Item 4H.
BCWMC 12-15-16

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BARR

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Bassett Creek 2016 Flood Control Project Inspection
Date: December 7, 2016
Project: 23270051.37 2016 4065

In accordance to the Operation and Maintenance Manual for the Bassett Creek Flood Control Project, an annual inspection is required to review the condition of the Flood Control Project (FCP) features. The FCP was turned over to the local sponsor during 2002. Therefore, inspection of the FCP features was initialized during the fall of 2002, which was the first formal inspection by the BCWMC. Except as noted, the annual inspections have been performed during the years 2002-2016. Inspections were not performed during 2003, 2011, and 2013 due to BCWMC budget considerations. Some of the municipalities have performed independent inspections of several of the FCP structures. The municipalities are responsible for routine maintenance and repair of the BCWMC FCP features located within their city (see Table 1 at the end of this memo). The municipalities are also responsible for submitting the completed Bassett Creek Flood Control Project Maintenance Record from the previous year's inspection. To date, maintenance records following last year's inspection have only been provided by the City of Plymouth. It is important that the BCWMC receive these records, as the inspection and reporting are essential to ensure the BCWMC maintains its eligibility to receive federal funds to repair or replace FCP features in the event of a catastrophe.

The municipalities may request reimbursement from the BCWMC for maintenance and repairs that exceed $25,000. However, the municipalities must perform regular, routine maintenance and submit the required reporting before requesting and receiving BCWMC reimbursement. This will help prevent the situation wherein the BCWMC pays for maintenance work over $25,000 because the municipalities neglected routine maintenance for several years. The BCWMC expects the municipalities to inform the Commission in advance (e.g., two years) of their request for reimbursement.

The BCWMC will consider adding maintenance and repair projects that are more than $100,000 to the BCWMC CIP. Table 1 (at the end of this memo) provides examples of maintenance and repairs that are major or could be major.

In addition, the cities (or other road authority) where the FCP features are located are responsible for maintenance, repair and replacement of road crossings, and their corresponding conveyance structures, that were installed as part of the FCP.

Following are the 2016 inspection comments and recommendations:

Plymouth Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp & Josh Phillips (Barr)

1. Plymouth Creek Fish Barrier (Constructed 1987)

a. The water flow over the weir structure was about three inches deep.

b. The overall condition of the structure was satisfactory and appeared similar to the previous inspection (the concrete appeared to be in good condition).

c. There are a few small cracks in the downstream portion of the left wing wall. No change from previous inspection notes.

d. The expansion joint in the middle of the right abutment wall appears to be consistent to last few years and the gap was measured at approximately ¾ inch.

e. Some of the riprap on the west (right) slope downstream of the structure has slid, exposing the filter fabric underlayment. This was noted in previous inspections and there has been no change.

f. Sediment has continued to accumulated upstream of the structure. The upstream pool is filling with sediment and has formed a delta/island with vegetation growing on it. Vegetation appears less dense than previous years. Sediment is depositing in two distinct areas while allowing flow to go between or toward the right and left banks. We understand the MPCA did not support or permit this activity during the 2010 channel restoration project.

g. Rust was noted on railings. The upstream end of the railing on both sides of the structure has deteriorated due to rust below the water line and is no longer connected to the concrete. The railing is still functional but should be repaired.

Recommended Action:

- Remove accumulation of sediment from upstream pool (coordination with MPCA and DNR will be necessary).
- Monitor west downstream slope and replace riprap, as necessary.

Note: references to "right" and "left" are with respect to facing downstream.

- Monitor width of joint opening during future inspection.
- Repair metal railings on both sides of the structure.

2. Medicine Lake Outlet Structure (Constructed 1996)

a. The overall condition of the structure appeared satisfactory. The concrete appeared to be in good condition with no major cracks.

b. The channel between the lake and the dam was full and water was flowing approximately 4 inches over the dam.

c. Some erosion was noted around the east end of the dam where it ties into the east (left) bank of the creek. During high flow conditions this erosion could increase and flow could bypass the dam. This erosion was noted in the 2015 inspection and appears unchanged.

d. There is a large tree on the east bank that is tipping and exposing soil and roots. If the tree falls, it will leave a void in the bank. The tree is underneath an existing chain link fence.

e. Geotextile fabric flap referenced and submerged during previous inspections was observed as a lapped joint in 2008. In 2009 more of the filter fabric was exposed than in the previous year. The fabric joint was submerged during this year's inspection and was not observed.

f. Private green chain link fence on west end of structure is damaged, missing top rail and tipping over.

