TENNESSEE GAS PIPELINE COMPANY, L.L.C.

SILT FENCE DESIGN CRITERIA AND METHODOLOGY FOR THE ACCESS ROADWAYS

CONNECTICUT PIPELINE EXPANSION PROJECT

CONNECTICUT LOOP

Submitted by:

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JULY 2014

INTRODUCTION

The following description of silt fence design criteria and methodology was performed as part of a comprehensive erosion and sedimentation control design of the Connecticut Expansion Pipeline (Project) within Connecticut. Tennessee Gas Pipeline Company ("Tennessee") is filing an application for a certificate of public convenience and necessity with the Federal Energy Regulatory Commission ("Commission" or "FERC") for the Project in Albany County, New York, Berkshire and Hampden Counties, Massachusetts and Hartford County, Connecticut. The proposed Project involves the construction of two sections of new 36-inch pipeline looping totaling 1.4 miles in New York and 3.8 miles in Massachusetts, and one section of new 24-inch pipeline looping totaling 8.1 miles in Massachusetts and Connecticut. To the extent that it is practicable, feasible, and in compliance with existing law, Tennessee proposes to locate the pipeline loops within or adjacent to the right-of-way ("ROW") associated with its existing pipelines designated as the 200 and 300 Lines. Tennessee proposes to begin construction of the Project facilities in 2015 and to place the facilities in-service by November 2016.

DESIGN CRITERIA AND METHODOLOGY

In order to reduce runoff velocity and effect deposition of transported sediment load, both standard and reinforced silt fencing has been specified for use in the Connecticut portion of the Tennessee Pipeline Construction areas.

As per the Connecticut Guidelines for Soil and Sediment Control (2002, section 5-11-35), silt fencing placement is applicable where small disturbed areas where the contributing drainage area is less than 1 acre. The maximum slope length for 20" reinforced silt fence is:

Slope Steepness	Slope Steepness (%)	Maximum Slope Length (ft)
2:1 to 3:1	50 to 33	50
3:1 to 5:1	33 to 20	75
5:1 or flatter	20 or less	100

As there are no Connecticut State standards for silt fence specification where either maximum slope steepness or slope length is exceeded (as in noted in the above table), Tennessee specifies the use of reinforced silt fence and super silt fence with the following maximum allowable slope length (see standard environmental details at the end of this document):

Maximum Slope Length (ft) Above Fence [1]		
Slope Steepness	**Slope Percent (%)**	**Super Silt Fence**
2:1	50	50
-	45	60
-	40	75
-	35	85
-	30	100
4:1	25	135
5:1	20	275
-	15	215
10:1	10	325
20:1	5	500
50:1	2	1000

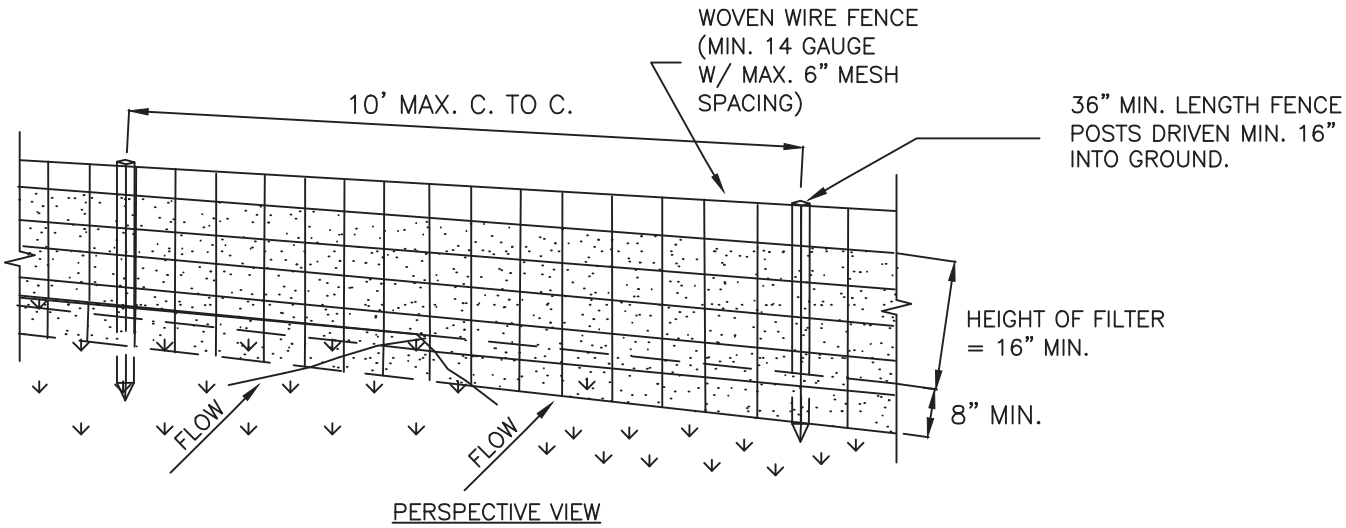
[1]This table is based on the table 4.4 Maximum Slope Length for Silt Fence of the PA DEP Erosion and Sediment Pollution Control Manual, 2012, page 76.

