



Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Barr)
Subject: Item 4D: Crystal 2021 Utility Reconstruction (Louisiana Avenue Culvert Replacement) – Crystal, MN
BCWMC March 18, 2021 Meeting Agenda
Date: March 10, 2021
Project: 23270051.52 2021 2243

4D Crystal 2021 Utility Reconstruction (Louisiana Avenue Culvert Replacement) – Crystal, MN BCWMC 2021-04

Summary:

Proposed Work: Replacement of arch culvert under Louisiana Avenue that conveys the North Branch of Bassett Creek

Basis for Review at Commission Meeting: Work within Bassett Creek

Impervious Surface Area: Decrease 0.03 acres

Recommendation: Approval

General Project Information

The proposed project is located in two locations in Crystal, MN as shown in the enclosed figure. The first location is along the right of way of Idaho Avenue North between Medicine Lake Road and 30th Avenue North and the second location is along the right of way of Louisiana Avenue from 36th Avenue North to just north of the intersection with Markwood Drive. The work in the Louisiana Avenue right of way will be a bid-alternate for the project. The proposed project includes street reconstruction, utility improvements including water main, sanitary sewer, storm sewer, and gas main, and replacement of an arch culvert under Louisiana Avenue that conveys the North Branch of Bassett Creek. The proposed project results in 2.31 acres of disturbance. The overall project creates 1.46 acres of fully reconstructed impervious surfaces and a decrease of 0.03 acres of impervious surfaces from 1.49 acres (existing) to 1.46 acres (proposed).

Floodplain

The proposed project includes work in the BCWMC 1% (base flood elevation, 100-year) floodplain of Bassett Creek. The February 2021 BCWMC Requirements for Improvements and Development Proposals (Requirements) document states that projects within the floodplain must maintain no net loss in floodplain storage and no increase in flood level at any point along the trunk system (managed to at least a precision of 0.00 feet). This precision is based on the Minnesota Department of Natural Resources

(MnDNR) requirements pertaining to no-rise certificates in Federal Emergency Management Agency (FEMA) floodplain “AE” zones (zones where there are published flood elevations).

The Commission provided the Phase 2 XP-SWMM model to the City for use in the evaluation of the Louisiana Avenue culvert replacement. The Phase 2 XP-SWMM model was provided to demonstrate relative change in the 100-year flood elevation (e.g. no rise in the proposed conditions upstream and downstream of the proposed project).

The applicant created a proposed conditions model to reflect the proposed project drawings. Specifically, the arch culvert was modified from corrugated metal pipe to concrete pipe, which resulted in increased flow through the culvert. In order to achieve no-rise, a weir set 3 inches above the arch culvert outlet invert was added. This weir is expected to be constructed by bolting a piece of stainless steel over the end of the flared end section. The proposed conditions model provided by the applicant indicates that the proposed 100-year flood level in the pipe and structures immediately upstream of the Louisiana Avenue is expected to decrease approximately 0.2 feet, and there are no expected increases in the 100-year flood elevation in the channel section downstream of Louisiana Avenue, as shown in Table 1. The proposed project meets the BCWMC floodplain requirements and policies.

Table 1 – Peak Water Surface Elevation Results (Arch Culvert Material Change Only) – 100-year

Location	Node Name	Existing 100-yr Peak W.S.E (ft. NAVD)	Proposed 100-yr Peak W.S.E (ft. NAVD)	Rise (ft.)
36th Avenue N	N-BPP-099	886.43	886.43	0.00
36th Avenue N	N-BPP-098	885.98	885.97	-0.01
South of 36th Avenue N	BPP-054	886.26	886.25	0.00
North of 36th Avenue N	N-BPP-097	885.37	885.22	-0.15
Subject Manhole	BPP-046	885.00	884.77	-0.23
Subject Culvert Outlet	BPP-018A	881.20	881.20	0.00
Open Channel Downstream	BPP-104B	881.18	881.18	0.00
Open Channel Downstream	BPP-018	881.17	881.17	0.00
Open Channel Downstream	N-BPP-094	881.03	881.03	0.00
Open Channel South of 36th Ave N	BPP-055	880.74	880.74	0.00

Wetlands

The City of Crystal is the local government units (LGU) responsible for administering the Wetland Conservation Act; therefore, BCWMC wetland review is not required.

Rate Control

The proposed linear project does not create one or more acres of net new impervious surfaces; therefore, BCWMC rate control review is not required.

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Water Quality

The proposed linear project does not create one or more acres of net new impervious surfaces; therefore, BCWMC water quality review is not required. The proposed linear project includes a reduction of impervious surfaces, which provides some water quality benefit.

Erosion and Sediment Control

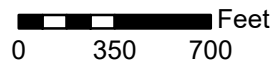
The proposed linear project results in one or more acres of land disturbance; therefore, the proposed project must meet the BCWMC erosion and sediment control requirements. Proposed temporary erosion and sediment control features include rock construction entrances, sediment control logs, silt fence, floating silt curtain, and storm drain inlet protection. Permanent erosion and sediment control features include riprap at the pipe outlets and stabilization with sod.

Recommendation

Approval



- Project Location
- Municipality
- BCWMC Legal Boundary
- Major Subwatershed
- Bassett Creek



BCWMC #2021-04
 2021 CRYSTAL UTILITY
 RECONSTRUCTION
 (LOUISIANA AVENUE
 CULVERT REPLACEMENT)
 Crystal, MN
 LOCATION MAP