538	7592
Starting Vehs	248	218	214	204	199	214
Ending Vehs	285	302	239	310	261	275
Denied Entry Before	1	1	3	2	4	1
Denied Entry After	2	3	3	2	1	0
Travel Distance (mi)	4667	4646	4616	4702	4654	4657
Travel Time (hr)	281.7	274.7	265.6	260.6	267.2	270.0
Total Delay (hr)	111.9	106.1	97.4	89.4	97.7	100.5
Total Stops	9887	9581	9407	9326	9442	9529
Fuel Used (gal)	182.3	180.1	176.8	177.1	178.0	178.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	7682	7651	7598	7731	7600	7657
Vehs Exited	7645	7567	7573	7625	7538	7592
Starting Vehs	248	218	214	204	199	214
Ending Vehs	285	302	239	310	261	275
Denied Entry Before	1	1	3	2	4	1
Denied Entry After	2	3	3	2	1	0
Travel Distance (mi)	4667	4646	4616	4702	4654	4657
Travel Time (hr)	281.7	274.7	265.6	260.6	267.2	270.0
Total Delay (hr)	111.9	106.1	97.4	89.4	97.7	100.5
Total Stops	9887	9581	9407	9326	9442	9529
Fuel Used (gal)	182.3	180.1	176.8	177.1	178.0	178.9

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	1.6	0.0	0.0	0.3
Total Del/Veh (s)	8.3	1.3	1.8	2.8
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.1	0.1
Total Del/Veh (s)	6.1	3.2	2.0	0.9	1.4
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.7	0.0	2.1	1.1
Total Del/Veh (s)	10.6	19.7	12.6	17.3	14.9
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.2	0.9	0.0	0.4
Total Del/Veh (s)	16.9	13.0	25.6	21.9	19.0
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

9: Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.8	0.2
Total Del/Veh (s)	1.9	1.0	12.9	2.7
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

12: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.2	0.1	0.1
Total Del/Veh (s)	1.2	2.5	54.6	10.9	7.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.9	0.3	0.0	0.4
Total Del/Veh (s)	78.2	18.6	12.4	39.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

18: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.5	2.7	3.1	1.5
Total Del/Veh (s)	15.4	24.3	14.8	15.7	16.7
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.6	0.1	0.8	0.8
Total Del/Veh (s)	35.9	35.7	41.1	36.6
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

32: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.5	1.7	14.7	7.8	2.7
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	44.7
Denied Entry Before	1
Denied Entry After	0

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	108	80	54	4
Average Queue (ft)	43	30	10	0
95th Queue (ft)	82	60	39	3
Link Distance (ft)	424		678	671
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	31	42	48
Average Queue (ft)	3	17	2	3
95th Queue (ft)	19	41	18	23
Link Distance (ft)	436	550	1618	678
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	142	130	267	71	143	160	105	160
Average Queue (ft)	39	75	160	24	54	83	37	68
95th Queue (ft)	88	122	255	58	111	145	81	128
Link Distance (ft)	1618			988	263	263	1083	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	0	2						
Queuing Penalty (veh)	0	2						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	TR	L	T
Maximum Queue (ft)	219	366	219	104	166	215	192	122	241
Average Queue (ft)	119	191	50	33	81	91	101	55	111
95th Queue (ft)	193	311	136	80	134	160	163	106	201
Link Distance (ft)	1767	1767			166	671		792	792
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					1				
Storage Bay Dist (ft)			290	80			175		
Storage Blk Time (%)		1	0	0	10	0	1		
Queuing Penalty (veh)		2	0	1	4	1	1		

Intersection: 9: Congress Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	TR	L	TR	LT	R
Maximum Queue (ft)	25	21	40	24	90	78
Average Queue (ft)	2	1	12	1	42	32
95th Queue (ft)	14	8	35	12	76	61
Link Distance (ft)		166		130	294	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		50			170
Storage Blk Time (%)			0	0		
Queuing Penalty (veh)			1	0		

Intersection: 12: Gilman Street & Congress Street

Movement	EB	WB	WB	NB	SB
Directions Served	TR	L	T	LTR	LTR
Maximum Queue (ft)	45	82	53	244	69
Average Queue (ft)	5	36	2	100	24
95th Queue (ft)	27	71	27	198	55
Link Distance (ft)	130		425	1063	624
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		65			
Storage Blk Time (%)		2			
Queuing Penalty (veh)		8			

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	478	514	1022	935	252	251	62	125	148	160
Average Queue (ft)	361	423	503	436	156	144	25	64	88	95
95th Queue (ft)	624	636	1221	1128	223	219	57	113	136	140
Link Distance (ft)			1529	1529	1274	1274		263	263	263
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	12	47	5							
Queuing Penalty (veh)	39	156	26							

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	134	247	226	90	153	158	270	76
Average Queue (ft)	67	131	82	72	37	90	118	69
95th Queue (ft)	116	211	176	101	101	150	234	85
Link Distance (ft)	965		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			8	14		2	5	29
Queuing Penalty (veh)			14	14		1	22	26

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	164	235	502	461	544	135	397	80
Average Queue (ft)	101	189	243	237	329	110	188	55
95th Queue (ft)	181	272	408	403	506	181	337	102
Link Distance (ft)			1640	792	792		1989	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95				110		55
Storage Blk Time (%)	9	25	41		44	0	47	3
Queuing Penalty (veh)	41	108	214		93	2	51	8

Intersection: 32: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	70	92	85
Average Queue (ft)	4	8	34	38
95th Queue (ft)	30	39	69	67
Link Distance (ft)	425	965	508	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 833

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	18.0	19.0	18.0	18.0	42.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	14.5	15.9	11.2	14.5	29.2
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	3	1	19	3	1
Cycles @ Minimum (%)	0	0	3	0	0
Cycles Maxed Out (%)	37	51	13	37	7
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	13.7	33.2	5.7	14.6	4.5	42.4	27.1
Minimum Green (s)	8.0	8.0	3.0	8.0	4.5	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	12.2	14.9	5.7	14.0	5.2	28.2	25.1
g/C Ratio	-0.01	NA	-0.01	NA	-0.01	NA	NA
Cycles Skipped (%)	4	0	11	0	67	0	0
Cycles @ Minimum (%)	8	38	0	2	27	0	0
Cycles Maxed Out (%)	53	4	83	70	33	9	58
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	34.0	11.0	11.0	18.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	33.6	10.9	11.0	17.7
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	86	92	100	88
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	18.5	5.5	12.5	5.5	18.5	7.5	10.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.6	19.7	6.0	13.8	5.5	23.1	8.9	12.0
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	42	0	31	3	75	0	20	14
Cycles @ Minimum (%)	0	0	12	0	5	0	0	0
Cycles Maxed Out (%)	57	100	54	74	19	100	58	65
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	40.0	25.0	40.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	39.1	20.7	35.8
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	78	42	44
Cycles with Peds (%)	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	8257	8173	8185	8369	8153	8227
Vehs Exited	8226	8128	8116	8278	8138	8177
Starting Vehs	243	260	247	199	236	229
Ending Vehs	274	305	316	290	251	282
Denied Entry Before	1	7	0	5	2	1
Denied Entry After	2	2	4	0	3	0
Travel Distance (mi)	4961	4880	4859	5016	4897	4922
Travel Time (hr)	277.1	280.2	274.8	278.3	273.4	276.8
Total Delay (hr)	96.2	101.9	97.4	94.8	94.4	96.9
Total Stops	10807	10700	10600	10991	10575	10732
Fuel Used (gal)	189.6	188.8	186.9	191.3	187.5	188.8

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	8257	8173	8185	8369	8153	8227
Vehs Exited	8226	8128	8116	8278	8138	8177
Starting Vehs	243	260	247	199	236	229
Ending Vehs	274	305	316	290	251	282
Denied Entry Before	1	7	0	5	2	1
Denied Entry After	2	2	4	0	3	0
Travel Distance (mi)	4961	4880	4859	5016	4897	4922
Travel Time (hr)	277.1	280.2	274.8	278.3	273.4	276.8
Total Delay (hr)	96.2	101.9	97.4	94.8	94.4	96.9
Total Stops	10807	10700	10600	10991	10575	10732
Fuel Used (gal)	189.6	188.8	186.9	191.3	187.5	188.8

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	2.5	0.0	0.0	0.3
Total Del/Veh (s)	9.0	2.8	2.2	3.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.5	0.1	0.3	0.2	0.6
Total Del/Veh (s)	12.4	4.0	8.8	12.3	11.1
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.7	0.0	1.4	0.9
Total Del/Veh (s)	12.6	17.4	12.7	17.7	14.3
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.3	0.9	0.0	0.5
Total Del/Veh (s)	22.3	16.5	31.5	23.3	24.5
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

12: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.0	1.9	31.3	14.6	3.7
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.9	0.4	0.0	0.5
Total Del/Veh (s)	38.2	17.9	13.2	24.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

18: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.5	2.7	3.1	1.5
Total Del/Veh (s)	17.8	22.9	13.3	15.1	17.0
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.7	0.1	1.1	0.9
Total Del/Veh (s)	44.8	27.3	31.0	34.3
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

22: Proposed Drop Off & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.0	1.7	19.8	2.0
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.0	0.2
Total Del/Veh (s)	2.0	1.2	12.1	2.7
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

32: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1	0.2	0.1
Total Del/Veh (s)	1.0	1.8	17.7	8.4	2.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	40.0
Denied Entry Before	1
Denied Entry After	0

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	58	67	145	21
Average Queue (ft)	30	33	28	1
95th Queue (ft)	58	56	99	7
Link Distance (ft)	549		677	671
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	197	132	34	73	196	99	258
Average Queue (ft)	94	47	11	14	83	32	125
95th Queue (ft)	165	96	34	48	162	81	216
Link Distance (ft)	559		663		1605		677
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	2	0		0	3	1	15
Queuing Penalty (veh)	2	0		0	1	4	7

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	194	134	283	71	145	177	38	29
Average Queue (ft)	64	90	155	25	62	92	13	8
95th Queue (ft)	140	138	246	57	117	164	37	28
Link Distance (ft)	1605			988	270	270	1083	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	1	3	0					
Queuing Penalty (veh)	2	4	0					

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	TR	L	T
Maximum Queue (ft)	275	433	315	104	159	429	200	124	223
Average Queue (ft)	141	230	71	43	82	176	159	55	105
95th Queue (ft)	229	362	204	92	138	344	217	107	209
Link Distance (ft)	1767	1767			172	671		792	792
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					0				
Storage Bay Dist (ft)			290	80			175		
Storage Blk Time (%)		3	0	1	8	4	8		
Queuing Penalty (veh)		5	0	2	4	16	25		

Intersection: 12: Gilman Street & Congress Street

Movement	EB	WB	WB	NB	SB
Directions Served	TR	L	T	LTR	LTR
Maximum Queue (ft)	52	77	95	133	70
Average Queue (ft)	6	31	4	54	28
95th Queue (ft)	30	64	39	102	58
Link Distance (ft)	122		170	1063	624
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		65			
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		6	0		

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	419	453	675	592	232	222	70	133	154	156
Average Queue (ft)	203	268	190	158	150	135	26	68	97	101
95th Queue (ft)	461	502	647	567	212	205	57	115	144	151
Link Distance (ft)			1519	1519	1275	1275		270	270	270
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	3	13	1							
Queuing Penalty (veh)	11	43	8							

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	186	333	207	90	125	156	283	76
Average Queue (ft)	75	148	74	69	31	82	111	69
95th Queue (ft)	136	265	159	101	82	145	226	86
Link Distance (ft)	966		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)		0	7	13		1	5	28
Queuing Penalty (veh)		0	12	13		1	23	25

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	164	235	659	415	530	135	290	80
Average Queue (ft)	116	190	277	184	289	119	150	57
95th Queue (ft)	195	276	523	333	472	174	256	102
Link Distance (ft)			1640	792	792		1376	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95				110		55
Storage Blk Time (%)	9	33	51		38	1	41	3
Queuing Penalty (veh)	39	141	271		107	4	45	9

Intersection: 22: Proposed Drop Off & Congress Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	176	88
Average Queue (ft)	28	33
95th Queue (ft)	113	72
Link Distance (ft)	201	194
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: Valley & Congress Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	L	TR	L	TR	LT	R
Maximum Queue (ft)	24	20	57	6	77	62
Average Queue (ft)	3	1	20	0	37	29
95th Queue (ft)	16	11	50	3	68	54
Link Distance (ft)		172		122	393	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		50			170
Storage Blk Time (%)			2			
Queuing Penalty (veh)			4			

Intersection: 32: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	70	106	74	88
Average Queue (ft)	6	9	34	40
95th Queue (ft)	43	54	62	69
Link Distance (ft)	201	966	624	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 834

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	31.0	19.0	5.5	21.0	19.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	20.1	12.5	5.6	18.9	12.5
g/C Ratio	NA	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	88	0	0
Cycles @ Minimum (%)	0	1	0	0	1
Cycles Maxed Out (%)	11	21	10	49	21
Cycles with Peds (%)	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	18.0	19.0	18.0	18.0	42.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	12.2	15.7	13.0	12.2	33.3
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	10	3	13	10	6
Cycles @ Minimum (%)	0	0	3	0	0
Cycles Maxed Out (%)	16	47	27	16	17
Cycles with Peds (%)	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	16.3	22.7	5.7	22.5	4.5	34.5	35.0
Minimum Green (s)	8.0	8.0	3.0	8.0	4.5	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	15.0	15.6	5.8	21.8	5.0	30.1	33.2
g/C Ratio	-0.01	NA	-0.01	NA	-0.01	NA	NA
Cycles Skipped (%)	2	0	9	0	48	0	0
Cycles @ Minimum (%)	2	29	0	0	48	0	0
Cycles Maxed Out (%)	58	29	84	73	52	38	64
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	34.0	11.0	11.0	18.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	33.9	10.7	11.0	17.9
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	89	89	95	92
Cycles with Peds (%)	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	18.5	5.5	12.5	5.5	18.5	5.5	12.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.6	19.2	6.0	13.1	5.6	22.5	8.3	12.6
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	51	0	33	1	81	0	18	19
Cycles @ Minimum (%)	0	0	15	0	4	0	0	0
Cycles Maxed Out (%)	48	100	49	73	13	100	79	48
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

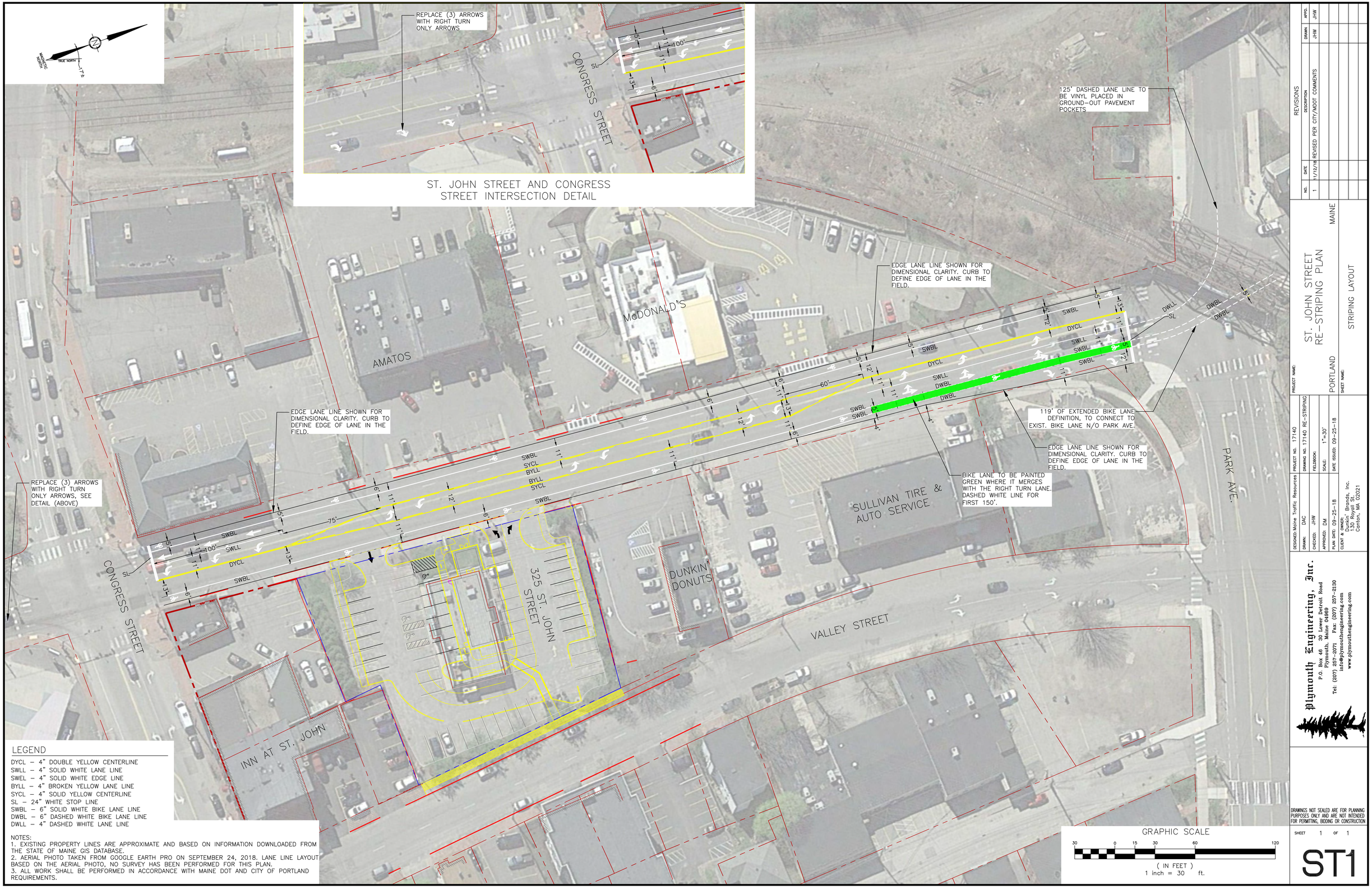
Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	29.0	17.0	19.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	28.9	15.4	18.8
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	93	65	96
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0



LEGEND

DYCL – 4" DOUBLE YELLOW CENTERLINE
SWLL – 4" SOLID WHITE LANE LINE
SWEL – 4" SOLID WHITE EDGE LINE
BYLL – 4" BROKEN YELLOW LANE LINE
SYCL – 4" SOLID YELLOW CENTERLINE
SL – 24" WHITE STOP LINE
SWBL – 6" SOLID WHITE BIKE LANE LINE
DWBL – 6" DASHED WHITE BIKE LANE LINE
DWLL – 4" DASHED WHITE LANE LINE

NOTES:
1. EXISTING PROPERTY LINES ARE APPROXIMATE AND BASED ON INFORMATION DOWNLOADED FROM THE STATE OF MAINE GIS DATABASE.
2. AERIAL PHOTO TAKEN FROM GOOGLE EARTH PRO ON SEPTEMBER 24, 2018. LANE LINE LAYOUT BASED ON THE AERIAL PHOTO, NO SURVEY HAS BEEN PERFORMED FOR THIS PLAN.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH MAINE DOT AND CITY OF PORTLAND REQUIREMENTS.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

REVISIONS

NO.	DATE	DESCRIPTION	DRAWN	APPD.
1	11/12/18	REVISED PER CITY/MDOT COMMENTS	JHW	JHW

PROJECT NAME:
ST. JOHN STREET
RE-STRIPING PLAN
PORTLAND MAINE

SHEET NAME:
STRIPING LAYOUT

DESIGNED:	Maine Traffic Resources
DRAWN:	DAC
CHECKED:	JHW
APPROVED:	DM
PLAN DATE:	09-25-18

PROJECT NO. 17140
DRAWING NO. 17140 RE-STRIPING
FIELDBOOK:
SCALE: 1"=30'
DATE ISSUED: 09-25-18

CLIENT & OWNER:
Dunkin' Brands, Inc.
130 Royall Street
Canton, MA 02021

Plymouth Engineering, Inc.
P.O. Box 46 30 Lower Detroit Road
Plymouth, Maine 04969
Tel: (207) 257-2071 Fax: (207) 257-2130
info@plymouthengineering.com
www.plymouthengineering.com

DRAWINGS NOT SEALED ARE FOR PLANNING PURPOSES ONLY AND ARE NOT INTENDED FOR PERMITTING, BIDDING OR CONSTRUCTION

SHEET 1 OF 1

ST1

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	7646	7538	7768	7754	7712	7687
Vehs Exited	7626	7569	7729	7698	7683	7659
Starting Vehs	239	271	247	222	259	242
Ending Vehs	259	240	286	278	288	271
Denied Entry Before	2	1	0	0	1	0
Denied Entry After	3	2	2	1	3	0
Travel Distance (mi)	5425	5384	5489	5511	5512	5464
Travel Time (hr)	275.8	275.2	276.8	283.5	278.1	277.9
Total Delay (hr)	79.3	80.8	77.7	84.1	78.6	80.1
Total Stops	9140	9229	9289	9366	9326	9268
Fuel Used (gal)	197.0	195.8	198.4	200.6	199.3	198.2

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	7646	7538	7768	7754	7712	7687
Vehs Exited	7626	7569	7729	7698	7683	7659
Starting Vehs	239	271	247	222	259	242
Ending Vehs	259	240	286	278	288	271
Denied Entry Before	2	1	0	0	1	0
Denied Entry After	3	2	2	1	3	0
Travel Distance (mi)	5425	5384	5489	5511	5512	5464
Travel Time (hr)	275.8	275.2	276.8	283.5	278.1	277.9
Total Delay (hr)	79.3	80.8	77.7	84.1	78.6	80.1
Total Stops	9140	9229	9289	9366	9326	9268
Fuel Used (gal)	197.0	195.8	198.4	200.6	199.3	198.2

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	3.4	0.0	0.0	0.2
Total Del/Veh (s)	8.1	3.1	2.0	2.8
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.4	0.1	0.5	0.1	0.4
Total Del/Veh (s)	15.0	6.9	5.9	6.8	7.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	2.7	0.0	2.1	0.8
Total Del/Veh (s)	12.7	16.2	13.7	16.4	14.2
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	0.3	1.2	0.0	0.6
Total Del/Veh (s)	30.7	17.5	42.3	26.9	30.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

12: Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.4	23.5	1.8
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.4	0.4	0.0	0.3
Total Del/Veh (s)	24.6	17.2	11.6	19.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

16: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.7	0.2
Total Del/Veh (s)	1.9	0.9	10.3	2.3
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.3	0.0	0.7	0.6
Total Del/Veh (s)	31.4	20.6	24.1	25.0
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.3	1.0	12.8	10.8	2.1
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

29: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.9	2.2	2.8	1.2
Total Del/Veh (s)	7.3	13.3	13.1	10.0	9.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

35: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.1
Total Del/Veh (s)	2.0	1.9	16.6	5.3	2.3
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	35.3
Denied Entry Before	0
Denied Entry After	0

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	38	62	158	61
Average Queue (ft)	10	31	29	4
95th Queue (ft)	34	54	91	26
Link Distance (ft)	620		678	670
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	158	82	36	54	128	74	196
Average Queue (ft)	67	29	11	23	52	25	83
95th Queue (ft)	119	62	35	46	104	63	150
Link Distance (ft)	564		489		1605		678
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	0				1	0	6
Queuing Penalty (veh)	0				0	1	2

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	302	132	254	93	170	270	48	54
Average Queue (ft)	64	70	131	24	77	136	13	13
95th Queue (ft)	190	116	211	59	144	229	40	41
Link Distance (ft)	1605			1012	268	268	937	
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						1		
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	1	1						
Queuing Penalty (veh)	2	1						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	R	L	T
Maximum Queue (ft)	644	847	315	98	123	428	168	124	245
Average Queue (ft)	187	355	186	44	59	204	38	75	127
95th Queue (ft)	403	689	359	87	107	369	147	136	219
Link Distance (ft)	1767	1767			178	670			796
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			290	80			175	100	
Storage Blk Time (%)		13	0	3	3	20	0	6	13
Queuing Penalty (veh)		43	1	5	2	8	0	18	12

Intersection: 12: Congress Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	4	112	73
Average Queue (ft)	0	14	23
95th Queue (ft)	3	66	58
Link Distance (ft)	169	202	174
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	375	394	349	319	187	192	91	146	138	135
Average Queue (ft)	177	250	105	105	127	110	40	60	70	72
95th Queue (ft)	394	428	318	240	175	169	80	110	112	111
Link Distance (ft)			2719	2719	1454	1454		268	268	268
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	2	4	0							
Queuing Penalty (veh)	8	22	2							

Intersection: 16: Valley & Congress Street

Movement	EB	EB	WB	NB	NB
Directions Served	L	TR	L	LT	R
Maximum Queue (ft)	24	24	46	62	63
Average Queue (ft)	2	1	13	23	28
95th Queue (ft)	13	12	37	52	55
Link Distance (ft)		178		315	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	50		50		170
Storage Blk Time (%)		0	0		
Queuing Penalty (veh)		0	1		

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	150	215	250	198	395	135	401	80
Average Queue (ft)	73	106	134	110	171	110	181	66
95th Queue (ft)	132	180	203	198	295	170	329	105
Link Distance (ft)			1678		796		2255	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95		175		110		55
Storage Blk Time (%)	4	10	26	0	19	1	36	5
Queuing Penalty (veh)	13	31	101	1	90	4	60	20

Intersection: 24: Gilman Street & Congress Street

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	62	47	88	48
Average Queue (ft)	5	12	37	17
95th Queue (ft)	31	37	68	45
Link Distance (ft)	124		1063	624
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		1		

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	51	226	165	90	104	125	125	75
Average Queue (ft)	17	101	46	70	48	60	35	45
95th Queue (ft)	44	174	126	102	96	111	83	77
Link Distance (ft)	965		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			0	12		0	2	7
Queuing Penalty (veh)			1	4		0	3	5

Intersection: 35: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	104	29	48	30
Average Queue (ft)	32	2	19	5
95th Queue (ft)	82	16	46	22
Link Distance (ft)	202	965	508	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 464

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	45.0	5.0	6.5	34.0	5.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	27.9	5.0	5.7	22.2	5.0
g/C Ratio	-0.01	-0.01	-0.01	NA	-0.01
Cycles Skipped (%)	9	9	75	0	9
Cycles @ Minimum (%)	0	91	7	1	91
Cycles Maxed Out (%)	9	91	7	20	91
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	26.0	21.0	18.0	26.0	44.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	13.8	16.2	11.5	13.8	30.6
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	6	4	12	6	3
Cycles @ Minimum (%)	0	0	1	0	0
Cycles Maxed Out (%)	4	29	16	4	6
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	19.1	15.7	4.7	17.7	5.0	29.8	29.2
Minimum Green (s)	8.0	8.0	3.0	8.0	5.0	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	16.3	15.3	4.9	17.2	5.2	30.3	27.6
g/C Ratio	NA	NA	-0.01	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	9	0	38	0	0
Cycles @ Minimum (%)	2	23	0	0	62	0	0
Cycles Maxed Out (%)	49	60	91	79	62	94	71
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	39.0	11.0	17.0	17.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	38.9	10.3	16.8	15.9
g/C Ratio	-0.01	-0.01	NA	NA
Cycles Skipped (%)	3	3	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	60	70	92	66
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	15.0	20.0	10.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	14.7	18.1	10.0
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	90	65	98
Cycles with Peds (%)	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	13.5	5.5	17.5	5.5	13.5	5.5	17.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.6	15.0	6.7	14.3	5.4	16.3	7.5	14.6
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	60	2	77	6	71	2	80	6
Cycles @ Minimum (%)	1	0	11	0	10	0	0	0
Cycles Maxed Out (%)	35	98	11	38	17	98	20	33
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:10	7:10	7:10	7:10	7:10	7:10
Total Time (min)	13	13	13	13	13	13
Time Recorded (min)	10	10	10	10	10	10
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1312	1361	1422	1347	1303	1354
Vehs Exited	1256	1336	1384	1268	1261	1302
Starting Vehs	217	241	248	228	209	227
Ending Vehs	273	266	286	307	251	272
Denied Entry Before	1	1	1	3	3	1
Denied Entry After	33	5	6	11	0	9
Travel Distance (mi)	773	800	844	789	747	790
Travel Time (hr)	47.2	45.2	48.0	45.9	39.3	45.1
Total Delay (hr)	18.9	16.1	17.3	17.2	12.1	16.3
Total Stops	1821	1757	1918	1743	1493	1748
Fuel Used (gal)	30.5	30.6	32.5	30.5	27.7	30.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1312	1361	1422	1347	1303	1354
Vehs Exited	1256	1336	1384	1268	1261	1302
Starting Vehs	217	241	248	228	209	227
Ending Vehs	273	266	286	307	251	272
Denied Entry Before	1	1	1	3	3	1
Denied Entry After	33	5	6	11	0	9
Travel Distance (mi)	773	800	844	789	747	790
Travel Time (hr)	47.2	45.2	48.0	45.9	39.3	45.1
Total Delay (hr)	18.9	16.1	17.3	17.2	12.1	16.3
Total Stops	1821	1757	1918	1743	1493	1748
Fuel Used (gal)	30.5	30.6	32.5	30.5	27.7	30.4

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	2.5	0.0	0.0	0.3
Total Del/Veh (s)	11.7	3.7	2.2	3.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	0.1	0.3	0.1	0.7
Total Del/Veh (s)	11.7	7.1	8.2	10.6	10.2
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.5	0.0	1.4	0.8
Total Del/Veh (s)	10.9	14.1	12.5	20.6	12.6
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.4	12.9	0.0	4.2
Total Del/Veh (s)	25.8	25.1	50.3	26.1	32.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	7	0	7

12: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.1	1.7	19.9	12.9	2.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.8	0.4	0.0	0.4
Total Del/Veh (s)	18.1	18.6	11.8	16.5
Denied Entry Before	0	0	0	0
Denied Entry After	1	0	0	1

18: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.4	2.6	3.2	1.5
Total Del/Veh (s)	13.7	22.4	13.5	13.7	15.1
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.6	1.5	1.1	1.5
Total Del/Veh (s)	40.0	31.4	27.0	34.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	1	0	1

22: Proposed Drop Off & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.2	1.8	19.9	2.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.8	0.2
Total Del/Veh (s)	2.1	1.0	14.4	3.0
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

32: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.2	2.0	15.6	6.9	2.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	2.6
Total Del/Veh (s)	35.1
Denied Entry Before	1
Denied Entry After	9

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	60	46	100	4
Average Queue (ft)	36	33	42	1
95th Queue (ft)	67	50	116	8
Link Distance (ft)	549		677	671
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	150	77	34	43	143	63	156
Average Queue (ft)	100	48	11	11	80	32	103
95th Queue (ft)	178	115	36	54	159	71	169
Link Distance (ft)	559		663		1605		677
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	2	0			2	1	13
Queuing Penalty (veh)	3	0			0	5	5

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	81	114	201	33	85	140	34	36
Average Queue (ft)	49	79	131	21	58	89	11	10
95th Queue (ft)	97	125	217	46	99	160	37	36
Link Distance (ft)	1605			988	270	270	1083	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	0	2						
Queuing Penalty (veh)	0	2						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	R	L	T
Maximum Queue (ft)	209	352	129	74	123	510	197	117	238
Average Queue (ft)	148	248	58	38	92	393	87	69	139
95th Queue (ft)	249	405	153	95	153	672	237	129	260
Link Distance (ft)	1767	1767			180	671			794
Upstream Blk Time (%)					0	1			
Queuing Penalty (veh)					1	8			
Storage Bay Dist (ft)			290	80			175	100	
Storage Blk Time (%)		4	0	0	15	41	0	2	14
Queuing Penalty (veh)		7	0	0	7	32	1	7	11

Intersection: 12: Gilman Street & Congress Street

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	34	66	65	43
Average Queue (ft)	9	29	42	21
95th Queue (ft)	36	65	71	51
Link Distance (ft)	122		1063	624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		2		
Queuing Penalty (veh)		7		

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	213	255	138	73	209	191	52	79	127	126
Average Queue (ft)	104	178	66	50	164	143	28	52	92	95
95th Queue (ft)	238	300	179	84	257	241	56	90	136	132
Link Distance (ft)			1519	1519	1275	1275		270	270	270
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	134	183	133	87	113	128	188	75
Average Queue (ft)	78	121	82	65	43	85	103	69
95th Queue (ft)	153	189	180	100	133	146	213	86
Link Distance (ft)	966		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			5	16		2	5	28
Queuing Penalty (veh)			9	16		1	20	25

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	138	218	321	200	558	135	188	78
Average Queue (ft)	96	193	270	170	385	118	134	55
95th Queue (ft)	172	268	448	250	740	179	213	99
Link Distance (ft)			1640		794		1376	
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					3			
Storage Bay Dist (ft)	95	95		175		110		55
Storage Blk Time (%)	12	33	54	1	37	0	37	3
Queuing Penalty (veh)	52	141	287	9	225	2	41	8

Intersection: 22: Proposed Drop Off & Congress Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	4	90	57
Average Queue (ft)	1	34	32
95th Queue (ft)	8	118	70
Link Distance (ft)	170	201	194
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 24: Valley & Congress Street

Movement	EB	WB	WB	NB	NB
Directions Served	L	L	TR	LT	R
Maximum Queue (ft)	14	38	2	72	45
Average Queue (ft)	3	16	0	45	28
95th Queue (ft)	16	43	4	85	56
Link Distance (ft)			122	393	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	50	50			170
Storage Blk Time (%)		1			
Queuing Penalty (veh)		2			

Intersection: 32: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	11	52	55	47
Average Queue (ft)	2	12	37	35
95th Queue (ft)	20	59	63	50
Link Distance (ft)	201	966	624	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 937

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	31.0	19.0	5.5	21.0	19.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	20.4	13.9	5.5	19.6	13.9
g/C Ratio	NA	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	92	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	8	31	8	46	31
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	18.0	19.0	18.0	18.0	42.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	12.0	15.3	13.2	12.0	34.5
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01
Cycles Skipped (%)	9	0	9	9	9
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	18	36	27	18	18
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	19.2	11.8	4.7	31.5	4.5	26.5	43.0
Minimum Green (s)	8.0	8.0	3.0	8.0	4.5	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	17.3	10.2	5.3	29.5	4.6	31.9	40.4
g/C Ratio	NA	NA	NA	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	0	0	50	0	0
Cycles @ Minimum (%)	0	57	0	0	33	0	0
Cycles Maxed Out (%)	57	29	100	71	50	83	71
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	34.0	11.0	11.0	18.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	33.9	10.8	11.4	19.2
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	70	82	80	90
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Attachment 7D

St. John / Congress Collision Diagram
Pedestrian and Bicycle Collision Locations
Left Turn Lane Warrants

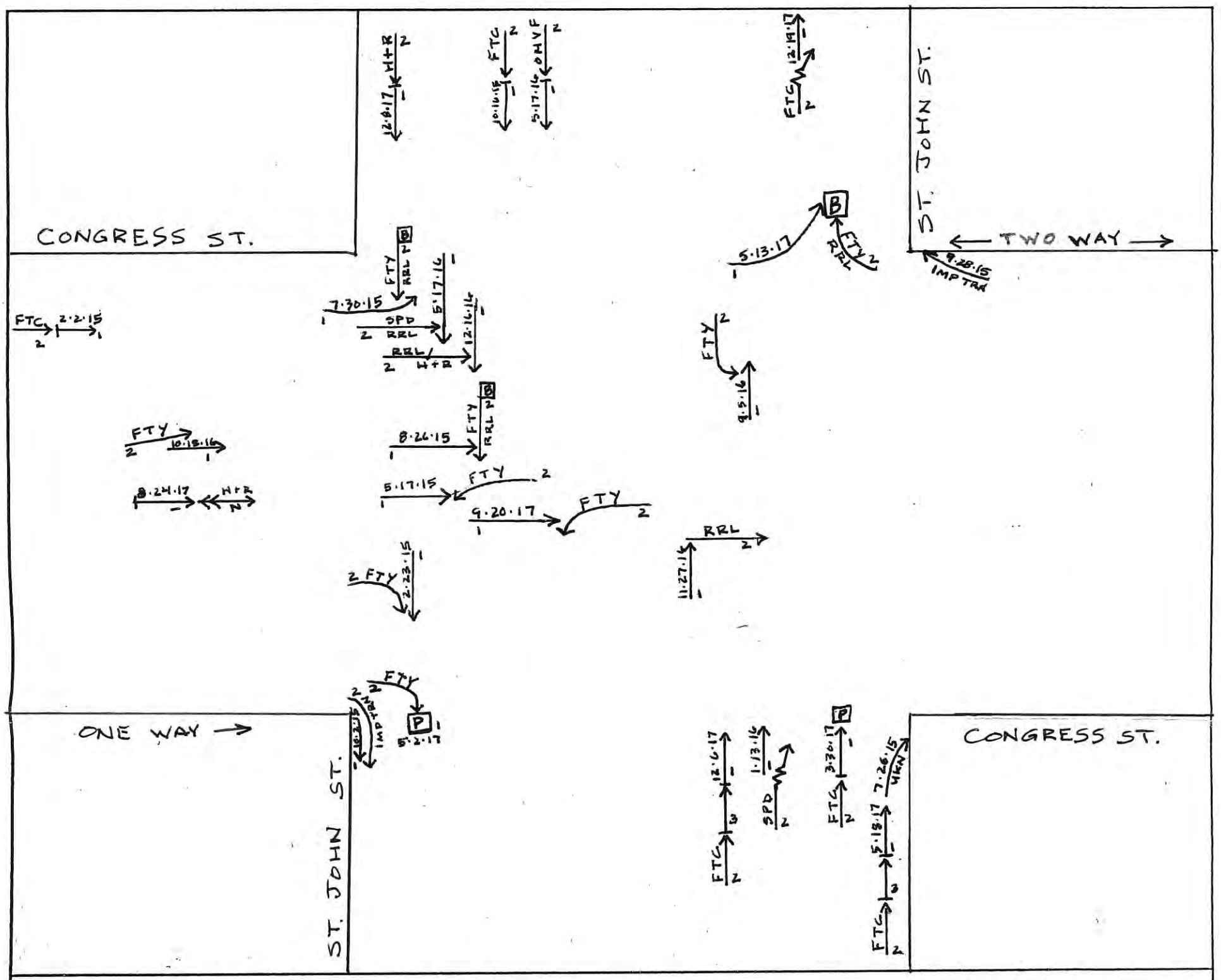
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, Maine NODE NO(S) 16765

YEARS REVIEWED 2015 - 2017 DATE PREPARED Nov. 16, 2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

S:/SHEETS/COLLISION DIAGRAM.DWG

LIGHT

1. DAWN (MORNING)
2. DAYLIGHT
3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON)
5. DARK (NO ST. LIGHTS)
6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE

1. DRY
2. WET
3. SNOW/SLUSH–SANDED
4. ICE/PACKED SNOW–SANDED
5. MUDDY
6. DEBRIS
7. OILY
8. SNOW/SLUSH–NOT SANDED
9. ICE–PKD. SNOW–NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS – HUMAN

1. NO IMPROPER ACTION
2. FAIL TO YLD. RIGHT OF WAY
3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE
5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER–NO PASSING
7. IMPROPER PASS–OVERTAKING
8. IMP. UNSAFE LANE CHANGE
9. IMP. PARKING START/STOP
10. IMPROPER TURN
11. UNSAFE BACKING
12. NO SIGNAL OR IMP. SIGNAL
13. IMPEDING TRAFFIC
14. DRIVER INATTENTION–DISTRACTION
15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR
17. PHYSICAL IMPAIRMENT
18. VISION OBSCURED–WINDSHIELD GLASS
19. VISION OBSCURED–SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT
30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN
51. UNKNOWN

– VEHICULAR

41. DEFECTIVE BRAKES
42. DEFECTIVE TIRE/FAILURE
43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR
45. DEFECTIVE STEERING
50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE
PEDESTRIAN
FATAL ACCIDENT
BACKING
REAR END
FIXED OBJECT
SIDE SWIPE
VEHICLE (MOVING)
HEAD ON
TURNING MOVE
BICYCLE
OVERTURN
CHANGE LANE
ANIMAL
PARKED VEHICLE
OUT OF CONTROL
SLED

WEATHER

C – CLEAR
F – FOG
R – RAIN
SL – SLEET
S – SNOW
CL – CLOUDY
XW – CROSS WINDS

INJURIES

K – FATAL
B – NON–INCAPACITATING
A – INCAPACITATING
C – POSSIBLE INJURY

COLLISION DIAGRAM

SHEET 2 OF 2

LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, Maine NODE NO(S) 16765

YEARS REVIEWED 2015 - 2017 DATE PREPARED Nov. 16, 2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
15·000457	02·02·15	15:00					2	3	4	
15·000921	02·23·15	11:38					2	1	2	
15·001773	05·17·15	16:12					2	1	2	
15·002529	07·26·15	21:21					4	1	51	swerve to miss vehicle
15·002575	07·30·15	19:30			1		3	1	30	Cyclist
15·002891	08·26·15	07:24				1	2	1	30	Cyclist
15·003256	09·28·15	16:23					2	1	10	
15·003322	10·02·15	13:18					2	1	10	
15·003479	10·16·15	13:19					2	1	4	
16·000137	01·13·16	08:55					2	3	3	
16·001002	03·27·16	12:50					2	1	3	
16·001459	05·17·16	08:00					2	1	30	
16·002712	09·05·16	06:00					2	1	2	
16·003213	10·18·16	06:53					2	1	2	
16·003632	11·27·16	17:25					4	1	5	Ran Red Light
16·003853	12·16·16	21:30					4	1	31	
17·001104	03·30·17	18:47					2	1	4	
17·001440	05·02·17	14:50				1	2	2	2	Pedestrian
17·001571	05·13·17	10:45				1	2	1	5	Cyclist
17·001623	05·18·17	16:55					2	1	4	
17·002694	08·24·17	08:25					2	1	31	
17·002991	09·20·17	05:38			1		4	2	2	
17·003791	12·06·17	14:21					2	1	4	
17·003814	12·08·17	13:26					2	1	31	
17·003968	12·19·17	07:34					2	3	4	

S:/SHEETS/COLLISION DIAGRAM.DWG

Pedestrian and Bicycle Collisions

Figure No. A



Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design: EAL Scale: NONE
Draft: Date: OCT 2018
Checked: RED File Name: 2866.01 - TIS Figures

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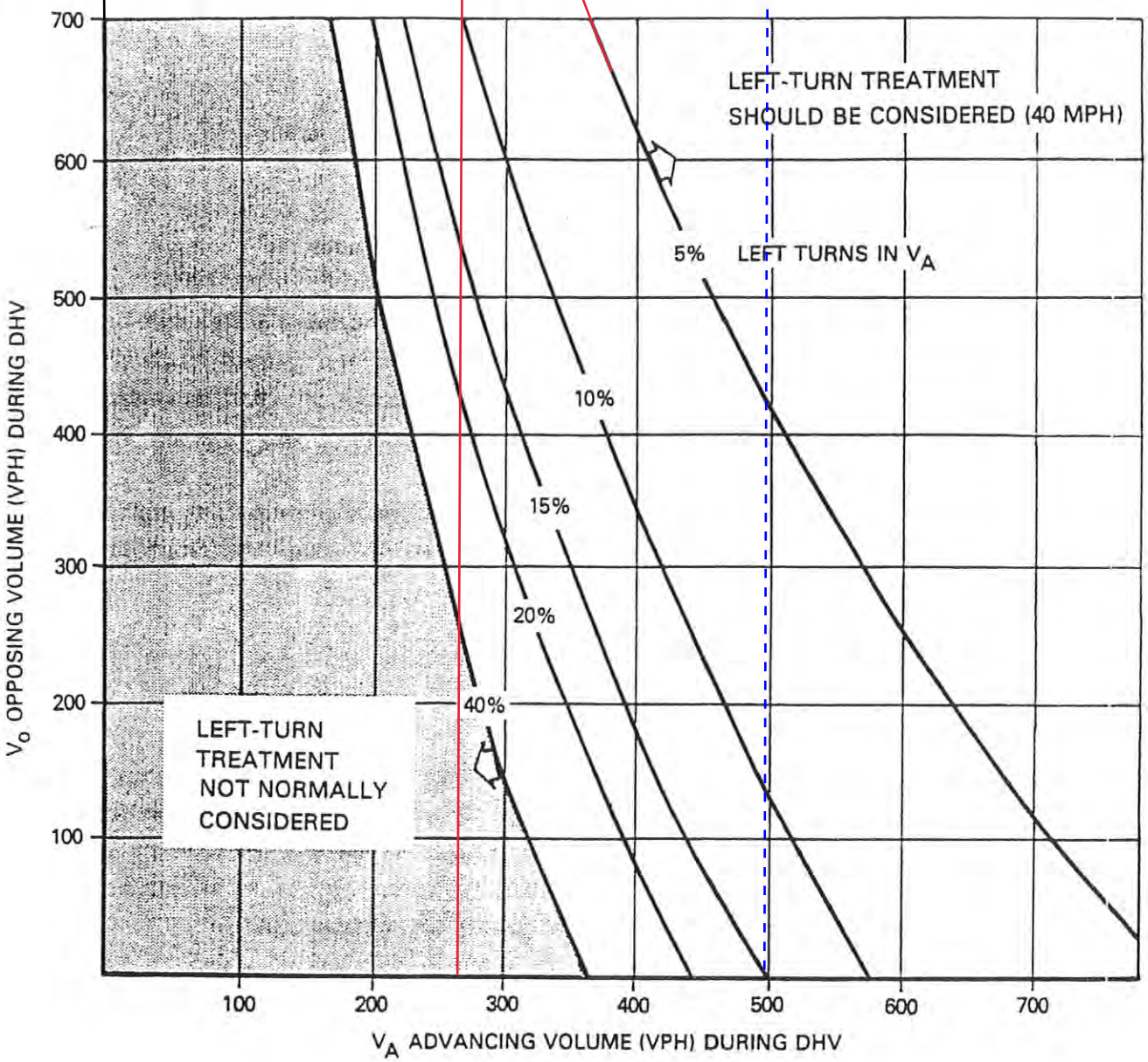
207.772.2515

Congress Street Proposed Drop Off Left Turn Lane Warrant

867



Instructions:

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.

4. Read V_A and V_O into the chart and locate the intersection of the two volumes.

5. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is warranted. If the point is to the left of the line, then a left-turn lane is not warranted based on traffic volumes.

AM Peak Hour
V_A = 269
V_O = 867
%L = 4.5%

PM Peak Hour
V_A = 496
V_O = 774
%L = 3.4%

VOLUME WARRANTS FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS (40 mph)

Figure 8-19

AM Peak Hour of Adjacent Street

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

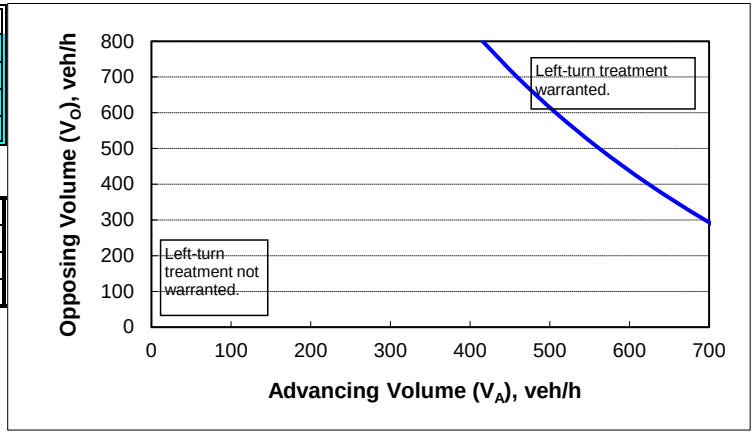
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	269
Opposing volume (V_O), veh/h:	867

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	389
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PM Peak Hour of Adjacent Street

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

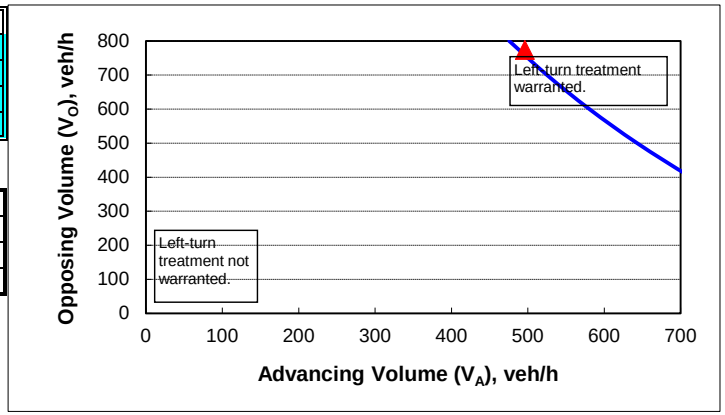
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	496
Opposing volume (V_O), veh/h:	774

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	488
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

November 12, 2018

Maine Medical Center
MaineHealth

Nell Donaldson, Senior Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: MMC Congress Building| 22 Bramhall St| Level III Site Plan
Request for Summary of Activity on the Bramhall Campus over 10 Years

Dear Nell:

Thank you for coordinating the review of the Maine Medical Center Congress Building project located at 22 Bramhall with frontage on Congress St.. This letter provides a summation of building projects on MMC's Bramhall Campus over the past ten years. This information was requested on Tuesday October, 23, 2018 by Tom Errico, TY Lin, as part of the Traffic Movement Permit (TMP) scoping meeting.

Executive Summary

Maine Medical Center is a provider of advanced healthcare services to Northern New England residents and visitors as described in MMC's Institutional Development Plan (IDP) which was approved by the Portland Planning Board on October 9, 2017 on file with at the City of Portland.

Many MMC departments and employees serve a system-wide role yet are considered MMC employees. Many of these departments are not located on MMC's Bramhall Campus. This means reporting the total number of MMC employees will not provide an accurate representation of the number of vehicle trips generated by MMC's Bramhall Campus.

MMC's human resources information systems are not built to report the number of employees working at the Bramhall Campus with a level of accuracy that would usefully inform a traffic analysis. The complexity of providing high-quality healthcare services in an ever-changing environment requires matrixed reporting relationships that create significant challenges to reporting this information accurately.

MMC transitioned to a new electronic medical record (EMR) in 2013 called EPIC. At the time, MMC decided not to translate data from its prior EMR into EPIC. This means that reporting information from and prior to 2013 is not commonly done within the organization. However, in 2003, MMC submitted a Certificate of Need application to the State of Maine which required the reporting of calendar year 2001 patient discharges. Patient discharges is a common way for hospitals to report patient volume. It is not a comprehensive metric of patient volume because it only captures inpatient volume, not outpatient volume. In calendar year 2001, MMC has 30,798 inpatient discharges. More recent inpatient discharge volumes are more readily available.

Figure 1 - MMC Inpatient Discharges CY 2014 - CY 2017

	CY 2014	CY 2015	CY 2016	CY 2017
MMC Inpatient Discharges	28,605	29,034	29,492	30,127

Source: MHDO 2014-2017

Existing Site Location of Development Permit

The Maine Department of Environmental Protection (MeDEP) issued a Site Location of Development Permit (SLODA) L-7981-T3-C-N to Maine Medical Center on June 2nd, 1998 for a 49,150 square foot medical office building located at 887 Congress St. A copy of this permit is included with this letter. At the time this permit was issued, the traffic permitting rules were essentially as they are today with a 100 peak hour threshold triggering the permit, but the process was incorporated into the SLODA permit and rather than a separate permit issued by the MaineDOT with delegated review authority to the City of Portland as is done today.

Past Facility Projects

In 2007, MMC completed a 192,000 square foot expansion for the Obstetrics and Newborn Center as well as a 512 space parking garage. The proposed expansion did not require a Traffic Movement Permit since the project was largely proposed to allow for decompression of the campus since much of the existing hospital space did not meet current industry standards. The traffic study completed in 2004 by Gorrill Palmer forecast an increase of 19 and 25 trip ends during the AM and PM peak hours respectively. Since the increase was less than 100 trip ends, a traffic permit was not required.

In 2016, MMC completed a 18,758 square foot expansion for additional inpatient beds and procedure spaces. The project forecasted to add 49 employees bringing the total employees added since and including the 2007 expansion to 184. The forecasted increase resulted in an estimated increase of 77 and 84 trip ends during the AM and PM peak hours respectively due to the 2007 and proposed expansions combined. This increase was less than the 100 trip ends threshold requiring a MaineDOT traffic movement permit.

Current Proposal

MMC is currently proposing to deconstruct a 1,200 space parking garage and construct a 265,000 square foot hospital building to internally reorganize cardiac services within the hospital campus, which means timely, efficient access for patients and care teams and reduction of time and effort spent traveling through the hospital corridors. The 19 procedure rooms will align with industry best practices, providing adequate space to treat patients, ultimately improving the experience at MMC. The project is anticipated to generate additional trip ends by 2026 as follows:

Figure 2 - Estimated Trip Ends in 2026

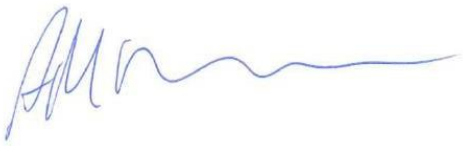
- AM Peak Hour Adjacent Street: 110 trip ends
- PM Peak Hour Adjacent Street: 107 trip ends
- AM Peak Hour of Generator: 126 trip ends
- PM Peak Hour of Generator: 152 trip ends
- Saturday Peak Hour: 172 trip ends

Source: MMC TMP Application Section 7 (Submitted by Gorrill Palmer) Amended October 2018

Closing

We hope that this clarifies the status of the traffic permitting and employee growth on the Bramhall campus for MMC over the past 10 years.

Sincerely,



Alexander M. Green
Director of Planning & Regulatory Compliance
Maine Medical Center

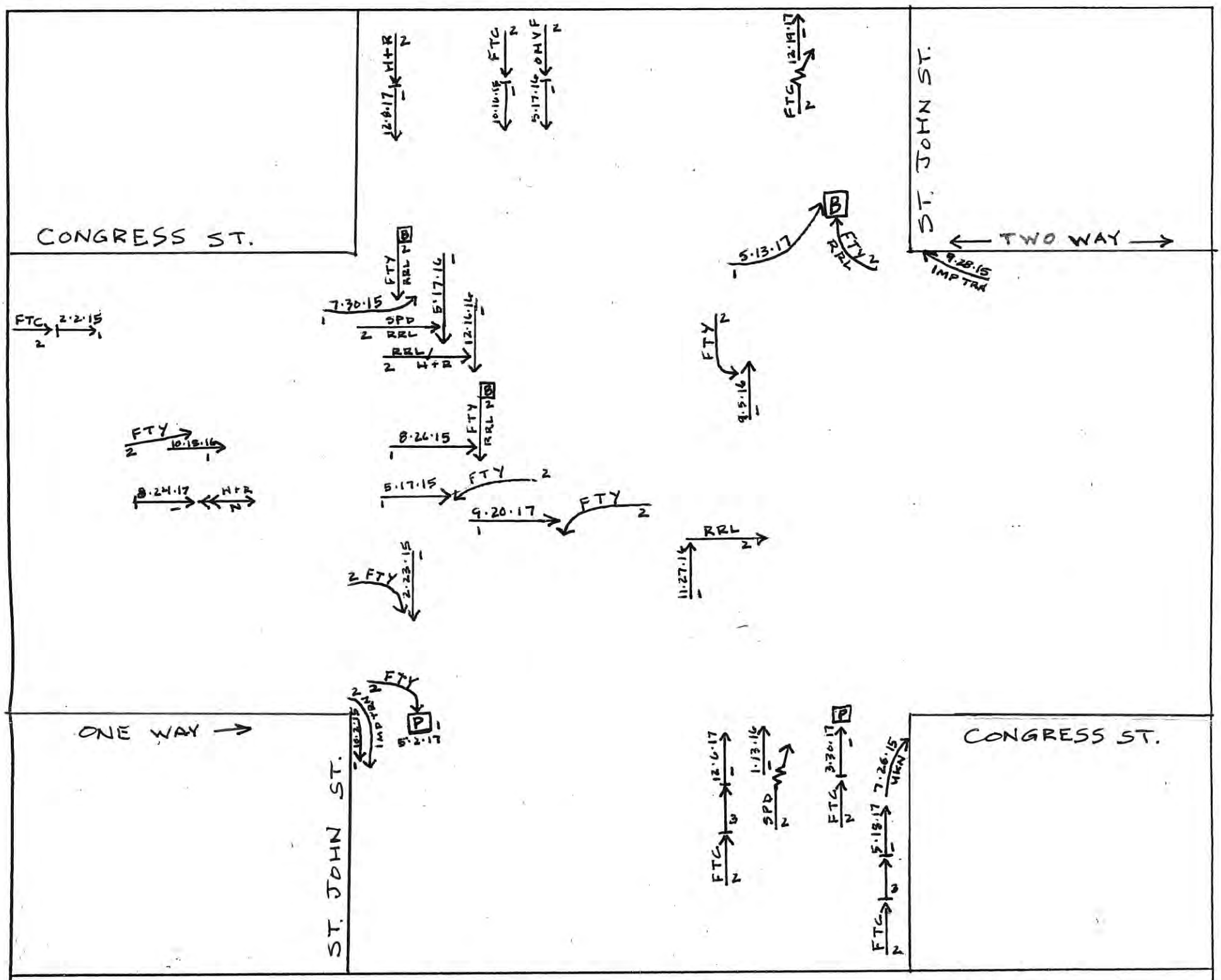
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, Maine NODE NO(S) 16765

YEARS REVIEWED 2015 - 2017 DATE PREPARED Nov. 16, 2018



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT

1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE

1. DRY 2. WET 3. SNOW/SLUSH–SANDED
4. ICE/PACKED SNOW–SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH–NOT SANDED 9. ICE–PKD. SNOW–NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS – HUMAN

1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER–NO PASSING 7. IMPROPER PASS–OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION–DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED–WINDSHIELD GLASS
19. VISION OBSCURED–SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

– VEHICULAR

41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE, BACKING, FIXED OBJECT, HEAD ON, OVERTURN, PARKED VEHICLE, PEDESTRIAN, REAR END, SIDE SWIPE, TURNING MOVE, CHANGE LANE, OUT OF CONTROL, FATAL ACCIDENT, VEHICLE (MOVING), BICYCLE (B), ANIMAL (A), SLED (S)

WEATHER

C – CLEAR
SL – SLEET
F – FOG
S – SNOW
R – RAIN
CL – CLOUDY
XW = CROSS WINDS

INJURIES

K – FATAL
A – INCAPACITATING
B – NON–INCAPACITATING
C – POSSIBLE INJURY

S:/SHEETS/COLLISION DIAGRAM.DWG

COLLISION DIAGRAM

SHEET 2 OF 2

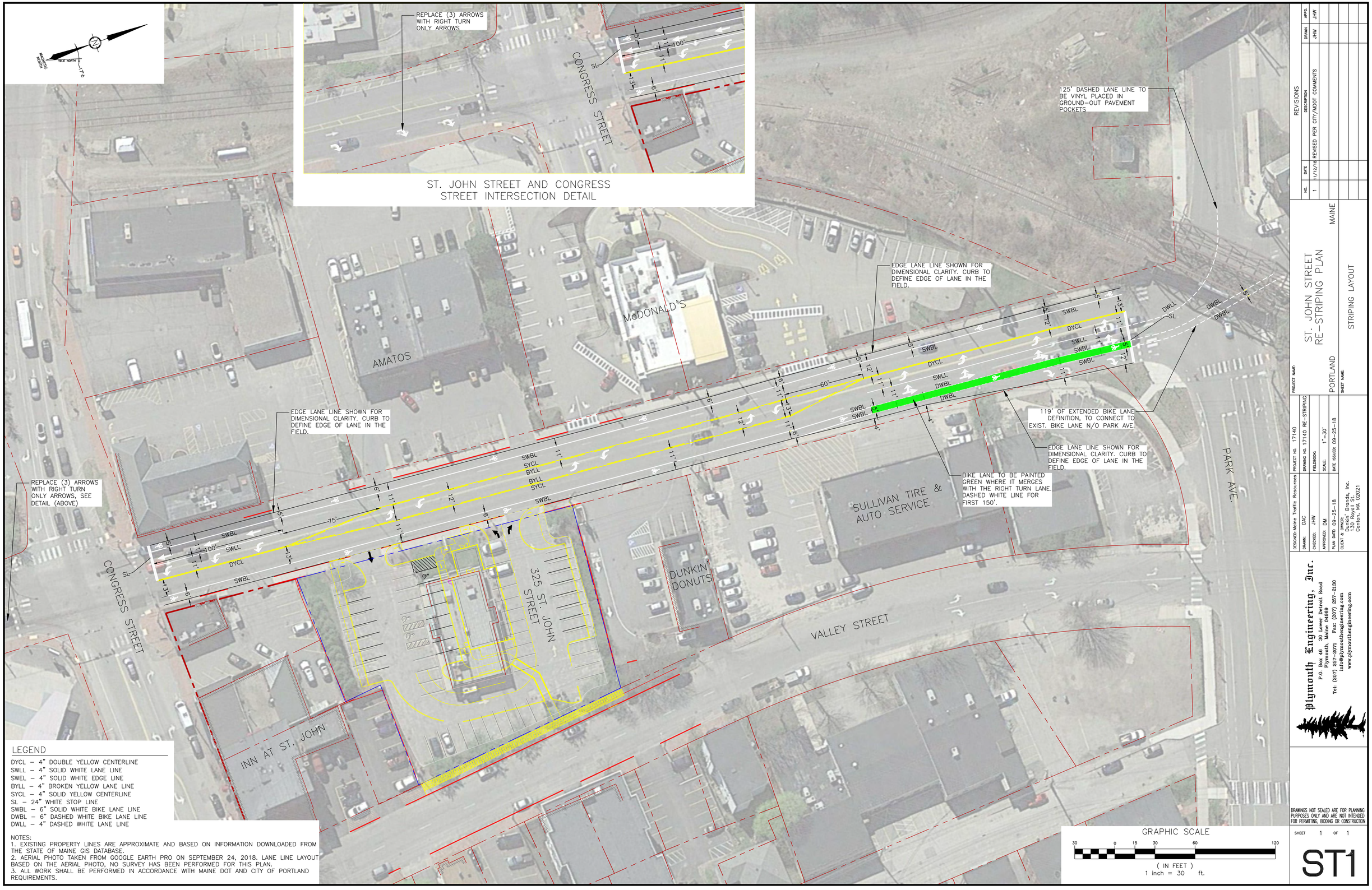
LOCATION Intersection of Congress Street & St. John Street

TOWN Portland, Maine NODE NO(S) 167165

YEARS REVIEWED 2015 - 2017 DATE PREPARED Nov. 16, 2018

REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
15·000457	02·02·15	15:00					2	3	4	
15·000921	02·23·15	11:38					2	1	2	
15·001773	05·17·15	16:12					2	1	2	
15·002529	07·26·15	21:21					4	1	51	swerve to miss vehicle
15·002575	07·30·15	19:30			1		3	1	30	Cyclist
15·002891	08·26·15	07:24				1	2	1	30	Cyclist
15·003256	09·28·15	16:23					2	1	10	
15·003322	10·02·15	13:18					2	1	10	
15·003479	10·16·15	13:19					2	1	4	
16·000137	01·13·16	08:55					2	3	3	
16·001002	03·27·16	12:50					2	1	3	
16·001459	05·17·16	08:00					2	1	30	
16·002712	09·05·16	06:00					2	1	2	
16·003213	10·18·16	06:53					2	1	2	
16·003632	11·27·16	17:25					4	1	5	Ran Red Light
16·003853	12·16·16	21:30					4	1	31	
17·001104	03·30·17	18:47					2	1	4	
17·001440	05·02·17	14:50				1	2	2	2	Pedestrian
17·001571	05·13·17	10:45				1	2	1	5	Cyclist
17·001623	05·18·17	16:55					2	1	4	
17·002694	08·24·17	08:25					2	1	31	
17·002991	09·20·17	05:38			1		4	2	2	
17·003791	12·06·17	14:21					2	1	4	
17·003814	12·08·17	13:26					2	1	31	
17·003968	12·19·17	07:34					2	3	4	

SHEETS/COLLISION DIAGRAM.DWG



LEGEND

DYCL – 4" DOUBLE YELLOW CENTERLINE
SWLL – 4" SOLID WHITE LANE LINE
SWEL – 4" SOLID WHITE EDGE LINE
BYLL – 4" BROKEN YELLOW LANE LINE
SYCL – 4" SOLID YELLOW CENTERLINE
SL – 24" WHITE STOP LINE
SWBL – 6" SOLID WHITE BIKE LANE LINE
DWBL – 6" DASHED WHITE BIKE LANE LINE
DWLL – 4" DASHED WHITE LANE LINE

NOTES:
1. EXISTING PROPERTY LINES ARE APPROXIMATE AND BASED ON INFORMATION DOWNLOADED FROM THE STATE OF MAINE GIS DATABASE.
2. AERIAL PHOTO TAKEN FROM GOOGLE EARTH PRO ON SEPTEMBER 24, 2018. LANE LINE LAYOUT BASED ON THE AERIAL PHOTO, NO SURVEY HAS BEEN PERFORMED FOR THIS PLAN.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH MAINE DOT AND CITY OF PORTLAND REQUIREMENTS.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

REVISIONS

NO.	DATE	DESCRIPTION	DRAWN	APPD.
1	11/12/18	REVISED PER CITY/MDOT COMMENTS	JHW	JHW

PROJECT NAME:
ST. JOHN STREET RE-STRIPING PLAN
PORTLAND MAINE

SHEET NAME:
STRIPING LAYOUT

DESIGNED: Maine Traffic Resources
DRAWN: DAC
CHECKED: JHW
APPROVED: DM
PLAN DATE: 09-25-18

PROJECT NO. 17140
DRAWING NO. 17140 RE-STRIPING
FIELDBOOK:
SCALE: 1"=30'
DATE ISSUED: 09-25-18

CLIENT & OWNER:
Dunkin' Brands, Inc.
130 Royall Street
Canton, MA 02021

Plymouth Engineering, Inc.
P.O. Box 46 30 Lower Detroit Road
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DRAWINGS NOT SEALED ARE FOR PLANNING PURPOSES ONLY AND ARE NOT INTENDED FOR PERMITTING, BIDDING OR CONSTRUCTION

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	7646	7538	7768	7754	7712	7687
Vehs Exited	7626	7569	7729	7698	7683	7659
Starting Vehs	239	271	247	222	259	242
Ending Vehs	259	240	286	278	288	271
Denied Entry Before	2	1	0	0	1	0
Denied Entry After	3	2	2	1	3	0
Travel Distance (mi)	5425	5384	5489	5511	5512	5464
Travel Time (hr)	275.8	275.2	276.8	283.5	278.1	277.9
Total Delay (hr)	79.3	80.8	77.7	84.1	78.6	80.1
Total Stops	9140	9229	9289	9366	9326	9268
Fuel Used (gal)	197.0	195.8	198.4	200.6	199.3	198.2

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	7646	7538	7768	7754	7712	7687
Vehs Exited	7626	7569	7729	7698	7683	7659
Starting Vehs	239	271	247	222	259	242
Ending Vehs	259	240	286	278	288	271
Denied Entry Before	2	1	0	0	1	0
Denied Entry After	3	2	2	1	3	0
Travel Distance (mi)	5425	5384	5489	5511	5512	5464
Travel Time (hr)	275.8	275.2	276.8	283.5	278.1	277.9
Total Delay (hr)	79.3	80.8	77.7	84.1	78.6	80.1
Total Stops	9140	9229	9289	9366	9326	9268
Fuel Used (gal)	197.0	195.8	198.4	200.6	199.3	198.2

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	3.4	0.0	0.0	0.2
Total Del/Veh (s)	8.1	3.1	2.0	2.8
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.4	0.1	0.5	0.1	0.4
Total Del/Veh (s)	15.0	6.9	5.9	6.8	7.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	2.7	0.0	2.1	0.8
Total Del/Veh (s)	12.7	16.2	13.7	16.4	14.2
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	0.3	1.2	0.0	0.6
Total Del/Veh (s)	30.7	17.5	42.3	26.9	30.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

12: Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.4	23.5	1.8
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.4	0.4	0.0	0.3
Total Del/Veh (s)	24.6	17.2	11.6	19.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

16: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.7	0.2
Total Del/Veh (s)	1.9	0.9	10.3	2.3
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.3	0.0	0.7	0.6
Total Del/Veh (s)	31.4	20.6	24.1	25.0
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.1	0.1	0.2
Total Del/Veh (s)	1.3	1.0	12.8	10.8	2.1
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

29: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.9	2.2	2.8	1.2
Total Del/Veh (s)	7.3	13.3	13.1	10.0	9.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

35: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.1
Total Del/Veh (s)	2.0	1.9	16.6	5.3	2.3
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	35.3
Denied Entry Before	0
Denied Entry After	0

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	38	62	158	61
Average Queue (ft)	10	31	29	4
95th Queue (ft)	34	54	91	26
Link Distance (ft)	620		678	670
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	158	82	36	54	128	74	196
Average Queue (ft)	67	29	11	23	52	25	83
95th Queue (ft)	119	62	35	46	104	63	150
Link Distance (ft)	564		489		1605		678
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	0				1	0	6
Queuing Penalty (veh)	0				0	1	2

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	302	132	254	93	170	270	48	54
Average Queue (ft)	64	70	131	24	77	136	13	13
95th Queue (ft)	190	116	211	59	144	229	40	41
Link Distance (ft)	1605			1012	268	268	937	
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						1		
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	1	1						
Queuing Penalty (veh)	2	1						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	R	L	T
Maximum Queue (ft)	644	847	315	98	123	428	168	124	245
Average Queue (ft)	187	355	186	44	59	204	38	75	127
95th Queue (ft)	403	689	359	87	107	369	147	136	219
Link Distance (ft)	1767	1767			178	670			796
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			290	80			175	100	
Storage Blk Time (%)		13	0	3	3	20	0	6	13
Queuing Penalty (veh)		43	1	5	2	8	0	18	12

Intersection: 12: Congress Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	4	112	73
Average Queue (ft)	0	14	23
95th Queue (ft)	3	66	58
Link Distance (ft)	169	202	174
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	375	394	349	319	187	192	91	146	138	135
Average Queue (ft)	177	250	105	105	127	110	40	60	70	72
95th Queue (ft)	394	428	318	240	175	169	80	110	112	111
Link Distance (ft)			2719	2719	1454	1454		268	268	268
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)	2	4	0							
Queuing Penalty (veh)	8	22	2							

Intersection: 16: Valley & Congress Street

Movement	EB	EB	WB	NB	NB
Directions Served	L	TR	L	LT	R
Maximum Queue (ft)	24	24	46	62	63
Average Queue (ft)	2	1	13	23	28
95th Queue (ft)	13	12	37	52	55
Link Distance (ft)		178		315	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	50		50		170
Storage Blk Time (%)		0	0		
Queuing Penalty (veh)		0	1		

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	150	215	250	198	395	135	401	80
Average Queue (ft)	73	106	134	110	171	110	181	66
95th Queue (ft)	132	180	203	198	295	170	329	105
Link Distance (ft)			1678		796		2255	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	95	95		175		110		55
Storage Blk Time (%)	4	10	26	0	19	1	36	5
Queuing Penalty (veh)	13	31	101	1	90	4	60	20

Intersection: 24: Gilman Street & Congress Street

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	62	47	88	48
Average Queue (ft)	5	12	37	17
95th Queue (ft)	31	37	68	45
Link Distance (ft)	124		1063	624
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		1		

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	51	226	165	90	104	125	125	75
Average Queue (ft)	17	101	46	70	48	60	35	45
95th Queue (ft)	44	174	126	102	96	111	83	77
Link Distance (ft)	965		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			0	12		0	2	7
Queuing Penalty (veh)			1	4		0	3	5

Intersection: 35: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	104	29	48	30
Average Queue (ft)	32	2	19	5
95th Queue (ft)	82	16	46	22
Link Distance (ft)	202	965	508	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 464

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	45.0	5.0	6.5	34.0	5.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	27.9	5.0	5.7	22.2	5.0
g/C Ratio	-0.01	-0.01	-0.01	NA	-0.01
Cycles Skipped (%)	9	9	75	0	9
Cycles @ Minimum (%)	0	91	7	1	91
Cycles Maxed Out (%)	9	91	7	20	91
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	26.0	21.0	18.0	26.0	44.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	13.8	16.2	11.5	13.8	30.6
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	6	4	12	6	3
Cycles @ Minimum (%)	0	0	1	0	0
Cycles Maxed Out (%)	4	29	16	4	6
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	19.1	15.7	4.7	17.7	5.0	29.8	29.2
Minimum Green (s)	8.0	8.0	3.0	8.0	5.0	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	16.3	15.3	4.9	17.2	5.2	30.3	27.6
g/C Ratio	NA	NA	-0.01	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	9	0	38	0	0
Cycles @ Minimum (%)	2	23	0	0	62	0	0
Cycles Maxed Out (%)	49	60	91	79	62	94	71
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	39.0	11.0	17.0	17.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	38.9	10.3	16.8	15.9
g/C Ratio	-0.01	-0.01	NA	NA
Cycles Skipped (%)	3	3	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	60	70	92	66
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	15.0	20.0	10.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	14.7	18.1	10.0
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	90	65	98
Cycles with Peds (%)	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 29: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	13.5	5.5	17.5	5.5	13.5	5.5	17.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	5.6	15.0	6.7	14.3	5.4	16.3	7.5	14.6
g/C Ratio	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cycles Skipped (%)	60	2	77	6	71	2	80	6
Cycles @ Minimum (%)	1	0	11	0	10	0	0	0
Cycles Maxed Out (%)	35	98	11	38	17	98	20	33
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:10	7:10	7:10	7:10	7:10	7:10
Total Time (min)	13	13	13	13	13	13
Time Recorded (min)	10	10	10	10	10	10
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1312	1361	1422	1347	1303	1354
Vehs Exited	1256	1336	1384	1268	1261	1302
Starting Vehs	217	241	248	228	209	227
Ending Vehs	273	266	286	307	251	272
Denied Entry Before	1	1	1	3	3	1
Denied Entry After	33	5	6	11	0	9
Travel Distance (mi)	773	800	844	789	747	790
Travel Time (hr)	47.2	45.2	48.0	45.9	39.3	45.1
Total Delay (hr)	18.9	16.1	17.3	17.2	12.1	16.3
Total Stops	1821	1757	1918	1743	1493	1748
Fuel Used (gal)	30.5	30.6	32.5	30.5	27.7	30.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1312	1361	1422	1347	1303	1354
Vehs Exited	1256	1336	1384	1268	1261	1302
Starting Vehs	217	241	248	228	209	227
Ending Vehs	273	266	286	307	251	272
Denied Entry Before	1	1	1	3	3	1
Denied Entry After	33	5	6	11	0	9
Travel Distance (mi)	773	800	844	789	747	790
Travel Time (hr)	47.2	45.2	48.0	45.9	39.3	45.1
Total Delay (hr)	18.9	16.1	17.3	17.2	12.1	16.3
Total Stops	1821	1757	1918	1743	1493	1748
Fuel Used (gal)	30.5	30.6	32.5	30.5	27.7	30.4

1: St. John Street & Margaritas Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	2.5	0.0	0.0	0.3
Total Del/Veh (s)	11.7	3.7	2.2	3.9
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

3: St. John Street & Garage Access/D St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	0.1	0.3	0.1	0.7
Total Del/Veh (s)	11.7	7.1	8.2	10.6	10.2
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

5: Valley & St. John Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	2.5	0.0	1.4	0.8
Total Del/Veh (s)	10.9	14.1	12.5	20.6	12.6
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	0	0	0	0

7: St. John Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.4	12.9	0.0	4.2
Total Del/Veh (s)	25.8	25.1	50.3	26.1	32.9
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	7	0	7

12: Gilman Street & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.1	1.7	19.9	12.9	2.8
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

13: Fore River Pkwy & Valley Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.8	0.4	0.0	0.4
Total Del/Veh (s)	18.1	18.6	11.8	16.5
Denied Entry Before	0	0	0	0
Denied Entry After	1	0	0	1

18: Bramhall Street/Deering Avenue & Congress Street Performance by approach

Approach	EB	WB	NE	SW	All
Denied Del/Veh (s)	0.0	1.4	2.6	3.2	1.5
Total Del/Veh (s)	13.7	22.4	13.5	13.7	15.1
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

19: St. John Street & Park Avenue Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	1.6	1.5	1.1	1.5
Total Del/Veh (s)	40.0	31.4	27.0	34.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	1	0	1

22: Proposed Drop Off & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.2	1.8	19.9	2.2
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

24: Valley & Congress Street Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	1.8	0.2
Total Del/Veh (s)	2.1	1.0	14.4	3.0
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

32: Visitor Garage/Forest Street Garage & Congress Street Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.2	2.0	15.6	6.9	2.6
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	2.6
Total Del/Veh (s)	35.1
Denied Entry Before	1
Denied Entry After	9

Intersection: 1: St. John Street & Margaritas

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	60	46	100	4
Average Queue (ft)	36	33	42	1
95th Queue (ft)	67	50	116	8
Link Distance (ft)	549		677	671
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: St. John Street & Garage Access/D St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	150	77	34	43	143	63	156
Average Queue (ft)	100	48	11	11	80	32	103
95th Queue (ft)	178	115	36	54	159	71	169
Link Distance (ft)	559		663		1605		677
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		150		100		75	
Storage Blk Time (%)	2	0			2	1	13
Queuing Penalty (veh)	3	0			0	5	5

Intersection: 5: Valley & St. John Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	81	114	201	33	85	140	34	36
Average Queue (ft)	49	79	131	21	58	89	11	10
95th Queue (ft)	97	125	217	46	99	160	37	36
Link Distance (ft)	1605			988	270	270	1083	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		110	335					265
Storage Blk Time (%)	0	2						
Queuing Penalty (veh)	0	2						

Intersection: 7: St. John Street & Congress Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	R	T	R	L	T
Maximum Queue (ft)	209	352	129	74	123	510	197	117	238
Average Queue (ft)	148	248	58	38	92	393	87	69	139
95th Queue (ft)	249	405	153	95	153	672	237	129	260
Link Distance (ft)	1767	1767			180	671			794
Upstream Blk Time (%)					0	1			
Queuing Penalty (veh)					1	8			
Storage Bay Dist (ft)			290	80			175	100	
Storage Blk Time (%)		4	0	0	15	41	0	2	14
Queuing Penalty (veh)		7	0	0	7	32	1	7	11

Intersection: 12: Gilman Street & Congress Street

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	34	66	65	43
Average Queue (ft)	9	29	42	21
95th Queue (ft)	36	65	71	51
Link Distance (ft)	122		1063	624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		2		
Queuing Penalty (veh)		7		

Intersection: 13: Fore River Pkwy & Valley

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T	T	R	L	R	R
Maximum Queue (ft)	213	255	138	73	209	191	52	79	127	126
Average Queue (ft)	104	178	66	50	164	143	28	52	92	95
95th Queue (ft)	238	300	179	84	257	241	56	90	136	132
Link Distance (ft)			1519	1519	1275	1275		270	270	270
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	430	430					415			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Movement	EB	EB	WB	WB	NE	NE	SW	SW
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	134	183	133	87	113	128	188	75
Average Queue (ft)	78	121	82	65	43	85	103	69
95th Queue (ft)	153	189	180	100	133	146	213	86
Link Distance (ft)	966		1272		1186		795	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		400		65		135		50
Storage Blk Time (%)			5	16		2	5	28
Queuing Penalty (veh)			9	16		1	20	25

Intersection: 19: St. John Street & Park Avenue

Movement	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	138	218	321	200	558	135	188	78
Average Queue (ft)	96	193	270	170	385	118	134	55
95th Queue (ft)	172	268	448	250	740	179	213	99
Link Distance (ft)			1640		794		1376	
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					3			
Storage Bay Dist (ft)	95	95		175		110		55
Storage Blk Time (%)	12	33	54	1	37	0	37	3
Queuing Penalty (veh)	52	141	287	9	225	2	41	8

Intersection: 22: Proposed Drop Off & Congress Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	4	90	57
Average Queue (ft)	1	34	32
95th Queue (ft)	8	118	70
Link Distance (ft)	170	201	194
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 24: Valley & Congress Street

Movement	EB	WB	WB	NB	NB
Directions Served	L	L	TR	LT	R
Maximum Queue (ft)	14	38	2	72	45
Average Queue (ft)	3	16	0	45	28
95th Queue (ft)	16	43	4	85	56
Link Distance (ft)			122	393	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	50	50			170
Storage Blk Time (%)		1			
Queuing Penalty (veh)		2			

Intersection: 32: Visitor Garage/Forest Street Garage & Congress Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	11	52	55	47
Average Queue (ft)	2	12	37	35
95th Queue (ft)	20	59	63	50
Link Distance (ft)	201	966	624	434
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 937

Intersection: 3: St. John Street & Garage Access/D St

Phase	2	4	5	6	8
Movement(s) Served	NBTL	EBTL	NBL	SBTL	WBTL
Maximum Green (s)	31.0	19.0	5.5	21.0	19.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	Min	None	None	Min	None
Avg. Green (s)	20.4	13.9	5.5	19.6	13.9
g/C Ratio	NA	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	92	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	8	31	8	46	31
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Valley & St. John Street

Phase	2	3	4	6	8
Movement(s) Served	NBTL	WBL	EBTL	SBTL	WBT
Maximum Green (s)	18.0	19.0	18.0	18.0	42.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0
Recall	None	None	None	None	None
Avg. Green (s)	12.0	15.3	13.2	12.0	34.5
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01
Cycles Skipped (%)	9	0	9	9	9
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	18	36	27	18	18
Cycles with Peds (%)	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 7: St. John Street & Congress Street

Phase	1	2	3	4	5	6	8
Movement(s) Served	EBL	WBL	SBL	NBT	WBL	EBTL	SBT
Maximum Green (s)	19.2	11.8	4.7	31.5	4.5	26.5	43.0
Minimum Green (s)	8.0	8.0	3.0	8.0	4.5	8.0	5.0
Recall	None	Min	None	None	None	Min	None
Avg. Green (s)	17.3	10.2	5.3	29.5	4.6	31.9	40.4
g/C Ratio	NA	NA	NA	NA	-0.01	NA	NA
Cycles Skipped (%)	0	0	0	0	50	0	0
Cycles @ Minimum (%)	0	57	0	0	33	0	0
Cycles Maxed Out (%)	57	29	100	71	50	83	71
Cycles with Peds (%)	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 13: Fore River Pkwy & Valley

Phase	4	6	7	8
Movement(s) Served	EBT	SBL	EBL	WBT
Maximum Green (s)	34.0	11.0	11.0	18.0
Minimum Green (s)	5.0	5.0	5.0	5.0
Recall	None	None	None	None
Avg. Green (s)	33.9	10.8	11.4	19.2
g/C Ratio	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0
Cycles Maxed Out (%)	70	82	80	90
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 18: Bramhall Street/Deering Avenue & Congress Street

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SWL	NETL	WBL	EBTL	NEL	SWTL	EBL	WBTL
Maximum Green (s)	5.5	18.5	5.5	12.5	5.5	18.5	5.5	12.5
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	6.4	20.3	6.7	13.3	5.3	23.0	9.0	11.6
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	50	0	30	9	70	0	20	10
Cycles @ Minimum (%)	0	0	20	0	0	0	0	0
Cycles Maxed Out (%)	50	100	50	55	10	100	80	40
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 19: St. John Street & Park Avenue

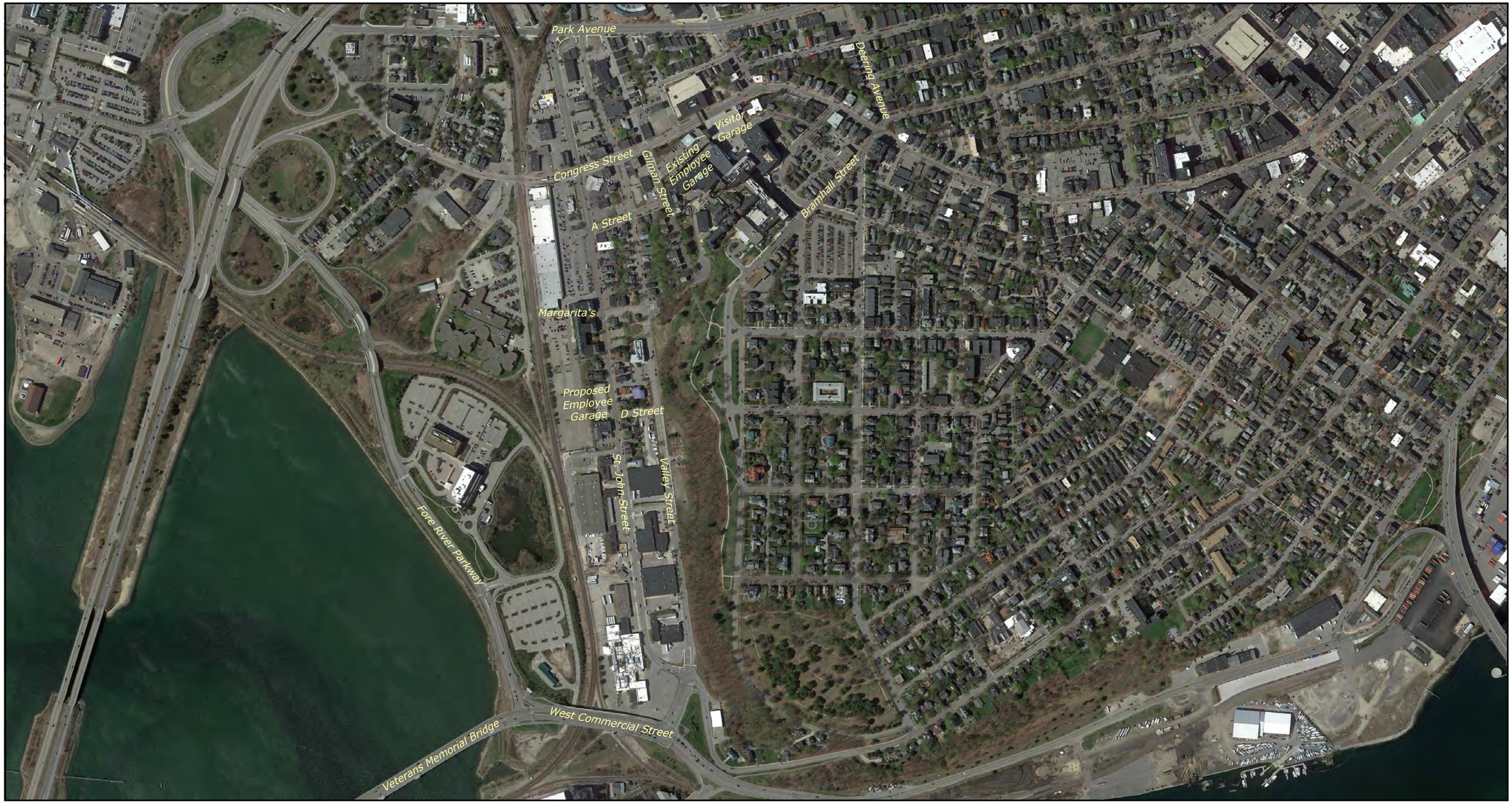
Phase	2	6	8
Movement(s) Served	NBTL	SBTL	WBTL
Maximum Green (s)	29.0	17.0	19.0
Minimum Green (s)	3.0	3.0	3.0
Recall	Min	Min	Min
Avg. Green (s)	31.4	16.3	19.0
g/C Ratio	NA	NA	NA
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	57	86
Cycles with Peds (%)	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Location Map

Figure No. 1



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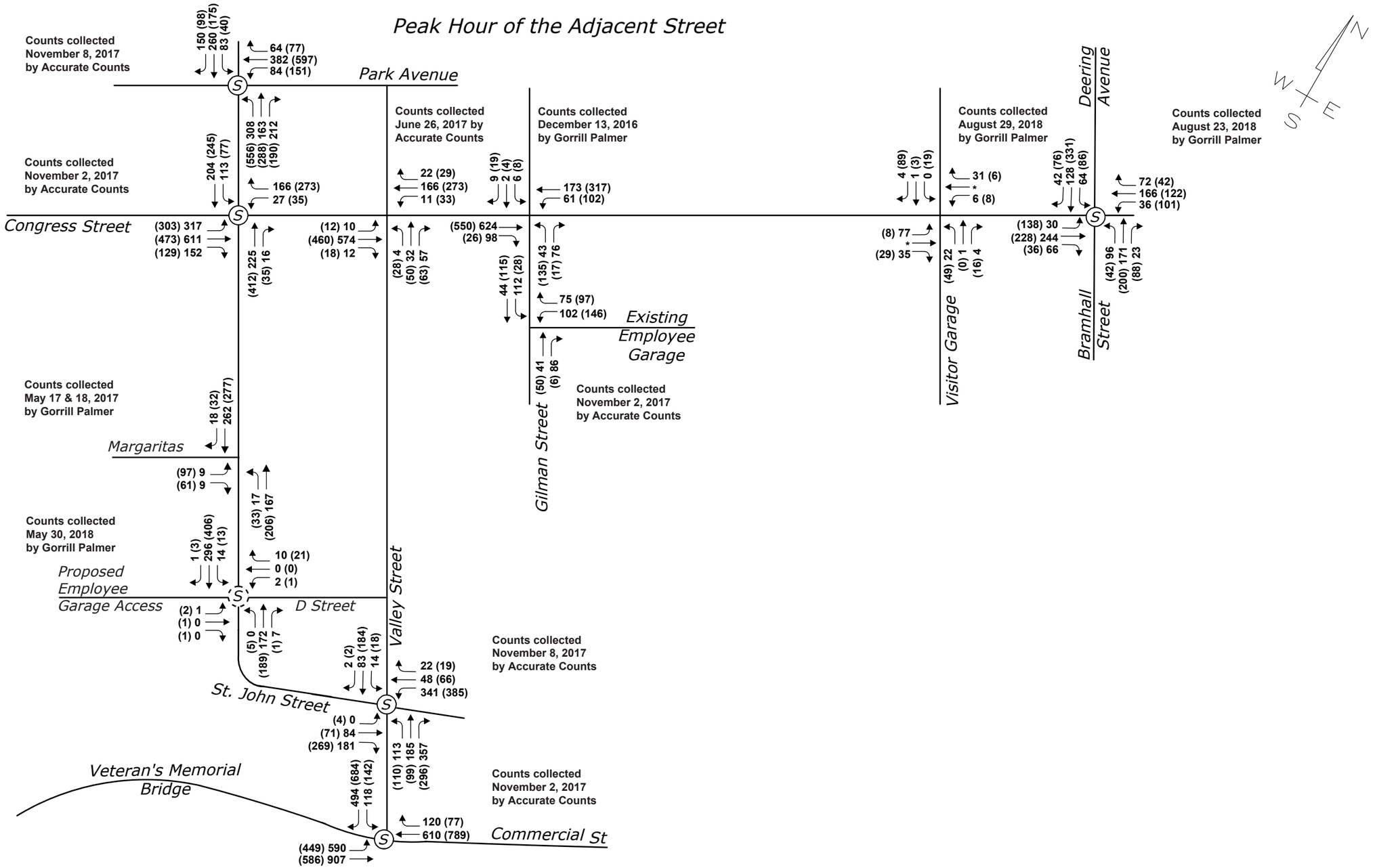

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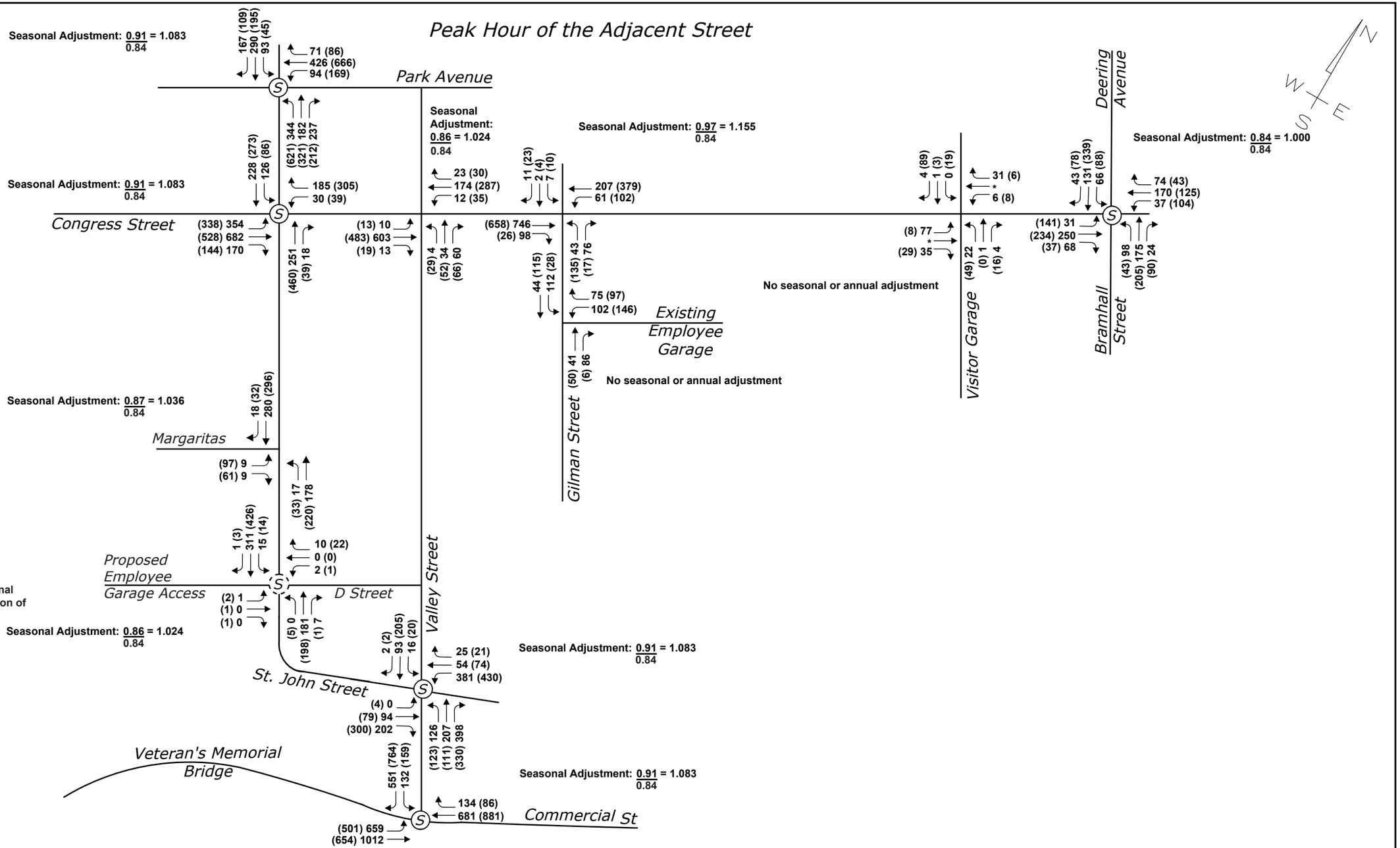
2023 Adjusted Volumes

Figure No. 3



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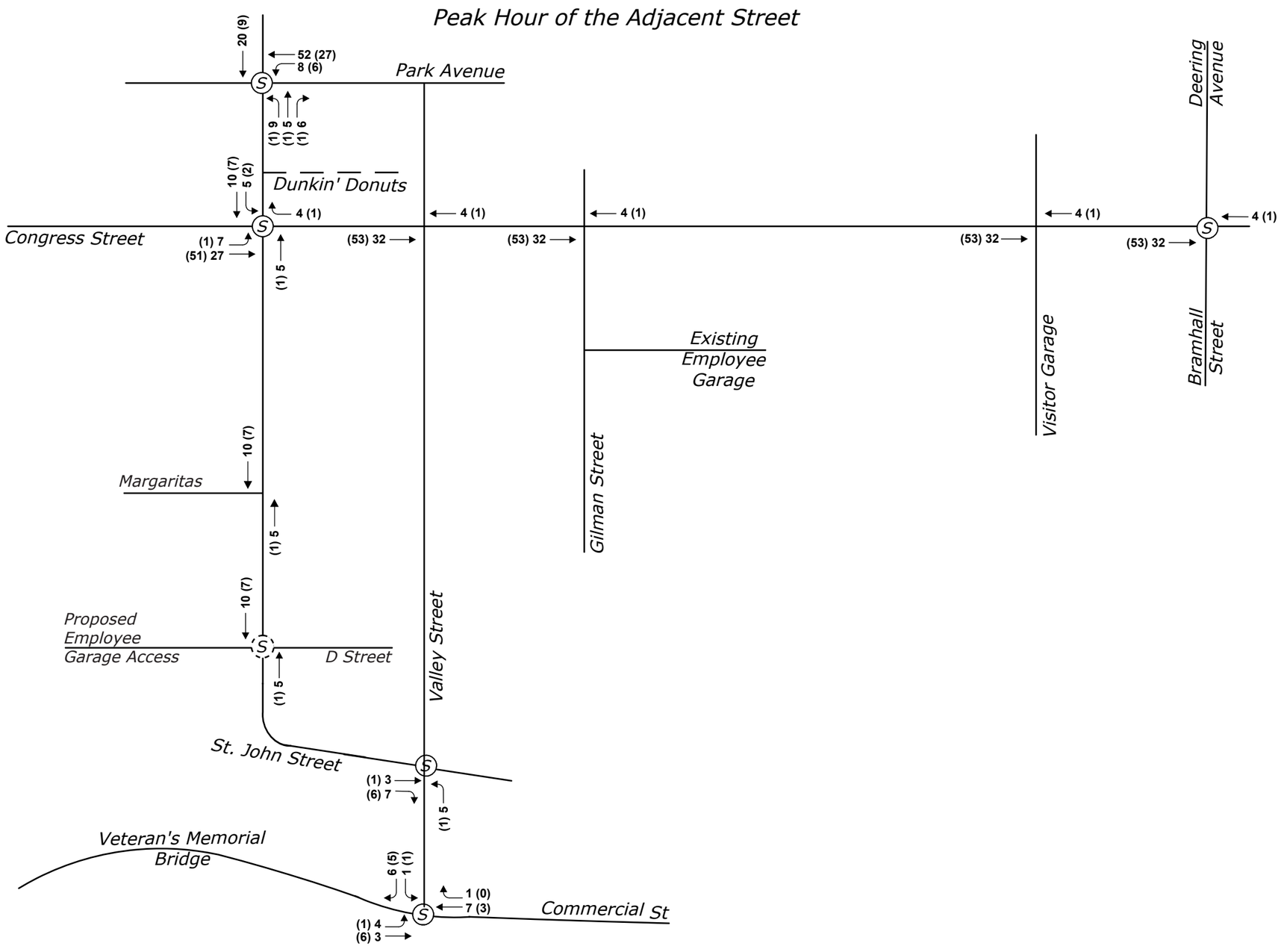
Other Development

Figure No. 4



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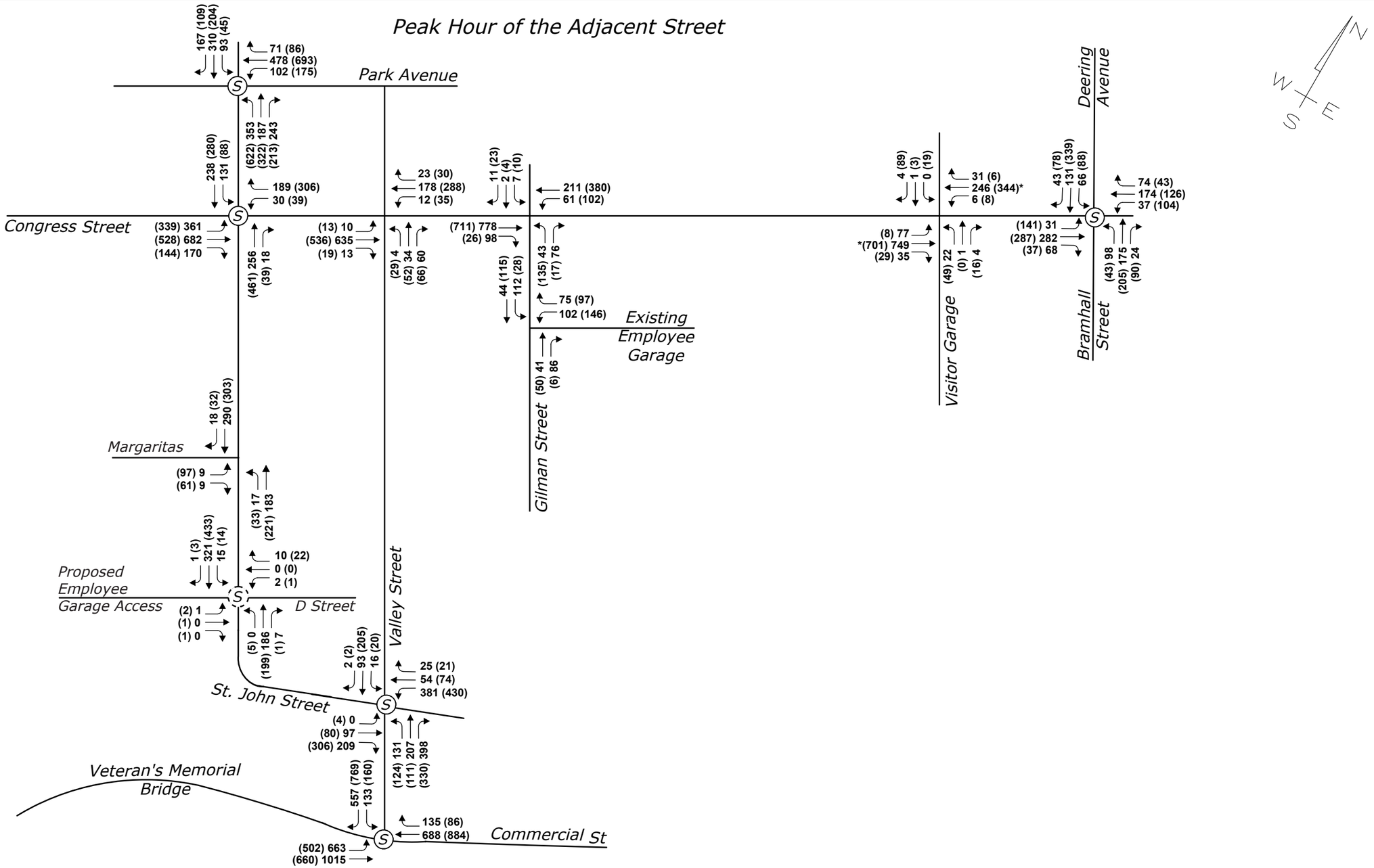
2023 Predevelopment

Figure No. 5



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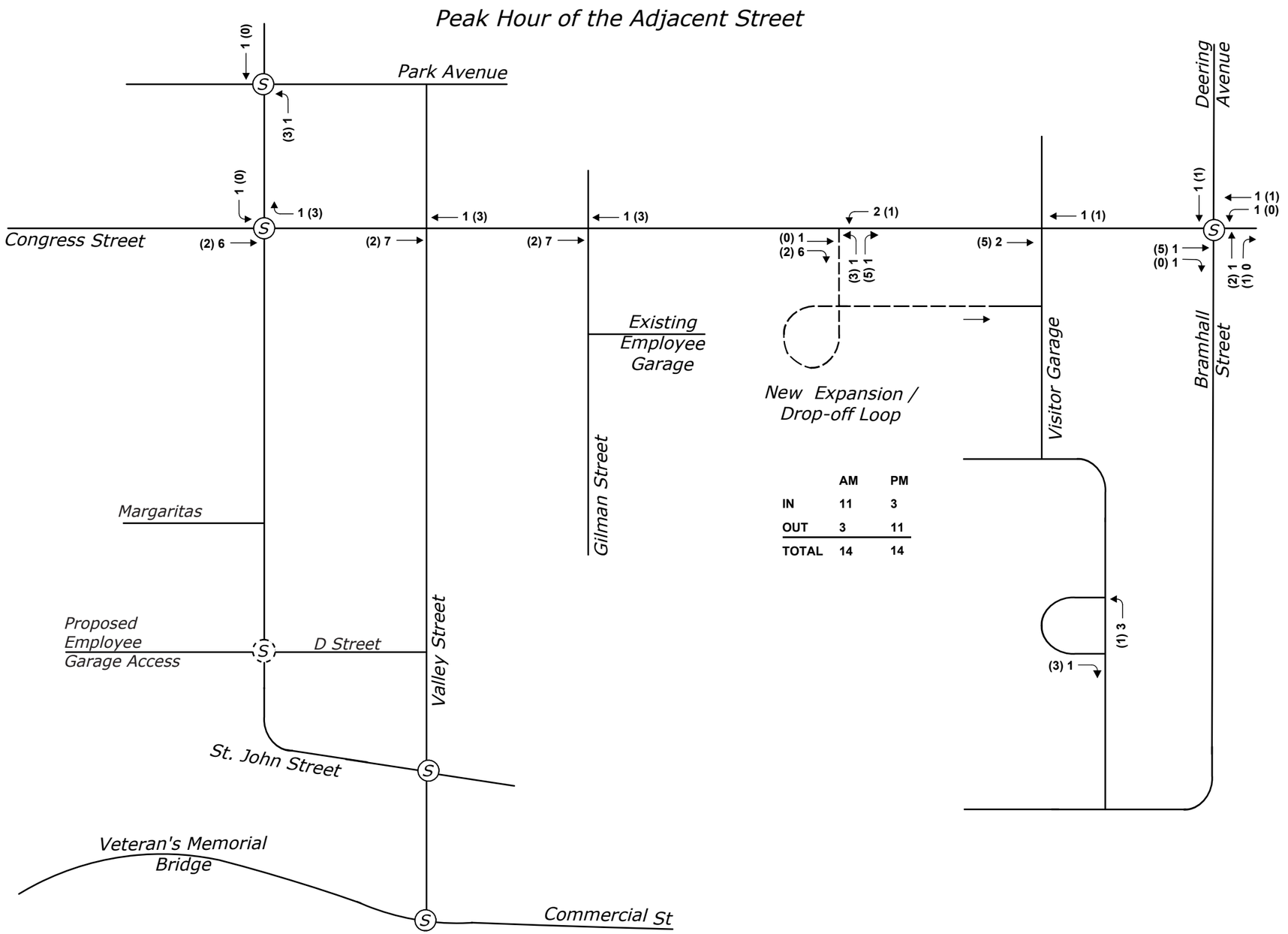
Phase 3 Patient/Visitor Assignment

Figure No. 6



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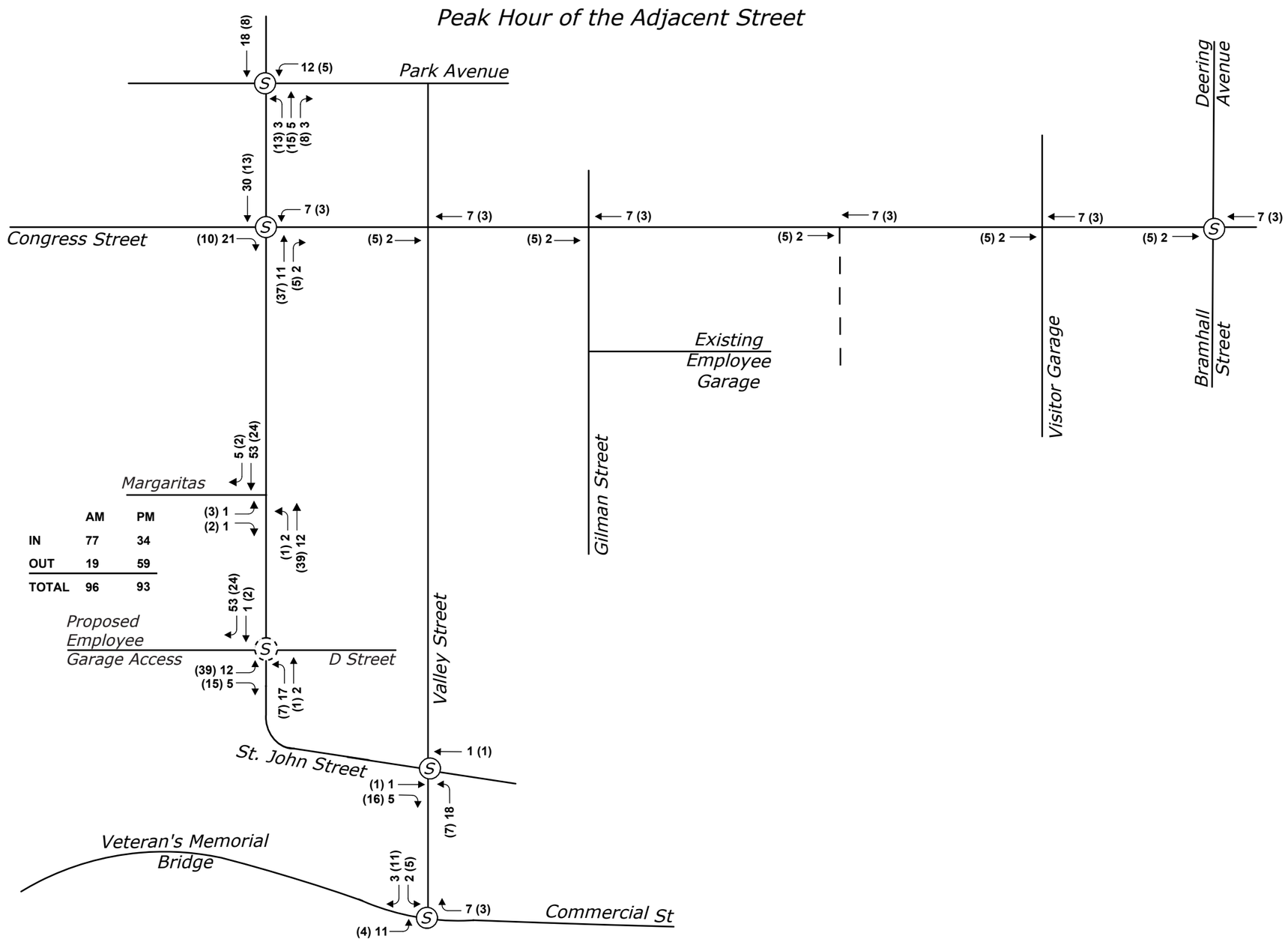
Phase 3 Employee Trip Assignment

Figure No. 7



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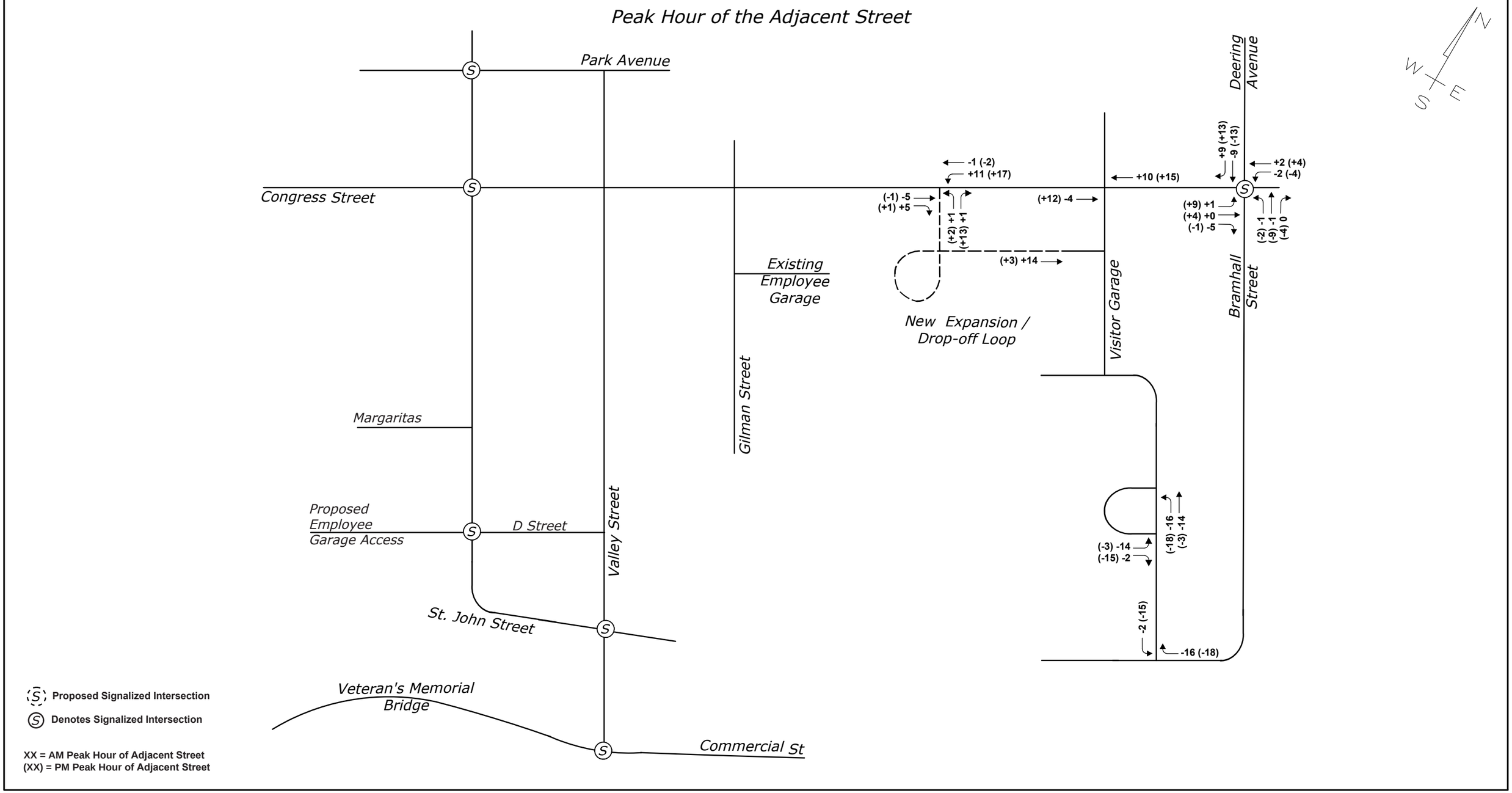
Phase 3 Drop Off Reassignment

Figure No. 8



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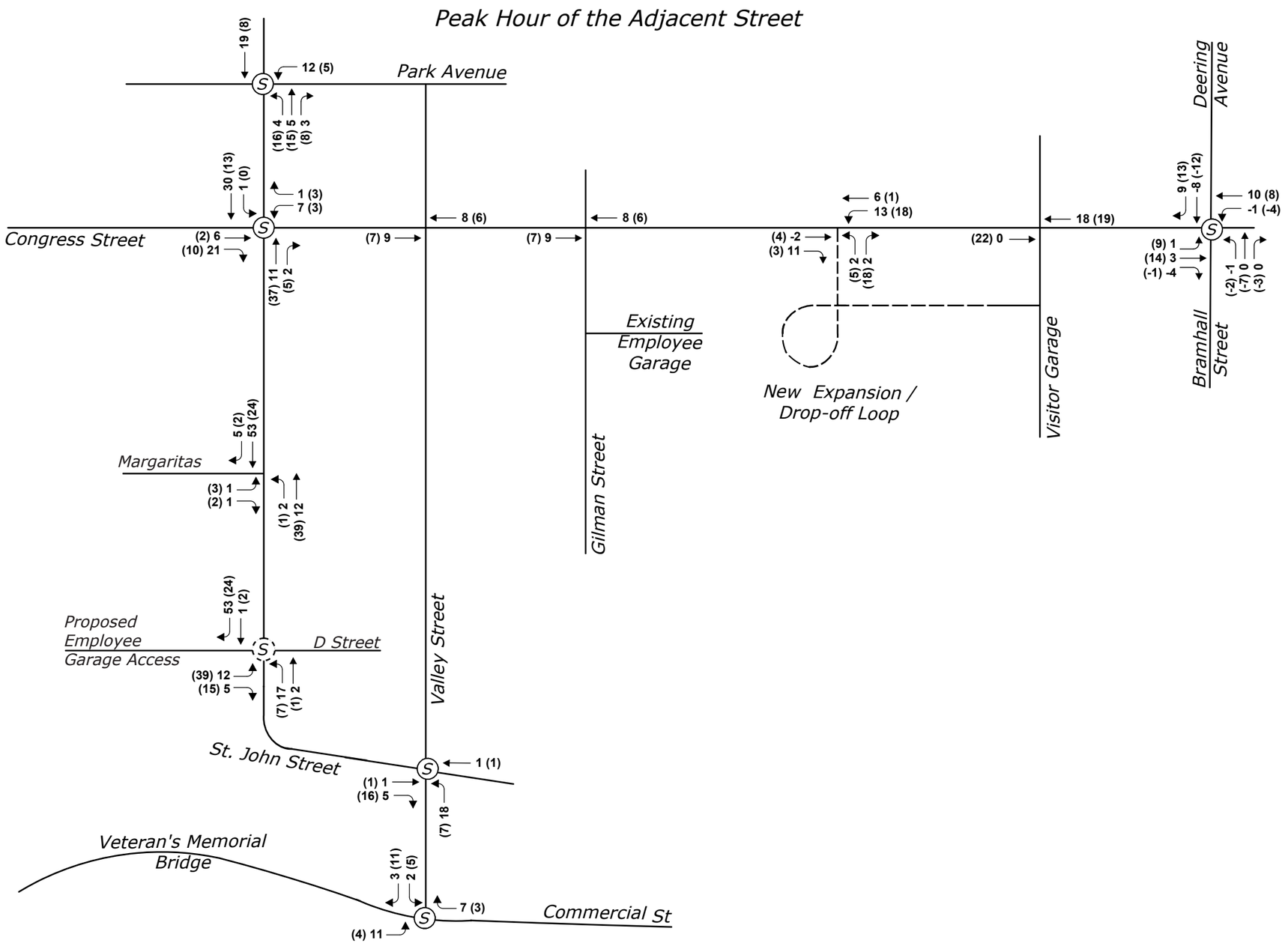

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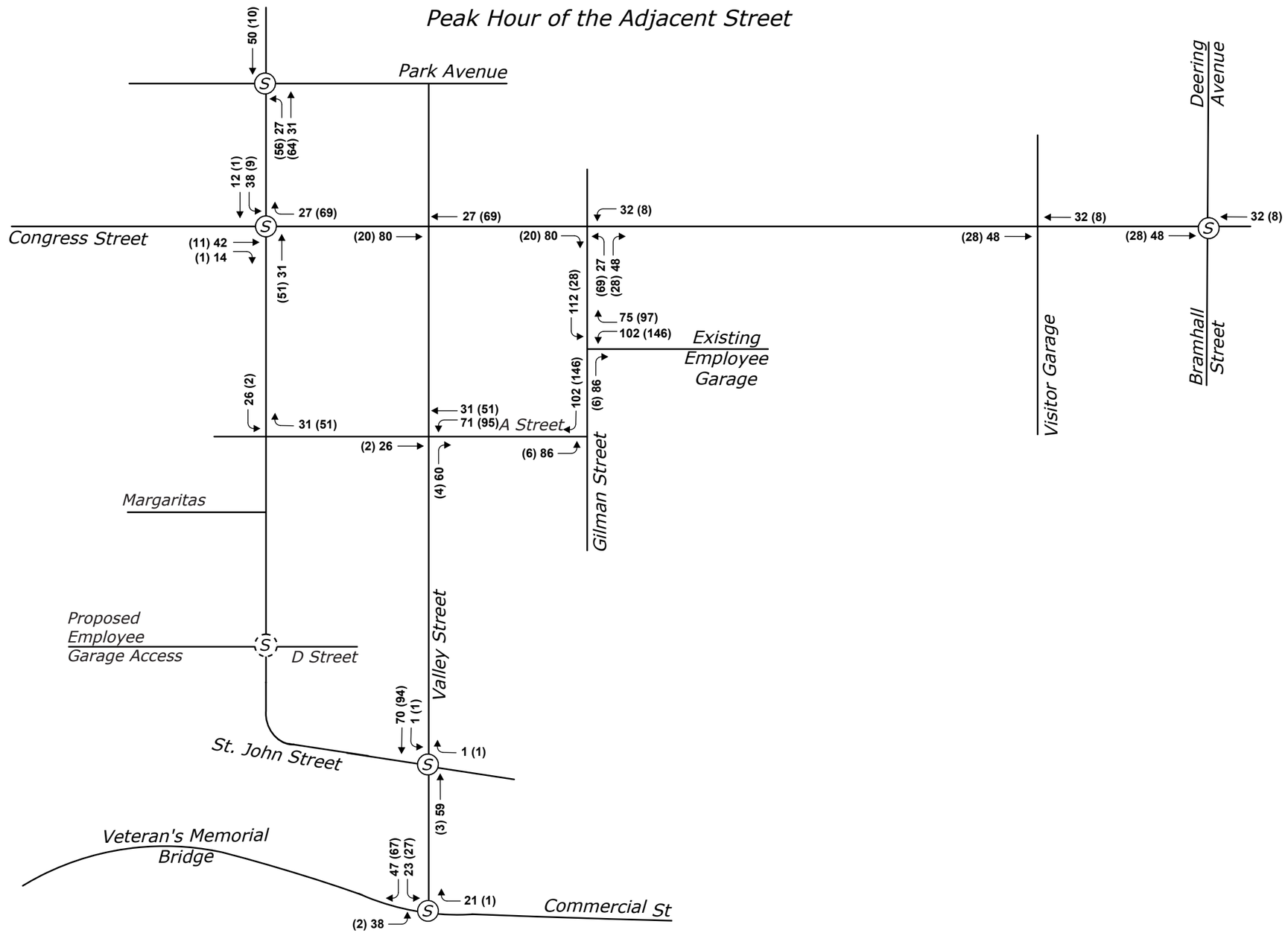
Existing Employee Garage Assignment

Figure No. 10



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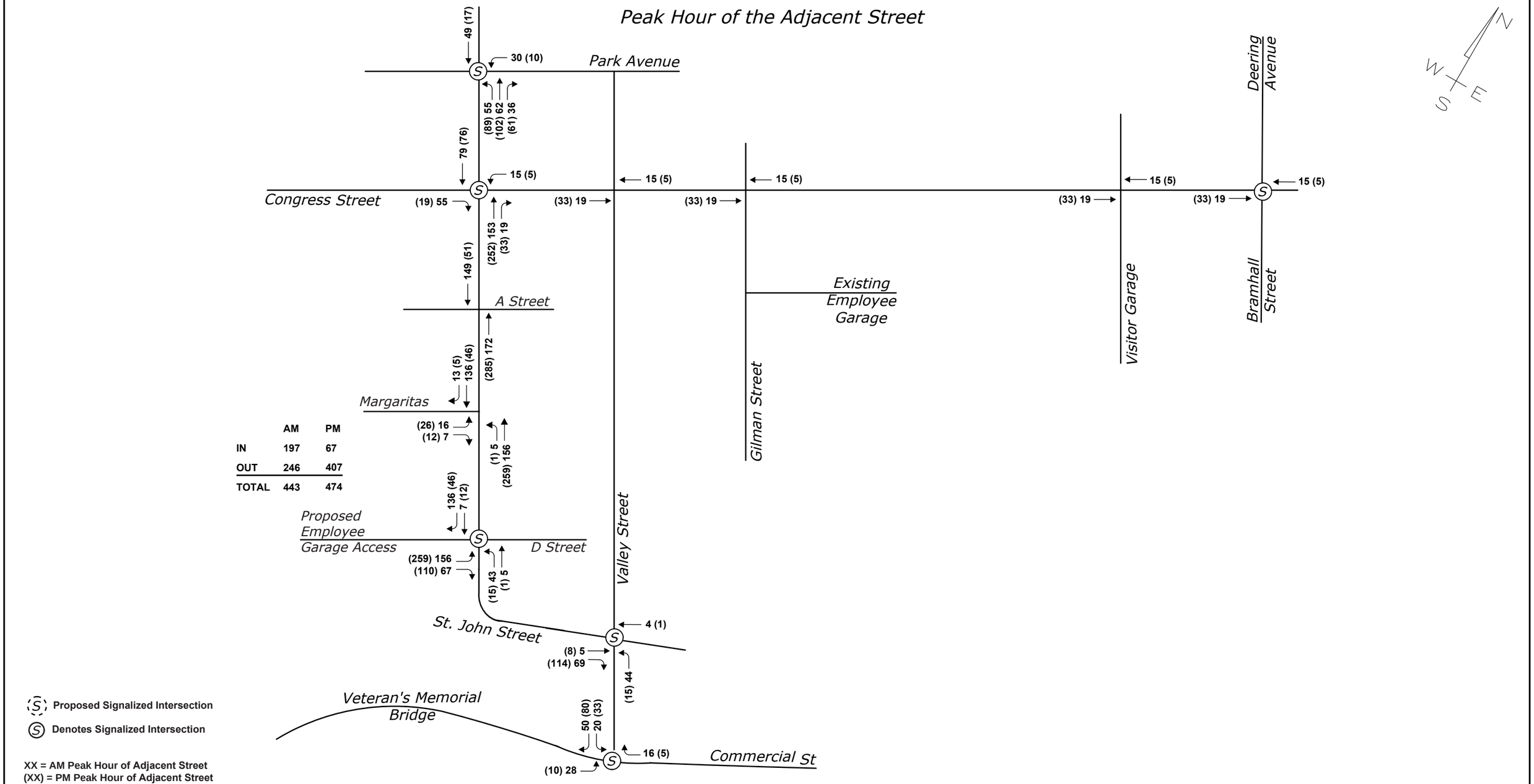
Proposed Garage Reassignment

Figure No. 11



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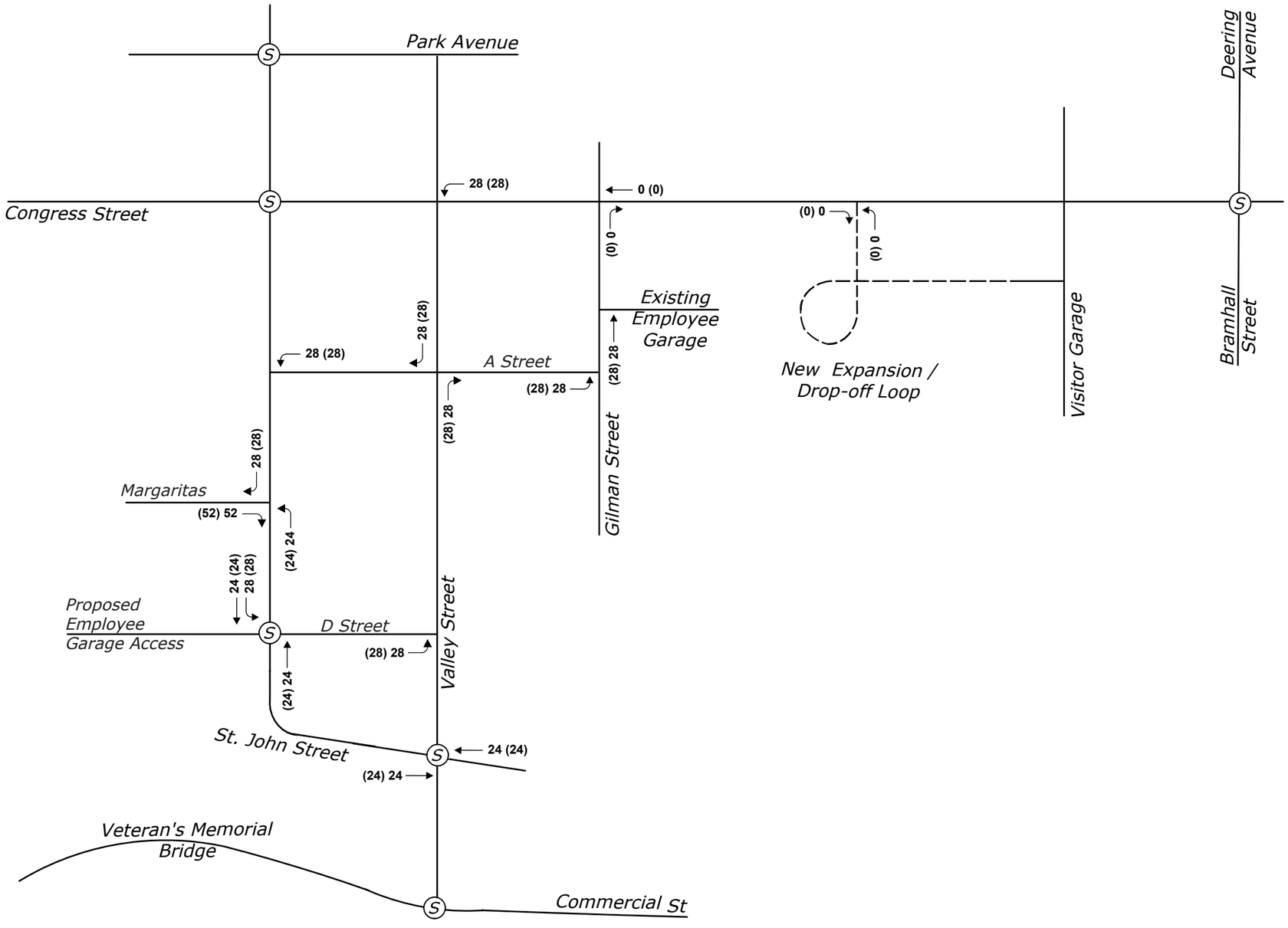
Shuttle Assignment

Figure No. 12

Peak Hour of the Adjacent Street



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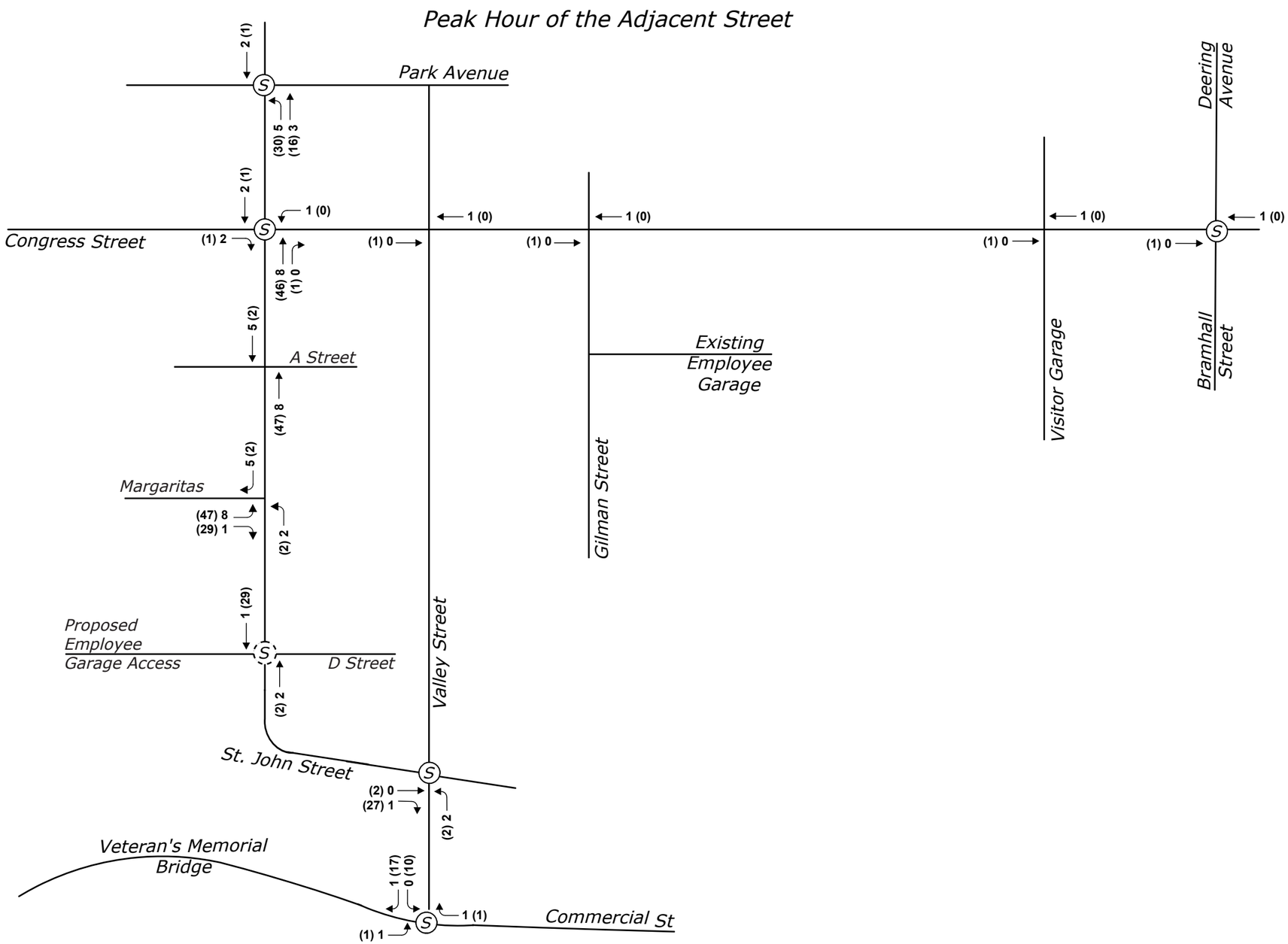
222 St. John Existing MMC Traffic

Figure No. 13



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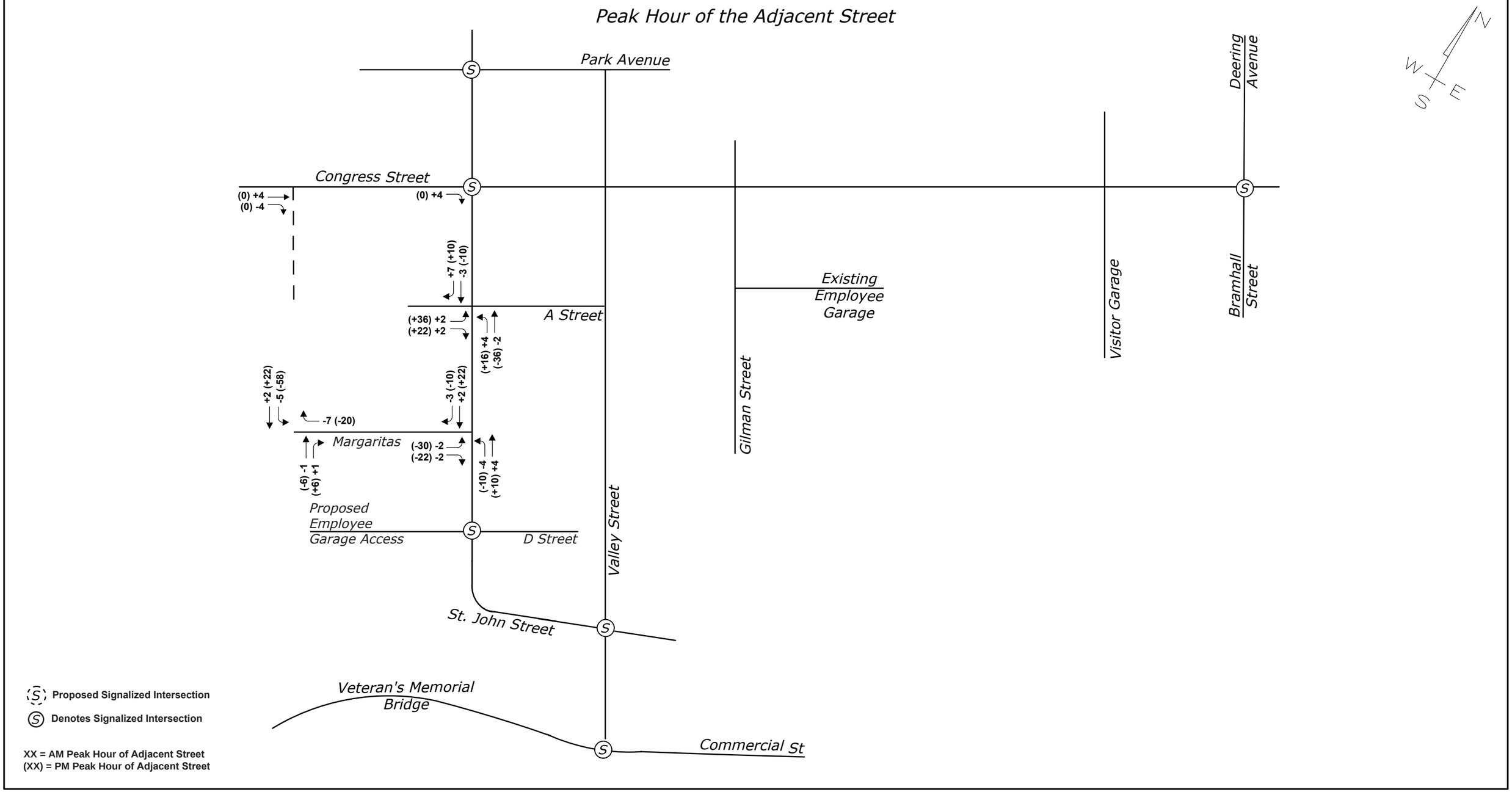
222 St. John Cut-Through (Non-MMC)

Figure No. 14



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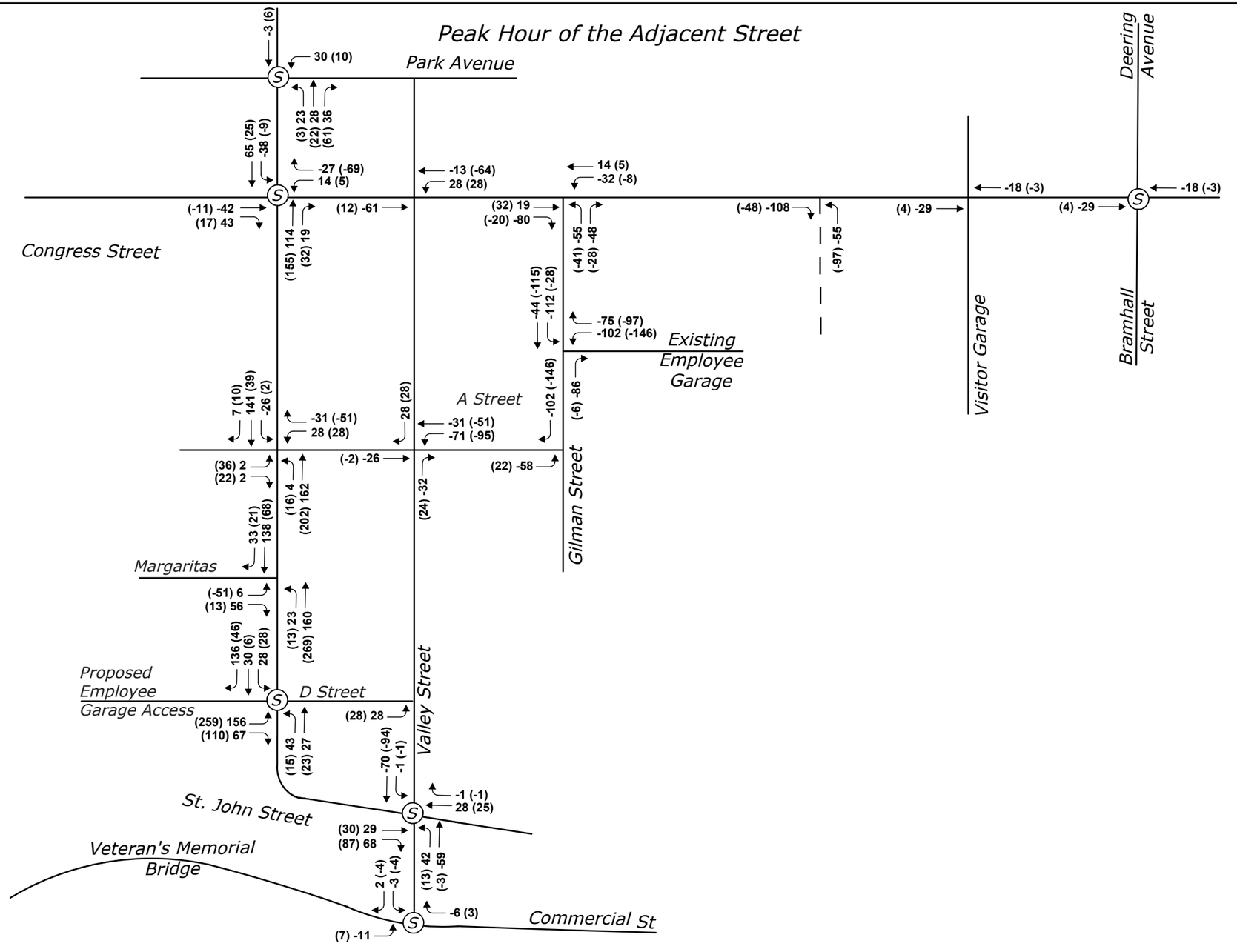
Net Impact Due to Proposed Employee Garage

Figure No. 15



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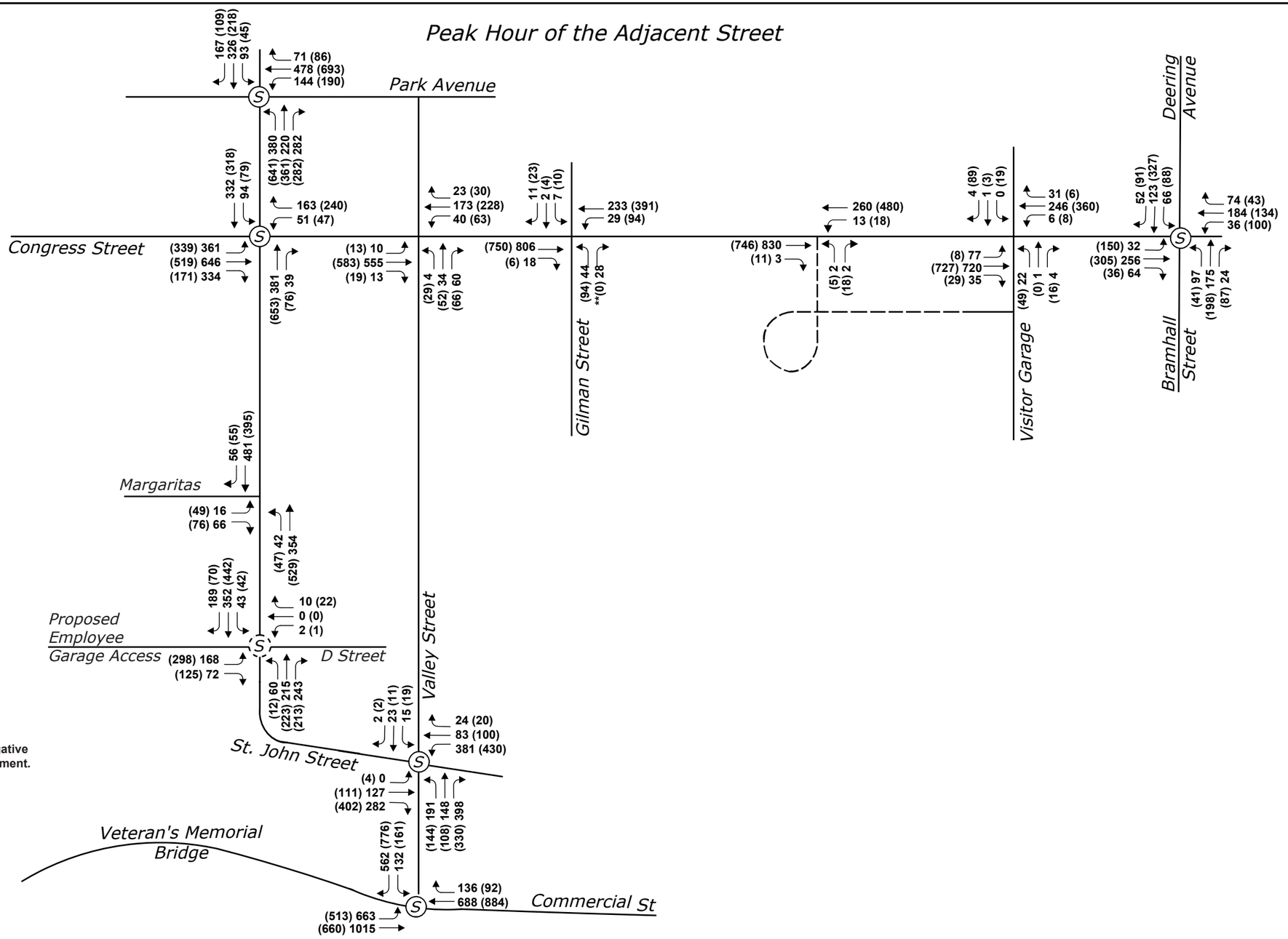

** Post development volumes forecast to be negative during the PM peak hour based on trip re-assignment.

* Through volumes based on volumes at adjacent intersections.

