

EROSION AND SEDIMENT CONTROL TYPICALS LEGEND

DETAIL NUMBER	DESCRIPTION	ACRONYM
1	CULVERT EQUIPMENT CROSSING	CEC
2	WETLAND EQUIPMENT CROSSING	BREC
3	BORED ROAD/RAILROAD CROSSING	BRRC
4	DAM AND PUMP CROSSING	DPC
5A, 5B	FLUME CROSSING	FC
6	DRY WATERBODY CROSSING	DWC
7	TYPE I "NON-SATURATED WETLAND" INSTALLATION PROCEDURE	WIP1
8	TYPE II "SATURATED WETLAND" INSTALLATION PROCEDURE	WIP2
9	TYPE III "UNDUNATED WETLAND" INSTALLATION PROCEDURE	WIP3
10	STABILIZED CONSTRUCTION ENTRANCE	SCE
11	STABILIZED CONSTRUCTION ENTRANCE WITH WASHRACK	SCEW
12	WATER BAR	WB
13	TRENCH PLUG (TRENCH BREAKER)	TP
14	CHECK DAM	CD
15	STRAW BALE BARRIER	SB
16	SEDIMENT FENCE	SF1
17	REINFORCED SEDIMENT FENCE	SF2
18	REINFORCED SEDIMENT BARRIER HOOK OUTLET STRUCTURE	SBH
19	WATERBAR OUTLET APRON	WOA
20	SILT CURTAIN	SC
21A, 21B	ELEVATED WASHRACK	EW
22	WELL POINT/SUMP PIT	SP
23	TRENCH DEWATERING	TD
24A, 24B	EROSION CONTROL BLANKET	ECB
25	DEWATERING STRUCTURE	DS
26	FILTER BAG	FB
27A, 27B	HYDROSTATIC DEWATERING STRUCTURE	HDS
28	ROAD CULVERT EXTENSION ACROSS PIPELINE TRENCH	RCE
29	TEMPORARY CULVERT ACROSS OPEN TRENCH	TCOP
30	ENERGY DISSIPATER	ED
31	TYPICAL EXTRA WORK SPACES AT WATERBODY CROSSINGS	WSC1
32	RIGHT-OF-WAY CROWNING	ROWC
33	TRENCH DEWATERING SEDIMENT CORRAL	TOSC
34	DUST CONTROL	DC
35	GRASS OUTLET SEDIMENT TRAP	GOST
36	SEDIMENT TRAP PIPE OUTLET	STPO
37	FILTER STRIPS	FS
38	TYPICAL EROSION CONTROL FABRIC	TECF
39	COMPOST FILTER SOCK	CFS
40	COMPOST SOCK SEDIMENT TRAP	CSST
41	SURFACE ROUGHENING	SR
42	PERMANENT DIVERSION	PD
43	TEMPORARY DIVERSION	TD
44	TOPSOIL SEGREGATION - 1	TS1
45	TOPSOIL SEGREGATION - 2	TS2
46	TOPSOIL SEGREGATION - 3	TS3
47	TEMPORARY SWALE	TS
48	PIPE SLOPE DRAIN	PSD
49	TEMPORARY ACCESS FORD	TAF
50	WOODCHIP FILTER BERM	WFB
51	DRIVEWAY DIVERSION BERM	DOB
52	LATERAL INTERCEPT DRAIN	LID
53	ROCK FILTER	RF
54	ROCK FILTER OUTLET	RFO
55	RIP RAP OUTLET PROTECTION	RROP
56	WATERBODY CROSSING HORIZONTAL DIRECTION DRILL (HDD)	WHDD
57	TYPICAL DRAIN TILE REPAIR ACROSS TRENCH - 1	DT1
58	TYPICAL DRAIN TILE REPAIR ACROSS TRENCH - 2	DT2
59	TYPICAL ACCESS ROAD CROSS SECTION	ARCS
60	100' CORRIDOR PARALLEL TO DEFINING LINE (EXISTING TGP)	ROW01
61	100' CORRIDOR (GREENFIELD) STANDARD	ROW02
62	100' CORRIDOR (GREENFIELD 50/50)	ROW03
63	100' CORRIDOR PARALLEL TO NON DEFINING LINE (EXISTING TGP)	ROW04
64	TYPICAL 100' CORRIDOR CONSTRUCTION WORKSPACE ADJACENT TO POWERLINE EASEMENT	ROW05
65	TYPICAL 100 FT. CONSTRUCTION WORKSPACE INSIDE POWERLINE EASEMENT	ROW06
66	TYPICAL 95' CONSTRUCTION WORKSPACE ADJACENT TO POWERLINE EASEMENT	ROW07
67	20" PIPELINE TAKE-UP & RELAY	ROW08
68	75' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 12" PROPOSED PIPELINE	ROW09
69	90' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 24" PROPOSED PIPELINE	ROW10
70	90' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 24" PROPOSED PIPELINE	ROW11
71	75' CORRIDOR (GREEN FIELD) FOR PROPOSED 12" PIPELINE	ROW12
72	90' CORRIDOR (GREEN FIELD) FOR PROPOSED 24" PIPELINE	ROW13

EROSION AND SEDIMENT CONTROL NOTES:

- EROSION CONTROLS WILL BE INSTALLED IMMEDIATELY FOLLOWING EARTH DISTURBANCE AND WILL BE MAINTAINED UNTIL PERMANENT STABILIZATION. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATED COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION THROUGHOUT THE SITE.
- ALL WETLAND AND WATERBODY BOUNDARIES WILL BE CLEARLY MARKED/FLAGGED IN THE FIELD PRIOR TO THE COMMENCEMENT OF EARTH DISTURBANCE ACTIVITIES.
- ALL EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) MUST BE INSPECTED DAILY IN ACTIVE CONSTRUCTION AREAS AND AT LEAST WEEKLY OR WITHIN ONE DAY FOLLOWING A PRECIPITATION EVENT THAT RESULTS IN STORMWATER RUNOFF IN NON-ACTIVE AREAS. MAINTENANCE, REPAIR OR REPLACEMENT OF FAILING BMPs SHALL BE PERFORMED IMMEDIATELY.
- SUBSOIL EXCAVATED AS PART OF THE PROJECT AND SEDIMENT REMOVED FROM BMPs WILL BE COMBINED AND USED TO BACKFILL THE TRENCH. TYPICALLY, EXCESS SOIL IS MINIMAL AND WILL EITHER BE USED TO CREATE A CROWN OVER THE TRENCH TO COUNTERACT SETTLING OR WILL BE SPREAD EVENLY ACROSS THE ROW, WHICH WILL HAVE A NEGIGIBLE EFFECT ON THE OVERALL GRADE. ALSO, ANY EXCESS EXCAVATED MATERIALS OR MATERIALS UNSUITABLE FOR BACKFILL WILL BE HANDLED, AS APPROVED BY LANDOWNER OR LAND MANAGEMENT AGENCY, OR DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- IT IS ACCEPTABLE FOR E&S BMPs TO BE TEMPORARILY REMOVED FROM EQUIPMENT CROSSING PATHWAYS DURING PERIODS OF ACTIVE CONSTRUCTION IF THESE CONTROLS WILL BE PROPERLY REINSTALLED AT THE END OF EACH WORK DAY.
- WETLAND MATS WILL BE PERMANENTLY REMOVED AFTER CLEAN-UP/RESTORATION. MATS WILL BE AT LEAST 12 FEET WIDE AND LENGTH IS DEPENDENT ON THE WETLAND CROSSING LENGTH FROM START TO END.
- WHEN WETLAND AREAS ARE TEMPORARILY DISTURBED, TOPSOIL WILL BE ISOLATED AND STOCKPILED FOR REPLACEMENT AFTER GRADING IS COMPLETED. NO SOIL AMENDMENTS SHOULD BE USED ON WETLAND AREAS.
- TEMPORARY SEEDING SHOULD BE APPLIED WHERE EXPOSED SOIL SURFACES WILL NOT BE BROUGHT TO FINAL GRADE FOR A PERIOD OF MORE THAN 30 WORKING DAYS. APPLICATIONS OF THIS PRACTICE INCLUDE EXCAVATED AREAS, SOIL STOCKPILES, BERMS, EMBANKMENTS AND SIDES OF SEDIMENT BASINS, TEMPORARY ROAD BANKS, AND OTHER EARTHWORKS. IN AN AREA OF GREATER THAN 2:1 SLOPE, MULCHING SHALL IMMEDIATELY FOLLOW SEEDING. APPLY TEMPORARY SEEDING IN ACCORDANCE WITH MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, PART III.
- A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
- IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BMPs TO MINIMIZE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION AND NOTIFY THE MASSDEP.
- ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ANY EXCESS MATERIAL AND MAKE SURE THE SITE(S) RECEIVING THE EXCESS HAS AN APPROVED AND FULLY IMPLEMENTED EROSION AND SEDIMENT CONTROL PLAN THAT MEETS APPLICABLE STATE OR FEDERAL REGULATIONS.
- MAJOR EARTHMOVING ACTIVITIES SHOULD NOT BE CONDUCTED DURING MAJOR RAINSTORMS OR WHEN SPRING THAW IS OCCURRING.
- THE LENGTH OF TIME FOR OPEN TRENCH SHOULD BE MINIMUM TIME NECESSARY TO EFFICIENTLY EXCAVATE THE TRENCH AND BEGIN STABILIZATION OF THE DISTURBED AREAS. THIS TIME PERIODS SHOULD NOT EXCEED 30 DAYS FOR STEEL PIPELINES.
- ADDITIONS AND/OR MODIFICATIONS TO THE PROPOSED EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED BASED ON ACTUAL FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION. REVIEWING AGENCY SHALL BE NOTIFIED OF ANY SUBSTANTIVE CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES.
- SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THE PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED SHOVELED, OR SWEEP INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
- AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
- VEHICLES AND EQUIPMENT SHALL ENTER AND EXIT THE WORKSPACE DIRECTLY ONLY FROM ACCESS POINTS SHOWN ON THE APPROVED E&S PLANS.
- AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY E&S BMPs MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPs. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPs MUST BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS SHOULD BE PERFORMED ONLY DURING THE GERMINATING SEASON.
- ALL CHANNELS SHALL BE KEPT FREE OF OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO FILL, ROCKS, LEAVES, WOODY DEBRIS, ACCUMULATED SEDIMENT, EXCESS VEGETATION, AND CONSTRUCTION MATERIAL/WASTES.
- UNDERGROUND UTILITIES CUTTING THROUGH ANY ACTIVE CHANNEL SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL RESTORED TO ITS ORIGINAL CROSS-SECTION AND PROTECTIVE LINING. ANY BASE FLOW WITHIN THE CHANNEL SHALL BE CONVEYED PAST THE WORK AREA IN THE MANNER DESCRIBED IN THIS PLAN UNTIL SUCH RESTORATION IS COMPLETE.
- UPON FINAL COMPLETION OF ANY EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY, THE SITE SHALL IMMEDIATELY HAVE TOPSOIL RESTORED, REPLACED, OR AMENDED, SEEDED, MULCHED OR OTHERWISE PERMANENTLY STABILIZED AND PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.
- TOPSOIL SHALL BE SPREAD AT A DEPTH OF 2 TO 4 INCHES. MORE TOPSOIL WILL BE NEEDED IF THE SUBSOIL IS ROCKY. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN DRAWINGS IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. SURROUND ALL TOPSOIL STOCKPILES WITH AN INTERCEPTOR DIKE OR WATER BAR WITH GRAVEL OUTLET AND SILT FENCE. TOPSOIL STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. MAINTAIN PROTECTIVE COVER ON STOCKPILES UNTIL NEEDED. STOCKPILE SIDE SLOPES MUST BE 2:1 OR FLATTER.
- TOPSOIL SHOULD NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION. WHEN THE SUBSOIL IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDING PREPARATION, TOPSOIL SHALL BE WORKED INTO THE LAYER BELOW FOR A DEPTH OF AT LEAST 6 INCHES MINIMUM.
- IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE THE DISTURBED AREAS. AREAS WHICH CANNOT BE SEEDDED BECAUSE OF THE SEASON, OR ARE OTHERWISE UNFAVORABLE FOR PLANT GROWTH, SHALL BE MULCHED. MULCH MUST BE APPLIED AT THE SPECIFIED RATES AS OUTLINED IN THE MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, PART III.
- AN EROSION CONTROL BLANKET SHALL BE APPLIED AT THE BASE OF GRASSED WATERWAYS, ON STEEP SLOPES (> 15%), AND ON ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS, AND WETLANDS.
- IRREGULARITIES IN THE SOIL SURFACE SHALL BE CORRECTED TO PREVENT THE FORMATION OF DEPRESSIONS.

PROJECT SEQUENCE AND SCHEDULE:

GENERAL CONDITIONS:

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED AND IMMEDIATELY STABILIZED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING, GRUBBING AND TOPSOIL STRIPPING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE. ANY DEVIATION FROM THE FOLLOWING SEQUENCE MUST BE APPROVED IN WRITING FROM THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP).

CONSTRUCTION WILL TAKE PLACE IN A SINGLE SPREAD. PIPELINE CONSTRUCTION CREWS WILL BE IN CLOSE PROXIMITY TO EACH OTHER AND WILL BE ABLE TO EFFICIENTLY COMMUNICATE DURING THE ENTIRE CONSTRUCTION PHASE OF THE PROJECT. THE MINIMAL LENGTH OF EACH CONSTRUCTION SPREAD WILL NOT REQUIRE CONSTRUCTION CREWS TO BE SEPARATED BY SIGNIFICANT DISTANCES DURING PIPELINE CONSTRUCTION.

WORK EFFORT WILL BE SUBDIVIDED INTO CATEGORIES AND PERFORMED BY SPECIALIZED CREWS (E.G. SITE PREPARATION/CLEARING, TRENCHING, PIPE CONSTRUCTION, ETC). EACH CREW WILL PROGRESS IN A LOGICAL MANNER, GENERALLY FROM THE BEGINNING TO END OF THE PIPELINE. THE TIME PERIOD BETWEEN TRENCH EXCAVATION AND FINAL STABILIZATION SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE. NO ONE SEGMENT OF AREA OF THE PIPELINE ALIGNMENT SHALL GO WITHOUT STABILIZATION (TEMPORARY OR PERMANENT) FOR A PERIOD GREATER THAN 30 DAYS. THE FOLLOWING DESCRIBES THE TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES THAT SHALL OCCUR WITHIN THE TYPES OF AREAS DESCRIBED BELOW, WHICH WILL BE ENCOUNTERED DURING CONSTRUCTION.

1. CONSTRUCTION PREPARATION ACTIVITIES

- AT LEAST 7 DAYS PRIOR TO INITIATING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PLAN, AND A REPRESENTATIVE OF THE MASSDEP TO AN ON-SITE PRE-CONSTRUCTION MEETING.
- AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY DIG SAFE AT 1-888-344-7233 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
- ESTABLISH CONSTRUCTION SUPPORT FACILITIES.
- IDENTIFY UTILITIES AND OTHER CRITICAL SITE FEATURES TO BE PROTECTED.
- FLAG AND/OR STAKE WETLAND AND OTHER SENSITIVE AREAS TO BE PROTECTED.
- FLAG AND/OR STAKE PROPOSED CONSTRUCTION LIMITS OF DISTURBANCE.
- INSTALL ROCK CONSTRUCTION ENTRANCES.
- INSTALL ACCESS ROAD.
- BRUSH HOG/MOW EXISTING VEGETATION OF FACILITATE INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROLS.
- INSTALL VEHICULAR TEMPORARY STREAM CROSSING (E.G., BRIDGE OR MULTIPLE PIPE CROSSING) AND TIMBER MAT WETLAND CROSSING.
- INSTALL TEMPORARY EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH THIS PLAN. EROSION AND SEDIMENT CONTROL INSTALLATION, SIMILAR TO OTHER ACTIVITIES, MAY BE CONDUCTED AS PIPELINE CONSTRUCTION ACTIVITIES PROGRESS, HOWEVER, SOIL DISTURBANCE SHALL BE MINIMIZED UNTIL THE APPROPRIATE TEMPORARY EROSION AND SEDIMENT CONTROLS HAVE BEEN INSTALLED IN THE PROPOSED WORK AREA.

2. SITE CLEARING (TREE CUTTING) & GRUBBING

- INITIATE CLEARING AND GRUBBING OF RIGHT-OF-WAY AND ACCESS ROADS AS NEEDED.
- WOODY VEGETATION CLEARING OF THE ROW, ATWS AND STAGING AREAS WILL TAKE PLACE IN A SINGLE PASS. NO GRUBBING OR GRUBBING WILL OCCUR DURING CLEARING OPERATIONS.
- HAUL MERCHANTABLE TIMBER OFF-SITE OR STACK AT A DESIGNATED LOCATION. AS DETERMINED BY LANDOWNER SPECIAL CONDITIONS OR CPG CHIEF INSPECTOR.
- CHIP UNMERCHANTABLE MATERIALS AND SPREAD EVENLY WITHIN THE RIGHT-OF-WAY LIMITS, EXCEPT IN WETLANDS, AGRICULTURE FIELDS, AND MANICURED LAWNS.
- GRUB TREE STUMPS IN CLEARED ROW. GRUB STUMPS AND REMOVE FROM ROW AND HULL OFF SITE OR STOCKPILED AT STAGING AREAS FOR USE AS MULCH STABILIZATION AFTER EARTH DISTURBING ACTIVITIES ARE COMPLETED.
- NOTIFY THE MASSDEP AFTER INSTALLATION OR STABILIZATION OR ALL PERIMETER SEDIMENT CONTROL BMPs (INCLUDING TOPSOIL PILES) WITHIN A NEW WORK AREA AND AT LEAST 3 DAYS PRIOR TO PROCEEDING WITH BULK EARTH DISTURBANCE ACTIVITIES.

3. SITE GRADING AND STABILIZATION

- RE-STAKE THE ROW TO REPLACE ANY SIGNAGE OR FLAGGING THAT WAS REMOVED OR DAMAGED DURING CLEARING ACTIVITIES.
- INSTALL ROCK CONSTRUCTION ENTRANCES WHERE VEHICLES WILL ENTER CONSTRUCTION AREAS FROM ACCESS ROADS. INSTALL WASH RACKS AS REQUIRED IF ROCK CONSTRUCTION ENTRANCES ARE NOT FUNCTIONING AS INTENDED.
- CLEAR, GRADE AND IMPROVE ACCESS ROAD AS NEEDED AS THEIR USE BECOMES REQUIRED.
- STOCKPILE TOPSOIL ALONG THE EDGE OF THE RIGHT-OF-WAY WHERE INDICATED AND TEMPORARILY STABILIZED.
- ROUGH GRADE SITE, REMOVE AND STOCKPILE TOPSOIL AS APPROPRIATE. INSTALL SILT FENCE, OR COMPOST FILTER SOCK AROUND STOCKPILE AS REQUIRED.
- THE MIXING OF TOPSOIL WITH SUBSOIL SHALL BE PREVENTED BY STRIPPING TOPSOIL FROM THE WORK AREA WITHIN DESIGNATED AREAS AND IN COORDINATION WITH THE APPLICABLE ACCESS AGREEMENTS.
- INSTALL TEMPORARY WATERBARS AS SHOWN ON E&S DRAWINGS.
- INSTALL TEMPORARY FLOW DIVERSION, FLUME STRUCTURES AND TEMPORARY BRIDGES AT STREAM CROSSINGS AS STREAM CROSSINGS ARE ENCOUNTERED.
- INSTALL APPROPRIATE TRENCH DEWATERING FILTER AND SURROUNDING SEDIMENT BARRIERS (STRAW BALES, SILT FENCE AND/OR COMPOST FILTER SOCKS AS DETERMINED IN THE FIELD) IN PREPARATION OF DEWATERING ACTIVITIES. THIS SHALL BE COMPLETED PRIOR TO PERFORMING EXCAVATION ACROSS WATERBODIES.
- INSTALL TIMBER MATS FOR EQUIPMENT ACCESS AS SHOWN ON E&S DRAWINGS AS WETLANDS / STREAMS ARE ENCOUNTERED.
- UTILIZED WOOD CHIPS IN HEAVILY TRAFFICKED AREAS TO REDUCE THE POTENTIAL FOR RUTTING EXCEPT IN WETLANDS.

4. PIPELINE CONSTRUCTION

UPLAND LOCATIONS:

- ENSURE THE APPROPRIATE UPLAND EROSION AND SEDIMENT CONTROLS ARE IN PLACE.
- GRADE/EXCAVATE PIPELINE TRENCH AND RIGHT-OF-WAY.
- SEGREGATE TOPSOIL IN AGRICULTURAL FIELDS AND MANICURED LAWNS FOR RESTORATION ACTIVITIES DURING FINAL CLEAN UP.
- STRING PIPE AND PREPARE THE PIPE JOINTS FOR WELDING.
- WELD PIPE JOINTS AND PERFORM NDT (NON-DESTRUCTIVE TESTING).
- DISCHARGE ALL WATER FROM TRENCH USING FILTER BAGS OR COMPOST SOCK SEDIMENT TRAP.
- INSTALL THE PIPELINE IN THE TRENCH.
- INSTALL TRENCH PLUGS.
- BACKFILL THE PIPELINE TRENCH.
- PERFORM PERMANENT STABILIZATION, INCLUDING:
 - GRADE AREAS AS CLOSELY AS POSSIBLE TO ORIGINAL CONTOURS.
 - REPLACE TOPSOIL.
 - APPLY PERMANENT SEEDING, SOIL AMENDMENTS AND MULCH OR EROSION CONTROL BLANKET.

ROADWAY, DRIVEWAYS AND RAILROADS CROSSINGS:

- STRING PIPE OUTSIDE OF ROAD/DRIVEWAY AND PREPARE THE PIPE JOINTS FOR WELDING AND NON-DESTRUCTIVE TESTING.
- EXCAVATE PIPELINE TRENCH FOR THE OPEN TRENCH CROSSING OR EXCAVATE BORE PITS FOR CONVENTIONAL BORED CROSSING.
- DISCHARGE ALL WATER FROM TRENCH USING FILTER BAGS OR COMPOST SOCK SEDIMENT TRAP.
- MOVE THE PIPE SECTIONS TO THE TRENCH OR PERFORM CONVENTIONAL BORE.
- INSTALL THE PIPELINE IN THE TRENCH.
- INSTALL TRENCH PLUGS.
- BACKFILL THE PIPELINE TRENCH.

STREAM CROSSING (LESS THAN 24 HOURS FOR STREAM LESS THAN 10 FEET WIDE, LESS THAN 48 HOURS FOR STREAMS BETWEEN 10 AND 100 FEET WIDE):

- ADJUST EROSION AND SEDIMENT CONTROLS AS NEEDED TO PERFORM WORK AT STREAM CROSSING LOCATIONS.
- INSTALL SANDBAG DIVERSION DAM OR MASSDEP APPROVED WATER-INFLATED DAM AROUND CHANNEL WORK AREA.
- ALL NON-PERENNIAL STREAMS AND DITCHES WILL BE FLUMED ONLY IF WATER IS PRESENT.
- DEWATER OPEN-CUT TRENCH WORK AREA WITH THE STREAM USING FILTER BAG OR COMPOST SOCK SEDIMENT TRAP AS NEEDED.
- EXCAVATE PIPELINE TRENCH.
- TEMPORARY TOPSOIL AND SUBSOIL STOCKPILES SHALL BE LOCATED AT LEAST 10 FEET AWAY FROM TOP OF STREAM BANKS.
- IN AN UPLAND LOCATION, STRING PIPE AND PREPARE THE PIPE JOINTS FOR WELDING AND NON-DESTRUCTIVE TESTING.
- DISCHARGE ALL WATER FROM TRENCH USING FILTER BAGS OR COMPOST SOCK SEDIMENT TRAP.
- INSTALL THE PIPELINE IN THE TRENCH.
- INSTALL TRENCH PLUGS AT TOP OF STREAM BANKS.
- BACKFILL THE PIPELINE TRENCH.
- PERFORM PERMANENT STABILIZATION, INCLUDING:
 - GRADE AREAS AS CLOSELY AS POSSIBLE TO ORIGINAL CONTOURS.
 - REPLACE TOPSOIL.
 - APPLY PERMANENT SEEDING, SOIL AMENDMENTS AND EROSION CONTROL BLANKET.
- REMOVE TEMPORARY CONTROL MEASURES.

WETLAND CROSSING:


- ADJUST EROSION AND SEDIMENT CONTROLS AS NEEDED TO WORK IN STREAM CROSSING LOCATIONS.
- EXCAVATE THE TOP 1-FOOT OF TOPSOIL AND STOCKPILE SEPARATELY FROM THE SUBSOIL.
- IN AN UPLAND LOCATION, STRING PIPE AND PREPARE THE PIPE JOINTS FOR WELDING AND NON-DESTRUCTIVE TESTING.
- DISCHARGE ALL WATER FROM TRENCH USING FILTER BAGS OR COMPOST SOCK SEDIMENT TRAP.
- INSTALL THE PIPELINE IN THE TRENCH.
- INSTALL TRENCH PLUGS AT EDGE OF WETLAND.
- BACKFILL THE PIPELINE TRENCH.
- PERFORM PERMANENT STABILIZATION, INCLUDING:
 - REPLACE SUBSOIL MATERIAL.
 - REPLACE TOPSOIL SUCH THAT THERE IS NO CROWNING OF SOIL MATERIAL.
 - APPLY TEMPORARY SEEDING.

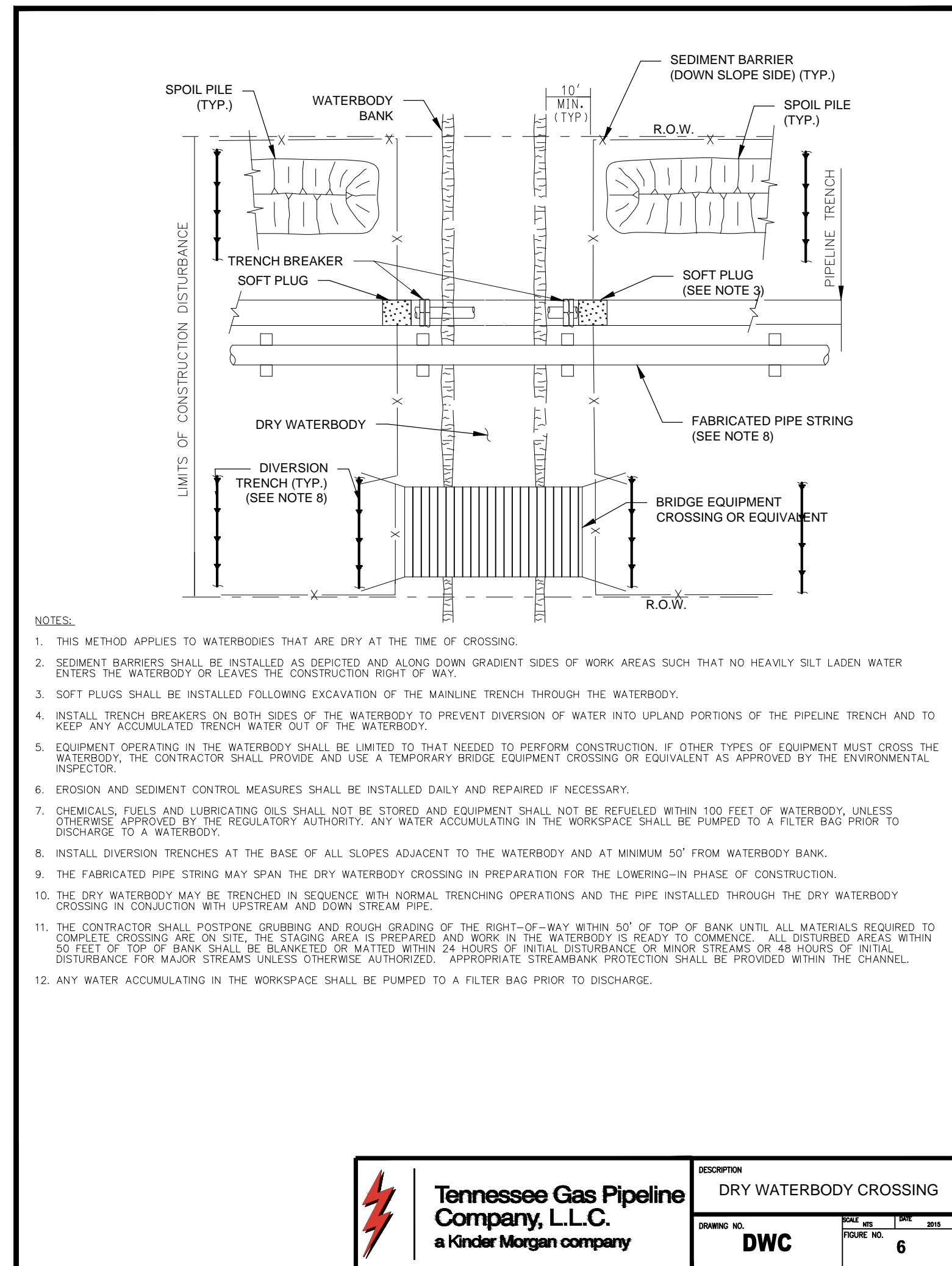
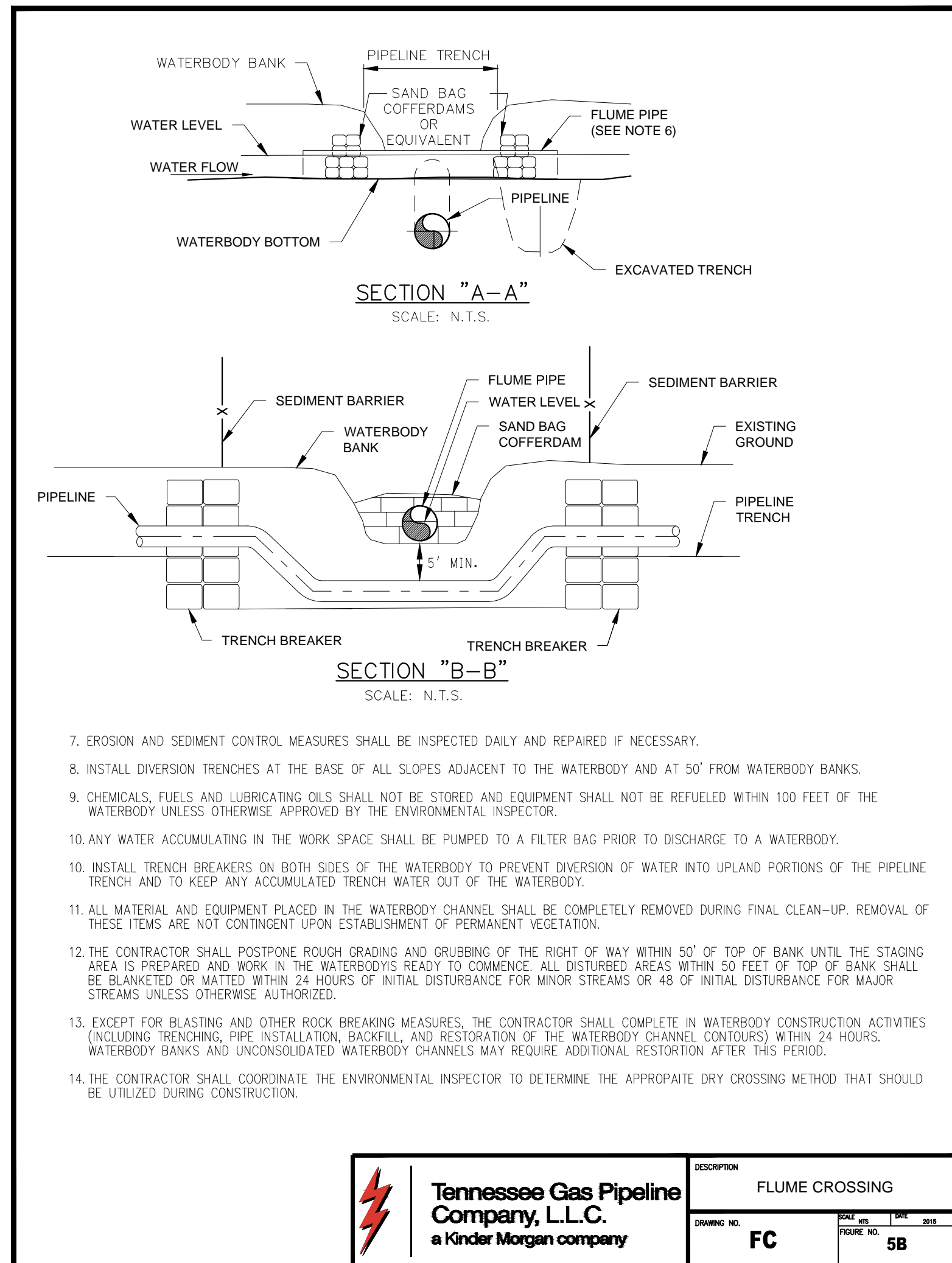
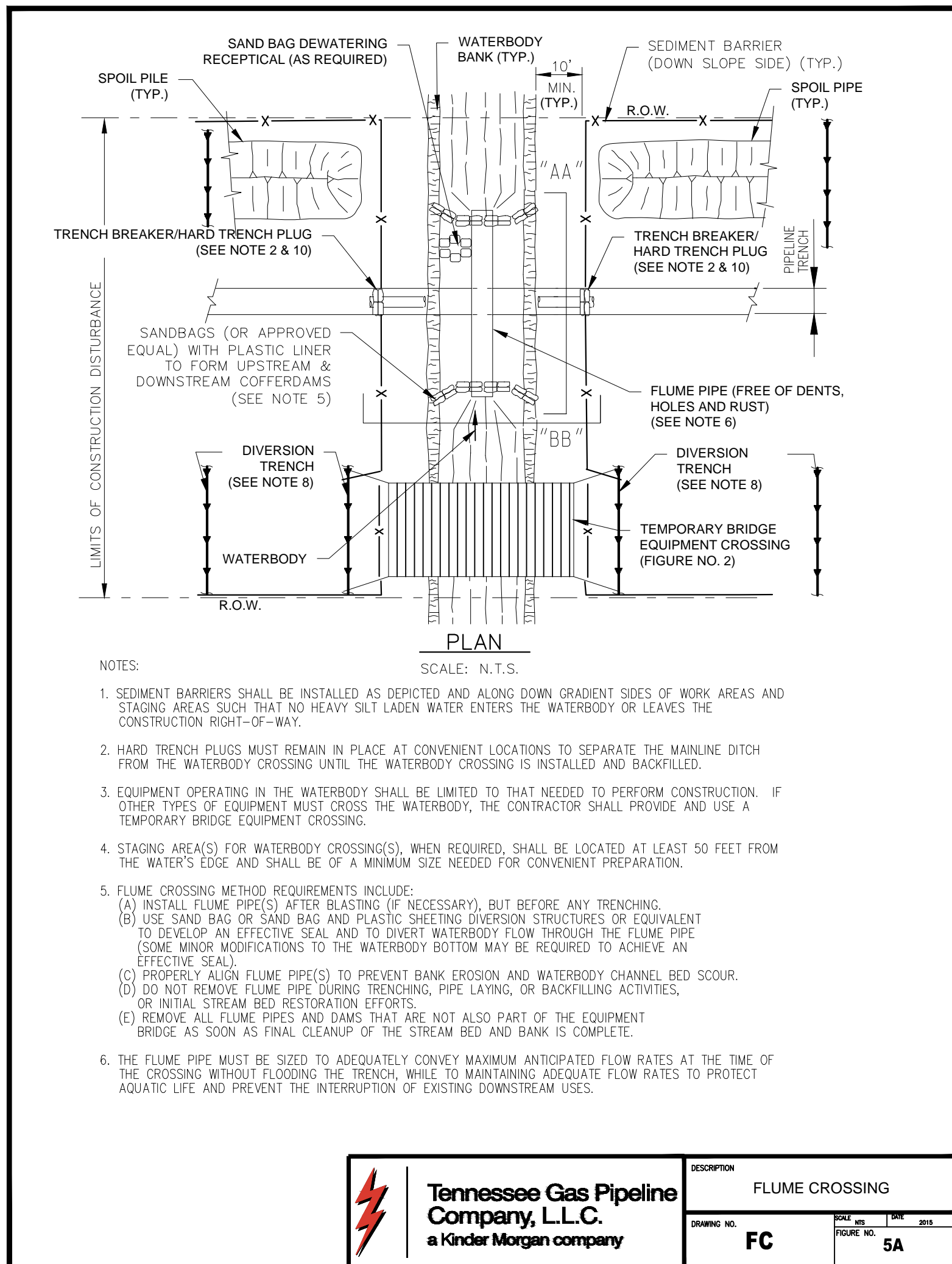
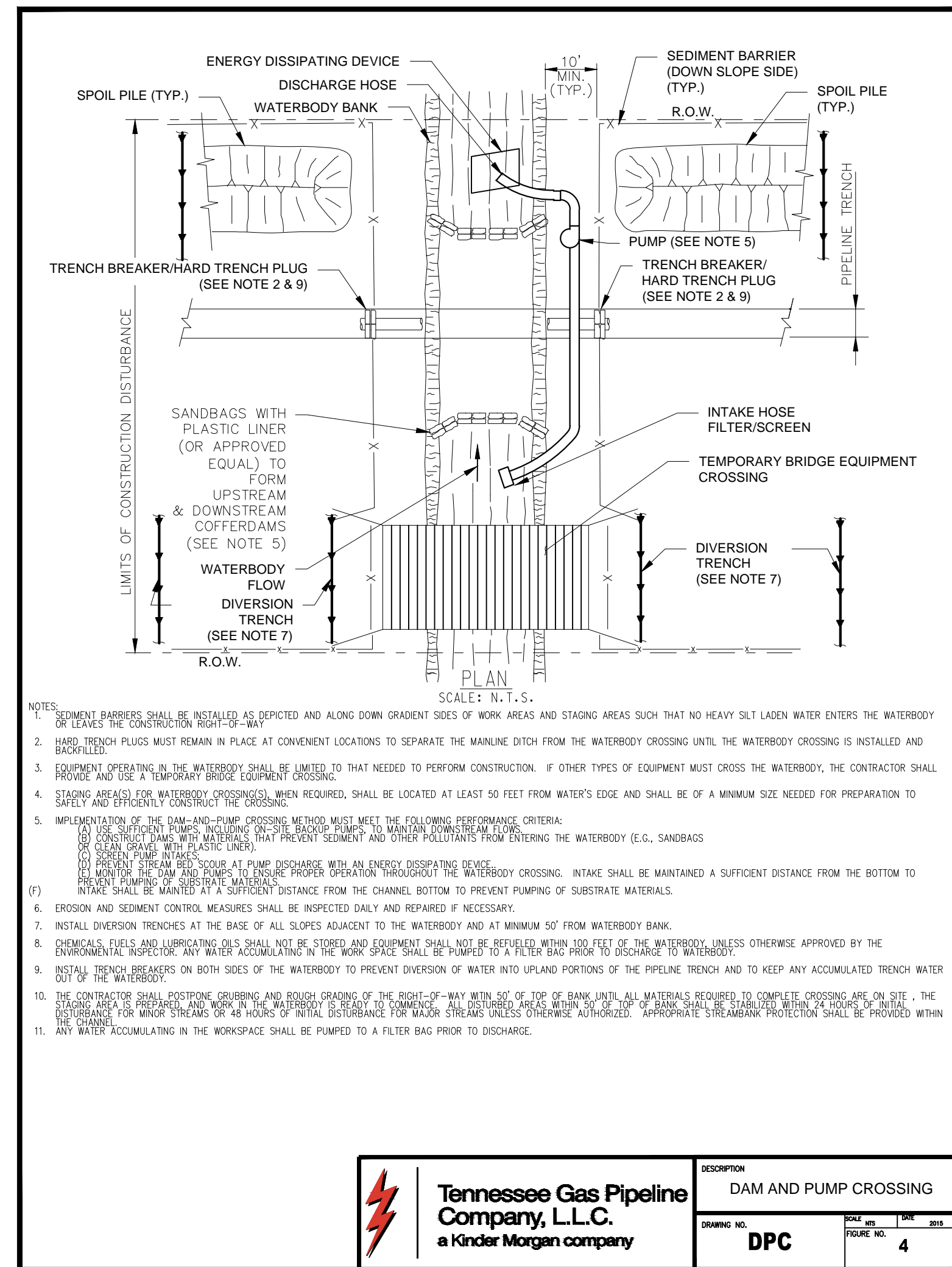
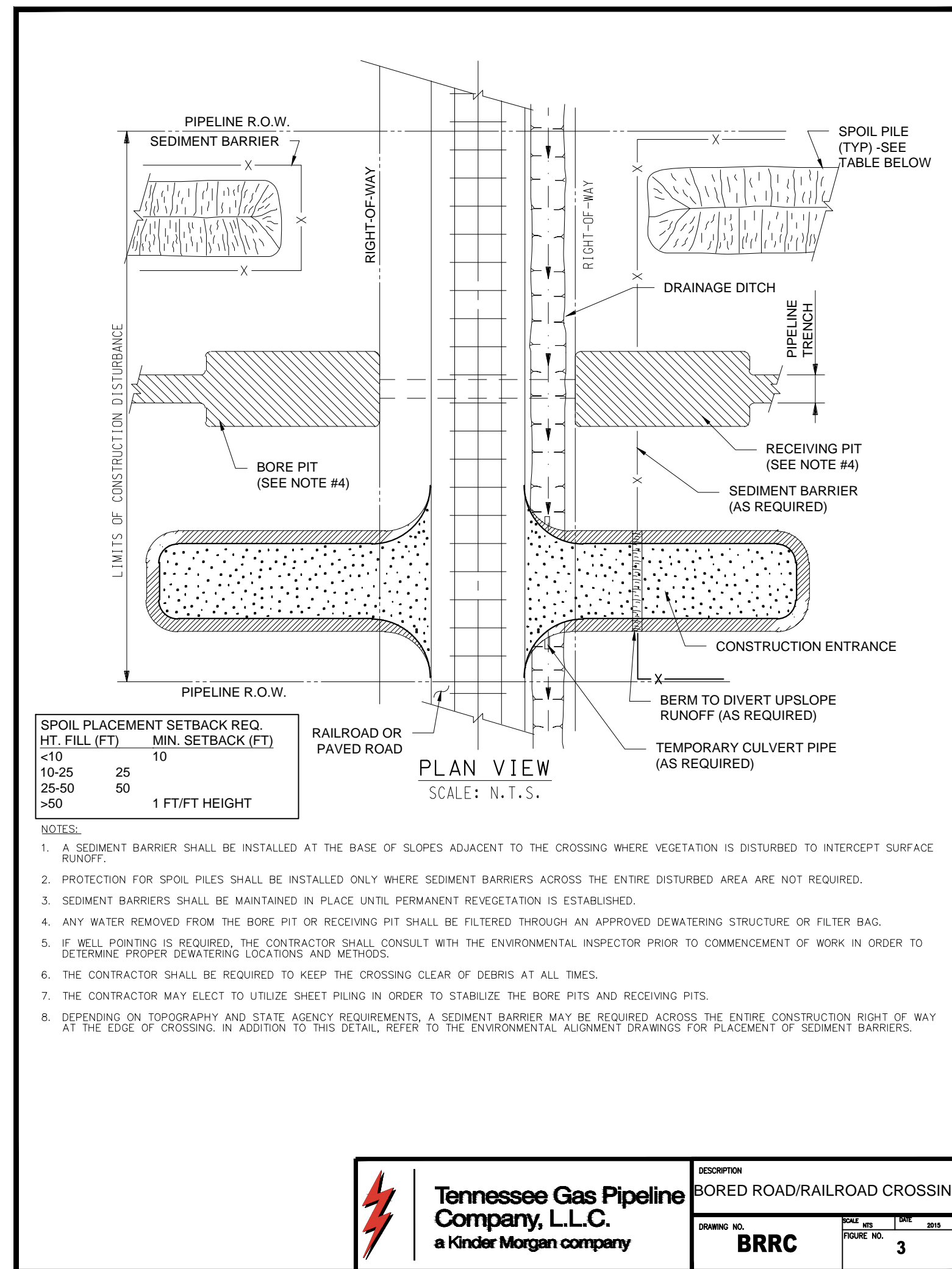
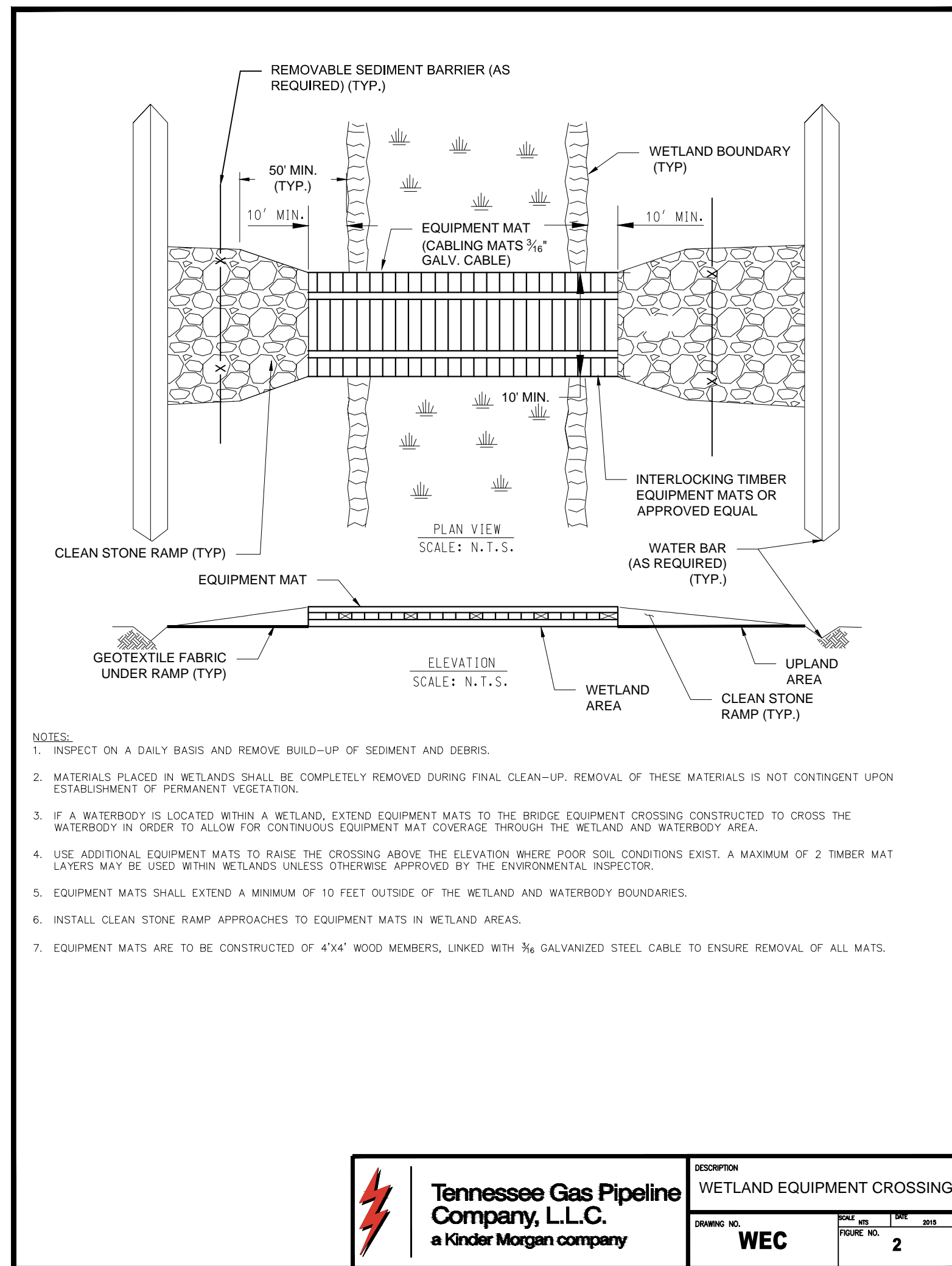
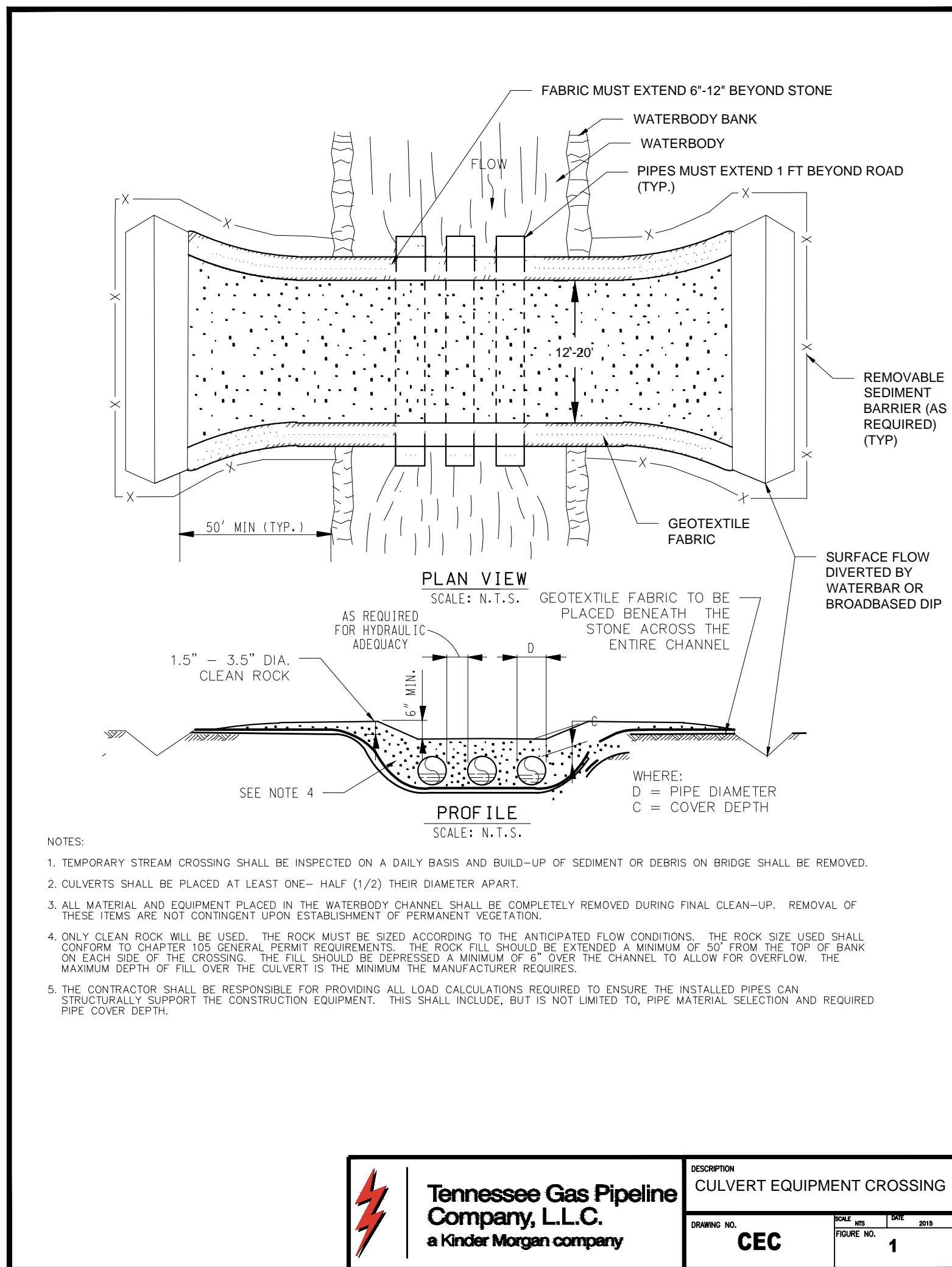
5. DEMOBILIZATION AND SITE CLEAN UP

