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EROSION & SEDIMENT CONTROL PLAN NARRATIVE

FOR

3 Point Garden Road

Smithfield Township, Northampton County, PA

LTS Homes
805 Seven Bridge Road
East Stroudsburg, Pennsylvania 18301

Date: October 11, 2024
Revised: November 4, 2024
Prepared by: Jeffrey L. Ott, PE
PA License No. 044775-E
Cpesc No. 6152
LTSI 2301

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EXPERIENCE OF PLAN PREPARER

The E&SPC plan and Narrative has been prepared by Jeffrey L. Ott, P.E.

Mr. Ott has prepared numerous E&SPC Plans and Narratives over the last 16 years in Lehigh, Northampton, Bucks, Berks, Monroe, Lackawanna and Luzerne Counties. Mr. Ott graduated from Drexel University with a Bachelor of Science in Civil Engineering in June 1989 and immediately began his employment in the Land Development industry. Over the years, Mr. Ott has attended numerous training seminars offered by the local County Conservation Districts. The following is a recent list of projects which required E&SPC Plans and Narratives, which were prepared by Mr. Ott:

Ravena Street Subdivision – Townhouse Development, Bethlehem, PA
PPL Interstate Pipeline Facility, Lower Mt. Bethel Township, PA
The Carriages at Jordan Creek, Allentown, PA
Panther Valley Middle School, Summit Hill, PA
Lots 4, 5 & 6 – Stabler Center, Upper Saucon Township, PA
Ravena Street Townhouses, Bethlehem, PA
Mountain Glen at Saucon Valley, Upper Saucon Township, PA
CVS in Bangor, PA
CVS in Wind Gap, PA
CVS in East Stroudsburg, PA
CVS in Reading, PA
CVS in Upper Nazareth, PA
CVS in Wilkes-Barre, PA
The Plaza at PPL Center, Allentown, PA
PPL Parking Structure, Allentown, PA
The Palmer Town Center, Palmer Township, PA
PPL Maintenance Building, West Rockhill Township, PA
Kutztown Rod & Gun Club, Kutztown, PA
Legacy Place, Salisbury Township, PA
Apartments in the Parkway, City of Allentown, PA
HMB Hotel and Banquet Center, Upper Saucon Township, PA
Transitional Care Facility, Upper Saucon Township, PA

Mr. Ott is employed as President and Principal Engineer by:

Ott Consulting Inc.
Lehigh Valley Office
P.O Box 386
Emmaus, PA 18049
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2. INTRODUCTION

The applicant is proposing the construction of 7 residential dwellings along with the associated site improvements, including driveways and stormwater BMPs. This site has a construction area of 5.1 acres on approximately 10.5 acres in Smithfield Township, Monroe County. The limits of disturbance are minimized by building on only a minimal percentage of the lot area and the duration is minimized through immediate stabilization per the Sequence of Construction. The project will utilize compost filter socks and slope matting. The site is currently vacant land with forest and meadow cover.

The project is located in Subarea 110 of the Brodhead-McMichael Watershed, the 2 year post-development peak rate runoff must be equal to the 1 year pre-development rate of runoff. The site is largely forested and has been vacant lot for decades. The Applicant is proposing to reduce the pre- to post- peak rate flow by implementing rain gardens for each lot. The receiving waters are listed as impaired. To meet the water quality requirements of the NPDES permit, on-lot rain gardens will be constructed to mitigate the 2 year pre- to post- runoff volume differential.

NOI CHECKLIST NOTES

1. The project will preserve the integrity of stream channels and maintain and protect physical, biological and chemical qualities of the receiving stream by using infiltration and capture/reuse bmps.
2. To prevent an increase in the rate of stormwater runoff the project will meet or exceed the runoff rates required by the Act 167 and DEP.
3. To minimize any increase in stormwater runoff volume the project will utilize infiltration BMPs.
4. To minimize impervious areas, the minimum amount of impervious is being constructed for the proposed use of the site.
5. To protect the existing drainage features and existing vegetation and minimize land clearing and grading, earth disturbance will only be done in the areas necessary for construction.
6. The duration of earth disturbance is minimized by employing immediate stabilization practices per the sequence of construction.
7. Soil compaction is minimized on the site by limiting the extents and limits of earth disturbance.
8. The E&SPC plans have been planned and designed to be consistent with the post-construction stormwater management plans, therefore this plan prevents increased runoff.
9. There are no existing nor proposed riparian forest buffers related to this project. Therefore, there are no waiver requests, areas proposed to be waived or riparian buffer offsets.
10. To our knowledge, there are not naturally occurring geologic formations or soil conditions that may have the potential to cause pollution during earth disturbance activities.
11. There are no wetlands adjoining or within the site.
12. The entire area shown hereon is within the watershed, therefore the boundaries of the watershed cannot be shown.

