SUPPLEMENTAL PACKET

CC 12-17-19

AFTON CREEK DEVELOPMENT

Contingency Plans for 2020

~~Prepared 12/11/2019~~Revised 12/16/19

Spring Thaw 2020

It is understood that spring rainfalls can occur during frozen ground conditions; those rains, in conjunction with spring snow melt, can create increased groundwater runoff from the site. Given the lack of established vegetation in ponds, infiltration basins, and some surrounding areas, there is risk of sediment leaving the site. The two primary areas of concern are at Pond 7 and the overflow berm at pond 5. The following is our sediment management plan including pumping of infiltration basins in the event of excess groundwater accumulation or runoff.

Action Level 1: Forecasting Phase – Prior to spring thaw / ice out with long range temperature forecasts

- As spring thaw approaches, developer will monitor daily weather forecasts for air temperatures rising above freezing
- Forecasted periods of time that show continuous temperatures greater than 32 degrees for more than 4 hours will warrant onsite monitoring by the developer.
- Stage adequate bio rolls and ~~reinforced~~ silt fence in the existing pole building on lot 4 of block 3 for quick deployment in anticipation of potential sediment release from the site.

Action Level 2: Forecasted Rainfall – anticipated rain events greater than ½" prior to ground thaw

- Install bio rolls and ~~reinforced~~ silt fence in high risk discharge areas surrounding pond 7 and the overflow berm of pond 5. Bio rolls will be used exclusively during frozen ground conditions. Silt fence will be used in conjunction with bio rolls as frost leaves the site.
- Any new areas of erosion will be addressed with bio rolls and silt fence as they are identified by the developer or WSB. All areas of erosion will be repaired within 48 hours as weather permits
- In preparation for potential flooding of basins 2, 4, 7, pond 5 and adjacent overflow cell, we will ~~S~~stage three 4" pumps & dewatering bags in the existing pole building on lot 4 of block 3 for quick deployment ~~in anticipation of potential flooding of basing 2, 4, and 7; as well as pond 5 and adjacent overflow cell~~. Included with this plan are the specifications for the dewatering bags. Length of the bag used will be determined by Peterson Companies based on water clarity on a case by case basis.
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- Developer will start daily monitoring of water levels in each basin and pond 5~~; elevated water levels will warrant pumping.~~
-

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Action Level 3: High water levels in ponds

- If water levels in basins 2, 4, 7 and Pond 5 get within 6" of overflow levels ~~are anticipated to reach or exceed overflow levels~~, pumps ~~will be deployed~~ and dewatering bags will be deployed ~~, and~~ ; w~~w~~ater will be pumped offsite through dewatering bags.

- Pond 7 – the dewatering bag will be placed ~~in the existing culvert apron under 60th street.~~on the south side of 60th, the pump hose will run through the existing culvert under 60th.
- All other ponds – dewatering bags will be placed on the downstream side of the outside pond berm

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Winter Work 2019/2020

In the late fall of 2019, we agreed to conduct further exploratory work and testing on basins 2, 4, 7, and pond 5 to ascertain the functionality of each. Surface layer silt was removed from basins 2,4, and 7; in addition, each was scarified to a depth of 6" with roto tiller attachment on a skid steer Caterpillar 247 track machine. As built surveys were ~~conducted~~ completed to show that the site was built in compliance with the approved plans. Double ring infiltrometer testing was completed to ensure appropriate infiltration rates were being met based on proposed calculations. Work was completed on pond 5 overflow berm to bring it up to the proposed plan elevations. Hand borings were completed at pond 7 to help rule out a shelfed water condition due to possible clay layers. At this time, we feel no additional work can be productively completed during winter 2019/2020. It is our goal to closely monitor each of these basins and the overflow cell of pond 5 through the spring thaw (as defined in the spring thaw plan) and into early summer to ensure everything is functioning properly. Failure to function will result in further maintenance as needed.

Seeding Plan 2020

All areas requiring further establishment will be seeded as soon as the weather permits in the spring; minimum requirements will be ground temperatures of approximately 50 degrees to provide adequate germination. We will loosen the soil prior to seeding with a "power rake" attachment on a skid steer or by dragging the area with a harrow drag. Each area will then be seeded utilizing a combination of a broadcast and brillion seeder attached to a low ground pressure tractor. Once each area is seeded it will be drug with a harrow drag to ensure the seed is properly bedded. Bare ground will then be topped with straw mulch or erosion blanket if the grade of the slope requires it. Sloped areas greater than 3:1 will receive ECB or hydraulically applied FGM at the discretion of Peterson Companies. All areas except the basins will receive MNDOT seed mix 21-111 @ 30 lbs. per acre in conjunction with MNDOT seed mix 21-111 @ 100 lbs./AC. The basins will be seeded with MNDOT Seed Mix 328 at 88 lbs./AC with no mulch or straw so that it will not affect infiltration rates. If no germination occurs within 14 days, then reapplication of seeding and stabilization will be completed; decisions surrounding germination and reapplication will be at the discretion of Peterson Companies.

