APPENDIX C-3
E&S Plan Sheets

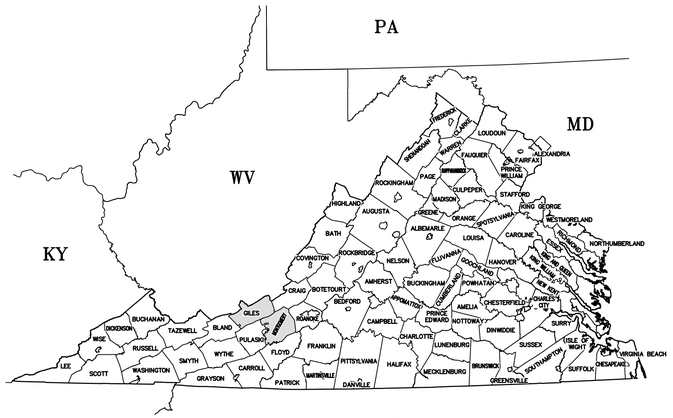
MOUNTAIN VALLEY PIPELINE, LLC

EROSION & SEDIMENT CONTROL DETAILS

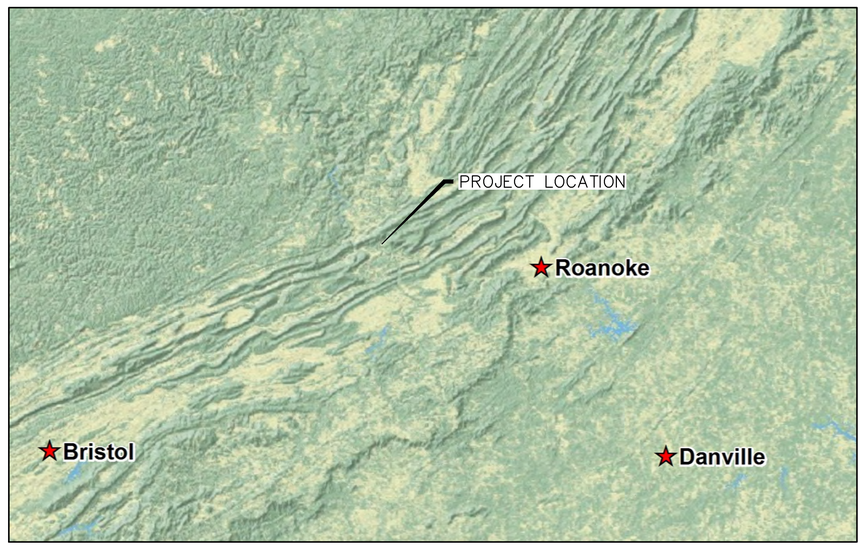
MVP PIPELINE PROJECT
JEFFERSON NATIONAL FOREST

OCTOBER 20, 2017

DRAWING INDEX	
SHEET NO.	DRAWING TITLE
GENERAL SET	
0.00JNF	COVER SHEET
0.01JNF TO 0.17JNF	EROSION AND SEDIMENT CONTROL DETAILS
0.18JNF TO 0.19JNF	GENERAL NOTES AND LEGEND
MONROE/GILES COUNTY	
12.01JNF	KEY PLAN
11.43JNF	EROSION & SEDIMENT CONTROL PLAN (MONROE COUNTY WV)
11.43AJNF	GENERAL DIRECTION FOR EROSION CONTROL AND SEEDING
12.02JNF TO 12.51JNF	EROSION & SEDIMENT CONTROL PLANS
12.52JNF TO 12.53JNF	POCAHONTAS ROAD (FR#972) CROSS SECTIONS
MONTGOMERY COUNTY	
13.01JNF	KEY PLAN
13.02JNF TO 13.06JNF	EROSION & SEDIMENT CONTROL PLANS
13.06AJNF	VMRC STREAM CROSSING (CRAIG CREEK)



LOCATION MAP
N.T.S.



LOCATION MAP
MVP PIPELINE PROJECT
GILES COUNTY, VIRGINIA TO MONTGOMERY COUNTY, VIRGINIA

WATERS OF THE U.S. PERMITS CERTIFICATION

I HEREBY CERTIFY THAT ALL WETLANDS PERMITS REQUIRED BY LAW WILL BE OBTAINED PRIOR TO COMMENCING WITH LAND DISTURBING ACTIVITIES.

SIGNATURE _____

OWNER/DEVELOPER _____

NAME TITLE

NOTE: PERMITS MUST BE PRESENTED TO THE COUNTY INSPECTOR PRIOR TO LAND DISTURBANCE.

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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.

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – COVER SHEET
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

TETRA TECH
complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

GENERAL DETAIL SET

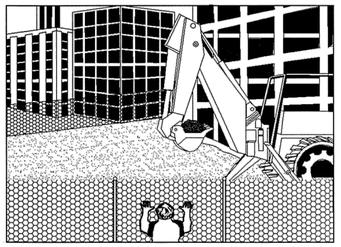
COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.00JNF OF 13.06JNF

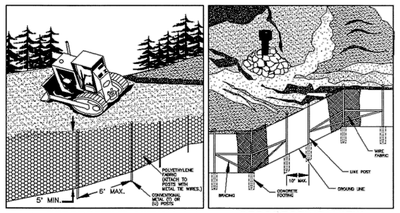
TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\00 – General\JNF\7157ES000.dwg PLOTTED ON: 10/26/2017 7:48 AM PLOTTED BY: Rickabough, Greg PLOT FILE: ENVIRONMENTAL_COLOR.ctb

1992 3.01

SAFETY FENCE



PERSPECTIVE VIEW



PERSPECTIVE VIEW
PLASTIC FENCE

PERSPECTIVE VIEW
METAL FENCE

Source: Adapted from Conwed Plastics and VDOT Road and Bridge Standards

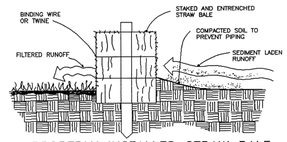
Plate 3.01-1

SAFETY FENCE
TAKEN FROM VADEQ 1992 MANUAL

June 3, 2022

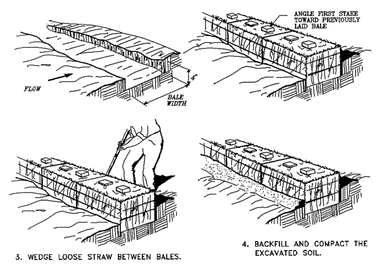
1992 3.04

STRAW BALE BARRIER



PROPERLY INSTALLED STRAW BALE
(CROSS SECTION)

1. EXCAVATE THE TRENCH.
2. PLACE AND STAKE STRAW BALES.



3. WEDGE LOOSE STRAW BETWEEN BALES.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

CONSTRUCTION OF STRAW BALE BARRIER

Source: Va. DSWC

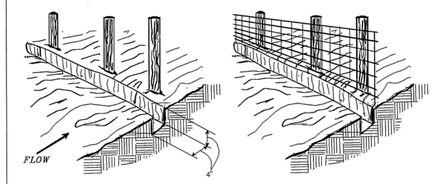
Plate 3.04-1

STRAW BALE BARRIER
TAKEN FROM VADEQ 1992 MANUAL

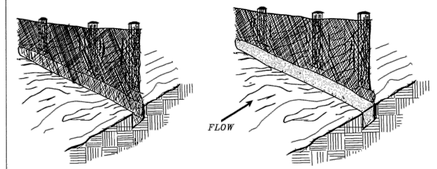
1992 3.05

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

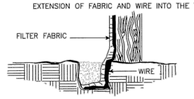
1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.
2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.



Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

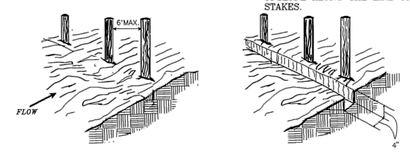
Plate 3.05-1

CONSTRUCTION OF SILT FENCE
(WITH WIRE SUPPORT)
TAKEN FROM VADEQ 1992 MANUAL

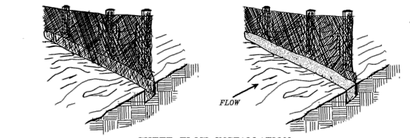
1992 3.05

CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)

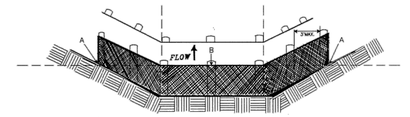
1. SET THE STAKES.
2. EXCAVATE A 4"X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SHEET FLOW INSTALLATION
(PERSPECTIVE VIEW)



POINTS A SHOULD BE HIGHER THAN POINT B.
DRAINAGEWAY INSTALLATION
(FRONT ELEVATION)

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

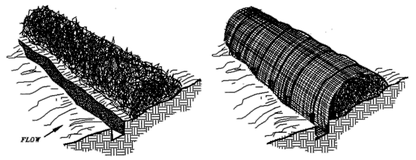
Plate 3.05-2

CONSTRUCTION OF SILT FENCE
(WITHOUT WIRE SUPPORT)
TAKEN FROM VADEQ 1992 MANUAL

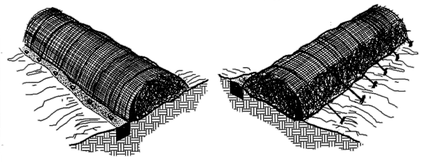
1992 3.06

CONSTRUCTION OF A BRUSH BARRIER COVERED BY FILTER FABRIC

(TREE/RESIDUAL MATERIAL WITH DIAMETER > 6")



1. EXCAVATE A 4"X 4" TRENCH ALONG THE UPHILL EDGE OF THE BRUSH BARRIER.
2. DRAPE FILTER FABRIC OVER THE BRUSH BARRIER AND INTO THE TRENCH. FABRIC SHOULD BE SECURED IN THE TRENCH WITH STAKES SET APPROXIMATELY 36" O.C.



3. BACKFILL AND COMPACT THE EXCAVATED SOIL.
4. SET STAKES ALONG THE DOWN-HILL EDGE OF THE BRUSH BARRIER, AND ANCHOR BY TYING TWINE FROM THE FABRIC TO THE STAKES.

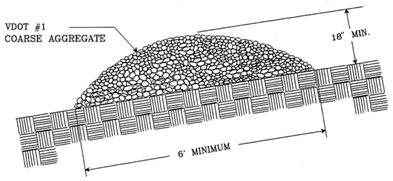
Source: Va. DSWC

Plate 3.06-1

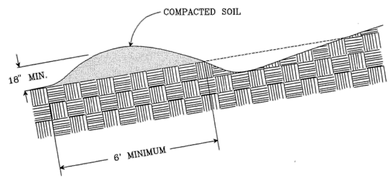
CONSTRUCTION OF A BRUSH BARRIER
TAKEN FROM VADEQ 1992 MANUAL

1992 3.11

TEMPORARY RIGHT-OF-WAY DIVERSIONS



TYPICAL GRAVEL STRUCTURE



TYPICAL EARTHEN STRUCTURE

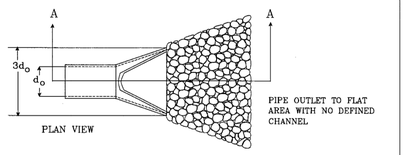
Source: Va. DSWC

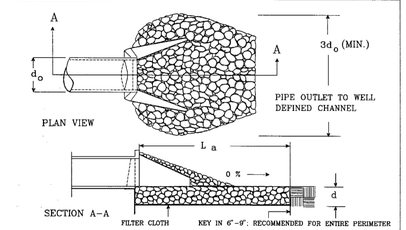
Plate 3.11-1

TEMPORARY RIGHT-OF-WAY DIVERSION
DEVELOPED FROM VADEQ 1992 MANUAL

1992 3.18

PIPE OUTLET CONDITIONS





NOTES: 1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18-3 AND 3.18-4
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

Source: Va. DSWC

Plate 3.18-1

PIPE OUTLET CONDITIONS
TAKEN FROM VADEQ 1992 MANUAL

REVISIONS:

NO.:	DATE:	DWN.:	CHK'D:	APP'D.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.01JNF OF 13.06JNF

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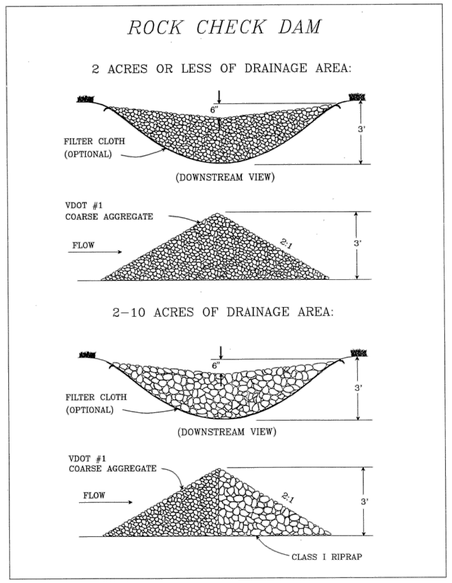


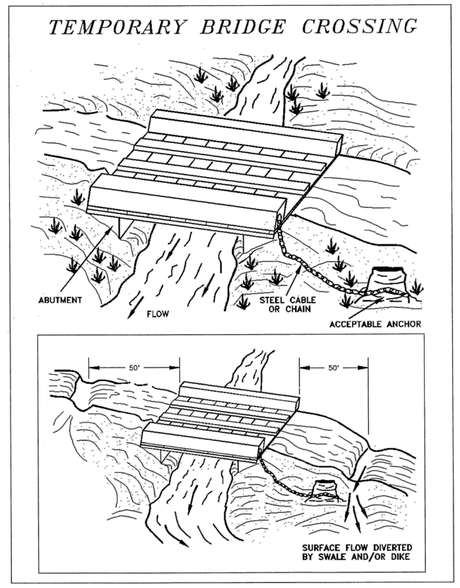
Source: Va. DSWC

Plate 3.20-1

ROCK CHECK DAM
DEVELOPED FROM VADEQ 1992 MANUAL

NOTES:
NO FORMAL DESIGN IS REQUIRED FOR A CHECK DAM, HOWEVER THE FOLLOWING CRITERIA SHOULD BE ADHERED TO WHEN SPECIFYING CHECK DAMS:

1. THE DRAINAGE AREA OF THE DITCH OR SWALE BEING PROTECTED SHALL NOT EXCEED 2 ACRES WHEN VDOT #1 COARSE AGGREGATE IS USED ALONE AND SHALL NOT EXCEED 10 ACRES WHEN A COMBINATION OF CLASS I RIPRAP (ADDED FOR STABILITY) AND VDOT #1 COARSE AGGREGATE IS USED.
2. THE MAXIMUM HEIGHT OF THE DAM SHALL BE 3.0 FEET.
3. THE CENTER OF THE CHECK DAM MUST BE AT LEAST 6 INCHES LOWER THAN THE OUTER EDGES. FIELD EXPERIENCE HAS SHOWN THAT MANY DAMS ARE NOT CONSTRUCTED TO PROMOTE THIS "WEIR" EFFECT. STORMWATER FLOWS ARE THEN FORCED TO THE STONE-SOIL INTERFACE, THEREBY PROMOTING SCOUR AT THE POINT AND SUBSEQUENT FAILURE OF THE STRUCTURE TO PERFORM ITS INTENDED FUNCTION.
4. FOR ADDED STABILITY, THE BASE OF THE CHECK DAM CAN BE KEYED INTO THE SOIL APPROXIMATELY 6 INCHES.
5. THE MAXIMUM SPACING BETWEEN THE DAMS SHOULD BE SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
6. HAND OR MECHANICAL PLACEMENT WILL BE NECESSARY TO ACHIEVE COMPLETE COVERAGE OF THE DITCH OR SWALE AND TO INSURE THAT THE CENTER OF THE DAM IS LOWER THAN THE EDGES.
7. FILTER CLOTH MAY BE USED UNDER THE STONE TO PROVIDE A STABLE FOUNDATION AND TO FACILITATE THE REMOVAL OF THE STONE.

