

# TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC ATLANTIC SUNRISE PROJECT PROPOSED 42" CENTRAL PENN LINE SOUTH

## BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET

SOUTH LONDONDERRY, SOUTH ANNVILLE, NORTH ANNVILLE, EAST HANOVER, UNION, SWATARA, NORTH LEBANON  
TOWNSHIPS

LEBANON COUNTY

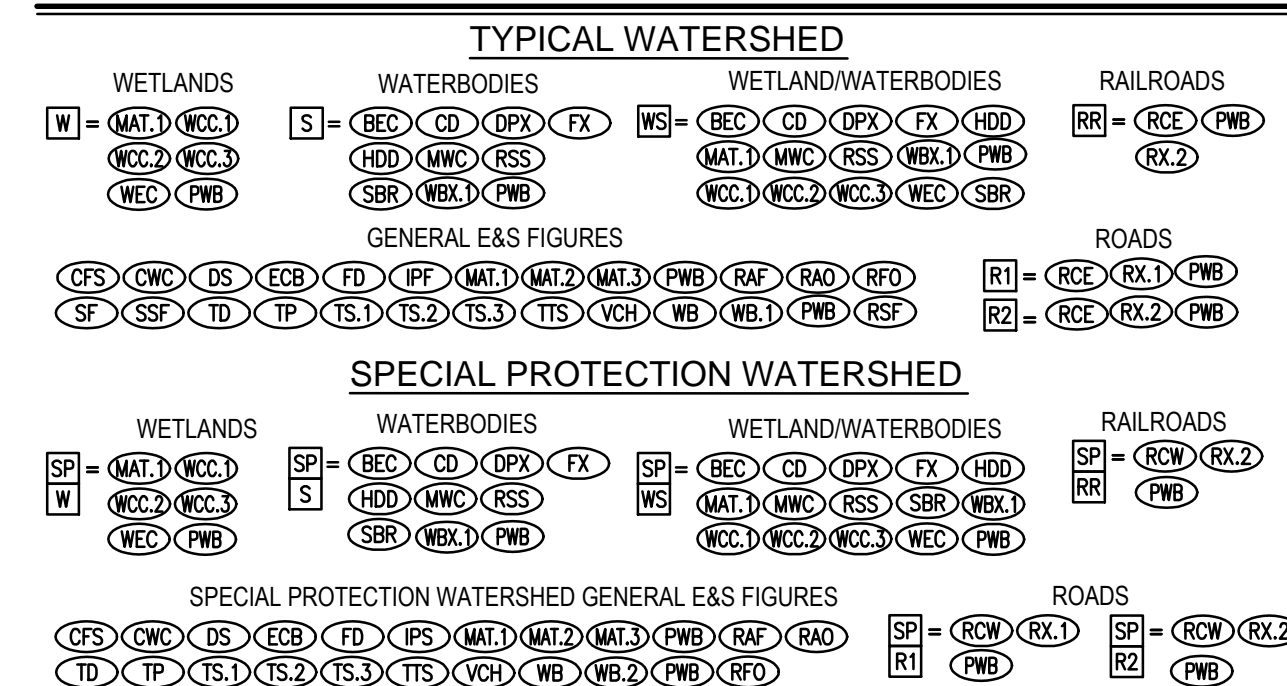
### BMP DETAIL SUMMARY

FIGURE	FIGURE TITLE	SHEET NO.
ARF	ABACT ROCK FILTER	1
<del>BBB</del>	<del>BROAD-BASED BMP</del>	
BEC	BRIDGE EQUIPMENT CROSSING	
CD	COFFERDAM STREAM CROSSING	
<del>GBM</del>	<del>GHEEK DAM</del>	2
CFS	COMPOST FILTER SOCK	
CS	CLEANOUT STAKE	
CST	COMPOST SOCK SEDIMENT TRAP	
CWC	CLEAN WATER CROSSING (FLUME CROSSING)	3
DPX	DAM AND PUMP STREAM CROSSING	
DS	HYDROSTATIC DEWATERING STRUCTURE	
ECB	EROSION CONTROL BLANKET	
FD	FILTER SOCK DIVERSION	4
FEN	CONSTRUCTION FENCE	
FX	FLUME STREAM CROSSING	
HDD	HORIZONTAL DIRECTIONAL DRILL	
<del>IPF</del>	<del>FILTER BAG INLET PROTECTION - TYPE M</del>	5
<del>IPS</del>	<del>STONE AND CONCRETE INLET PROTECTION - TYPE M</del>	
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MAT.2	TIMBER MATTING WITH FILL OVER EXISTING PIPELINES	
MAT.3	TIMBER MATTING AIR BRIDGE	6
MWC	WET MINOR WATERBODY CROSSING	
PWB	PUMP WATER FILTER BAG	
RAO	RIP RAP APRON AT PIPE OUTLET WITHOUT FLARED END SECTION	
RAP	RIP RAP GRADATION	7
RCE	ROCK CONSTRUCTION ENTRANCE	
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RSS	RIP RAP STREAM BANK STABILIZATION	
RX.1	TRENCHED ROAD CROSSING	
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TP	TRENCH PLUG INSTALLATION	10
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TS.2	TOPSOIL SEGREGATION (2)	
TS.3	TOPSOIL SEGREGATION (3)	11
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WCC.2	"SATURATED WETLAND" INSTALLATION PROCEDURE	
WCC.3	"INUNDATED WETLAND" INSTALLATION PROCEDURE	
WD	WATER DEFLECTOR	
WEC	WETLAND EQUIPMENT	

### DRAWING INDEX

DRAWING NUMBER	SHEET NO.	DRAWING NAME
24-1600-70-28-A/LL113_9-BMP	1-1	COVER SHEET
ASR-BMP-GN	1-3	GENERAL NOTES
ASR-BMP	1-11	BEST MANAGEMENT PRACTICES STANDARD CONSTRUCTION DETAILS
24-1601-70-28-A/LL113_9-BMP-LE-TB	1-4	QUANTITY, CROSSING, AND ACIDIC SOIL TABLES

### E&S DETAIL GROUP LEGEND FOR PIPELINE CROSSINGS



DETAILS IN THIS LEGEND ARE NOT COMPREHENSIVE AND ONLY REFER TO BMPs RELATED TO PIPELINE CROSSINGS. ADDITIONAL BMPs ARE PROVIDED FOR ACCESS ROADS.  
E&S DETAIL GROUP LEGEND IS ALSO PROVIDED ON THE PIPELINE E&S PLANS. LEGEND IS SHOWN HERE FOR COORDINATION PURPOSES.



REVISIONS					
NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK. APP.
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK SMK
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK SMK
3	3/28/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK AJB
4	04/20/16	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK AJB

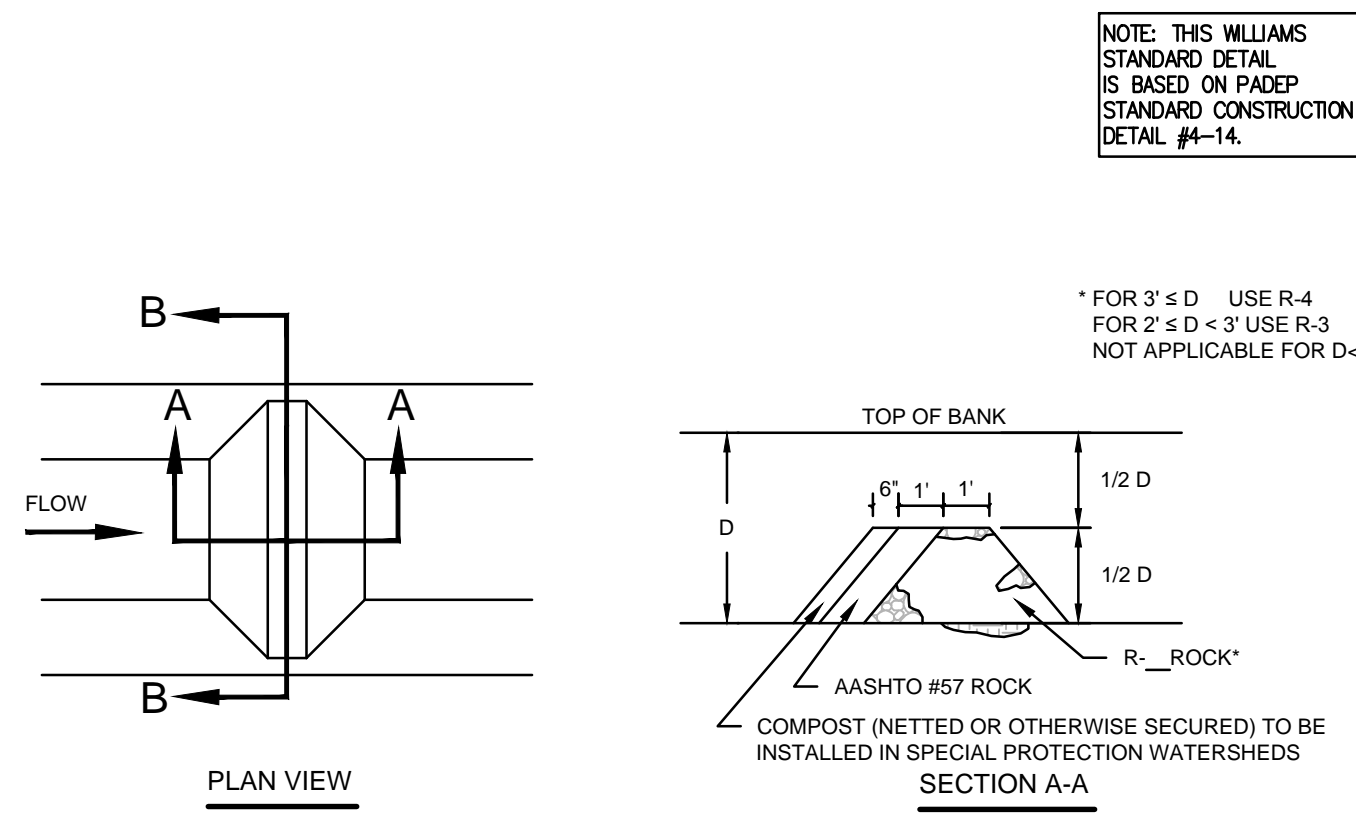
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT PROPOSED 42" CENTRAL PENN LINE SOUTH PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET LEBANON COUNTY, PENNSYLVANIA			
COVER SHEET			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	CONSTRUCTION	ISSUED FOR:	CONSTRUCTION
REVISION:	4	DRAWING NUMBER:	24-1600-70-28-A/LL113_9-BMP
SHEET:	1	OF:	1





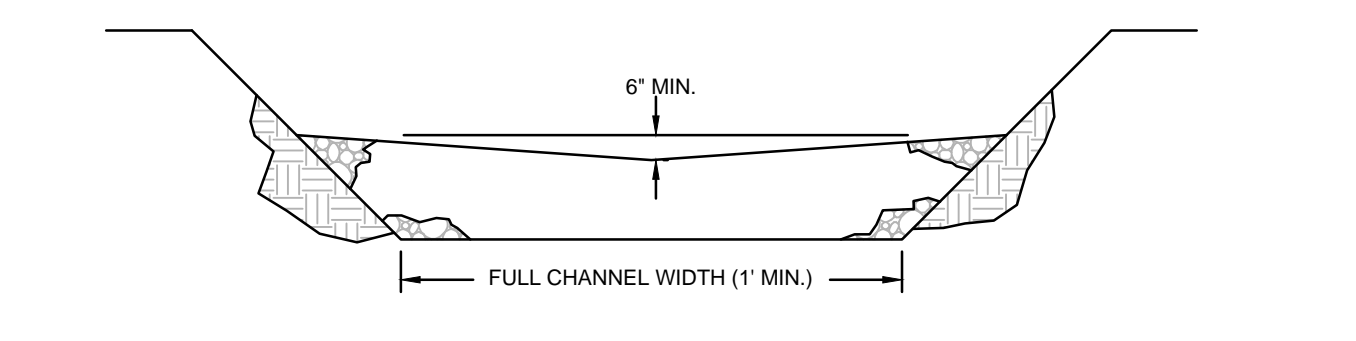






NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #14.

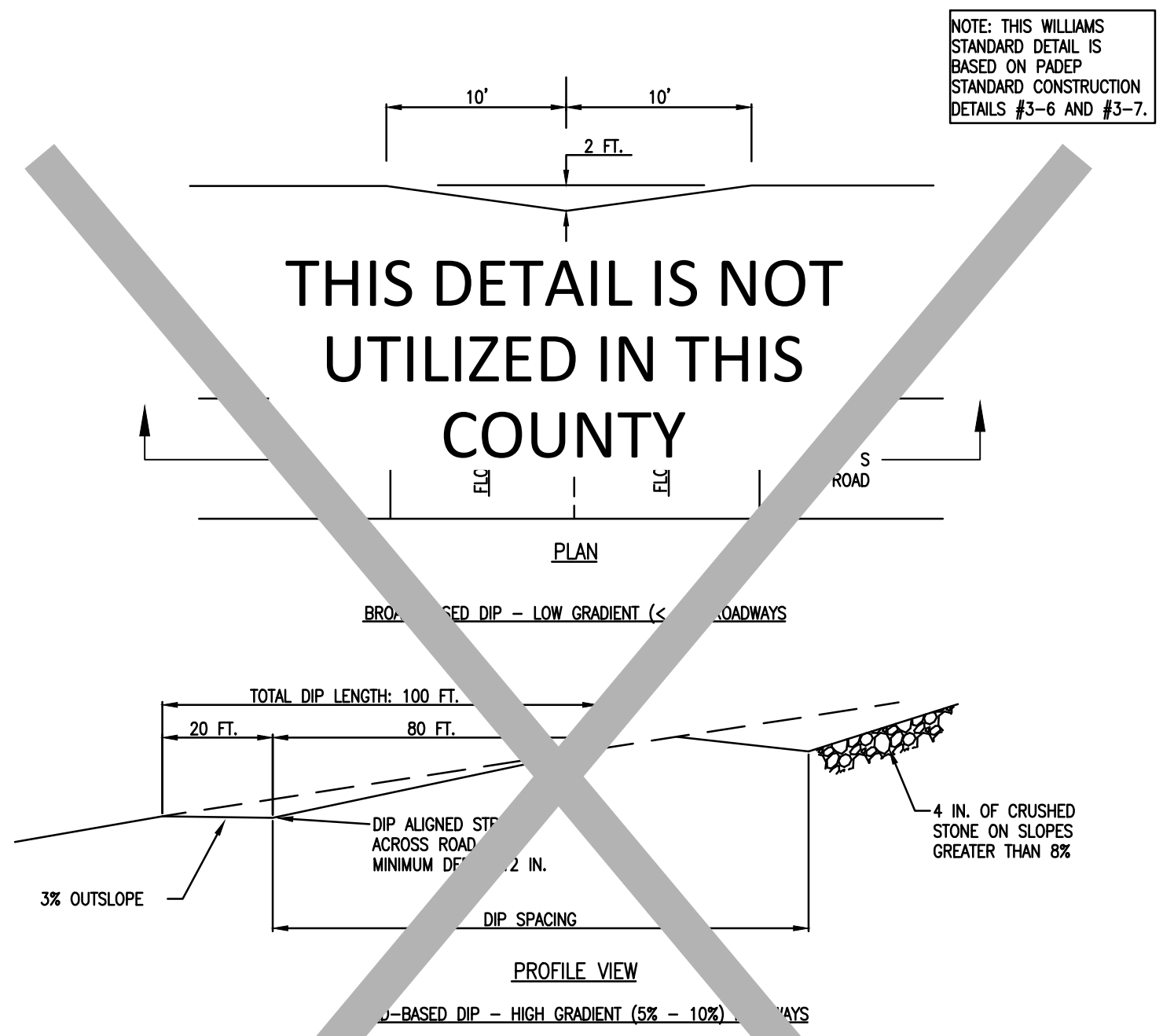
\*FOR 3' x D USE R-4  
FOR 2' x D x 3' USE R-3  
NOT APPLICABLE FOR D > 2'



ROCK FILTER NO.	LOCATION	D (FT.)	RIPRAP SIZE
ALL	ACCESS ROADS AS NECESSARY	2	R-3

- NOTES:
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF THE FILTER.
  - IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, INSTALLER SHALL REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK FILTER, AND STABILIZE DISTURBED AREAS.
  - IN SPECIAL PROTECTION WATERSHEDS, HQ OR EV, THE ANTI-DEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES (ABACT) ROCK FILTER WITH THE 6" LAYER OF COMPOST ANCHORED ON TOP OF THE UPSLOPE SIDE OF THE AASHTO #57 STONE SHALL BE USED. IN NON-SPECIAL PROTECTION WATERSHEDS, THE COMPOST LAYER MAY BE OMITTED.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			ARF ABACT ROCK FILTER				



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAILS #5-6 AND #5-7.

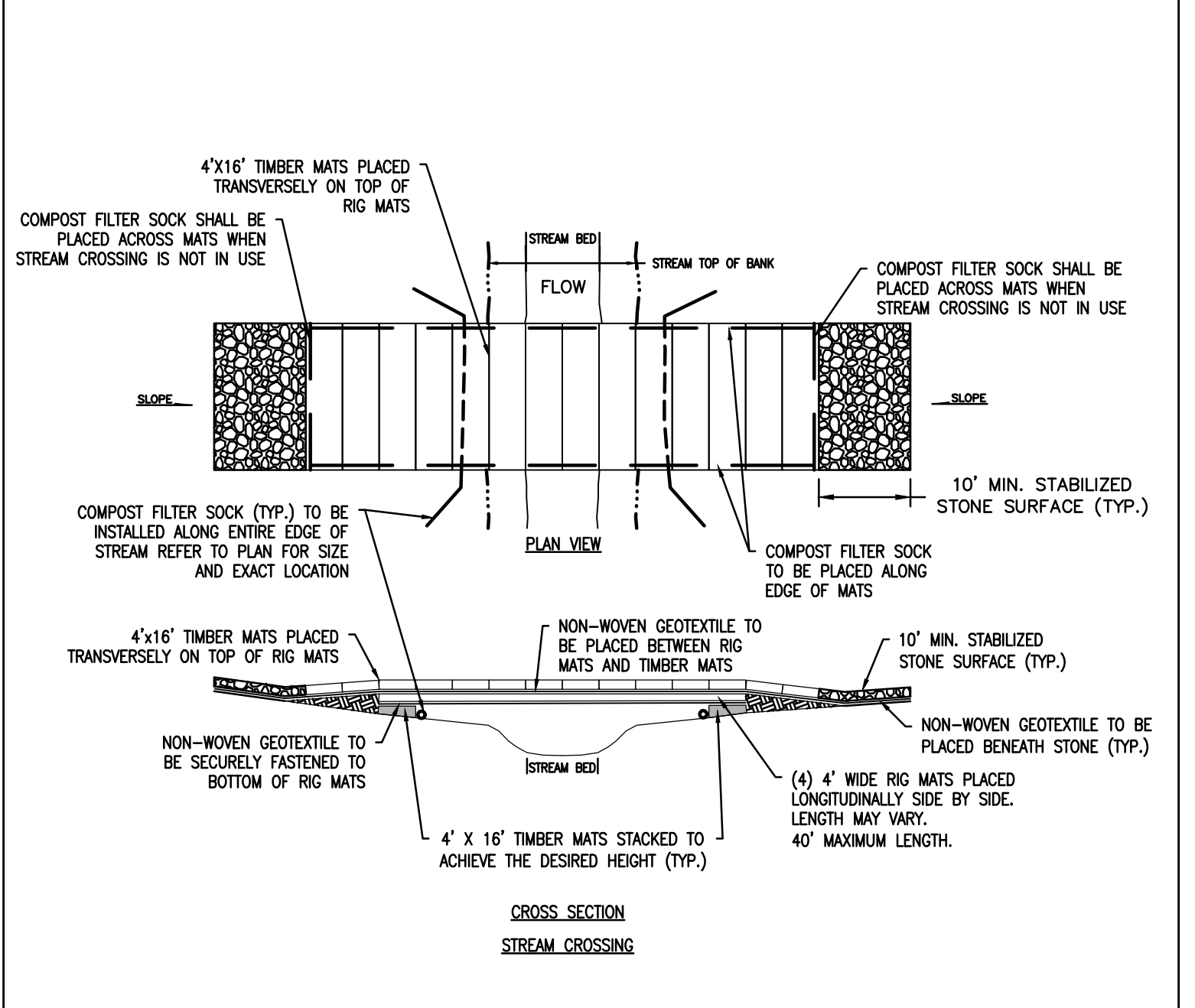
- NOTES:
- BROAD-BASED DIPS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN AND AT THE LOCATIONS SHOWN ON THE PLAN DRAWINGS.
  - DIPS SHALL BE CONSTRUCTED SO AS TO DISCHARGE TO THE LOW SIDE OF THE ROADWAY.
  - DIPS SHALL BE INSPECTED DAILY. DAMAGED OR NON-FUNCTIONING DIPS SHALL BE REPAIRED AT THE END OF THE WORKDAY.
  - MAXIMUM SPACING OF BROAD-BASED DIPS SHALL BE AS SHOWN IN TABLE 3.2.

TABLE 3.2 - MAXIMUM SPACING OF BROAD-BASED DIPS

PERCENT SLOPE	SPACING BETWEEN BROAD-BASED DIPS (FT)
2	300
3	235
4	200
5	180
6	165
7	155
8	150
9	
10	

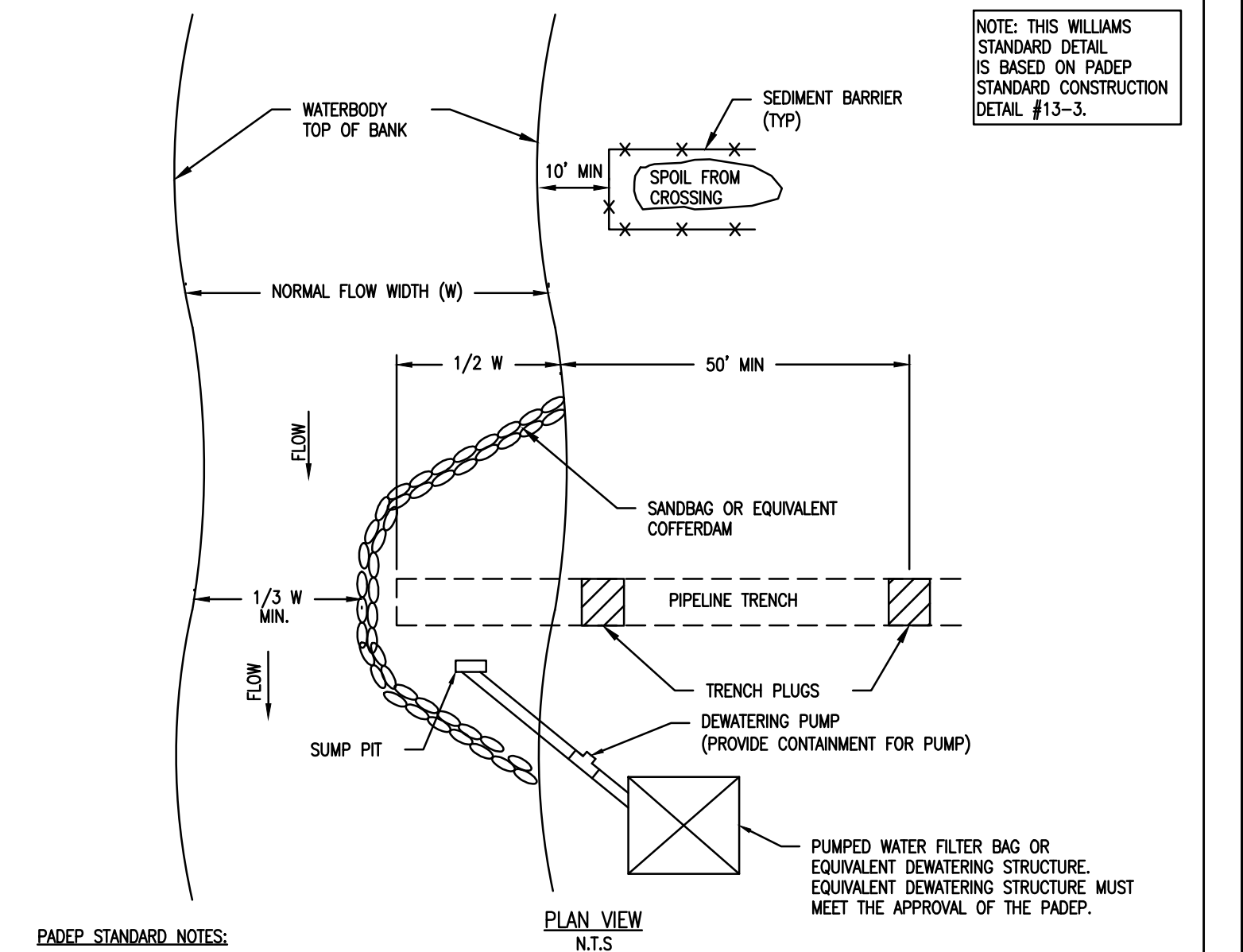
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NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			BBD BROAD-BASED DIP				



- NOTES:
- ALL STONE SURFACES ASSOCIATED WITH TEMPORARY EQUIPMENT CROSSINGS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
  - ANY SEDIMENT TRACKED ONTO THE TIMBER MATS SHALL BE IMMEDIATELY REMOVED AND EVENLY DISPERSED UPSLOPE OF A PROPERLY FUNCTIONING COMPOST FILTER SOCK.
  - THE CONTRACTOR HAS THE OPTION TO INSTALL A PIPE OR JERSEY BARRIER (IF NEEDED) OUTSIDE OF BASE FLOW OF STREAM CHANNEL FOR ADDITIONAL SUPPORT.

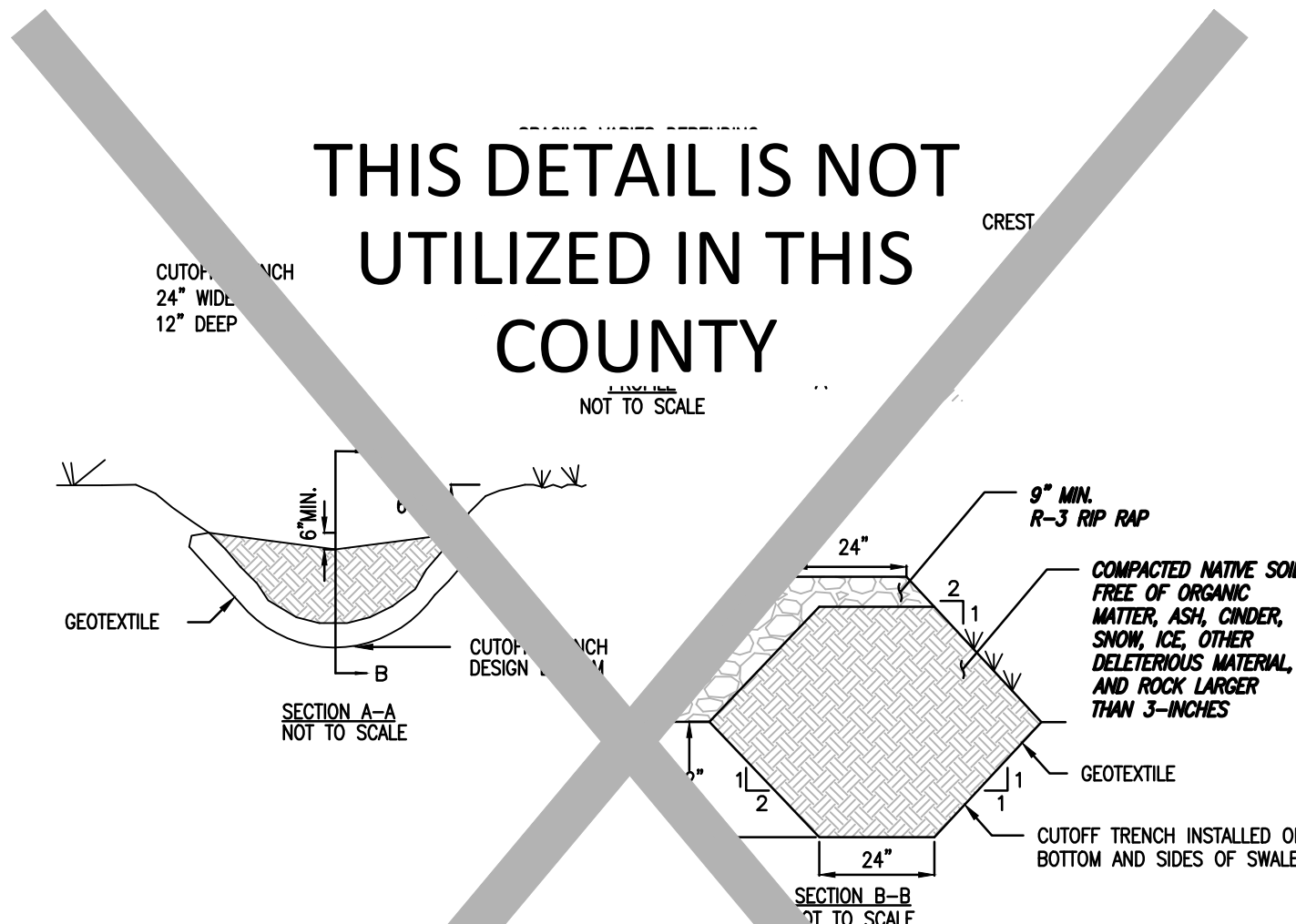
NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			BEC BRIDGE EQUIPMENT CROSSING				



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #13-3.

