



Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Barr)
Subject: Item 5A: Irving Avenue Sanitary Sewer Replacement – Minneapolis, MN
BCWMC August 20, 2020 Meeting Agenda
Date: August 13, 2020
Project: 23270051 2020 2221

5A Irving Avenue Sanitary Sewer Replacement – Minneapolis, MN BCWMC 2020-16

Summary:

Proposed Work: Sanitary sewer replacement

Basis for Review at Commission Meeting: Work in floodplain; utility crossing that disturbs the bed or banks of the creek; variance request for installing new utility pipe crossing with less than 4 feet of cover.

Impervious Surface Area: N/A

Recommendations:

- A. Consider approval of a variance to Section 8.3 of the BCWMC Requirements document for utility crossing requirement of a minimum depth of 4.0 feet below the channel invert.
- B. Conditional approval of the project.
- C. Require that a separate BCWMC application must be submitted for the diversion and dewatering plan. Consider authorizing Commission Engineer to review and approve application without bringing back to the BCWMC.

General Project Information

The proposed linear project is located in the Bassett Creek Main Stem subwatershed, within the Irving Avenue right of way, the Minneapolis impound lot, and Bryn Mawr Meadows Park in Minneapolis (note: per the definitions in the October 2019 BCWMC Requirements for Improvements and Development Proposals (Requirements) document, utility installations are linear projects). The City presented information regarding the project at the June 11, 2020 BCWMC meeting. The proposed linear project includes replacement of 2,300 linear feet of sanitary sewer, including 75 linear feet under Bassett Creek. Recent pipe inspections have revealed that at least a portion of the system is compromised. The proposed linear project results in 0.92 acres of grading (disturbance) and no change in impervious surfaces from the 2.04 acres of impervious within the project limits in existing conditions. A new 24-inch diameter ductile iron pipe will be installed across Bassett Creek in the location of the existing Irving Avenue Bridge. The existing 48-inch diameter and 52-inch equivalent diameter pipes will continue to convey wastewater until the new pipe is constructed. Due to unfavorable soils in the area, the new pipe must be installed on piles via open cut construction. Once the new pipe is in service, the existing pipe will be abandoned in place

and filled with a flowable cementitious fill. The BCWMC administrator and technical staff have been involved in several preliminary and follow-up coordination meetings and communications regarding this project. Anticipated construction schedule is from September 2020 through September 2021. Construction of the Bassett Creek crossing will be performed during low-flow periods in the winter of 2020-2021. The City of Minneapolis' July 29, 2020 letter to the Commission and variance request is attached.

Floodplain

The proposed linear project includes work in the Bassett Creek floodplain. The Requirements document ... *requires 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). The floodplain elevation of Bassett Creek is 811.2 feet NAVD88 downstream of Irving Avenue, and 811.3 feet NAVD88 upstream of Irving Avenue.

The Irving Avenue wooden bridge and abutments are no longer maintained and will be removed as part of the project, in advance of the sanitary pipe installation. The Metropolitan Council WOMP station, including the flow meter operated by BCWMC, will be relocated and the stairs adjacent to the bridge will be removed.

Barr evaluated the impact to Bassett Creek of removing the Irving Avenue Bridge and abutments and determined that this change does not increase flood elevations for the 2-year, 10-year, and 100-year events. Barr also evaluated the impact of raising the creek profile to increase cover over the proposed sanitary sewer pipe and the modeling indicates that filling to 802.6 feet NAVD88 (per the extent shown in Attachment G of the city's July 29, 2020 letter) to increase cover will not increase flood elevations for the 2-year, 10-year and 100-year events.

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.

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.

Erosion and Sediment Control

The proposed linear project does not result in one or more acres of land disturbance; therefore, BCWMC erosion and sediment control review is not required. However, proposed temporary erosion and sediment control features include rock construction entrances, sediment control logs, silt fence, and catch basin inlet protection. Proposed permanent erosion and sediment control features include stabilization with seeding, erosion control blanket, and other features within the creek as noted below.

