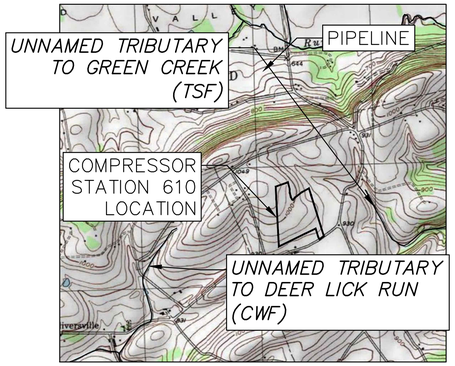
ATLANTIC SUNRISE PROJECT
PROPOSED 42" NATURAL GAS PIPELINE

POST CONSTRUCTION STORMWATER MANAGEMENT PLANS
FOR
COMPRESSOR STATION 610

PHASE 1

ORANGE TOWNSHIP
COLUMBIA COUNTY

PENNSYLVANIA



USGS BLOOMSBURG QUADRANGLE

VICINITY MAP

SCALE: 1"=2,000'

FACILITY NAME & TYPE	DRAWING NO.	SHEET NO.	DRAWING NAME
CS-610 COMPRESSOR STATION	(66-0610)F-1A-9	1 of 7	COVER SHEET
	(66-0610)F-1A-9	2 of 7	SENSITIVE RESOURCES MAP
	(66-0610)F-1A-9	3 of 7	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
	(66-0610)F-1A-9	4 of 7	PCSM NOTES AND DETAILS
	(66-0610)F-1A-9	5 of 7	PCSM NOTES AND DETAILS
	(66-0610)F-1A-9	6 of 7	PCSM NOTES AND DETAILS
	(66-0610)F-1A-9	7 of 7	PCSM NOTES AND DETAILS

811 Know what's below. Call before you dig.

PENNSYLVANIA ACT 287 (1974) AS AMENDED BY PENNSYLVANIA ACT 199 (2004) REQUIRES NO LESS THAN THREE (3) WORKING DAYS AND NO MORE THAN (10) WORKING DAYS NOTICE TO UTILITIES BEFORE YOU EXCAVATE, DRILL, BLAST OR DEMOLISH.

ENGINEER OF RECORD
BL COMPANIES
4242 CARLISLE PIKE, SUITE 260
CAMP HILL, PA 17011
P:717-651-9850
F:717-651-9858

ALARIC J. BUSHER REG NO. PE 60320

BL Companies — ARCHITECTURE, ENGINEERING, ENVIRONMENTAL, LAND SURVEYING

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W01161505	DAK	AJB
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W01161505	DAK	AJB
2	05/27/2016	BL	UPDATED PER BASIN SYSTEMS DESIGN COORDINATION	W01161505	AJB	AJB
3	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W01161505	AJB	AJB
4	*April 2017*	*BL*	*PADEP TECHNICAL DEFICIENCY RESPONSE #2*	*W01161505*	*AJB*	*AJB*

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
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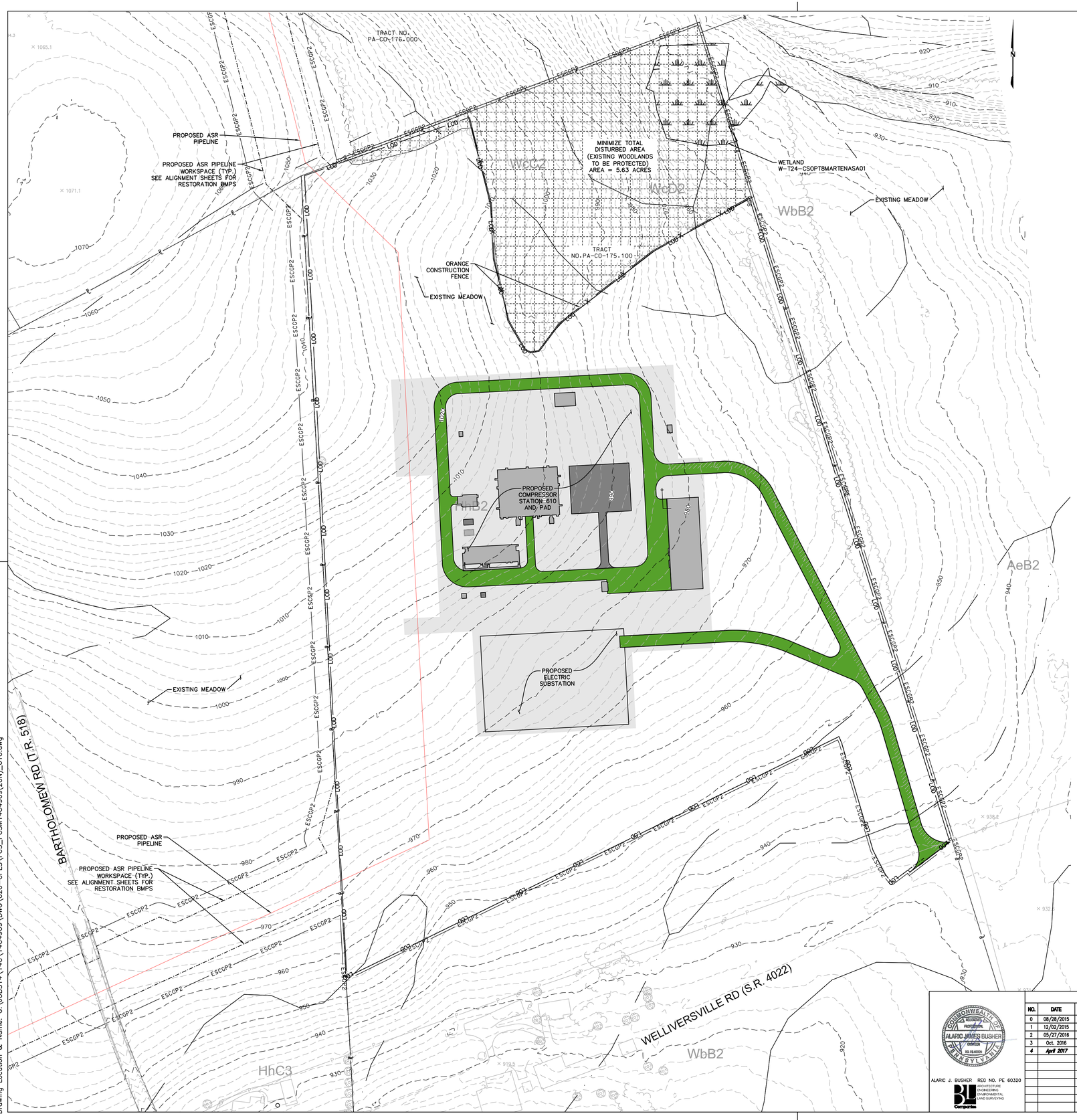
FOR COMPRESSOR STATION 610
ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA
COVER SHEET

Williams

DRAWN BY:	JEC	DATE:	04/03/15	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	AJB	DATE:	04/03/15	ISSUED FOR CONSTRUCTION:	REVISION: *4*
APPROVED BY:	AJB	DATE:	07/17/15	DRAWING NUMBER: (66-0610)F-1A-9	SHEET 1 OF 7
W.O:	1161505				

Drawn By & Date/Time: hthomas Apr 25, 2017 - 8:29am
Drawing Location & Name: G:\JOBS\14\14C\14C4909\DWG\020-CPLS\FCS_CV14C4909(20)_PCSM-COL-610.dwg



LEGEND

EXISTING FEATURES

- PROPERTY BOUNDARY LINE (APPROXIMATE)
- MAJOR CONTOUR (10' INTERVAL)
- MINOR CONTOUR (2' INTERVAL)
- FENCE
- STONE ROW
- SOIL BOUNDARY
- TREELINE
- CENTERLINE STREAM/EDGE WATERBODY
- DELINEATED WETLANDS
- × 1353.0 SPOT ELEVATION
- TREE OR BUSH
- UTILITY POLE AND UTILITY LINE
- GUY POLE
- GUY POLE OR ANCHOR
- POST
- SIGN
- WATER WELL
- UTILITY BOX
- MONUMENT (PROPERTY BOUNDARY MARKER)
- IRON PIPE OR PIN (PROPERTY BOUNDARY MARKER)
- WsB SOIL TYPE DESIGNATION
- ESCGP2 ESCGP-2 PERMIT BOUNDARY
- LOD LIMIT OF DISTURBANCE (COMPRESSOR STATION 610)
- LIMIT OF WORKSPACE (OVERALL PIPELINE PROJECT)
- CENTERLINE GAS PIPELINE
- EXISTING ROAD
- ROW

PROPOSED FEATURES

- WOODLANDS PROTECTED AREA
- WETLANDS PROTECTED AREA
- GRAVEL COVER
- ASPHALT ACCESS ROAD
- BUILDING
- FUTURE BUILDING

SENSITIVE NATURAL RESOURCES TABLE

EXISTING NATURAL SENSITIVE RESOURCE	MAPPED? YES/NO/N/A	TOTAL AREA (AC.)	PROTECTED AREA (AC.)
WATERBODIES	N/A	0.00	0.00
FLOODPLAINS	N/A	0.00	0.00
RIPARIAN AREAS	N/A	0.00	0.00
WETLANDS	YES	0.63	0.00*
WOODLANDS	YES	5.63	5.63
NATURAL DRAINAGE WAYS	N/A	0.00	0.00
STEEP SLOPES, 15%–25%	N/A	0.00	0.00
STEEP SLOPES, OVER 25%	N/A	0.00	0.00
OTHER:			
OTHER:			
TOTAL EXISTING:		5.63	5.63

SEE DEP STANDARD WORKSHEET 2 IN THE POST CONSTRUCTION STORMWATER MANAGEMENT COMPUTATIONS.
* – NO CREDIT TAKEN FOR PROTECTED AREA DUE TO OVERLAP WITH WOODED AREAS TO BE PROTECTED.

GRAPHIC SCALE
100 50 0 100
SCALE IN FEET
1 inch = 100 ft.

COMMONWEALTH OF PENNSYLVANIA — ALARIC JAMES BUSHER — PROFESSIONAL ENGINEER — RES PE-60320

ALARIC J. BUSHER REG NO. PE 60320

BL Companies — ARCHITECTURE, ENGINEERING, ENVIRONMENTAL, LAND SURVEYING

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FOR COMPRESSOR STATION 610
ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA
SENSITIVE RESOURCES MAP

Williams

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CHECKED BY:	AJB	DATE:	04/03/15	ISSUED FOR CONSTRUCTION:	REVISION: *4*
APPROVED BY:	AJB	DATE:	07/17/15	DRAWING NUMBER: (66–0610)F–1A–9	SHEET 2 OF 7
WO:	1161505				

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Drawing Location & Name: C:\JOBS\14\14C\404909\DWG\020–CPLS\FCS_PCSM14C4909(20N)_610.dwg

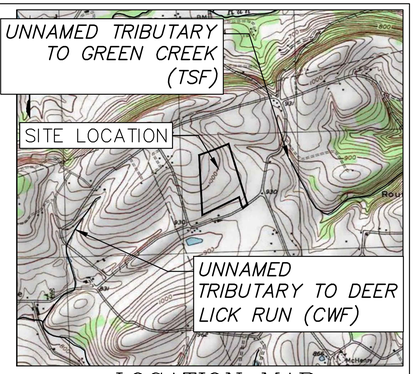
SITE SOIL TYPES

AeB2	ALLENWOOD SILT LOAM, 3 TO 12 PERCENT SLOPES
HhB2	HARLETON CHANNERY SILT LOAM, 3 TO 12 PERCENT SLOPES
HhC3	HARLETON CHANNERY SILT LOAM, 12 TO 20 PERCENT SLOPES
WbB2	WATSON SILT LOAM, 3 TO 8 PERCENT SLOPES
WcC2	WEIKERT CHANNERY SILT LOAM, 12 TO 20 PERCENT SLOPES

* NO SOILS WITHIN SITE LOD ARE KNOWN TO PRODUCE ACIDIC STORMWATER RUNOFF.

RECEIVING WATERCOURSE - CHAPTER 93 DESIGNATION

THE RECEIVING WATERCOURSES ARE UNNAMED TRIBUTARIES TO DEER LICK RUN, CWF, AND GREEN CREEK, TSF.
APPROXIMATE DISTANCE FROM SITE TO UNT TO DEER LICK RUN: ±2,900 FT (WEST)
APPROXIMATE DISTANCE FROM SITE TO UNT TO GREEN CREEK: ±1,500 FT (EAST)



LOCATION MAP

USGS BLOOMSBURG QUADRANGLE
SCALE: 1"=2,000'

PCSM PROTECTED AREA		
Line #	Length	Direction
L19	21.71	N84° 37' 25.42"E
L18	97.06	N64° 04' 05.85"E
L17	128.70	N75° 34' 52.36"E
L16	17.11	S87° 48' 44.40"E
L15	19.48	S41° 35' 10.99"E
L14	1.40	S20° 26' 09.35"E
L13	790.97	S69° 12' 12.52"W
L12	226.98	N16° 59' 05.52"W
L11	154.99	N17° 47' 52.36"W
L10	235.10	N61° 21' 53.74"E
L9	240.00	N52° 24' 27.57"E
L8	26.00	N43° 43' 02.63"E
L7	56.35	N36° 49' 57.21"E
L6	19.58	N79° 26' 45.46"E
L5	14.12	S58° 34' 59.28"E
L4	68.77	S29° 49' 33.62"E
L3	126.96	S11° 00' 11.77"E
L2	118.53	S5° 51' 42.56"E
L1	165.46	S13° 37' 15.04"E

ESCGP-2 PERMIT TABLE

LIMIT OF PERMIT BOUNDARY/SITE AREA	39.33
LIMIT OF DISTURBANCE	33.70
AREA OF PROTECTED/ SENSITIVE VALUE FEATURES	0.00
AREA OF RIPARIAN FOREST BUFFER PROTECTION	0.00
AREA OF MINIMUM DISTURBANCE/REDUCED GRADING	5.63
DEVELOPED AREA (ACCESS ROADS & PAD)	23.32
DEVELOPED AREA CONTROLLED BY BMPS	23.32

PROPOSED FEATURES

- 1460 — MAJOR CONTOUR (10' INTERVAL)
- MINOR CONTOUR (2' INTERVAL)
- LOD — LIMIT OF DISTURBANCE (COMPRESSOR STATION 610)
- LIMIT OF WORKSPACE (OVERALL PIPELINE PROJECT)
- ESCGP2 — ESCGP-2 PERMIT BOUNDARY
- X — X — ORANGE CONSTRUCTION FENCE
- CENTERLINE OF PIPELINE (APPROXIMATE)
- EROSION CONTROL BLANKET
- ROCK OUTLET/RIPRAP APRON
- TEST PIT LOCATION
- INFILTRATION TEST LOCATION
- TRM LINING
- CLAY CORE LIMITS
- INFILTRATION & RAIN GARDENS (WITH S75 EROSION CONTROL BLANKET)
- SWALE LINING FOR VEGETATED SWALES
- MINIMIZE TOTAL DISTURBED AREA (EXISTING WOODLANDS TO BE PROTECTED)
- LANDSCAPE RESTORATION AREA
- ASPHALT ACCESS ROAD/ STREET SWEEPING AREA
- ASPHALT ACCESS ROAD/ STREET SWEEPING AREA/ DISCONNECTED IMPERVIOUS
- GRAVEL COVER (PARKING AREA IMPERVIOUSNESS)
- BUILDING
- FUTURE BUILDING

SEE OPERATION AND MAINTENANCE PROGRAM ON SHEET 4 OF 7

NOTE: SEE SENSITIVE RESOURCES MAP FOR AREAS TO BE PROTECTED DURING CONSTRUCTION.

GRAPHIC SCALE
100 50 0 100
SCALE IN FEET
1 inch = 100 ft.

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BL Companies — ARCHITECTURE ENGINEERING ENVIRONMENTAL LAND SURVEYING

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POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

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WO:	1161505				

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PCSM STANDARD NOTES

PERMIT TERMINATION
UPON PERMANENT STABILIZATION OF THE EARTH DISTURBANCE ACTIVITY UNDER § 102.22(A)(2) (RELATING TO PERMANENT STABILIZATION), AND INSTALLATION OF BMPS IN ACCORDANCE WITH AN APPROVED PLAN PREPARED AND IMPLEMENTED IN ACCORDANCE WITH §§ 102.4 AND 102.8 (RELATING TO EROSION AND SEDIMENT CONTROL REQUIREMENTS; AND PCSM REQUIREMENTS), THE PERMITTEE OR CO-PERMITTEE SHALL SUBMIT A NOTICE OF TERMINATION TO THE DEPARTMENT OR CONSERVATION DISTRICT.