Recommended Action:

- Remove the tree that is falling over on the east bank along with the root ball, stabilize the bank with riprap, and replace the chain link fence.
- Monitor erosion around the east end of the weir.

Golden Valley Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp, Josh Phillips (Barr), & Tom Hoffman (City of Golden Valley)

1. Wisconsin Avenue Control Structure (Constructed 1987)

a. The overall condition of the structure appeared to be satisfactory.

b. The culverts appear to have settled approximately 3-4 inches directly under Wisconsin Avenue (water is deeper in the middle). This comment was noted in previous inspections and no

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noticeable change has occurred since 2005 inspection. The portion of the gabion baskets that were below water have deteriorated and baskets are not intact; riprap has fallen out of the baskets at some locations (the deterioration has increased over the years and since the 2002 inspection). Banks still appear in stable condition in these locations.

c. The flood gate was in the down-position at the time of the inspection; the gate had some rust forming along the bottom of the gate and there was some paint peeling off of the gate during the 2014 inspection. The bottom of the gate was currently under water and could not be inspected.

d. Lots of small trees are growing around the downstream end of the culvert.

Recommended Action:

- Monitor gabion baskets and potential erosion during future inspections.
- Sand, prime and paint lower portion of gate and other steel members, as necessary.
- Cut and remove trees and brush near culvert ends. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

2. Golden Valley Country Club—Includes Box Culvert, Overflow Weir, D/S Channel (Constructed 1994)

a. The channel appeared to be in satisfactory condition with no change as stated in previous inspections. The riprap is in place along the channel and there was no erosion noted on either bank. Some riprap had collected in the channel bottom. Weeds and grass that have grown in the riprap in the lower part of the channel have been mowed by golf course maintenance staff. No debris, trees or brush have accumulated in the channel.

b. The box culvert structure appears to be satisfactory. No debris was found around the structure to obstruct the flow. The box culvert was inspected and no issues were found with joints or concrete.

c. The handrails at each end of the box culvert appeared to be in good condition.

d. The overflow weir (earth berm) appeared in good condition. The turf grass was in good condition and there was complete coverage of the overflow weir with manicured fairway turf.

Recommended Action:

- None

Note: references to "right" and "left" are with respect to facing downstream.

3. Westbrook Road Crossing (Constructed 1993)

a. The overall condition of the structure appeared satisfactory.

b. The interior of the culvert was not inspected due to elevated water depth and flow. Cracking in the ceiling was present in previous inspections and does not appear to have changed.

c. Spalled concrete noted at multiple locations at the top of the wing wall sections and in one location near a railing connection; there has been no change since the 2007 inspection.

d. The last Bebo culvert section on the downstream end has separated at the top of the section. The joint gap appears to be wider between the last two sections and there are signs of pressure points where the last section has pushed against the top of the two wing walls, the east side had some concrete fractured out in the last few years, potentially due to the movement. This should continue to be monitored.

e. Storm sewer pipe entering Bebo from left (west) side has exposed rebar.

Recommended Action:

- Repair/patch exposed rebar at storm sewer connection entering Bebo section on west side of culvert. Place grout or mortar over exposed rebar to form better seal.
- Monitor cracks in the Bebo arch sections and the road surface during future inspections.
- Monitor spalling on top of the concrete headwall near wing walls and railing connections.

4. Regent Avenue Crossing (Constructed 1981–1984)

a. The overall condition of the structure is satisfactory. The interior of the culvert was partially inspected. The channel bottom being very soft along with deep water prevented full inspection of the interior. Cracking in the ceiling was present in previous inspections and does not appear to have changed.

b. Some scour/erosion was observed around the end of the left downstream bank and at the upstream right side wing wall, as noted during previous years. Riprap is gone and filter fabric is now exposed on the south side (right) upstream end of the culvert.

c. Top of upstream left/north wing wall has minor spalling with a long end section joint as noted in previous inspections.

d. Diagonal hairline crack near top of upstream left wing wall, and near top of the downstream right wing wall, as noted in previous inspections.

