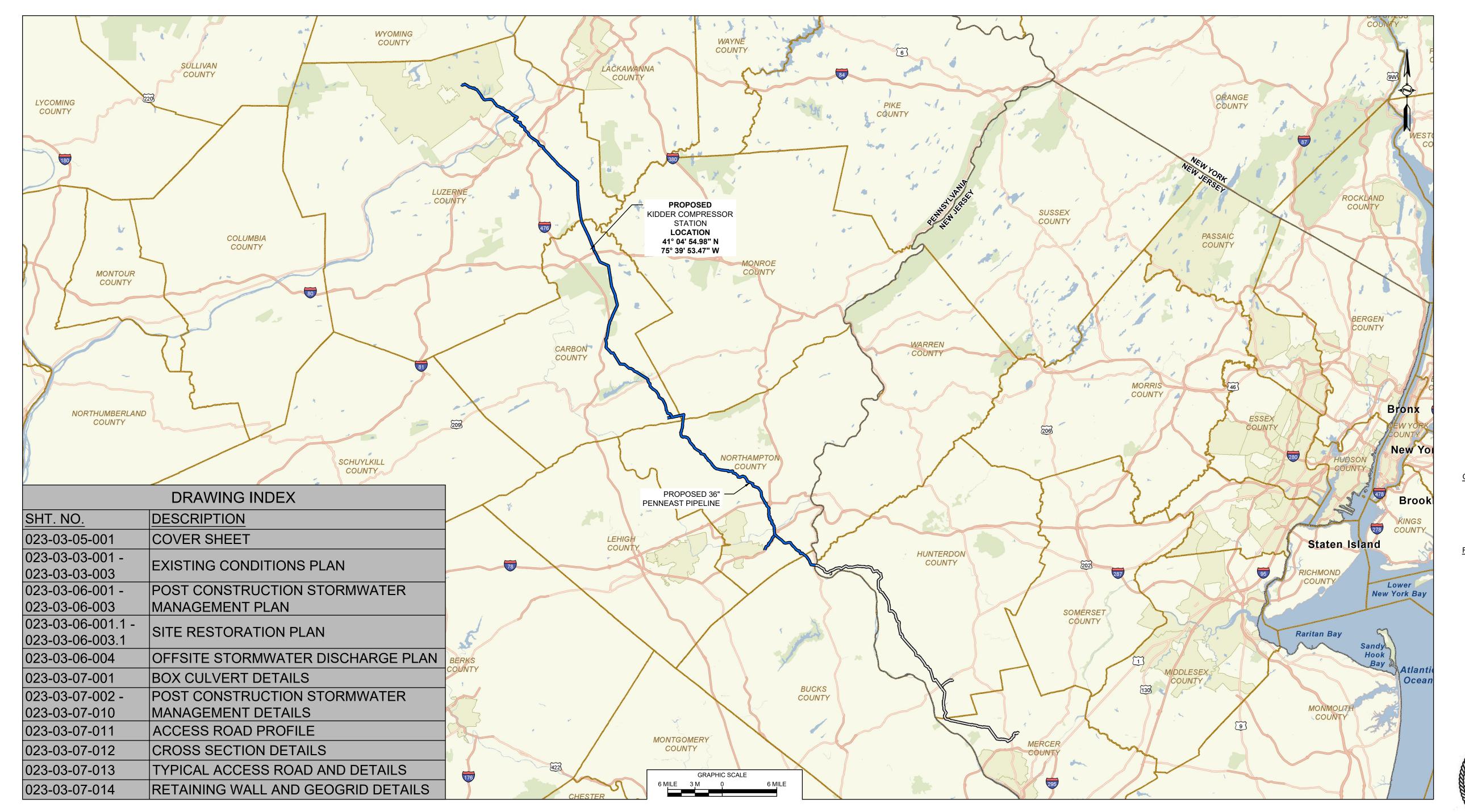
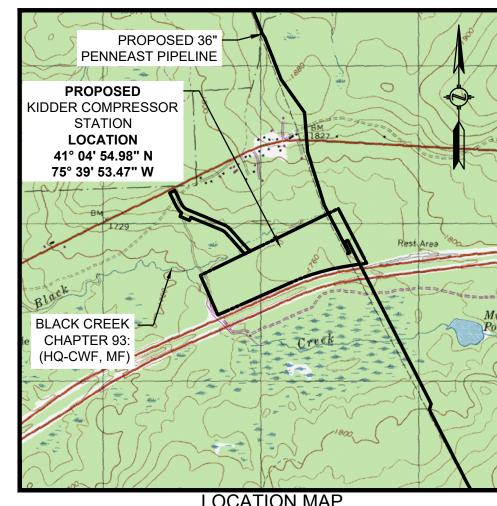
PENNEAST PIPELINE COMPANY, LLC

KIDDER COMPRESSOR STATION KIDDER TOWNSHIP CARBON COUNTY, PENNSYLVANIA PADEP - POST CONSTRUCTION STORMWATER MANAGEMENT PLAN





LOCATION MAP SCALE: 1" =2000' USGS QUAD: HICKORY RUN, PA

1. THIS PLAN SET CONTAINS INFORMATION FOR THE POST CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSM PLAN) REQUIRED FOR THE PADEP ESCGP. 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.

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.

- 2. SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU
- 3. PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED
- PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY. 4. WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2018.
- 5. HORIZONTAL DATUM IS UTM83-18F. VERTICAL DATUM IS NAVD1988

PENNSYLVANIA ONE-CALL SERIAL NUMBERS

20162661360-000





MACDONALD 111 WOOD AVENUE SOUTH ISELIN, NJ 08830 **UNITED STATES** 973-379-3400

INFO@MOTTMAC.COM

10/15/2018 AS SHOWN

	REFERENCE DRAWINGS		REVISIONS					
DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CK	APPR	
		Α	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)	$\mathbf{D}_{\mathbf{r}}$
		В	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)	
		<u> </u>						// PIPELINE
		<u> </u>						PIPELINE
		<u> </u>						
		<u> </u>						THIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC ("P.E."). IT MAY CONTAIN INFORMATION DESCRIBING TECHNOLOGY OWNED BY P.E. AND DEEMED TO BE COMMERCIALLY SENSITIVE. IT IS TO BE USED ONLY IN
•	· · · · · · · · · · · · · · · · · · ·	4		1	1	1	1	DESCRIBITO TECHNOLOGI OWITED BY T.E. MID DELINED TO BE COMMENCIALLY CENCITIVE. IT IS TO BE COLD ONE! IN



NNECTION WITH WORK PERFORMED FOR P.E. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER T RK FOR P.E. IS EXPRESSLY FORBIDDEN EXCEPT BY EXPRESS WRITTEN PERMISSION OF P.E. IT IS TO BE SAFEGUA GAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PAR

PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION **COVER SHEET**

CARBON COUNTY, PENNSYLVANIA CAF DATE ISSUED DRAWN BY WMC SCALE CHECKED BY JRD | APPROVED BY

CARBON COUNTY, PENNSYLVANIA USGS QUAD: HICKORY RUN, PENNSYLVANIA KIDDER COMPRESSOR STATION PROJECT LOCATION LAT 41° 04' 54.98" N PROPOSED 36" PENNEAST PIPELINE WATERBODY 112514_JC_1002_I_MI WETLAND 102114_JC_001_PFO PE-CA-012.001 WATERBODY 112514_JC_1001_I_MI LOCATION MAP SCALE: 1" = 15 MILES FLOODWAY 112514_JC_1001_I_MI LEGENDS PROPOSED FACILITY PERMANENT EASEMENT FACILITY LIMITS OF DISTURBANCE RIPARIÁN BUFFER 112514_JC_1001_I_MI ESCGP BOUNDARY EXISTING MAJOR CONTOUR ---- 658'- --- EXISTING MINOR CONTOUR SOIL BOUNDARY SOIL TYPE ABBREVIATION EXISTING UTILITY POLE PE-CA-A646.000 LINE LIST NUMBER WETLAND (DELINEATED) WATERBODY (DELINEATED) APPROXIMATE 100 YEAR FLOODWAY 112414_JC_004_PF0 --- APPROXIMATE 150' RIPARIAN BUFFER — EXISTING ROAD CENTERLINE OH EXISTING OVERHEAD LINE 10/25/2019 ENVIRONMENTAL NOTES: AS PER §102.4(B)(5)(III), THE LAND USE CHARACTERISTICS ARE CLASSIFIED BY PRIMARY VEGETATION COVER TYPE AND/OR PREDOMINANT LAND USE. THE MAJORITY OF THE FACILITY SITE IS LAND USE TYPE FORESTED/WOODLAND, WITH ABOUT 0.1 ACRES OF THE WORKSPACE ON OPEN LAND. AS PER §102.4(B)(5)(V), THE SITE DRAINS TO AN UNT TO BLACK CREEK, WHICH HAS A CHAPTER 93 DESIGNATED USE OF HQ-CWF (HIGH QUALITY COLD WATER FISH), AND MF (MIGRATORY FISH). REFERENCE DRAWINGS REVISIONS PENNEAST PIPELINE PROJECT DESCRIPTION DWG. NO. DATE DRAWN CK APPR 1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. KIDDER COMPRESSOR STATION ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED A ISSUED FOR PADEP **EXISTING CONDITIONS PLAN** 10/2019 MWF(MM) DOW(MM) MJD(MM) B RE-ISSUED FOR PADEP 2. SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019. CARBON COUNTY, PENNSYLVANIA

CAF DATE ISSUED

JRD APPROVED BY

KEK SCALE

023-03-03-001

10/15/201

AS SHOWN

DRAWN BY

CHECKED BY

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DESCRIBING TECHNOLOGY OWNED BY P.E. AND DEEMED TO BE COMMERCIALLY SENSITIVE. IT IS TO BE USED ONLY IN
CONNECTION WITH WORK PERFORMED FOR P.E. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN
WORK FOR P.E. IS EXPRESSLY FORBIDDEN EXCEPT BY EXPRESS WRITTEN PERMISSION OF P.E. IT IS TO BE SAFEGUARDED
A GAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.

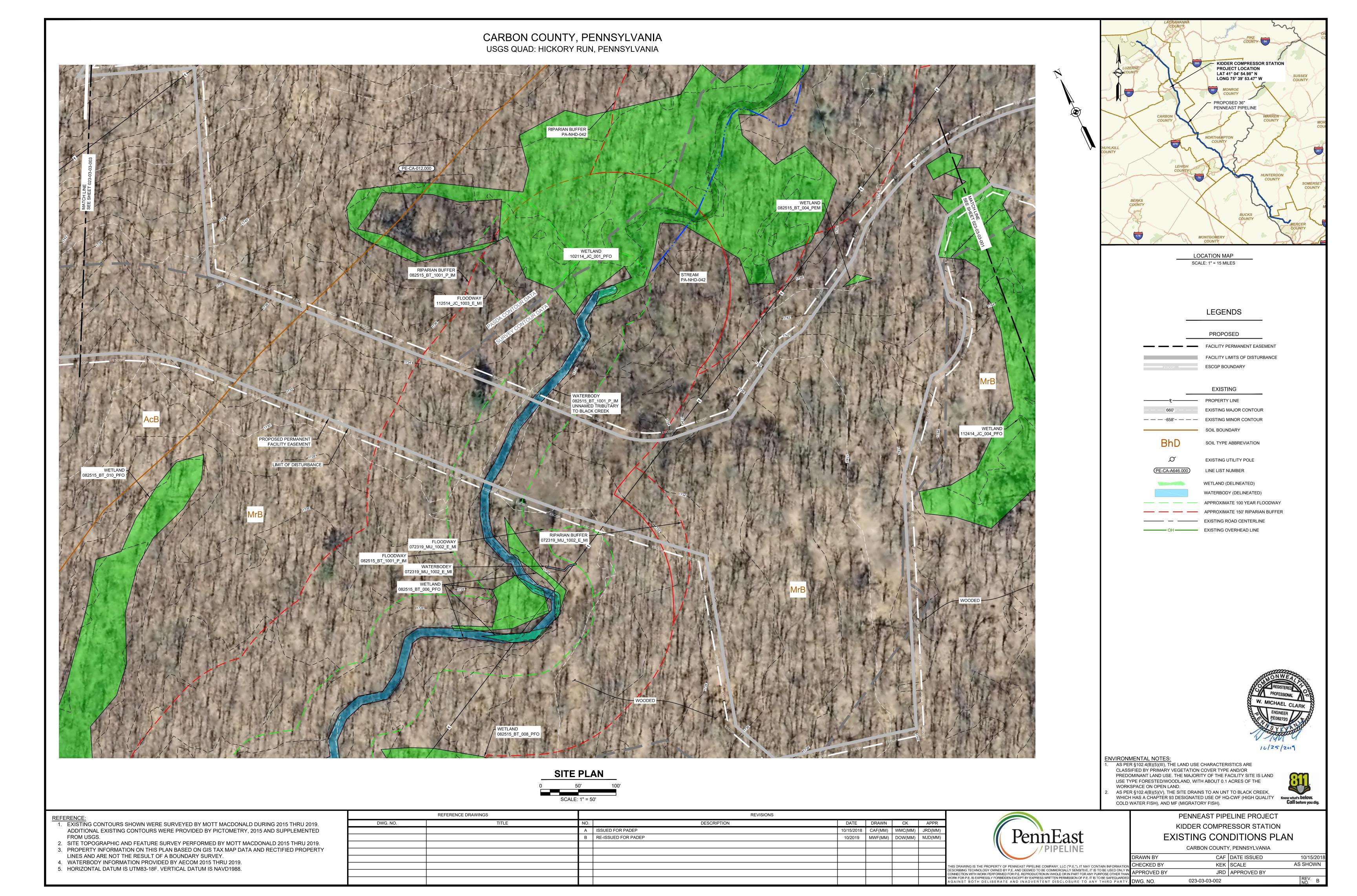
DWG. NO.

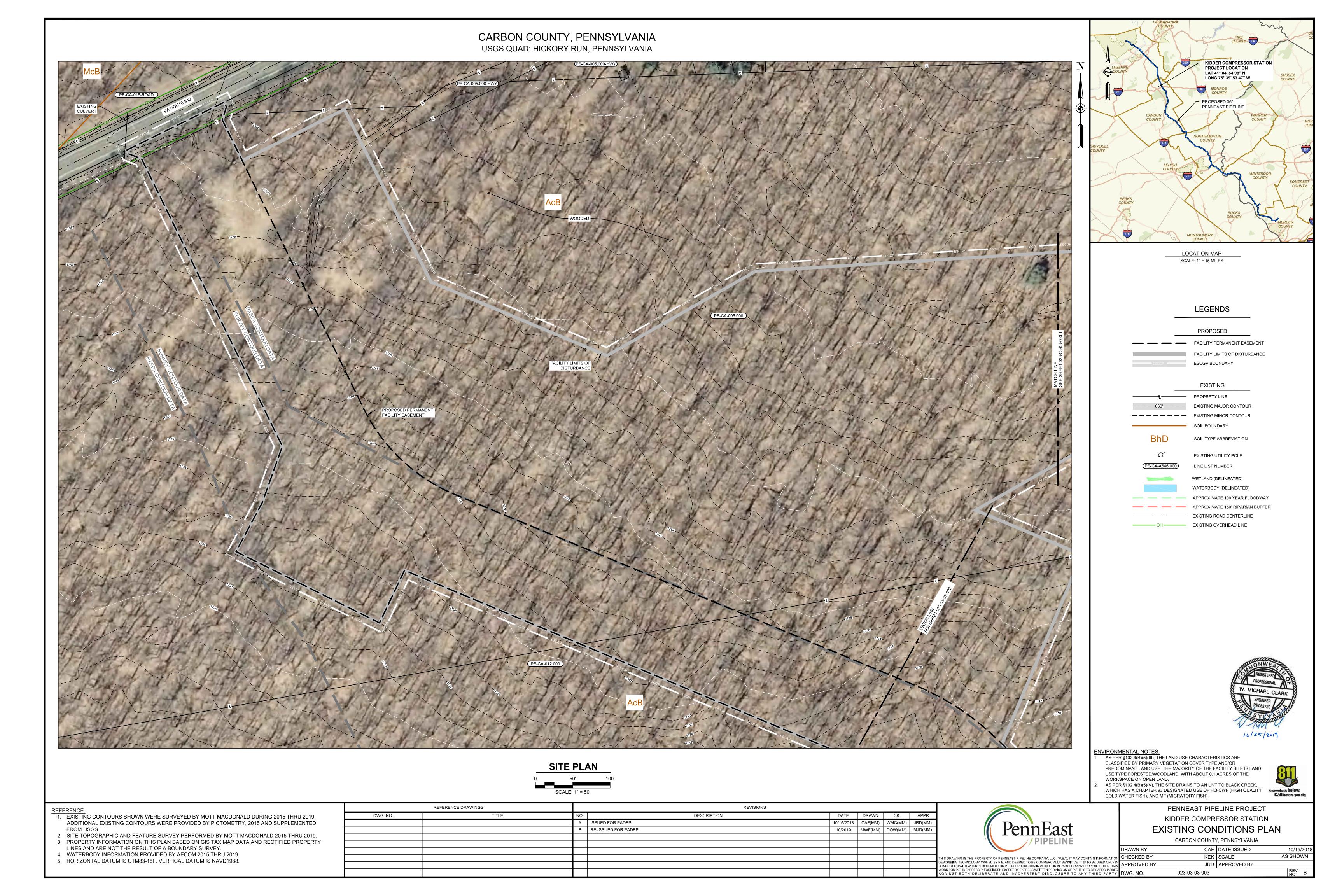
3. PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY

LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY.

4. WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2019.

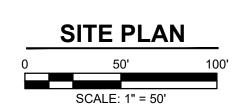
5. HORIZONTAL DATUM IS UTM83-18F. VERTICAL DATUM IS NAVD1988.





CARBON COUNTY, PENNSYLVANIA USGS QUAD: HICKORY RUN, PENNSYLVANIA





REFERENCE DRAWINGS 1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED 2. SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019.

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DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
		В	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	MJD(MM)
		·					
							1
				1			\sim

REVISIONS



DRAWN BY

WORKSPACE ON OPEN LAND.

ENVIRONMENTAL NOTES:

PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION **EXISTING CONDITIONS PLAN**

CARBON COUNTY, PENNSYLVANIA CAF DATE ISSUED

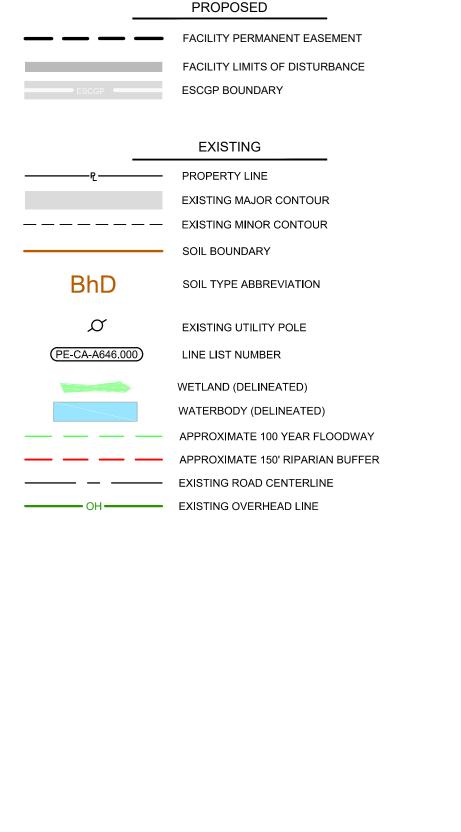
AS PER §102.4(B)(5)(III), THE LAND USE CHARACTERISTICS ARE CLASSIFIED BY PRIMARY VEGETATION COVER TYPE AND/OR

COLD WATER FISH), AND MF (MIGRATORY FISH).

