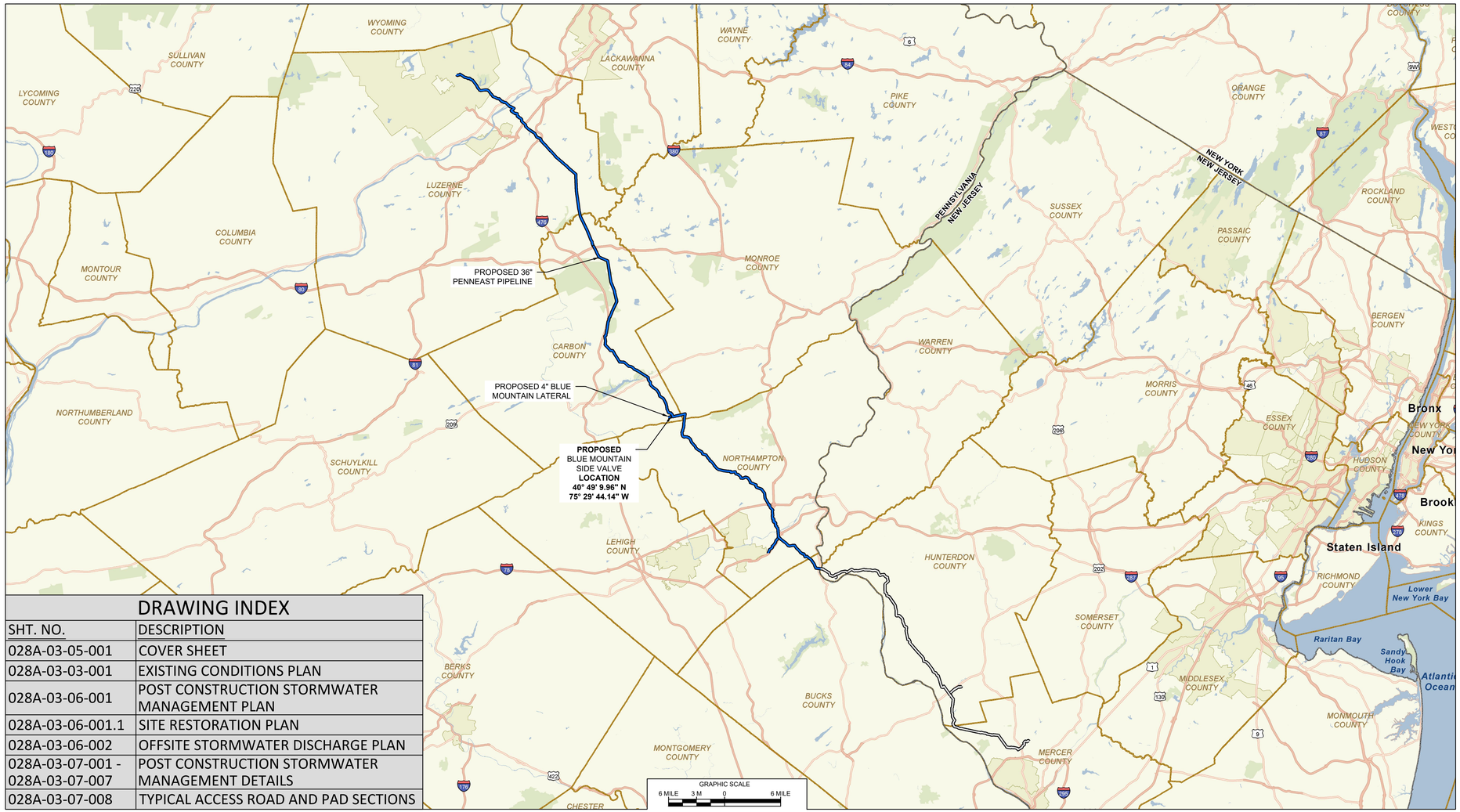
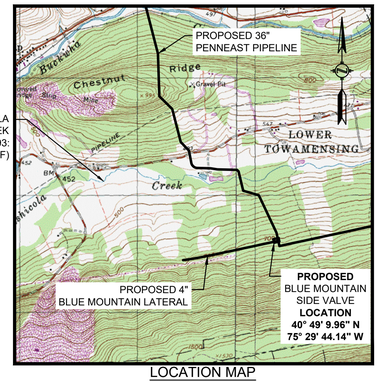
PENNEAST PIPELINE COMPANY, LLC

BLUE MOUNTAIN SIDE VALVE
LOWER TOWAMENSING TOWNSHIP
CARBON COUNTY, PENNSYLVANIA
PADEP - POST CONSTRUCTION STORMWATER MANAGEMENT PLAN



DRAWING INDEX	
SHT. NO.	DESCRIPTION
028A-03-05-001	COVER SHEET
028A-03-03-001	EXISTING CONDITIONS PLAN
028A-03-06-001	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
028A-03-06-001.1	SITE RESTORATION PLAN
028A-03-06-002	OFFSITE STORMWATER DISCHARGE PLAN
028A-03-07-001 - 028A-03-07-007	POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
028A-03-07-008	TYPICAL ACCESS ROAD AND PAD SECTIONS



LOCATION MAP

SCALE: 1" =2000'
USGS QUAD: PALMERTON, PA
KUNKLETOWN, PA

GENERAL NOTES:

1. THIS PLAN SET CONTAINS ALL INFORMATION FOR THE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSM PLAN) REQUIRED FOR THE PERMIT AS SPECIFIED ABOVE. THIS IS A PERMIT DOCUMENT ONLY. ADDITIONAL PLANS AND DOCUMENTATION ARE REQUIRED FOR CONSTRUCTION OF THE PROPOSED DEVELOPMENT.
2. FULL SIZE SHEETS OF THIS PLAN SET MAY BE PRINTED OUT ON 24"x36" SHEETS. REPRODUCTION AT DIFFERENT SIZES SHALL RESULT IN DIFFERENT SCALES.

REFERENCE (ALL SHEETS):

1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2018. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM PASDA.
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4. WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2018.
5. HORIZONTAL DATUM IS UTM83-18F. VERTICAL DATUM IS NAVD1988.

PENNSYLVANIA ONE-CALL SERIAL NUMBERS

20181421158-000

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720
10/25/2019

Know what's below. Call before you dig.

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

MOTT MACDONALD
111 WOOD AVENUE
SOUTH ISELIN,NJ 08830
UNITED STATES
973-379-3400
INFO@MOTTMAC.COM

G:\PennEast\353754_PennEast_Pipeline_EPCM\Data\Prod\Facilities\DRAFTING\013 - C - Plan & Profiles\Blue_Mountain\Valve_Site\PCSM\028A-03-05-001.dwg

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	RJD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
COVER SHEET
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-05-001	REV. NO.	B

CARBON COUNTY, PENNSYLVANIA
USGS QUAD: PALMERTON, PENNSYLVANIA
KUNKLETOWN, PENNSYLVANIA

N

UTM 18, GRID NORTH

PE-CA-187.012

PE-CA-187.013

PROPOSED PERMANENT FACILITY EASEMENT

PROPOSED 4" BLUE MOUNTAIN LATERAL

1+50

2+00

2+50

2+74.50

PROPOSED 36" PENNEAST PIPELINE

UTILITY EASEMENT (PPL ELECTRIC UTILITIES CORP.)

EXISTING PPL UTILITY ROAD

McD

ESCGP

695'

700'

705'

710'

715'

720'

SITE PLAN

0 10' 20'

SCALE: 1" = 10'

LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED

- PROPOSED PIPELINE
- PROPOSED PIPELINE PERMANENT EASEMENT
- FACILITY PERMANENT EASEMENT
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION & SEDIMENT CONTROL PLAN)
- ESCGP BOUNDARY

EXISTING

- PROPERTY LINE
- 1260' EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- McD SOIL TYPE ABBREVIATION
- PE-CA-187.013 LINE LIST NUMBER
- EXISTING UTILITY EASEMENT
- EXISTING ROAD CENTERLINE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720

10/25/2019

ENVIRONMENTAL NOTES:

1. AS PER §102.4(B)(5)(III), THE LAND USE CHARACTERISTICS ARE CLASSIFIED BY PRIMARY VEGETATION COVER TYPE AND/OR PREDOMINANT LAND USE. THE FACILITY SITE'S CURRENT LAND USE IS PREDOMINANTLY FORESTED/WOODLAND.
2. AS PER §102.4(B)(5)(V), THE SITE DRAINS TO AQUASHICOLA CREEK, WHICH HAS A CHAPTER 93 DESIGNATED USE OF HQ-CWF (HIGH QUALITY COLD WATER FISH).

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

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PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
EXISTING CONDITIONS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	KEK	SCALE	AS SHOWN
APPROVED BY	MJD	APPROVED BY	
DWG. NO.	028A-03-03-001	REV. NO.	B

CARBON COUNTY, PENNSYLVANIA
USGS QUAD: PALMERTON, PENNSYLVANIA
KUNKLETOWN, PENNSYLVANIA

NN
12°34'41"
UTM 18 GRID NORTH
PLANT NORTH

PE-CA-187.012
PE-CA-187.013

LS-1
32 LF LEVEL SPREADER
TOP OF CURB EL. 701.25

R-4 RIPRAP

HW-1
INV = 701.34

P-1 15"Ø HDPE
L=8.0' @ 1.00%

SAFETY FENCING
(TO PROTECT INFILTRATION
AREA DURING CONSTRUCTION)

IN-1 (DOUBLE TYPE M INLET)
RIM 706.67
INV IN = 701.59
INV OUT = 701.57

OS-1
OUTLET CONTROL STRUCTURE
RIM = 706.50
6" W RECTANGULAR WEIR @ EL. 703.25
48" W RECTANGULAR WEIR @ EL. 704.50
INV IN 701.50
INV OUT 701.00

175'W x 57'L PROPOSED SUBSURFACE
INFILTRATION BASIN
3 - 50 LF 36" DIA. PERFORATED HDPE
PIPES
PIPE INV. 701.50
BOTTOM OF STONE 701.00

SLOPE
3H : 1V

BMST-TP-2
(SEE DETAILS)

BMST-TP-1
(SEE DETAILS)

36" HEADER WITH
END CAP (TYP)

GRADE 707.33

PIPE INV. 701.50

ACCESS RISER
(TYP)

VEGETATED SWALE-2

CLEANOUT (TYP)
TOP OF CLEANOUT TO BE
FLUSH WITH FINISHED
GRADE

GRADE 707.53

GRADE 706.82

BASIN SLOPE 0.25%

CHECK DAM

PROPOSED PERMANENT
FACILITY EASEMENT

VEGETATED SWALE-1

LAT N40° 49' 10.15"
LONG W75° 29' 43.92"
ELEV. 709.35'

PROPOSED 4" BLUE MOUNTAIN LATERAL

PROPOSED 36" PENNEAST PIPELINE

41'

20'

31'

18'

SLOPE = 10%

PROPOSED
16' WIDE GATE

PROPOSED 4' WIDE
PERSONNEL GATE

LAT N40° 49' 10.06"
LONG W75° 29' 44.44"
ELEV. 709.35'

LAT N40° 49' 09.86"
LONG W75° 29' 43.83"
ELEV. 709.66'

PROPOSED 6' CHAIN
LINK FENCE

PROPOSED CONCRETE BLOCK (TYP.)
SEE DETAILS

LAT N40° 49' 09.77"
LONG W75° 29' 44.35"
ELEV. 709.66'

UTILITY EASEMENT
(PPL ELECTRIC UTILITIES CORP.)

EXISTING PPL UTILITY ROAD

AR-050AN

15' DRIVEWAY
LAT: N40° 49' 09.24"
LONG: W75° 29' 43.10"

SLOPE
2H : 1V

-7.4%

-9.7%

N 0+00

1+00

1+08

1+50

2+00

2+27+00

E 0+00

SITE PLAN
0 10' 20'
SCALE: 1" = 10'

LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED
- PROPOSED PIPELINE
- PROPOSED PIPELINE PERMANENT EASEMENT
- FACILITY PERMANENT EASEMENT
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION & SEDIMENT CONTROL PLAN)
- ESCGP — ESCGP BOUNDARY
- PAD/ROAD AREA
- PAD INFILTRATION AREA (COMPACTION TO BE MINIMIZED)
- PROPOSED SWALE/ BERM
- PROPOSED FENCE
- SAFETY FENCING
- PROPOSED CONCRETE BLOCK
- 710' — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

EXISTING
- PROPERTY LINE
- 700' — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- McD — SOIL TYPE ABBREVIATION
- PE-CA-187.013 — LINE LIST NUMBER
- EXISTING UTILITY EASEMENT
- EXISTING ROAD CENTERLINE
- TEST PITS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
W. MICHAEL CLARK
PE082720
10/25/2019

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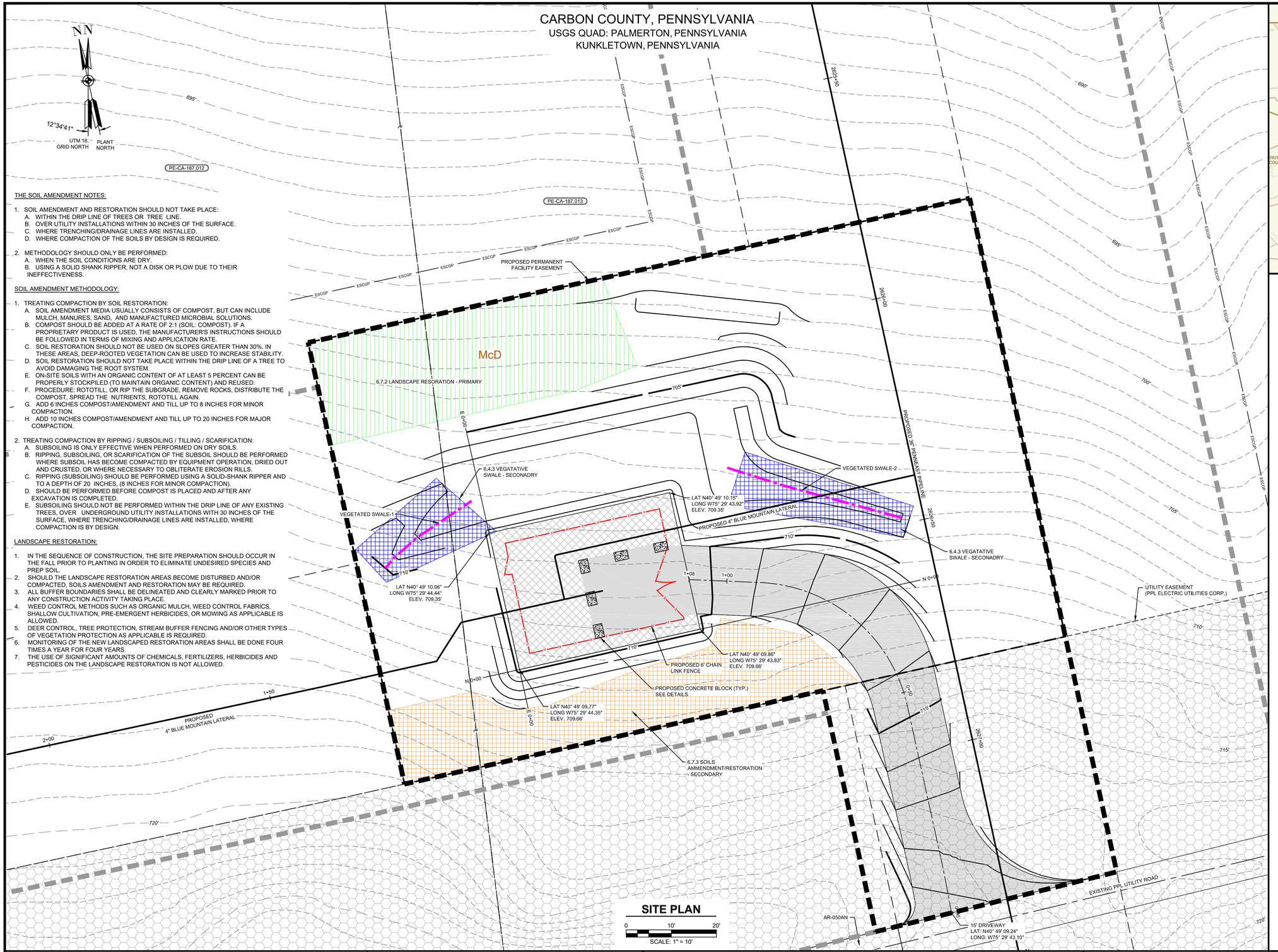
PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-06-001	REV. NO.	B