Note: references to “right” and “left” are with respect to facing downstream.

e. Some of small trees are growing around the upstream and downstream side of the structure, along the concrete wing walls.

Recommended Action:

- Monitor erosion of bank at downstream of left wing wall and consider repair of bank with riprap.
- Repair erosion at upstream right wing wall by adding new fabric/filter and riprap on creek bank.
- Monitor bed elevation at upstream end of culvert for possible scouring.
- Cut and remove trees and brush near culvert ends. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

5. Noble Avenue Crossing (Constructed 1981–1984)

a. The overall condition of the structure appeared satisfactory.

b. Hairline cracks were noted along the top of the Bebo arch culvert. Most Bebo pre-cast sections had 2-4 hairline cracks across each section. Most cracks were either along the center or spaced 2 ft. off-center (same comment noted in past inspections since 2002). Spalling has occurred exposing some plastic joint material in some of the culvert sections near the downstream end and along the cracks approximately two feet either side of center, as noted in previous inspections since 2014. The cement paste covering the plastic joint material is separating and exposing the plastic.

c. Downstream right wing wall tilted toward creek 1-1/8-inch. Measurement increased by 1/8 inch since 2008 inspection.

d. Spalled concrete noted at top of the left downstream wing wall and cracks nearby as noted in previous inspections. Some of the cracking appears to be expanding.

e. Erosion noted along outside edge of the upstream right wing wall. Filter fabric is exposed. Creek is entering the Bebo arch culvert at an angle. Additional riprap may minimize erosion.

f. Erosion of the banks noted on both sides of the downstream wing walls.

g. Storm sewer pipe on the north side entering the Bebo arch under the road has exposed rebar and should be patched with mortar. This has been noted in previous inspections since 2002.

h. The new coat of paint on the hand rails is chipping and coming off in a number of locations. Previous coat of paint is still covering metal in most areas.

Note: references to "right" and "left" are with respect to facing downstream.

Recommended Action:

- Repair/patch storm sewer connection entering Bebo section on north side of culvert.
- Monitor cracks, spalling and scour during future inspections, especially at the downstream left wing wall.
- Repair erosion at upstream wing wall by adding riprap.
- Monitor erosion at downstream wing walls.
- Monitor cracks in crown exposing plastic expansion material to determine if spalling is from weathering or movement of the Bebo sections.
- Monitor bed elevation at upstream end of culvert for possible scouring.

Golden Valley/Minneapolis Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp & Josh Phillips (Barr)

1. Highway 55 Control Structure (Constructed 1987)

a. The overall condition of the structure appeared satisfactory.

b. Erosion was observed around both the east and west sides of the structure from water flowing along the sides of the structure that runs off of the bituminous path from above the structure as noted in 2007 inspection. The east side is more noticeable than the west side. Riprap and filter fabric could be placed on both sides. Some gravel had been dumped off the trail down the east side along the structure wall.

c. There is a small hairline crack in the left wall of the inlet structure. The crack is positioned in the middle of the wall extending full height, this crack has been noted in previous inspections and there is no apparent change.

d. Silt has accumulated at upstream pool in front of weir. Pool used to be relatively deep and was only 8 to 12 inches deep during inspection. The silt/sediment has filled the pool and was generally the same elevation as the overflow weir.

Recommended Action:

- Remove accumulation of sediment from upstream pool.
- Monitor cracks and erosion during future inspections.
- Consider adding riprap and filter to each side of the structure, same comment since 2010.

Note: references to “right” and “left” are with respect to facing downstream.

Crystal Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp & Josh Phillips (Barr)

1. 36th Ave. & Hampshire Ave. Crossing/Markwood 8 ft. x 6 ft. Box Culverts (Constructed 1981–1984)

a. The overall condition of the structure appeared satisfactory.

b. Riprap was in the box culverts as noted in previous inspections; most of the riprap was located in the upstream end of the left (north) box culvert, before the first bend. Both culverts have some sediment buildup mostly in the downstream half of the culvert. The right culvert has more sediment than the left.

c. The crack located in the right/top of the south culvert noted in previous inspections has not changed.

d. On both culverts, the fifth joint from the downstream end had a 2 ½ inch gap, no change from previous inspections.

e. Natural boulder riprap in the channel downstream of the culverts appears undersized and has been redistributed somewhat by high flows. Does not appear to have changed significantly since previous inspection.