- PADEP STANDARD NOTES:
- GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP-OF-BANK UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION.
  - TRENCH PLUG SHALL BE INSTALLED WITHIN THE TRENCH ON BOTH SIDES OF THE WATERBODY CHANNEL.
  - WATER ACCUMULATING WITHIN THE WORK AREA SHALL BE PUMPED TO A PUMPED WATER FILTER BAG OR SEDIMENT TRAP PRIOR TO DISCHARGING INTO ANY SURFACE WATER.
  - HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF WATERBODY BANK.
  - ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM THE WATERBODY CROSSING AREA.
  - ALL DISTURBED AREAS WITHIN 50 FEET OF TOP-OF-BANK SHALL BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR WATERBODIES OR 48 HOURS OF INITIAL DISTURBANCE FOR INTERMEDIATE WATERBODIES UNLESS OTHERWISE AUTHORIZED.
- WILLIAMS STANDARD NOTES:
- APPROPRIATE WATERBODY BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
  - THE WATERBODY CROSSING WILL GENERALLY BE COMPLETED IN 2 STAGES. THE DETAIL DEPICTS STAGE 1. STAGE 2 WILL GENERALLY BE COMPLETED USING THE SAME CONFIGURATION FROM THE OPPOSITE BANK.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			CD COFFERDAM STREAM CROSSING				



THIS DETAIL IS NOT UTILIZED IN THIS COUNTY

- NOTES:
- CHECK DAMS ARE APPROPRIATE FOR SMALL DITCHES AND SWALES AND ARE NOT TO BE USED IN LIVE FLOWING STREAMS.
  - CHECK DAMS SHALL BE INSTALLED SUCH THAT COMPLETE COVERAGE OF THE ENTIRE WIDTH OF THE DITCH OR SWALE IS ACHIEVED.
  - SEDIMENT SHALL BE REMOVED WHEN IT ACCUMULATES TO A DEPTH OF ONE-HALF THE ORIGINAL DAM HEIGHT.
  - SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
  - INSTALL A CUTOFF TRENCH A MINIMUM OF 12 INCHES INTO THE SWALE BOTTOM AND SIDES TO PREVENT FLOWING AROUND THE DAM.
  - ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
  - THE HEIGHT OF CHECK DAMS IN SWALES ALONG ACCESS ROADS IS EQUAL TO THE DEPTH OF SWALE MINUS 6 INCHES. THE DEPTH OF SWALE IS SHOWN ON THE "SOIL EROSION CONTROL PLAN" IN THE "EROSION CONTROL AND LAYOUT PLANS FOR ACCESS ROADS" AND THE "POST CONSTRUCTION STORMWATER PLAN" IN THE "POST CONSTRUCTION STORMWATER PLAN FOR PERMANENT ACCESS ROADS" UNDER SEPARATE COVERS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			CDM CHECK DAM				



REVISIONS							
NO.	DATE	BY	DESCRIPTION	W.D.	NO.	CHK.	APP.
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1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	AJB	
3	03/26/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	AJB	
4	04/01/2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	AJB	

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	CONSTRUCTION	ISSUED FOR:	CONSTRUCTION
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OF:	11		

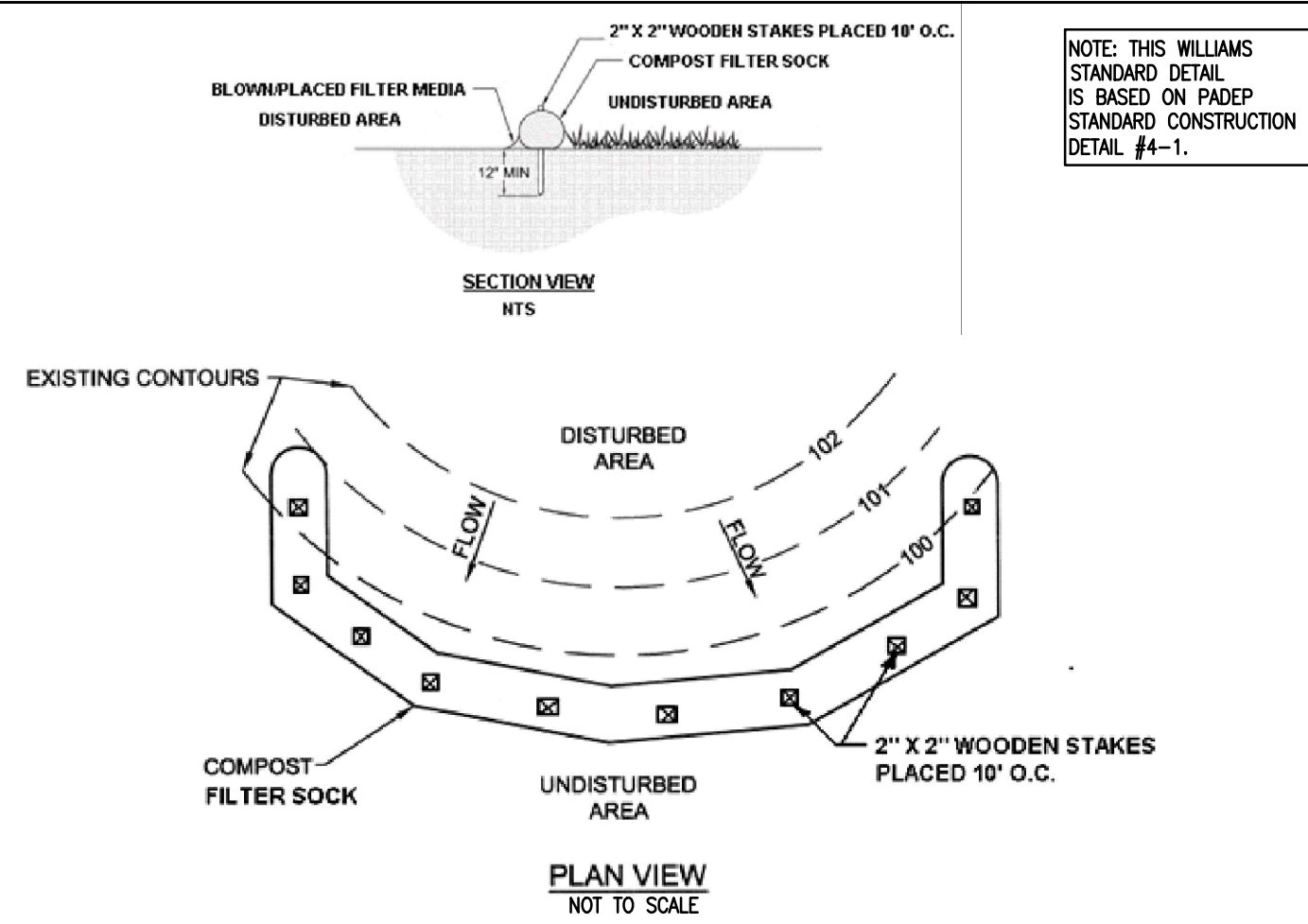
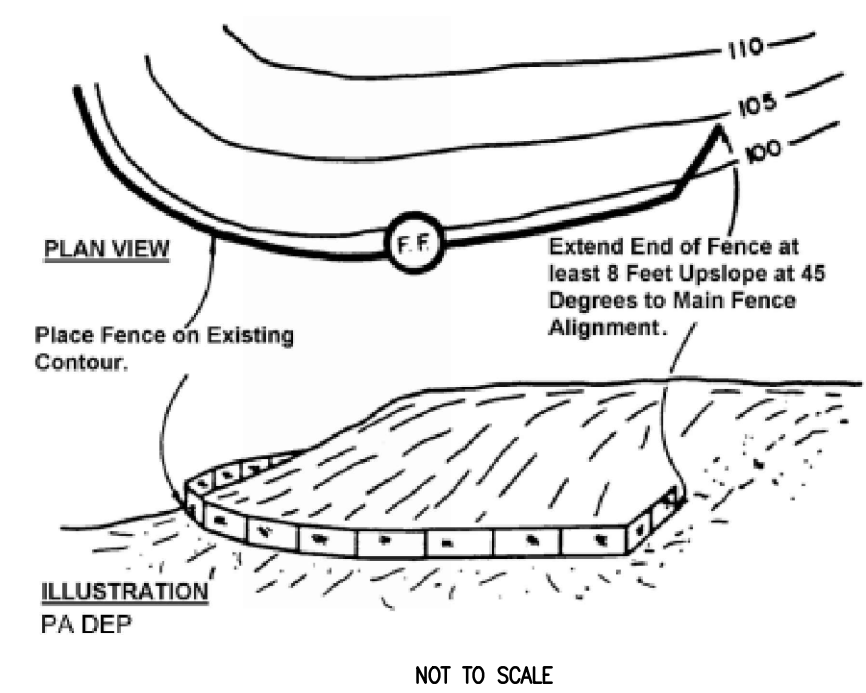
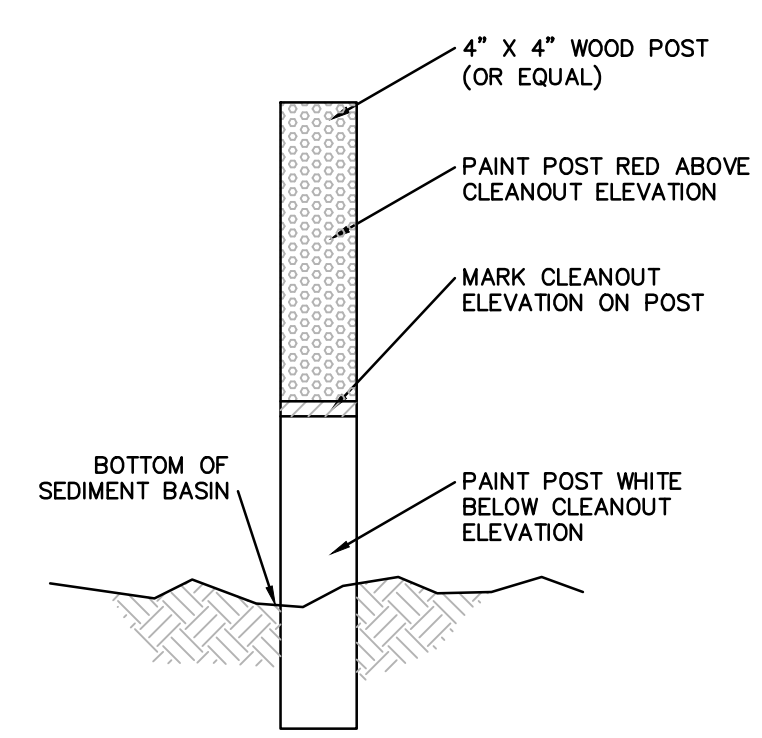


FIGURE 4.1  
Sediment Barrier Alignment



NOTE: 8" diameter socks should only be used to control small (< 1/4 acre) disturbed areas on individual house lots.



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #4-1.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CFS) COMPOST FILTER SOCK				

1 OF 3

TABLE 4.1  
COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS

Material Type	COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS				Heavy Duty Multi-Filament Polypropylene (HDMFPP)
	3 mil HDPE	4 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12", 18"	12", 18", 24"	12", 18", 24", 32"	12", 18", 24", 32"	12", 18", 24", 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	3/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr	23% at 1000 hr		100% at 1000 hr	100% at 1000 hr
Minimum Functional Longevity	6 months	6 months	6 months	1 year	2 years

Two-ply systems

Inner Containment Netting: HDPE biaxial net, Continuously wound, Fusion-welded junctures, 3/4" X 3/4" Max. aperture size

Outer Filtration Mesh: Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch), 3/16" Max. aperture size

SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.

TABLE 4.2  
COMPOST STANDARDS

ORGANIC MATTER CONTENT	25%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 - 8.5
MOISTURE CONTENT	30% - 60%
PARTICLE SIZE	30%-50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 DS/M (MMHOS/CM) MAXIMUM

NOTES:

- SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2. (SEE SHEET 2 OF 3 OF THIS DETAIL.)
- COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED THAT SHOWN ON FIGURE 4.2. (SEE SHEET 3 OF 3 OF THIS DETAIL.) STAKES MAY BE INSTALLED IMMEDIATELY DOWNSLOPE OF THE SOCK IF SO SPECIFIED BY THE MANUFACTURER.
- TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
- ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVEGROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
- SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
- BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
- SOCKS SHALL BE INSTALLED PARALLEL TO THE CONTOURS, TYPICALLY, IN AREAS WHERE THE SLOPE OF THE CATCHMENT AREA IS LESS THAN FIVE PERCENT, THE SOCKS MAY BE INSTALLED AS NECESSARY TO MINIMIZE THE NUMBER OF SEPARATE SOCK SEGMENTS ALONG THE EDGE OF DISTURBANCE.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CFS) COMPOST FILTER SOCK				

2 OF 3

FIGURE 4.2  
MAXIMUM PERMISSIBLE SLOPE LENGTH ABOVE COMPOST FILTER SOCKS

Adapted from Filtracx

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CFS) COMPOST FILTER SOCK				

3 OF 3

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CS) CLEANOUT STAKE				

NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #3-11.

PLAN VIEW

STAKING DETAIL

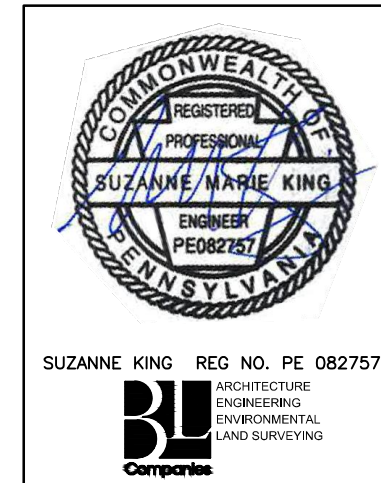
NOTES:

- SEE COMPOST FILTER SOCK (CFS) DETAIL FOR MORE INFORMATION. SOCK MATERIAL SHALL MEET THE STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2.
- COMPOST SOCK SEDIMENT TRAPS SHALL NOT EXCEED THREE SOCKS IN HEIGHT AND SHALL BE STACKED IN PYRAMIDAL FORM AS SHOWN ABOVE. MINIMUM TRAP HEIGHT IS ONE 24" DIAMETER SOCK. ADDITIONAL STORAGE MAY BE PROVIDED BY MEANS OF AN EXCAVATED SUMP 12" DEEP EXTENDING 1 TO 3 FEET UPSLOPE OF THE SOCKS ALONG THE LOWER SIDE OF THE TRAP.
- THE MAXIMUM TRIBUTARY DRAINAGE AREA IS 5.0 ACRES. SINCE COMPOST SOCKS ARE "FLOW-THROUGH," NO SPILLWAY IS REQUIRED.
- COMPOST SOCK SEDIMENT TRAPS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/3 THE HEIGHT OF THE SOCKS.
- PHOTODEGRADABLE AND BIODEGRADABLE SOCKS SHALL NOT BE USED FOR MORE THAN 1 YEAR.
- DESIGN NOTES:
  - COMPOST SOCK SEDIMENT TRAP SHALL BE SIZED TO PROVIDE 2,000 CUBIC FEET OF STORAGE CAPACITY WITH 12" FIBERBOARD FOR EACH ACRE TRIBUTARY TO THE TRAP.
  - MINIMUM BASE WIDTH IS EQUIVALENT TO THE HEIGHT.
  - SEDIMENT ACCUMULATION SHALL NOT EXCEED 1/3 THE TOTAL HEIGHT OF THE TRAP.
  - SOCKS SHALL BE OF LARGER DIAMETER AT THE BASE OF THE TRAP AND DECREASE IN DIAMETER FOR SUCCESSIVE LAYERS AS INDICATED TO THE LEFT.
  - ENDS OF THE TRAP SHALL BE A MINIMUM OF 1 FOOT HIGHER IN ELEVATION THAN THE MID-SECTION, WHICH SHALL BE LOCATED AT THE POINT OF DISCHARGE.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CST) COMPOST SOCK SEDIMENT TRAP				

REFER TO THE QUANTITY, CROSSING AND ACIDIC SOIL TABLES FOR DETAIL AND DESIGN

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(CWC) CLEAN WATER CROSSING (FLUME CROSSING)				



REVISIONS			
NO.	DATE	BY	DESCRIPTION
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
ATLANTIC SUNRISE PROJECT

BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET

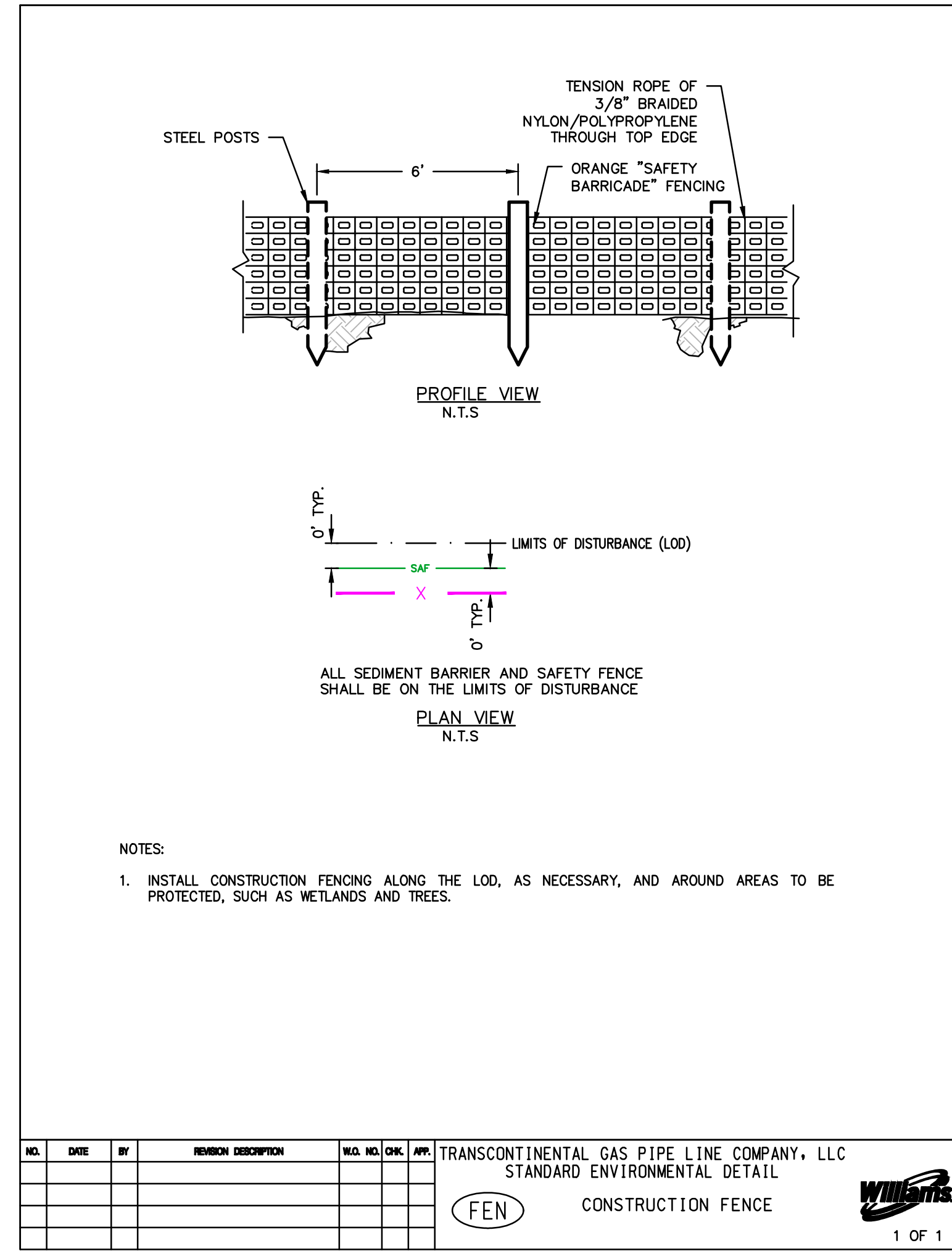
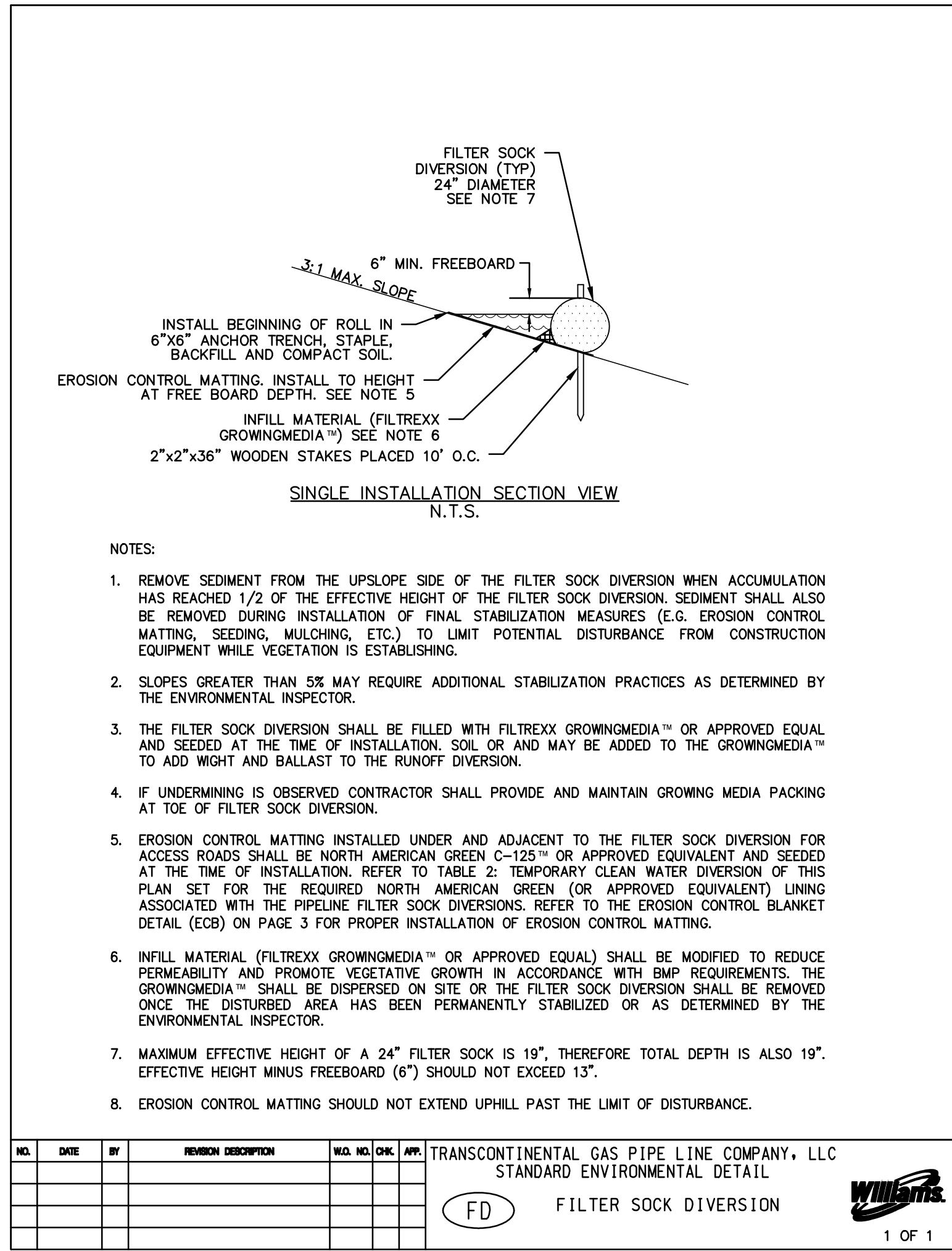
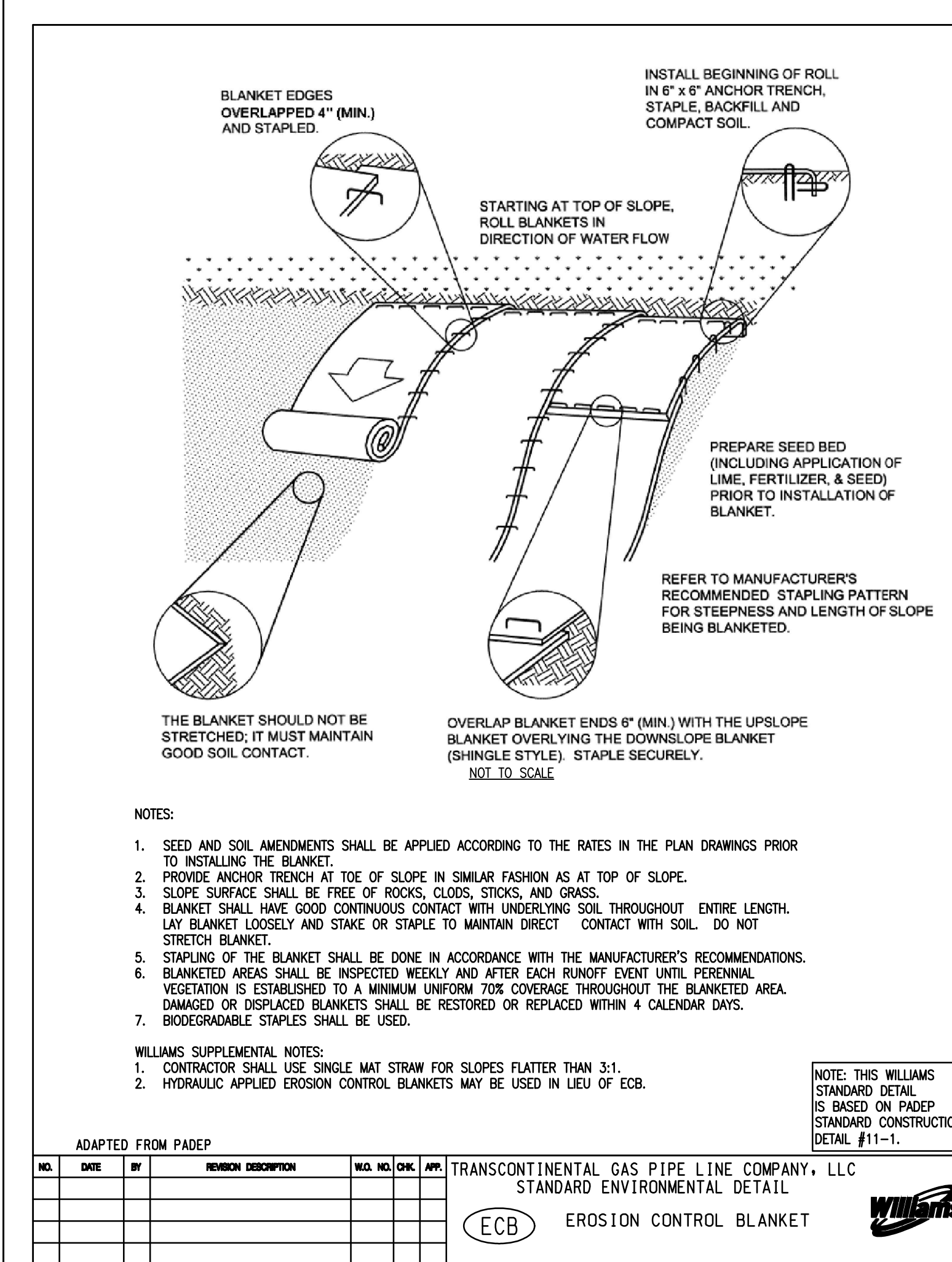
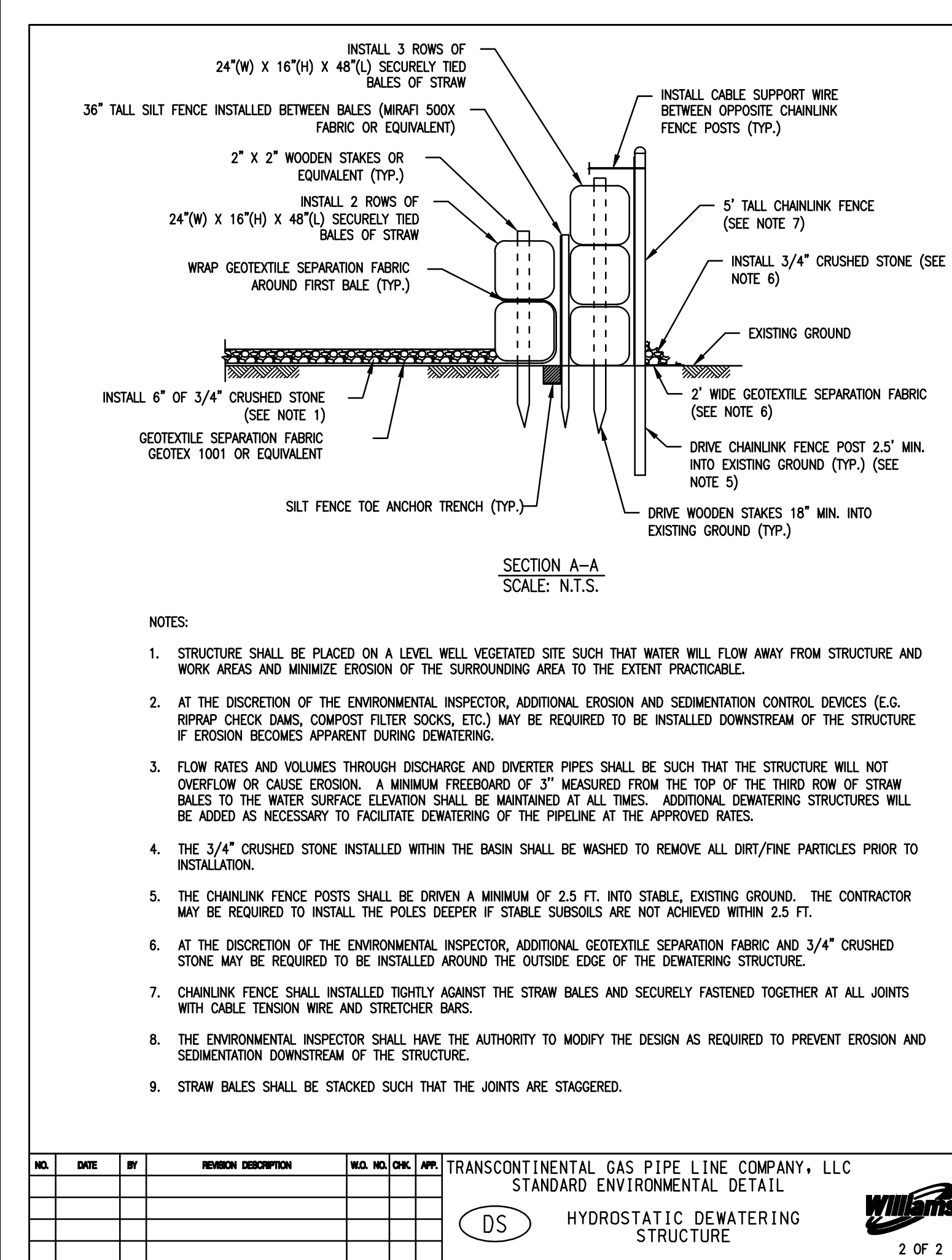
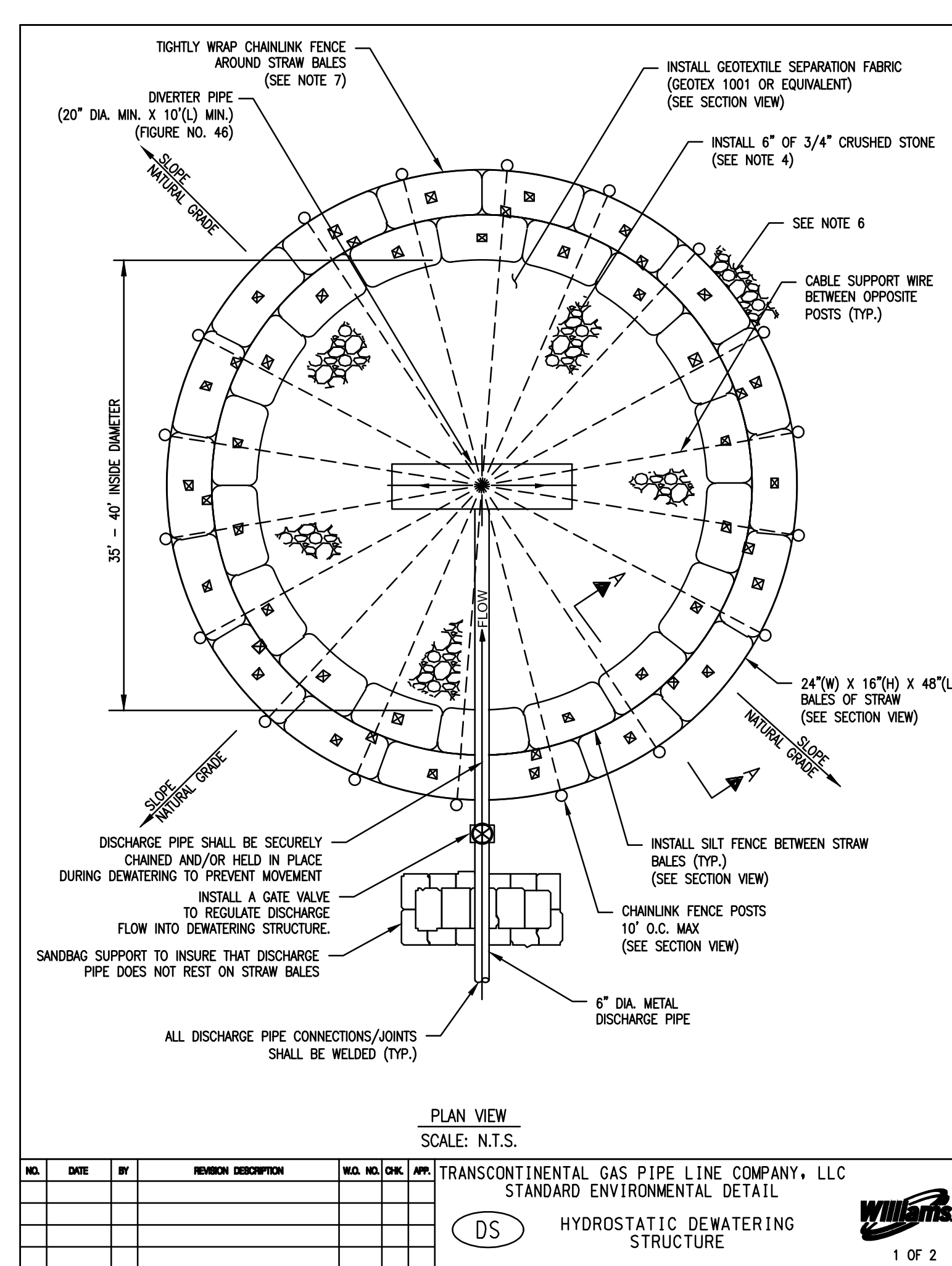
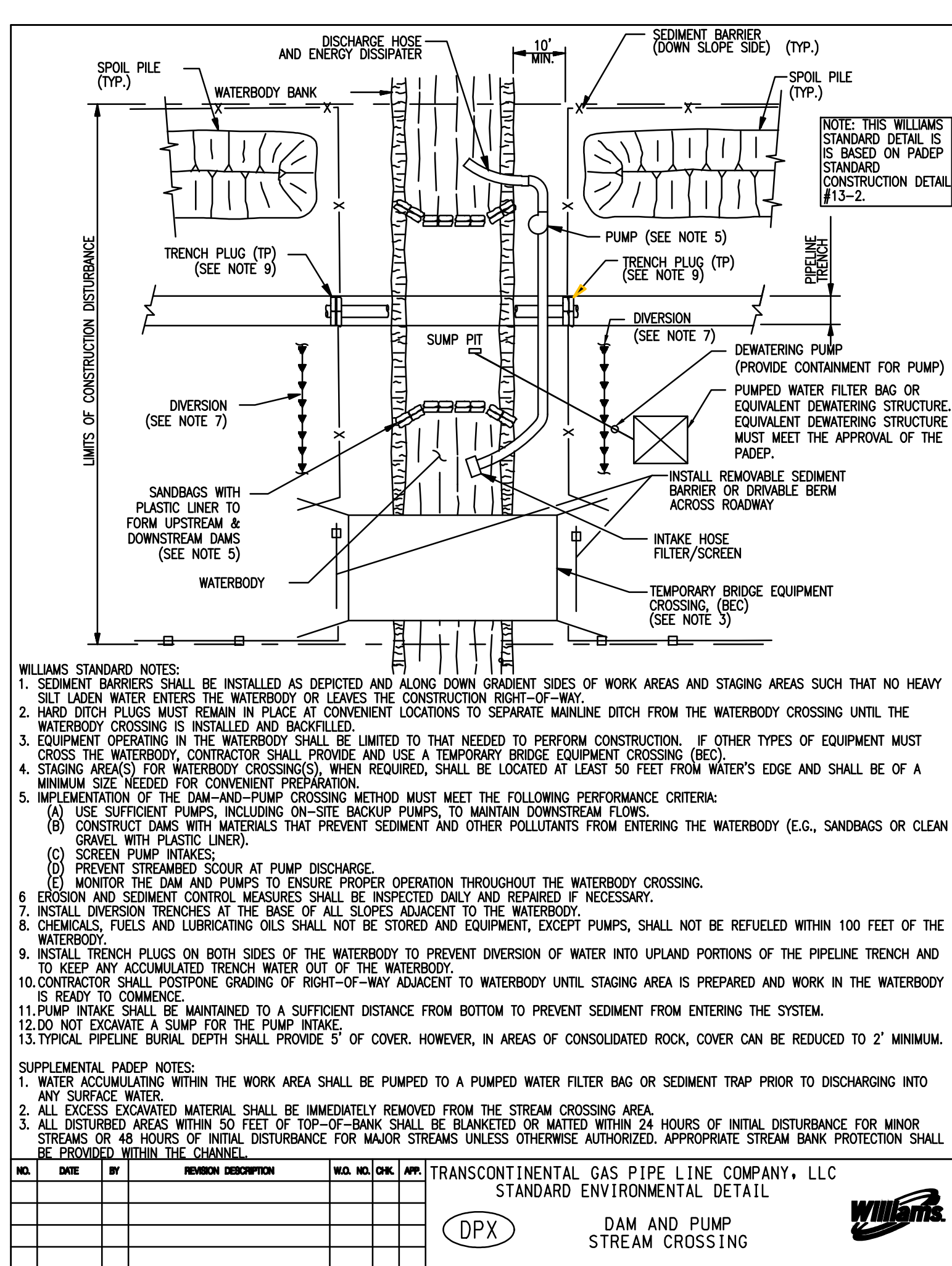
BEST MANAGEMENT PRACTICES DETAILS

DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:	SCALE:
CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:	REVISION:
APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	ASR-BMP

