



MEMORANDUM

TO: Al Green, MMC
FROM: David Senus, PE and Craig Sweet, PE
DATE: August 17, 2018
RE: MMC Staff Parking Garage | Valley Street Trail Condition Assessment

The purpose of this memorandum is to summarize Woodard & Curran's assessment of the existing conditions on and around the Valley Street Trail, identified within Maine Medical Center's (MMC) Institutional Development Plan (IDP) as a potential walking route for staff between the future Staff Parking Garage at 222 St. John Street and the MMC Bramhall entrance atop the Western Promenade.

On July 16, 2018, Woodard & Curran performed a visual inspection of the Western Promenade Trail to observe the general condition of the trail system, ADA accessibility, and to identify informal pathways that connect to the trail. Additionally, Bartlett Design Inc. performed a lighting assessment of the Valley Street Trail system.

Trail Condition

Overall the Valley Street Trail pavement is in good condition. Minimal pavement distress such as longitudinal cracks (parallel to walking direction), transverse cracks (across the trail), edge cracks, alligator cracks, rutting, and depressions were observed. The condition of retaining walls along the trail were also visually inspected for signs of damage or deteriorating condition. Overall the retaining walls appear to be in good condition, no leaning, or large settlement was observed. Graffiti is present on some of the walls and several cap stones have been removed at various locations; however, this does not appear to have any impact on the structural integrity of the wall systems. At the connection of the Valley Street Trail and Valley Street, some cap stone blocks have been removed and placed as makeshift "steps" for users of a steep, informal gravel foot path. Large amounts of accumulated sediment were observed at the Valley Street connection. This sediment has been deposited from an ongoing erosion issue caused by concentrated runoff flowing down the informal foot path during rain events at this location. Erosion was not observed at other locations along the extent of the trail.

ADA Accessibility

The current conditions of the Valley Street Trail were reviewed against ADA accessibility standards. The current ADA Standards specify the following requirements for maximum running slopes:

- Maximum allowable running slope without handrails is 5%.
- Maximum allowable running slope with handrails and level landings is 8.33%.

Additionally, the AASHTO Guide for the Development of Bicycle Facilities allows for an 8% running slope for no greater than 300 linear feet.

The Valley Street Trail was constructed in 2006 by the City of Portland. The majority of the trail was constructed with a running slope of 10% or greater, with a maximum slope of 13.3%, which is not in conformance with ADA or AASHTO standards. The City elected to install a trail in 2006 to replace a long stairwell at this location that was unsafe due to condition issues. At that time, the City understood



that the steepness of the trail exceeded design standards, but they elected to install a trail that offered a more accessible route for pedestrians to the top of the Western Promenade than what was provided with the previous staircase.

Foot Path Connectors

During the visual inspection, multiple informal gravel foot paths were observed along the Valley Street Trail, the general location of these paths are shown on the attached figure. As previously noted, at the Valley Street Trail and Valley Street connection, retaining wall endcap blocks were removed and placed as makeshift “steps” for users (Photographs 1 & 2). Pedestrians who utilize these steps either continue east on a gravel path towards the Valley Street Trail avoiding the first trail switchback or northeast on a gravel path and enter the woods adjacent to the trail. From the woods, the foot path continues to a driveway and parking area for 4 Gilman Street. Three other informal gravel foot paths were observed along the Valley Street Trail that connect to this section.

The Valley Street Trail eventually comes to a tee intersection where users can either access Gilman Street to the north or continue south and connect to the sidewalk located on the Western Promenade. From this location, multiple gravel foot path connectors were observed. At the sidewalk intersection, two gravel foot paths were observed (Photo 12), one gravel foot path continues east and connects with the sidewalk on the Western Promenade, the second foot path continues northeast and ties into the Maine Medical Center Campus (Photo 17). Additionally, at the connection of the Valley Street Trail and Gilman Street, a third foot path exists that travels southeast and connects to the previously described trail that ties into the Maine Medical Center Campus.

Trail Drainage

As shown in the attached photographs, the Valley Street Trail area consists of maintained lawn areas where the land is flat to moderately steep and higher “meadow” grasses on steeper slopes, with woodland areas and underbrush abutting the trail area to the north and south. Stormwater runoff generated from the Valley Street Trail sheet flows from the Western Promenade down to Valley Street. The runoff does not appear to concentrate, instead it generally flows overland across the paved trail, mowed lawn, and higher “meadow” grassed areas. These vegetated areas play an important role in limiting erosion by reducing the stormwater velocity as it travels down grade. The areas of higher grass have the most impact in reducing velocities, while the mowed areas have a lesser impact. Overall the majority of the Valley Street Trail system does not show signs of drainage concerns or erosion, with the exception of the locations of the foot path connectors.

