

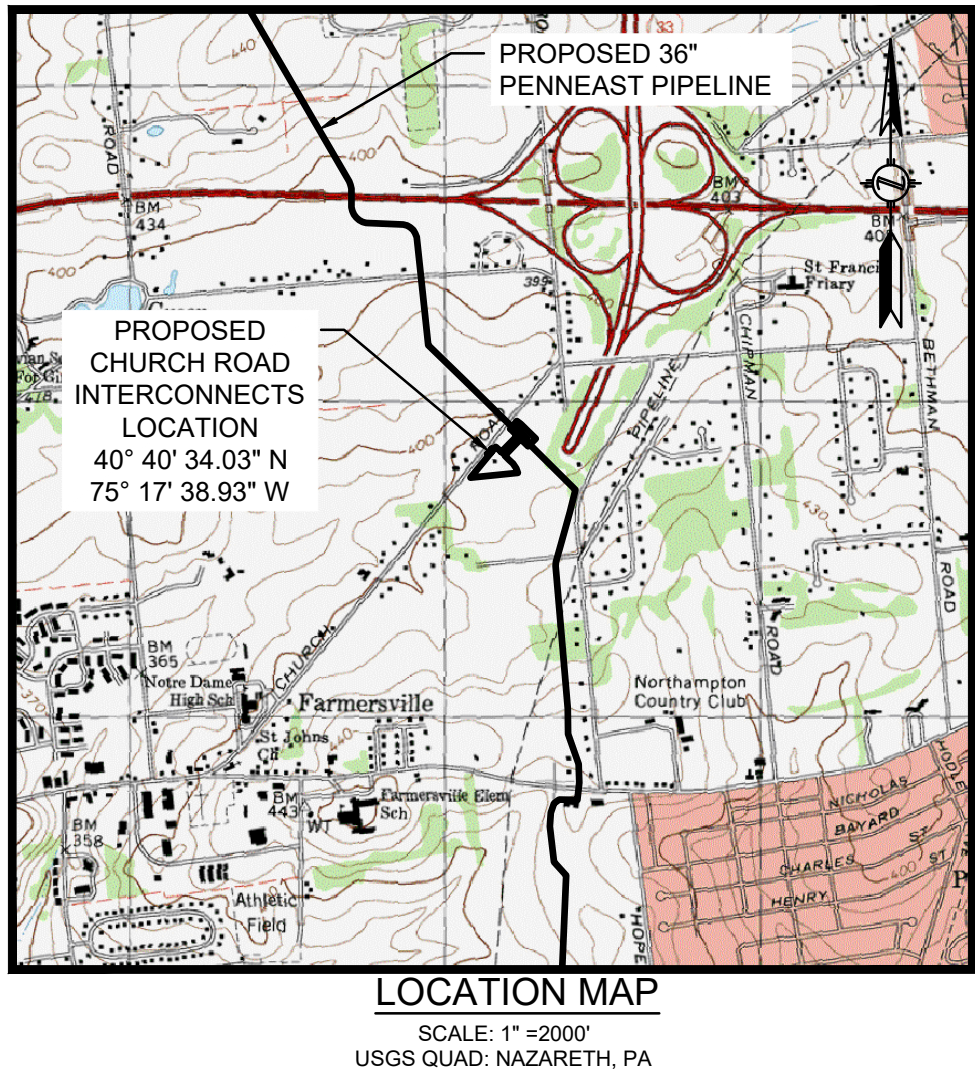
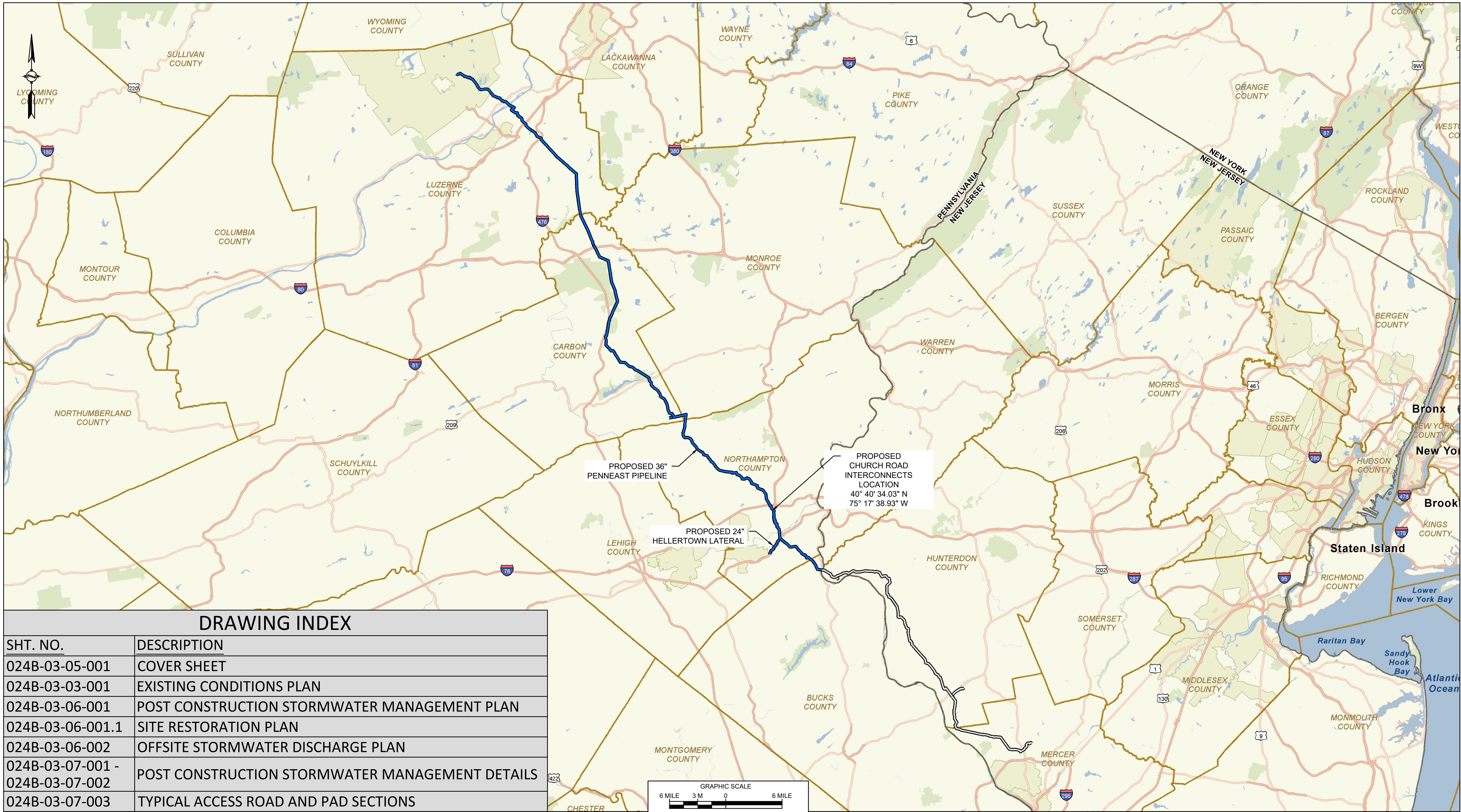
PENNEAST PIPELINE COMPANY, LLC

CHURCH ROAD INTERCONNECTS

BETHLEHEM TOWNSHIP

NORTHAMPTON COUNTY, PA

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN



DRAWING INDEX	
SHT. NO.	DESCRIPTION
024B-03-05-001	COVER SHEET
024B-03-03-001	EXISTING CONDITIONS PLAN
024B-03-06-001	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
024B-03-06-001.1	SITE RESTORATION PLAN
024B-03-06-002	OFFSITE STORMWATER DISCHARGE PLAN
024B-03-07-001 - 024B-03-07-002	POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
024B-03-07-003	TYPICAL ACCESS ROAD AND PAD SECTIONS

- GENERAL NOTES:**
- 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.
 - 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):**
- EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2018. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM PASDA.
 - SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2018.
 - PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY.
 - WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2018.
 - HORIZONTAL DATUM IS UTM83-18F. VERTICAL DATUM IS NAVD1988

PENNSYLVANIA ONE-CALL SERIAL NUMBERS

20151831983-000



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



3/27/2020

REFERENCE DRAWINGS			REVISIONS					
DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CK	APPR	
A		1	ISSUED FOR PADEP	02/2020	JDM	JDM	WMC	



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 COMMERCIAL 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 AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.

