Item 4H.
BCWMC 1-19-17

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BARR

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 4H – Northwood North Area Infrastructure Improvements – New Hope
BCWMC January 19, 2017 Meeting Agenda
Date: January 11, 2017
Project: 23270051 2016 2106

4H Northwood North Area Infrastructure Improvements – New Hope BCWMC 2016-26

Summary:

Proposed Work: Road reconstruction in the Northwood North neighborhood

Basis for Commission Review: Linear project disturbing over five (5) acres

Impervious Surface Area: Increase approximately 0.02 acres

Recommendation: Conditional Approval

General Background & Comments

The proposed project includes street reconstruction, water main and sanitary sewer replacement, and storm sewer improvements in the Northwood North neighborhood bounded by 42nd Ave North to the north, Highway 169 to the west, Northwood Park to the south, and Boone Ave North to the east. The project is in the Northwood Lake subwatershed and 12.09 acres will be graded as part of this project. The proposed project results in an increase of approximately 0.02 acres of impervious surface.

Floodplain

The project does not involve work in the Bassett Creek floodplain.

Wetlands

The project appears to involve work adjacent to wetlands. The City of New Hope is the LGU for administering the Minnesota Wetland Conservation Act of 1991.

Stormwater Management

Under existing conditions, the project drains to Northwood Lake. Under proposed conditions, the drainage patterns will ultimately remain similar; however, stormwater treatment will be provided within the project area by diverting water to underground filtration trenches.

Water Quality Management

There is currently little to no water quality treatment in the Northwood North neighborhood. Because the project is a linear redevelopment that creates one acre or greater of new and/or fully reconstructed impervious surfaces, the September 2015 BCWMC Requirements for Improvements and Development Proposals (Requirements) document requires that the project capture and retain the larger of 1) 0.55 inches of runoff from the new and fully reconstructed impervious surfaces, or 2) 1.1 inches of runoff from the net increase in impervious area. In this case, 0.55 inches of runoff from the new and fully reconstructed impervious surfaces is the larger volume, resulting in a required treatment volume of 0.30 acre-feet (12,997 cubic feet). If the performance goal is unable to be met due to site restrictions, the Requirements document requires that the MIDS flexible treatment options approach be used, following the MIDS design sequence flow chart.

The city proposes to construct underground filtration trenches with iron enhanced media to provide water quality treatment for the project. The underground filtration trenches will provide a storage volume reduction of 715 cubic feet. This is equivalent to 0.03 inches of runoff from the new and fully reconstructed impervious surfaces (6% of the required volume).

Because the city is not able to meet the MIDS performance goal, the city's consultant provided a sequencing analysis following the MIDS design sequence flow chart and indicating what treatment options were explored and feasible on the site. Based on the flow chart, the first alternative to be considered for this project is Flexible Treatment Option #2 (FTO 2). The flow chart analysis indicates that FTO 2 is feasible on the site. FTO 2 requires volume reduction to the maximum extent practicable, removal of 60% of the annual total phosphorus (TP) load, and discussion of options considered toward relocating elements and addressing varying soil conditions and constraints across the site.

The applicant has limited right of way area in which to construct stormwater BMPs because the project is primarily road reconstruction. The project area has Type D soils with low infiltration rates, which do not allow significant infiltration. The project area also has steep grades, which limit the areas where BMPs can be implemented. Based on limited right of way, soils with low infiltration rates, and steep grades within the project area, the applicant has demonstrated volume reduction to the maximum extent practicable by maximizing the size of the underground filtration trenches.

To meet the removal of 60% of the annual TP load requirement (7.0 pounds), the applicant is using treatment provided by the underground filtration trenches with iron enhanced media. Underground trenches will be installed on Jordan Avenue North, Gettysburg Avenue North, Flag Avenue North, Ensign Avenue North, 40 ½ Avenue North, 41st Avenue North, and Hopewood Avenue North. Using treatment provided by the underground filtration trenches with iron enhanced media, and in compliance with the FTO 2 criteria, the applicant indicated that the project removes 60% of the annual TP load (7.02 pounds), however, additional information must be provided to demonstrate use of iron enhanced media for subsurface treatment.