CARBON COUNTY, PENNSYLVANIA
USGS QUAD: PALMERTON, PENNSYLVANIA
KUNKLETOWN, PENNSYLVANIA



SITE PLAN
0 10' 20'
SCALE: 1" = 10'

THE SOIL AMENDMENT NOTES:

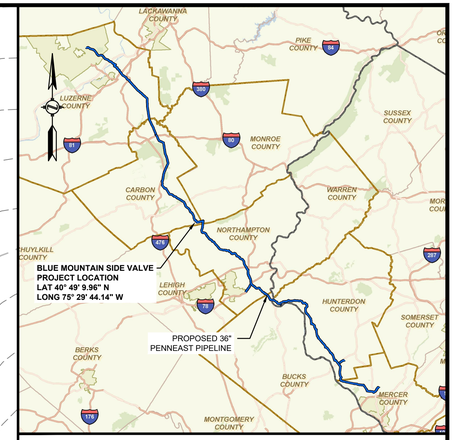
1. SOIL AMENDMENT AND RESTORATION SHOULD NOT TAKE PLACE:
   A. WITHIN THE DRIP LINE OF TREES OR TREE LINE.
   B. OVER UTILITY INSTALLATIONS WITHIN 30 INCHES OF THE SURFACE.
   C. WHERE TRENCHING/DRAINAGE LINES ARE INSTALLED.
   D. WHERE COMPACTION OF THE SOILS BY DESIGN IS REQUIRED.
2. METHODOLOGY SHOULD ONLY BE PERFORMED:
   A. WHEN THE SOIL CONDITIONS ARE DRY.
   B. USING A SOLID SHANK RIPPER, NOT A DISK OR PLOW DUE TO THEIR INEFFECTIVENESS.

SOIL AMENDMENT METHODOLOGY:

1. TREATING COMPACTION BY SOIL RESTORATION:
   A. SOIL AMENDMENT MEDIA USUALLY CONSISTS OF COMPOST, BUT CAN INCLUDE MULCH, MANURES, SAND, AND MANUFACTURED MICROBIAL SOLUTIONS.
   B. COMPOST SHOULD BE ADDED AT A RATE OF 2:1 (SOIL: COMPOST). IF A PROPRIETARY PRODUCT IS USED, THE MANUFACTURER'S INSTRUCTIONS SHOULD BE FOLLOWED IN TERMS OF MIXING AND APPLICATION RATE.
   C. SOIL RESTORATION SHOULD NOT BE USED ON SLOPES GREATER THAN 30%. IN THESE AREAS, DEEP-ROOTED VEGETATION CAN BE USED TO INCREASE STABILITY.
   D. SOIL RESTORATION SHOULD NOT TAKE PLACE WITHIN THE DRIP LINE OF A TREE TO AVOID DAMAGING THE ROOT SYSTEM.
   E. ON-SITE SOILS WITH AN ORGANIC CONTENT OF AT LEAST 5 PERCENT CAN BE PROPERLY STOCKPILED (TO MAINTAIN ORGANIC CONTENT) AND REUSED.
   F. PROCEDURE: ROTOTILL, OR RIP THE SUBGRADE, REMOVE ROCKS, DISTRIBUTE THE COMPOST, SPREAD THE NUTRIENTS, ROTOTILL AGAIN.
   G. ADD 6 INCHES COMPOST/AMENDMENT AND TILL UP TO 8 INCHES FOR MINOR COMPACTION.
   H. ADD 10 INCHES COMPOST/AMENDMENT AND TILL UP TO 20 INCHES FOR MAJOR COMPACTION.
2. TREATING COMPACTION BY RIPPING / SUBSOILING / TILLING / SCARIFICATION:
   A. SUBSOILING IS ONLY EFFECTIVE WHEN PERFORMED ON DRY SOILS.
   B. RIPPING, SUBSOILING, OR SCARIFICATION OF THE SUBSOIL SHOULD BE PERFORMED WHERE SUBSOIL HAS BECOME COMPACTED BY EQUIPMENT OPERATION, DRIED OUT AND CRUSTED, OR WHERE NECESSARY TO OBLITERATE EROSION RILLS.
   C. RIPPING (SUBSOILING) SHOULD BE PERFORMED USING A SOLID-SHANK RIPPER AND TO A DEPTH OF 20 INCHES, (8 INCHES FOR MINOR COMPACTION).
   D. SHOULD BE PERFORMED BEFORE COMPOST IS PLACED AND AFTER ANY EXCAVATION IS COMPLETED.
   E. SUBSOILING SHOULD NOT BE PERFORMED WITHIN THE DRIP LINE OF ANY EXISTING TREES, OVER UNDERGROUND UTILITY INSTALLATIONS WITH 30 INCHES OF THE SURFACE, WHERE TRENCHING/DRAINAGE LINES ARE INSTALLED, WHERE COMPACTION IS BY DESIGN.

LANDSCAPE RESTORATION:

1. IN THE SEQUENCE OF CONSTRUCTION, THE SITE PREPARATION SHOULD OCCUR IN THE FALL PRIOR TO PLANTING IN ORDER TO ELIMINATE UNDESIRED SPECIES AND PREP SOIL.
2. SHOULD THE LANDSCAPE RESTORATION AREAS BECOME DISTURBED AND/OR COMPACTED, SOILS AMENDMENT AND RESTORATION MAY BE REQUIRED.
3. ALL BUFFER BOUNDARIES SHALL BE DELINEATED AND CLEARLY MARKED PRIOR TO ANY CONSTRUCTION ACTIVITY TAKING PLACE.
4. WEED CONTROL METHODS SUCH AS ORGANIC MULCH, WEED CONTROL FABRICS, SHALLOW CULTIVATION, PRE-EMERGENT HERBICIDES, OR MOWING AS APPLICABLE IS ALLOWED.
5. DEER CONTROL, TREE PROTECTION, STREAM BUFFER FENCING AND/OR OTHER TYPES OF VEGETATION PROTECTION AS APPLICABLE IS REQUIRED.
6. MONITORING OF THE NEW LANDSCAPED RESTORATION AREAS SHALL BE DONE FOUR TIMES A YEAR FOR FOUR YEARS.
7. THE USE OF SIGNIFICANT AMOUNTS OF CHEMICALS, FERTILIZERS, HERBICIDES AND PESTICIDES ON THE LANDSCAPE RESTORATION IS NOT ALLOWED.



LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED
- PROPOSED PIPELINE
- PROPOSED PIPELINE PERMANENT EASEMENT
- FACILITY PERMANENT EASEMENT
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION & SEDIMENT CONTROL PLAN)
- ESCGP — ESCGP BOUNDARY
- PAD/ROAD AREA
- PAD INFILTRATION AREA (COMPACTION TO BE MINIMIZED)
- PROPOSED SWALE/ BERM
- PROPOSED FENCE
- PROPOSED CONCRETE BLOCK
- 710' — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 5.6.1 MINIMIZE TOTAL DISTURBED AREA - PRIMARY
- 6.7.2 LANDSCAPE RESTORATION - PRIMARY OR SECONDARY
- 5.6.2 MINIMIZE SOIL COMPACTION - SECONDARY
- 6.7.3 SOILS AMENDMENT / RESTORATION - SECONDARY
- 6.4.8 VEGETATED SWALE - SECONDARY

EXISTING
- PROPERTY LINE
- 700' — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- McD — SOIL TYPE ABBREVIATION
- PE-CA-187.013 — LINE LIST NUMBER
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- EXISTING ROAD CENTERLINE
- TEST PITS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720
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PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
SITE RESTORATION PLAN
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-06-001.1	REV. NO.	B

CARBON COUNTY, PENNSYLVANIA

USGS QUAD: PALMERTON, PENNSYLVANIA
KUNKLETOWN, PENNSYLVANIA

PLANT NORTH
UTM 18, GRID NORTH
12°34'41"

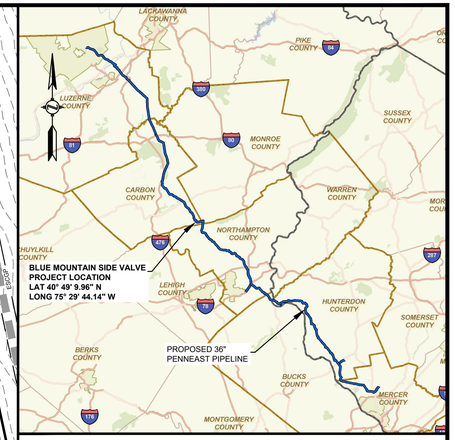
PE-CA-A254.00
PE-CA-187.013
PE-CA-187.011
PE-CA-187.012
PE-CA-187.010

WETLAND NWI-414
STREAM PA-NHD-079
PROPOSED FLOW PATH
LEVEL SPREADER
PROPOSED SITE

2635+00
2630+00
2625+00
2620+00
2615+00
2610+00

SITE PLAN

0 80' 160'
SCALE: 1" = 80'



LOCATION MAP
SCALE: 1" = 15 MILES

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- PROPOSED FENCE
- SAFETY FENCING
- PROPOSED FLOW PATH

EXISTING

- PROPERTY LINE
- 700' EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PE-CA-187.013 LINE LIST NUMBER
- EXISTING ROAD CENTERLINE
- WETLAND (PUBLIC)
- WETLAND (DELINEATED)
- WATERBODY (DELINEATED)
- STREAM (PUBLIC)

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
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PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
OFFSITE STORMWATER DISCHARGE PLAN
CARBON COUNTY, PENNSYLVANIA

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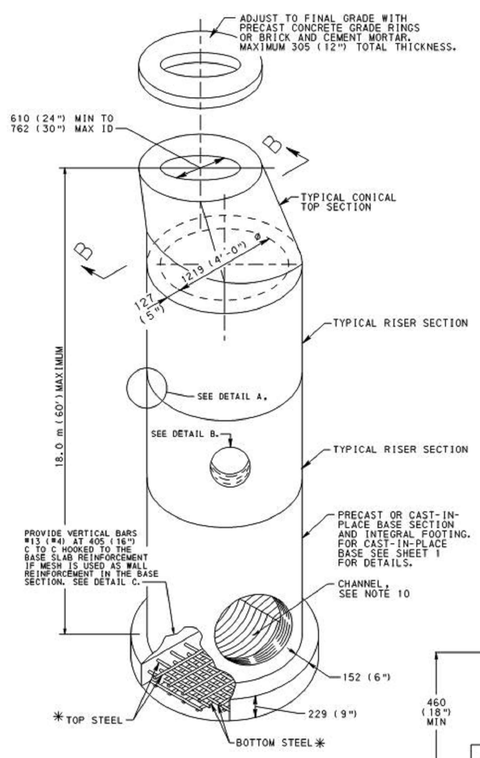
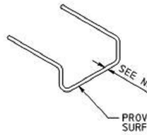
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-06-002	REV. NO.	B



PRECAST MANHOLE

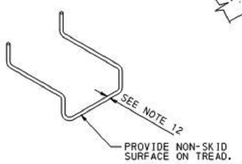
FOR PIPES 750 (30") INSIDE DIAMETER AND LESS

*SEE TABLE B FOR BASE SLAB STEEL REQUIREMENTS. PROVIDE WALL REINFORCEMENT DETAILS AT BASE SLAB TYPICAL OF CAST-IN-PLACE MANHOLE. SEE SHEET 1.

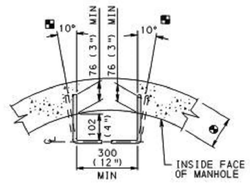


STEP WITHOUT HOOKS

SEE NOTE 13



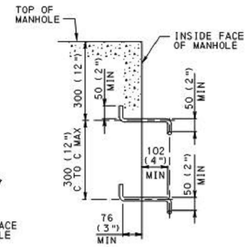
STEP WITH HOOKS



PLAN VIEW

■ ALTERNATE ACCEPTABLE CONFIGURATION

● 254 (10") FOR CAST-IN-PLACE
127 (5") FOR PRECAST

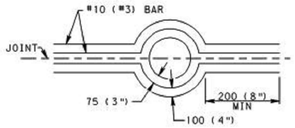


SIDE VIEW

TYPICAL STEP CONFIGURATION

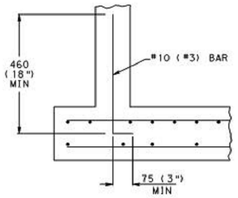
MANHOLE STEPS

SEE NOTE 11



ALTERNATE DETAIL AT OPENINGS

SEE NOTE 14



DETAIL C

MANHOLE WALL THICKNESS TABLE	
ID (FT)	WALL THK (IN)
4 FT	5"
5 FT	6"
6 FT	7"
7 FT	8"
8 FT	9"
9 FT	10"
10 FT	11"

NOTES

1. PRECAST MANHOLES MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 714, MAY BE SUBSTITUTED FOR THE STANDARD CAST-IN-PLACE MANHOLE. FOR DEVIATION OR MODIFICATION OF THE STANDARDS, SUBMIT SHOP DRAWINGS FOR APPROVAL.
2. FOR CONSTRUCTION REQUIREMENTS SEE NOTE 1, SHEET 1. FOR DESIGN REQUIREMENTS SEE NOTE 1, SHEET 5.
3. FOR PERMISSIBLE LOCATION OF PIPES SEE PLAN VIEW AND NOTE 3, SHEET 1.
4. FOR RISERS OR BASE SECTIONS WITH OPENINGS, PROVIDE A MINIMUM HEIGHT OF SECTION SO AS TO PROVIDE AN UNCUT WALL EQUAL TO 20% OF THE OPENING, BUT NO LESS THAN 203 (8") , BETWEEN THE OPENING AND THE CLOSEST JOINT BETWEEN RISERS - SEE DETAIL B.
5. FOR PRECAST RISER OR BASE SECTIONS WITH ONE OPENING LOCATED AT DEPTHS TO 18.0 m (60') , PROVIDE CIRCUMFERENTIAL REINFORCEMENT IN ACCORDANCE WITH SECTION B-B. FOR SECTIONS WITH TWO OR MORE OPENINGS, LOCATED AT DEPTH OF 3.0 m (10') AND LESS, PROVIDE CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 340 mm²/VERTICAL m (0.16 in²/VERTICAL FT) FOR THE HEIGHT OF RISER OR BASE SECTION.
6. FOR RISERS OR BASE SECTIONS WITH TWO OR MORE OPENINGS, LOCATED AT A DEPTH GREATER THAN 3.0 m (10') , BUT LESS THAN OR EQUAL TO 7.6 m (25') , PROVIDE CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 930 mm²/VERTICAL m (0.44 in²/VERTICAL FT) FOR THE HEIGHT OF THE RISER OR BASE SECTION.
7. FOR RISERS OR BASE SECTIONS WITH TWO OR MORE OPENINGS, LOCATED AT DEPTHS GREATER THAN 7.6 m (25') , USE A 254 (10") THICK WALL RISER OR BASE SECTION WITH CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 470 mm²/VERTICAL m (0.22 in²/VERTICAL FT) EACH FACE.
8. MARK RISERS OR BASE SECTIONS WITH HOLES CLEARLY WITH MAXIMUM ALLOWABLE DEPTH.
9. PROVIDE ADDITIONAL REINFORCEMENT BARS AROUND OPENINGS AS SHOWN ON REINFORCEMENT DETAILS AT OPENINGS SHEET 1.
10. FOR CHANNEL DETAILS IN PRECAST MANHOLE SEE CAST-IN-PLACE MANHOLE SHEET 1.
11. PROVIDE MANHOLE STEPS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 605.2(c). ALTERNATE CONFIGURATIONS AND DIMENSIONS, AS APPROVED BY THE ENGINEER, MAY BE USED.
12. PROVIDE MINIMUM 25 (1") SECTION DIMENSION FOR METAL STEPS. PROVIDE MINIMUM 19 (¾") SECTION DIMENSION FOR NON-DETERIORATING MATERIAL STEPS.
13. MECHANICAL ANCHOR REQUIRED FOR INSTALLATION OF STEPS WITHOUT HOOKS.
14. THE ALTERNATE OPENING REINFORCEMENT DETAIL IS NOT DESIRABLE BY DESIGN. USE IT TO MEET EXISTING PIPE ELEVATIONS.

