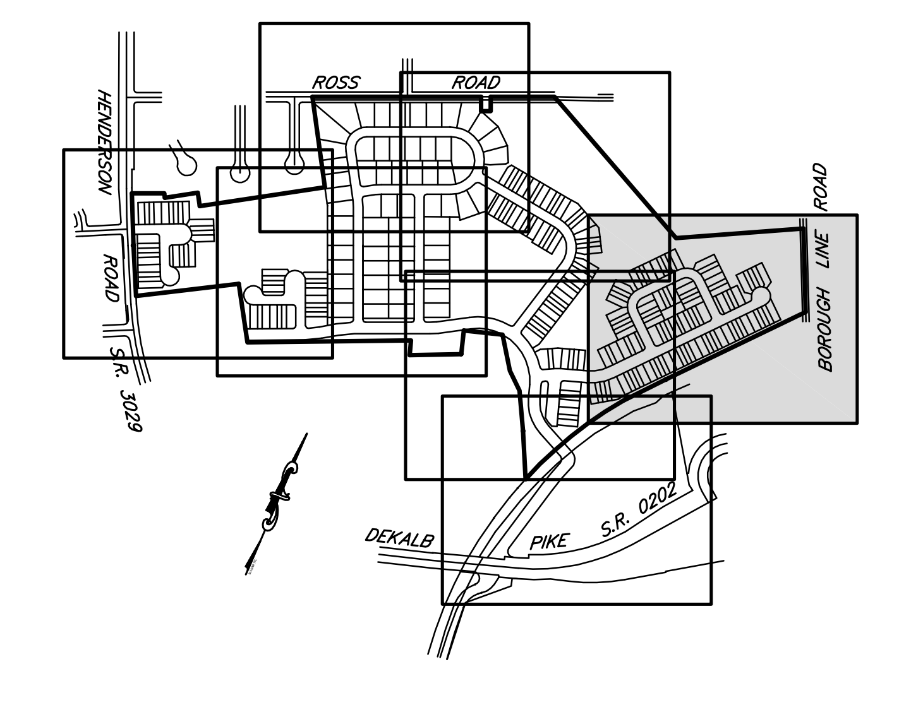


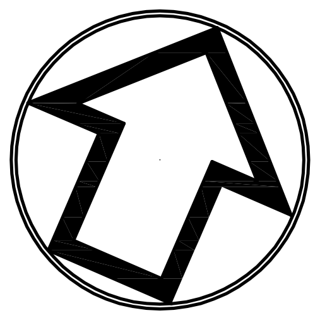
KEY MAP 1"=1000'

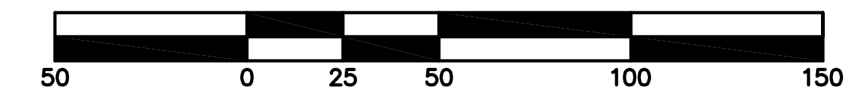
LEGEND

– – – – – –	LIMIT OF DISTURBANCE
━━━━━	NPDES PERMIT BOUNDARY
▬ ▬	BASIN/BMP SHED BOUNDARY
X	POINT OF INFLUENCE
△ T.P. #1	STORMWATER TEST PIT
⊞	AMENDED SOILS/ERNMX-178 (OR EQUAL)
▩	ROOFTOP DISCONNECTION
▨	PROTECT EXISTING TREES

LEGEND

PROPOSED WATER SERVICE	W
PROPOSED SANITARY LATERAL	CO. L
PROPOSED STORM SEWER	
PROPOSED SANITARY SEWER	
PROPOSED TREE ROW	
PROPOSED CURB	
PROPOSED EDGE OF ROAD	
PROPOSED EDGE OF ROAD	
PROPOSED EASEMENT	
PROPOSED RIGHT–OF–WAY	
PROPOSED CENTERLINE	
PROPOSED CONCRETE WALKWAY	
PROPOSED CONTOUR (MAJOR)	290
PROPOSED CONTOUR (MINOR)	292





GRAPHIC SCALE

No.	INT.	REVISIONS	DATE
		S.T.A. PLAN ORIGINATION DATE	DEC. 17, 2018

PCSM PLAN
OF THE
GLASGOW TRACT
PREPARED FOR
GLASGOW, INC.
SITE SITUATE IN
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

S T A
Engineering, Inc.
Civil Engineers • Land Surveyors
2499 KNIGHT ROAD, PENNSBURG, PA 18073
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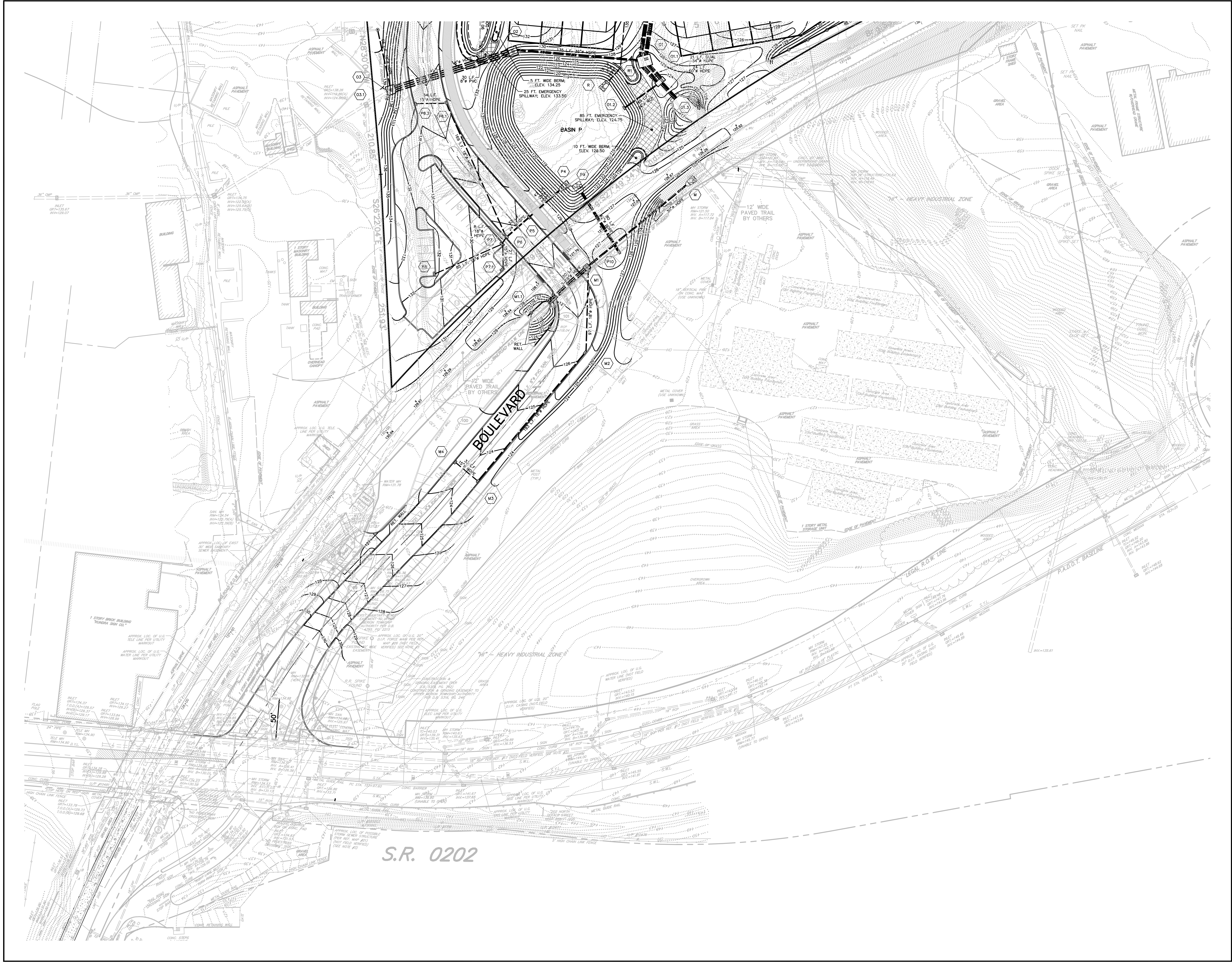
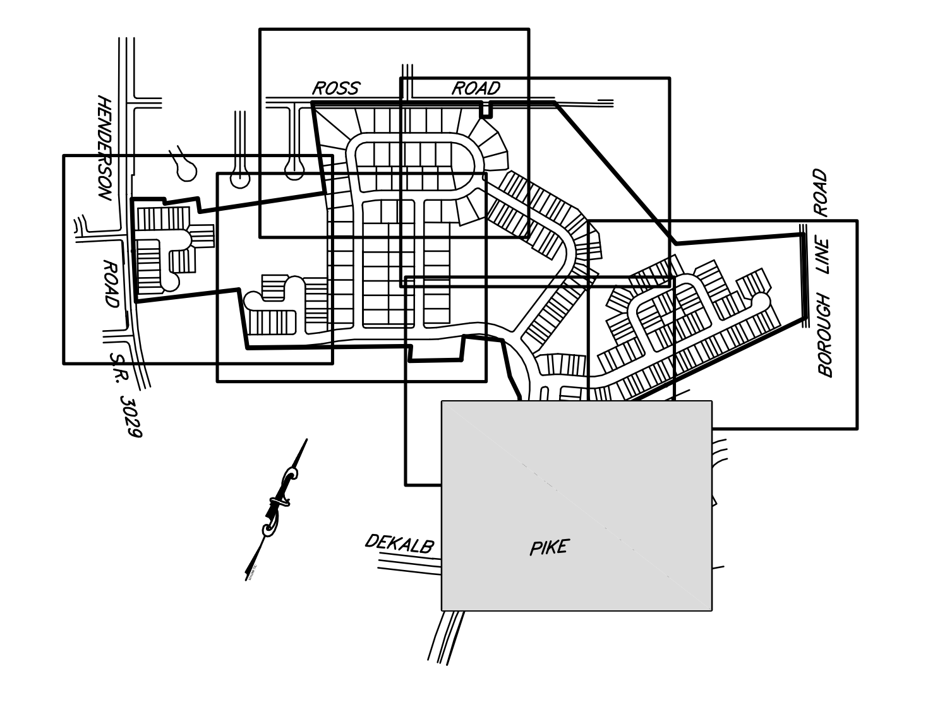
PH: (215) 679–0200; www.stotac.com

PLAN SCALE	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
HORIZONTAL: 1"=50'	A.C.H.	S.A.R.	51 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674PCSM	





KEY MAP 1"=1000'

LEGEND

— — — — —	LIMIT OF DISTURBANCE
———	NPDES PERMIT BOUNDARY
▬ ▬	BASIN/BMP SHED BOUNDARY
X	POINT OF INFLUENCE
△ T.P. #1	STORMWATER TEST PIT
⊞	AMENDED SOILS/ERNMX–178 (OR EQUAL)
▩	ROOFTOP DISCONNECTION
▨	PROTECT EXISTING TREES

LEGEND

PROPOSED WATER SERVICE	—W—
PROPOSED SANITARY LATERAL	CO. —L—
PROPOSED STORM SEWER	— — —
PROPOSED SANITARY SEWER	— ⊙ —
PROPOSED TREE ROW	⌒⌒⌒
PROPOSED CURB	═══
PROPOSED EDGE OF ROAD	———
PROPOSED EDGE OF ROAD	———
PROPOSED EASEMENT	—···—
PROPOSED RIGHT–OF–WAY	———
PROPOSED CENTERLINE	— – —
PROPOSED CONCRETE WALKWAY	═══
PROPOSED CONTOUR (MAJOR)	—290—
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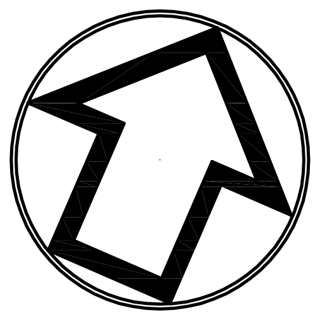

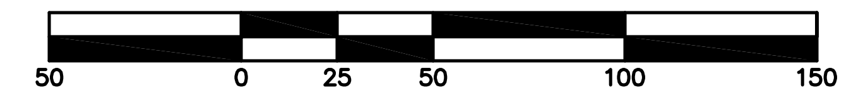

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PLAN SCALE HORIZONTAL:	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
1"=50'	A.C.H.	S.A.R.	52 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674PCSM	

POST CONSTRUCTION STORMWATER MANAGEMENT OPERATION AND MAINTENANCE NOTES

1. BMP DESCRIPTIONS:

The primary BMP's proposed for the development site consists of the following:

Non-Structural BMP's

1. BMP 5.4.1 - Protect Sensitive/Special Value Features - Existing Pond, Waters and Wetlans will remain
2. BMP 5.4.3 - Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design - On-site stormwater discharges into the existing pond or into the existing channel that conveys stormwater to the receiving watercourse
3. BMP 5.6.3 - Part 1 Protect Existing Trees
4. BMP 5.8.1 - Rooftop Disconnection

Structural BMP's

5. BMP 6.4.2/6.4.5 - Infiltration/Bio-retention Basins D, E, G, H, K, L, P
6. BMP 6.4.2/6.4.5 - Infiltration/Bio-retention BMPs F, J, N, R, S
7. 10. BMP 6.7.2/5.6.3 Part 2 - Landscape Restoration
8. BMP 6.7.3 - Soils Amendment & Restoration

2. GENERAL BMP OPERATION, MAINTENANCE, INSPECTION AND CERTIFICATION NOTES:

At such time that the site is stabilized and the temporary during construction erosion and sediment controls are removed, the permanent non-structural and structural BMP's will be installed and functioning. The structural BMP's are intended to be permanent facilities that mitigate peak flows and address minimal volume control in addition to promoting water quality.

General Maintenance - The stormwater management BMP's shall be owned and maintained by the established Homeowner's Association (HOA) in perpetuity. The HOA shall conduct maintenance on a short-term and long-term schedule in accordance with the maintenance procedures outlined in this narrative and on the PCSM plans. Until such time that the HOA is fully established and operational, the developer and/or permittee shall perform the required maintenance of the stormwater management BMP's. In addition to the procedures outlined in the narrative and on the plans, a member of the HOA Board of Directors or HOA Management Company shall be responsible to make a visual inspection of the BMP facilities after all major storm events to verify their integrity and to note any damage requiring corrective action. Furthermore, said party shall be responsible to perform an annual inspection of the facilities and generate a report to document the condition of the facilities. Copies of the annual report shall be submitted to the HOA for review and, where required, corrective action. If significant repairs are required, the Township Engineer shall be consulted prior to repair. The Municipality shall have the right, but not the duty, to inspect the stormwater management facilities, and if the HOA fails to do so, perform necessary maintenance.

Critical Stages/Oversight - The permittee shall provide engineering construction oversight during installation of all aspects of the stormwater management facility. A licensed professional engineer knowledgeable in the design and construction of stormwater BMPs, preferably the design engineer, shall conduct the oversight. Refer to the PCSM plans for a complete tabulation of the designated BMP's requiring construction oversight.
Final Certification - the permittee shall include with the Notice of Termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:
"I, (name), do hereby certify pursuant to the penalties of 18. Pa.c.s.a. § 4904 to the best of my knowledge, information and belief, that the accompanying record drawings accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the Rules and Regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices."

