POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

SUNOCO PIPELINE, LP - PENNSYLVANIA PIPELINE PROJECT - MIDDLETOWN STATION

LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PENNSYLVANIA

NOVEM□ER 2016

PREPARED BY:

TETRA TECH

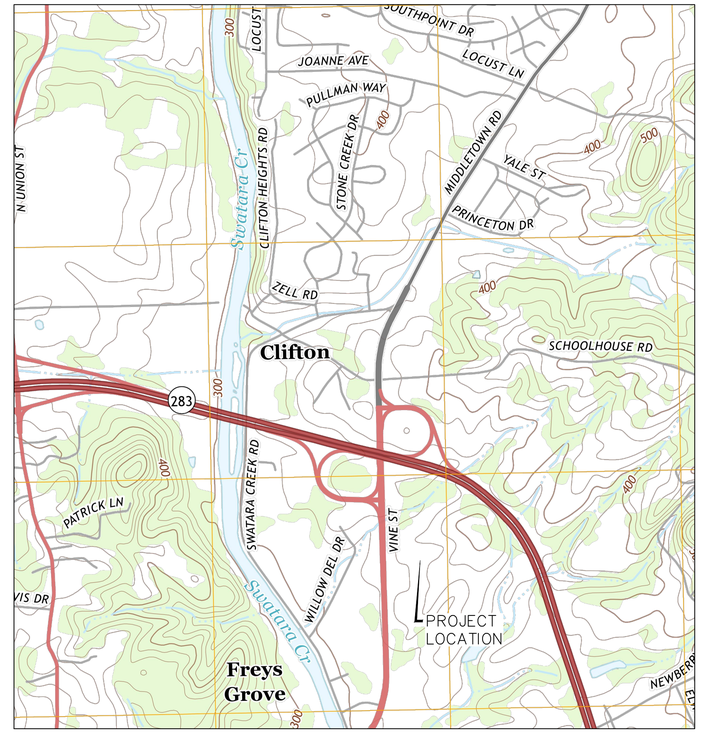
www.tetratech.com

1134 TWIN STACKS DRIVE
DALLAS, PA 18612
T: (570) 674-8648 | F: (570) 674-8651

DATE: NOVEMBER 21, 2016
COVER SHEET 1 OF 9
REVISION #1 – 4/22/16
REVISION #2 – 4/26/16
REVISION #3 – 10/27/16

DRAWING INDEX	
SHEET No.	DRAWING TITLE
1	COVER SHEET AND NOTES
2	EXISTING CONDITIONS PLAN
3	OVERALL SITE PLAN
4	PRE-DEVELOPED DRAINAGE AREA
5	POST-DEVELOPED DRAINAGE AREA
6	CONSTRUCTION DETAILS AND PIPE PROFILES
7	CONSTRUCTION DETAILS
8	CONSTRUCTION DETAILS
9	CONSTRUCTION DETAILS
10	CONSTRUCTION DETAILS

PREPARED FOR:
SUNOCO PIPELINE, LP
525 FRITZTOWN ROAD
SINKING SPRING, PENNSYLVANIA 19608
610-670-3200



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LOCATION MAP
MIDDLETOWN STATION
MIDDLETOWN QUADRANGLE
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY,
PENNSYLVANIA

0 1000 2000
SCALE IN FEET
SCALE: 1"=1000'

GENERAL NOTES

1. DEVELOPER/LEGAL OWNER: SUNOCO PIPELINE, LP
   525 FRITZTOWN ROAD
   SINKING SPRING, PA. 19608
   610-670-3200
2. TAX ACCOUNT #: 34-001-099
   INSTRUMENT #: 20150013017 RECORDED ON MAY 11, 2015
   TOTAL PARCEL SIZE = 27.74 AC
   THE PARCEL WAS FURTHER SUBDIVIDED AS SHOWN ON A MINOR SUBDIVISION PLAN FOR SUNOCO/RYDBOM, REVISION #3 DATED 12-3-2015. FINAL LOT SIZE FOR SUNOCO PIPELINE, LP IS 23.14 ACRES.
3. PUBLIC SEWER AND WATER WILL NOT BE PROVIDED. FACILITY IS UNMANNED.
4. EXISTING CONTOURS, BOUNDARY LINES AND FEATURES COMPILED FROM WWW.PASDA.PSU.EDU & TRICO SURVEYING & MAPPING, INC. ALL PROPOSED CONTOURS PROVIDED BY ROONEY ENGINEERING. ALL CONTOURS ARE BASED ON NAVD 88 DATUM. A BENCHMARK WILL BE SET PRIOR TO THE START OF CONSTRUCTION.
5. NO PORTION OF THE LIMIT OF DISTURBANCE OF THE SITE LIES WITHIN THE 100 YEAR FLOOD ZONE, AS PER F.E.M.A. MAPPING, FIRM PANEL 452 OF 501, MAP #42043C0452D, EFFECTIVE DATE IS 08/02/2012.
6. THERE ARE NO WETLANDS WITHIN THE DISTURBED AREA OF THE SITE.
7. THE ASSOCIATED STORM WATER MANAGEMENT REPORT FOR THIS PROJECT IS TITLED:
   STORMWATER MANAGEMENT REPORT (SWM)
   FOR PENNSYLVANIA PIPELINE PROJECT
   MIDDLETOWN PUMP STATION
   LONDONDERRY TOWNSHIP
   DAUPHIN COUNTY, PA
   MARCH, 2016
8. THE SITE LIES WITHIN A 100% RELEASE RATE DISTRICT OF THE SWATARA CREEK
9. UN-NAMED TRIBUTARY TO SWATARA CREEK IS LISTED AS "WWF" UNDER CHAPTER 93.
10. ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH PENNDOT'S PUBLICATION 408 AND PENNDOT'S PUBLICATION 72M, LATEST EDITION.
11. ALL FRAMES, CONCRETE TOP UNITS, AND GRADE ADJUSTMENT RINGS SHALL BE SET IN A FULL BED OF MORTAR IN ACCORDANCE WITH PUBLICATION 408.

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES 3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE – STOP CALL
Pennsylvania One Call System, Inc.
1-800-242-1776

CERTIFICATION OF ACCURACY

I, TIMOTHY J. CONNOLLY JR.,P.E., HEREBY CERTIFIES THAT THE STORMWATER MANAGEMENT PLAN MEETS ALL DESIGN STANDARDS AND CRITERIA OF THE LONDONDERRY TOWNSHIP'S STORMWATER MANAGEMENT ORDINANCE

COMMONWEALTH OF PENNSYLVANIA – REGISTERED PROFESSIONAL – TIMOTHY J. CONNOLLY, JR. – ENGINEER – No. PE-39066-E

11/21/2016

TIMOTHY J. CONNOLLY JR.,P.E. DATE
PE-39066-E
1134 TWIN STACKS DRIVE, DALLAS, PA. 18612

LEGEND

- EXISTING CONTOURS (360)
- PROPOSED CONTOURS (360)
- PRE-DEV DA BOUNDARY
- POST-DEV DA BOUNDARY
- PROPERTY LINE
- EX. DIRT DRIVE
- LIMIT OF DISTURBANCE = 9.1 AC (LOD)
- PADOT TYPE M PRECAST INLET
- EX. FENCE (x)
- LEVEL LIP SPREADER
- ESCGP-2 BOUNDARY (LOD)
- SOIL BOUNDARY LINE, SOIL TYPE (LrC2)
- EX. POWERLINE (P)
- TREELINE
- EX. WETLANDS

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE\ STEEL*	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Lewisberry		C								X	X	X				
Atkins	X	C/S			X	X	X	X	X	X	X	X				X
Basher	X	C/S			X	X	X	X	X	X	X	X				X

SOIL LIMITATION RESOLUTIONS

All soils within the site are suitable for the intended use. Any topsoil needed in the area can be imported from off-site areas. All soil groups are within acceptable limits of pH reaction. All soils within this project have a slight erosion hazard. However, erosion control blankets (S-150) will be placed on all slopes at 3:1 or steeper. None of the soils on site are susceptible to sinkholes. Soil Piping Resolution: All storm pipes are backfilled with select material, and all proposed storm pipes will have watertight connections. All pipe to inlet connections will also be grouted to remain watertight. Embankments for the detention basin will be compacted to 95% density.

TOPSOIL SPECIFICATIONS: All topsoil to be imported to the site shall meet the requirements of Section 802 of PADOT Form 408 specifications. The material shall meet the following grading requirements:

Sieve	Min. % passing
2 in.	100 %
No. 4	75 %
No. 10	60 %

Sand, silt and clay material passing the No. 10 sieve, as defined by PTM No. 103, and within the following ranges:

	Min. %	Max %
Sand	5	70
Silt	10	70
Clay	5	36

SOILS ANALYSIS

Existing soils on site include the following:
At - Atkins Silt loam
Erosion Hazard = Slight
Bc - Basher Silt loam
Erosion Hazard = Slight
LrB2, LrC2, LrD2 - Lewisberry gravelly sandy loam, 3-25%
Erosion Hazard = Moderate

SURVEY LEGEND

- 5/8" REBAR W/CAP INSCRIBED "GRAHAM SU 075199" (SET)
- IRON PIPE FOUND
- REBAR FOUND
- UTILITY POLE
- CHAIN LINK FENCE CORNER
- P.O.B. - POINT OF BEGINNING
- (M) - MEASURED DIMENSION
- (R) - RECORD DIMENSION
- HIGH TENSION POWER TOWER

FOR PROPERTY LINE INFORMATION, SEE THE ATTACHED FINAL MINOR SUBDIVISION PLAN PREPARED BY TRICO SURVEYING AND MAPPING, INC. DATED JUNE 25, 2015 (LAST REVISED ON 12.3.15)

0 75 150
SCALE: 1"=75'

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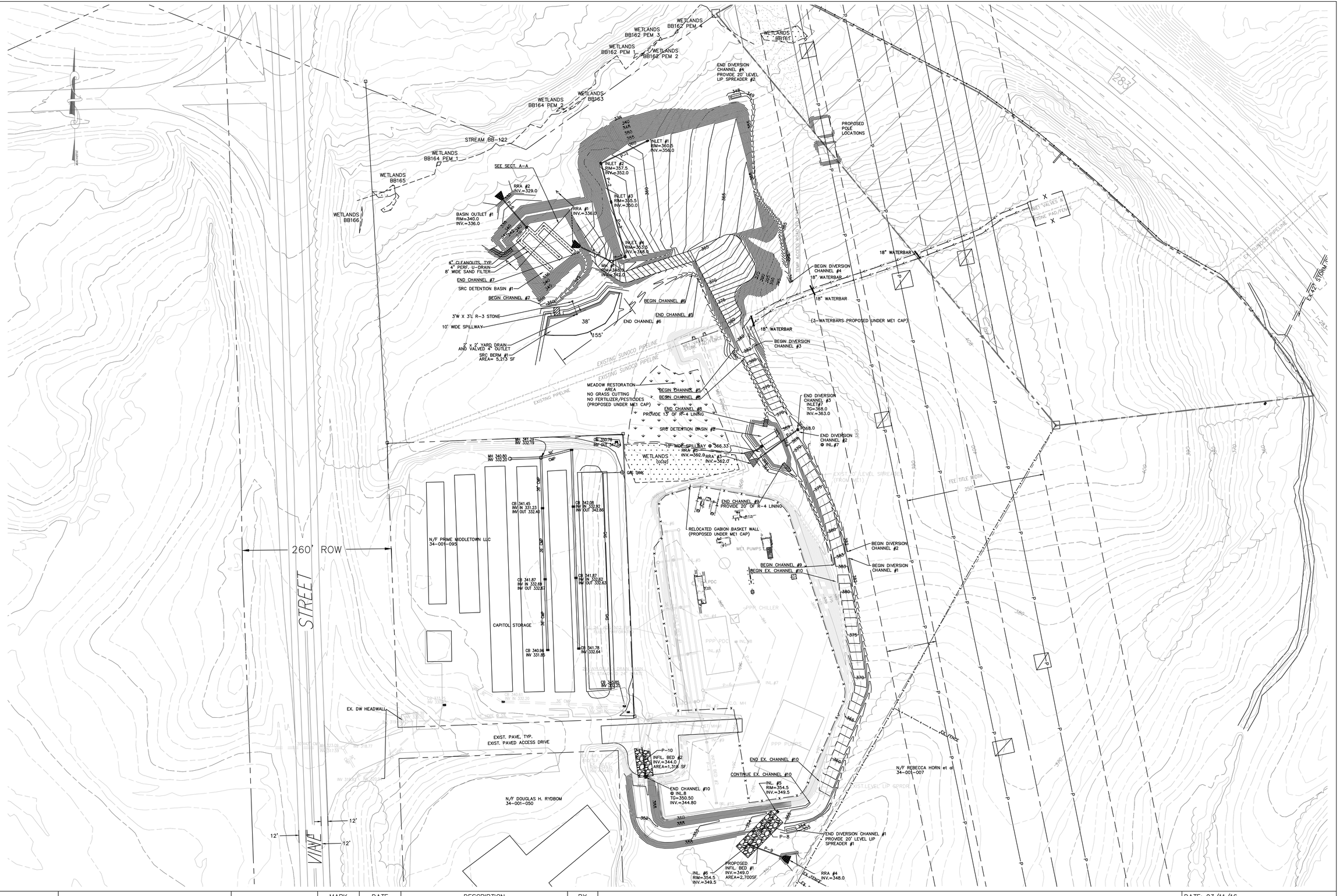
1.	4/22/16	REVISED PER EXISTING SURVEY	GZ
2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ

PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – EXISTING CONDITIONS

DATE:	03/11/16
PROJECT NO.:	112IC05370
DRAWN BY:	GZ
CHECKED BY:	TC
SCALE:	1"=75'
FILE:	BASEPLAN
NAME:	EX 2



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3 OF 9

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PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – OVERALL SITE

DATE: 03/11/16
PROJECT NO.: 112IC05370
DRAWN BY: GZ
CHECKED BY: TC
SCALE: 1"=75'
FILE: BASEPLAN
NAME: OVERALL3

0 75 150
SCALE: 1"=75'

4
OF
9

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PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

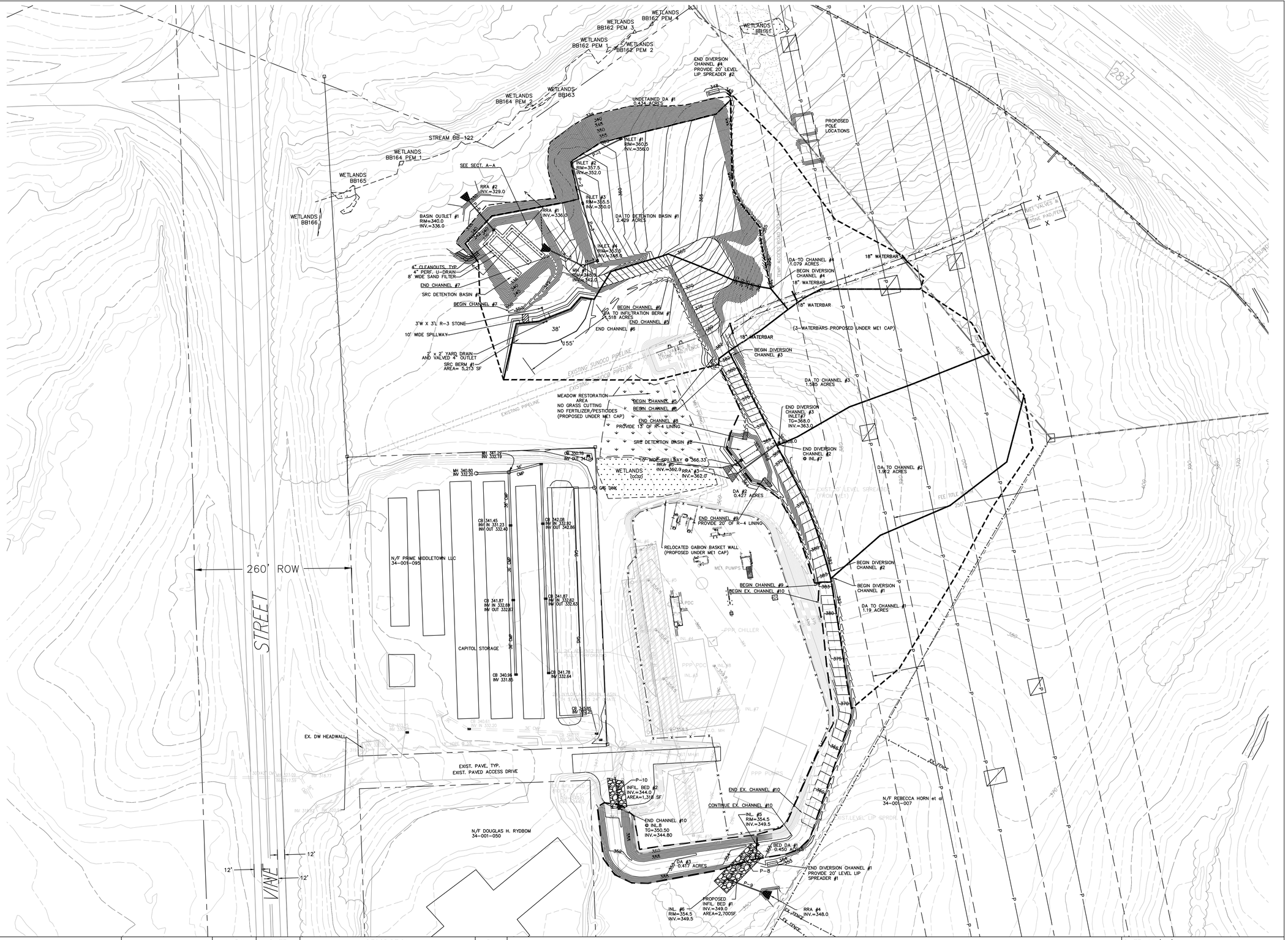
PCSM PLAN – PRE-DEVELOPED DRAINAGE AREA

DATE: 03/11/16
PROJECT NO.: 112IC05370
DRAWN BY: GZ
CHECKED BY: TC
SCALE: 1"=75'
FILE: BASEPLAN
NAME: DA4

PROPOSED STORM PIPE TABLE

INLET	TG	INV	PIPE	LENGTH	SIZE	SLOPE
INL. 1	360.50	356.00				
			P-1	89	15"	4.49%
INL. 2	357.50	352.00				
			P-2	67	15"	2.99%
INL. 3	355.50	350.00				
			P-3	97	15"	2.06%
INL. 4	353.50	348.00				
			P-4	22	15"	27.27%
MH 1	348.00	342.00				
			P-5	60	15"	10.00%
RRA 1	------	336.00	------	------	------	------
BASIN OUTLET	340.00	336.00				
			P-6	64	15"	10.94%
RRA 2	------	329.00	------	------	------	------
INL.7	368.00	363.00				
			P-7	89	15"	1.12%
RRA 3	------	362.00	------	------	------	------
INL 5	354.5	349.50				
			P-8	54	24" PERF.	0.00%
INL 6	354.5	349.50				
			P-9	50	15"	3.00%
RRA 4	------	348.00	------	------	------	------
INL.8	350.5	344.80				
			P-10	53	24" PERF.	0.57%
EX. INLET	------	344.50	------	------	------	------
BASIN OUTLET	367.00	362.33				
			P-7	22	15"	1.50%
RRA 5	------	362.00				

ALL INLETS ARE PADOT TYPE M PRECAST CONCRETE.
ALL MANHOLES ARE 4' DIAMETER PRECAST CONCRETE.
ALL STORM INLETS AND MANHOLES MUST HAVE LADDER RUNGS
ALL STORM PIPE IS SLCPP, ADS-N12 OR APPROVED EQUAL.
ALL COMPOST FILTER SOCK IS 24" HEIGHT.
PLACE "SILTSACK" FILTER BAGS IN ALL INLETS.
ALL INLETS SHALL CONTAIN A PAINTED MARKER THAT STATES, "NO DUMPING, DISCHARGES TO STREAMS".



0 75 150
SCALE: 1"=75'

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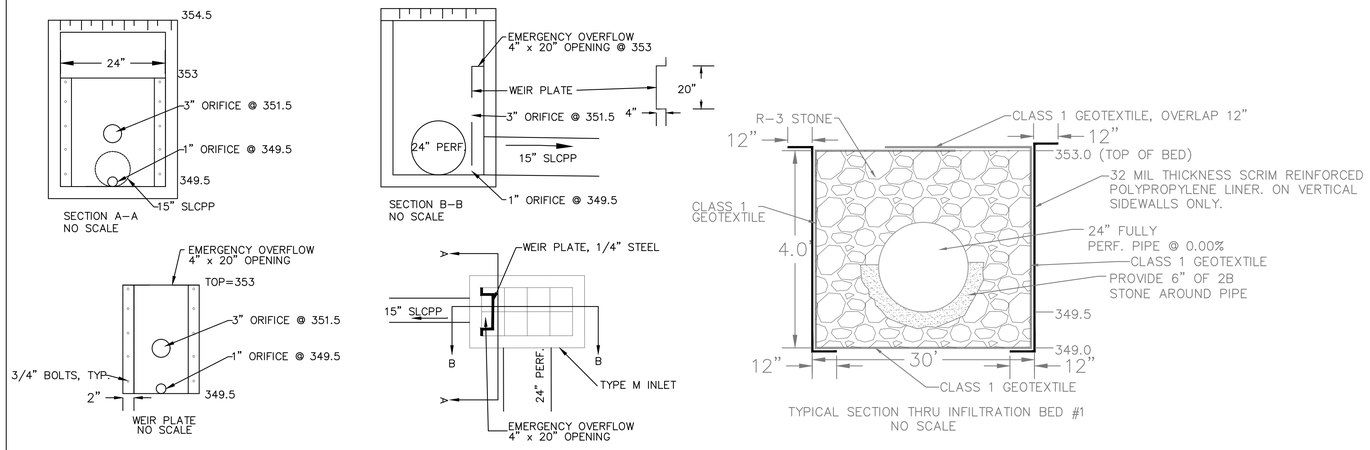
PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN - POST-DEVELOPED DRAINAGE AREA

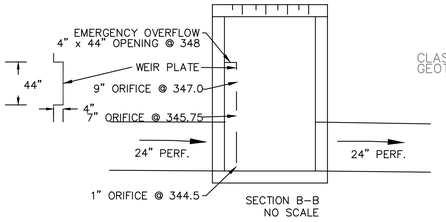
DATE:	03/11/16
PROJECT NO.:	112IC05370
DRAWN BY:	GZ
CHECKED BY:	TC
SCALE:	1"=75'
FILE:	BASEPLAN
NAME:	DA5

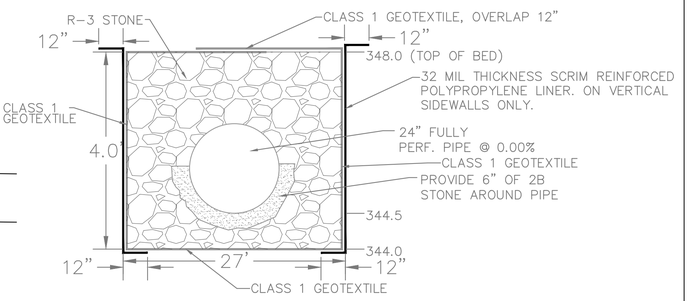
As part of site earthwork construction, the following Construction Testing and Inspection (CTI) procedures shall be implemented:

- Prior to bulk grading, all vegetation, topsoil, tree root balls, root zone materials, and other deleterious materials shall be completely removed from grading areas.
- Prior to placement of fill, subgrade areas shall be proof-rolled with a minimum 15-ton roller in the presence of a qualified geotechnical technician. Any localized soft and unstable areas encountered during the proof-rolling program that cannot be adequately stabilized and compacted shall be undercut and replaced using approved materials. Proof-rolling shall also occur at final "cut" area grades. Before placing the first layer of fill materials, the surface of areas where fill is to be placed shall be scarified to a depth of no less than 6 inches, and then compacted to no less than 92 percent of Modified Proctor Density (ASTM D1557).
- Fill material shall be placed in horizontal thin lifts with a compacted thickness no greater than 8 inches. **Importantly**, benching of fills into existing site slopes shall occur to ensure that lifts are placed horizontally (i.e., level) and not on a slope, and to tie placed fill materials into site in-situ soils. Benching of embankment fills shall be performed, where existing slopes are steeper than 6H:1V.
- Each thin lift of fill material shall be compacted to a minimum 92% of its maximum dry density, as determined by the Modified Proctor Test (ASTM D1557), except that the top 12 inches of sub-grade beneath structurally loaded areas (such as slabs, pavement, and foundations) shall be compacted to no less than 95 percentage points of optimum). Fill material shall be placed at moisture contents that facilitate compaction (typically at +/- 2-3% of optimum moisture, per ASTM D1557).
- Compaction Testing: Testing agency shall test compaction of soils in place using a density gauge according to ASTM D 2922 and ASTM D3017. Tests of each compacted lift of fill material shall be performed at the following frequency: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less, but in no case fewer than 3 tests.
- Site preparation, proof-rolling, fill placement, benching, and compaction of fill soils shall be monitored and tested on a full-time basis by a qualified geotechnical technician to document construction.