SHEET 1 NOTES:

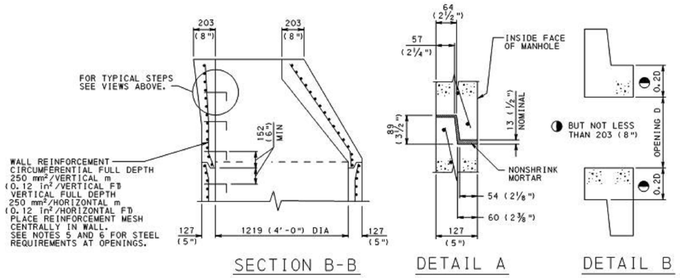
1. CONSTRUCTION REQUIREMENTS:
   - A. CONSTRUCT IN ACCORDANCE WITH PUBLICATION 408, SECTIONS 605, 606 AND 714; AND ASTM C-478M-90, STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, AS MODIFIED HEREIN.
   - B. MINIMUM CONCRETE CLASS:
     CAST-IN-PLACE CLASS A
     PRECAST CLASS AA
   - C. PROVIDE STEEL REINFORCEMENT IN ACCORDANCE WITH ASTM A185, STEEL WELDED WIRE FABRIC ASTM A663/A663M & A675/A675M, PLAIN BILLET STEEL BARS OR ASTM A615/A615M, DEFORMED BILLET STEEL BARS. PROVIDE MINIMUM YIELD STRENGTH OF 400 MPa (60,000 PSI).
   - D. CLEAR COVER FOR STEEL:

WALLS:	CAST-IN-PLACE	50 (2")	
	PRECAST	40 (1½")	
FOOTINGS:	CAST-IN-PLACE	60 (2½")	TOP BARS
		80 (3")	BOTTOM BARS
		50 (2")	SIDE COVER
	PRECAST	50 (2")	TOP BARS
		40 (1½")	BOTTOM BARS
		40 (1½")	SIDE COVER
SLABS:	CAST-IN-PLACE	50 (2")	TOP & BOTTOM BARS

2. FOR PIPES WITH INSIDE DIAMETERS GREATER THAN 750 (30") SEE MODIFIED CAST-IN-PLACE MANHOLES, SHEET 2.
3. PROVIDE 300 (12") MINIMUM HORIZONTAL CLEARANCE BETWEEN OPENINGS LOCATED AT THE SAME DEPTH. LOCATE PIPES NOT AT THE SAME DEPTH VERTICALLY AT LEAST ONE HALF THE MAXIMUM OPENING DIAMETER APART.
4. FORM A CONCRETE CHANNEL AT THE BOTTOM OF THE MANHOLE CONFORMING TO THE SHAPE OF THE LOWER HALF OF THE INCOMING AND/OR OUTGOING PIPES. PROVIDE A FULL DEPTH U-SHAPED CHANNEL WHEN NECESSARY TO REDUCE ENERGY LOSSES.
5. USE 127 (5") THICK WALLS WITH ONE (1) ROW OF REINFORCING, OR USE 254 (10") THICK OR GREATER WALLS WITH TWO (2) ROWS OF REINFORCING.
6. CONSTRUCTION JOINTS AND KEYS MAY BE CONSTRUCTED UPWARDS OR DOWNWARDS. CLEAN JOINTS AND KEYS THOROUGHLY BEFORE PLACING NEXT CONCRETE SEGMENT.
7. A SAFE BEARING CAPACITY OF 0.15 MPa (1.5 TONS/SF) UNDER THE ENTIRE BASE SLAB IS ASSUMED TO DETERMINE THE BASE SIZE. WHEN THE SUBSOIL IS EXTREMELY POOR, PROCEED WITH CONSTRUCTION ONLY AFTER THE ENGINEER SPECIFIES AN ADEQUATE BASE DESIGN.
8. FOR FOOTING TOP REINFORCEMENT, BOTH DIRECTIONS, USE #19 (#6) BARS AT 300 (12") FOR DEPTHS TO 18.0 m (60') OR 635 mm²/m (0.30 in²/FT) WWF FOR DEPTHS TO 9.0 m (30') AND 680 mm²/m (0.32 in²/FT) WWF FOR DEPTHS GREATER THAN 9.0 m (30'), 152 (6") MAXIMUM SPACING FOR WWF.
9. FOR FOOTING BOTTOM REINFORCEMENT, BOTH DIRECTIONS, USE #13 (#4) BARS AT 480 (18") FOR DEPTHS TO 18.0 m (60') OR 320 mm²/m (0.15 in² /FT) WWF FOR DEPTHS TO 9.0 m (30') AND 340 mm²/m (0.16 in² /FT) WWF FOR DEPTHS GREATER THAN 9.0 m (30'), 152 (6") MAXIMUM SPACING FOR WWF.
10. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN ( ) PARENTHESES.

SHEET 5 NOTES:

1. PROVIDE MANHOLE FRAMES AND COVERS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 605.2(b). DESIGN MANHOLE FRAME, COVER AND GRADE ADJUSTMENT RINGS FOR PHL 93 (HS25) LIVE LOAD. IF MANHOLES ARE NOT IN OR ADJACENT TO ROADWAY, DESIGN FOR ALL POSSIBLE LIVE LOADS AS APPROVED BY THE DEPARTMENT.
2. PROVIDE MANHOLE FRAMES, COVERS AND GRADE ADJUSTMENT RISERS SUPPLIED BY A MANUFACTURER AS LISTED IN BULLETIN 15. FOR DEVIATION OR MODIFICATION TO THE STANDARDS, SUBMIT SHOP DRAWINGS FOR APPROVAL.
3. PROVIDE A GASKET SEALING SYSTEM, DOVETAIL GROOVE AND CONTINUOUS GASKET, AS INDICATED IN DETAIL A, TO PREVENT INFLOW THROUGH THE BEARING SURFACES, OF SURFACE RUNOFF WATER INTO THE MANHOLE SYSTEM, WHEN SPECIFIED. PROVIDE 6 (¼") DIA ONE PIECE SELF-SEAL POLYISOPRENE ROUND GASKET, 40 DUROMETER GLUED IN PLACE. PROVIDE TWO (2) LIFT HOLES AT 180° TO FACILITATE COVER REMOVAL FOR SELF-SEALING MANHOLE COVER.



SECTION B-B

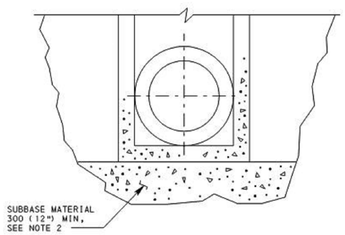
DETAIL A

DETAIL B

TABLE B

PRECAST MANHOLE HEIGHT	TOP STEEL REQUIREMENTS	BOTTOM STEEL REQUIREMENTS
0.0 m TO 9.0 m (0'-0" TO 30'-0")	#13 BARS AT 150 C TO C OR 700 mm²/m WWF 152 MAXIMUM SPACING / #4 BARS AT 6" C TO C OR 0.33 in² /FT WWF 6" MAXIMUM SPACING	#13 BARS AT 300 C TO C OR 340 mm²/m WWF 152 MAXIMUM SPACING / #4 BARS AT 12" C TO C OR 0.16 in² /FT WWF 6" MAXIMUM SPACING
> 9.0 m TO 18.0 m (> 30'-0" TO 60'-0")	#16 BARS AT 150 C TO C OR 1190 mm²/m WWF 152 MAXIMUM SPACING / #5 BARS AT 6" C TO C OR 0.56 in² /FT WWF 6" MAXIMUM SPACING	#13 BARS AT 150 C TO C OR 575 mm²/m WWF 152 MAXIMUM SPACING / #4 BARS AT 6" C TO C OR 0.27 in² /FT WWF 6" MAXIMUM SPACING

SEE NOTE 7, SHEET 1



PRECAST MANHOLE BASE PREPARATION

NOTE:

THESE DETAILS HAVE BEEN ADAPTED FROM PENNDOT JUNE 2010 STANDARD DRAWINGS. ADDITIONAL INFORMATION FROM STANDARD PENNDOT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED AS REFERENCED.

PRECAST DRAINAGE MANHOLES

NO SCALE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720

10/25/2019

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CLIENT APPROVAL

DATE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE

POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-001	REV. NO.	B

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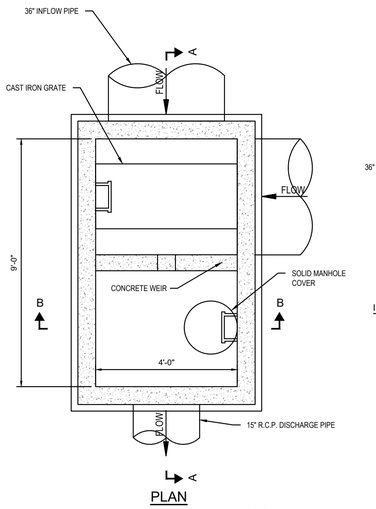
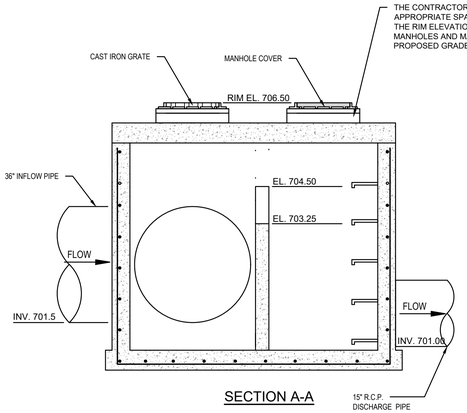
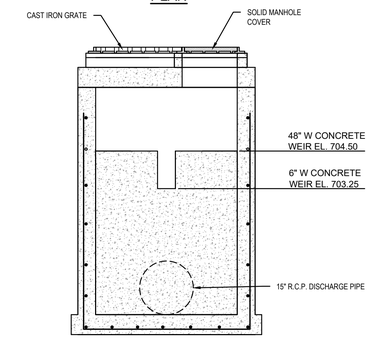


PLAN



SECTION A-A



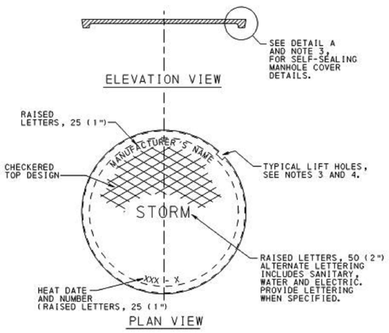
SECTION B-B

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL VERIFY AND COORDINATE ALL DIMENSIONS AND DETAILS CONCERNING HIS WORK BEFORE PROCEEDING WITH SAID WORK. ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.
2. THE CONTRACTOR SHALL VERIFY THE ELEVATIONS OF EXISTING STRUCTURES AND CLEARANCES TO THE NEW CONSTRUCTION.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE CONSTRUCTION SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI STANDARD 318-99)), AND "ACI DETAILING MANUAL- (ACI 66 (94)),EXCEPT AS SPECIFICALLY MODIFIED BY THE CONTRACT DRAWINGS AND THE SPECIFICATIONS.
4. ALL CONCRETE USED ON THE PROJECT SHALL HAVE A SPECIFIED 28-DAY COMPRESSIVE STRENGTH (FC') AS NOTED BELOW. SUCH STRENGTHS SHALL BE DETERMINED BY A TESTING LABORATORY.
   A) FC' = 5,000 PSI FOR ALL PRECAST STRUCTURES ALL REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH, FY = 60 KSI AND SHALL BE NEW DEFORMED BILLET-STEEL CONFORMING TO ASTM A615-96a, GRADE 60.
5. ALL COLUMN TIES AND BEAM STIRRUPS SHALL BE REINFORCING BARS CONFORMING TO ASTM A615-96a, GRADE 40.
6. ALL WELDED WIRE REINFORCING (WWR) SHALL CONFORM TO ASTM A185-01.
7. THE STRUCTURE IS DESIGNED TO MEET THE REQUIREMENTS OF ASTM C-478, "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS." THE REINFORCED CONCRETE STRUCTURES ARE TO BE DESIGNED TO WITHSTAND AASHTO HS-20 LIVE LOAD CONDITIONS (DESIGN OF FRAME AND COVER BY OTHERS).
8. CONTRACTOR TO SUBMIT SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER PRIOR TO CONSTRUCTION SHOWING FABRICATION DETAILS AND DIMENSIONS.