The permittee shall retain a copy of the record drawings as a part of the approved PCSM Plan and shall provide a copy of the record drawings as a part of the approved PCSM Plan to the person identified in this section as being responsible for the long-term operation and maintenance of the PCSM BMP's.

Upon permanent stabilization of the earth disturbance activity under § 102.22(a)(2) (relating to permanent stabilization), and installation of BMP's in accordance with an approved plan prepared and implemented in accordance with § 102.4 and 102.8 (relating to erosion and sediment control requirements; and PCSM requirements), the permittee or co-permittee shall submit a Notice of Termination (NOT) to the Department or Chester County Conservation District. Prior to accepting the NOT, the Department and/or Conservation District staff will perform a final inspection and approve or deny the NOT.

C. SPECIFIC BMP OPERATION AND MAINTENANCE NOTES:

Short Term:

Inspect BMP's after major storm events for damage and/or erosion activity, paying close attention to the embankments, spillway, and berm. Repair erosion with appropriate measures immediately.

Inspect BMP plantings installed from containers on a monthly basis during the growing season for the first two years to evaluate plant establishment and mortality - replace dead plants with same or like plants able to establish in the cultural conditions present. If necessary, replace plants with a different species suitable to any microclimatic effects that might develop.

Long Term:

Until the permittee or co-permittee has received written approval of a Notice of Termination, the permittee or co-permittee will remain responsible for compliance with the permit terms and conditions including long-term operation and maintenance of all PCSM BMP's on the project site and responsibility for violations occurring on the project site.

The permittee or co-permittee shall be responsible for long-term operation and maintenance of PCSM BMP's unless a different person is identified in the Notice of Termination and has agreed to long-term operation and maintenance of PCSM BMP's.

For any property containing a PCSM BMP, the permittee or co-permittee shall record an instrument with the recorder of deeds, which will assure disclosure of the PCSM BMP and the related obligations in the ordinary course of a title search of the subject property. The recorded instrument must identify the PCSM BMP, provide for necessary access related to long-term operation and maintenance for PCSM BMP's and provide notice that the responsibility for long-term operation and maintenance of the PCSM BMP is a covenant that runs with the land that is binding upon and enforceable by subsequent grantees, and provide proof of filing with the Notice of Termination under § 102.7(b)(5) (relating to permit termination).

The person or entity responsible for performing long-term operation and maintenance may enter into an agreement with another person including a conservation district, non-profit organization, municipality, authority, private corporation or other person to transfer the responsibility for PCSM BMP's or to perform long-term operation and maintenance and provide notice thereof to the department.

A permittee or co-permittee that fails to transfer long-term operation and maintenance of the PCSM BMP or otherwise fails to comply with this requirement shall remain jointly and severally responsible with the landowner for long-term operation and maintenance of the PCSM BMP's located on the property.

A written report must be completed to document each inspection and all BMP repair and maintenance activities.

The PCSM Plan, inspection reports and monitoring records shall be available for review and inspection by the Department or the Conservation District.

Specific BMP Construction Sequence and Long-Term Maintenance Notes:

GENERAL:

1. Catch basins and inlets should be inspected and cleaned at least two times per year and after runoff events.
2. Vehicles should not be parked or driven over infiltration BMP's.
3. Structural BMP's should be inspected for accumulation of sediment, damage to outlet structures, signs of contamination or spills, and berm stability.

INFILTRATION/BIO-RETENTION BMP's:

APPLIES TO BASINS D, E, G, H, K, L, P AND
BMPs F, J, N, R, S

Construction Sequence-Critical Stage:

1. Unless otherwise infeasible, construction of the permanent basin should be scheduled to allow for installation of the specified seed mixes as soon as permanent basin construction is complete between early April to mid-June to provide the plants with a full growing season to build strong root reserves for winter hardiness. In no case shall seed be installed prior to April 1 or later than September 15. If necessary, install annual rye cover crop for over-wintering, followed by site preparation and application of the specified seed mixes during the following spring.

2. A licensed professional engineer (or authorized representative) knowledgeable in the design and construction of stormwater BMP's, preferably the design engineer, shall conduct the oversight during installation.

3. Insure that all areas tributary to the basin are stabilized prior to basin construction.

4. Prepare site for excavation and/or embankment construction. All existing vegetation should remain if feasible and should only be removed for construction. Care should be taken to prevent compaction of the basin bottom. If excavation is required, clear the area to be excavated of all vegetation. Remove tree roots, rocks and boulders only in excavation area.

5. Excavate bottom of basin to design elevation.

6. Install surrounding embankments and inlet and outlet control structures. Install u-drain in accordance with the detail and provide solid cap within the inlet structure.

7. Grade subsoil in bottom of basin being careful not to compact the basin bottom area. If the area has been subject to compaction or sedimentation during construction, infiltration testing may be required during/prior to the construction of the BMP to verify the volume credits taken by design. If unfavorable conditions are encountered during installation (i.e. groundwater and/or bedrock, etc.), the engineer should be consulted and the location of the proposed facility should be re-evaluated.

8. Install soil mix to required design depth and fine grade, being careful not to compact. Refer to Basin and BMP soil mix specifications.

9. Prepare for seeding by eliminating any weed growth prior to seed installation using an appropriate herbicide to control undesirable vegetation. For optimal seed establishment, soil ph shall be between 5.5 and 6.5.

10. Apply seed by carefully proportioning seed for the entire area. Broadcast seed in two separate applications by applying seed at half the suggested rate for each application to ensure even and adequate coverage. After the full rate of seeding has been achieved, follow by rolling or tracking seed into the top 1/4 inch of soil to achieve good seed to soil contact - do not roll or track the seed when soil is wet.

11. Cover seeded area with a light layer of salt hay, threshed straw or pine needles or apply erosion control matting over 3:1 slopes.

12. Plant and mulch according to specifications on the landscape plan. Install any anti-grazing measures, if necessary.

Maintenance:

1. Maintenance is necessary to ensure proper function of the bio-retention/infiltration basin and should take place on a quarterly basis. When infiltration basins are first made functional they should be inspected monthly and after any large storm event. All inspections should include investigation for potential sources of contamination.

2. All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation at least four times per year, as well as after every storm greater than 1 inch.

3. Sediment removal should be conducted when the basin is completely dry. Sediment should be disposed of properly and once sediment is removed, disturbed areas need to be immediately stabilized and re-vegetated.

4. During the establishment of vegetation with the basin area, the solid cap should remain off. Once vegetation is fully established, install solid cap and perform routine inspections and maintenance as necessary. Solid cap is to remain in place until such time that it becomes necessary to drain the facility. The Township and/or the Conservation District shall be consulted prior to opening the cap. If slow drainage persists and the cap has to be opened on a regular basis, a professional engineer should evaluate the facility as required to determine an appropriate course of action. This includes, but is not limited to, replacement of the facility.

LANDSCAPE RESTORATION:

Construction Sequence:

1. All plant material to be installed in accordance with the planting practices stated in Chapter 3 of "Tree Maintenance" by P.P. Pirone (fifth or most recent edition).

2. Take extreme care in handling and installing all plants to prevent damage to bark, branches, and root balls.

3. All planting areas shall be free from weeds prior to the beginning of planting operation. Contact herbicide sprays should only be used as required and all manufactures specifications followed.

4. Prepare tree and shrub planting pits with proper size excavations and backfill during planting with prepared backfill mixture. Backfill in layers, water thoroughly to allow settlement and remove air pockets.

5. Plant root balls at the same relation to grade as previously grown at the nursery. High or low root balls shall not be accepted.

6. Backfill planting soil of 50% topsoil and 50% peat moss shall be mixed with existing soil at a rate of 1/3 planting soil and 2/3 existing soil.

7. Fertilize all plants with appropriate starter fertilizer at time of planting.

8. All plantings must be thoroughly watered within the first 12 hours of installation. The contractor is responsible for providing water for this operation.

9. Mulch all plantings immediately after planting operations are completed with a three-inch (3") layer of finely shredded bark mulch or licorice root. The mulch shall be aged a minimum of 6 months. A granular pre-emergent weed control shall be spread prior to mulching. The limit of this mulch for deciduous trees and single evergreen trees shall be the area of the pit excavation. For all evergreen tree and shrub clusters, a fully mulched bed shall be created. Mulch planting beds entirely around and between all plants for a fully mulched bed. Depth shall be cleanly cut and tapered to match surrounding lawn grades.

10. All shrubs are to be mulched in groups. No singularly mulched shrubs will be accepted, unless a singular speciman shrub in lawn has been shown on the drawings. A continuous mulch bed shall be provided for each grouping or cluster of shrubs to the extent of their collective branch drip line.

Maintenance:

1. Application of a carefully selected herbicide around the protective tree shelters/tubes may be necessary, and reinforced by selective cutting/manual removal, if necessary for the initial 2 to 3 years of growth and may be necessary for up to 5 years until tree growth and tree canopy begins to form, naturally inhibiting weed growth (once shading is adequate, growth of invasives and other weeds will be naturally prevented, and the trees becomes self-maintaining).

2. Review of the new trees should be undertaken intermittently to determine if replacement trees should be provided (some modest rate of planting failure is usual).

3. Landscape restoration areas planted with a proper cover crop can be expected to require annual mowing to control invasive species.

SOIL AMENDMENT AND RESTORATION:

Construction sequence:

1. A licensed professional engineer (or authorized representative) knowledgeable in the design and construction of stormwater bmp's, preferably the design engineer, shall conduct the oversight of installation of amended soils.

2. All on-lot construction and excavation should be completed and stabilized prior to commencement of soil amendment. If upslope areas are not stabilized, install silt fence upslope of soil amendment areas until upslope lawn is established.

3. Rototill or rip subgrade to ensure that the subsoil is in a loose, friable condition. Leave soil in a loose state. Remove rocks.

4. Distribute the compost/topsoil mix evenly over the prepared subsoil while minimizing soil compaction. Spread the nutrients. Rototill again. Rake, seed and stabilize.

Maintenance:

1. Maintain as lawn area with routine mowing and weed control maintenance.

2. The soil restoration process may need to be repeated over time due to compaction by use and/or settling.

SPECIAL GEOLOGIC FORMATIONS OR SOIL CONDITIONS & POTENTIAL POLLUTION:

To the best of our knowledge, no geologic formations or soil conditions having the potential to cause pollution to surface waters exist at the site.

THERMAL IMPACT STATEMENT:

Stormwater runoff from the proposed impervious surfaces will be directed into numerous bio-retention and infiltration stormwater management facilities before leaving the site in order to minimize the potential for thermal impacts upon the receiving watercourses. Stormwater runoff will be treated and filtered in the facility before entering the stormwater conveyance system or discharged through vegetated areas where the runoff has additional time to cool before reaching the surface waters.

NPDES POST CONSTRUCTION STORMWATER MANAGEMENT PLANNING AND DESIGN:

a. **Preserve the integrity of stream channels and maintain and protect the physical, biological and chemical qualities of the receiving stream.** The proposed infiltration and bio-retention facilities will promote the biological uptake of stormwater pollutants before being discharged from the site and entering the receiving stream.

b. **Prevent an increase in the rate of stormwater runoff.** A series of basins placed throughout the site are used to manage and meet the peak flow requirements. Post-development peak flow rates are designed to be less than the pre-development peak flow rates that leave the site at all discharge analysis points.

c. **Minimize any increase in stormwater runoff volume.** Numerous post-construction non-structural and structural stormwater BMPs are proposed to reduce the 2-year increase in the volume of stormwater runoff to the pre-development runoff volume. Non-structural and structural BMPs will help reduce stormwater volume and promote improvements in water quality.

d. **Minimize impervious areas.** Street imperviousness is reduced by reducing street widths from that which is required by ordinance. Ninety-five percent (95%) of the proposed impervious area drains to a Post-Construction Stormwater Management BMP.

e. **Maximize the protection of existing drainage features and existing vegetation.** No new stormwater discharge points are proposed as part of this land development. Post-development flows leaving the site are less than the calculated pre-development flows from the site.

f. **Minimize land clearing and grading.** Site grading exists primarily in the areas proposed for construction and a portion of the site will remain undisturbed. A portion of the existing impervious areas will be removed and restored to a vegetated area.

g. **Minimize Soil Compaction.** Soil compaction is minimized to the greatest extent possible.

h. **Utilize other structural or nonstructural BMPs that prevent or minimize changes in stormwater runoff.** In addition to the infiltration and bio-retention facilities that manage peak runoff, promote water quality and manage runoff volume; landscape restoration, soil amendment, preservation of existing trees, removal of existing unnecessary impervious surfaces and directing surface runoff into vegetated areas all work together to prevent or minimize changes in stormwater runoff.

SITE SPECIFIC CONSTRUCTION SEQUENCE

No.	INT.	REVISIONS	DATE
		PLAN ORIGINATION DATE	DEC. 17, 2018

PCSM DETAIL SHEET
AS PART OF THE
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N.T.S.	A.C.H.	S.A.R.	53 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674DET	

PLANTING SOIL MIX (AMENDED SOIL) FOR BASINS AND BMP'S

SPECIFICATIONS:

1. MUST BE WELL BLENDED, HOMOGENEOUS MIX OF APPROXIMATELY 50% SAND, 25% TOPSOIL, & 25% HIGH QUALITY ORGANIC COMPOST (SUCH AS LEAF MULCH OR PEAT).
2. MUST MEET SOIL PERMEABILITY CLASS RATING OF K3.
3. THE AMENDED SOIL MIXTURE SHOULD BE APPROVED BY THE ENGINEER OR SOIL SCIENTIST PRIOR TO PLACEMENT.
4. ON-SITE SOILS WITH AN ORGANIC CONTENT OF AT LEAST 5% CAN BE PROPERLY STOCKPILED (TO MAINTAIN ORGANIC CONTENT) AND REUSED AS THE TOPSOIL COMPONENT OF THE AMENDED SOILS.

APPLICATION:

1. REFER TO DETAILS FOR SOIL AMENDMENT DEPTHS WITHIN BASINS AND BMP.
2. THE AMENDED SOIL SHOULD BE PLACED DURING DRY, FRIABLE SOIL CONDITIONS ON SCARIFIED, UNCOMPACTED SUB-GRADE.
3. CARE SHOULD BE TAKEN TO AVOID COMPACTION OF BOTH THE SUB-GRADE AND AMENDED SOIL DURING PLACEMENT.
4. SEED AND STABILIZE IMMEDIATELY AFTER PLACEMENT.
5. PREVENT SEDIMENTATION OF THE AMENDED SOIL AFTER PLACEMENT.

SOIL AMENDMENT FOR LAWN AREAS

APPLICATION

1. SOIL RESTORATION AND AMENDMENT SHALL TAKE PLACE ON ALL LAWN AREAS AS INDICATED ON THE APPROVED PCSM PLANS.
2. AFTER SOIL RESTORATION AND AMENDMENT, THE LAWN SHALL BE STABILIZED WITH PERMANENT VEGETATION IMMEDIATELY. INTRODUCTION OF DEEP ROOTED PERENNIAL VEGETATION INCREASES THE INFILTRATION OF SURFACE WATERS AND ENHANCES THE SOIL'S MATRIX DESIGN.

