HOLE 1: STREAM CROSSING

HOLE ONE CURRENTLY HAS BANK EROSION WHERE THE FAIRWAY MEETS PLYMOUTH CREEK. THE METHODS PROPOSED TO FIX THE PROBLEM ARE BY INTRODUCING A NEW LOW-FLOW CROSSING POINT WITH BANK STEPS LEADING TO STEPPERS WITHIN THE GREEN SLOPE, INCREASING THE AMOUNT OF VEGETATION THROUGH SHRUB PLANTINGS AND NATIVE GRASSES. THE PUTTING GREEN FOR HOLE ONE IS LOCATED CLOSE TO THE MULCH RING TO ELIMINATE MUD AND EROSION. THE PROPOSED SOLUTION INCLUDES INCREASED VEGETATION AND FLATTENING OUT THE "GREEN" AREA. IN ADDITION, ADDING WOOD CHIPS IN THE HIGH TRAFFIC 20 FT RADIUS OF THE PIN WILL REDUCE THE AMOUNT OF MUD AND IMPROVE PLAY CONDITIONS.
HOLE 8 LOOKING ACROSS TO TEE BOX OF HOLE 12: STREAM ACCESS + STABILIZATION

ON HOLE 8 HAS A HIGH POTENTIAL FOR DISCS TO ENTER THE CREEK. THE EXISTING BANKS ARE IN NEED OF EROSION MITIGATION VEGETATION AND ARMORING. IN ORDER TO ACHIEVE BOTH DESIRED OUTCOMES A COMBINATION OF SHRUB PLANTINGS TO STABILIZE THE BANK WITH ACCESS STEPS LEADING TO THE CREEK'S EDGE FOR PULLING DISCS OUT. THE OUTSIDE BEND WILL BE ARMORED WITH VEGETATED REPAIR TO CONTROL FLOW VELOCITY AND PRESERVE THE VISUAL AESTHETIC WITH TALL GRASSES GROWING OVER THE ARMORING.

MULTIPLE EXISTING DRAINAGE SWALES OCCUR WITHIN THE DISC GOLF COURSE. THE ADDED REPAIR TO STABILIZE THE SOILS WILL MITIGATE SOIL EROSION INTO THE CREEK. PLAYABILITY OF THE COURSE WILL NOT BE AFFECTED AND A REDUCTION OF OVERALL MUD WILL BE ACHIEVED.

EXISTING SWALES

NOT FOR CONSTRUCTION
HOLE 8: MUDDY PATH OPTIONS

Existing trees within the flight path are scarred by discs repeatedly hitting the soft tissue of young trees. To protect the trees, disc stop poles would be placed between the tree and the direction of flying discs. With staggered rows of poles, deflection will serve to protect trees.

Shrub plantings

Disc stop poles

Steep slopes can be rectified through the use of berming, which also minimizes the foot traffic trampling any vegetation. The addition of disc stop poles will protect existing/newly planted trees and add a new element of difficulty for players to shoot around.

For areas of heavy foot traffic in sunny locations, the use of grass pavers would allow for reduced compaction and transition of turf grass cover. The soils in these locations would thus be stabilized while allowing for consistent golf traffic. In areas of heavily shaded due to tree canopy, the use of additional boardwalks will serve to focus traffic movements around tree roots and bare soils.
HOLE 11: MUDDY TEE BOX OPTIONS

For areas of heavy foot traffic in and around muddy tee boxes, the pathways can be boxed in using pressure treated timbers and the boxes filled with either woodchips or gravel. This will serve to reduce the amount of mud and keep the soil elevation down.
OXE-BOW: POLLINATOR HABITAT + FOOD

The rusty patched bumblebee became the first bee species ever listed under the Endangered Species Act in March of this year. However, pollinators of all kinds (bees, moths, and butterflies) are currently in a declining state across the U.S. For the island off the edge of the course, behind the ox-bow a dedicated pollinator habitat and nectar source is planned. A combination of seeding native grasses and forbs are proposed, as well as native forbs to increase the density. In order to achieve the necessary sunlight for these species, the current trees will be removed.

In addition to the pollinator specific island, native seed mixes and flowering shrub species will be used to stabilize the banks of the creek. The density of flowers will not be as intense, but they will serve as a connective pathway along the creek to the tree grader landscape within Plymouth. Like the pollinator island, trees along the corridor will need to be removed to allow needed sunlight for the new cover types. Removals will be limited to only what is necessary as to not change the character of the park and the ox-bow golf course.
Because the total disturbed area for this project is less than 5 acres, there are no additional temporary sedimentation basin requirements.