The soil within the area to be developed consists of the following:

SOILS TABLE

KEY	SOIL NAME	HYDROLOGIC SOIL GROUP	SLOPES	ERODIBILITY	HYDRIC/ COMPONENT
MbB	MARDIN VERY STONY SILT LOAM	D	0% TO 8%	MINIMAL	Y
BeB	BENSON-ROCK OUTCROP COMPLEX	D	0% TO 8%	MINIMAL	D
BeC	BENSON-ROCK OUTCROP COMPLEX	D	8% TO 25%	MINIMAL	D

SOILS TYPE USE LIMITATION AND RESOLUTION TABLE

KEY	SOIL NAME	LIMITATION	RESOLUTION
MbB	MARDIN VERY STONY SILT LOAM	WETNESS/DEPTH TO SATURATED ZONE	INSTALL FOUNDATION DRAINS, USE PUMPED FILTER BAGS
BeB	BENSON-ROCK OUTCROP COMPLEX	SLOW PERCOLATION	SOIL TESTS ARE STRONGLY RECOMMENDED
BeC	BENSON-ROCK OUTCROP COMPLEX	SLOW PERCOLATION	SOIL TESTS ARE STRONGLY RECOMMENDED

3. FIFTEEN FACTORS TO BE CONSIDERED

The basic concept of providing effective, efficient and practical erosion and sedimentation pollution control should be considered when determining the locations and types of Best Management Practices. The accompanying Erosion and Sedimentation Control Plans were planned and designed to be consistent with the Post-Construction Stormwater Management (PCSM) Plans. All off-site surface water should be diverted away from areas to be disturbed, all site stormwater should be collected and conveyed to a sediment basin/trap, or other BMP for sediment removal. Temporary stabilization should immediately be provided for earth exposed areas where earthwork is delayed or stopped and permanent stabilization should ultimately be provided for all disturbed areas. Pumped water filter bags shall be used for any water pumped from excavations. Access to the site and removal of mud from vehicle tires before vehicles exit onto existing paved areas may be required.

There are fifteen factors that must be considered when developing an Erosion and Sedimentation Pollution Control Plan for earth disturbance activities other than agricultural plowing or tilling. They are as follows:

1. ***The existing topographic features of the project site and the immediate surrounding area***.

   The required features as described in the Erosion & Sediment Pollution Control Program Manual are shown on the Erosion & Sediment Pollution Control (E&SPC) Plans.

2. ***The types, depth, slope, locations, and limitations of the soils***.

   The soil boundaries are delineated on the E&SPC Plans along with a soils table. The soils limitations and resolutions table on the previous page is also included on the plans.

3. ***The characteristics of the earth disturbance activity, including the past, present, and proposed land uses and the proposed alteration to the project site***.

   The property is currently on undeveloped land to the East of East Stroudsburg. Based upon USGS and other readily available aerial photography, the property has been within the past 5 years, undeveloped. Historically, land uses over the last 50 years have been the same. The applicant is proposing the construction of multiple residential buildings and utility improvements on approximately 10.5 acres.

4. ***The amount of runoff from the project area and the upstream watershed area.***

   The Applicant is proposing the use of multiple rain gardens to provide rate controls for the project. The proposed rain gardens will discharge to an existing grade.

5. ***The location of waters of the Commonwealth which may receive runoff within or from the project site and their classification pursuant to Chapter 93***.

   Runoff from this project discharges from the site and overland flows to Sambo Creek. The Sambo Creek is designated as Impaired. The Sambo Creek is tributary to the Brodhead Creek which drains to the Delaware River.

