

EROSION & SEDIMENTATION CONTROL PLAN

SUNOCO PIPELINE, LP - PENNSYLVANIA PIPELINE PROJECT - MIDDLETOWN STATION

LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PENNSYLVANIA
NOVEMBER 2016

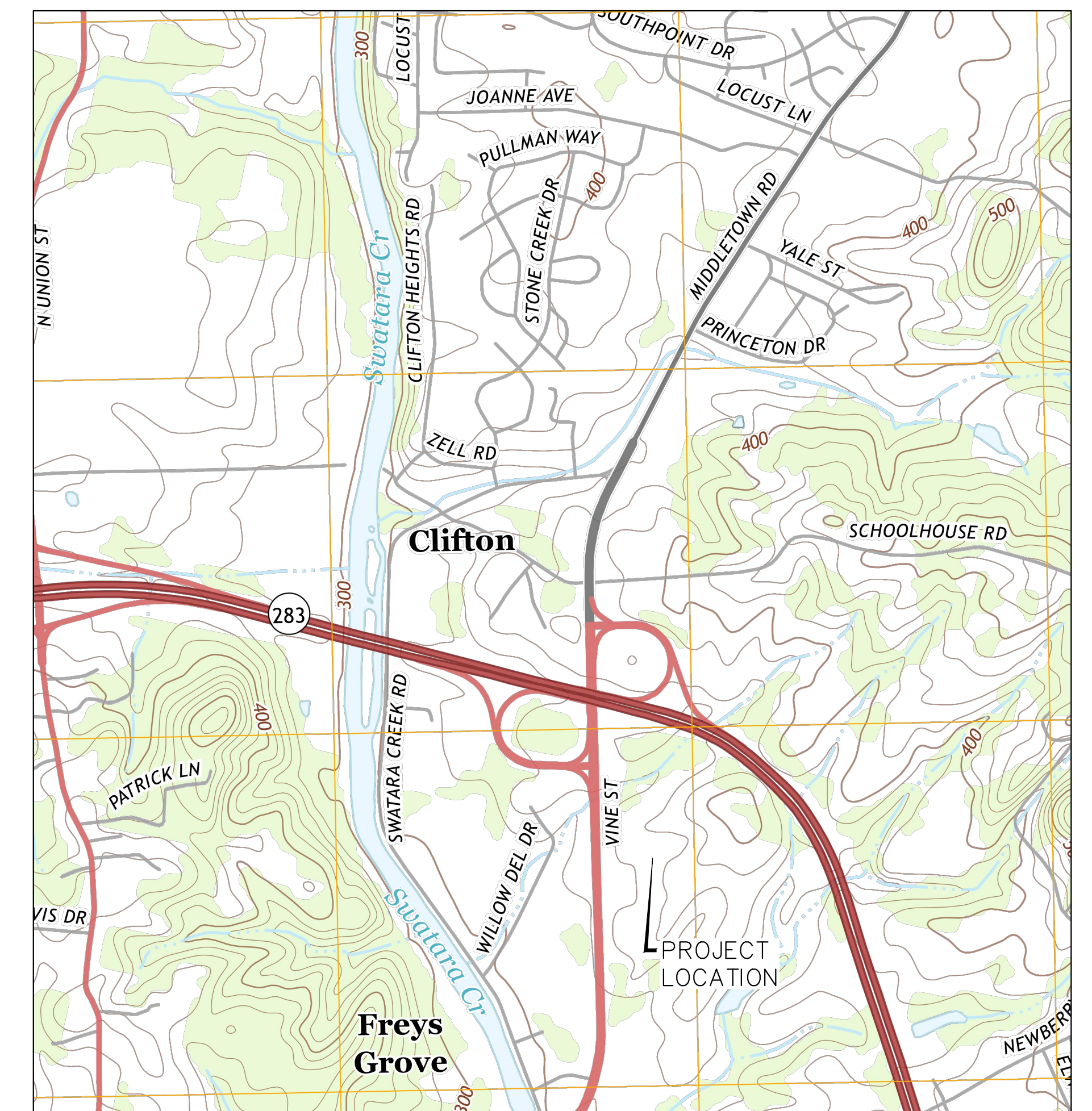
PREPARED BY:



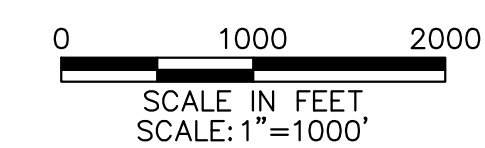
www.tetrattech.com
 1134 TWIN STACKS DRIVE
 DALLAS, PA 18612
 T: (570) 674-8648 | F: (570) 674-8651
 DATE: NOVEMBER 21, 2016
 COVER SHEET 1 OF 14
 REVISION #1 - 4/22/16
 REVISION #2 - 4/26/16
 REVISION #3 - 10/27/16
 REVISION #4 - 2/6/17

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	EROSION & SEDIMENTATION CONTROL PLAN
7	EROSION CONTROL BLANKET PLAN
8	CONSTRUCTION DETAILS AND PIPE PROFILES
9	CONSTRUCTION DETAILS
10	CONSTRUCTION DETAILS
11	CONSTRUCTION DETAILS
12	CONSTRUCTION DETAILS
13	CONSTRUCTION DETAILS
14	CONSTRUCTION DETAILS

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



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



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/RDDBOM, 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:
 EROSION AND SEDIMENT CONTROL PLAN
 PENNSYLVANIA PIPELINE PROJECT
 MIDDLETOWN SUBSTATION
 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

DATE: 2/6/2017

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

LEGEND	
---	EXISTING CONTOURS
---	PROPOSED CONTOURS
---	PRE-DEV DA BOUNDARY
---	POST-DEV DA BOUNDARY
---	24" COMPOST FILTER SOCK
---	PROPERTY LINE
---	EX. DIRT DRIVE
---	LIMIT OF DISTURBANCE = 9.1 AC
---	S-150 NA GREEN EROSION BLANKETS
---	C-125 CHANNEL LINING
---	STABILIZED ROCK CONSTRUCTION ENTRANCE PROVIDE WASH RACK
---	PADOT TYPE M PRECAST INLET
---	EX. FENCE
---	LEVEL LIP SPREADER
---	ESCGP-2 BOUNDARY
---	SOIL BOUNDARY LINE, SOIL TYPE
---	EX. POWERLINE
---	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					
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

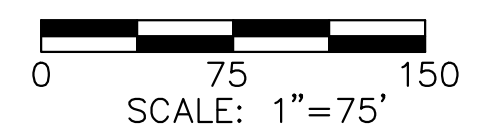
SOILS ANALYSIS
 Existing soils on site include the following:
 At - Atkins Silt loam
 Erosion Hazard = Slight
 Bc - Basher Silt loam
 Erosion Hazard = Slight
 LrB2, LrC2, LrD2 - Lewisberry gravelly sandy loam, 3-25%
 Erosion Hazard = Moderate



SURVEY LEGEND

- 5/8" REBAR W/CAP INSCRIBED ("GRAHAM SU 07539" (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)



2
OF
14

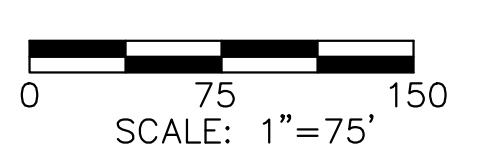
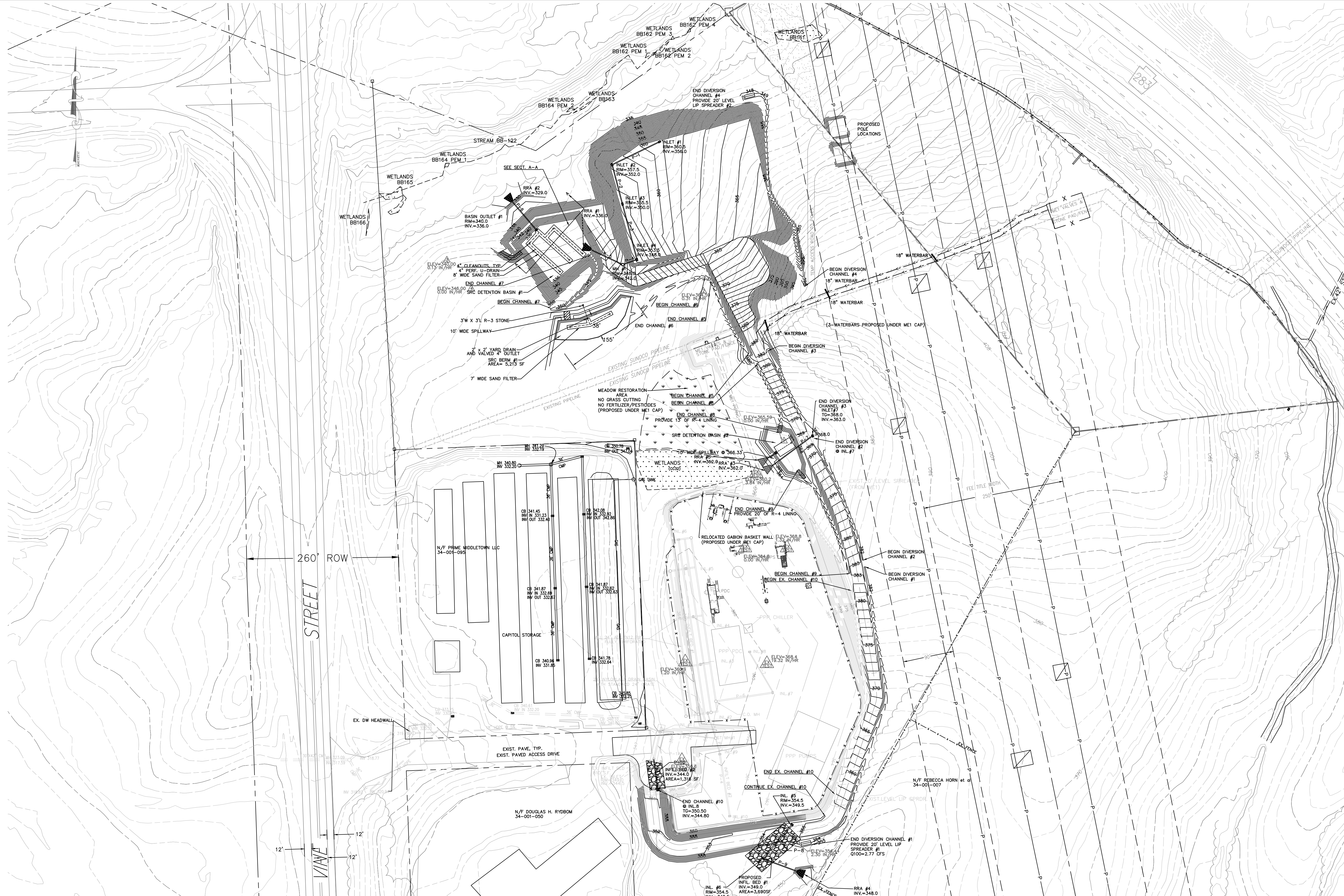
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2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ
4.	2/6/17	REVISED PER DEP COMMENTS	GZ

PPP - MIDDLETOWN PUMP STATION
 LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

E&S PLAN - EXISTING CONDITIONS

DATE: 03/11/16
PROJECT NO.: 1121C05370
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CHECKED BY: TC
SCALE: 1"=75'
FILE: BASEPLAN
NAME: EX 2
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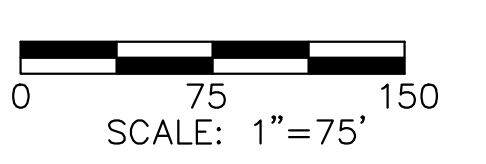
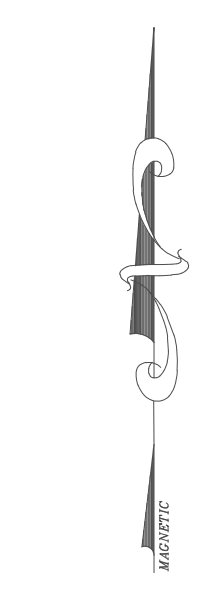
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PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY
E&S PLAN - OVERALL SITE

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

4
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PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY
E&S PLAN – PRE-DEVELOPED DRAINAGE AREA

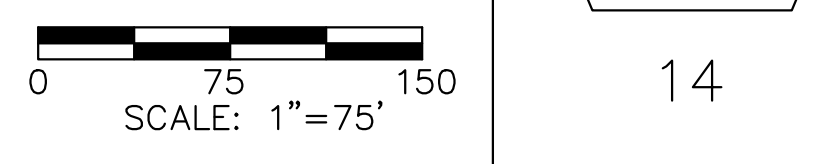
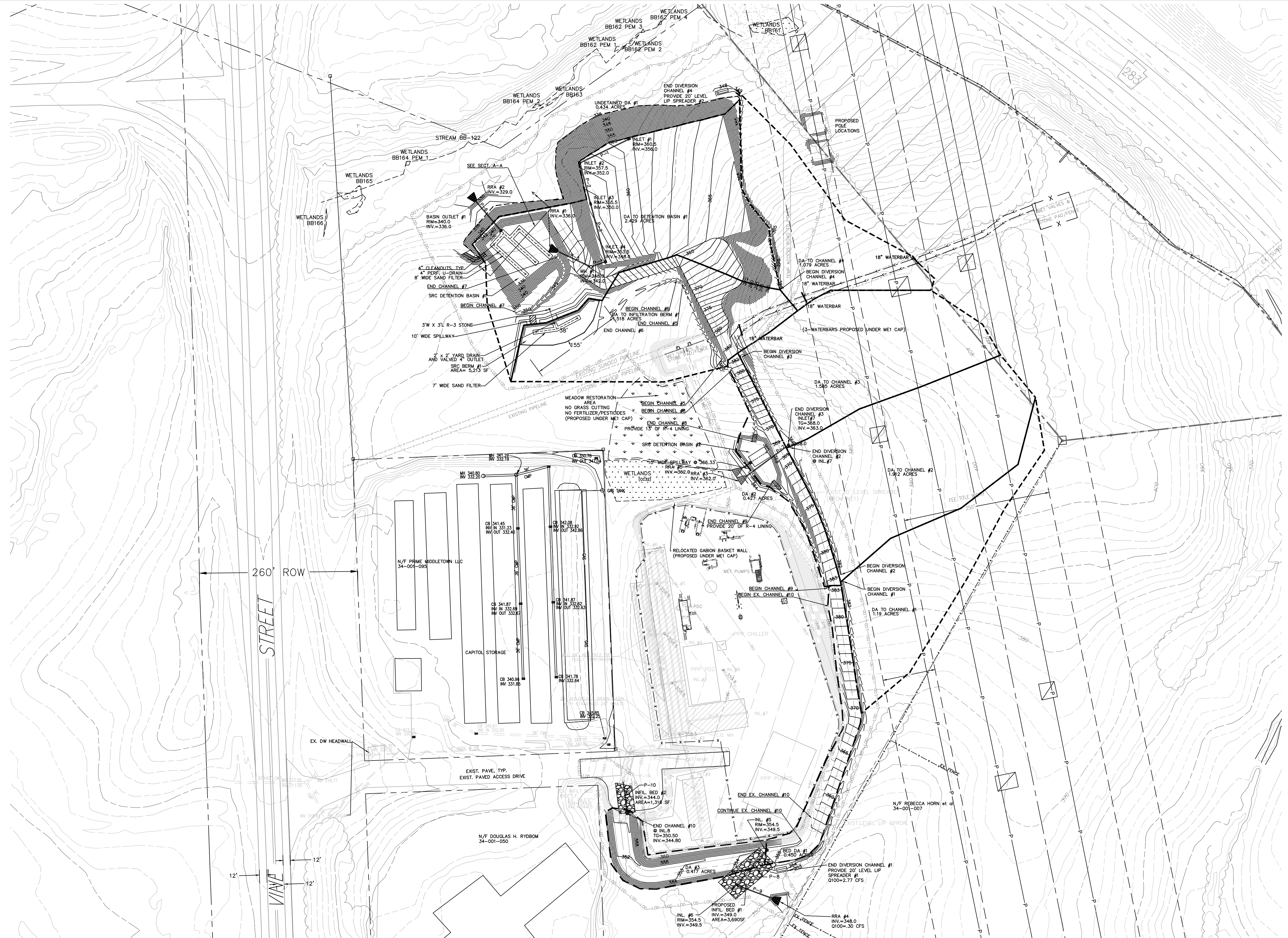
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PROJECT NO.: 112IC05370
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NAME: DA4
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PROPOSED STORM PIPE TABLE

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		67	15"	2.99%
INL 3	355.50	350.00		97	15"	2.06%
INL 4	353.50	348.00	P-4	22	15"	27.27%
MH 1	348.00	342.00		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		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 SLOPP, 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".

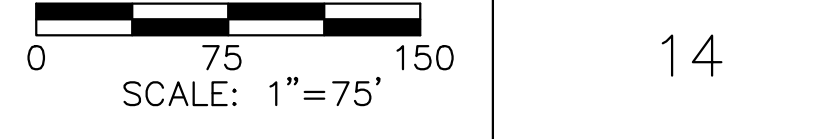
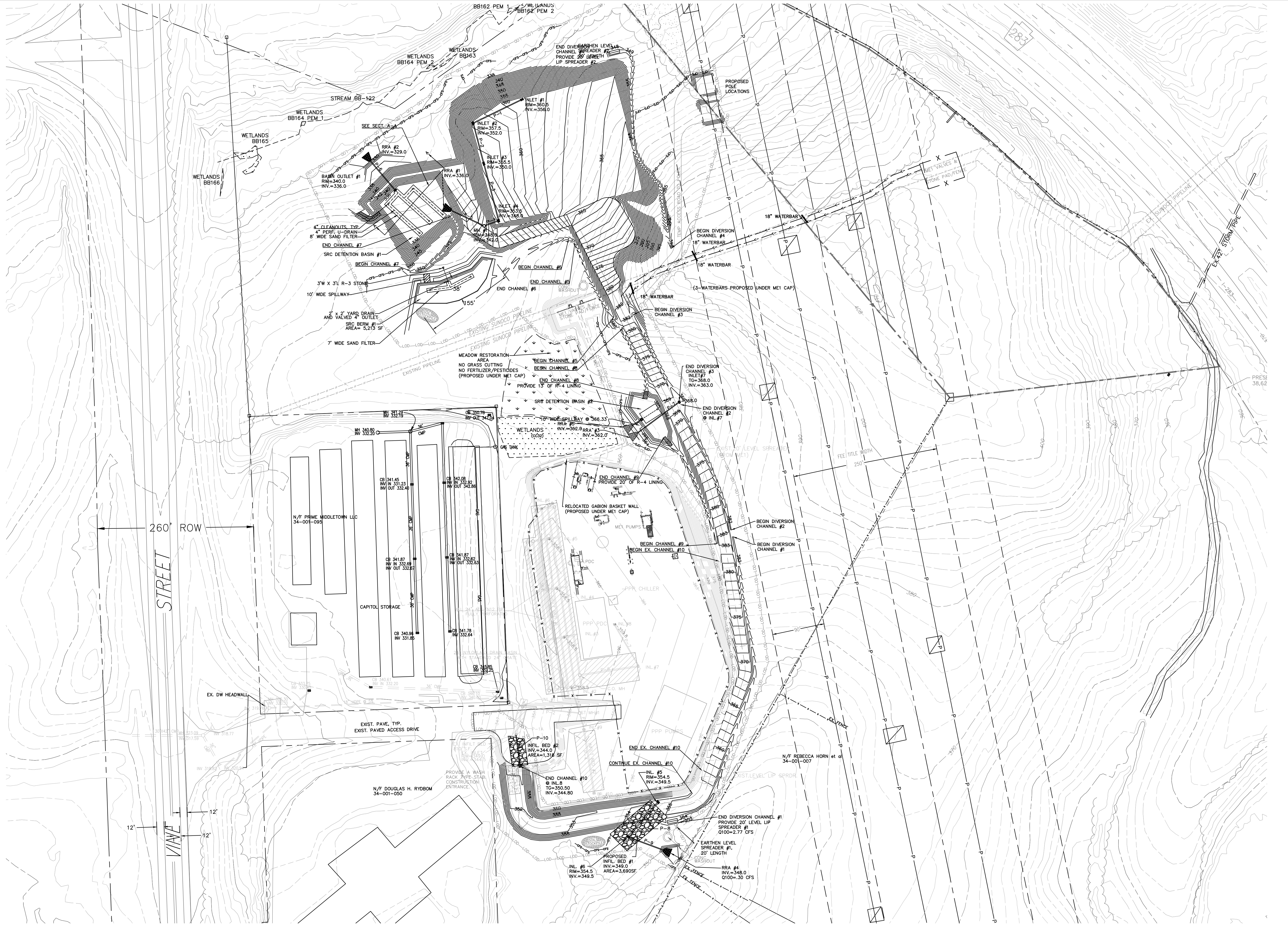


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PPP – MIDDLETOWN PUMP STATION
 LONDONDERRY TOWNSHIP, DAUPHIN COUNTY
 E&S PLAN – POST-DEVELOPED DRAINAGE AREA

DATE: 03/11/16
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NAME: DA5
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6
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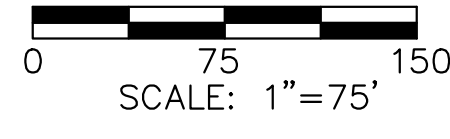
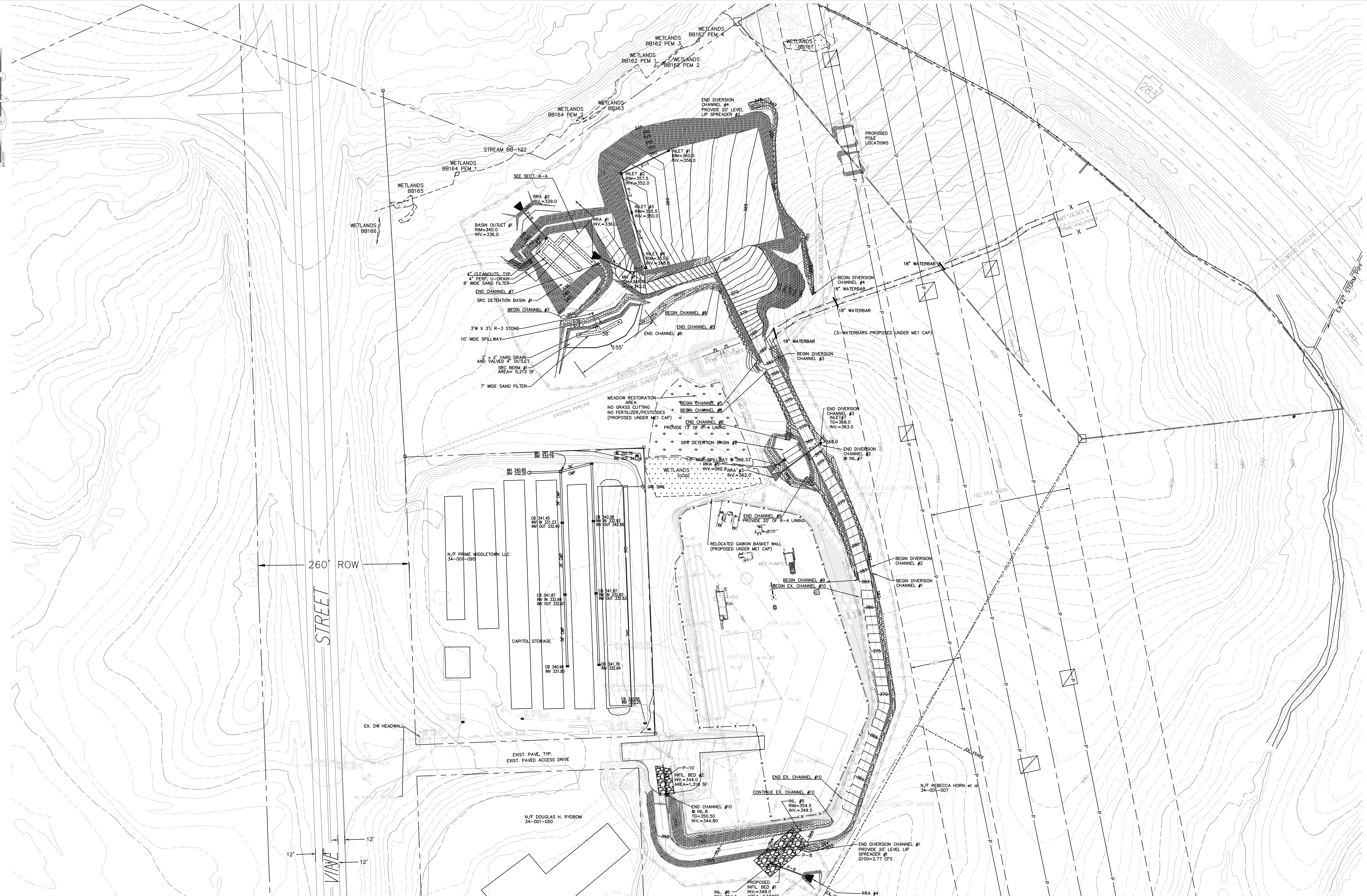