THE NOTICE OF TERMINATION MUST INCLUDE:
(1) THE FACILITY NAME, ADDRESS AND LOCATION.
(2) THE OPERATOR NAME AND ADDRESS.
(3) THE PERMIT NUMBER.
(4) THE REASON FOR PERMIT TERMINATION.
(5) IDENTIFICATION OF THE PERSONS WHO HAVE AGREED TO AND WILL BE RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS IN ACCORDANCE WITH § 102.8(M) AND PROOF OF COMPLIANCE WITH § 102.8(M)(2).

PCSM REQUIREMENTS

PCSM REPORTING AND RECORD KEEPING: THE PCSM PLAN, INSPECTION REPORTS AND MONITORING RECORDS SHALL BE AVAILABLE FOR REVIEW AND INSPECTION BY THE DEPARTMENT OR THE CONSERVATION DISTRICT.

LICENSED PROFESSIONAL OVERSIGHT OF CRITICAL STAGES: A LICENSED PROFESSIONAL OR A DESIGNEE SHALL BE PRESENT ONSITE AND BE RESPONSIBLE DURING CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN. THE CRITICAL STAGES MAY INCLUDE THE INSTALLATION OF UNDERGROUND TREATMENT OR STORAGE BMPS, STRUCTURALLY ENGINEERED BMPS, OR OTHER BMPS AS DEEMED APPROPRIATE BY THE DEPARTMENT OR THE CONSERVATION DISTRICT.

FINAL CERTIFICATION: THE PERMITTEE SHALL INCLUDE WITH THE NOTICE OF TERMINATION "RECORD DRAWINGS" WITH A FINAL CERTIFICATION STATEMENT FROM A LICENSED PROFESSIONAL, WHICH READS AS FOLLOWS:
"I (NAME) DO HEREBY CERTIFY PURSUANT TO THE PENALTIES OF 18 PA.C.S.A. § 4904 TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE ACCOMPANYING RECORD DRAWINGS ACCURATELY REFLECT THE AS-BUILT CONDITIONS, ARE TRUE AND CORRECT, AND ARE IN CONFORMANCE WITH CHAPTER 102 OF THE RULES AND REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE PROJECT SITE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PCSM PLAN, ALL APPROVED PLAN CHANGES AND ACCEPTED CONSTRUCTION PRACTICES."

(1) THE PERMITTEE SHALL RETAIN A COPY OF THE RECORD DRAWINGS AS A PART OF THE APPROVED PCSM PLAN.
(2) THE PERMITTEE SHALL PROVIDE A COPY OF THE RECORD DRAWINGS AS A PART OF THE APPROVED PCSM PLAN TO THE PERSON IDENTIFIED IN THIS SECTION AS BEING RESPONSIBLE FOR THE LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS.

PCSM LONG TERM OPERATIONS AND MAINTENANCE REQUIREMENTS

UNTIL THE PERMITTEE OR CO-PERMITTEE HAS RECEIVED WRITTEN APPROVAL OF A NOTICE OF TERMINATION, THE PERMITTEE OR CO-PERMITTEE WILL REMAIN RESPONSIBLE FOR COMPLIANCE WITH THE PERMIT TERMS AND CONDITIONS INCLUDING LONG-TERM OPERATION AND MAINTENANCE OF ALL PCSM BMPS ON THE PROJECT SITE AND IS RESPONSIBLE FOR VIOLATIONS OCCURRING ON THE PROJECT SITE. THE DEPARTMENT OR CONSERVATION DISTRICT WILL CONDUCT A FINAL INSPECTION AND APPROVE OR DENY THE NOTICE OF TERMINATION WITHIN 30 DAYS.

THE PERMITTEE OR CO-PERMITTEE SHALL BE RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS UNLESS A DIFFERENT PERSON IS IDENTIFIED IN THE NOTICE OF TERMINATION AND HAS AGREED TO LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS.

FOR ANY PROPERTY CONTAINING A PCSM BMP, THE PERMITTEE OR CO-PERMITTEE SHALL RECORD AN INSTRUMENT WITH THE RECORDER OF DEEDS WHICH WILL ASSURE DISCLOSURE OF THE PCSM BMP AND THE RELATED OBLIGATIONS IN THE ORDINARY COURSE OF A TITLE SEARCH OF THE SUBJECT PROPERTY. THE RECORDED INSTRUMENT MUST IDENTIFY THE PCSM BMP, PROVIDE FOR NECESSARY ACCESS RELATED TO LONG-TERM OPERATION AND MAINTENANCE FOR PCSM BMPS AND PROVIDE NOTICE THAT THE RESPONSIBILITY FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMP IS A COVENANT THAT RUNS WITH THE LAND THAT IS BINDING UPON AND ENFORCEABLE BY SUBSEQUENT GRANTEES, AND PROVIDE PROOF OF FILING WITH THE NOTICE OF TERMINATION UNDER § 102.7(B)(5) (RELATING TO PERMIT TERMINATION

THE PERSON RESPONSIBLE FOR PERFORMING LONG-TERM OPERATION AND MAINTENANCE MAY ENTER INTO AN AGREEMENT WITH ANOTHER PERSON INCLUDING A CONSERVATION DISTRICT, NONPROFIT ORGANIZATION, MUNICIPALITY, AUTHORITY, PRIVATE CORPORATION OR OTHER PERSON, TO TRANSFER THE RESPONSIBILITY FOR PCSM BMPS OR TO PERFORM LONG-TERM OPERATION AND MAINTENANCE AND PROVIDE NOTICE THEREOF TO THE DEPARTMENT.

A PERMITTEE OR CO-PERMITTEE THAT FAILS TO TRANSFER LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMP OR OTHERWISE FAILS TO COMPLY WITH THIS REQUIREMENT SHALL REMAIN JOINTLY AND SEVERALLY RESPONSIBLE WITH THE LANDOWNER FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS LOCATED ON THE PROPERTY.

CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE.)

CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE:

FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1A AND FP-1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL."

ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL AND MUST BE KEPT ON SITE AND MADE AVAILABLE UPON REQUEST BY THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. FAILURE TO PRODUCE THE FORM UPON REQUEST MAY RESULT IN THE REVOKING, SUSPENSION OR TERMINATION OF YOUR PERMIT COVERAGE. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.

ENVIRONMENTAL DUE DILIGENCE:
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 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 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.

RECYCLING AND DISPOSAL OF MATERIALS

BUILDING MATERIALS AND OTHER CONSTRUCTION SITE WASTES MUST BE PROPERLY MANAGED AND DISPOSED OF TO REDUCE POTENTIAL FOR POLLUTION TO SURFACE AND GROUND WATERS AS PER 25 PA. CODE § 102.4(B)(5)(XI). PROPER TRASH DISPOSAL, RECYCLING OF MATERIALS, PROPER MATERIALS HANDLING, AND SPILL PREVENTION AND CLEAN-UP REDUCE THE POTENTIAL FOR CONSTRUCTION SITE WASTES TO BE MOBILIZED BY STORMWATER RUNOFF AND CONVEYED TO SURFACE WATERS.

UNDER NO CIRCUMSTANCES MAY EROSION CONTROL BMPS BE USED FOR TEMPORARY STORAGE OF DEMOLITION MATERIALS OR CONSTRUCTION WASTES.

WHEREVER HEAVY EQUIPMENT WILL BE USED DURING CONSTRUCTION OF THE CUTS AND FILLS OR PROPOSED BUILDINGS, A POLLUTION PREVENTION AND CONTINGENCY (PPC) PLAN MUST BE AVAILABLE ON SITE. THE APPLICANT MUST PREPARE AND IMPLEMENT A PPC PLAN WHEN STORING, USING OR TRANSPORTING MATERIALS INCLUDING: FUELS, CHEMICALS, SOLVENTS, PESTICIDES, FERTILIZERS, LIME, PETROCHEMICALS, WASTEWATER, WASH WATER, CORE DRILLING WASTEWATER, CEMENT, SANITARY WASTES, SOLID WASTES, OR HAZARDOUS MATERIALS ONTO, ON, OR FROM THE PROJECT SITE DURING EARTH DISTURBANCE ACTIVITIES. THE PPC PLAN MUST BE AVAILABLE UPON REQUEST BY THE DEPARTMENT OR CONSERVATION DISTRICT. GUIDANCE FOR DEVELOPMENT OF A PPC PLAN CAN BE FOUND IN "GUIDELINES FOR THE DEVELOPMENT AND IMPLEMENTATION OF ENVIRONMENTAL EMERGENCY RESPONSE PLANS" (DOCUMENT #400-2200-001), WHICH CAN BE FOUND IN THE DEPARTMENT'S ELIBRARY AT WWW.DEPWEB.STATE.PA.US.

SILT, SEDIMENT, TRASH, CONSTRUCTION WASTES AND ALL OTHER WASTES GENERATED DURING OPERATION AND MAINTENANCE ACTIVITIES SHALL BE PROPERLY MANAGED AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS MUST BE FOLLOWED IN THE USE, HANDLING, AND DISPOSAL OF POTENTIALLY HAZARDOUS MATERIALS.

RESPONSIBLE PARTY

OPERATION AND MAINTENANCE SHALL BE THE RESPONSIBILITY OF WILLIAMS (APPLICANT).

LANDSCAPE SCHEDULE								
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	CALIPER	HEIGHT	SPREAD	ROOT	NOTES
SHRUBS								
CS	11	CORNUS SERICA	REDOSIER DOGWOOD 'WINTER FLAME'	0	18-24"	18–24"	3 GAL	FULL
IV	9	LLEX VERTICILLATA	COMMON WINTERBERRY	0	24-30"	18–24"	5 GAL	FULL PLANT TO BASE

OPERATIONS AND MAINTENANCE PROGRAM PERMANENT STORMWATER FACILITIES

THE PERMIT APPLICANT SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF PERMANENT STORMWATER FACILITIES LOCATED ON THE SUBJECT PROPERTIES. PERMANENT MAINTENANCE OF THE STORM SYSTEM AFTER ACCEPTANCE WILL PRIMARILY CONSIST OF ROUTINE CLEANING OF ACCUMULATED SEDIMENT AND DEBRIS BY FACILITY STAFF OR PRIVATE CONTRACTORS. THE SPECIFIC MAINTENANCE STEPS AND SCHEDULE ARE LISTED BELOW:

ANNUAL CERTIFICATION OF MAINTENANCE PROCEDURES: THE FACILITY SHALL MAINTAIN A CHECKLIST WHENEVER THE STORM SYSTEM IS INSPECTED AND CLEANED. AN ANNUAL LIST OF INSPECTIONS AND MAJOR CLEANING OPERATIONS AND REPAIRS (PUMPING, SWEEPING PARKING LOTS, CLEANING CATCH BASIN SUMPS ETC.) SHALL BE MAINTAINED. THE LOCAL CCD OR ENFORCEMENT OFFICIALS SHALL HAVE ACCESS TO THOSE RECORDS.

ESCGP2: COMPLIANCE WITH ESCGP-2 REQUIREMENTS AND RECORD KEEPING FOR PERMANENT STORMWATER DISCHARGE AND MAINTENANCE AND OTHER APPLICABLE ESCGP-2 AND DEP REQUIREMENTS REGARDING DISCHARGES.

REFER TO THE TABLES BELOW FOR THE OPERATION AND MAINTENANCE OF POST CONSTRUCTION BEST MANAGEMENT PRACTICES.

VEGETATED SWALES WITH CHECK DAMS

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
PLANT ALTERNATIVE GRASS SPECIES IN THE EVENT OF UNSUCCESSFUL ESTABLISHMENT. RESEED BARE AREAS; ROTOTILL OR CULTIVATE THE SURFACE OF THE SAND/SOIL BED OF DRY SWALES IF THE SWALE DOES NOT DRAW DOWN WITHIN 48 HOURS. WATER DURING DRY PERIODS, FERTILIZE, AND APPLY PESTICIDES WHEN NECESSARY. REMOVE SEDIMENT BUILD-UP WITHIN THE BOTTOM OF THE SWALE ONCE IT HAS ACCUMULATED TO 25% OF THE ORIGINAL DESIGN VOLUME, OR ONCE IT HAS COVERED VEGETATION.	AS NEEDED
INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, DAMAGE TO ***CHECK DAMS***, AND SEDIMENT AND DEBRIS ACCUMULATION. INSPECT GRASS ALONG SIDE SLOPES FOR EROSION, RILLS, OR GULLIES, & CORRECT. MOW AND TRIM VEGETATION TO ENSURE SAFETY, PROPER SWALE OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION. INSPECT FOR POOLS OF STANDING WATER; DEWATER & DISCHARGE TO AN APPROVED LOCATION, RESTORE TO DESIGN GRADE. INSPECT FOR UNIFORMITY IN CROSS-SECTION & LONGITUDINAL SLOPE, CORRECT AS NEEDED. INSPECT SWALE INLET AND OUTLET FOR SIGNS OF EROSION OR BLOCKAGE, CORRECT AS NEEDED.	ANNUAL
INSPECT SWALE IMMEDIATELY AFTER SPRING MELT. REMOVE RESIDUALS AND REPLACE DAMAGED VEGETATION. IF ROADSIDE OR PARKING LOT RUNOFF IS DIRECTED TO THE SWALE, MULCHING &/OR SOIL AERATION MAY BE REQUIRED IN THE SPRING TO RESTORE SOIL STRUCTURE & MOISTURE CAPACITY & TO REDUCE THE IMPACT OF DEICING AGENTS. USE NONTOXIC, ORGANIC DEICING AGENTS. PLANT SALT TOLERANT VEGETATION IN SWALES.	***ANNUAL – SPRING***

DISCONNECTION FROM STORM SEWERS

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
INSPECT AND MAINTAIN GRADE TO ENSURE DISCONNECTED IMPERVIOUS AREAS CONTINUE TO BE DIRECTED TO INFILTRATION AREAS AND VEGETATED SWALES	AS NEEDED

LEVEL SPREADER

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
THE RECEIVING LAND AREA SHOULD BE IMMEDIATELY RESTORED TO DESIGN CONDITIONS AFTER ANY DISTURBANCE. SEDIMENT & DEBRIS SHOULD BE ROUTINELY REMOVED.	AS NEEDED
THE AREA BELOW A LEVEL SPREADER SHOULD BE INSPECTED FOR CLOGGING, DENSITY OF VEGETATION, DAMAGE BY FOOT OR VEHICULAR TRAFFIC, EXCESSIVE ACCUMULATIONS, & CHANNELIZATION.	FOUR TIMES PER YEAR FOR FIRST YEAR; ANNUAL THEREAFTER
CATCH BASINS & INLETS DRAINING TO A LEVEL SPREADER SHOULD BE INSPECTED & CLEANED. UNWANTED OR INVASIVE GROWTH SHOULD BE REMOVED.	ANNUAL

GENERAL MAINTENANCE NOTES:
1. IT IS CRITICAL THAT EVEN SHEET FLOW CONDITIONS ARE SUSTAINED THROUGHOUT THE LIFE OF THE LEVEL SPREADER, AS THEIR EFFECTIVENESS CAN DETERIORATE DUE TO LACK OF MAINTENANCE, INADEQUATE DESIGN/LOCATION, & POOR VEGETATIVE COVER.
2. INSPECTIONS SHOULD ALSO BE MADE AFTER EVERY STORM EVENT >1 INCH.
3. IN NO CASE SHOULD STANDING WATER BE ALLOWED ALONG SLOPES FOR LONGER THAN 72 HOURS.
4. MAINTAINING A VIGOROUS VEGETATIVE COVER ON THE AREAS BELOW A LEVEL SPREADER IS CRITICAL FOR MAXIMIZING POLLUTANT REMOVAL EFFICIENCY & EROSION PREVENTION.