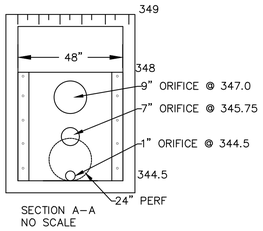


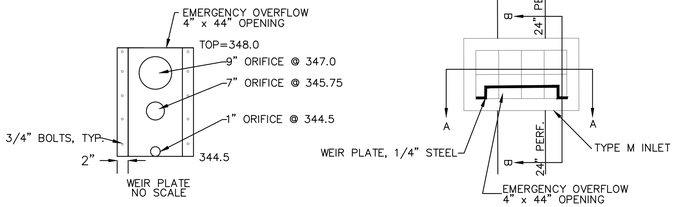
INLET #6 DETAILS – NO SCALE



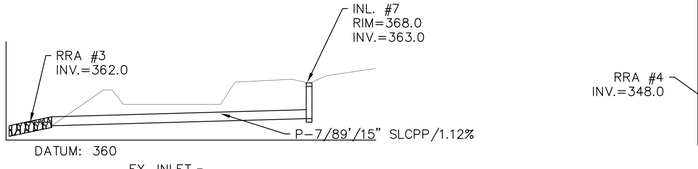


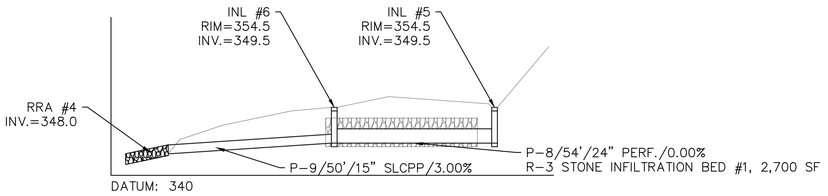
TYPICAL SECTION THRU INFILTRATION BED #2
NO SCALE

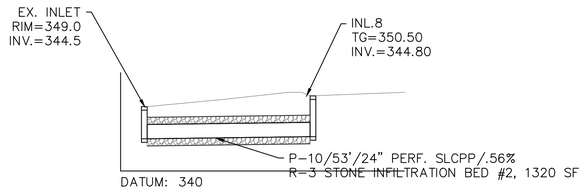


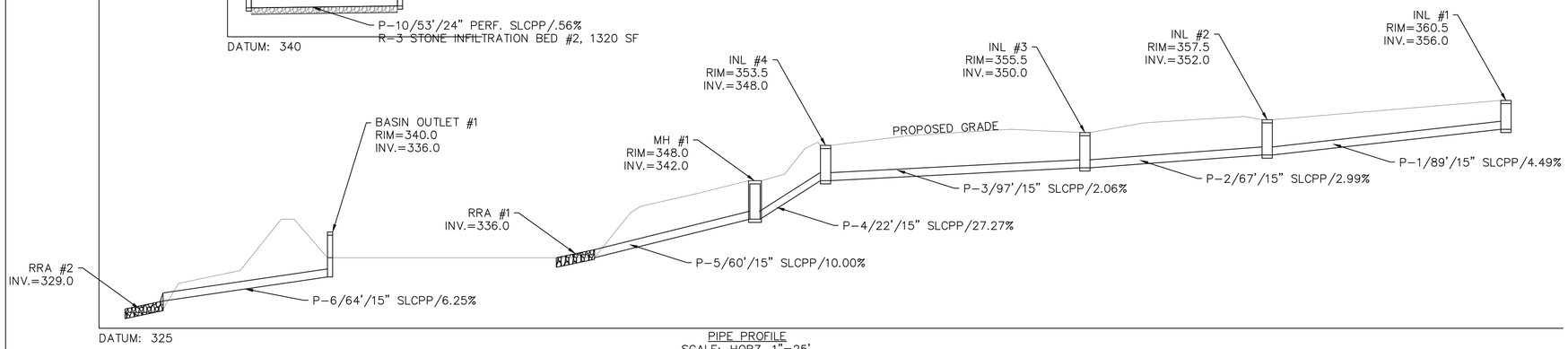


EX. INLET DETAILS – NO SCALE



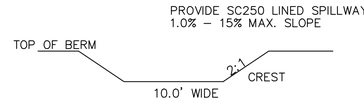




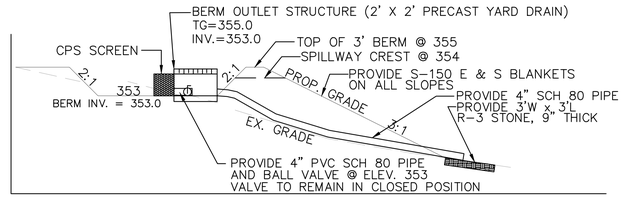


PIPE PROFILE
SCALE: HORZ. 1"=25'
VERT. 1"=10'

The following is a typical construction sequence for a SRC berm.
1. Protect berm area from compaction prior to installation.
2. If possible, install berm during later phases of site construction to prevent sedimentation and/or damage from construction activity. After installation, prevent sediment laden water from entering inlets and pipes.
3. Install and maintain proper Erosion and Sediment Control Measures during construction.
4. If necessary, excavate berm bottom to an uncompacted subgrade free from rocks and debris. Do NOT compact subgrade.
5. Install Outlet Control Structures, 4" ball valve and 4" outlet pipe, R–3 riprap.
6. Seed and stabilize topsoil. (Vegetate if appropriate with native plantings.)
7. Do not remove Inlet Protection or other Erosion and Sediment Control measures until site is fully stabilized.



TYP. SPILLWAY – INFILTRATION BERMS
NO SCALE



SRC BERM #1
NO SCALE

Maintenance Issues
SRC Berms have low to moderate maintenance requirements, depending on the design.
SRC Berms
Regularly inspect to ensure they are draining within 72 hours; monitor drawdown time after major storm events over 1". Inspect any structural components, such as inlet structures to ensure proper functionality.
If planted in turf grass, maintain by mowing. Other vegetation will require less maintenance. Trees and shrubs may require annual mulching, while meadow planting requires annual mowing and clippings removal.
Avoid running heavy equipment over the bottom area at the base of the berms. The crest of the berm may be used as access for heavy equipment when necessary to limit disturbance.
Routinely remove accumulated trash and debris. Clean in front of CPS screen
Remove invasive plants as needed
Inspect for signs of flow channelization; restore level gradient immediately after deficiencies are observed
4" BALL VALVE AND DRAIN IS ONLY TO BE USED TO SLOWLY DRAIN BERM AREA FOR MAINTENANCE OR IF ADDITIONAL STORAGE IS NEEDED FOR AN UPCOMING STORM.

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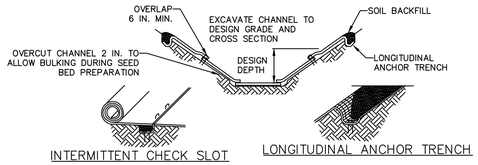
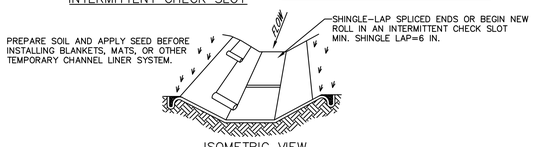
PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – CONSTRUCTION DETAILS AND PIPE PROFILES

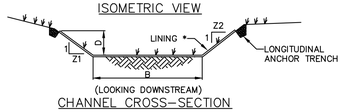
DATE:	03/11/16
PROJECT NO.:	112IC05370
DRAWN BY:	GZ
CHECKED BY:	TC
SCALE:	AS NOTED
FILE:	CONSTDET
NAME:	PCSM 6



INTERMITTENT CHECK SLOT LONGITUDINAL ANCHOR TRENCH



ISOMETRIC VIEW



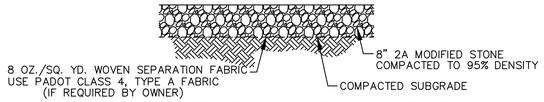
CHANNEL CROSS-SECTION

* SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, VEGETATIVE STABILIZATION FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION

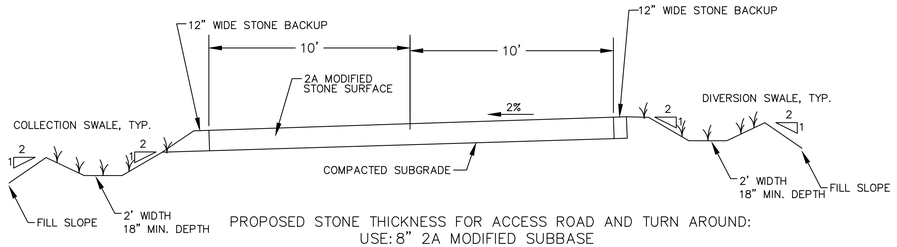
CHANNEL NO.	STATIONS	BOTTOM WIDTH B (FT)	DEPTH D (FT)	TOP WIDTH W (FT)	Z1 (FT)	Z2 (FT)	LINING *
1	FULL CHANNEL	2	2	10	2	2	C125
2	FULL CHANNEL	2	2	10	2	2	C125
3	FULL CHANNEL	2	2	10	2	2	C125
4	FULL CHANNEL	2	2	10	2	2	C125
5	FULL CHANNEL	2	2	10	2	2	C125
6	FULL CHANNEL	2	2	10	2	2	C125
7	FULL CHANNEL	2	2	10	2	2	C125
8	FULL CHANNEL	2	2	10	2	2	C125
9	FULL CHANNEL	2	2	10	2	2	C125
10	FULL CHANNEL	2	2	10	2	2	C125

NOTES:
-ANCHOR TRENCHES SHALL BE INSTALLED AT BEGINNING AND END OF CHANNEL IN THE SAME MANNER AS LONGITUDINAL ANCHOR TRENCHES.
-INSPECT CHANNELS AFTER ALL RAINFALL EVENTS OVER 1". COMPLETE DEP INSPECTION LOG FOR ALL SITE VISITS.
-CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CHANNEL SHALL BE CLEANED WHENEVER TOTAL CHANNEL DEPTH IS REDUCED BY 25% AT ANY LOCATION.
-SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.
-NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT CHANNELS TO ENSURE SUFFICIENT CHANNEL CAPACITY.

MODIFIED CONSTRUCTION DETAIL #6-1
VEGETATED CHANNEL

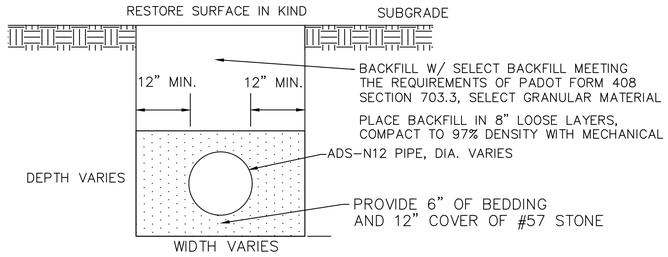


GRAVEL SURFACE FOR EQUIPMENT PAD & ACCESS ROAD
NOT TO SCALE

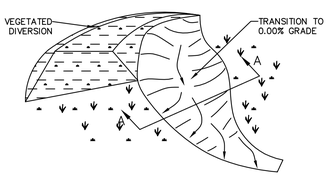


PROPOSED STONE THICKNESS FOR ACCESS ROAD AND TURN AROUND:
USE:8" 2A MODIFIED SUBBASE

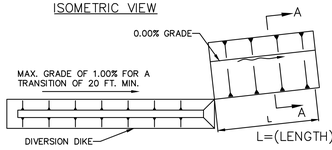
20' WIDE STONE ACCESS ROAD DETAIL
NOT TO SCALE



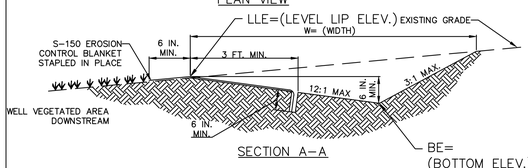
TYPICAL STORM SEWER TRENCH
(ON PRIVATE PROPERTY)
NO SCALE



ISOMETRIC VIEW



PLAN VIEW

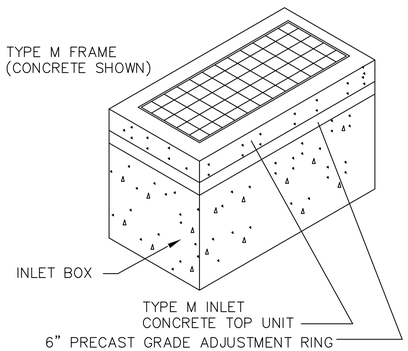


SECTION A-A

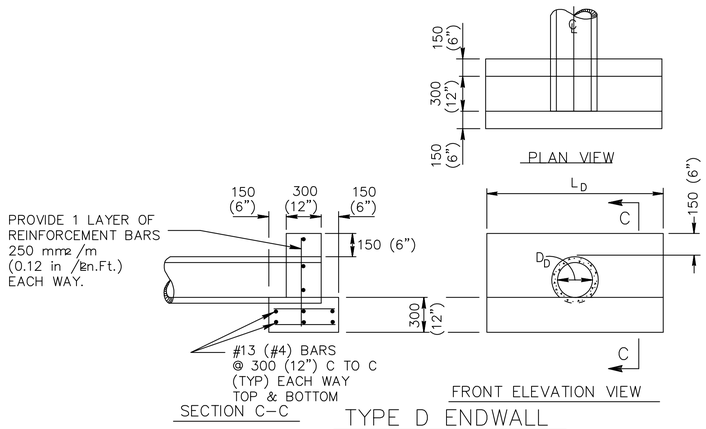
LEVEL SPREADER #	L=	BE=	LLE=	W=
#1	20'	352.5	353.0	6.5'
#2	20'	347.5	348.0	6.5'

MODIFIED CONSTRUCTION DETAIL #9-5
EARTHEN LEVEL SPREADER
NOT TO SCALE

MAINTENANCE SCHEDULE: LEVEL LIP SPREADERS
-INSPECT LEVEL LIP SPREADER AFTER ALL RAINFALL EVENTS OVER 1". COMPLETE DEP INSPECTION LOG FOR ALL SITE VISITS.
-LEVEL SPREADER DIMENSIONS SHALL BE CONSTANTLY MAINTAINED.
-NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED.
-REPAIR ANY WASHOUTS ON LEVEL LIP IMMEDIATELY.



