

## PCSM PLAN INTENT NOTE

The intent of the PCSM Plan sheets are to detail the Post Construction Stormwater Management facilities and associated Ownership and Maintenance Requirements associated with this project. Sequence of Construction notes and Ownership & Maintenance notes are on the following PCSM Detail sheet.

## GENERAL PCSM NOTES

- . No DEP permitting is required for the construction of this plan except for for the existing current NPDES Permit related to construction activities (PAG-02-0022-08-038R, expires 10-9-2018).
- 2. The entire project site is located within the Beaver Creek watershed 3. Wetlands shown on this plan are per field delineation performed by
- Aqua-Niche. 4. BMPs, trees, debris and any other materials not proposed to permanently remain on-site are to be recycled or disposed of in accordance with Department of Environmental Protection regulations. building materials and wastes must be removed from the site and recycled or disposed in accordance with the Department's Solid Waste Management Regulations at 25 Pa. Code 260.1 et seq., 271.1 et seq., and 287.1 et seg. No building material or wastes or unused building

materials shall be buried, dumped, or discharged at the site.

## STORMWATER MANAGEMENT NOTES

Post Construction Stormwater Management BMPs have been incorporated into the site design to collect, convey, promote infiltration, attenuate and treat stormwater runoff prior to discharge to surface waters. Reference the following list of proposed site Best Management Practices (BMPs) incorporated in to the project's design (the below list includes all BMPs associated with Phases IV and V although all Basins have already been constructed with Phase IV excluding future conversions from sediment BMPs to permanent BMPs):

- 1. The proposed Stormwater Water Bioretention—Detention Basins shall provide several key functions including but
- not limited to the following: a. Stormwater Runoff Rate control shall be provided by using the basin storage and associated outlet

structures to attenuate the stormwater discharge rates to below pre-development rates.

- b. The basin was designed to provide for extended detention. The attenuation of the basin discharges provides for stream bank protection, promotes infiltration and provides for longer periods of filtering and plant uptake within the basins.
- c. The basin shall be constructed with a flat bottom with shallow sump and planted with wetland seed mixtures which shall improve water quality, increase infiltration volume and promote evapotranspiration. d. The basin discharges into the historical natural drainage way for the site. Riprap apron shall be installed at basin discharge point although as shown in the routings the basin discharge is very small and non
- 2. The proposed Water Quality Bioretention Basins shall provide water quality benefits as indicated above although were not designed for rate control.
- 3. The proposed subsurface Infiltration Trenchs shall provide direct infiltration of roof top runoff for all roof area that does not drain to one of the Bioretention—Detention Basins. Roof top runoff is relatively clean which allows the use of a subsurface infiltration trench. Although roof runoff is relatively clean there are nutrients in the runoff from air pollution and some inorganic suspended solids from the roof tops; the infiltration will
- reduce nutrients and reduce surface runoff. 4. Rain Gardens can be used as a substitute to the above referenced Infiltration Trenches. Rain Gardens promote
- infiltration and promote nutrient uptake through plantings and filtration through the soil mix. 5.A vegetated swale was constructed with Phase IV to convey storm sewer discharge from Beaver Creek Road to Basin B28b. The swale shall be seeded with vegetation and stabilized with a permanent liner. Vegetated swales promote infiltration and improve water quality through vegetative filtering and plant uptake.
- 6. Street trees shall be planted along both sides of the street which will provide for some shading of the pavement. Pine trees shall be planted along the Bioretention Basins as well. The trees shall provide some shading to aid in thermal protection, provide runoff volume uptake and promote evapotranspiration. 7. Street Sweeping shall be performed by the Township in accordance with their MS4 requirements. Street sweeping provide direct water quality benefits through the physical removal of particulates. Street sweeping also prolongs the life of the pavement.

## CRITICAL STAGES OF PLAN IMPLEMENTATION

This plan identifies the Post Construction Stormwater Management BMPs for the project. In accordance with NPDES permitting requirements, critical stages of implementation of the plan shall have a licensed professional or designee on site. The critical stages of construction associated with this project would be construction of the Bioretention—Detention Basin embankments and outlet structures, soil restoration of basin bottoms and verification of appropriate basin seeding. All other BMPs can be inspected after construction to verify consistency with the intended design.

SOIL PROBE/PERCOLATION TEST As indicated all the basins have already been constructed; the following soil testing data is provided for reference (per previous Phase IV Plan). There are no known naturally occurring geologic features or so conditions on site that have the potential to create pollution. The main rock type underlying the site is shale; the shale of the Hamburg sequence is predominantly greenish—gray, gray, purple, and maroon phyllitic shale that is silty and siliceous. Several Soil Probes and percolation tests where conducted across the site; the soil probes rendered crumbly shale subsoils and the average percolation rates was 0.67 in/hr. See SWM Report for probe descriptions and percolation rates.