INFILTRATION BASIN / RAIN GARDEN

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, AND SEDIMENT AND DEBRIS ACCUMULATION. INSPECT GRASS ALONG SIDE SLOPES FOR EROSION, RILLS, OR GULLIES, & CORRECT. MOW AND TRIM VEGETATION TO ENSURE SAFETY, PROPER SWALE OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION. INSPECT FOR POOLS OF STANDING WATER; DEWATER & DISCHARGE TO AN APPROVED LOCATION, RESTORE TO DESIGN GRADE. INSPECT FOR UNIFORMITY IN CROSS-SECTION & LONGITUDINAL SLOPE, CORRECT AS NEEDED. INSPECT SWALE INLET AND OUTLET FOR SIGNS OF EROSION OR BLOCKAGE, CORRECT AS NEEDED.	ANNUAL
INSPECT OUTLET CONTROL DEVICES AFTER EVERY MAJOR RAINFALL EVENT (>1 IN.) TO ENSURE FREE FLOW.	AS NEEDED
INSPECT SOIL & REPAIR ERODED AREAS, REMOVE LITTER AND DEBRIS	***AS NEEDED***
INSPECT FOR SEDIMENT BUILDUP, EROSION, VEGETATIVE CONDITIONS, REMOVE & REPLACE DEAD & DISEASED VEGETATION.	TWICE PER YEAR

GENERAL MAINTENANCE NOTES:
1. WHILE VEGETATION IS BEING ESTABLISHED, PRUNING AND WEEDING MAY BE REQUIRED.
2. DURING PERIODS OF EXTENDED DROUGHT, BIORETENTION AREAS MAY REQUIRE WATERING.

PARKING AREA IMPERVIOUSNESS

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
INSPECT AND MAINTAIN GRAVEL AREAS	AS NEEDED

LANDSCAPE RESTORATION

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
RESTRICT VEHICLE ACCESS. ASSIGN RESPONSIBILITIES FOR WATERING, WEEDING, MOWING AND MAINTENANCE.	AT ALL TIMES
INSPECT AREA FOR GROWTH AND POTENTIAL PROBLEMS. MOW, WEED AND RESEED AS NEEDED FOR MEADOW ESTABLISHMENT.	ANNUALLY

STREET SWEEPING

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
INSPECT AREAS FOR SEDIMENT AND DEBRIS ACCUMULATION. REMOVE WITH DRY VACUUM EQUIPMENT.	AS NEEDED/ SEMI-ANNUALLY IN SPRING AND FALL

MINIMIZE TOTAL DISTURBED AREA

OPERATION & MAINTENANCE PROCEDURES	
ACTIVITY	SCHEDULE
REPLANT SUITABLE SPECIES IN THE EVENT OF DEAD OR DYING VEGETATION. RESEED BARE AREAS AND INSTALL APPROPRIATE EROSION CONTROLS WHEN SOIL IS EXPOSED.	AS NEEDED
INSPECT AND ENSURE PROTECTED AREAS REMAIN UNDISTURBED AFTER CONSTRUCTION ACTIVITIES CEASE.	BIANNUALLY

MINIMIZED TOTAL DISTURBED AREA NOTES:
1. THE PROTECTED AREA SHOULD NOT BE SUBJECT TO GRADING OR MOVEMENT OF EXISTING SOILS.
2. EXISTING NATIVE VEGETATION IS NOT TO BE REMOVED WITHIN THE PROTECTED AREA.
3. ADDITIONAL PLANTING OF NATIVE VEGETATION IS ALLOWED IN THE PROTECTED AREA.
4. THE PROTECTED AREA MUST BE DELINEATED IN THE FIELD AND PROTECTED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE.
5. SHOULD THE PROTECTED AREA BECOME COMPACTED AND/OR DISTURBED, SOILS AMENDMENT AND RESTORATION MAY BE REQUIRED.

GENERAL LANDSCAPE NOTES

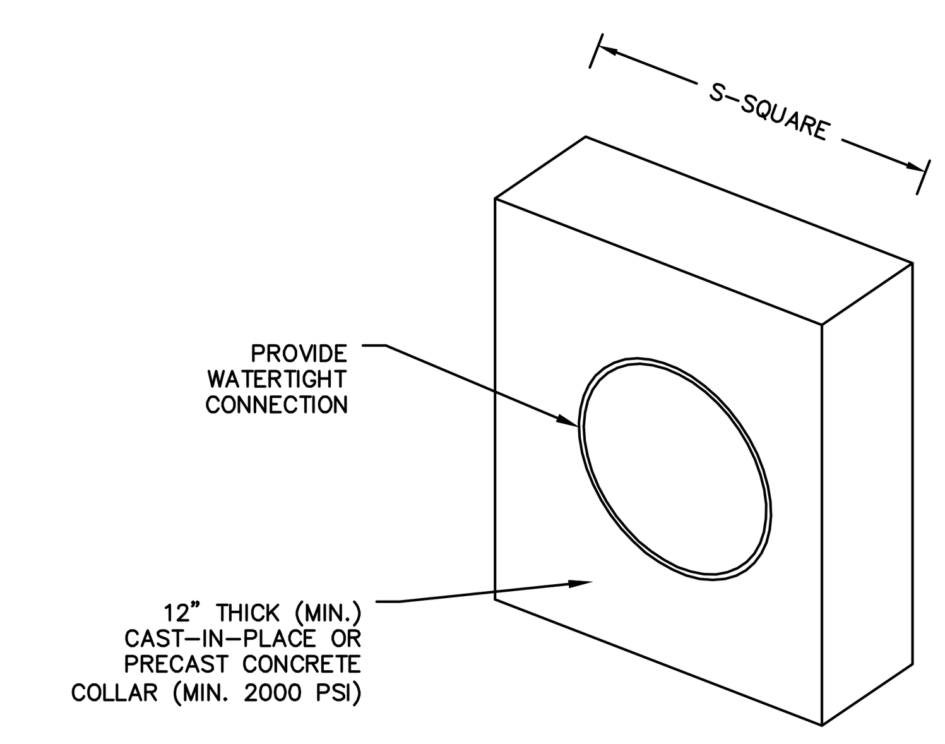
1. GUARANTEE: GUARANTEE ALL PLANTS AND LAWNS FOR A MINIMUM OF 1 YEAR TO BE ALIVE AND IN VIGOROUS GROWING CONDITION AT THE END OF THE GUARANTEE PERIOD. THE GUARANTEE PERIOD FOR ALL PLANTS SHALL BEGIN UPON APPROVAL AS SPECIFIED UNDER SUBSTANTIAL COMPLETION. PLANT MATERIALS AND LAWNS APPROVED IN THE SPRING SHALL BE ALIVE AND IN SATISFACTORY GROWTH ON JUNE 1 OF THE FOLLOWING YEAR; PLANTING DONE IN LATE FALL (AFTER NOVEMBER 1ST) SHALL BE MAINTAINED AND GUARANTEED UNTIL THE SPRING'S LEAFING AFTER THE SECOND YEAR. REPLACEMENTS: ALL PLANTS SHALL BE FREE OF DEAD OR DYING BRANCHES AND BRANCH TIPS, AND SHALL BEAR FOLIAGE OF A NORMAL DENSITY, SIZE AND COLOR. PROMPTLY REMOVE DEAD, UNSIGHTLY, UNHEALTHY, OR EXCESSIVELY PRUNED PLANTS. THESE AND ANY PLANTS MISSING DUE TO THE CONTRACTOR'S NEGLIGENCE, SHALL BE REPLACED OR ADDED WITH THE SAME KIND AND SIZE AS ORIGINALLY SPECIFIED AS SOON AS CONDITIONS PERMIT. METHOD OF REPLACEMENT SHALL BE THE SAME AS SPECIFIED FOR THE ORIGINAL PLANTING WITH REPLACEMENTS MATCHING ADJACENT SPECIMENS OF THE SAME SPECIES. REPLACEMENTS SHALL BE MADE AS MANY TIMES AS NECESSARY TO ENSURE HEALTHY PLANTS AND THEY SHALL BE MAINTAINED AND GUARANTEED. REPLACEMENTS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE AND SHALL BE GUARANTEED FOR TWO FULL YEARS FROM TIME OF REPLACEMENT. PLANTS SHALL BE OTHERWISE PROTECTED AND MAINTAINED, INCLUDING, BUT NOT LIMITED TO, WATER AND SHADE. ANY PLANTS DEEMED NOT IN SATISFACTORY HEALTH OF CONDITION AT THE TIME OF PLANTING SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.
2. THE CONTRACTOR SHALL SUPPLY ALL LABOR AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT SCHEDULE.
3. UTILITY LOCATIONS SHOWN IN THE DRAWINGS ARE APPROXIMATE. EXERCISE CARE WHEN DIGGING IN AREAS OF POTENTIAL CONFLICT WITH UNDERGROUND OR OVERHEAD UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO CONTRACTOR'S NEGLIGENCE AND SHALL REPLACE OR REPAIR ANY DAMAGE AT CONTRACTOR'S EXPENSE.
4. FOR ALL PLANTING AND LAWN AREAS, CONTRACTOR SHALL EXCAVATE EXISTING SOIL TO PROVIDE A MINIMUM OF 4" OF PLANTING TOPSOIL MIX FROM FINISHED PLANTING ELEVATION. CONTRACTOR SHALL SUBMIT TOPSOIL TO A CERTIFIED TESTING LABORATORY TO DETERMINE pH, FERTILITY, ORGANIC CONTENT AND MECHANICAL COMPOSITION. THE CONTRACTOR SHALL SUBMIT THE TEST RESULTS FROM REGIONAL EXTENSION OFFICE OF USDA TO THE OWNER OR LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. CONTRACTOR SHALL INCORPORATE AMENDMENTS FOR GOOD PLANT GROWTH AND PROPER SOIL ACIDITY RECOMMENDED FROM THE TOPSOIL TEST AT NO INCREASE IN CONTRACT PRICE.
5. ALL LANDSCAPING SHALL BE PERPETUALLY MAINTAINED BY THE PROPERTY OWNER. ANY LANDSCAPING NEEDED TO MEET AN ORDINANCE REQUIREMENT THAT DIES, IS REMOVED, OR IS SEVERELY DAMAGED SHALL BE REPLACED BY THE CURRENT PROPERTY OWNER AS SOON AS IS PRACTICAL CONSIDERING GROWING SEASONS, WITHIN A MAXIMUM OF 150 DAYS.
6. AT ALL TIMES, THE SITE SHALL BE KEPT NEAT AND SHALL BE KEPT FREE OF DEBRIS LEFT FROM THE PLANTING OPERATION.
7. ALL DISTURBED LANDSCAPE AREAS ARE TO BE RESEEDED.
8. DURING THE CONSTRUCTION AND GURANTEE PERIOD, WATER LAWN AT THE MINIMUM RATE OF 1 INCH (25 MM) PER WEEK. MOW LAWNS AS SOON AS THERE IS ENOUGH TOP GROWTH TO CUT WITH MOWER SET AT SPECIFIED HEIGHT FOR PRINCIPAL SPECIES PLANTED. REPEAT MOWING AS REQUIRED TO MAINTAIN SPECIFIED HEIGHT WITHOUT CUTTING MORE THAN 40 PERCENT OF GRASS HEIGHT. REMOVE NO MORE THAN 40 PERCENT OF GRASS-LEAF GROWTH IN INITIAL OR SUBSEQUENT MOWINGS. DO NOT DELAY MOWING UNTIL GRASS BLADES BEND OVER AND BECOME MATTED. DO NOT MOW WHEN GRASS IS WET.
9. ALL DISTURBED AREAS WITHIN 50' OF A STREAM CROSSING (WHERE THE STREAM WIDTH IS LESS THAN OR EQUAL 10') SHALL BE STABILIZED WITHIN 24 HOURS OF COMPLETING CONSTRUCTION AT THE CROSSING.
10. ALL DISTURBED AREAS WITHIN 50' OF A STREAM CROSSING (WHERE THE STREAM WIDTH > 10') SHALL BE STABILIZED WITHIN 48 HOURS OF COMPLETING CONSTRUCTION AT THE CROSSING.

ENGINEERED SOIL NOTES

NOTES:
1. CONTRACTOR SHALL VERIFY THAT THE AMENDED SOIL PROVIDES AN INFILTRATION RATE BETWEEN 0.40 IN/HR AND 10 IN/HR. CONTRACTOR TO CONDUCT IN-SITU TESTING OF INFILTRATION RATES AS PER THE SEQUENCE OF CONSTRUCTION.
2. AMENDED SOIL MIX SHALL CONSIST OF A 2:1 SOIL TO COMPOST RATIO. THE COMPOST SHALL HAVE A MINIMUM 80% ORGANIC MATTER CONTENT. SOIL SHALL HAVE A CLAY CONTENT OF LESS THAN 10% AND BE FREE OF TOXIC SUBSTANCES.
3. EXCAVATE TO PROPOSED INVERT ELEVATION AND SCARIFY EXISTING SOILS, DO NOT COMPACT IN-SITU SOILS.
4. BACKFILL WITH AMENDED SOIL, LIGHT HAND TAMPING IS ACCEPTABLE. OVERFILL AS REQUIRED TO ACCOUNT FOR SETTLEMENT.
5. UPON COMPLETION, SEED AND MULCH THE BASIN USING THE STORM BASIN SEED MIXTURE.

ENGINEERED SOIL PARAMETERS

SOIL TEXTURE	IDEAL BULK DENSITIES g/cm^3	BULK DENSITIES THAT MAY AFFECT ROOT GROWTH g/cm^3	BULK DENSITIES THAT RESTRICT ROOT GROWTH g/cm^3
SANDS, LOAMY SANDS	< 1.60	1.69	1.80
SANDY LOAMS, LOAMS	< 1.40	1.63	1.80
SANDY CLAY LOAMS, LOAMS, CLAY LOAMS	< 1.40	1.60	1.75
SILT, SILT LOAMS	< 1.30	1.60	1.75
SOIL LOAMS, SILTY CLAY LOAMS	< 1.10	1.55	1.65
SANDY CLAYS, SILTY CLAYS, SOME CLAY LOAMS (35–45% CLAY)	< 1.10	1.49	1.58
CLAYS (> 45% CLAY)	< 1.10	1.39	1.47



ALL COLLARS SHALL BE INSTALLED SO AS TO BE WATERTIGHT.

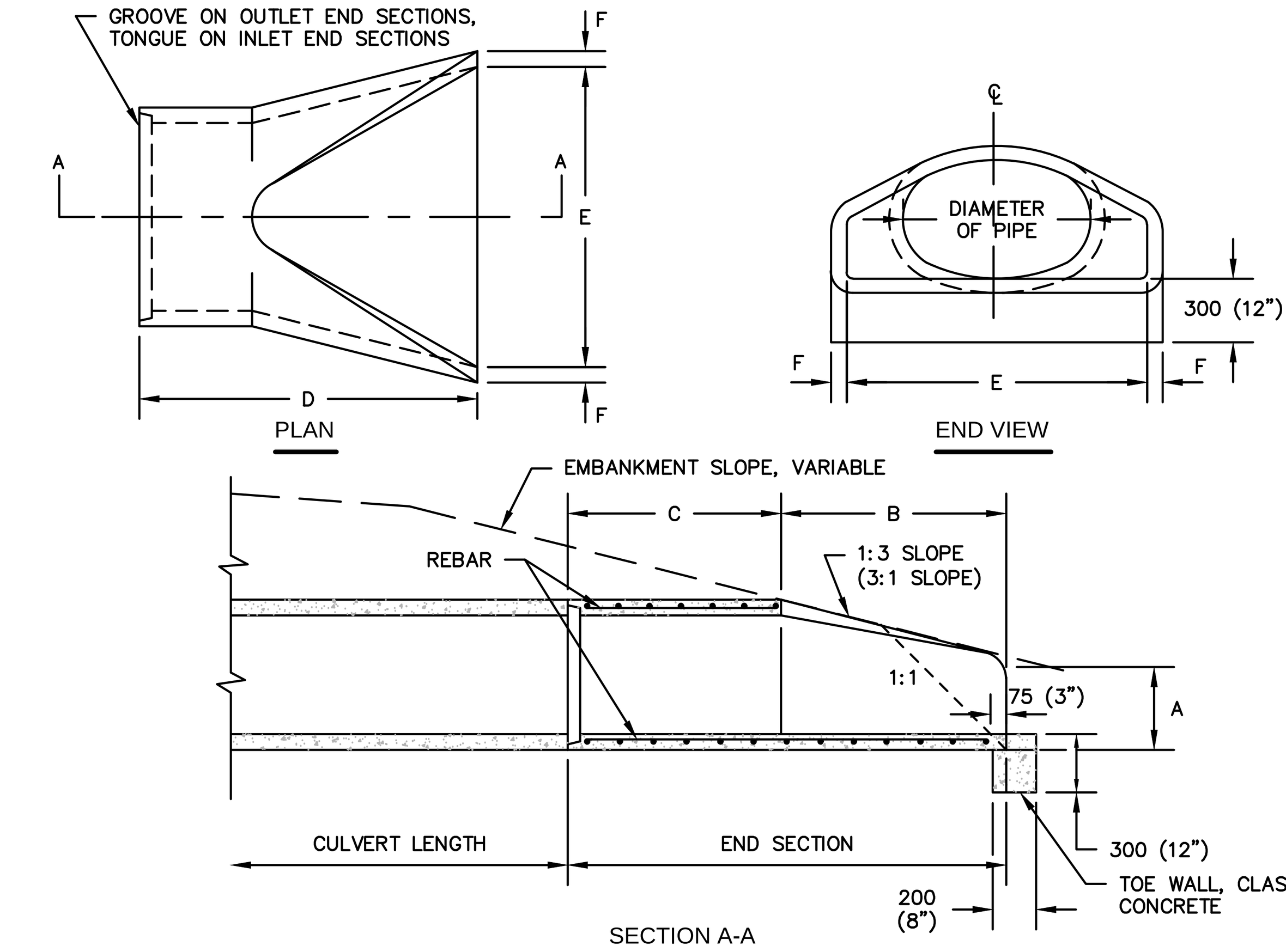
COLLAR SIZE AND SPACING SHALL BE AS INDICATED BELOW.