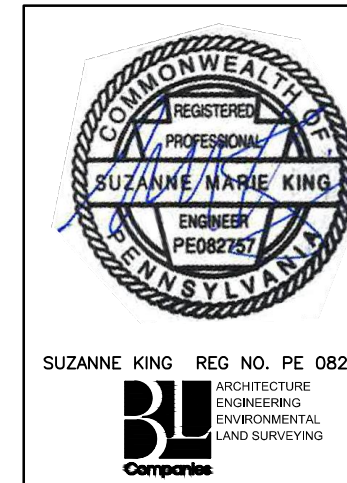
WILLIAMS GAS PIPELINE

SHEET 2 OF 11

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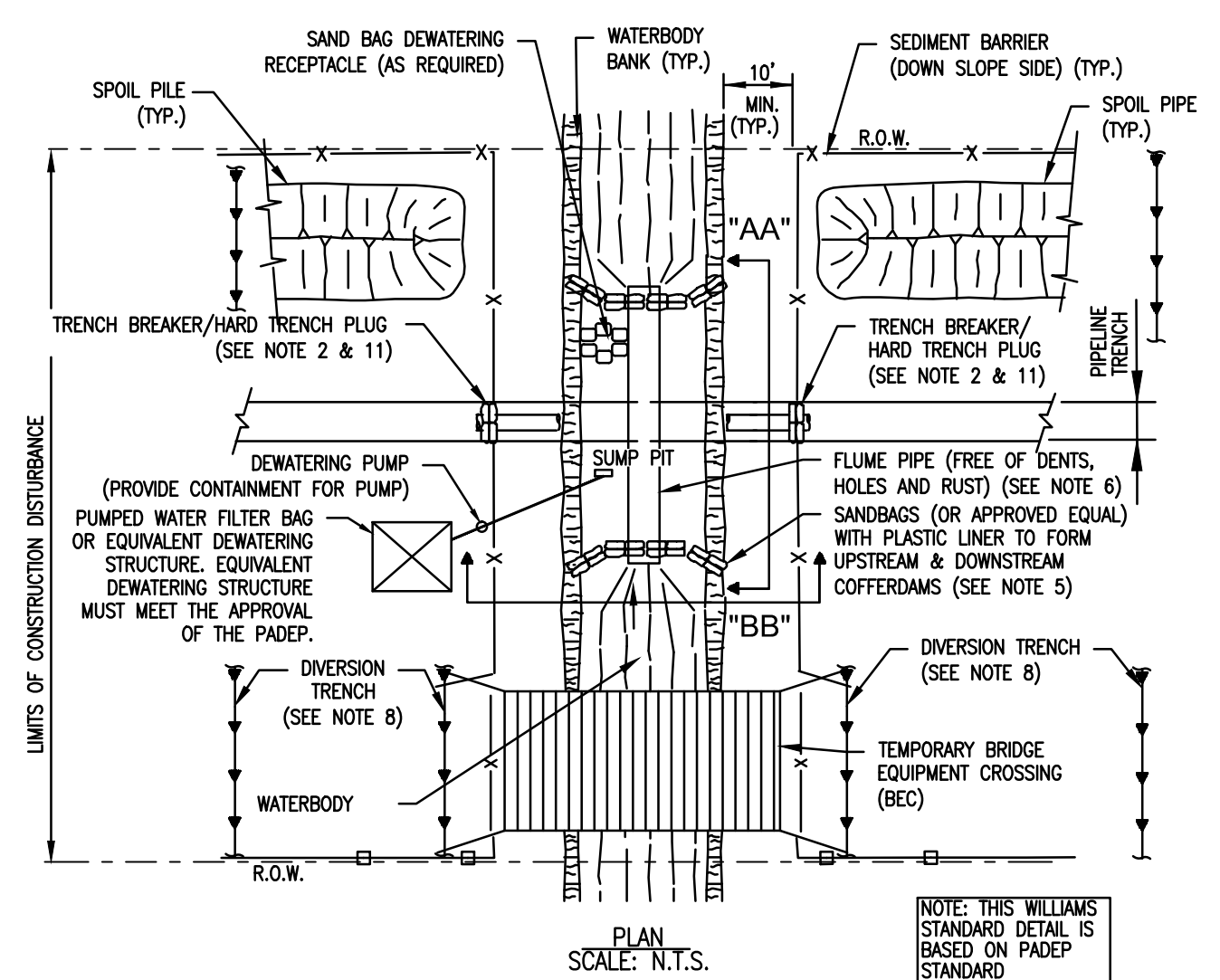


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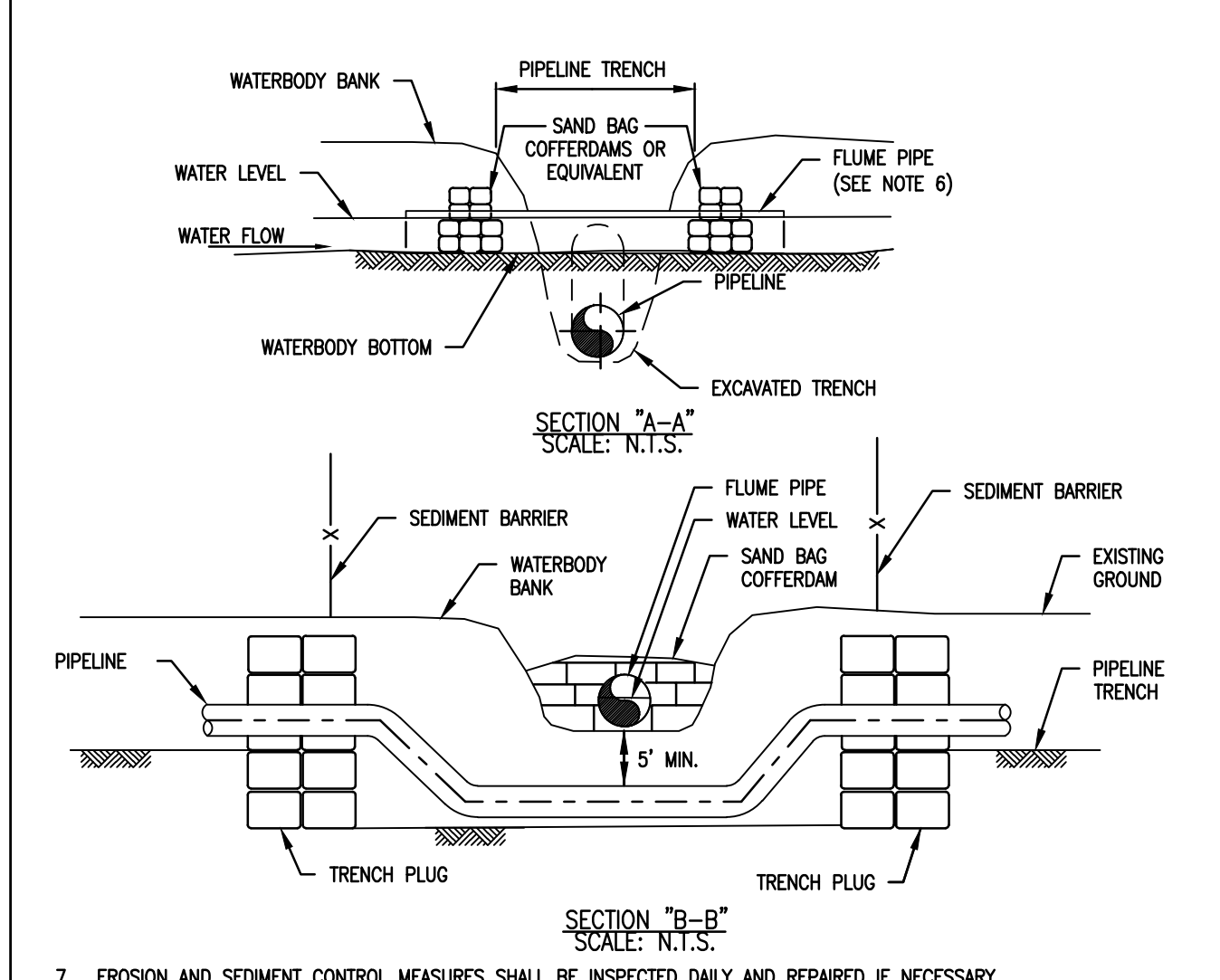
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1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT						
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET						
BEST MANAGEMENT PRACTICES DETAILS						
DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:		SCALE:
CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:		REVISION:
APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	ASR-BMP	SHEET 3 OF 11



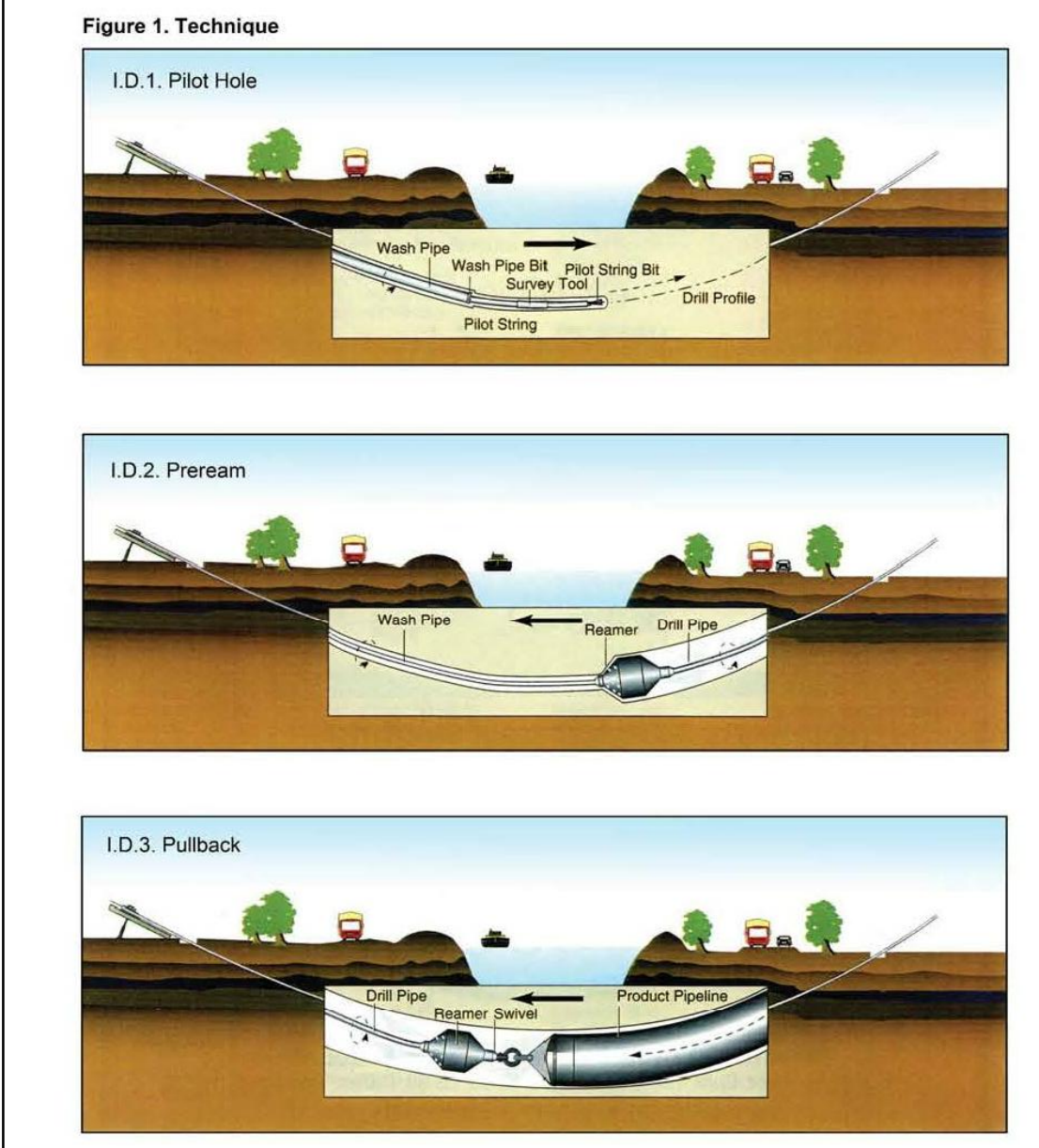
- NOTES:
- SEDIMENT BARRIERS SHALL BE INSTALLED AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVY SILT LADEN WATER ENTERS THE WATERBODY OR LEAVES THE CONSTRUCTION RIGHT-OF-WAY.
  - HARD TRENCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE THE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL THE WATERBODY CROSSING IS INSTALLED AND BACKFILLED.
  - EQUIPMENT OPERATING IN THE WATERBODY SHALL BE LIMITED TO THAT NEEDED TO PERFORM CONSTRUCTION. IF OTHER TYPES OF EQUIPMENT MUST CROSS THE WATERBODY, THE CONTRACTOR SHALL PROVIDE AND USE A TEMPORARY BRIDGE EQUIPMENT CROSSING.
  - STAGING AREA(S) FOR WATERBODY CROSSING(S), WHEN REQUIRED, SHALL BE LOCATED AT LEAST 50 FEET FROM THE WATER'S EDGE AND SHALL BE OF A MINIMUM SIZE NEEDED FOR CONVENIENT PREPARATION.
  - FLUME CROSSING METHOD REQUIREMENTS INCLUDE:
    - INSTALL FLUME PIPE(S) AFTER BLASTING (IF NECESSARY), BUT BEFORE ANY TRENCHING.
    - USE SAND BAG OR SAND BAG AND PLASTIC SHEETING DIVERSION STRUCTURES OR EQUIVALENT TO DEVELOP AN EFFECTIVE SEAL AND TO DIVERT WATERBODY FLOW THROUGH THE FLUME PIPE (SOME MINOR MODIFICATIONS TO THE WATERBODY BOTTOM MAY BE REQUIRED TO ACHIEVE AN EFFECTIVE SEAL).
    - PROPERLY ALIGN FLUME PIPE(S) TO PREVENT BANK EROSION AND WATERBODY CHANNEL BED SCOUR.
    - DO NOT REMOVE FLUME PIPE DURING TRENCHING, PIPE LAYING, OR BACKFILLING ACTIVITIES, OR INITIAL STREAM BED RESTORATION EFFORTS.
    - REMOVE ALL FLUME PIPES AND DAMS THAT ARE NOT ALSO PART OF THE EQUIPMENT BRIDGE AS SOON AS FINAL CLEANUP OF THE STREAM BED AND BANK IS COMPLETE.
  - THE FLUME PIPE MUST BE SIZED TO ADEQUATELY CONVEY MAXIMUM ANTICIPATED FLOW RATES AT THE TIME OF THE CROSSING WITHOUT FLOODING THE TRENCH, WHILE TO MAINTAINING ADEQUATE FLOW RATES TO PROTECT AQUATIC LIFE AND PREVENT THE INTERRUPTION OF EXISTING DOWNSTREAM USES.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(FX) FLUME STREAM CROSSING



7. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED DAILY AND REPAIRED IF NECESSARY.
8. INSTALL DIVERSION TRENCHES AT THE BASE OF ALL SLOPES ADJACENT TO THE WATERBODY AND AT 50' FROM WATERBODY BANKS.
9. CHEMICALS, FUELS AND LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT, EXCEPT FOR PUMPS, SHALL NOT BE REFUELED WITHIN 100 FEET OF THE WATERBODY UNLESS OTHERWISE APPROVED BY THE ENVIRONMENTAL INSPECTOR.
10. WATER ACCUMULATING IN THE WORK SPACE SHALL BE PUMPED TO A FILTER BAG PRIOR TO DISCHARGE TO A WATERBODY.
11. INSTALL TRENCH BREAKERS ON BOTH SIDES OF THE WATERBODY TO PREVENT DIVERSION OF WATER INTO UPLAND PORTIONS OF THE PIPELINE TRENCH AND TO KEEP ANY ACCUMULATED TRENCH WATER OUT OF THE WATERBODY.
13. EXCEPT FOR BLASTING AND OTHER ROCK BREAKING MEASURES, THE CONTRACTOR SHALL COMPLETE IN WATERBODY CONSTRUCTION ACTIVITIES (INCLUDING TRENCHING, PIPE INSTALLATION, BACKFILL AND RESTORATION OF THE WATERBODY CHANNEL CONTOURS) WITHIN 24 HOURS. WATERBODY BANKS AND UNCONSOLIDATED WATERBODY CHANNELS MAY REQUIRE ADDITIONAL RESTORATION AFTER THIS PERIOD.
14. TYPICAL PIPELINE BURIAL DEPTH SHALL PROVIDE 5' OF COVER. HOWEVER, IN AREAS OF CONSOLIDATED ROCK, COVER CAN BE REDUCED TO 2' MINIMUM.
- SUPPLEMENTAL PADEP NOTES:
- WATER ACCUMULATING WITHIN THE WORK AREA SHALL BE PUMPED TO A PUMPED WATER FILTER BAG OR SEDIMENT TRAP PRIOR TO DISCHARGING INTO ANY SURFACE WATER.
  - ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM THE STREAM CROSSING AREA.
  - ALL DISTURBED AREAS WITHIN 50 FEET OF TOP-OF-BANK SHALL BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(FX) FLUME STREAM CROSSING (SECTIONS)



NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(HDD) HORIZONTAL DIRECTIONAL DRILL

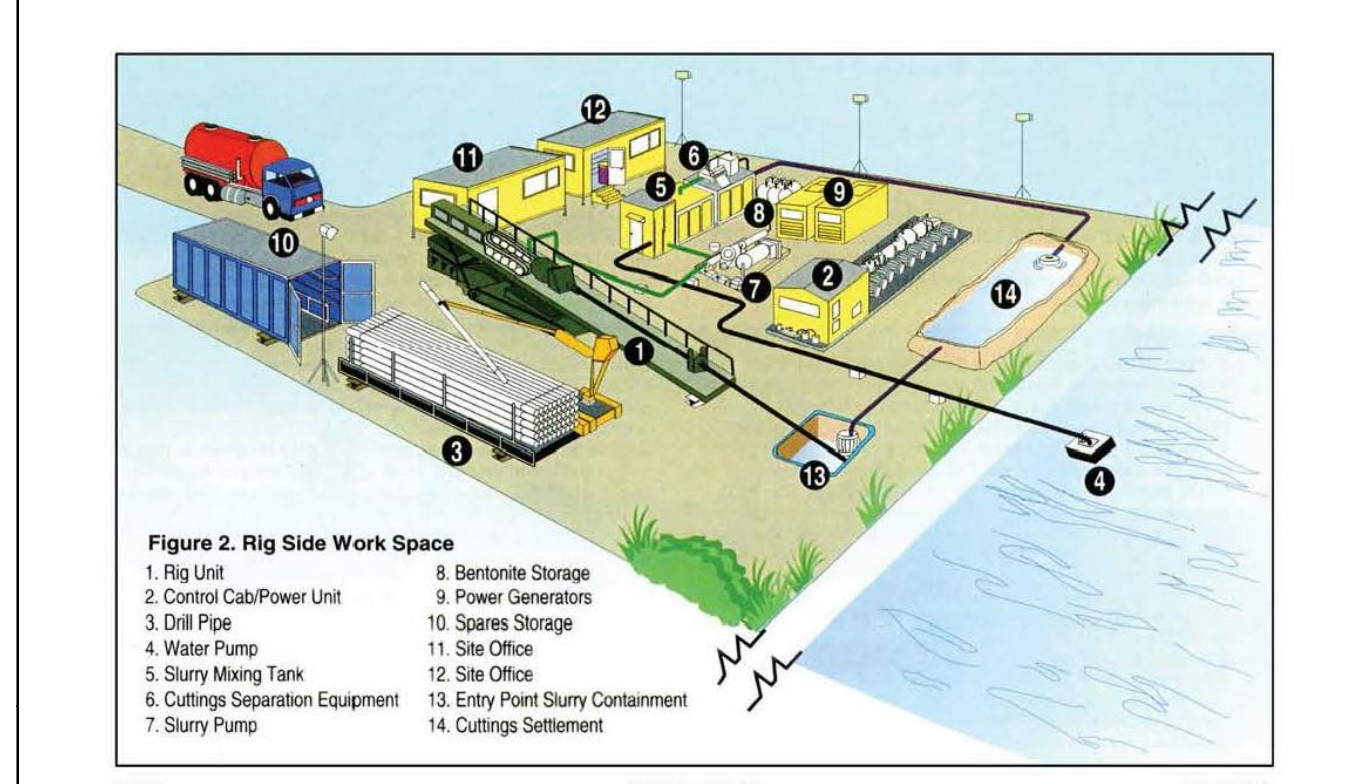


Figure 2. Rig Side Work Space

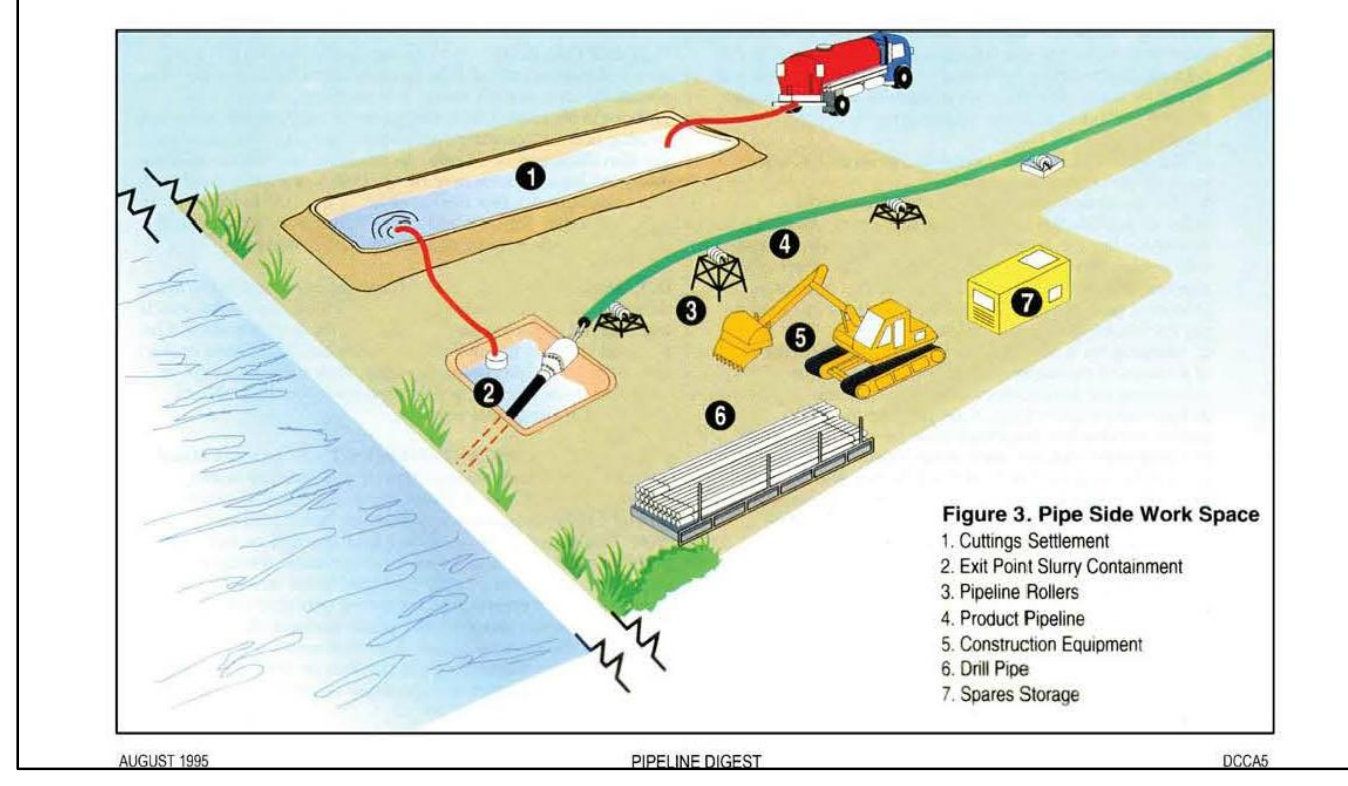
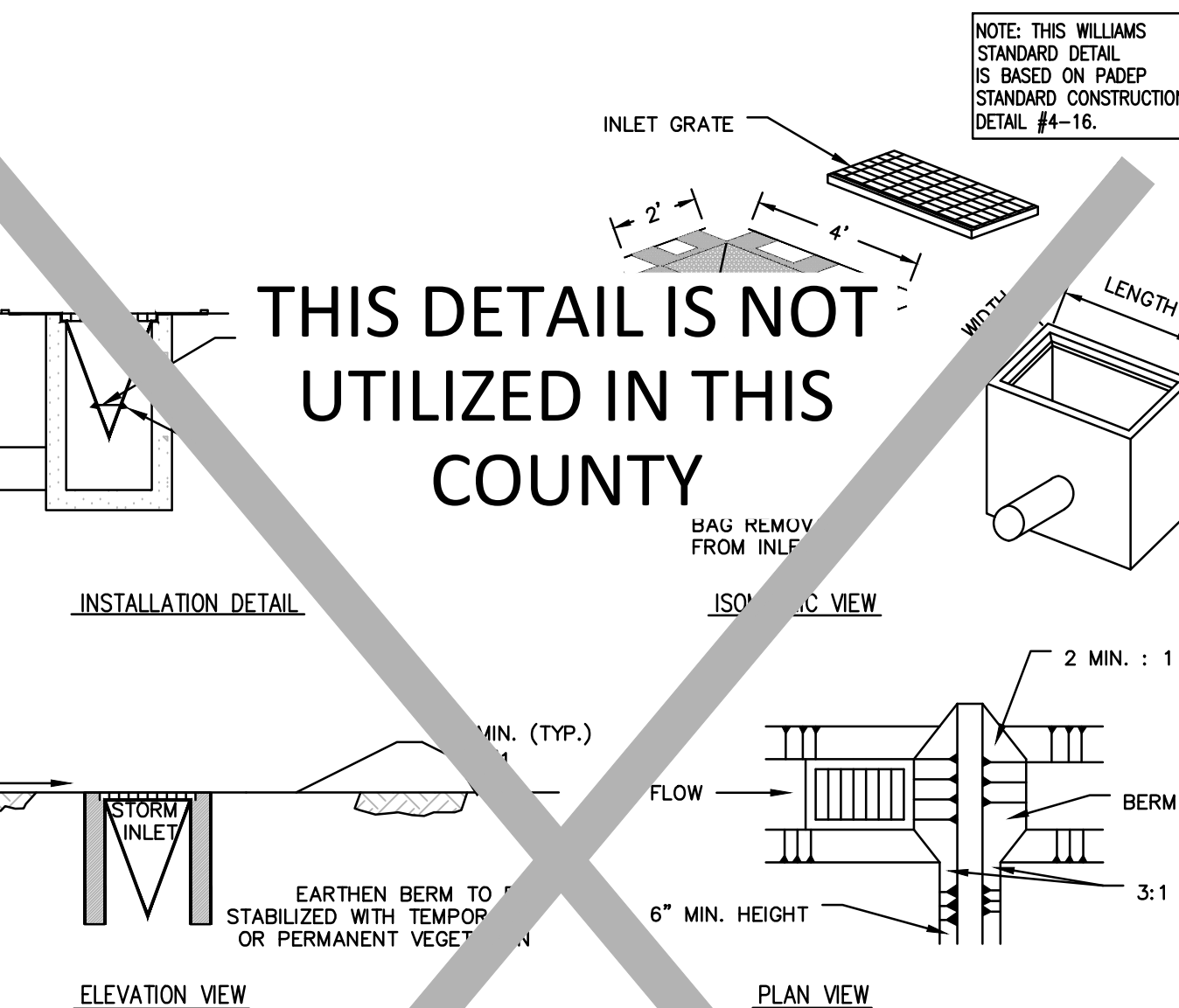


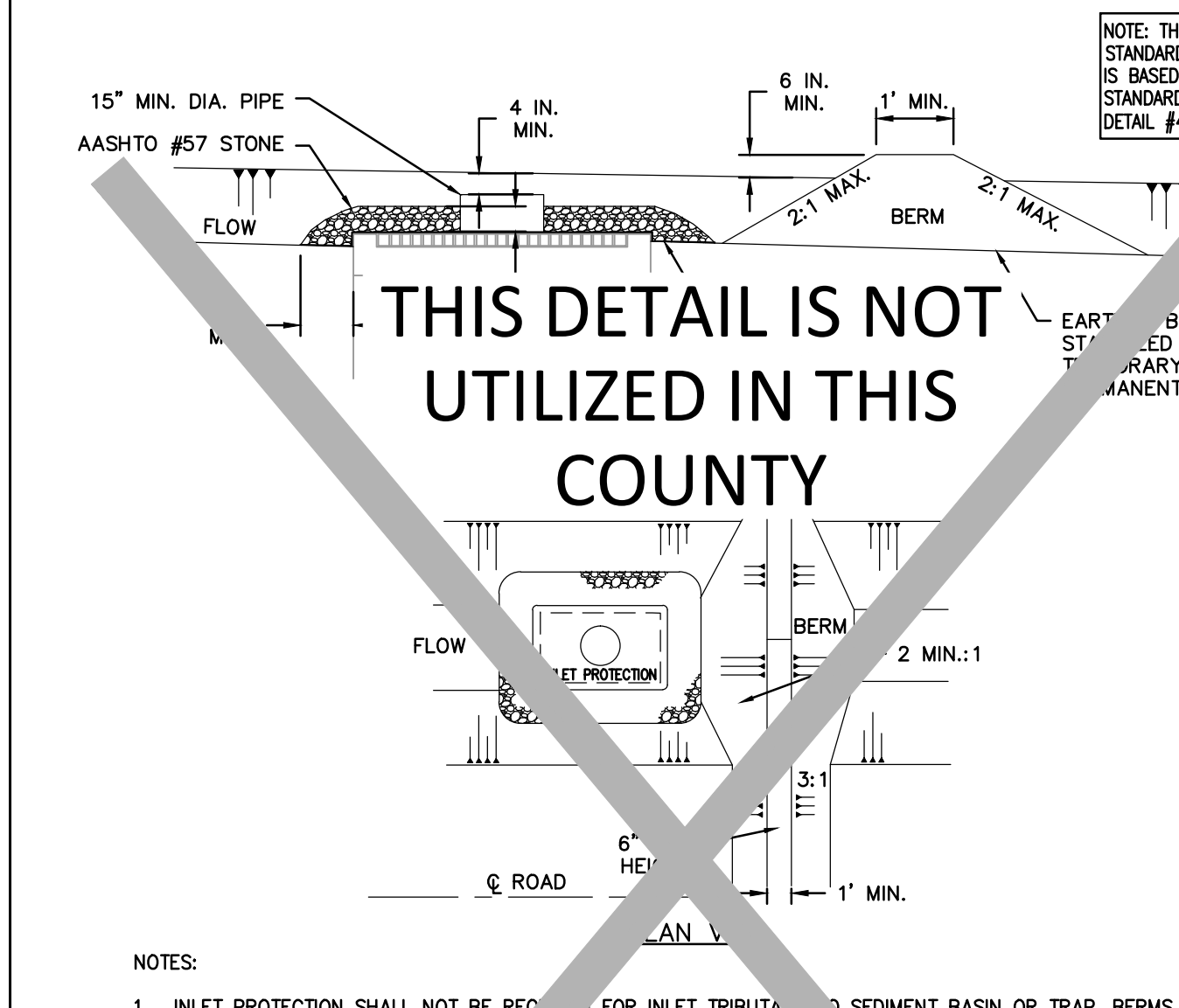
Figure 3. Pipe Side Work Space

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(HDD) HORIZONTAL DIRECTIONAL DRILL



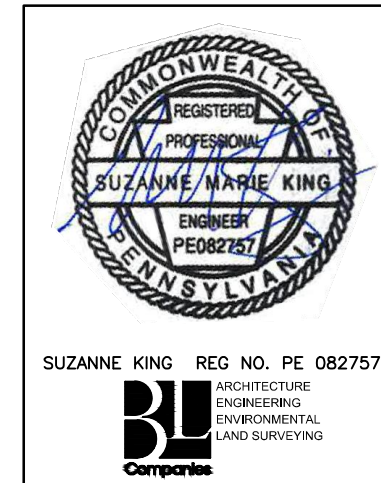
- NOTES:
- MAXIMUM DRAINAGE AREA = 1/2 ACRE
  - INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.
  - ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAINS PERMANENTLY.
  - AT A MINIMUM, THE BERM SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS, A MINIMUM TENSILE STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A 20 MESH SIEVE.
  - INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE REPORTED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE BERM. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.
  - DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(IPF) FILTER BAG INLET PROTECTION - TYPE M



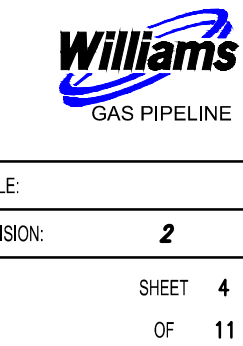
- NOTES:
- INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS NOT LOCATED AT A POINT.
  - ROLLED EARTHEN BERM IN ROADWAY SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAINS PERMANENTLY.
  - STONE INLET PROTECTION AND BERM FOR A TYPE M INLET CAN BE USED IN ONLY ONE (1) AREA. THE MAXIMUM DRAINAGE AREA WITH 15 IN. DIAMETER PIPE AND 4 IN. HEAD, A PERFORATED PLATE WELDED TO A METAL RISER MAY NOT BE SUBSTITUTED FOR THE WIRE MESH. A SLOTTED PLATE WELDED TO THE RISER MAY BE USED IN CONJUNCTION WITH THE WIRE MESH IF CALCULATIONS ARE PROVIDED TO SHOW SUFFICIENT CAPACITY OF THE INLET TO ACCEPT THE PEAK RUNOFF FOR A 2-YEAR STORM EVENT FROM THE TRIBUTARY DRAINAGE AREA. TOP OF PIPE SHALL BE AT LEAST 6 INCHES BELOW ADJACENT ROADWAY IF PONDED WATER WOULD POSE A SAFETY HAZARD TO TRAFFIC. EARTHEN BERM SHALL BE ROLLED.
  - SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.
  - SEWER SYSTEMS DISCHARGING TO HQ OR EV SURFACE WATER, A 6 IN. THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE. COMPOST SHALL MEET THE STANDARDS IN TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
- DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								(IPS) STONE AND CONCRETE INLET PROTECTION - TYPE M



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NO.	DATE	BY	DESCRIPTION	W.D.	NO.	CHK.	APP.
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1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK	

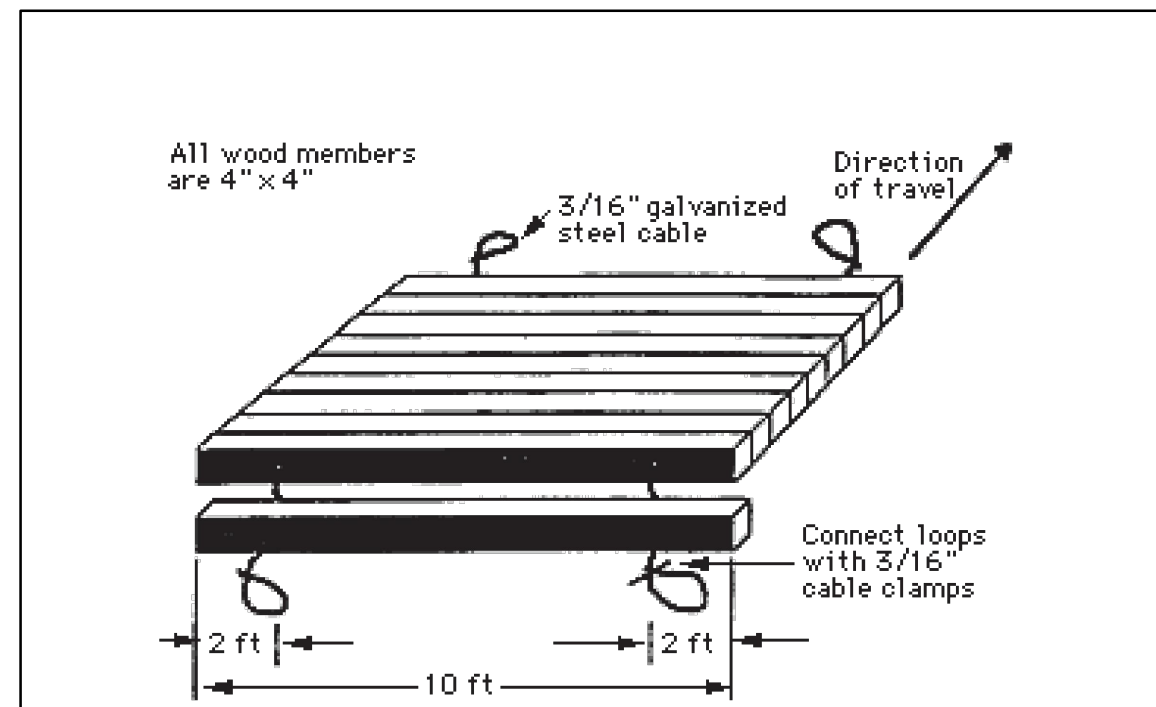
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT					
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET					
BEST MANAGEMENT PRACTICES DETAILS					
DRAWN BY:	ELZ	DATE:	05/15/15	ISSUED FOR BID:	SCALE:
CHECKED BY:	JLK	DATE:	07/02/15	ISSUED FOR CONSTRUCTION:	REVISION:
APPROVED BY:	SMK	DATE:	07/08/15	DRAWING NUMBER:	ASR-BMP
W.D.		NO.		CHK.	