- COMPLETE PERMANENT STABILIZATION OF ALL REMAINING AREAS OF DISTURBANCE, INCLUDING:
 - GRADE AREAS AS CLOSELY AS POSSIBLE TO ORIGINAL CONTOURS.
 - REPLACE TOPSOIL.
 - APPLY PERMANENT SEEDING, SOIL AMENDMENT, AND MULCH OR EROSION CONTROL BLANKET.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER OR OPERATOR SHALL CONTACT THE MASSDEP FOR AN INSPECTION PRIOR TO THE REMOVAL/CONVERSION OF THE EROSION AND SEDIMENT CONTROL BMPs.
- REMOVE TEMPORARY CONTROL MEASURES UPON APPROVAL OF THE MASSDEP AGENT.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES, REMOVAL OF ALL TEMPORARY BMPs, INSTALLATIONS OF ALL PERMANENT BMPs, AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE MASSDEP FOR A FINAL INSPECTION.
- ANY MATERIALS NOT INCORPORATED AS TRENCH BACKFILL OR GENERAL GRADING (E.G. UNCONTAMINATED SOIL, ROCK, STONE, GRAVEL, BRICK AND BLOCK, CONCRETE AND USED ASPHALT; AND WASTE FROM LAND CLEARING, GRUBBING AND EXCAVATION, INCLUDING TREES, BRUSH, STUMPS AND VEGETATIVE MATERIAL) WILL BE REUSED, RECYCLED OR REMOVED FROM THE CONSTRUCTION WORK LIMITS IN ACCORDANCE WITH GENERAL EROSION AND SEDIMENT CONTROL NOTE #6 ON THIS SHEET.
- CONTRACTOR DEMOBILIZATION.

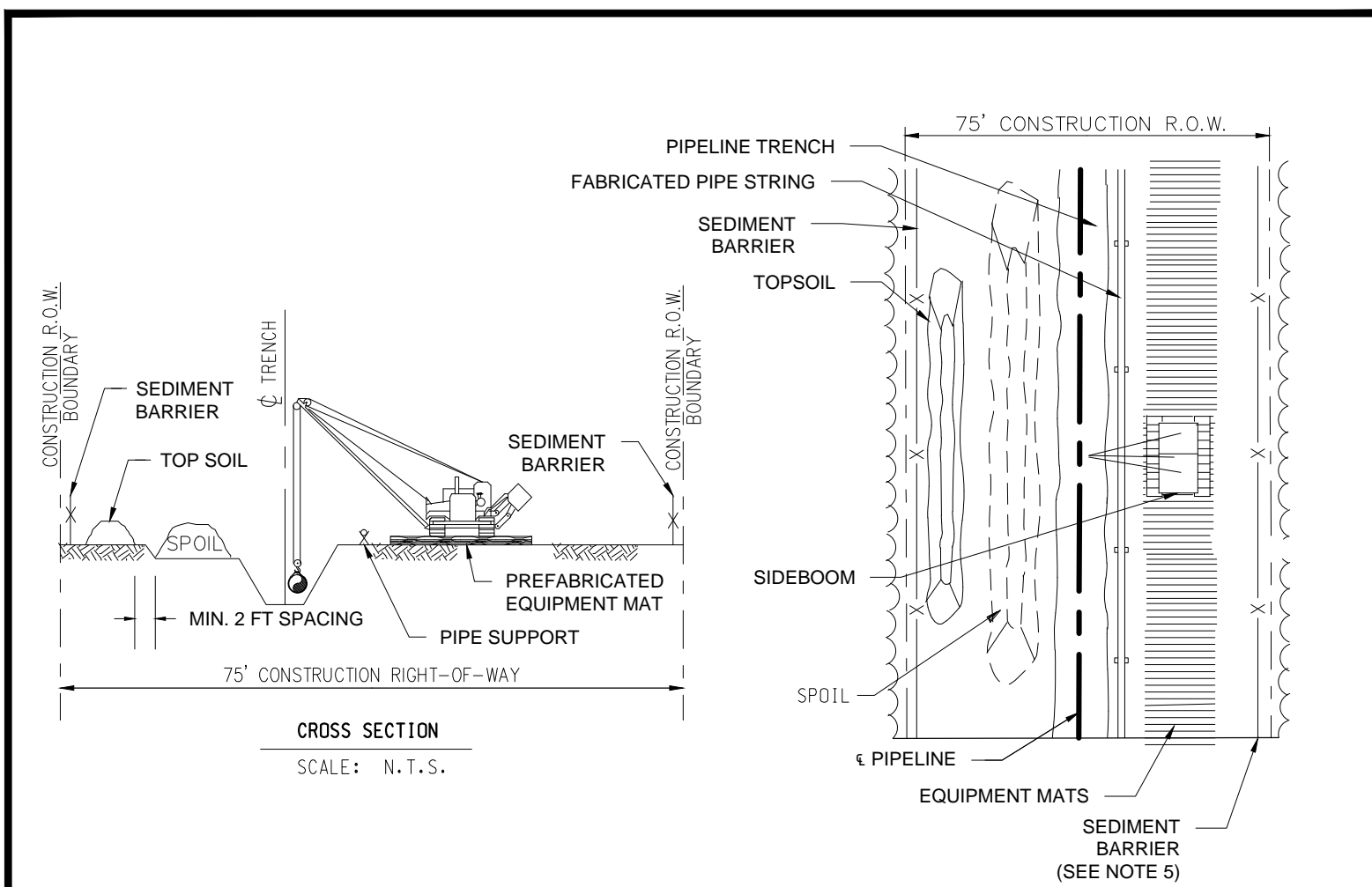
6. POST-CONSTRUCTION

- CONTINUE TO CONDUCT INSPECTIONS UNTIL THE SITE HAS REACHED, PERMANENT STABILIZATION.
- PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
- TEMPORARY E&S BMPs MAY BE REMOVED AFTER THE ENTIRE CONTRIBUTARY AREA TO EACH BMP REACHES PERMANENT STABILIZATION.
- REMOVE ANY REMAINING TEMPORARY WATERBODY AND WETLAND EQUIPMENT CROSSINGS.
- REMOVE ANY REMAINING STABILIZED CONSTRUCTION ENTRANCES.
- PRIOR TO APPLICATION OF THE SEED IN ALL SUPPORT & STAGING AREAS, THE SEEDBED WILL BE PREPARED TO A DEPTH OF 3 TO 4 INCHES USING APPROPRIATE EQUIPMENT TO PROVIDE A FIRM, SMOOTH SEEDBED THAT IS FREE OF DEBRIS AND SCARIFIED TO ENSURE SEEDS LODGE AND GERMINATE. THE SEED MIXTURE WILL BE APPLIED UNIFORMLY PER MASSDEP EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS.

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					
 Tennessee Gas Pipeline Company, L.L.C. a Kinder Morgan company					
NORTHEAST ENERGY DIRECT PROJECT LEGEND, NOTES, PROJECT SEQUENCE AND SCHEDULE MASSACHUSETTS					
Section:		Township:		Range:	
Co./Par.:			State: MASSACHUSETTS		
Division:			Op. Area:		
Drafter: DGP		Date:		Project ID:	
Chk'd:		Date:		Scale:	
Approved:		Date:		Filename: MA_ES_NOTES_LEGEND	
				Sheet:	
				Type:	



NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					
NORTHEAST ENERGY DIRECT PROJECT EROSION & SEDIMENT CONTROL TYPICALS MASSACHUSETTS					
Section:		Township:		Range:	
Co./Par.:		State:		MASSACHUSETTS	
Division:		Op. Area:			
Drafter: GV		Date:		Project ID:	
Chk'd:		Date:		Scale:	
Approved:		Date:		Filename: MA_ES_DETAILS_001	
				Sheet:	
				Type:	

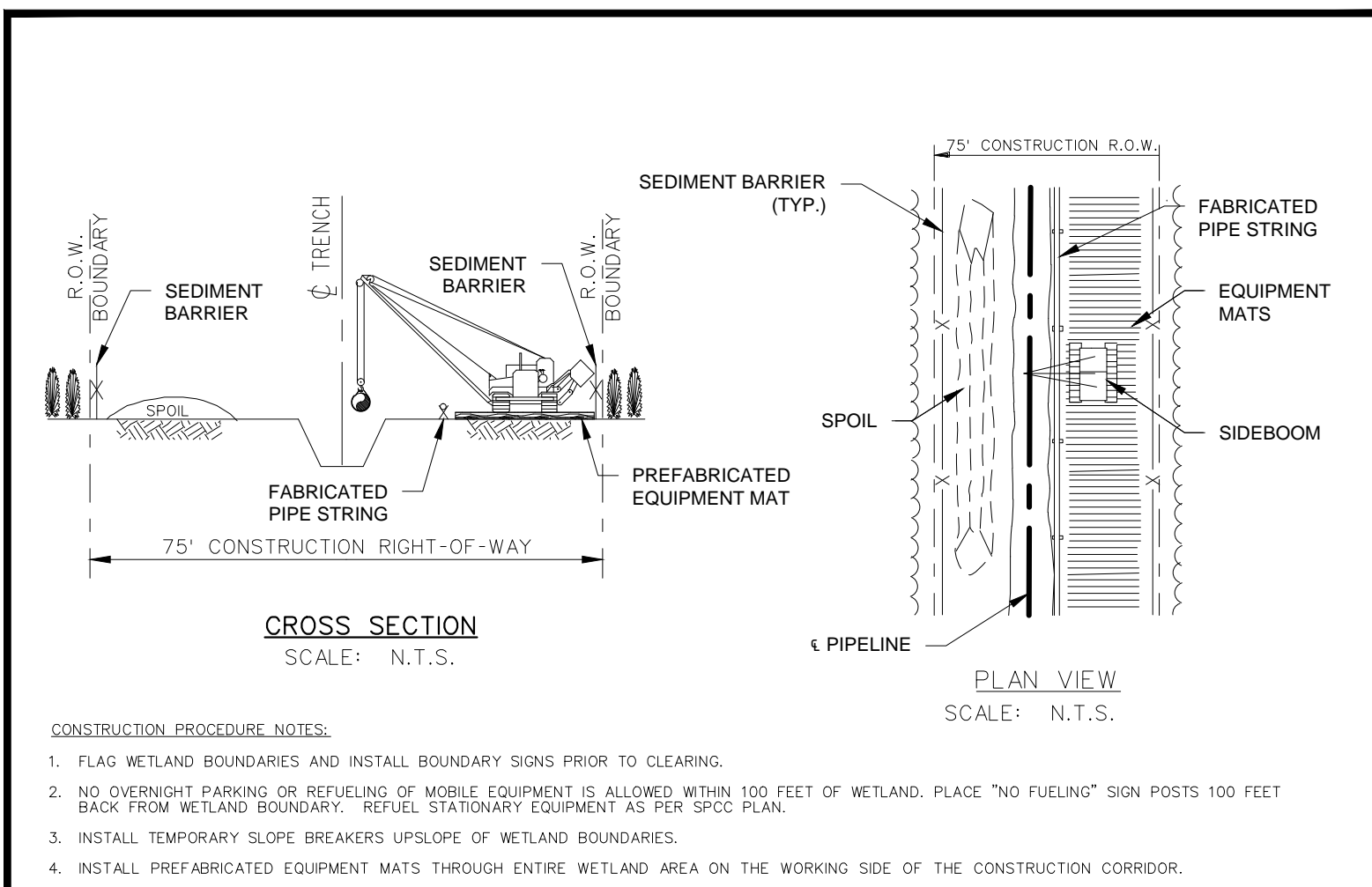


CONSTRUCTION PROCEDURE NOTES:

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. REFUEL STATIONARY EQUIPMENT AS PER SPEC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES.
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 THE 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.
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 COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
7. CONDUIT TRENCH LINE. TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED OR FROZEN). 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.
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, BACKFILLED 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 SHALL OCCUR WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY ENVIRONMENTAL INSPECTOR.
11. LOWER-IN PIPE PRIOR TO BACK FILLING TRENCH. INSTALL TRENCH BREAKERS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL MEASURES.
13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. SEED DISTURBED WETLAND AREAS (UNLESS STANDING WATER IS PRESENT) AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS AND EOP. 48 LB PLS/ACRE ANNUAL RYE GRASS AND STRAW MULCH AT 37/ACRE OR AS APPROVED BY THE APPLICABLE PERMITTING AGENCY.
15. NO FERTILIZER OR LIME IS PERMITTED.
16. DO NOT USE LIQUID MULCH BINDERS WITHIN 100 FT OF WETLANDS OR WATERBODIES.

PLAN VIEW
SCALE: N.T.S.

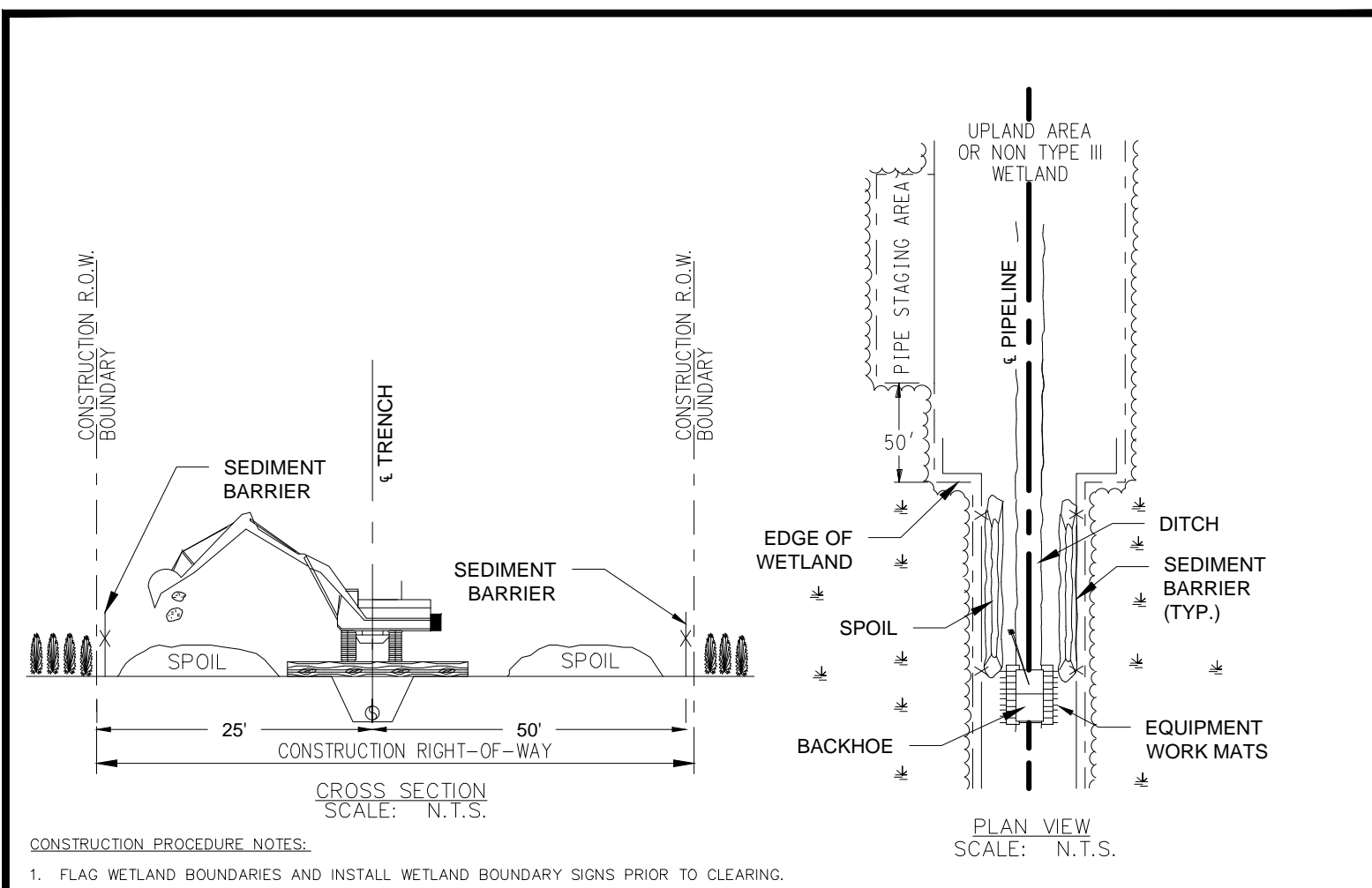
DESCRIPTION
TYPE I "NON-SATURATED WETLAND" INSTALLATION PROCEDURE
DRAWING NO. **WIP1** DATE: 07/10/11



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. REFUEL STATIONARY EQUIPMENT AS PER SPEC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES.
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 TRENCHLINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY 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, BACKFILLED 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 COMPANY ENVIRONMENTAL INSPECTOR.
11. LOWER-IN PIPE PRIOR TO BACKFILLING. INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL MEASURES.
13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. SEED DISTURBED WETLAND AREA (UNLESS STANDING WATER IS PRESENT) AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS AND EOP. 48 LB PLS/ACRE ANNUAL RYE GRASS AND STRAW MULCH AT 37/ACRE OR AS APPROVED BY THE APPLICABLE PERMITTING AGENCY.
15. NO FERTILIZER OR LIME IS PERMITTED.
16. DO NOT USE LIQUID MULCH BINDERS WITHIN 100 FT OF WETLANDS OR WATERBODIES.

DESCRIPTION
TYPE II "SATURATED WETLAND" INSTALLATION PROCEDURE
DRAWING NO. **WIP2** DATE: 07/10/11



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. REFUEL STATIONARY EQUIPMENT AS PER SPEC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS WITHIN 50' UPSLOPE OF WETLAND BOUNDARIES.
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 REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY 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 (PONTON MOUNTED BACKHOES) OR TRACKED BACKHOES SUPPORTED BY PREFABRICATED EQUIPMENT MATS OR FLOATS TO EXCAVATE TRENCH. IF PREFABRICATED EQUIPMENT MATS ARE USED FOR STABILIZATION, THE BACKHOES SHALL GRADUALLY MOVE ACROSS THE WETLAND BY MOVING THE MATS FROM IMMEDIATELY BEHIND TO IMMEDIATELY IN FRONT OF THE BACKHOES' PATH.
8. FABRICATE PIPE IN A STAGING AREA OUTSIDE THE TYPE III WETLAND AS INDICATED ON THE CONSTRUCTION DRAWINGS. NO CONCRETE COATING ACTIVITY SHALL OCCUR WITHIN 100 FEET OF THE WETLAND BOUNDARY, UNLESS APPROVED BY THE ENVIRONMENTAL INSPECTOR.
9. LEAVE HARD PLUGS AT THE EDGE OF TYPE III WETLAND UNTIL JUST PRIOR TO PIPE PLACEMENT.
10. FLOAT PIPE IN PLACE. LOWER-IN. INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS, 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 AND WILL NOT BE SEEDDED IF STANDING WATER IS PRESENT.
14. NO FERTILIZER OR LIME IS PERMITTED.
15. DO NOT USE LIQUID MULCH BINDERS WITHIN 100 FT OF WETLANDS OR WATERBODIES.

DESCRIPTION
TYPE III "UNDATED WETLAND" INSTALLATION PROCEDURE
DRAWING NO. **WIP3** DATE: 07/10/11

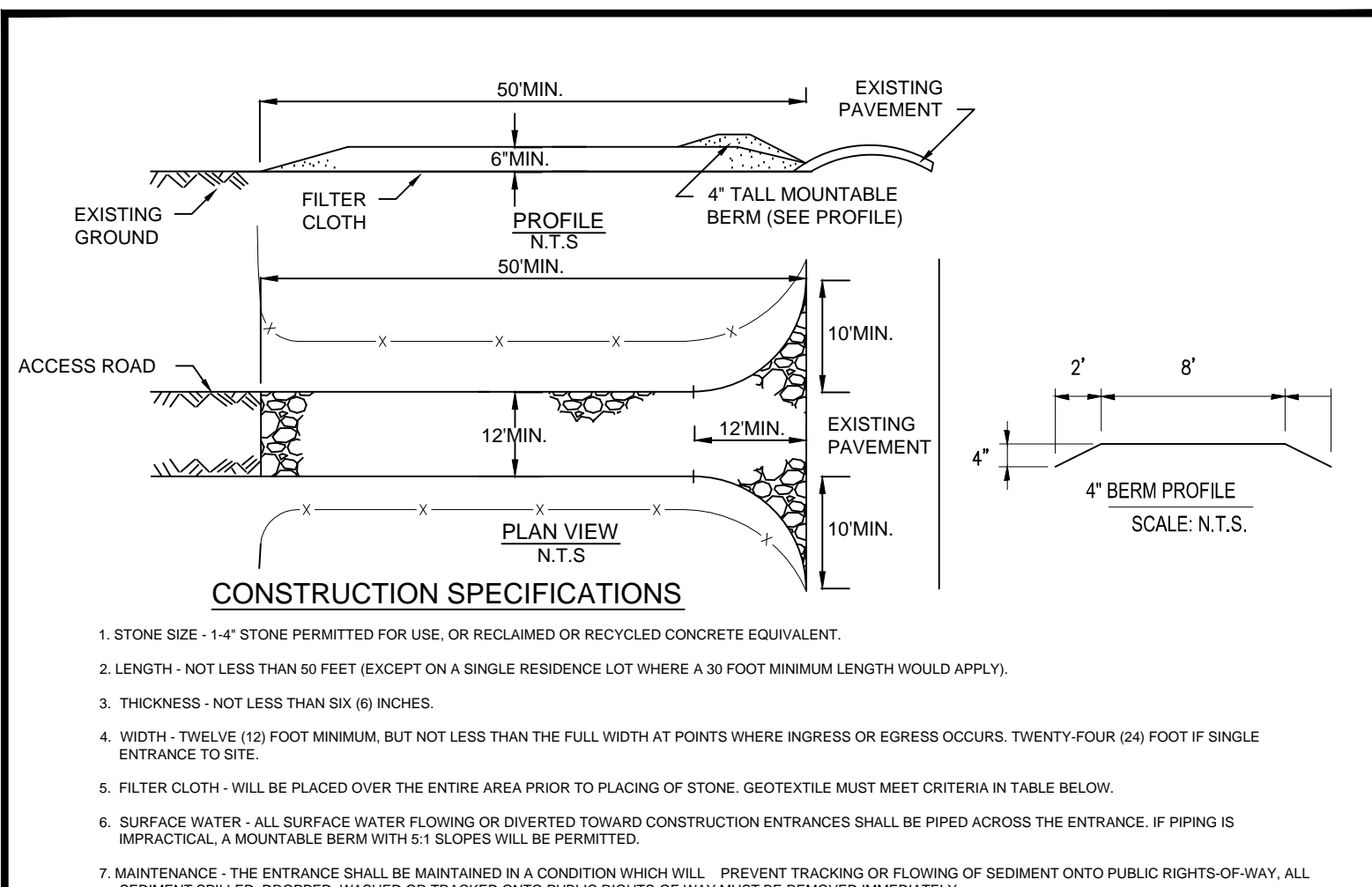
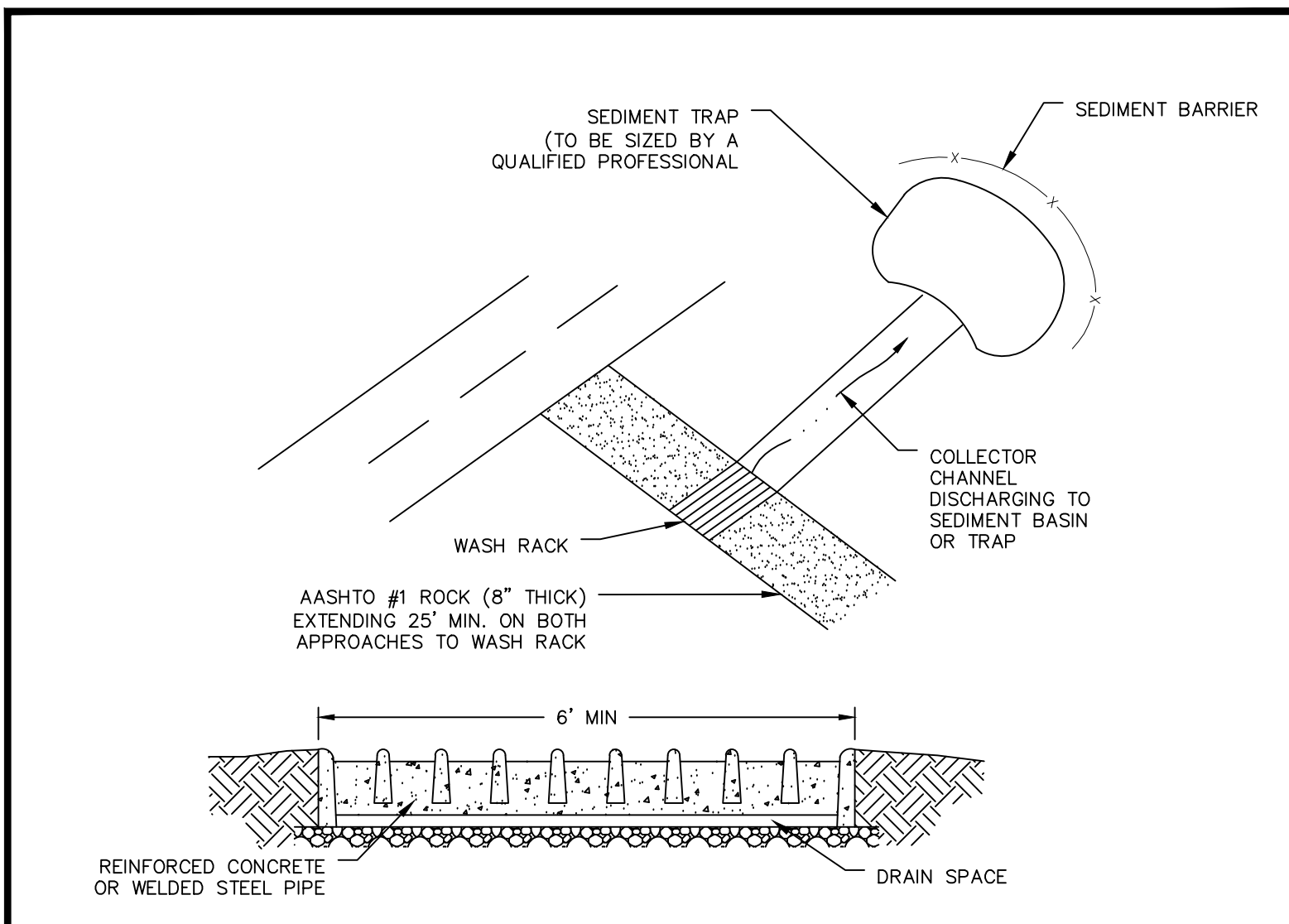


TABLE: CRITERIA FOR GEOTEXTILE

FABRIC PROPERTIES	ROADS	HEAVY DUTY HAUL ROADS	TEST METHOD
GRAB TENSILE STRENGTH (LBS)	200	220	ASTM D1682
ELONGATION AT FAILURE (%)	50	60	ASTM D1682
MULLEN BRUST STRENGTH (LBS)	190	430	ASTM D3786
PUNCTURE STRENGTH (LBS)	40	125	ASTM D3786 MODIFIED
EQUIVALENT	40-80	40-80	US STD SIEVE CW-02215
OPENING SIZE			
AGGREGATE DEPTH	6	10	

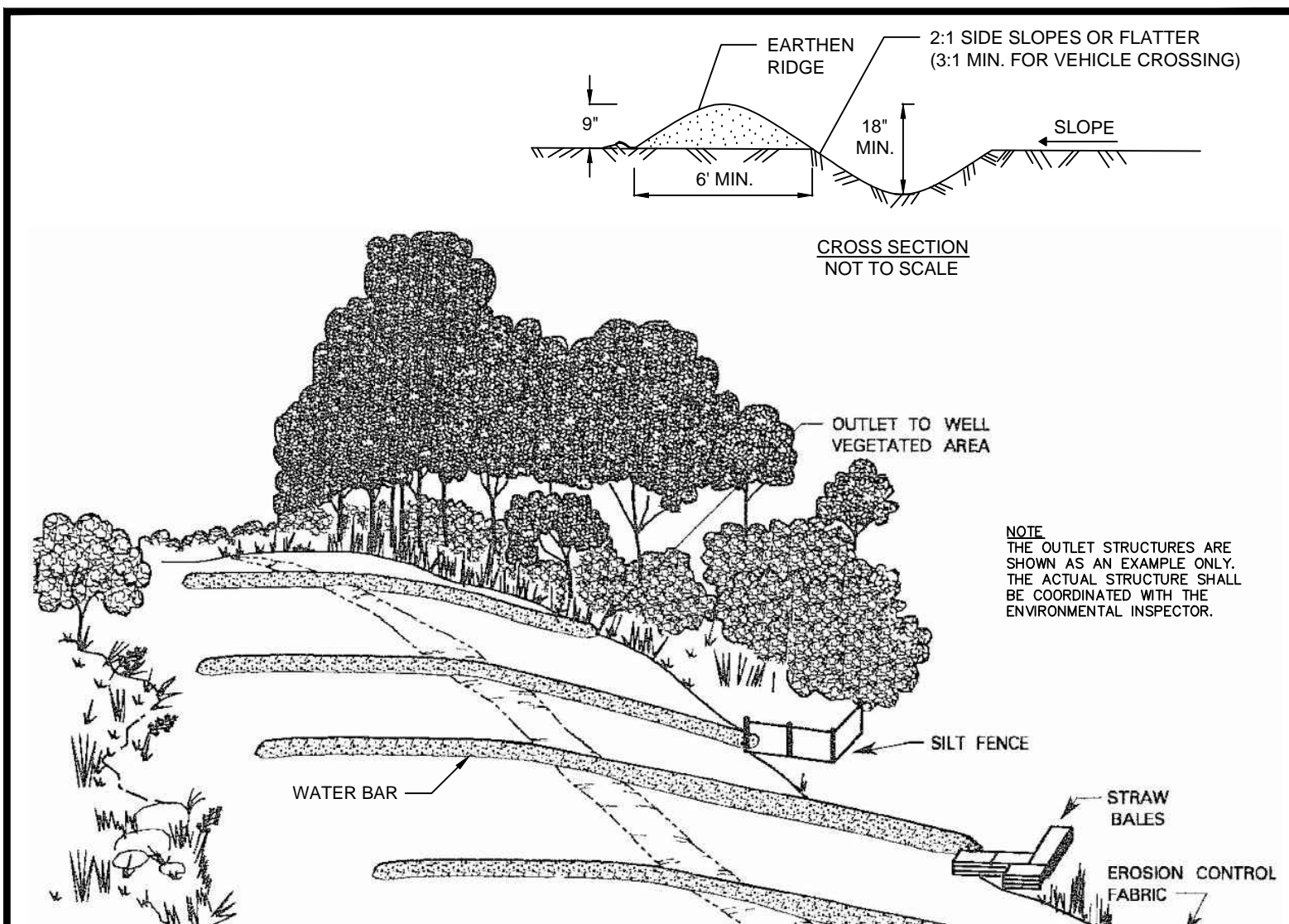
DESCRIPTION
STABILIZED CONSTRUCTION ENTRANCE
DRAWING NO. **SCE** DATE: 07/10/11



NOTES:

1. WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.
2. WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.
3. A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.
4. 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.