BASIN OR TRAP NO.	PIPE SIZE (IN)	S (IN)	NO. OF COLLARS	DISTANCE RISER TO 1ST COLLAR (FT)	COLLAR SPACING (FT)
BASIN 1	18	***58***	2	15	10

CONCRETE ANTI-SEEP COLLAR FOR PERMANENT BASINS OR TRAPS DETAIL

N.T.S

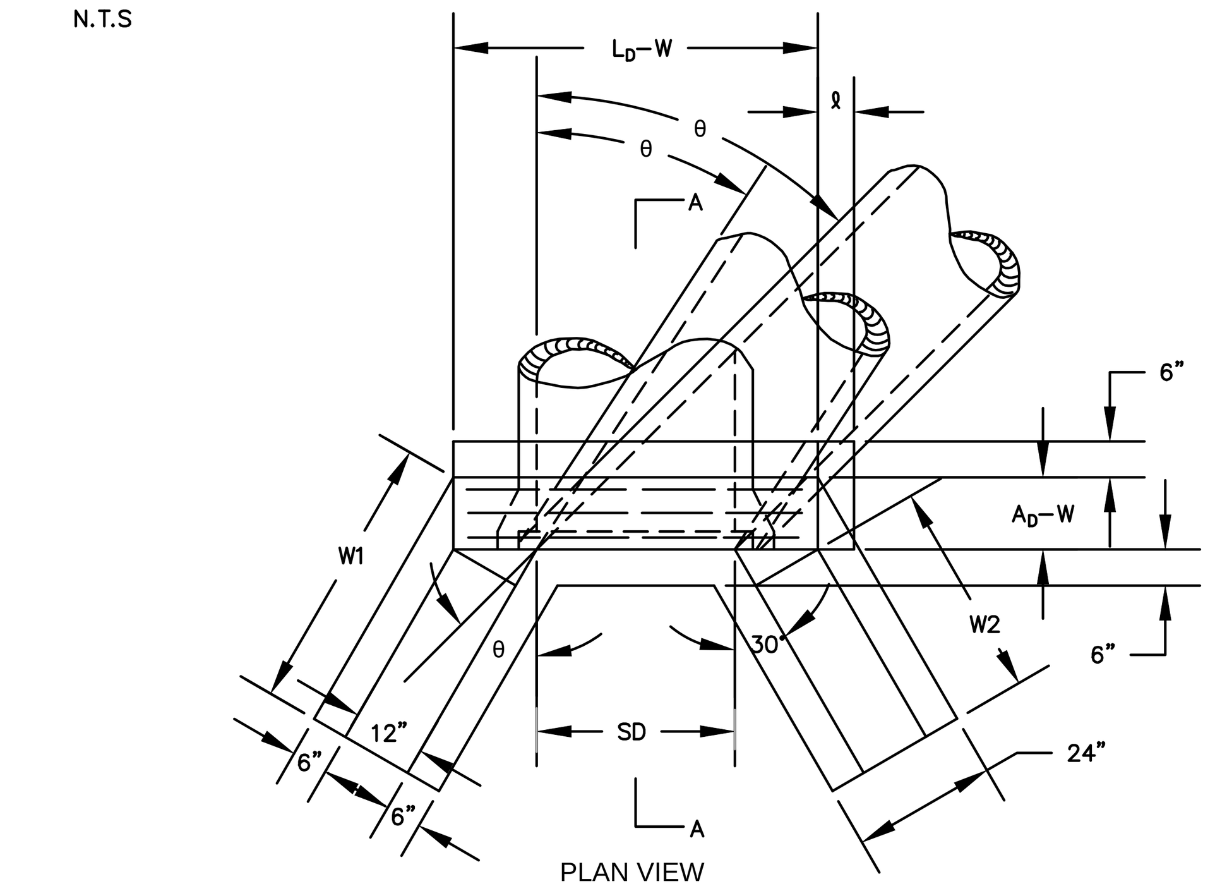
PADEP-7-16



DIA	A	B	C	D	E	F
18"	9"	2'–0"	2'–9"	6'–0"	3'–0"	2 1/2"
24"	9"	3'–3"	2'–9"	6'–0"	4'–0"	3 1/4"
30"	11"	4'–6"	1'–6"	6'–0"	5'–0"	3 3/4"
36"	12"	5'–0"	3'–0"	8'–0"	6'–0"	4 1/2"
42"	16"	5'–0"	3'–0"	8'–0"	6'–6"	5"
48"	21"	5'–0"	3'–0"	8'–0"	7'–0"	5 1/2"

CONCRETE FLARED END SECTION (ELLIPTICAL PIPE)

N.T.S



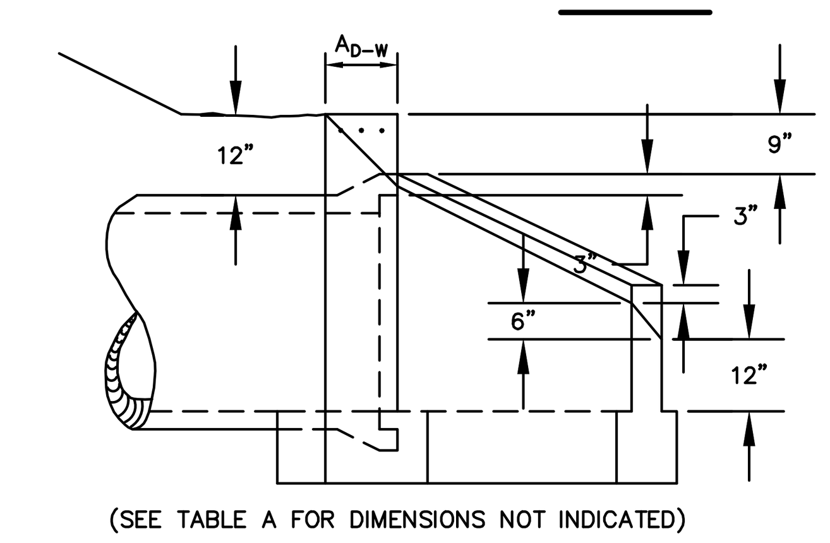
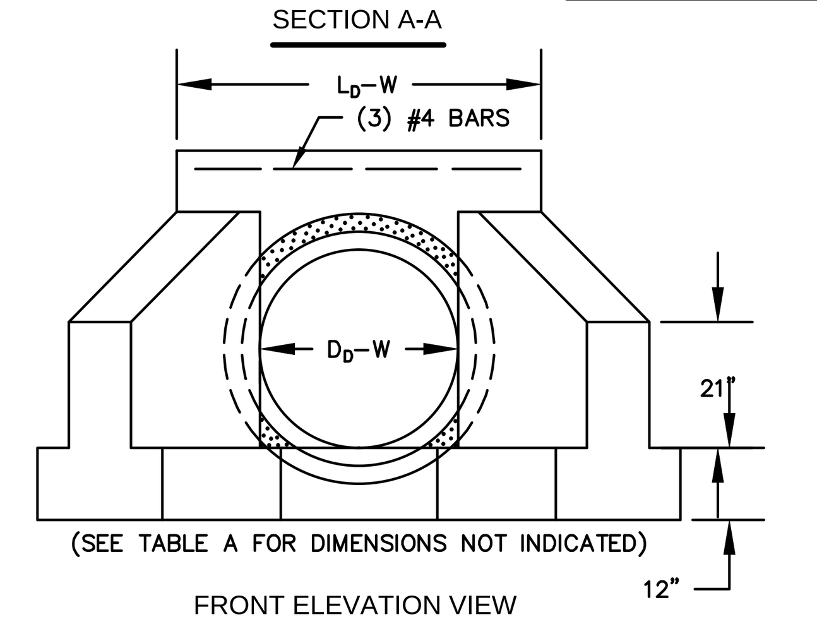


TABLE A			
PIPE DIAM	L	W	A
18"&<	4.0'	4.0'	12"
24"	4.6'	4.25'	12"
36"	5.8'	4.6'	12"
42"	6.3'	5.8'	12"
48"	6.9'	6.9'	12"
54"	7.5'	8.0'	12"
60"	8.1'	9.2'	15"
72"	9.2'	11.5'	15"

NOTES:
- CONCRETE SHALL BE CLASS "AA"
- EXPOSED EDGES SHALL BE CHAMFERED ONE (1) INCH



NOTES:

1. ALL ENDWALLS AND HEADWALLS SHALL HAVE A TRASH SCREEN (SEE DETAIL).

TYPE DW ENDWALL

N.T.S

ALARIC J. BUSHER REG NO. PE 60320

BL Companies — ARCHITECTURE ENGINEERING ENVIRONMENTAL LAND SURVEYING

REVISIONS						
NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W01161505	DAK	AJB
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W01161505	DAK	AJB
2	05/27/2016	BL	UPDATED PER BASIN SYSTEMS DESIGN COORDINATION	W01161505	AJB	AJB
3	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W01161505	AJB	AJB
4	***April 2017***	***BL***	***PADEP TECHNICAL DEFICIENCY RESPONSE #2***	***W01161505***	***AJB***	***AJB***

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
ATLANTIC SUNRISE PROJECT– PROPOSED 42" NATURAL GAS PIPELINE
POST CONSTRUCTION STORMWATER MANAGEMENT PLANS
FOR COMPRESSOR STATION 610
ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA
PCSM NOTES AND DETAILS

Williams

DRAWN BY: AOE	DATE: 04/03/15	ISSUED FOR BID:		SCALE:	AS NOTED
CHECKED BY: AJB	DATE: 04/03/15	ISSUED FOR CONSTRUCTION:		REVISION:	4
APPROVED BY: AJB	DATE: 07/17/15	DRAWING NUMBER:	(66–0610)F–1A–9	SHEET 4	OF 7
WO: 1161505					

Drawn By & Date/Time: hthomas Apr 26, 2017 – 6:51am
Drawing Location & Name: G:\JOBS14\14C\14C4909\DWG\020-CPLS\FCS_PCSM14C4909(20N)_610.dwg

RIP RAP GRADATION, FILTER BLANKET, MAXIMUM VELOCITIES

Riprap Gradation, Filter Blanket Requirements, Maximum Velocities

Class, Size NO. / Rock Size (Inches)	R-8	R-7	R-6	R-5	R-4	R-3
	Percent Passing (Square Openings)					
42	100					
30		100				
24	15-50		100			
18		15-50		100		
15	0-15					
12		0-15	15-50		100	
9				15-50		
6			0-15		15-50	100
4				0-15		
3					0-15	15-50
2						0-15
Nominal Placement Thickness (inches)	63	45	36	27	18	9
Filter Stone[1]	AASHTO #1	AASHTO #1	AASHTO #1	AASHTO #3	AASHTO #3	AASHTO #57
V_{max} (ft/sec)	17.0	14.5	13.0	11.5	9.0	6.5

Adapted from PennDOT Pub. 408, Section 703.2(c), Table C

ADAPTED FROM PENNDOT PUB. 408, SECTION 703.2 (c), TABLE C.

1. THIS IS A GENERAL STANDARD. SOIL CONDITIONS AT EACH SITE SHOULD BE ANALYZED TO DETERMINE ACTUAL FILTER SIZE. A SUITABLE WOVEN OR NON–WOVEN GEOTEXTILE UNDERLAYMENT, USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, MAY BE SUBSTITUTED FOR THE FILTER STONE FOR GRADIENTS < 10%.

LIMING AND FERTILIZER RATES

Soil Amendment	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	Notes
	Permanent Seeding Application Rate			
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

PA DEP TABLE 11.2

1 NO LIME AND/OR FERTILIZER MAY BE APPLIED IN WETLANDS.

SLOPE SEED MIX

Common Name	Scientific Name	# PLS/ acre	PLS/sq ft	% of Mix
Big Bluestem	Andropogon gerardii	2.0	6.0	10
Little Bluestem	Schizachyrium scoparium	1.0	6.0	10
Switchgrass	Panicum virgatum	1.3	12.0	20
Timothy	Phleum prantense	0.4	12.0	20
Virginia Wildrye	Elymus virginicus	4.4	7.5	13
Deertongue	Dichanthelium clandestinum	0.7	6.0	10
Blackeyed Susan	Rudbeckia hirta	0.1	3.0	5
White Clover	Trifolium repens	0.2	3.0	5
Oxeye Sunflower	Heliopsis helianthoides	0.6	1.5	3
Partridge Pea	Chamaecrista fasciculata	1.1	1.5	3
Purple Coneflower	Echinacea purpurea	0.6	1.5	3
Total	--	12.3	60.0	100.00

NOTES:

1 PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
PLS = PURE LIVE SEED

ROW SEED MIX

Common Name	Scientific Name	# PLS/ acre[1]	PLS/sq ft	% of Mix
Red Top	Agrostis gigantea	0.1	12.0	20
Timothy	Phleum prantense	0.4	12.0	20
Tall Fescue	Festuca arundinacea	1.7	9.0	15
Annual Ryegrass	Lolium perenne multiflorum	1.7	9.0	15
Italian Ryegrass	Festulium	1.7	9.0	15
Alsike Clover	Trifolium hybridum	0.2	3.0	5
White Clover	Trifolium repens	0.2	3.0	5
Ladino White Clover	Trifolium repens latum	0.2	3.0	5
Total	--	6.2	60.0	100

NOTES:

1 PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
PLS = PURE LIVE SEED

SPECIES TYPE AND SEASON OF PLANTING

Species Type and Season of Planting	
Cover Crops[1]	
Cool Season - Spring	March 1 to June 1
Warm Season	June 1 to August 15
Cool Season - Fall	August 15 - October 15
Permanent Crop[2]	
Spring	April 20 to June 15
Late Fall (dormant)	October 10 - March 1

NOTES:

1. SEEDING DATES FOR COVER CROPS ARE BASED ON DATES REFERENCED BY CLARK, ___.

2. SEEDING DATES FOR PERMANENT CROPS ARE BASED ON DATES REFERENCED BY LANDSHOOT, 1997 AND DELONG AND BRITTINGHAM, 2002.

SEED AFTER OCTOBER 10 WHEN GROUND TEMPERATURES AT A DEPTH OF 4 INCHES ARE 45 F OR LOWER AND COOLER AIR TEMPERATURES ARE FORECASTED.

DORMANT SEEDING CAN OCCUR UNTIL SOIL IS FROZEN AND ADEQUATE PENETRATION OF THE DRILL SEEDER DOES NOT OCCUR.