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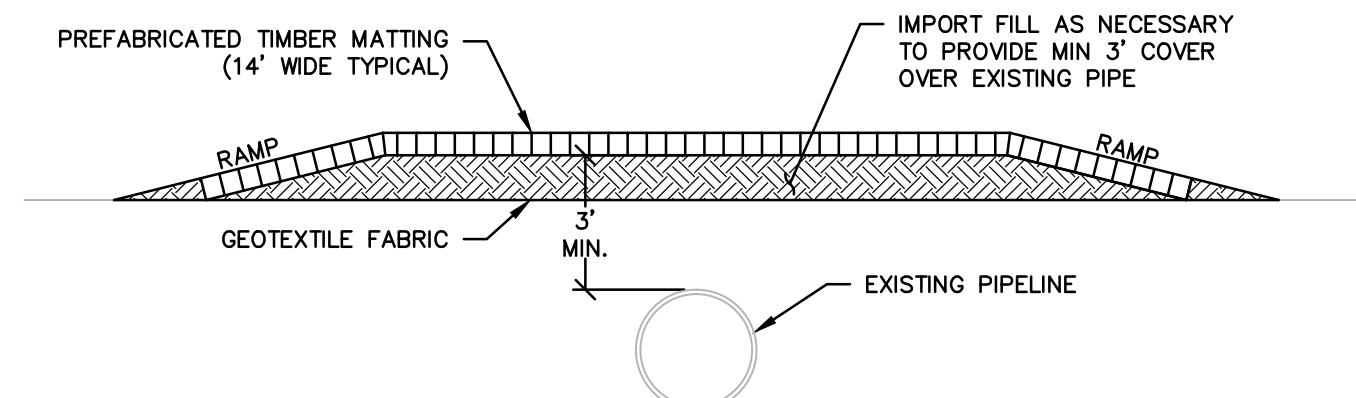


NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP FIGURE 3.07.



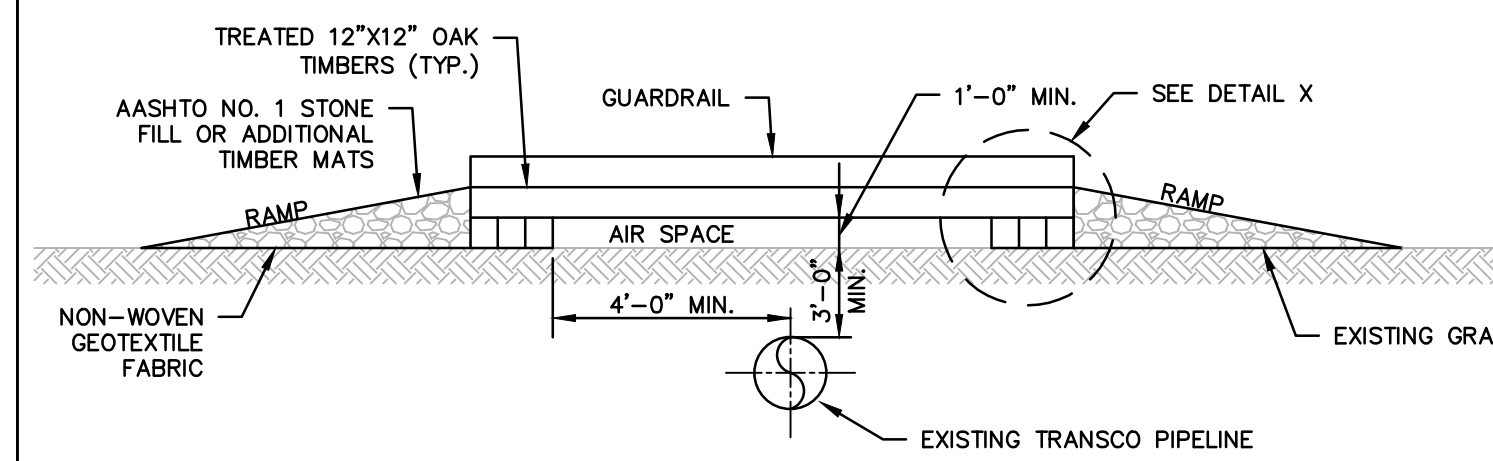
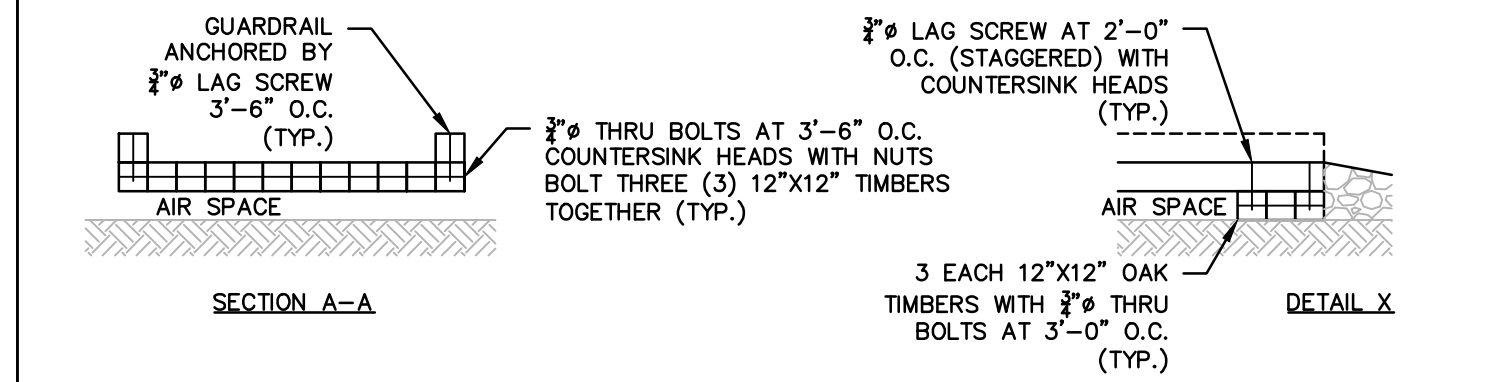
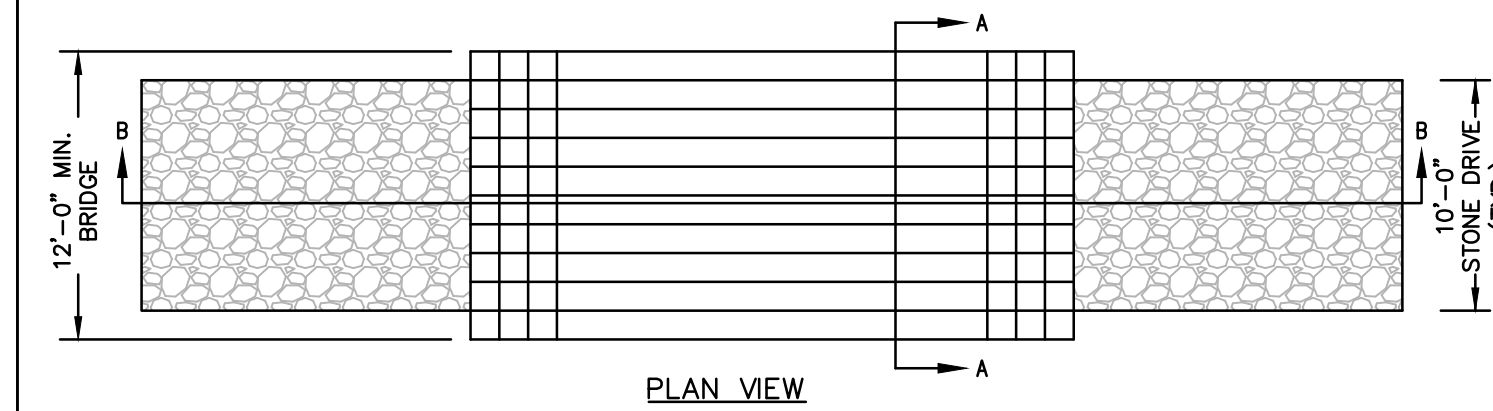
University of Minnesota FS 07009  
A geotextile underlayment shall be used under the wood mat.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(MAT-1) TIMBER MATTING IN WETLANDS OR AT LOW POINTS			



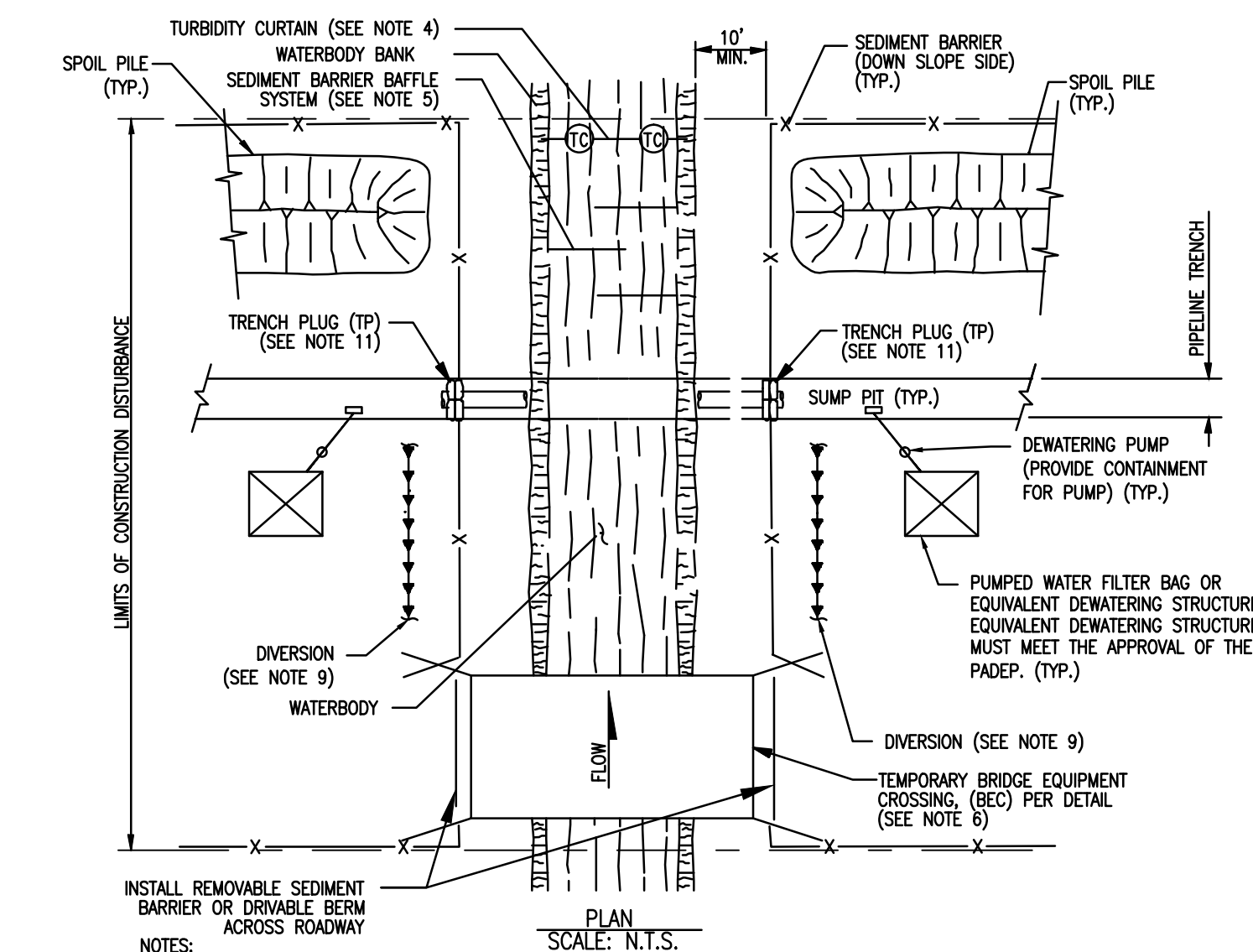
NOTES:  
1. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE THE NUMBER OF EQUIPMENT MATS REQUIRED.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(MAT-2) TIMBER MATTING WITH FILL OVER EXISTING PIPELINES			



NOTES:  
1. IF STONE USED FOR RAMP, INSTALL 1 (ONE) LAYER OF NON-WOVEN GEOTEXTILE FABRIC PRIOR TO INSTALLING THE STONE.  
2. MINIMUM WIDTH OF BRIDGE IS 12'-0" WITH A 10'-0" WIDE STONE DRIVE.

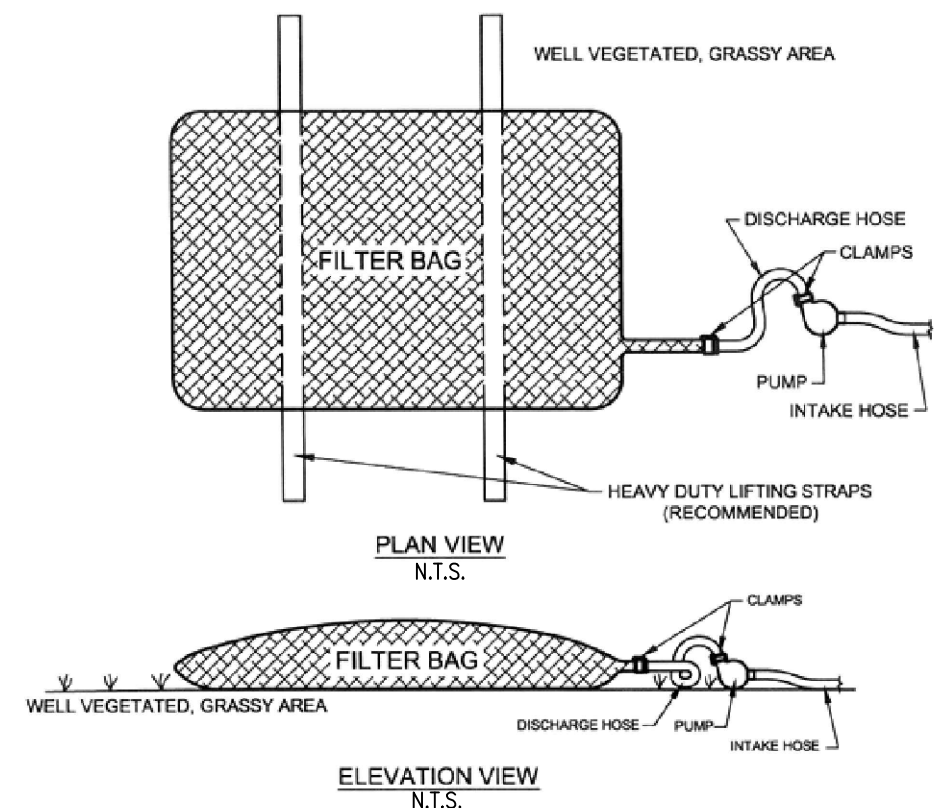
NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(MAT-3) TIMBER MATTING AIR BRIDGE			



NOTES:  
1. THIS METHOD APPLIES TO MINOR WATERBODY CROSSINGS THAT ARE DEFINED AS WATERBODIES THAT ARE LESS THAN OR EQUAL TO 10 FEET AT WATER'S EDGE AT THE TIME OF CROSSING.  
2. SEDIMENT BARRIERS SHALL BE INSTALLED AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS THE WATERBODY OR LEAVES THE CONSTRUCTION RIGHT OF WAY.  
3. HARD DITCH PLOUGS MUST REMAIN IN PLACE AT CONVEIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL THE WATERBODY IS INSTALLED AND BACK FILLED.  
4. INSTALL TURBIDITY CURTAINS DOWNSTREAM OF CROSSING AT EDGE OF WORK CORRIDOR IF STREAM FLOW IS CONDUCTIVE TO SUCH AN INSTALLATION.  
5. IF FLOW OF WATERBODY IS SUCH THAT TURBIDITY CURTAIN CAN NOT BE INSTALLED, THEN INSTALL DOWNSTREAM SEDIMENT BARRIER BAFFLE SYSTEM AS DEPICTED.  
6. EQUIPMENT OPERATING IN THE WATERBODY SHALL BE LIMITED TO THAT NEEDED TO PERFORM CONSTRUCTION. IF OTHER TYPES OF EQUIPMENT MUST CROSS THE WATERBODY, CONTRACTOR SHALL PROVIDE AND USE TEMPORARY STREAM CROSSING (BEC).  
7. STAGING AREA(S) FOR WATERBODY CROSSING(S), WHEN REQUIRED, SHALL BE LOCATED AT LEAST 50 FEET FROM WATER'S EDGE AND SHALL BE OF A MINIMUM SIZE NEEDED FOR CONVEIENT PREPARATION.  
8. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED DAILY AND REPAIRED IF NECESSARY.  
9. INSTALL DIVERSION TRENCHES AT THE BASE OF ALL SLOPES ADJACENT TO THE WATERBODY.  
10. CHEMICALS, FUELS AND LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT SHALL NOT BE REFUELED WITHIN 100 FEET OF THE WATERBODY.  
11. INSTALL TRENCH PLOUGS ON BOTH SIDES OF THE WATERBODY TO PREVENT DIVERSION OF WATER INTO UPLAND PORTIONS OF THE PIPELINE TRENCH AND TO KEEP ANY ACCUMULATED TRENCH WATER OUT OF THE WATERBODY.  
12. CONTRACTOR SHALL POSTPONE GRADING OF RIGHT-OF-WAY IMMEDIATELY ADJACENT TO WATERBODY UNTIL STAGING AREA IS PREPARED AND WORK IN THE WATERBODY IS READY TO COMMENCE.  
13. EXCEPT FOR BLASTING AND OTHER ROCK BREAKING MEASURES, COMPLETE IN STREAM CONSTRUCTION ACTIVITIES (INCLUDING TRENCHING, PIPE INSTALLATION, BACKFILL, AND RESTORATION OF THE STREAM BED CONTOURS) WITHIN 24 HOURS. STREAM BANKS AND UNCONSOLIDATED STREAM BEDS MAY REQUIRE ADDITIONAL RESTORATION AFTER THIS PERIOD.

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(MWC) WET MINOR WATERBODY CROSSING			

NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #3-16.



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

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4832	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS TO BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HO OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

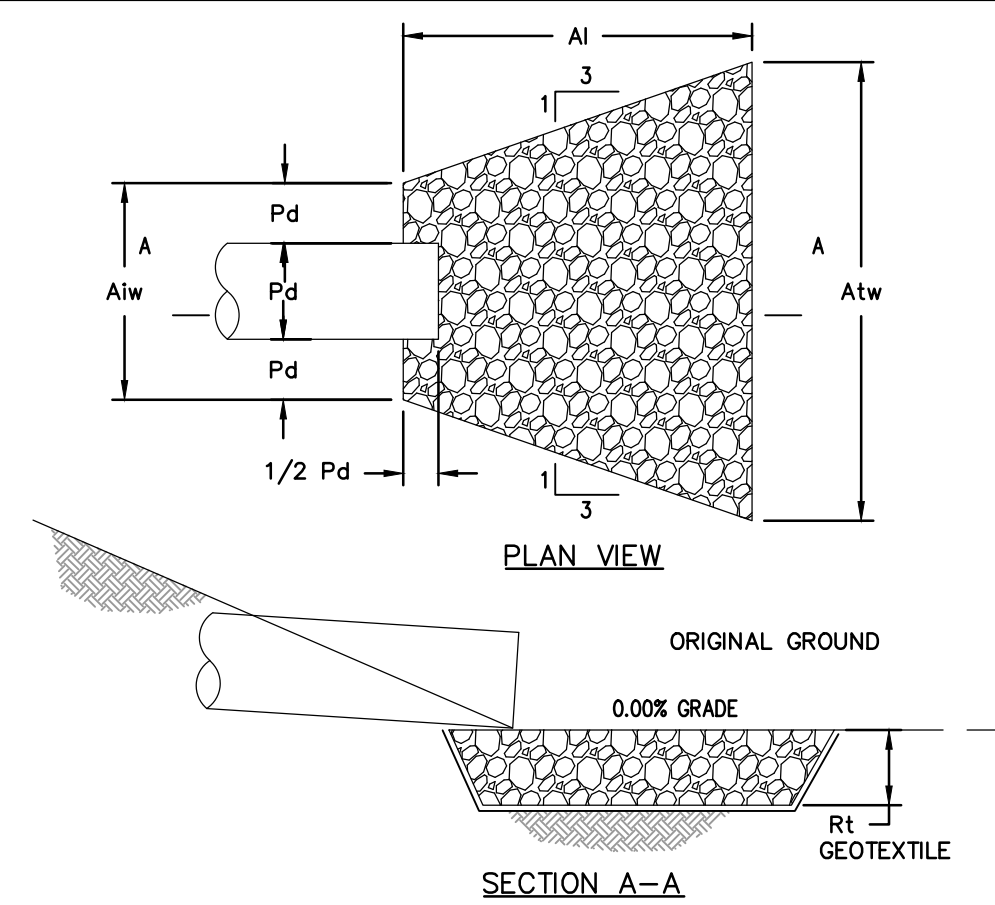
THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

ADAPTED FROM PADEP

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(PWB) PUMP WATER FILTER BAG			

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

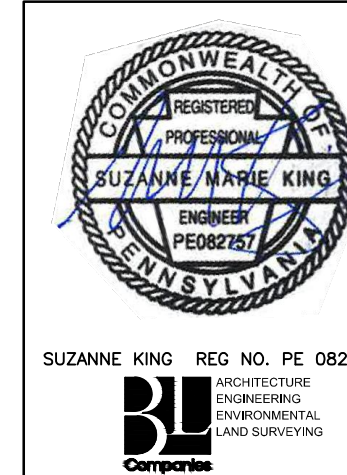


OUTLET NO.	PIPE DIA PD (IN)	RIPRAP		APRON	
		SIZE (R-)	THICK. Rt (IN)	LENGTH AI (FT)	TERMINAL WIDTH Atw (FT)

\* ALL INFORMATION CAN BE FOUND ON ACCESS ROAD AND EROSION AND SEDIMENT CONTROL PLANS. REFER TO NOTES 4 AND 5 FOR DIMENSION LOCATIONS.

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

NO.	DATE	BY	REVISION DESCRIPTION	W.D. NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL			
			(RAO) RIP RAP APRON AT PIPE OUTLET WITHOUT FLARED END SECTION			



NO.	DATE	BY	DESCRIPTION	W.D. NO.	CHK.	APP.
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	CONSTRUCTION	SCALE:	
DRAWING NUMBER:	ASR-BMP	REVISION:	2
SHEET	5	OF	11

**TABLE 6.6**  
**Riprap Gradation, Filter Blanket Requirements, Maximum Velocities**

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

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

<sup>1</sup> This is a general standard. Soil conditions at each site should be analyzed to determine actual filter size. A suitable woven or non-woven geotextile underlayment, used according to the manufacturer's recommendations, may be substituted for the filter stone for gradients < 10%.

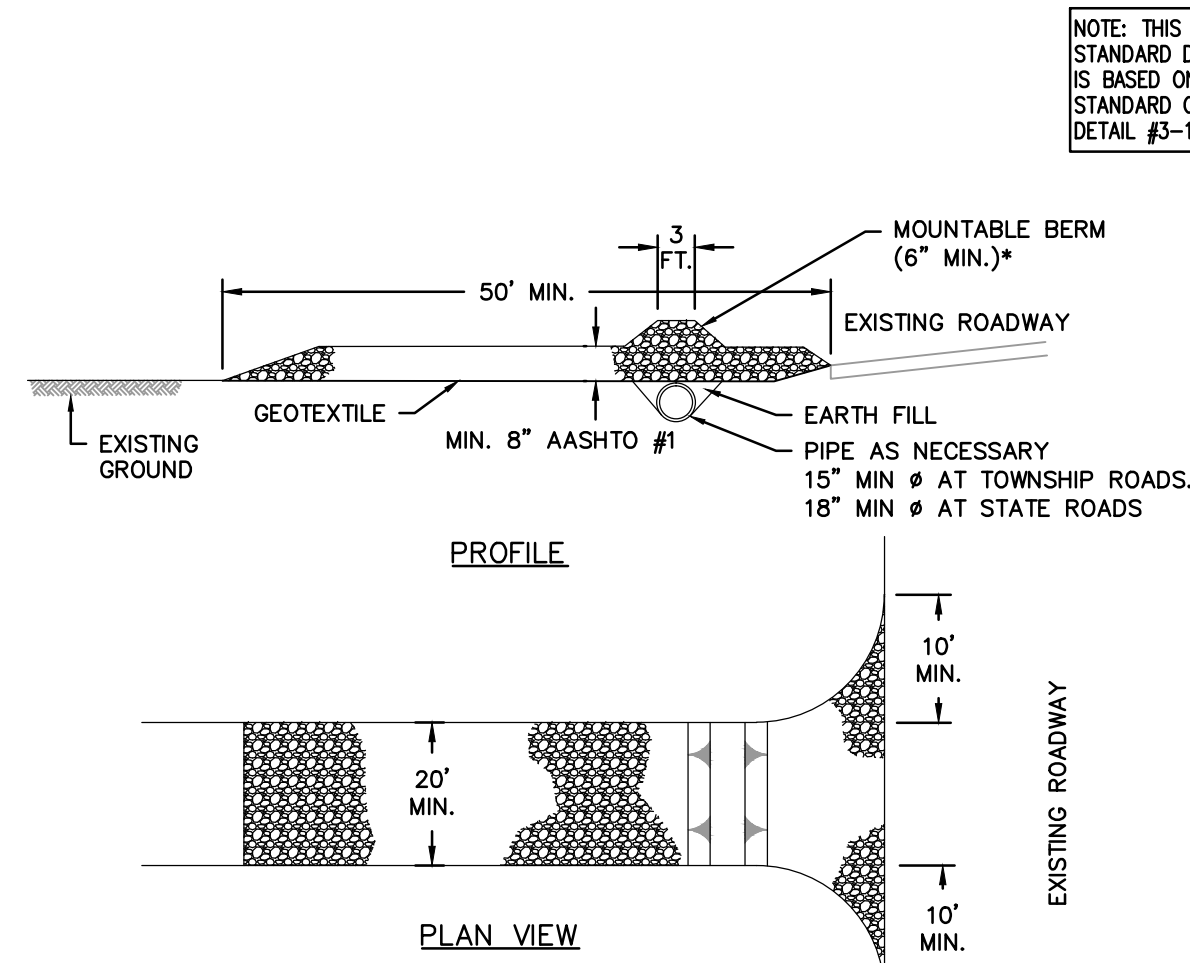
**TABLE 6.7**  
**Comparison of Various Gradations of Coarse Aggregates**

AASHTO NUMBER	Total Percent Passing															
	6"	4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	3/8"	#4	#8	#16	#30	#60	#100	
1	100	90-100	25-60	0-15												
3			100	90-100	35-70	0-15	0-5									
5					100	90-100	20-55	0-10	0-5							
57						100	90-100	25-60		0-10	0-5					
67						100	90-100	20-55	0-10	0-5						
7							100	90-100	40-70	0-15	0-5					
8								100	85-100	10-30	0-10	0-5				
10									100	75-100				10-30		

PennDOT Publication 408, Section 703.2(c), Table C

Tables 6.6 and 6.7 should be placed on the plan drawings of all sites where riprap channel linings are proposed.

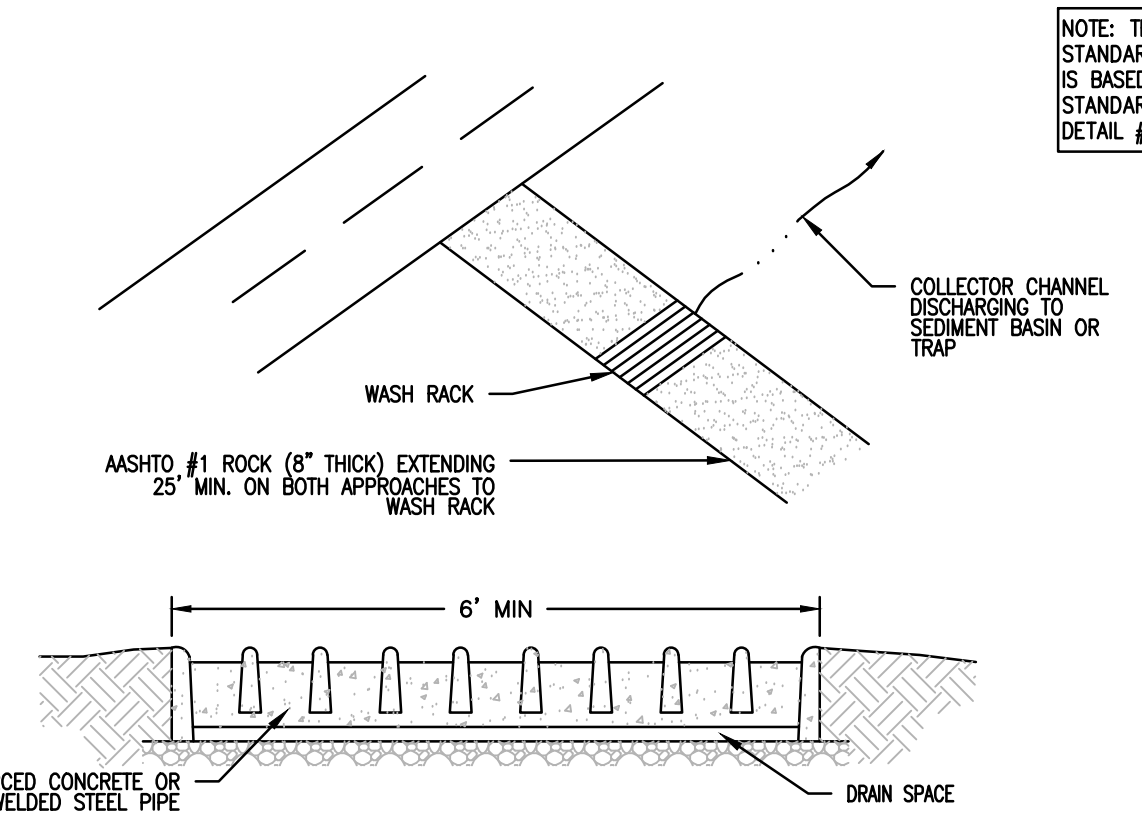
NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								<b>(RAP)</b> RIP RAP GRADATION



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #3-1.

- NOTES:**
- REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
  - RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
  - MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
  - MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK, WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.
  - RCE WITH WASH RACK, SEE DETAIL ROW, TO BE INSTALLED IN, OR WITHIN 100 FEET OF, SPECIAL PROTECTION WATERSHEDS AS WELL AS WITHIN 50 FEET OF WETLANDS.
  - WITHIN WETLANDS RCE AND/OR RCE WITH WASHRACK SHALL BE REPLACED WITH TIMBER MAT AND CLASS 1 GEOTEXTILE UNDERLAYMENT.