Lakes, Streams, and Wetlands

The proposed linear project includes bridge removal and pipe installation that will affect the Bassett Creek streambed and streambanks. As noted earlier, open cut construction is necessary to install the piles and pipe, which will result in disturbance of the creek bed and banks. The open cut construction will also

require the temporary diversion of Bassett Creek. The applicant proposes to construct a temporary channel on the south side of Bassett Creek, approximately 225 feet long. Sheet 7 of the applicant's drawings include the following notes:

Contractor shall submit a creek diversion plan for review by the city of Minneapolis and BCWMC at least 45 days in advance of starting the work. At a minimum, the plan must address the following:

- a. Bridge removal
- b. Capacity of the gravity flow channel and/or piping used to divert the flow around the work area.
- c. A contingency plan in the event the creek flows are greater than the diverted system.
- d. The design of watertight embankments upstream and downstream of the work area.
- e. Dewatering plan during pipe installation within the creek area.
- f. Prevention of contaminants from entering the creek through the soils or groundwater.
- g. Detailed survey of the creek bed and banks within the work area per the requirements of SP-8.
- h. Soils management plan; soils segregation, storage, disposal, and import.
- i. Method to attenuate flow at the discharge.
- j. Proposed schedule for the work.

Sheet 7 also includes the following note under Regulatory Requirements:

- i. Temporary Diversion plan shall include provisions to prevent erosion of the existing channel excavation and passing material downstream.

The applicant proposes to complete work during months with normally lower flows (i.e., in the winter) to reduce land use and environmental impacts. The applicant reviewed twenty years of Bassett Creek flow data collected by the BCWMC/MCES at the Irving Avenue WOMP station to gain a better understanding of the diversion requirements. The applicant anticipates it will take two to three months to complete the work within the creek.

The cross-section of the creek will be restored to match the existing elevations and grades, except in the vicinity of the pipe crossing, where the creek bed will be raised to provide additional cover and rip rap protection over the pipe. The applicant used the City of Minneapolis/BCWMC CIP Bassett Creek Main Stem Stabilization Project as the basis for the proposed creek restoration. Proposed stream restoration measures include riprap on the stream bed and banks (toe protection), rock cross vanes, and seeding.

The City of Minneapolis is the local government unit (LGU) responsible for administering the Wetland Conservation Act; therefore, BCWMC wetland review is not required. However, the applicant provided an exhibit identifying a 50-ft. buffer from the edge of the Bassett Creek wetland and noted the areas within the buffer that will be restored.

Water Resources

Soil contamination has been identified within the project area. Excavation, removal and disposal of contaminated soils will be managed in accordance with the Phase 2 Investigation Report and Response Action Plan (RAP). Soil excavated in the vicinity of Bassett Creek has chemical concentrations above MPCA industrial limits and will be disposed of at a landfill and replaced with clean fill. Barr prepared the RAP for the City of Minneapolis.

Utility Crossings

As noted, a new 24-inch diameter ductile iron pipe will be installed across Bassett Creek in the location of the existing Irving Avenue bridge. Section 8.3 of the Requirements document includes a requirement that utility crossings maintain a minimum depth of 4.0 feet below the channel invert. The City of Minneapolis provided a variance request for providing less than 4.0 feet of cover over the top of the pipe.

Variance Request

The City of Minneapolis requested a variance to Section 8.3 of the Requirements document for the utility crossing requirement of a minimum depth of 4.0 feet below the channel invert. According to the city, the existing sanitary sewer was installed in 1905 and has less than 4 feet of cover. The existing top of pipe elevation is at 796.8 ft. with a cover of 3.0 ft. The proposed top of pipe is at 800.1 ft. with 2.4 ft. of cover beneath the creek invert of 802.6 ft. The pipe cannot be lowered to accommodate the minimum cover requirement because it is a gravity sewer that has a controlled grade at the intersection of Irving Avenue and Currie Avenue.

The Commission Engineer coordinated closely with the City on this project and informed the City several weeks ago that we would support 3 ft. of cover over the proposed pipe (which is consistent with the Recommended Standards for Wastewater Facilities, 2014 Edition – also known as the Ten State Standards). The City revised its design by increasing the cover over the pipe to approximately 2.4 ft., as noted above, and increasing the size of the riprap in the channel bed over the pipe to minimize potential scour. A sheet pile weir across the creek channel, located downstream of the pipe crossing (installed as part of the Bassett Creek Flood Control Project) will also protect the pipe from scour. The sheet pile weir will remain as part of the project. Based on modifications (including the increased cover and larger riprap) and the sheet pile weir, the Commission Engineer supports the variance request, providing the City's operation and maintenance procedures includes future inspection and maintenance of the proposed cover, in the event the pipe becomes exposed.

Section 3.3 of the BCWMC Requirements document indicates that in granting variances, the Commission shall make a finding showing that all of the following conditions exist. The attached July 29, 2020 letter from the City addressed these conditions, as follows.

Condition #1: There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of the applicant's land.