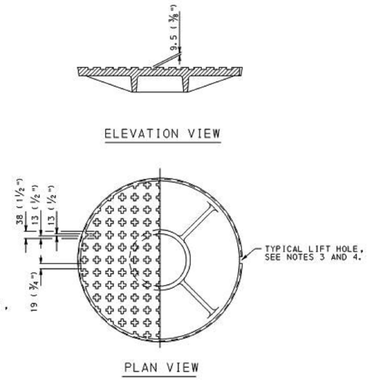
SUB-SURFACE DETENTION OUTLET CONTROL STRUCTURE

NO SCALE



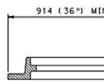
CAST IRON MANHOLE COVER

(PLATEN COVER)

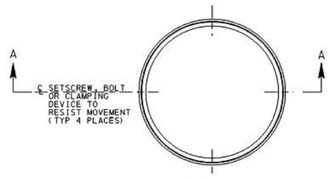


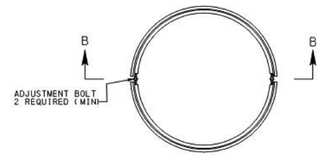
CAST IRON MANHOLE COVER

(STANDARD COVER)

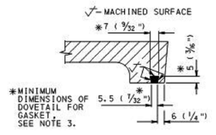


ELEVATION VIEW OF MANHOLE FRAME





ADJUSTMENT RISERS



DETAIL A

GASKET SEALING SYSTEM

NOTES

1. PROVIDE MANHOLE FRAMES AND COVERS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 605.2(b), DESIGN MANHOLE FRAME, COVER AND GRADE ADJUSTMENT RINGS FOR PHL 93 (HS25) LIVE LOAD. IF MANHOLES ARE NOT IN OR ADJACENT TO ROADWAY, DESIGN FOR ALL POSSIBLE LIVE LOADS AS APPROVED BY THE DEPARTMENT.
2. PROVIDE MANHOLE FRAMES, COVERS AND GRADE ADJUSTMENT RISERS SUPPLIED BY A MANUFACTURER AS LISTED IN BULLETIN 15. FOR DEVIATION OR MODIFICATION TO THE STANDARDS, SUBMIT SHOP DRAWINGS FOR APPROVAL.
3. PROVIDE A GASKET SEALING SYSTEM, DOVETAIL GROOVE AND CONTINUOUS GASKET, AS INDICATED IN DETAIL A, TO PREVENT INFLOW THROUGH THE BEARING SURFACES, OF SURFACE RUNOFF WATER INTO THE MANHOLE SYSTEM, WHEN SPECIFIED. PROVIDE 6 (1/4") DIA ONE PIECE SELF-SEAL POLYISOPRENE ROUND GASKET, 40 DUROMETER GLUED IN PLACE. PROVIDE TWO (2) LIFT HOLES AT 180° TO FACILITATE COVER REMOVAL FOR SELF-SEALING MANHOLE COVER.
4. PROVIDE ONE LIFT HOLE TO FACILITATE COVER REMOVAL FOR NON-SEALING MANHOLE COVER.
5. FRAME AND GRADE ADJUSTMENT RISER TO HAVE A MINIMUM BEARING SEAT OF 25 (1") FOR COVER.
6. LOCATE TOP OF FRAME OR ADJUSTMENT RISER 3 (1/8") BELOW THE TOP OF ROADWAY SURFACE.
7. PROVIDE GRADE ADJUSTMENT RISERS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 606, AND AS MODIFIED HEREIN:
   A. CUSTOM FABRICATE EACH ADJUSTMENT RISER FROM MEASUREMENTS PROVIDED WITH EACH ORDER.
   B. MANUFACTURE BAR STOCK AND RETAINER CLIP FROM U.S. MADE CARBON STEEL MEETING OR EXCEEDING THE MINIMUM REQUIREMENTS OF ASTM A-36M.
   C. REQUIRE FULL CIRCUMFERENTIAL WELDS ON BOTH TOP AND BOTTOM RINGS. MAKE THE INNER WELD A BEVEL GROOVE WELD (FLUSH FINISH) FOR PROPER SEATING OF MANHOLE LID AND MAKE THE OUTER WELD A FILLET WELD.
   D. MAKE THE MINIMUM WIDTH OF BOTTOM AND TOP BAR STOCK 25 (1") AND 10 (3/8"), RESPECTIVELY.
   E. TAP THE BOTTOM BAR STOCK FOR MULTI-PIECE ADJUSTMENT RISER FOR M14 ADJUSTMENT BOLT.
   F. REINFORCE THE ADJUSTMENT RISER ADEQUATELY TO PREVENT BENDING.
   G. PROVIDE AN ADJUSTMENT RISER WHICH IS FLUSH WITH COVER AND DOES NOT ALLOW EXCESSIVE MOVEMENT. PROVIDE AN ADJUSTMENT RISER WHICH CONFORMS TO THE SHAPE OF THE ORIGINAL FRAME.
8. ATTACH FRAME AND/OR PRECAST CONCRETE GRADE RINGS RIGIDLY TO TOP OF MANHOLE. USE 3-M14 (1/2") THREADED STUDS WITH HEX HEAD NUTS AND WASHERS, INSERTED THROUGH AT 16 (5/8") DIA HOLES THROUGH FRAME AND/OR RINGS. SPACE HOLES AT 120° AND 50 (2") FROM OUTSIDE EDGE OF FRAME. EMBED STUDS 102 (4") MINIMUM INTO MANHOLE. GROUT STUDS INTO MANHOLE.
9. SET THE BASE OF THE FRAME AND/OR PRECAST CONCRETE GRADE RINGS IN A BED OF CEMENT MORTAR.

PRECAST DRAINAGE MANHOLES FRAMES AND COVERS

NO SCALE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720

10/25/2019

NOTE:

THESE DETAILS HAVE BEEN ADAPTED FROM PENNDOT JUNE 2010 STANDARD DRAWINGS. ADDITIONAL INFORMATION FROM STANDARD PENNDOT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED AS REFERENCED.

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

CLIENT APPROVAL

DATE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-002	REV. NO.	B

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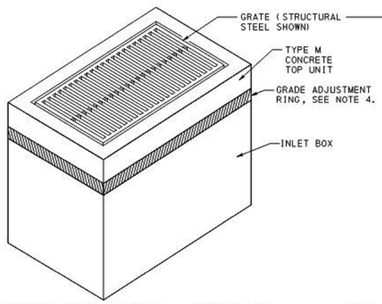
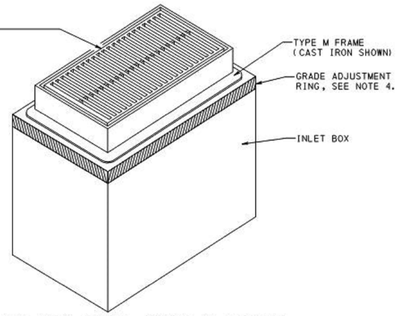
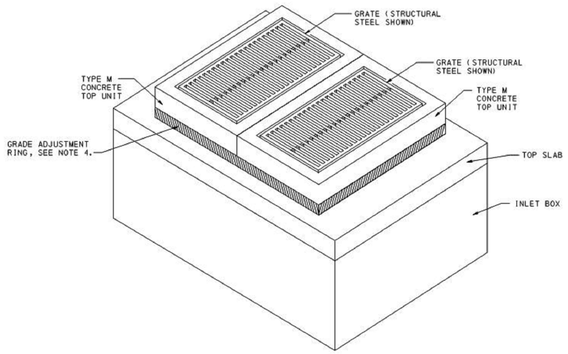


CONCRETE TOP UNIT - TYPE M



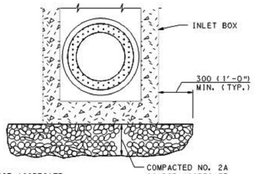
INLET BOX WITH TYPE M FRAME



CONCRETE TOP UNIT - DOUBLE TYPE M

NOTES:

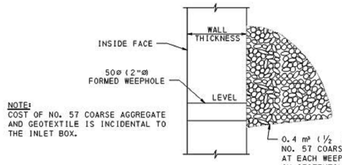
1. FOR ADDITIONAL INFORMATION, SEE SHEET 2 NOTES.
2. STANDARD INLET BOXES SHOWN, PROVIDE TOP SLABS FOR OTHER INLET BOX TYPES.
3. SEE RC-45M FOR DETAILS FOR THE CONCRETE TOP UNITS, FRAMES, AND GRATES.
4. PROVIDE GRADE ADJUSTMENT RINGS WHEN REQUIRED. SEE RC-45M FOR DETAILS.



NOTE:
COST OF NO. 2A COARSE AGGREGATE IS INCIDENTAL TO THE INLET BOX.

INLET BOX SUBBASE PREPARATION DETAIL

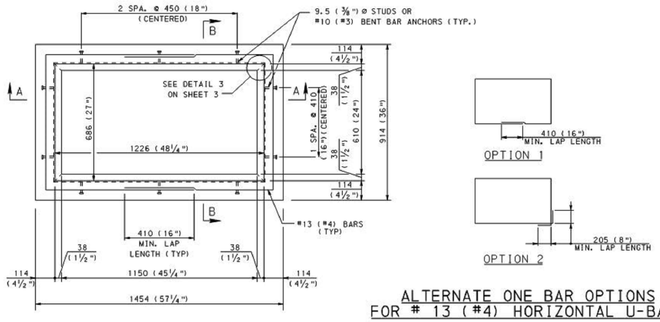
(SEE FIELD CONSTRUCTION NOTES ON SHEET 1)



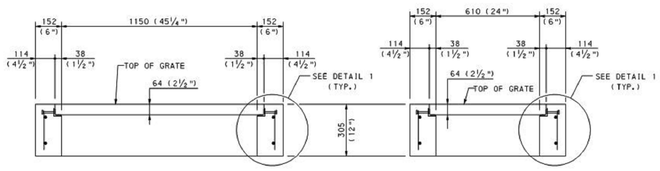
NOTE:
COST OF NO. 57 COARSE AGGREGATE AND GEOTEXTILE IS INCIDENTAL TO THE INLET BOX.

WEEPHOLE DETAIL

(SEE GENERAL NOTE 15 ON SHEET 1)



PLAN VIEW - TYPE M



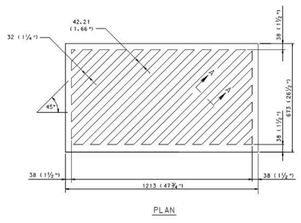
SECTION A-A

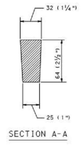
SECTION B-B

ALTERNATE ONE BAR OPTIONS FOR # 13 (#4) HORIZONTAL U-BARS

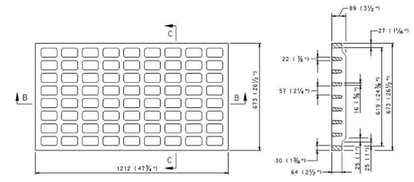
PRECAST INLET BOXES

(NOT TO SCALE)

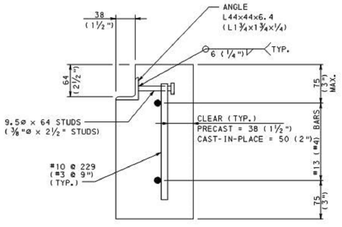




ONE PIECE CAST IRON GRATE



ONE PIECE CAST IRON GRATE - BICYCLE SAFE



DETAIL 1

RC-45M SHEET 9 NOTES:

CAST IRON GRATE NOTES:

1. SHEETS ~~3 AND 10~~ DEPICTS THE DIMENSIONS REQUIRED FOR UNIFORMITY AND INTERCHANGEABILITY. IT DOES NOT INCLUDE DETAILS REQUIRED FOR FABRICATION OR MANUFACTURING. FOR DEVIATIONS OR MODIFICATIONS OF THE STANDARDS, SUBMIT SHOP DRAWINGS ~~TO THE BUREAU OF DESIGN HIGHWAY QUALITY ASSURANCE DIVISION CHIEF~~ FOR REVIEW AND ACCEPTANCE.
2. PROVIDE CAST IRON GRATES SUPPLIED BY A MANUFACTURER LISTED IN **PENNDOT BULLETIN 15.**
3. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH THE PUBLICATION 408 AND THE CONTRACT SPECIAL PROVISIONS.
4. PROVIDE GRAY CAST IRON CONFORMING TO AASHTO M105 (ASTM A48/A48M), CLASS 225B (35B) AND AASHTO M306.
5. PROVIDE BICYCLE SAFE GRATES WHERE BICYCLE TRAFFIC IS ANTICIPATED, SUCH AS CURBED ROADWAYS IN URBAN AREAS OR ROADWAYS SPECIFICALLY ESTABLISHED AND SIGNED AS BIKEWAYS OR HAVING BIKE LANES. ALTERNATE BICYCLE SAFE GRATE DESIGNS REQUIRE A SHOP DRAWING, AS SPECIFIED IN NOTE 1, AND MUST CONFORM TO THE DIMENSIONAL REQUIREMENTS FOR PROPER INSTALLATION WITH THE CURRENT TOP UNITS.
6. PROVIDE ADA COMPLIANT GRATES WHERE PEDESTRIAN TRAFFIC IS ANTICIPATED, SUCH AS CURBED ROADWAYS IN URBAN AREAS ADJACENT TO SIDEWALKS. ALTERNATE ADA COMPLIANT GRADE DESIGNS REQUIRE A SHOP DRAWING, AS SPECIFIED IN NOTE 1 AND MUST CONFORM TO THE DIMENSIONAL REQUIREMENTS FOR PROPER INSTALLATION WITH THE CURRENT TOP UNITS.
7. CAST IRON GRATES ARE PERMITTED TO BE USED AS AN ALTERNATE TO THE STRUCTURAL STEEL GRATES PROVIDED THEY ARE SUPPLIED BY A MANUFACTURER LISTED IN BULLETIN 15 AND ARE APPROVED FOR PHL-93 OR HS-25 LOADING. CAST IRON GRATES NOT APPROVED FOR PHL-93 OR HS-25 LOADING MAY BE USED OUTSIDE OF THE TRAVEL LANES AT THE EDGE OF OUTSIDE SHOULDERS, SWALES, WIDE MEDIAN SWALES AND INFIELD AREAS.
8. REFER TO SHEET 10 FOR TWO PIECE CAST IRON GRATES.

PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION PUB 72M

RC-46M SHEET 1 NOTES:

GENERAL NOTES:

1. DESIGN SPECIFICATIONS AND REQUIREMENTS:
   - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND AS SUPPLEMENTED BY THE DESIGN MANUAL, PART 4, STRUCTURES.
   - DESIGN IS IN ACCORDANCE WITH THE LOAD AND RESISTANCE FACTOR DESIGN METHOD (LRFD).
   - INLET BOXES ARE DESIGNED FOR AN ALLOWABLE FOUNDATION PRESSURE EQUAL TO 2.0 TONS/SQ. FT. AT THE SERVICE LIMIT STATE.
2. CONSTRUCTION SPECIFICATIONS:
   - PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH THE CURRENT VERSION OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408 AND THE CONTRACT SPECIAL PROVISIONS.
3. SHOP DRAWINGS FOR INLET BOXES, TOP SLABS, AND TRANSITION SLABS ARE NOT REQUIRED IF THE ITEM IS CONSTRUCTED/FABRICATED IN ACCORDANCE WITH THIS STANDARD.
4. THIS STANDARD DEPICTS THE DIMENSIONS REQUIRED FOR UNIFORMITY AND INTERCHANGEABILITY. IT DOES NOT INCLUDE DETAILS REQUIRED FOR FABRICATION OR MANUFACTURING. FOR DEVIATIONS OR MODIFICATIONS OF THE STANDARDS, SUBMIT SHOP DRAWINGS TO THE BUREAU OF PROJECT DELIVERY, HIGHWAY DELIVERY DIVISION CHIEF FOR REVIEW AND ACCEPTANCE.
5. THE DESIGNER IS RESPONSIBLE FOR DETERMINING THE TYPE OF INLET BOX REQUIRED BASED ON THE REQUIRED PIPE SIZE(S) AND PIPE OPENING(S). REFER TO TABLES A AND B ON SHEET 34 FOR ADDITIONAL INFORMATION. THE DESIGNER IS ALSO RESPONSIBLE TO DETERMINE THE REQUIRED PAY ITEM FOR AN INSTALLATION BASED ON THE OVERALL INSTALLATION HEIGHT.
6. THE SELECTION OF COMPONENTS TO ACHIEVE A SPECIFIED INLET ASSEMBLY IS THE CONTRACTOR'S RESPONSIBILITY, UNLESS OTHERWISE INDICATED ON THE CONTRACT DOCUMENTS.
7. THE SIZE OF THE INLET TOP UNITS, PER RC-45M, ARE BASED ON THE MINIMUM DIMENSIONS INDICATED FOR THE STANDARD INLET BOX.
8. MINIMUM PIPE DIAMETERS (INSIDE):
   - FILL HEIGHT LESS THAN OR EQUAL TO 25': 18" FOR CIRCULAR PIPE (OR EQUIVALENT SIZE PIPE ARCH)
   - FILL HEIGHTS GREATER THAN 25': 24"
9. INSIDE INLET BOX DIMENSIONS ARE BASED ON PROVIDING A PIPE OPENING TO ACCOMMODATE A MINIMUM 18" PIPE TO A MAXIMUM 96" PIPE. IF A LARGER PIPE SIZE IS REQUIRED, THE DESIGNER IS RESPONSIBLE FOR PROVIDING DESIGN AND DETAILS IN ACCORDANCE WITH PENNDOT REQUIREMENTS.
10. INLETS THAT EXCEED THE MAXIMUM HEIGHT INDICATED REQUIRE SPECIAL DESIGN AND DETAILS. DESIGNER IS RESPONSIBLE FOR PROVIDING DESIGN AND DETAILS IN ACCORDANCE WITH PENNDOT REQUIREMENTS.
11. SHOW ORIENTATION OF INLET BOXES ON THE CONTRACT DRAWINGS.
12. THE TOP SLAB IS NOT PERMITTED TO BE POURED MONOLITHICALLY WITH THE ADJACENT BOX SECTION.
13. PROVIDE 2" DIAMETER WEEPHOLES IN THE WALLS WHEN THE DEPTH BETWEEN THE FINISHED GRADE ELEVATION AND THE TOP OF BOTTOM SLAB ELEVATION IS GREATER THAN 10'-0":
    - VERTICAL PLACEMENT: 5'-0" MAXIMUM SPACING
    - HORIZONTAL PLACEMENT: PLACE WEEPHOLES IN THE SIDE WALLS THAT ARE PERPENDICULAR TO TRAFFIC.
    - LOCATE WEEPHOLES A MINIMUM OF 6" FROM PIPE OPENINGS OR JOINTS.
    - LOCATE WEEPHOLES A MINIMUM OF 1'-0" ABOVE OUTLET PIPE INVERT.
14. PROVIDE MANHOLE STEPS WHEN THE DEPTH BETWEEN THE FINISHED GRADE ELEVATION AND THE TOP OF BOTTOM SLAB ELEVATION IS GREATER THAN 5'-0". LOCATE THE TOP STEP 6" MINIMUM BELOW THE TOP OF THE INLET BOX. SMALL/OR RECESSES, ON THE INSIDE FACE OF THE INLET, NOT GREATER THAN ⅜" IN DEPTH, FORMED BY MAGNETIC STEP FORMERS ARE ACCEPTABLE AND DO NOT REQUIRE PATCHING. FOR DETAILS, REFER TO RC-39M.
15. IF A REQUIRED DETAIL IS NOT FOUND IN THIS STANDARD OR ON THE CONTRACT DRAWINGS A SPECIAL SUBMISSION REQUESTING ACCEPTANCE FOR SPECIFIC DETAILS MUST BE MADE TO THE BUREAU OF PROJECT DELIVERY, HIGHWAY DELIVERY DIVISION CHIEF.
16. FOR INLET TOPS, GRATES, GRADE ADJUSTMENT RINGS AND FRAMES, REFER TO RC-45M.

RC-46M SHEET 2 NOTES:

1. CONSTRUCT INLET BOXES IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTION 714.
2. PROVIDE PRECAST CONCRETE INLET BOXES SUPPLIED BY A MANUFACTURER LISTED IN BULLETIN 15.
3. PROVIDE A TOP SLAB TO SUPPORT THE INLET TOP UNITS W, S, C AND C ALTERNATE WHEN A STANDARD INLET BOX IS NOT SPECIFIED. PROVIDE OPENING TO ACCOMMODATE THE STANDARD TOP COMPONENTS. PROVIDE A TOP SLAB WITH A ROUND OPENING FOR MANHOLE COVER WHEN SPECIFIED ON THE CONTRACT DRAWINGS.
4. PROVIDE A TRANSITION SLAB BETWEEN TWO SEPARATE INLET BOX SIZES, WHEN TWO SEPARATE INLET BOX SIZES ARE USED. (SEE TRANSITION SLAB NOTES.)
5. CLEAR COVER FOR STEEL:
   - WALLS: 1½"
   - FOOTINGS (BOTTOM SLAB):
     - TOP COVER: 2"
     - BOTTOM COVER: 1½"
     - SIDE COVER: 1½"
   - TOP AND TRANSITION SLABS (TOP AND BOTTOM): 1½"
6. MINIMUM SLAB AND WALL THICKNESS:
   - MINIMUM TOP SLAB THICKNESS: 8"
   - MINIMUM WALL THICKNESS: 6"
   - MINIMUM BOTTOM SLAB THICKNESS: 7"
7. THICKNESS OF WALL IS PERMITTED TO VARY FROM SECTION TO SECTION. INSIDE FACE OF WALLS MUST ALIGN BETWEEN SECTIONS.
8. FABRICATOR IS RESPONSIBLE FOR LIFTING, HANDLING AND TRANSPORTATION STRESSES.
9. LIFTING DEVICES:
   - PROVIDE GALVANIZED STEEL OR PLASTIC LIFTING DEVICES FOR HANDLING AND INSTALLATION.
   - FILL LIFTING DEVICES WITH NON-SHRINK GROUT AFTER INSTALLATION.
   - PROVIDE LIFTING DEVICES WITH A MINIMUM CAPACITY OF AT LEAST FOUR TIMES THE CALCULATED LOAD ON THE DEVICE.
10. TAPERS MAY BE PROVIDED ON THE INSIDE AND/OR OUTSIDE VERTICAL FACES OF THE INLET BOXES TO FACILITATE FORM STRIPPING. TAPERS MAY RESULT IN INTERNAL BOTTOM DIMENSIONS THAT VARY ¼"/FOOT PER SIDE TO A MAXIMUM OF 1" PER SIDE.
11. KEYED JOINTS MAY BE CONSTRUCTED UPWARDS OR DOWNWARDS. CLEAN JOINTS AND KEYS THOROUGHLY BEFORE PLACING NEXT SEGMENT. PLACE MORTAR OR CAULKING COMPOUND BETWEEN JOINTS IN ACCORDANCE WITH THIS STANDARD.
12. PROVIDE EITHER A SHIPLAP OR KEYED JOINT BETWEEN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOX.
13. PROVIDE EITHER A SHIPLAP OR KEYED JOINT BETWEEN THE TRANSITION SLAB AND THE ADJACENT TOP AND BOTTOM SECTIONS.
14. PROVIDE EITHER A SHIPLAP OR KEYED JOINT BETWEEN PRECAST SECTIONS.
15. SEGMENT HEIGHTS:
    - MINIMUM HEIGHT:
      - RISER SECTIONS = 1'-0"
      - BASE SECTIONS = 2'-0"
    - MAXIMUM HEIGHT = 8'-0"

NOTE:

THESE DETAILS HAVE BEEN ADAPTED FROM PENNDOT JUNE 2010 STANDARD DRAWINGS.
ADDITIONAL INFORMATION FROM STANDARD PENNDOT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED AS REFERENCED.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720

10/25/2019

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CLIENT APPROVAL

DATE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-003	REV. NO.	B

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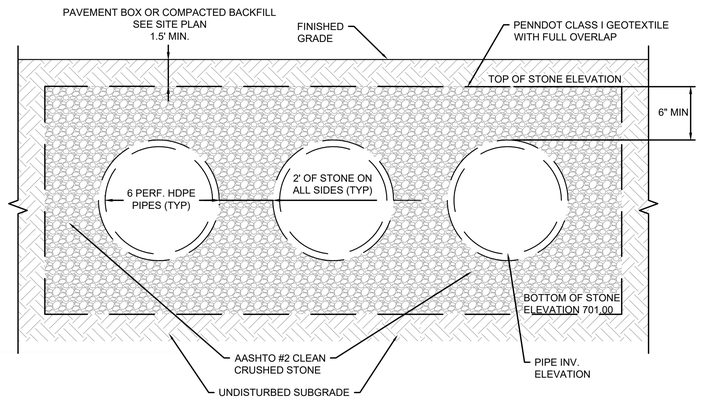
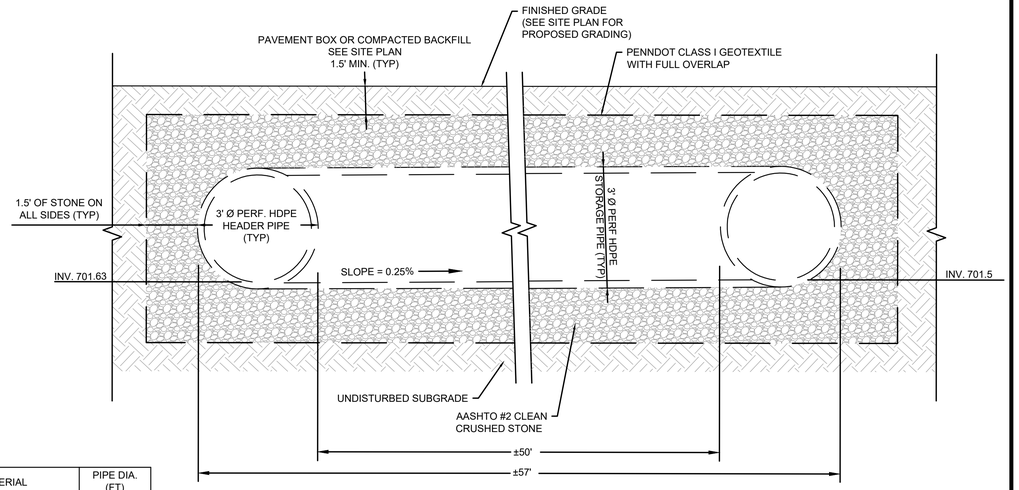


SECTION A - A

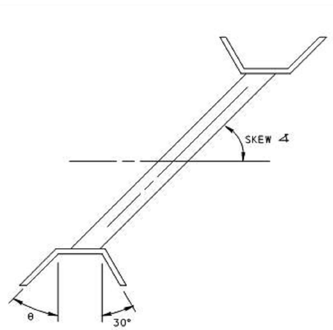


SECTION B - B

STATION	PIPE MATERIAL	PIPE DIA. (FT)
BLUE MOUNTAIN SIDE VALVE	DOUBLE WALLED PERFORATED HDPE	3

UNDERGROUND STORMWATER DETENTION SYSTEM

NO SCALE



METRIC EQUATION

$$**SD = \frac{D_{D-W}}{\cos\theta} = \frac{D_{D-W}}{\sin SKEW\ \angle}$$

$L_{D-W} = SD + 0.70\ m$

$W_1 = \frac{2D_{D-W} - 0.60\ m}{\cos\theta}$ FOR 1:2 SLOPE

$W_1 = \frac{X}{\cos\theta}(D_{D-W} - 0.5 - \frac{1.0}{X})$ (FOR VARIABLE SLOPE WHEN X EQUALS HORIZONTAL DIMENSION OF THE SLOPE DESIGNATION.)

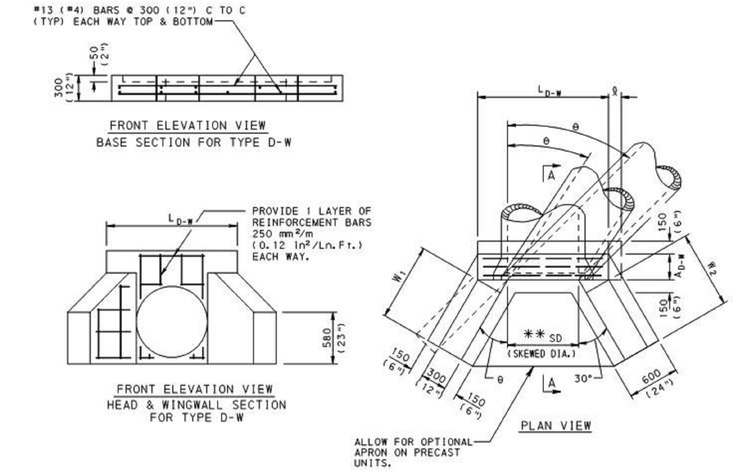
ENGLISH EQUATION

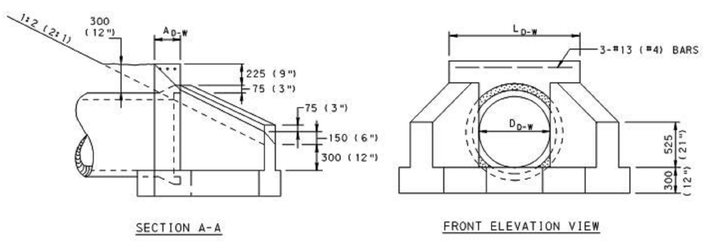
$$**SD = \frac{D_{D-W}}{\cos\theta} = \frac{D_{D-W}}{\sin SKEW\ \angle}$$

$L_{D-W} = SD + 2.3'$

$W_1 = \frac{2D_{D-W} - 2.0'}{\cos\theta}$ FOR 2:1 SLOPE

$W_1 = \frac{X}{\cos\theta}(D_{D-W} - 0.5 - \frac{1.0}{X})$ (FOR VARIABLE SLOPE WHEN X EQUALS HORIZONTAL DIMENSION OF THE SLOPE DESIGNATION.)



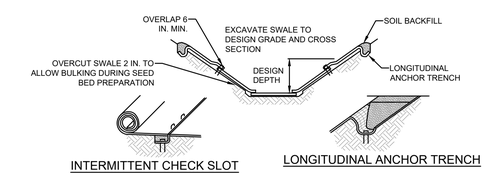


TYPE D-W ENDWALL

(SEE TABLE A FOR DIMENSIONS NOT INDICATED.)

CONCRETE END WALLS (HEADWALLS)

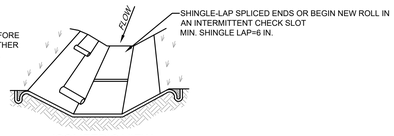
NO SCALE



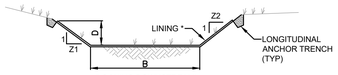
INTERMITTENT CHECK SLOT

LONGITUDINAL ANCHOR TRENCH

PREPARE SOIL AND APPLY SEED BEFORE INSTALLING BLANKETS, MATS, OR OTHER TEMPORARY SWALE LINER SYSTEM.



ISOMETRIC VIEW



SWALE 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.

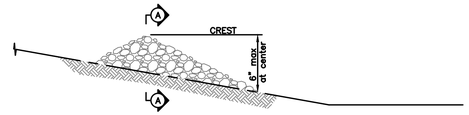
SWALE DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. SWALE SHALL BE CLEANED WHENEVER TOTAL SWALE DEPTH IS REDUCED BY 25% AT ANY LOCATION.
SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO SWALE WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED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

NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. 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 NO.	BOTTOM WIDTH B (FT)	DEPTH D (FT)	TOP WIDTH W (FT)	Z1 (FT)	Z2 (FT)	LINING
1	2.0	1.00	8.0	3.0	3.0	LANDLOK TRM-435 OR EQUAL
2	2.0	1.00	8.0	3.0	3.0	LANDLOK TRM-435 OR EQUAL

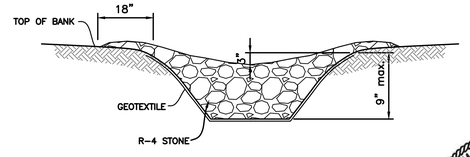
VEGETATED SWALE LINING

NO SCALE



PROFILE

NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND DAM.



