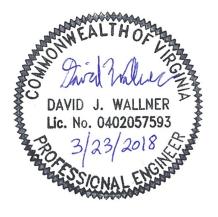
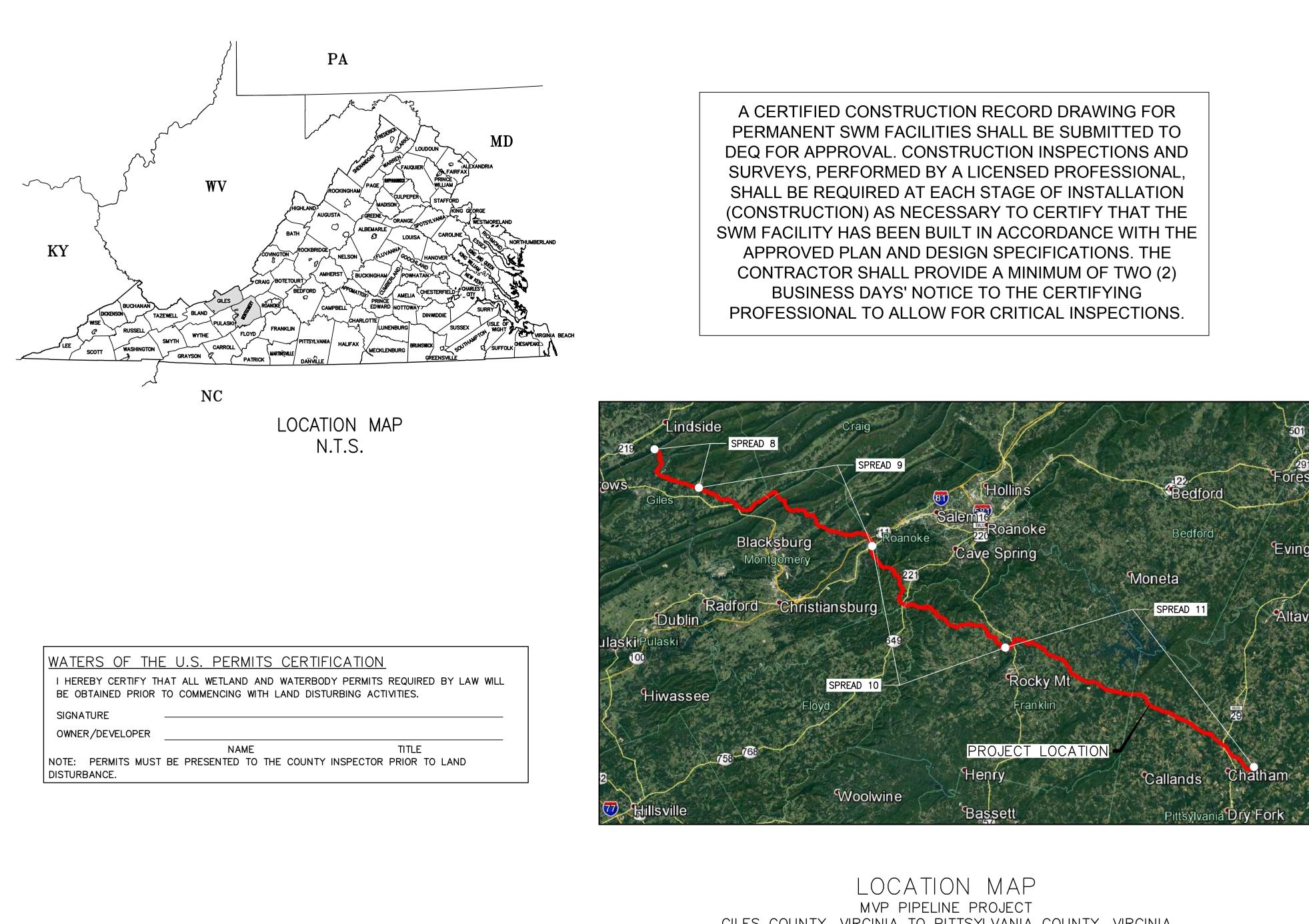
By virtue of this seal and signature, all supporting documents included in this package are accurate and support the design presented herein.



# **MOUNTAIN VALLEY PIPELINE, LLC EROSION & SEDIMENT CONTROL PLAN**

# **MVP PIPELINE PROJECT GILES COUNTY TO MONTGOMERY COUNTY SPREAD 9**



	-
SHEET No.	
0.00	COVER
0.01 TO 0.21	EROSI
0.22 TO 0.23	GENER
13.00A	VARIA
13.01 TO 13.02	KEY P
13.03EX TO 13.90EX	EXISTI
13.03ES TO 13.90ES	EROSI
13.03PC TO 13.90PC	POST



CONTRACTOR IS RESPONSIBLE TO **IDENTIFY ALL UTILITIES. THE UTILITY** LINES SHOWN ON THE PLAN ARE FOR INFORMATIONAL PURPOSES ONLY AND DO NOT REPRESENT SURVEYED LINE INFORMATION.

# GILES COUNTY, VIRGINIA TO PITTSYLVANIA COUNTY, VIRGINIA

# DRAWING INDEX DRAWING TITLE GENERAL SET SHEET ON AND SEDIMENT CONTROL DETAILS L NOTES AND LEGEND SPREAD 9 NCE AND EXEMPTION REQUESTS

NG CONDITIONS

ON & SEDIMENT CONTROL PLANS

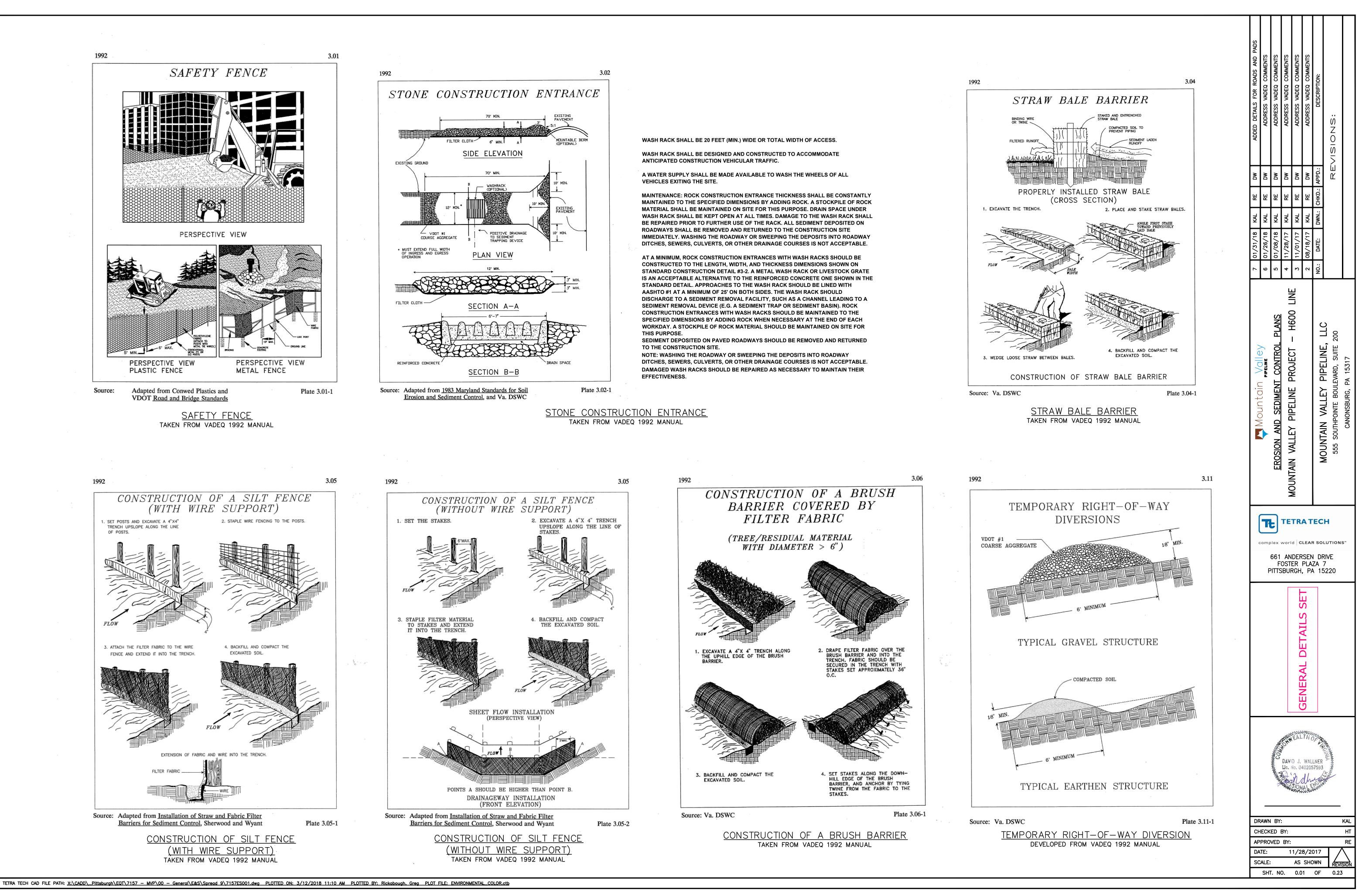
CONSTRUCTION STORMWATER AND RESTORATION PLANS

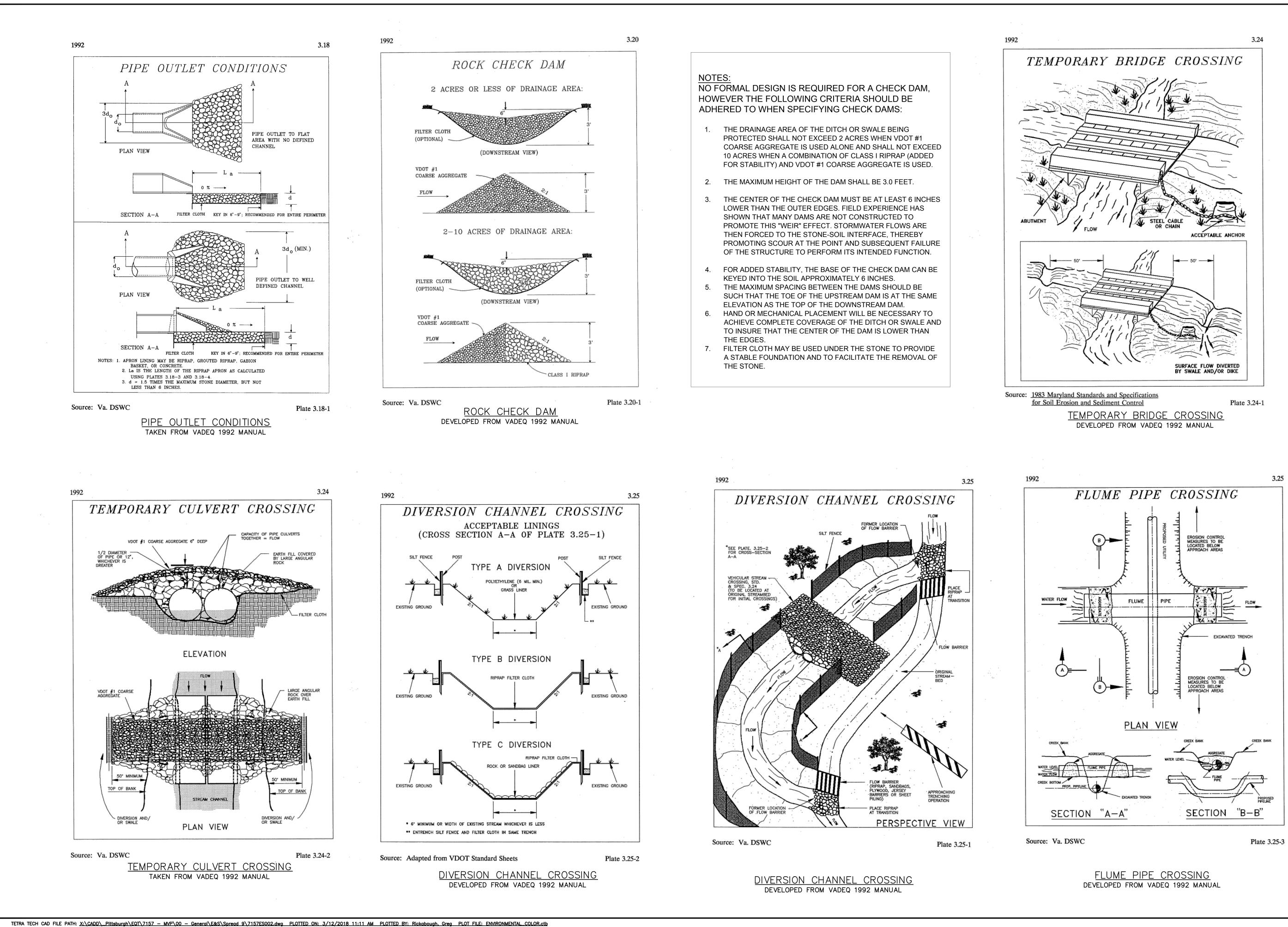


THREE DAYS BEFORE YOU DIG

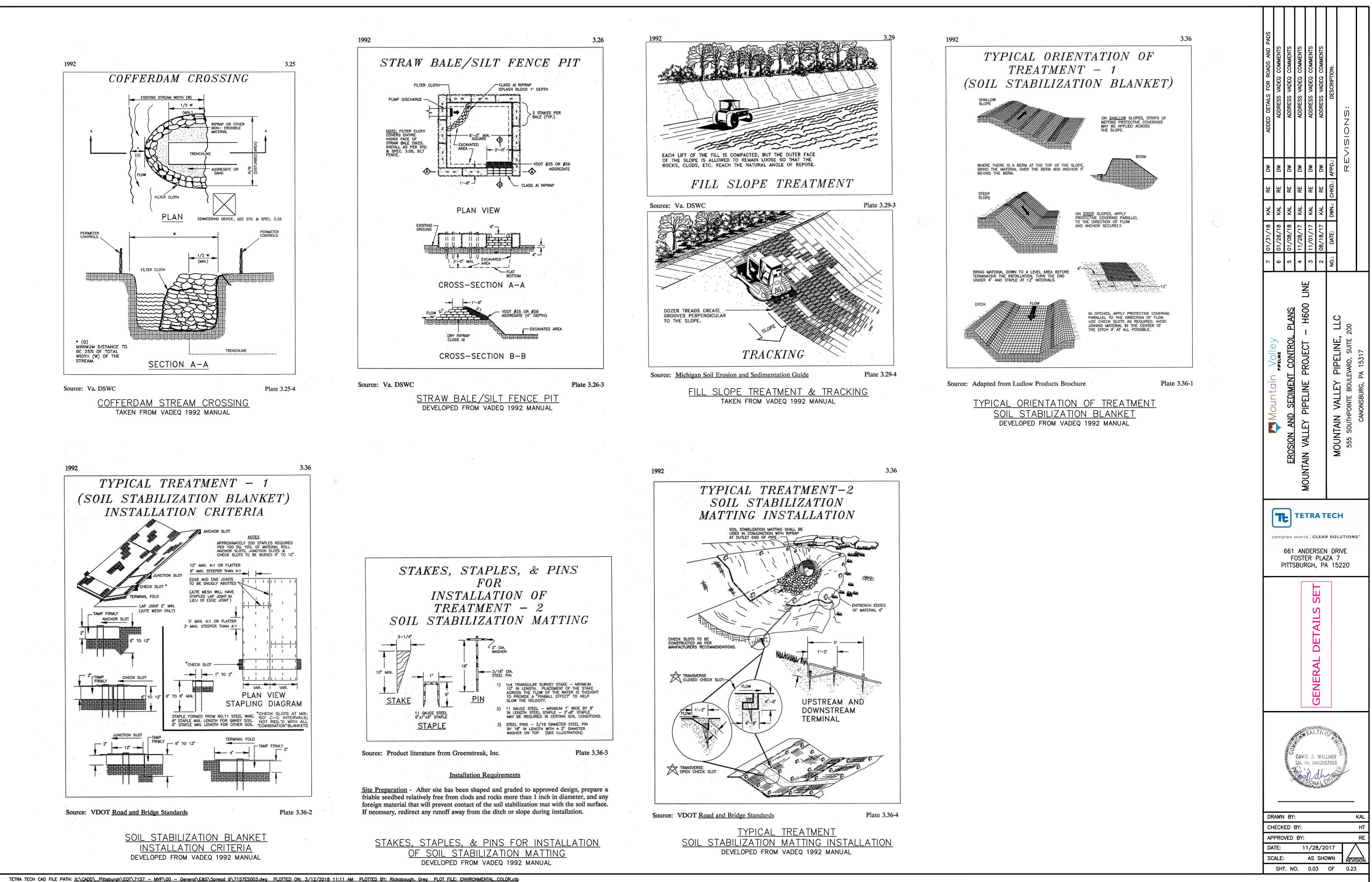
CALL VA ONE CALL SYSTEM TOLL FREE 811 OR 1-800-552-7001

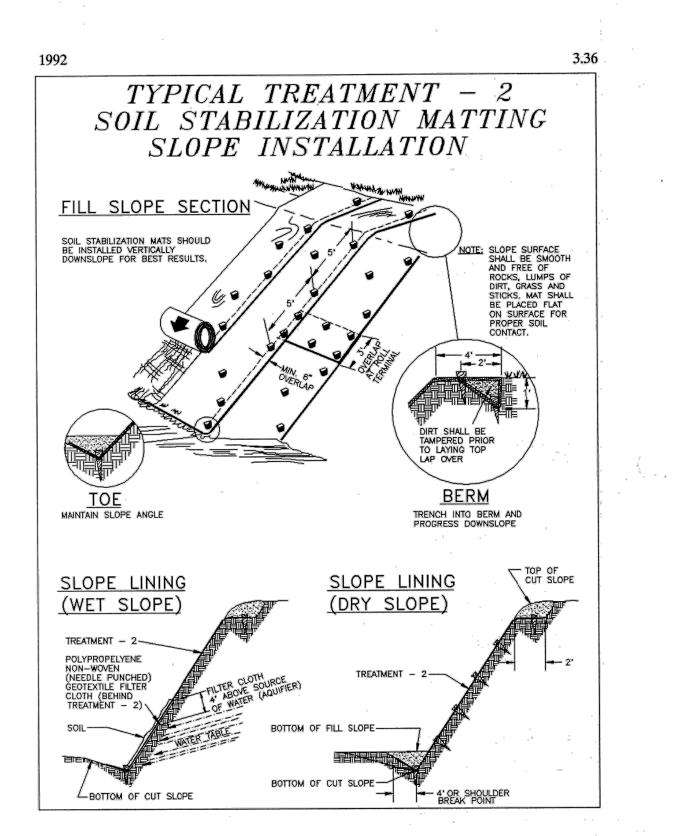
CH AP DA					7	01/31/18	KAL	RE DW	ADDED DETAILS FOR ROADS AND PADS
AWN IECK PRO TE: ALE:					9	01/26/18	KAL	RE DW	ADDRESS VADEQ COMMENTS
ED VED	Transferrencesses		661 F	EROSION AND SEDIMENT CONTROL PLANS	5	01/08/18	KAL	RE DW	ADDRESS VADEQ COMMENTS
BY: BY:			worl AN OST		4	11/28/17	KAL	RE DW	ADDRESS VADEQ COMMENTS
			⊣∣c DEF ER	MUUNIAIN VALLEI FIFELINE FRUJEUI - NOUU LINE	β	11/01/11	KAL	RE DW	ADDRESS VADEQ COMMENTS
8/2	WAL	GENERAL DE LAILS SE I	LEAI SEN PLA		2	08/18/17	KAL	RE DW	ADDRESS VADEQ COMMENTS
017 DWN	LNER 57593		I DF ZA		NO.:	DATE:	DWN.: CH	CHKD.: APPD.:	DESCRIPTION:
REVI	NIA		lution: RIVE	555 SOUTHPOINTE BOULEVARD, SUITE 200				Ľ	REVISIONS:
KAL HT RE			S™	CANONSBURG, PA 15317					





ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:				
DW	DW	MQ	DW	DW	DW	CHKD.: APPD.:	Ш Ш				
RE	RE	RE	RE	RE	RE	CHKD.:					
kal	8 KAL	kal	KAL	, KAL	, KAL	DWN.:					
01/31/18	01/26/18	01/08/18	11/28/17	11/01/17	08/18/17	DATE:					
7 C	6 C	5 0	4 1	3 1	2 0	NO.:					
	Mountain Valley Pipeline Project – H600 Line MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE S55 SOUTHPOINTE BOULEVARD, SUITE 200 555 SOUTHPOINTE BOULEVARD, SUITE 200 CANONSBURG, PA 15317										
G	Complex world CLEAR SOLUTIONS" 661 ANDERSEN DRIVE FOSTER PLAZA 7 PITTSBURGH, PA 15220										
DAVID J. WALLNER Lic. No. 0402057593											
	_										



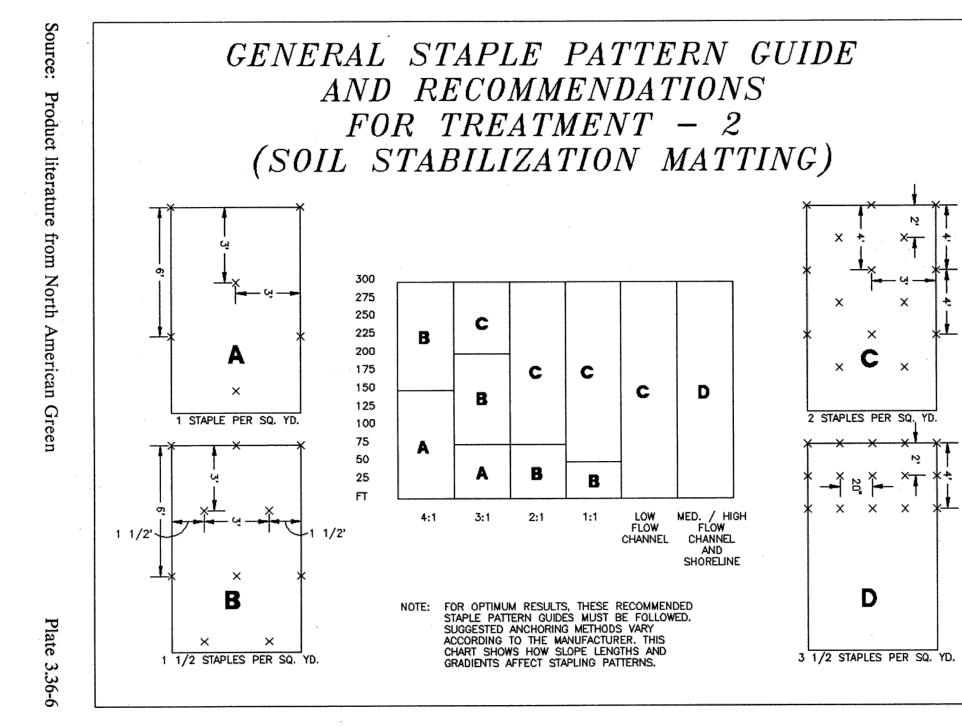


Source: VDOT Road and Bridge Standards

Plate 3.36-5

# SOIL STABILIZATION MATTING SLOPE

NOTE: FOR LANDS ON THE JEFFERSON NATIONAL FOREST, IF THE USE OF STABILIZATION NETTING IS REQUIRED/PERMITTED, WILDLIFE FRIENDLY GEOTEXTILES MUST BE USED. THESE PRODUCTS MUST EITHER NOT CONTAIN NETTING, OR NETTING MUST BE MADE OF 100% BIODEGRADABLE NON-PLASTIC MATERIALS SUCH AS JUTE, SISAL, OR COIR FIBER. PLASTIC NETTING (SUCH AS POLYPROPYLENE, NYLON, POLYETHYLENE, AND POLYESTER), EVEN IF ADVERTISED AS BIODEGRADABLE, IS NOT ACCEPTED ALTERNATIVE. ANY NETTING USED MUST ALSO HAVE A LOOSE-WEAVE DESIGN WITH MOVABLE JOINTS BETWEEN HORIZONTAL AND VERTICAL TWINES TO REDUCE THE CHANCE FOR WILDLIFE ENTANGLEMENT, INJURY, OR DEATH. (CA COASTAL COMMISSION, 2012)



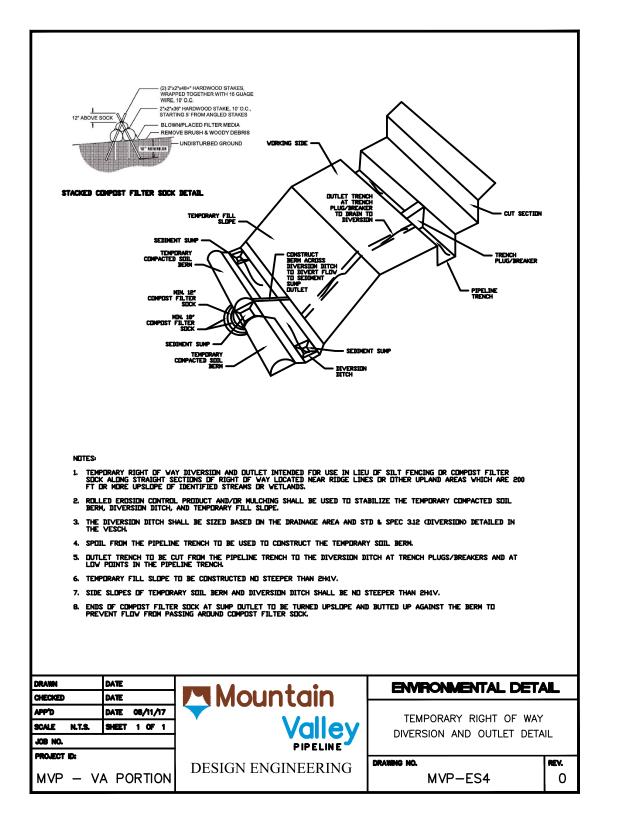
GENERAL STAPLE PATTERN GUIDE & RECOMMENDATIONS FOR TREATMENT DEVELOPED FROM VADEQ 1992 MANUAL

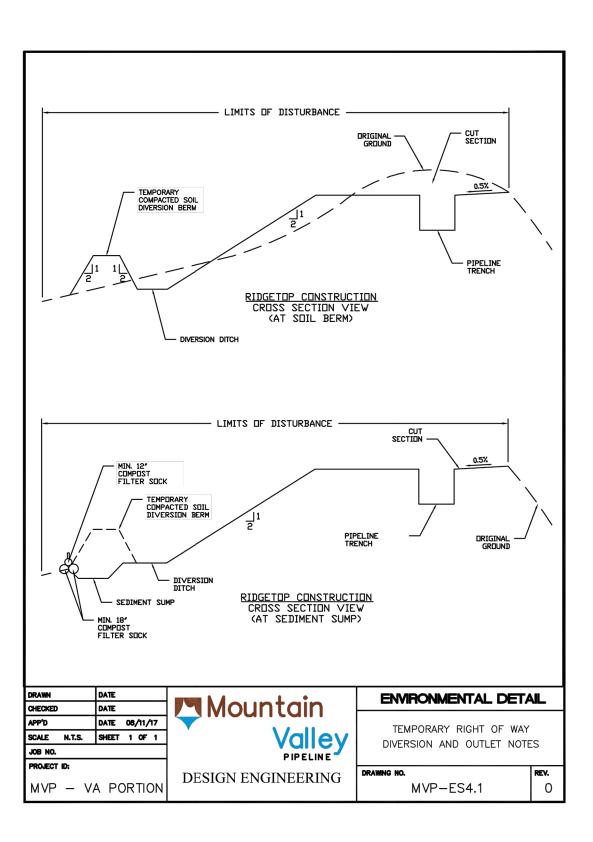
III - 368

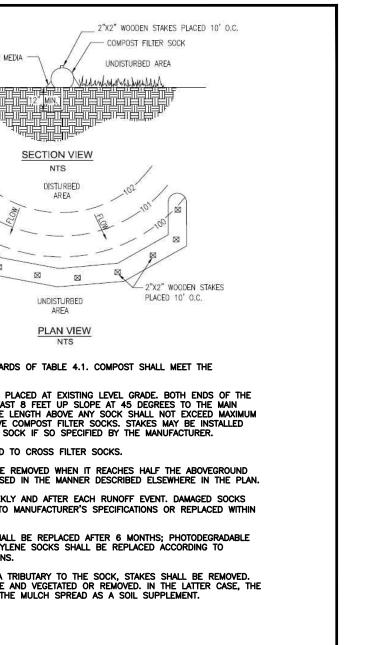
 N Z O W	PD.: DESCRIPTION: REVISIONS:	DESCRIPTION:	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDED DETAILS FOR ROADS AND PADS
	NO.: DATE: DWN.: CHKD.: APPD.: REVI	DATE: DWN.: CHKD.:	2 08/18/17 KAL RE DW	3 11/01/17 KAL RE DW	4 11/28/17 KAL RE DW	5 01/08/18 KAL RE DW	6 01/26/18 KAL RE DW	7 01/31/18 KAL RE DW
rions" E	MOUNTAIN VALLEY PIPELINE, LLC 555 SOUTHPOINTE BOULEVARD, SUITE 200 7555 SOUTHPOINTE BOULEVARD, SUITE 200	TEC AR SC N D AZA	CLEA RSEI PLA	IDEF ER RGH	TE worl AN OST	661 F(	(	(
	NER 7593	ULLNER D5759: VIC	WAL	EAL	A			
KAL HT RE REVISION 0.23		2017 łown		1/2	BY: BY:	BY: ED E VED	ECK	CH AP DA

1992 ω w

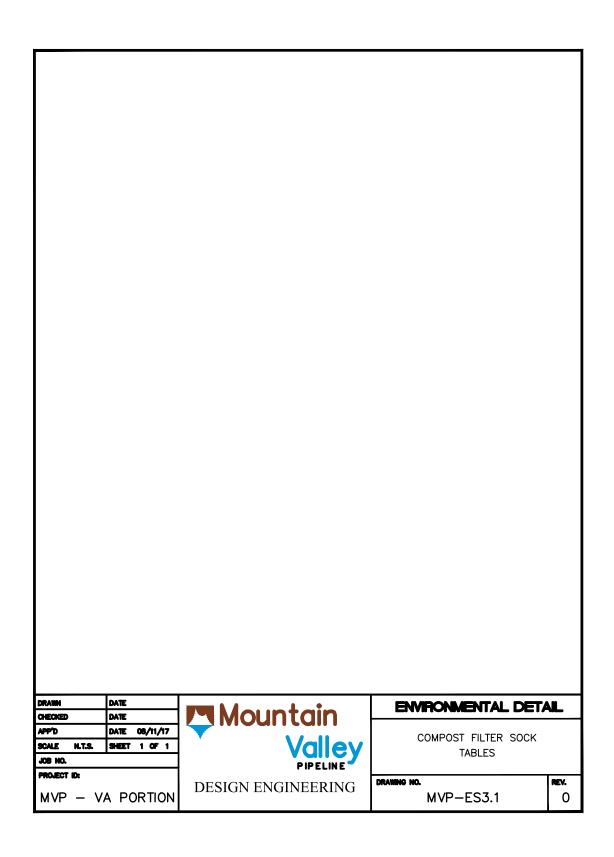
NO DOWNSLOPE SEDI SOCK SHALL BE INST STREAMS IN STATE AI AREA IS NOT AVAILAB THE PUMP DISCHARG AND SECURELY CLAM THE PUMPING RATE S WHICHEVER IS LESS. FILTER BAGS SHALL B	ALLED BELOW BAGS LOCATED IN TMDL WATERSHEDS, CL ID FEDERAL FORESTS, WITHIN 50 FEET OF ANY RECEIVILE. E HOSE SHALL BE INSERTED INTO THE BAGS IN THE M PED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS HALL BE NO GREATER THAN 750 GPM OR ½ THE MAXI PUMP INTAKES SHALL BE FLOATING AND SCREENED. IE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PU HE PROBLEM IS CORRECTED.	NG SURFACE WATER OR WHERE GRASSY NNNER SPECIFIED BY THE MANUFACTURER 3 PURPOSE. MUM SPECIFIED BY THE MANUFACTURER,	SOCKS AFTER 1 MANUFACTURER'S UPON STABILIZAT THE SOCK MAY	FILTER SOCKS SHALL YEAR. POLYPROPYLE S RECOMMENDATIONS TION OF THE AREA T BE LEFT IN PLACE / CUT OPEN AND THE
PROVIDED. FILTER BA KEPT AVAILABLE FOR TO FACILITATE REMOV BAGS SHALL BE LOC AREAS. WHERE THIS BE PLACED ON FILTE THAN 5%, FOR SLOP	F ACCESSING THE BAG WITH MACHINERY REQUIRED FOR SS SHALL BE REPLACED WHEN THEY BECOME ½ FULL ( REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FI UL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY TED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHAR S NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FI R STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHA S EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODI HE BAG TO REDUCE SLOPE STEEPNESS.	DF SEDIMENT, SPARE BAGS SHALL BE LLED, BAGS SHALL BE PLACED ON STRAPS ATTACHED. GE ONTO STABLE, EROSION RESISTANT LOW PATH SHALL BE PROVIDED. BAGS MAY LL NOT BE PLACED ON SLOPES GREATER BLE AND NON-POLLUTING MATERIAL MAY COMPOST BERM OR COMPOST FILTER	STANDARDS OF COMPOST FILTER SOCK SHALL BE SOCK ALIGNMENT PERMISSIBLE SLO IMMEDIATELY DO TRAFFIC SHALL I ACCUMULATED S HEIGHT OF THE SOCKS SHALL BE SHALL BE REPAI 24 HOURS OF II	E SOCK SHALL BE PL EXTENDED AT LEAST F. MAXIMUM SLOPE L OPE LENGTH ABOVE ( WINSLOPE OF THE SO NOT BE PERMITTED T EDIMENT SHALL BE F SOCK AND DISPOSED E INSPECTED WEEKLN RED ACCORDING TO INSPECTION.
Low volume filter   Stitched "/" Type Si		TY LIFTING STRAPS COMPOSITION STRAPS COMPOSITION STRAPS COMPOSITION WITH HIGH STRENGTH, DOUBLE RIAL SEWN WITH HIGH STRENGTH, DOUBLE	EXISTING CONT	BLOWN/PLACED FILTER MED DISTURBED AREA

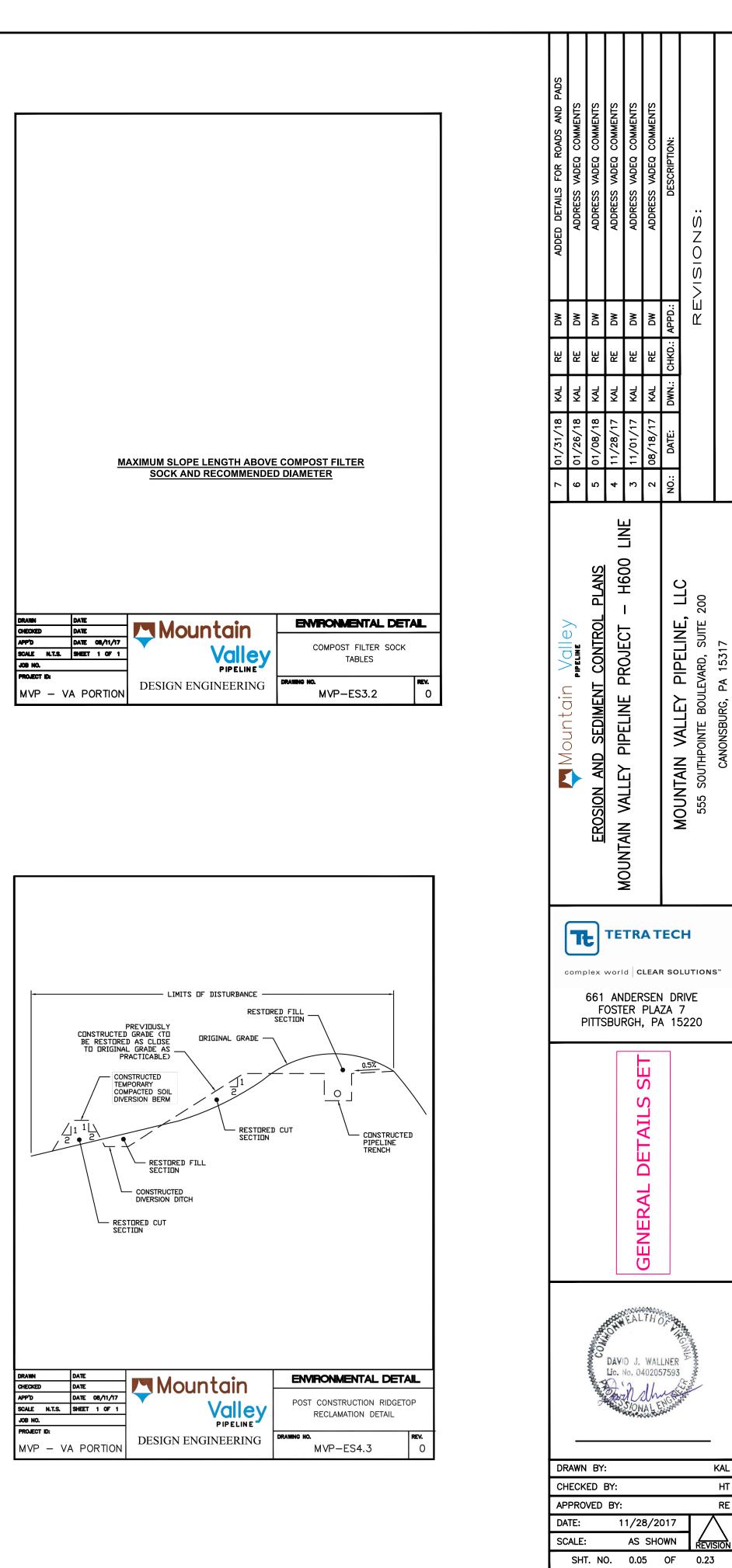


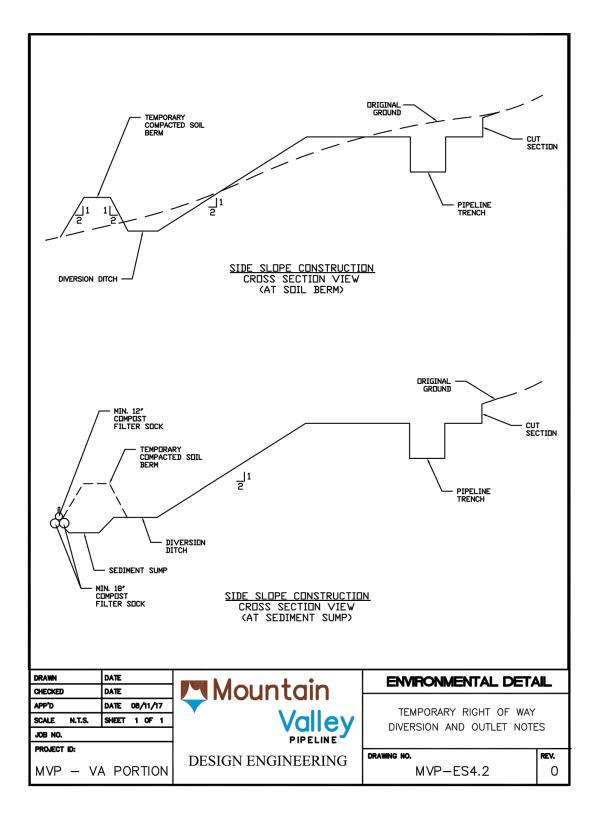


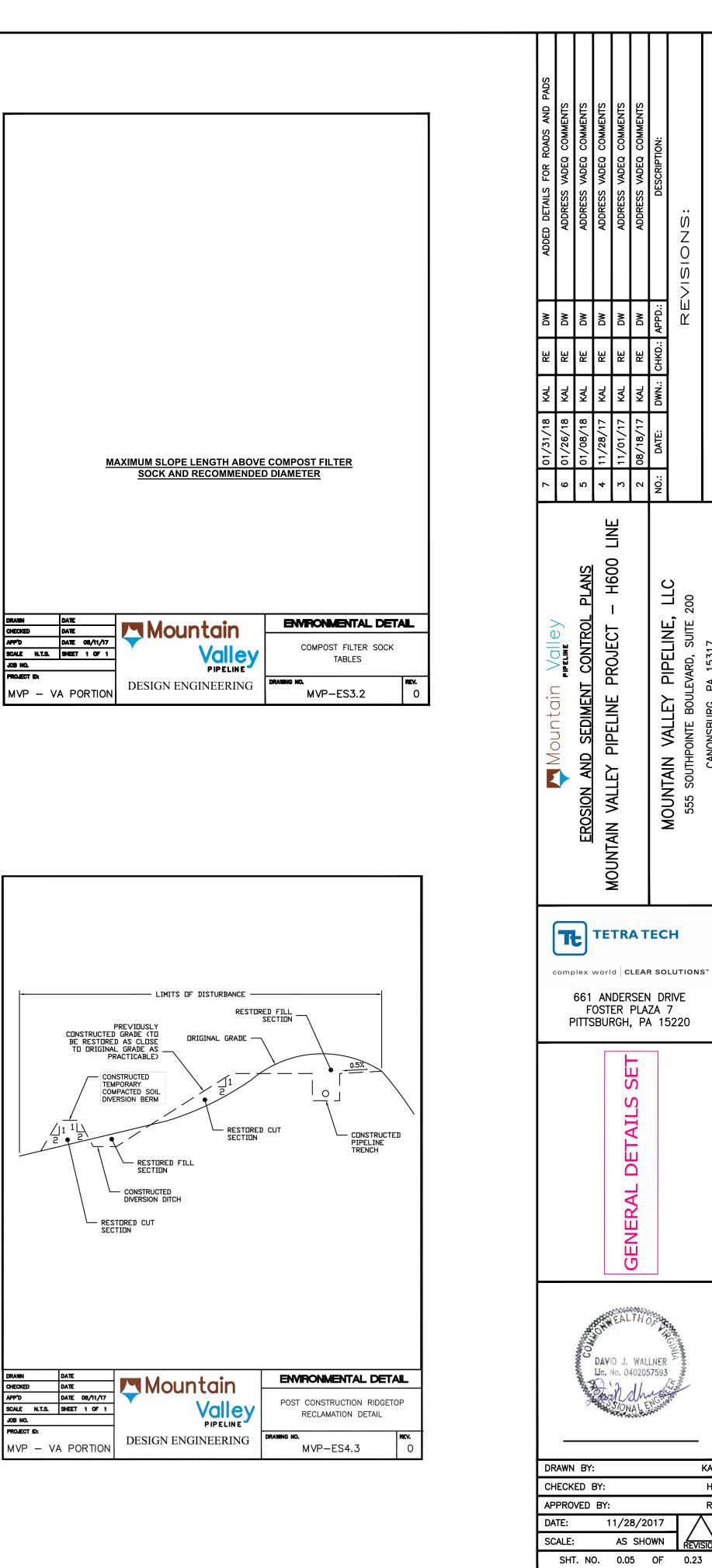


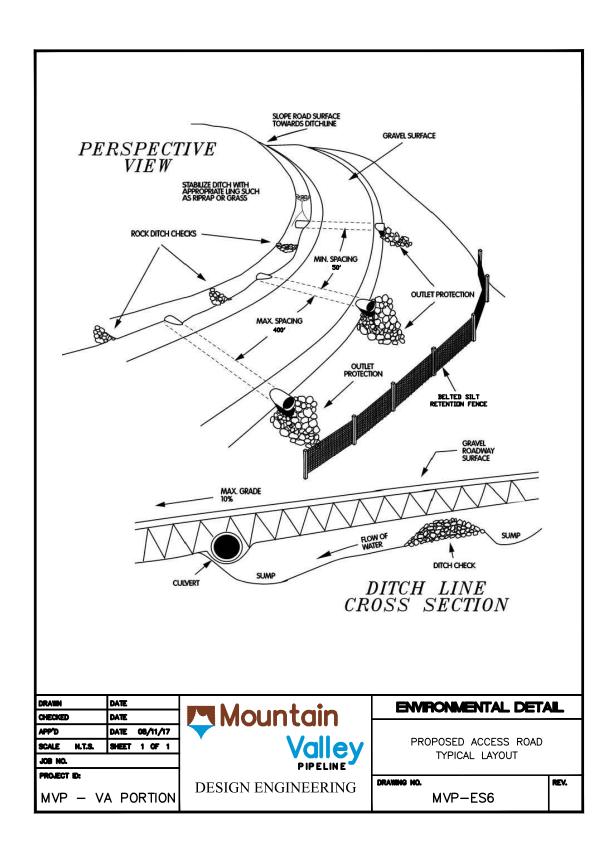
Intain	ENVIRONMENTAL DETA	VL.
	COMPOST FILTER SOCK	
NGINEERING	DRAWING NO.	REV.
	MVP-ES3	0