PADOT TYPE "M" PRECAST CONCRETE INLET



TYPE D ENDWALL

CONSTRUCTION SEQUENCE

1. **ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.**
2. Field mark Limit of Disturbance, Waters of the Commonwealth, which include wetlands, streams, spring seeps and all areas shown as Protected Areas on the Existing Conditions Plan. Field mark compost filter sock placement.
3. Install stabilized construction entrance.
4. Install and stabilize diversion channels #1 through #4. Install level lip spreaders on Channels #1 and #2. Place lining, seed and mulch channels immediately. Install inlet #7 and diversion pipe #7. Install riprap apron on pipe #7.
4. After diversion channels are constructed and stabilized, install remaining compost filter sock as indicated on plan, for remainder of site.
5. Complete clearing and grubbing of access roadway. Complete excavation/grading of access roadway up to pad area. Install all collector channels along roadway. (10, 9, 8, 5, 6, 7). Place subbase on roadway immediately after subgrade is completed.
6. When roadway and collector channels are stabilized, install headwall, pipe P-10, P-9, P-8, inlets #5 and #6 and Infiltration Bed #1 and #2. Install riprap apron #4. Stabilize all areas. PROFESSIONAL OVERSIGHT REQUIRED DURING INSTALLATION OF ALL ASPECTS OF BEDS #1 AND #2.
7. Install SRC Basin #1 and #2. Install SRC Berm #1. Do NOT install sand filter or 4" underdrain at this time. PROFESSIONAL OVERSIGHT REQUIRED DURING CONSTRUCTION OF ALL ASPECTS OF THE SRC BASINS/BERM AND OUTLET WORKS. Stabilize all basin slopes immediately after grading is completed, install S-150 erosion control blankets on slopes.
8. Any materials removed from the site, and not taken to a permitted landfill, will require a separate Erosion Control Plan submittal.
9. Complete remainder of site grading for proposed substation equipment pad area. Stabilize all slopes immediately. As grass areas reach final grade, seed and mulch, install S-150 erosion control blankets on all slopes steeper than 3H:1V.
10. After pad reaches final grade, install storm inlets and pipes into SRC Basin #1.
11. Complete all pump station NGL piping and substation equipment installation.
12. Complete final seeding and mulching of remaining disturbed areas.
13. After 70% stabilization is reached, install SRC Berm #1 and the outlet works. PROFESSIONAL OVERSIGHT REQUIRED DURING CONSTRUCTION OF THE SRC BERM AND OUTLET WORKS. Stabilize all berm slopes immediately after grading is completed, install S-150 erosion control blankets on slopes.
14. Install 4" perforated underdrain and 24" depth sand filter within both SRC basins #1 and #2. Connect 4" under drain to the basin outlet structure, provide 4" valve within structure. Insure that all pipe connections to the outlet structure are watertight. Limit the disturbance within the basin bottom during this phase of work. Stabilize all areas immediately.
15. An area shall be considered to have achieved final stabilization when it has a MINIMUM uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movement. After site reaches 70% stabilization, remove and dispose of any remaining compost filter socks in a legal manner. "Siltsacks" can be removed and reused on future phases/ projects. Bags shall be removed and cleaned or replaced when the bag is 1/2 full. At 70% stabilization, the stabilized construction entrance can also be removed.
16. All controls must be installed prior to beginning any grading or excavation work on the project. The developer will be responsible to insure that controls are installed and functioning as per plan, prior to the commencement of work.

TEMPORARY CONTROLS

1. Place compost filter sock as indicated.
2. Material imported to the site will be stockpiled in designated areas and surrounded by 12" high compost filter sock.
3. Sediment removed from control facilities will be stockpiled in designated areas, surrounded by compost filter sock and temporarily seeded. Sediment will be reused for future landscaping.
4. Areas left exposed and not subject to construction traffic shall receive a temporary seeding.
5. A stabilized construction entrance will be placed as shown and maintained until the project is complete.
6. Place Siltsacks in all inlets.
7. Place stone subbase over pad and driveway as soon as possible after grading is completed.
8. The total length of excavated trench open at any one time should not be greater than the total length of pipeline/utility line than can be placed in the trench and back-filled in one working day. No more than 50 l.f. of open trench should exist when pipeline/utility line installation ceases at the end of the workday. Complete soil supplements, seeding and mulching within 7 days after the pipeline/utility line is installed.
9. North American Green S-150 erosion control blankets will be placed **ON ALL DISTURBED AREA SLOPES AT 3H:1V OR STEEPER.**

PERMANENT CONTROLS

1. Permanent seeding and mulching specifications are described on plans.
2. Complete seeding and mulching as soon as areas are at grade.
3. Install Stormbasins in Inlets #4, 5, and 6.
4. Permanent diversion channels, level lip spreaders and Pipe #7 will re-direct upstream flows around the work areas.
5. Permanent collector channels will divert flows from roadways and other impervious areas into permanent BMPs.

INSPECTION AND MAINTENANCE OF CONTROL FACILITIES

1. ALL BMP'S are to be inspected AT LEAST ONCE WEEKLY AND AFTER ALL RUNOFF EVENTS OVER 1" IN DEPTH.
2. Retained sediment will be utilized for landscaping.
3. All control facilities will remain in place until final stabilization is complete. Maintenance must include inspections of all erosion and sedimentation control facilities after each runoff event and on a weekly basis. All preventative and remedial work, including cleanout, repair, replacement, regrading, reseeding, remulching and renetting, must be performed immediately. Any sediment removed from BMP's shall be disposed of in landscaped areas outside of steep slopes, wetlands, floodplains or drainage swales and immediately stabilized or placed in topsoil stockpiles.
4. The developer will be responsible for inspection and maintenance of facilities during construction. The developer (Sunoco Pipeline, LP) will be responsible for permanent inspection and maintenance after stabilization is complete. All controls must be installed prior to beginning any grading or excavation work on the project. The developer will be responsible to insure that the controls are installed as per plan. BMP's WILL BE OWNED AND MAINTAINED BY THE DEVELOPER. Maintenance of BMP's will include the following:

a. Inspect BMP's at least once per month or after any rainfall event over ONE INCH. Remove accumulated sediment and/or garbage that remain in the inlets or basin outlet structures.

b. Any accumulated sediment within the inlets will be removed and stockpiled in designated areas, or removed from the site and deposited in an approved landfill or dump area.

c. Inspect BMP's after any rainfall event over ONE INCH. Immediately repair and stabilize any washouts within swales or slope areas. Any gullies that form on surfaces must be immediately repaired with topsoil material, soil supplements, seed and mulch. Do not direct runoff to swales or BMP's until all upstream areas are stable and free from sediment-laden runoff.

d. The developer must ensure that visual site inspections are conducted weekly, and within 24 hours after each measurable rainfall event throughout the duration of construction.

5. Project construction wastes and demolition waste shall be disposed of in a legal manner. Individuals responsible for earth disturbance activities must ensure that proper mechanisms are in place to control waste materials. Building and demolition waste (ie. drywall, wood) will be transported to landfills. Construction wastes include, but are not limited to, excess soil material, building materials, concrete wash water, sanitary wastes, etc., that could adversely impact water quality. Any soil or rock not needed for construction purposes will be stockpiled in designated on-site areas and immediately seeded and mulched. Wherever possible, recycling of excess materials is preferred, rather than disposal. Any soil or rock waste or soil borrow areas created off-site will require a separate Erosion Control Plan submission to the appropriate Conservation District.
6. Until the site is stabilized, all erosion and sediment control BMP's must be maintained properly. Maintenance must include inspections of all erosion and sediment control BMP's after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean out, repair, replacement, regrading, reseeding, remulching and renetting must be performed immediately. If erosion and sediment control BMP's fail to perform as expected, replacement BMP's, or modifications of those installed will be required. Use DEP FORM 3150-FM-BWEW0083, dated 2/2012, "Visual Site Inspection Report" to document maintenance completed on the site after construction is completed.
7. All excavated material will remain on site, to be used for embankment areas. There will be no removal of soil to other off-site areas unless Form FP-001 is completed for each waste area.

ENVIRONMENTAL DUE DILIGENCE: DEFINITION

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 subjected to a spill or release of regulated substance. If the fill may have been affected by a spill or release of a regulated substance, it must be tested to determine if it qualifies as a clean fill. Testing should be performed in accordance with Appendix A of the Department's policy *"Management of Fill"*. Fill Material that does not qualify as clean fill is regulated fill. Regulated fill is waste and must be managed in accordance with the Department's municipal or residual waste regulations based on 25 Pa. Code Chapters 287 Residual Waste Management or 217 Municipal Waste Management, whichever is applicable.

DEFINITION: CLEAN FILL IS DESCRIBED AS: Uncontaminated, non-water soluble, non-decomposable, inert, solid material, used asphalt, and brick, block or concrete from construction or 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.)

IMPACT TO DOWNSTREAM WATERCOURSES

The impact to downstream watercourses is minimal. All runoff from the project is directed to an existing unnamed tributary to Swatara Creek.

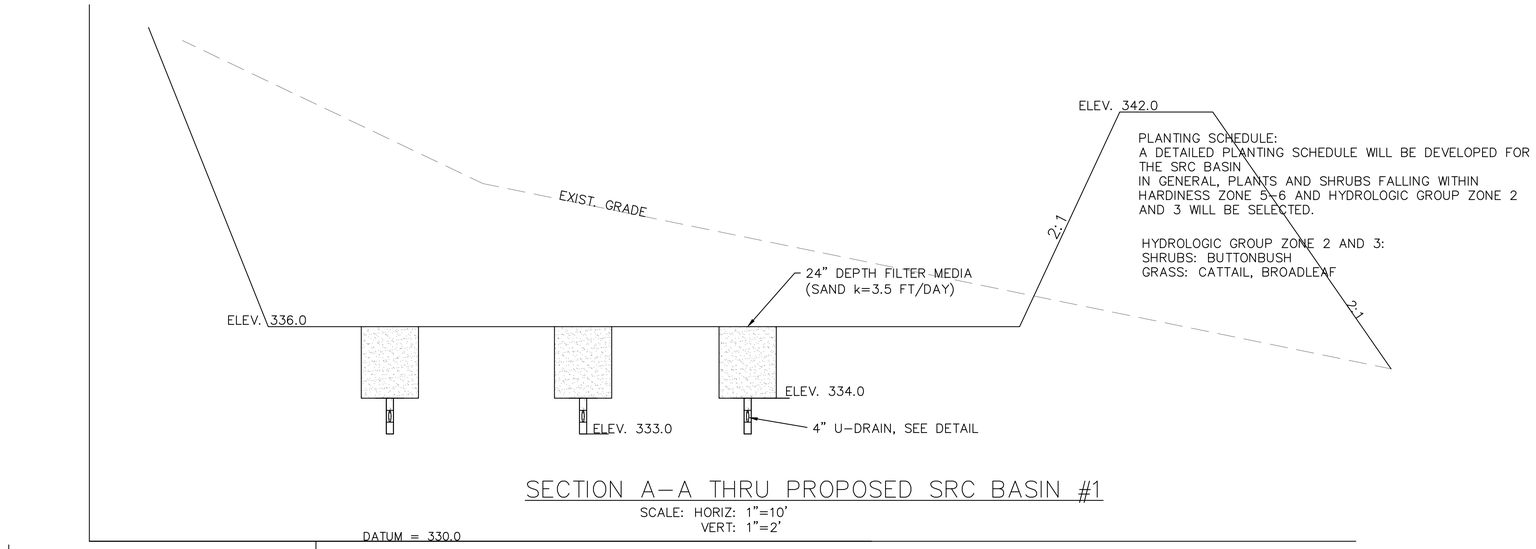
TETRA TECH
www.tetratech.com
1134 TWIN STACKS DRIVE
DALLAS, PA 18612
T: (570) 674-8648 | F: (570) 674-8651

MARK	DATE	DESCRIPTION	BY
2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ

PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – CONSTRUCTION DETAILS

DATE:03/11/16
PROJECT NO.:112IC05370
DRAWN BY:GZ
CHECKED BY:TC
SCALE:AS NOTED
FILE:CONSTDET
NAME:PCSM 7

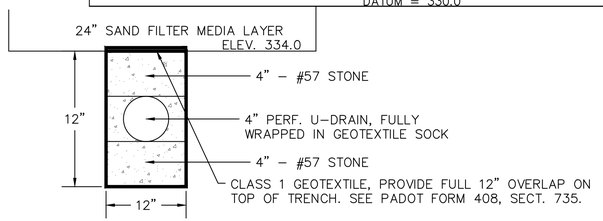


PLANTING SCHEDULE:
A DETAILED PLANTING SCHEDULE WILL BE DEVELOPED FOR THE SRC BASIN
IN GENERAL, PLANTS AND SHRUBS FALLING WITHIN HARDINESS ZONE 5-6 AND HYDROLOGIC GROUP ZONE 2 AND 3 WILL BE SELECTED.

