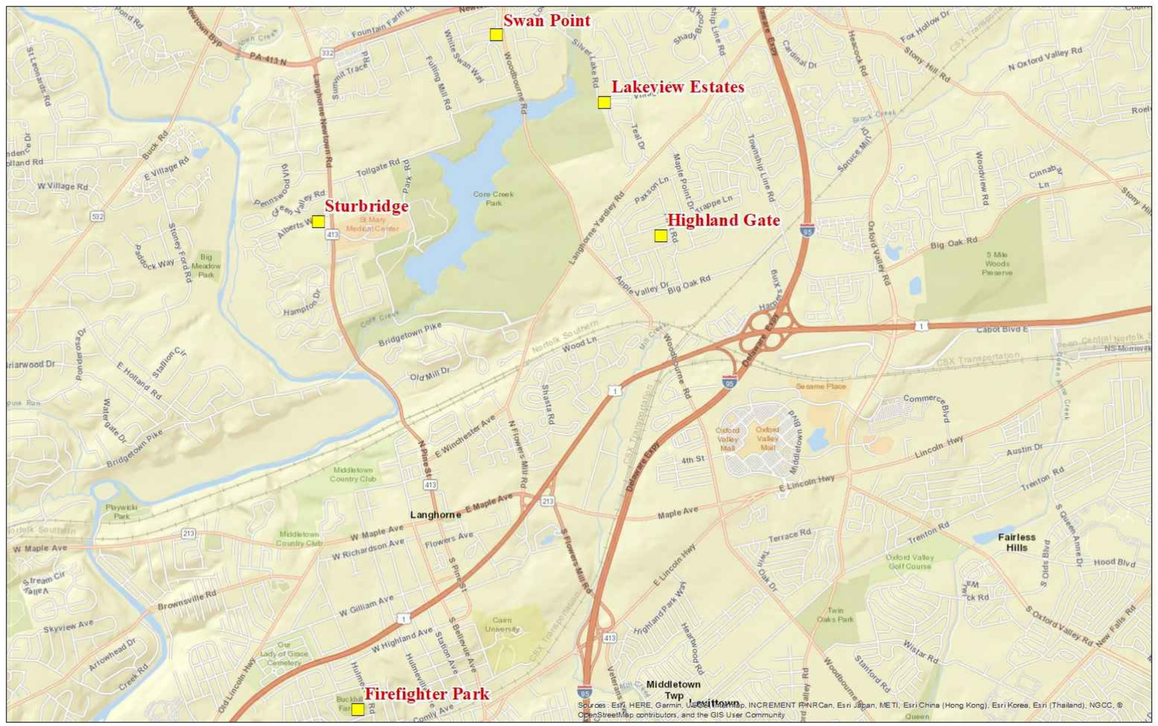
SEDIMENT REDUCTION INITIATIVE
STORMWATER BASIN RETROFIT

MIDDLETOWN TOWNSHIP
BUCKS COUNTY, PENNSYLVANIA



0 1,500 3,000 6,000 9,000 12,000 Feet

1 inch = 3,000 feet

DRAWING INDEX

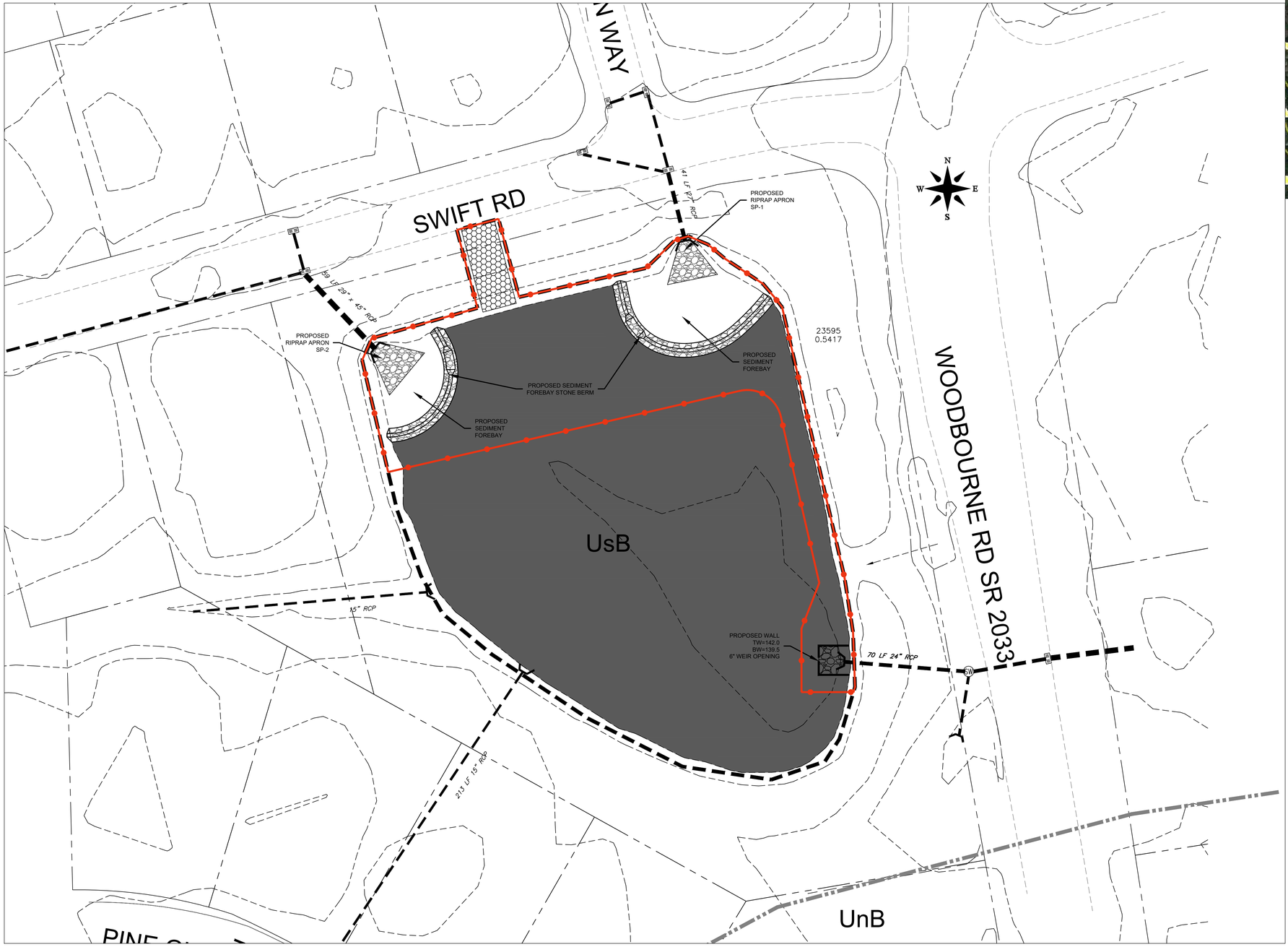
MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
PATRICK ENNIS
ENGINEER

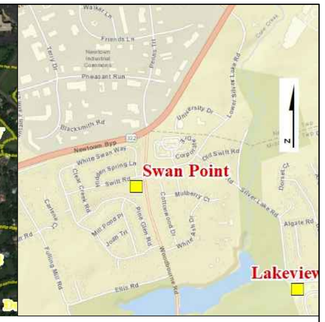
PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

KEY MAP

BASIN RETROFIT PROJECT		
DRAWN	DATE	
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
AS NOTED	1 OF 9	20-02



SOILS MAP
SCALE: 1"=1000'



LOCATION MAP
SCALE: 1"=2000'

PLAN NARRATIVE

The existing Swan Pointe drainage basin is a dry detention basin with a 2-15", 27" and 29"x45" inflow pipes and an 24" outflow pipe. There is no low flow orifice control to provide extended detention and water quality benefits during the more frequent storm events. The basin drainage area is 45 acres of a fully developed 1/4 acre residential development. The basin is approximately 260 feet wide by 325 feet long. The basin outlets to a storm sewer system along Woodbourne Road before discharging into an unnamed tributary to Core Creek that drains to the Neshaminy Creek, and is locatred in Tributary 2.

The proposed retrofit proposes two sediment forebays, a concrete weir wall and naturalized vegetation for the basin bottom and side slopes. The improvements will provide low flow detention, promote infiltration and reduce sediment laden outflow for improved water quality for the Neshaminy Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin to improve water quality benefits.The proposed basin will be planted with naturalized vegetation.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 24" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

Erosion Control:

The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Silt fence and compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet will be installed during construction to filter runoff before discharging from basin.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

The sediment forebay shall be cleaned of sediment by hand twice a year.