SPECIFICATIONS

A. SOIL AMENDMENT CAN INCLUDE COMPOST, MULCH, MANURES AND SAND.

B. COMPOST USED SHALL MEET THE FOLLOWING PHYSICAL PARAMETERS:

ORGANIC MATTER CONTENT	25% – 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
PH	5.5 – 8.5
MOISTURE CONTENT	30% – 60%
PARTICLE SIZE	30% – 60% PASS THROUGH ⅜" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 DS/M (MMHOS/CM) MAXIMUM

C. BULK DENSITY OF THE AMENDED SOIL TO MEET THE FOLLOWING CRITERIA:

SOIL TEXTURE	IDEAL BULK DENSITIES
	g/cm3
SANDS, LOAMY SANDS	<1.60
SANDY LOAMS, LOAMS	<1.40
SANDY CLAY LOAMS, LOAMS, CLAY LOAMS	<1.40
SILT, SILT LOAMS	<1.30
SILT LOAMS, SILTY CLAY LOAMS	<1.10
SANDY CLAYS, SILTY CLAYS, SOME CLAY LOAMS (35–45% CLAY)	<1.10
CLAYS (>45% CLAY)	<1.10
SOURCE: PROTECTING URBAN SOIL QUALITY, USDA–NRCS	

D. SOILS SHOULD BE 20% ORGANIC MATERIAL (COMPOST), 30% SAND AND 50% OF TOPSOIL, UNLESS A PROPRIETARY PRODUCT IS USED. AND, IN THIS CASE, THE MANUFACTURER'S INSTRUCTIONS SHOULD BE USED IN TERMS OF MIXING AND APPLICATION RATE.

E. ON-SITE SOILS WITH AN ORGANIC CONTENT OF AT LEAST 5 PERCENT CAN BE PROPERLY STOCKPILED (TO MAINTAIN ORGANIC CONTENT) AND REUSED TO AMEND SOILS.

SEEDING SPECIFICATIONS

TEMPORARY SEEDING (DURING CONSTRUCTION)

MIXTURE NUMBER	SPECIES	SEEDING RATE–PURE LIVE SEED (PLS)*	
		MOST SITES	ADVERSE SITES
1 (OR APPROVED EQUAL)	SPRING OATS (SPRING) OR ANNUAL RYEGRASS (SPRING OR FALL) OR WINTER WHEAT (FALL) OR WINTER RYE (FALL)	64 10 90 56	96 15 120 112

PERMANENT SEEDING FOR LAWN AREAS OUTSIDE OF BMP AREAS

MIXTURE NUMBER	SPECIES	SEEDING RATE–PURE LIVE SEED (PLS)*	
		MOST SITES	ADVERSE SITES
2 (OR APPROVED EQUAL)	FINE FESCUE OR KENTUCKY BLUEGRASS PLUS REDTOP OR PERENNIAL RYEGRASS SUITABLE FOR FREQUENT MOWING. DO NOT CUT SHORTER THAN 4 INCHES.	60 35 25 3 15	75 40 30 3 20

* PLS IS THE PRODUCT OF THE PERCENTAGE OF PURE SEED TIMES PERCENTAGE GERMINATION DIVIDED BY 100. FOR EXAMPLE, TO SECURE THE ACTUAL PLANTING RATE FOR SWITCHGRASS, DIVIDE 12 POUNDS PLS SHOWN ON THE SEED TAG. THUS, IF THE PLS CONTENT OF A GIVEN SEED LOT IS 35%, DIVIDE 12 PLS BY 0.35 TO OBTAIN 34.3 POUNDS OF SEED TO PLANT ONE ACRE. ALL MIXTURES IN THIS TABLE ARE SHOWN IN TERMS OF PLS.

NOTE: WHEN A DISTURBED AREA IS TO BE STABILIZED BY VEGETATION, NO MORE THAN 15,000 S.F. SHALL REACH FINAL GRADE WITHOUT BEING SEEDED AND MULCHED. WAITING UNTIL EARTHMOVING ACTIVITIES ARE COMPLETED BEFORE SEEDING AND MULCHING OPERATIONS ARE COMPLETED IS NOT RECOMENDED.

TABLE 11.2 SOIL AMENDMENT APPLICATION RATE EQUIVALENT

SOIL AMENDMENT	PERMANENT SEEDING APPLICATION RATE			NOTES
	PER ACRE	PER 1,000 S.F.	PER 1,000 S.Y.	
AGRICULTURAL LIME	6 TONS	240 lb.	2,480 lb.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
10–10–20 FERTILIZER	1,000 lb.	25 lb.	210 lb.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
	TEMPORARY SEEDING APPLICATION RATE			
AGRICULTURAL LIME	1 TON	40 lb.	410 lb.	TYPICALLY NOT REQUIRED FOR TOPSOIL STOCKPILES
10–10–10 FERTILIZER	500 lb.	12.5 lb.	100 lb.	TYPICALLY NOT REQUIRED FOR TOPSOIL STOCKPILES

Adapted from Penn State, "Erosion Control and Conservation Plantings on Noncropland"

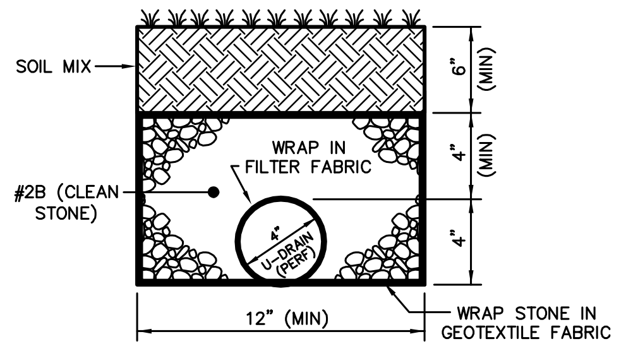
NOTES: A COMPOST BLANKET WHICH MEETS THE STANDARDS OF THIS CHAPTER MAY BE SUBSTITUTED FOR THE SOIL AMENDMENTS SHOWN IN THIS TABLE.

SOIL TESTING IS RECOMMENDED IN ORDER TO DETERMINE APPROPRIATE LIME AND FERTILIZATION RATES.

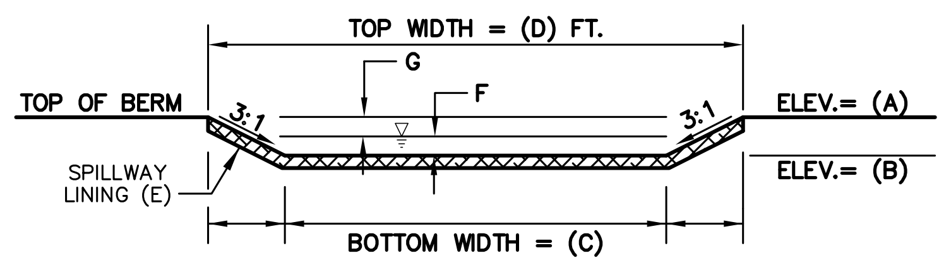
TABLE 11.6 MULCH APPLICATION RATES

MULCH TYPE	APPLICATION RATE (MIN.)			NOTES
	PER ACRE	PER 1,000 S.F.	PER 1,000 S.Y.	
STRAW	3 TONS	140 lb.	1,240 lb.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	3 TONS	140 lb.	1,240 lb.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CHIPS	4–6 TONS	185–275 lb.	1,650–2,500 lb.	MAY PREVENT GERMINATION OF GRASSES AND LEGUMES
HYDROMULCH	1 TON	47 lb.	415 lb.	SEE LIMITATIONS ABOVE

1. STRAW AND HAY MULCH SHOULD BE ANCHORED OR TACKIFIED IMMEDIATELY AFTER APPLICATION TO PREVENT BEING WINDBLOWN. A TRACTOR-DRAWN IMPLEMENT MAY BE USED TO "CRIMP" THE STRAW OR HAY INTO THE SOIL – ABOUT 3 INCHES. THIS METHOD SHOULD BE LIMITED TO SLOPES NO STEEPER THAN 3H:1V. THE MACHINERY SHOULD BE OPERATED ON THE CONTOUR. NOTE: CRIMPING OF HAY OR STRAW BY RUNNING OVER IT WITH TRACKED MACHINERY IS NOT RECOMMENDED.
2. POLYMERIC AND GUM TACKIFIERS MIXED AND APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS MAY BE USED TO TACK MULCH. AVOID APPLICATION DURING RAIN AND ON WINDY DAYS. A 24-HOUR CURING PERIOD AND A SOIL TEMPERATURE HIGHER THAN 45 DEGREES ARE TYPICALLY REQUIRED. APPLICATION SHOULD GENERALLY BE HEAVIEST AT EDGES OF SEEDED AREAS AND AT CRESTS OF RIDGES AND BANKS TO PREVENT LOSS BY WIND. THE REMAINDER OF THE AREA SHOULD HAVE BINDER APPLIED UNIFORMLY. BINDERS MAY BE APPLIED AFTER MULCH IS SPREAD OR SPRAYED INTO THE MULCH AS IT IS BEING BLOWN ONTO THE SOIL. APPLYING STRAW AND BINDER TOGETHER IS GENERALLY MORE EFFECTIVE.
3. SYNTHETIC BINDERS, OR CHEMICAL BINDERS, MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THEY ARE NON-TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.
4. MULCH ON SLOPES OF 8% OR STEEPER SHOULD BE HELD IN PLACE WITH NETTING. LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
5. SHREDDED PAPER HYDROMULCH SHOULD NOT BE USED ON SLOPES STEEPER THAN 5%. WOOD FIBER HYDROMULCH MAY BE APPLIED ON STEEPER SLOPES PROVIDED A TACKIFIER IS USED. THE APPLICATION RATE FOR ANY HYDROMULCH SHOULD BE 2,000 LB/ACRE AT A MINIMUM.



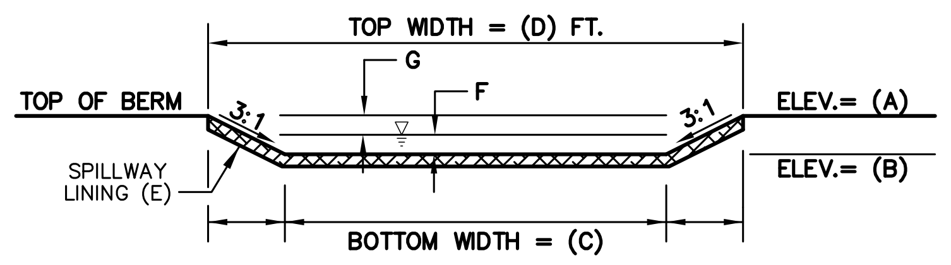
U-DRAIN DETAIL
BASINS & BMP'S



BASIN I.D.	TOP OF BERM ELEV. (FT.) Ⓐ	EMERGENCY SPILLWAY ELEV. (FT.) Ⓑ	BOTTOM WIDTH (FT.) Ⓒ	TOP WIDTH (FT.) Ⓓ	SPILLWAY LINING Ⓔ	FLOW DEPTH (FT.) Ⓕ	FREEBOARD (FT.) Ⓖ
D	149.40	148.15	130	137.50	P300	0.25	1.00
E	156.00	154.50	40	49.00	P300	0.50	1.00
G	155.00	153.25	100	110.50	P300	0.75	1.00
H	124.35	122.85	110	119.00	P300	0.50	1.00
K	125.25	124.00	110	117.50	P300	0.25	1.00
L	122.00	120.75	105	112.50	P300	0.25	1.00
P	126.50	124.75	85	95.50	P300	0.75	1.00

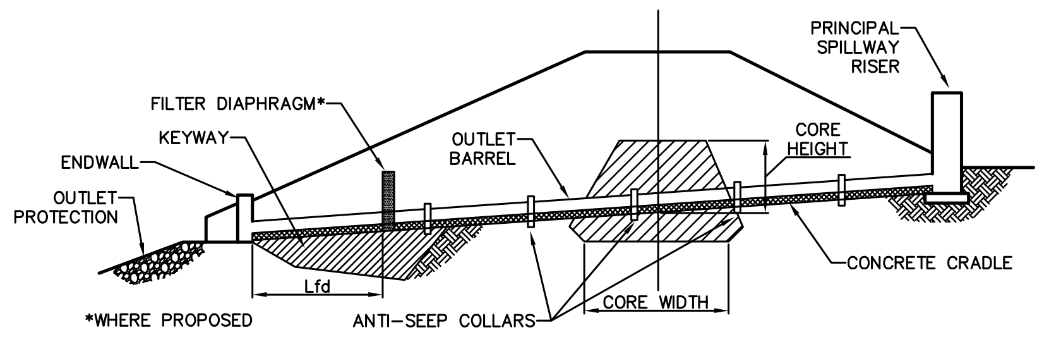
NOTES:
1. THE UPSTREAM EDGE OF THE SPILLWAY LINING IS TO EXTEND A MINIMUM OF 3 FEET BELOW THE SPILLWAY CREST ELEVATION AND THE DOWNSTREAM SLOPE OF THE SPILLWAY SHALL AS A MINIMUM EXTEND TO THE TOE OF THE EMBANKMENT.
2. SPILLWAY SHALL BE PERMANENTLY SEEDED IN ACCORDANCE WITH SPECIFICATIONS ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEET.
3. SPILLWAY LINING TO BE PERMANENT SPECIFIED N.A.G. LINING OR APPROVED EQUAL.

BASIN EMERGENCY SPILLWAY CROSS-SECTION

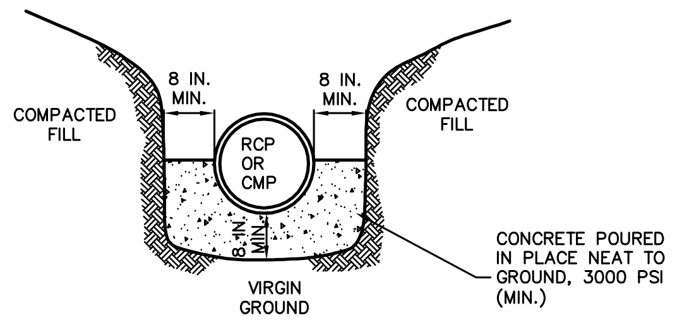


BMP I.D.	TOP OF BERM ELEV. (FT.) Ⓐ	EMERGENCY SPILLWAY ELEV. (FT.) Ⓑ	BOTTOM WIDTH (FT.) Ⓒ	TOP WIDTH (FT.) Ⓓ	SPILLWAY LINING Ⓔ	FLOW DEPTH (FT.) Ⓕ	FREEBOARD (FT.) Ⓖ
N	134.25	133.50	25	29.5	S75	0.25	0.50
F	151.25	150.50	30	34.5	S75	0.25	0.50
J	124.00	123.25	65	69.5	S75	0.25	0.50
R	131.50	130.75	20	24.5	S75	0.25	0.50
S	125.00	124.25	20	24.5	S75	0.25	0.50

BMP EMERGENCY SPILLWAY CROSS-SECTION



EMBANKMENT ALONG PRINCIPAL SPILLWAY

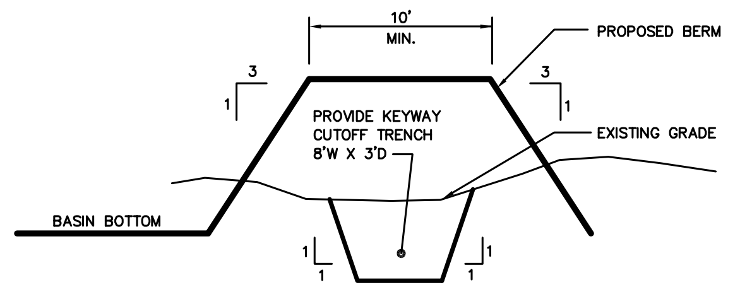


CROSS-SECTION AT OUTLET BARREL

NOTES:
1. TO BE USED WITH OUTLET BARRELS FOR BASINS D, E, G, H, K and L.
2. A CONCRETE CRADLE MAY BE USED IN CONJUNCTION WITH ANTI-SEEP COLLARS AND/OR FILTER DIAPHRAGM.
3. ANTI-SEEP COLLAR NUMBER, SIZE AND SPACING SHALL BE AS SHOWN ELSEWHERE IN PLAN.
4. FILTER DIAPHRAGM LOCATION (Lfd) SHALL BE AS SHOWN IN FIGURE 7.8 OF THE PA DEP EROSION CONTROL MANUAL.