PENNEAST PIPELINE PROJECT CHURCH ROAD INTERCONNECTS COVER SHEET			
NORTHAMPTON COUNTY, PENNSYLVANIA			
DRAWN BY	DOW	DATE ISSUED	02/21/2020
CHECKED BY	JDM	SCALE	AS SHOWN
APPROVED BY	WMC	APPROVED BY	
DWG. NO.	024B-03-05-001	REV. NO.	A

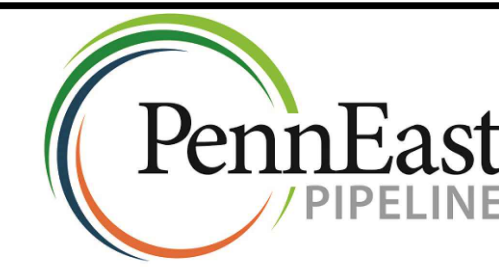
NORTHAMPTON COUNTY PENNSYLVANIA



1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM USGS.
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 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.

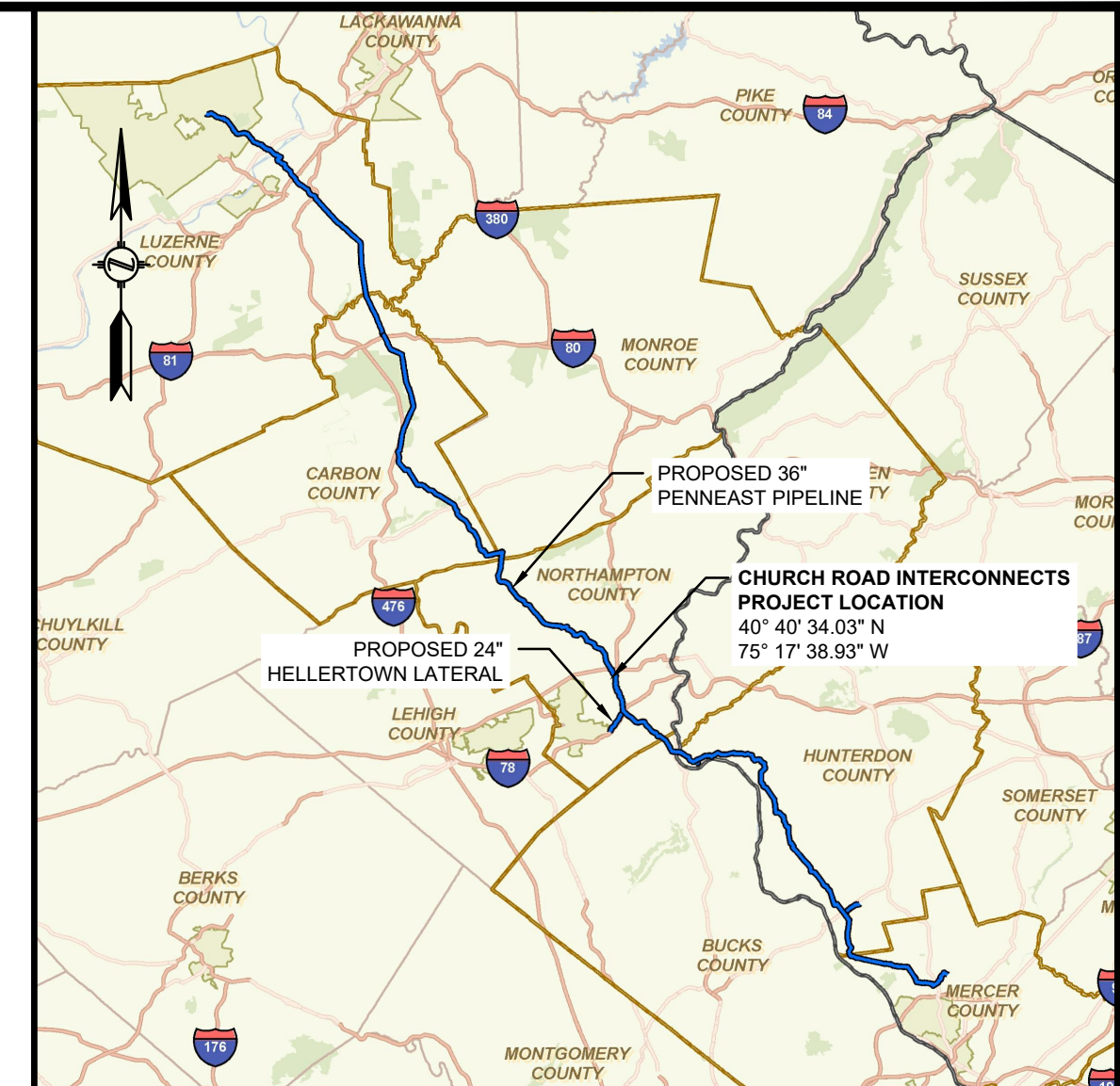
[illegible]

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 COMMERCIALY SENSITIVE. IT IS TO BE USED ONLY IN CONNECTION WITH WORK PERFORMED BY 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 AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.



PENNEAST PIPELINE PROJECT
CHURCH ROAD INTERCONNECTS
EXISTING CONDITIONS PLAN
NORTHAMPTON COUNTY, PENNSYLVANIA




INFORMATION ONLY IN THAN REDED RTY.	DRAWN BY		DOW	DATE ISSUED		02/21/2020	
	CHECKED BY		KEK	SCALE		AS SHOWN	
	APPROVED BY		MDN	APPROVED BY			
	DWG. NO.			024B-03-03-001			REV. NO.










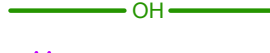


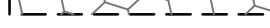
LOCATION MAP
SCALE: 1" = 15 MILES

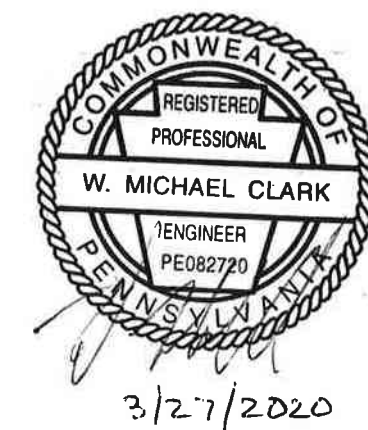
LEGENDS

PROPOSED

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

EXISTING

- | | |
|---|---------------------------|
|  | PROPERTY LINE |
|  | EXISTING MAJOR CONTOUR |
|  | EXISTING MINOR CONTOUR |
|  | SOIL BOUNDARY |
|  | SOIL TYPE ABBREVIATION |
|  | EXISTING OVERHEAD LINE |
|  | EXISTING PIPELINE |
|  | EXISTING UTILITY EASEMENT |
|  | EXISTING UTILITY POLE |
|  | EXISTING FENCE |
|  | LINE LIST NUMBER |