DESCRIPTION
STABILIZED CONSTRUCTION ENTRANCE WITH WASHRACK
DRAWING NO. **SCEW** DATE: 07/10/11



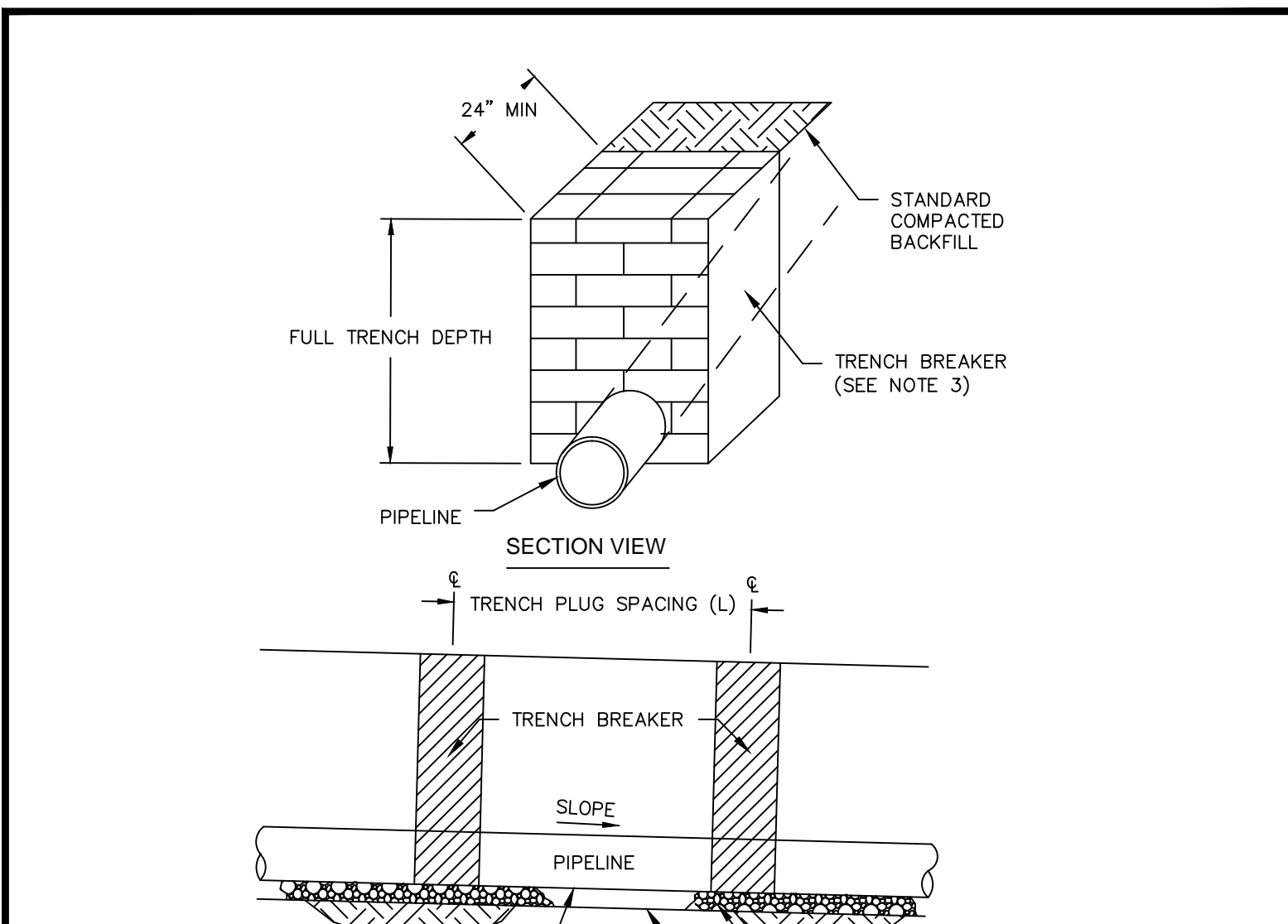
CONSTRUCTION SPECIFICATIONS

1. WATER BARS ARE CONSTRUCTED BY FORMING A RIDGE OR RIDGE AND CHANNEL DIAGONALLY ACROSS THE SLOPING RIGHT-OF-WAY.
2. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
3. DISK OR STRIP THE SOIL FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
4. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
5. ALL WATER BARS SHALL BE CONSTRUCTED WITH A POSITIVE SLOPE TOWARD A STABLE OUTLET. THE ACTUAL OUTLET STRUCTURE SHALL BE COORDINATED WITH THE ENVIRONMENTAL INSPECTOR.
6. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
7. POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATER BODIES, OR OTHER SENSITIVE RESOURCES.
8. FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALE BARRIER, EROSION CONTROL FABRIC, AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR).
9. SEED AND MULCH THE RIDGE AND CHANNEL IMMEDIATELY.
10. CONSTRUCT WATER BARS ON CONSTANT OR SLIGHTLY INCREASING GRADE NOT TO EXCEED 2%. AVOID REVERSE GRADES. A CROSSING ANGLE OF APPROXIMATELY 90 DEGREES IS PREFERRED.

FOR RIGHT-OF-WAY WIDTHS LESS THAN 100 FEET; SPACING AS FOLLOWS:

PERCENT SLOPE	SPACING (FT)
<5	125
5 TO 10	100
10 TO 20	75
20 TO 35	50
>35	25

DESCRIPTION
WATER BAR
DRAWING NO. **WB** DATE: 07/10/11



TRENCH BREAKER SPACING IN AGRICULTURAL LAND

SLOPE (%)	SPACING (L) (FT)
< 5	AS REQUIRED
5 - 10	150
>10 - 15	100
>15 - 20	80
>20 - 30	70
>30 - 40	50
>40 - 100	40
>100	25

TRENCH BREAKER SPACING IN NON-AGRICULTURAL LAND

SLOPE (%)	SPACING (L) (FT)
< 5	AS REQUIRED
5 - 10	150
>10 - 20	100
>20 - 35	80
<35 -	70

NOTES:

1. TOPSOIL SHALL NOT BE USED TO FILL SACS.
2. IMPERVIOUS TRENCH BREAKERS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER WATER BODY CROSSINGS.
3. BREAKER MATERIAL MAY CONSIST OF STACKED CLAY, BENTONITE, SAND BAGS OR FOAM.

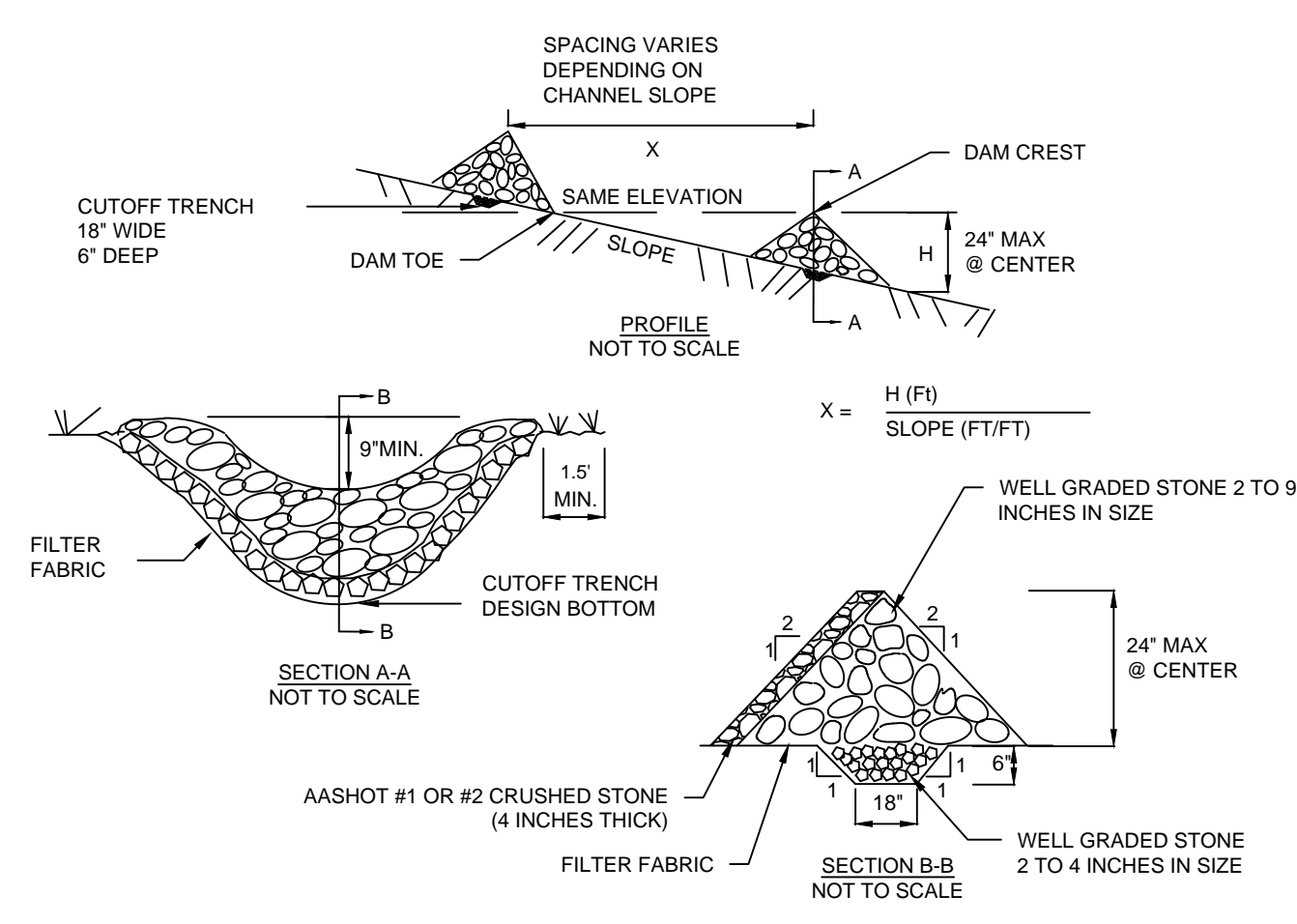
DESCRIPTION
TRENCH PLUG (TRENCH BREAKER)
DRAWING NO. **TP** DATE: 07/10/11

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section: _____ Township: _____ Range: _____
Co./Par.: _____ State: MASSACHUSETTS
Division: _____ Op. Area: _____
Drafter: GV Date: _____ Project ID: _____
Chkd: _____ Date: _____ Scale: _____
Approved: _____ Date: _____ Filename: MA ES DETAILS_002
Sheet: _____ Type: _____

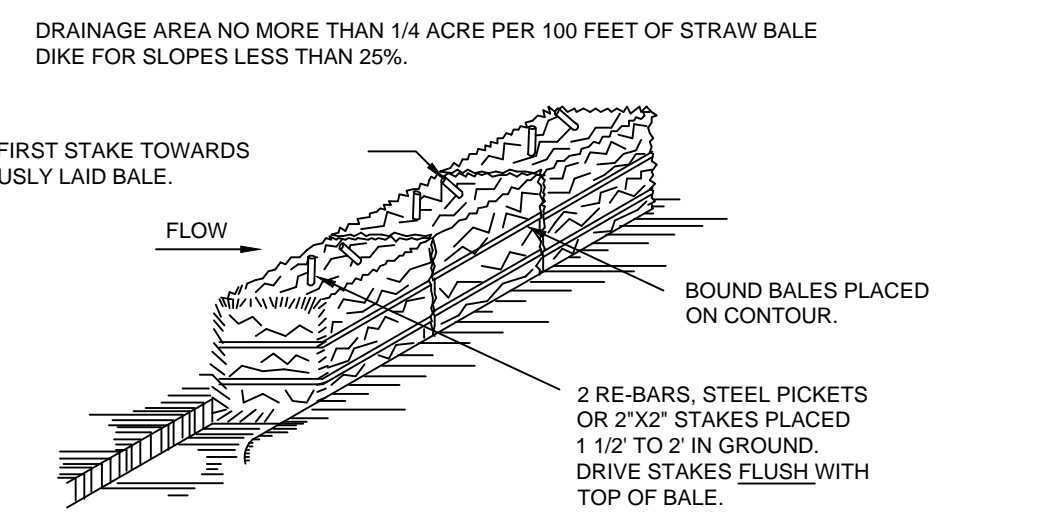


CONSTRUCTION SPECIFICATIONS

- STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
- 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.
- EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
- PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
- ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
- MAXIMUM DRAINAGE AREA 2 ACRES.

	DESCRIPTION CHECK DAM	FIGURE NO.	14
		DATE	10/2011

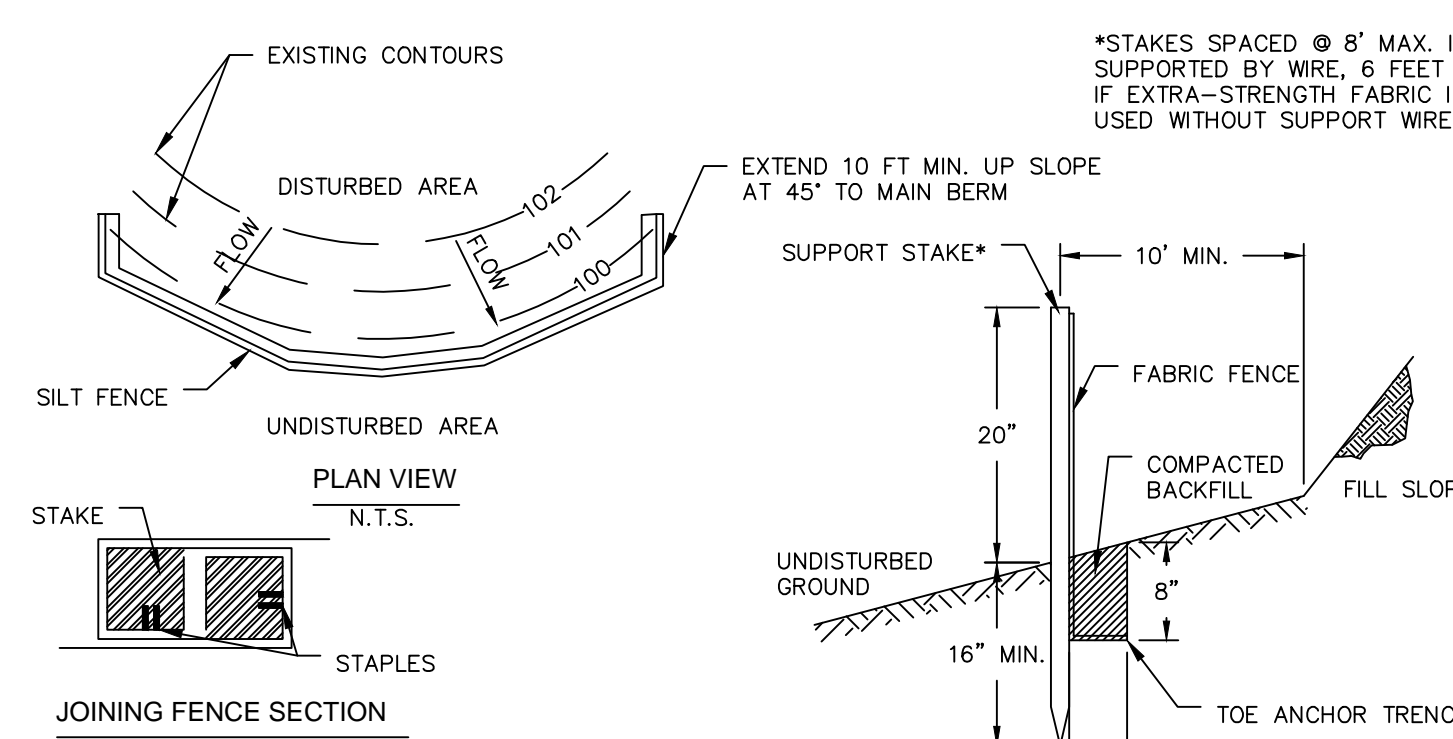
PERCENT SLOPE	MAXIMUM SLOPE LENGTH (FT)
1	180
4	100
9	60
14	40
18	30
30	20



CONSTRUCTION SPECIFICATIONS

- BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
- EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
- BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
- INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
- BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
- BALES SHALL NOT BE USED AS A SEDIMENT BARRIER IN LOCATIONS WHERE THEY ARE EXPECTED TO LAST LONGER THAN 3 MONTHS DUE TO NATURAL DEGRADATION.
- LENGTH OF SLOPE ABOVE THE STRAW BALE BARRIER SHOULD NOT EXCEED THE LIMITS INDICATED.

	DESCRIPTION STRAW BALE BARRIER	FIGURE NO.	15
		DATE	10/2011



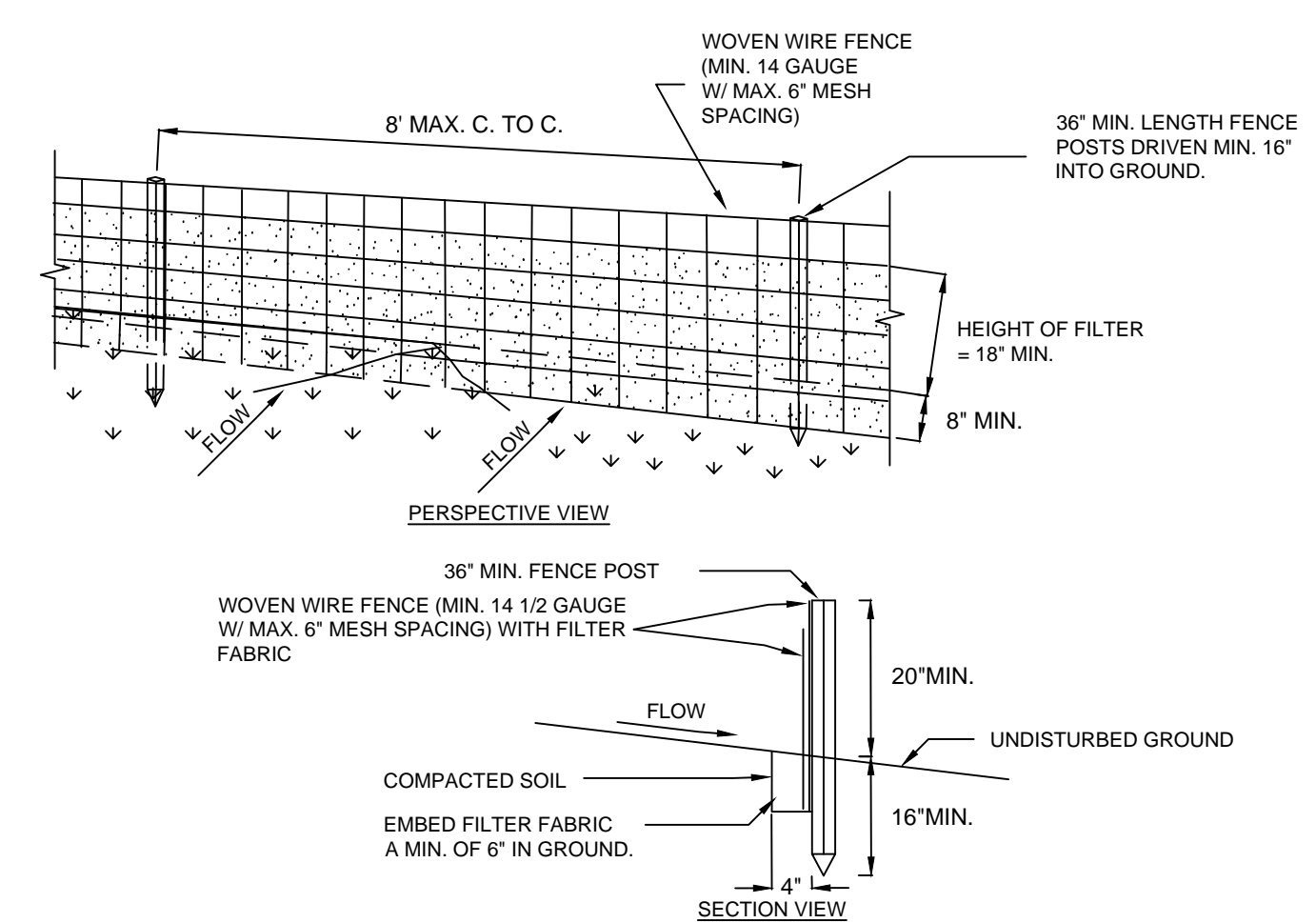
PERCENT SLOPE	MAXIMUM SLOPE DISTANCE ABOVE FENCE (FT)
2	250
5	180
10	100
20	50
30	30

NOTES:

- FABRIC SHALL HAVE THE MINIMUM PROPERTIES AS SHOWN IN THE TABLE BELOW.
- FABRIC WIDTH SHALL BE 30" MINIMUM. STAKES SHALL BE 4-IN DIAMETER PINE, HARDWOOD WITH CROSS SECTION AREA OF 3 SQUARE INCHES OR 1.33 LB./LINEAR FT. STEEL (U OR T) STAKES. STEEL POSTS SHOULD HAVE PROJECTIONS FOR FASTENING FABRIC.
- SILT FENCE SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 10 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH HALF THE ABOVEGROUND HEIGHT OF THE FENCE.
- ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.
- FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.
- SEDIMENT FENCE SHOULD NOT BE INSTALLED ON UNCOMPACTED FILLS OR IN EXTREMELY LOOSE SOILS (E.G. SANDY LOAM), IN ROCKY SOIL WHERE ANCHORING MAY BE DIFFICULT, OR IN FORESTED AREAS WHERE TREE ROOTS MAY BE SEVERED DURING INSTALLATION.
- MAXIMUM ALLOWABLE SLOPE LENGTHS FOR RUNOFF CONTRIBUTING TO SEDIMENT FENCING ARE SHOWN ABOVE.

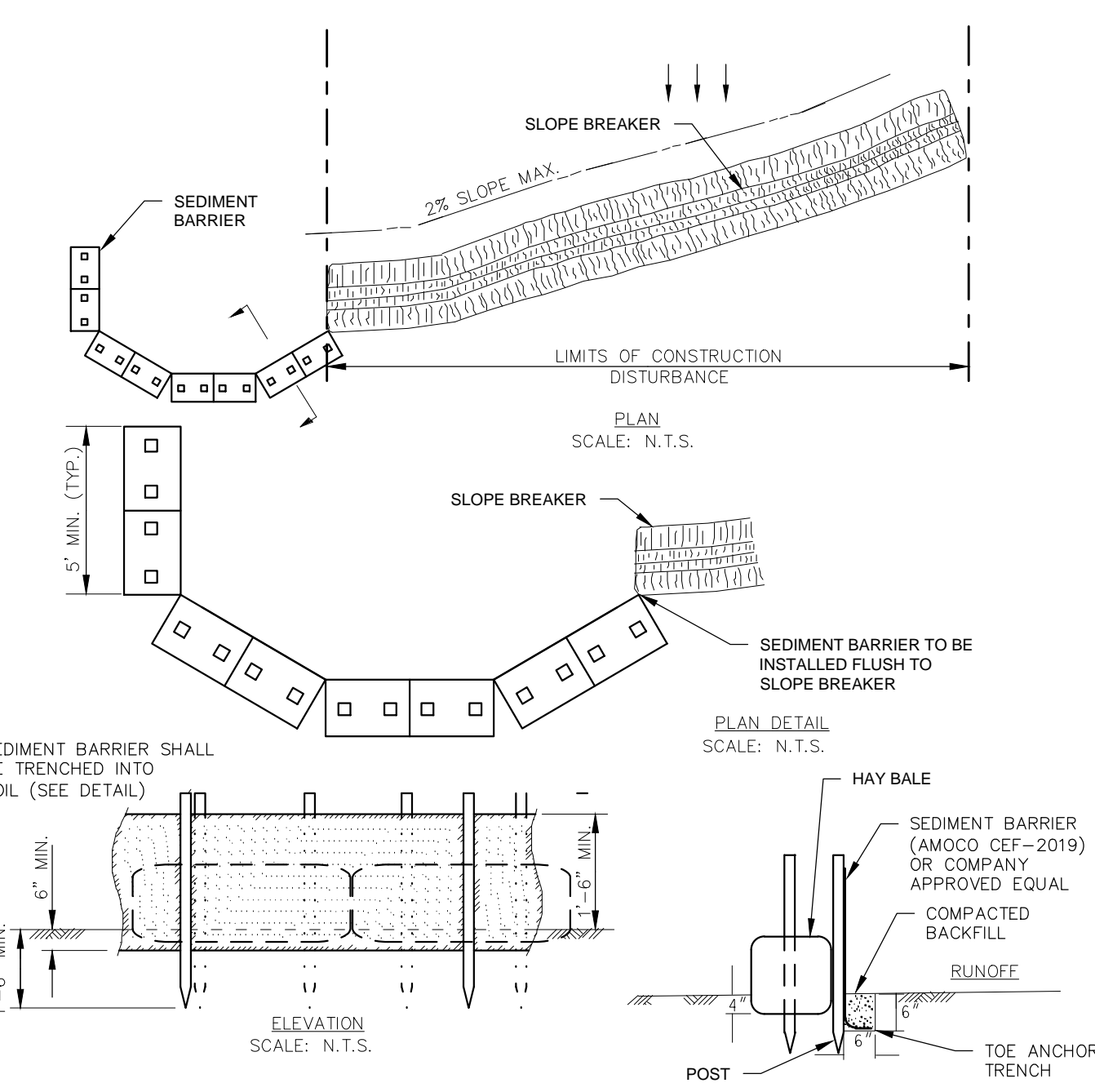
FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D1682
ELONGATION AT FAILURE (%)	50% MAX.	ASTM D1682
MULLEN BURST STRENGTH (PSI)	200	ASTM D3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	
PUNCTURE STRENGTH (LB)	40	ASTM D751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	40 - 80	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	90	ASTM G-26

PERCENT SLOPE	MAXIMUM SLOPE DISTANCE ABOVE FENCE (FT)
2	250
5	180
10	100
20	50
30	30



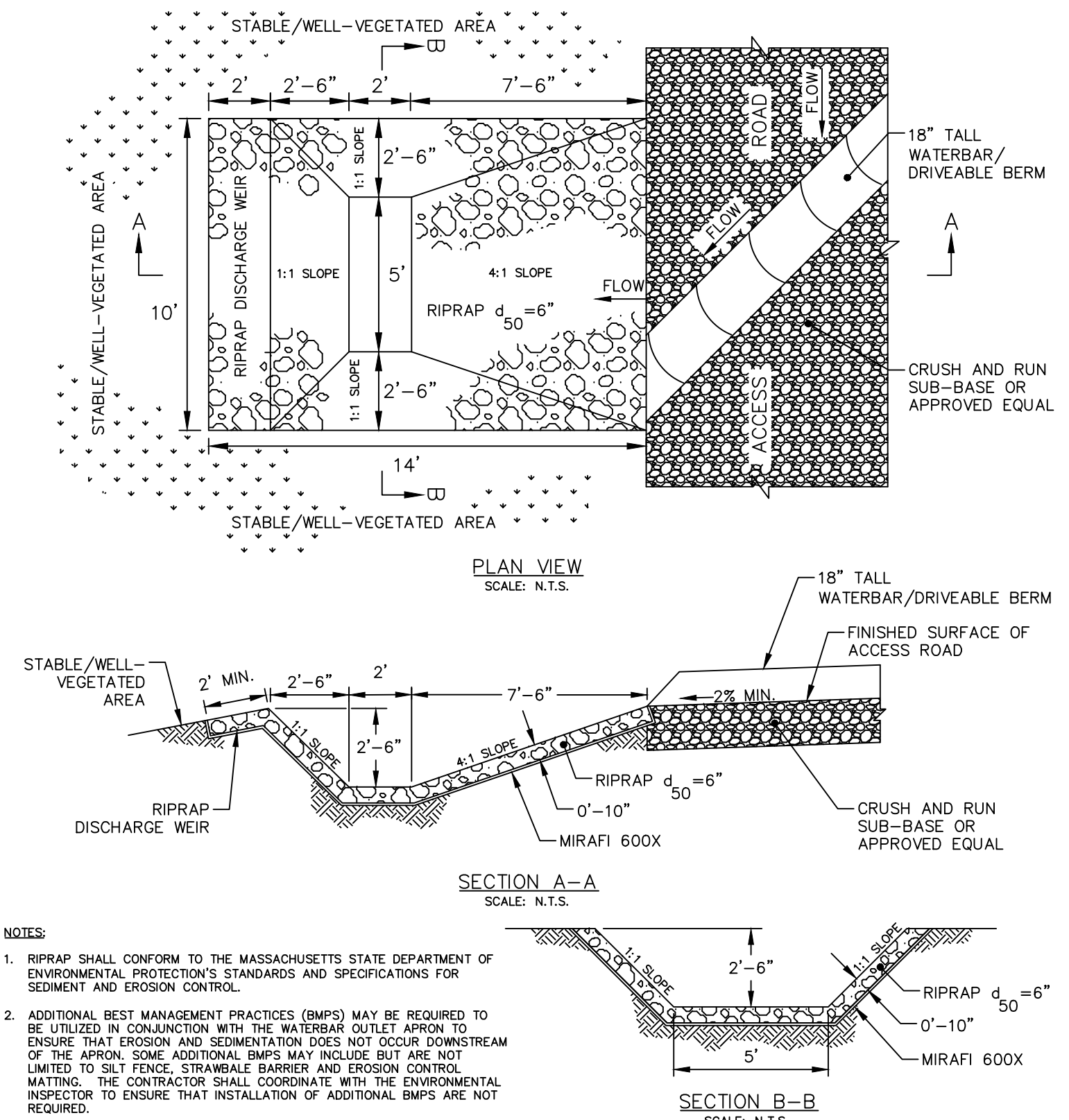
- WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "V" TYPE, PINE OR HARDWOOD.
- FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 14 GAUGE, 6" MAXIMUM MESH OPENING.
- WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER FABRIC SHALL BE EITHER FILTER X, MERRILL 100X, STABILIZED 1400L OR APPROVED EQUIVALENT.
- PREFABRICATED UNITS SHALL BE GEOTAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
- MAXIMUM DRAINAGE AREA FOR OVERLAND FLOW TO A SILT FENCE SHALL NOT EXCEED 1/4 ACRE PER 100 FEET OF FENCE.
- MAXIMUM ALLOWABLE SLOPE LENGTHS CONTRIBUTING TO SEDIMENT FENCING ARE AS FOLLOWS:

	DESCRIPTION REINFORCED SEDIMENT FENCE	FIGURE NO.	17
		DATE	10/2011



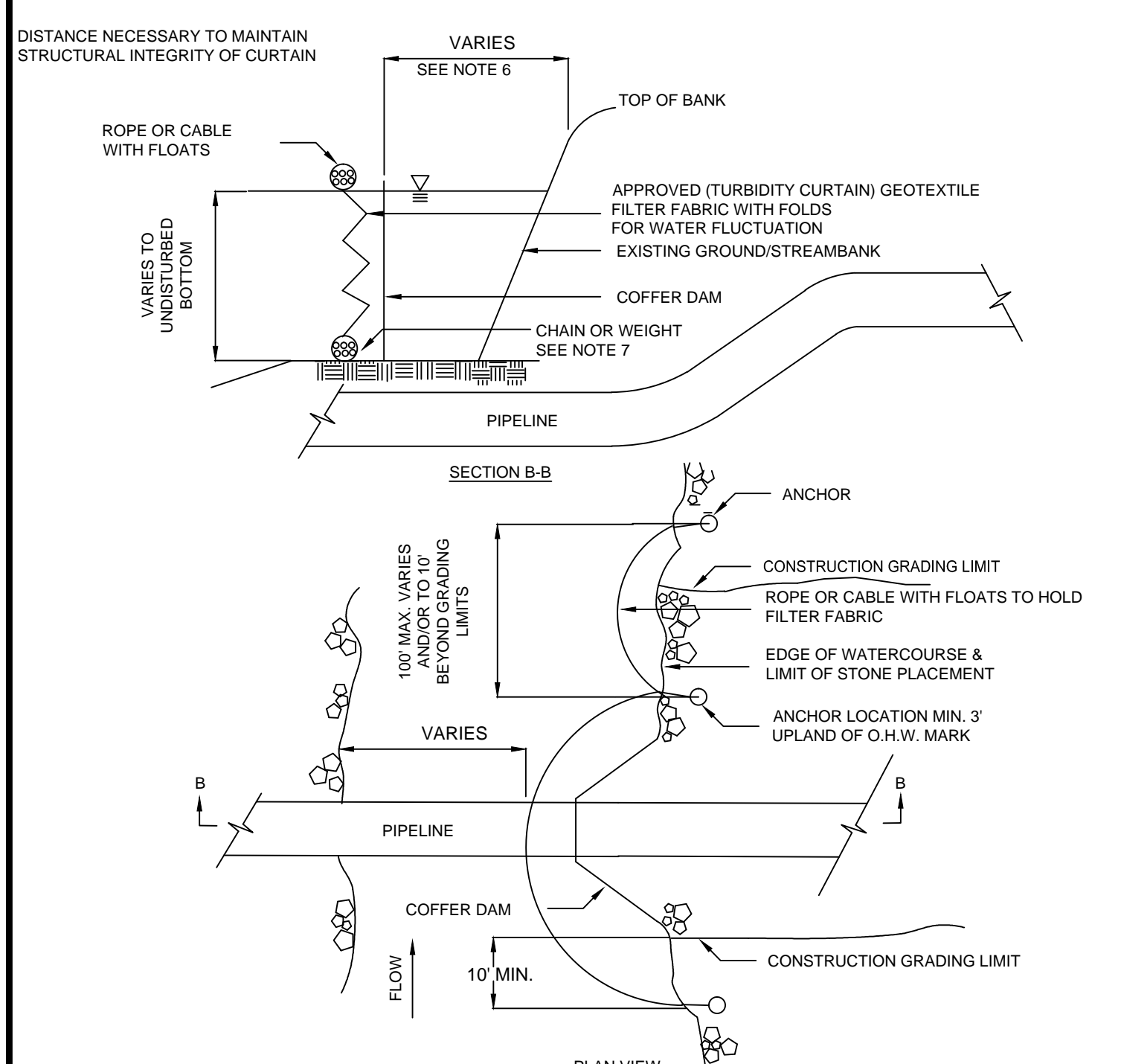
- NOTES:**
- REINFORCED SEDIMENT BARRIER HOOKS SHALL BE PLACED AT THE OUTLET OF SLOPE BREAKERS AS SHOWN ON THE PLAN.
 - ONCE THE DISTURBED AREA IS STABILIZED, THE REINFORCED SEDIMENT BARRIER HOOK SHALL BE REMOVED AND ANY DISTURBED AREAS CAUSED BY REMOVAL SHALL BE RETURNED TO ORIGINAL CONDITION AND REVEGETATED.
 - SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE SEDIMENT BARRIER.
 - STAKES SHALL BE 2"x2"x48" HARDWOOD OR EQUIVALENT STEEL ("U" OR "T") STAKES.

	DESCRIPTION REINFORCED SEDIMENT BARRIER HOOK OUTLET STRUCTURE	FIGURE NO.	18
		DATE	10/2011



- NOTES:**
- RIPRAP SHALL CONFORM TO THE MASSACHUSETTS STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL.
 - ADDITIONAL BEST MANAGEMENT PRACTICES (BMPs) MAY BE REQUIRED TO BE UTILIZED IN CONJUNCTION WITH THE WATERBAR OUTLET APRON TO ENSURE THAT EROSION AND SEDIMENTATION DOES NOT OCCUR DOWNSTREAM OF THE APRON. SOME ADDITIONAL BMPs MAY INCLUDE BUT ARE NOT LIMITED TO SILT FENCE, STRAWBALE BARRIER AND EROSION CONTROL MATTING. THE CONTRACTOR SHALL COORDINATE WITH THE ENVIRONMENTAL INSPECTOR TO ENSURE THAT INSTALLATION OF ADDITIONAL BMPs ARE NOT REQUIRED.