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PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY
E&S PLAN – EROSION & SEDIMENTATION CONTROL

DATE: 03/11/16
PROJECT NO.: 112IC05370
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7
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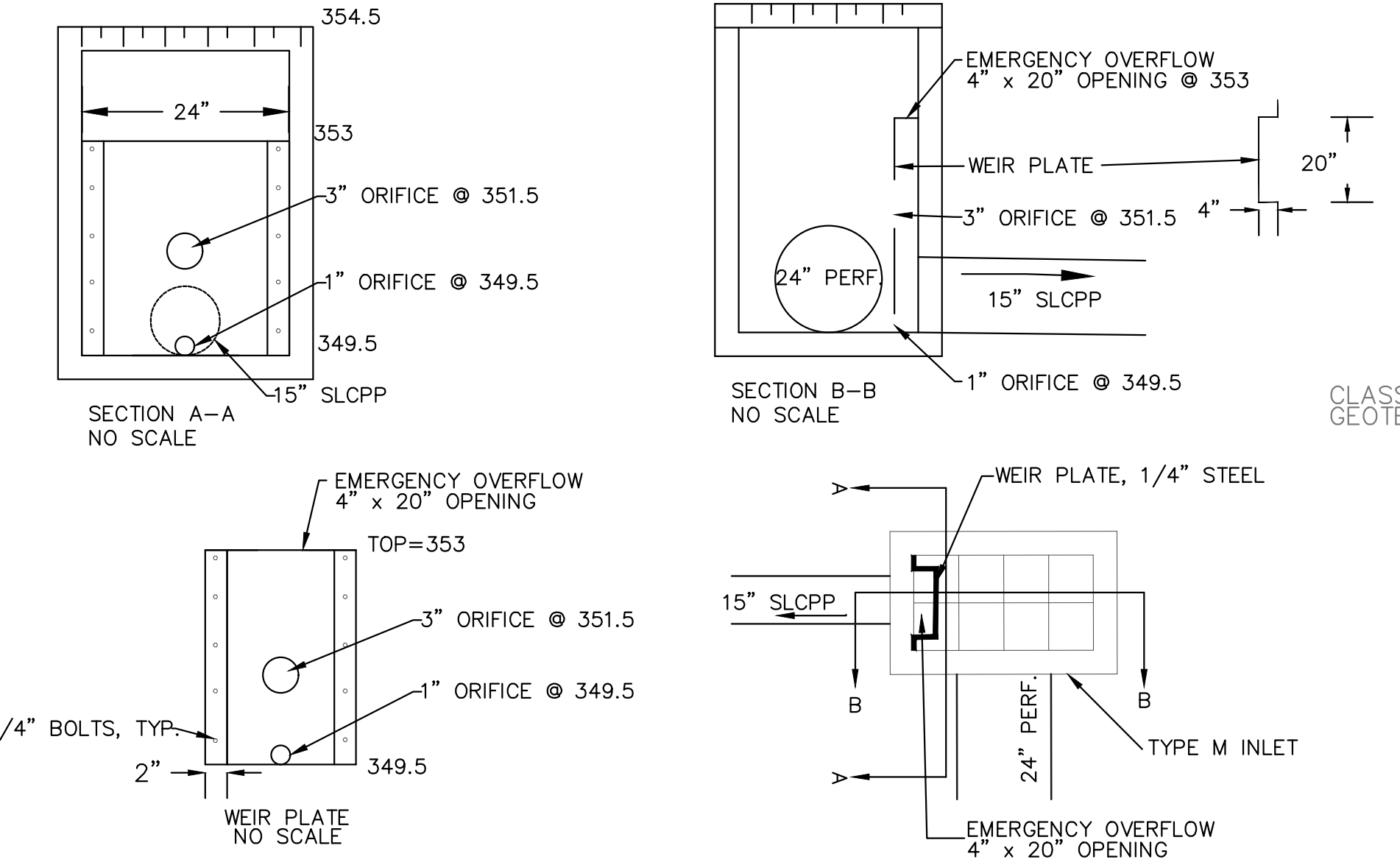
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4.	2/6/17	REVISED PER DEP COMMENTS	GZ

PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY
E&S PLAN – EROSION CONTROL BLANKET

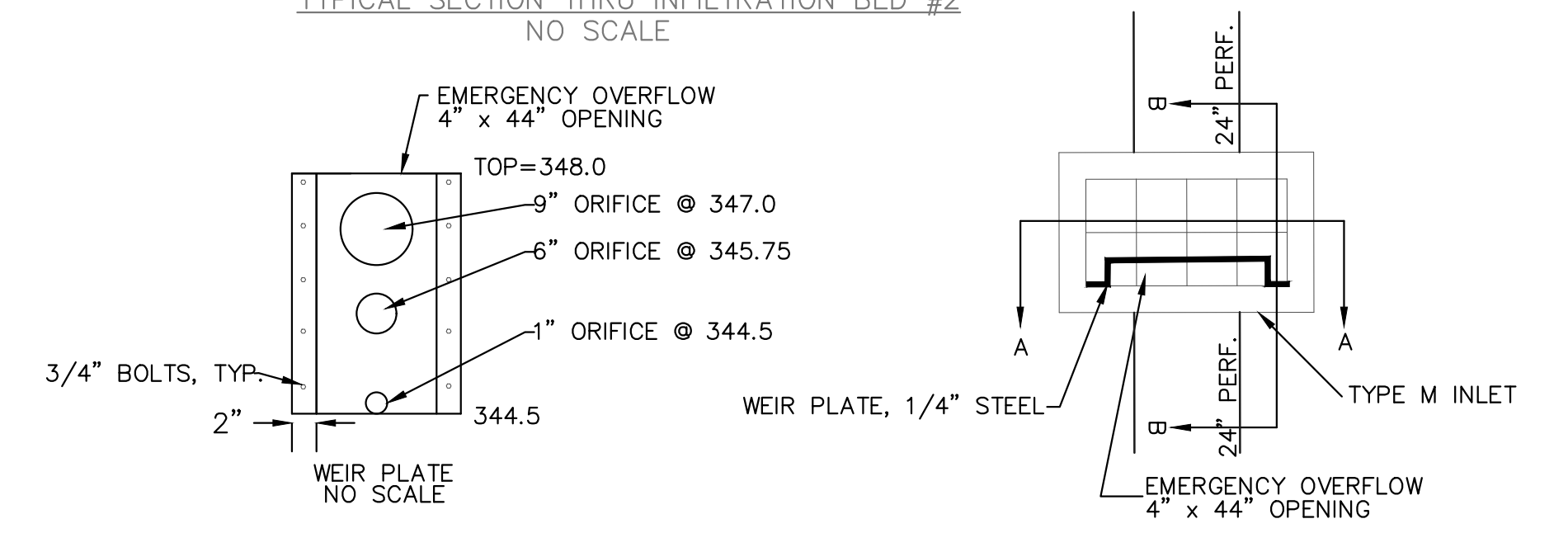
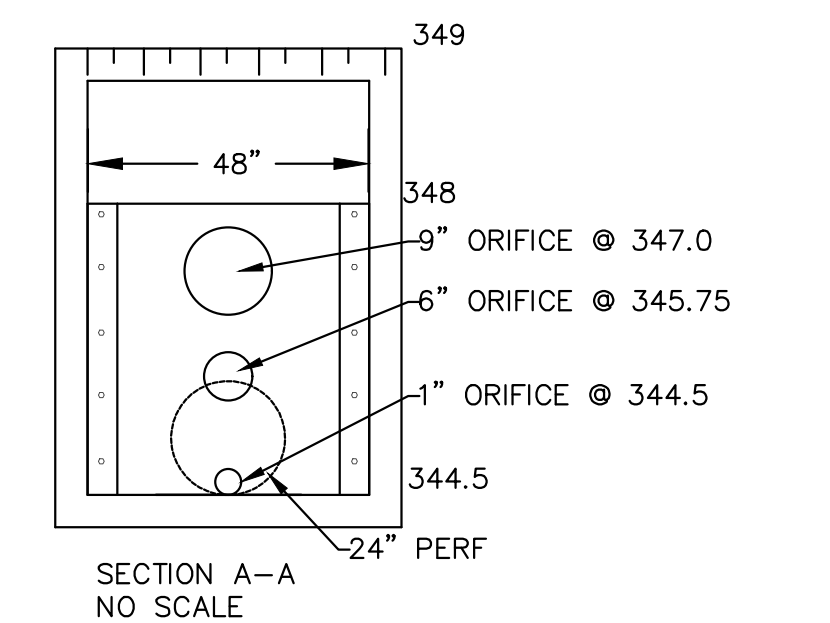
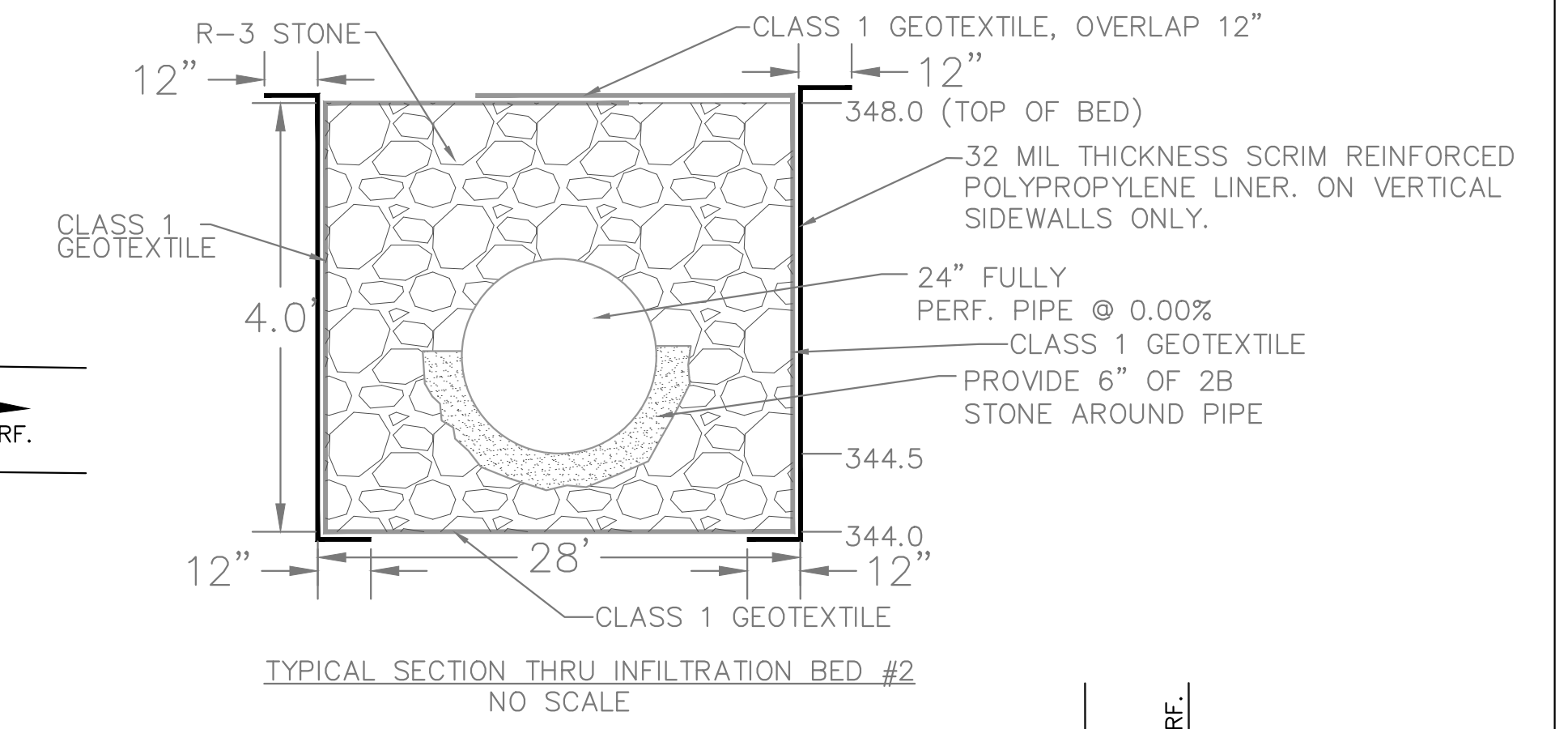
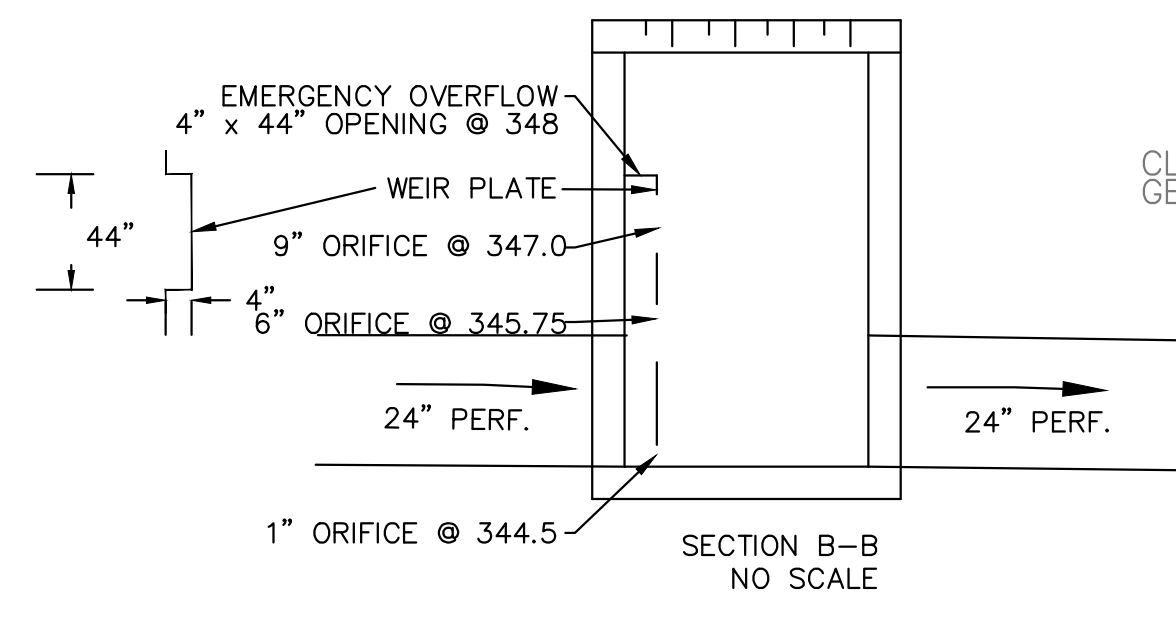
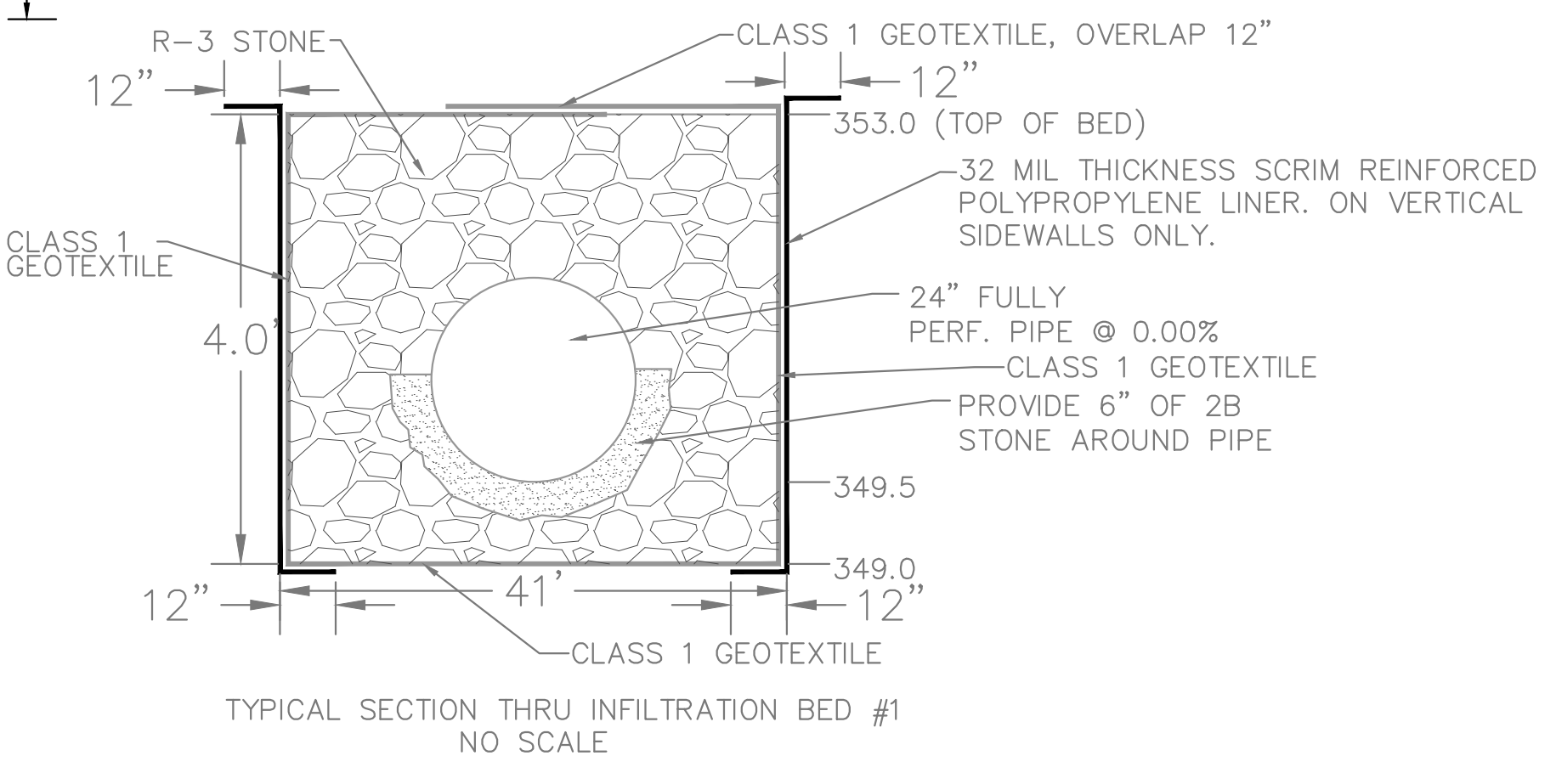
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PROJECT NO.: 112IC05370
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CHECKED BY: TC
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FILE: BASEPLAN
NAME: ES7
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As part of site earthwork construction, the following Construction Testing and Inspection (CTI) procedures shall be implemented:

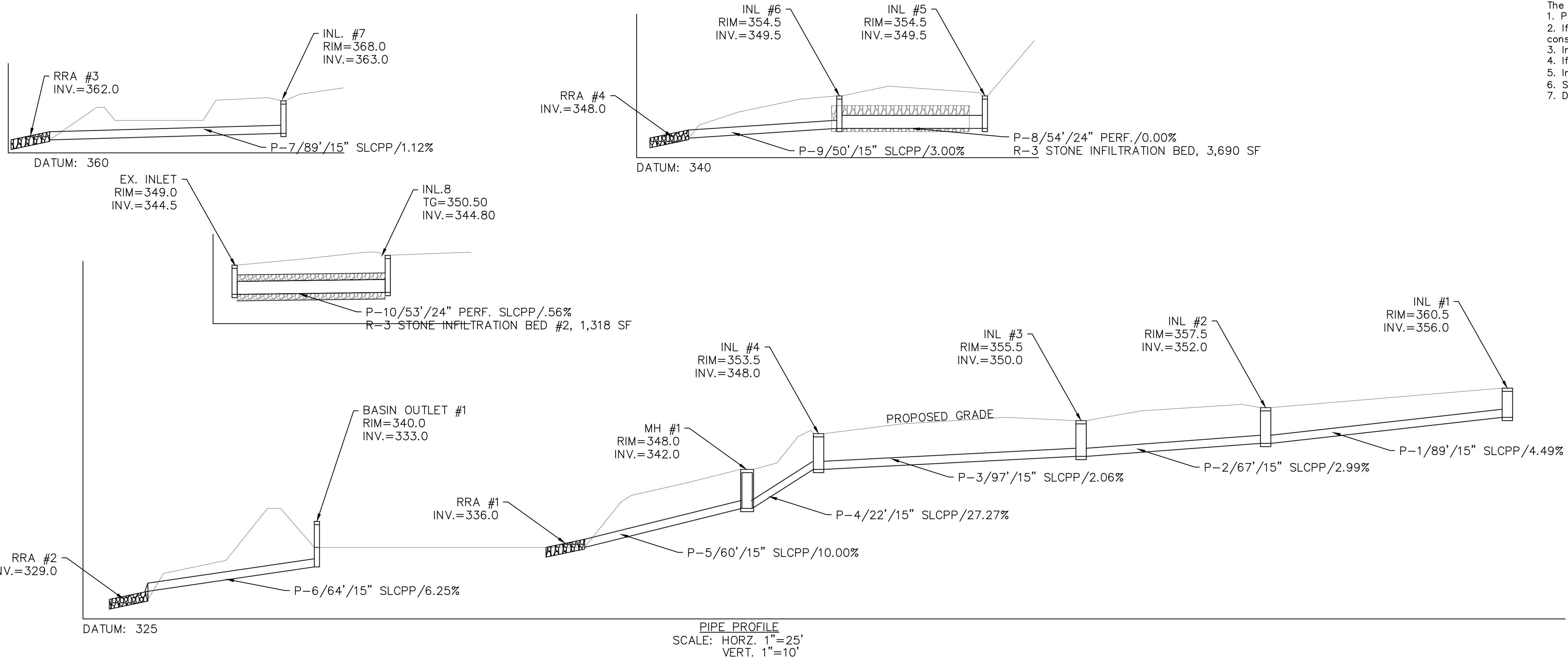
- Prior to bulk grading, all vegetation, topsoil, tree root balls, root zone materials, and other deleterious materials shall be completely removed from grading areas.
- Prior to placement of fill, subgrade areas shall be proof-rolled with a minimum 15-ton roller in the presence of a qualified geotechnical 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 lift 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.