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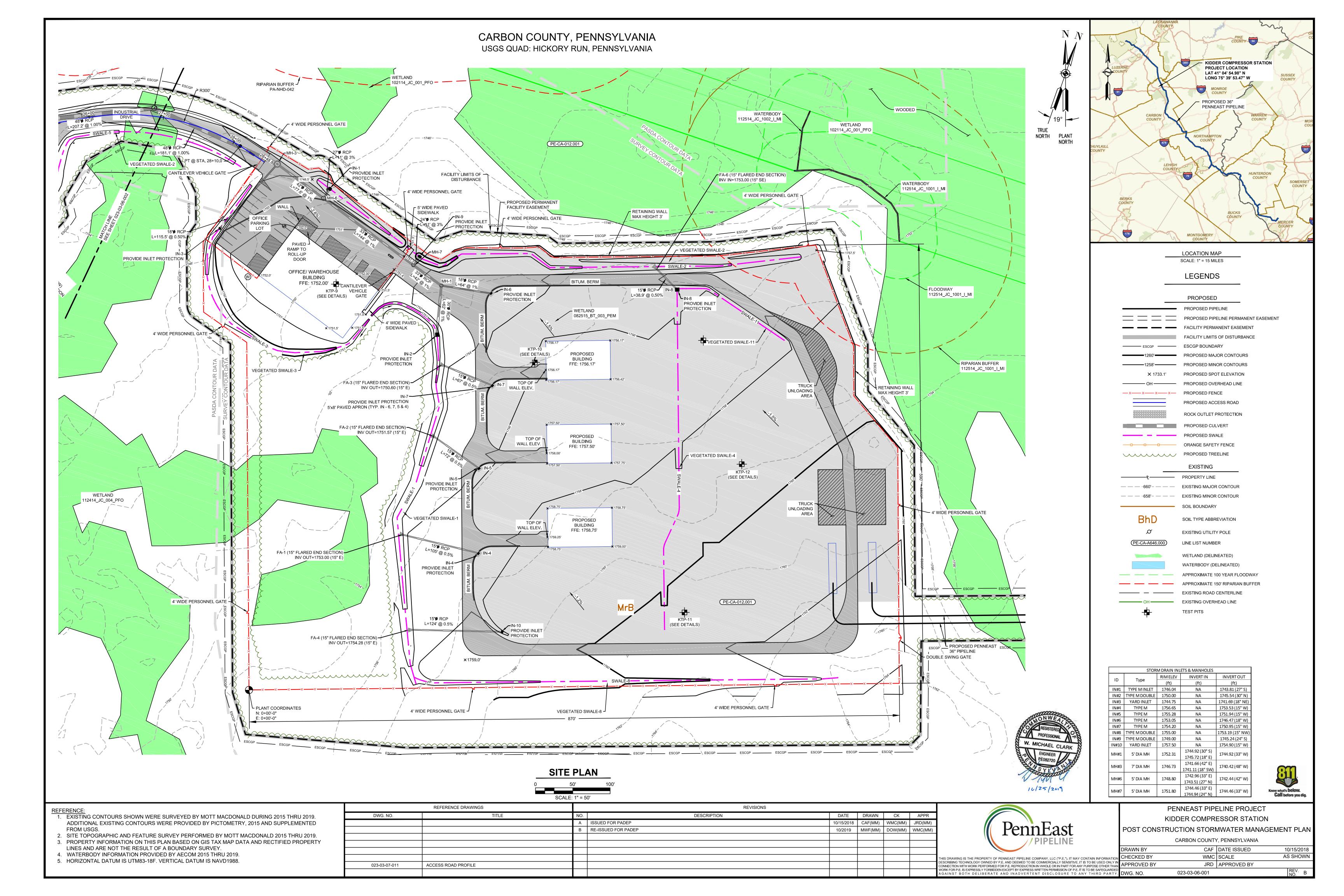


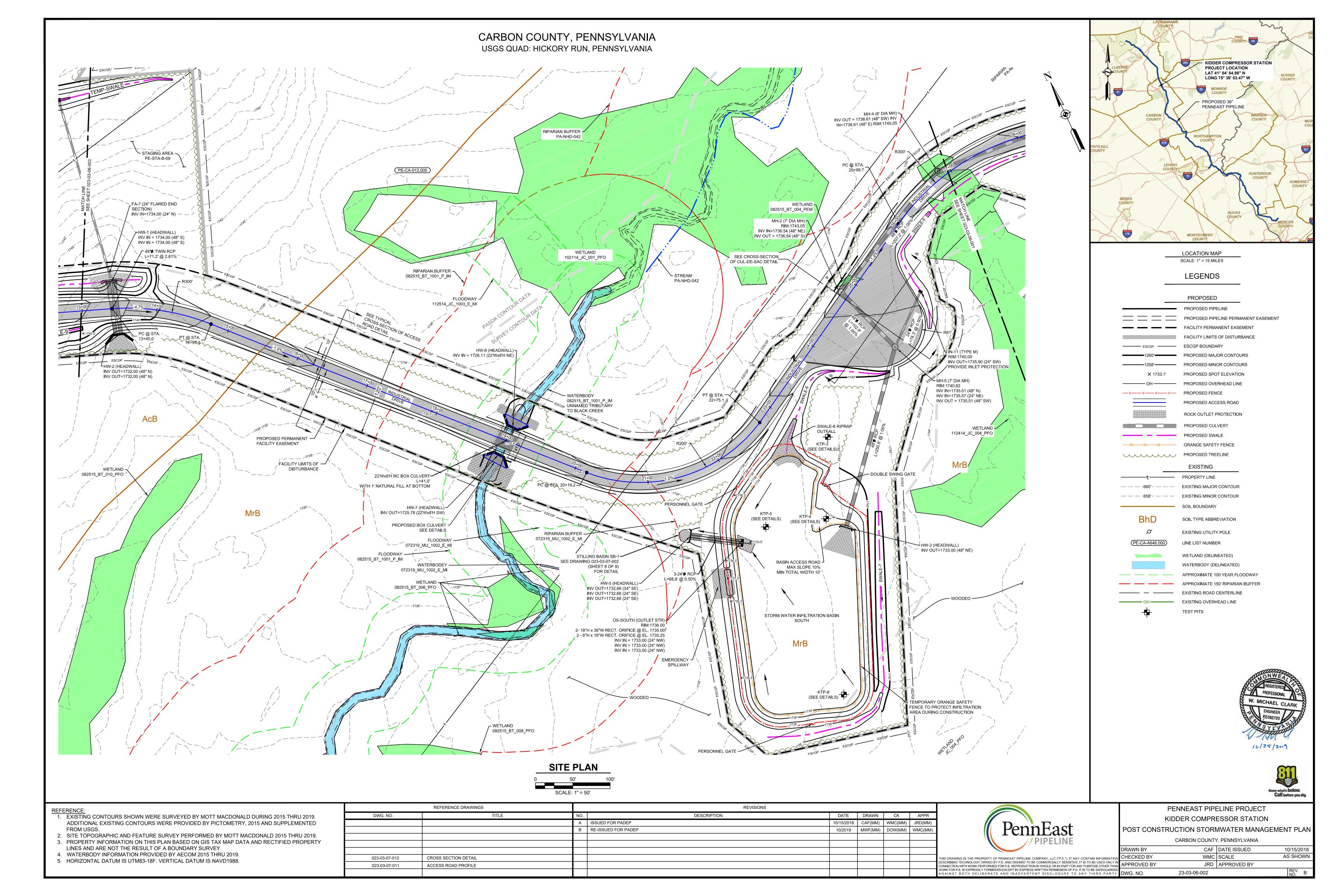
KIDDER COMPRESSOR STATION PROJECT LOCATION LAT 41° 04' 54.98" N