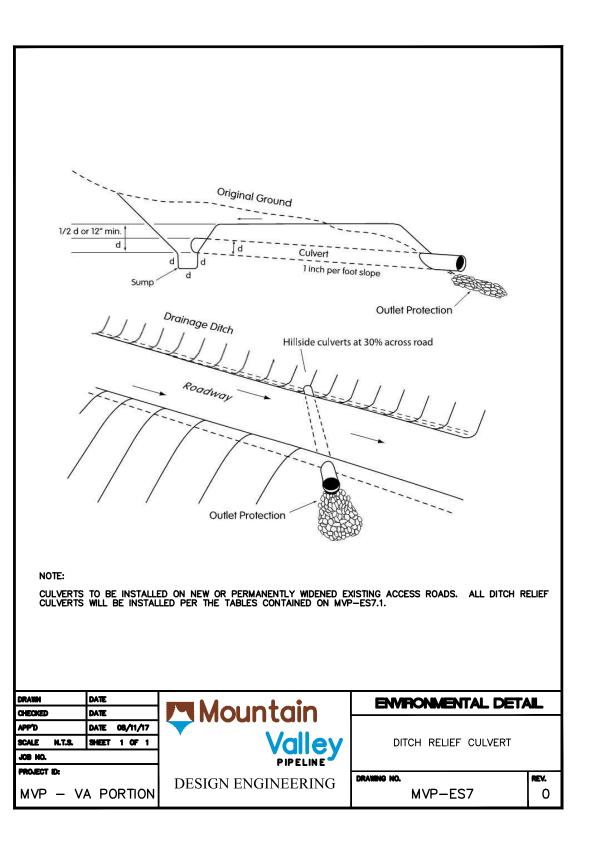


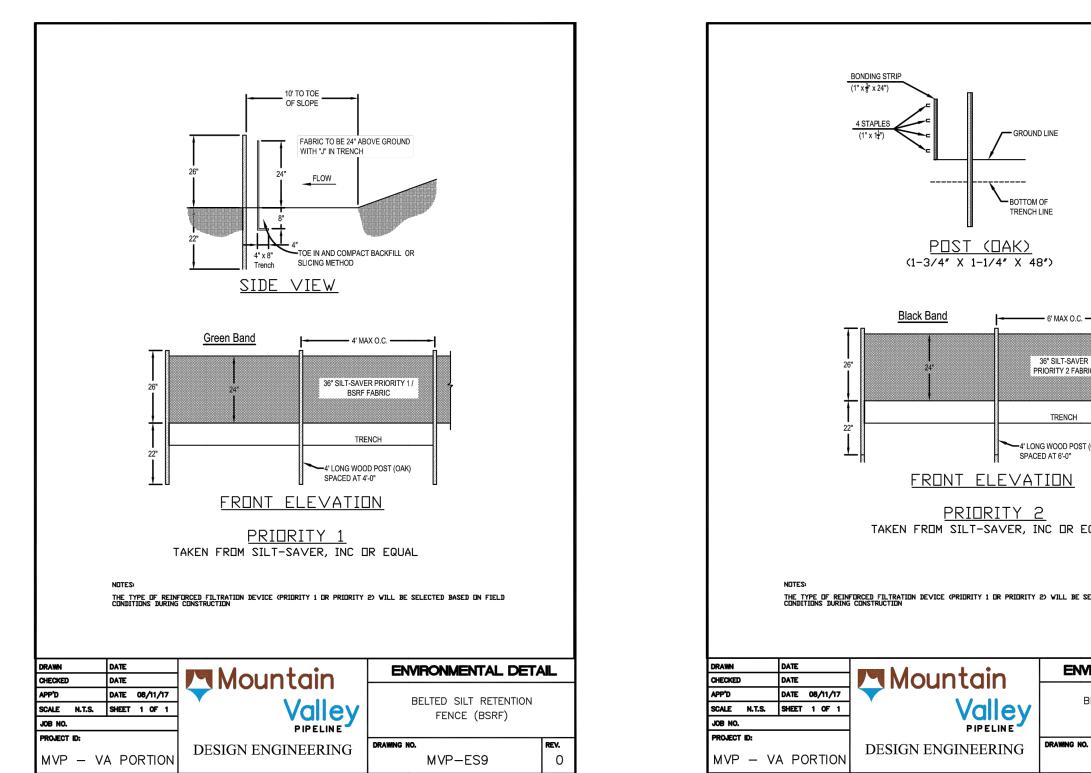












	3	235	12	15	15	15	18
	4	200	12	15	15	15	18
	5	180	12	12	15	15	15
	6	165	12	12	12	15	15
	7	155	12	12	12	12	15
	8	150	12	12	12	12	15
	9	145	12	12	12	12	15
	10	140	12	12	12	12	15
-	12	135	12	12	12	12	15
	TABLE	3.4 - Recomme		ermanent	Access Roads		CMP)
1022	d Grade ercent	Gravel, Sandy Gravels, Aggregate Surfacing	Cla	Gravels, ayey	Plastic and Nonplastic Inorganic Clays	Inorganic Silts, Silty or Clayey Sands	Sands, Silty Sands, and Gravelly Sands
				Cu	lvert Spacing Fee	at*	
	2	390	3	15	245	170	95
	4	335	2	275	210	145	85
	6	285	2	30	180	125	75
	8	240	1	95	150	105	65
	10	200	1	.60	125	90	55
	12	160	1 13	100	105	75	45
	14	200         12         15         15         15           180         12         12         12         15         15           165         12         12         12         12         12           155         12         12         12         12         12           150         12         12         12         12         12           145         12         12         12         12         12           145         12         12         12         12         12           140         12         12         12         12         12           135         12         12         12         12         12           acing may be adjusted slightly to take advantage of natural drainage         Soil Type in Ditch         Silty Gravels, Clayey         Plastic and Nonplastic Inorganic Clayey Sands         Silts, Silty or Clayey Sands           Aggregate         Gravels         Clayey         Clayes         Clayey Sands           Surfacing         Silts         245         170         335           275         210         145         285         230         180         125           240         195         150 </td <td>35</td>	35				

PIPELINE

DESIGN ENGINEERING

TABLE 3.3- Sizing and Spacing of Ditch Relief Culverts for Temporart Access Roads

Grade Spaceing\* <300 300-400 400-500 500-600 >600

12 15 15 15

Road Culvert

(%)

2

PROJECT ID:

MVP - VA PORTION

(ft)

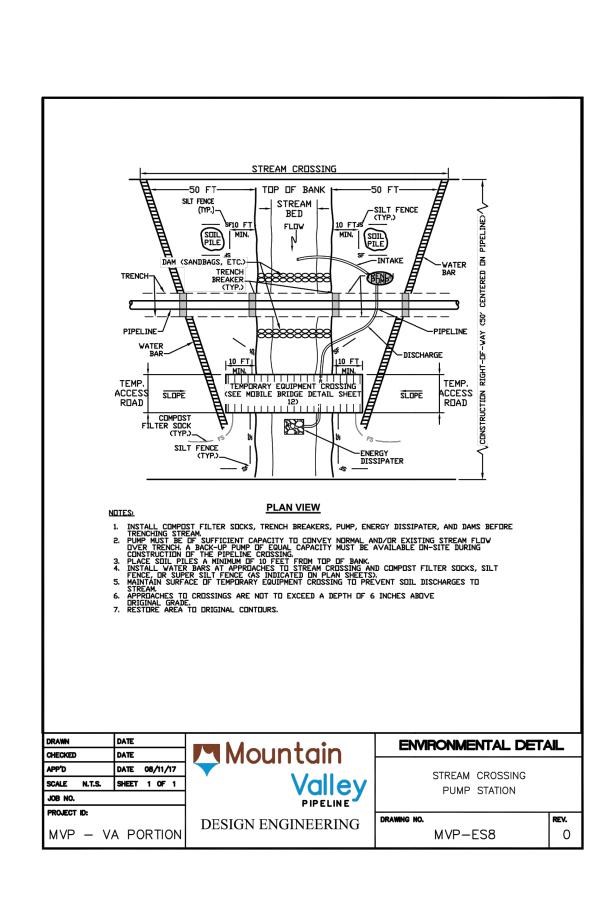
300

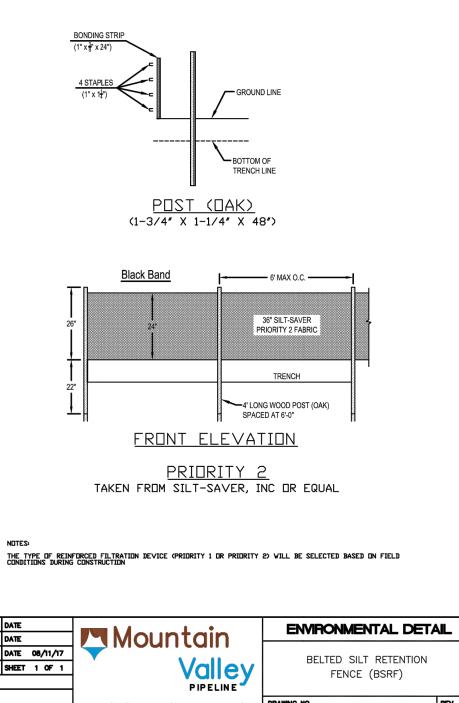
Length of Upslope Drainage (ft)

Minimum Culvert Size (in)

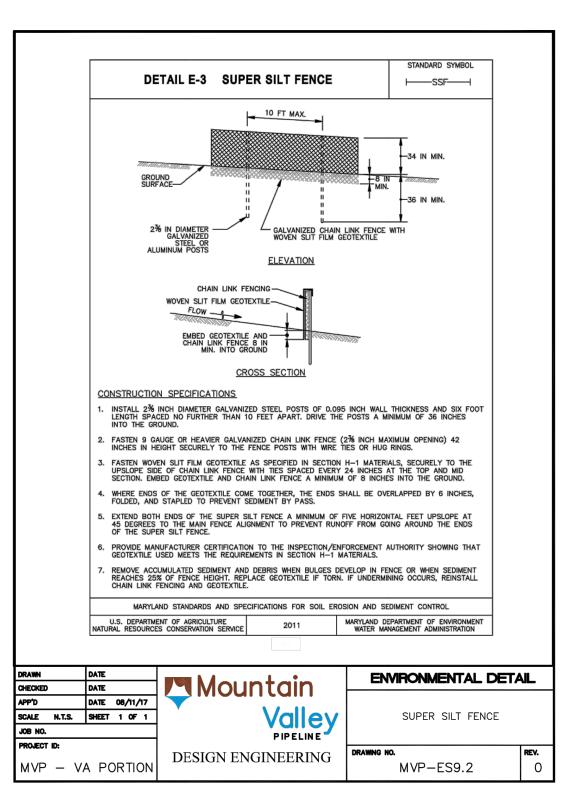
18

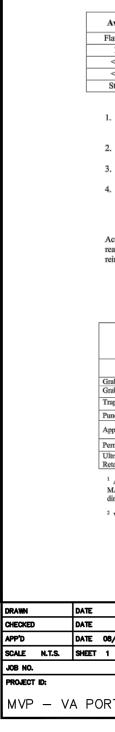
MVP-ES7.1





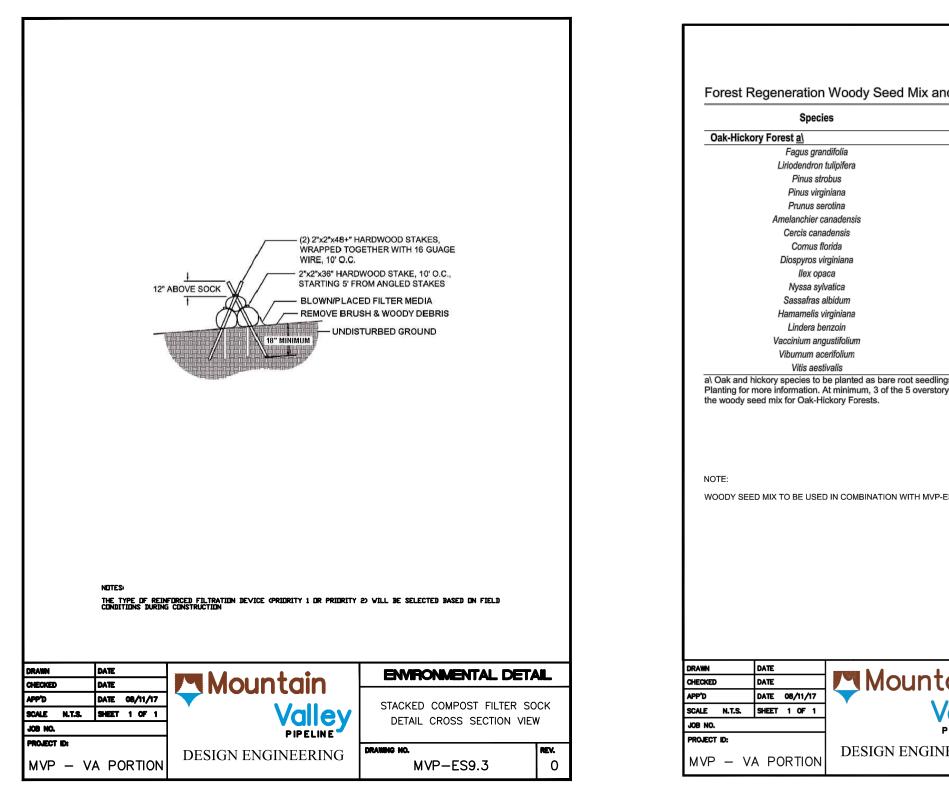
MVP-ES9.1





Maximum         Super Site Prease           Flatter than 10:1 (0 10%)         Unlimited         Unlimited           10:1 to 5:1 (10 - 20%)         200 feet         1,000 feet           -5:1 to 5:1 (20 - 33%)         150 feet         1,000 feet           -5:1 to 5:1 (20 - 33%)         100 feet         500 feet           -5:1 to 5:1 (20 - 33%)         100 feet         500 feet           -5:1 to 5:1 (20 - 33%)         50 feet         250 feet           -3:1 to 2:1 (-23 - 50%)         50 feet         250 feet	Average slope Steepness         Slope Length         Super Silt Fence Length           Flatter than 10:1 (0 - <10%)         Unlimited         Unlimited           10:1 to 5:1 (0 - 20%)         200 feet         1,500 feet           <5:1 to 3:1 (>20 - 33%)         150 feet         1,000 feet           <5:1 to 3:1 (>20 - 33%)         100 feet         500 feet           Steeper than 2:1 (>50%)         50 feet         250 feet           1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.         2.           2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.         3.           3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.         4.           4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         Maintenance           Maintenance           Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if form. If undermining occurs, reinstall chain link fencing and geotextile.           Moven Moven Geotextile Fabrics           Moven Moven Geotextile RolLV ALUE'           PROPERTY         TEST METHOD	1			Maxi	mum			Maxim	um
I0:1 to 5:1 (10 - 20%)         200 feet         1,500 feet $< 51$ to 3:1 ( $220 - 33\%$ )         150 feet         1,000 feet $< 31$ to 2:1 ( $>33 - 50\%$ )         100 feet         500 feet           Steeper than 2:1 ( $>50\%$ )         30 feet         250 feet           1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.         2           2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.         3.           3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.         4.           4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         Maintenance           Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.         WOVEN           WOVEN MONOPENTILE           GEOTEXTILE           ON MONOPENTILE           GEOTEXTILE           ON MONOPENTILE           GEOTEXTILE           Minimum VVEN            ON MONOPENTILE     <	10:1 to 5:1 (10 - 20%)       200 feet       1,500 feet $< 51$ to 3:1 (220 - 33%)       150 feet       1,000 feet $< 31$ to 2:1 (>3 - 50%)       100 feet       500 feet         Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.         2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.         3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.         4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         Maintenance         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.         WOVEN         WOVEN         GEOTEXTILE         PROPERTY       TEST METHOD         Maintenance       MINIMUM AVERAGE ROLL VALUE <sup>1</sup> PROPERTY       TEST METHOD       MD         Colspan="2">GEOTEXTILE         MINIMUM AVERAGE ROLL VALUE <sup>1</sup> GEOTEXTILE         PROPERTY<				Slope I	Length		Supe	er Silt Fei	ice Lengfl
<5:1 to 3:1 (>20 - 33%)       150 feet       1,000 feet         <3:1 to 2:1 (>33 - 50%)       100 feet       500 feet         Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2.         2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.       3.         3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.       4.         4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.       Maintenance         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.         MOVEN MOVEN MONOPERATIENT MONOVEN GEOTEXTLE         MINIMUM AVERAGE ROLL VALUE <sup>+</sup> MINIMUM AVERAGE ROLL VALUE <sup>+</sup> PROPERTY       TEST METHOD       MD       CD       MD       CD         Grab Tensile Strength       ASTM D-4632       200 lb       370 lb       200 lb       200 lb         Grab Tensile English       ASTM D-4633       75 lb       75 lb       100 lb       60 lb	<5:1 to 3:1 (>20 - 33%)       150 feet       1,000 feet         <3:1 to 2:1 (>33 - 50%)       100 feet       500 feet         Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2.         2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.       3.         3. The use of super silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         Maintenance         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.         WOVEN MOVEN MOVEN MONOPELAMENT MONOVEN GEOTEXTILE GE		-	/						
<3:1 to 2:1 [>33 - 50%)       100 feet       500 feet         Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2.50 feet         2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.       3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.         4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.       Maintenance         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile Fabries         WOVEN SUTFILM MONOFILAMENT GEOTEXTILE         MINIMUM AVERAGE ROLL VALUE <sup>1</sup> PROPERTY       TEST METHOD       MD       CD       State cols and cols	<3:1 to 2:1 [>33 - 50%)       100 feet       500 feet         Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2.         2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.       3.         3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.         4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         Maintenance         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile Fabries         WOVEN SUPPRINT ROPERATILE GOTEXTILE         MINIMUM AVERAGE ROLL VALUE <sup>1</sup> MONOPERATILE CD         MONOVEN REGOTEXTILE         ON MD CD MD CD MD CD MD CD MD         GO B 100 b       200 b			·						
Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.         3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.       4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <u>WOVEN</u> SUT FILM GEOTEXTILE <u>NONWOVEN</u> GEOTEXTILE <u>NONWOVEN</u>	Steeper than 2:1 (>50%)       50 feet       250 feet         1. Super silt fence should be placed on the contour. No section of super silt fence is to exceed a grade of 5% for a distance of more than 50 feet.       2. Super silt fence should be used with caution in areas where rocky soils may prevent trenching.         3. The use of super silt fence must conform to the design constraints listed in Table E.3 above.       4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <u>WOVEN</u> SUT FILM GEOTEXTILE <u>NONWOVEN</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>Super silt fence height. The geotextile Fabrics</u> <u>Super silt Ence height. The geotextile Fabrics</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>Super silt fence height. The geotextile Fabrics</u> <u>Super silt FILM</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>Super silt FILM</u> <u>NONWOVEN</u> </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
<ul> <li>5% for a distance of more than 50 feet.</li> <li>Super silt fence should be used with caution in areas where rocky soils may prevent trenching.</li> <li>The use of super silt fence must conform to the design constraints listed in Table E.3 above.</li> <li>Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         <i>Maintenance</i>         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The goetextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.     </li> <li> <b>Table H1: Geotextile Fabrics</b> </li> <li> <b>WOVEN WOVEN WOVEN WOVEN MONOVEN COUNTINE COUNTINE</b> </li> <li> <b>PROPERTY TEST METHOD MD CD MD CD</b></li></ul>	<ul> <li>5% for a distance of more than 50 feet.</li> <li>Super silt fence should be used with caution in areas where rocky soils may prevent trenching.</li> <li>The use of super silt fence must conform to the design constraints listed in Table E.3 above.</li> <li>Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         <i>Maintenance</i>         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The gootextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.     </li> <li><b>Table H.1: Geotextile Fabrics Table H.1: Geotextile Fabrics</b> </li> <li><b>WOVEN WOVEN WOVEN ONWOVEN GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE MINIMUM AVERAGE ROLL VALUE<sup>1</sup> MONOPERTY TEST METHOD MD CD MD MD M</b></li></ul>				50 f	feet			250 fe	et
<ul> <li>5% for a distance of more than 50 feet.</li> <li>Super silt fence should be used with caution in areas where rocky soils may prevent trenching.</li> <li>The use of super silt fence must conform to the design constraints listed in Table E.3 above.</li> <li>Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         <i>Maintenance</i>         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The goetextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.     </li> <li> <b>Table H1: Geotextile Fabrics</b> </li> <li> <b>WOVEN WOVEN WOVEN WOVEN MONOVEN COUNTINE COUNTINE</b> </li> <li> <b>PROPERTY TEST METHOD MD CD MD CD</b></li></ul>	<ul> <li>5% for a distance of more than 50 feet.</li> <li>Super silt fence should be used with caution in areas where rocky soils may prevent trenching.</li> <li>The use of super silt fence must conform to the design constraints listed in Table E.3 above.</li> <li>Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.         <i>Maintenance</i>         Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The gootextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile.     </li> <li><b>Table H.1: Geotextile Fabrics Table H.1: Geotextile Fabrics</b> </li> <li><b>WOVEN WOVEN WOVEN ONWOVEN GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE GEOTEXTILE MINIMUM AVERAGE ROLL VALUE<sup>1</sup> MONOPERTY TEST METHOD MD CD MD MD M</b></li></ul>									
3. The use of super silt fence must conform to the design constraints listed in Table E.3 above. 4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <b>Table H:1: Geotextile Fabrics</b> Table H:1: Geotextile Fabrics <u>WOVEN</u> <u>MINIMUM AVERAGE ROLL VALUE</u> <sup>i</sup> <u>PROPERTY</u> <u>TEST METHOD</u> <u>MD</u> <u>CD</u> <u>MD</u> <u>ASTM D-4632</u> <u>105</u> <u>100 lb</u> <u>400 lb</u> <u>450 lb</u> <u>000 lb</u> <u>450 lb</u> <u>000 lb</u> <u>450 lb</u> <u>Doto lb</u> <u>000 lb</u> <u>450 lb</u> <u>000 lb</u> <u>450 lb</u> <u>Doto lb</u> <u>000 lb</u> <u>450 lb</u> <u>Doto lb</u> <u>000 lb</u> <u>450 lb</u> <u>000 lb</u> <u>450 lb</u> <u>Doto lb</u> <u>000 lb</u> <u>450 lb</u> <u>Doto lb</u> <u>000 lb</u> <u>450 lb</u> <u>000 lb</u> <u>00</u>	3. The use of super silt fence must conform to the design constraints listed in Table E.3 above. 4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torm. If undermining occurs, reinstall chain link fencing and geotextile. <b>Table H.1: Geotextile Fabrics</b> <u>Table H.1: Geotextile Fabrics</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>Contextile Strength</u> <u>ASTM D-4632</u> <u>10%</u> <u>10%</u> <u>13%</u> <u>10%</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>00 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 lb</u> <u>00 lb</u> <u>450 lb</u> <u>00 </u>					No secti	ion of super	silt fence	is to exce	ed a grade
4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.           Maintenance           Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile.           Table H.1: Geotextile Fabrics           MOVEN GEOTEXTILE           MOVEN GEOTEXTILE           MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           MINIMUM AVERAGE ROLL VALUE <sup>1</sup> MINIMUM AV	4. Extend both ends of the silt fence a minimum five (5) feet horizontally upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends of the silt fence.           Maintenance           Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile.           Table H.1: Geotextile Fabrics           MOVEN GEOTEXTILE           MOVEN GEOTEXTILE           MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           MOVEN MOVEN GEOTEXTILE           GEOTEXTILE           MONOVEN GEOTEXTILE           MINIMUM AVERAGE ROLL VALUE <sup>1</sup> Grab Tensile Elongation ASTM D-4632 15% 10% 15% 15% 50% 50%           Grab Tensile Elongation ASTM D-4632 15% 10% 15% 15% 50% 50%           Grab Tensile Elongation ASTM D-4632 15% 10% 10. Is Sieve 70 (U.2.1 mm)           QUE ASTM D-4751 U.S. Sieve 70 (U.S. Sieve 70 (U.2.1 mm)           Que asta as the typical minus two standard	2. Super s	ilt fence sh	ould be used with	a caution	in areas	where rock	y soils m	ay preve	nt trenchir
fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <b>Table H.1: Geotextile Fabrics</b> <u>Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <u>Table H.1: Geotextile Fabrics</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVE</u></u>	fence alignment to prevent runoff from going around the ends of the silt fence. <u>Maintenance</u> Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. <b>Table H.1: Geotextile Fabrics</b> <u>Table H.1: Geotextile Fabrics</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>GEOTEXTILE</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>NONWOVEN</u> <u>NONWOVEN</u>	3. The use	e of super s	ilt fence must cor	form to t	he desig	n constrain	ts listed i	n Table I	3.3 above.
Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile.           Table H.1: Geotextile Fabrics           NONVOVEN           WOYEN         WOYEN         MONVOVEN           GEOTEXTILE         NONVOVEN           GEOTEXTILE         NONVOVEN           MONOFILAMENT         NONVOVEN           MINIMUM AVERAGE ROLL VALUE <sup>1</sup> Grab Tensile Elongation         ASTM D-4632         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-6241         450 lb         900 lb         450 lb         480 lb           Apparent Opening Size <sup>2</sup> ASTM D-4353         70% strength         0.28 see <sup>-1</sup> 1.1 sec <sup>-1</sup> <	Accumulated sediment and debris must be removed when bulges develop in the fence or when sediment reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. Table H.1: Geotextile Fabrics $\frac{WOVEN}{GEOTEXTILE} \frac{WOVEN}{GEOTEXTILE} \frac{NONWOVEN}{GEOTEXTILE}$								at 45 deg	rees to the
reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile.           Table H.1: Geotextile Fabrics           NONWOVEN GEOTEXTILE           WOVEN GEOTEXTILE         NONWOVEN GEOTEXTILE           MONOFILAMENT GEOTEXTILE         NONWOVEN GEOTEXTILE           MINIMUM AVERAGE ROLL VALUE <sup>1</sup> PROPERTY         TEST METHOD         MD         CD         MD         CD           Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4533         75 lb         70 lb         900 lb         450 lb           Puncture Strength         ASTM D-4511         U.S. Sieve 30         U.S. Sieve 70         U.S. Sieve 70         0.21 mm)           Permitivity         ASTM D-4355         70% strength         70% strength         70% strength           ASTM D-4355         70% strength         70% strength         70% strength         70% strength           Iltraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength	reaches 25 percent of the fence height. The geotextile must be replaced if torn. If undermining occurs, reinstall chain link fencing and geotextile. Table H.1: Geotextile Fabrics           Table H.1: Geotextile Fabrics           NONWOVEN GEOTEXTILE           WOVEN SLIT FILM GEOTEXTILE         NONWOVEN GEOTEXTILE           PROPERTY         TEST METHOD         MD         CD         MD         CD           Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Strength         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4533         75 lb         70 lb         900 lb         450 lb           Paparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 70         U.S. Sieve 70         U.S. Sieve 70           Q1traviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.				Mainte	enance				
reinstall chain link fencing and geotextile. Table H.1: Geotextile Fabrics           Table H.1: Geotextile Fabrics           MOVEN SLIT FILM GEOTEXTILE         MONWOVEN GEOTEXTILE           PROPERTY         TEST METHOD         MD         CD         MD         CD           Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4632         15%         10%         15%         50%         50%           Apparent Opening Size <sup>2</sup> ASTM D-4511         U.S. Sizve 30         U.S. Sizve 70         U.S. Sizve 70         U.S. Sizve 70           Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.	reinstall chain link fencing and geotextile. Table H.1: Geotextile Fabrics           Table H.1: Geotextile Fabrics           MOVEN SLIT FILM GEOTEXTILE         NONWOVEN GEOTEXTILE           PROPERTY         TEST METHOD         MD         CD         MD         CD           Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4632         15%         10%         15%         50%         50%           Apparent Opening Size <sup>2</sup> ASTM D-6241         450 lb         900 lb         450 lb         450 lb           Apparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 30         U.S. Sieve 70         U.S. Sieve 70         U.S. Sieve 70           Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is eross direction.									
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$				, geolexill	e must de	, replaced II	ionii nu	naermini	is occurs,
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$									
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$									
NONVOVEN GEOTEXTILESLIT FILM GEOTEXTILENONVOVEN GEOTEXTILENONVOVEN GEOTEXTILEPROPERTYTEST METHODMDCDMDCDMDCDGrab Tensile StrengthASTM D-4632200 lb200 lb370 lb250 lb200 lb200 lbGrab Tensile ElongationASTM D-463215%10%15%15%50%50%Trapezoidal Tear StrengthASTM D-453375 lb75 lb100 lb60 lb80 lb80 lbPuncture StrengthASTM D-6241 $450$ lb900 lb450 lb450 lbApparent Opening Size <sup>2</sup> ASTM D-4751U.S. Sieve 30U.S. Sieve 70(0.21 mm)(0.21 mm)PermitivityASTM D-44910.05 sec <sup>3</sup> 0.28 sec <sup>31</sup> 1.1 sec <sup>31</sup> Ultraviolet Resistance Retained at 500 hoursASTM D-435570% strength70% strength70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross	SLIT FILM GEOTEXTILENONOFILAMENT GEOTEXTILENONVOVEN GEOTEXTILEPROPERTYTEST METHODMDCDMDCDMDCDGrab Tensile StrengthASTM D-4632200 lb200 lb370 lb250 lb200 lb200 lbGrab Tensile ElongationASTM D-463215%10%15%15%50%50%Trapezoidal Tear StrengthASTM D-453375 lb75 lb100 lb60 lb80 lb80 lbPuncture StrengthASTM D-6241 $450$ lb900 lb450 lb450 lbApparent Opening Size <sup>2</sup> ASTM D-4751U.S. Sieve 30U.S. Sieve 70(0.21 mm)(0.21 mm)PermitivityASTM D-44910.05 sec <sup>31</sup> 0.28 sec <sup>31</sup> 1.1 sec <sup>31</sup> Ultraviolet Resistance Retained at 500 hoursASTM D-435570% strength70% strength70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross			Table I	L1: Geote	xtile Fabr	ies			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$								NONW	OVEN
Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4632         15%         10%         15%         50%         50%           Puncture Strength         ASTM D-6241         450 lb         900 lb         60 lb         80 lb         80 lb           Apparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 30         U.S. Sieve 70         U.S. Sieve 70         U.S. Sieve 70           Ultraviolet Resistance Retained at 500 hours         ASTM D-4491         0.05 sec <sup>4</sup> 0.28 sec <sup>21</sup> 1.1 sec <sup>4</sup> <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross	Grab Tensile Strength         ASTM D-4632         200 lb         200 lb         370 lb         250 lb         200 lb         200 lb           Grab Tensile Elongation         ASTM D-4632         15%         10%         15%         50%         50%           Trapezoidal Tear Strength         ASTM D-4632         15%         10%         15%         50%         50%           Puncture Strength         ASTM D-6241         450 lb         900 lb         60 lb         80 lb         80 lb           Apparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 30         U.S. Sieve 70         U.S. Sieve 70         0.21 mm)         (0.21 mm)         0.21 mm)           Permitivity         ASTM D-4491         0.05 sec <sup>3</sup> 0.28 sec <sup>-1</sup> 1.1 sec <sup>-1</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross         50 strength									
						XTILE	GEOTE	XTILE	GEOTI	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				GEOTE MD	CD	GEOTE	XTILE JE ROLL V CD	GEOTH VALUE <sup>1</sup> MD	CD
Puncture Strength         ASTM D-6241         450 lb         900 lb         450 lb           Apparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 30 (0.59 mm)         U.S. Sieve 70 (0.21 mm)         U.S. Sieve 70 (0.21 mm)           Permittivity         ASTM D-4491         0.05 sec <sup>-1</sup> 0.28 sec <sup>-1</sup> 1.1 sec <sup>-1</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> AII numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         CD is cross	Puncture Strength         ASTM D-6241         450 lb         900 lb         450 lb           Apparent Opening Size <sup>2</sup> ASTM D-4751         U.S. Sieve 30 (0.59 mm)         U.S. Sieve 70 (0.21 mm)         U.S. Sieve 70 (0.21 mm)           Permittivity         ASTM D-4491         0.05 sec <sup>-1</sup> 0.28 sec <sup>-1</sup> 1.1 sec <sup>-1</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> AII numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         CD is cross	Grab Tensile S	trength	ASTM D-4632	GEOTE MD 200 lb	CD 200 lb	GEOTE JM AVERAG MD 370 lb	XTILE 3E ROLL V CD 250 Ib	GEOTH VALUE <sup>1</sup> MD 200 lb	CD 200 lb
Apparent Opening Size         ASTM D-4/51         (0.59 mm)         (0.21 mm)         (0.21 mm)           Permitivity         ASTM D-4491         0.05 sec <sup>4</sup> 0.28 sec <sup>4</sup> 1.1 sec <sup>4</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.	Apparent Opening Size         ASTM D-4/51         (0.59 mm)         (0.21 mm)         (0.21 mm)           Permitivity         ASTM D-4491         0.05 sec <sup>4</sup> 0.28 sec <sup>4</sup> 1.1 sec <sup>4</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         Strong Strength	Grab Tensile S Grab Tensile E	trength longation	ASTM D-4632 ASTM D-4632	GEOTE MD 200 lb 15%	XTILE MINIMU CD 200 lb 10%	GEOTE JM AVERAG MD 370 lb 15%	XTILE 3E ROLL V CD 250 Ib 15%	GEOTH VALUE <sup>1</sup> MD 200 lb 50%	CD 200 1b 50%
Image: Permittivity         ASTM D-4491         0.05 sec <sup>1</sup> 0.28 sec <sup>2</sup> 1.1 sec <sup>4</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         CD is cross	Image: Permittivity         ASTM D-4491         0.05 sec <sup>-1</sup> 0.28 sec <sup>-1</sup> 1.1 sec <sup>-1</sup> Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         CD is cross	Grab Tensile S Grab Tensile E Trapezoidal Te	trength longation ar Strength	ASTM D-4632 ASTM D-4632 ASTM D-4533	GEOTE MD 200 lb 15% 75 lb	XTILE MINIMU CD 200 lb 10% 75 lb	GEOTE JM AVERAO MD 370 lb 15% 100 lb	XTILE 3E ROLL V CD 250 lb 15% 60 lb	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb	CD 200 lb 50% 80 lb
Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.         CD is cross	Ultraviolet Resistance Retained at 500 hours         ASTM D-4355         70% strength         70% strength         70% strength <sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Strenj	trength longation ar Strength gth	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241	GEOTE MD 200 lb 15% 75 lb 450 U.S. Si	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30	GEOTE JM AVERAO MD 370 lb 15% 100 lb 900 U.S. Si	XTILE 3E ROLL V CD 250 lb 15% 60 lb 1b eve 70	GEOTH MD 200 lb 50% 80 lb 450 U.S. S	CD 200 lb 50% 80 lb 0 lb eve 70
<sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.	<sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren Apparent Oper	trength longation ar Strength gth	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751	GEOTE MD 200 lb 15% 75 lb 450 U.S. Si (0.59	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm)	GEOTE JM AVERAG MD 370 lb 15% 100 lb 900 U.S. Si (0.21	XTILE 3E ROLL V CD 250 lb 15% 60 lb lb eve 70 mm)	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21	CD 200 lb 50% 80 lb 0 lb ieve 70 mm)
<sup>2</sup> Values for AOS represent the average maximum opening.	<sup>2</sup> Values for AOS represent the average maximum opening.	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res	trength longation ar Strength gth ing Size <sup>2</sup> istance	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4491	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup>	GEOTE JM AVERAG MD 370 lb 15% 100 lb 900 U.S. Si (0.21 0.28 :	XTILE 3E ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup>	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1;	CD 200 lb 50% 80 lb 0 lb eve 70 mm) sec <sup>-1</sup>
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numerid MARV is cal	trength longation ar Strength gth ing Size <sup>2</sup> istance ) hours c values exce	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st	XTILE           MINIMU           CD           200 lb           10%           75 lb           0 lb           ieve 30 mm)           sec <sup>-1</sup> trength           represent 1	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE SE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength rength	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1: 70% s alues (MA	XTILE CD 200 lb 50% 80 lb 0 lb leve 70 mm) sec <sup>-1</sup> rength RV).
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s typical minus two st	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent 1 riations. M	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE SE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength rength	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1: 70% s alues (MA	XTILE CD 200 lb 50% 80 lb 0 lb leve 70 mm) sec <sup>-1</sup> rength RV).
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s typical minus two st	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent 1 riations. M	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE SE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength rength	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1: 70% s alues (MA	XTILE CD 200 lb 50% 80 lb 0 lb leve 70 mm) sec <sup>-1</sup> rength RV).
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s typical minus two st	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent 1 riations. M	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE SE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength rength	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1: 70% s alues (MA	XTILE CD 200 lb 50% 80 lb 0 lb leve 70 mm) sec <sup>-1</sup> rength RV).
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s typical minus two st	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent 1 riations. M	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE SE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength rength	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1: 70% s alues (MA	XTILE CD 200 lb 50% 80 lb 0 lb leve 70 mm) sec <sup>-1</sup> rength RV).
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> rength represent riations. N g.	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE BE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength erage roll w e direction;	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 45( U.S. S (0.21 1.11 70% si alues (MA ; CD is ero	CD         200 lb           50%         80 lb           10         b           sec <sup>-1</sup> rength           RV).         ss
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Oper Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction.	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> rength represent riations. N g.	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE BE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength erage roll w e direction;	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 45( U.S. S (0.21 1.11 70% si alues (MA ; CD is ero	CD         200 lb           50%         80 lb           10         b           sec <sup>-1</sup> rength           RV).         ss
Mountain	Mountain	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numerid MARV is cal direction. <sup>2</sup> Values for	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) andard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> rength represent riations. N g.	GEOTE JM AVERAG MD 370 lb 15% 100 lb 9000 U.S. Si (0.21 0.28 70% st minimum av	XTILE BE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength erage roll w e direction;	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 45( U.S. S (0.21 1.11 70% si alues (MA ; CD is ero	CD         200 lb           50%         80 lb           10         b           sec <sup>-1</sup> rength           RV).         ss
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction. <sup>2</sup> Values for . <b>08/11/17</b>	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) iandard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent <i>i</i> viations. N g.	GEOTE           JM AVERAU           MD           370 lb           15%           100 lb           900           U.S. Si           (0.21           0.28           70% st           minimum ava           AD is machin	XTILE BE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength erage roll w e direction;	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 45( U.S. S (0.21 1.11 70% sl (0.21 1.11 70% sl (0.21 1.11 70% sl (0.21 1.11)	CD           200 lb           50%           80 lb           0 lb           ieve 70           mm)           sec <sup>-1</sup> rength           RV).           ss
		Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction. <sup>2</sup> Values for . <b>08/11/17</b>	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) iandard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent <i>i</i> viations. N g.	GEOTE           JM AVERAU           MD           370 lb           15%           100 lb           900           U.S. Si           (0.21           0.28           70% st           minimum ava           AD is machin	XTILE BE ROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>-1</sup> rength erage roll w e direction;	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 45( U.S. S (0.21 1.11 70% sl (0.21 1.11 70% sl (0.21 1.11 70% sl (0.21 1.11)	CD           200 lb           50%           80 lb           0 lb           ieve 70           mm)           sec <sup>-1</sup> rength           RV).           ss
08/11/17 1 OF 1 UBD/11/17 1 OF 1 UDD/11/17 SUPER SILT FENCE	08/11/17 1 OF 1 UBD/11/17 1 OF 1 UDD/11/17 SUPER SILT FENCE	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren, Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction. <sup>2</sup> Values for . <b>08/11/17</b>	trength longation ar Strength gth ing Size <sup>2</sup> istance 0 hours c values exce culated as the AOS represen	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4751 ASTM D-4355 pt apparent opening s typical minus two sl at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st ize (AOS) iandard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent <i>i</i> viations. N g.	GEOTE JM AVERAU MD 370 lb 15% 100 lb 900 U.S. Si (0.21 0.28 70% st minimum ava 4D is machin	XTILE FROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>4</sup> rength rength rength rength ENN	GEOTH VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1.1 70% sl alues (MA' ; CD is ero //RON	CD           200 lb           50%           80 lb           0 lb           ieve 70           mm)           sec <sup>-1</sup> rength           RV).           ss
	08/11/17 1 OF 1 DESIGN ENGINEERING DRAWING NO.	Grab Tensile S Grab Tensile E Trapezoidal Te Puncture Stren Apparent Open Permittivity Ultraviolet Res Retained at 500 <sup>1</sup> All numeric MARV is cal direction. <sup>2</sup> Values for . 08/11/17 1 OF 1	trength longation ar Strength gth ing Size <sup>2</sup> istance b hours cvalues excee culated as the AOS represed	ASTM D-4632 ASTM D-4632 ASTM D-4533 ASTM D-6241 ASTM D-4751 ASTM D-4491 ASTM D-4355 pt apparent opening s typical minus two st at the average maxim	GEOTE MD 200 lb 15% 75 lb 45( U.S. Si (0.59 0.05 70% st úze (AOS) andard dev um openin	XTILE MINIMU CD 200 lb 10% 75 lb 0 lb ieve 30 mm) sec <sup>-1</sup> trength represent 1 riations. M g.	GEOTE JM AVERAU MD 370 lb 15% 100 lb 900 U.S. Si (0.21 0.28 si 70% st minimum ave AD is machin	XTILE FROLL V CD 250 lb 15% 60 lb lb eve 70 mm) sec <sup>4</sup> rength rength rength rength ENN	GEOTI VALUE <sup>1</sup> MD 200 lb 50% 80 lb 450 U.S. S (0.21 1.1.1 70% sl alues (MA ; CD is ero A	CD           200 lb           50%           80 lb           1b           eve 70           mm)           sec <sup>-1</sup> rength           RV).           ss

Image: Construct of the construction of the constructio												
Image: Second bound in the second b	ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	'ISIONS:				
Image: Second House Second	DW	DW	DW	DW	DW	DW	APPD.:	Я И И				
Image: Second point of the second point point point of the second point p	RE	RE	RE	RE	RE	RE	CHKD.:					
	KAL	KAL	KAL	KAL	KAL	KAL	DWN.:					
	/31/18	/26/18	┝╺╄╸╇╺╇╸┥╸╴╵									
CANONSBURG, PA 15317 CANONSBURG, PA 15320 DRAWN BY: CANONSBURG: PA 15220 DRAWN BY: CANONSBURG: PA 15220 CANONSBURG:	7 01/											
Complex world CLEAR SOLUTIONS"   Complex world CLEAR SOLUTIONS"   661 ANDERSEN DRIVE FOSTER PLAZA 7 PITTSBURGH, PA 15220     Image: Strength of the streng	-						ž					
			EROSION AND SEDIMENT CONTROL		MOUNIAIN VALLET FIFELINE FROJEUT			555 SOUTHPOINTE BOULEVARD, SUITE 2	CANONSBURG, PA 15317			
DRAWN BY: KAL CHECKED BY: RE DATE: 11/28/2017 SCALE: AS SHOWN	α	complex world CLEAR SOLUTIONS™ 661 ANDERSEN DRIVE FOSTER PLAZA 7										
Lic. No. 0402057593 WWW BY: KAL CHECKED BY: HT APPROVED BY: RE DATE: 11/28/2017 SCALE: AS SHOWN					CENEDAL DETAILS SET	GENERAL DE LAILS SEI						
CHECKED BY:     HT       APPROVED BY:     RE       DATE:     11/28/2017       SCALE:     AS SHOWN		_	CLARK CONTRACTOR	Lic.	10. 04							
DATE: 11/28/2017 SCALE: AS SHOWN REVISION	СН	IECK	ED	BY:					ΗT			
REVISION			vED		1/2	8/2	017	17	RE			
								. /				



Wetland	ds Seed Mix a	and Application Rates in Vi	-		
	Species	Common Name	Seeding Rate (Ibs/acre)	pН	Bloom Period (if applicable)
	Alisma subcordatum	Mud Plantain	0.04		
	Carex gynandra	Fringed Sedge	0.10	5.0 - 7.0	Midsummer
	Carex lupulina	Hop Sedge	1.00		May to June
	Carex lurida	Shallow Sedge	3.00	6.2 - 7.0	June to October
	Carex scoparia	Blunt Broom Sedge	1.00	4.9 - 6.8	June to July
	Carex vulpinoidea	Fox Sedge	6.90	4.6 - 6.9	July to August
	Cinna arundinacea	Wood Reedgrass	0.40	6.8 - 8.9	June to August
	Elymus virginicus	Virginia Wildrye	4.00	4.0 - 8.5	August to September
	Juncus effusus	Soft Rush	0.60	5.0 - 7.4	June to October
	Onoclea sensibilis	Sensitive Fern	0.20	5.5 - 7.0	May to June
	Scirpus cyperinus	Woolgrass	0.20		June to October
	Species	Common Name	Seeding Rate (Ibs/acre)	рН	Bloom Period (if applicable)
	Scirpus polyphyllus	Many Leaved Bulrush	0.20	4.8 - 7.2	July to September
	Asclepias incarnata	Swamp Milkweed	0.40		July to August
Ει	upatorium coelestinun	Mistflower	0.10	5.0 - 8.0	June to July
E	upatorium fistulosum	Joe Pye Weed	0.14	5.5 - 7.5	July to October
E	upatorium perfoliatum	Boneset	0.20	4.5 - 7.0	July to September
1	Helenium autumnale	Common Sneezeweed	0.10		July to October
Н	leliopsis helianthoides	Oxeye Sunflower	0.40	4.0 - 7.5	August to September
	Ludwigia alternifolia	Seedbox	0.10		July to August
	Mimulus ringens	Square Stemmed Monkeyflower	0.10		August to September
	Verbena hastata	Blue Vervain	0.72		June to September
Ve	rnonia noveboracensi	s New York Ironweed	0.10		June to October
			20.00		
FOLLOWIN	IG RESTORATION A	USED AT A RATE OF 40 LBS/AC FOR ST/ ND TEMPORARY STABILIZATION WITH A IT REESTABLISH THE WETLAND, MVP W E WETLAND.	NNUAL RYEGRASS,	SHOULD TH	E NATIVE SEEDBANK
in Ked	DATE DATE	<b>Mountain</b>	EN	VIRONM	ENTAL DETAIL
)	DATE 08/11/17				D SEED MIX
E N.T.S.	SHEET 1 OF 1		<u>v</u>		ICATION RATES
		PIPELIN		NIU AFPL	IVATION NATES
NO.					
NO. JECT ID:		DESIGN ENGINEERI		<b>)</b> .	REV.