6. ***A narrative description of the location and type of perimeter and on site BMPs used before, during, and after the earth disturbance activity.***

   Rock Construction Entrances will provide access for construction traffic. Topsoil will be stripped and stockpiled as needed. Stockpiles will be contained by silt socks and will receive temporary seed. Silt socks will be used along the downstream side of earth disturbance to filter sediment laden runoff.

   The following is a description of the temporary BMPs to be employed at this site:

   a. Rock Construction Entrance.
   b. Concrete Washout (Compost Sock Washout)
   c. Compost Filter Socks (with Rock Filter Outlets, if needed).
   d. Slope Matting
   e. Temporary Seeding & Mulch

   The following is a description of the Post-Construction BMPs to be employed at this site:

   a. Rain Gardens

7. ***A sequence of BMP installation and removal in relation to the scheduling of earth disturbance activities, prior to, during, and after earth disturbance activities.***

   All Earth Disturbance activities shall proceed in accordance with the sequence detailed on the Erosion & Sedimentation Control Plans. Each stage of the sequence must be completed prior to initiation of the following stages. Clearing and grubbing shall be limited only to those areas described in each stage. The Contractor shall limit his operations to within the limits of construction shown on the Erosion & Sedimentation Control Plans. Refer to the **Staging of Earthmoving Activities** shown on the plans for additional information.

8. ***Supporting calculations.***

   Supporting calculations for the various E&SPC BMPs are included in this report.

9. ***Plan drawings.***

   The locations of the BMPs are shown on the plans. A legend, describing all symbols, is included on the plans. All construction details, specifications and maintenance requirements for the BMPs are included on the plans. Standard Construction Details taken from the latest Erosion and Sediment Pollution Control Program Manual are also shown on the plans.

10. ***A maintenance program which provides for inspection of BMPs on a weekly basis and after each measurable rainfall event, including the repair of BMPs to ensure effective and efficient operation.***

    A maintenance program for both the temporary and permanent erosion and sediment control BMPs is included within the E&SPC Plans, and as follows:

    Inspection of the various BMPs must be performed after each measurable runoff event as well as on a weekly basis. Cleanout, repair, replace, regrade, restabilize, etc. each of the BMPs as needed to ensure its proper performance. Materials removed from the BMPs shall not be removed from the project area. Sediment removed from BMPs should be disposed of in landscaped areas outside of steep slopes, wetlands, floodplains or drainage swales and should be immediately stabilized or placed in topsoil stockpiles.

11. ***Procedures which ensure that the proper measures for the recycling or disposal of materials associated with or from the project site will be undertaken in accordance with Department regulations.***

    Individuals responsible for earth disturbance activities must ensure that proper mechanisms are in place to control waste materials. Construction wastes include, but are not limited to, excess soil materials, building materials, concrete wash water, sanitary wastes, etc. that could adversely impact water quality. Measures should be planned and implemented for housekeeping, materials management, and litter control. Wherever possible, recycling of excess materials is preferred, rather than disposal. A note requiring recycling of waste materials, where feasible, is included on the plans.

12. ***Identification of the naturally occurring geologic formations or soil conditions that may have the potential to cause pollution during earth disturbance activities and include BMPs to avoid or minimize potential pollution and its impact from the formations.***

    Geologic formations containing minerals (e.g. pyrite) in sufficient quantities that could result in discharges which do not meet water quality standards for the receiving surface water(s) do not occur within the project boundaries. To our knowledge, there are no naturally occurring geologic formations or soil conditions that may have the potential to cause pollution during earth disturbance activities.

Bedrock or soil conditions which could result in significant slope failures resulting in mass soil movement into surface waters, property damage, or a public safety hazard do not occur within the project boundaries.

13. ***Identification of potential thermal impacts to surface waters of this Commonwealth from the earth disturbance activity including BMPs to avoid, minimize and mitigate potential pollution from thermal impacts.***

    Thermal impacts associated with this project will be avoided or minimized by phasing the E&S design, minimizing any changes to the drainage patterns, limiting the disturbed area, collecting runoff and discharging it into the ground through the use of subsurface infiltration beds.