Locations where reinforced silt barrier slope steepness or slope length are exceeded (as noted in the above table), Tennessee will be utilizing a swale to intercept runoff up gradient of the construction areas, sized appropriately to either transfer flow to a nearby waterbody, if appropriate or directed via storm drainage pipe through the construction area and outletting in a preferred down gradient location.

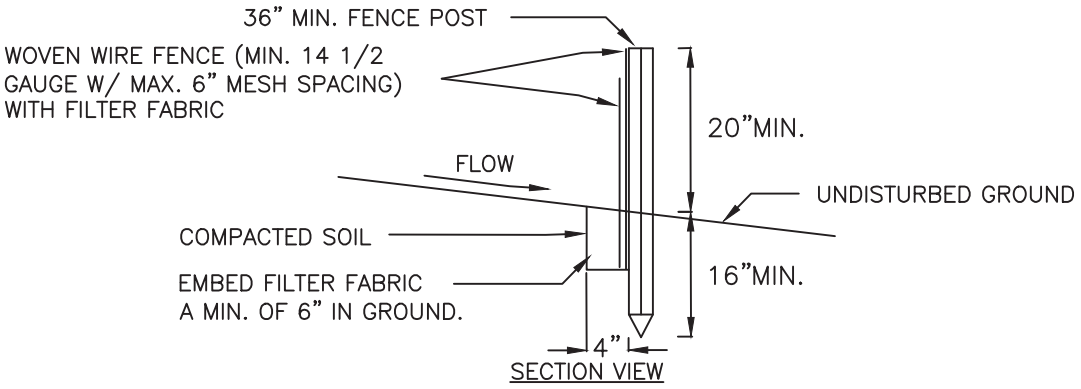
Finally, Silt fence materials will be according to specifications as noted in the Best Management Practices (BMPs) for Construction Activities in Connecticut.