Basin and Pond Failure plan 2020

Note: WSB has agreed to come up with a method for measuring the draw down period. The draw down period starts when a basin reaches its highest level and is complete when the water level reaches 2" in the bottom of the basin. WSB has outlined this method in memorandum form issued December 11th 2019; that memorandum is included with this plan

Pond 7 – 24 Hour Draw Down

Drain Tile: In the event this pond does not pass the method of measurement developed by WSB, we have proposed to install a drain tile system that assists in the infiltration and draining process of this pond. The proposed plan for this system is enclosed with this contingency plan. All calculations for that system are included with ~~the~~ said plan. Our engineer (Chuck Plowe) and the City Engineer (Nick Guilliams) have both expressed that this is a common solution for situations such as this. Both have communicated that this will likely solve any potential latency in draw down~~,; as well as, prevent sediment from leaving the site.~~ This plan is preliminary; we look forward to working with WSB to produce a final plan that all parties are satisfied will function properly if required to be installed.

Holding Pond: It has been expressed by our engineer that a holding pond will not work in this area due to lack of available space. In order to reach adequate depths, there would need to be substantial retaining walls installed. All other ponds in this development have drainage and utility easements for maintenance; increased slopes for a holding pond here would eliminate any existing space for vehicular access to conduct routine maintenance. The required steep slope and high walls would create several safety concerns for residents of the development, local traffic and surrounding neighbors. We have included two ~~a~~ rough ~~sketch~~sketches with basic calculations of size and scope; one with 3:1 slopes and on with 4:1 slopes. ~~however,~~ Plowe Engineering has expressed a strong opinion that neither ~~this~~ would ~~not~~ be a sound solution.

Overflow Berm at Pond 5

We have identified that additional grading is required on the south side of pond 5 to redirect runoff that is bypassing pond 5 and its adjacent overflow pond. Included with this contingency plan is a drawing showing the additional grading to be completed south of pond 5. This work will be completed once the frost has come out of the ground early summer of 2020. All disturbed areas will be reestablished within 7 days ~~with appropriate seed within~~in compliance with our afore mentioned seeding plan ~~7 days~~.

Basins 2 & 4 – 48 Hour Draw Down

Given the work and testing that was completed at basin 2 & 4 prior to winter conditions, we are very confident both will function properly after the spring thaw. If they do not meet the required draw down periods, we are prepared to replace the top 6" of infiltration media. Seeding in compliance with our afore mentioned seeding plan would be completed to reestablish both the basin sides and bottom. If replacement of the surface media proves to be inconsequential, we will retain Plowe Engineering to ~~engineer~~ develop a drain tile solution similar to pond 7.

AFTON CREEK DEVELOPMENT

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Revised 12/16/19

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FLO-WATER

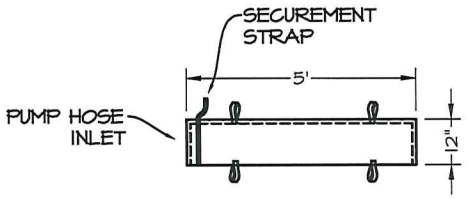
Pump-It Tube

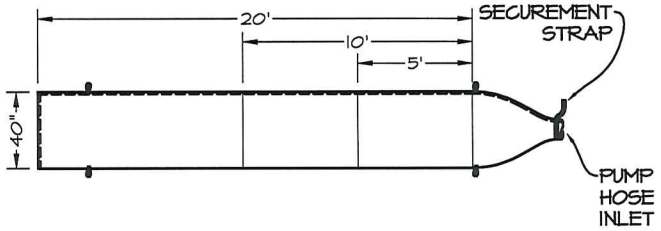
- ✓ High Flow Rates up to **192 gl/ft2/min**
- ✓ **91.6%** Sediment Capture
- ✓ Built in PolyScrim w/ heat set nonwoven fabric.
- ✓ Reduce footprint when dewatering (length or width)
- ✓ Easier Transport
- ✓ Use manifolds to run multiple bags. (**Eliminate downtime**)
- ✓ Fill Pump-It Tubes 50%
- ✓ Never hook straight to Pump: Attach to hose