- The City has carefully evaluated lowering the crown of the new 24-inch diameter pipe to increase the cover at the crossing. Due to project limitation, sewershed challenges such as flat slopes and future improvements needed to the MCEs Interceptor 1-MN-320 at Currie and Irving, it is deemed necessary to install the pipe at the proposed invert elevation. The proposed pipe crown is set at an elevation closely matching the crown of the existing sewer at the intersection of Irving and Currie Avenue. This approach will provide flexibility for the sewershed alternatives development in the future. Please see justification provided on July 29, 2020, included in Attachment E.

Condition #2: The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.

- The City of Minneapolis is committed to providing reliable and sustainable sanitary sewer service to its residents. As such, the City evaluated several options for the reconstruction of the sewer. Eight alternatives were developed in advance of the design development; four lift station options and four gravity options following different alignments in the area were considered. Through that evaluation, it was determined that the reconstruction of the sanitary in its current location was that the most efficient and reliable way to provide service to the project area.

Condition #3: The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

- Although temporary excavation is required in the Creek, the new sewer will not alter any conditions with the stream or floodplain (please see Condition #4 for further details). Where feasible, bank grading will be more gradual in the area of the bridge removal and provide a 2H:1V slope once construction is complete (see Sheet 43 for bank restoration.)

Condition #4: In applications relating to a use in the 1% (base flood elevation, 100-year flood) floodplain set forth in Table 2-9 of the Watershed Management Plan, the variance shall not allow a lower degree of flood protection than the current flood protection.

- The City contracted with Barr to perform the analysis needed to confirm that the bridge removal would not adversely impact the water surface elevations for Bassett Creek for the 2-, 10-, and 100-year 24-hour storm events. Findings from the additional modeling activities performed utilizing the existing BCWMC XP-SWMM model and concluded the following (see email from Sarah Stratton, CFM, Barr Engineering in Attachment F):
 - Modeling indicates removing the Irving Avenue Bridge and associated abutments does not increase flood elevations for the 2-yr, 10-yr and 100-yr events
 - Modeling indicates filling to 802.6 ft NAVD88 (per the extent shown in Attachment G) to increase cover will not increase flood elevations for the 2-yr, 10-yr and 100-yr events

Updated Model Velocity Table			
Event	Velocity (fps)	Flow Depth (ft)	Flow (cfs)
2-year	7.2	3.4	420.8
10-year	8.6	4.2	683.4
100-year	5.2	7.4	1,400

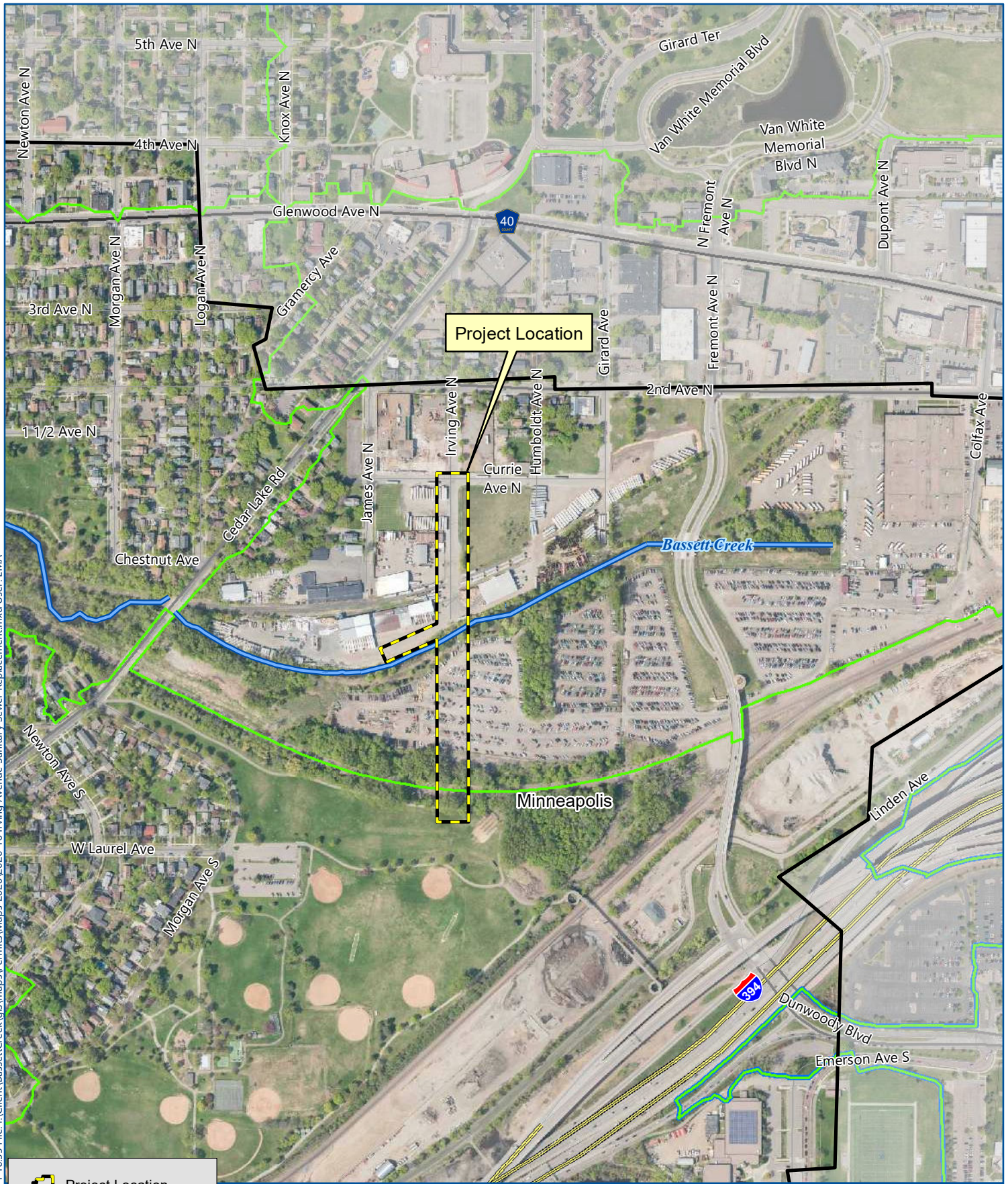
- Modeling indicates a critical velocity of 8.6 ft/s in the project area based on the 10-yr event (which is the critical event)
- Furthermore, and as noted in Item 6 above, a temporary diversion channel will be provided. Should an event occur which would cause the flows to increase beyond the designed channel diversion capacity, the flow will be allowed to overtop the temporary embankments and flow through the work site, i.e. the existing stream bed.