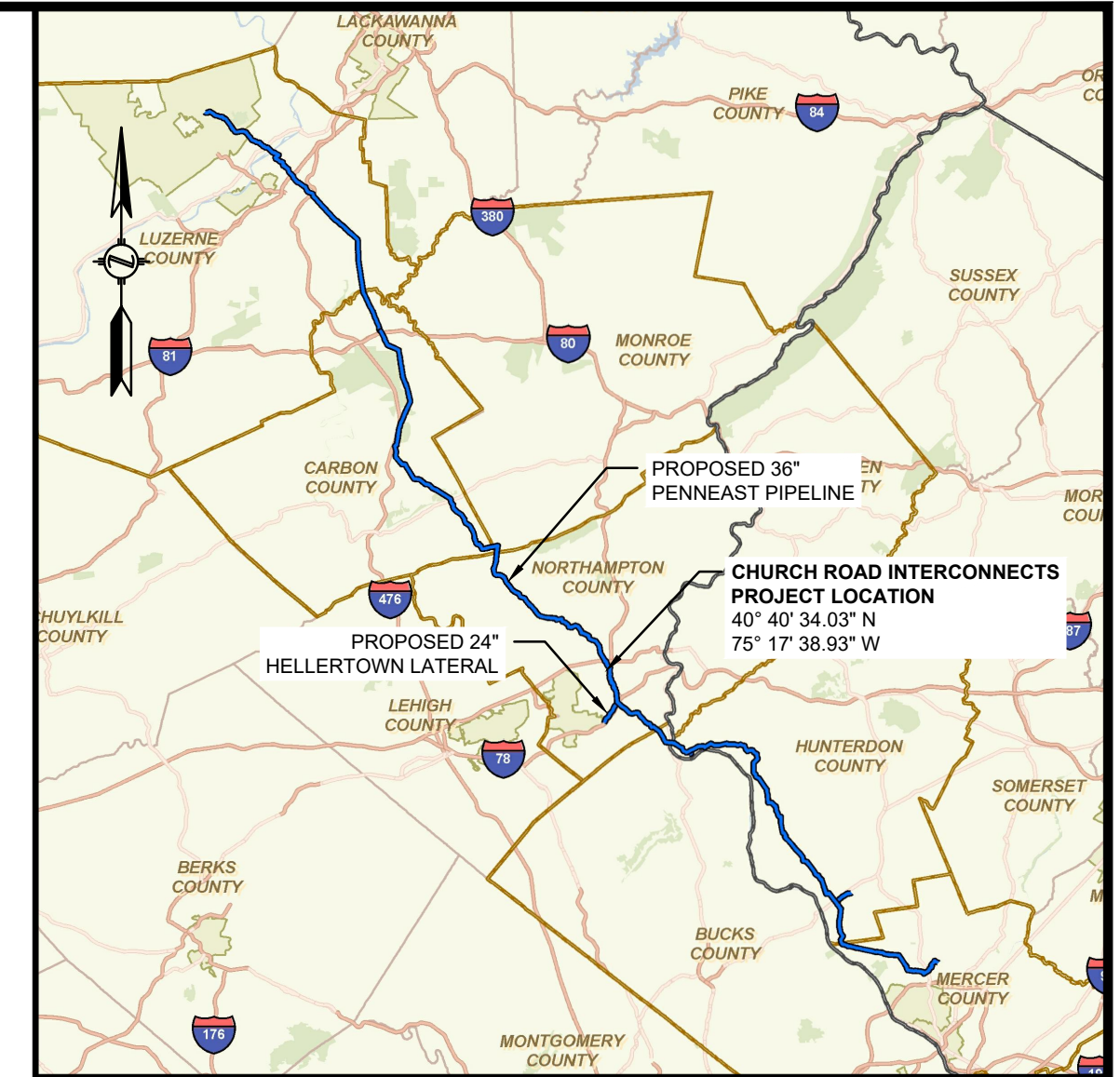
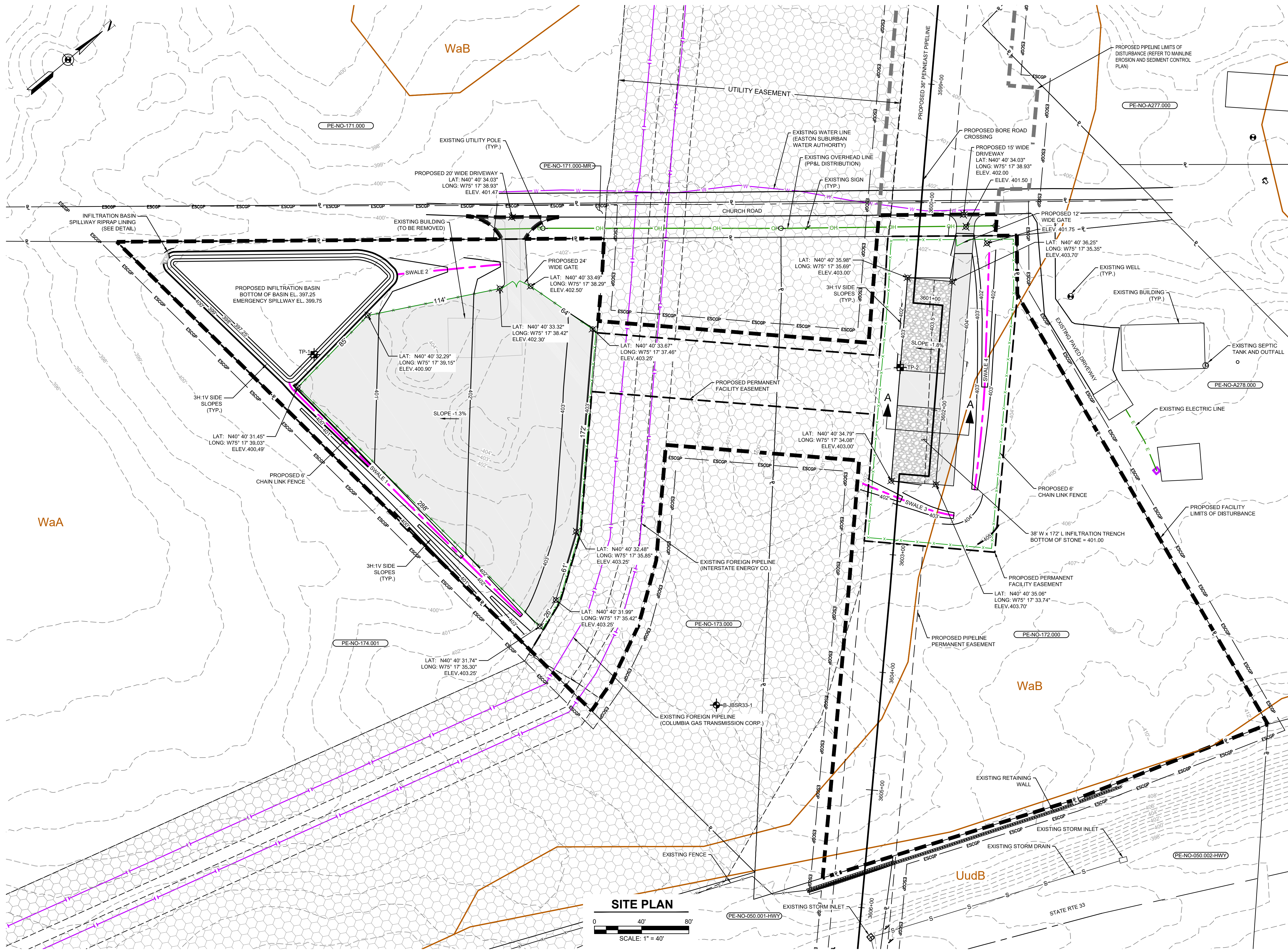


ENVIRONMENTAL NOTES:

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 TYPE IS PREDOMINANTLY OPEN LAND (MEADOW), WITH A SMALL PORTION OF IMPERVIOUS ROAD AND RESIDENTIAL (EXISTING SITE) TO THE SOUTHWEST.
2. AS PER §102.4(B)(5)(V), THE SITE DRAINS TO NANCY RUN, WHICH HAS A CHAPTER 93 DESIGNATED USE OF CWF (COLD WATER FISH), AND MF (MIGRATORY FISH).