(S) Proposed Signalized Intersection

(S) Denotes Signalized Intersection

XX = AM Peak Hour of Adjacent Street
(XX) = PM Peak Hour of Adjacent Street

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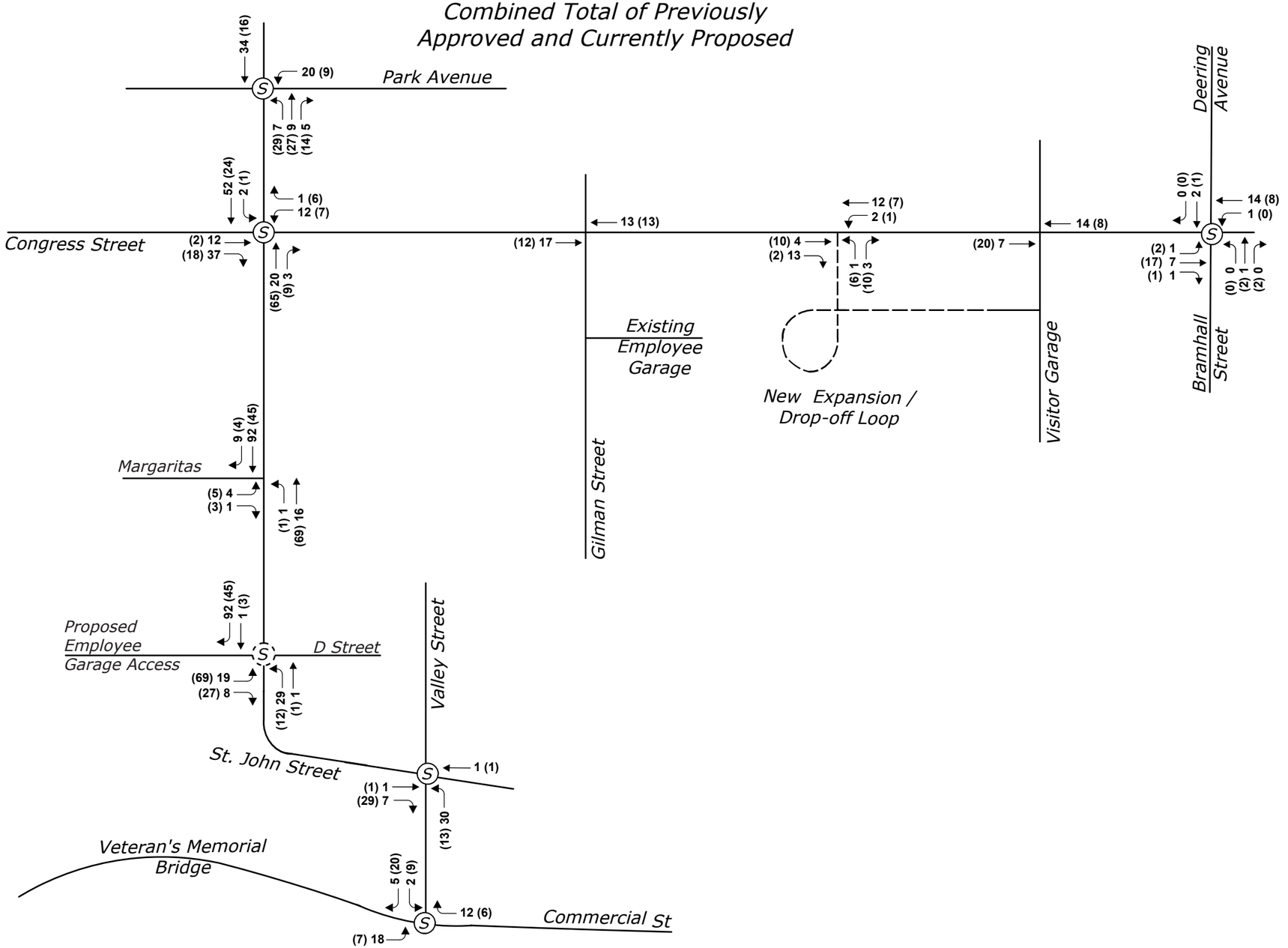
Study Area

Figure No. 17



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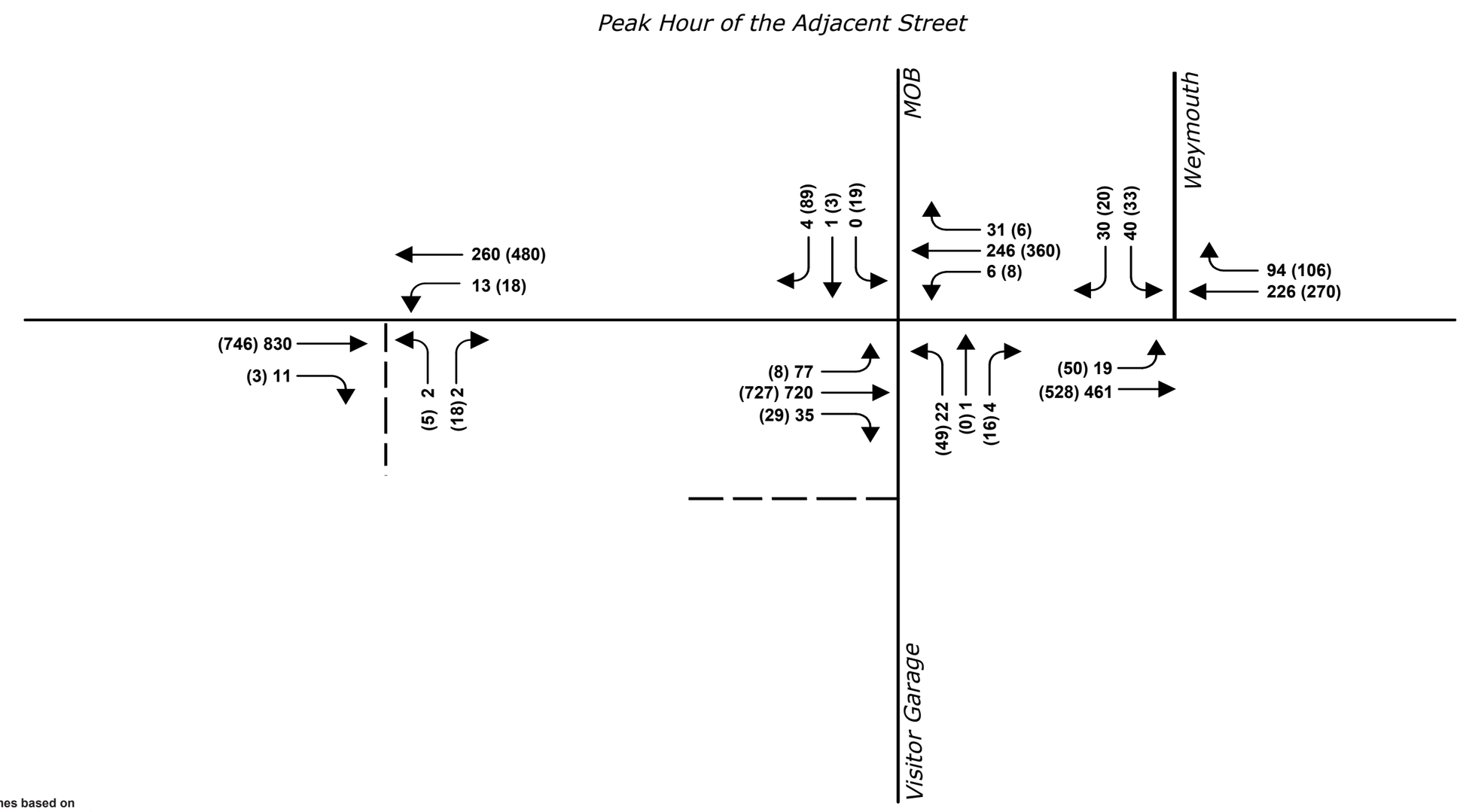
Peak Hour of the Adjacent Street



* Through volumes based on volumes at adjacent intersections.

(S) Proposed Signalized Intersection

(S) Denotes Signalized Intersection

XX = AM Peak Hour of Adjacent Street
(XX) = PM Peak Hour of Adjacent Street

Bramhall St. - 22; MMC Congress Street Building
PORTLAND, MAINE

Design: EAL Scale: NONE
Draft: Date: OCT 2018
Checked: RED File Name: 2866.01 - Revised

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MMC Congress Street - City Design Narrative

To: Al Green

From: Jeffrey Keilman

Date: September 14, 2018

Subject: **MMC Congress Street - City Design Narrative**

Attachments

The purpose of this memorandum is to document and provide design team process and responses to address the IOZ Design Review standards as required following up on conversations with City of Portland Planning Staff outlining design intent.

IDP Design Guidelines

Guideline No. 1
New buildings will be designed to contribute to the campus vision and organizational goals identified in the Master
FacilityPlan and the Transportation Plan, and best practice design
standards for healthcare.
Design Response
The design of the proposed Congress Street Patient Tower meets this guideline. The proposed building follows the design drivers outlined in MMC's Institutional Development Plan (Pgs. 100-102)

1. The building creates a new gateway to the hospital, highlighting a major axis in the City of Portland, along Congress Street and further expands upon the architectural character and vision of the MMC campus that was established by the Bean Expansion and East Tower. The Congress Street Patient Tower further defines the architectural character of the campus by articulating a design that adheres to best practice standards for healthcare as dictated by designing from the inside out in that the key plan and program requirements are expressed within the exterior massing. This massing relates to required scale for modern delivery of healthcare and further links to the architectural character and scale of the other building projects on the campus, including the East Tower addition and Bean Surgery expansion, both visible and reinforced in the layering of the buildings on campus.
2. The building will be an efficient and well-organized addition to campus. The Congress St. entrance, adjacent to the patient and visitor parking garage will be easy for patients and visitors to find. This entrance is glazed and highlighted by the multistory atrium that is visable from Congress Street and creates a destination for clarity of wayfinding.
3. The building design supports healing. The building is designed around the patient rooms and procedure rooms. Window heights, fenestration, and the façade articulation will all contribute to a better patient experience. The design aesthetics relate to the campus vision by epitomizing the top-quality, advanced healthcare delivered on campus. Attention to scale and proportions for the inhabitants drove design and massing decisions on the exterior. In

particular, decisions on where to include glazing, and more importantly, where solid wall is located was driven by the interior plan and program. A patient centric experience from the interior design was the key driver and critical in shaping the exterior expression of the architecture.

4. A sustainable and resilient campus is enhanced with the Congress St. Tower. Impervious surfaces are reduced with the use of green roofs, roof terraces & courtyards, and landscaped surfaces along Congress St.
5. The contextual landscape framework achieves a balance between the urban edge that the new building creates with Congress St. and providing landscaped amenities as appropriate. The landscape, in conjunction with the hardscape, create a layering of space from the public right-of-way to the new entry for the hospital. The landscape framework also mitigates the large grade changes and provides an urban plaza and pedestrian connections for the hospital previously lacking along Congress St. Decisions on landscape design and formal moves were considered not only from the context of the street experience, but also for patients who will be looking at these spaces from within the hospital with the understanding that a room with a view has clinically proven to improve patient outcomes

The stated MMC vision includes integrating inside and outside - achieved here through the internal circulation and window size and placement, as well as a "50 year palette" that selects materials based on cues from nature to create a timeless environment. This vision includes Sky, Sea, and Land as concepts for material/color selection. Although the design of the Congress Street Tower could be considered contemporary, the choice of materials, design details, and other elements relate to a sense of place, specifically, Maine.

Guideline No. 2

The overall composition and experience of the campus will be considered for cohesive identity from approaches along Congress Street and I-295.

Design Response

This guideline is met because the design of Congress Street Patient Care Tower was envisioned in conjunction with both the East Tower and Visitor Garage, in particular how long views and campus identity are reinforced, including both current and future phase goals. This is demonstrated in the provided renderings that link the buildings on the hill with those along Congress Street in approach and scale.

Guideline No. 3

Building entrances will be oriented toward, located adjacent to, accessible from, a sidewalk in a public right-of-way to create a pedestrian-oriented environment.

Design Response

This guideline is met as new entrances for vehicular drop-off, pedestrian access, and access from public transportation are created along Congress Street directly linked to the public right-of-way. The design of the landscape/hardscape along Congress Street further link the building to the public realm and assist in creating a pedestrian-oriented environment. The creation of a small plaza and an urban staircase

provide for a public space that mitigates the challenges created by grade at this location. Entrances were considered for their relation to the public, but also for their critical adjacencies within the facility. Ability for patients and visitors to quickly enter the building and access critical services through limited travel distances and intuitive wayfinding seamlessly link the exterior to the interior.

Guideline No. 4
Building designs will relate to and be compatible with the existing, or – in areas of change – planned character of residential and commercial neighbors. Design elements and characteristics to consider include:

- Building placement and relationship to the street
- Overall massing and scale
- Roof forms
- Proportion, directional expression, and composition of facades
- Rhythm of solids to voids
- Rhythm and proportion of openings
- Rhythm of entries and projections
- Relationship of materials, texture, and color

Design Response
This guideline is met because the design of Congress St. utilizes materials, scale, form, detail, to be compatible with adjacent MMC campus construction, while speaking to the required scale and aesthetics of modern healthcare. The design relates to both the East Tower and the recently completed Bean Addition. This is demonstrated through the rooflines, simplicity of details to adjacent construction, and materiality. Proportion, façade expression, and composition was developed to relate to the planned character for the Bramhall Campus, as it is an area of change. This is seen in the proportion of fenestration, expression and composition of facades with modern materials to relate to Surgery 2 expansion and proposed Congress Street building.

Guideline No. 5
Façade materials of buildings will be of high quality, and contribute to an attractive public realm.
Design Response
This guideline is met because the design utilizes high quality, high performance systems that provide attractive aesthetic design but also high performing environmental design adding aesthetically to the public realm. Choices in materials were selected deliberately to meet the rigors required by healthcare interior environments.

Façade materials are of high quality and more importantly appropriate performance from a thermal standpoint to align with the clinical programs within the building. Attention to detailing and current and future context were critical in the material selections. Additional long views have been developed that in conjunction with the campus aerial speak to the new vision and image for the MMC Bramhall Campus. Subsequently, constructability and programmatic drivers were real constraints in

selection of materials.

Guideline No. 6

The design process will consider long views of new buildings including roofs and associated structures to minimize visual impacts and provide visual interest. Rooftop appurtenances will be either screened from view or integrated into the building design, and will not be visible from adjacent streets, Western Promenade, or the Congress Street approach (helipad excluded).

Design Response

This guideline is met because the design of the Congress Street building demonstrated with perspectives indicating the long views and visual impacts achieved in unifying the campus. Rooftop screening is utilized in the limited locations where appurtenances would have potentially been visible from street and/or long views. Inclusion of green roofs, both visual and occupied, further enrich the roofscape.

Guideline No. 7

Vibrant, contributing and sustainable active ground floors will be provided to add activity and a sense of place to the priority node identified in the City's Comprehensive Plan.

Design Response

The Congress Street building provides this by aligning two entries along Congress St., providing activity and a sense of place along a key urban edge to the city. The inclusion of a major hospital entry along Congress St. that enables both vehicular and pedestrian connections enriches the streetscape but also provides identity to MMC in the place of a previously located parking garage. Linking this entry with a transparent concourse to the employee entry further activates the ground floor as activity will occur along this spine 24 hours a day, keeping eyes on the street.

Guideline No. 8

In areas where the occurrence of limited blank facades along public right-of-ways are unavoidable due to changes in topography or building use requirements, the following strategies will be used to mitigate visual impact:

- providing elements of visual interest along any black walls facing public streets, and,
- working with the City of Portland to ensure adequate lighting of public sidewalks to create a safe pedestrian experience.

Design Response

This guideline is met because Congress Street is activated with the addition of new entrances and activities along the Congress St. edge. In addition, MMC is working with the City of Portland regarding street and pedestrian level lighting along Congress St. The use of transparency and properly located glazing further strengthen the visual interest and depth of the facades. Photometric calculations have been provided indicating that proper light levels will be maintained. The location and rhythm of fenestration was determined by the patient focused planning and interior program drivers.

September 14, 2018
Re: **MMC Congress Street - City Design Narrative**

Guideline No. 9

Any parking structure within the IOZ will:

- screen views of cars from the public rights-of-way
- provide elements of architectural interest on upper floors to contribute positively to long views and gateway approaches
- for garage structures within 20' of the public right-of-way, meet street activation intent according to street type

Design Response

This guideline is not applicable to this submission because there is no proposed parking.

Building Relationship to Public Street

1. Urban Main Street (Congress Street)

MMC buildings abutting Congress St will be designed to:

- Provide urban-levels of density
- Create an urban street wall that provides a sense of enclosure to the public realm
- Have their primary orientation towards Congress Street
- Activate the public sidewalk with building entrances, lobbies, etc.
- To the extent possible, given programmatic needs, provide visual interest and ensure pedestrian safety with views into and out of the building along the public sidewalk
- To the extent possible, given programmatic needs, provide space for community oriented uses such as services or retail that can be shared between MMC users, neighbors, and the broader Portland community
- Support the existence of neighborhood amenities such as restaurants and other retail uses providing services to local residents and employees both during the day and evening hours.

In addition to the guidelines listed above, buildings that have frontage on Congress Street and that include parking components will activate portions of or place liner buildings along the ground floor facing Congress Street.

Design Response

The Congress Street building was conceived as the link for the MMC Bramhall Campus to the urban edge that is Congress Street. The buildings massing, while expressing the critical healthcare programs, also reinforces the street wall. Use of cantilevers and other changes within massing provide a sense of enclosure along the street edge while allowing for space to the benefit of the community such as urban plazas.

The new building is also oriented to Congress St. with the public entrance and lobby visible and active from the street. Also, since this is a hospital, its primary purpose programmatically is to provide community oriented services.

Crime Prevention Through Environmental Design (CPTED)

MMC will incorporate the following design strategies that have been demonstrated to deter crime:

- Providing a clean and aesthetically pleasing campus environment that is designed with vandal-resistant materials

- Providing clear and properly-sized signs in safe locations to ensure safe wayfinding
- Ensuring that paths from transit stops, bike storage areas, and parking areas to main pedestrian entrances are well-lit, with clear sight lines
- Designing street-level elevations to minimize potential hideouts
- To the extent possible, given clinical program demands, providing views in and out of building ground floors populated by users to serve as "eyes on the street"
- Generating foot traffic on public sidewalks with pedestrian entrances

Design Response

The new building is comprised of quality materials that are durable and resistant to abuse and vandalism. The public realm is properly lit, and designed to minimize potential areas for hideouts. Foot traffic, both on the sidewalk and within the concourse of the new facility will further activate the site and provide eyes on the street.

WRITTEN SUBMISSION 10 – ACCESS AND CIRCULATION
BRAMHALL ST. -22; MMC CONGRESS STREET BUILDING

THE INFORMATION REQUESTED IN THIS SECTION MAY BE FOUND WITHIN OUR RESPONSE TO SECTION 9 – TRANSPORTATION ANALYSIS – TRAFFIC IMPACT.

Vehicles entering the site at the patient drop-off / pick-up area will be directed right to travel around the loop. A median will be constructed at the site access to prevent drivers from directly accessing the visitor garage without going around the loop. As the vehicles complete their drop-off or pick-up, they will have the choice of going straight to exit onto Congress Street or turning right to enter the visitor garage. This design allows vehicle interconnection between the patient loop and visitor garage without recirculating onto Congress Street, which can further reduce congestion and increase safety. Vehicles wishing to park and not drop-off or pick-up can use the existing full movement access to the visitor garage onto Congress St..

There will be exterior signage and interior signage that supports the traffic flow described above. Exterior signs will differentiate the Congress St patient pick-up / drop-off from the existing patient and visitor garage entrance. Signs within the existing patient and visitor garage will direct exiting traffic and traffic intending to pick-up a patient. Signs within the circle drive will direct traffic intending to exit the site and traffic intending to enter the patient and visitor parking garage. In addition to signs supporting the traffic flow, traffic exiting the patient and visitor garage will have a stop sign to support safe pedestrian access to the building's entrance.

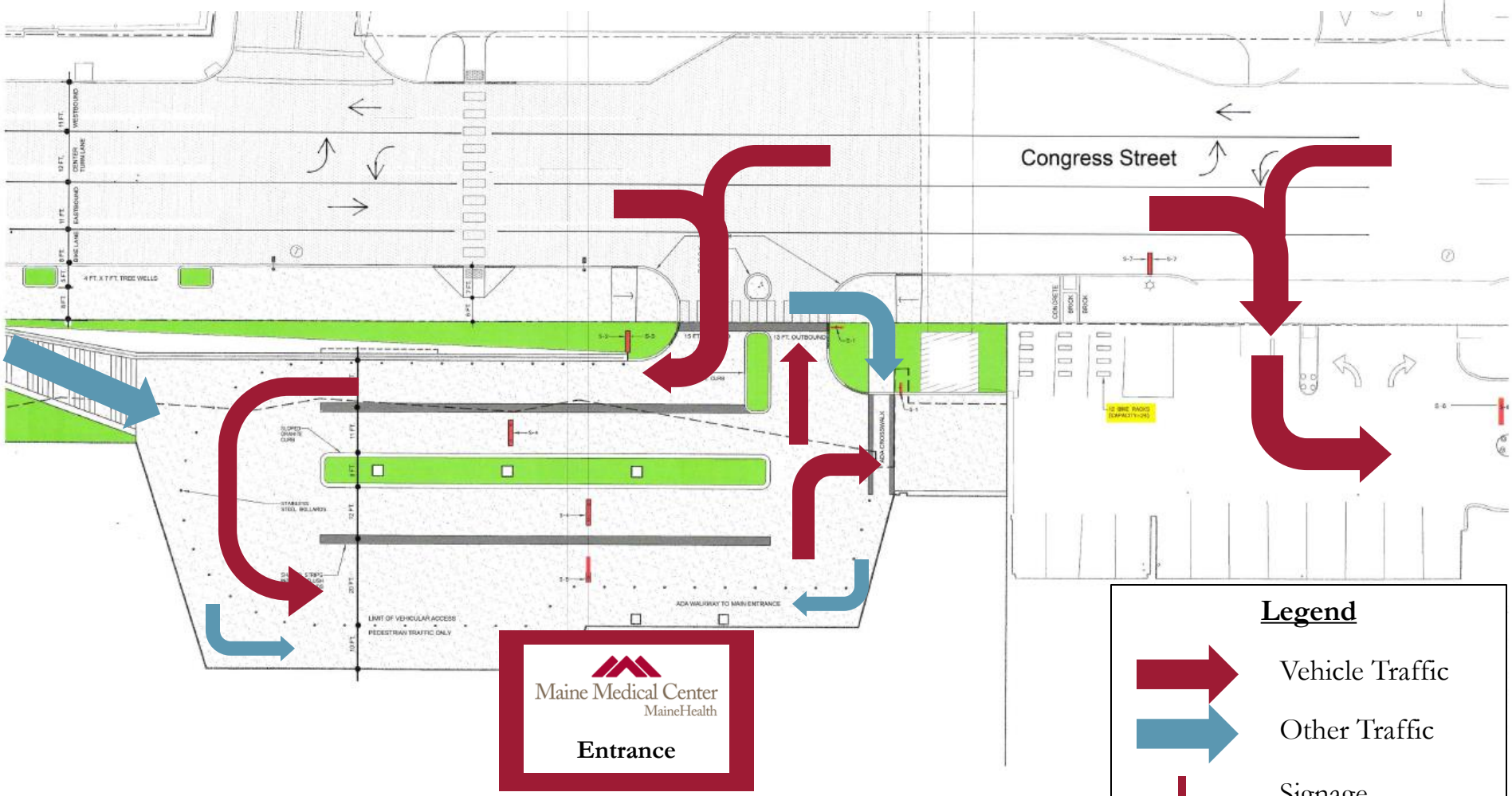
There is enough length within the entrance loop for approximately 11 vehicles to queue on-site without backing onto Congress Street. Traffic engineers observed the exiting entrance on Bramhall St to better understand the frequency and volume of queueing at a MMC entrance. Traffic engineers observed a maximum of 9 queued vehicles. The volume of patient pick-ups and drop-offs will be split between the existing entrance and the proposed new entrance in the future.

MMC intends to support the operations of the Congress St. entrance with valet service. Valet parking will improve the flow of the circular drive. In addition, valet attendants will assist individuals who do not wish to take advantage of the service by providing directions when needed.

At the October 23, 2018 Planning Board workshop, a planning board member commented that snow melters would be an excellent addition to the Congress St. entrance. MMC will be adding snow melters to this entrance.

MMC will continue to support the patient arrival experience by communicating with patients and their families in advance of scheduled appointments. These communications include details about the correct hospital entrance and parking location.

Patient or Visitor Arrival



Act with kindness and compassion.

Be an active listener.

Be a role model.

Set high standards.

Take responsibility.

Embrace change.

Maine Medical Center
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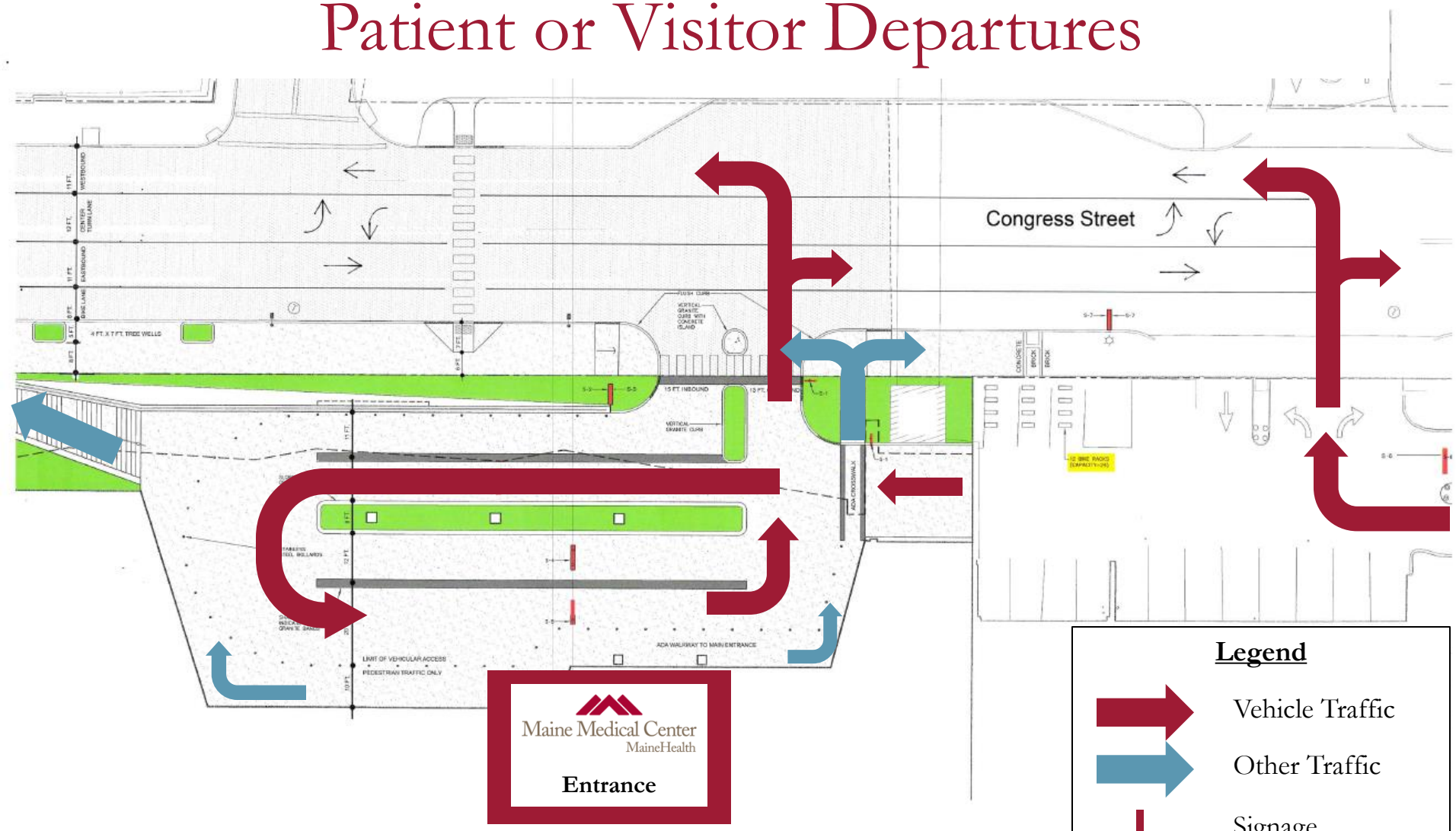
Patient or Visitor Departures



Act with kindness and compassion.

Be an active listener.

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Take responsibility.

Embrace change.

Maine Medical Center
MaineHealth

KK

MAINE MEDICAL CENTER

Congress Street Building

New Clinical Tower

Construction Management Plan

September 25, 2018

[Amended: November 2, 2018]

Prepared for: Portland Department of Planning & Urban Development Department

Project Proponent: Colliers International

Construction Manager: Turner Construction

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MAINE MEDICAL CENTER

New Clinical Tower
Construction Management

Plan 09.25.18

Purpose Statement

The purpose of this document is to provide the details of the third phase of construction for MMC's Master Facility Plan - Phase IIB. This document outlines Turner Construction's plan for controlling impacts from noise, vibrations, ground movement, truck traffic, and other construction related factors to the surrounding neighborhoods and buildings.

Maintaining normal campus operations and public safety are high priorities during the construction phase. This plan will be presented to the appropriate City and Neighborhood representatives. The City of Portland Planning Board will approve the final plan. It has been the goal of these programs to define the construction plan before construction begins. Turner's experience on projects with similar logistic constraints has proven that pre-planning and constant communication are necessary for a smooth efficiently run, incident free project.

Turner Construction and its subcontractors shall schedule and conduct operations in a manner that will limit the disturbance to the public in areas adjacent to the work and to occupants of buildings in the vicinity.

1.0 CONSTRUCTION MANAGEMENT PLAN

This Construction Management Plan (CMP), submitted to the Portland Department of Planning & Urban Development for approval by the City of Portland Planning Board prior to the start of construction, includes specific mitigation measures and staging plans to minimize impacts to surrounding residences and businesses. The Construction Manager and its trade contractors will be bound by the CMP.

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Project Director: Gregg Scholler
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2.0 CONSTRUCTION SCHEDULE & WORK HOURS

Construction work hours will be in accordance with Section 17-18 and Section 25-129.

2.1 Work Hours

- The construction period for the project is expected to be approximately 36 months in duration.
- It is anticipated that the project construction is estimated to start on or about Winter 2019 (December) and last through Fall 2022 (commissioning activities will occur into early 2023).
- Work hours will be 7AM to 7 PM Monday thru Friday.
- Workers will gather at their workplace from 6 AM to 7AM.
- Saturday work will be required on a periodic basis with hours from 7 AM to 6 PM.

2.2 Construction Timeline

2.2.1 Winter 2019 to Fall 2022 (commissioning activities will occur through early 2023)

Congress Street Staff Garage- dismantle and remove

Structurally dismantle existing Staff parking garage. This project is expected to start in late Fall 2019 (December and complete in Spring 2020 (6 Months)

Congress Street Clinical Tower

A new 265,000 SF building. This project is expected to start in Spring 2020 and complete in Fall 2022. (30 Months)

2.3 Construction Updates Reporting

The following shall be reported to Maine Medical Center as a part of the CMP.

- Monthly "look ahead" schedules and narrative for upcoming construction activities.
- Schedule of over-size deliveries to the site that will impact roadways
- Schedule of deliveries that will be outside the City of Portland's allowable work hours.
- Proposed schedule for utility connection or work in public roadways or sidewalks as a part of Turner Construction's work.
- Proposed off-hours or Saturday work.
- Construction activities that may impact the neighborhood in an adverse way, including noise, vibration, dust, on-street parking or work outside construction limits or times. Also, proposed options to mitigate these impacts.
- An estimate of the number of vehicles that will require off-site parking.

2.4 Construction Logistics

The proposed Logistics Plans included in the CMP are designed to isolate the construction while providing safe access for pedestrians, hospital operations, and automobiles during normal day-to-day activities and emergencies. Interaction with the public will occur mainly along Congress Street and Gilman Street. The logistics plan define the timeline of construction activities and the location of cranes, gates, access for each Phase.

Each site will be secured by an 8-foot high fence with privacy screening in accordance with the Logistics Plan.

Pedestrian Routes of travel are shown on Logistics Slides page number 2 - 5

2.5 Perimeter Protection / Public Safety

- Turner Construction will work to ensure the sidewalk protection minimizes impact to pedestrian and vehicular flow.

- The specific configuration of sidewalk protection and pedestrian access around the site will vary depending on the phase of the work being performed.
- In general, secured fencing will be used to isolate construction areas from pedestrian traffic.
- Flagmen or Police Details will be provided at all active gates when there are deliveries.
- Construction procedures will be designed to meet all OSHA safety standards for specific site construction activities.
- Subcontractors will implement and manage their own Health and Safety Program for the project.
- All Subcontractors are required to wear appropriate personal protective equipment.
- Snow removal and ice treatment will be provided on the surrounding area within the construction fence.
- Sidewalks will be cleaned of trash and debris as needed.
- Street lights will be taken down on Congress Street and stored offsite. The street lights will be reinstalled as part of the project completion.
- Concrete washout will be in concrete washout station, collected and placed in a dumpster. Concrete washout area to be located within the site fence.
- Turner Construction will provide sufficient temporary site lighting to ensure the safety of all pedestrians accessing the sidewalks around the site, including lighting at all covered pedestrian walkways, until permanent street lights are installed Light levels will be tested prior to temporary removal of site lighting.

2.6 Worker Parking & Traffic Impacts

- Turner Construction and its subcontractors shall encourage the use of public transportation by their workers.
- Jobsite personnel will be required to park at an offsite parking area to be determined and will be shuttled to the construction site. See Logistics Slide page number 6 and 7
  - Jobsite personnel will be required to park at MMC's Scarborough Campus
  - Jobsite personnel will be shuttled to the construction site
  - Subcontractors who violate this requirement will be fined $500 per offense
- Worker parking shall not be allowed on site except for company vehicles required to perform the work.
- Turner will qualify subcontractors' with a legitimate reason to park onsite and manage that parking within the construction fence and not impact parking in the surrounding area.
- No personal vehicles will be allowed to park at the project construction site or in the adjacent residential streets.
- The following language will be included in the contracts with all subcontractors
  - *"Parking: There shall be absolutely no parking on the project site, in the Hospital Parking Garages and / or Hospital Surface Parking lots, and on street parking adjacent to the Hospital. This is including but not limited to employee vehicles, company vehicles, delivery trucks, trucks containing equipment such as welders, etc. Turner to provide remote parking location, and transportation to and from the jobsite. Any workers found in violation of this policy will be subject to permanent removal from the project and the subcontractor shall be assessed a $500 fine per incident."*

The number of workers required during the construction will vary by Construction Phase.

Construction Phase - November 2019 to November 2022

- Fall/Winter 2019- Spring 2020 – average workers – 60
- Spring 2020- Spring 2021 – average workers – 100-125
- Spring 2021- Spring 2022 - average workers – 200-275
- Spring 2022 – Fall/Winter 2022 – 225 - 300

2.7 Truck Routes and Volumes – **See Logistics Plans page number 6 & 7 and additional truck route information attached at the end of the Logistics Plans.**

All street opening and occupancy in the public right of way will be in accordance with Chapter 25 of the City of Portland Land Use Code

- Truck traffic will vary throughout the construction period, depending on the activity.
- An offsite marshalling area will be utilized for large deliveries such as structural steel and exterior wall.
- All trucks will be brought to the construction areas at MMC by experienced dedicated drivers from the marshalling lot.
- Radio and cell phones will be utilized to coordinate all trucking.
- Trucks routes must be submitted and approved by the City of Portland and the Owner before the start of construction.
- Truck idling will be held to a minimum on-site, to minimize the impact to adjacent properties.
- Turner Construction and its subcontractors shall ensure that haul routes, debris and soil removal, and staging areas are conducted in a manner that minimizes the impacts to the abutting communities.
- Wheel wash stations will be installed and maintained by Turner and its subcontractors as needed and maintained at construction site exit areas.
- Street sweeping / vacuuming of all impacted City streets and sidewalks shall be performed by Turner Construction and its subcontractors on an as-needed basis.
- Streets, sidewalks, bicycle ways or other means of travel may not be obstructed or closed without permission from the Owner and other authorities having jurisdiction. The Owner shall be notified one week in advance of any such obstructions or closures.

3.1 CONSTRUCTION

3.2 METHODOLOGY- Staff Garage Structural Removal- See Logistics slides page number 9 – 11

Turner and the Contractor will develop the sequencing and methodology of the Staff Garage removal. All sequencing will be approved by a Structural Engineer of Record. At mobilization of the garage removal, debris netting will be installed from the garage roof down to grade, with wire rope. This netting will be on all exposed faces of the garage elevations. All areas will be cordoned off and all utilities and transformers will be protected, or shut off. A level platform will be created at the west and north elevations.

A physical separation of the existing pedestrian bridge at the northeast corner of the garage will be created.

Upon separation of the garage, high reach excavators (Volvo EC 700 or equivalent) equipped with rotating concrete processors will be mobilized. Excavators will be mobilized to assist the high reach equipment in concrete processing and debris load out.
Brokks equipment will also potentially be utilized of the top two levels of the structure in areas where the high reach equipment cannot gain access.
Concrete materials will be placed in the existing building footprint to act as a bench surface for high reach progression and earth retention equipment.

The garage removal will commence on the west side of the garage. The high reach processors will move east working from the north to the south. Each long bay of the garage will be removed working to the east. The removal will start at the top of the garage, working downward, structural column bay. The concrete will be processed in place by the rotating concrete processors and reinforcement bars will be cut during the course of garage removal. The outer concrete on the north and south side of the garage will be pulled into the building footprint. On the south side each parking level will be cut free of the south garage retaining wall. This will keep the retaining wall in position as it will be reinforced with structural tiebacks.

Once the concrete has been processed in place by the high reach excavators, additional equipment will be used for the haul out of debris. Concrete materials will be placed at strategic elevations to create a work bench for equipment to work from.
As the demolition progresses east near the Stair Tower and Visitor garage, special care will be taken to remove the column bay, and hydraulic crane equipment with steel debris shields will act as protection from falling debris.

As the garage is razed, excess concrete materials will be shipped from the site via trucks, and disposed at a legal Maine disposal facility.
All debris will be sorted onsite and separated in the various waste streams.
During all concrete removals a constant water mist will be used to prevent the spread of dust from the site.

3.11 TRUCK TRAFFIC FOR STAFF GARAGE STRUCTURAL DEBRIS

- All truck traffic will be directed to enter the site in accordance with truck route plans approved by the City of Portland and included in the Logistics plans.
- Materials will be removed from the site by loading triaxles and roll off containers. Turner will closely coordinate the load out operation, and the staging of trucks.
- All subcontractors and vendors will be provided with pamphlets indicating the appropriate truck routes to access the site.
- Trucks will be brought within the fence line. The hauling of these trucks will be at designated loadout periods near the end of the working day. (From 3 PM to 7 PM)

- **Average Trucks per day for Congress Street patient tower construction project:**

PROCESSED CONCRETE DEBRIS REMOVAL
TRUCKS LOADING IN AFTERNOONS
AVERAGE TRUCKS PER DAY

2020	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F
February	10	10	10	10	10	10	10	10	10	10	16	16	16	16	16	16	16	16	16	16
March	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
April	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
May	14	14	14	14	14	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0

3.2 Construction – New Clinical Tower– (Refer to Logistics Slides page number 12 to 18)

All street opening and occupancy in the public right of way will be in accordance with Chapter 25 of the City of Portland Land Use Code

- All truck traffic will be directed to enter the site utilizing one gate on Congress Street and two gates on Gilman Street.
- During the mass cut excavation trucks will be removing earthwork material and concrete foundations to create the basement.

MASS EXCAVATION & FOUNDATION REMOVAL
TRUCKS LOADING ALL DAY - 2 to 3 TRUCKS/HOUR
AVERAGE TRUCKS PER DAY

2020	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F
June	8	8	8	8	8	12	12	12	12	12	16	16	16	16	16	16	16	16	16	16
July	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
August	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
September	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	18	18	18	18	18

- A tower crane will be built within the site fence. During the erection and dismantling of the Tower crane police details and minor traffic interruption will be required. The foundation of the Tower crane will be a permanent structure. The tower crane foundation will remain in the ground, and will be utilized in future expansions by Maine Medical Center.
- All detours and paths of travel shown on the Site Logistics Plans will be followed.
- All road signage identified on the Maintenance of Traffic Plans will be installed and maintained by Turner during the Congress Street shutdown and detour.
- One lane of Congress Street will be closed during the construction timeframe. Congress Street will remain open for two way traffic. One lane of Gilman Street will be closed for the construction timeframe. Gilman Street will remain open for two way traffic.
- All subcontractors and vendors will be provided with instructions prior to their project start indicating the appropriate truck routes to access the site.

4.0 Dust Control, Noise, Air Monitoring, Vibration Monitoring

4.1 Dust Control

Control of dust is of paramount importance for this project, for Maine Medical Center, and for the city of Portland. There will be substantial dust control solutions on the site prior to the start of work. To reduce emission of dust and minimize impacts, physical barriers will be built to control spread of airborne dust, water – based dust suppression systems will be installed, specific storm water collection and filtering will be in place. It is a goal to have no visible emissions outside of the work limits.

4.11 Garage Removal Dust Control.

- Wetting agents will be used regularly to control and suppress dust that may come from the construction materials.
- Monsoon misting machines continually wetting down the perimeter of the work area
- Fire hoses spraying water above the work area, knocking down the dust.

- Water will be collected at the lowest part of the garage proper on the Gilman Street side of the garage. The water will be processed thru a Frac tank to remove sediment and concrete /stone pieces. The water will be recirculated to reuse for dust control.
- Tractor trailers, triaxles, and roll off containers will be used to remove processed concrete, ferrous, and nonferrous metals. All trucking will be fully covered with tarps during loadout.
- Trucks will enter and exit off of Gilman Street and Congress Street. Traffic flagmen will be positioned during all trucking operations to ensure safety and mitigate disruption and control traffic.
- Equipment will be fueled away from storm drains.
- Spill kits will be available to address any environmental issues. A hazardous materials response plan will be setup and approved. In the unlikely event of a spill, local authorities will be notified and an appropriate hazardous materials firm will provide the cleanup.
- Street and sidewalks will be cleaned to minimize dust accumulations as needed.

4.2 Noise

- The project will require the use of equipment that can be heard from off-site locations. This project will strive to mitigate construction noise impacts, to the extent possible.
- Increased community sound levels are an unavoidable consequence of construction activities.
- Construction will occur during the daytime hours as defined by the City of Portland Code of Ordinances (7:00 AM to 7:00 PM Monday through Friday).
- In some instances, a second shift, off hour, holiday and weekends may be required.
- When these events arise, all required permits will be obtained and notification will be posted in accordance with section 2.3
- Work shall be performed so as to prevent nuisance noise conditions that are preventable (e.g., unmaintained equipment, brake squeal, etc.).
- Should the noise level exceed the City of Portland noise standards, or a neighborhood or community complaint is made, the Contractor foreman will:
  - Notify the operator to cease the current method used to generate the noise, and look for another method or area to perform the task to see if it corrects the noise level
  - If still not within acceptable noise levels, a new dismantling plan or piece of equipment will be used.
- Turner Construction and all subcontractors shall use all reasonable efforts to implement noise reduction methods listed below to minimize construction noise emission levels.

- **Use of**:
  - Tie to local power grid to reduce the use of on-site generators.
  - Noise-deadening / isolating surrounds around exceptionally noisy work equipment or operations
  - The maintenance of the access roadways to minimize the “bouncing” of construction vehicles within the construction site.
  - Enforcing the site logistics plan, so as to maximize to every extent possible the forward movement of construction vehicles. This will, in turn, minimize the sound of back-up alarms.

Attaching:

- Intake / exhaust mufflers, shields or shrouds
- Noise-deadening material to equipment and fencing

Maintaining:

- Equipment mufflers and lubrication
- Pre-cast decking and plates to avoid rattling
- Smooth surfaces on construction sites and public ways to prevent unnecessary noise from surface irregularities.

Minimizing

- Noise from the use of backup alarms, using measures that meet OSHA regulations. The construction logistics has been designed such that the backing-up of equipment and trucks is limited.
- Use of self-adjusting ambient-sensitive backup alarms.
- Manually adjustable alarms on low setting
- Scheduling of activities so that alarm noise is minimized

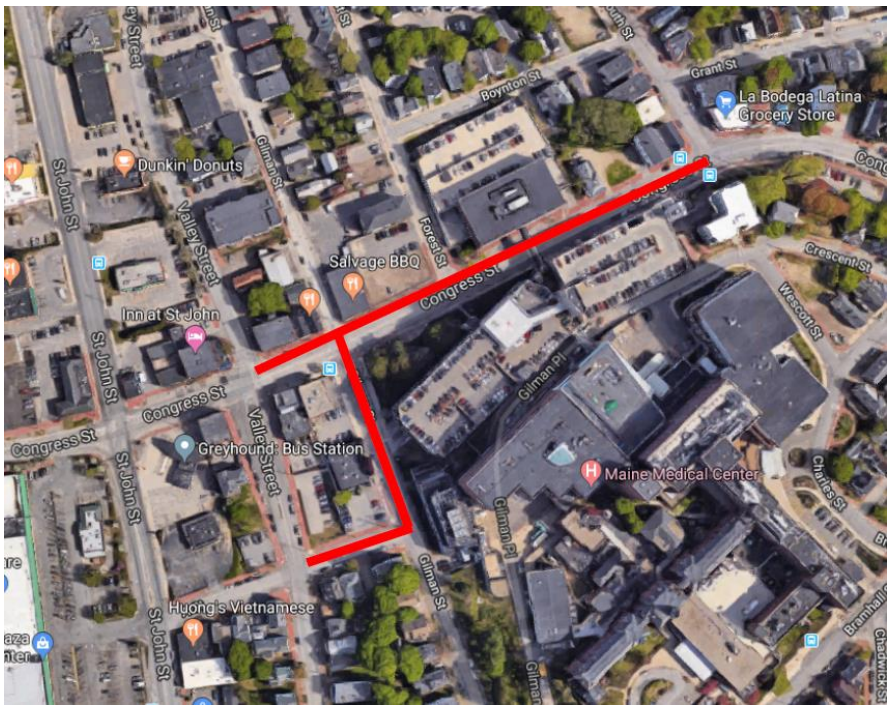
4.3 Air Monitoring

- Turner Construction and its subcontractor's shall employ dust, odor, and gas control measures to minimize the creation of airborne dusts, odors, and gases during the entire construction process. At a minimum, standard dust control techniques shall be employed where heavy equipment will be traveling, standing, or loading, such as watering down the site or utilizing dust control measures. All measures shall be taken in accordance with Turner's approved Health & Safety plan.
- Turner Construction and its subcontractors shall perform dustless street sweeping / vacuuming for all construction activities including demolition, excavation, slurry / soil mixing operations on an as needed basis.
- An air monitoring plan shall be developed by the Owner based on site contaminants of concern, particulate quantities / densities, and risk-based evaluations. The plan will be developed for off-site impacts. Turner Construction and its subcontractors will be responsible for on-site health and safety issues.
- The Owner will engage a qualified consultant to monitor for dust along the perimeter of the construction site. Results of this monitoring that indicate exceedances of air quality criteria will be immediately brought to the attention of Turner Construction. Turner and its subcontractors shall immediately address the site condition, including terminating construction activities to remedy the site conditions to the satisfaction of the Owner.
- Ductwork snorkels will be installed as required on building air intakes surrounding the job-site to minimize the amount of dust and construction vehicle gases being taken in through the air handling systems. The maintenance of the filters is by the individual building managers.

4.4 Vibration Monitoring

Site surveys will be completed:

- On Gilman St from Gilman/A to Gilman/Congress
- On A St from Gilman/A to Valley/A
- On Congress St from Weymouth/Congress to Valley/Congress



- The Maine Medical Center Project geotechnical engineer shall identify vibration-inducing: construction activities and work closely with the Turner to monitor vibration.
- Turner Construction Company and its subcontractors shall preauger Piles and other earthwork-induced vibrations (maximum peak particle velocity) to the limits outlined in the contract documents.
- The Owner shall conduct baseline vibration-level monitoring prior to construction and continuous monitoring of vibration during excavation. Vibration monitoring shall be conducted at the site perimeter locations and near adjacent buildings and other structures.
- It is acknowledged that episodic violations of the vibration criteria may result, primarily due to below grade obstructions. These obstructions shall be cleared in a manner that minimizes the impacts to neighbors.
- When a seismograph trigger level is reached or exceeded an email goes out to the Turner superintendent, Project Manager and Safety Engineer, the Maine Medical Center (MMC) Project Manager and Maine Medical Center safety and facilities staff. The following is the protocol that is followed.
- Events during work hours with the frequency between 5 hz. and 100 hz. and the peak particle velocity above the threshold values but below limiting values, Turner will investigate to determine if the event was caused by construction activities. If so determined, Turner will take steps to minimize the vibrations in the future.

- Turner will investigate and, if caused by construction, stop the activity, review the incident, and take steps to employ alternate means of construction to complete the task. Alternate means may include changes to the construction method being used or utilizing an alternate means of construction.
- The Contractor shall monitor groundwater levels before and during construction on a routine basis. Groundwater levels must be maintained within the allowable range.
- The discharge of pumped ground water shall be done in a manner as according to all required City, State and Federal Permits and approvals

5.0 Communication Strategies

5.1 Communication Plan

Turner will work with MMC's communications team to deliver a communications plan that encompasses:

- Plans for traffic management during Portland Seadogs games
- Plans for METRO bus stops and routes
- Implementation plans for all aspects of the detours outlined in the Maintenance of Traffic plan completed by Gorrill Palmer
- An emergency contacts list for the City of Portland including specifically Portland Police and Fire Departments.

5.2 Contacts, Distribution Lists

- Turner Construction shall develop a project contact list (e-mail addresses, office and cell phone numbers), to be posted by MMC on the project web site and supplied to Maine Medical Center (MMC) for 24/7 contacts.
- Turner Construction will request similar contact lists from the neighborhood associations (e-mail addresses, and phone numbers) of key contacts for the specific project.
- Turner Construction will set-up a project bulletin board for each Phase. These boards will be used as communication tools to the surrounding community. There will be a project website thru Maine Medical Center that also will communicate construction related activities to the community.
- Any last minute changes to the project schedule that may impact the neighborhood or Maine Medical Center (MMC) community will be communicated per section 2.3.
- Turner Construction will participate in the neighborhood council meetings as needed to discuss progress and issues.
- Turner shall maintain a log of all construction-related concerns, via the MMC website.
- MMC shall communicate final resolution of all complaints and concerns to the neighborhood, Maine Medical Center (MMC) community, and when appropriate, to the City of Portland.

5.3 Maintaining Bicycle and Pedestrian Circulation During Construction Activities

A temporary sidewalk or bike lane is not recommended by the Construction team. The construction fence will need to be maintained in the location outlined in the CMP for the majority of the project. It will be possible to set the construction fence back after significant structural, site work, and material deliveries are complete. Turner estimates that these activities will be completed in the Fall of 2022.

Share the road signs will be erected on Congress Street in each direction and Gilman Street prior to the roadway narrowing. These signs will remind drivers to be aware of bicyclists.

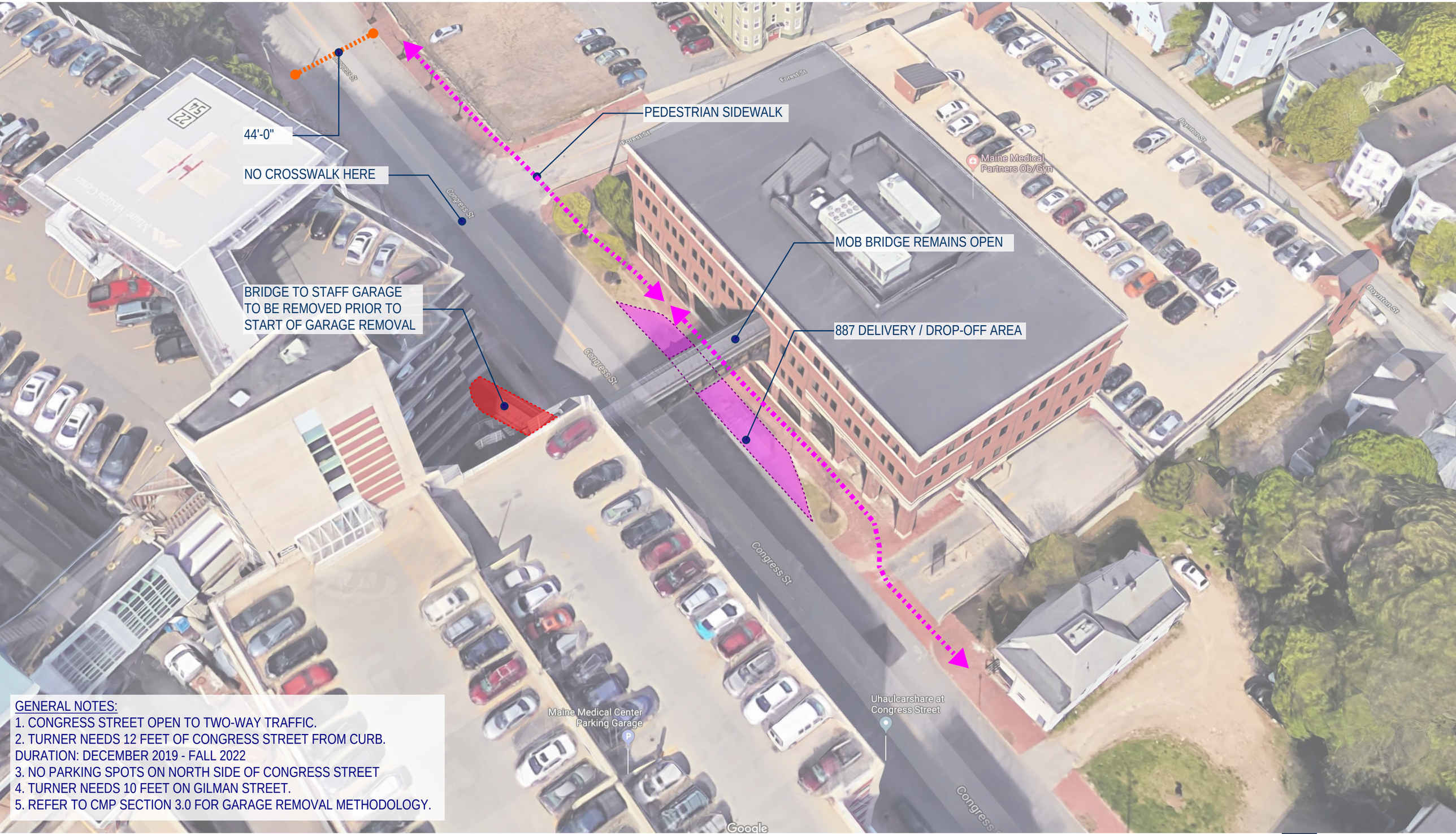
Maine Medical Center
MaineHealth

CONSTRUCTION MANAGEMENT PLAN

UPDATED [11-05-18]

[LOGISTICS PLANS & STUDIES]
CONGRESS STREET NEW CLINICAL TOWER

Turner



GENERAL NOTES:
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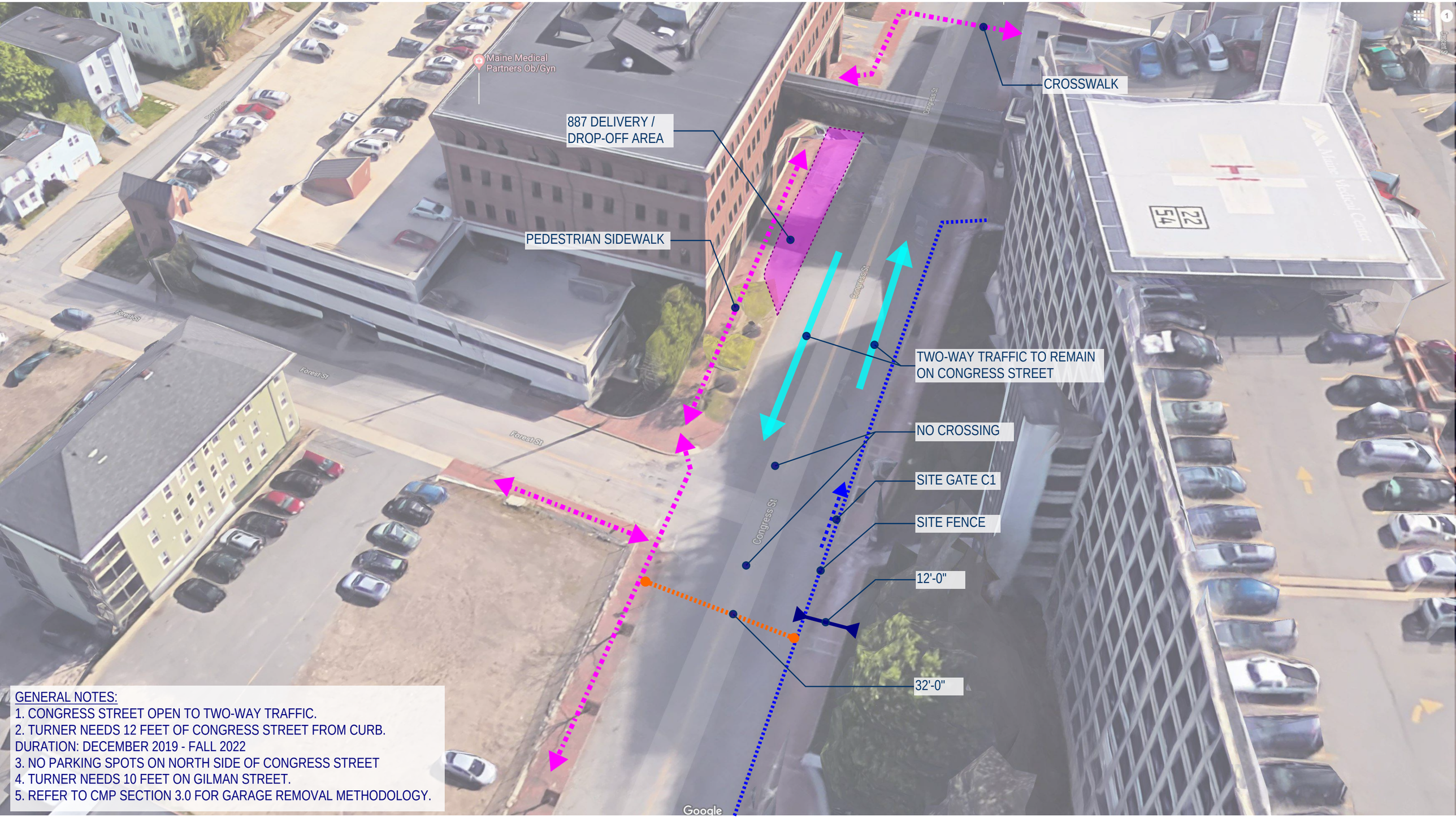
DURATION: DECEMBER 2019 - FALL 2022
3. NO PARKING SPOTS ON NORTH SIDE OF CONGRESS STREET
4. TURNER NEEDS 10 FEET ON GILMAN STREET.
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [887 Delivery / Drop-Off] CONGRESS STREET PEDESTRIAN ROUTING

Turner



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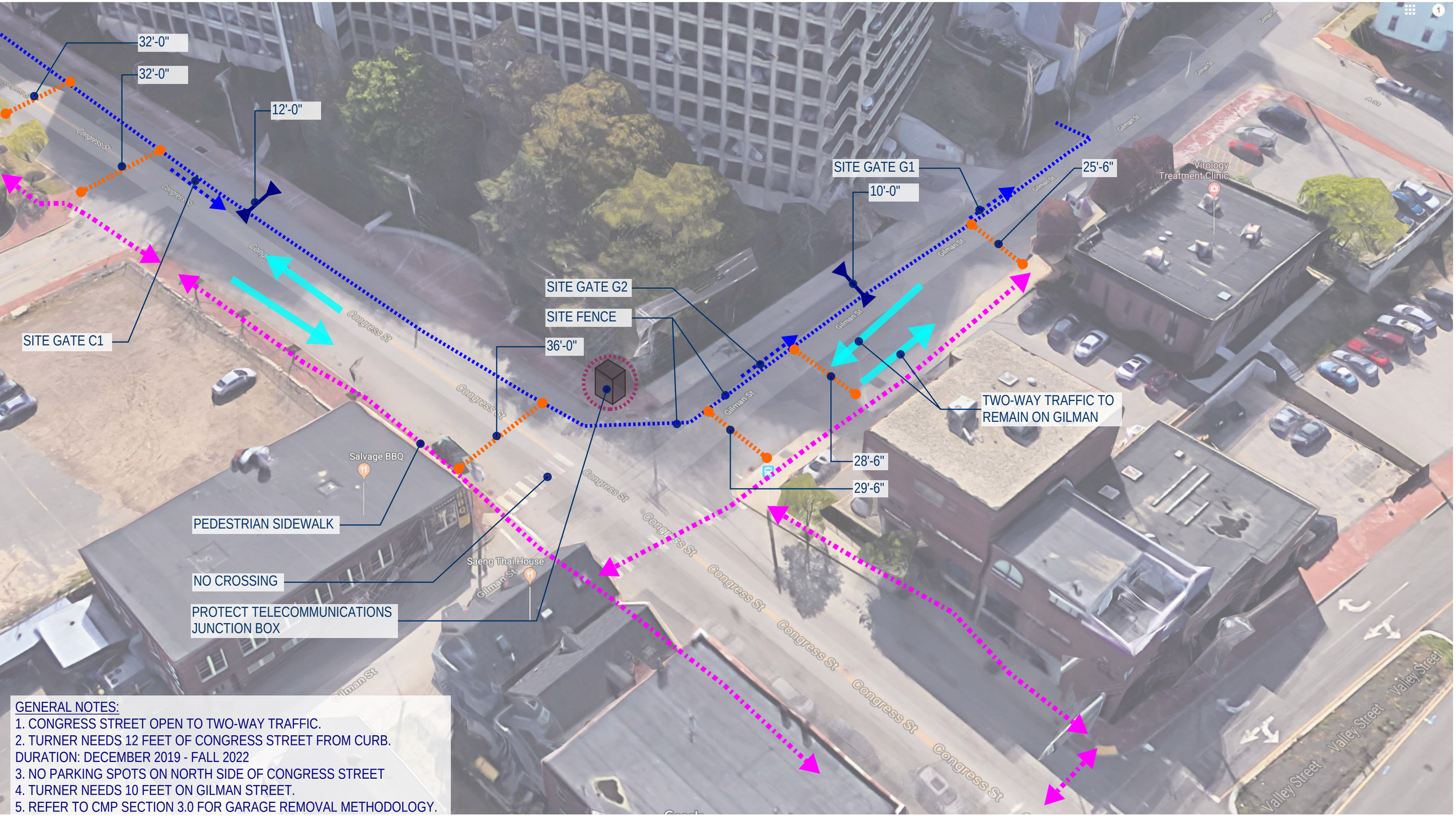
CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [887 Delivery / Drop-Off] CONGRESS STREET PEDESTRIAN ROUTING

Turner



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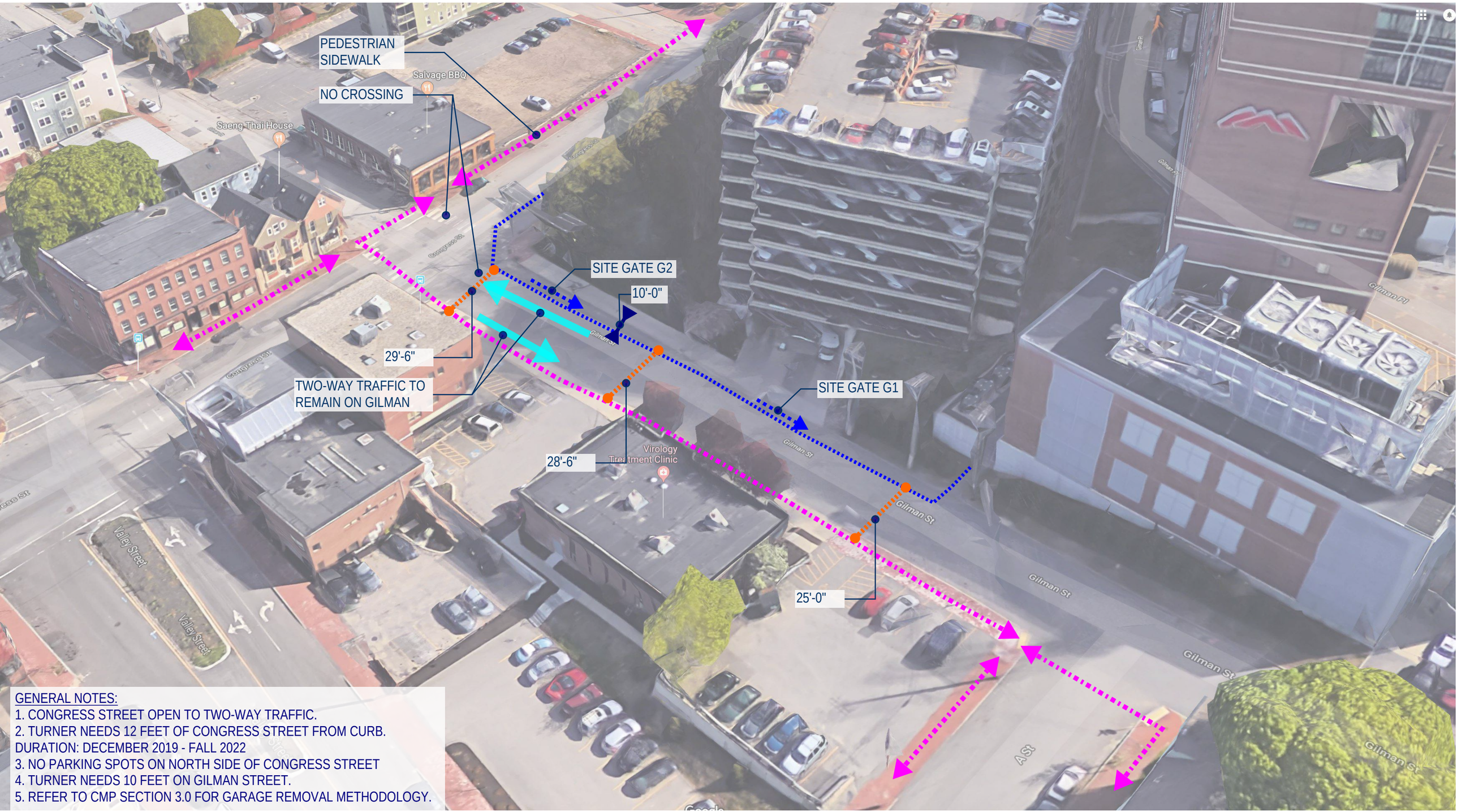
CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [CONGRESS/GILMAN/VALLEY PEDESTRIAN ROUTING]

Turner



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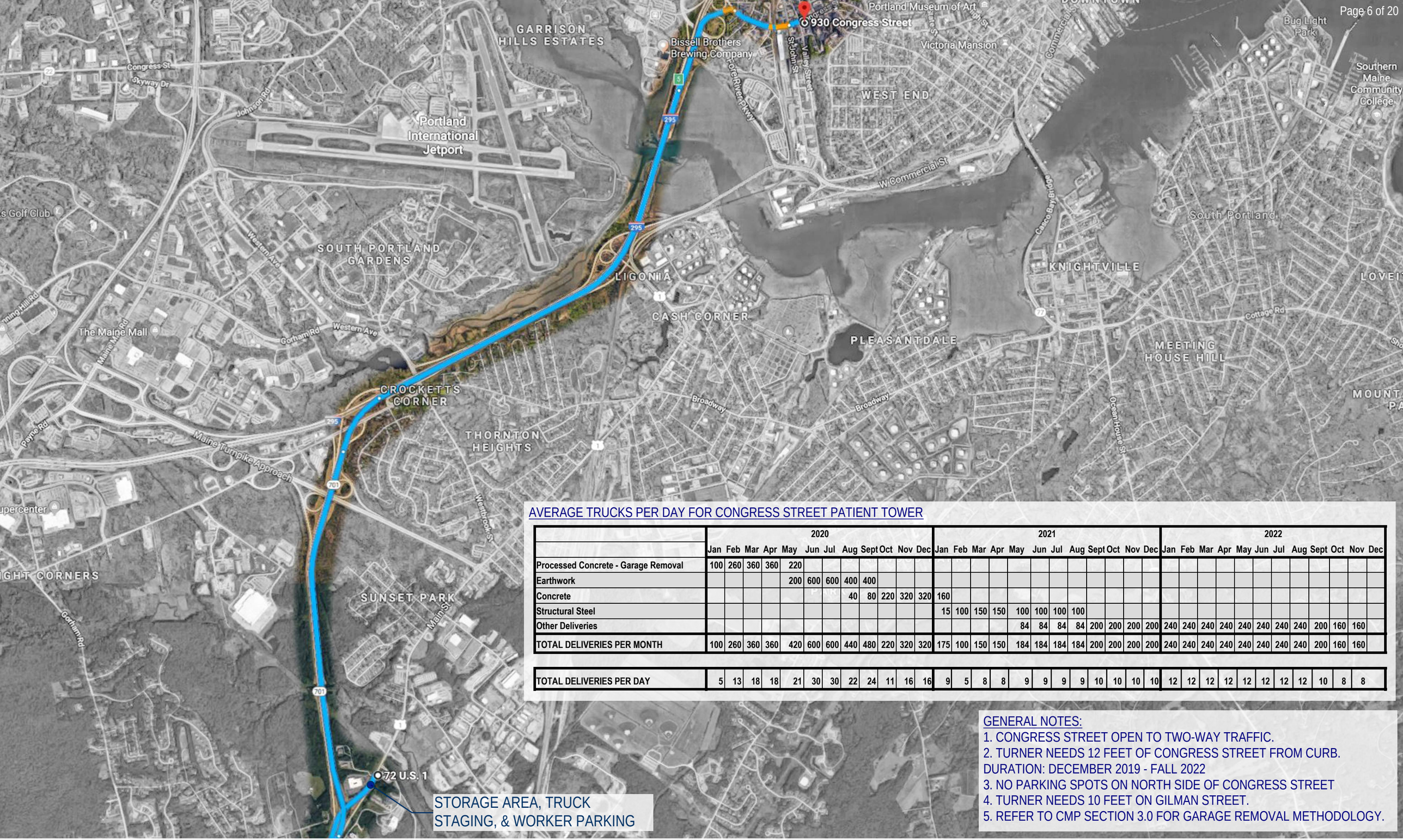
CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [PEDESTRIAN ROUTING GIMAN & A STREET]

Turner



AVERAGE TRUCKS PER DAY FOR CONGRESS STREET PATIENT TOWER

	2020												2021												2022											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Processed Concrete - Garage Removal	100	260	360	360	220																															
Earthwork					200	600	600	400	400																											
Concrete								40	80	220	320	320	160																							
Structural Steel													15	100	150	150	100	100	100	100																
Other Deliveries																	84	84	84	84	200	200	200	200	240	240	240	240	240	240	240	240	200	160	160	
TOTAL DELIVERIES PER MONTH	100	260	360	360	420	600	600	440	480	220	320	320	175	100	150	150	184	184	184	184	200	200	200	200	240	240	240	240	240	240	240	240	200	160	160	
TOTAL DELIVERIES PER DAY	5	13	18	18	21	30	30	22	24	11	16	16	9	5	8	8	9	9	9	9	10	10	10	10	12	12	12	12	12	12	12	12	10	8	8	

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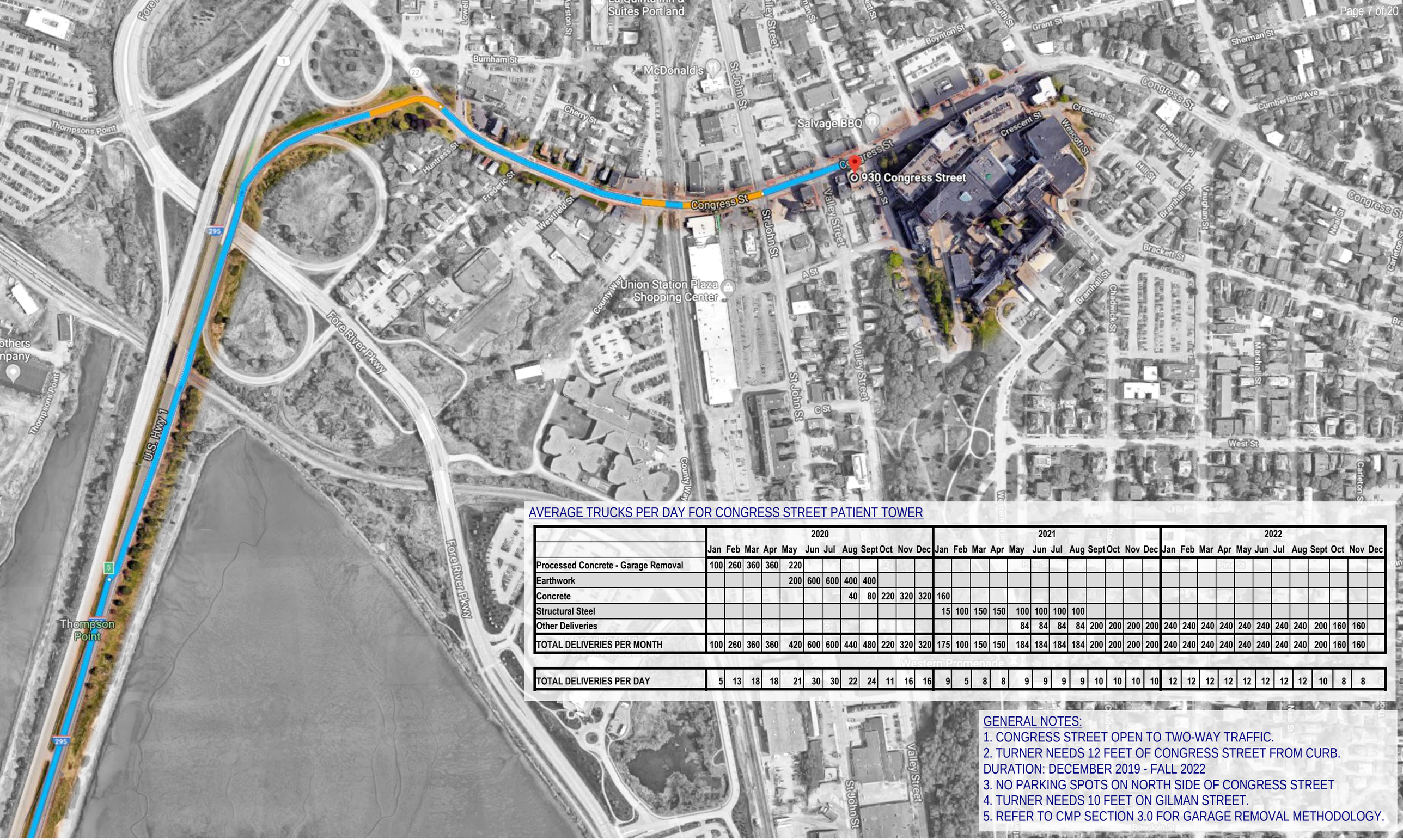
CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [TRAFFIC ROUTES] FROM US ROUTE 1, SCARBOROUGH

Turner



AVERAGE TRUCKS PER DAY FOR CONGRESS STREET PATIENT TOWER

	2020												2021												2022											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
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Other Deliveries																	84	84	84	84	200	200	200	200	240	240	240	240	240	240	240	240	200	160	160	
TOTAL DELIVERIES PER MONTH	100	260	360	360	420	600	600	440	480	220	320	320	175	100	150	150	184	184	184	184	200	200	200	200	240	240	240	240	240	240	240	240	200	160	160	
TOTAL DELIVERIES PER DAY	5	13	18	18	21	30	30	22	24	11	16	16	9	5	8	8	9	9	9	9	10	10	10	10	12	12	12	12	12	12	12	12	10	8	8	

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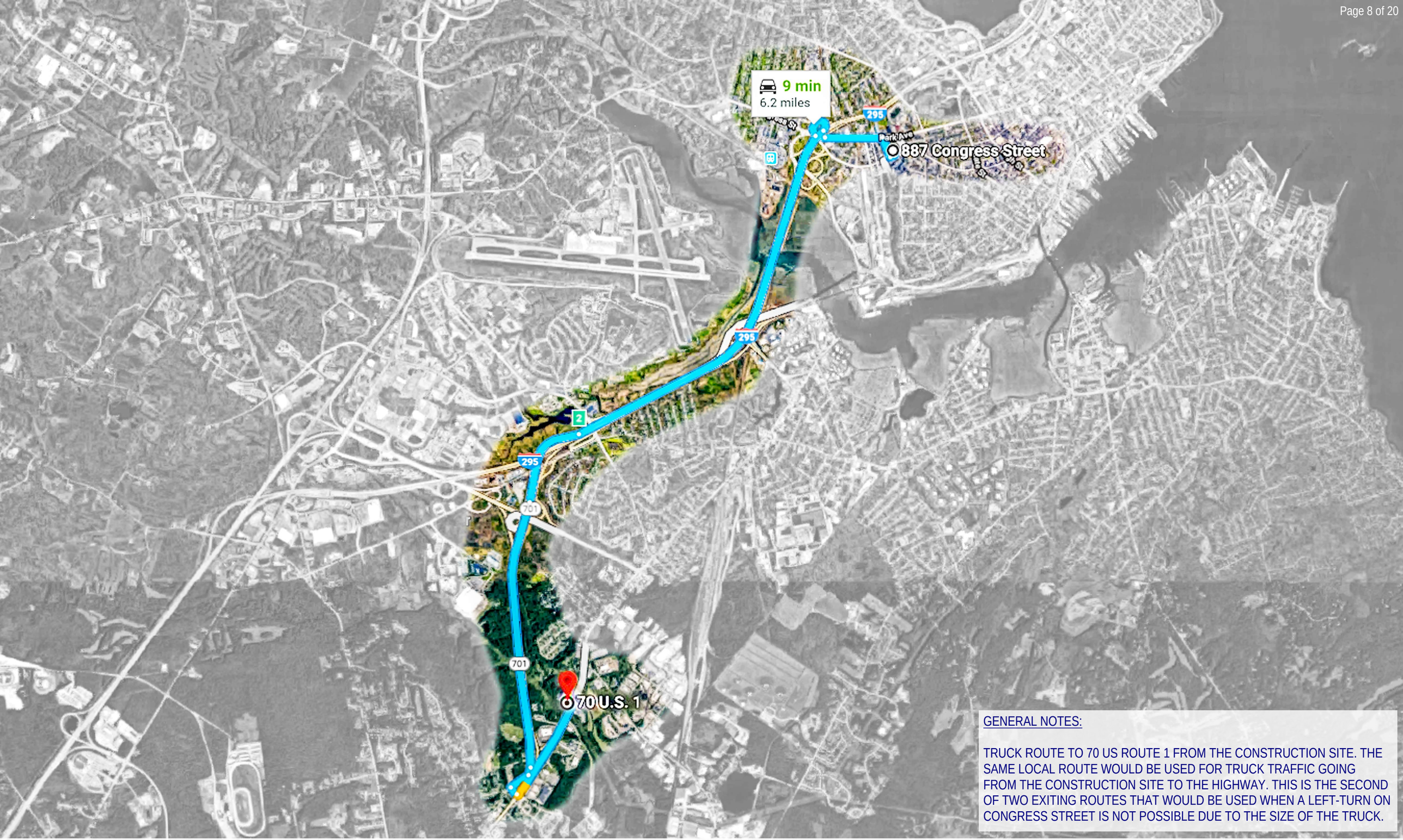
CONGRESS STREET NEW CLINICAL TOWER

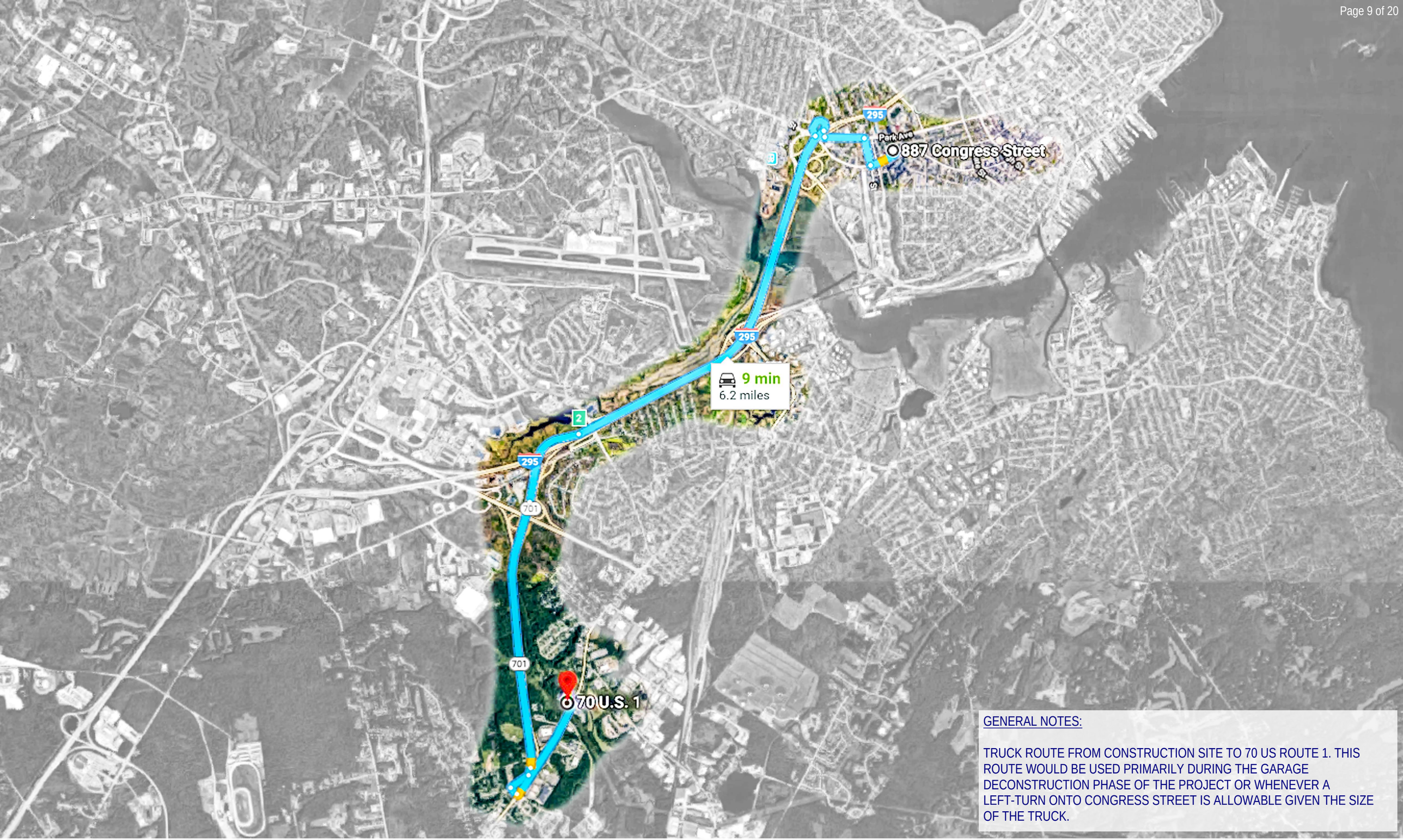
Additions and Renovations [TRAFFIC ROUTES] FROM US ROUTE 1, SCARBOROUGH

Turner



GENERAL NOTES:

TRUCK ROUTE TO 70 US ROUTE 1 FROM THE CONSTRUCTION SITE. THE SAME LOCAL ROUTE WOULD BE USED FOR TRUCK TRAFFIC GOING FROM THE CONSTRUCTION SITE TO THE HIGHWAY. THIS IS THE SECOND OF TWO EXITING ROUTES THAT WOULD BE USED WHEN A LEFT-TURN ON CONGRESS STREET IS NOT POSSIBLE DUE TO THE SIZE OF THE TRUCK.



GENERAL NOTES:

TRUCK ROUTE FROM CONSTRUCTION SITE TO 70 US ROUTE 1. THIS ROUTE WOULD BE USED PRIMARILY DURING THE GARAGE DECONSTRUCTION PHASE OF THE PROJECT OR WHENEVER A LEFT-TURN ONTO CONGRESS STREET IS ALLOWABLE GIVEN THE SIZE OF THE TRUCK.

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

TEMPORARY PEDESTRIAN BRIDGE INSTALLED PRIOR TO STRUCTURAL GARAGE REMOVAL

FILTERS ADDED TO PROTECT EXISTING MECHANICAL LOUVERS

ALL GARAGE RETAINING WALL TIE-BACKS (BEYOND) INSTALLED PRIOR TO START OF STRUCTURAL GARAGE REMOVAL

BEGIN SIDEWALK CLOSURE AT PROJECT START - DECEMBER 2019

CONGRESS STREET

FOREST STREET

GILMAN STREET

OVERHEAD POWER LINES TO BE RELOCATED

ELECTRICAL WORK ACROSS CONGRESS STREET.

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CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [Structural Garage Removal Logistics Plan]

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

DISONNECT BRIDGE TO STAFF GARAGE

BRIDGE TO MOB REMAINS OPEN

CONSTRUCTION GATE C1 - 30' ROLLING GATE

CONGRESS STREET

FOREST STREET

FAIRPOINT TELECOMM CABINET LOCATION

FILTERS ADDED TO PROTECT EXISTING MECHANICAL LOUVERS

ROAD (BEYOND) TO BE CLOSED DURING STRUCTURAL GARAGE REMOVAL.

PROTECT EXISTING TRANSFORMER BY TRENCH BOX & ROAD PLATES.

ALL GARAGE RETAINING WALL TIE-BACKS (BEYOND) INSTALLED PRIOR TO START OF STRUCTURAL GARAGE REMOVAL. WORK IN STAFF GARAGE TO START IN SPRING OF 2019

CONSTRUCTION ACCESS GATE G2 - 30' ROLLING GATE

AREA TO BE FILLED & LEVELED WITH GRAVEL (PRIOR TO STRUCTURAL GARAGE REMOVAL)

GILMAN STREET

OVERHEAD POWER LINES TO BE RELOCATED

CONSTRUCTION ACCESS GATE G1 - 30' ROLLING GATE

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CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [Structural Garage Removal Logistics Plan]

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

DISONNECT BRIDGE TO STAFF GARAGE

BRIDGE TO MOB REMAINS OPEN

CONSTRUCTION GATE C1 - 30' ROLLING GATE

DIRECTION OF STRUCTURAL GARAGE REMOVAL.

BEGIN STRUCTURAL GARAGE REMOVAL OF EXISTING CONGRESS STREET GARAGE WITH LONG ARM EXCAVATORS

INSTALL BREAK-AWAY TARPING SYSTEM FOR DUST AND DEBRIS CONTROL

HIGH REACH EXCAVATOR WITH CONCRETE PROCESSOR

CONSTRUCTION ACCESS GATE G2 - 30' ROLLING GATE

ROUGH TERRAIN CRANE WITH DEBRIS SHIELD TO BE UTILIZED AS PROTECTION.

SITE CLEARING AND REMOVAL OF EXISTING TREES AND FOLIAGE

REMOVAL OF EXISTING UTILITY POLES ON CONGRESS AND GILMAN STREET TO OCCUR BEFORE DEMOLITION STARTS

CONSTRUCTION ACCESS GATE G1 - 30' ROLLING GATE

CONGRESS STREET

GILMAN STREET

FOREST STREET

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CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [Structural Garage Removal Logistics Plan]

Turner

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DISONNECT BRIDGE TO STAFF GARAGE

BRIDGE TO MOB REMAINS OPEN

CONSTRUCTION GATE C1 - 30' ROLLING GATE

CONTINUE STRUCTURAL GARAGE REMOVAL OF CONGRESS STREET GARAGE WITH LONG ARM EXCAVATORS

INSTALL BREAK-AWAY TARPING SYSTEM FOR DUST AND DEBRIS CONTROL

CONSTRUCTION ACCESS GATE G2 - 30' ROLLING GATE

REMOVAL OF EXISTING UTILITY POLES ON CONGRESS AND GILMAN STREET TO OCCUR BEFORE DEMOLITION STARTS

CONSTRUCTION ACCESS GATE G1 - 30' ROLLING GATE

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DURATION: DECEMBER 2019 - FALL 2022
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4. TURNER NEEDS 10 FEET ON GILMAN STREET.
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

CONGRESS STREET NEW CLINICAL TOWER

Additions and Renovations [Structural Garage Removal Logistics Plan]

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

UNDERPINNING OF EXISTING GARAGE FOUNDATION WALLS AND ELEVATOR LOBBY WALLS

BRIDGE ACCESS TO GARAGE TO REMAIN.

CONSTRUCTION GATE C1 - 30' ROLLING GATE

MANGATE

ALL GARAGE RETAINING WALL TIE-BACKS (BEYOND) INSTALLED PRIOR TO START OF STRUCTURAL GARAGE REMOVAL

CONSTRUCTION ACCESS GATE G2 - 30' ROLLING GATE

TEMPORARY EARTH RETENTION.

CONSTRUCTION ACCESS GATE G1 - 30' ROLLING GATE

GENERAL NOTES:
1. CONGRESS STREET OPEN TO TWO-WAY TRAFFIC.
2. TURNER NEEDS 12 FEET OF CONGRESS STREET FROM CURB.
DURATION: DECEMBER 2019 - FALL 2022
3. NO PARKING SPOTS ON NORTH SIDE OF CONGRESS STREET
4. TURNER NEEDS 10 FEET ON GILMAN STREET.
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

WORK SCOPE:
1. EXCAVATION
2. EARTH RETENTION - PERMANENT
3. FOUNDATIONS REMOVAL
4. NEW FOUNDATIONS
5. UTILITIES INSTALLATION
6. TEMP. SUPPORT OF EXCAVATION

CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Earth Retention

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

CONSTRUCTION GATE C1
- 30' ROLLING GATE

CONSTRUCTION ACCESS
GATE G2 - 30' ROLLING GATE

CONSTRUCTION ACCESS GATE G1 -
30' ROLLING GATE

GENERAL NOTES:
1. CONGRESS STREET OPEN TO TWO-WAY TRAFFIC.
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DURATION: DECEMBER 2019 - FALL 2022
3. NO PARKING SPOTS ON NORTH SIDE OF CONGRESS STREET
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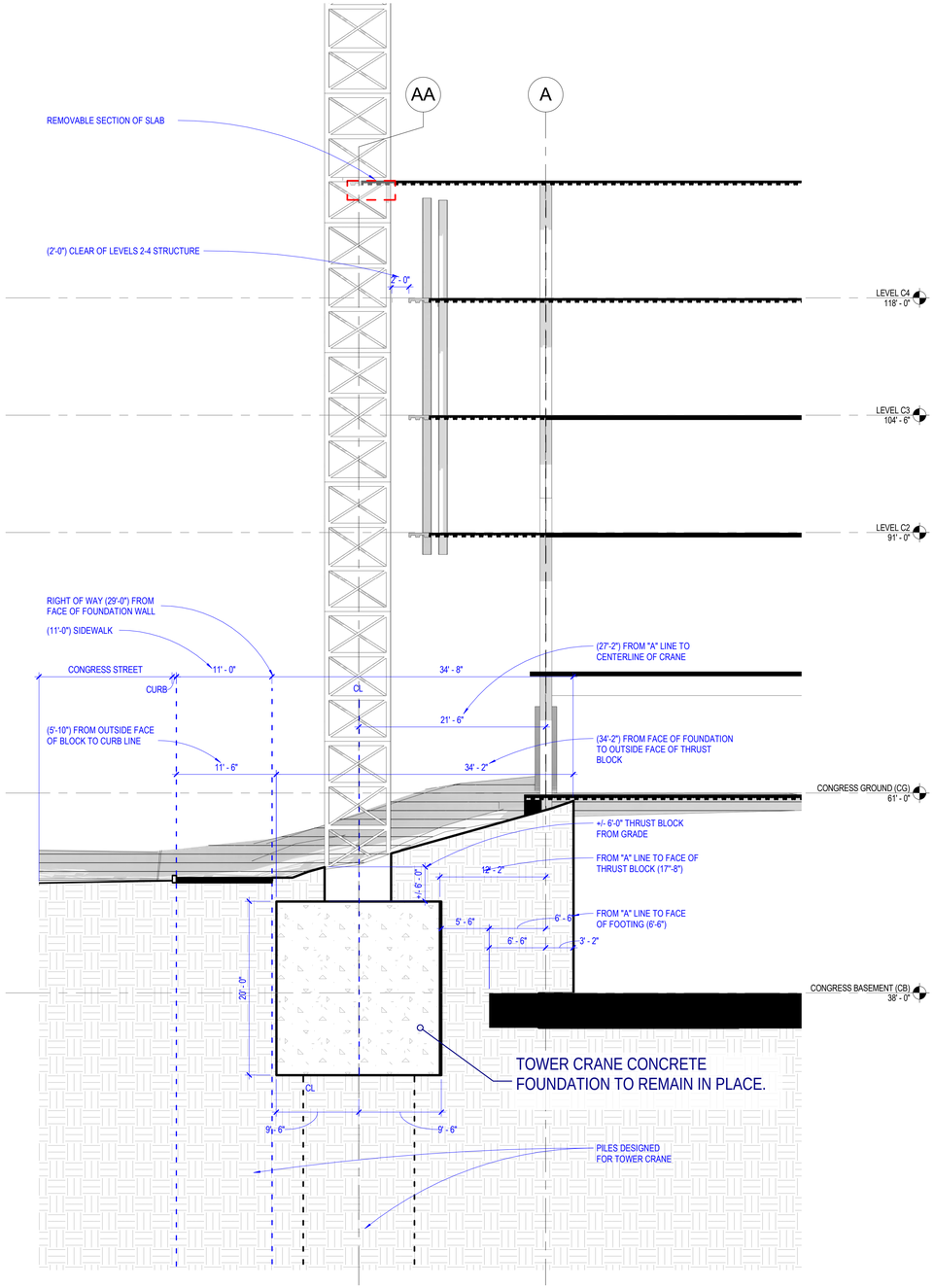
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

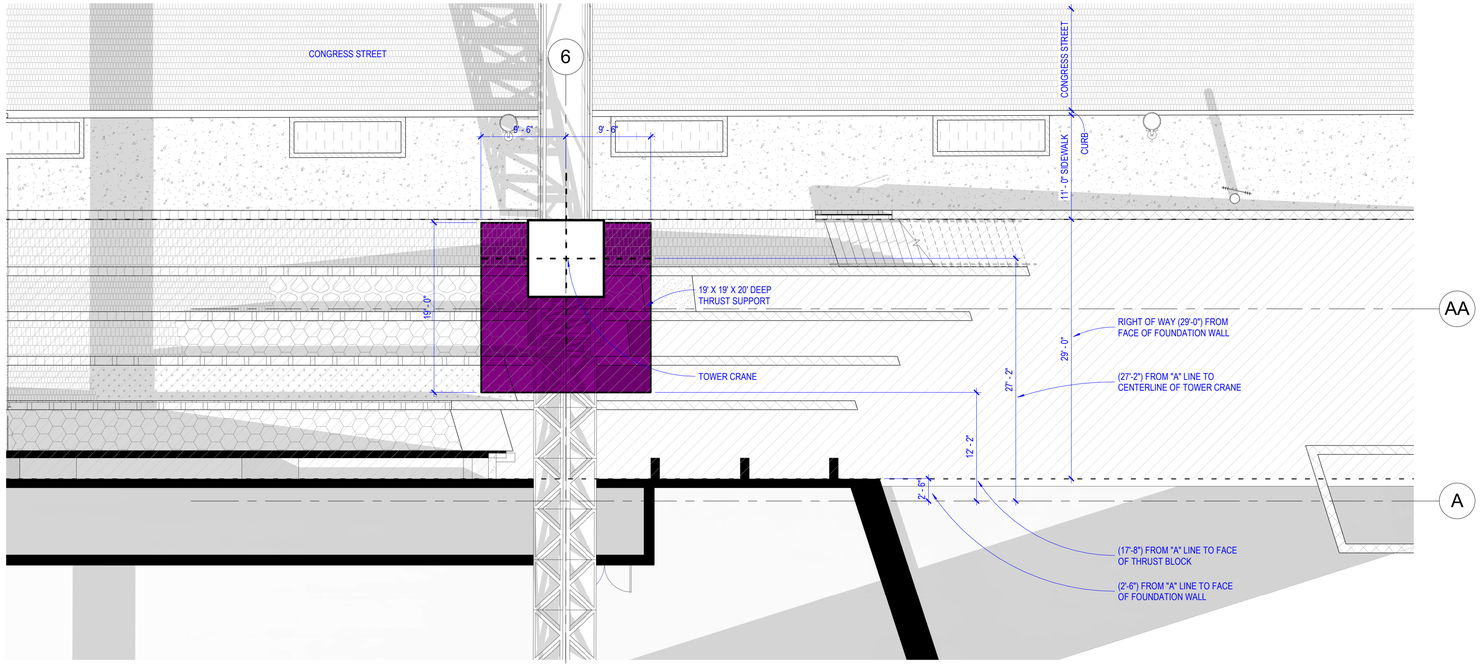
WORK SCOPE:
1. FOUNDATIONS - FOOTINGS & WALLS
2. MATT BASEMENT SLAB
3. RIGID INSULATION AND SECANT EARTH RETENTION
4. INSTALL TOWER CRANE BASE

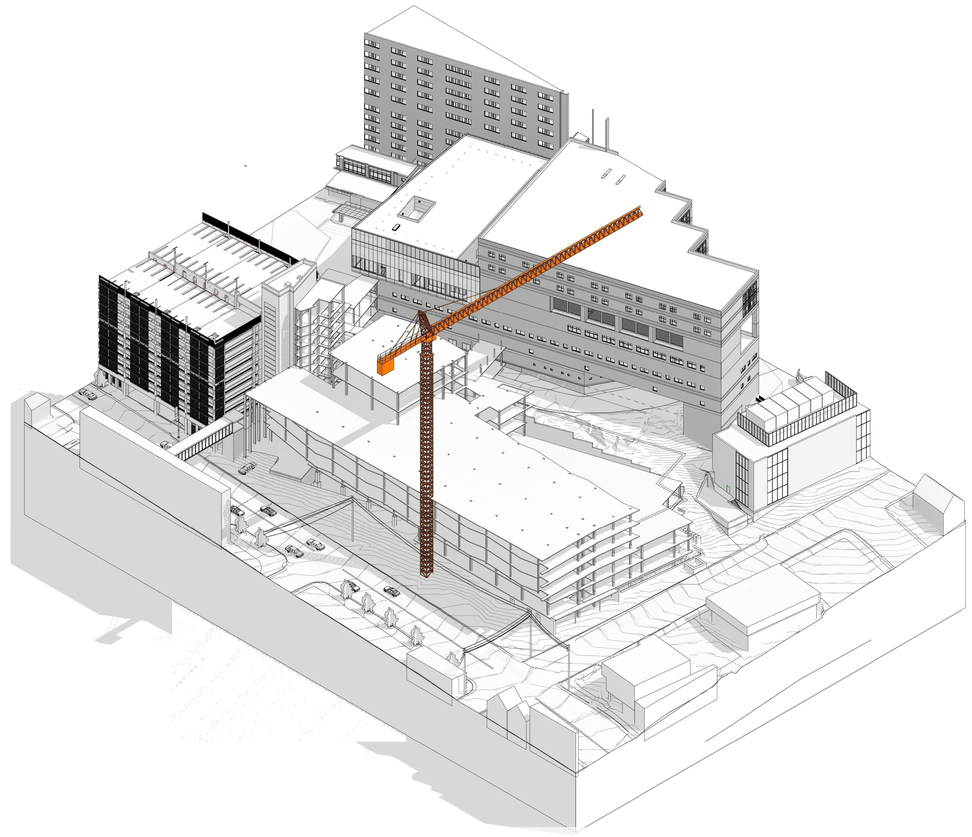
CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Foundations

Turner







WORK SCOPE:

1. CONCRETE BASE INSTALLATION IN SUMMER OF 2020
2. TOWER CRANE BUILD IN NOVEMBER/DECEMBER 2020
3. LOCALIZED CONGRESS STREET ROAD CLOSURE - TWO WAY TRAFFIC MAINTAINED

CONGRESS STREET NEW CLINICAL TOWER

Congress Street Tower Crane Location & Detail [Logistics Plan]

Turner

2019						2020											2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

TRUCK PATH THROUGH SITE.

CONSTRUCTION GATE C1
- 30' ROLLING GATE

TOWER
CRANE

HOIST

CONSTRUCTION ACCESS
GATE G2 - 30' ROLLING GATE

CONSTRUCTION ACCESS GATE G1 -
30' ROLLING GATE

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DURATION: DECEMBER 2019 - FALL 2022
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4. TURNER NEEDS 10 FEET ON GILMAN STREET.
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

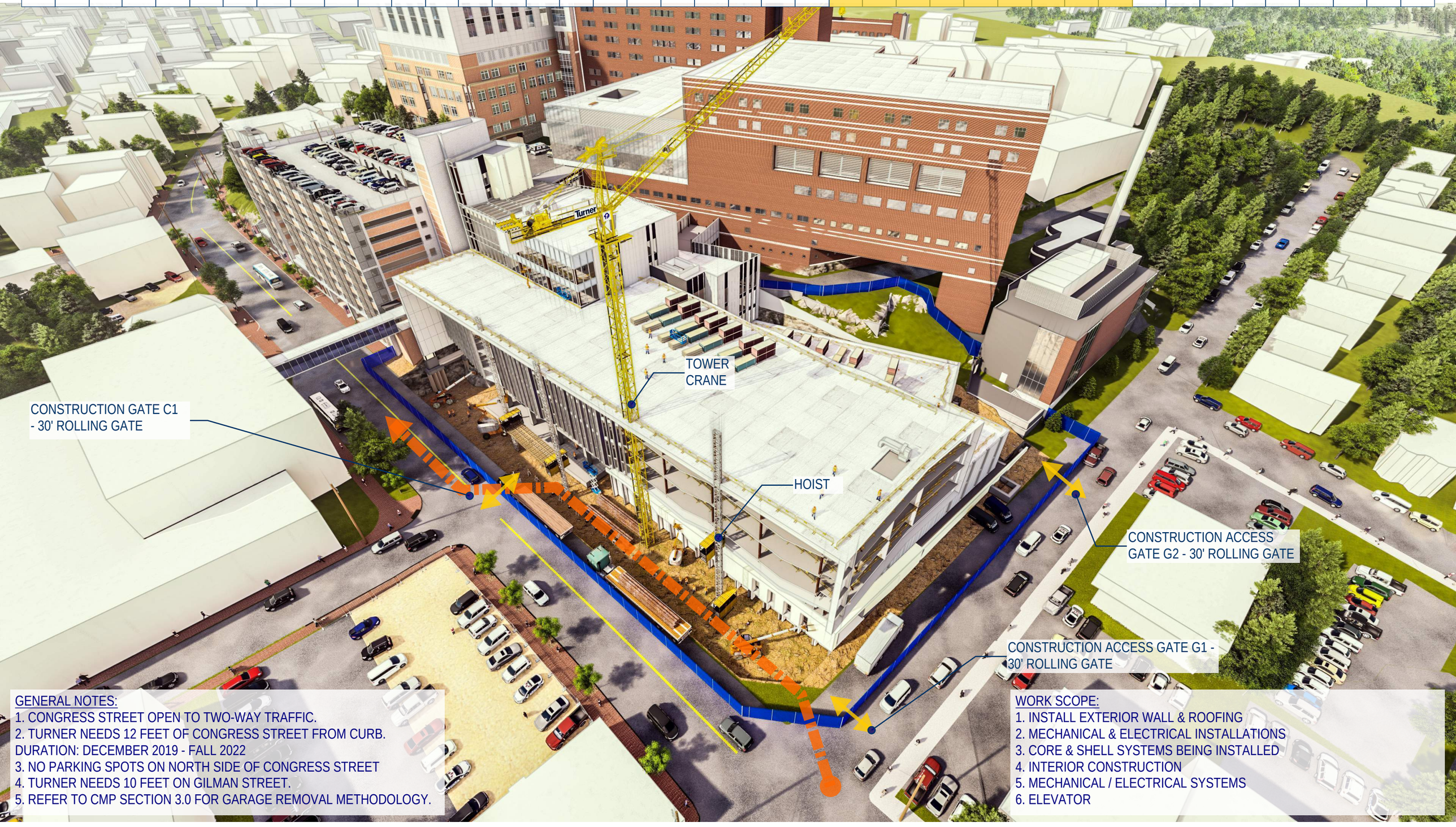
WORK SCOPE:
1. CONCRETE BASE INSTALLATION IN SUMMER OF 2020
2. TOWER CRANE BUILD IN NOVEMBER/DECEMBER 2020
3. LOCALIZED CONGRESS STREET ROAD CLOSURE - TWO WAY TRAFFIC MAINTAINED
4. INSTALL STRUCTURAL STEEL & DECK
5. PLACE CONCRETE SLAB
6. SPRAY ON FIREPROOFING

CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Structure

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.



CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Exterior Envelope

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

CONSTRUCTION GATE C1
- 30' ROLLING GATE

CONSTRUCTION ACCESS
GATE G2 - 30' ROLLING GATE

CONSTRUCTION ACCESS GATE G1 -
30' ROLLING GATE

GENERAL NOTES:
1. CONGRESS STREET OPEN TO TWO-WAY TRAFFIC.
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DURATION: DECEMBER 2019 - FALL 2022
3. NO PARKING SPOTS ON NORTH SIDE OF CONGRESS STREET
4. TURNER NEEDS 10 FEET ON GILMAN STREET.
5. REFER TO CMP SECTION 3.0 FOR GARAGE REMOVAL METHODOLOGY.

WORK SCOPE:
1. INTERIOR PATIENT ROOM FITOUT
2. CRITICAL CARE SUITES & ORs
3. MAIN LOBBY & PLUMBING SPACES FITOUT
4. SITE WORK AND HARDSCAPE

CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Interior Fitout

Turner

2019						2020												2021												2022											
JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

WORK SCOPE:
1. INSPECTIONS
2. CLEANING
3. MEDICAL EQUIPMENT
4. SITE IMPROVEMENTS

CONGRESS STREET NEW CLINICAL TOWER

Construction Management Plan [Logistics Plan] - Commissioning and Completion

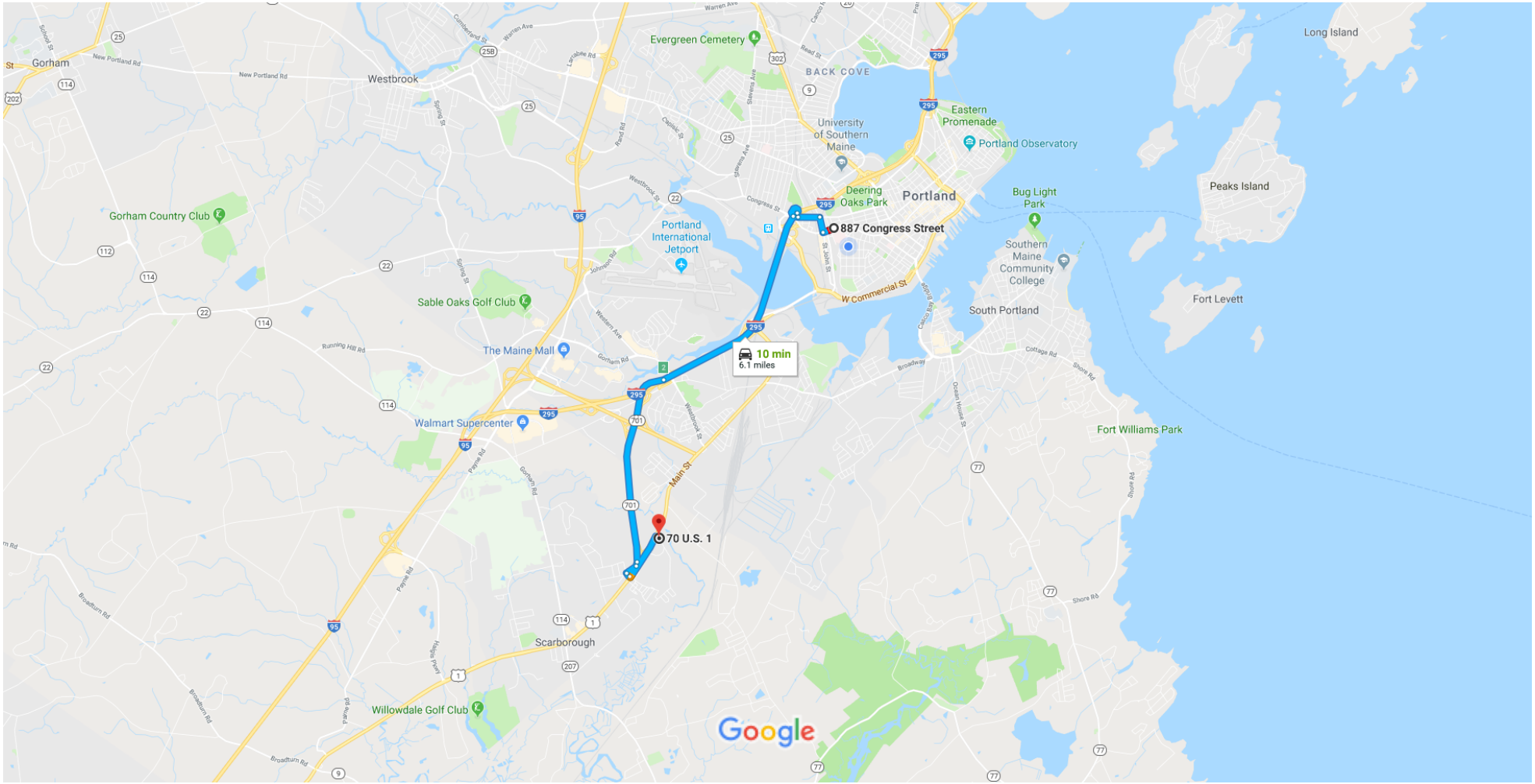
Turner

Google Maps

887 Congress St, Portland, ME 04102 to 70 US-1, Scarborough, ME 04074

Drive 6.1 miles, 10 min

Truck route from construction site to 70 US Route 1. This route would be used primarily during the garage deconstruction phase of the project or whenever a left-turn onto Congress St is allowable given the size of the truck.



887 Congress St

Portland, ME 04102

Get on I-295 S/US-1 S from St John St and Park Ave

3 min (0.8 mi)

1. Head southwest on Congress St toward Gilman St

0.1 mi

2. Turn right at the 3rd cross street onto St John St

0.2 mi

3. Turn left onto Park Ave

0.2 mi

4. Continue onto Congress St

295 ft

5. Slight right onto the Interstate 295 S/U.S. 1 ramp to So Portland

0.2 mi

Continue on I-295 S. Take ME-701 to US-1 S

5 min (4.6 mi)

6. Merge onto I-295 S/US-1 S
   Continue to follow I-295 S

2.4 mi

7. Use the right 2 lanes to take exit 2 toward U.S. 1 S/Scarborough/Old Orchard

0.6 mi

8. Continue onto ME-701

1.6 mi

Continue on US-1 N. Drive to Campus Dr

2 min (0.8 mi)

9. Use the right lane to merge onto US-1 S

243 ft

10. Slight right onto 1st St

0.1 mi

11. Turn left at the 1st cross street onto Green Acres Ln

325 ft

12. Use the right lane to turn left onto US-1 N

0.5 mi

13. Turn right onto Campus Dr

207 ft

70 US-1

Scarborough, ME 04074

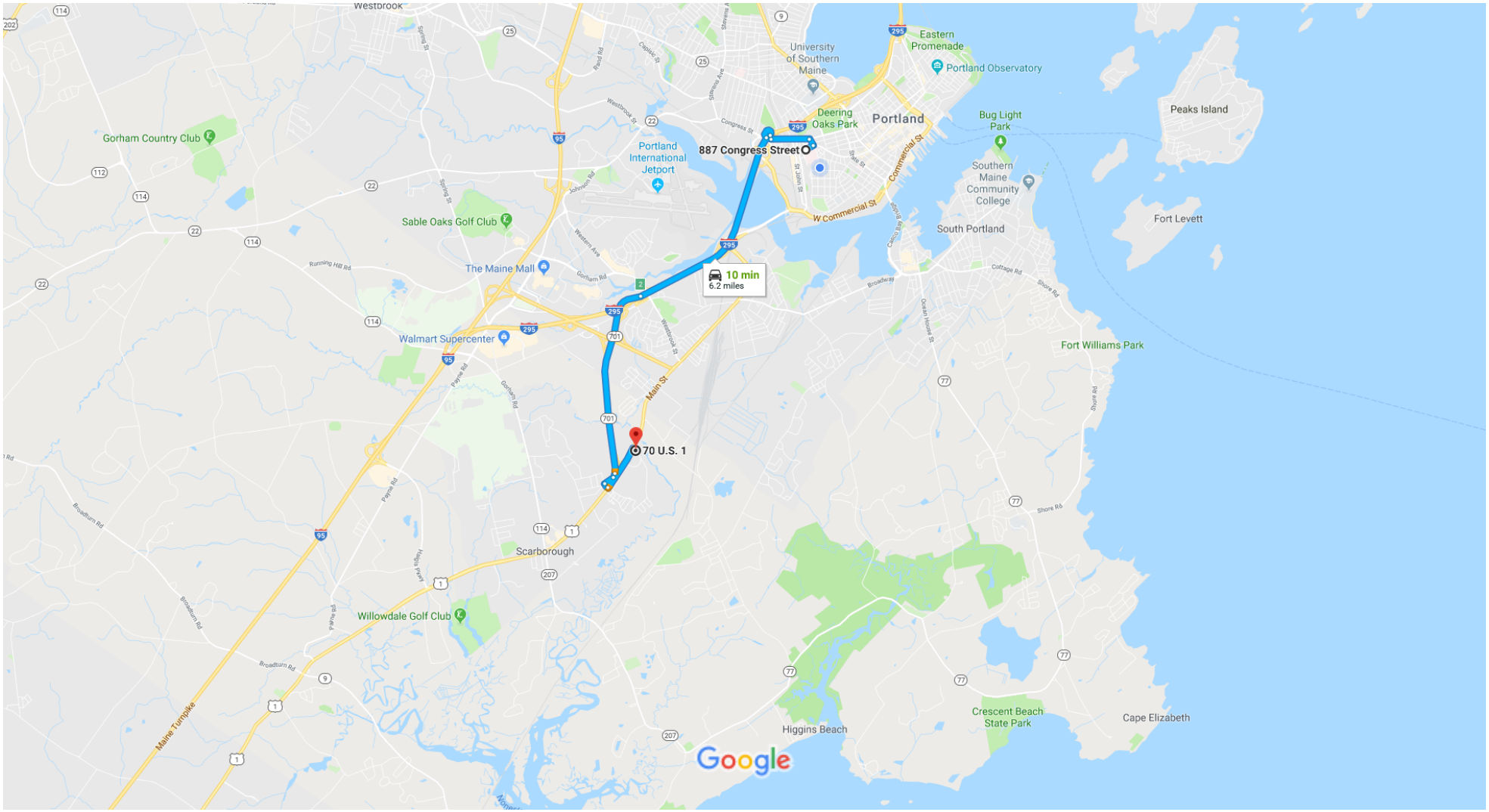
These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Google Maps

887 Congress St, Portland, ME 04102 to 70 US-1, Scarborough, ME 04074

Drive 6.2 miles, 10 min

Truck route to 70 US Route 1 from the construction site. The same local route would be used for truck traffic going from the construction site to the highway. This is the second of two exiting routes that would be used when a left-turn on Congress St is not possible due to the size of the truck.



Map data ©2018 Google 5000 ft

887 Congress St

Portland, ME 04102

Get on I-295 S/US-1 S from Park Ave

3 min (0.9 mi)

1. Head northeast on Congress St toward Weymouth St

0.1 mi

2. Turn left onto Weymouth St

443 ft

3. Turn left onto Park Ave

0.4 mi

4. Continue onto Congress St

295 ft

5. Slight right onto the Interstate 295 S/U.S. 1 ramp to So Portland

0.2 mi

Continue on I-295 S. Take ME-701 to US-1 S

5 min (4.6 mi)

6. Merge onto I-295 S/US-1 S
   Continue to follow I-295 S

2.4 mi

7. Use the right 2 lanes to take exit 2 toward U.S. 1 S/Scarborough/Old Orchard

0.6 mi

8. Continue onto ME-701

1.6 mi

Continue on US-1 N. Drive to Campus Dr

2 min (0.8 mi)

9. Use the right lane to merge onto US-1 S

243 ft

10. Slight right onto 1st St

0.1 mi

11. Turn left at the 1st cross street onto Green Acres Ln

325 ft

12. Use the right lane to turn left onto US-1 N

0.5 mi

13. Turn right onto Campus Dr

207 ft

70 US-1

Scarborough, ME 04074

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

L

WRITTEN SUBMISSION 19 – LANDSCAPING AND LANDSCAPE PRESERVATION
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THERE ARE MATURE EXISTING TREES ON THE SITE, HOWEVER, IT IS NOT POSSIBLE TO PRESERVE THEM WITH DEMOLITION OPERATIONS AND NEW CONSTRUCTION .

WRITTEN SUBMISSION 11 – LOADING AND SERVICING
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

L

THE PROJECT DOES NOT INCLUDE ANY LOADING OR SERVICE AREAS. THE NEW ADDITION WILL BE SERVICED FROM THE EXISTING LOADING DOCKS NEAR THE REAR OF THE BUILDING.

Level III Site Plan Neighborhood Meeting
October 17, 2018, 5:30PM – 7:00PM
Maine Medical Center – Congress Building Site Plan Application
East Tower 2 & 3

LL

Minutes

Attendees:

Karen Snyder	Richard Parsons
Troy Bennett	Gregg Scholler
Steve Whittier	Dominic Gagnon
George Rheavld	Matt Wickenheiser
Kris Hall	Randy Dunton
Thomas Cummings	Jeff Sanders
	Al Green
	Dennis Morelli

I. Welcome

Jeff Sanders extended a welcome to the attendees and discussed the objectives and previewed the content of the presentation.

II. Project Background and Need & Review Process

- MMC struggles to meet the daily patient care need due to capacity limitations created by semi-private rooms.
- A neighborhood attendee questioned the validity and statistical significance of the information MMC shared on a slide demonstrating a day at MMC. MMC explained the information is an example of a typical day at MMC and not meant to be statistically significant but that it is a scenario that MMC experiences often.
- Staff at MMC park in one of 8 different locations near MMC's Bramhall campus. This is a neighborhood and staff dissatisfier.
- City of Portland review of MMC's facility project is broken down into three site plan applications: 1. East Tower & Visitor garage (approved), 2. St John Garage (approved), 3. Congress Building (application submitted).
- Neighborhood attendees had several questions about the orientation of the proposed MMC buildings, the institutional overlay zone (IOZ), and the improvements to the right-of-way that were approved as part of the St John Street Garage site plan. Others questions were as follows:
    - Q: Why didn't MMC build a bigger garage?
        - A: MMC feels that the proposed garage is sized appropriately for MMC's needs.
    - Q: Will the garage be built of quality materials that last a long time?
        - A: Yes. Adhering to recommended maintenance schedules is also important when considering the lifespan of any building. MMC intends to adhere to all recommended maintenance schedules.
    - Q: How close is the proposed garage to the 222 St John historic building?

        - A: Less than 100'. MMC presented to the Historic Preservation board as required by City of Portland regulations.
    - Q: What beautification efforts are planned in the neighborhood?
        - A: The Planning Board approved plans submitted in MMC's St John Garage site plan application to replace broken or unsafe sidewalks, improve lighting, and add pedestrian street crossings between the new garage and MMC's Bramhall campus.

III. Design

- MMC reviewed the proposed design drivers of the Congress building, shared renderings of the proposed buildings, and discussed how each of the design guidelines outlined in MMC's institutional development plan (IDP) are met.
- A neighborhood attendee commented on the design of the building's façade at the street level on the corner of Gilman St and Congress St. The attendee felt that the design guideline to limit blank facades was not met by the proposed design. MMC shared that the employee entrance was added in part to address and meet the "limit blank facades" design guideline.
- One resident questioned the need to remove a large tree; MMC responded with information about trees being added and the inclusion of 2 green rooftop gardens in the new building's design.
- The trees being planted in front of the building will be approved by the City of Portland arborist.

IV. Construction Management Plan

- A representative of Turner construction provided some background on Turner construction, an overview of the project timeline, and logistics required to complete the project. The project is anticipated to be 36 months in duration.
- The topic of property surveys was discussed: Turner does not anticipate vibrations from construction activities to impact the adjacent properties. In order to ensure that adjacent properties are not impacted, vibrations monitoring devices will be placed around the construction site and building foundations will be installed using a screw-auger rather than an impact hammer. No blasting will occur during this project.
- City of Portland allows construction crews to work between 7:00AM – 7:00PM on weekdays. Turner will work within these times but anticipates the occasional weekend work will need to be completed.
- One resident had questions regarding MMC's future development plans, after Phase III. Response was that this is it for foreseeable future for this campus, but that additional floors to new Congress Street Building would be next logical expansion area.

V. Traffic

- MMC outlined the methods used to develop to complete the traffic analysis and shared the results of the analysis.

- MMC does not anticipate a significant increase in overall traffic as a result of the project. Traffic volumes will be redistributed from the MMC parking garage to the future St John St. garage and Bramhall St entrance to the future Congress St entrance.

VI. Communications

- For more information and on-going updates, anyone can visit MMC's website to sign up for email and text alerts: www.mmc.org/modernization.

For construction related issues, there are contact numbers on the MMC Modernization website, as well as on the City's website.

Link to project:
https://mainehealth.org/maine-medical-center/newsroom/modernization

M

WRITTEN SUBMISSION 12 – SIDEWALKS
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE PROJECT WILL INCLUDE NEW SIDEWALKS INCLUDING PUBLIC SIDEWALKS ALONG CONGRESS STREET AND GILMAN STREET. IN ACCORADNCE WITH THE IDP, THESE WILL BE BRROM FINISH CONCERTE SURFACES. TACTILE WARNING SURFACES AT CROSSWALK LOCATIONS ARE DESIGNED TO COMPLY WITH THE CITY TECHNICAL MANUAL, SECTION 1.

MM

Maine Medical Center
MaineHealth

Congress St Patient Tower

City of Portland Planning Board

Tuesday October 23, 2018

PATIENT CENTERED · RESPECT · INTEGRITY · EXCELLENCE · OWNERSHIP · INNOVATION

Contents

- How we got here
- Site plan I,II,III overview
- Construction progress to date
- Overview of Site Plan III
- Design
- Construction
- Ongoing communications
- Closing



A Typical Day at the Medical Center

Gassed Beds	
Total Beds:	637
Patient condition closures:	44
Construction closures:	4
Staffing closures:	13
Open beds:	576
Held for assigned admits:	7
Census at 0700:	553
Beds remaining:	16

Available Beds	
Medical/Surgical:	0
Cardiac:	4
Intermediate Care:	0
Intensive Care:	4
Psychiatric:	1
Childrens:	12
Obstetrics:	21
Beds remaining:	42

Patients Waiting for a Bed	
In the ED:	17
In the ED waiting for P6 (exculdes outside psych placement):	0
In the PACU:	2
Transfer from other facilities:	4
Total:	**23**

Expected Admissions	
ED admits:	45 - 55
Procedural admits:	45 - 50
Cath Lab admits:	1 - 4
Outisde admits:	10 - 15
Total:	**101 - 124**



Building History



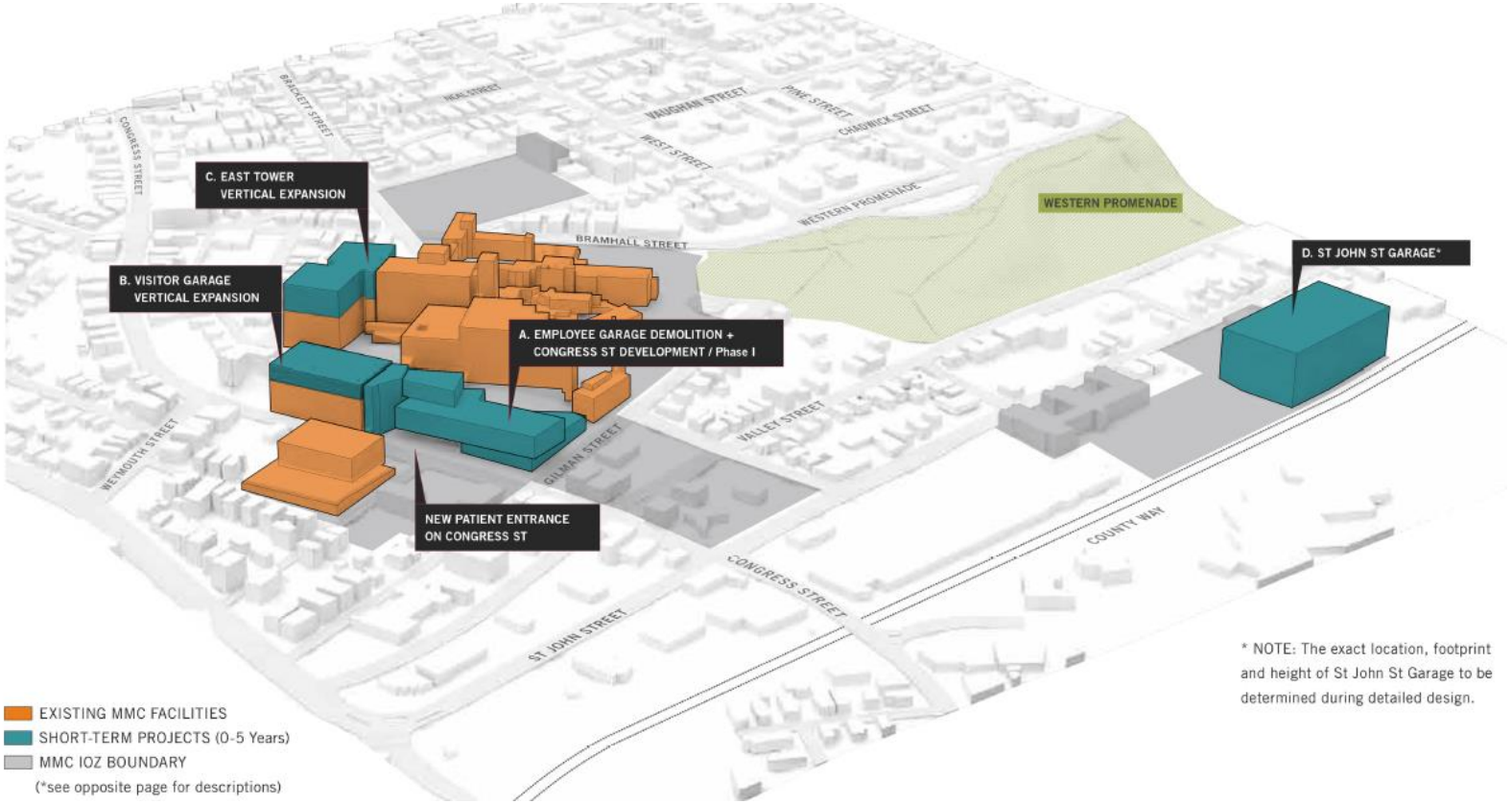
Institutional Development Plan (IDP) & Regulatory Framework

- MMC's Master Planning document recently approved by the Planning Board includes:
  - Maine Medical Center Master Facility Plan (MFP)
  - Transportation Plan
  - Environment & Infrastructure Plan
  - Design
  - Neighborhood Engagement

- The Regulatory Framework was approved by the City Council and includes:
  - Revised Boundary
  - Maximum Heights
  - Snow Ban Parking
  - Neighborhood Integration
  - Healthy Communities



Master Facility Plan

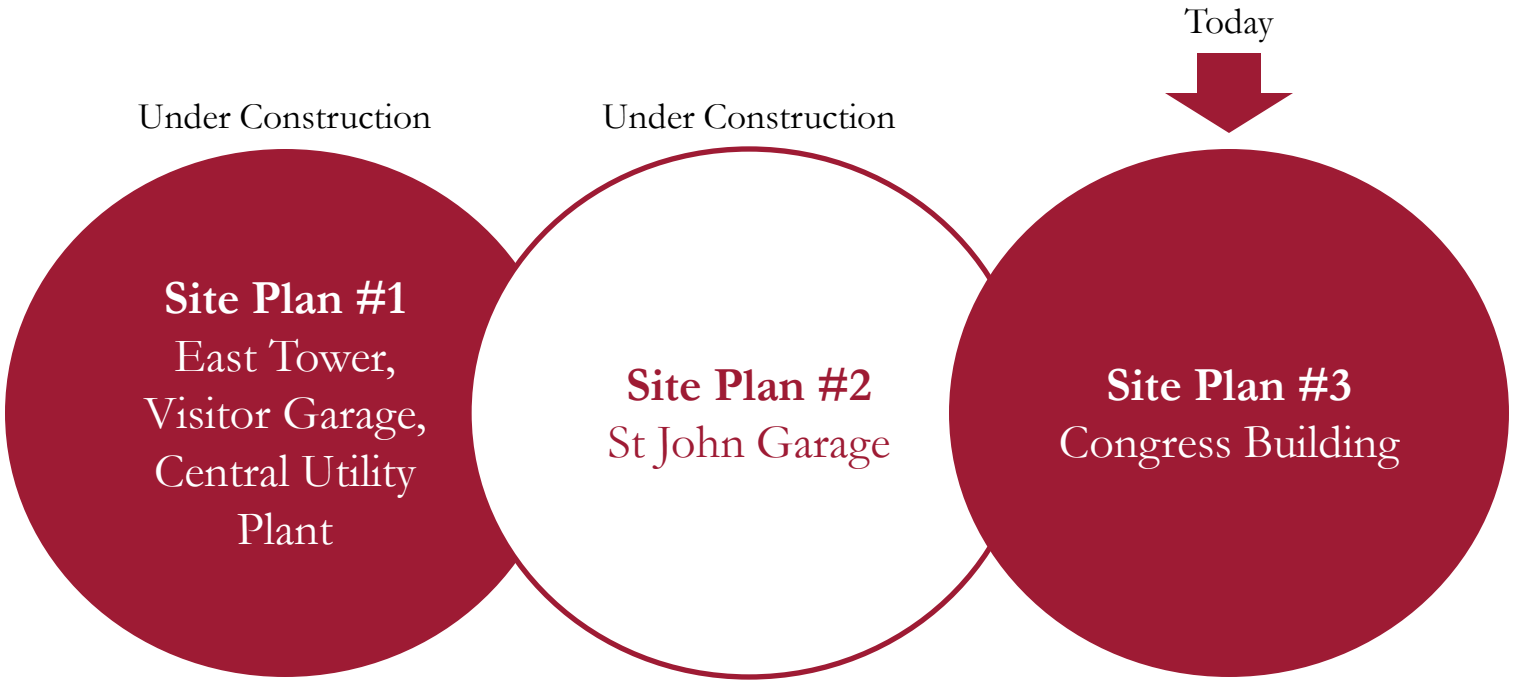


Act with kindness and compassion. | Be an active listener. | Be a role model. | Set high standards. | Take responsibility. | Embrace change.

Jeff Sanders,
Executive Vice President and COO,
MMC

Maine Medical Center
MaineHealth

MMC MFP Site Plan Review



- Three separate applications with overlapping schedules
- Intended to make the materials digestible and to provide more opportunities for feedback from the City and Neighbors

Act with kindness and compassion. Be an active listener. Be a role model. Set high standards. Take responsibility. Embrace change.

Congress St Patient Tower



Design

Jeff Keilman, Senior Project Manager, Senior Associate
Perkins + Will

Be a role model. Take responsibility. Set high standards.
Embrace change. Be an active listener.
Act with kindness and compassion.

Design Guidelines

Guideline	Summary	Status
1	Contribute to campus vision	✓
2	Consideration for a cohesive identity from afar	✓
3	Entrances oriented towards public rights-of-way	✓
4	Compatible with existing or planned character	✓
5	High quality materials	✓
6	Design to consider long-views	✓
7	Vibrant, contributing and sustainable ground floor	✓
8	Limited blank facades	✓
9	Screened parking	n/a





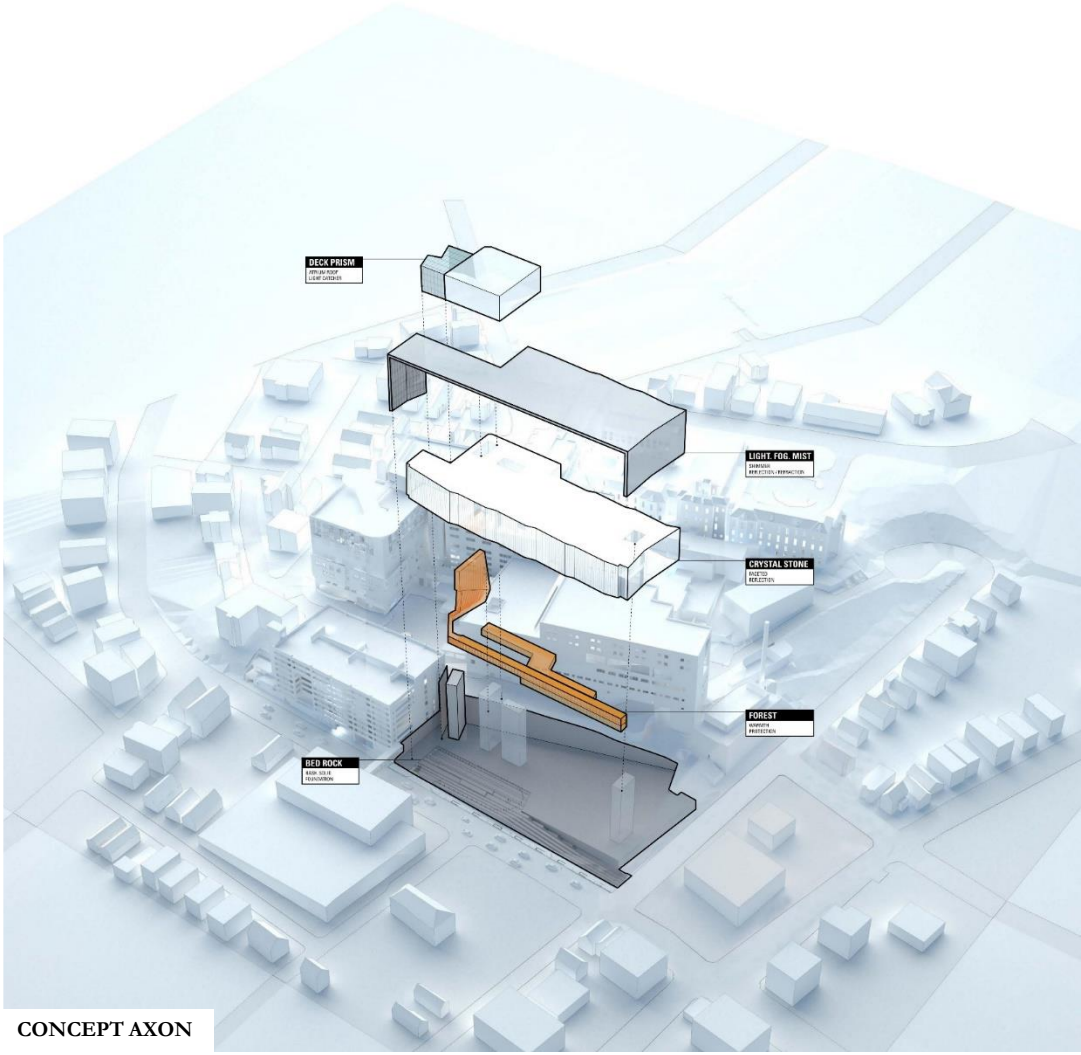
ROCK WALL



FOREST



BED ROCK



CONCEPT AXON

Act with kindness and compassion.

Be an active listener.

Be a role model.

Set high standards.

Take responsibility.

Embrace change.

Design Concept

Jeff Keilman,
Senior Project Manager,
Perkins+Will

Maine Medical Center
MaineHealth

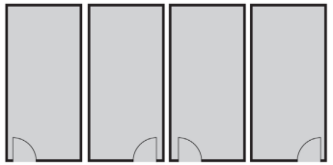
Planning Drivers

PATIENT ROOM PLANNING GOALS

- INCREASE VISIBILITY AND MAXIMIZE PATIENT OBSERVATION
- MINIMIZE WALKING DISTANCES
- CREATE CENTRALIZED INTERPROFESSIONAL COLLABORATION

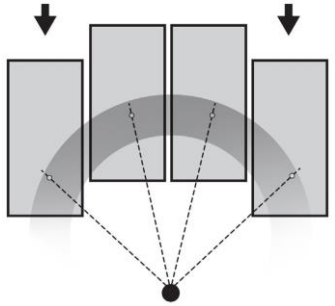
TRADITIONAL PATIENT ROOMS

- TRADITIONAL LINEAL PATIENT ROOM ARRANGEMENT



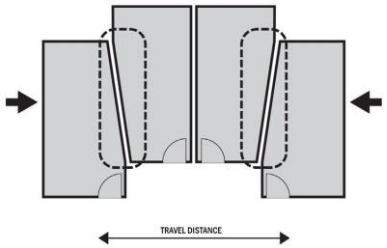
MODIFIED PATIENT ROOMS

- INCREASE STAFF VISIBILITY TO PATIENT
- IMPROVE PATIENT VIEWS OUT
- CENTRALIZE STAFF



NESTED PATIENT ROOMS

- REDUCE TRAVEL DISTANCE
- DECREASES THE OVERALL LENGTH OF THE BED FLOOR BAR / PERIMETER
- FURTHER IMPROVE STAFF VISIBILITY TO PATIENT



Act with kindness and compassion. | Be an active listener. | Be a role model. | Set high standards. | Take responsibility. | Embrace change.

Planning Drivers

PATIENT ROOM PLANNING : SOLAR ORIENTATION

- ALIGN BUILDING EXTERIOR AND FAÇADE TO REFLECT INTERNAL PLANNING STRATEGIES
- MAXIMIZE PATIENT VIEWS AND COMFORT BY REDUCING INCIDENTS OF DIRECT SUN AND GLARE

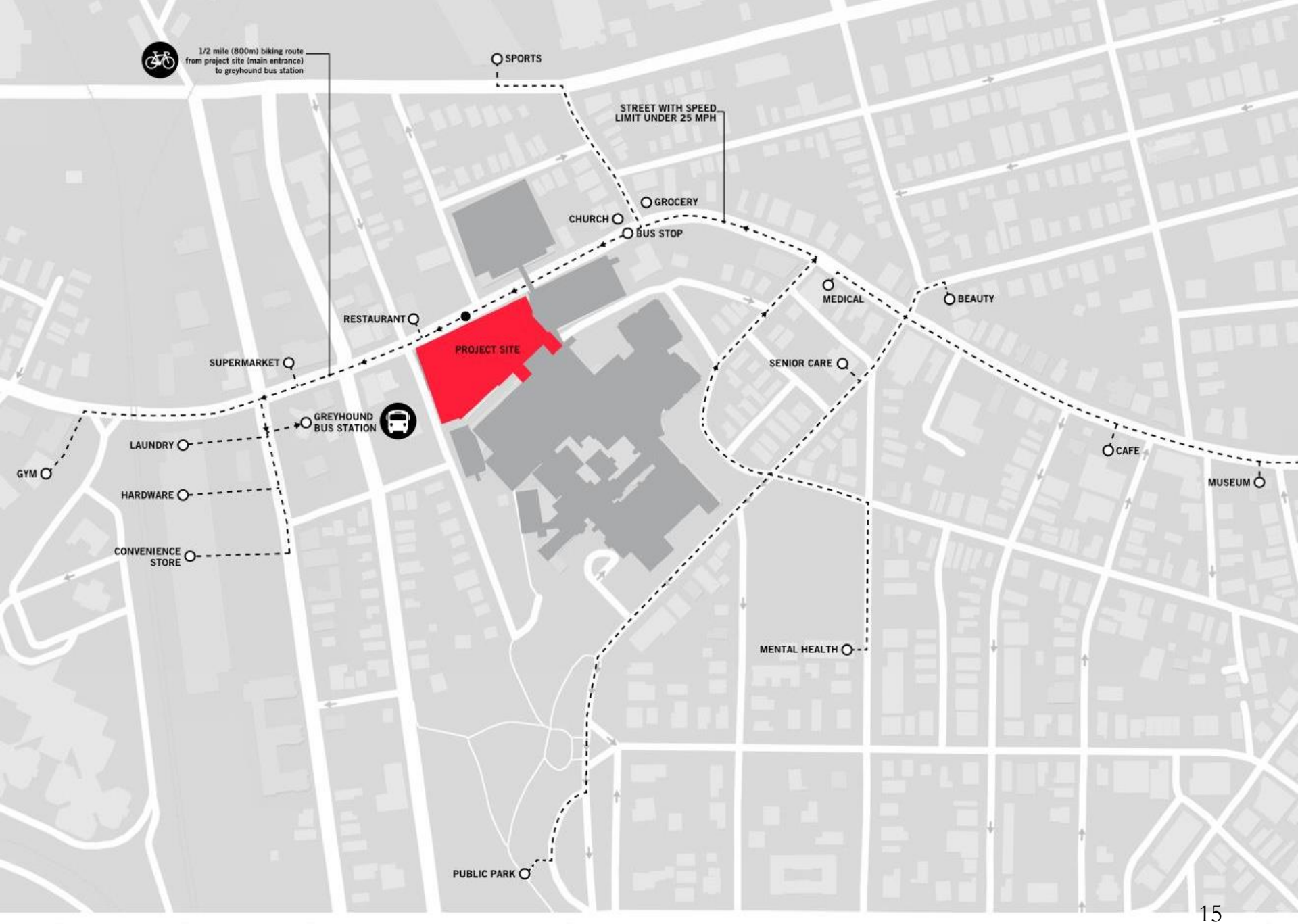


Act with kindness and compassion. | Be an active listener. | Be a role model. | Set high standards. | Take responsibility. | Embrace change.