# Infiltration Testing Locations at Brookview

PROBES

Probe #1 - N 40° 20.633' W76° 45.360' - Above detention area #2 on Phase II - Berks shaly silt loam series (BkB2) #3 - 14" - "A" Horizon - 10YR 5/3 Wet topsoil layer 14° - 44" - "B1" Horizon - 10YR 5/2 with mottles - 5YR 5/8 - Yellowish clay layer with some gray depleted soil (hydric layer) - Mottles begin at a depth of about 15" 44" - 72" - "B2" Horizon - 7.5YR 5/2 - Shaly layer - fractured material

<u>Probe #1A</u> - N 40° 20.617' W76° 45.365' - Center of grass swale - Berks (BkB2) 306 - 173 'A" Horizon - 10YR 5/2 Topsoil 6" - 30" - "B1" Horizon - 7.5YR 5/3 - Clay layer with mottles - 5YR 5/8 0" - 60" - "B2" Horizon - 10YR 3/2 - shaly layer Hard shale at 5.0' - stopped excavation.

5" - 72" - "B2" - 10YR 5/2 - shale bits flaking off - fractured materia

Probe #1B - N 40° 20.604' W76° 45.369' - West of grass swale and detention area #2 - Berks (BkB2) 7 - 14" - "A" Horizon - 10YR 4/3 - Moist topsoil layer 4" - 45" - "B1" - 10YR 6/6 - clay-like layer with mottles (Fe) - 5YR 5/8

Probe #2 - N 40° 20.490' W76° 45.443' - Below outfall #54, below cul-de-sac, Phase III - Comly Series (CoB2) 0 - 9" - 10YR 5/3 - "A" Horizon - Topsoil layer 9" - 16" - "B1" Horizon - 10YR 6/2 - Somewhat depleted soil 6" - 48" - "B2" - Horizon - 10YR 4/2 - Shaly layer

\* Water coming through side at 3.0 feet depth; hard shale at 4.0 feet Probe #3 - N 40° 20,400' W76° 45,389' - Off White Birch Lane - near outfall #84 - Brinkerton-Armagh Series (B:B2) - silty clay loam 0 - 14° - "A" Horizon - 10YR 4/3 - Topsoil; nice and crumbly

14" - 20" - "B1" Horizon - 10YR 5/2 - Depleted layer 20" - 28" - "B2" - 10YR 7/2 - Depleted, sticky yellow/gray layer with mottling; 7.5YR 5/8 3" - 72" - "B3" - 10YR 4/4 - Crumbly brown layer with tiny shale bits (horizontally layered!)

Probe #4 - N 40° 20.368' W76° 45.350' - Near detention area #1 - Berks Series (BkC2) 10 - 12" - "A" Horizon - 10YR 4/3 - Nice, crumbly topsoil
12" - 42" - "B1" Horizon - 10YR 5/4 - Some indistinct mottling below 24" - 7.5YR 5/6 42" - 72" - "B2" Horizon - 10YR 6/6 - Yellow-brown with soft shale bits, chunks

Probe #5 - N 40° 20.466' W76° 45.224' - Above UNT and "Old Tree-stand Wetland" - Near infiltration hole #14 - Berks Series (BkC2) 0 - 12" - "A" Horizon - 10YR 4/4 - Crumbly topsoil 12" - 24" - "B1" Horizon - 10YR 5/6 - Yellow-brown layer - no mottles " - 72" - "B2" Horizon - 10YR 5/6 - shaly layer with some weak sandstone. Strike of

he formation is visible here - SW - NE and "dip" is approx. 5-10 off vertical

Probe #6 - N 40° 20.473' W76° 45.313' - Near detention area #7 - Berks Series (BkB2) ) - 6" - "A" Horizon - 10YR 4/4 - Topsoil 5" - 18" - "B1" Horizon - 10YR 5/6 - No Fe mottling 8" - 60" - "B2" Horizon - 10YR 4/2 - Dark Manganese mottling on shale here

\* Hard shale at 5.0 feet.