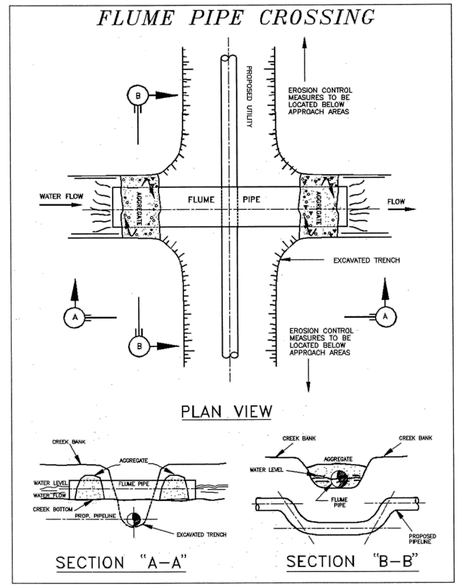


Source: 1983 Maryland Standards and Specifications for Soil Erosion and Sediment Control

Plate 3.24-1

NOTE: TIMBER MATS IN THE JEFFERSON NATIONAL FOREST WILL BE INSPECTED DAILY AND REPLACED/REPAIRED AS NECESSARY

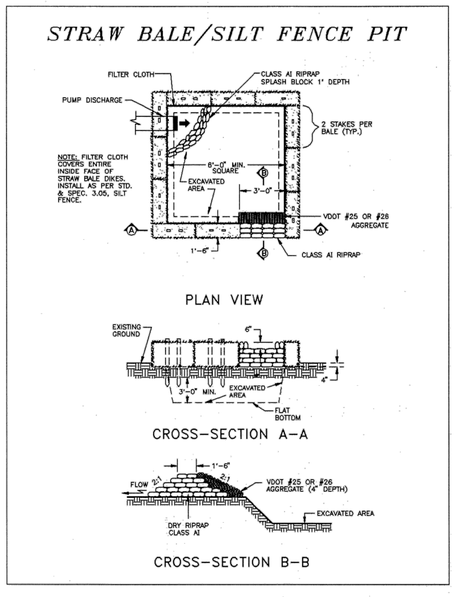
TEMPORARY BRIDGE CROSSING
DEVELOPED FROM VADEQ 1992 MANUAL



Source: Va. DSWC

Plate 3.25-3

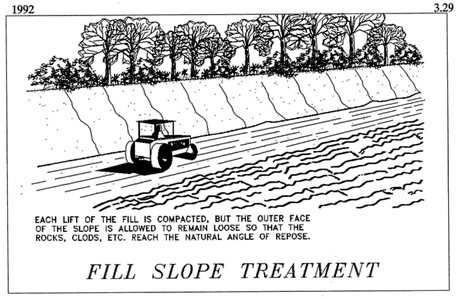
FLUME PIPE CROSSING
DEVELOPED FROM VADEQ 1992 MANUAL



Source: Va. DSWC

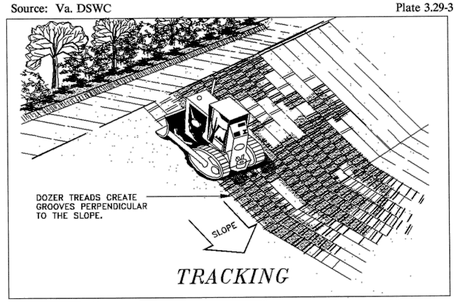
Plate 3.26-3

STRAW BALE/SILT FENCE PIT
DEVELOPED FROM VADEQ 1992 MANUAL



Source: Va. DSWC

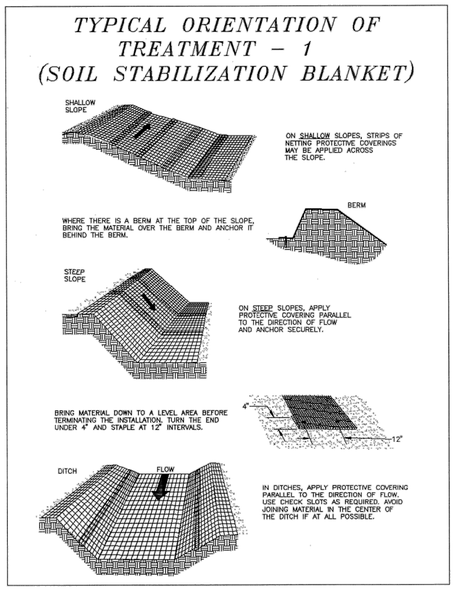
Plate 3.29-3



Source: Michigan Soil Erosion and Sedimentation Guide

Plate 3.29-4

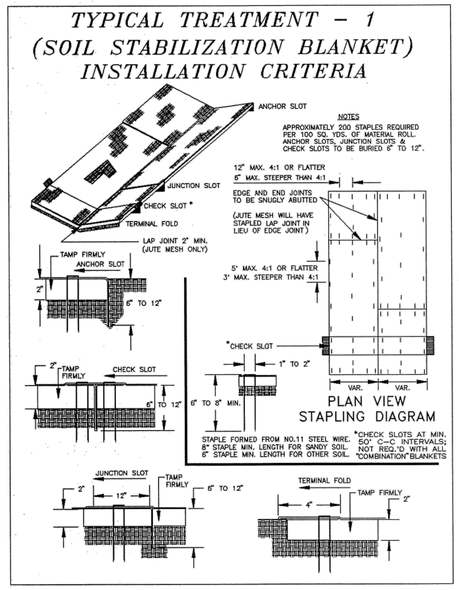
FILL SLOPE TREATMENT & TRACKING
TAKEN FROM VADEQ 1992 MANUAL



Source: Adapted from Ludlow Products Brochure

Plate 3.36-1

TYPICAL ORIENTATION OF TREATMENT
SOIL STABILIZATION BLANKET
DEVELOPED FROM VADEQ 1992 MANUAL



Source: VDOT Road and Bridge Standards

Plate 3.36-2

SOIL STABILIZATION BLANKET
INSTALLATION CRITERIA
DEVELOPED FROM VADEQ 1992 MANUAL

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

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PITTSBURGH, PA 15220

GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
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REVISION

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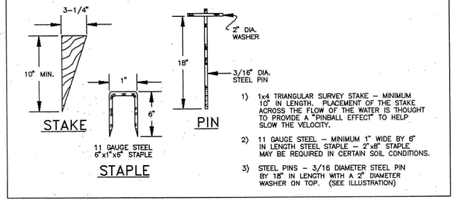
STAKES, STAPLES, & PINS FOR INSTALLATION OF TREATMENT – 2 SOIL STABILIZATION MATTING



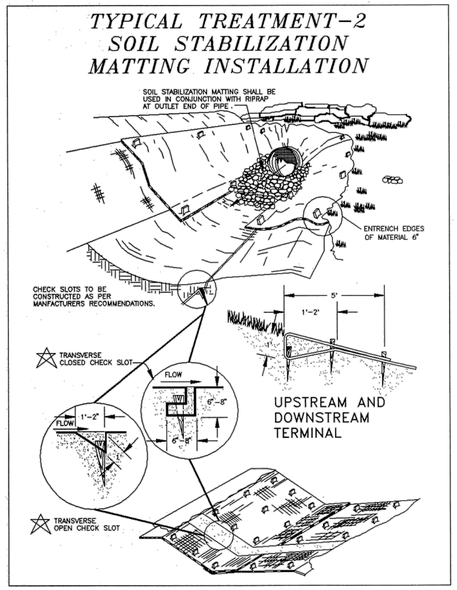
Source: Product literature from Greenstreak, Inc. Plate 3.36-3

Installation Requirements

Site Preparation - After site has been shaped and graded to approved design, prepare a friable seedbed relatively free from clods and rocks more than 1 inch in diameter, and any foreign material that will prevent contact of the soil stabilization mat with the soil surface. If necessary, redirect any runoff away from the ditch or slope during installation.

STAKES, STAPLES, & PINS FOR INSTALLATION OF SOIL STABILIZATION MATTING
DEVELOPED FROM VADEQ 1992 MANUAL

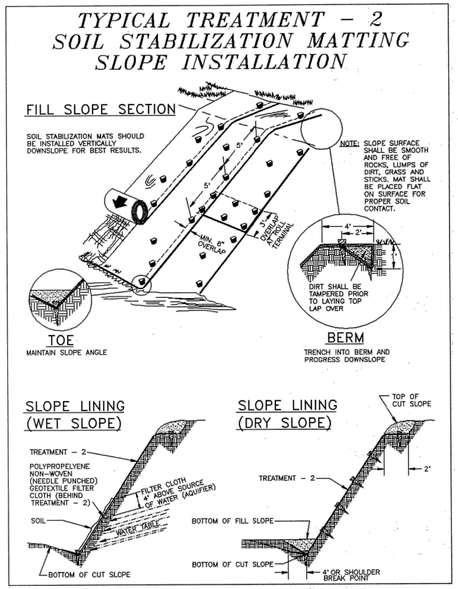
TYPICAL TREATMENT–2 SOIL STABILIZATION MATTING INSTALLATION



Source: VDOT Road and Bridge Standards Plate 3.36-4

TYPICAL TREATMENT
SOIL STABILIZATION MATTING INSTALLATION
DEVELOPED FROM VADEQ 1992 MANUAL

TYPICAL TREATMENT – 2 SOIL STABILIZATION MATTING SLOPE INSTALLATION

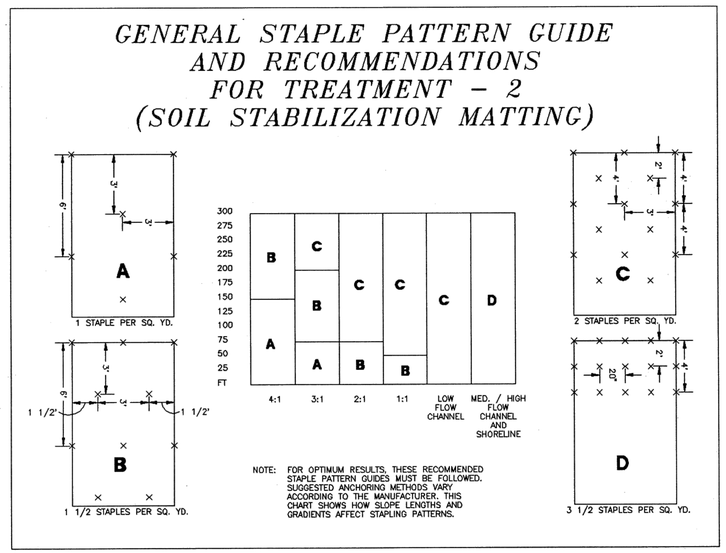


Source: VDOT Road and Bridge Standards Plate 3.36-5

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 AND RECOMMENDATIONS FOR TREATMENT – 2 (SOIL STABILIZATION MATTING)