Planning Drivers



Jeff Keilman,
Senior Project Manager,
Perkins+Will


1/2 mile (800m) biking route from project site (main entrance) to greyhound bus station
SPORTS
STREET WITH SPEED LIMIT UNDER 25 MPH
GROCERY
CHURCH
BUS STOP
MEDICAL
BEAUTY
RESTAURANT
PROJECT SITE
SUPERMARKET
SENIOR CARE
GREYHOUND BUS STATION
LAUNDRY
CAFE
GYM
MUSEUM
HARDWARE
CONVENIENCE STORE
MENTAL HEALTH
PUBLIC PARK
SCALE:
1/16 mile (100m)
1/8 mile (200m)
1/4 mile (400m)
N



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Perkins+Will

Maine Medical Center
MaineHealth



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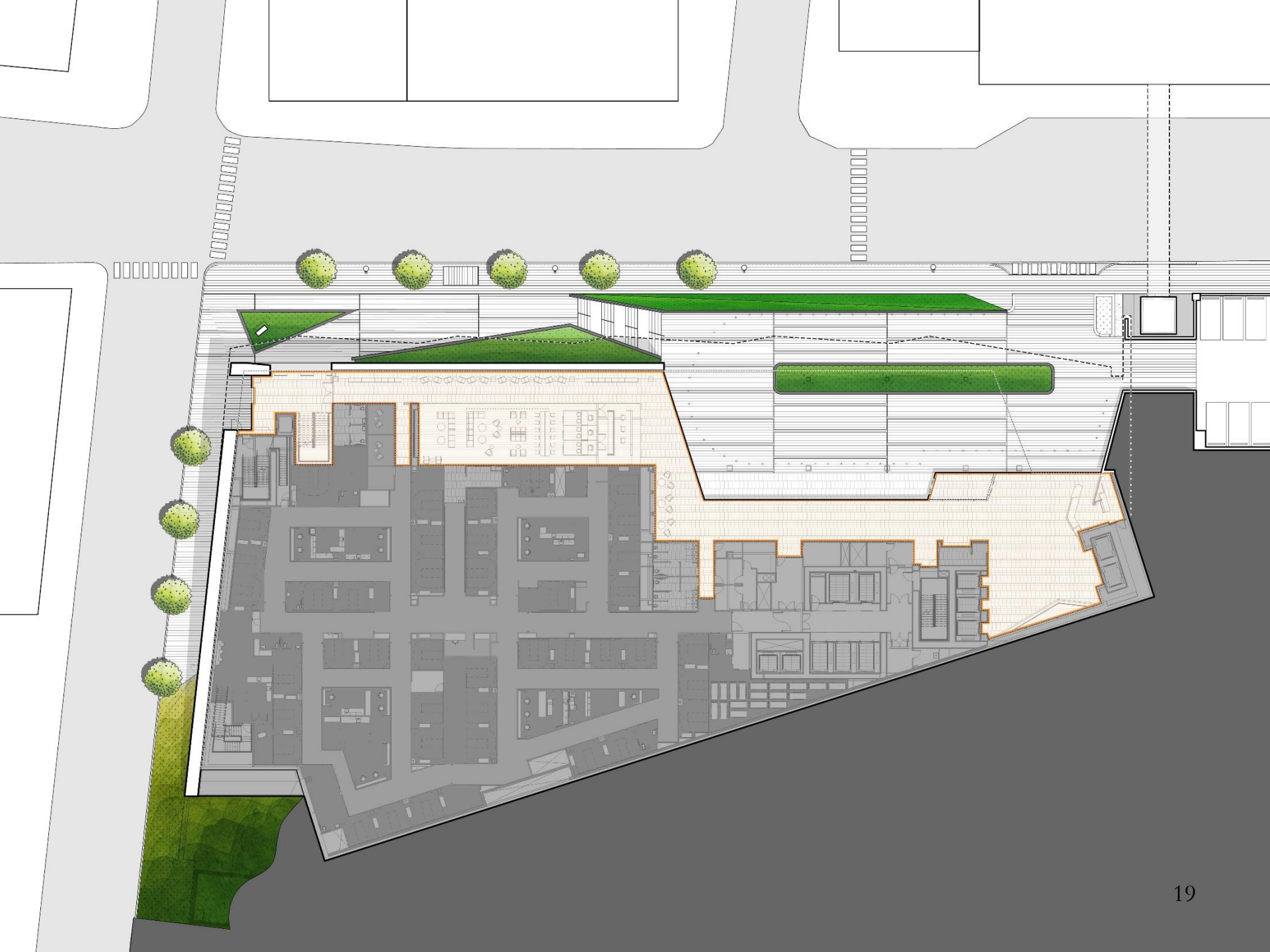
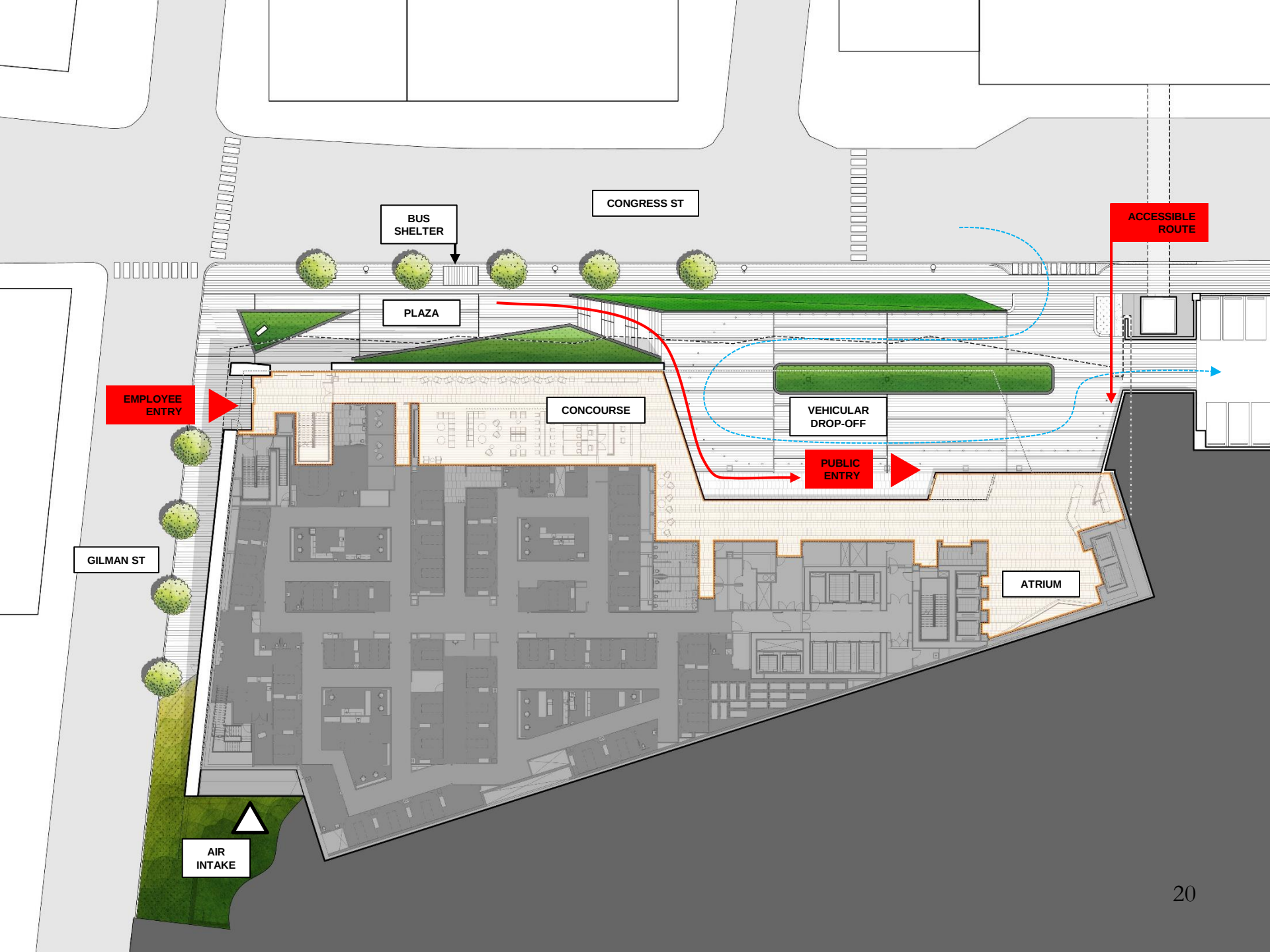
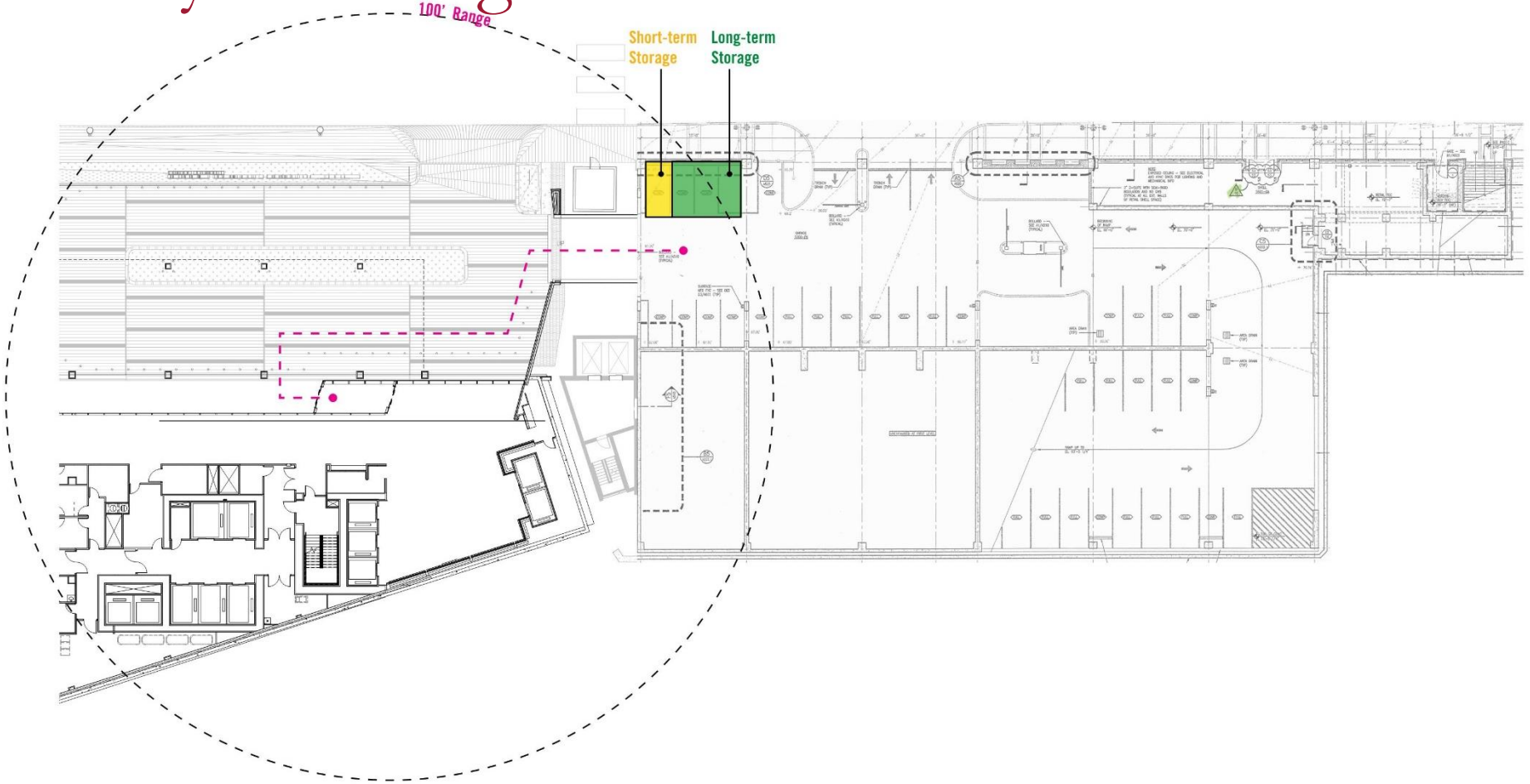



CONGRESS ST
BUS SHELTER
ACCESSIBLE ROUTE
PLAZA
EMPLOYEE ENTRY
CONCOURSE
VEHICULAR DROP-OFF
PUBLIC ENTRY
GILMAN ST
ATRIUM
AIR INTAKE

Bicycle Storage



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Perkins+Will



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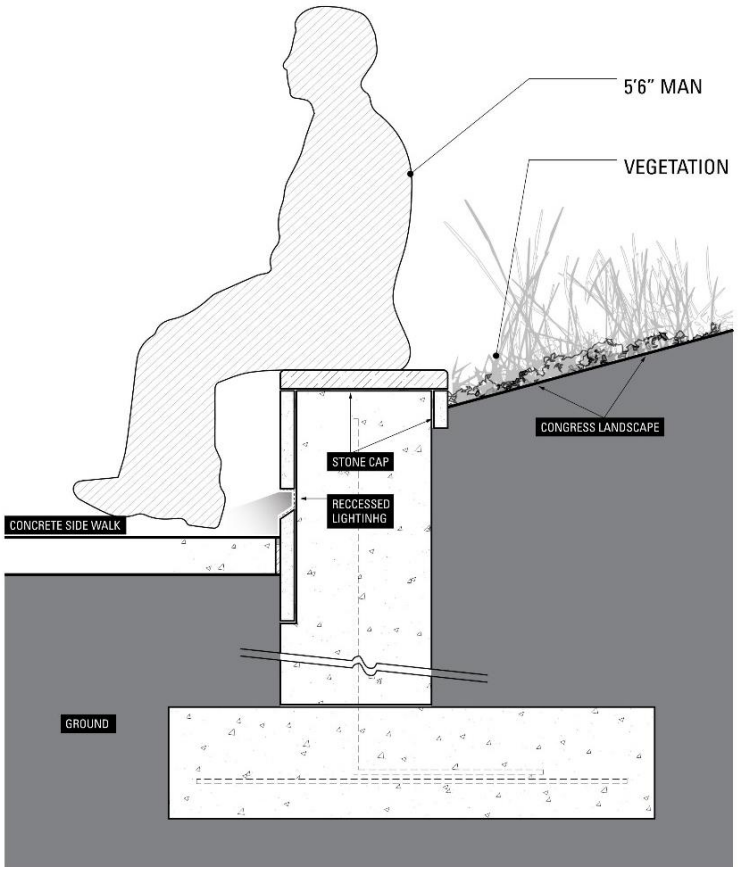
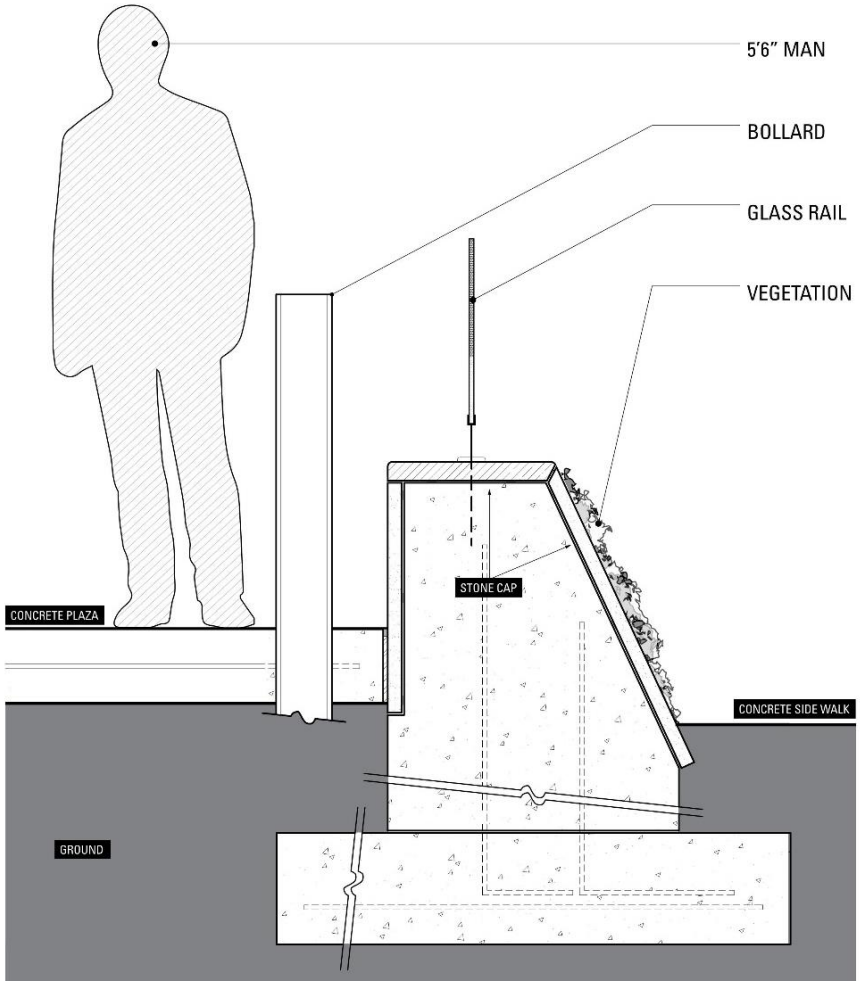
Senior Project Manager,
Perkins+Will



Jeff Keilman,
Senior Project Manager,
Perkins+Will

Site Design





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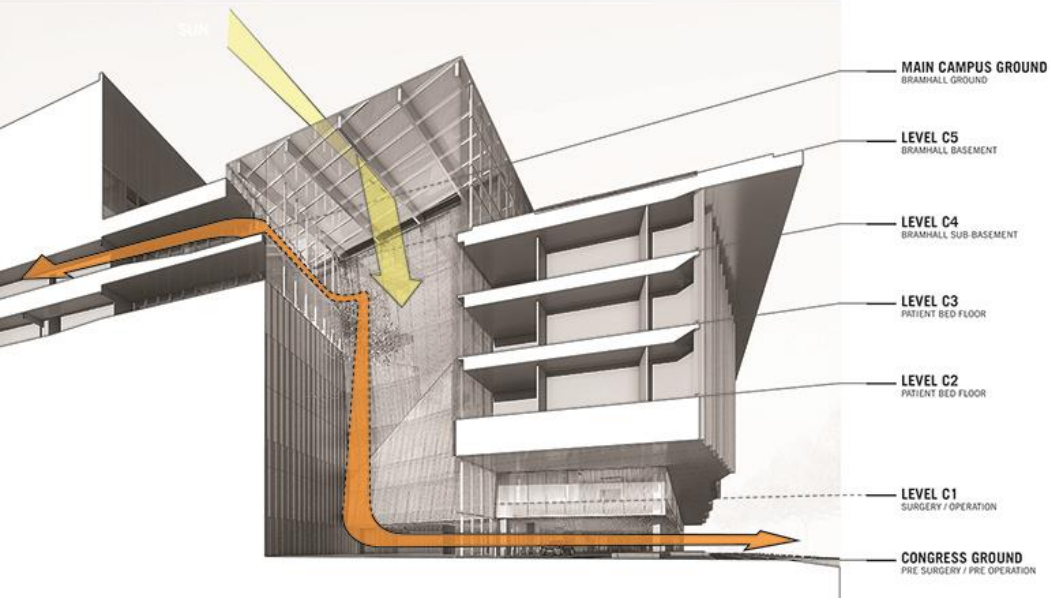



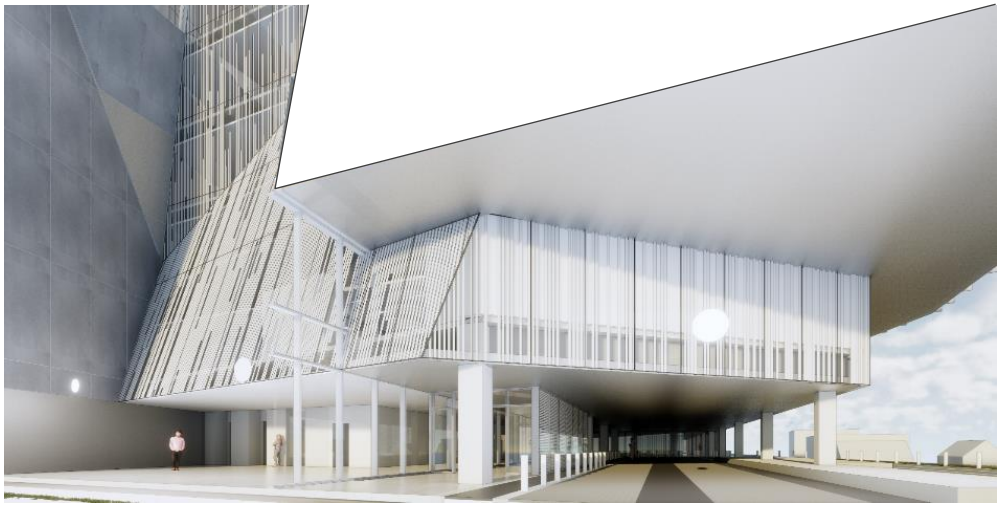

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1. **POINT CITY**
by introducing new transportation points, MMC strengthens pedestrian walk-ability and public circulation - bus stop is located at the front of building.

2. **BIKE STORAGE**
outdoor and indoor bike storage available on site.

3. **HIGH PERFORMANCE ENVELOPE**
well insulated exterior glazings help to prevent heat transfer and reduce heat loss.

4. **CONGRESS GROUND FLOOR GLAZING**
transparent glazing allows for natural daylighting to luminate concourse.

5. **PV-READY ROOF**
roof structure allows for addition of PV-Panels, cut building energy usage and provide roof shading.

6. **EFFICIENT LED LIGHTING**
energy efficient, long lasting fixtures.

7. **LOW FLOW PLUMBING FIXTURES**
reduce water usage and conserve water.

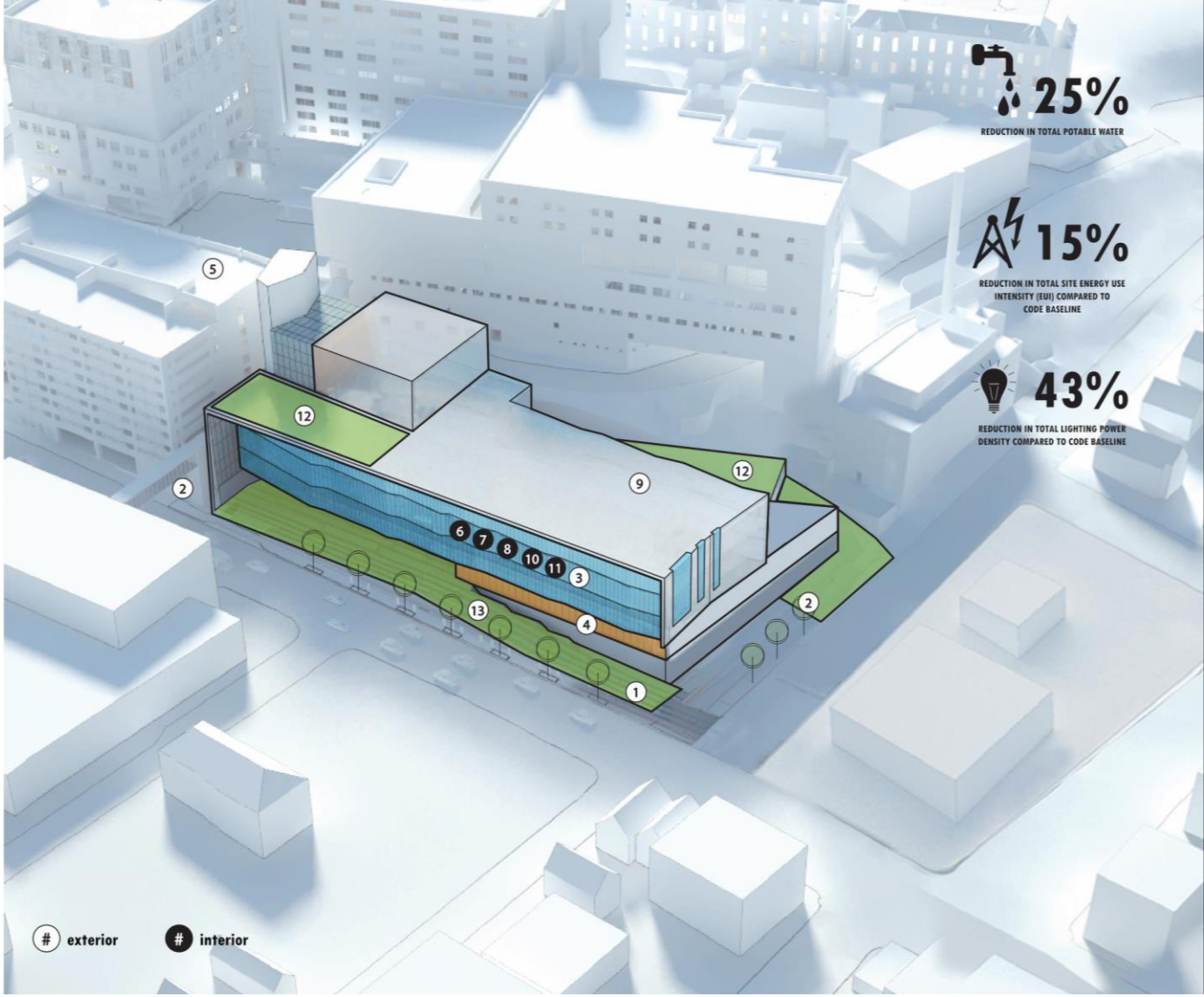
8. **EFFICIENT SYSTEMS**
use less energy to heat and cool the building.

9. **WHITE ROOF MEMBRANE**
helps to reduce heat island effect.

10. **HEALTHY MATERIALS**
improve indoor air quality and reduce exposure to harsh chemicals in materials.

11. **RECYCLING ALCOVE**
staffs have easy access to sustainable waste management.

12. **ROOF GARDENS/ IMPERVIOUS SURFACE**
decrease rate of flow into sewer, reduce storm water runoff, and improve thermo insulation.



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Senior Project Manager,
Perkins+Will

Maine Medical Center
MaineHealth

Construction Management Plan

Richard Parsons, Construction Executive,
Turner

Be a role model. Take responsibility. Set high standards.
Embrace change. Be an active listener.
Act with kindness and compassion.

Construction Approach & Challenges

- Minimize impacts to surrounding area
- Open and transparent communications
- Maintain hospital operations
- Safety

Turner

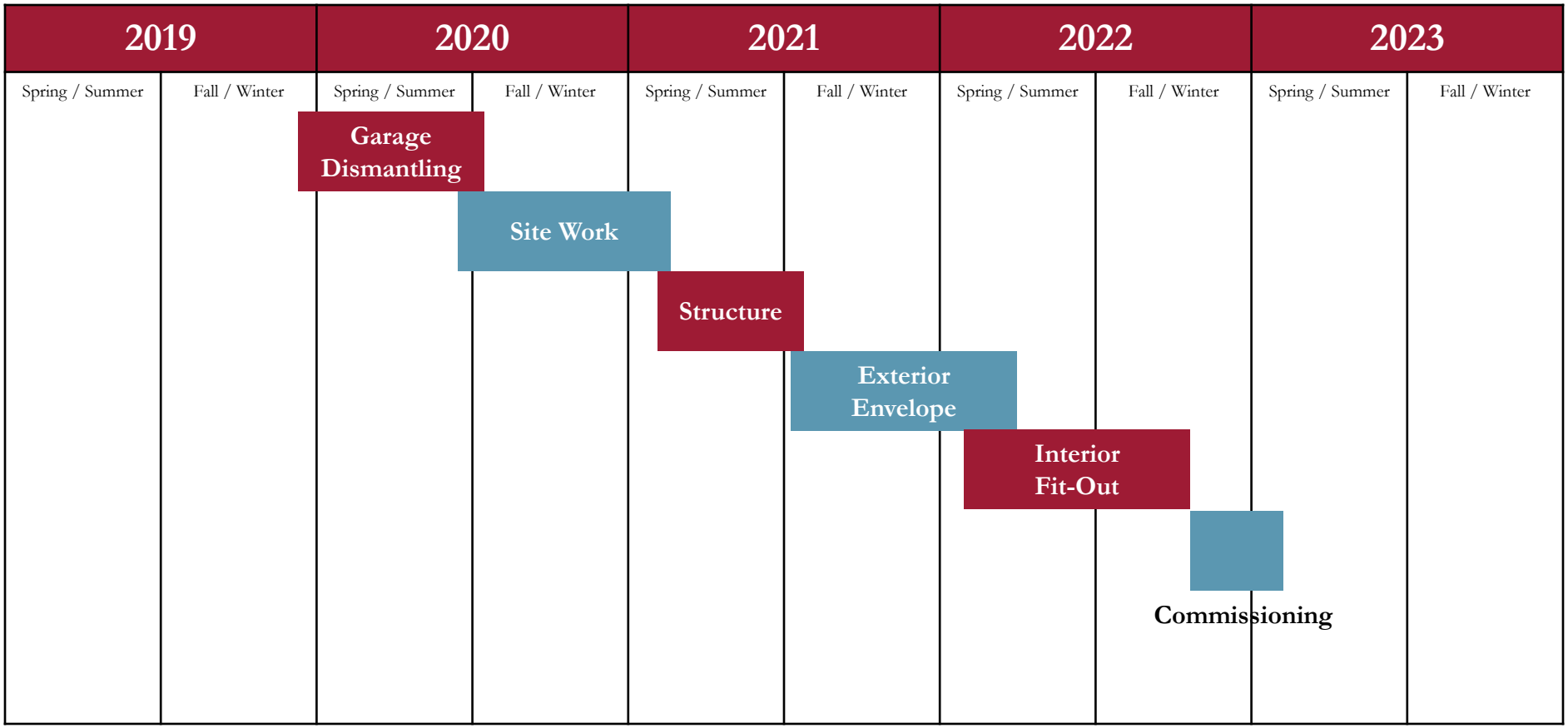


Contractor Parking

- Offsite Parking area will be available for workers
- Construction worker parking on MMC grounds and on adjacent streets will be prohibited
- Construction Manager personnel will monitor daily
- Language to be included in all subcontracts with offsite parking requirements and penalties for non-compliance



Construction Timeline



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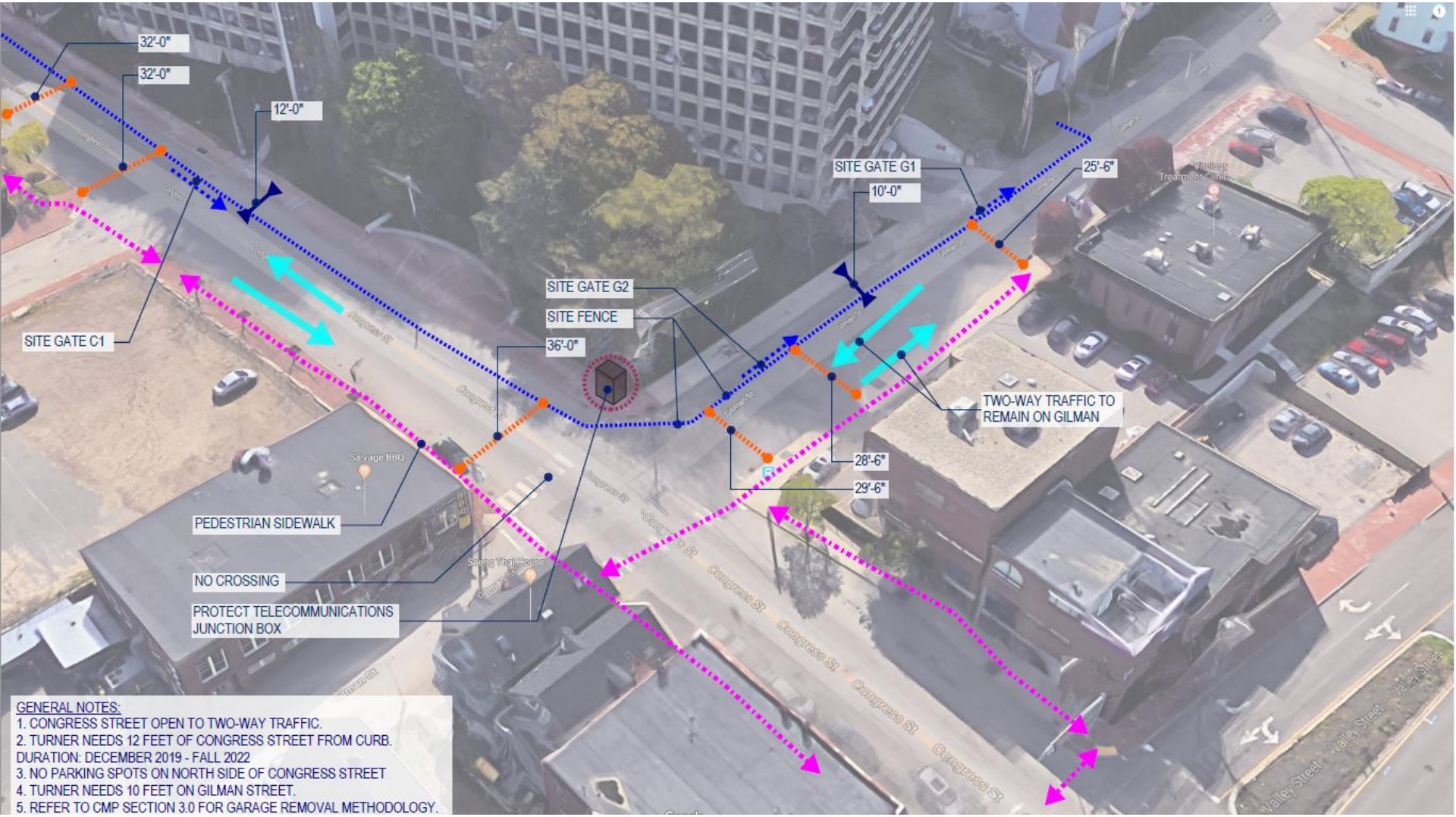
Embrace change.

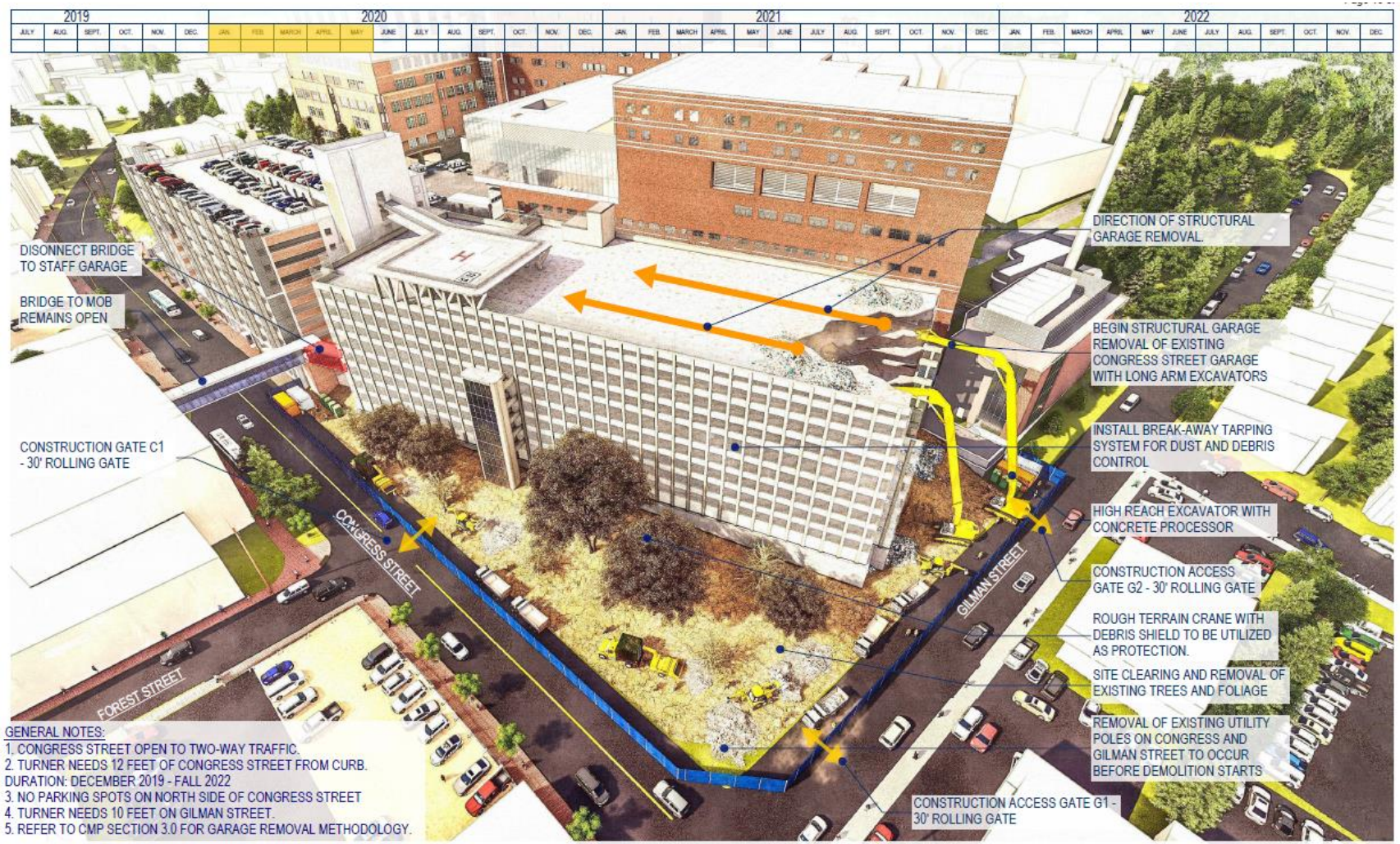
Dick Parsons,
Construction Executive,
Turner

Maine Medical Center
MaineHealth



Act with kindness and compassion. | Be an active listener. | Be a role model. | Set high standards. | Take responsibility. | Embrace change.

Pedestrian Routes



CONGRESS STREET NEW CLINICAL TOWER
Additions and Renovations [Structural Garage Removal Logistics Plan]

Turner

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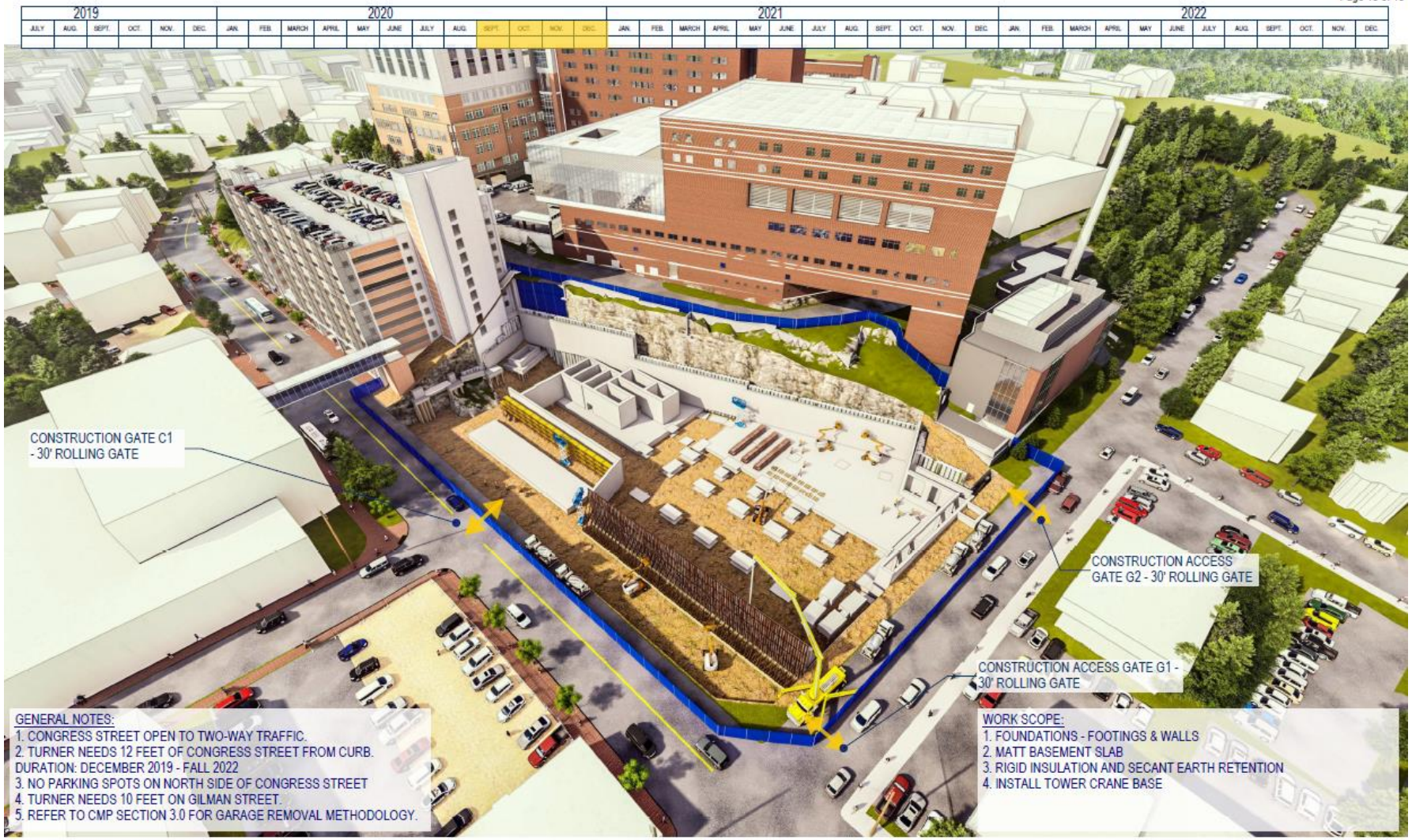
Garage Dismantling



CONGRESS STREET NEW CLINICAL TOWER
Construction Management Plan [Logistics Plan] - Foundations

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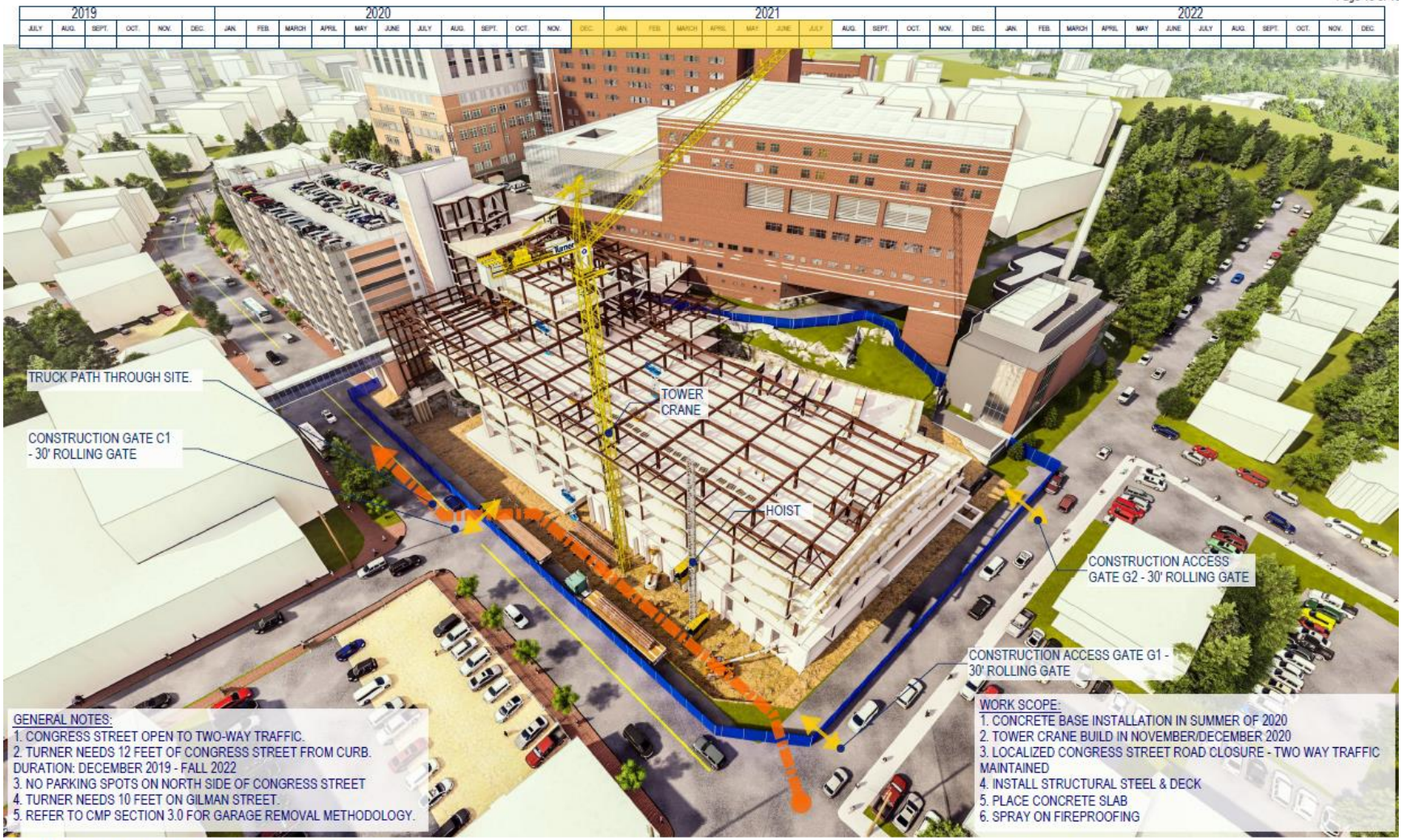
Site Work



CONGRESS STREET NEW CLINICAL TOWER
Construction Management Plan [Logistics Plan] - Structure

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Building the Structure

Dick Parsons,
Construction Executive,
Turner

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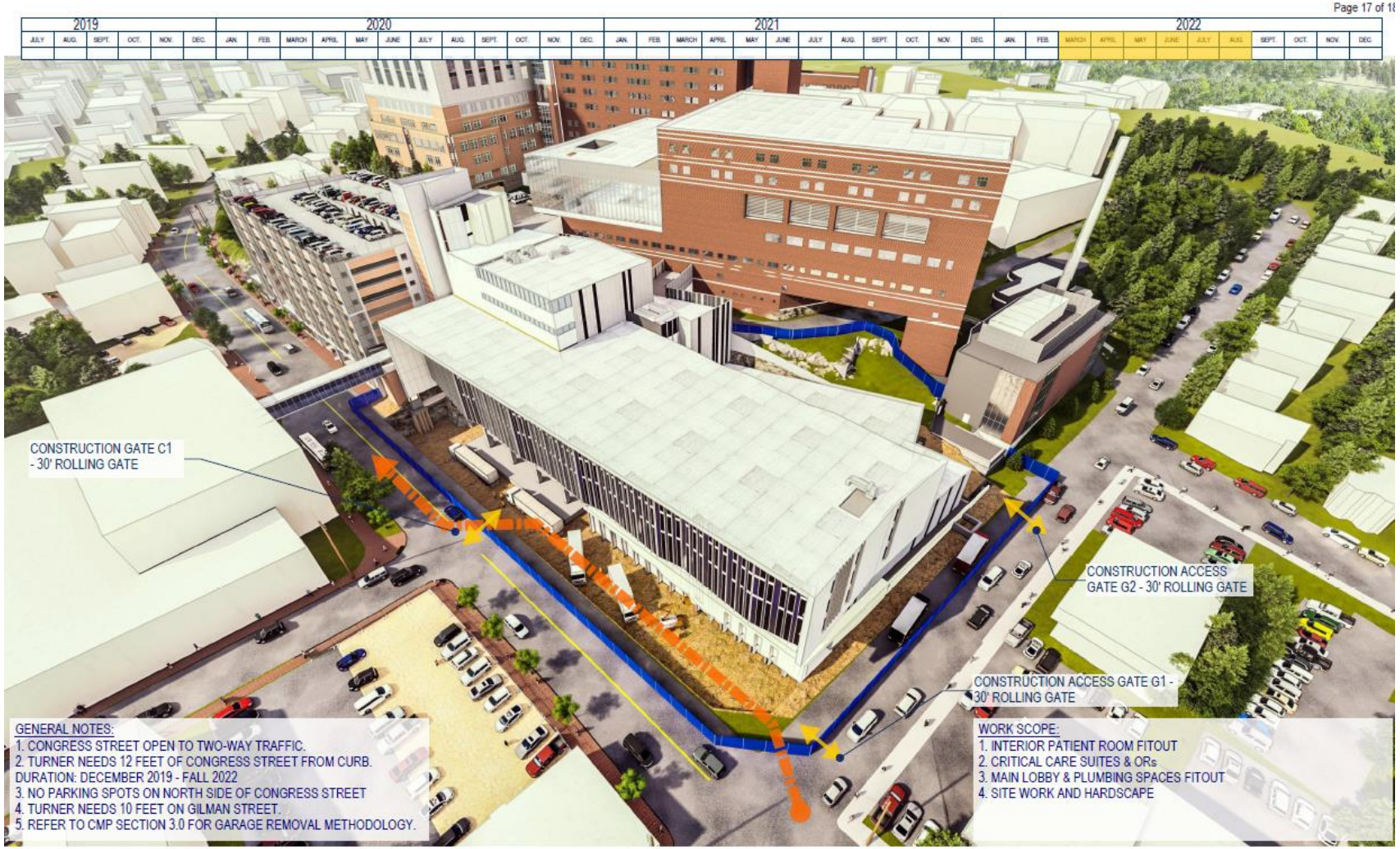

CONGRESS STREET NEW CLINICAL TOWER
Construction Management Plan [Logistics Plan] - Interior Fitout

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Dick Parsons,
Construction Executive,
Turner

Exterior Envelope & Interior Fit-Out

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Dick Parsons,
Construction Executive,
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Commissioning and Completion

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Ongoing Communications

Jeff Sanders, Executive Vice President, Chief Operating Officer
Maine Medical Center

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Communications

- For more information and on-going updates, anyone can visit MMC's website to sign up for email and text alerts: www.mmc.org/modernization



Newsroom

Media

Press Releases

MMC Campus Modernization Project

Project Updates

Neighborhood Meeting Minutes

Sign up for Project Alerts

Additional Information

MaineHealth › Maine Medical Center › Newsroom › *MMC Campus Modernization Project*

MMC Campus Replacement & Modernization Project

Maine Medical Center is excited to begin work on the largest modernization and replacement project in its history – a patient-focused initiative that will enable the state's largest hospital to meet the most urgent healthcare needs well into the future.

Altogether, the $525 million project will create 128 new private patient rooms, add 19 procedure rooms for surgeries and other complex treatments, provide an additional 225 spaces for patient and visitor parking, and consolidate MMC employee parking into one nearby garage that will meet current demand and future growth. The project will also open Maine Medical



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Jeff Sanders,
Executive Vice President and COO,
MMC

Maine Medical Center
MaineHealth

Thank You

Be a role model. Take responsibility. Set high standards.
Embrace change. Be an active listener.
Act with kindness and compassion.

WRITTEN SUBMISSION 13 – PUBLIC TRANSIT
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE APPLICANT HAS MET WITH REPRESENTATIVES FROM METRO ON SEVERAL OCCASIONS, AND THE SITE PLAN INCLUDES A PROPOSED LOCATION FOR A NEW METRO STOP, IN FRONT OF THE NEW BUILDING ON CONGRESS STREET. THE SITE PLAN ALSO INCLUDES A NEW CROSS WALK NEAR FOREST STREET. THE APPLICANT WILL CONTINUE TO MEET WITH METRO UNTIL THESE LOCATIONS ARE FINALIZED.

Maine Medical Center
MaineHealth

NN

Pedestrian Network Plan



The safety and security of pedestrians in and around its campus is of utmost importance to Maine Medical Center.

MMC's Campus Replacement and Modernization Project will transform the pedestrian experience of the campus along Congress Street. It will provide safe connections between Congress Street and neighborhood streets to the south of the Hospital.

Figure 1

Introduction: MMC Institutional Overlay Zone

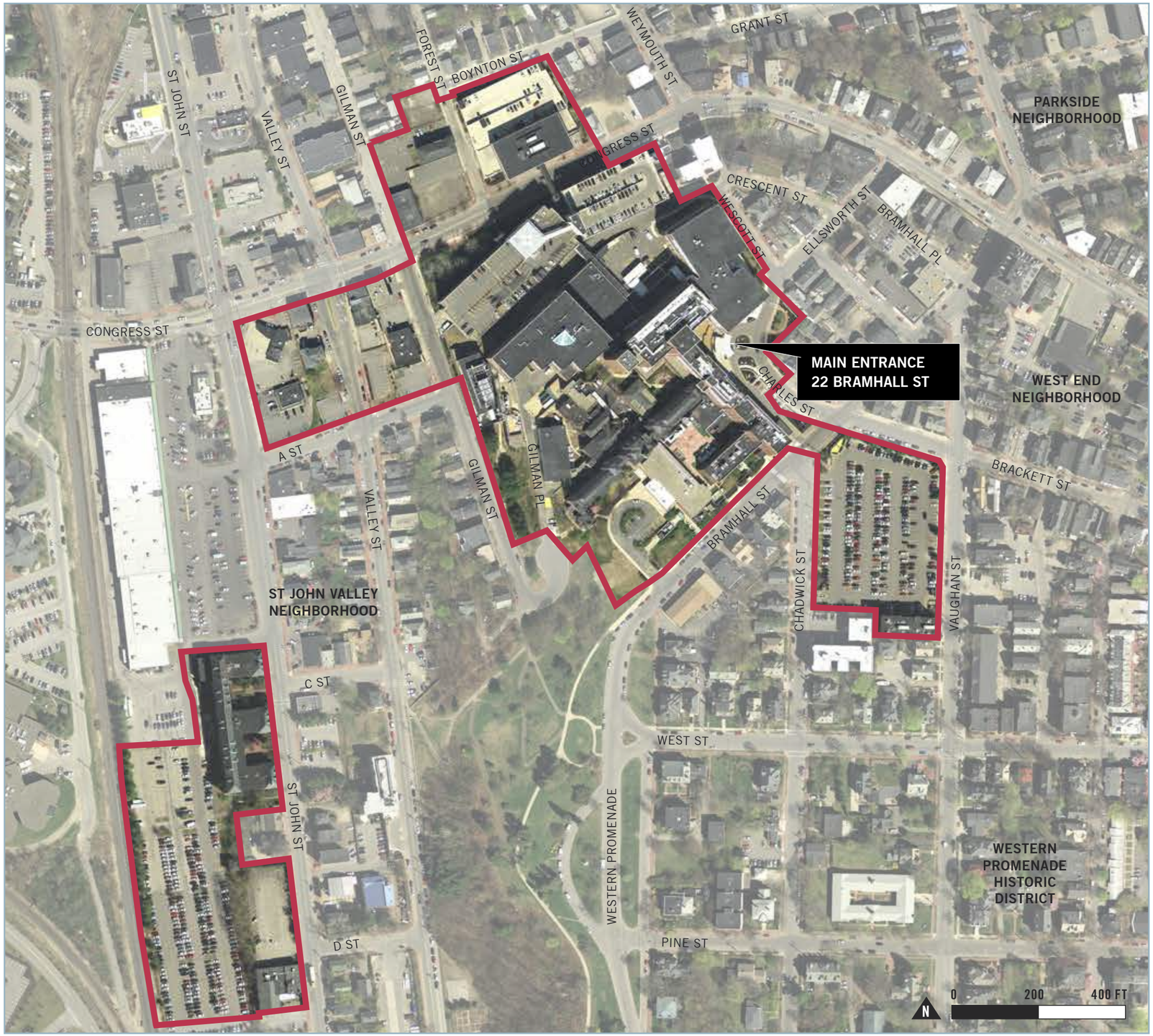
Maine Medical Center (MMC) is a complete health care resource for the people of greater Portland, the entire state of Maine, and northern New England. MMC is the state's largest medical center, licensed for 637 beds and employing more than 6,000 people.

On November 20, 2017, Portland City Council voted to approve MMC's application for a zoning amendment, creating the **MMC Institutional Overlay Zone (IOZ)** for the boundary shown at right. The regulatory framework for the IOZ, which was created with input from neighbors, City planning staff, and the general public, will enable MMC to modernize and expand its Bramhall St campus in harmony with surrounding neighborhoods and the Congress Street corridor.

Portland City Council subsequently approved the **MMC East Tower and Visitor Garage Vertical Expansion Project**. The Standard Conditions for the approval dated March 29, 2018 include the following requirement:

"*[…] the applicant shall develop a long term public Pedestrian Network Plan (both on and off the ROW) showing the integration of the upper level MMC campus with the Congress Street corridor, including measures to address CPTED principles, for implementation when the retail space beneath the Visitors Garage is available for lease or sale; such plan to be submitted for review and approval by the Planning Authority prior to the issuance of a building permit for the Congress Street Hospital Entrance;*"

This document was prepared for MMC by Perkins+Will with input from the City of Portland Planning Department to meet the Pedestrian Network Plan requirement cited above. It complements MMC's Institutional Development Plan (IDP), which was approved by the City of Portland Planning Board on September 26, 2017 and is available on the MMC website.



MMC INSTITUTIONAL OVERLAY ZONE (IOZ)

MMC Institutional Overlay Zone Boundary

Figure 2

Evolution of the MMC Bramhall Campus

MMC Bramhall campus occupies a steep hill that rises about 100 feet from Congress Street, Portland's main street, to Bramhall Street. It is nestled in Portland's historic urban fabric and a robust sidewalk network that connects the campus to its surroundings.

The original hospital building was sited facing the Western Promenade and the then emerging residential neighborhood abutting the park. The campus has maintained this orientation in its evolution into the state's largest medical center.

Since the 2000s, he campus has a main drop-off and pedestrian entrance at 22 Bramhall St that connects to Portland's robust network of public sidewalks. The sidewalk network connects pedestrians to multiple transit stops located within walking distance of the campus. A series of public corridors take patients and visitors from the main entrance to all clinical destinations on campus. Campus amenities such as the Impressions Cafe, the Pharmacy and the Gift Shop are also located along the public corridors (see "Figure 2" on page 4).

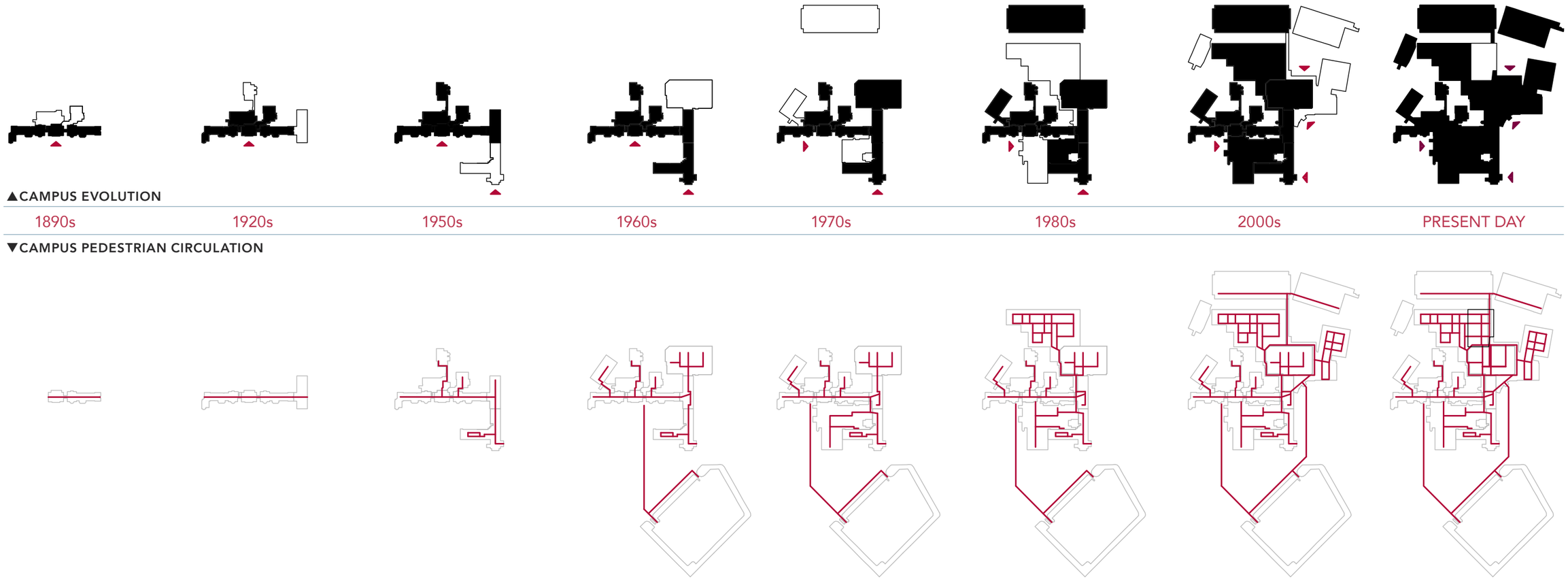
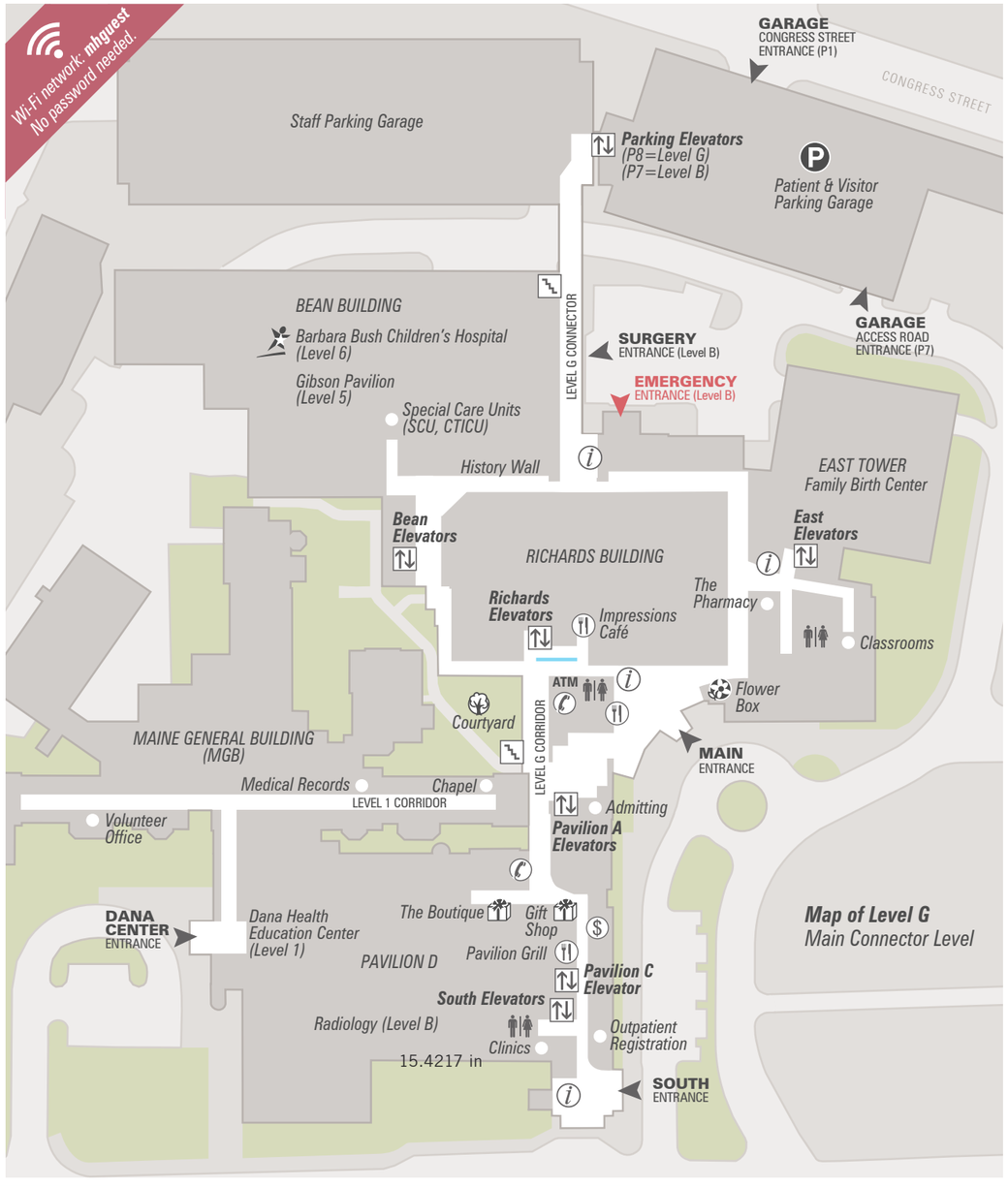


Figure 3

MMC Campus Pedestrian Circulation

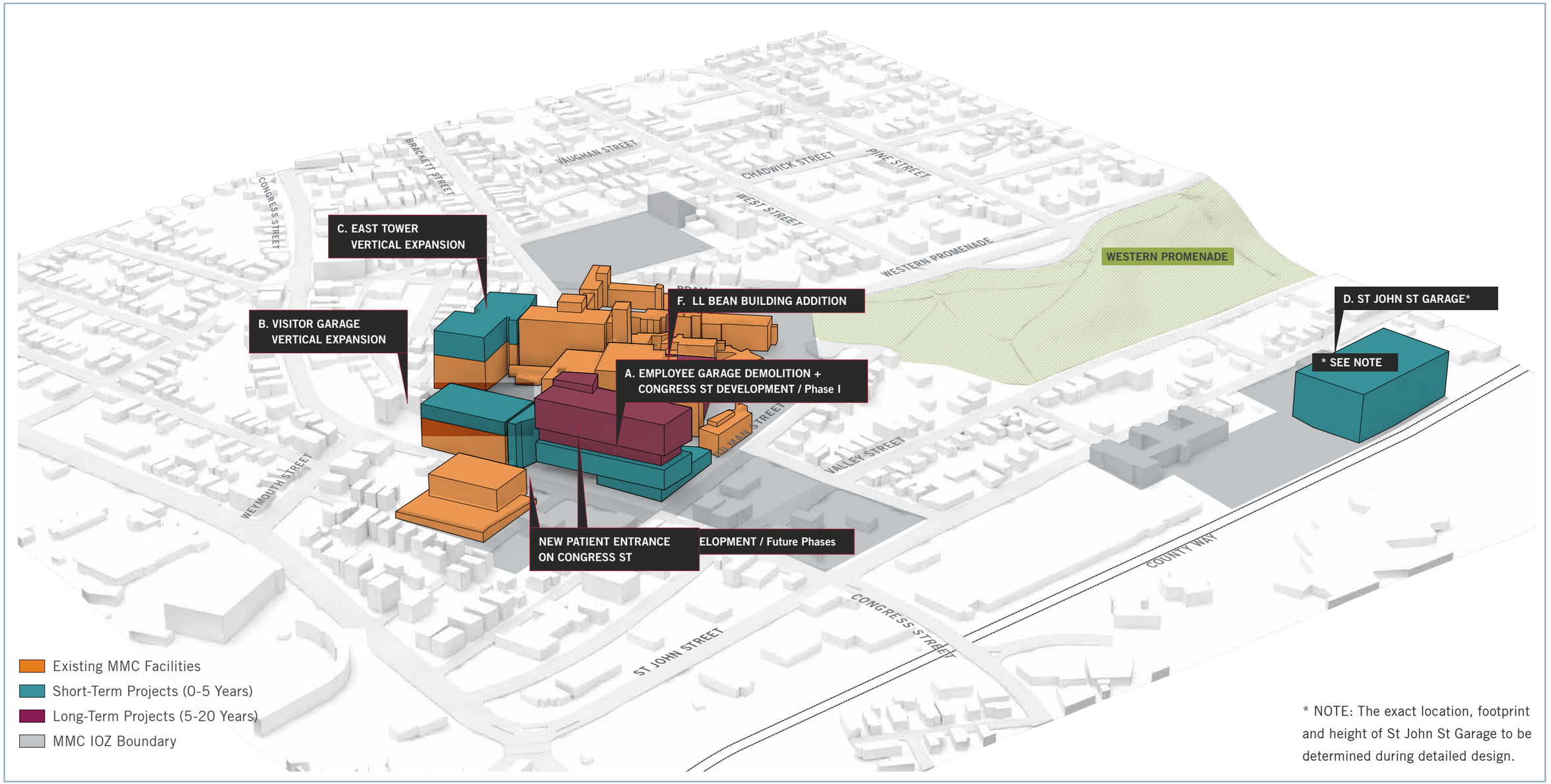


DESTINATION	LOCATION	LEVEL	NEAREST ELEVATOR
Admitting	Main Entrance	G	Richards
ATM *Cash Machine*	Main Entrance	G	Richards
Barbara Bush Children's Hospital	Bean	6	Bean
The Boutique	Pavilion A	G	South
Cafeteria *Impressions Café*	Richards	G	Richards
Cardiac Cath Lab	Richards	8	Richards
Cardiac Intensive Care Unit *CICU*	Richards	9	Richards
Cardiology	Richards	1, 7, 9	Richards
EKG/Echocardiography	Pavilion A	2	South
Ambulatory Cardiac Care Unit *ACCU*	Pavilion C	2	South
Cardiothoracic Intensive Care Unit *CTICU*	Bean	G	Bean
Cashier	Pavilion A	G	Pavilion A
Chapel/Prayer Room	Maine General Building	1	Pavilion A
Clinics	Pavilion D	G, 1, 2	South
OB/Gyn, Surgical, Pediatric Cardiovascular Specialty Clinic			
Continuing Care Nursery	East Tower	3	East
Dana Health Education Center	Dana Center	1	Pavilion A
Dialysis	Richards	5	Richards
Emergency	Richards	B	Richards
Endoscopy	Pavilion D	4	South
Family Birth Center	East Tower	G	East
Labor & Delivery/Recovery Mother-Baby Care			
Flower Box	Main Entrance	G	Richards
Gibson Pavilion	Bean	5	Bean
Gift Shop	Pavilion A	G	South
Joint Replacement Center	Bean	2	Bean
Laboratory	Pavilion A	G	South
Medical Records	Maine General Building	1	Pavilion A
Neonatal Intensive Care Unit *NICU*	East Tower	3	East
Outpatient Registration	South Entrance	G	Pavilion A
Pediatric Intensive Care Unit *PICU*	Bean	G	Bean
The Pharmacy	East Tower	G	East
Pavilion Grill	Pavilion A	G	South
Prenatal Care & Education	East Tower	G	East
Psychiatric Unit	Pavilion C	6	Pavilion C
Radiation Therapy	Radiology	B	South
Radiology	Radiology	B	South
X-Ray, CT Scan, MRI, Nuclear Medicine, Ultrasound, Pediatric Radiology			
Short Stay Unit *SSU*	Pavilion C	4	South
Special Care Units *SCU*	Bean	G	Bean
Surgery	Richards	B	Bean
Volunteer Services	Maine General Building	1	Pavilion A

Figure 4

MMC Bramhall Campus
Short and Long-Term Projects

(FROM MMC INSTITUTIONAL DEVELOPMENT PLAN, 2017)



* NOTE: The exact location, footprint and height of St John St Garage to be determined during detailed design.

Figure 5

MMC Bramhall Campus
Short and Long-Term Projects

(FROM MMC INSTITUTIONAL DEVELOPMENT PLAN, 2017)

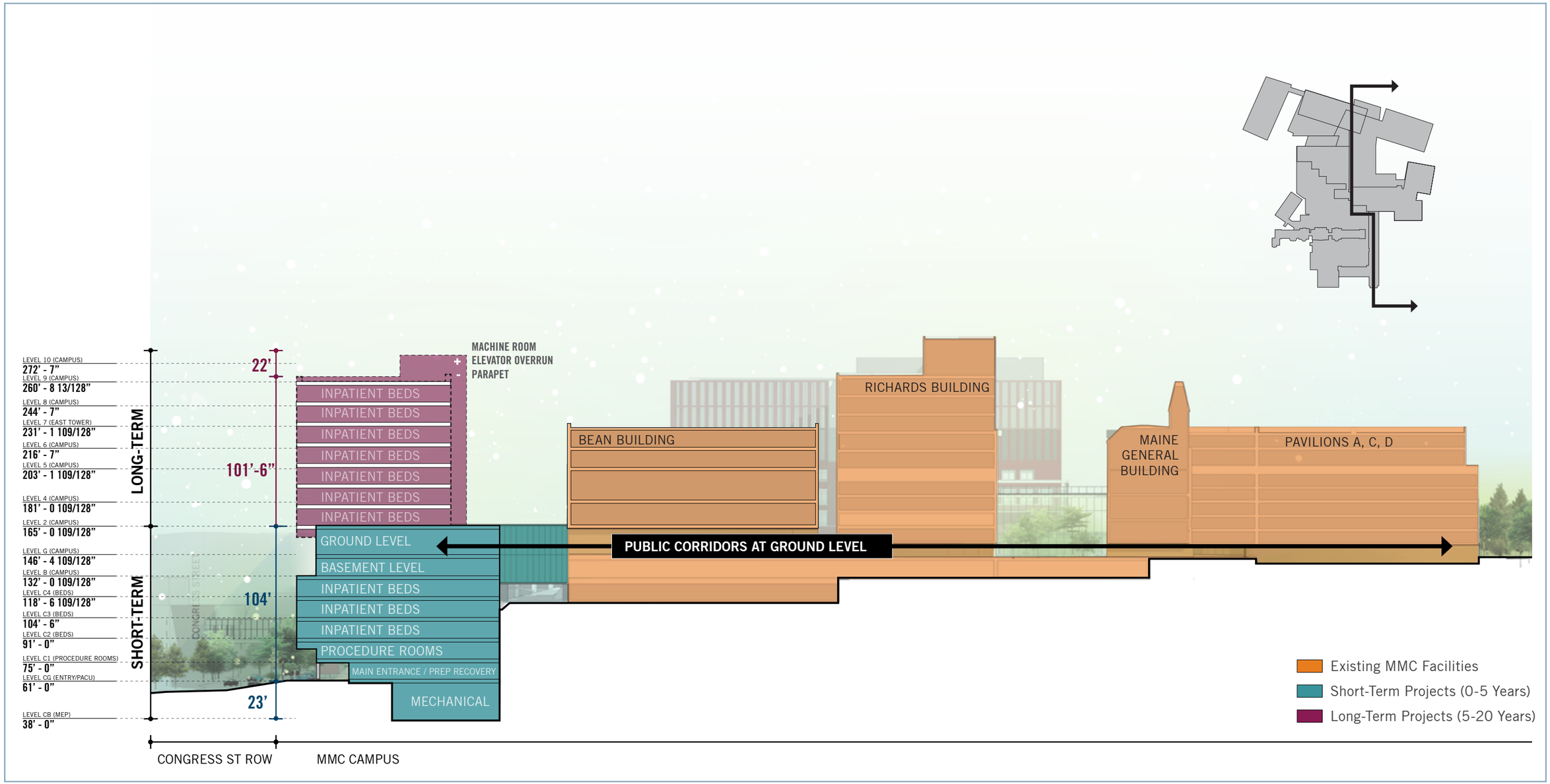
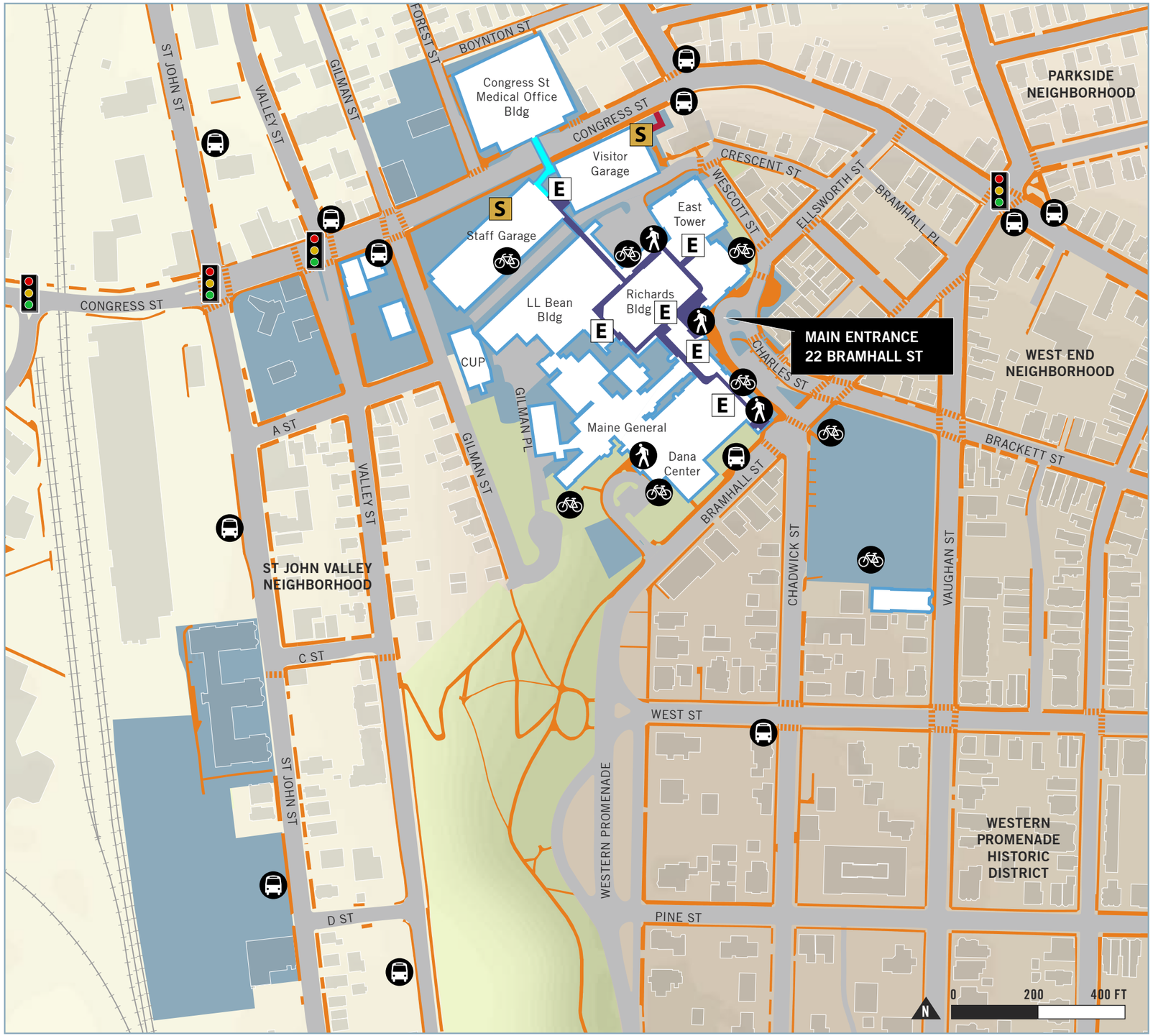


Figure 6

Existing Pedestrian Network

The MMC Bramhall campus straddles a steep hill that rises about 100 feet between Congress Street, Portland's main street, to Bramhall Street where the hospital's main entrance is located. A series of public corridors take patients and visitors from the main entrance to all clinical destinations and public amenities on campus. A pedestrian bridge carries the corridor over Crescent St to the Staff and Visitor Garages. From here, campus users can take the parking elevators to Level C2 to access a bridge across Congress St to reach the medical office building, or to Level CG to walk out to Congress Street. The stairwells that are connected to the Staff and Visitor Garages can also be used for egress onto Congress Street but are accessed by card or with key only*. Today, there are no official pedestrian entrances to the hospital complex along Congress Street.

** The Visitor Garage stairway was built in 2005 to provide public access between the MMC campus and Congress St, per requirement #16 of the 2005 Contract Zone Amendment. Due to chronic misuse of the stairway space, MMC installed security features that allow egress-only.*



PUBLIC PEDESTRIAN INFRASTRUCTURE

- Sidewalks and Pathways (from City of Portland GIS, 1/5/2018)
- Crosswalks
- Transit Stop
- Traffic-Light-Controlled Intersection

MAINE MEDICAL CENTER (MMC) PEDESTRIAN INFRASTRUCTURE

- MMC Campus Public Circulation, Ground Level
- MMC Campus Public Circulation, Level CG (Congress St)
- MMC Campus Public Circulation, Level CB (Staff Entrance)
- E MMC Public Elevators
- S MMC Stairway, Public Egress-Only
- MMC Bicycle Rack Locations
- MMC Public Pedestrian Entrances

MMC INSTITUTIONAL OVERLAY ZONE (IOZ)

- MMC IOZ Parcels
- MMC Buildings
- Non-MMC Buildings within MMC IOZ

Figure 7

Future Pedestrian Network

The MMC Campus Replacement and Modernization Project, which is described in the MMC Institutional Development Plan and illustrated in Figure 4 on page 6, will replace the existing Staff Garage with a new hospital building fronting Congress Street with a new drop-off and pedestrian entrance. Patients and visitors will be able to take elevators from the lobby area to the main public level of the hospital. The Visitor Garage stairway will remain egress-only per the current agreement between MMC, the City and neighbors. As part of this project, MMC proposes to improve the sidewalk between Gilman Street and the Visitor Garage and add a landscaped pedestrian space along the sidewalk that will moderate the 23 feet difference in grade between the new drop-off and Gilman St. A card-controlled staff entrance will be located at the corner of Congress and Gilman Sts. Sidewalk improvements and new crosswalks are also proposed for key routes between the proposed staff garage on St John St and the new staff entrance.

PUBLIC PEDESTRIAN INFRASTRUCTURE

- Sidewalks and Pathways (from City of Portland GIS, 1/5/2018)
- Proposed Sidewalk Improvements
- Existing Crosswalks / Proposed New Crosswalks
- Transit Stop / Traffic-Light-Controlled Intersection

MAINE MEDICAL CENTER (MMC) PEDESTRIAN INFRASTRUCTURE

- MMC Campus Public Circulation, Ground Level
- MMC Campus Public Circulation, Level CG (Congress St)
- MMC Campus Public Circulation, Level CB (Staff Entrance)
- E MMC Public Elevators / S MMC Stairway, Public Egress-Only
- MMC Bicycle Rack Locations
- MMC Public Pedestrian Entrances / MMC Staff Entrance

MMC INSTITUTIONAL OVERLAY ZONE (IOZ)

- MMC IOZ Parcels / MMC Buildings
- Non-MMC Buildings within MMC IOZ

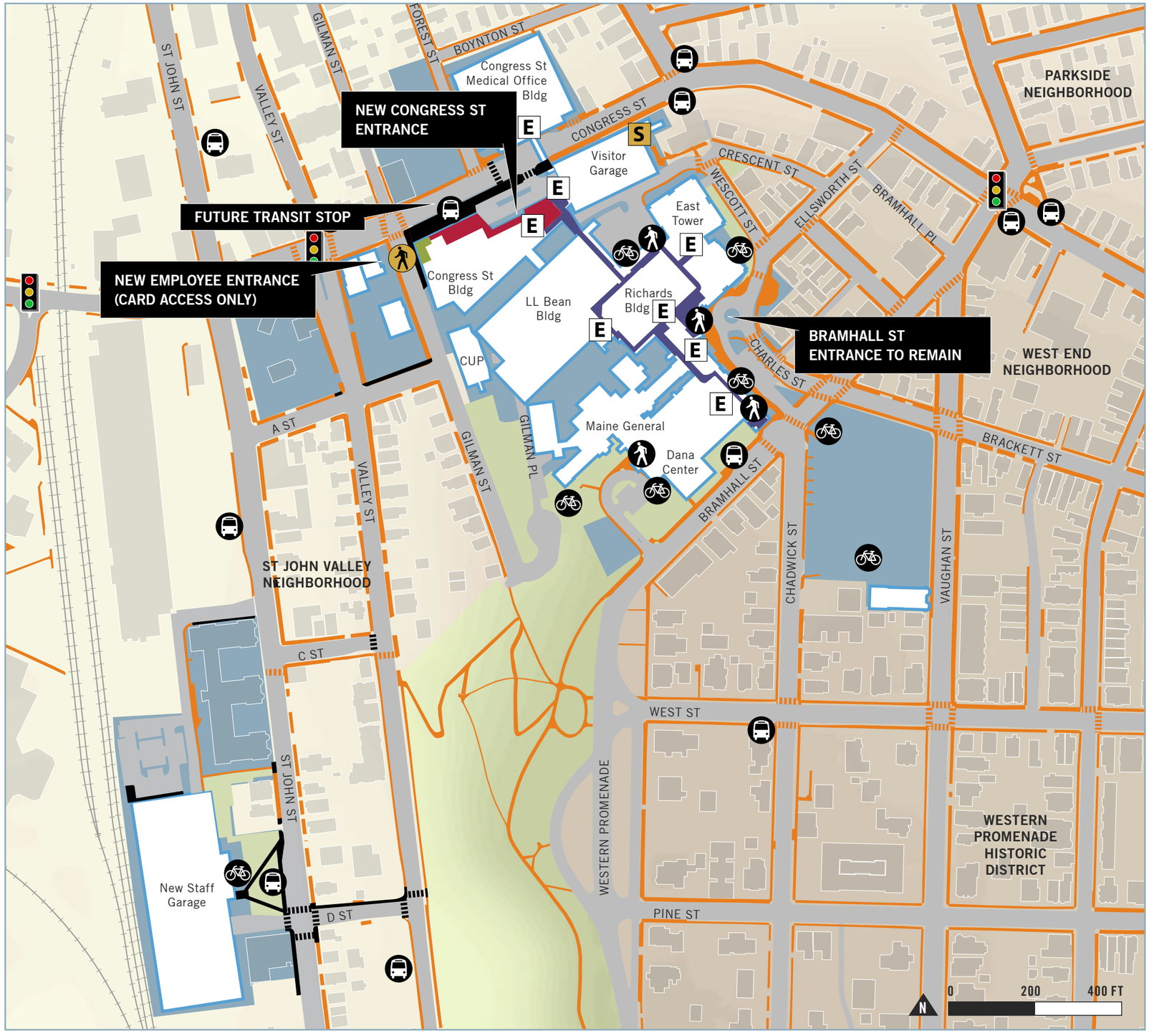


Figure 8

Proposed Pedestrian Improvements

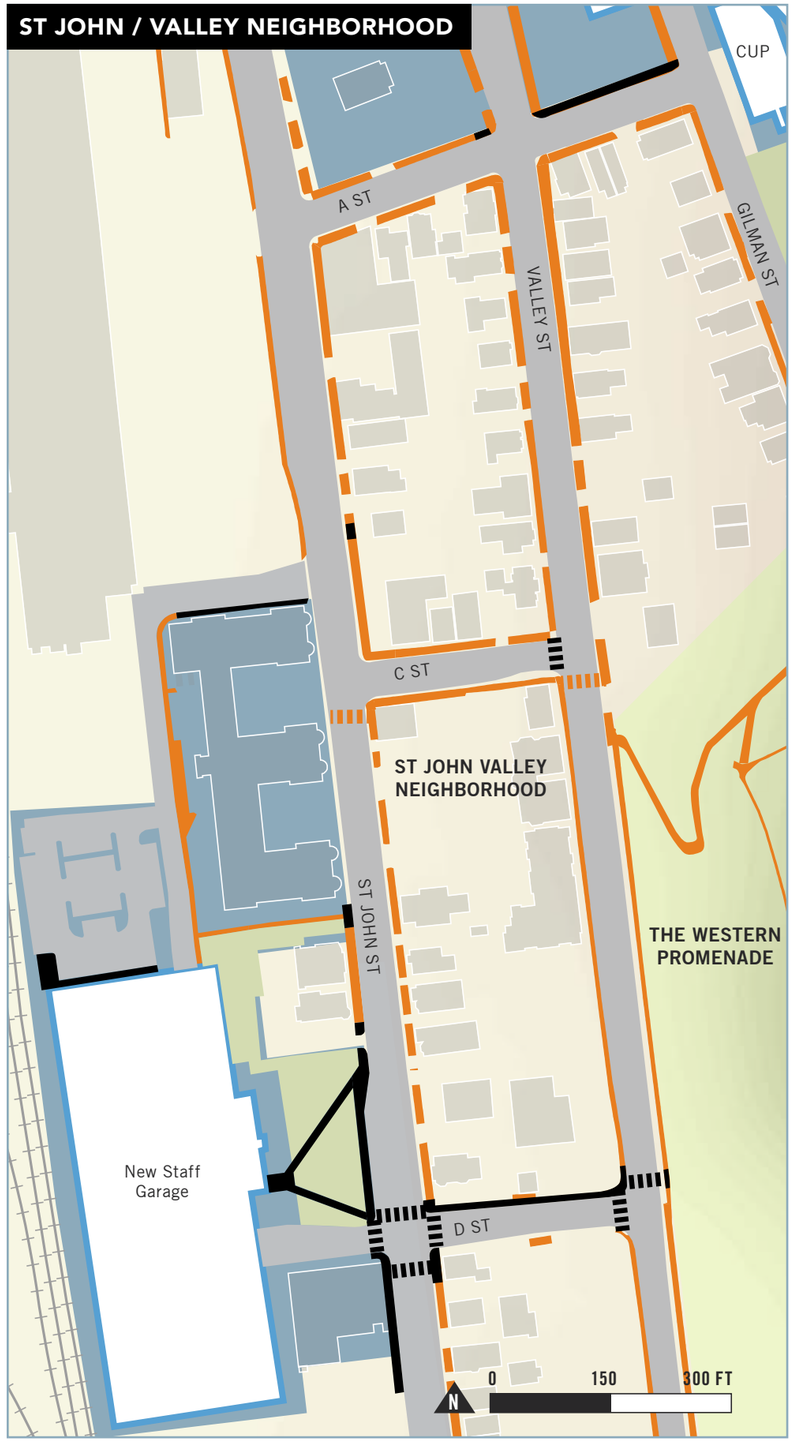
The following pedestrian and CPTED improvements are proposed as part of MMC's Campus Replacement and Modernization Project:

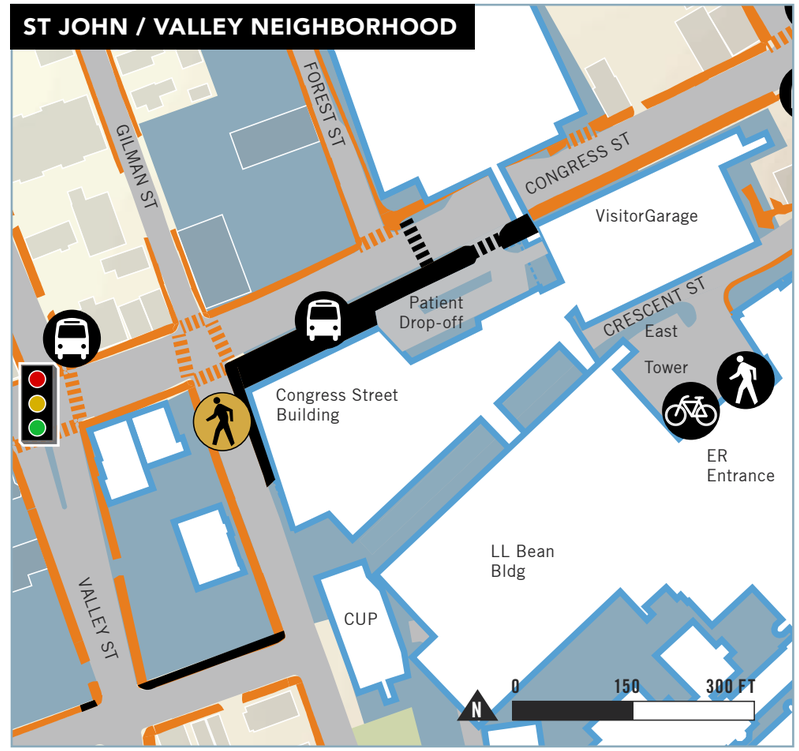
ST JOHN VALLEY NEIGHBORHOOD:

- New or repaired brick sidewalks and new standard crosswalks that meet the City of Portland Technical Standards:
  A, C, and D Streets, St John Street, and Valley Street (see Figure at right for specific locations)
- New pocket park between the Staff Garage and St John Street

CONGRESS STREET:

- New entrance provides public pedestrian connection between Congress Street and the main public floor of the uphill MMC campus
- New concrete sidewalk, as shown, in front of Congress Street Building and alongside its Gilman St facade
- Expanded sidewalk zone with pedestrian-friendly landscape moderating the grade difference between the drop-off plaza and Gilman Street
- New transit stop with shelter in front of the Congress St Building
- New Crosswalk on Congress at Forest Street
- New card-controlled staff entrance at the corner of Gilman Street





PUBLIC PEDESTRIAN INFRASTRUCTURE

- Sidewalks and Pathways (from City of Portland GIS, 1/5/2018)
- Proposed Sidewalk Improvements
- Existing Crosswalks
- Proposed New Crosswalks
- Transit Stop
- Traffic-Light-Controlled Intersection

MAINE MEDICAL CENTER (MMC)

- MMC Bicycle Rack Locations
- MMC Public Pedestrian Entrances
- MMC Controlled Staff Entrance
- MMC IOZ Parcels
- MMC Buildings
- Non-MMC Buildings within MMC IOZ

Figure 9

Crime Prevention Through Environmental Design (CPTED)

The MMC Campus Replacement and Modernization Project integrates best practices in CPTED to create a safe pedestrian environment along the campus edge. Key improvements include:

- The new pedestrian entrance on Congress Street provides a safe and secure public connection between Congress Street and the main public floor of the uphill MMC campus
- The new Congress St Building will increase pedestrian activity along Congress St. The sidewalk along the new building will be lit with pedestrian-oriented lighting meeting the City's Technical Standards.
- The englazed building lobby, which overlooks Congress Street, will provide "eyes on the street" and additional nighttime lighting for this zone
- Pedestrian improvements envisioned for the multiple routes between the Staff Garage and the Staff Entrance will be lit in accordance with City's Technical Standards
- Closure of the Visitor Garage stairway to public access from Congress Street addresses safety and security issues related to misuse of this space.

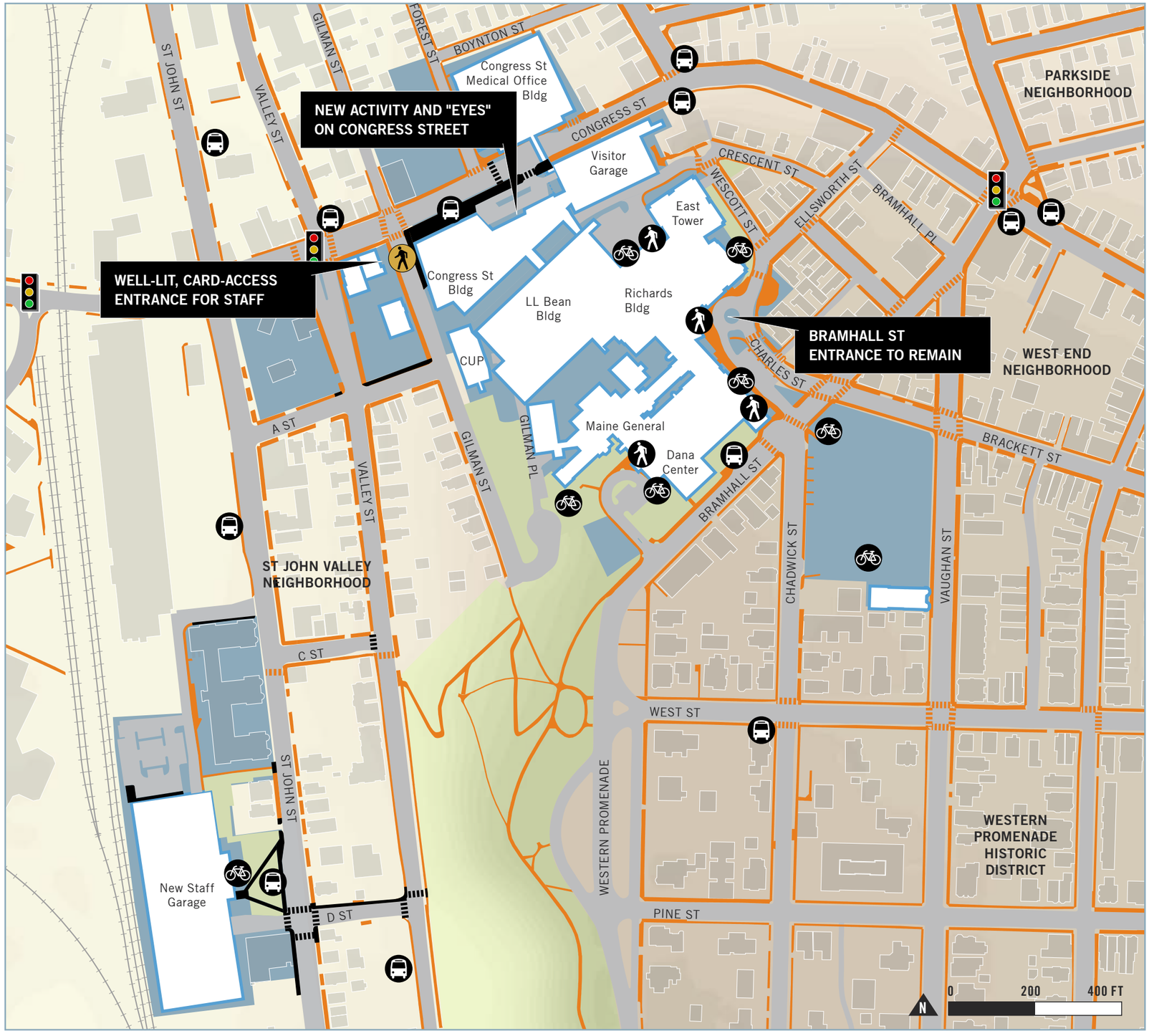


Figure 10

Sidewalk Materials

The MMC Institutional Overlay Zone (IOZ) and the surrounding area has a mix of sidewalk materials as surveyed by the City of Portland, and illustrated at right.

As indicated in the approved Institutional Development Plan, MMC may request waivers from the city's sidewalk material policy during site plan review in order to ensure safe pedestrian access to campus facilities.

MMC has identified the following sidewalk materials for public realm improvements included in its MMC Campus Replacement and Modernization Project :

- Brick sidewalks for proposed sidewalk improvement on A, C, and D Streets, St John Street, and Valley Street (See "Figure 8" on page 10 for locations)
- Concrete sidewalks in front of the future MMC Congress Street Building and alongside its Gilman St facade (See "Figure 8" on page 10 for locations)

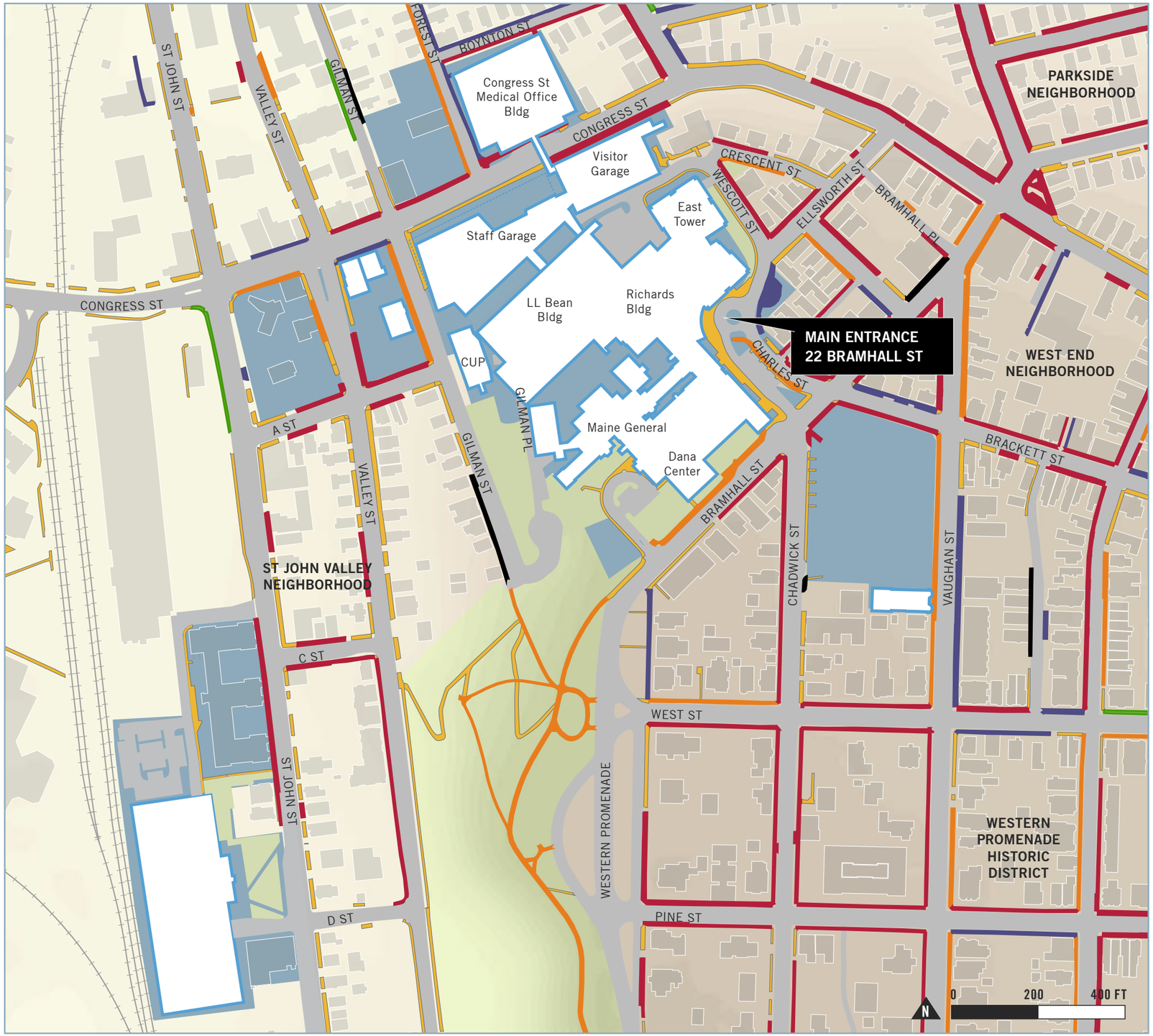
No additional changes are planned on campus sidewalks at this time.

SIDEWALK MATERIALS FROM CITY OF PORTLAND GIS

- Brick Sidewalks
- Brick-Concrete Sidewalks
- Concrete Sidewalks
- Asphalt-Brick Sidewalks
- Asphalt Sidewalks
- Other Sidewalks, no material listed

MAINE MEDICAL CENTER (MMC)

- MMC Bicycle Rack Locations
- MMC Public Pedestrian Entrances
- MMC Controlled Staff Entrance
- MMC IOZ Parcels
- MMC Buildings
- Non-MMC Buildings within MMC IOZ



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MaineHealth

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Maine Medical Center Campus-Wide Parking Study

Overview

Maine Medical Center (MMC) retained VHB to conduct a campus-wide parking study that includes an analysis of demand and supply for patient, visitor, and employee parking on MMC's Bramhall Campus. This parking study incorporates the targeted impact of MMC's Transportation Demand Management program.

This study quantifies the existing and future parking conditions, with a focus on peak period demand requirements, to help quantify and formulate sound parking strategies to adequately support MMC's patients, visitors, staff, and physicians into the future. The study took into consideration the assessment of two distinct user groups on-campus: patients/visitors and employees (all staff including physicians, nurses, administration, etc.). It also looked at all MMC-controlled parking, including both the on-campus parking as well as off-site, remote staff parking.

Existing Parking Supply

Table 1: Existing MMC Bramhall Campus Parking Supply Summary provides a summary of existing MMC parking spaces. Currently, there are 850 patient/visitor parking spaces. All patient/visitor parking spaces are located on-campus. There are 2,027 employee parking spaces.

Table 1: Existing MMC Bramhall Campus Parking Supply Summary

		Patient / Visitor	Employee	Total at Facility	Ownership
ON-CAMPUS	Employee Garage	0	1,274	1,274	*Owned*
850 patient/visitor spaces	Patient/Visitor Garage	480	0	480	*Owned*
1,538 employee spaces	South Lot	370	0	370	*Owned*
	887 Congress (Forest St Garage)	0	178	178	*Owned*
	7 Bramhall St	0	26	26	*Leased*
	905 Congress St (Sportsman Lot)	0	60	60	*Leased*
OFF-CAMPUS	222 St John St (First Atlantic Lot)	0	283	283	*Leased*
489 employee spaces	181 High St (Gateway Garage)	0	100	100	*Leased*
	993 Congress St (Classic Lot)	0	97	97	*Owned*
	321 Brackett St	0	9	9	*Leased*
	Total Parking Spaces	**850**	**2,027**	**2,877**	

Existing Parking Demand

MMC has continued to witness intensifying demands on the existing parking supply due to increased patient volumes and higher acuity patients with longer lengths of stay. Under current conditions, MMC's staff parking system typically operates at capacity during the weekday daytime hours. When off-site, remote staff parking facilities reach capacity, staff is directed to park on-campus in the Congress Visitor Garage. Some staff members independently choose to park nearby utilizing neighborhood on-street parking, although this is discouraged by MMC.

Patients, visitors, and staff at MMC often comment on the lack of adequate and predictable parking. MMC parking facilities do not have integrated technologies to accurately report parking utilization. Therefore, current demand was estimated using a combination of observed data and comparisons to facilities similar to MMC's Bramhall Campus.

Observations:

On behalf of MMC, VHB conducted on-site parking usage observations in January and March 2017. These months were ideal for parking observations because of the poor weather resulting in increased parking utilization. VHB collected parking count data during peak hours, which included late afternoon, evening, and overnight occupancy and turnover. Parking observations were completed during weekdays when MMC typically sees its biggest parking challenges – Tuesday – Friday. Historically, the highest patient volumes at MMC are on Thursdays and Fridays according to the MMC team responsible for managing parking. High patient volumes coincide with higher volumes of staff. The counts indicate that the parking system typically operates at or above capacity during weekday daytime hours. During the observations, it was difficult for VHB to differentiate staff from patients and visitors. Therefore, a total demand estimate is provided.

The observed data reveals that parking demand at the Bramhall campus among patients, visitors, physicians, and staff total roughly 3,125. MMC parking facilities have capacity of 2,877. The observed parking demand is almost 110% of supply. The observed parking demand is 4.4% below the expected parking demand (3,264) for a suburban hospital of MMC's size, according to Institute of Transportation Engineers (ITE) parking demand projections.[1] The difference equates to a shortage of 139 parking spaces.

In addition to VHB's observations, the MMC staff responsible for managing parking has estimated the employee parking deficit to be between 200 and 300 spaces.

Comparison to Peer Group:

VHB compared MMC's parking ratio per licensed bed to other hospitals in New England and nationally. MMC's 850 patient/visitor parking spaces equate to 1.33 parking spaces per bed which is low compared to peers. The midpoint patient and visitor parking space/licensed bed ratio among MMC peers is 1.87. It is important to note that based on a review of peer institutions, MMC would need to increase its patient/visitor allocation by 341 spaces, or 40%, to achieve a similar beds-to-spaces ratio as its peers. MMC's 2,027 staff parking spaces equate to 3.18 parking spaces per bed which is also low when compared to other peer institutions. The midpoint employee parking space/licensed bed ratio among MMC peers is 4.38. MMC has 637 licensed beds.

When compared to peers, MMC has a shortage of 341 patient and visitor parking spaces and 763 staff parking spaces.

$$\begin{aligned} &\textit{MMC Licensed Beds}\ (637) * \textit{Comparison Group Patient \& Visitor Parking Space per Bed}\ (1.87) \\ &\quad = \textit{Peer Equivalent Patient \& Visitor Parking Spaces}\ (1{,}191) \\ &\quad - \textit{MMC Patient \& Visitor Parking Space}\ (850) \\ &\quad = \boldsymbol{\textit{Patient \& Visitor Parking Space Deficit at MMC}\ (341)} \end{aligned}$$

$$\begin{aligned} &\textit{MMC Licensed Beds}\ (637) * \textit{Peer Group Staff Parking Spaces per Bed}\ (4.38) \\ &\quad = \textit{Peer Group Equivalent Staff Parking Spaces}\ (2{,}790) - \textit{MMC Staff Parking Spaces}\ (2{,}027) \\ &\quad = \boldsymbol{\textit{Staff Parking Space Deficit at MMC}\ (763)} \end{aligned}$$

Current Demand:

MMC used the observed and peer group data to determine the estimated parking demand.

Based on data available, the estimated current MMC parking demand exceeds patient and visitor supply by approximately 25 parking spaces and exceeds employee parking supply by approximately 220 parking spaces. Therefore, the estimated parking demand in 2017 is:

Table 2: 2017 Estimated Parking Demand

- 875 for patient and visitor parking ($875 = \textit{Current Patient Visitor Parking Supply}\ (850) + 25$)
- 2,250 for employees ($2{,}250 = \textit{Current Employee Parking Supply}\ (2{,}027) + 220$)
- 3,125 total estimated parking demand

The current parking demand for MMC's Bramhall campus is approximately 3,125 parking spaces.

[1] This approach is consistent with the City of Portland's Technical Manual, which recommends using ITE for parking demand projections. https://www.portlandmaine.gov/2148/TDM-Parking

MMC feels that the appropriate metric to measure parking utilization is parking demand per Bramhall campus employee. This metric is ideal because the number of employees will change over time. Other metrics such as parking space per bed or parking space per square foot would not accurately account for all factors impacting parking demand on campus. This metric allows for changes in both factors – the number of employees and parking demand. In addition, this metric focuses on MMC employees who are the target population of this transportation demand management plan.

MMC's Bramhall campus has roughly 6,000 employees as of 2017. Therefore the current employee parking demand per Bramhall campus employee is 0.375.

$$\frac{Estimated\ Employee\ Parking\ Demand\ (2{,}250)}{MMC\ Bramhall\ Employees\ (6{,}000)} = Employee\ Parking\ per\ Bramhall\ Employee\ (0.375)$$

Future MMC Parking Actions

MMC has proposed multiple capital projects and programs in connection with the Master Facility Plan outlined in MMC's IDP. Near-term (completed by 2021) projects to expand parking supply include:

1. Patient / Visitor Garage Addition: Expand the existing 480-space Patient/Visitor Garage by three levels to accommodate an additional 225 spaces; and
2. New St John St Garage: Construct a new 2,450 space parking garage on the nearby St. John Street and demolish the existing 1,274-space Employee Garage.

The resultant 2021 parking supply upon completion of these near-term projects is summarized in **Table 3: Expected 2021 MMC Bramhall Campus Parking Supply Summary**.

Table 3: Expected 2021 MMC Bramhall Campus Parking Supply Summary

		Patient / Visitor	Employee	Total at Facility	Ownership
ON-CAMPUS	Patient/Visitor Garage	705	0	705	*Owned*
1,075 patient/visitor spaces	South Lot	370	0	370	*Owned*
264 employee spaces	887 Congress (Forest St Garage)	0	178	178	*Owned*
	7 Bramhall St	0	26	26	*Leased*
OFF-CAMPUS	New Employee Garage	0	2,450	2,450	*Owned*
2,459 employee spaces	321 Brackett St	0	9	9	*Leased*
	Total Parking Spaces	**1,075**	**2,654**	**3,729**	

Per September 22, 2017 Institutional Development Plan

As shown in **Table 3**, the patient parking supply by 2021 will increase by 225 spaces and the employee parking supply will increase by 627 spaces with these two parking projects completed. With the new Employee Parking Garage located off-campus, the amount of employees who park remotely will increase from about 25 percent to 90 percent.

MMC anticipates consolidating the Gateway Garage and Classic Lot parking spaces into the new employee garage following the opening of the new parking garage.

These efforts are intended to enable MMC to continue with their primary Master Plan goals, which include the expansion of important clinical programs and the de-coupling of semi-private patient rooms to fully private rooms. The proposed new hospital building will be located on the site of the former Employee Garage. As defined in the MMC IDP, the hospital anticipates that the overall patient load will grow by approximately eight percent over the next ten years (or about 0.75 percent per year). Similarly, employment at MMC is expected to grow by approximately 7 percent over the next ten years (or about 0.70 percent per year). The growth rates were applied to the 2017 MMC parking demands to reflect overall anticipated institutional parking growth. **Tables 4 and 5** summarize how the new construction will affect the occupancies over time.

Table 4: Future MMC Bramhall Campus Employee Parking Supply/Demand Summary

	2020	2022	2026
Parking Spaces	**2,654**	**2,723**	**2,723**
Effective Parking Capacity	**2,521**	**2,521**	**2,521**
Parking Demand	**2,465**	**2,500**	**2,570**

For employee parking garages, the effective parking capacity is 95% of striped parking spaces, shown in **Table 4**. This is due to the user group familiarity of the parking garage layout, circulation and general trends of the garage availability due to their daily use of the facility and the low space turnover. Effective capacity for the employee parking spaces is not 100% because of anticipated user compliance with lined spaces (i.e. parking in a way that limits the use of the adjacent parking space).

Table 5: Future MMC Bramhall Campus Patient/Visitor Parking Supply/Demand Summary

	2020	2022	2026
Parking Spaces	**1,075**	**1,075**	**1,075**
Effective Parking Capacity	**970**	**970**	**970**
Parking Demand	**892**	**905**	**933**

For patient/visitor garages, the effective parking capacity is 90% of striped parking spaces, shown in **Table 5**. Patients and visitors are often unfamiliar with the garage layout and operations. Planning to accommodate this targeted utilization will ensure arriving patients and visitors have convenient and available parking.

To help alleviate existing and future parking demands, and to support use of other alternative, sustainable modes of transportation, MMC continues to pursue and bolster its Transportation Demand Management (TDM). The purpose of the TDM Plan, called the Commuter Choice Program, is to reduce the amount of single-occupancy vehicles by enabling and promoting alternative modes of transportation to and from MMC's Bramhall Campus for MMC employees.

In the 2017 Transportation Demand Management plan, MMC established the following short-term, mid-term, and long-term single-occupancy vehicle reduction goals shown in **Table 6** below:

Table 6: 2017 TDM Trip Reduction Goals

	Short-Term (0-2 years)	Mid-Term (2-5 years)	Long-Term (5+ years)
Trip Reduction Target	2%	4%	5%

MMC will continue to monitor parking demand and needs at the Bramhall campus and re-evaluate its program goals. The estimated impacts of the TDM program's reduction goals are summarized in **Table 7**.

Table 7: Employee Parking Demand Reduction Due to TDM Efforts Summary

	2020	2022	2026
Parking Demand	**2,465**	**2,500**	**2,570**
Estimated TDM Reduction	**-60**	**-100**	**-120**
TDM Influenced Demand	**2,405**	**2,400**	**2,420**

If TDM targets are met, parking demand will reduce by approximately 60 in the short term (2020), 90 in the mid-term (2022) and 120 forecasting out to longer-term (2026). Such reductions strive to follow with less single-occupancy vehicles travelling to and from the Bramhall campus as intended by the Transportation Demand Management plan and programs.

Table 8: Employee Parking Demand Reduction Due to TDM Efforts Compared to Effective Employee Parking Capacity

	2020	2022	2026
Effective Employee Parking Capacity	**2,521**	**2,521**	**2,521**
TDM Influenced Demand	**2,405**	**2,399**	**2,420**
Estimated Parking Surplus	**116**	**122**	**101**

Table 8 compares the TDM influenced parking demand to the effective parking capacity for employee parking spaces. The amount of parking surplus fluctuates between 2020 and 2026 because of the time it will take for MMC to enhance the existing TDM program.

This analysis projects parking demand for 2026. The lifespan of the parking garage is expected to exceed 30 years. The estimated 2026 parking surplus in **Table 8** is roughly 4% of the total employee parking spaces shown in **Table 3** and is within a reasonable margin of error.

Conclusion

This study quantifies the existing and future parking conditions, with a focus on peak period demand requirements, to help quantify and formulate sound parking strategies to adequately support MMC's patients, visitors, staff, and physicians into the future. VHB determined that existing estimated parking demand at the Bramhall campus exceeds existing supply. The demand for complex healthcare in Maine is growing. As a result, MMC is growing to meet that demand. MMC's forecasts an increase in patient activity at the Bramhall campus by 2026. Using this forecast, VHB estimated a parking demand that will be accommodated only through investments in parking facilities and MMC's Transportation Demand Management program.

OO

October 30, 2018

Maine Medical Center
MaineHealth

Nell Donaldson, Senior Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: MMC Congress Building| 22 Bramhall St| Level III Site Plan
Response to City Reviewer Comments 1

Dear Nell:

Thank you for coordinating the review of the Maine Medical Center Congress Building project located at 22 Bramhall with frontage on Congress St.. This letter provides a summation of our responses to the comments received from various reviewers as part of the Level III Site Plan process. The original comment in italics below, and our response follows each.

Comments from Transportation Project Manager – Bruce Hyman Dated October 10, 2018

1. *In general - the plans as presented do not show enough context to readily assess them. The scale and extent of the area shown should be revised. The shading/hatching patterns should be modified so the plan is legible when shown in its entirety on a computer screen - it currently is not legible.*

Response: The Site Plan scale has been changed to 1"=20 feet, providing more context as requested.

2. *I don't believe, based on the grading plan submitted, (C40-01/02) that the curb ramps serving the mid-block crosswalk meet ADA in terms of cross-slope (2% max. cross-slope) nor that the area shown for the bus stop has a bus landing area that meets ADA. Please document the ADA analysis.*

Response: The existing grade of Congress Street is uniformly 5.5%, exceeding ADA requirements. It is not possible to provide ADA compliant cross slopes.

3. *The grading plan for Gilman St appears incomplete/not shown in its entirety. Please show the entire site.*

Response: Submitted grading plan encompasses the entire site.

4. *Site Plan: The site plans do not show enough context of the entirety of the street configuration in the vicinity of the site - I'd request that the applicant resubmit and provide 1"=20' plans instead of the 1"=10' site plan (and 1"=5' grading plans - requires 2 sheets)*
    a. *The site plan key identifies #14 as "Bus Stop" but the elevations show a bus shelter - there is not sufficient bus landing area (5'x8' minimum") provided if a bus shelter is intended (or unless the landing area includes a portion interior to the shelter as the landing area - which is not preferred)*
    b. *No bus stop or shelter location is shown on the north side of Congress St as has been discussed with the applicant - a paired bus stop is desired*
    c. *The tree wells do not meet city design standard - they 1) do not use radius curb and 2) do not show a section of raised granite tree well along the Congress St curb line and 3) are not of standard size.*
    d. *The proposed street layout is not shown on the plans - locations of on-street parking, travel lanes, climbing bike lane, etc.*
    e. *Required signs (bus stop, etc) are not shown on the plans*
    f. *Curb ramp modifications on the opposite side of Gilman and Congress Streets are to be shown to achieve ADA compliance*
    g. *The sidewalks are shown on both Congress and Gilman Streets as broom finish concrete - I do not currently support this without further documentation of the need to stray from our Sidewalk Material Policy*

b. *I need to further assess curb ramp design- for instance, there is not sufficient landing area for the curb ramp serving the mid-block crossing along the retaining wall - a 5' deep (measured perpendicular to the street) ramp landing area is required where a ramp meets vertical obstructions (not the usual 4')*

Response: Response pending further conversations with City plan reviewers.

5. *Design Details: I did not find details available for the proposed materials within the public ROW: lighting, sidewalk, curb ramps, detectable warning panels, tree wells, bus shelter (if proposed), etc.*

Response: Acknowledged – new materials being submitted.

Comments from City of Portland Planning Division – Nell Donaldson Received October 10, 2018

1. *Dimensional Requirements: Provide analysis with respect to dimensional requirements in the revised submittal.*

Response: A complete zoning assessment will be submitted separately.

2. *Design: Please provide floor plans in revised submittal.*

Response: Floor plans are submitted in the October 30, 2018 submittal.

3. *Construction Management:*
   a. *Please provide some discussion on attempts to minimize impacts to pedestrian circulation along the south side of Congress Street. Could sidewalk closure be limited to certain construction/demolition phases?*

      Response: A temporary sidewalk or bike lane is not recommended by the Construction team. The construction fence will need to be maintained in the location outlined in the CMP for the majority of the project. It will be possible to set the construction fence back after significant structural, site work, and material deliveries are complete. Turner estimates that these activities will be completed in the Fall of 2022.

   b. *Provide discussion on bike accessibility around the construction site.*

      Response: Share the road signs will be erected on Congress Street in each direction and Gilman Street prior to the roadway narrowing. These signs will remind drivers to be aware of bicyclists.

4. *Access and Circulation:*
   a. *Please provide a circulation plan showing how visitors and employees access the main entrance/employee entrance by different modes.*

      Response: Revised plans for the Congress St. entrance will include details of the pedestrian access and traffic controls to that will ensure pedestrian safety.

   b. *Further discussion on the street layout pending. At the least, a climbing bike lane should be shown on Congress Street.*

      Response: Traffic and transportation discussions are on-going with the City. The final cross section will be determined in coordination with City staff.

   c. *The Congress Street sidewalk should be widened as possible to provide better pedestrian access along the site frontage*

      Response: Traffic and transportation discussions are on-going with the City. The final cross section will be determined in coordination with City staff.

d. *A sidewalk material waiver request should be submitted. Pending review of this request, in places where sidewalk material is proposed to transition, details should be provided. Ideally, transitions would occur at curb cut locations.*

Response: A sidewalk material waiver request is included with the October 30, 2018 submittal. The concrete to brick transition has been relocated to the east, coinciding with an existing granite accent band in the sidewalk near the MMC visitor garage.

e. *A sidewalk waiver request should be submitted for the Gilman Street frontage.*

Response: A sidewalk waiver request for the Gilman frontage is included in the October 30, 2018 submittal.

f. *Provide more information on 'mechanical areaway' showing in the Gilman Street ROW. This appears to be a sidewalk obstruction?*

Response: This will be a flush sidewalk condition similar to image provided with a hatch. Areaway is to allow for equipment removals or replacements and used very rarely. Perkins & Will is exploring relocating the areaway so as not to interfere with the Gilman St. ROW.

g. *Confirm how a pedestrian coming from the west would access the front door on foot if stairs are not an option?*

Response: In addition to the stairs, pedestrians can access the Congress St entrance from the Eastern side of curb cut adjacent to pedestrian bridge across Congress St.. Revised plans for the Congress St. entrance will include details of the pedestrian access and traffic controls to that will ensure pedestrian safety.

5. *Public Transit Access:*
   a. *Plans have been forwarded to METRO for review. Further discussion of bus shelters and associated access improvements (including crosswalk and north side shelter) pending.*

Response: Metro expressed a desire to consolidate the North-bound and South-bound Gilman St. / Congress St. bus stop and the Weymouth St. / Congress St. bus stop to a location as close to the MMC Congress St. entrance as possible. Metro also desires a bus shelter designed to Metro standards. The City of Portland / METRO / and MMC are still discussing the opportunities and challenges of this consolidation. The location of the consolidated bus stop is related to the ongoing conversation about the Congress St. streetscape design.

b. *At the least, bus shelter as proposed lies in the middle of the pedestrian desire line. Please propose alternate location.*

Response: The bus shelter could be placed on MMC property which would require an agreement between MMC and the City of Portland. This is an ongoing conversation with the Metro, the City, and MMC.

6. *Parking:*
   a. *Bike racks should be provided at this entrance. Please indicate on revised plans.*

Response: Attached diagram for consideration. This coincides with LEED efforts as well. Thought is to use covered portion in garage that is not ideal for parking due to entrance of cars.

7. *Landscaping and Landscape Preservation:*
   a. *See comments from others forthcoming.*

Response: Waiting for comment.

b. Provide street trees on Gilman Street.

Response: Street trees on Gilman St may be interference with the planned employee shuttle drop-off. The design team is evaluating this now.

8. *Water Quality, Storm Water Management and Erosion Control:*
   a. See comments from others.

   Response: Acknowledged

9. *Public Safety and Fire Prevention:*
   a. See comments from others forthcoming.

   Response: Acknowledged

10. *Availability and Adequate Capacity of Public Utilities:*
    a. Utility plans are still under review.

    Response: Acknowledged

11. *Exterior Lighting:*
    a. Please provide light fixture cut sheets for all lights proposed.

    Response: Cut sheets will be uploaded to eplan.

    b. Photometric plan should show average and max illumination levels.

    Response: Revised Photometric Plans are included in the October 30, 2018 submittal.

    Signage and Wayfinding:

    c. Revised sign plan still under review.

    Response: Acknowledged. A revised sign plan will be submitted to the City based on a conversation with Nell Donaldson and Caitlin Cameron on October 25, 2018.

12. *Zoning Related Design Standards:*
    a. See comments from Others.

    Response: Acknowledged

13. *Other Submittals Required.*
    a. Utility capacity letters

    Response: Acknowledged

    b. Plan edits
        i. Rescale site plan at 1" = 20'
        ii. Include distances to property lines on site plan
        iii. Add height calculation from average grade on elevations
        iv. Plans need to be stamped by an engineer

Response: A complete zoning assessment will be submitted separately.

14. *RTI (Rights, Title or Interest)*
    a. *Encroachments (building and 'mechanical areaway') into Gilman ROW need further review.*

    Response: Acknowledged

15. *Other Permits/Reviews Required:*
    a. *Site Location of Development*

    Response: DEP documentation underway.

    b. *FAA*

    Response: MMC will be submitting the FAA permit request for the building. Turner will be submitting for the crane. We do not anticipate submitted the permit request or receiving approval prior to the end of calendar year 2018.

16. *Waivers:*
    a. *Please provide formal requests for sidewalk material waiver and waiver of sidewalk along Gilman Street.*

    Response: A sidewalk material waiver request is included with the October 30, 2018 submittal.

17. *Outstanding Items from Earlier Reviews:*
    a. *Pedestrian Network Plan (requirement of IDP, included as condition of approval on East Tower) - That the applicant shall develop a long term public Pedestrian Network Plan (both on and off the ROW) showing the integration of the upper level MMC campus with the Congress Street corridor, including measures to address CPTED principles, for implementation when the retail space beneath the Visitors Garage is available for lease or sale; such plan to be submitted for review and approval by the Planning Authority prior to the issuance of a building permit for the Congress Street Hospital Entrance").*

    Response: A Pedestrian Network Plan will be uploaded to eplan on October 30, 2018.

Comments from City of Portland Traffic Consultant – Tom Errico, TY Lin Dated October 10, 2018

1. *A Traffic Movement Permit Scoping meeting is scheduled for October 23, 2018 and accordingly no comments are provided regarding off-site traffic impacts at this time.*

Response: Acknowledged

2. *The Gilman Street non-tangent curb alignment is not acceptable. A straight curb is suggested. Gilman Street width dimensions shall be provided.*

Response: Plans will be revised in future submissions when the Congress St configuration is determined.

3. *The flared curb ramp near the main entrance vehicle driveway is not acceptable partly because it creates a narrow pedestrian accessible route. Also, the crosswalk location should be evaluated.*

Response: Plans will be revised.

4. *The provision of the City's preferred two ramp configuration at the Gilman Street corner should be investigated.*

Response: Plans will be revised.

5. *Bus stop location and accessibility should be evaluated.*

Response: Please refer to above comments about ADA accessibility.

6. *Shuttle pick up and drop off operations at the employee entrance on Gilman Street should be detailed.*

Response: Complete shuttle routes to and from the Gilman Street entrance are on file with the City of Portland as part of the St John St garage site plan review. Shuttles will approach the Gilman St employee entrance from the South and stop to unload and load. The length of time for unloading and loading will vary but are estimated to be less than 15 minutes. The design team is revisiting the exact stop locations so as not to interfere with the street trees on Gilman St. that the City requested.

7. *Vehicle drop-off/pick-up operations/management at the vehicle loop should be provided.*

Response: Vehicles entering the site at the patient drop-off / pick-up area will be directed right to travel around the loop. A median will be constructed at the site access to prevent drivers from directly accessing the visitor garage without going around the loop. As the vehicles complete their drop-off or pick-up, they will have the choice of going straight to exit onto Congress Street or turning right to enter the visitor garage. This design allows vehicle interconnection between the patient loop and visitor garage without recirculating onto Congress Street, which can further reduce congestion and increase safety. Vehicles wishing to park and not drop-off or pick-up can use the existing full movement access to the visitor garage onto Congress St..

There will be exterior signage and interior signage that supports the traffic flow described above. Exterior signs will differentiate the Congress St patient pick-up / drop-off from the existing patient and visitor garage entrance. Signs within the existing patient and visitor garage will direct exiting traffic and traffic intending to pick-up a patient. Signs within the circle drive will direct traffic intending to exit the site and traffic intending to enter the patient and visitor parking garage. In addition to signs supporting the traffic flow, traffic exiting the patient and visitor garage will have a stop sign to support safe pedestrian access to the building's entrance.

There is enough length within the entrance loop for approximately 11 vehicles to queue on-site without backing onto Congress Street. Traffic engineers observed the exiting entrance on Bramhall St to better understand the frequency and volume of queueing at a MMC entrance. Traffic engineers observed a maximum of 9 queued vehicles. The volume of patient pick-ups and drop-offs will be split between the existing entrance and the proposed new entrance in the future.

MMC intends to support the operations of the Congress St. entrance with valet service. Valet parking will improve the flow of the circular drive. In addition, valet attendants will assist individuals who do not wish to take advantage of the service by providing directions when needed.

At the October 23, 2018 Planning Board workshop, a planning board member commented that snow melters would be an excellent addition to the Congress St. entrance. MMC will be adding snow melters to this entrance.

MMC will continue to support the patient arrival experience by communicating with patients and their families in advance of scheduled appointments. These communications include details about the correct hospital entrance and parking location.

A detailed site plan will be submitted that clarifies these movements in addition to pedestrian access.

8. *Pick-up/Drop-off loop interaction with parking garage entrance is a concern and an analysis should be provided.*

Response: A detailed site plan will be submitted that clarifies these movements in addition to pedestrian access.

9. *General sidewalk width given future pedestrian demand on Congress Street seems inadequate.*

Response: Pending conversation with the City reviewers.

10. *Congress Street cross-section width should specifically be detailed. How will bikes, parking, bus, vehicles be accommodated*

Response: MMC is currently working with the City on alternative cross-sections for Congress Street along the site frontage that will balance the priorities identified for the area.

11. *Pedestrian movements across the parking garage entrance to the Main Entrance is a concern.*

Response: Revised plans for the Congress St. entrance will include details of the pedestrian access and traffic controls to that will ensure pedestrian safety.

12. *A sidewalk on Gilman Street to A Street should be explored or a waiver analysis should be provided.*

Response: A sidewalk waiver request is submitted for consideration by the Planning Board.

13. *I have briefly reviewed the Construction Management Plan and noted the following:*
    a. *Local truck routings should be clearly documented from each construction entrance.*

    Response: Truck delivery routes are outlined in CMP. Truck routes exiting the construction site are submitted separately on October 30, 2018.

    b. *Roadway widths shall be detailed.*

    Response: An amendment to the CMP is provided via eplan on October 30, 2018

    c. *Is a temporary protected sidewalk on Congress Street feasible (if not for the entire project – but during certain phases).*

    Response: A temporary sidewalk or bike lane is not recommended by the Construction team. The construction fence will need to be maintained in the location outlined in the CMP for the majority of the project. It will be possible to set the construction fence back after significant structural, site work, and material deliveries are complete. Turner estimates that these activities will be completed in the Fall of 2022.

    d. *How will METRO service be accommodated.*

    Response: Existing stops will not change during construction. Two-way traffic will be maintained on Congress St.

Comments from City of Portland Civil Engineering Consultant – Wright Pierce Dated October 10, 2018

1. *Level III Site Plan applications with the City of Portland must submit a stormwater plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules. This includes conformance with the Basic, General, and Flooding Standards (Ref: Technical Manual, Section 5. II. Applicability in Portland. C. a.; and Ref: City of Portland Code of Ordinances Sec. 14-526. Site Plan Standards, (b). 3. b.)*

a. *Basic Standard: Plans and application material should be provided to address erosion and sedimentation requirements, inspection and maintenance requirements, and good housekeeping practices in accordance with MaineDEP Chapter 500, Appendix A, B, and C. The applicant has provided information that the project will be subject to the Basic Standard. The applicant has provided:*

   i. *An Erosion and Sedimentation Control Plan in Section 23 of the application. This item has been reviewed and accepted.*

      Response: Acknowledged

   ii. *Inspection and Maintenance information in Section 23 of the application. This item has been reviewed and accepted.*

      Response: Acknowledged

   iii. *Erosion and Sedimentation Control Details and Notes (C30-07). This item has been reviewed to indicate details for catch basin inlet protection. Given that there will be a level of disturbed surfaces, additional details should include temporary slope stabilization, construction entrances, perimeter erosion controls, dewatering, and other standard erosion and sedimentation details.*

      Response: Additional details including perimeter erosion controls and dewatering filter bags have been added to the plans the detail sheet C30-07. The location for erosion control measures have been added to the Demolition plan Sheet C04-01. Stabilized entrances are provided at the locations of the gated entrances identified on the Construction Management plan. As indicated in the Construction Management Plan, the majority of site disturbance will be internally drained, occurring below grade, behind temporary earth retention walls. Recommended locations for construction dewatering filter locations are indicated on Sheet C04-01.

   iv. *Location of Erosion and Sedimentation Control best practices were not observed on the Demolition Plan or Site Grading Plans. The applicant shall provide this information.*

      Response: The location of erosion and sedimentation control measures has been added to the Demolition plan Sheet C04-01. Stabilized entrances are provided at the locations of the gated entrances identified on the Construction Management plan. As indicated in the Construction Management Plan, the majority of site disturbance will be internally drained, occurring below grade, behind temporary earth retention walls. Recommended locations for construction dewatering filter bag locations are indicated on Sheet C04-01.

b. *General Standard: The applicant has provided information regarding the size and scope of the project indicating the project is subject to the Redevelopment Standard within the City of Portland. It is understood the City's redevelopment standard is more stringent than the Chapter 500 requirements for redevelopment. The City requirements indicate that greater than 50% of the proposed impervious surfaces must receive stormwater quality treatment pursuant to the MaineDEP Chapter 500 requirements. The applicant has provided information that greater than 50% of the facility impervious surfaces are conveyed to a Subsurface Sand Filter. The applicant shall clarify the following and provide responses:*

   i. *The applicant will be required to inspect, maintain, and report on the filter in accordance with the Chapter 32 stormwater requirements. The applicant has provided inspection, maintenance, and housekeeping information in Section 23 of the application. An executed stormwater maintenance agreement is required for the proposed stormwater treatment units.*

      Response: Noted, an executed agreement will be provided upon project approvals.

ii. *A 25% pre-treatment credit has been provided for the subsurface sand filters on Sheet 2 and Sheet 3 of the Underdrained Subsurface Sand Filter calculations. Under Chapter 500 Section 5 (a), Exemptions from the general standards, "The pre-treatment credit does not apply to subsurface underdrained filter structures using chambers." Please clarify how the 25% pretreatment credit is being applied to the proposed Subsurface Sand Filter in these calculations.*

Response: The pretreatment credit has been removed from the calculation sheet. The credit had only been applied to the water quality volume (WQv) calculation for the impervious area associated with the garage rooftop area. The credit reduced the total WQv for the system by about 550 cubic feet. The calculation is presented in the water quality calculations, sheet 3 of 3. A revised Stormwwater Management report dated 10/30/2018 is attached that incorporates the updated WQv calculations without pretreatment credits.

iii. *Please provide additional information on the "HIL" Unit at the existing parking garage, and how it conforms to the pretreatment credit.*

Response: The unit is a 6' diameter Hydro International Downstream Defender treatment unit designed and approved as part of the 2004 campus expansion Site Law approval by the City. The credit has been removed from the WQv calculations.

iv. *The MaineDEP Stormwater BMP manual indicates that, "The surface area of the filter must be no less than the sum of 5% of the impervious area and 2% of the landscaped area draining to the system.". The applicant has asked for a waiver of this principle to allow additional surface flows to be conveyed to the treatment system, as requested by the City. Whereas the magnitude of this difference may be modified as the pre-treatment calculations are revised, this waiver will be reviewed when the pre-treatment volumes have been revised.*

Response: The pretreatment credit was not applied to the surface area criteria. Although the system has been increased in size to meet the treatment volume criteria, a waiver remains required for the surface area criteria.

c. *Flooding Standard: The applicant has provided information indicating the project is required to meet the Flooding Standard of Chapter 500. The applicant has submitted the following:*
   - *Subcatchment Plans for Pre- and Post-Development*
   - *Hydrology computations of these conditions*
   - *Summary of Pre- and Post-Development Flow Rates*

   i. *HydroCAD outputs for the 2-year, 10-year, and 25-year, 24-hour storm events have been provided. The model indicates the post-development flow rates for the proposed project do not exceed flow rates for the pre-development condition.*

   Response: Acknowledged.

   ii. *"Subsurface Sandfilter Section" details match the HydroCAD model. Additional pipe invert, pipe length, and pipe size information on grading plans and details are needed to confirm that the HydroCAD model matches permitting plans.*

   Response: Plan sheet C30-01 has been revised to include additional structure labels. Structure tables and pipe tables with rim elevations, inverts, length and slope of all of the pipes and structures associated with the system are now included on both Sheet

C11-01 and Sheet C30-01. An outlet control structure detail has been added to sheet C30-04.

2. *Discharge to Combined Sewer Overflow (CSO) Locations*
   a. *The applicant has provided information for pre-development and post-development flow rates to the combined sewer system for a 1-inch, 24-hour rain event. This storm event has been mentioned in previous discussions with the applicant and City Department of Public Works (DPW). To ensure that all involved parties are in agreement with evaluating this storm event for the CSO location, please provide e-mail or other written confirmation from City DPW.*

   Response: A confirmation email has been requested from the Keith Gray.

   b. *The Pre-Development and Post-Development HydroCAD reports each indicate multiple inflows to Existing SMH-13952. In Table 2, it appears the pre-development flow rate accounts for only flows from Reach 172, and the post-development flow rate accounts for only flows from Reach 135. Please either provide discussion confirming how the pre- and post-development CSO storm events are represented by the model, or provide revised modeling indicating how the other flows to SMH-13952 are represented.*

   Response: The modeling is correct. Table 2 has been revised. The predevelopment flow at SMH-13952 with contributions from reach 172 and 135 is 1.61 cfs (not 1.34 cfs as initially reported).

   The post development flow at this location is correctly reported as 0.28 cfs which is due primarily to the offsite runoff in reach 135. In the post development condition the detention system reduces the peak flow from the campus at this location to only 0.04 cfs. Therefore the majority of runoff at this location during a 1" storm is from off site locations tributary to reach 135. A revised Table 2 is presented below and is included in the revised report dated 10/30/18. The revised results indicated slightly greater reduction in runoff at this location than previously reported

Table 2 CSO Event Summary Table

Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
ESMH-13952	1.61	0.28	-1.33 (83%)

3. *Connection to Existing System:*
   a. *The applicant shall provide written or e-mail confirmation from the Department of Public Works that proposed connections to existing drainage and sewer systems are being completed in accordance with City of Portland Code of Ordinances section 14-526 (b) 3.a, subsection iii and iv.*

   Response: A confirmation email has been requested from the Keith Gray.

   b. *The applicant has indicated that capacity to serve letters from utilities will be provided as they become available.*

Response: Acknowledged. Capacity to serve letters from utilites will be provided as they are received.

4. *Proposed Drainage Design*
    a. *More information is needed to confirm the pipe capacity and inlet capacity is adequate for each structure and pipe length. Information has been provided in the HydroCAD model, but the information provided in the site grading plans is currently limited.*

Response: Plan sheet C30-01 has been revised to include additional structure labels. Structure tables and pipe tables with rim elevations, inverts, length and slope of all of the pipes and structures associated with the system are now included on both Sheet C11-01 and Sheet C30-01. An outlet control structure detail has been added to sheet C30-04.

    b. *Please provide spot grades or standard details confirming grading at curb and drainage structures.*

Response: Plan sheet C30-01 has been revised to include additional structure labels. Structure tables and pipe tables with rim elevations, inverts, length and slope of all of the pipes and structures associated with the system are now included on both Sheet C11-01 and Sheet C30-01. An outlet control structure detail has been added to sheet C30-04.

5. *Soils:*
    a. *Medium-intensity soil survey indicates Hollis-Windsor-Au Gres soils, but Hinkley soils were reported based on a geotechnical report. This geotechnical report was referenced in Section 23 but was not included as part of this section. Please provide this report, or citation of where the soils information is located in the application.*

Response: The current Natural Resource Conservation Service soil data, obtained from the NRCS web soil survey service indicates that the project area is comprised of Hinkley (HID, HIB) soils.

A copy of the soil survey map of the area is attached in the revised Stormwater management report and is depicted below. The Windsor-Au Gres soils in the vicinity of the MMC campus are located offsite to southwest, in the vicinity of St John Street and Park Street.

Soil Map—Cumberland County and Part of Oxford County, Maine
(Maine Medical Center area)



Map Scale: 1:10,400 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

b. *Soil groups should be referenced as "hydrologic soil group".*

Response: Noted. A misspelling has been corrected on page 3 of the revised report changing the word "hydraulic" to "hydrologic".

6. *Snow Storage:*
   a. *The applicant has noted in Section 16 of the application that snow storage will be completed through means of removal and off-site storage. No further action is necessary at this time.*

   Response: Acknowledged

7. *Details have been provided confirming the following storm drain infrastructure items that are in conformance with the City Standard Details and Technical Manual:*
   a. *Manhole Frame, Cover*
   b. *Catch Basin Frame, Grate*
   c. *Manhole, Manhole Steps*

   Response: Acknowledged

8. *A catch basin detail was included indicating a 2' sump. Catch basins require 3' sumps per City Technical Manual. Please revise.*

Response: The catch basin details have been revised to include a 3' deep sump.

WRITTEN SUBMISSION 15 – BICYCLE PARKING P
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE TOTAL NUMBER OF PARKING SPACES SERVING THE CAMPUS IS 3,825 PARKING SPACES, INCLUDING THE ST. JOHN STREET PARKING GARAGE.

REQUIRED BICYCLE PARKING :
20 BIKE SPACES FOR THE FIRST 100 VEHICLE SPACES = 20 SPACES
3,825 TOTAL VEHICLE SPACES – 100 = 3,725 / 1 BIKE PER 20 VEHICLES = 186 BICYCLE SPACES
TOTAL REQUIRED BICYCLE SPACES - 20 + 186 = 206 SPACES

BICYCLE SPACES PROVIDED :
PER THE IDP PAGE 58 THERE ARE 193 SPACES ON CAMPUS
40 ADDITIONAL SPACES ARE PROPOSED AT THE ST. JOHN STREET PARKING GARAGE
TOTAL PROPOSED BICYCLE SPACES = 193 + 40 = 233 SPACES

THE APPLICANT IS CURRENTLY EVALUATING ON CAMPUS BICYCLE PARKING PER THE CONDITIONS OF APPROVAL FOR THE EAST TOWER AND VISITOR GARGE EXPANSIONS.

From: Bruce Hyman <bhyman@portlandmaine.gov>
Sent: Tuesday, October 23, 2018 4:08 PM
To: Chris Chop <CChop@mmc.org>
Cc: Helen Donaldson <hcd@portlandmaine.gov>
Subject: Re: Bike Rack Suitability

This message originated outside of MaineHealth. Use caution when opening attachments, clicking links or responding to requests for information.

Hi Chris,

Chatting briefly with Nell about your email, we would find these acceptable for a yet-to-be determined percentage of the bike parking to be provided on campus. As you can imagine, we'll want to know: where in the garage; how many; how accessible and visible it is; who the intended users are (visitors, employees, etc); and, what the distribution and type of bike parking is as part of your overall campus bike parking plan.

Thanks for checking in - we appreciate being able to chime in at good check-points in the process.

Best regards,

Bruce

On Tue, Oct 23, 2018 at 2:52 PM Chris Chop <CChop@mmc.org> wrote:

Bruce and Nell:

I hope you all are doing well.

We are exploring options for additional bike parking and identified the Dero Ultra Space Saver as a potentially good option for our patient/visitor parking garage (outside public ROW) because it could give us 45 spaces (compared to only 15 spaces if using the classic "inverted u" style). Does this style seem appropriate to you? I've seen it used in some of the newer buildings around town, like in some of the East End condos.

Thanks!

Chris Chop, AICP
Commuter Choice Program Manager
131 Chadwick Street, Portland ME 04102
Maine Medical Center
207-662-4120

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--
Bruce Hyman
Transportation Program Manager
Transportation Division

Department of Planning & Urban Development
389 Congress Street
Portland, Maine 04101
(207) 874-8717 phone

bhyman@portlandmaine.gov
http://www.portlandmaine.gov/1363/Transportation-Division
Yes! Transportation's Good Here ....

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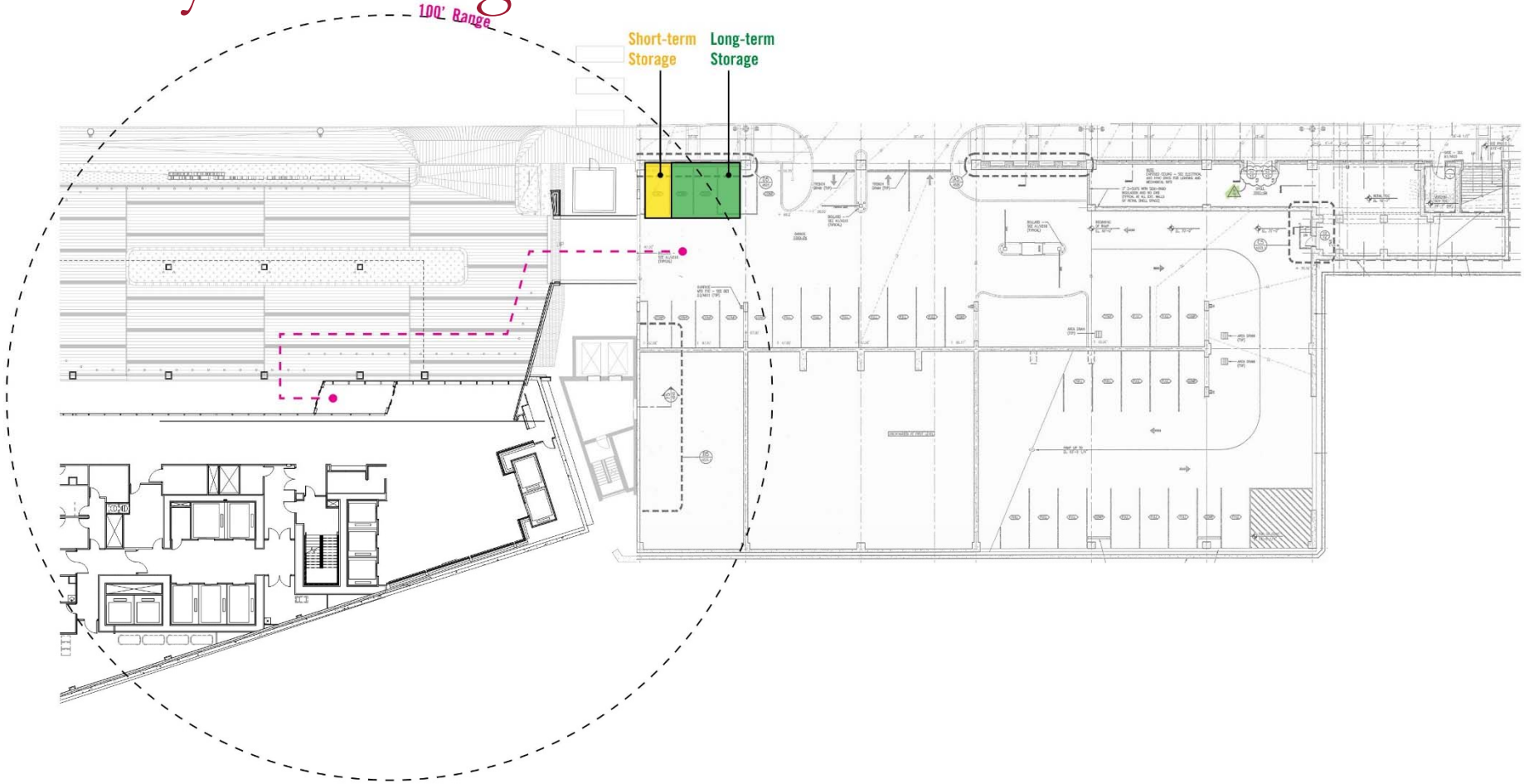
Bicycle Storage



Act with kindness and compassion.

Be an active listener.

Be a role model.

Set high standards.

Take responsibility.

Embrace change.