2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE DATE 08/11/17 DATE 08/11/17 RIPARIAN SEED MIX	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         Seeding Rate (bs/acre)         pH         Biom Period (if applicable)           Agrostis perennans         Auturn Bentgrass         0.04         5.0.7.0         Mdsummer           Andropogon geracifi         Big Bluestem         0.10         May to June         May to June           Elymus virginicus         Virginia Wildrye         1.00         6.2.7.0         June to October           Juncus tenuis         Path Rush         1.00         4.6.6.9         July to August           Sorghestum nutans         Indiangrass         0.40         4.0.8.5         August to September           Asolgpias insamata         Swamp Milkweed         4.00         5.0.7.4         June to October           Chamaecrista fasciculata         Partitidg Pea         0.60         5.5.7.0         May to June           Eupatorium coelestinum         Jos Py Vieed         0.20         4.8.7.2         July to September           Eupatorium coelestinum         Jos Py Vieed         0.20         June to October         June to October           Eupatorium periodiatum         Boneset         2.20         July to August         June to October           Eupatorium periodiatum         Boneset         0.20         4.0.7.5         July to Deptember           Monard	rian Seed Mix					
Species         Common Name         (Ibs/acre)         PH         (if applicable)           Agrostis prennans         Auturna Bentyrass         0.04         5.0 - 7.0         Midesummer           Androgoog seratii         Big Bluestem         0.10         May to June to October           Juncus effusus         Soft Rush         3.00         4.9 - 6.8         June to October           Juncus effusus         Soft Rush         3.00         4.6 - 6.9         July to August           Paricum clandestitum         Deetrongue         6.90         6.8 - 6.9         July to August           Sorghestim midans         Indiagrass         0.40         4.6 - 6.5         August observe           Sorghestim midans         Indiagrass         0.40         4.6 - 6.5         August observe           Sorghestim midans         Swamp Milkweed         4.00         5.0 - 7.4         June to October           Eupatorim coelestinum         Mistlower         0.20         4.8 - 7.2         July to August           Eupatorim coelestinum         Boneset         0.20         4.8 - 7.2         July to August           Geum canadense         White Avens         0.40         5.0 - 8.0         June to October           Fupatorim coelestinum         Biackeyed Suan         0.10		and Application				Bloom Period
Andropogon gerardii       Big Bluesterm       0.10       May to June         Lyncus drifuius       Virginie Widry       1.00       6.2 - 7.0       June to October         Juncus tenuis       Path Rush       1.00       4.6 - 6.3       June to August         Sorghastrum nutans       Indiangrass       0.40       4.0 - 6.5       August to Sorghestrum         Asclepias incarnata       Swamp Milkweed       4.00       5.0 - 7.4       June to August         Asclepias incarnata       Swamp Milkweed       4.00       5.0 - 7.4       June to October         Chamaecrista fasciculata       Partitidge Pea       0.60       5.5 - 7.0       May to June         Eupatorium coelestinum       Most Stower       0.20       4.8 - 7.2       July to September         Eupatorium coelestinum       Boneset       0.20       4.8 - 7.2       July to August         Geum canadense       Wilk Avens       0.40       5.0 - 6.0       June to October         Prioranthenum alumnale       Common Sneezeweed       0.10       5.5 - 7.5       July to October         Poreanthenum tenuifolium       Slender Mountainmint       0.10       4.0 - 7.5       August to September         Wohede fatulosa       Wilk Senna       Blue Vervain       0.10       June to October	•	1		(lbs/acre)	•	(if applicable)
Elymis virginicus       Virginia Wildrye       1.00       6.2 - 7.0       June to Oduy         Juncus effusus       Soft Rush       3.00       4.9 - 6.8       June to July         Juncus effusus       Path Rush       1.00       4.6 - 6.9       June to July         Sorghastrum nutans       Indiargrass       0.40       4.0 - 8.5       August to September         Asclepias incamada       Swamp Millweed       0.00       5.5 - 7.0       May to June         Eupatorim nutans       Indiargrass       0.40       4.0 - 8.5       August to September         Chamaecrista fasciculata       Partridge Pea       0.60       5.5 - 7.0       May to June         Eupatorim fisculasum       Jone by Pe Veed       0.20       June to October       June to October         Eupatorim fisculasum       Boneset       0.20       June to October       June to October         Periodiatum       Boneset       0.20       June to October       July to August         Geum canadense       White Avens       0.40       5.0 - 8.0       June to October         Portantemutumnale       Common Sneezeweed       0.10       5.5 - 7.5       July to October         Portantemutum tenifolium       Blackeyed Susan       0.40       4.0 - 7.5       August September	<b>o</b> 1		-		5.0 - 7.0	
Juncus eñtusus       Soft Rush       3.00       4.9 - 6.8       June to July         Juncus enuis       Path Rush       1.00       4.6 - 6.9       July to August         Sorghastrum nutans       Indiangrass       0.40       4.0 - 8.5       August to September         Asciepias incanata       Swamp Milkweed       4.00       5.0 - 7.4       May to June         Chamaerista fasciculata       Partridge Pea       0.60       5.5 - 7.0       May to June         Eupatorium coelestinum       Mistflower       0.20       June to October         Eupatorium coelestinum       Joe Pye Vieed       0.20       June to October         Eupatorium perfolatum       Boneset       0.20       June to October         Eupatorium perfolatum       Boneset       0.20       July to August         Geura canadense       White Avens       0.40       5.0 - 8.0       June to October         Heliopsis helianthoides       Oxaye Sunflower       0.14       4.5 - 7.0       July to September         Monard afstulosa       Wild Berganot       0.20       July to August       Sentember         Vatheski hirta       Blackeyed Susan       0.40       -0.7.5       August to September         Verbena hastata       Blue Vervain       0.10       June t			•		6.2 - 7.0	
Paricum clandestinum       Deertongue       6.90       6.8 - 8.9       June to August Agust to September         Sorghastrum nutans       Indiangrass       0.40       4.0 - 8.5       August to September         Asclepias incarnata       Swamp Milkweed       4.00       5.0 - 7.4       June to October         Chamaecrista fasciculata       Partidge Pea       0.60       5.5 - 7.0       May to June         Eupatorium coelestinum       Mistflower       0.20       4.8 - 7.2       July to September         Eupatorium perfoliatum       Boneset       0.20       June to October       July to August         Geum canadense       White Avens       0.40       5.0 - 8.0       July to September         Helenium autumnale       Common Sneezeweed       0.10       5.5 - 7.5       July to October         Monarda fistulosa       Wild Bergamot       0.20       July to October       July to October         Pronanthenum teruifolium       Stender Mountainmint       0.10       4.0 - 7.5       August to September         Verbena hastata       Blue Vervain       0.10       August to September       July to October         Verbena hastata       Blue Vervain       0.10       August to September       July to August         Verbena hastata       Blue Vervain <td< td=""><td></td><td></td><td></td><td>3.00</td><td>4.9 - 6.8</td><td>June to July</td></td<>				3.00	4.9 - 6.8	June to July
Sorghastrum nutans       Indiangrass       0.40       4.0 - 8.5       August to September         Asciepias incamata       Swamp Milkweed       4.00       5.0 - 7.4       June to October         Chamaecrista fasciculata       Partridge Pea       0.60       5.5 - 7.0       May to June         Eupatorium coelestinum       Mistflower       0.20       4.8 - 7.2       July to September         Eupatorium coelestinum       Boneset       0.20       d.8 - 7.2       July to August         Geum canadense       White Avens       0.40       5.0 - 8.0       June to October         Heilenium autumnale       Common Sneezeweed       0.10       5.5 - 7.5       July to August         Monarda fstulosa       Wild Bergamot       0.20       July to September         Pycnanthemum tenuifolium       Stender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hita       Blackeyed Susan       0.40       July to August       September         Rudbeckia hita       Blackeyed Susan       0.40       July to August       September         Rudbeckia hita       Blackeyed Susan       0.40       July to August       September         Verbena hastata       Blue Vervain       0.10       June to September         Ve						, ,
Asclepias incarnata       Swamp Milkweed       4.00       5.0 - 7.4       June to October         Chamaecrista fasciculata       Partridge Pea       0.60       5.5 - 7.0       May to June         Eupatorium colestinum       Mistflower       0.20       June to October         Eupatorium fistulosum       Joo Pye Weed       0.20       4.8 - 7.2       July to September         Eupatorium perfoilatum       Boneset       0.20       June to October       June to October         Eupatorium metrolitatum       Boneset       0.20       June to October       July to August         Geum canadense       White Avens       0.40       5.0 - 8.0       June to October         Heliopsis helianthoides       Oxeye Sunflower       0.14       4.5 - 7.0       July to Deptember         Monarda fistulosa       Wild Bergamot       0.20       July to October       July to October         Pycnanthemum tenuifolium       Stender Mountainminit       0.10       4.0 - 7.5       August to September         Verbena hastata       Blue Vervain       0.10       June to October         Verbena hastata       Blue Vervain       0.10       June to October         Verbena hastata       Blue Vervain       0.10       June to October         Varonia noveboracensis			-			-
Chamaecrista fasciculata       Partridge Pea       0.60       5.5 - 7.0       May to June         Eupatorium rocelestinum       Joe Pye Weed       0.20       4.8 - 7.2       July to September         Eupatorium fistulosum       Joe Pye Weed       0.20       4.8 - 7.2       July to September         Geum canadense       White Avens       0.40       5.0 - 8.0       June to Ottober         Heliopsis heliathtoides       Oxaye Sunflower       0.14       4.5 - 7.0       July to September         Heliopsis heliathtoides       Oxaye Sunflower       0.14       4.5 - 7.0       July to October         Pyranthemum tenuifolium       Slender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hita       Blackeyed Susan       0.40       -7.5       August to September         Verbena hastata       Blue Vervain       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to October         Verbena hastata       Blue Vervain       0.10       June to October         Varioria noveboracensis       New York Ironweed       0.72       June to October         4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)       4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)	•		*			* '
Eupatorium ccelestinum       Mistifower       0.20       June to October         Eupatorium fistulosum       Joe Pye Weed       0.20       4.8 - 7.2       July to August         Eupatorium perfoliatum       Boneset       0.20       June to October       July to August         Geum canadense       White Avens       0.40       5.0 - 8.0       July to August         Heinpis heliantholdes       Oxeye Sunflower       0.14       4.5 - 7.0       July to October         Pycnanthemum tenulfolium       Stender Mountainminit       0.10       4.0 - 7.5       August to September         Pycnanthemum tenulfolium       Stender Mountainminit       0.10       4.0 - 7.5       August to September         Pycnanthemum tenulfolium       Stender Mountainminit       0.10       4.0 - 7.5       August to September         Pycnanthemum tenulfolium       Stender Mountainminit       0.10       4.0 - 7.5       July to August         Senna hebecarpa       Wild Senna       0.10       June to October       June to October         Verbena hastata       Blue Vervain       0.10       June to September         Varian anoveboracensis       New York Ironweed       0.72       June to October         -4/30:       ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)       83/3:       German						
Eupatorium perfoliatum       Boneset       0.20       July to August         Geum canadense       White Avens       0.40       50-8.0       June to July         Helenous helenhandles       Oxeye Sunflower       0.11       5.5-7.5       July to August         Helenous helenhandles       Oxeye Sunflower       0.14       5.5-7.5       July to October         Monarda fistulosa       Wild Bergamot       0.20       July to September       July to October         Pycnanthemum temulfolium       Stender Mountainmint       0.10       4.0-7.5       August to September         Rudbeckia hirfa       Blackeyed Susan       0.40       July to August       September         Rudbeckia hirfa       Blackeyed Susan       0.10       June to September         Verbena hastata       Blue Vervain       0.10       June to September         Verbena hastata       Blue Vervain       0.10       June to October         Vernonia noveboracensis       New York Ironweed       0.72       June to October         4/30:       ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)       4/30:         8/31:       GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)       Branchand Seta       Berversed 1/24/18         Mate       Date       Dotto       Det			-		0.0 1.0	
Geum canadense       White Avens       0.40       50 - 8.0       June to July         Helenium autumnale       Common Sneezeweed       0.10       55 - 7.5       July to October         Monarda fistulosa       Wild Bergamot       0.20       July to September       July to October         Pyranthemum tenuifolium       Stender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hirta       Blackeyed Susan       0.40       July to August       September         Rudbeckia hirta       Blackeyed Susan       0.40       July to August to September         Rudbeckia hirta       Blackeyed Susan       0.40       July to August         Senna hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to October         Verbena noveboracensis       New York Ironweed       0.72       June to October         2/15:       50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)       -4/30:         - 4/30:       ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)       8/31:       GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         B/31:       GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)        Revised 1/24/18         DATE       DATE<			Joe Pye Weed	0.20	4.8 - 7.2	
Helenium autumnale       Common Sneezeweed       0.10       5.5 - 7.5       July to October         Heliopsis heliantholdes       Oxeye Sunflower       0.14       4.5 - 7.0       July to September         Monarda fistulosa       Wild Bergamot       0.20       July to October         Pycnanthemum tenuifolium       Slender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hirla       Blackeyed Susan       0.40       - 7.5       July to August         Senna hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to September         Vernonia noveboracensis       New York Ironweed       0.72       June to October         20.00       20.00       Second Line to September       20.00						
Heliopsis helianthoides       Oxeye Sunflower       0.14       4.5-7.0       July to September         Monarda fistulosa       Wild Bergamot       0.20       July to October         Pycnanthemum tenuifolium       Siender Mountainminit       0.10       4.0-7.5       August to September         Rudbeckia hirta       Blackeyed Susan       0.40       July to August to September         Sema hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to September         Vernorila noveboracensis       New York Ironweed       0.72       June to October         PORARY SEED MIX:       215:       50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)         -4/30:       ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)       8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         8/31:       GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)       Revised 1/24/18         DATE         DATE       MATE       ENVIRONMENTAL DETAIL         DATE       06/11/17       Image: Colspan="2">Contention						,
Monarda fistulosa       Wild Bergamot       0.20       July to October         Pycnanthemum tenuifolium       Stender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hirla       Blackeyed Susan       0.40       July to August         Senna hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to September         Vernonia noveboracensis       New York Ironweed       0.72       June to October         PORARY SEED MIX:       20.00       20.00       20.00         PORARY SEED MIX:       2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)         - 4/30:       ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)         8/31:       GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         Revised 1/24/18						•
Pycnanthemum tenuifolium       Slender Mountainmint       0.10       4.0 - 7.5       August to September         Rudbeckia hirta       Blackeyed Susan       0.40       July to August         Senna hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to September         Verbena hastata       Blue Vervain       0.10       June to September         Vernonia noveboracensis       New York Ironweed       0.72       June to October         20.00       20.00       20.00       Dive to October         PORARY SEED MIX:       2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)         -4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)       B/12       Serian ITALICA) (50 LBS/AC)         8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)       Revised 1/24/18         DATE       DATE       MOUNTAL DETAIL         DATE       DATE       MOUNTAL DETAIL         DATE       DATE       MOUNTAL DETAIL					4.5 - 7.0	
Rudbeckia hirta       Blackeyed Susan       0.40       July to August         Senna hebecarpa       Wild Senna       0.10       August to September         Verbena hastata       Blue Vervain       0.10       June to September         Vernonia noveboracensis       New York Ironweed       0.72       June to October         20.00       20.00       20.00       0			*		40-75	
Senna hebecarpa Verbena hastata       Wild Senna Blue Vervain       0.10 0.10       August to September June to September 20.00         PORARY SEED MIX:       20.00         2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)         -4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)         -4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)         8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         B/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         Revised 1/24/18         DATE         DATE         DATE         DATE					1.0 1.0	
Vernonia noveboracensis       New York Ironweed       0.72       June to October         20.00       20.00       20.00         PORARY SEED MIX:       2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC)         - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)       8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)         8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)       Revised 1/24/18         DATE       DATE       MOUNTLOIN         DATE       09/11/17       MOUNTLOIN	Senna hebecarp	1	Wild Senna	0.10		
PORARY SEED MIX: 2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 ENVRONMENTAL DETAIL						
PORARY SEED MIX: 2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE 08/11/17 FORMULTION	Vernonia noveborac	nsis	New York Ironweed			June to October
2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE OB/11/17				20.00		
2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE OB/11/17						
2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE OB/11/17						
2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE OB/11/17						
- 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC) 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE DATE 08/11/17	IPORARY SEED MIX:					
8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC) Revised 1/24/18 DATE DATE DATE 08/11/17 DATE 08/11/17 DATE 08/11/17	2/15: 50/50 MIX AN	IUAL RYEGRASS (LO	OLIUM MULTI-FLORUM)	AND WINTER RYE (	SECALE CERE/	ALE) (50-100 LBS/AC)
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL		GRASS (LOLIUM MU	ILTI-FLORUM) (60-100 L	.BS/AC)		
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL	- 4/30: ANNUAL RYE		A) (50 LBS/AC)			
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL		ET (SETARIA ITALIC	(00 200///0)			
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL		ET (SETARIA ITALIC	(00 200/10)			
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL		ET (SETARIA ITALIC.	N) (00 EBO/NO)			
DATE DATE MOUNTAIN ENVIRONMENTAL DETAIL		ET (SETARIA ITALIC	()(00 LD0/10)			
DATE 08/11/17 MOUNTAIN		ET (SETARIA ITALIC	() (00 150/70)			
		ET (SETARIA ITALIC			Revised	1/24/18
T.S. SHEET 1 OF 1	8/31: GERMAN MILL					
PIPELINE AND APPLICATION RATES	8/31: GERMAN MILL DATE DATE		ountair		MRONME	ENTAL DETAIL
	8/31: GERMAN MILL DATE DATE DATE 08/11/	7 <b>1</b>	ountair		<b>NIRONME</b> RIPARIAN	
	8/31: GERMAN MILL           DATE           DATE           DATE           DATE	7 1	ountair	ey	RIPARIAN AND APPLI	

nd Applicatio		See	ding Rate	_			
Commo	n Name		os/acre)				
America			0.3				
Tulip I	,		0.3				
White			0.3				
	a Pine		0.3				
Black			0.3				
	erviceberry		0.3				
Eastern			0.3				
Flowering	•		0.3				
Persir			0.3				
America			0.3				
	Gum		0.3				
	afras		0.3				
Witch			0.3				
	bush		0.3				
Lowbush			0.3				
Mapleleaf			0.3				
Gra ngs in addition to th			0.3				
-ES11.2 UPLAND MI	EADOW SEED N	IIX.					
ain	ENVIRONMENTAL DETAIL						
		EGENERATION ND APPLICATI					
NEERING	drawing no.	IVP-ES11.1		<b>rev.</b> ()			

Species	Common Name	Seeding Rate (Ibs/acre)	рН	Bloom Perie (if applicab
Elymus virginicus	Virginia Wildrye	4.00	5.0 - 7.4	June to Octob
Schizachyrium scoparium	Little Bluestem	11.68	5.0 - 8.4	July to Octob
Sorghastrum nutans	Indiangrass	1.00	5.0 - 7.8	August to Octo
Asclepias syriaca	Common Milkweed	0.10		June to Augu
Asclepias tuberosa	Butterfly Milkweed	0.10	4.8 - 6.8	June to Augu
Chamaecrista fasciculata	Partridge Pea	0.60	5.5 - 7.5	July to Septen
Chamaecrista nictitans	Sensitive Partridge Pea	0.06		June to Octol
Coreopsis lanceolata	Lanceleaf Coreopsis	0.44	6.0 - 7.0	April to July
Eupatorium coelestinum	Mistflower	0.04	5.5 - 7.5	July to Octob
Heliopsis helianthoides	Oxeye Sunflower	0.40		July to Augu
Lespedeza virginica	Slender Bushclover	0.10		July to Septen
Liatris graminifolia	Grassleaf Blazing Star	0.10	5.8 - 6.8	August to Octo
Monarda fistulosa	Wild Bergamot	0.10	6.0 - 8.0	June to Septer
Penstemon laevigatus	Appalachian Beardtongue	0.10		late May to la August
Pycnanthemum incanum	Hoary Mountainmint,	0.20		May to Jun
Rudbeckia fulgida var. fulgida	Orange Coneflower	0.02	< 6.8	summer
Rudbeckia hirta	Blackeyed Susan	0.04		July to Octob
Species	Common Name	Seeding Rate (Ibs/acre)	pН	Bloom Peri (if applicab
Senna hebecarpa	Wild Senna	0.60	6.0 - 7.0	May to July
Solidago juncea	Early Goldenrod	0.10		July to Augu
Solidago nemoralis	Gray Goldenrod	0.04		June to July
Tradescantia ohiensis	Ohio Spiderwort	0.04	6.5 - 7.5	August to Septe
Tradescantia virginiana	Virginia Spiderwort	0.10		late April to mid
		20.00		

9/1 - 2/15: 50/50 MIX ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) AND WINTER RYE (SECALE CEREALE) (50-100 LBS/AC) 2/16 - 4/30: ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) (60-100 LBS/AC)

5/1 - 8/31: GERMAN MILLET (SETARIA ITALICA) (50 LBS/AC)

DRAWN	DATE		ENVIRONMENTAL DETA	
CHECKED	DATE	Mountain		
APP'D	DATE 08/11/17		UPLAND MEADOW SEED MIX	,
SCALE N.T.S.	SHEET 1 OF 1	' Valley	AND APPLICATION RATES	<b>`</b>
JOB NO.		PIPELINE	AND APPLICATION RATES	
PROJECT ID:			PRAMINO NO	REV.
MVP - V	A PORTION	DESIGN ENGINEERING	drawing no. MVP-ES11.2	NEV.

OpeciesCommon Name(ibs/acre)pri(if applicableAgrostis perennansAutumn Bentgrass3.155.5 - 7.5MidsummerElymus virginicusVirginia Wildrye9.055.0 - 7.4June to OctobPanicum clandestinumDeertongue4.504.0 - 7.5May to SepterSchizachyrium scopariumLittle Bluestem11.255.0 - 7.4July to OctobSorghastrum nutansIndiangrass14.405.0 - 7.8August to OctoAsclepias syriacaCommon Milkweed0.09June to AuguAster pilosusHeath Aster0.055.4 - 7.0After fall frosChamaecrista fasciculataPartridge Pea0.456.0 - 7.0April to JulyCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 7.0May to JulySolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SepterRudbeckia hirtaBlackeyed Susan0.456.0 - 7.0May to JulySolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SepterTradescantia ohiensisOhio Spiderwort0.056.5 - 7.5August to Septer	Agrostis perennansAutumn Bentgrass3.155.5 - 7.5MidsElymus virginicusVirginia Wildrye9.055.0 - 7.4June toPanicum clandestinumDeertongue4.504.0 - 7.5May to SSchizachyrium scopariumLittle Bluestem11.255.0 - 7.4July toSorghastrum nutansIndiangrass14.405.0 - 7.8August 1Asclepias syriacaCommon Milkweed0.09June toAster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to SMonarda fistulosaWild Bergamot0.236.0 - 8.0June toPycnanthemum incanumHoary Mountainmint0.05< 6.8surRudbeckia hirtaBlackeyed Susan0.456.0 - 7.0MaySenna hebecarpaWild Senna0.23July to5.5	ummer OCtober Septembe
Panicum clandestinumDeertongue4.504.0 - 7.5May to SeptemSchizachyrium scopariumLittle Bluestem11.255.0 - 7.4July to OctobSorghastrum nutansIndiangrass14.405.0 - 7.8August to OctoAsclepias syriacaCommon Milkweed0.09June to AuguAster pilosusHeath Aster0.055.4 - 7.0After fall frosChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 7.0May to JulySenna hebecarpaWild Senna0.23July to AuguSolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SeptenTradescantia ohiensisOhio Spiderwort0.05Iate April to mid	Panicum clandestinumDeertongue4.504.0 - 7.5May to SSchizachyrium scopariumLittle Bluestem11.255.0 - 7.4July toSorghastrum nutansIndiangrass14.405.0 - 7.8August tiAsclepias syriacaCommon Milkweed0.09June toAster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to SHeliopsis helianthoidesOxeye Sunflower0.45July to SMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SPycnanthemum incanumHoary Mountainmint0.05< 6.8	Septembe
Schizachyrium scopariumLittle Bluestem11.255.0 - 7.4July to OctobSorghastrum nutansIndiangrass14.405.0 - 7.8August to OctoAsclepias syriacaCommon Milkweed0.09June to AuguAster pilosusHeath Aster0.055.4 - 7.0After fall frosChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 7.0May to JulyPycnanthemum incanumHoary Mountainmint0.05< 6.8	Schizachyrium scopariumLittle Bluestem11.255.0 - 7.4July toSorghastrum nutansIndiangrass14.405.0 - 7.8August 1Asclepias syriacaCommon Milkweed0.09June toAster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July toCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July toHeliopsis helianthoidesOxeye Sunflower0.45July toMonarda fistulosaWild Bergamot0.236.0 - 8.0June toPycnanthemum incanumHoary Mountainmint0.05< 6.8	
Sorghastrum rutansIndiangrass14.405.0 - 7.8August to OctoAsclepias syriacaCommon Milkweed0.09June to AuguAster pilosusHeath Aster0.055.4 - 7.0After fall frosChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctocMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Sorghastrum rutansIndiangrass14.405.0 - 7.8August iAsclepias syriacaCommon Milkweed0.09June toAster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to SHeilopsis helianthoidesOxeye Sunflower0.45July toLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August toMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SPycnanthemum incanumHoary Mountainmint0.05< 6.8	October
Asclepias syriacaCommon Milkweed0.09June to AuguAster pilosusHeath Aster0.055.4 - 7.0After fall frosChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Asclepias syriacaCommon Milkweed0.09June toAster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to SHeliopsis helianthoidesOxeye Sunflower0.45July toLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August toMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SPycnanthemum incanumHoary Mountainmint0.05< 6.8	
Aster pilosusHeath Aster0.055.4 - 7.0After fall fromChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Aster pilosusHeath Aster0.055.4 - 7.0AfterChamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to 5Coreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to 5Heliopsis helianthoidesOxeye Sunflower0.45July to 5Liatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August 1Monarda fistulosaWild Bergamot0.236.0 - 8.0June to 5Pycnanthemum incanumHoary Mountainmint0.05< 6.8	o Octobe
Chamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to SeptemCoreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Chamaecrista fasciculataPartridge Pea0.455.5 - 7.5July to 5Coreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July to 5Heliopsis helianthoidesOxeye Sunflower0.45July to 5Liatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August 1Monarda fistulosaWild Bergamot0.236.0 - 8.0June to 5Pycnanthemum incanumHoary Mountainmint0.05< 6.8	o August
Coreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0April to JulyEupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Coreopsis lanceolataLanceleaf Coreopsis0.456.0 - 7.0AprilEupatorium coelestinumMistflower0.055.5 - 7.5July toHeliopsis helianthoidesOxeye Sunflower0.45July toLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August toMonarda fistulosaWild Bergamot0.236.0 - 8.0June to 5Pycnanthemum incanumHoary Mountainmint0.05< 6.8	fall frost
Eupatorium coelestinumMistflower0.055.5 - 7.5July to OctobHeliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Eupatorium coelestinumMistflower0.055.5 - 7.5July toHeliopsis helianthoidesOxeye Sunflower0.45July toLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August fiMonarda fistulosaWild Bergamot0.236.0 - 8.0June to fiPycnanthemum incanumHoary Mountainmint0.05< 6.8	Septembe
Heliopsis helianthoidesOxeye Sunflower0.45July to AuguLiatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Heliopsis helianthoides       Oxeye Sunflower       0.45       July to         Liatris graminifolia       Grassleaf Blazing Star       0.09       5.8 - 6.8       August i         Monarda fistulosa       Wild Bergamot       0.23       6.0 - 8.0       June to i         Pycnanthemum incanum       Hoary Mountainmint       0.05       < 6.8	to July
Liatris graminifoliaGrassleaf Blazing Star0.095.8 - 6.8August to OctoMonarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Liatris graminifolia         Grassleaf Blazing Star         0.09         5.8 - 6.8         August 1           Monarda fistulosa         Wild Bergamot         0.23         6.0 - 8.0         June to 1           Pycnanthemum incanum         Hoary Mountainmint         0.05         < 6.8	October
Monarda fistulosaWild Bergamot0.236.0 - 8.0June to SeptenPycnanthemum incanumHoary Mountainmint0.05< 6.8	Monarda fistulosa         Wild Bergamot         0.23         6.0 - 8.0         June to 3           Pycnanthemum incanum         Hoary Mountainmint         0.05         < 6.8	August
Pycnanthemum incanum         Hoary Mountainmint         0.05         < 6.8         summer           Rudbeckia hirta         Blackeyed Susan         0.45         6.0 - 7.0         May to July           Senna hebecarpa         Wild Senna         0.23         July to Augu           Solidago nemoralis         Gray Goldenrod         0.05         6.5 - 7.5         August to Septe           Tradescantia ohiensis         Ohio Spiderwort         0.05         late April to mid	Pycnanthemum incanum         Hoary Mountainmint         0.05         < 6.8         sur           Rudbeckia hirta         Blackeyed Susan         0.45         6.0 - 7.0         May           Senna hebecarpa         Wild Senna         0.23         July to	o Octobe
Rudbeckia hirtaBlackeyed Susan0.456.0 - 7.0May to JulySenna hebecarpaWild Senna0.23July to AuguSolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SepteTradescantia ohiensisOhio Spiderwort0.05Iate April to mid	Rudbeckia hirtaBlackeyed Susan0.456.0 - 7.0MaySenna hebecarpaWild Senna0.23July to	Septembe
Senna hebecarpaWild Senna0.23July to AuguSolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SepteTradescantia ohiensisOhio Spiderwort0.05Iate April to mid	Senna hebecarpa Wild Senna 0.23 July to	nmer
Senna hebecarpaWild Senna0.23July to AuguSolidago nemoralisGray Goldenrod0.056.5 - 7.5August to SepteTradescantia ohiensisOhio Spiderwort0.05Iate April to mid	Senna hebecarpa Wild Senna 0.23 July to	to July
Tradescantia ohiensis Ohio Spiderwort 0.05 late April to mid	Solidago nemoralis Gray Goldenrod 0.05 6.5 - 7.5 August to	August
		Septemb
45.00	Tradescantia ohiensis Ohio Spiderwort 0.05 late April	to mid-Ju
	45.00	

DRAWN	DATE	Mountain	ENVIRONMENTAL DETA	AL.
CHECKED APP'D	DATE DATE 08/11/17	Mountain 🎦		
SCALE N.T.S.	SHEET 1 OF 1	Valley	UPLAND STEEP SLOPE SEED I AND APPLICATION RATES	MIX
JOB NO.		PIPELINE	AND APPLICATION RATES	
PROJECT ID:		DESIGN ENGINEERING	DRAWING NO.	REV.
MVP - V	A PORTION		MVP-ES11.3	0

Species	Common Name	Indicator Status	Riparian Planting <sup>1</sup>	Forested Wetland Planting <sup>2</sup>
	Nativ	e Trees		
Acer rubrum	Red Maple	FAC	Х	х
Acer saccharinum	Silver Maple	FACW	Х	Х
Betula nigra	River Birch	FACW	Х	Х
Carpinus caroliniana	American Hornbeam	FAC	Х	х
Carya glabra	Pignut Hickory	FACU	Х	
Carya ovata	Shagbark Hickory	FACU	Х	
Chionanthus virginicus	White Fringe Tree	FAC+	Х	
Diospyros virginiana	Common Persimmon	FAC-	Х	
Species	Common Name	Indicator Status	Riparian Planting <sup>1</sup>	Forested Wetland Planting <sup>2</sup>
Fraxinus pennsylvanica	Green Ash	FACW	Х	X

Juniperus virginiana	Eastern Red Cedar	FACU	х	х
Liquidambar styraciflua	Sweet Gum	FAC	Х	Х
Liriodendron tulipifera	Tuliptree	FACU	Х	Х
Nyssa sylvatica	Black Gum	FAC	Х	
Platanus occidentalis	American Sycamore	FACW-	Х	Х
Populus deltoids	Eastern Cottonwood	FAC	х	
Quercus bicolor	Swamp White Oak	FACW+	Х	Х
Quercus falcata	Cherrybark Red Oak	FACW	Х	Х
Quercus phellos	Willow Oak	FAC+	Х	Х
Quercus nigra	Water Oak	FAC	Х	
Quercus palustris	Pin Oak	FACW	х	Х
Salix nigra	Black Willow	FACW	х	Х
Ulmus americana	American Elm	FACW-	Х	Х

NOTE:

1. REFER TO MVP-ES11.8 AND MVP-ES11.9 FOR LOCATIONS OF BARE ROOT PLANTINGS.

 DRAWN
 DATE

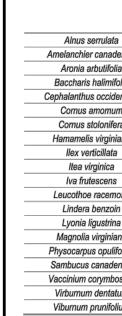
 CHECKED
 DATE

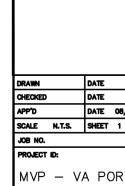
 APP'D
 DATE
 OB/11/17

 SCALE
 N.T.S.
 SHEET
 1 OF 1

 JOB NO.
 PIPELINE
 DESIGN ENGINEERING
 DRAWN G NO.

 MVP - VA PORTION
 DESIGN ENGINEERING
 DRAWN G NO.
 REV.





	Native S	hrubs		
ata	Brook-side Alder	OBL		Х
adensis	Canada Serviceberry	FAC	Х	
folia	Red Chokecherry	FACW	Х	Х
nifolia	Groundsel Bush	FACW-	Х	Х
identalis	Buttonbush	OBL		Х
num	Silky Dogwood	FACW	х	х
ifera	Red-osier Dogwood	FAC	х	Х
iniana	American Witchhazel	FAC-	х	
ata	Common Winterberry	FACW+	Х	Х
a	Virginia Willow	OBL		Х
ns	Marsh Elder	FACW+	х	х
emosa	Fetter-bush	FACW	Х	Х
toin	Spicebush	FACW-	Х	Х
rina	Maleberry	FACW	Х	Х
niana	Sweetbay Magnolia	FACW+	Х	Х
ulifolius	Eastern Ninebark	FACW-	Х	Х
densis	American Elder	FACW-	Х	х
nbosum	Highbush Blueberry	FACW-	Х	Х
tatum	Arrow-wood	FAC	Х	
folium	Black-haw	FACU	Х	

	Mountain	ENVIRONMENTAL DETA	<b>JL</b>
08/11/17 1 OF 1	Valley	NATIVE TREE AND SHRUB SPECIES BARE ROOT PLANTINGS WITHIN RIF	
	PIPELINE	AREAS AND FORESTED WETLAN	DS
	DESIGN ENGINEERING	DRAWING NO.	REV.
ORTION		MVP-ES11.7	0

ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:		REVISIONS:	
DW	DW	DW	DW	DW	DW	APPD.:		Щ И И	
RE	RE	RE	RE	RE	RE	DWN.: CHKD.: APPD.:			
3 KAL	3 KAL	3 KAL	7 KAL	7 KAL	7 KAL	DWN.:			
01/31/18	01/26/18	01/08/18	11/28/17	11/01/17	08/18/17	DATE:			
7	9	5	4	3	2	NO.:			
C + 2		ME		Ž		6	Ļ	BO	S
		EROSION AND SEDIMENT CONTROL PLANS		MUUNIAIN VALLET PIPELINE PROJECT - ROUU LINE				555 SOUTHPOINTE BOULEVARD, SUITE 200	CANONSBURG, PA 15317
(	comp	661 F	TE worl AN OST		LEAF SEN PLA	EC so I DF ZA		rion E	
(	comp	661 F	TE worl AN OST	TR a c DER ER RGH	LEAF SEN PLA	EC so I DF ZA		rion E	
(	comp		AN OST BUI			EC S SO J DF ZA LNER		rion E	
CH	F		TE AN OST BUI DAVI Lic.			EC S SO J DF ZA LNER		rion E	s <sup>™</sup>
DR CH AP DA	F		TE AN OST BUI DAVI Lic. BY: BY:		WALL CONTRACT OF C	LINER DITT			KAL

Waterbody Name	MP	County	State	Valuable Resource
Kimballton Branch	199.1, 199.4	Giles	VA	headwaters of wild trout stream, coldwater stream
Waterbody Name	MP	County	State	Valuable Resource
Stony Creek	200.4	Giles	VA	candy darter, green floater, coldwater stream, wild trout stream
Little Stony Creek	204.4	Giles	VA	coldwater stream, wild trout stream
Sinking Creek	211.2	Giles	VA	candy darter, green floater, coldwater stream, wild trout stream, non-listed mussels
UNT Craig Creek	219.2	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
UNT Craig Creek	219.3	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
Craig Creek	219.7	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
Craig Creek	219.7	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
UNT Craig Creek	219.8	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
UNT Craig Creek	220.0	Montgomery	VA	Headwaters of James spinymussel occurrences, USFS lands area
Mill Creek	222.2	Montgomery	VA	upstream of Roanoke logperch suitable habitat, orangefin madtom, coldwater stream, wild trout
North Fork[Roanoke River	227.2	Montgomery	VA	Roanoke logperch present, non-listed mussels present, orangefin madtom, coldwater stream, wild trout
North Fork Roanoke River	227.4	Montgomery	VA	Roanoke logperch present, non-listed mussels present, orangefin madtom, coldwater stream, wild trout
Bradshaw Creek	230.7	Montgomery	VA	Roanoke logperch suitable habitat, orangefin madtom, coldwater stream, wild trout
Bradshaw Creek	231.5	Montgomery	VA	Roanoke logperch suitable habitat, orangefin madtom, coldwater stream, wild trout
Roanoke River	235.4	Montgomery	VA	Roanoke logperch present, orangefin madtom, non-listed mussels present
Bottom Creek	241.1	Roanoke	VA	upstream of Bottom Creek Gorge, orangefin madtom, coldwater stream, wild trout
Bottom Creek	242.5	Roanoke	VA	upstream of Bottom Creek Gorge, orangefin madtom, coldwater stream, wild trout
N DATE				
CED DATE	Mo	untain		ENVIRONMENTAL DETA
DATE 08/11/17 N.T.S. SHEET 1 OF 1 IO.	•		ey   '	STREAM CROSSINGS PROPOSED BARE ROOT SEEDING PLANTING

	0.15.4			upstream of Bottom Creek Gorge,
Mill Creek	245.1	Roanoke	VA	orangefin madtom, coldwater stream, wild trout
Green Creek	247.1	Franklin	VA	upstream of Bottom Creek Gorge, orangefin madtom, coldwater stream, wild trout
Green Creek	247.4	Franklin	VA	upstream of Bottom Creek Gorge, orangefin madtom, coldwater stream, wild trout
North Fork Blackwater River	249.7	Franklin	VA	Roanoke logperch suitable habitat, coldwater stream wild trout stream
Waterbody Name	MP	County	State	Valuable Resource
Teels Creek	258.2	Franklin	VA	upstream of Roanoke logperch suitable habitat, one of numerous project crossings of Teels Creek
Teels Creek	260.3	Franklin	VA	upstream of Roanoke logperch suitable habitat, one of numerous project crossings of Teels Creek
Teels Creek	261.0	Franklin	VA	upstream of Roanoke logperch suitable habitat, one of numerous project crossings of Teels Creek
Teels Creek	261.8	Franklin	VA	upstream of Roanoke logperch suitable habitat, one of numerous project crossings of Teels Creek
Teels Creek	262.3	Franklin	VA	Roanoke logperch suitable habitat, one of numerous project crossings of Teels Creek contributing sediment impacts
Little Creek	262.6	Franklin	VA	Roanoke logperch suitable habitat, numerous crossings upstream contributing sediment impacts
Little Creek	263.3	Franklin	VA	Roanoke logperch suitable habitat, non- listed mussels present, numerous crossings upstream contributing sediment impacts
Maggodee Creek	269.4	Franklin	VA	Roanoke logperch suitable habitat
Blackwater River	269.7	Franklin	VA	Roanoke logperch present, non-listed mussels present
UNT to Jacks Creek	278.8	Franklin	VA	orangefin madtom
Turkey Creek	280.5	Franklin	VA	orangefin madtom
Strawfield Creek	282.3	Franklin	VA	orangefin madtom
Parrot Branch	282.9	Franklin	VA	orangefin madtom
Jonnikin Creek	284.4	Pittsylvania	VA	orangefin madtom
UNT to Rocky Creek	287.1	Pittsylvania	VA	orangefin madtom
Pigg River	289.1	Pittsylvania	VA	Roanoke logperch present, orangefin madtom, mussels present including yellow lampmussel (VA threatened)
Harpen Creek	289.9	Pittsylvania	VA	Roanoke logperch suitable habitat, orangefin madtom
Harpen Creek	292.0	Pittsylvania	VA	orangefin madtom
AWN DATE				
ECKED DATE	Mo	ountain		ENVIRONMENTAL DETAIL
P'D         DATE         08/11/17           ALE         N.T.S.         SHEET         1         0F         1				STREAM CROSSINGS PROPOSED FOR BARE ROOT SEEDING PLANTINGS
B NO.	4	PIPELIN	E 🖌 📘	
ROJECT ID: 1/VP - VA PORTION	DESIGN	ENGINEERI	NG DR	AWING NO. REV. MVP—ES11.9 0

	cientific Name	IIXES WI	thin the Jefferson Natio		Growth Habit	
50	cientific Name	Non-nati	ve Species for Temporary Eros	ion Cont		pH Preference
Lolium perenne s	subsp. multiflorum		Italian ryegrass; Annual ryegra		Graminoid	5.0-7.9
	(Panicum ramosum)	)	Browntop millett		Graminoid	5.5-6.9
Secale cereale		,	Cereal rye		Graminoid	5.2-8.0
Setaria italica			Foxtail millet		Graminoid	5.3-6.9
			Native – Highly Preferred			
Sorghastrum nuta	ans		Indiangrass		Graminoid	5.0 - 7.8
Tridens flavus			Purpletop		Graminoid	4.5-6.5
			Native – Preferred	I		
Agrostis perennal	ins		Autumn bentgrass; Upland bentgras	ss	Graminoid	5.5 - 7.5
Dichanthelium cla	andestinum		Deertongue		Graminoid	4.0-7.5
Elymus canadens	sis		Canada wildrye		Graminoid	5.0 - 7.9
Desmodium cana	adense		Showy ticktrefoil		Forb	wide tolerance
Heliopsis helianth	hoides		Oxeye sunflower; Smooth oxeye		Forb	unknown
Lespedeza virgini	nica		Slender bushclover; Slender lesped	eza	Forb	acid tolerant
Liatris spicata			Dense blazing star; Spiked gayfeath	ner	Forb	5.6 - 7.5
Senna hebecarpa	а		Wild senna; American senna		Forb	unknown
			Native – Moderately Preferred	d		
Panicum virgatun	m		Switchgrass		Graminoid	4.5-8.0
			Destalates was		E h	
Chamaecrista fas	sciculata		Partridge pea		Forb	5.5 - 7.5
Chamaecrista fas Rudbeckia hirta	sciculata		Blackeyed Susan		Forb	5.5 - 7.5 6.0 - 7.0
	sciculata					
Rudbeckia hirta	Arte		Blackeyed Susan		Forb	
Rudbeckia hirta	DATE			E	Forb	6.0-7.0 TAL DETAIL
Rudbeckia hirta	DATE DATE DATE 08/11/17		Blackeyed Susan		Forb	6.0 – 7.0 TAL DETAIL SERVICE
Rudbeckia hirta Awn D. ECKED D. P'D D. ALE N.T.S. S	DATE		Blackeyed Susan		Forb WIRONMEN US FOREST (NATIONAL FOR	6.0-7.0 TAL DETAIL SERVICE REST) LANDS
Rudbeckia hirta	DATE DATE DATE 08/11/17		Blackeyed Susan		Forb WIRONMEN US FOREST (NATIONAL FOR HYDROSEE	6.0-7.0 TAL DETAIL SERVICE REST) LANDS ED MIX
Rudbeckia hirta AMN D. ECKED D. P <sup>*</sup> D D. ALE N.T.S. SI B NO.	DATE DATE DATE 08/11/17 SHEET 1 OF 1	•	Blackeyed Susan		Forb WIRONMEN US FOREST (NATIONAL FOR HYDROSEE	6.0-7.0 TAL DETAIL SERVICE REST) LANDS ED MIX

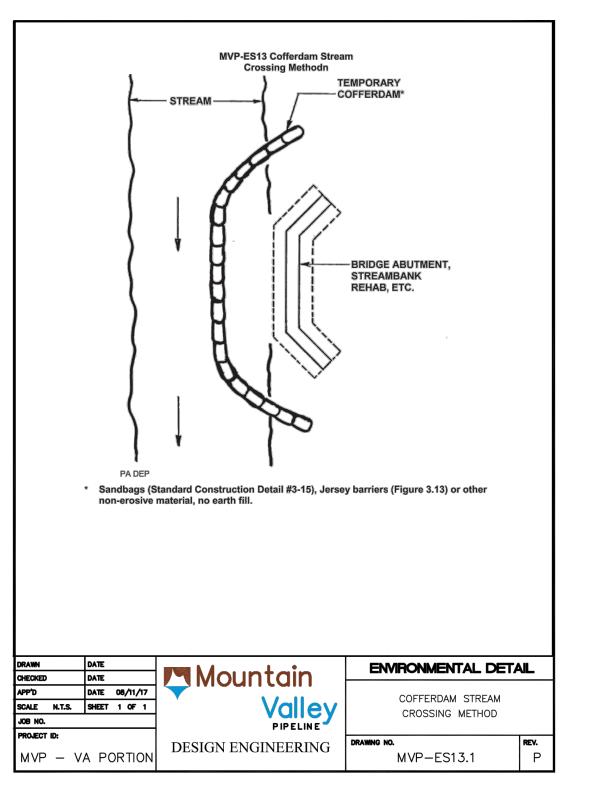
Nam	ne		Ph preference	Wetland Indicator Status
	nual Ryegrass enne var. ital	(Lolium Multiflorum (L. icum))	5.0-7.9	NI/moderate
Ger	man/Foxtail	Millet (Setaria italica)	5.3-6.9	FACU
Cer	eal Rye (Seco	ale cereale)	5.2-8.0	NI/damp
(int		(Panicum ramosum) A & south; possibly ok	5.5-6.9	FACU
2): APP 3): APP	YLY WHENEVER EF	OF THE ABOVE LISTED SPECIES S ROSION CONTROL IS NEEDED OU WITH PERMANENT EROSION CON RMANENT SEEDING WITH WILDLIF	TSIDE OF NORMAI NTROL	D L (PERMANENT) SEEDING SEASONS
1): A M 2): APP 3): APP	YLY WHENEVER EF	ROSION CONTROL IS NEEDED OU WITH PERMANENT EROSION CON RMANENT SEEDING WITH WILDLIF	TSIDE OF NORMAI NTROL TE MIXES	
1): A M 2): APP 3): APP 4): APP	DATE	ROSION CONTROL IS NEEDED OU WITH PERMANENT EROSION CON RMANENT SEEDING WITH WILDLIF	TSIDE OF NORMAI	L (PERMANENT) SEEDING SEASONS

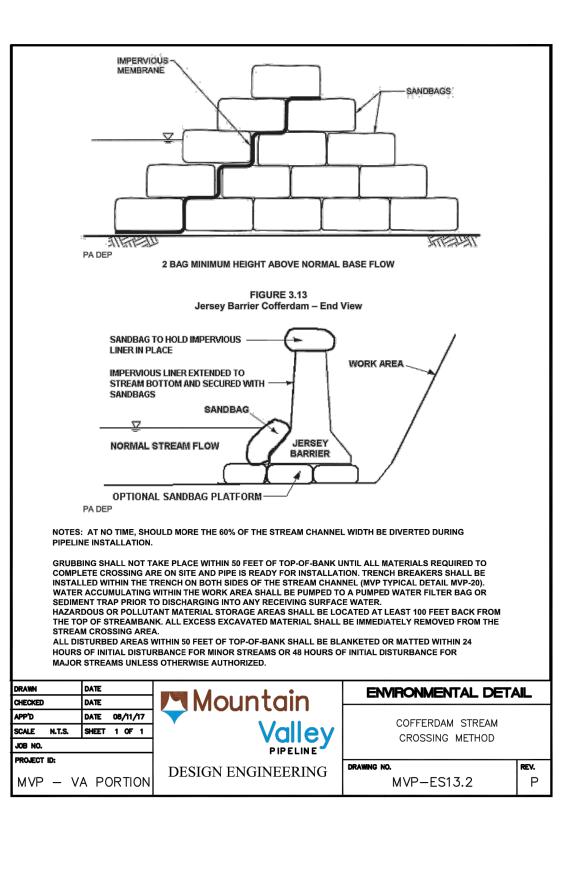
Scientific Name	Common Name	Growth Habit	pH Preference								
Upland Areas - Non-native Species for Erosion Control											
Lolium perenne subsp. multiflorum	Italian ryegrass; Annual ryegrass	Graminoid	5.0 - 7.9								
Urochloa ramosa (Panicum ramosum)	Browntop millett	Graminoid	5.5 - 6.9								
Secale cereale	Cereal rye	Graminoid	5.2 - 8.0								
Setaria italica	Foxtail millet	Graminoid	5.3 - 6.9								
	Upland Areas - Native Species	•									
Chasmanthium laxumª	Slender woodoats	Graminoid	4.5 - 7.0								
Eragrostis spectabilisª	Purple lovegrass	Graminoid	4.0 - 7.5								
Panicum virgatum	Switchgrass	Graminoid	4.5 - 8.0								
Sorghastrum nutans	Indiangrass	Graminoid	5.0 - 7.8								
Tridens flavusª	Purpletop	Graminoid	4.5 - 6.5								
Apocynum cannabinumª	Indian hemp	Forb	4.5 - 7.0								
Chamaecrista fasciculata	Partridge pea	Forb	5.5 - 7.5								
Desmodium canadense	Showy ticktrefoil	Forb	wide tolerance								
Desmodium paniculatum	Panicledleaf ticktrefoil	Forb	6.0 - 7.0								
Elymus virginicus <sup>b</sup>	Virginia wildrye	Graminoid	5.0 - 7.4								
Geum canadenseª	White avens	Forb	4.5 - 7.5								
Heliopsis helianthoides	Oxeye sunflower; Smooth oxeye	Forb	unknown								
Monarda fistulosa <sup>b</sup>	Wild bergamot	Forb	6.0 - 8.0								
Pycnanthemum spp. <sup>b</sup>	Mountain mint	Forb	unknown								
Rubus allegheniensis <sup>a</sup>	Common blackberry; Allegheny blackberry	Forb/ Subshrub	4.6 - 7.5								
Rudbeckia hirta	Blackeyed Susan	Forb	6.0 - 7.0								
Solidago canadensisª	Canada goldenrod	Forb	4.8 - 7.5								
Tradescantia virginianaª	Virginia spiderwort	Forb	4.0-8.0								

DRAWN	DATE	Mountain	ENVIRONMENTAL DETA	AIL.
APP'D SCALE N.T.S. JOB NO.	DATE 08/11/17 SHEET 1 OF 1		US FOREST SERVICE (NATIONAL FOREST) LANDS UPLAND AREA SEED MIX	
project id: MVP - V	A PORTION	DESIGN ENGINEERING	drawing no. MVP-ES12.1	rev.