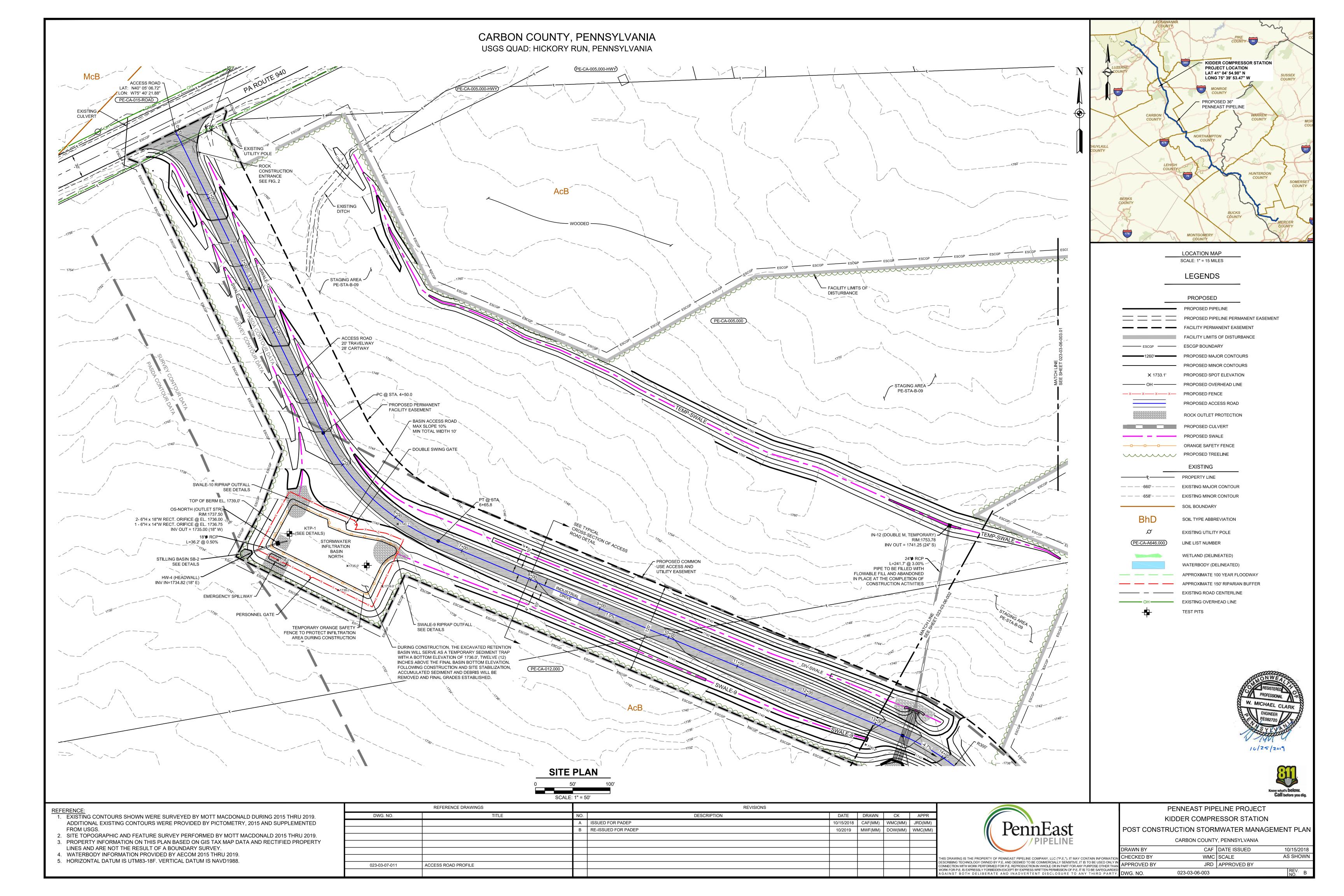
PROPOSED 36"
PENNEAST PIPELINE

LOCATION MAP SCALE: 1" = 15 MILES

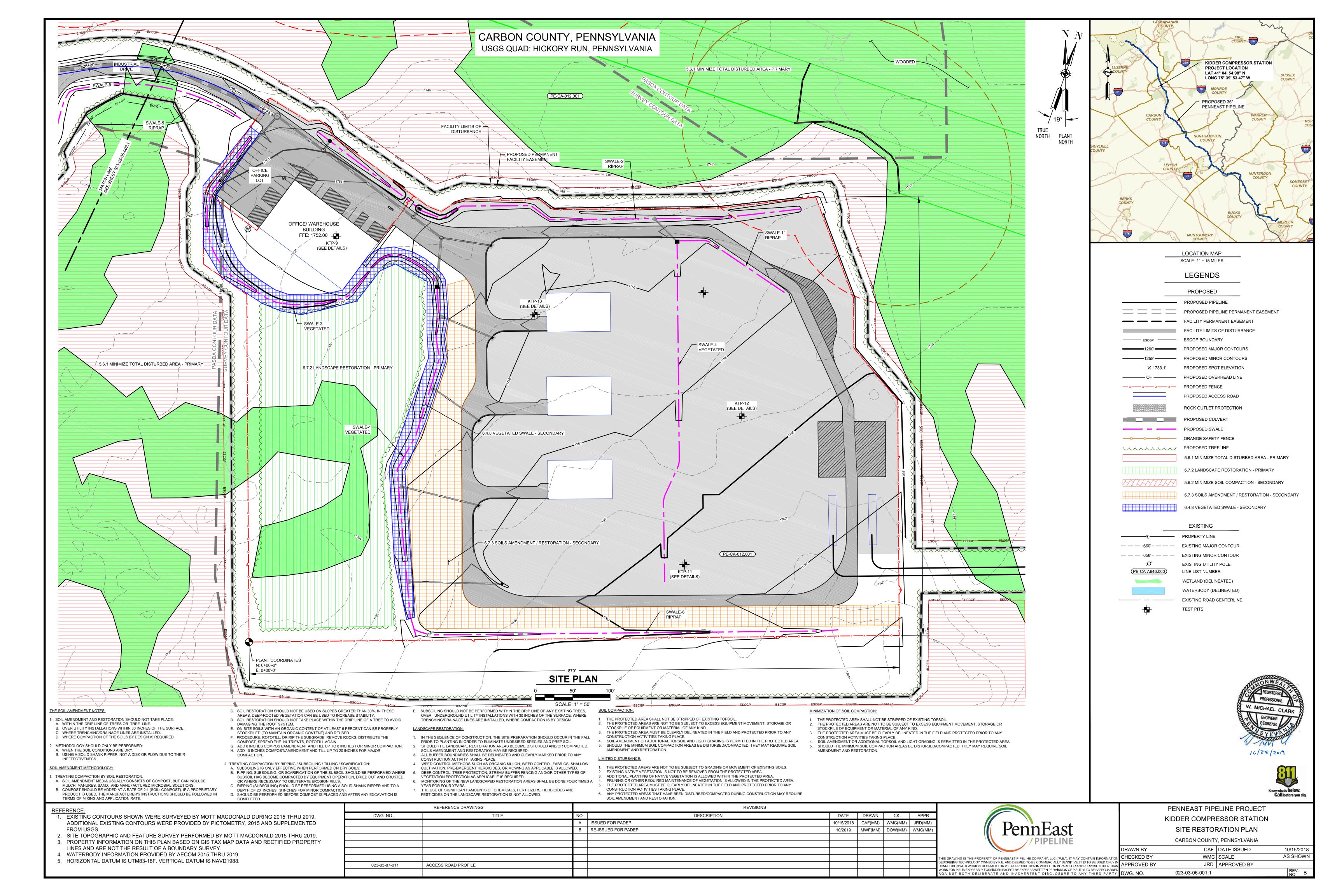
LEGENDS

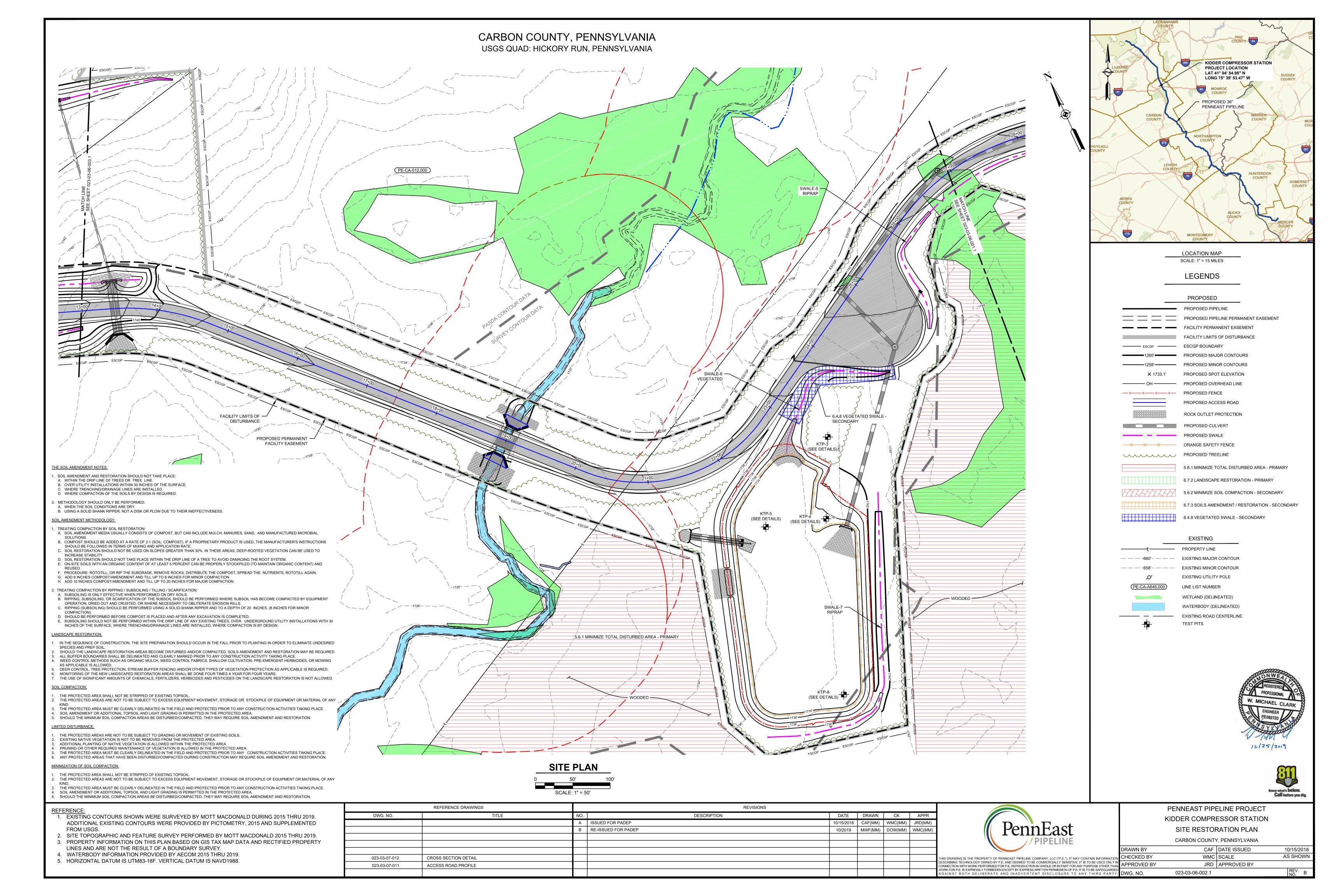


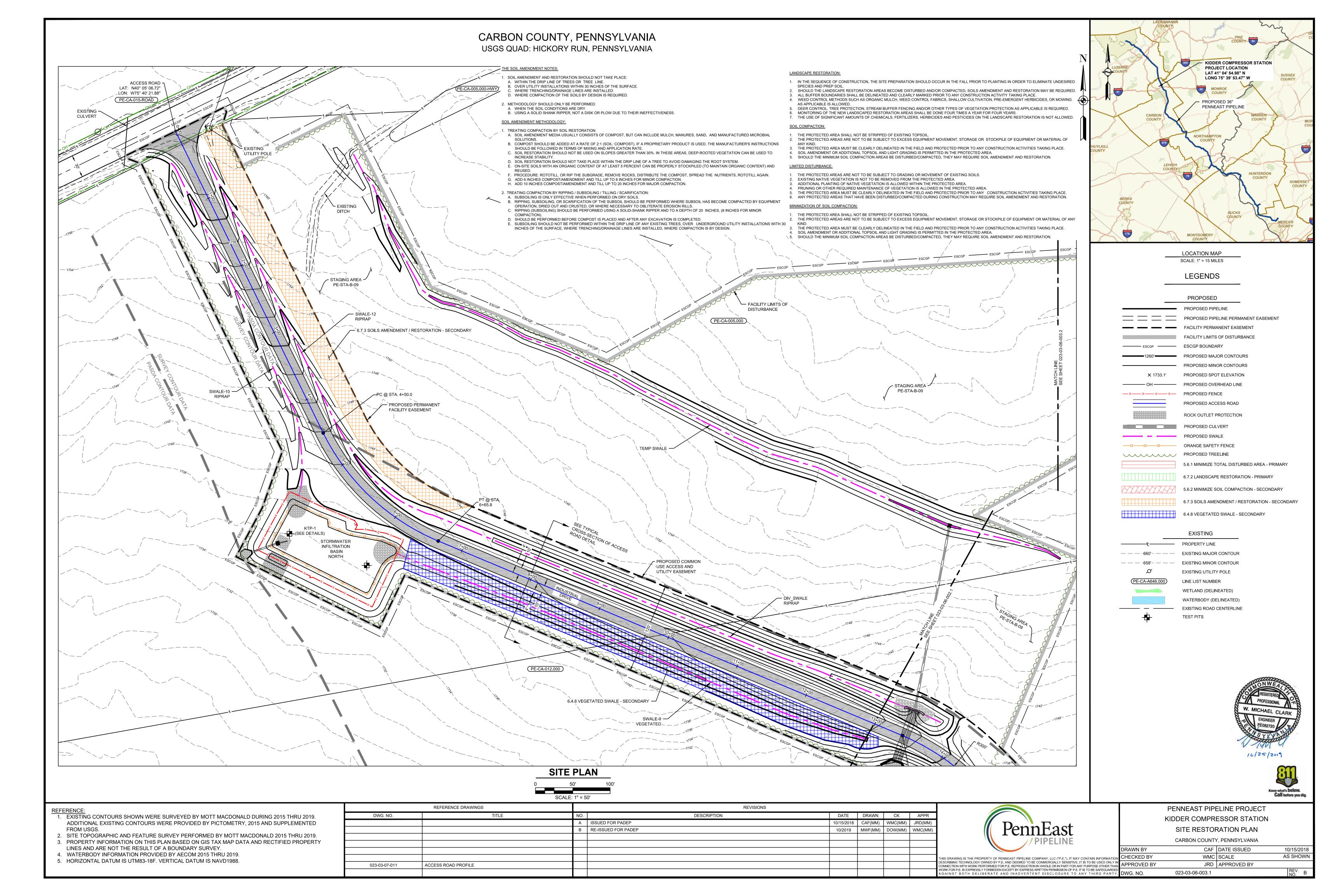




CARBON COUNTY, PENNSYLVANIA USGS QUAD: HICKORY RUN, PENNSYLVANIA KIDDER COMPRESSOR STATION PROJECT LOCATION LAT 41° 04' 54.98" N PROPOSED 36" PENNEAST PIPELINE LOCATION MAP SCALE: 1" = 15 MILES LEGENDS PROPOSED PROPOSED PIPELINE PROPOSED PIPELINE PERMANENT EASEMENT FACILITY PERMANENT EASEMENT FACILITY LIMITS OF DISTURBANCE ----- ESCGP BOUNDARY PROPOSED SPOT ELEVATION OH PROPOSED OVERHEAD LINE — x — x — x — PROPOSED FENCE PROPOSED ACCESS ROAD ROCK OUTLET PROTECTION PROPOSED CULVERT PROPOSED SWALE ORANGE SAFETY FENCE PROPOSED TREELINE **EXISTING** PROPERTY LINE — — — -660'— — — EXISTING MAJOR CONTOUR ---- 658'- --- EXISTING MINOR CONTOUR SOIL BOUNDARY SOIL TYPE ABBREVIATION EXISTING UTILITY POLE LINE LIST NUMBER WETLAND (DELINEATED) 112414_JC_001_PEM WATERBODY (DELINEATED) APPROXIMATE 100 YEAR FLOODWAY APPROXIMATE 150' RIPARIAN BUFFER EXISTING ROAD CENTERLINE SCALE: 1" = 50' REFERENCE DRAWINGS PENNEAST PIPELINE PROJECT DWG. NO. DESCRIPTION DATE DRAWN CK APPR 1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. KIDDER COMPRESSOR STATION A ISSUED FOR PADEP ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED 10/15/2018 | CAF(MM) | WMC(MM) | JRD(MM) POST CONSTRUCTION STORMWATER MANAGEMENT PLAN B RE-ISSUED FOR PADEP 10/2019 MWF(MM) DOW(MM) WMC(MM) 2. SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019. CARBON COUNTY, PENNSYLVANIA 3. PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY. CAF DATE ISSUED DRAWN BY 10/15/2018 4. WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2019. AS SHOWN CHECKED BY WMC SCALE THIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC ("P.E."). IT MAY CONTAIN INFORMATION DESCRIBING TECHNOLOGY OWNED BY P.E. AND DEEMED TO BE COMMERCIALLY SENSITIVE. IT IS TO BE USED ONLY IN CONNECTION WITH WORK PERFORMED FOR P.E. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN WORK FOR P.E. IS EXPRESSLY FORBIDDEN EXCEPT BY EXPRESS WRITTEN PERMISSION OF P.E. IT IS TO BE SAFEGUARDED A GAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY. DWG. NO. 5. HORIZONTAL DATUM IS UTM83-18F. VERTICAL DATUM IS NAVD1988. JRD APPROVED BY ACCESS ROAD PROFILE 023-03-07-011







CARBON COUNTY, PENNSYLVANIA USGS QUAD: HICKORY RUN, PENNSYLVANIA

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.
- 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 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)
- F. PROCEDURE: ROTOTILL, OR RIP THE SUBGRADE, REMOVE ROCKS, DISTRIBUTE THE COMPOST, SPREAD THE NUTRIENTS, ROTOTILL
- 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

LANDSCAPE RESTORATION:

- 1. IN THE SEQUENCE OF CONSTRUCTION, THE SITE PREPARATION SHOULD OCCUR IN THE FALL PRIOR TO PLANTING IN ORDER TO ELIMINATE
- SHOULD THE LANDSCAPE RESTORATION AREAS BECOME DISTURBED AND/OR COMPACTED, SOILS AMENDMENT AND RESTORATION MAY BE
- 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
- DEER CONTROL, TREE PROTECTION, STREAM BUFFER FENCING AND/OR OTHER TYPES OF VEGETATION PROTECTION AS APPLICABLE IS
- 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

SOIL COMPACTION:

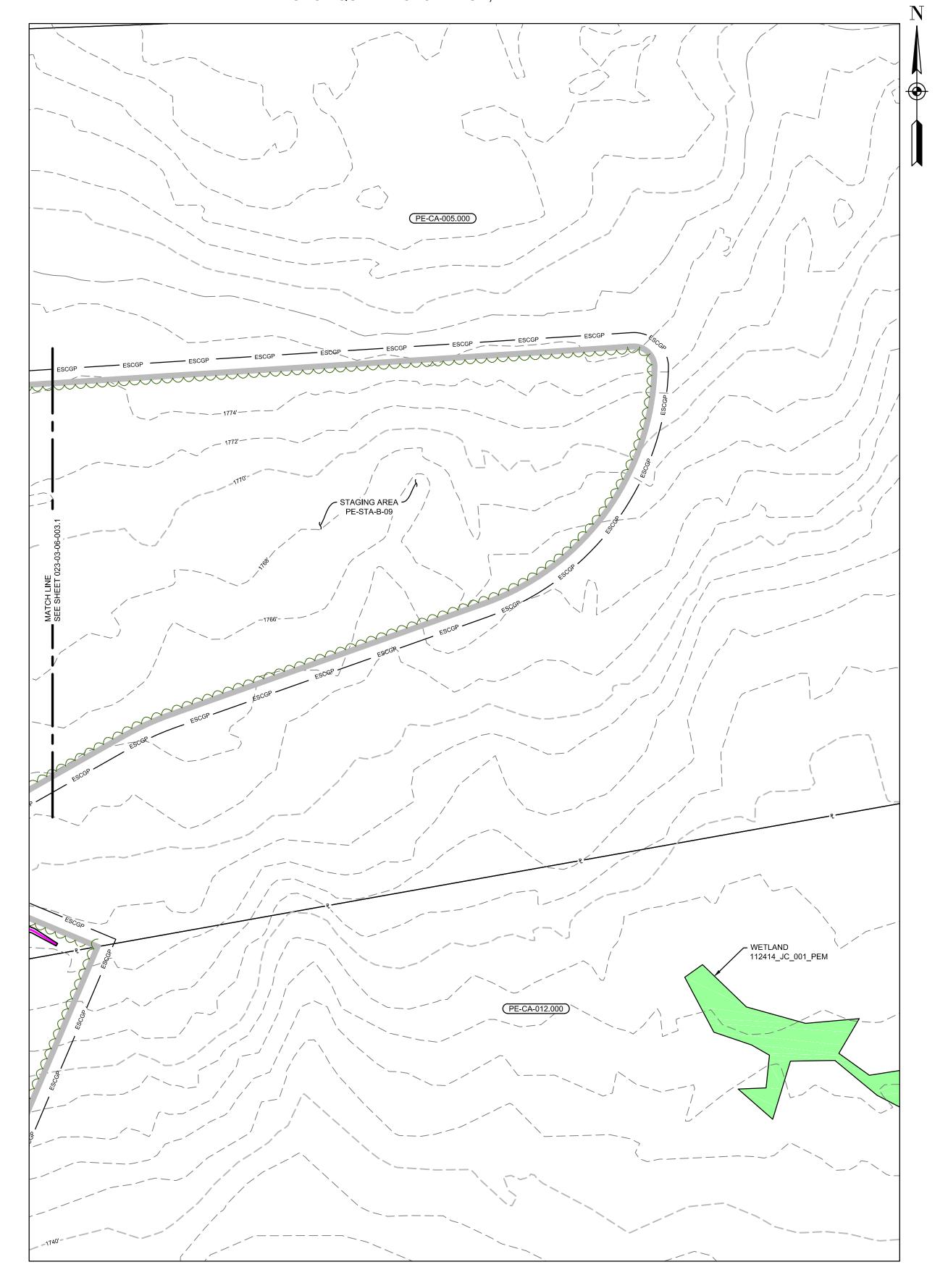
- 1. THE PROTECTED AREA SHALL NOT BE STRIPPED OF EXISTING TOPSOIL. THE PROTECTED AREAS ARE NOT TO BE SUBJECT TO EXCESS EQUIPMENT MOVEMENT, STORAGE OR STOCKPILE OF EQUIPMENT OR
- THE PROTECTED AREA MUST BE CLEARLY DELINEATED IN THE FIELD AND PROTECTED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING
- 4. SOIL AMENDMENT OR ADDITIONAL TOPSOIL AND LIGHT GRADING IS PERMITTED IN THE PROTECTED AREA.
- 5. SHOULD THE MINIMUM SOIL COMPACTION AREAS BE DISTURBED/COMPACTED, THEY MAY REQUIRE SOIL AMENDMENT AND RESTORATION.

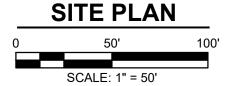
LIMITED DISTURBANCE:

- 1. THE PROTECTED AREAS ARE NOT TO BE SUBJECT TO GRADING OR MOVEMENT OF EXISTING SOILS.
- EXISTING NATIVE VEGETATION IS NOT TO BE REMOVED FROM THE PROTECTED AREA. ADDITIONAL PLANTING OF NATIVE VEGETATION IS ALLOWED WITHIN THE PROTECTED AREA.
- PRUNING OR OTHER REQUIRED MAINTENANCE OF VEGETATION IS ALLOWED IN THE PROTECTED AREA.
- THE PROTECTED AREA MUST BE CLEARLY DELINEATED IN THE FIELD AND PROTECTED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING 6. ANY PROTECTED AREAS THAT HAVE BEEN DISTURBED/COMPACTED DURING CONSTRUCTION MAY REQUIRE SOIL AMENDMENT AND

RESTORATION. MINIMIZATION OF SOIL COMPACTION:

- 1. THE PROTECTED AREA SHALL NOT BE STRIPPED OF EXISTING TOPSOIL.
- THE PROTECTED AREAS ARE NOT TO BE SUBJECT TO EXCESS EQUIPMENT MOVEMENT, STORAGE OR STOCKPILE OF EQUIPMENT OR MATERIAL OF ANY KIND. 3. THE PROTECTED AREA MUST BE CLEARLY DELINEATED IN THE FIELD AND PROTECTED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING
- 4. SOIL AMENDMENT OR ADDITIONAL TOPSOIL AND LIGHT GRADING IS PERMITTED IN THE PROTECTED AREA. 5. SHOULD THE MINIMUM SOIL COMPACTION AREAS BE DISTURBED/COMPACTED, THEY MAY REQUIRE SOIL AMENDMENT AND RESTORATION.





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DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CK	APPR	
		Α	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)	$\mathbf{D}_{\mathbf{r}}$
		В	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)	l Penneast I
								// PIPELINE
								PIPELINE
								THIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC ("P.E."). IT MAY CONTAIN INFORMATION $oldsymbol{C}$
023-03-07-011	ACCESS ROAD PROFILE							DESCRIBING TECHNOLOGY OWNED BY P.E. AND DEEMED TO BE COMMERCIALLY SENSITIVE. IT IS TO BE USED ONLY IN CONNECTION WITH WORK PERFORMED FOR P.E. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN
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PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION SITE RESTORATION PLAN

023-03-06-003.2

CARBON COUNTY, PENNSYLVANIA CAF DATE ISSUED DRAWN BY 10/15/2018 AS SHOWN WMC SCALE CHECKED BY JRD APPROVED BY

- KIDDER COMPRESSOR STATION

PROJECT LOCATION LAT 41° 04' 54.98" N

- PROPOSED 36"

LOCATION MAP

SCALE: 1" = 15 MILES

LEGENDS

PROPOSED

PROPOSED PIPELINE

PROPOSED PIPELINE PERMANENT EASEMENT

FACILITY PERMANENT EASEMENT

FACILITY LIMITS OF DISTURBANCE

PROPOSED MAJOR CONTOURS

— PROPOSED MINOR CONTOURS

PROPOSED SPOT ELEVATION

PROPOSED ACCESS ROAD

ROCK OUTLET PROTECTION

6.7.2 LANDSCAPE RESTORATION - PRIMARY

6.4.8 VEGETATED SWALE - SECONDARY

PROPERTY LINE -660'- — — EXISTING MAJOR CONTOUR

---- -658'- ---- EXISTING MINOR CONTOUR

EXISTING

EXISTING UTILITY POLE

WETLAND (DELINEATED) WATERBODY (DELINEATED) EXISTING ROAD CENTERLINE

LINE LIST NUMBER

TEST PITS

5.6.2 MINIMIZE SOIL COMPACTION - SECONDARY

5.6.1 MINIMIZE TOTAL DISTURBED AREA - PRIMARY

6.7.3 SOILS AMENDMENT / RESTORATION - SECONDARY

ESCGP BOUNDARY

— X — X — X — PROPOSED FENCE

PROPOSED CULVERT

PROPOSED SWALE

PROPOSED TREELINE

ORANGE SAFETY FENCE

OH PROPOSED OVERHEAD LINE

PENNEAST PIPELINE

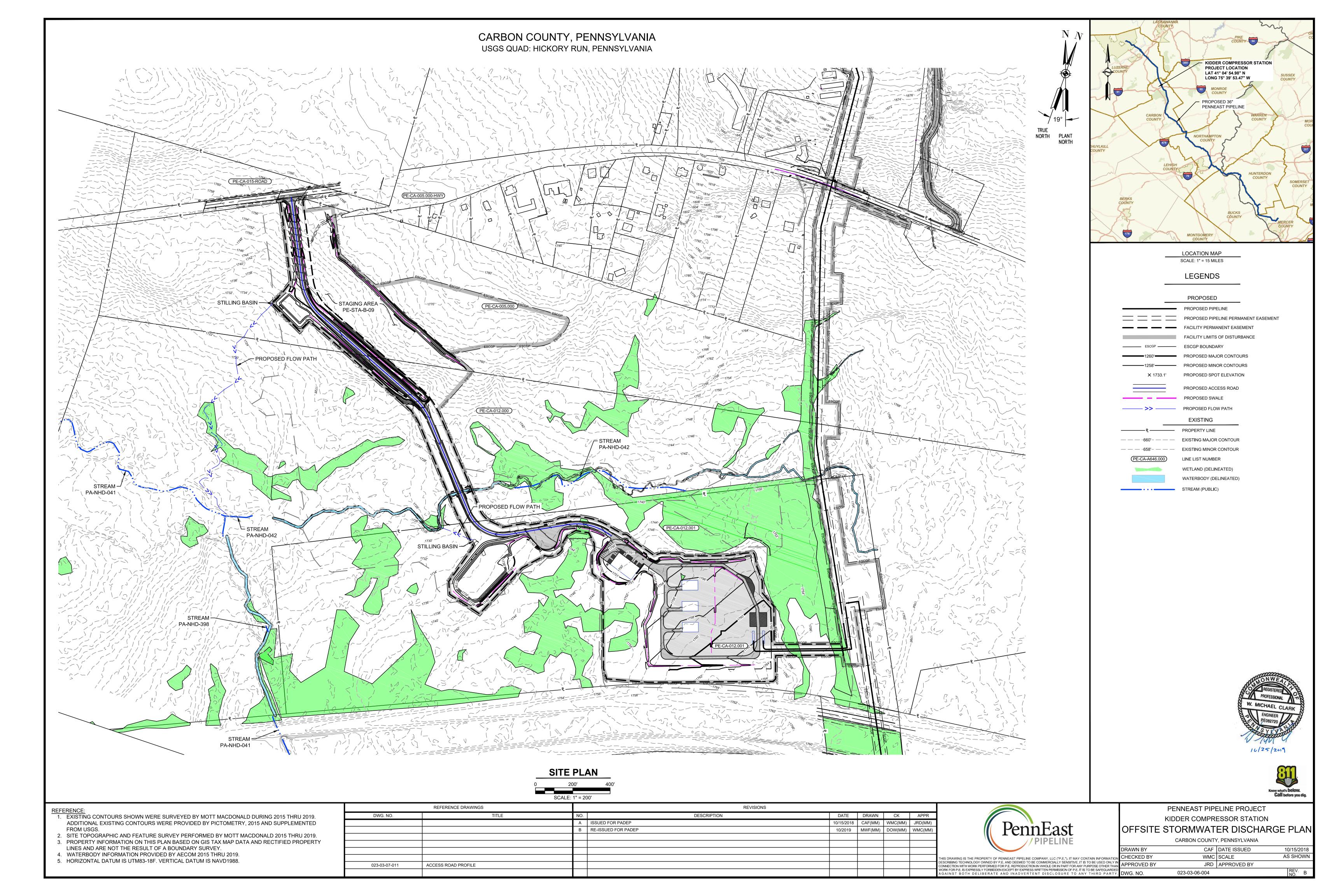
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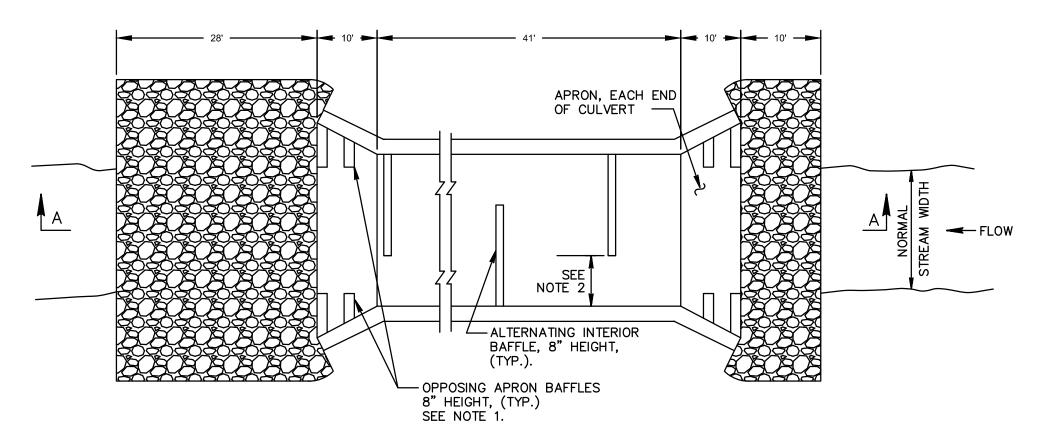
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2. SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019.

3. PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY

ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED





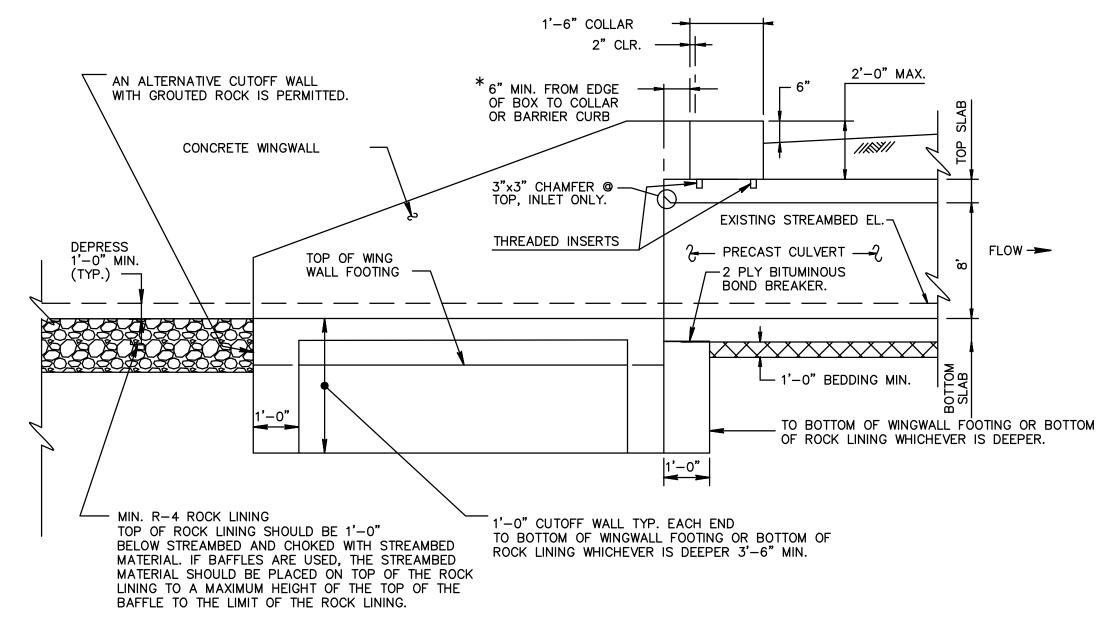
ROADWAY CROSS SLOPE ROADWAY PROFILE GRADE ₩ WING WALL (SEE DETAIL) EXISTING STREAMBED ELEY SEE NOTE 3 CUTOFF WALL, CUTOFF WALL, SEE NOTE ! SEE NOTE 4 SEE NOTE 4 (TYP.) (TYP.)