Jeff Keilman,
Senior Project Manager,
Perkins+Will

PP

November 27, 2018

Maine Medical Center
MaineHealth

Nell Donaldson, Senior Planner
City of Portland Planning Division
389 Congress Street
Portland, ME 04101

Re: MMC Congress Building| 22 Bramhall St| Level III Site Plan
Response to City Reviewer Comments 2

Dear Nell:

Thank you for coordinating the review of the Maine Medical Center Congress Building project located at 22 Bramhall with frontage on Congress St.. This letter provides a summation of our responses to the comments received from various reviewers as part of the Level III Site Plan process. The original comment in italics below, and our response follows each.

Comments from City of Portland Traffic Consultant – Tom Errico, TY Lin Dated November 9, 2018

1. I generally find the methods used in the development of the base traffic volumes to be reasonable and acceptable. It should be noted that the volume timeframe for the analyses was the peak hour of the roadway system, which does not correspond to employee peaking in the morning (employees arrive before the peak hour). The Applicant should provide documentation noting traffic volumes on roadways during both the peak hour of the system and peak hour of traffic generation from MMC.

   Response: The following table compares the total entering volumes at the key intersection of St. John Street with Congress Street during both the peak hour of adjacent street traffic and the peak hour of MMC. The traffic volumes for the adjacent street traffic are based on the 2023 Postdevelopment volumes from the TIS for Phase 3. The traffic volumes for the peak hour of MMC traffic generation are based on the 2022 Postdevelopment traffic volumes from the memo dated June 19, 2018 for the proposed St. John Street parking garage (Phase 2) that have been adjusted to the Phase 3 build out year of 2023.

Intersection	Adjacent Street		Peak Hour MMC	
	AM	PM	AM	PM
St. John / Congress	2,271	2,413	1,795	2,499

   As shown in the table, the AM peak hour of the adjacent street traffic volumes (approximately 7:30-8:30 AM) are higher than the AM peak hour of the generator (approximately 6:00-7:00 AM). The PM peak hours are similar, since the PM peak hour of the generator and PM peak hour of the adjacent street occur at approximately the same time for this intersection (start time between 4:00 and 4:30 PM). Since the AM traffic is higher during the adjacent street time period and the PM traffic is approximately equal, to be conservative, the adjacent street traffic was use for analysis

2. The Trip Generation estimate was based upon ITE methods and I find the estimate to be reasonable and meets MaineDOT TMP requirements.

   Response: Comment acknowledged.

3. The Trip Assignment of trips was based upon both localized turning movement volumes and MMC employee information. I find the methods used to be reasonable.

Response: Comment acknowledged.

4. The Park Avenue/Valley Street intersection is a High Crash Location. The Applicant shall provide specific recommendations with implication of such changes for review and consideration.

   Response: In the Traffic Impact Study, it was identified that the one crash pattern at this intersection involves left turning vehicles from Valley Street colliding with westbound Park Avenue vehicles. To address this pattern, we recommend restricting left turns from Valley Street. An additional review of the police reports showed that a contributing factor of one of the crash pattern collisions was limited sight distance due to a snowbank on Valley Street. Additional winter maintenance is recommended. It should be noted that the proposed expansion traffic is not expected to exacerbate the existing crash pattern.

5. The Congress Street/Gilman Street intersection is a High Crash Location. The Applicant suggests that the future removal of the traffic signal at Congress Street/Valley Street may mitigate crashes. I continue to review this, but a monitoring requirement post signal conditions may be suggested.

   Response: Comment acknowledged. Awaiting further comment.

6. The St. John Street/A Street is a High Crash Location. The Applicant suggests that traffic volume reductions may mitigate crashes. The new employee parking garage will increase traffic volumes in the area and may negatively impact conditions. I continue to review this, but a monitoring requirement after the employee parking garage is open may be suggested.

   Response: Comment acknowledged. Awaiting further comment.

7. Park Avenue/St. John Street is a High Crash Location. The Dunkin Donuts project on St. John Street will likely be implementing improvements to the northbound St. John Street approach. The DD scope of this work is not expected to mitigate all crash patterns. The Applicant shall specifically recommend strategies for mitigating all crash patterns that are correctable by improvements.

   Response: It is the understanding of GP that the DD mitigation items are anticipated to mitigate the northbound St. John Street crash patterns. The crash pattern that remains is westbound Park Avenue vehicles running a red light and colliding with northbound St. John Street vehicles. To aid in potentially reducing this type of crash, GP recommends the traffic signal heads be fitted with backplates that have retroreflective boarders and that the timing of the yellow interval be field reviewed and extended if necessary.

8. Valley Street between and A Street and C Street is a High Crash Location. The Applicant noted at the TMP Scoping Meeting that traffic volumes will be declining on Valley Street in this area and thus may reduce collisions. The Applicant shall document specific before/after traffic volumes changes on Valley Street as part of assessing mitigation of crash rates.

   Response: Recent counts are not available for this segment of Valley Street since it was not identified as part of the study area for in-depth analysis. However, as shown in the Traffic Impact Study on Figure 9, "Net Impact Phase 3" no impacts on this segment of Valley Street are forecast due to the proposed Phase 3 expansion. Additionally, as shown on Figure 15 in the Traffic Impact Study, "Net Impact due to Proposed Employee Garage" there is forecast to be a decrease of traffic through that section of Valley Street of 103 trip ends during the AM peak hour and 71 trip ends during the PM peak hour.

9. The Congress Street/St. John Street intersection is not a High Crash Location but experienced 25 crashes over the reported three-year period. The Applicant shall conduct a safety review of the intersection.

   Response: To better evaluate this location and identify correctable crash patterns, the police reports provided by MaineDOT were used to create a collision diagram (provided in the Traffic Impact Study). Based on a review of the collision diagram, there are two crash patterns at the intersections; rear end collisions on St. John Street northbound and rear end collisions on St. John Street southbound. These may be mitigated with adjustments to the clearance times of the intersection. It should be noted that this intersection is proposed to be modified as part of the Dunkin' Donuts project mitigation, which may impact any crash patterns. In addition, the phasing of this intersection is proposed to be converted from exclusive pedestrian phasing to concurrent pedestrian phasing which is expected to improve the operations of the intersection.

10. Congress Street is a High Crash Location between Forest Street and Weymouth Street. To assess potential mitigation strategies, I conducted a review of police reports. The Applicant has suggested the provision of a three lane roadway with a center left-turn lane. There were 10 crashes reported over the most recent three-year period with a Critical Rate Factor of 1.45. The following summarizes each reported collision.

    - January 10, 2015 at 8:40pm – Vehicle struck bicyclist in slushy roadway conditions. (Crash not likely to be mitigated with center turn lane)
    - May 11, 2015 at 4:35pm – A vehicle pulled over for an ambulance and was struck when re-entering travel lane. (Crash not likely to be mitigated with center turn lane)
    - June 1, 2015 at 4:55pm – Rear End Collision eastbound. During a congested time period a motorist applied vehicle brakes, but mechanical problems prevented an immediate stop. Not related to a turning movement (Center turn lane not likely to mitigate this crash)
    - August 12, 2015 at 3:02pm – Rear End Collision westbound. Drive Inattention. (Crash may be mitigated with center turn lane)
    - January 7, 2016 at 4:28pm - Rear End Collision eastbound. Drive Inattention during congested traffic period. (Unknown if related to a turn movement. Given time of day it may be related to congested traffic conditions. Crash may be mitigated with center turn lane)
    - September 27, 2016 at 10:36am – Westbound vehicle collided with parked vehicles near Weymouth Street. Drive error was likely contributing factor. (crash not likely to be mitigated with center turn lane)
    - January 4, 2017 at 1:50pm - Rear End Collision eastbound. Drive Inattention. (Unknown if related to a turn movement. Crash may be mitigated with center turn lane)
    - April 19, 2017 at 8:01am - Rear End Collision eastbound. Drive Inattention. (Unknown if related to a turn movement. Crash may be mitigated with center turn lane)
    - June 20, 2017 at 8:00am - Rear End Collision with right-turning vehicle. Drive Inattention. (Crash not likely to be mitigated with center turn lane)
    - September 25, 2017 at 8:20pm – Turning Collison Failed to yield right of way. (Crash not likely to be mitigated with center turn lane)

    Based upon my review of the data, at most 50% of the crashes could be mitigated with the introduction of a center turn lane. I would note again that some of the rear end collisions may not have been related to a left-turn movement, but to congested dense slow-moving vehicle conditions. The center turn lane would not mitigate those crashes. City staff is concerned about changing the roadway context of Congress Street (particularly in comparison with nearby in-town Congress Street conditions) and how it has the potential for dangerous increased vehicle speeds. I would note that the Applicant's traffic simulation model of Congress Street in this area depicts a roadway with little to no vehicle delay suggesting limited turning vehicle conflict opportunities. Lastly, it is my professional

opinion that this section of Congress Street will change contextually when the project is completed, functioning more like an urban street (similar to in-town Congress Street), due to changes to the building activity, enhanced streetscape, increased pedestrian/bicycle activity, slower vehicle speeds, thus creating a Complete Street serving all users. In my professional opinion this change to a Complete Street would result in safe conditions for all users.

Response: The MMC Team is working with City Staff on a design for the corridor that is intended to enhance safety along this section of Congress Street. This design is being refined.

11. Traffic Movement Permit regulations requires Applicants to document incremental changes to a site over the prior 10 years to determine factors that have influenced traffic generation from the site. In my professional opinion, the Applicant has not provided documentation that adequately addresses historical changes at MMC.

    Response: The 10 year history was described in the TIS under "Previously Approved Expansions". A supplemental description was also submitted by MMC to the City under separate cover.

12. The Applicant shall provide specific sight distance measurements at the Congress Street/Drop-Off driveway according to Site Plan information.

    Response: The speed limit on Congress Street along the site frontage is 25 mph. MaineDOT and the City require an available sight distance of 200 feet. Based on a field review, the available sight distances exiting the site looking left and right exceed 300 feet in each direction. In addition, proposed MMC sign locations have also been reviewed and will be outside of the public right of way and are not proposed within the sight triangle. When evaluating the sight distance, consideration was also given to potential roadway changes along Congress Street as described previously. A diagram illustrating the site triangles will be included in an updated sign plan submission.

13. The Park Avenue/St. John Street intersection has improving levels of service and delay following project build-out. The Applicant should specifically note any traffic signal equipment modifications that are needed to accomplish the noted optimization.

    Response: There are no traffic signal equipment modifications that are needed to accomplish the optimization. The optimization was completed by maintaining the existing signal phasing and adjusting the green time for each approach. GP recommends that once the hospital expansion is completed and occupied, the signal timing be field adjusted during peak hours of adjacent street traffic.

14. The Commercial Street/Valley Street intersection has improving levels of service and delay following project buildout. The Applicant should specifically note any traffic signal equipment modifications that are needed to accomplish the noted optimization.

    Response: There are no traffic signal equipment modifications that are needed to accomplish the optimization. The optimization was completed by maintaining the existing signal phasing and adjusting the green time for each approach. GP recommends that once the hospital expansion is completed and occupied, the signal timing be field adjusted during peak hours of adjacent street traffic.

15. I continue to review traffic model output for vehicle queuing and will provide comments in the future.

    Response: Comment acknowledged. Awaiting further comment.

16. The Congress Street/St. John Street intersection was modeled assuming existing roadway conditions. The Applicant shall also conduct an analysis assuming the Dunkin Donuts improvements on St. John Street are implemented (converting St. John Street from four lanes to three lanes).

Response: GP completed capacity and queue analyses for the 2023 AM and PM postdevelopment volumes with the geometry shown on the mitigation plan for Dunkin' Donuts dated September 25, 2018, provided by Bruce Hyman. This plan proposes revised intersection geometry at the intersections of Congress Street with St. John Street and Park Avenue with St. John Street. The timing at the two intersections has been optimized. The following table summarizes the results of the capacity analysis for the two intersections. The levels of service criteria are the same as those listed in the Traffic Impact Study.

Capacity Analysis Results Summary – Using DD Lane Uses

Approach	Level of Service	
	2023 AM Post	2023 PM Post
Congress / St. John		
Congress EB	C	C
Congress WB	B	C
St. John NB	D	D
St. John SB	C	C
Overall	**C**	**C**
Park / St. John		
Park WB	C	D
St. John NB	C	C
St. John SB	C	C
Overall	**C**	**C**

As shown in the table, both intersections are forecast to operate at acceptable levels of service.

The following table summarizes the results of the queue analysis, rounded up to the nearest five feet:

Queue Analysis Results Summary – Using DD Lane Uses

Approach	Storage Length (ft)	95th Percentile Queue Length	
		2023 AM Post	2023 PM Post
Congress / St. John			
Congress EB L		405	250
Congress EB T		690	405
Congress EB R	290	360	155
Congress WB L	80	90	95
Congress WB R		110	155
St. John NB T		370	675*
St. John NB R	175	150	240
St. John SB L	100	140	130

St. John SB T		220	260
Park / St. John			
Park WB L	95	135	175
Park WB T	95	180	270
Park WB TR		205	450
St. John NB L	175	200	250
St. John NB LT		295	740
St. John NB R	110	170	180
St. John SB LT		330	215
St. John SB R	55	105	100

*The queue length for this lane is forecast to extend past the adjacent intersection of St. John Street with Margarita's Driveway. Further discussion below.

As shown in the table, overall the 95th percentile queue lengths are forecast to exceed the available storage lengths by 2-3 vehicles, assuming a vehicle and the associated space between vehicles is 25 feet. The 95th percentile queue lengths of the Park Avenue westbound through lane are forecast to exceed the available storage length by 7 vehicles during the PM peak hour. Additionally, the 95th percentile queue length St. John Street northbound through lane at Congress is reported to be 675 feet during the PM peak hour. The queue was observed to extend past the intersection of St. John Street with Margaritas, which indicates that the actual 95th percentile queue length is longer than the reported 675 feet. The queue length may be reduced by adjusting the intersection timing, however it would be at the expense of the operation of other approaches.

17. The Applicant shall recommend pedestrian and vehicle improvements at the Congress Street/Valley Street intersection during post-traffic signal conditions.

    Response: The MMC Team is working closely with City Staff on the design of Congress Street along the site frontage and immediate intersections such as Congress Street / Valley Street.

Comments from Fire Department – Robert Thompson, Division Fire Chief Dated October 31, 2018

18. Here's the standard for Fire Department access.
    - Largest Fire Department Vehicle must be able to navigate through the parking lot to access building.
    - Fire Department access shall have an unobstructed vertical clearance of not less than 13 ft. 6 in.
    - Vertical clearance shall be permitted to be reduced, provided such reduction does not impair access by fire apparatus, and approved signs are installed and maintained indicating the established vertical clearance when approved.

    Response: Design conforms to required standards. New Connector Bridge over Service/Crescent Drive will be 13'-6" at a minimum allowing for access to Congress St. and Bean Buildings.

19. Because the drop off area is, for the most part, under the structure, I'd approve the 12 ft. clearance if signage indicating the clearance at the entrance of the drop off area is provided with a sign indicating passenger vehicles only.

    Response: The drop-off area consists of (2) levels of soffit and in turn differencing clearance. MMC is working with design consultants to ensure proper signage for passenger vehicles. The lower height immediately adjacent to the entry vestibule is approximately 10'-0" clear which is above required clearances for American Emergency Vehicles (ambulances) and associated ADA Access for Vans.

The larger height that covers the majority of the drop-off is 20'-0" clear. Fire department access will be best served from along Congress St., Gilman St., or Crescent St. providing coverage to all sides of the building.

20. Also, considering the location of the sprinkler room and fire pump room, the fire department connections shall not be located where fire department hose may block, or impede, egress. If the fire department connections are in the drop off area the required height will be 13 ft. 6 in. If the connections are on the Gilman Street side, near the fire pump room, they would have to be away from the exit stairs at the exit discharge.

    Response: Fire Department connections and test headers are on Gilman directly outside of the Fire pump room. These are south of the egress stairs and not in the path.

Comments from Department of Public Works – Jeremiah Bartlett, Transportation Systems Engineer Dated November 8, 2018

21. I concur with Tom's comments. In particular, I share concerns with the non-urban nature of a three-lane cross section fronting MMC and implications for vehicle speed, as well as a need to evaluate and recommend future pedestrian accommodations with an unsignalized Congress at Valley.

    Response: Acknowledged.

Comments from Parks, Recreation & Facilities Department – Jeff Tarling, City Arborist Dated November 1, 2018

22. Wanted to see if we could meet up or we can discuss via email the tree and landscape plan for the Maine Medical Center project. We would like to see when possible a higher degree of 'native' plant types in our city landscapes. The use of 'native' plants and we know that this is a general term, should fit well into the overall MMC goal. Tree and landscape values could be an theme for MMC and future project that consider landscape greenery and how it relates to human health and well being.
    - The web links below are interesting background information:
    - http://lhhl.illinois.edu
    - http://www.naturewithin.info/New/ISA_prcdngs.Ecosystem_Social_Capital_Wolf.pdf
    - http://www.naturewithin.info/UF/PsychBens-FS1.pdf

    Response: The MMC landscape architect has attempted to contact the City Arborist to discuss this comment. The City Arborist has not been available since this comment was received.

23. Street trees - knowing that the project frontage will have a bus stop and bring in a tall vehicle close to the curb, a more upright cultivar of Honeylocust like the 'Streetkeeper' might be a good selection. 'Princeton' or 'Accolade' Elm could work as well. The web links below offer some comparison values on the attributes that can help select what works best for this site. (Open to other suggestions also)
    - http://www.jfschmidt.com/introductions/streetkeeper
    - http://www.mortonarb.org/trees-plants/tree-plant-descriptions/accolade%E2%84%A2-elm
    - http://www.mortonarb.org/trees-plants/tree-plant-descriptions/princeton-elm
    - http://www.jfschmidt.com/introductions/streetkeeper
    - http://www.streetkeeper.net

    Response: The street trees on Congress Street will be specified as 'Streetkeeper' Honeylocust.

24. New England Native Plant suggestions - There could be options in this phase to consider woody and herbaceous plant options....

- https://extension.umaine.edu/gardening/manual/plants-for-the-maine-landscape
- https://wildseedproject.net/comprehensive-plant-list/

Response: The MMC landscape architect will discuss this comment with the City Arborist.

Comments from City Surveyor, William Scott, City Surveyor Dated October 31, 2018

25. A note should be added to Sheet 2 of the EC plan that defines the elevation datum for this project. It was listed as NAVD88 on the 2009 version of these plans.

    Response: The requested note has been added to Sheet 2.

26. A note should also be added to Sheet 2 of the EC plan and to both of the Utility Plan sheets that warns people that this elevation datum (NAVD88) is not the same as "City Datum" (NGVD29). A conversion formula should also be noted.

    Response: The requested note has been added to Sheet 2 and the Utility Plans.

27. A note should be added to the EC plan that refers the reader to the Utility Plan sheets for sewer and drain pipe invert elevations, sizes and materials.

    Response: The requested note has been added to the EC Plan.

28. State Plane coordinate pairs should be labeled for at least two of the property corners on the EC plan.

    Response: State Plane coordinate pairs have been added to two property corners along Congress Street.

Comments from City's Sewer & Stormwater Consultant, Wright Pierce Dated November 8, 2018

1. Level III Site Plan applications with the City of Portland must submit a stormwater plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules. This includes conformance with the Basic, General, and Flooding Standards (Ref: Technical Manual, Section 5. II. Applicability in Portland. C. a.; and Ref: City of Portland Code of Ordinances Sec. 14-526. Site Plan Standards, (b). 3. b.)
    1. Basic Standard: Plans and application material should be provided to address erosion and sedimentation requirements, inspection and maintenance requirements, and good housekeeping practices in accordance with MaineDEP Chapter 500, Appendix A, B, and C. The applicant has provided information that the project will be subject to the Basic Standard. The applicant has provided:
        1. Erosion and Sedimentation Control Details and Notes (C30-07). This item has been resubmitted with additional details including temporary slope stabilization, construction entrances, perimeter erosion controls, dewatering, and other standard erosion and sedimentation details. This item has been reviewed and accepted.

           Response: Acknowledged.

        2. Location of Erosion and Sedimentation Control best practices have been indicated on Sheet C04-01. This item has been reviewed and accepted.

           Response: Acknowledged.

2. General Standard: The applicant has provided information regarding the size and scope of the project indicating the project is subject to the Redevelopment Standard within the City of Portland. It is understood the City's redevelopment standard is more stringent than the Chapter 500 requirements for redevelopment. The City requirements indicate that greater than 50% of the proposed impervious surfaces must receive stormwater quality treatment pursuant to the MaineDEP Chapter 500 requirements. The applicant has provided information indicating that greater than 50% of the project's impervious surfaces, and greater than 50% of the total developed area, are conveyed to a Subsurface Sand Filter. The applicant has removed pretreatment credits that were included in the initial submission calculations, including the HIL unit credit. The applicant shall clarify the following and provide responses:
    1. The applicant will be required to inspect, maintain, and report on the filter in accordance with the Chapter 32 stormwater requirements. The applicant has provided inspection, maintenance, and housekeeping information in Section 23 of the application. The applicant has indicated that a stormwater maintenance agreement will be provided for the proposed stormwater treatment units upon project approval.

       Response: Acknowledged.

    2. The MaineDEP Stormwater BMP manual indicates that, "The surface area of the filter must be no less than the sum of 5% of the impervious area and 2% of the landscaped area draining to the system.".
        1. The applicant has asked for a waiver of this principle to allow additional surface flows to be conveyed to the treatment system, as requested by the City.

           Response: Acknowledged

        2. The revised calculations indicate that the proposed sand filter surface area is approximately 80% of the minimum required surface area. The applicant shall provide an understanding of how providing less than the minimum surface area is anticipated to impact TSS, nutrient loading, temperature, and other stormwater loading criteria.

           Response:

           As we presented to the Planning Board on November _ 2018:

           The stormwater system presented in the application has been designed to provide treatment for all of the areas required under the City's Ordinance and the Chapter 500 rules. The system was expanded at the City's request to add capacity to the extent practicable to detain and treat runoff from the existing Visitor's Garage. It is our opinion that the system as designed will not create a negative impact on TSS removal, nutrient loading or temperature in receiving waters based on several factors specific to this project.

           Based on the City/Chapter 500 standards, the site is required to treat 0.8 acres of developed area. The system provides treatment for approximately 1.95 acres of developed area (approximately 2.5 times the required area).

The system as designed provides approximately 80% of the surface area required based on the expanded tributary area. The system's pretreatment (isolator row) is oversized by approximately 17% to provide added pre-treatment to compensate in part for a reduced footprint. The Visitors' Garage includes an existing hydrodynamic separator unit which provides additional pre-treatment that is not accounted for in the sizing criteria.

We also note that the MDEP Chapter 500 surface area criteria is based solely on the tributary impervious and landscaped area, requiring an area equal to 5% of the tributary impervious area and 2% of tributary landscaped areas. This criteria does not differentiate between high pollutant load impervious area such as high turnover parking or gravel surfaces compared to lower pollutant load areas such as rooftops. Presumably the standard is conservative, assuming all impervious areas are higher TSS/pollutant load sources. For this project, the anticipated TSS/pollutant load is expected to be lower than an average site.

Approximately 55% of the impervious area tributary to the system is rooftop reducing potential pollutant load.

The garage parking surface comprises only 31% of the impervious area treated. Runoff from this area is pre-treated by the existing separator unit and the oversized isolator row.

The entrance plaza area tributary to the system is planned as heated concrete requiring limited sand and salt applications further reducing potential pollutant load.

The system storage and release rate is designed to maximize the detention of rainfall events up to1". The entire volume of this storm is released through the filter surface at a minimal discharge rate extending over a 24 hour period mitigating temperature impacts.

These smaller, "first flush" storms typically account the majority of a watershed's annual pollutant load. At this site, the runoff from these first flush events is conveyed by combined sewer to the wastewater treatment plant prior to discharge to Casco Bay, further mitigating TSS and temperature concerns with a smaller footprint.

The site is located with a watershed that is tributary to an entirely closed drainage system, tributary to either the treatment plant during small storms or directly to Casco Bay during a CSO event. Runoff is not tributary to any freshwater stream, wetland or pond where temperature is a more significant concern.

Based on these factors it is our opinion that the system will function as intended with are reduced surface area.

3. Flooding Standard: The applicant has provided information indicating the project is required to meet the Flooding Standard of Chapter 500. The applicant has submitted the following:
    - Subcatchment Plans for Pre- and Post-Development
    - Hydrology computations of these conditions

- Summary of Pre- and Post-Development Flow Rates

1. HydroCAD outputs for the 2-year, 10-year, and 25-year, 24-hour storm events have been provided. Applicant has provided additional pipe and structure detail to confirm that plan and design information matches model information. The model indicates the post-development flow rates for the proposed project do not exceed flow rates for the pre-development condition, and therefore meets the flooding standard.

   Response: Acknowledged

2. Discharge to Combined Sewer Overflow (CSO) Locations
    1. The applicant has provided information for pre-development and post-development flow rates to the combined sewer system for a 1-inch, 24-hour rain event. This storm event has been mentioned in previous discussions with the applicant and City Department of Public Works (DPW). The applicant has requested written confirmation from City DPW to ensure that all involved parties agree with evaluating this storm event for the CSO location. This confirmation will be provided as it becomes available.

       Response: Acknowledged

    2. Table 2, generated from HydroCAD reports, has been updated by the applicant to compare pre-development and post-development flow rates in a 1-inch rain event. These modifications indicate that the post-development conditions result in a reduction in flows and flow rates when compared to the pre-development condition.

       Response: Acknowledged.

3. Connection to Existing System:
    1. The applicant has asked for a written or e-mail confirmation from the Department of Public Works that proposed connections to existing drainage and sewer systems are being completed in accordance with City of Portland Code of Ordinances section 14-526 (b) 3.a, subsection iii and iv. The applicant has indicated that this confirmation will be provided as it becomes available.

       Response: Acknowledged.

4. Proposed Drainage Design
    1. Additional information has been provided on Sheet C30-01, C11-01, C40-01, and C30-04 to indicate site grading and pipe information. The following shall be clarified:
        1. SD-2 References two different pipes. Please clarify.

           Response: Pipe labels have been revised to clarify that the two pipes as SD-2 and SD-2.1

        2. SD-3 is a 12-inch pipe that accepts flow from a 15" pipe and conveys flow to a 15" pipe. Please revise or indicate the need for this size change.

           Response: The pipe labels have been clarified. SD-3 is a 15" pipe that receives flow from a 15" upstream pipe. SD-3.1 is a 12" pipe that is the outfall from CB-3 with no upstream tributary pipe.

3. Several of the slopes indicated in the "STORM DRAIN PIPE DATA" table do not match the slopes calculated from the invert and length data indicated in the "STORM DRAIN STRUCTURE DATA" table. Please revise.

   Response: The discrepancies appear to be related to rounding the length of the pipes and the precision of the slope value reported in the pipe tables. The length of pipe in the tables were rounded to the nearest whole foot measured from inside face to inside face of the structures. The slope calculation in the tables was calculated without rounding on a center-to-center of structure length. On short pipes this can result in the noted apparent discrepancies. The inverts on the structure tables are correct.

   The pipe tables have been revised to reduce the precision of the reported slope and to calculate the slope of the pipe based on an inside face-to-inside face dimension. Some small variations may remain, based on rounding up pipe lengths to a whole foot.

4. A 1% cross-slope is shown for the sidewalk locations of Congress Street, whereas the technical manual indicates a 2% cross-slope. Please indicate why a 1% cross-slope is being proposed or revise.

   Response: The cross slope grade in the Technical Manual is a maximum allowable grade. The selected 1% grade is appropriate with the 5.5% longitudinal slope along Congress Street.

2. Isolator row detail on C30-04 indicates a 12" maximum inlet pipe. Please confirm with manufacturer if this inlet is large enough facilitate maintenance/cleaning access to the isolator row.

   Response: The detail callout has been revised to 24" based on the size of the chamber specified. A 12" pipe size is a typical size for this system and is adequate for the water jet/vacuum equipment used to clean the isolator rows.

3. An updated catch basin detail with a 3' sump has been submitted. No further action necessary.

   Response: Acknowledged.

4. Additional spot grades have been provided to confirm grading at curb and drainage locations. Locations and details of granite headstone curb and gutterline "dishpan" grading at catch basins should be provided on construction documents for clarity.

   Response: Typical City standard curb inlet and gutter grade details have been added to the detail sheets. The headstone details are only applicable to catch basins in the public right of way that may be reset at the corner of Gilman Street and Congress Street as part of a the revised streetscape plan This plan is currently in progress and under review by the City. Callouts related to these structures will be included in a subsequent submission.

   Catch basins in the private plaza areas are placed against sloped curbs along tipdowns or are installed as area drains, they do not include a headstone.

5. Soils: The applicant has provided information from an NRCS Web Soil Survey indicating the proposed soils. No further action necessary.

Response: Acknowledged.

6. Additional Utility Infrastructure:

    1. Electrical and Communications Infrastructure
        1. Electrical and Communications manholes, pull boxes, and duct banks are proposed. Details were provided for utility manholes. Utility duct bank details were not observed on the proposed details. Please provide information or details on duct bank size and material; and approximate duct bank elevations in locations where utility crossings are proposed.

            Response: Utility duct banks will be constructed meeting CMP standards. A typical duct bank detail with minimum cover requirements have been added to the plans.

            A duct bank schedule identifying conduit count is presented on the utility plans.

            Maine Medical Center is currently coordinating the final number of conduit in each duct bank with the utility providers and seeking to reduce the number of required private MMC owned conduit by using existing conduit on the Medical Office building bridge. More specific duct bank details can be provided in subsequent submittals if required.

        2. A transformer is scheduled to be removed on the Demolition Plan under item U-4. Please confirm if the transformer is to be relocated, as well as the location of any new transformer. Above-ground utility infrastructure shall be sited and screened in accordance with City standards.

            Response: There are no transformers scheduled to be removed. The Demolition Plan Sheet C04-01 has been revised so that callout U-4 now reads "NOT USED". An existing pole mounted transformer on Pole #6.5 serves MMC buildings and is to be removed by CMP prior to the project.

    2. Sewer Infrastructure
        1. Sewer manhole, steps, frame and cover details, as well as pipe slopes, have been included on Sheet C11-01 and C30-03. Pipe design and slopes and in accordance with the City of Portland Technical Manual.

        Response: Acknowledged

    3. The applicant has indicated that capacity to serve letters from utilities will be provided as they become available. This may be considered a condition of approval for the project.
        1. The Capacity to Serve process will require a level of coordination between the applicant and utility companies and typically includes compliance with applicable utility standards and details. Central Maine Power and Consolidated Communications should review the plan and verify the depiction of changes to primary electrical and communication lines, respectively.
        2. Modifications to utility layout and design from the capacity to serve process shall be confirmed by the City prior to construction.

        Response: Acknowledged. Coordination of the overhead utility relocations with the utility providers is ongoing. The location shown on the current plans is generally accepted. Remaining coordination is related to the final number and size of conduit required.

Comments from Planning Department, Helen Donaldson, Received November 9, 2018 and supplemented on November 16, 2018

Transportation:

1) Impact to Surrounding Street Systems: There are a number of places in the application where the old employee trip gen figures are being cited still, and thus the trip generation is not figures are incorrect. Please review and revise.

   Response: Based on discussions at the meeting held on November 19, 2018, it was identified that further review of trip generation numbers in the TIS is required. GP has reviewed and revised numbers that were based on previous evaluations and adjusted the TIS accordingly.

2) Access and Circulation:
   a. Further discussion on the street layout pending. At the least, a climbing bike lane should be shown on Congress Street.
   b. The Congress Street sidewalk should be widened as possible to provide better pedestrian access along the site frontage
   c. Gilman sidewalk waiver is not supported by staff or the consulting traffic engineer. Please show this sidewalk on revised plans.
   d. Congress Street curbline still under review, pending additional discussion with DPW.
   e. Revise ramps as described by others.
   f. Move crosswalk to west side of Forest, proximate to bus shelter

      Response: The MMC Team is working closely with City Staff on the design of Congress Street along the site frontage and immediate intersections such as Congress Street / Valley Street.

   g. Provide additional information on mechanical areaway as well as electrical infrastructure in the Gilman ROW.

      Response: Mechanical areaway was conceived of as a flush hatch within the sidewalk that would allow for very rare equipment replacements required during the life of the building. Subsequent to the submission, the design team has reassessed means and methods and have found the ability to remove panels on the building to allow for replacement, keeping this necessary function completely on MMC property.

3) Public Transit Access: Please show shelter on south side of Congress in revised plans, as well as stop on north side of Congress.

   Response: A shelter on the south side and a stop on the north side of Congress St will be included in revised drawings.

4) Parking: Please clarify how bicyclists will know how to access the bicycle parking.

   Response: The primary users of the bicycle facilities adjacent to the Congress St entrance are expected to be employees and staff who will be familiar with the location and use of those facilities. For the occasional non-employee, there will be wayfinding signs visible to both on-street bicyclists as well as those who used the drop off area to identify how to access the bicycle parking. In addition, the valets will be able to direct bicyclists as needed should they not see the signs.

Environmental Quality

5) Landscaping and Landscape Preservation:
    a. Provide street trees on Gilman St.

        Response: Acknowledged. Street trees will be added to Gilman St.

    b. See comments from others.
    c. Install curb at ROW line on Congress St. planting bed

        Response: Acknowledged.

    d. Further discussion pending on rounded tree wells.

        Response: Please see response to joint design comment at the end of this document.

    e. Clarify street trees on Gilman Street and make sure plans are coordinated

        Response: MMC's landscape architect is awaiting a return call from the City's arborist.

Public Infrastructure and Community Safety

6) Public Safety and Fire Prevention:
    a. Further review of islands at driveway pending from Fire.
    b. Please verify vertical clearances within the turnaround area.
    c. Further review of islands at driveway pending from Fire

    Response: Acknowledged, awaiting further comment. Please review responses to comments from the Fire department earlier in this document.

7) Availability and Adequate Capacity of Public Utilities: Please clarify extent of utility infrastructure in Gilman Street ROW, particularly electrical infrastructure?

    Response: Response pending.

Site Design

8) Exterior Lighting:
    a. Lighting plan requires waiver from TM re maximum and average illumination levels.
    b. Show correct profile of lights on site plan and doublecheck to make sure that site plan matches others.

        Response: Please clarify waiver determination.

9) Signage and Wayfinding:
    a. Please provide revised sign plan per prior comments.
    b. Provide sight line analysis.

    Response: A revised sign master plan has been submitted.

10) Zoning Related Design Standards: Please provide rendering of main entrance from ground plane if possible.

    Response: Image submitted.

Other Submittals Required

11) Please confirm that the bike rack diagram and detail sheets have been uploaded to ePlan.

Response: An email conversation between MMC and Bruce Hyman, COP transportation manager, regarding a potential bike rack style has been uploaded to eplan.

12) Utility capacity letters

Response: Acknowledged. Capacity to serve letter will be shared with the City once received.

13) Plan edits
    a. -include distances to property lines on site plan
    b. -add height calculation from average grade on elevations (Still under review)
    c. -Tree well irrigation should be shown on plans.
    d. -Doublecheck location of main entrance as shown on site plan. I think the notation may be slightly misleading?

    Response: Comment acknowledged.

14) RTI
    a. Encroachments (building encroachment, 'mechanical areaway', potentially electrical/other utility infrastructure) are shown in the Gilman ROW. These will require license agreements

    Response: A mechanical areaway in the public ROW is no longer proposed.

    b. The Gilman Street sidewalk is proposed to extend onto private property. A public pedestrian easement is generally required in this type of instance.

    Response: Comment acknowledged.

15) Other Permits/Reviews Required
    a. Site Location of Development (under review)
    b. FAA

    Response: Acknowledged. Please refer to previous response regarding FAA requirements.

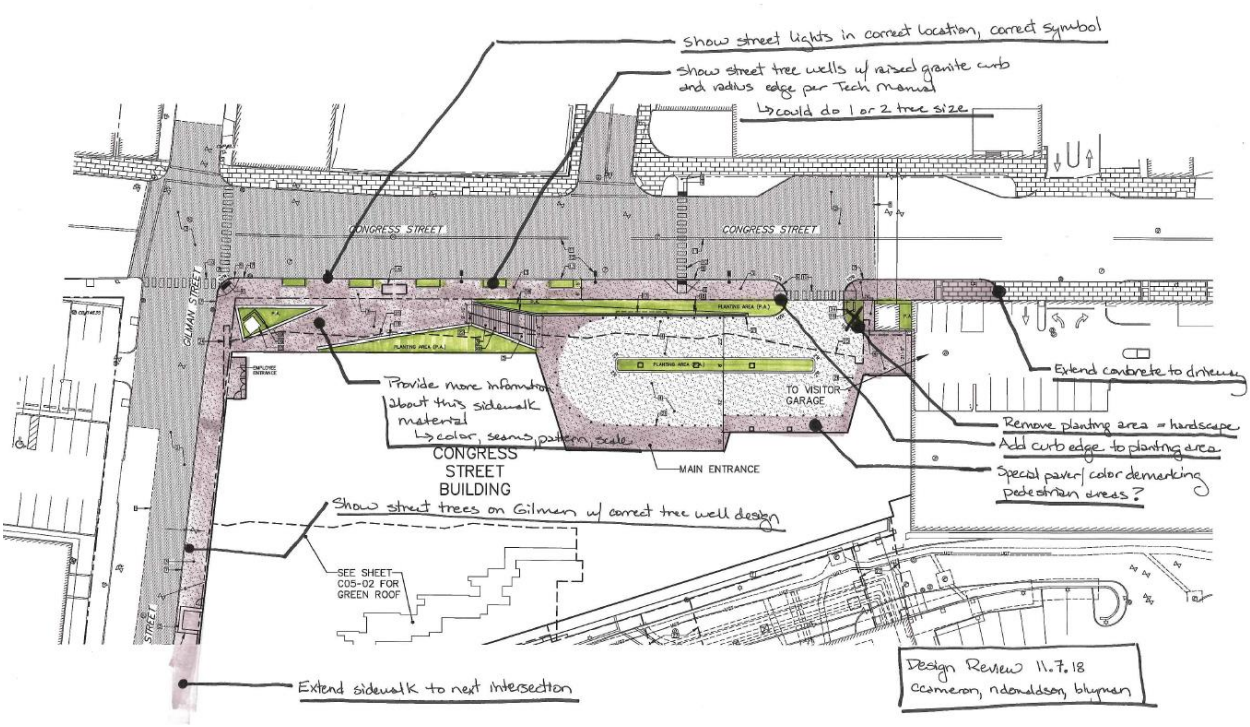
16) Waivers
    a. Sidewalk material waiver is recommended by staff.
    b. Gilman sidewalk waiver is not recommended by staff. Please show sidewalk on revised plans.
    c. Driveway width waiver still under review.

    Response: Acknowledged.

17) Outstanding Items from Earlier Reviews
    a. Pedestrian Network Plan (requirement of IDP, included as condition of approval on East Tower) - That the applicant shall develop a long term public Pedestrian Network Plan (both on and off the ROW) showing the integration of the upper level MMC campus with the Congress Street corridor, including measures to address CPTED principles, for implementation when the retail space beneath the Visitors Garage is available for lease or sale; such plan to be submitted for review and approval by the Planning Authority prior to the issuance of a building permit for the Congress Street Hospital Entrance"). (Under review by city)

Response: Pedestrian network plan has been submitted to the City. MMC has received preliminary comments and will follow up with the City to continue the conversation.

Comment from City design reviewers, Caitlin Cameron, Helen Donaldson, Bruce Hyman dated November 7, 2018.



Response:

7. Street lights
    - Submitted plans for spacing of streetlights correspond to submitted photometric calculations. Spacing and light levels meet city technical standards.
    - Unsure comment on symbol. Symbol is per our standard documentation and illustrates intent of scope.
8. Street Trees
    1. Raised granite curbs are indicated in submitted materials
    2. MMC and design team feel strongly against radius curb for multiple reasons including:
        1. Design team could not find specific language requiring radius curbs within the technical manual or standards. Please direct to specific language so we may review and properly respond.
        2. Uniform aesthetics are critical for a location that has continually been indicated as a gateway building and site. Owner and design team believe that design as submitted aesthetically connects the amenity of the urban plaza being provided by MMC to the public seamlessly with the required design of the city ROW.
        3. MMC has traditionally taken responsibility for snow and maintenance of this location due to hospital functions.
    3. Design will provide single trees at rhythm that connects ROW with design and layout of plaza including raised planter beds and plaza patterning.
9. Planting Area near Accessible Route/Pedestrian Bridge Pier
    1. Design team believes that maintaining this as planted material is important to first allow for additional natural materials connecting planting areas while providing a buffer between pedestrians and the vehicular entrance to the new entry plaza.
10. Requested Paver Color Variation

1. MMC and the design team believe strongly that maintaining a more holistic approach to paving, regardless or pedestrian or vehicular is critical to a uniform design linking the lower plaza to the upper plaza.
2. Separating modes of transportation with literal demarcation will emphasize vehicular importance as opposed to a more uniform plaza welcome to all modes of arrival to this new entry.
3. Bollards and tactile detection is utilized to further help delineate key separation and provide enhanced pedestrian safety.
4. Initial comments from City Planning Board supported currently documented design intent when asked during workshop.

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WRITTEN SUBMISSION 16 – SNOW STORAGE
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE APPLICANT WILL CONTRACT WITH A PROPERTY MANAGEMENT COMPANY TO REMOVE SNOW FROM THE SITE. A SNOW MELT SYSTEM IS CONTEMPLATED AT THE PASSENGER ARRIVAL / DEPARTURE PLAZA, HOWEVER, MAY NOT BE INSTALLED PENDING REVIEW OF CONSTRUCTION COSTS.

15466

QQ

SEBAGO TECHNICS

CIVIL ENGINEERING · SURVEYING · LANDSCAPE ARCHITECTURE

CITY OF PORTLAND DELEGATED REVIEW

Maine Department of Environmental Protection
38 M.R.S.A. §§ 481 to 490

SITE LOCATION OF DEVELOPMENT

MAINE MEDICAL CENTER
CONGRESS STREET BUILDING
22 Bramhall Street
Portland, Maine

Prepared for:

Maine Medical Center
22 Bramhall Street
Portland, Maine

Prepared by:

Sebago Technics, Inc.
75 John Roberts Road, Suite 4A
South Portland, Maine 04106

October 2018

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Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-3901

FOR DEP USE **FORM A PAGE 1**
ATS # _____
L-_____
Total Fees: _____
Date: Received _____

****

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.SA. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)	☐ 20 acre development ☐ Planning Permit ☐ Metallic Mining	☐ Marine Oil Terminal Structure ☐ Subdivision	☒ Major Amendment ☐ Minor Amendment
1. Name of Applicant:	Maine Medical Center	**6. Name of Agent (if applicable):**	William T. Conway Sebago Technics, Inc.
2. Applicant's Mailing Address:	22 Bramhall Street Portland, ME 04102	**7. Agent's Mailing Address:**	75 John Roberts Road, Suite 4A S. Portland, ME 04106
3. Applicant's Daytime Phone #:	(207) 662-3689	**8. Agent's Daytime Phone # :**	(207) 200-2055
4. Applicant's Fax # (if available):		**9. Agent's Fax # (if available):**	(207) 856-2206
5. Applicant's *e-mail address* (REQUIRED -license will be sent via: e-mail):	agreen@mmc.org	**10. Agent's *e-mail address* (REQUIRED - license will be sent via e-mail):**	wconway@sebagotechnics.com

PROJECT INFORMATION

11. Name of Development:	MMC New Congress Street Building See Deed Package, Sec. 2						
12. Map and Lot #'s:	**Map #:**	**Lot #:**	**13. Deed Reference #'s:**		**Book #:**	**Page #:**	
14. Location of Project City/Town:	Portland	**15. County:**	Cumberland	**16. UTM Northing**		**17. UTM Easting**	
18. Brief Description of Project including total parcel size:	Removal of the employee parking structure and redevelopment of the site at the corner of Congress Street and Gilman Street.						

19. Type of Direct Watershed: (Check all that apply)

☐ Lake not most at risk ☐ River, stream or brook ☐ Coastal wetland
☐ Lake most at risk ☐ Urban impaired stream ☐ Wellhead or public water
☐ Lake most at risk, severely blooming ☐ Freshwater wetland

20. Name of Waterbody Project Site drains to:			
21. Amount of Developed Area:	Total acres: 9.48	Existing Developed area: 9.15 acres	New Developed area: 0.33 acres
22. Amount of Impervious Area:	Total acres: 9.48	Existing Impervious areas 9.15 acres	New Impervious area: 0.33 acres

23. Development started prior to obtaining a license?:	☐ Yes ☒ No		
24. .Development or any portion of the site subject to enforcement action?	☐ Yes ☒ No	**If yes**, name of enforcement staff involved?	
25. Common scheme of development?:	☐ Yes ☒ No	**26. Title, Right or Interest:**	☒ own ☐ lease ☐ purchase option ☐ written agreement
27. Natural Resources Protection Act permit required?:	☐ Yes ☒ No	**If yes:** ☐ PBR	☐ Tier 1 ☐ Full Permit ☐ Tier 2
28. Existing DEP Permit number (if applicable):	n/a		
29. Names of DEP staff person(s) present at the pre-application meeting:	City of Portland Delegated Review, Barbara Barhydt		
30. Does agent have an interest in project? If yes, what is the interest?	☐ Yes ☒ No		

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the electronic address located on the front page of this application (see #5 for the applicant and #10 for the agent)"..

Signed: _____ **Title** Director of Planning **Date:** 10/31/18

Notice of Intent to Comply with Maine Construction General Permit	**With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.** **If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.** **Signed** _____ **Date:** 10/31/18

NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.

CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: _____

Name (print): William T. Conway

Date: _____

Re/Cert/Lic No.: _____

Engineer _____

Geologist _____

Soil Scientist _____

Land Surveyor _____

Site Evaluator _____

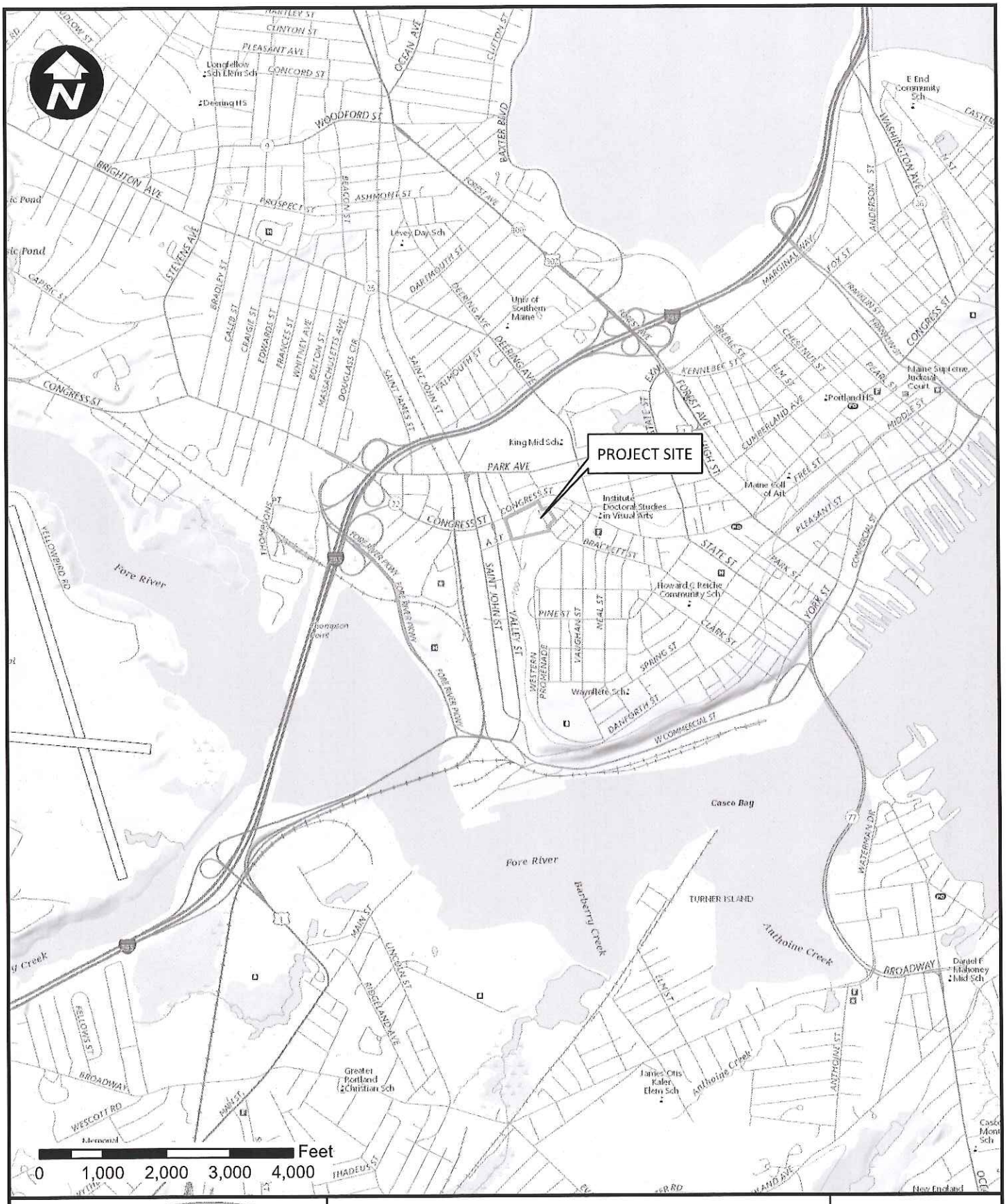
Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other _____

Section 1

Development Description



SEBAGO TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

TITLE FOR:	SITE LOCATION MAP MMC CONGRESS STREET PATIENT CARE BUILDING	SCALE:	1 " = 2,000 '
		DATE:	10/24/2018
LOCATION:	22 Bramhall Street Portland, ME 04102	INFORMATION:	USGS Quadrangle: Portland West

15466_LocationMap.mxd

PROJECT NUMBER: 15466

Section 2

Title, Right or Interest

Section 2: Right, Title, Interest

The record owner of the parcel(s) is Maine Medical Center. Reference is made to the deed package enclosed in this section indicating ownership by the original deed of Bailey to Maine General Hospital in 1870 and subsequent land transfers.

Know all Men by these Presents, That

I William H. Bailey of Portland in the State of Maine

in consideration of the sum of Two Hundred and fifty Dollars paid by

The Maine General Hospital, a Corporation established by law at Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital heirs and assigns forever.

Bailey to Maine General Hospital

U. S. I. R.
50 Cents
W. H. B.
June 6.
1870.

a certain lot of land situated on the Northwestern slope of Brownhills Hill in Portland, the same being lot numbered nine, on a plan made by Howe and Osgood September 1863 recorded in the Cumberland Registry of Deeds in Plan Book number two page 16. The said plan is of a tract of land extending from the rear of the State Arsenal lot to Congress street. The lot hereby conveyed is about forty feet in breadth and about sixty feet in length on the Southwest side of an unopened street laid down on said plan; the same conveyed to me by Moody F. Walker Oct. 14. 1863. Subject to the location of Ash street over any part of said lot, subject also to a mortgage for $37.50 given to Moody F. Walker which mortgage with all unpaid interest thereon, the present grantee is to assume and discharge.

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital heirs and assigns, to their use and behoof forever. And I do covenant with the said Grantee heirs and assigns, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I will and my heirs, shall and will warrant and defend the same to the said Grantee heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Grantor and Elvira W. my wife ~~of the said~~ in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seals this sixth day of June in the year of our Lord one thousand eight hundred and seventy.

Signed, Sealed and Delivered in presence of

P. Barnes to W. H. B. — William H. Bailey Seal

Joseph S. Bailey to E. W. B. — Elvira W. Bailey Seal

State of Maine Cumberland, ss. June 6th 1870. Personally appeared the above-named William H. Bailey and acknowledged the above instrument to be his free act and deed. Before me,

P. Barnes Justice of the Peace.

Received June 6. 1870, at 12 o'clock 54 m. P. M., and recorded according to the original.

Attest, Eben Leach Register.

Know all Men by these Presents, That

I, Hugh Carney of Portland in the State of Maine

in consideration of the sum of Five Hundred Dollars paid by The Maine General Hospital, a Corporation established by law at Portland aforesaid, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital ~~heirs and assigns forever~~,

U. S. I. R.
50 Cents
H. C.
June 6. 70

a certain parcel of land situated on the North-western slope of Bramhall's hill in Portland, bounded on the East by the State Arsenal lot and on the North by land of the City; the same conveyed to me by Moody T. Walker Oct. 14. 1863, in two lots about forty feet in width by about sixty feet in length, which are numbered two and four on a plan of the same and adjoining lands made by Howe and Osgood Sept. 1863, which is recorded under date of January 20, 1864 in Plan Book number two page 36 of the Cumberland Registry of Deeds. Subject to the location of Ash street over any part of said lots.

Carney to Maine General Hospital

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital ~~heirs and assigns~~, to their use and behoof forever. And I do covenant with the said Grantee ~~heirs and assigns~~, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I will and my heirs, shall and will warrant and defend the same to the said Grantee ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Grantor and Bridget D. my ~~wife of the said~~ in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seal this sixth day of June in the year of our Lord one thousand eight hundred and seventy.

Signed, Sealed and Delivered in presence of

P. Barnes to H. C. — Hugh his X mark Carney Seal.

Witnessed by Edward N. Bates — Bridget Carney Seal.

State of Maine
Cumberland, ss. June 6th 1870. Personally appeared the above-named Hugh Carney and acknowledged the above instrument to be his free act and deed. Before me,

P. Barnes Justice of the Peace.

Received June 6 1870, at 12 o'clock 54 m., P. M., and recorded according to the original.

Attest, Eben Leach Register.

State of Maine Cumberland ss Portland May 19th 1870.
Then personally appeared the abovenamed Sarah M. Bridges and acknowledged the foregoing instrument to be her free act and deed.
Before me, George R. Davis Justice of the Peace

Received May 19 1870 at 5 h. 20 m. P.M. and recorded according to the original
Attest. Ebenezer Leach Register

Agreement of Joseph S Bailey with Maine Hospital

Agreement made the 27th day of April 1870 by Joseph S Bailey of Portland for the conveyance of certain land to the Maine General Hospital.
For a valuable consideration the said Bailey agrees to convey by deed of warranty to the Maine General Hospital, upon the conditions hereinafter named, a certain parcel of land situated on the slope of Deamhalls Hill in Portland, being the western part of a parcel of about two acres extending from the General ground to Congress street, formerly owned by M. F. Walker and others, described, as divided into lots on a plan made by Howe and Osgood in 1863 through which two acre parcel a street called Oak street has recently been laid out, and being all of said two acre parcel, except the ten lots nearest the General, and except the part of the street adjoining the ten lots. The conveyance hereby agreed to be made is to include the fee of the land covered by the new street west of the ten lots, but subject to the location of the street.
This agreement is to be in force for the term of forty days from and after this date.
The conditions upon which the conveyance is to be made, are, that the Hospital shall within the said forty days pay to the said Bailey, or to his written order, the sum of two thousand dollars, upon which payment the deed is to be made and delivered, and shall therefore make and deliver to the said Bailey or to his written appointment two several negotiable promissory notes, one for two thousand dollars payable in two years from the date of the deed, and one for one thousand dollars payable in three years from the same date, both with interest half yearly at the rate of seven and one half per annum, with liberty to pay more than one thousand dollars on said notes at any time before maturity, together with a mortgage of the premises to secure the same, and shall assume and pay according to its tenor a mortgage now subsisting

on a part of said premises, for one thousand dollars, given by said Bailey in 1866 in six years, subject to which mortgage this agreement is made, interest accrued on said mortgage to the date of this conveyance to be paid by said Bailey.

In witness whereof, the said Bailey has hereunto set his hand and seal the day and year first above written.

U. S. Inter. Revenue 5 cts. J. S. B. Apl. 27. 1870.	Witness, P. Barnes	Joseph S. Bailey Seal

State of Maine Cumberland St. On this 21st day of May 1870 personally appeared Joseph S. Bailey and acknowledged the foregoing instrument by him subscribed to be his free act and deed.

Before me P. Barnes Justice of the Peace.

Received May 21, 1870 at 4h 10m P.M. and recorded according to the original.

Attest: Eben Leach Register.

U. S. I. R. $2.00 H. S. L. May 21 1870.	Know all men by these presents that I, Horatio S. Libby of Portland in the County of Cumberland and State of Maine in consideration of Two Thousand Dollars paid by John Lindsey of Scandish in the County of Cumberland and State of Maine,	Libby to Lindsey

the receipt whereof is hereby acknowledged, do hereby give grant, bargain, sell and convey unto the said John Lindsey, a certain lot of land and the buildings thereon situated on the Southwesterly side of Chestnut Street in said Portland and bounded beginning at the Northerly corner of land of Benjamin Tukey formerly Leonard Crosse's land and running thence Northwesterly on said street thirty five feet; thence Southwesterly at right angles with said street sixtynine feet to a stake or stones; thence Southeasterly on a line parallel with said street thirtyfive feet to a stake or stones; thence at right angles with the last line by Mr. A. Hay's land and said Tukey's land sixtynine feet to the bound begun at containing about two thousand and four hundred feet, being a part of the land conveyed to me by Miriam Libby sale by deed dated January 18th 1854 and recorded in Cumberland Registry of Deeds Book 257 Page 27. Subject to a mortgage to the City of Portland on which is now due about two thousand dollars.

To have and to hold the above granted premises

Portland May 7th 1874.
This mortgage having been paid and fully satisfied, is hereby cancelled and discharged.
Witness
John Lindsey

their hands and seals this twentieth day of October A. D. 1870.

Richard D. Rice {President of Maine Central Railroad Company

Countersigned by Joshua Nye, Treas. of Maine Central R. R. Co.

William L. Putnam Seal
Artemas Libbey Seal.
James T. Patten. Seal.

Cumberland ss. Oct. 20, 1870. Then personally appeared Richard D. Rice, President of the Maine Central Railroad Company and acknowledged the foregoing instrument to be the free act and deed of said Corporation, before me,

Josiah H. Drummond Justice of the Peace.

Received Nov. 2, 1870 at 2h. 30m. P. M. and recorded according to the original.

Attest: Chas Leach Register

City of Portland to Me. Gen. Hospital

Whereas the City Council of the City of Portland, upon the petition of the Maine General Hospital, praying that the City would grant to the Corporation certain lands for the purpose of enlarging the building site of the Hospital, and rendering the same more commodious and useful for the objects thereof, by concurrent order of the two Branches, passed by the same respectively, on the 13d and 14th days of May 1870, and approved by the Mayor on the 31st day of the same month, ordered, that the prayer of the petition be granted, and that a deed in furtherance thereof be executed and delivered for the conveyance prayed for.

Now, know all men by these presents that the City of Portland, in pursuance of the foregoing order, and in consideration of Ten Dollars paid by the Grantee hereinafter named, the receipt whereof is hereby acknowledged, doth hereby give, grant, bargain, sell and convey to the Maine General Hospital, a Corporation established by law at Portland aforesaid, a certain parcel of land, belonging to the City, situated on the slope of Bramhall's Hill, bounded on

the Northeast by a line, as now fenced, in continuation of the Northeast side line of the Maine State Arsenal lot, and on the Southwest by lands of Joseph S. Bailey and others, and extending Northward, between those limits, from the Arsenal lot to Congress street.

Also another parcel of land belonging to the City, situated on the Southwest side of the Arsenal lot and of the lands of Bailey and others, having a front on a line in continuation of the Northwest side line of Arsenal street as far as to the Northeast side line of a contemplated street, and extending Northwardly from Arsenal street between the contemplated street on the South and the Arsenal lot and Bailey land on the North to Congress street.

The said contemplated street is laid down and designated by the name of Gilman street on a Plan made by J. P. Chappell, Engineer, May 11. 1874, to which Plan, verified as required by the Order of the City Council, by the signature of the City Treasurer, reference is made for more exact ascertainment of the position and course of said street.

This conveyance is made upon the condition that the lands hereby granted and conveyed shall be held for the purposes of the Hospital, as a part of its building site and grounds; and that whenever the same shall cease to be so used, they shall revert to the City.

Also upon the further condition, that if the Hospital shall acquire a title to the lands of Bailey and others above mentioned, and the contemplated street shall at any time thereafter be laid out and opened across the same as described on said Plan, no damages or compensation shall be claimed by the Hospital therefor.

To have and to hold the premises, with the privileges and appurtenances thereof, to the said Maine General Hospital, to its use and behoof forever, subject to the conditions aforesaid.

In witness whereof, these presents are subscribed and sealed, in behalf of the City, by Henry H. Hersey, City Treasurer, duly authorized by the Order aforesaid, this fourth day of June in the year of our Lord

one thousand eight hundred and seventy.

Signed, sealed, and delivered in presence of Benj. Kingsbury Jr. } Henry W. Hersey City Treasurer.



State of Maine.

Cumberland ss. On this sixth day of August 1870, personally appeared Henry W. Hersey and acknowledged the foregoing instrument by him subscribed to be the deed of the City of Portland.

Before me,

Benj. Kingsbury Jr. Justice of the Peace.

Received Nov. 14. 1870 at 1 h. P.M. and recorded according to the original.

Attest. Eben Sacich Register

P. & O. R. R. Co to Davis et al

U. S. I. R. $800.00 P. & O. R. R. Co By S. J. A. Bu Nov. 1. 1870

Discharge Book 702 Page 65

Know all men by these presents, that the Portland and Ogdensburg Railroad Company, a Corporation established by the Legislature of the State of Maine, and authorized and empowered by the Legislature of New Hampshire to construct and extend its Railroad across said State of New Hampshire, subject to the laws thereof relating to Railroads, and having its principal office for the transaction of business at Portland in the County of Cumberland and State of Maine, for the purpose of effecting the several trusts and securities hereinafter set forth, created and declared, designed to enable and provide for the more speedy construction and equipment of the Railroad of said Company, and in consideration of One Dollar paid by the Grantees and Trustees hereinafter named, doth hereby give, grant, bargain, sell and convey to Woodbury Davis, Samuel E. Spring, and Weston F. Milliken, all of Portland aforesaid, Gentlemen, their survivors and successors as hereinafter designated, all that part of the Railroad of said Company extending and to be extended from the terminus in Portland, in the State of Maine to Bartlett in the State of New Hampshire, located and to be located within said limits, called the Portland and Ogdensburg Railroad, including all the rights of way and lands taken and

Know all Men by these Presents, That

I Phinehas Barnes of Portland, in the County of Cumberland, State of Maine

in consideration of Four Thousand and Seventy one 37/100 Dollars paid by

The Maine General Hospital, a Corporation established by the Laws of said State

the receipt whereof I do hereby acknowledge, do hereby remise, release, bargain, sell and convey, and forever quit claim unto the said Maine General Hospital, its successors

Barnes to Maine G Hospital

heirs and assigns forever, all my right, title and interest in and to Twenty several lots of land

U. S. I. R.
$4.50
P. B.
July 18/71.

situated on the Northwestern slope of Bramhall's Hill in said Portland described and numbered on a plan of a tract of about two acres, extending from the Maine State Arsenal Grounds, to Congress Street which plan was made in September 1863, by Howe and Osgood, and is recorded in the Cumberland Registry of Deeds, in Plan Book, numbered two, page thirty six - the lots hereby conveyed being numbered one, three, five, seven, eight, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, twenty one, twenty two, twenty three, and twenty four. 1. 3. 5. 7. 8. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23 & 24. together with all my right title, and interest in and to the land adjoining any of said lots, embraced within the location of Ash street, as laid out by the City the last year: The design of this Deed being to discharge trusts mentioned in Deeds to said Barnes from Moody F. Walker & wife dated 6 June 1870 recorded in said Registry, Book 377 page 302 & from Joseph S. Bailey dated 6 June 1870, recorded in said Registry Book 377 page 301, the Mortgage obligations of said Barnes mentioned in said Deeds having been discharged, by said Hospital

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to them the said Corporation, its successors

heirs and assigns forever. And I do covenant with the said Corporation, its successors

heirs and assigns, that I will warrant and forever defend the premises to them the said Corporation its successors

heirs and assigns forever, against the lawful claims and demands of all persons, claiming by, through, or under me.

In Witness Whereof, I the said Phinehas Barnes, and Ann B. Butler wife of the said Barnes, in testimony of her relinquishment of her right of Dower in the above described Premises

have hereunto set . . . hand and seal this Eighth day of July in the year of our Lord one thousand eight hundred and seventy one.

Signed, Sealed and Delivered in presence of
Wilfred Barnes to P. B.
Wilfred Barnes to A. B. B.

P. Barnes Seal
Ann B. Barnes Seal

State of Maine
Cumberland, ss. 8th July 1871. Personally appeared the above-named Phineas Barnes and acknowledged the above instrument to be his free act and deed. Before me,

James T. McCobb Justice of the Peace.

Received July 11 1871, at 11 o'clock 21 m., A. M., and recorded according to the original.

Attest, Eben Leach Register.

with interest, and all cost and expenses, including all sums paid by said Grantee or assigns for insurance of the premises and for taxes paying the surplus, if any, to the said Grantors, or their assigns: and such sale shall forever bar the said Grantors and all persons claiming under them from all right and interest in the premises at law or in equity. It being mutually agreed that the said Grantee or assigns may purchase at said sale, and that no other purchaser shall be answerable for the application of the purchase money.

In witness whereof, we the said Grantors, Emily F. Bailey and Benjamin H. Bailey have hereunto set our hands and seals this thirteenth day of January in the year of our Lord eighteen hundred and seventy one.

Signed, sealed and delivered in presence of
Benj. Kingsbury Jr.

Emily F. Bailey. Seal
Benj H. Bailey. Seal

State of Maine.
Cumberland ss. Portland January 13. 1871. Then personally appeared the abovenamed Benjamin H. Bailey and Emily F. Bailey and acknowledged the foregoing instrument to be their deed.

Before me,
Benj. Kingsbury Jr. Justice of the Peace.

Received Jan. 14. 1871 at 12 h. 29 m. P. M. and recorded according to the original.
Attest: Eben Leach Register

State of Maine
to
Maine General Hospital

State of Maine.
Resolve in favor of the Maine General Hospital.
Resolved, That all the right, title and interest of this State in and to the lot of land, not including the buildings thereon, situated on Bramhall Hill in the City of Portland and County of Cumberland, being the present site of the State Arsenal is hereby granted to the Maine General Hospital, a corporation established by acts of the Legislature, passed February twenty-fourth, one thousand eight hundred and sixty eight, to have and to hold to

said corporation for the purpose of erecting and maintaining thereon its hospital buildings; and when such land ceases to be so used, it shall revert to the State. But this grant shall not take effect until it is shown to the satisfaction of the Governor that said Corporation has raised by responsible private subscriptions or donations the sum of Twenty Thousand Dollars; nor until the Governor has certified on a copy of this resolve certified by the Secretary of State, that the aforenamed condition precedent has been complied with; but when that is done, the grant shall take effect; and the recording of such certified copy, with the Governor's certificate thereon, in the Registry of Deeds in the County of Cumberland, shall be sufficient record evidence thereof.

Resolved That when said Corporation has raised, received into its treasury and actually expended towards the construction of its hospital buildings on said lot, the sum of Thirty thousand dollars, and this fact is shown to the satisfaction of the Governor, he may draw his warrants on the Treasurer of State for the sum of Ten thousand dollars in favor of said Corporation and payable to its Treasurer; and when said Corporation has so raised, received into its Treasury and expended in the construction of its hospital buildings the sum of Ten thousand dollars more, or Fifty thousand dollars in all, including the Ten thousand from the State, and this fact is shown to the satisfaction of the Governor, he shall draw his warrants on the Treasurer of State for the sum of Ten thousand dollars more in favor of said Corporation and payable to its Treasurer; and the sum of Twenty thousand dollars is hereby appropriated to carry into effect the purposes of this Resolve, to be paid from any money in the Treasury not otherwise appropriated.

In the House of Representatives March 18 1870.

Read and passed finally.

Reuben Foster Speaker

In Senate March 18" 1870

Read and passed finally.

Wm. W. Bolster, President

March 19th 1870. Approved. Joshua L. Chamberlain, Governor

State of Maine
Office of Secretary of State,
Augusta, Dec. 15. 1870

I hereby certify that the foregoing is a true copy of the original as deposited in this Office.

Franklin M. Drew.
Secretary of State

I, Joshua L. Chamberlain Governor of Maine in compliance with the terms of the Resolve of which the foregoing is a copy certified by the Secretary of State, hereby certify that it has been shown to my satisfaction that the Maine General Hospital the Corporation within named has raised by responsible private subscriptions and donations the sum of twenty thousand dollars.

In witness whereof I have hereunto set my hand this sixteenth day of December A. D. 1870.

In presence of
F. C. Chamberlain
Charlotte M. Packard
} Joshua L. Chamberlain
Governor of Maine

Received Jan. 16. 1871 at 2 h. 44 m. P. M. and recorded according to the original.

Attest: Eben Leach Register

U. S. I. R. Fifty lets. N. H. K. Jan. 13. 1871

Know all men by these presents, that I, Wm. H. Kneeland of Stoneham, Mass. in consideration of Four Hundred Fifty Dollars to me paid by Seth Kneeland of Harrison, County of Cumberland, State of Maine, the receipt whereof is hereby acknowledged, do hereby sell, remise, release, and forever quitclaim unto the said Seth Kneeland, all my right, title and interest in and to a certain farm or parcel of real estate described as follows, to wit, the same deeded to me by the said Seth Kneeland by his deed; said deed dated Jany. forth 4. 1869, said deed recorded Book 364 Page 288. being the same farm Seth Kneeland now lives on in Harrison all taxes excepted.

Kneeland to Kneeland

To have and to hold the above released premises, with all the privileges and appurtenances to the same belonging, to the said Seth, his heirs and assigns, to their use and behoof forever. And I the said

Know all Men by these Presents, That

I, Bartholomew Wren of Portland in the county of Cumberland State of Maine

in consideration of five hundred dollars paid by

The Maine General Hospital a corporation doing its business in said Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital its successors its and their heirs and assigns forever, a certain lot of land on the easterly side of (what is or lately was) Ash Street in said Portland being sixty five feet in length & running back from the line of said Ash Street & forty feet in width being the same lot indicated as number six (No 6) on a certain plan of land surveyed for Moody F. Walker September 23. 1863 by Howe & Osgood Civil Engineers which plan is placed on file in the office of the Registry of Deeds for Cumberland county for the purpose of reference in the matter of conveyances that have been or may be made by said Moody F. Walker of the lots of land specified in said plan. The same property conveyed to me by said Moody F. Walker by deed dated the 16th October 1863 recorded in said Registry Book 323 page 199.

Wren
To
Maine Gen Hospital

U.S.I.R.
$0.50
B.W.
Sept. 15
1871

To Have and to Hold the aforegranted and bargained Premises, with all the privileges and appurtenances thereof, to the said Corporation its successors its & their heirs and assigns, to their use and behoof forever. And I do covenant with the said Corporation its successors its & their heirs and assigns, that I am lawfully seized in fee of the Premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Corporation to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee its successors its & their heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Bartholomew Wren and Margaret wife of the said Bartholomew Wren in testimony of her relinquishment of her right of dower in the above described premises, have hereunto set our hands and seals this twenty eighth day of August in the year of our Lord one thousand eight hundred and Seventy one

Signed, Sealed and Delivered
in presence of

James T. McCobb — Bartholomew Wren — Seal
Witness — Margreth her mark Wren — Seal
Michael White

Cumberland, ss. 15 September 1871 Personally appeared the above-named Bartholomew Wren and acknowledged the above instrument to be his free act and deed. Before me,

James T. McCobb Justice of the Peace.

Received Sept. 18 1871 at 4 o'clock 17m. P.M. and recorded according to the original.

Attest, Register.

Know all Men by these Presents, That

The City of Portland, a corporation in the County of Cumberland, State of Maine,

in consideration of One Dollar & other considerations paid by The Maine General Hospital, a corporation in said State & County & City,

the receipt whereof We do hereby acknowledge, do hereby remise, release, bargain, sell, and convey, and forever QUIT-CLAIM unto the said Maine General Hospital, its successors

~~heirs~~ and assigns forever, all our right, title, and interest in and to a lot of land, on the slope of "Bramhalls Hill", in said city, being the land which lies between the land owned by said Hospital & Gilman Street & Arsenal Street extended westerly & southerly bounded: Beginning at the southwest corner of a lot of land conveyed to said Hospital by said city in 1870, thence southwesterly on the northerly line of Arsenal Street produced 130 feet, more or less, to Gilman Street, thence northerly by east line of Gilman Street 653 feet, more or less, to Bailey's land, thence southeasterly by Bailey's land 71 feet, more or less, to land of said Hospital, thence by said Hospital land 544 feet, more or less to point of beginning: Provided, That The Powder House now on said lot be allowed to remain, without expense to the city until such time as the city shall provide some other house for powder, or remove this one from the lot.

Portland
To
M. General
Hospital

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said Grantees, their successors & assigns, their heirs & assigns forever. ~~And do covenant with the said heirs and assigns, that will warrant and defend the premises to the said heirs and assigns forever, against the lawful claims and demands of all persons, claiming by, through, or under.~~

In Witness Whereof, We the said Grantors, by Henry W. Hersey City Treasurer, authorized thereto by vote of the City Council of said City, approved the 2 March instant have hereunto set our hand and seal this sixth day of March in the year of our Lord one thousand eight hundred and seventy-five.

Signed, Sealed, and Delivered in presence of

3 printed words erased & 4 interlined before execution.

S. B. Beckett

City of Portland
by H. W. Hersey, Treas.

State of Maine

Cumberland, ss. March 1874. Personally appeared the above-named Henry W. Hersey and acknowledged the above instrument to be his free act and deed, & the free act & deed of said city.

Before me S. B. Beckett, Justice of the Peace.

Received March 19 1875, at 9 o'clock 45 m. A. M., and recorded according to the original.

Attest, Henry C. Houston Register.

470

Know all Men by these Presents, That

Book 1250
Page 470

I, Margaret E. L. Sherman, of Norwalk, in the County of Fairfield and State of Connecticut,

in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine, and located at Portland, in the County of Cumberland and State of Maine the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated on the northwesterly side of Arsenal Street in said Portland, bounded and described as follows; Beginning at a point on said northwesterly side of Arsenal Street where the northeasterly side line of land of said Maine General Hospital, formerly known as the Arsenal Lot, adjoins the lot hereby conveyed; thence running northeasterly by said Arsenal Street forty (40) feet to a point; and from these two points extending northwesterly, adjoining said land of Maine General Hospital and keeping a width of forty (40) feet, one hundred (100) feet more or less to Ellsworth Street.

Meaning and intending hereby to convey the same premises conveyed to William H. Bigelow by John B. Brown by deed dated March 30, 1865, recorded in Cumberland Registry of Deeds, Book 317, page 321, my title to the same having been acquired as devisee under the will of said William H. Bigelow, extract from which is recorded in said Registry of Deeds, Book 627, page 231, in which will I am designated as Margaret Eva Lena Taylor, and by deed of Joshua L. Taylor to me dated January 11, 1897, recorded in said Registry of Deeds, Book 640, page 282.

Said premises are conveyed subject to a mortgage to Portland Savings Bank upon which there is due the principal sum of $1,650, which the grantee hereby assumes and agrees to pay as a part of the consideration hereof.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except said mortgage; that I have good right to sell and convey the same to the said grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons. except as aforesaid.

In Witness Whereof, I, the said Margaret E. L. Sherman, and I, John C. Sherman, husband of the said Margaret E. L. Sherman joining in this deed as grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises,

have hereunto set our hand s and seal s this third day of December in the year of our Lord one thousand nine hundred and twenty-six.

Signed, Sealed and Delivered in presence of

John F. Dana to E.S.L.S. — Margaret E. L. Sherman Seal.

Geo. Davis, C. G. Hanson } as to J.C.S. — John C. Sherman Seal.

State of Maine, CUMBERLAND, ss. December 5, 1926. Personally appeared the above named Margaret E. L. Sherman and acknowledged the above instrument to be her free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received December 4, 1926, at 9 o'clock - m. A. M., and recorded according to the original.

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Book 1282
Page 323

Know all Men by these Presents, That

I, Emma W. Hill of Portland in the county of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations, paid by Maine General Hospital, a corporation existing by law, with an established place of business in said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated in said Portland, and bounded and described as follows: Beginning at the intersection of the northerly side line of Arsenal street and the westerly side line of a passageway extending from Arsenal street to Ellsworth street; thence north 20° west sixty-one and five tenths (61.5) feet by the westerly side line of said passageway to a point; thence south 70° west about thirty-four and three tenths (34.3) feet to land formerly of Nathan Moses; thence southerly by said Moses land sixty-seven (67) feet to a point on the northerly side of Arsenal street; thence north 60° 58' east by the northerly side line of Arsenal street thirty-four (34) feet, more or less, to the point of beginning.

Together with the rights of the grantor in a twelve (12) foot passageway.

Meaning and intending to hereby convey the same premises conveyed to Everett L. Hill by Micah M. Gwynn, by deed dated February 2, 1920, recorded in Cumberland Registry of Deeds, Book 1042, page 256, and the same conveyed to this grantor by said Everett L. Hill by deed dated October 15, 1924, recorded in Cumberland Registry of Deeds, Book 1168, page 351.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Emma W. Hill and Everett L. Hill, husband of the said Emma W. Hill, joining in this deed as grantor, and relinquishing and conveying his rights by descent and all other rights in the above described premises have hereunto set our hand s and seals this sixteenth day of December in the year of our Lord one thousand nine hundred and twenty-seven.

Signed, Sealed and Delivered in presence of

John B. Kehoe to both

Emma W. Hill Seal.

Everett L. Hill Seal.

State of Maine, CUMBERLAND, ss. December 16, 1927. Personally appeared the above named Emma W. Hill and acknowledged the above instrument to be her free act and deed.

Before me, John B. Kehoe, *Justice of the Peace.*

Received December 16, 1927, at 11 o'clock 10 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

Book 1295
Page 450

I, Harriet L. Stevens of Portland in the County of Cumberland and State of Maine,

in consideration of one ($1.00) dollar and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated in said Portland, bounded and described as follows: Beginning on the westerly side of a twelve (12) foot passageway leading from Arsenal Street to Ellsworth Street at a point sixty-one and five-tenths (61.5) feet distant from the intersection of the northerly side line of Arsenal Street with the westerly side line of said passage-way; thence south seventy (70°) degrees west, thirty-four and three-tenths (34.3) feet, more or less, to land formerly of Nathan Moses; thence northerly by said Moses land thirty-three (33) feet, more or less, to the southerly side line of Ellsworth Street; thence easterly along the southerly side line of Ellsworth Street thirty-four (34) feet, more or less, to its intersection with the westerly side line of said passageway; thence southerly along the westerly side line of said passageway thirty-eight and five-tenths (38.5) feet, more or less, to the point of beginning.

The above described premises are in the northerly portion of the premises conveyed to Shailer G. Cushing by Seth G. Gordon by his warranty deed dated September 21, 1907, and recorded in Cumberland County Registry of Deeds, Book 814, page 37.

Being the same premises conveyed to me under the name of Hattie L. Stevens by Perley W. Stevens by warranty deed dated December 24, 1912, and recorded in said Registry of Deeds, Book 906, page 161.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all encumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Harriet L. Stevens, and I, Perley W. Stevens, husband of the said Harriet L. Stevens, joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises

have hereunto set our hand s and seals this nineteenth day of February in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

R. E. Snow to both

Harriet L. Stevens Seal.
Perley W. Stevens Seal.

State of Maine, Cumberland, ss. February 19, 1928. Personally appeared the above named Harriet L. Stevens and acknowledged the above instrument to be her free act and deed.

Before me, Reuben E. Snow, *Justice of the Peace.*

Received March 20, 1928, at 8 o'clock 30 m. P. M., and recorded according to the original.

Know all Men by these Presents, That

I, Eunice M. Chase (formerly Eunice Margaret Graham) of Portland, in the County of Cumberland and State of Maine,

in consideration of One dollar ($1.00) and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland,
the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated on the westerly side of a thirty foot passage way leading Northerly from Ellsworth Street, in the City of Portland, State of Maine, and now known as Charles Street, and bounded and described as follows, namely;

Beginning in the westerly side line of said Charles Street at the northeasterly corner of land now or formerly of Charles A. Donnell, thence northerly, by said Charles Street, thirty feet, thence westerly, on a line parallel with the northerly line of said Donnell's land seventy-four and two-tenths (74 2/10) feet to the Arsenal Lot, so called, now owned by said Maine General Hospital; thence southerly by said Arsenal Lot, thirty feet to said Donnell's land; thence easterly by said Donnell's land seventy-four and two tenths (74 2/10) feet to the point of beginning.

Being the same premises conveyed to me under the name of Eunice Margaret Graham Chase by William Graham by warranty deed dated July 1, 1919, recorded in Cumberland Registry of Deeds, Book 1042, page 471.

Also a certain other lot or parcel of land with the buildings thereon situated in said Portland on the westerly side of Charles Street, and bounded and described as follows, to wit:

Beginning on the westerly side line of said Charles Street at a point distant seventy-three (73) feet northerly from the northeasterly corner of land now or formerly of Wiggins; thence northerly by said Charles Street forty-seven (47) feet to a stake; and from these two points extending back westerly, at right angles with said Charles Street and keeping said width of forty-seven (47) feet, about seventy-four and two-tenths (74.2) feet to the "Arsenal Lot" so called, now owned by said Maine General Hospital; and being the same premises conveyed to Mary Rich Graham, deceased, by Charles A. Donnell, by his deed dated July 1, 1893, recorded in the Cumberland Registry of Deeds, Book 604, page 124.

My title to said premises was acquired as an heir-at-law of said Mary Rich Graham, and by warranty deed from William Graham and Paul G. Graham to me under the name of Eunice Margaret Graham, dated August 2, 1912, recorded in said Registry of Deeds, Book 898, page 33.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Eunice M. Chase, and I, Harold B. Chase, husband of the said Eunice M. Chase joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises have hereunto set our hands and seals this twentieth day of April in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered
in presence of

John F. Dana to both

Eunice M. Chase Seal
Harold B. Chase Seal

State of Maine, Cumberland, ss. April 20, 1928. Personally appeared the above named Eunice M. Chase and acknowledged the above instrument to be her free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received April 20, 1928, at 10 o'clock 50 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

I, Elizabeth Naylor, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said

Maine General Hospital,its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon,situated in said Portland, on the northerly side of Ellsworth Street and westerly side of Charles Street,bounded and described as follows: Beginning at the corner formed by the intersection of the westerly side of Charles Street and the northerly side of Ellsworth Street, and running westerly by said Ellsworth Street to land conveyed by William R. Naylor to Samuel W. Joy by deed dated November 5,1905, and recorded in Cumberland County Registry of Deeds,Book 776,page 200;thence northerly by said Joy land to land now or formerly of Levi J. Jones;thence easterly by said Jones land to said Charles Street;thence southerly by said Charles Street to the point of beginning.

Being the same premises conveyed to William R. Naylor by John B. Brown by deed dated February 20,1872, recorded in Cumberland County Registry of Deeds,Book 393, page 105, excepting therefrom the portion thereof conveyed by William R. Naylor to Samuel W. Joy by deed aforesaid. My title to said premises having been acquired as devisee under the will of William R. Naylor, extract from which is recorded in said Registry of Deeds,Book 788,page 307.

Also hereby conveying any right,title and interest I may have in said Ellsworth Street.

Taxes for the year 1928 are to be prorated between the grantor and grantee.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital,its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee,its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee,its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Elizabeth Naylor, being unmarried,

have hereunto set my hand and seal this 3rd day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

Nathan W. Thompson

Elizabeth Naylor Seal

State of Maine, CUMBERLAND, ss. July 3, 1928. Personally appeared the above named Elizabeth Naylor and acknowledged the above instrument to be her free act and deed.

Before me, Nathan W. Thompson, *Justice of the Peace.*

Received July 7, 1928, at 10 o'clock 45 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

I, Samuel W. Joy, of Portland, in the County of Cumberland and State of Maine, in consideration of one dollar and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated on the northerly side of Ellsworth Street in said Portland, being numbered forty-three (43) on said Street, and bounded and described as follows; Beginning at a point thirty-two (32) feet westerly from the intersection of the northerly side line of said Ellsworth Street with the westerly side line of Charles Street; thence westerly by said Ellsworth Street forty-four (44) feet to the Arsenal lot, so called, now owned by the Maine General Hospital; thence northerly by said Arsenal or Hospital lot eighty-seven (87) feet to land now or formerly of Levi J. Jones; thence easterly thirty (30) feet to land now or formerly of William R. Naylor; thence southerly by said Naylor land eighty-seven (87) feet more or less to the first bound.

Being the same premises conveyed to me by William R. Naylor by deed dated November 5, 1905, recorded in Cumberland County Registry of Deeds, Book 776, page 200.

Also hereby conveying any right, title and interest I may have in and to said Ellsworth Street.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Samuel W. Joy, having no wife,

have hereunto set my hand and seal this seventh day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

John F. Dana

Saml W. Joy Seal

State of Maine, CUMBERLAND, ss. July 7, 1928. Personally appeared the above named Samuel W. Joy and acknowledged the above instrument to be his free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received July 7, 1928, at 10 o'clock 46 m. A. M., and recorded according to the original.

IN WITNESS WHEREOF, the said Lessor has hereunto set his hand and seal on the day and year first above written.

Signed, Sealed and Delivered in Presence of

It is further understood that no liquor, beer, or cigarette advertising shall be displayed on any structure that might be erected.

JOHN DONNELLY & SONS ------

WEST SCARBORO M.E.CHURCH ------

By A. W. Hodgman, Treas.

State of Maine. County of Cumberland,ss. March 31, 1939.

Personally appeared the above named Lessor and acknowledged the above instrument to be his free act and deed.

Before me, F. H. Tewksbury Justice of the Peace

Received March 31, 1939, at 3h 40m P. M., and recorded according to the original

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Canal Nat'l.Bk. of Port. Tr. & to Maine General Hospital Deed

KNOW ALL MEN BY THESE PRESENTS, That

WHEREAS, The Canal National Bank of Portland as Trustee having filed its Bill of Complaint against Vaughan Hall, Incorporated and Harry M. Verrill, Conservator of Casco Mercantile Trust Company dated May 20, 1938, praying for foreclosure of a certain mortgage indenture on property described in said Bill of Complaint, said mortgage indenture being dated as of the fifteenth day of September, 1925, and recorded in the office of the Registry of Deeds for Cumberland County in Book 1219 at Page 41, the Supreme Judicial Court within and for the County of Cumberland in proceedings numbered 5830 on the docket of said Court entered its decree of foreclosure and order of sale therein decreeing and ordering the sale of the property described in said mortgage and hereinafter described, and

WHEREAS, it was, among other things, ordered, adjudged and decreed by said decree of foreclosure that said sale should be made by and under the direction of Raymond J. Callahan who was thereby appointed Special Master for that purpose and who was thereby directed to make and conduct said sale and to execute a deed of conveyance of the property sold to the purchaser thereof upon an order of Court confirming such sale and upon payment or settlement of the purchase price as therein provided, and that such sale be made in the County Court House in the City of Portland, Maine, on a day and at an hour as fixed by said decree of said Supreme Judicial Court and that notice of the time, place and terms of said sale describing briefly the property to be sold and referring to said decree should be published at least once a week for three successive weeks prior to said sale in a newspaper of general circulation published in Portland, Maine, and that upon confirmation of the sale by the Court and upon payment by any purchaser of the purchase price of the property purchased by him in accordance with the decrees of said Court the Special Master should execute a deed conveying, assigning and transferring to such purchaser the property sold to him, and

WHEREAS, the Supreme Judicial Court, pursuant to said decree, duly fixed the time for said sale as February 15, 1939, at ten o'clock in the forenoon and on said date the Special Master, pursuant to the provisions of said decree dated January 17, 1939, and pursuant to order of Court dated February 15, 1939, adjourned said sale from time to time in accordance with orders and decrees of said Court until March 28, 1939, at the time and place ordered by said decree of Court dated January 17, 1939, and orders and decrees subsequent thereto and said Special Master made due advertisement of said sale in the manner described in said decree dated January 17, 1939, and posted all of said notices as required by the orders of Court made subsequent thereto and the Special Master did at the time and place and in the manner and subject to the conditions of said decree and orders of Court subsequent thereto fairly strike off and sell said property to Maine General Hospital, a corporation duly organized and existing under the laws of the State of Maine and having a usual place of business at Portland, in the County of Cumberland and State of Maine, and

WHEREAS, The Canal National Bank of Portland thereafter duly presented to the Court for confirmation the bid so received by said Special Master and the said Special Master duly made a report of said sale to said Court, and a decree of confirmation and a certain decree amending said decree of foreclosure and sale were made and entered therein on the thirty-first day of March, 1939, confirming said bid, report and sale, and making said sale subject to taxes levied against said premises or any part thereof which are or may be chargeable upon said property and directing the Special Master, upon payment of the purchase price in the manner prescribed by said decree of confirmation, to execute and deliver to said purchaser a deed or other instrument conveying, assigning and transferring to said purchaser said property so sold as aforesaid, and

WHEREAS, said Supreme Judicial Court, in accordance with said decree of confirmation, by a decree made and entered herein on the thirty-first day of March, 1939, approved the form of this deed as required by said decree of confirmation dated March 31, 1939, and

WHEREAS, said sale has been conducted and made in all respects in accordance with law and with the provisions of said decrees and order of sale;

NOW, THEREFORE, I, the said Raymond J. Callahan, in my capacity as Special Master and in consideration of these presents and of one dollar and other valuable considerations paid by Maine General Hospital, receipt whereof is hereby acknowledged, do hereby remise, release, bargain, sell and convey and quitclaim unto the said Maine General Hospital, a corporation organized and existing under the laws of the State of Maine, its successors or assigns, all the right, title and interest which said Vaughan Hall, Incorporated and/or Harry M. Verrill, Conservator of Casco Mercantile Trust Company, and all persons claiming under it or him has or have in and to the following described real estate situated in Portland, in the County of Cumberland and State of Maine, and all future rents and profits thereof arising

therefrom, subject, however, to the equity of redemption as provided in the Statutes of the State of Maine and subject also to the terms and conditions set forth in the decree of the Supreme Judicial Court dated January 17, 1939, and certain decrees dated March 31, 1939, and to any other decree which may be hereafter made which relates to the property hereby conveyed, together with the rights and privileges pertaining to said property subject to the conditions described in the decrees of the Supreme Judicial Court dated January 17, 1939, and March 31, 1939, and any unpaid taxes, but subject, however, at all times to the exceptions and provisions particularly described and set forth in the various decrees of said Supreme Judicial Court heretofore made and any that may be hereafter made during the period of redemption:

A certain lot or parcel of land with the buildings thereon situated in said Portland, and bounded and described as follows:- Beginning on the westerly side of Vaughan Street at the southeasterly corner of land now or formerly of the Portland Water District; thence southerly on Vaughan Street sixty (60) feet, more or less, to land now or formerly of John W.Deering; thence westerly by said Deering land one hundred and forty (140) feet, more or less, to land now or formerly of Portland School for Medical Instruction; thence northerly by land of said Portland School for Medical Instruction sixty (60) feet, more or less, to said land of said Portland Water District; thence easterly by said land of said Portland Water District one hundred and forty (140) feet, more or less, to the point of beginning; said lot containing eighty-four hundred (8400) square feet, more or less. Being the same premises conveyed to Vaughan Hall, Incorporated, by Ralph N. Bryant by his warranty deed dated December 19, 1913, and recorded in Cumberland County Registry of Deeds, in Book 927, Page 26.

For title to the above described premises reference is also hereby made to a certain mortgage indenture dated September 15, 1925, securing the First Mortgage Sinking Fund 5 1/2% Gold Bonds of Vaughan Hall Incorporated, said mortgage indenture being by and between said Vaughan Hall, Incorporated and The Canal National Bank of Portland, said mortgage indenture being recorded in Cumberland County Registry of Deeds in Book 1219, Page 41.

TO HAVE AND TO HOLD and possess and enjoy said property and every part and parcel thereof free from all claims, rights, interests whatsoever in or to the same by or of the said Vaughan Hall, Incorporated, its successors and assigns, or of Harry M. Verrill as Conservator of Casco Mercantile Trust Company and by or of the creditors of the Receiver appointed by the Supreme Judicial Court in the equity proceedings hereinbefore referred to, or by or of the stockholders of said Vaughan Hall, Incorporated, and by or of all persons claiming by, through or under them or any of them, including the said Receiver of said Vaughan Hall, Incorporated, and by or of all the parties to said cause hereinbefore described, but subject, however, to any and all taxes levied against said premises or any part thereof which are or may be chargeable upon said property or premises or any portion thereof prior to the

U.S.I.R. $31.50 R.J.C. 5/31/39

lien of the mortgage foreclosed in said proceedings and subject to the right of redemption of said property granted by the Statutes of the State of Maine and subject to the terms and conditions of all decrees of said Supreme Judicial Court made and entered in the cause herein referred to and to any other decree which may be hereinafter entered by said Court which relates or pertains to the property herein conveyed.

IN WITNESS WHEREOF, Raymond J. Callahan, as Special Master, has hereunto set his hand and seal this thirty-first day of March, 1939.

Signed, Sealed and Delivered in Presence of

Porter Thompson — Raymond J. Callahan Seal
Special Master

State of Maine. Cumberland,ss. March 31, 1939.

Personally appeared Raymond J. Callahan and acknowledged the foregoing instrument to be his free act and deed and his free act and deed in his said capacity.

Before me, Porter Thompson Justice of the Peace

APPROVED:

Guy H. Sturgis

Justice Supreme Judicial Court

Received March 31, 1939, at 4h -m P. M., and recorded according to the original =

Casco Mer. Tr. Co., Cons. of to Maine General Hospital Deed

WHEREAS, Harry M. Verrill of Portland, in the County of Cumberland and State of Maine, was appointed Permanent Conservator of Casco Mercantile Trust Company, a banking corporation organized and existing under the laws of the State of Maine and located at said Portland, by decree of the Supreme Judicial Court in Equity in and for the County of Cumberland and State of Maine, dated April 14, 1933, in an action in equity commenced by Sanger N. Annis against Casco Mercantile Trust Company in said Court by Bill in Equity dated March 18, 1933, and

WHEREAS, upon petition of Harry M. Verrill, Conservator as aforesaid, dated March 29, 1939, a decree issued out of said Court authorizing said Conservator to sell to Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at said Portland, all the right, title and interest of said Casco Mercantile Trust Company in and to the following described real estate, which said decree is dated March 31, 1939, and

WHEREAS, said Conservator has sold, pursuant to the terms of said decree, to said Maine General Hospital all the right, title and interest of said Casco Mercantile Trust Company in and to the real estate hereinafter described.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS, That I, the said Harry M. Verrill, by virtue of the power and authority in me vested as aforesaid, and in my capacity as Conservator of Casco Mercantile Trust Company, and in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, receipt whereof is hereby acknowledged, do hereby remise, release, bargain, sell, convey and quitclaim unto the said Maine General Hospital, its successors and assigns, all the

Know all Men by these Presents, That

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I, John T. Lennon of Portland in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable considerations paid by Maine Medical Center, a corporation organized and existing under the Laws of the State of Maine and located at said Portland

the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and assigns forever, certain lots or parcels of land with the buildings thereon situated in said Portland and bounded and described as follows:

First:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land now or formerly of Thomas H. Pratt, running thence westerly by said Bramhall Street fifty (50) feet to land now or formerly of Sophia M. Knight, and from these two points extending northerly towards Arsenal Street, holding to said width of fifty feet, and adjoining said Pratt premises on one side and said Knight premises on the other for a distance of sixty (60) feet to land now or formerly of Edward T. Burrowes. The said lot is the southerly portion of the premises conveyed to Albert B. Cole, Frank H. Cole and Warren W. Cole by Nettie E. Pierce by deed dated September 26, 1911 and recorded in the Registry of Deeds for said County of Cumberland in Book 882, Page 188. Said premises are numbered thirty (30) on said Bramhall Street.

Second:

A certain lot of land with the buildings thereon on the southerly side of Arsenal Street in said Portland bounded and described as follows:

Commencing at a point on the Westerly line of land of Maude E. Pratt at a point sixty (60) feet northerly from the northerly side of Bramhall Street, thence westerly on a line parallel with and sixty (60) feet from said Bramhall Street, fifty (50) feet, more or less, to land of Sophia M. Knight; thence northerly from these two points keeping a width of fifty (50) feet and bounded on the West by land of said Knight and on the East by land of said Pratt and George H. Fletcher, forty-nine (49) feet, more or less, to said Arsenal Street.

Being the same property conveyed to me by Harriet B. Foster by her warranty deed dated February 24, 1945 and recorded in the Cumberland County Registy of Deeds in Book 1771 Page 131.

Also conveying all my right, title and interest in and to Arsenal Street, recently abandoned by the City of Portland.

U.S.I.R.
$16.50
J.T.L.
5/5/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors and assigns heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said John T. Lennon and Ann C. Lennon wife of the said John T. Lennon joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises,

have hereunto set our hand_ and seal_ this fifth day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

John J. Devine
to both

John T. Lennon Seal
Ann C. Lennon Seal

State of Maine, CUMBERLAND, ss. May 5, 1953. Personally appeared the above named John T. Lennon and acknowledged the foregoing instrument to be his free act and deed.

Before me, John J. Devine, Justice of the Peace

Received May 5, 19 53, at 2 o'clock 30 m. P. M., and recorded according to the original.

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Know all Men by these Presents, That

I, Donald D. McPhee of Portland in the County of Cumberland and State of Maine,

in consideration of one dollar ($1) and other valuable considerations paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in said County and State the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland and being the premises conveyed to me by Hope K. Fletcher by deed dated November 22, 1946 and recorded in Cumberland County Registry of Deeds in Book 1848, Page 160, in which deed said premises are described as follows:

Beginning at the Northeast corner of Sophia T. Jones lot, so-called, on Arsenal Street; thence Northeasterly on Arsenal Street fifty (50) feet to land of one Raymond; thence Southeasterly by line of Raymond forty-eight (48) feet, more or less, to land of one Haskell; thence Southwesterly along line of said Haskell land thirteen (13) feet and two (2) inches to a point; thence Northwesterly parallel to land of said Raymond three (3) feet to a point; thence Southwesterly along the line of said Haskell land thirty-six (36) feet, more or less, to land of said Jones; thence Northwesterly forty-six (46) feet, more or less to point of beginning.

Also conveying all my interest in and to said Arsenal Street, recently abandoned by the City of Portland.

U.S.I.R. $14.30 D.D.McP. 5/9/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances: that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Donald D. McPhee and I, Lorraine J. McPhee wife of the said Donald D. McPhee joining in this deed as Grantor, and relinquishing and conveying my rights by descent and all other rights in the above described premises,

have hereunto set our hand s and seal s this 9th day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana to both

Donald D. McPhee Seal
Lorraine J. McPhee Seal

State of Maine, Cumberland, ss. May 9, 1953. Personally appeared the above named Donald D. McPhee and acknowledged the above instrument to be his free act and deed.

Before me, Edward F. Dana, Justice of the Peace

Received May 9, 1953, at 9 o'clock 37 m. A.M., and recorded according to the original. /P

Know all Men by these Presents, That

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I, Hazel B. Therio of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations paid by Maine Medical Center, a corporation duly organized and existing under the Laws of the State of Maine and located at said Portland
the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated on the Westerly side of Bramhall Street in said Portland, being more particularly described in deed from Hazel E. Skillings to the Grantor, dated September 18, 1945 and recorded in Cumberland County Registry of Deeds in Book 1790, Page 500, in which deed said premises are described as follows:

A certain lot or parcel of land, with the buildings thereon situated in said City of Portland, on the Northwesterly side of Bramhall Street, bounded and described as follows: Beginning at the most easterly corner of land now or formerly of Sophia P. Jones; thence Northeasterly on said Bramhall Street fifty (50) feet to land now or formerly of one Raymond; thence Northwesterly by said Raymond land fifty-nine (59) feet; thence Southwesterly thirteen (13) feet two (2) inches, more or less, to a fence; thence Northwesterly by the line of the division fence three (3) feet two (2) inches; thence Southwesterly by said fence thirty-six (36) feet five (5) inches, more or less, to said Jones land; thence Southeasterly by said Jones land sixty-two (62) feet two (2) inches to the point begun at.

Also, all my right, title and interest in and to Arsenal Street recently abandoned by the City of Portland.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors and Assigns heirs and assigns, that I am lawfully seised in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

U.S.I.R. $9.90 H.B.T. 5/16/53

In Witness Whereof, I the said Hazel B. Therio, being unmarried,

have hereunto set my hand and seal this 16th day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana — Hazel B. Therio — Seal

State of Maine, Cumberland, ss. May 16, 1953 Personally appeared the above named Hazel B. Therio and acknowledged the above instrument to be her free act and deed.

Before me, Edward F. Dana Justice of the Peace

m Received May 16 19 53, at 10 o'clock 35 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

We, Albert N. Tardif and M. Louise Tardif, both of Portland, County of Cumberland, State of Maine

in consideration of one dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation established by law at said Portland

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated on the northerly side of Bramhall Street in said Portland which was conveyed to the grantors by Wilhelmina M. Mantine, by deed dated September 16, 1935 and recorded in Cumberland County Registry of Deeds in Book 1478, Page 294 and therein described as follows: Beginning on the northerly side of Bramhall Street at the easterly corner of land formerly of James Miller; thence northeasterly by Bramhall Street twenty-one and seven twentieths (21 7/20) feet to a stake; thence northwesterly about one hundred eleven (111) feet to a point in the southerly side of Arsenal Street; thence southwesterly by Arsenal Street twenty-two and three quarters (22 3/4) feet to said Miller's land; thence southeasterly by said Miller's land one hundred eleven and four tenths (111 4/10) feet to the point of beginning.

Also all our right title and interest in and to Arsenal Street recently abandoned by the City of Portland.

U.S.I.R. $16.50 A.N.T.Et 6/11/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And we do covenant with the said Grantee, its successors and Assigns, heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances: that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its successors and Assigns heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Albert N. Tardif and M. Louise Tardif, the said Grantors, being Husband and Wife each joining in this deed as Grantors, and each relinquishing and conveying our respective rights by descent and all other rights in the above described premises,

have hereunto set our hand s and seal s this 11th day of June in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana — Albert N. Tardif — Seal

to both — M. Louise Tardif — Seal

State of Maine, Cumberland, ss. June 11, 1953 Personally appeared the above named Albert N. Tardif and M. Louise Tardif and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Dana Justice of the Peace

Received June 12 1953, at 11 o'clock 5 m. A. M., and recorded according to the original.

Know all Men by these Presents, That

We, Fred A. Patterson and Ella H. Whidden both of Derry in the County of Rockingham and State of New Hampshire, Ruby E. MacKenzie of Raymond in said County and State and Alzo F. Patterson of Portland in the County of Cumberland and State of Maine

in consideration of One dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation organized and existing under the laws of Maine and located at said Portland,

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its Successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the northerly side of Bramhall Street and bounded and described as follows:

Beginning on the northerly side of Bramhall Street at the southwesterly corner of land formerly of Frederick A. Carle; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake or point, and from these two points extending northerly adjoining said Carle land, keeping a width of twenty-five (25) feet, to Arsenal Street, being the premises conveyed to Daniel W. Patterson by Maria M. Jose by deed dated September 12, 1921 and recorded in Cumberland County Registry of Deeds in Book 1085, Page 228.

The said Daniel W. Patterson died intestate on September 3, 1952 leaving no widow and as his sole heirs-at-law, the Grantors herein.

The Grantee as part of the consideration hereof assumes and agrees to pay the taxes for the taxable year of 1953.

Also conveying all our right, title and interest in and to Arsenal Street recently abandoned by the City of Portland, Maine.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its Successors and Assigns to its and

their use and behoof forever. And we do covenant with the said Grantee, its Successors and Assigns,

heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid.

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its Successors and Assigns

heirs and assigns forever, against the lawful claims and demands of all persons.

U.S.I.R. 13.20
A.F.P.Et
5/20/53

In Witness Whereof, We the said Fred A.Patterson and Chrystine I.Patterson wife of the said Fred A.Patterson;Ella H.Whidden and Charles F.Whidden,husband of the said Ella H.Whidden;Ruby E.McKenzie and Elmer V.McKenzie,husband of the said Ruby E.McKenzie,and Alzo F.Patterson and Bessie E.Patterson,wife of the said Alzo F.Patterson joining in this deed as Grantors,and relinquishing and conveying our rights by descent and all other rights in the above described premises,

have hereunto set our hands and seals this twentieth day of May in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

R.E. Jensen
R.E. Jensen
Carmela Chase
Carmela Chase
Arthur K. Smith
Artour K. Smith
P. J. Campbell
P. J. Campbell

Alzo F.Patterson Seal
Bessie E. Patterson Seal
Fred A. Patterson Seal
Chrystine I. Patterson Seal
Ella H. Whidden Seal
Charles F. Whidden Seal
Ruby E. MacKenzie Seal
Elmer MacKenzie Seal

State of Maine. CUMBERLAND, ss. May 20, 1953 Personally appeared

the above named Alzo F. Patterson

and acknowledged the above instrument to be his free act and deed.

Before me, Raymond E. Jensen Justice of the Peace

Received June 12 1953, at 11 o'clock 5 m. A.M., and recorded according to the original.

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Know all Men by these Presents, That

We, Leola J. Noyes and William H. Noyes, Jr., both of Portland, County of Cumberland, State of Maine,

in consideration of one dollar ($1.00) and other valuable considerations paid by Maine Medical Center, a Corporation established by law in said Portland

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and Assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon situated in said Portland between Bramhall and Arsenal Streets adjoining land formerly belonging to Sophia P. Jones and conveyed to us by Maud L. Pillsbury by deed dated October 2, 1951, recorded in Cumberland County Registry of Deeds in Book 2060, Page 419, and therein bounded and described as follows: Beginning on the northerly side of Bramhall Street at the southwesterly corner of said Jones land; thence running westerly by said Bramhall Street twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land keeping a width of twenty-five (25) feet, a distance of sixty-eight feet and two inches (68' 2"), which distances are marked by stakes and which stakes are twenty-six (26) feet distant from the southerly boundary line of Arsenal Street.

U.S.I.R. $11.00
L.J.N.Et
6/12/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors and Assigns, to its and their use and behoof forever. And we do covenant with the said Grantee, its successors and Assigns, heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its successors and Assigns heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We, the said Leola J. Noyes and William H. Noyes, Jr., the said grantors, both being unmarried

have hereunto set our hand s and seals this 12th day of June in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana — Leola J. Noyes — Seal

to both — William H. Noyes, Jr. — Seal

State of Maine, CUMBERLAND, ss. June 12, 1953 Personally appeared the above named Leola J. Noyes and William H. Noyes, Jr. and acknowledged the above instrument to be their free act and deed.

Before me, Edward F. Dana Justice of the Peace

Received June 12 19 53, at 1 o'clock 44 m. P. M. and recorded according to the original.

Know all Men by these Presents, That

Maine Medical Center a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

in consideration of One Dollar and other valuable considerations paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at said Portland

the receipt whereof it does hereby acknowledge, does hereby, give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated in said City of Portland, between Bramhall and Arsenal Streets, adjoining land formerly owned by John W. Yeaton, and bounded and described as follows:

Beginning in the northerly line of Bramhall Street at the southeasterly corner of said Yeaton land; thence running easterly by Bramhall Street forty (40) feet and from these two points extending northerly, adjoining said Yeaton land, and keeping said width of forty (40) feet to Arsenal Street, being the same premises described in deed of J. B. Brown to Leon M. Bowdoin in 1867 by deed recorded in Cumberland County Registry of Deeds, Book 351, Page 340.

Being the same premises conveyed to this Grantor by Frederick W. McCarthy by deed dated June 30, 1953 and recorded in said Registry of Deeds in Book 2140, Page 92.

U.S.I.R. $33.55 M.M.C. 8/18/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors and assigns, to its and their use and behoof forever. And the said Grantor Corporation does hereby covenant with the said Grantee, its successors and assigns,

~~heirs and assigns~~, that it is lawfully seized in fee of the premises; that they are free of all incumbrances; that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors ~~heirs~~, shall and will warrant and defend the same to the said Grantee, its successors and assigns

~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Maine Medical Center has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Phillips M. Payson, its President, thereunto duly authorized,

~~hand and seal~~ this 18th day of August ~~have hereunto set~~ In the ~~year of our Lord~~ one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

Edward F. Dana

MAINE MEDICAL CENTER
CORPORATE SEAL
By Phillips M. Payson
President.

~~State of Maine~~, County of CUMBERLAND, ss. August 18, 1953. Then Personally appeared the above named Phillips M. Payson, President of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Edward F. Dana, Justice of the Peace.

Received August 19, 1953, at 1 o'clock 40 m.P. M., and recorded according to the original. p/

Know all Men by these Presents, That

I, Henry H. Grant of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration paid by Maine Medical Center, a corporation organized and existing under the Laws of the State of Maine and located at said Portland,

the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Maine Medical Center, its Successors and assigns forever, a certain lot or parcel of land with the buildings thereon situated between Bramhall and Arsenal Streets in said Portland, adjoining land now or formerly belonging to Sophia P. Jones, and more particularly bounded and described as follows:

Beginning on the northerly side line of said Bramhall Street, at the southwesterly corner of said Jones' land; thence westerly by said Bramhall Street, twenty-five (25) feet to a stake and from these two points extending northerly adjoining said Jones land, keeping the width of twenty-five (25) feet, to Arsenal Street.

Excepting and reserving however, a certain lot or parcel of land with the buildings thereon out of the aforesaid property, a conveyance by Westprom Realty Company to Maud L. and Janice M. Pillsbury by deed dated January 23, 1946 and recorded in Cumberland County Registry of Deeds in Book 1803, Page 444, to which reference may be had.

Meaning and intending to convey a parcel of land at the rear of 26 Bramhall Street, which parcel of land is approximately 26'x25' and contains a garage thereon.

Being the same premises conveyed to me by Westprom Realty Company by their warranty deed dated April 11, 1951 and recorded in said Registry of Deeds in Book 2040, Page 192.

U.S.I.R. $3.30 H.H.G. 9/4/53

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its Successors and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its Successors and assigns, heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its Successors and assigns heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Henry H. Grant and I, Gladys H. Grant, wife of the said Henry H. Grant joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises, have hereunto set our hands and seals this 4th day of September in the year of our Lord one thousand nine hundred and fifty-three.

Signed, Sealed and Delivered in presence of

H. Edwin Gee

Henry H. Grant Seal
Gladys H. Grant Seal

State of Maine, Cumberland, ss. September 4, 1953. Personally appeared the above named Henry H. Grant and acknowledged the above instrument to be his free act and deed.

Before me, H. Edwin Gee, Notary Public, Notarial Seal, My Commission Expires June 29, 1956

Received September 9, 1953, at 9 o'clock 50 m. A. M., and recorded according to the original. P

Know all Men by these Presents, That

I, James S. Bell of Portland, County of Cumberland and State of Maine, Executor under the Will of Ethel B. Bell, deceased, late of Portland.

having on the 24th day of November A. D. 19 53, obtained License from the Honorable Nathaniel M. Haskell Judge of Probate, within and for the County of Cumberland and State of Maine, to sell and convey at private sale the Real Estate hereinafter described of the said Ethel B. Bell for the sum of

Eleven thousand seven hundred fifty ($11750.00) dollars

the same being an advantageous offer therefor, and having agreeably to the order and decree of said Court, given due notice upon the petition for license to make such sale, and having given the bond required by law, by virtue of the power and authority with which I am as aforesaid vested, and in consideration of the aforesaid sum of Eleven thousand seven hundred fifty ($11750.00) dollars, to me paid by Maine Medical Center, a corporation duly organized and existing by law with an office and place of business at Portland, said County and State. the receipt whereof I do hereby acknowledge, have given, granted, and sold, and by these Presents do GIVE, GRANT, SELL AND CONVEY to the said Maine Medical Center, its Successors ~~Heirs~~ and Assigns forever, the following described Real Estate, viz.:

A certain lot or parcel of land with the buildings thereon, situated on Arsenal and Brackett Streets in said Portland, bounded and described as follows:

Beginning at the southwesterly side of said Brackett Street at the northwesterly corner of a lot of land conveyed by Mary J. Raymond to George E. Raymond by deed dated November 3, 1897, and recorded in the Cumberland County Registry of Deeds in Book 657, Page 411; thence southwesterly by said last named lot forty seven (47) feet; thence northwesterly and at right angles with the last described course to said Arsenal Street; thence northeasterly by said Arsenal Street to said Brackett Street; thence southeasterly by said Brackett Street to the point of beginning.

Excepting and reserving from the southeasterly portion of said above described premises so much thereof, as was described and conveyed in a certain deed from Ella C. Gardner to Gemma A. Applebee et al., said deed being dated November 27, 1935 and recorded in the Cumberland County Registry of Deeds, Book 1485, Page 206, and subject also to such easements and rights as were therein granted to said Gemma A. Applebee et al; by said deed above referred to.

Being the same premises conveyed to Kathryn Ireland by deed of Mary Dyer dated August twenty eighth, A. D. 1950 recorded in said Registry of Deeds for the County of Cumberland in Book 2014, Page 62.

Being the same premises conveyed to Sarah Friedman by deed of Kathryn Ireland which deed is recorded in the Cumberland County Registry of Deeds in Book 2051, Page 193.

Being the same premises conveyed to Ethel B. Bell by Sarah Friedman which deed is recorded in said Registry of Deeds.

U.S.I.R. $13.20 E.B.B. Est. 11/25/53

To Have and to Hold the same, with all the privileges and appurtenances to the same belonging, in manner as aforesaid, to the said Maine Medical Center, its Successors ~~Heirs~~ and Assigns forever.

And I the said James S. Bell in my said capacity do COVENANT to and with the said Maine Medical Center, its Successors Heirs and Assigns, that I have in all things observed the rules and directions of law relative to the selling of said Estate, and have good right and lawful authority to sell and convey the same in manner aforesaid.

In Witness Whereof, I hereunto set my hand and seal in my said capacity, this 25th day of November in the year of our Lord one thousand nine hundred and fifty three

Signed, Sealed and Delivered in presence of

Morris Greenberg

Estate of Ethel B Bell
James S. Bell Seal
Executor

State of Maine, Cumberland, ss. November 25, 1953. Personally appeared the above named James S. Bell and acknowledged the foregoing ~~above~~ instrument to be his free act and deed, in said capacity.

Before me, Morris Greenberg Justice of the Peace

RECEIVED November 25 19 53, at 4 o'clock 56 m., P. M., and recorded according to the original.

(102)

Know All Men by these Presents,

That MAINE GENERAL HOSPITAL

a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

Maine General Hospital to Maine Medical Center

in consideration of One Dollar ($1.00) and other valuable considerations (being less than $100)

paid by MAINE MEDICAL CENTER; a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center

its successors and assigns forever,

a certain lot or parcel of land being a portion of Arsenal Street discontinued by the City of Portland and a small portion of land of the Grantor adjoining said discontinued land in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at a point in the center line of discontinued Arsenal Street at its easterly extremity; thence northwesterly by said easterly extremity of discontinued Arsenal Street thirty (30) feet to land of the Grantor; thence southwesterly by land of the Grantor, being the northerly sideline of the former location of Arsenal Street and at right angles to the last described course about thirty (30) feet to the easterly face of the new Maine Medical Center building; thence northwesterly at about right angles to the last described course and by the easterly face of said new building about five (5) feet to a corner of said building; thence southwesterly by the northerly face of said new building and by a line between said new building and the old building, said old building being known as the pavilion and again by the northerly face of said new building about forty-five (45) feet to a corner of said new building; thence southeasterly by the face of said new building at about right angles to the last described course about five (5) feet to the former location of the northerly sideline of said Arsenal Street; thence southwesterly by other land of the Grantor being the northerly sideline of the former location of Arsenal Street and at about right angles to the last described course and ten (10) feet to a point; thence southeasterly at right angles to the last described course thirty (30) feet to the center line of the former location of said Arsenal Street; thence northeasterly by said center line and passing through said aforementioned new building about eighty-five (85) feet to the point of beginning.

22 **To have and to hold** the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine Medical Center, its successors ~~heirs~~ and assigns, to its and their use and behoof forever.

And the said Grantor Corporation does hereby COVENANT with the said Grantee, its successors ~~heirs~~ and assigns, that it is lawfully seized in fee of the premises, that they are free of all incumbrances;

that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will WARRANT AND DEFEND the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, the said Maine General Hospital ~~Company~~ has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Phillips M. Payson, its Treasurer, thereunto duly authorized, this 9th day of July in the year one thousand nine hundred and fifty-six.

Signed, Sealed and Delivered in presence of

Edward F. Dacey

MAINE GENERAL HOSPITAL

~~Corporate~~

By Phillips M. Payson

Treasurer.

State of Maine.

County of Cumberland ss. July 9, 1956

Then personally appeared the above named

Phillips M. Payson, Treasurer of said Grantor 23
Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me,

Edward F. Sawyer Justice of the Peace.

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE JUL 10 1956
Received at 1 H 5 M P M, and recorded in
BOOK 2301 PAGE 21 Robert H. Carey Register

Know All Men by These Presents.

That M. S. Hancock, Inc.

M S Hancock Inc to Gordon War

a Corporation organized and existing under the laws of the State of Maine and located at Casco in the County of Cumberland and State of Maine in consideration of one dollar and other valuable consideration

paid by Benjamin H. Gordon of New Britain in the County of Hartford and State of Connecticut the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey unto the said Benjamin H. Gordon, his heirs and assigns forever,

Three certain lots or parcels of land situate in said Casco and on the southerly shore of Coffee Pond, so-known, the lots herein conveyed being Lot #13, Lot #14 and Lot #15 and delineated on a certain plan entitled "Coffee Pond Pines, Part II" as recorded in the Cumberland County Registry of Deeds, Plan Book 44, Page 40, together with a right of user in common with others who may have been or who may hereafter be granted a similar right in and to the road or right of way leading to said lots from Route #11, so-known, said road being delineated on said plan.

It shall be a condition of this conveyance and the Grantee, for himself and his heirs, administrators, executors or assigns, agrees that no dwelling shall be erected or constructed on any of said lots unless the same shall equal or exceed the sum of $1500.00 to build exclusive, however, of any necessary outbuildings or garages.

(24)

Know all Men by these Presents,

161

That the CITY OF PORTLAND, a body politic and corporate, located in the County of Cumberland and State of Maine,

Portland City of

to

Maine General Hospital

Q C

in consideration of One ($1.00) Dollar and other valuable considerations, the total of which is less than One hundred ($100.00) Dollars

paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine,

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said

Maine General Hospital, its successors and assigns forever,

A certain lot or parcel of land situated in said Portland and bounded and described as follows:

Beginning at the point of intersection of the Northwesterly side line of Ellsworth Street extended in a Southwesterly direction and the Southwesterly side line of Charles Street; thence Southwesterly along a continuation of the Northwesterly side line of Ellsworth Street extended, a distance of thirty-eight (38) feet, more or less, to a point; thence in a Southeasterly direction parallel to and fifty (50) feet measured perpendicularly Southwesterly of the Northeasterly side line of Charles Street Extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the Northerly terminus of Brackett Street as established and renamed by the City Council of the City of Portland; thence Northeasterly along the line terminating said Brackett Street a distance of thirty-eight (38) feet, more or less, to the point of intersection formed by the above-mentioned line and the Southwesterly side line of Charles Street Extension, so-called; thence Northerly along the Southwesterly side line of Charles Street Extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the point of beginning.

Being the same premises conveyed to the Grantor by warranty deed of the Grantee dated April 9, 1954, recorded in Cumberland County Registry of Deeds in Book 2173, Page 412.

162

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said

Maine General Hospital, its successors

~~Heirs~~ and Assigns forever.

And the said Grantor Corporation does ~~covenant~~ with the said

Maine General Hospital, its successors

~~Heirs~~ and Assigns, that it will ~~Warrant~~ and ~~Forever Defend~~ the said premises to it the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said CITY OF PORTLAND

has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Edwin T. Simmons, Acting City Treasurer ~~xxxxx~~ thereunto duly authorized, this Fifteenth day of August in the year one thousand nine hundred and fifty-six.

Signed, Sealed and Delivered
in presence of

M. Jane King

CITY OF PORTLAND

By Edwin T. Simmons
Acting City Treasurer

(CORPORATE SEAL)

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE AUG 21 1956
Received at 1 H — M and recorded in
BOOK 2308 PAGE 161

State of Maine,
Cumberland } ss. August 15, 1956.

Personally appeared the above named Edwin T. Simmons, Acting City Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me

Justice of the Peace

Know all Men by these Presents, That

229

We, Albert E. Doak and Amelia Doak, both of Portland, County of Cumberland and State of Maine,
in consideration of one dollar and other valuable considerations
paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of the State of Maine, and having its principal place of business at said Portland,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said MAINE GENERAL HOSPITAL, its successors and assigns, forever,

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Charles Street in said Portland, bounded and described as follows: Beginning at a fence post standing on the westerly side line of Charles Street and distant northerly seventy-three and eighty-four hundredths (73.84) feet from the northwesterly corner of Ellsworth and Charles Streets; thence northerly by said Charles Street forty (40) feet to land now or formerly of Frank Abbott; thence westerly by said Abbott's land seventy-four and fifty-six hundredths (74.56) feet to land of the said grantee; thence by land of said grantee southerly forty (40) feet to land now or formerly of W. R. Naylor; thence easterly by said Naylor's land seventy-four and forty-two hundredths (74.42) feet to the point of beginning.

Being the same premises conveyed to these grantors by Henry T. Orlando by deed dated May 29, 1951, and recorded in Cumberland County Registry of Deeds in Book 2044, Page 288.

The grantee corporation herein assumes and agrees to pay the 1957 real estate taxes as part consideration for this transfer.

Doak & to Maine General Hospital -- War

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MAINE GENERAL HOSPITAL, its successors

~~and~~ assigns, to its and their use and behoof forever. And we do covenant with the said Grantee, its successors ~~and~~ assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors ~~and~~ assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we, the said Albert E. Doak and Amelia Doak, husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this third day of May in the year of our Lord one thousand nine hundred and fifty-seven.

Signed, Sealed and Delivered in presence of

Edward B. Perry
E. Bailey

Albert E. Doak
Amelia Doak

State of Maine, Cumberland ss. May 3, 1957.

Personally appeared the above named Albert E. Doak

and acknowledged the foregoing instrument to be his free act and deed.

Before me, Edward B. Perry NOTARY PUBLIC.

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received MAY 3 1957 at 2 o'clock 35 m. P.M., and recorded in BOOK 2349 PAGE 229 Attest: Martha H. S. Bailey Register's Clerk

$6.05

Book 2619
Page 499

Grant
&
to
Maine
Medical
Center
--
War

Know All Men by These Presents,

499

That We, Henry H. Grant and Gladys H. Grant, both of Portland in the County of Cumberland and State of Maine,

in consideration of one ($1.00) dollar and other valuable considerations

paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine and located at said Portland,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated in Portland in the County of Cumberland and State of Maine, on the northwesterly side of Bramhall Street, bounded and described as follows:

Commencing at the southwesterly corner of land, now or formerly, of James Miller and Charlotte Johnson on Bramhall Street; thence northwesterly by land of said James Miller and Charlotte Johnson, sixty (60) feet to land formerly of William J. Knowlton; thence southwesterly along said Knowlton land, parallel with said street, fifty-five (55) feet to a corner of land formerly of William J. Knowlton; thence parallel with first mentioned line sixty (60) feet, more or less, to said street; thence northeasterly by said street fifty-five (55) feet to the place of beginning.

Being the same premises conveyed to us by Russell Fanning by deed recorded in Cumberland County Registry of Deeds in Book 1833, Page 415, and are conveyed subject to the conditions contained in said deed.

The Grantee herein, as part of the consideration hereof, assumes and agrees to pay taxes for the taxable year 1961.



500

We have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said

Maine Medical Center, its successors

~~heirs~~ and assigns, to its and their use and behoof forever.

And we do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that we are lawfully seized in fee of the premises, that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will Warrant and Defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We the said Henry H. Grant

and Gladys H. Grant, being husband and

wife ~~xxxxxxxxxx~~

joining in this deed as Grantor s, and relinquishing and conveying all right by descent and all other rights in the above described premises, have hereunto set our hand s and seals this thirty-first day of July in the year of our Lord one thousand nine hundred and sixty-one.

Signed, Sealed and Delivered
in presence of

Geraldine F. Wall — Henry H. Grant

R. E. Jensen — Gladys H. Grant

State of Maine. Cumberland, ss. July 31, 1961.

Personally appeared the above named Henry H. Grant

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Raymond E. Jensen
Justice of the Peace
~~Notary Public~~

AUG 4 1961
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 28 M A M, and recorded in
BOOK 2619 PAGE 499 Sewall R. Thompson Register

Know All Men by These Presents,

369

That Sewall M. Hobson, 2nd, of Portland, County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration

paid by Maine Medical Center, a corporation duly organized and existing under the laws of the State of Maine with its principal office in said Portland

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated on the northwesterly side of Bramhall Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the northwesterly side line of Bramhall Street with the easterly side line of Western Promenade; thence northeasterly by Bramhall Street One Hundred Four and one-tenth (104.1) feet to the southerly corner of land conveyed by John W. Yeaton to William J. Knowlton, by deed dated April 4, 1885, and recorded in Cumberland County Registry of Deeds, in Book 517, Page 86; thence northwesterly at right angles with Bramhall Street and by said Knowlton land Sixty (60) feet to the southeasterly side line of land conveyed by John W. Yeaton to William J. Knowlton by deed dated June 6, 1882, and recorded in said Registry of Deeds, in Book 488, Page 204; thence southwesterly by said Knowlton land Forty-one and seven tenths (41.7) feet to the easterly side line of Western Promenade at a point Seventy-seven and five tenths (77.5) feet southerly thereon from the southeasterly side line of Arsenal Street; thence southerly by Western Promenade Eighty-six and seventy-eight hundredths (86.78) feet to the point of beginning.

For Grantors title reference is made to the will of Annie H. Dana, and abstract of which is recorded in said Registry of Deeds, in Book 2423, Page 273, and to a certain deed from Saint Germain Foundation et als. dated February 1, 1960, and recorded in said Registry of Deeds in Book 2526, Page 80.

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors

heirs and assigns, to it and their use and behoof forever.

And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises, that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and any heirs shall and will Warrant and Defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof. We the said Sewall M. Hobson, 2nd

and Anne S. Hobson

wife of the said Sewall M. Hobson, 2nd

joining in this deed as Grantor, and relinquishing and conveying her right by descent and all other rights in the above described premises, have hereunto set our hands and seals this Tenth day of July in the year of our Lord one thousand nine hundred and sixty-two.

Signed, Sealed and Delivered
in presence of

Gerald S Cope
to both

Sewall M. Hobson, 2nd (S)
Anne S Hobson (S)



State of Maine. Cumberland ss. July 10th 19 62.

Personally appeared the above named Sewall M. Hobson, 2nd

and acknowledged the foregoing instrument to be his free act and deed.

Before me, Gerald S Cope
Justice of the Peace
~~Notary Public~~

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at JUL 10 1962 11 H 51 M. M. and recorded in
BOOK 2185 PAGE 369 Register

326 (108)

Know all Men by these Presents.

That I, VINCENT C. NEWTON of Portland in the County of Cumberland and State of Maine

Newton

to

Maine General Hospital

War

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of Maine and located at Portland in the County of Cumberland and State of Maine,

the receipt whereof I do hereby acknowledge, do hereby

give, grant, bargain, sell and convey, unto the said Maine General Hospital,

its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated on the westerly side of Charles Street in said Portland, bounded and described as follows:

Beginning on the westerly side line of said Charles Street at the northeasterly corner of land formerly of John M. Jones, now of Maine General Hospital; thence running northerly by said street thirty-eight (38) feet to land formerly occupied by one Graham, now owned by Maine General Hospital; and from these two points extending back westerly at right angles from said street keeping the width of thirty-eight (38) feet and bounded southerly by said Jones land and northerly by said Graham land about seventy-four and two tenths (74.2) feet to the Arsenal Lot, so-called, now of Maine General Hospital; being the same premises conveyed to me by Charles H. Abbott et al by deed dated February 10, 1944, recorded in Cumberland County Registry of Deeds in Book 1737, Page 278.



To Have and to Hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine General Hospital, its successors

heirs and assigns, to its and their use and behoof forever.

And I do COVENANT with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises that they are free of all encumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will WARRANT and DEFEND the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Vincent C. Newton, being unmarried

have hereunto set my hand and seal this 15th day of June in the year of our Lord one thousand nine hundred and sixty-five.

Signed, Sealed and Delivered in presence of

Edward J. McGoldrick

Vincent C. Newton (L.S.)

State of Maine, Cumberland } ss. June 15, 1965.

Personally appeared the above named Vincent C. Newton and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. McGoldrick
Notary Public

EDWARD J. McGOLDRICK NOTARY PUBLIC MAINE MY COMMISSION EXPIRES OCTOBER 8, 1972

STATE OF MAINE
CUMBERLAND, ss. REGISTRY OF DEEDS
Received at 1 H. 26 M. P. M. on JUN 15 1965 and recorded in Book 2901 Page 326. Attest
Register

(184)
EXECUTOR'S AND TRUSTEE'S DEED
[WHEN THE WILL AUTHORIZES A SALE]

927

Know all Men by these Presents.

That I, HELEN M. GRIFFIN

of Portland in the county of Cumberland

sole acting executor of the last will and testament

of Mary Davis late of Portland

deceased, testate, by virtue of the authority to me given by

the said Mary Davis in her last will and

testament, in my capacity of executor as afore-

said, and in consideration of One Dollar ($1.00) and other

valuable considerations

to me paid by MAINE MEDICAL CENTER, a corporation organized under the laws of Maine and situated in Portland

the receipt whereof is hereby ac-

knowledged, do hereby sell and convey unto the said Maine Medical Center, its successors

and assigns, the following described real estate, which was

the property of the said Mary Davis.

A certain lot or parcel of land with the buildings thereon situated in Portland on the northerly side of Brackett Street, bounded and described as follows:

Beginning at the intersection of the northerly side of Brackett Street with the westerly side of Russell Street; thence running northeasterly by Russell Street thirty-seven (37) feet, more or less, to land formerly owned by Hobart W. Richardson; thence running northwesterly by said Richardson land seventy-four (74) feet, more or less, to land formerly owned or occupied by W. S. Dunn; thence southwesterly by the line of said Dunn's land forty-one (41) feet, more or less, to a lane; thence southeasterly by said lane forty-one (41) feet, more or less, to Brackett Street; thence easterly by Brackett Street thirty-seven (37) feet, more or less, to the point of beginning.

Being the same premises conveyed to Mary Davis by Harry E. Davis by deed dated March 18, 1915, recorded in Cumberland County Registry of Deeds in Book 945, Page 109.

Reference is made to Will of said Mary Davis, abstract of which is recorded in said Registry of Deeds in Book 3025, Page 28.

Davis Est

to

Maine Medical Center

Exec

928 To have and to hold the above-granted premises unto the said Maine Medical Center, its successors and assigns forever. And I the said Helen M. Griffin, in my said capacity, do hereby covenant to and with the said Maine Medical Center, its successors and assigns, that I am the lawful executor of the last will and testament of the said Mary Davis ; that I have power under said will to sell as aforesaid; and that in making this conveyance, I have in all respects, acted in pursuance of the authority granted in and by the said last will and testament.

In Witness Whereof, I the said Helen M. Griffin in my said capacity of executor as aforesaid have hereunto set my hand and seal this 31st day of March in the year of our Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered in presence of

Helen M Griffin

State of Maine, Cumberland ss. March 31 1966.

Then personally appeared the above named Helen M. Griffin and acknowledged the above instrument to be her free act and deed in her said capacity.

Before me,

Justice of the Peace.

MAR 31 1966
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 h 55 m, and recorded in
BOOK 2927 PAGE 927 Register

2081

722

Know all Men by these Presents,

J B Brown & Sons to Maine Medical Center

Q C

That J. B. BROWN & SONS, a corporation organized and existing under the laws of the State of Maine, and located at Portland in the County of Cumberland and State of Maine in consideration of one dollar and other valuable considerations, being less than $100.00 paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine, and located at said Portland, the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said MAINE MEDICAL CENTER, its successors and assigns forever,

All its right, title and interest in a strip of land, in the City of Portland, County of Cumberland and State of Maine, said strip being that portion of Charles Street lying between Brackett Street and Ellsworth Street bounded as follows: Beginning at a point on the southeasterly line of Ellsworth Street distant southwesterly One Hundred Sixty-three and seven tenths (163.7) feet from a point in said street line Fifty-seven (57) feet at right angles from a stone monument on three feet offset at the northwest corner of Ellsworth and Wescott Streets; thence running southeasterly making an included angle with the northwesterly direction of Ellsworth Street of One Hundred and One degrees and Twenty minutes (101° 20') a distance of One Hundred and Sixteen (116) feet, more or less, to the northerly line of Brackett Street near Arsenal Street. Said strip is Thirteen (13) feet wide and lies on the southerly side of the above described line.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MAINE MEDICAL CENTER, its successors and assigns forever.

In Witness Whereof, the said J. B. BROWN & SONS has caused this instrument to be sealed with its corporate seal and signed in its corporate name by , its thereunto duly authorized, this 4th day of May in the year of our Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered in presence of

Ruth M. Brown

J. B. BROWN & SONS

By Lyman A. Cousens Jr. Treas.
Philip G. Clifford Director
(Corporate Seal)

May 4 1966

State of Maine, Cumberland ss. 19 66.

Personally appeared the above named Lyman A. Cousens Jr. & Philip G. Clifford of said Grantor Corporation, as aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Nellie H. Foster NOTARY PUBLIC ~~JUSTICE OF THE PEACE.~~

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS
Received MAY 4 1966 at 3 o'clock 17 m. P. M., and recorded
in BOOK 2955 PAGE 722 Attest: Samuel R. Thompson Register.

Know all Men by these Presents, That

We, FRANK S. NEUTS and DELLA J. NEUTS, both of Portland, in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration s paid by JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, both of said Portland

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said

JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, as joint tenants and not as tenants in common, their heirs and assigns forever.

A certain lot or parcel of land, with the buildings thereon, situated on Charles Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the westerly side of Charles Street at the northerly corner of land formerly owned by C. B. Saunders; thence westerly by said Saunders northerly line seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence northerly by line of said Hospital land thirty-six (36) feet to a point; thence easterly on a line parallel with Saunders northerly line seventy-five (75) feet, more or less, to the westerly side line of Charles Street; thence southerly by said Charles Street thirty-six (36) feet to the point begun at.

Being the same premises conveyed to us by Maine General Hospital by deed dated January 30, 1962 and recorded in Cumberland County Registry of Deeds in Book 2637, Page 19.

This conveyance is made subject, however, to the common passageway established by agreement between Maine General Hospital and Clarence D. Read, et al, dated October 29, 1954 and recorded in said Registry of Deeds in Book 2203, Page 413.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, as joint tenants and not as tenants in common, their

heirs and assigns, to them and their use and behoof forever. And we do covenant with the said Grantees, their heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances, except as aforesaid, that we have good right to sell and convey the same to the said Grantees to hold as aforesaid; and that we and our heirs and assigns shall and will warrant and defend the same to the said Grantees, their heirs and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, we, the said FRANK S. NEUTS and DELLA J. NEUTS, being husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our respective rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this second day of March in the year of our Lord one thousand nine hundred and sixty-seven.

Signed, Sealed and Delivered in presence of

Frank S. Neuts

Della J. Neuts

State of Maine, Cumberland, ss. March 2, 1967.

Personally appeared the above named Frank S. Neuts and Della J. Neuts and acknowledged the foregoing instrument to be their free act and deed.

Before me, Notary Public, Justice of the Peace.

STATE OF MAINE, CUMBERLAND COUNTY, ss. REGISTRY OF DEEDS

Received MAR 3 1967 at 11 o'clock 2 m. A. M., and recorded in BOOK 2988 PAGE 139 Attest Leonard R. Thayer Register.

KNOW ALL MEN BY THESE PRESENTS

THAT OLD COLONY TRUST COMPANY a Corporation located in Boston, County of Suffolk and Commonwealth of Massachusetts, sole surviving Trustee under a Trust Agreement created by ALICE A. BURKITT late of Portland and dated March 30, 1961 by virtue of the authority to it given by said Trust Agreement in its capacity of Trustee as aforesaid, and in consideration of One Dollar ($1.00) and other valuable considerations to it paid by MAINE MEDICAL CENTER of Portland, Maine, the receipt whereof is hereby acknowledged, does hereby sell and convey unto the said Maine Medical Center its successors and assigns forever, the following described real estate, which was the property of Alice A. Burkitt late of Portland, situated in said Portland, Maine and bounded as follows:

a certain lot or parcel of land with the buildings thereon, situated in said Portland, bounded and described as follows: Beginning at a point on the easterly side of Western Promenade, which point is eighty-five (85) feet from the intersection of the northeasterly side line of said Promenade with the northwesterly side line of Bramhall Street; thence northerly by the line of said Promenade seventy-seven and five tenths (77.5) feet, more or less, to Arsenal Street; thence northeasterly by said Arsenal Street seventy-four and one tenths (74.1) feet, more or less, to land now or formerly of William J. Miller et al; thence southeasterly at right angles to Arsenal Street by said Miller land fifty-five and five tenths (55.5) feet, more or less, to land formerly of Hiram Knowlton; thence southwesterly parallel with said Arsenal Street one hundred and twenty-seven (127) feet, more or less, to the Western Promenade and point of beginning, containing fifty-six hundred (5600) square feet more or less.

Also another parcel of land adjoining the above described lot, and bounded and described as follows: Commencing at a point on the northwesterly side of Bramhall Street, which point is the northeasterly corner of land of Frederick C. Hussey et al, and ninety-eight and two tenths (98.2) feet, more or less, from the intersection of said northwesterly side line of Bramhall Street with the easterly side line of the Western Promenade; thence northeasterly on said Bramhall Street thirty-three and five tenths (33.5) feet to a point and land formerly of Hiram Knowlton, and from these two points extending northwesterly keeping a width of thirty-three and five

tenths (33.5) feet a distance of sixty (60) feet to the first parcel herein conveyed, containing two thousand and ten (2010) square feet.

Meaning and intending to convey and hereby conveying the real estate acquired by Alice A. Burkitt by Warranty Deed of Good Will Home Association dated December 11, 1930 recorded in the Cumberland County Registry of Deeds Book 1361, page 373; said real estate having been devised to the Grantor as Trustee by the Will of Alice A. Burkitt duly probated in the Cumberland County Probate Court.

TO HAVE AND TO HOLD the above-granted premises unto the said Maine Medical Center its successors and assigns forever. And the said Old Colony Trust Company in its said capacity does hereby covenant to and with the said Maine Medical Center its successors and assigns that it is the sole surviving Trustee under said Trust Agreement; that it has power under said Trust Agreement to sell as aforesaid; and that in making this conveyance it has in all respects acted in pursuance of the authority granted in and by said Trust Agreement.

IN WITNESS WHEREOF, the said Old Colony Trust Company in its said capacity as Trustee as aforesaid has caused this instrument to be signed in its corporate name and sealed with its corporate seal by S. Vincent its Trust Officer Vice President thereunto duly authorized this 4th day of February 1969.

Witness:

OLD COLONY TRUST COMPANY

By S. Vincent
Its Trust Officer
Vice President

COMMONWEALTH OF MASSACHUSETTS
SUFFOLK, SS. February 4, 1969.

Then personally appeared the above-named S. Vincent who made oath that the foregoing instrument was his free act and deed and the free act and deed of the Grantor corporation in its said capacity as Trustee as aforesaid.

Before me,

Notary Public

Mary F. Archoska
NOTARY PUBLIC
My commission expires May 28, 1971

CERTIFICATE OF TRUSTEE

I, JAMES R. KINGSBURY of Newton Massachusetts, Trust Officer of Old Colony Trust Company of Boston, Massachusetts, hereby certify that Old Colony Trust Company became a Co-Trustee of a certain Revocable Inter Vivos Trust created by ALICE A. BURKITT with said Old Colony Trust Company and NORMAN A. BURKITT as Co-Trustees under a Trust Agreement dated March 30, 1961;

That Norman A. Burkitt is deceased and the Old Colony Trust Company is now acting as sole surviving Trustee;

That said Trust is no longer revocable inasmuch as the Settlor who reserved the power of revocation has since died;

That among the powers given to the Trustees is the following:

> "The Trustees, in addition to and not in limitation of all common law and statutory authority, shall have power, as to any real or personal property in the trust fund or any part thereof, to mortgage, to lease with or without option to purchase and although for a term extending beyond the termination of the trust, to sell in whole or in part at public or at private sale without approval of any court and without liability upon any person dealing with the Trustees to see to the application of any money or other property delivered to them; . . ."

Dated at Boston, Massachusetts, this 4TH day of February 1969.

James R. Kingsbury

COMMONWEALTH OF MASSACHUSETTS
SUFFOLK, SS.

February 4, 1969.

Personally appeared the above named James R. Kingsbury and made oath to the truth of the foregoing certificate by him subscribed.

Before me,

Mary F. Archoska
Notary Public

Mary F. Archoska
NOTARY PUBLIC
My commission expires May 28, 1971

FEB 17 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 11 & 35 A.M. and recorded in
BOOK 3673 PAGE 669 Samuel R. Kingsbury Register

No. 184

Know All Men by these Presents,

That I, CLARA G. READ, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation having a place of business in said Portland, in said County and State,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its Successors Heirs and Assigns forever,

the following described property:

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street in said Portland, bounded and described as follows:

Beginning on said southwesterly side of Charles Street at a point thirty (30) feet northwesterly by said Street from the northeasterly corner of land formerly of Charles A. Donnell; thence northwesterly by said Street thirty (30) feet; thence southwesterly parallel with the line of said Donnell land seventy-four and two-tenths (74.2) feet to land formerly known as the Arsenal property; thence southeasterly by said Arsenal lot thirty (30) feet; thence northeasterly parallel with said Donnell land seventy-four and two-tenths (74.2) feet to the point of beginning.

Being the same premises conveyed to this Grantor and Clarence D. Read, as joint tenants, by Grace R. Loomis by deed dated September 1, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 336. The said Clarence D. Read having deceased and his estate is of record in the Registry of Probate for Cumberland County, Maine.

The Grantor herein shall have the right to occupy the premises hereby conveyed until September 15, 1969.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation
13.75

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its Successors

~~Heirs~~ and Assigns, to them and their use and behoof forever.

And I do **covenant** with the said Grantee, its Successors ~~Heirs~~ and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will **Warrant and Defend** the same to the said Grantee, its Successors

~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Clara G. Read, being a widow,

~~and~~ ~~wife of the said~~

~~joining in this deed as Grantor and relinquishing and conveying~~

~~right by descent and all other rights in the above~~

~~described premises~~, have hereunto set my hand and seal this 22nd day of July in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

John W. Sturgis — Clara G. Read

State of Maine, CUMBERLAND } ss. July 22, 1969.

Personally appeared the above named

CLARA G. READ

and acknowledged the above instrument to be her free act and deed.

Before me, John W. Sturgis
Justice of the Peace

JUL 23 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 h 58 m, and recorded in
BOOK 3095 PAGE 34 Gerard R. Thompson Register

21-1

47333 No. 116

Know All Men by these Presents,

That We, WILLIAM C. GOKEY and SUZANNE E. GOKEY, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its successors Heirs and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated on the southeasterly side of Ellsworth Street in said Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the northeasterly corner of a lot of land on Bramhall's Hill which John B. Brown sold to one Tuttle; thence northeasterly on said Ellsworth Street forty (40) feet; thence southeasterly about seventy-four (74) feet to land formerly of Davis; thence southwesterly by said Davis's land to land formerly of said Tuttle forty (40) feet; thence northwesterly to said Ellsworth Street, the bounds begun at, seventy-four (74) feet.

Being the same premises conveyed to William C. Gokey and Suzanne E. Gokey by Thelma A. Barter, by deed dated June 19, 1968, recorded in Cumberland County Registry of Deeds in Book 3045, Page 187.

This conveyance is made subject to taxes for the year 1969 which the Grantee assumes and agrees to pay.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
$18.15

To have and to hold the aforegranted and bargained premises, 245
with all privileges and appurtenances thereof to the said
Maine Medical Center, its successors

~~Heirs~~ and Assigns, to its and their use and behoof
forever.

And we do covenant with the said Grantee, its successors ~~Heirs~~
and Assigns, that we are lawfully seized in fee of the premises;
that they are free of all incumbrances;
that we have good right to sell and convey the same to the said
Grantee to hold as aforesaid; and that we and our Heirs, shall
and will Warrant and Defend the same to the said Grantee,
its successors
~~Heirs~~ and Assigns forever, against the lawful claims and demands
of all persons.

In Witness Whereof, we the said William C. Gokey
and Suzanne E. Gokey, being husband and wife

~~xxxx~~ ~~xxxxxxxxxxxxxxxxxxxx~~

~~joining in this deed as Grantor, and relinquishing and conveying~~
~~rights by dower and all other rights in the above~~
~~described premises~~, have hereunto set our hands and seals this
11th day of August in the year of our Lord
one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered
in presence of

Edward F. Jones

William C. Gokey
Suzanne E. Gokey

State of Maine,
Cumberland } ss.