STANDARD CONSTRUCTION DETAIL #7-17
CONCRETE CRADLE FOR BASIN OR TRAP OUTLET BARREL

NOT TO SCALE



CONSTRUCTION NOTES:

1. SITE PREPARATION – Areas under the embankment and any structural works shall be cleared, grubbed and the topsoil stripped to remove the trees, vegetation, roots, or objectionable material. In order to facilitate clean-out and other restoration, the pool area will be cleared of all brush and excess trees.

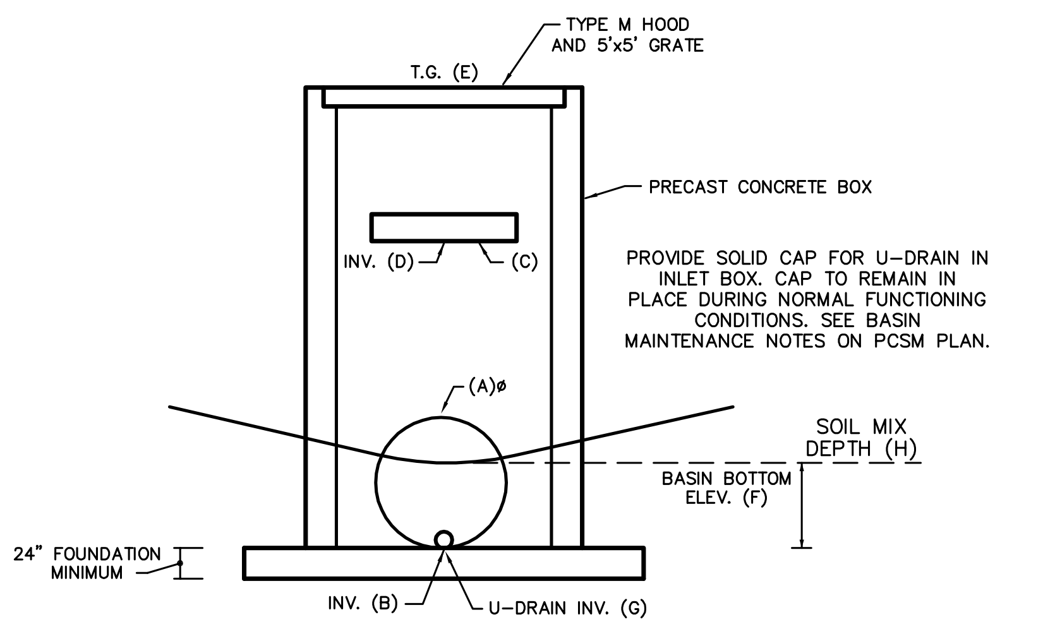
2. CUT OFF TRENCH – A cut-off trench will be excavated along the centerline dam on earth fill embankments. the minimum depth shall be 3 feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be 8 feet but wide enough to permit operation of compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for embankment. The trench shall be kept free from standing water during backfilling operations.

3. EMBANKMENT – The fill material shall be taken from selected borrow areas. It shall be free of roots, woody vegetation, oversized stones, rocks or other objectionable material. Areas on which fill is to be placed shall be scarified prior to placement of fill.

The fill material should contain sufficient moisture so that it can be formed be hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction.

Fill material will be placed in 6 to 8 inch layers and shall be continuous over the entire length of the fill. Compaction will be obtained by routing earthmoving equipment and vibratory roller compactors over the fill so that the entire surface of the fill is traversed but at least one tread track of the equipment and compactor drum. The embankment shall be constructed to an elevation of 5% higher than the design height to allow for settlement.

BASIN BERM CONSTRUCTION DETAIL

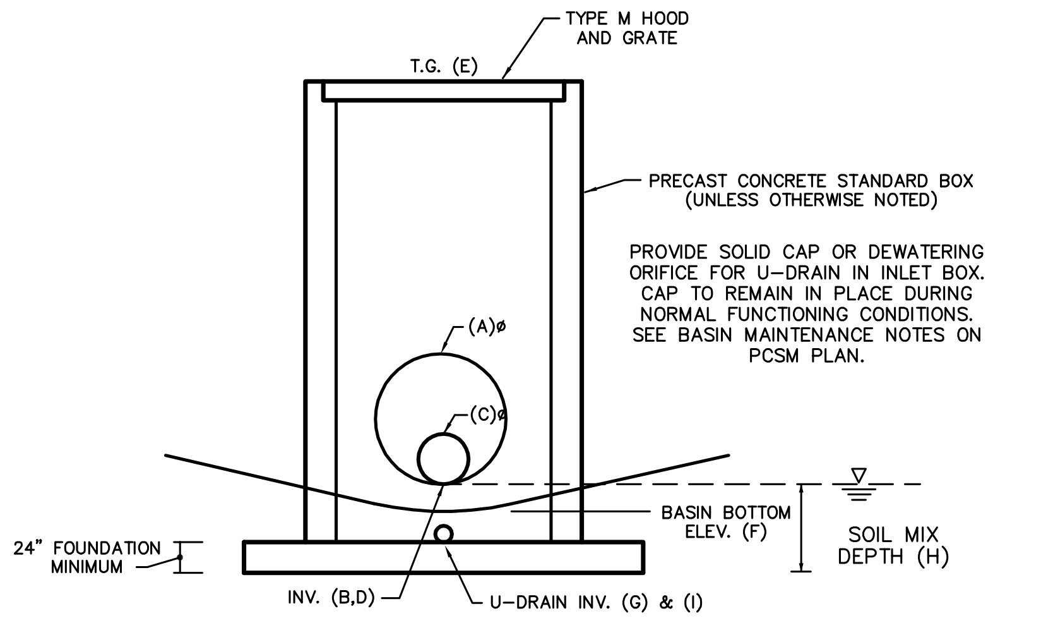


BASIN I.D.	OUTLET PIPE DIAMETER (IN.) Ⓐ	OUTLET PIPE INV. (FT.) Ⓑ	BASE ORIFICE (IN.) Ⓒ	BASE ORIFICE INV. (FT.) Ⓓ	TOP OF BOX ELEV. (FT.) Ⓔ	BASIN BOTTOM ELEV. (FT.) Ⓕ	U-DRAIN INV. Ⓖ	SOIL MIX DEPTH (FT.) Ⓗ	SOIL SURFACE AREA (S.F.)
G	18	144.00	4	147.50	149.75	147.00	144.33	2.0	14,540
H	24	116.33	6	119.50	121.85	119.00	116.33	2.0	16,895
P	24	117.50	4"x54"	119.00	121.25	119.00	117.50	1.5	13,095

NOTES:
1. LIMITS OF SOIL MIX TO BE STAKED IN THE FIELD PRIOR TO PLACEMENT FOR FINAL CONVERSION.
2. USE MASTIC OR EQUIVALENT TO ENSURE WATERTIGHT SEALS WITHIN STORM SEWER STRUCTURES.

BASIN G, H & P OUTLET STRUCTURE DETAIL

N.T.S.



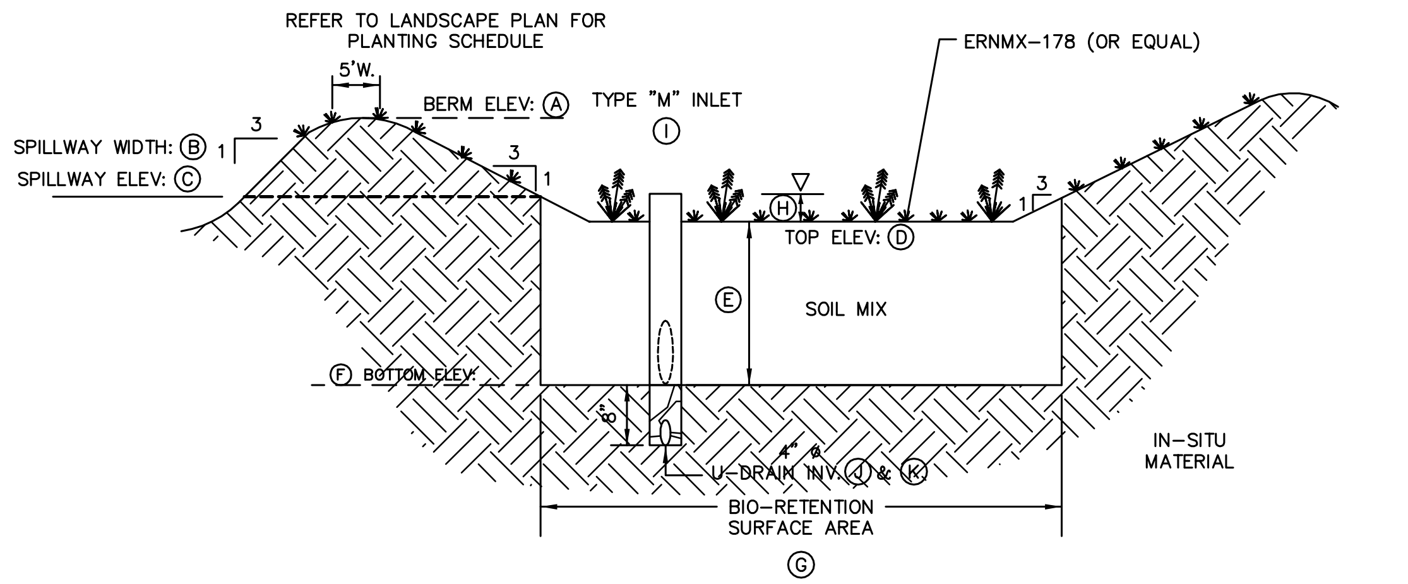
BASIN I.D.	OUTLET PIPE DIAMETER (IN.) Ⓐ	OUTLET PIPE INV. (FT.) Ⓑ	BASE ORIFICE DIAMETER (IN.) Ⓒ	BASE ORIFICE INV. (FT.) Ⓓ	TOP OF BOX ELEV. (FT.) Ⓔ	BASIN BOTTOM ELEV. (FT.) Ⓕ	U-DRAIN INV. Ⓖ	SOIL MIX DEPTH (FT.) Ⓗ	SOIL SURFACE AREA (S.F.)	DEWATERING ORIFICE (IN.) Ⓘ
D	15	144.15	N/A	N/A	146.90	145.65	144.15	1.5	5,055	1
E	15	148.00	4	151.50	153.75	151.00	148.33	2.0	8,000	1
K	18	117.20	4	120.00	122.75	119.50	117.33	1.5	3,155	1
L	18	113.30	4	117.50	120.00	117.00	114.33	2.0	4,365	1

NOTES:

1. LIMITS OF SOIL MIX TO BE STAKED IN THE FIELD PRIOR TO PLACEMENT FOR FINAL CONVERSION.
2. OUTLET STRUCTURE A7 TO BE TYPE 5 BOX.
3. USE MASTIC OR EQUIVALENT TO ENSURE WATERTIGHT SEALS WITHIN STORM SEWER STRUCTURES.

BASIN OUTLET STRUCTURE DETAIL

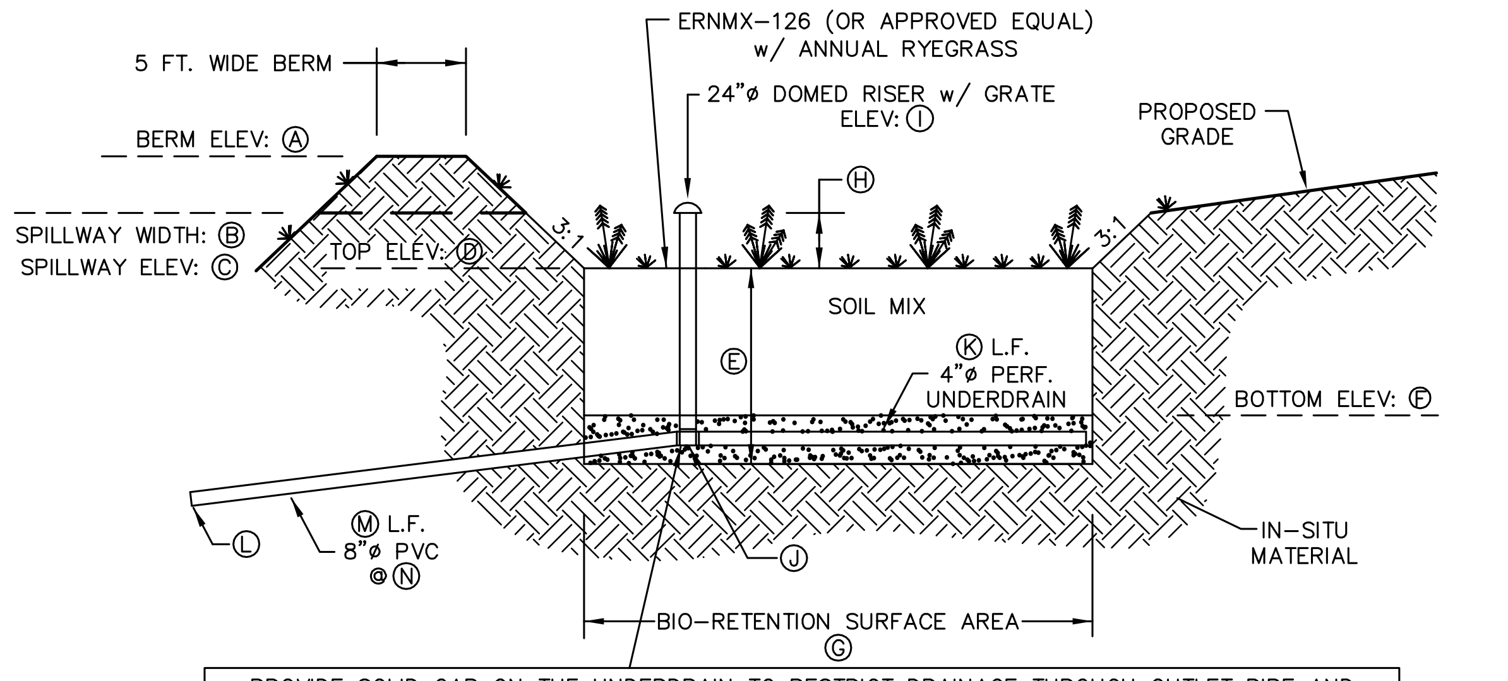
N.T.S.