As stated above, the foot path connections show signs of erosion. This is due to the concentration of stormwater runoff funneled down these connector trails with no vegetation to control the rate of stormwater flow. Continued foot traffic compacts the surface further reducing its ability to grow vegetation and slow stormwater velocities. As stormwater flows down grade it begins to channelize within the foot path connectors, causing increased erosion. As the foot path connectors begin to erode the condition is exacerbated as the foot path deepens, further collecting and conveying fast flowing stormwater runoff. The combination of channelized stormwater runoff and the lack of ground cover results in noticeable, moderate erosion and sediment runoff conditions in several areas. The notable area of concern is the foot path connector located to the east of the Valley Street entrance, continuing along the norther edge of the trail towards Gilman Street. Large amounts of trail erosion was observed at the entrance of the Valley Street Trail as shown in Photographs 1 & 2.

To address the drainage concerns at these foot paths we recommend that the foot path connectors be restored to their original intended conditions (field grass or planted trees/undergrowth). Additionally, a



series of stone berm check dams should be installed along the current foot path location to divert and/or slow stormwater flows and prevent further erosion. Please refer to the attached Valley Street Trail Possible Improvements Sketch for further detail.

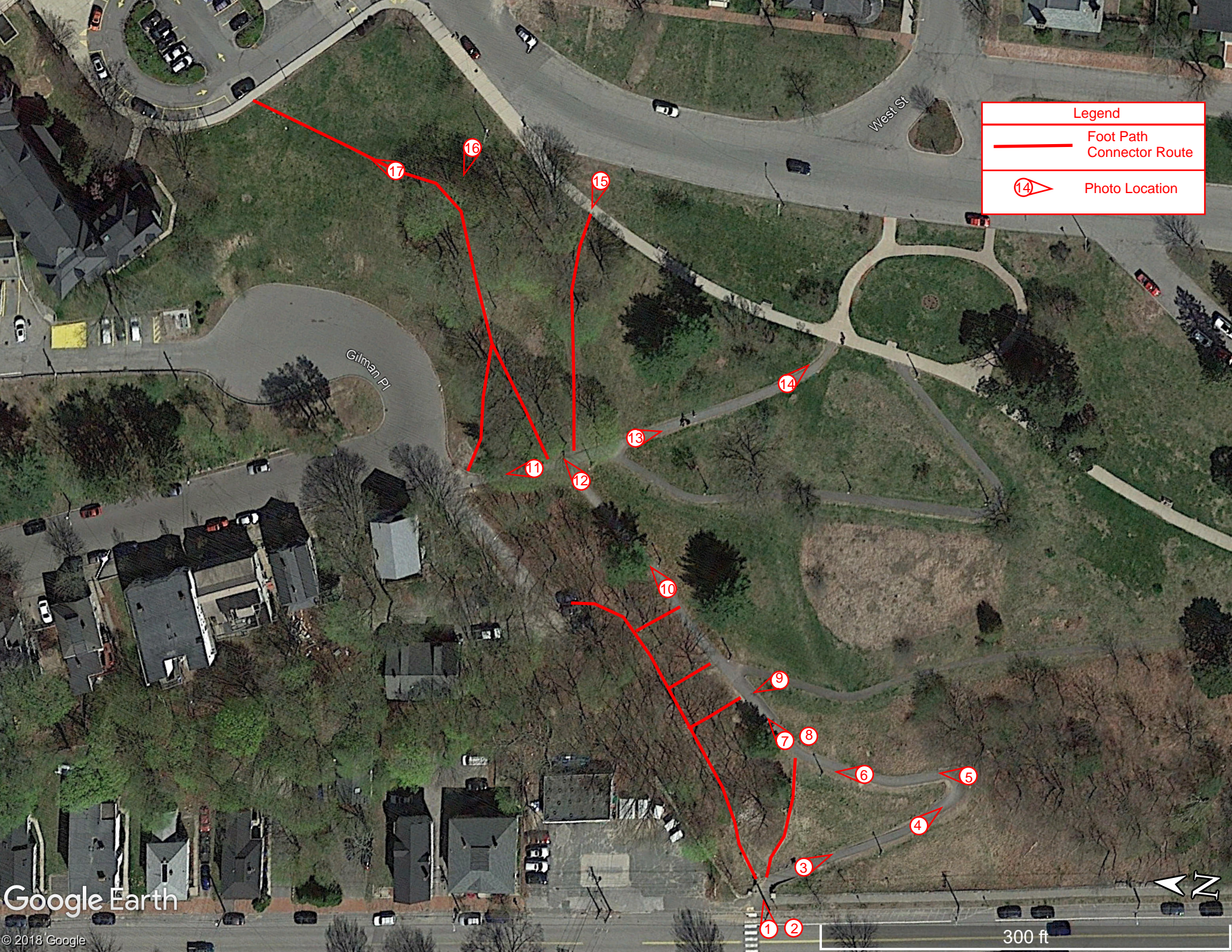
Snow Removal

The City of Portland requested an assessment of maneuvering capabilities of the City's Trackless sidewalk plow equipment along the Valley Street Trail system. The City of Portland provided dimensions for two vehicles a Holder C9.78 (information provided as part of original design in 2006) with an inside turning radius of 7.5-feet and a Trackless MT6 with an inside turning radius of 8-feet. Additionally, City staff have measured their current equipment and provided an outside turning radius of 10-feet. These dimensions were compared to the current trail conditions and it was determined that the current trail can adequately support the maneuvering of the existing tractors.