	Riparian Seed Mix Scientific N
-	Oolentanio I
	Lolium perenne subsp. n
	Urochloa ramosa (Panic
	Secale cereale
	Setaria italica
	Agrostis perennans
	Elymus virginicus
	Sorghastrum nutans
	Asclepias incarnata
	Chamaecrista fasciculata
	Eutrochium fistulosum (E
	fistulosum)
	Eupatorium maculatum
	Eupatorium perfoliatum
	Helenium autumnale
	Senna hebecarpa
	Senna marilandica
	Vernonia noveboracensi

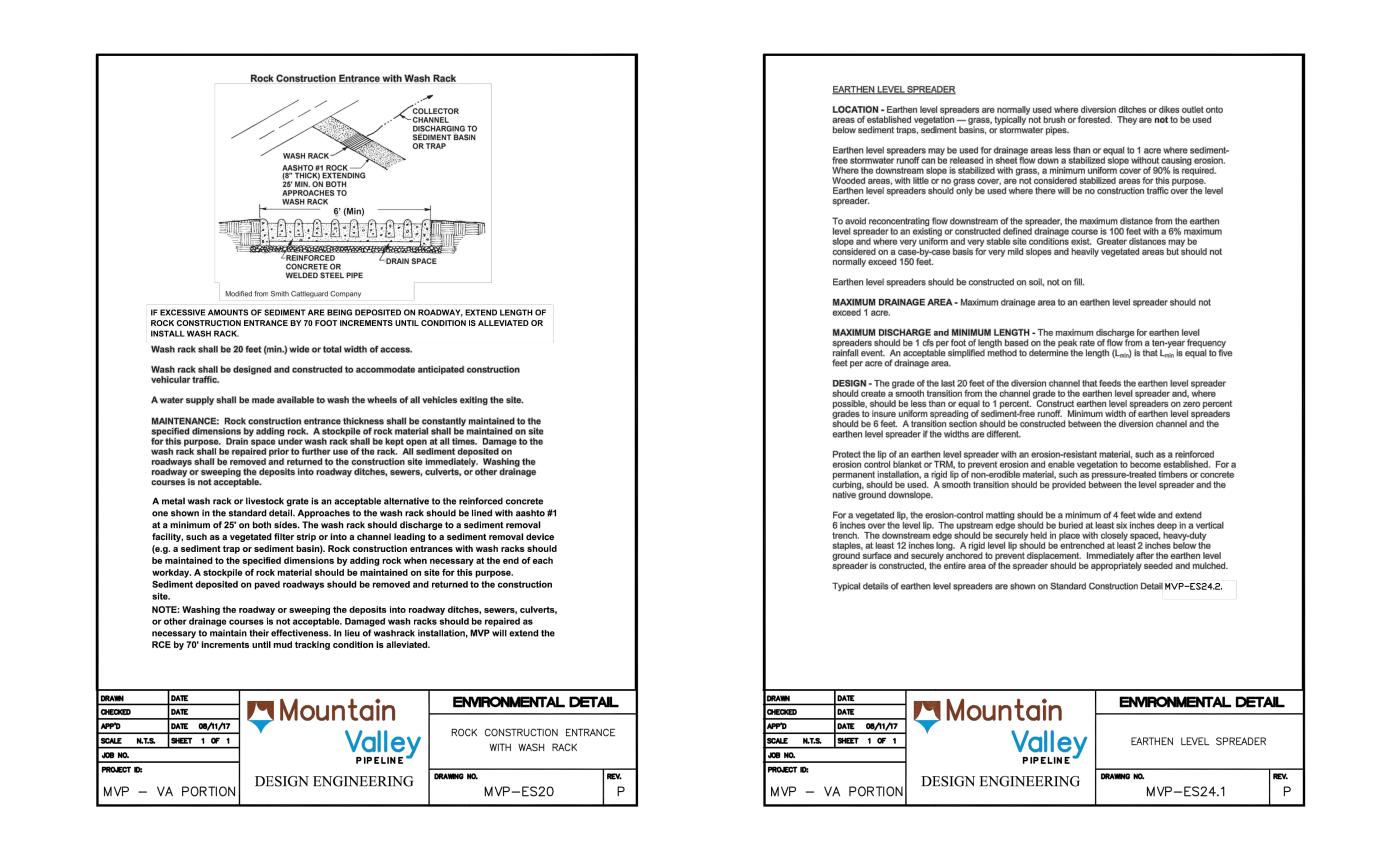
	DATE	Mountain	ENMRONMENTAL DETA	۲
	DATE DATE 08/11/17 SHEET 1 OF 1	Mountain Valley	US FOREST SERVICE (NATIONAL FOREST) LANDS	
JOB NO.		PIPELINE	RIPARIAN SEED MIX	
PROJECT ID:		DESIGN ENGINEERING	DRAWING NO.	REV.
MVP – V	A PORTION	DESIGN ENGINEERING	MVP-ES12.2	0

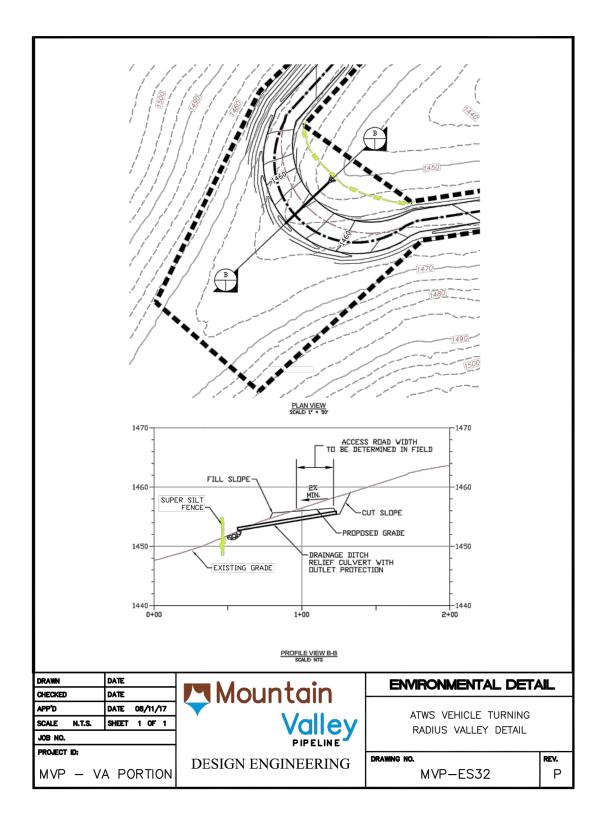


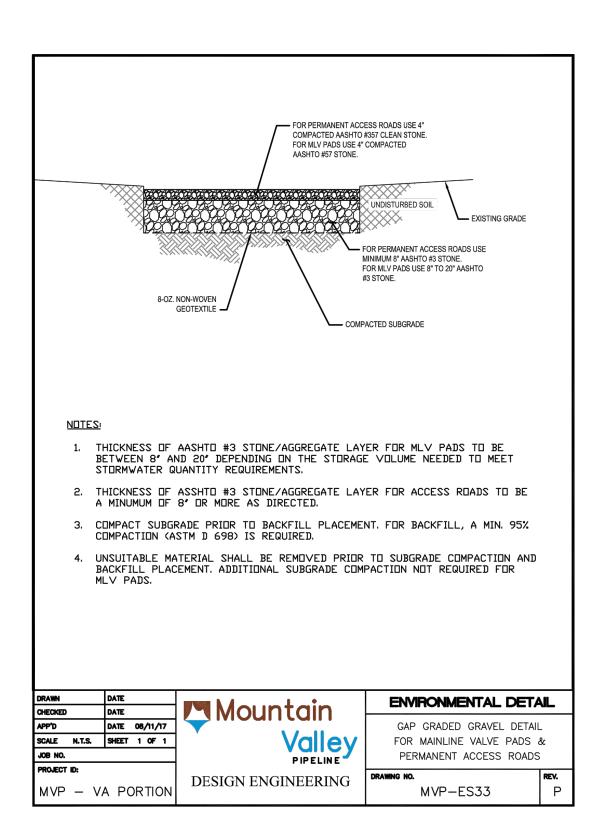


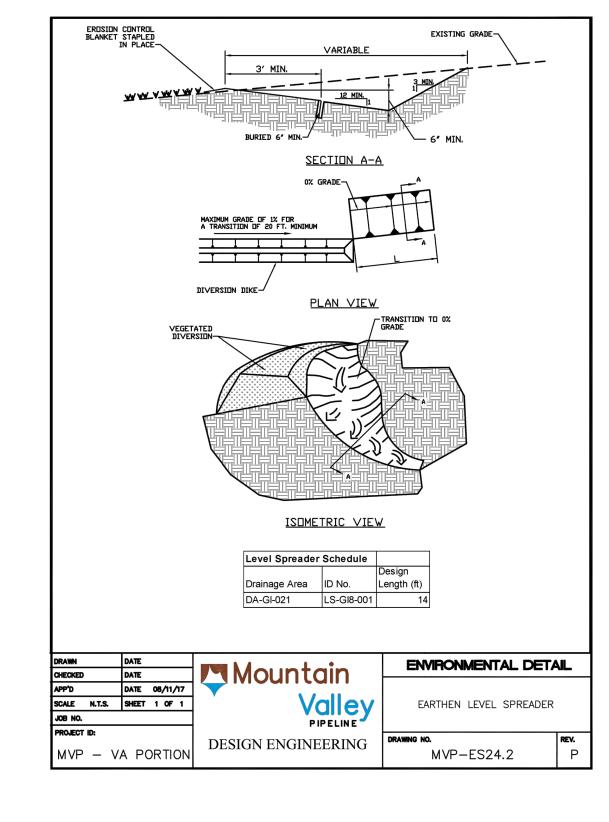
Name	Common Name	Habit	pH Preference
N	Ion-native Species for Erosion Control		
multiflorum	Italian ryegrass; Annual ryegrass	Graminoid	5.0 – 7.9
cum ramosum)	Browntop millett	Graminoid	5.5 – 6.9
	Cereal rye	Graminoid	5.2 - 8.0
	Foxtail millet	Graminoid	5.3 – 6.9
	Native Species		
	Autumn bentgrass; upland bentgrass	Graminoid	5.5 - 7.5
	Virginia Wildrye	Graminoid	5.0 - 7.4
ł	Indiangrass	Graminoid	5.0 - 7.8
ł	Swamp milkweed	Forb	5.0 - 8.0
ta	Partridge pea	Forb	5.5 - 7.5
(Eupatorium	Joe pye weed	Forb	4.5 – 7.0
	Spotted joe pye weed	Forb	5.5 - 7.0
1	Boneset	Forb	unknown
	Common sneezeweed	Forb	4.0 - 7.5
	Wild senna; American senna	Forb	unknown
1	Maryland senna	Forb / Subshrub	4.0 - 7.0
sis	New York ironweed	Forb	4.5 -8.0

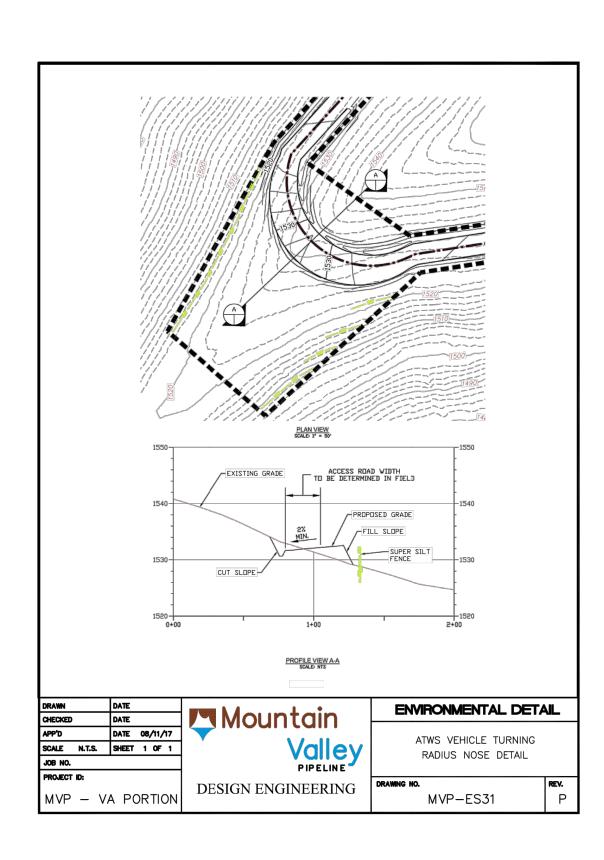
01/31/18 KAL RE DW ADDED DETAILS FOR ROADS AND PADS	01/26/18 KAL RE DW ADDRESS VADEQ COMMENTS	01/08/18 KAL RE DW ADDRESS VADEQ COMMENTS	11/28/17 KAL RE DW ADDRESS VADEQ COMMENTS	11/01/17 KAL RE DW ADDRESS VADEQ COMMENTS	08/18/17 KAL RE DW ADDRESS VADEQ COMMENTS	DATE: DWN.: CHKD.: APPD.: DATE: DESCRIPTION:	REVISIONS:	
7 0	9	5 0	4	3	2	NO.:		
Mollan Vallav		EROSION AND SEDIMENT CONTROL PLANS		MUUNIAIN VALLET FIFELINE FRUJEUT - NOUU LINE			555 SOUTHPOINTE BOULEVARD, SUITE 200	CANONSBURG, PA 15317
c		661 F	AN OST	a   c DER ER	SEN PLA	I DF ZA	7	5™
	F	פדדוי	SBUF		, P/	A 15	5220	
					GENERAL DE LAILS			
				EAL	еееса ТН (			
		Transformation COLUMN	Lic.	D J. No. 0	40205 2005	57593	NIA 47 Mar	

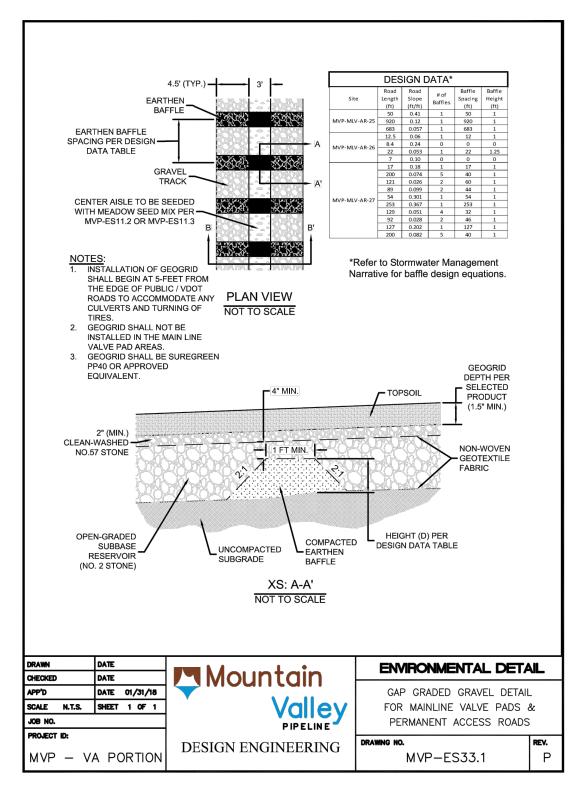


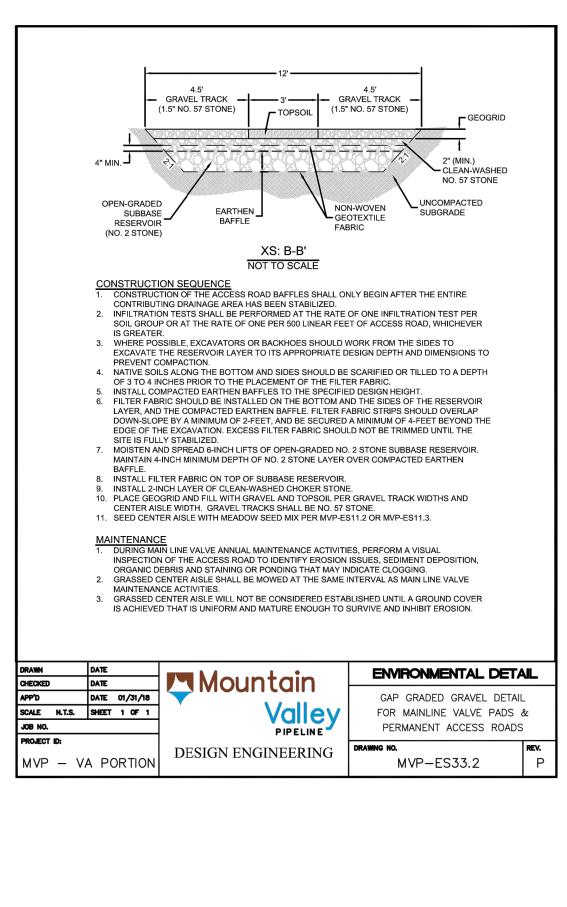




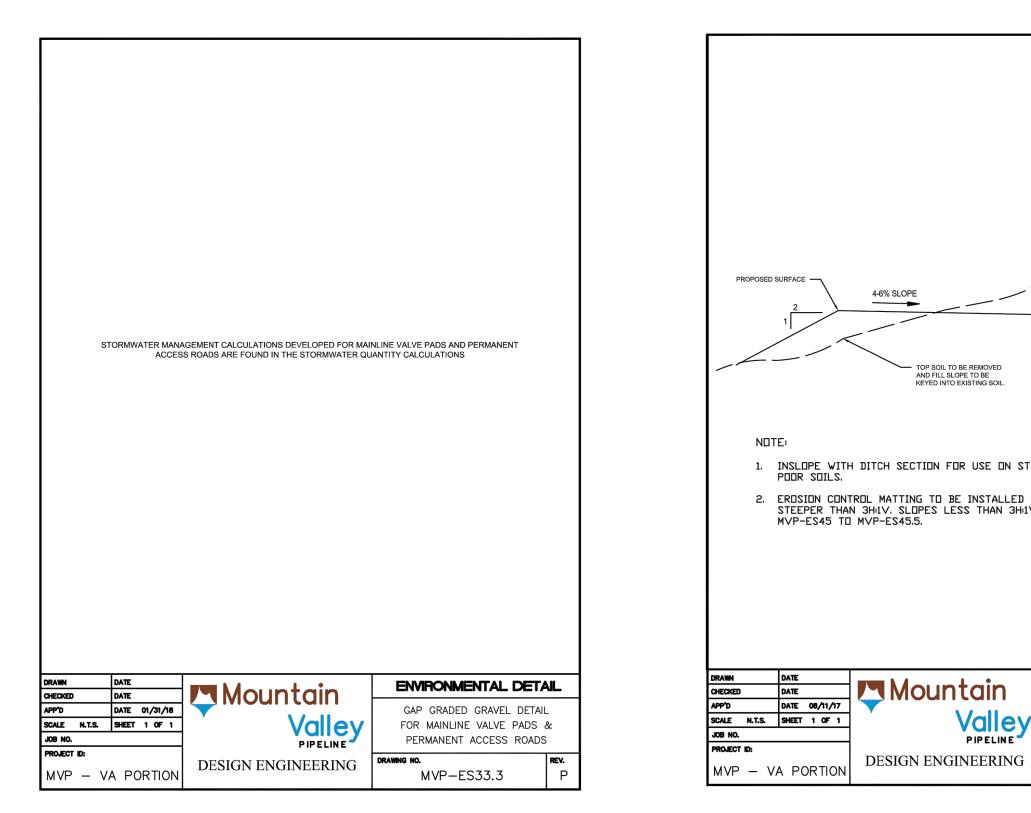


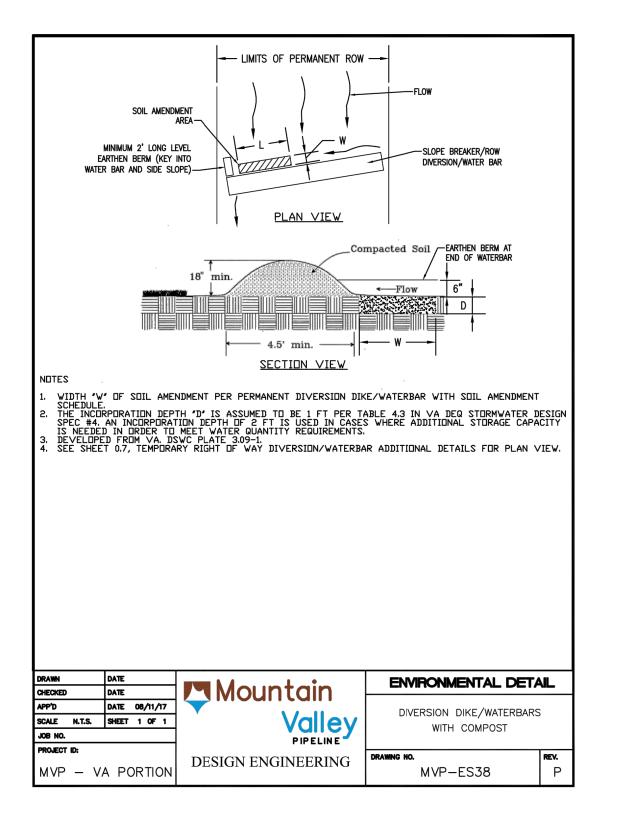


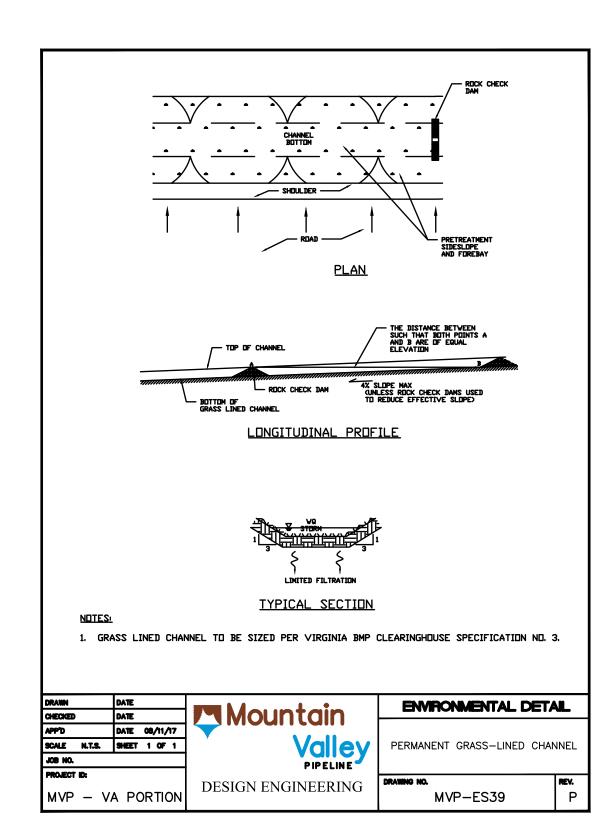


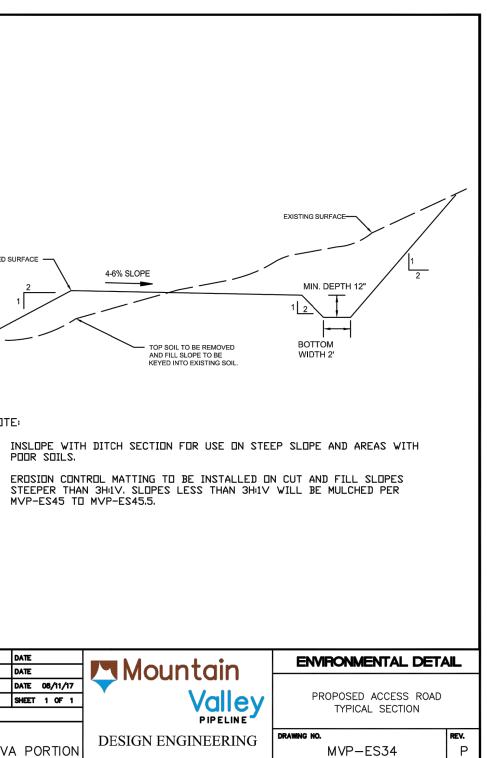


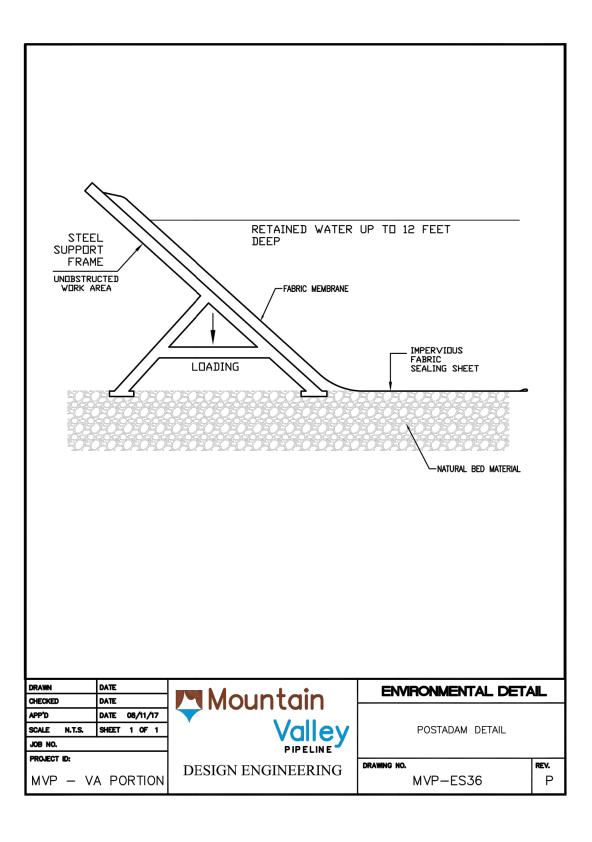
Andrew Mountain	ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:		REVISIONS:	
Image: Section Secting Section Section Sectin Section Section Section Section Section S	DW	DW	DW	DW	DW	DW	APPD.:		Ш	
CANONSBURG, PA 15317 CANONSBURG, PA 15317 CANONSBUR	RE	RE	RE	RE	RE	RE	CHKD.:			
CANONSBURG, PA 15317 CANONSBURG, PA 15317 CANONSBUR				KAL			DWN.:			
CANONSBURG, PA 15317 CANONSBURG, PA 15317 CANONSBUR	/31/18	/26/18	/08/18	/28/17	/01/17	8/18/17	DATE:			
Complex world CLEAR SOLUTIONS* 661 ANDERSEN DRIVE FOSTER PLAZA 7	7 01	6 01	5 01	4 11	3 11	2 08	NO.:			
,			SEDIME		רורברווא			ALLE	POINTE B	NONSBURG,
	(	Gomp	661 F	TE worl AN OST	TR d   c DER ER RGH	LEAF SEN PLA	EC so I DF ZA		rion E	
DAVID J. WALLNER Lic. No. 0402057593 DAVID J. WALLNER Lic. No. 0402057593 DRAWN BY: KAL CHECKED BY: HT	C	F	661 FOITTS	TE AN OST BUI			EC S SO J DF ZA 15 LNER		rion E	(S <sup>™</sup>
DRAWN BY: KAL	DR CH AP			TE AN OST BUF Lic. BY: BY:		WALLEAF	LINER TSP3		rion E	IS <sup>™</sup>





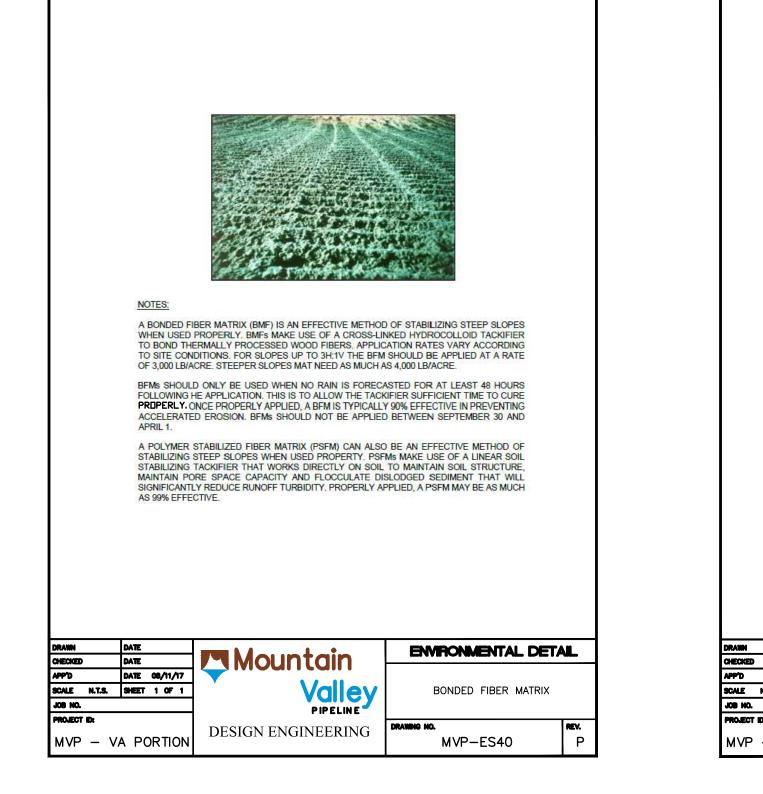


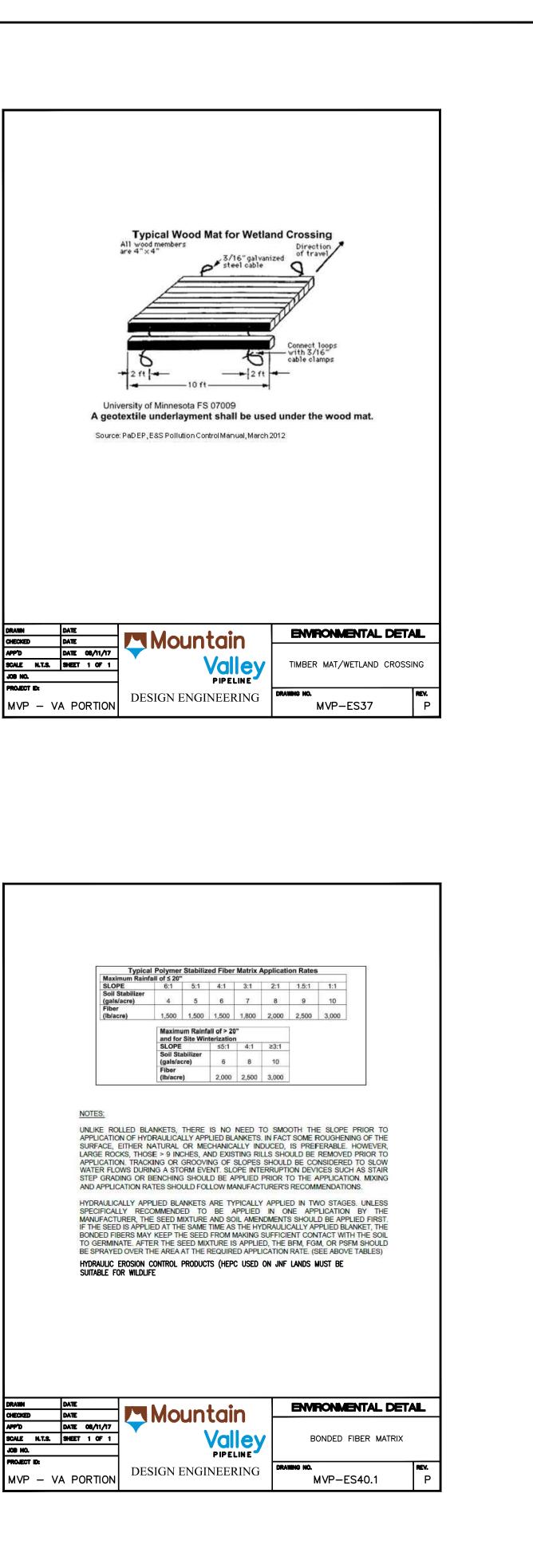


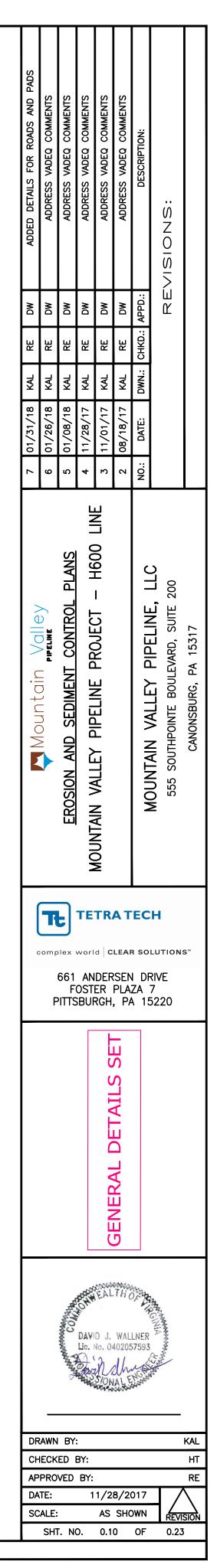


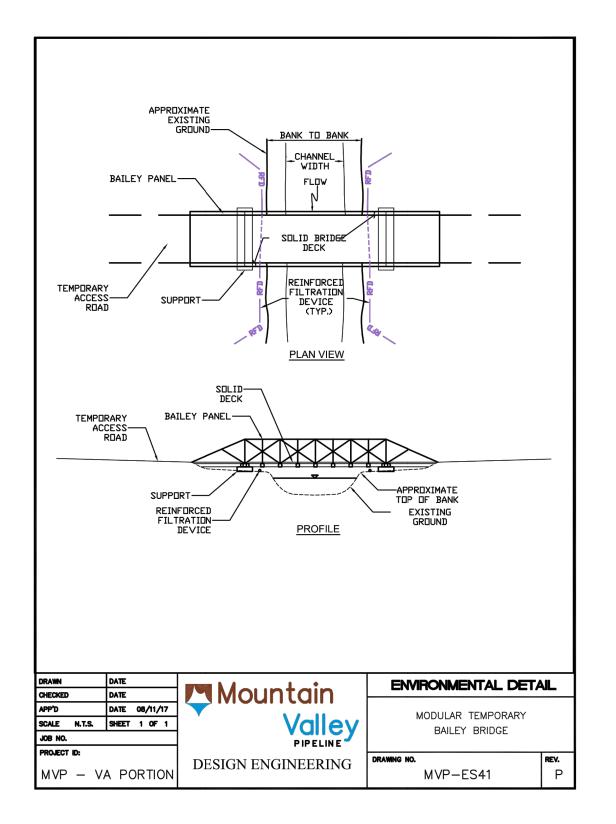
DRAWN DATE CHECKED DATE APP'D DATE SCALE N.T.S. SHEET JOB NO.	CHECKED DATE APP'D DATE SCALE N.T.S. SHEET	CHECKED APP'D SCALE	N.T.S	0	ATE				
CHECKED DATE	CHECKED DATE	CHECKED DATE	CHECKED DATE	CHECKED DATE	CHECKED DATE	CHECKED			
								- 1	
						DRAWN			

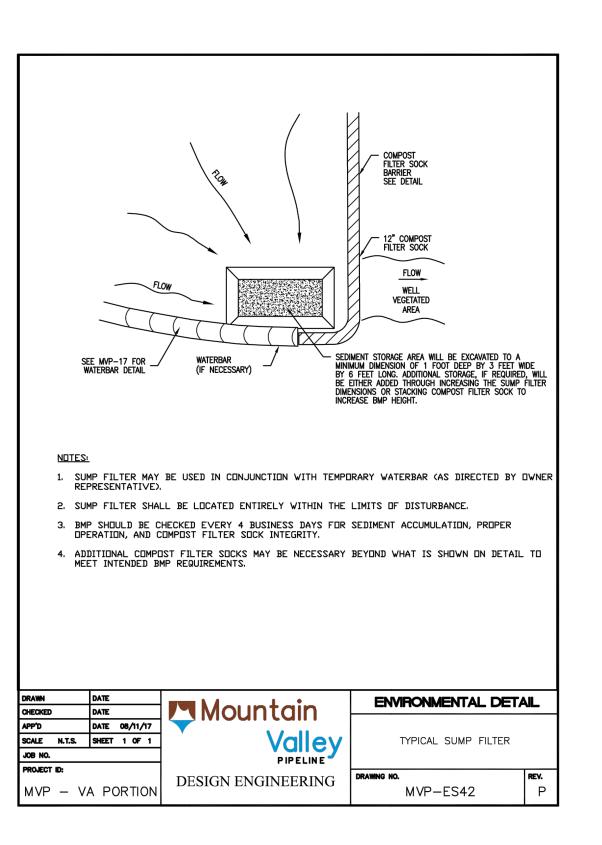
PROJECT ID:

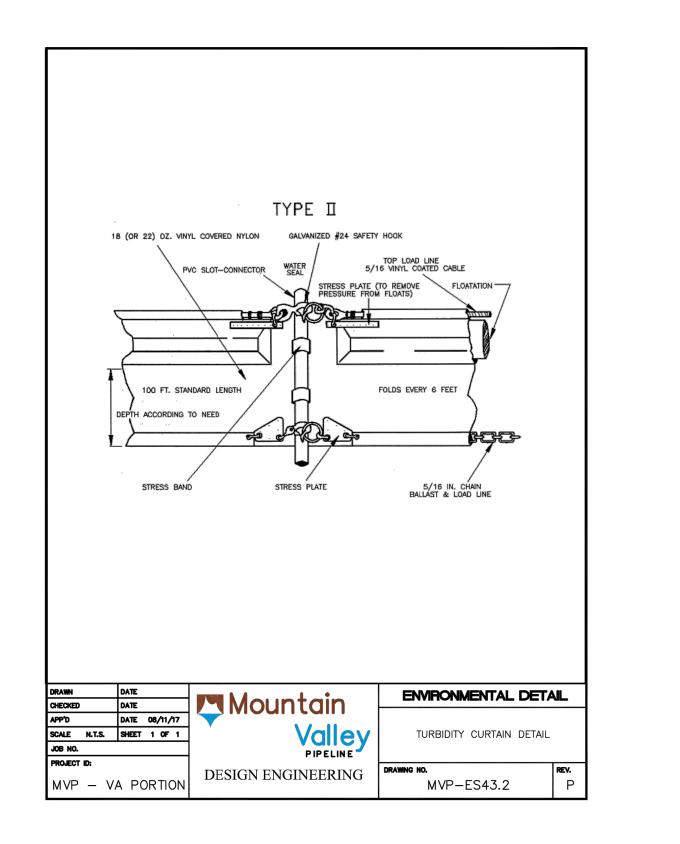


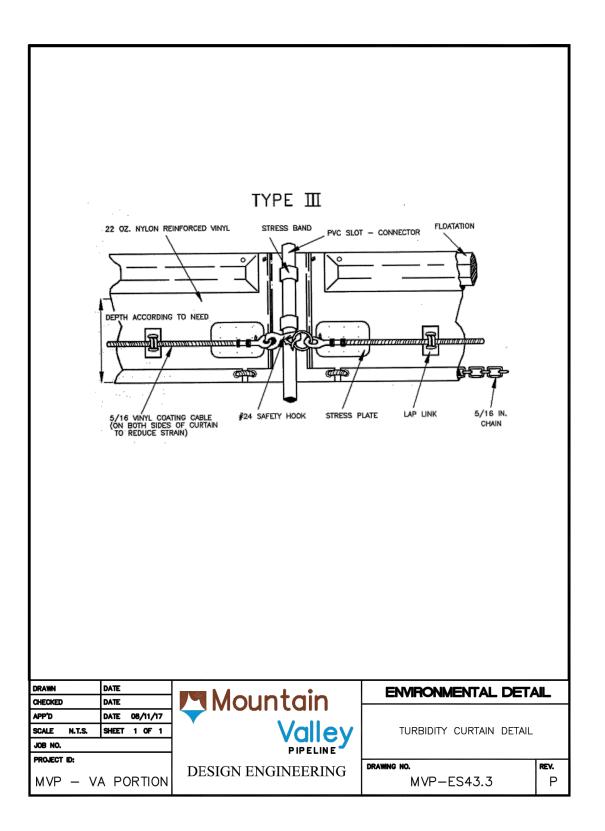


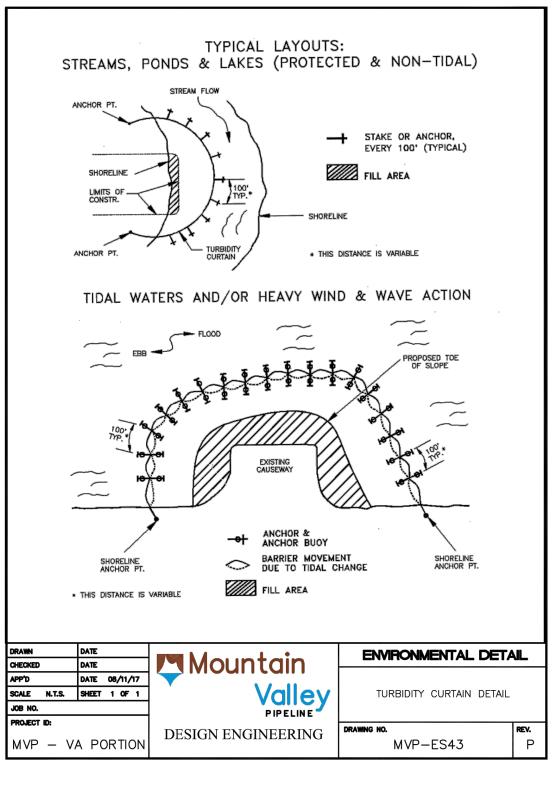


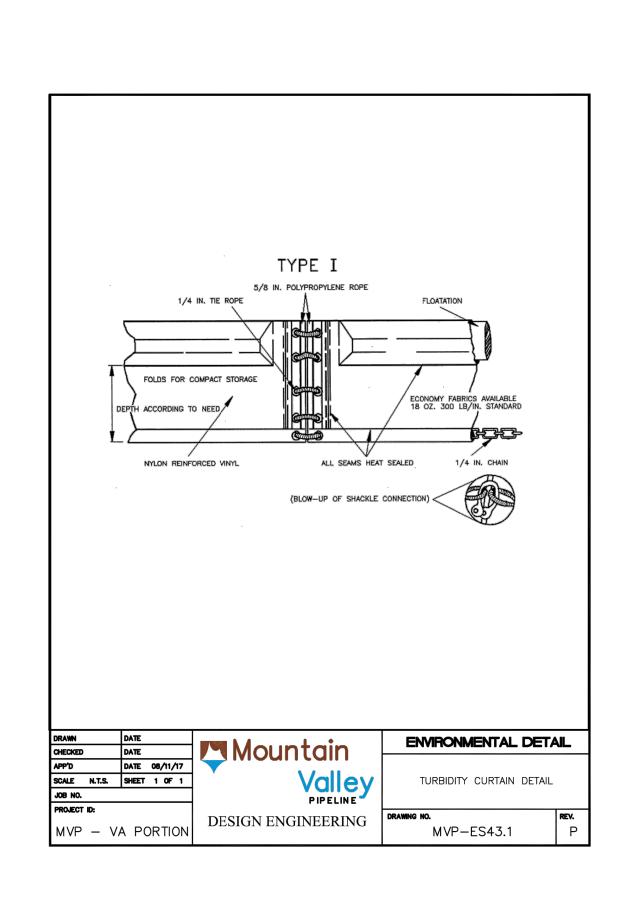




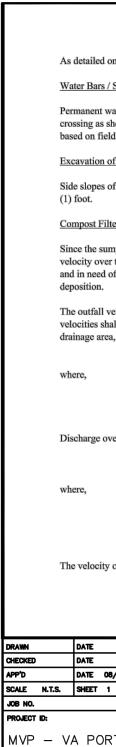








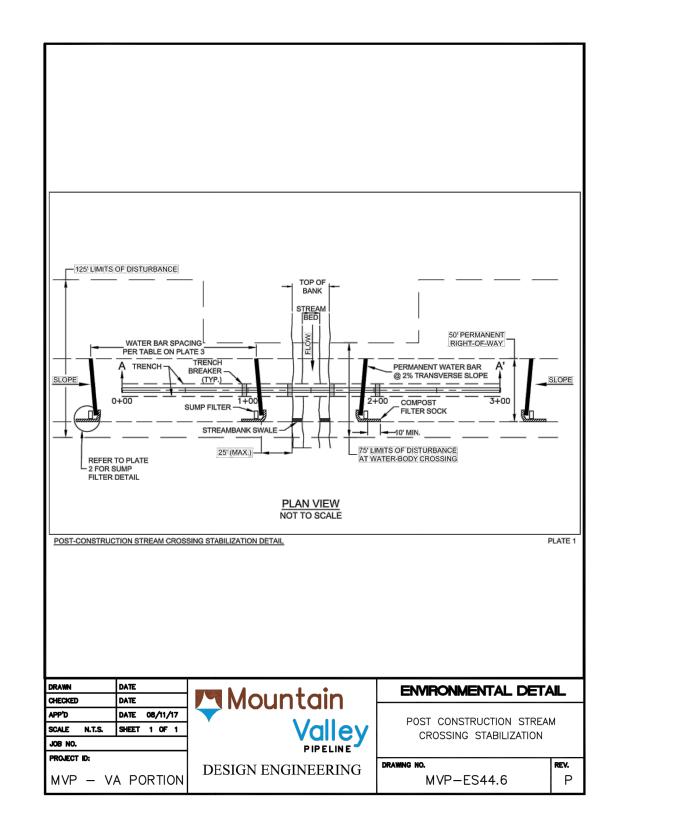
	1051-0015	FRUCTION STREAM CROSSING M.V.P.	3 STABILIZATION FOR	
		Definition		
		d sediment control measures to limit the forma g the edge of a stream, river and other waterbo		
		Purpose		
		potential along the edge of stream, river or othe nanent right-of-way of a pipeline.	er water body as a result of the change	
		Conditions Where Practice App	lies	
	Applicable to stream,	river or other water body crossings within the	natural gas pipeline right-of-way.	
		Planning Considerations		
		with compost filter socks and sump filters wit river and other waterbody crossings in accord n Plates 1-4	-	
	the MVP Environmer determined. Consider existing (or formation	vation of the post-construction field conditions tal Inspector, the necessity for and location of ations will include but are not limited to location of) rills and/or gullies along the streambank a cipated potential for erosion.	streambank swales will be ons where there is visual evidence of	
	required depth. Plans	iodically removed from the sump filter and con shall detail how excavated sediment is to be d an approved off-site location.		
RAWN	DATE			ETA"
CHECKED	DATE DATE 08/11/17	Mountain 🔼		
ICALE N.1 IOB NO.			POST CONSTRUCTION S CROSSING STABILIZAT	
		PIPELINE		
ROJECT ID:		DESIGN ENGINEERING	DRAWING NO.	REV.