14. ***The E&S Plan shall be planned, designed and implemented to be consistent with the PCSM Plan.***

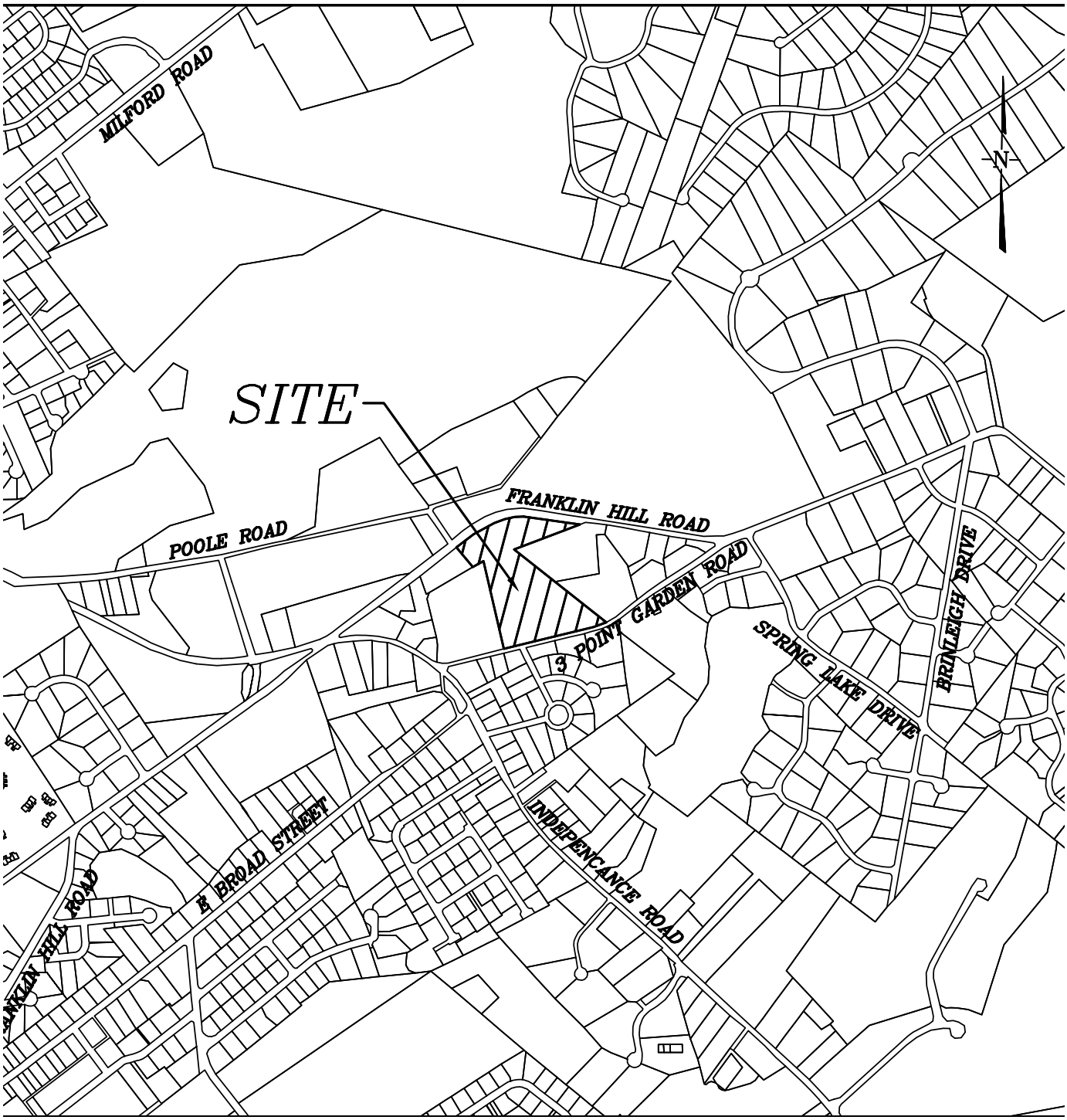
    The E&S Plan and PCSM Plans have been planned, designed and will be implemented together so as to be consistent with each other. Since the PCSM Plan proposed infiltration and the plans were developed consistently, the E&S plan prevents increased runoff.

15. ***Identification of existing and proposed riparian forest buffers.***

    There are no existing nor proposed riparian forest buffers related to this project.