NORTHAMPTON COUNTY, PENNSYLVANIA
USGS QUAD: NAZARETH, PENNSYLVANIA














LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED

-
- PROPOSED PIPELINE
- PROPOSED PIPELINE PERMANENT EASEMENT
- PROPOSED FACILITY PERMANENT EASEMENT
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION AND SEDIMENT CONTROL PLAN)
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- ESCGP
- ESCGP BOUNDARY
- PAD/ROAD AREA
- INFILTRATION TRENCH
- PROPOSED SWALE
- PROPOSED FENCE
- 370'
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- TP-1
- BORE LOG
- B-1

EXISTING

- | | |
|---|---------------------------|
|  | PROPERTY LINE |
|  | EXISTING MAJOR CONTOUR |
|  | EXISTING MINOR CONTOUR |
|  | SOIL BOUNDARY |
|  | SOIL TYPE ABBREVIATION |
|  | EXISTING OVERHEAD LINE |
|  | EXISTING PIPELINE |
|  | EXISTING UTILITY EASEMENT |
|  | EXISTING UTILITY POLE |
|  | EXISTING FENCE |
|  | LINE LIST NUMBER |



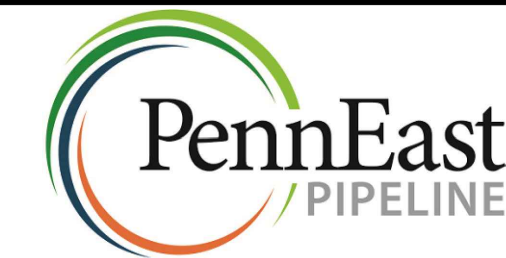
3/27/2020



Know what's below.
Call before you dig.

REFERENCE

1. EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM USGS.
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 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.

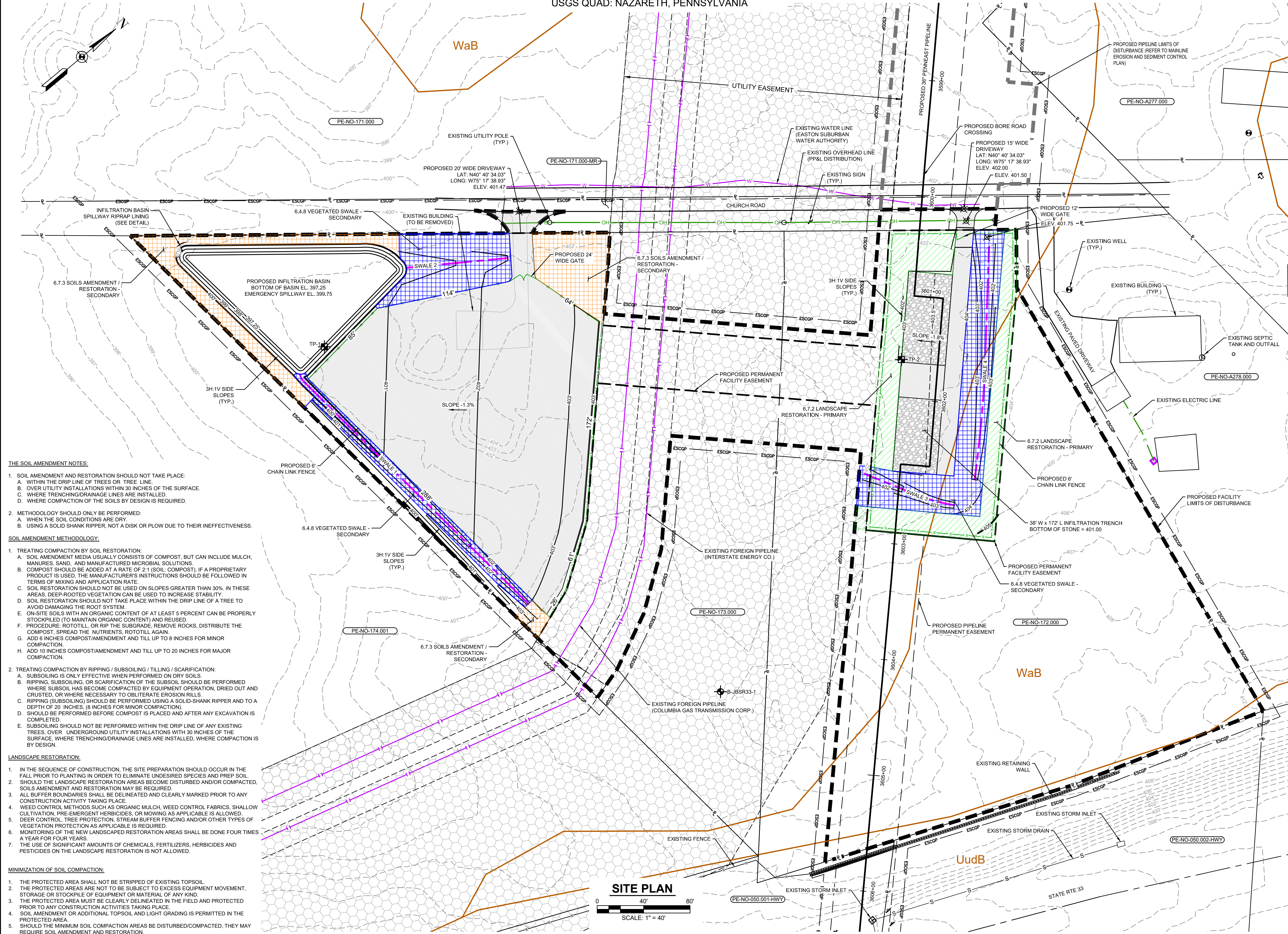
[illegible]

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 COMMERCIALY 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 AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.

PENNEAST PIPELINE PROJECT CHURCH ROAD INTERCONNECTS POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

DRAWN BY	DOW	DATE ISSUED	02/21/2020
CHECKED BY	JDM	SCALE	AS SHOWN
APPROVED BY	WMC	APPROVED BY	
DWG. NO.	024B-03-06-001		REV. NO. A

NORTHAMPTON COUNTY, PENNSYLVANIA
USGS QUAD: NAZARETH, PENNSYLVANIA



THE SOIL AMENDMENT NOTES:

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

SOIL AMENDMENT METHODOLOGY:

- TREATING COMPACTION BY SOIL RESTORATION:
 - SOIL AMENDMENT MEDIA USUALLY CONSISTS OF COMPOST, BUT CAN INCLUDE MULCH, MANURES, SAND, AND MANUFACTURED MICROBIAL SOLUTIONS.
 - 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.
 - SOIL RESTORATION SHOULD NOT BE USED ON SLOPES GREATER THAN 30%. IN THESE AREAS, DEEP-ROOTED VEGETATION CAN BE USED TO INCREASE STABILITY.
 - SOIL RESTORATION SHOULD NOT TAKE PLACE WITHIN THE DRIP LINE OF A TREE TO AVOID DAMAGING THE ROOT SYSTEM.
 - ON-SITE SOILS WITH AN ORGANIC CONTENT OF AT LEAST 5 PERCENT CAN BE PROPERLY STOCKPILED (TO MAINTAIN ORGANIC CONTENT) AND REUSED.
 - PROCEDURE: ROTOTILL, OR RIP THE SUBGRADE, REMOVE ROCKS, DISTRIBUTE THE COMPOST, SPREAD THE NUTRIENTS, ROTOTILL AGAIN.
 - ADD 6 INCHES COMPOST/AMENDMENT AND TILL UP TO 8 INCHES FOR MINOR COMPACTION.
 - ADD 10 INCHES COMPOST/AMENDMENT AND TILL UP TO 20 INCHES FOR MAJOR COMPACTION.
- TREATING COMPACTION BY RIPPING / SUBSOILING / TILLING / SCARIFICATION:
 - SUBSOILING IS ONLY EFFECTIVE WHEN PERFORMED ON DRY SOILS.
 - 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.
 - RIPPING (SUBSOILING) SHOULD BE PERFORMED USING A SOLID-SHANK RIPPER AND TO A DEPTH OF 20 INCHES, (8 INCHES FOR MINOR COMPACTION).
 - SHOULD BE PERFORMED BEFORE COMPOST IS PLACED AND AFTER ANY EXCAVATION IS COMPLETED.
 - 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:

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

MINIMIZATION OF SOIL COMPACTION:

- 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.
- THE PROTECTED AREA MUST BE CLEARLY DELINEATED IN THE FIELD AND PROTECTED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE.
- SOIL AMENDMENT OR ADDITIONAL TOPSOIL AND LIGHT GRADING IS PERMITTED IN THE PROTECTED AREA.
- SHOULD THE MINIMUM SOIL COMPACTION AREAS BE DISTURBED/COMPACTED, THEY MAY REQUIRE SOIL AMENDMENT AND RESTORATION.

REFERENCE:

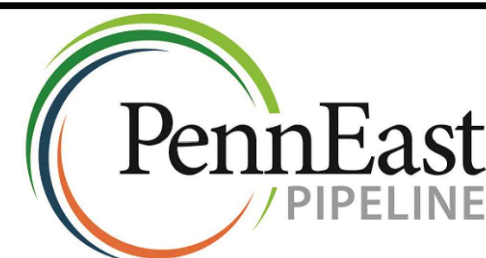
- EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM USGS.
- SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019.
- PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY.
- WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2019.
- HORIZONTAL DATUM IS UTM83-10F; VERTICAL DATUM IS NAVD1988.

REFERENCE DRAWINGS

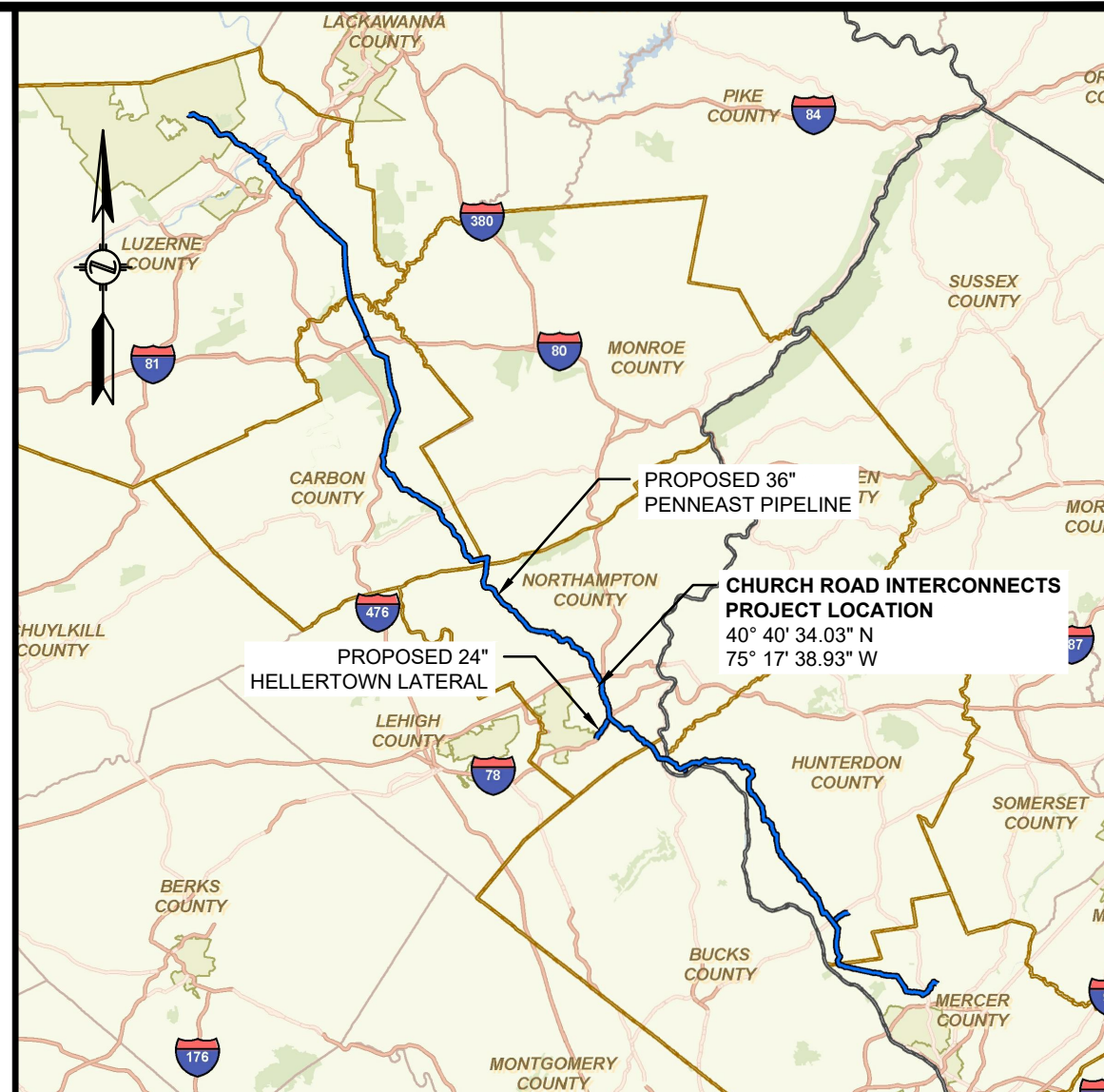
DWG. NO.	TITLE	NO.	DESCRIPTION
		A	ISSUED FOR PADEP

REVISIONS

DATE	DRAWN	CK	APPR
02/2020	DOW(MM)	JDM(MM)	WMC(MM)



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 COMMERCIALY 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 AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.



LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED

- PROPOSED PIPELINE
- PROPOSED PIPELINE PERMANENT EASEMENT
- PROPOSED FACILITY PERMANENT EASEMENT
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION AND SEDIMENT CONTROL PLAN)
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- ESCCP
- ESCCP BOUNDARY
- PAD/ROAD AREA
- INFILTRATION TRENCH
- PROPOSED SWALE
- PROPOSED FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- TEST PITS
- BORE LOG

- 6.7.2 LANDSCAPE RESTORATION - PRIMARY
- 6.7.3 SOILS AMENDMENT / RESTORATION - SECONDARY
- 6.4.8 VEGETATED SWALE - SECONDARY

EXISTING

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- SOIL BOUNDARY
- SOIL TYPE ABBREVIATION
- EXISTING OVERHEAD LINE
- EXISTING PIPELINE
- EXISTING UTILITY EASEMENT
- EXISTING UTILITY POLE
- EXISTING FENCE
- LINE LIST NUMBER



