

## Memorandum

**To:** Bassett Creek Watershed Management Commission  
**From:** Barr Engineering Co.  
**Subject:** Item 6C – Discuss Interest and Logistics of Inviting Commissioners to Participate in Bassett Creek Deep Tunnel Inspection  
**Date:** June 12, 2018

### **6C. Discuss Interest and Logistics of Inviting Commissioners to Participate in Bassett Creek Deep Tunnel Inspection**

#### **Recommendations:**

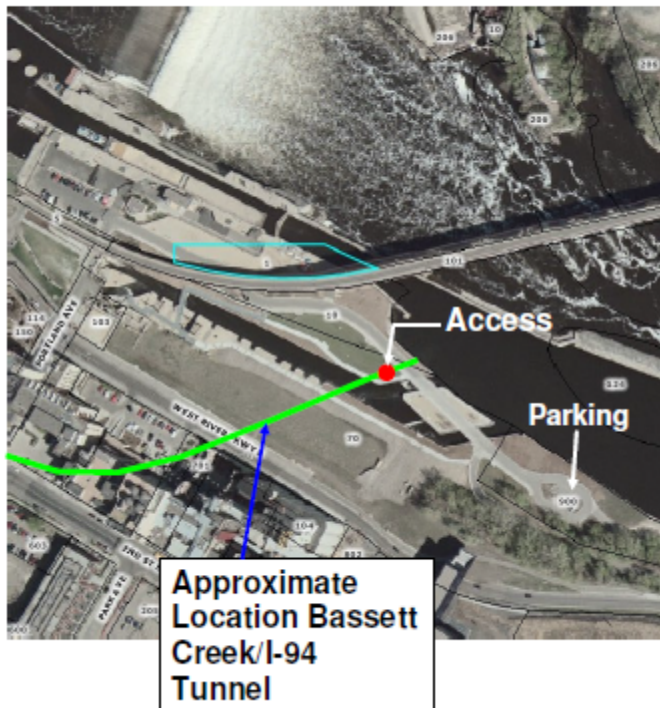
1. Gather input regarding participation and an approximate head count of the Commissioners/TAC members that may be interested in a tunnel tour.
2. Because the tunnel is a significant component of the Bassett Creek Flood Control Project, we recommend Commissioners/TAC members participate in one of the tunnel tour options.

#### **Tunnel Tour**

The Commission Engineer is scheduled to inspect the Bassett Creek deep tunnel during 2018. This presents an opportunity for Commissioners/TAC members to enter and observe portions of the tunnel. If the Commissioners/TAC members are interested in participating in such a tour, there are several logistical items regarding planning, safety, confined space entry, equipment (hard hats, lamps, safety harnesses, safety glasses, waders, high visibility vests), etc. to be considered and planned. Although the Commission has not yet committed to participate, we are seeking input regarding participation and an approximate head count of the interested Commissioners/TAC members.

The tunnel entry is near Mill Ruins Park (see figure). At this location, the tunnel is submerged and several hundred feet of the tunnel is underwater. The Commission Engineer has been coordinating with the U.S. Army Corps of Engineers (Corps) to schedule the inspection during early November to minimize navigation impacts and minimize disruptions to Xcel Energy's operation of the St. Anthony Falls hydropower dam. The middle pool—the area between the lower and upper locks—needs to be lowered for access to the tunnel and also to drain the tunnel for inspection. Although preliminary feedback from the Corps Mississippi River Valley Division office has discouraged the request to lower the pool, the Commission Engineer and local Corps staff have provided additional information to support the need to lower the pool for the inspection. The inspection will be cancelled if the Corps does not approve its variance to lower the pool. The inspection typically includes a 3-person inspection team, surface attendants for at least two access/emergency egress locations, a crane and man basket (subcontractor) and a standby emergency extraction team (subcontractor).

## Access Location Map



Tour conditions/considerations:

- There may be 1 – 2 feet of water flowing in the tunnel.
- Access to the tunnel would be via a manhole some distance upstream of the tunnel outlet (access from tunnel outlet is not likely).
- Participants would use a ladder to descend approximately 12 feet to the bottom of the tunnel.
- Participants would likely need to wear hard hats, head lamps, safety harnesses, safety glasses, waders and high visibility vests.
- The following two tour options could be considered:
  1. Short duration tour: After entering the tunnel, walk approximately 70 ft. downstream to tunnel outlet (great view of stone arch bridge), then walk up the tunnel a few hundred feet to the cathedral arch section, then return to ladder and exit tunnel. City of Minneapolis staff take council members and others in its tunnels on similar short duration trips. This may be the best manageable approach and will allow several Commissioners/TAC members to access the tunnel in shifts (approximately 20-30 minutes in tunnel, and 30-70 feet underground).
  2. Long duration tour: After entering the tunnel, walk the entire Second Street Tunnel (5,146 feet), walk the Third Avenue Tunnel (1,450 feet) to bottom of drop structure, return to ladder and exit tunnel (a few hours in the tunnel, walking approximately 2.5 miles round trip, and 80-95 feet underground). A variation would be to walk one-way and exit the tunnel via man basket and crane located at the upstream end of the Third Avenue tunnel near the drop structure.

If all of the Commissioners and TAC members want to participate, we would likely need to perform the tour in shifts, due to availability of equipment, overcrowding, etc. Also, everybody entering the tunnel would need to go through site-specific confined space training and sign a waiver prepared by the Commission Legal Counsel to reduce potential risks for the Commission. Training could be performed at the end of a Commission meeting prior to the tour or on-site prior to tunnel entry. The Commission Engineer and the City of Minneapolis may have sufficient safety equipment to share if the tunnel was viewed in shifts.

## Budget

The existing budget for the inspection and the estimated budget for the two tunnel tour options are shown in the following table. The actual added cost to include the Commission tour is difficult to estimate because of many variable factors (number of participants, length of tour, amount of safety equipment to obtain, whether tour can be performed when existing inspection infrastructure is in place). The long duration tour cost would be the most cost-effective if performed during a time when the existing inspection infrastructure is in place (rescue team, crane operator for emergency egress, surface attendants, etc.), because, otherwise we would need to secure the safety measures just for the tour.

The tour could be performed under the BCWMC's Surveys & Studies budget (2018 budget = \$12,000) and any unused flood control inspection budget.

Existing 2018 tunnel inspection budget:	\$36,000
Short Duration tour	\$1,000-\$2,000
Long Duration tour	\$3,000-\$6,000

We can provide an updated cost estimate once we know the number of participants and tour length.

## General Bassett Creek Tunnel Information

The Bassett Creek tunnel was constructed in three phases:

- Phase 1: Second Street Tunnel (constructed by MnDOT during 1979). The Second Street tunnel generally consists of a concrete-lined 12-foot arch tunnel along Second Street North in Minneapolis. The entire tunnel is approximately 8,900 feet long; however, the portion that conveys Bassett Creek is 5,146 feet. The Second Street tunnel was designed to convey runoff from Interstate 94 and 394, as well as Bassett Creek.
- Phase 2: Third Avenue Tunnel and Drop Structure (constructed by the Corps during 1990). The Third Avenue tunnel generally consists of a concrete-lined 13-foot arch tunnel, 1,450 feet long, along Third Avenue North in Minneapolis. The tunnel was constructed to convey Bassett Creek flow from the drop structure to the Second Street tunnel.
- Phase 3: Double Box Culvert (constructed by the Corps during 1992). This phase included 5,572 feet of box culvert—5,256 feet of 11-foot by 11-foot double box culvert and 316 feet of 11-foot by 11-foot single box culvert (near the drop structure and inlet structure).