# **IMPERVIOUS LOT COVERAGE**

Hole #21 - N 40° 20.397' W76° 45.395' (BtB2) \* Surface Test

\* All infiltration tests were done using double-ring infiltrometer

INFILTRATION TESTS

Phase III Hole #1 - N 40° 20.630' W76° 45.359' (BkB2) Hole #2 - N 40° 20.590' W76° 45.353' (BkB2) Hole #3 - N 40° 20.496' W76° 45.442' (CoB2)

Hole #4 - N 40° 20.558' W76° 45.466' (BkB2

Phases tV and V Hole #6 - N 40° 20.312' W76° 45.433' (BtB2)

Hole #7 - N 40° 20.397' W76° 45.395' (BtB2) Hole #8 - N 40° 20.439' W76° 45.321' (BkC2

ole #9 - N 40° 20.465' W76° 45.298' (BkC2)

tole #10 - N 40° 20.392' W76° 45,306' (BkB2)

Hole #11 - N 40° 20.365' W76° 45.301' (BkC2)

Hole #12 - N 40° 20 331' W76° 45 297' (BkC2

Hole #13 - N 40° 20.361' W76° 45.345' (BkC2 Tole #14 - N 40° 20.467' W76° 45.217' (BkC2)

lole #15 - N 40° 20.489' W76° 45.173' (BkB2)

lole #17 - N 40° 20,557' W76° 45,147' (BkC2)

Hole #18 - N 40° 20.579' W76° 45.165' (BkC2)

Hole #16 - N 40° 20.497' W76° 45.214' (BkB2)

ole #5 - N 40° 20.590' W76° 45.362' (BkB2'

Hole #19 - N 40° 20.617' W76° 45.369' \* Surface Test

Hole #20 - N 40° 20.602' W76° 45.369' \* Surface Test

The below table reflects the impervious lot coverage shown on this plan and the impervious coverage allocated to each lot in the stormwater design. Any lot that proposes impervious coverage beyond the allocated amount must provide additional stormwater measures; actual coverage shall be detailed at time of building permit for each lot.

Lot	Coverage Shown	Allocated Coverage
#	(Square Feet)	(Square Feet)
79	2562	4062
80	2691	4191
81	2667	4167
82	2564	4064
83	3826	5326
84	2667	4167
85	2564	4064
86	3815	5315
87	2608	4108
88	2667	4167
89	3105	4605
90	2564	4064
91	3126	4626

## SOIL DESCRIPTION SLOPE (%) BkB2 | Berks shaly silt loam 3 to 8% Berks shaly silt loam 8 to 15% Berks shaly silt loam 15 to 25% Brinkerton /Armagh silt loam 0 to 3% Brinkerton/Armagh silt loam 3 to 8% Comly Silt Loam 2 to 8%

Implications and resolutions of the above soil types are as follows: In general, the soils present should not pose any significant limitation to the type of

development proposed. Reference the following recommendation pertaining to possible issues that may be encountered during construction. • If unrippable rock is encountered during proposed grading, blasting or drilling may be required. Removed rock can be crushed if necessary and used for fill.

• If water table is encountered during excavation, dirty water shall be pumped out into



Mellott Engineering, Inc.

ENGINEERING, and Planning & Development - Water Heights Road - Hummelstown, PA in mellotteng@comcast.net

MELLOTT .

INC.

mothy L. Mellott, P.E. 7500 Devonshire Heights Road PH: 717-566-6533 FAX: 717-427-2700

TIMOTHY L. MELLOT

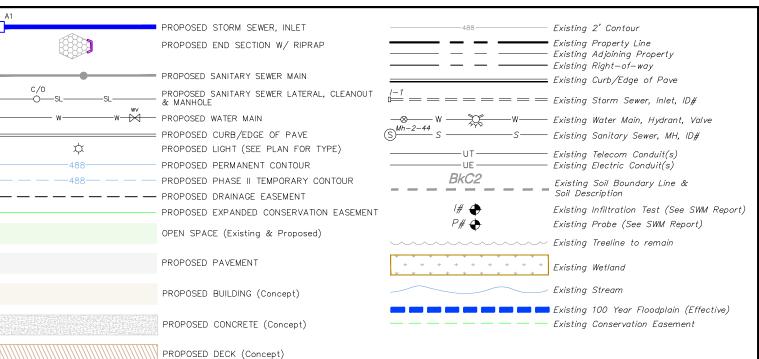
## LEGEND

Philo silt Ioam

a filter bag or sediment removal pond.

SOILS TABLE

SOIL SYMBOL



the Township.

HYDROLOGIC

## STORMWATER PLAN CERTIFICATION **OWNERSHIP BMP STATEMENT**

HEREBY CERTIFY THAT THE MANAGEMENT PLAN MEETS ALL DESIGN STANDARDS AND CRITERIA OF THE APPLICABLE 2009 WEST HANOVER TOWNSHIP STORMWATER MANAGEMENT ORDINANCE.

certify acknowledge that the stormwater BMPs are fixture hat cannot be altered or removed without prior approval b

OWNERSHIP ACKNOWLEDGEMENT NOTES A Operation and Maintenance (O & M) Agreement is required

May 3, 2018

PCSM #1