PROJECT LIMITS = 63,493 SF = 1.46 AC
LIMIT OF SOIL DISTURBANCE = 24,335 SF = 0.56 AC

SITE DRAINS TO TO A STORM SEWER SYSTEM ALONG WOODBOURNE ROAD BEFORE DISCHARGING INTO AN UNNAMED TRIBUTARY TO CORE CREEK THAT DRAINS TO THE NESHAMINY CREEK, WWF.

LEGEND

- EX. FENCE
- EX. STORM INLET
- EX. STORM SEWER
- EX.CONTOUR (129)
- EX. CURB
- EX. SIDEWALK
- PROP. RIPRAP
- PROP. CONTOUR (135)
- PROP. CONST. ENTRANCE
- SOIL BOUNDARY LINE
- LIMIT OF SOIL DISTURBANCE
- PROJECT LIMIT
- UnB — URBAN LAND-LANSDALE COMPLEX, 0 TO 8 PERCENT SLOPES
- UsB — URBAN LAND-DUFFILED COMPLEX, 0 TO 8 PERCENT SLOPES

PLANTING LEGEND

REMOVE INVASIVE VEGETATION.
MAINTAIN EXISTING SHRUBS AND TREES.
PLANT MEADOW MIX ON BASIN BOTTOM AND SIDES.
MEADOW MIX WILL ENHANCE INFILTRATION, PROVIDE A NATURALIZED WILDFLOWER APPEARANCE AND LOWER MAINTENANCE ACTIVITIES.
A SEDIMENT FOREBAY WILL BE CONSTRUCTED.

NOTE:

AREA BETWEEN THE PROJECT LIMIT AND LIMIT OF SOIL DISTURBANCE IS TO BE RAKED (YORK RAKE OR LANDSCAPING RAKE) AND SEEDED WITH THE SPECIFIED PLANT MIXTURE.

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

GRAPHIC SCALE
1 inch = 30 feet
(30 10 20 0 30 60 90)

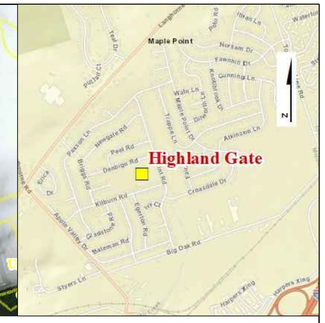
COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — PATRICK ENNIS — ENGINEER — IN FILE

PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

EROSION CONTROL, GRADING & LANDSCAPING PLAN

BASIN RETROFIT PLAN		
DRAWN	DATE	SWAN POINTE
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
1"=30'	2 OF 9	20-02

SOILS MAP
SCALE: 1"=1000'



LOCATION MAP
SCALE: 1"=2000'

PLAN NARRATIVE

The existing Highland Gate drainage basin is a dry detention basin with a 30", 42" and 48" inflow pipe and a 24" outflow culvert. There is no low flow orifice control to provide extended detention and water quality benefits during the more frequent storm events. The basin drainage area is 95 acres of a fully developed 1/4 acre residential development. The basin is approximately 400 feet wide by 600 feet long. The basin outlets to a storm sewer system along Flint Road before discharging into an unnamed tributary to Mill Creek.

The proposed retrofit plan is to add a concrete weir wall and naturalized vegetation for the basin bottom and side slopes. The improvements will provide low flow detention, promote infiltration and reduce sediment laden outflow for improved water quality for the Mill Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin to improve water quality benefits.The proposed basin will be planted with naturalized vegetation.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 18" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

Erosion Control:

The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Silt fence and compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet will be installed during construction to filter runoff before discharging from basin.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

The sediment forebay shall be cleaned of sediment by hand twice a year.

LEGEND

- EX. FENCE
- EX. STORM INLET
- EX. STORM SEWER
- EX.CONTOUR (129)
- EX. CURB
- EX. SIDEWALK
- PROP. RIPRAP
- PROP. CONTOUR (135)
- PROP. CONST. ENTRANCE
- SOIL BOUNDARY LINE
- LIMIT OF SOIL DISTURBANCE
- PROJECT LIMIT
- UmB — URBAN LAND-DOYLESTOWN COMPLEX, 0 TO 8 PERCENT SLOPES
- UsB — URBAN LAND-LAWRENCEVILLE COMPLEX, 0 TO 8 PERCENT SLOPES
- UnB — URBAN LAND-DUFFIELD COMPLEX, 0 TO 8 PERCENT SLOPES

PLANTING LEGEND

RETENTION BASIN FLOOR MIX
PLANT TO ELEVATION 154.00

NATIVE WILDFLOWER MIX
ELEVATION 154.00 TO 156.00

REMOVE INVASIVE VEGETATION.
MAINTAIN EXISTING SHRUBS AND TREES.
PLANT MEADOW MIX ON BASIN BOTTOM AND SIDES.
MEADOW MIX WILL ENHANCE INFILTRATION, PROVIDE A NATURALIZED WILDFLOWER APPEARANCE AND LOWER MAINTENANCE ACTIVITIES.
A SEDIMENT FOREBAY WILL BE CONSTRUCTED.

NOTE:

AREA BETWEEN THE PROJECT LIMIT AND LIMIT OF SOIL DISTURBANCE IS TO BE RAKED (YORK RAKE OR LANDSCAPING RAKE) AND SEEDED WITH THE SPECIFIED PLANT MIXTURE.

PROJECT LIMIT = 180,432 SF = 4.14 AC.
LIMIT OF SOIL DISTURBANCE = 8,420 SF = 0.19 AC.

SITE DRAINS TO STORM SEWER TO UNNAMED TRIBUTARY TO NESHAMINY CREEK, WWF.

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

40 20 0 40 80 120
30 10
GRAPHIC SCALE
1 inch = 40 feet

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
PATRICK ENNIS
ENGINEER

PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

EROSION CONTROL, GRADING & LANDSCAPING PLAN

BASIN RETROFIT PLAN

DRAWN	DATE	HGHLAND GATE
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
1"=40'	3 OF 9	20-02

PLAN NARRATIVE

The existing Sturbridge drainage basins are dry detention basin in a series configuration with the upper basin having a 21" and 36" inflow pipe and an 30" outflow to the lower basin. The lower basin has a 18" and 30" inflow pipe and an 21" outflow. There is no low flow orifice control to provide extended detention and water quality benefits during the more frequent storm events. The basin drainage area is 20 acres. Approximately 70% is fully developed 1/4 acre residential development, the balance being paved parking and grass areas. The upper basin is approximately 165 feet wide by 500 feet long, the lower basin is 105 feet wide by 310 feet long. The basin outlets to a storm sewer system before discharging into an unnamed tributary to Neshaminy Creek, and is located in South1.

The proposed retrofit plan is to add a sediment forebays, concrete weir walls and naturalized vegetation for the basin bottom and side slopes. The improvements will provide low flow detention, promote infiltration and reduce sediment laden outflow for improved water quality for the Neshaminy Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin to improve water quality benefits.The proposed basin will be planted with naturalized vegetation.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 18" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

PLAN NARRATIVE (CONT)

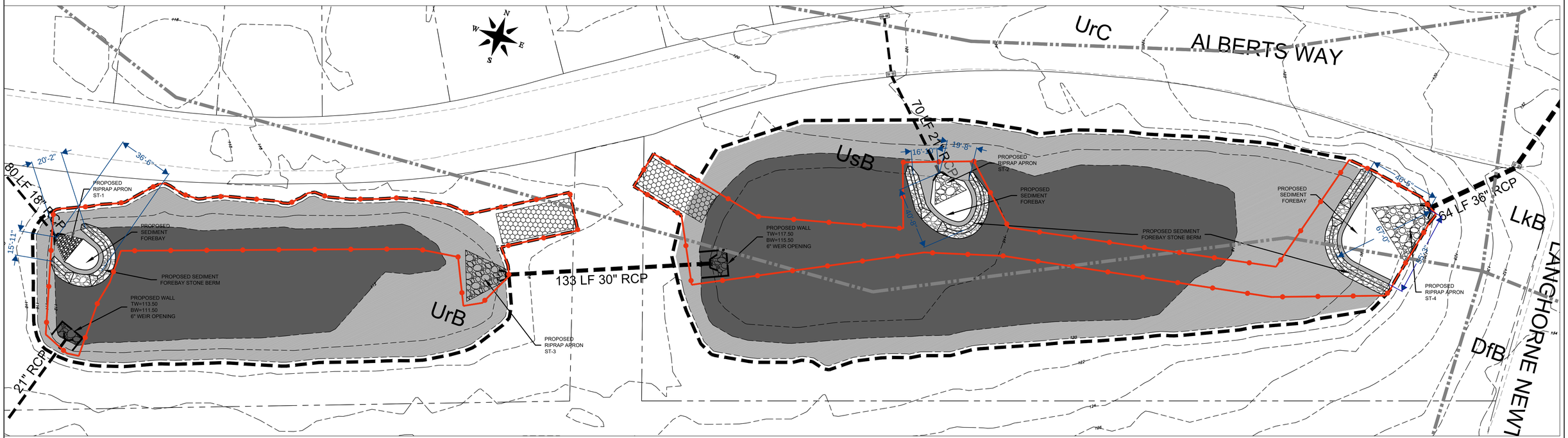
The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Silt fence and compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet will be installed during construction to filter runoff before discharging from basin.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

The sediment forebay shall be cleaned of sediment by hand twice a year.