August 11, 1969

Personally appeared the above named
William C. Gokey
and acknowledged the above instrument to be his free act and
deed.

Before me, Edward F. Jones
Justice of the Peace

AUG 11 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 2 H 24 M, and recorded in
BOOK 3097 PAGE 244 Edward R. Thompson Register

(106)

396 [illegible]

Know all Men by these Presents,

That JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine, and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center, its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land, with the buildings thereon, situated on Charles Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the westerly side of Charles Street at the northerly corner of land formerly owned by C. B. Saunders; thence westerly by said Saunders northerly line seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence northerly by line of said Hospital land thirty-six (36) feet to a point; thence easterly on a line parallel with Saunders northerly line seventy-five (75) feet, more or less, to the westerly side line of Charles Street; thence southerly by said Charles Street thirty-six (36) feet to the point begun at.

Being the same premises conveyed to us by Frank S. Neuts, by deed dated March 2, 1967, recorded in Cumberland County Registry of Deeds in Book 2988, Page 139.

This conveyance is made subject, however, to the common passageway established by agreement between Maine General Hospital and Clarence D. Read et al, dated October 29, 1954, recorded in said Registry of Deeds in Book 2203, Page 413.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation
$1.85

397

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine Medical Center, its successors

~~xxxxx~~ and assigns, to its and their use and behoof forever.

And we do COVENANT with the said Grantee, its successors ~~xxxxx~~ and assigns, that we are lawfully seized in fee of the premises that they are free of all encumbrances except as aforesaid;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will WARRANT and DEFEND the same to the said Grantee, its successors ~~xxxxx~~ and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, we the said John P. Constantine and Charlene M. Constantine, being husband and wife,

~~and~~

~~wife~~ ~~xxxxxxxxxx~~

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~ have hereunto set our hands and seals this 7th day of November in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

Edward F. Sims to both

John P. Constantine

Charlene M. Constantine

State of Maine, Cumberland } ss. 19 69.

Personally appeared the above named John P. Constantine and acknowledged the above instrument to be his free act and deed.

NOV 7 1969 Before me, Edward F. Sims

Justice of the Peace, Register ~~Notary Public.~~

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE

Received at 11 M 18 M. and recorded in

BOOK 3108 PAGE 396 Edward R. [illegible]

No. 108
14804

Know All Men by these Presents.

That I, AGNES E. TWEEDIE, formerly AGNES E. BROWN, of Portland, County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and having its principal place of business at Portland, County of Cumberland and State of Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER,

its successors ~~Heirs~~ and Assigns forever,

the following described property: A certain lot or parcel of land, with the buildings thereon, situated in the City of Portland, County of Cumberland and State of Maine, on the corner of Brackett and Russell Streets and bounded as follows: Southwesterly by said Brackett Street; northwesterly by said Russell Street; northeasterly by land formerly of J. K. Emery and southeasterly by land now or formerly of Annie F. Chapman; containing about twenty-one hundred and fifty-one (2151) square feet.

Being the same premises conveyed to the Grantor herein and her late husband, Kenneth C. Brown, by deed dated January 22, 1962 and recorded in the Cumberland County Registry of Deeds, Book 2655, Page 344.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

031316

STATE OF MAINE
REAL ESTATE TRANSFER TAX
AUG-2'72 Bureau of Taxation $16.50

To have and to hold the aforegranted and bargained premises. with all privileges and appurtenances thereof to the said

MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And I do **covenant** with the said Grantee, its ~~Heirs~~ successors and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will **Warrant and Defend** the same to the said Grantee, its successors

~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons, except as aforesaid

In Witness Whereof, I the said

AGNES E. TWEEDIE, being a widow

~~and~~ ~~[illegible]~~

~~joining in this deed as Grantor, and relinquishing and conveying rights by descent and all other rights in the above described premises,~~ have hereunto set my hand and seal this day of in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

[signature] — Agnes E. Tweedie

State of Maine, Cumberland } ss.

July 30 1971

Personally appeared the above named AGNES E. TWEEDIE

and acknowledged the above instrument to be her free act and deed.

Before me, [signature]

Justice of the Peace

My commission [illegible]

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE AUG 2, 1971
Received at 2 H 41 M P M, and recorded in
BOOK 3183 PAGE 576 [signature] Register

234 **Know all Men by these Presents, That** 16674 Book 3187 Page 234

I, MARGUERITE M. BROOKS of Portland, County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration

paid by MAINE MEDICAL CENTER, a corporation organized under the laws of the State of Maine with a place of business at Portland, County of Cumberland and State of Maine,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said MAINE MEDICAL CENTER, its successors and assigns forever.

A certain lot or parcel of land with the buildings thereon, situated on the southeasterly side of Ellsworth Street, in the City of Portland, County of Cumberland and State of Maine, and at present numbered forty-four (44) on said street; said lot of land being bounded and described as follows:

Beginning at the northeasterly corner of Ellsworth Street and a lane running from said Ellsworth Street to the junction of Brackett and Arsenal Streets; thence northeasterly by said Ellsworth Street, twenty-six (26) feet, more or less, to land now or formerly of Neal P. Thompson; thence southeasterly by said Thompson land, seventy-four (74) feet, more or less, to land now or formerly owned by John Russell; thence southwesterly by said Russell land, forty (40) feet, more or less, to said lane; thence northwesterly by said lane, seventy-five (75) feet, more or less, to the point begun at.

Being the same premises conveyed to me by Walter E. Mangum et al by deed dated October 15, 1957 and recorded in Cumberland County Registry of Deeds in Book 2379, Page 181.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation 30.80

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MAINE MEDICAL CENTER, its successors

~~heirs~~ and assigns, to their use and behoof forever. And I do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances except as aforesaid, that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, I, the said MARGUERITE M. BROOKS, being single,

~~joining in this deed as Grantor, and relinquishing and conveying rights by descent and all other rights in the above described premises~~, have hereunto set my hand and seal this 23rd day of August in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

Charles R. Cartwicker — Marguerite M. Brooks

State of Maine, Cumberland ss. August 23, 1971.

Personally appeared the above named MARGUERITE M. BROOKS

and acknowledged the foregoing instrument to be her free act and deed.

Before me, Charles R. Cartwicker ~~NOTARY PUBLIC~~ JUSTICE OF THE PEACE.

STATE OF MAINE, CUMBERLAND COUNTY, SS. *REGISTRY OF DEEDS*

Received AUG 23 1971 *at* 1 o'clock 40 *m.* 00 *M., and recorded in BOOK* 3187 *PAGE* 234 *Attest:* [signature] *Register.*

17480

Book 3188
Page 710

710

Know all Men by these Presents, That

PORTLAND WATER DISTRICT, a quasi-municipal corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

in consideration of one dollar and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and located at said Portland in said County and State

the receipt whereof it does hereby acknowledge, do es hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said MAINE MEDICAL CENTER, its successors and assigns forever,

A certain lot or parcel of land situated in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the intersection of the westerly side line of Vaughan Street with the southwesterly side line of Brackett Street; thence northwesterly by Brackett Street, two hundred forty-two and seventy-two hundredths (242.72) feet, more or less, to Bramhall Street; thence southwesterly by Bramhall Street, eighty-one and five hundredths (81.05) feet, more or less, to Chadwick Street; thence southerly by Chadwick Street, three hundred fifty-seven and forty-five hundredths (357.45) feet, more or less, to land of Chadwick Realty Corp.; thence by land of said Chadwick Realty Corp. and land of Maine General Hospital, two hundred eighty-eight and sixty-five hundredths (288.65) feet, more or less, to Vaughan Street; thence northerly by Vaughan Street, three hundred fifty-three and sixty-two hundredths (353.62) feet, more or less, to Brackett Street and the point of beginning. Containing 2.52 acres, more or less, and being known as the Bramhall Reservoir Lot.

A portion of the above-described premises, known as the J. & W. Warren Lot, was conveyed to the Portland Water Company by the following warranty deeds all dated May 1, 1869: deed of George Warren et al of a 1/3rd interest, recorded in Cumberland County Registry of Deeds, Book 368, Page 421; deed of John G. Warren of a 1/3rd interest, recorded in said Registry of Deeds, Book 368, Page 424; deed of Caroline Chadbourne et al of a 1/9th interest, recorded in said Registry of Deeds, Book 368, Page 423; and deed of Benjamin F. Chadbourne et al of a 2/9ths interest, recorded in said Registry of Deeds, Book 368, Page 425; and the remaining portion of said premises, known as the Payson Lot, was conveyed to said Portland Water Company by Henry M. Payson by warranty deed dated July 17, 1885, and recorded in said Registry of Deeds, Book 531, Page 32; all of said premises having been conveyed to said Portland Water District by Portland Water Company by quit-claim deed dated August 10, 1908, and recorded in said Registry of Deeds, Book 827, Page 147.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said

MAINE MEDICAL CENTER, its successors

~~their~~ and assigns forever. And it do es covenant with the said Grantee , its successors ~~heirs~~ and ~~heirs~~ assigns, that it will warrant and forever defend the premises to the said Grantee , its successors ~~heirs~~ and ~~heirs~~ assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said PORTLAND WATER DISTRICT has caused this instrument to be sealed with its corporate seal and signed in its corporate name by William D. Monie , its Treasurer , thereunto duly authorized,

~~All of the dower and homestead and other rights and conveying rights by descent and all other rights in the above described premises have hereunto set~~ this first day of September in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

Robert B. Williamson

PORTLAND WATER DISTRICT

By William D. Monie
Its Treasurer

State of Maine, Cumberland ss. September 1, 1971.

Personally appeared the above named William D. Monie, Treasurer of said Grantor Corporation, as aforesaid

and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Robert B. Williamson
~~Notary Public~~ Justice of the Peace.

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received SEP 1 1971 at 12 o'clock 06 m. P M., and recorded in BOOK 3188 PAGE 710 Attest: Margaret E. Kelley Register.

17050

Know All Men by These Presents,

209

That the CITY OF PORTLAND, a body politic and corporate,

[redacted]

[redacted] located at Portland

in the County of Cumberland and State of Maine

in consideration of Thirteen Thousand Five Hundred ($13,500.00) Dollars

paid by the MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine, whose address is 22 Bramhall Street, Portland, Maine

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey and Forever Quit-Claim unto the said

Maine Medical Center, its successors

[redacted] and assigns forever,

a certain lot or parcel of land in the City of Portland, County of Cumberland and State of Maine, being bounded and described as follows:

Beginning at a point marking the intersection of the westerly terminus of the northerly side line of Bramhall Street and the Northerly terminus of the easterly side line of Western Promenade; thence on a course of South 61° 00' 30" West along a prolongation of the northerly side line of said Bramhall Street, a distance of eighty-six and eight hundredths (86.08) feet to a point; thence North 50° 49' 20" West, a distance of one hundred fifty-one and thirty-nine hundredths (151.39) feet to a point which point is on the southeasterly side line of Arsenal Street as it was formerly laid out; thence North 62° 24' 00" East fifty (50) feet to a point; thence North 27° 36' 00" West, a distance of forty (40) feet to a point on the northwesterly side line of Arsenal Street, as it was formerly laid out; thence North 62° 24' 00" East, a distance of two hundred seventy-two (272) feet, more or less, to a point which point is two hundred forty-eight (248) feet from the starting point hereof when measured on a course of North 16° 58' 00" East from said starting point; thence South 16° 58' 00" West, a distance of two hundred forty-eight (248) feet to said starting point.

Being a portion of the premises conveyed to the Grantor by deed of Sarah Little dated July 11, 1856, recorded in Cumberland County Registry of Deeds in Book 274, Page 6.

By acceptance of this deed, the Grantee covenants and agrees for itself, its successors and assigns:

(1) That the Grantee shall secure Planning Board review and approval of the site plan for its proposed development prior to beginning construction of any building and landscaping of the land herein conveyed.

(2) That the Grantee shall submit to the Planning Board for review and approval a grading plan within three months from the date hereof; that it will initiate actual grading work within six months from the date hereof; and that it will complete such grading work within three months from the date of completion of the proposed building.

(3) That the Grantee shall provide and forever maintain access for fire equipment satisfactory to the Fire Chief of the City of Portland to the proposed building and the remainder of the Medical Center Building Complex.

210

(4) That in the event of failure of the Grantee to complete or substantially complete the construction of the proposed building, landscaping, and grading in accordance with the approved site plan within three (3) years from the date hereof, the Grantee shall be required at the election of the Grantor, to reconvey to the Grantor all or such portion of the premises herein conveyed as the Grantor shall require for an amount which bears the same per square foot price as was paid for the premises herein conveyed.

(5) That if within a period of eight (8) years from the date hereof, the Grantee shall decide to sell any portion of the premises herein conveyed without selling all of its premises, it shall notify the Grantor in writing by registered mail directed to the City Manager of the City of Portland of its desire to sell such portion and thereupon the Grantor shall have the exclusive option for a period of sixty (60) days from the receipt of such notice to buy such portion for an amount which bears the same per square foot price as was paid for the premises herein conveyed.

(6) That the Grantee shall simultaneously with delivery of this deed to it, deliver to the Grantor at no cost to it a deed covering a parcel of land located at the intersection of the easterly side line of Gilman Street and the northwesterly side line of Arsenal Street for the purpose of providing a turn-around area serving Gilman Street.

(7) That the Grantee shall construct or cause to be constructed at no cost to the Grantor said turn-around area in accordance with specifications to be approved by the Director of Public Works of the City of Portland.

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said Maine Medical Center its successors and Assigns forever. And the said Grantor Corporation does covenant with the said Maine Medical Center, its successors and Assigns, that it will Warrant and Forever Defend the premises to it the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said CITY OF PORTLAND has caused this instrument to be sealed with its corporate seal and signed in its corporate name by JOHN G. DePALMA, its Director of Finance thereunto duly authorized, this 4th day of August in the year one thousand nine hundred and seventy-two.

Signed, Sealed and Delivered in presence of

CITY OF PORTLAND

By John G. DePalma
Director of Finance

[CORPORATE SEAL]

State of Maine. CUMBERLAND ss. August 4 1972.

Personally appeared the above named JOHN G. DePALMA, Director of Finance of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me,

Notary Public

AUG 4 1972
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 H 05 M. and recorded in
BOOK 3278 PAGE 209 Register

23119

115

KNOW ALL MEN BY THESE PRESENTS that STATE OF MAINE, a body corporate and politic existing by law, in consideration of One Dollar ($1.00) and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine with its principal place of business in the City of Portland, County of Cumberland and State of Maine, the receipt whereof it does hereby acknowledge, does hereby RELEASE, GRANT and TRANSFER unto the said MAINE MEDICAL CENTER, its successors and assigns, all and any rights and interests in the former site of the State Arsenal situated on Bramhalls Hill, so-called, in the City of Portland, County of Cumberland and State of Maine, being all and the same premises described by Chapter 180 of the Resolves of the State of Maine, 1870, and Chapter 107 of the Resolves of the State of Maine, 1951, including any right of entry, reversion or other interest of the State of Maine in said premises reserved in the State of Maine by either of said Resolves and State of Maine does hereby waive as to said Maine Medical Center its successors and assigns any such rights which may now exist or which may in the future exist in State of Maine by virtue of said Resolves.

TO HAVE AND TO HOLD the aforegranted premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors and assigns, and State of Maine does hereby covenant with said Maine Medical Center, its successors and assigns that State of Maine lawfully holds rights in said premises by virtue of said Resolves; that said rights are not encumbered; that it has good right to grant the same to Maine Medical Center as aforesaid; and that State of Maine, its successors and assigns, shall and will warrant and defend the same to Maine Medical Center, its successors and assigns forever against the lawful claims and demands of all persons; provided, nevertheless, that any and all liability of State of Maine for any damage or loss to Maine Medical Center, its successors and assigns, by virtue of any breach of the foregoing covenants and warranties shall be and hereby is limited forever to the total amount of One Dollar ($1.00).

IN WITNESS WHEREOF, Kenneth M. Curtis, Governor of the State of Maine, and Edmund C. Darey, Chairman of the Executive Council of the State of Maine, acting for and with the advice and consent of the said Executive Council given this date, have caused this instrument to be executed and sealed on behalf of the State of Maine this 6th day of September, 1972.

Witness:

Peter M. Dawborn

Thea L. Stewart

STATE OF MAINE

By Kenneth M. Curtis
Its Governor

By Edmund C. Darey
Its Chairman - Executive Council

STATE OF MAINE
KENNEBEC, ss.

September 6, 1972

Personally appeared the above-named Kenneth M. Curtis, Governor of the State of Maine, and Edmund C. Darey, Chairman of the Executive Council of the State of Maine and acknowledged the foregoing to be their free act and deed in said capacity and the free act and deed of said State of Maine.

Before me,

Peter M. Dawborn
~~Notary Public~~
Justice of the Peace

Approved as to form:
Lynn E. Hutchins
Assistant Attorney General

STATE OF MAINE

CUMBERLAND, ss. REGISTRY OF DEEDS

Received at 11 H 16 M A M on OCT 12 1972 and recorded in Book 3310 Page 115

Attest Loretta Murphy Register

116

23120

KNOW ALL MEN BY THESE PRESENTS, that CITY OF PORTLAND, a body corporate and politic existing by law, situated at Portland, County of Cumberland and State of Maine, in consideration of One Dollar ($1.00) and other valuable considerations paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine with its principal place of business in the City of Portland, County of Cumberland and State of Maine, the receipt whereof it does hereby acknowledge, does hereby RELEASE, GRANT and TRANSFER unto the said MAINE MEDICAL CENTER, its successors and assigns, all its rights and interests in the land situated on Bramhall's Hill, so-called, in the City of Portland, County of Cumberland and State of Maine which land was conveyed by City of Portland to Maine General Hospital by deed dated June 4, 1870, which deed is duly recorded in the Cumberland County Registry of Deeds, Book 381, Pages 260, 261 and 262, to which deed reference is made for a particular description of said land, including any right of entry, possibility of reverter, reversionary or other interest of the City of Portland in said land reserved to said City in said deed and City of Portland does hereby waive as to said Maine Medical Center, its successors and assigns, said right of entry and any such other rights which may now exist or which may in the future exist in the City of Portland by virtue of said deed.

TO HAVE AND TO HOLD the aforegranted premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors and assigns, and City of Portland does hereby covenant with said Maine Medical Center, its successors and assigns that City of Portland lawfully holds rights in said land by virtue of said deed of June 4, 1870; that said rights are not encumbered; that it has good right to grant the same to Maine Medical Center as aforesaid; that City of Portland, its successors and assigns, shall and will warrant and defend the same to Maine Medical Center, its successors and assigns forever against the lawful claims and demands of all persons; provided, nevertheless, that any and all liability of City of Portland for any damage or loss to Maine Medical Center, its successors and assigns, by virtue of any breach of the foregoing covenants and warranties shall be and hereby is limited forever to the total amount of One Dollar ($1.00).

IN WITNESS WHEREOF, City of Portland has caused this deed to be sealed and executed by John G. DePalma, its Director of Finance hereunto duly authorized, this 14th day of September, 1972.

Witness:

CITY OF PORTLAND

By _____
Its Director of Finance

STATE OF MAINE
CUMBERLAND, ss.

September 14, 1972

Personally appeared the above-named John G. DePalma, Director of Finance of said City of Portland and acknowledged the foregoing to be his free act and deed in said capacity and the free act and deed of said City of Portland.

Before me,

_____
Justice of the Peace — Notary Public

OCT 12 1972
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 11 H/7 M/4 M. and recorded in
BOOK 3310 PAGE 116 _____ Register

53

No. 108
6367

Know All Men by these Presents,

That We, LEROY E. APPLEBEE and ROBERTA M. APPLEBEE, both of Portland, in the County of Cumberland and State of Maine,

in consideration of One Dollar ($1) and other valuable considerations,

paid by MAINE MEDICAL CENTER, a Maine corporation with a place of business in Portland, in the County of Cumberland and State of Maine,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER, its successors and Assigns forever,

~~the following described property:~~

See attached Exhibit A.

54

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns, to it and their use and behoof forever.

And we do covenant with the said Grantee, its/ ~~Heirs~~ Successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, We, the said LEROY E. APPLEBEE

and ROBERTA M. APPLEBEE, ~~wife~~ husband and wife,

joining in this deed as Grantors, and relinquishing and conveying our/ mutual rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 7th day of April in the year of our Lord one thousand nine hundred and seventy-seven.

Signed, Sealed and Delivered in presence of

LEROY E. APPLEBEE

ROBERTA M. APPLEBEE

State of Maine,
Cumberland, } ss.

April 7 1977

Personally appeared the above named LEORY E. APPLEBEE and ROBERTA M. APPLEBEE and acknowledged the above instrument to be their free act and deed.

Before me,

Justice of the Peace

EXHIBIT A

A certain lot or parcel of land with the buildings thereon, situated on Bramhall Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at a stone monument on the westerly corner of Brackett and Bramhall Streets; thence North 57° 20' West, 70.7 feet by the westerly sideline of Brackett Street; thence South 61° 07' West, 42.3 feet by the northerly sideline of a garage on the lot under description; thence South 27° 57' East, 62-1/2' feet to a point on the northerly sideline of Bramhall Street; thence North 61° 51' East, 77.5 feet by the northerly sideline of Bramhall Street to the stone monument aforesaid and point of beginning, together with the right to have the eaves of said garage which project over land of Ella C. Gardner remain as now constructed as long as said garage is maintained in its present position.

Being the same premises conveyed to Leroy E. Applebee and Roberta M. Applebee by Edna M. Sharp by deed dated September 27, 1972, and recorded in Cumberland County Registry of Deeds in Book 3303, Page 200.

APR 7 1977
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 22 M A.M., and recorded in
BOOK 3995 PAGE 53. Margaret L. Fisher Register

WARRANTY DEED

319

Know all Men by these Presents,

That JAMES H. SULLIVAN, Jr. of 26 Charles Street, Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation with a place of business in Portland, in the County of Cumberland and State of Maine whose mailing address is 22 Dramhall Street, Portland, Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors

heirs and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street and the southeasterly side of Congress Street, in Portland, Maine, bounded and described as follows: Beginning at a point on the southwesterly side of said Charles Street at the northerly corner of land conveyed by Edward E. Proctor to Lulu M. Stickney by warranty deed dated May 16, 1890 and recorded in the Cumberland County Registry of Deeds in Book 567, Page 348; thence running southwesterly by said Stickney land a distance of seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence running northwesterly by said Hospital land to the southeasterly side of Congress Street; thence running northeasterly by the southeasterly side of Congress Street seventy-five (75) feet, more or less, to land conveyed by Henry A. Sargent to Lucinda B. Proctor by warranty deed dated August 14, 1896, and recorded in said Registry of Deeds in Book 639, Page 284; thence running southeasterly by said Proctor land and by the southwesterly side line of said Charles Street to said Stickney land and the point of beginning.

Being the same premises conveyed to James H. Sullivan, Jr. by deed dated August 23, 1976 and recorded in said Registry of Deeds in Book 3936, Page 282.

320

To have and to hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors

~~heirs~~ and assigns, to it and ~~their~~ its use and behoof forever.

And I do covenant with the said Grantee, its/ ~~heirs~~ successors and assigns, that I am lawfully seized in fee of the premises, that they are free of all encumbrances

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will warrant and defend the same to the said Grantee, its/ ~~heirs~~ successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said James H. Sullivan, Jr. being unmarried

~~and~~

~~husband/wife of the said~~

~~joining in the deed of Grantee and~~ relinquishing and conveying all rights by descent and all other rights in the above described premises, have hereunto set my hand and seal this 25th day of the month of May, A.D. 19 83.

Signed, Sealed and Delivered in presence of

[signature] James H. Sullivan, Jr.

State of Maine, County of Cumberland **ss.** 25 May, 19 83.

Then personally appeared the above named James H. Sullivan, Jr.

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

[signature]

My commission expires Sept. 20, 1986

Justice of the Peace
Notary Public
Attorney at Law

MAY 26 1983

REGISTRY OF DEEDS CUMBERLAND COUNTY, MAINE
Received at 12:01 P.M., and recorded in
BOOK 6177 PAGE 319

James J. Walsh Register

024397 BK0309PG0005

Book 8309
Page 6

QUITCLAIM DEED
With Covenant

Know all Men by these Presents,

That we, JOHN J. HAMMETT and ELIZABETH B. HAMMETT, both of Portland, County of Cumberland, Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MMC REALTY CORP., a Maine corporation with a place of business at 22 Bramhall Street, in the County of Cumberland, Maine

whose mailing address is 22 Bramhall Street, Portland, Maine 04102

the receipt whereof we do hereby acknowledge, do hereby remise, release, bargain, sell and convey, and forever quitclaim unto the said MMC Realty Corp., its

successors and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the northwesterly corner of Bramhall and Brackett Streets, in said Portland, and bounded and described as follows:

Beginning at the northwesterly corner of Brackett and Bramhall Streets; thence westerly on Brackett Street seventy-five (75) feet ten (10) inches, more or less, to land conveyed by William H. Chapman to Charles E. Graham by deed of April 29, 1920 and recorded in the Cumberland County Registry of Deeds in Book 1050, Page 213; thence northerly by land now or formerly of said Graham sixty-one (61) feet six (6) inches, more or less, to land conveyed by Alden J. Blethen to James K. Emery by deed dated April 30, 1880 and recorded in said Registry of Deeds in Book 467, Page 152; thence easterly by land now or formerly of said Emery sixty-six (66) feet six (6) inches to Bramhall Street; thence southerly by said Bramhall Street thirty (30) feet three (3) inches, more or less, to the point of beginning.

Being the same premises conveyed to the Grantors herein by Sumner J. Goffin by deed dated February 4, 1950 and recorded in said Registry of Deeds in Book 1985, Page 483.

MAINE REAL ESTATE TRANSFER TAX PAID

BK8309PG0006

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MMC Realty Corp., its successors

~~Heirs~~ and assigns forever.

And we do covenant with the said Grantee, its/ successors ~~Heirs~~ and assigns, that we shall and will warrant and defend the premises to the said Grantee, its/ successors ~~Heirs~~ and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under us.

In Witness Whereof, we, the said John J. Hammott and Elizabeth B. Hammott

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~ have hereunto set our hands and seals this 31st day of the month of May, A.D. 19 88.

Signed, Sealed and Delivered
in presence of

[signature]
[signature]

[signature]
John J. Hammott
[signature]
Elizabeth B. Hammott, by John J. Hammott as her Attorney in Fact pursuant to Power of Attorney dated August 16, 1984 and recorded herewith in the Cumberland County Registry of Deeds

State of Maine, County of Cumberland ss. May 31, 1988.

Then personally appeared the above named John J. Hammott

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

[signature]
Notary Public
Attorney at Law

Printed Name Lee D. Urban

RECEIVED
RECORDED REGISTRY OF DEEDS
1988 JUN -1 AM 8:31
CUMBERLAND COUNTY
James J. Walsh

BK8855PG0081

036413 WARRANTY DEED

MAINE REAL ESTATE TAX PAID

KNOW ALL MEN BY THESE PRESENTS, that GILMAN STREET LAND COMPANY, a Maine corporation, and GILMAN STREET ASSOCIATES, a Maine limited partnership, for consideration paid, grant to MMC REALTY CORP., a Maine Corporation with a principal place of business in Portland, County of Cumberland, State of Maine, whose mailing address is 22 Bramhall Street, Portland, Maine 04103, with WARRANTY COVENANTS a certain lot or parcel of land, with the improvements thereon, located at 52 Gilman Street, in the City of Portland, County of Cumberland, State of Maine, all as more particularly described in Schedule A attached hereto and incorporated herein.

IN WITNESS WHEREOF, the said GILMAN STREET LAND COMPANY has caused this instrument to be sealed with its corporate seal and signed in its corporate names by William H. Webster, its President, hereunto duly authorized, this 4th day of August, 1989, and the said GILMAN STREET ASSOCIATES has caused this instrument to be signed and sealed by William H. Webstar, President of its General Partner MORSE, PAYSON & NOYES PROPERTIES, hereunto duly authorized, this 4th day of August, 1989.

WITNESS:

Robert B. Patterson, Jr.

GILMAN STREET LAND COMPANY

By: W. H. Webster
William H. Webster
Its President

GILMAN STREET ASSOCIATES

By: MORSE, PAYSON & NOYES PROPERTIES,
Its General Partner

Robert B. Patterson, Jr.

By: W. H. Webster
William H. Webster
Its President

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

August 4, 1989

Then personally appeared before me the above named William H. Webster, President of Gilman Street Land Company, and President of Morse, Payson & Noyes Properties, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporations and partnership.

Before me,

Robert B. Patterson Jr.
~~Notary Public~~/Attorney at-Law

Robert B. Patterson, Jr.
Printed Name

~~My Commission Expires~~ _____

SCHEDULE A TO WARRANTY DEED

PARCEL ONE

A certain lot or parcel of land with the buildings thereon known as 52 Gilman Street, in Portland, County of Cumberland and State of Maine bounded and described as follows:

Beginning at a point on said street distant one hundred six and fifty-five one hundredths (106.55) feet northerly from the intersection of the westerly side of Gilman Street with the northerly side of A Street, and running thence northerly on said Gilman Street, thirty-seven and one half (37-1/2) feet to a point; thence westerly with an included angle of 91° 11' seventy and forty-two one hundredths (70.42) feet to a point; thence southerly and parallel to said Gilman Street, thirty-seven and one half (37-1/2) feet to land formerly of S. H. Jose, now of Gilman Street Land Company; thence easterly with an included angle of 91° 11' seventy and forty-two one hundredths (70.42) feet to the point of beginning.

PARCEL TWO

A certain lot or parcel of land with the buildings thereon, situated in said Portland, bounded and described as follows:

Beginning at a point in the Westerly side line of Gilman Street distant sixty-six (66) feet and one (1) inch South from the Southerly side line of Congress Street; thence running South by the side line of Gilman Street twenty-four (24) feet and eight (8) inches, more or less, to the Northerly line of land formerly of Winfield L. Smith, now of Gilman Street Land Company; thence by said line formerly of Smith and through the center of the partition wall between the house on said former Smith lot and the house on the lot herein described and by said line extended seventy and forty-two hundredths (70.42) feet and to land formerly of the City of Portland; thence North by said City of Portland land twenty-three (23) feet and eight (8) inches, more or less, to land conveyed by William B. Jordan to Willis B. Moulton et als, by deed dated May 14, 1897, and recorded in Cumberland County Registry of Deeds, Book 648, Page 450; thence in an easterly direction by said Moulton land seventy (70) feet and eight (8) inches to said Gilman Street and the point of beginning.

PARCEL THREE

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Gilman Street in said Portland and bounded as follows:

Beginning at a point on said westerly side of Gilman Street sixty-nine and five hundredths (69.05) feet northerly

from the northwesterly corner of Gilman and A Streets, and running thence northerly on Gilman Street thirty-seven and one-half (37-1/2) feet; thence westerly with an included angle of ninety-one degrees eleven minutes (91° 11') seventy and forty-two hundredths (70.42) feet to a stake; thence southerly with an included angle of eighty degrees forty-nine minutes (80° 49') thirty-seven and one half (37-1/2) feet; thence easterly with an included angle of ninety-one degrees eleven minutes (91° 11') seventy and forty-two hundredths (70.42) feet to the starting point. Being the southerly half of the lot conveyed to Samuel H. Jose by Charles F. Jose by deed dated December 6, 1886, and recorded in Cumberland County Registry of Deeds in Book 530, Page 255, to which reference is made. The premises herein conveyed are designated as No. 50 on said Gilman Street.

PARCEL FOUR

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Gilman Street in Portland, County of Cumberland and State of Maine, the house being the southerly house in a block of two houses built on this and the adjoining lot, bounded and described as follows:

Beginning on the westerly sideline of Gilman Street ninety and seventy-eight hundredths (90.78) feet from the southerly line of Congress Street; thence southerly on line of Gilman Street fifty (50) feet to land formerly of Charles F. Jose, now of Gilman Street Land Company; thence westerly by said land formerly of Jose, seventy and forty-two hundredths (70.42) feet to land formerly of City of Portland; thence northerly by said City of Portland land fifty (50) feet; thence easterly seventy and forty-two hundredths (70.42) feet passing through the center of the division wall between said two houses to the point of beginning; containing 2520 square feet.

Meaning and intending to convey and hereby conveying the same premises which were conveyed to Gilman Street Land Company by John A. Godsoe, John E. Knowles, John T. Libby, Marvin C. Adams, Thomas A. Martin, Jr., and Vincent N. Oliviero, Trustees, by Trustees Deed dated December 28, 1984 and recorded in the Cumberland County Registry of Deeds in Book 6653, Page 290.

Subject to partition wall rights and obligations as set forth in deed from Virginia R. Buckley to Helen M. Sawyer dated May 4, 1948 and recorded in Cumberland County Registry of Deeds in Book 1912, Page 424 and in deed from Judith P. Johnson to Edgar J. Murphy and Louise M. Murphy dated August 31, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 311.

RECEIVED
RECORDED REGISTRY OF DEEDS
1989 AUG -4 PM 4:02
CUMBERLAND COUNTY

056000

MAINE REAL ESTATE TAX PAID

KNOW ALL MEN BY THESE PRESENTS, That CASCO AERIE, NO. 565, FRATERNAL ORDER OF EAGLES, a/k/a CASCO AERIE FRATERNAL ORDER OF EAGLES #565, a/k/a FRATERNAL ORDER OF EAGLES CASCO AERIE NO. 565, a Maine corporation with a mailing address of 265 Valley Street, Portland, Maine 04112, and having a place of business at Portland, in the County of Cumberland and State of Maine, in consideration of $1.00 and other valuable consideration paid by MMC REALTY CORP., a Maine corporation, whose mailing address is 22 Bramhall Street, Portland, Maine 04102, the receipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey unto the said MMC REALTY CORP., its successors and assigns forever, certain lots or parcels of land in the City of Portland, County of Cumberland, State of Maine, with any buildings thereon, bounded and described as follows:

261-269 Valley Street

A certain lot or parcel of land with the buildings thereon, situated in Portland and described as follows:

Beginning at a point on the North side of A Street, Portland, Maine, said point being the intersection of said North side line of A Street with the East side line of B Street, the name of which was changed to Valley Street in 1939; thence Northerly and making an included angle of Eighty-two (82) degrees Fifty-nine (59) minutes with the East direction of said North side line of A Street a distance of Two hundred eighty-five (285) feet, more or less, to a point in the South side line of Congress Street, said point being thirty-five (35) feet East along said South side line of Congress Street from its intersection with the East side line of Valley Street as now laid out and accepted; thence East along said South line of Congress Street and making an included angle of Ninety-four (94) degrees 49', a distance of forty-five (45) feet, more or less, to a point in the division line between the lot of land of the Grantor under description and land now or formerly of one Charles F. Jones; thence South along the said division line between land of the Grantor and land now or formerly of Charles F. Jones and land now or formerly of Charles C. Plummer, Ellsworth W. Stuart, Charles F. Jose, Maris M. and Charles F. Jose, Trustees, and Charles F. Jose a distance of 281.17 feet, more or less, to a point in the North side line of A Street; thence West and making an included angle of 89 degrees 57' and along the North side line of A Street a distance of Eighty (80) feet more or less to the point of beginning, containing 17,570 square feet, more or less.

Excepting therefrom a portion bounded and described as follows, to wit:

Beginning at a point on the East side line of said Valley Street One Hundred Fifty (150) feet South from the intersection of said East side line of Valley Street with the South side line of Congress Street, thence North by said East line of Valley Street One Hundred Fifty (150) feet to the South side line of Congress Street; thence East along said South side line of Congress Street making an included angle of 94 degrees 49', a distance of Forty-five (45) feet more or less, to a point in the division line between the lot of land under description and land now or formerly of one Charles F. Jones; thence South along the said division line between the land under description and the land of said Charles F. Jones and others One Hundred Fifty (150) feet, to a point; thence West 63.48 feet, to the point of beginning.

42 - 46 Gilman Street

A certain lot or parcel of land with the buildings thereon situated on the northwesterly corner of Gilman and A Streets in the City of Portland, County of Cumberland, State of Maine, and bounded and described as follows:

Beginning at the intersection of the westerly side of said Gilman Street with the northerly side of said A Street, and running thence northerly on said Gilman Street, sixty-nine and five one-hundredths (69.05) feet to land formerly of S.H. Jose; thence westerly by said S. H. Jose land, seventy and forty-two one-hundredths (70.42) feet to a stake; thence southerly and parallel with said Gilman Street seventy and forty-seven one-hundredths (70.47) feet to A Street; thence easterly by said A Street, seventy and forty-one one-hundredths (70.41) feet to the place of beginning.

268 - 270 Valley Street

A certain lot or parcel of land with the buildings thereon situated on the westerly side of Valley Street, formerly called B Street, in said Portland, bounded and described as follows:

Beginning at a point on said westerly side line of Valley Street at a point distance one hundred thirty six (136) feet northerly from the intersection of the westerly side of Valley Street and the northerly side of A Street; thence running southerly by said westerly side of Valley Street seventy-one (71) feet to a point; thence running westerly sixty (60) feet to land now or formerly of George W. Billings and Catherine A. Reed, at a point which is distant sixty-five (65) feet northerly from the northerly side line of A Street; thence running northerly by said Billings and Reed land sixty-four and seventy-six hundredths (64.76) feet to land formerly of William G. Davis and continuing northerly by said Davis land six and forty-three hundredths (6.43) feet; thence easterly approximately fifty-seven (57) feet to the point of beginning.

Being the same premises conveyed to the within grantors by the following deeds: Deed from Mid-Central Fish Company of Maine dated January 15, 1963 and recorded in Cumberland County Registry of Deeds in Book 2727, Page 347; Deed from Sebastiano Pennisi, et al dated June 25, 1963 and recorded in Cumberland County Registry of Deeds in Book 2759, Page 254; and Deed from Eugene S. Martin dated March 28, 1980 and recorded in Cumberland County Registry of Deeds in Book 4582, Page 291.

Subject to the following:

1. Taking of Valley Street as referenced in the deed from the City of Portland to the Unity Company dated October 20, 1937 and recorded in Cumberland County Registry of Deeds in Book 1527, Page 318 (261-269 Valley Street).

To have and to hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MMC REALTY CORP., its successors and assigns, to them and their use and behoof forever.

AND the said Grantor Corporation does hereby covenant with the said Grantee, its sucessors and assigns, that it is lawfully seized in fee of the premises, that they are free of all encumbrances except as aforesaid, that it has good right to sell and convey the same to the said Grantee to hold as aforesaid; and that it and its successors, shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, the said CASCO AERIE, NO. 565, FRATERNAL ORDER OF EAGLES has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Robert James, Richard Brichetto, Hilbert Welch, Reginald Conohan and Fred Darling.

its Trustees thereunto duly authorized, this 21ST day of November, A.D. 1990.

CASCO AERIE, NO. 565,
FRATERNAL ORDER OF EAGLES

Witness

By: Robert James
Robert James
Its Trustee

Witness

By: Richard Brichetto
Richard Brichetto
Its Trustee

Witness

By: Hilbert Welch
Hilbert Welch
Its Trustee

Witness

By: Reginald Conohan
Reginald Conohan
Its Trustee

Witness

By: Fred Darling
Fred Darling
Its Trustee

STATE OF MAINE
COUNTY OF CUMBERLAND

November 21, 1990

Then personally appeared the above named Robert James, Richard Brichetto, ~~Hilbert Welch,~~ Reginald Conohan and ~~Fred Darling,~~ Trustees of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be their free act and deed in their said capacity, and the free act and deed of said Corporation.

Before me,

Attorney at Law
Notary Public
SHERRIE LYNN FONTAINE
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES NOVEMBER 19 1996

Printed Name

SEAL

RECEIVED
90 NOV 21 PM 3:54
CUMBERLAND COUNTY

47527

DEED OF SALE BY PERSONAL REPRESENTATIVE
(Testate)
Maine Statutory Short Form

47527 B 9722 P 45

Book 9722
Page 45

Know all Men by these Presents,

That Thomas F. Kane, Jr.

of Scarborough, County of Cumberland, State of Maine,

duly appointed and acting personal representative of the estate of Edna Faye Kane,

deceased (testate), as shown by the probate records of the County of Cumberland, Maine,

(and having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale) ~~(and not having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale, such notice not being required under the terms of the decedent's will)~~, by the power conferred by the Probate Code, and every other power, for consideration paid, grants to Maine Medical Center* of Portland,

*a nonprofit corporation organized and existing under the laws of the State of Maine

County of Cumberland, State of Maine,

whose mailing address is 22 Bramhall Street, Portland, ME 04102,

the real property in Portland, County of Cumberland,

State of Maine, described as follows:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the southeasterly side of Ellsworth Street, bounded and described as follows: -viz;-Beginning on the said southeasterly side of Ellsworth Street at land now or formerly of S.F. Haggett; thence southeasterly by said Haggett's land seventy-five (75) feet, more or less, to land now or formerly of J.T. Walton; thence southwesterly by said Walton's land and land now or formerly of N. Waterhouse eighty (80) feet, more or less, to land now or formerly of N.P. Thompson; thence northwesterly by said Thompson's land seventy-five (75) feet, more or less, to said Ellsworth Street; thence northeasterly by said Ellsworth Street to point begun at. Containing five thousand eight hundred forty (5,840) square feet, more or less. Said lot is numbered 34-36 and 38 as shown upon valuation plan of the City of Portland.

Being the same premises conveyed to Edna F. Kane by May Porter by her Warranty Deed, dated April 3, 1940 and recorded in Cumberland County Registry of Deeds in Book 1603, Page 134.

MAINE REAL ESTATE TAX PAID

Instr 47527 Bk 9722 Pg 46

Witness my hand and seal this 20th day of September, 19 91.

Signed, Sealed and Delivered in presence of

Samuel J. Shatz

Personal Representative of the Estate of Edna Faye Kane

Thomas F. Kane, Jr.

Samuel J. Shatz

Thomas F. Kane, Jr.

State of Maine, County of Cumberland ss. September 20, 19 91.

Then personally appeared the above named Thomas F. Kane, Jr.

in his said capacity and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Samuel J. Shatz

Notary Public
Attorney at Law

Recorded
Cumberland County
Registry of Deeds
09/20/91 03:59:12PM
Robert P. Titcomb
Register

54881

WARRANTY DEED
(Maine Statutory Short Form)

KNOW ALL BY THESE PRESENTS, that I, William H. Leschey, Jr., whose mailing address is 930 Congress Street, Portland, ME 04102, for consideration paid, GRANT to MMC Realty Corp., a Maine corporation with an established place of business at and mailing address of 22 Bramhall Street, Portland, Maine 04102, with WARRANTY covenants, the land in Portland, County of Cumberland, State of Maine, which is more particularly described as follows:

A certain lot or parcel of land, with any buildings or improvements that may be thereon, situated on the southerly side of Congress Street, bounded and described as follows: BEGINNING on the southerly sideline of Congress Street at its intersection with the westerly sideline of Gilman Street; thence southerly by the westerly sideline of Gilman Street, sixty-six feet, one inch (66' 1") to the northeasterly corner of land now or formerly of Helen M. Sawyer; thence westerly by said Sawyer land seventy feet, eight inches (70' 8") to the easterly sideline of land now or formerly of Schwartz Bros. Inc.; thence northerly by said Schwartz Bros. Inc. land, sixty-two feet, one inch (62' 1") to the southerly sideline of Congress Street; thence easterly by the southerly sideline of Congress Street, seventy feet, eight inches (70' 8") to the point of beginning.

Being the same premises conveyed to the Grantor herein by deed of Edythe D. Field, dated May 11, 1987, and recorded in the Cumberland County Registry of Deeds in Book 7784, Page 182.

MAINE REAL ESTATE TAX PAID

WITNESS my hand and seal this 1st day of September, 1994.

SIGNED, SEALED AND DELIVERED
in the presence of:

William H. Leschey, Jr.

STATE OF MAINE
COUNTY OF CUMBERLAND, ss September 1, 1994

Then personally appeared the above-named William H. Leschey, Jr. and acknowledged the foregoing instrument to be his free act and deed.

Before me,

~~Notary Public~~/Attorney at Law
Printed Name: CHRISTOPHER J.W. CROSSHALL

RECEIVED
RECORDED REGISTRY OF DEEDS
94 SEP -1 PM 3:05
CUMBERLAND COUNTY
John B O'Brien

BKL/4078/AAO/DR

Section 3: Financial Capacity

A. Estimated Costs

An estimate of probable overall construction cost associated with the new MMC Congress Street Building is ±$210,000,000.00.

The following is the estimate for a selection of applicable SLODA site work:

1.	Earthwork / Soils/ ESC	$ 608,150.00
2.	Site Utilities (Water, Sewer, Storm)	$ 861,825.00
3.	Pavement/Site Walls	$ 1,140,963.00
4.	Landscape and Irrigation	$ 549,671.00
	Total	$ 3,161,609.00

B. Financing

The applicant for the development of this project is the record owner, Maine Medical Center. See enclosure, this section for demonstration of financial capacity.

C. Certificate of Good Standing

The State of Maine Department of Secretary of State indicates that Maine Medical Center is in good standing, see attached corporate name information summary.

MAINE MEDICAL CENTER LEVEL III SITE PLAN APPLICATION

CONGRESS ST PATIENT TOWER

EVIDENCE OF FINANCIAL & TECHINICAL CAPACITY

The health care landscape has been in a state of change, particularly since the signing of the Affordable Care Act (ACA). Given the recent changes in the executive and legislative branches of the federal government and continued references to "repealing" the ACA, it is nearly impossible to anticipate the scope of future changes. Maine Medical Center's strategic financial plan assumes continued market basket increases at or near 3% annually. Additionally, the strategic financial plan assumes the following:

- Little or no increase in Medicare or Medicaid payments
- Stable payer mix
- No expansion to the Medicaid program
- Achievement of operational efficiencies based on analyses of national benchmark data
- Stable utilization of hospital services
- Continuation of provider-based billing at existing locations
- Stable levels of bad debt and charity care

Minor changes in the law or regulatory environment impacting these assumptions will likely not jeopardize the overall strategic financial plan. Substantive changes, however, will need to be monitored closely to ensure support of the project.

MMC is fully licensed and accredited, and has been providing services of this scale and scope for years.

Through multiple building projects throughout the history of the organization, MMC has demonstrated its ability to develop new and renovated facilities that meet all licensure and accreditation requirements.

The proposed project's program, and design, developed by a team of health care architects and engineers, and hospital physicians and staff, are in conformance with Guidelines for Design and Construction of Health Care Facilities, 2006 Edition, Facilities Guidelines Institute, (American Institute of Architects, Washington, DC, 2006) as required by the State of Maine Department of Health and Human Services' Division of Licensing and Regulatory Services. In addition, the guidelines for Design and Construction of Health Care Facilities, 2014 Edition, Facilities Guidelines Institute, (American Institute of Architects, Washington, DC, 2014) were also used in the proposed project's design.

Interactive Corporate Services

MAINE

Department of the Secretary of State

Bureau of Corporations, Elections and Commissions

Corporate Name Search

Information Summary

Subscriber activity report

This record contains information from the CEC database and is accurate as of: Wed Oct 24 2018 14:03:50. Please print or save for your records.

Legal Name	Charter Number	Filing Type	Status
MAINE MEDICAL CENTER	19510013ND	NONPROFIT CORPORATION (T13-B)	GOOD STANDING

Filing Date	Expiration Date	Jurisdiction
03/21/1951	N/A	MAINE

Other Names	(A=Assumed ; F=Former)
MAINEHEALTH CARE	A
THE BARBARA BUSH CHILDREN'S HOSPITAL	A
THE BARBARA BUSH CHILDREN'S HOSPITAL AT MAINE MEDICAL CENTER	A
NORTHERN NEW ENGLAND POISON CENTER - CANCELLED	A
CASCO BAY FAMILY PHYSICIANS	A
CLINICAL TRIAL CENTER	A

Clerk/Registered Agent

LUGENE INZANA
22 BRAMHALL STREET
PORTLAND, ME 04102

Section 4

Technical Ability

Section 4: Technical Ability

A. Prior experience / B. Personnel

The applicant has successfully developed and managed Maine Medical Center through an extensive series of expansions and improvements. Notably, in 2015 MMC completed construction of a new surgical center that included a new two-story operating wing encompassing 41,000 square feet with five new operating rooms and 20 pre and post-surgery recovery bays. The aforementioned surgery building and the proposed new Congress Street building was designed by the Boston-based studio of global architecture firm Perkins + Will. MMC has retained the services of Sebago Technics, Inc. for civil, landscape architecture and site permitting services.

Sebago Technics, Inc. (STI) is a multi-disciplinary engineering firm that offers a wide range of services specializing in land development, planning, permitting, and engineering design services. We maintain a staff of multi-disciplinary professionals to provide services in the areas of general civil engineering, road and utility infrastructure design, construction management, permitting, landscape architecture, soil science, wetlands science, geotechnical services, land surveying, and environmental engineering. Over the years, we have found our depth of services to be a key element in meeting the customer's needs with timely and responsive services.

Please see this Section for resumes of key personnel.

Introduction to Sebago Technics, Inc.



Year Established: 1981 (36 years in business)

About Us: Sebago Technics, Inc. (STI) is a consulting firm of more than 65 design professionals and technical staff providing services throughout New England. From the start, our business plan was simple: "to provide quality, cost-effective civil engineering services that are responsive to a customer's goals, schedule and budget." Our One Company capabilities and resources provide clients with experience and solutions to respond to their planning, permitting and design needs.



Structure: Employee-owned since 1998

Services: Civil, environmental, transportation & traffic engineering; municipal engineering; local/state/federal permitting and planning; land surveying & laser scanning; GIS; landscape architecture; environmental services; and natural resources.

Employee Disciplines:
Professional Engineers, Civil Engineers, Transportation Engineers, Landscape Architects, Professional Land Surveyors, Survey Technicians, CADD Designers, Wetland Scientist, Soil Scientist, Construction Inspectors, Environmental Scientists, GIS Professionals, Marketing, Administrative & Financial



Professional Focus: Sebago Technics provides engineering and planning services to both public and private sector clients. In the municipal and government sectors we have provided multiple discipline services through General Services Contracts (GSC) and project specific contracts. A few examples include the Portland Jetport, City of Portland Public Services, City of South Portland, City of Lewiston, City of Westbrook and several smaller communities. Our municipal sector work includes street and utility infrastructure design, municipal facility planning and specialty work such as Island marine and solid waste planning & engineering.

Location: South Portland, ME

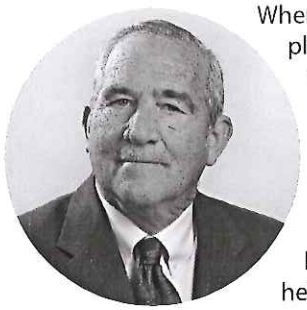


Geographic Service Area: Maine, New Hampshire, Vermont, Massachusetts

Web Site: www.sebagotechnics.com

WILLIAM T. CONWAY, RLA, LEED-AP

Senior Vice President, Landscape Architecture



When Mr. Conway joined Sebago Technics, Inc. in 1988, he established new disciplines of master planning, land planning, and landscape architecture. His extensive experience with multi-disciplinary professional teams and sound project management for government agencies, corporate clients, and private developers resulted in substantial growth in this field. The company is now recognized as one of the leading firms in the State of Maine for Landscape Architectural services.

Mr. Conway has had significant exposure and experience in professional practice resulting from his work throughout several regions of the United States, as well as Europe and the Middle East. He has also held key positions with design firms in Atlanta, Georgia and Tucson, Arizona prior to moving to Maine. He has held professional registrations in the states of Arizona, Georgia, Connecticut, Maine, and Hew Hampshire.

Much of his work involves large-scale projects, including the L.L. Bean Freeport Retail Store and Desert Road Campus, several projects for the American Skiing Company, the UNUM Provident Headquarters in Portland (HO-III), master planning and site design for Maine Medical Center in Portland and Scarborough, Maine, and a site selection study for IDEXX Laboratories in the Greater Portland area.

EXPERIENCE

Portsmouth Public Library, Portsmouth, New Hampshire - Will worked closely with City officials in the planning and design of this building, a recipient of LEED Silver Certification. Located in the vicinity of Strawberry Banke, the site design features an outdoor reading courtyard, in part enclosed by the remains of an historic armory which once stood on the library site.

Stroudwater Landing, Westbrook, Maine - Master planning services for a 65 acre elderly housing campus planned for comprehensive housing alternatives including independent and assisted living opportunities. Avita of Westbrook, a 70 bed assisted living facility specializing in memory care services, features extensively landscaped, secure exterior courtyards. Stroudwater Landing Lodge is a 95 unit independent and assisted living community, offering residents a variety of outdoor recreational amenities. The future build out of the campus is planned to accommodate 44 independent living cottage units and medical offices.

Avita of Brunswick, Brunswick, Maine – Site planning and landscape architectural services for a 70 bed assisted living facility, located within Brunswick Landing, a former naval air station. This project includes a graceful arrival to this one story building, comprised of three resident "neighborhoods" which share common core services and administrative offices. Each neighborhood has easy access to a secure exterior courtyard. The courtyards are lush garden areas with ample seating and activities including gardening and group activities.

Southern Maine Area on Aging Day Services, Biddeford, Maine – Site planning and landscape architecture for a day services facility serving the elderly population in southern York County. Working closely with the Southern Maine Area on Aging staff, this site was designed to facilitate daily drop off and pick up activities inherent with the facility program. The 10,000 square foot, single story building is complimented with a secure exterior courtyard with extensive landscape plantings, raised benches for gardening activities, walking paths and seating facilities.

Maine Veteran's Cemetery, Augusta, Maine – Site planning and landscape architectural services for a major expansion to the cemetery located in Augusta, Maine. The project is located in the heart of the cemetery grounds, and was designed with geometry derived from Arlington National Cemetery in Washington, D.C. Design review was coordinated with and approved by the Maine Bureau of General Services, the Maine Veterans Cemetery System, and the U.S. Department of Veterans Affairs.

EDUCATION

University of Tucson, Tucson, AZ
Bachelor of Science
Landscape Architecture, 1979

REGISTRATIONS

Registered Landscape Architect:
Maine #20000108

LEED Accredited Professional
CLARB Certified

MEMBERSHIPS

American Society of Landscape Architects

Council of Landscape Architectural Registration Boards

PUBLICATIONS

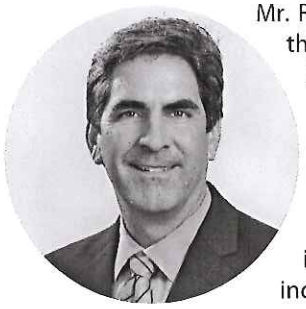
Doris Allen Twitchell Village Student Housing/ University of Maine, Orono, Maine; article in Contemporary Trends in Landscape Architecture, Van Nostrand Reinhold, 1997

SEBAGO TECHNICS

207.200.2055 WCONWAY@SEBAGOTECHNICS.COM

DANIEL L. RILEY, PE, CFM

Vice President, Engineering



Mr. Riley is a Senior Project Manager and Vice President of Engineering with over 20 years of experience in the civil engineering field on projects for the private sector, as well as federal and municipal clients. He has a diverse background in civil engineering, site design, residential and commercial development and permitting.

He is experienced and well versed in presenting complex, controversial and publicly sensitive issues to a variety of audiences. Since 2008, Mr. Riley has been the Contract Manager and lead engineer for Sebago Technics' General Engineering Services Contract with the City of South Portland. In that role, he is responsible for coordinating the firm's services and providing engineering support for City Departments including Planning and Development, Bus/Transportation and Waterfront, Public Works, and Parks and Recreation.

Prior to joining Sebago Technics, Mr. Riley worked as a professional engineer in Colorado specializing in water resources engineering. In that role, he managed projects for federal and municipal clients, including stormwater master planning studies and floodplain analysis and delineation projects. He has also assisted communities with the implementation of Stormwater Management Utilities.

EXPERIENCE

Maine Medical Center Bramhall Campus Expansion
Site and utility design for a comprehensive facilities construction project on the hospital's downtown Portland campus. The scope of the project includes a 4-story birthing center, 512 car parking garage, central utility plant and helicopter pad. The project includes the vacation and realignment of two public streets and the development of a steep, challenging site.

Central Maine Medical Center Emergency Department Expansion
Site and utility design for a 46,500 sf expansion of the hospital's emergency department providing 52,000 annual emergency room patient visits. Site improvements included the reconfiguration of patient parking areas, ambulance access from Main Street, pedestrian improvements lighting and landscaping. New traffic calming measures were constructed along Main Street in Lewiston to better define ambulance access and enhance the safety of pedestrian crossings.

Jordan's Meats Redevelopment - Portland, ME
Mr. Riley managed the site design and permitting of the Westin Hotel and Residences, a 480,000 square feet mixed use development. The site is located on a full city block adjacent to Portland's developing waterfront. The project approvals, including major utility relocations and City Council approval of a contract zone to allow 30 feet of additional building height, were approved in less than 8 months.

After securing entitlements the property was sold. Mr. Riley was the engineer of record for the current owner, responsible for the site design and utility construction for first phase development of the Hampton Inn that occupies the site today.

City of South Portland Maine Engineering Services
Mr. Riley has been the Contract Manager and lead engineer for Sebago Technics' General Engineering Services Contract with the City of South Portland. In that role, he is responsible for coordinating the firm's services and providing engineering support for City Departments including Planning and Development, Bus/Transportation and Waterfront, Public Works, and Parks and Recreation.

EDUCATION

Villanova University, Villanova, PA
Bachelor of Science, Civil Engineering
1991

REGISTRATIONS

Professional Engineer:
Maine #9967
Colorado: #32176

Certified Floodplain Manager
#32249

MEMBERSHIPS

Chi Epsilon, National Civil Engineering Honor Society

American Society of Civil Engineers

SEBAGO TECHNICS

207.200.2080 DRILEY@SEBAGOTECHNICS.COM

Section 5

Noise

05: Noise

A. Developments producing a minor noise impact

Per item (3) Schools and hospitals, the new patient care building is redevelopment at an existing hospital and is considered to be a development producing minor noise impact.

B. Developments potentially producing a major noise impact.
Not applicable.

Section 6

Visual Quality and Scenic Character

06: Visual Quality and Scenic Character

The proposed new property services facility will not negatively impact the visual quality of the surrounding landscape, nor will it significantly affect the scenic character of the Congress Street, Portland location. The project is located within a dense urban setting consisting of hospital, office buildings, parking and multi-family residential housing. The proposed site improvements have been designed to be consistent with the MMC campus and to complement surrounding properties. This project includes the removal of the Gilman Street staff parking garage for the building expansion into the space and reorienting the campus toward Congress Street. The proposed site improvements are part of a revitalization to one of the City gateways. We have included an existing conditions photo of MMC taken from I-295 and a photo simulation of the completed project.

The development does not impact areas of significant scenic character, therefore a Visual Impact Analysis has not been prepared. The site meets the standard for no unreasonable impact on scenic resources, and the proposed site activity will not be visible from scenic resources as defined by Chapter 315 of the relevant Maine DEP regulations.

Existing Northeasterly View to MMC from Interstate-295

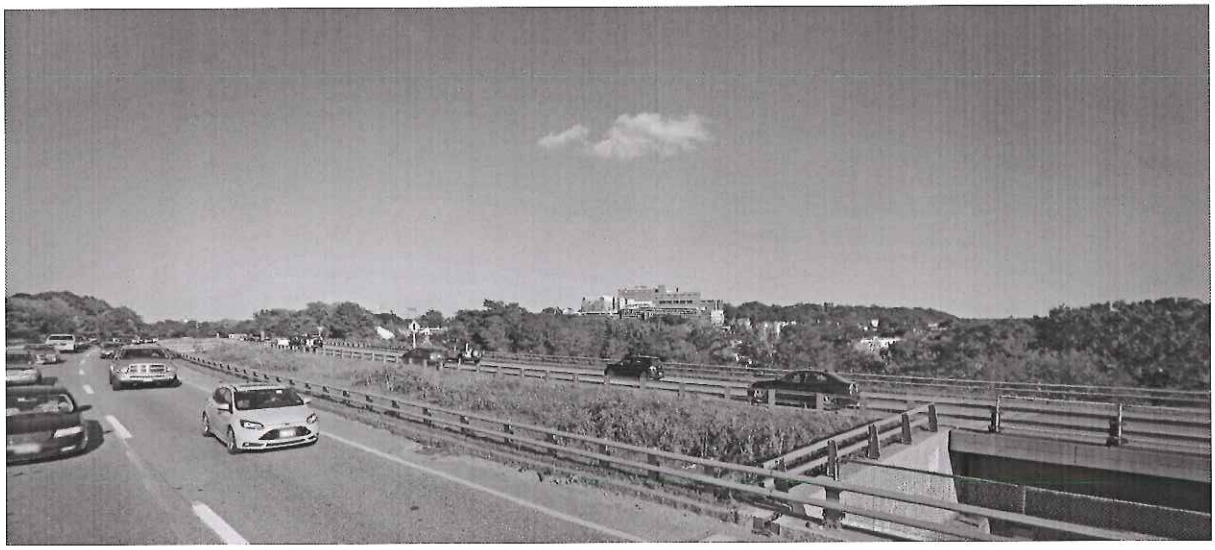
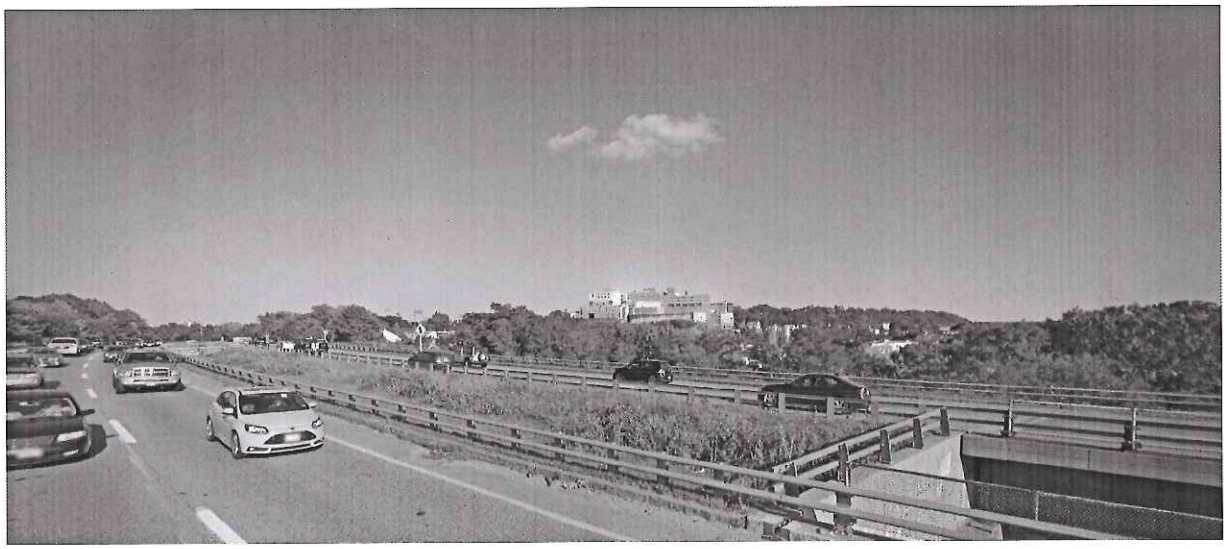


Photo Simulation of Completed Project



Section 7

Wildlife & Fisheries

Section 7: Wildlife & Fisheries

Sebago Technics has recently solicited an updated site review by the Maine Department of Inland Fisheries and Wildlife (MDIFW) for the presence of essential habitats that will be affected by the project. Significant impacts are not anticipated as the site is mostly developed and occurs in a dense urban setting. Enclosed in this section is a copy of the letter sent to MDIFW all future correspondence and the determination letter will be forwarded to the City upon receipt.

SEBAGO
TECHNICS

October 24, 2018
15466

Mr. John Perry
Environmental Coordinator
Maine Department of Inland Fisheries
41 State House Station
Augusta, Maine 04333
John.Perry@Maine.gov

Re: Maine Medical Center
New Congress Street Patient Care Building
22 Bramhall Street, Portland

Dear John:

Sebago Technics is in the process of updating resource letters as part of the required permit applications for proposed site improvements associated with the redevelopment of a portion of the Maine Medical Center Campus. This project includes the demolition and removal of the existing employee garage on the Bramhall Campus. In its place, MMC will build a new six-story medical building. The proposed new building will provide patient and procedure rooms and will include a new arrival/departure plaza and main entrance to the hospital on Congress Street.

We respectfully request that you review your resources for any lands that support rare, threatened and endangered species, designated essential and significant wildlife habitats, and fisheries habitat. For your reference, I have attached a site location map for your reference and record. If you have any questions on this project, please do not hesitate to contact me at snichols@sebagotechnics.com or on my direct line at (207) 200-2120. I look forward to hearing from you.

Sincerely,

SEBAGO TECHNICS, INC.

Stefanie Nichols

Stefanie Nichols
Permitting Specialist/Project Coordinator

enc.

Section 8

Historic Sites

Section 8: Historic Sites

Sebago Technics recently solicited an updated review from the Maine Historic Preservation Commission (MHPC) for the presence of archaeological features or historic properties of concern within the vicinity of the site redevelopment project. Historic impacts are not anticipated as part of the project as the project includes removal of an existing parking structure and replacement with a new patient care building and other associated site improvements. A copy of the letter to MHPC is included in this section and future correspondence and the determination letter will be forwarded to the City upon receipt.

SEBAGO
TECHNICS

October 24, 2018
15466

Mr. Kirk Mohney
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04039-0065

Re: Maine Medical Center
New Congress Street Patient Care Building
22 Bramhall Street, Portland

Dear Mr. Mohney

Sebago Technics is in the process of updating resource letters as part of the required permit applications for proposed site improvements associated with the redevelopment of a portion of the Maine Medical Center Campus. This project includes the demolition and removal of the existing employee garage on the Bramhall Campus. In its place, MMC will build a new six-story medical building. The new building will provide new patient and procedure rooms and will include a new arrival/departure plaza and main entrance to the hospital on Congress Street.

Sebago Technics intends to file an amended Site Location of Development Act application for delegated review by the City. We have reviewed City resources and determined that the Bramhall MMC Campus is not located within a designated Historic District. We respectfully request a review by the Maine Historic Preservation Commission for any Archaeological or Historic Sites within or adjacent to the redevelopment area in accordance with the provisions of 36 CFR, Part 800, Section 106.

The 22 Bramhall Street Maine Medical Center Campus is located at a high point in the west end and The Campus is located in a densely developed urban setting consisting of the hospital, office buildings with their associated parking, public roadways and multi-family residential housing. The proposed project redevelopment location is bounded by Congress and Gilman Streets, the existing Central Heating Plant/Bean Building/Emergency entrance and the Visitor Parking Garage.

We have enclosed a site location map and a selection of keyed photographs for your use. At your earliest convenience, please review and forward your findings. If you have any questions

or need further information please do not hesitate to contact me at snichols@sebagotechnics.com.

Sincerely,

SEBAGO TECHNICS, INC.

Stefanie Nichols
Permitting Specialist/Project Coordinator

enc.

Section 9

Unusual Natural Areas

Section 9: Unusual Natural Areas

Sebago Technics recently requested an updated site review from the State of Maine Department of Agriculture, Conservation and Forestry Natural Areas Program (MNAP) for the presence of known mapped significant natural features within and adjacent to the project site. Due to the dense urban nature of the site we do not anticipate unusual natural areas to affect the proposed project. A copy of the letter to MNAP is enclosed in this section. The determination letter will be forwarded to the City upon receipt.

SEBAGO
TECHNICS

October 24, 2018
15466

Ms. Lisa St.Hilaire
Maine Natural Areas Program
93 State House Station
Augusta, ME 04333-0093

Re: Maine Medical Center
New Congress Street Patient Care Building
22 Bramhall Street, Portland

Dear Lisa:

Sebago Technics is in the process of updating resource letters as part of the required permit applications for proposed site improvements associated with the redevelopment of a portion of the Maine Medical Center Campus. This project includes the demolition and removal of the existing employee garage on the Bramhall Campus. In its place, MMC will build a new six-story medical building. The new building will provide new patient and procedure rooms and will include a new arrival/departure plaza and main entrance to the hospital on Congress Street.

As part of the applications, a review of by Maine Natural Areas Program for any lands that support rare and endangered plants, rare natural communities and ecosystems, and other natural communities and ecosystems in the vicinity of the proposed project area is requested.

For your reference, I have enclosed a USGS Site Location Map with the proposed project location identified. If you have any questions on this project, please do not hesitate to contact me at snichols@sebagotechnics.com or on my direct line at (207) 200-2120. I look forward to hearing from you.

Sincerely,

SEBAGO TECHNICS, INC.

Stefanie Nichols

Stefanie Nichols
Permitting Specialist/Project Coordinator

Section 10

Buffers

Section 10: Buffers

None of the proposed work area is located in a previously designated buffer area and no new dedicated buffering is proposed as part of this site development project.

Section 11

Soils

Section 11: Soils

A. Soil survey map and report

The project site is a redevelopment that includes razing and existing parking garage and redevelopment by constructing a new patient services building. A soil survey was not performed for the project. Soils classifications within the project area are referenced from the Cumberland County Medium-Intensity Soil Survey. The site is primarily comprised of Hinckley gravelly sand loam.

C. Geotechnical investigation

A geotechnical investigation was performed for the redevelopment site and the narrative is included in this section. The geotechnical evaluation indicates significant depths of granular fill overlaying glacial till.

D. Hydric soils mapping

Not applicable

REPORT DRAFT

February 21, 2017
16-1136 S

EXPLORATIONS AND GEOTECHNICAL ENGINEERING SERVICES
Proposed Congress Street Medical Office Building
Maine Medical Center Facility
Portland, Maine

SUBMITTED TO:
Maine Medical Center
Attention: Dennis Morelli, AIA
Director of Facilities Development
22 Bramhall Street
Portland, ME 04102

PREPARED BY:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039
(207) 657-2866
PKohler@swcole.com

S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

www.swcole.com

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LIST OF ATTACHMENTS

Attachment A	Limitations
Sheet 1	Exploration Location Plan
Sheet 1.1 – 1.4	Subsurface Profiles A through F
Sheets 2 – 19	Recent Exploration Logs
Sheet 20	Key to the Notes and Symbols used on Logs
Sheet 21	Foundation Underdrain Detail
Appendix A	Boring Logs B-02-1, B-96-15 and B-96-16
Appendix B	S. W. Cole Laboratory Test Results
Appendix C	Katahdin Analytical Test Results

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16-1136

February 20, 2017

Maine Medical Center
Attention: Dennis Morelli, AIA – Director of Facilities Development
22 Bramhall Street
Portland, ME 04102

Subject: Explorations and Geotechnical Engineering Services
Proposed Congress Street Medical Office Building
Maine Medical Center Facility
Portland, Maine

Dear Dennis:

In accordance with our Proposal, dated May 10, 2016, we have performed subsurface explorations for the subject project. We understand two projects are proposed; the Gilman Street Parking Garage and the Congress Street Medical Office Building. This report focuses on the proposed Medical Office Building and summarizes our findings and geotechnical recommendations. The contents of this report are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at certain areas of the site in order to provide geotechnical recommendations relative to foundations, earthwork and pavement associated with the proposed construction. Our scope of services included a review of prior subsurface explorations made at the nearby New Parking Garage (circa 2002), an exploration program consisting of test borings, soils laboratory testing, and a preliminary geotechnical analysis of the subsurface findings and preparation of this preliminary report.

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1.2 Site and Proposed Construction

Based on information provided by Simpson Gumpertz & Heger (SGH - project structural engineer), we understand an 8-level medical office building is proposed on the Maine Medical Center (MMC) campus on the southerly side of Congress Street and westerly side of Gilman Street in Portland, Maine. The site of the proposed medical office building is situated in an area occupied by an existing circa 1970's parking garage and landscaped areas. We understand the existing 9-level parking garage will be demolished in favor of the proposed construction.

Based on the information provided, we understand the proposed 8-level, trapezoidal-shaped medical office building will be on the order of 295 by by 120 feet in plan dimensions. We understand the lowest floor level (level 5) will be at about elevation 38 feet (project datum). The highest floor level (Ground level) will be at about elevation 145 feet. The southerly wall line of the proposed building will be near and parallel to the existing southerly retaining wall of the existing parking garage. The northerly, westerly and easterly wall lines will be parallel to Congress Street, Gilman Street and the existing 2002 parking garage, respectively.

Although existing floor grade information for the existing parking garage is not available at this time, based on the exterior topographic information shown on Sheet 1 and visual observations at the site during drilling, it appears the on-grade slab of the parking garage slopes upward from about elevation 52 feet at the Gilman Street entrance to about elevation 65 feet at the easterly end of the garage. An interior ramp exists along a portion of the southerly wall line that slopes upward to the west to access the next level of parking. The ground surface on the northerly side of the existing parking garage (grassed and landscaped area) varies from about 43 feet at the intersection of Gilman and Congress Streets up to about 64 feet near the easterly end of the garage; roughly following the slope of Congress Street. Based on a proposed floor elevation of 38 feet for the lowest floor level (level 5) and the approximate existing grades, cuts on the order of 5 feet will be needed near the Gilman/Congress Street intersection; cuts on the order of 15 feet at the Gilman Street garage entrance and cuts on the order of 27 feet at the easterly end of the garage to achieve floor grade. Deeper cuts will be needed in the area of the existing interior ground floor ramp along the southerly parking garage wall line.

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Based on concept drawings provided by SGH, we understand the southerly wall line of the proposed medical office building will utilize the existing parking garage wall as a new foundation wall from about elevation 65 feet (between floor levels 3 and 4) up to about level 1 floor grade (104 feet). Based on the topographic information shown on Sheet 1, the exterior grade along the southerly wall line of the garage (Crescent Street and landscaped areas) varies from about elevation 75 to 115 feet (west to east). Thus, the proposed floor grade (level 5) will be about 37 to 77 feet below existing grades on the southerly side of the garage.

Additionally, we understand the existing southerly parking garage wall will be left in place, underpinned, reinforced and supported using tie-backs for the new structure. Further, a new tie-back wall system is planned to support the excavation below the existing garage wall. The underpinning, tiebacks and wall system will be evaluated and designed by others.

Existing site features are shown on the "Exploration Location Plan" attached as Sheet 1. Proposed building location, site grading and structural loading information is not available at this time.

2.0 EXPLORATION AND TESTING

2.1 Explorations

2.1.1 Recent Explorations

Nine test borings (B-16-1 through B-16-9) were made from November 21 through December 9, 2016 by S. W. Cole Explorations, Inc., a subsidiary of S. W. Cole Engineering, Inc. (S.W.COLE) for the proposed Parking Garage and Congress Street Building. Borings B-16-5 through B-16-9 were made for the proposed Medical Office Building. The borings were made outside the footprint of the existing garage area. Due to the low head room in the garage, no borings were made within the garage footprint.

The approximate locations of the test borings made are shown on the "Exploration Location Plan" attached as Sheet 1. Generalized subsurface profiles for both the proposed Gilman Parking Garage and the proposed Congress Street Medical Office Building sites are attached as Sheets 1.1 and 1.4.

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Logs of the test borings made for both the Proposed Parking Garage and the Proposed Medical Office Building sites are attached as Sheets 2 through 19. The elevations shown on the logs were estimated based on topographic information shown on Sheet 1. A key to the notes and symbols used on the boring logs is attached as Sheet 20.

2.1.2 Previous Explorations

Several test borings were made for the existing newer parking garage (circa 2002). Two borings (B-96-15 and B-96-16) were made near the easterly side of the proposed Medical Office Building site. The approximate locations of these two test borings are shown on Sheet 1. Additionally, the approximate location of Boring B-02-1, made in the northwest corner of the existing Central Utility Plant, is shown on Sheet 1. The logs for these three borings are attached in Appendix A. Logs of other borings and test pits made for nearby sites can be found in the previous geotechnical reports.

2.2 Testing

The recent test borings were drilled using a combination of hollow stem auger and cased wash-boring techniques. The soils were sampled at 2 to 10 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) methods. SPT blow counts are noted on the logs. Pocket penetrometer testing (PPT) was performed on stiffer cohesive soil samples. Shelby Tube sampling and in-situ vane shear testing (VST) were performed in softer cohesive soils. SPT blow counts, PPT and VST results are shown on the logs.

Soil samples obtained during drilling were returned to our laboratory for classification and testing. The results of soil moisture content and Atterberg limit testing are noted on the logs. Results of soil gradation tests and a one-dimensional laboratory consolidation tests performed on a Shelby Tube sample from Boring B-16-3 are attached in Appendix B.

A soil sample from boring B-16-8 2D (2.3'-4.3') was submitted to Katahdin Analytical Services for determination of pH (SW846 9045D), water soluble chloride content (EPA 325.2) and water soluble sulfate content (EPA 375.4). Results are included in Appendix C.

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3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Surficial

The site of the proposed Medical Office Building is located at the site of an existing parking garage (circa 1970's) on the southeasterly side of the intersection of Congress and Gilman Streets. The existing 9-level garage occupies a majority of the southerly portion of the site and is on the order of 340 by 120 feet in plan dimensions. The sloped on-grade garage floor varies from about elevation 52 feet on the west side (Gilman Street entrance) to about elevation 65 feet on the east side. The remainder of the site is landscaped and varies from about elevation 43 feet at the intersection of Congress and Gilman Streets to about 64 feet on the east end of the site. A newer parking garage (circa 2002) exists on the easterly side of the site. The Central Utility Plant exists at the southwesterly corner of the site. Crescent Street and landscaped areas exist on the southerly side of the site varying from about elevation 75 to 115 feet (west to east).

Existing site features are shown on the "Exploration Location Plan" attached as Sheet 1.

3.2 General Geological Conditions

Overburden mapping by the Maine Geological Survey (MGS) describes the unconsolidated overburden as Urban Fill overlying marine clay and glacial till. This is consistent with boring logs for the area, describing variable sand, silt, and gravel material locally with debris. Bedrock depths were generally about 65 to 73 feet below ground surface (bgs) where encountered. The bedrock geology has been described by the MGS, (Hussey, 2003) as stratified meta-sedimentary rock of Silurian-Ordovician age (Eliot Formation), descried as quartz-plagioclase-biotite phyllite. Linear features trending approximately north-south and north 35° to 55° east.

3.3 Soil and Bedrock

Below the existing concrete pavement and topsoil, the explorations encountered a soil profile generally consisting of granular and clayey fill overlying glaciomarine clay overlying sandy soils overlying glacial till and probable bedrock with depth. The principal strata encountered in the explorations are summarized below; refer to the attached logs for detailed subsurface information. Not all the strata were encountered at each of the explorations.

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Topsoil: Borings B-16-6 through B-16-8 encountered about 12 to 18 inches of topsoil and/or bark mulch at the surface.

Pavement: Borings B-16-5 and B-16-9 encountered about 6 inches of concrete pavement at the surface.

Uncontrolled Fill: Borings B-16-5 through B-16-9 encountered generally loose to medium dense uncontrolled fill varying from about 3 to 13 feet in thickness. The uncontrolled fill generally consists of sand with varying amounts of silt and gravel, as well as sandy, clayey silt. Boring B-16-6 encountered what may be the concrete foundation for the existing parking garage at a depth of about 4 feet. Thus, the boring was shifted about 4 feet north. This area may have been developed prior to the construction of the parking garage. Thus, miscellaneous uncontrolled fill, existing and relic foundations and subsurface utilities should be expected.

Glaciomarine Clay: Below the fill, Borings B-16-5 through B-16-7 encountered a glaciomarine deposit of stiff brown silty clay to depths varying from about 10.5 to 19.5 feet. Gray silty clay of medium consistency was encountered below the brown silty clay at Borings B-16-5 and below the fill at B-16-8. The gray silty clay deposit is about 5 feet thick at these two locations. The glaciomarine deposit was not observed at B-16-9.

Based on the laboratory consolidation testing of a Shelby Tube sample at Boring B-16-3, the gray silty clay in this area appears to be over-consolidated by about 1,500 psf. In-situ vane shear test results performed in the gray silty clay at nearby B-16-1 and B-16-3 were about 850 to 1,000 psf virgin strength and 130 to 220 psf remolded strengths.

Outwash Sands: Below the glaciomarine clay deposit or fill, the borings encountered a deposit of loose to medium dense outwash sand with zones of clay and silt layers. In general, the sand thickness ranged from about 4 to 21 feet at borings B-16-5 through B-16-9.

Glacial Till: Medium dense to very dense glacial till generally consisting of sand and silt with varying amounts of gravel with zones having a trace to some clay was encountered below the outwash sands at depths varying from about 15 to 38 feet below the ground surface at borings B-16-5 through B-16-9.

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The depth to glacial till was shallowest at boring B-16-9. Cobbles were encountered occasionally during drilling. The glacial till may also contain some boulders. Borings B-16-7 through B-16-9 were terminated in very dense glacial till at depths of 79.5 to 81.5 feet below the existing ground surface.

Refusal Surfaces: Probable bedrock was encountered at depths of about 73 and 68 feet below the existing ground surface at Borings B-16-5 and B-16-6, respectively. A roller cone was advanced about 2 feet into the probable bedrock surface at these two borings.

3.4 Groundwater

The soils were generally moist from the ground surface. The borings were started with hollow-stem augers and then switched to cased wash-borings at depth, upon which water was introduced obscuring groundwater observations during drilling. In general, it appears perched water exists within the fills at depths of about 5 to 10 feet. Groundwater piezometers were installed at borings B-16-8 and B-16-9. Water levels in the piezometers were measured to be about 14 and 31 feet below the ground surface at these two boring locations, respectively, on January 4, 2017. Based on the moisture content test results, the softer gray silty clay and underlying glacial till are at or near saturation.

Long-term groundwater levels were not determined. It should be anticipated that groundwater will be perched atop silty and clayey soils as well as the underlying glacial till. Groundwater levels should be expected to fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

3.5 Frost and Seismic

The 100-year Air Freezing Index for the Portland, Maine area is about 1,407-Farenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the subsurface findings, we interpret the site soils to correspond to Seismic Soil Site Class D according to IBC 2009/ASCE 7-05. We offer the following seismic design parameters for consideration:

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RECOMMENDED SEISMIC DESIGN PARAMETERS (2,500-year Design Earthquake)		
Peak Ground Acceleration (PGA)	0.2-second Spectral Acceleration (S_s)	1-second Spectral Acceleration (S_1)
0.17 g	0.242 g	0.078 g

NOTE: Seismic design parameters from USGS.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations include:

- Due to the presence of uncontrolled fills, variable thickness of soft to medium compressible glaciomarine clays and loose to medium dense sands with silt and clay layers, beneath the westerly portion of the site, anticipated heavy column loads as well as anticipated differential settlement between foundations supported on the medium dense glacial till (easterly side) and variable glaciomarine clays and outwash sands (westerly side), we recommend the proposed medical office building structure be supported on a deep foundation consisting of driven piles bearing in the very dense glacial till or on bedrock. Alternatively, a specialty ground improvement contractor can be consulted to assess the suitability of using ground improvement techniques such as rammed aggregate piers (RAPs) or geo-concrete columns (GCCs) to improve the soils sufficiently for potential spread footings.

- Based on the information at the boring locations, it appears cuts varying from about 5 to 27 feet, or greater, will be needed to achieve floor grade for level 5 (lowest floor elevation). Based on the findings at borings B-16-5 through B-16-9, it appears that in general, the subgrade for the proposed first level slab-on-grade floor will consist of existing loose to medium dense fill, stiff brown silty clay, softer gray silty clay and medium dense sands with varying amounts of silt and clay layers in the westerly portion of the proposed building footprint and medium dense glacial till in the easterly portion.

- It is our opinion that the floor slab can be supported on properly prepared soil subgrades. Existing foundations, fill and soft, disturbed soils will need to be removed prior to placing new fills. We recommend on-grade slabs be underlain

with at least 12 inches of compacted Crushed Stone overlying a non-woven geotextile fabric to provide a drainage layer and passive radon venting if deemed necessary by the project structural engineer. The Crushed Stone should be positively connected to foundation and sub-slab underdrains drains.

- The site is developed with many years of various development likely including previous structures and foundations, uncontrolled fills and subsurface utilities. Thus, uncontrolled fills, relic foundations and other manmade structures and utilities should be expected during excavation including the foundation system for the existing garage.

- Conventional asphalt pavements appear suitable for proposed parking areas, entrances and sidewalks. The pavement gravels should be positively connected to foundation drains. Existing granular fills should be densified by proof-rolling and soft areas removed and replaced with additional pavement sub-base aggregate.

- Based on the subsurface findings and our understanding of the proposed construction, the proposed 5 to 22 foot cuts along Congress and Gilman Streets appears feasible from a geotechnical standpoint. Braced shoring will be needed to support surrounding grades, structures and utilities during construction. Perched groundwater should be expected in the soils. We understand evaluation and design of excavations, water control, bracing and shoring, underpinning, reinforcing and tie-back anchorage will be by others.

- Structural Fill, Crushed Stone, and pavement base and sub-base gravels will be required for construction. Existing soils are unsuitable for reuse.

4.2 Settlement Analysis

We have made an estimate of post-construction settlement of the underlying medium dense glacial till (east side) and variable glaciomarine clays and outwash sands (westerly side). Our estimate is been based on:

1. A proposed finished floor elevation of 38 feet;
2. Subsurface information found at borings B-16-7 and B-16-9,
3. An assumed column load of 400 kips and soil contact pressure of 4 ksf.

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Our field and laboratory testing from boring B-16-4 indicates that the gray silty clay soils beneath the site are over-consolidated by about 1.5 ksf.

We estimate that settlement of the glaciomarine clays and outwash sands (westerly side) beneath an individual square footing with a contact pressure of 4 ksf could result in several inches of total post-construction settlement. We estimate that post-construction settlement of the existing medium dense glacial till (easterly side) could be on the order of 1 inch. The estimated post-construction settlement on the westerly side and the anticipated differential settlement between glacial till supported foundations and foundations supported on the glaciomarine clays and outwash sands on the easterly side are not considered within tolerable limits for the proposed structure, if supported on shallow spread footings. Thus, we recommend the structure be supported on driven piles. Alternatively, consideration can be given to ground improvement using rammed aggregate piers (RAPs) or Geo-Concrete Columns (GCCs) to improve ground conditions for spread footing foundation support.

4.3 Pile Foundations

Considering the subsurface findings, steel H-piles and steel pipe piles driven to end-bearing in the glacial till stratum or on bedrock appear well-suited for foundation support of the proposed structure. We understand that the pile type, size, driving criteria and allowable loads will be provided by a design-build contractor using design loading information provided by SGH (project structural engineer). We offer the following common pile types and estimated capacities for preliminary design:

Estimated Pile Capacities		
Pile Type	Section	Estimated Allowable Axial Compressive Capacity (kips)
Concrete Filled Steel Pipe Pile, 46-ksi steel, driven to practical refusal. 0.25" min wall thickness, Closed End, flat plate at tip	10 ¾" diameter 12 ¾" diameter	180 220
Steel H-Pile with cast driving tips, 50-ksi steel, driven to practical refusal. Assumes 1/16" corrosion	HP 12 x 53	190
	HP 12 x 74	290
	HP 14 x 89	340
	HP 14 x 117	500

All grade beams, pile caps and foundations exposed to freezing temperatures should extend at least 4.5 feet below finished grade. Piles should be spaced a minimum center- to-center distance of at least 3 pile diameters, but no less than 30 inches. Piles in groups should be driven from the interior working outward to preclude densification and excessively hard driving conditions on the interior. We recommend that a working mat of at least 8 inches of Crushed Stone be provided below all pile caps and grade beams.

Passive soil lateral resistance acting on grade beams and pile caps backfilled with compacted Select Fill should consider a total unit weight of compacted granular backfill (γ_t) of 125 pcf, an angle of internal friction of 32 degrees and a passive lateral earth pressure coefficient (K_p) of 3.3. Several inches of lateral deflection may be required to fully mobilize passive lateral earth pressures. We recommend that the surficial 3 feet of soil around the structure not be included in passive soil lateral resistance. Additional resistance to lateral loads can be mobilized along the pile shafts. S.W.COLE can assist with evaluation of lateral pile capacity, if requested. Battered piles can be considered to help resist lateral loads.

Considering the depths to glacial till and probable bedrock encountered at test borings B-16-5 and B-16-6 and a first level floor slab elevation 38 feet (project datum), we estimate pile lengths may range from about 55 to 75 feet. Because subsurface conditions vary across the site, the actual tip elevations and lengths of driven piling will vary. To assess this variability and to better refine estimates for pile lengths, we recommend that several test piles be driven at different locations across the site before production piles are driven.

The IBC International Building Code (2009) requires that pile load tests be performed on piles with design capacities over 40 tons (80 kips). We recommend monitoring the test piles with a Pile Driving Analyzer (PDA) to assess pile capacity and to define the "set" or stop driving criteria. In any case, the pile driving contractor should submit information relative to pile driving equipment and a WEAP analysis for geotechnical review prior to beginning driving. S.W.COLE should be retained to review the pile submittal and to observe the test pile program and driving of production piles.

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We recommend pre-construction surveys of adjacent structures be completed prior to pile driving and that construction vibrations be monitored. S.W.COLE can assist with pre-construction surveys of adjacent structures and vibration monitoring during construction.

4.4 Spread Footing Foundations

As mentioned above, a specialty ground improvement contractor can be consulted to assess the suitability of the underlying soils for potential ground improvement techniques to support potential spread footings. Footings should be underlain with at least 12 inches of Crushed Stone wrapped in non-woven geotextile filter fabric, such as Mirafi 180N, bearing on properly prepared subgrades as designed by a specialty ground improvement contractor. For foundations bearing on properly prepared subgrades, we offer the following preliminary geotechnical parameters for design consideration following successful ground improvement program:

Geotechnical Parameters for Spread Footings and Foundation Walls	
Design Frost Depth	4.5 feet
Net Allowable Soil Bearing Pressure (Improved Ground)	Estimate 4.0 ksf to be determined by Specialty Contractor
Base Friction Factor	0.35
Total Unit Weight of Backfill (compacted Structural Fill)	130 pcf
Internal Friction Angle of Backfill (compacted Structural Fill)	30°
At-Rest Lateral Earth Pressure Coefficient	0.5
Total Post-Construction Settlement	Determined by Specialty Contractor
Differential Post-Construction Settlement	Determined by Specialty Contractor

We anticipate the RAPs or GCCs would need to extend through existing fills and glaciomarine clays and sands to transfer loads to the underlying stable glacial till soils. If ground improvement is selected, we recommend the contract documents require an engineered submittal for the ground improvement technique to improve ground conditions to meet or exceed the geotechnical parameters for bearing capacity and settlement requirements selected by the structural engineer. The submittal must include QC and modulus testing procedures. We recommend load tests be completed prior to installing production ground improvement elements. The submittal must be

prepared and sealed by a Professional Engineer licensed in the State of Maine and endorsed by the Installer.

4.4 Foundation Walls

Based on the proposed on-grade slab elevation, it appears a deep cut will be needed along Congress and Gilman Streets. We offer the following geotechnical soil parameters for foundation wall design consideration:

Geotechnical Parameters for Foundation Walls	
Design Frost Depth	4.5 feet
Base Friction Factor (concrete on Crushed Stone)	0.35
Subgrade Reaction Modulus, k_s	120 pci
Total Unit Weight of Backfill (compacted Structural Fill)	130 pcf
Internal Friction Angle of Backfill (compacted structural fill)	32°
At-Rest Lateral Earth Pressure Coefficient (K_o)	0.5
At-Rest Lateral Earth Pressure (equivalent fluid)	65 pcf
Surcharge Lateral Area Load Coefficient	0.5

Note: The above parameters do not apply to proposed retaining walls or the existing parking garage wall.

4.5 Slab-On-Grade

We recommend all slab-on-grade areas be over-excavated to allow for at least 12 inches of compacted Crushed Stone overlying a non-woven geotextile fabric such as Mirafi 180N. The on-grade floor slab may be designed using a subgrade reaction modulus of 120 pci (pounds per cubic inch) provided the slab is underlain by at least 12 inches of compacted Crushed Stone overlying a non-woven geotextile fabric and properly prepared subgrades. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

We recommend a sub-slab vapor retarder particularly in areas of the building where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. The vapor retarder must have a permeance that is less than the floor covering or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with the sub-slab base material and construction activity. The vapor retarder material shall be placed according to the manufacturer's recommended method, including the taping and lapping

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of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

Floor slabs should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.6 Foundation Drainage

We recommend that an exterior perimeter foundation drainage system be provided near pile cap/foundation subgrade (4.5 feet minimum depth). We also recommend sub-slab underdrains be provided within the Crushed Stone at a spacing of about 15 to 20 feet on center. The underdrain pipe should consist of rigid, 4-inch diameter perforated SDR-35 foundation drain pipe with perforations of ¼ to ½ inch enveloped in 12 inches of MaineDOT 703.22 Underdrain Backfill Type C Crushed Stone bedding wrapped in a non-woven geotextile filter fabric such as Mirafi 180N. The underdrain must have a positive gravity outlet protected from freezing, clogging and backflow. Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that are not to be paved or occupied by entrance slabs in order to reduce surface water infiltration into the foundation backfill. Surface grades should be sloped away from the building for positive surface water drainage. Details of the recommended foundation drainage system are presented on the attached Sheet 21.

4.7 Entrances, Sidewalks and Exterior Slabs

Entrance approaches, sidewalks and exterior slabs should be designed to reduce the effects of differential frost action between doorways and entrances. We recommend that excavations beneath the entire width and length of entrances, sidewalks, and exterior slabs, continue to at least 4.5 feet below finish grade. These areas should be backfilled with compacted non-frost susceptible granular fill meeting the Structural Fill gradation to limit abrupt heave or differential movement. The zone of Structural Fill adjacent to exterior foundations and below entrance slabs and sidewalks should transition up to the bottom of adjacent sidewalk or pavement subbase gravel at a 3H:1V or flatter slope (see details on Sheet 21).

4.8 Excavation, Grading and Dewatering

An erosion control system should be instituted prior to any construction activity at the site to help protect adjacent drainage ways. As much vegetation and existing pavement should remain in-place over areas of inactive construction to lessen the potential for erosion. Excavation work will encounter uncontrolled fills generally consisting of silty sand and gravel, relic foundations and utilities. Below the fills, excavation will encounter stiff brown silty clay and softer gray silty clay. The subgrades will be sensitive to disturbance from construction activity. Construction equipment should not operate directly on wet to saturated subgrades nor on the native silts and clays. Pre-excavating or pre-augering at proposed pile or ground improvement element locations may be needed in some areas. Over-excavated areas should be replaced with compacted Structural Fill or Pavement Subbase, as appropriate. A woven geotextile fabric may be needed below the compacted fill if the subgrade is wet, soft or unstable. The on-site soils are unsuitable for reuse in construction.

Based on the findings at the explorations during drilling, groundwater and wet soil conditions will likely be encountered in foundation excavations deeper than about 10 feet below existing grades. In our opinion, ditching with sump and pump dewatering techniques at a minimum should be anticipated to control groundwater in shallow footing excavations. It may be necessary to place a layer of geotextile filter fabric and crushed stone to act as a drainage media from which to sump and pump. Deeper excavations, will likely require braced sheet pile shoring for groundwater cutoff and excavation stability. In any case, excavations must be properly shored and/or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the excavation.

4.9 Backfill and Compaction

Based on the subsurface findings, the existing site soils are unsuitable for reuse as fill and backfill in building areas but may be reused in landscape areas. We recommend the following fill and backfill materials:

Geotextile Fabrics: Non-woven geotextile fabric (such as Mirafi 180N) for use as a filter media fully wrapping the Crushed Stone surrounding the underdrain piping. Woven geotextile fabric (such as Mirafi 600X) for use in areas requiring over-excavation and for silty clay subgrades beneath floor slab areas. Geotextile fabric is not recommended at proposed pile locations.

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Structural Fill: Backfill below floor slabs, entrance slabs, exterior slabs, in depressions left from removal of existing foundations and adjacent to new foundations should consist of clean, non-frost susceptible sand and gravel meeting the following gradation requirements.

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
#40	0 to 30
#200	0 to 5

Crushed Stone: Crushed Stone used around underdrains and as the working mat at all pile cap and grade beam locations should consist of crushed rock meeting the gradation requirements of MaineDOT Standard Specifications 703.22 "Underdrain Backfill Type C".

MaineDOT 703.22 Underdrain Backfill Type C – Crushed Stone	
Sieve Size	**Percent Finer by Weight**
1 inch	100
¾ inch	90-100
⅜ inch	0-75
#4	0-25
#10	0-5

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted in loose lifts not exceeding 12 inches with a vibratory plate compactor with a static weight of at least 500 pounds. Soft or yielding areas should be over excavated and replaced with the woven geotextile fabric and additional sub base aggregates.

4.10 Pavement

We anticipate that asphalt pavement is proposed in entrance drives and some sidewalk areas. We also anticipate pavement will be primarily subjected to passenger vehicle and light delivery truck traffic. Considering the site soils and proposed usage, we offer the following pavement section for consideration. Materials are based on 2014 Maine Department of Transportation (MaineDOT) Standard Specifications.

Pavement Layer	Standard Duty
MaineDOT 9.5 mm Hot Mix Asphalt (50 Gyration Design)	1¼ inches
MaineDOT 19.0 mm Hot Mix Asphalt (50 Gyration Design)	2¼ inches
MaineDOT 703.06 Aggregate Base Type A	3 inches
MaineDOT 703.06 Aggregate Sub base Type D	15 inches

We recommend placing woven geotextile fabric such as Mirafi 600X on silty or clayey subgrades prior to placing subbase material. Soft or yielding areas should be over excavated and replaced with additional subbase aggregate underlain by woven geotextile fabric, as needed.

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. The surface and binder layers of hot mix asphalt should ideally be placed during the same construction season. We recommend that bituminous pavements be compacted to 92 to 97 percent of their theoretical maximum densities as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated. We recommend consideration be given to providing perimeter drainage swales and underdrains beneath paved areas to help drain pavement gravels.

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4.11 Weather Considerations

Subgrades, foundations and floor slabs must be protected from freezing conditions. Fill soils and concrete must not be placed on frozen soil and once placed, the soil beneath the structure must be protected from freezing. Further, the uncontrolled fills and native site soils are moisture sensitive and as such subgrades will be susceptible to disturbance during wet and freeze-thaw conditions. Consequently, site work and construction activities should take appropriate measures to protect exposed subgrades, particularly during wet and freezing conditions. This may require the use of temporary haul roads and staging areas to preclude subgrade damage due to construction traffic. Geotextile fabric may also be needed below haul roads, staging and proposed slabs to help stabilize subgrades.

4.12 Design Review and Construction Testing

S.W.COLE should be retained to review the construction documents before bidding to determine that our earthwork, foundation and pavement recommendations have been properly interpreted and implemented.

S.W.COLE should be retained to provide geotechnical observation and testing services for the piling, excavation and foundation phases of construction. This is to observe compliance with the design recommendations, drawings and specifications and to allow design changes in the event that subsurface conditions are found to differ from those anticipated prior to the start of construction.

A Special Inspections program including observation of pile installation, reinforced concrete, structural masonry and structural steel should also be implemented during construction to observe compliance with the construction documents. S.W.COLE is available to provide Special Inspections and testing services for piling, soils, concrete, steel, spray-applied fireproofing and asphalt construction materials.

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5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you as the design progresses and during the construction.

Sincerely,

S. W. Cole Engineering, Inc.

Paul F. Kohler, P.E.
Senior Geotechnical Engineer

PFK:tjb-mas/jlm

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Attachment A
Limitations

This report has been prepared for the exclusive use of Maine Medical Center for specific application to the proposed Medical Office Building project located on the southeasterly side of the intersection of Gilman and Congress Streets in Portland, Maine. Information provided in this report from the nearby proposed Gilman Street Parking Garage site or other past projects is included for informational purposes. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

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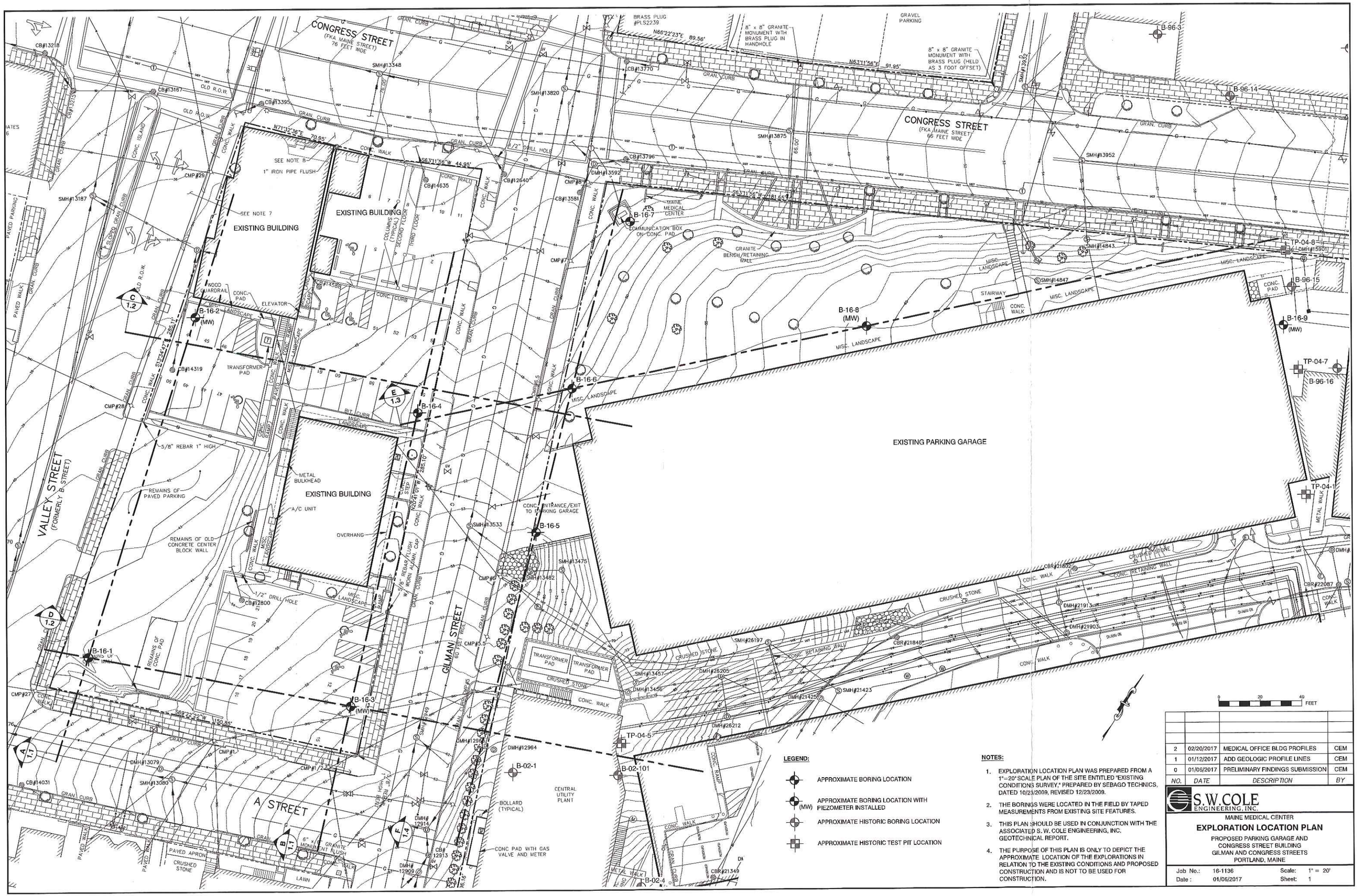


LEGEND:

- APPROXIMATE BORING LOCATION
- (MW) APPROXIMATE BORING LOCATION WITH PIEZOMETER INSTALLED
- APPROXIMATE HISTORIC BORING LOCATION
- APPROXIMATE HISTORIC TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "EXISTING CONDITIONS SURVEY," PREPARED BY SEBAGO TECHNICS, DATED 10/23/2009, REVISED 12/23/2009.
2. THE BORINGS WERE LOCATED IN THE FIELD BY TAPED MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE APPROXIMATE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

NO.	DATE	DESCRIPTION	BY
2	02/20/2017	MEDICAL OFFICE BLDG PROFILES	CEM
1	01/12/2017	ADD GEOLOGIC PROFILE LINES	CEM
0	01/06/2017	PRELIMINARY FINDINGS SUBMISSION	CEM

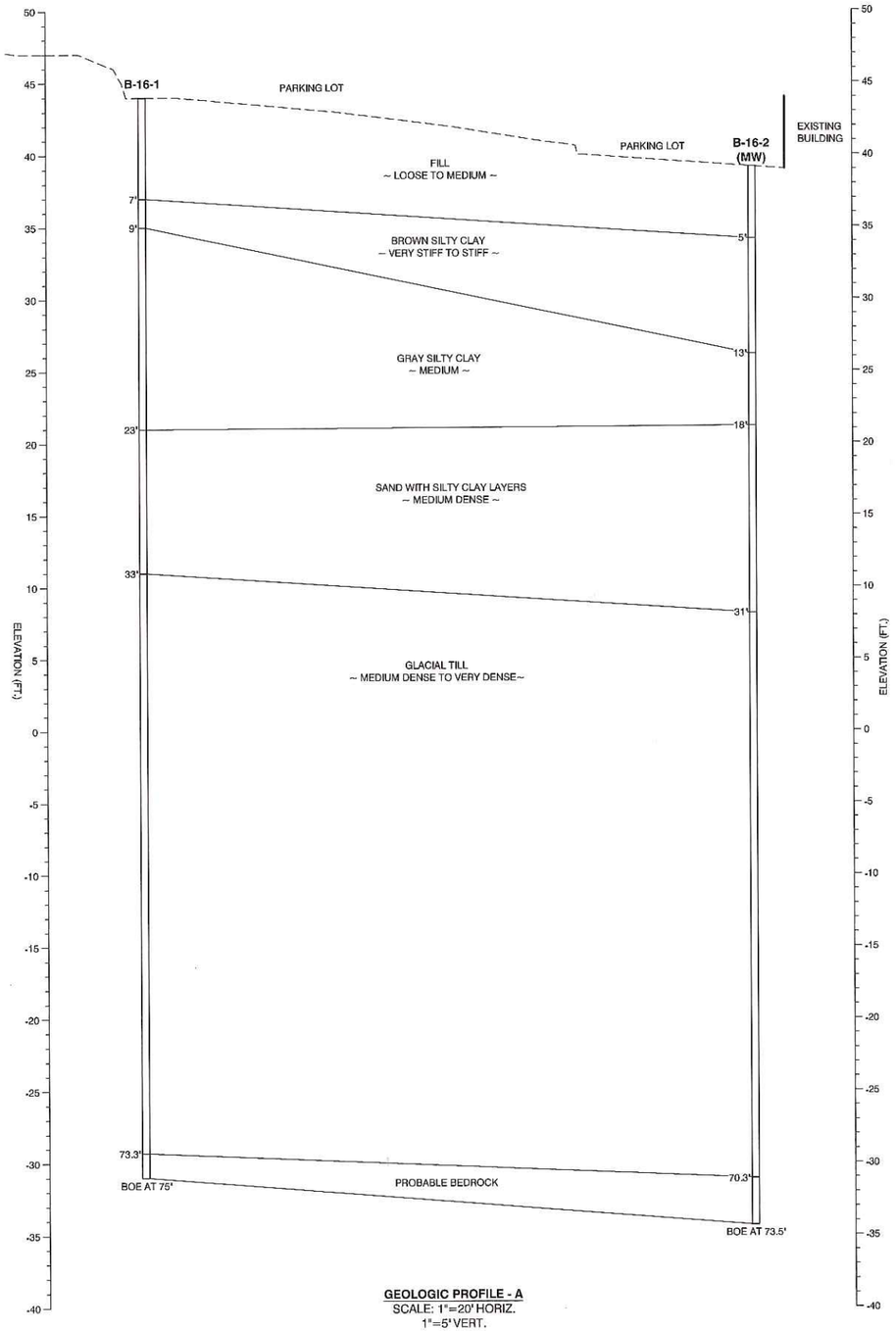
S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

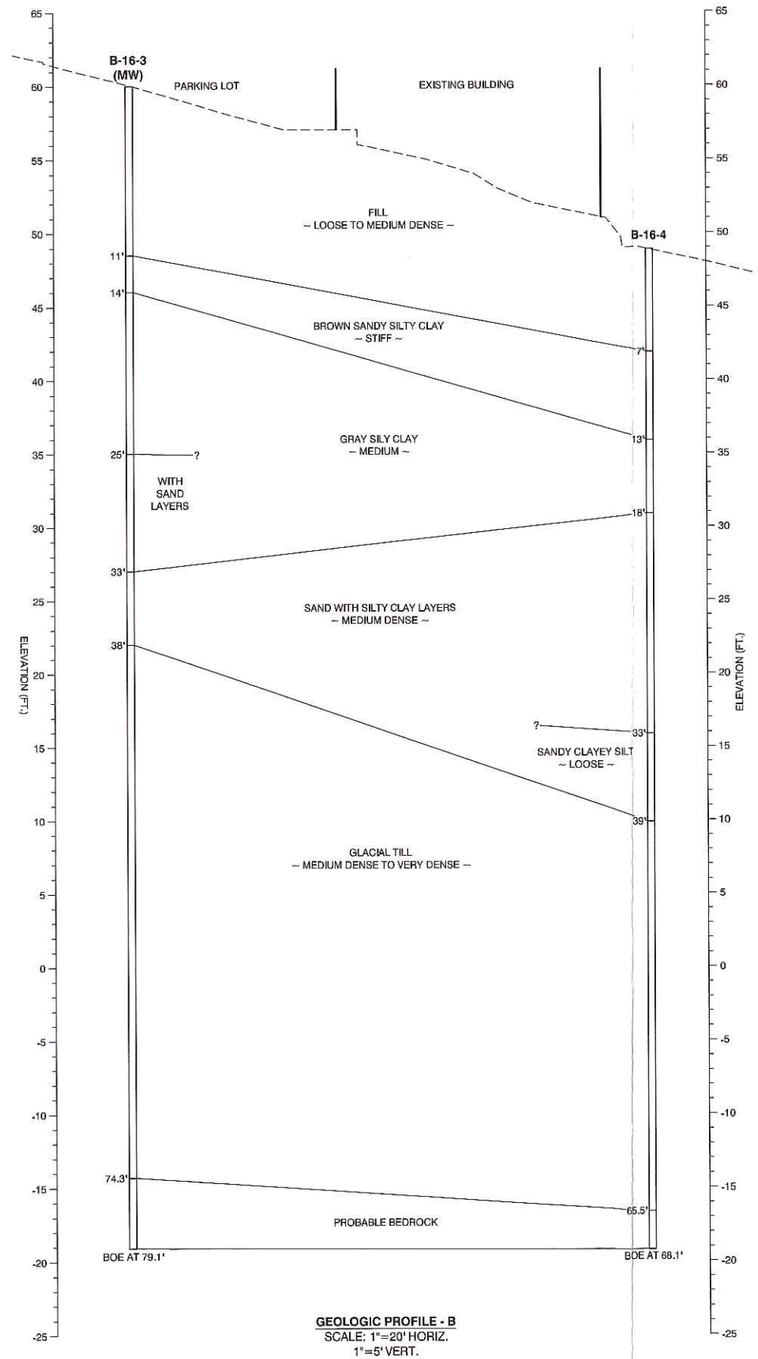
EXPLORATION LOCATION PLAN

PROPOSED PARKING GARAGE AND
CONGRESS STREET BUILDING
GILMAN AND CONGRESS STREETS
PORTLAND, MAINE

Job No.: 16-1136 Scale: 1" = 20'
Date: 01/06/2017 Sheet: 1



GEOLOGIC PROFILE - A
SCALE: 1"=20' HORIZ.
1"=5' VERT.



GEOLOGIC PROFILE - B
SCALE: 1"=20' HORIZ.
1"=5' VERT.

LEGEND

B-16-4 (MW)	BORING NUMBER PIEZOMETER INSTALLED
	APPROXIMATE EXISTING GROUND SURFACE
7'	STRATA CHANGE
SILT	STRATA DEFINITION
BOE	BOTTOM OF EXPLORATION

NOTES:

1. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTION WERE GENERALIZED FROM AND INTERPOLATED BETWEEN EXPLORATION LOCATIONS. THE TRANSITION BETWEEN MATERIALS MAY BE MORE OR LESS GRADUAL THAN INDICATED. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATIONS INDICATED AND AT THE TIME OF EXPLORATION. SEE BORING LOGS FOR MORE DETAILED INFORMATION.

NO.	DATE	DESCRIPTION	BY
.	.	.	.
0	01/12/2017	PRELIMINARY FINDINGS SUBMISSION	CEM

S.W. COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

GEOLOGIC PROFILES A & B

PROPOSED PARKING GARAGE AND
CONGRESS STREET BUILDING
GILMAN AND CONGRESS STREETS
PORTLAND, MAINE

Job No.:	16-1136	Scale:	1" = 20'
Date :	01/12/2017	Sheet:	1.1

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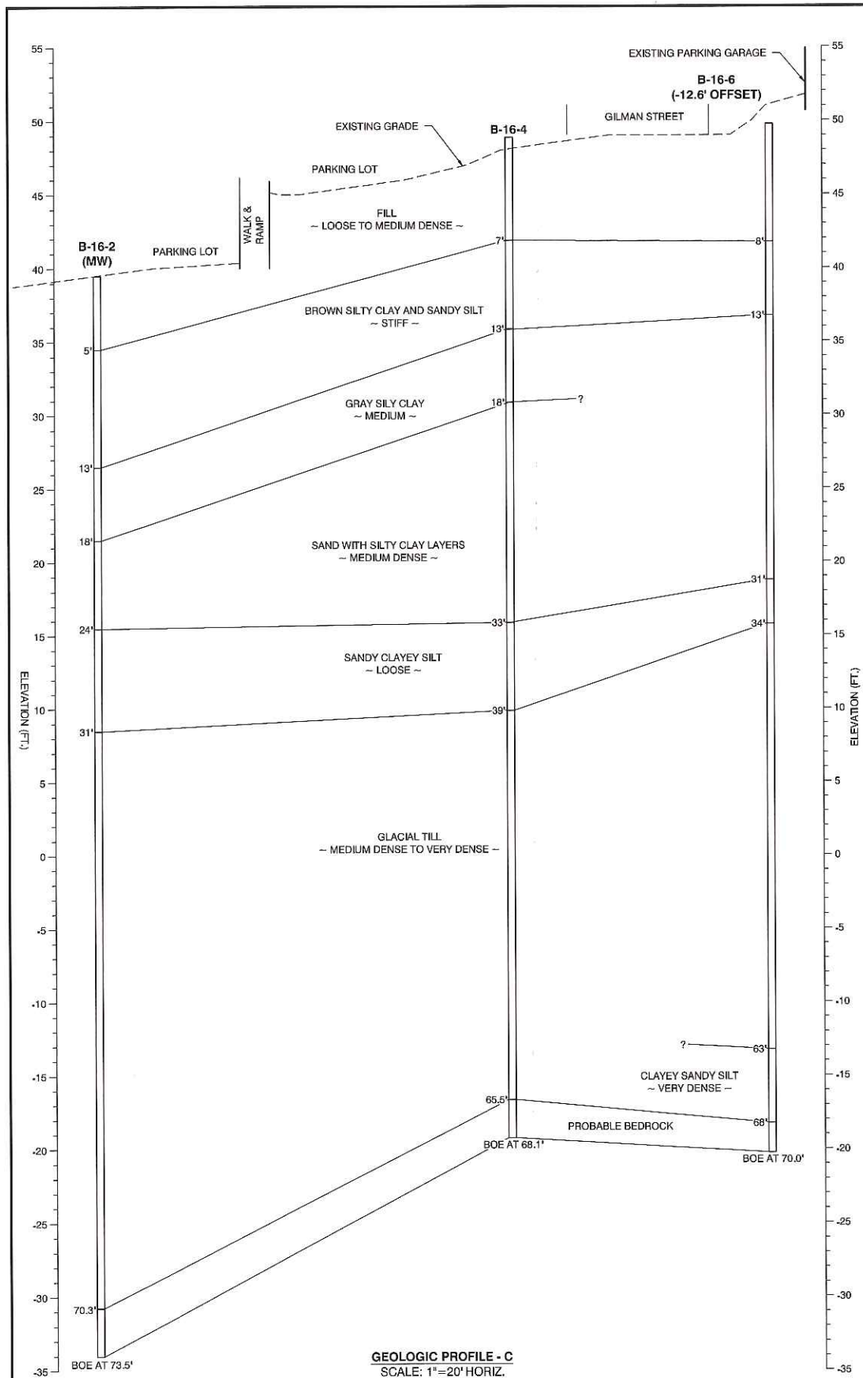
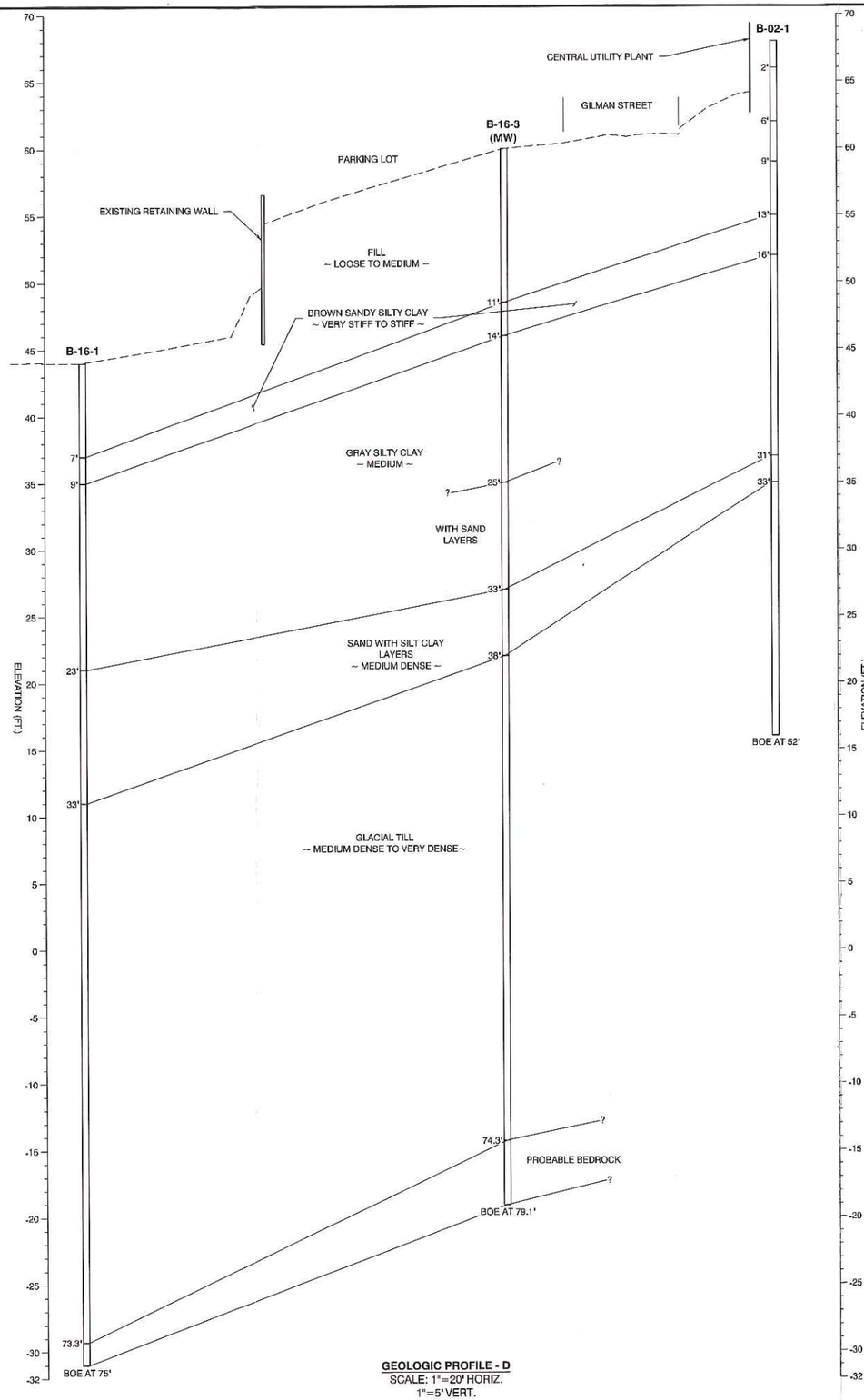


GEOLOGIC PROFILE - C
SCALE: 1"=20' HORIZ.
1"=5' VERT.



GEOLOGIC PROFILE - D
SCALE: 1"=20' HORIZ.
1"=5' VERT.

LEGEND

B-16-4 (MW)	BORING NUMBER PIEZOMETER INSTALLED
	APPROXIMATE EXISTING GROUND SURFACE
7'	STRATA CHANGE
SILT	STRATA DEFINITION
BOE	BOTTOM OF EXPLORATION

NOTES:

1. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTION WERE GENERALIZED FROM AND INTERPOLATED BETWEEN EXPLORATION LOCATIONS. THE TRANSITION BETWEEN MATERIALS MAY BE MORE OR LESS GRADUAL THAN INDICATED. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATIONS INDICATED AND AT THE TIME OF EXPLORATION. SEE BORING LOGS FOR MORE DETAILED INFORMATION.

NO.	DATE	DESCRIPTION	BY
0	01/12/2017	PRELIMINARY FINDINGS SUBMISSION	CEM

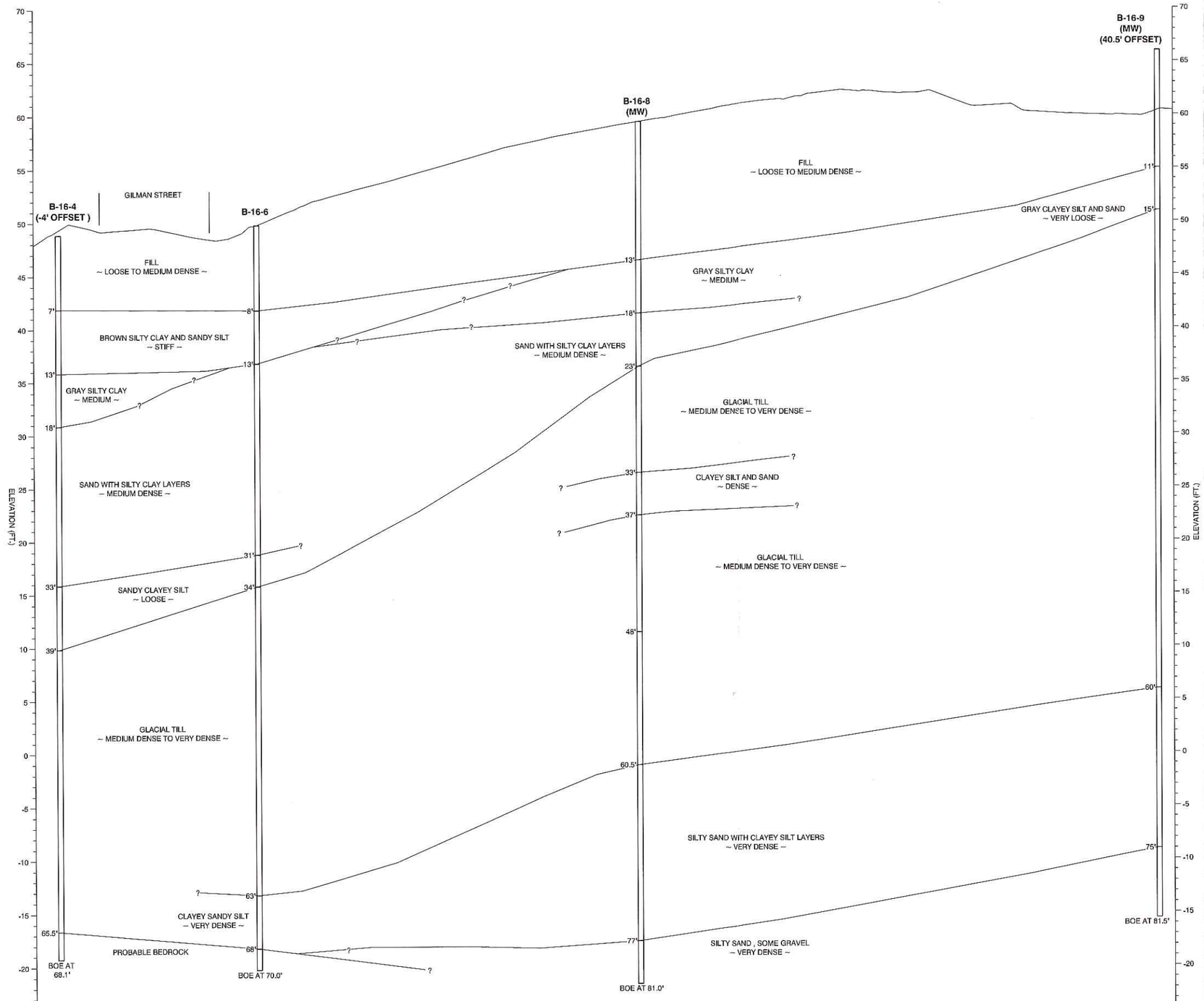
S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

GEOLOGIC PROFILES C & D

PROPOSED PARKING GARAGE AND
CONGRESS STREET BUILDING
GILMAN AND CONGRESS STREETS
PORTLAND, MAINE

Job No.: 16-1136 Scale: 1" = 20'
Date: 01/12/2017 Sheet: 1.2



GEOLOGIC PROFILE - E
SCALE: 1"=20' HORIZ.
1"=5' VERT.

LEGEND

B-16-4 (MW)	BORING NUMBER PIEZOMETER INSTALLED
	APPROXIMATE EXISTING GROUND SURFACE
7'	STRATA CHANGE
SILT	STRATA DEFINITION
BOE	BOTTOM OF EXPLORATION

NOTES:

1. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTION WERE GENERALIZED FROM AND INTERPOLATED BETWEEN EXPLORATION LOCATIONS. THE TRANSITION BETWEEN MATERIALS MAY BE MORE OR LESS GRADUAL THAN INDICATED. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATIONS INDICATED AND AT THE TIME OF EXPLORATION. SEE BORING LOGS FOR MORE DETAILED INFORMATION.

NO.	DATE	DESCRIPTION	BY
0	02/20/2017	PRELIMINARY FINDINGS SUBMISSION	CEM

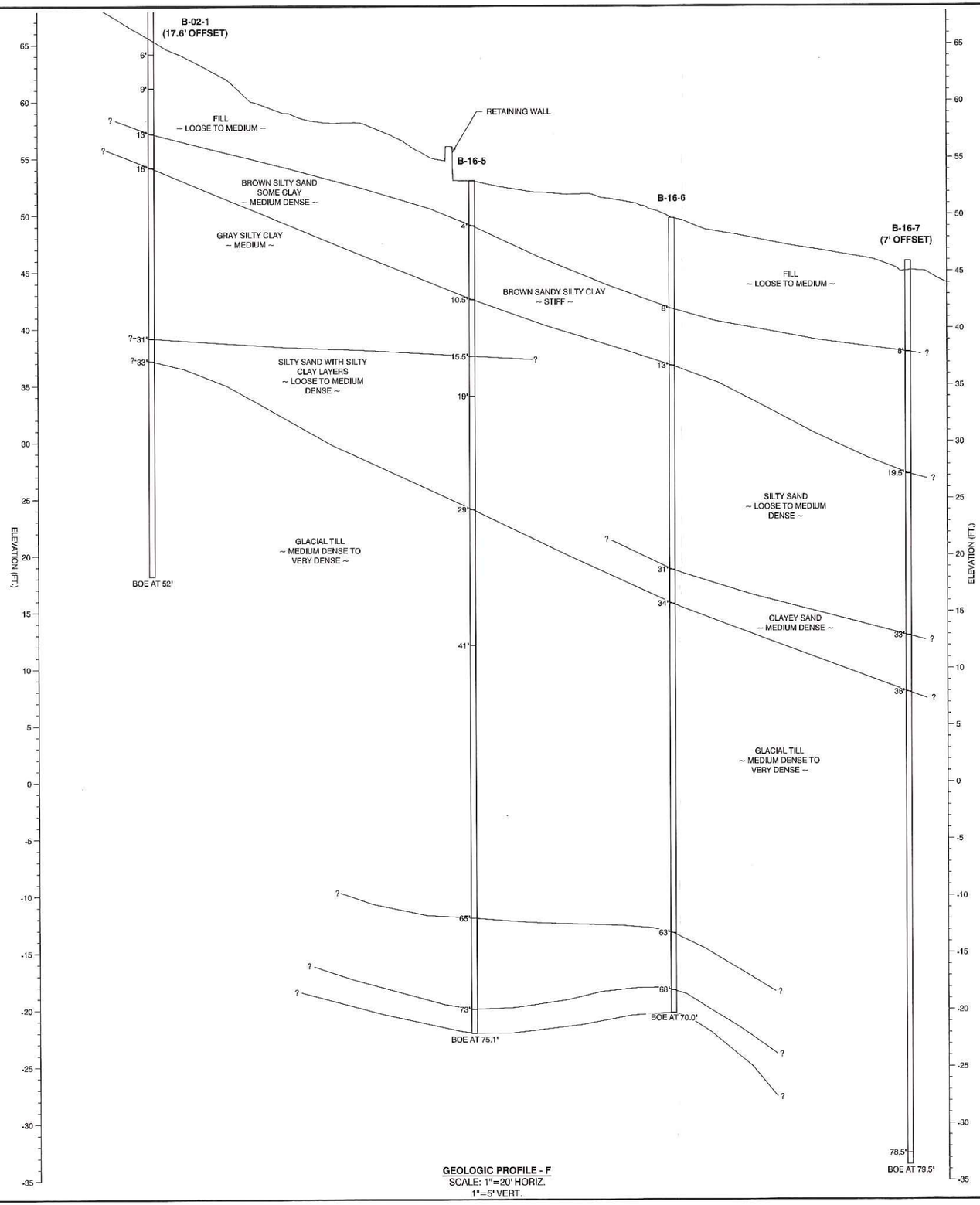
S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

GEOLOGIC PROFILE E

PROPOSED PARKING GARAGE AND
CONGRESS STREET BUILDING
GILMAN AND CONGRESS STREETS
PORTLAND, MAINE

Job No.: 16-1136 Scale: 1" = 20'
Date : 02/20/2017 Sheet: 1.3



GEOLOGIC PROFILE - F
SCALE: 1"=20' HORIZ.
1"=5' VERT.

LEGEND

B-16-4 (MW)	BORING NUMBER PIEZOMETER INSTALLED
	APPROXIMATE EXISTING GROUND SURFACE
7'	STRATA CHANGE
SILT	STRATA DEFINITION
BOE	BOTTOM OF EXPLORATION

NOTES:

1. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTION WERE GENERALIZED FROM AND INTERPOLATED BETWEEN EXPLORATION LOCATIONS. THE TRANSITION BETWEEN MATERIALS MAY BE MORE OR LESS GRADUAL THAN INDICATED. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATIONS INDICATED AND AT THE TIME OF EXPLORATION. SEE BORING LOGS FOR MORE DETAILED INFORMATION.

NO.	DATE	DESCRIPTION	BY
0	02/20/2017	PRELIMINARY FINDINGS SUBMISSION	CEM

S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

GEOLOGIC PROFILE F

PROPOSED PARKING GARAGE AND
CONGRESS STREET BUILDING
GILMAN AND CONGRESS STREETS
PORTLAND, MAINE

Job No.: 16-1136 Scale: 1" = 20'
Date: 02/20/2017 Sheet: 1.4

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-1**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 11/21/2016
DATE FINISH: 11/21/2016
ELEVATION: 44' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 10'
FREE WATER AT 4.3' PRIOR TO CASING

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	7D	24"	17"	42.0'	9	16	28	25		GRAY GRAVELLY SAND AND SILT (GLACIAL TILL) w = 10.7% ...DENSE~
	8D	24"	8"	47.0'	16	18	19	36		
	9D	24"	14"	52.0'	14	24	29	33		~VERY DENSE~
	10D	17"	12"	56.4'	23	46	52/5"			
	11D	24"	20"	61.9'	37	44	52	51/5"		GRAY GRAVELLY SAND AND SILT (GLACIAL TILL) w = 7.3%
	12D	15"	12"	66.2'	24	47	50/3"			
	13D	22"	20"	71.8'	26	28	34	52/4"		GRAY SILT AND SAND, TRACE GRAVEL (GLACIAL TILL) w = 15.9%
									73.3'	
									75.0'	ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
										BOTTOM OF EXPLORATION AT 75.0'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-1**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-2**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 11/22/2016
DATE FINISH: 11/23/2016
ELEVATION: 39' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 22.5' IN PIEZO ON 12/11/2016
WATER AT 22.3' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA										2 ¾" ASPHALT / PARKING LOT
									1.5'	BROWN GRAVELY SAND, SOME SILT (FILL) ~MEDIUM DENSE~
	1D	24"	15"	2.6'	8	7	3	2		~LOOSE~
									4.0'	GRAY SILTY SAND (FILL) PETROLEUM ODOR / PID = 3,050 PPM
	2D	24"	20"	4.6'	4	4	4	4	5.0'	GRAY-BROWN CLAYEY SANDY SILT (REWORKED / FILL) ~LOOSE~
										~VERY STIFF~
	3D	24"	22"	7.0'	6	5	8	9		BROWN SILTY CLAY q_p = 6.5 to 8 ksf
										w = 26.8%
4" HW										~STIFF~
	4D	24"	22"	12.0'	2	3	4	3		WITH OCCASIONAL SAND SEAMS, q_p = 3 to 4 ksf
									13.0'	
OPEN										~MEDIUM~
HOLE	5D	24"	14"	17.0'	W O H	1	2	3		GRAY SILTY CLAY
TO 40'										w = 36.6% q_p = < 0.5 ksf
THEN									18.0'	
4" HW										~MEDIUM DENSE~
TO 30'										BROWN SILTY SAND
	6D	24"	14"	22.0'	6	5	8	9		
									24.0'	
										~MEDIUM DENSE~
	7D	24"	17"	27.0'	3	8	11	10		RUST BROWN - BROWN SILTY SAND
										WITH GRAY SILTY CLAY LAYERS
									31.0'	
	8D	24"	20"	32.0'	1	9	8	9		~MEDIUM DENSE~
OPEN										
HOLE										DARK GRAY SILT AND SAND, SOME GRAVEL (GLACIAL TILL)
										OCCASIONAL COBBLES
	9D	24"	18"	37.0'	7	10	13	18		

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 22.6'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-2**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-2**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 11/22/2016
DATE FINISH: 11/23/2016
ELEVATION: 39' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: KEVIN HANSCOM

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 22.5' IN PIEZO ON 12/11 AND 1/4/2016
WATER AT 22.3' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										~DENSE~
	10D	24"	18"	42.0'	7	11	21	27		DARK GRAY SAND AND SILT, SOME GRAVEL, TRACE CLAY (GLACIAL TILL)
										w = 10.9%
	11D	24"	1"	47.0'	7	8	9	6		~MEDIUM DENSE~
	12D	24"	22"	52.0'	7	9	11	24		~MORE SILTY AND CLAYEY~
	13D	11"	11"	55.9'	41	74/5"				~VERY DENSE~
									57.0'	
	14D	11"	11"	60.9'	28	60/5"				~VERY DENSE~ GRAY SILT AND SAND, SOME CLAY, TRACE GRAVEL (GLACIAL TILL) w = 39.6%
	15D	5"	5"	65.4'	50/5"					~MORE SAND~
									68.0'	
	16D	4"	4"	70.3'	50/4"				70.3'	~VERY DENSE~ GRAY GRAVELLY SAND AND SILT, SOME CLAY (GLACIAL TILL)
									73.5'	ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
										BOTTOM OF EXPLORATION AT 73.5'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 22.6'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-2**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-3**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 11/30/2016
DATE FINISH: 11/30/2016
ELEVATION: 60' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 10'±
WATER AT 35.3' IN PIEZO ON 12/11 AND 1/5/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										3" ASPHALT / PARKING LOT
									2.0'	DARK BROWN SILTY SAND, SOME GRAVEL (FILL) ~MEDIUM DENSE~
	1D	24"	14"	2.3'	4	4	7	5		~LOOSE~
										LIGHT BROWN GRAVELLY SAND, SOME SILT (FILL)
	2D	24"	10"	4.3'	4	5	3	4	5.0'	
										~MEDIUM DENSE~
	3D	24"	20"	6.3'	3	4	6	4		BROWN CLAYEY SILTY FINE SAND, SOME GRAVEL (PROBABLE FILL)
										w = 29.2%
	4D	24"	18"	12.0'	2	6	4	2	11.5'	
										BROWN SANDY SILTY CLAY
									14.0'	~MEDIUM TO STIFF~
	5D	24"	24"	16.0'	W O R / 24"					GRAY SILTY CLAY q_p = ≤ 0.5 ksf
										~MEDIUM~
										w = 40.6%
										W_L = 48
										W_P = 20
	1S	24"	24"	21.0'	3" SHELBY TUBE					
	1V			22.7'	3 5/8" X 6" VANE					S_v = 1.00 ksf / 0.13 ksf
	1V'			23.4'	3 5/8" X 6" VANE					S_v = 0.99 ksf / 0.16 ksf
	6D	24"	24"	26.0'	W O H / 18"			2	25.5'	w = 36.9%
										PROBABLE GRAY SILTY CLAY WITH SAND LAYERS
	2V			29.7'	3 5/8" X 6" VANE					S_v = ≥ 1.00 ksf
										(NO ROTATION)
									33.0'	
	7D	24"	15"	36.0'	8	11	14	19		~MEDIUM DENSE~
										LIGHT BROWN SAND, SOME SILT
									38.0'	
										GRAY SAND AND SILT, SOME CLAY, TRACE GRAVEL (GLACIAL TILL)
										OCCASIONAL COBBLES

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 36.7'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-3**

DRAFT

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-3**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 11/30/2016
DATE FINISH: 11/30/2016
ELEVATION: 60' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 10'±
WATER AT 35.3' IN PIEZO ON 12/11 AND 1/5/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	8D	24"	16"	41.0'	9	12	12	12		~MEDIUM DENSE~
	9D	24"	21"	46.0'	5	12	8	9		
	10D	24"	22"	51.0'	12	14	11	13		GRAY SAND AND SILT, SOME CLAY, SOME GRAVEL (GLACIAL TILL) w = 12.1%
	11D	24"	16"	56.0'	11	13	19	26		
	12D	24"	10"	61.0'	45	19	49	50/5"		~VERY DENSE~ ...MORE GRAVEL...
	13D	23"	15"	65.9'	24	35	46	50/5"		
	14D	11"	8"	69.9'	43	50/5"			71.0'	
	15D	3"	3"	74.3'	50/3"				74.3'	~VERY DENSE~ PROBABLE GLACIAL TILL AND WEATHERED ROCK
										ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
	16D	1"	0"	79.1'	50/1"				79.1'	BOTTOM OF EXPLORATION AT 79.1'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 36.7'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-3**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-4**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 11/30/2016
DATE FINISH: 12/1/2016
ELEVATION: 49' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS WET AT 4.5' ±
FREE WATER AT 20' ± ON 12/2/16

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24
H S A								
	1D	24"	15"	2.4'	6	4	3	2
	2D	24"	4"	4.4'	3	3	3	2
	3D	24"	18"	6.4'	4	6	7	5
4" HW	4D	24"	20"	11.0'	3	4	5	5
OPEN HOLE TO 50' THEN 4" HW TO 44'	5D	24"	22"	16.0'	2	2	2	3
	6D	24"	12"	21.0'	12	7	12	13
	7D	24"	12"	26.0'	6	12	11	9
	8D	24"	10"	31.0'	7	5	6	14
	9D	24"	2"	36.0'	2	2	5	5

DEPTH	STRATA & TEST DATA
	3"± ASPHALT / PARKING LOT
1.0'	BROWN GRAVELLY SAND, SOME SILT (FILL) ~LOOSE~
2.1'	BROWN SAND, SOME SILT (FILL) ~LOOSE~
4.5'	DARK BROWN SAND AND SILT (FILL) ~LOOSE~
5.5'	BROWN SAND, SOME SILT (FILL) ~LOOSE TO MEDIUM DENSE~
7.0'	~MEDIUM DENSE~ BROWN SANDY CLAYEY SILT, TRACE GRAVEL (FILL)
13.0'	~STIFF~ BROWN SILTY CLAY WITH FREQUENT SAND SEAMS q_p = 4 to 5 ksf
18.0'	~MEDIUM~ GRAY-BROWN SILTY CLAY WITH OCCASIONAL SAND SEAMS q_p = 1 to 2 ksf
29.0'	~MEDIUM DENSE~ BROWN SAND, SOME SILT WITH OCCASIONAL GRAY CLAYEY SILT SEAMS SOME GRAVEL BELOW 25'
33.0'	~MEDIUM DENSE~ RUST BROWN-BROWN SAND WITH GRAY CLAYEY SILT LAYERS
39.0'	~LOOSE~ GRAY-BROWN SANDY CLAYEY SILT
	DARK GRAY SILT AND SAND, TRACE GRAVEL (GLACIAL TILL)

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-4**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-4**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 11/30/2016
DATE FINISH: 12/1/2016
ELEVATION: 49' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS WET AT 4.5' ±
FREE WATER AT 20' ± ON 12/2/16

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	10D	24"	18"	41.0'	4	5	6	9		~MEDIUM DENSE~ GRAY SILT AND SAND, SOME CLAY, TRACE GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	11D	24"	16"	47.0'	12	12	19	18		~DENSE~ ...MORE GRAVEL...
	12D	17"	17"	51.4'	46	45	50/5"			~VERY DENSE~
	13D	18"	18"	56.5'	25	34	50			
	14D	22"	20"	61.8'	17	22	38	50/4"		
	15D	2"	2"	65.2'	50/2"				65.5'	
	16D	1"	1"	68.1'	50/1"				68.1'	ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
										BOTTOM OF EXPLORATION AT 68.1'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-4**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-5**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 12/1/2016
DATE FINISH: 12/2/2016
ELEVATION: 53' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
FREE WATER AT 4.5' DURING DRILLING

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									0.5'	6"± CONCRETE
	1D	24"	12"	2.5'	4	6	5	5		~MEDIUM DENSE~ BROWN GRAVELLY SAND, SOME SILT (FILL)
									4.0'	
	2D	24"	22"	7.0'	3	3	3	5		~STIFF~ BROWN SILTY CLAY WITH FREQUENT FINE SAND SEAMS q_p = 3 to 4 ksf
									10.5'	~MEDIUM~ q_p = 1.5 ksf
	3D	24"	22"	12.0'	2	1	2	3		~MEDIUM~ q_p = < 0.5 ksf GRAY SILTY CLAY WITH FREQUENT SAND SEAMS / LAYERS
4" HW									15.5'	
	4D	24"	23"	17.0'	2	3	6	6		~LOOSE~ BROWN SILTY SAND WITH GRAY CLAYEY SILT LAYERS
									19.0'	
	5D	24"	12"	22.0'	12	11	10	14		~MEDIUM DENSE~ RUST BROWN-BROWN FINE SAND, WITH CLAYEY SILT LAYERS
									25.0'	
	6D	24"	11"	27.0'	12	14	16	18		~MEDIUM DENSE~ w = 13.6% LIGHT BROWN SAND, SOME SILT
									29.0'	
	7D	24"	16"	32.0'	10	8	7	9		~MEDIUM DENSE~ GRAY CLAYEY SILTY SAND, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	8D	24"	1"	37.0'	13	14	20	22		~DENSE~

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-5**

DRAFT

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-5**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 12/1/2016
DATE FINISH: 12/2/2016
ELEVATION: 53' +/-
SWC REP.: PJO

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC
DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
FREE WATER AT 4.5' DURING DRILLING

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									41.0'	
	9D	24"	14"	42.0'	13	12	56	35		~VERY DENSE~
	10D	8"	6"	45.6'	33	50/2"				DARK GRAY SAND AND SILT, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES w = 9.9%
	11D	24"	24"	52.0'	21	27	35	48		
	12D	24"	22"	57.0'	23	38	38	55		~VERY DENSE~
	13D	18"	17"	61.5'	36	33	50			w = 8.6%
									65.0'	
	14D	24"	20"	67.0'	26	30	23	63		~VERY DENSE~ w = 28.4% DARK GRAY CLAYEY SILT, SOME SAND
	15D	2"	2"	70.1'	50/2"				73.0'	
									75.1'	ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
										BOTTOM OF EXPLORATION AT 75.1'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-5**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-6**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 12/5/2016
DATE FINISH: 12/5/2016
ELEVATION: 50' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 30'±
FREE WATER AT 18' WHEN CASING PULLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
H S A									1.0'	BARK MULCH AND TOPSOIL
	1D	24"	20"	2.0'	1	12	12	9		~MEDIUM DENSE~ BROWN SILTY SAND WITH SOME GRAVEL (FILL) NOTE: HIT PROBABLE CONCRETE AT 4', MOVED BORING 5' WEST
									5.0'	
	2D	24"	24"	7.0'	2	3	4	4		~STIFF TO ~VERY STIFF~ q_p = 4 to 6 ksf BROWN SILTY CLAY (DISTURBED/FILL)
									8.0'	
4" HW										~STIFF~ BROWN SILTY CLAY WITH SAND LAYERS w = 34.1%
	3D	24"	24"	12.0'	3	3	3	5	13.0'	
	4D	24"	16"	17.0'	6	9	9	12		~MEDIUM DENSE~ LIGHT BROWN SAND, TRACE SILT w = 6.2%
									18.0'	
	5D	24"	12"	22.0'	13	12	14	15		~MEDIUM DENSE~ BROWN SILTY SAND WITH GRAY CLAYEY SILT LAYERS
	6D	24"	15"	27.0'	5	9	10	7		
									31.0'	
	7D	24"	24"	32.0'	2	1	1	4		~VERY LOOSE~ GRAY CLAYEY SILTY SAND
									34.0'	
OPEN HOLE	8D	24"	14"	37.0'	8	12	10	14		~MEDIUM DENSE~ DARK GRAY SAND AND SILT, SOME CLAY, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES w = 13.3%

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-6**

DRAFT

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-6**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 12/5/2016
DATE FINISH: 12/5/2016
ELEVATION: 50' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 30'±
FREE WATER AT 18' WHEN CASING PULLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	9D	24"	24"	42.0'	15	17	45	50/5"		~VERY DENSE~
	10D	15"	12"	46.2'	22	43	50/3"			w = 10.3% GRAY SAND AND SILT, TRACE GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	11D	23"	20"	51.9'	18	33	33	50/5"		
	12D	5"	5"	55.4'	50/5"					
	13D	10"	6"	60.8'	53	50/4"				... MORE SANDY...
									63.0'	
	14D	22"	20"	66.8'	25	23	25	50/4"		~VERY DENSE~ DARK GRAY SANDY CLAYEY SILT
									68.0'	
	15D	0"	0"	70.0'	25/0"				70.0'	ADVANCED BY ROLLER CONE (PROBABLE BEDROCK)
										BOTTOM OF EXPLORATION AT 70.0'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-6**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-7**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 12/7/2016
DATE FINISH: 12/8/2016
ELEVATION: 46' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED AT 34.5'± DURING DRILLING

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
H S A										DARK BROWN SILTY SAND, SOME GRAVEL, ORGANICS (FILL)
	1D	24"	10"	2.0'	2	4	5	5		~LOOSE~
									3.0'	
										~MEDIUM DENSE~
										BROWN SILTY SAND (FILL)
	2D	24"	16"	7.0'	11	10	13	19		
									8.0'	
										~STIFF~
4" HW	3D	24"	22"	10.5'	3	4	4	4		BROWN SILTY CLAY q_p = 2 ksf
	4D	24"	24"	15.5'	2	3	4	5		...FREQUENT SAND SEAMS...
									19.5'	
	5D	24"	24"	20.5'	3	4	5	6		~LOOSE BECOMING...
										RUST BROWN SAND, SOME SILT
	6D	24"	18"	25.5'	10	11	13	13		...MEDIUM DENSE~
	7D	24"	20"	31.5'	13	13	17	20		
									33.0'	
										~MEDIUM DENSE~
										GRAY-BROWN CLAYEY SAND
										WITH CLAYEY SILT LAYERS
	8D	24"	22"	36.5'	3	7	5	4		
									38.0'	
										BROWN SAND AND SILT, SOME GRAVEL (GLACIAL TILL)

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-7**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-7**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 12/7/2016
DATE FINISH: 12/8/2016
ELEVATION: 46' +/-
SWC REP.: PFK / TSD

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC
DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 38.5'

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	9D	18"	12"	40.5'	20	33	50/6"			BROWN SAND AND SILT, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	10D	11"	4"	44.4'	37	50/5"				~VERY DENSE~
	11D	23"	18"	50.4'	40	43	42	50/5"		
	12D	12"	12"	54.5'	39	50				
	13D	10"	8"	59.4'	42	50/4"				
	14D	5"	4"	68.9'	50/5"					~VERY DENSE~ GRAY-BROWN SILTY SAND, TRACE GRAVEL (GLACIAL TILL)
									78.5'	
									79.5'	DARK GRAY SILT AND SAND, TRACE GRAVEL (GLACIAL TILL) ~VERY DENSE~
	15D	12"	8"	79.5'	37	50/6"				BOTTOM OF EXPLORATION AT 79.5'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-7**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-8**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 12/6/2016
DATE FINISH: 12/6/2016
ELEVATION: 59' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 20.7' IN PIEZO ON 12/11/2016
WATER AT 14' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
H S A										BARK MULCH AND TOPSOIL (FILL)
	1D	24"	8"	2.0'	4	4	7	8	1.5'	
	2D	24"	15"	7.0'	3	3	4	5		BROWN-GRAY CLAYEY SILT AND SANDY SILTY CLAY (MIXED FILL) ~LOOSE~
4" HW	3D	24"	14"	11.0'	3	2	3	3	13.0'	
	4D	24"	24"	16.0'	W O H / 12"		1	1	18.0'	~MEDIUM~ GRAY SILTY CLAY WITH SAND SEAMS w = 39.7%
	5D	24"	16"	21.0'	5	7	9	8	23.0'	~MEDIUM DENSE~ RUST BROWN-BROWN SILTY SAND WITH CLAYEY SILT LAYERS w = 23.8%
OPEN HOLE	6D	24"	10"	26.0'	8	6	5	7		~MEDIUM DENSE~ GRAY SAND AND SILT, SOME CLAY (GLACIAL TILL) OCCASIONAL COBBLES w = 13.4%
	7D	24"	22"	31.0'	10	13	13	18	33.0'	
	8D	24"	13"	36.0'	17	16	21	24	37.0'	~DENSE~ BROWN CLAYEY SILT AND SAND
										BROWN SAND AND SILT, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 38'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-8**

DRAFT

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-8**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 12/6/2016
DATE FINISH: 12/6/2016
ELEVATION: 59' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	H S A	2 1/4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 20.7' IN PIEZO ON 12/11/2016
WATER AT 14' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	9D	24"	16"	41.0'	20	16	15	24		~DENSE~ BROWN SAND AND SILT, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES w = 13.3%
	10D	24"	14"	46.0'	11	12	12	9	48.0'	
	11D	17"	16"	51.0'	28	37	50/5"			~VERY DENSE~ GRAY SAND AND SILT, SOME CLAY, SOME GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	12D	11"	8"	54.9'	54	50/5"				w = 8.5%
	13D	22"	18"	60.8'	17	27	31	50/4"	60.5'	
	14D	10"	9"	64.8'	32	50/4"				~VERY DENSE~ BROWN-GRAY SILTY SAND WITH CLAYEY SILT LAYERS
	15D	16"	12"	70.3'	47	58	50/4"			...SOME GRAVEL...
									77.0'	
	16D	6"	6"	79.5'	77				81.0'	~VERY DENSE~ GRAY SILTY SAND, SOME GRAVEL BOTTOM OF EXPLORATION AT 81'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 38'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-8**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-9**
SHEET: 1 OF 2
PROJECT NO.: 16-1136
DATE START: 12/9/2016
DATE FINISH: 12/9/2016
ELEVATION: 66' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 35.1' IN PIEZO ON 12/11/2016
WATER AT 30.9' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
4" HW									0.5'	6" CONCRETE
	1D	24"	14"	2.5'	9	7	5	5		~MEDIUM DENSE~ BROWN SAND, SOME GRAVEL, SOME SILT (FILL)
	2D	24"	24"	7.0'	7	6	6	7		
	3D	24"	8"	9.0'	5	3	2	2		~LOOSE~
OPEN HOLE	4D	24"	10"	11.5'	1	1	2	3	11.0'	~VERY LOOSE~ DARK GRAY CLAYEY SAND AND SILT
	5D	24"	14"	16.5'	8	12	25	24	15.0'	~DENSE~ DARK GRAY SAND AND SILT, SOME GRAVEL, TRACE CLAY (GLACIAL TILL) OCCASIONAL COBBLES
	6D	24"	16"	21.5'	8	12	25	24		w = 9.1%
	7D	24"	20"	26.5'	12	14	19	19	30.0'	
	8D	24"	10"	31.5'	9	12	14	20		~MEDIUM DENSE~ GRAY SAND AND SILT, SOME CLAY, TRACE GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	9D	24"	24"	36.5'	15	12	10	15		

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 39'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-9**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-16-9**
SHEET: 2 OF 2
PROJECT NO.: 16-1136
DATE START: 12/9/2016
DATE FINISH: 12/9/2016
ELEVATION: 66' +/-
SWC REP.: PFK

PROJECT / CLIENT: PROPOSED GILMAN ST. GARAGE & CONGRESS ST. BUILDING / MAINE MEDICAL CENTER
LOCATION: PORTLAND, MAINE
DRILLING CO. : S.W.COLE EXPLORATIONS, LLC DRILLER: SCOTT HOLLABOUGH

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LBS	30"
CORE BARREL:				

WATER LEVEL INFORMATION
WATER AT 35.1' IN PIEZO ON 12/11/2016
WATER AT 30.9' IN PIEZO ON 1/4/2016

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	10D	24"	18"	41.5'	10	14	12	24		GRAY SAND AND SILT, SOME CLAY, TRACE GRAVEL (GLACIAL TILL) OCCASIONAL COBBLES
	11D	24"	10"	46.5'	12	17	22	26		~DENSE~ ...MORE GRAVEL...
	12D	21"	20"	51.2'	10	21	30	50/3"		~VERY DENSE~ ...SOME SAND LAYERING...
	13D	10"	8"	55.3'	54	50/4"				GRAY SILTY SAND, SOME GRAVEL (GLACIAL TILL)
									60.0'	
	14D	10"	6"	60.3'	50	50/4"				~VERY DENSE~ GRAY-BROWN SILTY SAND WITH CLAYEY SILT LAYERS
	15D	10"	8"	70.3'	60	50/4"				...SOME GRAVEL...
									75.0'	
										DARK GRAY SAND AND SILT, SOME GRAVEL, TRACE CLAY WITH PIECES OF WEATHERED ROCK (GLACIAL TILL) ~VERY DENSE~
	16D	12"	12"	80.5'	22	54			81.5'	BOTTOM OF EXPLORATION AT 81.5'

DRAFT

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: BOTTOM OF PIEZO AT 39'± WITH 5' SCREEN

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16-9**

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

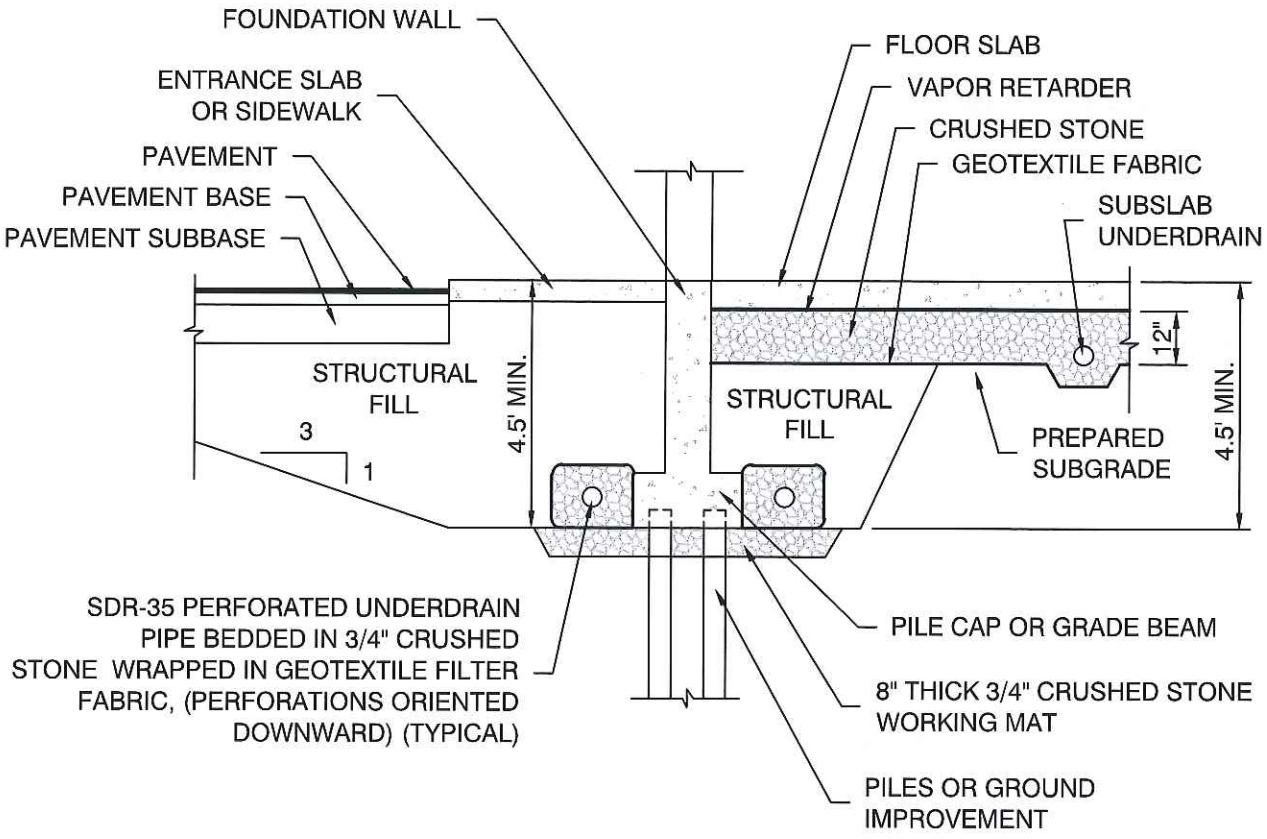
Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.



