

# SUPPLEMENTAL PACKET



## Memorandum

**To:** *Honorable Mayor and City Council, City of Afton*

**From:** *Nick Guilliams, PE, City Engineer*

**Date:** *January 30, 2018*

**Re:** *30<sup>th</sup> Street Culvert  
WSB Project No. 11166-000*

This memorandum is to provide City Council options and costs associated with the 30<sup>th</sup> Street culvert replacement and reclamation of 30<sup>th</sup> Street from Nybeck Avenue to Neal Avenue.

An existing culvert located west of Nybeck Avenue on 30<sup>th</sup> Street has experienced extensive erosion resulting in deterioration of the guardrail such that it is no longer anchored. The existing culvert consists of approximately 40 feet of 8'x8' box culvert and an approximately 100yr old brick mortar section. The following photos illustrate the condition of the existing culvert along with the adjacent erosion.



Following discussions with Tri-County and the City Council in 2017, a proposal was brought forward by Tri-County to replace the existing 100yr brick culvert section with a pre-cast culvert that extends substantially beyond the current culvert's north end to allow a new guardrail to be installed. The new pre-cast culvert would tie into the existing precast culvert, that was proposed to remain in place.

The City Council directed the City staff to work with Valley Branch Watershed District (VBWD) to determine the minimum size of the box culvert allowable to reduce construction costs and maintain existing drainage. VBWD reviewed the drainage model and provided reduced size options. The City considered options to do a full replacement as recommended by WSB and Associates, or install a 36-foot section of 7'x6' box culvert as recommended and quoted by Tri-County. At the March 21, 2017 City Council Meeting, the City Council directed staff to purchase the 36-foot section of 7'x6' box culvert at a cost of \$20,120 in preparation of replacing the deficient culvert.

Following production of the box culvert, Staff investigated the existing condition of 30<sup>th</sup> Street as a portion of the roadway would be required to be replaced as necessary to facilitate construction. Following review, it was determined 30<sup>th</sup> Street has deteriorated beyond regular routine maintenance and has been

prioritized for improvement in 2018. Coring's of the roadway indicate bituminous pavement reclamation as a cost-effective means to provide a street surface with an extended life.

There are 2 options available to address the 30<sup>th</sup> Street Culvert:

Option 1: Replace 36' Masonry Section with 7x6 Culvert

- Box culvert has been purchased for **\$20,120**
- Labor and Restoration (Tri-County): **\$37,371** – Includes replacement of brick culvert with new box culvert, rip rap, fill to build sides, and lime rock for road base
- Restoration, guard rail, curb and gutter, erosion control, etc. is proposed to be included in the upcoming road reclamation project
- The condition of the existing 8'x8' box culvert is unknown
- This option will require a field joint between the existing 8'x8' section and 7'x6' section. WSB recommends this option be reviewed by a structural engineer.
- Supporting soils data and structural review is recommended to determine the stability of the proposed repair and to determine if wing walls or other elements are required
- Maintenance review post large rain events and semi-annually recommended

Option 2: Replace entire Masonry Section and Box Culvert with new 7x6 Culvert

- Will require an additional 36' of 7'x6' Box Culvert for **\$21,275**
- Labor and Restoration (Tri-County): **\$42,371** – Includes full culvert replacement, rip rap, fill to build sides, and lime rock for road base
- Restoration, guard rail, curb and gutter, erosion control, etc. is proposed to be included in the upcoming road reclamation project
- Joints sealed per MnDot specifications with rubber gaskets. Reduces the risk of an eroding field joint
- Reduces risk of unknown conditions and construction change orders
- New culvert reduces recommended inspections and long term maintenance costs
- Considering life cycle costs and maintenance Option 2 is more cost effective long term

Road Reclamation Costs

The cost to reclaim 30<sup>th</sup> Street from Nybeck to Neal is estimated to be approximately **\$300,000** which includes approximately **\$30,000** for culvert restoration (guard rail, curb and gutter, erosion control). The cost is estimated considering the following:

- Economy of scale. This project is less than a mile, last year's project was nearly 15 miles. The greater the scope of work the better the pricing received from the contractor.
- The bid prices received last year were extraordinary low. Average bid pricing is assumed.

If you have any questions, please contact me at 651-286-8479 or [nquilliams@wsbeng.com](mailto:nquilliams@wsbeng.com)