**Erosion and Sediment Control Practices**

All exposed soil areas must have temporary erosion protection (erosion control blanket, seed) as soon as possible or within 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.

CONTRACTOR shall implement appropriate construction phasing, vegetative buffer strips, horizontal slope control, and other construction practices that minimize erosion when practical. The normal wetted perimeter of any temporary or permanent drainage ditch that diverts water from a construction site, or diverts water around a site, must be stabilized within 200 linear feet from the property edge, or from the point of discharge to any surface water.

Stabilization must be completed within 24 hours of connecting to a surface water. Pipe outlets must be provided with temporary or permanent energy dissipation within 24 hours of connection to a surface water.

The following measures will be taken as sediment control practices in order to minimize sediments from entering surface waters:

1. Installation of floating silt curtain within the creek channel at the downstream extent of construction activity prior to site disturbance. Floating silt curtain shall be installed in two locations upgradient of the culverts under Farmbrook Lane and Amnopolis Lane as shown on Sheets EC-102 and EC-103. Install silt curtain as shown on Sheet D-104.
2. Installation of perimeter silt fence in the locations shown on Sheets EC-102 through EC-104 prior to site disturbance. Perimeter silt fence shall be installed as shown on Sheet D-104.
3. Installation of inlet protection in the locations shown on Sheets EC-102 through EC-104 prior to site disturbance. Inlet protection shall be installed as shown on Sheet D-104.
4. Installation of rock construction entrances in the locations shown on Sheet C-203 to prevent tracking of sediment offsite. Street sweeping of tracked sediment shall be performed as required.

**Washing of Construction Vehicles**

Washing of construction vehicles must be performed in a manner to minimize pollutants entering surface water or groundwater.

**Hazardous Materials**

Hazardous materials, including but not limited to oil, gasoline, paint and any hazardous substance must be properly stored including secondary containments, to prevent spills, leaks or other discharge. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations.

**Concrete Washout Area**

The contractor shall provide effective containment for all liquid and solid wastes generated by washout operations to prevent runoff to surface waters. Liquid and solid wastes must be disposed of properly in compliance with MPCA rules.

**Final Stabilization**

All areas disturbed by construction will receive seed according to the plans and specifications and within the specified vegetative time schedule.

Final stabilization will occur when the site has a uniform vegetative cover with a density of 70% over the entire disturbed area. All temporary synthetic erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization. All sediment must be cleaned out of conveyances and temporary sedimentation basins if applicable.

Notice of Termination (NOT) must be submitted within 30 days of final stabilization. Before Termination, revegetation establishment and coverage must meet the permit requirements.

**Pollution Prevention Measures**

**Solid Waste**

Solid Waste, including but not limited to, collected asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other waste must be disposed of properly and must comply with MPCA disposal requirements.

**Washing of Construction Vehicles**

Washing of construction vehicles must be performed in a manner to minimize pollutants entering surface water or groundwater.

Amend the SWPPP as necessary to address any changes in design, construction, operation, maintenance weather or seasonal conditions that have a significant effect on discharge of pollutants to surface or underground waters; or to address concerns identified during inspections or investigations by OWNER or local government entities.

**EROSION CONTROL ESTIMATED QUANTITIES**

**Material**

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>MnDOT Seed Mix 34-26G</td>
<td>14.5 trac 0.4 acres = 6 LBS</td>
</tr>
<tr>
<td>Erosion Control Blanket</td>
<td>1,650 SY</td>
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<tr>
<td>Silt Fence</td>
<td>400 LF</td>
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<tr>
<td>Berm</td>
<td>200 LF</td>
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<tr>
<td>Inlet Protection</td>
<td>5 EA</td>
</tr>
<tr>
<td>Sediment Control Blanket</td>
<td>50 LF</td>
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<tr>
<td>Construction Entrance</td>
<td>4 EA</td>
</tr>
</tbody>
</table>

This Project is not located within 1 mile of a special water. This Project is located within 1 mile of an impaired water (see figure above): Plymouth Creek impaired for CI, E, C.

Because of the proximity of the project to an impaired water during construction, all exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.

This Project will impact wetlands. A wetland delineation has been performed and wetland permits have been obtained.

**Certification**

This document was trained under the University of Minnesota Erosion and Sediment Control Certification Program for certification in Design of SWPPP and submitted May 6, 2016.

**Responsible Partner**

Louis H Sigtermans

**Design of Corporate SWPPP**

City of Plymouth

1750-10 EC-101

WENCK

SWPPP