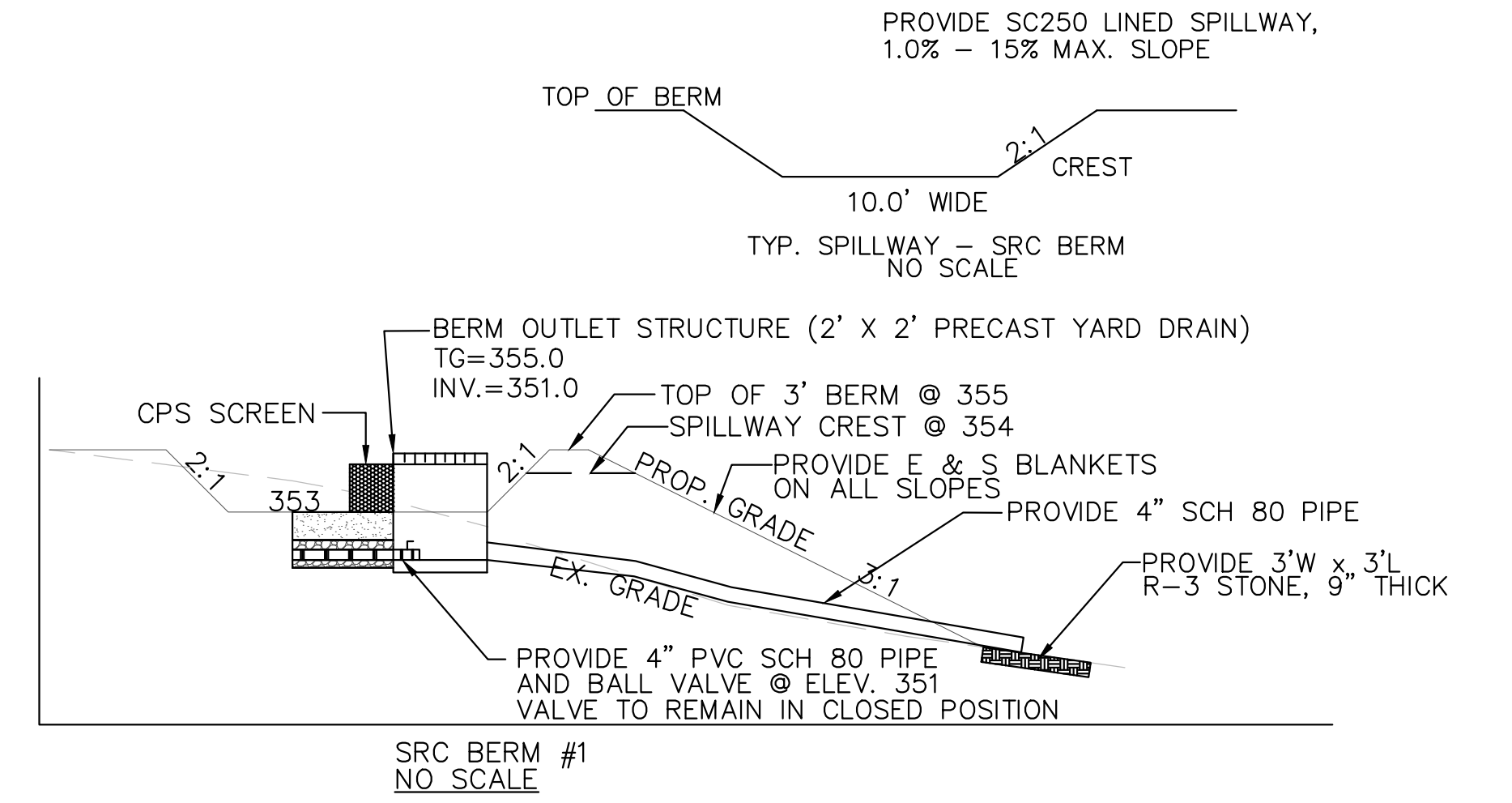
INLET #6 DETAILS - NO SCALE



EX. INLET DETAILS - NO SCALE



- The following is a typical construction sequence for a infiltration berm.
1. Protect infiltration berm area from compaction prior to installation.
 2. If possible, install infiltration 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 infiltration 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.



Maintenance Issues
Infiltration Berms have low to moderate maintenance requirements, depending on the design.

Infiltration Berms
Regularly inspect to ensure they are infiltrating; 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 infiltration 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 CMS 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 DRAIN BERM AREA FOR MAINTENANCE OR IF ADDITIONAL STORAGE IS NEEDED FOR AN UPCOMING STORM.

8 OF 14

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PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

E&S 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:CONSTDET 8
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STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES

- ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
- AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, AND A REPRESENTATIVE FROM THE LOCAL PADEP OR CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
- AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776 FOR BURIED UTILITIES LOCATIONS.
- ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION
- CLEARING, GRUBBING, AND TOPSOIL STRIPPED SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THE E&S PLAN.
- AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
- TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAP(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.
- IMMEDIATELY UPON DISCOVERING UNFORSEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.
- ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
- UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS 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 THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
- A LOG SHOWING DATES THAT E&S BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND BE MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.
- SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEEPED INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
- ALL SEDIMENT REMOVED FROM BMPS SHALL BE PLACED WITHIN THE RIGHT-OF-WAY EXCEPT IN WETLAND AREAS OR AS OTHERWISE DESCRIBED IN THE PLAN DRAWINGS.
- AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES – 6 TO 12 INCHES ON COMPACTED SOILS – PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
- E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE PA DEP OR THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE PA DEP OR LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.
- UNDERGROUND UTILITIES CUTTING THROUGH ANY ACTIVE CHANNEL SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL RESTORED TO ITS ORIGINAL CROSS-SECTION AND PROTECTIVE LINING. ANY BASE FLOW WITHIN THE CHANNEL SHALL BE CONVEYED PAST THE WORK AREA IN THE MANNER DESCRIBED IN THIS PLAN UNTIL SUCH RESTORATION IS COMPLETE.
- 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 MOVEMENTS.
- IF EARTH DISTURBANCE ACTIVITIES ARE TO CEASE FOR MORE THAN 4 DAYS, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS. ACCESS AREAS THAT CONTINUE TO BE DISTURBED WILL BE STABILIZED ONCE ACTIVITY IS COMPLETE.
- AT STREAM CROSSINGS, 50' BUFFER AREAS SHOULD BE MAINTAINED. ON BUFFERS, CLEARING, SOD DISTURBANCES, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING LOGS, BURNING CLEARED BRUSH, DISCHARGING RAINWATER FROM TRENCHES, WELDING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE OF BUFFERS.
- MULCH WITH NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER AND WITHIN 100' OF SPECIAL PROTECTION WATERS OR 50' OF SURFACE WATERS.
- THE OPERATOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., AND 287.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE.

REVEGETATION

A. TEMPORARY GRASS COVER SHALL BE ESTABLISHED IN THE FOLLOWING AREAS:

- WHERE VEGETATIVE FILTERS MUST BE ESTABLISHED BELOW FILTER BAGS, A MINIMUM DISTANCE OF 10 FT SHALL BE SEEDED DOWNSLOPE OF THE TRAP OUTLET. TEMPORARY COVER – SEED MIXTURE FOR TEMPORARY COVER SHALL CONSIST OF 100% ANNUAL RYEGRASS. SEED SHALL BE APPLIED AT THE RATE OF 40 LB/ACRE OR AS RECOMMENDED BY A LOCAL RECOGNIZED SEED SUPPLIER APPROVED BY THE OWNER'S REPRESENTATIVE. PRIOR TO SEEDING, APPLY 1 TON OF AGRICULTURAL GRADE LIMESTONE PER ACRE PLUS 10-10-10 FERTILIZER AT THE RATE OF 500 LB. PER ACRE AND WORK INTO SOIL.

TOPSOIL APPLICATION

Graded areas should be scarified or otherwise loosened to a depth of 3 to 5 inches to permit bonding of the topsoil to the surface areas and to provide a roughened surface to prevent topsoil from sliding down slope. Topsoil should be uniformly distributed across the disturbed area to a depth of 4 to 8 inches minimum (USE 6" MINIMUM DEPTH) 2 inches on fill outslopes. Spreading should be done in such a manner that sodding or seeding can proceed with a minimum of additional preparation or tillage. Irregularities in the surface resulting from topsoil placement should be corrected in order to prevent formation of depressions unless such depressions are part of the PCSM plan. Topsoil should not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation. Compacted soils should be scarified 6 to 12 inches along contour wherever possible prior to seeding.

TABLE 11.4

Recommended Seed Mixtures			
Mixture Number	Species	Seeding Rate - Pure Live Seed 1	
		Most Sites	Adverse Sites
1	Spring oats (spring), or 64 96	64	96
	Annual ryegrass (spring or fall), or	10	15
	Winter wheat (fall), or	90	120
	Winter rye (fall)	56	112
2	Tall fescue, or 75	60	75
	Fine fescue, or 40	35	40
	Kentucky bluegrass, plus 25 30	25	30
	Redtop4, or	3	3
3	Perennial ryegrass	15	20
	Birdsfoot trefoil, plus 6 10	6	10
4	Tall fescue	30	35
	Birdsfoot trefoil, plus	6	10
	Reed canarygrass	10	15
5	Crownvetch, plus	10	15
	Tall fescue, or	20	25
	Perennial ryegrass	20	25
6	Crownvetch, plus	10	15
	Annual ryegrass	20	25
	Birdsfoot trefoil, plus	6	10
7	Crownvetch, plus	10	15
	Tall fescue	20	30
	Flatpea, plus	20	30
8	Tall fescue, or	20	30
	Perennial ryegrass	20	25
	Serecia lespedeza, plus	10	20
9	Tall fescue, plus	20	25
	Redtop4	3	3
	Tall fescue, plus	40	60
10	Fine fescue	10	15
	Deertongue, plus	15	20
	Birdsfoot trefoil	6	10
12	Switchgrass, or	15	20
	Big Bluestem, plus	15	20
	Birdsfoot trefoil	6	10
	Orchardgrass, or	20	30
13	Smooth bromegrass, plus	25	35
	Birdsfoot trefoil	6	10

Penn State, "Erosion Control and Conservation Plantings on Noncropland"
 1. 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 required to plant one acre. All mixtures in this table are shown in terms of PLS.

- If high-quality seed is used, for most sites seed spring oats at a rate of 2 bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at 1 bushel per acre. If germination is below 90%, increase these suggested seeding rates by 0.5 bushel per acre.
- This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.
- Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.
- Use for highway slopes and similar sites where the desired species after establishment is crownvetch.
- Use only in extreme southeastern or extreme southwestern Pennsylvania. Serecia lespedeza is not well adapted to most of PA.
- Do not mow shorter than 9 to 10 inches.
- Seed mixtures containing crown vetch should not be used in areas adjacent to wetlands or stream channels due to the invasive nature of this species.

TABLE 11.2

Soil Amendment Application Rate Equivalents				
Soil Amendment	Permanent Seeding Application Rate			Notes
	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	
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"
NOTE: A compost blanket which meets the standards of this chapter may be substituted for the soil amendments shown in Table 11.2.

TABLE 11.5

Recommended Seed Mixtures for Stabilizing Disturbed Areas			
Site Condition	Nurse Crop	Seed Mixture (Select one mixture)	
		1 plus	3 or 7
Slopes and Banks (not mowed)			
Well-drained	1 plus	3, 5, 8, or 12	
Variable drainage	1 plus	3 or 7	
Slopes and Banks (mowed)			
Well-drained	1 plus	2 or 10	
Slopes and Banks (grazed/hay)			
Well-drained	1 plus	2, 3, or 13	
Gullies and Eroded Areas	1 plus	3, 5, 7, or 12	
Erosion Control Facilities (BMPs)			
Sod waterways, spillways, frequent water flow areas	1 plus	2, 3, or 4	
Drainage ditches			
Shallow, less than 3 feet deep	1 plus	2, 3, or 4	
Deep, not mowed	1 plus	5 or 7	
Pond banks, dikes, levees, dams, diversion channels, and occasional water flow areas			
Mowed areas	1 plus	2 or 3	
Non-mowed areas	1 plus	5 or 7	
For hay or silage on diversion channels and occasional water flow areas	1 plus	3 or 13	
Highways			
Non-mowed areas			
Pure crownvetch	1 plus	5 or 6	
Well-drained	1 plus	5, 7, 8, 9, or 10	
Variable drained	1 plus	3 or 7	
Poorly drained	1 plus	3 or 4	
Areas mowed several times per year	1 plus	2, 3, or 10	
Utility Right-of-way			
Well-drained	1 plus	5, 8, or 12	
Variable drained	1 plus	3 or 7	
Well-drained areas for grazing/hay	1 plus	2, 3, or 13	
Effluent Disposal Areas	1 plus	3 or 4	
Sanitary Landfills	1 plus	3, 5, 7, 11, or 12	
Surface mines			
Spoils, mine wastes, fly ash, slag, settling basin			
Residues and other severely disturbed areas (lime to soil test)	1 plus	3, 4, 5, 7, 8, 9, 11, or 12	
Severely disturbed areas for grazing/hay	1 plus	3 or 13	

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

- For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.
- Contact the Pennsylvania Department of Transportation district roadside specialist for specific suggestions on treatment techniques and management practices.
- Seed mixtures containing crown vetch should not be used in areas adjacent to wetlands or stream channels due to the invasive nature of this species.

TABLE 11.6

Mulch Type	Mulch Application Rates			Notes
	Application Rate (Min.)			
	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	
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	See limitations above

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.

CONSTRUCTION SEQUENCE

- 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.
- 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.
- Install stabilized construction entrance.
- 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.
- After diversion channels are constructed and stabilized, install remaining compost filter sock as indicated on plan, for remainder of site.
- 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.
- 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.
- 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.
- Any materials removed from the site, and not taken to a permitted landfill, will require a separate Erosion Control Plan submittal.
- 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.
- After pad reaches final grade, install storm inlets and pipes into SRC Basin #1.
- Complete all pump station NGL piping and substation equipment installation.
- Complete final seeding and mulching of remaining disturbed areas.
- 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.
- 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.
- 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. "Siltbags" 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.
- 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

- Place compost filter sock as indicated.
- Material imported to the site will be stockpiled in designated areas and surrounded by 12" high compost filter sock.
- 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.
- Areas left exposed and not subject to construction traffic shall receive a temporary seeding.
- A stabilized construction entrance will be placed as shown and maintained until the project is complete.
- Place Siltbags in all inlets.
- Place stone subbase over pad and driveway as soon as possible after grading is completed.
- 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 500 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.
- North American Green S-150 erosion control blankets will be placed **ON ALL DISTURBED AREA SLOPES AT 3H:1V OR STEEPER.**

PERMANENT CONTROLS

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


INSPECTION AND MAINTENANCE OF CONTROL FACILITIES

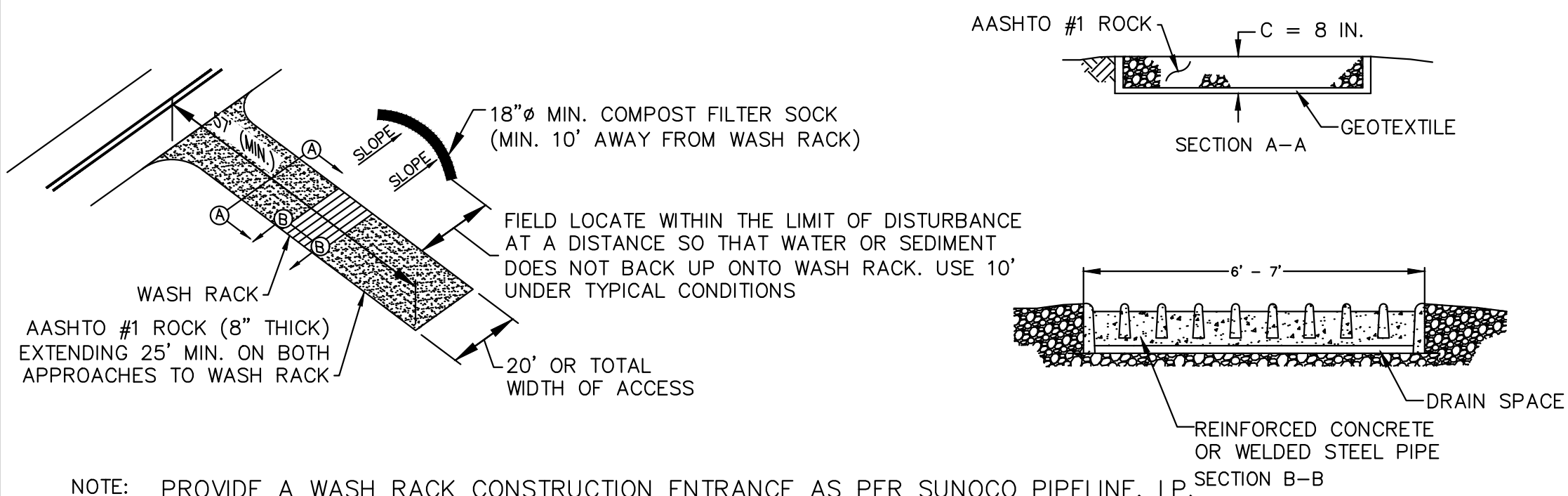
- ALL BMP's are to be inspected AT LEAST ONCE WEEKLY AND AFTER ALL RUNOFF EVENTS OVER 1" IN DEPTH.
- Retained sediment will be utilized for landscaping.
- All control facilities will remain in place until final stabilization is complete. Maintenance must include inspections of all erosion and sedimentation 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.
- 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:
 - 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - 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 2/20/12, "Visual Site Inspection Report" to document maintenance completed on the site after construction is completed.
 - 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.

<p>9 OF 14</p>	 <p>TETRA TECH</p> <p>www.tetrattech.com</p> <p>1134 TWIN STACKS DRIVE DALLAS, PA 18612 T: (570) 674-8648 F: (570) 674-8651</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>MARK</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>2.</td> <td>4/26/16</td> <td>REVISED PER HRG COMMENTS (4.14.16)</td> <td>GZ</td> </tr> <tr> <td>3.</td> <td>10/27/16</td> <td>REVISED PER DEP COMMENTS (9.6.16)</td> <td>GZ</td> </tr> <tr> <td>4.</td> <td>2/6/17</td> <td>REVISED PER DEP COMMENTS</td> <td>GZ</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	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	4.	2/6/17	REVISED PER DEP COMMENTS	GZ													<p>PPP – MIDDLETOWN PUMP STATION LONDONDERRY TOWNSHIP, DAUPHIN COUNTY</p> <p>E&S PLAN – CONSTRUCTION DETAILS</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DATE:03/11/16</td> </tr> <tr> <td>PROJECT NO.:112IC05370</td> </tr> <tr> <td>DRAWN BY:GZ</td> </tr> <tr> <td>CHECKED BY:TC</td> </tr> <tr> <td>SCALE:AS NOTED</td> </tr> <tr> <td>FILE:CONSDTET</td> </tr> <tr> <td>NAME:CONSDTET 9</td> </tr> <tr> <td>COPYRIGHT TETRA TECH INC.</td> </tr> </table>	DATE:03/11/16	PROJECT NO.:112IC05370	DRAWN BY:GZ	CHECKED BY:TC	SCALE:AS NOTED	FILE:CONSDTET	NAME:CONSDTET 9	COPYRIGHT TETRA TECH INC.
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NOTE: PROVIDE A WASH RACK CONSTRUCTION ENTRANCE AS PER SUNOCO PIPELINE, LP WASH RACK ONLY REQUIRED IN HQ OR EV WATERSHED AREAS. TYPICAL ROCK CONSTRUCTION ENTRANCE ACCEPTABLE IN ALL OTHER AREAS. (THIS SITE IS NOT LOCATED WITHIN AN HQ OR EV WATERSHED)

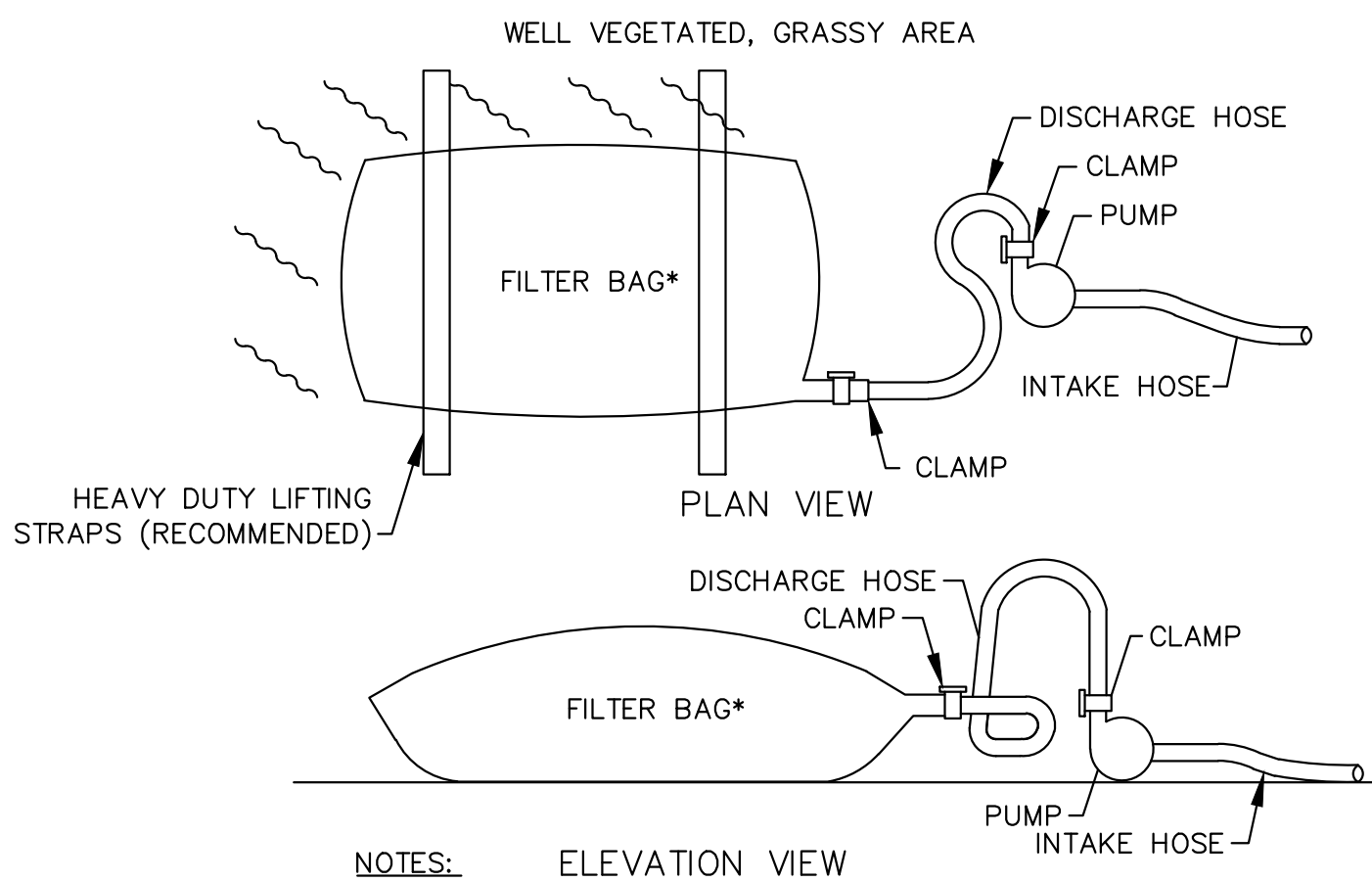
REASONABLE METHODS WHICH ARE SANCTIONED BY THE PADEP AS ALTERNATIVES TO INSTALLATION OF TIRE WASH STATIONS ON PUBLIC ROAD ACCESS POINTS FOR GATHERING PIPELINE PROJECTS IN EV/HQ WATERSHEDS INCLUDE:

- FOR PAVED SURFACE PUBLIC ROADS: USE OF A VACUUM TRUCK SWEEPER OR SWEEPER WITH A CATCH BIN ATTACHMENT.
- FOR DIRT OR GRAVEL SURFACE PUBLIC ROADS: RIGOROUS MANUAL REMOVAL OF MUD/DIRT FROM VEHICLE/EQUIPMENT TIRES PRIOR TO EXITING CONSTRUCTION SITE, SUPPLEMENTED BY IMMEDIATE RECOVER, BY MANUAL OR MECHANICAL MEANS, OF SOIL WHICH MAY BECOME DISCHARGED ONTO PUBLIC ROADWAYS. DUST CONTROL AND/OR COMPACTION VIA ROLLING OF THE DIRT PUBLIC ROAD SURFACE WILL BE IMPLEMENTED AS NEEDED.

A PREDICATE FOR UTILIZING ALTERNATIVE 1 AND 2 ABOVE IS THAT THE ROCK PAD CONSTRUCTION ENTRANCE MUST BE EXTENDED TO A MINIMUM TOTAL LENGTH OF 100 FEET AND MUST BE CONSTANTLY MAINTAINED INCLUDING STRUCTURE THICKNESS TO INSURE ITS EFFECTIVENESS REMAINS INTACT AT ALL TIMES.

FREQUENCY OF MECHANICAL AND/OR MANUAL CONTROLS WILL BE DEPENDENT UPON CONSTRUCTION TRAFFIC INTENSITY, WEATHER AND SOIL MOISTURE CONDITIONS. AT A MINIMUM FOR PAVED ROADS - ANY DAY IN WHICH CONSTRUCTION TRAFFIC IS EXITING THE ROCK CONSTRUCTION ENTRANCE, THE VACUUM TRUCK SWEEPER OR SWEEPER WITH A CATCH BIN ATTACHMENT SHALL CLEAN THE ROADWAY AT THE END OF THE WORK DAY AND PRIOR TO ANY FORECASTED RAIN EVENT. THE REQUIREMENT IS TO NOT INTRODUCE SEDIMENT LOAD FROM CONSTRUCTION TRAFFIC ONTO PUBLIC ROAD SURFACES AND INTO ROAD DITCHES WHICH WILL FLOW INTO THE EV/HQ WATER RESOURCES WHICH ARE THE SUBJECT OF THE INCREASED PROTECTION MEASURES.