Source: Product literature from North American Green Plate 3.36-6

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

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					REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

TETRA TECH
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661 ANDERSEN DRIVE
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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

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SHT. NO.	0.03JNF OF 13.06JNF

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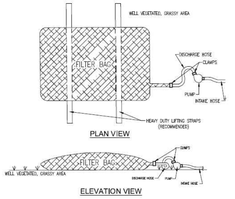

ELEVATION VIEW

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

Property	Test Method	Minimum Standard
Avg. Wide Width Strength	ASTM D-4884	60 lb/in
Grab Tensile	ASTM D-4632	205 lb
Puncture	ASTM D-4833	110 lb
Mullen Burst	ASTM D-3786	350 psi
UV Resistance	ASTM D-4355	70%
AOS % Retained	ASTM D-4751	80 Sieve

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME ½ FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

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

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

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

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR ½ THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

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

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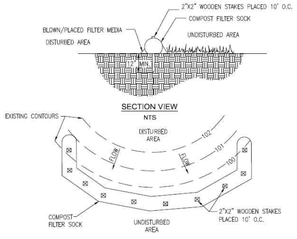
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

PUMPED WATER FILTER BAG

DRAWING NO. MVP–ES2 | REV. 0



SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED MAXIMUM PERMISSIBLE SLOPE LENGTH ABOVE COMPOST FILTER SOCKS. STAKES MAY BE INSTALLED IMMEDIATELY DOWNSLOPE OF THE SOCK IF SO SPECIFIED BY THE MANUFACTURER.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVEGROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

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

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

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

COMPOST FILTER SOCK

DRAWING NO. MVP–ES3 | REV. 0

TABLE 4.1

Compost Sock Fabric Minimum Specifications

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12"	12"	12"	12"	12"
	18"	18"	18"	18"	18"
		24"	24"	24"	24"
		32"	32"	32"	32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting	HDPE biaxial net				
	Continuously wound				
	Fusion-welded junctures				
	3/4" X 3/4" Max. aperture size				
Outer Filtration Mesh	Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max. aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

TABLE 4.2

Compost Standards

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

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

COMPOST FILTER SOCK TABLES

DRAWING NO. MVP–ES3.1 | REV. 0

Slope Percent	Maximum Slope Length for Compost Filter Sock in Feet				
	Note: Table developed from Filtrexx Sediment Control product cut sheet by Filtrexx International, LLC. As a general reference. Refer to manufacturers specifications for brand of compost filter sock used.				
	8 in	12 in	18 in	24 in	32 in
2 (or less)	600	750	1000	1300	1650
5	400	500	550	650	750
10	200	250	300	400	500
15	140	170	200	325	450
20	100	125	140	260	400
25	80	100	110	200	275
30	60	75	90	130	200
35	60	75	80	115	150
40	60	75	80	100	125
45	40	50	60	80	100
50	40	50	55	65	75

MAXIMUM SLOPE LENGTH ABOVE COMPOST FILTER SOCK AND RECOMMENDED DIAMETER

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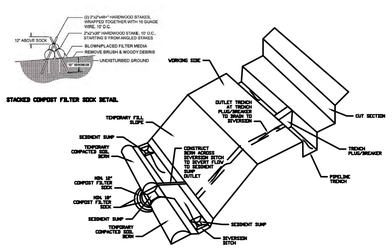
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

COMPOST FILTER SOCK TABLES

DRAWING NO. MVP–ES3.2 | REV. 0



NOTES:

1. TEMPORARY RIGHT OF WAY DIVERSION AND OUTLET INTENDED FOR USE IN LIEU OF SILT FENCING OR COMPOST FILTER SOCK ALONG STRAIGHT SECTIONS OF RIGHT OF WAY LOCATED NEAR RIDGE LINES OR OTHER UPLAND AREAS WHICH ARE 200 FT OR MORE UPSLOPE OF IDENTIFIED STREAMS OR WETLANDS.
2. ROLLED EROSION CONTROL PRODUCT AND/OR MULCHING SHALL BE USED TO STABILIZE THE TEMPORARY COMPACTED SOIL BERM, DIVERSION DITCH, AND TEMPORARY FILL SLOPE.
3. THE DIVERSION DITCH SHALL BE SIZED BASED ON THE DRAINAGE AREA AND STD & SPEC 3.12 (DIVERSION) DETAILED IN THE VESCH.
4. SPOIL FROM THE PIPELINE TRENCH TO BE USED TO CONSTRUCT THE TEMPORARY SOIL BERM.
5. OUTLET TRENCH TO BE CUT FROM THE PIPELINE TRENCH TO THE DIVERSION DITCH AT TRENCH PLUGS/BREAKERS AND AT LOW POINTS IN THE PIPELINE TRENCH.
6. TEMPORARY FILL SLOPE TO BE CONSTRUCTED NO STEEPER THAN 2H:1V.
7. SIDE SLOPES OF TEMPORARY SOIL BERM AND DIVERSION DITCH SHALL BE NO STEEPER THAN 2H:1V.
8. ENDS OF COMPOST FILTER SOCK AT SUMP/ OUTLET TO BE TURNED UPSLOPE AND BUTTED UP AGAINST THE BERM TO PREVENT FLOW FROM PASSING AROUND COMPOST FILTER SOCK.

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

TEMPORARY RIGHT OF WAY DIVERSION AND OUTLET DETAIL

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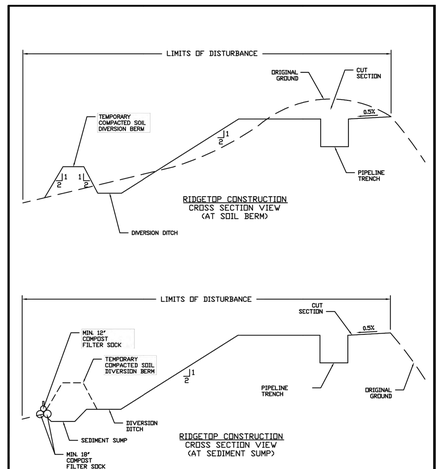

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

TEMPORARY RIGHT OF WAY DIVERSION AND OUTLET NOTES

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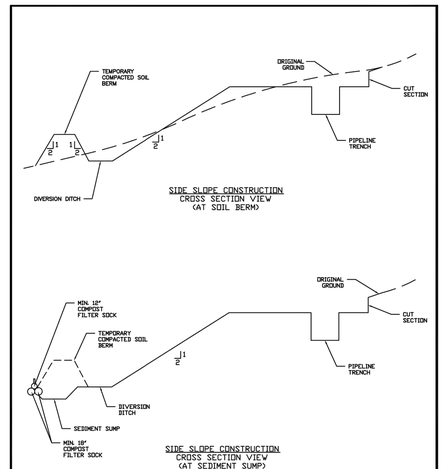

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

TEMPORARY RIGHT OF WAY DIVERSION AND OUTLET NOTES

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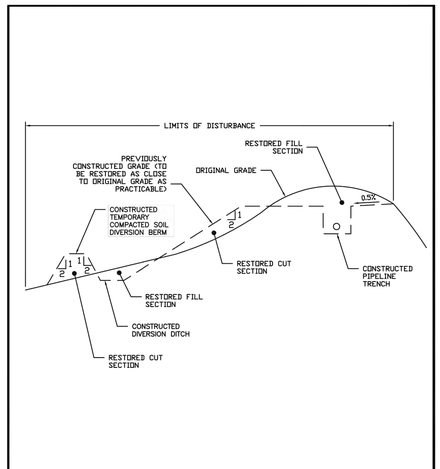