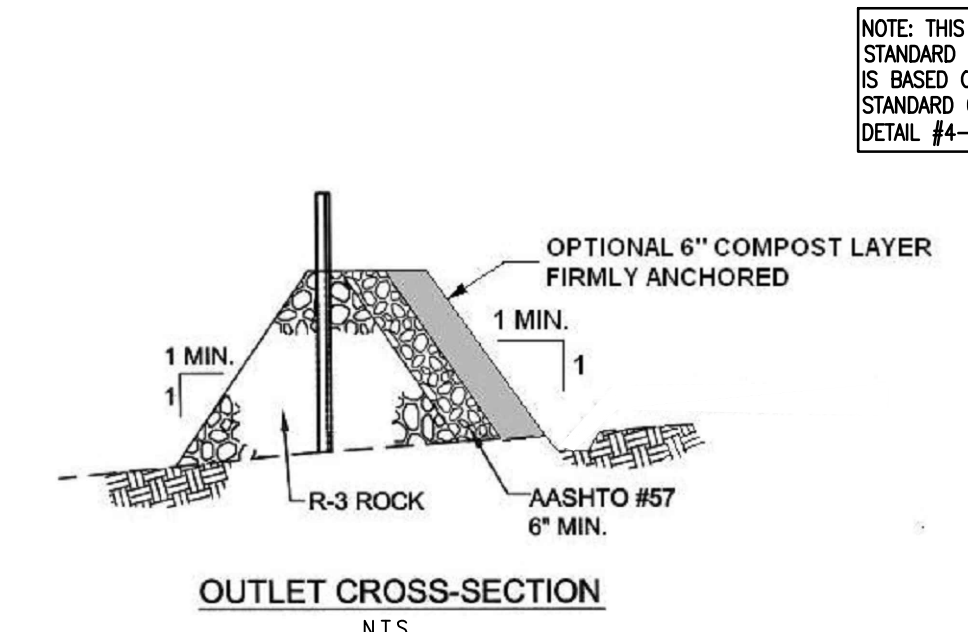
NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								<b>(RCE)</b> ROCK CONSTRUCTION ENTRANCE



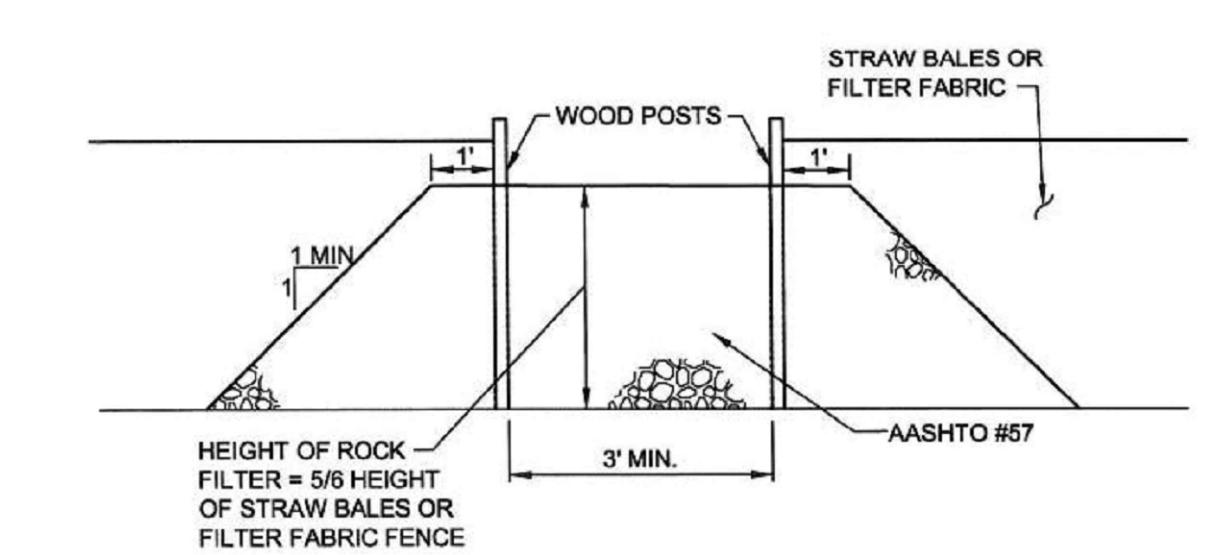
NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #3-2.

- PADEP STANDARD NOTES:**
- WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.
  - WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.
  - A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.
  - MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.
- SUPPLEMENTAL NOTES:**
- RCE TO BE INSTALLED IN, OR WITHIN 100 FEET OF, SPECIAL PROTECTION WATERSHEDS AS WELL AS WITHIN 50 FEET OF WETLANDS.
  - WASH RACK SHALL BE INSTALLED IN COORDINATION WITH THE NOXIOUS AND INVASIVE PLANT MANAGEMENT PLAN. ALTERNATIVE WHEEL WASHING METHODS, SUCH AS PRESSURE WASHING, BRUSHING, OR USE OF COMPRESSED AIR AND/OR AN ELEVATED WASH RACK, MAY BE USED IN CERTAIN LOCATIONS DEPENDING ON THE ANTICIPATED SEDIMENT AND LOCAL VEGETATION.
  - VACUUM SWEEPING MAY BE USED TO MITIGATE THE SPREAD OF SEDIMENT BEYOND THE RCES. RCES WILL BE INSPECTED FOR SEDIMENT TRACKING ONTO PUBLIC ROADWAYS. IF SEDIMENT IS OBSERVED IN THE PUBLIC ROADWAY, THE ROADWAY SHALL BE VACUUM SWEEPED UPON DISCOVERY. ANY LARGE CLUMPS OF DIRT THAT ACCUMULATE ON THE ROAD SURFACE WILL NEED TO BE HAND CLEARED BEFORE VACUUM SWEEPING. ALL VEHICLES LEAVING THE RCE SHALL BE INSPECTED FOR LARGE CLUMPS OF DEBRIS. IF DEBRIS, LARGER THAN 1/2 DIAMETER IS OBSERVED, IT SHALL BE MANUALLY REMOVED FROM THE VEHICLE. DIRT ROADS SHALL BE INSPECTED WEEKLY FOR RUTTING. THERE SHALL BE NO MORE THAN A MAXIMUM OF 8" OF RUTTING ON ACCESS ROADS. IF RUTTING IN EXCESS OF 8" IS OBSERVED, THE ROAD SHALL BE ROLLED AS SOON AS FEASIBLE. DUMP TRUCKS HAULING MATERIAL FROM RCES IN SPECIAL PROTECTION WATERSHEDS WILL BE COVERED WITH A TARPULIN.
  - WITHIN WETLANDS RCE AND/OR RCE WITH WASHRACK SHALL BE REPLACED WITH TIMBER MAT AND CLASS 1 GEOTEXTILE UNDERLAYMENT.

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								<b>(RCW)</b> ROCK CONSTRUCTION ENTRANCE WITH WASH RACK

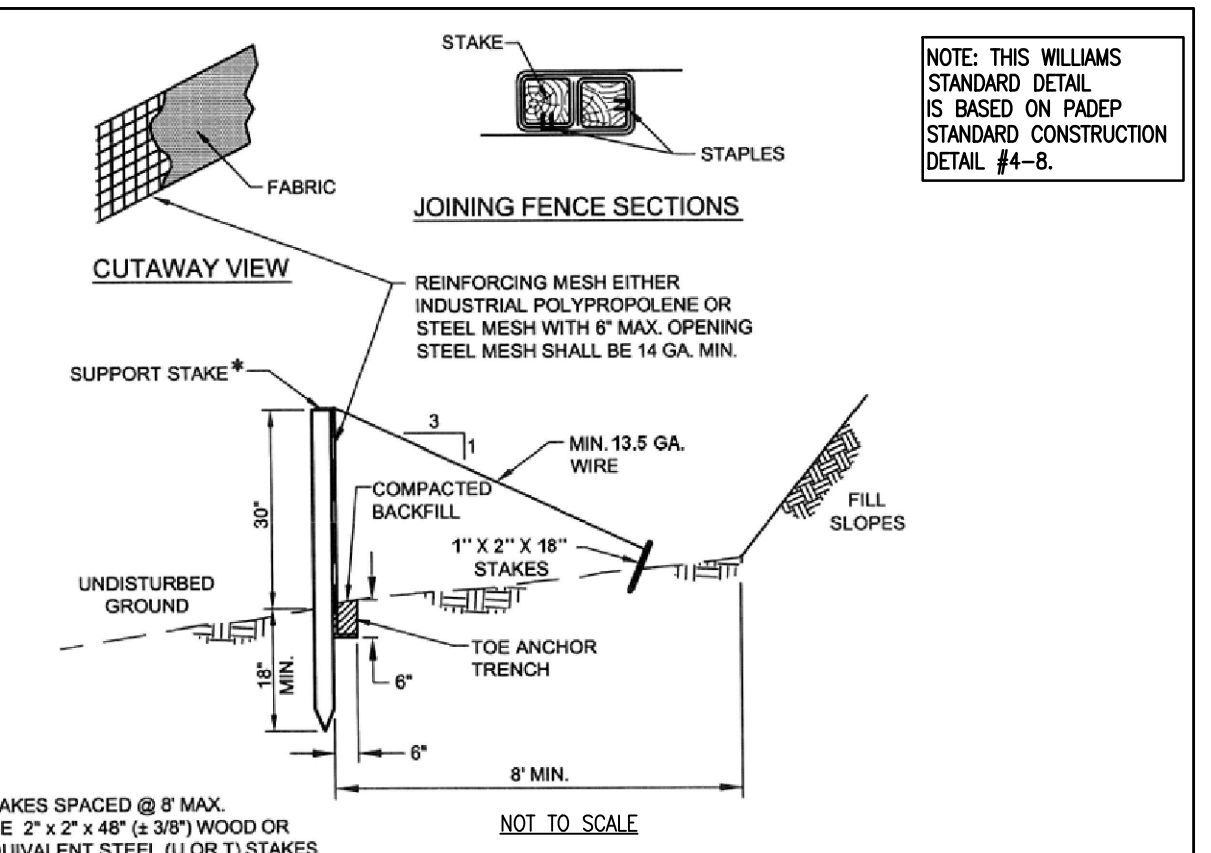


NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #4-6.



- ADAPTED FROM MARYLAND DOE**
- NOTES:**
- A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A STRAW BALE BARRIER OR FILTER FABRIC FENCE HAS OCCURRED DUE TO CONCENTRATED FLOW.
  - SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.
- PADEP SUPPLEMENTAL NOTE:**
- ANCHORED COMPOST LAYER SHALL BE USED ON UP SLOPE FACE IN HQ AND EV WATERSHEDS.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								<b>(RFO)</b> ROCK FILTER OUTLET



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #4-8.

AT A MINIMUM, THE FABRIC SHALL HAVE THE FOLLOWING PROPERTIES:

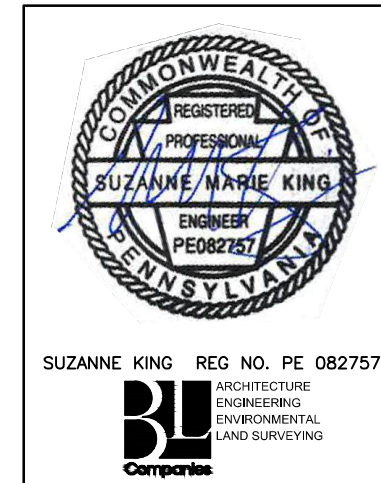
FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D1682
MULLEN BURST STRENGTH (PS)	200	ASTM D 3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	ASTM 5141
PUNCTURE STRENGTH (LB)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

- FABRIC WIDTH SHALL BE 42" MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (1) OR (1) STAKES. 18" SUPPORT STAKE SHALL BE DRIVEN 12" MIN. INTO UNDISTURBED GROUND.
- SILT FENCE SHALL BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION SHALL BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
- SEDIMENT SHALL BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
- ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (RFO).
- FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.
- SILT FENCE SHOULD BE PLACED ON CONTOURS TO THE EXTENT PRACTICAL. SILT FENCE SHOULD NOT BE USED TO DELINEATE THE LIMITS OF THE CONSTRUCTION RIGHT-OF-WAY.
- SILT FENCE IS NOT ALLOWED IN CERTAIN SPECIAL PROTECTION WATERSHEDS; COMPOST FILTER SOCKS SHALL BE USED.

MAXIMUM SLOPE LENGTHS FOR REINFORCED SILT FENCE:

SLOPE-PERCENT	MAXIMUM SLOPE LENGTH (FT)
2 (OR LESS)	500
5	250
10	150
15	100
20	70
25	55
30	45
35	40
40	35
45	30
50	25

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.	TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL
								<b>(RSF)</b> REINFORCED SILT FENCE (30" HIGH)



REVISIONS						
NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK
3	03/28/2016	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	ABJ
4	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	ABJ

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
ATLANTIC SUNRISE PROJECT

BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET

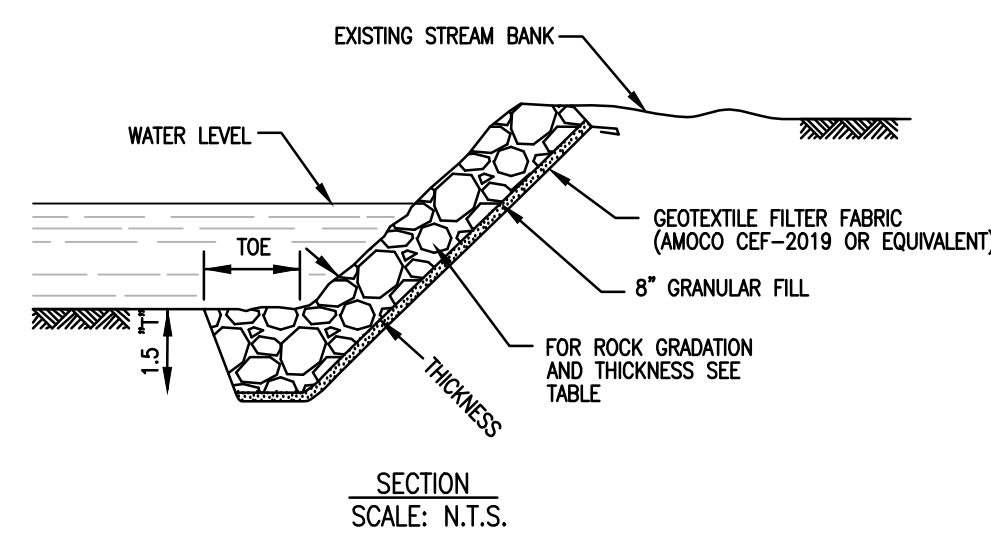
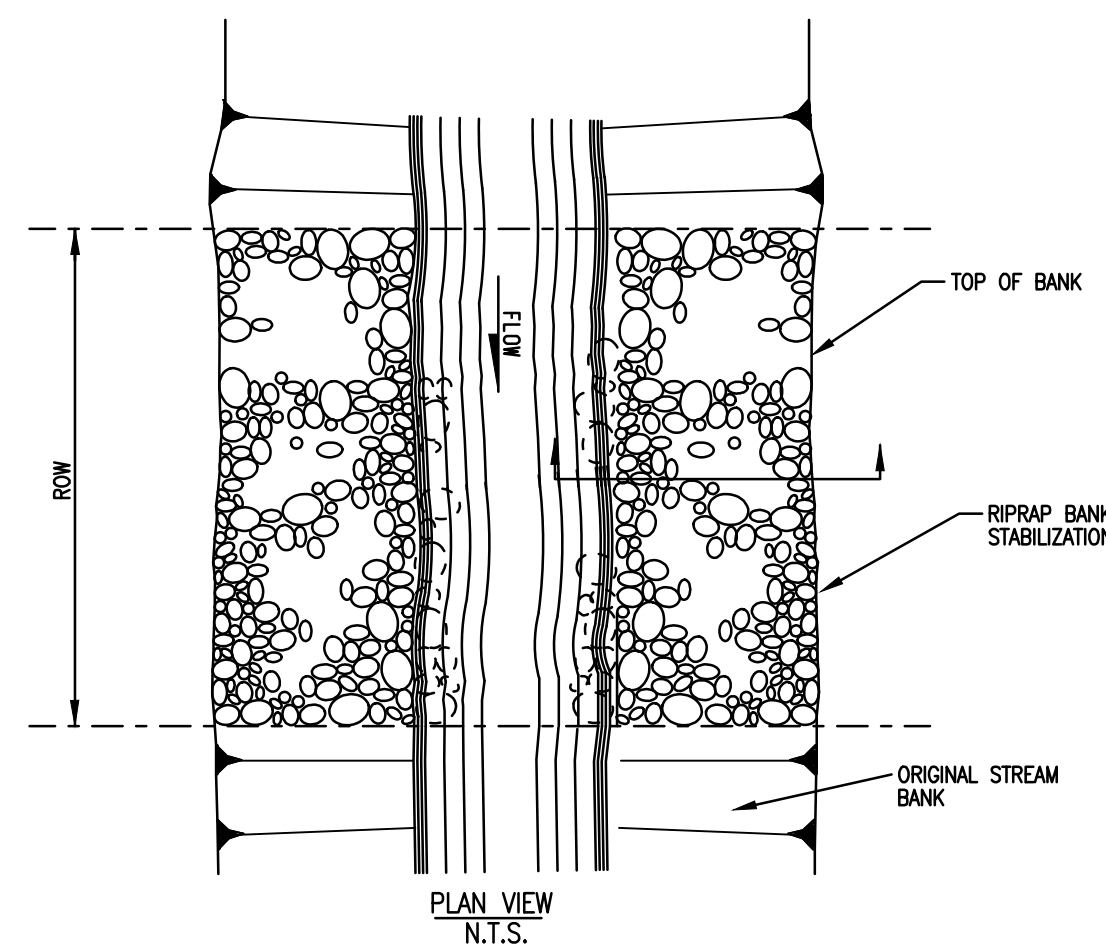
**Williams**  
GAS PIPELINE

BEST MANAGEMENT PRACTICES DETAILS

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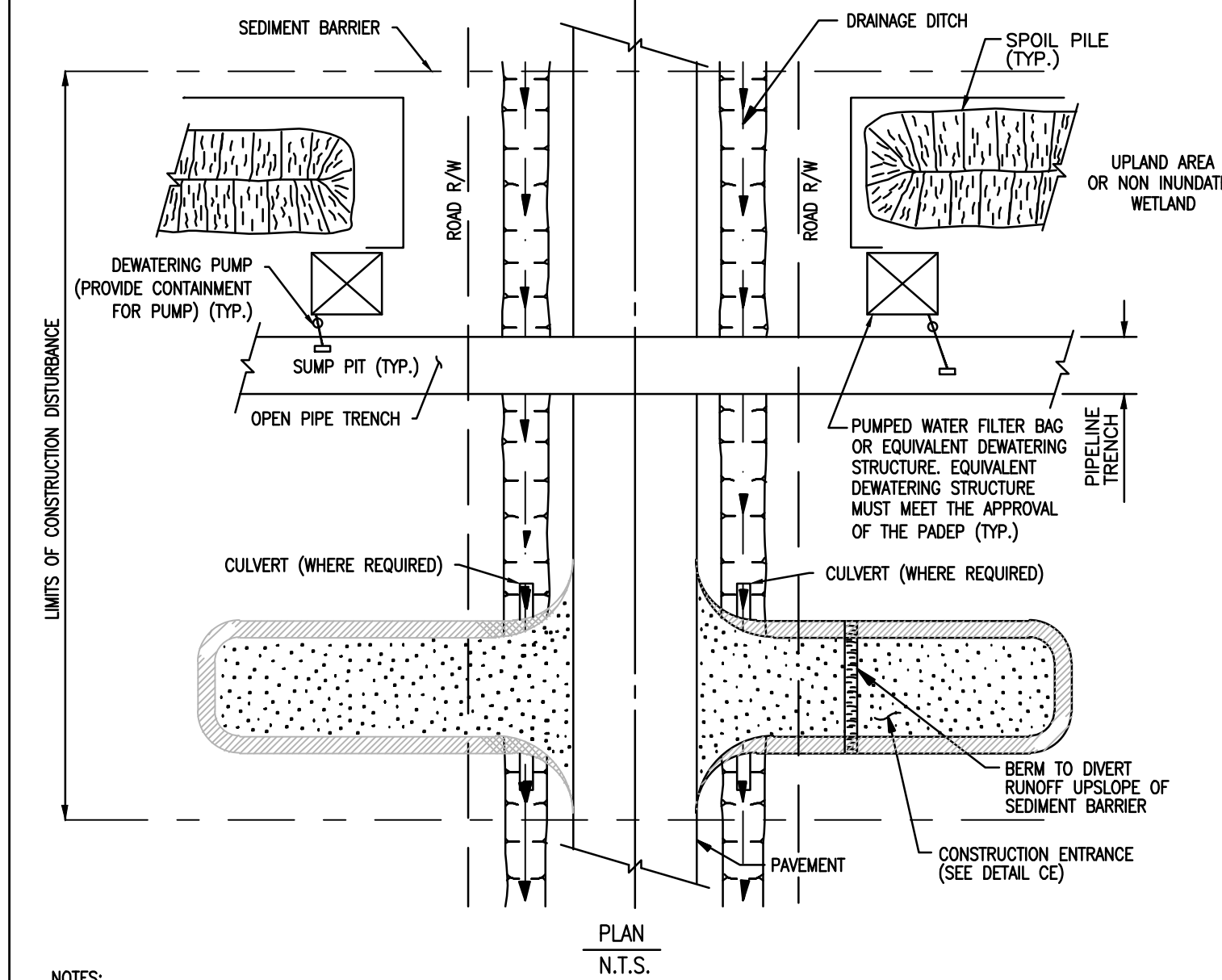
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APPROVED BY: SMK DATE: 07/08/15 DRAWING NUMBER: ASR-BMP SHEET 6 OF 11

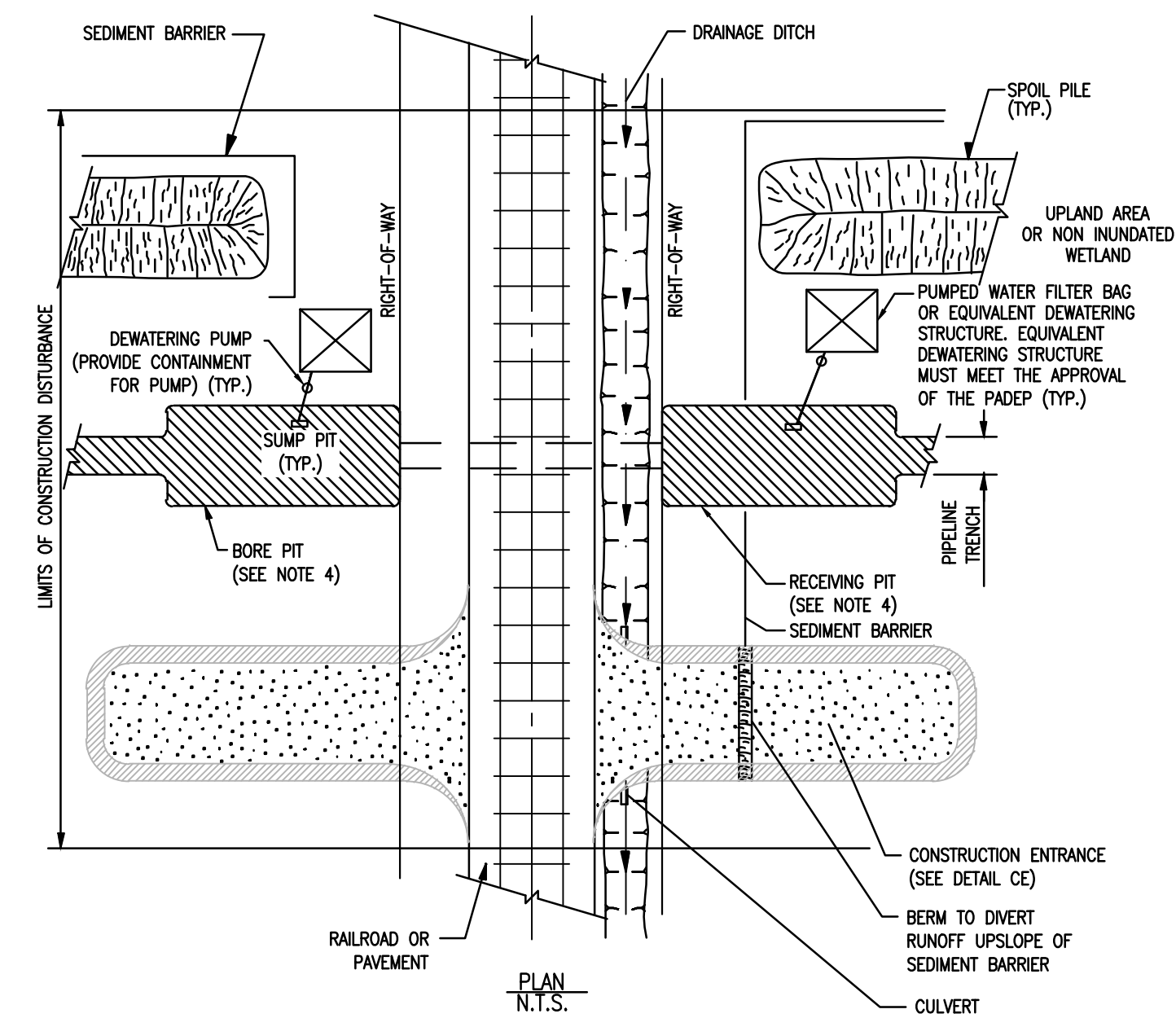


RIP RAP GRADATION TABLE		
REFER TO TABLE 6.6 RIP RAP GRADATION, FILTER BLANKET REQUIREMENTS, MAXIMUM VELOCITIES ON PAGE 6 OF THIS SET.		
REFER TO TABLE 6.7 COMPARISON OF VARIOUS GRADATIONS OF COARSE AGGREGATES ON PAGE 6 OF THIS SET.		

- NOTES:
- ROCK UTILIZED FOR RIPRAP SHALL CONSIST OF SOUND, DURABLE ROCK, INSOLUBLE IN WATER, AND RESISTANT TO WEATHERING.
  - ALL MATERIAL SHALL BE FREE OF STRUCTURAL DEFECTS, SHALE SEAMS AND ORGANIC MATTER.
  - INDIVIDUAL PIECES SHOULD BE SHARPLY ANGULAR, BLOCK SHAPED AND HAVE A MINIMUM SPECIFIC GRAVITY OF 2.5.
  - NO PIECE SHALL HAVE A LENGTH EXCEEDING THREE (3) TIMES ITS WIDTH OR DEPTH.
  - EACH LOAD OF ROCK SHALL BE OF WELL-GRADED MIXTURE. A WELL-GRADED MIXTURE, AS USED HEREIN, IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF LARGER STONE, BUT WITH A SUFFICIENT MIXTURE OF SMALLER SIZES TO FILL THE VOIDS.
  - MATERIAL SHALL MEET NSA SPECIFICATIONS - SEE TABLE ABOVE.
  - IF STREAM WIDTH IS EQUAL TO OR LESS THAN 2 TIMES THE TOE WIDTH, RIPRAP SHALL BE PLACED ACROSS THE ENTIRE STREAM WIDTH.
  - RIPRAP SHALL BE PLACED TO THE FULL COURSE THICKNESS IN ONE CONTINUOUS OPERATION. OPERATIONS WHICH CAUSE SEGREGATION OF THE MATERIALS SHALL NOT BE PERMITTED. INDIVIDUAL ROCKS MAY BE REARRANGED, AND THE VOIDS FILLED WITH HAND PLACED SMALLER ROCK IN ORDER TO ACHIEVE THE DESIRED UNIFORM ARMOR.
  - SLOPE SHALL BE GRADED TO 2:1 OR FLATTER PRIOR TO PLACING GRANULAR FILL, FILTER FABRIC, OR RIPRAP.
  - ENDS OF THE RIPRAP SHALL BE KEED INTO A STABLE BANK. WHEN TYING INTO OTHER STRUCTURES, LARGER RIPRAP CAN BE LAID IN STEPS OR STACKED AS NEEDED TO FIT. STONES LARGER THAN THOSE DESIGNED FOR FLOW SHALL BE USED FOR THIS PURPOSE.
  - REMAINING DISTURBED AREAS SHALL BE GRADED AND PERMANENTLY SEEDED AND MULCHED.



- NOTES:
- SEDIMENT BARRIER SHALL BE INSTALLED AT THE BASE OF SLOPES ADJACENT TO ROAD CROSSINGS WHERE VEGETATION IS DISTURBED, TO INTERCEPT SURFACE RUNOFF. TEMPORARILY RELOCATE SEDIMENT BARRIERS WITHIN LIMITS OF TRENCH OPENING AS NEEDED TO INSTALL PIPE. IMMEDIATELY REPLACE BARRIERS AFTER BACKFILLING TRENCH.
  - PROTECTION FOR SPOIL PILES SHALL BE INSTALLED ONLY WHERE SEDIMENT BARRIERS ACROSS THE ENTIRE DISTURBED AREA ARE NOT REQUIRED.
  - SEDIMENT BARRIERS SHALL REMAIN IN PLACE UNTIL PERMANENT REVEGETATION IS ESTABLISHED.
  - CULVERTS TO BE SIZED AND PLACED WHERE REQUIRED TO MAINTAIN WATER FLOW.
  - CONTRACTOR SHALL BE REQUIRED TO KEEP THE ROAD CLEAN OF DEBRIS AT ALL TIMES.
  - CONTRACTOR MAY ELECT TO UTILIZE SHEET PILING IN ORDER TO STABILIZE PIPE TRENCH.
  - CONTRACTOR MAY ELECT TO UTILIZE WELL-POINTS IN ORDER TO REDUCE THE WATER TABLE PRIOR TO COMMENCING EXCAVATION.
  - DEPENDING ON TOPOGRAPHY AND STATE REQUIREMENTS, SEDIMENT BARRIER MAY BE REQUIRED ACROSS THE ENTIRE CONSTRUCTION RIGHT-OF-WAY AT THE EDGE OF ROAD. IN ADDITION TO THIS DETAIL, REFER TO THE ENVIRONMENTAL ALIGNMENT DRAWINGS FOR PLACEMENT OF SEDIMENT BARRIERS.
  - CONSTRUCTION ENTRANCE NEEDED AS SHOWN ON SPECIFIC PLAN.



- NOTES:
- SEDIMENT BARRIER SHALL BE INSTALLED AT THE BASE OF SLOPES ADJACENT TO ROAD CROSSINGS WHERE VEGETATION IS DISTURBED, TO INTERCEPT SURFACE RUNOFF. TEMPORARILY RELOCATE SEDIMENT BARRIERS WITHIN LIMITS OF TRENCH OPENING AS NEEDED TO INSTALL PIPE. IMMEDIATELY REPLACE BARRIERS AFTER BACKFILLING TRENCH.
  - PROTECTION FOR SPOIL PILES SHALL BE INSTALLED ONLY WHERE SEDIMENT BARRIERS ACROSS THE ENTIRE DISTURBED AREA ARE NOT REQUIRED.
  - SEDIMENT BARRIERS SHALL REMAIN IN PLACE UNTIL PERMANENT REVEGETATION IS ESTABLISHED.
  - WATER REMOVED FROM BORE PIT AND RECEIVING PIT SHALL BE FILTERED THROUGH A DEWATERING STRUCTURE OR FILTER BAG.
  - IF WELL POINTING IS REQUIRED PRIOR TO EXCAVATING BORE PITS, CONTRACTOR SHALL CONSULT WITH COMPANY'S ENVIRONMENTAL INSPECTOR PRIOR TO COMMENCEMENT OF WORK IN ORDER TO DETERMINE PROPER DEWATERING LOCATION.
  - CONTRACTOR SHALL BE REQUIRED TO KEEP THE CROSSING CLEAN OF DEBRIS AT ALL TIMES.
  - CONTRACTOR MAY ELECT TO UTILIZE SHEET PILING IN ORDER TO STABILIZE BORE PITS.
  - DEPENDING ON TOPOGRAPHY AND STATE REQUIREMENTS, SEDIMENT BARRIER MAY BE REQUIRED ACROSS THE ENTIRE CONSTRUCTION RIGHT OF WAY AT THE EDGE OF ROAD. IN ADDITION TO THIS DETAIL, REFER TO THE ENVIRONMENTAL ALIGNMENT DRAWINGS FOR PLACEMENT OF SEDIMENT BARRIERS.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(RSS) RIP RAP STREAM BANK STABILIZATION

1 OF 2

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(RSS) RIP RAP STREAM BANK STABILIZATION

2 OF 2

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

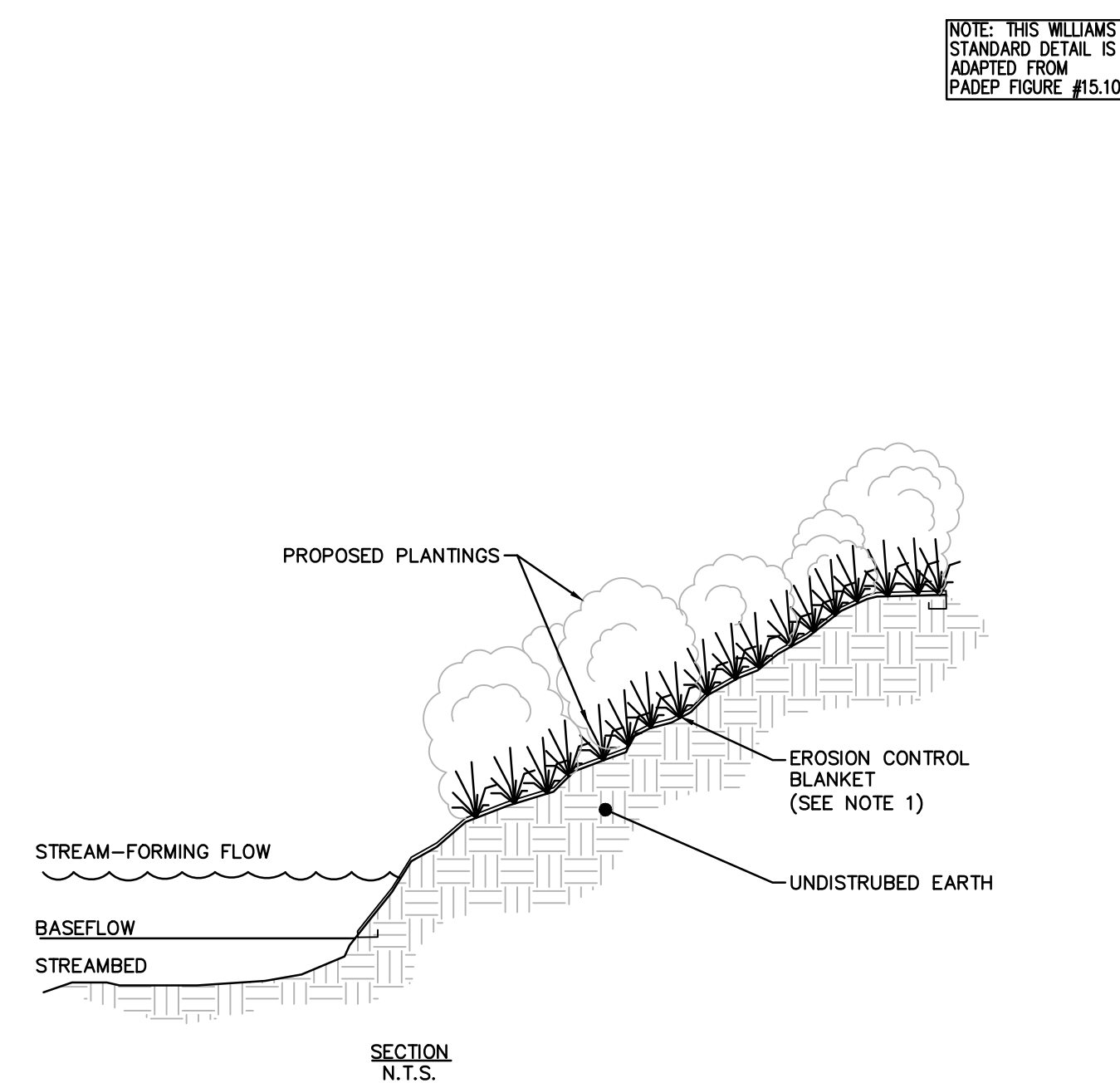
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(RX.1) TRENCHED ROAD CROSSING