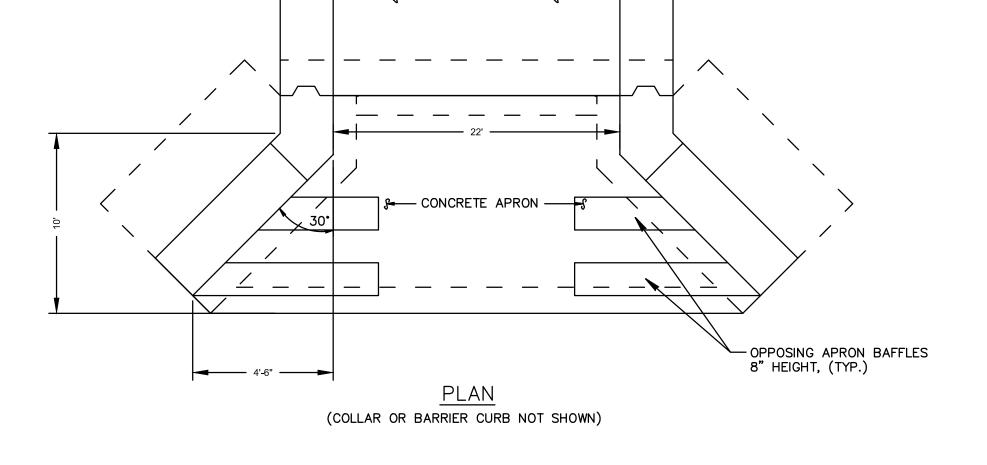
SECTION A-A

PLAN VIEW

PRE-FABRICATED BOX CULVERT

NOT TO SCALE





ELEVATION

PROFILE

CULVERT WINGWALLS NOT TO SCALE

BOX CULVERT DESIGN CRITERIA

THE ENGINEER OF RECORD SHALL DELEGATE THE RESPONSIBILITY FOR THE DESIGN AND PLANS OF THE BOX CULVERT TO A SPECIALTY ENGINEER LICENSED IN THE COMMONWEALTH OF PENNSYLVANIA. BASIS OF DESIGN AND PROVIDED ITEMS ASSOCIATED WITH THE BOX CULVERT CONSTRUCTION SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

- 1. SUBMIT SHOP DRAWINGS AND CALCULATIONS TO THE ENGINEER OF RECORD FOR REVIEW PRIOR TO FABRICATING ANY BRIDGE COMPONENTS. SHOP DRAWINGS AND DESIGN CALCULATIONS SHALL BE SIGNED, DATED, AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN PENNSYLVANIA.
- 2. BOX CULVERT DESIGN AND CONSTRUCTION SHALL MEET THE FOLLOWING CRITERIA: a. DESIGN SPECIFICATIONS: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LOAD AND RESISTANCE FACTOR (LRFD) BRIDGE DESIGN SPECIFICATIONS (7TH) EDITION AND ALL SUBSEQUENT INTERIMS.
- b. GOVERNING CONSTRUCTION SPECIFICATIONS: COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT) PUBLICATION 408/2016 SPECIFICATIONS AS AMENDED BY THESE PLANS OR PROJECT SPECIFICATIONS. c. DESIGN LOADINGS:
- i. DEAD LOADS
- 1. SELF-WEIGHT OF ALL STRUCTURAL COMPONENTS AND TRAFFIC RAILING
- 2. EARTHWORK/FILL 120 PCF 3. ASPHALT - 145 PCF
- 4. FUTURE ADDITIONAL ASPHALT 15 PSF
- ii. LIVE LOADS FOR BOX CULVERT AND WING WALLS 1. HL-93 DESIGN LOAD
- 2. PENNDOT LEGAL LOAD FOR LOAD RATING
- 3. CONSTRUCTION LOADING: IT IS THE CONSTRUCTION CONTRACTOR'S RESPONSIBILITY TO PROVIDE SUPPORT FOR CONSTRUCTION LOADS THAT EXCEED HL-93 LOADING AND ANY CONSTRUCTION LOAD APPLIED PRIOR TO THE PLACEMENT OF THE DESIGN COMPACTED FILL
- ABOVE THE TOP SLAB. 4. TL-3 TRAFFIC RAILING LOAD
 - e. MATERIAL PROPERTIES AND CONCRETE CLEAR COVER SHALL MEET PENNDOT
 - f. FILTER FABRIC SHALL BE PLACED OVER JOINTS IN SLABS AND HEADWALLS AS REQUIRED TO PREVENT SOIL LEACHING UNDER FULLY SUBMERGED CONDITIONS. THE DESIGN LIFE OF THE FILTER FABRIC AND PLACEMENT DETAILS SHALL BE NO LESS THAN THE BOX CULVERT
 - g. BOX CULVERT GEOMETRY SHALL PROVIDE THE REQUIRED HYDRAULIC OPENING, SLAB ELEVATIONS, AND BRIDGE WIDTH SHOWN IN THE PLANS. LARGER STRUCTURES WHICH
 - h. LIMIT DIFFERENTIAL SETTLEMENT BETWEEN SEPARATE ADJACENT PRECAST BOX SECTIONS
- 3. CONTRACTOR SHALL SUBMIT A SIGNED AND SEALED LOAD RATING FOR THE AS-BUILT CONDITION OF THE BOX CULVERT MEETING THE REQUIREMENTS OF THE PENNDOT BRIDGE

SIGNED AND SEALED BY THE BOX CULVERT SPECIALTY ENGINEER.

4. CONTRACTOR SHALL PROVIDE AS-BUILT BOX CULVERT PLANS AND A CERTIFICATION LETTER STATING THAT THE STRUCTURE HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. BOTH THE AS-BUILT PLANS AND THE CERTIFICATION LETTER SHALL BE

NOTES:

- 1. THE OPENING IN THE APRON BAFFLES SHOULD BE EQUAL TO AVERAGE NORMAL WIDTH OF THE STREAM. THE APRON BAFFLES SHOULD CONNECT TO THE WING WALLS AT EACH SIDE OF THE CULVERT. PLACE THE FIRST SET OF BAFFLES AT THE END OF THE APRON. IF THE APRON IS GREATER THAN 8'-0" LONG, A SECOND SET OF OPPOSING BAFFLES ARE REQUIRED TO BE SET AT 1/2 THE DISTANCE FROM THE END BAFFLE TO THE FACE OF THE BOX. FOR LONGER APRONS, BAFFLES NOT TO EXCEED 8' - 0" SPACING.
- 2. THE OPENING IN THE INTERIOR BAFFLES SHOULD BE EQUAL TO 1/3 THE AVERAGE NORMAL WIDTH OF THE STREAM.
- 3. BAFFLES SHOULD BE SPACED AT THE AVERAGE NORMAL STREAM WIDTH OR 8', WHICHEVER IS GREATER. THE FIRST INTERIOR BAFFLE AT THE OUTLET SHOULD BE LOCATED AS CLOSE TO THE DOWNSTREAM END OF CULVERT AS
- POSSIBLE AND SPACED ACCORDINGLY FROM THAT POINT TO THE INLET. 4. CUTOFF WALL IS TO ENSURE STREAMFLOW DOES NOT PASS BENEATH THE CULVERT. BOTTOM OF CUTOFF WALL IS TO EQUAL WING WALL FOOTINGS
- OR ROCK LINING WHICHEVER IS DEEPER 3'-6" MIN. ROCK LINING AT THE INLET AND OUTLET SHOULD BE DEPRESSED THE ENTIRE LENGTH AND CHOKED WITH NATURAL STREAMBED MATERIAL. THE ROCK SHOULD BE FLUSH WITH THE CULVERT BOTTOM, NOT THE TOP OF THE BAFFLES. STREAMBED MATERIAL SALVAGED FROM EXCAVATION FOR THE BOX CULVERT SHOULD BE PLACED ON TOP OF THE ROCK LINING AND APRON TO THE MAXIMUM HEIGHT OF THE TOP OF THE BAFFLE TO THE LIMIT OF THE ROCK LINING TO FACILITATE THE DEVELOPMENT OF A NATURAL STREAM BOTTOM IF FEASIBLE.
- 6. THE SLOPE OF THE NEW STRUCTURE SHOULD MATCH THE NATURAL STREAM SLOPE.

10/25/2019

DETAILS FOR CONCRETE CULVERT AS ADOPTED FROM PENNDOT PUBLICATION 218M: BRIDGE DESIGN (BD) STANDARDS, BD-632M, DATED NOV. 2014.

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PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION **BOX CULVERT DETAILS**

CARBON COUNTY, PENNSYLVANIA DRAWN BY CAF DATE ISSUED 10/15/201 AS SHOWN WMC SCALE CHECKED BY JRD | APPROVED BY APPROVED BY

023-03-07-001

d. DESIGN SERVICE LIFE = 75 YEARS PROJECT BOX CULVERT STRUCTURE DIMENSIONS CULVERT SPAN (FT) = 22 CULVERT RISE (FT) = 8 DESIGN SERVICE LIFE. OPENING OF INTERIOR BAFFLE (FT) = 4 (SEE NOTE 2) MEET THE PROJECT REQUIREMENTS MAY BE PROVIDED. TO 0.50 INCHES OR LESS. BAFFLE SPACING (FT) = 11 (SEE NOTE 3) SAFETY INSPECTION MANUAL (PUB 238, CURRENT EDITION). RIPRAP LINING D50 (in) = 12 NOMINAL PLACEMENT THICKNESS (in) = 30

GENERAL NOTES

- 1. PROVIDE END SECTIONS MEETING THE REQUIREMENTS
 OF PUBLICATION 408, SECTION 616. PROVIDE
 GALVANIZED STEEL END SECTIONS WHEN SECTIONS ARE
 REQUIRED WITH ALUMINIZED STEEL PIPE OR PRECOATED
 GALVANIZED STEEL PIPE.
- 2. PROVIDE 2.77 THICK (12 GAGE) SIDES AND 3.50 THICK (10 GAGE) CENTER PANELS FOR 3 PIECE UNITS. PROVIDE CENTER PANEL WIDTH GREATER THAN 20% OF PIPE PERIPHERY. PROVIDE 50 (2") LAP JOINT TIGHTLY FASTENED BY 10 (3/8") Ø GALVANIZED OR ALUMINIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM ALLOY RIVETS OR BOLTS FOR ALUMINUM UNITS, ON CENTERLINE, SPACED 150 (6") C TO C FOR MULTIPLE PANEL UNITS. CONSTRUCT SKIRTS OF THE SAME THICKNESS AND PIECES AS THE END SECTION.
- 3. PROVIDE TOE PLATES OF THE SAME MATERIAL AS THE END SECTION. LOCATE PUNCHED HOLES IN PLATE TO MATCH HOLES IN SKIRT. PROVIDE 10 (3/8") Ø GALVANIZED OR ALUMINIZED BOLTS AND NUTS FOR STEEL UNITS AND ALUMINUM ALLOY BOLTS AND NUTS FOR ALUMINUM UNITS. PROVIDE TOE PLATE LENGTHS AS FOLLOWS:

 PIPE-ARCH CULVERT 1060 × 740, 1010 × 790

 (42" × 29", 40" × 31") OR SMALLER-W+250 (+10")

 PIPE-ARCH CULVERT 1240 × 840, 1160 × 920

 (49" × 33", 46" × 36") OR LARGER-W+500 (+20") PIPE 750 (30") DIAMETER OR SMALLER-W+250 (+10") PIPE 900 (36") DIAMETER OR LARGER-W+500 (+20")
- SUPPLEMENT REINFORCED EDGES WITH GALVANIZED STEEL STIFFENER ANGLES WITH GALVANIZED OR ALUMINIZED BOLTS AND NUTS OR ALUMINUM ALLOY STIFFENER ANGLES WITH ALUMINUM ALLOY NUTS AND BOLTS OF THE
- FOLLOWING SIZES:

 •50 (2") × 50 (2") × 6 (¼") FOR,

 1500 (60") TO 1800 (72") DIAMETER PIPE,

 1950 × 1320, 1850 × 1400 (77" × 52", 73" × 55") AND

 2100 × 1450, 2050 × 1500 (83" × 57", 81" × 59")

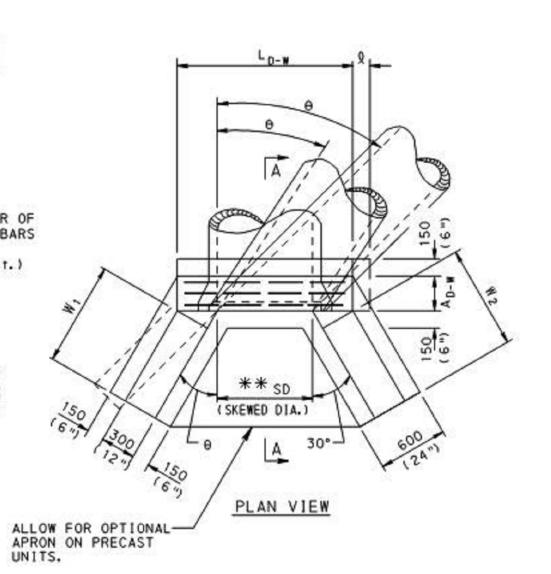
 PIPE-ARCH CULVERT.
- •63 (2½") × 63 (2½") × 6 (¼") FOR, 1950 TO 2100 (78" TO 84") DIAMETER PIPE.
- PLACE ANGLE REINFORCEMENT UNDER THE CENTER PANEL SEAMS FOR, 1950 × 1320, 1850 × 1400 (77" × 52", 73" × 55") AND 2100 × 1450, 2050 × 1500 (83" × 57", 81" × 59") PIPE-ARCH CULVERTS.
- 5. ANCHOR ALUMINUM OR STEEL END SECTIONS, THAT ARE USED ON THE INLET END OF PIPE LARGER THAN 1350 (54") DIAMETER, AS INDICATED ON THE PLAN.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESES.
- FOR DIMENSION TABLES SEE TABLE A BELOW. 8. PROVIDE TOE WALL OF CLASS A CONCRETE.

	C	IMENSI	BLE A (ONS FOR CONCRE	END S	ECTION	٧	
DIA	A	В	С	D	Ε	F	R
18"	9"	2' - 3"	3'-10"	6' - 1"	3' - 0"	21/2"	71/2
21"	9"	3' - 0"	3' - 1"	6' - 1"	3' - 6"	2 1/4"	8"
24"	91/2"	3' - 71/2"	2' - 6"	6' - 11/2"	4' - 0"	3"	8 "
27"	101/2"	4' - 0"	2' - 11/2"	6' - 11/2"	4' - 6"	31/4"	9"
30"	12"	4' - 6"	1' - 7 1/4"	6' - 1 1/4"	5' - 0"	31/2"	8 "
33 "	131/2"	4'-101/2"	3' - 11/2"	8'- 0"	5' - 6"	33/4"	9"
36"	15"	5' - 3"	2' - 9"	8'- 0"	6' - 0"	4"	10"
42=	21"	5' - 3"	2' - 9"	8'- 0=	6' - 6"	41/2"	11"
48"	24"	6' - 0"	2' - 0"	8'- 0"	7' - 0"	5"	12"

CONCRETE FLARED END SECTIONS

NOT TO SCALE

METRIC EQUATION LD-# = SD + 0.70 m $W_1 = \frac{X}{COS \Theta} (D_{D-W} - 0.5 - \frac{1.0}{X})$ (FOR VARIABLE ENGLISH EQUATION $**sp = \frac{D_{D-W}}{\cos \theta} = \frac{D_{D-W}}{\sin skew} = \frac{1}{2}$ Lo-# = 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 #13 (#4) BARS @ 300 (12") C TO C (TYP) EACH WAY TOP & BOTTOM FRONT ELEVATION VIEW BASE SECTION FOR TYPE D-W - PROVIDE 1 LAYER OF REINFORCEMENT BARS 250 mm 2/m (0.12 in2/Ln.Ft.)

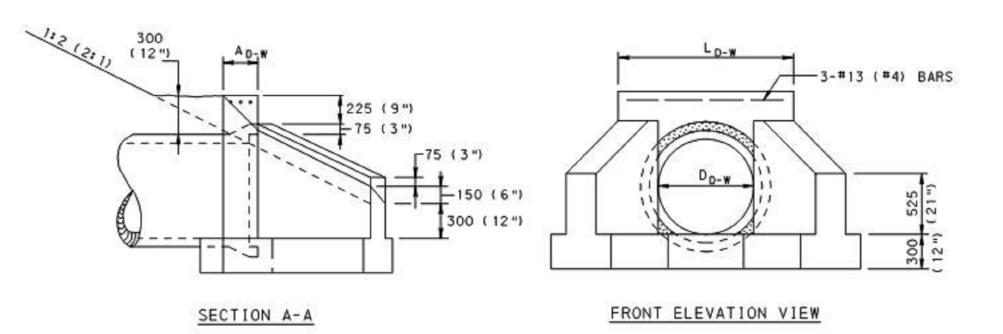


SLOPE WHEN X EQUALS HORIZONTAL

SLOPE WHEN X EQUALS HORIZONTAL

DIMENSION OF THE SLOPE DESIGNATION.)

DIMENSION OF THE SLOPE DESIGNATION.)



EACH WAY.

FRONT ELEVATION VIEW

HEAD & WINGWALL SECTION FOR TYPE D-W

TYPE D-W ENDWALL (SEE TABLE A FOR DIMENSIONS NOT INDICATED.)

CONCRETE END WALLS (HEAD WALLS)

NOT TO SCALE



CLIENT APPROVAL

DATE **Call** before you dig. REVISIONS DATE DRAWN CK APPR DESCRIPTION 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 PROJECT

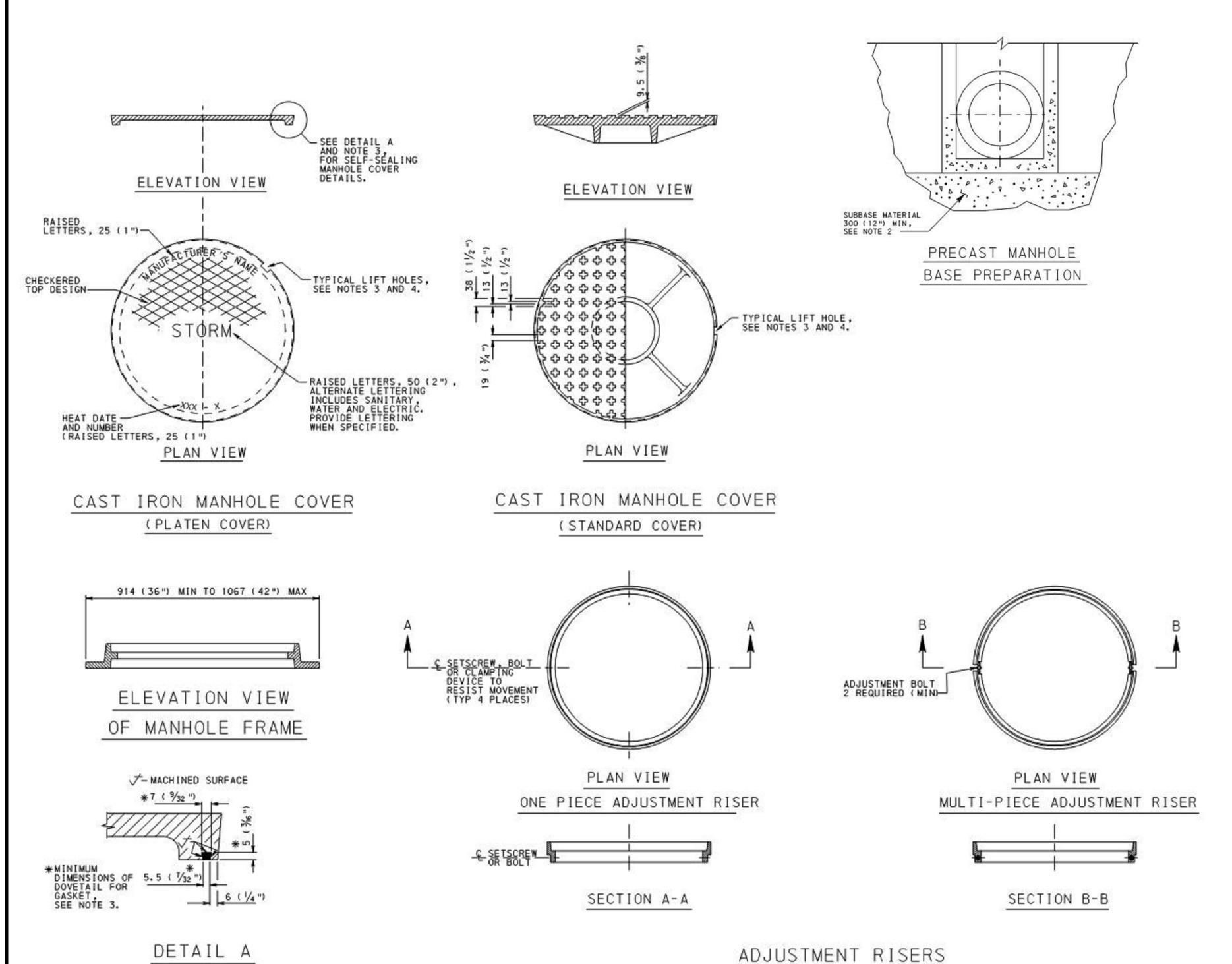
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KIDDER COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS CARBON COUNTY, PENNSYLVANIA

DRAWN BY CAF DATE ISSUED 10/15/201 AS SHOW CHECKED BY WMC | SCALE JRD | APPROVED BY APPROVED BY

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.