AASHTO #1 ROCK CONSTRUCTION ENTRANCE NOT TO SCALE

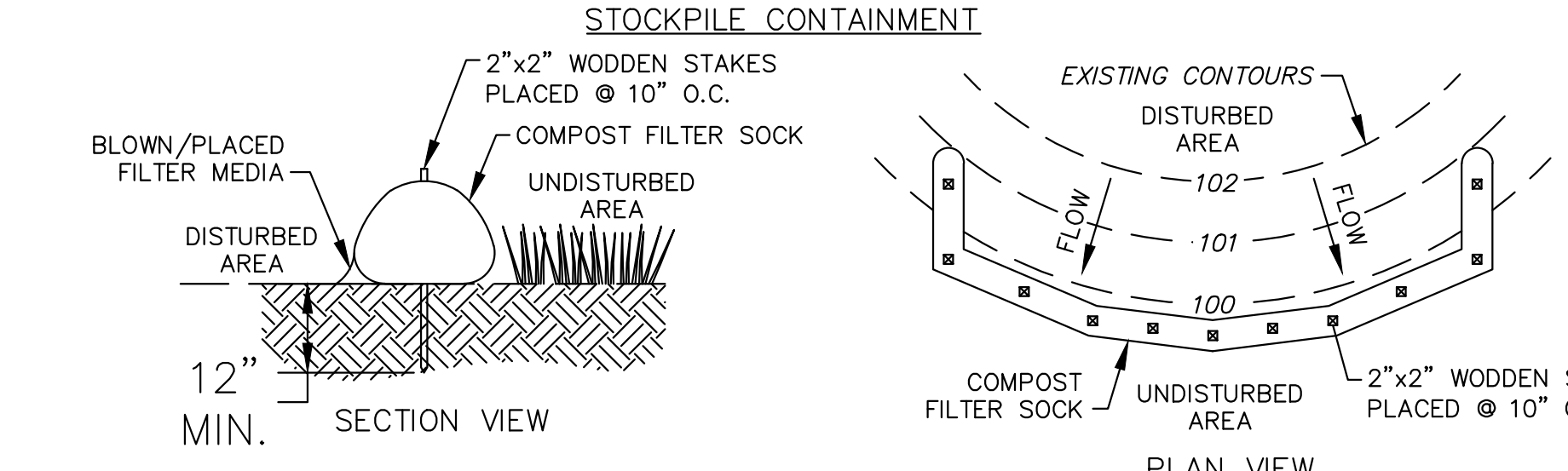
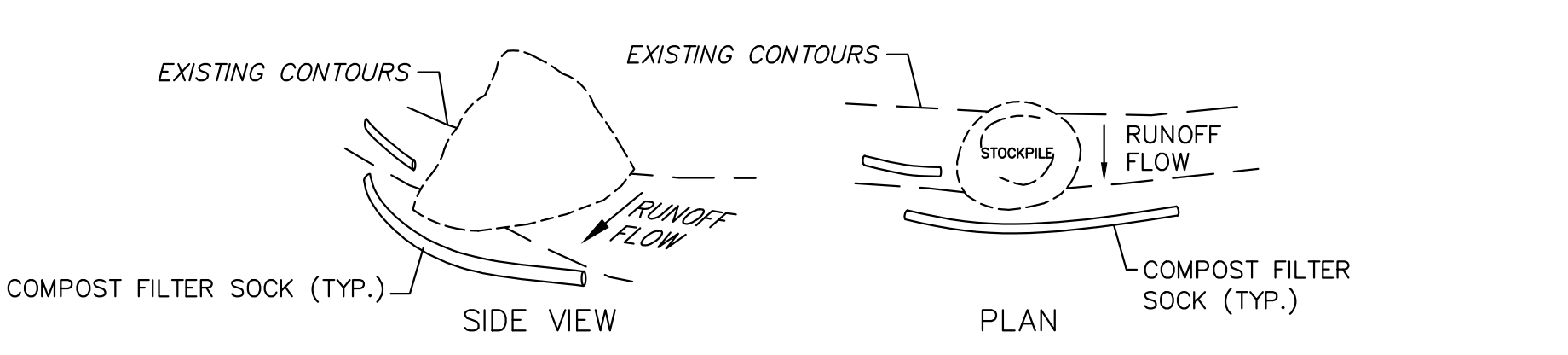
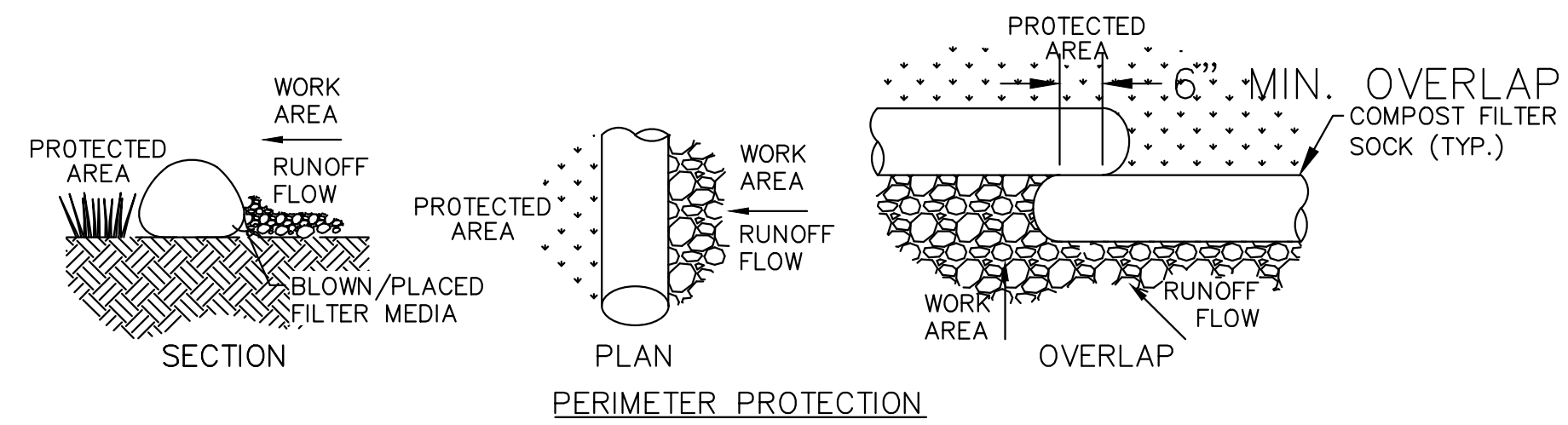
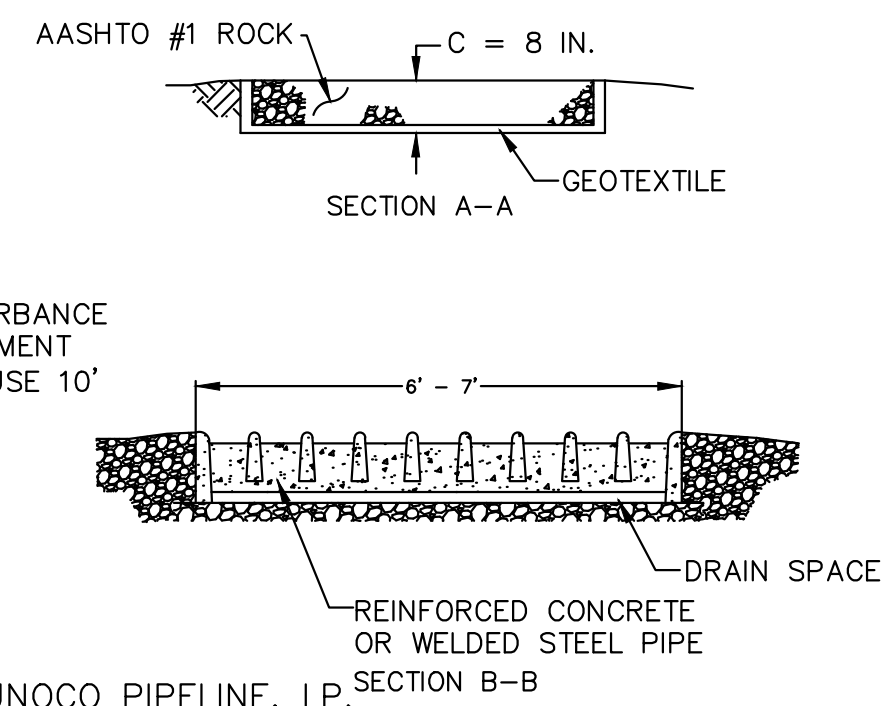


1. LOW VOLUME FILTER BAGS SHALL BE MADE OF NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE-STITCHED "J" SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 lb/in
GRAB TENSILE	ASTM D-4632	205 lb
PUNCTURE	ASTM D-4833	110 lb
MULLEN BURST	ASTM D-3786	350 psi
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 Sieve

- SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FULL. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
- BAGS SHALL BE LOCATED IN WELL VEGETATED (GRASSY) AREAS, AND DISCHARGE INTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5% CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
- NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.
- THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED.
- THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.
- FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

PUMPED WATER FILTER BAG NOT TO SCALE



COMPOST STANDARDS	
ORGANIC MATTER CONTENT	80%-100% (DRY WEIGHT BASIS)
ORGANIC	FIBROUS & ELONGATED
pH	5.5-8.0
MOISTURE CONTENT	35%-55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION	5.0 dS/m MAXIMUM

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE SOCK SHALL NOT EXCEED THAT SHOWN ON FIGURE 4.2 IN ATTACHMENT 3.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

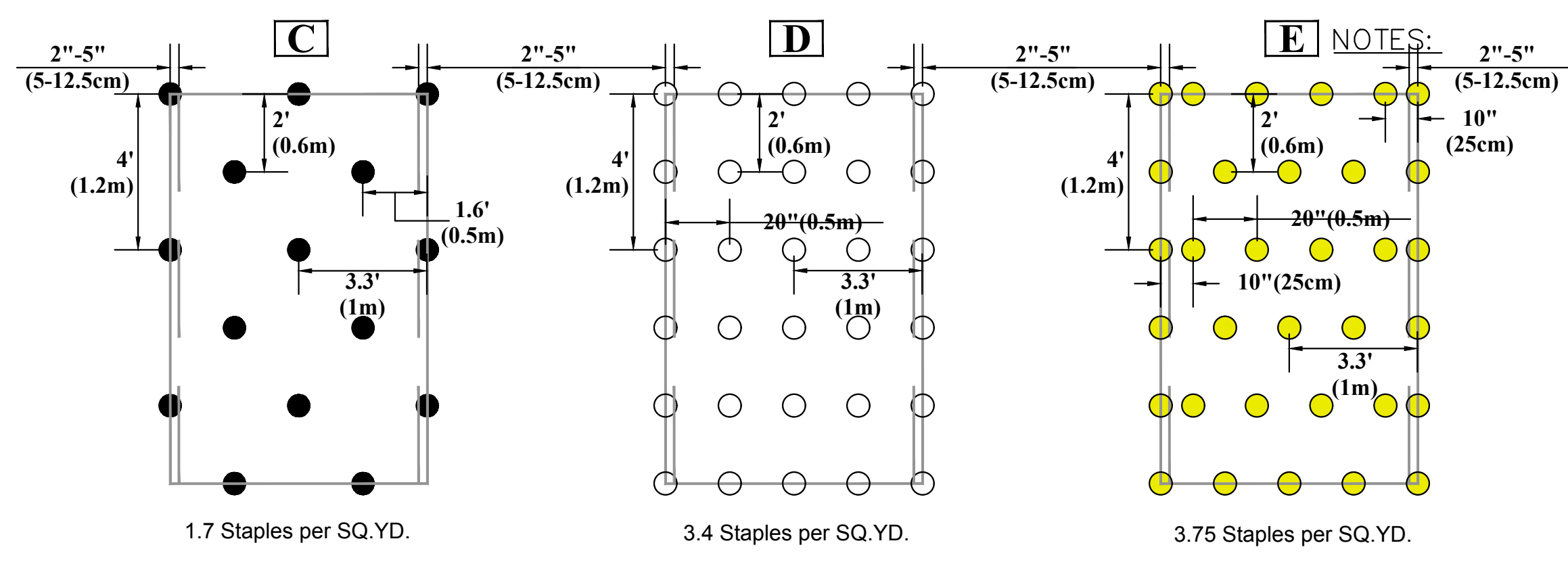
SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

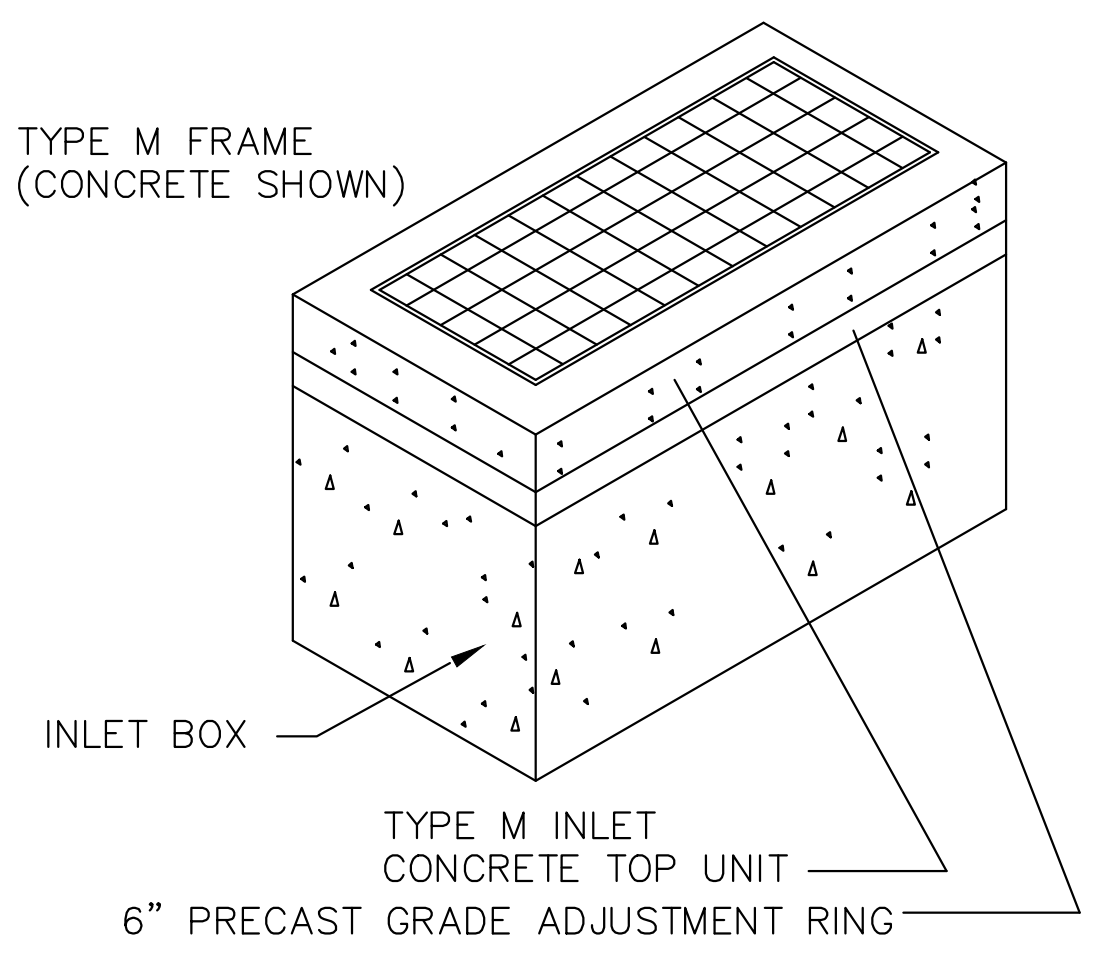
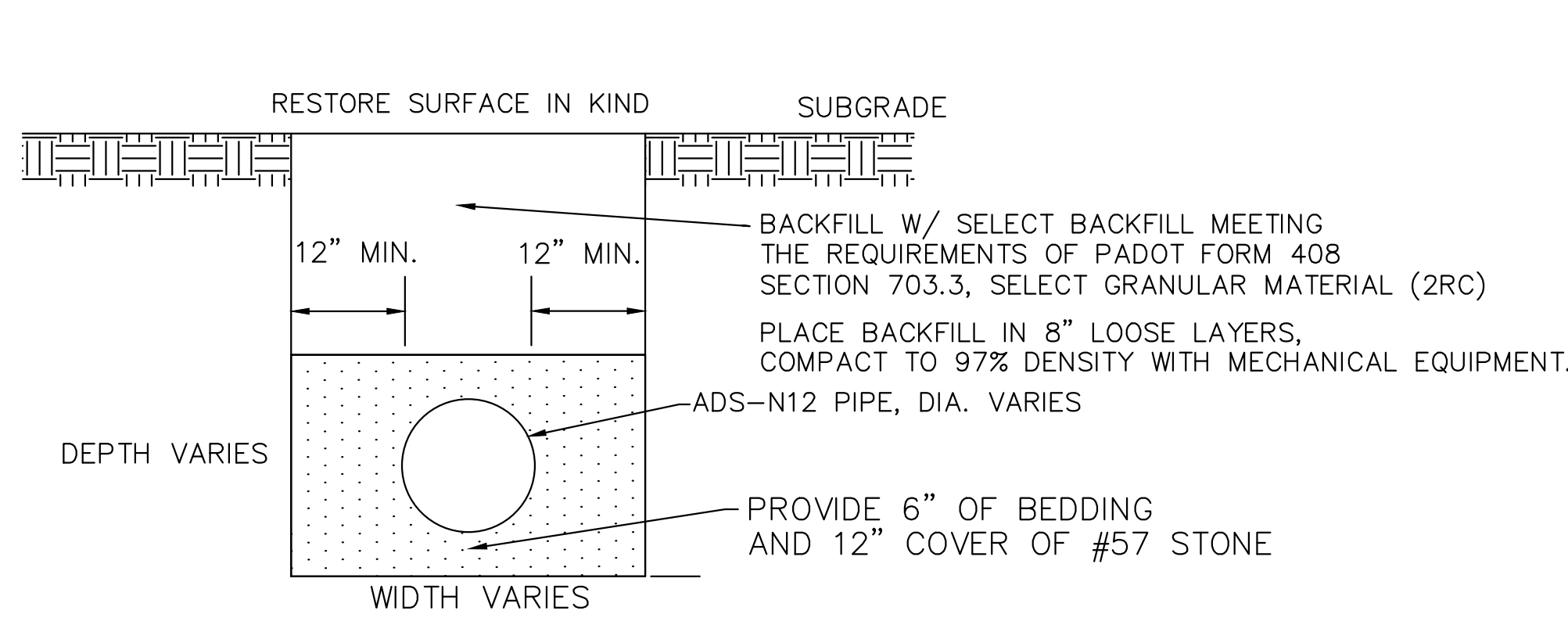
UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

COMPOST FILTER SOCK NOT TO SCALE

% SLOPE	MAXIMUM SLOPE LENGTHS FOR COMPOST FILTER SOCK			
	12" DIAMETER	18" DIAMETER	24" DIAMETER	32" DIAMETER
2 (OR LESS)	520	700	1000	1300
5	250	350	500	650
10	150	250	300	400
15	100	190	250	350
20	70	140	200	250
25	50	90	150	180
30	40	70	100	125
35	35	60	90	100
40	30	50	70	90
45	25	40	60	70
50	20	30	50	60

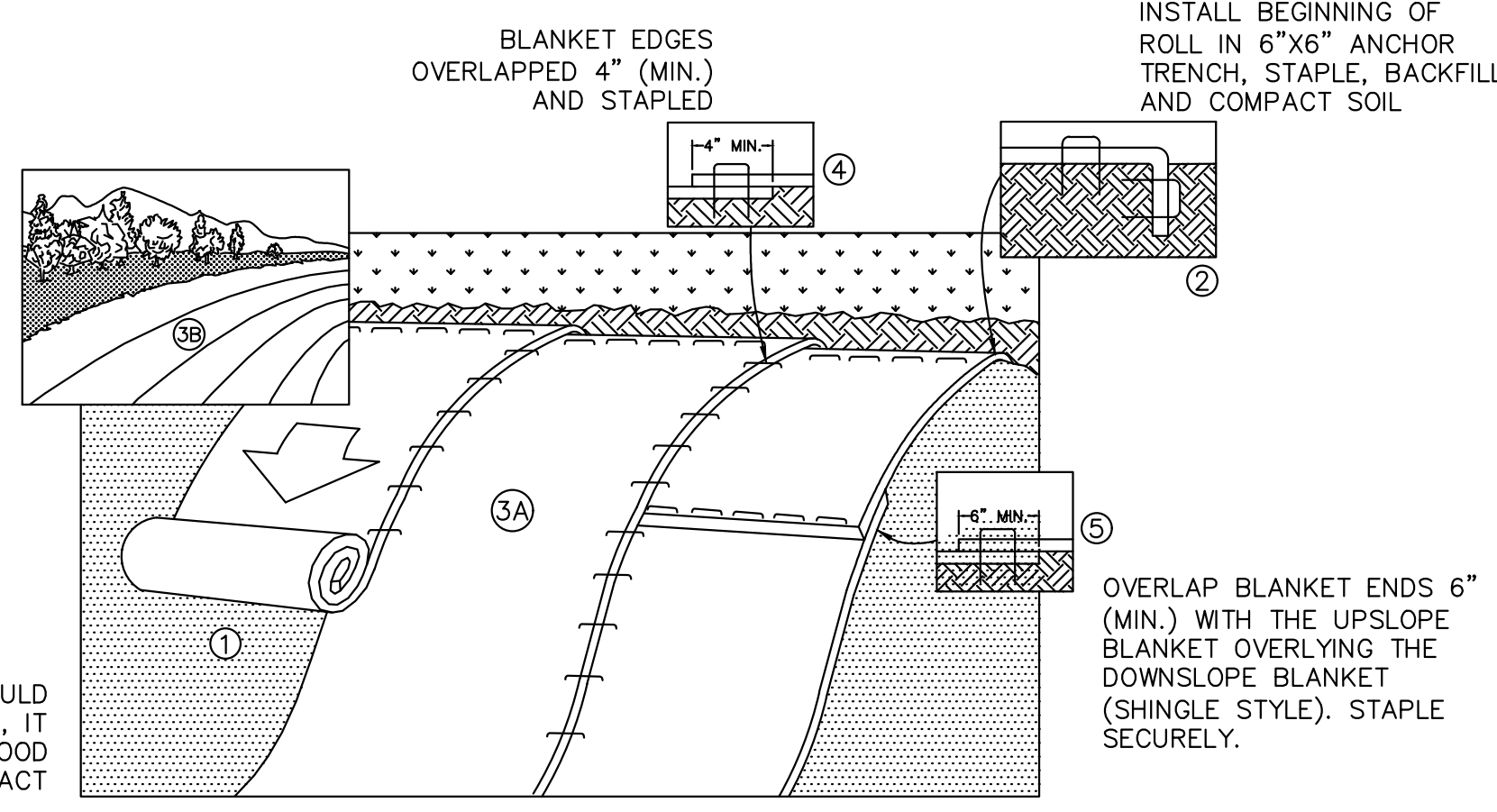
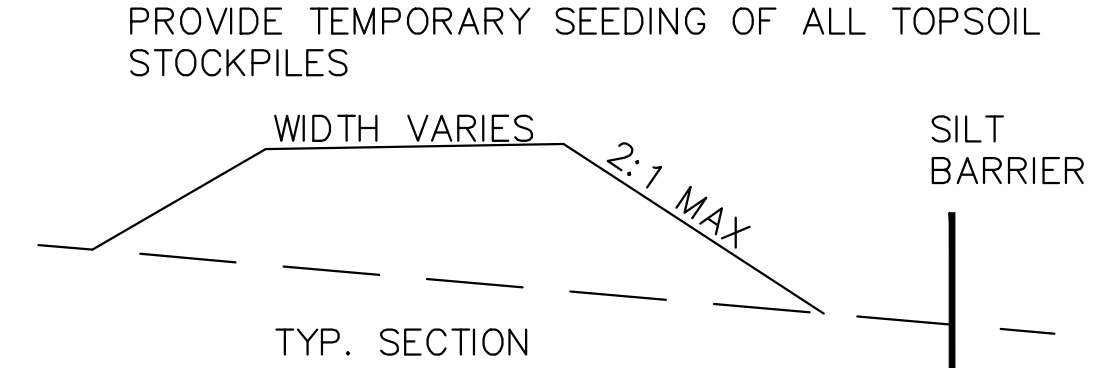