SEDIMENT BARRIER TYPE AND LOCATION - CONNECTICUT ACCESS ROADS

ACCESS ROAD TYPE AND NAME	SEDIEMNT BARRIER LOCATION (STA. TO STA.)	Length of Barrier (FT)	SEDIMENT BARRIER TYPE	ACTUAL SLOPE PERCENT ABOVE BARRIER (%)	ACTUAL SLOPE LENGTH ABOVE BARRIER (FT)	ALLOWABLE SLOPE LENGTH ABOVE BARRIER (FT)	REMAINING SLOPE LENGTH (FT)	PERCENTAGE OF SLOPE LENGTH REMAINING	RESULT	Comments
			-	0	0				-	
CT-1	**100+00-101+50**	**150**	20 INCH SILT FENCE	6.6	75	100	25	25%	OK	
CT-2	**100+00-103+00**	**300**	20 INCH SILT FENCE	7.2	99	100	1	1%	OK	
CT-3	**100+00-106+11**	**611**	20 INCH SILT FENCE	2	10	100	90	90%	OK	
CT-4	**100+00-102+75**	**175**	20 INCH SILT FENCE	2	10	100	90	90%	OK	
	102+75-105+00	**225**	SUPER SILT FENCE	3.3	135	500	365	73%	OK	
	105+00-111+57	**500**	20 INCH SILT FENCE	2	10	100	90	90%	OK	
CT-4a	**200+00-210+00**	**1000**	20 INCH SILT FENCE	2	10	100	90	90%	OK	
	210+00-216+19	**519**	SUPER SILT FENCE	2.8	352	500	148	30%	OK	
CT-5	**1+00-5+50**	**450**	20 INCH SILT FENCE	1.8	40	100	60	60%	OK	
	5+50-10+00	**450**	SUPER SILT FENCE	2	251	1000	749	75%	OK	
	10+00-18+00	**800**	20 INCH SILT FENCE	5	30	100	70	70%	OK	
	18+00-21+91	**391**	SUPER SILT FENCE	2	180	1000	820	82%	OK	
CT-5a	**50+00-54+91**	**491**	20 INCH SILT FENCE	2	20	100	80	80%	OK	
CT-6	**1+00-14+14**	**1314**	20 INCH SILT FENCE	1	20	100	80	80%	OK	
CT-7	**100+00-108+00**	**800**	20 INCH SILT FENCE	0.37	89	100	11	11%	OK	
	108+00-112+00	**300**	20 INCH SILT FENCE	2	20	100	80	80%	OK	
	112+00-118+00	**600**	20 INCH SILT FENCE	2	55	100	45	45%	OK	
	118+00-119+47	**147**	20 INCH SILT FENCE	2	56	100	44	44%	OK	
CT-7a	**111+00-113+58**	**258**	20 INCH SILT FENCE	10	50	100	50	50%	OK	
	100+00-111+00	**1100**	20 INCH SILT FENCE	2	20	100	80	80%	OK	
CT-8	**100+00-101+76**	**176**	20 INCH SILT FENCE	2.9	35	100	65	65%	OK	
CT-8A		**65**	20 INCH SILT FENCE	2	20	100	80	80%	OK	AT ENTRANCE TO EXIST PAVED LOT
Pipe Yard 1										
NE corner to SE corner	**0' - 475'**	**475**	SUPER SILT FENCE	0.0667	150	1000	850	85%	OK	
	475' - 1035'	**560**	20 INCH SILT FENCE	0.25	30	100	70	70%	OK	
	1035' - 1987	**952**	20 INCH SILT FENCE	0.121	95	100	5	5%	OK	
SW corner to NW corner	**0'-1540'**	**1540**	SUPER SILT FENCE	0.102	343	1000	657	66%	OK	
	1540' - 2148'	**608**	SUPER SILT FENCE	0.0565	177	1000	823	82%	OK	
N edge		**268**	SUPER SILT FENCE	0.0298	336	1000	664	66%	OK	
			SUPER SILT FENCE			0	0	0%	-	
Pipe Yard 2			SUPER SILT FENCE			0	0	0%	-	
SW corner to NW corner	**0' - 637'**	**637**	SUPER SILT FENCE	0.023	214	1000	786	79%	OK	
N edge		**482**	SUPER SILT FENCE	0.001	105	1000	895	90%	OK	
NE corner to SE corner	**0' - 460'**	**857**	SUPER SILT FENCE	0.0009	333	1000	667	67%	OK	



PERSPECTIVE VIEW



SECTION VIEW

CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE 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.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER THEY SHALL BE OVER–LAPPED BY SIX INCHES AND FOLDED. FILTER FABRIC SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
6. MAXIMUM DRAINAGE AREA FOR OVERLAND FLOW TO A SILT FENCE SHALL NOT EXCEED 1/4 ACRE PER 100 FEET OF FENCE.
7. MAXIMUM ALLOWABLE SLOPE LENGTHS CONTRIBUTING RUNOFF TO SILT FENCE PLACED ON A SLOPE ARE AS FOLLOWS:

SLOPE STEEPNESS	MAXIMUM LENGTH (FT)
2:1	25
3:1	50
4:1	75
5:1 OR GREATER	100

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.