Recommended Action:

- Monitor cracks and joint gaps during future inspections.
- Monitor sediment and riprap buildup in the culverts.

2. Markwood Open Channel (Constructed 1981–1984)

a. Channel banks were cleared of brush and trees prior to the 2015 inspection. Regrowth of small trees along the banks is occurring. The bottom of the channel is mostly free of vegetation.

b. Erosion exists at the toe of both channel banks along most of the channel, cutting a vertical wall 2 to 3 feet up from the bottom of the channel. This erosion does not appear to have significantly changed since the last inspection.

c. Some retaining walls and fences (likely installed by homeowners) along the channel are leaning toward the channel and appear to be failing. Some of the blocks at one of the retaining walls have been removed from the channel after falling in and placed on top of the wall.

Note: references to "right" and "left" are with respect to facing downstream.

d. The CMP storm sewer discharging into the channel between 6833 and 6825 Markwood Drive is in poor condition – the pipe bottom is corroded and there is erosion and undercutting around the pipe end.

Recommended Action:

- Erosion on the banks should continue to be monitored.
- Although not part of flood control project, retaining walls should be inspected on regular basis in case they fail and impede the channel flow.
- Although not part of flood control project, City may want to consider CMP storm sewer repairs.

3. Markwood Channel Gabion Section (Constructed 1981–1984)

a. Most of the trees that were growing through the gabion baskets have been cut to prevent damage to the baskets.

Recommended Action:

- Monitor for new tree/brush growth from the gabion baskets and remove as needed. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

4. Markwood D/S Overflow (Constructed 1981–1984)

a. The inlet to the overflow appears satisfactory; there is a slight build-up of sediment that should be monitored during future inspections.

Recommended Action:

- None.

5. Markwood 8 ft. x 4 ft. Box Culvert (Constructed 1981–1984)

a. Some minor sediment buildup occurring at the end of the culvert. Outlet is in satisfactory condition.

Recommended Action:

- None.

Note: references to "right" and "left" are with respect to facing downstream.

6. Georgia Ave. Crossing (Constructed 1981–1984)

a. The overall condition of the two culverts is satisfactory.

b. Improvements to the channel and culvert inlet/outlet areas are generally in good condition. Riprap appears undersized and has been redistributed somewhat by high flows on the downstream end.

c. The casting assembly on the manhole over the north culvert on the east side of Georgia is off-set on the concrete opening of the manhole top exposing soil when observed from below. The manhole is in the boulevard area and the soil around it appears to be stable. This was first noted in the 2007 inspection and was noted again during 2015 inspection.

d. Some small trees are growing around upstream and downstream ends of the culverts.

Recommended Action

- Remove trees near culvert ends, as necessary. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

7. Edgewood Embankment (Constructed 1981–1984)

a. The overall condition of the feature appeared satisfactory.

b. There is a small amount of erosion on the upstream end, north side (left) of the culvert at the embankment, no change from previous inspections.

c. There is no visible settlement along the embankment.

d. The trees on the west side of the berm that have been referenced in previous inspections are now 6 to 8 inches in diameter or larger.

e. The pool on the downstream side of the culvert and the creek banks downstream of the pool were repaired and new natural boulder riprap was installed in 2014. These areas appear to be in good condition.

Recommended Action

- Trees should be removed from west side of embankment, as necessary. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

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8. Douglas Drive (Constructed 1981–1984)

a. The overall condition of the structure appeared satisfactory.

b. Grouted riprap installed at the outlet of the box culvert on either side has started to deteriorate. A gap has opened between the grout and the wall of the box culvert.

Recommended Action

- Continue to monitor grouted riprap at the downstream end of the box culvert.