PRECAST DRAINAGE MANHOLES

NOT TO SCALE

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.
- 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. MANHOLE COVER.
- 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.
- 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 (3/6"), 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 (%") 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.
- SET THE BASE OF THE FRAME AND/OR PRECAST CONCRETE GRADE RINGS IN A BED OF CEMENT MORTAR.



PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION

POST CONSTRUCTION STORMWATER

MANAGEMENT DETAILS

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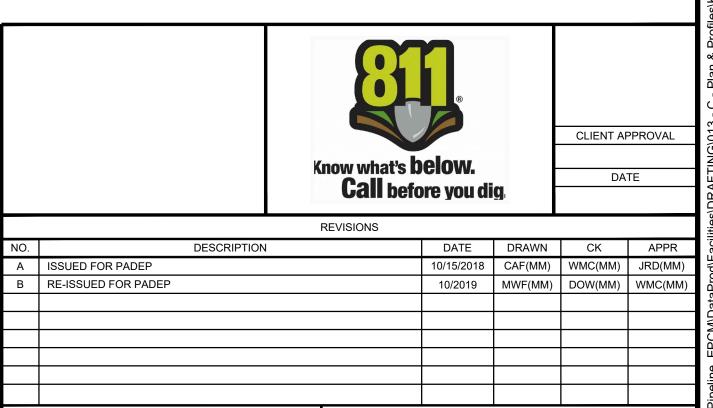
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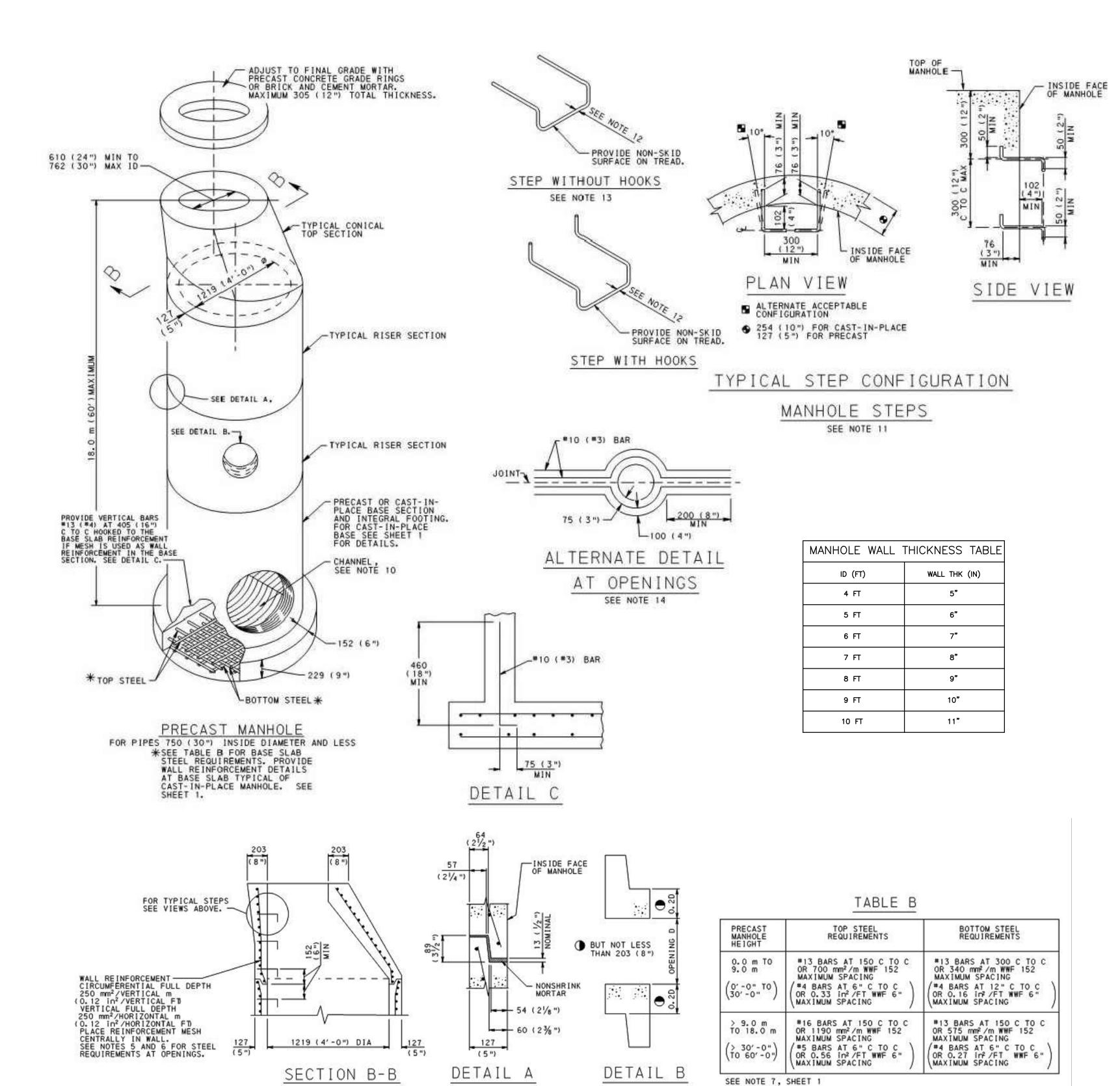
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DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.

GASKET SEALING SYSTEM



PRECAST DRAINAGE MANHOLES NOT TO SCALE

- 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 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,
- 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 nnm²/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.
- 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 (34") SECTION DIMENSION FOR NON-DETERIORATING
- 13. MECHANICAL ANCHOR REQUIRED FOR INSTALLATION OF STEPS
- 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 PRECAST

PRECAST

) TOP BARS BOTTOM BARS FOOTINGS: CAST-IN-PLACE SIDE COVER TOP BARS 40 (11/2") BOTTOM BARS

40 (1½") SIDE COVER SLABS: CAST-IN-PLACE 50 (2") TOP & BOTTOM BARS

- FOR PIPES WITH INSIDE DIAMETERS GREATER THAN 750 (30") SEE MODIFIED CAST-IN-PLACE MANHOLES, SHEET 2.
- 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.
- 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)
- 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 in 2/FT) WWF FOR DEPTHS TO 9.0 m (30') AND 680 mm²/m (0.32 in 2/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.
- 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.

NOTE:

ALL PROPOSED INLETS AND MANHOLES SHOWN ON THESE PLANS SHALL HAVE A 3-FT SUMP BELOW THE INVERT OF THE LOWEST CONNECTING PIPE, UNLESS OTHERWISE NOTED.

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

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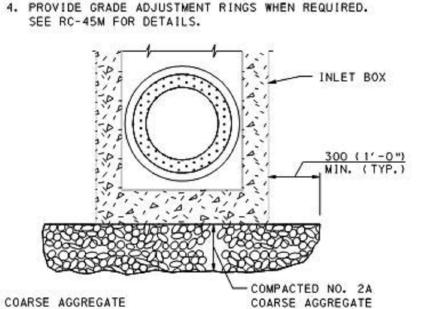
PROFESSIONAL W. MICHAEL CLARK

PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

CARBON COUNTY, PENNSYLVANIA DRAWN BY CAF DATE ISSUED 10/15/201 AS SHOW WMC | SCALE CHECKED BY JRD | APPROVED BY APPROVED BY

023-03-07-004

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.



NOTE: COST OF NO. 2A COARSE AGGREGATE IS INCIDENTAL TO THE INLET BOX. 300 (1'-0") MIN. THICKNESS

1. FOR ADDITIONAL NOTES, SEE SHEET 1 NOTES.

3. SEE RC-45M FOR DETAILS FOR THE CONCRETE

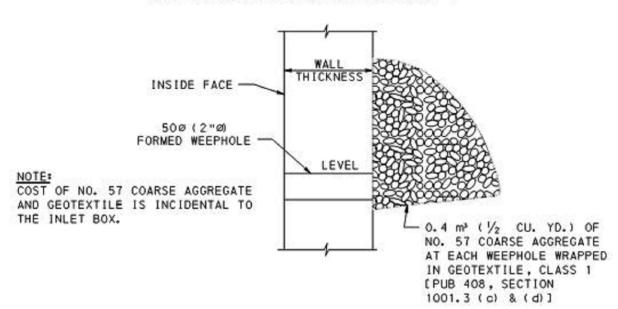
FOR OTHER INLET BOX TYPES.

TOP UNITS, FRAMES, AND GRATES.

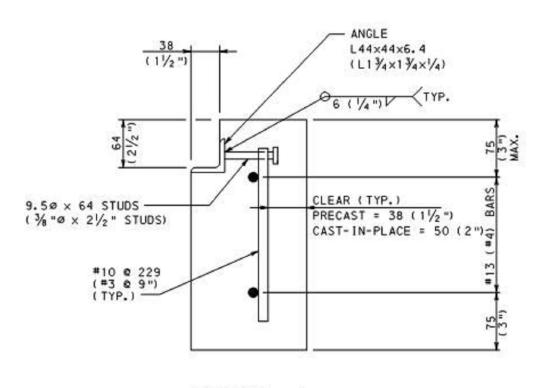
2. STANDARD INLET BOXES SHOWN, PROVIDE TOP SLABS

INLET BOX SUBBASE PREPARATION DETAIL

(SEE FIELD CONSTRUCTION NOTES ON SHEET 1)

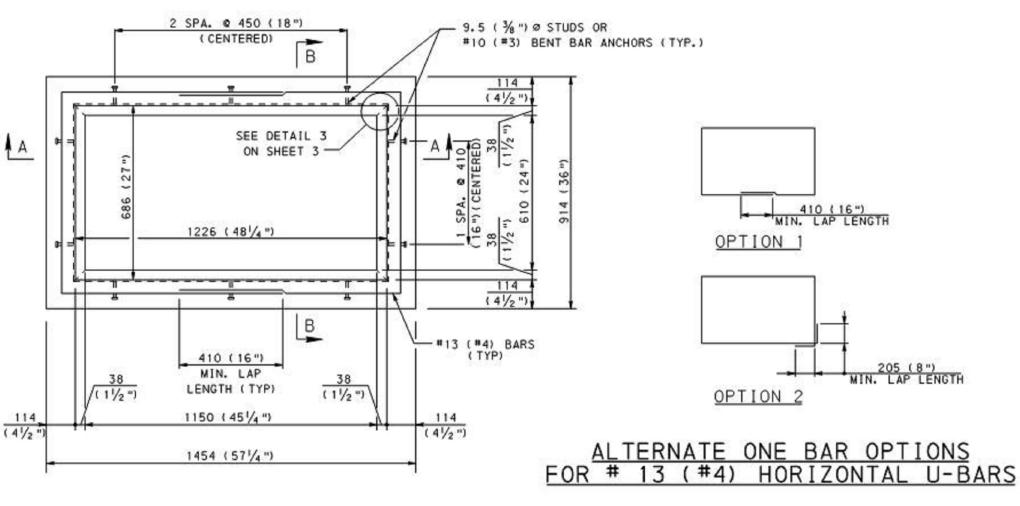


WEEPHOLE DETAIL (SEE GENERAL NOTE 15 ON SHEET 1)

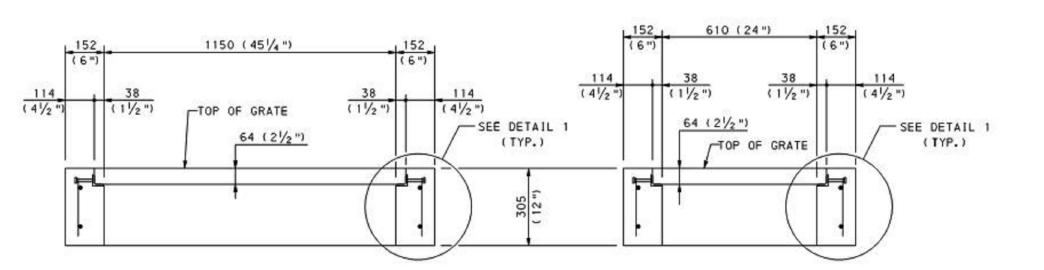


DETAIL 1

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM

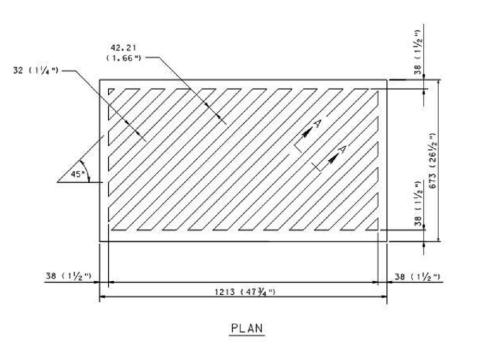


PLAN VIEW - TYPE M

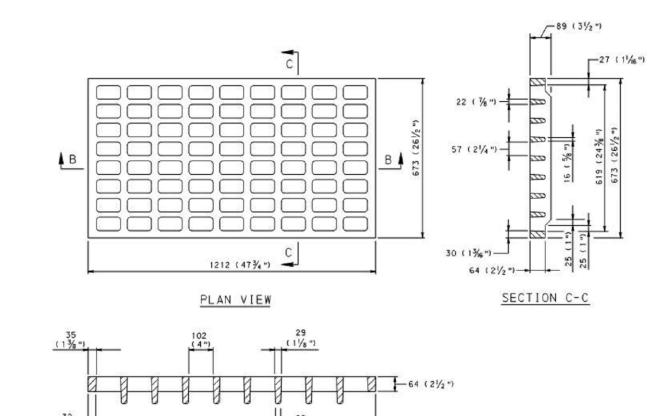


SECTION A-A

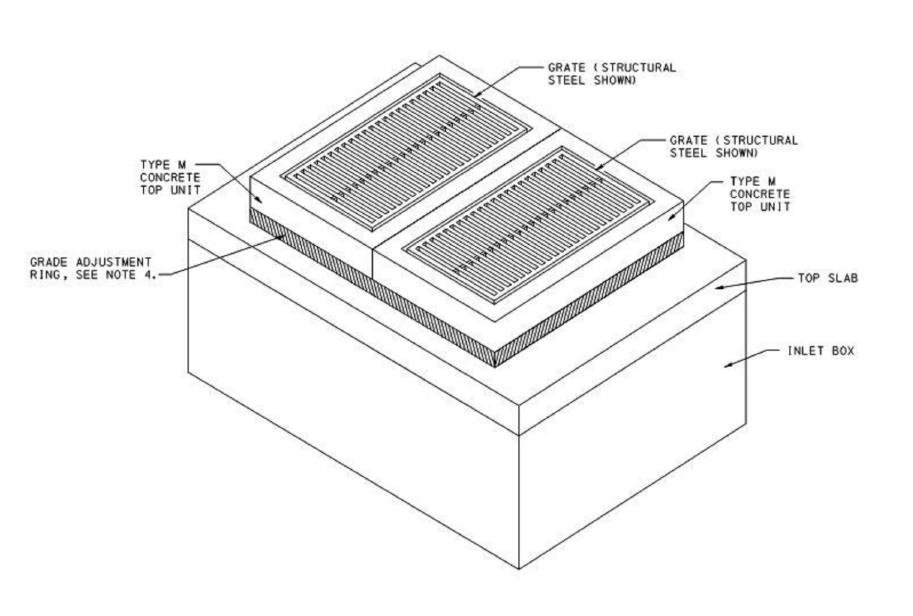
SECTION B-B



ONE PIECE CAST IRON GRATE



ONE PIECE CAST IRON GRATE - BICYCLE SAFE



SECTION B-B

CONCRETE TOP UNIT - DOUBLE TYPE M

PRECAST INLET BOX NOT TO SCALE



___ 32 (1½")

SECTION A-A

- SHEETS 9 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 MIO5 (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.

SHEET 1 NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESIS.
- 2. METRIC UNITS INDICATED ARE SOFT CONVERTED FROM U.S. CUSTOMARY UNITS.
- 3. 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 0.190 MPa (2.0 TONS/SQ. FT.) AT THE SERVICE LIMIT STATE.
- 4. 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.
- SHOP DRAWINGS FOR INLET BOXES, TOP SLABS, AND TRANSITION SLABS ARE NOT REQUIRED IF THE ITEM IS CONSTRUCTED/FABRICATED IN ACCORDANCE WITH
- 6. 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 DESIGN HIGHWAY QUALITY ASSURANCE DIVISION CHIEF FOR REVIEW AND ACCEPTANCE.
- 7. 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 45 FOR ADDITIONAL INFORMATION. THE DESIGNER IS ALSO RESPONSIBLE TO DETERMINE THE REQUIRED PAY ITEM FOR AN INSTALLATION BASED ON THE OVERALL
- 8. THE SELECTION OF COMPONENTS TO ACHIEVE A SPECIFIED INLET ASSEMBLY IS THE CONTRACTOR'S RESPONSIBILITY, UNLESS OTHERWISE INDICATED ON THE CONTRACT
- THE SIZE OF THE INLET TOP UNITS, PER RC-45M, ARE BASED ON THE MINIMUM DIMENSIONS INDICATED FOR THE STANDARD INLET BOX.
- 10. MINIMUM PIPE DIAMETERS [INSIDE]:
 FILL HEIGHT LESS THAN OR EQUAL TO 7600 mm (25'): 450 mm (18") FOR CIRCULAR PIPE (OR EQUIVALENT SIZE PIPE ARCH)
- FILL HEIGHTS GREATER THAN 7600 mm (25'): 600 mm (24")
- 11. INSIDE INLET BOX DIMENSIONS ARE BASED ON PROVIDING A PIPE OPENING TO ACCOMMODATE A MINIMUM 450 mm (18") PIPE TO A MAXIMUM 2438 mm (96") PIPE. IF A LARGER PIPE SIZE IS REQUIRED, THE DESIGNER IS RESPONSIBLE FOR PROVIDING DESIGN AND DETAILS IN ACCORDANCE WITH PENNDOT REQUIREMENTS.
- 12. 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.
- 13. SHOW ORIENTATION OF INLET BOXES ON THE CONTRACT DRAWINGS.
- 14. THE TOP SLAB IS NOT PERMITTED TO BE POURED MONOLITHICALLY WITH
- 15. PROVIDE 50 mm (2") DIAMETER WEEPHOLES IN THE WALLS WHEN THE DEPTH BETWEEN
 THE FINISHED CRADE ELEVATION AND THE TOP OF BOTTOM SLAB ELEVATION IS
 GREATER THAN 3048 mm (10'-0").
 VERTICAL PLACEMENT: 1500 mm (5'-0") MAXIMUM SPACING
 HORIZONTAL PLACEMENT: PLACE WEEPHOLES IN THE SIDE WALLS THAT ARE
 - PERPENDICULAR TO TRAFFIC. . LOCATE WEEPHOLES A MINIMUM OF 150 mm (6") FROM PIPE OPENINGS OR JOINTS.
 - . LOCATE WEEPHOLES A MINIMUM OF 305 mm (1'-0") ABOVE OUTLET PIPE INVERT.