	DESCRIPTION WATERBAR OUTLET APRON	FIGURE NO.	19
		DATE	10/2011

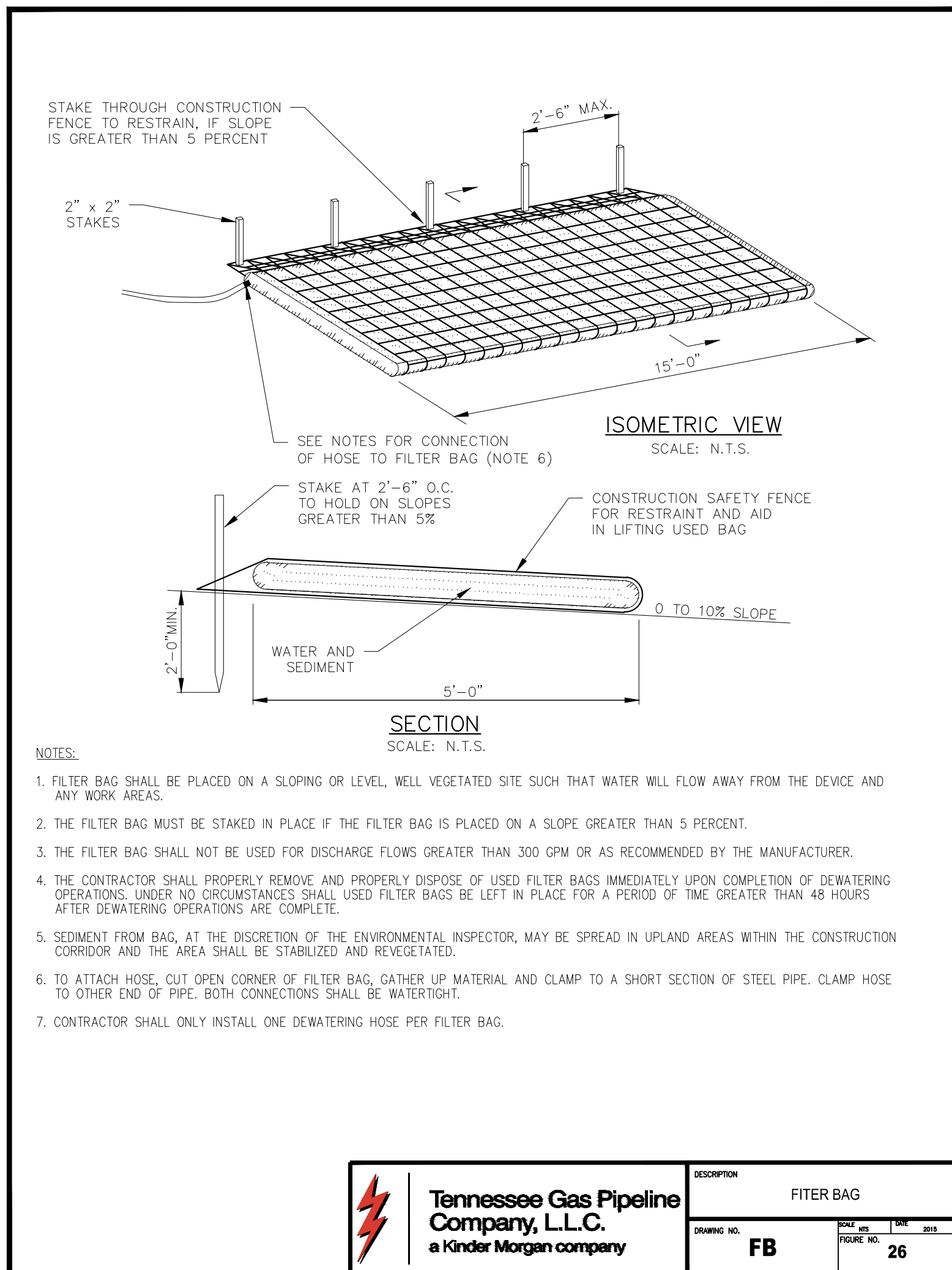


- NOTES:**
- TO BE USED IN AREAS AS OUTLINED IN THE CONSTRUCTION DRAWINGS OR AS ORDERED BY THE ENVIRONMENTAL INSPECTOR.
 - HEIGHT OF THE CURTAIN SHALL BE 20% GREATER THAN THE DEPTH OF THE WATER.
 - NOT PERMITTED FOR USE ACROSS WATERCOURSES.
 - AREA SHALL NOT CONTAIN LARGE CURVED OR ANGLE AREAS.
 - TURBIDITY CURTAIN SHALL BE A MAX OF 100' LONG FOR EACH SECTION OF CURTAIN REQUIRED. END SECTIONS SHALL TERMINATE 10' BEYOND THE LIMIT OF DISTURBANCE.
 - THE TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
 - THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR OF THE BOTTOM OF THE WATERBODY.

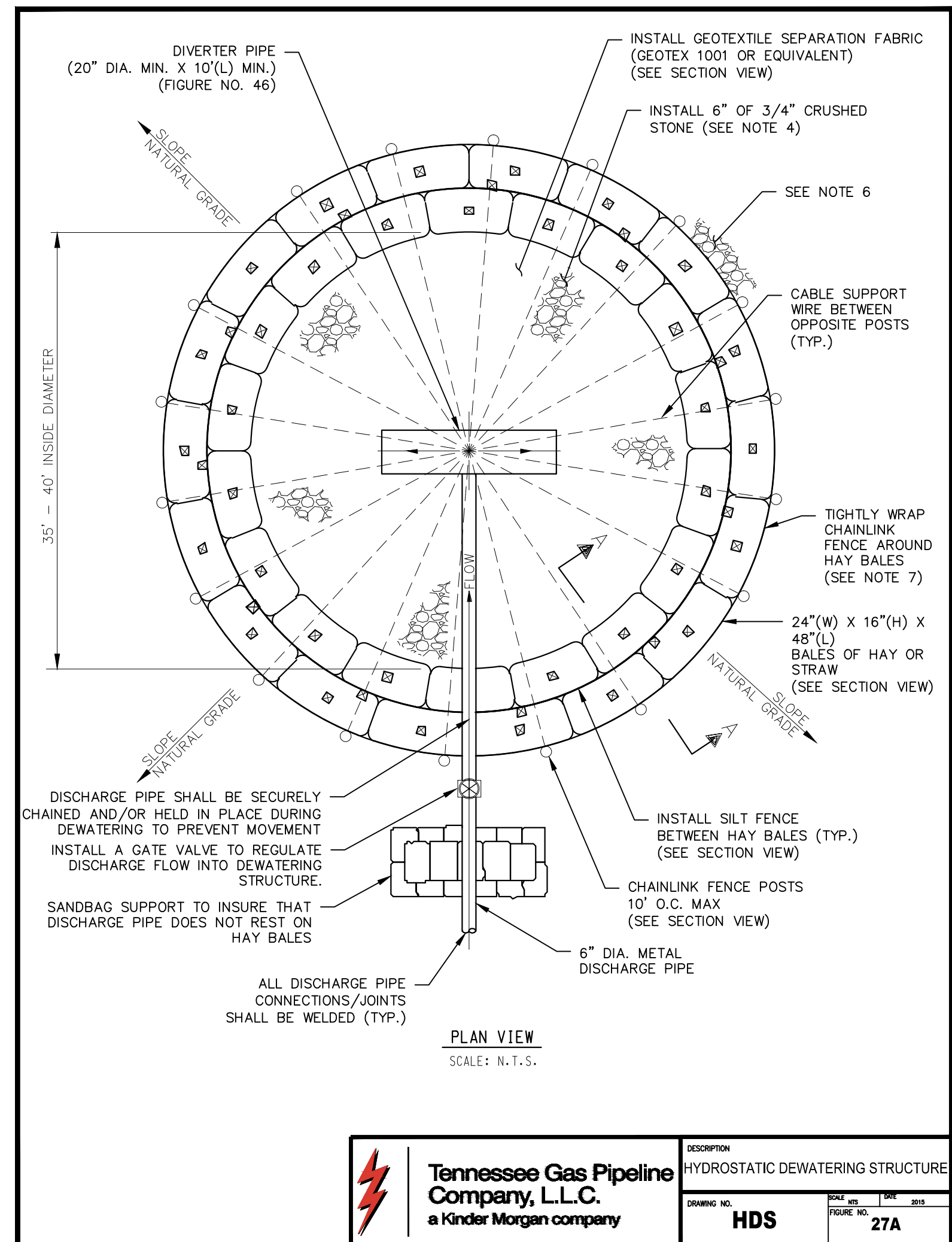
	DESCRIPTION SILT CURTAIN	FIGURE NO.	20
		DATE	10/2011

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

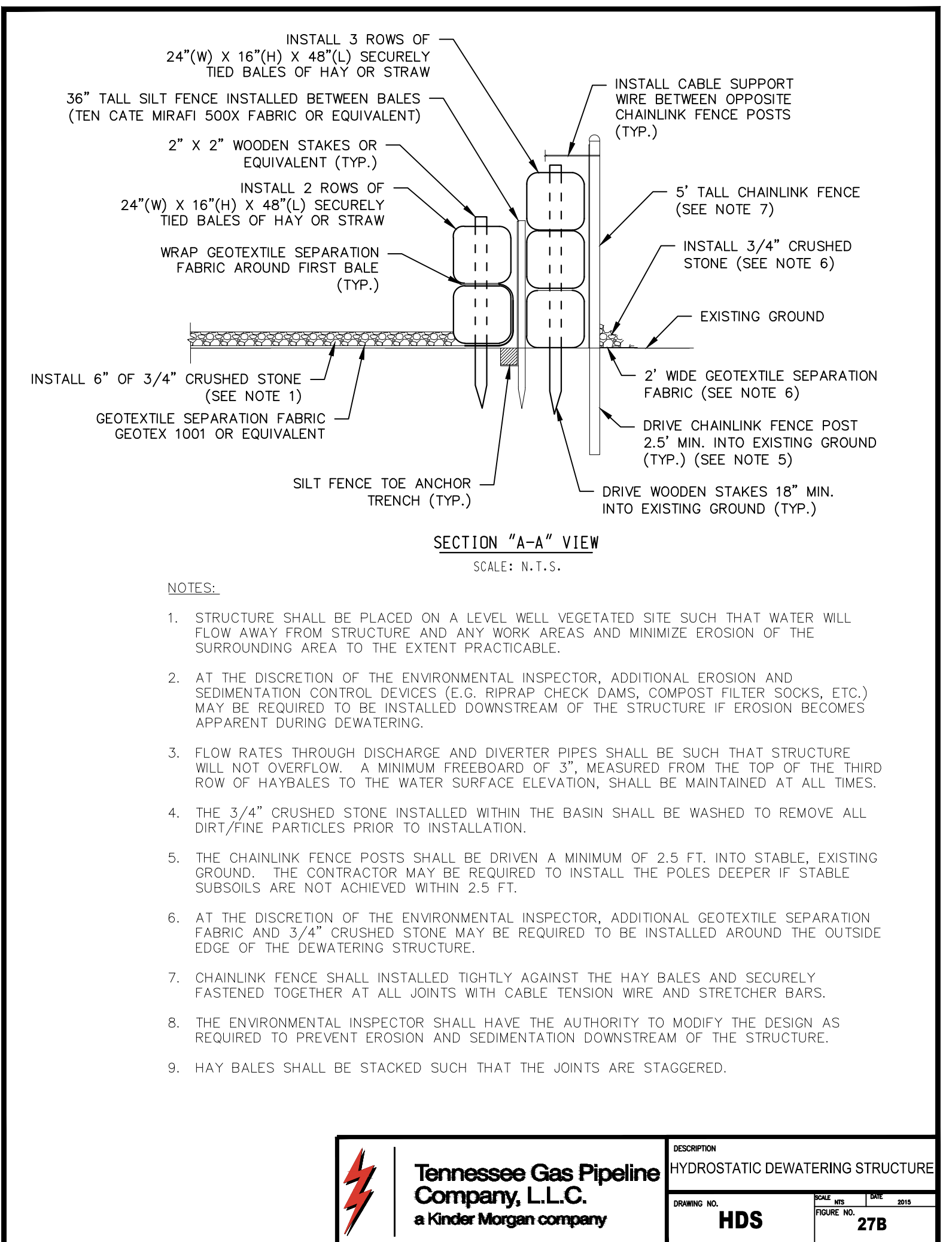
NORTHEAST ENERGY DIRECT PROJECT EROSION & SEDIMENT CONTROL TYPICALS MASSACHUSETTS		
Section:	Township:	Range:
Co./Par.:	State: MASSACHUSETTS	
Division:	Op. Area:	
Drafter: GV	Date:	Project ID:
Chk'd:	Date:	Scale:
Approved:	Date:	Filename: MA_ES_DETAILS_003
		Sheet:
		Type:



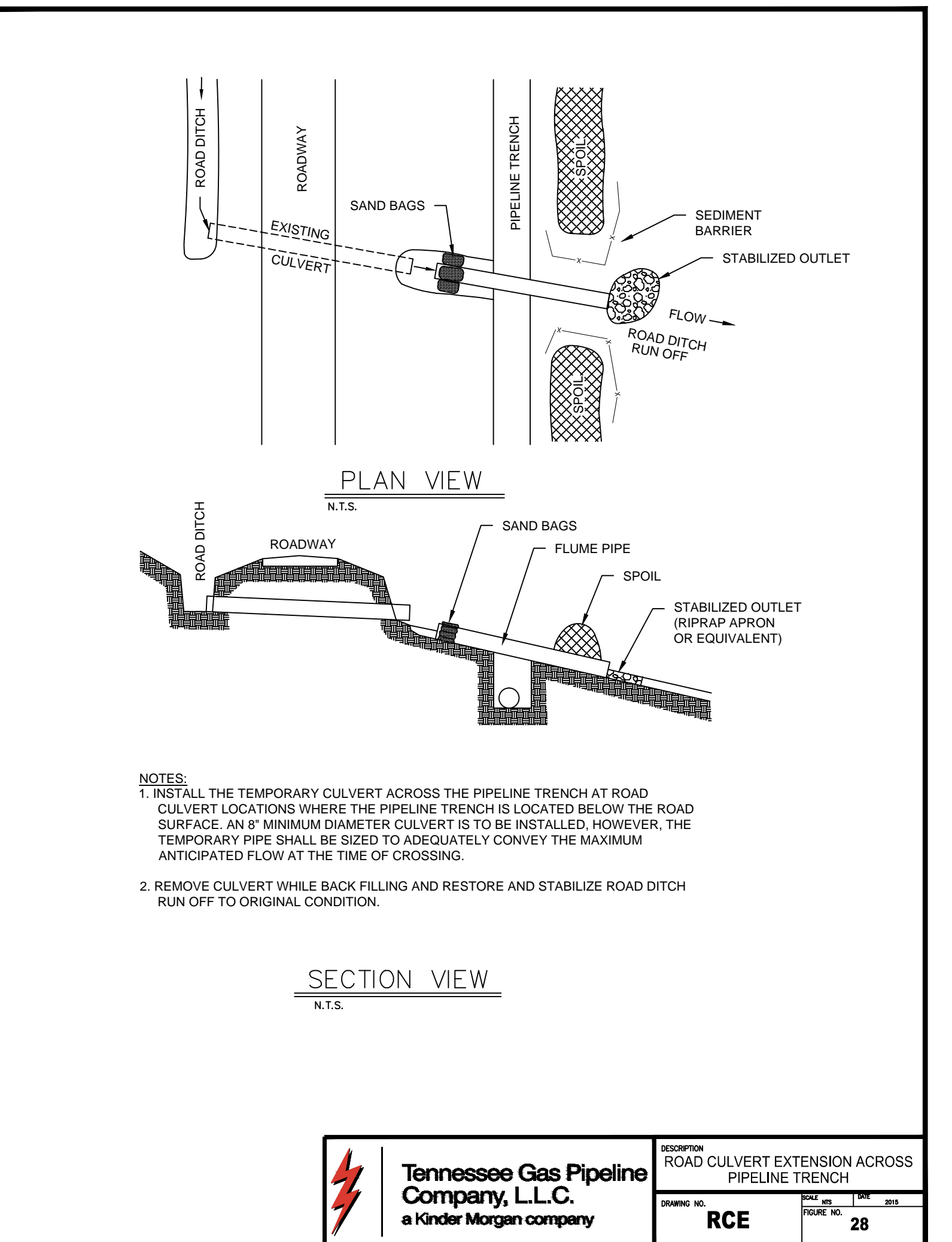
	DESCRIPTION	FILTER BAG
	DRAWING NO.	FB
	FIGURE NO.	26



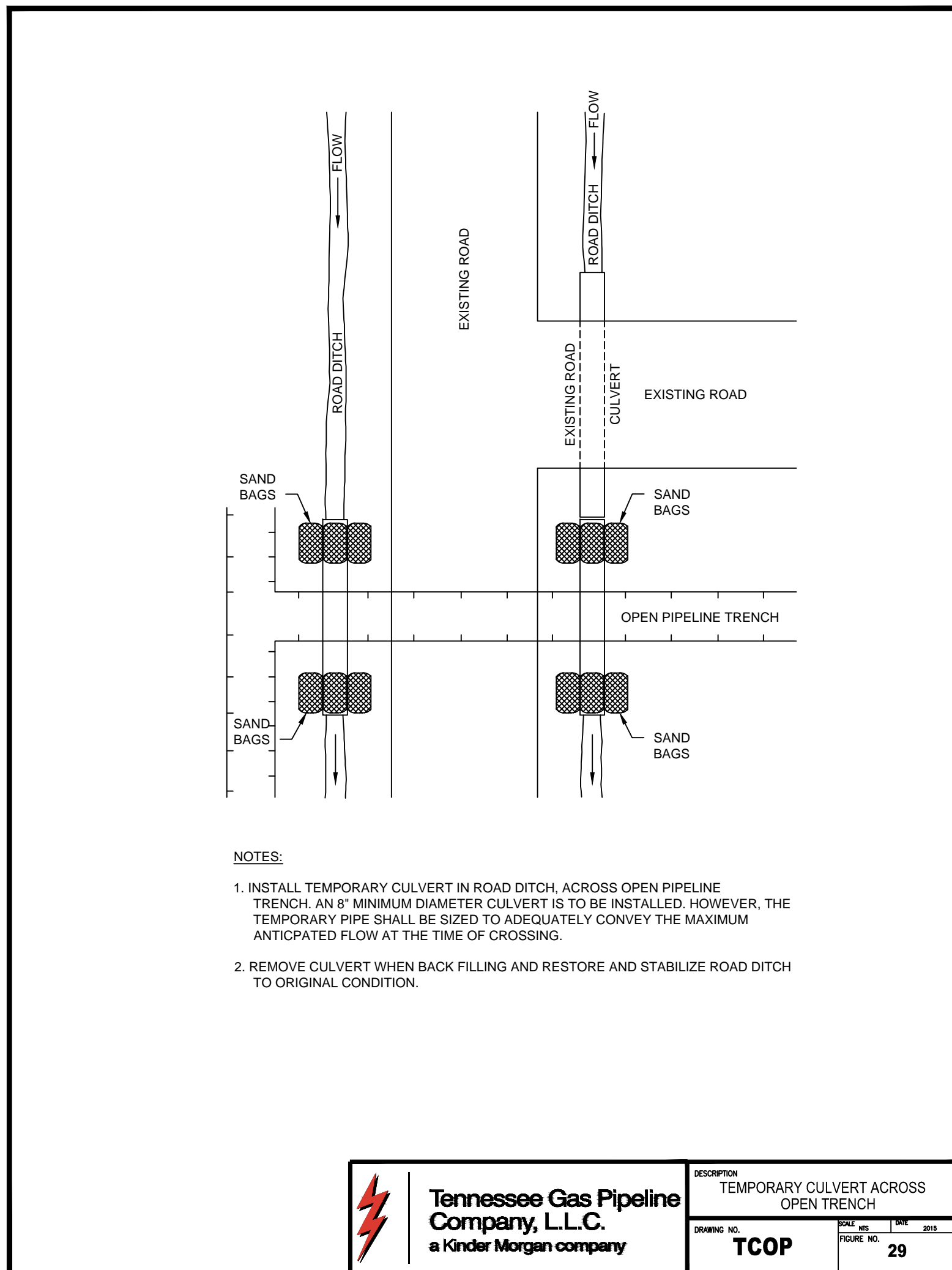
	DESCRIPTION	HYDROSTATIC DEWATERING STRUCTURE
	DRAWING NO.	HDS
	FIGURE NO.	27A



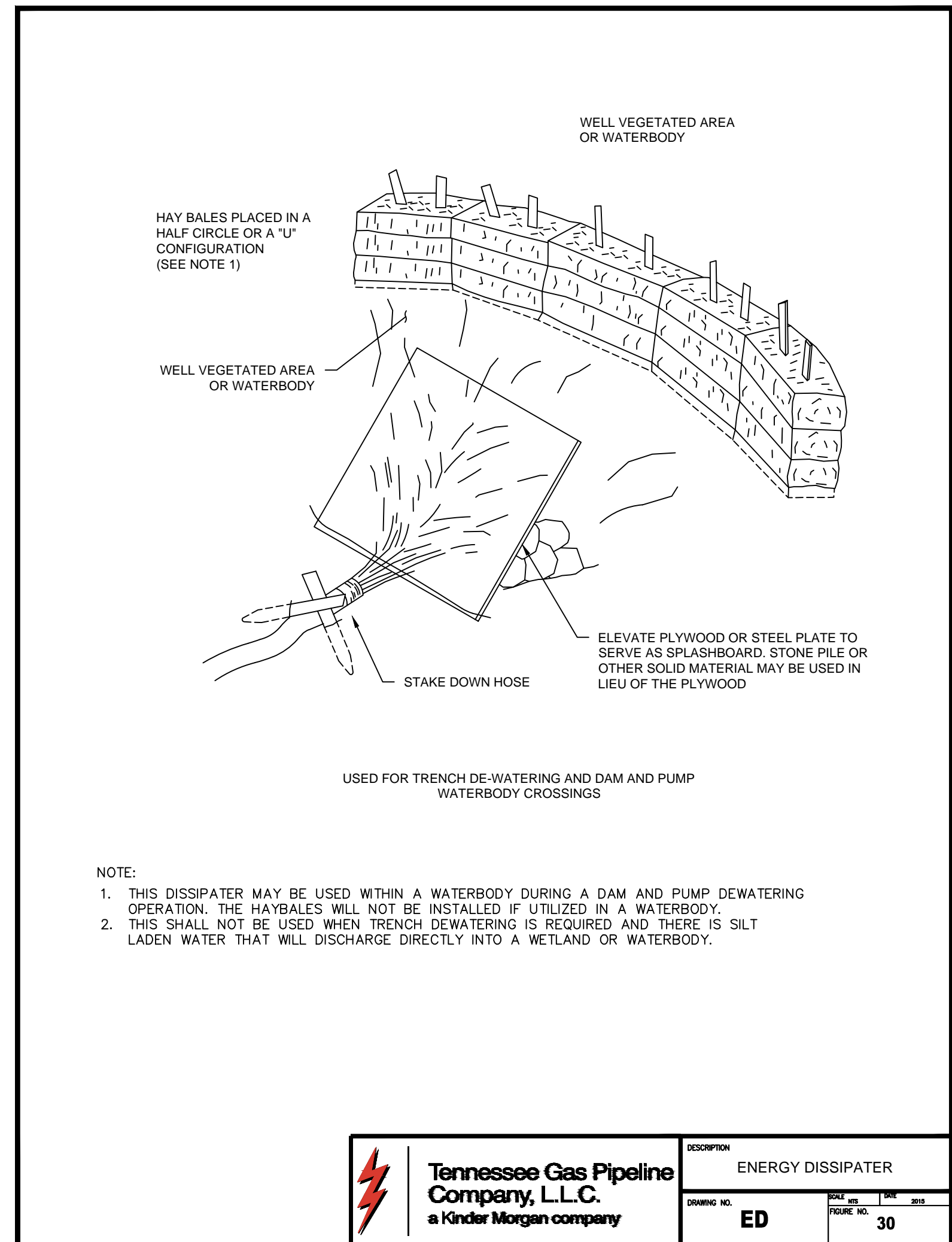
	DESCRIPTION	HYDROSTATIC DEWATERING STRUCTURE
	DRAWING NO.	HDS
	FIGURE NO.	27B



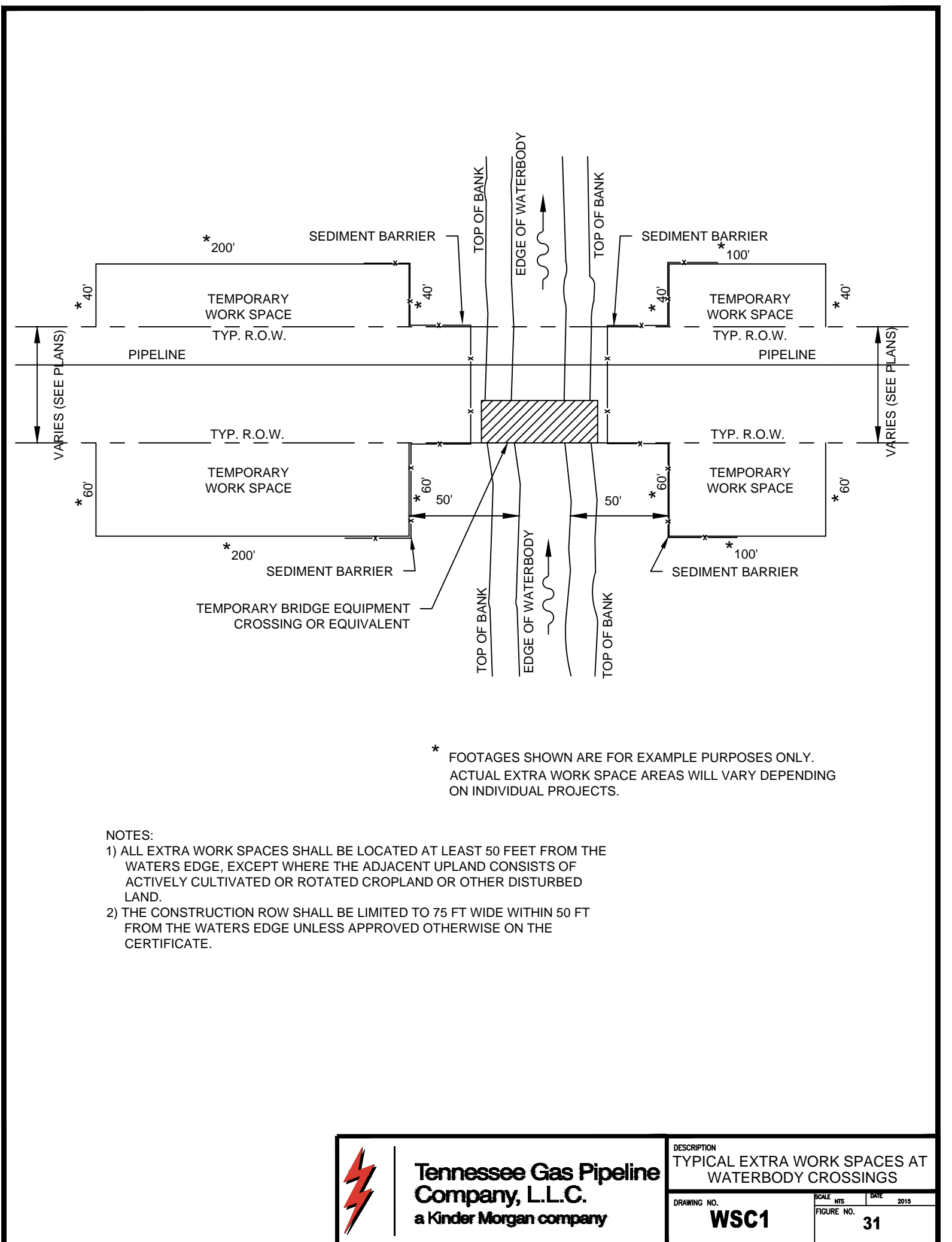
	DESCRIPTION	ROAD CULVERT EXTENSION ACROSS PIPELINE TRENCH
	DRAWING NO.	RCE
	FIGURE NO.	28



	DESCRIPTION	TEMPORARY CULVERT ACROSS OPEN TRENCH
	DRAWING NO.	TCOP
	FIGURE NO.	29



	DESCRIPTION	ENERGY DISSIPATER
	DRAWING NO.	ED
	FIGURE NO.	30

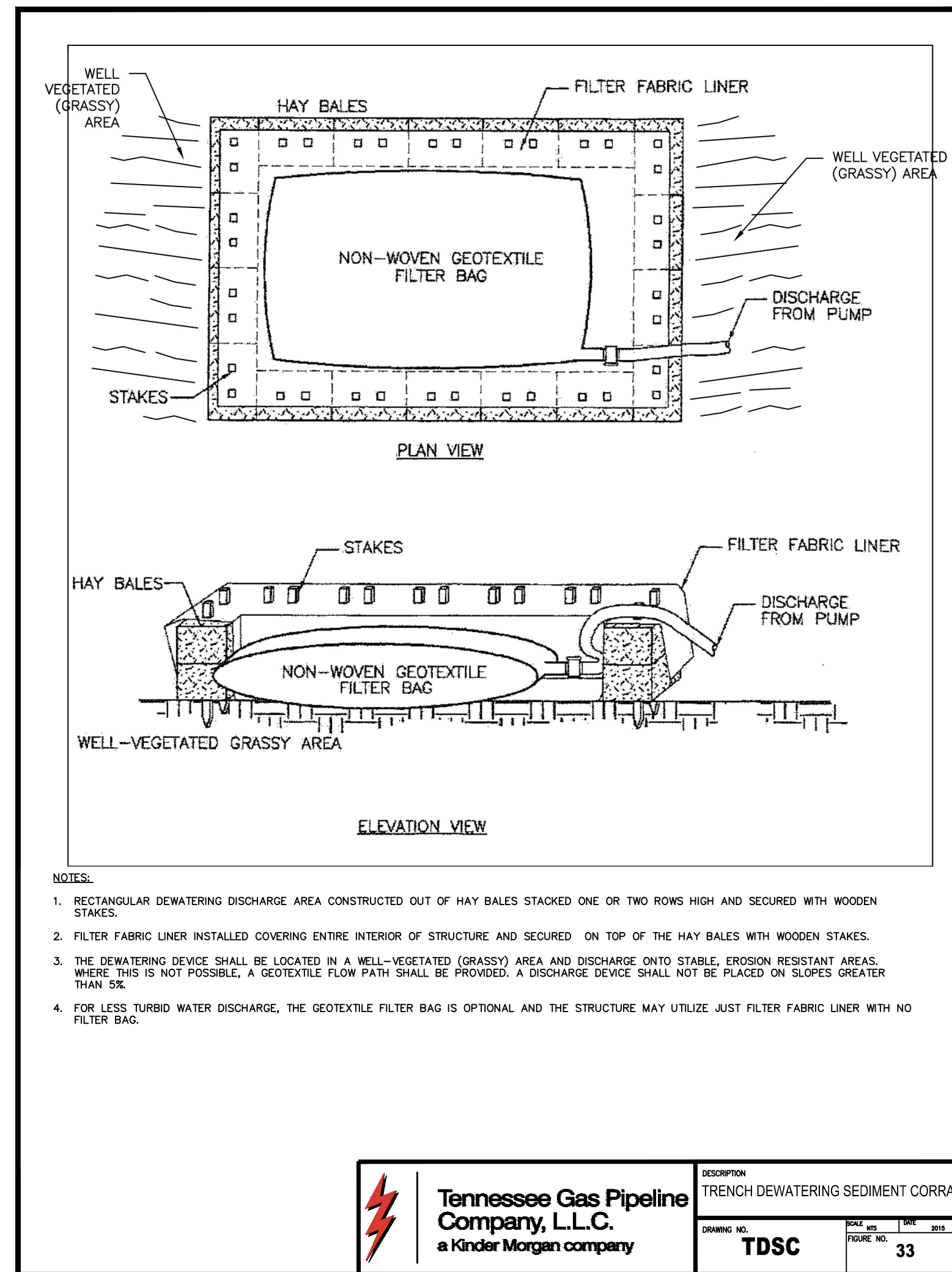
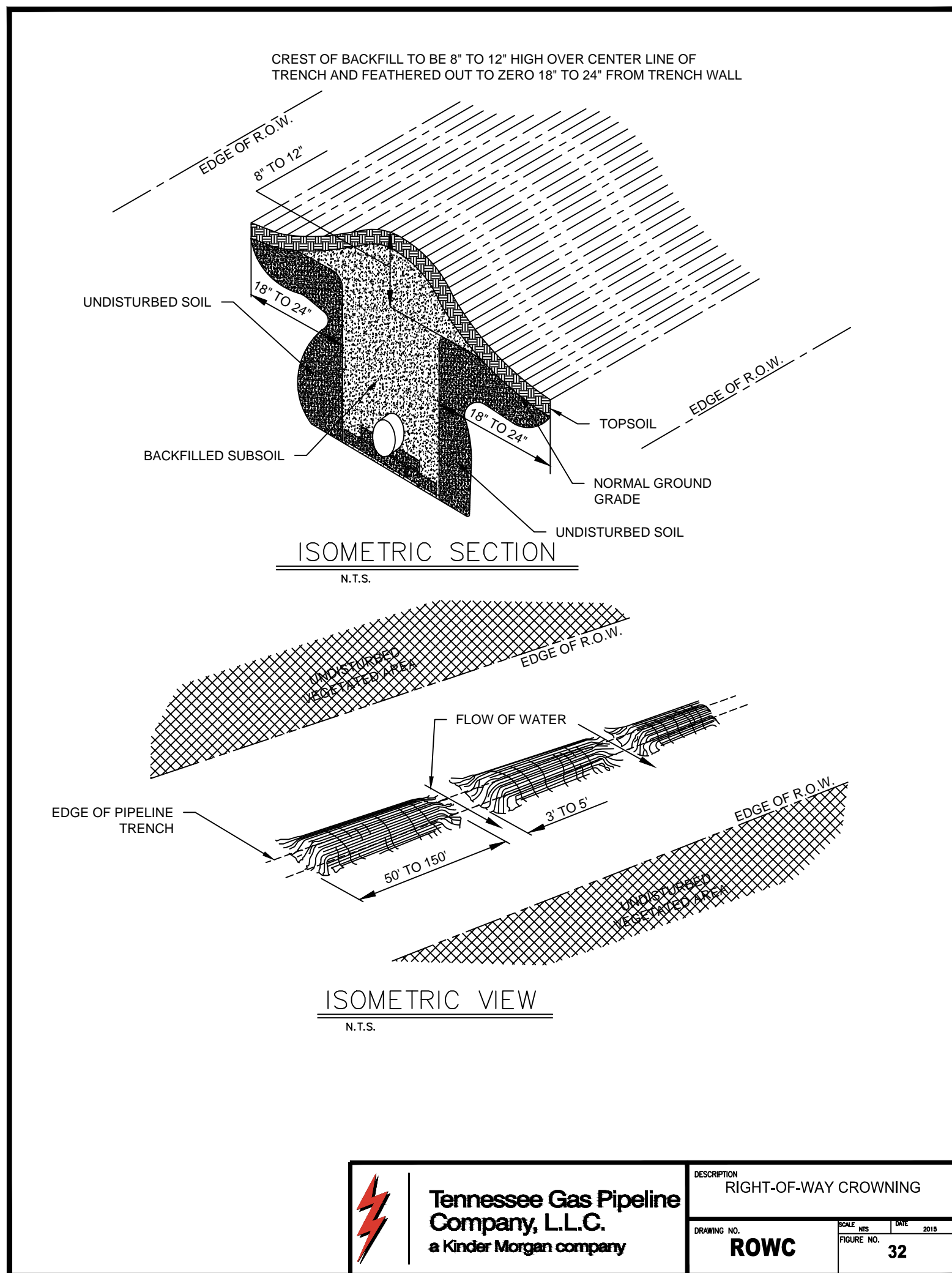


	DESCRIPTION	TYPICAL EXTRA WORK SPACES AT WATERBODY CROSSINGS
	DRAWING NO.	WSC1
	FIGURE NO.	31

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section:	Township:	Range:
Co./Par.:	State:	MASSACHUSETTS
Division:	Op. Area:	
Drafter: GV	Date:	Project ID:
Chk'd:	Date:	Scale:
Approved:	Date:	Filename: MA_ES_DETAILS_005
		Sheet:
		Type:

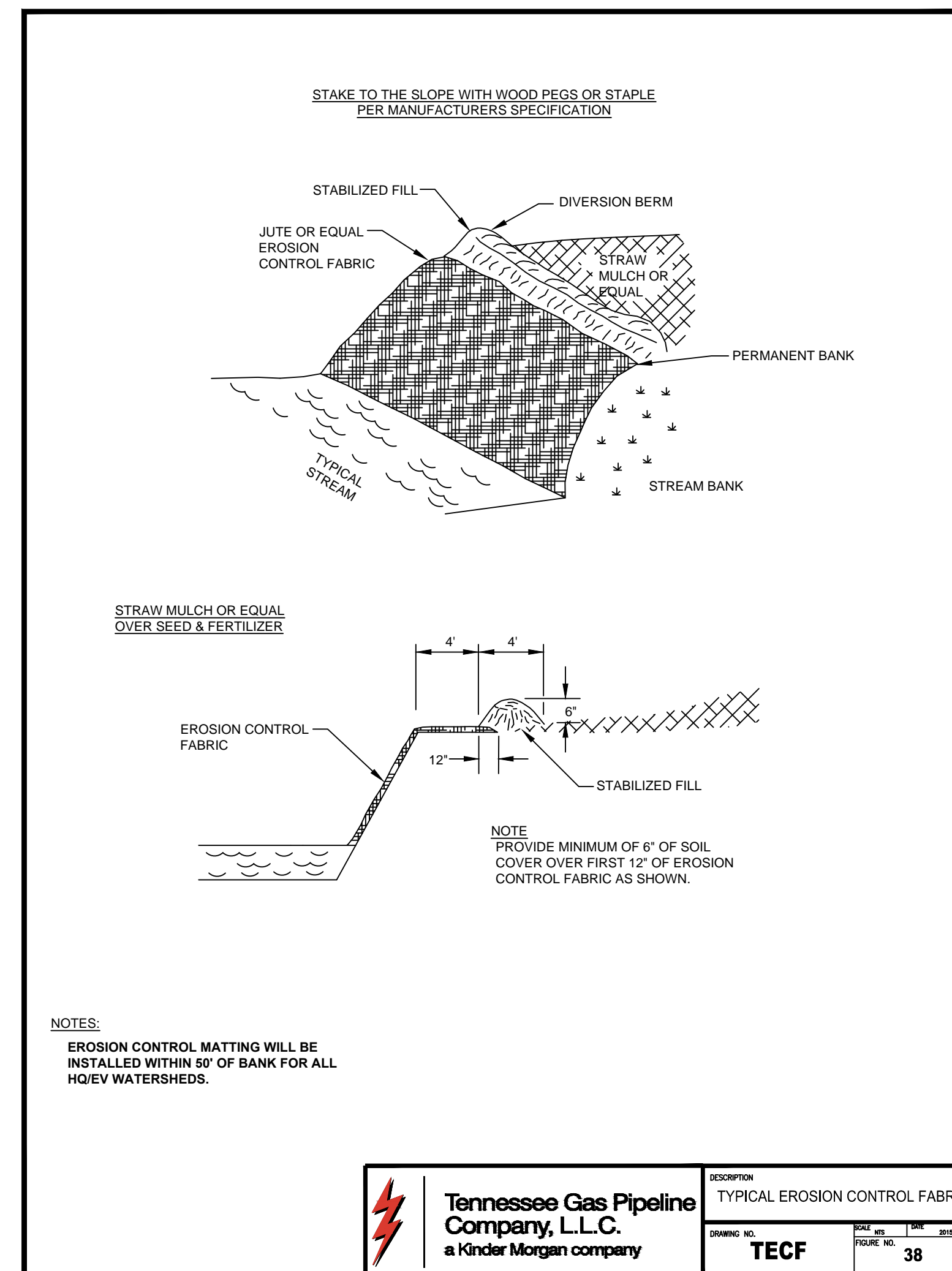
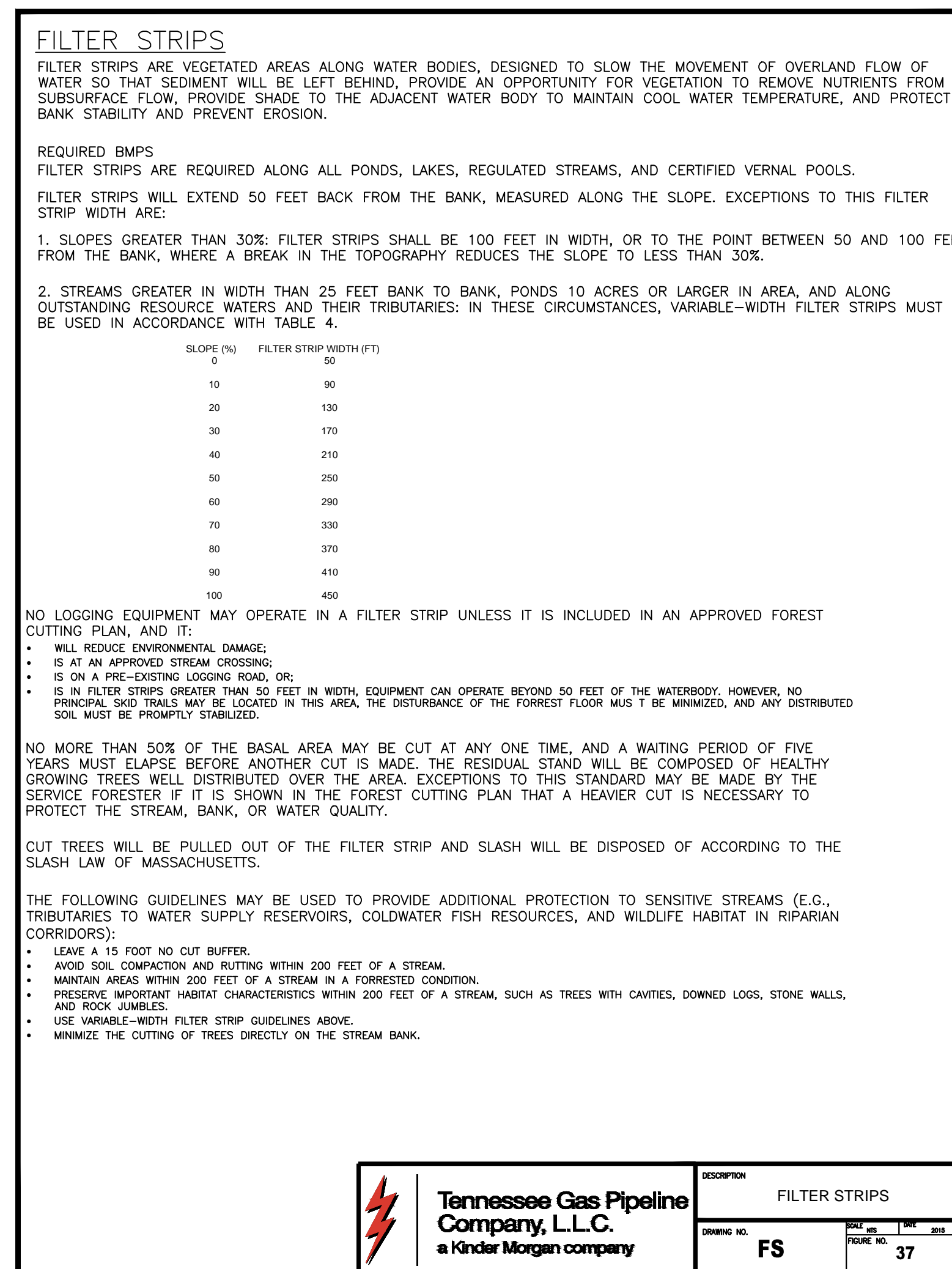
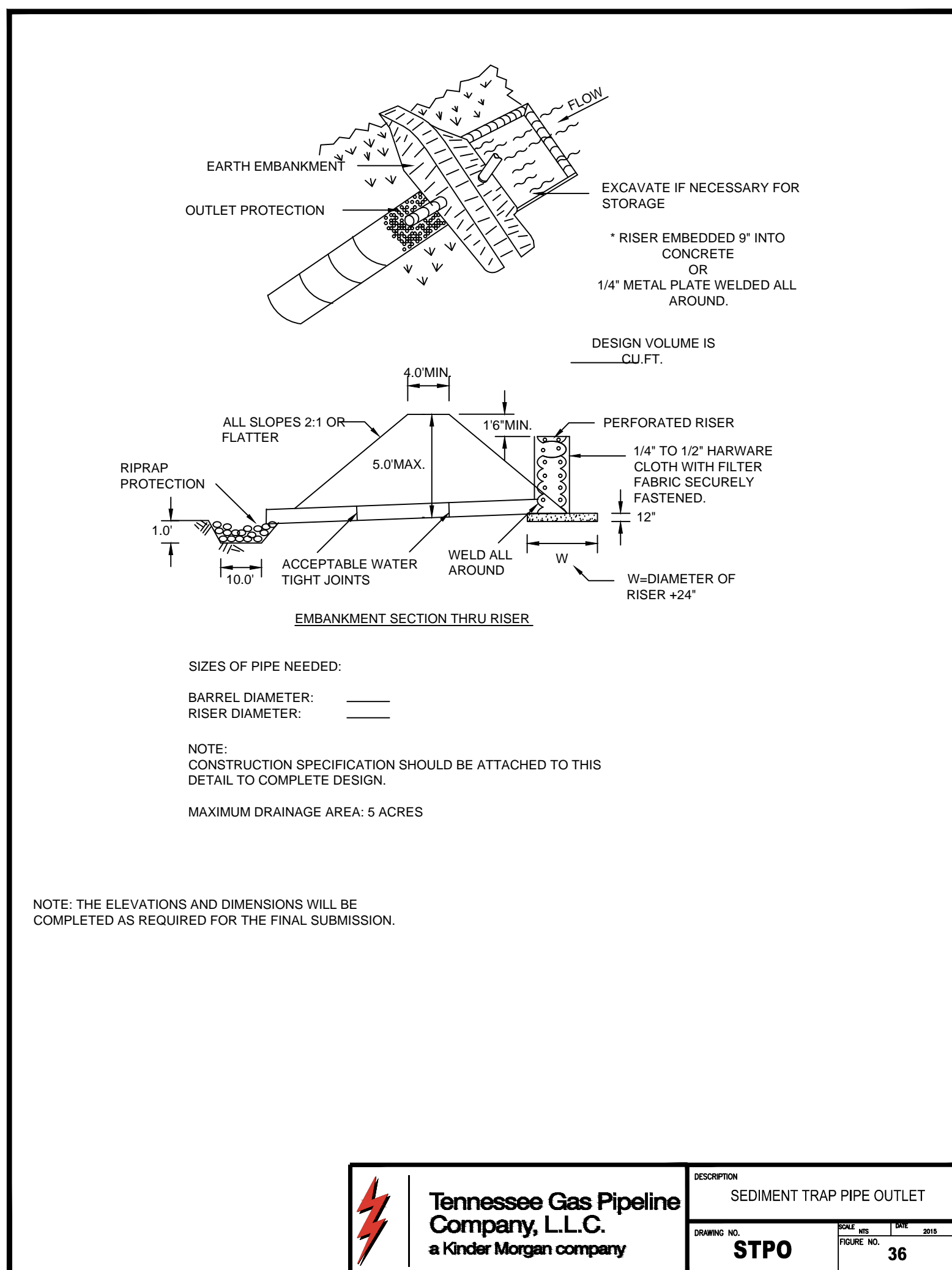
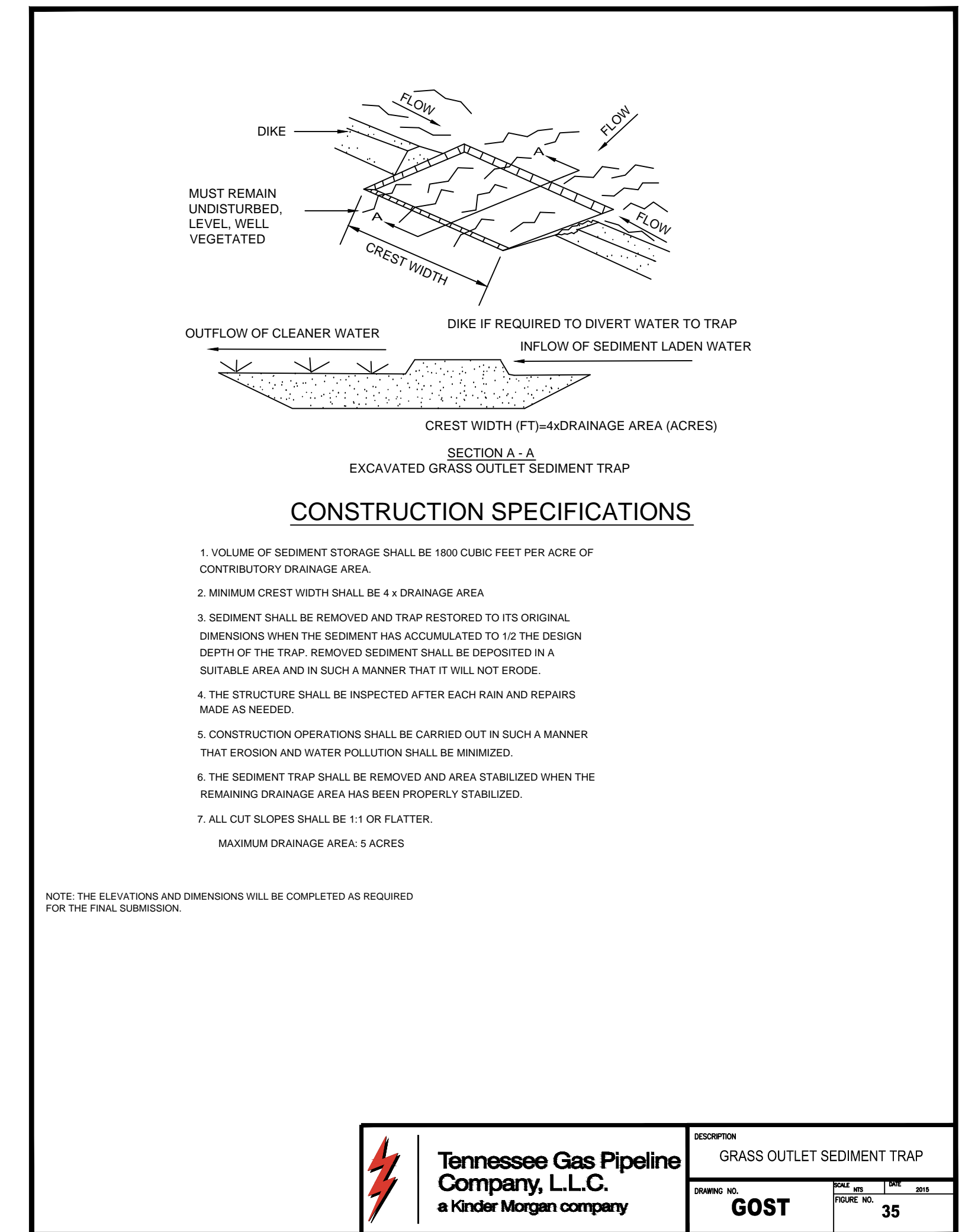


NOTES:

- THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL ALONG THE SITE. THE CONTRACTOR SHALL COORDINATE WITH THE ENVIRONMENTAL INSPECTOR TO DETERMINE WHICH PRACTICES ACCOMMODATE THEIR NEEDS BASED ON SPECIFIC SITE AND WEATHER CONDITIONS. SOME OF THE TYPICAL PRACTICES INCLUDE THE FOLLOWING:
 - SPRINKLING/IRRIGATION, SPRINKLING THE GROUND SURFACE WITH WATER UNTIL IT IS MOIST IS AN EFFECTIVE DUST CONTROL METHOD FOR HAUL ROADS AND OTHER TRAFFIC ROUTES (SMOLEN ET AL., 1988). THIS PRACTICE CAN BE APPLIED TO ALMOST ANY SITE.
 - VEGETATIVE COVER, IN AREAS NOT EXPECTED TO HANDLE VEHICLE TRAFFIC, VEGETATIVE STABILIZATION OF DISTURBED SOIL IS OFTEN DESIRABLE. VEGETATIVE COVER PROVIDES COVERAGE TO SURFACE SOILS AND SLOWS WIND VELOCITY AT THE GROUND SURFACE, THUS REDUCING THE POTENTIAL FOR DUST TO BECOME AIRBORNE.
 - MULCH, MULCHING CAN BE A QUICK AND EFFECTIVE MEANS OF DUST CONTROL FOR A RECENTLY DISTURBED AREA (SMOLEN ET AL., 1988).
 - WIND BREAKS, WIND BREAKS ARE BARRIERS (EITHER NATURAL OR CONSTRUCTED) THAT REDUCE WIND VELOCITY THROUGH A SITE AND THEREFORE REDUCE THE POSSIBILITY OF SUSPENDED PARTICLES. WIND BREAKS CAN BE TREES OR SHRUBS LEFT IN PLACE DURING SITE CLEARING OR CONSTRUCTED BARRIERS SUCH AS A WIND FENCE, SNOW FENCE, TARP CURTAIN, HAY BALE, CRATE WALL, OR SEDIMENT WALL (USEPA, 1992).
 - TILLAGE, DEEP TILLAGE IN LARGE OPEN AREAS BRINGS SOIL CLOSER TO THE SURFACE WHERE THEY REST ON TOP OF DUST, PREVENTING IT FROM BECOMING AIRBORNE.
 - STONE, STONE MAY BE AN EFFECTIVE DUST DETERRENT FOR CONSTRUCTION ROADS AND ENTRANCES OR AS A MULCH IN AREAS WHERE VEGETATION CANNOT BE ESTABLISHED.
 - SPRAY-ON CHEMICAL SOIL TREATMENTS, THE PENNSYLVANIA DIRT AND GRAVEL ROAD PROGRAM HAS PLACED STRICT LIMITATIONS ON THE USE OF PRODUCTS THAT MAY CAUSE DAMAGE TO THE ENVIRONMENT. WITH THIS IN MIND, IT HAS APPROVED A NUMBER OF CHEMICAL DUST SUPPRESSANTS. WHEN CONSIDERING CHEMICAL APPLICATION TO SUPPRESS DUST, CONSIDERATION SHOULD BE TAKEN AS TO WHETHER THE CHEMICAL IS BIODEGRADABLE OR WATER-SOLUBLE AND WHAT EFFECT ITS APPLICATION COULD HAVE ON THE SURROUNDING ENVIRONMENT, INCLUDING WATERBODIES AND WILDLIFE.
- TABLE H.1 SHOWS APPLICATION RATES FOR SOME COMMON DUST SUPPRESSANTS, AS RECOMMENDED BY THE PENNSYLVANIA DIRT AND GRAVEL ROAD PROGRAM.

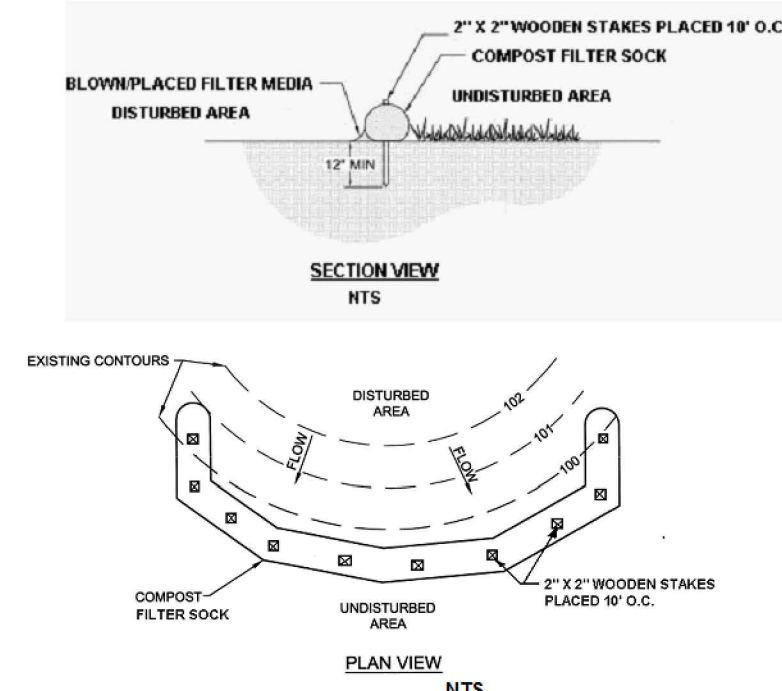
PRODUCT	WATER DILUTION	TYPE
PENN SUPPRESS "D"	1:4 EMULSION TO WATER (MINIMUM)	PETROLEUM EMULSION
ULTRABOND 2000	1:4 EMULSION TO WATER (MINIMUM)	PETROLEUM EMULSION
COHEREX	1:10 EMULSION TO WATER (MINIMUM)	PETROLEUM EMULSION
DUST BOND	1:10 EMULSION TO WATER (MINIMUM)	PETROLEUM EMULSION
EK 35	100% ACTIVE, NOT WATER REQUIRED FOR APPLICATION	SYNTHETIC FLUID
ENVIROKLEEN	100% ACTIVE, NOT WATER REQUIRED FOR APPLICATION	SYNTHETIC FLUID
PAVE-CYRL SUPPRESS	AS RECEIVED (51% SOLIDS)	ACRYLIC POLYMER (PVA)
PAVE-CYRL SUPPRESS PLUS	AS RECEIVED (51% SOLIDS)	ACRYLIC POLYMER (PVA)
DIRT GLUE	AS RECEIVED (51% SOLIDS)	ACRYLIC POLYMER (PVA)

DESCRIPTION: DUST CONTROL
DRAWING NO: DC
FIGURE NO: 34



NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					
NORTHEAST ENERGY DIRECT PROJECT EROSION & SEDIMENT CONTROL TYPICALS MASSACHUSETTS					
Section:		Township:		Range:	
Co./Par.:		State:		MASSACHUSETTS	
Division:		Op. Area:			
Drawer:	GV	Date:	Project ID:		
Chk'd:	Date:	Scale:		File name:	
Approved:	Date:	Sheet:		MA_ES_DETAILS_006	
		Type:			

**STANDARD CONSTRUCTION DETAIL 4-1
COMPOST FILTER SOCK**



Adapted from Filtrix

Sock fabric shall meet standards of Table 4.1. Compost shall meet the following standards:

Organic Matter Content	80% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.0
Moisture Content	35% - 55%
Particle Size	98% pass through 1" screen
Soluble Salt Concentration	5.0 dS Maximum

NOTES:

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 500 FEET. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUN OFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

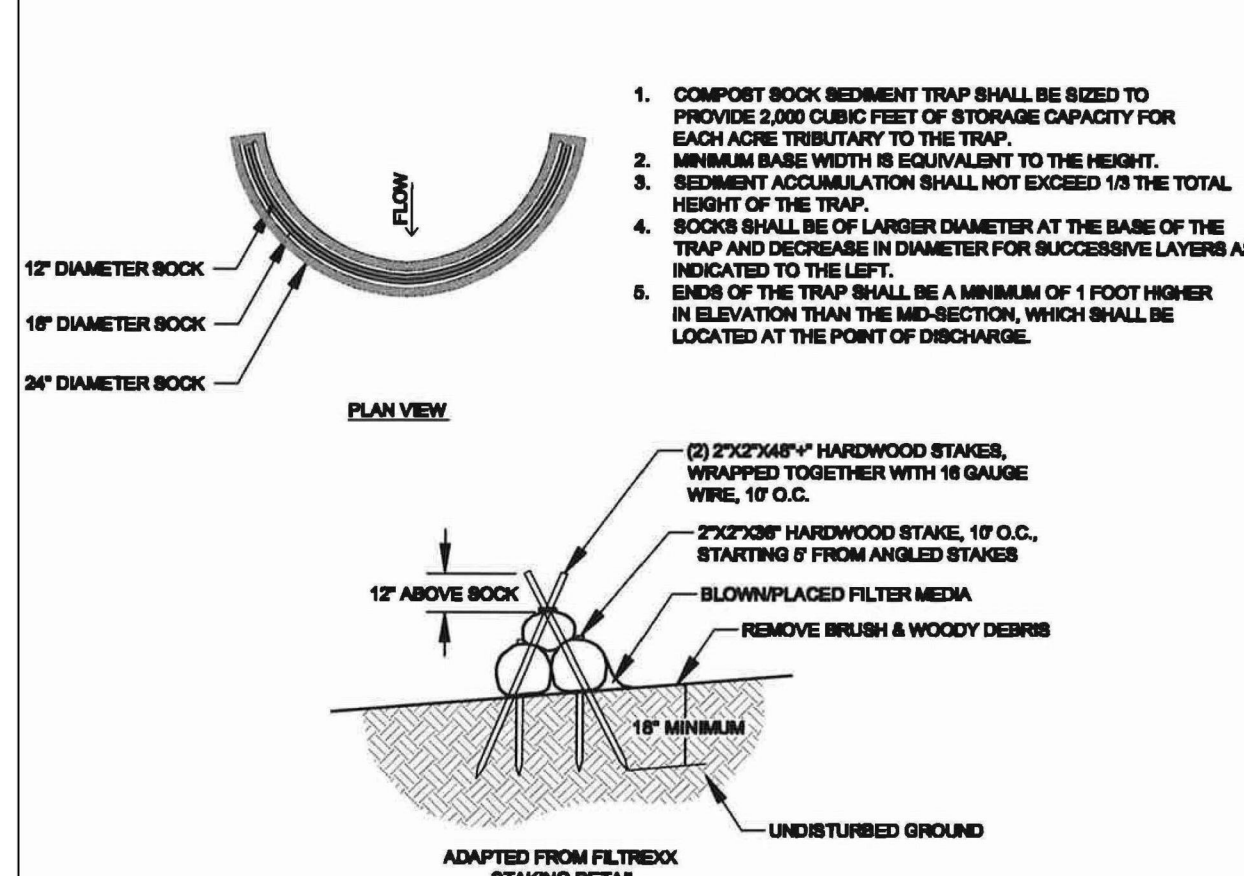
BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

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 MULCH SPREAD AS SOIL SUPPLEMENT.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: COMPOST FILTER SOCK
DRAWING NO.: CFS
FIGURE NO.: 39

COMPOST SOCK SEDIMENT TRAP



SOCK MATERIAL SHALL MEET THE STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE FOLLOWING STANDARDS:

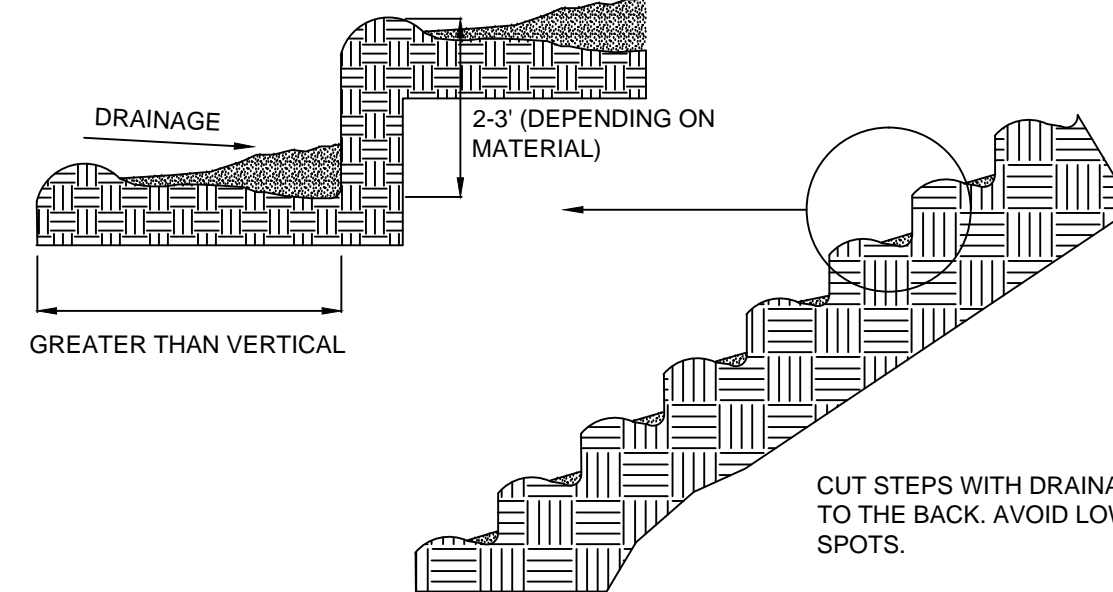
Organic Matter Content	80% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.0
Moisture Content	35% - 55%
Particle Size	98% Pass Through 1" Screen
Soluble Salt Concentration	5.0 dS Maximum

COMPOST SOCK TRAPS SHALL NOT EXCEED THREE FEET IN HEIGHT AND SHALL BE STACKED IN PYRAMIDAL FORM AS SHOWN ABOVE. MINIMUM TRAP HEIGHT IS 24" DIAMETER SOCK. ADDITIONAL STORAGE MAY BE PROVIDED BY MEANS OF AN EXCAVATED BUMP 18" DEEP EXTENDING 1 TO 2 FEET UP SLOPE OF THE SOCK.
COMPOST SOCK TRAPS SHALL PROVIDE 2,000 CUBIC FEET STORAGE CAPACITY WITH 12" FREEBOARD FOR EACH TRIBUTARY DRAINAGE AREA. THE MAXIMUM TRIBUTARY DRAINAGE AREA IS 6.5 ACRES. SINCE COMPOST SOCKS ARE "FLOW THROUGH", NO RILLWAY IS REQUIRED.
COMPOST SOCK TRAPS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE HEIGHT OF THE SOCK.
PHOTODEGRADABLE AND BIODEGRADABLE SOCKS SHALL NOT BE USED FOR MORE THAN 1 YEAR.

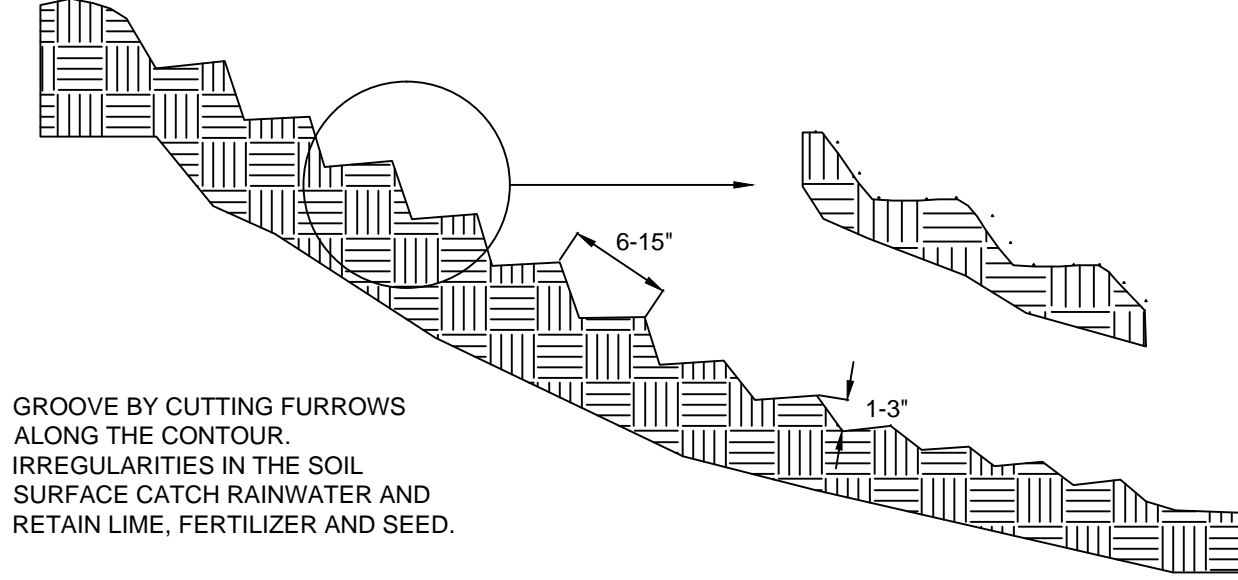
Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: COMPOST SOCK SEDIMENT TRAP
DRAWING NO.: CSST
FIGURE NO.: 40

DEBRIS FROM SLOPE ABOVE IS CAUGHT BY STEPS



STAIR STEPPING CUT SLOPES

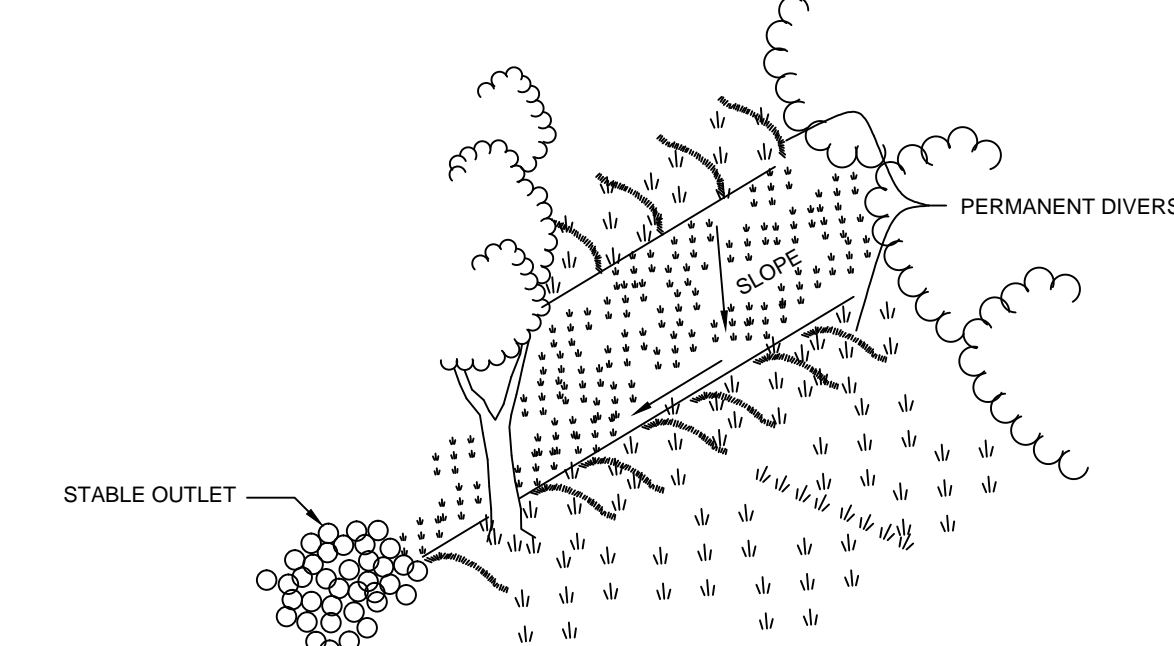
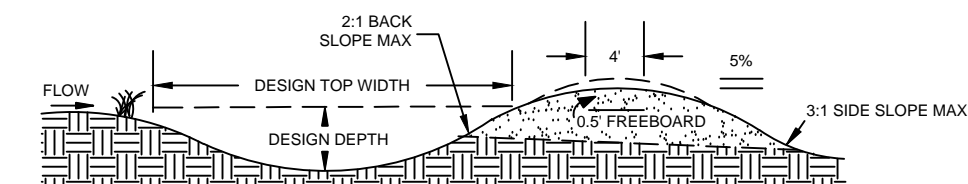


GROOVE BY CUTTING FURROWS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND RETAIN LIME, FERTILIZER AND SEED.

GROOVING SLOPES

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: SURFACE ROUGHENING
DRAWING NO.: SR
FIGURE NO.: 41



CONSTRUCTION SPECIFICATIONS

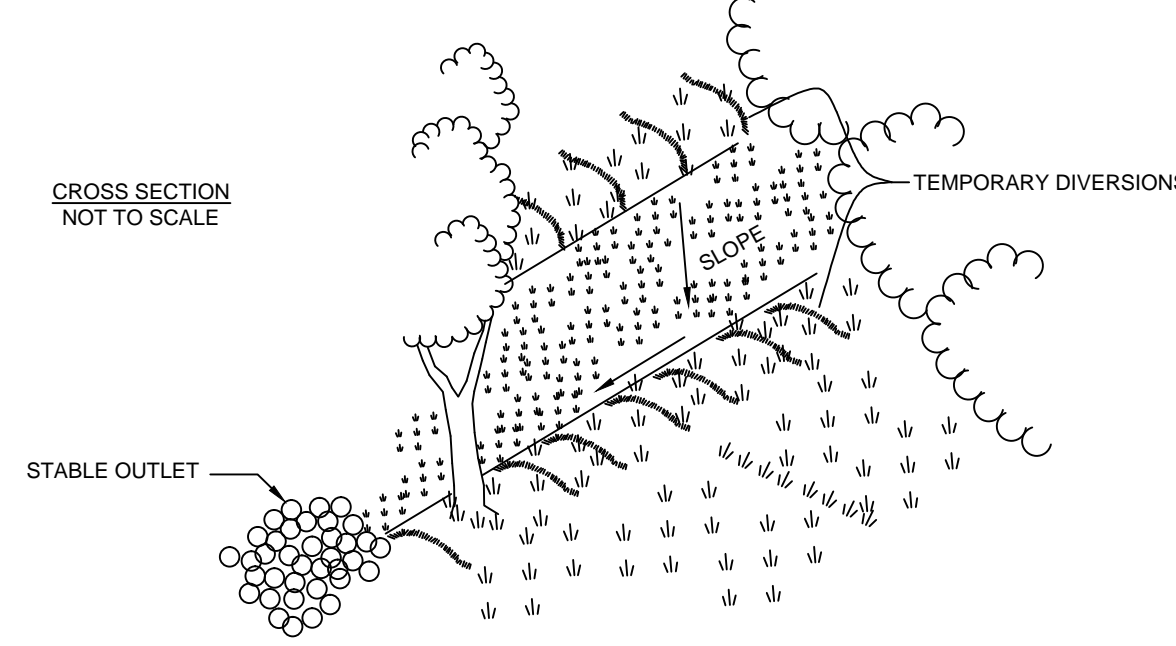
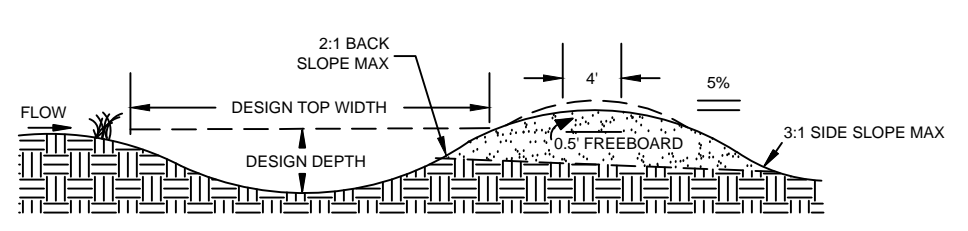
- INSTALL DIVERSIONS AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
- STABILIZE PERMANENT DIVERSIONS WITH VEGETATION OR MATERIALS SUCH AS RIPRAP, PAVING STONE, OR CONCRETE AS SOON AS POSSIBLE AFTER INSTALLATION. VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE IMMEDIATELY SEEDED AND MULCHED.
- TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED SO THE WILL NOT INTERFERE WITH PROPER FUNCTIONING OF THE DIVERSION.
- DITCHES OR GULLIES WHICH MUST BE CROSSED SHALL BE FILLED AND COMPACTED PRIOR TO OR AS PART OF THE CONSTRUCTION.
- THE BASE FOR THE DIVERSION RIDGE SHOULD BE PREPARED SO THAT A GOOD BOND IS OBTAINED BETWEEN THE ORIGINAL GROUND AND THE PLACED FILL. VEGETATION SHALL BE REMOVED AND THE BASE THOROUGHLY DISKED BEFORE PLACEMENT OF THE FILL. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
- DIVERTED RUNOFF SHOULD OUTLET ONTO A STABILIZED OUTLET AREA INTO A PROPERLY DESIGNED WATERWAY. GRADE STABILIZATION STRUCTURE OR SEDIMENT TRAPPING FACILITY. PERMANENT PIPE SLOPE DRAINS MAY BE USED ALONG THE DIVERSIONS TO CARRY CONCENTRATED RUNOFF UP HILL OF THE DIVERSION SAFELY DOWN STEEP SLOPES AND DISCHARGING INTO A STABILIZED WATER COURSE. SEDIMENT TRAPPING DEVICE OR ONTO A STABILIZATION AREA.
- PERIODICALLY INSPECT DIVERSIONS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.
- THE GRADE MAY BE VARIABLE DEPENDING UPON THE TOPOGRAPHY AND MUST HAVE A POSITIVE GRADE TO THE OUTLET. THE MAXIMUM CHANNEL GRADE SHOULD BE LIMITED TO 1%.
- THE GRADE MAY BE VARIABLE DEPENDING UPON THE TOPOGRAPHY AND MUST HAVE A POSITIVE GRADE TO THE OUTLET.
- SIDE SLOPE:

MAXIMUM SPACING OF DIVERSIONS

PERCENT SLOPE	SPACING (FT)
<1	300
2	200
3 TO 5	150
>5	100

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: PERMANENT DIVERSION
DRAWING NO.: PD
FIGURE NO.: 42



CONSTRUCTION SPECIFICATIONS

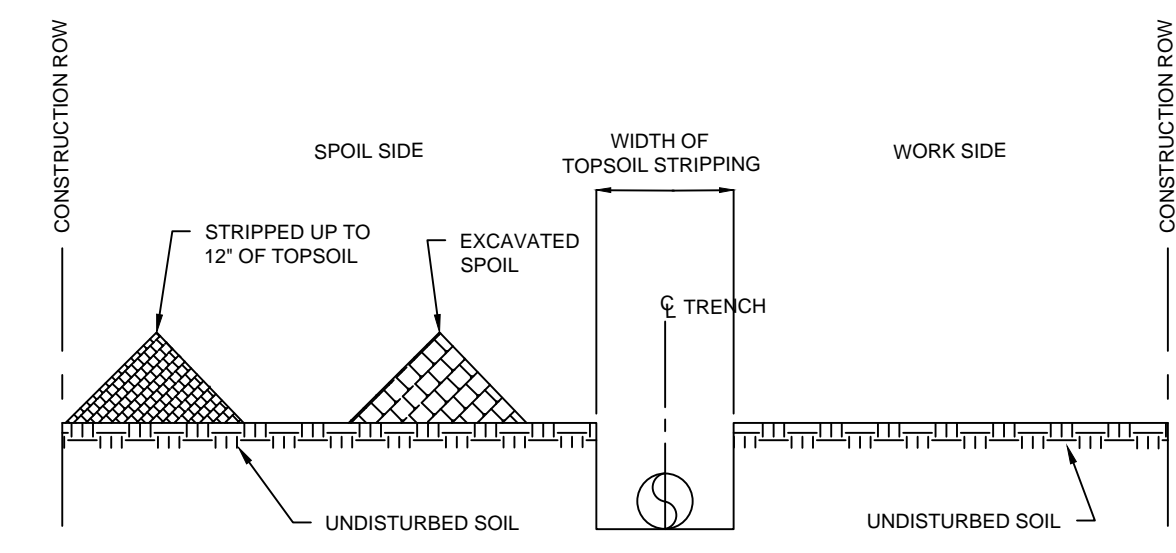
- INSTALL TEMPORARY DIVERSIONS AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
- DIVERTED RUNOFF SHOULD OUTLET ONTO A STABILIZED OUTLET AREA INTO A PROPERLY DESIGNED WATERWAY. GRADE STABILIZATION STRUCTURE OR SEDIMENT TRAPPING FACILITY. TEMPORARY PIPE SLOPE DRAINS MAY BE USED ALONG THE DIVERSIONS TO CARRY CONCENTRATED RUNOFF UP HILL OF THE DIVERSION SAFELY DOWN STEEP SLOPES AND DISCHARGING INTO A STABILIZED WATER COURSE. SEDIMENT TRAPPING DEVICE OR ONTO A STABILIZATION AREA.
- TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
- VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE IMMEDIATELY SEEDED AND MULCHED.
- PERIODICALLY INSPECT DIVERSIONS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.
- THE GRADE MAY BE VARIABLE DEPENDING UPON THE TOPOGRAPHY AND MUST HAVE A POSITIVE GRADE TO THE OUTLET. THE MAXIMUM CHANNEL GRADE SHOULD BE LIMITED TO 1%.
- IF THE DIVERSION WILL BE IN PLACE FOR GREATER THAN 15 DAYS, IT SHOULD BE STABILIZED WITH TEMPORARY OR PERMANENT VEGETATION.
- SIDE SLOPE:

MAXIMUM SPACING OF DIVERSIONS

PERCENT SLOPE	SPACING (FT)
<1	300
2	200
3 TO 5	150
>5	100

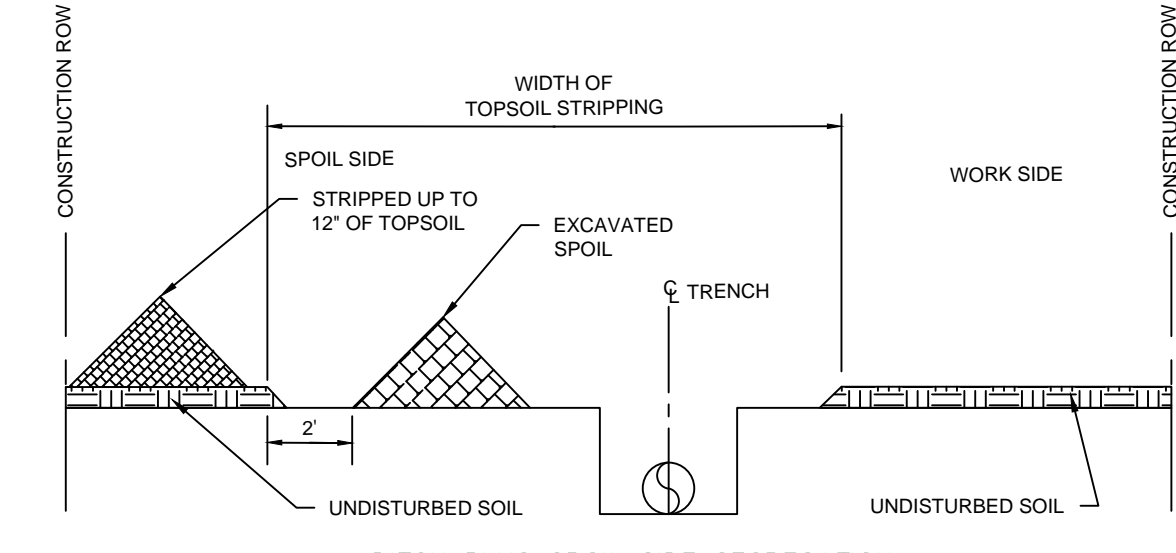
Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TEMPORARY DIVERSION
DRAWING NO.: TD
FIGURE NO.: 43



DITCH LINE TOPSOIL STRIPPING

ALSO USED IN NON-SATURATED WETLANDS

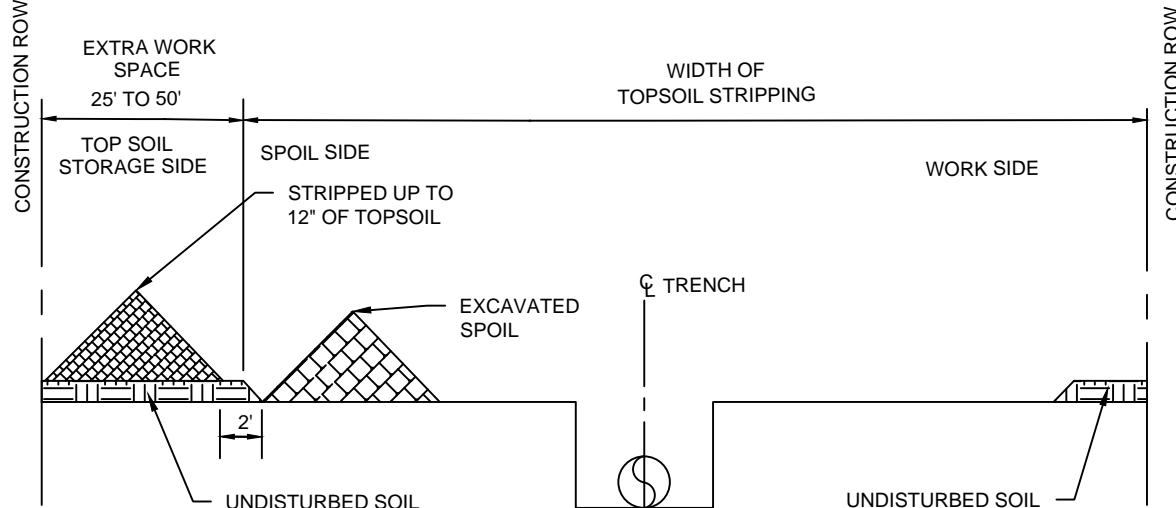


DITCH PLUS SPOIL SIDE SEGREGATION

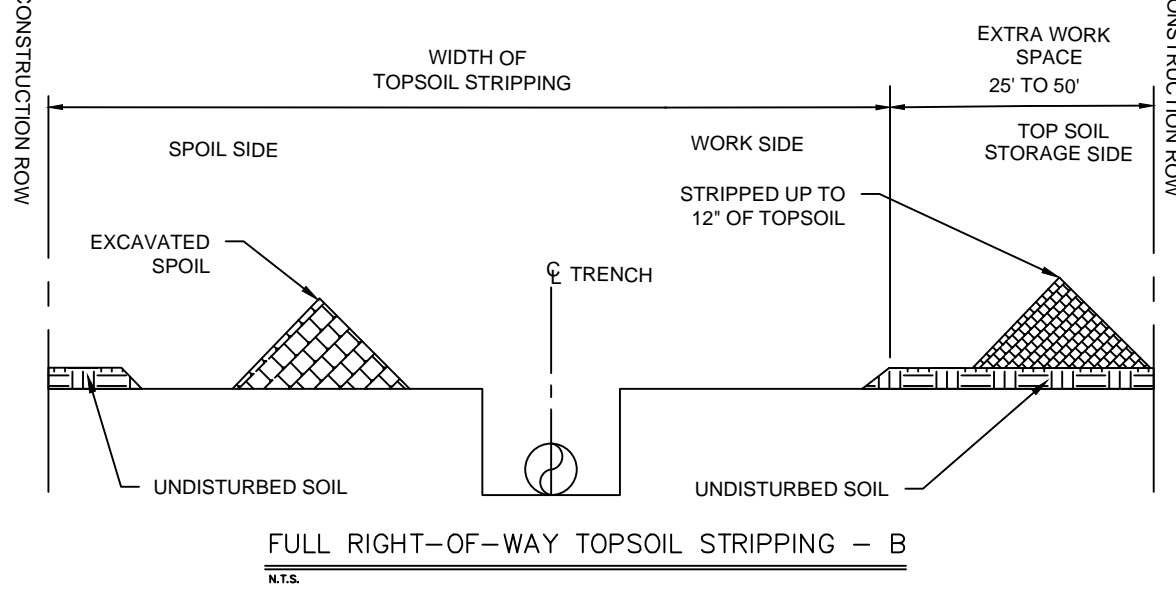
- NOTES:**
- ALLOW FOR A 3' SEPARATION BETWEEN THE TOPSOIL PILE AND THE TRENCH SPOIL.
 - RETURN TRENCH SPOIL TO TRENCH AND COMPACT. FEATHER OUT EXCESS SPOIL OVER STRIPPED AREA LEAVING A LOW CROWN CENTERED OVER THE TRENCH. ALLEVIATE COMPACTION OF SUBSOILS OVER THE STRIPPED AREA.
 - RETURN TOPSOIL EVENLY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

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TOP SOIL SEGREGATION (1)
DRAWING NO.: TS1
FIGURE NO.: 44



FULL RIGHT-OF-WAY TOPSOIL STRIPPING - A



FULL RIGHT-OF-WAY TOPSOIL STRIPPING - B

- NOTES:**
- ALLOW FOR A 3' SEPARATION BETWEEN THE TOPSOIL PILE AND THE TRENCH SPOIL.
 - 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.
 - RETURN TOPSOIL EVENLY OVER THE STRIPPED AREA AFTER TRENCH HAS SUFFICIENTLY SETTLED OR HAS BEEN COMPACTED.
 - ALLEVIATE COMPACTION OF TOPSOIL OVER ENTIRE RIGHT-OF-WAY.
 - SEGREGATED TOPSOIL MAY NOT BE USED FOR PADDING THE PIPE.
 - INSTALL SEDIMENT BARRIER AS REQUIRED.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

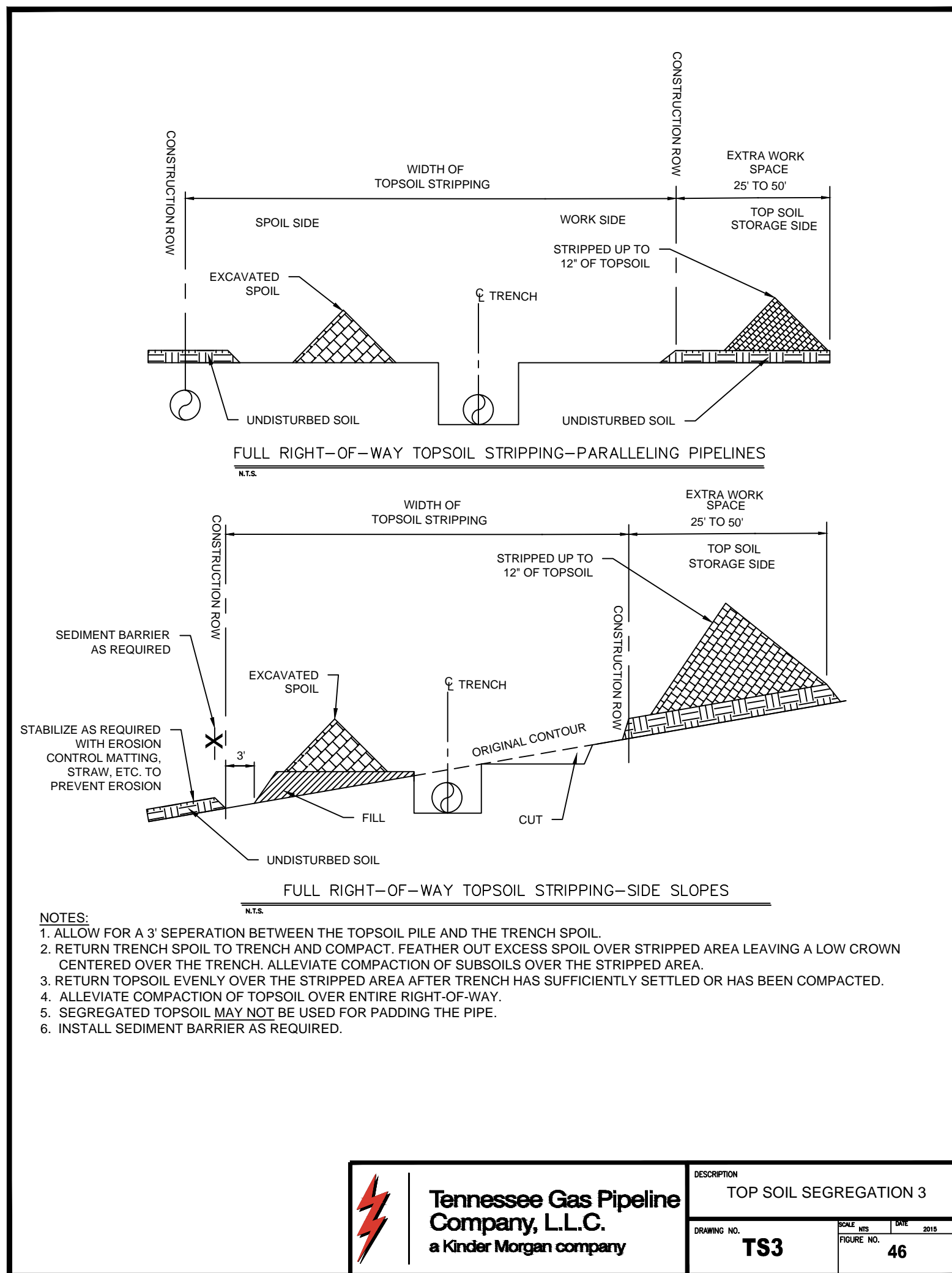
DESCRIPTION: TOP SOIL SEGREGATION (2)
DRAWING NO.: TS2
FIGURE NO.: 45

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section: _____ Township: _____ Range: _____
Co./Par.: _____ State: MASSACHUSETTS
Division: _____ Op. Area: _____
Drafter: GV Date: _____ Project ID: _____
Chk'd: _____ Date: _____ Scale: _____
Approved: _____ Date: _____ File Name: MA_ES_DETAILS_007
Sheet: _____ Type: _____

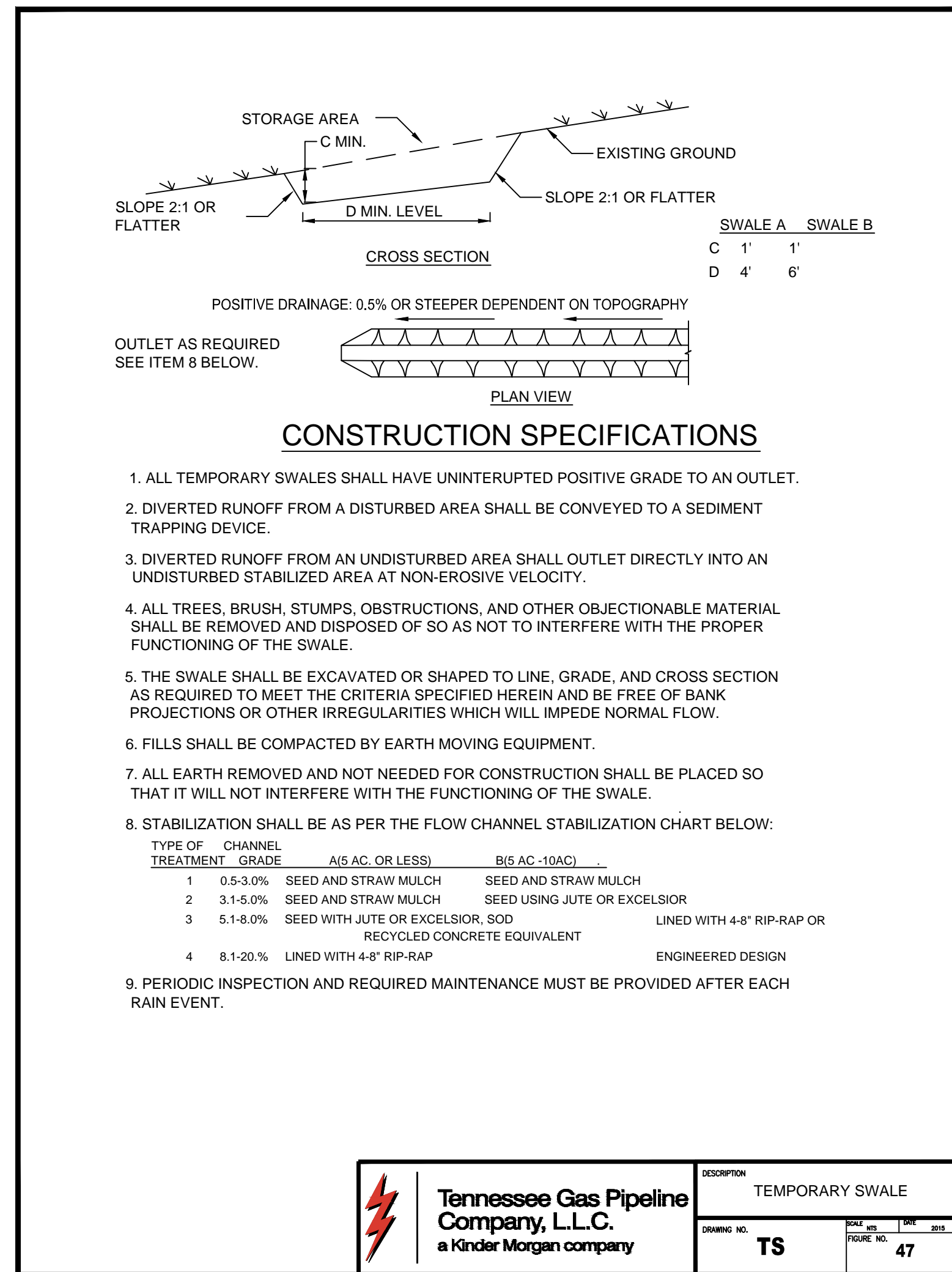


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TOP SOIL SEGREGATION 3

DRAWING NO.: TS3

FIGURE NO.: 46

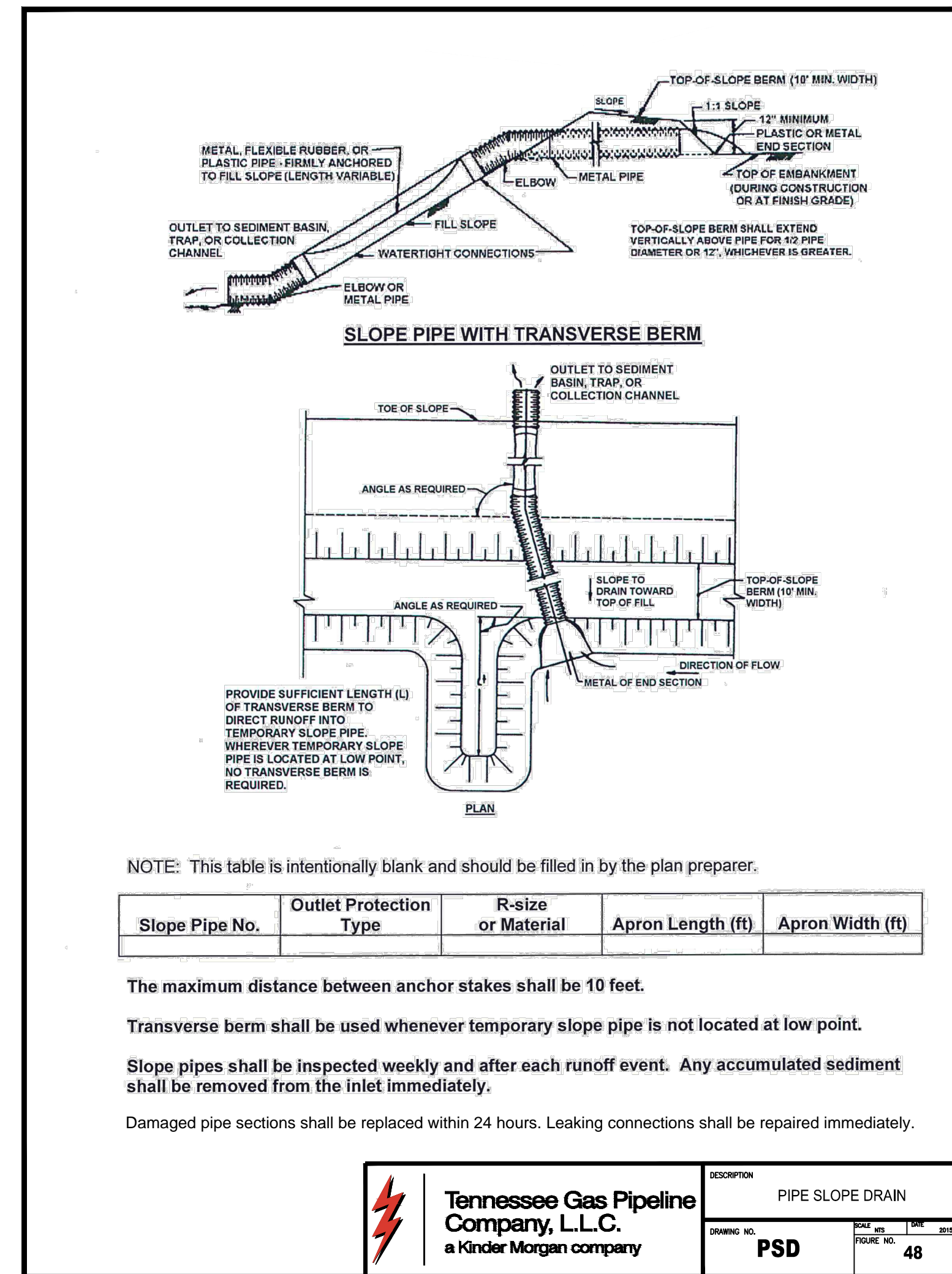


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TEMPORARY SWALE

DRAWING NO.: TS

FIGURE NO.: 47

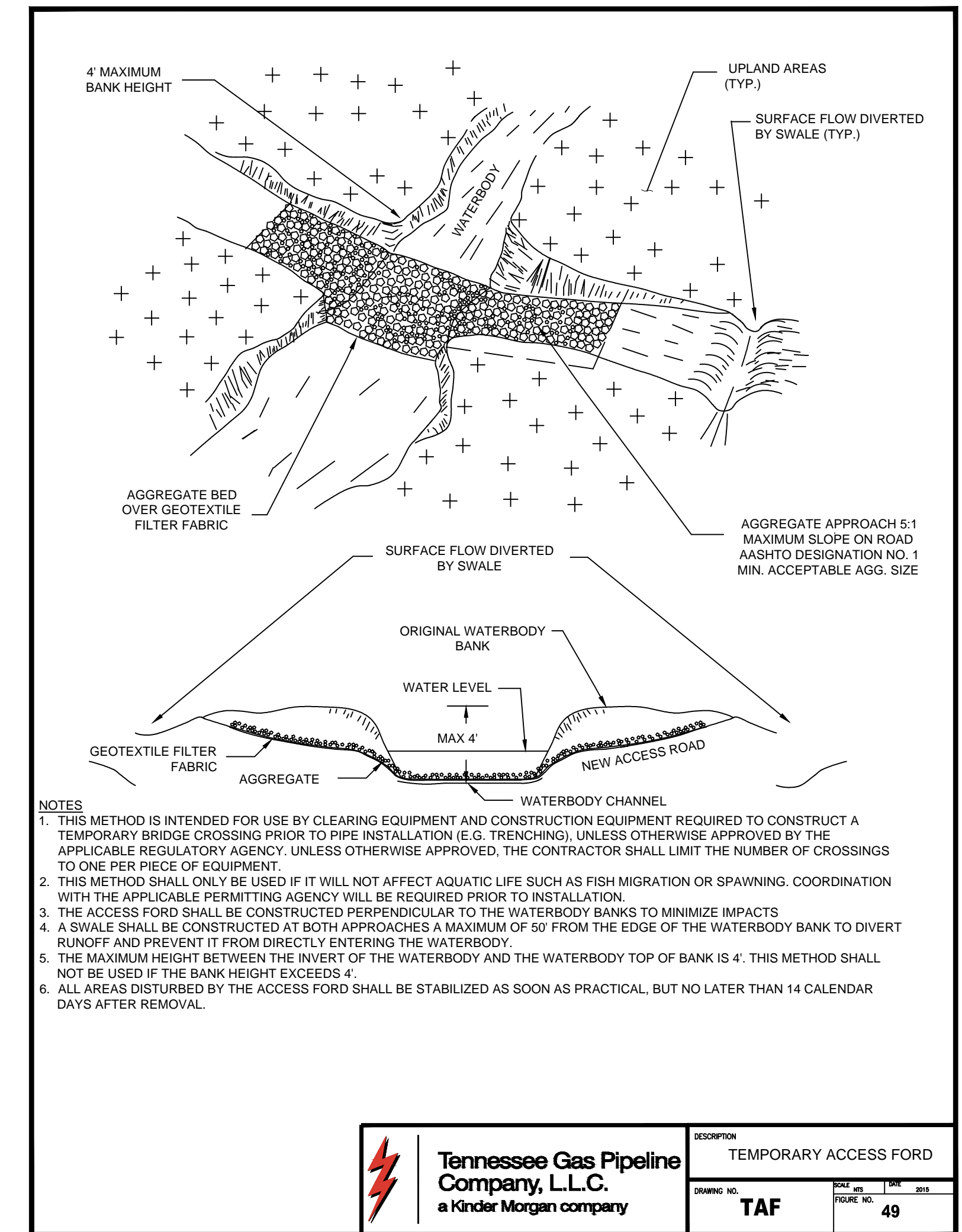


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: PIPE SLOPE DRAIN

DRAWING NO.: PSD

FIGURE NO.: 48

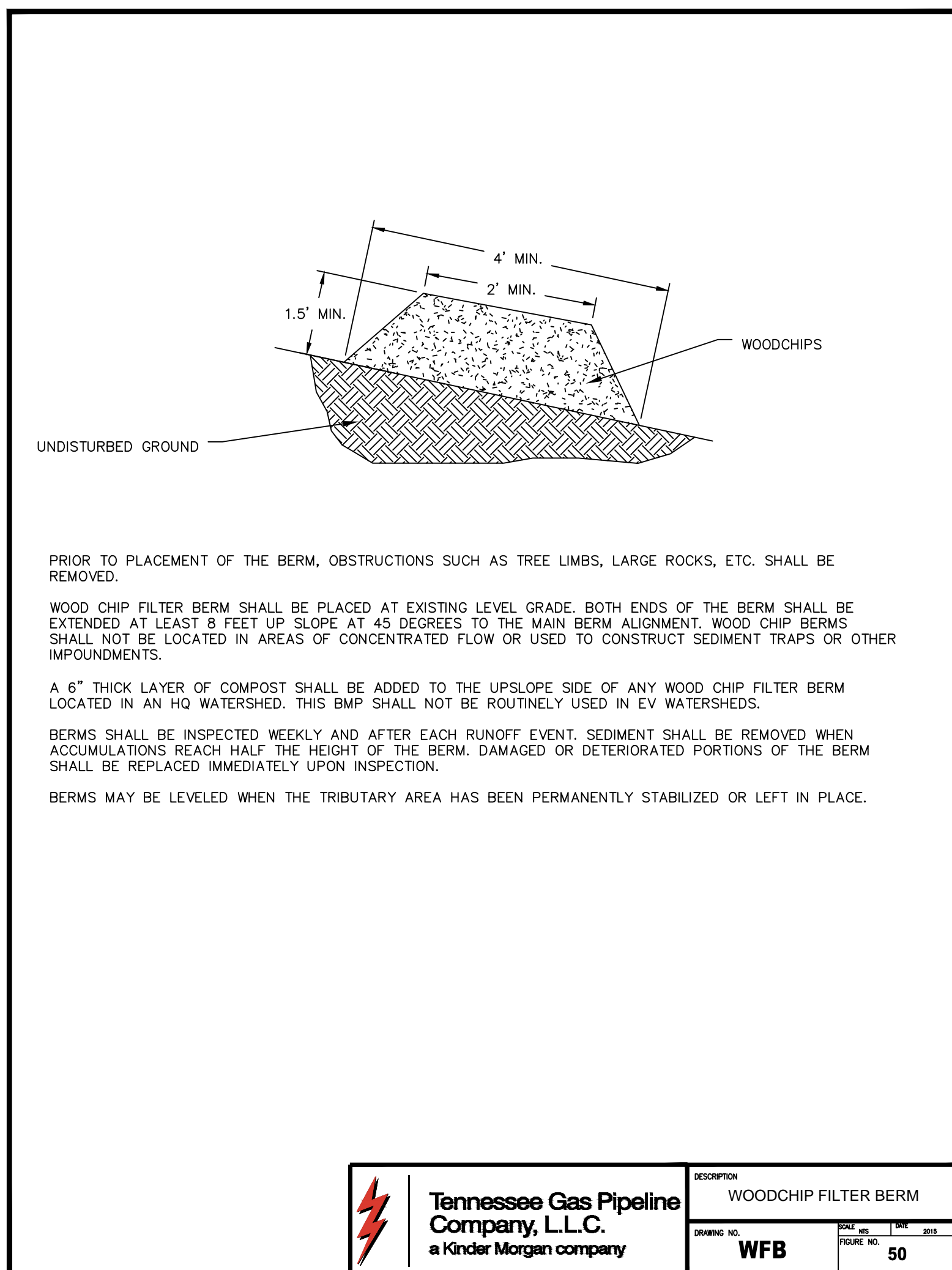


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TEMPORARY ACCESS FORD

DRAWING NO.: TAF

FIGURE NO.: 49

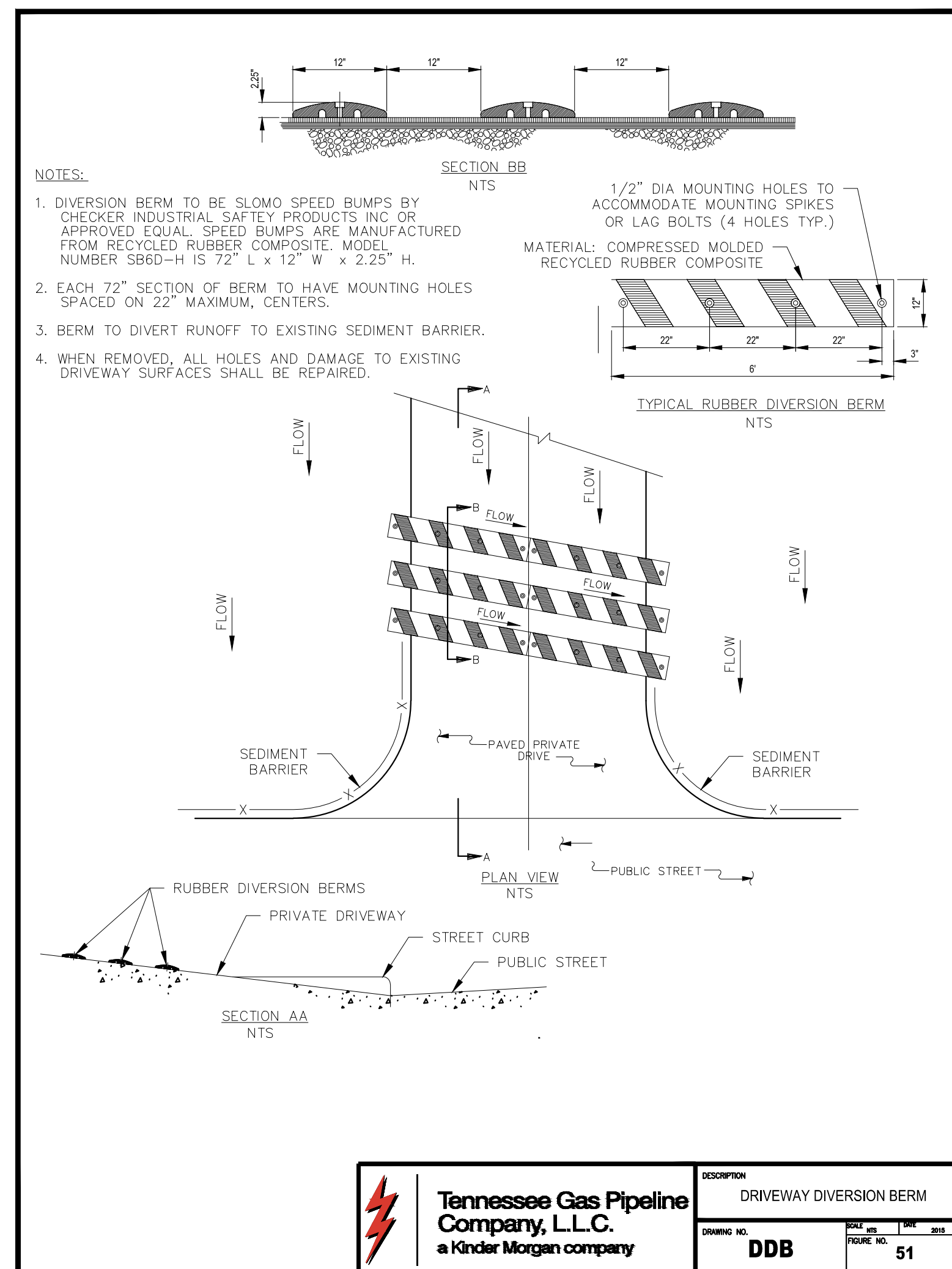


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: WOODCHIP FILTER BERM

DRAWING NO.: WFB

FIGURE NO.: 50

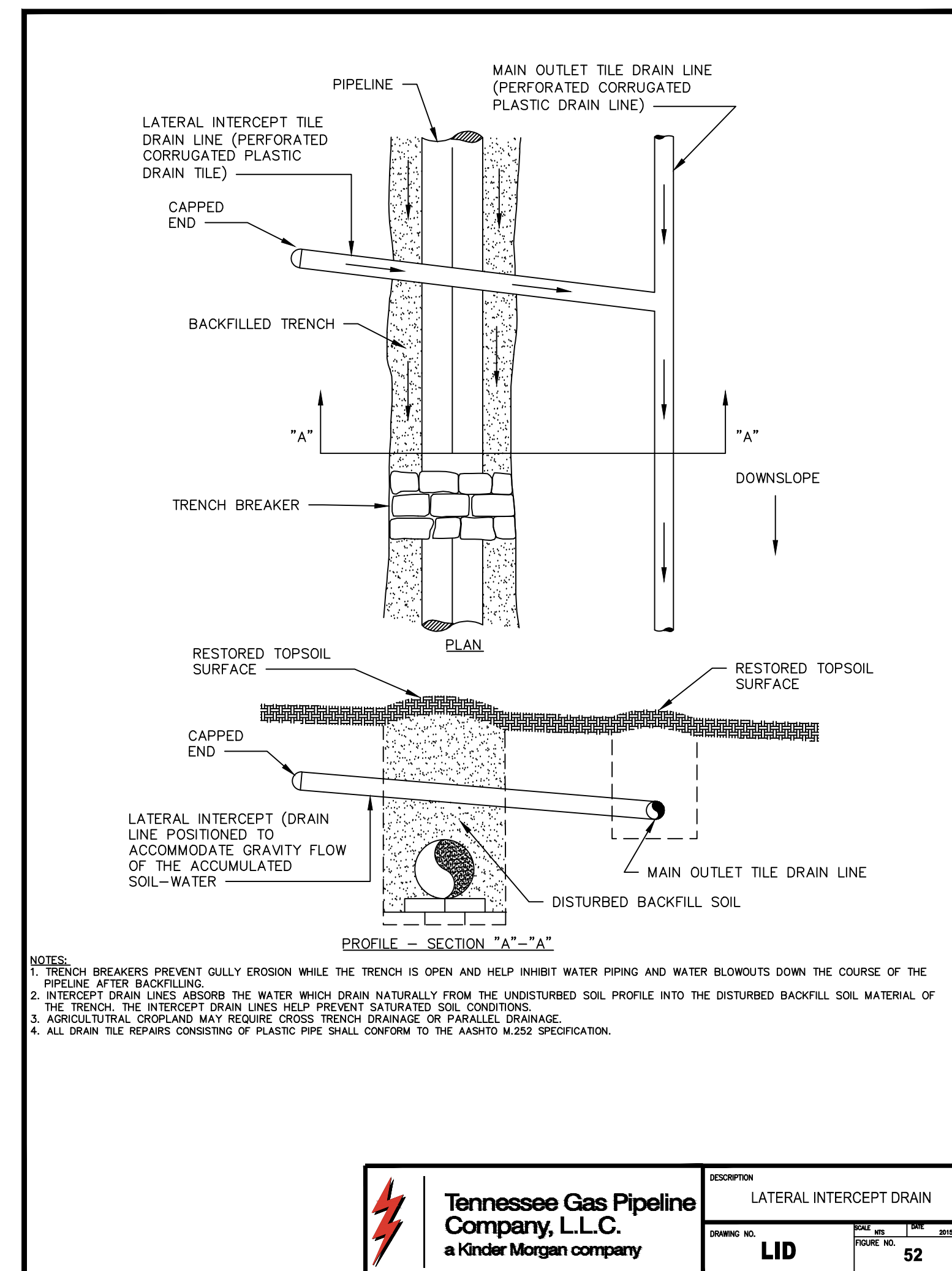


Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: DRIVEWAY DIVERSION BERM

DRAWING NO.: DDB

FIGURE NO.: 51



Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: LATERAL INTERCEPT DRAIN

DRAWING NO.: LID

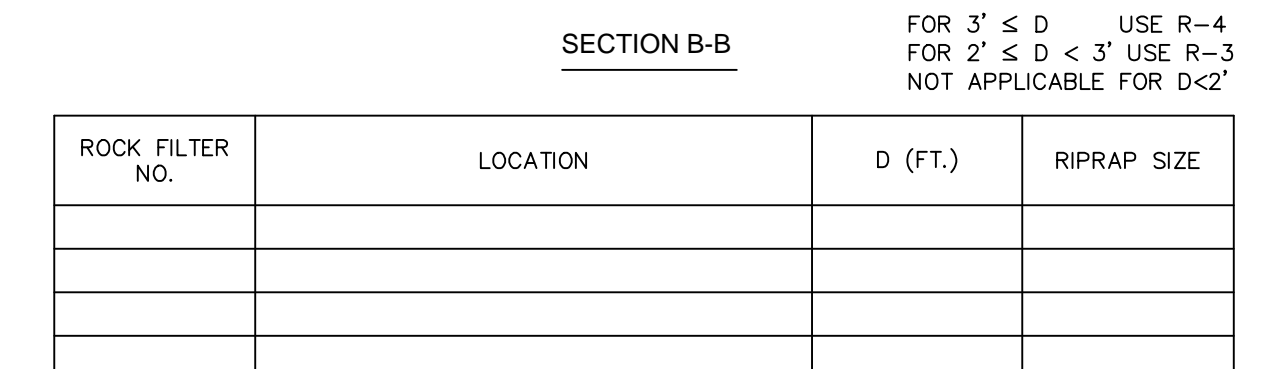
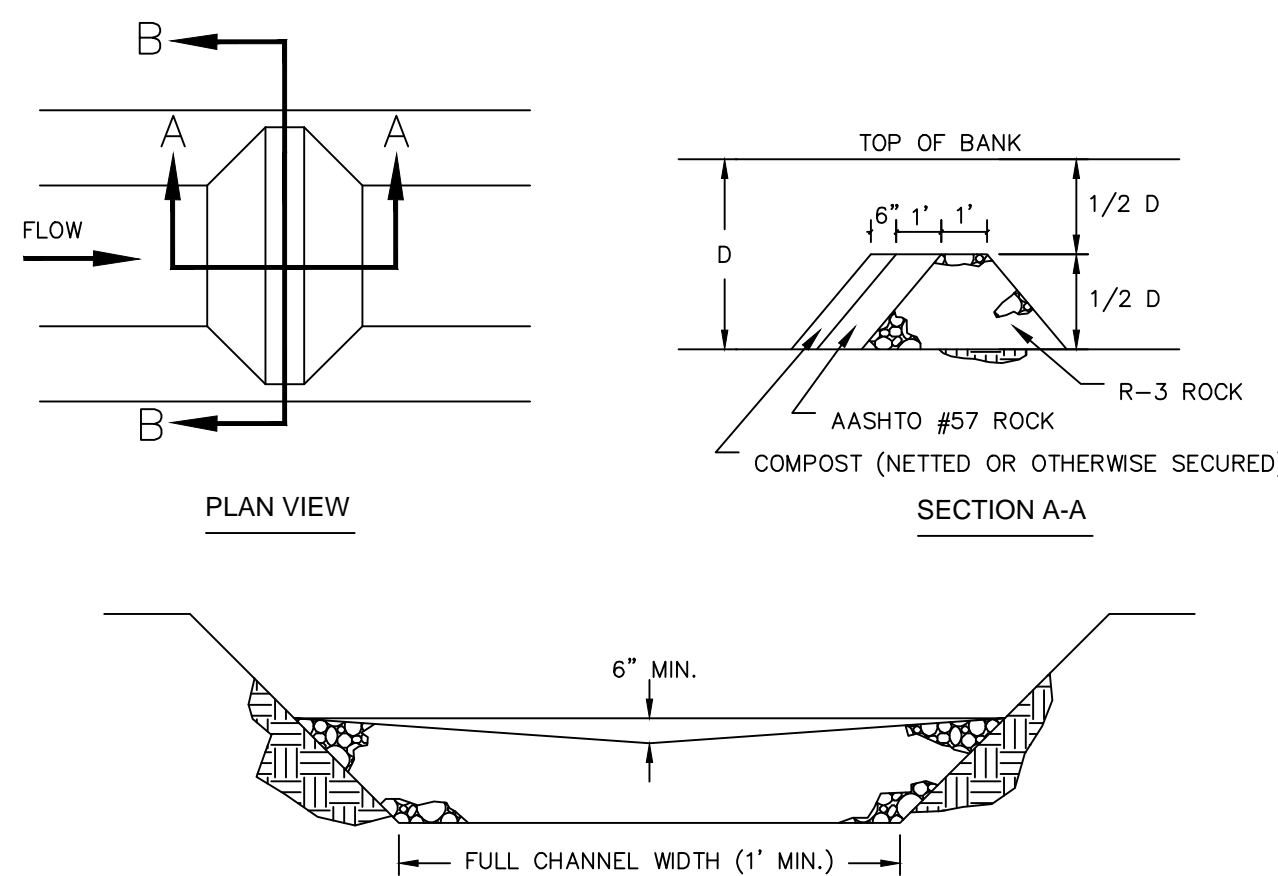
FIGURE NO.: 52

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section: _____ Township: _____ Range: _____
Co./Par.: _____ State: MASSACHUSETTS
Division: _____ Op. Area: _____
Drafter: GV Date: _____ Project ID: _____
Chk'd: _____ Date: _____ Scale: _____
Approved: _____ Date: _____ Filename: MA_ES_DETAILS_008
Sheet: _____
Type: _____



ROCK FILTER NO.	LOCATION	D (FT.)	RIPRAP SIZE

THIS TABLE IS INTENTIONALLY LEFT BLANK AND SHOULD BE FILLED IN BY THE PLAN PREPARER.