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(RX.2) BORED ROAD/RAILROAD CROSSING

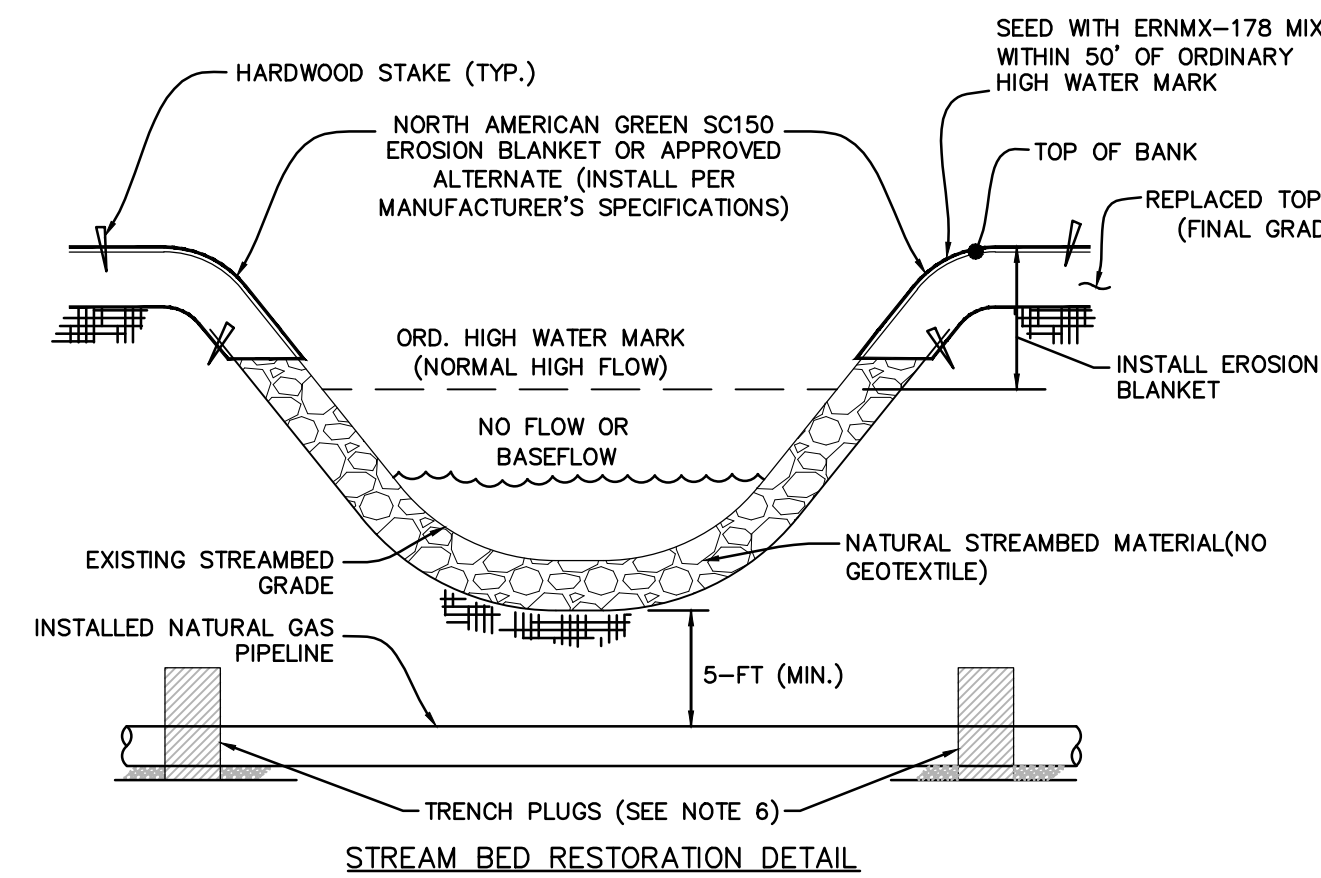


- NOTES:
- ON STREAM BANKS WITH SLOPES 2:1 OR LESS, EROSION CONTROL BLANKET NAG SC150 OR APPROVED EQUAL SHALL BE USED. FOR ALL OTHER SLOPES, EROSION CONTROL BLANKET NAG C125 OR APPROVED EQUAL SHALL BE UTILIZED. REFER TO EROSION CONTROL BLANKET DETAIL (ECB) FOR INSTALLATION.
  - STREAM BANK STABILIZATION SHALL UTILIZE REINFORCEMENT BLANKET EXCEPT WHEN STABILIZATION CANNOT BE ACHIEVED IN THE FIELD. IN WHICH CASE, RIP RAP STREAM BANK STABILIZATION SHALL BE IMPLEMENTED. REFER TO THE RIP RAP STREAM BANK STABILIZATION DETAIL, RSS, IN THIS PLAN SET.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(SBR) STREAM BANK STABILIZATION WITH REINFORCEMENT BLANKET

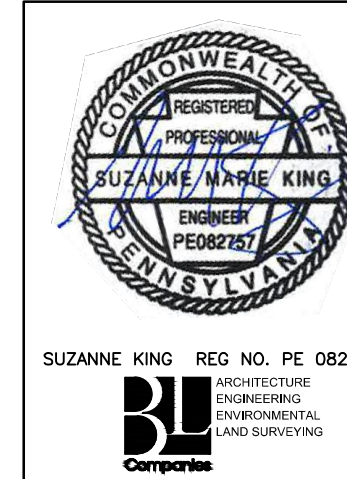


- NOTES:
- REMOVE EXISTING STREAMBED MATERIAL AND STOCKPILE SEPARATELY.
  - ONCE PIPELINE IS INSTALLED, REPLACE SUBSTRATE BACK IN STREAMBED AND RESTORE TO EXISTING CONDITION.
  - SEE RECOMMENDED SEED MIXTURES TABLES FOR SEED MIXES.
  - ON STREAMBANKS WITH SLOPES 2:1 OR LESS, EROSION CONTROL BLANKET NAG SC150 OR APPROVED EQUAL SHALL BE USED. FOR ALL OTHER SLOPES, EROSION CONTROL BLANKET NAG C125 OR APPROVED EQUAL SHALL BE UTILIZED.
  - THE USE OF EROSION CONTROL BLANKET IS NOT ALLOWED ON STATE GAME LANDS. HYDRAULICALLY APPLIED SLOPE STABILIZATION MUST BE USED.
  - REFER TO TRENCH PLUG INSTALLATION DETAIL (TP) FOR MORE INFORMATION.

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

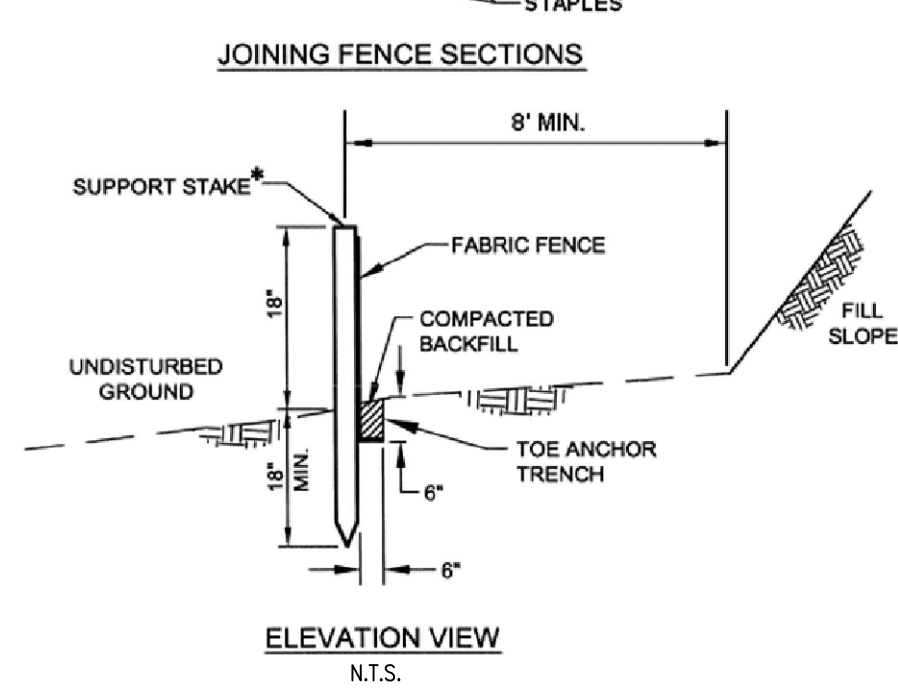
(SBR) STREAM BANK STABILIZATION WITH REINFORCEMENT BLANKET



REVISIONS			
NO.	DATE	BY	DESCRIPTION
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	ISSUED FOR CONSTRUCTION	SCALE:	
DRAWING NUMBER:	ASR-BMP	REVISION:	2
SHEET	7	OF	11

\*STAKES SPACED @ 8' MAX. USE 2" x 2" (± 3/8") WOOD OR EQUIVALENT STEEL (U OR T) STAKES



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #4-7.

AT A MINIMUM, THE FABRIC SHALL HAVE THE FOLLOWING PROPERTIES:

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D1682
MULLEN BURST STRENGTH (PSI)	200	ASTM D 3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	ASTM 5141
PUNCTURE STRENGTH (LB)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

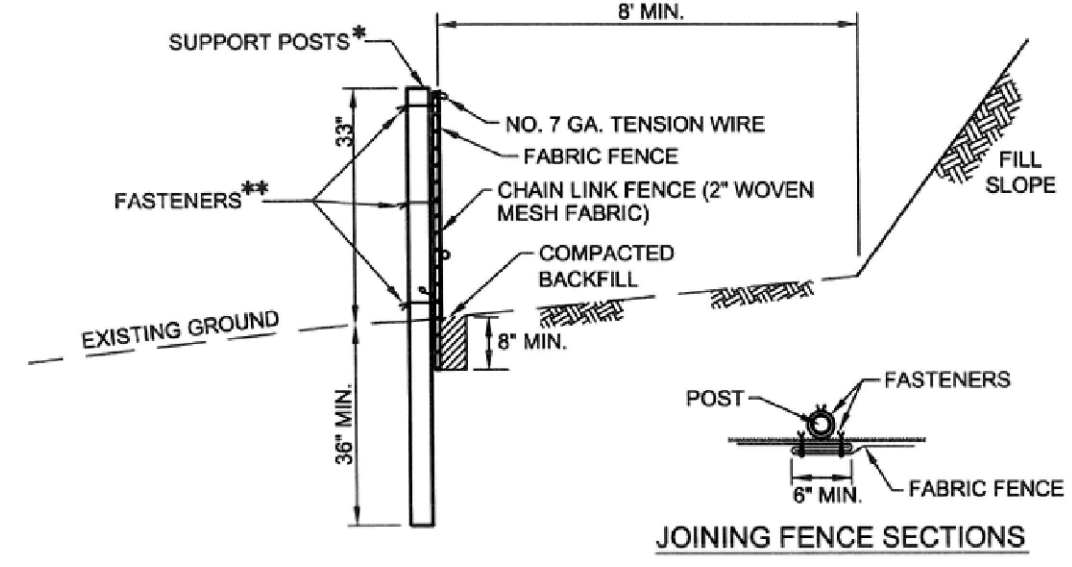
- ADAPTED FROM NEW YORK DEC AND PENN-DOT PUB 408 AND PENN-DOT PUB 408
- FABRIC WIDTH SHALL BE 30' MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (U OR T) STAKES.
  - SILT FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
  - SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
  - ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (RFO).
  - FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.
  - SILT FENCE SHOULD BE PLACED ON CONTOURS TO THE EXTENT PRACTICAL. SILT FENCE SHOULD NOT BE USED TO DELINEATE THE LIMITS OF THE CONSTRUCTION RIGHT-OF-WAY.
  - SILT FENCE IS NOT ALLOWED IN CERTAIN SPECIAL PROTECTION WATERSHEDS; COMPOST FILTER SOCKS SHALL BE USED.

ADAPTED FROM PA DEP

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(SF) STANDARD SILT FENCE (18" HIGH)



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #4-10.

\*POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. HEAVY DUTY GALVANIZED OR ALUMINUM POSTS.  
\*\*CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 9 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 13.5 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX C. TO C.

AT A MINIMUM, THE FABRIC SHALL HAVE THE FOLLOWING PROPERTIES:

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D1682
MULLEN BURST STRENGTH (PSI)	200	ASTM D 3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	ASTM 5141
PUNCTURE STRENGTH (LB)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

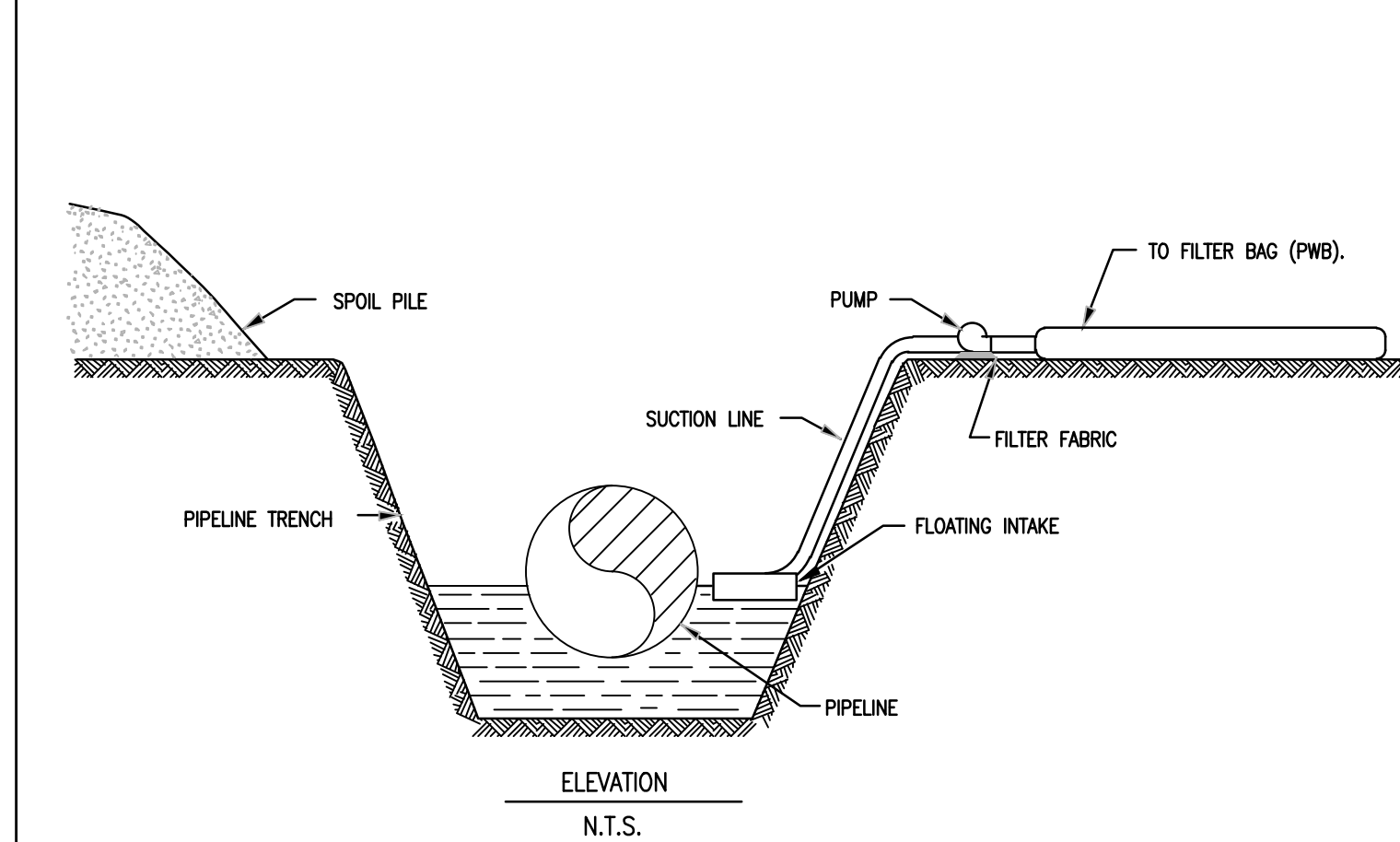
- ADAPTED FROM NEW YORK DEC AND PENN-DOT PUB 408
- FILTER FABRIC WIDTH SHALL BE 42' MINIMUM.
  - POSTS SHALL BE INSTALLED USING A POSTHOLE DRILL.
  - CHAIN LINK SHALL BE GALVANIZED NO. 11.5 GA. STEEL WIRE WITH 2" OPENING, NO. 11 GA. ALUMINUM COATED STEEL WIRE IN ACCORDANCE WITH ASTM-A-491, OR GALVANIZED NO. 9 GA. STEEL WIRE TOP AND BOTTOM WITH GALVANIZED NO. 11 GA. STEEL INTERMEDIATE WIRES. NO. 7 GAGE TENSION WIRE TO BE INSTALLED HORIZONTALLY THROUGH HOLES AT TOP AND BOTTOM OF CHAIN-LINK FENCE OR ATTACHED WITH HOG RINGS AT 5' (MAX.) CENTERS.
  - SILT FENCE SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO MAIN BARRIER ALIGNMENT.
  - SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
  - FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.
  - SILT FENCE SHOULD BE PLACED ON CONTOURS TO THE EXTENT PRACTICAL. SILT FENCE SHOULD NOT BE USED TO DELINEATE THE LIMITS OF THE CONSTRUCTION RIGHT-OF-WAY.
  - SILT FENCE IS NOT ALLOWED IN CERTAIN SPECIAL PROTECTION WATERSHEDS; COMPOST FILTER SOCKS SHALL BE USED.

ADAPTED FROM PA DEP

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(SSF) SUPER SILT FENCE (33" HIGH)



ELEVATION N.T.S.

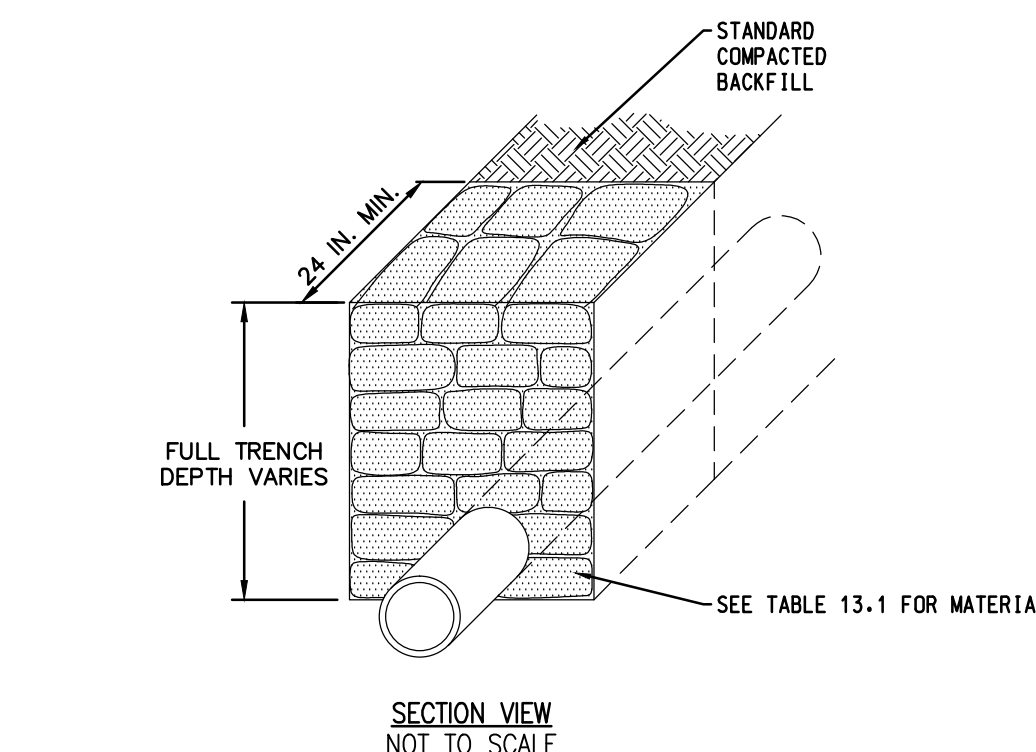
- NOTES:
- WATER PUMPED OUT OF TRENCH SHALL NOT BE DISCHARGED INTO WATERWAYS. WATER SHALL BE DISCHARGED INTO A FILTER BAG OR DEWATERING STRUCTURE.
  - PUMP SHALL BE CONTROLLED SO THAT DISCHARGE DOES NOT OVERFLOW DEWATERING STRUCTURE.
  - PUMP SUCTION HOSE MUST NOT BE ALLOWED TO COME IN CONTACT WITH TRENCH BOTTOM. PROVISIONS MUST BE MADE TO ELEVATE THE SUCTION HOSE TO AT LEAST ONE FOOT ABOVE THE BOTTOM OF THE PIPE TRENCH UNTIL BOTTOM DEWATERING IS NECESSARY.
  - DEWATERING SHALL NOT OCCUR DURING TIMES OF HEAVY RAINFALL EXCEPT AS REQUIRED TO PREVENT FLOODING OF CONSTRUCTION EQUIPMENT LOCATED IN BORE PITS AND TRENCHES.
  - PUMP WATER FILTER BAG (PWB) SHALL BE PLACED ON A WELL VEGETATED AREA AWAY FROM CONSTRUCTION SO THAT FILTERED WATER IS NOT RETURNED TO THE TRENCH.

ADAPTED FROM MARYLAND DOE

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(TD) TRENCH DEWATERING



NOTE: THIS WILLIAMS STANDARD DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #13-4.

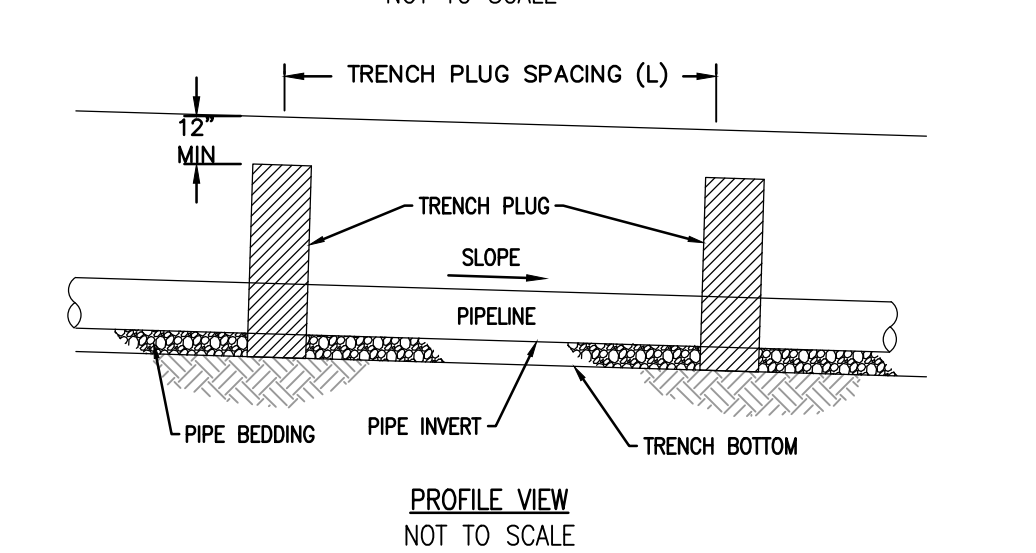


TABLE 13.1  
MAXIMUM SPACING AND MATERIALS FOR TRENCH PLUGS

TRENCH SLOPE (%)	SPACING L (FT)	TRENCH PLUG MATERIAL FOR FILLED SACKS
<5	1,000	* CLAY, BENTONITE, OR CONCRETE FILLED SACKS
5 - 15	500	* CLAY, BENTONITE, OR CONCRETE FILLED SACKS
15 - 25	300	* CLAY, BENTONITE, OR CONCRETE FILLED SACKS
25 - 35	200	* CLAY, BENTONITE, OR CONCRETE FILLED SACKS
35 - 100	100	* CLAY, BENTONITE, OR CONCRETE FILLED SACKS
>100	50	* CEMENT FILLED BAGS (WETTED) OR MORTARED STONE

\*TOPSOIL MAY NOT BE USED TO FILL SACKS.  
IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER WATER BODY CROSSINGS. FOAM TRENCH PLUGS ARE NOT TO BE USED IN WETLANDS.

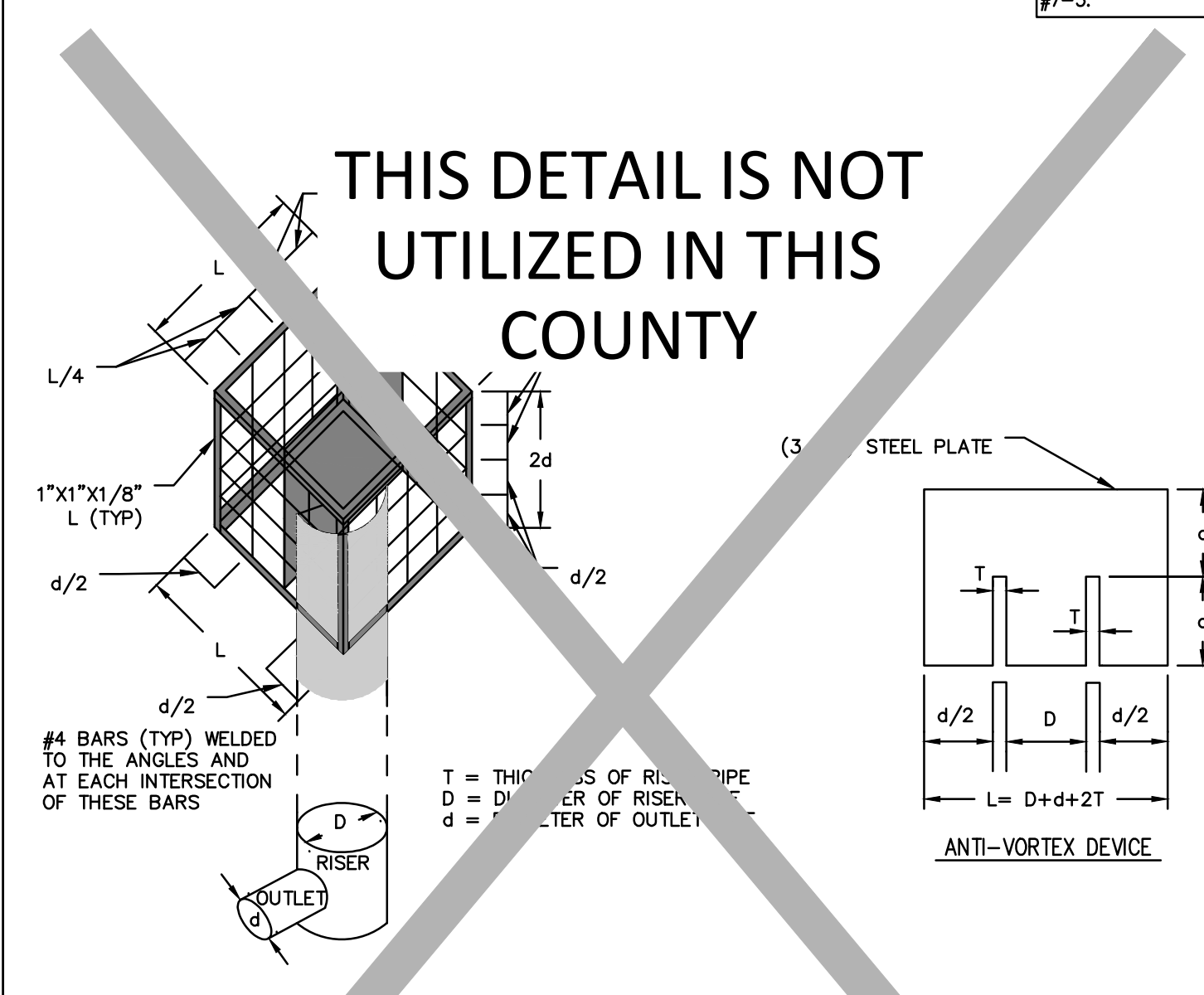
ADAPTED FROM MARYLAND DOE

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(TP) TRENCH PLUG INSTALLATION

THIS DETAIL IS NOT UTILIZED IN THIS COUNTY



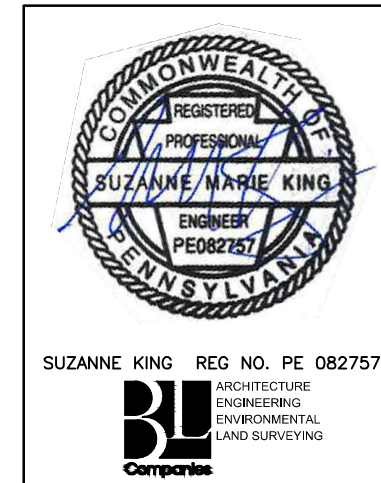
NOTE: THIS DETAIL IS BASED ON PADEP STANDARD CONSTRUCTION DETAIL #7-5.

ADAPTED FROM PA DEP

NO.	DATE	BY	REVISION DESCRIPTION	NO.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
STANDARD ENVIRONMENTAL DETAIL

(TRV) TRASH RACK AND ANTI-VORTEX DEVICE



REVISIONS			
NO.	DATE	BY	DESCRIPTION
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	ISSUED FOR CONSTRUCTION	SCALE:	
DRAWING NUMBER:	ASR-BMP	REVISION:	2
SHEET:	8	OF:	11



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Drawing Location & Name: G:\08514\14C\14C4008\DWG\BMPs&DETAILS\PL\_DNT14C4909(205)\_LLE-BMP-08.dwg

**NOTES:**

1. ALLOW FOR A 3' SEPARATION BETWEEN THE TOPSOIL PILE AND THE TRENCH SPOIL.
2. RETURN TRENCH SPOIL TO TRENCH AND COMPACT. FEATHER OUT EXCESS SPOIL OVER STRIPPED AREA LEAVING A LOW CROWN CENTERED OVER THE TRENCH. ALLEVIATE COMPACTION OF SUBSOILS OVER THE STRIPPED AREA.
3. RETURN TOPSOIL EVENLY OVER THE STRIPPED AREA AFTER TRENCH HAS SUFFICIENTLY SETTLED OR HAS BEEN COMPACTED.
4. ALLEVIATE COMPACTION OF TOPSOIL OVER ENTIRE RIGHT-OF-WAY.
5. SEGREGATED TOPSOIL MAY NOT BE USED FOR PADDING THE PIPE.
6. INSTALL SEDIMENT BARRIER AS SHOWN ON PLAN.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(TS.1) TOPSOIL SEGREGATION (1)				

**NOTES:**

1. ALLOW FOR A 3' SEPARATION BETWEEN THE TOPSOIL PILE AND THE TRENCH SPOIL.
2. RETURN TRENCH SPOIL TO TRENCH AND COMPACT. FEATHER OUT EXCESS SPOIL OVER STRIPPED AREA LEAVING A LOW CROWN CENTERED OVER THE TRENCH. ALLEVIATE COMPACTION OF SUBSOILS OVER THE STRIPPED AREA.
3. RETURN TOPSOIL EVENLY OVER THE STRIPPED AREA AFTER TRENCH HAS SUFFICIENTLY SETTLED OR HAS BEEN COMPACTED.
4. ALLEVIATE COMPACTION OF TOPSOIL OVER ENTIRE RIGHT-OF-WAY.
5. SEGREGATED TOPSOIL MAY NOT BE USED FOR PADDING THE PIPE.
6. INSTALL SEDIMENT BARRIER AS SHOWN ON PLAN.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(TS.2) TOPSOIL SEGREGATION (2)				

**NOTES:**

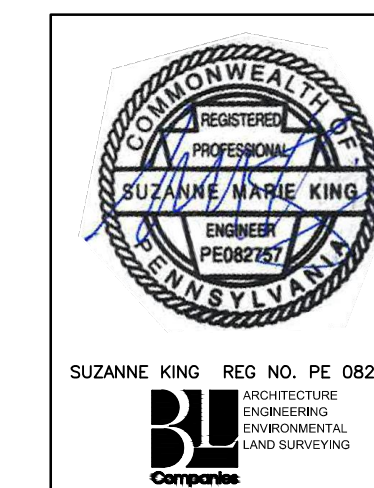
1. ALLOW FOR A 3' SEPARATION BETWEEN THE TOPSOIL PILE AND THE TRENCH SPOIL.
2. RETURN TRENCH SPOIL TO TRENCH AND COMPACT. FEATHER OUT EXCESS SPOIL OVER STRIPPED AREA LEAVING A LOW CROWN CENTERED OVER THE TRENCH. ALLEVIATE COMPACTION OF SUBSOILS OVER THE STRIPPED AREA.
3. RETURN TOPSOIL EVENLY OVER THE STRIPPED AREA AFTER TRENCH HAS SUFFICIENTLY SETTLED OR HAS BEEN COMPACTED.
4. ALLEVIATE COMPACTION OF TOPSOIL OVER ENTIRE RIGHT-OF-WAY.
5. SEGREGATED TOPSOIL MAY NOT BE USED FOR PADDING THE PIPE.
6. INSTALL SEDIMENT BARRIER AS SHOWN ON PLAN.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(TS.3) TOPSOIL SEGREGATION (3)				

**NOTES:**

1. TWO-TONE THE RIGHT-OF-WAY TO LIMIT THE NEED FOR DEEP CUTS AND ADDITIONAL RIGHT-OF-WAY ON STEEP SLOPES. THE MINIMUM WORKSPACE WIDTH ALONG STEEP SIDE SLOPES WILL VARY DEPENDING ON THE DIAMETER OF PIPE TO BE INSTALLED. ADDITIONAL TEMPORARY WORKSPACE MAY BE REQUIRED FOR WORKER SAFETY DEPENDING ON THE SEVERITY OF THE GRADE.
2. EMPLOY EROSION CONTROL MEASURES SUCH AS WATERBARS, CROSS DITCHES, TEMPORARY DRAINAGE PIPES, TEMPORARY SWALES, TEMPORARY OUTLET PROTECTION, ETC. AS REQUIRED TO PREVENT EROSION AND SEDIMENTATION OUTSIDE OF THE CONSTRUCTION RIGHT-OF-WAY. CLEAR AND STAKE ATWS TO ALLOW FOR EXTRA SPACE.
3. ENSURE SIDE BOOM TRACTORS ARE EQUIPPED WITH BOOM EXTENDERS AND COUNTERWEIGHTS IF REQUIRED.
4. USE BACKHOE TO ASSIST BULLDOZERS WITH REPLACING CUTS.
5. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL MEASURES AS REQUIRED.
6. REVEGETATE / SEED DISTURBED AREAS AS NOTED IN THE CONSTRUCTION DOCUMENTS OR AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR.

