

APPENDIX P

CIVIL ENGINEERING EXISTING CONDITIONS, SUMMARY, AND RECOMMENDATIONS

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2016

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PIERCE PINI & ASSOCIATES, INC.
CONSULTING CIVIL ENGINEERS

Peavey Plaza Existing Conditions Civil Engineering Report
PPA Project #15-052

August 2nd, 2016

Soils

American Engineering Testing has performed three geotechnical investigations in the area of the proposed work. The on-site soils for this project consist approximately of four to fourteen feet of fill underlain by sands, gravels and sand/gravel mixture that is 20-38 feet thick. These underlying sands fall into hydrological soil group A which has an approximate infiltration rate of 0.8 inches per hour per the Minnesota Stormwater Manual guidelines.

Stormwater Management

The City of Minneapolis and Minnesota Pollution Control Agency (MPCA) are the regulatory agencies for this area and the project will need to adhere to the stormwater management requirements for each agency.

City of Minneapolis

The City of Minneapolis stormwater management rule applies to any site that disturbs more than one acre. Since this project will connect to the city's storm sewer infrastructure, it will need to comply with the city's stormwater requirements. Site development/redevelopment projects are required to meet the following standards:

- Rate Control – Proposed runoff shall not exceed existing runoff rates for the 2-yr, 10-yr and 100-yr 24-hour storm events.
- Water Quality – 70% total suspended solids is required.

Minnesota Pollution Control Agency (MPCA)

The Minnesota Pollution Control Agency (MPCA) requires permanent stormwater management to meet their requirements is if the amount of new impervious area will be 1.0 acre or more. The MPCA stormwater management rule requires meeting the following standards:

- Rate Control – Proposed runoff shall not exceed existing 5.66 cubic feet per second for the 100-yr 24-hour storm event.
- Water Quality – 80% total suspended solids is required.
- Volume Control – 1" abstracted from the impervious areas on site.

The renovation of the existing plaza will not create 1.0 acre of NEW impervious, therefore the site will not need to meet the stormwater management requirements of the MPCA. Storm Water Pollution Prevention measures will still be required but a permit will only be required if there is a disturbance of 1.0 acre or more.

No land disturbing activities shall commence until plans have been reviewed and approved by the permitting agencies.

Existing Conditions

Within the existing site there is no on-site stormwater management treatment.

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The existing site is a series of steps and walls with various elevations changes. The drains on the lower levels and within the fountains drain to the sanitary sewer due to be part of the existing fountain features. There are some small areas drains on the upper levels within the landscaping and pedestrian walkways that drain to the city storm sewer.

There are numerous constraints on this site which include:

1. Geology;
2. Existing utility and building infrastructure;
3. Site use;
4. Elevation of existing storm sewer;
5. Potential reuse system;
6. Construction cost.

Geology of the site is identified in the Geotechnical Report and would be further explored in the design phase. The geology of the site will determine those areas conducive to infiltration. Utilizing the existing geotechnical information, the site is adequate for infiltration. Infiltration systems will need to be situated such that the drainage pattern does not adversely affect the adjacent or surrounding building basements.

There are existing utility infrastructure for the fountains and the adjacent building. Stormwater management systems may be situated above these systems in the form of permeable pavers or surface filtration/infiltration systems but underground systems will need to keep out of these areas.

The site programming is such that there may be little space for large stormwater management systems if the site disturbance is limited. There is not a lot of available space for surface stormwater systems and the majority of treatment systems will need to be below grade to accommodate the programming for the site.

There can be issues with water infiltration through the below-grade walls and into the lower level spaces within surrounding buildings. The hydrogeology of the area will need to be analyzed to determine if infiltration is a viable method of treatment. The location of infiltration systems will need to be carefully evaluated with respect to the proximity underground space so as to not adversely affect these spaces.

The existing storm sewer system is approximately 5-10' deep. Surface systems or shallow underground systems may be able to connect to the system via gravity flow but any stormwater systems that are deeper than the existing storm sewer will need to be pumped or will need to fully infiltrate. If a system is located at a low elevation where there is no emergency overflow elevation then it will need to be designed to hold the back-to-back 100-year storm events to prevent flooding of lower level egresses into the adjacent structure.

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There may be a desire to explore stormwater reuse systems on the site for potential fountain system needs. A stormwater retention system would need to be constructed with pumping systems to connect to fountain systems.

There is consideration of the construction cost for each stormwater management system. The system needs to function and meet treatment requirements but it needs to be cost effective to construct and maintain. This is an important consideration in the selection of stormwater management systems.

Analysis of these constraints will aid in selection of the appropriate on-site stormwater management systems.

If areas were renovated, there may be some potential treatment systems that could be implemented in these reconstructed areas. Some potential systems consist of permeable pavers, Stockholm tree system, infiltration swales in landscape areas, an underground infiltration or filtration system or a retention system that can function as an underground pond or has the potential to be used for water reuse. The appropriate system will be dependent on the site disturbance, sustainability goals and budget.

An NPDES permit is required for construction projects that disturb one acre or more of land, or if the project is a part of a subdivision. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared as part of the construction document set. The application for the NPDES permit is prepared by the contractor and submitted to the Minnesota Pollution Control Agency (MPCA). The contractor and owner both have to sign the permit and are accountable for the erosion and sediment control during construction. After the site is fully stabilized, a NOT (notice of termination) is submitted for the project.

Existing Conditions Survey

An existing conditions survey was prepared by Sunde Land Survey for this site. Existing utility information was provided by City of Minneapolis as-built drawings and private utility locates via Gopher One Call. The exact location of the underground infrastructure is based on surface features such as manholes, hand holes and valves and approximating the connection of utilities between these elements. Actual underground locations may deviate and will need to be located during construction.

The survey did not include any title work so it is not currently known if there are any easements within the site area. The adjacent Orchestra Hall has egress doors that require traversing Peavey Plaza so there may be some shared access or easements through the site. This will need to be reviewed during design to be sure there are not encumbrances on the site.

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