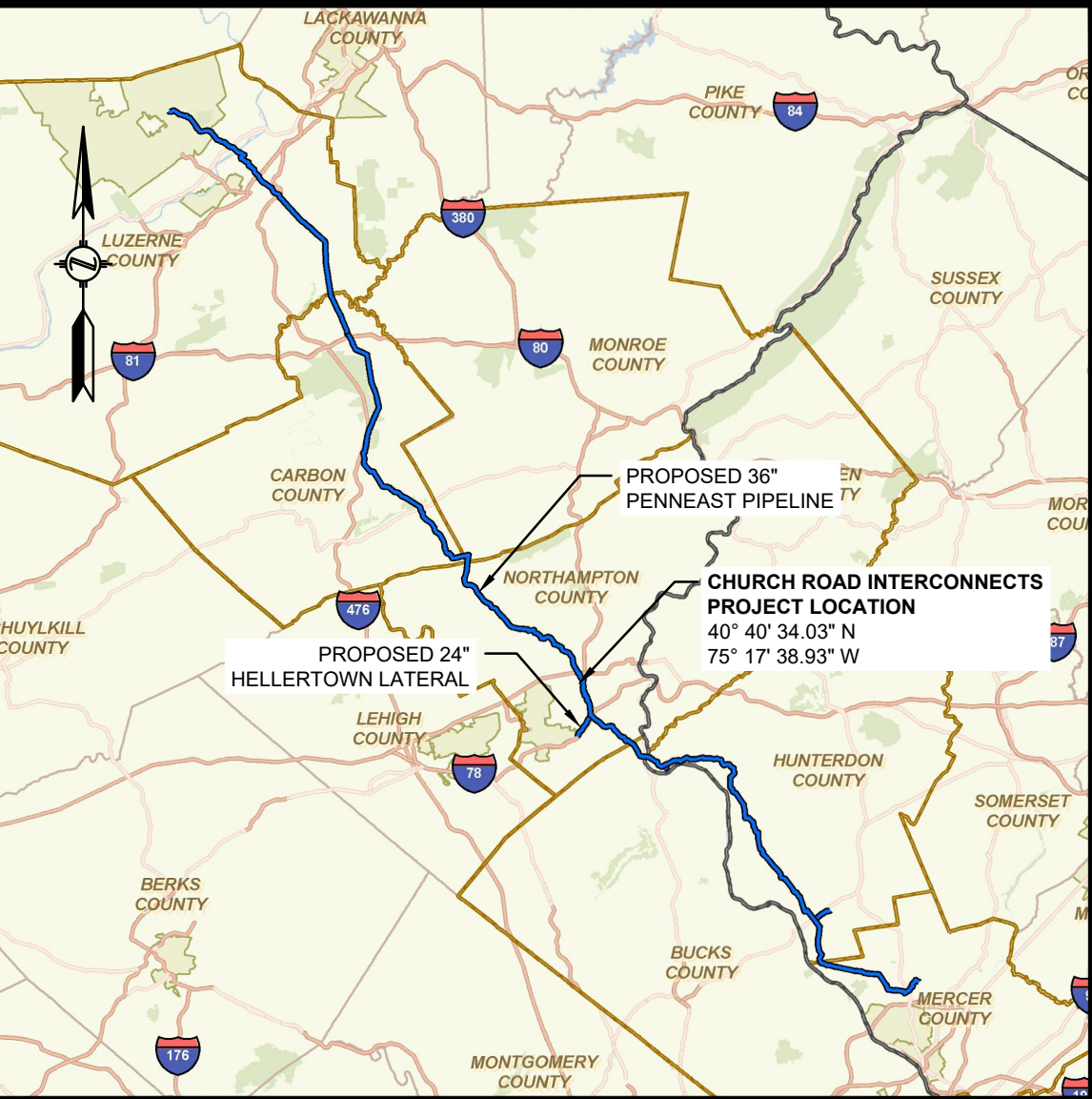
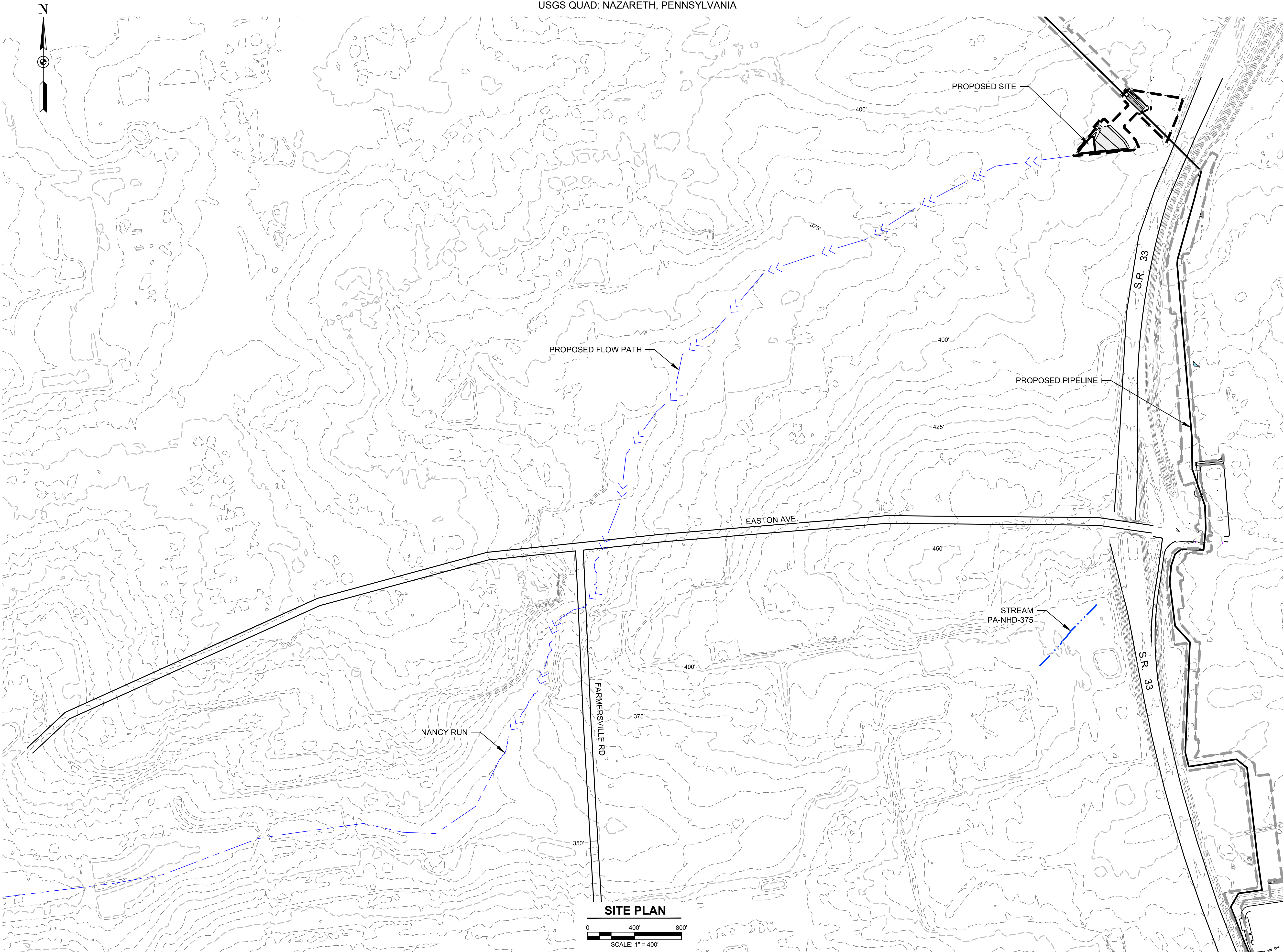
3/27/2020



PENNEAST PIPELINE PROJECT
CHURCH ROAD INTERCONNECTS
SITE RESTORATION PLAN
NORTHAMPTON COUNTY, PENNSYLVANIA

DRAWN BY	DOW	DATE ISSUED	02/21/2020
CHECKED BY	JDM	SCALE	AS SHOWN
APPROVED BY	WMC	APPROVED BY	
DWG. NO.	024B-03-06-001	REV. NO.	A

NORTHAMPTON COUNTY, PENNSYLVANIA
USGS QUAD: NAZARETH, PENNSYLVANIA



LOCATION MAP
SCALE: 1" = 15 MILES

LEGENDS

PROPOSED

- PROPOSED PIPELINE
- PROPOSED PIPELINE LIMITS OF DISTURBANCE (REFER TO MAINLINE EROSION AND SEDIMENT CONTROL PLAN)
- PROPOSED FACILITY LIMITS OF DISTURBANCE
- PAD/ROAD AREA
- PROPOSED FLOW PATH

EXISTING

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- TRIBUTARY
- EDGE OF ROAD



- REFERENCE:
- EXISTING CONTOURS SHOWN WERE SURVEYED BY MOTT MACDONALD DURING 2015 THRU 2019. ADDITIONAL EXISTING CONTOURS WERE PROVIDED BY PICTOMETRY, 2015 AND SUPPLEMENTED FROM USGS.
 - SITE TOPOGRAPHIC AND FEATURE SURVEY PERFORMED BY MOTT MACDONALD 2015 THRU 2019.
 - PROPERTY INFORMATION ON THIS PLAN BASED ON GIS TAX MAP DATA AND RECTIFIED PROPERTY LINES AND ARE NOT THE RESULT OF A BOUNDARY SURVEY.
 - WATERBODY INFORMATION PROVIDED BY AECOM 2015 THRU 2019.
 - HORIZONTAL DATUM IS UTM83-16F. VERTICAL DATUM IS NAVD1988.