SOILS MAP
SCALE: 1"=1000'

LOCATION MAP
SCALE: 1"=2000'



PROJECT LIMIT = 97,724 SF = 2.24 AC.
LIMIT OF SOIL DISTURBANCE = 33,121 SF = 0.76 AC.

SITE DRAINS TO STORM SEWER TO UNNAMED TRIBUTARY TO NESHAMINY CREEK, WWF.

LEGEND

- EX. FENCE
- EX. STORM INLET
- EX. STORM SEWER
- EX.CONTOUR (129)
- EX. CURB
- EX. SIDEWALK
- PROP. RIPRAP
- PROP. CONTOUR (135)
- PROP. CONST. ENTRANCE
- SOIL BOUNDARY LINE
- LIMIT OF SOIL DISTURBANCE
- PROJECT LIMIT
- UrB — URBAN LAND-LANSDALE COMPLEX, 0 TO 8 PERCENT SLOPES
- UsB — URBAN LAND-LAWRENCEVILLE COMPLEX, 0 TO 8 PERCENT SLOPES
- UrC — URBAN LAND-LAWRENCEVILLE COMPLEX, 8 TO 15 PERCENT SLOPES

PLANTING LEGEND

RETENTION BASIN FLOOR MIX
PLANT TO ELEVATION
UPPER BASIN 118.00
LOWER BASIN 112.00

NATIVE WILDFLOWER MIX
UPPER BASIN 118.00 TO 120.00
LOWER BASIN 112.00 TO 116.00

REMOVE INVASIVE VEGETATION.
MAINTAIN EXISTING SHRUBS AND TREES.
PLANT MEADOW MIX ON BASIN BOTTOM AND SIDES.
MEADOW MIX WILL ENHANCE INFILTRATION, PROVIDE A NATURALIZED WILDFLOWER APPEARANCE AND LOWER MAINTENANCE ACTIVITIES.
A SEDIMENT FOREBAY WILL BE CONSTRUCTED.

NOTE:

AREA BETWEEN THE PROJECT LIMIT AND LIMIT OF SOIL DISTURBANCE IS TO BE RAKED (YORK RAKE OR LANDSCAPING RAKE) AND SEEDED WITH THE SPECIFIED PLANT MIXTURE.

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

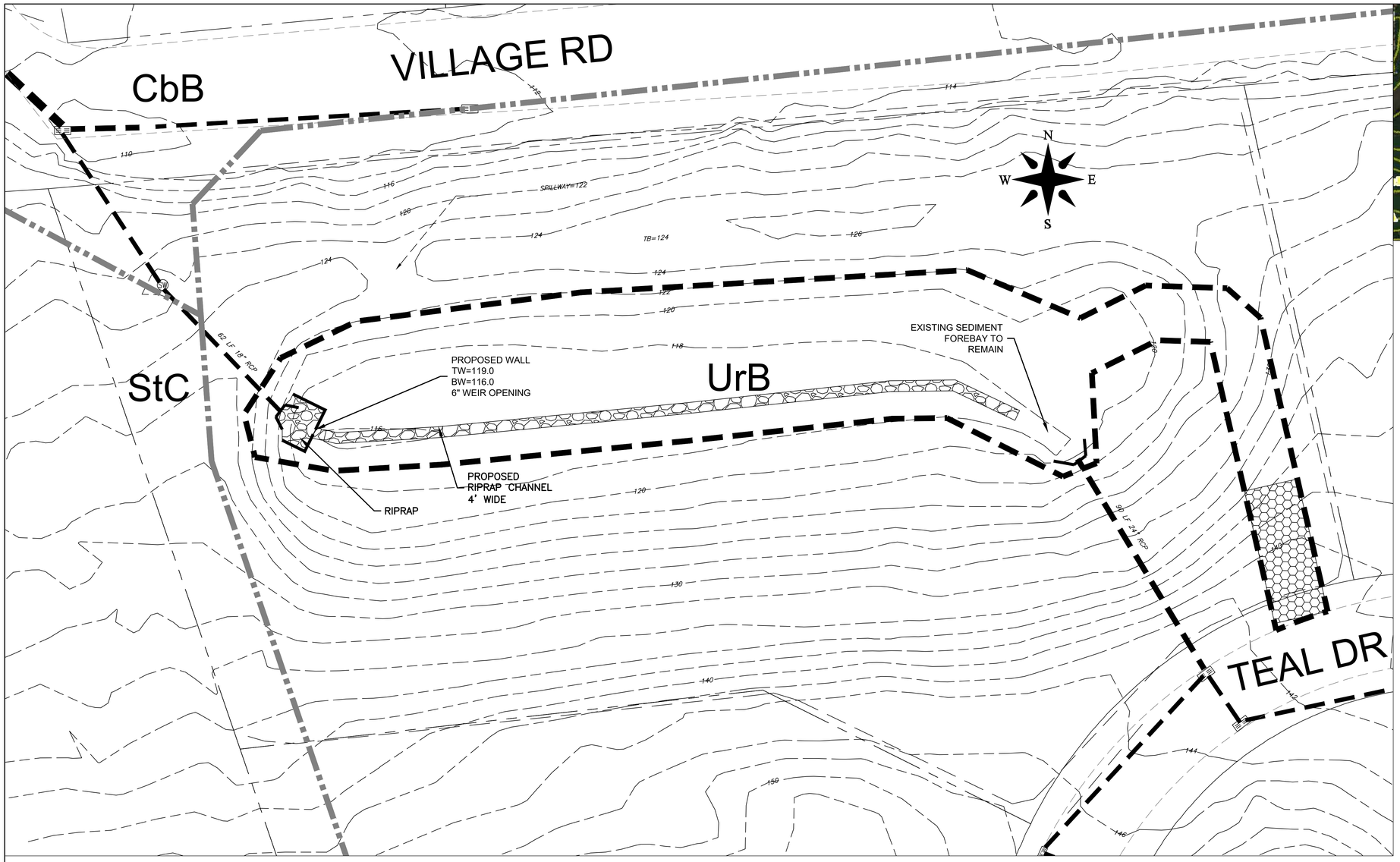
20 0 30 60 90
30 10
GRAPHIC SCALE
1 inch = 30 feet

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — PATRICK ENNIS — ENGINEER — 56595

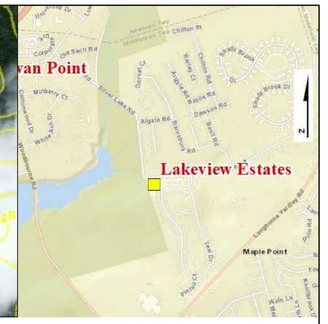
PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

EROSION CONTROL, GRADING & LANDSCAPING PLAN

BASIN RETROFIT PLAN		
DRAWN	DATE	STURBRIDGE
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
1"=30'	4 OF 9	20-02



SOILS MAP
SCALE: 1"=1000'



LOCATION MAP
SCALE: 1"=2000'

PLAN NARRATIVE

The existing Lakeview Estates drainage basin is a dry detention basin with a 24" inflow pipe and an 18" outflow. There is no low flow orifice control to provide extended detention and water quality benefits during the more frequent storm events. The basin drainage area is 30 acres of a fully developed $\frac{1}{2}$ to $\frac{3}{4}$ acre residential development. The basin is approximately 110 feet wide by 380 feet long. The basin outlets to a storm sewer system along Village Road before discharging into lake Luxembourg. The unnamed tributary has severely eroded channels and contributes sediment to the Neshaminy Creek.

The proposed improvements include a riprap channel and a concrete weir wall. The improvements will provide low flow detention, promote infiltration, stabilize the basin bottom channel, and reduce sediment laden outflow for improved water quality for the Neshaminy Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin to improve water quality benefits.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 18" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

Erosion Control:

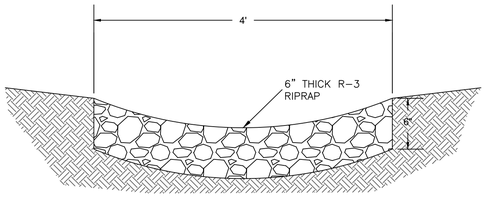
The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Silt fence and compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet will be installed during construction to filter runoff before discharging from basin.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

The sediment forebay shall be cleaned of sediment by hand twice a year.