COVER CROP SEED MIXES

Cover Crop Seed Mixes

Common Name	Crop Type	# PLS/ acre	PLS/sq ft	% of Mix
Warm Season				
Pearl Millett	Grass	6.9	12.6	70
Sunn Hemp	Legume	10.5	3.6	20
Nitro Radishes	Brassicas	3.1	1.8	10
Total	--	20.5	18.0	100
Cool Season				
Annual ryegrass	Grass	8.0	35.1	65
Red Clover	Legume	3.2	13.5	25
Nitro Radishes	Brassicas	9.4	5.4	10
Total	--	20.6	54.0	100

NOTES:

1 PLS IS ROUNDED TO THE NEAREST TENTH OF A POUND.
PLS = PURE LIVE SEED

TEMPORARY SEED MIX

TEMPORARY SEEDING SHALL CONSIST OF ANNUAL RYEGRASS (100 PERCENT BY WEIGHT), OR EQUIVALENT, AND SHALL BE PLACED AT THE RATE OF 5 POUNDS PER 1,000 SQUARE YARDS. TEMPORARY SEEDING SHALL BE APPLIED TO THOSE AREAS THAT ARE A POTENTIAL EROSION PROBLEM DURING CONSTRUCTION AND TO THOSE AREAS EXPOSED FOR LONGER THAN 20 CALENDAR DAYS. IF CONDITIONS DO NOT PERMIT TEMPORARY SEEDING, MULCHING SHALL BE EMPLOYED. ADDITIONALLY, NITROGEN FERTILIZER (50–50–50) @ ONE (1) TON PER ACRE, AGRICULTURAL LIME @ ONE (1) TON PER ACRE, AND STRAW MULCH @ THREE (3) TONS PER ACRE. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

PERMANENT SEED MIXTURES COOL & WARM SEASON GRASSES

HAYFIELDS

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Orchardgrass	Dactylis glomerata	4.0	60.0	40
Timothy	Phleum pratense	2.0	60.0	40
Ladino White Clover	Trifolium repens latum	0.8	15.0	10
Red Clover	Trifolium pratense	2.4	15.0	10
Total	--	9.2	150.0	100

PASTURES

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Timothy	*Phleum pratense*	0.5	15.0	25%
Perennial Ryegrass	*Lolium perenne*	2.3	12.0	20%
Red Top	*Agrostis gigantea*	0.1	9.0	15%
Italian Ryegrass	*Festulolium*	1.7	9.0	15%
Alsike Clover	*Trifolium hybridum*	0.6	9.0	15%
Ladino White Clover	*Trifolium repens latum*	0.3	6.0	10%
Total	--	5.5	60.0	100%

SLOPING/FORESTED LAND

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Sideoats Grama	*Bouteloua curtipendula*	1.4	6.0	10%
Little Bluestem	*Schizachyrium scoparium*	1.0	6.0	10%
Switchgrass	*Panicum virgatum*	1.3	12.0	20%
Timothy	*Phleum pratense*	0.4	12.0	20%
Virginia Wildrye	*Elymus virginicus*	4.24	7.2	12%
Deertongue	*Dichanthelium clandestinum*	0.7	6.0	10%
Blackeyed Susan	*Rudbeckia hirta*	0.1	2.4	4%
White Clover	*Trifolium repens*	0.1	2.4	4%
Oxeye Sunflower	*Heliopsis helianthoides*	0.8	1.8	3%
Partridge Pea	*Chamaecrista fasciculata*	1.7	2.4	4%
Purple Coneflower	*Echinacea purpurea*	0.7	1.8	3%
Total	--	12.3	60.0	100%

DROUGHT/ROCKY SITES

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Little Bluestem	*Schizachyrium scoparium*	1.5	9.0	15%
Timothy	*Phleum pratense*	0.3	9.0	15%
Prairie Junegrass	*Koeleria macrantha*	0.1	6.0	10%
Deertongue	*Dichanthelium clandestinum*	1.0	9.0	15%
Sideoats Grama	*Bouteloua curtipendula*	2.7	12.0	20%
Virginia Wildrye	*Elymus virginicus*	3.5	6.0	10%
Partridge Pea	*Chamaecrista fasciculata*	2.1	3.0	5%
Ladino White Clover	*Trifolium repens latum*	0.2	3.0	5%
Lanceleaf Coreopsis	*Coreopsis lanceolata*	0.6	3.0	5%
Total	--	12.0	60.0	100%

NON-AGRICULTURAL MEADOWS

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Virginia Wildrye	*Elymus virginicus*	5.3	9.0	15%
Little Bluestem	*Schizachyrium scoparium*	1.5	9.0	15%
Sideoats Grama	*Bouteloua curtipendula*	2.1	9.0	15%
Deertongue	*Dichanthelium clandestinum*	1.0	9.0	15%
Partridge Pea	*Chamaecrista fasciculata*	4.2	6.0	10%
Oxeye Sunflower	*Heliopsis helianthoides*	1.3	3.0	5%
Lanceleaf Coreopsis	*Coreopsis lanceolata*	1.2	6.0	10%
Blackeyed Susan	*Rudbeckia hirta*	0.1	3.0	5%
Butterfly Milkweed	*Asclepias tuberosa*	5.2	6.0	10%
Total	--	21.8	60.0	100%

NATIVE NON-NATIVE FOOD PLOT MIX

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Timothy	*Phleum pratense*	0.4	12.0	20%
Upland Bent Grass	*Agrostis perennans*	0.1	9.0	15%
Virginia Wildrye	*Elymus virginicus*	5.3	9.0	15%
White Clover	*Trifolium repens*	0.5	9.0	15%
Ladino White Clover	*Trifolium repens latum*	0.7	12.0	20%
Crimson Clover	*Trifolium incarnatum*	3.5	9.0	15%
Total	--	10.4	60.0	100%

STORM BASIN MIX

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Orchardgrass	*Dactylis glomerata*	0.8	12.0	20%
Timothy	*Phleum pratense*	0.4	12.0	20%
Switchgrass	*Panicum virgatum*	1.0	9.0	15%
Virginia Wildrye	*Elymus virginicus*	7.1	12.0	20%
Fox Sedge	*Carex vulpinoidea*	0.3	9.0	15%
Oxeye Sunflower	*Heliopsis helianthoides*	1.3	3.0	5%
Swamp Milkweed	*Asclepias incarnata*	1.7	3.0	5%
Total	--	12.6	60.0	100%

POLLINATOR MIX (TO BE ADDED TO ANY MIX UPON LANDOWNER REQUEST)

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Butterfly Milkweed	*Asclepias tuberosa*	2.6	3.0	15%
Purple Coneflower	*Echinacea purpurea*	1.1	3.0	15%
Dense Blazing Star	*Liatris spicata*	0.7	2.0	10%
Lanceleaf Coreopsis	*Coreopsis lanceolata*	0.4	2.0	10%
Blackeyed Susan	*Rudbeckia hirta*	0.1	3.0	15%
Oxeye Sunflower	*Heliopsis*	1.3	3.0	15%
Wild Bergamot	*Monarda fistulosa*	0.1	2.0	10%
Hoary Mountainmint	*Pycnanthemum*	0.0	2.0	10%
Total	--	6.3	20.0	100%

BRASSICA MIX

Common Name	Scientific Name	# PLS/acre	PLS/sq ft	% of Mix
Bonar (Rape)	*Brassica napus*	2.7	6.6	33%
Turnip	*Brassica rapa*	12.9	6.6	33%
Nitro Radish	*Raphanus*	11.8	6.8	34%
Total	--	27.4	20.0	100%

SITE SOIL TYPES AND LIMITATIONS

MAP UNIT NAME	MAP UNIT DESIGNATION	SLOPES	SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	HIGH WATER TABLE	HYDRIC/HYDRIC INCLUSIONS	LOW STRENGTH	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK–SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
ALLENWOOD SILT LOAM	AeB2	3–12%	ALLENWOOD	X	C/S					X	X	X	X	X	X				
HARLETON CHANNERY SILT LOAM	HhC3	12–20%	HARLETON	X	C	X					X	X	X	X	X				
	HhB2	3–12%		X	C	X					X	X	X	X	X				
WATSON SILT LOAM	WbB2	3–8%	WATSON	X	C/S	X			X	X	X	X	X		X	X			
WEIKERT CHANNERY SILT LOAM	WcC2	12–20%	WEIKERT	X	C/S	X				X	X	X	X	X	X				

SOILS LIMITATIONS AND RESOLUTIONS

LIMITATION	RESOLUTION
CUTBANKS CAVE	EXCAVATIONS WILL BE PROPERLY SUPPORTED BY SHEETING AND SHORING TO PREVENT CAVES.
CORROSIVE TO CONCRETE/STEEL	NO CONCRETE OR STEEL PIPING IS PROPOSED WITHOUT APPROPRIATE COATINGS AND PROTECTION.
DROUGHTY	EXISTING SUITABLE TOPSOIL AND SOIL AMENDMENTS WILL BE USED DURING CONSTRUCTION.
EASILY ERODIBLE	TEMPORARY AND PERMANENT EROSION CONTROL BMPS WILL BE EMPLOYED THROUGHOUT THE SITE.
FLOODING	ENSURE THAT THE SITE HAS PROPER DRAINAGE.
HIGH WATER TABLE	A GEOTECHNICAL INVESTIGATION WAS CONDUCTED TO MINIMIZE CONFLICTS WITH SATURATED ZONES.
HYDRIC/HYDRIC INCLUSIONS	A WETLAND INVESTIGATION WAS COMPLETED TO DETERMINE IF WETLANDS ARE PRESENT IN THE DEVELOPMENT AREA.
LOW STRENGTH	A MAXIMUM OF 3:1 SLOPES ARE PROPOSED.
SLOW PERCOLATION	FIELD INVESTIGATIONS OF PERCOLATION RATES AT THE INFILTRATION AREAS WERE PERFORMED TO VERIFY THE SOILS PERCOLATION CAPACITY.
PIPING	WATERTIGHT PIPE, ANTISEEP COLLARS, CLAY CORES THROUGH BASIN BERMS, AND CONCRETE ENDWALLS WILL BE USED TO MINIMIZE THE DANGER OF PIPING.
POOR SOURCE OF TOPSOIL	EXISTING TOPSOIL, WHICH HAS PROVEN TO BE SUITABLE, WILL BE REUSED ON THE SITE.
FROST ACTION	PAVEMENT SUBBASE WILL BE PROVED TO MINIMIZE FROST AFFECTS.
SHRINK–SWELL	STONE BASE WILL BE PROVED TO PREVENT SHRINK–SWELL FROM EFFECTING PAVEMENT.
POTENTIAL SINKHOLE	GEOTECHNICAL ENGINEER OF RECORD RECOMMENDATIONS WILL BE FOLLOWED FOR ANY POTENTIAL OCCURRENCES.
PONDING	SURFACE GRADING AND DRAINAGE FACILITIES WILL BE PROVIDED TO MINIMIZE PONDING AFFECTS.
WETNESS	WET WEATHER CONSTRUCTION RECOMMENDATIONS, PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS, WILL BE EMPLOYED TO MINIMIZE THE AFFECTS OF WETNESS DURING CONSTRUCTION, SURFACE GRADING. SURFACE GRADING AND DRAINAGE WILL BE PROVIDED TO MINIMIZE WETNESS AFFECTS AFTER CONSTRUCTION.

MULCH

1. MULCHES SHOULD BE APPLIED AT THE RATES SHOWN IN TABLE 11.6
2. STRAW AND HAY MULCH SHOULD BE ANCHORED OR TACKIFIED IMMEDIATELY AFTER APPLICATION TO PREVENT BEING WINDBLOWN. A TRACTOR–DRAWN IMPLEMENT MAY BE USED TO "CRIMP" THE STRAW OR HAY INTO THE SOIL – ABOUT 3 INCHES. THIS METHOD SHOULD BE LIMITED TO SLOPES NO STEEPER THAN 3H:1V. THE MACHINERY SHOULD BE OPERATED ON THE CONTOUR. CRIMPING OF HAY OR STRAW BY RUNNING OVER IT WITH TRACKED MACHINERY IS NOT RECOMMENDED.
3. POLYMERIC AND GUM TACKIFIERS MIXED AND APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS MAY BE USED TO TACK MULCH. AVOID APPLICATION DURING RAIN AND ON WINDY DAYS. A 24–HOUR CURING PERIOD AND A SOIL TEMPERATURE HIGHER THAN 45°F ARE TYPICALLY REQUIRED. APPLICATION SHOULD GENERALLY BE HEAVIEST AT EDGES OF SEEDED AREAS AND AT CRESTS OF RIDGES AND BANKS TO PREVENT LOSS BY WIND. THE REMAINDER OF THE AREA SHOULD HAVE BINDER APPLIED UNIFORMLY. BINDERS MAY BE APPLIED AFTER MULCH IS SPREAD OR SPRAYED INTO THE MULCH AS IT IS BEING BLOWN ONTO THE SOIL. APPLYING STRAW AND BINDER TOGETHER IS GENERALLY MORE EFFECTIVE.
4. SYNTHETIC BINDERS, OR CHEMICAL BINDERS, MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THEY ARE NON–TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.
5. MULCH ON SLOPES 8% OR STEEPER SHOULD BE HELD IN PLACE WITH NETTING. LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. SHREDDED PAPER HYDROMULCH SHOULD NOT BE USED ON SLOPES STEEPER THAN 5%. WOOD FIBER HYDROMULCH MAY BE APPLIED ON STEEPER SLOPES PROVIDED A TACKIFIER IS USED. THE APPLICATION RATE FOR ANY HYDROMULCH SHOULD BE 2,000 LB/ACRE AT A MINIMUM.
7. HYDRAULICALLY APPLIED BLANKETS CAN BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. THEY MAKE USE OF A CROSS–LINKED HYDROCOLLOID TACKIFIER TO BOND THERMALLY PROCESSED WOOD FIVERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. IN ANY CASE, MANUFACTURER'S RECOMMENDATIONS SHOULD BE FOLLOWED. SHOULD NOT BE USED IN AREAS OF CONCENTRATED FLOW (E.G. SWALES).
8. NO MULCH MAY BE APPLIED IN WETLANDS.

TABLE 11.6

MULCH APPLICATION RATES

MULCH TYPE	APPLICATION RATE (MIN.) PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YD.	NOTES
STRAW	3 TONS	140 LB.	1,240 LB.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
WOOD CHIPS	4–6 TONS	185–275 LB.	1,650–2,500 LB.	MAY PRVENT GERMINATION OF GRASSES AND LEGUMES
HYDRO– MULCH	1 TON	47 LB.	415 LB.	SEE LIMITATIONS ABOVE
HYDRAULICALLY APPLIED BLANKETS	3,000 LB.	N/A	N/A	SLOPES UP TO 3H:1V
	4,000 LB.	N/A	N/A	SLOPES STEEPER THAN 3H:1V

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ALARIC JAMES BUSHER ENGINEER NO. PE-60320

ALARIC J. BUSHER REG NO. PE 60320

BL Companies ARCHITECTURE ENGINEERING ENVIRONMENTAL LAND SURVEYING

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W01161505	DAK	AJB
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W01161505	DAK	AJB
2	05/27/2016	BL	UPDATED PER BASIN SYSTEMS DESIGN COORDINATION	W01161505	AJB	AJB
3	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W01161505	AJB	AJB
4	April 2017	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #2	W01161505	AJB	AJB

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
ATLANTIC SUNRISE PROJECT– PROPOSED 42" NATURAL GAS PIPELINE
POST CONSTRUCTION STORMWATER MANAGEMENT PLANS
FOR COMPRESSOR STATION 610
ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA
PCSM NOTES AND DETAILS

Williams

DRAWN BY: AOE	DATE: 04/03/15	ISSUED FOR BID:		SCALE:	AS NOTED
CHECKED BY: AJB	DATE: 04/03/15	ISSUED FOR CONSTRUCTION:		REVISION:	4
APPROVED BY: AJB	DATE: 07/17/15	DRAWING NUMBER:	(66–0610)F–1A–9	SHEET 5	OF 7
WO: 1161505					

Drawn By & Date/Time: hthomas Apr 27, 2017 – 7:10am
Drawing Location & Name: G:\JOBS14\14C\14C4909\DWG\020–CPLS\FCS_PCSM14C4909(20N)_610.dwg

EARTH DISTURBANCE ACTIVITY - PAST, PRESENT, AND FUTURE LAND USES

THE LAND USES AND AQUATIC FEATURES FOUND WITHIN THE PROJECT AREA OCCUR ON MIXED HARDWOOD UPLAND FOREST, AND SHALLOW FORESTED WETLANDS. ACCORDING TO THE IMAGERY PROVIDED BY THE PENNSYLVANIA GEOLOGICAL SURVEY, THE LAND USES WITHIN THE PROJECT AREA REMAINED SIMILAR BETWEEN 1939 AND 1967. THE LAND USES ON THE 1939 AERIALS WERE PRIMARILY COMPOSED OF MIXED HARDWOOD UPLAND FOREST. FUTURE LAND USE WOULD INVOLVE THE INSTALLATION OF THE METER STATION PAD AND ACCESS ROADS.

THERMAL IMPACT ANALYSIS

IN ORDER TO PREVENT AN INCREASE IN STREAM TEMPERATURE, THIS SITE WILL INCORPORATE THE FOLLOWING BMP'S TO ADDRESS POTENTIAL THERMAL IMPACTS. GRAVEL WILL PRIMARILY BE USED IN LIEU OF ASPHALT FOR PAD CONSTRUCTION TO PREVENT THE COLLECTION AND SUBSEQUENT HEATING OF STORMWATER ON THE SURFACE OF THESE AREAS. THE RECEIVING WATERS FOR THE SITE ARE 1,500' ± FROM THE SITE. VEGETATED SWALE WITH CHECK DAMS AND AN INFILTRATION BASIN WILL BE PROVIDED TO CAPTURE AND AID IN THE INFILTRATION OF THE NET RUNOFF VOLUME INCREASE ASSOCIATED WITH THE TRANSITION FROM PRE-DEVELOPMENT CONDITIONS TO POST-DEVELOPMENT CONDITIONS.