REFERENCE DRAWINGS			REVISIONS					
DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CK	APPR	
A	ISSUED FOR PADEP			02/2020	DOW(MM)	JDM(MM)	WMC(MM)	



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 COMMERCIAL 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 AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY.

PENNEAST PIPELINE PROJECT CHURCH ROAD INTERCONNECTS OFFSITE STORMWATER DISCHARGE PLAN			
NORTHAMPTON COUNTY, PENNSYLVANIA			
DRAWN BY	DOW	DATE ISSUED	02/21/2020
CHECKED BY	JDM	SCALE	AS SHOWN
APPROVED BY	WMC	APPROVED BY	
DWG. NO.	0248-03-06-002	REV. NO.	A

POST CONSTRUCTION STORM WATER BMP NOTES:

GENERAL:

1. DISTURBANCE TO VEGETATION AND EXISTING DRAINAGE FEATURES SHALL BE LIMITED TO THE GREATEST EXTENT PRACTICAL.
2. POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) BMPS SHALL BE INSTALLED AS LATE IN THE CONSTRUCTION PROCESS AS POSSIBLE.
3. 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.
4. ENTRY OF SEDIMENT LADEN WATER TO THE PCSM BMPS SHALL BE PREVENTED.
5. PCSM BMPS SHALL BE INSPECTED DURING CONSTRUCTION AS PER THE REQUIREMENTS OF THE PA BMP MANUAL AND AS SPECIFIED ELSEWHERE ON CONSTRUCTION DRAWINGS.
6. 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 NORTHAMPTON 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 THESE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776 TO DETERMINE THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
3. INSTALL ROCK CONSTRUCTION ENTRANCES.
4. INSTALL COMPOST FILTER SOCK DOWNSLOPE OF ANY PROPOSED DISTURBED/EXCAVATED AREA AND STOCKPILES AS SHOWN ON THE ESC PLAN.
5. PERFORM CLEARING AND GRUBBING TO THOSE AREAS DESCRIBED IN EACH STAGE OF WORK. DISPOSE OF EXCESS TOPSOIL OFF-SITE. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT OFF-SITE WASTE AREAS HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR PADEP PRIOR TO BEING ACTIVATED.
6. CONSTRUCT DIVERSION CHANNELS ON THE EASTERLY SIDE OF THE SITE (SWALE 3 AND SWALE 4). IMMEDIATELY PROVIDE TEMPORARY SEEDING AND MULCH TO NEWLY GRADED SLOPES. INSTALL WEIGHTED SEDIMENT FILTER TUBES IN SWALES AT LOCATIONS SHOWN ON THE E&S PLANS. CONSTRUCT PROPOSED INFILTRATION TRENCH. ENGINEER SHALL INSPECT THE INFILTRATION TRENCH UPON INSTALLATION.
7. PERFORM GRADING ACTIVITIES DETAILED BY PROPOSED GRADING, NOTES, AND DETAILS SHOWN ON THE PLAN DRAWINGS. AS PER PROJECT SPECIFICATIONS, ADDITIONAL TEMPORARY PLACEMENT OF COMPOST FILTER SOCK MAY BE NECESSARY AT THE CONTRACTOR'S DISCRETION SHOULD ACCELERATED EROSION BE OBSERVED DURING GRADING ACTIVITIES.
8. CONSTRUCT PAD AND FACILITIES ACCORDING TO SPECIFICATIONS WITHIN THESE PLAN SHEETS INCLUDING ALL STABILIZATION MEASURES.
9. CONSTRUCT PROPOSED INFILTRATION BASIN AND BOTH SWALES (SWALE 1 AND SWALE 2) LEADING TO THE BASIN. INSTALL WEIGHTED SEDIMENT FILTER TUBES IN SWALES AT LOCATIONS SHOWN ON THE E&S PLANS. ENGINEER SHALL INSPECT THE BASIN AND SWALE INSTALLATION.
10. AREAS WITH MINOR SOIL COMPACTION SHALL BE RIPPED TO A DEPTH OF 8", AND AREAS OF MAJOR COMPACTION SHALL BE RIPPED TO A DEPTH OF 20". NO RIPPING SHALL TAKE PLACE IN THE VICINITY OF THE MAINLINE PIPING OR OTHER UNDERGROUND UTILITIES.
11. PLACE TOPSOIL IN ALL AREAS TO BE VEGETATED. IF WORK IS COMPLETED OUTSIDE OF THE GERMINATING SEASON, THEN IMMEDIATELY PROVIDE TEMPORARY SEEDING AND MULCH TO NEWLY GRADED SLOPES.
12. APPLY PERMANENT SEED MIX AND MULCH TO DISTURBED AREAS AS SPECIFIED AND IN ACCORDANCE WITH THIS PLAN.
13. ANY TEMPORARY MEASURES (SUCH AS COMPOST FILTER SOCK AND WEIGHTED SEDIMENT FILTER TUBES) INSTALLED BY CONTRACTOR DURING GRADING SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS. THE ENGINEER SHALL INSPECT FINAL STABILIZATION PRIOR TO REMOVAL OF TEMPORARY MEASURES.
14. CLEAN WORK AREA OF ANY DEBRIS CREATED DURING THE CONSTRUCTION SEQUENCE.

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 AND TRENCH. 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. AREAS WHERE FILL IS TO BE PLACED SHOULD BE SCARIFIED PRIOR TO PLACEMENT. FILL MATERIALS FOR THE EMBANKMENT SHOULD BE PLACED IN MAXIMUM 8-INCH LIFTS. THE PRINCIPAL SPILLWAY SHOULD BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.
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 SLIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHOULD BE STABILIZED BY SEEDING, PLANTING AND MULCHING.

MAINTENANCE AND INSPECTION NOTES:

THESE REQUIREMENTS ARE INDEPENDENT OF THE EROSION AND SEDIMENT CONTROL REQUIREMENT DURING CONSTRUCTION. HOWEVER CERTAIN TASKS MAY OVERLAP.