Condition #5: The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

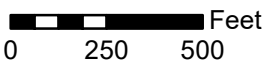
- Although there will be temporary impacts, it is expected the long-term effects of the project will be favorable to the overall water quality in the watershed while considering two main contributing factors:
 - Contaminated soils excavated during construction will be removed and properly disposed of at a regulated landfill. New fill will be brought in.
 - The new ductile iron pipe sewer will provide a more reliable watertight system, preventing infiltration or exfiltration.

Recommendation

- A) Consider approval of the City of Minneapolis' variance to Section 8.3 of the BCWMC Requirements document for the utility crossing requirement of a minimum depth of 4.0 feet below the channel invert with the following condition:
 - The City shall inform the BCWMC of its operations plan to monitor the cover on the pipe and its maintenance procedure if the pipe becomes exposed.
- B) Conditional approval of the project based on the following comments:
 1. Sheet 15: We recommend using Class II riprap for boulder vane bedding material—it is difficult to bed boulders in larger Class III riprap (also for consistency with the City's Main Stem project).
 2. Sheet 43: the limits of where the creek is restored at a 2H:1V cross section (per detail on Sheet 15) must be clarified on the drawings.
 3. Sheet 43: the plans show full-channel riprap at the downstream extents of the construction limits in Bassett Creek. Unless this is needed for a stream crossing during construction or for other design considerations, it is recommended removing the mid-channel riprap and showing only toe protection (both sides) at the downstream end (also for consistency with the City's Main Stem project).
 4. Revised Drawings (paper and final electronic files) and supplemental documentation must be provided to the BCWMC Engineer for final review and approval.
- C) A separate BCWMC application shall be submitted for review of the creek diversion and dewatering plan. The plan must include adequate erosion and scour protection during potential overflow events. The Commission could consider authorizing the Commission Engineer to review and approve the application without bringing the application back to the BCWMC.