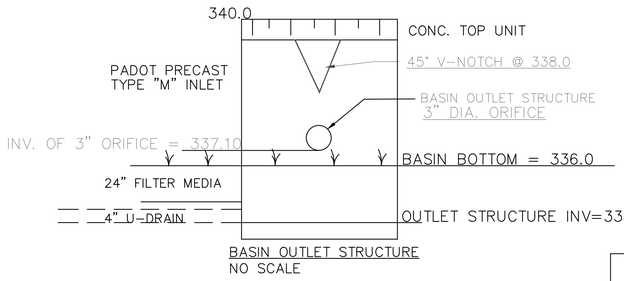
HYDROLOGIC GROUP ZONE 2 AND 3:
SHRUBS: BUTTONBUSH
GRASS: CATTAIL, BROADLEAF

SECTION A-A THRU PROPOSED SRC BASIN #1

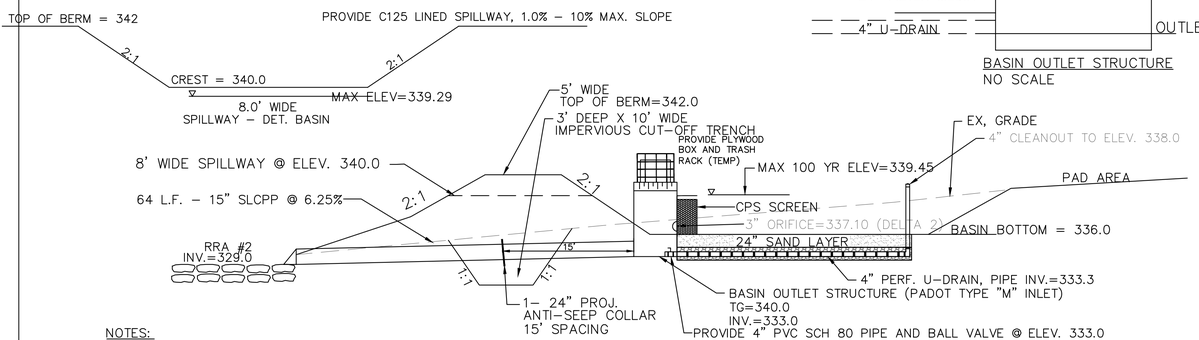
SCALE: HORIZ: 1"=10'
VERT: 1"=2'

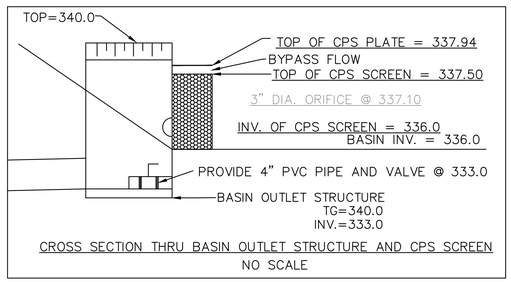


SECTION THRU 4" U-DRAIN
NO SCALE



BASIN OUTLET STRUCTURE
NO SCALE





CROSS SECTION THRU BASIN OUTLET STRUCTURE AND CPS SCREEN
NO SCALE

NOTES:

1. ALL EMBANKMENTS SHALL BE PLACED IN A MAXIMUM 8" LIFTS TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS ESTABLISHED BY ASTM D-1557.
2. Maintenance is necessary to ensure proper functionality of the basin and should take place on a quarterly basis. A basin maintenance plan should be developed which includes the following measures:
3. 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.
Structures include basin bottoms, forebays, trash racks, outlets structures, riprap or gabion structures, and inlets.
4. Sediment removal should be conducted when the basin is completely dry. Sediment should be disposed of properly and once sediment is removed, disturbed areas should be immediately stabilized and revegetated.
5. Mowing and/or trimming of vegetation should be performed as necessary to sustain the system, but all waste and debris should be removed from the basin.
6. Vegetated areas should be inspected annually for erosion.
7. Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species.
8. Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.
9. Catch Basins and Inlets (upgradient of basin) should be inspected and cleaned at least two times per year and after major runoff events.
10. Vehicles should not be parked or driven on a Basin, and care should be taken to avoid excessive compaction by mowers.
11. Inspect the basin after runoff events and make sure that runoff drains down within 72 hours. Mosquito's should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
12. Also inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms. Mow only as appropriate for vegetative cover species.
13. Remove accumulated sediment from basin as required. Properly dispose of sediment.
14. Inspect "CPS Screen" to insure proper functioning of basin outlet works. Remove debris and cleanout screen after all storm events over 1" and at least twice per year.

TYP.SECTION THRU SRC DETENTION BASIN #1

NO SCALE

INSPECTION AND MAINTENANCE SCHEDULE: CPS SCREEN
1. INSPECT ONLY AFTER NO RAINFALL FOR AT LEAST 24 HOURS.
2. REMOVE DEBRIS TRAPPED IN FRONT OF SCREEN. USE RAKE TO INSURE ALL MATERIAL IS REMOVED FROM THE FRONT OF THE DEVICE.
3. INSPECT INSIDE OF SCREEN AND REMOVE ANY DEBRIS.
4. RECORD ALL FINDINGS ON THE DEP INSPECTION LOG.
5. COMPLETE INSPECTIONS AT LEAST TWICE YEARLY.

Connector Pipe Screen
Stormwater filtering technology

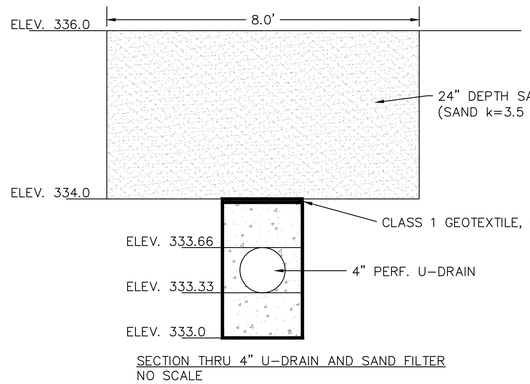
A **C**onnector **P**ipe **S**creen (CPS) is a catchbasin insert filter that is designed to capture trash. Unlike other catchbasin inserts that are typically installed closer to the inlet (under the drain grate or below the curb opening), CPS inserts are installed in front of the catchbasin's outlet pipe - trapping trash and debris inside the catch basin while allowing filtered stormwater to exit into the storm drain infrastructure.

CPS insert features:

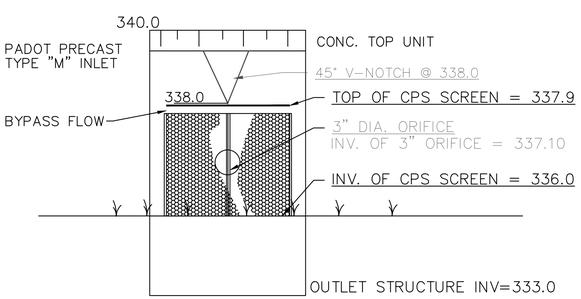
- Manufactured from perforated, 14 gauge, 304 - Stainless Steel sheets
- Perforations have a 5 millimeter diameter – screen has an open area greater than 50%
- CPS net open area (when converted to an equivalent pipe diameter) exceeds the actual diameter of the outlet pipe leaving the catchbasin - CPS can pass more volume than the outlet pipe it covers
- Overflow / bypass prevents flooding if screen becomes blocked or covered

The CPS is manufactured to cover a specific pipe diameter - its size does not depend on the size of the catchbasin drain. The CPS is a compact, affordable product that is easy to install and adaptable over a wide range of catchbasin sizes and styles. The design utilizes very little space, maximizes the trash storage capacity within the catchbasin and allows for easy maintenance.

Fabco Industries, Inc - 66 Central Ave, Farmingdale, NY 11735 - T: 631-393-6024 - www.fabco-industries.com



SECTION THRU 4" U-DRAIN AND SAND FILTER
NO SCALE



BASIN OUTLET STRUCTURE
NO SCALE

TETRA TECH
www.tetratech.com
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MARK	DATE	DESCRIPTION	BY
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PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN - CONSTRUCTION DETAILS

DATE:	03/11/16
PROJECT NO.:	112IC05370
DRAWN BY:	GZ
CHECKED BY:	TC
SCALE:	AS NOTED
FILE:	CONSTDET
NAME:	PCSM 8

SRC DETENTION BASIN/SRC BERMS/BEDS:

Construction Sequence:

1. Install all temporary erosion and sedimentation controls.
a. The area immediately adjacent to the basin/berm must be stabilized in accordance with the PADEP's Erosion and Sediment Pollution Control Program Manual (2000 or latest edition) prior to basin construction.
2. Prepare site for excavation and/or embankment construction.
a. All existing vegetation should remain if feasible and should only be removed if necessary for construction.
b. Care should be taken to prevent compaction of the basin/berm bottom.
c. If excavation is required, clear the area to be excavated of all vegetation. Remove all tree roots, rocks, and boulders only in excavation area.
3. Excavate bottom of basin/berm to desired elevation (if necessary).
4. PROFESSIONAL OVERSIGHT REQUIRED: Install cutoff trench, basin outlet pipe, anti-seep collar. Backfill of outlet pipe is critical to basin function as an impounding structure. Complete surrounding embankments and inlet and outlet control structures. Insure watertight connections to all structures.
5. Grade subsoil in bottom of basin, taking care to prevent compaction. Compact surrounding embankment areas and around inlet and outlet structures.
6. Apply and grade planting soil.
7. Apply geo-textiles and other erosion-control measures. Install CPS screen on basin outlet structure.
8. Seed, plant and mulch according to Planting Plan.
9. Install any anti-grazing measures, if necessary.

Maintenance Issues:

Maintenance is necessary to ensure proper functionality of the basin/berm and should take place on a quarterly basis. A basin/berm maintenance plan should be developed which includes the following measures:

- All basin/berm 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 in depth.
- Structures include basin bottoms, trash racks, outlets structures, riprap or gabion structures, CPS screen and inlets.
- 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 revegetated.
- Mowing and/or trimming of vegetation should be performed as necessary to sustain the system, but all detritus should be removed from the basin/berm.
- Vegetated areas should be inspected annually for erosion.
- Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species.
- Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.

DETENTION BASIN/INFILTRATION BERM: Construction Specifications

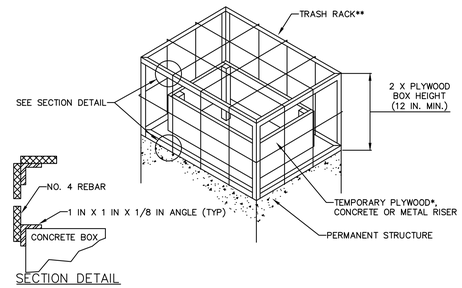
The following specifications are provided for information purposes only. These specifications include information on acceptable materials for typical applications, but are by no means exclusive or limiting.

1. Site Preparation
a. All excavation areas, embankments, and where structures are to be installed shall be cleared and grubbed as necessary, but trees and existing vegetation should be retained and incorporated within the basin area where possible.
b. Where feasible, trees and other native vegetation should be protected. A minimum 10-foot radius around the inlet and outlet structures can be cleared to allow construction.
c. Any cleared material should be used as mulch for erosion control or soil stabilization.
d. Care should be taken to prevent compaction of the bottom of the basin. If compaction should occur, soils should be restored and amended.
2. Earth Fill Material & Placement
a. The fill material should be taken from approved designated excavation areas. It should be free of roots, stumps, wood, rubbish, stones greater than 6 inches, or other objectionable materials. Materials on the outer surface of the embankment must have the capability to support vegetation.
b. Areas where fill is to be placed should be scarified prior to placement. Fill materials for the embankment should be placed in maximum 8-inch lifts. The principal spillway should be installed concurrently with fill placement and not excavated into the embankment.
c. The movement of the hauling and spreading equipment over the site should be controlled. For the embankment, each lift should be compacted to 95% of the standard proctor. Fill material should contain sufficient moisture so that if formed in to a ball it will not crumble, yet not be so wet that water can be squeezed out.
3. Embankment Core
a. The core should be parallel to the centerline of the embankment as shown on the plans. The top width of the core should be at least four feet. The height should extend up to at least the 10-year water elevation or as shown on the plans. The side slopes should be 1 to 1 or flatter. The core should be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. The core should be placed concurrently with the outer shell of the embankment.
4. Structure Backfill
a. Backfill adjacent to pipes and structures should be of the type and quality conforming to that specified for the adjoining fill material. The fill should be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material should fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation should driven equipment be allowed to operate closer than four feet to any part of the structure. Equipment should not be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24 inches or greater over the structure or pipe.
b. Structure backfill may be flowable fill meeting the requirements of the PADOT Standard Specifications for Construction. Material should be placed so that a minimum of 6 inches of flowable fill should be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill material should be 7 inches to assure flowability of the mixture. Adequate measures should be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill all metal pipe should be bituminous coated. Adjoining soil fill should be placed in horizontal layers not to exceed 4 inches in thickness and compacted by hand tampers or other manually directed compaction equipment.
c. Refer to Chapter 220 Of PennDot Pub. 408 (2000).
5. Rock Riprap
a. Rock riprap should meet the requirements of Pennsylvania Department of Transportation Standard Specifications.
6. Stabilization
a. All borrow areas should be graded to provide proper drainage and left in good condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms should be stabilized by seeding, planting and mulching.