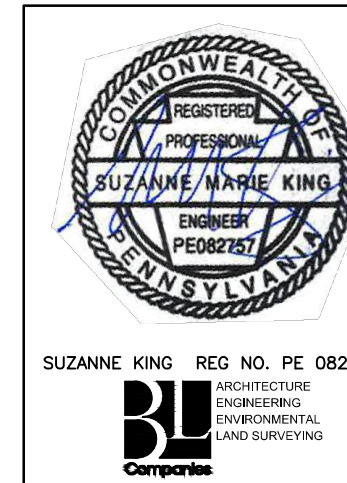
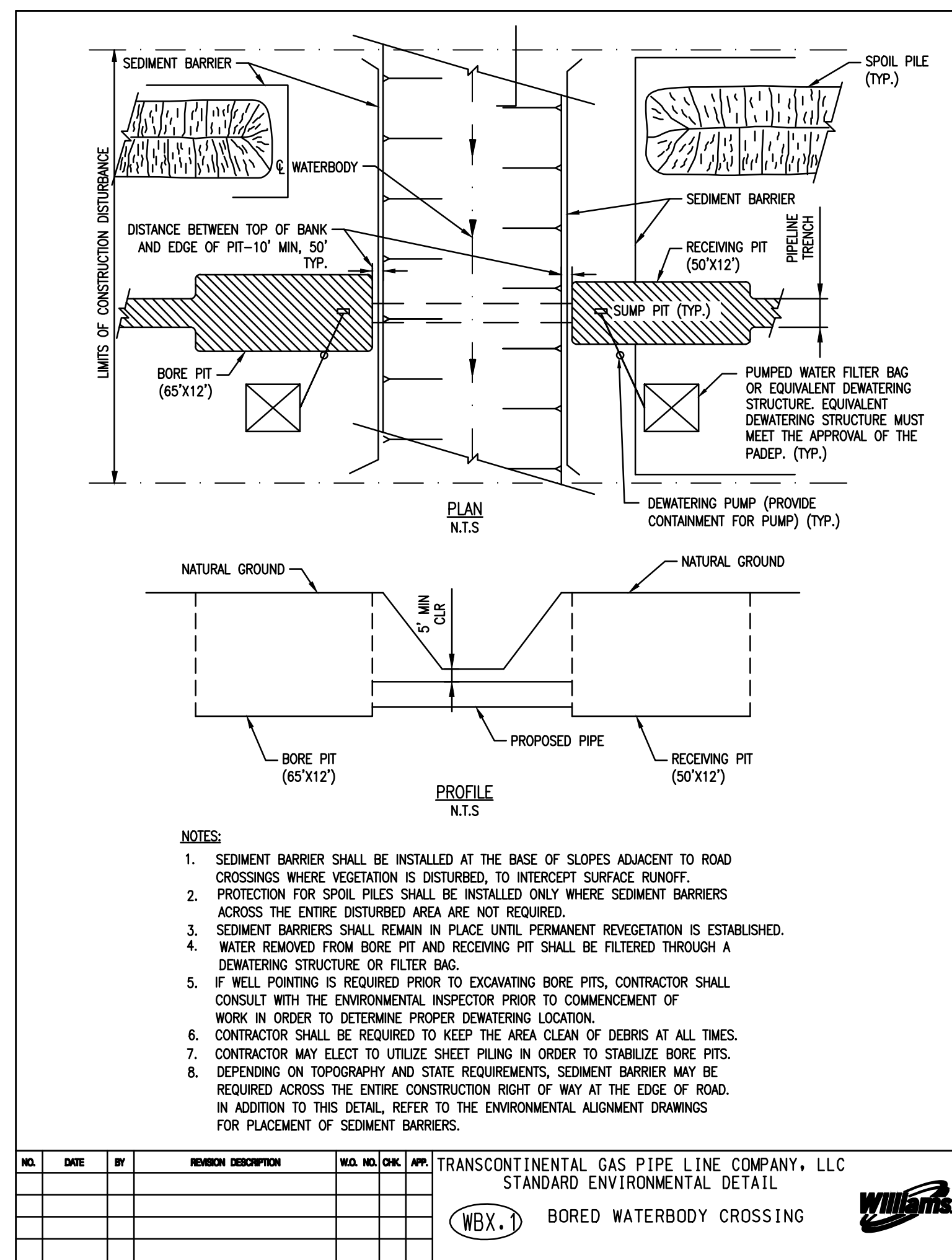
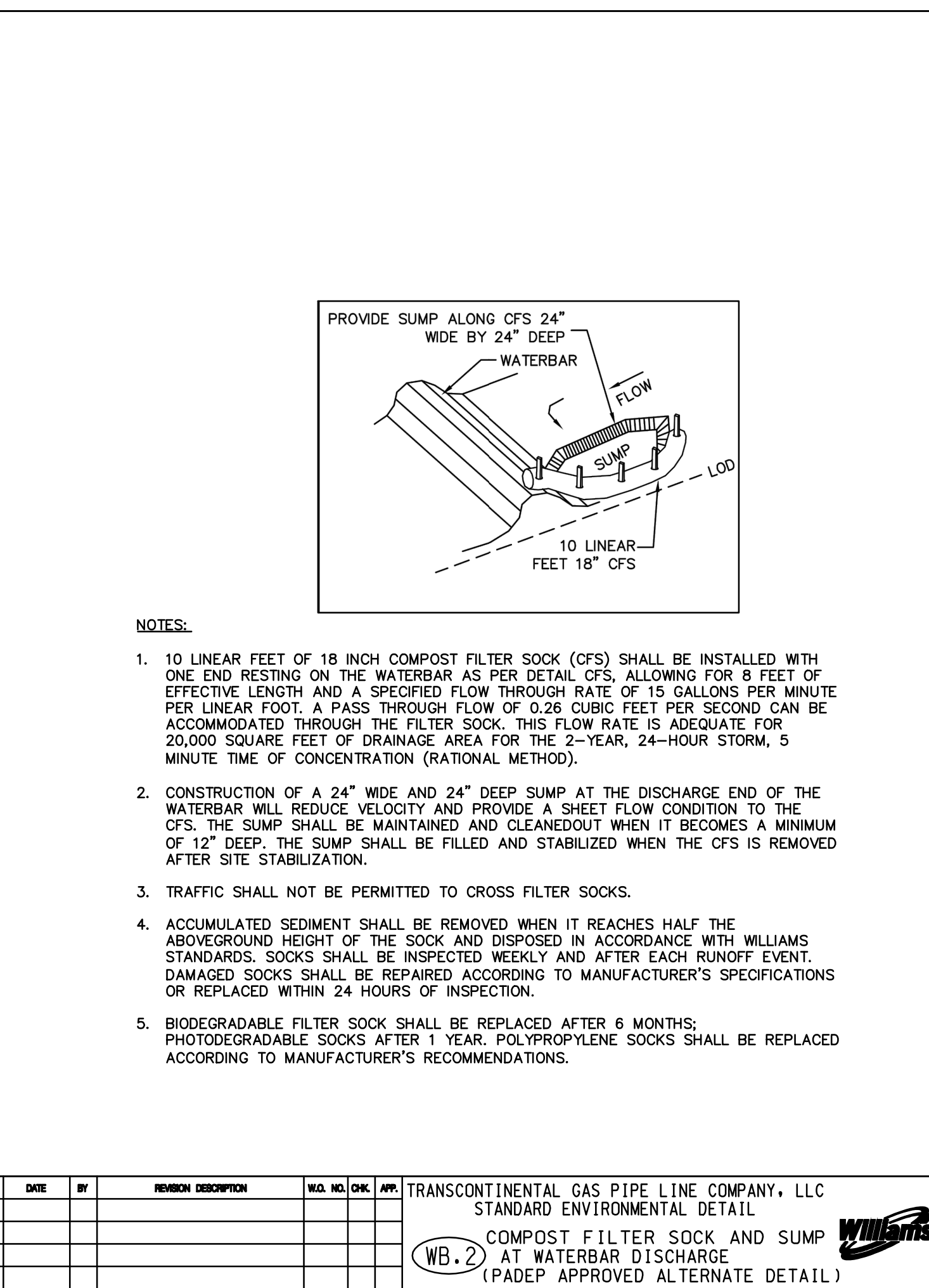
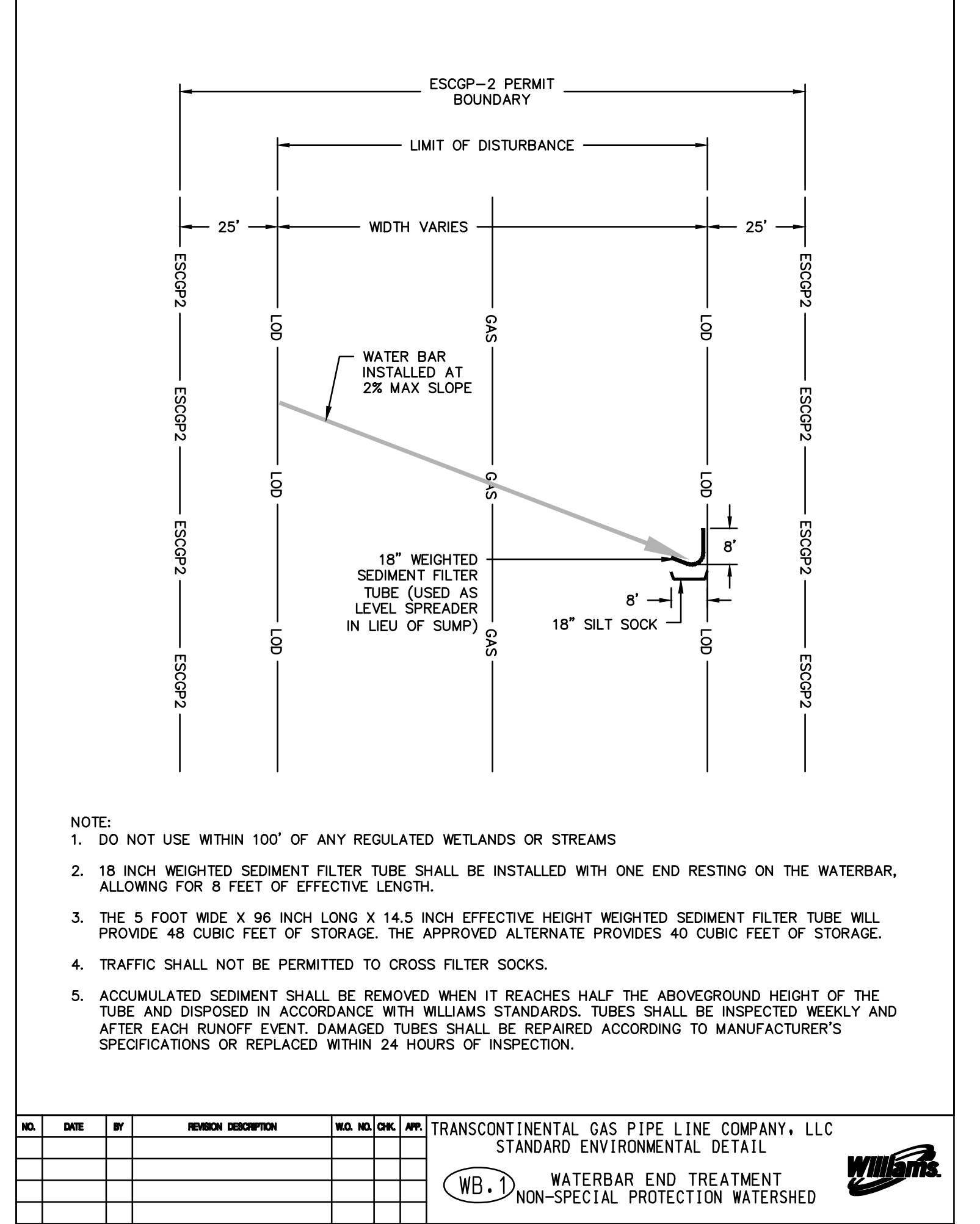
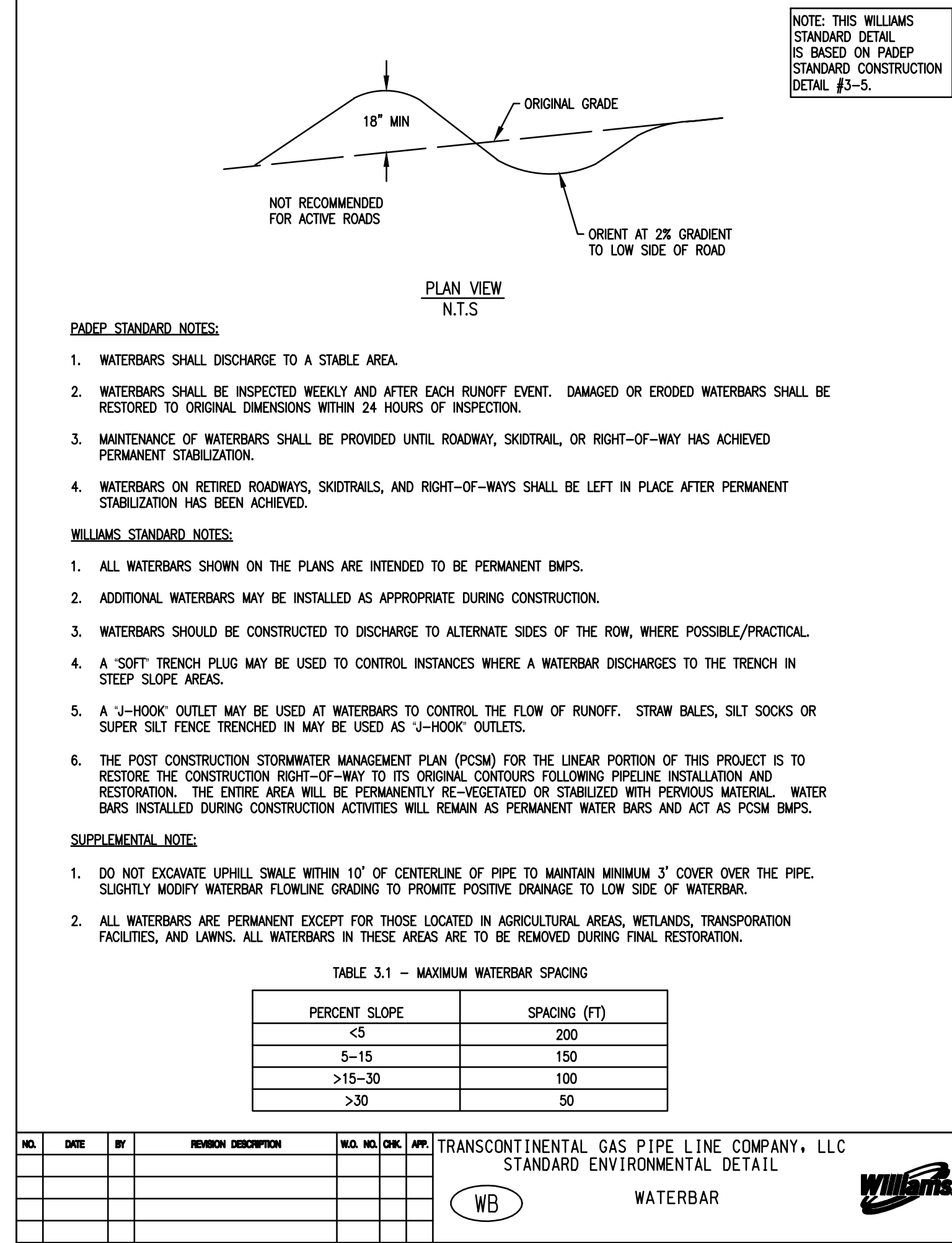
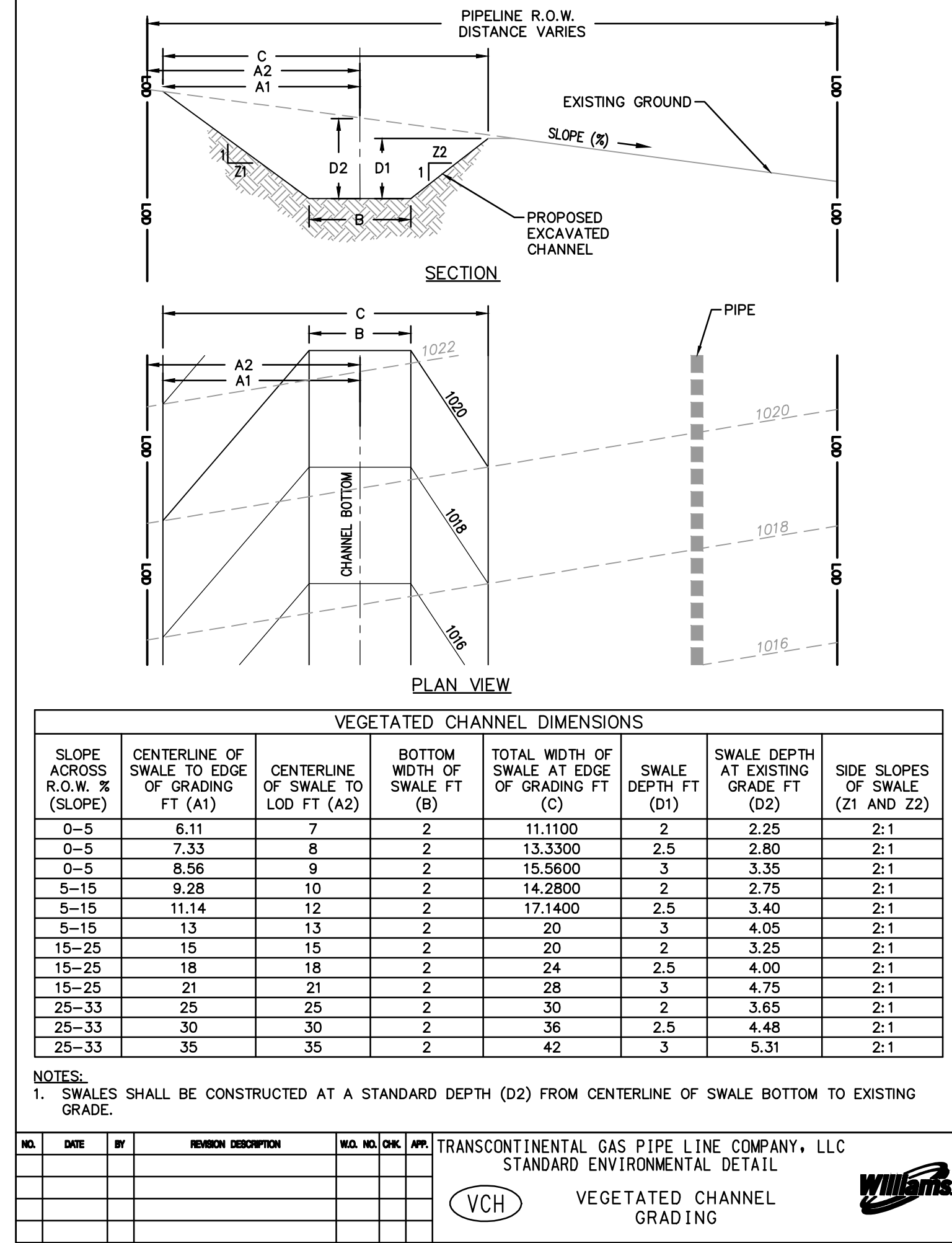
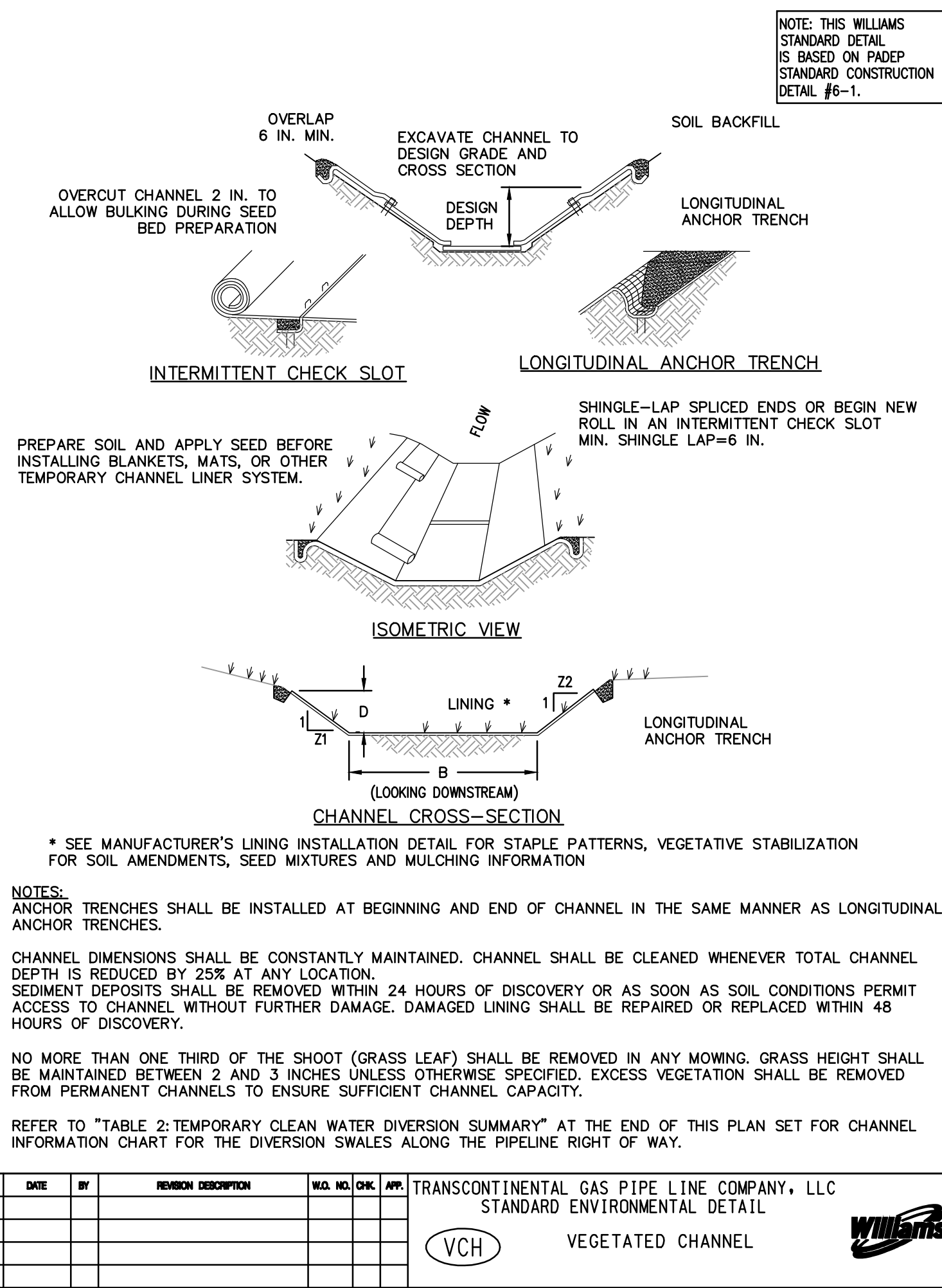
NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			(TTS) SIDE SLOPE (TWO-TONE) CONSTRUCTION PROCEDURE				



REVISIONS							
NO.	DATE	BY	DESCRIPTION	W.D.	NO.	CHK.	APP.
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL		W0572385	JLK	SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL		W0572385	JLK	SMK
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1		W0572385	JLK	SMK

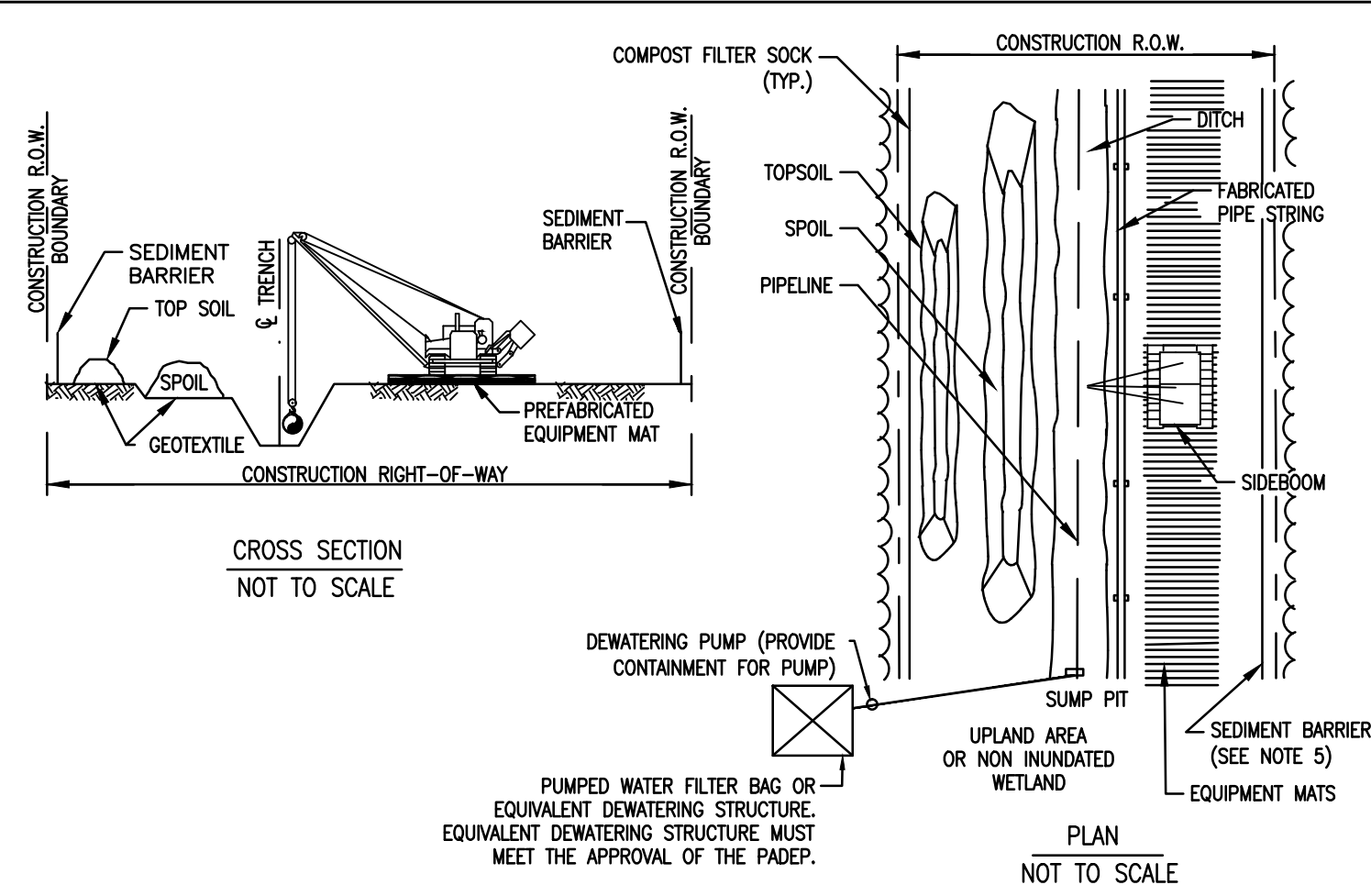
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELJ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	ISSUED FOR CONSTRUCTION	REVISION:	2
DRAWING NUMBER:	ASR-BMP	SHEET:	9
		OF:	11





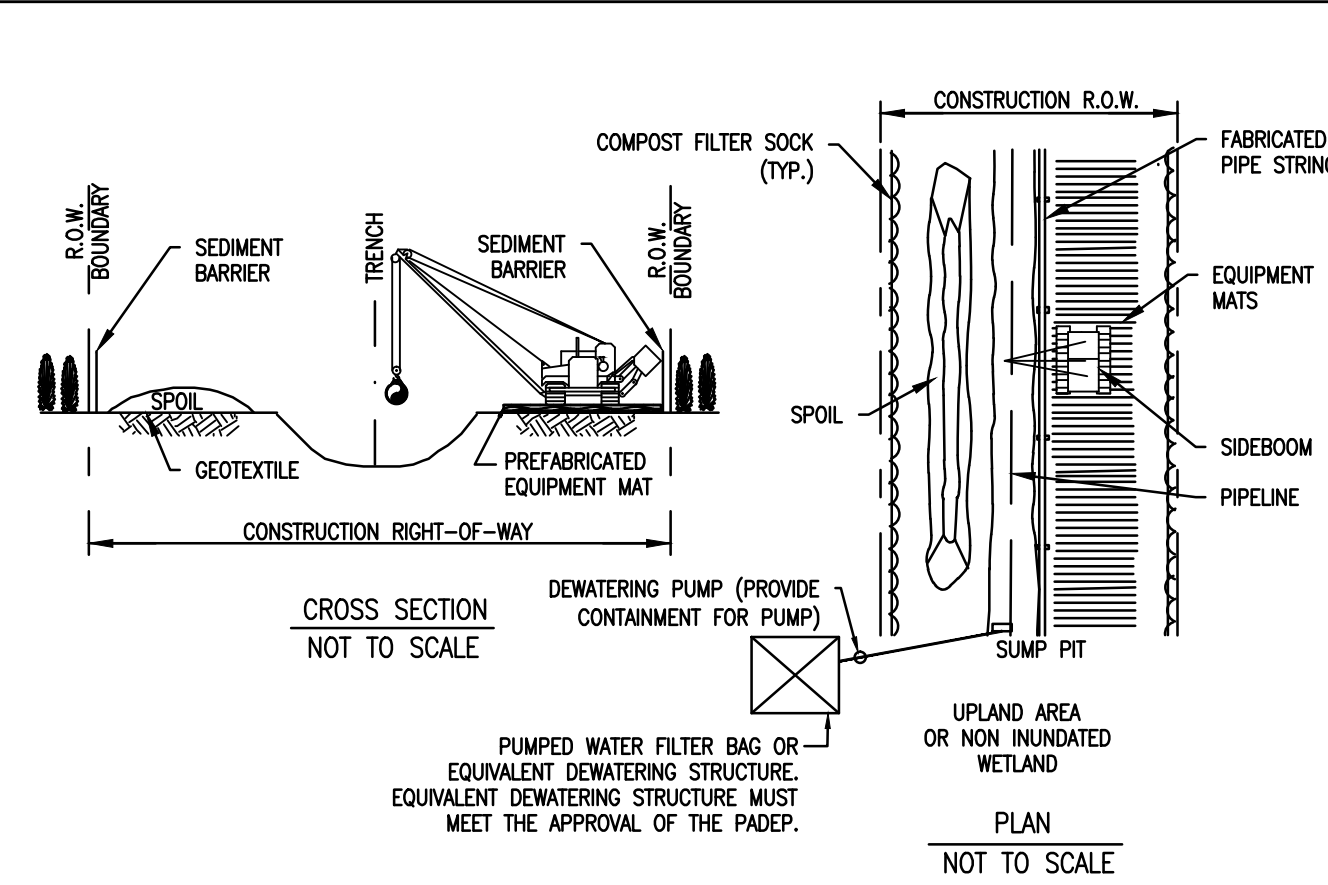
REVISIONS			
NO.	DATE	BY	DESCRIPTION
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	ISSUED FOR CONSTRUCTION	SCALE:	
DRAWING NUMBER:	ASR-BMP	REVISION:	2
SHEET	10	OF	11