ALL PROPOSED INLETS AND MANHOLES SHOWN ON THESE PLANS SHALL HAVE A 3-FT SUMP BELOW THE INVERT OF THE LOWEST CONNECTING PIPE, UNLESS

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REVISIONS DATE DRAWN CK APPR DESCRIPTION A ISSUED FOR PADEP B RE-ISSUED FOR PADEP 10/2019 | MWF(MM) | DOW(MM) | WMC(MM)

DWG. NO.

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OTHERWISE NOTED.

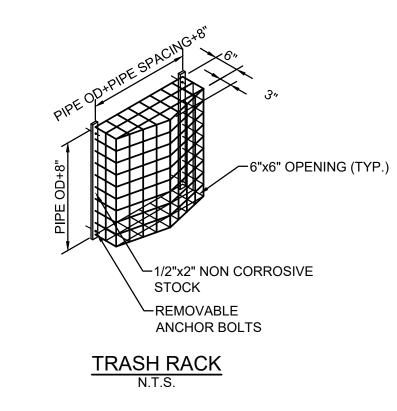
PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS CARBON COUNTY, PENNSYLVANIA

CAF DATE ISSUED 10/15/201 DRAWN BY AS SHOW WMC SCALE CHECKED BY JRD | APPROVED BY APPROVED BY

023-03-07-005

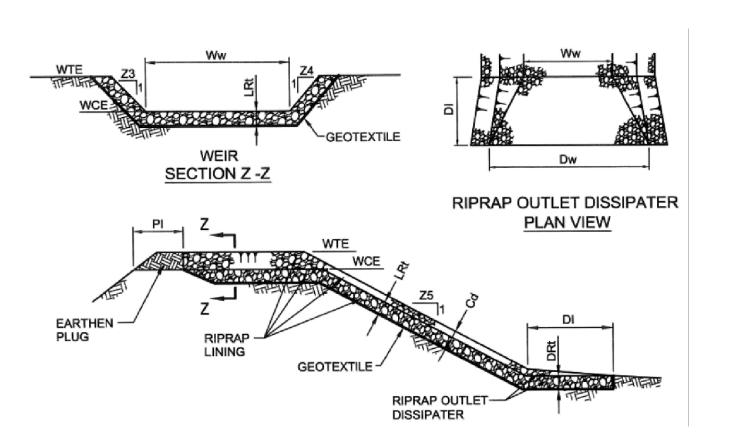
10/25/2019

PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.



ENTRANCE TRASH RACK FOR PROPOSED HEADWALL HW#1

NOT TO SCALE



NOTES:

DISPLACED RIPRAP WITHIN SPILLWAY AND/OR OUTLET CHANNEL SHALL BE REPLACED IMMEDIATELY.

		WEIR						LINING CH		CHANNEL		DISSIPATER			
SITE		Z3	Z4	TOP	CREST	WIDTH	RIPRAP	RIPRAP	Z5	DEPTH	LENGTH	WIDTH	RIPRAP	RIPRAP	
	BASIN ID	(FT)	(FT)	ELEV	ELEV	Ww	SIZE	THICK	(FT)	Cd		Dw	SIZE	THICK	
				WTE	WCE	(FT)	(R)	LRt		(FT)	DI	(FT)	(R)	DRt	
				(FT)	(FT)			(IN)			(FT)			(IN)	
KIDDER COMPRESSOR STATION	NORTH	3	3	1738.00	1737.25	25	R-5	27	3	1	4	28	R-5	18	
	SOUTH	3	3	1739.00	1738.00	35	R-7	45	3	1	4	38	R-7	54	

EMERGENCY SPILLWAY
NO SCALE

| FNGINEER | PE082720 | SALVEN | 10/25 | 2019 |

REVISIONS

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)

REVISIONS

DWG. NO.

PennEast

PENNEAST PIPELINE PROJECT

KIDDER COMPRESSOR STATION

POST CONSTRUCTION STORMWATER

MANAGEMENT DETAILS

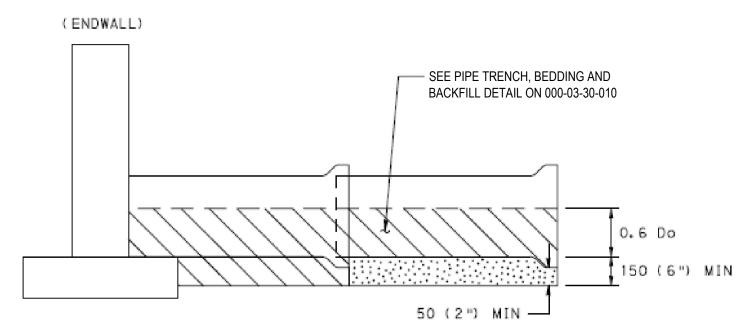
CARRON COUNTY PENNSYLVANIA

CARBON COUNTY, PENNSYLVANIA

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DATE ISSUED
10/15/2018
CHECKED BY
WMC
SCALE
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JRD
APPROVED BY

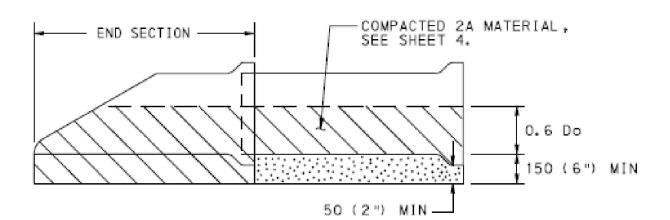
023-03-07-006

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.



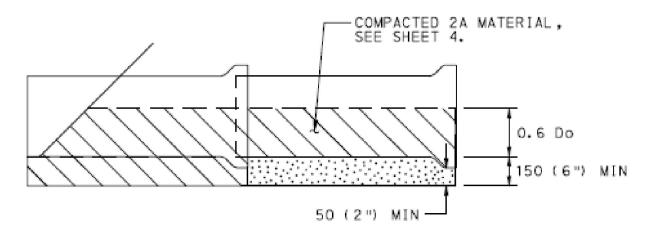
BACKFILL DETAIL AT ENDWALL

(FOR CONCRETE PIPE)



BACKFILL DETAIL AT END SECTION

(FOR CONCRETE PIPE)



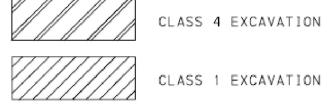
BACKFILL DETAIL AT LAST SECTION OF PIPE

(FOR CONCRETE PIPE)

<u>NOTES</u>

- 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.
- 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 (11/2") 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

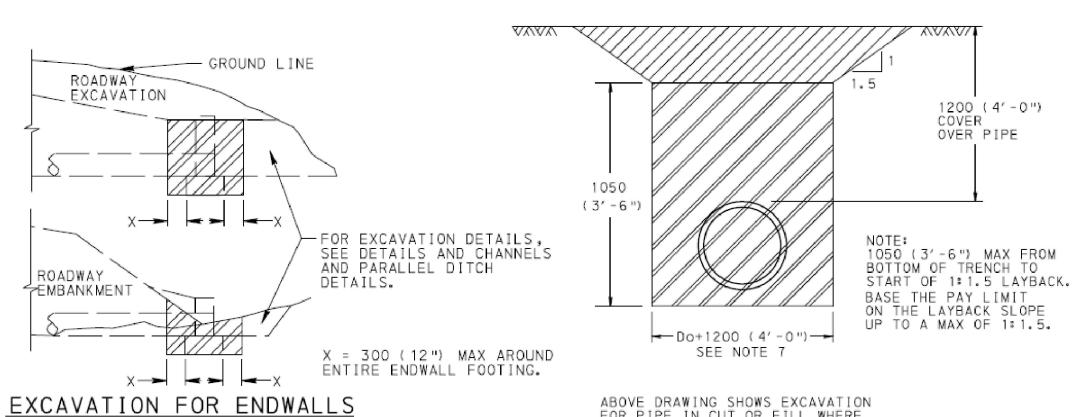


AGGREGATE FOR BEDDING (AASHTO NO. 8)

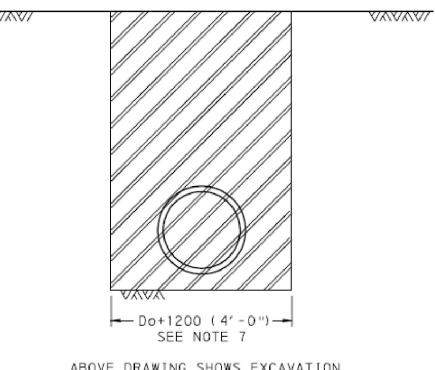


COARSE AGGREGATE (2A)

Do = OUTSIDE DIAMETER OF PIPE.



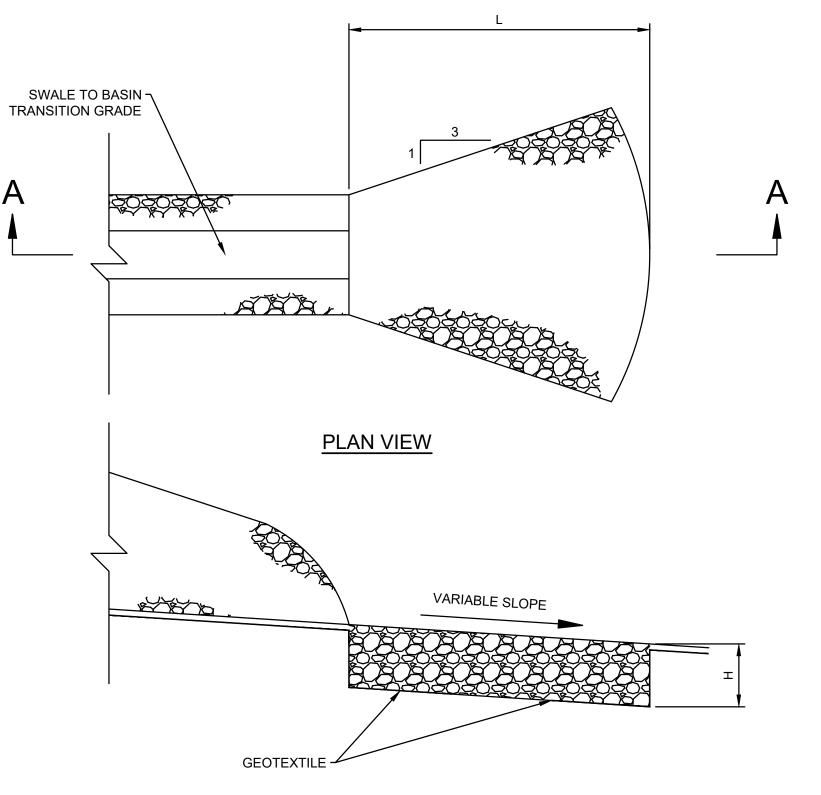
ABOVE DRAWING SHOWS EXCAVATION FOR PIPE IN CUT OR FILL WHERE SUBGRADE IS 1050 (3'-6") OR MORE ABOVE THE BOTTOM OF THE TRENCH.



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 NOT TO SCALE



SECTION A-A

SWALE ID	RIPRAP SIZE	LENGTH OF APRON L, FT	PLACEMENT THICKNESS H, IN
SWALE 6	R-3	9	9
SWALE 9	R-3	13	9
SWALE 10	R-4	10	18

SWALE OUTFALL PROTECTION NOT TO SCALE



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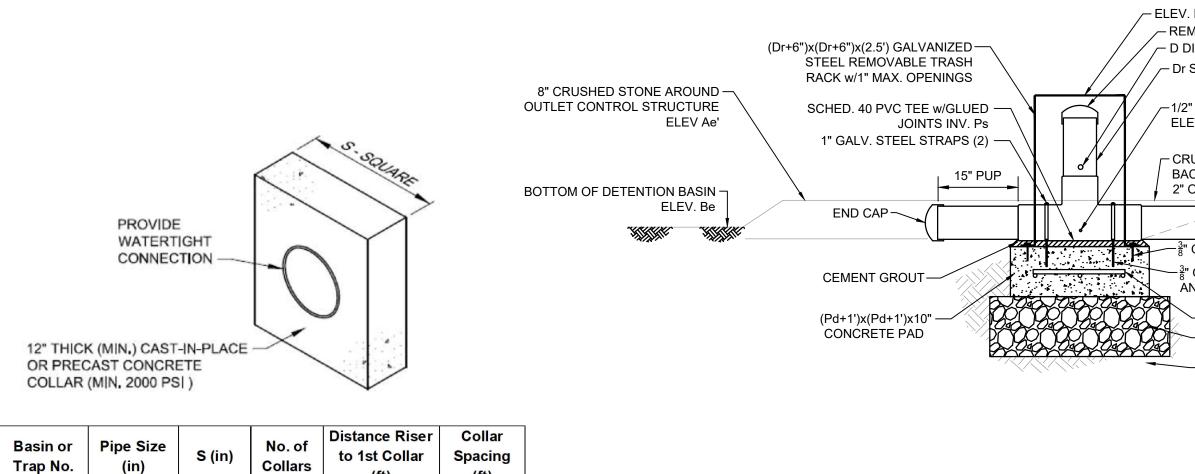
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DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY

CONSTRUCTION, DATED JUNE 2010.

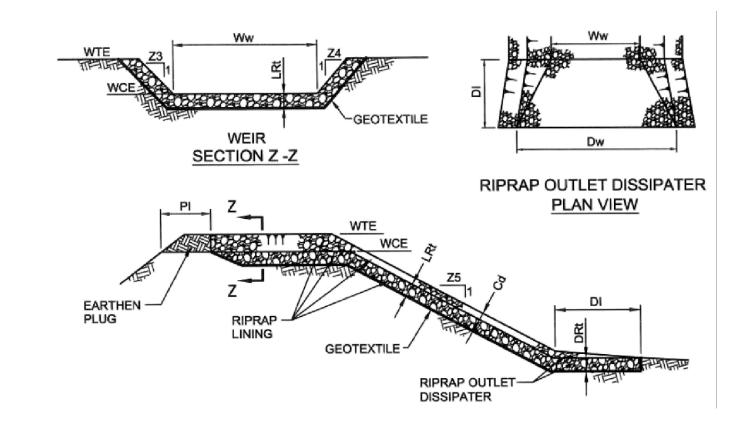


ANTI-SEEP COLLAR

NOT TO SCALE

42

37



NA

NOTES:

NORTH

SOUTH

18

24

DISPLACED RIPRAP WITHIN SPILLWAY AND/OR OUTLET CHANNEL SHALL BE REPLACED IMMEDIATELY.

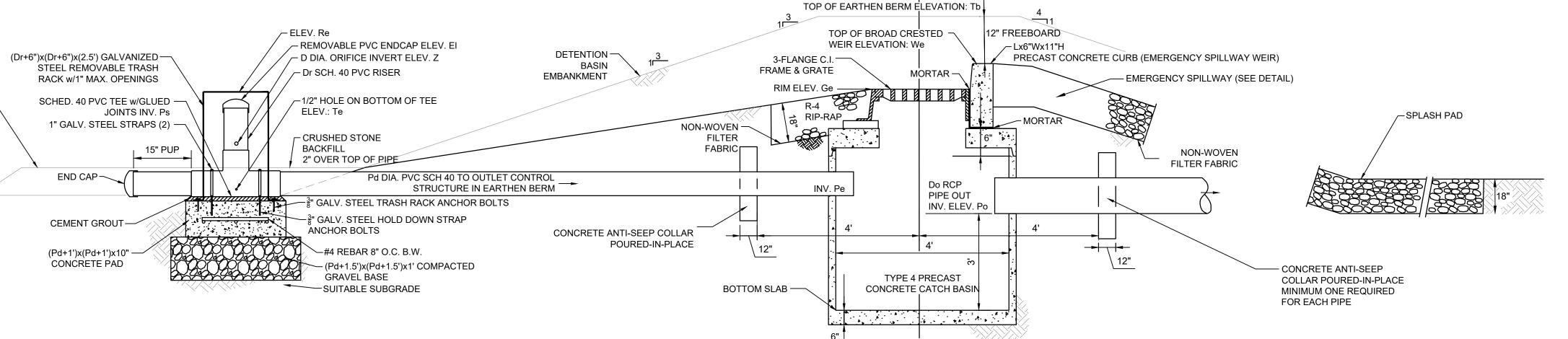
			WEIR			LIN	ING	CHAI	CHANNEL		DISSIPATER				
BASIN ID	Z3 (FT)	Z4 (FT)	TOP ELEV WTE (FT)	CREST ELEV WCE (FT)	WIDTH Ww (FT)	RIPRAP SIZE (R)	RIPRAP THICK LRt (IN)	Z5 (FT)	DEPTH Cd (FT)	LENGT H DI (FT)	WIDTH Dw (FT)	RIPRAP SIZE (R)	RIPRAP THICK DRt (IN)		
NORTH	3	3	1738.00	1737.25	25	R-5	27	3	1	4	28	R-5	18		
SOUTH	3	3	1739.00	1738.00	35	R-7	45	3	1	4	38	R-8	18		

SURFACE BASIN SPILLWAY RIPRAP LINING NOT TO SCALE

Test Pit Summary										
BASIN NAME	Test Pit No.	Existing Grade Elevation (feet)	Proposed BMP Invert (feet)	Infiltration Test Elevation (feet)	Excavation Depth Elevation (feet)	Depth to High Groundwater (feet)				
NORTH	KTP-1	1735.9	1735.0	1735.0	1732.9	No evidence of high groundwater observed				
BASIN	KTP-2	1736.3	1735.0	1735.0	1733.0	No evidence of high groundwater observed				
	KTP-3	1737.5	1733.0	1733.0	1731.0	No evidence of high groundwater observed				
	KTP-4	1739.0	1733.0	1733.0	1731.0	No evidence of high groundwater observed				
SOUTH	KTP-5	1736.2	1733.0	1733.0	1731.0	No evidence of high groundwater observed				
BASIN	KTP-6	1736.1	1733.0	1733.0	1731.0	No evidence of high groundwater observed				
	KTP-7	1736.8	1733.0	1733.0	1731.0	No evidence of high groundwater observed				
	KTP-8	1738.7	1733.0	1733.0	1731.0	No evidence of high groundwater observed				

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.