4. SUPPORTING CALCULATIONS

a. Location Map


MILFORD ROAD
N
SITE
FRANKLIN HILL ROAD
POOLE ROAD
3 POINT GARDEN ROAD
SPRING LAKE DRIVE
BRINLEIGH DRIVE
E BROAD STREET
INDEPENDANCE ROAD
FRANKLIN HILL ROAD

Map Scale: 1:2,570 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, Pennsylvania
Survey Area Data: Version 17, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 21, 2022—Jul 20, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BeB	Benson-Rock outcrop complex, 0 to 8 percent slopes	D	13.3	67.9%
BeC	Benson-Rock outcrop complex, 8 to 25 percent slopes	D	1.4	7.1%
CnB	Chippewa and Norwich soils, 0 to 8 percent slopes, extremely stony	D	0.0	0.1%
MbB	Mardin very stony silt loam, 0 to 8 percent slopes	D	4.9	24.9%
Totals for Area of Interest			**19.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

b. Peak Flow Summary Table

3 Point Garden Road

Stormwater Management Rate Summary

Date: 11/4/2024
By: DJF
Revised:
By:

Samba Creek
Subarea XXXXX
Release Rate = 2-Yr Post Match 1-Yr Pre, All others match

POI 001

Return Period	Onsite PreDev Peak Q	Offsite PreDev Peak Q	Allowable Postdev Peak Q	Bypass/ Undetained Q	Routed Basin Q	Total Postdev POI Q	Total POI Q Variation
1	2.94	1.83					
2	4.27	2.52	5.47	0.84	0.31	1.15	-4.31
5	6.36	3.57	9.93	1.16	1.11	2.27	-7.66
10	8.28	4.51	12.78	1.44	2.39	3.84	-8.95
25	11.42	6.01	17.43	1.89	6.27	8.16	-9.27
50	14.36	7.931	22.29	2.30	9.78	12.08	-10.21
100	17.9	9.037	26.94	2.79	14.18	16.97	-9.97

POI 002

Return Period	Onsite PreDev Peak Q	Offsite PreDev Peak Q	Allowable Postdev Peak Q	Bypass/ Undetained Q	Routed Basin Q	Total Postdev POI Q	Total POI Q Variation
1	2.08	1.41					
2	3.04	2.06	4.14	0.71	0.35	1.07	-3.07
5	4.55	3.08	7.63	1.01	1.19	2.20	-5.43
10	5.92	4.01	9.93	1.28	1.96	3.24	-6.69
25	8.17	5.53	13.70	1.71	3.77	5.48	-8.23
50	10.28	6.97	17.25	2.11	7.06	9.17	-8.08
100	12.82	8.68	21.50	2.58	11.57	14.15	-7.35

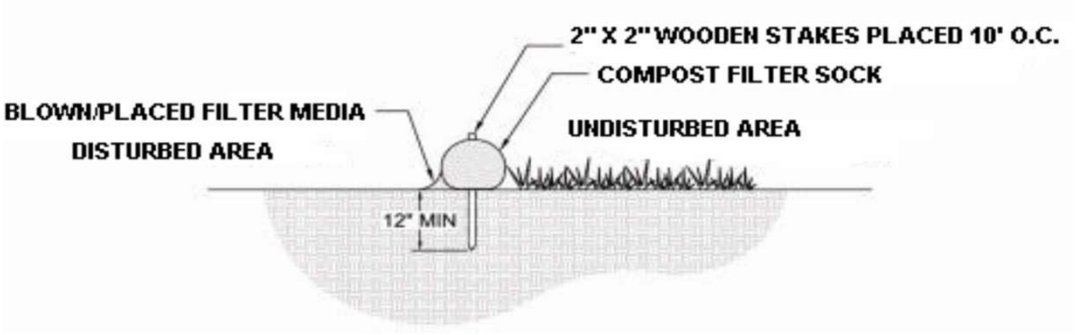
POI 003

Return Period	Onsite PreDev Peak Q	Offsite PreDev Peak Q	Allowable Postdev Peak Q	Bypass/ Undetained Q	Routed Basin Q	Total Postdev POI Q	Total POI Q Variation
1	0.94	0.37					
2	1.37	0.55	1.48	0.82	0.46	1.28	-0.21
5	2.05	0.82	2.86	1.16	1.02	2.18	-0.68
10	2.66	1.07	3.73	1.47	1.32	2.79	-0.94
25	3.67	1.47	5.14	1.96	2.26	4.22	-0.92
50	4.63	1.85	6.48	2.42	3.48	5.89	-0.58
100	5.77	2.31	8.07	2.96	5.10	8.06	-0.02