LIMIT OF SOIL DISTURBANCE/PROJECT LIMIT = 20,352 SF = 0.47 AC.

SITE DRAINS TO A STORM SEWER SYSTEM ALONG VILLAGE ROAD BEFORE DISCHARGING INTO LAKE LUXEMBOURG. THE UNNAMED TRIBUTARY HAS SEVERELY ERODED CHANNELS AND CONTRIBUTES SEDIMENT TO THE NESHAMINY CREEK, WWF.



RIPRAP CHANNEL
N.T.S.

LEGEND

- EX. FENCE
- EX. STORM INLET
- EX. STORM SEWER
- 129 EX.CONTOUR
- EX. CURB
- EX. SIDEWALK
- PROP. RIPRAP
- 135 PROP. CONTOUR
- PROP. CONST. ENTRANCE
- SOIL BOUNDARY LINE
- PROJECT LIMIT
- UrB URBAN LAND-LANSDALE COMPLEX, 0 TO 8 PERCENT SLOPES
- CbB CHALFONT SILT LOAM, 3 TO 8 PERCENT SLOPES
- StC STEINSBURG GRAVELLY LOAM, 8 TO 15 PERCENT SLOPES

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

20 10 0 20 40 60
15 5
GRAPHIC SCALE
1 inch = 20 feet

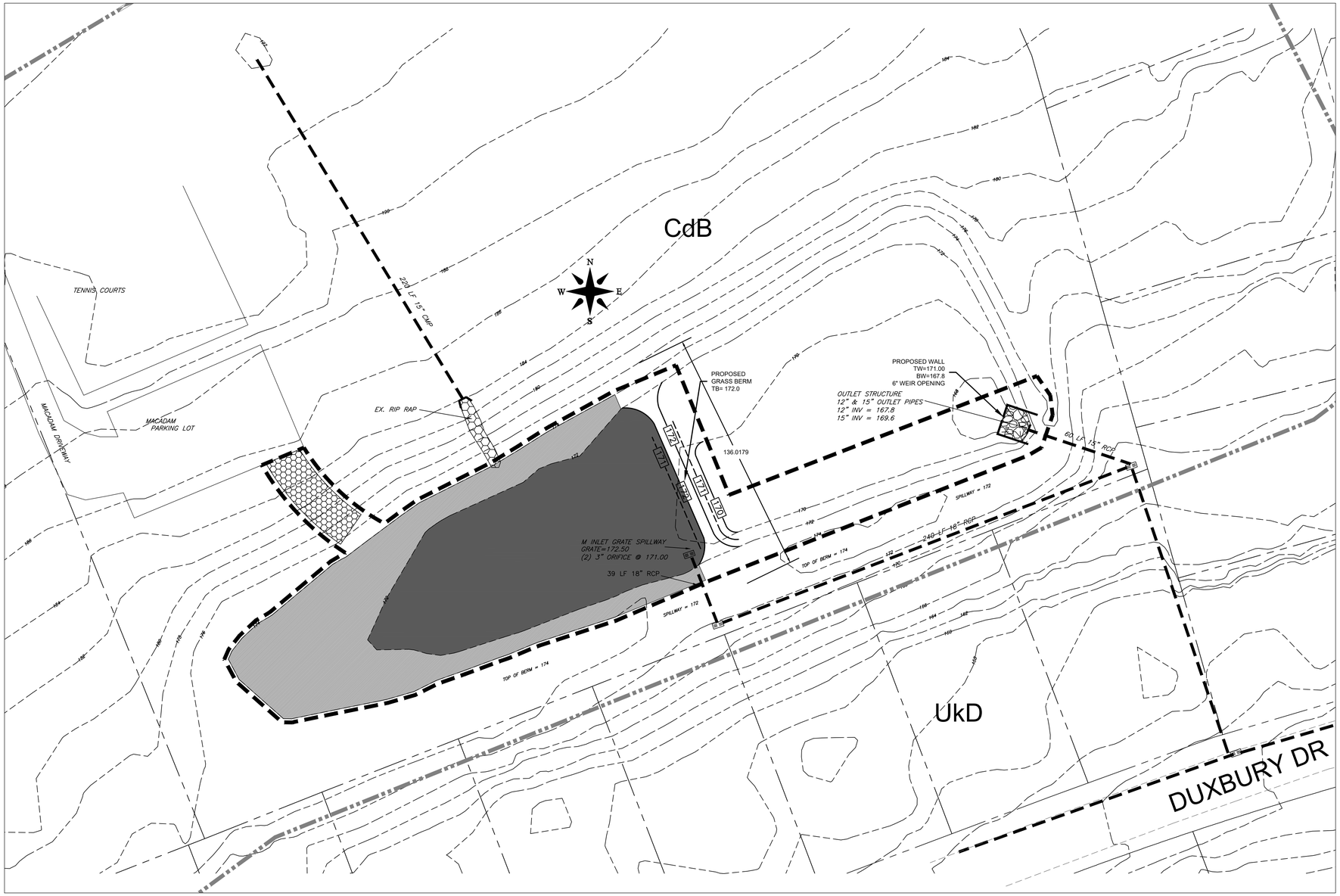
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
PATRICK ENNIS
ENGINEER

PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

BID ALTERNATE #1

EROSION CONTROL, GRADING & LANDSCAPING PLAN

BASIN RETROFIT PLAN		
DRAWN	DATE	VILLAGE ROAD
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
1"=20'	5 OF 9	20-02



SOILS MAP
SCALE: 1"=1000'

LOCATION MAP
SCALE: 1"=2000'

PLAN NARRATIVE

The existing Firefighter Park drainage basin is a dry detention basin with a 15" inflow pipe and an 15" outflow having a 12" and 15" orifice to control flows. There is a second overflow inlet with a 3" orifice that will be utilized as a water quality inlet with the addition of a 2' high berm. The basin drainage area is 14 acres comprised of 70% grass park and 20% of a fully developed 1/4 acre residential development and 10% parking lot. The basin is approximately 140 feet wide by 520 feet long. The basin outlets to an unnamed tributary to Neshaminy Creek and is located in South 1.

The proposed retrofit plan is to add a sediment forebay by adding a grass berm, concrete weir wall and naturalized vegetation for the basin bottom and side slopes. The improvements will provide low flow detention, promote infiltration and reduce sediment laden outflow for improved water quality for the Neshaminy Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin to improve water quality benefits.The proposed basin will be planted with naturalized vegetation.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 18" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

Erosion Control:

The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Silt fence and compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet will be installed during construction to filter runoff before discharging from basin.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

The sediment forebay shall be cleaned of sediment by hand twice a year.

LIMIT OF SOIL DISTURBANCE/PROJECT LIMIT = 36,563 SF = 0.84 AC.

SITE DRAINS TO TO A STORM SEWER SYSTEM ALONG WOODBOURNE ROAD BEFORE DISCHARGING INTO AN UNNAMED TRIBUTARY TO CORE CREEK THAT DRAINS TO THE NESHAMINY CREEK, WWF.

LEGEND

- EX. FENCE
- EX. STORM INLET
- EX. STORM SEWER
- 129 EX.CONTOUR
- EX. CURB
- EX. SIDEWALK
- PROP. RIPRAP
- 135 PROP. CONTOUR
- PROP. CONST. ENTRANCE
- SOIL BOUNDARY LINE
- PROJECT LIMIT
- Cdb CHESTER SILT LOAM, 3 TO 8 PERCENT SLOPES
- UkD URBAN LAND-CHESTER COMPLEX, 8 TO 25 PERCENT SLOPES

PLANTING LEGEND

RETENTION BASIN FLOOR MIX
PLANT TO ELEVATION 172.00

NATIVE WILDFLOWER MIX
ELEVATION 172.00 TO 174.00

REMOVE INVASIVE VEGETATION.
MAINTAIN EXISTING SHRUBS AND TREES.
PLANT MEADOW MIX ON BASIN BOTTOM AND SIDES.
MEADOW MIX WILL ENHANCE INFILTRATION, PROVIDE A NATURALIZED WILDFLOWER APPEARANCE AND LOWER MAINTENANCE ACTIVITIES.
A SEDIMENT FOREBAY WILL BE CONSTRUCTED.

NOTE:

THE AREA OF NEW SEEDING IS TO BE RAKED (YORK RAKE OR LANDSCAPING RAKE) AND SEEDED WITH THE SPECIFIED PLANT MIXTURE.