TEST PIT SUMMARY

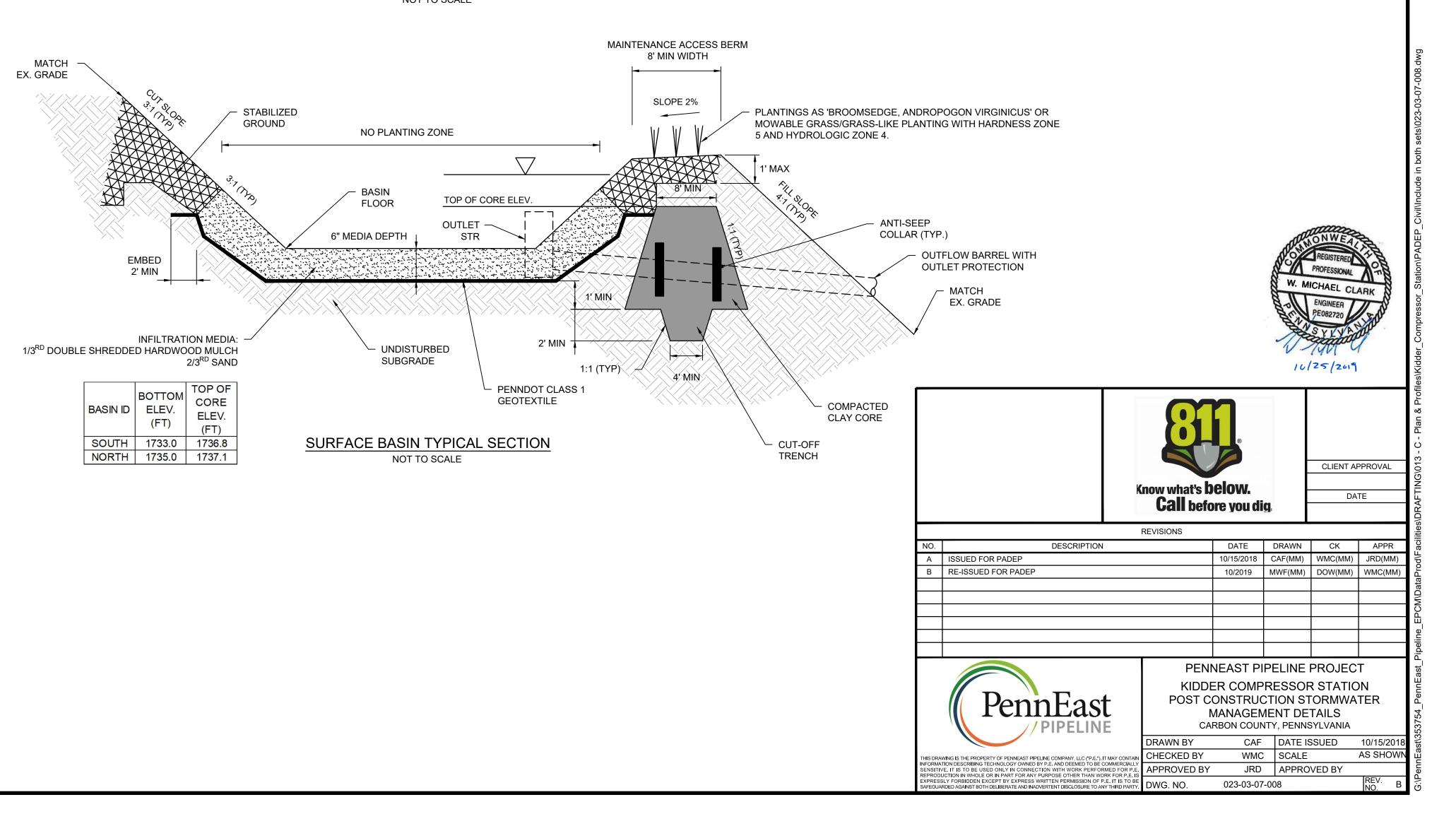


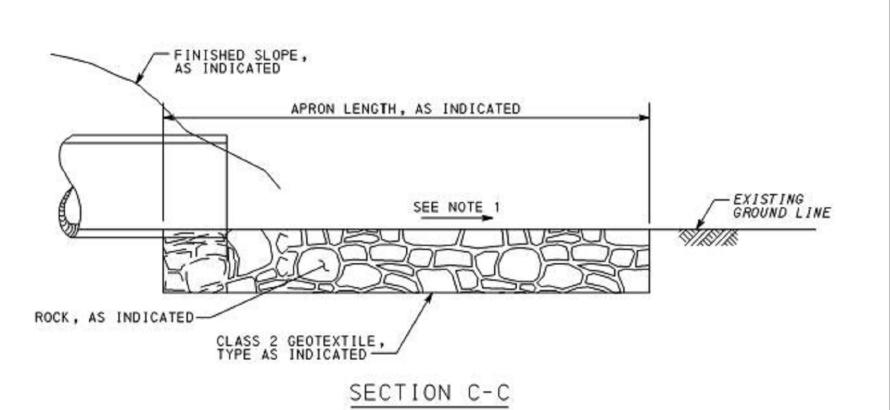
NOTES:

- 1. REFER TO GRADING AND DRAINAGE PLANS FOR INVERT ELEVATIONS OF BASIN OUTLET STRUCTURES.
- 2. SITE SOILS FREE OF ORGANIC SUBSTANCE, LARGE AGGREGATES AND DEBRIS SHALL BE USED FOR BASIN BOTTOM FILL.
- 3. THE BASIN BOTTOM AND EARTHEN BERM SHALL RECEIVE A NATIVE SPECIES SEED MIX IN ACCORDANCE WITH PENNSYLVANIA BMP MANUAL PLANTS LIST. SEE APPENDIX B OF PA BMP MANUAL FOR RECOMMENDED PLANT SPECIES LIST. HYDROLOGIC ZONE 3, HYDROLOGIC ZONE 4 AND PLANT HARDINESS ZONE 6 ARE TO BE USED FOR BASIN BOTTOM AND BASIN BERM PLANT SPECIES SELECTION.
- 4. NO COMPACTION IS ALLOWED FOR BASIN BOTTOM.
- 5. FOLLOWING STABILIZATION THE CONTRACTOR SHALL PERFORM INFILTRATION TESTS ON EACH INFILTRATION BASIN. A MINIMUM OF TWO TESTS SHALL BE PERFORMED PER BASIN OR ONE PAIR OF TESTS PER 8,000 SF OF BASIN INVERT AREA WHICHEVER RESULTS IN A GREATER NUMBER OF TESTS. THE INFILTRATION TESTS SHALL BE CONDUCTED AS PER THE PA BMP MANUAL. SHOULD THE INFILTRATION TESTING FAIL TO PROVIDE THE DESIGN INFILTRATION RATE (½ TESTED RATE) THAT WOULD ALLOW THE BASIN TO DRAIN FROM THE LOW OUTLET TO THE BASIN INLET IN 72 HOURS. THE CONTRACTOR SHALL RESTORE OR AMEND THE 18" OF SOIL AND THE TEST REPEATED. THE TEST SHALL CONTINUE UNTIL A DESIGN INFILTRATION RATE THAT CAN DRAIN THE BASIN IN 72 HOUR AS DESCRIBED ABOVE IS REACHED.

SITE AND BASIN DESCRI				RISER				CATCH BASIN										
SITE	BASIN ID	Be (FT)	D (IN)	ORIFICE QUANTITY	EI (FT)	Z (FT)	Ps (FT)	Re (FT)	Pe (FT)	Pd (IN)	Ge (FT)	Tb (FT)	Po (FT)	We (FT)	Do (IN)	L (FT)	Riser Height (FT)	No. of outlet pipes
KIDDER COMPRESSOR STATION	NORTH-BASIN	1735	6	2	1737.17	1736	1735.31	1737.42	1735.00	14	1737.5	1739	1735	1738	18	36.2	2	1
RIDDER CONPRESSOR STATION	SOUTH-BASIN	1733	18	2	1737.17	1735	1733.38	1737.42	1733.00	14	1736	1738.25	1733	1737.25	24	68.9	4	3

OUTLET CONTROL AND EMERGENCY OVERFLOW STRUCTURE NOT TO SCALE



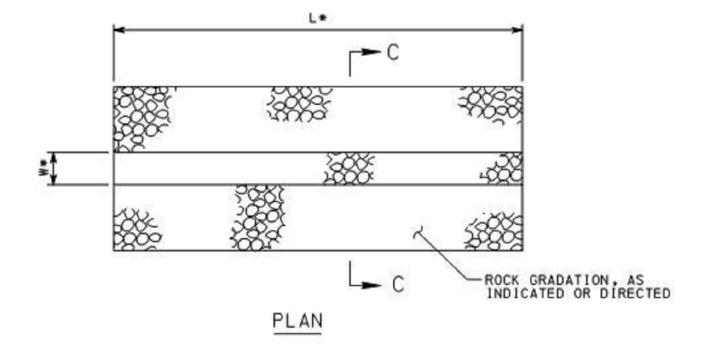


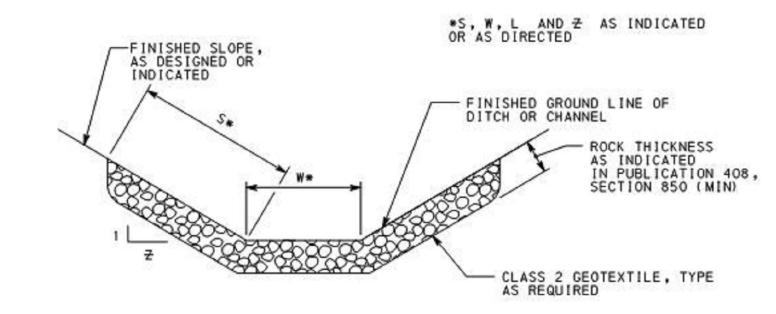
ROCK APRON (FLAT AREA)

	PIPE DIA. Pd (IN)	RIPR	RAP	APRON					
OUTLET NO.		SIZE (R)	THICK. Rt (IN)	LENGTH AI (FT)	INITIAL WIDTH Alw (FT)	TERMINAL WIDTH Atw (FT)			
BASIN SOUTH (HW#3)	48	R-6	36	30	12	42			
HW#2	48	R-5	27	30	24	54			

RIPRAP OUTLET PROTECTION

NOT TO SCALE





SECTION C-C

NOTES

- REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE-HALF THE HEIGHT OF THE ROCK BARRIER. REPLACE CLOGGED FILTER STONE. REMOVE AND DISPOSE OF SEDIMENT IN AN APPROVED MANNER.
- PROVIDE GEOTEXTILE MATERIAL ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.

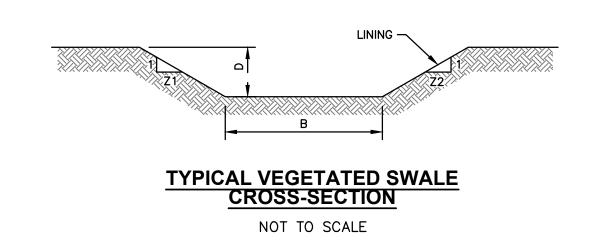
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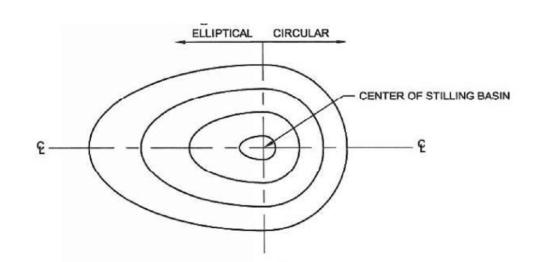
- 1. CHANNEL DIMENSIONS ARE FOR THE COMPLETED CHANNEL AFTER ROCK PLACEMENT, CHANNEL MUST BE OVER-EXAVATED A SUFFICIENT AMOUNT TO ALLOW FOR THE VOLUME OF ROCK
- PLACED WITHIN THE CHANNEL WHILE PROVIDING THE SPECIFIED FINISHED DIMENSIONS.
- 2. CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. 3. CHANNEL SHALL BE CLEANED WHENEVER TOTAL DEPTH IS REDUCED BY 25% AT ANY
- 4. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HRS OF DISCOVERY OR AS SOIL
- CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE.
- 5. DAMAGED LINING SHALL BE REPLACED WITHIN 48 HRS OF DISCOVERY.
- 6. THE MINIMUM ROCK THICKNESS (t) SHALL BE 1.5 TIMES THE MAX ROCK SIZE.

CHANNEL ID	BOTTOM WIDTH Wo (FT)	DEPTH D (FT)	Z1 (FT)	Z2 (FT)	RIPRAP GRADATION	ROCK THICKNESS t (IN)	UNDERLAYMENT	UNDERLAYMENT THICKNESS (IN)
DIV_SWALE	6	4	2.5	2	R-3	9	AASHTO#3	6
SWALE10	3	2	3	3	R-4	18	AASHTO#3	6
SWALE11	4	1	3	3	R-3	9	AASHTO#3	6
SWALE12	2	2	3	3	R-8	63	AASHTO#3	6
SWALE2	3	2	3	3	R-4	18	AASHTO#3	6
SWALE5	4	2	3	3	R-3	9	AASHTO#3	6
SWALE7	4	2	3	3	R-4	18	AASHTO#3	6
SWALE8	2	1	3	3	R-3	9	AASHTO#3	6

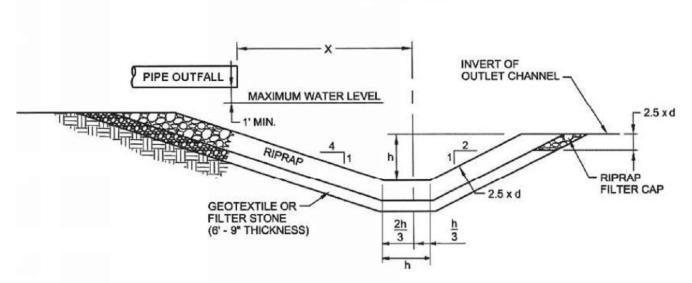
RIPRAP SWALE LINING

NOT TO SCALE





PLAN VIEW

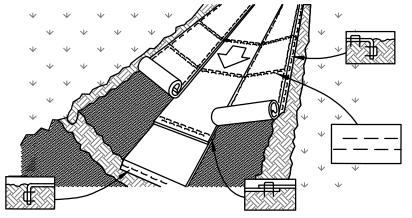


SECTION ALONG CENTERLINE

OUTLET NO.	X (ft)	h (ft)	Riprap Size (R_)	d₅ Stone Size	Placement Thickness (ft)	Major Axis, Ft	Minor Axis, Ft
NORTH BASIN (SB-2)	3	1	R-3	3	1	5	2
SOUTH BASIN (SB-1)	4	2	R-7	18	4	10	15

NOTE: MINOR AXIS FOR SB-1 ACCOUNTS FOR THREE OUTFALL PIPES.

STILLING BASIN NOT TO SCALE



NOTE: HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

REFER TO STAPLE PATTERN DETAIL FOR

STAPLE REQUIREMENTS. NOTES:

- 1. ALL GRADING IS TO MINIMIZE HARD EDGES TO PRODUCE CONTOURED SMOOTH GRADE
- CHANGES.
- CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED.
 CHANNEL SHALL BE CLEANED WHENEVER TOTAL DEPTH IS REDUCED BY 25% AT ANY
- SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HRS OF DISCOVERY OR AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE.
 DAMAGED LINING SHALL BE REPLACED WITHIN 48 HRS OF DISCOVERY.
- 6. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT CHANNELS TO ENSURE SUFFICIENT CHANNEL CAPACITY.

CHANNEL ID	BOTTOM WIDTH B (FT)	DEPTH D (FT)	Z1 (FT)	<i>Z</i> 2 (FT)
SWALE1	6	2	3	3
SWALE3	4	1	3	3
SWALE4	8	1	3	3
SWALE6	4	2	3	3
SWALE9	3	2	3	3

VEGETATED SWALE LINING

NOT TO SCALE



CLIENT APPROVAL DATE **Call** before you dig REVISIONS DESCRIPTION DATE DRAWN CK APPR 10/15/2018 CAF(MM) WMC(MM) JRD(MM) A ISSUED FOR PADEP B RE-ISSUED FOR PADEP 10/2019 | MWF(MM) | DOW(MM) | WMC(MM)

DWG. NO.

CRITICAL POINTS

a. OVERLAPS AND SEAMS b. PROJECTED WATER LINE

c. CHANNEL BOTTOM/SIDE SLOPE VERTICES

PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS CARBON COUNTY, PENNSYLVANIA

CAF DATE ISSUED 10/15/2018 DRAWN BY AS SHOW WMC SCALE CHECKED BY HIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC ("P.E."). IT MAY CONTAIN JRD APPROVED BY APPROVED BY

023-03-07-009

DETAILS FOR DRAINAGE STRUCTURES AS ADOPTED FROM PENNDOT PUBLICATION 72M: STANDARDS FOR ROADWAY CONSTRUCTION, DATED JUNE 2010.

PROJECT CONSTRUCTION SEQUENCING/SOIL LIMITATIONS

CONSTRUCTION SEQUENCE:

- 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.
- AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776 TO DET STAKE OUT
- INSTALL STABILIZED ROCK CONSTRUCTION ENTRANCE AND EROSION/SEDIMENT CONTROL BARRIERS (ECB) WHERE CONSTRUCTION TRAFFIC WILL EXIT THE PROJECT SITE ONTO PA ROUTE 940.
- 4. INSTALL TEMPORARY PARKING AREAS AS NEEDED IN STAGING AREA PE-STA-B-09 WITH STABILIZED CRUSHED GRAVEL

TREE CLEARING (15 DAYS)

5. CLEAR TREES AND BRUSH; HAUL MERCHANTABLE TIMBER OFF SITE; CHIP REMAINDER OF VEGETATION AND HAUL OFF

TREE STUMP REMOVE, TOPSOIL STRIPPING, ACCESS ROAD, SITE GRADING, AND RUNOFF MEASURES (20 DAYS)

- STAKE OUT REMAINDER OF TEMPORARY ECBS; INSTALL ECBS. EXCAVATE AND ROUGH GRADE STORMWATER DETENTION BASIN (NORTH BASIN), LESS 12 INCHES OF DEPTH; INSTALL OUTLET CONTROL STRUCTURE WITH TEMPORARY RISER AT END OF THE PVC PIPE TO OUTLET CONTROL STRUCTURE. DO NOT DRILL HOLES IN PERMANENT RISER UNTIL FINAL GRADING OF NORTH BASIN IS PERFORMED. ENGINEER SHALL INSPECT INSTALLATION AND STABILIZATION OF TEMPORARY SWALE, STORMWATER DETENTION BASIN (NORTH BASIN) LESS 12 INCHES OF DEPTH, AND TEMPORARY OUTLET CONTROL STRUCTURE
- GRUB TREE STUMPS AND ROOTS; HAUL STUMPS OFF SITE OR GRIND STUMPS AND DISPOSE OF CHIPS OFFSITE. STRIP AND STACK TOPSOIL; SCREEN ESTIMATED QUANTITY OF TOPSOIL NEEDED FOR REUSE AND STACK ON SITE; HAUL
- INSTALL PERMANENT TWIN 48-INCH RCPS WITH CONCRETE HEADWALLS AT STA. 13+90; BACKFILL RCPS WITH BORROW 10. INSTALL TEMPORARY COFFERDAM AND PUMP BYPASS MEASURES. MAINTAIN BASE STREAM FLOW BY PUMPING FROM
- UPSTREAM TO DOWNSTREAM OF THE COFFERDAMS. DEWATER WORK AREA; WATER FROM THE EXCAVATION SHALL BE PUMPED TO A SEDIMENT FILTER BAG. WHERE POSSIBLE, EXCAVATION SHALL BE FROM THE TOP OF THE STREAM BANK, WHERE TECHNICALLY FEASIBLE. INSTALL 22-FOOT W X 8-FOOT H PRECAST CONCRETE BOX CULVERT, HEADWALLS, AND RIP RAP AT STA. 19+40; BACKFILL STRUCTURES WITH BORROW GRAVEL. UPON BACKFILLING OF THE COMPLETED BOX CULVERT AND HEADWALL INSTALLATION, REMOVE TEMPORARY COFFERDAM AND PUMP BYPASS MEASURES. PROVIDE STREAMBANK RESTORATION.
- 11. STAKE OUT ACCESS ROAD TO STA. 29+00; EXCAVATE AND FILL ACCESS ROAD TO SUBGRADE; EXCAVATE ROADSIDE
- 12. INSTALL DRAINAGE PIPING, MANHOLES, CATCHBASINS AND INLETS; EXCAVATE PERIMETER DRAINAGE SWALE IN COMPRESSOR PAD AREA; INSTALL ECBS AT CATCHBASINS AND INLETS. ENGINEER SHALL INSPECT CULVERT
- INSTALLATION. ENGINEER SHALL INSPECT DRAINAGE PIPING, MANHOLES, CATCHBASINS AND INLETS, AND SWALES. 13. PROOF ROLL ACCESS ROAD SUBGRADE; INSTALL LAYER OF PENNDOT 2A GRAVEL SUB-BASE OVER APPROVED SUBGRADE; GRADE AND ROLL GRAVEL.
- 14. STAKE OUT COMPRESSOR PAD AREA; EXCAVATE AND FILL PAD TO SUBGRADE; INSTALL BORROW MATERIAL AS NEEDED TO BRING THE PAD TO SUBGRADE ELEVATIONS.
- 15. STAKE OUT OFFICE/WAREHOUSE BUILDING PARKING AREA AND PERIMETER ACCESS ROAD IN COMPRESSOR PAD AREA; EXCAVATE AND FILL PARKING AREA AND ROADWAY TO SUBGRADE.
- 16. PROOF ROLL PERIMETER ROAD SUBGRADE; INSTALL LAYER OF PENNDOT 2A GRAVEL SUB-BASE OVER APPROVED SUBGRADE: GRADE AND ROLL GRAVEL
- 17. EXCAVATE STORMWATER DETENTION BASIN (SOUTH BASIN); INSTALL OUTLET CONTROL STRUCTURES AND ASSOCIATED PIPING; INSTALL ECBS AT PERIMETER OF BASIN, INLETS, AND OUTLETS. ENGINEER SHALL INSPECT STORMWATER DETENTION BASIN (SOUTH BASIN), OUTLET CONTROL STRUCTURES, ASSOCIATED PIPING, INLETS AND OUTLETS.
- 18. EXCAVATE ACCUMULATED SEDIMENT AND DEBRIS IN NORTH BASIN AND PERFORM FINAL GRADING. CUT TEMPORARY RISER FROM END OF THE PVC PIPE TO OUTLET CONTROL STRUCTURE AND INSTALL END CAP. DRILL HOLES FOR PERMANENT RISER PER STORMWATER DETAILS. IMMEDIATELY SEED BASIN AND INSTALL EROSION CONTROL BLANKET ON EMBANKMENT SLOPES. INSTALL ECBS AT PERIMETER OF BASIN, INLETS, AND OUTLETS. ENGINEER SHALL INSPECT STORMWATER DETENTION BASIN (NORTH BASIN) AND PERMANENT OUTLET CONTROL STRUCTURE.