SECTION A

CHECK DAM

NO SCALE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE068720

10/25/2019

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CLIENT APPROVAL

DATE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-004	REV NO.	B

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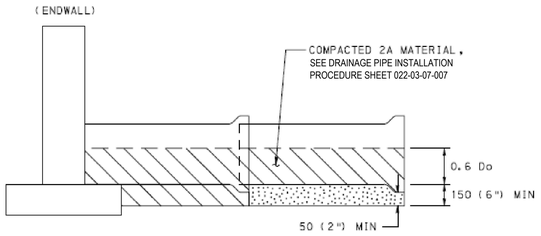
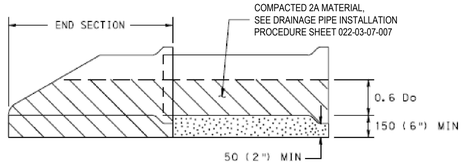
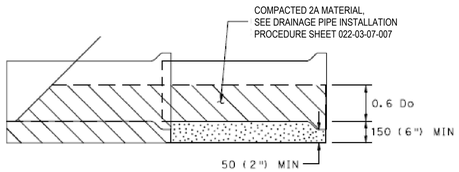


BACKFILL DETAIL AT ENDWALL
(FOR CONCRETE PIPE)



BACKFILL DETAIL AT END SECTION
(FOR CONCRETE PIPE)



BACKFILL DETAIL AT LAST SECTION OF PIPE
(FOR CONCRETE PIPE)

NOTES

1. PROVIDE MATERIALS AND CONSTRUCT AS SPECIFIED IN PUBLICATION 408, SECTION 601 FOR PIPE CULVERTS, SECTION 602 FOR CORRUGATED METAL PIPE-ARCH CULVERTS AND SECTION 603 FOR METAL PLATE CULVERTS.
2. SHORING OR TRENCH BOX INSTALLATION FOR FLEXIBLE PIPE IS NOT NORMALLY USED. IF SHORING OR TRENCH BOX INSTALLATION IS PERMITTED IN SPECIAL CIRCUMSTANCES, REFER TO PUBLICATION 408, SECTION 601.3(g).
3. IN ALL EXCAVATION AREAS FOLLOW OSHA SAFETY REQUIREMENTS.
4. DO NOT COMPACT NO. 8 MATERIAL USED FOR BEDDING UNDER CONCRETE PIPES.
5. ALLOW NO PAYMENT FOR EXCAVATION IN EXCESS OF SPECIFIED LIMITS AND FOR ADDITIONAL BACKFILL MATERIAL REQUIRED.
6. PAYMENT FOR THE BACKFILL ENVELOPE, INCLUDING BEDDING, COARSE AGGREGATE AND SUITABLE MATERIAL UP TO 300 (12") ABOVE THE PIPE IS INCIDENTAL TO THE PIPE.
7. FOR BOTTOM TRENCH WIDTHS ≥ 2.5 m (8'-0"), ALL EXCAVATION IS CLASS 1.
8. FOR INLET OR OUTLET PROTECTION SEE DETAIL ~~A.~~
9. CONSTRUCT FLEXIBLE BASE REPLACEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTION 316.
10. PREPARE EXPOSED VERTICAL AND HORIZONTAL SURFACES AS PER PUBLICATION 408, SECTION 409.3(k).
11. FOR NON-OVERLAY APPLICATIONS, THE TOP 40 (1½") OF BASE REPLACEMENT WILL BE SUPERPAVE WEARING COURSE.
12. FOR RESTORATION OF RIGID PAVEMENT, REFER TO PUBLICATION 408, SECTION 516 AND RC-26M.
13. FOR SUPERPAVE BASE REPLACEMENT, SAW CUTTING, EXCAVATION, HAULING AND DISPOSAL, BITUMINOUS TACK COAT, BITUMINOUS MATERIAL, AND SEALING OF THE JOINTS ARE CONSIDERED AS INCIDENTAL.
14. PERFORM AND COMPLETE PIPE RESTORATION WORK PRIOR TO THE FLEXIBLE SUPERPAVE BASE REPLACEMENT.

LEGEND

- CLASS 4 EXCAVATION
- CLASS 1 EXCAVATION
- AGGREGATE FOR BEDDING (AASHTO NO. 8)
- COARSE AGGREGATE (2A)

Do = OUTSIDE DIAMETER OF PIPE.

EXCAVATION FOR ENDWALLS

ABOVE DRAWING SHOWS EXCAVATION FOR PIPE IN CUT OR FILL WHERE SUBGRADE IS 1050 (3'-6") OR MORE ABOVE THE BOTTOM OF THE TRENCH.

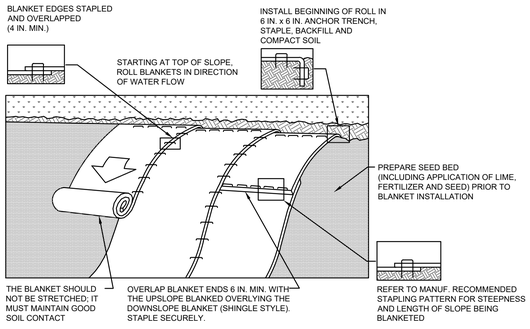
ABOVE DRAWING SHOWS EXCAVATION FOR PIPE IN CUT OR FILL WHERE SHORING OR A TRENCH BOX IS USED.

PAY LIMITS FOR PIPE EXCAVATION

PIPE TRENCH, BEDDING AND BACKFILL DETAIL
NO SCALE

NOTE:

THESE DETAILS HAVE BEEN ADAPTED FROM PENNDOT JUNE 2010 STANDARD DRAWINGS. ADDITIONAL INFORMATION FROM STANDARD PENNDOT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED AS REFERENCED.



NOTES:

SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.

PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.

SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.

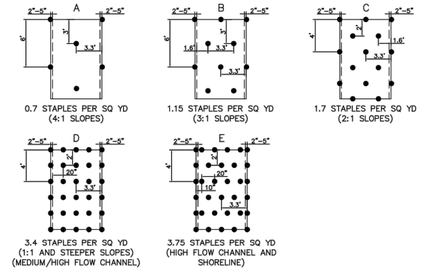
BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.

THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

EROSION CONTROL BLANKET INSTALLATION STANDARD CONSTRUCTION DETAIL #11-1
NO SCALE

STAPLE PATTERN GUIDE



NOTES:

1. FOR SLOPES BETWEEN 3:1 AND 1:1, USE NORTH AMERICAN GREEN ERONET SC 150 OR OWNER APPROVED EQUAL MATERIAL/METHOD.
2. IN AREAS WHERE LIVESTOCK ARE KEPT, USE NORTH AMERICAN GREEN BIONET SC 150 BN OR OWNER APPROVED EQUAL MATERIAL/METHOD.
3. SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.
4. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE
5. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.
6. 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.
7. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS,
8. 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 STAPLE PATTERN GUIDE
NO SCALE

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CLIENT APPROVAL
DATE

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B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-005	REV. NO.	B

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DRAINAGE PIPE INSTALLATION PROCEDURE

CONSTRUCTION DETAILS BELOW COVER THE FOLLOWING CONDITIONS:

(A) PIPE LYING ON TOP OF THE NATURAL GROUND, ROCK OR COMPACTED (97% SPD) FILL.

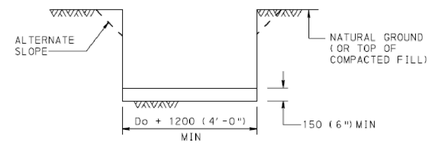
(B) THE EXISTING GROUND IS BETWEEN THE TOP AND THE BOTTOM OF THE PROPOSED PIPE AND THE PIPE IS TO BE COVERED WITH EARTH FILL.

(C) THE TOP OF PIPE IS BELOW THE LEVEL OF THE NATURAL GROUND OR COMPACTED FILL (TO MINIMUM 97% SPD) AND TO BE COVERED WITH EARTH FILL TO HEIGHTS ABOVE THE NATURAL GROUND.

STEP 1 : REMOVE TOPSOIL (COMPRESSIBLE LAYER OF ORGANIC MATERIAL) TO A WIDTH EQUAL TO 5 OUTSIDE DIAMETERS OF THE PIPE IN ALL FILL CONDITIONS ABOVE (A), (B) & (C). ALSO IF SPECIFIED ON THE CONTRACT DRAWING, UNDERCUT FOR THE DEPTH BELOW THE BEDDING AS SHOWN BY DESIGN (MAKE MIN WIDTH 5 DIAMETERS OF PIPE). PAY AS CLASS 1 EXCAVATION.

STEP 2 : CONSTRUCT THE EMBANKMENT TO 1200 (4'-0") ABOVE THE TOP OF PIPE OR TO THE SUBGRADE ELEVATION, WHICHEVER IS LESS. FOR PIPES 1800 (72") OR GREATER SEE NOTE 1.

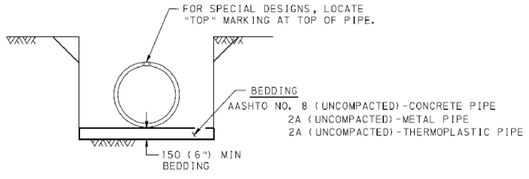
STEP 3 : EXCAVATE THE TRENCH TO THE WIDTH OF THE OUTSIDE DIAMETER OF THE PIPE BARREL PLUS 1200 (4'-0") AND CREATE AN APPROPRIATE BEDDING 150 (6") DEEP.



STEP 4 : FOR CONCRETE PIPE, IF THIS EXCAVATION IS THROUGH ROCK, OR HARD SHALE, OR IN AREAS OF UNDERCUT, PROVIDE 150+40 mm/m (6"+½" INCH/FT) OF Do+1200 (4'-0"), BELOW THE INTENDED BOTTOM ELEVATION OF THE PIPE, 400 (16") MAX.

NOTE: IF UNSUITABLE MATERIAL IS FOUND, UNDERCUT AS DIRECTED AND BACKFILL WITH SUITABLE MATERIAL TO BOTTOM OF BEDDING ELEVATION. (UNLESS OTHERWISE SPECIFIED.)

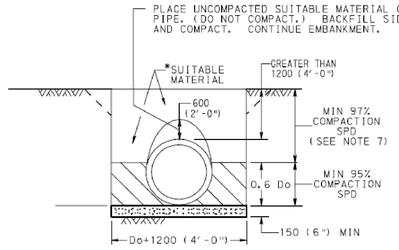
STEP 5 : LAY PIPE ON APPROPRIATE BEDDING. SEE STEP 6D FOR METAL PIPE ARCH AND METAL PLATE PIPE ARCH.



STEP 6 : FOR CONCRETE PIPE, SEE STEP 6A.
: FOR METAL PIPE AND METAL PLATE PIPE, SEE STEP 6B.
: FOR THERMOPLASTIC PIPE, SEE STEP 6C.
: FOR METAL PIPE ARCH AND METAL PLATE PIPE ARCH, SEE STEP 6D.

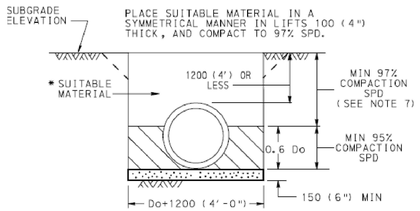
STEP 6A : **CONCRETE PIPE**

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 0.6 Do. COMPACT TO 95% SPD. TEST THE SIDE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



GREATER THAN 1.2 m (4') TO 14.6 m (48')

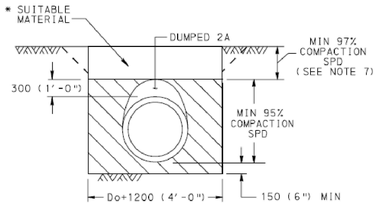
FOR FILLS OVER 14.6 m (48'), SEE NOTE 8.



SHALLOW FILLS 1200 (4'-0") AND LESS

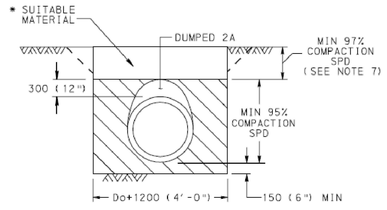
STEP 6B : **METAL PIPE AND METAL PLATE PIPE**

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 300 (12") ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



STEP 6C: **THERMOPLASTIC PIPE**

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 300 (12") ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



NOTES

1. THE INSTALLATION OF PIPES 1800 (72") OR GREATER INSIDE DIAMETER OR SPAN IS PERMITTED WITHOUT PLACING EMBANKMENT FIRST. MAKE THE BACKFILL ENVELOPE AS SHOWN ON THIS DRAWING EXCEPT PROVIDE 2A MATERIAL ON EACH SIDE OF THE PIPE EQUAL TO ONE OUTSIDE DIAMETER OR SPAN OF THE PIPE. FOR CONCRETE PIPE, THE WIDTH OF UNCOMPACTED AGGREGATE FOR BEDDING (AASHTO NO. 8) REMAINS AT Do + 1200 (4'-0"). PAYMENT FOR THE 2A MATERIAL IS AS PER NOTE 3.
2. A HIGHER STRENGTH PIPE THAN SPECIFIED MAY BE SUPPLIED AT NO ADDITIONAL COST ~~TO THE DEPARTMENT.~~
3. PAYMENT FOR THE BACKFILL ENVELOPE INCLUDING BEDDING, COARSE AGGREGATE AND SUITABLE MATERIAL UP TO 300 (12") ABOVE THE PIPE IS INCIDENTAL TO THE PIPE.
4. TO PRECLUDE POINT LOADING ON RELATIVELY RIGID CONCRETE PIPE, DO NOT COMPACT AASHTO NO. 8 BEDDING MATERIAL.
5. FOR TRENCH BOX/SHORING INSTALLATION REQUIREMENTS REFER TO PUBLICATION 408, SECTION 601.
6. PERMIT PLACEMENT OF BACKFILL MATERIAL IN LAYERS, LIFTS, 200 (8") THICK WHEN USING VIBRATORY COMPACTION EQUIPMENT.
7. COMPACT TOP 1000 (3'-0") OF SUBGRADE TO 100% IN ACCORDANCE WITH PUBLICATION 408, SECTION 206.3.
8. FOR REINFORCED CONCRETE PIPES INSTALLED WITH GREATER THAN 14.6 m (48') OF FILL, PROVIDE 300 (12") BEDDING MINIMUM AND 400 (16") WHEN ROCK IS PRESENT.

LEGEND

AGGREGATE FOR BEDDING (AASHTO NO. 8), UNCOMPACTED

COARSE AGGREGATE (2A)

Do = OUTSIDE DIAMETER OF PIPE, MILLIMETERS (INCHES)

SPD = STANDARD PROCTOR DENSITY

ID = INSIDE DIAMETER

* SUITABLE MATERIAL = MATERIAL CONTAINING NO DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN ONE-HALF THE THICKNESS OF THE COMPACTED LAYERS BEING PLACED.

NOTE:

WHEN LAYING PIPE FOR INFILTRATION TRENCHES, LEVEL SPREADERS AND SUBSURFACE STORMWATER STORAGE FACILITIES CARE SHALL BE TAKEN TO AVOID COMPACTION OF SUBGRADE.