REPAIR AND REPLACEMENT OF RIPRAP APRONS/DETENTION BASIN/INFILTRATION BEDS/BERMS:

1. Inspect BMPs and riprap aprons every quarter and after all rainfall events over 1".
2. After 1" rainfalls, note on the inspection log the approximate depth of water in the basin and if any flow was evident through the outlet structure. Note the time needed for complete dewatering of the basin.
3. If complete dewatering of the BASIN in 72 hours is not achieved for several 1" rainstorms, complete tilling of the bottom of the basin. Scarify the bottom of the basin to a depth of 12".
4. If the basin continues to have standing water after 72 hours, consult with the original design Engineer to determine a reasonable repair, which may include installation of a perforated underdrain in the basin bottom.
5. All washouts on slopes shall be repaired immediately.
6. All sediment shall be removed from the basin or outlet structure and disposed of in a proper manner.
7. Cut vegetation on a regular basis. Do not travel on basin bottom.
8. The basin outlet pipe shall be inspected quarterly for noticeable sediment in the pipe and to insure that the pipe remains tightly sealed to the basin outlet structure.
9. The emergency spillway will be kept clear of debris and tree growth.
10. The likelihood of basin replacement is slim; however, if the total reconstruction of the basin is necessary, the original design engineer should be notified to investigate the cause of the basin failure, so that steps can be taken to avoid a repeat.
11. If riprap aprons continue to wash out and stone becomes dislodged on several occasions, remove old stone and place the next greater size riprap in its place. Increase the size of the thickness of the stone to accommodate the increased size stone.
12. The Owner must prepare a written report for every on-site inspection. Use DEP Form 3150-FM-BWEW0083, dated 2/2012. (Visual Site Inspection Report)

BMP	Operation And Maintenance
Channels	Channel dimensions shall be constantly maintained
	Channel shall be cleaned whenever total depth is reduced by 25% at any location
	Damaged lining shall be replaced or repaired within 48 hours
	Grass height shall be maintained between 2 and 3 inches
	Excess vegetation shall be removed from permanent channels to ensure sufficient channel capacity
Detention Basins	Basin structures inspected at least 4 times per year as well as after every storm greater than 1 inch
	Sediment shall be removed from basin when it is completely dry
	Inspected annually for unwanted vegetative growth
Infiltration Basin	The vegetation along the surface of the Infiltration basin should be maintained in good condition, and any bare spots revegetated as soon as possible.
	Vehicles should not be parked or driven on an Infiltration Basin, and care should be taken to avoid excessive compaction by mowers.
	Inspect the basin after runoff events and make sure that runoff drains down within 72 hours Mosquito's should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
	Also inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms.
	Mow only as appropriate for vegetative cover species.
	Remove accumulated sediment from basin as required. Restore original cross section and infiltration rate. Properly dispose of sediment.
Storm Pipes	Storm pipes shall be cleaned whenever total depth is reduced by 25% at any location.
	Damaged pipes shall be replaced or repaired within 48 hours.
	Pipe to inlet connections shall be watertight.



SECTION DETAIL

* 3/4 IN. PRESSURE TREATED PLYWOOD BOX WITH 2 IN. X 2 IN. PRESSURE TREATED CORNER SUPPORTS, SET INTO 1-1/2 IN. GRATE OFFSETS, CAULK ALL SEAMS TO FORM WATERTIGHT SEALS.
** TRASH RACK COMPOSED OF 1 IN. X 1 IN. X 1/8 IN. L (TYP.) AND #4 BARS (TYP.) WELDED TO THE ANGLES AND AT EACH INTERSECTION OF THE BARS; #4 BARS SPACED AT HALF THE DIAMETER OF THE BARREL MAX.

NOTES:

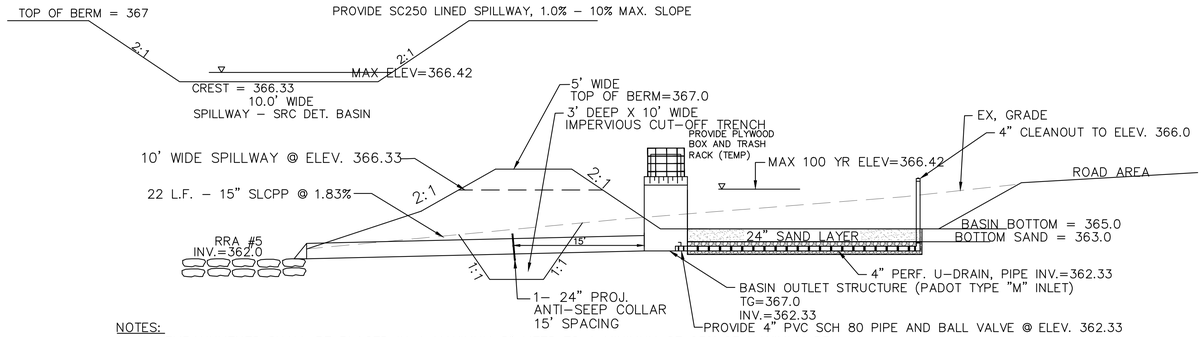
BOX SHALL BE BOLTED, STRAPPED, OR OTHERWISE SECURED TO THE PERMANENT RISER.

TOP OF TEMPORARY RISER EXTENSION SHALL BE AT LEAST AS HIGH AS SEDIMENT BASIN TEMPORARY RISER AND SHALL BE 6 IN. (MINIMUM) BELOW CREST OF EMERGENCY SPILLWAY.

ALL JOINTS SHALL BE WATER TIGHT.

CLOGGED OR DAMAGED SPILLWAYS SHALL BE REPAIRED IMMEDIATELY. TRASH AND OTHER DEBRIS SHALL BE REMOVED FROM THE BASIN AND RISER.

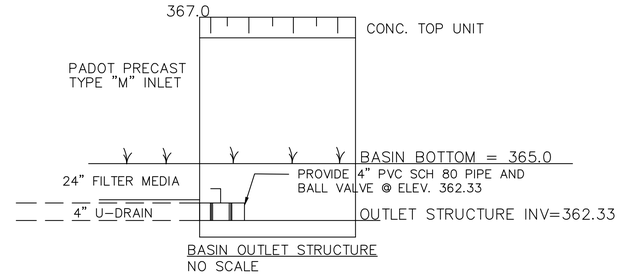
STANDARD CONSTRUCTION DETAIL #7-10
TEMPORARY RISER EXTENSION AND
TRASH RACK FOR PERMANENT STRUCTURE
NOT TO SCALE



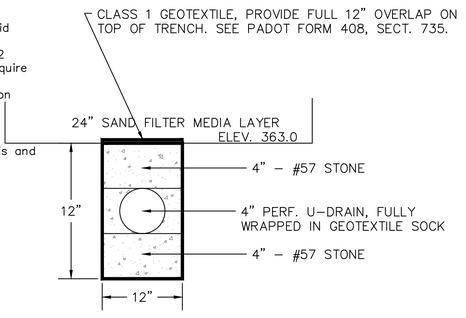
NOTES:

1. ALL EMBANKMENTS SHALL BE PLACED IN A MAXIMUM 8" LIFTS TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS ESTABLISHED BY ASTM D-1557.
2. Maintenance is necessary to ensure proper functionality of the basin and should take place on a quarterly basis. A basin maintenance plan should be developed which includes the following measures:
3. 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.
Structures include basin bottoms, forebays, trash racks, outlets structures, riprap or gabion structures, and inlets.
4. Sediment removal should be conducted when the basin is completely dry. Sediment should be disposed of properly and once sediment is removed, disturbed areas should be immediately stabilized and revegetated.
5. Mowing and/or trimming of vegetation should be performed as necessary to sustain the system, but all waste and debris should be removed from the basin.
6. Vegetated areas should be inspected annually for erosion.
7. Vegetated areas should be inspected annually for unwanted growth of exotic/invasive species.
8. Vegetative cover should be maintained at a minimum of 95 percent. If vegetative cover has been reduced by 10%, vegetation should be reestablished.
9. Catch Basins and Inlets (upgradient of basin) should be inspected and cleaned at least two times per year and after major runoff events.
10. Vehicles should not be parked or driven on a Basin, and care should be taken to avoid excessive compaction by mowers.
11. Inspect the basin after runoff events and make sure that runoff drains down within 72 hours. Mosquito's should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
12. Also inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms.
Mow only as appropriate for vegetative cover species.
13. Remove accumulated sediment from basin as required. Properly dispose of sediment.
14. Inspect "CPS Screen" to insure proper functioning of basin outlet works. Remove debris and cleanout screen after all storm events over 1" and at least twice per year.

TYP. SECTION THRU SRC DETENTION BASIN #2
NO SCALE



BASIN OUTLET STRUCTURE
NO SCALE



SECTION THRU 4" U-DRAIN
NO SCALE

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www.tetratech.com
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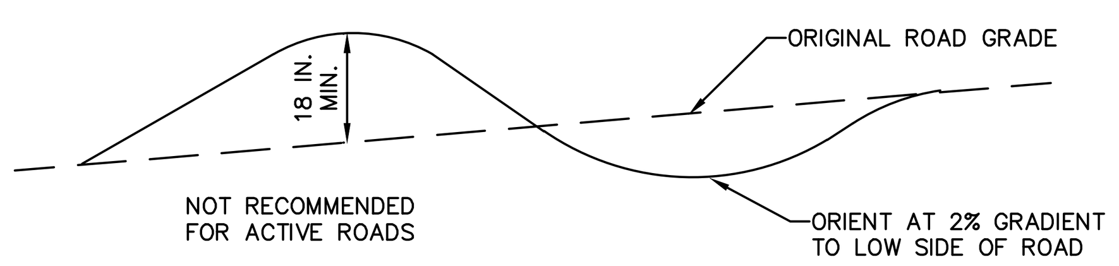
MARK	DATE	DESCRIPTION	BY
2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ

PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN - CONSTRUCTION DETAILS

DATE:	03/11/16
PROJECT NO.:	112IC05370
DRAWN BY:	GZ
CHECKED BY:	TC
SCALE:	AS NOTED
FILE:	CONSTDET
NAME:	PCSM 8



SECTION VIEW

NOTES:

WATERBARS SHALL DISCHARGE TO A STABLE AREA.

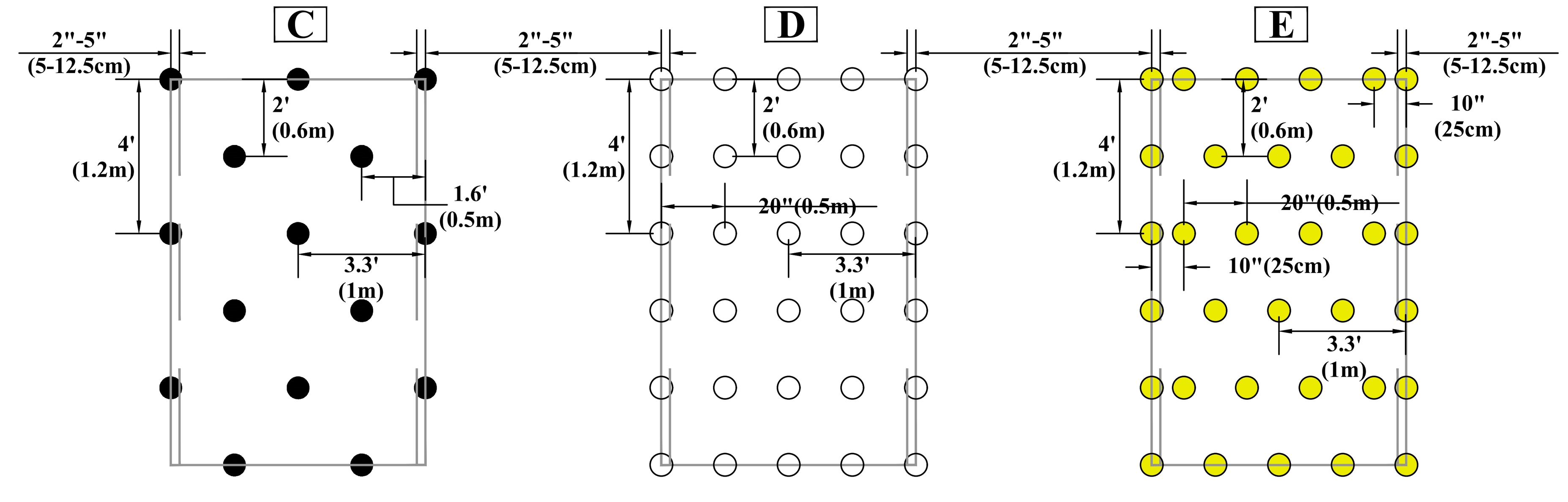
WATERBARS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RUNOFF EVENT OVER 1". DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION.

MAINTENANCE OF WATERBARS SHALL BE PROVIDED UNTIL ROADWAY, SKIDTRAIL, OR RIGHT–OF–WAY HAS ACHIEVED PERMANENT STABILIZATION.