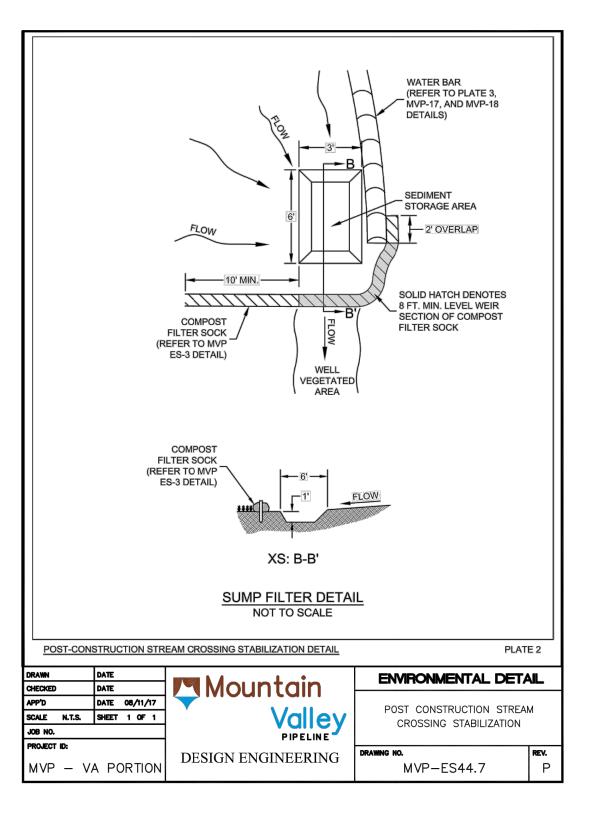


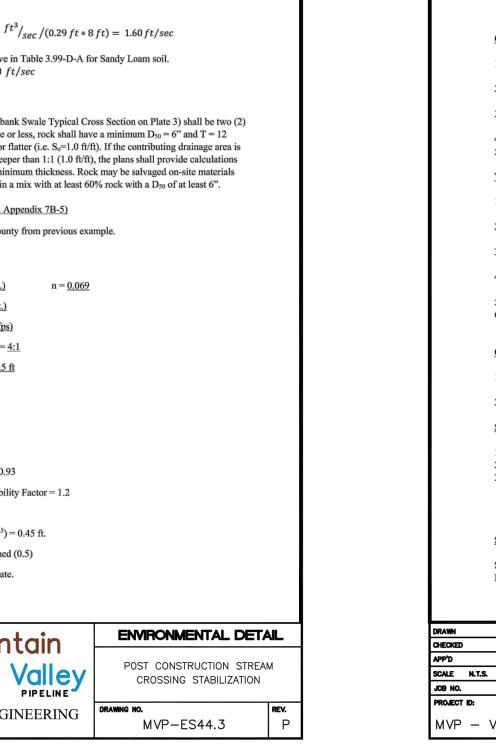
Design Criteria	
on Plates 1-3, design criteria per specific erosion and sediment contra	ol measures include:
/ Slope Breakers	
water bars will be installed twenty-five (25) feet from edge of stream shown on Plate 2. Slopes greater than 65% may require site specific a eld conditions as approved by MVP Design Engineering and MVP Er	stabilization measures
of Sump Filter	
of sump filter should be no steeper than 1:1. The minimum depth of	excavation should be one
lter Sock	
Imp filter will function as a pre-treatment for sediment removal, calculated of the compost filter sock size conservatively assumes that the sumple of maintenance and that no flow is occurring through the sock due to	ilter is full of sediment
velocity from this BMP should be non-erosive for the 2-year design s nall meet the criteria in Table 3.99-D-A. Due to the anticipated small ea, the Rational Method shall be used to calculate discharge:	-
Q = CiA	
Q = discharge (ft <sup>3</sup> /sec) i = Rainfall intensity (inches/hour) A = Contributing drainage area (acres)	
ver the compost filter sock is calculated using the broad-crested wei	equation:
$Q = C_d L H^{3/2}$	
$Q = Discharge \text{ over weir } (ft^3/sec)$ $C_d = Weir Coefficient$ L = Length of weir crest (ft) H = Overtopping depth (ft)	
y over the weir is calculated using the following equation:	
v = Q/A	
🔤 🖪 Mountain 🛛 🖻	VIRONMENTAL DETAIL
	ST CONSTRUCTION STREAM CROSSING STABILIZATION
RTION DESIGN ENGINEERING DRAWING IN	<b>n. rev.</b> MVP-ES44.1 P

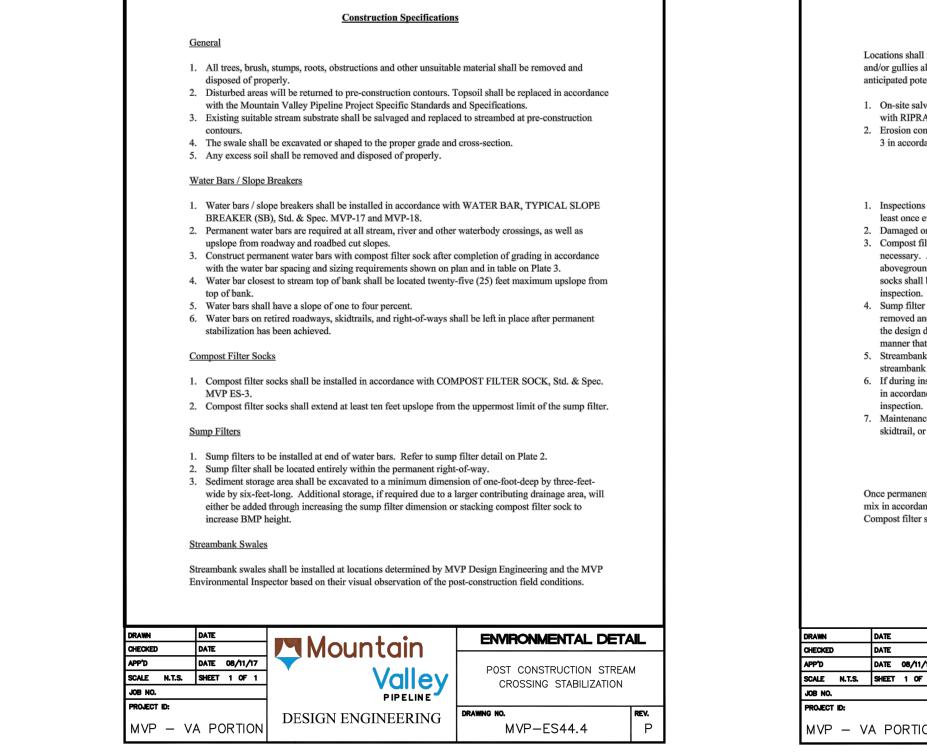
ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:	
DW	DW	DW	DW	DW	DW	PD.:	て て し て	
RE	RE	RE	RE	RE	RE	HKD.: AF		
KAL	KAL	KAL	KAL	KAL	KAL	DWN.: CHKD.: APPD.:		
	01/26/18	1/08/18	1/28/17	11/01/17	08/18/17			
01/31/18	01/26	01/08	11/28	11/01	08/15	: DATE:		
7	9	5	4	3	2	NO.:		
		EROSION AND SEDIMENT CONTROL PLANS		MOUNIAIN VALLET FIFELINE FROJECT - NOUO LINE			555 SOUTHPOINTE BOULEVARD, SUITE 200	CANONSBURG, PA 15317
, C		661 F	worl AN OST	⊣∣c DER ER	LEAF SEN PLA	I DF ZA	lution	S≥
					GENERAL DE LAILS SE I			
	_	COACTER COACTER	Lic.		WAL 40205		ALL AND	
		BY: ED						KAL HT
	PRO TE:	VED		1/2	8/2	017		RE
_		_	_				-1 /	
SC	ALE: SH1		Э.	AS 0.1		OWN	REVI 0.23	

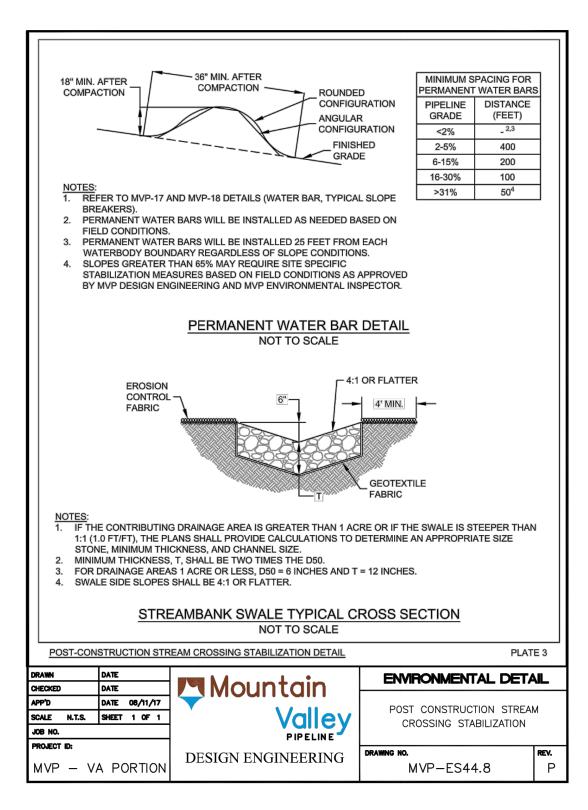
project id: MVP — V	A PORTION	DESIGN ENGINEERING	drawing no. MVP-ES44.2	2	<b>rev.</b> P	project id: MVP —	VA PORTION	DESIGN EN
JOB NO.		PIPELINE	CROSSING STADI			JOB NO.		4
SCALE N.T.S.	SHEET 1 OF 1		POST CONSTRUCTIO CROSSING STABIL		VI	SCALE N.T.S.	. SHEET 1 OF 1	ľ
APP'D	DATE 08/11/17					APP'D	DATE 08/11/17	
CHECKED	DATE	Mountain				CHECKED	DATE	Mou
DRAWN	DATE		ENVIRONMENTA		\ <b>I</b>	DRAWN	DATE	
	3. Calculat	e the velocity over the compost filter sock:					Therefore, a	assumed D50 is appropri
		$H = (Q/(C_D * L))^{\frac{2}{3}} = (3.66 \ ft^3/sec/(2$	$(2.99 * 8 ft))^{2/3} = 0.29 ft$					uted (0.45) < D50 Assur
1	2. Rearrang	ging the weir equation to solve for overtopping d	lepth:					-
1		Q = CiA = 0.9 * 4.07 inches/hour *	$1 acre = 3.66 ft^3/sec$					$1 * 6.81^3 / (0.5^{0.5} * 0.93)$
1	1. Calculat	e the discharge:						$1 * V_a^3 / (d_{avg}^{0.5} * K_1^{1.5})$
	Solution:						For Specific	c Gravity = 2.65 and St
		eir length of 8 feet, in a Sandy Loam soil installe						$in^2 14^\circ / sin^2 41.5^\circ)]^{0.5} =$
	Given: A one-ac	re drainage area in Giles County, an 18-inch diar	meter compost filter sock with a	an			K <sub>1</sub> = [1 - (si	$\ln^2 \Theta / \sin^2 \Phi$ ] <sup>0.5</sup>
	Example						Side Slope =	$= \underline{4}: 1 \qquad \mathbf{e} = \underline{14^*}$
1							$\Phi = \underline{41.2^{\circ}}  (\mathbb{A}$	Appendix 7E-1)
		Plate 5-39, Virginia Erosion and Sediment C 3rd Ed., 1992.	Control Handbook,				VERIFY A	SSUMED ROCK SIZE
		Source: Chapter 5, Engineering Calculations					ASSUMED	<b>PROCK SIZE - D50 =</b>
1		<u>NOTE</u> : Correction factor value = 0.8 for flor one foot has been applied to original table.	w depths less than				A = 0.54 (ff	<u>2)</u> Side Slope
		Shales and Hard Pans	4.8				$d_n = 0.37$ (ff	
		Cobbles and Shingles	4.4					
		Alluvial Silts (colloidal) Coarse Gravel (noncolloidal)	4.0 4.8				$S_0 = 1.00$ (ff	
		Alluvial Silts (noncolloidal)	4.4				Q = 3.66 (cf	$f_{s}$ P = 3.02 (
		Graded, Silt to Cobbles (colloidal)	4.4				Solution: CHANNEL DATA	
1		Stiff Clay (very colloidal) Graded, Loam to Cobbles (noncolloidal)	4.0 4.0				Solution:	-
		Fine Gravel Stiff Clay (very colloidal)	4.0				Given: A one-acre d	drainage area in Giles C
		Ordinary Firm Loam	2.8				Calculations (from	VDOT Drainage Manua
		Silt Loam (noncolloidal)	2.0				and may contain top	osoil, fines, sand, grave
		Fine Sand (noncolloidal) Sandy Loam (noncolloidal)	2.0 2.0				(A) (A)	ropriate size stone and i
		Soil Types	(ft./sec.)				greater than one (1)	acre or if the swale is s
			Permissible Velocities				times the D50. For di	s (T, as shown on Strear rainage areas one (1) ac anks with a slope of 1:1
		PERMISSIBLE VELOCITES FOR EA	Corrected					
		TABLE 3.99-D-A					Streambank Swale	
		A = Flow area over weir (ft2)					4. Verify that	the velocity is non-eros 1.60 ft/sec < 2
		v = Velocity (ft/sec) $Q = Discharge over weir (ft^3/sec)$						v = Q/A = 3.6

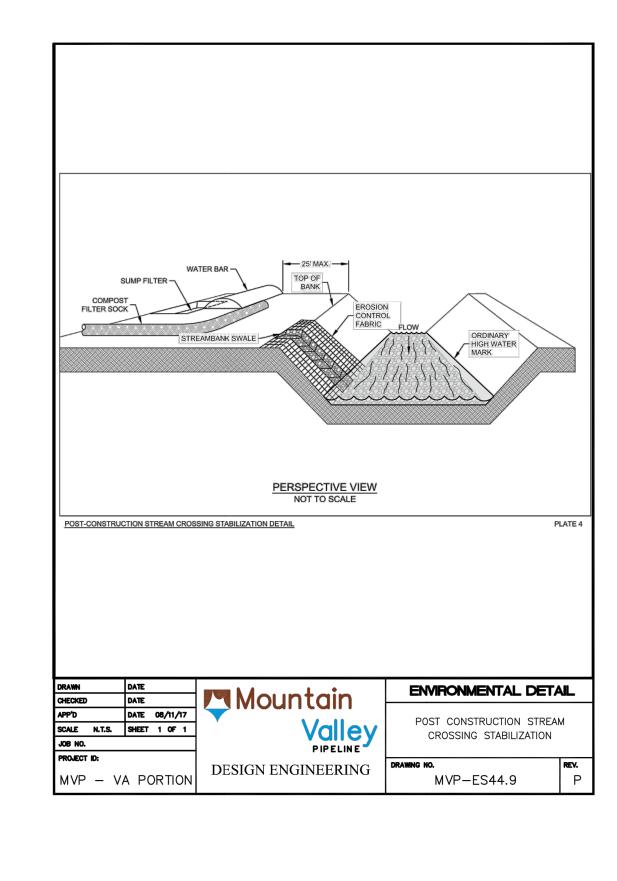












Locations shall include but are not limited to locations where there is visual evidence of formation of rills and/or gullies along the streambank and/or evidence of concentrated flow along the streambank with anticipated potential for erosion.

 On-site salvaged rock and/or riprap, if on-site rock is not salvageable, shall be installed in accordance with RIPRAP, Std. & Spec. 3.19.
 Erosion control fabric shall be installed along the edges of the riprap-lined channel as shown on Plate 3 in accordance with SOIL STABILIZATION BLANKETS AND MATTING, Std. & Spec. 3.36.

## Inspections and Maintenance

Inspections shall be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48-hours following a measurable storm event.
 Damaged or eroded water bars shall be restored to original dimensions within 24-hours of inspection.
 Compost filter sock shall be inspected for sediment accumulation, integrity, and maintained as necessary. Accumulated sediment shall be removed when it reaches no more than half the aboveground height of the sock and disposed in the manner described elsewhere in the plan. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

Sump filter shall be inspected for sediment accumulation and proper operation. Sediment shall be removed and the sump filter restored to original dimensions when sediment has accumulated to half the design depth. Sediment removal from the sump shall be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.
 Streambank swales shall be inspected for integrity and proper operation. Damaged or eroded streambank swales shall be restored to original dimension within 24-hours of inspection.

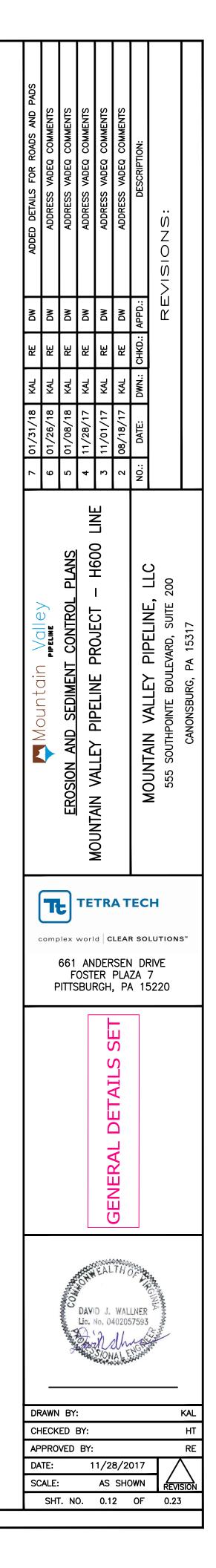
6. If during inspection, additional rills and/or gullies are observed, streambank swales shall be installed in accordance with the construction specifications herein at these locations within 24-hours of

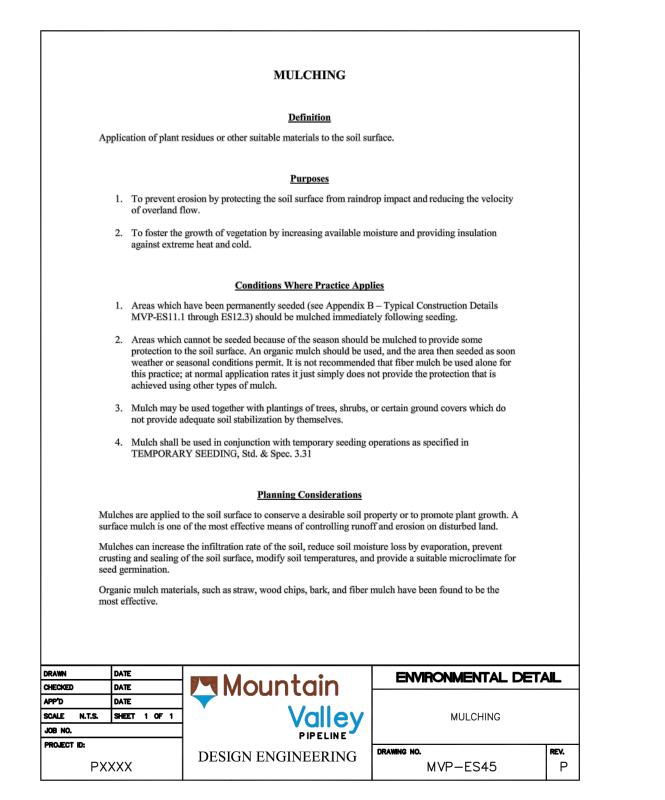
 Maintenance of water bars, compost filter socks and sump filters shall be provided until roadway, skidtrail, or right-of-way has achieved permanent stabilization.

#### Post Stabilization

Once permanent stabilization has been achieved, sediment storage should be seeded with permanent seed mix in accordance with the Mountain Valley Pipeline Project Specific Standards and Specifications. Compost filter socks shall remain to decompose in place and streambank swales shall remain in place.

	Mountain	ENVIRONMENTAL DETAIL		
08/11/17 1 OF 1		POST CONSTRUCTION STREAM CROSSING STABILIZATION		
RTION	DESIGN ENGINEERING	drawing no. MVP-ES44.5	<b>rev.</b> P	





mulches, particularly in critical areas such as water the soil surface.
The choice of materials for mulching will be based season and economics. It is especially important to and on cut slopes and southern slope exposures.
Organic Mulches
<u>Straw</u> - The mulch most commonly used in conjunt or oats (free of troublesome weed seeds) and may b and must be anchored down by an acceptable metho
$\underline{\text{Hay}}$ – Hay shall not be used as mulch for Project as
Com Stalks - These should be shredded into 4- to 6 resistant to displacement.
<u>Wood Chips</u> - Suitable for areas that will not be clo decompose slowly and do not require tacking. They prevent nutrient deficiency in plants; however, can from trees cleared on the site.
Bark Chips, Shredded Bark - These are by-products plantings. Bark is also a suitable mulch for areas pla applied by hand or mechanically and is not usually fertilizer is not required.

susceptible to displacement.

seasonally. Creative use of these materials can reduce costs. Chemical Mulches and Soil Binders

with fiber mulches or straw.

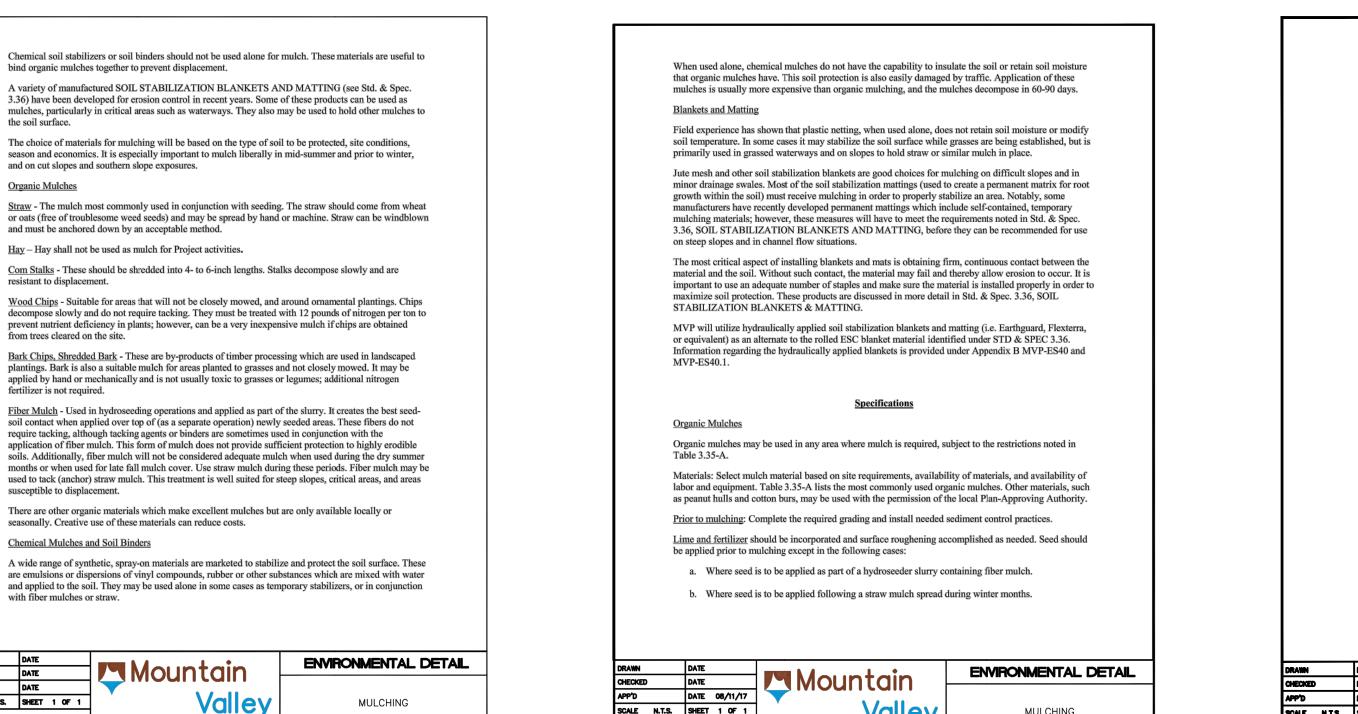
DRAWING NO.

MVP-ES45.1

DRAWN	DATE	
CHECKED	DATE	Mountain
APP'D	DATE	
SCALE N.T.S.	SHEET 1 OF 1	Vallev
JOB NO.		PIPELINE
PROJECT ID:		
PX	XXX	DESIGN ENGINEERING

PROJECT ID:		DESIGN ENGINEERING	DRAWING NO.	REV.	PXXXX	DESIGN
JOB NO.			MOLCHING		JOB NO. PROJECT ID:	-
APP'D Scale N.T.S.	DATE SHEET 1 OF 1		MULCHING		SCALE N.T.S. SHEET 1 OF 1	Mc
CHECKED	DATE	Mountain			APP'D DATE	
DRAWN	DATE	Mountain	ENVIRONMENTAL DE	TAIL	CHECKED DATE	
					DRAWN DATE	
1	more times a	around each peg.				
l	mulch by str	retching twine between pegs in a criss-cross-within around each peg.				
		ds cannot be used. Drive 8- to 10-inch wooden pea ry 4 feet in all directions. Stakes may be driven be				
		ne: Because it is labor-intensive, this method is fea				
1		manufacturer's recommendations.	-			
		ngs: Lightweight plastic, cotton, or paper nets may	be stapled over the mulch			
		enter valuable water supplies. Avoid applications				
	synt	hetic or organically based binders and tackifiers. V ironmental concerns should be addressed to ensure	When this method is used, that petroleum-based products do			
	The	development of hydraulic seeding equipment pro-	moted the industry to turn to			
	*No	te: This particular method is not used as commonl	v today as it once was in the past			
		heavier applications as it may cause the straw to " gnations are from the Asphalt Institute Specificati				
		ly asphalt at 0.10 gallon per square yard (10 gal./1				
	RS-	2, CRS-1, and CRS-2).				
	curi	sfactory. Recommended for use are rapid curing (F ng (MC-250, MC-800) and emulsified asphalt (SS				
		phalt - Any type of asphalt thin enough to be blow			soil surface; repair	as needed.
		ecommended by the manufacturer to anchor mulch			place up until grass plantings, inspect p	eriodically througho
	a. Svn	thetic binders - Formulated binders or organically	formulated products may be used		install netting or ma	atting as necessary a
	The following	ng types of binders may be used:			for erosion. Where mats should be insp	erosion is observed
		nto the mulch as it is being blown onto the soil.	L ally and a week		All mulches and so	
		as and at crests of ridges and banks, to prevent dis have binder applied uniformly. Binders may be ap				
		h binders: Application of liquid mulch binders and				eeded slurry at any ti s shall be followed.
		ditional mulch to the newly seeded area.	maren a nuo un undeu cenent of			Chemical mulches r
		: A very common practice with widespread use to eder at a rate of 500-750 lbs/acre over top of straw				e applied immediate
	safely. Macl	ninery shall be operated on the contour.			areas w SURFA	vith slopes no steeper ACE ROUGHENING
	control with	straw. It is limited to use on slopes no steeper that	1 0			farch 15 to May 1 a
		oring tool (often referred to as a Krimper or Krimp lesigned to punch mulch into the soil surface. This			practic	
a	nchoring straw may	7 be used:			b. In coni	unction with tempor
		traw mulch must be anchored immediately after sp es listed in Table 3.35-A do not require anchoring			a. Where	no other mulching n
		0-90 lbs. (n to 2 bales) of straw in each section to b			Chemical mulches*	may be used alone
		w mulch by hand, divide the area to be mulched in			Chemical Mulches	
v						

TETRA TECH CAD FILE PATH: X:\CADD\\_Pittsburgh\EQT\7157 - MVP\00 - General\E&S\Spread 9\7157ES013.dwg PLOTTED ON: 3/12/2018 11:12 AM PLOTTED BY: Rickabough. Greg PLOT FILE: ENVIRONMENTAL\_COLOR.ctb



SCALE N.T.S. SHEET 1 OF 1

MVP - VA PORTION

JOB NO.

PROJECT ID:

Vallev

PIPELINE

DESIGN ENGINEERING

MULCHING

MVP-ES45.2

PIPELINE ESIGN ENGINEERING	DRAWING NO. REV. MVP-ES45.5 P	JOB NO. PROJECT ID:	xxx	PIPELINE	drawing no. MVP-ES46	<b>REV.</b>
Valley	MULCHING	SCALE N.T.S.	DATE SHEET 1 OF 1	Valley	TOPSOILING & SOIL HANDL	LING
Mountain		CHECKED	DATE	Mountain 🚽		
ountain	ENVIRONMENTAL DETAIL	DRAWN	DATE	Mountain	ENVIRONMENTAL DE	TAIL
		to t avai Alth stoc dela wee Adw capa In s The whe	he presence of orga ilable to plants, and hough topsoil prov- ckpiling, and reapp by seeding or soddi ed seeds, and weed vantages of topsoil acity, and nutrient ite planning, the op c clay content of su en properly limed a	ption of topsoiling should be compared with that bsoils does provide high moisture availability and and fertilized, subsoils may provide a good growt	ent, carrying much of the nutrients ints. Ivantages to its use. Stripping, ys be cost-effective. Topsoiling can enuded areas. Most topsoil contains le consistence, water-holding of preparing a seedbed in subsoil. d deter leaching of nutrients and, h medium which is generally free	TAL
should be inspected periodically (par oserved in mulched areas, additional ainstorms for dislocation or failure. 1	mulch should be applied. Nets and f washouts or breakage occur, re- slope or ditch. Inspections should take conjunction with ornamental		<ol> <li>Providing a su</li> <li>Where the sub</li> <li>a. The terresson</li> <li>b. The serve</li> <li>moister</li> <li>c. The serve</li> <li>3. Only on slope</li> </ol>	servation or importation of topsoil is determined iitable growth medium. psoil or existing soil presents the following proble exture, pH, or nutrient balance of the available so nable means to provide an adequate growth medin oil material is too shallow to provide an adequate ure and nutrients for plant growth. oil contains substances potentially toxic to plant g s that are 2:1 or flatter unless other measures are	ems: il cannot be modified by um. e root zone and to supply necessary growth.	
	endations for application of chemical			Conditions Where Practice Applie	<u>s</u>	
fay 1 and August 15 to September 3 steeper than 4:1, which have been 1 ENING, Std. & Spec. 3.29. If rill en rediately.	oughened in accordance with rosion occurs, another mulch material		provide a suitable provide a suitable prestation.	<u>Purposes</u> growth medium for final site stabilization with ve	getation and promote successful	
temporary seeding during the times	when mulch is not required for that			g and using the surface layer of undisturbed soil, or desirable planting and growth medium.	often enriched in organic matter, in	
ching material is available.				Definition		
d alone only in the following situation	ns:		TO	OPSOILING & SOIL HANDLING I	FOR M.V.P.	

RAWN	C	ATE	:
	Soil : pipel will l	ine	stati
			Solu
			test i bein
			Orga pH r
	the N	4V.	
	In ar Envi		
	Field justif loam being grow	ý s ), I g al	tripp t sha
	<u>Mate</u>		
	5	5.	If toj it wi good
	4	ŀ.	Care Clay the j subs
			Allo plan
			Loca on th
	1	•	Whe dept
	If top	oso	iling
	of we lowe main shall	r m ten	ainte ance

PXXXX

DRAWN			DATE	
CHECKED			DATE	
APP'D			DATE	80
SCALE	N.T.S	r.	SHEET	1
JOB NO.				
PROJECT	ID:			
MVP	_	V	A P	DR

OR	GANIC MULCH	TABLE 3.35-A MATERIALS AND	APPLICATION RATES
	RA	TES:	NOTEO
MULCHES:	Per Acre	Per 1000 sq. ft.	NOTES:
Straw	1 ½ - 2 tons (Minimum 2 tons for winter cover)	70 – 90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	35 lbs.	Do not use as mulch for winter cover or during hot, dry periods.* Apply as slurry.
Corn Stalks	4 – 6 tons	185 – 275 lbs.	Cut or shredded in 4-6" lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4 – 6 tons	185 – 275 lbs.	Free of coarse matter. Air- dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark	50 – 70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air- dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

Source: Va. DSWC

Mountain	ENVIRONMENTAL DETAIL		
Valley	MULCHING		
PIPELINE			
DESIGN ENGINEERING	DRAWING NO.	REV.	
DESIGN ENGINEERING	MVP-ES45.3	Р	
	Mountain Valley PIPELINE DESIGN ENGINEERING	MOUNTAIN Valley PIPELINE DESIGN ENGINEERING	

ds. In many cases topsoiling may not be required for the establishment of less demanding, enance plant material. Topsoiling is strongly recommended where ornamental plants or high-
turf will be grown. Topsoiling is a required procedure when establishing vegetation on s, soils containing potentially toxic materials, and soils of critically low pH (high acid) levels.
is to be done, the following items should be considered:

hether an adequate volume of topsoil exists on the site. Topsoil will be spread at a compacted pth of 2 to 4 inches (depths closer to 4 inches are preferred).

cation of the topsoil stockpile so that it meets specifications and does not interfere with work the site.

ow sufficient time in scheduling for topsoil to be spread and bonded prior to seeding or

e must be taken not to apply topsoil to subsoil if the two soils have contrasting textures. ayey topsoil over sandy subsoil is a particularly poor combination, as water may creep along junction between the soil layers, causing the topsoil to slough. Sandy topsoil over a clay bsoil is equally as likely to fail.

psoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and will be difficult to establish vegetation. Topsoiling of steep slopes should be discouraged unless bod bonding of soils can be achieved.

### **Specifications**

ration of the site shall be made to determine if there is sufficient surface soil of good quality to ping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, clay ll be free of debris, trash, stumps, rocks, roots, and noxious weeds, and shall give evidence of o support healthy vegetation. It shall contain no substance that is potentially toxic to plant

here revegetation is of concern based on existing soil conditions and determined by the MVP ental Inspector (EI), topsoil samples shall be taken for analysis. Samples will be collected by EI and sent to a recognized laboratory for analysis of the following criteria: rganic matter content shall be not less than 1.5% by weight.

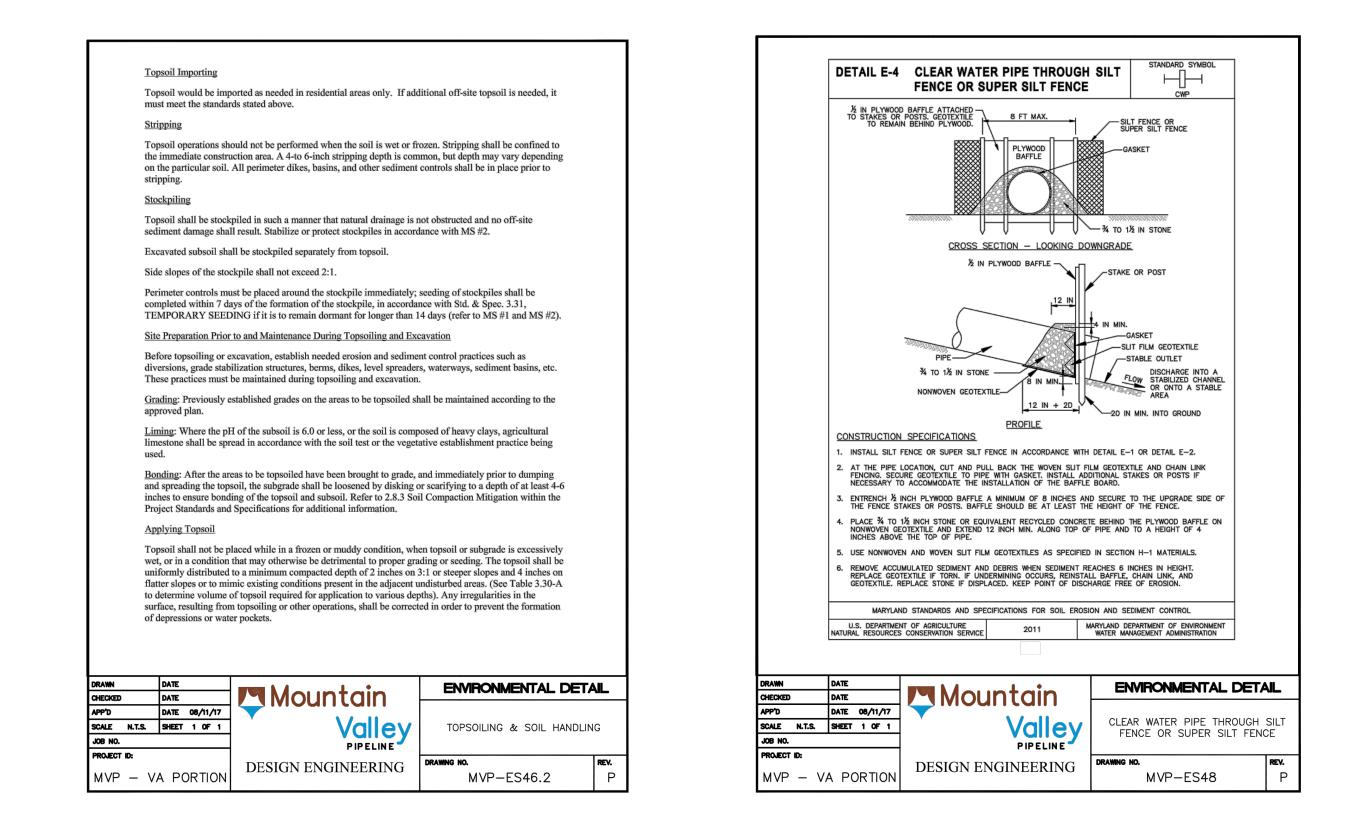
range shall be from 6.0-7.5. If pH is less than 6.0, lime shall be added in accordance with soil t results or in accordance with the recommendations of the vegetative establishment practice ing used.

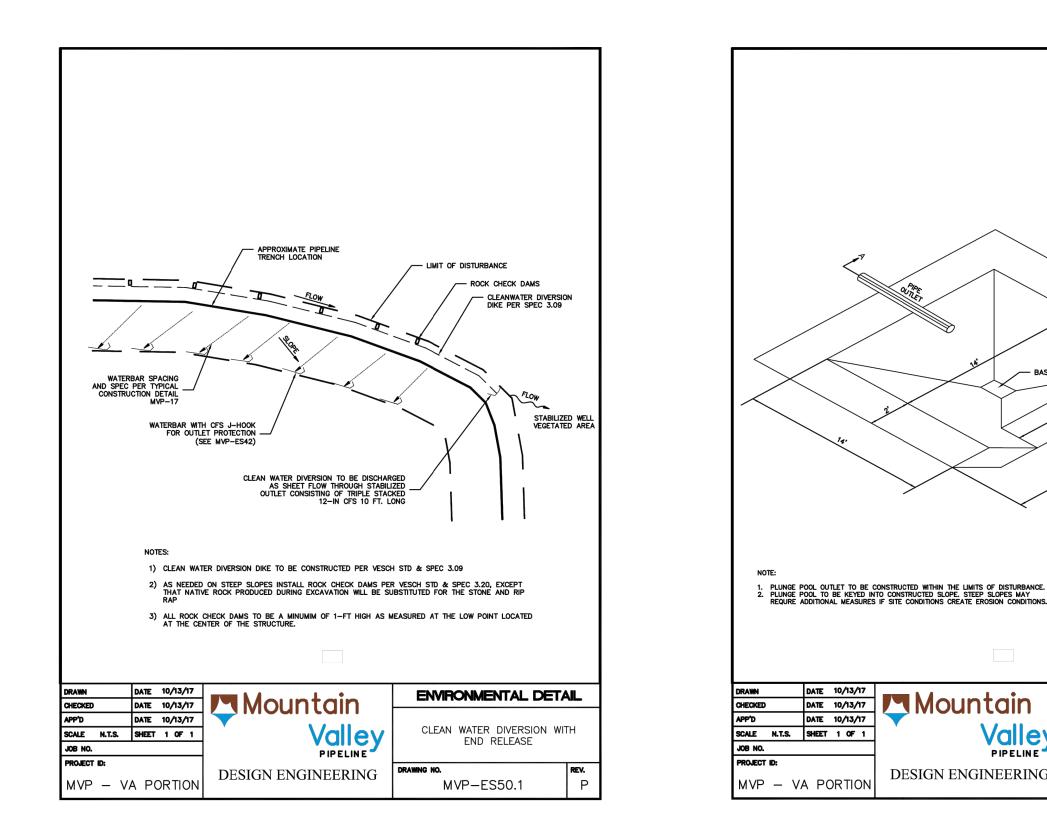
bluble salts shall not exceed 500 ppm.

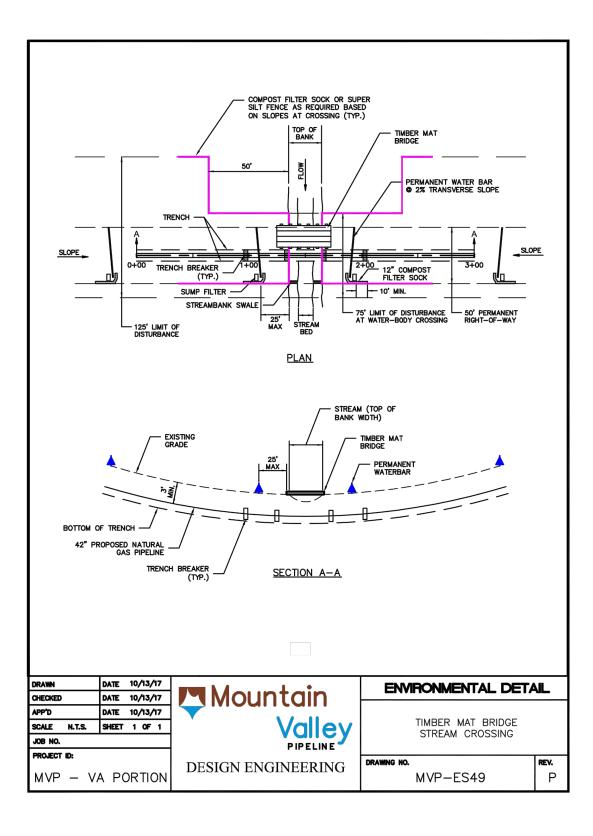
s collected and sent for analysis will be identified by the MVP Constructions Spread # and tion from which the sample was obtained. Areas that fail to revegetate following restoration npled and analyzed based on the above parameters.