c. Sediment Barriers & Filters

STANDARD E&S WORKSHEET #1
Compost Filter Socks

PROJECT NAME: 3 Point Garden Road
LOCATION: Smithfield Township
PREPARED BY: DJC DATE: 11/4/2024
CHECKED BY: DJF DATE: 11/4/2024



SOCK NO.	LOCATION	SLOPE PERCENT	SLOPE LENGTH ABOVE BARRIER (FT)
SOCK #1	Lot 1	0.11	186
SOCK #2	Lot 2	0.08	178
SOCK #3	Lot 3	0.07	355
SOCK #4	Lot 4	0.06	429
SOCK #5	Lot 4 - Rear Yard	0.04	421
SOCK #6	Lot 5	0.12	187
SOCK #7	Lot 5 - Driveway	0.06	116
SOCK #8	Lot 6	0.08	379
SOCK #9	Lot 7	0.20	253
SOCK #10	Lot 7 - Driveway	0.18	124

3 Point Garden Road By: DJC
CALCULATIONS FOR STANDARD WORKSHEET #1 Date: 11/4/2024

Compost Filter Sock Calculater

SOCK #1		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	63	11	0.17	180	-	35%	65%
L2	78	1	0.01	690	449	11%	54%
L3	45	7	0.16	190	102	24%	30%
L4							
L5							
L6							

SOCK #2		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	168	9	0.05	340	-	49%	51%
L2	10	1	0.10	250	126	4%	47%
L3							
L4							
L5							
L6							
L7							

SOCK #3		**24" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	80	4	0.05	480	-	17%	83%
L2	118	8	0.07	390	325	30%	53%
L3	147	7	0.05	480	255	31%	22%
L4	10	1	0.10	300	67	3%	19%
L5							

SOCK #4		**24" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	56	6	0.11	280	-	20%	80%
L2	84	2	0.02	1000	800	8%	72%
L3	196	7	0.04	640	458	31%	41%
L4	93	5	0.05	480	197	19%	22%

SOCK #5		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	132	3	0.02	1000	-	13%	87%
L2	196	7	0.04	640	556	31%	56%
L3	93	5	0.05	480	270	19%	37%
L4							

3 Point Garden Road By: DJC
CALCULATIONS FOR STANDARD WORKSHEET #1 Date: 11/4/2024

Compost Filter Sock Calculater

SOCK #6		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	45	3	0.07	290	-	16%	84%
L2	89	12	0.13	220	186	40%	44%
L3	53	9	0.17	180	79	29%	15%
L4							
L5							
L6							

SOCK #7		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	49	4	0.08	270	-	18%	82%
L2	67	3	0.04	430	352	16%	66%
L3							
L4							
L5							
L6							
L7							

SOCK #8		**32" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	40	1.5	0.04	800	-	5%	95%
L2	85	9	0.11	370	352	23%	72%
L3	254	20	0.08	460	331	55%	17%
L4							
L5							

SOCK #9		**32" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	32	9	0.28	140	-	23%	77%
L2	73	17	0.23	200	154	37%	41%
L3	148	12	0.08	460	187	32%	8%
L4							

SOCK #10		**18" Filter Sock**		Allowable	Remaining		%
Segment	Length	Vert Diff	Slope	Length	Length	% Used	Remain
	(ft)	(ft)	(ft/ft)	(ft)	(ft)		
L1	52	13	0.25	150	-	35%	65%
L2	72	7	0.10	300	196	24%	41%
L3							
L4							