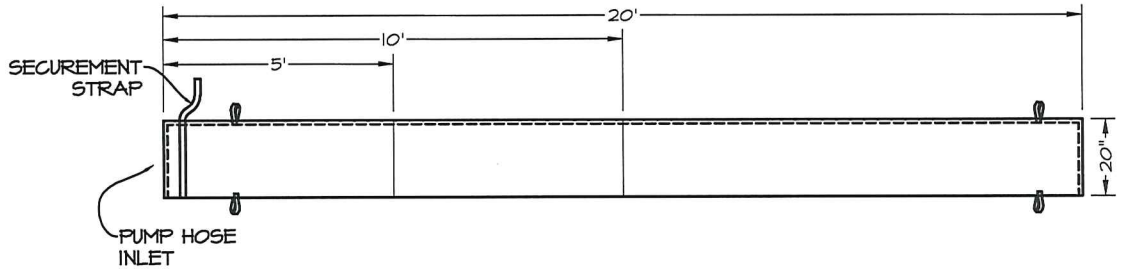
PATENT PENDING

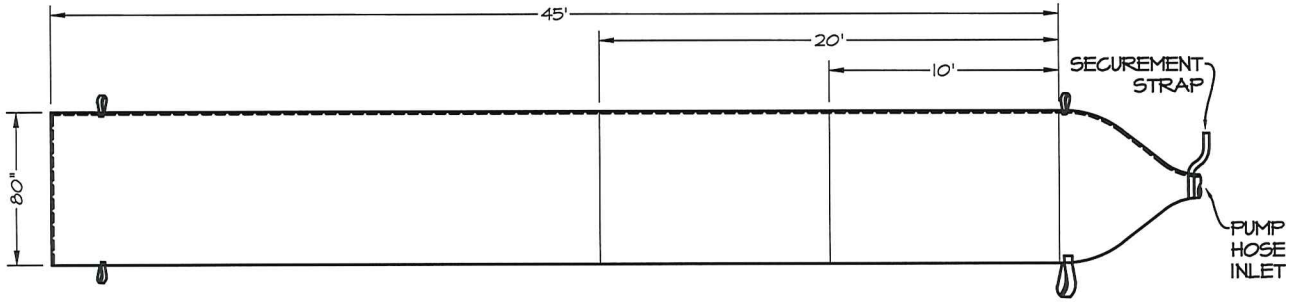
➢ Pump-It Tube Sizing

- ➢ Up to **2"** Pump- 12"x5' Pump-It Tube
  - **FW1205PT**
- ➢ Up to **4"** Pump- 20"x5', 20"x10', 20"x20' Pump-It Tubes
  - **FW2005PT, FW2010PT, & FW2020PT**
- ➢ Up to **6"** Pump- 40"x5', 40"x10', 40"x20' Pump-It Tubes
  - **FW4005PT, FW4010PT, & FW4020PT**
- ➢ **Larger Pumps-** 80"x10', 80"x20', 80"x30', 80"x45'
  - **FW8010PT, FW8020PT, FW8030PT, FW8045PT**
- ➢ **Jumbo Tubes-** 30'x30', 30'x45',, & 45'x45' Pump-It Tubes
  - **FW30'30'PT, FW30'45'PT, FW45'45'PT**









FLO-WATER SPECIFICATION

(EXCLUDING MAXXFLO)

PROPERTIES	ASTM TEST	VALUE
MASS PER UNIT AREA (OZ/YD^2)	D 3776	5.20
GRAB TENSILE STRENGTH, MDxCD (lbs)	D 4632	297x223
GRAB ELONGATION, MDxCD (%)	D 4632	58 / 59
TRAPEZOID TEAR, MDxCD (lbs)	D 4533	81 x 75
PUNCTURE (lbs)	D 4833	99
BURST STRENGTH (psi)	D 3786	340
PERMITTIVITY (sec-1)	D 4491	2.60
A.O.S. (U.S. SIEVE - [MM])	D 4751	60
WATER FLOW RATE (gpm/ft^2)	D 4491	192
FILTERING EFFICIENCY (%)	D 5141	91.60

* UNDER NORMAL CIRCUMSTANCES

PUMP-IT TUBE™ SIZING:

80" X 10' 40" X 05' 20" X 05' 12" X 05'

80" X 20' 40" X 10' 20" X 10'

80" X 45' 40" X 20' 20" X 20'

20' X 20' 30' X 30' 30' X 45'

CUSTOM SIZING AVAILABLE

INSTALLATION INSTRUCTIONS:

1. ATTACH PUMP-IT TUBE TO PUMP HOSE, DO NOT ATTACH DIRECTLY TO PUMP.

FLO-WATER

DRAWING: 05-15-2017

REVISED:

FLO-WATER
308 33RD STREET
WEST DES MOINES, IA 50265
PH: 515-577-6763
WEB SITE: FLO-WATER.NET
EMAIL: CORYDON@FLO-WATER.NET