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



BCWMC #2020-16
 IRVING AVENUE SANITARY
 SEWER REPLACEMENT
 Minneapolis, MN

LOCATION MAP

July 29, 2020

Bassett Creek Watershed Management Commission
c/o Barr Engineering Co.
Attn: Jim Herbert, P.E.
4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435-5422

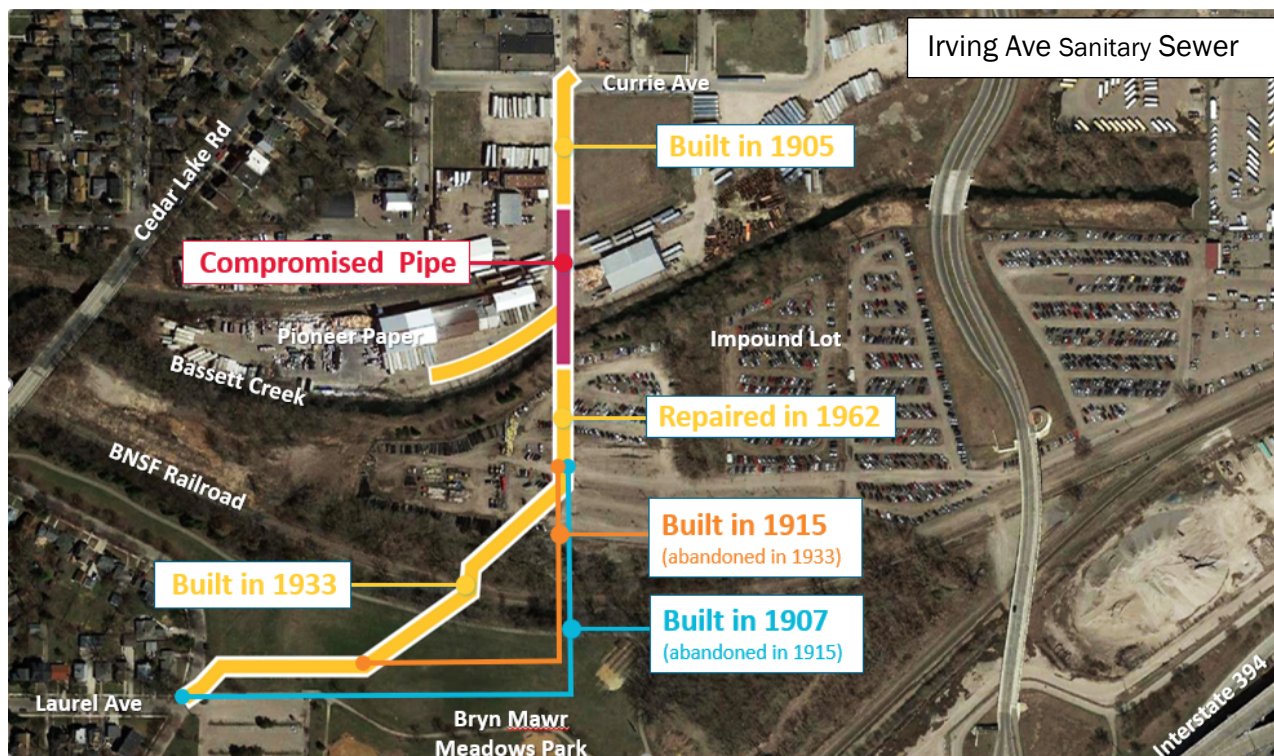
**Subject: Irving Avenue Sanitary Sewer Reconstruction Project – Project Approval and Variance Request
Reconstruction Project, BCWMC #2020-16**

Dear Mr. Herbert:

As we have been discussing over the past few months, the City of Minneapolis (City) Surface Water and Sewers (SWS) Division is seeking a Variance Request and an overall Project Approval from the Bassett Creek Watershed Management Commission (BCWMC) for the reconstruction of the Irving Avenue Sanitary Sewer. This letter summarizes the work to be undertaken in and around Bassett Creek, and proposed measures to mitigate impacts on the creek and overall watershed.

Project Summary

SWS owns and operates an existing 48- and 52-inch equivalent diameter sanitary sewer located within the Irving Ave right-of-way, the Minneapolis Impound Lot and Bryn Mawr Meadows Park. Recent pipe inspections have revealed that at least a portion of the system is compromised in the Creek area (see figure below). Accordingly, the City needs to move forward with the replacement of the pipe as soon as possible. Overall, approximately 2,300 linear feet of sanitary sewer will be replaced, including a 75 linear foot section located under Bassett Creek. The first phase of the project extends from Currie Avenue to the south side of the BNSF right of way. The second phase is in the Bryn Mawr Meadows Park and is scheduled to be constructed as a separate contract in 2022.



A new 24-inch diameter ductile iron pipe will be installed parallel to the existing sanitary sewer pipe along the Irving Avenue right of way corridor and across Bassett Creek, in the location of the existing Irving Avenue Bridge. The new pipe will be installed on piles using open cut construction. The existing 48-inch diameter pipe will continue to convey wastewater until the new pipe is constructed. Once the new pipe is in service, the existing pipe will be abandoned in place with high density controlled low strength material (CLSM).