PIPE TRENCH, BEDDING AND BACKFILL DETAIL

NO SCALE

NOTE:

THESE DETAILS HAVE BEEN ADAPTED FROM PENNDOT JUNE 2010 STANDARD DRAWINGS. ADDITIONAL INFORMATION FROM STANDARD PENNDOT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED AS REFERENCED.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL W. MICHAEL CLARK ENGINEER PE082720

10/25/2019

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PennEast PIPELINE

PENNEAST PIPELINE PROJECT

BLUE MOUNTAIN SIDE VALVE
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CARBON COUNTY, PENNSYLVANIA

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POST CONSTRUCTION STORM WATER BMP NOTES:

GENERAL:

1. DISTURBANCE TO VEGETATION AND EXISTING DRAINAGE FEATURES SHALL BE LIMITED TO THE GREATEST EXTENT PRACTICAL.
2. NO VEGETATION SHALL BE DISTURBED AND NO GROUND CLEARED FOR THE INSTALLATION OF THE INFILTRATION BERMS, EXCEPT FOR THE FOOTPRINT OF THE BERM ITSELF.
3. POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) BMPS SHALL BE INSTALLED AS LATE IN THE CONSTRUCTION PROCESS AS POSSIBLE.
4. AREAS TO BE OCCUPIED BY PCSM BMPS SHALL BE IDENTIFIED PRIOR TO CONSTRUCTION AND SURROUNDED WITH SAFETY FENCE OR OTHER BARRIER, CARE SHALL BE TAKEN TO PREVENT COMPACTION OF SOIL IN UNDISTURBED AREAS AND THOSE AREAS OCCUPIED OR TO BE OCCUPIED TO PCSM BMPS.
5. ENTRY OF SEDIMENT LADEN WATER TO THE PCSM BMPS SHALL BE PREVENTED.
6. PCSM BMPS SHALL BE INSPECTED DURING CONSTRUCTION AS PER THE REQUIREMENTS OF THE PA BMP MANUAL AND AS SPECIFIED ELSEWHERE ON CONSTRUCTION DRAWINGS.
7. ALL PLANTINGS AND SEEDING SHALL BE NATIVE NON-INVASIVE SPECIES.

CONSTRUCTION SEQUENCE:

1. AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OWNER AND/OR OPERATOR SHALL NOTIFY THE PADEP AND CARBON COUNTY CONSERVATION DISTRICT BY EITHER TELEPHONE OR CERTIFIED MAIL OF THE INTENT TO COMMENCE EARTH DISTURBANCE ACTIVITIES. ATTENDANCE AT A PRE-CONSTRUCTION CONFERENCE IS REQUIRED UPON REQUEST OF THE PADEP.
2. AT LEAST THREE (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 TO DETERMINE THE LOCATION OF EXISTING SUBSURFACE UTILITIES.
3. INSTALL THE ROCK CONSTRUCTION ENTRANCE AS SHOWN ON THE ESC PLAN.
4. VERIFY COMPOST FILTER SOCK PLACEMENT DOWNSLOPE OF PROPOSED DISTURBED/EXCAVATED AREA AND STOCKPILES AS SHOWN ON THE ESC PLAN. INSPECT PERMANENT AND TEMPORARY WATERBARS AS SHOWN ON THE ESC PLAN AND MAKE REPAIRS AS NEEDED.
5. PERFORM CLEARING AND GRUBBING TO THOSE AREAS DESCRIBED IN EACH STAGE OF WORK. REMOVE EXCESS TOPSOIL FROM THE LIMITS OF DISTURBANCE AND STOCKPILE OFF-SITE. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY OFF-SITE WASTE AREAS HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR PADEP PRIOR TO BEING ACTIVATED. ORANGE SAFETY FENCING SHALL BE INSTALLED TO PREVENT COMPACTION OF INFILTRATION AREAS.
6. PERFORM GRADING ACTIVITIES DETAILED BY PROPOSED CONTOURS, NOTES, AND DETAILS SHOWN ON THE PLAN DRAWINGS. REMOVE TEMPORARY WATERBAR CONCURRENTLY WITH DEVELOPMENT OF ACCESS ROAD. INSTALL WEIGHTED FILTER TUBE IN SWALES 1 AND 2 AND MAINTAIN PER BMP MAINTENANCE SCHEDULE IN SECTION 7 OF THIS REPORT UNTIL THE SITE HAS BEEN STABILIZED. PER PROJECT SPECIFICATIONS, ADDITIONAL TEMPORARY PLACEMENT OF COMPOST FILTER SOCK MAY BE NECESSARY AT THE CONTRACTOR'S DISCRETION, SHOULD ACCELERATED EROSION BE ENCOUNTERED DURING GRADING ACTIVITIES.
7. INSTALLATION OF SUBSURFACE STORMWATER DETENTION SYSTEM SHALL BE COORDINATED WITH BULK FILLING OPERATIONS. INSTALL GEOTEXTILE AT THE BOTTOM OF THE STONE BASE AS SHOWN ON THE PLANS. INSTALL CRUSHED STONE BASE AND PERFORATED HDPE PIPING IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. THE BOTTOM ELEVATIONS OF STONE BASE, PIPE INVERTS, AND PIPE SPACING SHALL BE IN ACCORDANCE WITH THE PCSM PLAN. GRADE THE STONE BASE TO A SMOOTH, UNIFORM GRADE TO ALLOW FOR PROPER PLACEMENT OF THE PIPE. FILL THE AREAS BETWEEN THE PIPE RUNS AND THE EDGES WITH CRUSHED STONE. CRUSHED STONE SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS. CONTRACTOR SHALL PERFORM LEVEL RUNS DURING THE INSTALLATION OF SUBSURFACE DETENTION SYSTEM TO CONFIRM CRITICAL ELEVATIONS (INCLUDING BUT NOT LIMITED TO PIPE INVERTS, BOTTOM OF STONE, TOP OF STONE) AND SUBMIT RECORDS OF THE SAME TO ENGINEER FOR REVIEW BEFORE BACKFILLING. HEAVY CONSTRUCTION EQUIPMENT SHALL BE PLACED OUTSIDE OF THE FOOTPRINT OF THE SUBSURFACE DETENTION SYSTEM TO THE MAXIMUM EXTENT PRACTICABLE, TO AVOID COMPACTION OF UNDERLYING SOILS. ONCE THE TOP OF STONE ELEVATION IS ACHIEVED, WRAP THE GEOTEXTILE OVER THE TOP TO PREVENT SILTING OF PIPES OR THE STONE. COORDINATE WITH THE ENGINEER FOR FINAL INSPECTION OF THE INSTALLED SUBSURFACE DETENTION SYSTEM BEFORE BACKFILLING. BACKFILL MATERIAL SHALL BE PLACED IN LOOSE LIFTS AND COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. INSTALL ORANGE SAFETY FENCE AROUND THE PERIMETER OF THE INFILTRATION BASIN TO KEEP HEAVY CONSTRUCTION EQUIPMENT OUTSIDE FOOTPRINT OF THE SUBSURFACE DETENTION SYSTEM.
8. GRADES WILL BE LEFT 1 FOOT BELOW TOP OF GRATE ELEVATIONS AT IN-1 AND IN-2 TO PREVENT SILT-LADEN STORMWATER RUNOFF FROM ENTERING THE SUBSURFACE PIPING. INLET FILTER BAGS SHALL BE INSTALLED ON INLET GRATES AND CHECKED PER BMP MAINTENANCE SCHEDULE. INSTALL PCSM BMPS DETAILED BY PROPOSED CONTOURS, NOTES, AND DETAILS SHOWN ON THE E&SCP & PCSM PLAN DRAWINGS. ONCE THE SITE HAS BEEN STABILIZED AND INSPECTED BY THE ENGINEER, GRADING SHALL BE BROUGHT TO FINAL ELEVATIONS.
9. GRAVEL SHALL BE INSTALLED AND GRADED ON THE PAD AREA AND ACCESS ROAD.
10. PLACE TOPSOIL IN AREAS TO BE VEGETATED. FINE GRADE TOPSOIL, APPLY FERTILIZER AND SEED. IMMEDIATELY INSTALL EROSION CONTROL BLANKETS OVER SEEDED AREAS IN ACCORDANCE WITH THIS PLAN.
11. ANY TEMPORARY BMPS INSTALLED BY CONTRACTOR DURING GRADING SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS OCCURRED WITH 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.
12. UPON ACHIEVING SITE STABILIZATION, EXCAVATE ACCUMULATED SEDIMENT IN TRAPS. REPAIR, REGRADE, RESEED, AND MULCH ANY BARE SOIL AREAS AS NEEDED TO STABILIZE THE SURFACE.
13. CLEAN WORK AREA OF ANY DEBRIS CREATED DURING CONSTRUCTION ACTIVITIES.

SPECIFICATIONS:

PCSM FACILITIES SHALL BE CONSTRUCTED PER PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL

1. SITE PREPARATION
   - A. ALL EXCAVATION AREAS, EMBANKMENTS, AND WHERE STRUCTURES ARE TO BE INSTALLED SHALL BE CLEARED AND GRUBBED AS NECESSARY.
   - B. A MINIMUM 10-FOOT RADIUS AROUND THE INLET AND OUTLET STRUCTURES CAN BE CLEARED TO ALLOW CONSTRUCTION.
   - C. CARE SHOULD BE TAKEN TO PREVENT COMPACTION OF THE BOTTOM OF THE BASIN. IF COMPACTION SHOULD OCCUR, SOILS SHOULD BE RESTORED AND AMENDED TO A DEPTH OF 18" USING A MIXTURE OF 3 PARTS SAND TO 1 PART TOPSOIL.
2. EARTH FILL MATERIAL & PLACEMENT
   - A. THE FILL MATERIAL SHOULD BE TAKEN FROM APPROVED DESIGNATED EXCAVATION AREAS. IT SHOULD BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6 INCHES, OR OTHER OBJECTIONABLE MATERIALS. MATERIALS ON THE OUTER SURFACE OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION.
   - B. THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE SITE SHOULD BE CONTROLLED. FOR THE EMBANKMENT, EACH LIFT SHOULD BE COMPACTED TO 95% OF THE STANDARD PROCTOR. FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED IN TO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.
3. STRUCTURE BACKFILL
   - A. BACKFILL ADJACENT TO PIPES AND STRUCTURES SHOULD BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHOULD BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHOULD FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHOULD DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET TO ANY PART OF THE STRUCTURE. EQUIPMENT SHOULD NOT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24 INCHES OR GREATER OVER THE STRUCTURE OR PIPE.
   - B. STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF THE PADOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. MATERIAL SHOULD BE PLACED SO THAT A MINIMUM OF 6 INCHES OF FLOWABLE FILL SHOULD BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL MATERIAL SHOULD BE 7 INCHES TO ASSURE FLOWABILITY OF THE MIXTURE. ADEQUATE MEASURES SHOULD BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOWABLE FILL ALL METAL PIPE SHOULD BE BITUMINOUS COATED. ADJOINING SOIL FILL SHOULD BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 4 INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT.
   - C. REFER TO CHAPTER 220 OF PENNDOT PUB. 408 (2000).
4. ROCK RIPRAP
   - A. ROCK RIPRAP SHOULD MEET THE REQUIREMENTS OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
5. STABILIZATION
   - A. ALL BORROW AREAS SHOULD BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHOULD BE STABILIZED BY SEEDING, PLANTING AND MULCHING.
6. ALL DRAINAGE PIPING, FLARED END SECTIONS, PRECAST STRUCTURES AND CASTINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH PADOT FORM 408 AS AMENDED.
7. ALL DRAINAGE PIPING SHALL HAVE WATER TIGHT JOINTS.

MAINTENANCE AND INSPECTION NOTES:

THESE REQUIREMENTS ARE INDEPENDENT OF THE EROSION AND SEDIMENT CONTROL REQUIREMENT DURING CONSTRUCTION. HOWEVER CERTAIN TASKS MAY OVERLAP. A REPRESENTATIVE FROM PENNEAST WILL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF ALL STORMWATER BMP'S INSTALLED AT THIS SITE.

1. SWALES:

MAINTENANCE ACTIVITIES TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH):

- A. INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, AND SEDIMENT AND DEBRIS ACCUMULATION (ADDRESS WHEN > 3 INCHES AT ANY SPOT OR COVERING VEGETATION)
- B. INSPECT VEGETATION ON SIDE SLOPES FOR EROSION AND FORMATION OF RILLS OR GULLIES, CORRECT AS NEEDED
- C. INSPECT FOR POOLS OF STANDING WATER; DEWATER AND DISCHARGE TO AN APPROVED LOCATION AND RESTORE TO DESIGN GRADE
- D. MOW AND TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER SWALE OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION; DISPOSE OF CUTTINGS IN A LOCAL COMPOSTING FACILITY; MOW ONLY WHEN SWALE IS DRY TO AVOID RUTTING
- E. INSPECT FOR LITTER; REMOVE PRIOR TO MOWING
- F. INSPECT FOR UNIFORMITY IN CROSS-SECTION AND LONGITUDINAL SLOPE, CORRECT AS NEEDED
- G. INSPECT SWALE INLET (CURB CUTS, PIPES, ETC.) AND OUTLET FOR SIGNS OF EROSION OR BLOCKAGE, CORRECT AS NEEDED

MAINTENANCE ACTIVITIES TO BE DONE AS NEEDED:

- A. PLANT ALTERNATIVE GRASS SPECIES IN THE EVENT OF UNSUCCESSFUL ESTABLISHMENT
- B. RESEED BARE AREAS; INSTALL APPROPRIATE EROSION CONTROL MEASURES WHEN NATIVE SOIL IS EXPOSED OR EROSION CHANNELS ARE FORMING
- C. ROTOTILL AND REPLANT SWALE IF DRAW DOWN TIME IS MORE THAN 48 HOURS
- D. INSPECT AND CORRECT CHECK DAMS WHEN SIGNS OF ALTERED WATER FLOW (CHANNELIZATION, OBSTRUCTIONS, EROSION, ETC.) ARE IDENTIFIED
- E. WATER DURING DRY PERIODS, FERTILIZE, AND APPLY PESTICIDE ONLY WHEN ABSOLUTELY NECESSARY

MAINTENANCE UNDER WINTER CONDITIONS:

- A. INSPECT SWALE IMMEDIATELY AFTER THE SPRING MELT, REMOVE RESIDUALS (E.G. SAND) AND REPLACE DAMAGED VEGETATION WITHOUT DISTURBING REMAINING VEGETATION.
- B. IF ROADSIDE OR PARKING LOT RUNOFF IS DIRECTED TO THE SWALE, MULCHING AND/OR SOIL AERATION/MANIPULATION MAY BE REQUIRED IN THE SPRING TO RESTORE SOIL STRUCTURE AND MOISTURE CAPACITY AND TO REDUCE THE IMPACTS OF DEICING AGENTS.
- C. USE NONTOXIC, ORGANIC DEICING AGENTS, APPLIED EITHER AS BLENDED, MAGNESIUM CHLORIDE-BASED LIQUID PRODUCTS OR AS PRETREATED SALT.
- D. USE SALT-TOLERANT VEGETATION IN SWALES.

2. INFILTRATION BASINS:

- A. OUTLET CONTROL STRUCTURES WILL BE INSPECTED AND CLEANED AT LEAST TWO TIMES PER YEAR AND AFTER RUNOFF EVENTS.
- B. THE BASIN WILL BE INSPECTED AFTER RUNOFF EVENTS TO MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN 72 HOURS. THE BASIN WILL ALSO BE INSPECTED FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION CONTROL MEASURES, SIGNS OF WATER CONTAMINATION/ SPILLS. ACCUMULATED SEDIMENT WILL BE REMOVED (ADDRESS WHEN > 3 INCHES AT ANY SPOT) BY EITHER MANUAL METHODS OR VACUUM TRUCK.
- C. SEDIMENT WILL BE PROPERLY DISPOSED OF.