9. 34th Ave. Crossing (Constructed 1981–1984)

a. The overall condition of the structure is satisfactory.

b. The creek channel was restored upstream of the culvert, new natural boulder riprap was installed, some riprap has washed into the culvert. The natural boulder riprap in the channel downstream is in good condition.

c. The culvert generally has 2″-6″ of accumulated sediment with some spots as deep as 12″.

d. The tie rods are rusty and flaking near the center section of the culvert, as noted in previous inspections.

e. A large tree has fallen across the channel about 200 ft downstream of the pipe end and is impeding flow.

Recommended Action

- Remove large tree downstream of pipe end.
- Monitor sediment accumulation in culvert.

10. Brunswick Crossing (Constructed 1981–1984)

a. The overall condition of the structure appeared satisfactory.

b. The creek upstream and downstream of the culverts was restored with natural boulder riprap in 2014. New natural boulder riprap that was installed in 2014 on the upstream end of the two culverts is in good condition.

c. On the south culvert, the fourth pipe joint from the downstream side has two broken ties and had been re-grouted by the City. The joint appears to be moving and is now about a 3-inch opening, with a gap between the pipe joint and the new grout.

d. There are a number of joints that were cracking or spalling. Grout that was placed to fill the separating joints has started to detach due to joint movement and is falling out. On the south

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culvert, the third joint from the downstream side, there is a crack on the bell end of the pipe, which extends across the top of the pipe.

e. The cracks in the pavement over the culverts did not appear to have changed since previous inspection.

f. Some small trees and brush had been removed on the upstream side. There are still additional small and medium-sized trees are growing near the upstream and downstream ends of the culvert that should be removed.

Recommended Action

- Repair or replace pipe ties, weld new rods on pipe ties.
- Monitor concrete pipe joints condition during future inspections.
- Continue to monitor for cracks in pavement.
- Removed small and medium sized trees growing near upstream and downstream ends of pipe. Chemically treat stumps with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

11. 32nd Ave. Crossing (Constructed 1981–1984)

a. The overall condition of the structure appeared satisfactory.

b. The creek channel upstream of the culvert, as well as the upstream and downstream ends of the culvert, was repaired and restored with new natural boulder riprap along each side of the creek in 2014. Some of the riprap on the downstream end appears to have been moved by the flow, but overall these repairs are in good condition.

c. Some brush has been cleared on the upstream side. There are still additional small trees growing near the upstream and downstream ends of the culvert that should be removed.

Recommended Action

- Remove small trees growing near the upstream and downstream ends of the culvert. Chemically treat with Garlon 3A herbicide to prevent regrowth, it's our understanding the DNR has recommended and approved this product for use near bodies of water.

12. Bassett Creek Park Pond and Outlet (Constructed 1995)

a. The overall condition of the outlet pipes appears satisfactory.

Note: references to "right" and "left" are with respect to facing downstream.

b. The creek stabilization completed in 2014 along the reach where the pond outlet culvert discharges to Bassett Creek is in good condition.

c. There is a large amount of sediment that has accumulated in the northwest corner of the pond where the creek enters the pond. This has been noted in previous inspections; small and large trees, brush and vegetation is growing in these areas on the sediment deltas.

d. Most of the shoreline of the pond was in good condition. There were two locations on the south side of the pond, near the outlet pipes, where some bank erosion was noted.

Recommended Action

- Dredging of Bassett Creek Park Pond and upstream channel improvements (BCP-2) is included in the BCWMC CIP Table 5-3. The BCWMC is preparing a feasibility study for the dredging of Bassett Creek Park Pond (and Winnetka Ponds), which is scheduled for BCWMC approval in May 2017. After completion of the feasibility study, the BCWMC will determine if and when the project will be performed.

13. Detention Pond and Outlet

a. The overall condition of the outlet structure appears satisfactory.

b. Although the pond appears in good condition from the surface, a survey is needed to assess accumulated sediment.

Recommended Action

- Pond should be surveyed in future to determine if it has accumulated sediment from Highway 100, which would reduce treatment volume.