STAPLE PATTERNS FOR 2:1 SLOPES, USE STAPLE PATTERN "C" FOR 1:1 AND STEEPER SLOPES, USE STAPLE PATTERN "D"



PADOT TYPE "M" PRECAST CONCRETE INLET

- TOPSOIL STOCKPILE INSTALLATION:
- INSTALL SILT BARRIER AS SHOWN.
 - CLEAR TREES, IF NECESSARY.
 - PLACE STRIPPED TOPSOIL IN LAYERS, COMPACT WITH DOZER TRACKS DURING SPREADING.
 - SLOPES SHOULD NOT EXCEED 2H:1V.
 - STOCKPILE HEIGHTS SHALL NOT EXCEED 35'.
 - DO NOT PLACE STOCKPILES WITHIN 50' OF STREAMS



- SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.
- PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE
- SLOPE SURFACE SHALL BE FREE OF ROCKS, CLOUDS, STICKS, AND GRASS.
- BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE PROJECT LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
- THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
- BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

EROSION CONTROL BLANKET - SLOPE INSTALLATION NOT TO SCALE

10 OF 14

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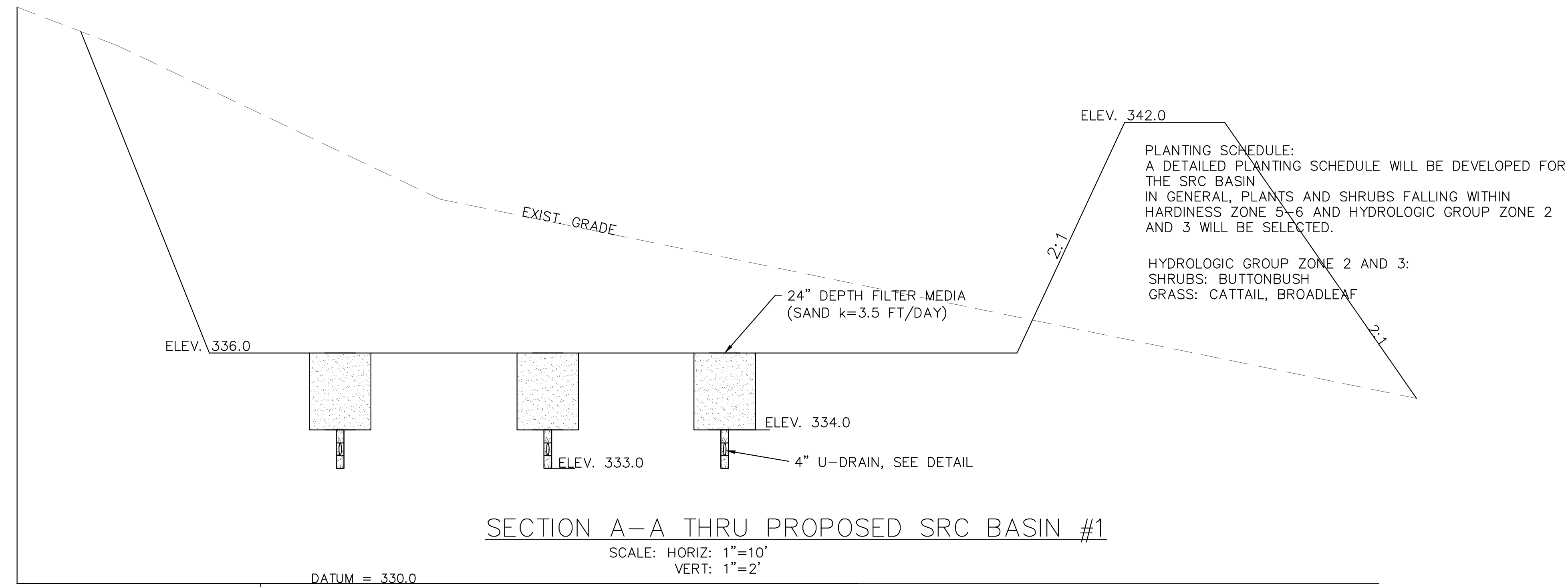
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PPP - MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

E&S PLAN - CONSTRUCTION DETAILS

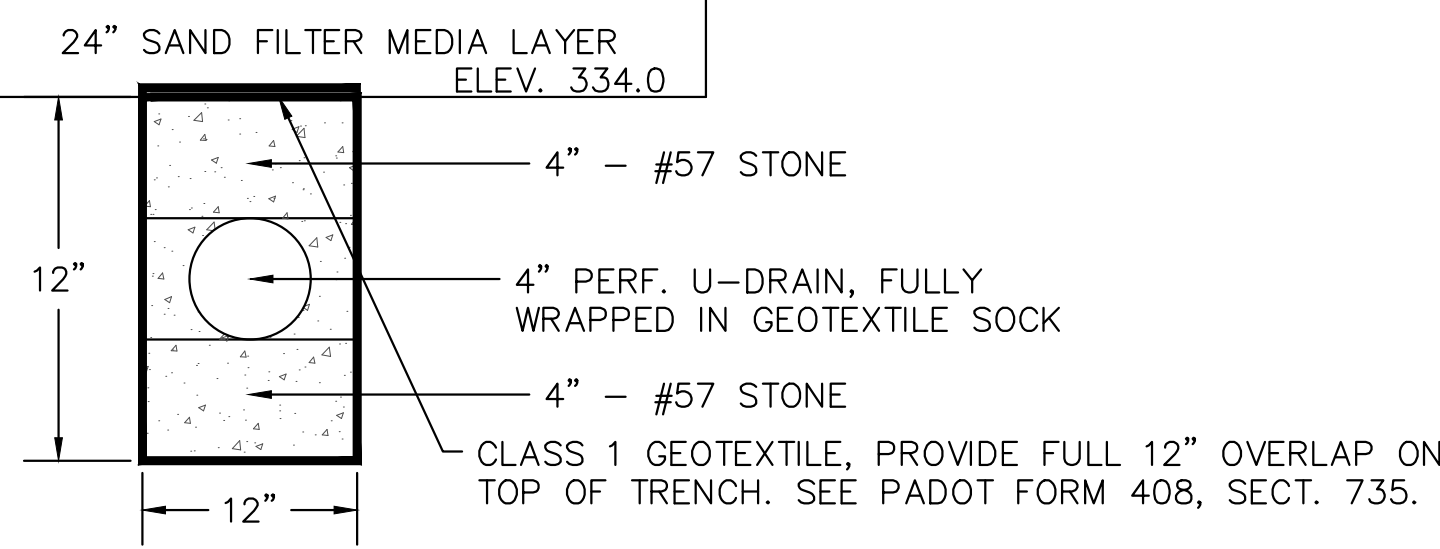
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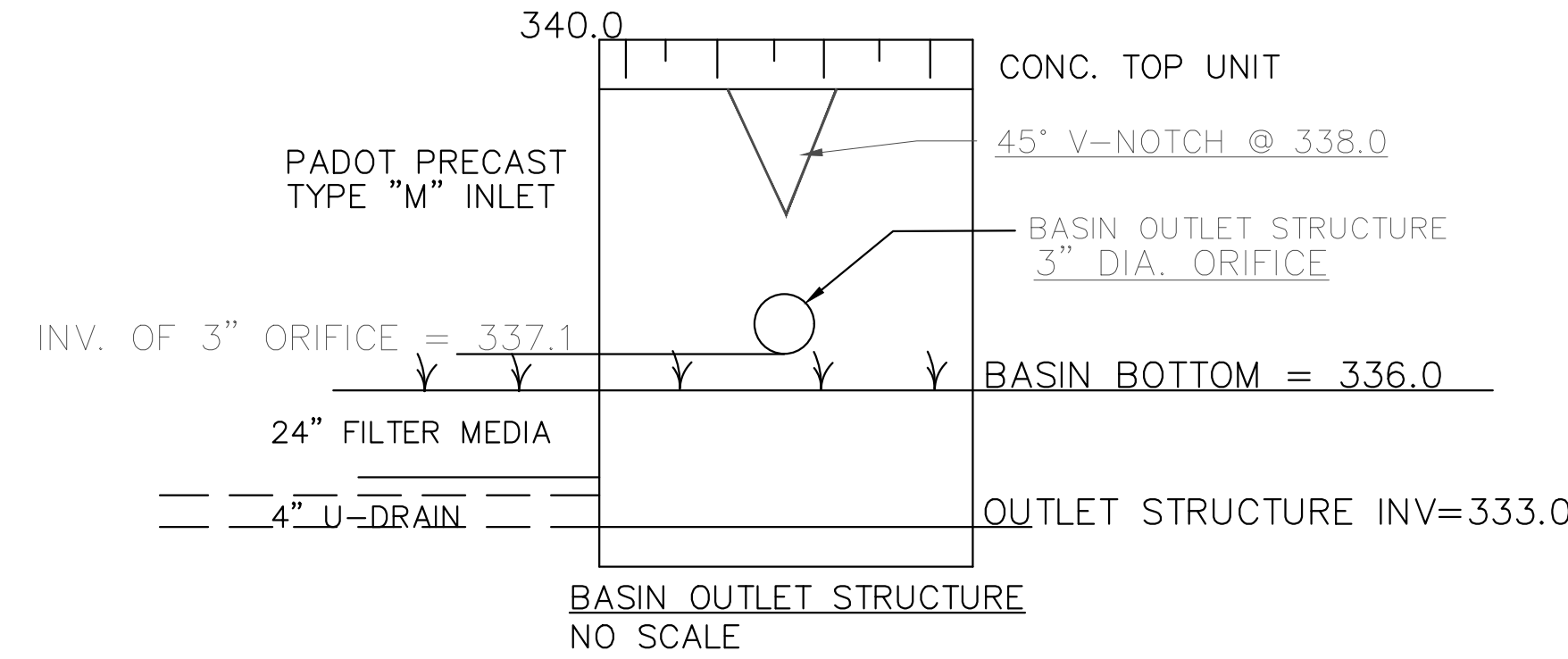
SECTION A-A THRU PROPOSED SRC BASIN #1

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

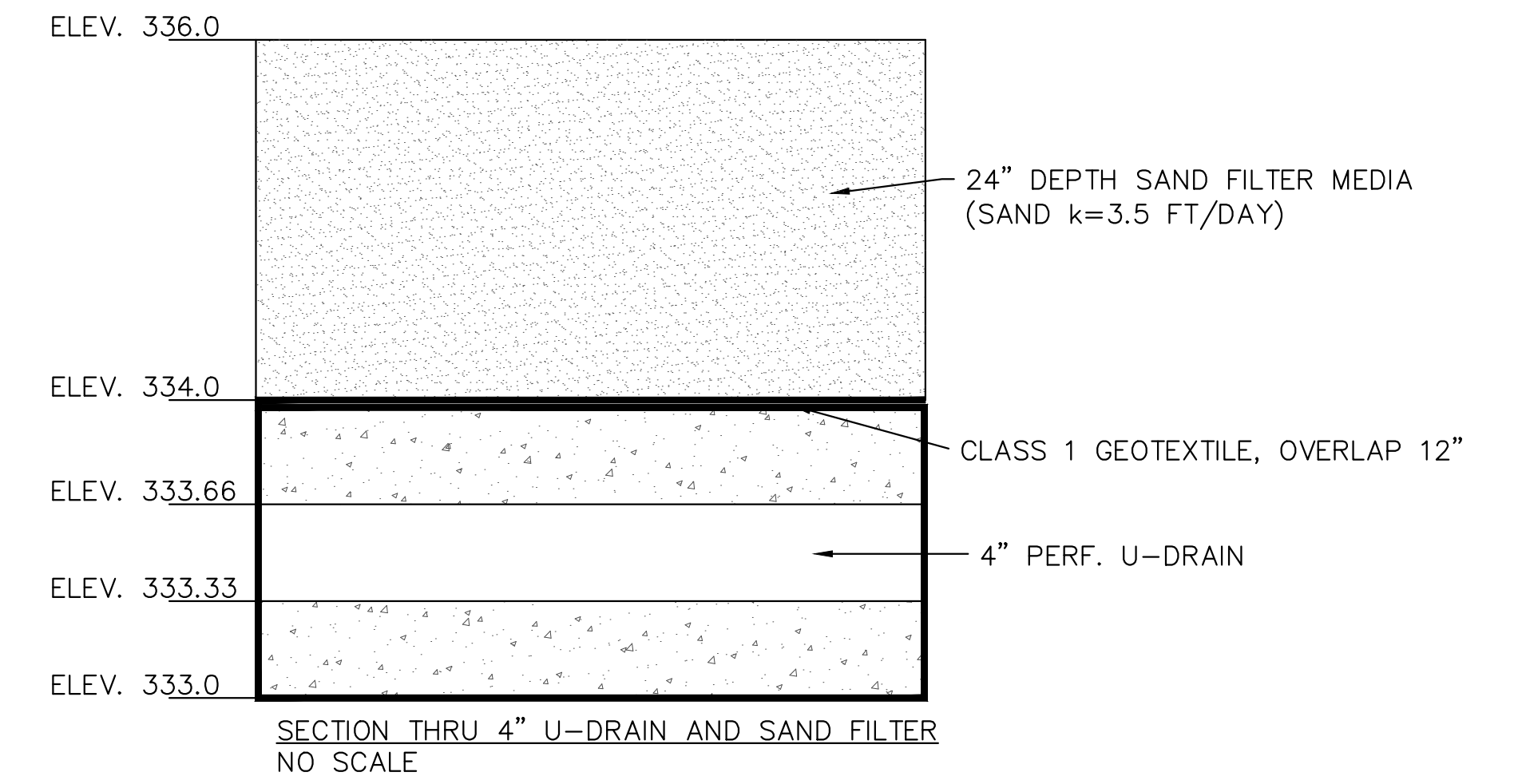
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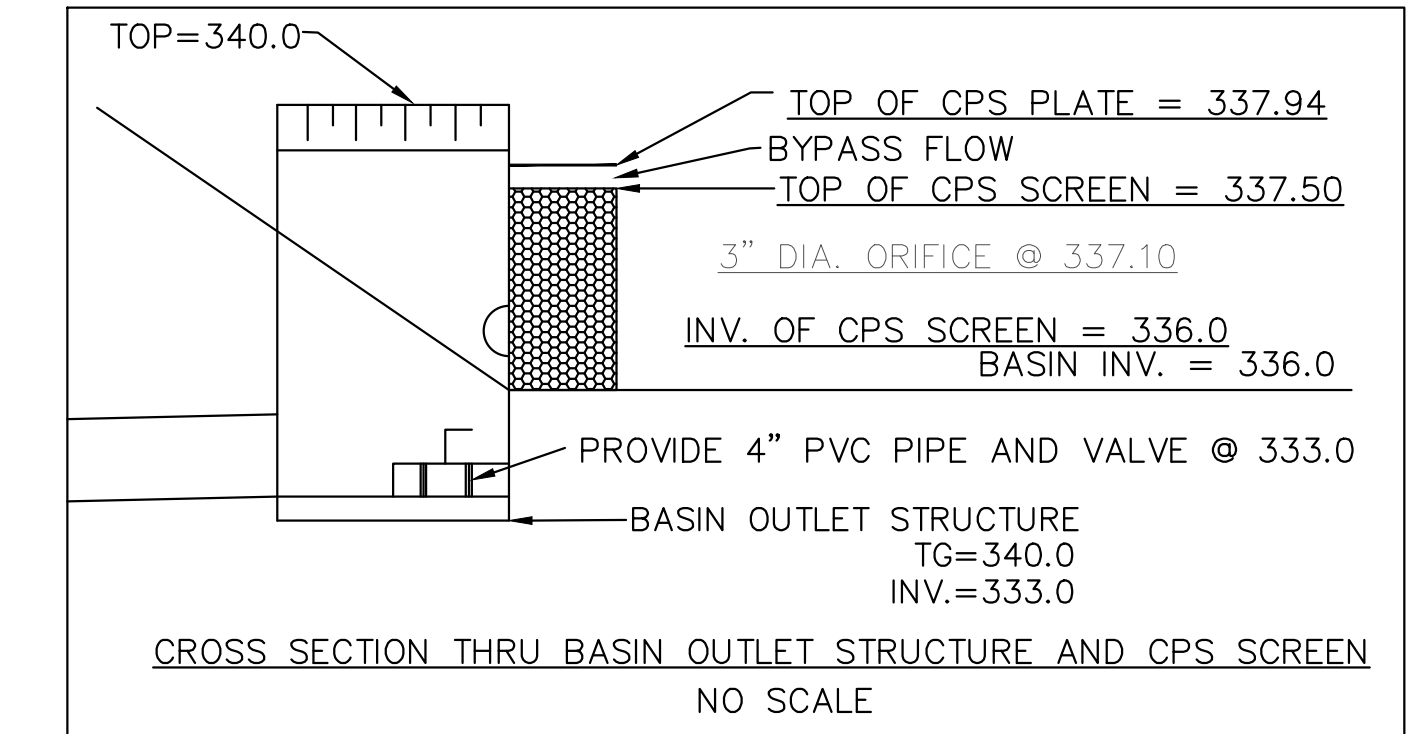
SECTION THRU 4" U-DRAIN
NO SCALE



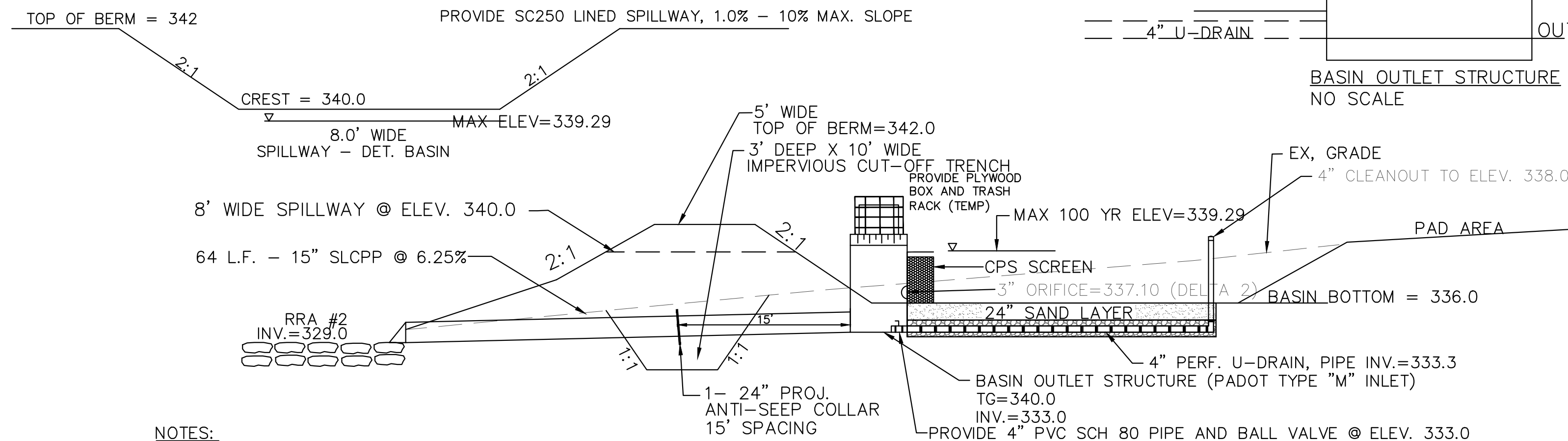
BASIN OUTLET STRUCTURE
NO SCALE



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



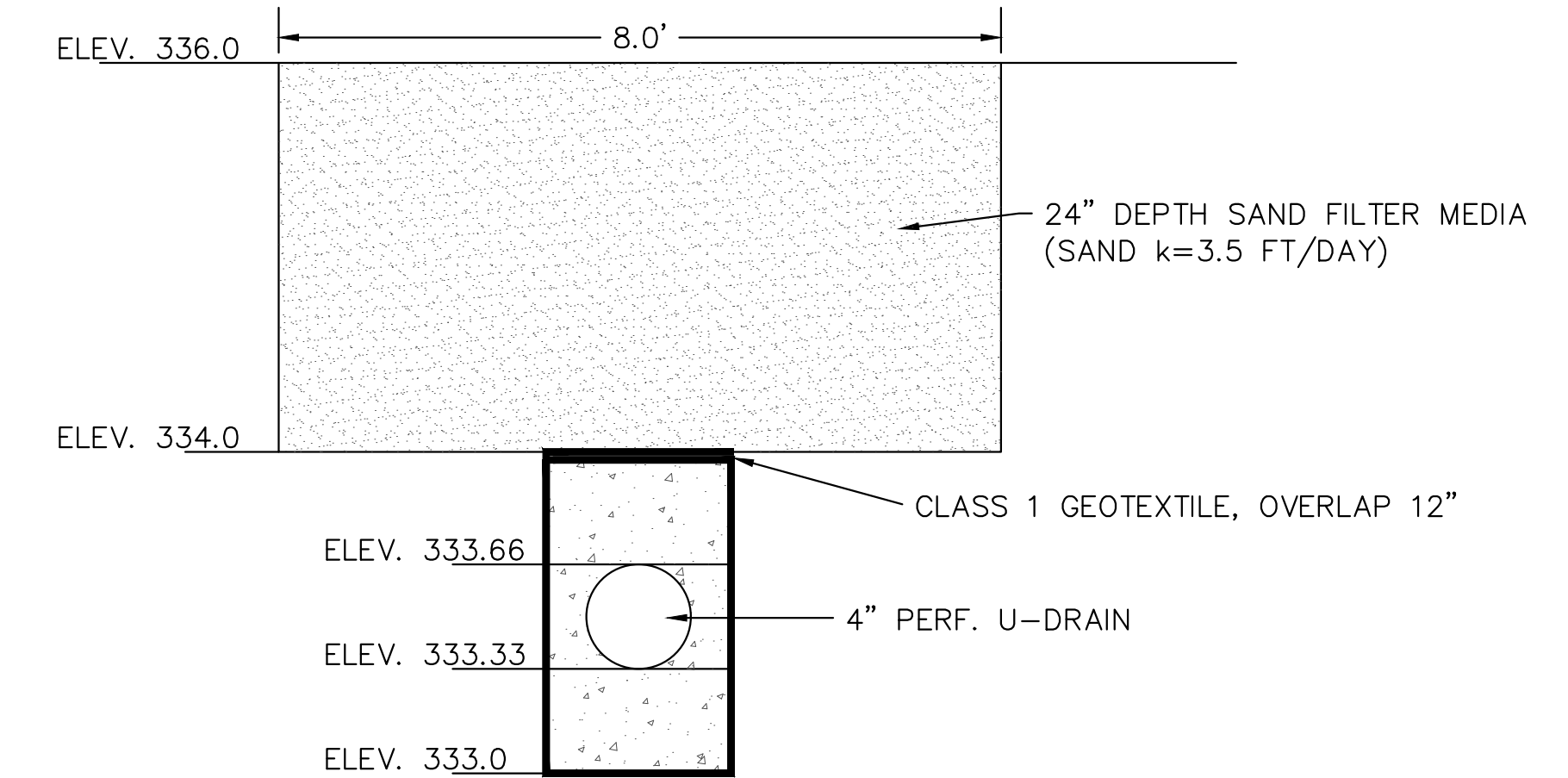
CROSS SECTION THRU BASIN OUTLET STRUCTURE AND CPS SCREEN
NO SCALE



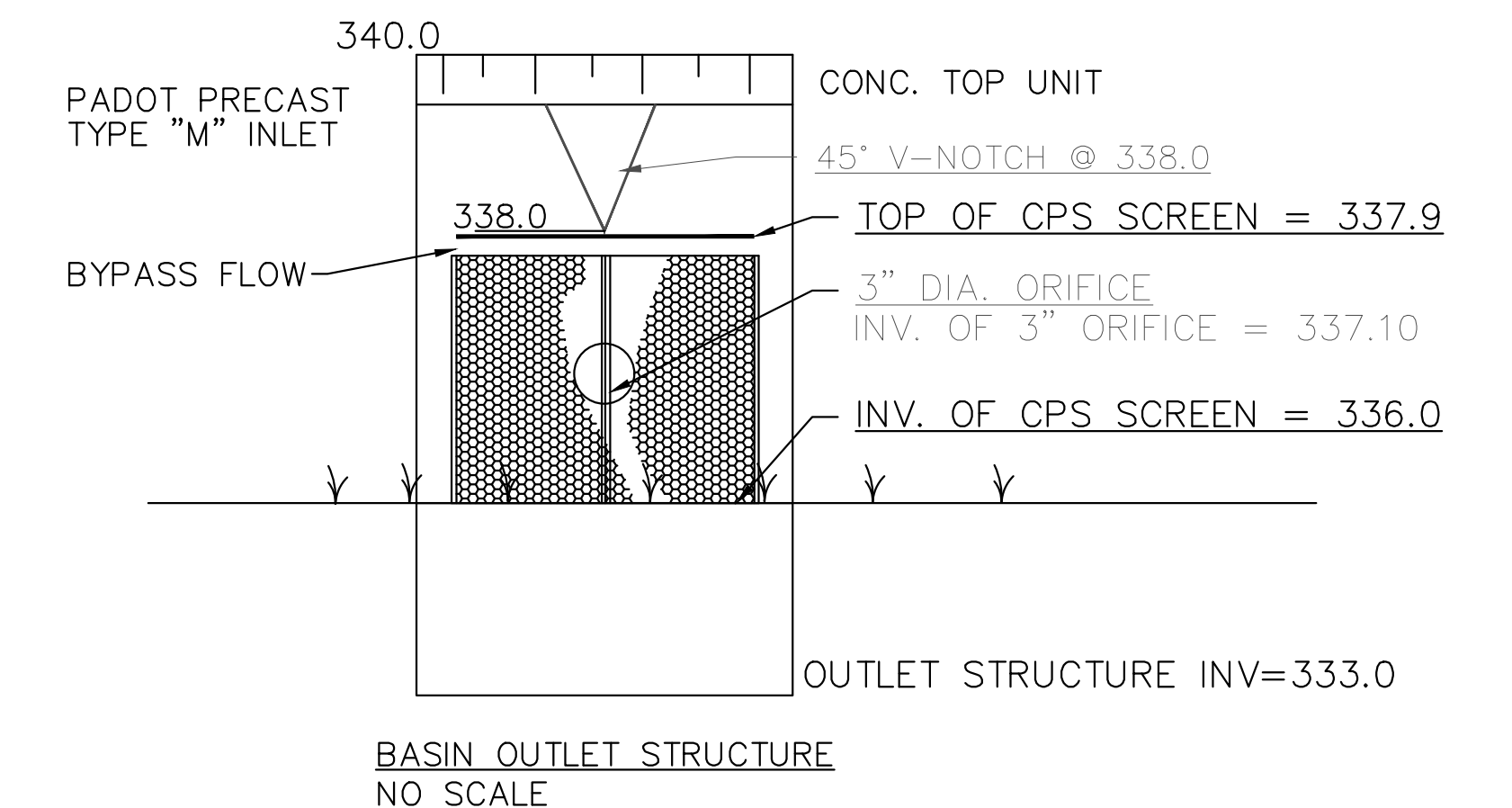
TYP. SECTION THRU SRC DETENTION BASIN #1
NO SCALE

NOTES:

- 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.
- 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:
- 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.
- 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.
- 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.
- 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.
- Catch Basins and Inlets (upgradient of basin) should be inspected and cleaned at least two times per year and after major runoff events.
- Vehicles should not be parked or driven on a 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. Properly dispose of sediment.
- 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.