THERMAL IMPACTS ASSOCIATED WITH CPL NORTH, CPL SOUTH, AND ASSOCIATED FACILITIES WILL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. THE FOLLOWING PROVISIONS RELATED TO THERMAL IMPACTS ARE INCLUDED IN THE E&SC PLAN WITHIN SECTION 2 OF THE ESCGP-2 NOI:

- THE MINIMUM PERMANENT CHANGES IN LAND COVER, NECESSARY TO CONSTRUCT THE REQUIRED FACILITIES ARE BEING PROPOSED.
- RUNOFF FROM THE PERMANENT IMPERVIOUS AREAS WILL BE COLLECTED AS PART OF THE POST CONSTRUCTION STORMWATER MANAGEMENT/SITE RESTORATION (PCSM/SR) PLAN AND ROUTED TO PCSM/SR BMPS. IN ADDITION, IMPERVIOUS AREAS WILL BE GRAVEL INSTEAD OF ASPHALT WHEREVER PRACTICAL.
- PCSM/SR BMPS INCORPORATE THE USE OF INFILTRATION FACILITIES SUCH AS BASINS AND VEGETATED SWALES WITH EARTHEN CHECK DAMS.
- THE REMOVAL OF VEGETATION, ESPECIALLY TREE COVER, WILL BE LIMITED TO ONLY THAT NECESSARY FOR CONSTRUCTION.
- THE AMOUNT OF IMPERVIOUS SURFACES WILL BE LIMITED TO ONLY THAT NECESSARY TO SUPPORT THE CONSTRUCTION OF THIS FACILITY.

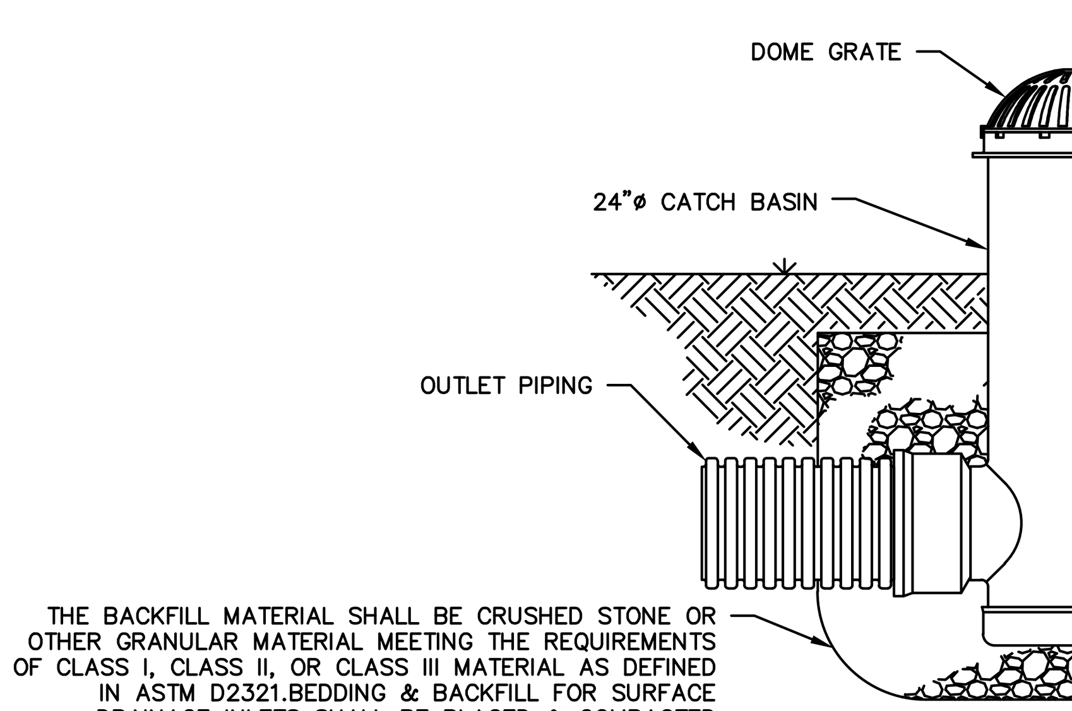
CRITICAL STAGES OF CONSTRUCTION

THE FOLLOWING ARE CRITICAL STAGES OF CONSTRUCTION:

1. INSTALLATION OF SEDIMENT BASIN.
2. INSTALLATION OF VEGETATED SWALES AND CHECK DAMS.
3. CONVERSION SEDIMENT BASIN TO STORMWATER BASIN.
4. LANDSCAPE RESTORATION.

COMPRESSOR STATION SEQUENCE OF CONSTRUCTION

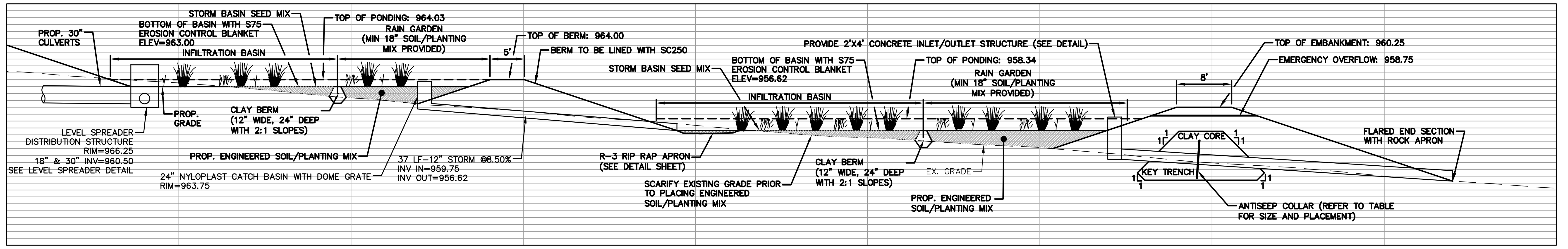
1. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, ENVIRONMENTAL INSPECTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
2. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
3. INSTALL ORANGE CONSTRUCTION FENCE AROUND AREAS TO BE PROTECTED.
4. LOCATE STAGING AREAS AND ACCESS POINTS INCLUDING CONSTRUCTION ENTRANCES. FIELD LOCATE LIMITS OF DISTURBANCE.
5. INSTALL ROCK CONSTRUCTION ENTRANCES (RCES).
6. REMOVE BRUSH TO EFFECTIVELY INSTALL PERIMETER CONTROLS, LEVEL SIDE CUTS TO GRANT ACCESS FOR VEHICLES AND WORKERS TO SAFELY PERFORM THE INSTALLATION OF SEDIMENT BARRIERS ON THE SITE AS SHOWN ON THE CONSTRUCTION DRAWINGS.
7. THE COMPLIANCE MANAGER SHALL PROVIDE PADEP AND CCD AT LEAST THREE DAYS' NOTICE PRIOR TO BULK EARTH DISTURBANCE AND UPON COMPLETED INSTALLATION OF PERIMETER EROSION CONTROLS.
8. INSTALL COMPOST FILTER SOCK 2,3, AND 4. INSTALL SWALE 1, IMMEDIATLEY SEED AND STABILIZE.
9. * INSTALL SEDIMENT BASIN 1 BERM INCLUDING CLAY CORE, OUTFALL STRUCTURE, APRON, AND ANTISEEP COLLARS IMMEDIATELY AFTER INSTALLING COMPOST FILTER SOCK 2, 3 AND 4 AND PRIOR TO ANY OTHER DISTURBANCE ON SITE. EXCAVATE TEMPORARY SWALES TO ALLOW FOR THE DISCHARGE OF THE PAD CULVERTS INTO THE BASIN.
10. INSTALL CFS SEDIMENT TRAP 1.
11. * INSTALL REMAINDER OF SEDIMENT BASIN 1 INCLUDING SLOPE LINERS, CLEANOUT STAKE, AND ASSOCIATED IMPROVEMENTS. INSTALL FILTER SOCK DIVERSIONS 1 AND 2 ONLY AFTER BASIN IS COMPLETED.
12. INSTALL VEGETATED ROADSIDE SWALES, CULVERTS AND RIPRAP OUTLET PROTECTION.
13. * INSTALL EARTHEN CHECK DAMS AND DRAINAGE CHANNEL APRONS AS SOON AS SWALE GRADING IS COMPLETE.
14. BEGIN CONSTRUCTION STAKING FOR GRADING.
15. BEGIN GRADING AND STRIP AND STOCKPILE TOPSOIL WITHIN THE AREA OF IMPROVEMENTS AND INSTALL SEDIMENT BARRIERS AROUND STOCKPILES.
16. UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OF AN ACTIVITY WHERE THE CESSATION OF EARTH DISTURBANCE ACTIVITIES WILL EXCEED FOUR DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED, OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION PENDING FUTURE EARTH DISTURBANCE ACTIVITIES. FOR AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OF AN ACTIVITY TO BE CONSIDERED TEMPORARILY STABILIZED, THE DISTURBED AREAS SHALL BE COVERED WITH ONE OF THE FOLLOWING: A MINIMUM UNIFORM COVERAGE OF MULCH AND SEED, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED EROSION AND SEDIMENTATION, OR AN ACCEPTABLE BMP WHICH TEMPORARILY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION. TEMPORARY STABILIZATION WILL NOT OCCUR ON ACTIVE VEHICULAR TRAVEL WAYS WITHIN THE ROW. THE ON-SITE ENVIRONMENTAL INSPECTOR WILL LOG DAILY ACTIVITY WITHIN THE LOD AND NOTIFY THE CONTRACTOR OF AREAS REQUIRING TEMPORARY STABILIZATION (I.E., AREAS WHERE WORK HAS CEASED FOR AT LEAST FOUR DAYS).
17. GRADE THE COMPRESSOR STATION PADS AND ACCESS ROADS, INCLUDING STORMWATER RUNOFF CONVEYANCE FEATURES AS SHOWN ON THE E&SC AND PCSM/SR PLANS (SECTIONS 2 AND 3 OF THE ESCGP-2 NOI).
18. IMMEDIATELY STABILIZE SIDE SLOPES WITH EROSION CONTROL MATTING WHEN SLOPES ARE 3:1 OR GREATER. SEE PCSM/SR PLANS AND DETAIL SHEETS, AS PROVIDED IN SECTION 3 OF THE ESCGP-2 NOI, (PATTERNS DIFFER BY SLOPE CATEGORY). INSTALL RIP RAP SLOPE STABILIZATION WHERE SHOWN ON THE PCSM/SR PLANS.
19. REMOVE FSD 2. MAINTAIN DRAINAGE TO THE SEDIMENT BASIN WHILE PLACING FILL.
20. CONSTRUCT FACILITY INCLUDING ACCESS ROADS.
21. ESTABLISH FINAL GRADE.
22. SPREAD TOPSOIL.
23. SURFACE STABILIZATION, APPLY PERMANENT STABILIZATION MEASURES IMMEDIATELY TO ANY DISTURBED AREAS WHERE WORK HAS REACHED FINAL GRADE.
24. UPON COMPLETION OF ALL EARTHWORK ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATORS SHALL CONTACT THE LOCAL CCD FOR AN INSPECTION PRIOR TO THE REMOVAL/CONVERSION OF THE E&SC BMPS.
25. * REMOVE COMPOST FILTER SOCK SEDIMENT TRAP AND IMMEDIATELY SEED AND STABILIZE LANDSCAPE RESTORATION AREAS.
26. * INSTALL VEGETATED SWALE 3. REMOVE FSD 1.
27. * AFTER ALL UPSLOPE DISTURBED AREAS ARE STABILIZED, REMOVE ACCUMULATED SEDIMENTS AND RAISE BASIN BOTTOM TO FINAL GRADE, CONVERT SEDIMENT BASIN TO PROPOSED INFILTRATION BASIN, INCLUDING CONSTRUCTION OF BERM, BERM DIVERSION PIPING, LEVEL SPREADER AND INFILTRATION AREA LOCATED WITHIN DRIVE ISLAND AND PLACE ENGINEERED SOIL. REMOVE TEMPORARY SKIMMER FROM PERMANENT OUTLET STRUCTURE AND INSTALL WATERTIGHT PLUG IN ORIFICE. REMOVE TEMPORARY PLATE OVER PERMANENT ORIFICE IN OUTLET STRUCTURE AND INSTALL TOP GRATE.
28. ALL MATERIAL REMOVED FROM TEMPORARY BASINS, TRAPS AND INFILTRATION BERMS TO BE REMOVED FROM SITE.
29. AFTER FINISH GRADING AND TOPSOIL PLACEMENT IS COMPLETED, DISTURBED AREAS SHALL BE FERTILIZED, SEEDED, AND MULCHED. SEED MIXTURES, FERTILIZER AND MULCH APPLICATIONS RATES AND DATES SHALL CONFORM TO THE TABLES PROVIDED ON THE PCSM/SR PLANS AND DETAIL SHEETS (SECTION 3 OF THE ESCGP-2 NOI), LAND OWNER AGREEMENTS AND/OR THE ECP (SECTION 4 OF THE ESCGP-2 NOI).
30. AFTER SEEDING, FERTILIZING AND MULCHING IS COMPLETE, INSTALL ECBS AS REQUIRED OR ORDERED OR ON SLOPES OF 3:1 OR GREATER.
31. AFTER THE SITE IS PERMANENTLY STABILIZED AND UPON PADEP OR LOCAL CCD AND OWNER APPROVAL OF STABILIZATION AND RE-VEGETATION, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND STABILIZE AREAS DISTURBED BY REMOVAL.
32. COMPLETE SITE STABILIZATION. INCLUDING SEED APPLICATION, ECB AND MULCHING.
33. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATORS SHALL CONTACT THE LOCAL CCD FOR A FINAL INSPECTION.
34. MAINTAIN E&SC BMPS UNTIL SITE WORK IS COMPLETE AND UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
35. REMOVE AND PROPERLY DISPOSE/RECYCLE E&SC BMPS. REMOVE ORANGE CONSTRUCTION FENCE. REPAIR AND PERMANENTLY STABILIZE AREAS DISTURBED DURING E&SC BMP REMOVAL UPON ESTABLISHMENT OF UNIFORM 70% VEGETATIVE COVER.