NOTE:

1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.

2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.

S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

UNDERDRAIN DETAIL

PROPOSED CONGRESS STREET MEDICAL OFFICE BUILDING
CONGRESS STREET
PORTLAND, MAINE

Job No.:	16-1136	Scale:	Not to Scale
Date :	02/20/2017	Sheet:	21

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APPENDIX A

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-1
SHEET: 1 OF 2
PROJECT NO.: 02-0763 S
DATE START: 9/3/2002
DATE FINISH: 9/3/2002
ELEVATION: 68+/-
SWC REP.: KGB

PROJECT / CLIENT: PROPOSED CENTRAL UTILITIES PLANT / MAINE MEDICAL CENTER
LOCATION: GILMAN STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	2 1/2"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
NO GROUNDWATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-1	24"	19"	2.0'	3	8	10	11	2.0'+/-	BROWN SILTY SAND, SOME GRAVEL, SOME ORGANICS (FILL) ~ MEDIUM DENSE ~
									6.0'	BROWN SILTY SAND, SOME FINE GRAVEL (FILL) ~ MEDIUM DENSE ~
	S-2	24"	20"	7.0'	7	14	16	18	9.0'	BROWN SILTY SAND, TRACE OF FINE GRAVEL (FILL) ~ MEDIUM DENSE TO DENSE ~
19										
28	S-3	24"	20"	12.0'	8	7	7	10	13.0'	LIGHT BROWN MEDIUM SAND, SOME FINE GRAVEL, TRACE OF SILT (PROBABLE FILL) ~ MEDIUM DENSE ~
48										
45									16.0'	BROWN SILTY SAND, SOME GRAVEL, TRACE OF CLAY ~ MEDIUM DENSE ~
	S-4	24"	24"	17.0'	3	1	1	1		~ MEDIUM ~
	1U	24"	24"	19.0'	HYDRAULIC PUSH					GRAY SILTY CLAY WITH SOME SAND LAYERS qu = 1.24 ksf W = 40.4% qp = 0.5 ksf WI = 38 Wp = 18
	S-5	24"	24"	22.0'	WOH/24"					
	3.5" X 6" VANE			25.8'						Sv = 1.3/0.21 ksf
	3.5" X 6" VANE			26.5'						Sv = NO ROTATION
	2U	12"	10"	31.0'	HYDRAULIC PUSH				31.0'	W = 31.0% WI = 28 qu = 2.9 ksf Wp = 17
	S-6	24"	17"	33.0'	12	8	7	18	33.0'	LIGHT BROWN FINE SAND WITH FREQUENT IRON STAINING, TRACE OF SILT AND SEAMS OF SILTY SAND, TRACE OF CLAY ~ MEDIUM DENSE ~
	S-7	24"	24"	37.0'	1	3	4	7		GRAY SILT AND SAND, SOME GRAVEL AND TRACE OF CLAY (TILL) ~ MEDIUM DENSE ~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: B-1

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-1
SHEET: 2 OF 2
PROJECT NO.: 02-0763 S
DATE START: 9/3/2002
DATE FINISH: 9/3/2002
ELEVATION: 68+/-
SWC REP.: KGB

PROJECT / CLIENT: PROPOSED CENTRAL UTILITIES PLANT / MAINE MEDICAL CENTER
LOCATION: GILMAN STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	2 1/2"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
NO GROUNDWATER OBSERVED

NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	ELEV.	STRATA & TEST DATA
S-8	24"	14"	42.0'	5	4	8	11		- MEDIUM DENSE BECOMING . . .
S-9	24"	14"	47.0'	5	7	8	10		GRAY SILT AND SAND, SOME GRAVEL AND TRACE OF CLAY (TILL)
									. . . DENSE -
S-10	24"	21"	52.0'	7	13	15	23	52.0'	
									BOTTOM OF EXPLORATION AT 52.0'
									NOT REFUSAL
									NOTE :
									BORING MADE APROXIMATELY 15' SOUTH OF EXISTING STORM DRAI

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-1

B-96-15

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-15
SHEET: 1 OF 1
PROJECT NO.: 96-0043 S
DATE START: 1/6/1997
DATE FINISH: 1/6/1997
ELEVATION: 65.0'+/-
SWC REP.: RRJ

PROJECT / CLIENT: MEDICAL OFFICE AND PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CONGRESS STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS, INC. DRILLER: DAVE DIONNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
OPEN HOLE TO 21.0'
WATER AT 10.3' AFTER 24 HOURS

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									0.2'	DARK BROWN LOAMY SANDY SILT WITH ORGANICS (TOPSOIL)
	S-1	24"	6"	2.0'	3	4	5	8	2.0'	BROWN SILTY SAND WITH SOME GRAVEL (FILL) ~ MEDIUM DENSE ~
	S-2	24"	10"	7.0'	9	16	23	25		~ DENSE ~
	S-3	24"	18"	12.0'	20	22	25	25		GRAY GRAVELLY SILTY SAND (TILL) W = 8.5%
	S-4	24"	18"	17.0'	5	8	9	15		~ MEDIUM DENSE ~
	S-5	24"	20"	22.0'	8	8	10	13		~ DENSE ~
	S-6	24"	12"	27.0'	7	11	28	25	27.0'	
										BOTTOM OF EXPLORATION AT 27.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-15

B-96-16

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-16
SHEET: 1 OF 2
PROJECT NO.: 96-0043 S
DATE START: 1/8/1997
DATE FINISH: 1/8/1997
ELEVATION: 68.5'+/-
SWC REP.: RRJ

PROJECT / CLIENT: MEDICAL OFFICE AND PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CONGRESS STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS, INC. DRILLER: DAVE DIONNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED AT 10'+/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6": 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									0.2'	ASPHALT PAVEMENT
	S-1	18"	8"	1.7'	15	9	23		2.0'	DARK BROWN GRAVELLY SAND WITH SOME SILT (FILL)
	S-2	24"	20"	7.0'	18	75	21	17		GRAY CLAYEY SAND WITH SOME SILT AND TRACE OF GRAVEL (TILL) ~ DENSE TO VERY DENSE ~
	S-3	24"	18"	12.0'	6	17	16	35		
	S-4	24"	0	17.0'	39	43	50	61		
	S-5	24"	24"	22.0'	6	16	25	27	23.0'	
									24.5'	BOULDER
	S-6	24"	10"	26.5'	11	20	33	48		GRAY SAND AND SILT WITH SOME GRAVEL (TILL) ~ VERY DENSE ~
	S-7	24"	24"	32.0'	41	33	20	32		
	S-8	24"	12"	37.0'	10	12	38	42		

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-16

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-16
SHEET: 2 OF 2
PROJECT NO.: 96-0043 S
DATE START: 1/6/1997
DATE FINISH: 1/6/1997
ELEVATION: 66.5'+/-
SWC REP.: RRJ

PROJECT / CLIENT: MEDICAL OFFICE AND PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CONGRESS STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS, INC. DRILLER: DAVE DIONNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED AT 10'+/-

CASING BLOWS PER FOOT	SAMPLE NO	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										GRAY SAND AND SILT WITH SOME GRAVEL (TILL)
	S-9	24"	24"	42.0'	12	16	22	31	42.0'	~ VERY DENSE ~
										BOTTOM OF EXPLORATION AT 42.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-16

APPENDIX B

S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name: PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING

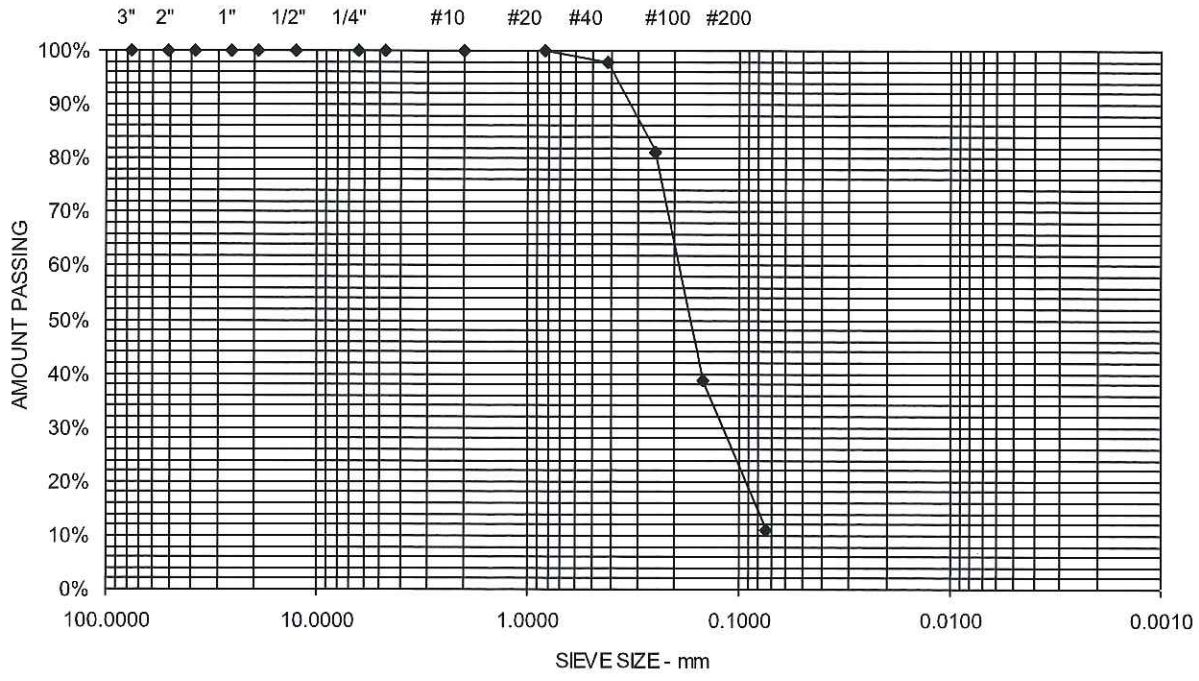
Client: MAINE MEDICAL CENTER

Material Source: **B-16-1 5D 30-32'**

Project Number: 16-1136
Lab ID: 21874G
Date Received: 11/30/2016
Date Completed: 12/5/2016
Tested By: JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**98**	89% Sand
250 um	**No. 60**	**81**	
150 um	**No. 100**	**39**	
75 um	**No. 200**	**11.0**	11% Fines

SAND, SOME SILT



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S.W.COLE ENGINEERING, INC.

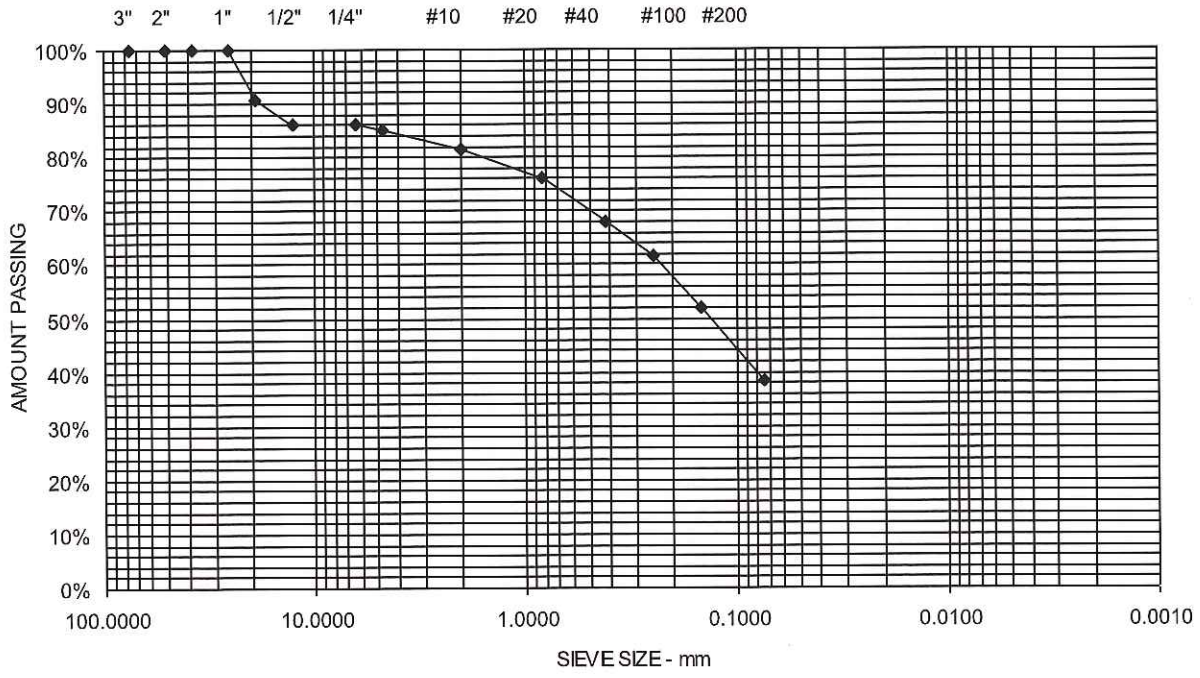
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21875G
		Date Received	11/30/2016
		Date Completed	12/5/2016
Material Source	**B-16-1 9D 40-42'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**91**	
12.5 mm	**1/2"**	**86**	
6.3 mm	**1/4"**	**86**	
4.75 mm	**No. 4**	**85**	14.8% Gravel
2.00 mm	**No. 10**	**82**	
850 um	**No. 20**	**76**	
425 um	**No. 40**	**68**	46.7% Sand
250 um	**No. 60**	**62**	
150 um	**No. 100**	**52**	
75 um	**No. 200**	**38.5**	38.5% Fines

GRAVELLY SAND AND SILT



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S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name: PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING

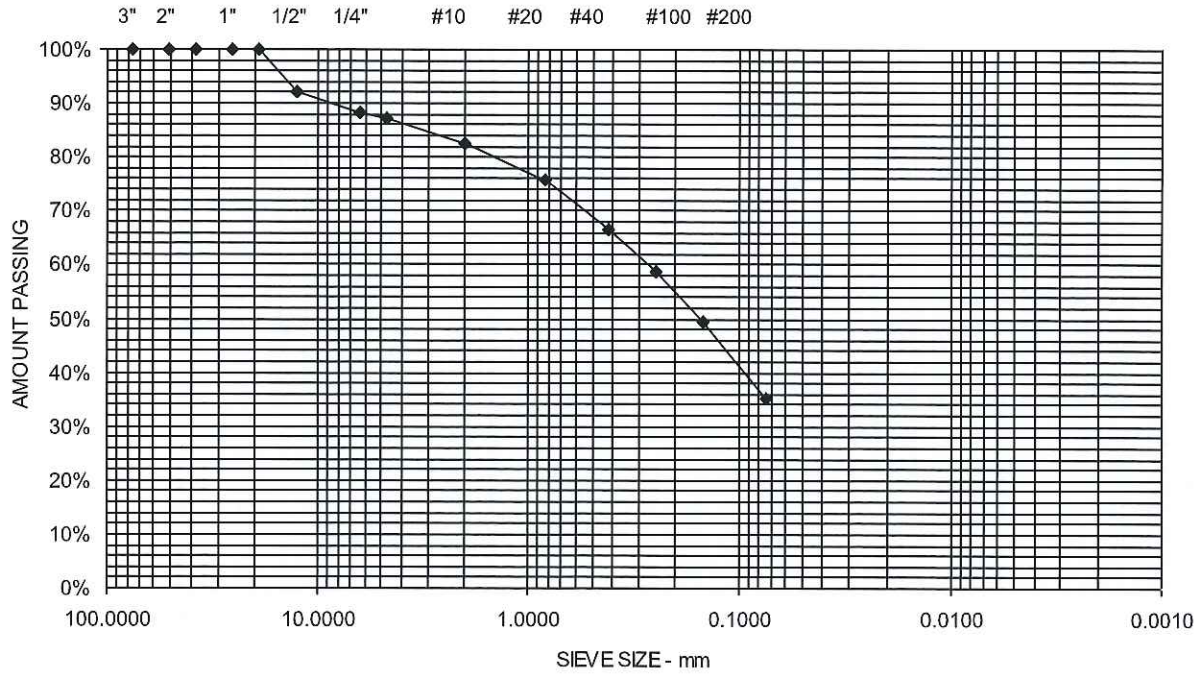
Client: MAINE MEDICAL CENTER

Material Source: **B-16-1 11D 60-61.9'**

Project Number: 16-1136
Lab ID: 21876G
Date Received: 11/30/2016
Date Completed: 12/7/2016
Tested By: JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**92**	
6.3 mm	**1/4"**	**88**	
4.75 mm	**No. 4**	**87**	12.9% Gravel
2.00 mm	**No. 10**	**82**	
850 um	**No. 20**	**76**	
425 um	**No. 40**	**67**	51.7% Sand
250 um	**No. 60**	**59**	
150 um	**No. 100**	**49**	
75 um	**No. 200**	**35.4**	35.4% Fines

GRAVELLY SAND AND SILT



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S.W.COLE ENGINEERING, INC.

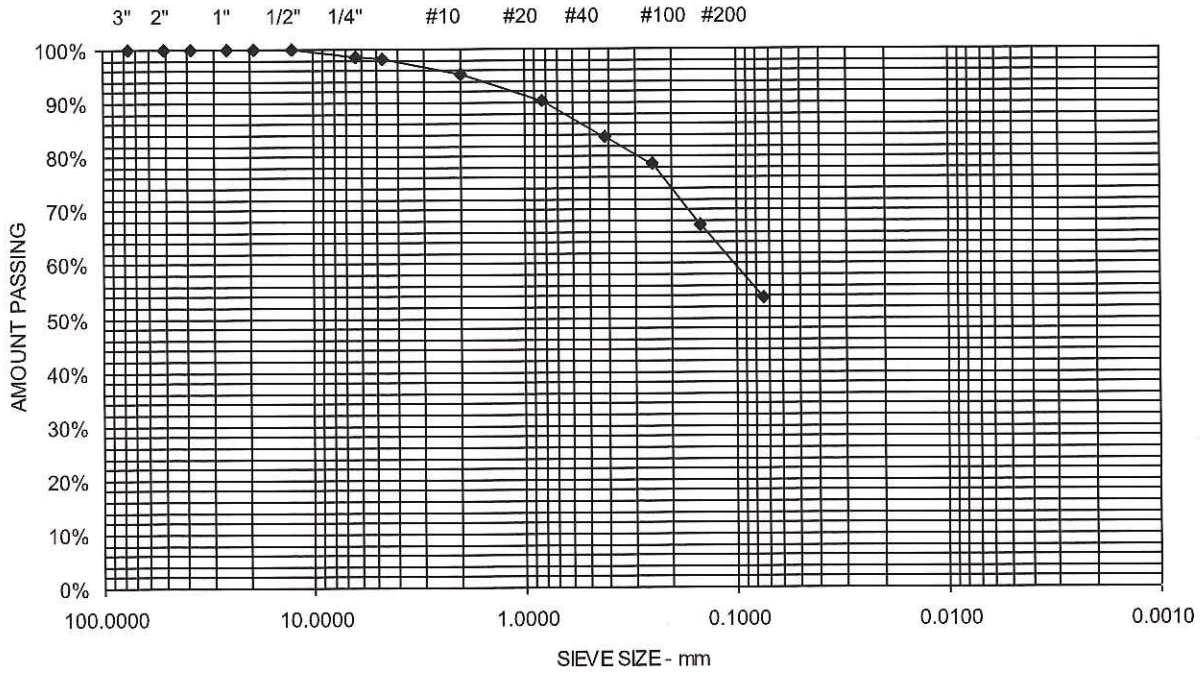
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21877G
		Date Received	11/30/2016
		Date Completed	12/7/2016
Material Source	**B-16-1 13D 70-71.8'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**99**	
4.75 mm	**No. 4**	**98**	1.8% Gravel
2.00 mm	**No. 10**	**95**	
850 um	**No. 20**	**90**	
425 um	**No. 40**	**84**	44.3% Sand
250 um	**No. 60**	**79**	
150 um	**No. 100**	**67**	
75 um	**No. 200**	**53.9**	53.9% Fines

SILT AND SAND, TRACE GRAVEL



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S.W.COLE ENGINEERING, INC.

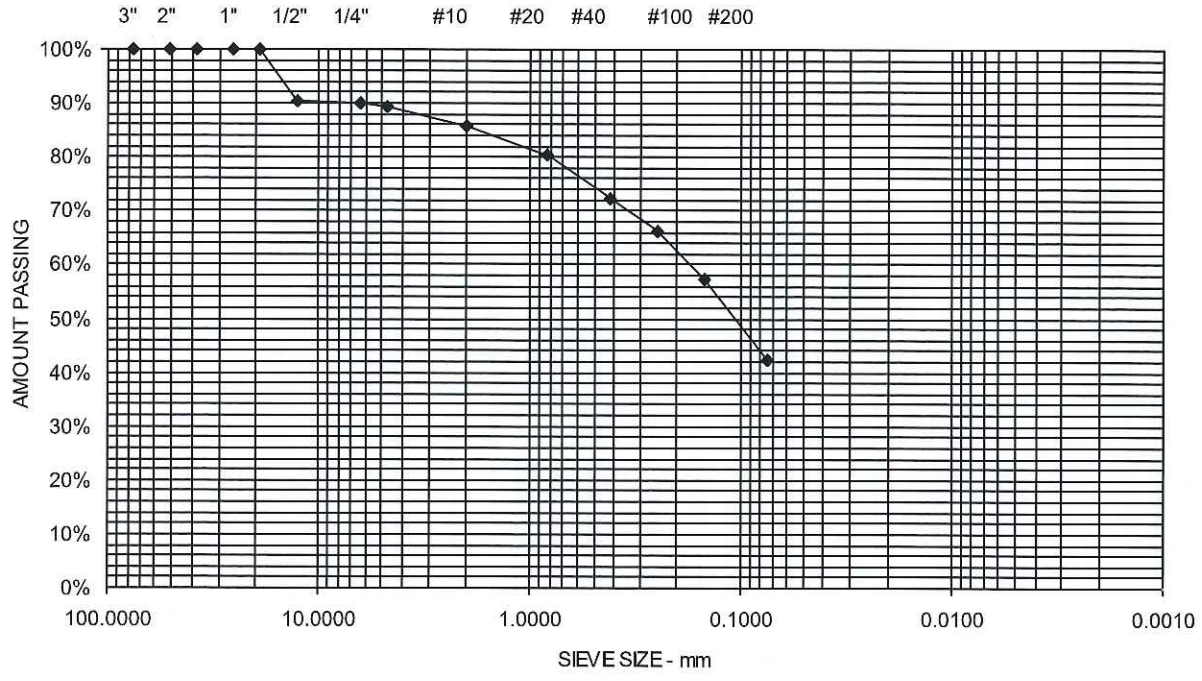
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21880G
		Date Received	11/30/2016
		Date Completed	12/7/2016
Material Source	**B-16-2 10D 40-42'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**90**	
6.3 mm	**1/4"**	**90**	
4.75 mm	**No. 4**	**89**	10.8% Gravel
2.00 mm	**No. 10**	**86**	
850 um	**No. 20**	**80**	
425 um	**No. 40**	**72**	47% Sand
250 um	**No. 60**	**66**	
150 um	**No. 100**	**57**	
75 um	**No. 200**	**42.2**	42.2% Fines

SAND AND SILT, SOME GRAVEL, TRACE CLAY



Comments: w = 10.9%

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S.W.COLE ENGINEERING, INC.

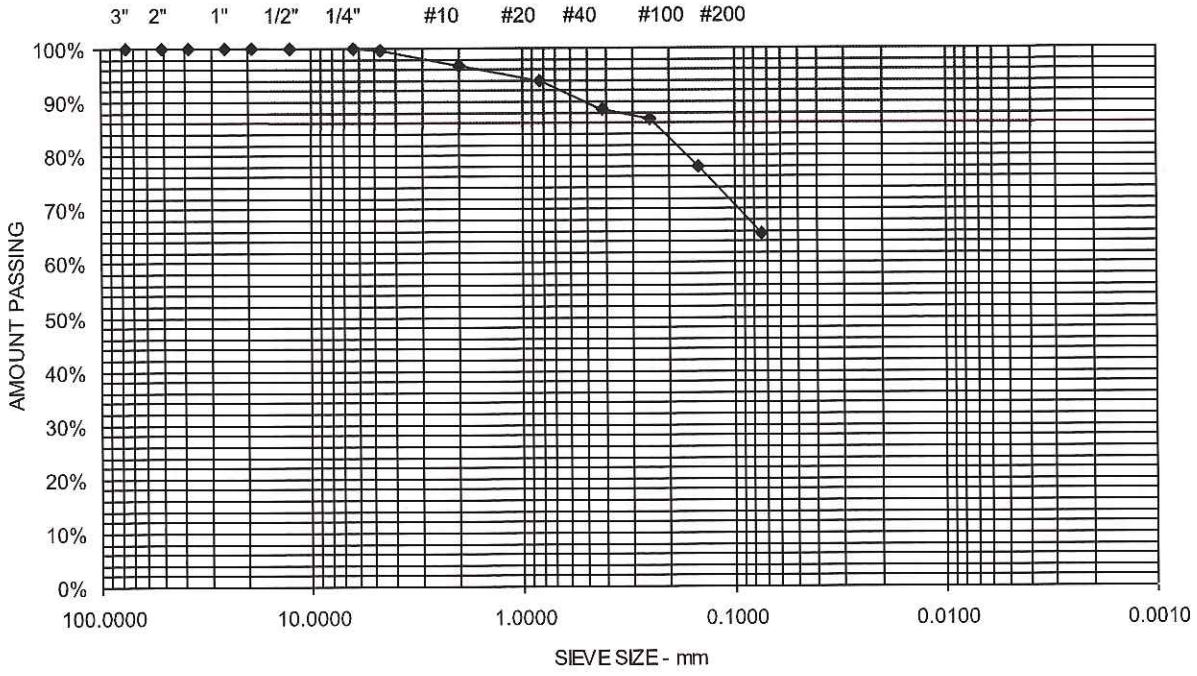
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21881G
		Date Received	11/30/2016
		Date Completed	12/7/2016
Material Source	**B-16-2 14D 60-60.9'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/um)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0.4% Gravel
2.00 mm	**No. 10**	**97**	
850 um	**No. 20**	**94**	
425 um	**No. 40**	**89**	34.3% Sand
250 um	**No. 60**	**87**	
150 um	**No. 100**	**78**	
75 um	**No. 200**	**65.3**	65.3% Fines

SILT AND SAND, SOME CLAY, TRACE GRAVEL



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S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name: PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING

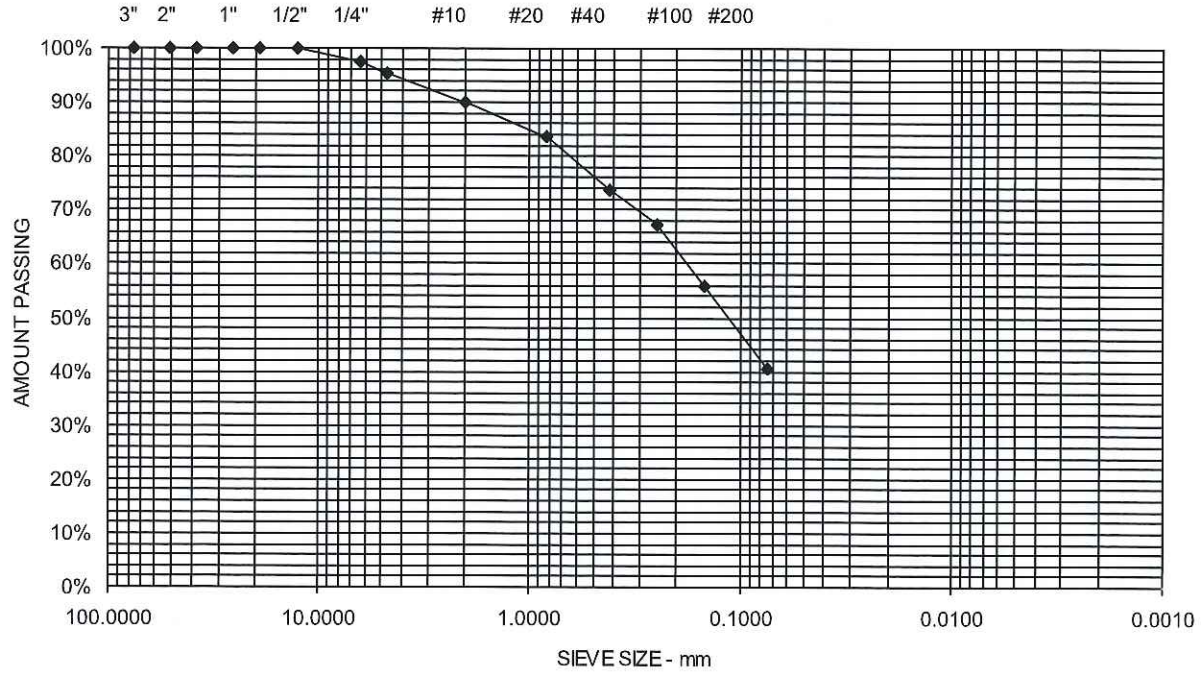
Client: MAINE MEDICAL CENTER

Material Source: **B-16-3 10D 49-51'**

Project Number: 16-1136
Lab ID: 21884G
Date Received: 11/30/2016
Date Completed: 12/7/2016
Tested By: JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**98**	
4.75 mm	**No. 4**	**95**	4.6% Gravel
2.00 mm	**No. 10**	**90**	
850 um	**No. 20**	**83**	
425 um	**No. 40**	**74**	54.8% Sand
250 um	**No. 60**	**67**	
150 um	**No. 100**	**56**	
75 um	**No. 200**	**40.6**	40.6% Fines

SAND AND SILT, SOME CLAY, TRACE GRAVEL



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S.W.COLE ENGINEERING, INC.

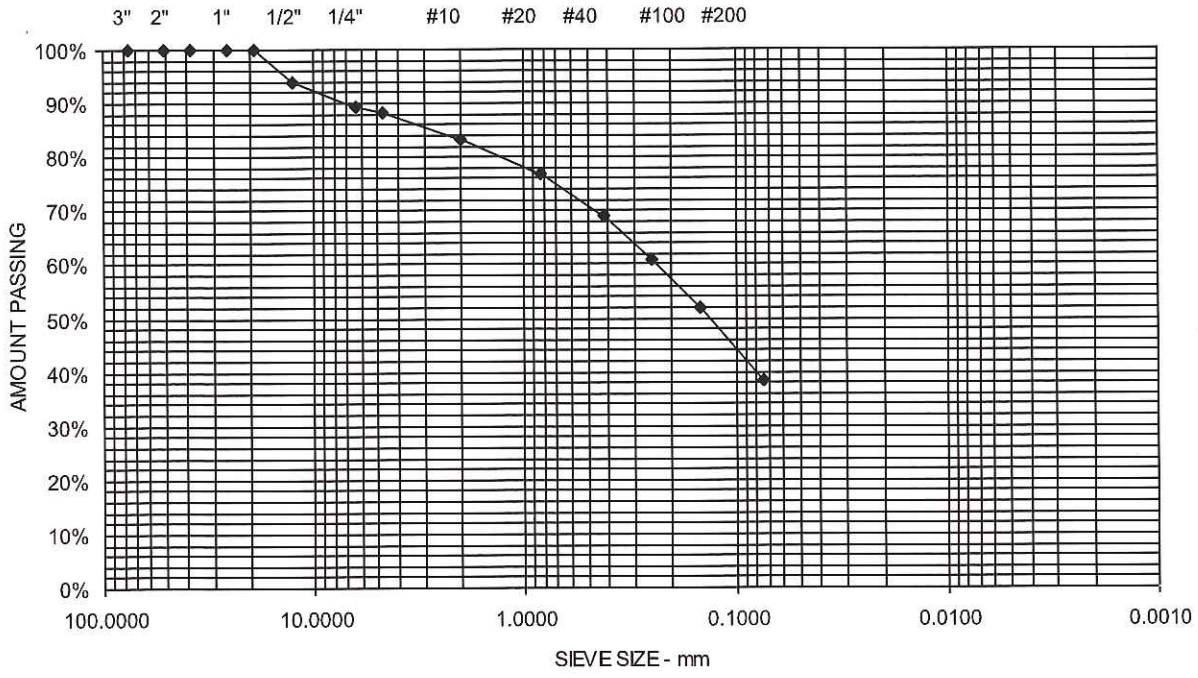
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21900G
		Date Received	12/7/2016
		Date Completed	12/14/2016
Material Source	**B-16-5 10D 45-47'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**94**	
6.3 mm	**1/4"**	**89**	
4.75 mm	**No. 4**	**88**	11.6% Gravel
2.00 mm	**No. 10**	**83**	
850 um	**No. 20**	**77**	
425 um	**No. 40**	**69**	50% Sand
250 um	**No. 60**	**61**	
150 um	**No. 100**	**52**	
75 um	**No. 200**	**38.4**	38.4% Fines

SAND AND SILT, SOME GRAVEL



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S.W.COLE ENGINEERING, INC.

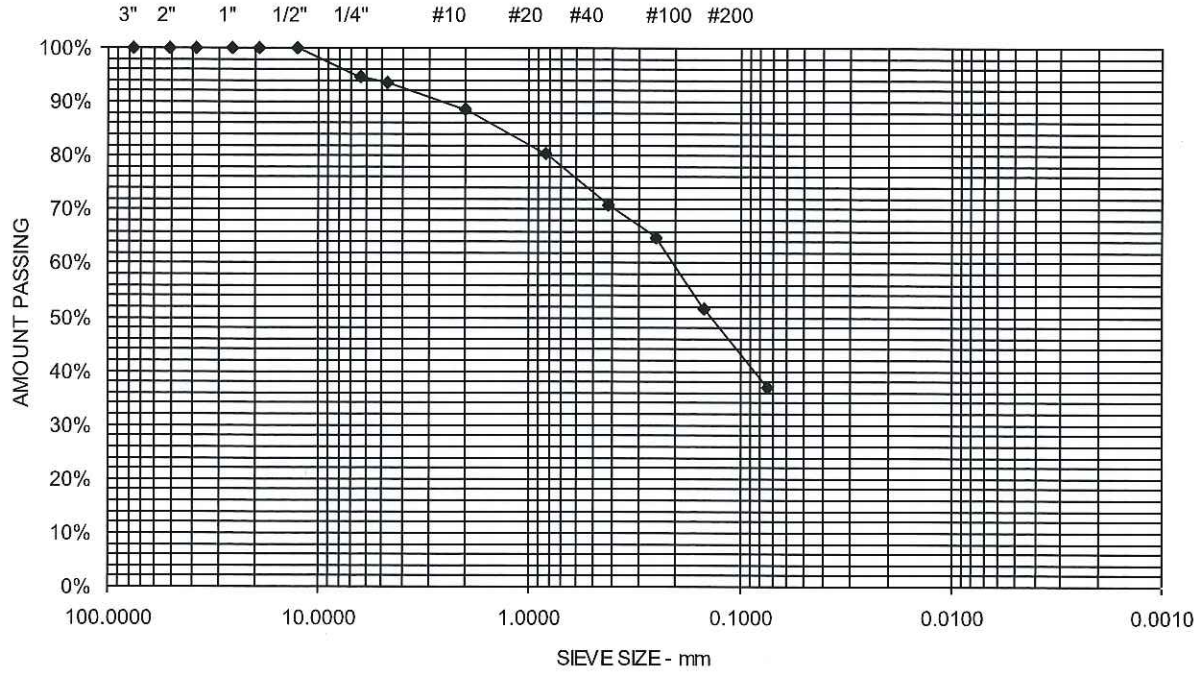
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21901G
		Date Received	12/7/2016
		Date Completed	12/14/2016
Material Source	**B-16-5 13D 60-61'**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**95**	
4.75 mm	**No. 4**	**94**	6.4% Gravel
2.00 mm	**No. 10**	**89**	
850 um	**No. 20**	**81**	
425 um	**No. 40**	**71**	56.7% Sand
250 um	**No. 60**	**65**	
150 um	**No. 100**	**52**	
75 um	**No. 200**	**36.9**	36.9% Fines

SAND AND SILT, SOME GRAVEL



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S.W.COLE ENGINEERING, INC.

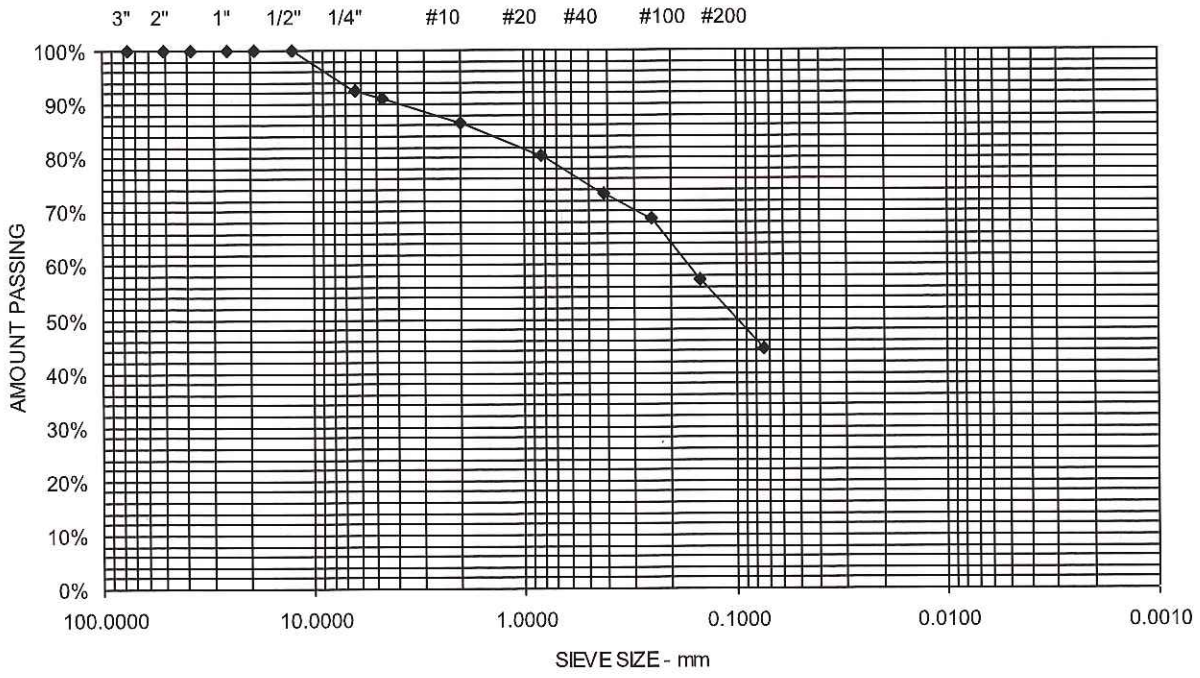
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21905G
		Date Received	12/7/2016
		Date Completed	12/14/2016
Material Source	**B-16-6 8D 35-37'**	Tested By	PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**92**	
4.75 mm	**No. 4**	**91**	9% Gravel
2.00 mm	**No. 10**	**86**	
850 um	**No. 20**	**80**	
425 um	**No. 40**	**73**	46.5% Sand
250 um	**No. 60**	**69**	
150 um	**No. 100**	**57**	
75 um	**No. 200**	**44.6**	44.6% Fines

SAND AND SILT, SOME CLAY, SOME GRAVEL



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S.W.COLE ENGINEERING, INC.

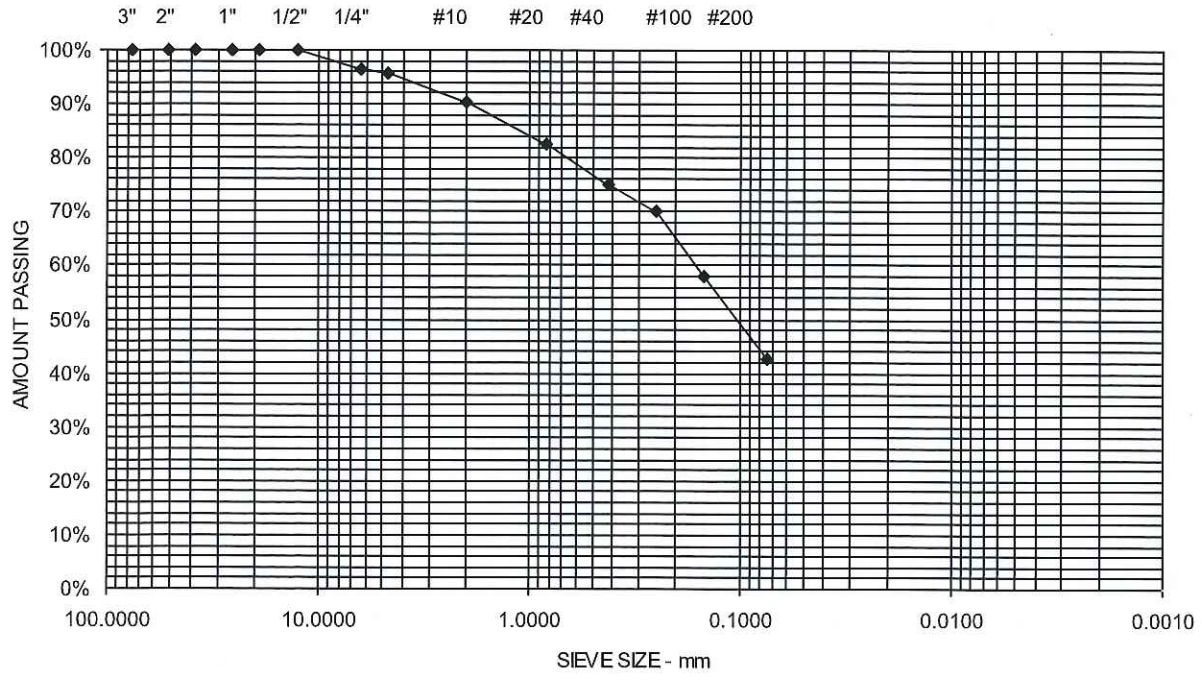
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21906G
		Date Received	12/7/2016
		Date Completed	12/15/2016
Material Source	**B-16-6 11D 50-52'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**96**	
4.75 mm	**No. 4**	**96**	4.3% Gravel
2.00 mm	**No. 10**	**90**	
850 um	**No. 20**	**83**	
425 um	**No. 40**	**75**	53.1% Sand
250 um	**No. 60**	**70**	
150 um	**No. 100**	**58**	
75 um	**No. 200**	**42.6**	42.6% Fines

SAND AND SILT, TRACE GRAVEL



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S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name: PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING

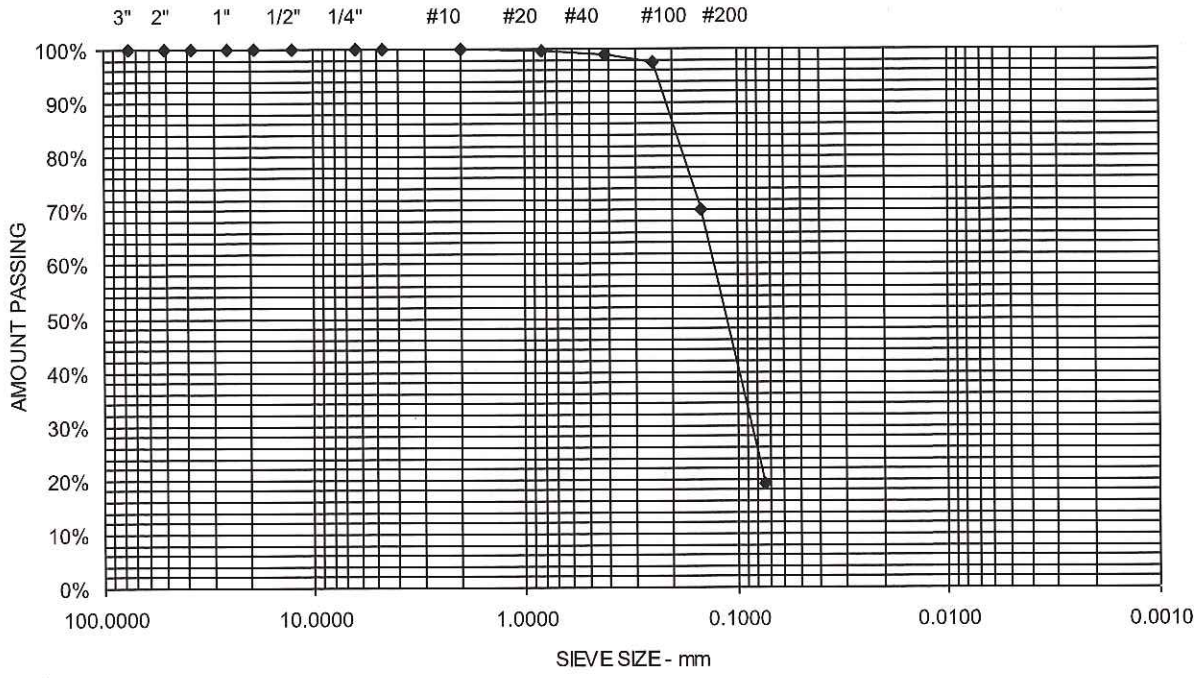
Client: MAINE MEDICAL CENTER

Material Source: **B-16-8 5D 19-21'**

Project Number: 16-1136
Lab ID: 21908G
Date Received: 12/7/2016
Date Completed: 12/15/2016
Tested By: PAUL SHAFFER

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**100**	
850 um	**No. 20**	**100**	
425 um	**No. 40**	**99**	80.8% Sand
250 um	**No. 60**	**97**	
150 um	**No. 100**	**70**	
75 um	**No. 200**	**19.2**	19.2% Fines

SILTY SAND



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S.W.COLE ENGINEERING, INC.

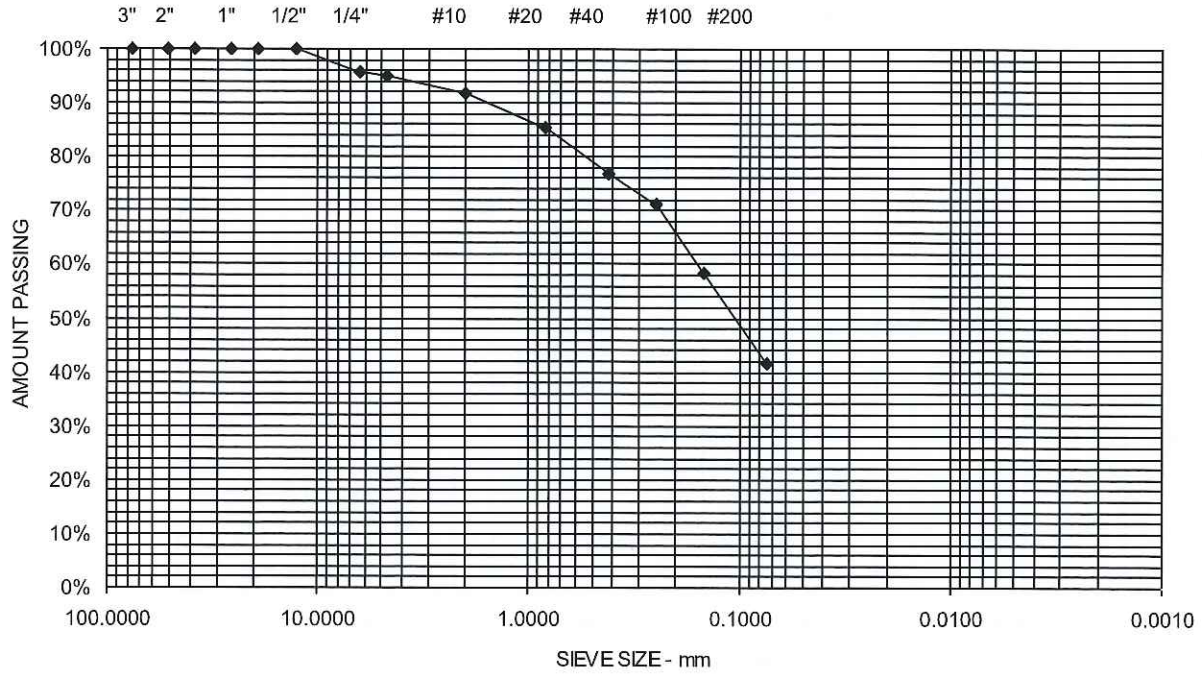
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21909G
		Date Received	12/7/2016
		Date Completed	12/15/2016
Material Source	**B-16-8 6D 24-26'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**96**	
4.75 mm	**No. 4**	**95**	4.9% Gravel
2.00 mm	**No. 10**	**92**	
850 um	**No. 20**	**85**	
425 um	**No. 40**	**77**	53.3% Sand
250 um	**No. 60**	**71**	
150 um	**No. 100**	**58**	
75 um	**No. 200**	**41.8**	41.8% Fines

SAND AND SILT, SOME CLAY, TRACE GRAVEL



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S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name: PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING

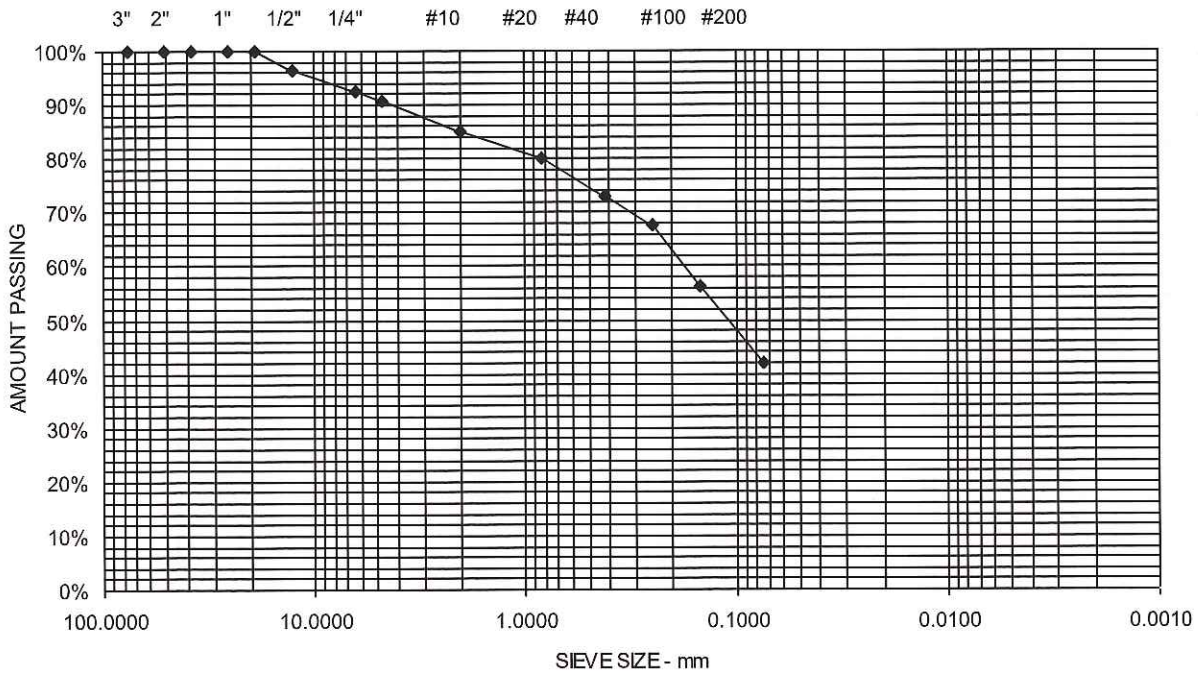
Client: MAINE MEDICAL CENTER

Material Source: **B-16-8 12D 54-56'**

Project Number: 16-1136
Lab ID: 21911G
Date Received: 12/7/2016
Date Completed: 12/15/2016
Tested By: JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**96**	
6.3 mm	**1/4"**	**92**	
4.75 mm	**No. 4**	**91**	9.4% Gravel
2.00 mm	**No. 10**	**85**	
850 um	**No. 20**	**80**	
425 um	**No. 40**	**73**	48.6% Sand
250 um	**No. 60**	**67**	
150 um	**No. 100**	**56**	
75 um	**No. 200**	**42.1**	42.1% Fines

SAND AND SILT, SOME CLAY, SOME GRAVEL



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S.W.COLE ENGINEERING, INC.

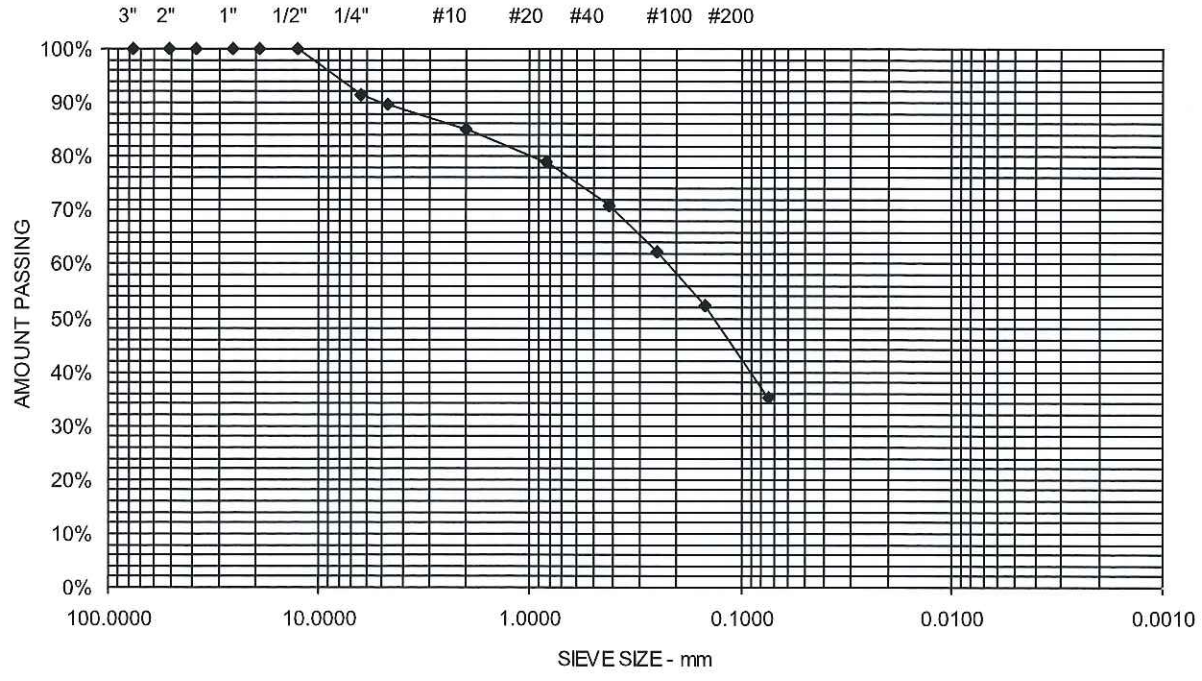
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21928G
		Date Received	12/15/2016
		Date Completed	12/19/2016
Material Source	**B-16-9 19.5-21.5'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**92**	
4.75 mm	**No. 4**	**90**	10.4% Gravel
2.00 mm	**No. 10**	**85**	
850 um	**No. 20**	**79**	
425 um	**No. 40**	**71**	54.4% Sand
250 um	**No. 60**	**62**	
150 um	**No. 100**	**52**	
75 um	**No. 200**	**35.2**	35.2% Fines

SAND AND SILT, SOME GRAVEL



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S.W.COLE ENGINEERING, INC.

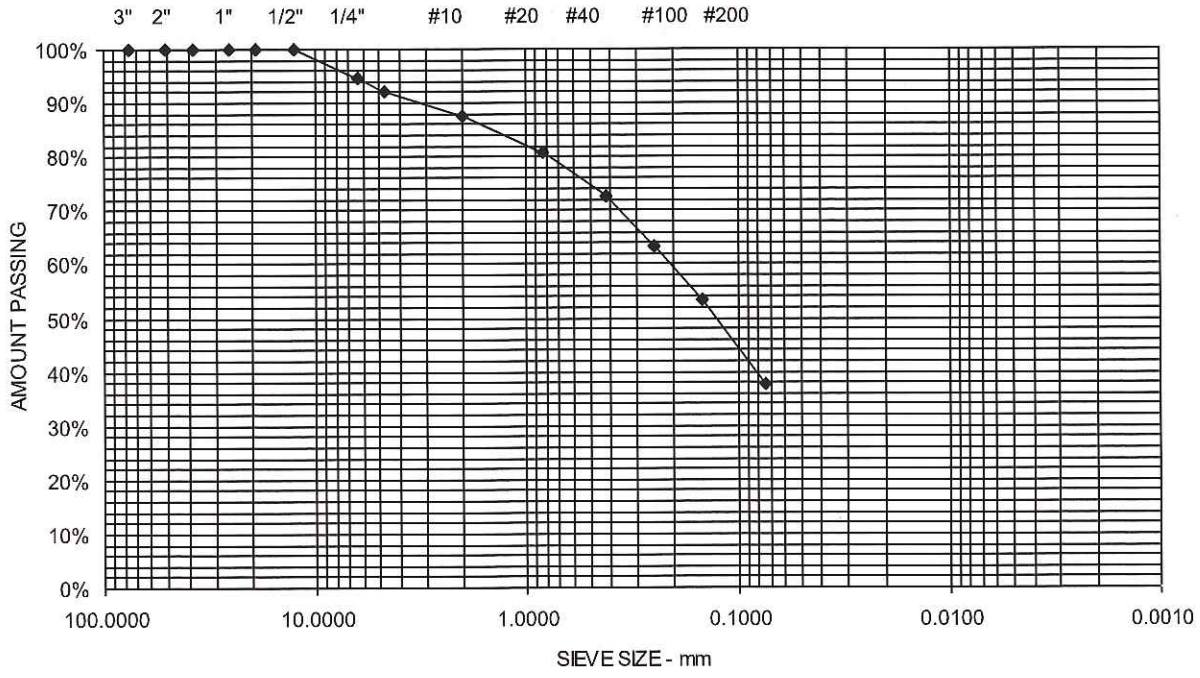
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND ME - PROPOSED GILMAN STREET GARAGE AND CONGRESS STREET BUILDING - GEOTECHNICAL ENGINEERING	Project Number	16-1136
Client	MAINE MEDICAL CENTER	Lab ID	21929G
		Date Received	12/15/2016
		Date Completed	12/19/2016
Material Source	**B-16-9 34.5-36.5'**	Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**95**	
4.75 mm	**No. 4**	**92**	7.8% Gravel
2.00 mm	**No. 10**	**88**	
850 um	**No. 20**	**81**	
425 um	**No. 40**	**72**	54.6% Sand
250 um	**No. 60**	**63**	
150 um	**No. 100**	**53**	
75 um	**No. 200**	**37.6**	37.6% Fines

SAND AND SILT, SOME GRAVEL



Comments: w = 11.8%

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S.W.COLE ENGINEERING, INC.

Consolidation Test

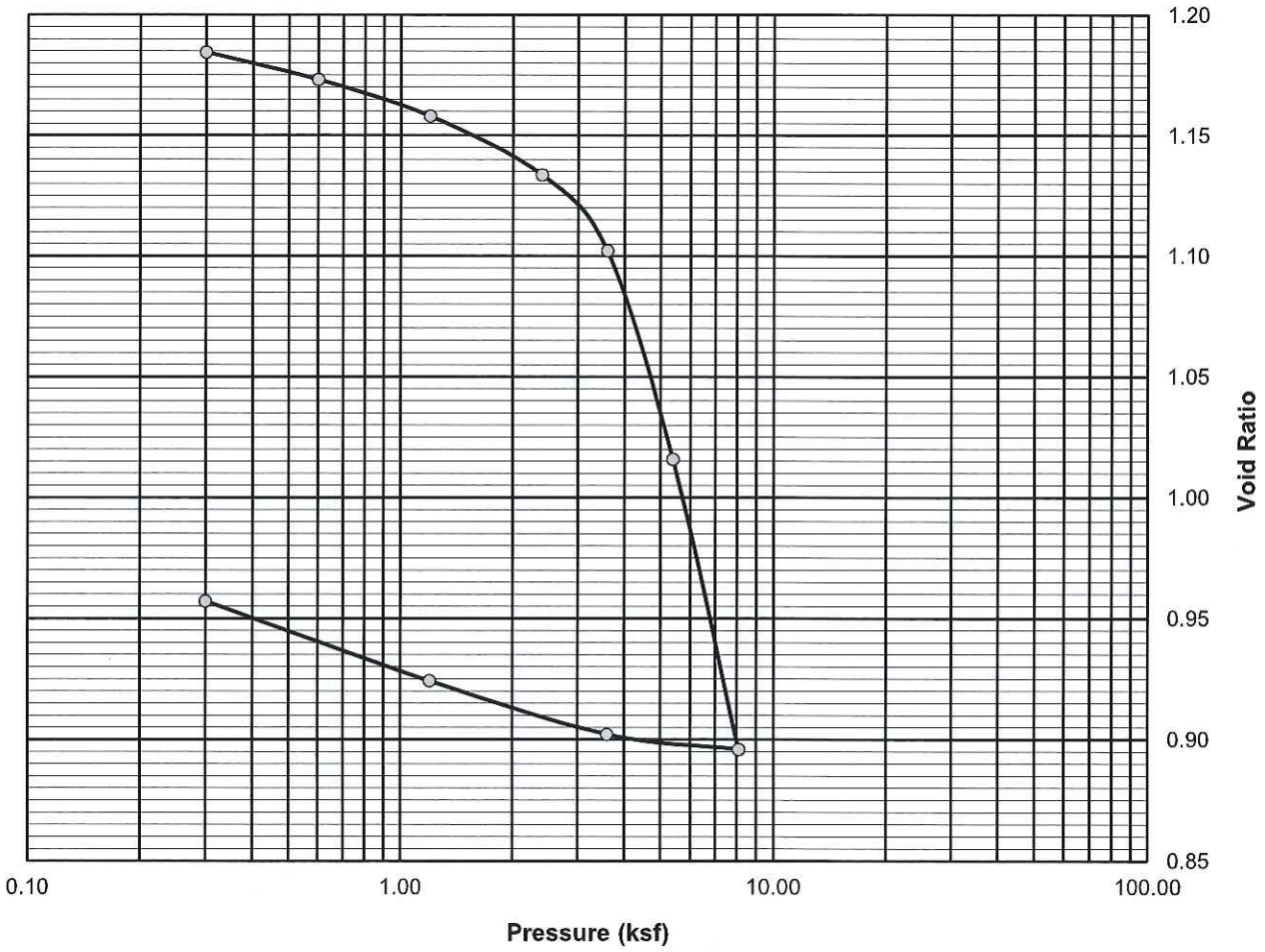
ASTM D-4767

Project Name: Proposed Gilman St. Garage & Congress St. Building
Client: Maine Medical Center

Project Number: 16-1136
Lab ID: 20156B
Date: 12/6/2016

Boring: B-3
Sample: 1S
Depth: 19-21'

P_C =	3.8 ksf
C_C =	0.66
C_R =	0.04
w =	40.1%
W_L =	48
W_P =	20



Comments:

EMW
Reviewed By

APPENDIX C

Report of Analytical Results

Client: Paul Kohler
S. W. Cole Engineering, Inc.
286 Portland Road
Gray,ME 04039

Lab Sample ID: TJ0628-2
Report Date: 28-DEC-16
Client PO:
Project: 16-1136
SDG: TJ0628

Sample Description	Matrix	Date Sampled	Date Received
B-16-8 2D 5-7'	SL	14-DEC-16 00:00:00	15-DEC-16

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes	RPD/RSD
Chloride	200 mg/Kgdrywt	20	9.9	EPA 325.2	WG197220	21-DEC-16 15:36:00	EPA 300.0	15-DEC-16	SC		
Sulfate-Turbidimetric	300 mg/Kgdrywt	19.	3.8	EPA 375.4	WG197331	23-DEC-16 15:50:24	EPA 300.0	15-DEC-16	SC		
Total Solids	92. %	1		SM2540G	WG196836	19-DEC-16 12:23:19	SM2540G	16-DEC-16	AP		
pH(Soil)	7.2 pH	0.10	0.10	SW846 9045D	WG196958	15-DEC-16 16:23:51	SW846 9045C	15-DEC-16	AP		

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P.O. Box 540, Scarborough, ME 04070

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sales@katahdinlab.com

Section 12

Stormwater Management

SEBAGO
TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

STORMWATER MANAGEMENT PLAN

Maine Medical Center
Congress Street Building
Portland, Maine

Prepared for

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

September 25, 2018



09/25/2018

STORMWATER MANAGEMENT PLAN

Maine Medical Center Congress Street Building
Portland, ME

Introduction

This Stormwater Management Plan has been prepared to address the potential impacts on stormwater runoff associated with the construction of a new hospital building on Maine Medical Center's Bramhall Campus.

The Congress Street Building project will consist of a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The proposed building replaces the existing employee-parking garage located at the corner of Congress Street and Gilman Street and includes redevelopment of the site along Congress Street. The total area of the campus affected by the work, as shown on the exhibits attached to this report is approximately 1.95 acres.

As discussed in this report, the Stormwater analysis and treatment/detention system has been designed to detain and treat rooftop runoff from the existing Visitors Parking Garage adjacent to the new building. Providing treatment from an additional 26,400 sf of parking deck that currently drains un-detained into the combined sewer system in Congress Street.

The impact of the new building is mitigated in part by redeveloping an existing parking structure with the new building whose rooftop includes green roof components.

Development on the Maine Medical Center Bramhall Campus is subject to the Maine Department of Environmental Protection (MDEP) Site location of Development Act and Chapter 500 Stormwater standards, reviewed by the City of Portland under its delegated review authority from MDEP. Based on the proposed development, the project is subject to the MDEP Chapter 500 Basic, General, and Flooding standards, including the redevelopment standards for a Site Law project, as incorporated into the City of Portland Land Use Ordinance and Site Plan review regulations.

The site is located in an area served by a combined sewer system where the City of Portland seeks to mitigate and reduce combined sewer overflow (CSO) events. The design storm events for CSO evaluation is a 1" rainfall, 24-hour design storm (CSO Storm).

Based on discussions with the City staff, the stormwater analysis and the proposed detention/treatment system has been designed to reduce the rate of runoff from the project site including both the new Congress Street Building and the existing Visitor Garage, to the greatest extent possible during this 1" CSO Storm event.

The proposed erosion controls, inspection and maintenance criteria, and the stormwater management systems have been designed to meet MDEP and City of Portland requirements. The proposed design includes a subsurface sand filter Best Management Practice (BMP) which has been designed to meet

the system sizing and treatment requirements for the new building's and redevelopment project standard. The system has been expanded to the extent practicable and to provide treatment for runoff from the adjacent parking garage.

The proposed design meets the applicable standards for system volume, but due to the limited site area, incorporating the runoff from the Visitor Garage will require waiver of the system surface area design criteria. The waiver is simply a trade-off to allow detention of existing runoff volume to address the CSO flows reduction desired by the City.

Permitting and Analysis History

A comprehensive stormwater analysis of the Maine Medical Center Bramhall Campus was completed in January 2004 as part of the Site Location of Development review, by the City of Portland, of the Bramhall Campus Expansion project. This project constructed from 2004-2007 was significant redevelopment of the campus including the construction of the Visitors Garage, Central Utility Plant and East Tower and renovations of the Emergency Department. The 2004 project also included the reconstruction and re-alignment of Crescent Street and separation of storm drainage in Gilman Street.

The redevelopment project fully separated stormwater runoff from the combined sewers within hospital property the campus and the immediately adjacent streets. The separated runoff re-enters the City's combined system at 7 locations abutting the site to facilitate future separation projects that may be undertaken by the City as part if its CSO program.

The 2004 redevelopment project included the installation of two hydrodynamic separator treatment units and separated runoff from approximately 6.3 acres of the campus and Gilman Street (uphill of A Street) the municipal separated storm drain in A Street, fully utilizing the design capacity of the A Street Storm drain.

The 2004 analysis is presented in a Stormwater Management Report dated January 2004 attached to the Maine Medical Center's January 2004 Site Location of Development Application on file in the City of Portland Planning office.

The 2004 post-development analysis subdivided the campus and tributary offsite areas into 20 onsite and offsite sub catchment areas. These sub catchment areas are the basis of the current study's pre-development analysis. The full campus watershed plan is attached for reference, identifying the sub catchments affected by the currently proposed redevelopment.

The discussion of our current analysis focuses on those sub catchments and study points affected by the proposed project, the analysis of off site areas of the campus remains unchanged from the 2004 analysis with exception of the design rainfall events which have been updated in accordance with the design rainfall adopted by the MDEP Chapter 500 regulations in August of 2015.

Site Existing Conditions

The project site includes the area occupied by the hospital's existing employee garage at the corner of Congress Street and Gilman Street. The runoff evaluation area includes portions of Congress Street to the north and east, Gilman Street to the west and the access road between the existing garage and the LL Bean Wing of the hospital to the south.

The campus located in a densely developed urban setting consisting of hospital and office buildings with their associated parking and landscaped areas, public roadways, and multi-family residential housing. The undeveloped areas of the site consist of steeply sloped land abutting Congress Street and Gilman Street. Ground cover in this area consists primarily of grass, brush and evergreen tree growth.

The subject site is located at a high point in the west end of the Portland Peninsula. Runoff from the project site is collected through a series of roof drains and catch basins and conveyed to the combined sanitary/stormwater sewers located within public streets abutting the site. There are currently two Downstream Defender units, installed in 2005, which provide stormwater quality treatment to runoff from the site. One Downstream Defender unit is located in the Visitor Garage on Congress Street, tributary to the municipal combined sewer system that runs down Forest Street to Park Avenue. The outfall of the Visitor Garage's downstream defender will be redirected to a proposed detention and treatment system associated with new Congress Street building to provide peak flow mitigation during the CSO design storm.

The second Downstream Defender unit is located along Gilman Street, in front of the Central Utility Plant, treating stormwater before it enters the municipal separated storm drain in A Street.

Soils

Soil classifications within the project area were referenced from the Cumberland County Medium Intensity Soil Survey. The site is primarily comprised of Hinckley gravelly sand loam. The project geotechnical evaluation report indicates significant depths of granular fill overlaying glacial till. For modeling purposes of this report the soils were considered hydraulic soil groups A consistent with the Cumberland County soil survey.

Proposed Development

Maine Medical Center proposes to construct a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The new building incorporates green roof elements and replaces the impervious surfaces associated with the existing employee-parking garage.

The Visitors Garage east of the site will remain. The drainage system from the Visitors Garage will be modified for redirect runoff to the proposed building's stormwater treatment system. The stormwater analysis was developed to consider treatment for both the proposed hospital expansion and the existing parking garage.

The site is subject to the Chapter 500 redevelopment standards as a Site Law, although the proposed development will result in the following:

Total Developed Area Subject to Treatment Standards	= 1.53 acres
Total Post Development Impervious area	= 1.19 acres
Redevelopment Impact Rating	= (- 0.5)
Redeveloped Area Requiring Treatment (50%)	= 0.77 acres
Redeveloped Area Receiving Treatment	= 1.95 acres

Regulatory Requirements

City of Portland:

The project is subject to the City of Portland's land use ordinance and Technical Standards applicable to a project with an existing Site Location of Development Permit and reviewed under the City's delegated review authority. The City's standards incorporate the MDEP Chapter 500 standards as follows.

Maine Department of Environmental Protection (MDEP)

MDEP Rule Chapters 500 and 502 describe stormwater management requirements for new development projects. These rules describe performance standards divided into five major categories: Basic Standard, General Standard, Phosphorous Standard, Urban Impaired Stream Standard, and Flooding Standard. The following sections describe how this project will address these stormwater management performance standards.

Basic Standard: A project must meet basic standards if it disturbs an area greater than one (1) acre. As this development will disturb approximately 1.53 acres, it must meet the basic standard. The standard includes various erosion and sedimentation controls, inspection and maintenance procedures, and general housekeeping requirements.

General Standard: A project is subject to the general standard if it results in the creation of one (1) or more acres of impervious area or developed areas greater than five (5) acres. As this project will include approximately 1.19 acres of impervious area, it must meet the general standard, including provisions in the General Standards for Redevelopment projects.

The redevelopment standard applicable to this project is outlined in the Chapter 500.4.C(2)(d). This standard establishes treatment requirements based on a pre and post development pollutant impact rating which establishes a sliding scale of the percentage of Developed Area which must be treated. For Site Law projects, the scale ranges from a minimum of 50% of the developed area to a maximum treatment equal to a new development.

The redevelopment calculations for the current project indicates that a minimum of 50% of the site's redevelopment must be treated. The treatment system proposed exceeds the minimum requirement

as a stand alone project including the Congress Street building and significantly exceeds the minimum standards by providing treatment for the Visitor Garage runoff.

Standard BMPs have been defined by the MDEP and are described thoroughly in their publication Stormwater Management for Maine: Best Management Practices manual, as revised March 2016.

Phosphorous Standard: A project must meet the phosphorous standards if located within a lake watershed. As this project is not tributary to a lake watershed, it is not subject to the phosphorus standard.

Urban Impaired Stream Standard: A project must meet the urban impaired stream standards if located within an urban impaired stream watershed. As this project is not tributary to an Urban Impaired Stream as defined by MDEP Chapter 502, this project is not subject to the urban impaired stream standard.

Flooding Standard: A project must meet to the flooding standards if it creates impervious areas greater than three (3) acres, or developed areas greater than twenty (20) acres. This project includes approximately 1.19 acres of impervious area; however, the City of Portland Technical Manual Section II-C states that all Level III site plans are required to meet the Maine DEP Chapter 500 flooding standard.

City of Portland Combined Sewers

In addition to the Stormwater Management provisions of the Land Use Ordinance and Technical Standards, the project is located in an area served by a combined sewer system where the City seeks to mitigate the rate of flow in the system that contribute to Combined Sewer Overflow (CSO) events. Discussions with the City Public works department in July 2018 have defined the CSO storm event to be a 1" rainfall event modeled using a 24-hour duration Type III storm distribution. The City has requested that the proposed treatment system be designed to mitigate to the extent practicable the rate of runoff from the site during this storm event, and to detain if practicable the runoff from the existing parking garage.

Quality Treatment

To meet the stormwater quality treatment requirements for the site, a subsurface sand filter BMP and a vegetated roof BMP are proposed to treat runoff from proposed development.

A subsurface sand filter utilizing a Cultec pretreatment row and ACF R-Tank detention modules is proposed to treat and store runoff generated from the roof surface of the proposed Congress Street building. Runoff from the roof will be collected in the building's roof drainage system and directed to the subsurface sand filter installed beneath the paved area of the proposed main entrance. The treated stormwater will discharge to the existing combined sewer at a new Manhole in Congress Street, tributary to Study Point C2.

The proposed subsurface sand filter has been sized based on chapter 7.3 of the Maine Department of Environmental Protection (MDEP) BMP Manual: Subsurface Sand Filters, to provide adequate treatment for the water quality volume, pretreatment of the one-year storm using an inlet control structure and isolator row, and detention for larger storm events.

Redevelopment standards apply because the proposed building will replace existing buildings and pavement areas. After completing the calculations outlined in §4.C(2)(d) of Chapter 500, the ranked impact change due to redevelopment is calculated to be -0.5. Because the project is subject to an existing Site Law Permit the minimum level of treatment required 50% of the redeveloped area.

The redevelopment impact ratings are included in Attachment A to this report.

Also included in Attachment A are tables summarizing the impervious and developed areas for the proposed development and the BMP measures treating these areas. The conclusion is a tabulation of the effective treatment percentages for the proposed development. The results of this tabulation indicate the following:

- The post-development area subject to treatment standards includes 1.53 acres of developed area on the Congress Street building site. This area is comprised of approximately 1.19 acres of impervious area (rooftop, driveway and sidewalk areas) and 0.34 acres of landscaped areas.

- The redevelopment standard requires treatment for 50% of this developed areas for a minimum of 0.77 acres.

- The total area receiving treatment is approximately 1.95 acres of developed area including the new Congress Street Building roof and entrance driveway area (1.34 acres) and the Visitor Garage (0.61 acres).

The redevelopment standard requires treatment for 50% of the new developed areas. As such, the site is required to provide treatment for a minimum of 0.77 acres. The total area receiving treatment is approximately 1.95 acres or 128% of the required area.

Stormwater Treatment System

A subsurface soil filter system is proposed below the Congress Street building's entrance plaza at Congress Street is proposed to provide Stormwater Quality and Quantity Treatment. The system presented on the plans is based on R-Tank chambers with Cultec chamber isolator rows for pre treatment

The system sizing criteria is provided in Attachment A to this report and summarized as follows:

Storage Volume Required	= 5,279 cf
Storage Volume Provided	= 5,385 cf
Surface Area Required (Congress Building only)	= 2,564 sf
Surface Area Required (Congress Building and Visitor Garage)	= 3,883 sf
Surface Area Provided	= 3,082 sf

Methodology:

In order to evaluate drainage characteristics as a result of the proposed development activities, a quantitative analysis was performed to determine peak runoff rates in the pre-development and post-development conditions. The evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations.

The peak runoff rates were calculated using a 24-hour duration storm event with a Type III rainfall distribution. The rainfall amounts for Cumberland County have recently been updated and the following 24-hour duration rainfall amounts were used for this report:

Storm Frequency	24-hr Duration Rainfall (in.)
CSO Storm	1.0
2-yr	3.1
10-yr	4.6
25-yr	5.8

Twenty sub catchments were analyzed in the pre-development condition, and twenty-two watersheds in the post-development condition. The pre development sub catchment delineations are based the 2004 study post-development watersheds modified to reflect site improvements constructed as part of the 2004-2007 Bramhall Campus Expansion project construction along with record drawings, and field surveys of the drainage infrastructure.

Sub catchment delineations along the hospital building rooftops are based on visible roof drain locations and record design drawings. Due to the age of a number of buildings, records indicating the locations of roof drain connections to the surrounding sewer system are not available. In these cases, the assumed watershed delineations were made based observations of the rooflines and the surrounding topography and sewer infrastructure.

Five Study Points, identified on the attached watershed plans and hydrologic model output as points SP-C1 through SP-C5 have historically been used to evaluate pre and post-developed runoff conditions from the campus. The Study Points represent locations where stormwater runoff, from the project site, enters the public drainage infrastructure system. In most cases, the capacity of the existing combined sewers is small relative the area draining to them under existing conditions. In these cases,

the study points represent the total stormwater discharge at the study point including both gutter flow and flow into the sewer.

Of these study points only two SP-C2 and SP-C3 are affected by the proposed redevelopment.

Study Point SP-C1 represents the point where stormwater runoff from the site enters a combined sewer at the intersection of Wescott Street and Crescent Street. The study point represents runoff at a manhole identified as DMH-25868 on the project plans. The sewer outlet from this manhole is a 12" cement line that drains in a westerly direction along Crescent Street, eventually draining to Park Avenue via sewers in Ellsworth Street, Congress Street and Weymouth Street.

Study Point SP-C2 represents the point where runoff from the existing Maine Medical Center parking garage, enters a combined sewer at the intersection of Congress Street and Forest Street. The study point represents runoff at a manhole SMH-13952 on the project plans. The sewer outlet from this manhole is an 18" reinforced concrete pipe that drains in a northerly direction along Forest Street to Park Avenue.

Study Point SP-C3 represents the point where runoff from areas of the project site east of the existing visitor garage enters the combined sewer system at the intersection of Gilman Street and Congress Street. At this point runoff within the sewer system discharges in a northerly direction along Gilman Street to Park Avenue. Runoff in the roadway that bypasses the catch basins at the intersection discharges in a westerly direction along Congress Street to St. John Street.

Study Point SP-C4 represents at the intersection of Gilman Street and A Street where runoff from areas of the site including the existing emergency room parking area, L.L. Bean wing, and service areas abutting the central utility plant is directed to the A Street storm drain. A Downstream Defender stormwater treatment system was installed in 2005.

Study Point SP-C5 represents runoff at the intersection of Ellsworth Street and Wescott Street. Runoff currently enters the combined sewer system via manholes in Ellsworth Street and drains in an easterly direction along Ellsworth Street towards its intersection with Congress Street.

The areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development. Due to the highly-developed nature of the site, the time of concentration in some watersheds is less than six minutes. A minimum time of concentration of six minutes was used in these cases.

Table 1 summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

Table 1 Stormwater Peak Discharge Summary Table									
Study Point	2-Year Storm			10-Year Storm			25-Year Storm		
	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)
SP-C1	1.28	1.28	0.00	2.39	2.39	0.00	3.31	3.31	0.00
SP-C2	6.45	3.78	-2.67	9.14	6.88	-2.26	11.23	11.15	-0.08
SP-C3	1.72	1.53	-0.19	4.28	4.05	-0.23	5.76	5.21	-0.55
SP-C4	14.04	13.78	-0.26	25.22	24.94	-0.28	34.61	34.33	-0.28
SP-C5	1.60	1.60	0.00	3.01	3.01	0.00	4.07	4.07	0.00

The results of the stormwater modeling at Study Point SP-C1 to SP-C5 indicate that the peak rates of runoff in the post-development condition will be less than the pre-developed condition for the 2-year, 10-year, and 25-year storm events.

Study points SP-C2 and SP-C3 were further evaluated to determine the impact on peak flow rate and runoff duration from the project site during the 1" CSO Storm event. The proposed subsurface sand filter has been expanded in size to allow for the detention of runoff from the Congress building and the Parking Garage. The system outlets have been designed to maximize the detention of runoff generated from a 1" rainfall to reduce the peak rate of runoff during this storm and to extend the duration of that runoff as long as practicable to mitigate and reduce the site's contribution to offsite CSO events. The results during this event are summarized in Table 2 below.

The modeling node used to evaluate the connection point to the City system is node SMH-1 representing ESMH-13952.

Table 2 CSO Event Summary Table			
Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
ESMH-13952	1.34	0.28	-1.06 (80%)

The results of the analysis indicates that the proposed system reduces the rate of runoff at the connection to the City's combined sewer by approximately 80%.

To further evaluate the attenuation of flow from the project site during smaller storm events, Table 3 below summarized the performance of the proposed subsurface sand filter detention system identified as Node 1P+G(R-Tank System with Garage) in the model. The table below evaluates the inflow

hydrograph into the system and the outflow hydrograph to the City system during a 1" storm event. This summary most closely represents the contribution of the project site runoff, without the influence of offsite runoff.

The proposed design will reduce the peak rate of runoff from a 1" storm event by 97% compared to the un detained discharge

Table 3 CSO Event Summary Table			
Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
R-Tank System	1.48	0.04	-1.44 (97%)

Conclusion

Erosion and sedimentation controls, inspection and maintenance procedures and general housekeeping requirements have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

By utilizing Best Management practices, stormwater quality treatment has been provided for at least 50% of the total impervious area and at least 50% of the total developed area. Based on the modeling data, the post-development peak rates of runoff for the 2-year, 10-year, and 25-year storm events demonstrate decreases in the peak rates of runoff when compared to the pre-development peak rates of runoff.

The proposed detention and treatment system meets all of the applicable sizing criteria for minimum surface area, channel protection volume, sediment pretreatment volume to address the requirements for the Congress Street Building project. At the City's request, the system has been expanded to accept runoff from the adjacent Visitor Garage for the purpose of detaining runoff from the existing development during a CSO event storm.

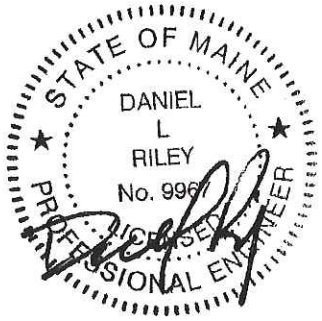
With the addition of this area, the system continues to meet the applicable sizing criteria with the exception of the minimum surface area criteria. The proposed system provides approximately 120% of the required area for the Congress Street Building alone. The proposed system provides 80% of the required area for the combined Congress Building and parking garage footprint. Meeting the full area requirement would require an additional 800 sf of system area which is not available on this site.

With the incorporation of the above referenced erosion control, treatment and detention measures, the project has been designed in conformance with the Maine Department of Environmental Protection Chapter 500 Stormwater Law and City of Portland Stormwater Management Standards.

Accordingly, it is anticipated that stormwater runoff from the proposed development will not cause a significant adverse effect to off-site receiving channels or downstream properties.

Prepared by,

SEBAGO TECHNICS, INC.



09/25/2018

Daniel L. Riley, P.E.
Vice President, Engineering

September 25, 2018

Appendix A

STORWATER QUALITY CALCULATIONS

Table 3: MDEP GENERAL STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

AREA ID	WATERSHED SIZE (S.F.)	EXISTING IMPERVIOUS AREA (To Remain) (S.F.)	NEW IMPERVIOUS AREA (S.F.)	EXISTING LANDSCAPED AREA (To Remain) (S.F.)	NEW LANDSCAPED AREA (S.F.)	NEW DEVELOPED AREA (S.F.)	UNDEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	NEW IMPERVIOUS AREA TREATED* (S.F.)	NEW LANDSCAPED AREA TREATED* (S.F.)	NEW DEVELOPED AREA TREATED* (S.F.)	TREATMENT BMP
3.1	10,051	8,335	0	1,716	0	0	0	NO	0	0	0	NONE
3.2	4,089	4,089	0	0	0	0	0	NO	0	0	0	NONE
14.1	22,477	14,929	5,018	0	2,530	7,548	0	NO	0	0	0	NONE
15.1	18,644	10,163	443	8,038	0	443	0	NO	0	0	0	NONE
17.1A	43,616	0	43,616	0	0	43,616	0	YES	43,616	0	43,616	SSSF
17.1B	14,879	0	2,836	0	12,043	14,879	0	YES	2,836	12,043	14,879	Green Roof
18	26,386	26,386	0	0	0	0	0	YES	26,386	0	26,386	SSSF
SUM	140,142	63,902	51,913	9,754	14,573	66,486	0	-	72,838	12,043	84,881	-

Designations: SSSF=Subsurface Sand Filter

TOTAL NEW IMPERVIOUS AREA (S.F.)	51,913	TOTAL NEW DEVELOPED AREA (S.F.)	66,486
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	72,838	TOTAL DEV. AREA RECEIVING TREATMENT (S.F.)	84,881
% OF IMPERVIOUS AREA RECEIVING TREATMENT	140.3%	% OF DEV. AREA RECEIVING TREATMENT	127.7%

Table 4: MDEP REDEVELOPMENT STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

Existing Areas by Pollutant Ranking (S.F.)							Proposed Areas by Pollutant Ranking (S.F.)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0	6,538	17,424	1,739	43,699	0	69,400	0	328	22,153	46,919	0	0	69,400

Existing Areas by Pollutant Ranking (acres)							Proposed Areas by Pollutant Ranking (acres)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0.000	0.150	0.400	0.040	1.003	0.000	1.593	0.000	0.008	0.509	1.077	0.000	0.000	1.593

Existing Weighted Average (Item C)	Proposed Weighted Average (Item D)
5.083	4.256

Total Development Area (acres)	Total Redevelopment Area (acres)
1.593	1.593

Ranked Impact Change Due to Redevelopment (Item E)
-0.5

Percent Increase in Developed Area
0.00%

Treatment Levels for Redevelopment Projects	
Ranked Impact Change Due to Redevelopment (Item E)	**Percentage of Developed Area that Must be Treated**
0.0 or less	0% (Stormwater projects) 50% (Site projects)
≤ 0.0 to ≥ 1.0	60%
> 1.0 to ≥ 2.0	70%
> 2.0 to ≥ 3.0	80%
> 3.0	Same treatment level as for new development

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 4A
South Portland, Maine 04106
Tel. (207) 200-2100

JOB	15466 - Congress Street Building		
SHEET NO.	1	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.B.(2)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Proposed Congress Building

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,043	SF					
Impervious Area	46,452	SF					

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,043	SF	Area	240.9	SF		
Total Impervious Area	46,452	SF	Area	2,322.6	SF		
Required Minimum Surface Area				2,563.5	SF		
Provided Surface Area				3,082.0	SF		

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,043	SF	Volume	401.4					
Impervious Area	46,452	SF	Volume	3,871.0					
CPV Required				4,272.4	CF	0.098	AF		
Provided CPV				6,800.0	CF	4,790 cf@ Elev 52.75			

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	3.32	cfs			
Iso Row sizing for:	902HD	**0.2**	cfs		
Total number of Isolator Row Chambers required:	17		25	Provided	

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South Portland, Maine 04106
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JOB	15466 - Congress Street Building		
SHEET NO.	2	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.B.(2)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Existing Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	0	SF					
Impervious Area	26,386	SF					

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	0	SF	Area	0.0	SF		
Total Impervious Area	26,386	SF	Area	1,319.3	SF		
Required Minimum Surface Area				1,319.3	SF		
Provided Surface Area				*	SF		

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	0	SF	Volume	0.0					
Impervious Area	26,386	SF	Volume	2,198.8					
Pre Treatment Credit (%)	25%								
CPV Required				1,649.1	CF	0.038	AF		
Provided CPV				*	CF				

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	1.53	cfs	
Iso Row sizing for:	902HD	**0.2**	cfs
Total number of Isolator Row Chambers required:	8		

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 4A
South Portland, Maine 04106
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JOB	15466 - Congress Street Building		
SHEET NO.	3	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.B.(2)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Congress Building and Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,073	SF				
Impervious Area	72,838	SF				

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,073	SF	Area	241	SF	
Total Impervious Area	72,838	SF	Area	3,642	SF	
Required Minimum Surface Area				3,883	SF	
Provided Surface Area				3,082	SF	

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,073	SF	Volume	402				
Impervious Area (Bldg)	43,558	SF	Volume	3,630				
Site Pavement	2,894							
Impervious Area (Garage)	26,386			2,199				
Pretreatment Credit (Garage, 25%)		-25%		-550		(ASSUMES 25% Pretreament Credit for HIL Unit)		
CPV Required				5,279	CF	0.121	AF	
Provided CPV				5,385	CF	@ Elev 51.2		

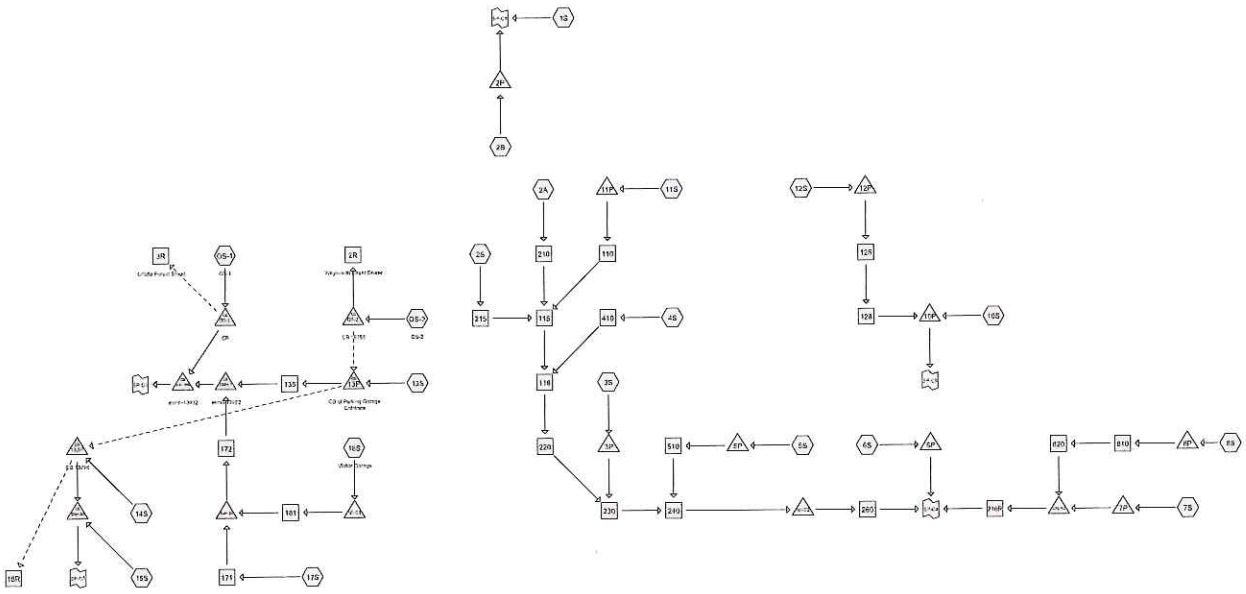
Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	4.50	cfs	
Iso Row sizing for: 902HD	**0.2**	cfs	
Total number of Isolator Row Chambers required:	23	25	

Appendix B

HYDROCAD OUTPUT



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD PRE
Prepared by Sebago Technics, Inc., Printed 9/24/2018
HydroCAD® 10.00-15 s/n 01856 © 2015 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.354	39	>75% Grass cover, Good, HSG A (1S, 2B, 3S, 5S, 6S, 8S, 10S, 14S, 15S)
7.080	98	Paved parking (1S, 2A, 2B, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14S, 15S, 17S)
2.834	98	Roofs (5S, 6S, 8S, 10S, 18S)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**83**	**TOTAL AREA**

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,157	98	Paved parking
	16,157		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3S:

Runoff = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	3,076	39	>75% Grass cover, Good, HSG A
*	11,898	98	Paved parking
	14,974	86	Weighted Average
	3,076		20.54% Pervious Area
	11,898		79.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	106	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.2	222	0.0530	14.83	26.20	**Pipe Channel, PIPE C TO D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	358	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	56,212	43	Woods/grass comb., Fair, HSG A
*	36,084	98	Paved parking
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14S:

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,684	98	Paved parking
	15,059	39	>75% Grass cover, Good, HSG A
	29,743	68	Weighted Average
	15,059		50.63% Pervious Area
	14,684		49.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	45	0.0680	0.23		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
1.0	217	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
1.7					**Direct Entry, DIRECT**
6.0	262	Total			

Summary for Subcatchment 15S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	11,909	39	>75% Grass cover, Good, HSG A
*	15,681	98	Paved parking
	27,590	73	Weighted Average
	11,909		43.16% Pervious Area
	15,681		56.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.5	190	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.5	176	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	384	Total			

Summary for Subcatchment 17S:

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	40,392	98	Paved parking
	40,392		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	27,443	98	Roofs
	27,443		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	135	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	316	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

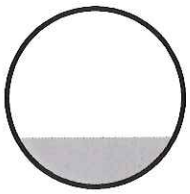
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



Summary for Reach 115:

Inflow Area = 1.203 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.04 cfs @ 12.10 hrs, Volume= 0.079 af
Outflow = 1.02 cfs @ 12.10 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



Summary for Reach 118:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.48 cfs @ 12.10 hrs, Volume= 0.114 af
Outflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.86 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 0.7 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



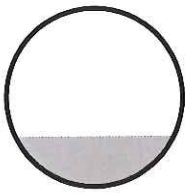
Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



Summary for Reach 171:

Inflow Area = 0.927 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.40 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 29.32 cfs

15.0" Round Pipe
n= 0.012
Length= 31.0' Slope= 0.1755 '/'
Inlet Invert= 57.44', Outlet Invert= 52.00'



Summary for Reach 172:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.34 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 27.27 cfs

15.0" Round Pipe
n= 0.012
Length= 38.0' Slope= 0.1518 '/'
Inlet Invert= 51.66', Outlet Invert= 45.89'



Summary for Reach 181:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.54 cfs @ 12.10 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.9 min

Peak Storage= 10 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.96 cfs

12.0" Round Pipe
n= 0.012
Length= 104.0' Slope= 0.0425 '/'
Inlet Invert= 56.28', Outlet Invert= 51.86'



Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



Summary for Reach 215:

Inflow Area = 0.371 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 1.1 min

Peak Storage= 7 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



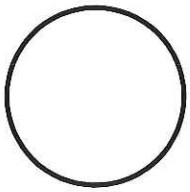
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



Summary for Reach 220:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af
Outflow = 1.42 cfs @ 12.12 hrs, Volume= 0.114 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.18 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 1.8 min

Peak Storage= 51 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



Summary for Reach 230:

Inflow Area = 2.081 ac, 96.61% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.48 cfs @ 12.12 hrs, Volume= 0.120 af
Outflow = 1.47 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.41 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.27 fps, Avg. Travel Time= 0.3 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



Summary for Reach 240:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 2.00 cfs @ 12.12 hrs, Volume= 0.167 af
Outflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.43 fps, Avg. Travel Time= 0.4 min

Peak Storage= 15 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



Summary for Reach 260:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Outflow = 1.96 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



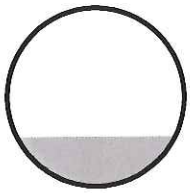
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



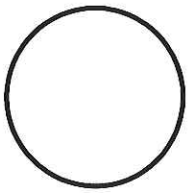
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



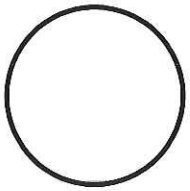
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900
n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
1=Culvert (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.344 ac, 79.46% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.683 ac, 49.37% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 23.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 23.95 hrs HW=42.50' (Free Discharge)
↑—**1=12" SD** (Passes 0.00 cfs of 4.72 cfs potential flow)
↑—**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.06 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB at Parking Garage Entrance

Inflow Area =	0.827 ac, 85.62% Impervious,	Inflow Depth =	0.32"	for 1-Inch event
Inflow =	0.29 cfs @ 12.10 hrs,	Volume=	0.022 af	
Outflow =	0.29 cfs @ 12.10 hrs,	Volume=	0.022 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.29 cfs @ 12.10 hrs,	Volume=	0.022 af	
Secondary =	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
↑—**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area =	3.164 ac, 47.24% Impervious,	Inflow Depth =	0.02"	for 1-Inch event
Inflow =	0.01 cfs @ 12.50 hrs,	Volume=	0.004 af	
Outflow =	0.01 cfs @ 12.52 hrs,	Volume=	0.004 af,	Atten= 0%, Lag= 0.8 min
Primary =	0.01 cfs @ 12.52 hrs,	Volume=	0.004 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.61' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=37.61' (Free Discharge)
1=12" SD (Inlet Controls 0.00 cfs @ 0.45 fps)

Summary for Pond hil-01:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Primary = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
↑—**1=Stormdrain** (Passes 0.07 cfs of 5.24 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
↑**1=Stormdrain** (Passes 0.30 cfs of 3.12 cfs potential flow)
↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SMH 1: esmh-13952

Inflow Area = 2.384 ac, 95.01% Impervious, Inflow Depth = 0.63" for 1-Inch event
Inflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af
Outflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 45.19' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0660 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.60 cfs @ 12.10 hrs HW=45.18' (Free Discharge)
↑**1=Sewer** (Inlet Controls 1.60 cfs @ 2.58 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Outflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.23' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.70 cfs @ 12.10 hrs HW=41.23' (Free Discharge)
↑**1=Sewer** (Inlet Controls 1.70 cfs @ 2.62 fps)

Summary for Pond SMH-20:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Primary = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.370 ac, 71.34% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af
Primary = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.09 cfs 0.089 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=1.75"
Flow Length=358' Tc=6.0 min CN=86 Runoff=0.69 cfs 0.050 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=0.68"
Flow Length=262' Tc=6.0 min CN=68 Runoff=0.45 cfs 0.039 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=0.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=0.62 cfs 0.049 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=188' Tc=6.0 min CN=98 Runoff=2.72 cfs 0.222 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=316' Tc=6.0 min CN=98 Runoff=1.85 cfs 0.151 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.68' Max Vel=5.19 fps Inflow=3.51 cfs 0.288 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.48 cfs 0.288 af

Reach 118: Avg. Flow Depth=0.50' Max Vel=9.76 fps Inflow=5.04 cfs 0.415 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=5.01 cfs 0.415 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.28' Max Vel=9.40 fps Inflow=1.29 cfs 0.136 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.28 cfs 0.136 af

Reach 171: Avg. Flow Depth=0.26' Max Vel=14.91 fps Inflow=2.72 cfs 0.222 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=2.72 cfs 0.222 af

Reach 172: Avg. Flow Depth=0.35' Max Vel=16.46 fps Inflow=4.56 cfs 0.372 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=4.55 cfs 0.372 af

Reach 181: Avg. Flow Depth=0.33' Max Vel=8.24 fps Inflow=1.85 cfs 0.151 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=1.84 cfs 0.151 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.42' Max Vel=3.48 fps Inflow=1.09 cfs 0.089 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.08 cfs 0.089 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.54' Max Vel=8.82 fps Inflow=5.01 cfs 0.415 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.91 cfs 0.415 af

Reach 230: Avg. Flow Depth=0.34' Max Vel=18.51 fps Inflow=5.59 cfs 0.465 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.57 cfs 0.465 af

Reach 240: Avg. Flow Depth=0.51' Max Vel=21.42 fps Inflow=11.29 cfs 0.883 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=11.25 cfs 0.883 af

Reach 260: Avg. Flow Depth=0.61' Max Vel=13.86 fps Inflow=11.25 cfs 0.883 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=11.22 cfs 0.883 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.69 cfs 0.050 af
Primary=0.69 cfs 0.050 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.81' Inflow=1.10 cfs 0.045 af
Primary=1.10 cfs 0.045 af Secondary=0.00 cfs 0.000 af Outflow=1.10 cfs 0.045 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.29' Inflow=1.94 cfs 0.143 af
Primary=1.29 cfs 0.136 af Secondary=0.65 cfs 0.007 af Outflow=1.94 cfs 0.143 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: Peak Elev=38.30' Inflow=1.72 cfs 0.094 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=1.72 cfs 0.094 af

Pond hil-01: Inflow=1.85 cfs 0.151 af
Primary=1.85 cfs 0.151 af

Pond hil-02: Inflow=11.25 cfs 0.883 af
Primary=11.25 cfs 0.883 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH 1: esmh-13952 Peak Elev=45.84' Inflow=5.83 cfs 0.509 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=5.83 cfs 0.509 af

Pond SMH-13932: esmh-13932 Peak Elev=41.96' Inflow=6.45 cfs 0.572 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.45 cfs 0.572 af

Pond SMH-20: Inflow=4.56 cfs 0.372 af
Primary=4.56 cfs 0.372 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=6.45 cfs 0.572 af
Primary=6.45 cfs 0.572 af

Link SP-C3: Inflow=1.72 cfs 0.094 af
Primary=1.72 cfs 0.094 af

Link SP-C4: Inflow=14.04 cfs 1.117 af
Primary=14.04 cfs 1.117 af

Link SP-C5:

Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.219 af Average Runoff Depth = 1.69"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.63 cfs 0.135 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=3.10"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.21 cfs 0.089 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=1.60"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.21 cfs 0.091 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=1.97"
Flow Length=384' Tc=6.0 min CN=73 Runoff=1.42 cfs 0.104 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=188' Tc=6.0 min CN=98 Runoff=4.07 cfs 0.337 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=316' Tc=6.0 min CN=98 Runoff=2.77 cfs 0.229 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=0.81 cfs 0.006 af
Outflow=0.81 cfs 0.006 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.89' Max Vel=5.64 fps Inflow=5.25 cfs 0.438 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.21 cfs 0.438 af

Reach 118: Avg. Flow Depth=0.62' Max Vel=10.90 fps Inflow=7.54 cfs 0.632 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.50 cfs 0.632 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.31' Max Vel=9.87 fps Inflow=1.55 cfs 0.215 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.54 cfs 0.215 af

Reach 171: Avg. Flow Depth=0.31' Max Vel=16.76 fps Inflow=4.07 cfs 0.337 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=4.07 cfs 0.337 af

Reach 172: Avg. Flow Depth=0.43' Max Vel=18.44 fps Inflow=6.81 cfs 0.566 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=6.81 cfs 0.566 af

Reach 181: Avg. Flow Depth=0.41' Max Vel=9.21 fps Inflow=2.77 cfs 0.229 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=2.75 cfs 0.229 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.53' Max Vel=3.86 fps Inflow=1.63 cfs 0.135 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.62 cfs 0.135 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.67' Max Vel=9.84 fps Inflow=7.50 cfs 0.632 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.37 cfs 0.632 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.94 fps Inflow=8.56 cfs 0.720 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.53 cfs 0.720 af

Reach 240: Avg. Flow Depth=0.67' Max Vel=24.51 fps Inflow=18.55 cfs 1.461 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.50 cfs 1.461 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.91 fps Inflow=18.50 cfs 1.461 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.46 cfs 1.461 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.21 cfs 0.089 af
Primary=1.21 cfs 0.089 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.10' Inflow=3.67 cfs 0.129 af
Primary=2.86 cfs 0.123 af Secondary=0.81 cfs 0.006 af Outflow=3.67 cfs 0.129 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.41' Inflow=4.01 cfs 0.253 af
Primary=1.55 cfs 0.215 af Secondary=2.47 cfs 0.038 af Outflow=4.01 cfs 0.253 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: Peak Elev=39.37' Inflow=4.28 cfs 0.227 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.28 cfs 0.227 af

Pond hil-01: Inflow=2.77 cfs 0.229 af
Primary=2.77 cfs 0.229 af

Pond hil-02: Inflow=18.50 cfs 1.461 af
Primary=18.50 cfs 1.461 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH 1: esmh-13952 Peak Elev=46.32' Inflow=8.33 cfs 0.781 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=8.33 cfs 0.781 af

Pond SMH-13932: esmh-13932 Peak Elev=42.54' Inflow=9.14 cfs 0.884 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=9.14 cfs 0.884 af

Pond SMH-20: Inflow=6.81 cfs 0.566 af
Primary=6.81 cfs 0.566 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=9.14 cfs 0.884 af
Primary=9.14 cfs 0.884 af

Link SP-C3: Inflow=4.28 cfs 0.227 af
Primary=4.28 cfs 0.227 af

Link SP-C4: Inflow=25.22 cfs 1.972 af
Primary=25.22 cfs 1.972 af

Link SP-C5:

Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.847 af Average Runoff Depth = 2.92"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=244' Tc=6.0 min CN=98 Runoff=2.06 cfs 0.172 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=4.22"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.63 cfs 0.121 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=2.47"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.92 cfs 0.140 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=2.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=2.13 cfs 0.154 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=188' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.430 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=316' Tc=6.0 min CN=98 Runoff=3.50 cfs 0.292 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.41 cfs 0.027 af
Outflow=2.41 cfs 0.027 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.15' Max Vel=5.72 fps Inflow=6.64 cfs 0.558 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.57 cfs 0.558 af

Reach 118: Avg. Flow Depth=0.71' Max Vel=11.58 fps Inflow=9.50 cfs 0.805 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.46 cfs 0.805 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.32' Max Vel=10.11 fps Inflow=1.70 cfs 0.273 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.69 cfs 0.273 af

Reach 171: Avg. Flow Depth=0.35' Max Vel=17.93 fps Inflow=5.15 cfs 0.430 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=5.14 cfs 0.430 af

Reach 172: Avg. Flow Depth=0.48' Max Vel=19.67 fps Inflow=8.62 cfs 0.722 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=8.61 cfs 0.722 af

Reach 181: Avg. Flow Depth=0.46' Max Vel=9.79 fps Inflow=3.50 cfs 0.292 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=3.48 cfs 0.292 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.61' Max Vel=4.07 fps Inflow=2.06 cfs 0.172 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=2.04 cfs 0.172 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.44 fps Inflow=9.46 cfs 0.805 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.32 cfs 0.805 af

Reach 230: Avg. Flow Depth=0.48' Max Vel=22.44 fps Inflow=10.92 cfs 0.926 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.89 cfs 0.926 af

Reach 240: Avg. Flow Depth=0.78' Max Vel=26.27 fps Inflow=24.37 cfs 1.935 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.31 cfs 1.935 af

Reach 260: Avg. Flow Depth=0.93' Max Vel=17.11 fps Inflow=24.31 cfs 1.935 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=24.27 cfs 1.935 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.63 cfs 0.121 af
Primary=1.63 cfs 0.121 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.21' Inflow=6.05 cfs 0.218 af
Primary=3.64 cfs 0.190 af Secondary=2.41 cfs 0.027 af Outflow=6.05 cfs 0.218 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.50' Inflow=5.84 cfs 0.351 af
Primary=1.70 cfs 0.273 af Secondary=4.14 cfs 0.077 af Outflow=5.84 cfs 0.351 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: Peak Elev=40.41' Inflow=5.76 cfs 0.345 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.76 cfs 0.345 af

Pond hil-01: Inflow=3.50 cfs 0.292 af
Primary=3.50 cfs 0.292 af

Pond hil-02: Inflow=24.31 cfs 1.935 af
Primary=24.31 cfs 1.935 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH 1: esmh-13952 Peak Elev=46.82' Inflow=10.28 cfs 0.995 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=10.28 cfs 0.995 af

Pond SMH-13932: esmh-13932 Peak Elev=43.13' Inflow=11.23 cfs 1.128 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=11.23 cfs 1.128 af

Pond SMH-20: Inflow=8.62 cfs 0.722 af
Primary=8.62 cfs 0.722 af

Link SP-C1: Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

Link SP-C2: Inflow=11.23 cfs 1.128 af
Primary=11.23 cfs 1.128 af

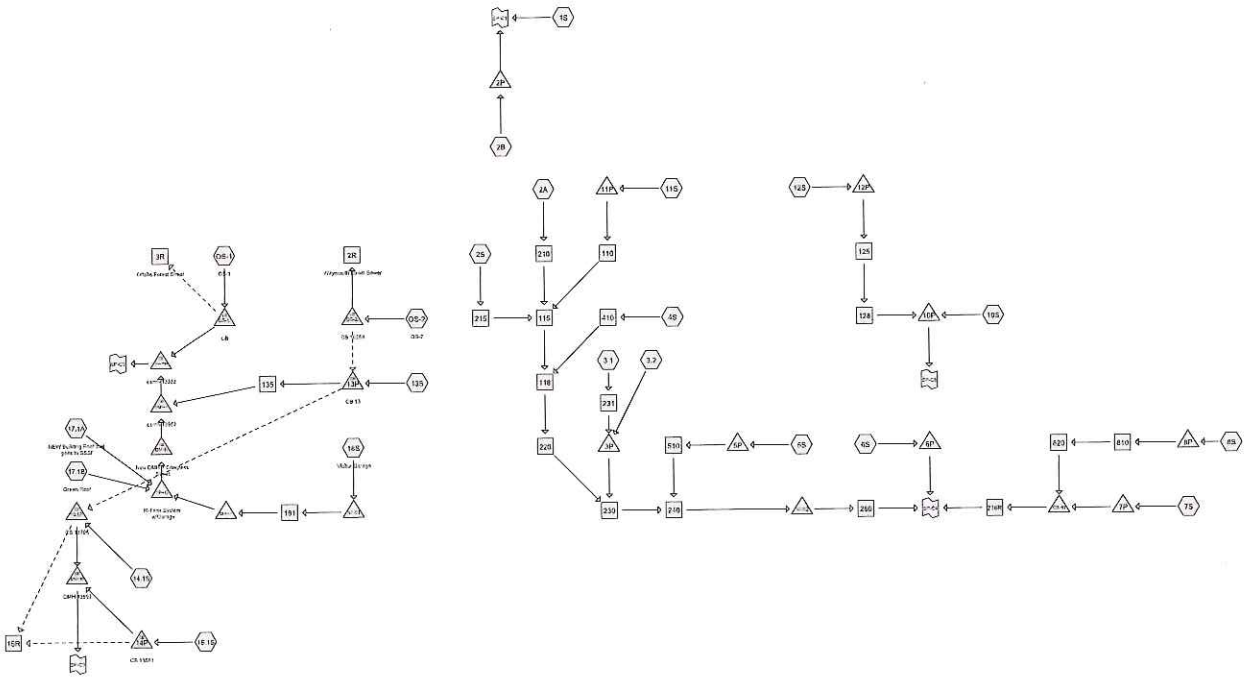
Link SP-C3: Inflow=5.76 cfs 0.345 af
Primary=5.76 cfs 0.345 af

Link SP-C4: Inflow=34.61 cfs 2.702 af
Primary=34.61 cfs 2.702 af

Link SP-C5:

Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Total Runoff Area = 15.783 ac Runoff Volume = 5.230 af Average Runoff Depth = 3.98"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD Post Dev 20180207
Prepared by Sebago Technics, Inc., Printed 9/24/2018
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.026	39	>75% Grass cover, Good, HSG A (1S, 2B, 2S, 3.1, 3.2, 5S, 6S, 8S, 10S, 14.1S, 15.1S)
0.276	86	Green roof (no Walkways) (17.1B)
6.639	98	Paved parking (1S, 2A, 2B, 2S, 3.1, 3.2, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14.1S, 15.1S, 18S)
0.028	98	Paved parking & roofs (17.1A)
3.260	98	Roofs (2S, 5S, 6S, 8S, 10S, 17.1A, 17.1B)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
0.039	98	Walkways (17.1B)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**84**	**TOTAL AREA**

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,481	98	Paved parking
	2,220	39	>75% Grass cover, Good, HSG A
*	2,456	98	Roofs
	16,157	90	Weighted Average
	2,220		13.74% Pervious Area
	13,937		86.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3.1:

Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	1,661	39	>75% Grass cover, Good, HSG A
*	8,390	98	Paved parking
	10,051	88	Weighted Average
	1,661		16.53% Pervious Area
	8,390		83.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.6	220	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
5.0					**Direct Entry, DIRECT**
6.0	250	Total			

Summary for Subcatchment 3.2:

Runoff = 0.00 cfs @ 12.36 hrs, Volume= 0.001 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	2,788	98	Paved parking
	1,301	39	>75% Grass cover, Good, HSG A
	4,089	79	Weighted Average
	1,301		31.82% Pervious Area
	2,788		68.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	66	0.0250	1.34		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
5.2					**Direct Entry, DIRECT**
6.0	66	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	36,084	98	Paved parking
	56,212	43	Woods/grass comb., Fair, HSG A
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14.1S:

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	19,947	98	Paved parking
	2,530	39	>75% Grass cover, Good, HSG A
	22,477	91	Weighted Average
	2,530		11.26% Pervious Area
	19,947		88.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	30	0.0500	1.51		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.4	295	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.3					**Direct Entry, DIRECT ENTRY**
6.0	325	Total			

Summary for Subcatchment 15.1S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	8,038	39	>75% Grass cover, Good, HSG A
*	10,606	98	Paved parking
	18,644	73	Weighted Average
	8,038		43.11% Pervious Area
	10,606		56.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.4	170	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.6	195	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	383	Total			

Summary for Subcatchment 17.1A: NEW Building Roof that goes to SSSF

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	1,202	98	Paved parking & roofs
*	42,414	98	Roofs
	43,616	98	Weighted Average
	43,616		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17.1B: Green Roof

Runoff = 0.09 cfs @ 12.10 hrs, Volume= 0.007 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	12,043	86	Green roof (no Walkways)
*	1,692	98	Walkways
*	1,144	98	Roofs
	14,879	88	Weighted Average
	12,043		80.94% Pervious Area
	2,836		19.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	26,386	98	Paved parking
	26,386		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.3	83	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.6					**Direct Entry, DIRECT**
6.0	264	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

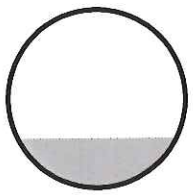
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



Summary for Reach 115:

Inflow Area = 1.203 ac, 95.77% Impervious, Inflow Depth = 0.65" for 1-Inch event
Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.065 af
Outflow = 0.83 cfs @ 12.11 hrs, Volume= 0.065 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.0 min

Peak Storage= 16 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



Summary for Reach 118:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.29 cfs @ 12.10 hrs, Volume= 0.100 af
Outflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.58 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.7 min

Peak Storage= 18 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



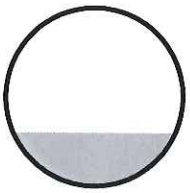
Summary for Reach 181:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 1.1 min

Peak Storage= 12 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.73 cfs

12.0" Round Pipe
n= 0.012
Length= 60.0' Slope= 0.0050 '/'
Inlet Invert= 54.46', Outlet Invert= 54.16'



Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



Summary for Reach 215:

Inflow Area = 0.371 ac, 86.26% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



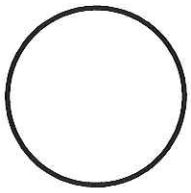
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



Summary for Reach 220:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af
Outflow = 1.23 cfs @ 12.13 hrs, Volume= 0.100 af, Atten= 4%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 47 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



Summary for Reach 230:

Inflow Area = 2.062 ac, 94.23% Impervious, Inflow Depth = 0.61" for 1-Inch event
Inflow = 1.29 cfs @ 12.12 hrs, Volume= 0.105 af
Outflow = 1.28 cfs @ 12.13 hrs, Volume= 0.105 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



Summary for Reach 231:

Inflow Area = 0.231 ac, 83.47% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af
Outflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 240:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.80 cfs @ 12.12 hrs, Volume= 0.153 af
Outflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.45 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.31 fps, Avg. Travel Time= 0.4 min

Peak Storage= 14 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



Summary for Reach 260:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Outflow = 1.77 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.79 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



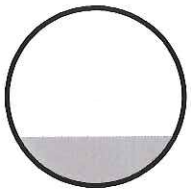
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



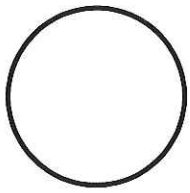
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



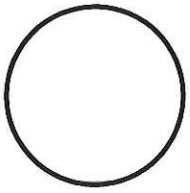
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 1P+G: R-Tank System w/Garage

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.70" for 1-Inch event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.113 af
Outflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af, Atten= 98%, Lag= 126.4 min
Primary = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 50.69' @ 17.15 hrs Surf.Area= 2,963 sf Storage= 3,942 cf

Plug-Flow detention time= 504.5 min calculated for 0.030 af (26% of inflow)
Center-of-Mass det. time= 345.5 min (1,139.4 - 794.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.58'	973 cf	**8.50'W x 76.37'L x 5.75'H Field A** 3,732 cf Overall - 1,300 cf Embedded = 2,432 cf x 40.0% Voids
#2A	51.33'	1,300 cf	**Cultec R-902HD** x 20 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#3B	48.37'	3,596 cf	**10.56'W x 179.94'L x 8.96'H Field B** 17,019 cf Overall - 8,029 cf Embedded = 8,989 cf x 40.0% Voids
#4B	48.37'	7,628 cf	**ACF R-Tank HD 5.0** x 375 Inside #3 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 75 Chambers
#5C	50.83'	286 cf	**8.50'W x 21.37'L x 5.75'H Field C** 1,044 cf Overall - 329 cf Embedded = 715 cf x 40.0% Voids
#6C	51.58'	329 cf	**Cultec R-902HD** x 5 Inside #5 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#7D	48.37'	675 cf	**10.56'W x 39.19'L x 7.96'H Field D** 3,293 cf Overall - 1,606 cf Embedded = 1,687 cf x 40.0% Voids
#8D	48.37'	1,526 cf	**ACF R-Tank HD 5.0** x 75 Inside #7 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 15 Chambers
		16,312 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard
Storage Group D created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.94'	**12.0" Round Stromdrain** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.94' / 45.76' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	46.04'	**1.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	48.37'	**2.410 in/hr Filtration over Surface area above 48.37'** Excluded Surface area = 2,314 sf
#4	Device 1	51.20'	**6.0" Vert. Orifice** C= 0.600
#5	Primary	52.20'	**0.4' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#6	Device 1	53.95'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.04 cfs @ 14.20 hrs HW=50.58' (Free Discharge)
- **1=Stromdrain** (Passes 0.04 cfs of 7.55 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.04 cfs of 0.13 cfs potential flow)
    - **3=Filtration** (Exfiltration Controls 0.04 cfs)
  - **4=Orifice** (Controls 0.00 cfs)
  - **6=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
- **1=Culvert** (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.325 ac, 79.05% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.516 ac, 88.74% Impervious, Inflow Depth = 0.36" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.60' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.20 cfs @ 12.10 hrs HW=42.60' (Free Discharge)
↑—**1=12" SD** (Passes 0.20 cfs of 4.79 cfs potential flow)
↑—**2=Curb Inlet** (Weir Controls 0.20 cfs @ 1.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB 13

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads

#2	Secondary	66.20'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
↑—**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: CB 13581

Inflow Area =	0.428 ac, 56.89% Impervious, Inflow Depth =	0.02"	for 1-Inch event	
Inflow =	0.00 cfs @	15.12 hrs, Volume=	0.001 af	
Outflow =	0.00 cfs @	15.12 hrs, Volume=	0.001 af, Atten= 0%, Lag= 0.0 min	
Primary =	0.00 cfs @	15.12 hrs, Volume=	0.001 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.62'	**8.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.62' / 39.00' S= 0.1080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=42.50' (Free Discharge)
↑—**1=12" SD** (Passes 0.00 cfs of 2.09 cfs potential flow)
↑—**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=40.62' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area =	3.164 ac, 47.24% Impervious, Inflow Depth =	0.02"	for 1-Inch event	
Inflow =	0.01 cfs @	12.50 hrs, Volume=	0.004 af	
Outflow =	0.01 cfs @	12.52 hrs, Volume=	0.004 af, Atten= 0%, Lag= 0.8 min	
Primary =	0.01 cfs @	12.52 hrs, Volume=	0.004 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)

Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20: DMH 13592

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.81' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=37.81' (Free Discharge)
1=12" SD (Inlet Controls 0.21 cfs @ 1.60 fps)

Summary for Pond DMH-7:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af
Primary = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond DMH1: New DMH-1 Congress Street

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.18" for 1-Inch event
Inflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af
Outflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 45.77' @ 14.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.66'	**15.0" Round Stormdrain** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.66' / 45.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.04 cfs @ 14.20 hrs HW=45.77' (Free Discharge)
↑—**1=Stormdrain** (Barrel Controls 0.04 cfs @ 1.09 fps)

Summary for Pond hil-01:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Primary = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
↑—**1=Stormdrain** (Passes 0.07 cfs of 5.24 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area =	1.168 ac, 85.00% Impervious, Inflow Depth =	0.28"	for 1-Inch event	
Inflow =	0.31 cfs @	12.16 hrs, Volume=	0.028 af	
Outflow =	0.31 cfs @	12.16 hrs, Volume=	0.028 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.31 cfs @	12.16 hrs, Volume=	0.028 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain**
			L= 35.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
↑—**1=Stormdrain** (Passes 0.30 cfs of 3.12 cfs potential flow)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SMH-1: esmh-13952

Inflow Area =	2.775 ac, 85.75% Impervious, Inflow Depth =	0.22"	for 1-Inch event	
Inflow =	0.28 cfs @	12.12 hrs, Volume=	0.052 af	
Outflow =	0.28 cfs @	12.12 hrs, Volume=	0.052 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.28 cfs @	12.12 hrs, Volume=	0.052 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 44.84' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Culvert** L= 41.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0724 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.27 cfs @ 12.12 hrs HW=44.84' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.27 cfs @ 1.62 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af
Outflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.90' @ 12.13 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.36 cfs @ 12.13 hrs HW=40.90' (Free Discharge)
↑**1=Sewer** (Inlet Controls 0.36 cfs @ 1.74 fps)

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.351 ac, 70.70% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af
Primary = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=2.08"
Flow Length=244' Tc=6.0 min CN=90 Runoff=0.88 cfs 0.064 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=1.91"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.50 cfs 0.037 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=1.26"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.13 cfs 0.010 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=2.16"
Flow Length=325' Tc=6.0 min CN=91 Runoff=1.26 cfs 0.093 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=0.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.42 cfs 0.033 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=2.94 cfs 0.239 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=1.91"
Flow Length=188' Tc=6.0 min CN=88 Runoff=0.75 cfs 0.054 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=264' Tc=6.0 min CN=98 Runoff=1.78 cfs 0.145 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.65' Max Vel=5.11 fps Inflow=3.30 cfs 0.263 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.27 cfs 0.263 af

Reach 118: Avg. Flow Depth=0.49' Max Vel=9.65 fps Inflow=4.83 cfs 0.391 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=4.80 cfs 0.391 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.29' Max Vel=9.56 fps Inflow=1.37 cfs 0.137 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.36 cfs 0.137 af

Reach 181: Avg. Flow Depth=0.59' Max Vel=3.70 fps Inflow=1.78 cfs 0.145 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=1.76 cfs 0.145 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.37' Max Vel=3.29 fps Inflow=0.88 cfs 0.064 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=0.87 cfs 0.064 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.52' Max Vel=8.72 fps Inflow=4.80 cfs 0.391 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.70 cfs 0.391 af

Reach 230: Avg. Flow Depth=0.33' Max Vel=18.24 fps Inflow=5.32 cfs 0.437 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.30 cfs 0.437 af

Reach 231: Inflow=0.50 cfs 0.037 af
Outflow=0.50 cfs 0.037 af

Reach 240: Avg. Flow Depth=0.50' Max Vel=21.28 fps Inflow=11.02 cfs 0.855 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=10.98 cfs 0.855 af

Reach 260: Avg. Flow Depth=0.60' Max Vel=13.77 fps Inflow=10.98 cfs 0.855 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=10.95 cfs 0.855 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=53.01' Storage=9,113 cf Inflow=5.45 cfs 0.438 af
Outflow=2.18 cfs 0.355 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.64 cfs 0.047 af
Primary=0.64 cfs 0.047 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.94' Inflow=1.83 cfs 0.099 af
Primary=1.83 cfs 0.099 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.099 af

Pond 13P: CB 13 Peak Elev=66.33' Inflow=1.94 cfs 0.143 af
Primary=1.37 cfs 0.137 af Secondary=0.56 cfs 0.006 af Outflow=1.94 cfs 0.143 af

Pond 14P: CB 13581 Peak Elev=42.66' Inflow=0.42 cfs 0.033 af
Primary=0.42 cfs 0.033 af Secondary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.033 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: DMH 13592 Peak Elev=38.44' Inflow=2.25 cfs 0.132 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=2.25 cfs 0.132 af

Pond DMH-7: Inflow=1.76 cfs 0.145 af
Primary=1.76 cfs 0.145 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=46.57' Inflow=2.18 cfs 0.355 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=2.18 cfs 0.355 af

Pond hil-01: Inflow=1.78 cfs 0.145 af
Primary=1.78 cfs 0.145 af

Pond hil-02: Inflow=10.98 cfs 0.855 af
Primary=10.98 cfs 0.855 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH-1: esmh-13952 Peak Elev=45.45' Inflow=3.17 cfs 0.493 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=3.17 cfs 0.493 af

Pond SMH-13932: esmh-13932 Peak Elev=41.57' Inflow=3.78 cfs 0.556 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=3.78 cfs 0.556 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=3.78 cfs 0.556 af
Primary=3.78 cfs 0.556 af

Link SP-C3: Inflow=2.25 cfs 0.132 af
Primary=2.25 cfs 0.132 af

Link SP-C4: Inflow=13.78 cfs 1.089 af
Primary=13.78 cfs 1.089 af

Link SP-C5: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.296 af Average Runoff Depth = 1.75"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=3.49"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.44 cfs 0.108 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=3.29"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.85 cfs 0.063 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=2.46"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.27 cfs 0.019 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=3.59"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.05 cfs 0.155 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=1.97"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.96 cfs 0.070 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=4.40 cfs 0.364 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=3.29"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.26 cfs 0.094 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=264' Tc=6.0 min CN=98 Runoff=2.66 cfs 0.220 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=1.22 cfs 0.011 af
Outflow=1.22 cfs 0.011 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.86' Max Vel=5.61 fps Inflow=5.06 cfs 0.411 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.03 cfs 0.411 af

Reach 118: Avg. Flow Depth=0.61' Max Vel=10.83 fps Inflow=7.35 cfs 0.605 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.31 cfs 0.605 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.33' Max Vel=10.15 fps Inflow=1.73 cfs 0.219 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.72 cfs 0.219 af

Reach 181: Avg. Flow Depth=0.80' Max Vel=3.96 fps Inflow=2.66 cfs 0.220 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.64 cfs 0.220 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.49' Max Vel=3.75 fps Inflow=1.44 cfs 0.108 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.43 cfs 0.108 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.66' Max Vel=9.78 fps Inflow=7.31 cfs 0.605 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.19 cfs 0.605 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.75 fps Inflow=8.29 cfs 0.687 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.26 cfs 0.687 af

Reach 231: Inflow=0.85 cfs 0.063 af
Outflow=0.85 cfs 0.063 af

Reach 240: Avg. Flow Depth=0.66' Max Vel=24.42 fps Inflow=18.27 cfs 1.428 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.22 cfs 1.428 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.85 fps Inflow=18.22 cfs 1.428 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.19 cfs 1.428 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=53.95' Storage=11,275 cf Inflow=8.29 cfs 0.678 af
Outflow=4.58 cfs 0.595 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.12 cfs 0.083 af
Primary=1.12 cfs 0.083 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.13' Inflow=4.31 cfs 0.189 af
Primary=3.09 cfs 0.178 af Secondary=1.22 cfs 0.011 af Outflow=4.31 cfs 0.189 af

Pond 13P: CB 13 Peak Elev=66.52' Inflow=4.01 cfs 0.253 af
Primary=1.73 cfs 0.219 af Secondary=2.29 cfs 0.034 af Outflow=4.01 cfs 0.253 af

Pond 14P: CB 13581 Peak Elev=42.78' Inflow=0.96 cfs 0.070 af
Primary=0.96 cfs 0.070 af Secondary=0.00 cfs 0.000 af Outflow=0.96 cfs 0.070 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: DMH 13592 Peak Elev=39.23' Inflow=4.05 cfs 0.249 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.05 cfs 0.249 af

Pond DMH-7: Inflow=2.64 cfs 0.220 af
Primary=2.64 cfs 0.220 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=47.13' Inflow=4.58 cfs 0.595 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=4.58 cfs 0.595 af

Pond hil-01: Inflow=2.66 cfs 0.220 af
Primary=2.66 cfs 0.220 af

Pond hil-02: Inflow=18.22 cfs 1.428 af
Primary=18.22 cfs 1.428 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH-1: esmh-13952 Peak Elev=45.88' Inflow=6.09 cfs 0.813 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=6.09 cfs 0.813 af

Pond SMH-13932: esmh-13932 Peak Elev=42.04' Inflow=6.88 cfs 0.916 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.88 cfs 0.916 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=6.88 cfs 0.916 af
Primary=6.88 cfs 0.916 af

Link SP-C3: Inflow=4.05 cfs 0.249 af
Primary=4.05 cfs 0.249 af

Link SP-C4: Inflow=24.94 cfs 1.939 af
Primary=24.94 cfs 1.939 af

Link SP-C5: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.955 af Average Runoff Depth = 3.01"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=4.65"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.89 cfs 0.144 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=4.43"
Flow Length=250' Tc=6.0 min CN=88 Runoff=1.14 cfs 0.085 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=3.50"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.38 cfs 0.027 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=4.76"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.67 cfs 0.205 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=2.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=1.44 cfs 0.104 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=5.56 cfs 0.464 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=4.43"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.68 cfs 0.126 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=264' Tc=6.0 min CN=98 Runoff=3.36 cfs 0.281 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.76 cfs 0.033 af
Outflow=2.76 cfs 0.033 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.09' Max Vel=5.70 fps Inflow=6.47 cfs 0.530 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.41 cfs 0.530 af

Reach 118: Avg. Flow Depth=0.70' Max Vel=11.53 fps Inflow=9.35 cfs 0.777 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.30 cfs 0.777 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.35' Max Vel=10.44 fps Inflow=1.94 cfs 0.280 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.93 cfs 0.280 af

Reach 181: Avg. Flow Depth=1.00' Max Vel=3.94 fps Inflow=3.36 cfs 0.281 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.94 cfs 0.281 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.58' Max Vel=4.00 fps Inflow=1.89 cfs 0.144 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.88 cfs 0.144 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.40 fps Inflow=9.30 cfs 0.777 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.15 cfs 0.777 af

Reach 230: Avg. Flow Depth=0.47' Max Vel=22.28 fps Inflow=10.64 cfs 0.890 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.61 cfs 0.890 af

Reach 231: Inflow=1.14 cfs 0.085 af
Outflow=1.14 cfs 0.085 af

Reach 240: Avg. Flow Depth=0.77' Max Vel=26.20 fps Inflow=24.09 cfs 1.899 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.04 cfs 1.899 af

Reach 260: Avg. Flow Depth=0.92' Max Vel=17.05 fps Inflow=24.04 cfs 1.899 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=23.99 cfs 1.899 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=54.27' Storage=11,982 cf Inflow=9.96 cfs 0.871 af
Outflow=8.32 cfs 0.788 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.51 cfs 0.113 af
Primary=1.51 cfs 0.113 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.23' Inflow=6.54 cfs 0.276 af
Primary=3.78 cfs 0.243 af Secondary=2.76 cfs 0.033 af Outflow=6.54 cfs 0.276 af

Pond 13P: CB 13 Peak Elev=66.65' Inflow=5.84 cfs 0.351 af
Primary=1.94 cfs 0.280 af Secondary=3.91 cfs 0.071 af Outflow=5.84 cfs 0.351 af

Pond 14P: CB 13581 Peak Elev=42.87' Inflow=1.44 cfs 0.104 af
Primary=1.44 cfs 0.104 af Secondary=0.00 cfs 0.000 af Outflow=1.44 cfs 0.104 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: DMH 13592 Peak Elev=39.99' Inflow=5.21 cfs 0.347 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.21 cfs 0.347 af

Pond DMH-7: Inflow=2.94 cfs 0.281 af
Primary=2.94 cfs 0.281 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=48.22' Inflow=8.32 cfs 0.788 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=8.32 cfs 0.788 af

Pond hil-01: Inflow=3.36 cfs 0.281 af
Primary=3.36 cfs 0.281 af

Pond hil-02: Inflow=24.04 cfs 1.899 af
Primary=24.04 cfs 1.899 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH-1: esmh-13952 Peak Elev=46.78' Inflow=10.17 cfs 1.067 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=10.17 cfs 1.067 af

Pond SMH-13932: esmh-13932 Peak Elev=43.10' Inflow=11.15 cfs 1.200 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=11.15 cfs 1.200 af

Link SP-C1:
Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

Link SP-C2:
Inflow=11.15 cfs 1.200 af
Primary=11.15 cfs 1.200 af

Link SP-C3:
Inflow=5.21 cfs 0.347 af
Primary=5.21 cfs 0.347 af

Link SP-C4:
Inflow=34.33 cfs 2.666 af
Primary=34.33 cfs 2.666 af

Link SP-C5:
Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

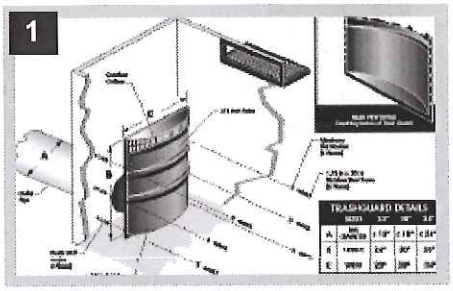
Total Runoff Area = 15.783 ac Runoff Volume = 5.358 af Average Runoff Depth = 4.07"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

R-TANK

R-TANK MAINTENANCE

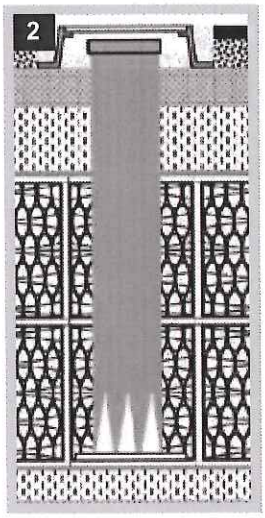
With adequate pre-treatment of stormwater before it enters the ACF R-Tank, heavy sediments, trash, and other debris will not enter the system. Systems like the TrashGuard (see image 1) are simple and inexpensive, but also highly effective. Therefore, most maintenance efforts should be directed at the pre-treatment structures to ensure they are functioning properly.