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



BASIN OUTLET STRUCTURE
NO SCALE

11
OF
14

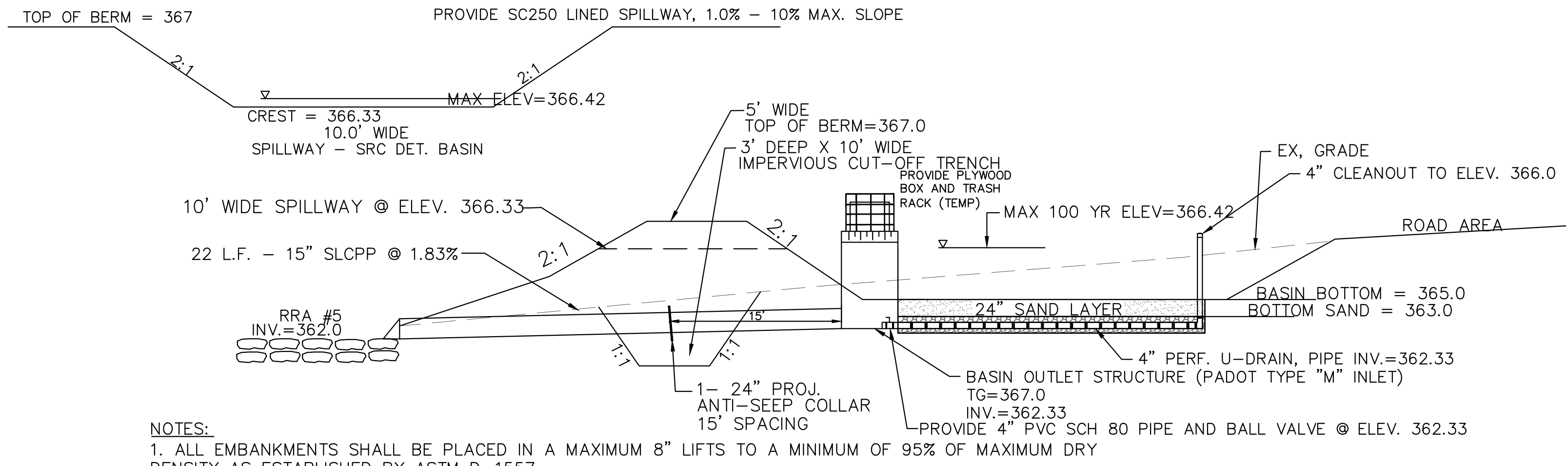
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PPP - MIDDLETOWN PUMP STATION
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E&S PLAN - CONSTRUCTION DETAILS

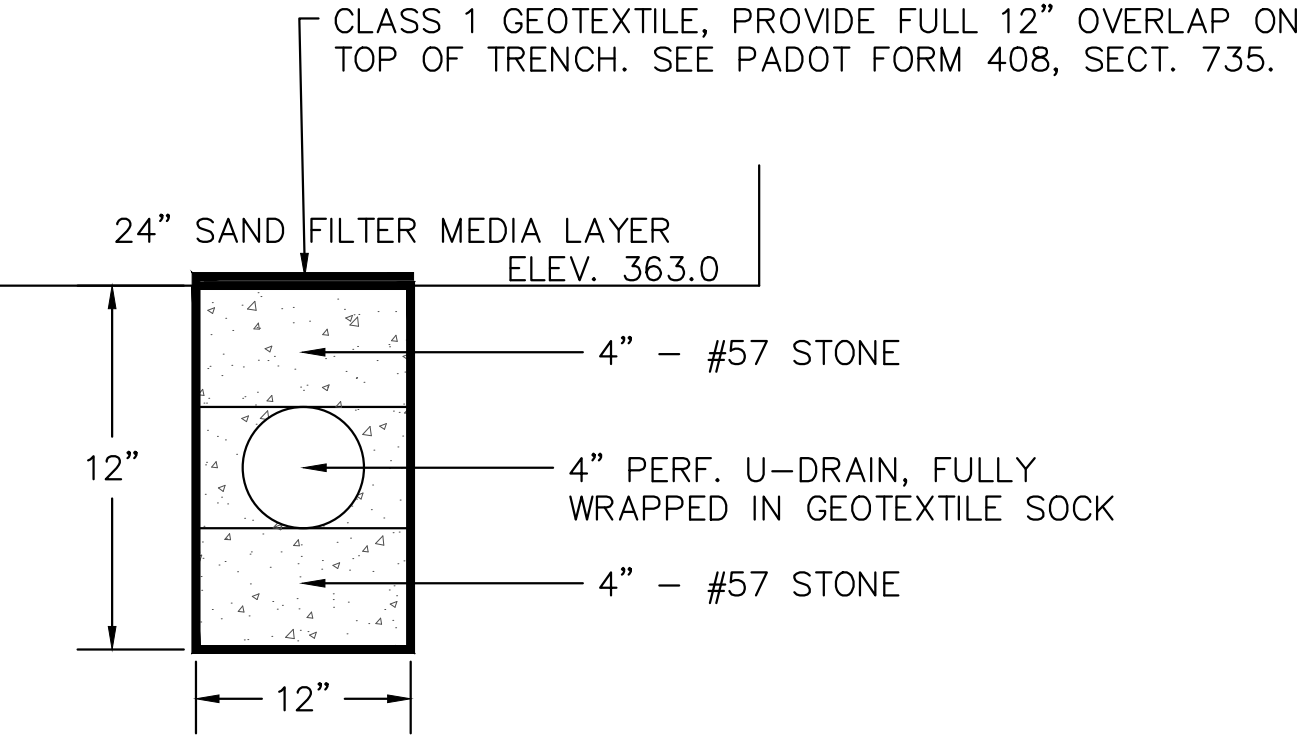
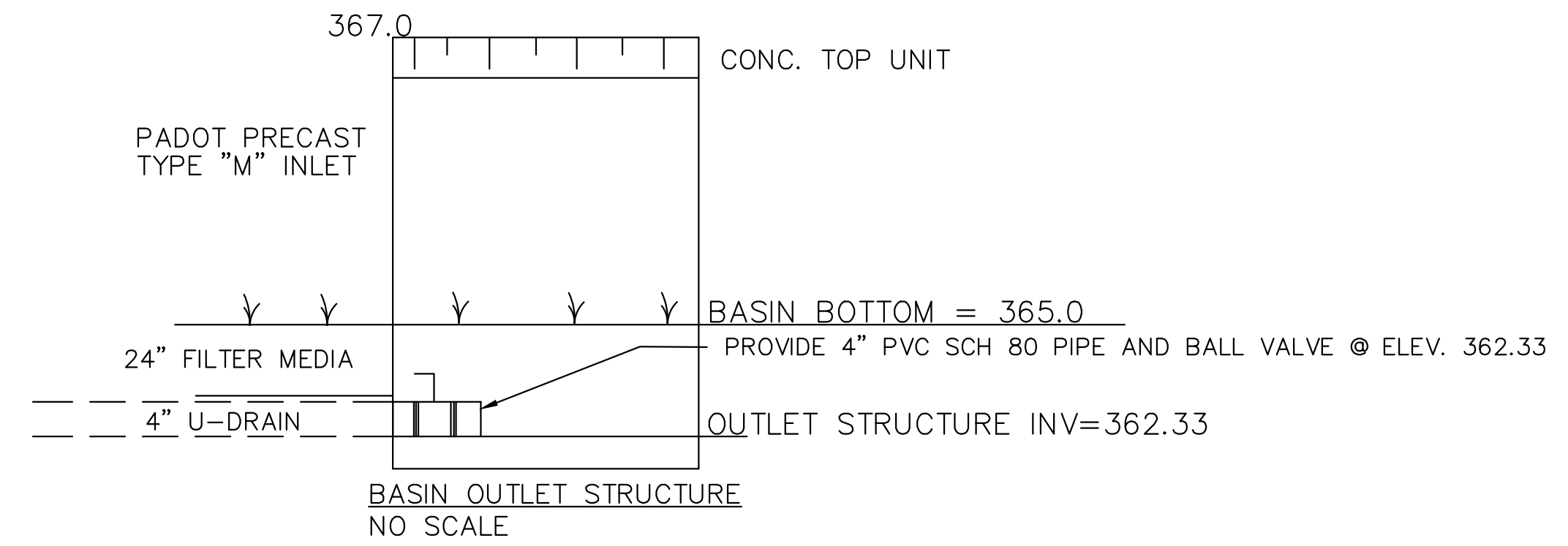
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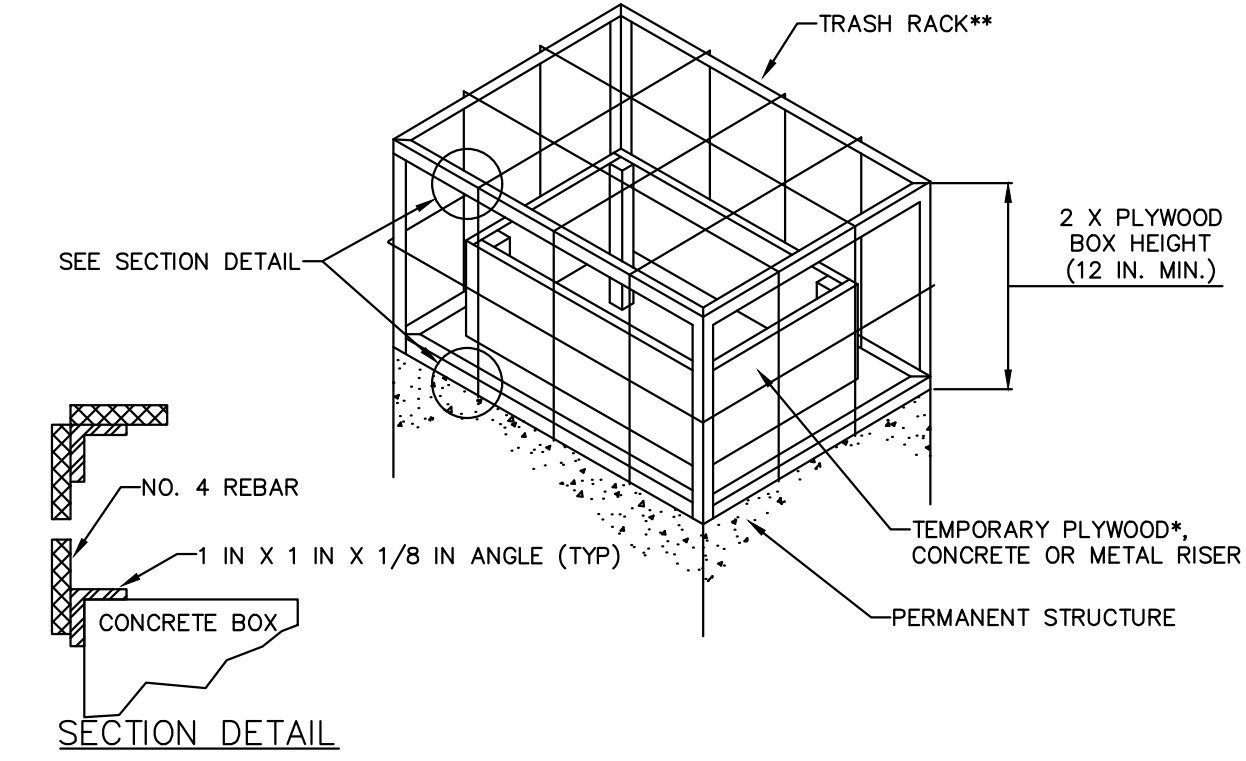
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 3. All basin structures expected to receive and/or trap debris and sediment should be inspected for clogging and excessive debris and sediment accumulation at least four times per year, as well as after every storm greater than 1 inch. Structures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

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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



SECTION THRU 4" U-DRAIN
NO SCALE



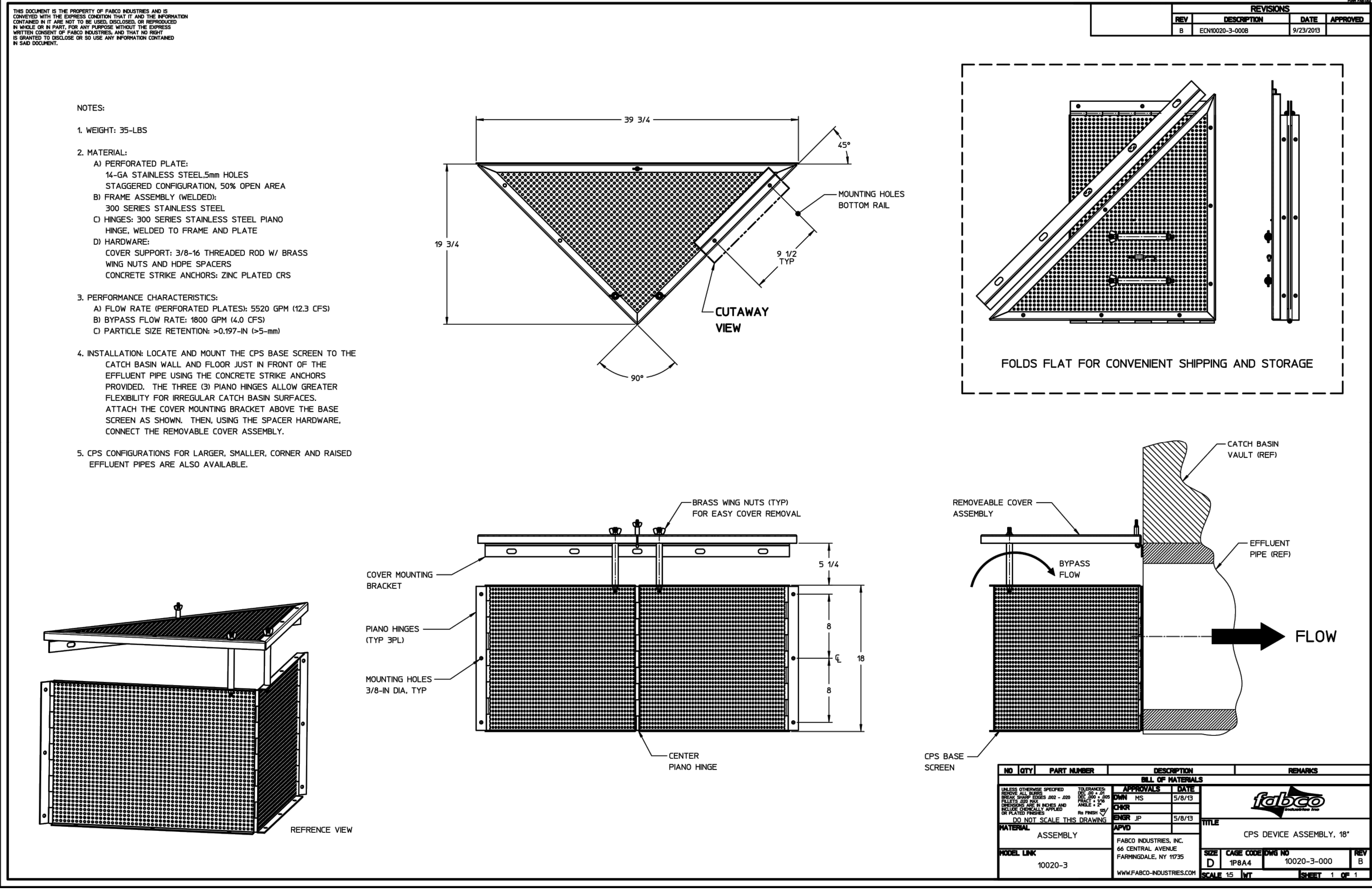
- NOTES:**
- 3/4 IN. PRESSURE TREATED PLYWOOD BOX WITH 2 IN. X 2 IN. PRESSURE TREATED CORNER SUPPORTS, SET INTO 1-1/2 IN. GRATE OFFSETS, CAULK ALL SEAMS TO FORM WATERTIGHT SEALS.
 - ** TRASH RACK COMPOSED OF 1 IN. X 1 IN. X 1/8 IN. L (TYP.) AND #4 BARS (TYP.) WELDED TO THE ANGLES AND AT EACH INTERSECTION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



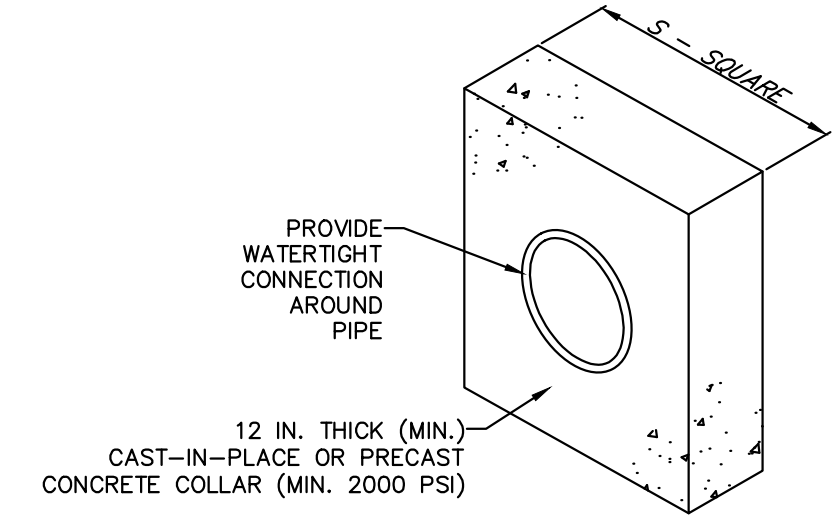
fabco
Connector Pipe Screen
Stormwater filtering technology

A Connector Pipe Screen (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.

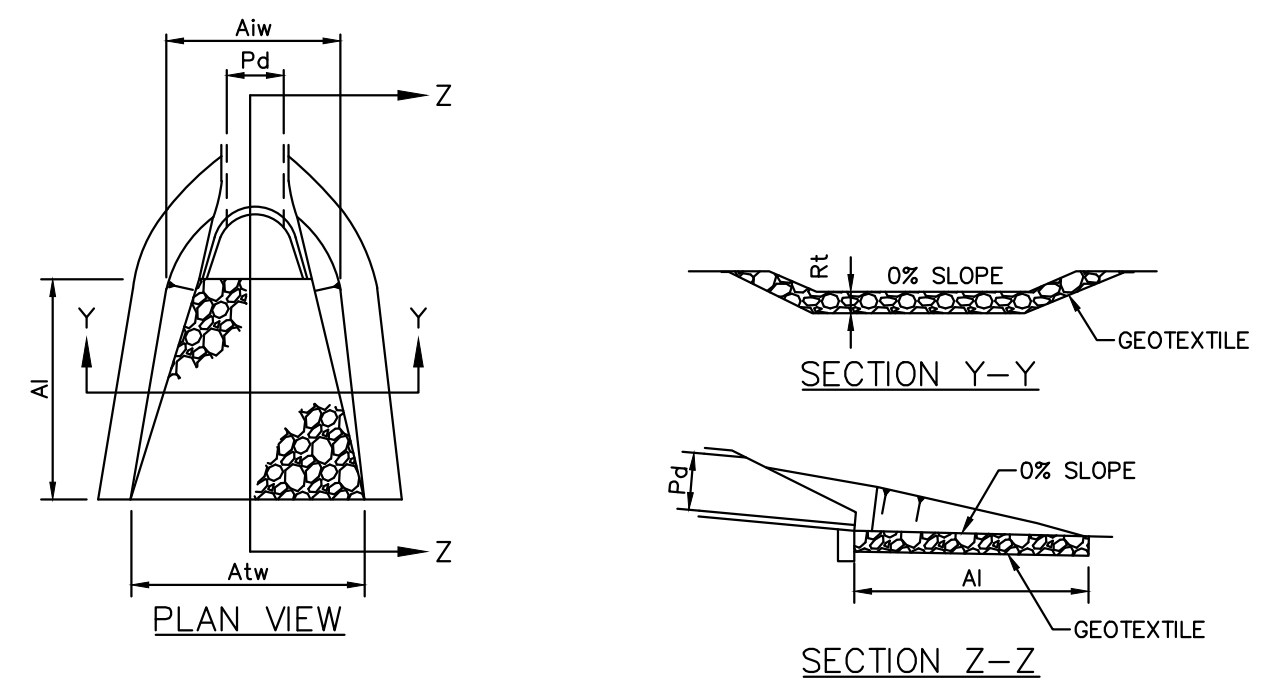
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BASIN OR TRAP NO.	PIPE SIZE (IN)	S (IN)	NO. OF COLLARS	RISER TO FIRST COLLAR (FT)	COLLAR SPACING (FT)
1	15	56	1	15	N/A

- 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 #7-10
CONCRETE ANTI-SEEP COLLAR FOR PERMANENT BASINS OR TRAPS
NOT TO SCALE



OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP			APRON	
		SIZE R-	THICK. Rt (IN)	LENGTH Ai (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH Atw (FT)
RR1	15	R-4	18	12	4	16
RR2	15	R-4	18	8	4	12
RR3	15	R-4	18	10	4	14
RR4	15	R-4	18	8	4	12
RR5	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

12
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14

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4.	2/6/17	REVISED PER DEP COMMENTS	GZ