CAPTURING SEDIMENT ON THE GO, ENABLING CLEAN WATER TO FLOW

TITLE

PUMP-IT TUBE™ DEWATERING BAGS

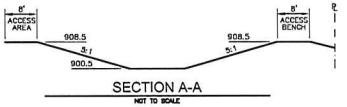
REV. A

SHEET 1 OF 1

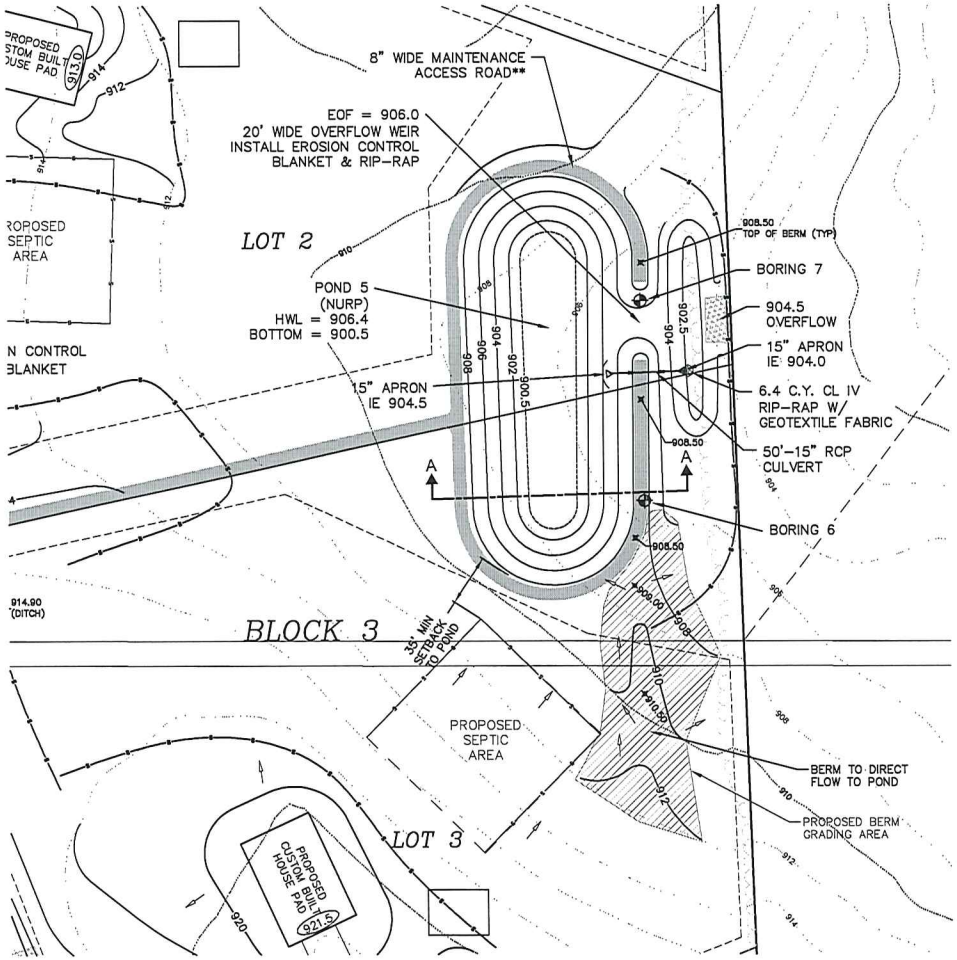
NOTE: HOUSE PAD GRADING CONCEPTUAL ONLY. FINAL GRADING TO BE DETERMINED WITH ACTUAL HOUSE PLAN AND LOCATION.

—S— PROPOSED SILT FENCE

PROPOSED ROCK CONSTRUCTION ENTRANCE* *TO BE INSTALLED PRIOR TO START OF HOUSE PAD GRADING



SECTION A-A
NOT TO SCALE



* NURP POND WITH 3:1 SLOPES REQUIRES FENCE AROUND THE PERIMETER OF THE POND

TEMPORARY SEEDING AND EROSION CONTROL SHALL BE REQUIRED AS NOTED IN THE STORM WATER POLLUTION PREVENTION PLAN.

EXISTING ROW CROP CULTIVATED AREAS THAT ARE NOT SODDED WITH NEW HOME CONSTRUCTION WILL BE SEEDED TO ESTABLISH A NATIVE LANDSCAPE TO PROVIDE A LONG TERM ECOLOGICALLY SOUND LANDSCAPE. THE WORK SHALL BE DONE BY NATIVE LANDSCAPE PROFESSIONALS TO ENSURE SEEDING METHOD USED AND SITE PREPARATION IS PERFORMED PROPERLY. TWO TO THREE YEARS OF ESTABLISHMENT PERIOD VEGETATION MANAGEMENT WILL BE DONE.