TABLE E.1 LIMITATIONS OF PENNSYLVANIA SOILS
PERTAINING TO EARTHMOVING PROJECTS
(ABSENCE OF AN X DOES NOT MEAN "NO POTENTIAL LIMITATION")

LIMITING SOIL CHARACTERISTICS LEGEND																			
MAP SYMBOL	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	MIN. DEPTH TO BEDROCK	pH
McD	MARDIN VERY STONY LOAM, 8 TO 25 PERCENT SLOPES	X	S	X	X		X	X	X	X	X		X				X	X	

SOURCE: PADEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, TG NO.363-2134-008

THE SOIL LIMITATIONS SHALL BE ADDRESSED AS FOLLOWS:

LIMITATIONS AND RESOLUTIONS:

LIMITATION: CUTBANKS CAVE, LOW STRENGTH - CUTBANKS HAVE POTENTIAL TO CAVE AND MANY SOILS ARE LOW STRENGTH.
RESOLUTION: CONTRACTOR SHALL BE AWARE OF POTENTIAL ISSUES AND FOLLOW OSHA GUIDELINES FOR OPEN TRENCHING. LOW SOIL STRENGTH IS NOT A CONCERN DUE TO THE NATURE OF THE PROPOSED PROJECT. UTILITY TRENCHING WILL NOT BE ADVERSELY EFFECTED BY POOR SOIL STRENGTH.

LIMITATION: CORROSIVE TO STEEL AND/OR CONCRETE
RESOLUTION: IF STEEL PIPE IS USED RUST PROTECTION BY COATINGS AND/OR USE OF CATHODIC PROTECTION IS RECOMMENDED. IF CONCRETE IS USED SOIL SHALL BE TESTED AND CONCRETE COATED AS RECOMMENDED BY MANUFACTURER.

LIMITATION: DROUGHTY - SOILS EXHIBITING A POOR MOISTURE-HOLDING CAPACITY, WHICH MAY LIMIT THE VEGETATIVE STABILIZATION ABILITY OF THE SOIL.
RESOLUTION: FOR DROUGHTY SOILS, CONTRACTOR TO REFER TO "TABLE 11-3: PLANT TOLERANCES OF SOIL LIMITATION FACTORS" TO SELECT APPROPRIATE VEGETATION. EROSION CONTROL BLANKETS SHOULD ALSO BE CONSIDERED IN SOIL CONDITIONS THAT MAKE REVEGETATION DIFFICULT (E.G. DROUGHTY). WHEN INSTALLED PROPERLY, EROSION CONTROL BLANKETS CAN HELP HOLD SOIL PARTICLES IN PLACE AND RETAIN SOIL MOISTURE, PROMOTING SEED GERMINATION.

LIMITATION: EASILY ERODIBLE
RESOLUTION: SPECIAL ATTENTION SHALL BE GIVEN TO MAINTAINING EXISTING VEGETATION IN EASILY ERODIBLE SOILS, TO THE EXTENT POSSIBLE. EASILY ERODIBLE SOILS WITHIN 50 FEET OF A SURFACE WATER SHOULD BE BLANKETED. WHEREVER ERODIBLE SOILS ARE PRESENT, OR WHERE THERE IS NOT A SUFFICIENT VEGETATIVE FILTER STRIP BETWEEN THE WATERBAR AND A RECEIVING SURFACE WATER, THE WATERBAR SHOULD BE PROVIDED WITH A TEMPORARY PROTECTIVE LINER.

LIMITATION: FLOODING - ANY SOIL SUBJECT TO INUNDATION DURING A 2-YEAR/24HR STORM EVENT.
RESOLUTION: (SEE WET SOILS)

LIMITATION: HIGH WATER TABLE, POTENTIALLY HYDRIC - HIGH WATER TABLE IS TO BE EXPECTED AND MANY OF THE SOILS ARE POTENTIALLY HYDRIC.
RESOLUTION: FOLLOW E&S PLAN WITH REGARD TO PUMPING AND DEWATERING. DISCHARGE OF SEDIMENT LADEN WATER IS PROHIBITED UNLESS WITHOUT FIRST PASSING THRU A "PUMPED WATER FILTER BAG" BMP.

LIMITATION: HYDRIC / HYDRIC INCLUSIONS - A SOIL THAT IS SATURATED, FLOODED, OR PONDED LONG ENOUGH DURING THE GROWING SEASON TO DEVELOP ANAEROBIC-CONDITIONS. WHEN SUCH A SOIL IS LOCATED IN AN AREA THAT HAS HYDROPHYTIC VEGETATION AND WETLAND HYDROLOGY, A WETLAND IS PRESENT.
RESOLUTION: HYDRIC SOILS THAT ARE DELINEATED WETLANDS, SHOULD BE AVOIDED TO THE EXTENT POSSIBLE. STAGING AREAS SHOULD BE LOCATED 50 FEET FROM THE EDGE OF WETLAND. MOVEMENT OF VEHICLES ACROSS WETLAND MUST BE MINIMIZED. WHERE VEHICLES NEED TO CROSS WETLANDS, THE USE OF TEMPORARY TIMBER MATS SHALL BE USED DUE TO THE POTENTIAL FOR RUTTING. TRENCH PLUGS SHALL BE INSTALLED TO PREVENT THE TRENCH FROM DRAINING THE WETLANDS OR CHANGING THE HYDROLOGY.

LIMITATION: LOW STRENGTH / LANDSLIDE PRONE - SOILS WITH LOW STRENGTH HAVE A LESSER ABILITY TO RESIST SLOPE FAILURE, SUCH AS SLUMPING, FLOWING, ETC. MATERIALS WITH LOW SHEAR STRENGTH ARE MORE SUSCEPTIBLE TO LANDSLIDES AND EMBANKMENT FAILURES.
RESOLUTION: PRECAUTIONS SHOULD BE TAKEN TO PREVENT SLOPE FAILURES DUE TO IMPROPER CONSTRUCTION PRACTICES SUCH AS OVER-STEEPENING AND OVERLOADING SLOPES, REMOVAL OF LATERAL SUPPORT, AND FAILURE TO PREVENT SATURATION OF SLOPES. SETBACKS SHOULD COMPLY WITH THE STANDARDS CONTAINED IN CHAPTER 16 OF THE, "PADEP - EROSION AND SEDIMENT CONTROL PROGRAM MANUAL," UNLESS IT CAN BE SHOWN THAT PROPOSED CUTS AND FILLS DO NOT POSE A HAZARD TO PUBLIC SAFETY OR SURFACE WATERS. ALSO, ROAD FILL MATERIAL WILL LIKELY NEED TO BE IMPORTED IN AREAS WHERE SOILS HAVE LOW STRENGTH.

LIMITATION: SLOW PERCOLATION - PERMEABILITY RATE LESS THAN OR EQUAL TO 0.2 INCHES/HR.
RESOLUTION: BMPS TO BE INSPECTED AFTER RUNOFF EVENTS, MAKE SURE THERE IS ADEQUATE AREA FOR PUMPED WATER DISCHARGE. PCSM FACILITIES DESIGN BASED ON SITE SPECIFIC TESTING.
LIMITATION: PIPING
RESOLUTION: PIPING POTENTIAL IN THE SOIL WILL BE MINIMIZED BY THE USE OF TRENCH PLUGS. FURTHERMORE, ANY PLANNED EMBANKMENTS OR PERMANENT IMPOUNDMENTS SUSCEPTIBLE TO PIPING SHALL UTILIZE ANTI-SEEP COLLARS OR FILTER DIAPHRAGMS ON OUTLET BARRELS.

LIMITATION: LIMITED AVAILABLE TOPSOIL
RESOLUTION: ANY EXCAVATED TOPSOIL WILL BE STOCKPILED AND REUSED. IF NECESSARY, ADDITIONAL TOPSOIL WILL BE BROUGHT ON-SITE.

LIMITATION: FROST ACTION - THE LIKELIHOOD OF UPWARD OR LATERAL EXPANSION OF THE SOIL CAUSED BY THE FORMATION OF SEGREGATED ICE LENSES, OR FROST HEAVE, AND THE SUBSEQUENT COLLAPSE OF THE SOIL AND LOSS OF STRENGTH ON THAWING, WHICH CAN DAMAGE ROADS, BUILDINGS, AND OTHER STRUCTURES AS WELL AS PLANT ROOTS.
RESOLUTION: PRECAUTIONS ARE NEEDED TO PREVENT DAMAGE TO ROADWAYS AND STRUCTURES.

LIMITATION: WET SOILS - SOME SOILS MAY EXHIBIT A HIGH WATER TABLE OR PONDING.
RESOLUTION: IF HIGH WATER TABLE IS ENCOUNTERED, TRENCH DEWATERING WILL BE EMPLOYED. LOCATE PCSM FACILITIES AWAY FROM WET SOILS.

LIMITATION: MIN. DEPTH TO BEDROCK - SOME SOILS HAVE A MIN DEPTH OF BEDROCK LESS THAN THE THE TYPICAL TRENCH DEPTH OF 7 FT (ASSUMES 3 FT OF COVER, PIPE DIAMETER, AND BEDDING DEPTH OF 1 FT).
RESOLUTION: CONTRACTOR TO PLAN FOR ROCK REMOVAL DURING TRENCHING OPERATIONS. FOR SEDIMENT BARRIERS REQUIRING STAKING (E.G. SILT FENCES, ETC.), DEPTH TO BEDROCK LESS THAN 2 FT CAN IMPACT ABILITY TO DRIVE STAKE AND/OR POLE (FOR SUPER SILT FENCE). IN THESE AREAS, COMPOST FILTER SOCK OR OTHER APPLICABLE BMP NOT REQUIRING STAKING MAY BE CONSIDERED.

LIMITATION: pH - SOME SOILS HAVE pH VALUES LESS THAN 5.5, WHICH MAY LIMIT THE VEGETATIVE STABILIZATION ABILITY OF THE SOIL.
RESOLUTION: AS IS TYPICAL FOR THESE TYPE OF SOILS, LIME WILL BE ADDED AS NEEDED TO PRODUCE VEGETATIVE STABILITY.

LIMITATION: LOW FERTILITY
RESOLUTION: IF NECESSARY TO PRODUCE VEGETATIVE STABILITY OF THE SOIL, FERTILIZER OR NUTRIENT SUPPLEMENTS WILL BE ADDED TO THE SOIL TO PRODUCE VEGETATIVE STABILITY. FOR LOW FERTILITY SOILS, CONTRACTOR TO REFER TO "TABLE 11-3: PLANT TOLERANCES OF SOIL LIMITATION FACTORS" TO SELECT APPROPRIATE VEGETATION. EROSION CONTROL BLANKETS SHOULD ALSO BE CONSIDERED IN SOIL CONDITIONS THAT MAKE REVEGETATION DIFFICULT (E.G. LOW FERTILITY). WHEN INSTALLED PROPERLY, EROSION CONTROL BLANKETS CAN HELP HOLD SOIL PARTICLES IN PLACE AND RETAIN SOIL MOISTURE, PROMOTING SEED GERMINATION.

Test Pit No.	Existing Grade Elevation (feet)	Proposed BMP Invert (feet)	Infiltration Test Elevation (feet)	Excavation Depth Elevation (feet)	Depth to High Groundwater (feet)
BM-ST-TP-1	705.2	701.0	701.7	5.5	No evidence of high groundwater observed
BM-ST-TP-2	704.5	701.0	701.0	5.5	No evidence of high groundwater observed

TEST PIT DATA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE082720

10/25/2019

Know what's below. Call before you dig.

CLIENT APPROVAL

DATE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
B	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)

PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
CHECKED BY	WMC	SCALE	AS SHOWN
APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-007	REV NO.	B

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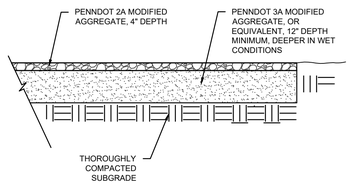
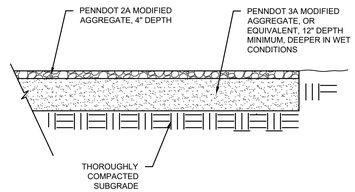


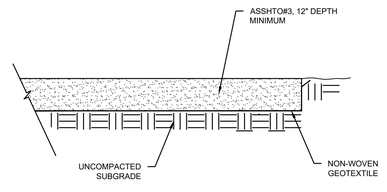
TYPICAL ACCESS ROAD CROSS-SECTION DETAIL

N.T.S.



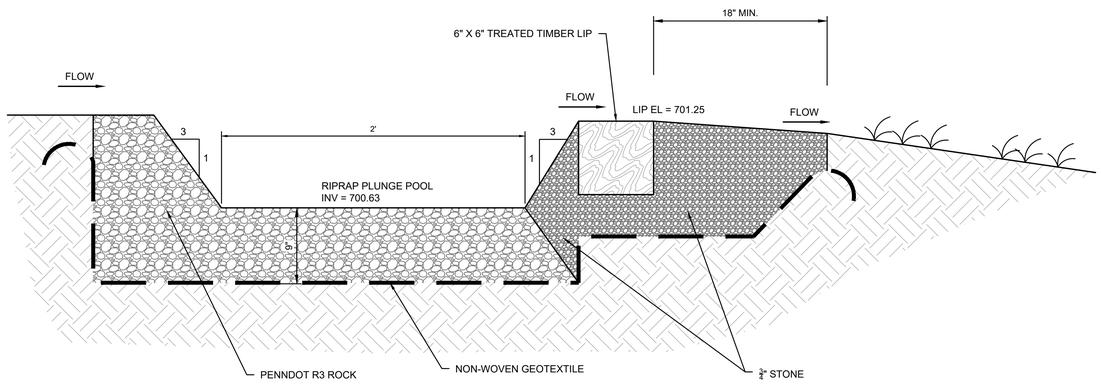
TYPICAL PAD
CROSS SECTION DETAIL

N.T.S.



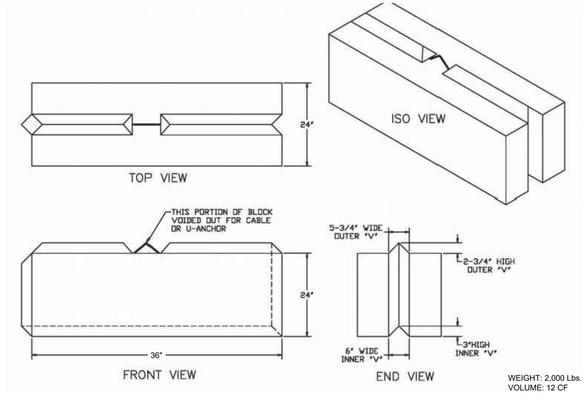
PAD INFILTRATION AREA
CROSS SECTION DETAIL
(COMPACTION TO BE MINIMIZED)

N.T.S.



LEVEL SPREADER WITH TIMBER LIP

NO SCALE



TYPICAL CONCRETE BLOCK DETAIL

(NOT TO SCALE)

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
W. MICHAEL CLARK
ENGINEER
PE#082730

10/25/2019

Know what's below. Call before you dig.

CLIENT APPROVAL

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PennEast PIPELINE

PENNEAST PIPELINE PROJECT
BLUE MOUNTAIN SIDE VALVE
TYPICAL ACCESS ROAD AND PAD SECTIONS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY	CAF	DATE ISSUED	10/15/2018
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APPROVED BY	JRD	APPROVED BY	
DWG. NO.	028A-03-07-008	REV. NO.	B

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