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

30 10 20 0 30 60 90
GRAPHIC SCALE
1 inch = 30 feet

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL PATRICK ENNIS ENGINEER

PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

BID ALTERNATE #2

EROSION CONTROL, GRADING & LANDSCAPING PLAN

BASIN RETROFIT PLAN		
DRAWN	DATE	FIREFIGHTER PARK
PJE	05-18-20	MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE	SHEET	PROJECT NO.
1"=30'	6 OF 9	20-02

EROSION/SEDIMENT CONTROL PLAN STANDARD NOTES

- Stockpile heights must not exceed 35 feet; stockpile slopes must not exceed 2:1.
- The operator/responsible person (O/RP) on site shall assure that the approved erosion and sediment control plan is properly and completely implemented.
- Immediately upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the O/RP shall implement appropriate Best Management Practices (BMPs) to eliminate the potential for accelerated erosion and/or sediment pollution.
- The O/RP shall assure that an erosion and sediment control plan has been prepared and approved by the Bucks County Conservation District and is being implemented and maintained for all soils and/or rock spoil and borrow areas regardless of their locations.
- All pumping of sediment-laden water shall be through a sediment control BMP such as a pumped water filter bag discharging over an undisturbed area.
- A copy of the approved erosion and sediment control plan must be available on the project site at all times.
- Erosion and sediment BMPs must be constructed, stabilized and functional before site disturbance begins within the tributary areas of those BMPs.
- After final site stabilization has been achieved, temporary erosion and sediment BMP controls must be removed. Areas disturbed during the removal of the BMPs must be stabilized immediately.
- At least seven (7) days before starting any earth disturbance activity, the O/RP shall invite all contractors involved in that activity, the landowner, all appropriate municipal officials, the erosion and sediment control plan designer and the Bucks County Conservation District to a pre-construction meeting. Also, at least three (3) days before starting any earth disturbance activity, all contractors involved in that activity shall notify the Pennsylvania One-Call System Inc. at 1-800-242- 1776 to determine any underground utilities locations.
- Immediately after earth disturbance activity ceases, the O/RP shall stabilize any areas disturbed by the activity. During non-germinating periods, mulch must be applied at specified rates. Disturbed areas that are not finished grade and which will be re-disturbed within one year must be stabilized in accordance with temporary vegetative stabilization specifications.
- Disturbed areas that are at a finished grade or which will not be re-disturbed within one year must be stabilized in accordance with permanent vegetative stabilization specifications.
- An area shall be considered to have achieved final stabilization when it has a minimum uniform 70% vegetative or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements.
- Upon the installation of temporary sediment basin riser(s), a qualified site representative shall conduct an immediate inspection of the riser(s), whereupon the Bucks County Conservation District shall be notified in writing that the riser is sealed (watertight).
- At stream crossings, a 50-foot buffer shall be maintained. On buffers, clearings, sod disturbances and excavations, equipment traffic should be minimized. Activity such as stacking logs, burning cleared brush, discharged rainwater from trenches, welding pipe sections, refueling and maintaining equipment should be avoided within buffer zones.
- Until a site is stabilized, all erosion and sediment BMPs must be maintained properly. Maintenance must include inspections of all erosion control BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including cleanout, repair, replacement, re-grading, re- seeding, re-mulching and re-netting must be performed immediately. If erosion and sediment control BMPs fail to perform as expected, replacement BMPs, or modifications of those installed, will be required.
- Sediment removed from BMPs shall be disposed of on-site in landscaped areas outside of steep slopes, wetlands, floodplains or drainage swales and immediately stabilized or placed in soil stockpiles and stabilized.
- All building material and wastes must be removed from the site and recycled in accordance with DEP's Solid Waste Regulations (25 PA Code 260.1 et seq., 271.1 et seq., and 287.1 et seq.) and/or any additional local, state or federal regulations. No building materials (used or unused) or waste materials shall be burned, buried, dumped, or discharged at the site.

MAINTENANCE

Compost filter sock shall have accumulated sediment removed when it reaches 1/2 the above ground height of the sock and disposed in the manner described elsewhere in the plan.

Silt fence shall have accumulated sediment removed when it reaches ½ the fence height and disposed in the manner described elsewhere in the plan.

Rock construction entrance will be reconstructed when clogged with sediment. Materials must be washed completely free of all foreign materials or new rock used to rebuild the filter.

Rock filter berm and filter outlet to be cleaned or reconstructed once sediment level reaches 1/3 the berm height.

PRE-CONSTRUCTION CONFERENCE

The permittee or co-permittee shall contact the reviewing entity at least 7 days before construction activities begin to determine if a pre-construction conference is required. The permittee or co-permittee and others undertaking the earth disturbance activity must attend a pre-construction conference if requested by the reviewing entity.

RECYCLING AND DISPOSAL METHODS

All building materials and wastes must be removed from the site and recycled or disposed of in accordance with the Department's solid waste management regulations at 25 PA. Code 260.1 et seq. 271.1 and 287.1 et seq. No building materials or wastes or unused building materials shall be burned, buried, dumped or discharged at the site.

PREPAREDNESS, PREVENTION AND CONTINGENCY PLANS

If the potential exists for causing accidental pollution of air, land or water or for causing endangerment of public health and safety through accidental release of toxic, hazardous or other polluting materials, the permittee or co-permittee must develop a Preparedness, Prevention and Contingency (PPC) Plan. The PPC plan shall be developed in accordance with Department regulations. The PPC plan shall identify areas which may include, but are not limited to, waste management areas. Raw material storage areas, temporary and permanent spoils storage areas, maintenance areas, and any other areas that may have the potential to cause non-compliance with the disposal of any toxic or hazardous substances such as oil, gasoline, the storage, handling of pesticides, herbicides, solvents, etc. must have BMPs developed and implemented for each identified area. The PPC plan shall be maintained on site at all times and shall be made available for review at the Department's or the local conservation district's request.

UTILITY LINE TRENCH EXCAVATION NOTES

Limit advance clearing and grubbing operations to a distance equal to 2 times the length of the pipe installation that can be completed in one day.

Work crews and equipment for trenching, placement of pipe plug construction and backfilling will be self-contained and separate from clearing and grubbing and site restoration and stabilization operations.

All soil excavated from a trench will be placed on the uphill side of the trench.

Limit daily trench excavation to the length of pipe placement, plug installation and backfilling that can be completed in the same day.

Water that accumulates in the open trench will be completely removed by pumping before pipe placement and/or backfilling begins. Water removed from the trench will be pumped through a filtration device.

On the day following pipe placement and trench backfilling, the disturbed area will be graded to final contours and immediately stabilized.

ENVIRONMENTAL DUE DILLIGENCE

The applicant must perform environmental due diligence to determine if the fill materials associated with the project qualify as clean fill. Environmental due diligence is defined as investigative techniques including, but not limited to, visual property inspections, electronic data base searches, review of property ownership, review of property use history, Sanborn maps, environmental questionnaires, transaction screens, analytical testing, environmental assessments or audits. Analytical testing is not a required part of due diligence unless visual inspection and/or review of the past land use of the property indicates that the fill may have been subject to a spill or release of a regulated substance. If the fill may have been affected by a spill or the release of a regulated substance, it must be tested to determine if it qualifies as clean fill. Testing should be performed in accordance with Appendix A of the Department's policy "Management of Fill."

DEFINITION OF CLEAN FILL

Clean fill is defined as uncontaminated, non-water soluble, non-decomposable, inert, solid material. The term includes soil, rock, stone, dredged material, used asphalt, and brick, block or concrete from construction and demolition activities that is separate from other waste and is recognizable as such. The term does not include materials placed in or on the Waters of the Commonwealth unless otherwise authorized. (The term "used asphalt" does not include milled asphalt or asphalt that has been processed for re-use). Clean fill affected by a spill or release of a regulated substance still qualifies a clean fill provided the testing reveals that the fill material contains concentrations of regulated substances that are below the residential limits in Tables FP-1A and FP-1B found in the Department's policy "Management of Fill."

Any person placing clean fill that has been affected by a spill or release of a regulated substance must use Form FP-001 to certify the origin of the fill materials and the results of the analytical testing to qualify the material as clean fill. Form FP-001 must be retained by the owner of the property receiving the fill. A copy of Form FP-001 can be found at the end of these instructions,

CONCRETE WASHWATER FROM CONCRETE TRUCK CHUTES. HAND MIXERS OR OTHER EQUIPMENT SHALL BE PUMPED OR DRAINED INTO WASHOUT CONTAINERS TO BE TAKEN OFF SITE FOR RECYCLING AND TREATMENT.