NOTES:

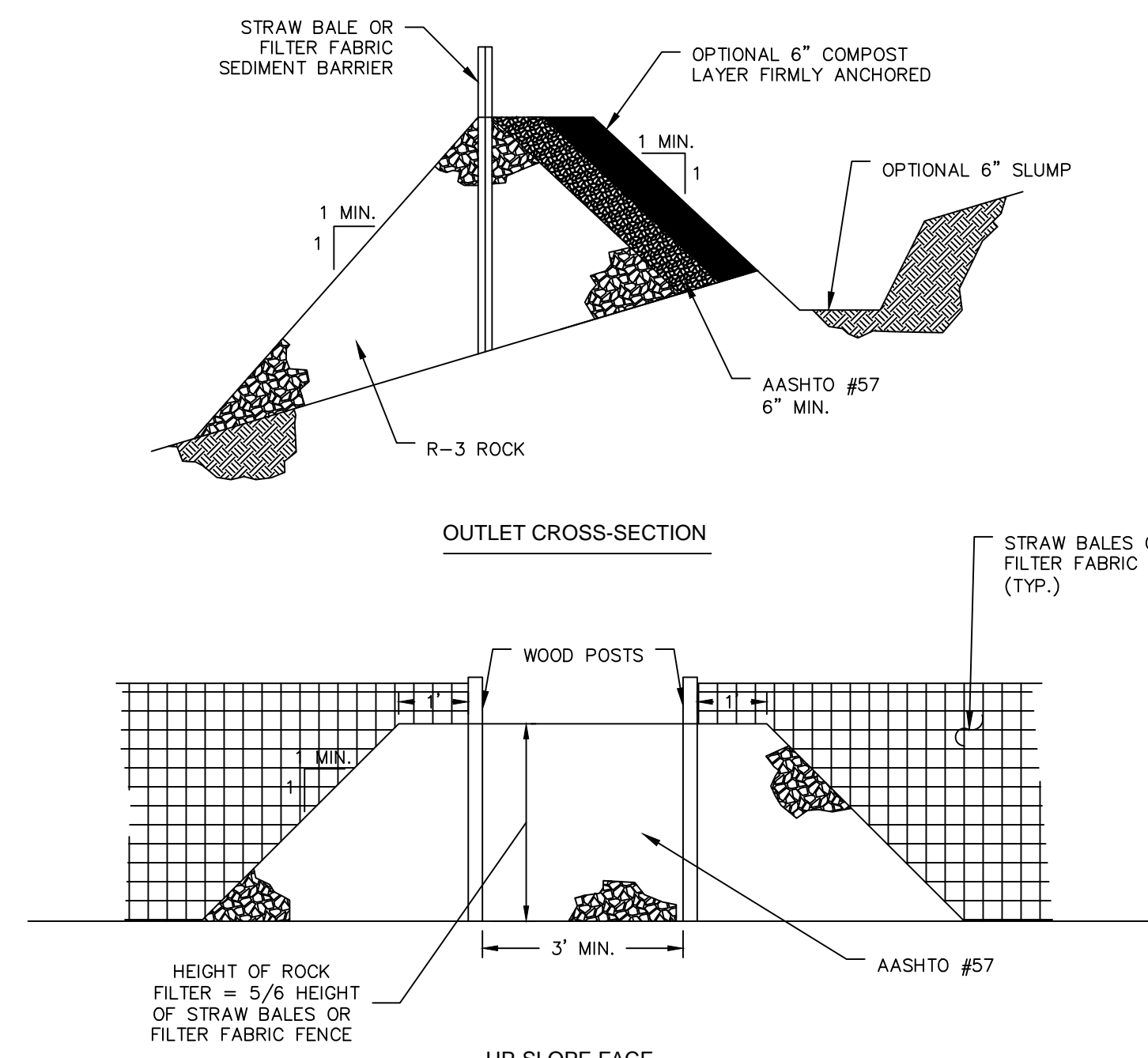
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF THE FILTER.
- IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, INSTALLER SHALL REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK FILTER, AND STABILIZE DISTURBED AREAS.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: ROCK FILTER

DRAWING NO.: RF

FIGURE NO.: 53



NOTES:

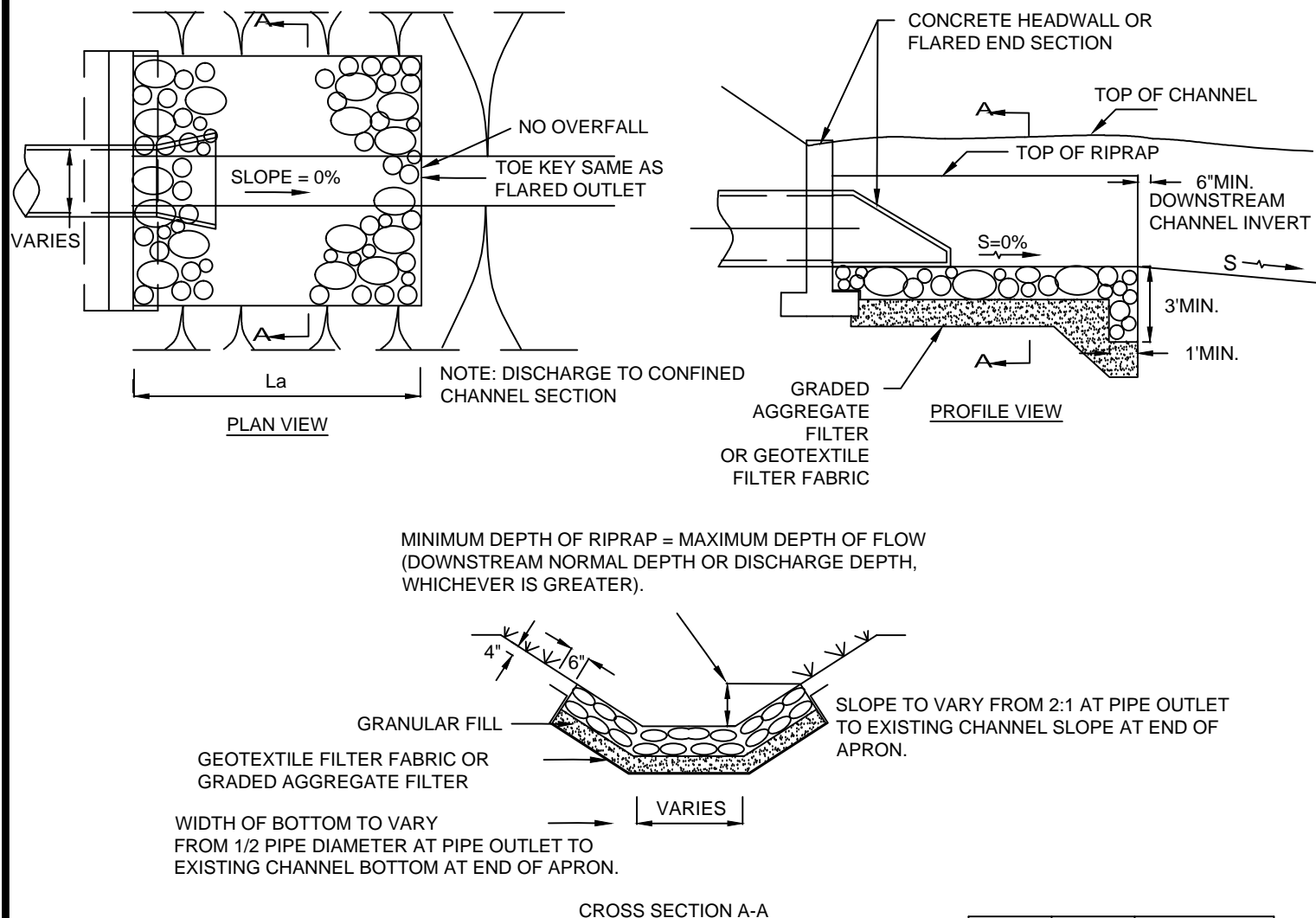
- A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A SILT FENCE OR STRAW BALE BARRIER HAS OCCURRED DUE TO CONCENTRATED FLOW. ANCHORED COMPOST LAYER SHALL BE USED ON UPSLOPE FACE IN HIGH QUALITY AND EXCEPTIONAL VALUE WATERSHEDS.
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: ROCK FILTER OUTLET

DRAWING NO.: RFO

FIGURE NO.: 54



NOTES:

- THE OUTLET PROTECTION MAY BE DONE USING ROCK RIPRAP, GROUDED RIPRAP, OR GABIONS. RIPRAP SHALL BE COMPOSED OF A WELL-GRADED MIXTURE OF STONE SIZE SO THAT 50 PERCENT OF THE PIECES, BY WEIGHT, SHALL BE LARGER THAN THE D50 SIZE DETERMINED BY USING THE CHART. A WELL-GRADED MIXTURE, AS USED HEREIN, IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF LARGER STONE SIZES, BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.
- THE MINIMUM THICKNESS OF THE RIPRAP LAYER SHALL BE 1.5 TIMES THE MAXIMUM STONE DIAMETER FOR D50 OF 15 INCHES OR LESS, AND 1.2 TIMES THE MAXIMUM STONE SIZE FOR D50 GREATER THAN 15 INCHES.

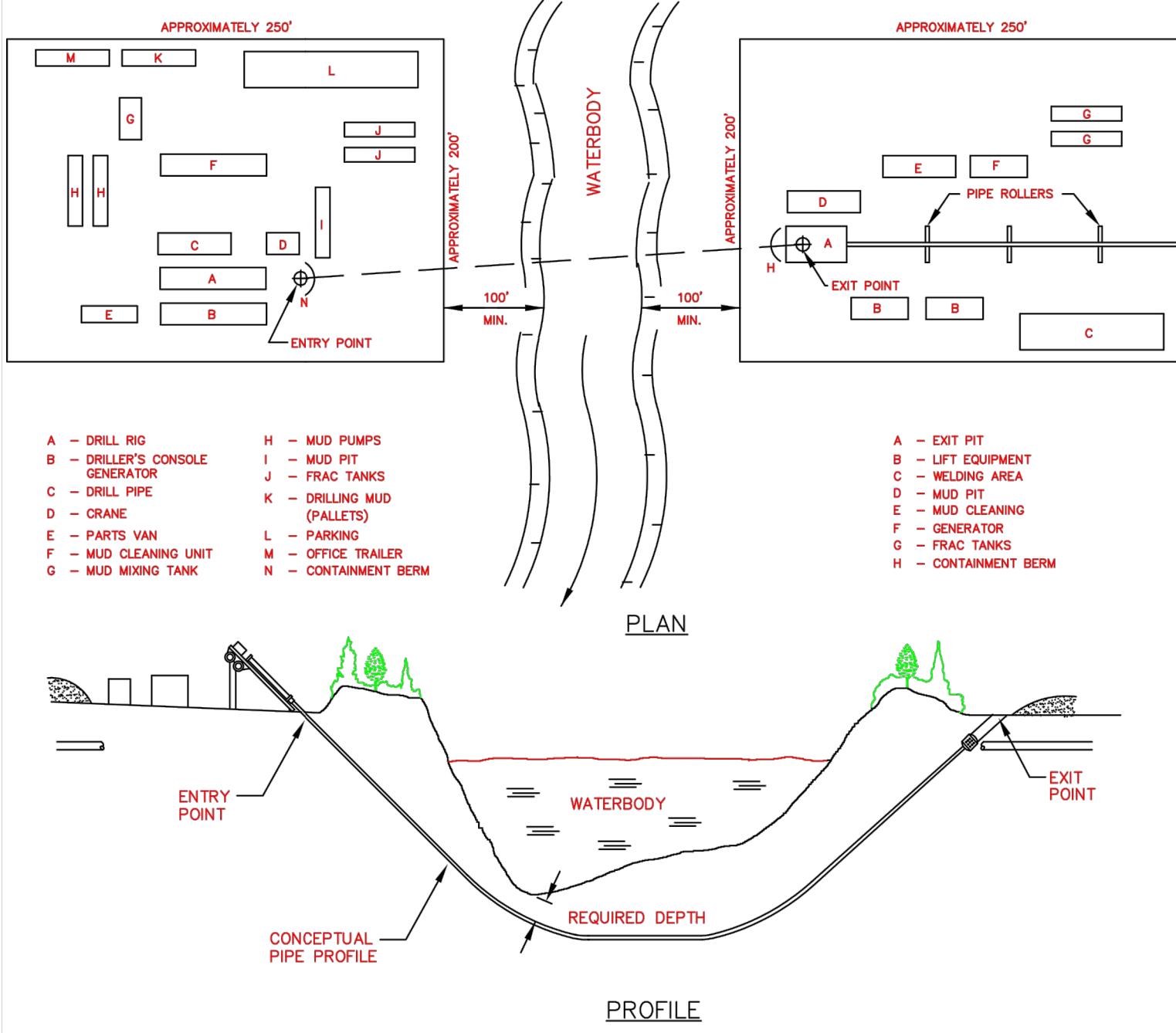
D 50 (IN)	d max (IN)	MIN. BLANKET THICKNESS (IN)
4	6	9
6	9	14
9	14	20
12	18	27
15	22	32
18	27	32
21	32	38
24	36	43

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: RIP RAP OUTLET PROTECTION

DRAWING NO.: RROP

FIGURE NO.: 55



NOTES:

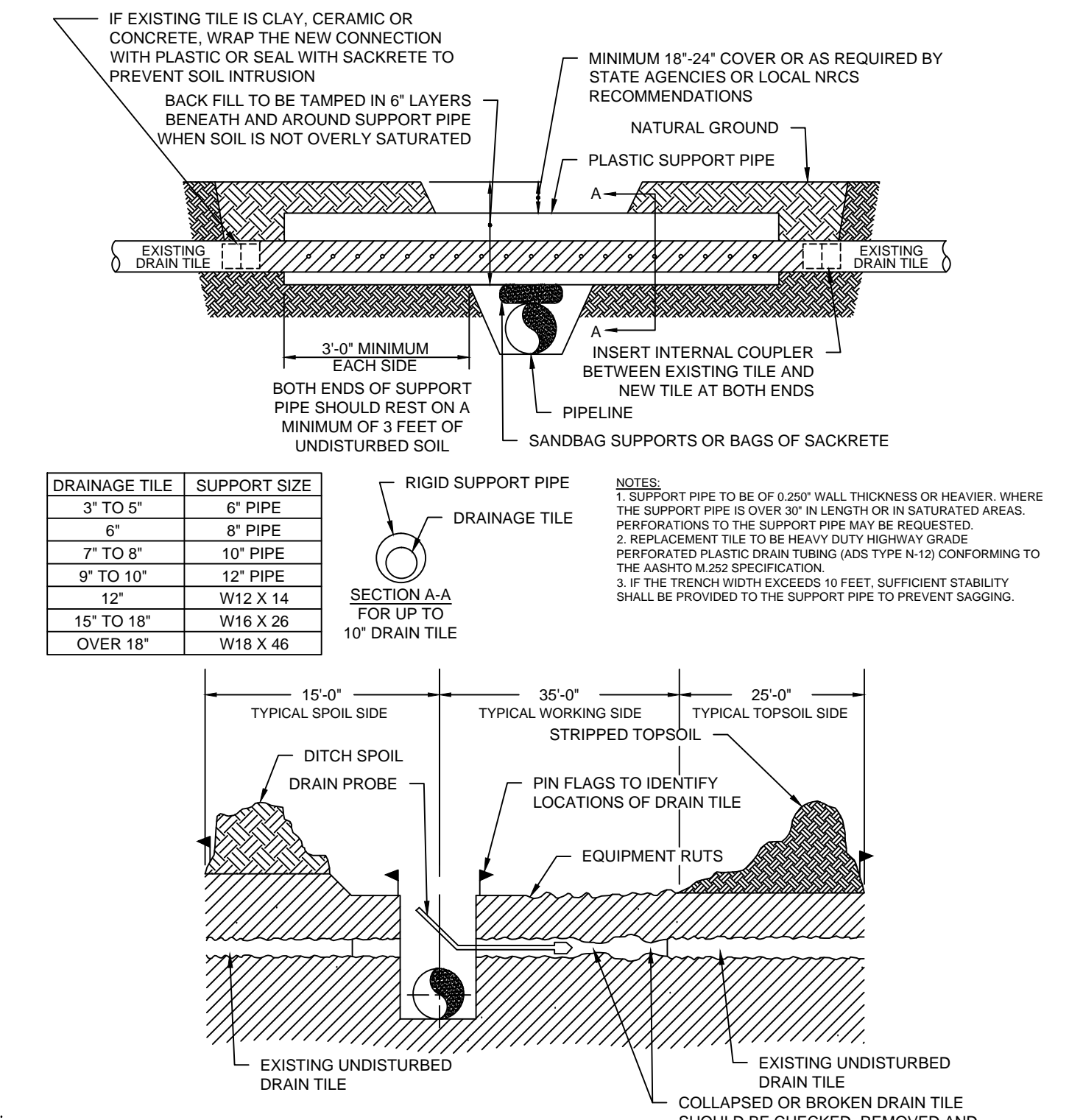
- SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERCOURSE. DO NOT CLEAR OR GRADE WITHIN THE 100 FOOT ZONE.
- ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. DO NOT ALLOW THE USE OF ANY ADDITIVES TO THE DRILLING MUD WITHOUT THE APPROVAL OF COMPANY'S INSPECTOR.
- INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
- INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
- DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: WATERBODY CROSSING HORIZONTAL DIRECTION DRILL (HDD)

DRAWING NO.: WHDD

FIGURE NO.: 56



NOTES:

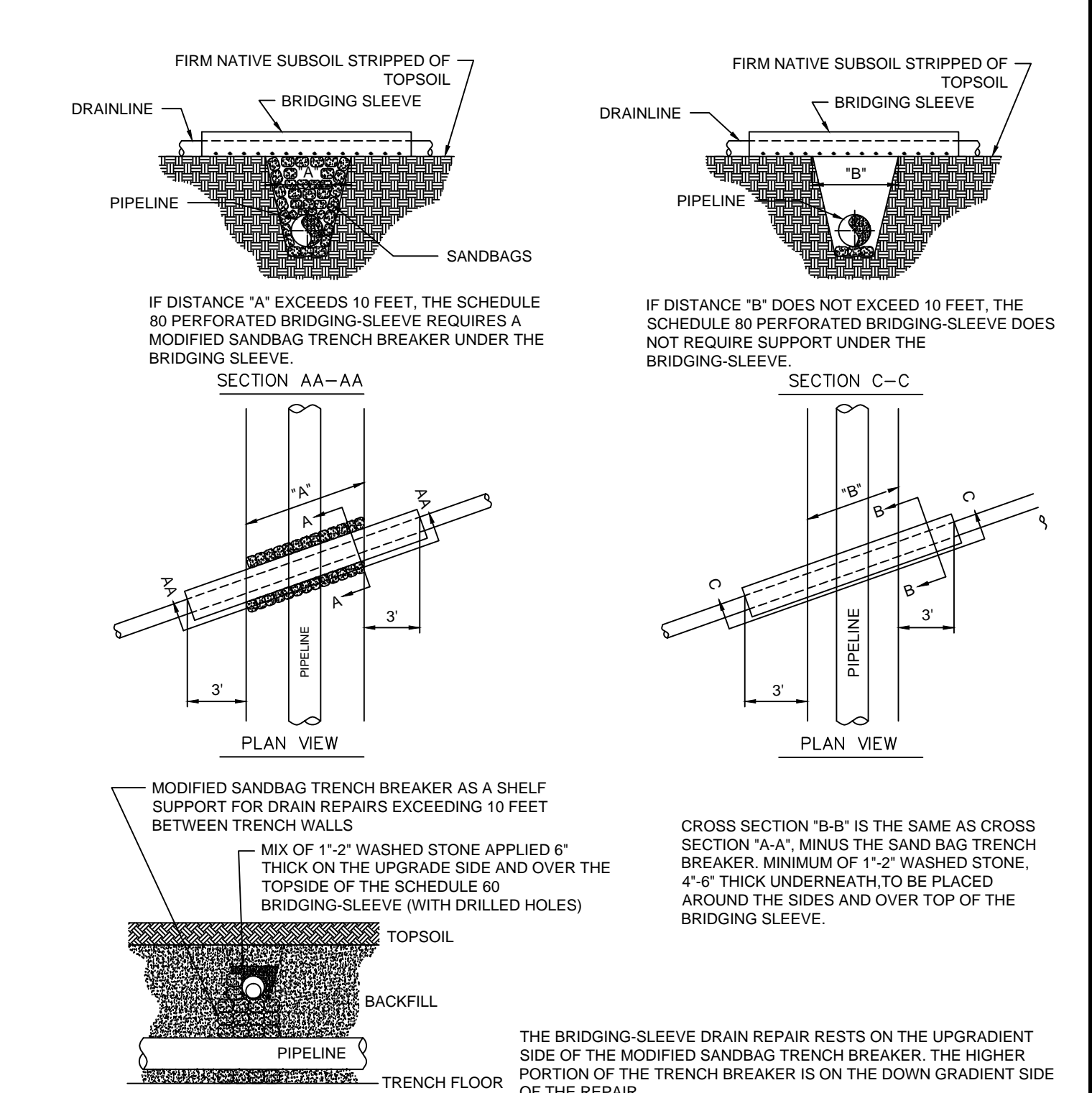
- CLEAN OUT DRAIN TILES TO THE PERMANENT R.O.W. LIMITS ON THE BACKFILL SIDE AND TO THE TEMPORARY R.O.W. LIMIT ON THE WORKING SIDE.
- REPLACE DAMAGED TILES AND REPAIR TILES AND JOINTS THAT REQUIRE WORK AND ARE WITHIN THE AREAS OF CONSTRUCTION ACTIVITIES.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TYPICAL DRAIN TILE REPAIR ACROSS TRENCH (1)

DRAWING NO.: DT1

FIGURE NO.: 57



NOTES:

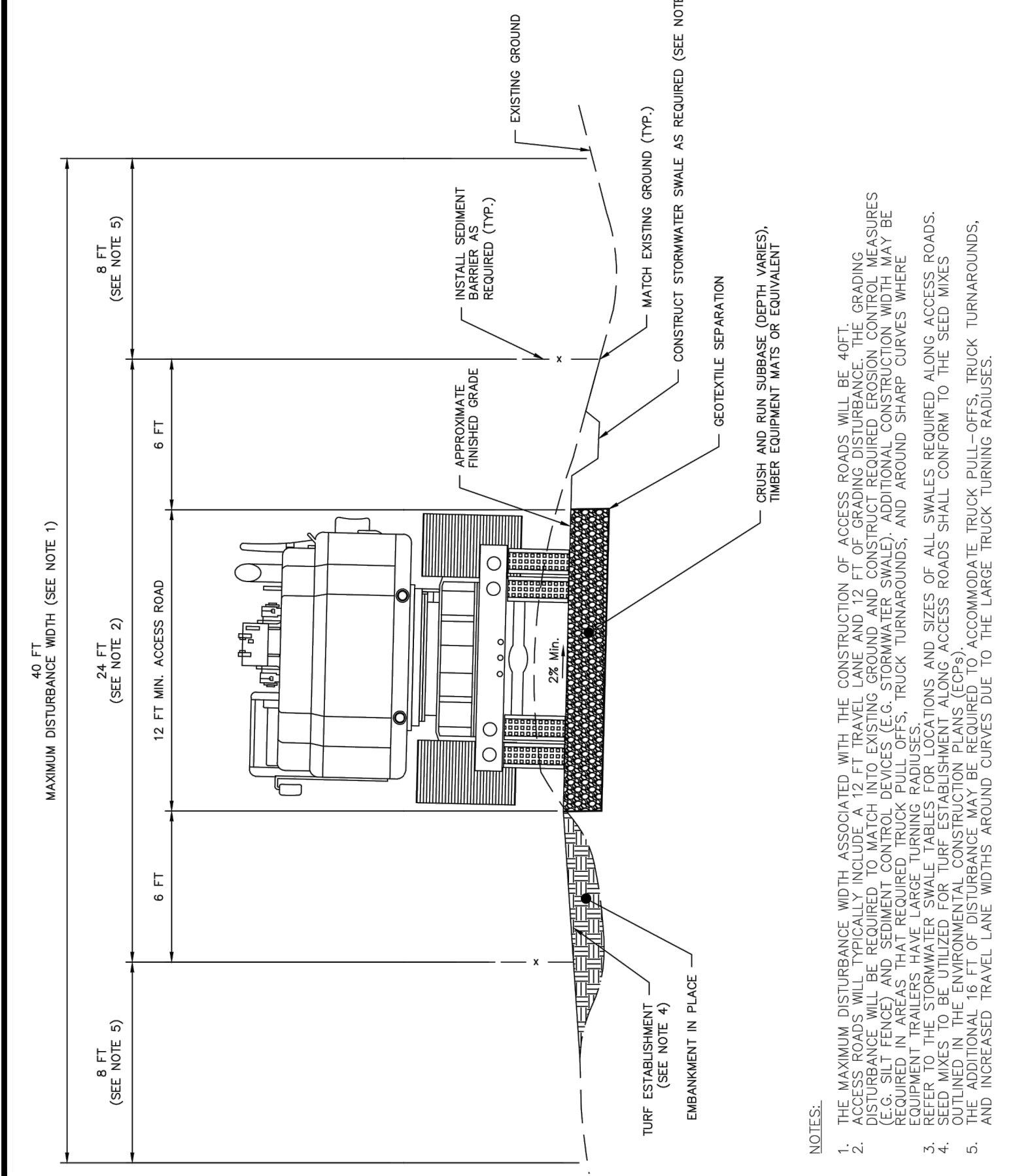
- IF THE REPAIR OF THE SEVERED DRAINLINE CROSSES THE PIPELINE TRENCH AT AN ANGLE REQUIRING MORE THAN 20° OF BRIDGING-SLEEVE BETWEEN THE FARTHEST ENDS OF THE FIRM SHELVES, MODIFY THE CROSSING ANGLE TO SHORTEN THE TOTAL LENGTH OF THE CROSSING AND THEN TIE TO THE EXISTING DRAIN TILE.
- ALL DRAIN TILE REPAIRS CONSISTING OF PLASTIC PIPE SHALL CONFORM TO THE AASHTO M.252 SPECIFICATION.

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TYPICAL DRAIN TILE REPAIR ACROSS TRENCH (2)