DRAWN BY:	DESIGN BY:
C.M.	C.W.P.
CHCKD BY:	PROJ. NO.
C.W.P.	17-1707

ORIGINAL DATE: AUGUST 14, 2017

DATE	REVISION DESCRIPTION
12/16/19	NOTATE BERM GRADING AREA

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

CHARLES W. PLOWE
DATE: 12.16.2019 LIC. NO. 18227

AFTON CREEK PRESERVE
AFTON, MINNESOTA
POND 5 GRADING PLAN

PREPARED FOR:
AFTON CREEK PRESERVE DEVELOPMENT, LLC

SITE PLANNING & ENGINEERING
PLOWE ENGINEERING, INC.
6776 LAKE DRIVE
SUITE 110
LINO LAKES, MN 55014
PHONE: (651) 361-8210
FAX: (651) 361-8701

NORTH

0 20 40
1 INCH = 40 FEET

PLOWE
ENGINEERING, INC.
6776 Lake Drive, Suite 110
Lino Lakes, MN 55014
Office 651-361-8210
Fax 651-361-8701
www.plowe.com

To: Nick Guilliams, City Engineer, City of Afton

From: Charles W. Plowe, PE

Date: December 11, 2019

Re: Afton Creek Preserve
POND 7

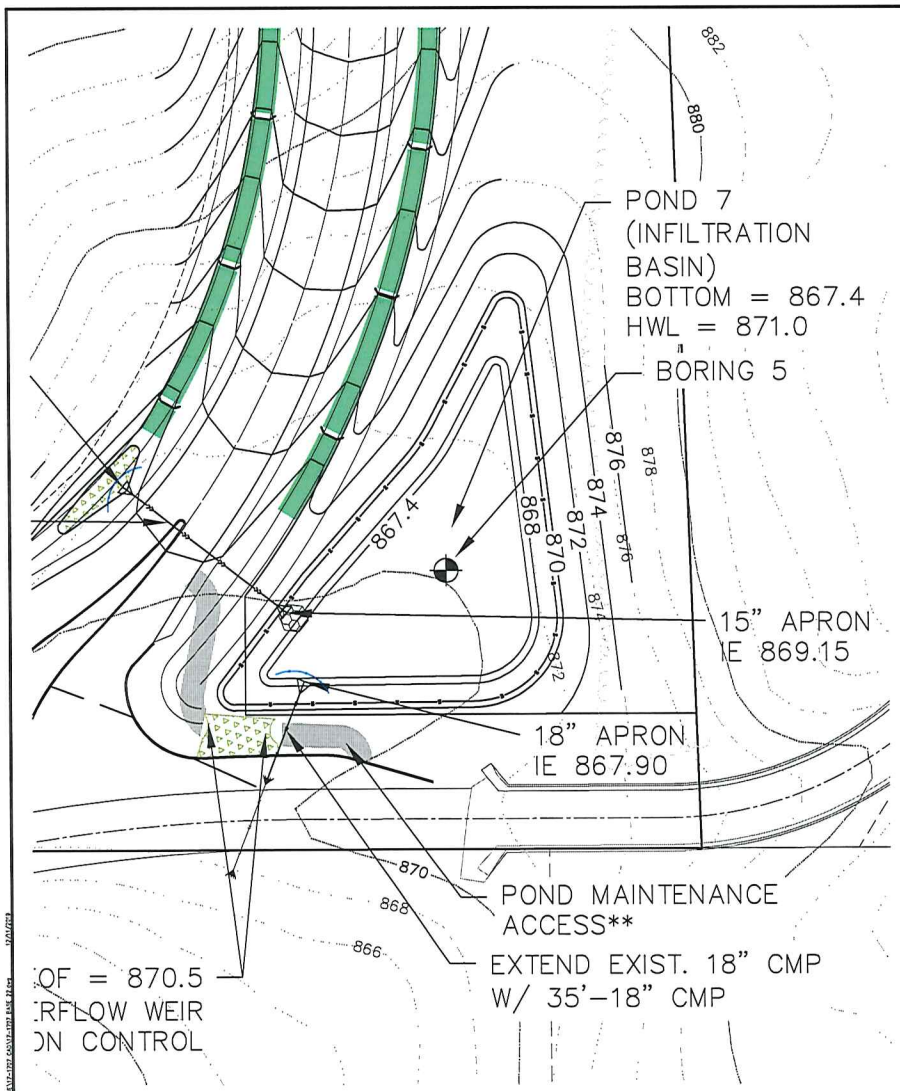
We have reviewed an option of wet pond (NURP POND) for Pond 7. A drawing is attached that shows the area and depth needed to meet the required dead storage volume of runoff for the 2.5" rainfall event.

Required volume below the culvert outlet elevation = 32,452 cu. ft.
Volume provided in the attached plan = 33,100 cu. ft.