REVISIONS

Division:	Op. Area:	
St.:	Co./Par.:	
Section:	Township:	Range:
Dft:	Date:	Project ID:
Chk:	Date:	Scale:
Appr:	Date:	Filename:

TENNESSEE GAS PIPELINE, LLC.
STANDARD ENVIRONMENTAL DETAIL
CONNECTICUT EXPANSION PROJECT
REINFORCED SILT FENCE

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

FIG. NO. 31

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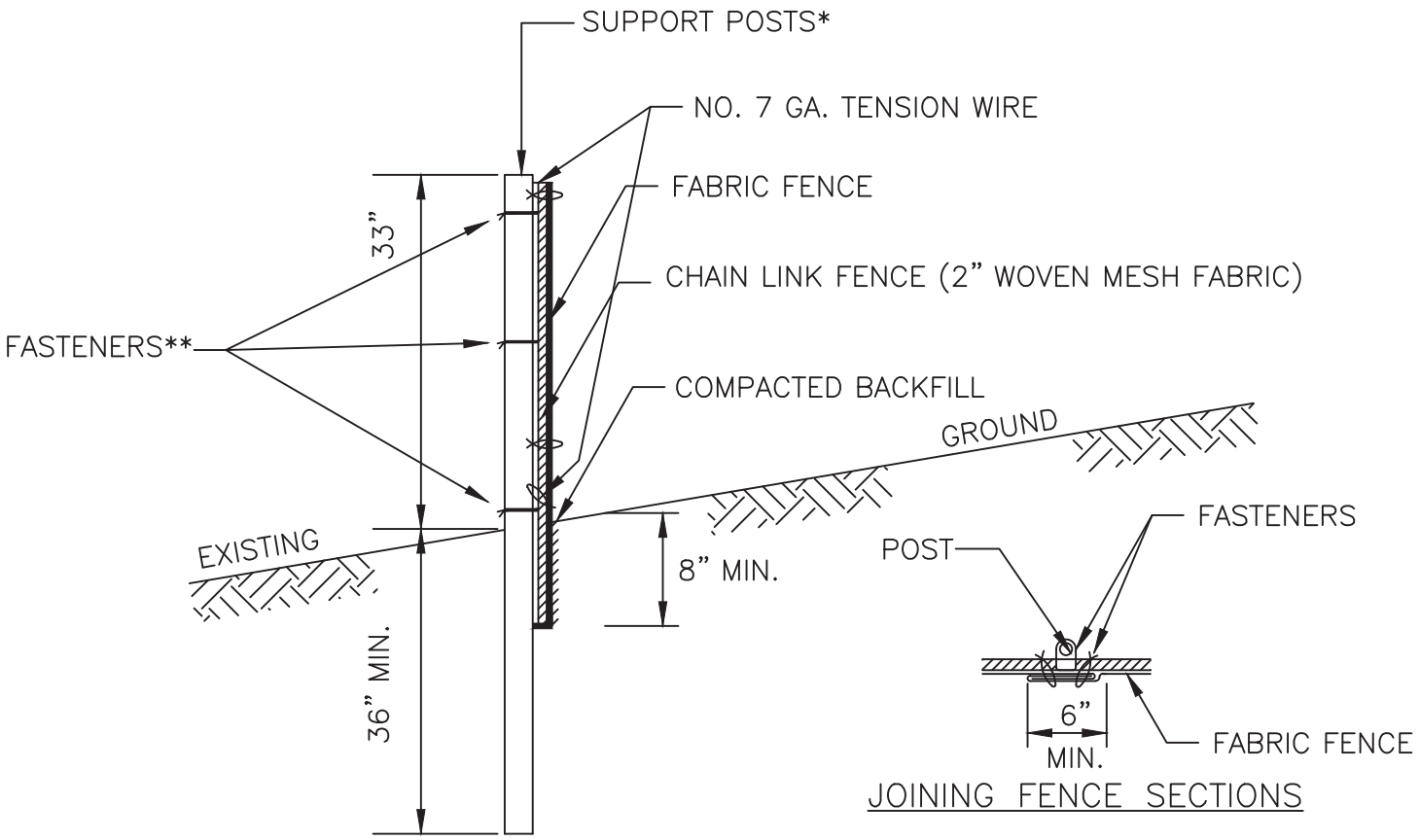
Type:

STANDARD CONSTRUCTION DETAIL #22
Super Filter Fabric Fence



* POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. GALVANIZED OR ALUMINUM POSTS.

** CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 6 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE–FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX. C TO C.

NO. 7 GA. TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN–LINK FENCE.

FILTER FABRIC FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.

REVISIONS

Division:	Op. Area:	
St.:	Co./Par.:	
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TENNESSEE GAS PIPELINE, LLC.
STANDARD ENVIRONMENTAL DETAIL
CONNECTICUT EXPANSION PROJECT
SUPER SILT FENCE (1)

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

FIG. NO. 32

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