To monitor the accumulation of fine sediments that may enter the detention/ retention area, ACF R-Tank systems should include maintanance ports.



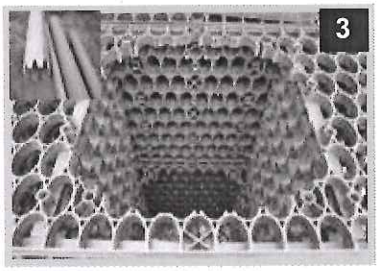
Maintenance

Running from the bottom of the ACF R-Tank up to ground level, Maintenance Ports are made from solid PVC Pipe with notches cut into the bottom. As water is pumped into the port the notches will direct water throughout the bottom of the system to create turbulence, thereby re-suspending accumulated sediments.



After pumping water into the tanks, flushing is completed by vacuuming sediment laden water out of the system either through the outlet structure or through the flush port.

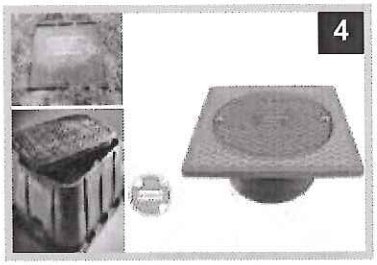
The diameter of the flush port is determined by a number of factors including the rate at which water will be pumped into the system, the number of flush ports incorporated, and the possible requirement of vacuuming through the port. Experience has shown that a 12" port is more than adequate for virtually any required use, with 6" ports more common when vacuuming will be performed at the outlet structure.



Installing the Maintenance System

To install the PCV Pipe, remove the center small plate and cut the top large plate between the remaining interior small plates. Before inserting the port into the Tank, install an anti-scour plate in the bottom of the Tank to prevent disturbance of the base materials.

Maintenance ports should be capped at the surface. In landscaped areas, this may be accomplished with a simple pipe cap or plastic valve box (see image 4 lower inset). In paved areas, metal lids are more appropriate (see image 4).



R-TANK MAINTENANCE

Maintenance Intervals

Maintenance Schedules for the ACF R-Tank System are a function of the contributing area and the type of pre-treatment specified. A standard maintenance schedule may include quarterly inspections through the first year of use, with yearly inspections thereafter. Flushing should be performed if sediment should the lesser of 6" or 15% of the system height.



Availability

All system components, including caps, lids, anti-scour plates, frames and covers are available from ACF. In fact, we've created Maintenance Port Kids (see image 5) that include everything needed except for the pipe itself. Contact your local sales representative or our Sales Office at 800-448-3636 for assistance.

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R TANK

R-TANK OPERATION, INSPECTION & MAINTENANCE

Operation

Your ACF R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspection frequency for your system must be determined based on the contributing drainage area, but should never exceed one year between inspections (six months during the first year of operation).

Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment your inspection and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you MUST follow all local/regional requirements as well as OSHA standards.

R-Tank Systems may incorporate Inspection Ports, Maintenance Ports, and/or adjoining manholes. Each of these features are easily accessed by removing the lid at the surface. With the cover removed, a visual inspection can be performed to identify sediment deposits within the structure. Using a flashlight, ALL access points should be examined to complete a thorough inspection.

Inspection Ports

Usually located centrally in the R-Tank System, these perforated columns are designed to give the user a base-line sediment depth across the system floor.

Maintenance Ports

Usually located near the inlet and outlet connections, you'll likely find deeper deposits of heavier sediments when compared to the Inspection Ports.

Manholes

Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Bear in mind that these manholes often include a sump below the invert of the pipe connecting to the R-Tank. These sumps are designed to capture sediment before it reaches the R-Tank, and they should be kept clean to ensure they function properly. However, existence of sediment in the sump does NOT necessarily mean sediment has accumulated in the R-Tank.

After inspecting the bottom of the structure, use a mirror on a pole (or some other device) to check for sediment or debris in the pipe connecting to the R-Tank.

R-TANK OPERATION INSPECTION & MAINTENANCE

If sediment or debris is observed in any of these structures, you should determine the depth of the material. This is typically accomplished with a stadia rod, but you should determine the best way to obtain the measurement.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guideline.

Maintenance

The R-Tank System should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Use the chart below as a guideline to determine the point at which maintenance is required on your system.

R-Tank Unit	Height	Max Sediment Dept
Mini	9.5"	1.5"
Single	17"	3"
Double	34"	5"
Triple	50"	6"
Quad	67"	6"
Pent	84"	6"

Before any maintenance is performed on your system, be sure to plug the outlet pipe to prevent contamination of the adjacent systems.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. Water should be pumped into ALL Maintenance Ports. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out.

If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

Once removed, sediment-laden water may be captured for disposal or pumped through a Dirtbag™ (if permitted by the locality).

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Step-By-Step Inspection & Maintenance Routine

1) **Inspection**
    a. Inspection Port
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
    b. Maintenance Port/s
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
        vi. Repeat for ALL Maintenance Ports
    c. Adjacent Manholes
        i. Remove Cover
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod, accounting for depth of sump (if present)
        iv. Inspect pipes connecting to R-Tank
        v. Record results on Maintenance Log
        vi. Replace Cover
        vii. Repeat for ALL Manholes that connect to the R-Tank

2) **Maintenance**
    a. Plug system outlet to prevent discharge of back-flush water
    b. Determine best location to pump out back-flush water
    c. Remove Cap from Maintenance Port
    d. Pump water as rapidly as possible (without over-topping port) into system until at least 1"
    of water covers system bottom
    e. Replace Cap
    f. Repeat at ALL Maintenance Ports
    g. Pump out back-flush water to complete back-flushing
    h. Vacuum all adjacent structures and any other structures or stormwater pre-treatment systems that require attention
    i. Sediment-laden water may be captured for disposal or pumped through a Dirtbag™.
    j. Replace any remaining Caps or Covers
    k. Record the back-flushing event in your Maintenance Log with any relevant specifics

R-Tank Maintenance Log

Site Name:_____

Location:_____

System Owner:_____

Company Responsible for Maintenance:_____

Contact:_____

Phone Numer:_____

Date	Location	Depth to Bottom	Depth to Sediment	Sediment Depth	Observations/Notes	Initials

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Operation and Maintenance Guidelines
for CULTEC Stormwater Management Systems

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May 2017

These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pre-treatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

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2. **StormFilter Access**
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

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	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

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WQMP
Operation & Maintenance (O&M) Plan

Project Name:_____

Prepared for:

Project Name: _____

Address:_____

City, State Zip:_____

Prepared on:

Date:_____

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This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

8.1.1 Project Information

Project name	
Address	
City, State Zip	
Site size	
List of structural BMPs, number of each	
Other notes	

8.1.2 Responsible Party

The responsible party for implementation of this WQMP is:

Name of Person or HOA Property Manager	
Address	
City, State Zip	
Phone number	
24-Hour Emergency Contact number	
Email	

8.1.3 Record Keeping

Parties responsible for the O&M plan shall retain records for at least 5 years.

All training and educational activities and BMP operation and maintenance shall be documented to verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in this document.

8.1.4 Electronic Data Submittal

This document along with the Site Plan and Attachments shall be provided in PDF format. AutoCAD files and/or GIS coordinates of BMPs shall also be submitted to the City.

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Appendix ____

BMP SITE PLAN

Site plan is preferred on minimum 11" by 17" colored sheets, as long as legible.

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BMP OPERATION & MAINTENANCE LOG

Project Name: _____

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

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Minor Maintenance

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

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Major Maintenance

	Frequency		Action
Inlets and Outlets	**Every 3 years**		Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
			Notes
	□ Year 1	Date:	
	□ Year 4	Date:	
	□ Year 7	Date:	
	□ Year 10	Date:	
	□ Year 13	Date:	
	□ Year 16	Date:	
	□ Year 19	Date:	
	□ Year 22	Date:	
	Spring and Fall		Check inlet and outlets for clogging and remove any debris, as required.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
CULTEC Stormwater Chambers	**2 years after commissioning**		□ Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
			Notes
	□ Year 2	Date:	

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Major Maintenance

	Frequency		Action
CULTEC Stormwater Chambers	**9 years after commissioning every 9 years following**		□ Clean stormwater management chambers and feed connectors of any debris. □ Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
			Notes
	□ Year 9	Date:	
	□ Year 18	Date:	
	□ Year 27	Date:	
	□ Year 36	Date:	
	45 years after commissioning		□ Clean stormwater management chambers and feed connectors of any debris. □ Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. □ Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. □ Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. □ Attain the appropriate approvals as required. □ Establish a new operation and maintenance schedule.
			Notes
	□ Year 45	Date:	

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Major Maintenance

	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

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CULG008 05-17

Section 13

Urban Impaired Stream Submissions

Section 13: Urban Impaired Streams

A project must meet the urban impaired stream standards if located within an urban impaired stream watershed As this project is not tributary to an Urban Impaired Stream as defined by Maine DEP Chapter 502, this project is not subject to the urban impaired stream standard.

Section 14

Basic Standards

Section 14: Basic Standards

A. Narrative

Site specific Erosion and Sedimentation Control (ESC) measures have been designed for the site. All ESC and stabilization measures have been prepared to address the requirements of the basic stabilization standards as defined by Maine DEP Chapter 500, Stormwater Management regulations. Maintenance, inspections and Housekeeping is addressed in the Stormwater Management Plan, Section 12.

B. Implementation schedule

Final stabilization removals are anticipated during late 2022. Reference is made to Section 1 for the construction schedule timing.

C./D./E. ESC Plan, Details and Work Limits

The proposed measures include the drainage and erosion control elements, their locations and the work/disturbance limits, as required.

F. Design Drawings

The design drawings include ESC measures designed in accordance with the *Erosion and Sediment Control Handbook for Construction: Best Management Practices*, latest edition.

G. ESC Calculations for sizing, spacing or stabilizing ESC measures.

Reference is made to Section 12-Stormwater for calculations related to sizing and spacing of ESC measures, as applicable.

Section 15

Groundwater

Section 15: Groundwater

A. Narrative and Report

The proposed property maintenance facility with not draw from, or eject to aquifers. No groundwater degradation is anticipated as a result of the site development.

(1) Location and Maps
The site has been previously reviewed under the provisions of Site Law that included significant sand and gravel aquifers, surficial geology, and bedrock maps. Copies of the maps are not included in this submittal.

(2) Quantity
Not applicable.

(3) Sources

Solid waste:

Construction period solid waste removal will be facilitated by the Construction Manager by contract with a licensed waste facility.

Post construction solid waste will be collected internal to the building and placed in external dumpsters that are emptied on a regular schedule and disposed of off-site as part as part of an existing solid waste removal contract between MMC and Troiano Waste Services.

Hazardous materials will be handled and disposed of by existing MMC protocol. No changes to existing procedures are proposed or anticipated as part of the site redevelopment.

(4) Measures to prevent degradation.
The Construction Manager will carefully monitor construction activity and MMC will be responsible for post-construction monitoring.

B. Groundwater Protection Plan
Not applicable

Section 16

Water Supply

Will Conway

From: Dylan Stuart
Sent: Monday, September 24, 2018 11:22 AM
To: rbartels@pwd.org
Cc: Will Conway; 15466
Subject: Maine Medical Center Ability to Serve Request
Attachments: 15466U2-U-CONGRESS.pdf

Robert,

I am writing to request an ability to serve letter for the Maine Medical Center Expansion project following our meeting from last week. We have updated the locations for the domestic and fire services coming from Gilman and Congress Street. Please see the attached Utility plan as well as the most updated Peak Flow Based on Fixture Count form that was filled out by our MEP engineer.
Please let me know if you have any questions or require any additional information.

Thank you,

Dylan Stuart *Civil Engineer*
Office: 207.200.2100 | Direct: 207.200.2093
75 John Roberts Rd., Suite 4A, South Portland, ME 04106
dstuart@sebagotechnics.com | www.sebagotechnics.com
An Employee-Owned Company

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TECHNICS

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Peak Flow Based on Fixture Count

Customer	Maine Medical Center
Street Address	22 Bramhall Street
City	Portland

Fixture	Fixture Value 60 psi		No. of Fixtures		Fixture Value
Bathtub	8	x	0	=	0
Bedpan Washers	10	x	5	=	50
Bidet	2	x	0	=	0
Dental Unit	2	x	0	=	0
Drinking Fountain - Public	2	x	0	=	0
Kitchen Sink	2.2	x	95	=	209
Lavatory	1.5	x	141	=	211.5
Showerhead (Shower Only)	2.5	x	100	=	250
Service Sink	4	x	10	=	40
Toilet -Flush Valve	35	x	142	=	4970
-Tank Type	4	x	0	=	0
Urinal -Pedestal Flush Valve	35	x	0	=	0
-Wall Flush Valve	16	x	17	=	272
Wash Sink (Each Set of Faucets)	4	x	8	=	32
Dishwasher	2	x	0	=	0
Washing Machine	6	x	0	=	0
Hose (50 ft. Wash Down) -1/2 in.	5	x	0	=	0
-5/8 in.	9	x	0	=	0
-3/4 in.	12	x	0	=	0

Combined Fixture Value Total: 6034.5

Customer Peak Demand From Fig. 4-2 or 4-3	175
Pressure Factor From Table 4-1	1.17

No. of Irrigation Sections (Areas of 100 sq. ft.)	0
Irrigation Factor (1.16-Spray Systems, 0.40-Rotary Systems)	

Hose Bibs for Irrigation:

Size	Fixture Value	No. of Fixtures
1/2"		
5/8"		
3/4"		

Total Fixed Demand (Peak Flow) 204.75 gpm

Table 4-1 Pressure Adjustment Factors

Working Pressure at Meter Discharge (psi)	Pressure Adjustment Factor
35	0.74
40	0.80
50	0.90
60	1.00
70	1.09
80	1.17
90	1.25
100	1.34

Adapted from AWWA Manual M22 table 4-1

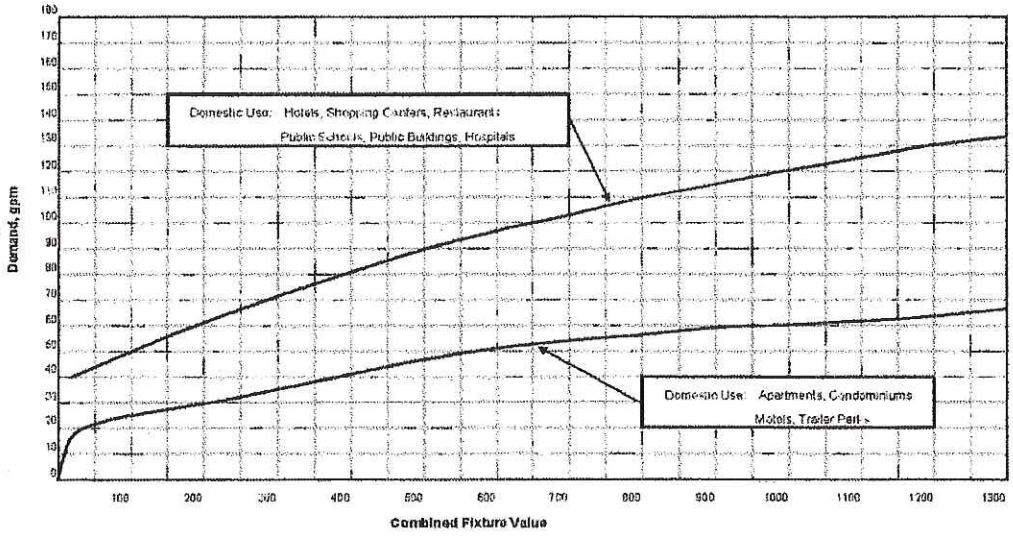


Figure 4-2 Water flow demand per fixture value - low range

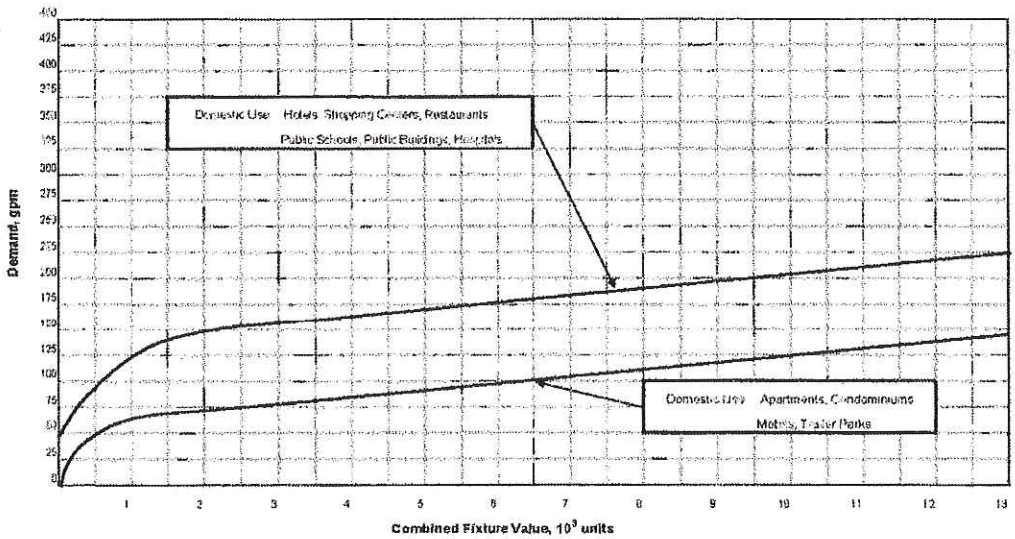


Figure 4-3 Water flow demand per fixture value - High range

Section 17

Wastewater Disposal

Section 17: Wastewater Disposal

A municipal facility with provide sewage disposal. A City of Portland Wastewater Capacity Application will be reviewed by Water Resources as part of the Site Plan Review.

Section 18

Solid Waste

Section 18: Solid Waste

Construction period solid waste removal will be managed by the construction manager. Demolition debris will be recycled to the greatest extent possible and will be disposed of at a licensed facility.

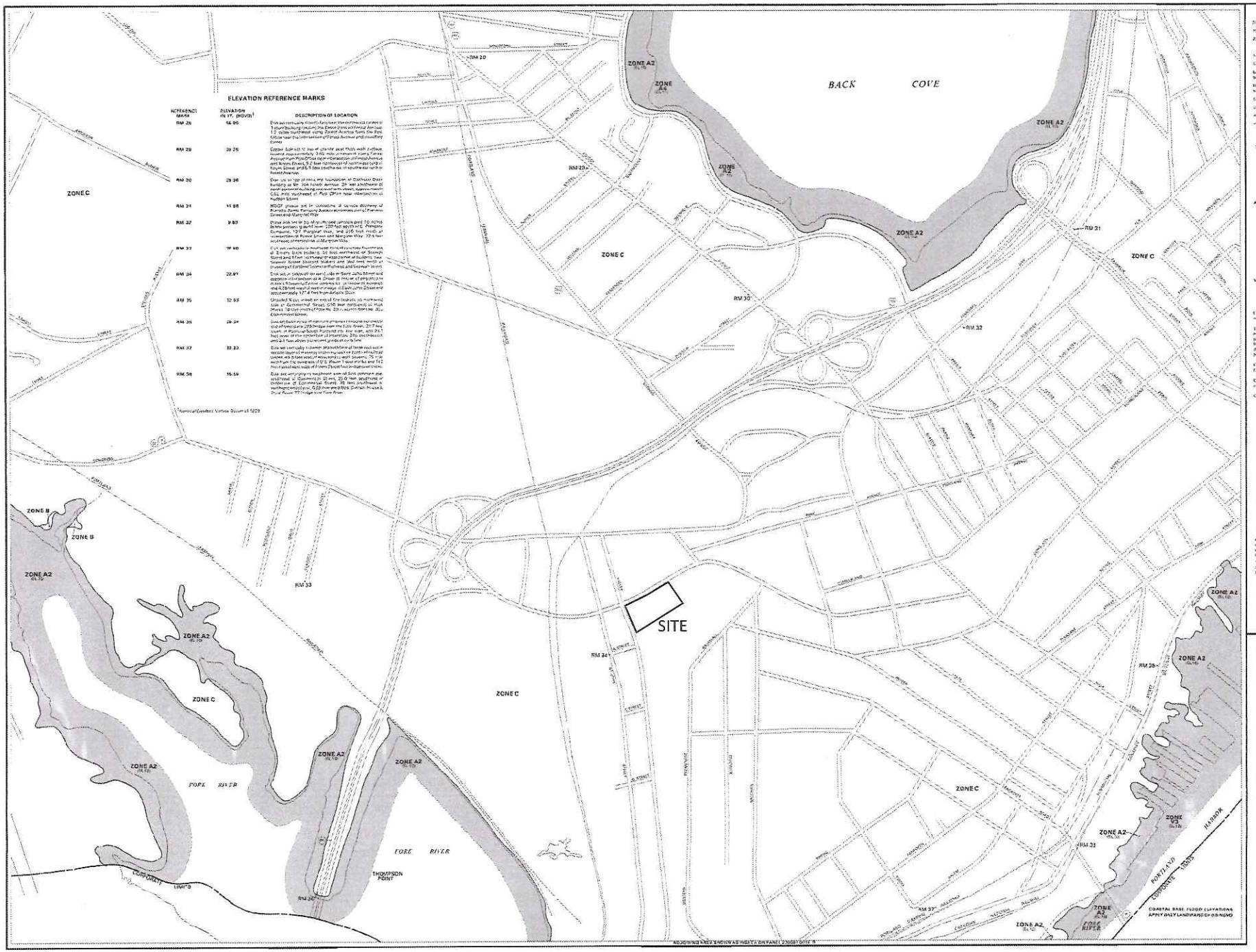
Post construction solid waste will be handled under the provisions of an existing waste disposal contracts in place between Troiano Waste Management and MMC.

Section 19

Flooding

Section 19: Flooding

The project site is not located in a flood plain and will not cause an unreasonable flood hazard to any structure. A copy of the FEMA Flood Insurance Rate Map (FIRM) is enclosed in this section.



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 20	16.06	Disk set vertically in north face of the northwest corner of 3-story building (number 79) on Fore Street at Forest Avenue, 1.2 miles northeast along Forest Avenue from the flashing beacon at the intersection of Forest Avenue and Woodfords Corner
RM 29	20.26	Copper bolt set in top of granite post flush with surface, located approximately 3.65 mile northeast along Forest Avenue from Woodfords Corner intersection of Forest Avenue and Nasons Street, 5.2 feet northwest of northwest corner of Nasons Street and 5.1 feet southwest of southwest curb of Forest Avenue.
RM 30	29.36	Drill set in top of rock, the foundation of Clarkson Dorr Building at 96 Forest Avenue, 29 feet southwest of west pavement edge, southeast from street, approximately 0.62 mile northeast of Park Circle near intersection of Hutton Street
RM 31	11.88	BENCH plaque set in concrete at outside doorway of Portland Public Services Building, 55 Portland Street and Franklin Street and Franklin Wharf
RM 32	9.89	Drive rock set in top of reinforced concrete post 10 inches below present ground level, 220 feet south of C. Penguin Company, 127 Marginal Way, and 205 feet south of intersection of Fleet Street and Marginal Way, 37.9 feet southeast of centerline of Marginal Way
RM 33	10.00	Disk set vertically in northeast corner foundation of 2-story brick building, 50 feet southeast of Swamp Street and 8 feet southwest of east corner of building, Saw Tooth Street (railroad station) and 300 feet north of driveway of Portland Terminal Company railroad and Eastman Street
RM 34	22.91	Disk set in sidewalk on west side of Saint John Street and opposite intersection of A Street (5 miles of centerline of Anson A. Nourse) Estate corner, 61 inches northeast and 4.2 feet west of corner of edge of Saint John Street and approximately 17.4 feet from Atlantic Drum
RM 35	12.93	Chiseled X cut, inset in end of fire hydrant on northwest side of Commercial Street, 250 feet northeast of High Street, 12 feet west of Hole No. 20 in eastern flange, 30 x Commercial Street
RM 36	28.24	Drive rock set in top of concrete pedestal mounted northerly side of Interstate 295 Bridge over the Fore River, 217 feet south of Washington Portland (to Ann Arbor, and 29.1 feet west of the centerline of Interstate 295 southbound and 4.1 feet above pavement grade at curb line
RM 37	33.23	Disk set vertically in lower portion of large oval stone wall on west side of Veranda Street, approximately 0.25 mile south of Hannah Lowell Road, 0.5 mile east of intersection of Veranda Street and Hannah Lowell Road, 75 feet south of the northeast of U.S. Route 1 and Interstate 295 and 54.2 feet southeast from edge of Interstate 295 southbound pavement.
RM 38	16.59	Disk set vertically in headwall on the 48 foot concrete pipe culvert, 0.2 mile southeast of Commerce Drive, 20.0 feet southeast of centerline of Commerce Drive, 70 feet southeast of northeast end of culvert, 42.8 feet west from Catholic Church, Saint Peter, 77 Hodgkins Cove Road

[1] National Geodetic Vertical Datum of 1929

KEY TO MAP

- 500-Year Flood Boundary — ZONE B
- 100-Year Flood Boundary — ZONE A1
- Zone Designations[2] — ZONE A3
- Limit of Moderate Wave Action (LiMWA) — ZONE A5
- 500-Year Flood Boundary — ZONE B
- Base Flood Elevation Line (BFE)
- Base Flood Elevation in Feet[2]
- Elevation Reference Mark
- Shaded Zone D
- River Mile

[2] Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year (base) flood elevations and flood hazard factors not determined.
AE	Areas of 100-year (base) flooding where elevations are determined (see (1) and (2)). Flood elevations and flood hazard factors determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet (usually areas of ponding); base flood elevations and flood hazard factors determined.
A1-A30	Areas of 100-year (base) flood elevations and flood hazard factors determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
B	Areas of 500-year flood; areas of 100-year flood with average depths of less than one foot or with drainage areas less than one square mile; or areas protected by levees from 100-year flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas within the coastal flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance and flood plain management purposes only. It does not necessarily show all areas subject to flooding in the community or all flood hazards. Contact your local flood agency for more information.

The boundaries may be revised periodically. Refer to Map Index.

Coastal base flood elevations shown on this map apply only landward of 0.0 NGVD.

INITIAL IDENTIFICATION:
JULY 17, 1986
FLOOD HAZARD BOUNDARY MAP REVISIONS DATE:

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 17, 1986
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP (FIRM) INDEX for zone designations and effective dates for communities shown on this panel.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
SEE MAP INDEX FOR PANELS NOT PRINTED

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

Section 20

Blasting

Section 20: Blasting

Given the nature of the site and the proposed project scope it is anticipated that no blasting will be required. Should ledge be encountered during construction, a blasting plan will be submitted.

Sections 21, 22, 23 and 24

Air Emissions
Odors
Water Vapor
Sunlight

SECTION 21: Air Emissions

No unreasonable adverse environmental effect on air quality is anticipated as part of the proposed site development activities. Vehicular traffic will be limited to existing adjacent parking facilities associated with MMC. Heating and ventilation sources for the proposed building expansion will be comparable with other existing commercial units found throughout the MMC campus. The majority of the units associated with the new building will be placed within the basement level of the new building, however, there will be limited HVAC units on the roof of the tall section of the building. This building expansion project does not require an Air Emission License.

SECTION 22: Odors

The proposed site improvements represent a reorganization and expansion to existing uses and will not result in the creation of any significant odors during or after construction.

SECTION 23: Water Vapor

No large-scale water vapor emissions are proposed as part of the removal of the Gilman Street garage and proposed building expansion, therefore, no adverse effect or unreasonable alteration of climate is associated with this project.

SECTION 24: Sunlight

The proposed new building conforms to the massing of the campus. The taller section of the new Congress Street Patient Care Building abuts the tall elevator/stair tower portion of their visitor garage, while the remainder of the building steps down at the edge of the campus. The new building is of a scale that is compatible with other MMC structures and has a vertical presence that is similar to the existing staff garage that it is replacing. The proposed new building will not block access to direct sunlight by neighboring structures that utilize solar energy through active or passive systems.

R

Maine Medical Center
MaineHealth

centered around you

Get on Board!

Maine Medical Center

Transportation Demand Management Program
August 22, 2018



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Introduction

Purpose

The purpose of Maine Medical Center's Transportation Demand Management program, Get on Board, is to reduce the amount of single-occupancy vehicles by enabling and promoting alternative modes of transportation to and from MMC's Bramhall Campus for MMC employees.

Maine Medical Center

Maine Medical Center is a complete health care resource for the people of greater Portland, the entire state of Maine, and northern New England.

Incorporated in 1868, Maine Medical Center is the state's largest medical center, licensed for 637 beds and employing more than 8,000 people – with approximately 2,000 of those employees residing in the City of Portland. Maine Medical Center's unique role as both a community hospital and a referral center requires an unparalleled depth and breadth of services, including the state's only medical school, through a partnership with Tufts University School of Medicine, and a world-class biomedical research center, the Maine Medical Center Research Institute.

Our care model includes the state's largest multispecialty medical group, Maine Medical Partners. Maine Medical Partners provides a wide range of primary, specialty, and subspecialty care delivered through a network of more than 40 locations throughout greater Portland and the southern Maine region.

Maine Medical Center is the flagship hospital of MaineHealth, a 12-member health system touching central, southern, and western Maine and eastern New Hampshire. The collaboration of MaineHealth's members allows greater availability to community health improvement programs, access to clinical trials and research, and shared electronic medical records.

The strength of the health system, anchored by Maine Medical Center, enables its members to invest in shared programs and services that improve the quality of care while reducing costs whenever possible. As a nonprofit institution, Maine Medical Center has provided more than $200 million annually in community benefits, delivering care to those who need it, regardless of their ability to pay.

MISSION, VISION AND VALUES

Maine Medical Center is dedicated to maintaining and improving the health of the communities it serves by:

- Caring for its community
- Educating tomorrow's caregivers
- Researching new ways to provide care

It proudly carries its unique responsibility as Maine's leader in patient care, education and research. MMC is dedicated to the traditions and ideals of not-for-profit healthcare. It provides care to all who seek it.

MMC's efforts to execute its Mission are aimed at achieving a simple, yet powerful Vision: "Working together so our communities are the healthiest in America."

MMC is guided by a set of Values, helping to meet and exceed the expectations of those it is privileged to serve. MMC's Values:

- Patient-Centered
- Integrity
- Ownership
- Excellence
- Respect
- Innovation

MMC Facility Planning

Maine Medical Center recently announced a project that will expand and modernize much of its patient care facilities. Over the next five years Maine Medical Center plans to spend $512 million on the construction, renovation and expansion of inpatient and outpatient facilities and services. The majority of this investment will occur at MMC's main Bramhall campus.

Every aspect of this project is designed around the needs of patients. The project will optimize current bed capacity at, Maine Medical Center, the state's largest hospital and calls for increasing the number of single rooms available to patients as well as replacing surgical and treatment areas with ones that adhere to 21st century standards. In addition, patient rooms will be universal meaning that each rooms can meet the needs of patients at any point during their stay whether they require critical care or acute care services. About $50 million of the total project cost will be invested in outpatient facilities through the hospital's multi-specialty medical group organization - Maine Medical Partners.

The project also involves the replacement of the largest parking garage on campus, a 1,200-space structure used by employees that sits along Congress Street. The need to replace that garage creates an opportunity to reorient the hospital's main entrance to Congress Street, one of the city's main thoroughfares. The hospital's current main entrance faces Bramhall Street in the city's largely residential West End.

The project is organized into three separate site plan descriptions:

- Site Plan #1:
    - Two floor addition to the East Tower housing 64 private universal rooms.
    - Relocation of the helipad which is currently on the employee garage to the top of the East Tower. Patients arriving via the helipad will have a direct vertical connection via elevator to MMC's Emergency Department and trauma services on the first floor of the East Tower.
    - Three floor addition to the visitor garage on Congress St.
- Site Plan #2:
    - New employee parking garage on St John St that will include over 2,400 parking spaces. The location of the new garage is roughly a quarter mile from the main campus and employees will be encouraged to walk during nice weather.

- Site Plan #3:
    - Removal of the current employee parking garage on Congress St.
    - Construction of a new hospital tower with 64 private universal rooms, 19 procedure rooms, and space for an additional 32 private universal rooms. This building will also include a new hospital entrance and drop-off area with direct connection to the visitor garage.

The project is expected to be completed in the Fall of 2022.

Commitment to TDM

MMC has a long-standing history of promoting health outside of and within its organization. The medical center developed a Transportation Demand Management (TDM) program in 2008, becoming one of the first in Maine to publish such a plan.

In 2008, MMC became one of the first in Maine to develop an independent TDM program.

Known as "Get on Board!," the program supports alternative commuting options such as carpool, public transportation, bicycling, and walking. MMC also engages in an extensive campaign to educate employees about the benefits of alternative modes of transportation and the Get on Board! program. Total enrollment in Get on Board continues to increase year after year.

Over the years, MMC has added elements to strengthen the program's offerings. In 2015, for example, MMC installed additional bicycle parking in its South Parking Lot to enhance cycling access to the main areas of the campus.

The following Plan documents MMC's current TDM efforts, planned program enhancements, as well as new TDM programs. The Plan is intended to serve as a living document. Monitoring reports will be submitted annually to the City's Planning Department.

While MMC encourages sustainable commuting practices across its organization, this TDM Plan applies to MMC's main campus in the west end of Portland, ME, where the majority of MMC's staff is located. Presently, the main campus has approximately 4,400 employed individuals on any given week day. Maine Medical Center employs more than 8,000 people throughout Southern Maine, roughly 6,000 of MMC employees work at the Bramhall Campus.

Contributors to this Plan

MMC would like to thank the City of Portland, the West End, Western Promenade, Libbytown, St John Valley, and Parkside neighborhoods, and Vanasse Hangen Brustlin, Inc. (VHB) for contributing to this Transportation Demand Management Plan.

MMC engaged VHB to assist in the creation of this plan. VHB is a national consulting firm specializing in transportation engineering and a leader in the development and management of Transportation Demand Management plans.

Context

Land Use

CURRENT

MMC's Bramhall campus is located at a high point in the west end of the Portland peninsula that is renowned for the Western Promenade—an 18-acre park and national historic landmark designed by the Olmsted Brothers, among others. The campus abuts the Western Promenade in a dense urban setting that serves, in many ways, as a transitional zone between areas with diverse character, land uses, and demographics.

The campus, which serves the entire state of Maine as well as eastern New Hampshire, is located within less than a mile's distance of I-295, which links Portland to destinations across New England. To the north, the campus fronts on Congress St —Portland's main thoroughfare that extends along the spine of the peninsula to Portland's downtown and beyond. The MMC campus is located at the western gateway into the City.

FUTURE

The area surrounding MMC is identified in the City's Comprehensive Plan as an area with transformational potential. MMC's TDM plan aligns with this future vision. As part of the project, MMC will add a new entrance to Congress Street and envisions providing active ground floor uses in new buildings. This change will heighten the level of pedestrian activity on Congress Street, and serve to promote the corridor.

Parking

CURRENT SUPPLY

MMC offers its patients, visitors, physicians, and employees several options for parking. MMC currently controls approximately 2,877 total off-street parking spaces either via ownership or through leases with others that specifically serve the Bramhall Campus. Of the 2,877 spaces, 850 spaces are available for public use by patients and visitors, and 2,027 parking spaces are subscribed to staff and physicians.

TABLE 1: Existing Parking Spaces

		Patient / Visitor	Employee	Total at Facility	Ownership
ON-CAMPUS	Employee Garage	0	1,274	1,274	Owned
850 patient / visitor	Patient / Visitor Garage	480	0	480	Owned
1,538 employee spaces	South Lot	370	0	370	Owned
	887 Congress (Forest St Garage)*	0	178	178	Owned
	7 Bramhall St	0	26	26	*Leased*
	905 Congress St (Sportsman Lot)	0	60	60	*Leased*
OFF-CAMPUS	222 St John St (First Atlantic Lot)	0	283	283	*Leased*
489 employee spaces	181 High St (Gateway Garage)	0	100	100	*Leased*
	993 Congress St (Classic Lot)	0	97	97	Owned
	321 Brackett St	0	9	9	*Leased*
	TOTAL PARKING SPACES	850 Patient / Visitor	2,027 Employee	2,877 Total	

* The Forest St Garage has an additional 222 spaces that are dedicated to medical office staff and patients.

PARKING DEMAND

MMC has continued to witness intensifying demands on the existing parking supply due to increased patient volumes and higher acuity patients with longer lengths of stay. Under current conditions, MMC's staff parking system typically operates at capacity during the weekday daytime hours. When off-site, remote staff parking facilities reach capacity, staff is directed to park on-campus in the Congress Visitor Garage. Some staff members independently choose to park nearby utilizing neighborhood on-street parking, although this is discouraged by MMC.

Patients, visitors, and staff at MMC often comment on the lack of adequate and predictable parking. MMC parking facilities do not have integrated technologies to accurately report parking utilization. Therefore, current demand was estimated using a combination of observed data and comparisons to facilities similar to MMC's Bramhall Campus.

Observations:

On behalf of MMC, VHB conducted on-site parking usage observations in January and March 2017. These months were ideal for parking observations because of the poor weather resulting in increased parking utilization. VHB collected parking count data during peak hours, which included late afternoon, evening, and overnight occupancy and turnover. Parking observations were completed during weekdays when MMC typically sees its biggest parking challenges – Tuesday – Friday. Historically, the highest patient volumes at MMC are on Thursdays and Fridays according to the MMC team responsible for managing parking. High patient volumes coincide with higher volumes of staff. The counts indicate that the parking system typically operates at or above capacity during weekday daytime hours. During the observations, it was difficult for VHB to differentiate staff from patients and visitors. Therefore, a total demand estimate is provided.

The observed data reveals that parking demand at the Bramhall campus among patients, visitors, physicians, and staff total roughly 3,125. MMC parking facilities have capacity of 2,877. The observed

parking demand is almost 110% of supply. The observed parking demand is 4.4% below the expected parking demand (3,264) for a suburban hospital of MMC's size, according to Institute of Transportation Engineers (ITE) parking demand projections.[1] The difference equates to a shortage of 139 parking spaces.

In addition to VHB's observations, the MMC staff responsible for managing parking has estimated the employee parking deficit to be between 200 and 300 spaces.

Comparison to Peer Group:

VHB compared MMC's parking ratio per licensed bed to other hospitals in New England and nationally. MMC's 850 patient/visitor parking spaces equate to 1.33 parking spaces per bed which is low compared to peers. The midpoint patient and visitor parking space/licensed bed ratio among MMC peers is 1.87. It is important to note that based on a review of peer institutions, MMC would need to increase its patient/visitor allocation by 341 spaces, or 40%, to achieve a similar beds-to-spaces ratio as its peers. MMC's 2,027 staff parking spaces equate to 3.18 parking spaces per bed which is also low when compared to other peer institutions. The midpoint employee parking space/licensed bed ratio among MMC peers is 4.38. MMC has 637 licensed beds.

When compared to peers, MMC has a shortage of 341 patient and visitor parking spaces and 763 staff parking spaces.

$$\begin{aligned} &MMC\ Licensed\ Beds\ (637) * \ Comparison\ Group\ Patient\ \&\ Visitor\ Parking\ Space\ per\ Bed\ (1.87) \\ &\quad = Peer\ Equivalent\ Patient\ \&\ Visitor\ Parking\ Spaces\ (1{,}191) \\ &\quad - MMC\ Patient\ \&\ Visitor\ Parking\ Space\ (850) \\ &\quad = \boldsymbol{Patient\ \&\ Visitor\ Parking\ Space\ Deficit\ at\ MMC\ (341)} \end{aligned}$$

$$\begin{aligned} &MMC\ Licensed\ Beds\ (637) * \ Peer\ Group\ Staff\ Parking\ Spaces\ per\ Bed\ (4.38) \\ &\quad = \ Peer\ Group\ Equivalent\ Staff\ Parking\ Spaces\ (2{,}790) \\ &\quad - MMC\ Staff\ Parking\ Spaces\ (2{,}027) = \boldsymbol{Staff\ Parking\ Space\ Deficit\ at\ MMC\ (763)} \end{aligned}$$

Current Demand:

MMC used the observed and peer group data to determine the estimated parking demand.

Based on data available, the estimated current MMC parking demand exceeds patient and visitor supply by approximately 25 parking spaces and exceeds employee parking supply by approximately 220 parking spaces. Therefore, the estimated parking demand in 2017 is:

2017 Estimated Parking Demand
- 875 for patient and visitor parking ($875 = Current\ Patient\ Visitor\ Parking\ Supply\ (850) + 25$)
- 2,250 for employees ($2{,}250 = \ Current\ Employee\ Parking\ Supply\ (2{,}027) + 220$)
- 3,125 total estimated parking demand

The current parking demand for MMC's Bramhall campus is approximately 3,125 parking spaces.

MMC feels that the appropriate metric to measure parking utilization is parking demand per Bramhall campus employee. This metric is ideal because the number of employees will change over time. Other

[1] This approach is consistent with the City of Portland's Technical Manual, which recommends using ITE for parking demand projections. https://www.portlandmaine.gov/2148/TDM-Parking

metrics such as parking space per bed or parking space per square foot would not accurately account for all factors impacting parking demand on campus. This metric allows for changes in both factors – the number of employees and parking demand. In addition, this metric focuses on MMC employees who are the target population of this transportation demand management plan.

MMC's Bramhall campus has roughly 6,000 employees as of 2017. Therefore the current employee parking demand per Bramhall campus employee is 0.375.

$$\frac{Estimated\ Employee\ Parking\ Demand\ (2{,}250)}{MMC\ Bramhall\ Employees\ (6{,}000)} = Employee\ Parking\ per\ Bramhall\ Employee\ (0.375)$$

FUTURE

Looking towards the future, MMC will undertake a project to modernize its Bramhall campus. The project is detailed above and is anticipated to increase patient/visitor and employee parking demand. This demand will be offset by TDM methods described later in this document, along with expansions in its campus parking capacity.

Data Collection

Currently, MMC has a limited transportation mode data collection system. MMC recognizes the need for an improved system. MMC employs a large number of individuals and tracking their commute behaviors will require a system that relies on automatic data collection wherever possible. MMC is exploring options to improve data collection, such as a card reading system, similar to EZ-PASS, in new parking buildings.

In addition, MMC is exploring various commute management platforms to better understand, manage, and influence employee commute behavior. The commute platforms can help raise awareness for alternative transportation choices, engage (and possibly reward) employees, and provide the data and tools to make informed transportation decisions. Many of the platforms also enable employees to participate in commuting challenges with colleagues (e.g. most cycling trips).

MMC has contacted several commute management companies that are used by employers to explore how commuting platforms can enhance MMC's data collection efforts while potentially rewarding its employees. One Seattle-based commute management provider is currently used by organizations, like Seattle Children's Hospital, Delta Dental of Washington, Boeing, and the Bill and Melinda Gates Foundation. Another provider is located in Santa Monica and is used by companies and institutions, such as Google, Patagonia, the University of Maryland, and MIT. Both platforms are mobile and desktop-friendly and allow employees to easily track their daily commutes, while giving employers the ability to manage commuting programs, data, resources, and rewards in one centralized system. These platforms, among others, will be explored as MMC looks to improve its data collection capabilities.

FIGURE 1: Commute Management Platforms



Commute management platforms offer enhanced opportunities to understand employee commuting behavior and potentially incentivize and reward staff who commute by alternative modes of transportation. Many of these platforms are mobile-friendly and offer easy ways in which to track personal commutes.

Source: Luum

Transit

MMC's main campus is located in a section of the City that is served by the Greater Portland Transit system (METRO), which has multiple routes that stop within walking distance of the Medical Center. The campus is also served by the ZOOM turnpike Express route operated by ShuttleBus-ZOOM.

The METRO routes accessible from the Bramhall Campus have varying service spans with buses generally arriving every 30 to 60 minutes. They provide connections to the nearby Portland Transportation Center (PTC) and the Downtown Hub, which are served by additional METRO and regional bus lines. The PTC also serves as the local connection to Amtrak's Downeaster service that runs along the coast between Boston and Brunswick. The closest bus shelter to the hospital is along Bramhall Street, between the Dana Health Education Center and the South Entrance. This stop is served by METRO Route #8, which provides connections to other parts of the peninsula. There are two other nearby bus stops on the corners of Congress St and Gilman St and Congress St and Weymouth St. These bus stops are served by routes #9, #1, METRO's express service BREEZ, and the ZOOM turnpike express. For the most up to date METRO stops and routes, go to www.gpmetrobus.com.

FIGURE 2: Map of Existing Transit Routes and Stops



Bicycle and Pedestrian Infrastructure

MMC understands that all campus users walk at some point to arrive at their MMC destination. To enhance pedestrian accessibility, MMC maintains its network of campus pathways and public sidewalks adjacent to campus. Similar to other medical centers of its size, MMC provides elevated, covered, and temperature-controlled walkways between its parking garages and key campus circulation corridors.

The bike facility network surrounding MMC's campus is fragmented and lacks bicycle infrastructure as illustrated in Figure 7 below. In addition, the hilly nature of the Western Promenade impacts bicycling and walking in this area.

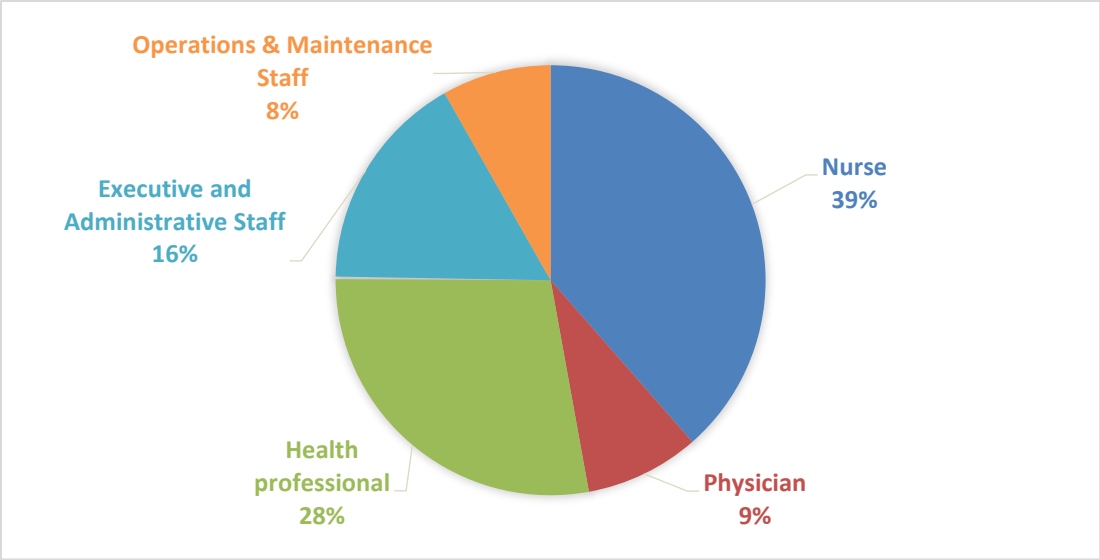
Current Travel Behavior

As part of its efforts to monitor and enhance the Get on Board program, MMC recently conducted a survey of its employees to understand how they commute, any barriers to using alternative transportation, and their interest in other TDM initiatives. The Medical Center also analyzed employee residence data using geospatial analysis tools to better understand employee commuting patterns. The findings from the survey and analysis are summarized below.

Commuting Survey

Approximately 1,600 MMC employees participated in the voluntary survey, administered in February 2017 – nearly a 40% response rate. Approximately 81% of the respondents work at the Bramhall campus. The respondents included a diverse spectrum of employees including operations and maintenance staff, students, executive and administrative staff, health professionals, nurses, and physicians. Figure 3 illustrates the various roles held by the survey participants.

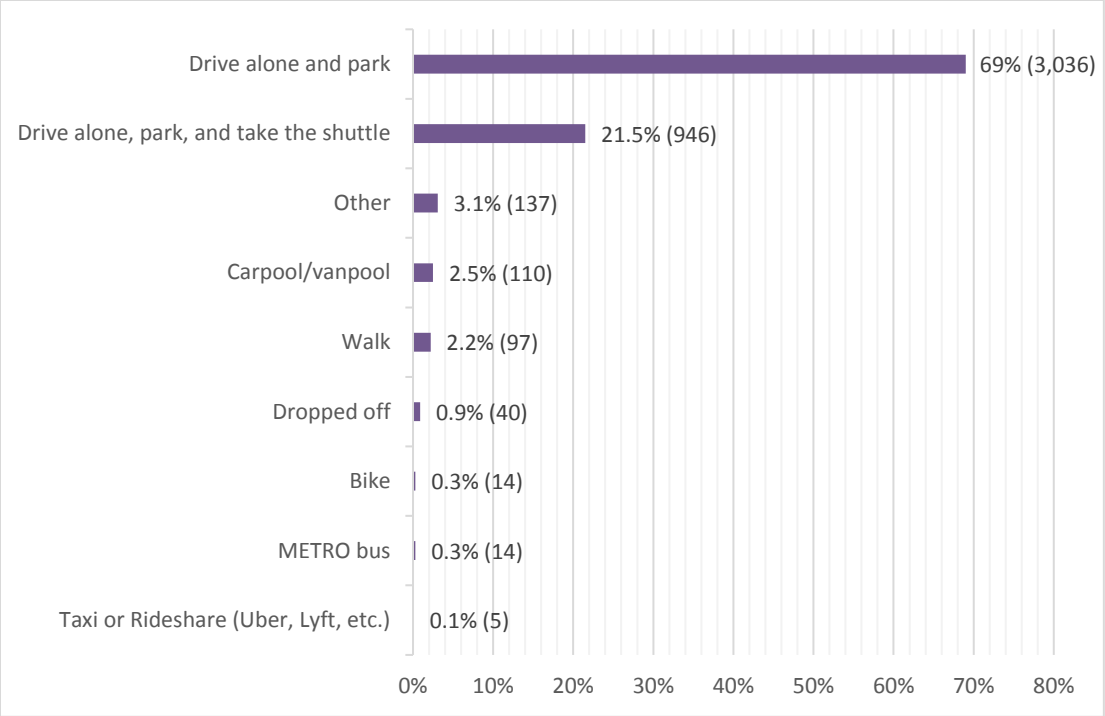
FIGURE 3: Survey Respondents by Hospital Affiliation



The survey found that the majority of employees drive to campus. Among alternative modes, carpooling was the most used mode of travel, followed closely by walking. Figure 4 illustrates the commuting modes of MMC employees.

FIGURE 4: Estimated Employee Travel Mode To and From MMC on an Average Workday

(4,400 estimated employees on campus per average weekday)



The survey also revealed that among Get on Board enrollees who participate in the program, carpooling benefits were the most used benefits, followed by biking benefits and transit benefits.

As the Get on Board program evolves, MMC intends to administer a commuting survey once every two years to track travel trends and to gauge the effectiveness of specific initiatives. The information collected will enable MMC to develop informed, data-based enhancements to Get on Board, providing a greater prospect for program success.

Geospatial Analysis

MMC analyzed the residence locations of its employees to understand employee commuting patterns. The analysis showed that approximately 27% of employees live within a 3-mile radius and approximately 73% of employees live beyond a three mile radius of MMC (See, Figures 5 and 6). Three miles is generally considered a reasonable biking distance by industry standards.

FIGURE 5: MMC Bramhall Campus Employees, Distance to Work by Type of Employee

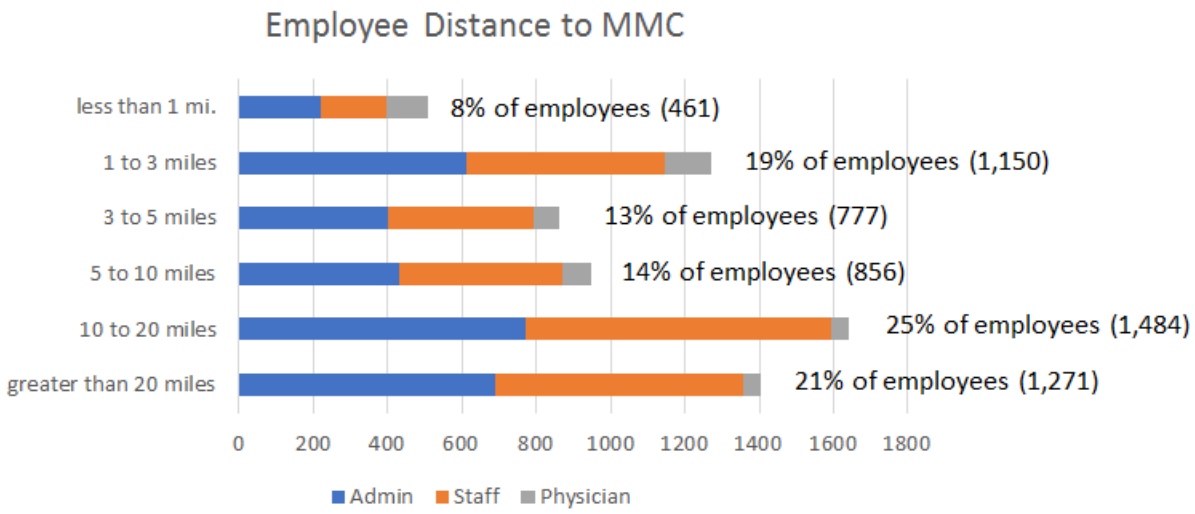
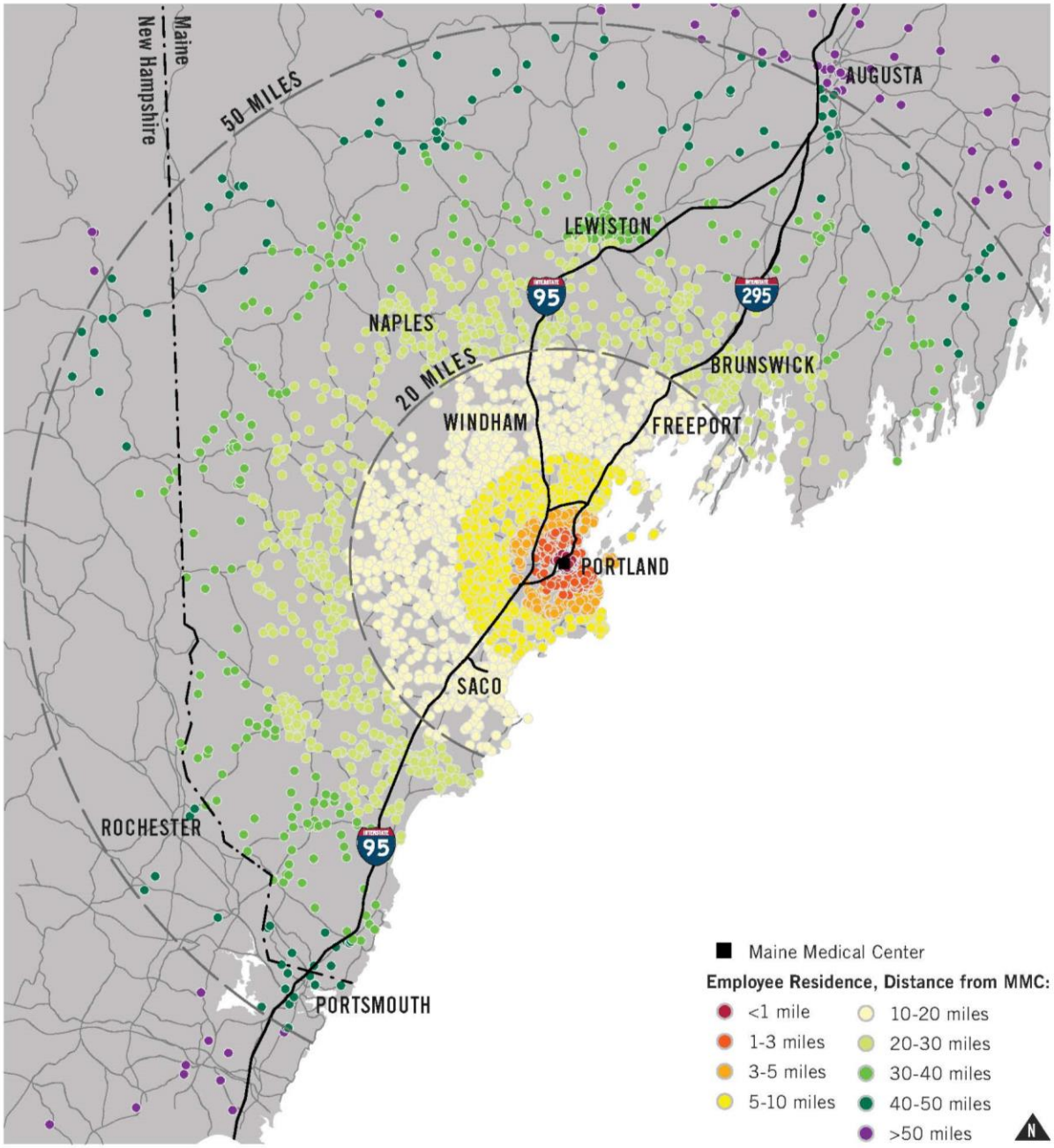


FIGURE 6: Map of MMC Bramhall Campus Employee Residences Illustrating Distance to Work and Travelsheds



Program Goals

The goal of the program is to reduce employee use of single-occupancy vehicles as they commute to work at MMC's Bramhall Campus. At this time, MMC has determined the best way to measure a reduction in employee single-occupancy vehicles is to monitor employee parking demand per employee.

$$Employee\ Parking\ Demand\ Per\ Employee\ = \frac{Estimated\ Employee\ Parking\ Demand}{Bramhall\ Campus\ Employees}$$

As the program grows and evolves and as data collection improves, new goals and metrics may be identified. MMC will also continue to conduct surveys as a way to measure the share of employees who commute by alternative modes of transportation.

VHB conducted a study to determine the existing parking demand for employees (refer to the Context section of this document). VHB's observations and peer group comparison will serve as the baseline for future reduction targets.

Peak parking demand at the Bramhall campus is 4.4% below the expected parking demand for a suburban hospital of MMC's size.

The Get on Board program aims to reduce single-occupancy vehicles on MMC's Bramhall campus through effective TDM measures. These measures include a parking "cash out" program, discounted transit fares, premium parking for carpoolers, and bicycle parking and facilities, among others. Additional details about the program elements are described in the next section. MMC believes the program has had a positive impact on employee travel behavior and has contributed to reduced parking demand over the years.

Based on a review of federal census data, employee travel origin and destination information, existing employee travel mode split, and transportation survey results, MMC believes it can further reduce the portion of employees driving alone to work, thus reducing trip making and resultant parking demands. An initial estimate is that an additional 65 individuals who currently drive to MMC could be shifted into alternative modes of accessing the campus over 5 years. This represents an additional 2% reduction from the ITE parking demand projections.

In consultation with the City, MMC has established the following aggressive short-term, mid-term, and long-term trip reduction goals. These targets are applied to the 2017 baseline identified in the Context section of this document.

	2017 Baseline	Short-Term (0-2 years)	Mid-Term (2-5 years)	Long-Term (5+ years)
Targeted Reduction		2%	4%	5%
Employee Parking Demand Per Employee	0.375	0.367	0.360	0.356

MMC hopes these targets will be achieved through the strategies outlined below. It will endeavor to reduce the number beyond the target identified above through further enhancements or program expansions in the coming years. MMC will continue to monitor parking demand and needs at the Bramhall campus, and re-evaluate its program goals after the initial five year period as needed.

TDM Strategies

Current Get on Board Program Elements

Get on Board is advanced through a range of incentives and the provision of services to support alternative modes. The individual program elements are described below.

Active Transportation

The MMC campus is located in close proximity to existing and planned routes in the City of Portland's growing bicycle and pedestrian network as shown in Figure 7. MMC offers a variety of bike facilities to make bicycle commuters feel welcome and safe. In 2008, MMC installed five (5) strategically-located bike racks and ten (10) bike lockers on its main campus. Three (3) new bicycle racks were added in the vicinity of the Bramhall entrance and in the South Lot in 2016, bringing total storage capacity to 193 bicycles across campus. MMC will conduct a bike rack inventory in July/August 2018 to evaluate the location, condition, and model (or style) of existing bike racks. This assessment will ensure that the racks meet the City's standards regarding the quantity, quality, and distribution of bike parking across the Bramhall campus. MMC understands the city's strong preference for inverted u-racks and bike hitch (or post and ring) racks.

Bicycle and other active transportation commuters also have access to showers facilities across campus, including at Environmental Services, Engineering, the 5th floor of the Maine General Building, and at 229 Vaughan Street.

Beyond on-campus facilities, MMC is an advocate of the City of Portland's Bikeway Network Plan, which will provide bicycle infrastructure on streets adjacent to campus to connect bicyclists with existing and shared use paths.

The City of Portland's latest Comprehensive Plan proposes transforming the streets surrounding MMC into "neighborhood byways", whose design treatments help reduce vehicle speeds and create a safer environment for active transportation users. Neighborhood byway design could encourage walking and biking for employees who live within a reasonable distance of the hospital. MMC also supports ongoing collaboration with the City of Portland, local and regional transit agencies, and neighborhood and advocacy organizations to explore opportunities to improve pedestrian, bicycle, and transit infrastructure and networks serving the Bramhall Campus. The City of Portland has plans to expand the bike lanes illustrated in Figure 7 and add neighborhood byways.

FIGURE 7: Portland Bikeway and Pedestrian Network



Source: City of Portland

In the winter months, some employees choose to leverage their wintertime hobbies, like cross-country skiing, to get to work.



Public Transportation

Under Get on Board (GOB), employees can purchase discounted bus tickets and Shuttle-Bus Zoom tickets conveniently on campus. This is a clear demonstration of MMC's commitment to making the TDM Plan work for its employees and for the City of Portland. Table 2 lists the MMC's current Greater Portland METRO Bus and Shuttle-Bus Zoom discounts provided through "Get on Board!". Note: MMC is dedicated to providing a 100% METRO discount in the short term (as discussed in the recommended Program Enhancements section).

TABLE 2: MMC Transit Discounts

	Regular Price	MMC Sale Price	% Discount
METRO	$13.50	$8.00	40%
S. Portland	$13.50	$8.00	40%
Zoom 10 Ride	$39.00	$29.60	25%
Zoom Monthly	$100.00	$84.50	15%
Zoom Quarterly	$260.00	$197.50	25%

The *Portland Peninsula Transit Study* [2]established several strategies for improving the utilization of transit in Portland. These strategies involved expanding the transit service to development areas, creating more direct connections, and increasing service frequency to compete with drive-alone commute times. The *Portland Transportation Hub Link Feasibility Study*[3] also proposed a route alignment along Congress Street that would increase transit frequency near the hospital. These improvements, if implemented, would highly benefit MMC's campus population in light of the distance that most employees reside from MMC and the fluctuating nature of employees' schedules.

In addition, an MMC representative was recently appointed to the PACTS/GPCOG Transit Committee. MMC is excited to participate in this dynamic group and looks forward to exploring ways in which to improve transit accessibility, connectivity, and reliability in the Greater Portland region.

Carpool

Carpooling is the most popular component of the Get on Board program. Over half of program participants at the main campus take advantage of this benefit. Currently, employees participating in a carpool are given access to preferred parking in an area of the Employee Garage that connects directly to the Main Lobby on the ground floor of the hospital. MMC is planning to relocate its employee parking garage to St. John St. Appropriate incentives that encourage participation in the carpool program have not been fully identified. However, until other incentives are identified, carpool participants will have preferred parking in the St. John St. employee garage.

[2] Portland Transit Committee. *Portland Peninsula Transit Study* (2009), Retrieved from: https://www.portlandmaine.gov/DocumentCenter/Home/View/3383.

[3] Portland Area Comprehensive Transportation System (PACTS). *Portland "Hub Link" Feasibility Study* (2015), Retrieved from: http://www.portlandmaine.gov/DocumentCenter/View/14793 .

Parking Cash Out

Presently, MMC operates a "parking cash out" program that offers employees monetary payments in lieu of a parking space. Program participants submit a form every three months that certifies their use of alternative transportation during the week to commute to work. Upon receipt of a certification, MMC issues the employee a payment equal to the cost of parking at MMC's employee garage. MMC will explore opportunities to help automate this process. For example, commute management platforms (discussed in Data Collection section of the Plan) could allow employees to easily track and manage their daily commutes, potentially reducing the need to submit paperwork.

MMC Shuttles

MMC operates employee shuttle services between the Bramhall campus and off-site parking locations Mondays-Fridays, 6:00 am to 11:00 pm. The shuttles include:

- MMC and off-site parking lots at 222 St. John Street and 995 Congress Street (Monday – Friday, 6:00 AM to 11:00 PM)
- MMC Bramhall campus and the 110 Free Street Office Building (Monday-Friday, 6:00 AM to 4:00 PM, every 20 minutes)
- MMC Bramhall and Brighton Medical Center (335 Brighton Avenue) (Monday-Friday, 6:00 AM to 4:00 PM)

MMC also provides shuttle service for contractors from the parking lot at 993 Congress Street to the hospital. The shuttles provide a predictable alternative to employees commuting between the three sites and serves to reduce vehicular traffic in and around MMC.

Scooters and Motorcycles

The campus provides a designated parking space for scooters and motorcycles on the first floor of the employee parking garage.



UCar

MMC currently dedicates a space in its Congress Street parking garage for a carshare vehicle, as part of the city-wide carshare program called U Car Share. The program allows members to borrow a car by the hour, providing employees who bike, walk, or ride transit to work with additional mobility for off-site meetings. Between mid-March and October of 2016, the UCar program had 96 reservations for a total of 4,105 miles.

Electric Vehicle (EV) Charging

Electric vehicle (EV) charging stations can encourage motorists to commute by electric vehicles, thereby reducing carbon emissions. MMC offers free charging stations for staff and visitors.

TDM and GoMAINE website

The current employee GOB portal is linked to the GoMAINE Commuter Connections website, which is an alternative commuting program operated by MaineDOT. GoMAINE provides commuters with additional commuting resources and benefits that supplement those provided by MMC. These benefits include a carpool ride-matching program and a rewards program for participants.

Pay for Parking

MMC charges its employees no less than $3 per paycheck to utilize MMC parking. MMC employees are paid bi-weekly. Therefore, the annual employee parking cost is $78.

$$\$3\ per\ paycheck\ \times 26\ pay\ periods\ =\ \$78$$

Enhanced Get on Board Program Elements

Program enhancements, discussed below, are anticipated to occur within 1-3 years.

Active Transportation

As part of the modernization of Bramhall, MMC will orient entrances to public streets and provide active ground floor uses where possible to encourage pedestrian activity.

MMC will continue to offer bike storage, bike repair tools, and on-site shower and locker facilities to commuters who choose to bicycle to work.

MMC will also continue its parking cash out program to incentivize current bicyclists. To support "interested but cautious" bicyclists, MMC will seek out local bicycling support organizations to host educational safety seminars and/or adult bicycling skills classes at least once per year on the Bramhall Campus. MMC will also promote rewards programs, such as GO MAINE and Bicycle Benefits, to further motivate increased bicycle commuting.

MMC is exploring additional active transportation incentives through commuter challenges, like a Bike Month Challenge (discussed in Education and Marketing section) with corporate-sponsored giveways, like gift cards to local businesses.

MMC will also consider purchasing Bicycle Benefits memberships for bicycle commuters. The memberships cost $5 (one-time fee) and include a helmet sticker, which provides discounts to dozens of local businesses in the Portland region.

MMC understands that Portland Bike Share, a non-profit organization with a goal to establish a bike share system in the City of Portland, plans to launch a bike share pilot in 2018. MMC has contacted the Executive Director of the North American Bikeshare Association regarding bike share opportunities and has conducted preliminary research on private bike share systems, which, if implemented, could help connect employees at MMC and MaineHealth, located on Free Street.

MMC also recognizes the importance of safe and accessible infrastructure to active transportation. The presence of infrastructure can provide the sense of safety and security that cautious bicyclists seek to spur a change in travel behavior. Additionally, as active modes become more widespread throughout the City of Portland, the visibility of pedestrians and bicyclists in the community can encourage greater participation among MMC employees. MMC supports the City of Portland in its work to improve public rights-of-way and expand its active transportation network.

The City of Portland has proposed a bike lane on Congress St. and a Neighborhood Byway on Bramhall St., both of which are adjacent to MMC's Bramhall campus. These improvements, among others, can help address gaps in the community's active transportation network and could help encourage more MMC employees to bike, walk, skate, and ski to work.





Carpooling/Vanpooling

Given the success of its carpooling program, MMC will continue to provide carpoolers with premium parking in the new employee parking garage. Similar to bicyclists, pedestrians, and transit riders, carpoolers will also continue to be eligible for parking "cash out" benefits. To facilitate the formation of carpools and vanpools, MMC will promote GOMAINE's carpool matching program to facilitate carpool matching.

MMC Shuttle

Once the new employee parking garage is constructed, MMC will redesign its shuttle route system to serve employees parking at the new site. The new parking garage will consolidate previously dispersed parking options for MMC employees. MMC anticipates the new route will reduce traffic congestion into and around the campus area.

UCar

Working with UHaul and the City's Parking Department, MMC will continue to monitor the use of the UCar vehicle presently located in its Congress Street parking garage. In the event an additional car is warranted, MMC will work with its partners in finding a suitable location on the main campus for the storage and use of the additional UCar.

Enhanced Transit Subsidies

To further incentivize transit use, MMC will fully cover the cost of METRO bus tickets (100% subsidy) for employees who elect to use transit as their primary mode of commuting to the campus. If METRO ticket costs change, MMC will address program participation rates and work with METRO to find the best solution to support employees who wish to ride METRO. The type and amount of subsidy will depend upon ongoing discussions with METRO to enhance partnerships (see below).

METRO's electronic fare deployment, scheduled for 2019, represents an opportune time for MMC to launch this enhanced subsidy program. MMC will explore ways in which employees can "purchase" transit passes up front, rather than on a reimbursement basis. This "payment-in-advance" option may be contingent on MMC's capacity to verify transit ridership (e.g. through electronic boarding data) in order to minimize abuse of this benefit. It also possible that electronic fare collection and/or commute management platforms (discussed in Data Collection section), if implemented, could allow staff to easily log trips, potentially helping verify transit usage.

New Program Elements

In addition to enhancements to the initiatives described above, MMC intends to initiate complementary elements to ensure the program's continued success. The strategies are prioritized based on their implementation timeframe.

Short-Term (1-5 years)

The following actions MMC will pursue immediately (some are already underway) with the intention that all programs are fully operational within the 3-year time horizon.

Get on Board! Coordinator

MMC has hired a designated resource who will work to reduce employee single-occupancy vehicles on the Bramhall campus through the implementation, facilitation, and continuing sustainability of Get on Board. The coordinator will track the progress of the TDM program, oversee operations, and identify future opportunities to reduce single-occupancy vehicles on MMC's Bramhall campus by employees. The Coordinator is responsible for program evaluation, data collection, and TDM program updates as required.

Way 2 GO MAINE

In October 2017, MMC participated in GOMAINE's Way 2 GO MAINE program for the first time. Way 2 GO MAINE is a 3-week business to business commuter challenge where employees log commute trips and earn prizes. In the first year participating, MMC ranked 2nd for large companies participating with 1,094 trips logged.

MMC will participate in the Way 2 GO MAINE challenge in the future.

Guaranteed Ride Home (GRH) Program

MMC will implement a Guaranteed Ride Home program to ensure that employees who regularly commute using alternative modes will have transportation in emergency situations.

Pay for Parking

MMC will evaluate employee parking fees in the mid-term. In evaluating future price, MMC will consider the prevailing market price for parking in the surrounding area at the time of implementation, as well as best practices in setting affordable parking prices in the region.

Improving Data Collection Capabilities

MMC will improve its data collection capabilities as described below.

Long-Term Actions (5+ years)

MMC recognizes that the following program elements require partnerships with outside partners and agencies and, as such, will take longer to achieve. MMC has already laid the groundwork for all of these elements and will continue to pursue them in the coming years.

Regional Connections Partnership

Through its TDM Coordinator, MMC will seek to form partnerships with other major employers in the city, including the City itself, to foster a holistic approach to travel management. The partnerships would enable the exchange of TDM-related information and experiences between institutions, and it would foster a community that is focused on promoting alternative transportation in the City of Portland. Such collaborations would afford the opportunity to think regionally and help guide both employer provided or sponsored benefits as well as critical external resources such as METRO transit, sidewalks, and bicycle infrastructure. Opportunities to improve existing transit infrastructure would be a focus of any regional connections partnership.

Supporting Public Transportation

MMC intends to explore a partnership with the METRO to identify strategies for increasing MMC ridership, such as service updates and/or pricing agreements. Service updates could include changes in existing routes, new routes, or alternative route schedules. The formation of a partnership could be mutually beneficial, by providing METRO with feedback for increasing ridership while maximizing the usefulness of the transit system for MMC employees. As MMC formalizes its ties to other local institutions through a regional partnership, its collaboration with METRO could also extend to other employers.

Education and Marketing Strategies

MMC has a number of approaches to raise awareness about the benefits of alternative transportation and opportunities for participating in the Get on Board program. These strategies are integrated into various aspects of the organization's engagement with employees to reinforce the importance of TDM. The new TDM Coordinator provides MMC with an unprecedented opportunity to help educate and inform employees about the hospital's TDM programs.

Sharing TDM Program Information

Information about the Get on Board program is available to all MMC employees via the MMC intranet. MMC's intranet is a place where employees routinely go for information. The Get on Board page provides information about all of MMC's TDM programs as well as links to the GOMAINE.org webpage. MMC is committed to reorganizing information on its intranet site within the first six months following the hiring of the TDM Coordinator.

MMC will develop and deliver information about the Get on Board program using communications best practices that are refined throughout the program's lifespan. Communication methods that are effective will be further refined while elements that are less effective will be reevaluated. Some examples of communication methods include:

- Introducing the program to new employees at orientation: MMC currently shares information about the Get on Board program with new employees during orientation and understands that this information can be overlooked amidst all of the materials that are provided to new employees. MMC will transform its existing TDM orientation brochure into a more graphical, eye-catching pamphlet or postcard. MMC will also consider incorporating a brief TDM presentation at orientation.
- Social media: MMC will use social media as an effective tool to communicate with employees about the Get on Board program.
- Get on Board Booths: To supplement information available on the Get on Board intranet site, MMC will explore opportunities to setup Get On Board booths to help market the program and potentially offer free giveaways, like bike lights or helmets. The booth could be installed and staffed at a high visibility location, such as the hospital's South entrance or outside the future employee parking garage.
- Leveraging Existing MMC Programs: The TDM Coordinator will explore possibilities to leverage (and learn from) other MMC employee programs, such as "Work on Wellness" and Moment to Shine. Work on Wellness (WOW!) allows employees to earn rewards for participating in various health and wellbeing programs, while Moment to Shine allows employees to recognize and reward colleagues for exemplary performance. Moment to Shine, available on the MMC intranet and on iPhone and Android apps, also allows "shining" employees to redeem their rewards through a user-friendly shopping portal. While it is important that the MMC employee programs maintain their autonomy, there could be opportunities for Get on Board to utilize some of the same features, like the rewards portal.
- Branding: There may also be opportunities to rebrand the Get on Board program as MMC looks to add new life to the program.

Get on Board Fair/Seminars

MMC will explore offering educational sessions about the importance of TDM and specific TDM methods such as walking, biking, or riding the bus. Educational sessions will rely on the expertise of local organizations specializing in alternative modes of transportation.

Get on Board Blitz

October is National Rideshare month and the same month of GOMAINE's Way 2 GOMAINE business to business challenge. In the future, MMC will explore ways to increase marketing of the Get on Board program during the month of October, potentially leveraging social media and internal communications vehicles, such as electronic newsletters.

Commuter Challenges

MMC will explore internal commuter challenges, such as a bicycle commuter challenge in the month of May, which has been nationally designated as "Bike Month" by the League of American Bicyclists. As discussed in the Data Collection section, commute management platforms could help MMC manage these friendly competitions and allow participants to log commutes and view leaderboards. MMC will contact businesses regarding potential sponsorships for the monthly commuter challenges.

Comprehensive Data and Goal Monitoring

MMC understands from its prior experience with TDM initiatives that achieving change is an iterative process that involves tracking the effectiveness of its programming and making mid-term adjustments if necessary to improve program effectiveness. MMC will collect and analyze data on a regular basis to monitor progress towards its TDM targets. The data would be collected through a range of instruments and will be used to make annual comparisons and to identify trends, and areas for growth. MMC will submit monitoring reports that include a summary of the data monitoring results, comparisons of the data to trip reduction targets, and adjustments to programs as needed.

Parking Utilization Data

MMC is exploring options to improve data collection in the new employee parking garage. The most likely option utilizes EZ-Pass technology to automatically collect information about the vehicles in the garage.

In addition, MMC plans to install a parking guidance system in the new employee garage, as well as a controlled-access parking system in the visitor parking garages. Together, these systems will allow MMC to monitor occupancy in each garage and to collect data regarding who uses the parking facilities and the temporal fluctuations in parking demand across various periods of time. These systems will provide quantifiable information to assist in determining future utilization of MMC's parking facilities. MMC will utilize this parking usage data to assess its parking arrangement twice every year.

MMC has received feedback about inappropriate use of its parking garages. MMC hopes to reduce the misuse of its garages in the future by implementing these monitoring and controlling systems.

Employee Surveys

MMC conducted an employee travel survey in 2017 to understand employee commuter preferences and intends to administer the survey once every two years going forward. The survey is administered electronically using a survey platform and produces data that MMC (or a third party) can use to identify changes and progress from one period to the next. The surveys seek information about the following topics to gauge the effectiveness of initiatives:

- TDM program participation rates
- Individual program effectiveness
- Barriers to TDM use
- Changes in commuting preferences
- Marketing effectiveness

Employee Surveys

As discussed earlier, MMC is also exploring contracts with various commute management platforms to help encourage, track, and incentivize alternative commutes. These platforms can provide robust data related to commuting patterns, trends, and changes.

Reporting Frequency

MMC will submit annual monitoring reports that will include a summary of progress toward targets established in the TDM Plan.

Conclusion

The purpose of Maine Medical Center's Transportation Demand Management program, Get on Board, is to reduce the amount of employee single-occupancy vehicles at MMC's Bramhall Campus by enabling and promoting alternative modes of transportation to and from MMC's Bramhall Campus for MMC employees. The program has aggressive short- and long-term goals. While the program's success partially relies on a cultural shift away from personal vehicles, Maine Medical Center is committed to exploring and identifying the most impactful TDM strategies to reduce single-occupancy vehicle travel and encourage alternative commuting choices.

MMC NEIGHBORHOOD ADVISORY COMMITTEE CHARTER
Expansion Group Discussion Questions 12/7/18

RR

DRAFT Charter Provision	Questions
Section 1: Objective	
1.1 Charter Background/ Overview Maine Medical Center ("MMC") sits at the intersection of several diverse residential and mixed-use neighborhoods: the West End, the Western Promenade, Parkside, St. John/Valley, and Libbytown. Prior to the adoption of the Institutional Overlay Zone, representatives from neighborhood organizations, MMC, and the City of Portland began meeting regularly to discuss MMC's facility modernization plans. To maintain and improve dialogue, collaboration, and transparency between these stakeholders, this Neighborhood Advisory Committee ("NAC") Charter was developed and finalized in December 2018.	
1.2 Neighborhood Advisory Committee Purpose MMC, its adjacent neighborhood organizations, and the City of Portland recognize that continued mutually respectful, transparent, and consistent communication benefits all members involved in the Neighborhood Advisory Committee. Furthermore, all stakeholders engaged in this charter share a common interest in preserving and improving the health, wellness, and livability of their respective neighborhoods. To these ends, the NAC will: 1. Support meaningful, productive communication between MMC, Neighborhood organizations, and the City of Portland, helping all members develop and maintain a healthy, transparent, and respectful working relationship 2. Promote the health, wellness, and livability of MMC and the surrounding neighborhoods by: – Collaboratively problem-solving around hospital-neighborhood concerns – Actively facilitating the development of hospital-community partnerships – Jointly administering MMC's Caring Community Grant program to support mutually agreed upon neighborhood proposals addressing initiatives identified in MMC's Institutional Overlay Zoning. – Encouraging the sharing of information amongst members and the Portland residents who live in the member neighborhoods. – Providing a forum for feedback from neighborhood residents through NAC membership.	
1.3 NAC Membership The Neighborhood Advisory Committee will consist of the District 2 City Councilor, plus two representatives each from the following organizations: – The West End neighborhood – The Western Promenade neighborhood – The Parkside neighborhood – The St. John/Valley neighborhood – The Libbytown neighborhood – MMC In the case that a member may not attend, a substitute may be assigned at the discretion of the member organization. The City of Portland's Department of Planning and Urban Development will not serve as a formal member organization, but will participate in NAC meetings.	1. Should the District 3 Councilor be involved?

1.4 NAC Member Role and Responsibilities NAC members are responsible for: – Attending all NAC meetings – Engaging in productive, mutually respectful, and transparent dialogue – Disseminating information from the NAC to each member organization in a timely manner – Gathering feedback and providing input to the NAC on the part of each member organization	2. Do these responsibilities seem equitable enough?
Section 2: Organizational Structure & Procedures	
2.1 Organizational Structure The NAC will have two co-facilitators, appointed to different member organizations on a rotating one-year basis. No member or organization will serve in the co-facilitator role more than once in a three-year period. The City Councilor will not act as co-facilitator. The NAC will designate a notekeeper, who will hold the appointment continuously until otherwise decided by the committee.	3. Is this the right approach to facilitation? 4. Is one year too long for an appointment? How would appointments rotate? 5. Should MMC be defined as the notekeeper in the charter? Do we need this level of specificity?
2.2 Procedures *Meeting Frequency:* The NAC will meet at least quarterly at a mutually agreeable time and location specified by the committee co-facilitators. If a member deems that an additional meeting is necessary, that member may request a meeting by contacting the committee co-facilitators. The co-facilitators will make all reasonable efforts to arrange a meeting within two weeks of the request. During periods of MMC construction, the NAC will meet monthly unless otherwise decided by the committee. *Agenda Setting:* The co-facilitators are responsible for developing a draft agenda, circulating the draft among committee members, integrating member input, and providing a final draft agenda prior to meetings of the NAC. *Meeting Materials:* Should a request for feedback on a particular item be included on the agenda, committee members will ensure that sufficient time for such feedback is provided (i.e. materials shall be provided in advance of the meeting and feedback collected at the meeting, or materials distributed at the meeting and feedback collected subsequent to the meeting). *Meeting Guests:* Any committee member may request permission of the co-facilitators to invite a guest speaker or presenter to the next scheduled meeting and to place the same on the agenda for such meeting. If a guest request is relevant to an agenda item, permission will be granted freely. *Meeting Facilitation:* Meetings will be facilitated by the co-facilitators. *Meeting Minutes:* The notekeeper will keep meeting minutes, including documentation of action items resulting from meetings. The notekeeper will distribute meeting minutes to all parties within seven days of the meeting. Meeting minutes will also be posted on MMC's website. As they become available, neighborhood association meeting minutes will also be shared with the committee.	6. Should meetings always be held at MMC, or should the location and time be the choice of the co-facilitators? 7. Should the charter require that all materials shared at meetings be provided to all members electronically? 8. How long should members have to gather feedback on materials (i.e. how far in advance of meetings should materials be required?) 9. Should meetings be recorded and archived?

Section 3: Scope	
3.1 In Scope Within three months of the NAC's first yearly meeting and annually thereafter, the committee will develop a set of mutually agreed upon goals to work toward over the subsequent year. These goals will be directly tied to the NAC's purpose, including: – Supporting positive and productive communication – Collaboratively problem-solving around hospital-neighborhood concerns – Jointly pursuing opportunities for hospital-neighborhood partnerships focused on health, wellbeing, and livability of neighborhoods, measuring outcomes if appropriate On an annual basis, the NAC will be responsible for soliciting, reviewing, and selecting the recipient of MMC's Caring Community Grant. Within three months of its first meeting, the NAC will develop a framework for administering the grant program, including program goals, selection process, and guidelines, using the Institutional Overlay Zoning as a guide.	10. Does the charter speak sufficiently to conflict resolution and ways to hold members accountable? 11. How should the details of the 'framework' for the grant program be established? 12. How should the framework for administering the grant funding be 'adopted'?

General Questions	13. What is the process for adopting the charter?

WRITTEN SUBMISSION 18 – PRESERVATION OF SIGNIFICANT NATURAL FEATURES
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

S

THER ARE NO SUCH FEATURES WITHIN THE PROJECT SITE.

WRITTEN SUBMISSION 20 – SITE LANDSCAPING
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

U

THE LANDSCAPE PLAN FOR THE NEW BUILDING IS DESIGNED TO COMPLIMENT THE UNIFORMITY AND SIMPLE NATURE OF THE BUILDING DESIGN.

THERE ARE FOUR LANDSCAPE ZONES WITHIN THE SITE :

1. PASSENGER ARRIVAL AND DEPARTURE PLAZA – THIS AREA WILL BE COMPLETELY IN SHADE. THE CENTER ISLAND WILL BE PLANTED WITH EUROPEAN WILD GINGER WITH ACCENTS OF TRILLIUM. THESE SELECTIONS WILL PROVIDE EVERGREEN COLOR ALL YEAR AND WILL NOT OBSTRUCT VISIBILITY IN THE PLAZA.
2. TRIANGLE PLANTER BELOW RETAINING WALL – THIS AREA INCLUDE ENGLISH IVY, PLANTED AT THE BASE OF THE RETAINING WALL, AS WELL AS EUONYMUS GROUNDCOVER (EVERGREEN), WITH VERTICAL ACCENTS OF FEATHER REED GRASS.
3. TWO TRIANGLE PLANTERS AT THE PUBLIC PLAZA – THESE AREAS REPEAT THE USE OF EUONYMUS GROUNDCOVER WITH ACCENTS OF FEATHER REED GRASS, AFFORDING A SIMPLE YET ELEGANT FOREGROUND TO THE VERTICAL BUILDING BEYOND.
4. THE GREEN ROOF WILL BE PLANTED WITH GREEN AND RED SEDUM, LOWBUSH BLUEBERRY, AND TALLER SWITCH GRASS ALONG THE PATIENT BEDROOM EDGE OF THE ROOF.

WRITTEN SUBMISSION 21 – PARKING LOT LANDSCAPING
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

V

THIS SUBMISSION ITEM IS NOT APPLICABLE TO THIS APPLICATION.

W

WRITTEN SUBMISSION 22 – STREET TREES
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

THE LANDSCAPE PLAN INCLUDES (5) NEW HONEY LOCUST TREES ALONG CONGRESS STREET. HONEY LOCUST TREES ARE SUITED FOR THE URBAN CONDITIONS AND ARE FOUND ON MANY PORTLAND STREETS TODAY.

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

X

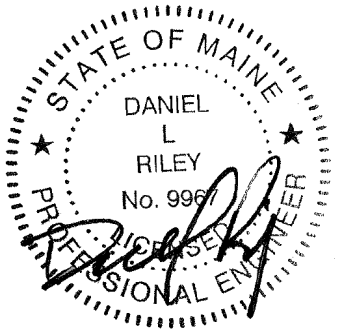
STORMWATER MANAGEMENT PLAN

Maine Medical Center
Congress Street Building
Portland, Maine

Prepared for

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

October 30, 2018



10/30/2018

STORMWATER MANAGEMENT PLAN

Maine Medical Center Congress Street Building
Portland, ME

Introduction

This Stormwater Management Plan has been prepared to address the potential impacts on stormwater runoff associated with the construction of a new hospital building on Maine Medical Center's Bramhall Campus.

The Congress Street Building project will consist of a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The proposed building replaces the existing employee-parking garage located at the corner of Congress Street and Gilman Street and includes redevelopment of the site along Congress Street. The total area of the campus affected by the work, as shown on the exhibits attached to this report is approximately 1.95 acres.

As discussed in this report, the Stormwater analysis and treatment/detention system has been designed to detain and treat rooftop runoff from the existing Visitors Parking Garage adjacent to the new building. Providing treatment from an additional 26,400 sf of parking deck that currently drains un-detained into the combined sewer system in Congress Street.

The impact of the new building is mitigated in part by redeveloping an existing parking structure with the new building whose rooftop includes green roof components.

Development on the Maine Medical Center Bramhall Campus is subject to the Maine Department of Environmental Protection (MDEP) Site location of Development Act and Chapter 500 Stormwater standards, reviewed by the City of Portland under its delegated review authority from MDEP. Based on the proposed development, the project is subject to the MDEP Chapter 500 Basic, General, and Flooding standards, including the redevelopment standards for a Site Law project, as incorporated into the City of Portland Land Use Ordinance and Site Plan review regulations.

The site is located in an area served by a combined sewer system where the City of Portland seeks to mitigate and reduce combined sewer overflow (CSO) events. The design storm events for CSO evaluation is a 1" rainfall, 24-hour design storm (CSO Storm).

Based on discussions with the City staff, the stormwater analysis and the proposed detention/treatment system has been designed to reduce the rate of runoff from the project site including both the new Congress Street Building and the existing Visitor Garage, to the greatest extent possible during this 1" CSO Storm event.

The proposed erosion controls, inspection and maintenance criteria, and the stormwater management systems have been designed to meet MDEP and City of Portland requirements. The proposed design includes a subsurface sand filter Best Management Practice (BMP) which has been designed to meet

the system sizing and treatment requirements for the new building's and redevelopment project standard. The system has been expanded to the extent practicable and to provide treatment for runoff from the adjacent parking garage.

The proposed design meets the applicable standards for system volume, but due to the limited site area, incorporating the runoff from the Visitor Garage will require waiver of the system surface area design criteria. The waiver is simply a trade-off to allow detention of existing runoff volume to address the CSO flows reduction desired by the City.

Permitting and Analysis History

A comprehensive stormwater analysis of the Maine Medical Center Bramhall Campus was completed in January 2004 as part of the Site Location of Development review, by the City of Portland, of the Bramhall Campus Expansion project. This project constructed from 2004-2007 was significant redevelopment of the campus including the construction of the Visitors Garage, Central Utility Plant and East Tower and renovations of the Emergency Department. The 2004 project also included the reconstruction and re-alignment of Crescent Street and separation of storm drainage in Gilman Street.

The redevelopment project fully separated stormwater runoff from the combined sewers within hospital property the campus and the immediately adjacent streets. The separated runoff re-enters the City's combined system at 7 locations abutting the site to facilitate future separation projects that may be undertaken by the City as part if its CSO program.

The 2004 redevelopment project included the installation of two hydrodynamic separator treatment units and separated runoff from approximately 6.3 acres of the campus and Gilman Street (uphill of A Street) the municipal separated storm drain in A Street, fully utilizing the design capacity of the A Street Storm drain.

The 2004 analysis is presented in a Stormwater Management Report dated January 2004 attached to the Maine Medical Center's January 2004 Site Location of Development Application on file in the City of Portland Planning office.

The 2004 post-development analysis subdivided the campus and tributary offsite areas into 20 onsite and offsite sub catchment areas. These sub catchment areas are the basis of the current study's pre-development analysis. The full campus watershed plan is attached for reference, identifying the sub catchments affected by the currently proposed redevelopment.

The discussion of our current analysis focuses on those sub catchments and study points affected by the proposed project, the analysis of off site areas of the campus remains unchanged from the 2004 analysis with exception of the design rainfall events which have been updated in accordance with the design rainfall adopted by the MDEP Chapter 500 regulations in August of 2015.

Site Existing Conditions

The project site includes the area occupied by the hospital's existing employee garage at the corner of Congress Street and Gilman Street. The runoff evaluation area includes portions of Congress Street to the north and east, Gilman Street to the west and the access road between the existing garage and the LL Bean Wing of the hospital to the south.

The campus located in a densely developed urban setting consisting of hospital and office buildings with their associated parking and landscaped areas, public roadways, and multi-family residential housing. The undeveloped areas of the site consist of steeply sloped land abutting Congress Street and Gilman Street. Ground cover in this area consists primarily of grass, brush and evergreen tree growth.

The subject site is located at a high point in the west end of the Portland Peninsula. Runoff from the project site is collected through a series of roof drains and catch basins and conveyed to the combined sanitary/stormwater sewers located within public streets abutting the site. There are currently two Downstream Defender units, installed in 2005, which provide stormwater quality treatment to runoff from the site. One Downstream Defender unit is located in the Visitor Garage on Congress Street, tributary to the municipal combined sewer system that runs down Forest Street to Park Avenue. The outfall of the Visitor Garage's downstream defender will be redirected to a proposed detention and treatment system associated with new Congress Street building to provide peak flow mitigation during the CSO design storm.

The second Downstream Defender unit is located along Gilman Street, in front of the Central Utility Plant, treating stormwater before it enters the municipal separated storm drain in A Street.

Soils

Soil classifications within the project area were referenced from the Cumberland County Medium Intensity Soil Survey. The site is primarily comprised of Hinckley gravelly sand loam. The project geotechnical evaluation report indicates significant depths of granular fill overlaying glacial till. For modeling purposes of this report the soils were considered hydrologic soil group A consistent with the Cumberland County soil survey.

Proposed Development

Maine Medical Center proposes to construct a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The new building incorporates green roof elements and replaces the impervious surfaces associated with the existing employee-parking garage.

The Visitors Garage east of the site will remain. The drainage system from the Visitors Garage will be modified for redirect runoff to the proposed building's stormwater treatment system. The stormwater analysis was developed to consider treatment for both the proposed hospital expansion and the existing parking garage.

The site is subject to the Chapter 500 redevelopment standards as a Site Law, although the proposed development will result in the following:

Total Developed Area Subject to Treatment Standards	= 1.53 acres
Total Post Development Impervious area	= 1.19 acres
Redevelopment Impact Rating	= (- 0.5)
Redeveloped Area Requiring Treatment (50%)	= 0.77 acres
Redeveloped Area Receiving Treatment	= 1.95 acres

Regulatory Requirements

City of Portland:

The project is subject to the City of Portland's land use ordinance and Technical Standards applicable to a project with an existing Site Location of Development Permit and reviewed under the City's delegated review authority. The City's standards incorporate the MDEP Chapter 500 standards as follows.

Maine Department of Environmental Protection (MDEP)

MDEP Rule Chapters 500 and 502 describe stormwater management requirements for new development projects. These rules describe performance standards divided into five major categories: Basic Standard, General Standard, Phosphorous Standard, Urban Impaired Stream Standard, and Flooding Standard. The following sections describe how this project will address these stormwater management performance standards.

Basic Standard: A project must meet basic standards if it disturbs an area greater than one (1) acre. As this development will disturb approximately 1.53 acres, it must meet the basic standard. The standard includes various erosion and sedimentation controls, inspection and maintenance procedures, and general housekeeping requirements.

General Standard: A project is subject to the general standard if it results in the creation of one (1) or more acres of impervious area or developed areas greater than five (5) acres. As this project will include approximately 1.19 acres of impervious area, it must meet the general standard, including provisions in the General Standards for Redevelopment projects.

The redevelopment standard applicable to this project is outlined in the Chapter 500.4.C(2)(d). This standard establishes treatment requirements based on a pre and post development pollutant impact rating which establishes a sliding scale of the percentage of Developed Area which must be treated. For Site Law projects, the scale ranges from a minimum of 50% of the developed area to a maximum treatment equal to a new development.

The redevelopment calculations for the current project indicates that a minimum of 50% of the site's redevelopment must be treated. The treatment system proposed exceeds the minimum requirement

as a stand alone project including the Congress Street building and significantly exceeds the minimum standards by providing treatment for the Visitor Garage runoff.

Standard BMPs have been defined by the MDEP and are described thoroughly in their publication Stormwater Management for Maine: Best Management Practices manual, as revised March 2016.

Phosphorous Standard: A project must meet the phosphorous standards if located within a lake watershed. As this project is not tributary to a lake watershed, it is not subject to the phosphorus standard.

Urban Impaired Stream Standard: A project must meet the urban impaired stream standards if located within an urban impaired stream watershed. As this project is not tributary to an Urban Impaired Stream as defined by MDEP Chapter 502, this project is not subject to the urban impaired stream standard.

Flooding Standard: A project must meet to the flooding standards if it creates impervious areas greater than three (3) acres, or developed areas greater than twenty (20) acres. This project includes approximately 1.19 acres of impervious area; however, the City of Portland Technical Manual Section II-C states that all Level III site plans are required to meet the Maine DEP Chapter 500 flooding standard.

City of Portland Combined Sewers

In addition to the Stormwater Management provisions of the Land Use Ordinance and Technical Standards, the project is located in an area served by a combined sewer system where the City seeks to mitigate the rate of flow in the system that contribute to Combined Sewer Overflow (CSO) events. Discussions with the City Public works department in July 2018 have defined the CSO storm event to be a 1" rainfall event modeled using a 24-hour duration Type III storm distribution. The City has requested that the proposed treatment system be designed to mitigate to the extent practicable the rate of runoff from the site during this storm event, and to detain if practicable the runoff from the existing parking garage.

Quality Treatment

To meet the stormwater quality treatment requirements for the site, a subsurface sand filter BMP and a vegetated roof BMP are proposed to treat runoff from proposed development.

A subsurface sand filter utilizing a Cultec pretreatment row and ACF R-Tank detention modules is proposed to treat and store runoff generated from the roof surface of the proposed Congress Street building. Runoff from the roof will be collected in the building's roof drainage system and directed to the subsurface sand filter installed beneath the paved area of the proposed main entrance. The treated stormwater will discharge to the existing combined sewer at a new Manhole in Congress Street, tributary to Study Point C2.

The proposed subsurface sand filter has been sized based on chapter 7.3 of the Maine Department of Environmental Protection (MDEP) BMP Manual: Subsurface Sand Filters, to provide adequate treatment for the water quality volume, pretreatment of the one-year storm using an inlet control structure and isolator row, and detention for larger storm events.

Redevelopment standards apply because the proposed building will replace existing buildings and pavement areas. After completing the calculations outlined in §4.C(2)(d) of Chapter 500, the ranked impact change due to redevelopment is calculated to be -0.5. Because the project is subject to an existing Site Law Permit the minimum level of treatment required 50% of the redeveloped area.

The redevelopment impact ratings are included in Attachment A to this report.

Also included in Attachment A are tables summarizing the impervious and developed areas for the proposed development and the BMP measures treating these areas. The conclusion is a tabulation of the effective treatment percentages for the proposed development. The results of this tabulation indicate the following:

- The post-development area subject to treatment standards includes 1.53 acres of developed area on the Congress Street building site. This area is comprised of approximately 1.19 acres of impervious area (rooftop, driveway and sidewalk areas) and 0.34 acres of landscaped areas.

- The redevelopment standard requires treatment for 50% of this developed areas for a minimum of 0.77 acres.

- The total area receiving treatment is approximately 1.95 acres of developed area including the new Congress Street Building roof and entrance driveway area (1.34 acres) and the Visitor Garage (0.61 acres).

The redevelopment standard requires treatment for 50% of the new developed areas. As such, the site is required to provide treatment for a minimum of 0.77 acres. The total area receiving treatment is approximately 1.95 acres or 128% of the required area.

<u>Stormwater Treatment System</u>

A subsurface soil filter system is proposed below the Congress Street building's entrance plaza at Congress Street is proposed to provide Stormwater Quality and Quantity Treatment. The system presented on the plans is based on R-Tank chambers with Cultec chamber isolator rows for pre treatment

The system sizing criteria is provided in Attachment A to this report and summarized as follows:

Storage Volume Required	= 5,829 cf
Storage Volume Provided	= 5,949 cf
Surface Area Required (Congress Building only)	= 2,564 sf
Surface Area Required (Congress Building and Visitor Garage)	= 3,883 sf
Surface Area Provided	= 3,134 sf

Methodology:

In order to evaluate drainage characteristics as a result of the proposed development activities, a quantitative analysis was performed to determine peak runoff rates in the pre-development and post-development conditions. The evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations.

The peak runoff rates were calculated using a 24-hour duration storm event with a Type III rainfall distribution. The rainfall amounts for Cumberland County have recently been updated and the following 24-hour duration rainfall amounts were used for this report:

Storm Frequency	24-hr Duration Rainfall (in.)
CSO Storm	1.0
2-yr	3.1
10-yr	4.6
25-yr	5.8

Twenty sub catchments were analyzed in the pre-development condition, and twenty-two watersheds in the post-development condition. The pre development sub catchment delineations are based the 2004 study post-development watersheds modified to reflect site improvements constructed as part of the 2004-2007 Bramhall Campus Expansion project construction along with record drawings, and field surveys of the drainage infrastructure.

Sub catchment delineations along the hospital building rooftops are based on visible roof drain locations and record design drawings. Due to the age of a number of buildings, records indicating the locations of roof drain connections to the surrounding sewer system are not available. In these cases, the assumed watershed delineations were made based observations of the rooflines and the surrounding topography and sewer infrastructure.

Five Study Points, identified on the attached watershed plans and hydrologic model output as points SP-C1 through SP-C5 have historically been used to evaluate pre and post-developed runoff conditions from the campus. The Study Points represent locations where stormwater runoff, from the project site, enters the public drainage infrastructure system. In most cases, the capacity of the existing combined sewers is small relative the area draining to them under existing conditions. In these cases,

the study points represent the total stormwater discharge at the study point including both gutter flow and flow into the sewer.

Of these study points only two SP-C2 and SP-C3 are affected by the proposed redevelopment.

Study Point SP-C1 represents the point where stormwater runoff from the site enters a combined sewer at the intersection of Wescott Street and Crescent Street. The study point represents runoff at a manhole identified as DMH-25868 on the project plans. The sewer outlet from this manhole is a 12" cement line that drains in a westerly direction along Crescent Street, eventually draining to Park Avenue via sewers in Ellsworth Street, Congress Street and Weymouth Street.

Study Point SP-C2 represents the point where runoff from the existing Maine Medical Center parking garage, enters a combined sewer at the intersection of Congress Street and Forest Street. The study point represents runoff at a manhole SMH-13952 on the project plans. The sewer outlet from this manhole is an 18" reinforced concrete pipe that drains in a northerly direction along Forest Street to Park Avenue.

Study Point SP-C3 represents the point where runoff from areas of the project site east of the existing visitor garage enters the combined sewer system at the intersection of Gilman Street and Congress Street. At this point runoff within the sewer system discharges in a northerly direction along Gilman Street to Park Avenue. Runoff in the roadway that bypasses the catch basins at the intersection discharges in a westerly direction along Congress Street to St. John Street.

Study Point SP-C4 represents at the intersection of Gilman Street and A Street where runoff from areas of the site including the existing emergency room parking area, L.L. Bean wing, and service areas abutting the central utility plant is directed to the A Street storm drain. A Downstream Defender stormwater treatment system was installed in 2005.

Study Point SP-C5 represents runoff at the intersection of Ellsworth Street and Wescott Street. Runoff currently enters the combined sewer system via manholes in Ellsworth Street and drains in an easterly direction along Ellsworth Street towards its intersection with Congress Street.

The areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development. Due to the highly-developed nature of the site, the time of concentration in some watersheds is less than six minutes. A minimum time of concentration of six minutes was used in these cases.

Table 1 summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

Table 1 Stormwater Peak Discharge Summary Table									
Study Point	2-Year Storm			10-Year Storm			25-Year Storm		
	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)
SP-C1	1.28	1.28	0.00	2.39	2.39	0.00	3.31	3.31	0.00
SP-C2	6.45	3. 59	-2.87	9.14	6.73	-2.41	11.23	10.91	-0.32
SP-C3	1.72	1.53	-0.19	4.28	4.05	-0.23	5.76	5.21	-0.55
SP-C4	14.04	13.78	-0.26	25.22	24.94	-0.28	34.61	34.33	-0.28
SP-C5	1.60	1.60	0.00	3.01	3.01	0.00	4.07	4.07	0.00

The results of the stormwater modeling at Study Point SP-C1 to SP-C5 indicate that the peak rates of runoff in the post-development condition will be less than the pre-developed condition for the 2-year, 10-year, and 25-year storm events.

Study points SP-C2 and SP-C3 were further evaluated to determine the impact on peak flow rate and runoff duration from the project site during the 1" CSO Storm event. The proposed subsurface sand filter has been expanded in size to allow for the detention of runoff from the Congress building and the Parking Garage. The system outlets have been designed to maximize the detention of runoff generated from a 1" rainfall to reduce the peak rate of runoff during this storm and to extend the duration of that runoff as long as practicable to mitigate and reduce the site's contribution to offsite CSO events. The results during this event are summarized in Table 2 below.

The modeling node used to evaluate the connection point to the City system is node SMH-1 representing ESMH-13952.

Table 2 CSO Event Summary Table			
Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
ESMH-13952	1.61	0.28	-1.33 (83%)

The results of the analysis indicates that the proposed system reduces the rate of runoff at the connection to the City's combined sewer by approximately 83%.

To further evaluate the attenuation of flow from the project site during smaller storm events, Table 3 below summarized the performance of the proposed subsurface sand filter detention system identified as Node 1P+G(R-Tank System with Garage) in the model. The table below evaluates the inflow

hydrograph into the system and the outflow hydrograph to the City system during a 1" storm event. This summary most closely represents the contribution of the project site runoff, without the influence of offsite runoff.

The proposed design will reduce the peak rate of runoff from a 1" storm event by 97% compared to the un detained discharge

Table 3 CSO Event Summary Table

Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
R-Tank System	1.48	0.04	-1.44 (97%)

Conclusion

Erosion and sedimentation controls, inspection and maintenance procedures and general housekeeping requirements have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

By utilizing Best Management practices, stormwater quality treatment has been provided for at least 50% of the total impervious area and at least 50% of the total developed area. Based on the modeling data, the post-development peak rates of runoff for the 2-year, 10-year, and 25-year storm events demonstrate decreases in the peak rates of runoff when compared to the pre-development peak rates of runoff.

The proposed detention and treatment system meets all of the applicable sizing criteria for minimum surface area, channel protection volume, sediment pretreatment volume to address the requirements for the Congress Street Building project. At the City's request, the system has been expanded to accept runoff from the adjacent Visitor Garage for the purpose of detaining runoff from the existing development during a CSO event storm.

With the addition of this area, the system continues to meet the applicable sizing criteria with the exception of the minimum surface area criteria. The proposed system provides approximately 120% of the required area for the Congress Street Building alone. The proposed system provides 80% of the required area for the combined Congress Building and parking garage footprint. Meeting the full area requirement would require an additional 800 sf of system area which is not available on this site.

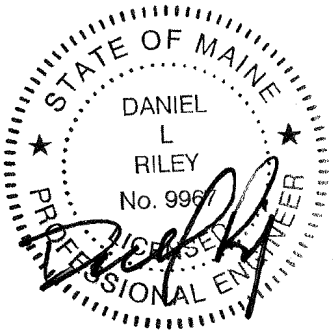
With the incorporation of the above referenced erosion control, treatment and detention measures, the project has been designed in conformance with the Maine Department of Environmental Protection Chapter 500 Stormwater Law and City of Portland Stormwater Management Standards.

Accordingly, it is anticipated that stormwater runoff from the proposed development will not cause a significant adverse effect to off-site receiving channels or downstream properties.

Prepared by,

SEBAGO TECHNICS, INC.





Daniel L. Riley, P.E.
Vice President, Engineering

10/30/2018

October 30, 2018

Attachment A

STORWATER QUALITY CALCULATIONS

Table 4: MDEP REDEVELOPMENT STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

Existing Areas by Pollutant Ranking (S.F.)							Proposed Areas by Pollutant Ranking (S.F.)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0	6,538	17,424	1,739	43,699	0	69,400	0	328	22,153	46,919	0	0	69,400

Existing Areas by Pollutant Ranking (acres)							Proposed Areas by Pollutant Ranking (acres)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0.000	0.150	0.400	0.040	1.003	0.000	1.593	0.000	0.008	0.509	1.077	0.000	0.000	1.593

Existing Weighted Average (Item C)	Proposed Weighted Average (Item D)
5.083	**4.256**

Total Development Area (acres)	Total Redevelopment Area (acres)
1.593	**1.593**

Ranked Impact Change Due to Redevelopment (Item E)
-0.5

Percent Increase in Developed Area
0.00%

Treatment Levels for Redevelopment Projects

Ranked Impact Change Due to Redevelopment (Item E)	Percentage of Developed Area that Must be Treated
0.0 or less	**0% (Stormwater projects)** **50% (Site projects)**
≤ 0.0 to ≥ 1.0	**60%**
> 1.0 to ≥ 2.0	**70%**
> 2.0 to ≥ 3.0	**80%**
> 3.0	**Same treatment level as for new development**

Table 3: MDEP GENERAL STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

AREA ID	WATERSHED SIZE (S.F.)	EXISTING IMPERVIOUS AREA (To Remain) (S.F.)	NEW IMPERVIOUS AREA (S.F.)	EXISTING LANDSCAPED AREA (To Remain) (S.F.)	NEW LANDSCAPED AREA (S.F.)	NEW DEVELOPED AREA (S.F.)	UNDEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	NEW IMPERVIOUS AREA TREATED* (S.F.)	NEW LANDSCAPED AREA TREATED* (S.F.)	NEW DEVELOPED AREA TREATED* (S.F.)	TREATMENT BMP
3.1	10,051	8,335	0	1,716	0	0	0	NO	0	0	0	NONE
3.2	4,089	4,089	0	0	0	0	0	NO	0	0	0	NONE
14.1	22,477	14,929	5,018	0	2,530	7,548	0	NO	0	0	0	NONE
15.1	18,644	10,163	443	8,038	0	443	0	NO	0	0	0	NONE
17.1A	43,616	0	43,616	0	0	43,616	0	YES	43,616	0	43,616	SSSF
17.1B	14,879	0	2,836	0	12,043	14,879	0	YES	2,836	12,043	14,879	Green Roof
18	26,386	26,386	0	0	0	0	0	YES	26,386	0	26,386	SSSF
SUM	**140,142**	**63,902**	**51,913**	**9,754**	**14,573**	**66,486**	**0**	-	**72,838**	**12,043**	**84,881**	-

Designations: SSSF=Subsurface Sand Filter

TOTAL NEW IMPERVIOUS AREA (S.F.)	**51,913**	**TOTAL NEW DEVELOPED AREA (S.F.)**	**66,486**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	**72,838**	**TOTAL DEV. AREA RECEIVING TREATMENT (S.F.)**	**84,881**
% OF IMPERVIOUS AREA RECEIVING TREATMENT	**140.3%**	**% OF DEV. AREA RECEIVING TREATMENT**	**127.7%**

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 4A
South Portland, Maine 04106
Tel. (207) 200-2100

JOB	15466 - Congress Street Building		
SHEET NO.	1	OF	3
CALCULATED BY	DLR	DATE	10/25/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	10/30/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Proposed Congress Building

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,043	SF							
Impervious Area	46,452	SF							

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,043	SF	Area	240.9	SF			
Total Impervious Area	46,452	SF	Area	2,322.6	SF			
Required Minimum Surface Area				2,563.5	SF			
Provided Surface Area				3,134.0	SF			

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,043	SF	Volume	401.4				
Impervious Area	46,452	SF	Volume	3,871.0				
CPV Required				4,272.4	CF	0.098	AF	
Provided CPV				5,949.0	CF	@ Elev 51.2		

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	3.32	cfs		
Iso Row sizing for: 902HD	**0.2**	cfs		
Total number of Isolator Row Chambers required:	17		25	Provided

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JOB	15466 - Congress Street Building		
SHEET NO.	2	OF	3
CALCULATED BY	DLR	DATE	10/25/2018
FILE NAME	15466 - Stormwater calcs Congre	PRNT DATE	10/30/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Existing Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	0	SF					
Impervious Area	26,386	SF					

Minimum Surface Area for sand filter and chamber system

Required	(2% X Landscaped + 5% X Impervious)					
Total Landscaped Area	0	SF	Area	0.0	SF	
Total Impervious Area	26,386	SF	Area	1,319.3	SF	
Required Minimum Surface Area				1,319.3	SF	
Provided Surface Area				*	SF	

Channel Protection Volume (CPV)

Required	(0.4" X Landscaped + 1.0" X Impervious)							
Landscaped Area	0	SF	Volume	0.0				
Impervious Area	26,386	SF	Volume	2,198.8				
CPV Required				2,198.8	CF	0.050	AF	
Provided CPV				*	CF			

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	1.53	cfs	
Iso Row sizing for:	902HD	**0.2**	cfs
Total number of Isolator Row Chambers required:	8		

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JOB	15466 - Congress Street Building		
SHEET NO.	3	OF	3
CALCULATED BY	DLR	DATE	10/25/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	10/30/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Congress Building and Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,073	SF				
Impervious Area	72,838	SF				

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,073	SF	Area	241	SF	
Total Impervious Area	72,838	SF	Area	3,642	SF	
Required Minimum Surface Area				3,883	SF	
Provided Surface Area				3,134	SF	

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,073	SF	Volume	402				
Impervious Area (Bldg)	43,558	SF	Volume	3,630				
Site Pavement	2,894							
Impervious Area (Garage)	26,386			2,199				
				0		(ASSUMES 25% Pretreament Credit for HIL Unit)		
CPV Required				5,829	CF	0.134	AF	
Provided CPV				5,949	CF	@ Elev 51.2		

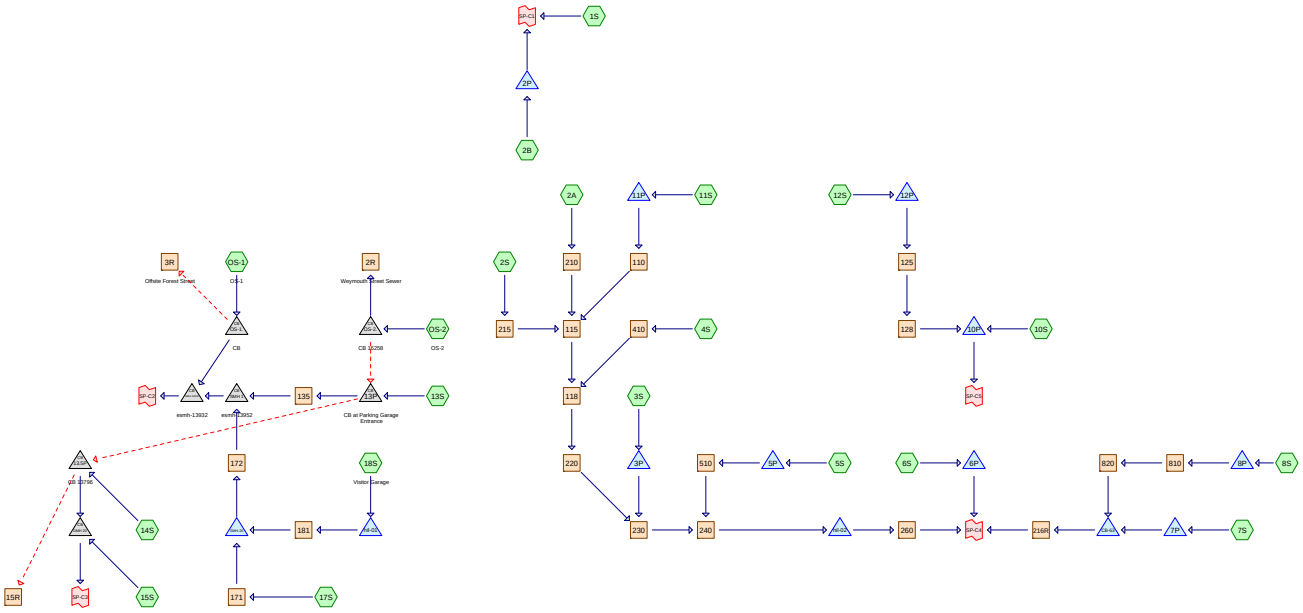
Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	4.50	cfs	
Iso Row sizing for: 902HD	**0.2**	cfs	
Total number of Isolator Row Chambers required:	23	25	

Attachment B

HYDROCAD OUTPUT



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD PRE

Prepared by Sebago Technics, Inc., Printed 9/24/2018

HydroCAD® 10.00-15 s/n 01856 © 2015 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.354	39	>75% Grass cover, Good, HSG A (1S, 2B, 3S, 5S, 6S, 8S, 10S, 14S, 15S)
7.080	98	Paved parking (1S, 2A, 2B, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14S, 15S, 17S)
2.834	98	Roofs (5S, 6S, 8S, 10S, 18S)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**83**	**TOTAL AREA**

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,157	98	Paved parking
	16,157		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3S:

Runoff = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	3,076	39	>75% Grass cover, Good, HSG A
*	11,898	98	Paved parking
	14,974	86	Weighted Average
	3,076		20.54% Pervious Area
	11,898		79.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	106	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.2	222	0.0530	14.83	26.20	**Pipe Channel, PIPE C TO D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	358	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	56,212	43	Woods/grass comb., Fair, HSG A
*	36,084	98	Paved parking
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14S:

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,684	98	Paved parking
	15,059	39	>75% Grass cover, Good, HSG A
	29,743	68	Weighted Average
	15,059		50.63% Pervious Area
	14,684		49.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	45	0.0680	0.23		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
1.0	217	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
1.7					**Direct Entry, DIRECT**
6.0	262	Total			

Summary for Subcatchment 15S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	11,909	39	>75% Grass cover, Good, HSG A
*	15,681	98	Paved parking
	27,590	73	Weighted Average
	11,909		43.16% Pervious Area
	15,681		56.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.5	190	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.5	176	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	384	Total			

Summary for Subcatchment 17S:

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	40,392	98	Paved parking
	40,392		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	27,443	98	Roofs
	27,443		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	135	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	316	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

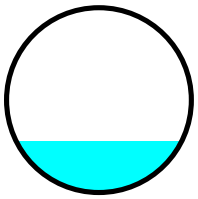
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



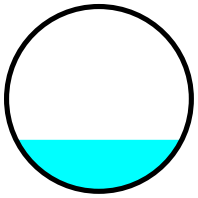
Summary for Reach 115:

Inflow Area = 1.203 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.04 cfs @ 12.10 hrs, Volume= 0.079 af
Outflow = 1.02 cfs @ 12.10 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



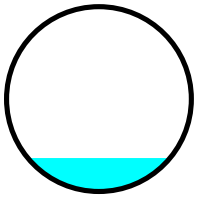
Summary for Reach 118:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.48 cfs @ 12.10 hrs, Volume= 0.114 af
Outflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.86 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 0.7 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



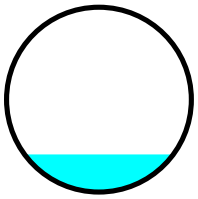
Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



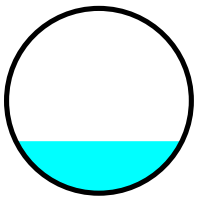
Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



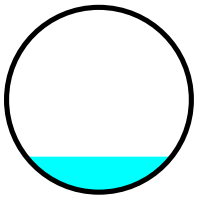
Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



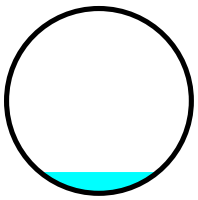
Summary for Reach 171:

Inflow Area = 0.927 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.40 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 29.32 cfs

15.0" Round Pipe
n= 0.012
Length= 31.0' Slope= 0.1755 '/'
Inlet Invert= 57.44', Outlet Invert= 52.00'



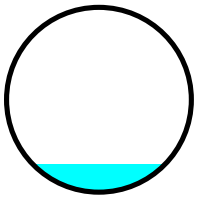
Summary for Reach 172:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.34 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 27.27 cfs

15.0" Round Pipe
n= 0.012
Length= 38.0' Slope= 0.1518 '/'
Inlet Invert= 51.66', Outlet Invert= 45.89'



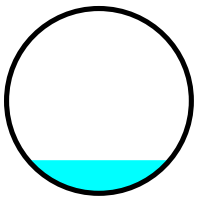
Summary for Reach 181:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.54 cfs @ 12.10 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.9 min

Peak Storage= 10 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.96 cfs

12.0" Round Pipe
n= 0.012
Length= 104.0' Slope= 0.0425 '/'
Inlet Invert= 56.28', Outlet Invert= 51.86'



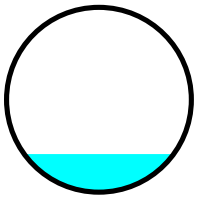
Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



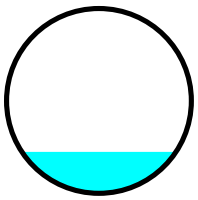
Summary for Reach 215:

Inflow Area = 0.371 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 1.1 min

Peak Storage= 7 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



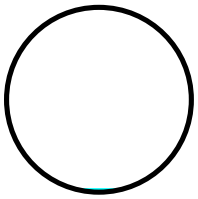
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



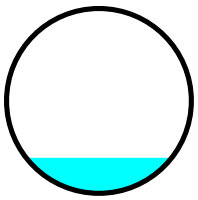
Summary for Reach 220:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af
Outflow = 1.42 cfs @ 12.12 hrs, Volume= 0.114 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.18 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 1.8 min

Peak Storage= 51 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



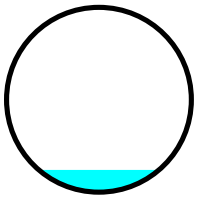
Summary for Reach 230:

Inflow Area = 2.081 ac, 96.61% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.48 cfs @ 12.12 hrs, Volume= 0.120 af
Outflow = 1.47 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.41 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.27 fps, Avg. Travel Time= 0.3 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



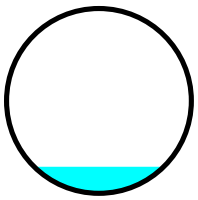
Summary for Reach 240:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 2.00 cfs @ 12.12 hrs, Volume= 0.167 af
Outflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.43 fps, Avg. Travel Time= 0.4 min

Peak Storage= 15 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



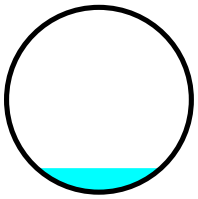
Summary for Reach 260:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Outflow = 1.96 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



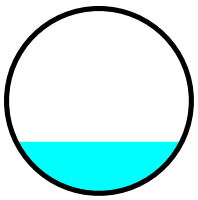
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



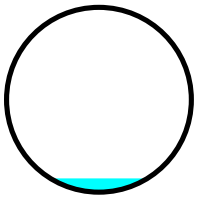
Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



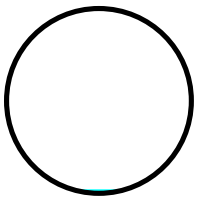
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



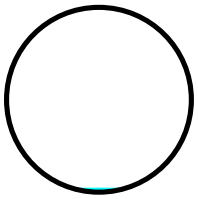
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900
n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.344 ac, 79.46% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.683 ac, 49.37% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 23.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 23.95 hrs HW=42.50' (Free Discharge)
└**1=12" SD** (Passes 0.00 cfs of 4.72 cfs potential flow)
└**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.06 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB at Parking Garage Entrance

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
└**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.8 min
Primary = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.61' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=37.61' (Free Discharge)
1=12" SD (Inlet Controls 0.00 cfs @ 0.45 fps)

Summary for Pond hil-01:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Primary = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
↑└**1=Stormdrain** (Passes 0.07 cfs of 5.24 cfs potential flow)
↑└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
↑└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
└**1=Stormdrain** (Passes 0.30 cfs of 3.12 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SMH 1: esmh-13952

Inflow Area = 2.384 ac, 95.01% Impervious, Inflow Depth = 0.63" for 1-Inch event
Inflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af
Outflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 45.19' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0660 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.60 cfs @ 12.10 hrs HW=45.18' (Free Discharge)
└**1=Sewer** (Inlet Controls 1.60 cfs @ 2.58 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Outflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.23' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.70 cfs @ 12.10 hrs HW=41.23' (Free Discharge)
└**1=Sewer** (Inlet Controls 1.70 cfs @ 2.62 fps)

Summary for Pond SMH-20:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Primary = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.370 ac, 71.34% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af
Primary = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.09 cfs 0.089 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=1.75"
Flow Length=358' Tc=6.0 min CN=86 Runoff=0.69 cfs 0.050 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=0.68"
Flow Length=262' Tc=6.0 min CN=68 Runoff=0.45 cfs 0.039 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=0.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=0.62 cfs 0.049 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=188' Tc=6.0 min CN=98 Runoff=2.72 cfs 0.222 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=316' Tc=6.0 min CN=98 Runoff=1.85 cfs 0.151 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.68' Max Vel=5.19 fps Inflow=3.51 cfs 0.288 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.48 cfs 0.288 af

Reach 118: Avg. Flow Depth=0.50' Max Vel=9.76 fps Inflow=5.04 cfs 0.415 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=5.01 cfs 0.415 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.28' Max Vel=9.40 fps Inflow=1.29 cfs 0.136 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.28 cfs 0.136 af

Reach 171: Avg. Flow Depth=0.26' Max Vel=14.91 fps Inflow=2.72 cfs 0.222 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=2.72 cfs 0.222 af

Reach 172: Avg. Flow Depth=0.35' Max Vel=16.46 fps Inflow=4.56 cfs 0.372 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=4.55 cfs 0.372 af

Reach 181: Avg. Flow Depth=0.33' Max Vel=8.24 fps Inflow=1.85 cfs 0.151 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=1.84 cfs 0.151 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.42' Max Vel=3.48 fps Inflow=1.09 cfs 0.089 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.08 cfs 0.089 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.54' Max Vel=8.82 fps Inflow=5.01 cfs 0.415 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.91 cfs 0.415 af

Reach 230: Avg. Flow Depth=0.34' Max Vel=18.51 fps Inflow=5.59 cfs 0.465 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.57 cfs 0.465 af

Reach 240: Avg. Flow Depth=0.51' Max Vel=21.42 fps Inflow=11.29 cfs 0.883 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=11.25 cfs 0.883 af

Reach 260: Avg. Flow Depth=0.61' Max Vel=13.86 fps Inflow=11.25 cfs 0.883 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=11.22 cfs 0.883 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.69 cfs 0.050 af
Primary=0.69 cfs 0.050 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.81' Inflow=1.10 cfs 0.045 af
Primary=1.10 cfs 0.045 af Secondary=0.00 cfs 0.000 af Outflow=1.10 cfs 0.045 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.29' Inflow=1.94 cfs 0.143 af
Primary=1.29 cfs 0.136 af Secondary=0.65 cfs 0.007 af Outflow=1.94 cfs 0.143 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: Peak Elev=38.30' Inflow=1.72 cfs 0.094 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=1.72 cfs 0.094 af

Pond hil-01: Inflow=1.85 cfs 0.151 af
Primary=1.85 cfs 0.151 af

Pond hil-02: Inflow=11.25 cfs 0.883 af
Primary=11.25 cfs 0.883 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH 1: esmh-13952 Peak Elev=45.84' Inflow=5.83 cfs 0.509 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=5.83 cfs 0.509 af

Pond SMH-13932: esmh-13932 Peak Elev=41.96' Inflow=6.45 cfs 0.572 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.45 cfs 0.572 af

Pond SMH-20: Inflow=4.56 cfs 0.372 af
Primary=4.56 cfs 0.372 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=6.45 cfs 0.572 af
Primary=6.45 cfs 0.572 af

Link SP-C3: Inflow=1.72 cfs 0.094 af
Primary=1.72 cfs 0.094 af

Link SP-C4: Inflow=14.04 cfs 1.117 af
Primary=14.04 cfs 1.117 af

Link SP-C5: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.219 af Average Runoff Depth = 1.69"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.63 cfs 0.135 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=3.10"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.21 cfs 0.089 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=1.60"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.21 cfs 0.091 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=1.97"
Flow Length=384' Tc=6.0 min CN=73 Runoff=1.42 cfs 0.104 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=188' Tc=6.0 min CN=98 Runoff=4.07 cfs 0.337 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=316' Tc=6.0 min CN=98 Runoff=2.77 cfs 0.229 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=0.81 cfs 0.006 af
Outflow=0.81 cfs 0.006 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.89' Max Vel=5.64 fps Inflow=5.25 cfs 0.438 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.21 cfs 0.438 af

Reach 118: Avg. Flow Depth=0.62' Max Vel=10.90 fps Inflow=7.54 cfs 0.632 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.50 cfs 0.632 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.31' Max Vel=9.87 fps Inflow=1.55 cfs 0.215 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.54 cfs 0.215 af

Reach 171: Avg. Flow Depth=0.31' Max Vel=16.76 fps Inflow=4.07 cfs 0.337 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=4.07 cfs 0.337 af

Reach 172: Avg. Flow Depth=0.43' Max Vel=18.44 fps Inflow=6.81 cfs 0.566 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=6.81 cfs 0.566 af

Reach 181: Avg. Flow Depth=0.41' Max Vel=9.21 fps Inflow=2.77 cfs 0.229 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=2.75 cfs 0.229 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.53' Max Vel=3.86 fps Inflow=1.63 cfs 0.135 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.62 cfs 0.135 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.67' Max Vel=9.84 fps Inflow=7.50 cfs 0.632 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.37 cfs 0.632 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.94 fps Inflow=8.56 cfs 0.720 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.53 cfs 0.720 af

Reach 240: Avg. Flow Depth=0.67' Max Vel=24.51 fps Inflow=18.55 cfs 1.461 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.50 cfs 1.461 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.91 fps Inflow=18.50 cfs 1.461 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.46 cfs 1.461 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.21 cfs 0.089 af
Primary=1.21 cfs 0.089 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.10' Inflow=3.67 cfs 0.129 af
Primary=2.86 cfs 0.123 af Secondary=0.81 cfs 0.006 af Outflow=3.67 cfs 0.129 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.41' Inflow=4.01 cfs 0.253 af
Primary=1.55 cfs 0.215 af Secondary=2.47 cfs 0.038 af Outflow=4.01 cfs 0.253 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: Peak Elev=39.37' Inflow=4.28 cfs 0.227 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.28 cfs 0.227 af

Pond hil-01: Inflow=2.77 cfs 0.229 af
Primary=2.77 cfs 0.229 af

Pond hil-02: Inflow=18.50 cfs 1.461 af
Primary=18.50 cfs 1.461 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH 1: esmh-13952 Peak Elev=46.32' Inflow=8.33 cfs 0.781 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=8.33 cfs 0.781 af

Pond SMH-13932: esmh-13932 Peak Elev=42.54' Inflow=9.14 cfs 0.884 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=9.14 cfs 0.884 af

Pond SMH-20: Inflow=6.81 cfs 0.566 af
Primary=6.81 cfs 0.566 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=9.14 cfs 0.884 af
Primary=9.14 cfs 0.884 af

Link SP-C3: Inflow=4.28 cfs 0.227 af
Primary=4.28 cfs 0.227 af

Link SP-C4: Inflow=25.22 cfs 1.972 af
Primary=25.22 cfs 1.972 af

Link SP-C5: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.847 af Average Runoff Depth = 2.92"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=244' Tc=6.0 min CN=98 Runoff=2.06 cfs 0.172 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=4.22"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.63 cfs 0.121 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=2.47"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.92 cfs 0.140 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=2.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=2.13 cfs 0.154 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=188' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.430 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=316' Tc=6.0 min CN=98 Runoff=3.50 cfs 0.292 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.41 cfs 0.027 af
Outflow=2.41 cfs 0.027 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.15' Max Vel=5.72 fps Inflow=6.64 cfs 0.558 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.57 cfs 0.558 af

Reach 118: Avg. Flow Depth=0.71' Max Vel=11.58 fps Inflow=9.50 cfs 0.805 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.46 cfs 0.805 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.32' Max Vel=10.11 fps Inflow=1.70 cfs 0.273 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.69 cfs 0.273 af

Reach 171: Avg. Flow Depth=0.35' Max Vel=17.93 fps Inflow=5.15 cfs 0.430 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=5.14 cfs 0.430 af

Reach 172: Avg. Flow Depth=0.48' Max Vel=19.67 fps Inflow=8.62 cfs 0.722 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=8.61 cfs 0.722 af

Reach 181: Avg. Flow Depth=0.46' Max Vel=9.79 fps Inflow=3.50 cfs 0.292 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=3.48 cfs 0.292 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.61' Max Vel=4.07 fps Inflow=2.06 cfs 0.172 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=2.04 cfs 0.172 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.44 fps Inflow=9.46 cfs 0.805 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.32 cfs 0.805 af

Reach 230: Avg. Flow Depth=0.48' Max Vel=22.44 fps Inflow=10.92 cfs 0.926 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.89 cfs 0.926 af

Reach 240: Avg. Flow Depth=0.78' Max Vel=26.27 fps Inflow=24.37 cfs 1.935 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.31 cfs 1.935 af

Reach 260: Avg. Flow Depth=0.93' Max Vel=17.11 fps Inflow=24.31 cfs 1.935 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=24.27 cfs 1.935 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.63 cfs 0.121 af
Primary=1.63 cfs 0.121 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.21' Inflow=6.05 cfs 0.218 af
Primary=3.64 cfs 0.190 af Secondary=2.41 cfs 0.027 af Outflow=6.05 cfs 0.218 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.50' Inflow=5.84 cfs 0.351 af
Primary=1.70 cfs 0.273 af Secondary=4.14 cfs 0.077 af Outflow=5.84 cfs 0.351 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: Peak Elev=40.41' Inflow=5.76 cfs 0.345 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.76 cfs 0.345 af

Pond hil-01: Inflow=3.50 cfs 0.292 af
Primary=3.50 cfs 0.292 af

Pond hil-02: Inflow=24.31 cfs 1.935 af
Primary=24.31 cfs 1.935 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH 1: esmh-13952 Peak Elev=46.82' Inflow=10.28 cfs 0.995 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=10.28 cfs 0.995 af

Pond SMH-13932: esmh-13932 Peak Elev=43.13' Inflow=11.23 cfs 1.128 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=11.23 cfs 1.128 af

Pond SMH-20: Inflow=8.62 cfs 0.722 af
Primary=8.62 cfs 0.722 af

Link SP-C1: Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

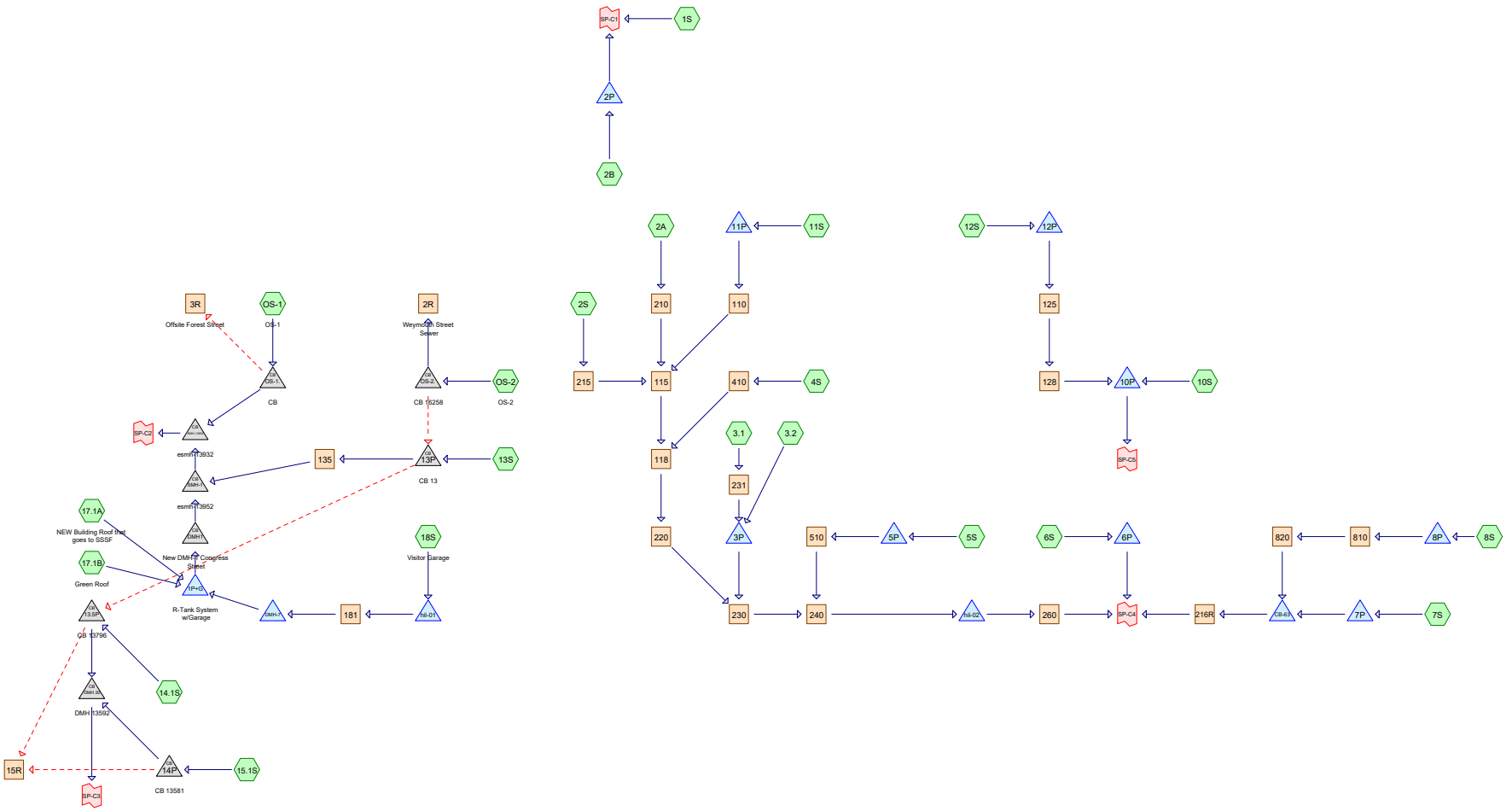
Link SP-C2: Inflow=11.23 cfs 1.128 af
Primary=11.23 cfs 1.128 af

Link SP-C3: Inflow=5.76 cfs 0.345 af
Primary=5.76 cfs 0.345 af

Link SP-C4: Inflow=34.61 cfs 2.702 af
Primary=34.61 cfs 2.702 af

Link SP-C5: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Total Runoff Area = 15.783 ac Runoff Volume = 5.230 af Average Runoff Depth = 3.98"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD Post Dev 20181025

Prepared by {enter your company name here}, Printed 10/30/2018

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.026	39	>75% Grass cover, Good, HSG A (1S, 2B, 2S, 3.1, 3.2, 5S, 6S, 8S, 10S, 14.1S, 15.1S)
0.276	86	Green roof (no Walkways) (17.1B)
6.639	98	Paved parking (1S, 2A, 2B, 2S, 3.1, 3.2, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14.1S, 15.1S, 18S)
0.028	98	Paved parking & roofs (17.1A)
3.260	98	Roofs (2S, 5S, 6S, 8S, 10S, 17.1A, 17.1B)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
0.039	98	Walkways (17.1B)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**84**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=0.11"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.03 cfs 0.004 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=0.79"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.50 cfs 0.038 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=0.11"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.02 cfs 0.003 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=0.32"
Flow Length=244' Tc=6.0 min CN=90 Runoff=0.13 cfs 0.010 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=0.25"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.06 cfs 0.005 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=0.07"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.00 cfs 0.001 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=0.79"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.46 cfs 0.035 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=0.20"
Flow Length=510' Tc=6.0 min CN=86 Runoff=0.53 cfs 0.047 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=0.20"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.05 cfs 0.004 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.00"
Flow Length=634' Tc=6.0 min CN=65 Runoff=0.00 cfs 0.000 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=0.05"
Flow Length=399' Tc=6.0 min CN=77 Runoff=0.01 cfs 0.004 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.00"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.00 cfs 0.000 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=0.79"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=0.79"
Flow Length=200' Tc=6.0 min CN=98 Runoff=0.46 cfs 0.035 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=0.32"
Flow Length=196' Tc=6.2 min CN=90 Runoff=0.29 cfs 0.022 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=0.36"
Flow Length=325' Tc=6.0 min CN=91 Runoff=0.21 cfs 0.015 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=0.02"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.00 cfs 0.001 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.87 cfs 0.066 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=0.25"
Flow Length=188' Tc=6.0 min CN=88 Runoff=0.09 cfs 0.007 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=0.79"
Flow Length=264' Tc=6.0 min CN=98 Runoff=0.53 cfs 0.040 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=0.28"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.10 cfs 0.009 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=0.28"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.31 cfs 0.028 af

Reach 2R: Weymouth Street Sewer Inflow=0.31 cfs 0.028 af
Outflow=0.31 cfs 0.028 af

Reach 3R: Offsite Forest Street Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.19' Max Vel=2.79 fps Inflow=0.22 cfs 0.017 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.22 cfs 0.017 af

Reach 115: Avg. Flow Depth=0.31' Max Vel=3.52 fps Inflow=0.84 cfs 0.065 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=0.83 cfs 0.065 af

Reach 118: Avg. Flow Depth=0.25' Max Vel=6.58 fps Inflow=1.29 cfs 0.100 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=1.28 cfs 0.100 af

Reach 125: Avg. Flow Depth=0.20' Max Vel=4.10 fps Inflow=0.46 cfs 0.035 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=0.46 cfs 0.035 af

Reach 128: Avg. Flow Depth=0.28' Max Vel=2.54 fps Inflow=0.46 cfs 0.035 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=0.45 cfs 0.035 af

Reach 135: Avg. Flow Depth=0.13' Max Vel=6.13 fps Inflow=0.29 cfs 0.022 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=0.28 cfs 0.022 af

Reach 181: Avg. Flow Depth=0.30' Max Vel=2.69 fps Inflow=0.53 cfs 0.040 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=0.52 cfs 0.040 af

Reach 210: Avg. Flow Depth=0.21' Max Vel=4.34 fps Inflow=0.50 cfs 0.038 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=0.50 cfs 0.038 af

Reach 215: Avg. Flow Depth=0.14' Max Vel=1.89 fps Inflow=0.13 cfs 0.010 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=0.13 cfs 0.010 af

Reach 216R: Avg. Flow Depth=0.02' Max Vel=3.12 fps Inflow=0.01 cfs 0.004 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=0.01 cfs 0.004 af