DRAWING NO.: DT2

FIGURE NO.: 58



Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

DESCRIPTION: TYPICAL ACCESS ROAD CROSS SECTION

DRAWING NO.: ARCS

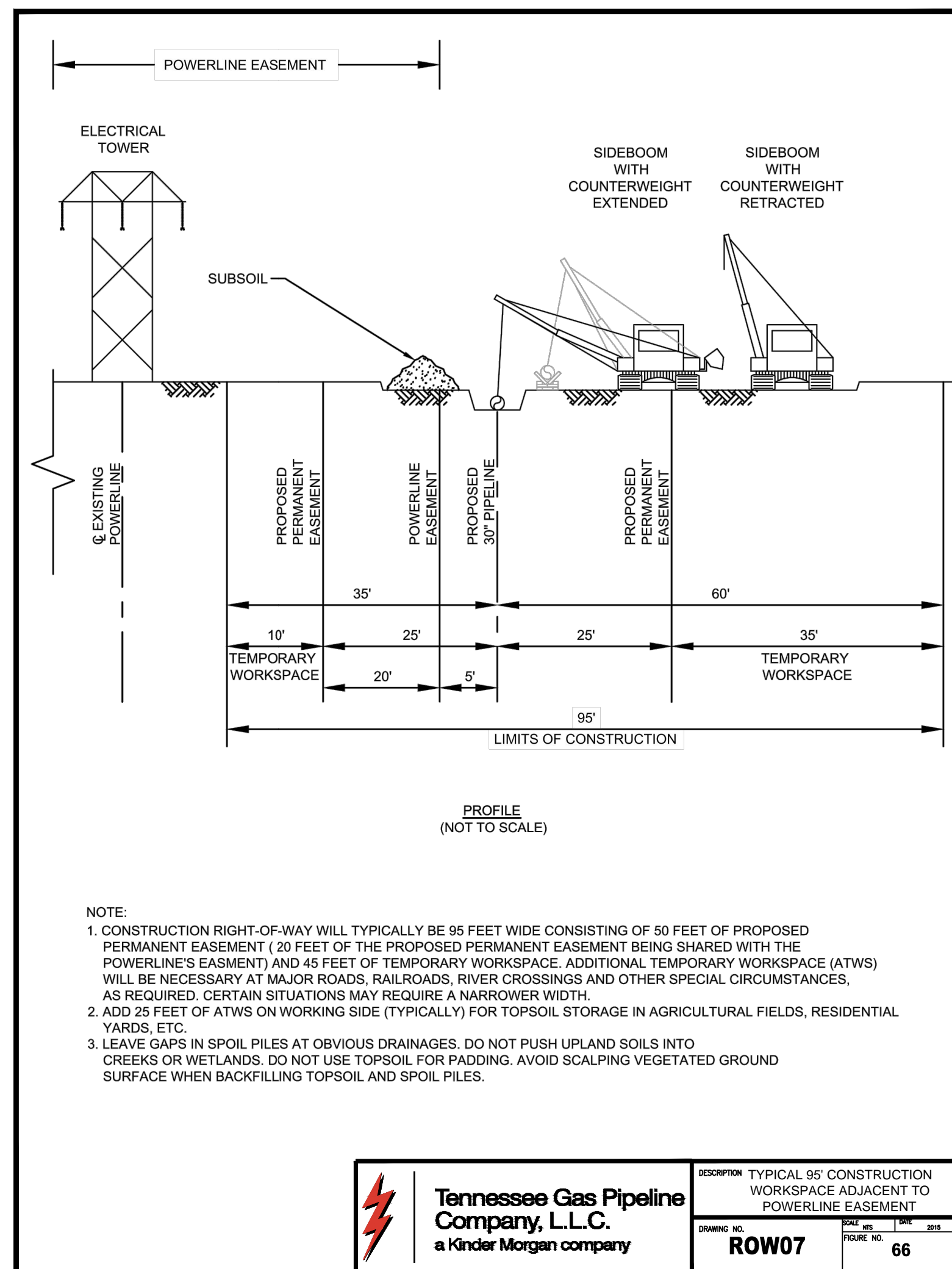
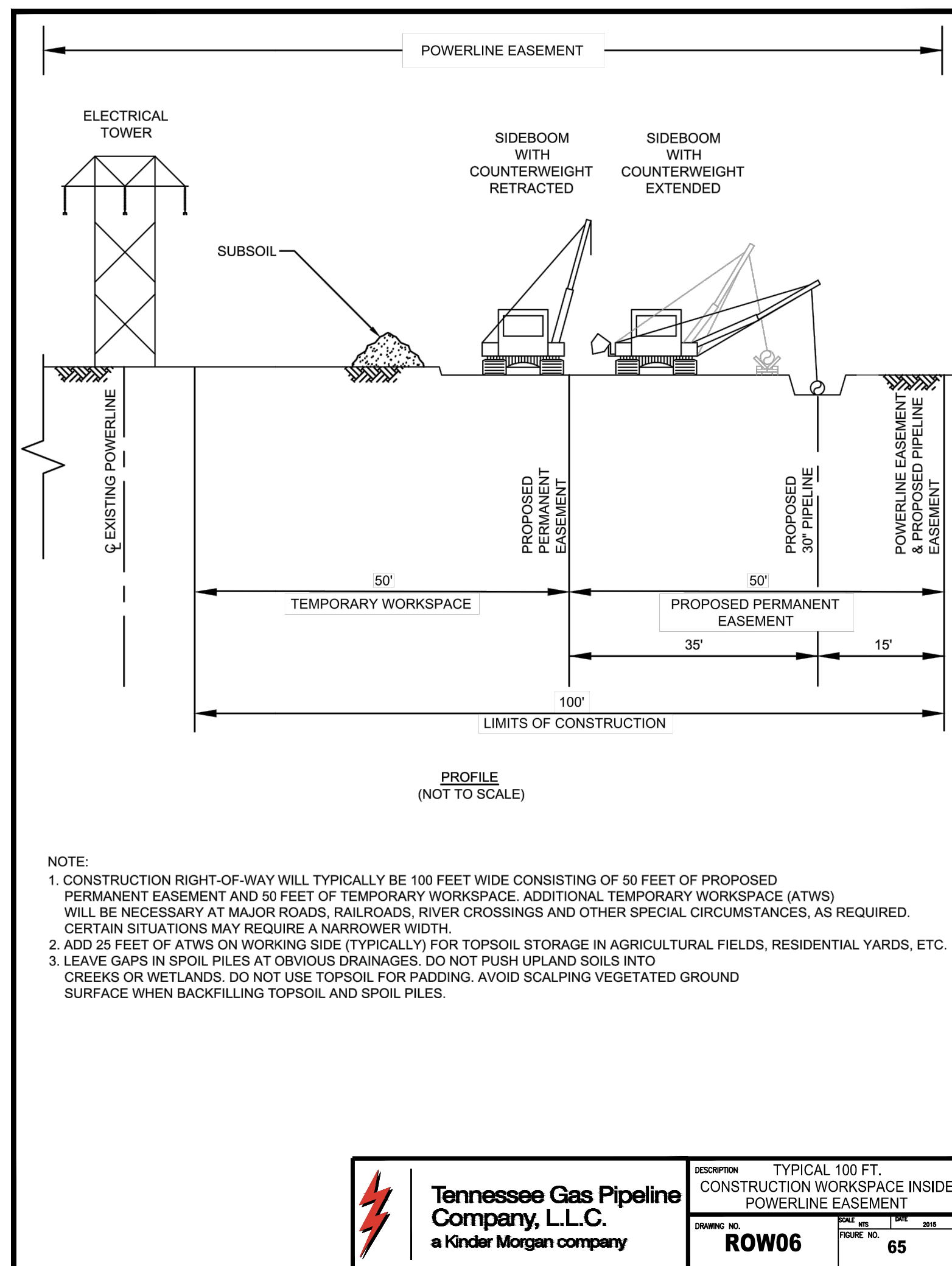
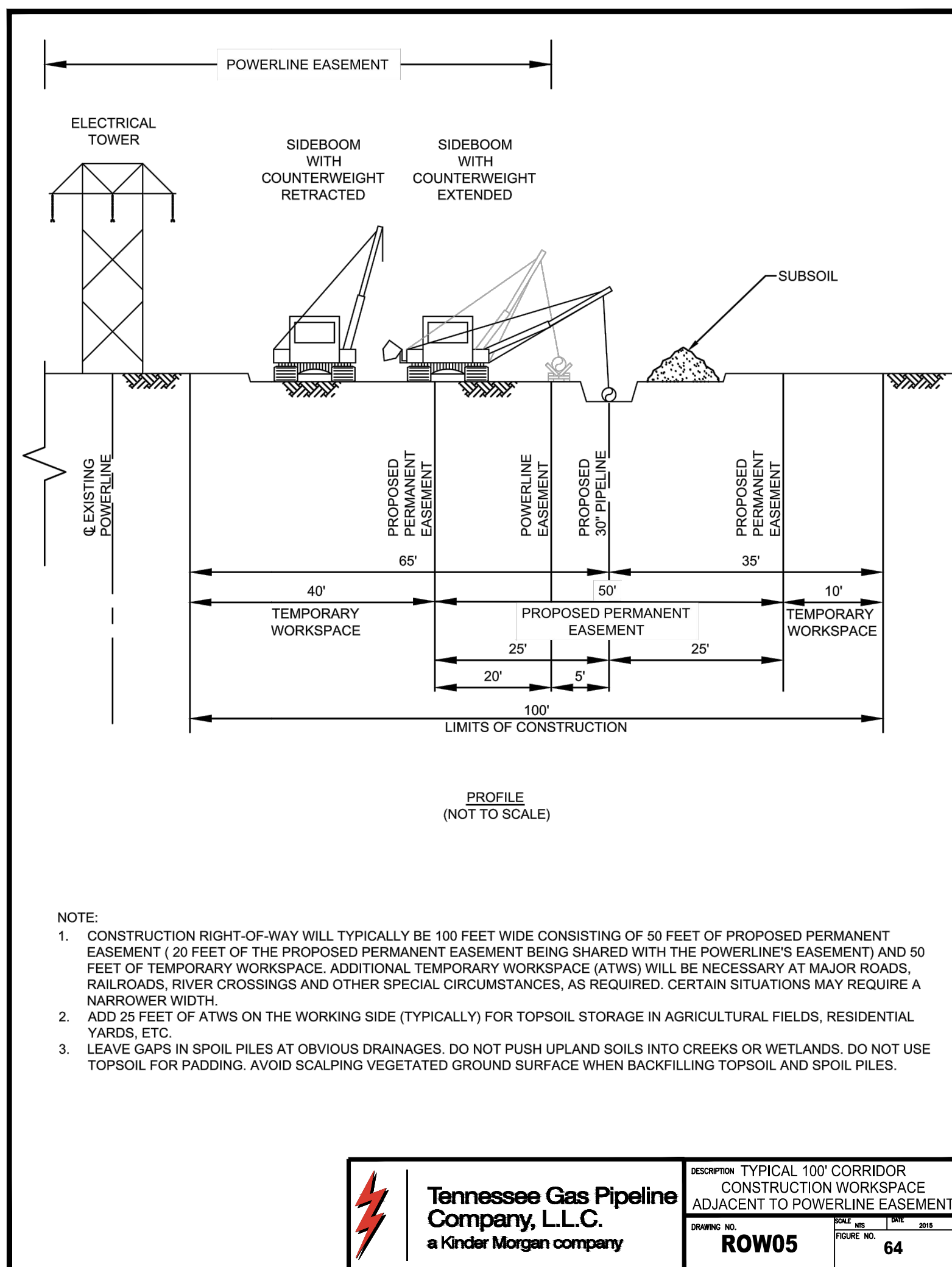
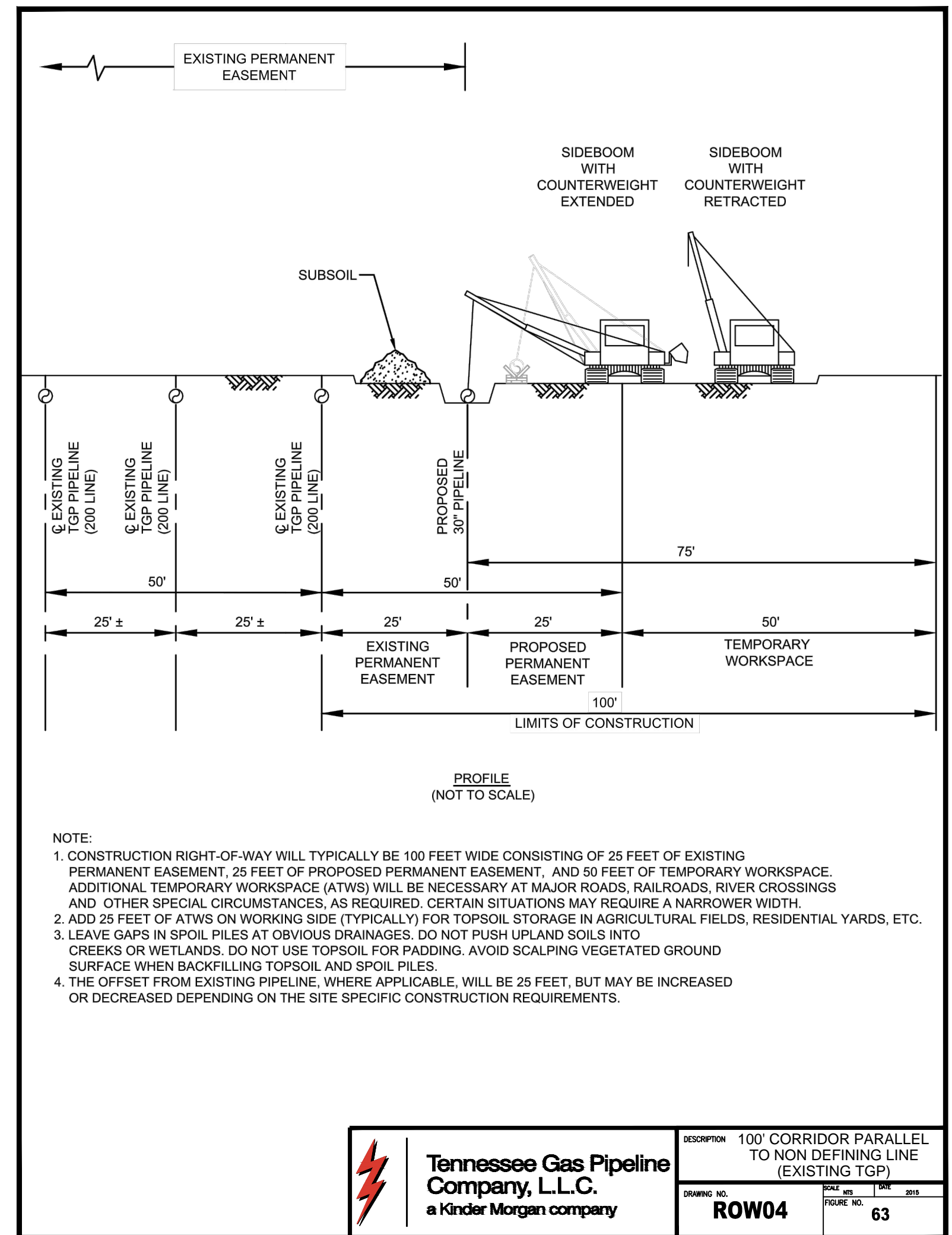
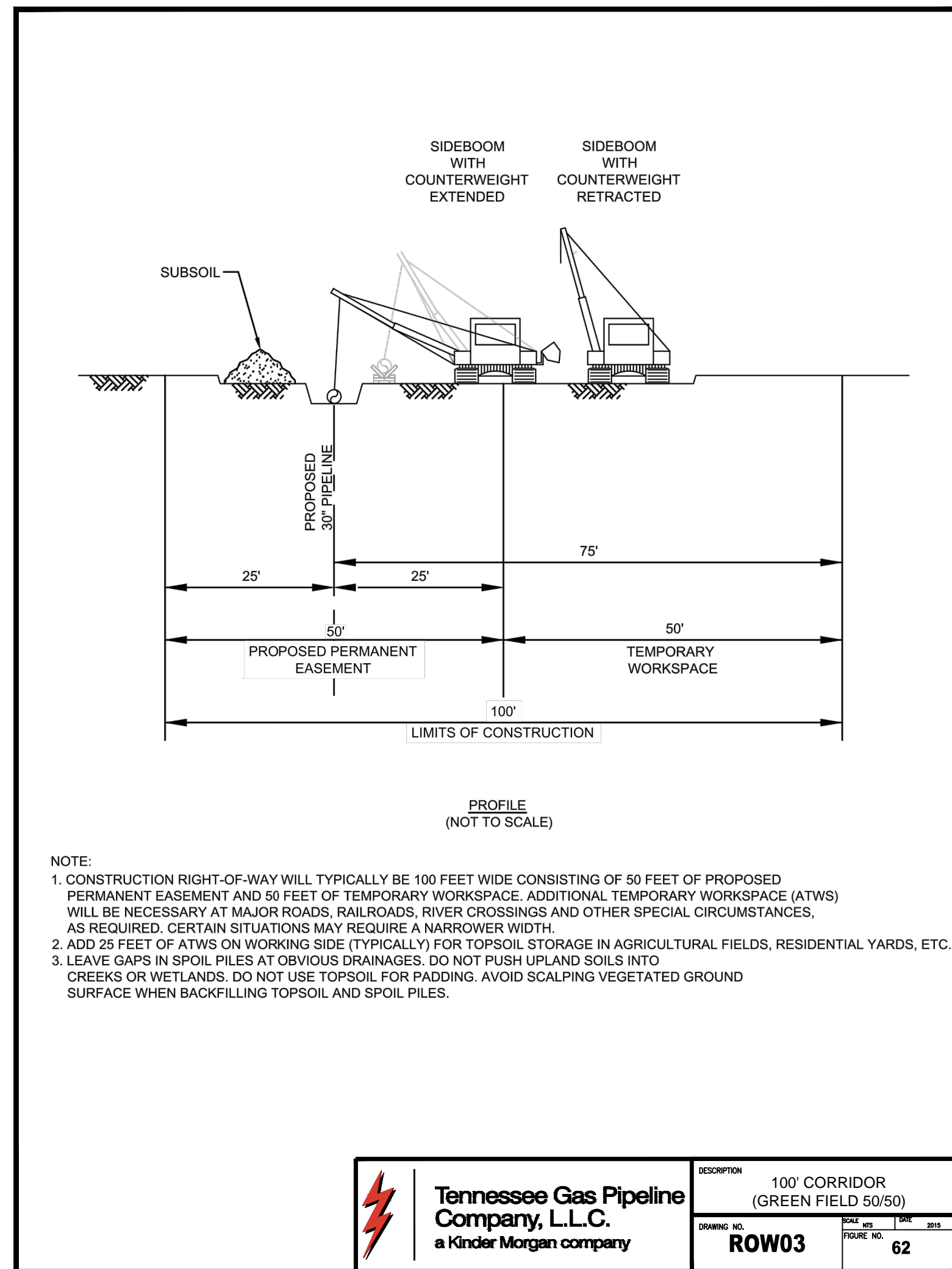
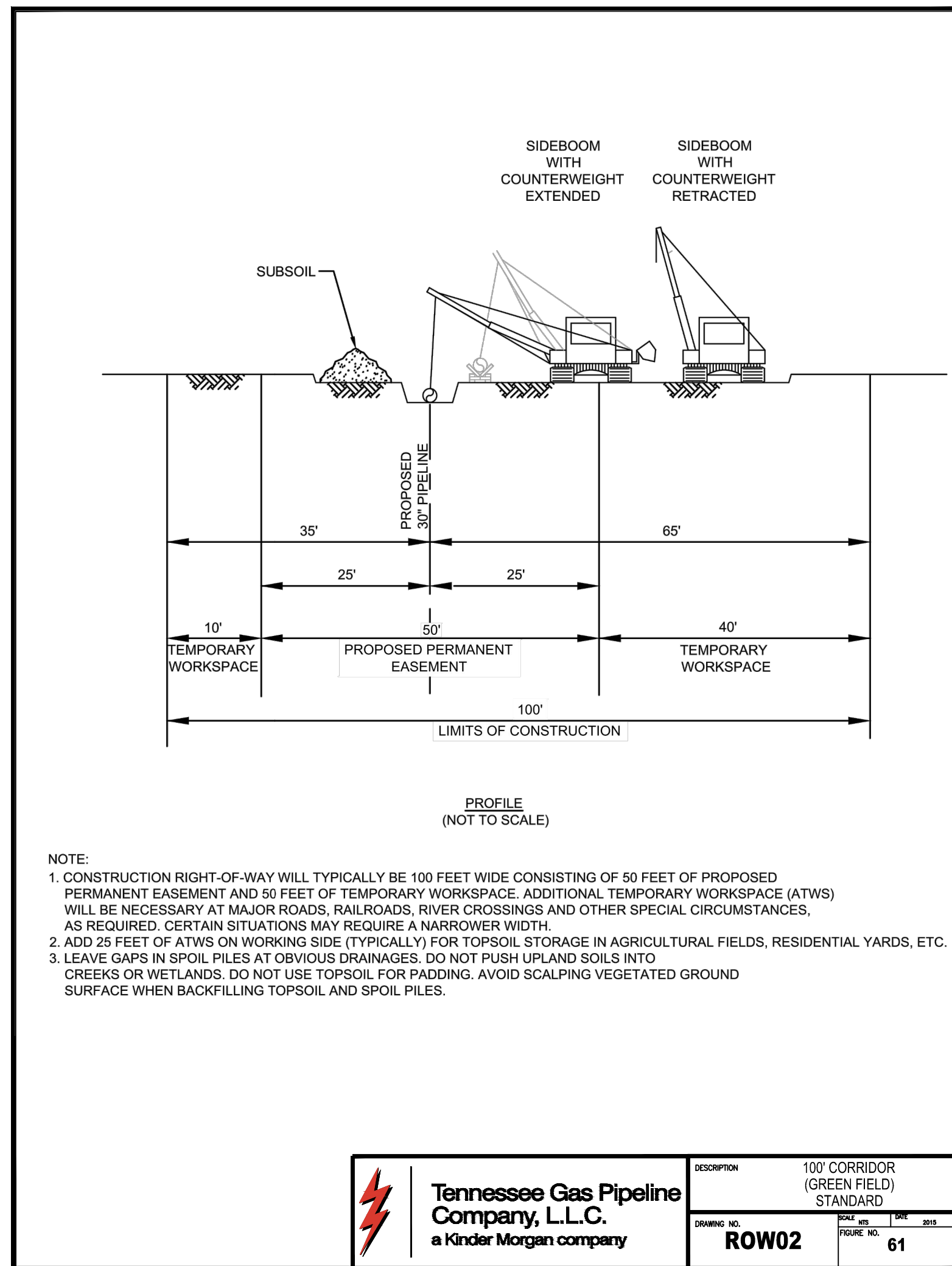
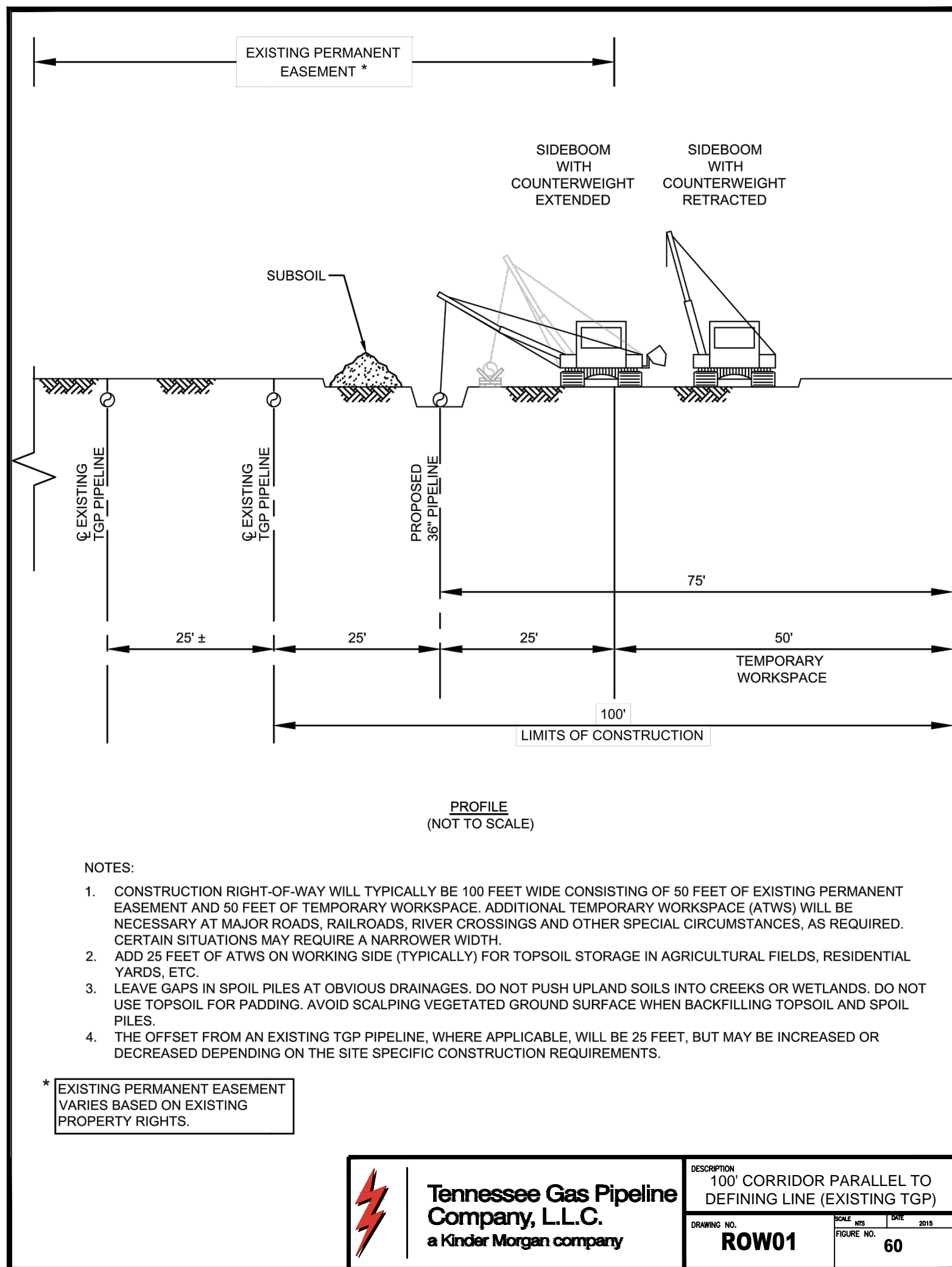
FIGURE NO.: 59

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section: _____ Township: _____ Range: _____
Co./Par.: _____ State: MASSACHUSETTS
Division: _____ Op. Area: _____
Drafter: GV Date: _____ Project ID: _____
Chk'd: _____ Date: _____ Scale: _____
Approved: _____ Date: _____ Filename: MA_ES_DETAILS_009
Sheet: _____
Type: _____



NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
EROSION & SEDIMENT CONTROL TYPICALS
MASSACHUSETTS

Section: _____ Township: _____ Range: _____

Co./Par.: _____ State: MASSACHUSETTS

Division: _____ Op. Area: _____

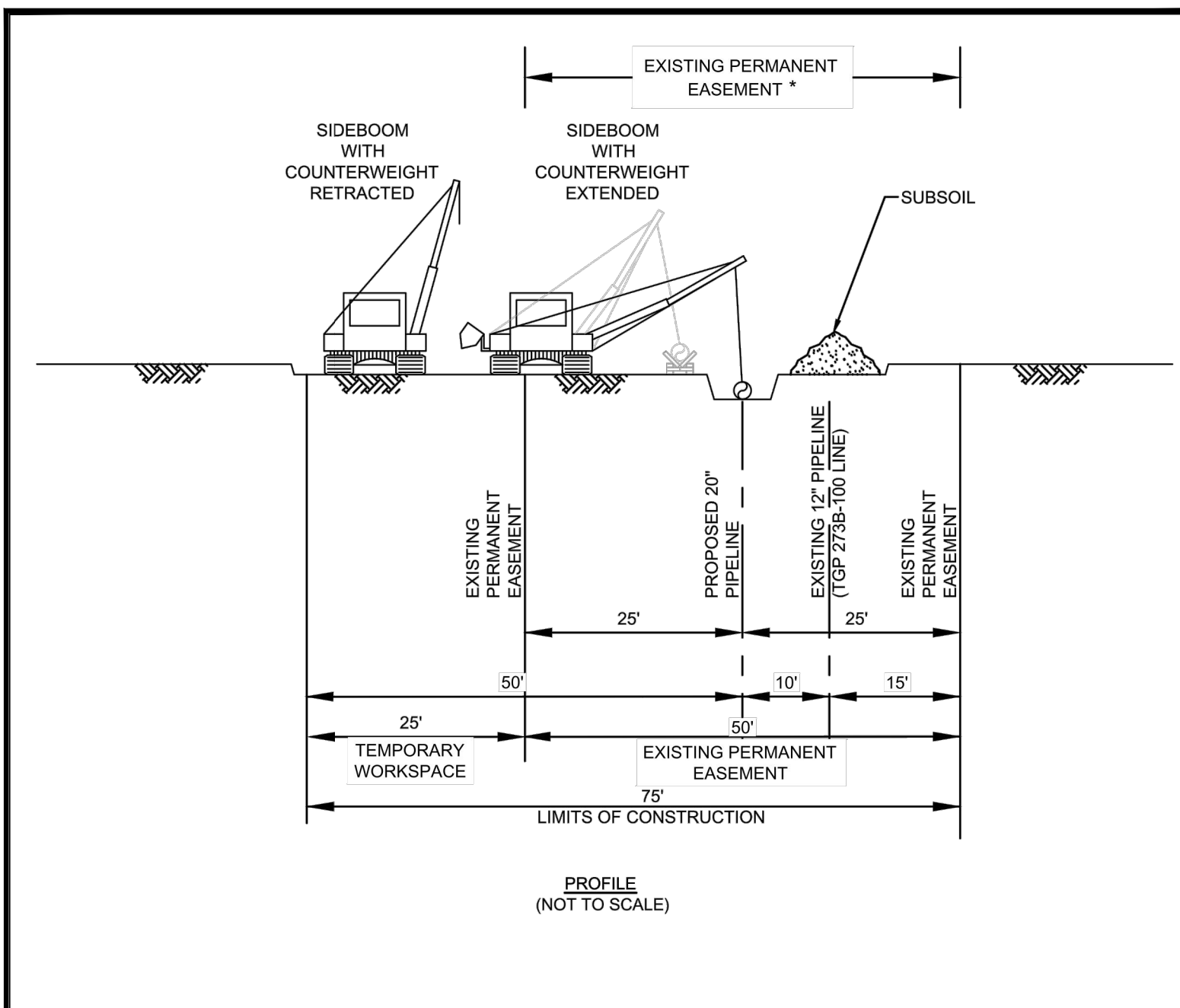
Drafter: GV Date: _____ Project ID: _____

Chk'd: _____ Date: _____ Scale: _____

Approved: _____ Date: _____ Filename: MA_ES_DETAILS_010

Sheet: _____

Type: _____

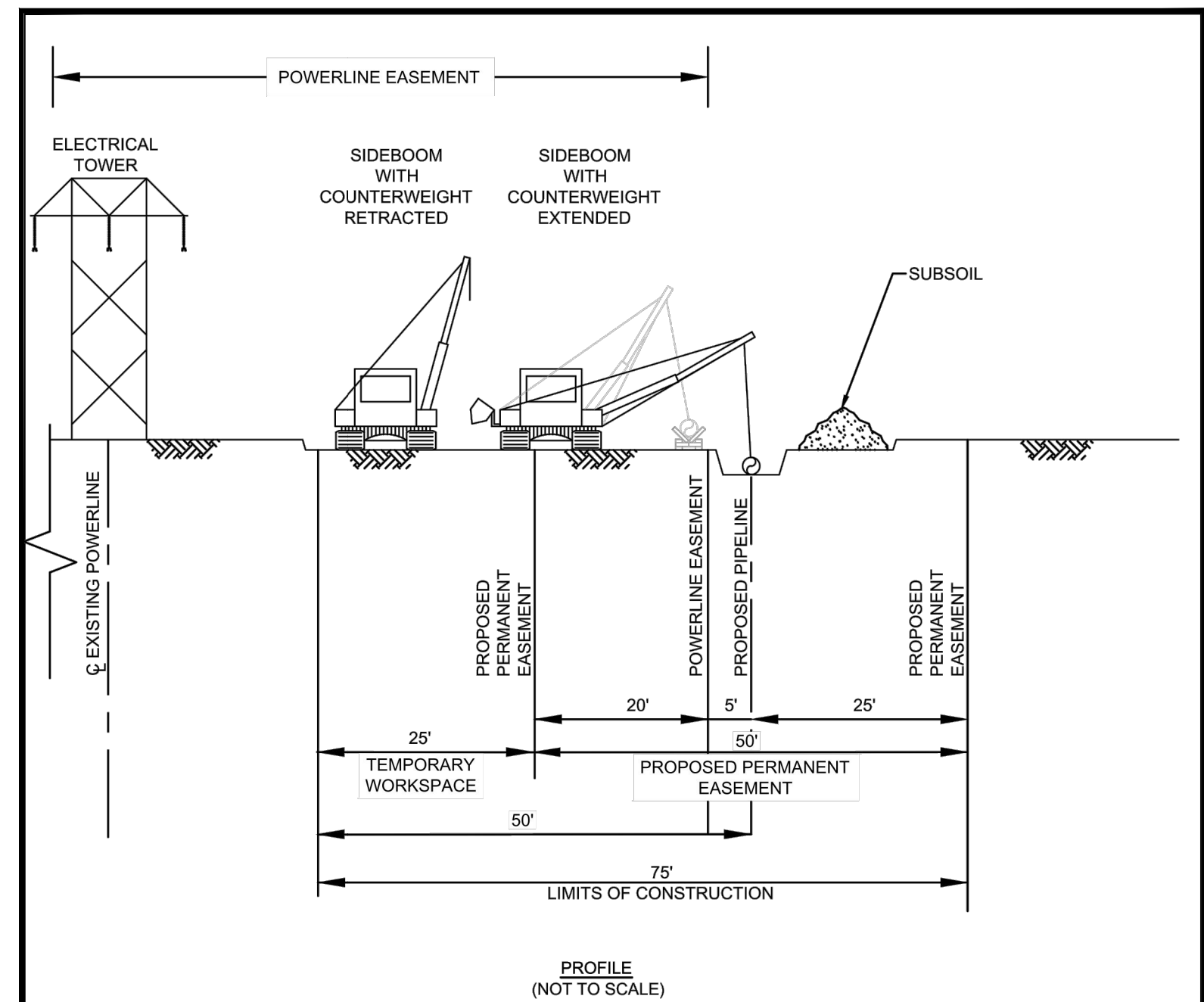


NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF EXISTING PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.
 4. A PORTION OF THE EXISTING 10" TGP 2708-300 PIPELINE WILL BE REMOVED AND REPLACED WITH A PROPOSED 20" PIPELINE.

* EXISTING PERMANENT EASEMENT VARIES BASED ON EXISTING PROPERTY RIGHTS.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

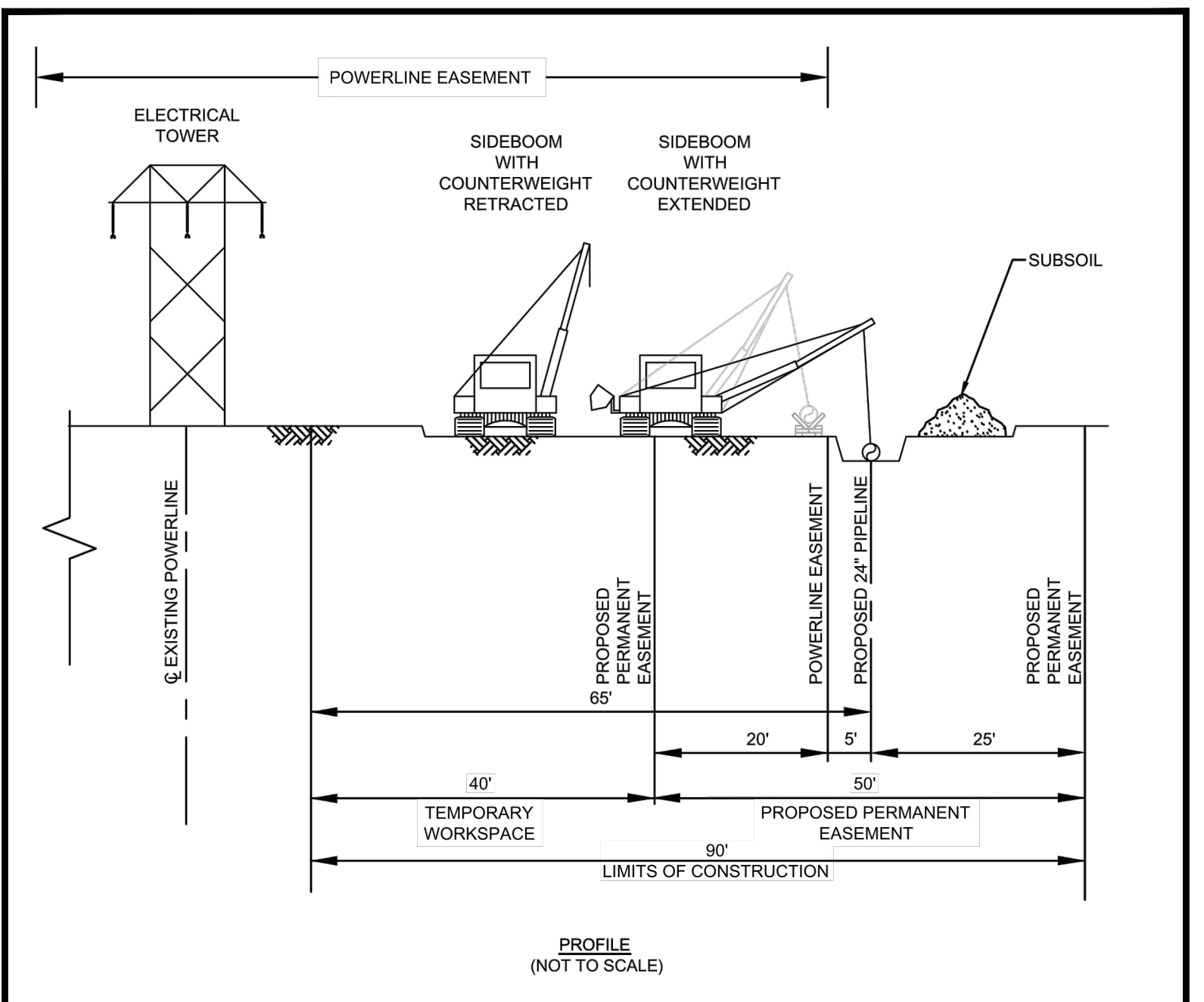
DESCRIPTION: 20" PIPELINE TAKE-UP & RELAY
 DRAWING NO.: ROW08
 SHEET NO.: 67



NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PROPOSED PERMANENT EASEMENT (20 FEET OF THE PROPOSED PERMANENT EASEMENT BEING SHARED WITH THE POWERLINE EASEMENT) AND 25 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

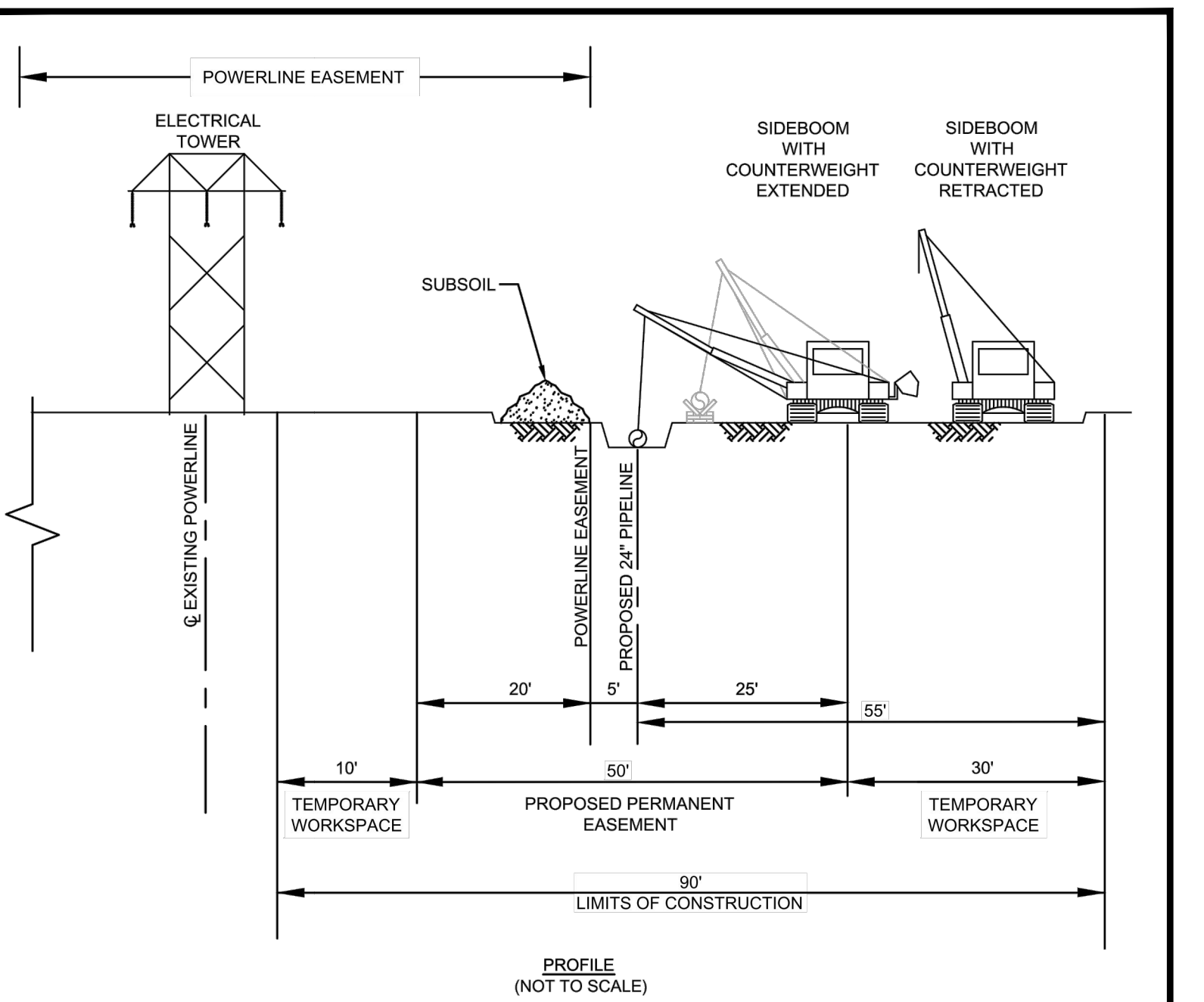
DESCRIPTION: 75' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 12" PROPOSED PIPELINE
 DRAWING NO.: ROW09
 SHEET NO.: 68



NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 90 FEET WIDE CONSISTING OF 50 FEET OF PROPOSED PERMANENT EASEMENT (20 FEET OF THE PROPOSED PERMANENT EASEMENT BEING SHARED WITH THE POWERLINE EASEMENT) AND 40 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

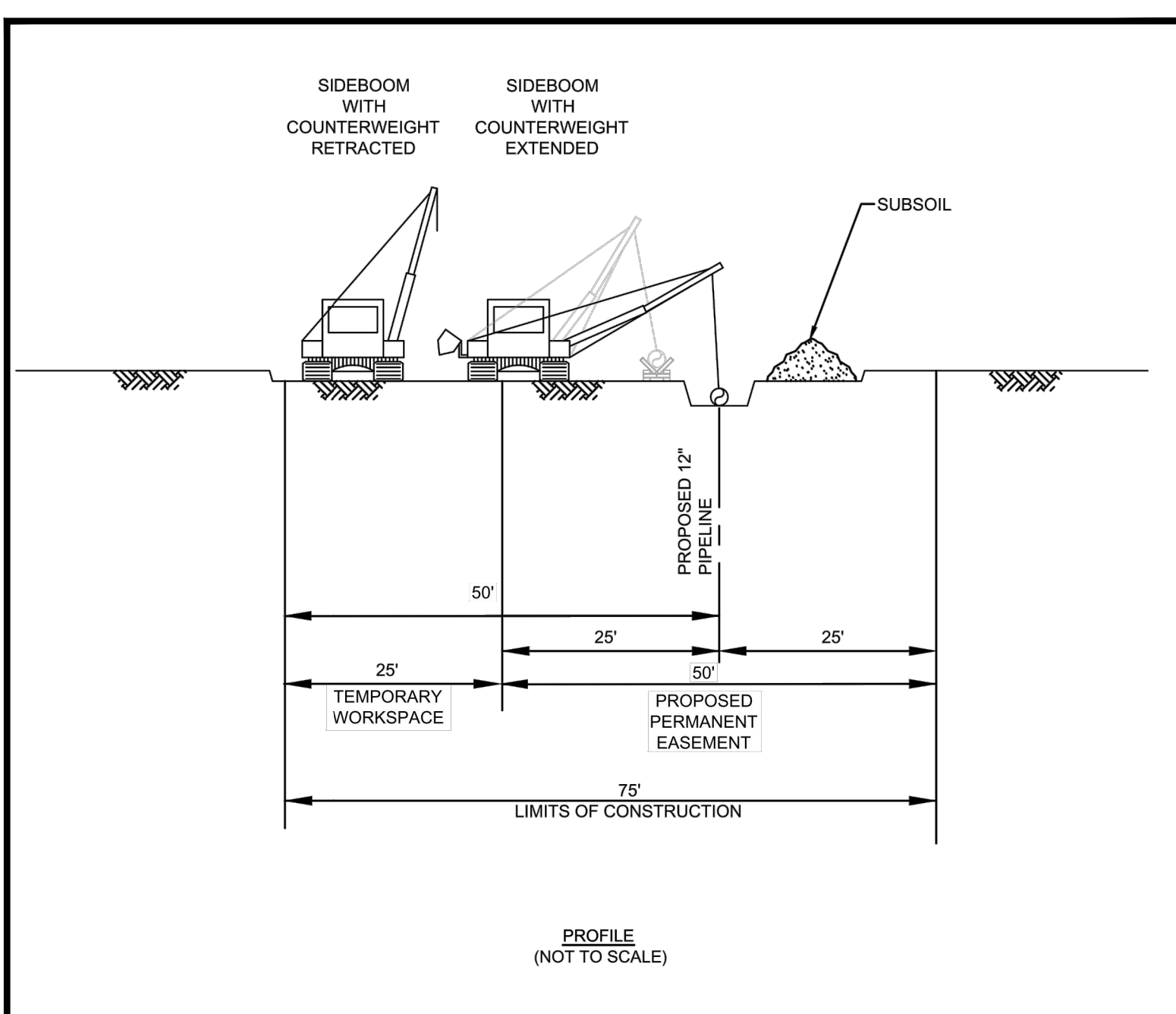
DESCRIPTION: 90' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 24" PROPOSED PIPELINE
 DRAWING NO.: ROW10
 SHEET NO.: 69



NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 90 FEET WIDE CONSISTING OF 50 FEET OF PROPOSED PERMANENT EASEMENT (20 FEET OF THE PROPOSED PERMANENT EASEMENT BEING SHARED WITH THE POWERLINE EASEMENT) AND 40 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

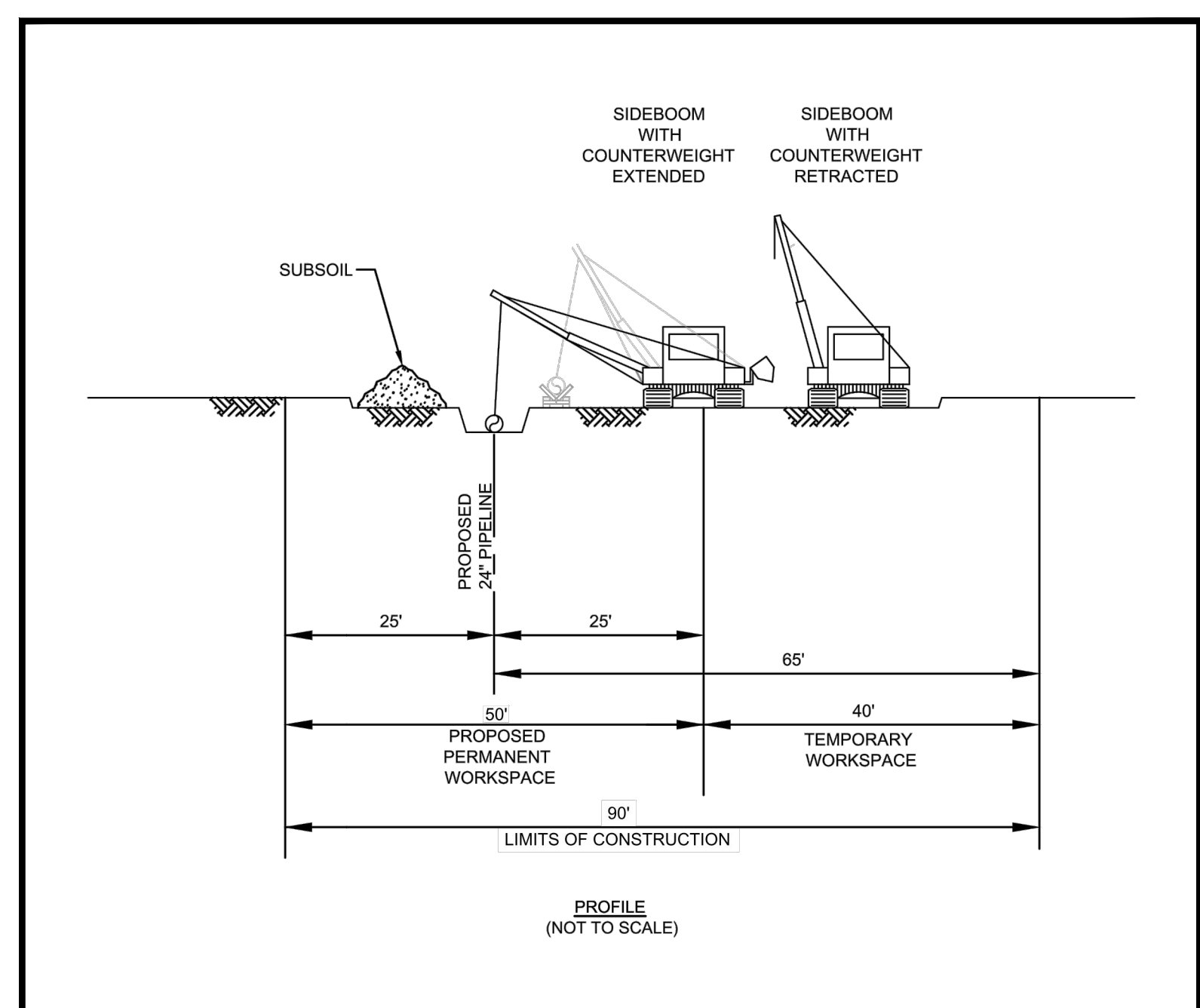
DESCRIPTION: 90' CORRIDOR PARALLEL TO POWERLINE EASEMENT FOR 24" PROPOSED PIPELINE
 DRAWING NO.: ROW11
 SHEET NO.: 70



NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PROPOSED PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

DESCRIPTION: 75' CORRIDOR (GREEN FIELD) FOR PROPOSED 12" PIPELINE
 DRAWING NO.: ROW12
 SHEET NO.: 71



NOTE:
 1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 90 FEET WIDE CONSISTING OF 50 FEET OF PROPOSED PERMANENT EASEMENT AND 40 FEET OF TEMPORARY WORKSPACE. ADDITIONAL TEMPORARY WORKSPACE (ATWS) WILL BE NECESSARY AT MAJOR ROADS, RAILROADS, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES. AS REQUIRED, CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
 2. ADD 25 FEET OF ATWS ON WORKING SIDE (TYPICALLY) FOR TOPSOIL STORAGE IN AGRICULTURAL FIELDS, RESIDENTIAL YARDS, ETC.
 3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

DESCRIPTION: 90' CORRIDOR (GREEN FIELD) FOR PROPOSED 24" PIPELINE
 DRAWING NO.: ROW13
 SHEET NO.: 72

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

Tennessee Gas Pipeline Company, L.L.C.
 a Kinder Morgan company

NORTHEAST ENERGY DIRECT PROJECT
 EROSION & SEDIMENT CONTROL TYPICALS
 MASSACHUSETTS

Section: _____ Township: _____ Range: _____
 Co./Par.: _____ State: MASSACHUSETTS
 Division: _____ Op. Area: _____
 Drafter: GV Date: _____ Project ID: _____
 Chk'd: _____ Date: _____ Scale: _____
 Approved: _____ Date: _____ Filename: MA_ES_DETAILS_011
 Sheet: _____
 Type: _____