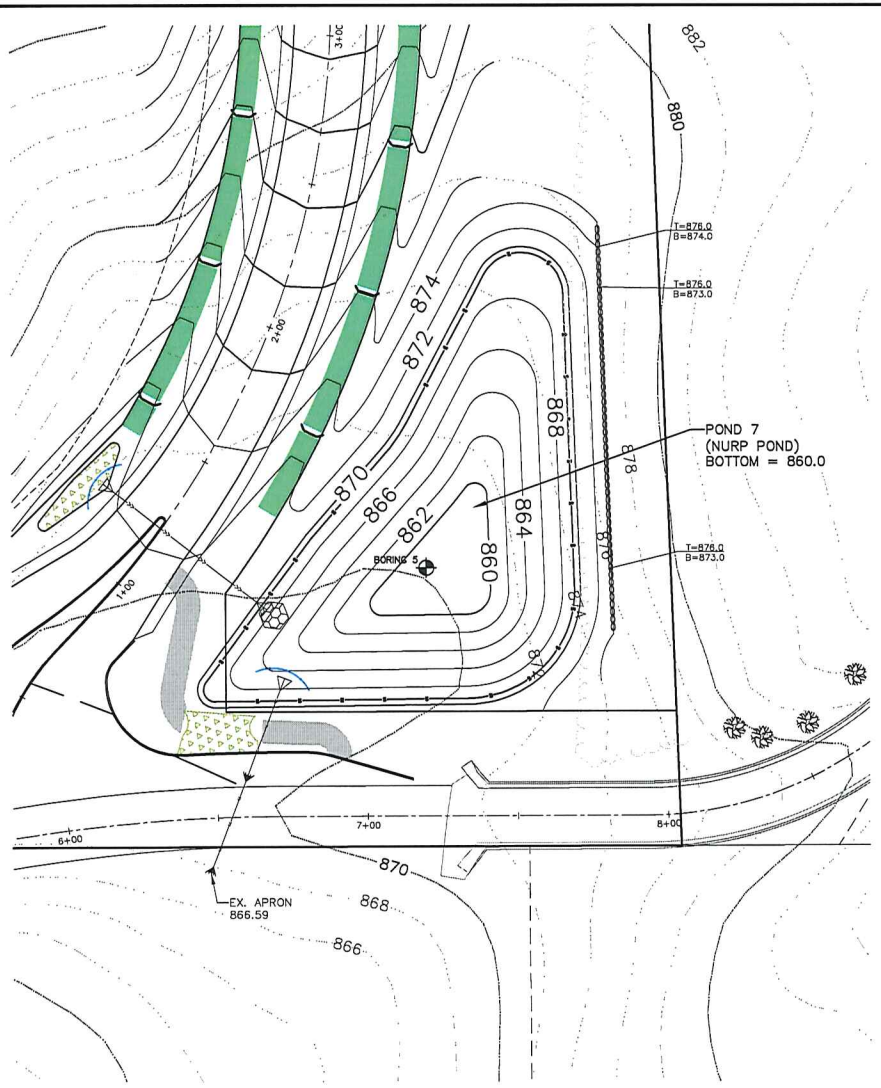
The pond construction would result in the following:

- 8 ft. depth from NWL (Existing culvert elevation)
- Move easterly closer to adjacent property
- Construction of a minimum 3 ft. high retaining wall that would be 16 feet above the pond bottom
- A vehicle access maintenance road along the east and north sides is not feasible
- Pond side slopes are 3:1; Other on-site project NURP ponds are 4:1 or flatter slopes.
- There may be some safety concern due to the pond depth, slopes, retaining wall and location next to Oakridge Trail South and 60th Street

It is our opinion; this would not be a preferred option if an alternative to the current pond 7 is required.