NOTES:
1. LIMITS OF SOIL MIX TO BE STAKED IN THE FIELD PRIOR TO PLACEMENT FOR FINAL CONVERSION.
2. USE MASTIC OR EQUIVALENT TO ENSURE WATERTIGHT SEALS WITHIN STORM SEWER STRUCTURES.

SYSTEM NO.	BERM ELEV. Ⓐ	SPILLWAY WIDTH Ⓑ	SPILLWAY ELEV. Ⓒ	TOP ELEV. Ⓓ	SOIL MIX DEPTH Ⓔ	BOTTOM ELEV. Ⓕ	SURFACE AREA Ⓖ	SURFACE STORAGE DEPTH Ⓗ	T.G. Ⓘ	U-DRAIN INV. Ⓙ	DEWATERING ORIFICE (IN.) Ⓚ
F	151.25	30 FT.	150.50	148.00	2.0 FT.	146.00	1,680 S.F.	2.00 FT.	148.50	145.33	1
J	124.00	65 FT.	123.25	120.00	2.0 FT.	118.00	3,240 S.F.	2.00 FT.	121.00	117.33	1

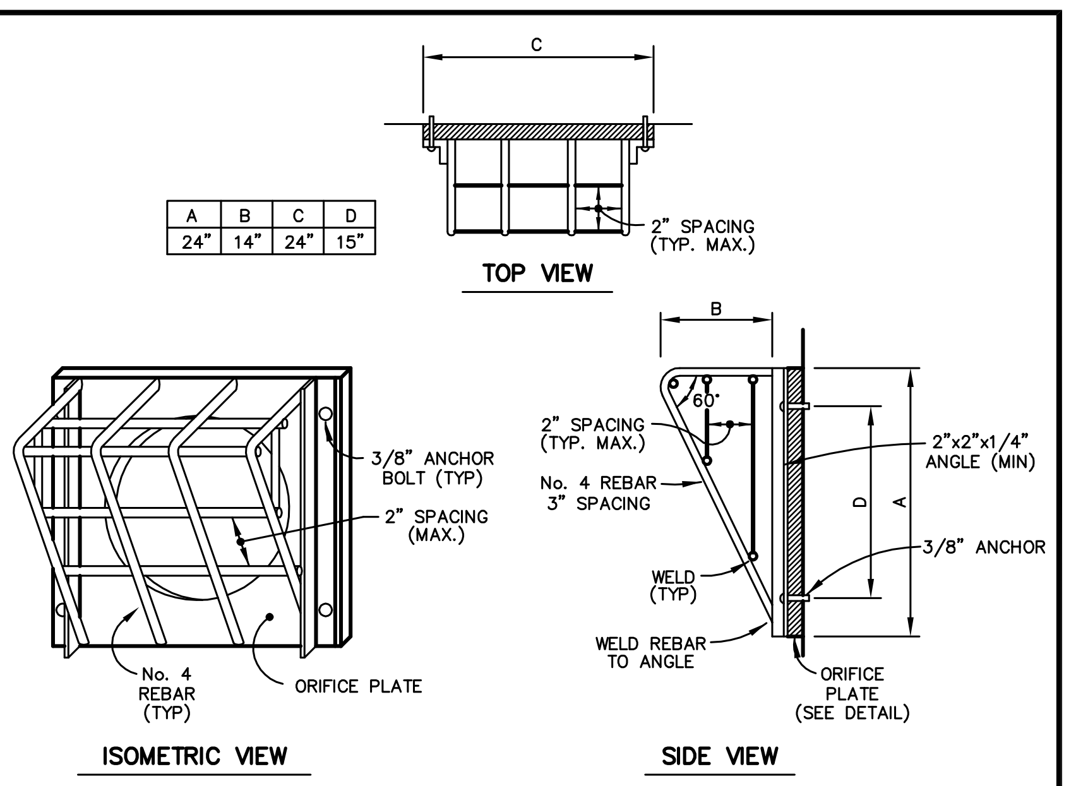
BIO-RETENTION AREA DETAIL



PROVIDE SOLID CAP ON THE UNDERDRAIN TO RESTRICT DRAINAGE THROUGH OUTLET PIPE AND ENCOURAGE INFILTRATION. CAP TO BE OPENED AS CONDITIONS WARRANT AND WHEN RAIN GARDEN FAILS TO DRAIN COMPLETELY WITHIN 72 HOURS FOLLOWING A STORM EVENT.

SYSTEM NO.	BERM ELEV. Ⓐ	SPILLWAY WIDTH Ⓑ	SPILLWAY ELEV. Ⓒ	TOP ELEV. Ⓓ	SOIL MIX DEPTH Ⓔ	BOTTOM ELEV. Ⓕ	SURFACE AREA Ⓖ	SURFACE STORAGE DEPTH Ⓗ	RISER ELEV. Ⓘ	U-DRAIN INV. Ⓙ	U-DRAIN LENGTH Ⓚ	OUTLET INV. Ⓛ	OUTLET L.F. Ⓜ	OUTLET SLOPE Ⓝ
N	134.25	25 FT.	133.50	131.45	1.5 FT.	129.95	2,370 S.F.	1.05 FT.	132.50	129.28	90 L.F.	128.00	30	0.0427
R	131.50	20 FT.	130.75	128.00	1.5 FT.	126.50	930 S.F.	1.50 FT.	129.50	125.83	40 L.F.	125.45	40	0.0095
S	125.00	20 FT.	124.25	120.00	1.5 FT.	118.50	595 S.F.	3.00 FT.	123.00	117.83	35 L.F.	117.33	50	0.0100

BMP N, R & S DETAIL

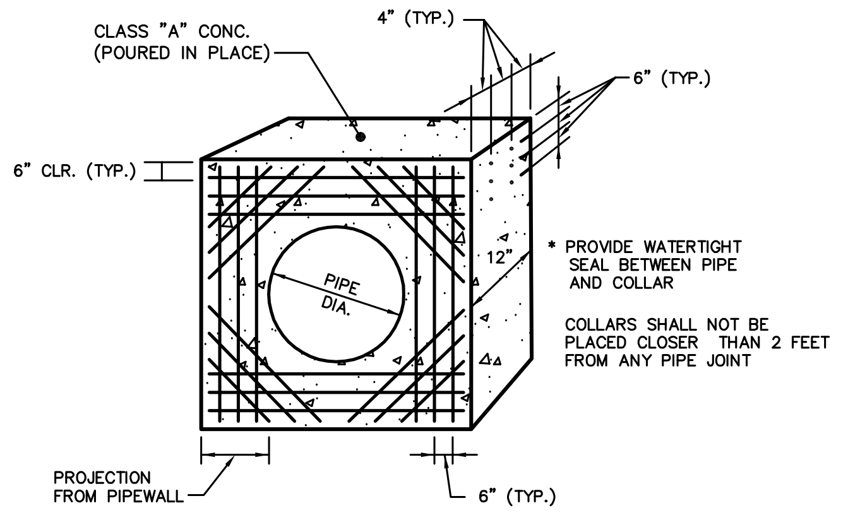


A	B	C	D
24"	14"	24"	15"

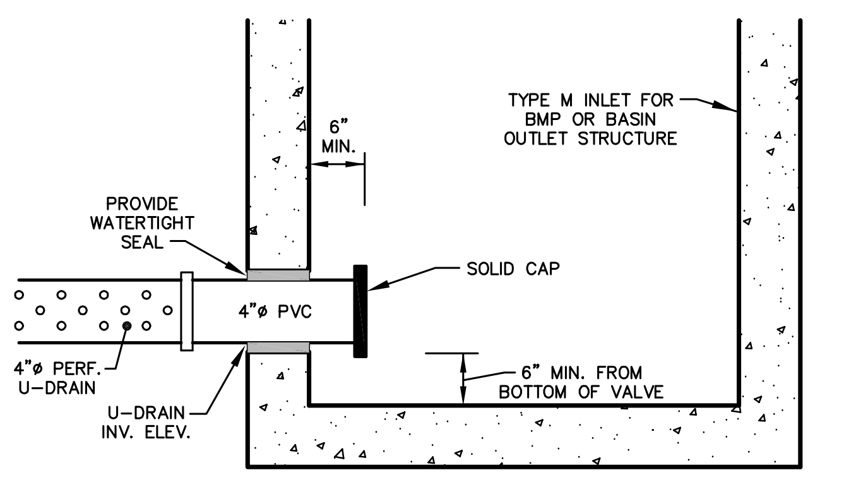
TRASH RACK DETAILS

AFTER RACK IS CONSTRUCTED (WELDED) THE ASSEMBLY SHALL BE PAINTED WITH EPOXY COATING.

BASIN/ POND	OUTLET PIPE DIAMETER (IN.)	DESIGN COLLAR PROJECTED FROM PIPE (FT.)	DESIGN COLLAR DIMENSIONS (FT.)	NUMBER OF COLLARS
D	15	2.15	6.05	1
E	15	2.00	5.75	2
G	18	2.38	6.75	2
H	24	2.00	6.50	2
K	18	2.00	6.00	2
L	18	2.00	6.00	2
P	24	2.00	6.50	2



REINFORCED CAST-IN-PLACE ANTI-SEEP COLLAR



NOTES:
1. CAP TO REMAIN OFF DURING ESTABLISHMENT OF VEGETATION.
2. CAP TO BE PROVIDED WHEN VEGETATION IS FULLY ESTABLISHED AND IS TO REMAIN CLOSED UNTIL SUCH TIME THAT IT BECOMES NECESSARY TO DRAIN THE FACILITY.
3. THE TOWNSHIP AND/OR CONSERVATION DISTRICT SHALL BE CONSULTED PRIOR TO OPENING THE CAP.

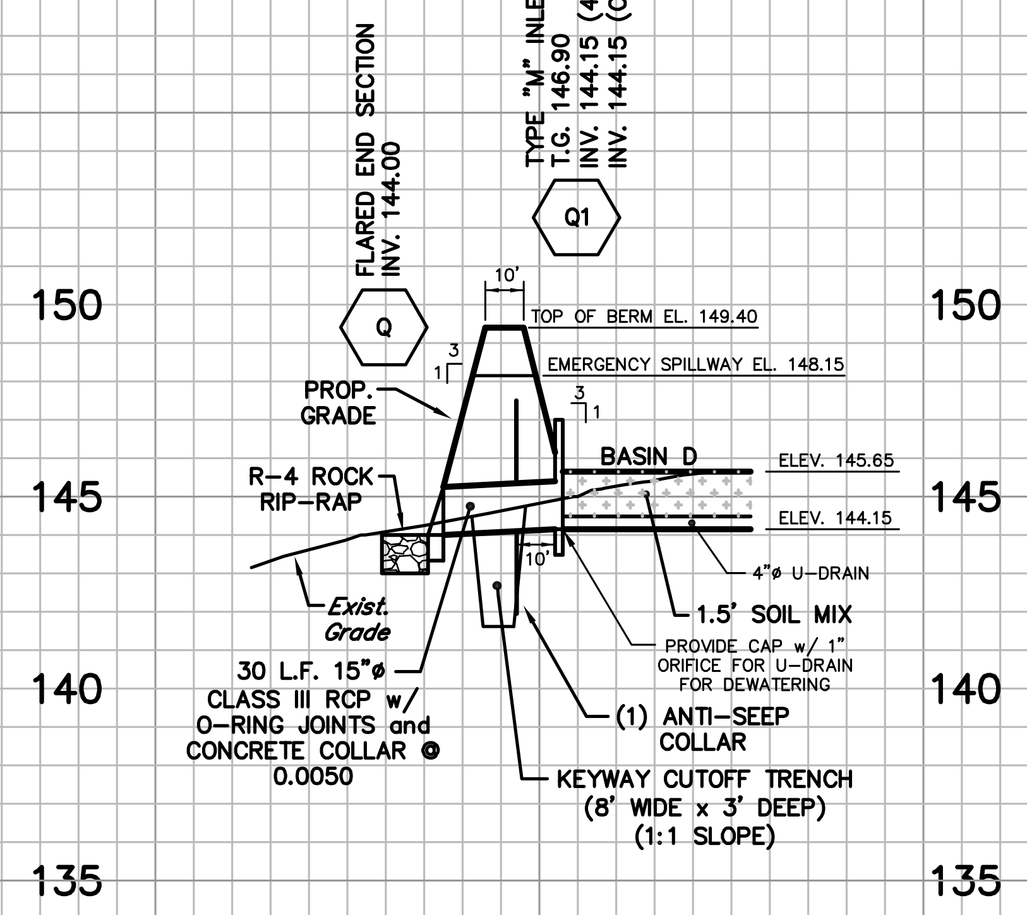
CAP DETAIL FOR BMP's AND BASINS

No.	INT.	REVISIONS	DATE
		PLAN ORIGINATION DATE	DEC. 17, 2018

PCSM DETAIL SHEET
AS PART OF THE
GLASGOW TRACT
PREPARED FOR
GLASGOW, INC.
SITE SITUATE IN
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