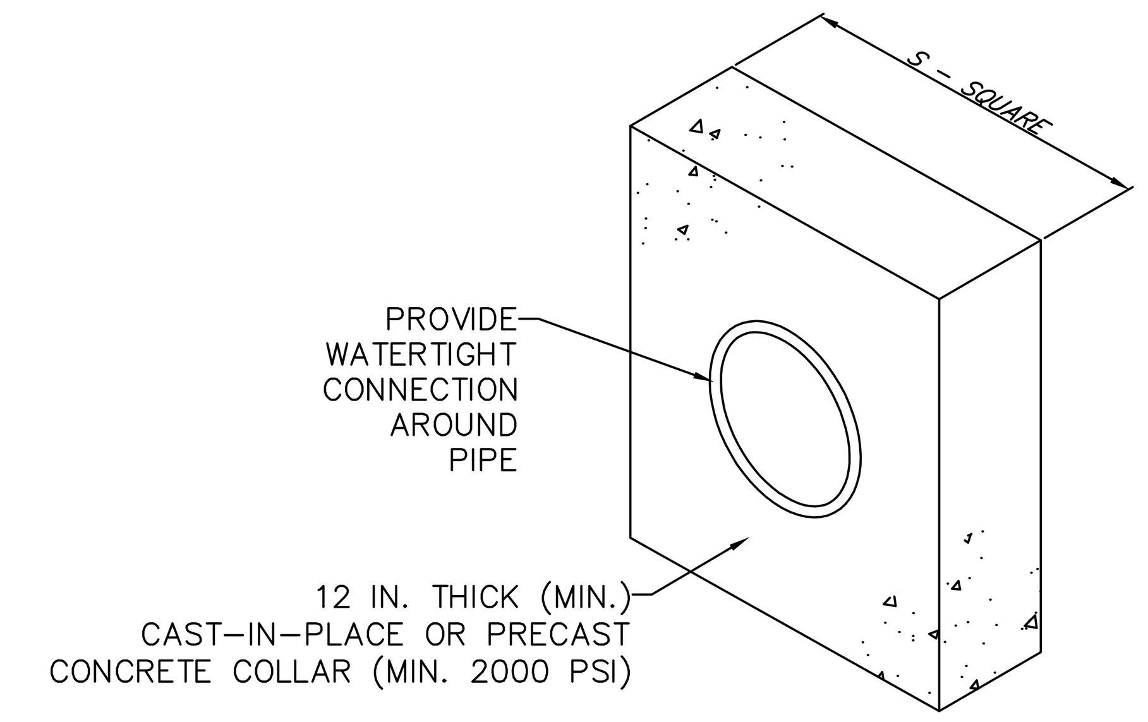
WATERBARS ON RETIRED ROADWAYS, SKIDTRAILS, AND RIGHT–OF–WAYS SHALL BE LEFT IN PLACE AFTER PERMANENT STABILIZATION HAS BEEN ACHIEVED.

SEE PA DEP EROSION CONTROL MANUAL TABLE 3.1 FOR WATERBAR SPACING.

STANDARD CONSTRUCTION DETAIL #3-5
WATERBAR



STAPLE PATTERNS



BASIN OR TRAP NO.	PIPE SIZE (IN)	S (IN)	NO. OF COLLARS	RISER TO FIRST COLLAR (FT)	COLLAR SPACING (FT)
1	15	56	1	15	N/A

NOTES:

–ALL COLLARS SHALL BE INSTALLED SO AS TO BE WATERTIGHT.
–COLLAR SIZE AND SPACING SHALL BE AS INDICATED WITHIN TABLE.
–DO NOT CONSTRUCT WITH 2' OF A PIPE JOINT.

STANDARD CONSTRUCTION DETAIL #7-16
CONCRETE ANTI-SEEP COLLAR FOR PERMANENT BASINS OR TRAPS

NOT TO SCALE

DWG NO.	SHT	REV	FORM
9730-1E-000	1	E	1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
E	ECN9730-1E-000E	5/10/11	

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NOTES:

1. WEIGHT (EMPTY): 50 LB MAX, NO CARTRIDGES

2. MATERIAL:
   A) ADJUSTABLE FLANGE AND DEFLECTOR: ALUMINUM ALLOY 6063-T6
   B) BASIN (PLASTIC): POLYPROPYLENE POLYETHYLENE COPOLYMER
   C) CORNER FILL: ALUMINUM ALLOY: 5052-H32
   D) SUPPORT HARDWARE: CRES 300 SERIES
   E) SPLASH GUARD: NEOPRENE RUBBER (TRIM IF NECESSARY)

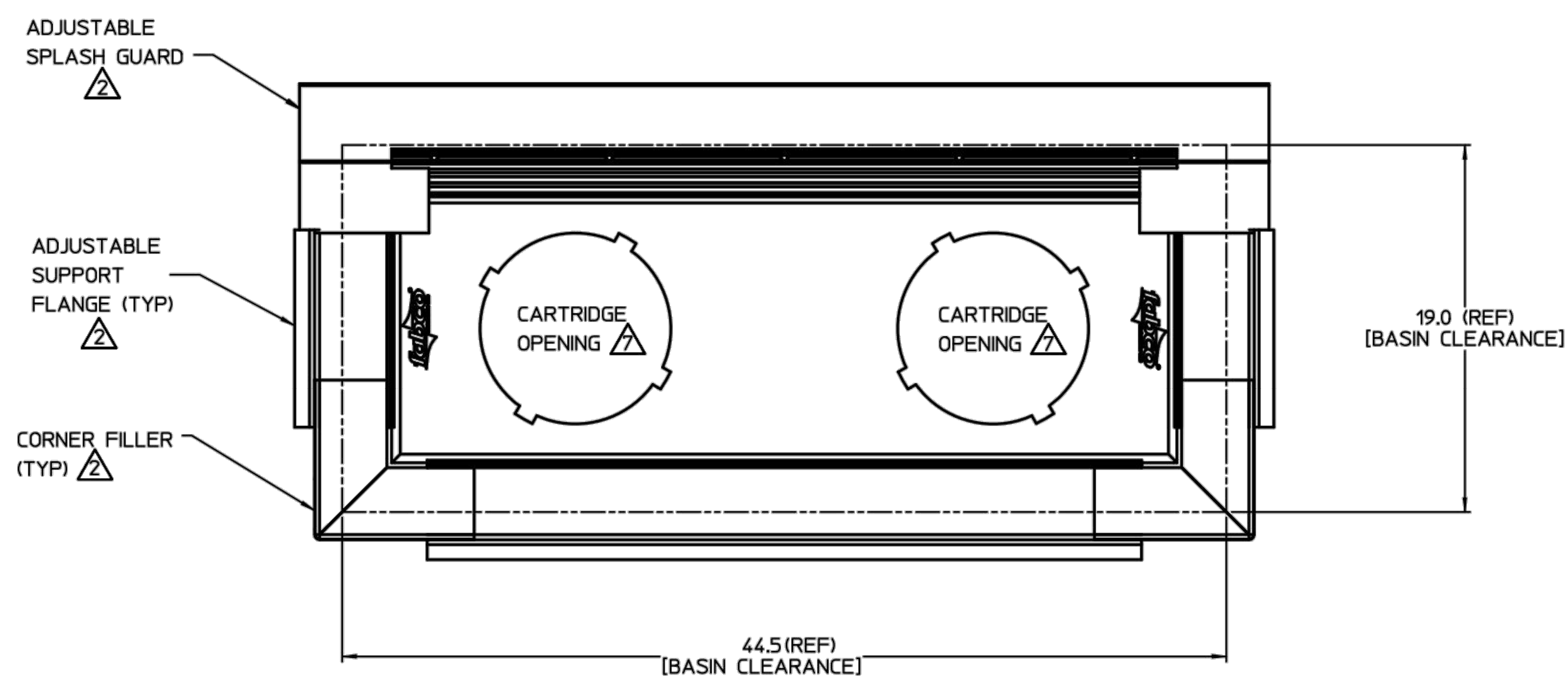
3. PERFORMANCE CHARACTERISTICS (TYP):
   A) DEBRIS CAPACITY: 5.2 CU-FT
   B) FILTERED FLOW RATE (CLEAN STANDARD CARTRIDGE): 230 GPM (0.51 CFS)
   C) PRIMARY BYPASS FLOW RATE: 1917 GPM (4.3 CFS)
   D) SECONDARY BYPASS FLOW RATE: 164 GPM (0.37 CFS)
   E) TOTAL BYPASS FLOW RATE: 2082 GPM (4.6 CFS)

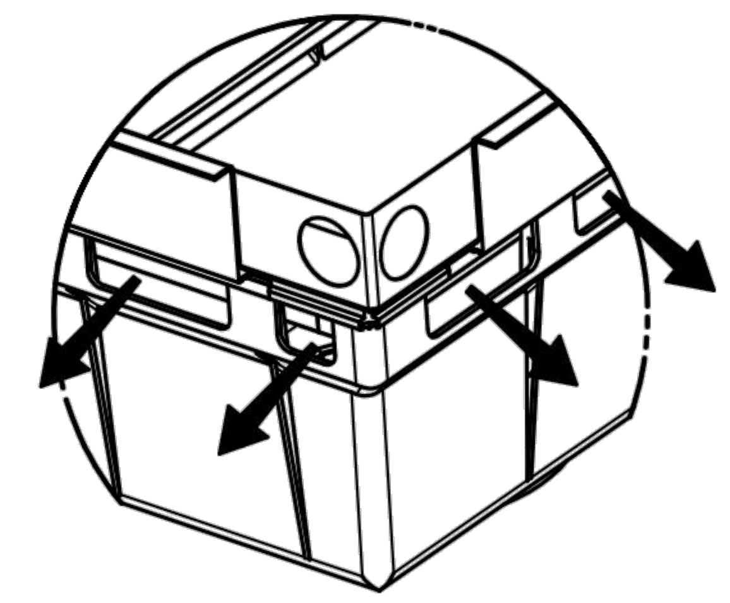
4. CLEAR OPENING RANGE (0.5 INCH INCREMENTS):
   A) MINIMUM SIZE: 19.0 X 45.0
   B) MAXIMUM SIZE: 24.0 X 50.0

5. RECOMMENDED MINIMUM VAULT DEPTH 2-IN BELOW CARTRIDGE

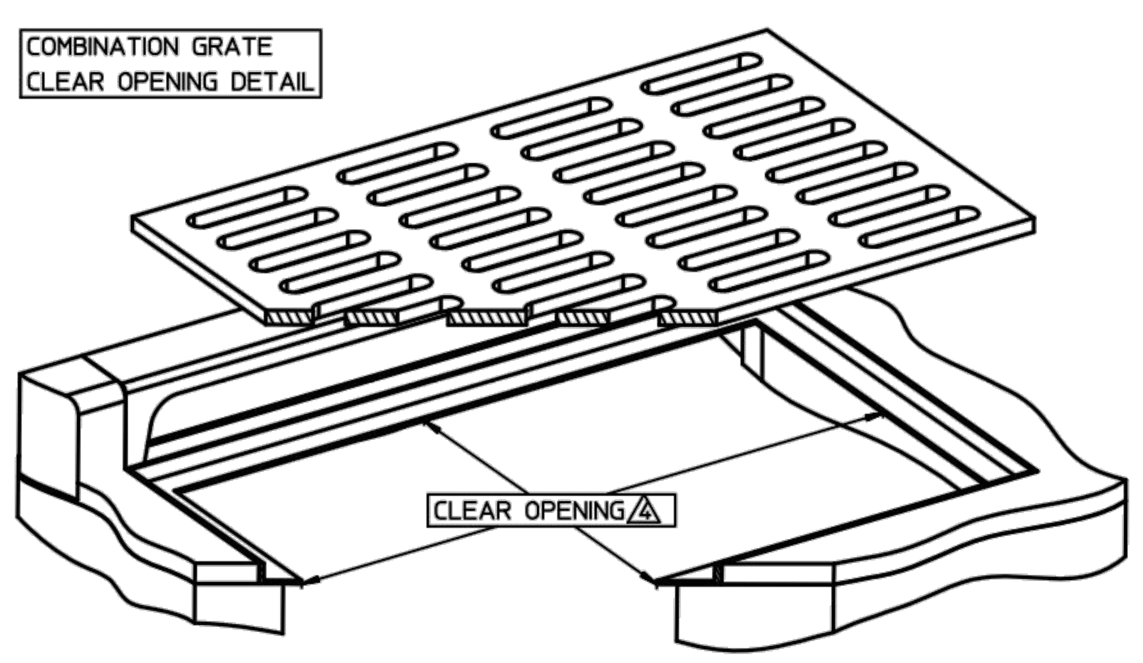
6. TYPICAL INSTALLATION: REMOVE STORM GRATE, MEASURE CATCH BASIN CLEAR OPENING AND ADJUST FLANGES TO REST ON GRATE SUPPORT LEDGE. INSTALL STORMBASIN INSERT WITH RUBBER SPLASH GUARD EXTENDING INTO CURB-BOX AND VERIFY THE ADJUSTABLE FLANGES ARE SECURELY RESTING ON THE GRATE SUPPORT LEDGES. INSTALL THE CORNER FILL PIECES. REINSTALL THE STORM GRATE DIRECTLY ON STORMBASIN SUPPORT FLANGES.