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

POST CONSTRUCTION RIDGETOP RECLAMATION DETAIL

DRAWING NO. MVP–ES4.3 | REV. 0

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Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
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Wetland/Wet Seed Mix	
Scientific Name	**Common Name**
Baptisia australis	Blue False Indigo
Elymus hystrix (Hystrix patula)	Bottlebrush Grass
Anemone canadensis	Canadian Burnet
Panicum clandestinum (Dichanthelium c.), 'Tioga'	Deertongue, 'Tioga'
Carex crinita	Fringed (Nodding) Sedge
Lobelia siphilitica	Great Blue Lobelia
Vernonia noveboracensis	New York Ironweed
Juncus tenuis	Path Rush
Eupatorium purpureum	Purple Node Joe Pye Weed
Panicum rigidulum (P. stipitatum))	Redtop Panicgrass
Juncus effusus	Soft Rush
Eupatorium maculatum (Eupatoriadelphus maculatus)	Spotted Joe Pye Weed
Carex squarrosa	Squarrose Sedge
Asclepias incarnata	Swamp Milkweed
Panicum virgatum, 'Cave-In-Rock'	Switchgrass, 'Cave-In-Rock'
Carex stricta	Tussock Sedge
Senna hebecarpa (Cassia h.))	Wild Senna
Scirpus cyperinus	Woolgrass

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
US FOREST SERVICE
(NATIONAL FOREST) LANDS
TEMPORARY EROSION CONTROL SPECIES

DRAWING NO. MVP–ES12.5 | REV. 0

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

Source: PaDEP, E&S Pollution Control Manual, March 2012

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Mountain Valley PIPELINE
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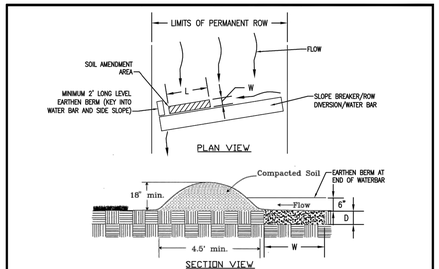
ENVIRONMENTAL DETAIL
TIMBER MAT/WETLAND CROSSING

DRAWING NO. MVP–ES37 | REV. P



NOTES

1. WIDTH "W" OF SOIL AMENDMENT PER PERMANENT DIVERSION DIKE/WATERBAR WITH SOIL AMENDMENT SCHEDULE.
2. THE INCORPORATION DEPTH "D" IS ASSUMED TO BE 1 FT PER TABLE 4.3 IN VA DEQ STORMWATER DESIGN SPEC #4. AN INCORPORATION DEPTH OF 2 FT IS USED IN CASES WHERE ADDITIONAL STORAGE CAPACITY IS NEEDED IN ORDER TO MEET WATER QUANTITY REQUIREMENTS.
3. DEVELOPED FROM VA. DSWC PLATE 3.09-1.
4. SEE SHEET 0.7, TEMPORARY RIGHT OF WAY DIVERSION/WATERBAR ADDITIONAL DETAILS FOR PLAN VIEW.

Diversion Dikes/Waterbars with Compost Schedule

Drainage Area	Diversion Dike Identification #	Soil Amendment Depth (D) (ft)	Soil Amendment Width (W) (ft)	Minimum Length of Soil Amendment (L) (ft)
DA-GI-002	WB-G18-001	1	2	30
DA-GI-018C	WB-G18-002	1	2	5
DA-GI-020A	WB-G18-003	1	2	40
DA-GI-022A	WB-G18-004	2	2	26
DA-GI-026D	WB-G18-005	1	2	40
DA-GI-027C	WB-G18-006	1	3	44
DA-GI-028B	WB-G18-007	1	2	33
DA-GI-034A	WB-G18-008	1	2	41

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
DIVERSION DIKE/WATERBARS
WITH COMPOST

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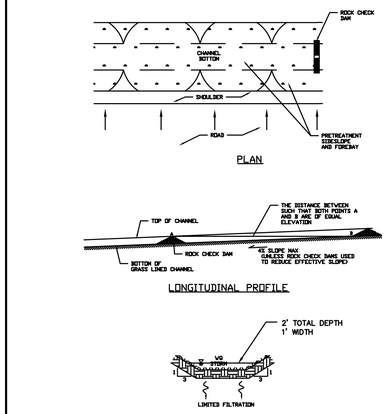

NOTES:

1. GRASS LINED CHANNEL TO BE SIZED PER VIRGINIA BMP CLEARINGHOUSE SPECIFICATION NO. 3.

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
POCAHONTAS ROAD
PERMANENT GRASS-LINED CHANNEL

DRAWING NO. MVP–ES39 | REV. P

NOTES:

A BONDED FIBER MATRIX (BMF) IS AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. BMFs MAKE USE OF A CROSS-LINKED HYDROCOLLOID TACKIFIER TO BOND THERMALLY PROCESSED WOOD FIBERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. FOR SLOPES UP TO 3H:1V THE BFM SHOULD BE APPLIED AT A RATE OF 3,000 LB/ACRE. STEEPER SLOPES MAT NEED AS MUCH AS 4,000 LB/ACRE.

BFMs SHOULD ONLY BE USED WHEN NO RAIN IS FORECASTED FOR AT LEAST 48 HOURS FOLLOWING HE APPLICATION. THIS IS TO ALLOW THE TACKIFIER SUFFICIENT TIME TO CURE PROPERTY. ONCE PROPERLY APPLIED, A BFM IS TYPICALLY 90% EFFECTIVE IN PREVENTING ACCELERATED EROSION. BFMs SHOULD NOT BE APPLIED BETWEEN SEPTEMBER 30 AND APRIL 1.

A POLYMER STABILIZED FIBER MATRIX (PSFM) CAN ALSO BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERTY. PSFMs MAKE USE OF A LINEAR SOIL STABILIZING TACKIFIER THAT WORKS DIRECTLY ON SOIL TO MAINTAIN SOIL STRUCTURE, MAINTAIN PORE SPACE CAPACITY AND FLOCCULATE DISLODGED SEDIMENT THAT WILL SIGNIFICANTLY REDUCE RUNOFF TURBIDITY. PROPERLY APPLIED, A PSFM MAY BE AS MUCH AS 99% EFFECTIVE.

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ENVIRONMENTAL DETAIL
BONDED FIBER MATRIX

DRAWING NO. MVP–ES40 | REV. P

Typical Polymer Stabilized Fiber Matrix Application Rates

Maximum Rainfall of ≤ 20" SLOPE	6:1	5:1	4:1	3:1	2:1	1.5:1	1:1
Soil Stabilizer (gals/acre)	4	5	6	7	8	9	10
Fiber (lb/acre)	1,500	1,500	1,500	1,800	2,000	2,500	3,000

Maximum Rainfall of > 20" and for Site Winterization SLOPE	≤5:1	4:1	≥3:1
Soil Stabilizer (gals/acre)	6	8	10
Fiber (lb/acre)	2,000	2,500	3,000

NOTES:

UNLIKE ROLLED BLANKETS, THERE IS NO NEED TO SMOOTH THE SLOPE PRIOR TO APPLICATION OF HYDRAULICALLY APPLIED BLANKETS. IN FACT SOME ROUGHENING OF THE SURFACE, EITHER NATURAL OR MECHANICALLY INDUCED, IS PREFERABLE. HOWEVER, LARGE ROCKS, THOSE > 9 INCHES, AND EXISTING RILLS SHOULD BE REMOVED PRIOR TO APPLICATION. TRACKING OR GROOVING OF SLOPES SHOULD BE CONSIDERED TO SLOW WATER FLOWS DURING A STORM EVENT. SLOPE INTERRUPTION DEVICES SUCH AS STAIR STEP GRADING OR BENCHING SHOULD BE APPLIED PRIOR TO THE APPLICATION. MIXING AND APPLICATION RATES SHOULD FOLLOW MANUFACTURER'S RECOMMENDATIONS.