Crystal/Golden Valley Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp & Josh Phillips (Barr)

1. HWY 100 Double Box Culverts

a. The control inlet structure condition appeared satisfactory.

b. The improvements to the creek channel upstream of the structure are in good condition.

c. The large cracks and transition joint damage as noted in previous inspections were repaired by Mn/DOT in 2007. The repairs remain in good shape with just a few hairline cracks observed and should continue to be monitored. During the 2015 inspection it was noticed that some of the

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concrete patching has become dislodged at the top of the culvert, additional deterioration of the patching was noted during this year's inspection.

d. As noted in previous inspections, sediment has accumulated in the northern (left) box culvert. The sediment is approximately 12 to 24 inches deep. In previous years the sediment had collected downstream of the right angled bend in the northern culvert and is now progressing further upstream in the culvert up to the Mn/DOT storm sewer connection. Although the inlet structure controls the flow into the double box culverts, the accumulated sediment in the north culvert is reducing the capacity of the twin culvert section.

e. The outlet portion of the structure appeared in satisfactory condition.

Recommended Action:

- Monitor accumulated silt in northeasterly (left) box culvert and consider removal in future.

Minneapolis Features

Inspection Date: October 20, 2016

Personnel: Patrick Brockamp & Josh Phillips (Barr)

1. Inlet Structure

a. The overall condition of the inlet structure appeared satisfactory.

b. The overall condition of the fence and railing appeared satisfactory.

c. Minor cracks were noted in the concrete, especially where handrail posts were embedded. Some spalling was noted on the back of the south wing wall as indicated in previous inspections.

d. There was only a minor amount of debris collected on the inlet structure grate, mostly leaves, at the time of the inspection.

e. The creek channel was fully inspected this year. The banks are generally covered with brush and trees about 3-4 feet above the channel bottom. Below the level of the trees and brush, the banks are bare soil on both sides for most of the length of the channel. No obvious signs of bank erosion were noted.

Recommended Action:

- The BCWMC completed a feasibility study for the 2017 Bassett Creek Main Stem Erosion Repair Project (CIP 2017 CR-M) in May 2016, and ordered construction of the project at their September meeting. The resultant construction project should address the noted erosion issues.

Note: references to "right" and "left" are with respect to facing downstream.

2. Debris Barrier

a. The debris barrier cable is missing in the center portion of the channel. The cable is supposed to be continuous from end to end, attached at each post, but has come detached and/or broken off of the wood poles and needs to be reinstalled or replaced.

b. Barrier is clear of debris.

Recommended Action:

- Repair/replace steel cable on debris barrier.

3. Double Box Culvert

a. The 5-year double box culvert inspection was last performed on December 9-10, 2014. In cooperation with the City of Minneapolis, a separate report was prepared.

Note: references to "right" and "left" are with respect to facing downstream.

Table 1 Routine vs. Major Maintenance and Repair Items

Item #	Routine vs. Major Maintenance and Repairs – as Recommended by the TAC[1] and approved by the BCWMC[2]
Routine	
1	Vegetation: removal of trees, removal of brush, chemical treatment of stumps, control of noxious weeds, establish vegetation on bare areas.
2	Removal of debris: woody debris, riprap, trash from channel, inlets, culverts
3	Repair erosion; channels, inlet and outlet structures, culvert ends
4	Repair/replace riprap: on inlet and outlet ends of culverts, channels, banks
6	Remove sediment from channels, structures, culverts, etc.
10	Repair/maintain guard rails, hand rails and fencing: remove rust, prime and paint, repair damaged rails and posts, replace rusted-out sections, repair cables, replace posts, repair chain link fence
12	Repair concrete pipe: repair joints, tie-bolts, spalling, connection to culverts, breakage
13	Repair/replace catch basins, manholes, casting assemblies, grates
14	Repair/maintain debris barrier: removal of debris, repair cables, replace poles
15	Repair/maintain tunnel inlet trash rack: repair/replace trash rack rods, loose or broken, vandalized, bent
16	Street repairs: pavement, curb and gutter, cracks, depressions, settlement
Major	
5	Repair/replace gabion baskets
7	Remove sediment/dredge ponds, basins, etc.
17	Tunnel repairs: concrete and other repairs to the new Bassett Creek tunnel
Could be major depending on extent	
8	Repair scouring/undercutting at structures and culvert outlets
9	Repair concrete structures: cracking, spalling, breakage
11	Culverts/Bebo sections: joints, settlement, separation, concrete spalling, wing walls – movement and breakage

[1] Based on needed repairs identified during 2015 FCP inspection
[2] Per BCWMC actions at their May 19, 2016 and July 21, 2016 meetings:

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