The following information and attachments summarize the major project components and have been prepared for your review and consideration of this Variance Request and overall Project Approval.

1. Permit Applications – BCWMC, DNR and USACE

The BCWMC Application for Development Proposals was submitted by the City on May 27, 2020 - see Attachment A.

The following Minnesota Department of Natural Resources (DNR) permits are also required for work in and or around the Creek:

1. Work in Public Waters (temporary diversion of the Creek for pipe installation)
2. Water Appropriation (construction dewatering), and
3. License to Cross

The permit applications for Work in Public Waters and Water Appropriation have been submitted to the DNR through their water permitting and reporting system, MPARS, and are currently under review.

We understand through discussions with Mr. Lucas Yougsmas of the DNR, that the City's application through the MPARS system also serves as a notification to the United States Army Corps of Engineers (USACE) and that the USACE will contact the City if there are any outstanding issues or further actions are needed. Please note that the USACE has also separately been notified of the project and permit application through the USACE notification system.

2. Irving Avenue Bridge Removal

An existing bridge was constructed across the Creek along Irving Avenue in the 1980's and is no longer maintained or inspected. With the installation of the new pipe within the bridge footprint, the City has elected to remove the bridge as part of this Project. Accordingly, the wooden bridge and abutments will be removed in advance of the new pipe installation. Pictures of the existing bridge deck and abutment are provided below. The Metropolitan Council WOMP station and flow meter (operated by BCWMC) will be relocated and the stairs adjacent to the bridge will be removed. Impacts of the bridge removal on the streambed, streambanks, and floodplain are discussed in Item 6 below.



Irving Ave Bridge Deck



North Bridge Abutment

3. Rate Control

The proposed project will not create any new impervious surfaces. Accordingly, a Rate Control Review is not required.

4. Water Quality

The proposed project will not create any new impervious surfaces. Accordingly, a Water Quality Review is not required.

5. Erosion and Sediment Control

Work in and around Bassett Creek will be performed in accordance with the Stormwater Pollution Prevention Plan (SWPPP) and best management practices (BMP) outlined in Sheets 23 and 24 of the contract documents included in Attachment B. Proposed temporary erosion and sediment control features include rock construction entrances, sediment control logs, silt fence, and catch basin inlet protection. The work site will be protected by redundant erosion control measures as shown in

Sheets 27 and 28, using the details provided on Sheet 24. Proposed permanent erosion and sediment control features include stabilization with seeding, erosion control blanket, and other features within the creek (see Sheets 43 & 44). All erosion and sediment control will be completed per City of Minneapolis and/or MnDOT Specifications. Overall, the proposed project will result in less than one acre of land disturbance.

6. Utility Crossings: Installation of new Sanitary Sewer Pipe

The pipe and pile installation will require the temporary diversion of Bassett Creek. It is proposed a temporary channel be constructed on the south side of the Creek (see Sheet 16 in Attachment B). As presented, the proposed channel will be approximately 225 linear feet in length; its width and depth will be determined by the Contractor based on his/her method of construction. The Contractor will be required to construct watertight embankments both upstream and downstream of the work area. Once the creek area is dry, it is anticipated the work will be completed within sheeting and shoring in the bridge area. If the flows were to become greater than the diversion channel capacity, the flows would overtop the embankment and allowed through the work area.

It is proposed the work be completed during the normally lower flow, i.e. in the winter months, to reduce land use and environmental impacts. Overall, it is anticipated the work within the Creek will take two to three months to complete. To get a better understanding of the diversion requirements and provide information to the bidding contractors, a review of Bassett Creek flows was performed. Twenty years of data collected at the Irving Avenue WOMP station was reviewed. A summary of the Creek flows is provided Attachment C and summarized in a table on Sheet 7 of the contract documents. As noted in the contract documents, the Contractor will be required to submit his/her diversion channel design to the City and BCWMC for review and approval prior to installation (see Sheet 7: WORK WITHIN BASSETT CREEK).

7. Contamination – Soils and Groundwater

A Phase 2 Environmental Site Assessment (ESA) conducted during design revealed that groundwater and soil contamination were present in the project area. Accordingly, excavation, removal and disposal of contaminated soils will be managed in accordance with the Phase 2 Investigation Report and Response Action Plan (RAP) prepared by Barr Engineering (see Attachment D). Highlights of the project regulatory requirements, including RAP requirements is provided on Sheet 7, REGULATORY REQUIREMENTS GENERAL NOTES.