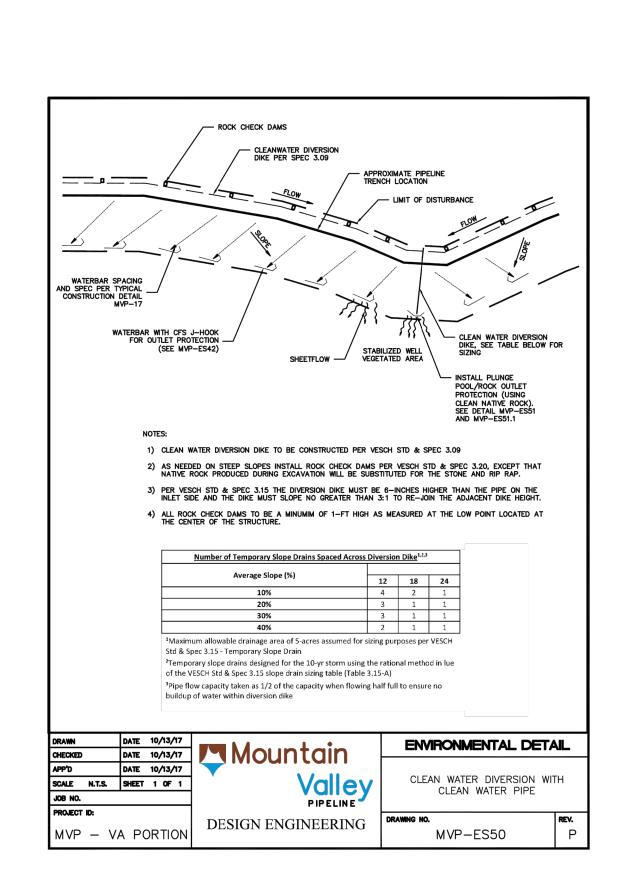
	Mountain	ENVIRONMENTAL DETA	JL
08/11/17 1 OF 1		TOPSOILING & SOIL HANDLIN	G
RTION	DESIGN ENGINEERING	drawing no. MVP-ES46.1	<b>rev.</b> P

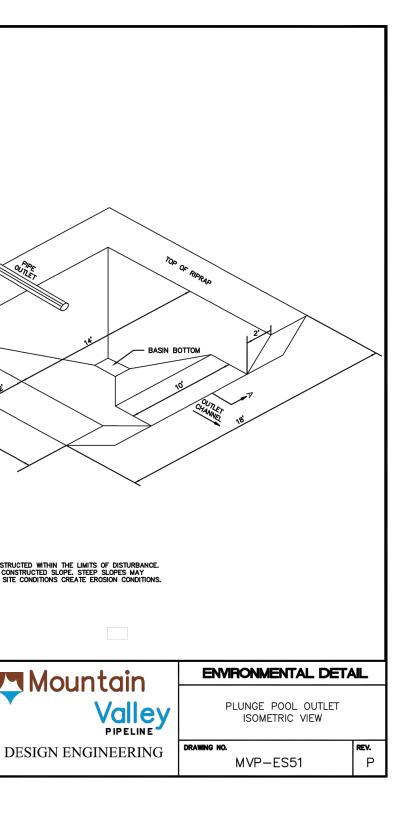
- 1								
				7 0	7 01/31/18	KAL RE	DW	ADDED DETAILS FOR ROADS AND PADS
				6 01,	/26/18	KAL RE	E DW	ADDRESS VADEQ COMMENTS
		661 F	EROSION AND SEDIMENT CONTROL PLANS	5 01,	/08/18	KAL RE	E DW	ADDRESS VADEQ COMMENTS
		worl AN OST		4 11,	/28/17	KAL RE	E DW	ADDRESS VADEQ COMMENTS
		⊣∣c DER ER	MOUNIAIN VALLET FIFELINE FRUJEUT - 1900 LINE	3 1	11/01/17	KAL RE	E DW	ADDRESS VADEQ COMMENTS
	GENERAL DE LAILS SEI	LEAF SEN PLA		2 08,	/18/17	KAL RE	E DW	ADDRESS VADEQ COMMENTS
		IDF ZA T		NO.:	DATE: D	DWN.: CHK	CHKD.: APPD.:	DESCRIPTION:
		LUTION	555 SOUTHPOINTE BOULEVARD, SUITE 200				Ц Ц	REVISIONS:
		6™	CANONSBURG, PA 15317					

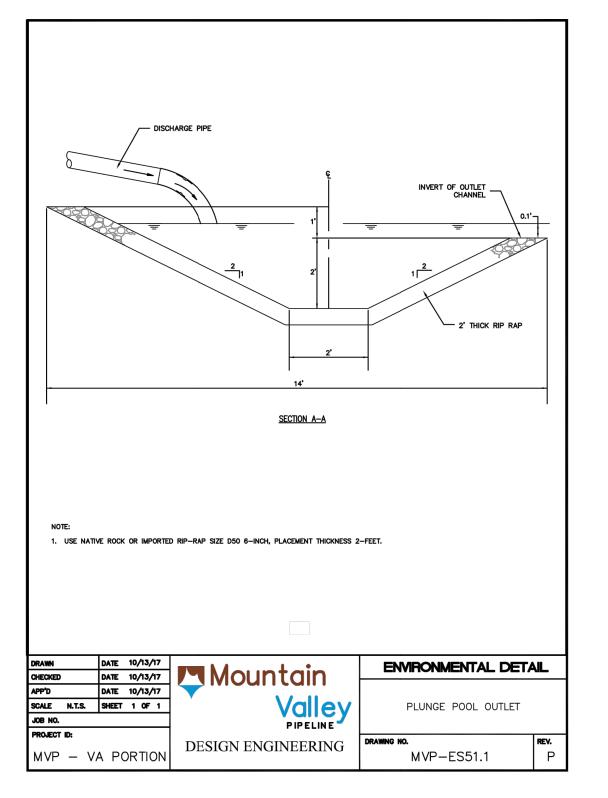


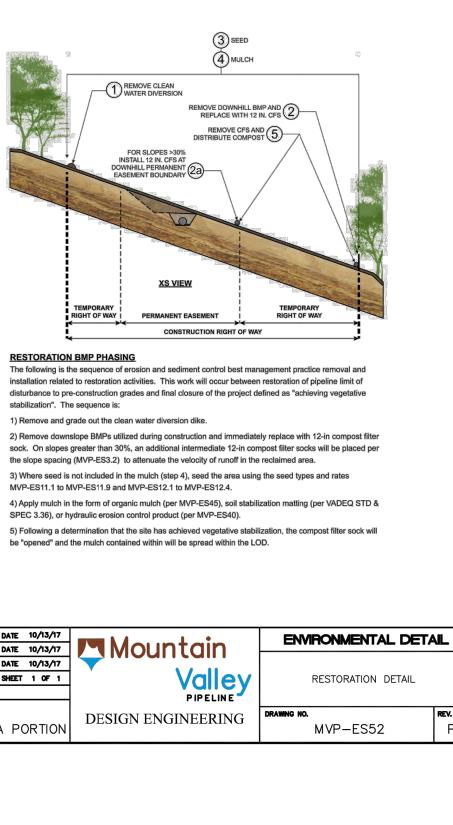




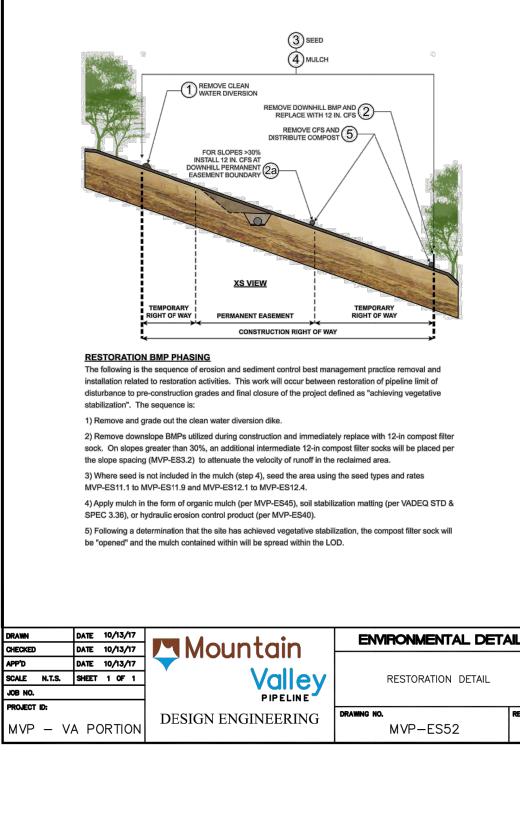




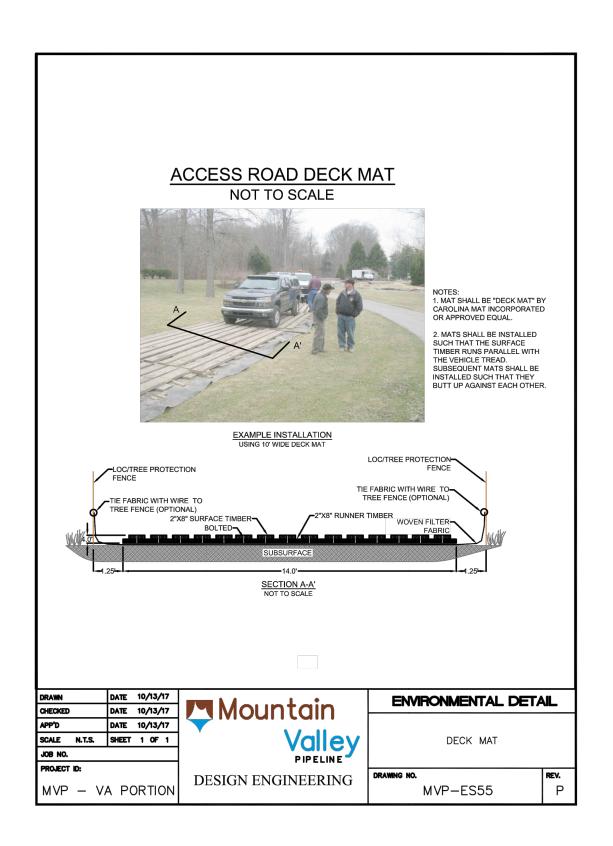


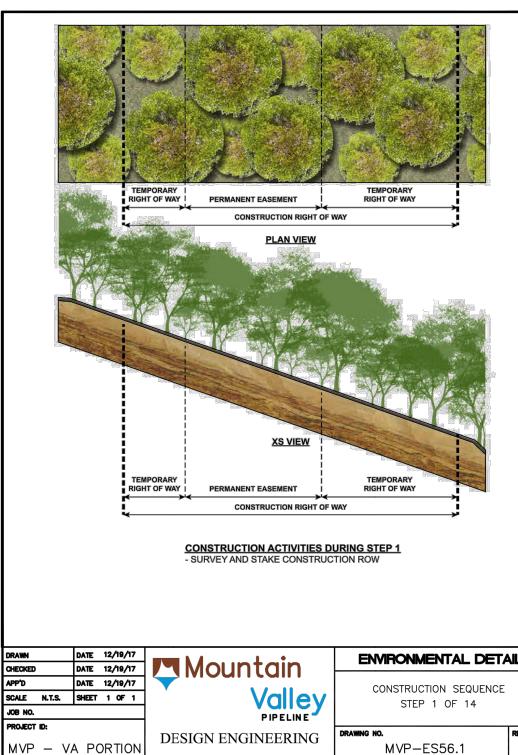


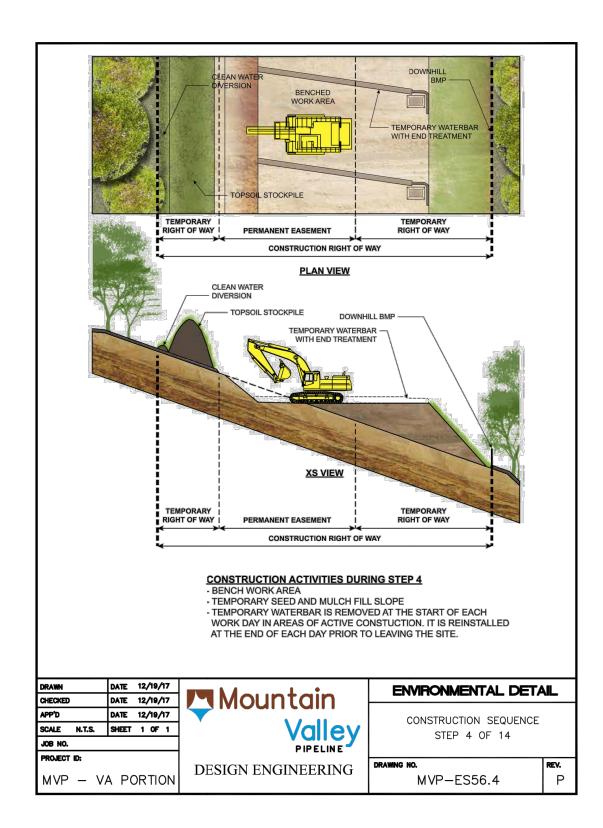
RESTO The follo installat disturba stabiliza
1) Rem
2) Rem sock. C the slop
3) Whe MVP-E
4) Apply SPEC 3
5) Follo be "ope

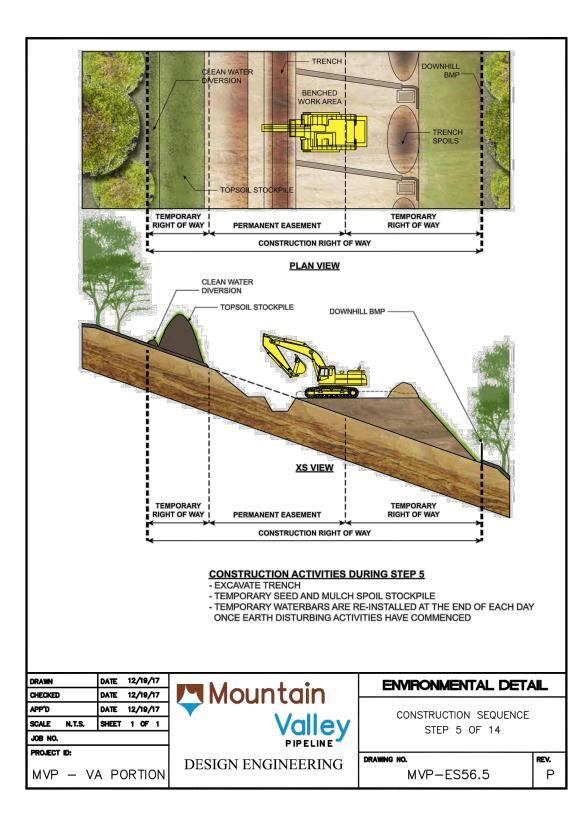


ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:	
DW	DW	DW	DW	DW	DW	APPD.:	Ц	
RE	RE	RE	RE	RE	RE	DWN.: CHKD.: APPD.:		
KAL	KAL	KAL	KAL	KAL	KAL	DWN.:		
01/31/18	01/26/18	01/08/18	1/28/17	1/01/17	38/18/17	DATE:		
7 01,	6 01,	5 01,	4 11,	3 11,	2 08,	NO.: [		
		EROSION AND SEDIMENT CONTROL PLANS					555 SOUTHPOINTE BOULEVARD, SUITE 200	CANONSBURG, PA 15317
c		661 F	worl AN OST	⊲∣c DER ER	LEAF SEN PLA	I DF ZA	lution: RIVE	S™
					GENERAL DE LAILS SE I			
		COLUMN COLUMN	Lic.		WAL WAL	LNER	AND SIMIA AVER	
		_						
	AWN	BY: ED I	: BY:					KAL HT

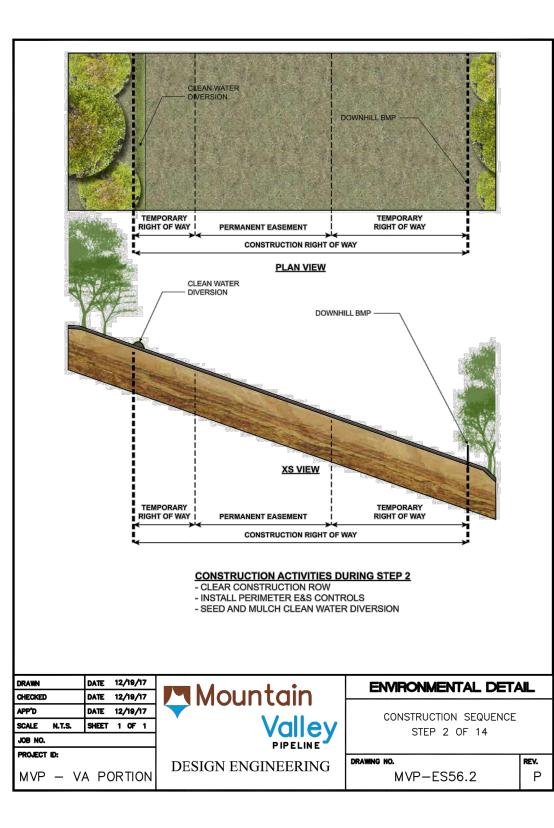


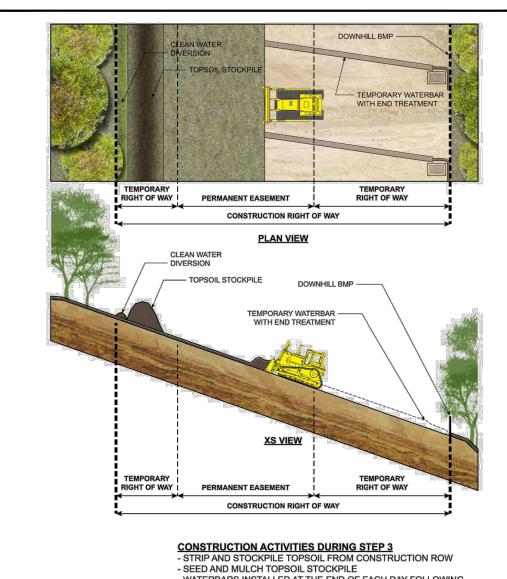




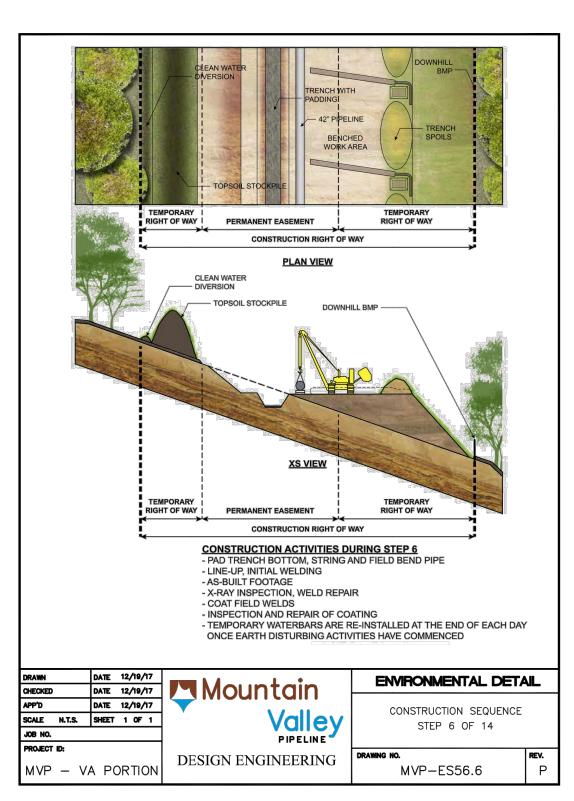


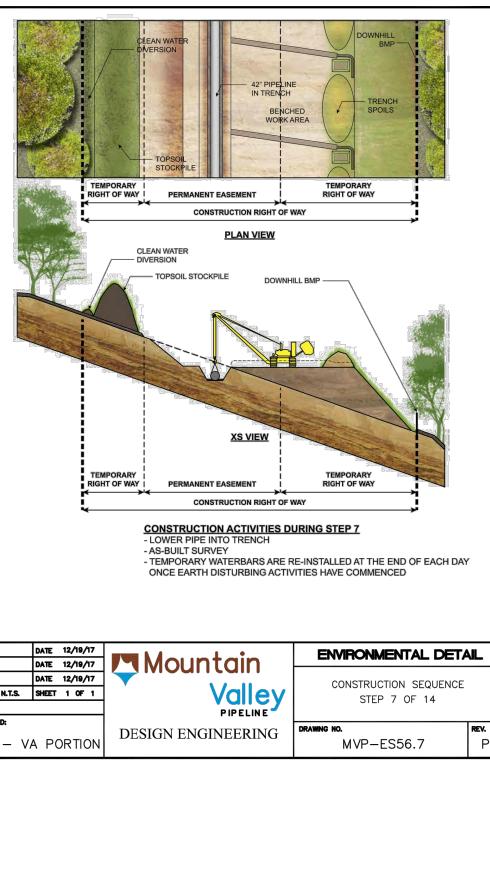
tain	ENVIRONMENTAL DETA	JL
	CONSTRUCTION SEQUENCE STEP 1 OF 14	
NEERING	drawing no. MVP-ES56.1	<b>rev.</b> P

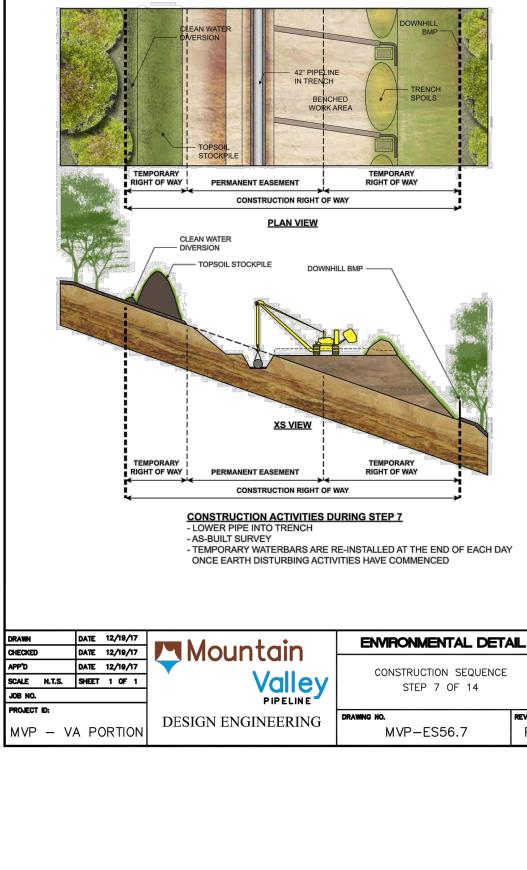




DRAWN	DATE 12/19/17		ENVIRONMENTAL DETA	
CHECKED	DATE 12/19/17	Mountain		
APP'D	DATE 12/19/17		CONSTRUCTION SEQUENCE	
SCALE N.T.S.	SHEET 1 OF 1	' Valley	STEP 3 OF 14	
JOB NO.		PIPELINE	SIEF 5 0F 14	
PROJECT ID:				004
		DESIGN ENGINEERING	DRAWING NO.	REV.
MVP - V	A PORTION		MVP-ES56.3	P

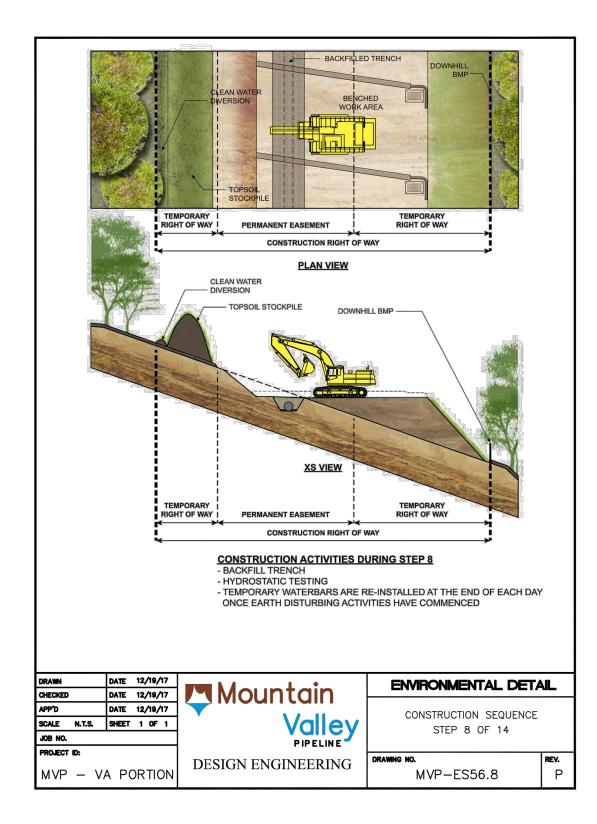


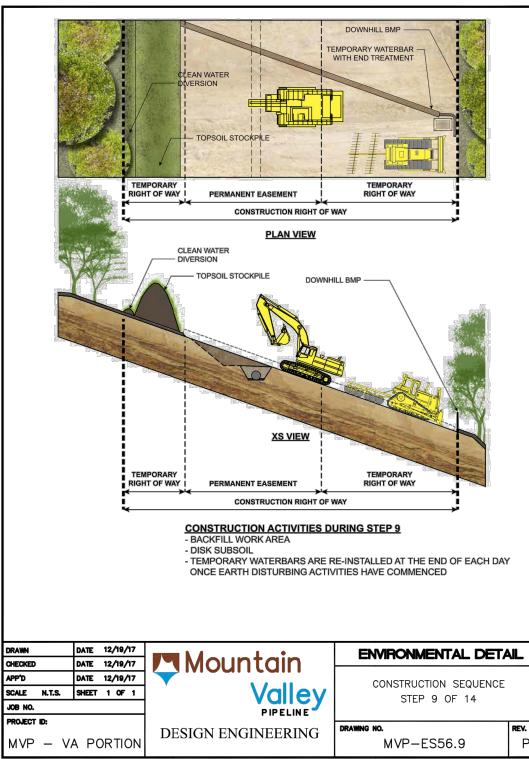


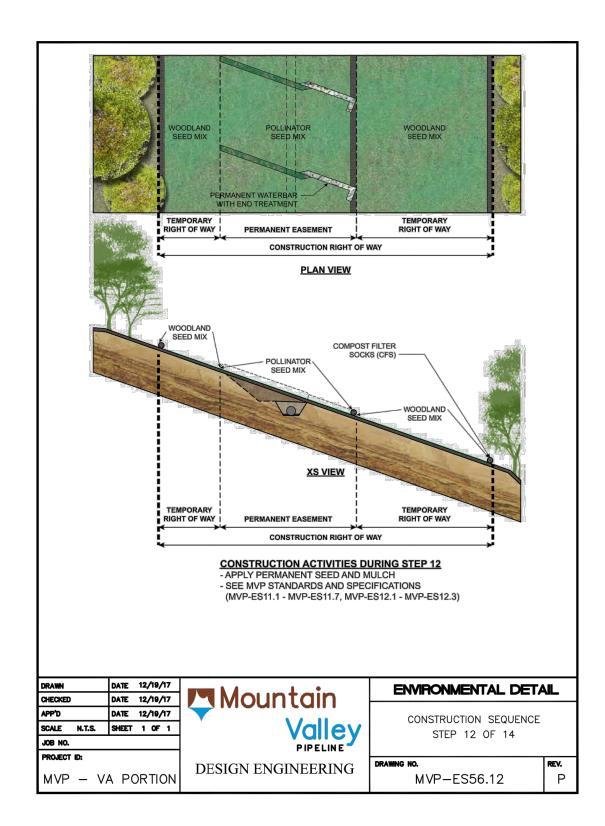


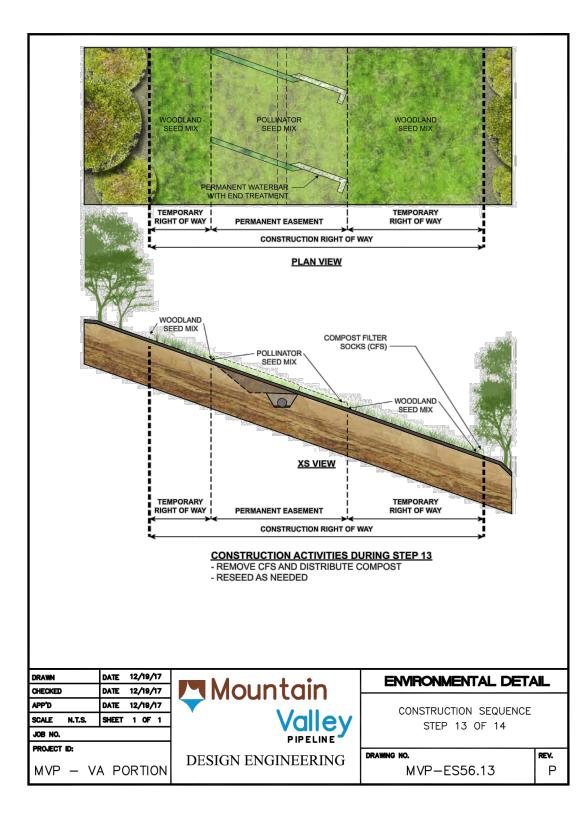
- WATERBARS INSTALLED AT THE END OF EACH DAY FOLLOWING EARTH DISTURBANCE



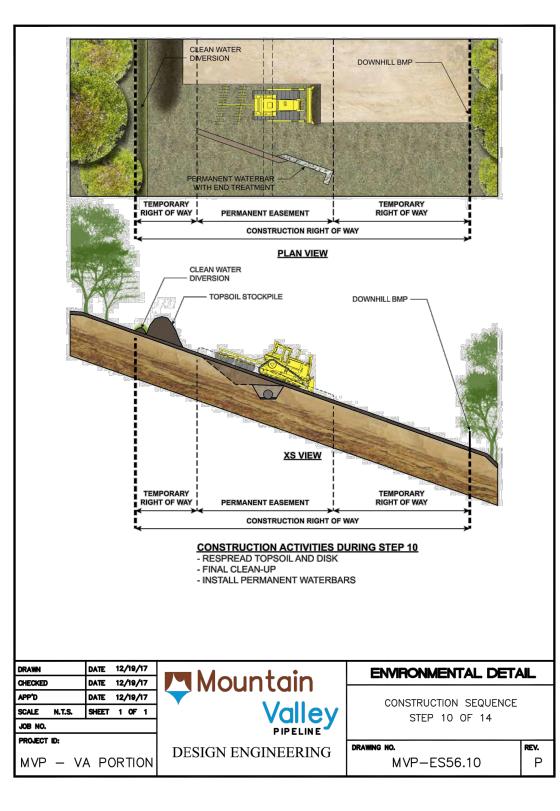


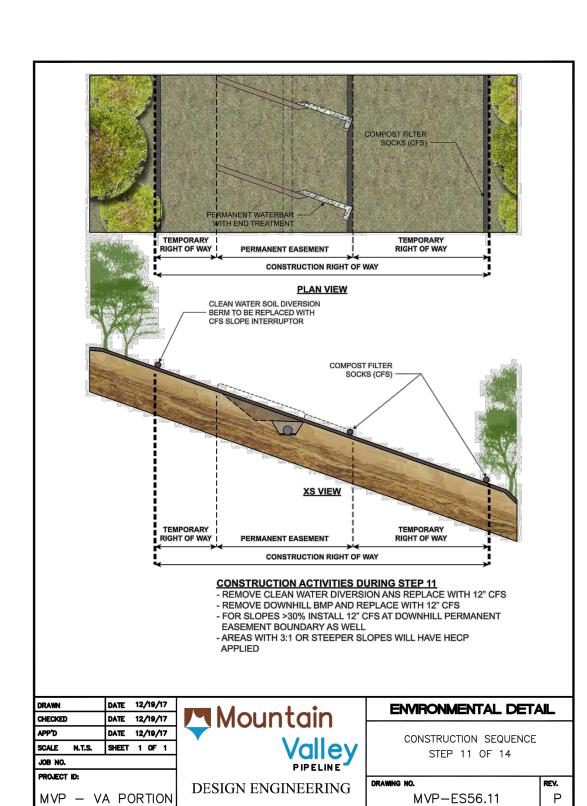


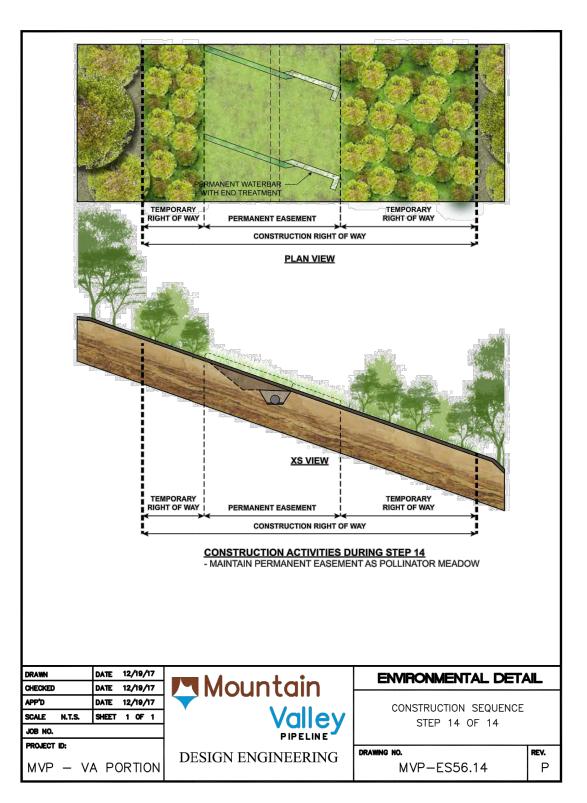




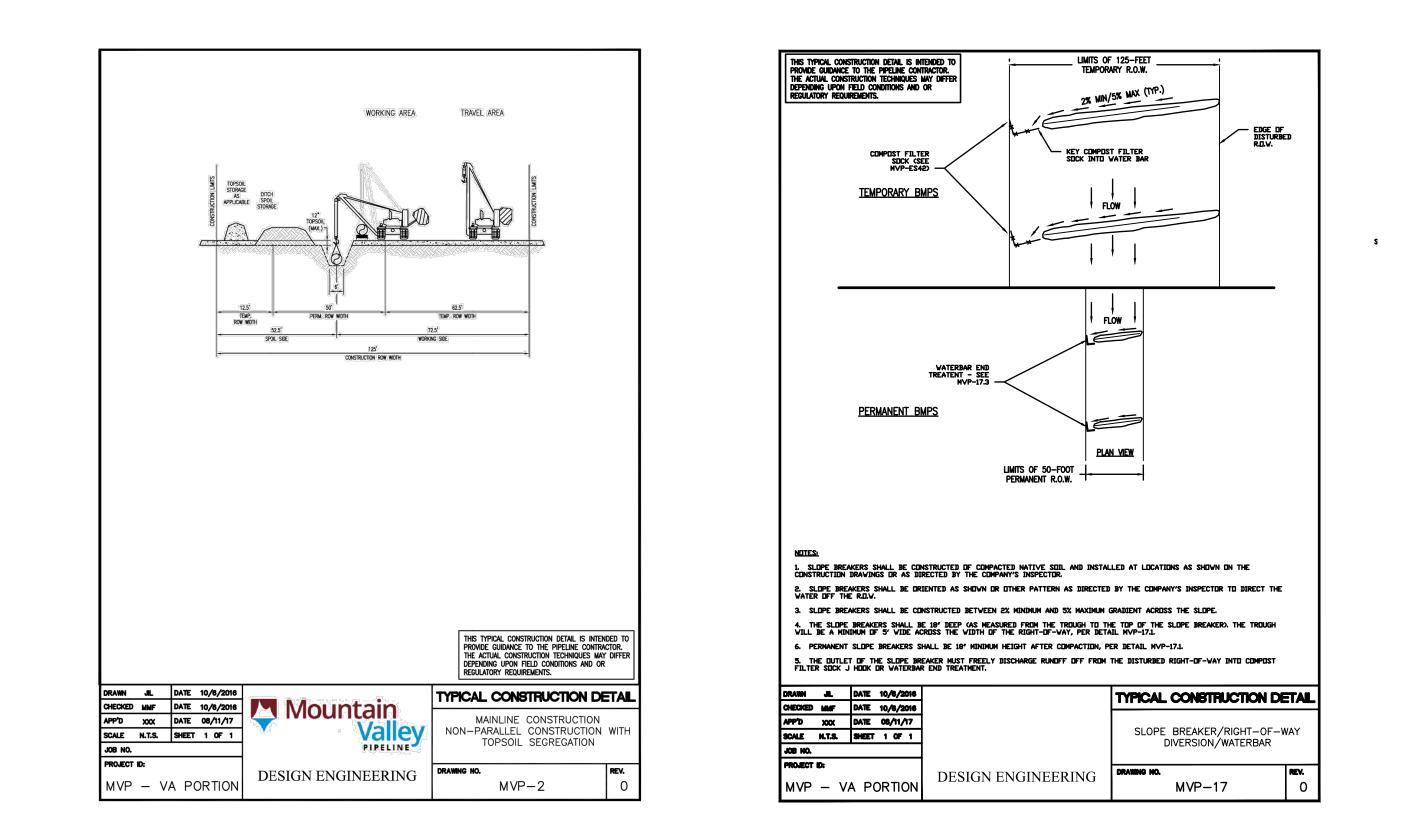
tain	ENVIRONMENTAL DETA	JL
	CONSTRUCTION SEQUENCE STEP 9 OF 14	
NEERING	DRAWING NO.	REV.
	MVP-ES56.9	Р

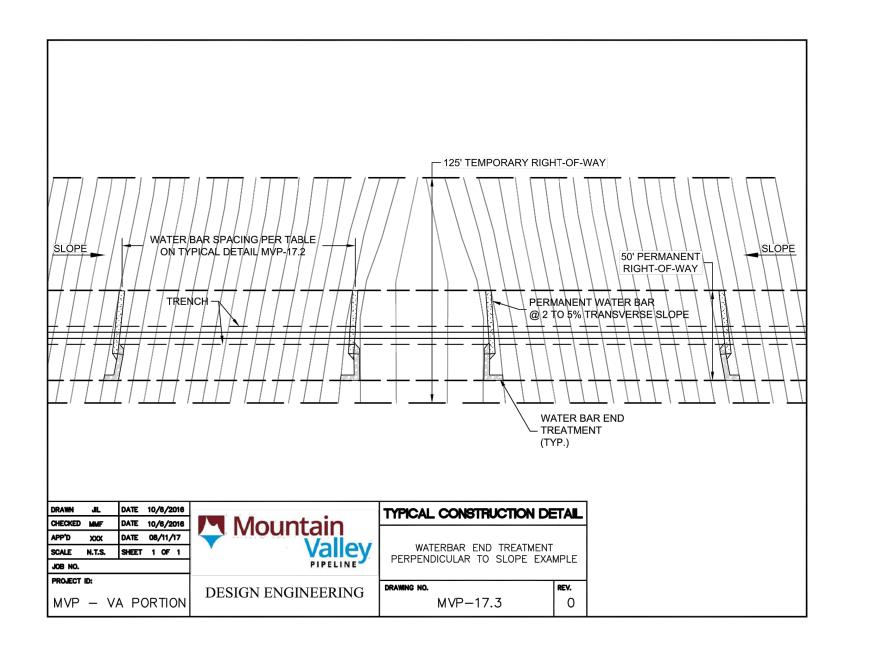


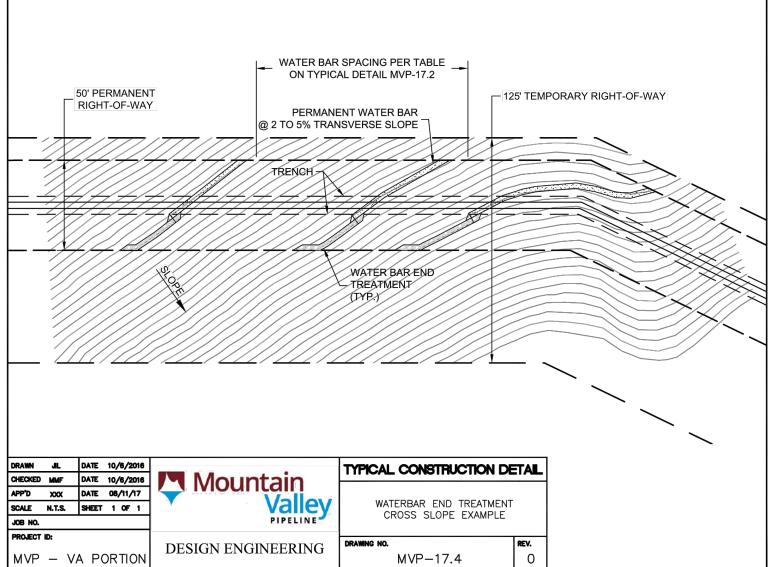


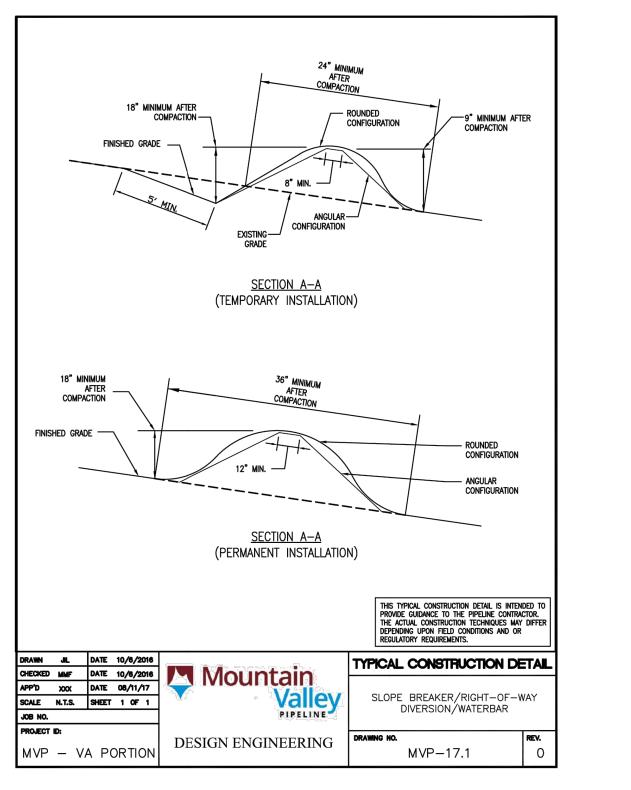


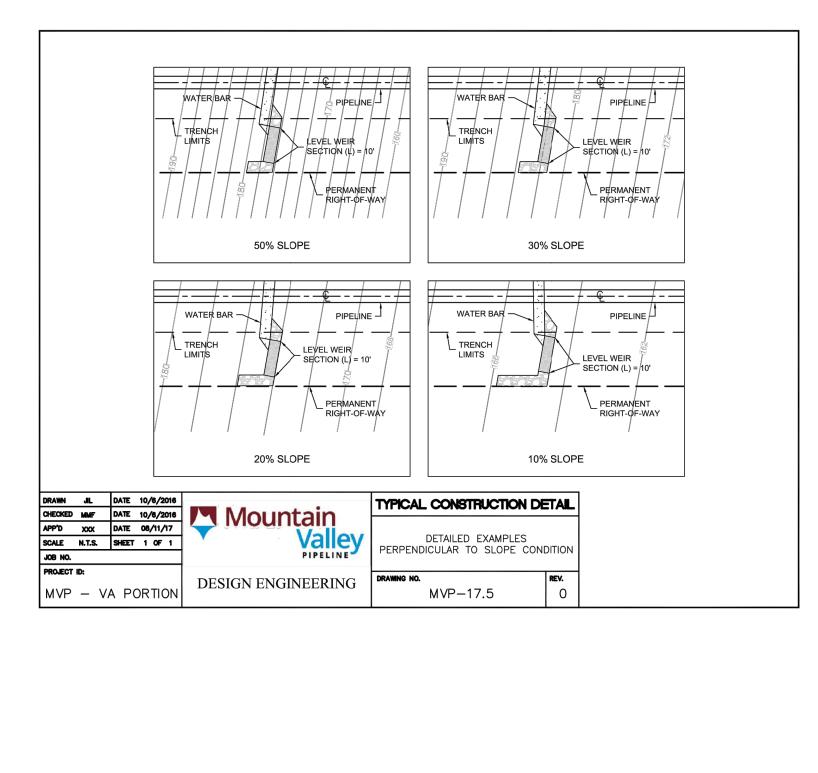
ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:	
DW	DW	DW	DW	DW	DW	APPD.:	Ц	
RE	RE	RE	RE	RE	RE	CHKD.:		
3 KAL	3 KAL	3 KAL	/ KAL	/ KAL	7 KAL	DWN.:		
01/31/18	01/26/18	01/08/18	11/28/17	11/01/17	08/18/17	DATE:		
7 0	6 0	5 0	4 1	3 1	2 0	NO.:		
Mountain Val	DIPELINE PIPELINE	EROSION AND SEDIMENT CONTROL PLANS	ז עמע דאר דעט ד				555 SOUTHPOINTE BOULEVARD, SUITE 200	CANONSBURG, PA 15317
(	T	E)	TE worl	DER	SEN	EC sol	H	
(	comp	661 F	TE worl AN OST	TR. a   c DER ER	SEN PLA	EC sol	H	
(	comp	661 F	TE worl AN OST	TR. DER ER RGH	SEN PLA	EC sol	H LUTION RIVE 7	
G	P	661 FOITTS	AN OST BUI		WALL NELLAND	EC I DF ZA 15	H LUTION RIVE 7	
CH CH	F		TE AN OST BUI Lic.		WALL NELLAND	LINER I DF	H LUTION RIVE 7	S
DR CH AP	F		TE AN OST BUI DAVI Lic. BY: BY:			LINER TSP3		s <sup>™</sup>











RECOMMENDED	MAXIMUM SPACING FOR
	SLOPE BREAKERS
PIPELINE GRADE	DISTANCE (FEET)
<2%	- 1,2
2-5%	400
6-15%	200
16-30%	100
>31%	50 <sup>3</sup>

<sup>1</sup> PERMANENT SLOPE BREAKERS WILL BE INSTALLED AS NEEDED BASED ON FIELD CONDITIONS. <sup>2</sup> PERMANENT SLOPE BREAKERS WILL BE INSTALLED 25 FEET FROM EACH WATERBODY BOUNDARY REGARDLESS OF SLOPE CONDITIONS.

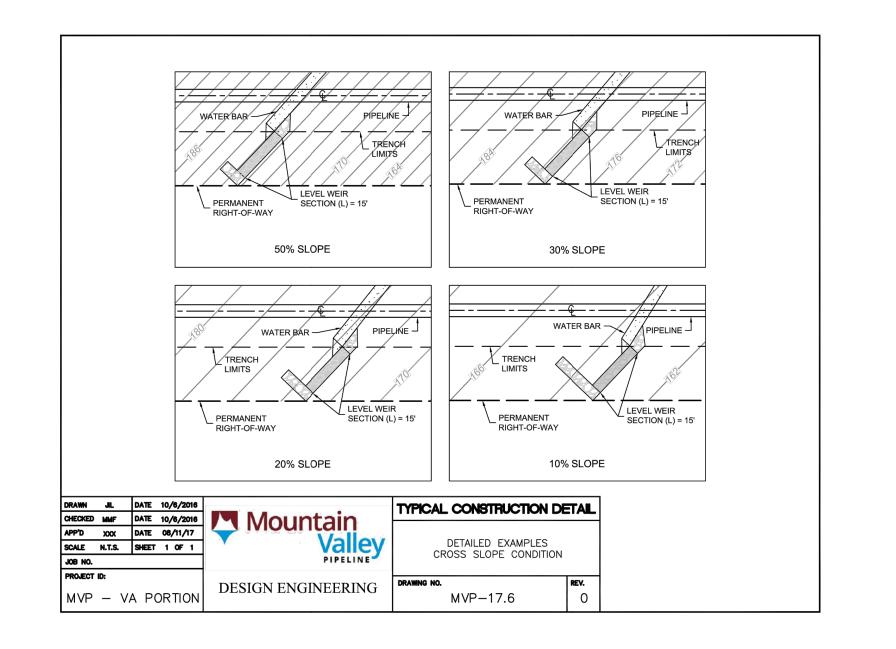
<sup>3</sup> SLIPES GREATER THAN 65% MAY REQUIRE SITE SPECIFIC STABILIZATION MEASURES BASED ON FIELD CONDITIONS AS APPROVED BY MVP DESIGN ENGINEERING AND MVP ENVIRONMENTAL INSPECTOR.

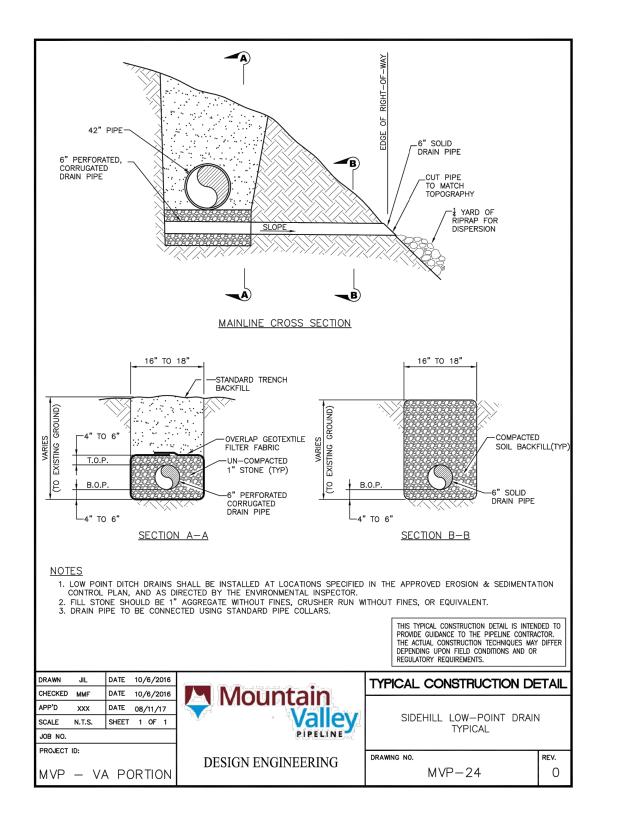
NOTES:

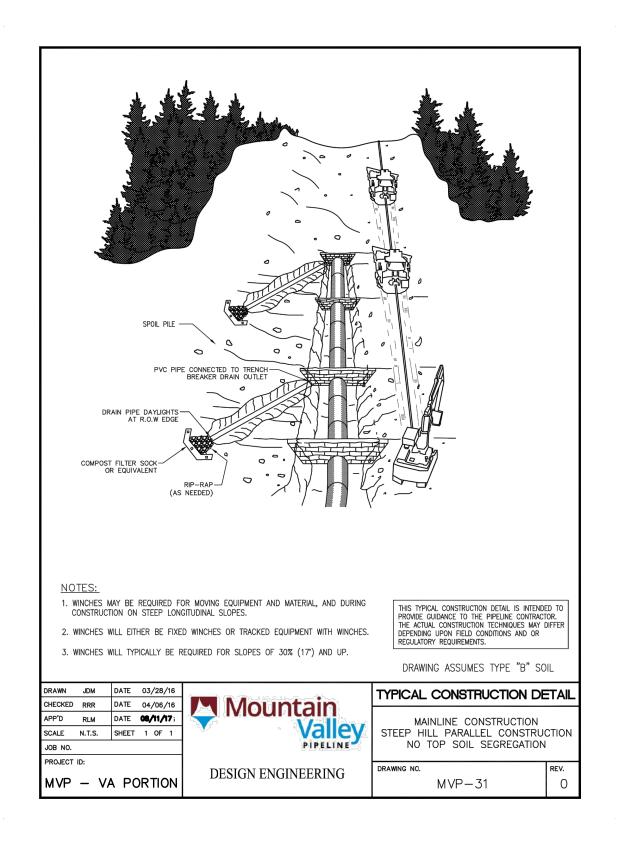
1. WATERBARS SHALL BE INSPECTED EVERY 4 BUSINESS DAYS (DAILY ON ACTIVE ROADS), DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION 2. MAINTENANCE OF WATERBARS SHALL BE PROVIDED UNTIL ROADWAY, SKIDTRAIL, OR RIGHT-OF-WAY HAS ACHIEVED PERMANENT STABILIZATION 3. WATERBARS ON RIGHT-OF-WAYS SHALL BE LEFT IN PLACE AFTER PERMANENT STABILIZATION HAS BEEN ACHIEVED 4. SUMP FILTERS TO BE INSTALLED AT END OF TEMPORARY WATERBARS. REFER TO SUMP FILTER DETAIL MVP-ES42. 5. DUTLET PROTECTION/COMPOST FILTER SOCK SHOULD BE INSTALLED AT THE DUTLET OF ALL TEMPORARY WATERBARS PER DETAIL MVP-ES42. WATERBAR END TREATMENTS WILL BE INSTALLED FDR PERMANENT WATERBARS PER DETAILS MVP-17.3 THROUGH MVP-17.7.