In discussion with City of Portland Arborist, Jeff Tarling, it was noted that the City's snow clearing equipment can maneuver through the trail during smaller snow storm events, but during larger storm events the City has issues maneuvering vehicles due to snow load and encroaching snow banks. Due to steep grades in the area, widening the trail would require relocating existing and/or building additional retaining walls to adjust the grades in these areas. This option would be expensive, and would require a significant impact to the area for a minimal gain, only to accommodate larger storm events. Maine Medical Center recommends that the Valley Street Trail not be altered at this time.

Attachments

- **Photo Key Map & Sketch of Foot Path Connections**
- **Site Photos**
- **Lighting Assessment by Bartlett Design Inc.**
- **Valley Street Trail Possible Improvements Sketch**





Legend	
	Foot Path Connector Route
	Photo Location





Photo 1: Erosion from retaining wall



Photo 2: Foot path connection at top of retaining wall



Photo 3: Trail section in good condition



Photo 4: Trail section in good condition



Photo 5: Trail and retaining wall section in good condition



Photo 6: Trail section in good condition



Photo 7: Trail section in good condition



Photo 8: Retaining wall in good condition,



Photo 9: Foot path connection at trail



Photo 10: Trail section in good condition



Photo 11: Trail section in good condition



Photo 12: Foot path connections at trail tee intersection



Photo 13: Trail section in good condition



Photo 14: Trail section in good condition



Photo 15: Foot path connector at Western Promenade



Photo 16: Foot path connector at Western Promenade



Photo 17: Foot path connection to MMC campus

MMC St. John Street Parking Garage
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WESTERN PROM EXISTING TRAIL LIGHTING



WESTERN PROM TRAIL PLAN
Red Indicates Lighted Section of Trail

TRAIL LIGHT POST

The existing trail network that extends from Valley Street to the Western Promenade above includes one path that is illuminated by post lights that have luminaires with prismatic glass diffusers and high intensity discharge lamps. The spacing of the existing light posts is such that the resulting horizontal illuminance at grade is very uneven. There are numerous places along the path between light posts that have less than 0.2 footcandles of illuminance.

The *Illuminating Engineering Society of North America (IESNA)* publishes recommendations for remote walkways in DG-5-94 Recommended Lighting for Walkways and Class 1 Bikeways. The recommended illuminance levels for a walkway within a commercial district that is remote from a street where personal safety is an issue are as follows:

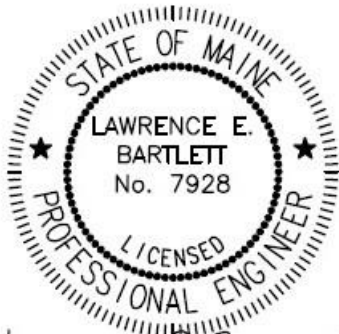
- Average Horizontal Illuminance at Grade – 1.0 footcandles
- Horizontal Average-to-Minimum Uniformity – 4.0-to 1 (or better)
- Average Vertical Illuminance at 5'-0" Above Grade – 2.0 footcandles
- Vertical Average-to-Minimum Uniformity – 5.0-to-1 (or better)

Because the post light luminaires utilize prismatic glass diffusers, the light that is directed side-to-side provides a significant degree of vertical illuminance which can be effective in lighting faces of oncoming pedestrians. Unfortunately, the relatively high brightness of the luminaires is such that once an approaching pedestrian passes in front of a post light, the luminaire brightness immediately behind the person casts them in silhouetted shadow.

The *Illuminating Engineering Society of North America (IESNA)* classifies exterior luminaires according to their potential for producing glare in the publication *IESNA TM-15-11*. The rating system is a numeric index for luminaires with a symmetrical optical distribution that ranges from zero (maximum of 660 zonal lumens directed between 60 and 80 degrees) to five (greater than 12,000 lumens directed between 60 and 80 degrees). The existing trail post light luminaires have a rating of three, which represents a high potential for excessive glare.

An additional consideration is that the existing post light luminaires direct a considerable amount of light skyward which contributes to astronomic light pollution. The *IESNA* publication *TM-15-11* also classifies exterior luminaires according to their potential for producing uplight. Similar to the rating system for potential glare, the uplight rating system is a numeric index that ranges from zero (no uplight) to five (greater than 5000 lumens direct upward). The existing trail post light luminaires have a rating of five.

Submitted by:
Lawrence E. Bartlett, PE



Lawrence E. Bartlett