8. Variance Request: Depth of Cover under Creek

A variance from BCWMC is requested due to lack of available pipe cover. Below are responses to the conditions outlined in Section 3.3.3 of the BCWMC Requirements for Improvements and Development Proposals and additional information requested:

Condition #1: There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of the applicant's land.

- The City has carefully evaluated lowering the crown of the new 24-inch diameter pipe to increase the cover at the crossing. Due to project limitation, sewershed challenges such as flat slopes and future improvements needed to the MCES Interceptor 1-MN-320 at Currie and Irving, it is deemed necessary to install the pipe at the proposed invert elevation. The proposed pipe crown is set at an elevation closely matching the crown of the existing sewer at the intersection of Irving and Currie Avenue. This approach will provide flexibility for the sewershed alternatives development in the future. Please see justification provided on July 24, 2020, included in Attachment E.

Condition #2: The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.

- The City of Minneapolis is committed to providing reliable and sustainable sanitary sewer service to its residents. As such, the City evaluated several options for the reconstruction of the sewer. Eight alternatives were developed in advance of the design development; four lift station options and four gravity options following different alignments in the area were considered. Through that evaluation, it was determined that the reconstruction of the sanitary in its current location was that the most efficient and reliable way to provide service to the project area.

Condition #3: The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

- Although temporary excavation is required in the Creek, the new sewer will not alter any conditions with the stream or floodplain (please see Condition #4 for further details). Where feasible, bank grading will be more gradual in the area of the bridge removal and provide a 2H:1V slope once construction is complete (see Sheet 43 for bank restoration.)

Condition #4: In applications relating to a use in the 1% (base flood elevation, 100-year flood) floodplain set forth in Table 2-9 of the Watershed Management Plan, the variance shall not allow a lower degree of flood protection than the current flood protection.

- The City contracted with Barr Engineering to perform the analysis needed to confirm that the bridge removal would not adversely impact the water surface elevations for Bassett Creek for the 2-, 10-, and 100-year 24-hour storm events. Findings from the additional modeling activities performed utilizing the existing BCWMC XP-SWMM model and concluded the following (see email from Sarah Stratton, CFM, Barr Engineering in Attachment F):
 - Modeling indicates removing the Irving Avenue Bridge and associated abutments does not increase flood elevations for the 2-yr, 10-yr and 100-yr events
 - Modeling indicates filling to 802.6 ft NAVD88 (per the extent shown in Attachment G) to increase cover will not increase flood elevations for the 2-yr, 10-yr and 100-yr events
 - Modeling indicates a critical velocity of 8.6 ft/s in the project area based on the 10-yr event (which is the critical event)

Updated Model Velocity Table			
Event	Velocity (fps)	Flow Depth (ft)	Flow (cfs)
2-year	7.2	3.4	420.8
10-year	8.6	4.2	683.4
100-year	5.2	7.4	1,400

- Furthermore, and as noted in Item 6 above, a temporary diversion channel will be provided. Should an event occur which would cause the flows to increase beyond the designed channel diversion capacity, the flow will be allowed to overtop the temporary embankments and flow through the work site, i.e. the existing stream bed.

Condition #5: The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

- Although there will be temporary impacts, it is expected the long-term effects of the project will be favorable to the overall water quality in the watershed while considering two main contributing factors:
 - Contaminated soils excavated during construction will be removed and properly disposed of at a regulated landfill. New fill will be brought in.
 - The new ductile iron pipe sewer will provide a more reliable watertight system, preventing infiltration or exfiltration.

Scour Evaluation at the Pipe Crossing

The City has evaluated the potential for scour at the Creek Crossing using HEC-23. This methodology is an industry standard for the protection of embankments, streambanks and streambeds. The calculations were performed using the velocity, depth and flow extracted from the XP-SWMMM model and included in the table above. Side slopes at 1.75 horizontal to 1.0 vertical (conservative) and a factor of safety of 1.2 were assumed. Results from the analysis (presented in Attachment H), show that a 12-inch minimum blanket thickness using a D₅₀ riprap of 0.65-foot (7.8-inches, equivalent to a Class III riprap) is required to meet the critical event requirements.

Per the details on Sheet 15 of the contract documents, a minimum of 18-inches of riprap is specified. This thickness was specified to be consistent with the existing USACE as-built information (see Attachment I for USACE as-built drawings).

Based on the results, the 29-inches of cover available above the proposed pipe will be sufficient to accommodate the required pipe bedding as well as the riprap blanket thickness. Final thicknesses will be established once a detailed survey is completed. This information will be provided to BCWMC for review.