EWOC T3 ENTERPRISES, LLC PREFABRICATED CONCRETE WASHOUT CONTAINER
(OR APPROVED EQUAL)

CONSTRUCTION / BMP SEQUENCE

1. CONTACT BCCD AT LEAST 7 DAYS PRIOR TO EARTHMOVING ACTIVITIES.
2. INSTALL CONSTRUCTION ENTRANCE AND COMPOST FILTER SOCK AS SHOWN ON THE PLAN. THE LIMIT OF DISTURBANCE SHALL BE MARKED IN THE FIELD WITH WOODEN STAKES LABELED "LOD".
3. INSTALL RIP RAP AT INLET AND OUTLET PIPES.
4. INSTALL ROCK FILTER AT OUTLET PIPE.
5. EXCAVATE SEDIMENT FOREBAY AND RE-GRADE BASIN BOTTOM.
6. INSTALL GABION WALL.
7. CONSTRUCT CONCRETE WEIR WALL.
8. VEGETATE BASIN.
9. REMOVE STONE FILTER WHEN VEGETATION ACHIEVES 70% MINIMUM UNIFORM VEGETATIVE STABILIZATION.

EROSION CONTROL NARRATIVE

The existing Ivystream drainage basin is a dry detention basin with a 36" inflow pipe and an 18" outflow separated by only 25 feet. There is no low flow orifice control to provide extended detention and water quality benefits during the more frequent storm events. The basin drainage area is 12.3 acres of a fully developed 1/4 acre residential development. The basin is approximately 55 feet wide by 155 feet long. The basin outlets to a storm sewer system along Hollywood Avenue before discharging into an unnamed tributary to Neshaminy Creek. The unnamed tributary has severely eroded channels and contributes sediment to the Neshaminy Creek.

The proposed retrofit plan is to add increased volume by increasing the area at the bottom of the basin. In addition, the retrofit proposes a sediment forebay, a gabion wall to increase flow path, a concrete weir wall with (7) 6" low flow orifices and naturalized vegetation for the basin bottom and side slopes. The improvements will provide low flow detention, promote infiltration, reduce sediment and improve water quality in the Neshaminy Creek.

The E&S control plan maximizes protection of existing drainage features and vegetation by enhancing the existing drainage basin wto improve water quality benefits.The proposed basin will be planted with naturalized vegetation.

The E&S control plan minimizes soil compaction because the plan confines the limits of disturbance to a construction entrance and the work within the existing basin.

The E&S Plan utilizes a stone filter before the existing 18" outflow pipe to prevent sediment laden runoff from leaving the basin and entering the storm sewer system.

The past 30 years of land use has been a residential drainage basin.

Erosion Control:

The plan and construction sequence utilize a number of erosion and sedimentation control devices during construction as follows:

1. Rock construction entrance is used to clean construction vehicle tires prior to entering the roadway.
2. Compost filter sock is used on perimeter downslope areas to prevent sediment laden runoff from leaving the site.
3. A rock filter outlet is used to filter runoff from basin before entering 18" discharge pipe.
4. Temporary and vegetative stabilization specifications and details shall be implemented for all non-stabilized disturbed areas to minimize erosion and prevent sediment laden runoff from leaving the site.
5. The sequence of construction provides a step by step implementation of temporary erosion control measures during the construction period, followed by stabilization and installment of permanent BMPs.

TEMPORARY & PERMANENT STABILIZATION

IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS WITH MULCH OR PROTECTIVE BLANKETING AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN ONE YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN ONE YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.

HAY OR STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.

MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER.

STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

SEEDING SPECIFICATIONS AND SCHEDULE

NOTE: THE FOLLOWING SEEDING SPECIFICATIONS ARE GENERAL GUIDELINES ONLY AND ARE INTENDED FOR THE STABILIZATION OF DISTURBED AREAS. ALL CONTRACTORS AND LOT OWNERS SHOULD CONDUCT A SOIL TEST PRIOR TO STABILIZATION TO DETERMINE THE EXACT NUTRIENT REQUIREMENTS OF THE SOIL PRIOR TO STABILIZATION EFFORTS. APPLY TEMPORARY SEEDING AND MULCHING TO ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY HAS CEASED TEMPORARILY. STABILIZE AS FOLLOWS:

1. APPLY 1 TON OF AGRICULTURAL GRADE LIMESTONE PER ACRE.
2. APPLY FERTILIZER 10-10-10 AT A RATE OF 500 LBS. PER ACRE.
3. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE OR WHICH WILL BE REDISTURBED WITHIN ONE YEAR SHALL BE SEEDED WITH ANNUAL RYE GRASS AT A RATE OF 64 LBS. PER ACRE AFTER WORKING LIME AND FERTILIZER INTO THE SOIL (ODES NOT APPLY TO NON-GERMINATING SEASONS). DISTURBED AREAS THAT ARE AT FINISHED GRADE OR WILL NOT BE REDISTURBED WITHIN ONE YEAR SHALL BE PERMANENTLY SEEDED IN ACCORDANCE WITH THE PERMANENT SEEDING SPECIFICATIONS. ALL SEED SHALL BE LABELED, DATED AND OF QUALITY CONSISTENT WITH ITEM 6 OF THE PERMANENT SEEDING SPECIFICATIONS.
4. APPLY HAY OR STRAW MULCH IN ACCORDANCE WITH MULCHING SPECIFICATIONS. DURING NON-GERMINATING PERIODS. APPLY MULCH ONLY. OCTOBER 15TH TILL APRIL 15TH.

PERMANENT SEEDING (FOR DISTURBED AREAS OUTSIDE OF BASIN)

WHEN THE FINISHED GRADE SURFACE IS TO BE STABILIZED BY SEEDING. THE FOLLOWING PROCEDURE BE FOLLOWED:

1. A MINIMUM OF 4 INCHES OF TOPSOIL SHALL BE SPREAD OVER AREAS TO BE SEEDED. TOPSOIL SHALL BE FREE OF STONES. STICKS. WASTE MATERIAL AND SIMILAR DEBRIS. FROZEN GROUND SHALL NOT BE SPREAD AS TOPSOIL AND TOPSOIL SHALL NOT BE SPREAD OVER FROZEN GROUND. TOPSOIL SHALL BE SPREAD ONLY WHEN PREPARED TO FOLLOW UP WITH FERTILIZATION AND SEEDING.

2. AFTER SPREADING AND RAKING THE TOPSOIL, THE FOLLOWING SHALL BE SPREAD AND WORKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES: AGRICULTURAL GRADE LIMESTONE AT A RATE OF 6 TONS PER ACRE OR RATE DETERMINED FROM SOIL TESTING FERTILIZER, 10-10-20 AT A RATE OF 1000 LBS. PER ACRE.

3. SEEDING SHALL BE DONE DURING THE PERIODS OF APRIL 15TH TO OCTOBER 1ST UNLESS OTHERWISE DIRECTED.

4. GRASS SEED SHALL NOT BE PLANTED AFTER A HEAVY RAIN OR WATERING.

5. ALL SEED SHALL BE LABELED IN ACCORDANCE WITH THE US DEPT. OF AGRICULTURE RULES AND REGULATIONS UNDER THE FEDERAL SEED ACT IN EFFECT AT TIME OF PURCHASE. INERT MATTER SHALL NOT EXCEED 15% AND BLUE TAG CERTIFIED SEED SHALL BE PROVIDED WHEREVER POSSIBLE.

6. SMOOTH AND FIRM SEED BED WITH A CULTIPACKER OR SIMILAR EQUIPMENT PRIOR TO SEEDING. APPLY SEED UNIFORMLY BY BROADCASTING. DRILLING OR HYDROSEEDING. COVER SEEDS WITH 1/4" OF SOIL WITH SUITABLE EQUIPMENT OR BY HAND RAKING.

7. APPLY MULCH PER SPECIFICATIONS.

SEED SPECIFICATIONS

MOWED AREAS WITH SLOPES LESS THAN 2 HORIZONTAL TO 1 VERTICAL
LAWN SEED (RATE=100 LBS/ACRE)
KENTUCKY BLUE GRASS, 2 OR MORE VARIETIES NONE GREATER THAN 25% OF TOTAL
50% BY WEIGHT, 90% PURITY, 80% GERMINATION, 0.2% MAX WEED SEED
PENNFINE PERENNIAL RYE GRASS
20% BY WEIGHT, 90% PURITY, 90% GERMINATION, 0.15% MAX WEED SEED
PENNLAWN RED FESCUE
30% BY WEIGHT, 98% PURITY, 85% GERMINATION, 0.25% MAX WEED SEED

SPECIAL AREAS (IE: SWALES, POND EMBANKMENTS, LEVEES, DIVERSION CHANNELS AND OCCASIONAL FLOW AREAS) RATE=110 LBS/ACRE
RED TOP
80% BY WEIGHT, 92% PURITY, 80% GERMINATION, 0.2% MAX WEED SEED
ORCHARD GRASS
20% BY WEIGHT. 95% PURITY, 90% GERMINATION, 0.15% MAX WEED SEED
SWITCH GRASS 60PLS
DEER TONGUE
95% PURITY, 75% GERMINATION

NOTE: DURING NON-GERMINATING PERIODS (OCTOBER 15 THRU APRIL 15) APPLY HAY OR STRAW MULC ACCORDANCE WITH MULCHING SPECIFICATIONS.