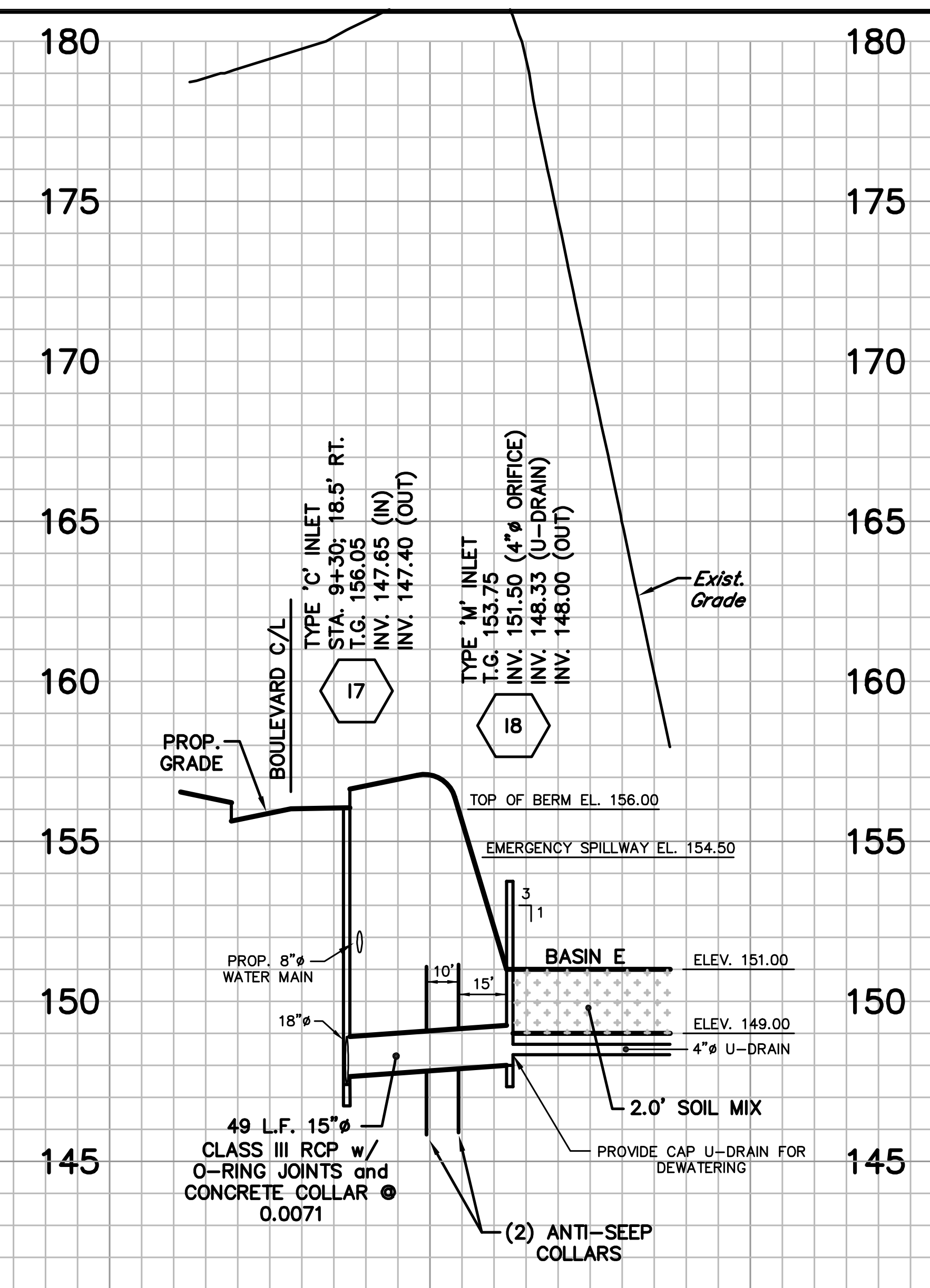
S T A
Engineering, Inc.
Civil Engineers • Land Surveyors
2499 KNIGHT ROAD, PENNSBURG, PA 18073
MAILING: P.O. BOX 87, RED HILL, PA 18076
PH: (215) 679–0200; www.stotac.com

PLAN SCALE HORIZONTAL:	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
N.T.S.	A.C.H.	S.A.R.	54 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674DET	