THE BACKFILL MATERIAL SHALL BE CRUSHED STONE OR OTHER GRANULAR MATERIAL MEETING THE REQUIREMENTS OF CLASS I, CLASS II, OR CLASS III MATERIAL AS DEFINED IN ASTM D2321.BEDDING & BACKFILL FOR SURFACE DRAINAGE INLETS SHALL BE PLACED & COMPACTED UNIFORMLY IN ACCORDANCE WITH ASTM D2321

NYLOPLAST OUTLET STRUCTURE

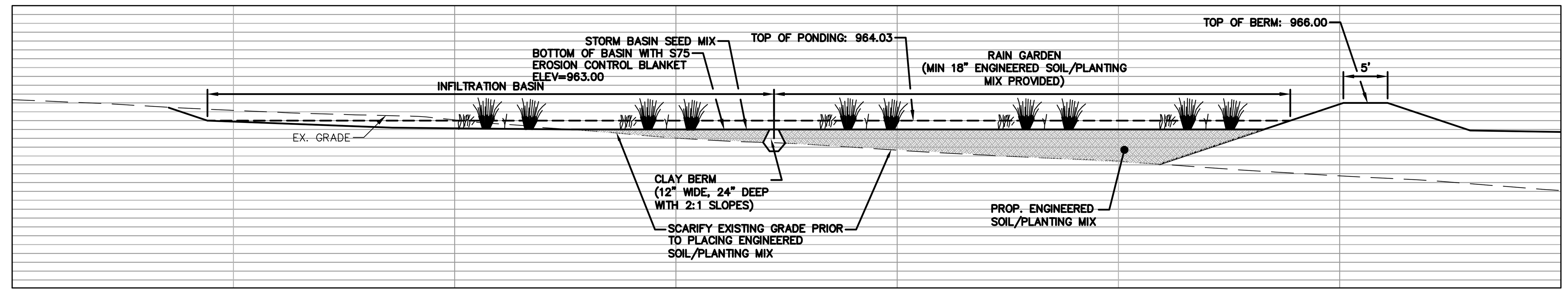
N.T.S



INFILTRATION AREA 1 & 2 CROSS SECTION (MAIN BASIN)

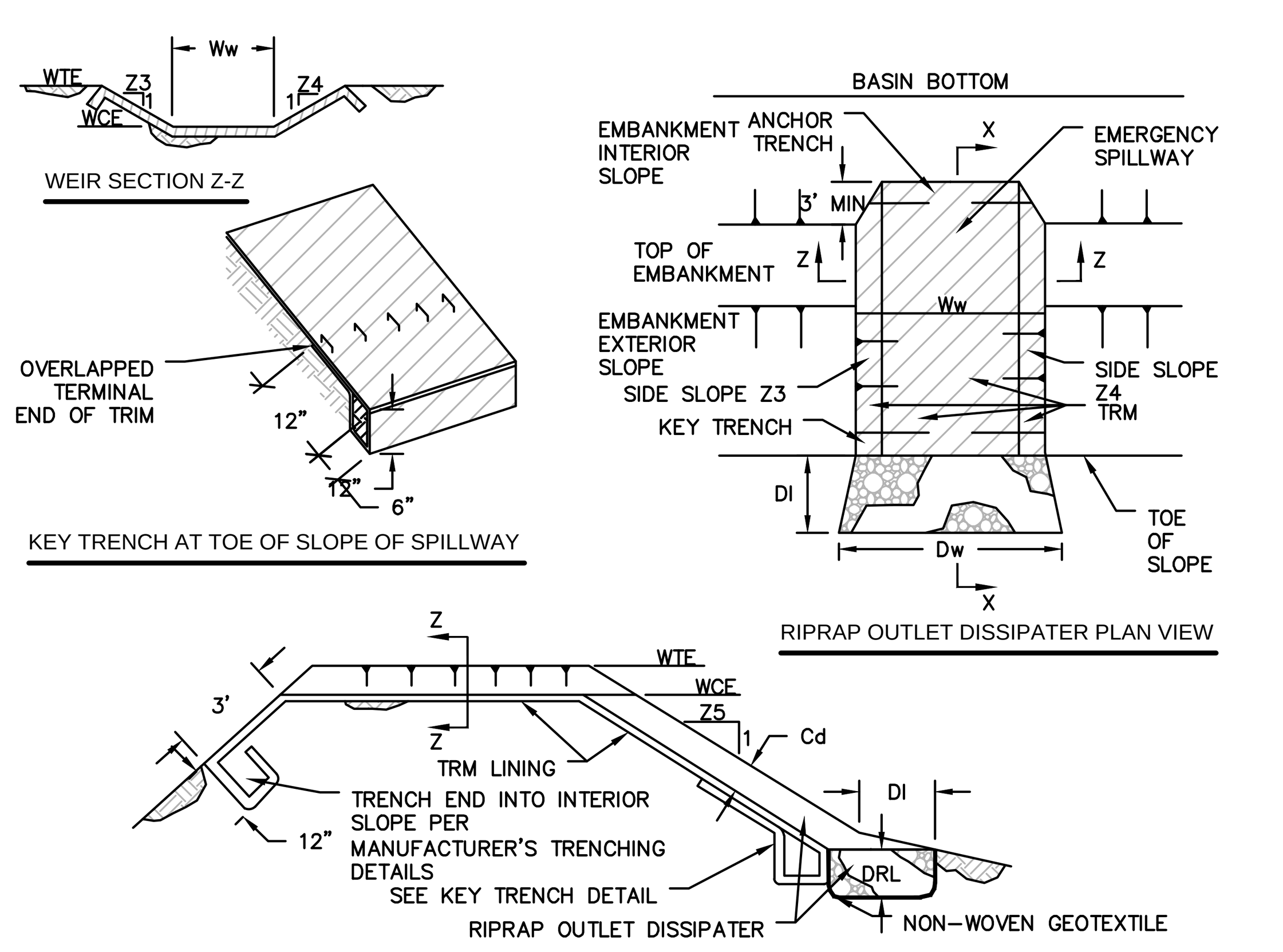
N.T.S

NOTE:
1. CLAY CORE SHALL BE COMPOSED OF CL, CH, MH OR CL-ML SOILS WITH A PERMEABILITY LESS THAN OR EQUAL TO 1.0×10^{-6} CM/S. MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% MAXIMUM DENSITY PER ASTM-D 1557; WITHIN ± 3% OPTIMUM MOISTURE CONTENT.



INFILTRATION AREA 1 CROSS SECTION (LOCATED IN DRIVE ISLAND)

N.T.S



BASIN NO.	WEIR: Z3 (FT)	WEIR: Z4 (FT)	WEIR: TOP ELEV WTE (FT)	WEIR: CREST ELEV WCE (FT)	WEIR: WIDTH Ww (FT)	LINING: TRM TYPE	LINING: STAPLE PATTERN	SWALE: Z5 (FT)	SWALE: DEPTH Cd (FT)	DISSIPATER: LENGTH Dl (FT)	DISSIPATER: WIDTH Dw (FT)	DISSIPATER: RIPRAP SIZE (R-_)	DISSIPATER: RIPRAP THICK. DRt (IN)
2	3	3	***960.33***	958.75	15	W3000	NA	N/A	1.25	SEE APRON TABLE			

HEAVY EQUIPMENT SHALL NOT CROSS OVER SPILLWAY WITHOUT PRECAUTIONS TAKEN TO PROTECT TRM LINING.

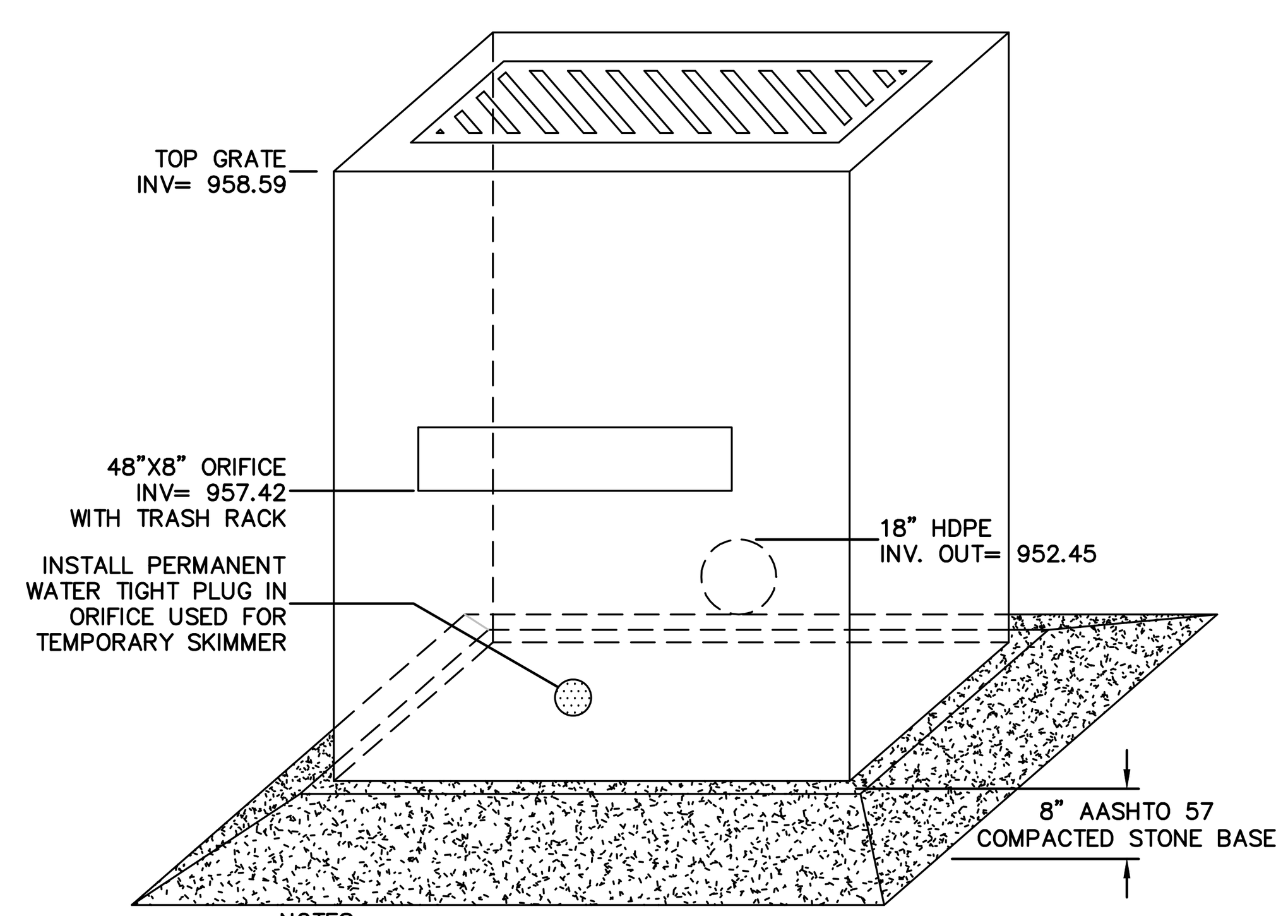
DISPLACED LINER WITHIN THE SPILLWAY AND/OR OUTLET SWALE SHALL BE REPLACED IMMEDIATELY.

RIPRAP AT TOE OF EMBANKMENT SHALL BE EXTENDED A SUFFICIENT LENGTH IN BOTH DIRECTIONS TO PREVENT SCOUR.

THE USE OF BAFFLES THAT REQUIRE SUPPORT POSTS ARE RESTRICTED FROM USE IN BASINS REQUIRING IMPERVIOUS LINERS.

BASIN EMERGENCY SPILLWAY WITH TRM LINING

N.T.S PADEP-7-13

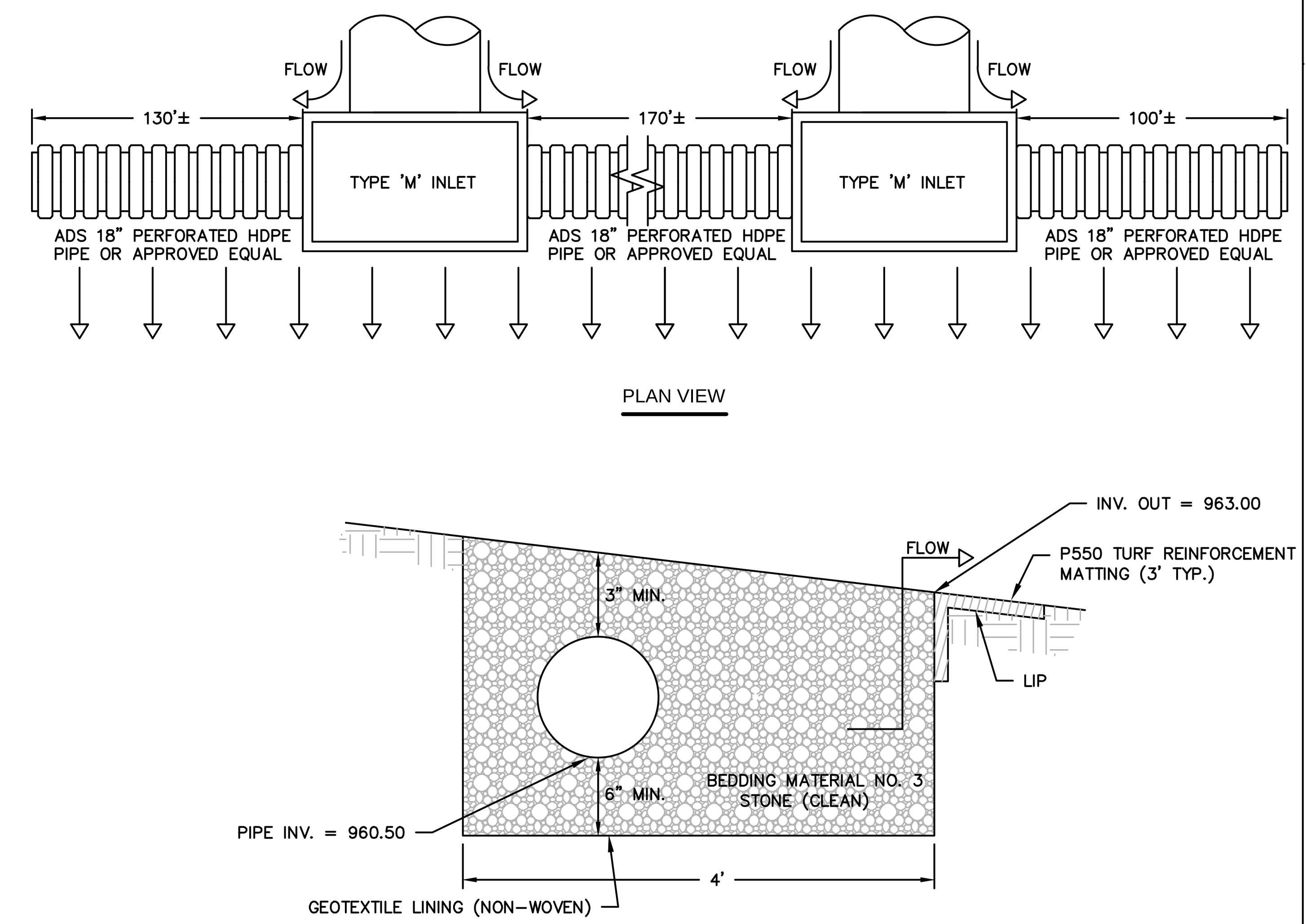


NOTES:

1. THE PROPOSED OUTLET STRUCTURE SHALL BE A TYPE "M" INLET IN ACCORDANCE WITH PENNDOT PUBLICATION 408, SECTION 605 AND STANDARDS FOR ROADWAY CONSTRUCTION, RC-34.
2. OUTLET STRUCTURE SHALL CONTAIN A TRASH RACK.
3. ***FILL INLET BOX WITH 6" OF CONCRETE BELOW INVERT.***

INFILTRATION AREA PERMANENT OUTLET STRUCTURE

N.T.S



LEVEL SPREADER WITH SUBSURFACE DISCHARGE

N.T.S

LEVEL SPREADER SUMMARY TABLE			
LEVEL SPREADER NO.	LENGTH (L) (FT)	PIPE INVERT	SPREADER INVERT OUT
BASIN 1	400	960.50	963.00

ALARIC J. BUSHER REG NO. PE 60320

BL Companies ARCHITECTURE ENGINEERING ENVIRONMENTAL LAND SURVEYING

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W01161505	DAK	AJB
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W01161505	DAK	AJB
2	05/27/2016	BL	UPDATED PER BASIN SYSTEMS DESIGN COORDINATION	W01161505	AJB	AJB
3	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W01161505	AJB	AJB
4	***April 2017***	***BL***	***PADEP TECHNICAL DEFICIENCY RESPONSE #2***	***W01161505***	***AJB***	***AJB***

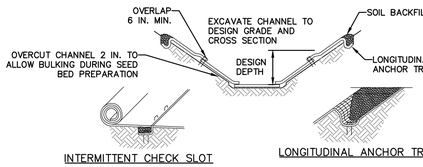
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
ATLANTIC SUNRISE PROJECT– PROPOSED 42" NATURAL GAS PIPELINE
POST CONSTRUCTION STORMWATER MANAGEMENT PLANS
FOR COMPRESSOR STATION 610
ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA
PCSM NOTES AND DETAILS

Williams

DRAWN BY: AOE	DATE: 04/03/15	ISSUED FOR BID:		SCALE:	AS NOTED
CHECKED BY: AJB	DATE: 04/03/15	ISSUED FOR CONSTRUCTION:		REVISION:	***4***
APPROVED BY: AJB	DATE: 07/17/15	DRAWING NUMBER:	(66–0610)F–1A–9	SHEET 6	OF 7
WO: 1161505					

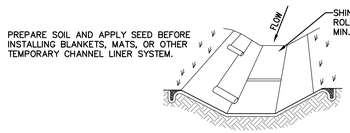
Drawn By & Date/Time: hthomas Apr 25, 2017 – 8:41am
Drawing Location & Name: G:\JOBS14\14C\14C4909\DWG\020–CPLS\FCS_PCSM14C4909(20N)_610.dwg

NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #6-1.

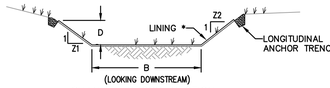


INTERMITTENT CHECK SLOT

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

NOTES:

ANCHOR TRENCHES SHALL BE INSTALLED AT BEGINNING AND END OF SWALE IN THE SAME MANNER AS LONGITUDINAL ANCHOR TRENCHES.