INFILTRATION BASIN



NURP POND

3:1 Slope

DRAWN BY: C.M.	DESIGN BY: C.W.P.
CHCKD BY: C.W.P.	PROJ. NO. 17-1707
ORIGINAL DATE: AUGUST 14, 2017	

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AFTON CREEK PRESERVE
AFTON, MINNESOTA
POND 7 GRADING PLAN

PREPARED FOR:
AFTON CREEK PRESERVE DEVELOPMENT, LLC

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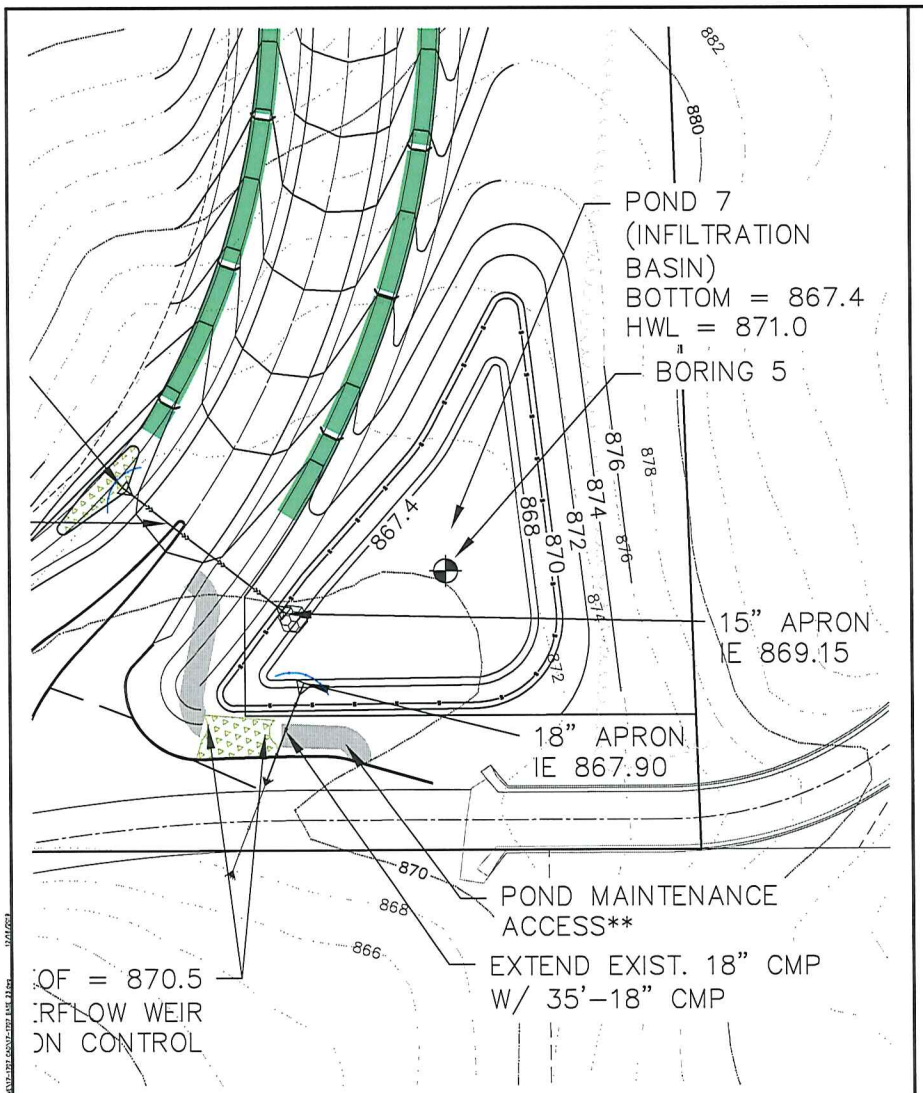

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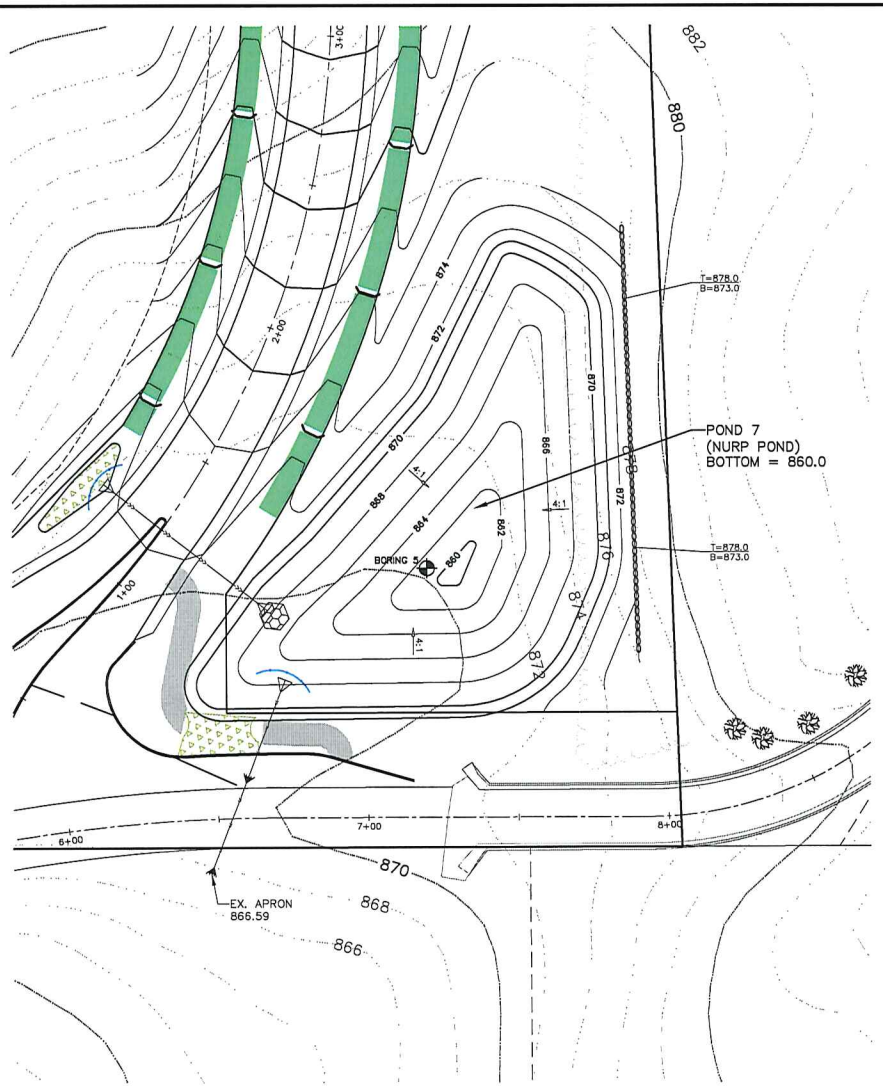