SLOPE	32" Filter Sock MAX SLOPE LENGTH	18" Filter Sock MAX SLOPE LENGTH	24" Filter Sock MAX SLOPE LENGTH
0.02	**1300**	**690**	**1000**
0.03	1000	560	790
0.04	800	430	640
0.05	**650**	**340**	**480**
0.06	570	320	440
0.07	500	290	390
0.08	460	270	360
0.09	430	260	330
0.10	**400**	**250**	**300**
0.11	370	240	280
0.12	360	230	270
0.13	360	220	260
0.14	355	210	255
0.15	**350**	**200**	**245**
0.16	345	190	240
0.17	310	180	230
0.18	290	170	220
0.19	265	160	210
0.20	**250**	**150**	**200**
0.21	230	140	190
0.22	220	130	180
0.23	200	120	170
0.24	190	110	160
0.25	**180**	**100**	**150**
0.26	160	96	140
0.27	150	92	130
0.28	140	88	120
0.29	130	84	110
0.30	**120**	**80**	**100**
0.31	115	78	96
0.32	110	76	94
0.33	105	74	92
0.34	100	72	90
0.35	**98**	**70**	**88**
0.36	96	68	86
0.37	94	66	84
0.38	92	64	82
0.39	91	62	81
0.40	**90**	**60**	**80**
0.41	89	58	79
0.42	86	56	76
0.43	84	54	74
0.44	82	52	72
0.45	**80**	**50**	**70**
0.46	78	48	68
0.47	74	46	64
0.48	70	44	60
0.49	69	42	59
0.50	**68**	**40**	**58**

d. Slope Matting Calculations

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SLOPE ANALYSIS

> > > Lot 1

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	18
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 18 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.3 in	0.0 in	0.5 in	0.0 in	0.25 in	>10	STABLE	A
Estb. Veg.	0.5 in	0.0 in	N/A in	N/A in	0.03 in	1.821	STABLE	--

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SLOPE ANALYSIS

> > > Lot 2

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	20
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 20 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.3 in	0.0 in	0.6 in	0.0 in	0.25 in	>10	STABLE	A
Estb. Veg.	0.5 in	0.0 in	N/A in	N/A in	0.03 in	1.728	STABLE	--

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SLOPE ANALYSIS

> > > Lot 3

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	12
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 12 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.2 in	0.0 in	0.4 in	0.0 in	0.25 in	>10	STABLE	A
Estb. Veg.	0.1 in	0.0 in	N/A in	N/A in	0.03 in	>10	STABLE	--

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SLOPE ANALYSIS

> > > Lot 4

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	24
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 24 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.4 in	0.0 in	0.6 in	0.0 in	0.25 in	>10	STABLE	A
Estb. Veg.	0.5 in	0.0 in	N/A in	N/A in	0.03 in	1.577	STABLE	--

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SLOPE ANALYSIS

> > > Lot 5

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	26
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 26 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.4 in	0.0 in	0.7 in	0.0 in	0.25 in	>10	STABLE	C
Estb. Veg.	0.6 in	0.0 in	N/A in	N/A in	0.03 in	1.515	STABLE	--

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SLOPE ANALYSIS

> > > Lot 6

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	15
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 15 ft

Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
S75BN	0.3 in	0.0 in	0.4 in	0.0 in	0.25 in	>10	STABLE	A
Estb. Veg.	0.4 in	0.0 in	N/A in	N/A in	0.03 in	1.996	STABLE	--

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SLOPE ANALYSIS

> > > Lot 7

Country	United States
State/Region	Pennsylvania
City	Scranton
Annual R Factor	100.00
Adjusted R Factor	100.00
Total Slope Length	75
Protection Type	Permanent
Protection Period	
Beginning Month	July
Slope Gradient (H:1)	3
Soil Type	Silt Loam
K Factor	0.33

Reach 1

Start: 0ft End: 75 ft
Vegetation Type: 80-95%

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
P300	0.9 in	0.0 in	1.6 in	0.0 in	0.25 in	>10	STABLE	D
S75BN	0.9 in	0.1 in	1.6 in	0.1 in	0.25 in	2.798	STABLE	C
Estb. Veg.	0.9 in	0.0 in	N/A in	N/A in	0.03 in	0.89	UNSTABLE	--
P300 Reinf. Veg	0.9 in	0.0 in	1.4 in	0.0 in	0.03 in	4.039	STABLE	D