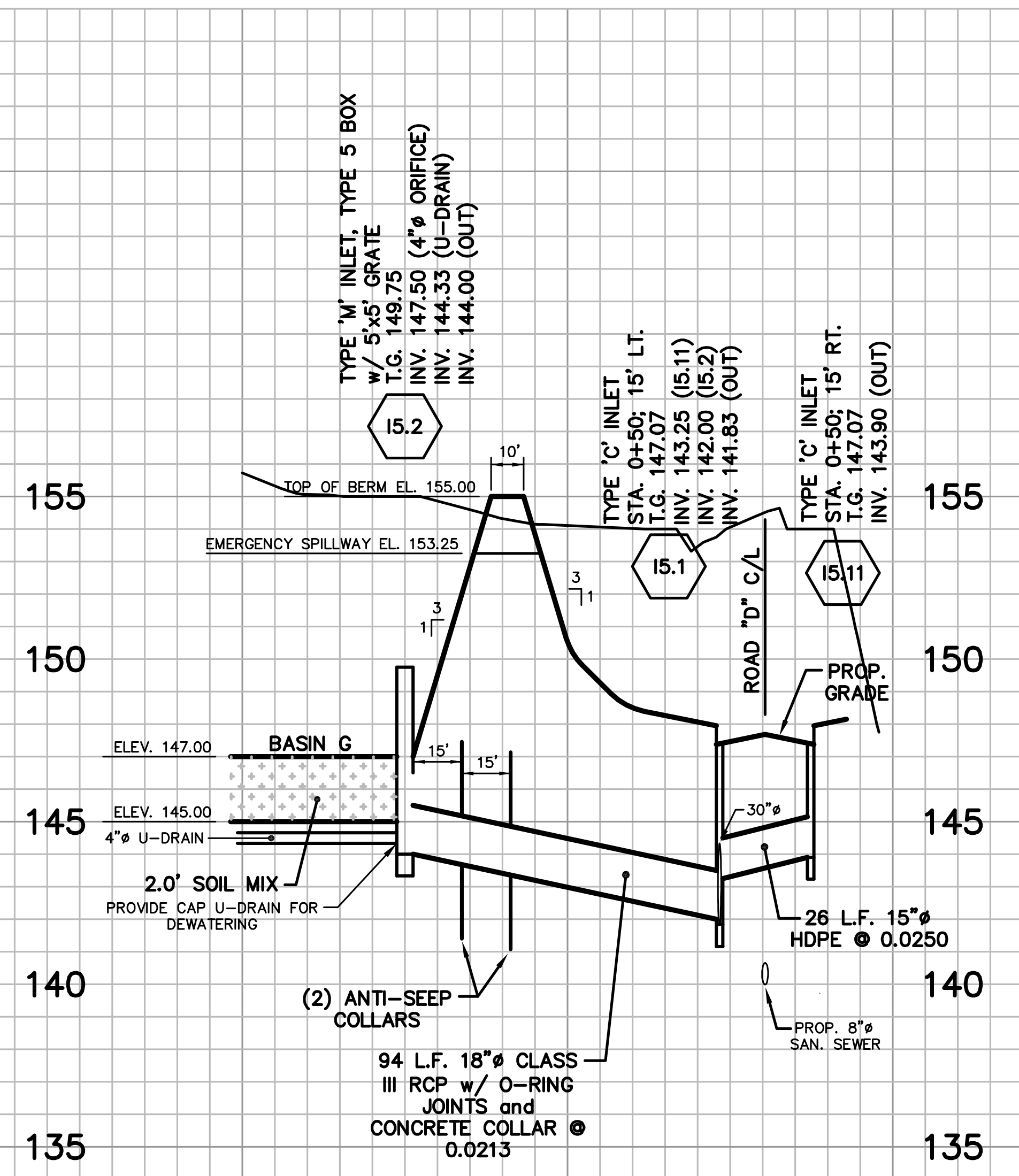
BASIN D OUTFALL

		0	+25	+50	+75	1
143.1	143.9	144.3	144.8	145.3	145.6	



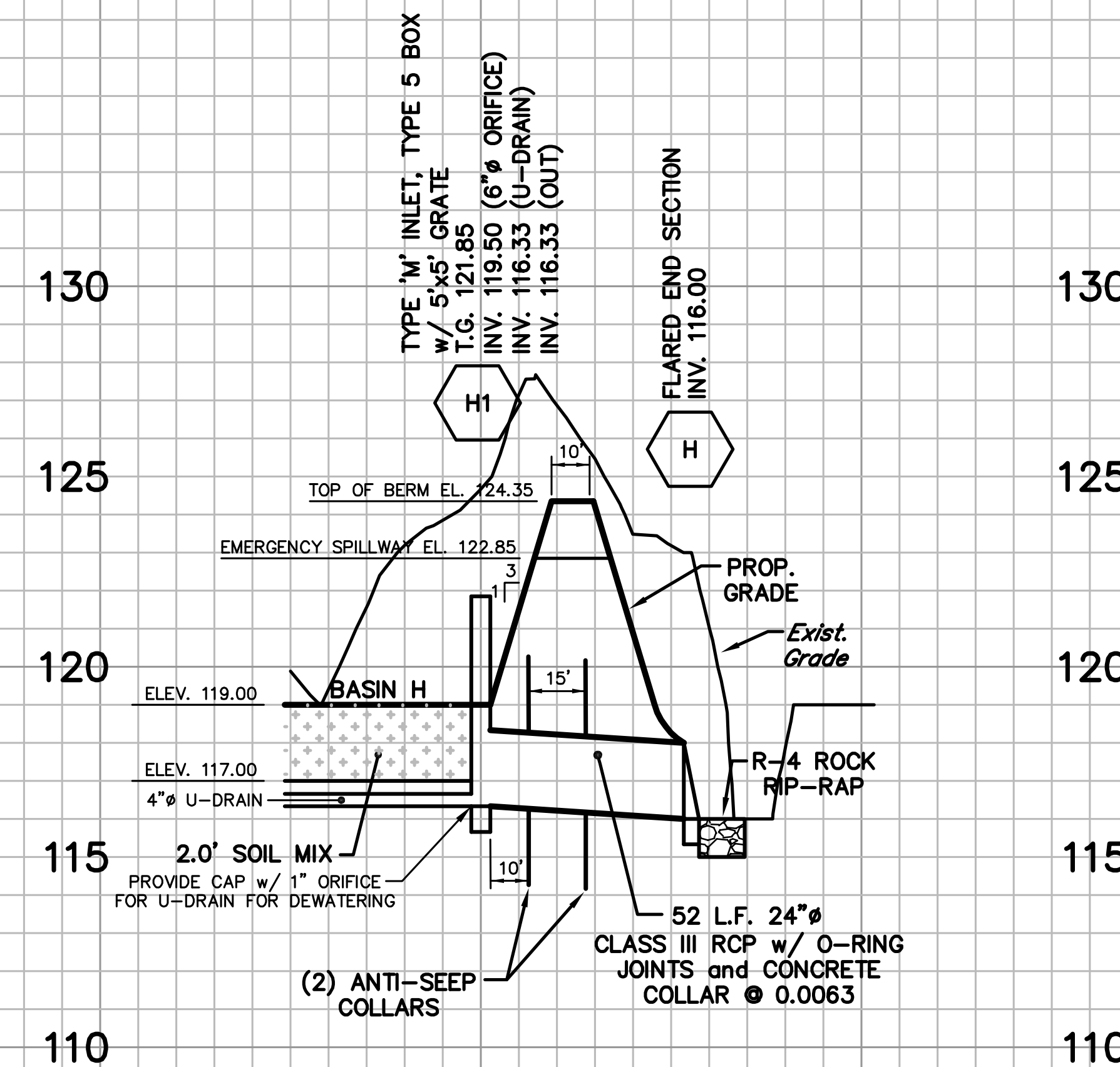
BASIN E OUTFALL

		0	+25	+50	+75	1
178.7	179.5	180.4	181.0	181.0	169.7	158.0



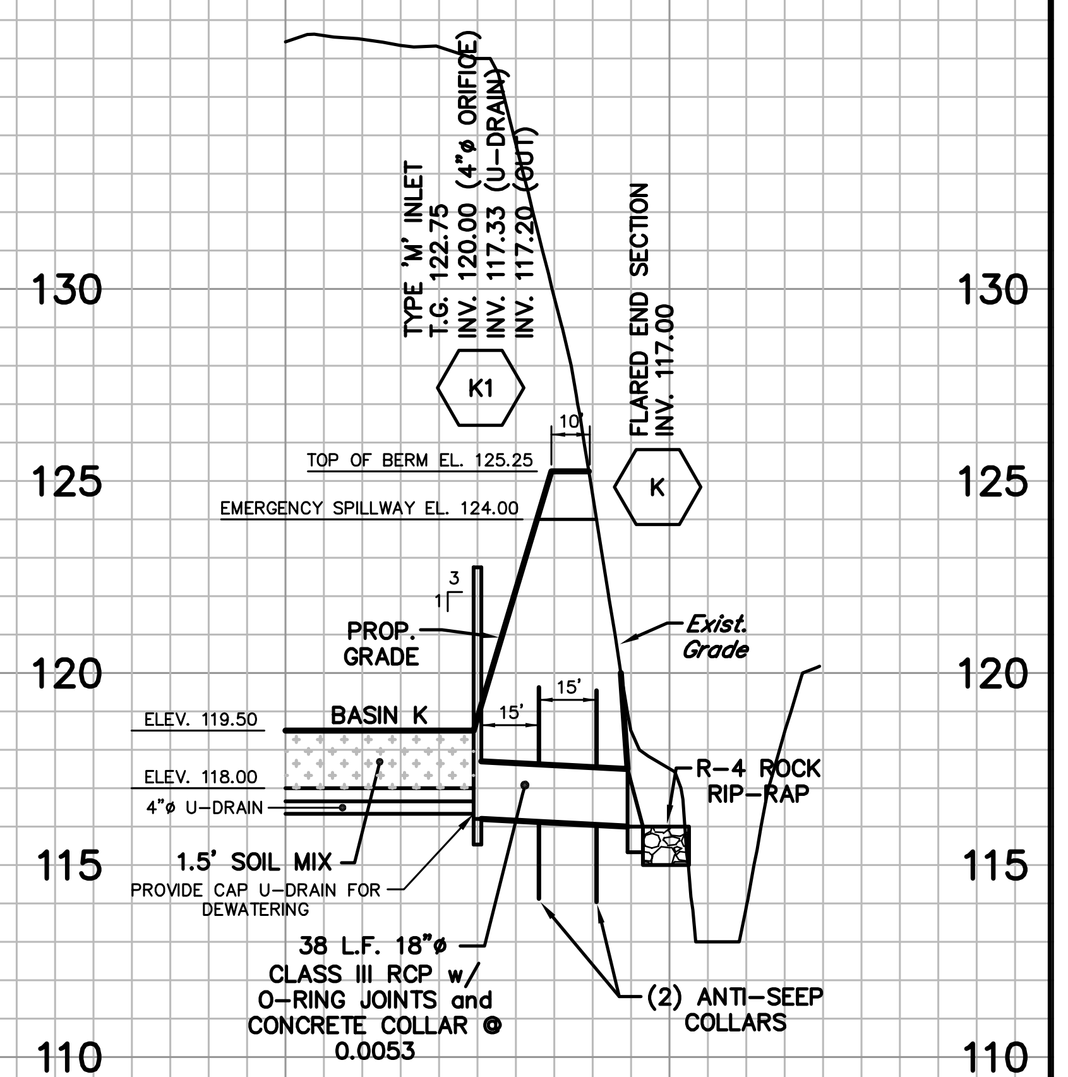
BASIN G OUTFALL

		0	+25	+50	+75	1	+25
155.73	155.05	155.00	154.45	154.11	154.00	154.06	154.00



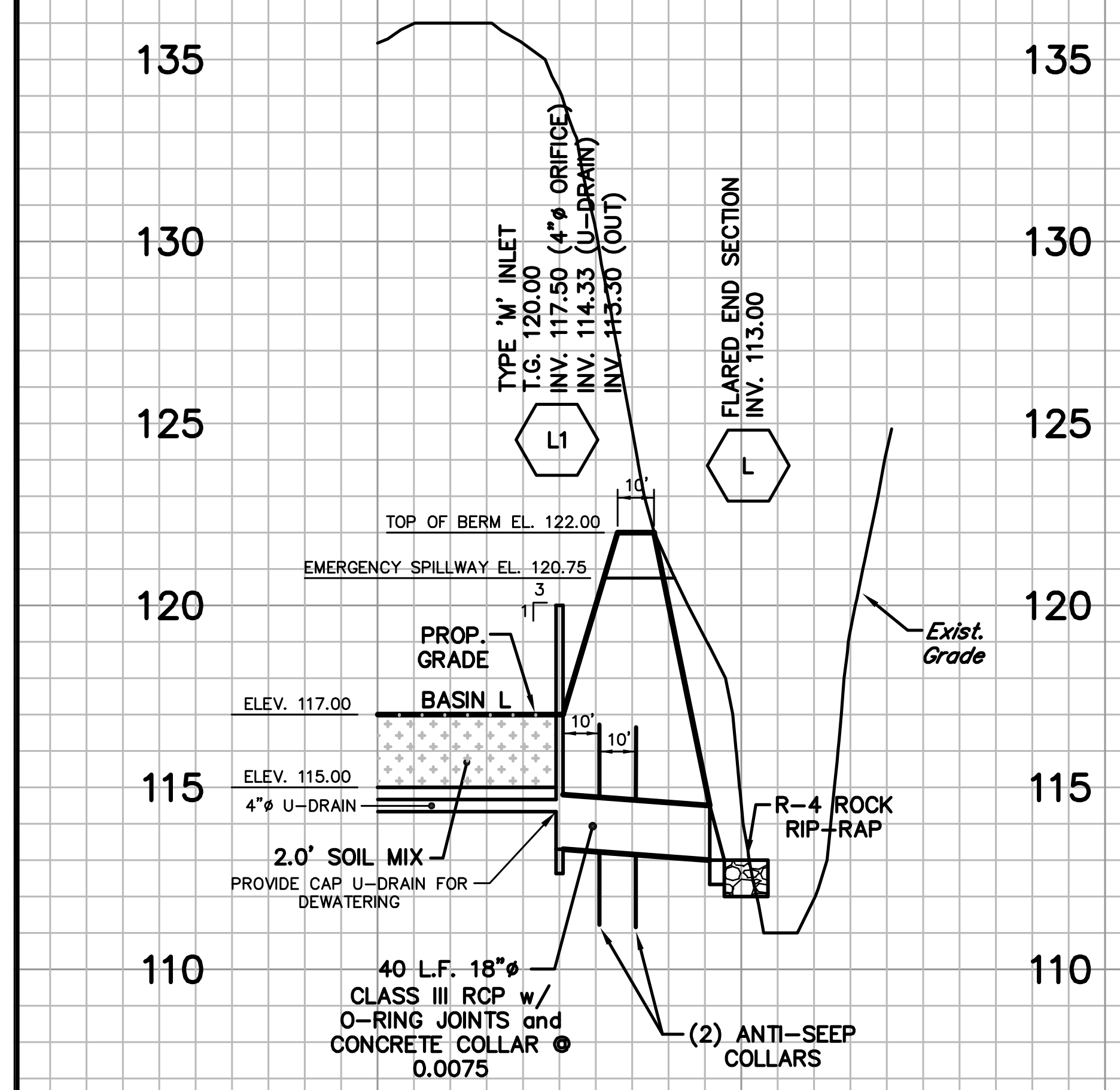
BASIN H OUTFALL

		0	+25	+50	+75	1
119.88	122.61	124.66	126.16	123.18	116.00	119.00



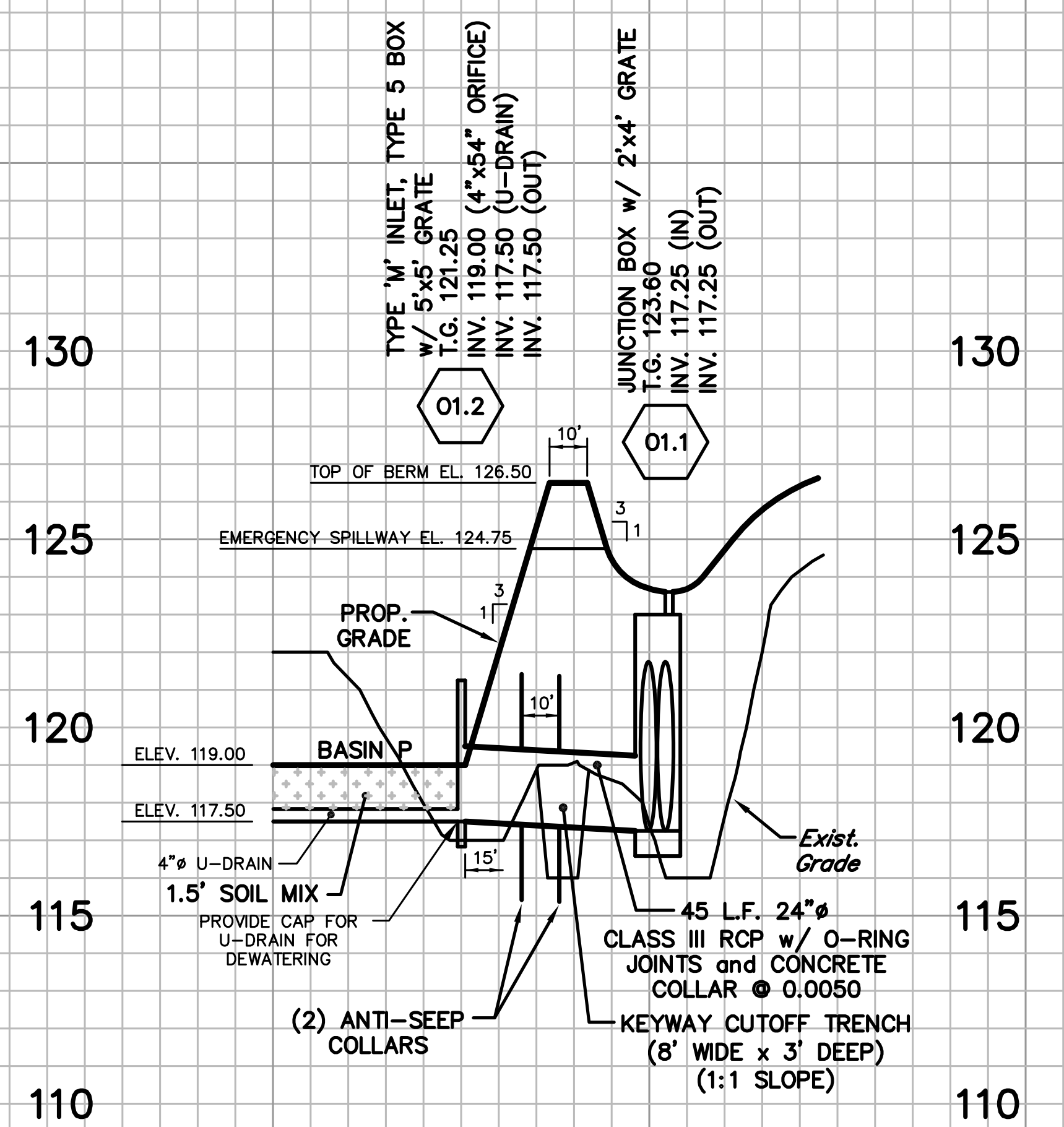
BASIN K OUTFALL

		0	+25	+50	+75	1
136.43	136.43	136.00	127.64	117.50	116.63	



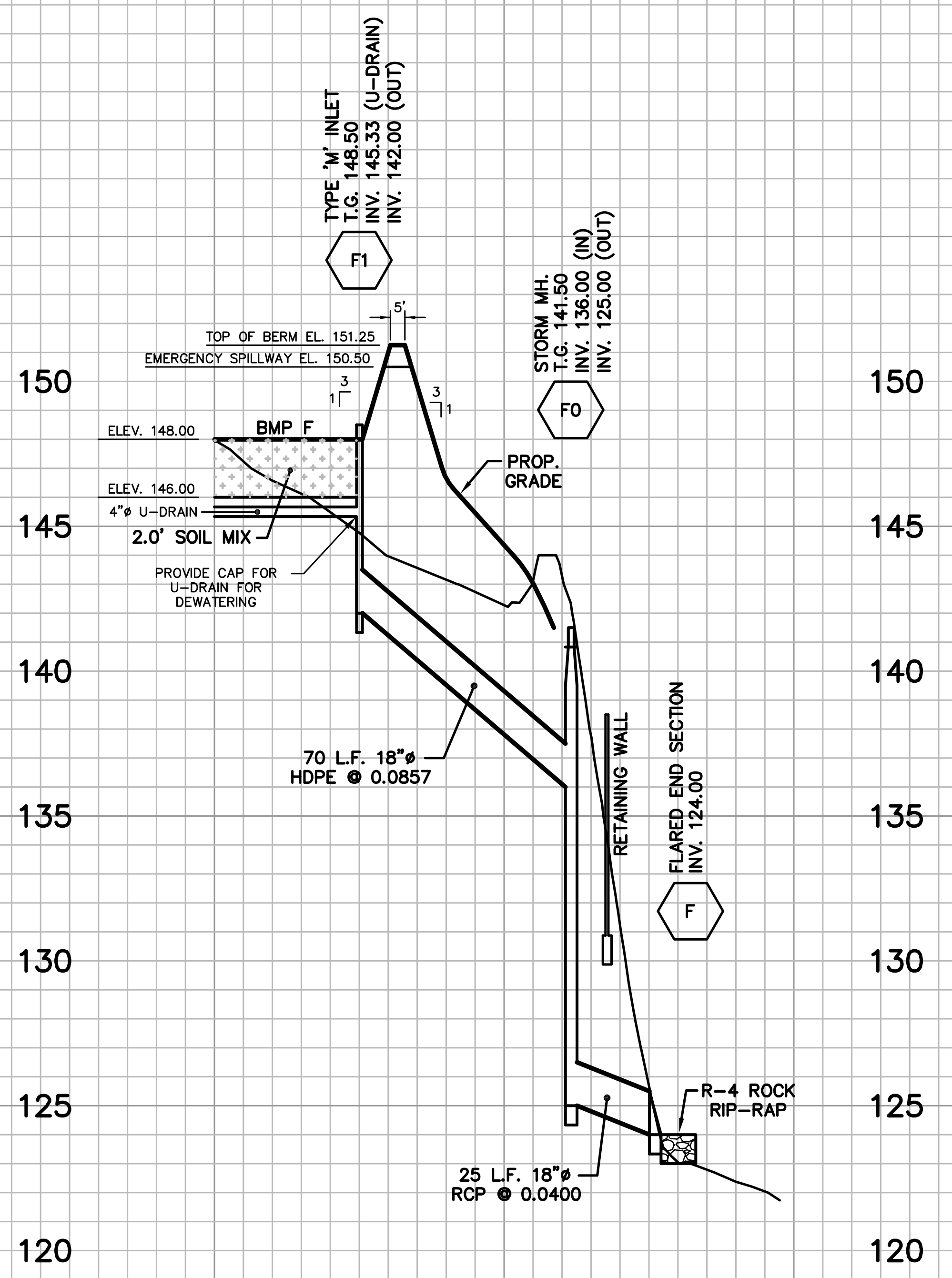
BASIN L OUTFALL

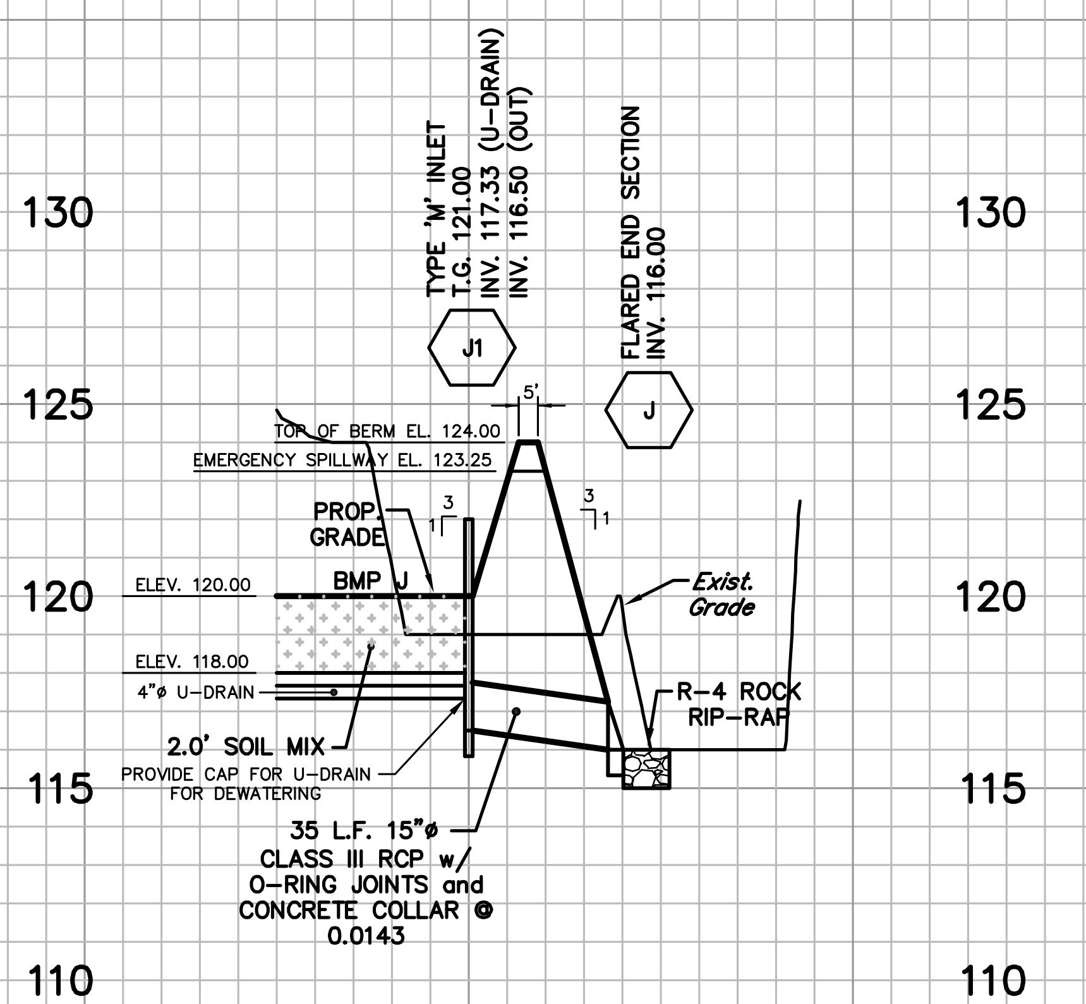
		0	+25	+50	+75	1
134.4	135.0	133.1	121.4	113.5	113.5	