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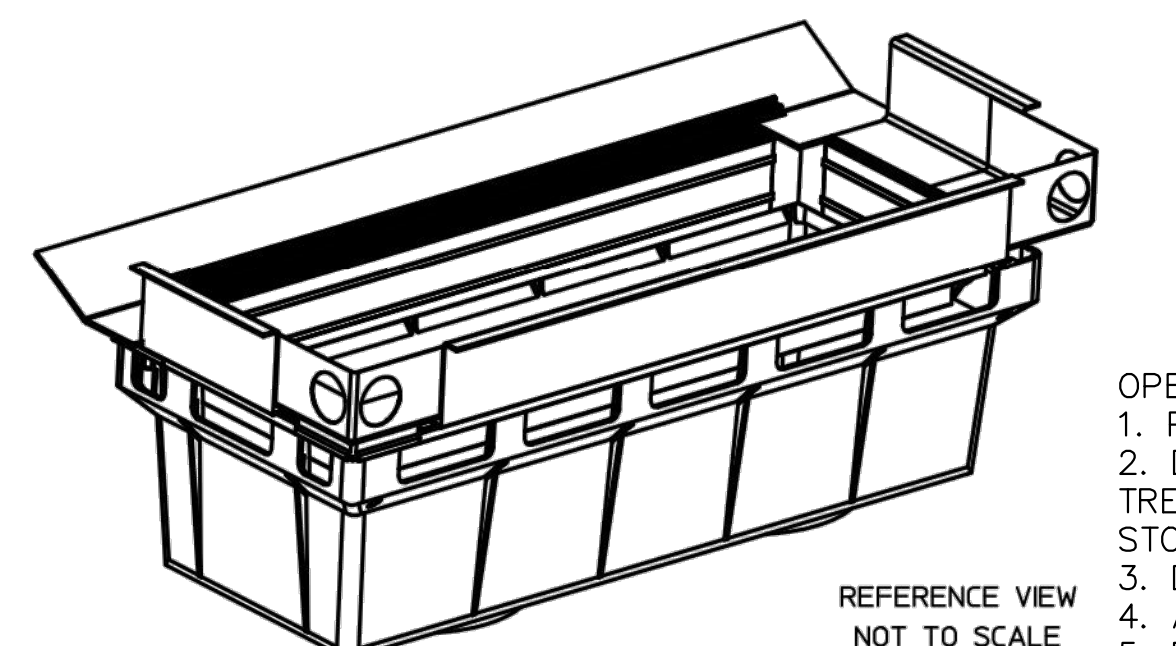
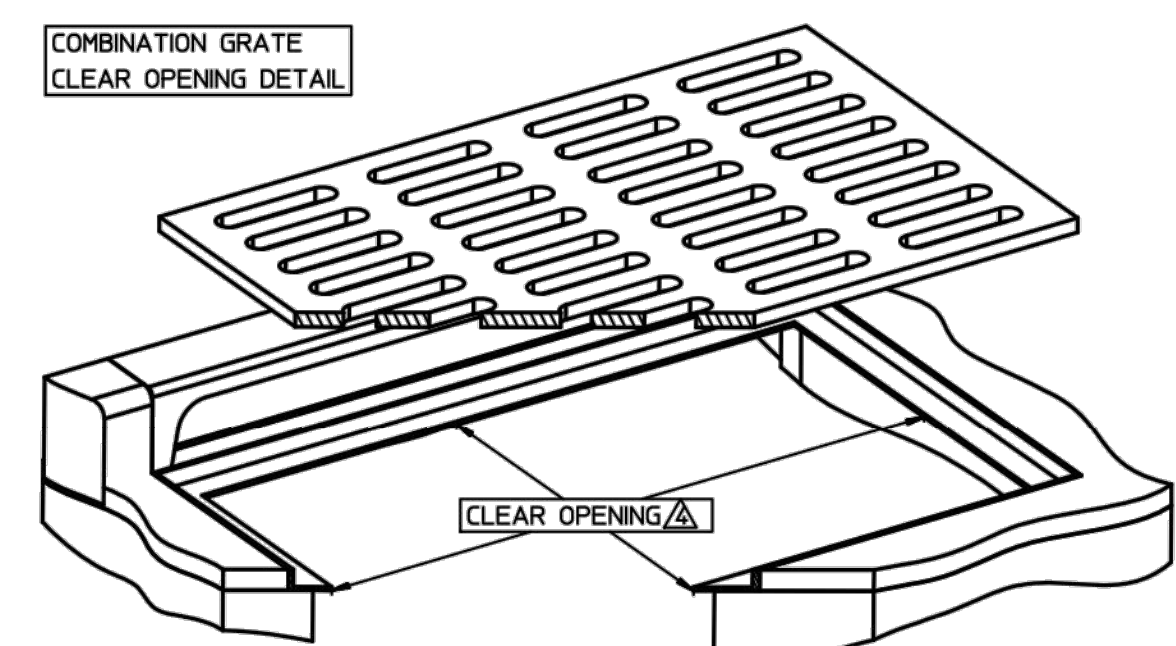
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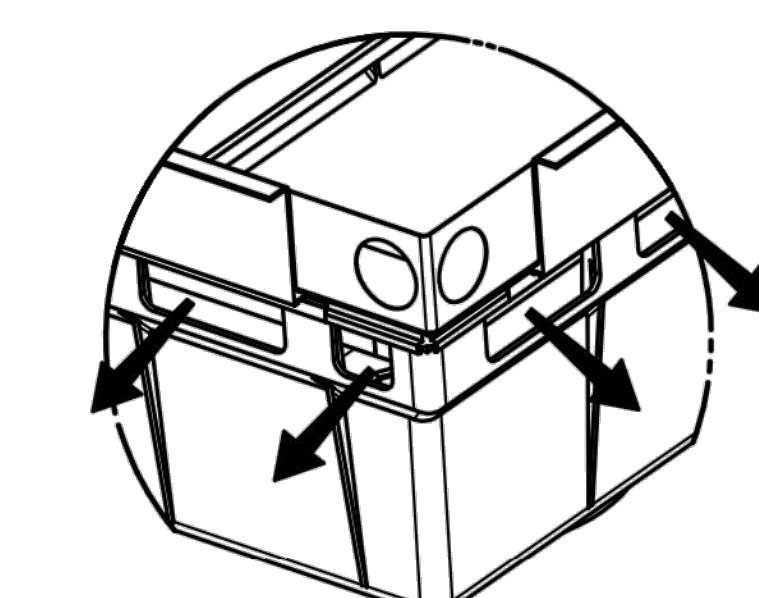
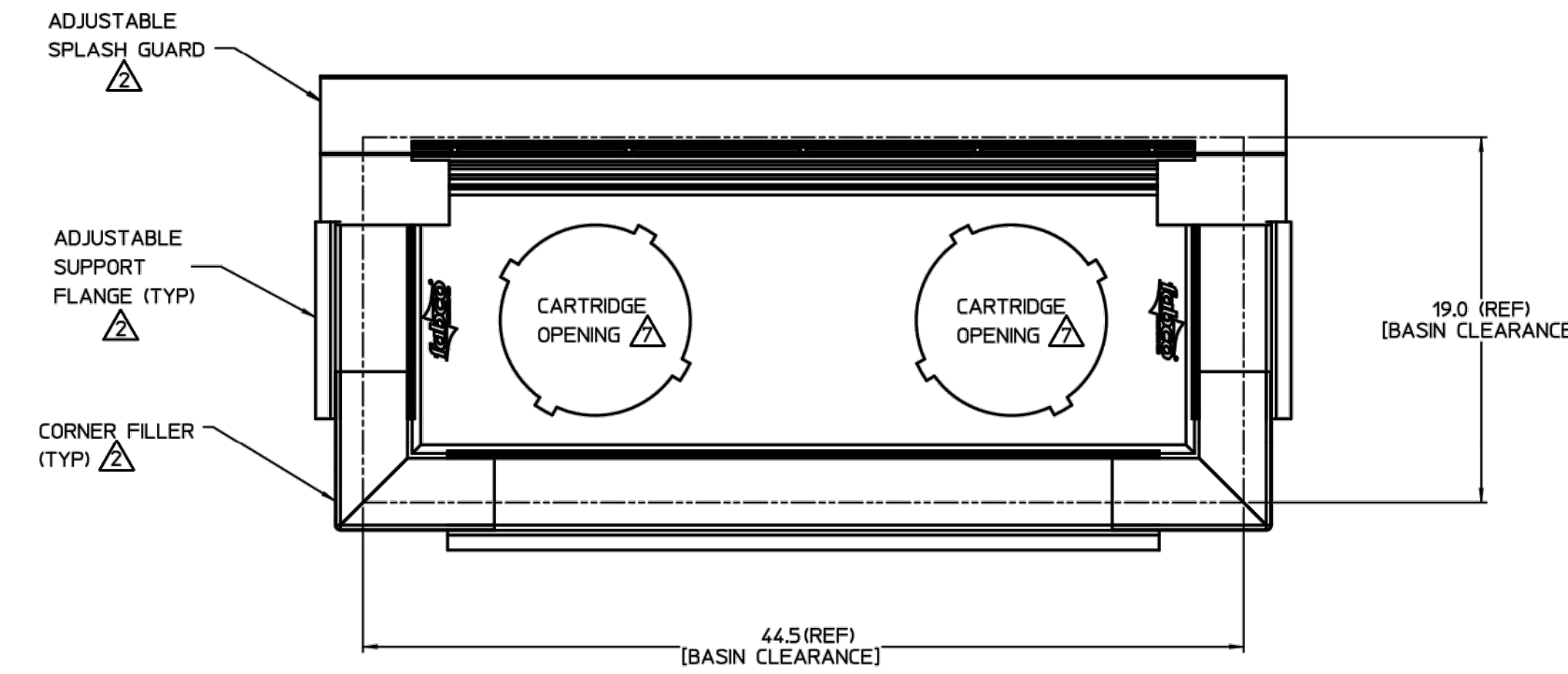
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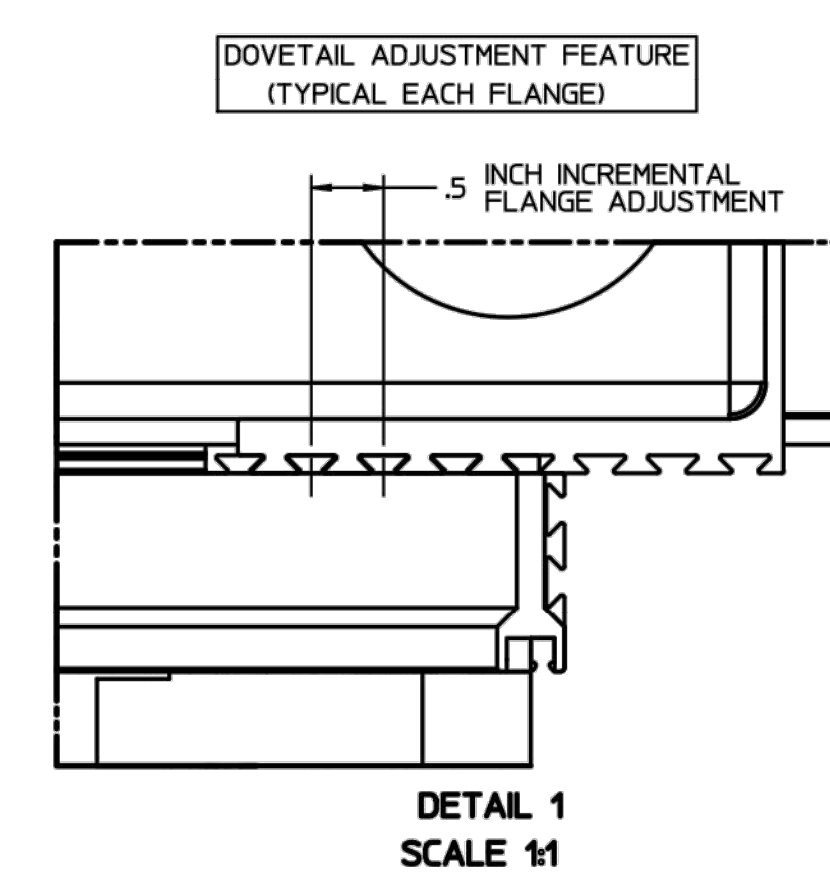
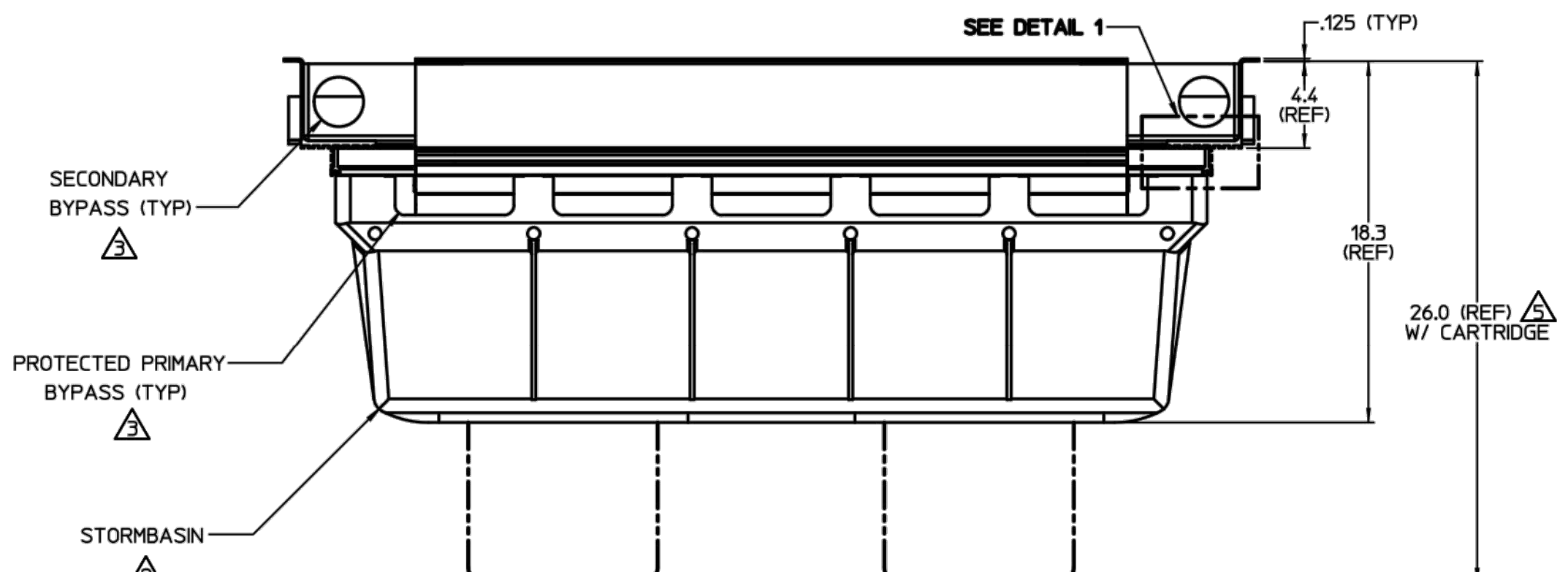
- WEIGHT (EMPTY): 50 LB MAX, NO CARTRIDGES
- MATERIAL:
 - A) ADJUSTABLE FLANGE AND DEFLECTOR: ALUMINUM ALLOY 6063-T6
 - B) BASIN (PLASTIC): POLYPROPYLENE POLYETHYLENE COPOLYMER
 - C) CORNER FILL: ALUMINUM ALLOY: 5052-H32
 - D) SUPPORT HARDWARE: CRES 300 SERIES
 - E) SPLASH GUARD: NEOPRENE RUBBER (TRIM IF NECESSARY)
- 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)
- CLEAR OPENING RANGE (0.5 INCH INCREMENTS):
 - A) MINIMUM SIZE: 19.0 X 45.0
 - B) MAXIMUM SIZE: 24.0 X 50.0
- RECOMMENDED MINIMUM VAULT DEPTH 2-IN BELOW CARTRIDGE
- 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.
- USE WITH FABCO REPLACEABLE MEDIA CARTRIDGES ONLY.



REFERENCE VIEW NOT TO SCALE



PROTECTED BYPASS, TYPICAL (NOT TO SCALE)



DETAIL 1 SCALE 1:1

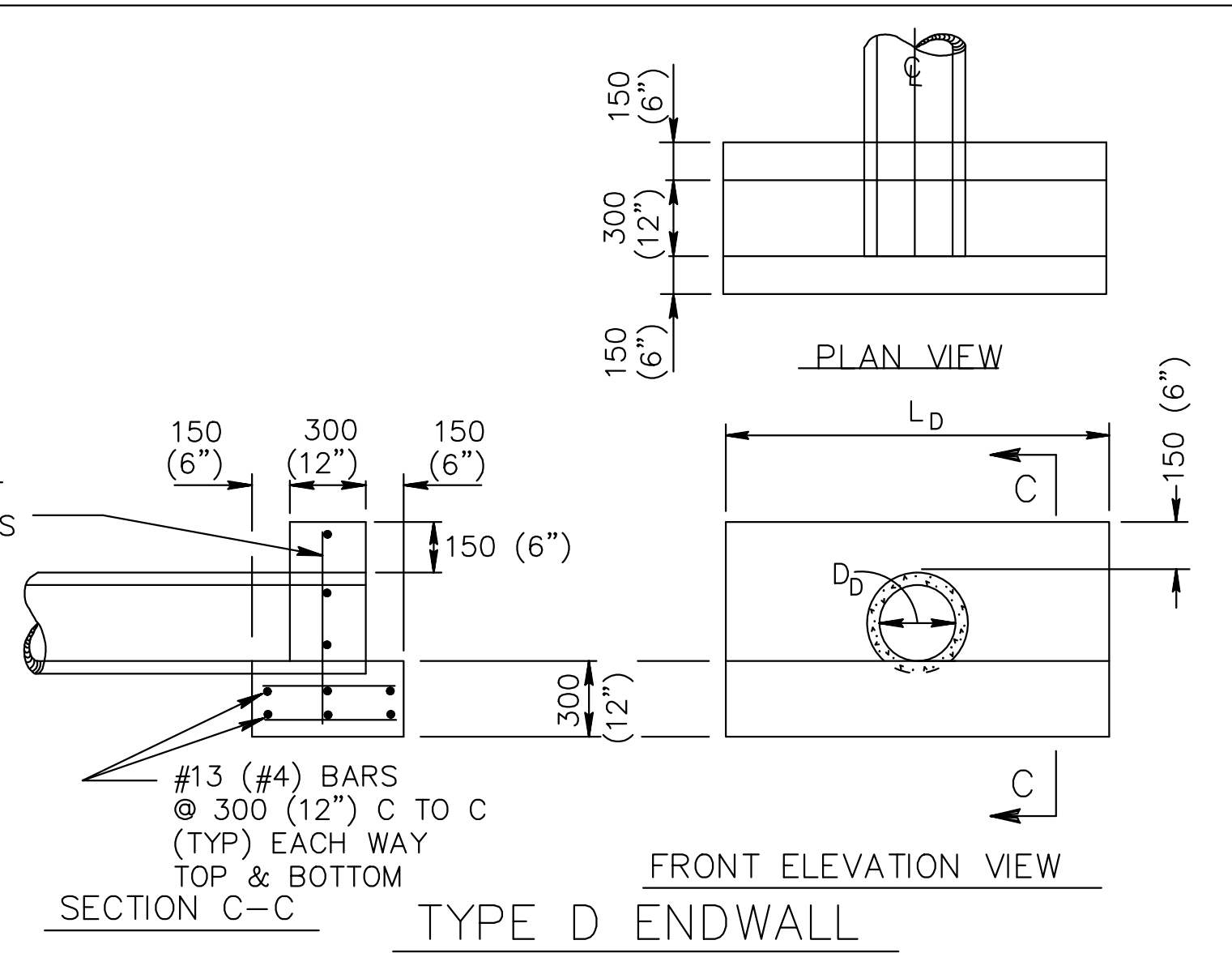
PROVIDE STORMBASINS IN INLETS #4, 5, AND 6.
USE 9718-1 STANDARD FILTERS IN ALL STORMBASINS

- OPERATION AND MAINTENANCE SCHEDULE: STORMBASIN FILTERS
- PRE-CLEAN THE INLET PRIOR TO INSTALLATION.
 - 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.
 - DO NOT STEP OR STAND ON THE STORMBASIN UNIT. USE VACUUM OR RAKE TO REMOVE DEBRIS.
 - AFTER CLEANING, REMOVE THE FILTER CARTRIDGE AND CLEAN AROUND THE FOAM FILTER.
 - REPLACE FILTER CARTRIDGES ON A YEARLY BASIS. USE PART NUMBER 9718-1, STANDARD CARTRIDGE.

NO	QTY	PART NUMBER	DESCRIPTION	REMARKS
UNLESS OTHERWISE SPECIFIED TOLERANCES: DIMENSIONS: ANGLES: FINISHES: DO NOT SCALE THIS DRAWING				
MATERIAL: SEE NOTES				
MODEL LINK: 9730-1E-ASSY3				
APPROVALS: DATE: DWG NO: 9730-1E-000				
TITLE: STORMBASIN, 19X45 CS				
SCALE: 3/16"=1'				
SHEET 1 OF 1				

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

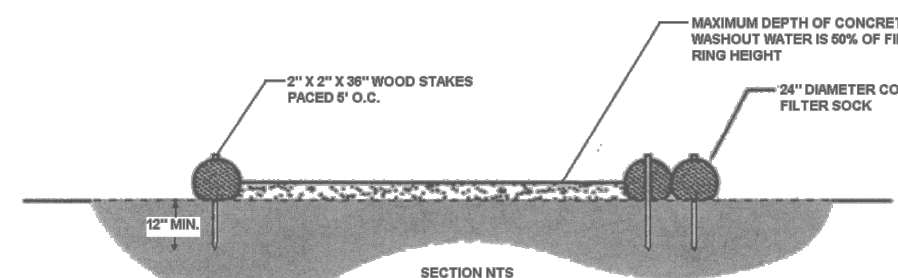
PROVIDE 1 LAYER OF REINFORCEMENT BARS 250 mm²/m (0.12 in²/sq.Ft.) EACH WAY.



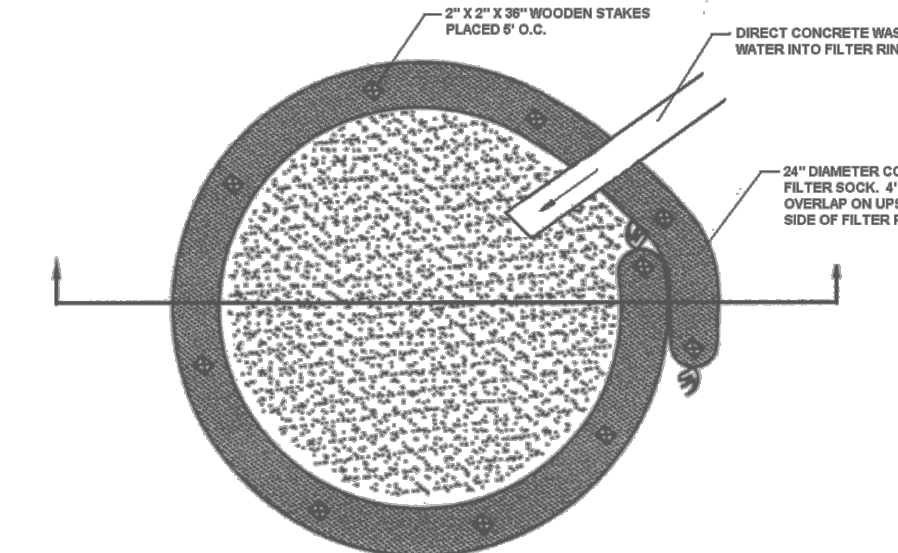
SECTION C-C TYPE D ENDWALL



FIGURE 3.18 Typical Compost Washout Installation



NOTES:
1. INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE
2. 8\"/>



A suitable impervious geomembrane shall be placed at the location of the washout prior to installing the socks.
Adapted from Filtrrex

363-2134-008 / March 31, 2012 / Page 58

ALL CONCRETE WASHOUT FACILITIES SHOULD BE INSPECTED DAILY. DAMAGED OR LEAKING WASHOUTS SHOULD BE DEACTIVATED AND REPAIRED OR REPLACED IMMEDIATELY. ACCUMULATED MATERIALS SHOULD BE REMOVED WHEN THE WASHOUT REACHES 75% CAPACITY. THE 30 MIL PLASTIC LINER SHOULD BE REPLACED WITH EACH CLEANING OF THE WASHOUT FACILITY.