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CHANNEL ANALYSIS

> > > IN-4 Swale NW

Name	IN-4 Swale NW
Discharge	8.308
Channel Slope	0.0448
Channel Bottom Width	0.1
Left Side Slope	2
Right Side Slope	5
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Bunch Type
Vegetation Density	Very Good 80-95%
Soil Type	Silt Loam (SM)

SC250

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	8.31 cfs	4.43 ft/s	0.72 ft	0.035	3 lbs/ft2	2 lbs/ft2	1.5	STABLE	E
Underlying Substrate	Straight	8.31 cfs	4.43 ft/s	0.72 ft	0.035	2.2 lbs/ft2	0.98 lbs/ft2	2.25	STABLE	E
SC250 Reinforced Vegetation	Straight	8.31 cfs	3.66 ft/s	0.79 ft	0.046	10 lbs/ft2	2.21 lbs/ft2	4.52	STABLE	E
Underlying Substrate	Straight	8.31 cfs	3.66 ft/s	0.79 ft	0.046	3 lbs/ft2	1.08 lbs/ft2	2.79	STABLE	E

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CHANNEL ANALYSIS

> > > IN-4 Swale SE

Name	IN-4 Swale SE
Discharge	8.002
Channel Slope	0.0635
Channel Bottom Width	0.1
Left Side Slope	2
Right Side Slope	5
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Bunch Type
Vegetation Density	Very Good 80-95%
Soil Type	Silt Loam (SM)

SC250

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	8 cfs	5.24 ft/s	0.65 ft	0.033	3 lbs/ft2	2.56 lbs/ft2	1.17	STABLE	E
Underlying Substrate	Straight	8 cfs	5.24 ft/s	0.65 ft	0.033	2.2 lbs/ft2	1.25 lbs/ft2	1.76	STABLE	E
SC250 Reinforced Vegetation	Straight	8 cfs	4.43 ft/s	0.7 ft	0.041	10 lbs/ft2	2.79 lbs/ft2	3.58	STABLE	E
Underlying Substrate	Straight	8 cfs	4.43 ft/s	0.7 ft	0.041	3 lbs/ft2	1.36 lbs/ft2	2.21	STABLE	E

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CHANNEL ANALYSIS

> > > IN-9 Berm

Name	IN-9 Berm
Discharge	10
Channel Slope	0.05
Channel Bottom Width	0.1
Left Side Slope	2
Right Side Slope	5
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Bunch Type
Vegetation Density	Very Good 80-95%
Soil Type	Silt Loam (SM)

S200

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
S200 Unvegetated	Straight	10 cfs	5.4 ft/s	0.71 ft	0.03	2.3 lbs/ft2	2.22 lbs/ft2	1.04	STABLE	E
Underlying Substrate	Straight	10 cfs	5.4 ft/s	0.71 ft	0.03	1.68 lbs/ft2	1.08 lbs/ft2	1.56	STABLE	E
S200 Reinforced Vegetation	Straight	10 cfs	4.16 ft/s	0.81 ft	0.043	10 lbs/ft2	2.54 lbs/ft2	3.93	STABLE	E
Underlying Substrate	Straight	10 cfs	4.16 ft/s	0.81 ft	0.043	2.3 lbs/ft2	1.23 lbs/ft2	1.86	STABLE	E

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CHANNEL ANALYSIS

> > > Lot 7 Swale

Name	Lot 7 Swale
Discharge	4.749
Channel Slope	0.04
Channel Bottom Width	0.1
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	Bunch Type
Vegetation Density	Very Good 80-95%
Soil Type	Silt Loam (SM)

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	4.75 cfs	2.96 ft/s	0.72 ft	0.05	4 lbs/ft2	1.78 lbs/ft2	2.24	STABLE	--
Underlying Substrate	Straight	4.75 cfs	2.96 ft/s	0.72 ft	0.05	1.43 lbs/ft2	0.87 lbs/ft2	1.65	STABLE	--

DS75

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
DS75 Unvegetated	Straight	4.75 cfs	4.18 ft/s	0.6 ft	0.031	1.6 lbs/ft2	1.49 lbs/ft2	1.07	STABLE	D
Underlying Substrate	Straight	4.75 cfs	4.18 ft/s	0.6 ft	0.031	1.17 lbs/ft2	0.73 lbs/ft2	1.61	STABLE	D