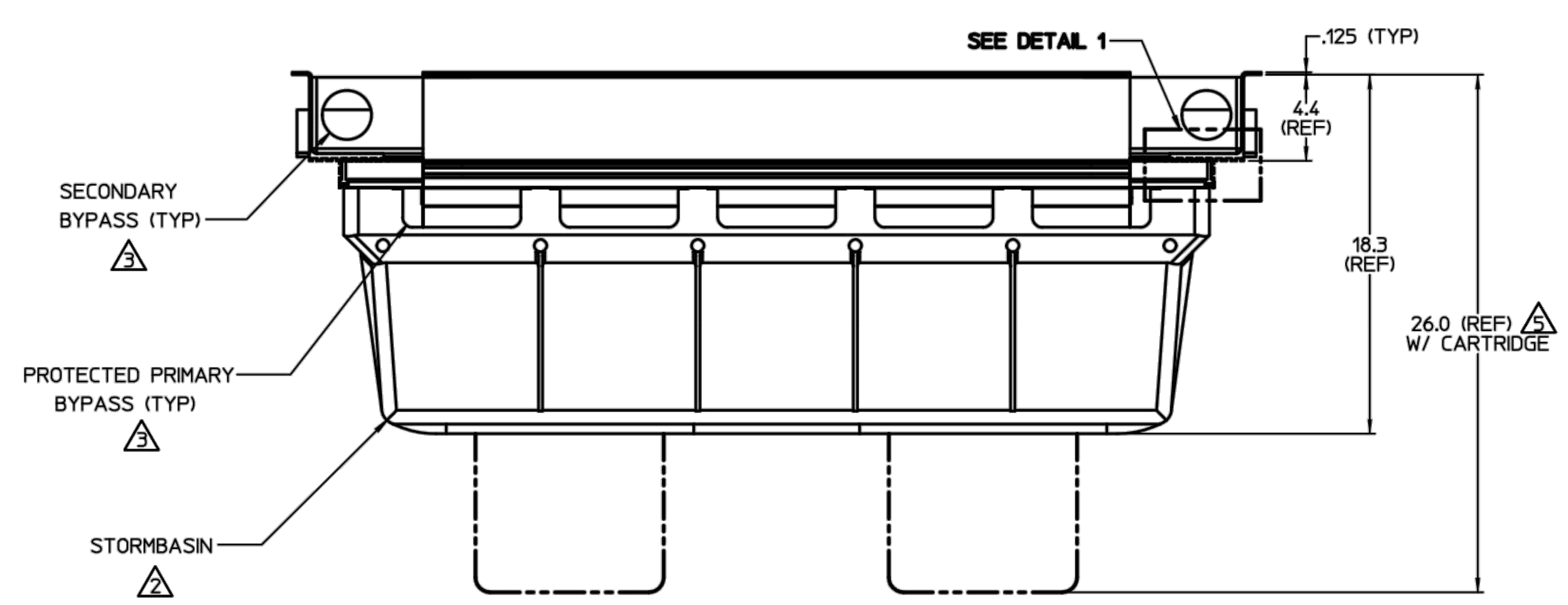
7. USE WITH FABCO REPLACEABLE MEDIA CARTRIDGES ONLY.

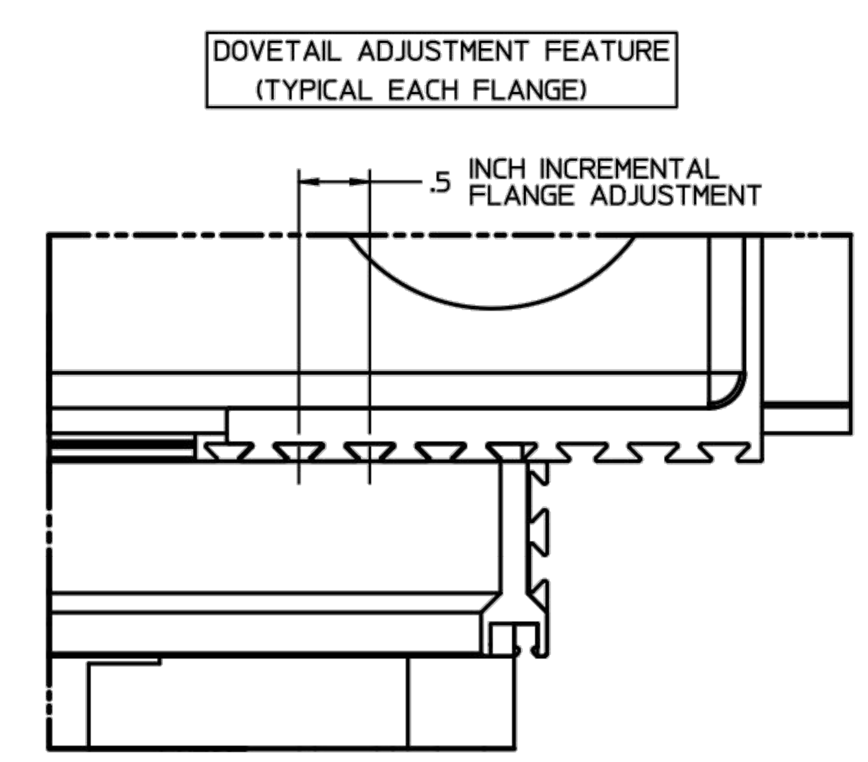




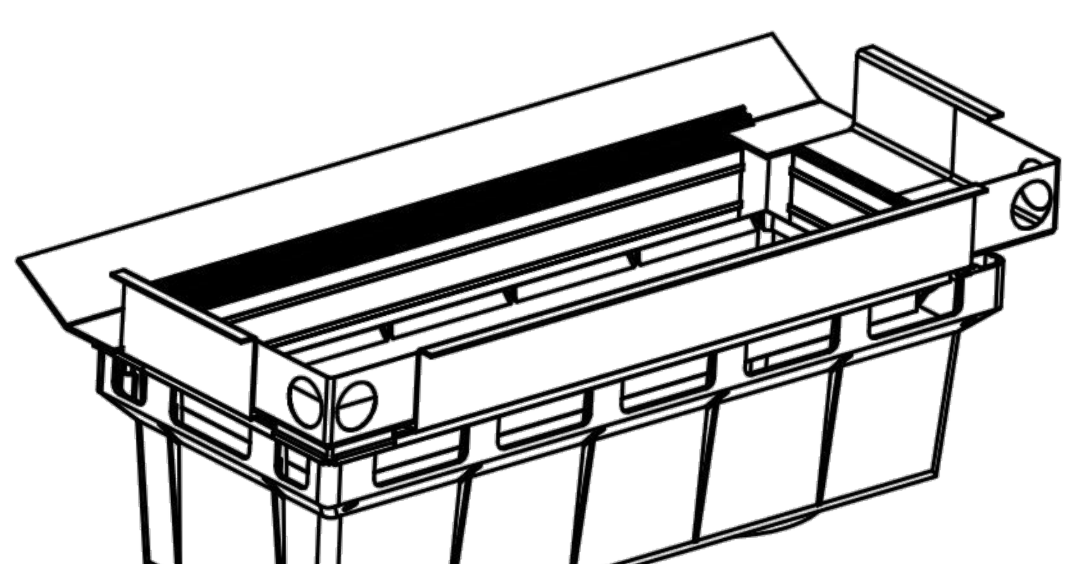
PROTECTED BYPASS, TYPICAL
(NOT TO SCALE)







DETAIL 1
SCALE 1:1



REFERENCE VIEW
NOT TO SCALE

PROVIDE STORMBASINS IN INLETS #4, 5, AND 6.
USE 9718–1 STANDARD FILTERS IN ALL STORMBASINS

OPERATION AND MAINTENANCE SCHEDULE: STORMBASIN FILTERS
1. PRE–CLEAN THE INLET PRIOR TO INSTALLATION.
2. DEPENDING ON SITE CONDITIONS, CLEANOUT THE STORMBASIN AT LEAST TWO TIMES PER YEAR. IF SIGNIFICANT TREES ARE PRESENT, ADJUST SCHEDULE ACCORDINGLY TO INSURE ALL LEAVES ARE REMOVED FROM THE STORMBASIN.
3. DO NOT STEP OR STAND ON THE STORMBASIN UNIT. USE VACUUM OR RAKE TO REMOVE DEBRIS.
4. AFTER CLEANING, REMOVE THE FILTER CARTRIDGE AND CLEAN AROUND THE FOAM FILTER.
5. REPLACE FILTER CARTRIDGES ON A YEARLY BASIS. USE PART NUMBER 9718–1, STANDARD CARTRIDGE.

NO	QTY	PART NUMBER	DESCRIPTION	REMARKS
BILL OF MATERIALS				

UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS BREAK SHARP EDGES .002 - .020 FILLETS .020 MAX DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES
TOLERANCES: DEC .00 ± .01 DEC .000 ± .005 FRACT ± 1/16 ANGLE ± 2° Ra FINISH 125
DO NOT SCALE THIS DRAWING

APPROVALS		DATE
DWN	N.NEUWIRTH	9/17/07
CHKR	R.MARSTON	5/10/11
ENGR	J. PETERS	9/17/07
APVD		

MATERIAL: SEE NOTES
MODEL LINK: 9730-1E_ASSY3

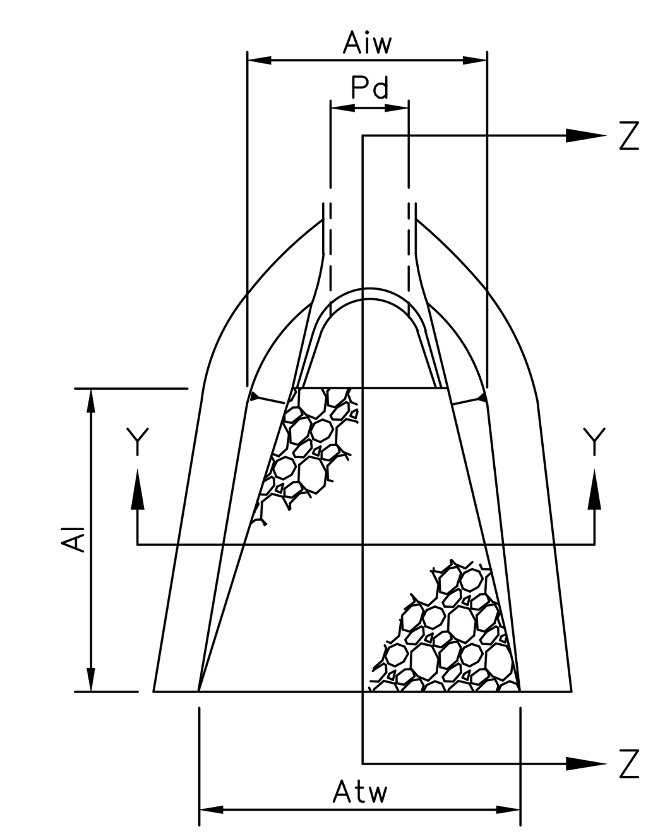
FABCO INDUSTRIES, INC.
66 CENTRAL AVENUE
FARMINGDALE, NY 11735
WWW.FABCO-INDUSTRIES.COM

fabco Industries Inc

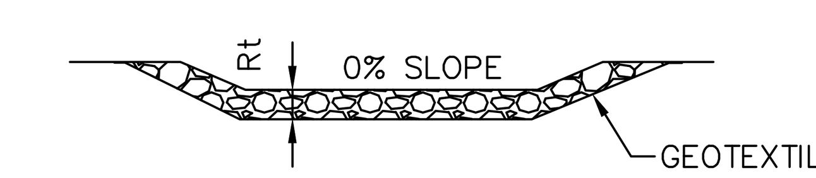
TITLE: STORMBASIN, 19X45 CS

SIZE	CAGE CODE	DWG NO	REV
D	1P8A4	9730-1E-000	E

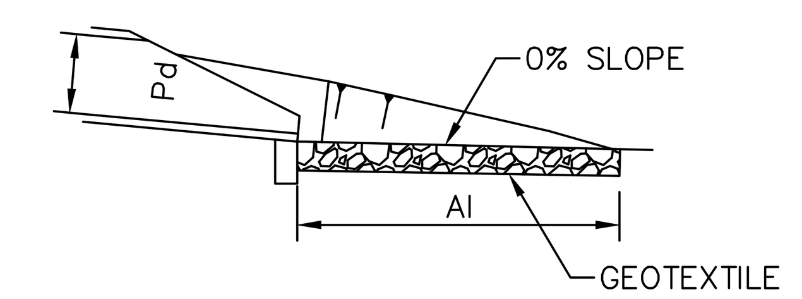
SCALE 3/16 WT SHEET 1 OF 1



PLAN VIEW



SECTION Y–Y



SECTION Z–Z

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP SIZE R–_	RIPRAP THICK. Rt (IN)	APRON LENGTH Al (FT)	APRON INITIAL WIDTH Aiw (FT)	APRON TERMINAL WIDTH Atw (FT)
RRA1	15	R–4	18	12	4	16
RRA2	15	R–4	18	8	4	12
RRA3	15	R–4	18	10	4	14
RRA4	15	R–4	18	8	4	12
RRA5	15	R–4	18	12	4	16

NOTES:

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 OVER 1". DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY. IF WASHOUTS OCCUR REGULARLY, REPLACE STONE WITH LARGER RIPRAP.

PLACE CLASS 2 TYPE B GEOTEXTILE UNDER ALL RIPRAP APRONS.

MODIFIED CONSTRUCTION DETAIL #9-1
RIPRAP APRON AT PIPE OUTLET WITH FLARED END SECTION OR ENDWALL

NOT TO SCALE

TETRA TECH
www.tetratech.com
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DALLAS, PA 18612
T: (570) 674–8648 | F: (570) 674–8651

MARK	DATE	DESCRIPTION	BY
2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ

PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – CONSTRUCTION DETAILS

DATE:03/11/16
PROJECT NO.:112IC05370
DRAWN BY:GZ
CHECKED BY:TC
SCALE:AS NOTED
FILE:CONSTDET
NAME:PCSM 9