

Summary Report of the Structural Assessment Fridley Pumping Station

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Background

The 2014 *Master Plan* provided a 40-year roadmap of major capital improvements for the utility's water supply, treatment and pumping infrastructure. One of the studies recommended in the roadmap was a structural assessment of the Mississippi River Pumping Station.

The main Pump Station was constructed in 1923 and has been in operation ever since. In 1959, a North Intake structure was constructed to allow for water to be drawn from the river in times of extremely low river levels. The main Pump Station has a history of scour below the downstream corner of the building foundation, which has been a source for some concern over the years.

The consulting firm GEI Consultant's Inc. was hired to perform this assessment and the following is a brief summary of its major findings and recommendations.

Executive Summary

The structural condition of the Fridley Pump Station is generally sound and should support pumping operations for the next 40 years with continued, pro-active maintenance.

- The Pump Station is constructed primarily of reinforced cast-in-place concrete. There are occasional shrinkage cracks in the walls and floor slabs, which is common to concrete construction and does not represent structural distress.
- The foundation of the Pump Station consists of a gridwork of submerged timber piles and a concrete mat pile cap. Some of the piles have been exposed for many years due to scour on the river side (west) of the structure. Visual inspection, knife probing, and core sampling of these piles indicated they were in good condition.
- A review of the historical river soundings and scour extents show that the current limit of scour around the timber piles under the Pump Station has not noticeably increased since the early 1960s. The structure has functioned since that time without notable structural distress.
- Freeze-thaw damage to concrete in a riverine environment in cold climates is expected to occur, especially after many years of service. Given the location of this structure, the amount of observed freeze-thaw concrete deterioration is relatively low.
- Maintenance should be planned for the Pump Station, including concrete restoration in localized places, gate hardware repairs, and properly preparing and backfilling the south end of the steel sheet pile (SSP) wall. This includes resetting the leaning fence post in this location.
- Several options are presented to address the scour under the Pump Station, ranging from Do-Nothing, to forming and placing cementitious fill under the building.
- We recommend further evaluation of the SSP system, which may include exposing buried tie rods and associated steel anchorages behind the wall. These components are critical to the stability of the sheet pile wall, which supports buried pipes and other utilities in this area.