13 OF 14

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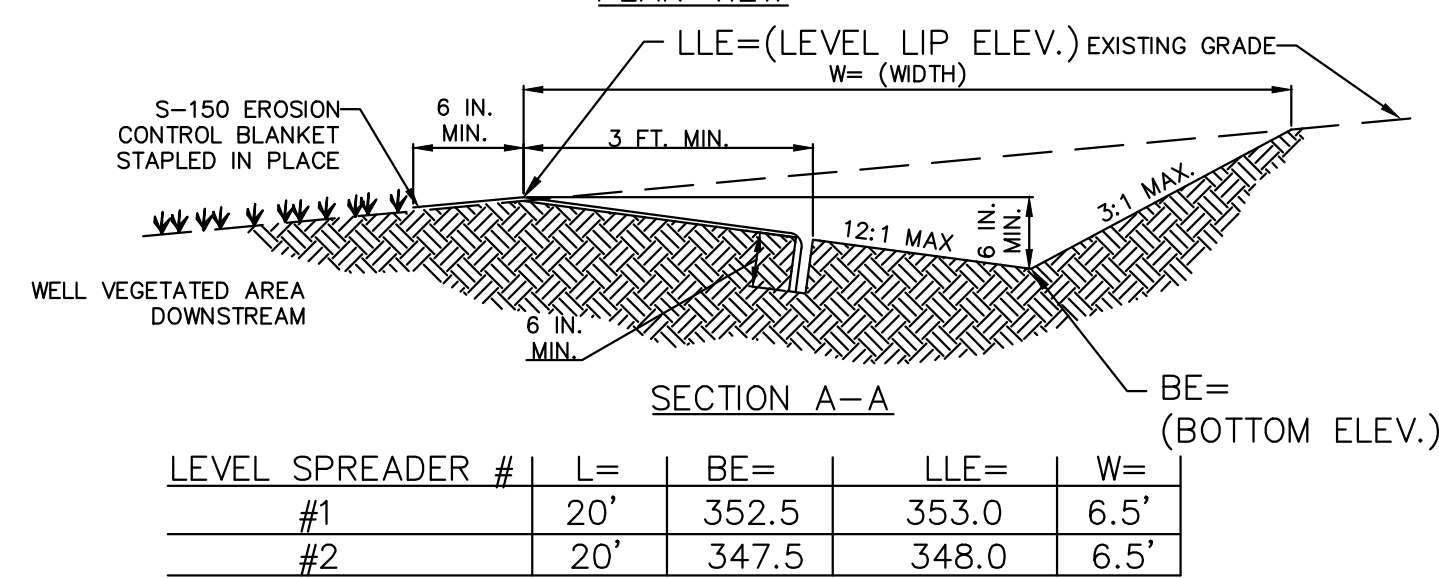
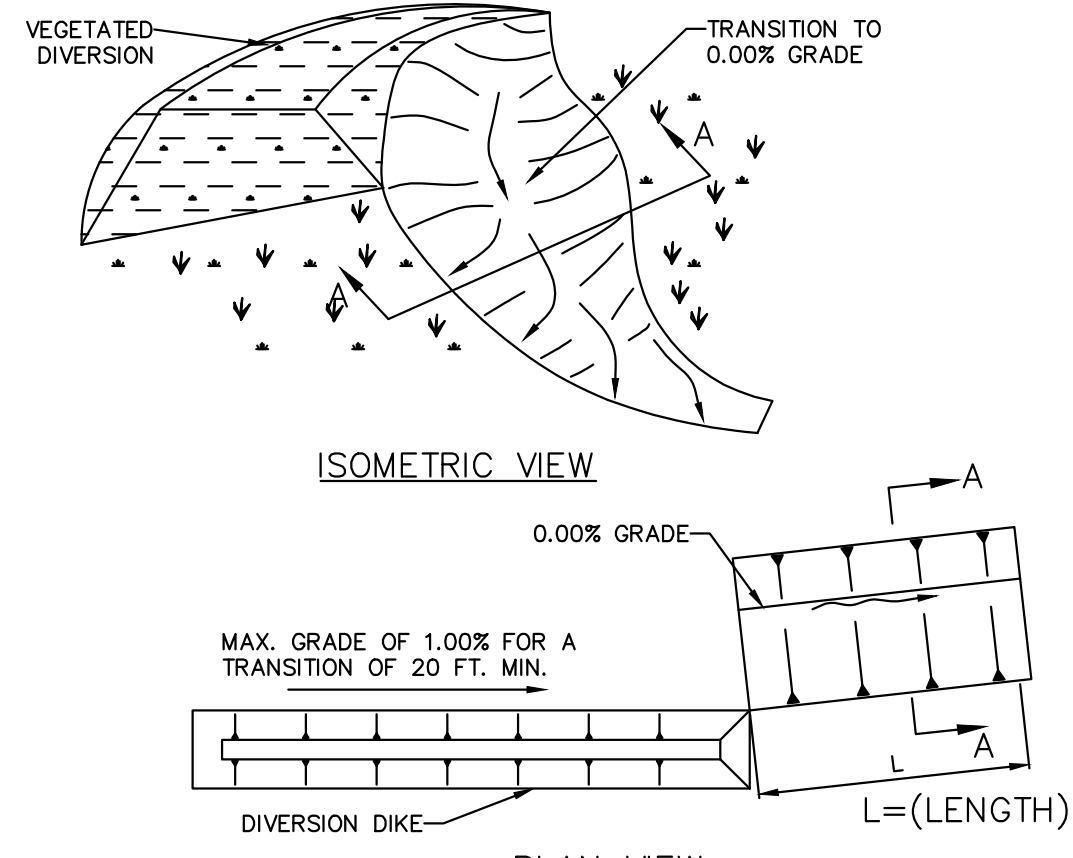
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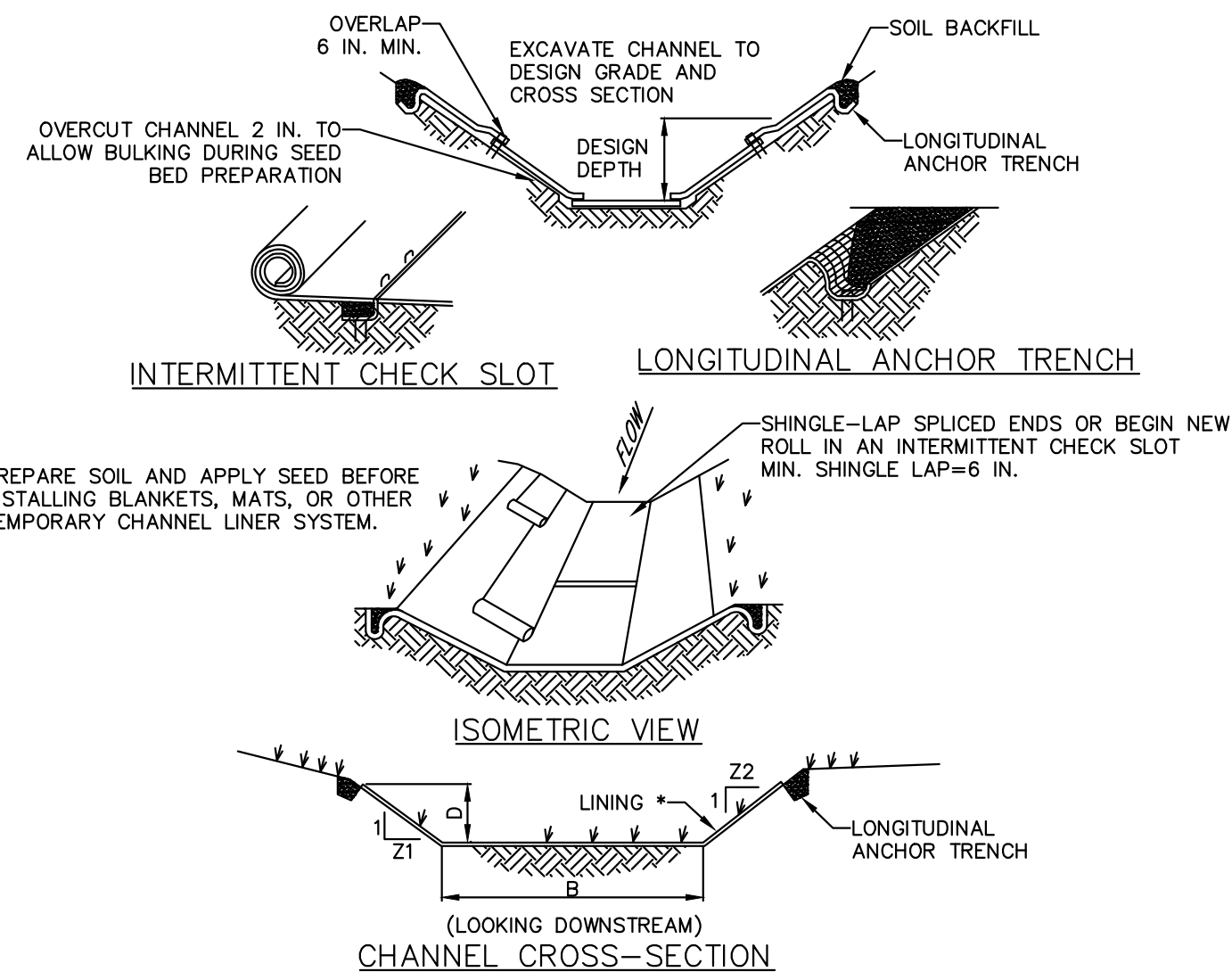
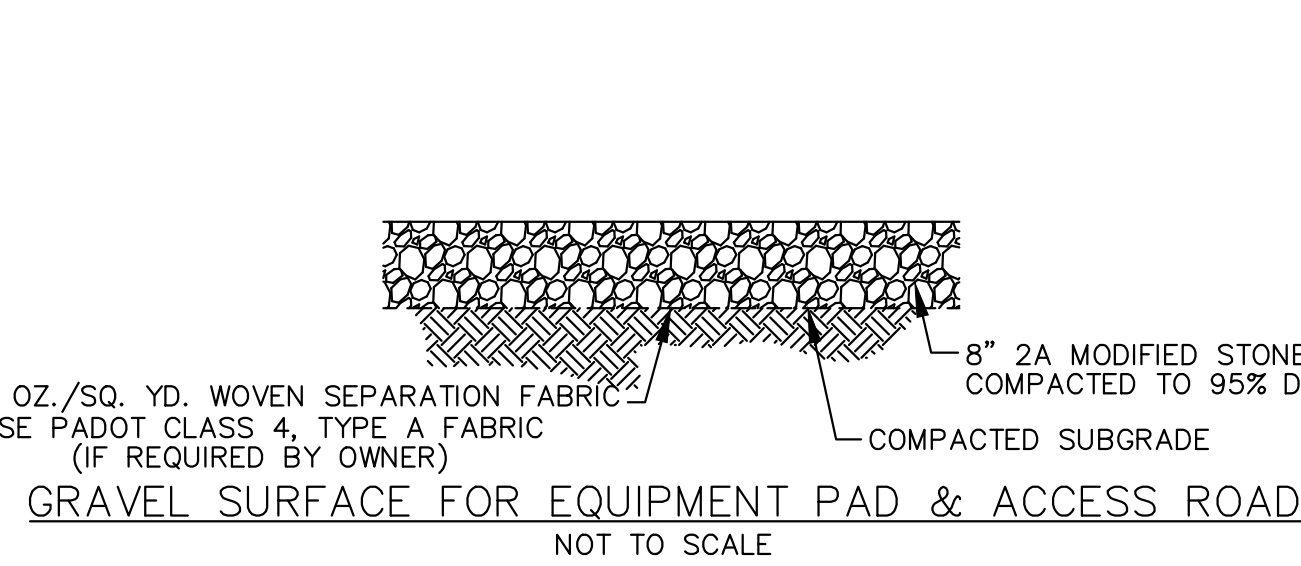
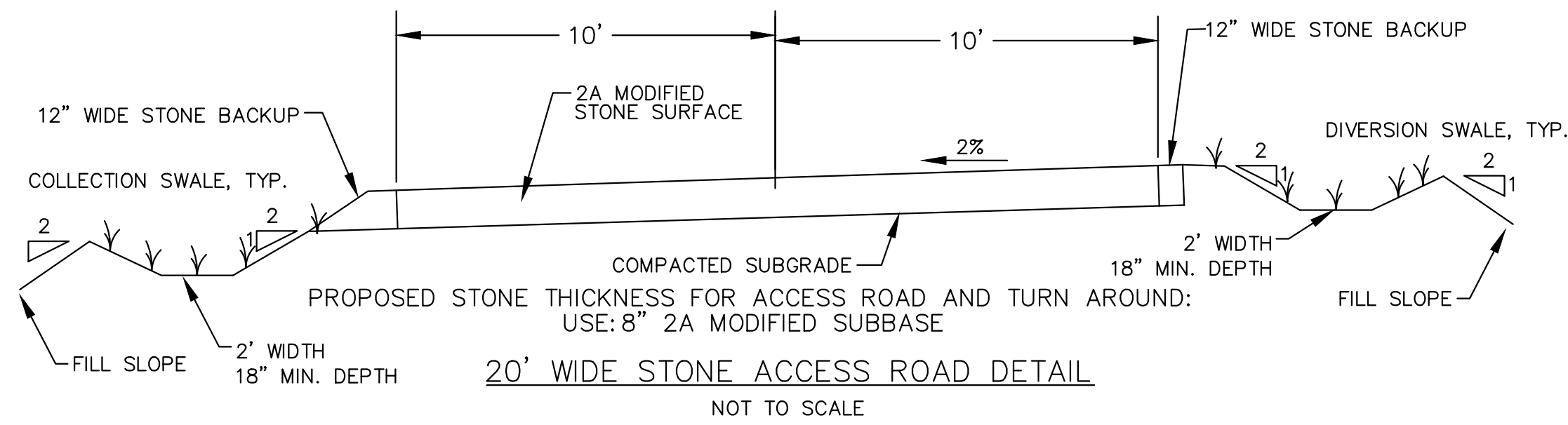
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MAINTENANCE SCHEDULE: LEVEL LIP SPREADERS
 -INSPECT LEVEL LIP SPREADER AFTER ALL RAINFALL EVENTS OVER 1". COMPLETE DEP INSPECTION LOG FOR ALL SITE VISITS.
 -LEVEL SPREADER DIMENSIONS SHALL BE CONSTANTLY MAINTAINED.
 -NO MORE THAN ONE THIRD OF THE SHOOT (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.



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

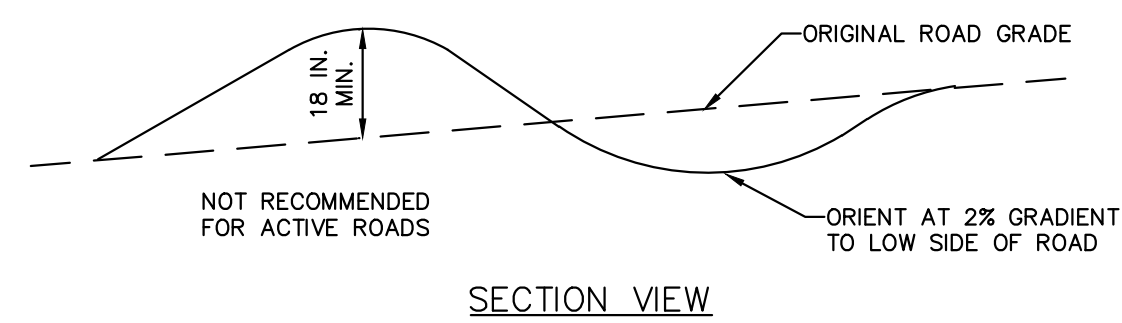


* SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, VEGETATIVE STABILIZATION FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION

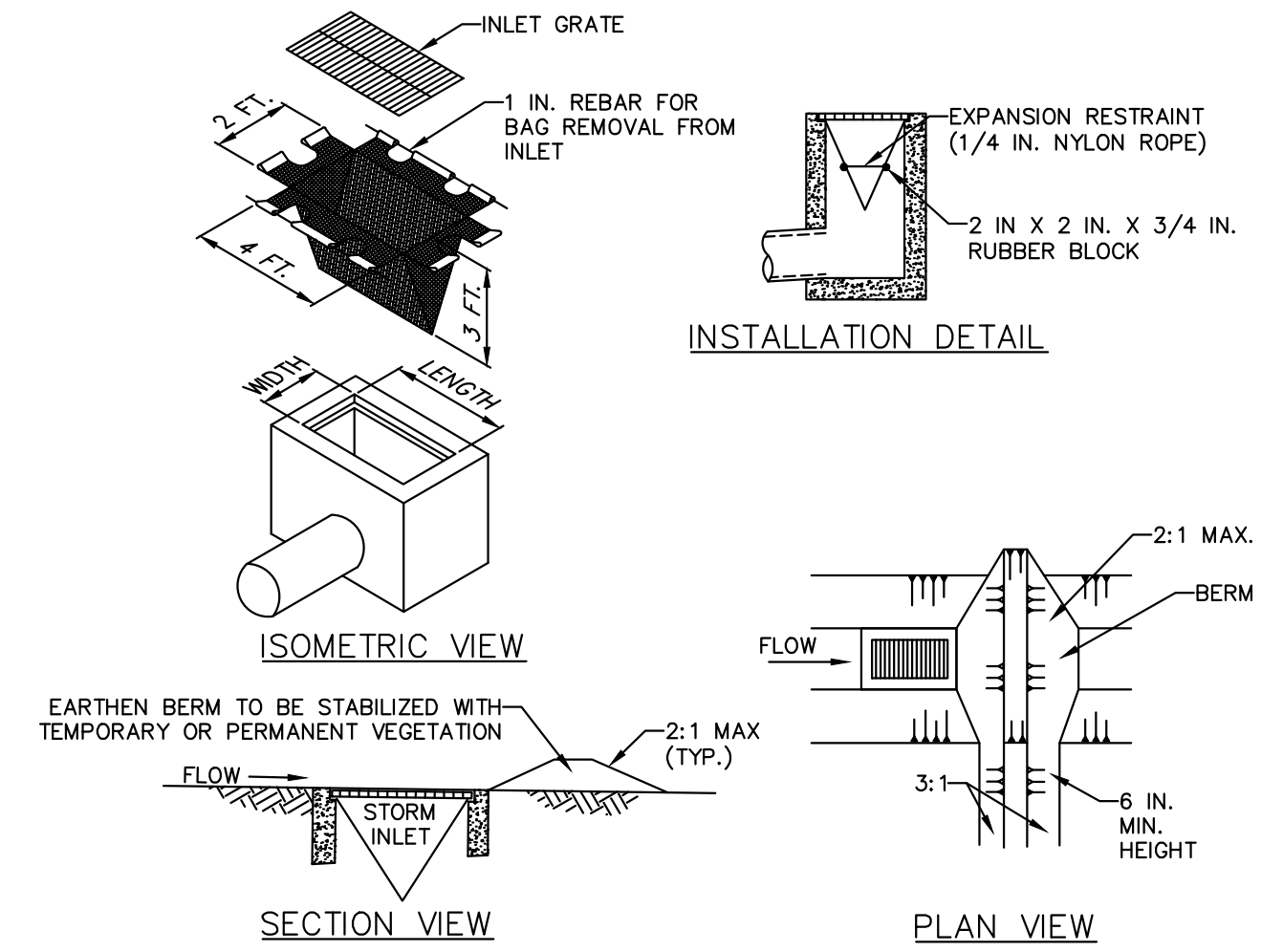
CHANNEL NO.	STATIONS	BOTTOM WIDTH B (FT)	DEPTH D (FT)	TOP WIDTH W (FT)	Z1 (FT)	Z2 (FT)	LINING *
1	FULL CHANNEL	2	2	10	2	2	C125
2	FULL CHANNEL	2	2	10	2	2	C125
3	FULL CHANNEL	2	2	10	2	2	C125
4	FULL CHANNEL	2	2	10	2	2	C125
5	FULL CHANNEL	2	2	10	2	2	C125
6	FULL CHANNEL	2	2	10	2	2	C125
7	FULL CHANNEL	2	2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



NOTES:
 WATERBARS SHALL DISCHARGE TO A STABLE AREA.
 WATERBARS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RAINFALL 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

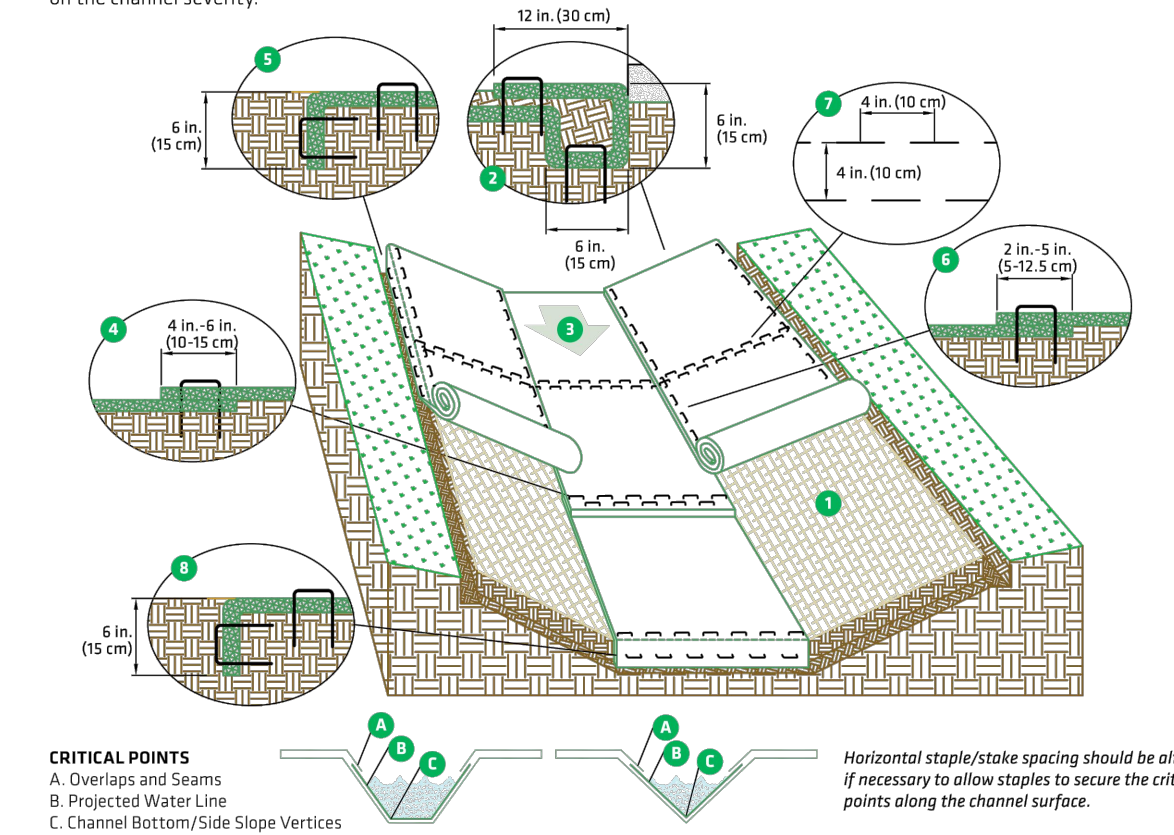


NOTES:
 MAXIMUM DRAINAGE AREA = 1/2 ACRE.
 INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.
 ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.
 AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.
 INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

STANDARD CONSTRUCTION DETAIL #4-16
 FILTER BAG INLET PROTECTION - TYPE M INLET
 NOT TO SCALE

NA GREEN LINING INSTALLATION DETAIL
 Channel Installation

The following channel guide outlines general recommendations for installing RollMax System temporary and/or permanent RECPS in concentrated flow applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the channel severity.



- CRITICAL POINTS**
 A. Overlaps and Seams
 B. Projected Water Line
 C. Channel Bottom/Side Slope Vertices
- CHANNEL INSTALLATION STEPS**
1. Prepare soil before installing RECPS, including any necessary application of lime, fertilizer and seed.
 2. Begin at the top of the channel by anchoring the RECPS in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPS extended beyond the upslope portion of the trench. For supplemental scour protection, use RaveetMax System StoneMax Mat at the channel/culvert outlet as needed. Anchor the RECPS with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPS back over the seed and compacted soil. Secure RECPS over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPS.
 3. Roll center RECPS in direction of water flow in bottom of channel. RECPS will unroll with appropriate side and fold the soil surface. All RECPS must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
 4. Place consecutive RECPS end-over-end (shingle style) with a 4 in. (10-15 cm) overlap. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center to secure RECPS.
 5. Full-length edge of RECPS at top of side slopes must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.
 6. Adjacent RECPS must be overlapped approximately 2 in. (5-12.5 cm) (depending on RECPS type) and stapled.
 7. In high flow channel applications a staple check slot is recommended at 30 to 40 ft (9-12 m) intervals. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center over entire width of the channel.
 8. The terminal end of the RECPS must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.
- NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPS.

14
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