HYDRAULICALLY APPLIED BLANKETS ARE TYPICALLY APPLIED IN TWO STAGES. UNLESS SPECIFICALLY RECOMMENDED TO BE APPLIED IN ONE APPLICATION BY THE MANUFACTURER, THE SEED MIXTURE AND SOIL AMENDMENTS SHOULD BE APPLIED FIRST. IF THE SEED IS APPLIED AT THE SAME TIME AS THE HYDRAULICALLY APPLIED BLANKET, THE BONDED FIBERS MAY KEEP THE SEED FROM MAKING SUFFICIENT CONTACT WITH THE SOIL TO GERMINATE. AFTER THE SEED MIXTURE IS APPLIED, THE BFM, FGM, OR PSFM SHOULD BE SPRAYED OVER THE AREA AT THE REQUIRED APPLICATION RATE. (SEE ABOVE TABLES)

HYDRAULIC EROSION CONTROL PRODUCTS (HECP) USED ON JNF LANDS MUST BE SUITABLE FOR WILDLIFE

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ENVIRONMENTAL DETAIL
BONDED FIBER MATRIX

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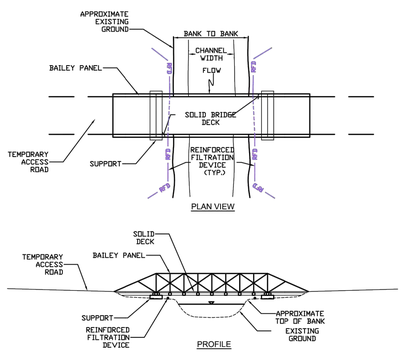

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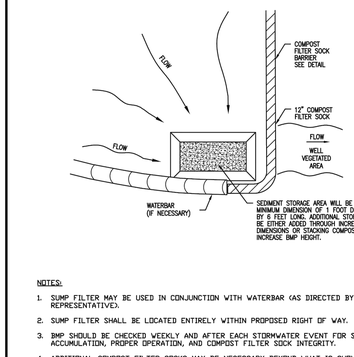
APP'D	DATE 08/11/17
SCALE N.T.S.	SHEET 1 OF 1
JOB NO.	
PROJECT ID:	MVP – VA PORTION

Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
MODULAR TEMPORARY
BAILEY BRIDGE

DRAWING NO. MVP–ES41 | REV. P



NOTES:

1. SUMP FILTER MAY BE USED IN CONJUNCTION WITH WATERBAR (AS DIRECTED BY OWNER REPRESENTATIVE).
2. SUMP FILTER SHALL BE LOCATED ENTIRELY WITHIN PROPOSED RIGHT OF WAY.
3. BMP SHOULD BE CHECKED WEEKLY AND AFTER EACH STORMWATER EVENT FOR SEDIMENT ACCUMULATION, PROPER OPERATION, AND COMPOST FILTER SOCK INTEGRITY.
4. ADDITIONAL COMPOST FILTER SOCKS MAY BE NECESSARY BEYOND WHAT IS SHOWN ON DETAIL TO MEET INTENDED BMP REQUIREMENTS.

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PROJECT ID:	MVP – VA PORTION

Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
TYPICAL SUMP FILTER

DRAWING NO. MVP–ES42 | REV. P

REVISIONS:

NO.:	DATE:	DWN.:	CHK'D:	APP'D.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.07JNF OF 13.06JNF

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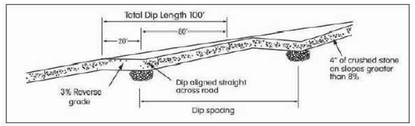

Table III-6 Spacing of Broad-Based Dips

Road Grade (%)	Distance Between Drains (Ft)
2	300
3	235
4	200
5	180
6	165
7	155
8	150
9	145
10	140

DESIGN CRITERIA:
1. MAXIMUM ROAD GRADE ON WHICH DIPS CAN BE CONSTRUCTED IS 10%
2. A 3% REVERSE GRADE SHOULD BE CONSTRUCTED IN THE EXISTING ROADBED, BY CUTTING UPGRADE OF THE DIP LOCATION.
3. BROADBASED DIP SHOULD BE ARMORED WITH STONE TO WITHSTAND EXPECTED TRAFFIC.
4. DRAINAGE OUTLET PROTECTION SHALL BE PROVIDED WITH APPROPRIATE SEDIMENT BARRIER STRUCTURES.
5. SPACING: REFER TO TABLE II-4.

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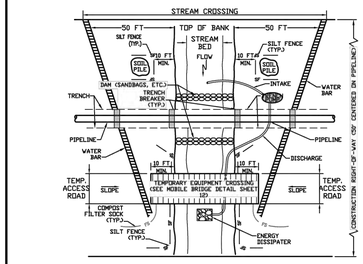
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

BROAD BASED DIP

DRAWING NO. MVP–ES5 | REV. 0



PLAN VIEW

NOTES:
1. INSTALL COMPOST FILTER SOCKS, TRENCH BREAKERS, PUMP, ENERGY DISSIPATER, AND DAMS BEFORE TRENCHING STREAM.
2. PUMP TRENCH AT SUFFICIENT CAPACITY TO CONVEY NORMAL AND/OR EXISTING STREAM FLOW OVER TRENCH. A SUFFICIENT PUMPING CAPACITY MUST BE AVAILABLE ON-SITE DURING CONSTRUCTION OF THE PIPELINE CROSSING.
3. PLACE SOIL PILES A MINIMUM OF 10 FEET FROM TOP OF BANK.
4. INSTALL WATER BARS AT APPROACHES TO STREAM CROSSING AND COMPOST FILTER SOCKS, SILT FENCE, AND SUPER SILT FENCE AS NECESSARY DURING CONSTRUCTION.
5. MAINTAIN SURFACE OF TEMPORARY EQUIPMENT CROSSING TO PREVENT SOIL DISCHARGES TO STREAM.
6. APPROACHES TO CROSSINGS ARE NOT TO EXCEED A DEPTH OF 6 INCHES ABOVE ORIGINAL GRADE.
7. RESTORE AREA TO APPROXIMATE ORIGINAL CONTOURS.

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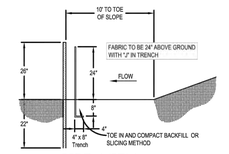
Mountain Valley PIPELINE — DESIGN ENGINEERING

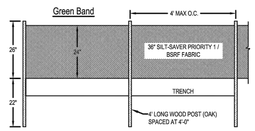
ENVIRONMENTAL DETAIL

STREAM CROSSING
PUMP STATION

DRAWING NO. MVP–ES8 | REV. 0



SIDE VIEW



FRONT ELEVATION

PRIORITY 1
TAKEN FROM SILT-SAVER, INC OR EQUAL

NOTES:
THE TYPE OF REINFORCED FILTRATION DEVICE (PRIORITY 1 OR PRIORITY 2) WILL BE SELECTED BASED ON FIELD CONDITIONS DURING CONSTRUCTION

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JOB NO.	
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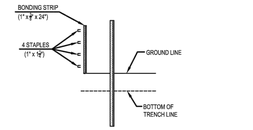
Mountain Valley PIPELINE — DESIGN ENGINEERING

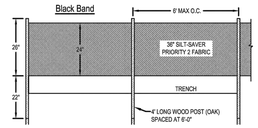
ENVIRONMENTAL DETAIL

BELTED SILT RETENTION FENCE (BSRF)

DRAWING NO. MVP–ES9 | REV. 0



POST (OAK)
(1-3/4" X 1-1/4" X 48")



FRONT ELEVATION

PRIORITY 2
TAKEN FROM SILT-SAVER, INC OR EQUAL

NOTES:
THE TYPE OF REINFORCED FILTRATION DEVICE (PRIORITY 1 OR PRIORITY 2) WILL BE SELECTED BASED ON FIELD CONDITIONS DURING CONSTRUCTION

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JOB NO.	
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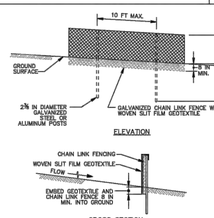
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

BELTED SILT RETENTION FENCE (BSRF)

DRAWING NO. MVP–ES9.1 | REV. 0

DETAIL E-3 SUPER SILT FENCE — STANDARD SYMBOL: SSF



ELEVATION

CROSS SECTION

CONSTRUCTION SPECIFICATIONS
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HOG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN, IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

SUPER SILT FENCE

DRAWING NO. MVP–ES9.2 | REV. 0

Table E.3: Super Silt Fence Design Constraints

Average Slope Steepness	Maximum Slope Length	Maximum Super Silt Fence Length
Flatter than 10:1 (0 - <10%)	Unlimited	Unlimited
10:1 to 5:1 (10 - 20%)	200 feet	1,500 feet
<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. 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 torn. If undermining occurs, reinstall chain link fencing and geotextile.

Table II.1: Geotextile Fabrics

		WOVEN SLIT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MINIMUM AVERAGE ROLL VALUE[1]					
PROPERTY	TEST METHOD	MD	CD	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%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D-4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D-6241	450 lb		900 lb		430 lb	
Apparent Opening Size[2]	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^{-1}		0.28 sec^{-1}		1.1 sec^{-1}	
Ultraviolet Reisistance Retained at 500 hours	ASTM D-4355	70% strength		70% strength		70% strength	

[1] 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.