			THIS TYPICAL CONSTRUCTION DETAIL IS INTEND PROVIDE GUIDANCE TO THE PIPELINE CONTRAC THE ACTUAL CONSTRUCTION TECHNIQUES MAY DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.	TOR.
DRAWN JIL CHECKED MMF	DATE 10/6/2016 DATE 10/6/2016	Mountain	TYPICAL CONSTRUCTION DE	TAL
APP'D XXX SCALE N.T.S.	DATE 08/11/17 SHEET 1 OF 1	Mountain Valley	SLOPE BREAKER/RIGHT-OF-W	AY
JOB NO.		PIPELINE	DIVERSION/WATERBAR	
project id: MVP - V	A PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-17.2	rev. O

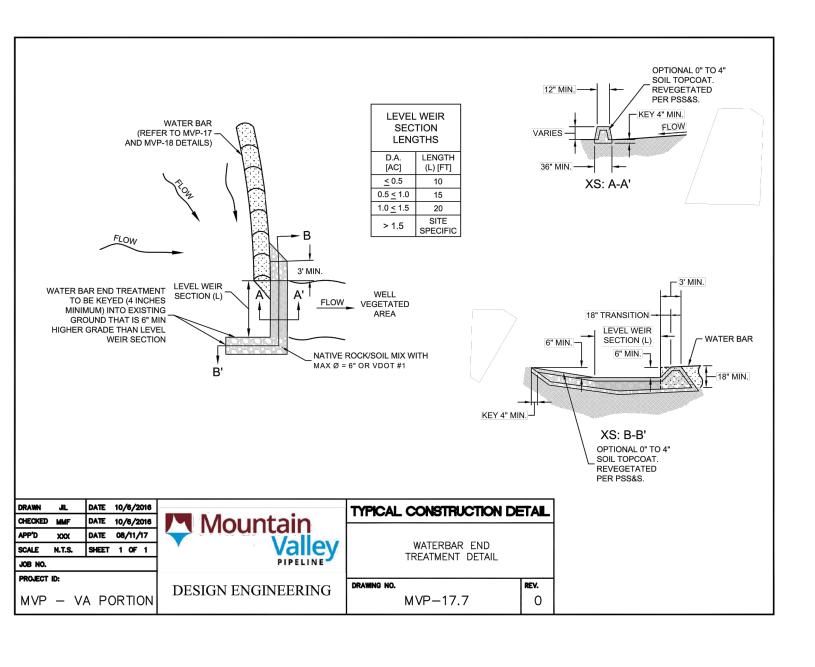
Mountain       Value         EROSION AND SEDIMENT CONTROL PLANS       01/31/18       KAL       RE       DW         MOUNTAIN VALLEY PIPELINE PROJECT - H600       LIN       5       01/26/18       KAL       RE       DW         MOUNTAIN VALLEY PIPELINE PROJECT - H600       LIN       3       11/28/17       KAL       RE       DW         MOUNTAIN VALLEY PIPELINE PROJECT L       H600       LIN       3       11/01/17       KAL       RE       DW         MOUNTAIN VALLEY PIPELINE       PROJECT L       H600       LIN       3       11/01/17       KAL       RE       DW         S55 SOUTHPOINTE BOULEVARD, SUITE 200       No:       DATE:       DWN:       CHKD::       APPD::         CANONSBURG, PA 15317       CANONSBURG, PA 15317       AL       RE       DW       DM       AL       RE       DW	ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:	.),-),-,,-,,-,,-,,-,,-,,-,,-,,-,,-,,-,,-,	
7 01/31/18 6 01/26/18 5 01/08/18 4 11/28/17 3 11/01/17 2 08/18/17 NO.: DATE:	DW	DW	DW	DW	DW	DW	: APPD.:	Г Ц Ц	 ,	
7 01/31/18 6 01/26/18 5 01/08/18 4 11/28/17 3 11/01/17 2 08/18/17 NO.: DATE:			RE				: CHKD.			
N 2 2 4 5 5 4							DWN.			
N 2 4 6 5 6 7	01/31/1	01/26/1	01/08/1	11/28/1	11/01/1	08/18/1	DATE:			
EROSION AND SEDIMENT CONTROL PLANS         EROSION AND SEDIMENT CONTROL PLANS         MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE         Sess souther and summer summer source solution         Sess souther Boulevard, sum source solution         CANONSBURG, PA 15317	7			4	3		NO.:			
			SEDIMENT CONT	יבו ישם ביי					IINIE BUULEVARD, SI	VSBURG, PA 15317
	(	Comp	661 F	TE worl AN OST	TR a   c DER ER	SEN PLA	EC so I DF ZA		ONS	
GENERAL DETAILS SET	(	Comp	661 F	TE worl AN OST	TR a   c DER ER RGH	SEN PLA , PA	EC so I DF ZA	H LUTIA RIVE 7	ONS	
CEREBATICS STATES	(	Comp		TE AN OST BUI			LINER TSP3	H RIVE 5220	ONS	
DAVID J. WALLNER Lic. No. 0402057593	DR	F		TE AN OST BUI			LINER TSP3	H RIVE 5220	)	s" KAL
DAVID J. WALLNER Lic. No. 0402057593				TE AN OST BUF Lic. BY: BY:		WALL OF THE WALL	LINER TSP3	H RIVE 5220	)	s <sup>™</sup>

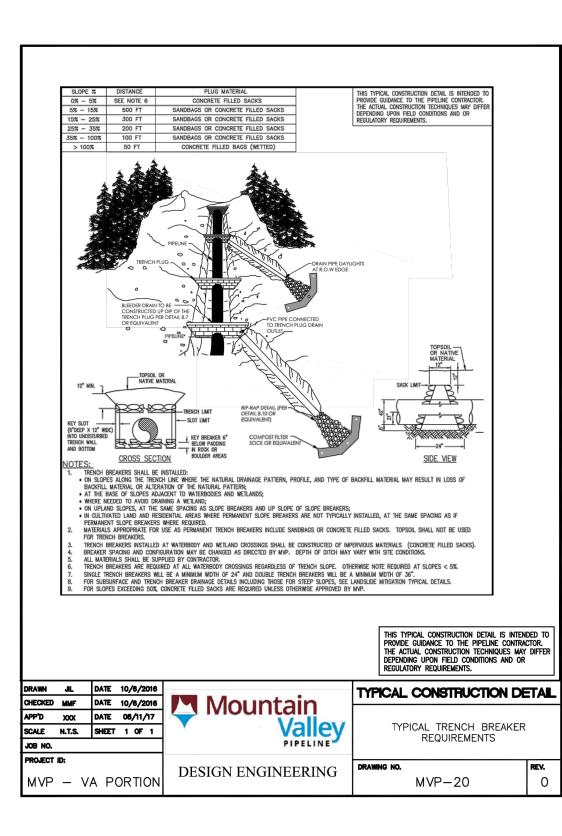


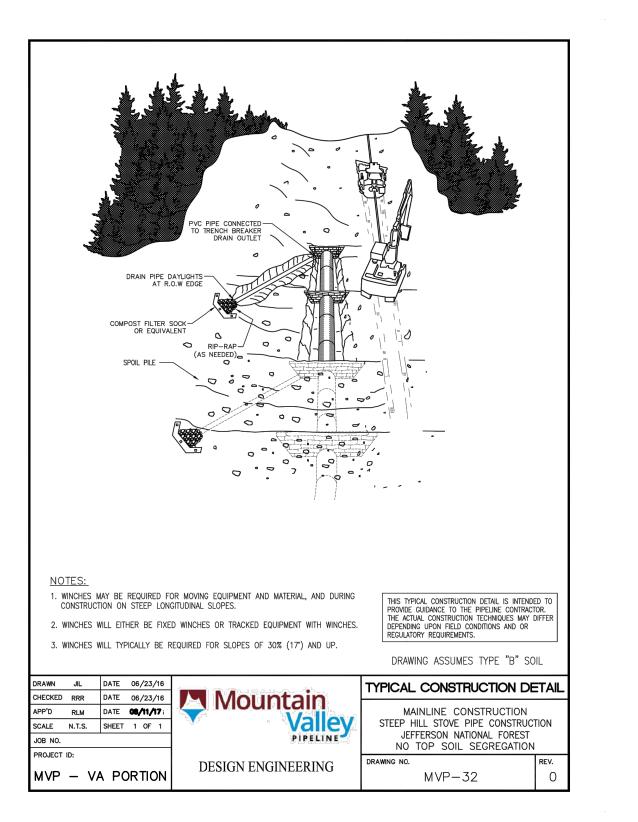


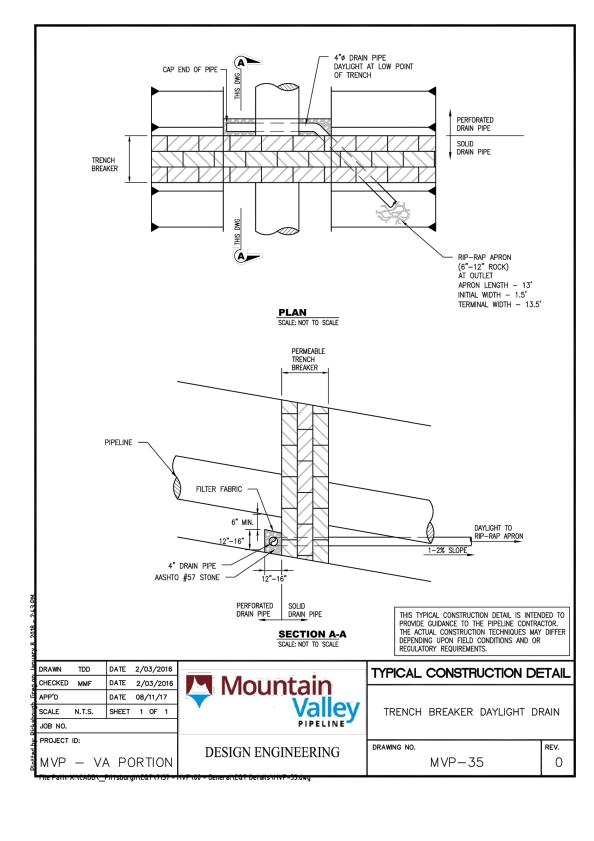


TETRA TECH CAD FILE PATH: X:\CADD\\_Pittsburgh\EQT\7157 - MVP\00 - General\E&S\Spread 9\7157ES018.dwg PLOTTED ON: 3/12/2018 11:13 AM PLOTTED BY: Rickabough. Greg PLOT FILE: ENVIRONMENTAL\_COLOR.ctb

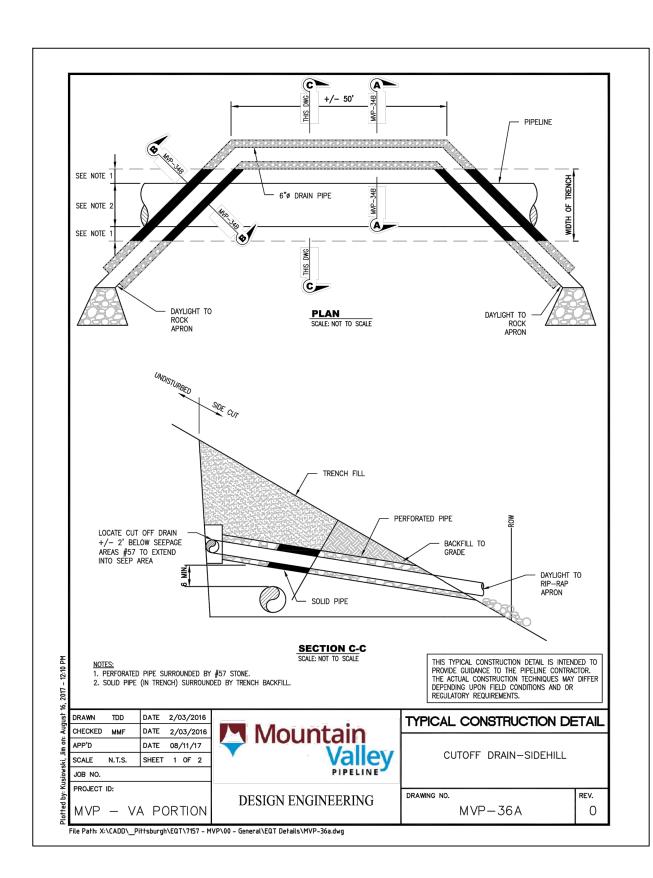


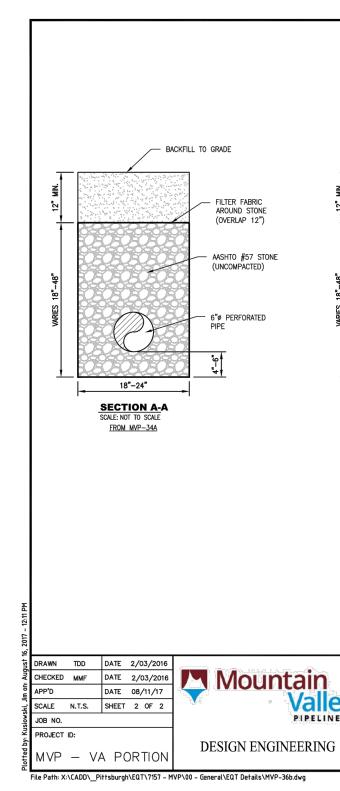


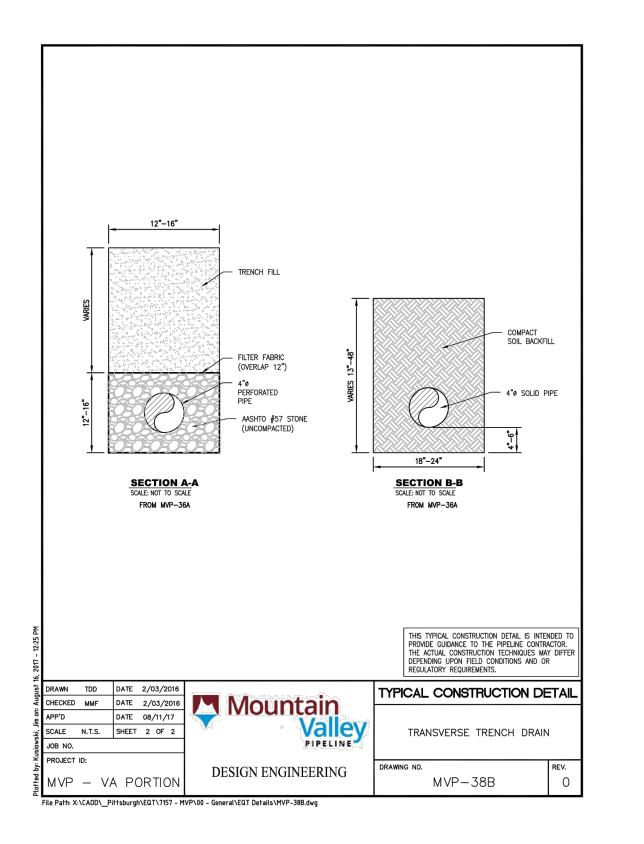


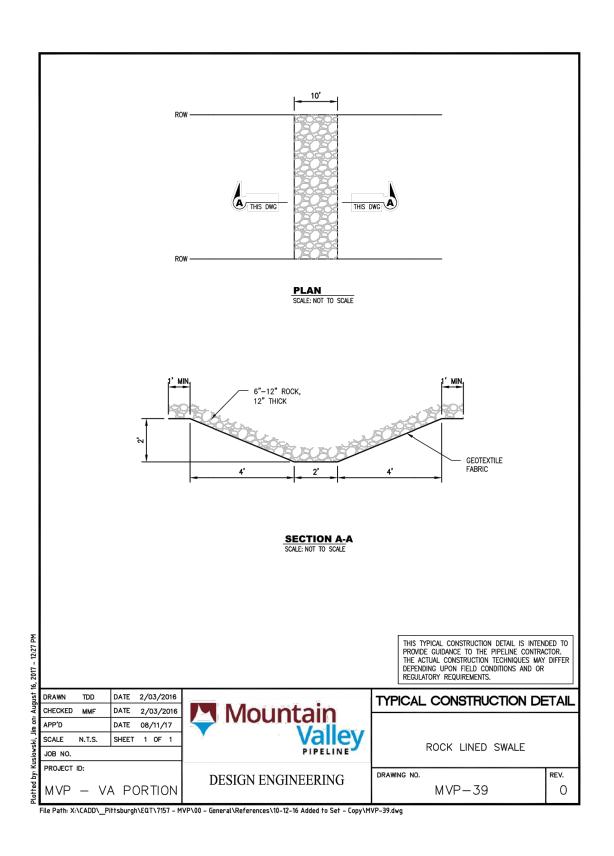


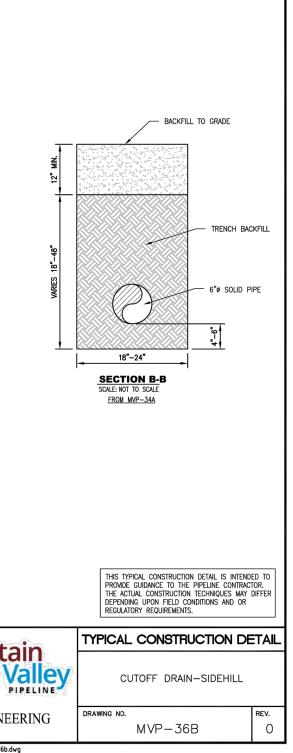
ADDED ETILICS IN ALLEY PIPELINE PROJECT - H600 LINE 201/18 KAL RE DW ADDED ETMLS FOR ROADS AND PADE T 0/131/18 KAL RE DW ADDED ETMLS FOR ROADS AND PADE EROSION AND SEDIMENT CONTROL PLANS 6 0/126/18 KAL RE DW ADDESS VACE COMMENTS 9 0/108/18 KAL RE DW ADDESS VACE COMMENTS 1 1/101/17 KAL RE DW ADDESS VACE COMMENTS 1 1/101	DETAILS FOR ROADS AND PADS	DEQ COMMENTS	COMMENTS	OMMENTS	AMENTS	AENTS			
Mountain       Muntain         101/31/18       Kur         101/31/18       Kur         101/31/18       Kur         11/38/11       Kur         11/31/31	ADDEL	ADDRESS VA	ADDRESS VADEQ	ADDRESS VADEQ C	ADDRESS VADEQ CON	ADDRESS VADEQ COM	DESCRIPTION:	ISIONS:	
CHANNE BY: CANONEBREG, PA 152317 CANONEBREG, PA 152201 CANONEBREG, PA 152201 CANONEBREG, PA 15220 CANONEBREG, PA 1520 CANONEBREG, PA 152	M	DW	MQ	DW	MQ	MQ	APPD.:	Ц Ц Х	
CHONGENGE, PA 15317 CONORDER, PA 15230 CONNERCE BOLLEVARD, SURVEY CONNERCE BOLLEVARD, SURVEY CONNERCE PLAZA 7 DELETINE ROLLEVARD, SURVEY CONNERCE BOLLEVARD, SURVEY CONNERCE PLAZA 7 DILESCONTROLLER CONNERCE PLAZA 7 DILESCONTROLLER CONNERCE PLAZA 7 DILESCONTROLLER CONNERCE PLAZA 7 DILESCONTROLLER CONNERCE PLAZA 7 DILESCONTROLLER CONNERCE PLAZA 7 DILESCONTROLLER CONSTRUCT CONS	RE	RE	RE	RE	RE	RE	CHKD.:		
	KAL						DWN.:		
	01/31/18	01/26/18	1/08/18	1/28/17	1/01/17	18/18/17	DATE:		
DRAWN BY: DRAWN BY: DRAWN BY: ACCHECKED BY: ACCHECKED BY: COMPLEX WORLD CLEAR SOLUTIONS* CLEAR S	7 0		5 0	4 1	3 1		NO.:		
661 ANDERSEN DRIVE FOSTER PLAZA 7 PITTSBURGH, PA 15220			EROSION AND SEDI		MUUNIAIN VALLET FIFEL			555 SOUTHPOINTE	CANONSBU
DRAWN BY: KAL CHECKED BY: RE DATE: 11/28/2017	c		661 F	AN OST	IDER ER	RSEN PLA	I DF ZA	RIVE 7	S™
Lic. No. 0402057593 DRAWN BY: KAL CHECKED BY: HT APPROVED BY: RE DATE: 11/28/2017 COME: AD. CHOWN						GENERAL DE LAILS SE I			
CHECKED BY: HT APPROVED BY: RE DATE: 11/28/2017			COLUMN COLUMN	Lic.	No. O	40205 Uh	57593	AND CONVIA	
DATE: 11/28/2017	Γ₽	<u></u>							KVI
	СН	ECK	ED I	BY:					HT

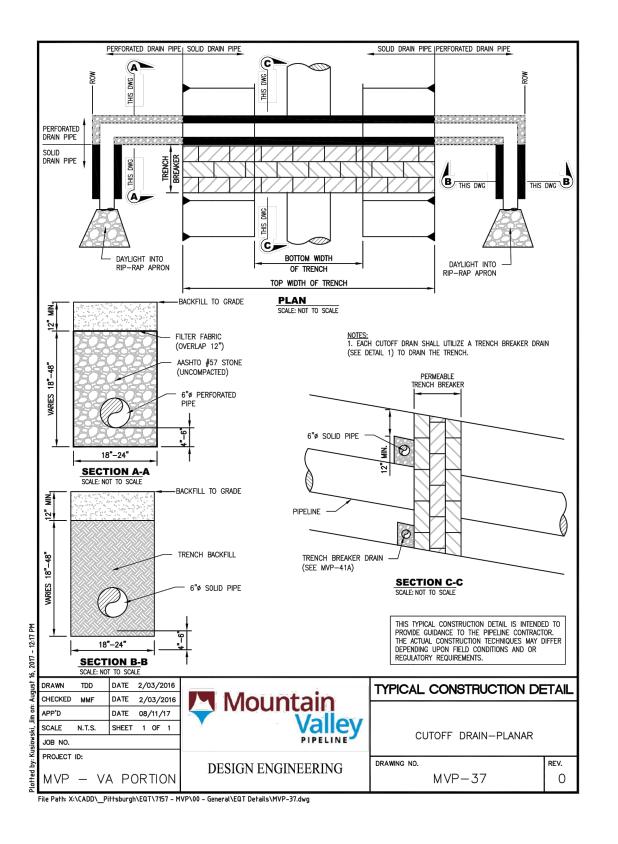


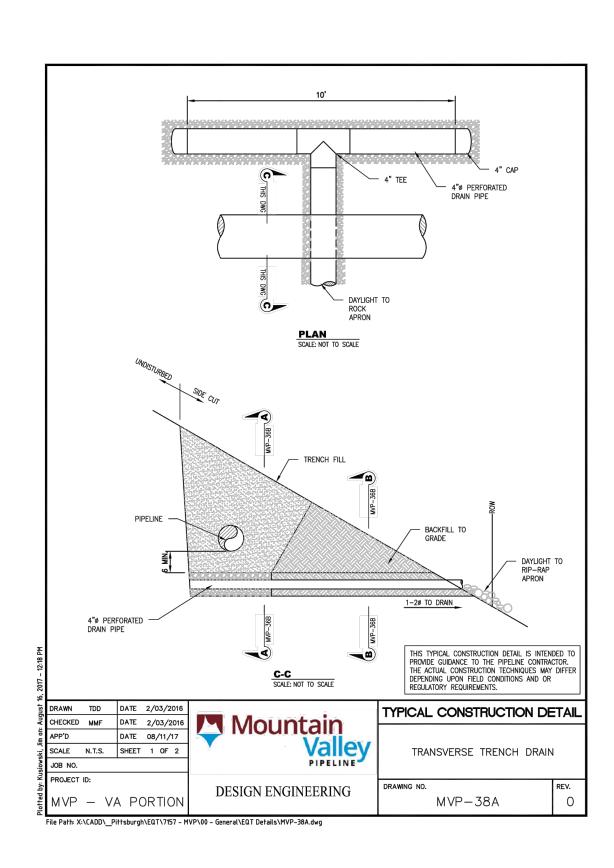


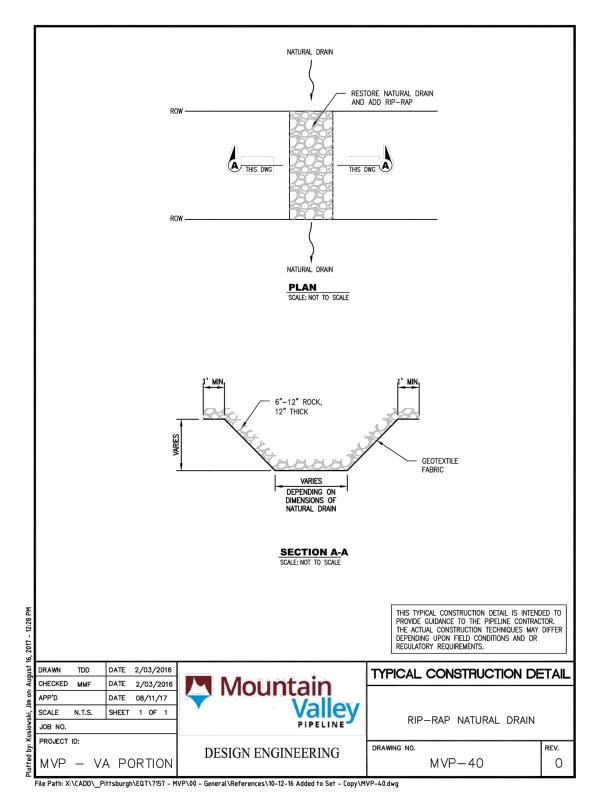


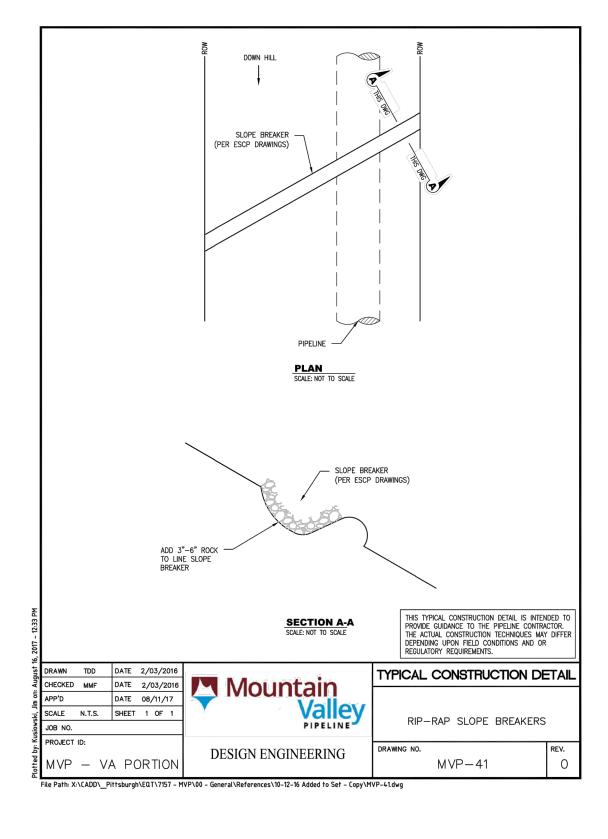


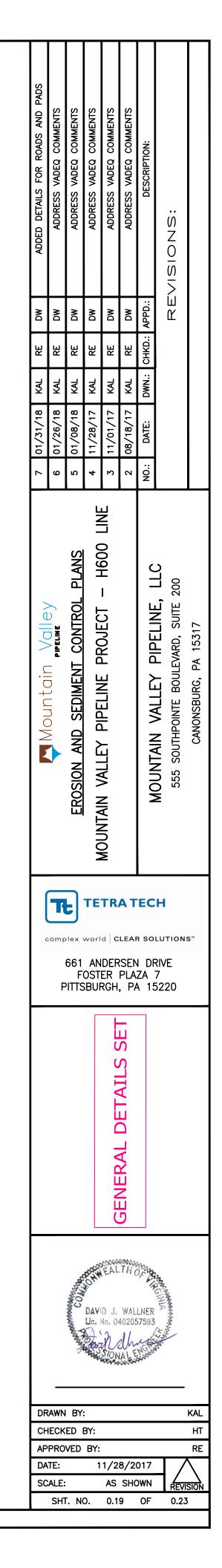


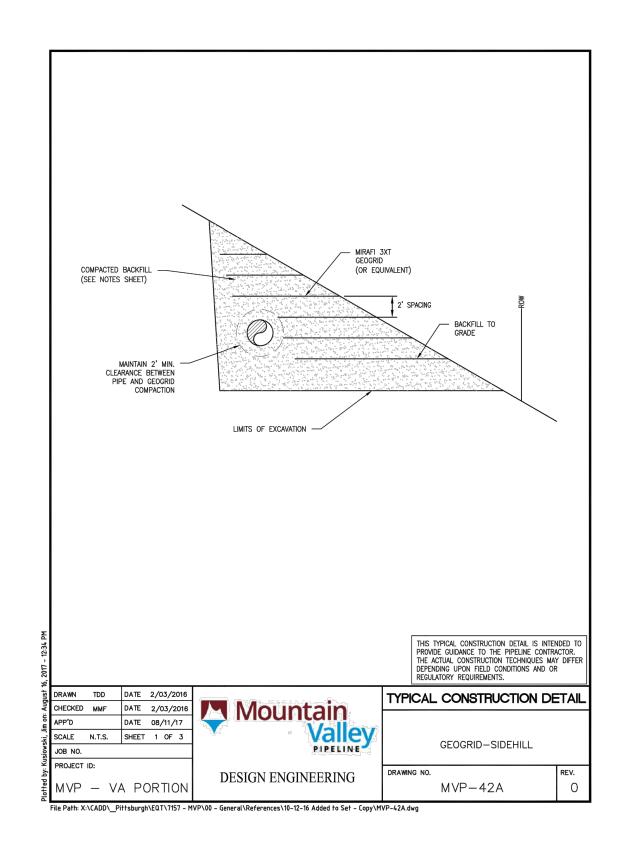


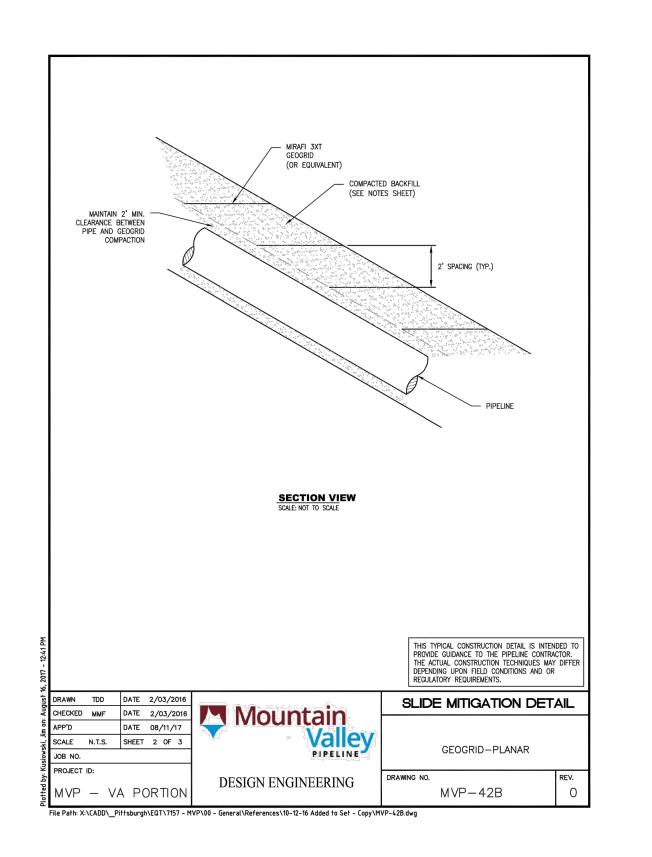


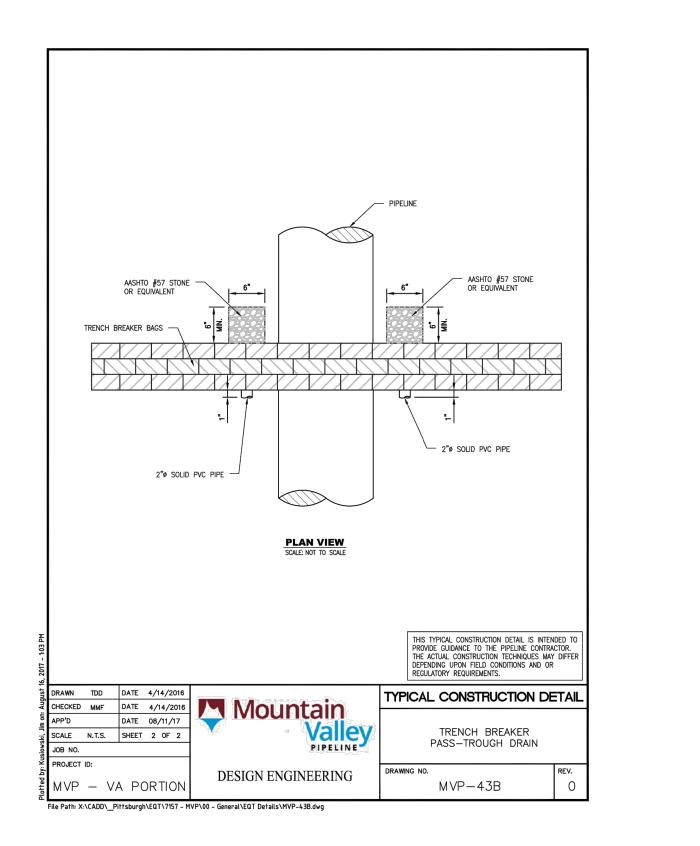


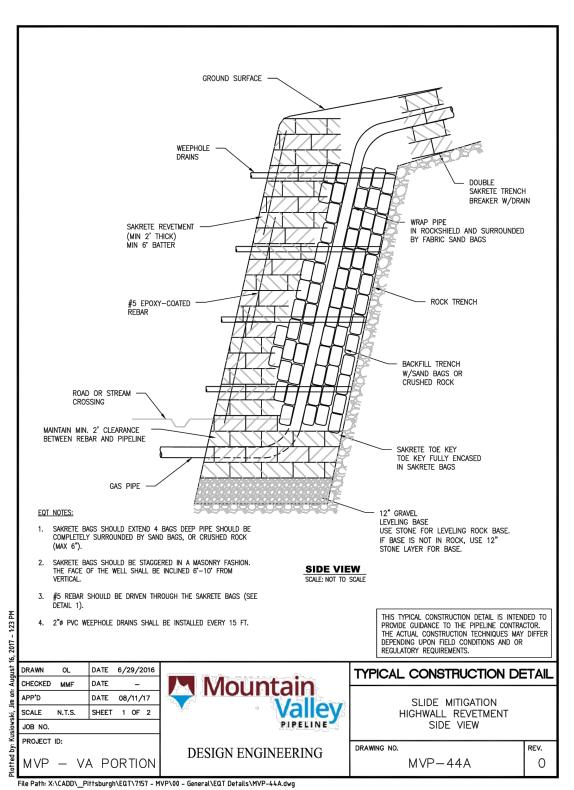


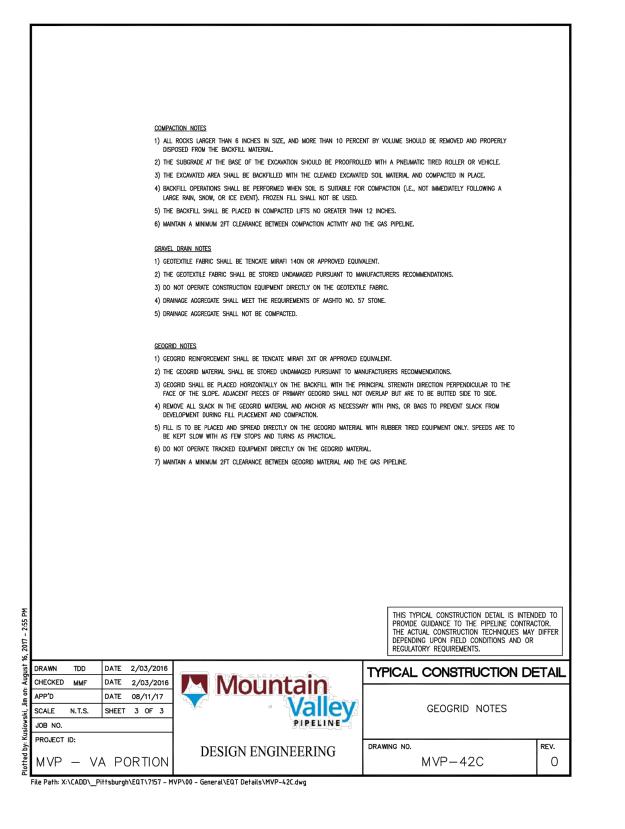


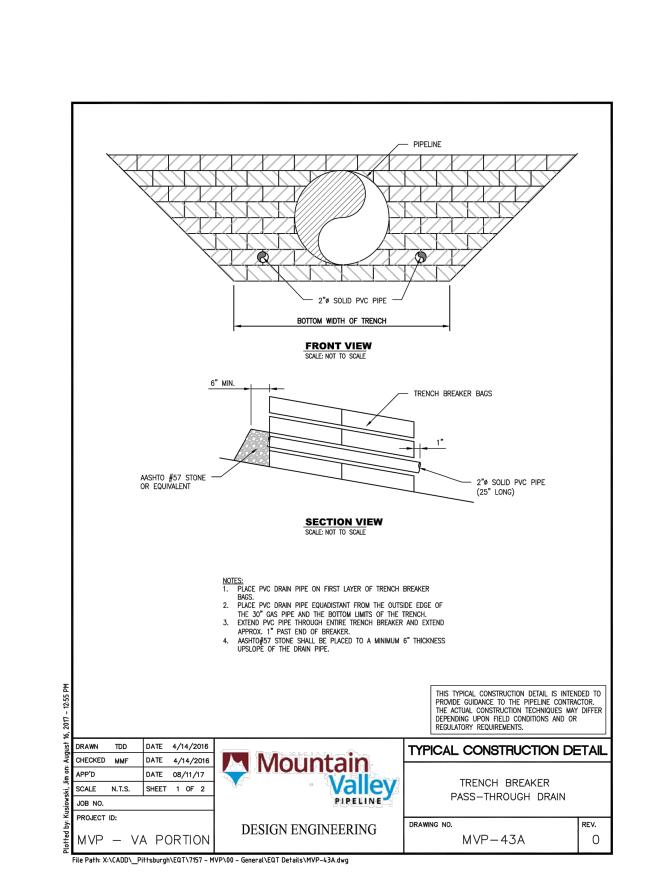


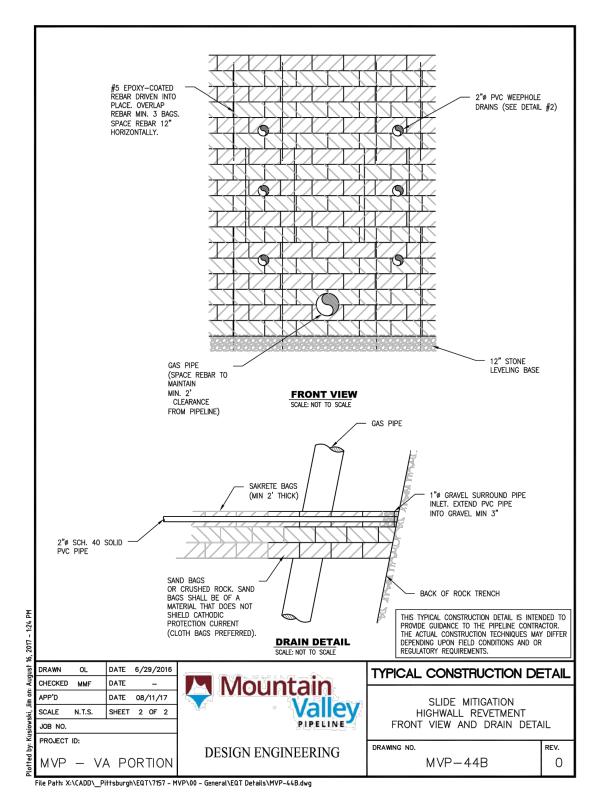












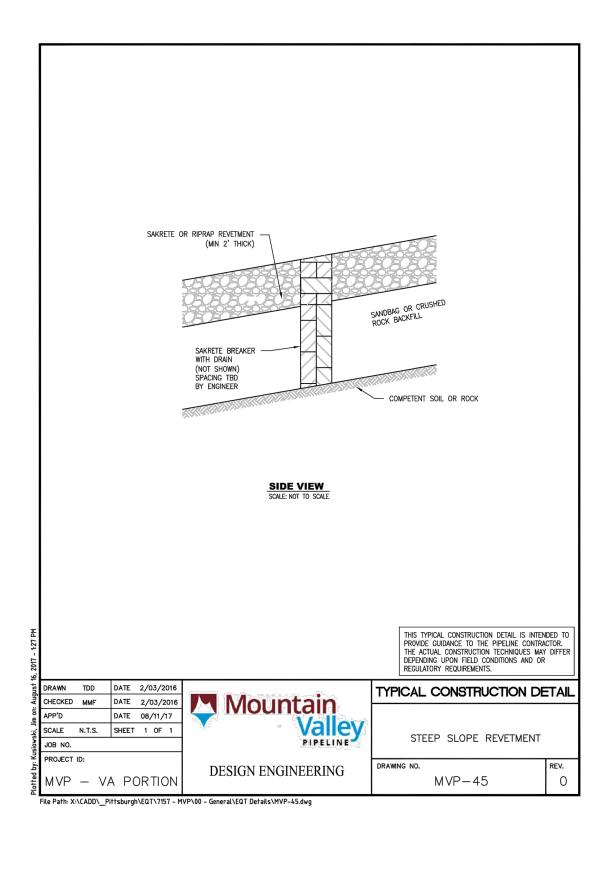
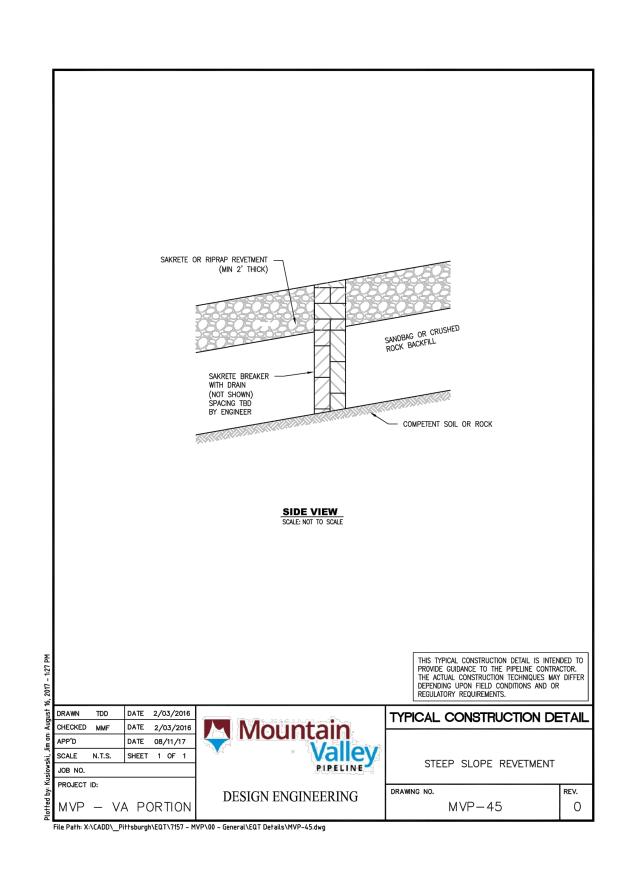
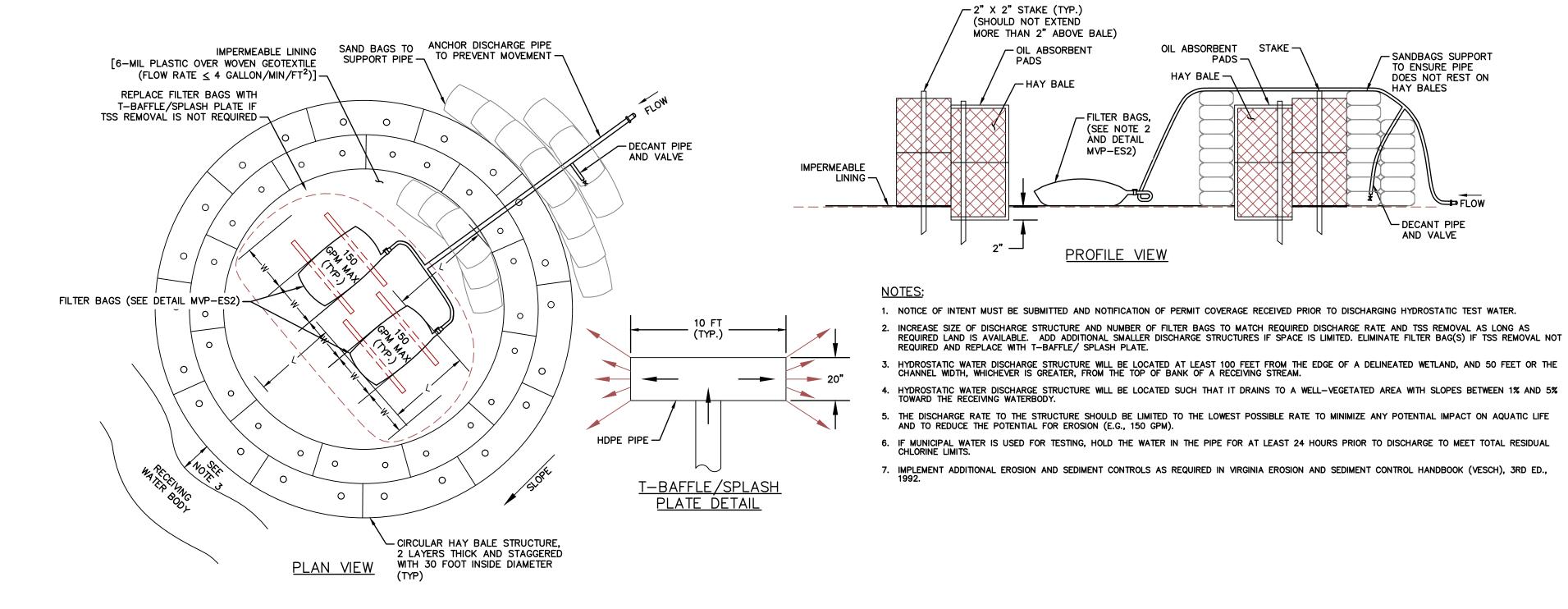
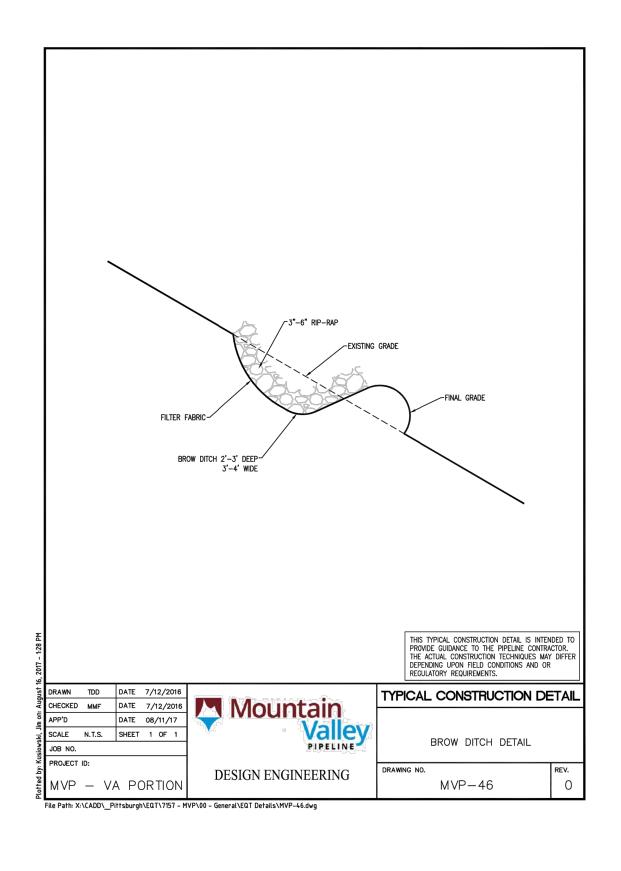