NURP POND

4:1 Slope

DRAWN BY: C.M.	DESIGN BY: C.W.P.
CHCKD BY: C.W.P.	PROJ. NO. 17-1707

ORIGINAL DATE: AUGUST 14, 2017

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12/16/19	POND REVISION

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AFTON, MINNESOTA

POND 7 GRADING PLAN

PREPARED FOR:
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1 INCH = 20 FEET

wsb

Memorandum

To: Afton Creek Preserve Development Team

From: Nick Guilliams, City Engineer
Jennifer Hildebrand, PE Services

Date: December 16, 2019

Re: Spring Contingency Plan and 2020 Work Activities

WSB has reviewed the Spring Contingency Plan and planned work activities for this Summer and offers the following comments:

1. Overall, the plan is cohesive and well thought through
2. For the Spring Thaw Section here are a few items for clarification:
    a. What temperature constitutes runoff for temperatures above freezing? For example, if it remains above 32 degrees for more than 4 hours during the course of the day?
    b. How will rills or areas of erosion be repaired expeditiously? Could we state that any identified areas which occur due to spring runoff conditions be repaired within 24 hours?
    c. For Action level 2 you indicate that reinforced silt fence is to be installed. Do you really mean you will use wire backed silt fence?
    d. For Action level 2 you indicate that action will occur when elevated water levels warrant pumping. Please articulate numerically for Pond 2, 4, 7 and 5 what Elevated water levels mean? Also, how you will know when they reach this level?
    e. We cannot place the dewatering bag in the existing culvert apron under 60th street. Is there another alternative you could propose?
    f. What size dewatering bags will be used, what is there allowable rate? (how many GPM?) Where will they be placed, not on dirt or vegetation rather asphalt, concrete, or aggregate with geotextile fabric?
    g. For Action Level 3 you indicate that steps will be taken if each pond should reach overflow levels. As indicated previously please identify numerically what the levels are for each of the ponds and how these will be measured in the field by Carlson team members.
    h. Who, specifically, is responsible for making these field decisions? Peterson, Plowe, Carlson, etc....
3. Overall the plan is not detailed about who is monitoring field conditions, how frequent, and how these field conditions will be communicated?
4. Under winter work section, please clarify that the monitoring will be done as defined by elevations within the spring thaw plan
5. Under seeding plan, please clarify that all sloped areas steeper than 3:1 will receive ECB or hydraulically applied FGM, not straw
6. Under seeding plan, it states that seeding will not be done until soil temps are higher than 50 degrees. Dormant seeding and protections can be done well in advance of soil

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temperatures reaching 50degrees. Germination will likely not occur until then, but the work can be done in advance. Please clarify.

7. Could the Carlson team consider that if the soil temperatures are above 50 degrees and no germination is occurring within 14 days; then reapplication of seeding and stabilization should be completed.
8. Under Pond 7 – 24 hours draw down period it states that the drain tile will prevent sediment leaving the site; this is unfortunately not a correct statement. Please remove.
9. Under Pond Berm, please consider a statement that indicates that if the soil temperatures are above 50 degrees and no germination is occurring within 14 days; then reapplication of seeding and stabilization should be completed.
10. Under the memo regarding Pond 7 being developed into a wet pond:
    a. Consider the size of the footprint needed to create 4:1 slopes, and how much land that would take – please state
    b. If the pond is this deep and side slopes would be 3:1; it is likely safety fence would be required to keep animals and people from entering the pond – please indicate
    c. It may be conducive to research increased likelihood for mosquito breeding habitat should this area be turned into a wet pond-Carlson team may wish to also state this in more detail
11. For the drawing indicating shaping work to be completed near the north side of the overflow berm at Pond 5; could you shade the area to be graded and indicate what elevation changes will be completed along with the measures planned for stabilization?
12. In regard to the draintile solution for basin 7 we would recommend another 6" line (running north south parallel to the 58' draintile) to get a little better coverage in the basin. Also, it seems like it would be beneficial to daylight the 8" PVC at the same location as the apron.