BASIN P OUTFALL

		0	+25	+50	+75	1
122.0	120.6	117.0	119.0	117.4	119.7	



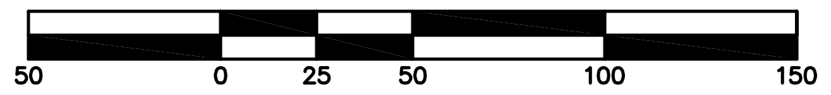


BMP J OUTFALL

		0	+25	+50	+75
124.8	123.3	119.0	119.0	116.0	116.0

BMP F OUTFALL

		0	+25	+50	+75	1	
147.9	146.3	144.8	143.4	142.3	141.0	125.7	122.6



GRAPHIC SCALE

No.	INT.	REVISIONS	DATE
		S.T.A. PLAN ORIGINATION DATE	DEC. 17, 2018

PCSM PROFILES – BASIN & BMP OUTFALLS
OF
STORM SEWER
AS PART OF THE
GLASGOW TRACT
PREPARED FOR
GLASGOW, INC.
SITE SITUATE IN
UPPER MERION TOWNSHIP
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S T A
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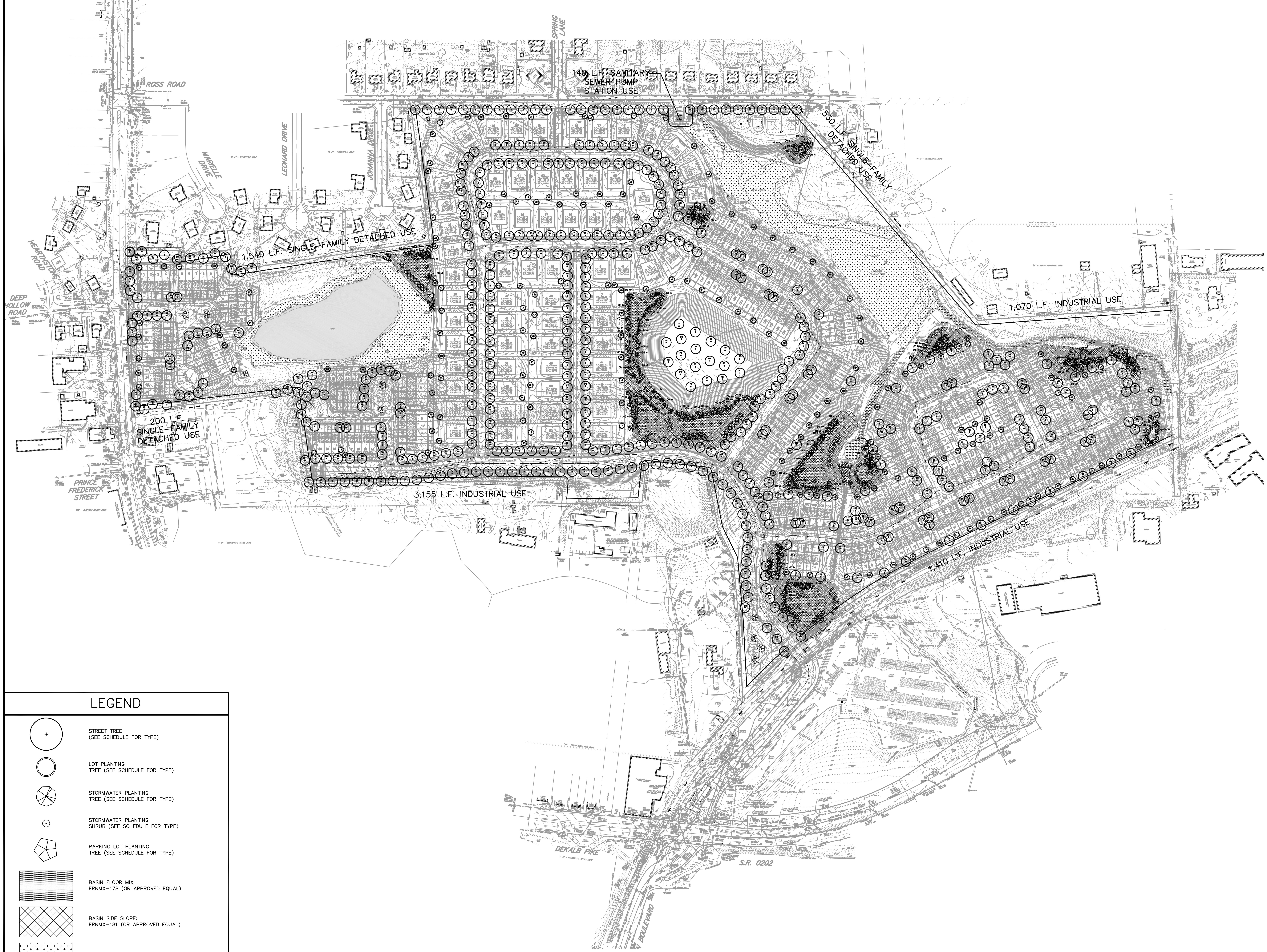
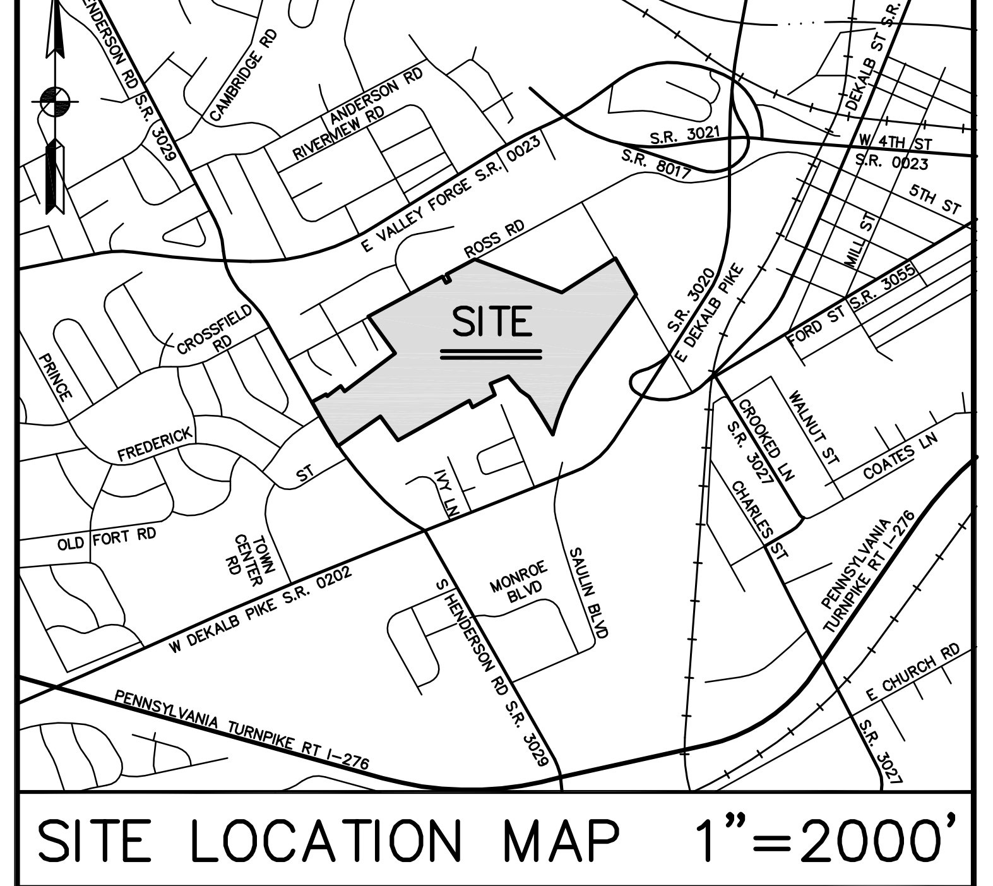
2499 KNIGHT ROAD, PENNSBURG, PA 18073
MAILING: P.O. BOX 87, RED HILL, PA 18076
PH: (215) 679–0200; www.stotac.com

PLAN SCALE	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
HORIZONTAL: 1" = 50' VERTICAL: 1" = 5'	A.C.H.	S.A.R.	55 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674PSTM	

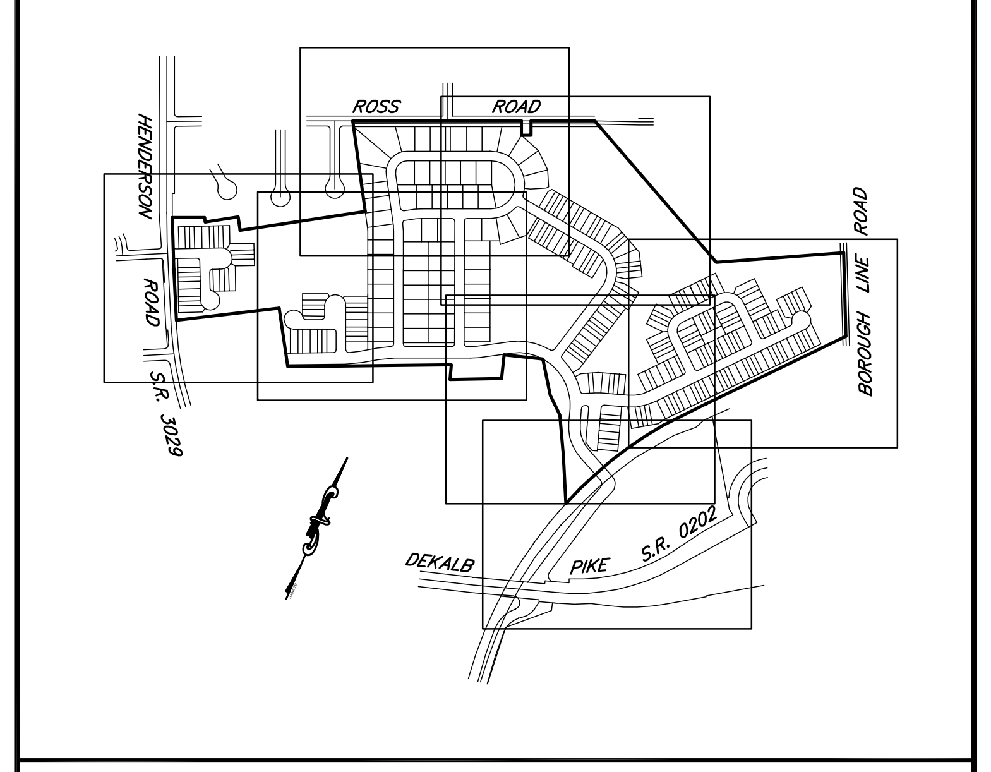


LEGEND

⊕	STREET TREE (SEE SCHEDULE FOR TYPE)
◎	LOT PLANTING TREE (SEE SCHEDULE FOR TYPE)
✳	STORMWATER PLANTING TREE (SEE SCHEDULE FOR TYPE)
⊙	STORMWATER PLANTING SHRUB (SEE SCHEDULE FOR TYPE)
⬠	PARKING LOT PLANTING TREE (SEE SCHEDULE FOR TYPE)
▒	BASIN FLOOR MIX: ERNMX-178 (OR APPROVED EQUAL)
▩	BASIN SIDE SLOPE: ERNMX-181 (OR APPROVED EQUAL)
⊞	AMENDED SOILS
—X——X——X—	TREE PROTECTION FENCE



SITE LOCATION MAP 1"=2000'



KEY MAP 1"=1000'

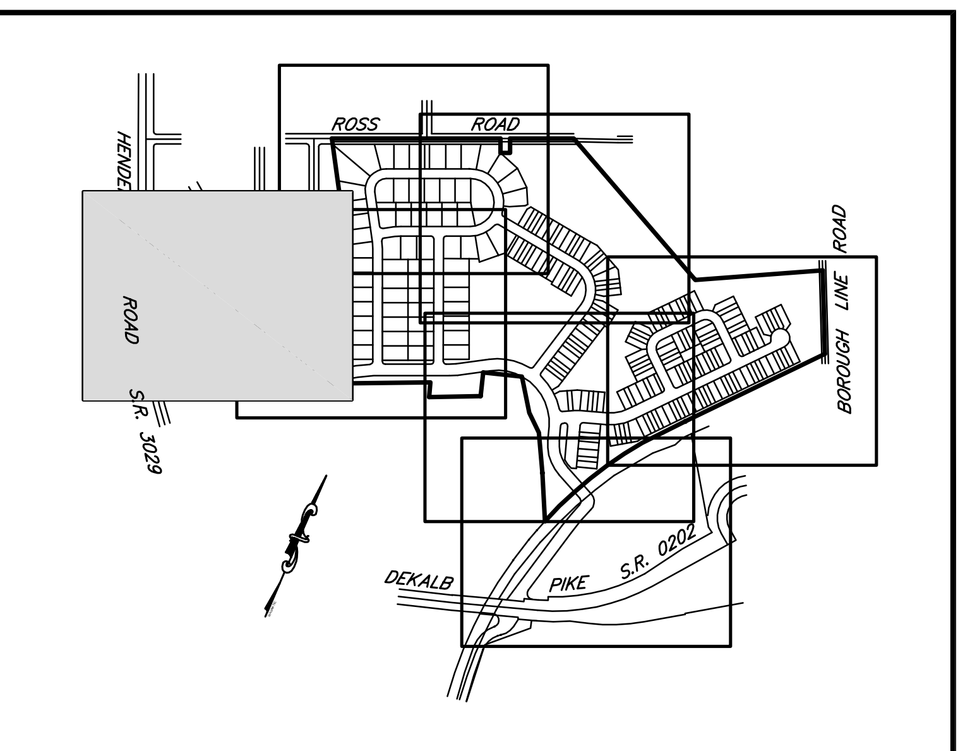
150 0 75 150 300 450
GRAPHIC SCALE

No.	INT.	REVISIONS	DATE
		S.T.A. PLAN ORIGINATION DATE	DEC. 17, 2018

OVERALL PCSM LANDSCAPE PLAN
OF THE
GLASGOW TRACT
PREPARED FOR
GLASGOW, INC.
SITE SITUATE IN
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

S T A
Engineering, Inc.
Civil Engineers • Land Surveyors
2499 KNIGHT ROAD, PENNSBURG, PA 18073
MAILING: P.O. BOX 87, RED HILL, PA 18076
PH: (215) 679–0200; www.stotac.com

PLAN SCALE HORIZONTAL:	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
1"=150'	A.C.H.	S.A.R.	56 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674LA	



KEY MAP 1"=1000'

LEGEND

⊕	STREET TREE (SEE SCHEDULE FOR TYPE)
◎	LOT PLANTING TREE (SEE SCHEDULE FOR TYPE)
⊛	STORMWATER PLANTING TREE (SEE SCHEDULE FOR TYPE)
⊙	STORMWATER PLANTING SHRUB (SEE SCHEDULE FOR TYPE)
⬠	PARKING LOT PLANTING TREE (SEE SCHEDULE FOR TYPE)
▒	BASIN FLOOR MIX: ERNMX–178 (OR APPROVED EQUAL)
▩	BASIN SIDE SLOPE: ERNMX–181 (OR APPROVED EQUAL)
⊞	AMENDED SOILS
—X——X——X—	TREE PROTECTION FENCE
– – – – – –	SIGHT TRIANGLE

50 0 25 50 100 150
GRAPHIC SCALE

No.	INT.	REVISIONS	DATE
		S.T.A. PLAN ORIGINATION DATE	DEC. 17, 2018

PCSM LANDSCAPE PLAN
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PLAN SCALE HORIZONTAL:	DRAFTED BY	PROJECT MANAGER	PLAN SHEET NUMBER
1"=50'	A.C.H.	S.A.R.	57 OF 90
	PROJECT NUMBER 5674	DRAWING FILE NUMBER 5674LA	