Additionally, the proposed sanitary sewer will be constructed of ductile iron pipe, supported on a steel pipe pile cap. Some of the advantages of ductile iron over other sanitary sewer pipe materials, such as HDPE, PVC, HOBAS, or others, include its overall impact resistance, abrasion resistance, and low-temperature impact resistance. The pipe is also strapped to a pile cap to prevent lateral and vertical movement of the pipe in the event channel materials were to erode and expose the pipe over time.

Bassett Creek Restoration

Restoration plans are provided on Sheets 43-46 in Attachment B. Generally, the disturbed areas will be restored to pre-existing conditions. Details from the Bassett Creek Main Stem Stabilization Project were used for the restoration of the streambed and streambanks.

1. Creek Topography: Contract documents require that a detailed Creek survey be conducted by the Contractor to document the existing Creek topography and allow restoration to its original condition. Specifications require that points be collected in a 3-foot by 3-foot grid, along with breaklines and any other changes in the topography.
2. Sheet Pile Weir: An existing sheet pile weir, located downstream of the existing sanitary sewer pipe, was installed in the Creek bed in 1990 by the USACE. The Creek survey prepared by Barr Engineering for the Bassett Creek Main STEM Stabilization Project indicates that the sheet pile is located approximately 35 feet downstream of the existing pipe, and not 20 feet downstream as depicted in the USACE as-built information. The sheet pile weir is depicted on Sheets 16, 27, 31, 37, 43 and 44. The sheet pile will be removed as needed for construction. If removed, the sheet pile will be reinstalled in its existing location; relocating the sheet pile further downstream would place the weir immediately downstream of the storm culvert outlet discharging on the north side of the creek, which may introduce turbulence upstream of the sheet pile and may negate the sheet pile's intent which is presumed be to protect the sanitary pipe.
3. Riprap at Bridge Area: Both the existing and proposed Creek cross-section within the project area are depicted on Sheet 15 (refer to Sheet 55 in Attachment I for the existing USACE as-built information). The existing and proposed cross-sections are consistent with one another and will allow riprap to be blended.
4. Riprap Toe Protection: Toe protection is shown on both sides of the Creek at the bridge removal and pipe crossing location (open cut area). However, because there are no impacts anticipated on the north banks from the construction of the diversion channel, restoration of the north banks outside of the open cut area is not anticipated (banks will remain untouched). The riprap toe protection is shown as 18-inch in depth to be consistent with existing conditions.
5. Streambanks: The banks will be restored to existing conditions, except on the south side of the bridge area where it is assumed that the banks will be restored at a more gradual slope of 2 Horiz: 1 Vert slope. This revision was discussed with Sarah Stratton of Barr, and is consistent with the revised model assumption.
6. Cross-vanes: Two cross-vanes are proposed along the channel (see Sheet 43). Final location of the cross-vanes will be coordinated with BCWMC during construction.
7. Wetland buffer: The 50-foot wetland buffer area from the edge of the Bassett Creek wetland boundary has been identified in the Wetland Buffer Exhibit (Attachment J). Areas within the buffer will be restored using the Riparian Seed Mix provided on Sheet 15.

Project Schedule

The project is currently advertised for public bidding. The City will open bids on August 17 and anticipates issuing a notice to proceed (NTP) in October, to allow for a Contractor mobilization in November 2020. Construction for the Bassett Creek crossing will start immediately thereafter to allow for construction to occur during the winter low-flow period of 2020-2021. It is anticipated, overall project construction will carry through December 2021.

We appreciate your time reviewing the attached information and are available to review with you at your earliest convenience.

Please do not hesitate to contact me if you have questions or comments. I can be reached at 612-919-4243 or Kelly.MacIntyre@minneapolismn.gov.

Sincerely,

Kelly MacIntyre, Project Manager
Professional Engineer – Public Works, Surface Water & Sewers

cc: Laura Jester, BCWMC Administrator
Elizabeth Stout, City of Minneapolis
Julie E Benadum, Brown and Caldwell

Attachments (10)

1. Attachment A: Bassett Creek Watershed Management Commission Permit Application
2. Attachment B: Preliminary Contract Drawings
3. Attachment C: Bassett Creek Flow Summary
4. Attachment D: Investigation Report and Response Action Plan (RAP)
5. Attachment E: Variance Justification and Exhibits
6. Attachment F: Modeling Results
7. Attachment G: Proposed Creek Bed Profile above the Proposed Pipe
8. Attachment H: HEC-23 Results
9. Attachment I: USACE Bassett Creek As-Builts Extracts
10. Attachment J: Wetland Buffer Exhibit