[2] Values for AOS represent the average maximum opening.

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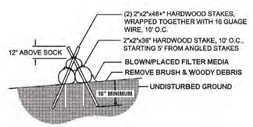
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

SUPER SILT FENCE

DRAWING NO. MVP–ES9.2A | REV. 0



NOTES:
THE TYPE OF REINFORCED FILTRATION DEVICE (PRIORITY 1 OR PRIORITY 2) WILL BE SELECTED BASED ON FIELD CONDITIONS DURING CONSTRUCTION

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

STACKED COMPOST FILTER SOCK DETAIL CROSS SECTION VIEW

DRAWING NO. MVP–ES9.3 | REV. 0

REVISIONS:

NO.:	DATE:	DWN.:	CHK'D:	APP'D.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
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REVISION

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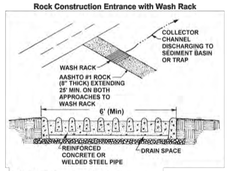
Rock Construction Entrance with Wash Rack



Modified from Smith Cattleguard Company

IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 70 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK.

Wash rack shall be 20 feet (min.) wide or total width of access.

Wash rack shall be designed and constructed to accommodate anticipated construction vehicular traffic.

A water supply shall be made available to wash the wheels of all vehicles exiting the site.

MAINTENANCE: Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile of rock material shall be maintained on site for this purpose. Drain space under wash rack shall be kept open at all times. Damage to the wash rack shall be repaired prior to further use of the rack. All sediment deposited on roadways shall be removed and returned to the construction site immediately. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

At a minimum, rock construction entrances with wash racks should be constructed to the length, width, and thickness dimensions shown on standard construction detail #3-2. A metal wash rack or livestock grate is an acceptable alternative to the reinforced concrete one shown in the standard detail. Approaches to the wash rack should be lined with aashto #1 at a minimum of 25' on both sides. The wash rack should discharge to a sediment removal facility, such as a vegetated filter strip or into a channel leading to a sediment removal device (e.g. a sediment trap or sediment basin). Rock construction entrances with wash racks should be maintained to the specified dimensions by adding rock when necessary at the end of each workday. A stockpile of rock material should be maintained on site for this purpose. Sediment deposited on paved roadways should be removed and returned to the construction site.

NOTE: Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable. Damaged wash racks should be repaired as necessary to maintain their effectiveness. In lieu of washrack installation, MVP will extend the RCE by 70' increments until mud tracking condition is alleviated.

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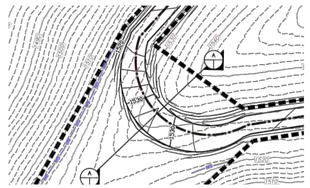
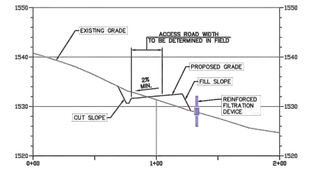
Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

ROCK CONSTRUCTION ENTRANCE WITH WASH RACK

DRAWING NO. MVP–ES20 REV. P





SECTION VIEW A-A

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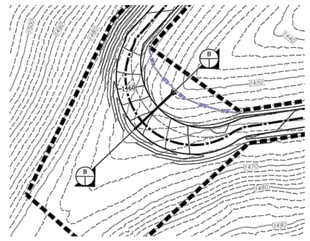
Mountain Valley PIPELINE — DESIGN ENGINEERING

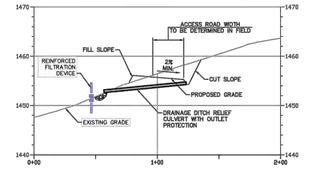
ENVIRONMENTAL DETAIL

ATWS VEHICLE TURNING RADIUS NOSE DETAIL

DRAWING NO. MVP–ES31 REV. P



PLAN VIEW



SECTION VIEW B-B

DRAWN	DATE
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JOB NO.	
PROJECT ID:	MVP – VA PORTION

Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

ATWS VEHICLE TURNING RADIUS VALLEY DETAIL

DRAWING NO. MVP–ES32 REV. P

Upland Area Seed Mixes within the Jefferson National Forest

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 laxum[2]	Slender woodoats	Graminoid	4.5 – 7.0
Eragrostis spectabilis[2]	Purple lovegrass	Graminoid	4.0 – 7.5
Panicum virgatum	Switchgrass	Graminoid	4.5 – 8.0
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Tridens flavus[2]	Purpletop	Graminoid	4.5 – 6.5
Apocynum cannabinum[3]	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[3]	Virginia wildrye	Graminoid	5.0 – 7.4
Geum canadense[4]	White avens	Forb	4.5 – 7.5
Helianthoides helianthoides	Oxeye sunflower; Smooth oxeye	Forb	unknown
Monarda fistulosa[2]	Wild bergamot	Forb	6.0 – 8.0
Pycnanthemum spp.[3]	Mountain mint	Forb	unknown
Rubus allegheniensis[2]	Common blackberry; Allegheny blackberry	Forb/ Subshrub	4.6 – 7.5
Rudbeckia hirta	Blackeyed Susan	Forb	6.0 – 7.0
Solidago canadensis[2]	Canada goldenrod	Forb	4.8 – 7.5
Tradescantia virginiana[2]	Virginia spiderwort	Forb	4.0 – 8.0

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

US FOREST SERVICE (NATIONAL FOREST) LANDS UPLAND AREA SEED MIX

DRAWING NO. MVP–ES12.1 REV. 0

Riparian Seed Mixes within Jefferson National Forest

Scientific Name	Common Name	Habit	pH Preference
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
Native Species			
Agrostis perennans	Autumn bentgrass; upland bentgrass	Graminoid	5.5 – 7.5
Elymus virginicus	Virginia Wildrye	Graminoid	5.0 - 7.4
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Asclepias incarnata	Swamp milkweed	Forb	5.0 – 8.0
Chamaecrista fasciculata	Partridge pea	Forb	5.5 – 7.5
Eutrochium fistulosum (Eupatorium fistulosum)	Joe pye weed	Forb	4.5 – 7.0
Eupatorium maculatum	Spotted joe pye weed	Forb	5.5 – 7.0
Eupatorium perfoliatum	Boneset	Forb	unknown
Helenium autumnale	Common sneezeweed	Forb	4.0 – 7.5
Senna hebecarpa	Wild senna; American senna	Forb	unknown
Senna marilandica	Maryland senna	Forb / Subshrub	4.0 – 7.0
Vernonia noveboracensis	New York ironweed	Forb	4.5-8.0

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

US FOREST SERVICE (NATIONAL FOREST) LANDS RIPARIAN SEED MIX

DRAWING NO. MVP–ES12.2 REV. 0

Species for hydroseed mixes within the Jefferson National Forest.

Scientific Name	Common Name	Growth Habit	pH Preference
Non-native Species for Temporary 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
Native – Highly Preferred			
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Tridens flavus	Purpletop	Graminoid	4.5 – 6.5
Native – Preferred			
Agrostis perennans	Autumn bentgrass; Upland bentgrass	Graminoid	5.5 – 7.5
Dichanthelium clandestinum	Deertongue	Graminoid	4.0 – 7.5
Elymus canadensis	Canada wildrye	Graminoid	5.0 – 7.9
Desmodium canadense	Showy tickrefoil	Forb	wide tolerance
Heliopsis helianthoides	Oxeye sunflower; Smooth oxeye	Forb	unknown
Lespedeza virginica	Slender bushclover; Slender lespedeza	Forb	acid tolerant
Liatris spicata	Dense blazing star; Spiked gayfeather	Forb	5.6 – 7.5
Senna hebecarpa	Wild senna; American senna	Forb	unknown
Native – Moderately Preferred			
Panicum virgatum	Switchgrass	Graminoid	4.5 – 8.0
Chamaecrista fasciculata	Partridge pea	Forb	5.5 – 7.5
Rudbeckia hirta	Blackeyed Susan	Forb	6.0 – 7.0

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

US FOREST SERVICE (NATIONAL FOREST) LANDS HYDROSEED MIX

DRAWING NO. MVP–ES12.3 REV. 0

Name	Ph preference	Wetland Indicator Status
Annual Ryegrass (Lolium Multiflorum (L. perenne var. italicum))	5.0–7.9	NI/moderate
German/Foxtail Millet (Setaria italica)	5.3–6.9	FACU
Cereal Rye (Secale cereale)	5.2–8.0	NI/damp
Browntop Millet (Panicum ramosum) (Introduced in VA & south; possibly ok for WV?)	5.5–6.9	FACU

NOTES:

1): A MINIMUM OF (2) OF THE ABOVE LISTED SPECIES SHALL BE UTILIZED

2): APPLY WHENEVER EROSION CONTROL IS NEEDED OUTSIDE OF NORMAL (PERMANENT) SEEDING SEASONS

3): APPLY CONCURRENT WITH PERMANENT EROSION CONTROL

4): APPLY PRIOR TO PERMANENT SEEDING WITH WILDLIFE MIXES

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Mountain Valley PIPELINE — DESIGN ENGINEERING

ENVIRONMENTAL DETAIL

US FOREST SERVICE (NATIONAL FOREST) LANDS TEMPORARY EROSION CONTROL SPECIES

DRAWING NO. MVP–ES12.4 REV. 0

NO.:	DATE:	DWN.:	CHK'D:	APP'D.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

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661 ANDERSEN DRIVE
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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
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DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	1
SHT. NO.	0.06JNF OF 13.06JNF

POST-CONSTRUCTION STREAM CROSSING STABILIZATION FOR M.V.P.