PENNSYLVANIA ONE CALL SYSTEM, INC.

925 Irwin Run Road
West Mifflin, Pennsylvania
15122 – 1078

PENNSYLVANIA ONE CALL SYSTEM, INC. 1-800-242-1776 STOP-CALL BEFORE YOU DIG!

BEFORE YOU DIG ANYWHERE IN PENNSYLVANIA! CALL 1–800–242–1776

NON–MEMBERS MUST BE CONTACTED DIRECTLY

PA LAW REQUIRES THREE WORKING DAYS NOTICE TO UTILITIES BEFORE YOU EXCAVATE, DRILL, BLAST OR DEMOLISH

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

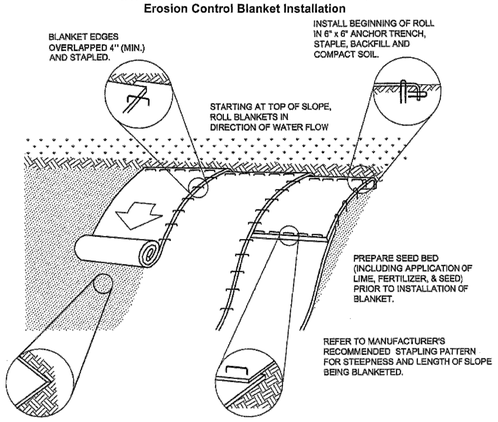
COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL PATRICK ENNIS ENGINEER

PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595

CONSTRUCTION DETAILS

BASIN RETROFIT PLAN		
DRAWN PJE	DATE 05-18-20	OXFORD DRIVE MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE NONE	SHEET 7 OF 9	PROJECT NO. 20-02

STANDARD CONSTRUCTION DETAIL # 11-1
Erosion Control Blanket Installation



Source Unknown

Seed and soil amendments shall be applied according to the rates in the plan drawings prior to installing the blanket.

Provide anchor trench at toe of slope in similar fashion as at top of slope.

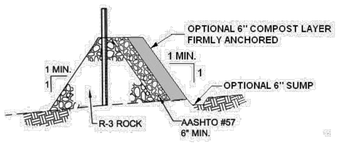
Slope surface shall be free of rocks, clods, sticks, and grass.

Blanket shall have good continuous contact with underlying soil throughout entire length. Lay blanket loosely and stake or staple to maintain direct contact with soil. Do not stretch blanket.

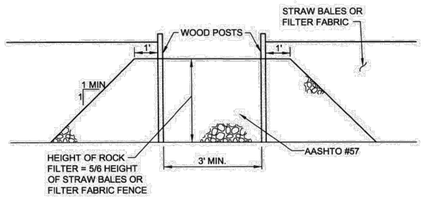
The blanket shall be stapled in accordance with the manufacturer's recommendations.

Blanketed areas shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 70% coverage throughout the blanketed area. Damaged or displaced blankets shall be restored or replaced within 4 calendar days.

STANDARD CONSTRUCTION DETAIL # 4-6
Rock Filter Outlet



OUTLET CROSS-SECTION



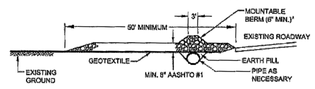
UP-SLOPE FACE

PA DEP

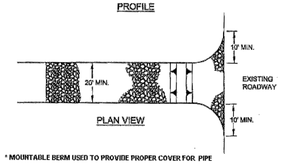
A rock filter outlet shall be installed where failure of a silt fence or straw bale barrier has occurred due to concentrated flow. Anchored compost layer shall be used on upslope face in HQ and EV watersheds.

Sediment shall be removed when accumulations reach 1/3 the height of the outlet.

STANDARD CONSTRUCTION DETAIL # 3-1
Rock Construction Entrance



PROFILE



PLAN VIEW

* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

Modified from Maryland DOE

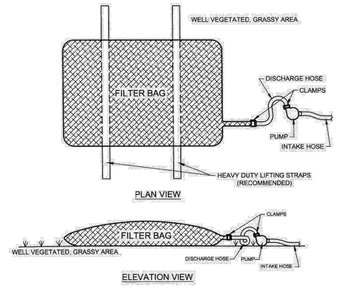
Remove topsoil prior to installation of rock construction entrance. Extend rock over full width of entrance.

Runoff shall be diverted from roadway to a suitable sediment removal BMP prior to entering rock construction entrance.

Mountable berm shall be installed wherever optional culvert pipe is used and proper pipe cover as specified by manufacturer is not otherwise provided. Pipe shall be sized appropriately for size of ditch being crossed.

MAINTENANCE: Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. All sediment deposited on paved roadways shall be removed and returned to the construction site immediately. If excessive amounts of sediment are being deposited on roadway, extend length of rock construction entrance by 50 foot increments until condition is alleviated or install wash rack. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

STANDARD CONSTRUCTION DETAIL # 3-16
Pumped Water Filter Bag



PA DEP

Low volume filter bags shall be made from non-woven geotextile material sewn with high strength, double stitched "J" type seams. They shall be capable of trapping particles larger than 150 microns. High volume filter bags shall be made from woven geotextiles that meet the following standards:

Property	Test Method	Minimum Standard
Avg. Wide Width Strength	ASTM D-4884	60 lb/in
Grab Tensile	ASTM D-4632	205 lb
Puncture	ASTM D-4833	110 lb
Mullen Burst	ASTM D-3786	350 psi
UV Resistance	ASTM D-4355	70%
AOS % Retained	ASTM D-4751	80 Sieve

A suitable means of accessing the bag with machinery required for disposal purposes shall be provided. Filter bags shall be replaced when they become ½ full of sediment. Spare bags shall be kept available for replacement of those that have failed or are filled. Bags shall be placed on straps to facilitate removal unless bags come with lifting straps already attached.

Bags shall be located in well-vegetated (grassy) area, and discharge onto stable, erosion resistant areas. Where this is not possible, a geotextile underlayment and flow path shall be provided. Bags may be placed on filter stone to increase discharge capacity. Bags shall not be placed on slopes greater than 5%. For slopes exceeding 5%, clean rock or other non-erodible and non-polluting material may be placed under the bag to reduce slope steepness.

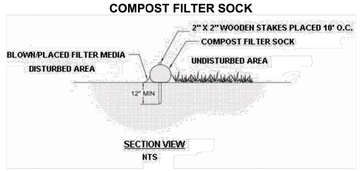
No downslope sediment barrier is required for most installations. Compost berm or compost filter sock shall be installed below bags located in HQ or EV watersheds, within 50 feet of any receiving surface water or where grassy area is not available.

The pump discharge hose shall be inserted into the bags in the manner specified by the manufacturer and securely clamped. A piece of PVC pipe is recommended for this purpose.

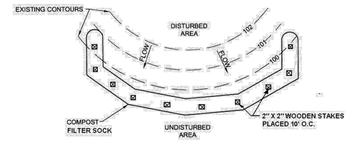
The pumping rate shall be no greater than 750 gpm or ½ the maximum specified by the manufacturer, whichever is less. Pump intakes shall be floating and screened.

Filter bags shall be inspected daily. If any problem is detected, pumping shall cease immediately and not resume until the problem is corrected.

STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK



SECTION VIEW
NTS



PLAN VIEW

Filtrexx **NTS**

Sock fabric shall meet standards of Table 4.1. Compost shall meet the standards of Table 4.2.

Compost filter sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up slope at 45 degrees to the main sock alignment (Figure 4.1). Maximum slope length above any sock shall not exceed that shown on Figure 4.2. Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.

Traffic shall not be permitted to cross filter socks.

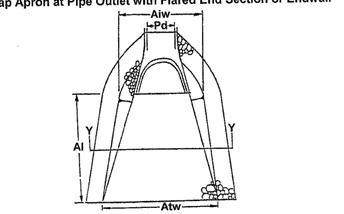
Accumulated sediment shall be removed when it reaches half the aboveground height of the sock and disposed in the manner described elsewhere in the plan.

Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

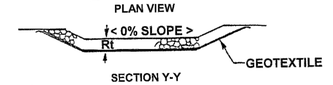
Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's recommendations.

Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the mesh shall be cut open and the mulch spread as a soil supplement.

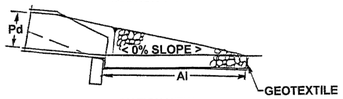
STANDARD CONSTRUCTION DETAIL # 9-1
Riprap Apron at Pipe Outlet with Flared End Section or Endwall



PLAN VIEW



SECTION Y-Y



ELEVATION VIEW

PA DEP

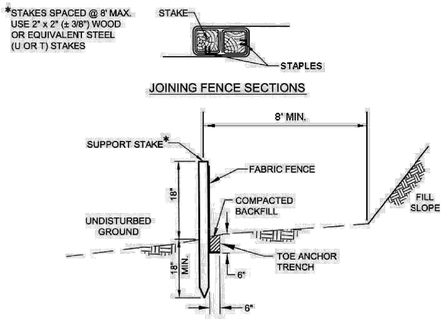
NOTE: This table is intentionally blank and should be filled in by the plan preparer.