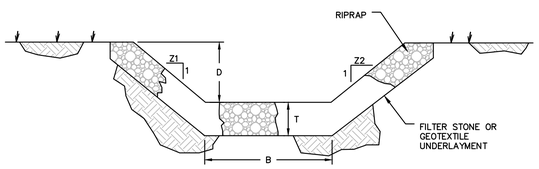
SWALE DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. SWALE SHALL BE CLEANED WHENEVER TOTAL SWALE DEPTH IS REDUCED BY 25% AT ANY LOCATION. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO SWALE WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.

NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWNG. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT SWALES TO ENSURE SUFFICIENT SWALE CAPACITY.

SWALE SUMMARY TABLE							
SWALE NO.	BOTTOM WIDTH B (FT)	DEPTH D (FT)	TOP WIDTH W (FT)	Z1 (FT)	Z2 (FT)	TEMPORARY LINING*	PERMANENT LINING
VEGETATED SWALE 1	2.0	2.0	10.0	2.0	2.0	SC250	GRASS/SC250
VEGETATED SWALE 2	2.0	2.0	14.0	3.0	3.0	SC250	GRASS/SC250
VEGETATED SWALE 3	2	2	14	3	3	W3000	GRASS/W3000
BENCH 1	0.0	1	6.0	3.0	6.0	SC250	GRASS/SC250
BENCH 2	0.0	1	6.0	3.0	6.0	SC250	GRASS/SC250

VEGETATED SWALE

N.T.S



SWALE CROSS-SECTION

SWALE	STATIONS	B	D	Z1	Z2	RIPRAP GRADATION	T	UNDERLAYMENT	UNDERLAYMENT THICKNESS
DITCH 1	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 2A	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 2B	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 3	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 4	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 5	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 6	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 7	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 8	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA
DITCH 9A	NA	2	2	2	2	R-4	18	GEOTEXTILE	NA

FILTER STONE UNDERLAYMENT FOR BED SLOPES GREATER THAN OR EQUAL TO .10 FT/FT SHALL BE USED.

SWALE DIMENSIONS ARE FOR THE COMPLETED SWALE AFTER ROCK PLACEMENT. SWALE MUST BE OVER-EXCAVATED A SUFFICIENT AMOUNT TO ALLOW FOR THE VOLUME OF ROCK PLACED WITHIN THE SWALE WHILE PROVIDING THE SPECIFIED FINISHED DIMENSIONS.

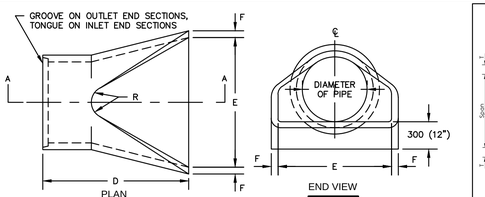
SWALE DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. SWALE SHALL BE CLEANED WHENEVER TOTAL SWALE DEPTH IS REDUCED BY 25% AT ANY LOCATION. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO SWALE WITHOUT FURTHER DAMAGE.

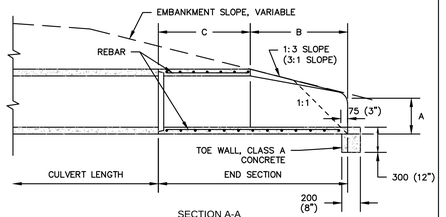
DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.

THE MINIMUM ROCK THICKNESS (T) SHALL BE 1.5 TIMES THE MAX ROCK SIZE.

RIPRAP SWALE DETAIL

N.T.S PADEP-6-3



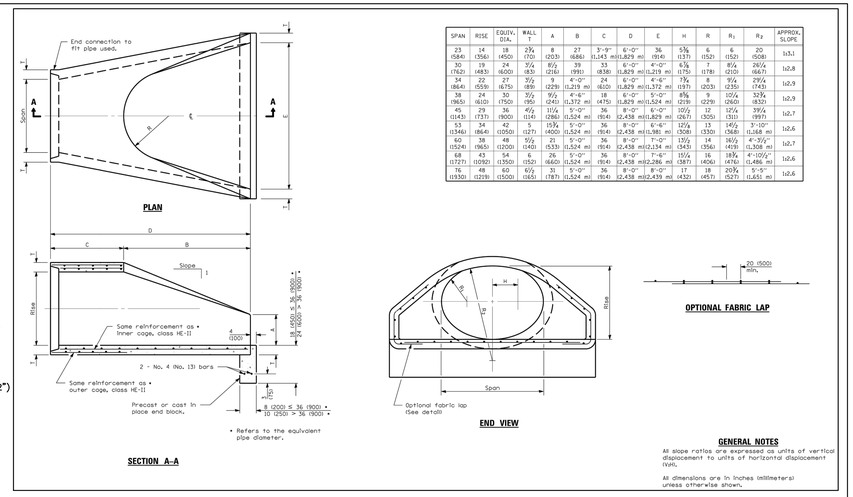


SECTION A-A

DIA	A	B	C	D	E	F
12"	4"	2'-0"	4'-1"	6'-1"	2'-0"	2"
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"
24"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"
30"	12"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"
36"	1"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42"	21"	5'-3"	2'-9"	8'-0"	6'-6"	4 1/2"
48"	24"	6'-0"	2'-0"	8'-0"	7'-0"	5"

CONCRETE FLARED END SECTION (ROUND PIPE)

N.T.S



SPAN	RISE	EQUIV. DIA.	WALL T	A	B	C	D	E	H	R	R_1	R_2	APPROX. SLOPE
23 (584)	14 (356)	18 (450)	2¾ (70)	8 (203)	27 (686)	3'-9" (1,143 m)	6'-0" (1,829 m)	36 (914)	5⅝ (131)	6 (152)	6 (152)	20 (508)	1:1
30 (762)	19 (483)	24 (600)	3¼ (83)	8½ (216)	33 (781)	5'-0" (1,524 m)	6'-0" (1,829 m)	4'-0" (1,219 m)	6⅞ (175)	7 (178)	8¼ (210)	26½ (667)	
34 (864)	22 (559)	27 (675)	3½ (89)	9 (229)	39½ (1,219 m)	6'-0" (1,829 m)	6'-0" (1,829 m)	4'-6" (1,372 m)	7¾ (197)	8 (203)	9¼ (235)	29¾ (743)	1:2.9
38 (965)	24 (610)	30 (750)	3½ (95)	9½ (241)	4'-6" (1,372 m)	6'-0" (1,829 m)	6'-0" (1,829 m)	5'-0" (1,524 m)	8⅝ (219)	9 (229)	10¼ (260)	32¾ (832)	1:2.9
45 (1143)	29 (737)	36 (900)	4½ (114)	11¼ (286)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	6'-0" (1,829 m)	10½ (267)	12 (305)	12¼ (311)	39¼ (997)	1:2.7
53 (1346)	34 (864)	42 (1050)	5 (127)	13½ (400)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	6'-6" (1,981 m)	12¼ (308)	13 (330)	14½ (368)	3'-10" (1,168 m)	1:2.6
60 (1524)	38 (965)	48 (1200)	5½ (140)	15 (533)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	7'-0" (2,134 m)	13½ (343)	14 (356)	16½ (419)	4'-3½" (1,308 m)	1:2.7
68 (1727)	43 (1092)	54 (1350)	6 (152)	17 (660)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	7'-6" (2,286 m)	15¼ (387)	16 (406)	18½ (470)	4'-10½" (1,486 m)	1:2.6
75 (1930)	48 (2219)	60 (1500)	6½ (165)	21 (787)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	8'-0" (2,439 m)	17 (432)	18 (457)	20⅝ (527)	5'-5" (1,651 m)	1:2.6

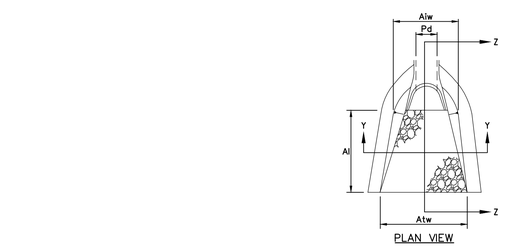
GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (v:h).

All dimensions are in inches (millimeters) unless otherwise shown.

CONCRETE FLARED END SECTION (ELIPTICAL PIPE)

N.T.S



OUTLET NO.	PIPE DIA PD (IN)	RIPRAP		APRON		
		SIZE (R-_)	THICK. Rt (IN)	LENGTH Ai (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH (Atw) (FT)
EW-1	18	4	18	8	5	13
EW-3	18	5	27	15	5	20
EW-4	14"x23"	4	18	8	5	13
EW-6	36	5	27	14	9	23

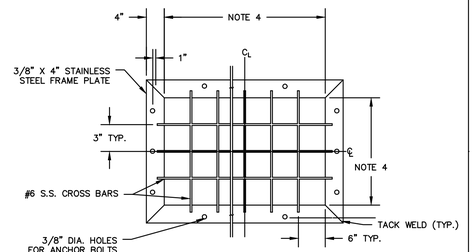
NOTES:

1. ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON THE PLANS. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.
2. ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIPRAP WITHIN THE

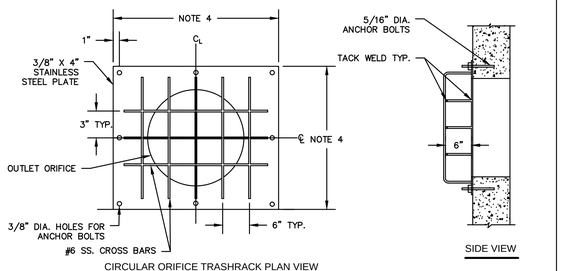
RIP-RAP APRON AT PIPE OUTLET WITH FLARED END SECTION OR ENDWALL

N.T.S

NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #9-1.



RECTANGULAR ORIFICE TRASHRACK PLAN VIEW



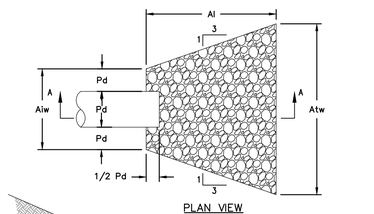
NOTES:

1. TRASH RACK MATERIAL TO BE STAINLESS STEEL.
2. SECURE THE TRASHRACK PLATE TO THE SIDE OF THE INLET BOX USING 5/16"ø x 2" STAINLESS STEEL BOLTS AND APPROPRIATE ANCHORS.
3. DURING INSTALLATION OF THE TRASH RACK PLATE, PLACE THIN LAYER OF BLACK MASTIC MATERIAL BETWEEN THE TRASHRACK PLATE AND THE INLET BOX WALL AS A GASKET TO CREATE A WATERTIGHT SEAM.
4. SEE PERMANENT OUTLET STRUCTURE DETAIL FOR ORIFICE PLATE DIMENSIONS.

PERMANENT OUTLET STRUCTURE TRASH RACK

N.T.S

NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #9-2.



SECTION A-A

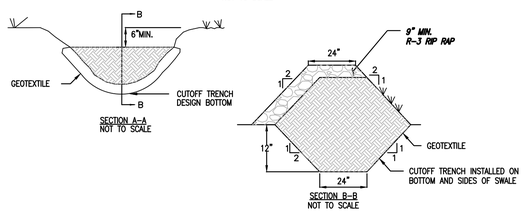
OUTLET NO.	PIPE DIA PD (IN)	RIPRAP		APRON		
		SIZE (R-_)	THICK. Rt (IN)	LENGTH Al (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH (Atw) (FT)
* ALL INFORMATION CAN BE FOUND ON ACCESS ROAD AND EROSION AND SEDIMENT CONTROL PLANS. REFER TO NOTES 4 AND 5 FOR DIMENSION LOCATIONS.						

NOTES:

1. ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON THE PLANS. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.
2. ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY.
3. EXTEND RIPRAP ON BACK SIDE OF APRON TO AT LEAST 1/2 DEPTH OF PIPE ON BOTH SIDES TO PREVENT SCOUR AROUND THE PIPE.
4. FOR APRONS ON ACCESS ROADS, THE DIMENSIONS FOR THE APRONS ARE GIVEN AS FOLLOWS: L x D x W/W
   WHERE: L = LENGTH OF APRON OR "Al" AS SHOWN IN THE PLAN VIEW ABOVE
   D = DEPTH OF RIP RAP OR "Rt" AS SHOWN IN THE SECTION ABOVE
   W/W = WIDTH OF SHORT END OF APRON/WIDTH OF LONG END OF APRON OR "Aiw"/"Atw" AS SHOWN IN THE PLAN VIEW ABOVE
5. FOR APRON ON SWALES AND FLUME CROSSINGS, THE DIMENSIONS FOR THE APRONS ARE AS FOLLOWS:
   DIMENSIONS LOCATED ON TABLE 2: TEMPORARY CLEAN WATER DIVERSION SUMMARY:
   a. RIP RAP SIZE (R-_) UNDER WATERBODY
   b. APRON INITIAL WIDTH AND TERMINAL WIDTH IS TWO FEET FOR FILTER SOCK DIVERSIONS AND SWALES.
   c. RIP RAP THICKNESS (Rt)
   d. APRON LENGTH (Al)

RIP-RAP APRON AT PIPE OUTLET WITHOUT FLARED END SECTION

N.T.S

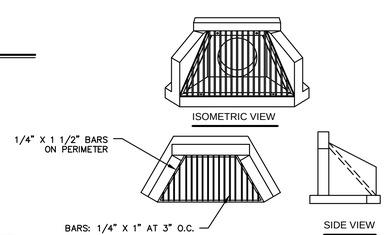


NOTES:

1. CHECK DAMS ARE APPLICABLE FOR SMALL DITCHES AND SWALES AND ARE NOT TO BE USED IN LIVE FLOWING STREAMS.
2. CHECK DAMS SHALL BE INSTALLED SUCH THAT COMPLETE COVERAGE OF THE ENTIRE WIDTH OF THE DITCH OR SWALE IS ACHIEVED.
3. SEDIMENT SHALL BE REMOVED WHEN IT ACCUMULATES TO A DEPTH OF ONE-HALF THE ORIGINAL DAM HEIGHT.
4. SET SPACING OF CHECK DAMS TO ASSURE THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
5. INSTALL A CUTOFF TRENCH A MINIMUM OF 12 INCHES INTO THE SWALE BOTTOM AND SIDES TO PREVENT CUTTING AROUND THE DAM.
6. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

EARTHEN CHECK DAM

N.T.S



NOTES:

1. TRASH RACK MATERIAL TO BE HOT DIPPED GALVANIZED STEEL.
2. ATTACH TRASH RACK TO HEADWALL WITH 3/8" DIA. S.S. ANCHOR BOLTS.
3. HINGED VERSION AVAILABLE.

TYPE DW ENDWALL WITH TRASHRACK

N.T.S

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP		APRON		
		SIZE (R-_)	THICK. Rt (IN)	LENGTH Al (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH (Atw) (FT)
VEGETATED SWALE 1	NA	3	9	8	13	13
VEGETATED SWALE 2	NA	3	9	6	9	9
VEGETATED SWALE 3	NA	4	18	12	9	18
BENCH 1	NA	3	9	6	9	9
BERM DIVERSION	12	3	9	6	3	9
CULVERT 2	30	5	27	16	8	24
CULVERT 5	30	5	27	16	8	24

ALARIC J. BUSHER REG NO. PE 60320

BL Companies — ARCHITECTURE ENGINEERING ENVIRONMENTAL LAND SURVEYING

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W01161505	DAK	AJB
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W01161505	DAK	AJB
2	05/27/2016	BL	UPDATED PER BASIN SYSTEMS DESIGN COORDINATION	W01161505	AJB	AJB
3	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W01161505	AJB	AJB
4	April 2017	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #2	W01161505	AJB	AJB

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

ATLANTIC SUNRISE PROJECT– PROPOSED 42" NATURAL GAS PIPELINE

POST CONSTRUCTION STORMWATER MANAGEMENT PLANS

FOR COMPRESSOR STATION 610

ORANGE TOWNSHIP, COLUMBIA COUNTY, PENNSYLVANIA

PCSM NOTES AND DETAILS

Williams

DRAWN BY:	AOE	DATE:	04/03/15	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	AJB	DATE:	04/03/15	ISSUED FOR CONSTRUCTION:	REVISION: 4
APPROVED BY:	AJB	DATE:	07/17/15	DRAWING NUMBER: (66-0610)F-1A-9	SHEET 7 OF 7
WO:	1161505				

Drawn By & Date/Time: hthomas Apr 25, 2017 - 8:41am
Drawing Location & Name: G:\JOBS\14\14C\14C4909\DWG\020-CPLS\FCS_PCSM14C4909(20N)_610.dwg