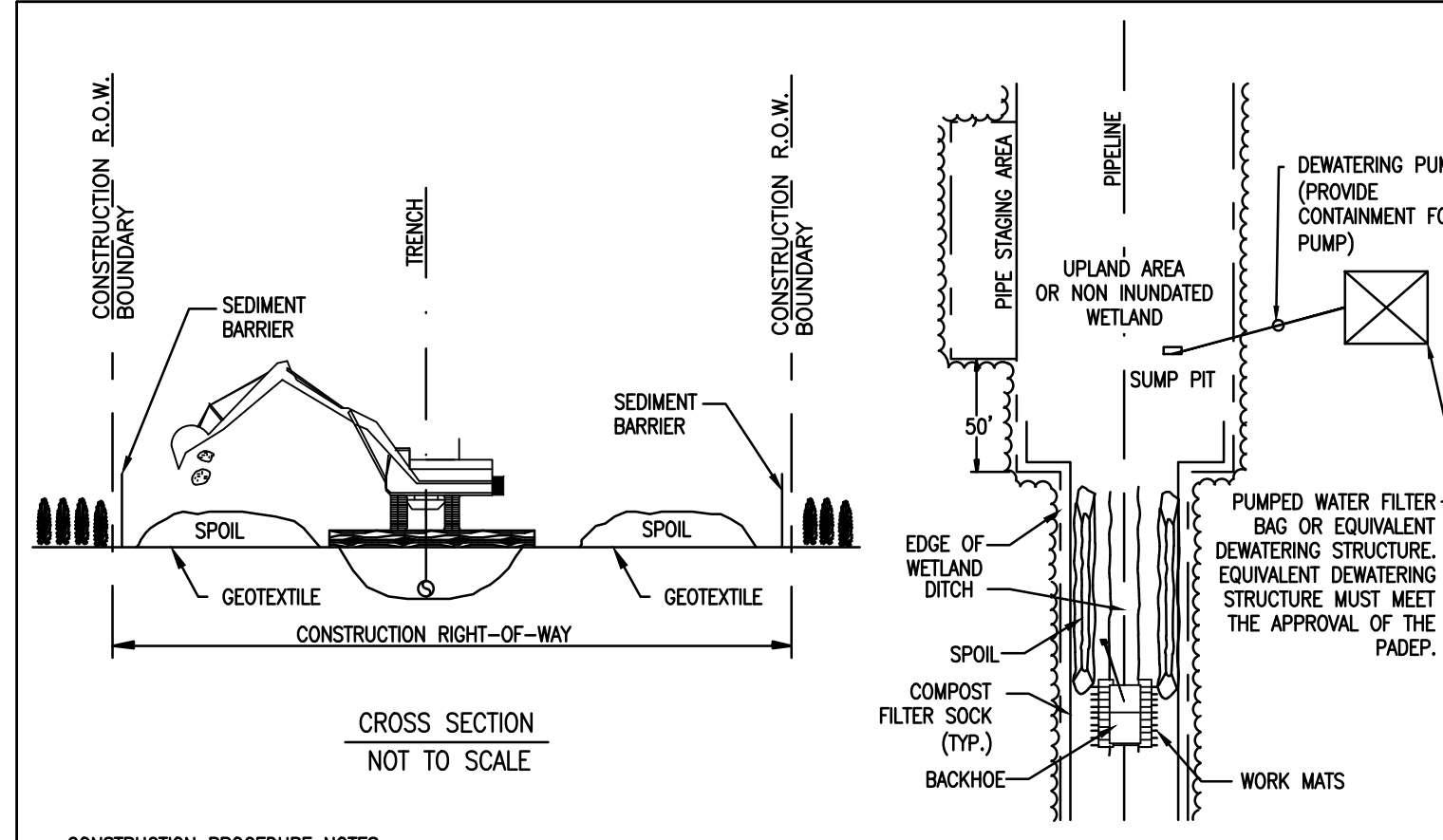
- CONSTRUCTION PROCEDURE NOTES:**
1. FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
  2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
  3. INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
  4. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF THE WETLAND. INSTALL SEDIMENT BARRIERS ALONG THE EDGE OF THE SPOIL SIDE OF THE CONSTRUCTION CORRIDOR THROUGH THE WETLAND AND ALONG THE DOWN SLOPE EDGE OF THE WETLAND. IF THE DOWN SLOPE EDGE OF THE WETLAND IS THE SPOIL SIDE, THEN SEDIMENT BARRIERS ARE NOT REQUIRED ON THE WORKING SIDE OF THE CORRIDOR UNLESS EQUIPMENT TRAVELING THROUGH THE WETLAND CAUSES SPOIL AND SEDIMENT TO EXIT THE CONSTRUCTION CORRIDOR.
  5. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCH LINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
  6. CONDUCT TRENCH LINE TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED). SALVAGE TOPSOIL TO ACTUAL DEPTH OR A MAXIMUM DEPTH OF 12 INCHES, AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR. SEGREGATED TOPSOIL PILE MAY BE LOCATED ON SPOIL SIDE, AS REQUIRED.
  7. LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
  8. TRENCHING THROUGH WETLANDS MAY PROCEED WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEED CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACK FILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
  9. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY ENVIRONMENTAL INSPECTOR.
  10. LOWER-IN PIPE. PRIOR TO BACK FILLING TRENCH, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
  11. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.
  12. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
  13. SEED DISTURBED WETLANDS AREAS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			WCC-1 "UNSATURATED WETLAND" INSTALLATION PROCEDURE				



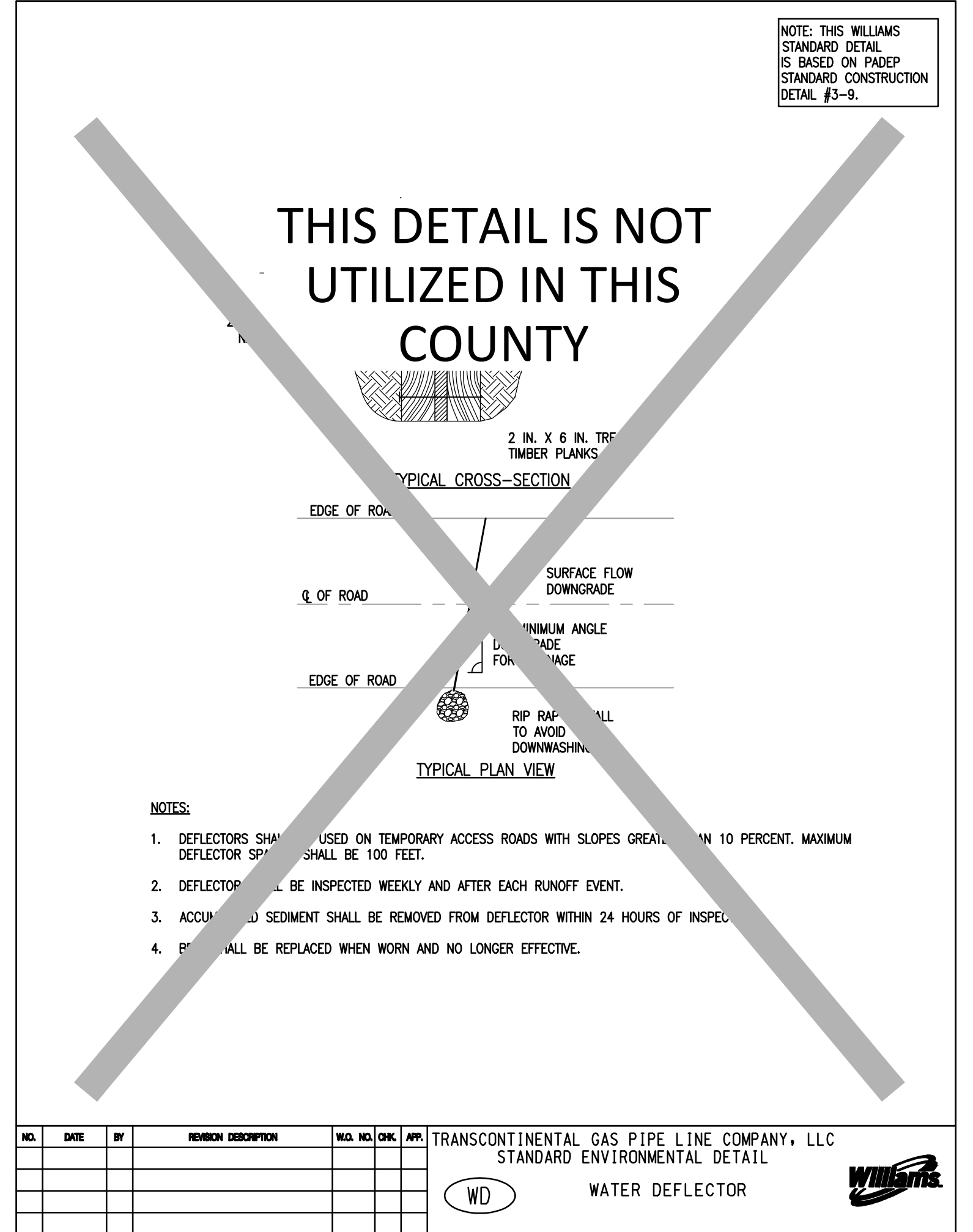
- CONSTRUCTION PROCEDURE NOTES:**
1. FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
  2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY.
  3. INSTALL TEMPORARY SLOPE BREAKERS UP SLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
  4. INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
  5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
  6. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCH LINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
  7. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
  8. LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
  9. TRENCHING THROUGH WETLANDS MAY PROCEED WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEED CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACK FILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
  10. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY ENVIRONMENTAL INSPECTOR.
  11. LOWER-IN PIPE. PRIOR TO BACKFILLING, INSTALL TRENCH PLUGS.
  12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
  13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
  14. SEED DISTURBED WETLAND AREA.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			WCC-2 "SATURATED WETLAND" INSTALLATION PROCEDURE				

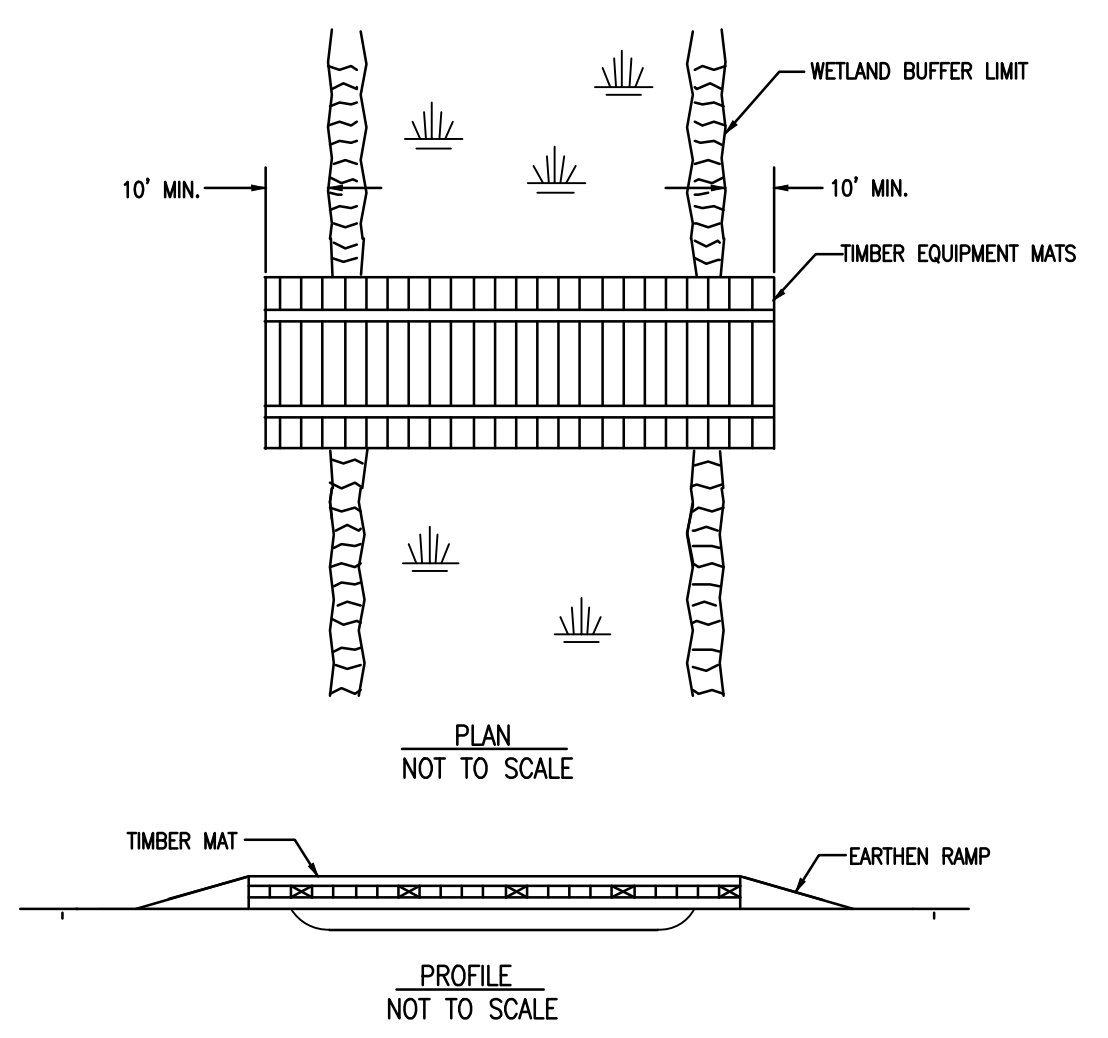


- CONSTRUCTION PROCEDURE NOTES:**
1. FLAG WETLAND BOUNDARIES AND INSTALL WETLAND BOUNDARY SIGNS PRIOR TO CLEARING.
  2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY.
  3. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
  4. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
  5. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER TRENCH LINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
  6. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
  7. UTILIZE AMPHIBIOUS EXCAVATORS (PONTOON MOUNTED BACKHOES) OR TRACKED BACKHOES SUPPORTED BY PREFABRICATED EQUIPMENT MATS OR FLOATS, TO EXCAVATE TRENCH. IF PREFABRICATED EQUIPMENT MATS ARE USED FOR STABILIZATION, THE BACKHOE SHALL GRADUALLY MOVE ACROSS THE WETLAND BY MOVING THE MATS FROM IMMEDIATELY BEHIND TO IMMEDIATELY IN FRONT OF THE BACKHOE'S PATH.
  8. FABRICATE PIPE IN A STAGING AREA OUTSIDE THE TYPE III WETLAND. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY ENVIRONMENTAL INSPECTOR.
  9. LEAVE HARD PLUGS AT THE EDGE OF "INUNDATED WETLAND UNTIL JUST PRIOR TO PIPE PLACEMENT.
  10. FLOAT PIPE IN PLACE, LOWER-IN, INSTALL TRENCH PLUGS, AND BACKFILL.
  11. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
  12. REMOVE ANY MATS UTILIZED TO SUPPORT AMPHIBIOUS EQUIPMENT FROM WETLANDS UPON COMPLETION.
  13. WETLANDS CROSSED USING PUSH/PULL METHOD TEND TO BE TOO WET FOR EFFECTIVE SEEDING. HOWEVER, IF THE SITE IS DRY ENOUGH AND IF DIRECTED BY THE ENVIRONMENTAL INSPECTOR, THE RIGHT-OF-WAY SHALL BE SEED.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			WCC-3 "INUNDATED WETLAND" INSTALLATION PROCEDURE				

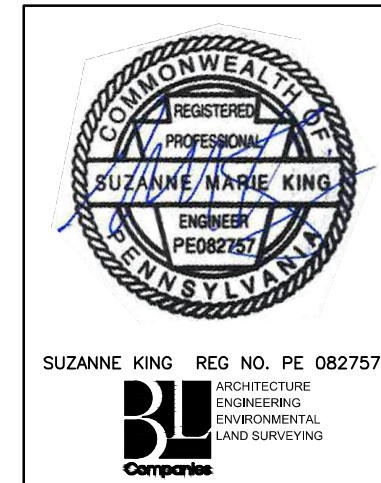


NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			WD WATER DEFLECTOR				



- NOTES:**
1. PERIODICALLY CHECK INSTALLATION AND REMOVE BUILD-UP OF SEDIMENT OR DEBRIS.
  2. MATERIALS PLACED IN WETLANDS SHALL BE COMPLETELY REMOVED DURING FINAL CLEAN-UP. REMOVAL OF THIS STRUCTURE IS NOT CONTINGENT UPON ESTABLISHMENT OF PERMANENT VEGETATION.
  3. IF A WATERBODY IS LOCATED WITHIN A WETLAND SYSTEM, EXTEND TIMBER EQUIPMENT MATS TO THE BRIDGE EQUIPMENT CROSSING (BEC) USED TO CROSS THE WATERBODY IN ORDER TO ALLOW FOR CONTINUOUS TIMBER EQUIPMENT MAT COVERAGE THROUGH THE WETLAND AND WATERBODY AREA.
  4. USE ADDITIONAL TIMBER MAT LAYERS TO RAISE CROSSING ABOVE GRADE WHERE POOR SOIL CONDITIONS EXIST.
  5. TIMBER EQUIPMENT MATS SHALL EXTEND A MINIMUM OF 10 FEET OUTSIDE OF THE WETLAND BOUNDARIES.
  6. INSTALL EARTHEN RAMP APPROACHES TO TIMBER EQUIPMENT MATS. EARTHEN RAMPS TO BE CONSTRUCTED OF UPLAND MATERIAL. TOP SOIL SHALL NOT BE USED TO CONSTRUCT EARTHEN RAMPS.

NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.
			TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC STANDARD ENVIRONMENTAL DETAIL				
			WEC WETLAND EQUIPMENT CROSSING				



REVISIONS							
NO.	DATE	BY	DESCRIPTION	W.D.	NO.	CHK.	APP.
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK	SMK	
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK	SMK	
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK	SMK	

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC			
ATLANTIC SUNRISE PROJECT			
BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET			
BEST MANAGEMENT PRACTICES DETAILS			
DRAWN BY:	ELZ	DATE:	05/15/15
CHECKED BY:	JLK	DATE:	07/02/15
APPROVED BY:	SMK	DATE:	07/08/15
ISSUED FOR:	CONSTRUCTION	DRAWING NUMBER:	ASR-BMP
SCALE:		REVISION:	2
			SHEET 11 OF 11

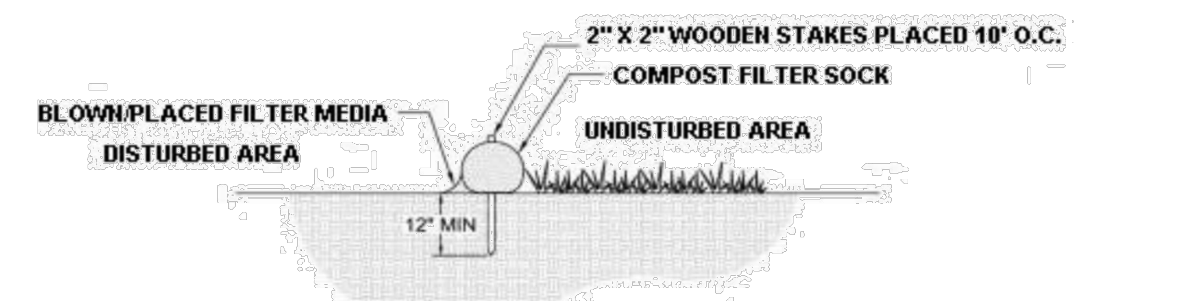
Drawn By & Date/Time: joutlaw Nov 13, 2016 - 2:39pm  
Drawing Location & Name: G:\OBS14\14C\14C4909(205)\DWG\BMPs&DETAILS\PL\_DNT14C4909(205)\_L1E-BMP-11.dwg





TABLE 1: SEDIMENT BARRIER SUMMARY (CONTINUED)

E&S WORKSHEET #1 Compost Filter Sock PROJECT NAME: ATLANTIC SUNRISE PROPOSED GAS PIPELINE...



E&S WORKSHEET #1 Compost Filter Sock PROJECT NAME: ATLANTIC SUNRISE PROPOSED GAS PIPELINE...

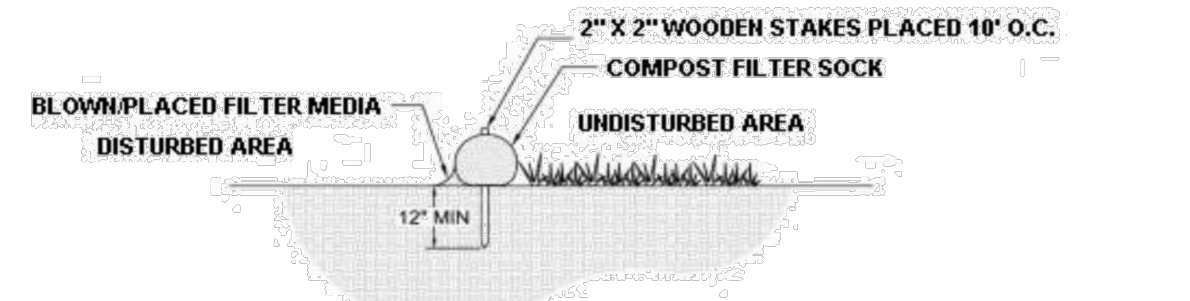


Table with columns: MILEPOST NO., Dia. In., LOCATION (BEGIN STA., END STA., TYPE), SLOPE PERCENT, SLOPE LENGTH ABOVE BARRIER (FT).

Table with columns: MILEPOST NO., Dia. In., LOCATION (BEGIN STA., END STA., TYPE), SLOPE PERCENT, SLOPE LENGTH ABOVE BARRIER (FT).

Reroute Area SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372

Reroute Area SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372

E&S WORKSHEET #1 Compost Filter Sock PROJECT NAME: ATLANTIC SUNRISE PROPOSED GAS PIPELINE...

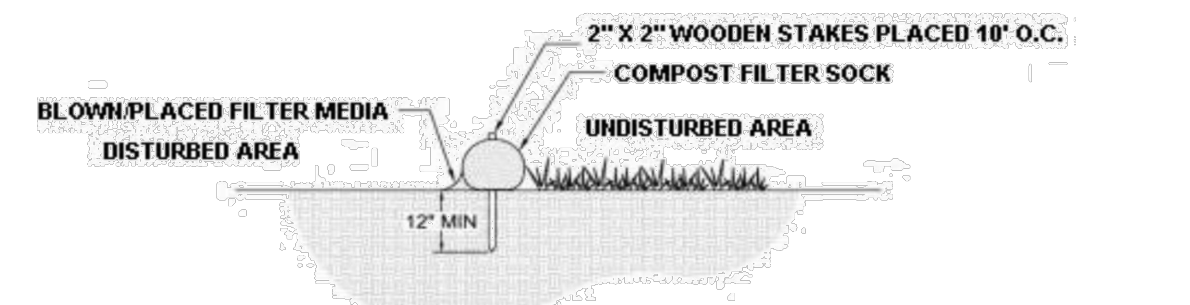


Table with columns: MILEPOST NO., Dia. In., LOCATION (BEGIN STA., END STA., TYPE), SLOPE PERCENT, SLOPE LENGTH ABOVE BARRIER (FT).

SOURCE: Pennsylvania Erosion and Sediment Pollution Control Manual, Page 372

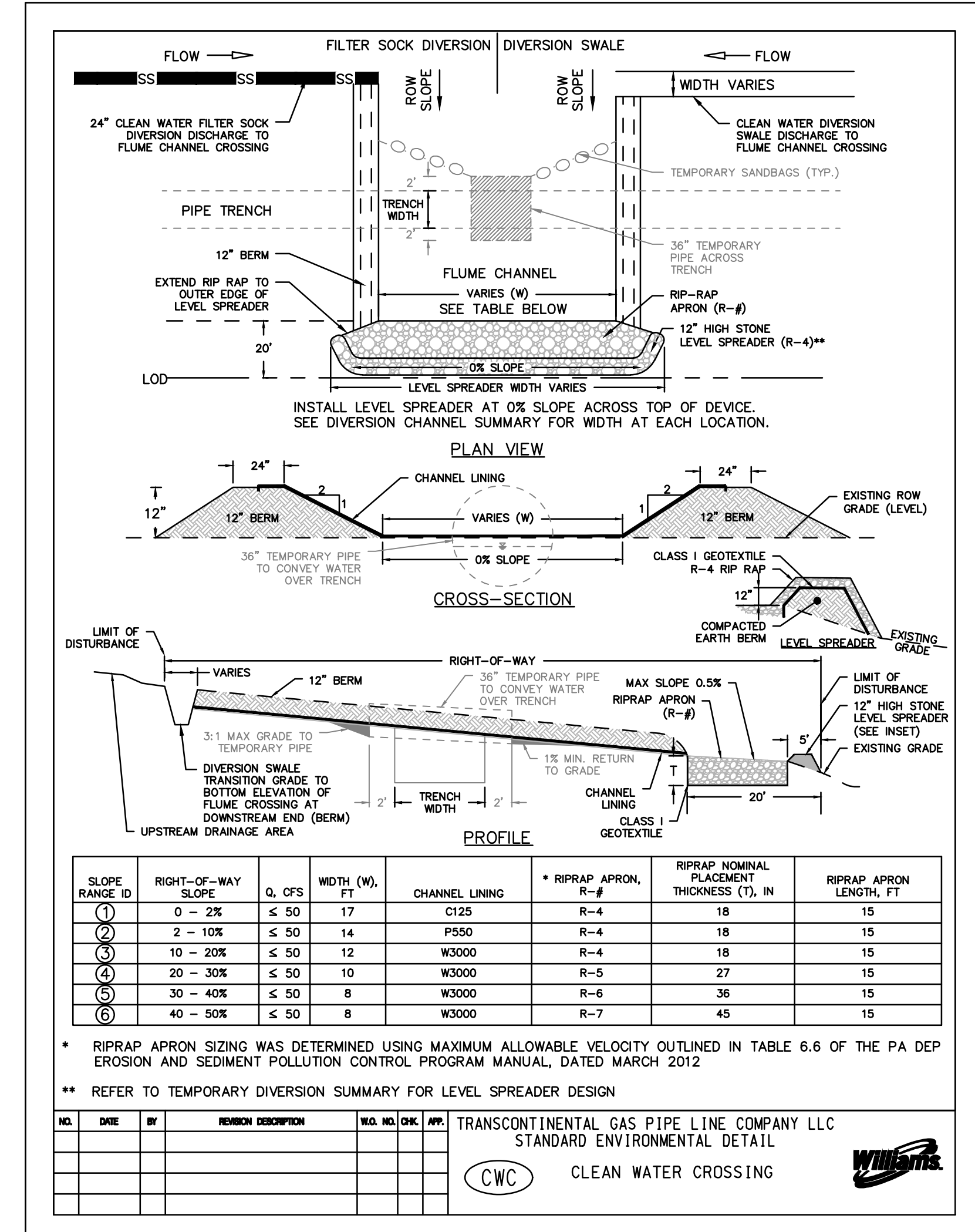
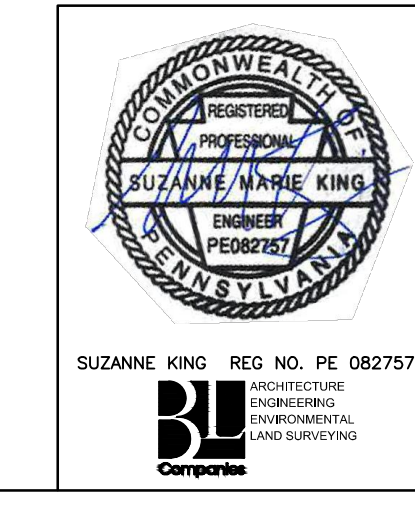


TABLE 2: TEMPORARY CLEAN WATER DIVERSION SUMMARY

Large table with columns: MILEPOST, DIVERSION ID, DIVERSION TYPE, BOTTOM WIDTH, DEPTH, TOP WIDTH, TEMPORARY LINING, PERMANENT LINING, DISCHARGE TYPE, WIDTH, LENGTH, RIP RAP SIZE, FLUME SLOPE, FLUME CHANNEL WIDTH, FLUME CHANNEL LINING, RIP RAP SIZE, Q (CFS), H (FT), Cc, LENGTH, DOWNSTREAM COVER, ALLOWABLE VELOCITY (FT/S), VELOCITY (FT/S).

\*High Quality or Exceptional Value watershed \*\* Diversion End Treatment to Stream or Wetland \*\*\* Sizing was determined using maximum allowable velocity outlined in Table 6.6 of the PA DEP Erosion and Sediment Pollution Control Program Manual, dated March 2012

Drawn By & Date/Time: joutlaw Nov 13, 2016 -- 2:40pm Drawing Location & Name: G:\00514\14C\14C4909\DWG\BMPs&DETAILS\PL\_DNT14C4909(205)\_LE\_TB.dwg



REVISIONS table with columns: NO., DATE, BY, DESCRIPTION, W.O. NO., CHK., APP.

PROJECT INFORMATION: TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC. ATLANTIC SUNRISE PROJECT. PROPOSED 42" CENTRAL PENN LINE SOUTH PENNSYLVANIA BEST MANAGEMENT PRACTICES AND QUANTITIES PLAN SET.





TABLE 5: LOCATIONS OF ACID SOILS ALONG CPLS PIPELINE IN LEBANON COUNTY

MP Begin	MP End	County	Map Unit Symbol	pH
36.64	36.68	Lebanon	1JhD	6.1
36.68	36.75	Lebanon	1JhB	6.1
36.75	36.82	Lebanon	1JhB	5.9
36.82	36.89	Lebanon	1JhB	6.1
36.89	36.95	Lebanon	NhC	5.3
36.95	36.99	Lebanon	WbB	5.5
36.99	37.01	Lebanon	NhC	5.3
37.01	37.06	Lebanon	1JhB	6.1
37.06	37.11	Lebanon	WbB	5.5
37.11	37.14	Lebanon	NhE	5.3
37.14	37.18	Lebanon	1JhB	6.1
37.18	37.22	Lebanon	NhE	5.3
37.22	37.29	Lebanon	NhC	5.3
37.29	37.31	Lebanon	LhB	5.9
37.31	37.41	Lebanon	BhB	6.1
37.41	37.50	Lebanon	ByB	5.4
37.50	37.54	Lebanon	Bm	5.8
37.54	37.58	Lebanon	AhA	6.1
37.58	37.67	Lebanon	ReB	5.8
37.67	37.86	Lebanon	ByB	5.4
37.86	37.90	Lebanon	AhA	6.1
37.90	37.95	Lebanon	PeC	6.1
37.95	38.00	Lebanon	PhB	6.1
38.00	38.12	Lebanon	ByB	5.4
38.12	38.17	Lebanon	Bm	5.8
38.17	38.23	Lebanon	ByB	5.4
38.23	38.30	Lebanon	AhA	6.1
38.30	38.48	Lebanon	ByB	5.4
38.48	38.53	Lebanon	BhA	5.3
38.53	38.73	Lebanon	PhB	6.1
38.73	38.81	Lebanon	ReB	6.1
38.81	38.90	Lebanon	PeC	6.1
38.90	39.00	Lebanon	PhB	6.1
39.00	39.15	Lebanon	ByB	5.4
39.15	39.18	Lebanon	Bm	5.8
39.18	39.25	Lebanon	PhB	6.1
39.25	39.31	Lebanon	PeC	6.1
39.31	39.42	Lebanon	PhB	6.1
39.42	39.50	Lebanon	PeC	6.1
39.50	39.55	Lebanon	Ro	5.8
39.55	39.57	Lebanon	PeC	6.1
39.57	39.60	Lebanon	ReB	6.1
39.60	39.64	Lebanon	PhC	6.1
39.64	39.73	Lebanon	BhB	6.1
39.73	39.83	Lebanon	BhC	6.1
39.83	39.92	Lebanon	BhB	6.1
39.92	39.96	Lebanon	BhC	6.1
39.96	40.51	Lebanon	BhB	6.1
40.51	40.58	Lebanon	WbB	5.5
40.58	40.84	Lebanon	BhB	6.1
40.84	41.07	Lebanon	NhC	5.3
41.07	41.10	Lebanon	MeB	5.8
41.10	41.19	Lebanon	WbB	5.5
41.19	41.38	Lebanon	NhC	5.3
41.38	41.50	Lebanon	UoC	Water
41.50	41.67	Lebanon	UoB	5.4
41.67	41.70	Lebanon	UoC	5.4
41.70	41.78	Lebanon	UPE	5.4
41.78	41.97	Lebanon	UoC	5.4
41.97	42.01	Lebanon	UPE	5.4
42.01	42.06	Lebanon	UoC	5.4
42.06	42.14	Lebanon	UoC	5.4
42.14	42.44	Lebanon	CKB	5.8
42.44	42.50	Lebanon	HbC	6.2
42.50	42.58	Lebanon	DFB	6.7
42.58	42.78	Lebanon	ThA	6.2
42.78	43.00	Lebanon	HbB	6
43.00	43.04	Lebanon	HbC	6.2
43.04	43.06	Lebanon	HbB	6
43.06	43.13	Lebanon	HbC	6.2
43.13	43.32	Lebanon	HbB	6
43.32	43.40	Lebanon	CKB	5.8
43.40	44.91	Lebanon	HbB	6
44.91	44.95	Lebanon	HbC	6.2
44.95	45.09	Lebanon	HbB	6
45.09	45.20	Lebanon	CKB	5.8

NOTE: SEE THE SUPPORTING PIPELINE AND ACCESS ROAD EROSION AND SEDIMENT CONTROL NARRATIVES FOR DEFINITIONS AND DESCRIPTIONS OF THE MAP UNIT SYMBOL ABBREVIATIONS.

TABLE 6: LOCATIONS OF ACIDIC BEDROCK ALONG CPLS PIPELINE IN LEBANON COUNTY

Pipeline Facility/County	Mile Post From	Mile Post To	Linear Distance	Bedrock Formation	Acid Potential	Karst	Rock Type	Rippability	MoC Number MP to MP	Formation	Rock Type
Lancaster/Lebanon	36.8	37.3	0.5	Diabase	Typically Non-acid sulfide bearing.		Diabase (basalt)	Difficult	M-0164 0.0 to 0.38	New Oxford	shale, sndst. & congl.
Lebanon	40.6	42.0	1.4	Hammer Creek	Typically Non-acid sulfide bearing.		Quartz conglomerate	Difficult			
Lebanon	46.7	46.9	0.2	Hamburg	Contain variable amount of pyrite or other sulfide minerals that may only be locally acid-producing, should be field verified.	Formation associated with Karst in the limestone unit, however does not form significant karst terrain along CPLS	Shale with some sandstone	Moderately easy (shale) to difficult (sandstone)	M-0183 1.0 to 1.99	Annvile, Hershey-Myerstown, & Hamburg	limestone and shale
Lebanon	57.6	58.0	0.4	Tuscarora / Clinton Group	Typically Non-acid sulfide bearing.		Quartzite / sandstone and shale	Difficult (quartzite) to moderately difficult (sandstone & shale)	M-0165 0.0 to 0.48 M-0199 0.0 to 0.26 M-0168 0.0 to 0.19 M-0180 0.0 to 0.41 M-0176 0.0 to 0.39 M-0200 0.0 to 0.76	Hamburg Hamburg Martinsburg and Hamburg Catskill Sherman Creek Catskill Sherman Creek	shale and limestone shale & sandst. shale & sandst. shale & sandst. sandst. & silst.

Drawn By & Date/Time: Idelo Nov 15, 2016 - 2:19pm  
Drawing Location & Name: G:\0851\14\14C4609\DWG\BMPs&DETAILS\PL\_DNT14C4909(205)\_LE\_TB.dwg



REVISIONS					
NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK. APP.
0	08/26/2015	BL	ISSUED FOR PADEP SUBMITTAL	W0572385	JLK SMK
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	W0572385	JLK SMK
2	Oct. 2016	BL	PADEP TECHNICAL DEFICIENCY RESPONSE #1	W0572385	JLK SMK

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
ATLANTIC SUNRISE PROJECT  
PROPOSED 42" CENTRAL PENN LINE SOUTH  
PENNSYLVANIA BEST MANAGEMENT PRACTICES AND  
QUANTITIES PLAN SET  
LEBANON COUNTY, PENNSYLVANIA  
QUANTITY, CROSSING AND ACIDIC SOIL TABLES

DRAWN BY: ELZ	DATE: 05/15/15	ISSUED FOR BID:	SCALE:
CHECKED BY: JLK	DATE: 07/02/15	ISSUED FOR CONSTRUCTION:	REVISION: 2
APPROVED BY: SMK	DATE: 07/08/15	DRAWING NUMBER: 24-1600-70-28-A/LL113_9-BMP-LE-TB	SHEET 4 OF 4