	OUTLET NO.	PIPE DIA Pd(IN) Do	PIPE DIA Pd(IN) Wo	RIPRAP SIZE (R-_)	RIPRAP THICK Rt (IN)	APRON TERMINAL WIDTH Atw (FT)	APRON INITIAL WIDTH AiW (FT)	APRON LENGTH Al (FT)
SWAN POINT	SP-1	27 "		4	18	22.5	6.75	15.8
	SP-2	29 "	45 "	4	18	24.2	7.25	16.9
STURBRIDGE	ST-1	18 "		4	18	15.0	4.5	10.5
	ST-2	21 "		4	18	17.5	5.25	12.3
	ST-3	30 "		4	18	25.0	7.5	17.5
	ST-4	36 "		5	22	30.0	9	21.0

All aprons shall be constructed to the dimensions shown. Terminal widths shall be adjusted as necessary to match receiving channels.

All aprons shall be inspected at least weekly and after each runoff event. Displaced riprap within the apron shall be replaced immediately.

STANDARD CONSTRUCTION DETAIL # 4-7
Standard Silt Fence (18" High)



ELEVATION VIEW

PA DEP

Fabric shall have the minimum properties as shown in Table 4.3.

Fabric width shall be 30" minimum. Stakes shall be hardwood or equivalent steel (U or T) stakes.

Silt fence shall be placed at level existing grade. Both ends of the fence shall be extended at least 8 feet up slope at 45 degrees to the main fence alignment (see Figure 4.1).

Sediment shall be removed when accumulations reach half the aboveground height of the fence.

Any section of silt fence which has been undermined or topped shall be immediately replaced with a rock filter outlet (Standard Construction Detail # 4-6).

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.

SILT FENCE DETAIL IS SHOWN IF CONTRACTOR DECIDES TO USE IN ADDITION TO COMPOST FILTER SOCK.

CONSTRUCTION DETAILS

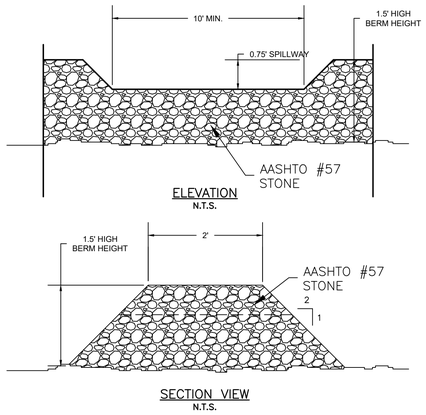
BASIN RETROFIT PLAN

DRAWN PJE	DATE 05-18-20	OXFORD DRIVE MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE NONE	SHEET 8 OF 9	PROJECT NO. 20-02

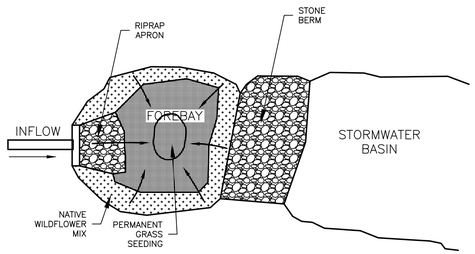
MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
215-750-3800

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL PATRICK ENNIS ENGINEER

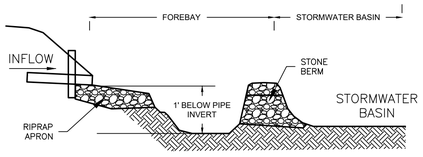
PATRICK J. ENNIS, P.E.
PROFESSIONAL ENGINEER
PA LICENSE # 56595



SEDIMENT FOREBAY STONE BERM
N.T.S.



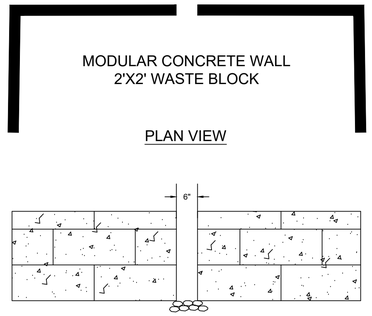
PLAN VIEW
N.T.S.



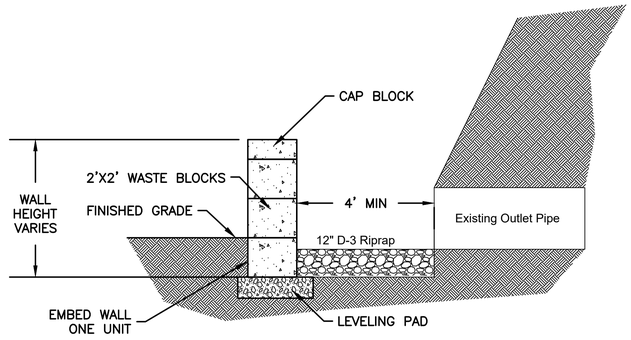
SECTION VIEW
N.T.S.

SEDIMENT FOREBAY DETAIL
N.T.S.

MODULAR CONCRETE WEIR WALL DETAILS
2'X2' WASTE BLOCK WALL SYSTEM BLOCKS OR APPROVED EQUAL



ELEVATION



SECTION VIEW
N.T.S.

LEVELLING PAD SHALL BE COMPACTED 3/4" GRAVEL, 12" THICK, EXTENDING 6" IN FRONT AND BEHIND MESA WALL UNIT.

Showy Northeast Native Wildflower Mix

ERNMX #	ERNMX-153-1
Cost Per Pound	$88.69
Seeding Rate	6-10 lb per acre with 20 lb per acre of a cover crop (grain oats, Jan 1-Aug 1; grain rye, Aug 1-Jan
Mix Type	Upland & Meadow Sites
Species List (click for details)	12.7% Tall White Beardtongue, PA Ecotype (Penstemon digitalis, PA Ecotype) 11.7% Purple Coneflower (Echinacea purpurea) 11.7% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype) 8.3% Lanceleaf Coreopsis, Coastal Plain NC Ecotype (Coreopsis lanceolata, Coastal Plain NC Ecotype) 6.7% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype) 6.7% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype) 6.7% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA Ecotype) 6.7% Blackeyed Susan, Coastal Plain NC Ecotype (Rudbeckia hirta, Coastal Plain NC Ecotype) 6.7% Butterfly Milkweed (Asclepias tuberosa) 5% New England Aster, PA Ecotype (Aster novae-angliae (Symphyotrichum n.), PA Ecotype) 5% Smooth Blue Aster, NY Ecotype (Aster laevis (Symphyotrichum laeve), NY Ecotype) 2.7% Browneyed Susan, WV Ecotype (Rudbeckia triloba, WV Ecotype) 2.3% Wild Bergamot, Fort Indiantown Gap-PA Ecotype (Monarda fistulosa, Fort Indiantown Gap-PA Ecotype) 1.7% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype) 1.7% Maryland Senna (Senna marilandica (Cassia m.)) 1.7% Wild Senna, VA & WV Ecotype (Senna hebecarpa (Cassia h.), VA & WV Ecotype) 1.7% Early Goldenrod, VA Ecotype (Solidago juncea, VA Ecotype) 0.3% Hoary Mountainmint, MD Ecotype (Pycnanthemum incanum, MD Ecotype) Total: 100%

Retention Basin Floor Mix - Low Maintenance

ERNMX #	ERNMX-126
Cost Per Pound	$13.86
Seeding Rate	20-40 lb per acre, or 1 lb per 1,000 sq ft
Mix Type	Storm Water Management Facility Sites
Species List (click for details)	20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype) 20% Alkaligrass, 'Fults' (Puccinellia distans, 'Fults') 17% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga') 17% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype) 14% Creeping Bentgrass (Agrostis stolonifera) 4% Ticklegrass (Rough Bentgrass), PA Ecotype (Agrostis scabra, PA Ecotype) 4% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype) 3% Soft Rush (Juncus effusus) 1% Path Rush, PA Ecotype (Juncus tenuis, PA Ecotype) Total: 100%

CONSTRUCTION DETAILS

MIDDLETOWN TOWNSHIP
3 MUNICIPAL WAY
LANGHORNE, PA 19047
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BASIN RETROFIT PLAN

DRAWN PJE	DATE 05-18-20	OXFORD DRIVE MIDDLETOWN TOWNSHIP
APPROVED	DATE	BUCKS COUNTY, PA
SCALE NONE	SHEET 9 OF 9	PROJECT NO. 20-02