Reach 220: Avg. Flow Depth=0.27' Max Vel=5.93 fps Inflow=1.28 cfs 0.100 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=1.23 cfs 0.100 af

Reach 230: Avg. Flow Depth=0.17' Max Vel=11.91 fps Inflow=1.29 cfs 0.105 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=1.28 cfs 0.105 af

Reach 231: Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach 240: Avg. Flow Depth=0.20' Max Vel=12.45 fps Inflow=1.80 cfs 0.153 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=1.78 cfs 0.153 af

Reach 260: Avg. Flow Depth=0.25' Max Vel=8.04 fps Inflow=1.78 cfs 0.153 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=1.77 cfs 0.153 af

Reach 410: Avg. Flow Depth=0.28' Max Vel=2.62 fps Inflow=0.46 cfs 0.035 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=0.46 cfs 0.035 af

Reach 510: Avg. Flow Depth=0.11' Max Vel=8.95 fps Inflow=0.53 cfs 0.047 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=0.52 cfs 0.047 af

Reach 810: Avg. Flow Depth=0.02' Max Vel=3.26 fps Inflow=0.01 cfs 0.004 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=0.01 cfs 0.004 af

Reach 820: Avg. Flow Depth=0.02' Max Vel=2.55 fps Inflow=0.01 cfs 0.004 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=0.01 cfs 0.004 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=50.62' Storage=4,017 cf Inflow=1.48 cfs 0.113 af
Outflow=0.04 cfs 0.027 af

Pond 2P: Peak Elev=107.03' Storage=0 cf Inflow=0.02 cfs 0.003 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.02 cfs 0.003 af

Pond 3P: Inflow=0.06 cfs 0.005 af
Primary=0.06 cfs 0.005 af

Pond 5P: Inflow=0.53 cfs 0.047 af
Primary=0.53 cfs 0.047 af

Pond 6P: Inflow=0.05 cfs 0.004 af
Primary=0.05 cfs 0.004 af

Pond 7P: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Pond 8P: Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af

Pond 10P: Inflow=0.45 cfs 0.035 af
Primary=0.45 cfs 0.035 af

Pond 11P: Inflow=0.22 cfs 0.017 af
Primary=0.22 cfs 0.017 af

Pond 12P: Inflow=0.46 cfs 0.035 af
Primary=0.46 cfs 0.035 af

Pond 13.5P: CB 13796 Peak Elev=42.60' Inflow=0.21 cfs 0.015 af
Primary=0.21 cfs 0.015 af Secondary=0.00 cfs 0.000 af Outflow=0.21 cfs 0.015 af

Pond 13P: CB 13 Peak Elev=66.03' Inflow=0.29 cfs 0.022 af
Primary=0.29 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.022 af

Pond 14P: CB 13581 Peak Elev=42.50' Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond CB-63: Peak Elev=59.84' Storage=1 cf Inflow=0.01 cfs 0.004 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=0.01 cfs 0.004 af

Pond DMH 20: DMH 13592 Peak Elev=37.81' Inflow=0.21 cfs 0.016 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=0.21 cfs 0.016 af

Pond DMH-7: Inflow=0.52 cfs 0.040 af
Primary=0.52 cfs 0.040 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=45.77' Inflow=0.04 cfs 0.027 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=0.04 cfs 0.027 af

Pond hil-01: Inflow=0.53 cfs 0.040 af
Primary=0.53 cfs 0.040 af

Pond hil-02: Inflow=1.78 cfs 0.153 af
Primary=1.78 cfs 0.153 af

Pond OS-1.: CB Peak Elev=55.05' Inflow=0.10 cfs 0.009 af
Primary=0.10 cfs 0.009 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.009 af

Pond OS-2.: CB 16258 Peak Elev=83.13' Inflow=0.31 cfs 0.028 af
Primary=0.31 cfs 0.028 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.028 af

Pond SMH-1: esmh-13952 Peak Elev=44.84' Inflow=0.28 cfs 0.049 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=0.28 cfs 0.049 af

Pond SMH-13932: esmh-13932 Peak Elev=40.90' Inflow=0.37 cfs 0.059 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=0.37 cfs 0.059 af

Link SP-C1: Inflow=0.05 cfs 0.007 af
Primary=0.05 cfs 0.007 af

Link SP-C2: Inflow=0.37 cfs 0.059 af
Primary=0.37 cfs 0.059 af

Link SP-C3: Inflow=0.21 cfs 0.016 af
Primary=0.21 cfs 0.016 af

Link SP-C4: Inflow=1.82 cfs 0.161 af
Primary=1.82 cfs 0.161 af

Link SP-C5: Inflow=0.45 cfs 0.035 af
Primary=0.45 cfs 0.035 af

Total Runoff Area = 15.783 ac Runoff Volume = 0.392 af Average Runoff Depth = 0.30"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,481	98	Paved parking
	2,220	39	>75% Grass cover, Good, HSG A
*	2,456	98	Roofs
	16,157	90	Weighted Average
	2,220		13.74% Pervious Area
	13,937		86.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3.1:

Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	1,661	39	>75% Grass cover, Good, HSG A
*	8,390	98	Paved parking
	10,051	88	Weighted Average
	1,661		16.53% Pervious Area
	8,390		83.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.6	220	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
5.0					**Direct Entry, DIRECT**
6.0	250	Total			

Summary for Subcatchment 3.2:

Runoff = 0.00 cfs @ 12.36 hrs, Volume= 0.001 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	2,788	98	Paved parking
	1,301	39	>75% Grass cover, Good, HSG A
	4,089	79	Weighted Average
	1,301		31.82% Pervious Area
	2,788		68.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	66	0.0250	1.34		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
5.2					**Direct Entry, DIRECT**
6.0	66	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C**
					Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	36,084	98	Paved parking
	56,212	43	Woods/grass comb., Fair, HSG A
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14.1S:

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	19,947	98	Paved parking
	2,530	39	>75% Grass cover, Good, HSG A
	22,477	91	Weighted Average
	2,530		11.26% Pervious Area
	19,947		88.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	30	0.0500	1.51		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.4	295	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.3					**Direct Entry, DIRECT ENTRY**
6.0	325	Total			

Summary for Subcatchment 15.1S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	8,038	39	>75% Grass cover, Good, HSG A
*	10,606	98	Paved parking
	18,644	73	Weighted Average
	8,038		43.11% Pervious Area
	10,606		56.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.4	170	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.6	195	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	383	Total			

Summary for Subcatchment 17.1A: NEW Building Roof that goes to SSSF

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	1,202	98	Paved parking & roofs
*	42,414	98	Roofs
	43,616	98	Weighted Average
	43,616		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17.1B: Green Roof

Runoff = 0.09 cfs @ 12.10 hrs, Volume= 0.007 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	12,043	86	Green roof (no Walkways)
*	1,692	98	Walkways
*	1,144	98	Roofs
	14,879	88	Weighted Average
	12,043		80.94% Pervious Area
	2,836		19.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	26,386	98	Paved parking
	26,386		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.3	83	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.6					**Direct Entry, DIRECT**
6.0	264	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

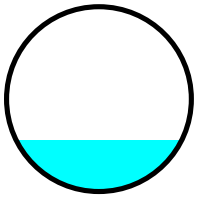
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



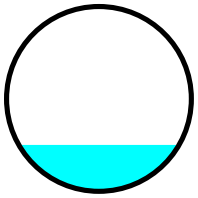
Summary for Reach 115:

Inflow Area = 1.203 ac, 95.77% Impervious, Inflow Depth = 0.65" for 1-Inch event
Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.065 af
Outflow = 0.83 cfs @ 12.11 hrs, Volume= 0.065 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.0 min

Peak Storage= 16 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



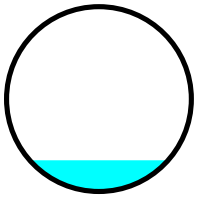
Summary for Reach 118:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.29 cfs @ 12.10 hrs, Volume= 0.100 af
Outflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.58 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.7 min

Peak Storage= 18 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



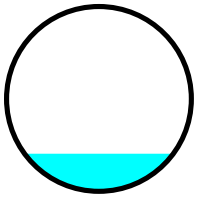
Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



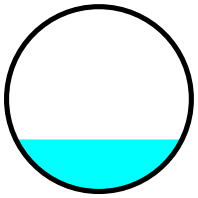
Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



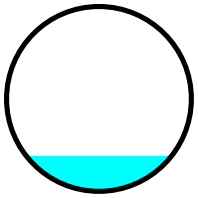
Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



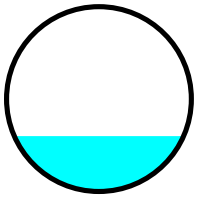
Summary for Reach 181:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 1.1 min

Peak Storage= 12 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.73 cfs

12.0" Round Pipe
n= 0.012
Length= 60.0' Slope= 0.0050 '/'
Inlet Invert= 54.46', Outlet Invert= 54.16'



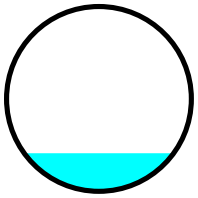
Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



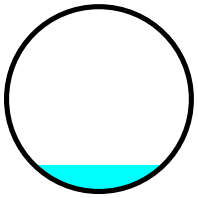
Summary for Reach 215:

Inflow Area = 0.371 ac, 86.26% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



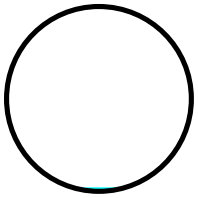
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



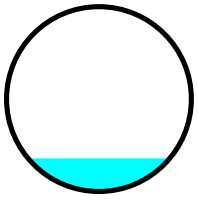
Summary for Reach 220:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af
Outflow = 1.23 cfs @ 12.13 hrs, Volume= 0.100 af, Atten= 4%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 47 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



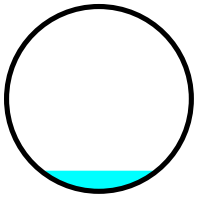
Summary for Reach 230:

Inflow Area = 2.062 ac, 94.23% Impervious, Inflow Depth = 0.61" for 1-Inch event
Inflow = 1.29 cfs @ 12.12 hrs, Volume= 0.105 af
Outflow = 1.28 cfs @ 12.13 hrs, Volume= 0.105 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



Summary for Reach 231:

Inflow Area = 0.231 ac, 83.47% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af
Outflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

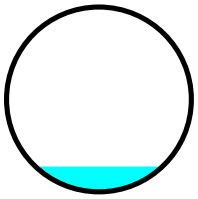
Summary for Reach 240:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.80 cfs @ 12.12 hrs, Volume= 0.153 af
Outflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.45 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.31 fps, Avg. Travel Time= 0.4 min

Peak Storage= 14 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



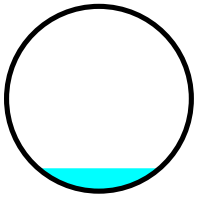
Summary for Reach 260:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Outflow = 1.77 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.79 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



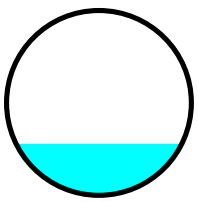
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



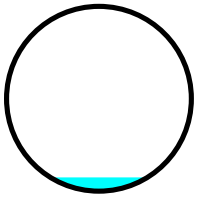
Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



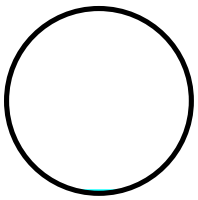
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



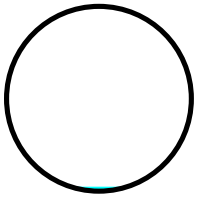
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 1P+G: R-Tank System w/Garage

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.70" for 1-Inch event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.113 af
Outflow = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af, Atten= 98%, Lag= 183.4 min
Primary = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 50.62' @ 17.15 hrs Surf.Area= 3,087 sf Storage= 4,017 cf
Flood Elev= 60.04' Surf.Area= 3,269 sf Storage= 17,041 cf

Plug-Flow detention time= 535.9 min calculated for 0.027 af (24% of inflow)
Center-of-Mass det. time= 369.5 min (1,163.5 - 794.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.58'	973 cf	**8.50'W x 76.37'L x 5.75'H Field A** 3,732 cf Overall - 1,300 cf Embedded = 2,432 cf x 40.0% Voids
#2A	51.33'	1,300 cf	**Cultec R-902HD** x 20 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#3B	48.37'	3,779 cf	**10.56'W x 189.32'L x 8.96'H Field B** 17,906 cf Overall - 8,458 cf Embedded = 9,449 cf x 40.0% Voids
#4B	48.37'	8,035 cf	**ACF R-Tank HD 5.0** x 395 Inside #3 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 79 Chambers
#5C	50.83'	286 cf	**8.50'W x 21.37'L x 5.75'H Field C** 1,044 cf Overall - 329 cf Embedded = 715 cf x 40.0% Voids
#6C	51.58'	329 cf	**Cultec R-902HD** x 5 Inside #5 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#7D	48.37'	711 cf	**10.56'W x 41.53'L x 7.96'H Field D** 3,490 cf Overall - 1,713 cf Embedded = 1,777 cf x 40.0% Voids
#8D	48.37'	1,627 cf	**ACF R-Tank HD 5.0** x 80 Inside #7 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 16 Chambers
		17,041 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard
Storage Group D created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.94'	**12.0" Round Stromdrain** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.94' / 45.76' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	46.04'	**1.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	48.37'	**2.410 in/hr Filtration over Surface area above 48.37'** Excluded Surface area = 2,438 sf
#4	Device 1	51.20'	**6.0" Vert. Orifice** C= 0.600
#5	Primary	52.20'	**0.4' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#6	Device 1	53.95'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.04 cfs @ 15.15 hrs HW=50.58' (Free Discharge)
- **1=Stromdrain** (Passes 0.04 cfs of 7.55 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.04 cfs of 0.13 cfs potential flow)
    - **3=Filtration** (Exfiltration Controls 0.04 cfs)
  - **4=Orifice** (Controls 0.00 cfs)
  - **6=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
1=Culvert (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.325 ac, 79.05% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.516 ac, 88.74% Impervious, Inflow Depth = 0.36" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.60' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.20 cfs @ 12.10 hrs HW=42.60' (Free Discharge)
↑└**1=12" SD** (Passes 0.20 cfs of 4.79 cfs potential flow)
↑└**2=Curb Inlet** (Weir Controls 0.20 cfs @ 1.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
↑└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB 13

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.20'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
└**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: CB 13581

Inflow Area = 0.428 ac, 56.89% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.62'	**8.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.62' / 39.00' S= 0.1080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=42.50' (Free Discharge)
└**1=12" SD** (Passes 0.00 cfs of 2.09 cfs potential flow)
└**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=40.62' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.8 min
Primary = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20: DMH 13592

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.81' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=37.81' (Free Discharge)
1=12" SD (Inlet Controls 0.21 cfs @ 1.60 fps)

Summary for Pond DMH-7:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af
Primary = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond DMH1: New DMH-1 Congress Street

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.17" for 1-Inch event
Inflow = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af
Outflow = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 45.77' @ 15.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.66'	**15.0" Round Stormdrain** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.66' / 45.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.04 cfs @ 15.15 hrs HW=45.77' (Free Discharge)
↑—**1=Stormdrain** (Barrel Controls 0.04 cfs @ 1.09 fps)

Summary for Pond hil-01:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Primary = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
└**1=Stormdrain** (Passes 0.07 cfs of 5.24 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
└**1=Stormdrain** (Passes 0.30 cfs of 3.12 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SMH-1: esmh-13952

Inflow Area = 2.775 ac, 85.75% Impervious, Inflow Depth = 0.21" for 1-Inch event
Inflow = 0.28 cfs @ 12.12 hrs, Volume= 0.049 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.12 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 44.84' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Culvert** L= 41.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0724 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.27 cfs @ 12.12 hrs HW=44.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.27 cfs @ 1.62 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.22" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af
Outflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.90' @ 12.13 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.36 cfs @ 12.13 hrs HW=40.90' (Free Discharge)
└**1=Sewer** (Inlet Controls 0.36 cfs @ 1.74 fps)

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.22" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.351 ac, 70.70% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af
Primary = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=2.08"
Flow Length=244' Tc=6.0 min CN=90 Runoff=0.88 cfs 0.064 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=1.91"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.50 cfs 0.037 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=1.26"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.13 cfs 0.010 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=2.16"
Flow Length=325' Tc=6.0 min CN=91 Runoff=1.26 cfs 0.093 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=0.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.42 cfs 0.033 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=2.94 cfs 0.239 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=1.91"
Flow Length=188' Tc=6.0 min CN=88 Runoff=0.75 cfs 0.054 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=264' Tc=6.0 min CN=98 Runoff=1.78 cfs 0.145 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.65' Max Vel=5.11 fps Inflow=3.30 cfs 0.263 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.27 cfs 0.263 af

Reach 118: Avg. Flow Depth=0.49' Max Vel=9.65 fps Inflow=4.83 cfs 0.391 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=4.80 cfs 0.391 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.29' Max Vel=9.56 fps Inflow=1.37 cfs 0.137 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.36 cfs 0.137 af

Reach 181: Avg. Flow Depth=0.59' Max Vel=3.70 fps Inflow=1.78 cfs 0.145 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=1.76 cfs 0.145 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.37' Max Vel=3.29 fps Inflow=0.88 cfs 0.064 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=0.87 cfs 0.064 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.52' Max Vel=8.72 fps Inflow=4.80 cfs 0.391 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.70 cfs 0.391 af

Reach 230: Avg. Flow Depth=0.33' Max Vel=18.24 fps Inflow=5.32 cfs 0.437 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.30 cfs 0.437 af

Reach 231: Inflow=0.50 cfs 0.037 af
Outflow=0.50 cfs 0.037 af

Reach 240: Avg. Flow Depth=0.50' Max Vel=21.28 fps Inflow=11.02 cfs 0.855 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=10.98 cfs 0.855 af

Reach 260: Avg. Flow Depth=0.60' Max Vel=13.77 fps Inflow=10.98 cfs 0.855 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=10.95 cfs 0.855 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=52.94' Storage=9,376 cf Inflow=5.45 cfs 0.438 af
Outflow=2.03 cfs 0.353 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.64 cfs 0.047 af
Primary=0.64 cfs 0.047 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.94' Inflow=1.83 cfs 0.099 af
Primary=1.83 cfs 0.099 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.099 af

Pond 13P: CB 13 Peak Elev=66.33' Inflow=1.94 cfs 0.143 af
Primary=1.37 cfs 0.137 af Secondary=0.56 cfs 0.006 af Outflow=1.94 cfs 0.143 af

Pond 14P: CB 13581 Peak Elev=42.66' Inflow=0.42 cfs 0.033 af
Primary=0.42 cfs 0.033 af Secondary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.033 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: DMH 13592 Peak Elev=38.44' Inflow=2.25 cfs 0.132 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=2.25 cfs 0.132 af

Pond DMH-7: Inflow=1.76 cfs 0.145 af
Primary=1.76 cfs 0.145 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=46.54' Inflow=2.03 cfs 0.353 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=2.03 cfs 0.353 af

Pond hil-01: Inflow=1.78 cfs 0.145 af
Primary=1.78 cfs 0.145 af

Pond hil-02: Inflow=10.98 cfs 0.855 af
Primary=10.98 cfs 0.855 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH-1: esmh-13952 Peak Elev=45.42' Inflow=2.99 cfs 0.490 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=2.99 cfs 0.490 af

Pond SMH-13932: esmh-13932 Peak Elev=41.54' Inflow=3.59 cfs 0.554 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=3.59 cfs 0.554 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=3.59 cfs 0.554 af
Primary=3.59 cfs 0.554 af

Link SP-C3: Inflow=2.25 cfs 0.132 af
Primary=2.25 cfs 0.132 af

Link SP-C4: Inflow=13.78 cfs 1.089 af
Primary=13.78 cfs 1.089 af

Link SP-C5: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.296 af Average Runoff Depth = 1.75"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=3.49"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.44 cfs 0.108 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=3.29"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.85 cfs 0.063 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=2.46"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.27 cfs 0.019 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=3.59"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.05 cfs 0.155 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=1.97"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.96 cfs 0.070 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=4.40 cfs 0.364 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=3.29"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.26 cfs 0.094 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=264' Tc=6.0 min CN=98 Runoff=2.66 cfs 0.220 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=1.22 cfs 0.011 af
Outflow=1.22 cfs 0.011 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.86' Max Vel=5.61 fps Inflow=5.06 cfs 0.411 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.03 cfs 0.411 af

Reach 118: Avg. Flow Depth=0.61' Max Vel=10.83 fps Inflow=7.35 cfs 0.605 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.31 cfs 0.605 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.33' Max Vel=10.15 fps Inflow=1.73 cfs 0.219 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.72 cfs 0.219 af

Reach 181: Avg. Flow Depth=0.80' Max Vel=3.96 fps Inflow=2.66 cfs 0.220 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.64 cfs 0.220 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.49' Max Vel=3.75 fps Inflow=1.44 cfs 0.108 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.43 cfs 0.108 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.66' Max Vel=9.78 fps Inflow=7.31 cfs 0.605 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.19 cfs 0.605 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.75 fps Inflow=8.29 cfs 0.687 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.26 cfs 0.687 af

Reach 231: Inflow=0.85 cfs 0.063 af
Outflow=0.85 cfs 0.063 af

Reach 240: Avg. Flow Depth=0.66' Max Vel=24.42 fps Inflow=18.27 cfs 1.428 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.22 cfs 1.428 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.85 fps Inflow=18.22 cfs 1.428 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.19 cfs 1.428 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=53.90' Storage=11,657 cf Inflow=8.29 cfs 0.678 af
Outflow=4.42 cfs 0.592 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.12 cfs 0.083 af
Primary=1.12 cfs 0.083 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.13' Inflow=4.31 cfs 0.189 af
Primary=3.09 cfs 0.178 af Secondary=1.22 cfs 0.011 af Outflow=4.31 cfs 0.189 af

Pond 13P: CB 13 Peak Elev=66.52' Inflow=4.01 cfs 0.253 af
Primary=1.73 cfs 0.219 af Secondary=2.29 cfs 0.034 af Outflow=4.01 cfs 0.253 af

Pond 14P: CB 13581 Peak Elev=42.78' Inflow=0.96 cfs 0.070 af
Primary=0.96 cfs 0.070 af Secondary=0.00 cfs 0.000 af Outflow=0.96 cfs 0.070 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: DMH 13592 Peak Elev=39.23' Inflow=4.05 cfs 0.249 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.05 cfs 0.249 af

Pond DMH-7: Inflow=2.64 cfs 0.220 af
Primary=2.64 cfs 0.220 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=47.09' Inflow=4.42 cfs 0.592 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=4.42 cfs 0.592 af

Pond hil-01: Inflow=2.66 cfs 0.220 af
Primary=2.66 cfs 0.220 af

Pond hil-02: Inflow=18.22 cfs 1.428 af
Primary=18.22 cfs 1.428 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH-1: esmh-13952 Peak Elev=45.85' Inflow=5.94 cfs 0.811 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=5.94 cfs 0.811 af

Pond SMH-13932: esmh-13932 Peak Elev=42.01' Inflow=6.73 cfs 0.913 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.73 cfs 0.913 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=6.73 cfs 0.913 af
Primary=6.73 cfs 0.913 af

Link SP-C3: Inflow=4.05 cfs 0.249 af
Primary=4.05 cfs 0.249 af

Link SP-C4: Inflow=24.94 cfs 1.939 af
Primary=24.94 cfs 1.939 af

Link SP-C5: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.955 af Average Runoff Depth = 3.01"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=4.65"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.89 cfs 0.144 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=4.43"
Flow Length=250' Tc=6.0 min CN=88 Runoff=1.14 cfs 0.085 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=3.50"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.38 cfs 0.027 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=4.76"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.67 cfs 0.205 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=2.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=1.44 cfs 0.104 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=5.56 cfs 0.464 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=4.43"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.68 cfs 0.126 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=264' Tc=6.0 min CN=98 Runoff=3.36 cfs 0.281 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.76 cfs 0.033 af
Outflow=2.76 cfs 0.033 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.09' Max Vel=5.70 fps Inflow=6.47 cfs 0.530 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.41 cfs 0.530 af

Reach 118: Avg. Flow Depth=0.70' Max Vel=11.53 fps Inflow=9.35 cfs 0.777 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.30 cfs 0.777 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.35' Max Vel=10.44 fps Inflow=1.94 cfs 0.280 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.93 cfs 0.280 af

Reach 181: Avg. Flow Depth=1.00' Max Vel=3.94 fps Inflow=3.36 cfs 0.281 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.94 cfs 0.281 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.58' Max Vel=4.00 fps Inflow=1.89 cfs 0.144 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.88 cfs 0.144 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.40 fps Inflow=9.30 cfs 0.777 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.15 cfs 0.777 af

Reach 230: Avg. Flow Depth=0.47' Max Vel=22.28 fps Inflow=10.64 cfs 0.890 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.61 cfs 0.890 af

Reach 231: Inflow=1.14 cfs 0.085 af
Outflow=1.14 cfs 0.085 af

Reach 240: Avg. Flow Depth=0.77' Max Vel=26.20 fps Inflow=24.09 cfs 1.899 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.04 cfs 1.899 af

Reach 260: Avg. Flow Depth=0.92' Max Vel=17.05 fps Inflow=24.04 cfs 1.899 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=23.99 cfs 1.899 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=54.25' Storage=12,492 cf Inflow=9.96 cfs 0.871 af
Outflow=8.08 cfs 0.785 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.51 cfs 0.113 af
Primary=1.51 cfs 0.113 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.23' Inflow=6.54 cfs 0.276 af
Primary=3.78 cfs 0.243 af Secondary=2.76 cfs 0.033 af Outflow=6.54 cfs 0.276 af

Pond 13P: CB 13 Peak Elev=66.65' Inflow=5.84 cfs 0.351 af
Primary=1.94 cfs 0.280 af Secondary=3.91 cfs 0.071 af Outflow=5.84 cfs 0.351 af

Pond 14P: CB 13581 Peak Elev=42.87' Inflow=1.44 cfs 0.104 af
Primary=1.44 cfs 0.104 af Secondary=0.00 cfs 0.000 af Outflow=1.44 cfs 0.104 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: DMH 13592 Peak Elev=39.99' Inflow=5.21 cfs 0.347 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.21 cfs 0.347 af

Pond DMH-7: Inflow=2.94 cfs 0.281 af
Primary=2.94 cfs 0.281 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=48.09' Inflow=8.08 cfs 0.785 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=8.08 cfs 0.785 af

Pond hil-01: Inflow=3.36 cfs 0.281 af
Primary=3.36 cfs 0.281 af

Pond hil-02: Inflow=24.04 cfs 1.899 af
Primary=24.04 cfs 1.899 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH-1: esmh-13952 Peak Elev=46.71' Inflow=9.92 cfs 1.065 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=9.92 cfs 1.065 af

Pond SMH-13932: esmh-13932 Peak Elev=43.02' Inflow=10.90 cfs 1.197 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=10.90 cfs 1.197 af

Link SP-C1: Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

Link SP-C2: Inflow=10.90 cfs 1.197 af
Primary=10.90 cfs 1.197 af

Link SP-C3: Inflow=5.21 cfs 0.347 af
Primary=5.21 cfs 0.347 af

Link SP-C4: Inflow=34.33 cfs 2.666 af
Primary=34.33 cfs 2.666 af

Link SP-C5: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Total Runoff Area = 15.783 ac Runoff Volume = 5.358 af Average Runoff Depth = 4.07"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Attachment C

INSPECTION, MAINTENANCE, AND HOUSEKEEPING

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Maine Medical Center
Portland, ME

Introduction

The owner of the development is Maine Medical Center. The owner's address is 22 Bramhall Street, Portland, Maine 04102. The owner of the proposed project will be responsible for the maintenance of all stormwater management structures, the establishment of any contract services required to implement the program, and the keeping of records and maintenance logbook. The owner will assure that the following maintenance program will be adhered.

Records of all inspections and maintenance work accomplished must be kept on file and retained for a minimum 5-year time span. The maintenance logbook will be made available to the Maine Department of Environmental Protection (MDEP) and the City of Portland upon request. At a minimum, the appropriate and relevant activities for each of the stormwater management systems will be performed on the prescribed schedule.

The following plan outlines the anticipated inspection, maintenance, and housekeeping procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in the Inspection, Maintenance, and Housekeeping Plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional details on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the MDEP.

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within seven (7) calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

   The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three (3) years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

   A. <u>Sediment Barriers:</u>

   - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
   - If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
   - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
   - Filter berms shall be reshaped as needed.
   - Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

   B. <u>Riprap Materials:</u>

   - Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to this plan.

D. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

E. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

F. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

   A. Spill Prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

   B. Groundwater Protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

   C. Fugitive Sediment and Dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

   D. Debris and Other Materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   E. Trench or Foundation Dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

After Construction

1. **Inspection:** After construction, the owner or operator shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

2. **Maintenance, and repair:** If a BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator shall take corrective actions to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective actions to the Department of Public Works (DPW). The following is a list of permanent erosion control and stormwater management measures and the inspection, maintenance, and housekeeping tasks to be performed after construction.

A. Vegetated Areas:

- Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
- Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

B. Winter Sanding:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

C. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.

D. ACF R-Tank System:

- Refer to R-Tank – Operation, Inspection & Maintenance manual for guidance on required maintenance and inspection.

E. Cultec Stormwater Chamber System:

- Refer to Cultec – Operation & Maintenance Guidelines for guidance on required maintenance and inspection.

3. **Annual Report:** The owner or operator or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification that the person has inspected the BMPs and that they are adequately maintained

and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance or repair, including the record of the deficiency and corrective actions taken.

4. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

Attachments

Attachment 1 – Sample Stormwater Inspection and Maintenance Form

Attachment 1 - Sample Stormwater Inspection and Maintenance Form

Maine Medical Center
Portland, ME

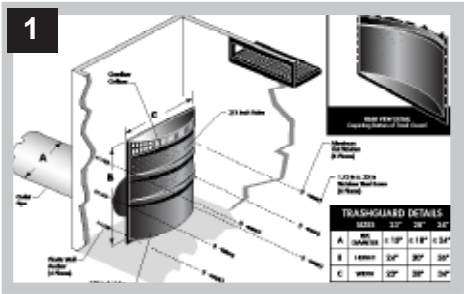
This log is intended to accompany the stormwater Inspection, Maintenance and Housekeeping Plan for Maine Medical Center. The following items shall be checked, cleaned and maintained on a regular basis as specified in the Maintenance Plan and as described in the table below. This log shall be kept on file for a minimum of five (5) years and shall be available for review. Qualified personnel familiar with drainage systems and soils shall perform all inspections. Attached is a copy of the construction and post-construction maintenance logs.

Item	Maintenance Required & Frequency	Date Completed	Maintenance Personnel	Comments
Ditches and Swales	Inspect after major rainfall event producing greater than 3" of rain in 2 hours.			
	Repair erosion or damage immediately.			
Catch Basins	Remove accumulated sediment and debris			
	Sump depth			
Vegetated Areas	Inspect Slopes			
	Replant Bare Areas			
	Check after Major Storms			
Winter Sanding	Clean annually (Spring)			
	Remove sand and sediment from roadway shoulders			
ACF R-Tanks	Inspect quarterly through first year of use, with yearly inspections thereafter			
Cultec Stormwater Chambers	Inspect monthly in first year, with yearly inspections thereafter and every third year following			

R-TANK MAINTENANCE

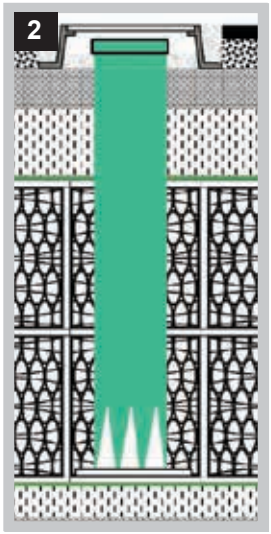
With adequate pre-treatment of stormwater before it enters the ACF R-Tank, heavy sediments, trash, and other debris will not enter the system. Systems like the TrashGuard (see image 1) are simple and inexpensive, but also highly effective. Therefore, most maintenance efforts should be directed at the pre-treatment structures to ensure they are functioning properly.

To monitor the accumulation of fine sediments that may enter the detention/ retention area, ACF R-Tank systems should include maintanance ports.



Maintenance

Running from the bottom of the ACF R-Tank up to ground level, Maintenance Ports are made from solid PVC Pipe with notches cut into the bottom. As water is pumped into the port the notches will direct water throughout the bottom of the system to create turbulence, thereby re-suspending accumulated sediments.



After pumping water into the tanks, flushing is completed by vacuuming sediment laden water out of the system either through the outlet structure or through the flush port.

The diameter of the flush port is determined by a number of factors including the rate at which water will be pumped into the system, the number of flush ports incorporated, and the possible requirement of vacuuming through the port. Experience has shown that a 12” port is more than adequate for virtually any required use, with 6” ports more common when vacuuming will be performed at the outlet structure.



Installing the Maintenance System

To install the PCV Pipe, remove the center small plate and cut the top large plate between the remaining interior small plates. Before inserting the port into the Tank, install an anti-scour plate in the bottom of the Tank to prevent disturbance of the base materials.

Maintenance ports should be capped at the surface. In landscaped areas, this may be accomplished with a simple pipe cap or plastic valve box (see image 4 lower inset). In paved areas, metal lids are more appropriate (see image 4).



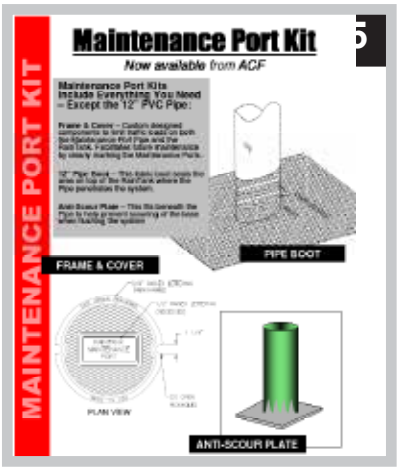
R-TANK MAINTENANCE

Maintenance Intervals

Maintenance Schedules for the ACF R-Tank System are a function of the contributing area and the type of pre-treatment specified. A standard maintenance schedule may include quarterly inspections through the first year of use, with yearly inspections thereafter. Flushing should be performed if sediment should the lesser of 6" or 15% of the system height.

Availability

All system components, including caps, lids, anti-scour plates, frames and covers are available from ACF. In fact, we've created Maintenance Port Kids (see image 5) that include everything needed except for the pipe itself. Contact your local sales representative or our Sales Office at 800-448-3636 for assistance.



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R-TANK OPERATION, INSPECTION & MAINTENANCE

Operation

Your ACF R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspection frequency for your system must be determined based on the contributing drainage area, but should never exceed one year between inspections (six months during the first year of operation).

Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment your inspection and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you MUST follow all local/regional requirements as well as OSHA standards.

R-Tank Systems may incorporate Inspection Ports, Maintenance Ports, and/or adjoining manholes. Each of these features are easily accessed by removing the lid at the surface. With the cover removed, a visual inspection can be performed to identify sediment deposits within the structure. Using a flashlight, ALL access points should be examined to complete a thorough inspection.

Inspection Ports
Usually located centrally in the R-Tank System, these perforated columns are designed to give the user a base-line sediment depth across the system floor.

Maintenance Ports
Usually located near the inlet and outlet connections, you'll likely find deeper deposits of heavier sediments when compared to the Inspection Ports.

Manholes
Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Bear in mind that these manholes often include a sump below the invert of the pipe connecting to the R-Tank. These sumps are designed to capture sediment before it reaches the R-Tank, and they should be kept clean to ensure they function properly. However, existence of sediment in the sump does NOT necessarily mean sediment has accumulated in the R-Tank.

After inspecting the bottom of the structure, use a mirror on a pole (or some other device) to check for sediment or debris in the pipe connecting to the R-Tank.

R-TANK OPERATION INSPECTION & MAINTENANCE

If sediment or debris is observed in any of these structures, you should determine the depth of the material. This is typically accomplished with a stadia rod, but you should determine the best way to obtain the measurement.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guideline.

Maintenance

The R-Tank System should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Use the chart below as a guideline to determine the point at which maintenance is required on your system.

R-Tank Unit	Height	Max Sediment Dept
Mini	9.5"	1.5"
Single	17"	3"
Double	34"	5"
Triple	50"	6"
Quad	67"	6"
Pent	84"	6"

Before any maintenance is performed on your system, be sure to plug the outlet pipe to prevent contamination of the adjacent systems.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. Water should be pumped into ALL Maintenance Ports. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out.

If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

Once removed, sediment-laden water may be captured for disposal or pumped through a Dirtbag™ (if permitted by the locality).

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Step-By-Step Inspection & Maintenance Routine

1) **Inspection**
    a. Inspection Port
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
    b. Maintenance Port/s
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
        vi. Repeat for ALL Maintenance Ports
    c. Adjacent Manholes
        i. Remove Cover
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod, accounting for depth of sump (if present)
        iv. Inspect pipes connecting to R-Tank
        v. Record results on Maintenance Log
        vi. Replace Cover
        vii. Repeat for ALL Manholes that connect to the R-Tank

2) **Maintenance**
    a. Plug system outlet to prevent discharge of back-flush water
    b. Determine best location to pump out back-flush water
    c. Remove Cap from Maintenance Port
    d. Pump water as rapidly as possible (without over-topping port) into system until at least 1”
    of water covers system bottom
    e. Replace Cap
    f. Repeat at ALL Maintenance Ports
    g. Pump out back-flush water to complete back-flushing
    h. Vacuum all adjacent structures and any other structures or stormwater pre-treatment systems that require attention
    i. Sediment-laden water may be captured for disposal or pumped through a Dirtbag™.
    j. Replace any remaining Caps or Covers
    k. Record the back-flushing event in your Maintenance Log with any relevant specifics

R-Tank Maintenance Log

Site Name:_____

Location:_____

System Owner:_____

Company Responsible for Maintenance:_____

Contact:_____

Phone Numer:_____

Date	Location	Depth to Bottom	Depth to Sediment	Sediment Depth	Observations/Notes	Initials

Contactor® & Recharger®
Stormwater Chambers



Operation and Maintenance Guidelines
for CULTEC Stormwater Management Systems

The Founder of Plastic Chamber Technology

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Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail tech@cultec.com.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CULG008 05-17
May 2017

These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pretreatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

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2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

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	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

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WQMP
Operation & Maintenance (O&M) Plan

Project Name:_____

Prepared for:

Project Name: _____

Address:_____

City, State Zip:_____

Prepared on:

Date:_____

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This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

8.1.1 Project Information

Project name	
Address	
City, State Zip	
Site size	
List of structural BMPs, number of each	
Other notes	

8.1.2 Responsible Party

The responsible party for implementation of this WQMP is:

Name of Person or HOA Property Manager	
Address	
City, State Zip	
Phone number	
24-Hour Emergency Contact number	
Email	

8.1.3 Record Keeping

Parties responsible for the O&M plan shall retain records for at least 5 years.

All training and educational activities and BMP operation and maintenance shall be documented to verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in this document.

8.1.4 Electronic Data Submittal

This document along with the Site Plan and Attachments shall be provided in PDF format. AutoCAD files and/or GIS coordinates of BMPs shall also be submitted to the City.

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Appendix ____

BMP SITE PLAN

Site plan is preferred on minimum 11” by 17” colored sheets, as long as legible.

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BMP OPERATION & MAINTENANCE LOG

Project Name: _____

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

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Minor Maintenance

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

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Major Maintenance

	Frequency		Action
Inlets and Outlets	**Every 3 years**		Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
			Notes
	□ Year 1	Date:	
	□ Year 4	Date:	
	□ Year 7	Date:	
	□ Year 10	Date:	
	□ Year 13	Date:	
	□ Year 16	Date:	
	□ Year 19	Date:	
	□ Year 22	Date:	
	Spring and Fall		Check inlet and outlets for clogging and remove any debris, as required.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
CULTEC Stormwater Chambers	**2 years after commissioning**		□ Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
			Notes
	□ Year 2	Date:	

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Major Maintenance

	Frequency		Action
CULTEC Stormwater Chambers	**9 years after commissioning every 9 years following**		□ Clean stormwater management chambers and feed connectors of any debris. □ Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
			Notes
	□ Year 9	Date:	
	□ Year 18	Date:	
	□ Year 27	Date:	
	□ Year 36	Date:	
	45 years after commissioning		□ Clean stormwater management chambers and feed connectors of any debris. □ Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. □ Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. □ Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. □ Attain the appropriate approvals as required. □ Establish a new operation and maintenance schedule.
			Notes
	□ Year 45	Date:	

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Major Maintenance

	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

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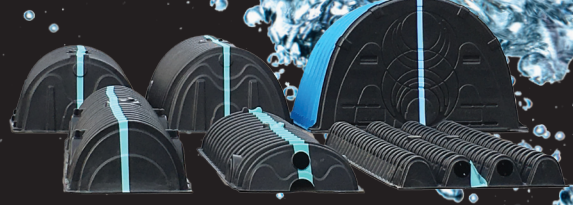


Attachment D

SOILS MAP

Soil Map—Cumberland County and Part of Oxford County, Maine
(Maine Medical Center area)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 15, Sep 6, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Au	Au Gres loamy sand	6.9	1.5%
BgB	Belgrade very fine sandy loam, 0 to 8 percent slopes	8.1	1.8%
Cu	Cut and fill land	39.7	8.6%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	60.4	13.1%
Gp	Gravel pits	5.5	1.2%
HfD2	Hartland very fine sandy loam, 15 to 25 percent slopes, eroded	3.1	0.7%
HlB	Hinckley loamy sand, 3 to 8 percent slopes	261.8	57.0%
HlC	Hinckley loamy sand, 8 to 15 percent slopes	13.4	2.9%
HlD	Hinckley loamy sand, 15 to 25 percent slopes	33.9	7.4%
Sz	Swanton fine sandy loam	0.4	0.1%
W	Water	4.7	1.0%
Wa	Walpole fine sandy loam	4.1	0.9%
WmB	Windsor loamy sand, 0 to 8 percent slopes	17.2	3.7%
Totals for Area of Interest		**459.3**	**100.0%**

Y

WRITTEN SUBMISSION 24 – CONSISTENCY WITH CITY MASTER PLANS
BRAMHALL ST. – 22; MMC CONGRESS STREET BUILDING
LEVEL III SITE PLAN APPLICATION

PAGES 24 – 27 OF MMC'S INSTITUTIONAL DEVELOPMENT PLAN DESCRIBES HOW MMC'S PLAN IS CONSISTENT WITH THE CITY OF PORTLAND'S COMPREHENSIVE PLAN. THOSE PAGES ARE ATTACHED TO THIS DOCUMENT.

COMPLIANCE WITH THE COMPREHENSIVE PLAN

MMC, being a long term member of the Portland community, recognizes the Comprehensive Plan contains the City's overall goals for growth and change through the articulation of a variety of policy directives and goals for the development. Among other things, the Plan addresses the City's infrastructure, commercial/business development, transportation resources, industry, and commerce and residential housing plans.

The MMC IDP and Regulatory Framework are in basic harmony with the City's overarching goals and policies. With its IDP and Regulatory Framework, MMC has balanced and accommodated the many City goals and policies in a way that advances the City's overall best interests while at the same time addresses the high priority healthcare needs of Portland's residents and the people of the State of Maine. This balancing is exactly the type of flexibility that the City's recently drafted IOZ ordinance is meant to facilitate.

The Comprehensive Plan challenges the City to "support the vision of large, transformative projects [such as the MMC modernization project] through strategic, cost effective, and incremental actions" (*Comprehensive Plan*, p.74).

MMC IDP: COMPLIANCE WITH THE COMPREHENSIVE PLAN

In this IDP, MMC conveys the need to modernize its facility in order to meet the healthcare needs of the people of northern New England. This includes not only upgrading clinical space and providing for the needs of patients and families, but also continuing its investment in its personnel and their ability to travel to and from the workplace and secure needed parking. The adopted 2035 Comprehensive Plan "promotes the orderly expansion of institutional uses, such as educational and hospital campuses, which are central to workforce development, employment, and the health of the local and regional economies" (*Comprehensive Plan*, p.45).

<u>Economic Growth</u>

Employee engagement indicators reveal that one of the issues of greatest importance to current and future employees, in addition to compensation, is parking availability. In order to attract a high quality, highly educated workforce, MMC factors into its operations these two important considerations. Following the completion of its short-term modernization project, MMC projects a growth in its employment base into the future in part because of its status as an excellent academic medical center. Portland's Comprehensive Plan promotes the growth in employment base and supports sustainable growth in education and medical institutions (*Comprehensive Plan*, pp. 44 and 88)

Transportation

MMC has considered its transportation needs holistically, factoring into its future development alternative means of transportation. Since 2009, MMC has implemented a Transportation Demand Management (TDM) plan called "Get on Board!". MMC is updating that plan and considering enhancements to encourage more walking, cycling, and public transportation by its employees.

MMC's ability to promote alternative modes of transportation and success in TDM relies on the availability of a regional system of safe and reliable alternative modes of transportation. Therefore, MMC supports the City's effort to 'explore the technical and financial feasibility of a Transportation Management Association (TMA) as a means of improving access to, and mobility around, downtown, and the waterfront.' (Comprehensive plan, p.76)".

MMC has been, and continues to be, committed to the process and has often been cited by the City of Portland Planning Department as a TDM role model in the City.

Environment

A clean environment is important for healing and health. MMC is environmentally conscious and engages in recycling to minimize the generation and environmental impacts of solid waste. The Hospital conserves water when possible, and has switched away from pesticides to more organic landscape solutions reflecting Portland's goal of "model[ling] environmentally sound landscape management practices, such as planting native species, and limiting the use of pesticides and fertilizers" (*Comprehensive Plan*, p. 20). Buildings are built with energy efficiency standards in mind. Local farmers visit the campus weekly during harvest months and employees are encouraged to support the local food movement. The Comprehensive Plan also notes the need to "support a healthy, resilient, and sustainable food system by collaborating with local and regional stakeholders" (*Comprehensive Plan*, p.20).

MMC REGULATORY FRAMEWORK: COMPLIANCE WITH THE COMPREHENSIVE PLAN

In keeping with the goals of the Comprehensive Plan, MMC has projected its future expansion needs, taking into account the neighborhood context in which it is situated. MMC has minimized future expansion into residential areas adjacent to its campus, thereby preserving housing stock in the City (*Comprehensive Plan*, pp. 48-50). It has appreciated the neighborhood involvement in

its zoning process and has been responsive to the concerns raised.

MMC is taking the bold step of reorienting its front entrance to Congress St, which serves as a gateway corridor to the City of Portland. The area presently is commercial in nature and in need of investment and activation as is recognized by the City's *Comprehensive Plan* (pp. 84, 86). Welcoming the public at the new entrance accomplishes a number of land use goals: it adds tremendous activity to the streetscape, with people coming and going. It also eliminates traffic in the residential neighborhoods of the West End and Western Promenade by providing clear wayfinding directly off of Interstate 295 and the major arterials entering the City. Further, investment in this area will transform the area with the expectation that other properties in the vicinity will likewise invest. In fact, the owners of Union Plaza, located at the junction of Congress St and St John St, testified before the Portland Planning Board that they have been waiting for such investment before they took the step of redesigning and investing further in that property. MMC expects, and is excited about, a transformation of the area into a more vibrant, active and clean area, good for local merchants, hospitality businesses, restaurants and residents.

The *Comprehensive Plan* identifies the St John St / Congress St area as a "priority node, an area that has seen disinvestment, grown in sprawling patterns, simply have the potential to serve as focal points for change in the forms of increased density or, height, streetscape improvements, or diversification of uses to better serve neighborhood needs" (*Comprehensive Plan* p. 84, see **Fig.1.8 on page 27**). MMC's IDP will serve as the catalyst to stimulate new development, investment and reinvestment in this area of the City.

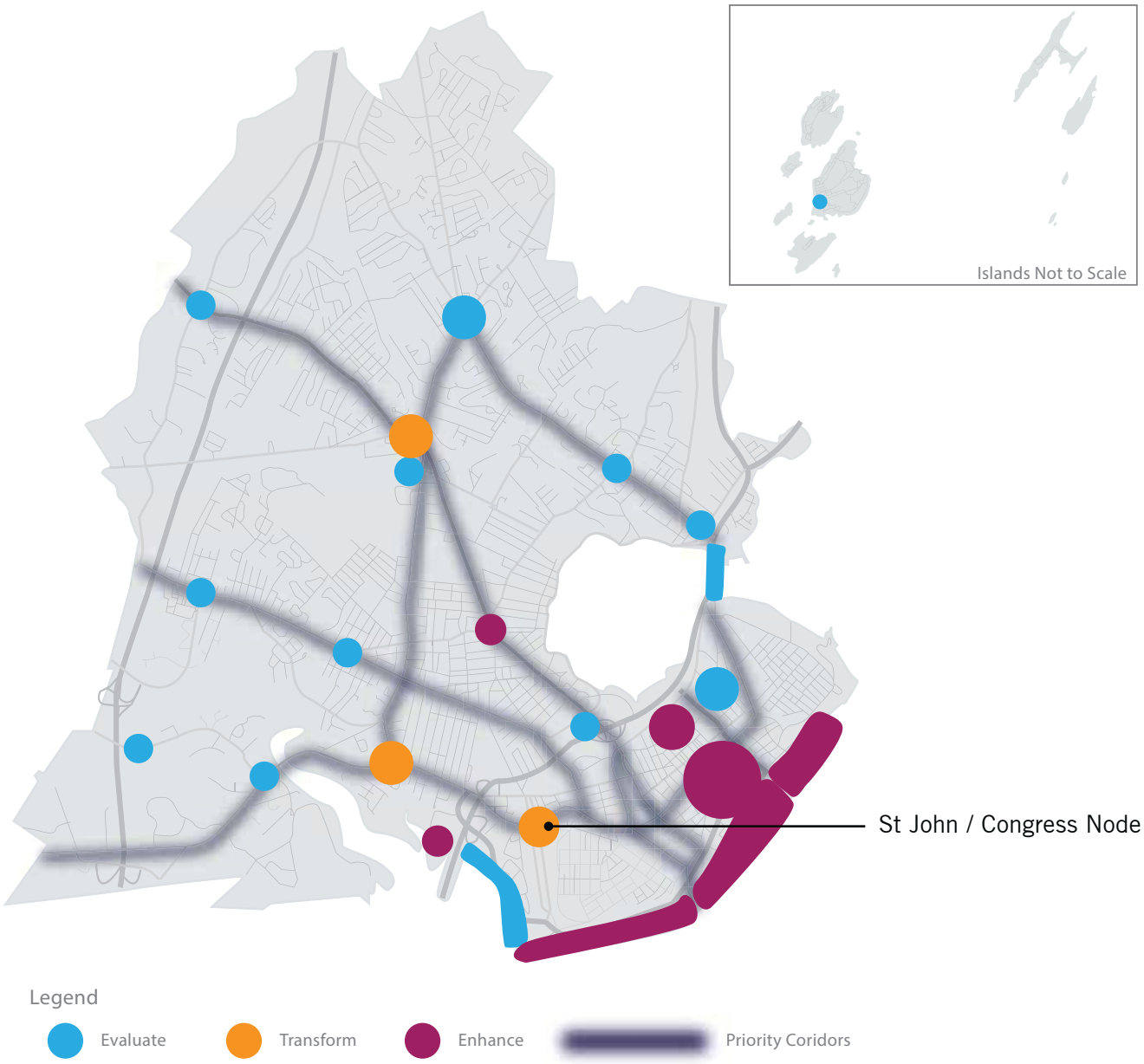
MMC's IOZ Regulatory Framework provides the mechanism for thoughtful, future development to transform the priority corridor identified by the City into an area of "additional mixed uses, higher density growth to take advantage of the transit benefits and services that well-designed, diverse corridors can offer" (*Comprehensive Plan*, p.84).

CONCLUSION

From an analysis of MMC's IDP, it becomes clear that the IDP is consistent with the City's Comprehensive Plan and the purposes contained within the City's IOZ ordinance.

From an analysis of the Regulatory Framework that accompanies MMC's IDP, it becomes clear that the Regulatory Framework is consistent with the City's Comprehensive Plan and with MMC's IDP.

Fig.1.8 Diagram Showing Priority Nodes and Corridors, City of Portland Comprehensive Plan (2017)



Maine Medical Center
Congress Street
New Construction Code Report
February 14, 2018



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INTRODUCTION

Perkins + Will has retained AKF Group LLC to prepare this narrative code report for the proposed Congress Street building on the Maine Medical Center (MMC) campus in Portland, ME. The seven-story high-rise building will have operating rooms, patient sleeping/recovery rooms, storage areas, offices, and staff facilities including locker rooms and lounges. The building will be constructed directly adjacent to the Visitor Garage and the Bean Building. A fire wall will be constructed between the Congress Street building and the Visitor Garage. A fire wall will not be constructed between the Congress Street building and the Bean Building since these buildings will be considered part of the same building. This report summarizes the code requirements for the Congress Street building.

QUICK FACTS

- Aggregate Area: Approximately 234,300 SF
- Height: 7 stories above grade; basement below grade
- Sprinkler Status: To be fully sprinklered
- Standpipe System: Class I standpipe system to be installed
- Occupancy: Use Groups A-3, B, I-2 (Condition 2), S-1, & S-2
- Construction Type: Modified Type IA (i.e. Type IB)

1. APPLICABLE CODES & STANDARDS

The State of Maine requires municipalities with more than 4,000 residents to adopt and enforce the Maine Uniform Building and Energy Code (MUBEC). The next edition of MUBEC became effective on January 23, 2018. The following codes and standards are applicable to the project.

- International Building Code (IBC), 2015 Edition with ME Amendments
- International Energy Conservation Code (IECC), 2009 Edition with ME Amendments
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1, Standard for Ventilation and Indoor Air Quality, 2013 edition

In addition to the codes identified above, the State Fire Marshal's Office promulgates the Rules of the State Fire Marshal, which adopt numerous NFPA codes and standards, including the following:

- NFPA 1, Uniform Fire Code, 2006 Edition with ME Amendments
- NFPA 13, Standard for Installation of Sprinkler Systems, 2016 Edition

The Plumbers' Examining Board promulgates the Maine Plumbing Code, which includes the following:

- International Association of Plumbing and Mechanical Officials (IAPMO), 2015 Uniform Plumbing Code (UPC), with ME amendments

The Electricians' Examining Board adopts and amends the following electrical code:

- NFPA 70, National Electrical Code, 2017 Edition

The following federal regulation also applies to the project (as referenced by the Maine Human Rights Commission – 5 M.R.S. §4594-G):

- Americans with Disabilities Act (ADA), 2010 Standards for Accessible Design

The Joint Commission also requires compliance with the following:

- NFPA 101, Life Safety Code, 2012 Edition
- NFPA 99, Health Care Facilities Code, 2012 Edition

The following design standards will also be used for the project:

- Facilities Guidelines Institute (FGI), Guidelines for Design and Construction of Hospitals and Outpatient Facilities, 2014 Edition

- ASHRAE Standard 170, Ventilation of Healthcare Facilities, 2013 edition

2. PROPOSED SCOPE OF WORK & USE

The proposed project involves the new construction of a seven story clinical building on Congress Street in Portland, Maine. The building will have operating rooms, patient sleeping/recovery rooms, storage areas, offices, and staff facilities including locker rooms and lounges.

The building will include the following use groups and occupancies:

Group A-3/ assembly:	Conference rooms, lounges, and multi-purpose spaces exceeding 750 SF and 50 people.
Group B/ business:	Office areas, staff lockers, conference/meeting space less than 750 SF or 50 people
Group I-2 (Condition 2)/ healthcare:	Inpatient hospital care
Group S-1/ ordinary hazard storage:	Linen storage
Group S-2/ low hazard storage:	Storage/utility spaces

As indicated in the list above, the building contains Use Groups A-3, B, I-2, S-1, and S-2. These occupancies are permitted as mixed, nonseparated occupancies per the height and area analysis located in Section 4 of this report.

3. HIGH-RISE BUILDING FEATURES

The building is considered a high-rise structure since it contains an occupied floor that is located more than 75 feet above the lowest level of fire department vehicle access (IBC 202 and NFPA 101 Section 3.3.32.7). High-rise buildings must comply with IBC 403 and NFPA 101 Section 11.8. The applicable provisions for high-rise buildings are summarized below.

3.1 Structural

Since the building is considered Risk Category IV per IBC Table 1604.5, the structural integrity requirements of IBC 403.2.3 apply. Section 403.2.3 requires interior exit stairway and elevator hoistway wall assemblies to comply with impact classifications of ASTM C 1629/ C 1629M. Spray fire-resistant materials (SFRM) must have a minimum bond strength of 430 psf (IBC Table 403.2.4).

3.2 Fire Protection Systems

The following fire protection systems are required within the building as noted. Refer to Section 8 of this report for further details regarding fire protection systems.

Automatic Sprinkler System

An automatic sprinkler system is required throughout the building per IBC Sections 403.3 & 903.2.6 and NFPA 101 Sections 11.8.3.1 & 18.3.5.1. A secondary onsite water supply is required if the building is located in seismic design category C, D, E, or F (IBC 403.3). The seismic design category should be confirmed with the geotechnical or structural engineer of record.

Standpipe System

Class I standpipes must be provided (IBC 905.3 & 403.4.3 and NFPA 101 Section 11.8.4.1).

Fire Alarm System

A manual fire alarm system with an emergency voice/alarm communication system must be provided in accordance with IBC 907.2.13 (IBC 403.4.2 & 403.4.4 and NFPA 101 Section 11.8.4.1).

Smoke Detection System

An automatic smoke detection system must be provided in accordance with IBC 907.2.13.1 (IBC 403.4.1).

Emergency Responder Radio Coverage

Emergency responder radio coverage or a two-way telephone communication system must be provided (IBC 403.4.5, NFPA 1 Section 13.7.2.27.2.2, and NFPA 101 Section 11.8.4.2).

Fire Command Center

A fire command center (FCC) complying with IBC 911 must be provided in a location approved by the fire department (IBC 403.4.6 & NFPA 101 Section 11.8.6). The fire command center will be located on Level CG adjacent to Stair 1. The FCC must comply with the following requirements and contain the following features.

1. Location, layout, and features must be approved by the fire chief
2. Must be separated by 1-hr rated construction
3. Must be 200 sf with minimum dimension of 10 ft
4. Unrelated storage is prohibited in the FCC
5. Emergency voice/alarm communication system control unit
6. Fire department communications system
7. Fire detection and alarm system annunciator
8. Annunciator unit visually indicating the location of the elevators and whether they are operational

9. System indicators and controls for air distribution systems

10. Fire fighter's control panel for smoke control systems

11. Controls for unlocking interior exit stairway doors simultaneously

12. Sprinkler valve and waterflow detector display panels

13. Emergency and standby power status indicators

14. Telephone for fire department use with controlled access to the public telephone system

15. Fire pump status indicators

16. Schematic building plans

17. Building Information Card

Smoke Removal

A means of smoke removal in post-fire salvage operations must be provided in accordance with IBC 403.4.7. The means of smoke removal may be provided by natural or mechanical ventilation. Post-fire smoke purge can be achieved through natural or mechanical ventilation. Natural ventilation must consist of operable windows /panels distributed at 50-foot intervals (maximum) and with a total area of at least 40 SF per 50 linear feet of perimeter. Mechanical ventilation must provide one air change every 15 minutes with return and exhaust air moved directly to the outside.

3.3 Standby and Emergency Power

Standby power must be provided for the following (IBC 403.4.8.3 and NFPA 101 Section 11.8.5.2.4):

1. Power and lighting for the fire command center
2. Ventilation and automatic fire detection equipment for smokeproof enclosures
3. Elevators, including elevators provided for accessible means of egress and fire service access, where applicable
4. Mechanical equipment for smoke control systems
5. Electric fire pump
6. Jockey pump
7. Air compressor serving dry-pipe and pre-action systems

Emergency power must be provided for the following (IBC 403.4.8.4):

1. Exit signs and means of egress illumination
2. Elevator car lighting
3. Automatic fire detection systems
4. Fire alarm systems

5. Electrically powered fire pumps

Standby and emergency power must comply with IBC 2702 and 3003. In addition, standby power for elevators serving as accessible means of egress must comply with IBC 1009.4. Generator sets and fuel line piping located inside the building must be protected in accordance with IBC 403.4.8.1 and 403.4.8.2.

3.4 Means of Egress

Means of egress in high-rise buildings must comply with the additional provisions of IBC 403.5. These provisions include the following.

Remoteness

Required interior exit stairways in the high-rise portions of the building must be separated by a distance of at least 30 feet or at least one quarter of the length of the maximum overall diagonal of the building or area served (whichever is less). This separation distance is measured in a straight line between the closest points of the stairway enclosures. Where three or more interior exit stairways exist, at least two must be separated in accordance with IBC 403.5.1. The proposed stairs comply with the remoteness criteria.

Stairwell Re-entry & Communication System

Since the stairs serve more than four stories, re-entry to other floors from inside the stairwells must be provided in accordance with NFPA 101 Section 7.2.1.5.8 (NFPA 101 Section 18.2.2.2.9). Per this section, all stair enclosure doors must meet one of the following conditions:

1) Re-entry from the stair enclosure to the interior of the building must be provided.
2) An automatic release that is actuated with the initiation of the building fire alarm system must be provided to unlock all stair enclosure door assemblies to allow re-entry.
3) Selected re-entry must be provided and must satisfy all of the following criteria:
    a. There shall be not less than two levels where it is possible to leave the stair enclosure to access another exit.
    b. There shall be not more than four stories intervening between stories where it is possible to leave the stair enclosure to access another exit.
    c. Re-entry shall be possible on the top story or next-to-top story served by the stair enclosure, and such story shall allow access to another exit.
    d. Door assemblies allowing re-entry shall be identified as such on the stair side of the door leaf.
    e. Door assemblies not allowing re-entry shall be provided with a sign on the stair side indicating the location of the nearest door opening, in each direction of travel, that allows re-entry or exit.

In addition, stairway doors other than the discharge doors cannot be locked from the stairway side unless they can be unlocked simultaneously from the fire command center (IBC 403.5.3). This requires a stairwell communication system provided on at

least every fifth floor. The communication system must connect to an approved constantly attended station (IBC 403.5.3.1).

Smokeproof Enclosures

Every required exit stairway serving high-rise portions of the building must comply with the smokeproof enclosure requirements of IBC 909.20 and 1023.11 (IBC 403.5.4). The most common method for providing smokeproof enclosures in sprinklered buildings is through stair pressurization complying with IBC 909.20.5. A ventilated vestibule is not required using this method, provided that the pressure difference between the stair shaft and the balance of the building is a minimum of 0.10 inch of water and a maximum of 0.35 inch of water. The pressure difference must be measured with the stairway doors closed and under maximum anticipated conditions of stack effect and wind effect (IBC 909.20.5).

Luminous Egress Path Markings

Luminous egress path markings must be provided in accordance with IBC 1058.

3.5 Elevators

The following sections provide information regarding the elevator requirements.

Fire Service Access Elevators

A minimum of two fire service access elevators are required in buildings with an occupied floor greater than 120 feet above the lowest level of fire department vehicle access where at least two elevators are provided (IBC 403.6.1). Based on the plans provided to AKF on February 12, 2018 the highest occupied floor (i.e. Level G) is less than 120 feet above the lowest level of fire department vehicle access. Therefore, fire service access elevators are not required at this time. However, since future growth is expected to include a vertical expansion to the building, the current design includes two fire service access elevators. The fire service access elevator requirements of IBC 3007 include the following:

Every floor must be served by fire service access elevators (IBC 3007.1).

Fire service access elevators must be provided with a lobby complying with IBC 3007.6 (note that multiple fire service access elevators are permitted to be served by the same lobby). Per IBC 3007.6, the fire service access elevator lobbies must meet the following requirements:

- Enclosed with a smoke barrier having a minimum 1-hour fire-resistance rating and ¾-hour fire door assemblies
  - Enclosed fire service access elevator lobbies are not required on the level of exit discharge
- Have access to an interior exit stairway either directly from the lobby or through a protected path travel
  - The protected path of travel must have the same level of fire protection as the elevator lobby

- The protected path of travel must be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly complying with IBC 716.5.3

- Must have a minimum area of 150 SF with a minimum dimension of 8 feet, regardless of how many fire service access elevators are served
- Symbols complying with 780 CMR 3007.6.5 must be installed on each side of the hoistway door frame of each fire service access elevators
- A Class I standpipe hose connection must be provided in the exit stairway adjacent to the lobby. Access to this stairway is also required from each floor without passing through the FSAE lobby. It is our understanding that the design team is seeking a variance for relief from this requirement.
- Fire service access elevators must be provided with an approved method to prevent the infiltration of water into the hoistway enclosure caused by the operation of the automatic sprinkler system outside of the enclosure (IBC 3007.3).

As indicated in Section 3.3 of this report, fire service access elevators are required to be provided with standby power.

Other Elevator Lobbies

Enclosed elevator lobbies are required for all other elevators that serve high-rise levels within the building (IBC 3006.2(5)). These lobbies are required to consist of smoke partitions complying with IBC 710. Doors penetrating the enclosed elevator lobby must comply with IBC 710.5.2.2, 710.5.2.3, and 716.5.9. Ducts and air transfer openings must comply with IBC 717.5.4.1.

Number of Elevator Cars per Hoistway

Where four or more elevator cars serve all or the same portion of a building, the elevators must be located in at least two separate hoistways. A maximum of four elevator cars can be located in a single hoistway (IBC 3002.2).

Two-Way Communication

A two-way communication system must be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the level of exit discharge. The two-way communication system must provide communication between the required location and the fire command center or a central control point location approved by the fire department. The system must include both audible and visible signals. Directions for the use of the system and written identification of the location must be posted adjacent to the system (IBC 1009.8).

4. HEIGHT & AREA

The building must comply with the building height and area limitations of IBC 504 and 506 based on the most restrictive occupancy classification of the building. The height and area limitations have been evaluated based on non-separated mixed uses including Use Groups A-3, B, I-2, S-1, and S-2. Since the building exceeds 5 stories in height, Type IA

construction (i.e. noncombustible, 3-hour rated) is required (IBC 503.3 and 504.4). Type IA construction is not limited in building height, number of stories, or floor area.

High-rise buildings are permitted a reduction in the required fire-resistance ratings for building elements where sprinkler control valves are provided with supervisory initiating devices and water-flow initiating deices on each floor (IBC 403.2.1.1). Since the building is less than 420 feet in height, the fire-resistance ratings required for Type IB construction (with the exception of columns) may be used while granting unlimited height and area allowances per Type IA construction (IBC 403.2.1). Although NFPA 101 does not contain a similar allowance, NFPA 101 Table 18.1.6.1 permits sprinklered healthcare buildings of Type IB (222) construction to be an unlimited in number of stories. Therefore, the building can be constructed using the required ratings for Type IB construction (except that columns must be 3-hour rated), while still utilizing the height and area limits applicable to Type IA construction.

Note that any future vertical expansion projects cannot extend the height of the building to above 420 feet since the reduction permitted by IBC 403.2.1 does not apply to buildings over 420 feet in height.

5. TYPE OF CONSTRUCTION

The following table summarizes the required ratings for modified Type IA construction (i.e. Type IB) in accordance with IBC Table 601 and NFPA 1 Table A.12.2.1.

IBC Table 601 & NFPA 101 Table A.8.2.1.2
Fire-Resistance Rating Requirements for Building Elements (Hours)

Element	Modified Type IA (i.e. Type IB) Rating (hours)
Primary structural frame (see Section 202) Columns Other	 3[A] 2[A]
Bearing walls Exterior Interior	 2[A] 2[A]
Nonbearing walls and partitions Exterior	See Table 602 discussion below.
Nonbearing walls and partitions Interior	0
Floor construction and secondary members (see Section 202)	2[A]
Roof construction and secondary members (see Section 202)	1

[A] Not less than the rating of the assemblies supported, i.e. shaft enclosures, etc.

The non-bearing exterior wall requirements are based on the fire separation distance (FSD) of each wall. The FSD is measured perpendicularly from the face of each exterior wall to the closest interior lot line, the centerline of a street, alley, or public way, or an imaginary lot line between two buildings on the same lot. Where the FSD is greater than or equal to 30 feet, the non-bearing exterior walls do not require a fire-resistance rating.

Where Table 601 or 602 requires an exterior wall to be fire-resistance rated and the FSD is less than or equal to 10 feet, the wall must be rated for exposure to fire from both sides (IBC 705.5). The exterior walls are required to maintain their structural stability for the duration of the time indicated by the fire-resistance rating.

IBC Table 602 Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance Type IA Construction

Fire Separation Distance = X (feet)	Required Fire Resistance Rating
$X < 5$	1-hr
$5 \leq X < 10$	1-hr
$10 \leq X < 20$	1-hr
$X \geq 20$	0

Since the Congress Street building and Bean building are considered part of the same building, exterior wall protection is not required for the walls facing the Bean building. In addition, the entire north and west walls of the Congress Street building have a FSD of more than 20 feet, thus allowing unrated exterior walls in these areas. A 3-hour fire wall will be provided between the Congress Street and Visitor Garage buildings. Any exterior walls facing the Visitor Garage (other than the fire wall) must have a 1-hour rating due to the distance between the Visitor Garage and the Congress Street building.

6. FIRE AND SMOKE PROTECTED FEATURES

6.1 Exterior Walls & Opening Protectives

Openings in the exterior walls must comply with IBC 406.5.2 based on the FSD of each wall. The opening limitations are summarized below for Type IA construction.

IBC Table 705.8 Maximum Area of Exterior Wall Openings Based on Fire Separation Distance and Degree of Opening Protection

Fire Separation Distance (feet)	Degree of Opening Protection	Allowable Area
$X < 3$	Unprotected, Sprinklered	Not Permitted
$3 \leq X < 5$	Unprotected, Sprinklered	15%
$5 \leq X < 10$	Unprotected, Sprinklered	25%
$10 \leq X < 15$	Unprotected, Sprinklered	45%
$15 \leq X < 20$	Unprotected, Sprinklered	75%
$20 \leq X$	Unprotected, Sprinklered	No Limit

Since the north and west walls of the Congress Street building have a FSD of more than 20 feet, these walls are permitted to have unlimited unprotected openings. Due to the separation distance between the Congress Street and Visitor Garage buildings, no openings are permitted in the exterior walls facing Visitor Garage.

6.2 Shaft Enclosures

Vertical openings must be enclosed with shaft construction unless an alternative provision in IBC 712 and NFPA 101 Section 8.6 is met. Shafts connecting four stories or more must be enclosed with at least 2-hour fire-resistance rated construction. Shafts connecting three stories or less must be enclosed with 1-hour rated construction (IBC 713.4 and NFPA 101 Section 8.6.5).

Where the exterior wall of an exit enclosure is exposed to adjacent exterior walls by an angle less than 180 degrees, the adjacent exterior wall, or the exit enclosure wall must be rated. Whichever wall is rated must have a rating of at least 1-hour with ¾-hour opening protectives. The rating must extend at least 10 feet horizontally from the nonrated wall. The protection must extend from the ground to a level 10 feet above the highest landing of the stair, or the roofline, whichever is lower (IBC 1023.7).

6.3 Atrium

A 7-story atrium is proposed within the building. Atriums must comply the IBC 404 and NFPA 101 Section 8.6.7. In general, atriums must be enclosed with 1-hour fire barriers, with exceptions permitted for sprinkler-protected glass and glass-block walls. AKF is conducting perform a fire modeling analysis for the design of the atrium smoke control system to be reviewed with the local AHJ and State Fire Marshal's office.

Note that the atrium is not required to be included in the smoke compartment area since it is separated by sprinkler-protected glass in accordance with IBC 404.6(1.1) and NFPA 101 8.6.7 (NFPA 101 Section 18.3.7.1(3)).

6.4 Corridors

In Group I-2 occupancies, corridors must be continuous to exits and separated from other areas with walls that comply with the requirements for smoke partitions (IBC 407.2 & 407.3 and NFPA 101 Section 18.3.6.1). Doors within corridor walls are not required to be fire-resistance rated; however they must be self-latching, be provided with positive latching hardware, and must provide an effective barrier to limit smoke spread (IBC 407.3.1 and NFPA 101 Sections 18.3.6.2.2, 18.3.6.3.1, & 18.3.6.3.5). Note that there are some spaces that are permitted to be open to corridors as outlined below.

Waiting Areas

Waiting areas that are open to corridors must comply with the following requirements (IBC 407.2.1 and NFPA 101 Section 18.3.6.1(2)).

1. Must be constructed as required for corridors (i.e. smoke partitions);
2. Does not contain sleeping rooms, treatment rooms, incidental uses, or hazardous uses;
3. The space is protected by an automatic fire detection system complying with IBC 907;

4. The corridor into which the space opens is protected by an automatic fire detection system that complies with IBC 907 or the smoke compartment is protected by quick-response sprinklers;
5. The space does not obstruct access to required exits;
6. The aggregate waiting area open to the corridor in each smoke compartment is no more than 600 SF.

Care Providers' Stations

Corridors may be open to spaces for care providers, supervisory staff, doctors' and nurses' charting, communications, and related clerical areas so long as such spaces are constructed as required for corridors (i.e. smoke partitions) per IBC 407.2.2.

6.5 Smoke Compartments

Smoke barriers must be used to subdivide every story having an occupant load of 50 or more persons or used by persons receiving care, treatment or sleeping into at least two smoke compartments, each with a maximum area of 22,500 SF (as limited by NFPA 101 Section 18.3.7.1). Smoke compartments are not required on Level CB, B, or G since these spaces do not contain a healthcare occupancy and are located above or below the healthcare occupancy (NFPA 101 Section 18.3.7.2). Similarly, a smoke compartment and corresponding refuge area are not required for the lobby area of Level CG since the area does not contain a healthcare occupancy and the space is separated from the healthcare occupancy by a 2-hour horizontal exit (NFPA 101 Section 18.3.7.2 (2)). The following requirements apply to the smoke compartments.

Fire-Resistance

The smoke compartments must be separated by 1-hour rated smoke barriers with 20-minute opening protections complying with IBC 709 and NFPA 101 Section 8.5 (IBC 407.5 and NFPA 101 Section 18.3.7.3).

The smoke barrier walls will serve as horizontal exits on Level CG through C4 in order to provide additional capacity and/or reduce travel distances. Horizontal exit walls must have a 2-hour fire-resistance rating and must be constructed as fire barriers. The requirements for horizontal exits are found in Section 1.1 of this report.

Travel Distance

The travel distance from the most remote point in each smoke compartment to the smoke barrier door must be a maximum of 200 feet (IBC 407.5 and NFPA 101 Section 18.3.7.1(4)). Refer to associated Life Safety Plans for measurements of travel distances to the smoke barriers.

Refuge Area

Each smoke compartment must contain a refuge area sized to accommodate the inpatient care occupants from adjacent smoke compartments. The refuge areas must be sized using a factor of 30 SF per patient. Where the refuge area serves ambulatory occupants, the area must be sized using a factor of 6 SF per occupant. Refuge areas may consist of corridors, sleeping areas, treatment rooms, lounges, dining areas, and

other low-hazard areas (IBC 407.5.1 and NFPA 101 Section 18.3.7.5.1). Refer to the associated Life Safety Plans for illustrations of refuge areas.

Independent Egress
Means of egress from each smoke compartment must be arranged such that once occupants egress from a smoke compartment they are not required to return through the smoke compartment to evacuate the building (IBC 407.5.2 and NFPA 101 Section 18.2.4.4).

Horizontal Assemblies
Where horizontal assemblies support smoke barriers that are part of smoke compartments, such horizontal assemblies must be designed to resist the passage of smoke (IBC 407.5.3).

Smoke Dampers
Smoke dampers are required for duct penetrations through a smoke barrier wall; however there is an exception for Group I-2, Condition 2 occupancies. If the HVAC system is fully ducted and the building is equipped throughout with quick-response sprinklers in accordance with IBC 903.3.2, smoke dampers are not required (IBC 717.5.5(2).

6.6 Care Suites

Care suites are provided on Level CG and C1. Care suites are permitted in lieu of providing patient sleeping rooms with direct access to a corridor (IBC 407.4.1 and NFPA 101 Section 18.2.5.6.4). The following requirements apply to the proposed care suites. Since the post-op patients may require up to 23-hour stays in these suites, the suites are considered "patient care sleeping suites" as defined by NFPA 101 Section 3.3.272.4).

Exit Access
Spaces not classified as care suites are not permitted to exit through a care suite. In care suites required to have more than one means of egress, on exit access path is permitted to pass through an adjacent care suite (IBC 407.4.4.1 and NFPA 101 Section 18.2.5.7.2.2(C)). One means of egress from the suite must be directly to a corridor (NFPA 101 Section 18.2.5.7.2.2(B)).

Separation
Care suites must be separated from other portions of the building by smoke partitions (IBC 407.4.4.2 and NFPA 101 Section 18.2.5.7.1.2).

Protection
Patient sleeping rooms must be provided with at least one of the following (IBC 407.4.4.5 and NFPA 101 Section 18.2.5.7.2.1(D)):

- Direct visual supervision from a normally attended location within the suite (glass walls and cubicle curtains are permitted) and any sleeping rooms not provided with direct visual supervision are provided with automatic smoke detection; or
- The entire suite is provided with automatic smoke detection.

Access to Corridor

Movement from habitable rooms within the care suite to a corridor door must not require passage through more than three doors and 100 feet of travel distance (IBC 407.4.4.3 and NFPA 101 Section 18.2.5.7.2.4(A)).

Number of Means of Egress

Care suites containing sleeping rooms must have two remote exit access doors from the suite where the suite is more than 1,000 SF (IBC 407.4.4.5.2 and NFPA 101 Section 18.2.5.7.2.2(A)).

Maximum Size

Care suites containing sleeping rooms must not exceed 7,500 SF. However, the maximum area of such care suites is permitted to be increased to 10,000 SF where both direct visual supervision and smoke detection are provided throughout the suite (IBC 407.4.4.5.1 and NFPA 101 Section 18.2.5.7.2.3).

All care suites included in the current design comply with the above requirements.

6.7 Incidental Uses

IBC Table 509 and NFPA 101 Table 8.5 prescribe requirements for the protection of several incidental uses in Group I-2/healthcare occupancies. The requirements of these tables are provided below.

Incidental Uses

Room or Area	Separation and/or Protection	Code Section
Boiler and fuel-fired heater rooms	1 hour	NFPA 101 Table 18.3.2.1
Laboratories not classified as Group H	1-hour and provide automatic sprinkler system	IBC Table 509
Laundry rooms over 100 SF	1 hour	IBC Table 509 & Section 509.4.2
Physical plant maintenance shops	1 hour	IBC Table 509 & NFPA 101 Table 18.3.2.1
In Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 64 gallons (8.6 ft^3) or more	1 hour	NFPA 101 Table 18.3.2.1
In Group I-2 occupancies, storage rooms greater than 100 SF	1 hour	IBC Table 509
In Group I-2 occupancies, storage rooms less than 100 SF but greater than 50 SF and storing combustible material	Smoke partition	NFPA 101 Table 18.3.2.1 & Section 8.7.1.2

Room or Area	Separation and/or Protection	Code Section
Fire Command Center	1 hour	IBC 403.4.6 & NFPA 101 Section 11.8.6
Fire Service Access Elevator Lobby	1-hour smoke barrier	IBC 3007.4.2
Other Elevator Lobbies	Smoke partition	IBC 3006.2(5)
Emergency Electrical Rooms	2-hours or sprinkler protection	NEC 700.10(D)(2)
Emergency Feeder Circuit Wiring	2-hours or sprinkler protection	NEC 700.10(D)(1)

Note that the 2-hour floor assembly between Level CB and Level CG will serve as the separation between the storage rooms located on Level CB and the Group I-2 occupancy located on Level CG. This arrangement is consistent with the approach for separated occupancies in both IBC 508.4 and NFPA 101 Section 6.1.14.4.

6.8 Fire Walls

The Congress Street building will be connected to two other buildings on the MMC site: the Bean Building and the Visitor Garage. A fire wall will be provided between the Congress Street Building and the Visitor Garage due to the difference in construction type between these two buildings. It is our understanding that the Congress Street building and Bean Building are considered part of the same building. Therefore, both the Congress Street and Bean buildings must be consistent with Type I construction. The requirements and implications for fire walls are identified in this section.

Fire-Resistance Rating

A 3-hour fire-resistance rating is required for fire walls in Group I occupancies (IBC 706.4).

Openings

The aggregate width of openings through a fire wall at any floor level cannot exceed 25% of the length of the wall (IBC 706.8). Doors or fire shutters in the fire wall must also have a 3-hour rating (IBC Table 716.5). Doors within the fire walls must be self- or automatic-closing (IBC 716.5.9). If doors are automatic-closing, they must be automatic-closing by the actuation of smoke detectors or by loss of power to the smoke detector or hold-open device. The doors must begin to close within 10 seconds of smoke detector activation or power failure (IBC 716.5.9.3).

Horizontal Continuity

Per IBC 706.5, fire walls must be continuous from exterior wall to exterior wall and must extend at least 18 inches beyond the exterior surface of exterior walls. However there are exceptions as follows:

1. The fire wall may terminate at combustible exterior sheathing or siding if the exterior walls within 4 feet of the fire wall on each side are 1-hour rated with ¾-hour opening protectives.
2. The fire wall may terminate at noncombustible exterior sheathing, siding, or other finish if such noncombustible finishes are extended a distance of at least 4 feet on each side of the fire wall.

Per IBC 706.5.2, fire walls must extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees, and similar projections that are within 4 feet of the fire wall. Note however there are some exceptions to this requirement. The applicability of the exceptions depends on whether the projections contain concealed openings. If the projections do not contain concealed spaces, the fire wall is not required to extend to the edge of the projection if the exterior wall behind and below the projection is 1-hour fire-resistance rated for a distance at least equal to the depth of the projection. Exterior openings within this rated wall must be protected with ¾-hour opening protectives (IBC 706.5.2(1)).

Vertical Continuity

Per IBC 706.6, fire walls must have vertical continuity such that they extend from the foundation to a termination point at least 30 inches above both adjacent roofs unless one of the exceptions to Section 706.6 is met, as follows.

1. The buildings comply with the requirements for stepped buildings in IBC 706.6.1.
2. Two-hour fire-resistance rated fire walls may terminate at the underside of the roof sheathing, deck, or slab if the following provisions are met:
    a. The lower roof assembly within 4 feet of the fire wall is at least 1-hour fire-resistance rated and the entire length of the span of supporting elements for the rated roof assembly are1-hour rated as well.
    b. There are no openings in the roof within 4 feet of the fire wall.
    c. Each building has at least a Class B roof covering.
3. Where both buildings have at least a Class B roof covering, fire walls may terminate at the underside of noncombustible roof sheathing, deck or slabs. Openings in the roof within 4 feet of the fire wall are prohibited.
4. The buildings have sloped roofs complying with IBC 706.6.2.

Exterior Wall Exposure

Where the fire wall intersects the exterior walls and exterior walls form an angle of less than 180 degrees, protection must be provided by one of the following methods (IBC 706.5.1).

1. The exterior walls on both sides of the fire wall must have a 1-hour fire-resistance rating and ¾-hour opening protectives for a distance of 4 feet from the intersection with the fire wall.
2. An imaginary lot line must extend beyond the fire wall and the required fire-resistance rating and opening protection for the exterior walls on either side of the fire wall must be based on the FSD to this imaginary lot line.

7. INTERIOR FINISH

The interior finishes of the walls, ceilings, and floors of the building are governed by IBC Chapter 8 and NFPA 101 Chapter 10. These chapters outline the testing requirements for the different surfaces. The required tests and finish classifications are summarized in the tables below.

Finish Characteristics

Element	Test Method	Criteria
Wall & Ceiling Finishes	ASTM E84 or UL 723	Class A = FSI 0-25; SDI 0-450
		Class B = FSI 26-75; SDI 0-450
		Class C = FSI 76-200; SDI 0-450
Floor Finish	NFPA 253	Class I = 0.45 W/cm^2 or greater
		Class II = 0.22 W/cm^2 up to 0.45 W/cm^2
	DOC FF-1	Pass

Notes:
FSI = flame spread index
SDI = smoke-developed index

Interior Wall and Ceiling Finish Requirements by Occupancy (Fully Sprinklered Building)

Use Group	Walls & Ceilings			Floors	
	Exit enclosures and exit passageways	Corridors	Rooms and enclosed spaces	Exits and corridors	Other spaces
A-3	B	B	C	DOC FF-1	DOC FF-1
B	B	C	C	DOC FF-1	DOC FF-1
I-2	B	B	B[A]	Class II	Class II
S-1 & S-2	C	C	C	DOC FF-1	DOC FF-1

[A] Class C interior finish materials are permitted in rooms with a capacity of four persons or less.

The tables above show the required interior finish classes throughout the building based on the most restrictive requirements of IBC Table 803.11 and NFPA 101 Table A.10.2.2. Note that where corridors are shared by both occupancies, the most restrictive finish must be used (i.e. Class B). All floors throughout the building must pass the DOC FF-1 "pill test".

8. FIRE PROTECTION SYSTEMS

In addition to the systems discussed in Section 3 of this report, the following fire protection requirements also apply.

8.1 Automatic Sprinkler System

Since the smoke compartments contain patient sleeping rooms, listed quick-response or listed residential sprinklers must be used (NFPA 101 Section 18.3.5.6).

8.2 Fire Alarm and Detection System

In addition to the manual fire alarm system, an automatic smoke detection system must be provided in the inpatient corridors and in any areas open to the corridors (i.e. not separated by smoke partitions). Based on the plans provided to AKF on February 12, 2018, the proposed waiting areas are not open to the inpatient corridors.

The fire alarm system must transmit an alarm automatically to the municipal fire department (NFPA 101 Section 9.6.4 & 18.3.4.3.2.1).

8.3 Standpipe System

A standpipe system is required throughout the building since the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access. Class I standpipes must be provided in sprinklered high-rise buildings per IBC 905.3.1 and NFPA 101 Section 11.8.3.2.

Class I standpipes must be installed in the following locations in accordance with IBC 905.4:

- In every required interior exit stairway. Class I standpipe hose connections must be provided for each story above and below grade and must be located at an intermediate landing between stories, unless otherwise approved by the authority having jurisdiction (AHJ).

- At each horizontal exit. Class I standpipe hose connections must be provided on each side of the wall adjacent to the exit opening, unless the floor areas adjacent to the horizontal exit are reachable from an interior exit stairway hose connection by a 30-foot hose stream from a nozzle attached to 100 feet of hose.

- In every exit passageway. Class I standpipe hose connections must be provided at the entrance from the exit passageway to other areas of the building, unless the floor areas adjacent to the exit passageway are reachable from an interior exit stairway hose connection by a 30-foot hose stream from a nozzle attached to 100 feet of hose.

- In remote portions of the floor. Where the most remote portion of a sprinklered floor is more than 200 feet from a hose connection, the fire code official is authorized to require that additional hose connections be provided in approved locations.

8.4 Portable Fire Extinguishers

Portable fire extinguishers must be provided in accordance with NFPA 10 (IBC 906 and NFPA 101 Section 18.3.5.12).

8.5 Electrical Systems

The essential electrical system for electrical components, equipment, and systems must be designed and constructed in accordance with IBC Chapter 27 and NFPA 99 (IBC 407.10 and NFPA 101 Section 18.5.1.2).

9. MEANS OF EGRESS

The applicable means of egress requirements for the building are described below.

9.1 Egress Summary

See the associated Life Safety Plans for the calculated occupant loads throughout the building. The occupant loads of the building were calculated based on the occupant load factors in accordance with IBC Table 1004.1.2 and NFPA 101 Table 7.3.1.2. The capacities of the exits are calculated in accordance with IBC 1005.1 and NFPA 101 Table 7.3.3.1.

9.2 Exit Access Travel Distance

The exits are required to be arranged such that the maximum exit access travel distance is as follows (IBC 1017.2 and NFPA 101 Sections 12.2.6.2(1), 18.2.6.2.1, 38.2.6.3, & 42.2.6).

Occupancy	With Sprinkler System (feet)
A-3	250
B	300
I-2	200
S-1	250
S-2	400

The maximum travel distance allowed from a Group I-2 sleeping room to an exit access door in that room is 50 feet (IBC 407.4.2 and NFPA 101 Section 18.2.6.2.3).

Refer to the associated Life Safety Plans to note travel distance compliance.

9.3 Corridor Width

Corridors must provide the following minimum clear widths (IBC 1020.2 and NFPA 101 Section 18.2.3.4 & 38.2.3.2):

- 96 inches where serving bed movement areas;
- 44 inches in other areas where the occupant load is 50 or more; and
- 36 inches in other areas where the occupant load is less than 50 people.

Where corridors are required to be 96 inches, the following projections are permitted by NFPA 101 Section 18.2.3.4:

- Projections into the required width are permitted for wheeled equipment, provided all of the following conditions are met:
  - The wheeled equipment does not reduce the required clear unobstructed corridor width to less than 60 inches
  - The health care occupancy fire safety plan and training program address the relocation of the wheeled equipment during a fire or similar emergency
  - The wheeled equipment is limited to the following: equipment in use and carts in use, medical emergency equipment not in use, and patient lift and transport equipment

- Projections into the required width are permitted for fixed furniture, provided all of the following conditions are met:
  - The fixed furniture is securely attached to the floor or to the wall
  - The fixed furniture does not reduce the clear unobstructed corridor width to less than 6 feet
  - The fixed furniture is located only on one side of the corridor
  - The fixed furniture is grouped such that each grouping does not exceed an area of 50 sf
  - The fixed furniture groupings are separated from each other by a distance of at least 10 ft
  - The fixed furniture is located so as to not obstruct access to building service and fire protection equipment
  - Corridors throughout the smoke compartment are protected by an electrically supervised automatic smoke detection system, or the fixed furniture spaces are arranged and located to allow direct supervision by the facility staff from a nurses' station or similar space.

Since the IBC does not address corridor projections for I-2 Condition 2 occupancies, we recommend reviewing any proposed projections with the building official for approval.

The exit access must be arranged such that dead ends do not exceed 20 feet in corridors serving Group I-2 and A-3 occupancies and do not exceed 50 feet in corridors serving other occupancies (IBC 1020.4 and NFPA 101 Sections 38.2.5.2.1 & 42.2.5).

9.4 Number of Exits and Continuity

Two means of egress must be provided from individual spaces where the occupant load and/or common path of travel distance exceeds the limitations of IBC Table 1006.2.1 and NFPA 101 Sections 12.2.5.1.2, 38.2.5.3.1 & 42.2.5.

Spaces with One Means of Egress

Use Group	Maximum Occupant Load	Maximum Common Path of Travel Distance (ft)
A-3	49	75[A]
B	49	100
I-2	10	75
S-1, S-2	29	100

[A] The common path of travel in assembly occupancies is permitted to be 75 feet where the path serves not more than 50 occupants. Where the path serves more than 50 occupants, the common path of travel is limited to 20 feet; however, an occupant load exceeding 50 will require a second means of egress.

In addition, habitable spaces must have an exit access door leading directly to a corridor unless an exit door is provided directly to the exterior at ground level (IBC 407.4.1 and NFPA 101 Section 18.2.5.6.1).

All spaces within each story must have access to the minimum number of independent exits from the story as required by IBC Table 1006.3.1 and NFPA 101 Section 7.4.1.2 below.

Minimum Number of Exits Per Story

Occupant Load (persons per story)	Minimum Number of Exits (per story)
1-500	2
501-1,000	3
More than 1,000	4

Where more than one means of egress is required, the exits must be separated by ⅓ of the overall diagonal distance of the space served (IBC 1007.1.1 and NFPA 101 Section 7.5.1.3.2). This separation distance is measured between the doors to Stair 1 and 2. See Section 3.4 of this report for the required separation between the closest points of the stairway enclosures.

Where more than one means of egress is required, at least two accessible means of egress must be provided. Where one means of egress is permitted, at least one means of egress must be accessible (IBC 1009.1 and NFPA 101 Section 7.5.4).

9.5 Exterior Stairs

An exterior stair is proposed for Level CG, C1, and C2 and the stair will be at or very near grade. The stair provides access from the building to Gilman Street. The use of the exterior stair as a means of egress from Level CG, C1, and the green roof on C2 will likely require a compliance alternative or variance.

There are two types of exterior stairs: exterior exit stairs and exterior exit discharge stairs. Exterior exit discharge stairs are generally considered stairs that provide occupants access to grade, but only require travel on the stair for less than a story.

Exterior exit stairs are those outside stairs that require occupants to travel a story or more to reach grade. The proposed stair falls into a gray area of the code because while occupants would travel more than a story to reach street level, the stair itself would be at grade or very near grade due to the sloped site.

Since exterior exit stairs require travel for a story or more, greater protection measures are required for such stairs. Typically these stairs are not permitted in Group I-2 occupancies and/or in buildings more than six stories in height or high-rise buildings (IBC 1027.2). That being said, the height limitation is to prevent occupants from experiencing vertigo or from being afraid to use the stair. Since the stair only connects the first through third story and will be at or near grade, it complies with the intent of the code and aligns with the intent of an exit discharge stair. In addition, NFPA 101 permits the use of exterior exit stairs in hospitals (Section 18.2.2.3). Therefore, in our opinion this is a reasonable compliance alternative approach to be reviewed with the building official.

Exterior stairs must comply with the following requirements. While the stair could be considered an exit discharge stair, we recommend complying with the following as part of the compliance alternative or variance approach.

- Exterior exit stairs must be open on at least one side, except as required for structural columns, beams, handrails, and guards (IBC 1027.3 and NFPA 101 Section 7.2.2.6.6).
    - Open sides must be at least 50% open and have an aggregate open area of at least 35 SF adjacent to each floor level and the level of each intermediate landing.
    - The required open area must be located at least 42 inches above the adjacent floor or landing level.
    - The stair must be arranged to avoid impediments to its use by persons having fear of high places. Stairs more than 36 feet above the finished ground level must be provided with an opaque visual obstruction not less than 48 inches in height (NFPA 101 Section 7.2.2.6.2).
- The open areas adjoining the stair must be either yards, courts, or public ways. The remaining sides may be enclosed by the exterior walls of the building (IBC 1027.4).
- The stair must have a minimum FSD of 10 feet measured at right angles from the exterior edge of the stair to adjacent lot lines, other portions of the building, and other buildings (IBC 1027.5).
- The exterior stairway must be separated from the interior of the building as required for interior stairs. Since the proposed stair connects less than 4 stories, a 1-hour separation is required (IBC 1027.6 & 1023.2 and NFPA 101 Section 7.2.2.6.3.1).
    - The 1-hour separation must extend horizontally for at least 10 feet beyond the stair and vertically from finished ground level to a point 10 feet above the topmost landing of the stair, or to the roofline (whichever is less) (NFPA 101 Section 7.2.2.6.3.2).
    - Roof construction must provide protection beneath the stairs and must extend horizontally at least 10 feet to each side of the stair (NFPA 101 Section 7.2.2.6.3.3).

- Where a vertical plane projecting from the edge of the stair and stair landing is exposed by other parts of the building by an angle less than 180 degrees, the exterior wall must be rated in accordance with IBC 1023.7. See section 6.2 of this report.
- All openings below the stair must have a ¾-hour rating where the stair is located as follows (NFPA 101 Section 7.2.2.6.4):
    - In an enclosed court with a smallest dimension that does not exceed ⅓ its height; or
    - In an alcove having a width that does not exceed ⅓ its height and a depth that does not exceed ¼ its height.
- The stair must be designed to minimize water accumulation on the walking surface (IBC 1011.7.2 and NFPA 101 Section 7.2.2.6.5).

9.6 Horizontal Exits

Horizontal exits will be provided on various levels of the building. In addition to the inpatient floors, horizontal exits will also be provided at the connection to the Bean Building for Levels B and G. Requirements for horizontal exits are as follows.

Separation

The separation between buildings or portions thereof connected by a horizontal exit must be provided by a fire wall or fire barrier (IBC 1026.1). The minimum fire-resistance rating of the separation is 2 hours, but the separation cannot be less than required by other sections of the code. The fire wall between the Congress Street building and the Visitor Garage must have a minimum 3-hour fire-resistance rating per IBC 706.4.

Horizontal exits constructed as fire barriers must be continuous from exterior wall to exterior wall so as to divide completely the floor served by the horizontal exit. In addition, where the fire barrier serving as a horizontal exit intersects exterior walls at an angle of less than 180 degrees, the exterior walls must have a 1-hour fire-resistance rating with ¾-hour rated opening protectives for a distance of at least 10 feet on both sides of the horizontal exit (IBC 1026.2 and NFPA 101 Section 7.2.4.3.). The smoke barrier/horizontal exit wall on Level C2 through C4 intersects exterior walls that are at an angle of less than 180 degrees. Therefore, exterior wall protection is required. Refer to the associated life safety plans for further details.

Opening Protectives

Fire doors in horizontal exits must be self-closing or automatic-closing when activated by a smoke detector. Doors, where located in a cross-corridor condition, must be automatic closing by smoke detector activation (IBC 2026.3 and NFPA 101 Sections 7.2.4.3.10 & 7.2.4.3.11). Doors in horizontal exits must provide a minimum 1½-hour fire-resistance rating. However, doors in 3-hour fire walls must provide a minimum 3-hour rating (IBC Table 716.5 and NFPA Table 101 8.3.4.2)

Refuge Areas & Capacity

The refuge area of a horizontal exit must be a space occupied by the same tenant or a public area. Each refuge area must be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the

adjoining compartment. The anticipated occupant load from the adjoining compartment must be based on the capacity of the horizontal exit doors entering the refuge area (IBC 1026.4).

The capacity of the refuge area should be computed based on a net floor area allowance of 3 SF per occupant. The capacity of refuge areas serving Group I-2 occupants must be calculated at 15 SF per occupant for ambulatory occupancies and 30 SF per occupant for nonambulatory occupancies (IBC 1026.4.1 and NFPA 101 Section 7.2.4.2.4).

Not less than one means of egress from the area of refuge must lead directly to the exterior or to an interior exit stairway or ramp (IBC 1026.4.2).

9.7 Doors

Cross-corridor door openings in corridors required to be at least 96 inches wide must have a clear width as follows (NFPA 101 Section 18.2.3.4(6)):

- 6 feet, 11 inches for pairs of doors; and
- 41 ½ inches for a single door.

The above provisions also apply to any doors in the means of egress from the patient rooms (NFPA 101 Section 18.2.3.6). However, exit stair enclosure doors are only required to provide a minimum clear width of 32 inches (NFPA 101 Section 18.2.3.7). Since the proposed exterior stair will be serving as an exit stair, it is our opinion that the doors serving this stair are also only required to provide a minimum of 32 inches in clear width. Doors not serving bed-traffic must have a minimum clear width of 32 inches (IBC 1010.1.1 and NFPA 101 Section 7.2.1.2.3.2). All doors serving an occupant load of 50 or more people must swing in the direction of egress travel (IBC 1010.1.2 and NFPA 101 Section 7.2.1.4.2).

9.8 Locking Devices

Unless complying with IBC 1010.1.9.6 and NFPA 101 Section 18.2.2.2.5, locking devices that restrict access to a care recipient's room from the corridor and that are operable only by staff from the corridor side must not restrict the means of egress from the care recipient's room (IBC 407.4.1.1 and NFPA 101 Section 18.1.3.2(1)).

9.9 Aisles and Aisle Accessways

In assembly areas such as the Interprofessional Lounges on Level C2 and C3, aisles and aisle accessways must provide a minimum clear width between seating as summarized below.

Aisles

Aisles serving table seating on one side must have a clear width of at least 55 inches. Where seating is provided on both sides of the aisle, the aisle must have a clear width of 74 inches when serving less than 50 seats, and 80 inches when serving 50 or more

seats. The clear aisle width must be measured from the edge of the tables (IBC 1029.9.6 & 1029.12.1).

Aisle Accessways

Aisle accessways serving seating on one side must have a minimum clear width of 31 inches. Aisle accessways serving seating on both sides must have a minimum clear width of 50 inches. The clear width must be increased ½-inch for each additional foot, or fraction thereof, beyond 12 feet of aisle accessway length. No minimum width for aisle accessways having a length not exceeding 6 feet and used by a maximum of four people. The clear aisle accessway width must be measured from the edge of the tables (IBC 1029.12.1).

10. ACCESSIBILITY

Accessibility requirements for medical facilities are provided in the American's with Disabilities Act Standards (ADA). All of the patient sleeping rooms must comply with ADA 805 (ADA 223.2.2).

11. MECHANICAL

The building must be provided with mechanical ventilation in accordance with ASHRAE 62.1, 2013 edition.

12. ENERGY CONSERVATION

The building is subject to with the requirements of IECC 502, 503, and C504 or ASHRAE 90.1 – 2013 (IECC 501.2).

13. PLUMBING FIXTURES

The following table summarizes the plumbing fixtures provided in the Congress Street building. The subsequent sections discuss the analysis for each of the floors. The plumbing fixture analysis is based on the requirements of the 2015 IAPMO UPC as adopted and amended by Maine.

Floor Level[A]	Occupancy	Toilets Provided		Urinals	Lavatories Provided		Max Occupant Load Supported			Maximum Expected Occupant Load
		Male	Female		Male	Female	Male	Female	Total	
CB	Group B	1	1	0	1	1	50	15	30	11
CG	Group A-3	2	3	0	2	3	200	100	200	181
	Group I-2 - Employee	1	2	0	1	2	15	15	30	25
	Group I-2 - Patient	4 Unisex					32 patients			41[B]
C1	Group I-2 - Employee	2	3	0	2	3	35	35	70	4
C2	Group I-2 - Employee	1	2	0	1	2	15	15	30	16
	Group I-2 - Public	1	1	0	1	1	1 waiting room			1 waiting room
	Group I-2 - Patient	1 per room					32 patient rooms			32 patient rooms
C3	Group I-2 - Employee	1	2	0	1	2	15	15	30	16
	Group I-2 - Public	1	1	0	1	1	1 waiting room			1 waiting room
	Group I-2 - Patient	1 per room					32 patient rooms			32 patient rooms
B	Group I-2 - Employee	3	5	2	3	3	135	95	190	190
G	Group B	2	3	1	3	3	200	50	100	49

[A] Level C4 is not included in the table since the space is shell space and will be fit-out at a future date. Bathroom fixtures will be provided once the space is fit-out for occupancy.

[B] While the post-op suite includes 41 beds, full occupancy is not expected at one time. The toilet fixtures provided for patients have a capacity of 32 patients, which is approximately 78% of the number of beds.

13.1 LEVEL CB

On Level CB, bathrooms are provided for the IT offices located on this level as well as potential transient staff. The IT office has 11 work stations. Although the floor plans show two toilets and lavatories for each sex, it is our understanding that the number of fixtures may be reduced to one toilet per sex. Therefore, the table above only includes one toilet and lavatory per sex. These fixtures support a total staff population of 30 people. This proves sufficient to support the IT staff as well as additional capacity for transient workers. It is also our understanding that additional staff bathrooms may be provided at or near the employee entrance on Gilman Street. Since staff members are accommodated with bathrooms on other floors, these additional staff toilet rooms are not required but provided for convenience purposes for staff arriving/leaving through the staff entrance at this location. The number of plumbing fixtures provided here is subject to the design team's consideration.

13.2 LEVEL CG

A combination of staff, public, and patient restrooms are provided on this floor. The following sections discuss each population.

Staff
A total of 3 unisex staff bathrooms are provided on Level CG. These fixtures can support a maximum of 30 staff members. Approximately 25 staff workstations are shown on the plans. Therefore, the proposed fixtures provide sufficient capacity.

Public
A total of 3 unisex bathrooms and one set of individual bathrooms for each sex are provided for public use. These fixtures can support a maximum of 200 people. Approximately 181 seats are shown in the CG waiting area. Therefore, the fixtures provide sufficient capacity for the expected occupant load.

Patients
A total of 4 unisex patient bathrooms are provided on Level CG. These fixtures can support a maximum of 32 patients.

While the post op suites contains 41 patient beds, we do not expect all beds to be occupied at one time and therefore the 4 patient toilet rooms are considered sufficient since they provide for 78% of the beds to be occupied. If all beds could be occupied at one time, two additional patient bathrooms are required. We recommend reviewing the proposed layout with MMC the local plumbing inspector for approval.

13.3 LEVEL C1

Level C1 is provided with 5 unisex staff toilets that are intended to serve staff in the PACU suite. The 5 staff toilets can support a maximum of 70 employees. A total of 4 staff workstations are shown in the PACU suite. Therefore, the proposed fixtures provide sufficient capacity.

Due to the de-gowning process for operating room (OR) staff, the OR employees are expected to use the bathrooms in the locker rooms located on Level B. No patient bathrooms are provided on this floor since patients in the PACU suite and ORs will be unconscious and unable to use the restroom. Once patients become conscious, they are moved to a different floor (i.e. Stage 2) where they will have access to restrooms. Stage 2 will be either Level CG post op suite to await discharge or relocation to an inpatient room.

13.4 LEVEL C2 & C3

A combination of staff, public, and patient restrooms are provided on Level C2 and C3. The following sections discuss each population.

Staff
A total of 3 unisex staff toilet rooms are provided on each floor. These toilet rooms can support a maximum of 30 employees. Levels C2 and C3 will contain a staff to patient ratio of 1:2. Since there are 32 beds on each floor, approximately 16 employees are expected on each floor. Therefore, the proposed staff fixtures can accommodate the expected staff population as well as additional transient staff who may be on the floors temporarily such as doctors, nutritionists, etc.

Public

A total of 2 unisex toilet fixtures are provided for the waiting rooms on each floor. These fixtures provide sufficient capacity in accordance with UPC Table 422.1.

Patient

Each patient room is provided with an individual toilet room in accordance with UPC Table 422.1.

13.5 Level C4

Level C4 is not included in the plumbing fixture analysis since the space is being constructed as shell space for future fit-out. Plumbing fixtures will be provided on Level C4 at a later date as needed for the future program.

13.6 LEVEL B

Locker rooms are provided on Level B for use by OR staff. There are 19 ORs provided on Level C1 with a maximum of 6-10 employees expected in each OR. This staff count totals a maximum of 190 people. With the ORs operating at 80% capacity, the typical OR staff population is approximately 152 people. As shown in the attached summary table, proposed locker room fixtures can support both the typical (i.e. 152) and maximum (i.e. 190) expected occupant loads for the OR staff.

13.7 LEVEL G

Level G contains a staff lounge as well as serves as a public entrance to the building from the Visitor Garage. Therefore, public restrooms have been provided at this level. As shown in the table on page 26, sufficient restrooms have been provided on other floors for both the public and staff populations. Therefore, the fixtures provided on Level G are for convenience only.

The staff lounge on Level G has a calculated occupant load of 49 people and therefore qualifies as a Group B occupancy. Using the factors applicable to Group B occupancies, the proposed fixtures can support 100 people (UPC Table 422.1). This capacity is sufficient for the population of the staff lounge and provides excess capacity for transient staff and/or members of the public.

Memorandum
Planning and Urban Development Department
Planning Division

To: Sean Dundon, Chair and Members of the Portland Planning Board

From: James Dealaman, Administrative Officer, Stuart O'Brien, Planning Director, and Jeff Levine, Planning and Urban Development Director

Date: December 14, 2018

Re: Proposed Division 30 Text Amendments for Hotel Inclusionary Zoning, City of Portland, Applicant

Meeting Date: December 17, 2018

I. INTRODUCTION

Stemming from policy ideas gleaned in the 2016 Housing Committee public feedback process, as well as targeting the 2017 committee priority to "implement policies to capitalize the Housing Trust Fund," the 2018 Housing Committee underwent three meetings of review and is providing the Planning Board guidance in support of the following proposed ordinance, "Hotel Inclusionary Zoning (IZ)," which incorporates a methodology similar to the inclusionary zoning ordinance 14-387, and would become a requirement on any hotel development of 10 units or more. The amendment would first provide a first option for all hotel uses (hotel/inn/motel) to provide low-income affordable housing units for rent on-site. Those units would then be differentiated from the rest of the development through deed restrictions and other requirements to ensure that they would be used for permanent affordable housing. If the hotel developer does not want to provide these units on-site, then the option would exist for a fee-in-lieu paid to the Housing Trust Fund to fund affordable housing.

The policy proposal is offered as a tool to help achieve the City Council's goal to "increase access to rental and ownership housing that is safe and affordable for working and low-income families," as analysis has shown hotel developments with contributing to affordable housing demand due to a percentage of newly employed households that cannot afford to live in Portland.

II. BACKGROUND TO ENSURING WORKFORCE HOUSING IN PORTLAND

In 2015, the City Council introduced Inclusionary Zoning *(City of Portland Land Use Code 14-487)* as an amendment to the ordinance which applied to any residential development project of ten or more units. Any residential development with ten or more units is either required to make available a minimum of 10% of their units as workforce housing eligible units for a given duration with the option of building units off-site (within the same census block), or also have the option of paying a fee-in-lieu towards the City's Housing Trust Fund, which is uniquely able to fund workforce housing driven projects, whereas federally funded HUD projects are limited to funding creation of low-income housing. Since its launch, residential Inclusionary Zoning fee-in-lieu contributed $1,185,648 into the Housing Trust fund and has so far subsidized projects which have created a total of 38 units available to eligible workforce households. Portland considers a workforce housing unit to mean rented to households earning 100% AMI or less, or a dwelling unit for sale to households earning 120% or less of AMI. (City

of Portland Land Use Code 14-485). Attached is an excerpt taken from the City's Interim Housing Report which indicates the current HUD AMI levels (Attachment 3).

III. PROPOSAL SUMMARY

In recent years, the city has experienced a steady rise in hotel/inn/motel development with an increase of 21 percent since 2012. This policy is guided by the Comprehensive Plan, and builds on existing programs such Inclusionary Zoning and Housing Trust Fund to implement best practices in workforce and affordable housing development. In addition, this policy fulfills the Comp Plan goal to "pursue policies to enable people who work in Portland to have the option to live in Portland" *(Portland's Plan 2030, 50)*. Local and national data strongly indicates that job creation in the hospitality industry will involve a considerable amount of working households at average wage rates below what is required to afford housing in Portland. For those workers unable to afford residence in Portland, nearer to their place of employment, means they would find themselves in the position of commuting longer distances and incur additional costs resulting from travel, parking, etc. Conversely, there may also be households that choose to commit more of their income to a point considered "unaffordable," (e.g. Portland considers affordable to mean 30% or less of a households' income is committed to rent or other housing expenses (*City Land Use Code 14-485)*), which in policy terms is considered inequitable, as those earning less income are in the position of spending disproportionally more than those with greater means, in order to be able to live in Portland. Finally, influx of workers into the rapidly expanding hospitality industry creates a dynamic of adding additional pressure to the housing market for all households and accordingly, increases pressure on housing availability across sectors. Although this is true to a degree among all growing industries, the impact is especially acute related to growth in the hospitality industry given the nature of employment categories, hours of operations and services provided.

As a result of the specifics of the industry's profile and anticipating an increase in hotel/inn/motel development in the coming years (30 percent between 2019-2021) City Staff are proposing Hotel Inclusionary Zoning as an ordinance amendment to the City's Land-Use Code, Chapter 14, Division 30 (Attachment 1). The requirement would apply to hotel projects with 10 or more units within any 5-year period, and aims to encourage creation of affordable housing offered to eligible households based on one or both of the following:

- **"Housing Creation"** requires a hotel project to provide one unit of low-income housing for rent onsite for every 28 hotel rooms, with any hotel project that provides 10-27 rooms or a room total in between increments of 28 rooms to be rounded up to the nearest increment of 28 rooms and subject to that corresponding unit requirement. Portland considers a low-income housing unit to mean rented to households earning 80% AMI or less (City of Portland Land Use Code 14-485).

- **"Fee in Lieu Alternative"** is still subject to the unit requirements outlined under Housing Linkage provided above, but instead of providing units for every 28 rooms, a hotel project can pay a linkage fee of $3,806 per room to meet the requirement, which is deposited into the City's Housing Trust Fund *(City of Portland Land Use Code 14-489)*. The linkage fee will be adjusted through periodic updates to the nexus study.

Under the proposed Hotel Inclusionary Zoning proposal, the number of hotel rooms per required low-income unit is determined by two variables:

A) The proposal uses the same fee-in-lieu per unit as is used in the calculation in Land Use Code Sec 14-483 to then determine the number of hotel rooms equivalent to one unit. The fee-in-lieu contribution amount for a dwelling unit is updated annually. Presently, the fee-in-lieu per unit is **$104,699**.

B) The second variable is per key (hotel unit/room) is based on a nexus study (Attachment 2) assigned linkage fee amount determined by U.S. Census American Community Survey data to arrive at an amount targeting the affordability gap; with current data the amount is **$3,806 per unit**.

A **÷ B = C**

Fee-in-lieu per unit ÷ Linkage fee per hotel room = Number of hotel rooms per unit

C) Currently, the number of hotel rooms that equal the fee-in-lieu for one unit is roughly 27.5, or rounded up to 28 rooms per unit.

The Nexus Study is an important step in gauging whether or not there is a "nexus" or connection between a hotel development project and an affordability gap that exists for its workers in an area. Further, the study provides a proportional measure for a using a linkage fee to mitigate an affordability gap of any scale of hotel development. Earlier this year, the City commissioned a Job-Housing Nexus Study for analysis. Based on those findings documented in the Greater Portland Council of Government study (*Proposed Hotel Linkage Fee: Supportable Range*), which final version took into account feedback and updated data from the Maine Innkeepers Association, a range of potential fees based on a per key basis was provided which would allow the city to more broadly assess and address the affordability gap. Having a per key calculation provides the city the ability to measure by unit the varying scales of hotel development with their commensurate affordability gaps they are estimated with contributing.

Staff finds that of the three options offered by the nexus study the $3,806 per key calculation was most appropriate, as it incorporates the minimum wage requirement in effect, but also retains the diversity of employment types captured in the American Community Survey data. For developers who would prefer not to provide units on-site, the fee-in-lieu alternative allows for a predictable way to developers to anticipate the costs.

It is also relevant to note, that in addition to the proposed Hotel IZ requirements that any existing residential units that decided to convert into hotel use would also be subject to the Housing Replacement requirements of the ordinance *(City Land Use Code 14-483)* in addition to the current proposed Hotel Inclusionary Zoning requirements. The Hotel IZ could also be considered to provide an added layer of cost to deter projects from removing residential units from the housing stock.

IV. RETROSPECTIVE ANALYSIS

At the last Planning Board workshop September 25th the board had asked if data was available to quantify the amount of funds that would have been generated to the Housing Trust Fund over a period of five years under the current proposal. Staff have been able to determine that based on the current proposed fee-in-lieu ($3,806), between fiscal years 2014-2018 the Housing Trust Fund would have seen approximately $1,883,970 (495 new hotel units), or an average of $376,794/yr deposited into the HTF.

Additionally, staff took the opportunity to factor in all current projects in the pipeline (either under review, approved, or under construction) and show what revenue could have generated (table provided on right). However, based on the ordinance draft language applying to projects having not received approval, the actual forecast of revenue (assuming projects are approved, totaling 261 units) that could still be collected by the Housing Trust Fund to be $993,366, or by FY2021, or 10 low-income units.

Hotel, Inn, Motel Land Uses Issued CO (FY2014-18), and Pending Development (FY2019-21)

Fiscal Year	Total Keys Issued CO	Approx. Fee-in-lieu HTF Contribution (Based on Current Calculation of $3,806)
2014	217	$825,902
2015	241	$917,246
2016	22	$83,732
2017	0	$0
2018	15	$57,090
Total	**495**	**$1,883,970**
5-Year Average (FY2014-18)	**99**	**$376,794.00**
2019	180	$685,080
2020	253	$962,918
2021	261	$993,366
Total (FY19-21)	**694**	**$2,641,364**
Averaged Per Year (FY2019-21)	**231**	**$880,454.67**
Weighted Average (FY2014-21)	**149**	**$565,666.75**

Source: City of Portland Assessing, Planning, and Permitting Data

V. Staff Analysis

Based on the conclusions of the nexus study which confirm and quantify an affordability gap of hospitality worker households resulting from a hotel project, as well an upward trend in upcoming hotel development, Planning Staff find the attached proposal will help to address the affordability gap, by incentivizing affordable housing. If implemented, Hotel Inclusionary Zoning will be a useful tool in helping to create housing units, or alternatively, through increasing funding for the Housing Trust.

Based on additional analysis conducted by Collier's International which was based on the proposed $3,806 linkage fee, staff have found marginal impacts on the difference in Internal Rate of Return (IRR) and in Return on Investment (ROI), for a Downtown Hotel, which is estimated at being a (.58%) and (.34%) decrease, respectively. For a Suburban Airport Hotel the difference in IRR and ROI was only slightly higher, at (.66%) and (.43%), respectively. Collier's analysis also provides that Hotel Inclusionary Zoning fee would represent less than 2.8 percent on total development costs for any hotel project.

Staff have concluded that given the current pace of hotel development seen across past years as well as the anticipated growth in the hospitality industry in Portland, hotel development is shown to be able to accommodate a housing linkage policy to address the affordability gap of new workers households they produce.

VI. Comprehensive Plan



The City of Portland's Comprehensive plan, *Portland's Plan 2030*, provides important short term and longer-term goals and strategies for informing policy makers as they consider policies and priorities. The proposed text amendment allowing for Hotel Inclusionary Zoning is relevant to a variety of important sections throughout the plan. Several key examples include:

Goals:

- Invest in, attract, and retain human capital to support a growing economy.
- Increase, preserve, and modify the overall supply of housing city-wide to meet the needs, preferences and financial capabilities of all Portland residents.
- Pursue policies to enable people who work in Portland to have the option to live in Portland.

Housing Strategies:

- **Build on Existing Programs**
  a) Reinforce existing housing tools, policies, and programs while continuing to explore emerging best practices.
  b) Continue to implement best practices in workforce and affordable housing development such as the Housing Trust Fund, inclusionary zoning, and other tools.
- **Adopt Measurable Objectives**
  a) Consider national best practices in developing metrics.
- **Explore New Tools**
  b) Explore tools that support innovative frameworks for housing creation, stability, and affordability, such as but not limited to community land trusts and a Transfer of Development Rights program.

VII. Next Steps

1. City Council Public Hearing

VIII. Attachments:

1. Draft Hotel Inclusionary Zoning Ordinance, 12/5/18
2. Nexus Study Report provided by GPCOG entitled, "Proposed Hotel Linkage Fee: Supportable Range," 8/29/18
3. HUD AMI Levels, Excerpt from City of Portland "Interim Housing Report," 11/2018
4. Portland Impact Fee Analysis Summary provided by Colliers International, 9/24/18
5. Staff Memo to Housing Committee, Jeff Levine, Director, Planning and Urban Development Department, 8/29/18
6. Staff Memo to Housing Committee, Jeff Levine, Director, Planning and Urban Development, 6/21/18
7. Chapter 14 Land Use Code Definitions of Hotel, Motel, and Inn

Sec.14-484. Purpose.
It is in the public interest to promote an adequate supply of affordable housing for the city's residents. The purpose of this division therefore is to offer incentives to developers to include units of affordable housing within development projects or based on demonstrated need caused by creation of new lower-income jobs, thereby mitigating the impact of market rate housing construction on the limited supply of available land for suitable housing, and helping to meet the housing needs of all economic groups within the city. The city believes that this division will assist in meeting the city's comprehensive goals for affordable housing, in the prevention of overcrowding and deterioration of the limited supply of affordable housing, and by doing so promote the health, safety and welfare of its citizens.

Sec. 14-485. Definitions.

…

Hotel Project is any hotel, inn or motel, as defined in this ordinance, consisting of 10 or more rooms for rent. Any such development that expands by 10 or more rooms within any 5 year period will also be considered a Hotel Project.

14-489 Inclusionary Zoning for Hotel Projects

(a) Purpose: This section is based on City analysis, most specifically documented in the Greater Portland Council of Government study "Proposed Hotel Linkage Fee: Supportable Range" dated 8/29/18, that finds that new hospitality developments create a need for new affordable housing. This need is the result of the fact that these uses create a number of jobs that do not pay sufficiently to afford housing provided in the market.

(b) Applicability: This section applies to all Hotel Projects as defined in 14-485 that have not submitted complete applications as of the effective date of this section.

(c) Housing Linkage: All Hotel Projects shall provide one unit of Low Income Housing for Rent in the City of Portland for every 28 rooms in the Hotel Project. This amount shall be rounded up to the nearest increment of 28 rooms. These units shall be deed restricted for the longest period permitted by law; shall not be used for Short Term Rentals of less than 30 days; and must be provided with distinct entrances from the street to delineate them from the hotel itself.

DRAFT

(d) Fee-in-Lieu Alternative: As an alternative to providing units as per (c) above, a Hotel Project may pay a fee-in-lieu of $3,806 per room. This amount shall be paid into the City's Housing Trust and used for the purposes set forth in the ordinance and regulations applicable to that trust:

(e) **Annual Adjustments:** The amounts in (d) above shall be adjusted annually in the same way as the fee under Division 29 for Housing Replacement.

(f) **Regulations:** The Planning Board may promulgate implementing regulations based on this ordinance.

Sec. 14-490. Housing trust fund.

DRAFT

To: **Jeff Levine, Planning & Urban Development Director**
From: **Stephanie Carver, GPCOG Planning Director**
Date: **8/29/18**
RE: **Proposed Hotel Linkage Fee: Supportable Range**

This memo has been expanded and updated based on additional data provided by the Maine Innkeepers Association.

Introduction

The City of Portland's Department of Planning & Urban Development is examining the feasibility of a proposal for assessing hotel linkage fees that would recover the cost of producing housing that is affordable for hotel employees. The purpose of this memo is to provide information to the City regarding the use of linkage fees for this purpose and outline a potential methodology for the calculation of a fee.

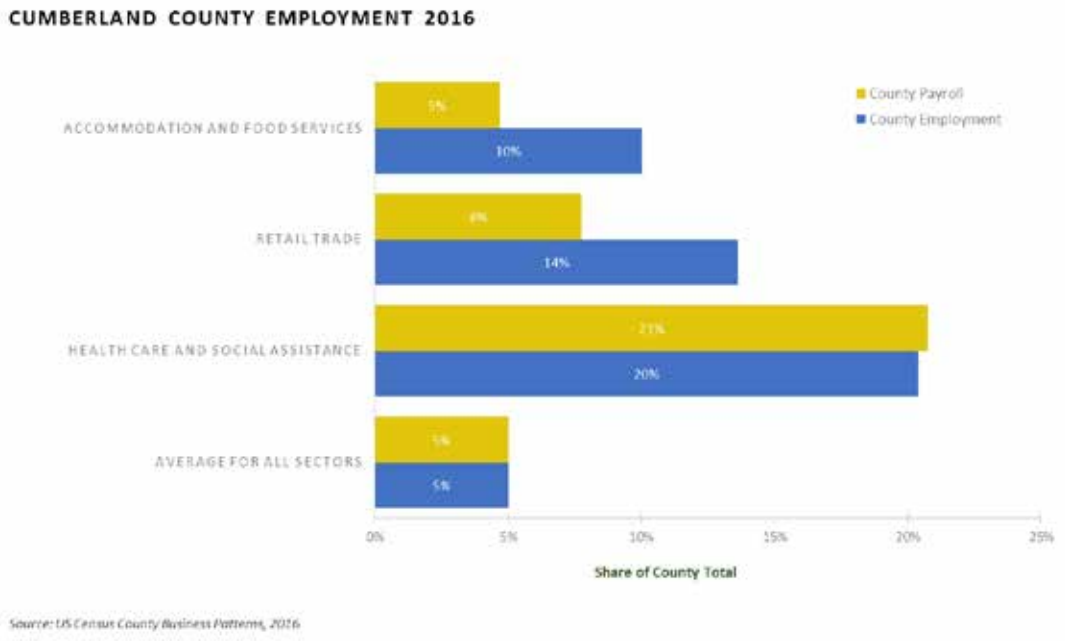
We have used the best available data to demonstrate how this methodology could be used to estimate a potential hotel linkage fee, but this does not constitute a recommendation from GPCOG as to the amount the City of Portland should charge for the hotel linkage fee nor is it a recommendation for the City of Portland to enact a hotel linkage fee ordinance.

Background

Linkage fees are fees that cities may choose to implement to help mitigate the impact of new commercial development on the demand and availability of affordable housing. Prior to implementing a fee policy, communities often conduct a study to identify the connection, or "nexus" between new commercial development and the need for additional affordable housing. It is assumed that new commercial development contributes additional workers to a city's workforce and adds new worker households. In many industries, a percentage of these households do not make enough to live and work in the same city. Looking outside the city to find affordable housing often results in longer commute times and higher transportation costs. If implemented, a linkage fee is typically charged to a developer as a condition of approval and it is assessed based on total square footage or number of units in the development.

The City's Comprehensive Plan identifies the increasing demand for affordable housing as an emerging issue and sets a goal of pursuing "policies to enable people who work in Portland to have the option to live in Portland." To be considered affordable, housing should consume no more than 30% of a household's income including rent, mortgage, utilities and other household related costs. Of the 1,130 housing units that were permitted and/or built in Portland between 2010 to 2014,

including apartments, condominiums and single-family homes, just 29% were offered at a rent or sales price affordable to a household earning the median income[i].



The Maine Office of Tourism estimates over 6 million tourists visited Portland in 2017. Hotel development is steadily increasing, with 1,811,050 square feet of hotel development - representing 2,647 units - currently in operation throughout the City. According to the US Census, the accommodation and food service sector is the third largest share of employment in Cumberland County, representing 10% of the County's workforce but only 5% of the County's payroll.

According to the Maine State Housing Authority the average rent (including utilities) for a two-bedroom apartment in Portland is $1,053 per month, and the household income needed to afford the average rent in Portland is $42,111 per year. However, this is the average rent paid by existing renters in Portland and new households moving to Portland will pay the current market rate, which is generally higher than the average rent. As of June 15, 2018, there are roughly 60 two-bedroom apartments listed for rent in Portland on Zillow, with monthly rents ranging between $1,300-$3,500. One third of those apartments are listed with rents between $1,500 and $2,000, and another third of those apartments are listed for more than $2,000 per month. Therefore, a new household moving to Portland will expect to pay between 120%-330% of the average rent to live in the City.

There are a range of estimates available regarding the average wages of a full-time employee in this sector, and all are well below the household income needed to afford housing in Portland. According to the US Census, the average Cumberland County employee in this sector earns $312 a week or $16,227 per year. The Maine Department of Labor (DOL) estimates the median income for a full-time

Cumberland County employee in this sector to be significantly higher, $24,908 per year. Additionally, as of 2017 the minimum wage in Portland is $10.68/hour, so a full-time employee making this salary would earn an annual income of $22,214. This affordability gap may force accommodation workers employed in Portland to seek housing outside of Portland.

Data

The minimum justified fee per square footage of hotel development outlined in this memo is based on data from both the US Census American Community Survey (ACS), and wage data from the Maine Department of Labor (DOL).

The US Census American Community Survey (ACS) data in this memo was used because it is the most comprehensive and consistent data source for demographic and economic characteristics of the population in GPCOG's service area. However, there are some limitations to the ACS data. First, it is 5-year sample data because this is the only data consistently available at the municipal, county, and state level. The drawback to using data pooled over five years is it averages out any short-term changes in income due to economic cycles or Portland's more recent minimum wage increase. Second, the median earnings reported by the ACS are based on what individuals report for their earnings regardless of whether they work full-time or part-time. As a result, these earnings may be skewed lower by individuals who work part-time, which may be more common for employment in the retail, food service, or accommodation sectors.

To balance these limitations, the median weekly wage data from the Maine DOL was also included in the analysis. The Maine DOL wage data is from the Quarterly Census of Employment and Wages (QCEW), which is based on employment and wage data reported to the Unemployment Insurance (UI) of the United States. The Maine DOL data also has some limitations. First, the data are only available at the industry level, so it is not possible to calculate the affordability gap for different occupations in the hotel sector. Second, the average weekly wage reported by the QCEW also does not differentiate between full-time and part-time employment. As a result, the weekly wage data reported by the Maine DOL may be skewed both by higher wage occupations and by part-time employment. The average weekly wage reported by Maine DOL was used to calculate yearly income based on full-time employment. This also assumes individuals employed in the accommodation sector can work full-time if they are willing and able to[ii].

Methodology

Methodologies used to calculate linkage fees vary, but in most cases the analysis begins with an estimation of the number of new employees associated with a typical development, in this case a hotel. In this methodology, a formula is used to calculate the affordability gap between what workers can afford to pay for housing and the average cost of market rate housing.

In Portland's case, a link is established between the creation of new jobs in the hotel sector and the increased demand for affordable housing through the following steps:

- **New Jobs.** Industry data was used to estimate the number of direct jobs that will be created by a new hotel with 180 units. According to the Urban Land Institute the typical hotel employs between 0.5-0.8 employees per hotel room. Using an average value of 0.65 employees per hotel room, it is estimated that a hotel with 180 rooms will employ 117 people. The current ratio of jobs per household was used to estimate how many households will be created by this new employment.
- **Households.** Currently there are 37,737 employed civilians aged 16 and over within the 30,211 total households in Portland. This means that on average there are 1.2 jobs per every household in Portland. Based on this ratio it is estimated that the 117 additional jobs created by a new hotel will create 94 new households in Portland. However, it is assumed employment in these households will be split up between different occupations, such as management, sales, service, and maintenance. The wages for each specific occupation may be higher or lower than the median wage for the hotel industry. Therefore, industry occupation employment and wage data examined from the ACS was used to estimate how many new households will be low income.

EMPLOYED POPULATION PER HOUSEHOLD 2016

	Portland	Cumberland County	Maine
Employed Civilian Population 16+	37,737	155,014	652,638
Total Households	30,211	117,871	551,109
Jobs/Household	1.2491	1.3151	1.1842

Source: American Community Survey 2016 5-year estimate

- **Jobs by Occupation.** Based on industry and occupation employment data from the ACS 64% of jobs in the hotel industry are service occupations, 19% of hotel jobs are management occupations, 13% of hotel jobs are sales and office occupations, and the remainder are maintenance and transportation occupations. The total number of jobs and households that will be created in each occupation was calculated by multiplying the share of hotel employment by occupation by the total number of new hotel jobs created.

NEW JOBS AND HOUSEHOLDS BY OCCUPATION CREATED BY NEW HOTEL EMPLOYMENT

	Share of Hotel Employment	Number of New Jobs	Number of New Households
Service	**64%**	**74**	**60**
Sales and Office	13%	15	12
Transportation	4%	4	3
Maintenance	1%	1	1
Management	19%	22	18
Total - All Occupations	100%	117	94

Source: American Community Survey 2016 5-year estimate; GPCOG Analysis

- **Household Income**. Median wage by occupation data for Cumberland County from the ACS was used to calculate the household income for each household in each occupation category. This calculation assumes 1 person in each new household works full-time in the hotel industry and any additional workers in the household earn the area median income:

NEW HOUSEHOLDS AND HOUSEHOLD INCOME BY OCCUPATION (ACS DATA)

	Number of New Households	Median Wage for Hotel Income Earner	Median Wage for Second Income Earner	Total Household Income
Service	**60**	**$18,109**	**$9,015**	**$27,124**
Sales and Office	**12**	**$30,444**	**$9,015**	**$39,459**
Transportation	**3**	**$31,695**	**$9,015**	**$40,710**
Maintenance	1	$33,421	$9,015	$42,436
Management	18	$52,910	$9,015	$61,925

Source: GPCOG Analysis and American Community Survey 2016 5-year estimates

Median wage by industry data from the Maine DOL was also used to calculate the average household income for the 94 new households created by hotel employment:

NEW HOUSEHOLDS AND HOUSEHOLD INCOME (MAINE DOL DATA)

	Number of New Households	Median Wage for Hotel Income Earner	Median Wage for Second Income Earner	Total Household Income
Accommodation	**94**	**$24,908**	**$12,164**	**$37,072**

Source: GPCOG Analysis and Maine DOL QCEW 2016

- **Affordability Gap.** These estimates for household income by occupation were compared to housing affordability data from the Maine State Housing Authority to show the difference between what the new households created by hotel employment earn and the minimum income needed to afford a two-bedroom apartment in Portland. These results show that households with Service, Sales and Office, and Transportation occupations have a household income that is lower than the minimum income needed to afford rental housing in Portland. This household affordability gap is largest ($14,987) for households with Service occupations, which also represent nearly 2/3 of households created by the new hotel employment.

AFFORDABILITY GAP ANALYSIS (ACS DATA)

	Number of New Households	Total Household Income	Income Needed to Afford Rent in Portland	Household Affordability Gap	Total Affordability Gap
Service	**60**	**$27,124**	**$42,111**	**$14,987**	**$892,820**
Sales and Office	**12**	**$39,459**	**$42,111**	**$2,652**	**$32,048**
Transportation	**3**	**$40,710**	**$42,111**	**$1,401**	**$4,856**
Maintenance	1	$42,436	$42,111	NA	$0
Management	18	$61,925	$42,111	NA	$0
Total					**$929,724**

Source: Maine State Housing Authority, 2017; American Community Survey 2016 5-year estimates

The household affordability gap using the median wage by industry data from the Maine DOL was also calculated:

AFFORDABILITY GAP ANALYSIS (MAINE DOL DATA)

	Number of New Households	Total Household Income	Income Needed to Afford Rent in Portland	Household Affordability Gap	Total Affordability Gap
Accommodation	**94**	**$37,072**	**$42,111**	**$5,039**	**$472,007**

Source: Maine State Housing Authority, 2017; Maine DOL QCEW 2016

- **Aggregate Affordability Gap.** The household affordability gap for each occupation was multiplied by the number of households with employment in each occupation to arrive at a total affordability gap that ranges between $472,007 and $929,724 per year. This number represents the difference between these households' ability to pay for their housing and the market cost of their housing based on the median monthly rent, for one year. In reality these

households may face higher rental housing costs since current Portland rents for new units are significantly higher than the median rent.

- **Final Calculation.** Dividing the affordability gap by the number of new hotel rooms results in an average affordability gap that ranges between $2,622 and $5,165 per room, or between $3.91 and $7.70 per square foot. Therefore, a fee between ***$3.90-$7.70 per square foot*** would cover a minimum justified housing affordability gap for the 94 new households created by a new 180-unit hotel employment for one year. This methodology assumes the median wage for a hotel income earner in the service industry, including full-time and part-time employees, is $18,109 based on US Census ACS data. If it is instead assumed that hotel service industry employees are working full-time at the City's minimum wage of $10.68/hour and making $22,241 annually, then the minimum justified fee would be between $2,622 and $3,806 per room or ***$3.90-$5.67 per square foot*** of hotel development for one year. However, this assumes individuals working in the service sector are able to procure full-time employment, which is not always the case[ii].

This example estimate represents the full cost of the affordability gap for employment in one hotel for one year as calculated by the proposed methodology. Multiple factors could potentially impact the demand for affordable housing and the City may determine a higher or lower percentage of this fee based on these variables. Furthermore, this fee could be re-evaluated periodically as circumstances such as inflation, rents, and rental housing supply change.

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[i] Portland 2030 Housing Demand, GPCOG 2015

[ii] According to a 2016 study (https://www.epi.org/publication/still-falling-short-on-hours-and-pay-part-time-work-becoming-new-normal/#epi-toc-21) from the Economic Policy Institute the retail trade and leisure and hospitality sectors contributed to 63% of the growth in part-time employment and 54% of the growth in involuntary part-time employment from 2007-2015. Involuntary part-time employment is defined as individuals who are working part time because full time work could not be found or hours were reduced due to economic conditions (slack work).

(Excerpt from City's of Portland Housing and Community Development Division's Interim Housing Report providing HUD AMI Levels, Nov. 2018)

2018 INCOME LIMIT- PORTLAND HUD METRO AREA

The U.S. Department of Housing and Urban Development (HUD) computes income limits for Portland based on local Area Median Income (AMI). At least 11 HUD programs and 14 other federal programs use some variation of HUD's income limits. Portland applies HUD's income limits to determine and monitor household eligibility with the City's Inclusionary Zoning and Low-Income Housing programs, and for residential housing federally funded through HOME and Community Development Block Grants (CDBG).

The chart below depicts the maximum income level for various household sizes using HUD's AMI designations. HUD describes households in the 30% AMI bracket as extremely low-income. 50% AMI is also known as very-low income households. 80% AMI households are low-income earners, and 100% to 120% AMI are commonly known as workforce housing households.

Household Size

AMI	1	2	3	4	5	6	7	8
30%	**$18,950**	**$21,650**	**$24,350**	**$27,050**	**$29,250**	**$31,400**	**$33,550**	**$35,750**
50%	**$31,550**	**$36,050**	**$40,550**	**$45,050**	**$48,700**	**$52,300**	**$55,900**	**$59,500**
60%	**$37,860**	**$43,260**	**$48,660**	**$54,060**	**$58,440**	**$62,760**	**$67,080**	**$71,400**
80%	**$50,350**	**$57,550**	**$64,750**	**$71,900**	**$77,700**	**$83,450**	**$89,200**	**$94,950**
100%	**$63,070**	**$72,080**	**$81,090**	**$90,100**	**$97,308**	**$104,516**	**$111,724**	**$118,932**
110%	**$69,400**	**$79,300**	**$89,200**	**$99,100**	**$107,050**	**$115,000**	**$122,900**	**$130,850**
120%	**$75,700**	**$86,500**	**$97,300**	**$108,100**	**$116,750**	**$125,400**	**$134,050**	**$142,700**

Source: HUD, 2018 Income limits – Portland HUD Metro FMR Area

PORTLAND IMPACT FEE ANALYSIS

SUMMARY
9/24/2018

DRAFT

Colliers INTERNATIONAL

	Downtown Hotel	Suburban Airport Hotel
# of Residential Units		
# of Hotel Room Keys	150 Keys	200 Keys
Surface Parking GSF		65,000 GSF
Structured Parking GSF		
Development GSF (ex. Parking)	52,500 GSF	70,000 GSF

Total Development Cost (Without Impact Fee)	$22,775,860	$27,270,015
$/Unit/Key/GFA (Without Impact Fee)	$151,839.06/ Key	$136,350.08/ Key

Estimated Impact Fee to Developer	**$522,026**	**$685,976**
Percent of TDC	**2.29%**	**2.52%**

Hotel Inclusionary Fee	**$570,900**	**$761,200**
Percent of TDC	**2.51%**	**2.79%**

TOTAL (ALL FEES)	$ 23,868,786	$ 28,717,191

IRR (**Without** Impact Fee)	10.19%	10.95%
IRR (**With** Impact Fee)	9.63%	10.33%
IRR (With Impact Fee & Inclusionary Fee)	9.04%	9.68%
Difference in IRR (Impact fees only)	**0.56%**	**0.62%**
Difference in IRR (Impact fees and Inc. Fee)	**1.14%**	**1.28%**

ROI (**Without** Impact Fee)	5.85%	6.46%
ROI (**With** Impact Fee)	5.50%	6.01%
ROI (With Impact Fee and Inclusionary Fee)	5.16%	5.58%
Difference in ROI (Impact fees only)	**0.35%**	**0.45%**
Difference in ROI (Impact fees and Inc. Fee)	**0.69%**	**0.88%**

Portland, Maine Yes. Life's good here.

Jeff Levine, AICP
Director, Planning & Urban Development Department

Memorandum

To: Housing Committee

From: Jeff Levine, Director

Date: August 29, 2018

Re: Hotel Linkage Update

Since you referred the issue of a proposed hotel linkage program to the Planning Board, staff has had additional internal discussion, as well as a constructive set of meetings with representatives from the hospitality industry to better understand their market. As a result of these discussions, we are bringing this item back to the Housing Committee for an update and potential revised referral.

- Change to the Draft Ordinance: Based on additional conversations with Corporation Counsel – which we mentioned at the previous discussion – we are recommending a revision to the draft ordinance that adopts a methodology similar to the inclusionary zoning ordinance in 14-387. That revision would provide a first option for all hotel uses to provide low-income housing units for sale or rent on-site. Those units would have to be differentiated from the rest of the development through deed restrictions and other requirements to ensure that they would be used for permanent affordable housing.

  If the hotel developer does not want to provide these units on-site, then the option would exist for a fee-in-lieu. That fee-in-lieu, which we think many hotel developers would prefer, would be based on the nexus study. We think these revisions result in a stronger ordinance and tie the goals of the ordinance more closely to the process that would be used to implement it.

- Updated GPCOG Study: We asked the Greater Portland Council of Governments to update their hotel linkage study with additional data we have collected from the Maine Innkeepers Association. They have been kind enough to provide comments on the earlier study and pointed us to additional data sources that we asked GPCOG to incorporate into an updated study. As a result, they have a revised study with a range of possible fees in lieu that could be provided should a hotel development choose not to provide their units on-site. GPCOG's revised range is from $2,622 to $5,165 per room. This range includes a fee-in-lieu of $2,622 based on Maine Department of Labor Data – which is more specific in some ways but does not differentiate between types of employees in the accommodation sector. It also includes a fee-in-lieu of $3,806 if the more differentiated American

Community Survey data is utilized, but an assumption is added that no employee earns less than they would earn at the City's minimum wage at a full-time position. Finally, it includes a fee-lieu number of $5,165 if the original assumptions and methodology is used.

Staff feels that any of these three options are reasonable. However, staff recommends that the ordinance utilize the $3,806 per room fee, as it incorporates the minimum wage requirement in effect, but also retains the diversity of employment types captured in the American Community Survey data.

Portland, Maine Yes. Life's good here.

Jeff Levine, AICP
Director, Planning & Urban Development Department

Memorandum

To: Housing Committee

From: Jeff Levine, Director

Date: June 21, 2018

Re: Hotel Linkage – Revised Nexus Study and Draft Ordinance

As per your direction at your June 5, 2018, meeting, we have worked with the Greater Portland Council of Governments to revise their nexus study and also drafted a proposed ordinance based on that study. Both are attached.

The nexus study revisions were based on three major comments, which are repeated with their responses and staff comments below:

- *Income needed to afford rent seems low*. GPCOG used Maine Housing data in the initial memo. To address the concern of the subcommittee they added language about the limitations of the Maine Housing data.
- *Static Affordability Gap*. The methodology used to address the affordability gap only covers a single year because it is using annual salary as the basis for the calculation. To research the answer to this question, GPCOG staff reached out to Karl Seidman, a consultant who has completed several of these studies throughout the country, to ask how he would approach this issue. He said the methodology is rational and perhaps we could use a financing guideline to determine a duration of time. They also contacted both Maine Housing and Avesta but were unable to find any relevant guideline to assign a duration of time. Karl suggested it's likely the City would simply need to make a decision about how many years it wanted to use in the calculation. Given that using even one year's impact results in a range of per-room fees up to $5,165, staff does not recommend going above that level at this time.
- *Revise to Linkage Fee Terminology*- They edited the memo accordingly. Staff recommends using the term "Hotel Linkage Fee" rather than "Housing Impact Fee" in order to avoid confusion about this proposed ordinance and the Impact Fee study and proposed ordinance under development for transportation, stormwater/sewer and parks/open space.
- *Jobs per Household Data*- GPCOG's methodology used Cumberland County data for jobs created per household. They changed this data to reflect Portland's geography.

Hospitality Land-Use Types - Definitions

(Excerpt from City of Portland Land Use Code, Sec. 14-47. Definitions.)

Hotel: A building used for more or less temporary occupancy of individuals who are lodged with or without meals, having ten (10) or more guest rooms. No owner, operator, employee, shareholder, partner, corporate officer or agent of a bed and breakfast facility, hostel, hotel, inn, lodging house, motel, or tourist home (as defined in this code) may, for direct or indirect economic remuneration, arrange for or provide any housing accommodations including but not limited to long term, short term or overnight accommodations for an actual or potential guest, customer, or patron of the business at any offpremises site in the City, unless such a facility is authorized under the applicable provisions of Portland's Land Use Code, to offer such accommodations as a bed and breakfast, hotel, inn, lodging house, motel or tourist home.

Inn: A building used for more or less temporary occupancy of individuals, who are lodged with or without meals, having ten (10) but no more than fifty (50) rooms. Guest rooms shall not contain separate kitchen facilities. No owner, operator, director, employee, shareholder, partner, corporate officer or agent of a bed and breakfast facility, hostel, hotel, inn, lodging house, motel, or tourist home (as defined in this code) may, for direct or indirect economic remuneration, arrange for or provide any housing accommodations including but not limited to long term, short term or overnight accommodations for an actual or potential guest, customer, or patron of the business at any off-premises site in the City, unless such a facility is authorized, under the applicable provisions of Portland's Land Use Code, to offer such accommodations as a bed and breakfast, hotel, inn, lodging house, motel or tourist home.

Motel: A building or group of attached or detached buildings containing guest rooms or dwelling units most of which have separate outside entrances and parking space hereby intended to be used principally by automobile transients for compensation. Motels include tourist courts, motor lodges or cabins. No owner, operator, director, employee, shareholder, partner, corporate officer or agent of a bed and breakfast facility, hostel, hotel, inn, lodging house, motel, or tourist home (as defined in this code) may, for direct or indirect economic remuneration, arrange for or provide any housing accommodations including but not limited to long term, short term or overnight accommodations for an actual or potential guest, customer, or patron of the business at any off-premises site in the City, unless such a facility is authorized, under the applicable provisions of Portland's Land Use Code, to offer such accommodations as a bed and breakfast, hotel, inn, lodging house, motel or tourist home.