EXCAVATE, FORM, POUR COMPRESSOR FOUNDATION BLOCKS (9 DAYS)

- 19. EXCAVATE FOR COMPRESSOR FOUNDATION BLOCKS (3). 20. FORM, INSTALL REINFORCING STEEL, AND POUR BLOCKS.

EXCAVATE, FORM, POUR BUILDING FOUNDATIONS (21 DAYS)

- 22. EXCAVATE FOR OFFICE/WAREHOUSE BUILDING FOUNDATION. 23. FORM, INSTALL REINFORCING STEEL, AND POUR BUILDING FOUNDATION.
- 24. INSTALL GRAVEL BACKFILL AND COMPACT SOIL. 25. UNDER-SLAB UTILITY INSTALLATION.
- 26. POUR CONCRETE FLOOR SLAB.

EXCAVATE, FORM, POUR REMAINING FOUNDATIONS (21 DAYS)

- 27. EXCAVATE FOR GAS COOLER, FILTER SEPARATORS, LAUNCHER/RECEIVER, BLOWDOWN SILENCERS, LIQUID TANKS,
- MISCELLANEOUS FOUNDATIONS. 28. FORM, INSTALL REINFORCING STEEL, AND POUR FOUNDATIONS.

29. INSTALL GRAVEL BACKFILL AND COMPACT SOIL. **EXCAVATE, INSTALL PLANT BURIED CONDUIT (9 DAYS)**

- 30. TRENCH EXCAVATION FOR BURIED CONDUIT.
- 31. CONDUIT INSTALLATION. 32. ENCASE CONDUIT AND BACKFILL WITH SELECT MATERIAL.

INSTALL PLANT POWER FEED, PHONE, CABLE, LIGHTING ALONG ACCESS ROAD (4 DAYS)

- 33. UTILITY POLES INSTALLATION.
- 34. STRING OVERHEAD CABLES. 35. STREET LIGHTS INSTALLATION.

ERECT, SET WAREHOUSE/OFFICE/CONTROL BUILDING (24 DAYS)

36. BUILDING ERECTION.

SET COMPRESSORS (3 DAYS)

37. INSTALLATION OF COMPRESSOR AND ENGINES. 38. START COMPRESSOR BUILDING ERECTION ONCE UNITS ARE SET

- SET MAIN GAS EQUIPMENT (27 DAYS)
- 39. INSTALL BELOW GRADE AND ABOVE GRADE GAS PIPING IN COMPRESSOR PAD AREA. 40. INSTALL CRUSHED STONE SURFACE IN COMPRESSOR PAD AREA.
- 41. EXCAVATE LARGE BORE PIPE TRENCHES. 42. FABRICATE, INSTALL LARGE BORE AND SMALL BORE PIPING AND SKIDS - RUNS TO SEPTEMBER.

FINAL GRADING AND PAVING

- 43. RESTORE DISTURBED AREAS; SPREAD TOPSOIL; SEED AND MULCH.
- 44. INSTALL PERMANENT SECURITY GATE AND FENCING. 45. INSTALL HOT MIXED ASPHALT BASE COURSE AND BINDER COURSE.
- 46. GRADE ROADSIDE SWALES; INSTALL TOPSOIL; SEED AND MULCH.
- 47. INSTALL PENNDOT 2A GRAVEL ROADWAY SHOULDERS. 48. INSTALL HOT MIXED ASPHALT WEARING COURSE (TOP COURSE).

ERECT COMPRESSOR BUILDING FRAMING AND INTERIOR LINER (30 DAYS)

- 49. BUILDING ERECTION OF FRAMING AND INTERIOR LINER STARTS IMMEDIATELY AFTER COMPRESSORS ARE SET 50. INSTALL SMALLER MECHANICAL AND ELECTRICAL EQUIPMENT
- 51. SET ELECTRICAL BUILDINGS
- 52. PULL AND TERMINATE WIRES

FINAL CLEANUP, DEMOBILIZATION, AND MAINTENANCE (38 DAYS)

- 53. MAINTAIN ECBS AND REPAIR ANY ERODED AREAS; REPAIR ANY AREAS DISTURBED DURING CONSTRUCTION ACTIVITIES.
- 54. FINAL CLEANUP, REMOVE SURPLUS AND TRASH FROM SITE. 55. DEMOBILIZE CONTRACTOR EQUIPMENT.
- 56. MONITOR AND MAINTAIN SEEDED AREAS.

REMOVE ECBS UPON ESTABLISHMENT OF VEGETATION.

LIMITING SOIL CHARACTERISTICS LEGEND DEPTH TO SATURATED CORROSIVI HYDRIC/ STRENGTH SLOW CUTBANKS SOURCE FROST | SHRINK - | POTENTIAL SOIL NAME DROUGHTY FLOODING **PIPING** PONDING WETNESS DEPTH TO HYDRIC SYMBOL CONCRETE ERODIBLE SEASONAL OF ACTION SWELL SINKHOLE PERCOLATION INCLUSIONS | LANDSLIDE BEDROCK **TOPSOIL** HIGH WATER **PRONE** TABLE ALBRIGHTS VERY STONY LOAM, 0 TO 8 PERCENT SLOPES C/S MORRIS VERY STONY SILT LOAM, 0 TO 8 PERCENT SLOPES C/S

SOURCE: AS TAKEN FROM TABLE E.1 OF THE THE PADEP E&SPCP MANUAL. MARCH 2012. HTTP://WWW.ELIBRARY.DEP.STATE.PA.US/DSWEB/GET/DOCUMENT-88925/363-2134-008.PDF

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

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

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.

RESOLUTION: AS IS TYPICAL FOR THESE TYPE OF SOILS, LIME WILL BE ADDED AS NEEDED TO PRODUCE

LIMITATION: pH - SOME SOILS HAVE pH VALUES LESS THAN 5.5, WHICH MAY LIMIT THE VEGETATIVE STABILIZATION ABILITY OF THE SOIL.

LIMITATION: LOW FERTILITY

VEGETATIVE STABILITY.

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.

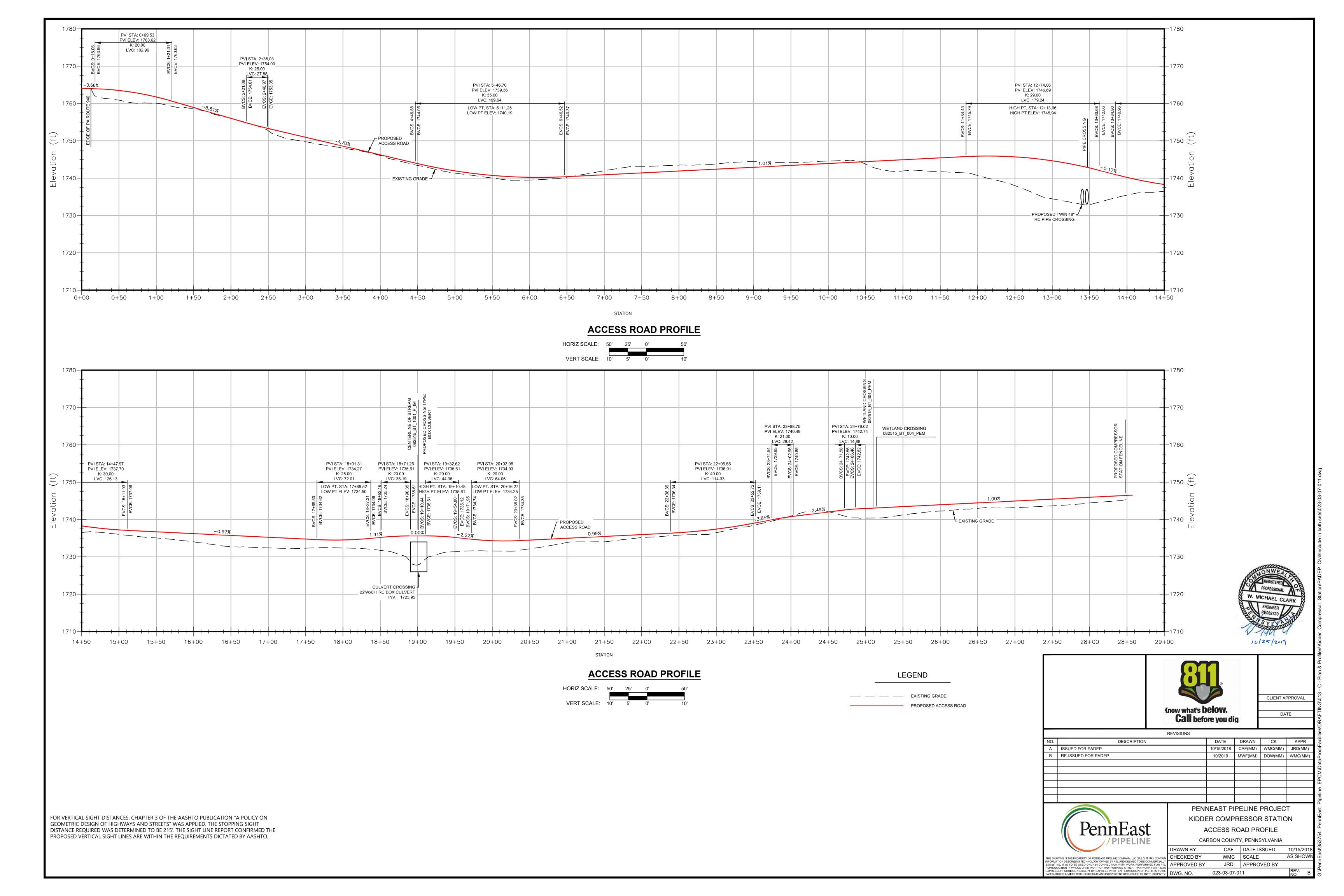


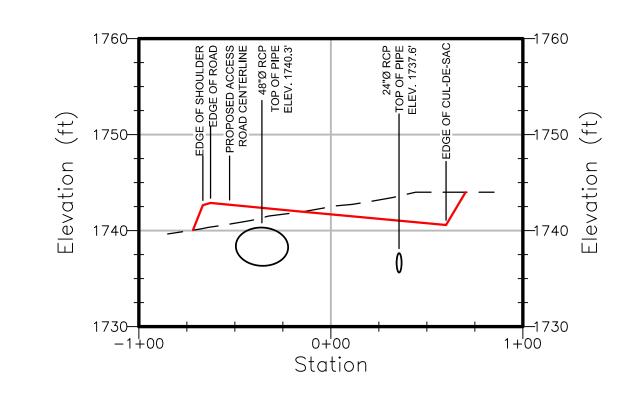
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Α	ISSUED FOR PADEP	10/15/2018	CAF(MM)	WMC(MM)	JRD(MM)
В	RE-ISSUED FOR PADEP	10/2019	MWF(MM)	DOW(MM)	WMC(MM)
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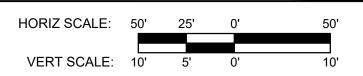
PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

CARBON COUNTY, PENNSYLVANIA DRAWN BY CAF DATE ISSUED 10/15/201 AS SHOWN WMC SCALE CHECKED BY JRD | APPROVED BY APPROVED BY 023-03-07-010

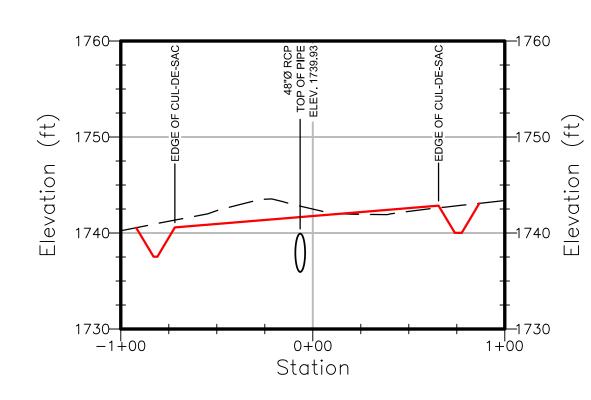




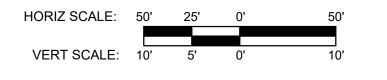








CUL-DE-SAC CROSS SECTION B-B





CLIENT APPROVAL DATE **Call** before you dig

REVISIONS DESCRIPTION DATE DRAWN CK APPR
 10/15/2018
 CAF(MM)
 WMC(MM)
 JRD(MM)

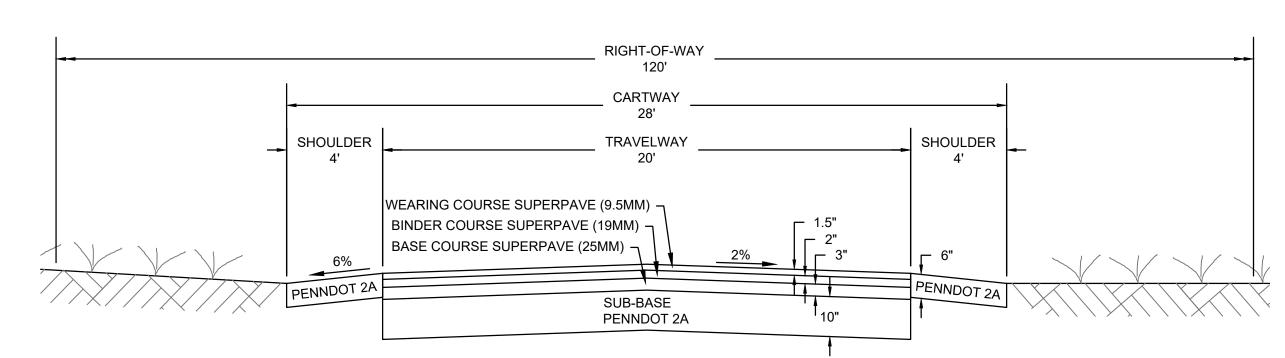
 10/2019
 MWF(MM)
 DOW(MM)
 WMC(MM)
 B RE-ISSUED FOR PADEP

A ISSUED FOR PADEP

PENNEAST PIPELINE PROJECT KIDDER COMPRESSOR STATION CROSS SECTION DETAILS

CARBON COUNTY, PENNSYLVANIA CAF DATE ISSUED 10/15/2018 DRAWN BY WMC SCALE AS SHOWN

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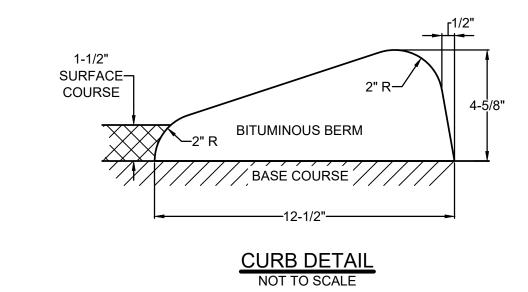
TYPICAL CROSS-SECTION OF ACCESS ROAD NOT TO SCALE

BASED ON KIDDER TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE, TABLE 153-29-1, DESIGN STANDARDS FOR ROADS (NONRESIDENTIAL BUSINESS AND INDUSTRIAL, LOCAL STREET).

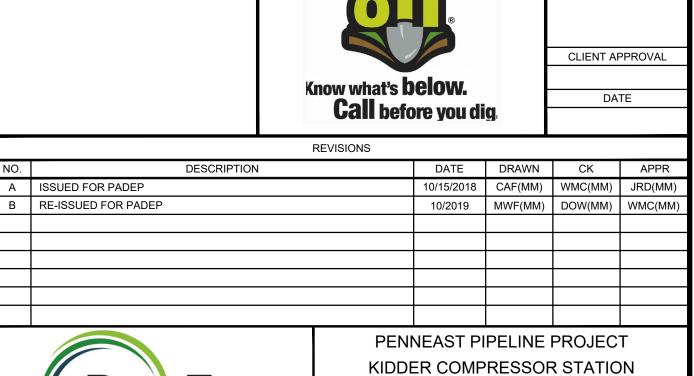
NOTE:
THE PROPOSED CARTWAY WIDTH IS BASED ON

THE PROPOSED CARTWAY WIDTH IS BASED ON PROPOSED TOWNSHIP REGULATIONS. IF THE PROPOSED TOWNSHIP REGULATIONS ARE NOT ADOPTED, PENNEAST WILL REQUEST A WAIVER DURING FINAL PLAN APPROVAL.

SPEED LIMIT = 35 MPH MAX SLOPE = 10%







KIDDER COMPRESSOR STATION
TYPICAL ACCESS ROAD SECTION
AND DETAILS
CARBON COUNTY, PENNSYLVANIA

DRAWN BY
CAF DATE ISSUED 10/1

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DRAWN BY

CAF DATE ISSUED 10/15/2018

CHECKED BY

WMC SCALE

AS SHOWN

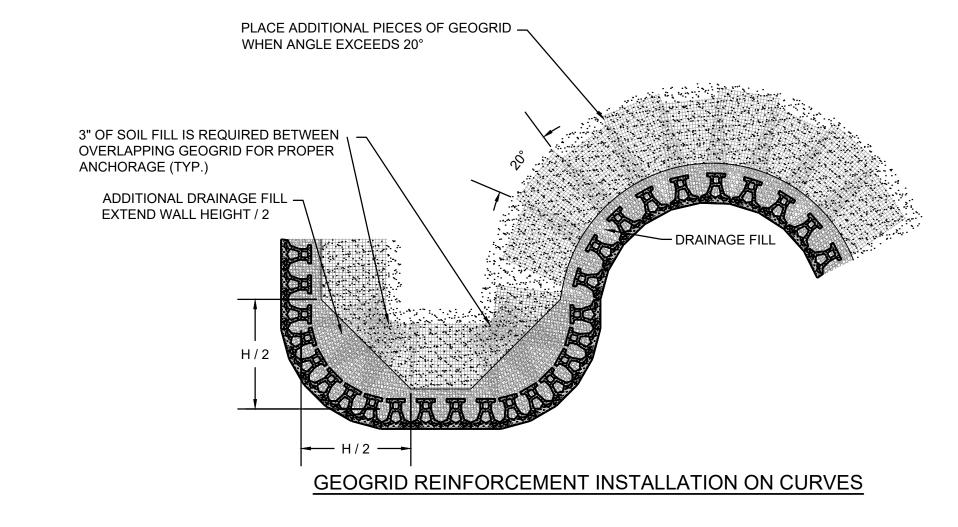
APPROVED BY

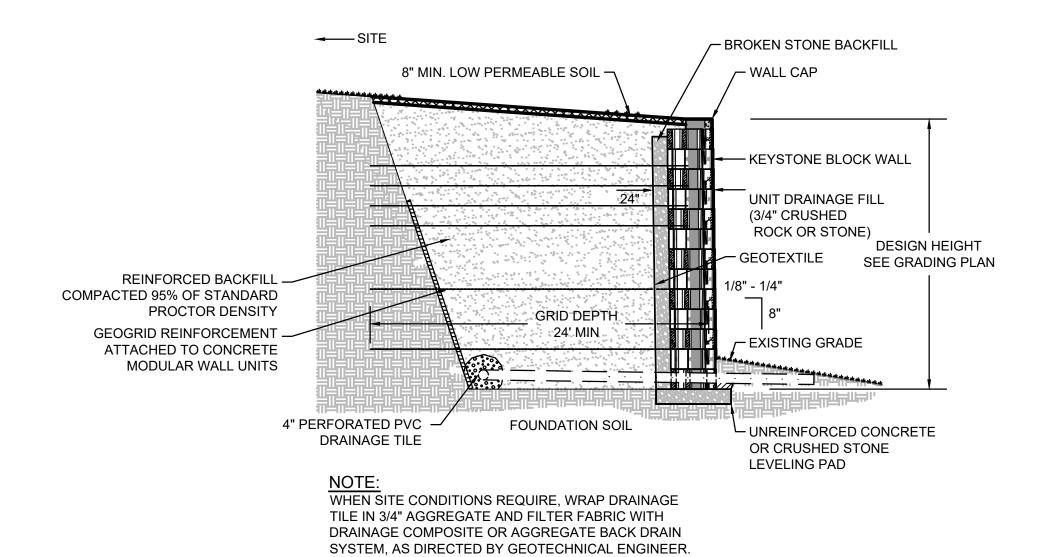
JRD APPROVED BY

BWG. NO. 023-03-07-013

REV. NO. B

TYPICAL REINFORCED RETAINING WALL SECTION WITH SWALE





TYPICAL REINFORCED RETAINING WALL SECTION WITHOUT SWALE



Know what's below.
Call before you dig.

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 PROJECT
KIDDER COMPRESSOR STATION
RETAINING WALL AND GEOGRID DETAILS

DRAWN BY

DWG. NO.

CHECKED BY

APPROVED BY

CARBON COUNTY, PENNSYLVANIA

WMC SCALE

023-03-07-014

JRD APPROVED BY

CAF DATE ISSUED 10/15/2018

AS SHOWN