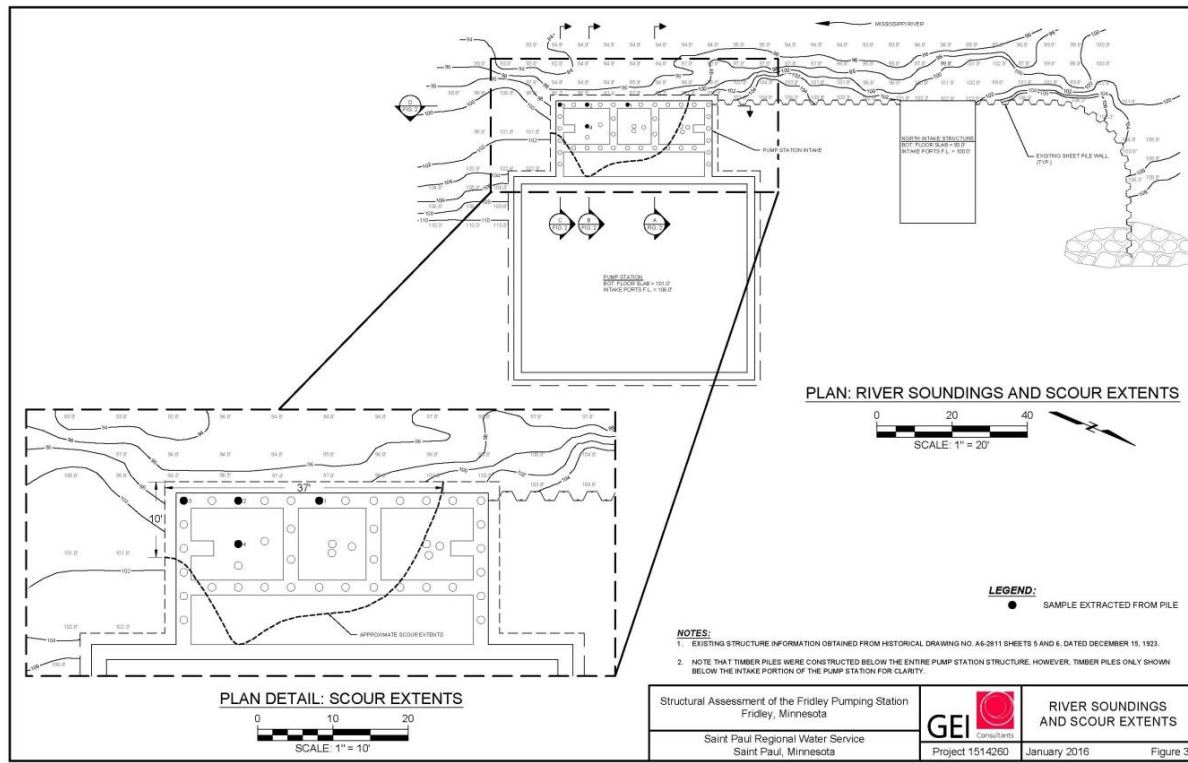


Figure 1: Extents of Scouring

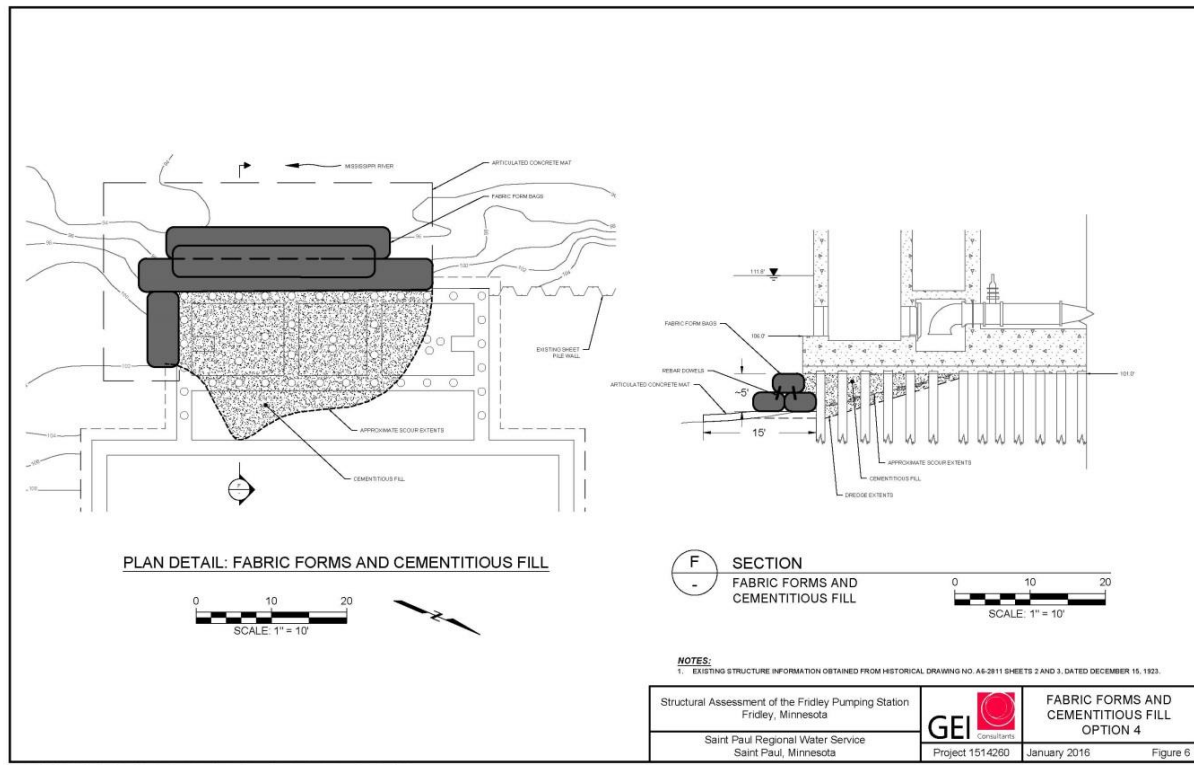


Figure 2: Recommended Improvements with Cementitious Fill

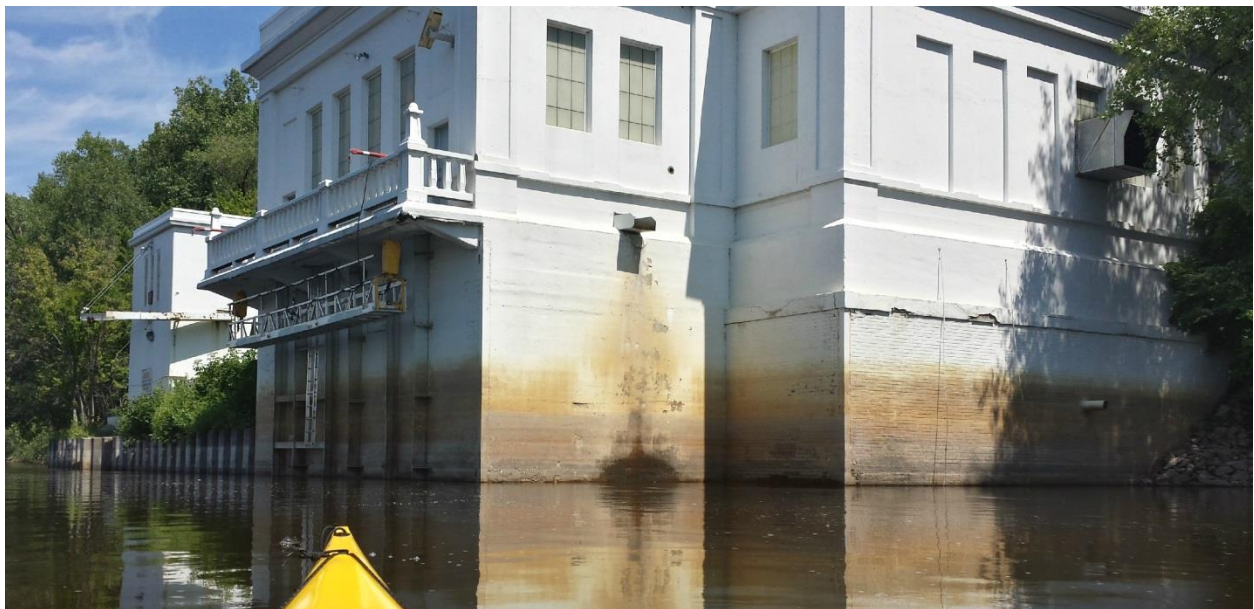


Figure 3: View of South West Corner of Fridley Pump Station South Intake



Figure 4: Profile View of Fridley Pump Station South Intake (1923)