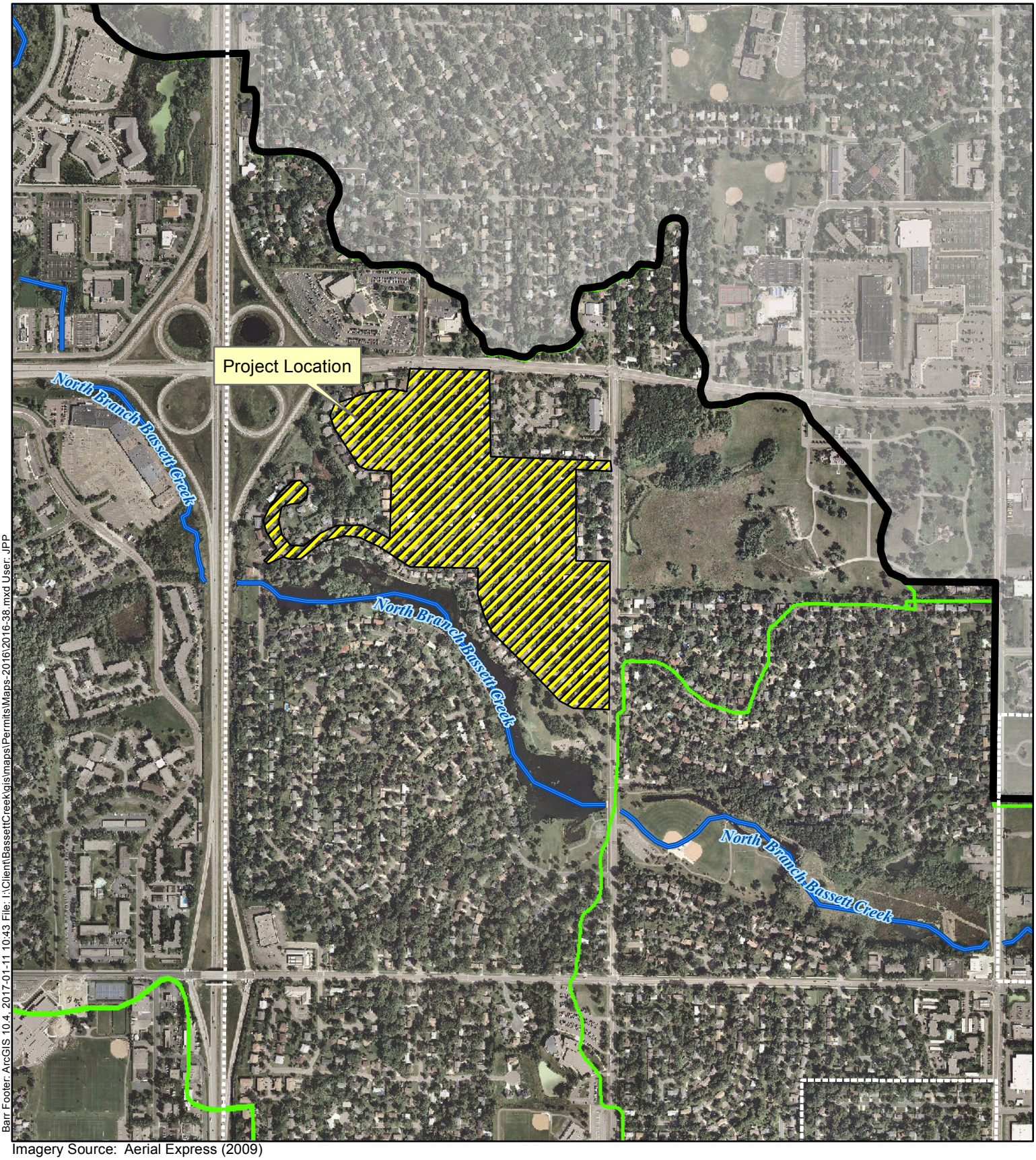
Erosion and Sediment Control

Since the area to be graded is greater than 10,000 square feet, the proposed project must meet the BCWMC erosion control requirements. Proposed temporary erosion control features include inlet protection, rock construction entrances, and concrete washouts. Permanent erosion control features include erosion control blanket.

Recommendation

Conditional approval based on the following comments:

1. This project creates more than one acre of new or redeveloped impervious area, therefore the applicant must provide documentation that stormwater runoff is managed such that peak flow rates leaving the site are equal to or less than the existing rates leaving the site for the 2-, 10-, and 100-year events based on Atlas 14 precipitation amounts and using a nested 24-hour rainfall distribution, as described in the BCWMC Requirements for Improvements and Development Proposals.
2. The filtration trench detail #2 on Sheet C8.03 indicates that 3' sumps will be placed on catch basins upstream of filtration trenches however sump elevations are not included for structure CBMH-11 on Sheet C5.02, CBMH-25 on Sheet C5.04, CBMH-62 on Sheet C5.05, CBMH-51 on Sheet C5.06, and CBMH-75 on Sheet C5.07. Sump elevations must be included on these sheet to ensure the structures are built correctly.
3. Iron enhanced sand is generally not recommended for use in subsurface filtration due to the requirement for oxygenation of the iron enhanced filter bed between rainfall events. The applicant must provide documentation indicating that the system is properly designed to provide oxygenation of the iron between rainfall events or must revise the design to meet the MIDS treatment requirements without the use of iron-enhanced sand in a subsurface filtration system.
4. Inlet protection must be added to the northwest corner of Decatur Avenue North and 40 ½ Ave North. A maintenance plan for the underground filtration trenches must be developed.
5. Revised drawings (paper copy and final electronic files) must be provided to the BCWMC Engineer for final review and approval.



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Imagery Source: Aerial Express (2009)

- Project Location
- Bassett Creek
- WMC Boundary
- Major Subwatershed
- Municipality
- Stream

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Feet

0 500 1,000 1,500

Bassett Creek Watershed Management Commission

LOCATION MAP
APPLICATION 2016-38
Nothwood North Area
Infrastructure Improvements
New Hope, MN