Image: Construct of the consthe construct of the construct of the construct of the construct o	ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	DESCRIPTION:	REVISIONS:	
CONNERING PATE: DRAWN RFY: CANONEBIG: DRAWN RFY: C	DW	MQ	DW	DW	DW	DW	APPD.:	Ц	
CONNERING PATE: DRAWN RFY: CANONEBIG: DRAWN RFY: C	RE	RE	RE	RE	RE	RE	CHKD.:		
				_			DWN.:		
	1/31/18	1/26/18	1/08/18	1/28/17	1/01/17	8/18/17	DATE:		
TETRATECH     complex world     CLEAR BOLUTIONS*     661 ANDERSEN DRIVE   FOSTER PLAZA 7   PITTSBURGH, PA 15220     IS   STUTION     IS   STUTION   IS   STUTION     IS   SUPE   KAL   CHECKED BY:   NTE:   11/28/2017	7 0	6 0	5 0	4	3 1	2 0	NO.:		
TETRATECH     complex world     CLEAR BOLUTIONS*     661 ANDERSEN DRIVE   FOSTER PLAZA 7   PITTSBURGH, PA 15220     IS   STUTION     IS   STUTION   IS   STUTION     IS   STUTION   IS   STUTION     IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   STUTION   IS   IS </th <th></th> <th></th> <th>EROSION AND SEDIME</th> <th>MOLINITAIN VALLEY DIDELINE</th> <th></th> <th></th> <th>MOLINITAIN VALLEY</th> <th>555 SOUTHPOINTE BO</th> <th>CANONSBURG</th>			EROSION AND SEDIME	MOLINITAIN VALLEY DIDELINE			MOLINITAIN VALLEY	555 SOUTHPOINTE BO	CANONSBURG
DAVID J. WALLNER Lic. No. 0402057593 DRAWN BY: KAL CHECKED BY: HT APPROVED BY: RE DATE: 11/28/2017	( 	omp	661 F	worl AN OSTI	a∣c DER ER RGH,	SEN PLA	r so I DF ZA	lution RIVE 7	S™
CHECKED BY: HT APPROVED BY: RE DATE: 11/28/2017									
DATE: 11/28/2017			Starting Construction	Lic.	ULL N L L L L		LNER	A CANARA AND A STATE	
	СН	IECK	i by: Ed i	Lic.	ULL N L L L L		LNER	AND GIVIA	





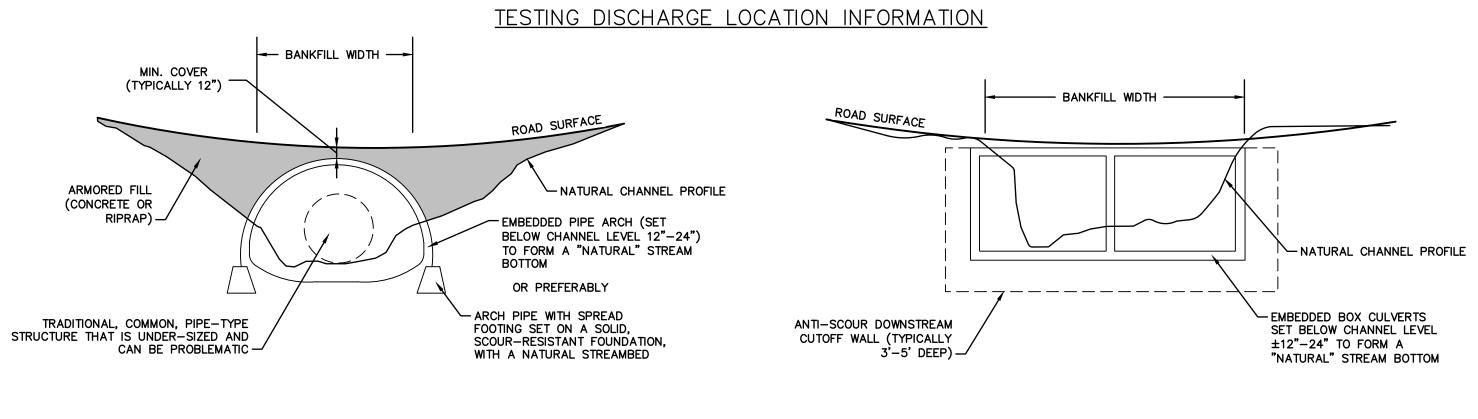
Test Break Name	Test Break Coc	ordinates	Proposed Outfall Coordinates		Anticipated Discharge Volume (gal)	Recommended Discharge Range (GPM)	Time to Release (days)	# of Hay Bale Structures	Receiving Water Name
	Latitude Lo		Latitude	Longitude	Anticipated Discharge Volume (gar)	Recommended Discharge Range (GFW)	Time to Release (uays)	# OF Hay bale structures	Receiving water Name
9A	37° 20' 30.66"	-80° 37' 9.84"	37° 20' 32.42"	-80° 37' 9.64'''	3,620,000	600 to 1200	4 to 2	2 to 4	Little Stony Creek
9B	37° 16' 7.85"	-80° 18' 52.91"	37° 16' 6.010"	-80° 18' 55.920"	1,580,000	300 to 600	4 to 2	1 to 2	North Fork Roanoke River
9C	37° 13' 50.92"	-80° 11' 53.89"	37° 13' 50.290"	-80° 11' 52.360'''	3,040,000	600 to 1200	4 to 2	2 to 4	UNT to Roanoke River



			<u>10-Year</u>		Existing	<u>Existing</u>	Proposed	Proposed	<u>Lidar</u>	<u>Lidar</u>	Invert	<u>Invert</u>				<u>Culvert</u>		
	Accesss Road	Drainage Area	Design Flow	<u>Culvert</u>	Inlet Cover	Outlet Cover	Inlet Cover	Outlet Cover	Elevation at	Elevation at	Elevation at	Elevation at	<u>Culvert</u>		Replacement Culvert	<b>Dimensions</b>	<u>Embedment</u>	
Stream ID	<u>Station</u>	<u>(ac)</u>	<u>(cfs)</u>	<u>Length (ft)</u>	<u>(ft)</u> <sup>3</sup>	<u>(ft)</u> <sup>3</sup>	<u>(ft)</u> <sup>4</sup>	<u>(ft)</u> <sup>4</sup>	Inlet (ft) <sup>1</sup>	<u>Outlet (ft)</u>	Inlet (ft) <sup>2</sup>	Outlet(ft) <sup>2</sup>	<u>Slope</u>	<b>Replacement Culvert Type</b>	<u>Material</u>	(Span/Rise)	<u>Depth (in)</u>	Scour Protection
S-MN32	33 + 35.49	426.08	524.55	12	3	3	7.667	7.667	1317.895	1317.827	1313.562	1313.494	0.6%	Box Culvert	Concrete	12'/8'	16	AASHTO Riprap Class A
S-MN33	25 + 83.30	14.23	40.40	12	2	2	2.75	2.75	1321.995	1321.737	1318.828	1315.570	2.2%	Box Culvert	Concrete	4'/3'	14	AASHTO Riprap Class A
S-MN34	20 + 88.96	87.49	278.12	12	1	1	5.313	5.313	1338.584	1337.743	1335.917	1335.076	7.0%	Box Culvert	Concrete	9'/6'	20	Grouted Riprap
<sup>1</sup> Roadway c	rest elevation ba	sed on Lidar elev	vation at inlet +	required fill.														

<sup>4</sup>Fill required to accommodate box culvert.

## DISCHARGE STRUCTURES TO BE USED FOR HYDROSTATIC TEST WATER NOT TO SCALE



"STREAM SIMULATION" EMBEDDED ARCH OR PIPE-ARCH CULVERTS

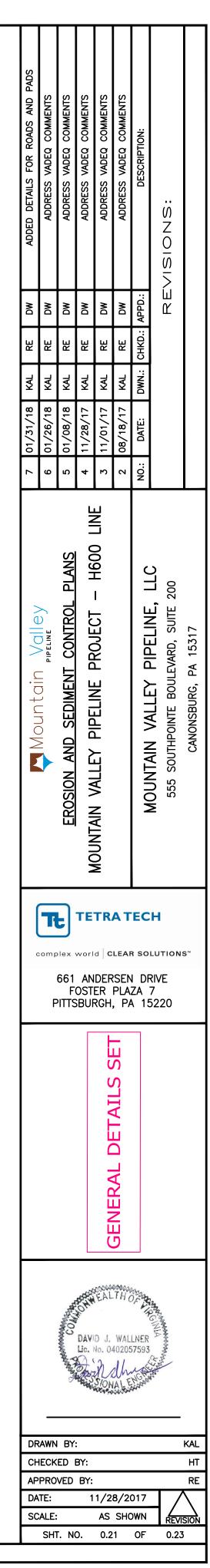
FISH PASSABLE EMBEDDED BOX CULVERT

# "FISH FRIENDLY" CULVERT STRUCTURES NOT TO SCALE

NOTE: LOW-WATER CROSSINGS THAT PROVIDE PASSAGE FOR FISH AND OTHER AQUATIC SPECIES. THE EMBEDDED CULVERTS WOULD HAVE A LAYER OF STREAMBED MATERIAL AT LEAST 1- TO 2-FOOT THICK COVERING THE CULVERT FLOOR.

<sup>2</sup> Calculated culvert invert based on Lidar elevations adjusted for stream depth from wetland data sheets.

<sup>3</sup>Based on wetland data sheet maximum top of bank height (assumed measurement from bottom of stream to top of road).



# GENERAL CONSTRUCTION SEQUENCE

THE FOLLOWING IS A GENERAL SEQUENCE FOR EARTHMOVING ACTIVITIES ASSOCIATED WITH CONSTRUCTION OF THE PIPELINE:

- 1. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS PRIOR TO EARTH DISTURBANCE. REFER TO BEST MANAGEMENT PRACTICES (BMP) INSTALLATION AND REMOVAL NOTES. APPROPRIATE BMPS SHOULD BE PLACED AROUND SENSITIVE AREAS PRIOR TO EARTH DISTURBANCE. STONE CONSTRUCTION ENTRANCES (SCE) ARE TO BE PROVIDED AT ALL LOCATIONS WHERE ACCESS ROADS AND PIPELINES WILL BE ACCESSING OR CROSSING A PUBLIC ROADWAY. NOTE THAT SILT FENCE, COMPOST FILTER SOCK AND SUPER SILT FENCE IS BEING INSTALLED AS PART OF A "SYSTEM" OF EROSION CONTROL BMPS INCLUDING CLEAN WATER DIVERSIONS, WATERBARS AND BONDED FIBER MATRIX. THIS BMP SYSTEM APPROACH ALLOWS MVP TO MANAGE SLOPE LENGTH LIMITATIONS OF SUPER SILT BY INTRODUCING SLOPE BREAKS AND ADDITIONAL SURFACE EROSION PROTECTION.
- 2. INSTALL TEMPORARY E&S CONTROLS FOR STREAM CROSSINGS AT LOCATIONS SHOWN ON THE E&S PLAN SHEETS. NO EARTH DISTURBANCE ACTIVITIES WITHIN 50 FEET OF STREAM CHANNELS WILL BE PERFORMED UNTIL MATERIALS NEEDED TO COMPLETE THE CROSSING ARE AT THE NEAREST AVAILABLE LOCATION.
- 3. GENERAL CLEARING AND GRUBBING OF THE TREES AND BRUSH ALONG THE RIGHT-OF-WAY (ROW) FOR PIPELINE TRENCHING MAY COMMENCE TO THE WIDTH SPECIFIED IN THE ROW AGREEMENTS OR CONSTRUCTION ALIGNMENT SHEETS, WHICHEVER IS LESS. SMALLER DEBRIS, SUCH AS SHRUBS OR LIMBS, ARE TO BE CHIPPED AND UTILIZED ON-SITE AS PART OF THE SOIL STABILIZATION. WHERE CHIPPED MATERIAL IS USED AS MULCH, SPREAD AT A RATE NOT TO EXCEED 1 TON/ACRE. UNLESS OTHERWISE DIRECTED BY THE LANDOWNER, LOGS WILL EITHER BE HAULED OFF-SITE OR GIVEN TO THE LANDOWNER UPON THEIR REQUEST; STUMPS AND/OR LOGS WILL BE GROUND, CHIPPED, WINDROWED, OR HAULED OFF-SITE.
- 4. INSTALL CLEAN WATER DIVERSIONS AND CLEAN WATER DIVERSION PIPES IN ACCORDANCE WITH VESCH STD & SPEC 3.09 AND MVP-ES50 AND MCP-ES50.1. IN ADDITION, INSTALL OUTLET STRUCTURES FOR CLEAN WATER PIPES IN ACCORDANCE WITH MVP-ES51 AND MVP-ES51.1. FOLLOWING INSTALLATION OF CLEAN WATER DIVERSION BERMS STABILIZE THE UPHILL SIDE OF THE BERM USING TEMPORARY SEED, EROSION CONTROL MATTING OR BONDED FIBER MATRIX. FINALLY INSTALL ROCK CHECK DAMS IN ACCORDANCE WITH VESCH STD & SPEC 3.20 EXCEPT THAT COMPOST FILTER SOCK OR NATIVE ROCK (SIZED APPROPRIATELY PER VESCH STD & SPEC 3.20) EXCAVATED DURING GRADING WILL BE USED FOR CONSTRUCTION.
- 5. INSTALL TEMPORARY AND PERMANENT RIGHT-OF-WAY DIVERSIONS/WATERBARS IMMEDIATELY AFTER INITIAL DISTURBANCE OF THE SOIL IN ACCORDANCE WITH THE WATERBAR SPACING AND SIZING REQUIREMENTS SHOWN ON THE PLAN AND DETAIL SHEETS (SEE DETAILS VADEQ STD & SPEC 3.11 AND MVP-17). RIGHT-OF-WAY DIVERSIONS/WATERBARS WILL BE CONSTRUCTED OF SOIL, AND USED TO REDUCE RUNOFF VELOCITY AND DIVERT WATER OFF THE PIPELINE ROW. WATERBARS WILL BE INSTALLED WITH SUMP FILTERS (DETAIL MVP-ES42) AT THE DISCHARGE END.
- 6. EXCAVATE PIPELINE TRENCH AND BEGIN GRADING OF PROPOSED METER AND RECTIFIER ANODE BED SITES. THE PROPOSED CONSTRUCTION ROW AND EXTRA WORKSPACES ARE TO BE USED AS A WORK AREA FOR TRENCH EXCAVATION, EQUIPMENT MOVEMENT AND THE TEMPORARY STORAGE OF SOIL STOCKPILES, AS NEEDED. EQUIPMENT, SOIL STOCKPILES, AND OTHER MATERIALS ARE TO REMAIN UPSLOPE OF BMPS DURING CONSTRUCTION ACTIVITIES. REFER TO BMP INSTALLATION AND REMOVAL SEQUENCE FOR THE BMPS TO BE USED FOR PROTECTION DURING TRENCH EXCAVATION AND AROUND TEMPORARY SOIL STOCKPILES. STOCKPILES AND NON-WORK AREA SLOPES WILL BE STABILIZED THROUGH AN APPLICATION OF EITHER MULCH (ORGANIC, EROSION CONTROL BLANKET OR BONDED FIBER MATRIX) OR TEMPORARY SEED. SEGREGATION OF TOPSOIL AND SUBSOIL WILL BE PERFORMED WHERE TRENCH EXCAVATION TAKES PLACE IN AN AGRICULTURAL, WETLAND, OR RESIDENTIAL AREA.
- 7. PIPELINE SECTIONS WILL BE TRANSPORTED TO THE WORK AREA AND STRUNG ALONG THE WORKING SIDE OF THE ROW PARALLEL TO THE TRENCH LINE. WELDING CAN OCCUR IN OR OUT OF THE TRENCH. THE PIPELINE WILL BE BENT TO CONFORM TO THE TRENCH CONTOUR, ALIGNED WELDED AND PLACED ON TEMPORARY SUPPORTS ALONGSIDE THE TRENCH. WELDS WILL BE VISUALLY AND RADIO-GRAPHICALLY INSPECTED AND REPAIRED AS NECESSARY. THE PIPE SECTION WILL BE LOWERED INTO THE TRENCH AND PLACED ON PADDING PER MVP CONSTRUCTION STANDARDS. ANY WETNESS ENCOUNTERED DURING CONSTRUCTION WORK WILL BE DEWATERED BY USING PUMPS, HOSES, AND PUMPED BAGS (DETAIL MVP-ES2), AND WILL BE DISCHARGED TO A WELL VEGETATED, UPLAND AREA.
- 8. STREAM PIPELINE CROSSING CONSTRUCTION METHODS WILL BE INSTALLED AT LOCATIONS SHOWN ON THE E&S PLAN SHEETS AND AS SPECIFIED ON DETAIL SHEET. STREAM BANK STABILIZATION WILL BE INSTALLED IMMEDIATELY FOLLOWING COMPLETION OF PIPELINE INSTALLATION AS SHOWN ON THE DETAIL SHEET.
- 9. INSTALL TRENCH BREAKERS AT LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY MVP AND AS SPECIFIED ON THE DETAIL SHEET (DETAIL MVP-20).
- 10. THE TRENCH WILL SUBSEQUENTLY BE BACKFILLED WITH SUITABLE EXCAVATED MATERIAL. THE BACKFILL MATERIAL WILL BE SLIGHTLY CROWNED IN UPLAND AREAS TO ALLOW FOR SETTLEMENT THAT MAY OCCUR. CROWNING THE SOIL SLIGHTLY OVER THE PIPELINE WILL HELP PREVENT FUTURE STORM WATER-RELATED PROBLEMS FROM SETTLING OF THE BACKFILLED AREA. NO CROWNING OF SOILS WILL TAKE PLACE IN WETLANDS, STREAMS, OR FLOOD PLAINS. IN AREAS WHERE TOPSOIL HAS BEEN SEGREGATED, THE SUBSOIL WILL BE REPLACED FIRST, AND THEN THE TOPSOIL WILL BE SPREAD OVER THE AREA FROM WHICH IT WAS REMOVED. DISTURBED AREAS WILL BE RESTORED TO THEIR APPROXIMATE ORIGINAL TOPOGRAPHIC CONTOURS.
- 11. STABILIZE EXPOSED AND UNWORKED SOILS BY APPLICATION OF EFFECTIVE BMPS THAT PROTECT THE SOIL FROM THE EROSIVE FORCES OF RAINDROPS, FLOWING WATER, AND WIND. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. WHERE A DENUDED AREA WILL REMAIN IDLE FOR MORE THAN 7 CALENDAR DAYS, TEMPORARY SEEDING (VA STD & SPEC 3.31, TABLE 3.31-B) WILL BE APPLIED TO THE ROUGH GRADED AREA. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
- 12. IN THE UNLIKELY EVENT THAT THERE ARE EXCESS EXCAVATED MATERIALS REMAINING AFTER THE TRENCH HAS BEEN BACKFILLED, THE MATERIAL IS TO BE DISPOSED OF WITHIN THE EXISTING ROW IN AN UPLAND AREA OUTSIDE OF THE 100-YEAR FLOOD PLAIN. MATERIAL WILL BE SPREAD IN A THIN LAYER AND TIED INTO EXISTING CONTOURS TO CREATE POSITIVE DRAINAGE FOR STORMWATER RUNOFF.
- 13. CONSTRUCT PERMANENT RIGHT-OF-WAY DIVERSION/WATERBARS AFTER COMPLETION OF GRADING IN ACCORDANCE WITH THE WATERBAR SPACING AND SIZING REQUIREMENTS SHOWN ON PLAN AND DETAIL SHEETS (DETAIL MVP-17).
- 14. PRIOR TO SEEDING MVP WILL DISC AREAS TO A DEPTH OF 4-6" TO FACILITATE REVEGETATION. DISCING WILL BE PERFORMED ON SUBSOILS TO A DEPTH OF 4-6" AND AGAIN FOLLOWING TOPSOILING.
- 15. REVEGETATE DISTURBED AREA PER THE TABLES ON DETAILS MVP-ES11.1 TO 11.9 AND MVP-12.1 TO 12.4 OR PER LANDOWNER REQUEST. FOR 3:1 OR STEEPER SLOPES THE DISTURBED AREA WILL HAVE EROSION CONTROL FABRIC (BLANKETING, HYDROSEEDING, FLEXTERRA, OR APPROVED EQUAL) INSTALLED AS SHOWN ON DETAIL SHEET (DETAILS VA STD & SPEC 3.36, MVP-ES40 AND MVP ES-40.1).
- 16. RE-ESTABLISH APPROPRIATE DRAINAGE IN EXISTING ROAD CHANNELS PRIOR TO SEEDING AND MULCHING.
- 17. CONDUCTING INSPECTIONS OF TEMPORARY ESC CONTROLS AND SWM BMPS ON AT LEAST THE FOLLOWING FREQUENCIES:
  - A. IN NON-TMDL WATERSHEDS
     AT LEAST ONCE EVERY FIVE BUSINESS DAYS, OR
  - •AT LEAST ONCE EVERY 10 BUSINESS DAYS AND NO LATER THAN 48 HOURS FOLLOWING A MEASURABLE STORM EVENT (OR ON THE NEXT BUSINESS DAY IF THE STORM EVENT OCCURS WHEN THERE ARE MORE THAN 48 HOURS BETWEEN BUSINESS DAYS. B. IN TMDL WATERSHEDS:
  - AT LEAST ONCE EVERY FOUR BUSINESS DAYS, OR
  - •AT LEAST ONCE EVERY 5 BUSINESS DAYS AND NO LATER THAN 48 HOURS FOLLOWING A MEASURABLE STORM EVENT (OR ON THE NEXT BUSINESS DAY IF THE STORM EVENT OCCURS WHEN THERE ARE MORE THAN 48 HOURS BETWEEN BUSINESS DAYS.

TEMPORARY BMP'S WILL BE REMOVED UPON ACHIEVING VEGETATIVE STABILIZATION, WHICH IS DEFINED AS "A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION". DISTURBED AREAS NOT ATTAINING AN ACCEPTABLE VEGETATIVE COVER SHALL BE RESEEDED AS NEEDED UNTIL THE ENDPOINT IS ACHIEVED.

18. ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND LEGALLY DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF SURFACE WATERS. WOODY DEBRIS MAY BE CHIPPED AND SPREAD ON-SITE. FOR STREAM CROSSINGS, REFER TO THE FOLLOWING STEPS:

- 1. INSTALL TEMPORARY EQUIPMENT BRIDGE, BYPASS HOSE, FLUME, PUMP, OR COFFERDAM AS DESCRIBED IN STREAM CROSSING DETAILS AROUND THE WORK AREA.
- 2. DEWATER WORK AREA UTILIZING PUMP WATER FILTER BAGS. WHERE POSSIBLE, EXCAVATION WILL BE FROM THE TOP OF THE STREAM BANK.
- 3. INSTALL TRENCH PLUGS, PIPE, AND BACKFILL.
- 4. STABILIZE CHANNEL EXCAVATION AND STREAM BANKS PRIOR TO REDIRECTING STREAM FLOW.
- 5. REMOVE BYPASS HOSE, FLUME, PUMP, AND TEMPORARY DAM AS NEEDED.
- IF WORKING WITHIN A WETLAND AREA, FOLLOW THE GENERALIZED CONSTRUCTION SEQUENCE BELOW:
- 1 INSTALL EITHER SUPER SILT FENCE, ORANGE CONSTRUCTION FENCE, OR COMPOST FILTER SOCKS ALONG THE PERIMETERS OF THE SITE AS SHOWN ON THE CONSTRUCTION DRAWINGS.
- 2. MATS, PADS, OR SIMILAR DEVICES WILL BE USED DURING THE CROSSINGS OF WETLANDS. ORIGINAL GRADES THROUGH WETLANDS MUST BE RESTORED AFTER TRENCHING AND BACKFILLING. ANY EXCESS FILL MATERIALS MUST BE REMOVED FROM THE WETLAND AND NOT SPREAD WITHIN WETLANDS.
- 3. SOIL EXCAVATED FROM WETLAND AREAS WILL BE CAREFULLY REMOVED WITH THE ROOTS INTACT. THIS SOIL WILL BE PLACED IN A SEPARATE STOCKPILE TO BE REUSED DURING THE WETLAND SURFACE RESTITUTION.
- 4. DEWATER WORK AREA UTILIZING PUMPED WATER FILTER BAGS.
- 5. INSTALL PIPE.
- 6. INSTALL TRENCH PLUGS IN WETLAND AREAS TO PREVENT THE TRENCH FROM DRAINING THE WETLAND OR CHANGING ITS HYDROLOGY.
- 7. BACKFILL PIPE TRENCH. BACKFILL THE TOP 12-INCHES OF THE EXCAVATED TRENCH WITH THE STOCKPILED WETLAND SOIL TO MATCH ORIGINAL SURFACE GRADES.
- 8. COMPACT BACKFILL AND GRADE THE SURFACE OF THE TRENCH AREA TO ALLOW FOR POSITIVE DRAINAGE TO SOIL E&SCS AND TO PREPARE DISTURBED AREAS FOR PERMANENT TRENCH RESTORATION.
- 9. MAINTAIN ALL E&SCS DEVICES UNTIL SITE WORK IS COMPLETE AND A GROUND COVER IS ACHIEVED THAT IS UNIFORM AND MATURE ENOUGH TO SURVIVE AND INHIBIT EROSION.
- 10. REMOVE ALL SOIL AND E&SC MEASURES UPON ESTABLISHMENT OF A GROUND COVER THAT IS UNIFORM AND MATURE ENOUGH TO SURVIVE AND INHIBIT EROSION. RE-GRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE SOIL E&SCS.

### BMP MAINTENANCE

- TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH THE APPROVED STANDARDS AND SPECIFICATIONS.
- IN NON-AGRICULTURAL AREAS THE VISUAL SURVEY SHALL BE COMPARED TO THE DENSITY AND COVER OF ADJACENT UNDISTURBED LANDS. IN AGRICULTURAL AREAS, THE VISUAL SURVEY SHALL BE COMPARED TO THE ADJACENT UNDISTURBED PORTIONS OF THE SAME FIELD, UNLESS THE EASEMENT AGREEMENT SPECIFIES OTHERWISE.
- WETLANDS ALONG THE PROPOSED PIPELINE ARE EXPECTED TO EXHIBIT VARYING DEGREES OF SATURATION AND WATER ELEVATION, REQUIRING A VARIETY OF PLANT SPECIES TO BE RE-ESTABLISHED. IN UNSATURATED WETLANDS, MOST VEGETATION WILL BE REPLACED BY SEEDING. SATURATED WETLANDS WILL TYPICALLY BE ALLOWED TO RE-VEGETATE NATURALLY. WETLAND REVEGETATION WILL BE CONSIDERED SUCCESSFUL WHEN THE COVER OF HERBACEOUS AND/OR WOODY SPECIES IS AT LEAST 80 PERCENT OF THE TYPE, DENSITY, AND DISTRIBUTION OF THE VEGETATION IN ADJACENT WETLAND AREAS THAT WERE NOT DISTURBED BY CONSTRUCTION. REVEGETATION EFFORTS WILL CONTINUE UNTIL WETLAND REVEGETATION IS SUCCESSFUL.
- CONDUCTING INSPECTIONS OF TEMPORARY ESC CONTROLS AND SWM BMPS AT LEAST ONCE EVERY FOUR BUSINESS DAYS.
- TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHOULD BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED.

## RESTORATION BMP PHASING

THE FOLLOWING IS THE SEQUENCE OF EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE REMOVAL AND INSTALLATION RELATED TO RESTORATION ACTIVITIES. THIS WORK WILL OCCUR BETWEEN RESTORATION OF PIPELINE LIMIT OF DISTURBANCE TO PRE-CONSTRUCTION GRADES AND FINAL CLOSURE OF THE PROJECT DEFINED AS "ACHIEVING VEGETATIVE STABILIZATION". THE SEQUENCE IS:

1) REMOVE AND GRADE OUT THE CLEAN WATER DIVERSION DIKE.

2) REMOVE DOWNSLOPE BMPS UTILIZED DURING CONSTRUCTION AND IMMEDIATELY REPLACE WITH 12-IN COMPOST FILTER SOCK. ON SLOPES GREATER THAN 30%, AN ADDITIONAL INTERMEDIATE 12-IN COMPOST FILTER SOCKS WILL BE PLACED PER THE SLOPE SPACING (MVP-ES3.2) TO ATTENUATE THE VELOCITY OF RUNOFF IN THE RECLAIMED AREA.

3) APPLY SPECIALTY SEEDS AS REQUIRED THAT WILL NOT BE INCLUDED IN THE MULCH PHASE (STEP 4), SEED THE AREA USING THE SEED MIXES AND RATES SPECIFIED IN MVP-ES11.1 TO MVP-ES11.9 AND MVP-ES12.1 TO MVP-ES12.4.

4) APPLY MULCH IN THE FORM OF ORGANIC MULCH (PER MVP-ES45), SOIL STABILIZATION MATTING (PER VADEQ STD & SPEC 3.36), OR HYDRAULIC EROSION CONTROL PRODUCT (PER MVP-ES40).

5) FOLLOWING A DETERMINATION THAT THE SITE HAS ACHIEVED VEGETATIVE STABILIZATION, THE COMPOST FILTER SOCK WILL BE "OPENED" AND THE MULCH CONTAINED WITHIN WILL BE SPREAD WITHIN THE LIMITS OF DISTURBANCE.

10								
ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	REVISIONS:						
M	DW	R Г						
RE	RE	RE	RE	CHKD.: APPD.:				
KAL	KAL	KAL	1					
01/31/18	01/26/18	01/08/18	11/28/17	11/01/17	08/18/17	DATE:		
7 01	6 01	5 01	4 11	3 11	2 08	NO.:		
Vallav Anhana Vallav	Gomp	661 F	TE worl AN OST	DER ER	SEN PLA	I DF ZA		<sup>∞</sup> CANONSBURG, PA 15317
					GENERAL DE LAILS SE I			
DF				D J.	WAL		A DATA	KAL
CH	AWN HECK	BY: ED I	Lic.	D J.	WAL	17593	A Source of the A State	KAL HT RE
CH AP DA	IECK	BY: ED I VED	Lic.	D J. No. 04 2/0N	WAL 40205	07593		ΗT

BEST MANAGEMENT PRACTICES (BMP) INSTALLATION & REMOVAL NOTES	STREAM
TEMPORARY AND PERMANENT BMPS WILL BE USED DURING CONSTRUCTION ACTIVITIES TO AVOID AND/OR MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS OF CONSTRUCTION ACTIVITIES.	<u>GENERAL:</u> PROCEDURE
THE FOLLOWING ARE GENERAL BMP INSTALLATION NOTES FOR PIPELINE CONSTRUCTION ACTIVITIES.	MINIMIZ     PIPELIN
<ul> <li>A STONE CONSTRUCTION ENTRANCE, PER VESCH STD &amp; SPEC 3.02 AND MVP-ES20, SHALL BE PROVIDED AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC WILL BE ACCESSING A PAVED ROAD DIRECTLY FROM A DISTURBED AREA.</li> </ul>	ONLY T     LIMIT O     FROM T
<ul> <li>TEMPORARY SEDIMENT BARRIERS, INCLUDING APPROPRIATELY SIZED COMPOST FILTER SOCK, SILT FENCE OR SILT FENCE WILL BE PLACED AROUND SOIL STOCKPILES, AS NEEDED.</li> </ul>	• STORIN AREAS
COMPOST FILTER SOCK WILL BE PLACED AROUND WETLANDS AND WATERBODIES IN AND ADJACENT TO THE WORK AREA PRIOR TO ANY TRENCHING ACTIVITIES. COMPOST FILTER SOCK HAS BEEN SIZED PER MVP-ES3 AND THE SIZE IS SPECIFIED ON THE PLAN SETS UTILIZING THE LINE TYPES CONTAINED IN THE LEGEND ON EACH SHEET.	SPOIL F     ONCE V     EMPHAS
• STOCKPILE SLOPES WILL BE 2:1 OR FLATTER, AND STOCKPILES WILL NOT EXCEED 35 FEET IN HEIGHT.	SPOILS

- TEMPORARY STREAM CROSSINGS SHALL BE INSTALLED AS INDICATED ON THE E&S PLAN SHEETS AND AS PER THE E&S DETAIL SHEETS.
- WATERBARS WILL BE INSTALLED IMMEDIATELY AFTER INITIAL DISTURBANCE OF THE SOIL IN ACCORDANCE WITH THE SPACING AND SIZING REQUIREMENTS SHOWN ON PLAN AND DETAIL SHEET. WATERBARS WILL BE CONSTRUCTED OF SOIL TO REDUCE RUNOFF VELOCITY AND DIVERT WATER OFF THE PIPELINE ROW.
- EXCAVATED TRENCH SPOIL MATERIAL WILL BE USED FOR TEMPORARY RIGHT OF WAY DIVERSIONS AS SHOWN IN THE DETAIL AT THE LOCATIONS INDICATED ON THE PLAN SHEETS.
- TRENCH DEWATERING, IF NEEDED, WILL BE CONDUCTED USING A PUMP AND HOSE. WATER WILL BE RELEASED INTO A FILTER BAG THAT WILL BE LOCATED IN A WELL-VEGETATED UPLAND AREA.
- TRENCH BREAKERS WILL BE INSTALLED ON SLOPES ADJACENT TO STREAMS, WETLANDS, AND ROAD CROSSINGS TO PREVENT SUBSURFACE EROSION. TRENCH BREAKERS WILL BE INSTALLED AS SHOWN ON THE DETAILS.
- THE WORK AREA WILL BE BACKFILLED FOLLOWING PIPELINE INSTALLATION OR OTHER EXCAVATION WORK. IN AREAS WHERE TOPSOIL HAS BEEN SEGREGATED. THE SUBSOIL WILL BE REPLACED FIRST, AND THEN THE TOPSOIL WILL BE SPREAD OVER THE AREA FROM WHICH IT WAS REMOVED. DISTURBED AREAS WILL BE RESTORED TO THEIR ORIGINAL TOPOGRAPHIC CONTOURS.
- PERMANENT WATERBARS, WILL BE CONSTRUCTED WITH A TWO PERCENT (TYPICAL) OUTSLOPE TO DIVERT SURFACE FLOW TO A WELL VEGETATED STABLE AREA.
- IMMEDIATELY FOLLOWING BACKFILLING ALL DISTURBED AREAS WILL BE GRADED IN PREPARATION FOR SEEDING AND MULCHING. PRIOR TO SEEDING MVP WILL DISC AREAS TO A DEPTH OF 4-6" TO FACILITATE REVEGETATION. DISCING WILL BE PERFORMED ON SUBSOILS TO A DEPTH OF 4-6" AND AGAIN FOLLOWING TOPSOILING. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL COVER MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. REFER TO TABLES ON THIS SHEET FOR TEMPORARY AND PERMANENT SEEDING SPECIFICATIONS.
- FOR 3:1 OR STEEPER SLOPES THE DISTURBED AREA WILL HAVE EROSION CONTROL BLANKETING INSTALLED AS INDICATED ON DETAIL SHEET.
- TEMPORARY SEDIMENT BARRIERS WILL BE MAINTAINED UNTIL VEGETATION HAS BECOME ESTABLISHED WITH A GROUND COVER THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION. ONCE THIS COVERAGE HAS BEEN OBTAINED, APPROPRIATE CONTROLS WILL BE REMOVED FROM THE WORK AREA. AREAS DISTURBED DURING THE REMOVAL OF THE EROSION CONTROLS WILL BE STABILIZED IMMEDIATELY.
- ALL WASTE MATERIAL WILL BE TRANSPORTED OFFSITE FOR RECYCLING AND/OR DISPOSAL AT A FACILITY APPROVED TO RECEIVE THE MATERIAL.
- IN NON-AGRICULTURAL AREAS THE VISUAL SURVEY SHALL BE COMPARED TO THE DENSITY AND COVER OF ADJACENT UNDISTURBED LANDS. IN AGRICULTURAL AREAS, THE VISUAL SURVEY SHALL BE COMPARED TO THE ADJACENT UNDISTURBED PORTIONS OF THE SAME FIELD, UNLESS THE EASEMENT AGREEMENT SPECIFIES OTHERWISE.
- WETLANDS ALONG THE PROPOSED PIPELINE ARE EXPECTED TO EXHIBIT VARYING DEGREES OF SATURATION AND WATER ELEVATION, REQUIRING A VARIETY OF PLANT SPECIES TO BE RE-ESTABLISHED. IN UNSATURATED WETLANDS, MOST VEGETATION WILL BE REPLACED BY SEEDING. SATURATED WETLANDS WILL TYPICALLY BE ALLOWED TO RE-VEGETATE NATURALLY. WETLAND REVEGETATION WILL BE CONSIDERED SUCCESSFUL WHEN THE COVER OF HERBACEOUS AND/OR WOODY SPECIES IS AT LEAST 80 PERCENT OF THE TYPE, DENSITY, AND DISTRIBUTION OF THE VEGETATION IN ADJACENT WETLAND AREAS THAT WERE NOT DISTURBED BY CONSTRUCTION. REVEGETATION EFFORTS WILL CONTINUE UNTIL WETLAND REVEGETATION IS SUCCESSFUL.

PERMANENT STABILIZATION SHALL OCCUR IMMEDIATELY UPON INSTALLATION, BACKFILLING, AND GRADING AT EACH STREAM CROSSING.

# CROSSING PROCEDURES

ES THAT WILL BE FOLLOWED AT STREAM CROSSING LOCATIONS INCLUDE THE FOLLOWING:

ZE CLEARING AND GRUBBING OF VEGETATION UP TO STREAMS, AS POSSIBLE, UNTIL THE TIME OF THE NE INSTALLATION;

THAT AREA WHICH IS REQUIRED FOR PIPELINE INSTALLATION SHALL BE DISTURBED WITHIN THE PROPOSED OF DISTURBANCE OR RIGHT-OF-WAY AT STREAM CROSSINGS; LOCATING STAGING AREAS 50 FEET AWAY THE STREAM, WHERE POSSIBLE;

IG CHEMICALS, STORING EQUIPMENT, WASHING EQUIPMENT, OR REFUELING EQUIPMENT MUST BE DONE IN THAT ARE GREATER THAN 100 FEET AWAY FROM THE STREAM;

PILE PLACEMENT AND BMPS WILL BE MONITORED AT ALL TIMES DURING STREAM CROSSING PROCEDURES; WORK WITHIN A STREAM AREA IS STARTED, IT WILL BE CONDUCTED CONTINUOUSLY TO COMPLETION; SIS WILL BE PLACED ON MINIMIZING TIME OF DISTURBANCE;

FROM STREAM CROSSINGS MUST BE PLACED AT LEAST 10 FEET FROM THE WATER'S EDGE; AND

• CONSTRUCTION EQUIPMENT WILL NOT BE ALLOWED IN THE STREAM CHANNEL WHEN EXCAVATION CAN BE DONE FROM EITHER SIDE OR A TEMPORARY CROSSING WHILE WORKING AT THE STREAM CROSSING.

• ESC BMPS WILL BE MONITORED/MAINTAINED AT ALL TIMES FOLLOWING INITIAL EARTH DISTURBANCE AND WILL CONTINUE UNTIL RESTORATION IS DEEMED COMPLETE.

THE FOLLOWING SECTIONS DESCRIBE STREAM CROSSING TECHNIQUES THAT MAY BE USED DURING PIPELINE RELOCATION /INSTALLATION ACTIVITIES. REFER TO THE DETAIL SHEETS AND APPROVED STANDARDS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

### DRY CROSSING TECHNIQUES:

THESE TECHNIQUES WILL BE USED TO PERFORM PIPELINE WORK IN A RELATIVELY DRY WORKING CONDITION OR AROUND THE OPEN EXCAVATION. THESE TECHNIQUES INCLUDE PUMP AROUND AND FLUME PIPE CROSSING METHODS. THE LIMITING FACTORS FOR THESE TECHNIQUES ARE USUALLY STREAM SIZE, FLOW, AND WATER DEPTH.

DIRECTIONAL BORING IS ALSO A TECHNIQUE THAT CAN BE UTILIZED AS IT WILL LESSEN THE IMPACTS ON THE WATERBODIES.

E&S CONTROL MEASURES WILL BE INSTALLED PRIOR TO ANY EARTH DISTURBANCE AND MONITORED/MAINTAINED UNTIL CONSTRUCTION AND RESTORATION THROUGH THE WATER-BODY IS COMPLETE.

FLUME PIPE METHOD: PLEASE SEE DETAIL SHEETS AND SWPPP FOR MORE INFORMATION ON THE FLUME PIPE METHOD. THIS PROCEDURE INVOLVES CONSTRUCTING TWO BULKHEADS, EITHER SANDBAGS OR PLASTIC DAMS, TO DIRECT THE STREAM FLOW THROUGH A FLUME PIPE PLACED OVER THE TRENCH PRIOR TO EXCAVATION. THE FLUME SHALL BE ALIGNED AS TO PREVENT BANK EROSION AND BED SCOUR. THE FLUME WILL NOT BE REMOVED DURING TRENCHING, PIPE LAYING OR BACKFILLING.

PUMP AROUND METHOD: PLEASE SEE THE DETAIL SHEETS AND APPROVED STANDARDS AND SPECIFICATIONS FOR MORE INFORMATION ON THE PUMP AROUND METHOD. THIS PROCEDURE INVOLVES CONSTRUCTING TWO BULKHEADS, EITHER SANDBAGS OR PLASTIC DAMS. THE UPSTREAM DAM WILL CAUSE THE WATER TO POND WHERE IT CAN BE PUMPED AROUND THE WORK AREA AND BE DISCHARGED BEHIND THE DOWNSTREAM BULKHEAD. PUMPS OF SUFFICIENT SIZE TO TRANSMIT THE FLOW DOWNSTREAM WILL BE USED. BACKUP PUMPS MUST BE ON-SITE. PUMP INTAKES MUST BE SCREENED. PUMP DISCHARGES MUST NOT CAUSE SCOUR.

TEMPORARY ROAD CROSSINGS

TEMPORARY ROAD CROSSINGS, CONSISTING OF BRIDGES OF TIMBER MATS OR CLEAN ROCK FILL AND FLUME(S), WILL BE INSTALLED TO CROSS MINOR OR INTERMEDIATE STREAMS. TIMBER MATS SHALL BE USED TO CROSS SMALLER STREAMS WHERE THE SPAN OF THE MAT WILL STRETCH FROM BANK TO BANK. CLEAN ROCK FILL AND FLUMED CROSSINGS WILL BE UTILIZED WHERE IT IS NOT FEASIBLE TO UTILIZE TIMBER MATS. AS AN ALTERNATIVE, PORTABLE BRIDGES MAY BE USED INSTEAD FOR SMALL CROSSINGS. EQUIPMENT WILL NOT BE ALLOWED TO FORD FLOWING STREAMS DURING CONSTRUCTION ACTIVITIES. TEMPORARY ROAD CROSSINGS OF STREAMS MUST MAINTAIN FOR ADEQUATE FLOW DOWNSTREAM.

### STREAM BANK STABILIZATION:

LEGEND	<ul> <li>CLEAN WATER DIVERSION DIKE (SEE DETAIL MVP-ES50 AND MVP-ES51</li> <li>STREAM</li> <li>US FOREST SERVICE (NATIONAL FOREST) LANDS</li> <li>APPALACHIAN NATIONAL SCENIC TRAIL</li> <li>EXISTING ROAD/TRAIL</li> <li>EXISTING PROPERTY LINE</li> <li>EXISTING STATE LINE</li> <li>EXISTING COUNTY LINE</li> <li>POND</li> <li>WETLAND</li> </ul>	ADDED DETAILS FOR ROADS AND PADS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	ADDRESS VADEQ COMMENTS	VADEQ	ADDRESS VADEQ COMMENTS	DESCRIPTION:	SIONS:	
	- ACID FORMING MATERIAL							0.:	Г Ы	
AGRI AGRI AGRI	– AGRICULTURAL LAND USE BOUNDARY = PROPOSED LIMIT OF DISTURBANCE	M	ð	ð	ð	ð	M	: APPD.:	Ľ	
DOMN DOMN	- PROPOSED ACCESS ROAD CENTERLINE	RE	盟	R	R	R	RE	CHKD.:		
REX	- PROPOSED PIPELINE - PROPOSED SILT FENCE	KAL	Ł	KAL	Ł	KAL	KAL	DWN.:		
	- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)	1/18	5/18	3/18	3/17	117	3/17	ц.		
RFD RFD EQT	– PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP–ES9, 9.1, 9.2, 9.3) – ORANGE CONSTRUCTION SAFETY FENCE	01/31	01/26,	01/08,	11/28,	11/01/	08/18/	DATE:		
OVH	– PROPOSED 12" COMPOST FILTER SOCK (SEE DETAILS MVP–ES3, 3.1, 3.2) – PROPOSED 18" COMPOST FILTER SOCK (SEE DETAILS MVP–ES3, 3.1, 3.2)	2	9	5	4	٣	2	NO.:		
>>	- PROPOSED 24" COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)	Γ			Ļ	ц				
COL	– GRASS–LINED CHANNEL (SEE DETAIL MVP–ES39) – CLEAN WATER DIVERSION PIPE				6					
	TIMBER MAT (SEE DETAIL MVP-ES37)			PLANS		DU0H		¢		
	STEEP SLOPE EROSION CONTROL (SEE NOTE 2)		>			I			E 200	
	STEEP SLOPE AREAS (SEE NOTE 4)		PIPELINE	CONTRO		<b>PRUVEU</b>			, SUITE	5317
	PROPOSED ROCK CONSTRUCTION ENTRANCE				ן ב	л Ч Ч			BOULEVARD,	PA 15
<b>-</b>	PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20) TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)	•		SEDIMENT					·	URG,
Ā	PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)	2 - -		AND SEC	l (	<b>FIFELINE</b>			SOUTHPOINTE	CANONSBURG
ACCORDANCE 2. FLEXTERRA, E	REGATION WILL BE PERFORMED IN ALL—CONSTRUCTION AREAS OF THE PROJECT IN WITH DETAIL MVP—ES46.1 THROUGH MVP—ES46.3. ARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL DIRECTED BY MVP.					MUUNIAIN				
<ol> <li>CONTRACTOR FOR INFORMA</li> <li>SLOPES OF 3 SLOPE TECHN STABILIZATION MOUNTAIN VA</li> <li>WHERE CONS THE CONTRAC</li> <li>IMPROVEMENT</li> </ol>	IS RESPONSIBLE TO IDENTIFY ALL UTILITIES. THE UTILITY LINES SHOWN ON THE PLAN ARE TIONAL PURPOSES ONLY AND DO NOT REPRESENT SURVEYED LINE INFORMATION. O' OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP IQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE—SPECIFIC DESIGN OF MEASURES IN SELECTED HIGH—HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED LEY PIPLELINE PROJECT. TRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS TOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP. S TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE ESS ROAD DETAILS.		com	•1ex 661 F	wor AN OST	Id   c IDEF ER	RSEN PLA	r so I Df ZA	lutions' RIVE	м
7. TEMPORARY A PERMANENT F 8. ALL NON VMF	CCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY OAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS. IC STREAM CROSSINGS WILL BE PERFORMED AS DESCRIBED IN THE STREAM CROSSING DED IN THIS PACKAGE.						GENERAL DETAILS SET			
		CI	IECK	N BY	Lic. : BY: BY:	No. 0	WALL WALL WALL WALL WALL WALL WALL WALL	57593		(AL HT RE