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. VEHICLES WILL NOT BE PARKED OR DRIVEN ON THE BASIN, AND EXCESSIVE COMPACTION BY MOWERS WILL BE AVOIDED.
 - C. 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, AND SIGNS OF WATER CONTAMINATION/ SPILLS. ACCUMULATED SEDIMENT WILL BE REMOVED, AND SEDIMENT AND DEBRIS ACCUMULATION (ADDRESS WHEN > 3 INCHES AT ANY SPOT).
 - D. INSPECT FOR LITTER, REMOVE FROM BASIN AS REQUIRED.
 - E. THE ORIGINAL CROSS SECTION AND INFILTRATION RATE OF THE BASIN WILL BE RESTORED, AND SEDIMENT WILL BE PROPERLY DISPOSED OF.
 3. INFILTRATION TRENCH:
 - A. OUTLET CONTROL STRUCTURES WILL BE INSPECTED AND CLEANED AT LEAST TWO TIMES PER YEAR AND AFTER RUNOFF EVENTS.
 - B. VEHICLES WILL NOT BE PARKED OR DRIVEN ON THE TRENCH, AND EXCESSIVE COMPACTION BY MOWERS WILL BE AVOIDED.
 - C. THE TRENCH WILL BE INSPECTED AFTER RUNOFF EVENTS TO MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN 72 HOURS. THE TRENCH WILL ALSO BE INSPECTED FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION CONTROL MEASURES, AND SIGNS OF WATER CONTAMINATION/ SPILLS. ACCUMULATED SEDIMENT WILL BE REMOVED, AND SEDIMENT AND DEBRIS ACCUMULATION (ADDRESS WHEN > 3 INCHES AT ANY SPOT).
 - D. INSPECT FOR LITTER, REMOVE FROM TRENCH AS REQUIRED.
 - E. THE ORIGINAL CROSS SECTION AND INFILTRATION RATE OF THE TRENCH WILL BE RESTORED, AND SEDIMENT WILL BE PROPERLY DISPOSED OF.

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: LOW 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 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.

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

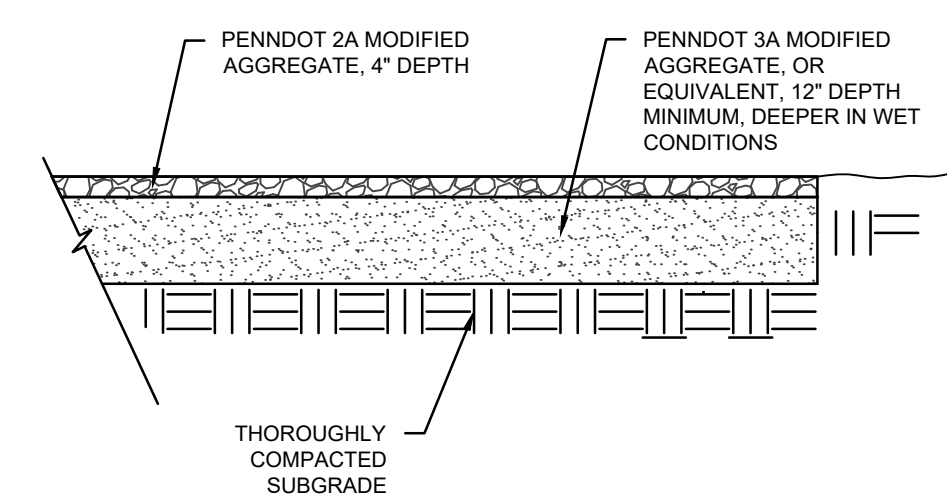
LIMITING SOIL CHARACTERISTICS LEGEND																		
MAP SYMBOL	SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK- SWELL	POTENTIAL SNR/HOLE	PONDING	WETNESS	MIN. DEPTH TO BEDROCK
UuB	URBAN LAND-UDORTHENTS, LIMESTONE COMPLEX, 0 TO 8 PERCENT SLOPES	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	X
WuA	WASHINGTON SILT LOAM, 0 TO 3 PERCENT SLOPES	X	S				X	X	X	X	X		X	X	X			X
WuB	WASHINGTON SILT LOAM, 3 TO 8 PERCENT SLOPES	X	S				X	X	X	X	X		X	X	X			X

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

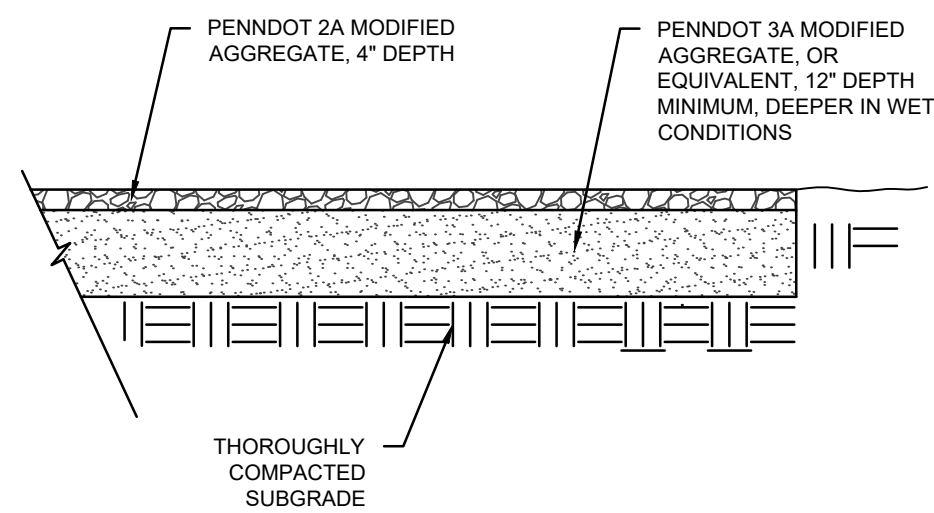


3/27/2020

		CLIENT APPROVAL			
		DATE			
REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	02/2020	DOW(MM)	JDM(MM)	WMC(MM)
		PENNEAST PIPELINE PROJECT CHURCH ROAD INTERCONNECTS POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS NORTHAMPTON COUNTY, PENNSYLVANIA			
		DRAWN BY	DOW	DATE ISSUED	02/21/2020
THIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC (P.E.C.). IT MAY CONTAIN INFORMATION DESCRIBING TECHNOLOGY OWNED BY P.E.C. AND DEEMED TO BE CONFIDENTIAL AND SENSITIVE. IT IS TO BE USED ONLY IN CONNECTION WITH WORK PERFORMED FOR P.E.C. REPRODUCTION WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS EXPRESSLY FORBIDDEN EXCEPT BY EXPRESS WRITTEN PERMISSION OF P.E.C. IT IS TO BE DESTROYED IMMEDIATELY UPON COMPLETION OF THE PROJECT AND NOT REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.		CHECKED BY	JDM	SCALE	AS SHOWN
		APPROVED BY	WMC	APPROVED BY	
DWG. NO.		024B-03-07-002		REV. NO.	A



TYPICAL ACCESS ROAD CROSS-SECTION DETAIL
N.T.S.



TYPICAL PAD CROSS SECTION DETAIL
N.T.S.



	CLIENT APPROVAL
	DATE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CK	APPR
A	ISSUED FOR PADEP	02/2020	DOW(MM)	JDM(MM)	WMC(MM)

PENNEAST PIPELINE PROJECT
CHURCH ROAD INTERCONNECTS
TYPICAL ACCESS ROAD AND PAD SECTIONS
NORTHAMPTON COUNTY, PENNSYLVANIA

DRAWN BY	DOW	DATE ISSUED	02/21/2020
CHECKED BY	JDM	SCALE	AS SHOWN
APPROVED BY	WMC	APPROVED BY	
DWG. NO.	024B-03-07-003	REV. NO.	A

THIS DRAWING IS THE PROPERTY OF PENNEAST PIPELINE COMPANY, LLC ("P.E.C."). IT MAY CONTAIN INFORMATION DESCRIBING TECHNOLOGY OWNED BY P.E.C. AND DESIGNED TO BE CONFIDENTIAL. SENSITIVE. IT IS TO BE USED ONLY IN CONNECTION WITH WORK PERFORMED FOR P.E.C. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN WORK FOR P.E.C. IS EXPRESSLY FORBIDDEN EXCEPT BY EXPRESS WRITTEN PERMISSION OF P.E.C. IT IS TO BE KEPT SECURED AGAINST BOTH UNAUTHORIZED AND UNAUTHORIZED DISCLOSURE TO ANY THIRD PARTY.