Definition

A series of erosion and sediment control measures to limit the formation of rills and/or gullies in the landscape approaching the edge of a stream, river and other waterbody, within the permanent natural gas pipeline right-of-way.

Purpose

To minimize erosion potential along the edge of stream, river or other water body as a result of the change in land use in the permanent right-of-way of a pipeline.

Conditions Where Practice Applies

Applicable to stream, river or other water body crossings within the natural gas pipeline right-of-way.

Planning Considerations

Permanent water bars with compost filter socks and sump filters with discretionary streambank swales are required at all stream, river and other waterbody crossings in accordance with the spacing and sizing requirements shown on Plates 1-4

Based on visual observation of the post-construction field conditions by MVP Design Engineering and the MVP Environmental Inspector, the necessity for and location of streambank swales will be determined. Considerations will include but are not limited to locations where there is visual evidence of existing (or formation of) rills and/or gullies along the streambank and/or concentrated flow along the streambank with anticipated potential for erosion.

Sediment must be periodically removed from the sump filter and compost filter sock to maintain the required depth. Plans shall detail how excavated sediment is to be disposed of, such as by use in fill areas on site or removal to an approved off-site location.

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Design Criteria

As detailed on Plates 1-3, design criteria per specific erosion and sediment control measures include:

Water Bars / Slope Breakers

Permanent water bars will be installed twenty-five (25) feet from edge of stream, river or other waterbody crossing as shown on Plate 2. Slopes greater than 65% may require site specific stabilization measures based on field conditions as approved by MVP Design Engineering and MVP Environmental Inspector.

Excavation of Sump Filter

Side slopes of sump filter should be no steeper than 1:1. The minimum depth of excavation should be one (1) foot.

Compost Filter Sock

Since the sump filter will function as a pre-treatment for sediment removal, calculation of the 2-year velocity over the compost filter sock size conservatively assumes that the sump filter is full of sediment and in need of maintenance and that no flow is occurring through the sock due to clogging or sediment deposition.

The outfall velocity from this BMP should be non-erosive for the 2-year design storm. The 2-year velocities shall meet the criteria in Table 3.99-D-A. Due to the anticipated small size of contributing drainage area, the Rational Method shall be used to calculate discharge:

$$Q = CiA$$

where,

$Q = discharge\ (ft^3/sec)$
$i = Rainfall\ intensity\ (inches/hour)$
$A = Contributing\ drainage\ area\ (acres)$

Discharge over the compost filter sock is calculated using the broad-crested weir equation:

$$Q = C_d L H^{3/2}$$

where,

$Q = Discharge\ over\ weir\ (ft^3/sec)$
$C_d = Weir\ Coefficient$
$L = Length\ of\ weir\ crest\ (ft)$
$H = Overtopping\ depth\ (ft)$

The velocity over the weir is calculated using the following equation:

$$v = Q/A$$

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where,

$v = Velocity\ (ft/sec)$
$Q = Discharge\ over\ weir\ (ft^3/sec)$
$A = Flow\ area\ over\ weir\ (ft^2)$

TABLE 3.99-D-A
PERMISSIBLE VELOCITES FOR EARTH LININGS

Soil Types	Corrected Permissible Velocities (ft./sec.)
Fine Sand (noncolloidal)	2.0
Sandy Loam (noncolloidal)	2.0
Silt Loam (noncolloidal)	2.4
Ordinary Firm Loam	2.8
Fine Gravel	4.0
Stiff Clay (very colloidal)	4.0
Graded, Loam to Cobbles (noncolloidal)	4.0
Graded, Silt to Cobbles (colloidal)	4.4
Alluvial Silts (noncolloidal)	4.4
Alluvial Silts (colloidal)	4.0
Coarse Gravel (noncolloidal)	4.8
Cobbles and Shingles	4.4
Shales and Hard Pans	4.8

NOTE: Correction factor value = 0.8 for flow depths less than one foot has been applied to original table.
Source: Chapter 5, Engineering Calculations: Table 5-22 and Plate 5-39, *Virginia Erosion and Sediment Control Handbook*, 3rd Ed., 1992.

Example

Given: A one-acre drainage area in Giles County, an 18-inch diameter compost filter sock with an effective level weir length of 8 feet, in a Sandy Loam soil installed per details in Plate 2.

Solution:

1. Calculate the discharge:
$$Q = CiA = 0.9 * 4.07\ inches/hour * 1\ acre = 3.66\ ft^3/sec$$
2. Rearranging the weir equation to solve for overtopping depth:
$$H = (Q/(C_D * L))^{\frac{2}{3}} = (3.66\ ft^3/sec\ /(2.99 * 8\ ft))^{2/3} = 0.29\ ft$$
3. Calculate the velocity over the compost filter sock:

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$$v = Q/A = 3.66\ ft^3/_{sec}\ /(0.29\ ft * 8\ ft) = 1.60\ ft/sec$$

4. Verify that the velocity is non-erosive in Table 3.99-D-A for Sandy Loam soil.
$1.60\ ft/sec < 2.0\ ft/sec$

Streambank Swale

Minimum thickness (T, as shown on Streambank Swale Typical Cross Section on Plate 3) shall be two (2) times the D_{50}. For drainage areas one (1) acre or less, rock shall have a minimum D_{50} = 6" and T = 12 inches for stream banks with a slope of 1:1 or flatter (i.e. S_o=1.0 ft/ft). If the contributing drainage area is greater than one (1) acre or if the swale is steeper than 1:1 (1.0 ft/ft), the plans shall provide calculations to determine an appropriate size stone and minimum thickness. Rock may be salvaged on-site materials and may contain topsoil, fines, sand, gravel in a mix with at least 60% rock with a D_{50} of at least 6".

Calculations (from VDOT Drainage Manual Appendix 7B-5)

Given: A one-acre drainage area in Giles County from previous example.

Solution:
CHANNEL DATA

Q = 3.66 (cfs) P = 3.02 (ft.) n = 0.069
S_o = 1.00 (ft/ft) R = 0.18 (ft.)
d_n = 0.37 (ft.) V_n = 6.81 (fps)
A = 0.54 (ft^2) Side Slope = 4:1

ASSUMED ROCK SIZE - D50 = 0.5 ft

VERIFY ASSUMED ROCK SIZE

ϕ = 41.2° (Appendix 7E-1)

Side Slope = 4: 1 θ = 14°

$K_1 = [1 - (\sin^2\theta / \sin^2\phi)]^{0.5}$

$K_1 = [1 - (\sin^2 14° / \sin^2 41.5°)]^{0.5} = 0.93$

For Specific Gravity = 2.65 and Stability Factor = 1.2

$D50 = 0.001 * V_n^2 / (d_{avg}^{0.5} * K_1^{1.5})$

$D50 = 0.001 * 6.81^2 / (0.5^{0.5} * 0.93^{1.5}) = 0.45$ ft.

D50 Computed (0.45) < D50 Assumed (0.5)

Therefore, assumed D50 is appropriate.

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Construction Specifications

General

1. All trees, brush, stumps, roots, obstructions and other unsuitable material shall be removed and disposed of properly.
2. Disturbed areas will be returned to pre-construction contours. Topsoil shall be replaced in accordance with the Mountain Valley Pipeline Project Specific Standards and Specifications.
3. Existing suitable stream substrate shall be salvaged and replaced to streambed at pre-construction contours.
4. The swale shall be excavated or shaped to the proper grade and cross-section.
5. Any excess soil shall be removed and disposed of properly.

Water Bars / Slope Breakers

1. Water bars / slope breakers shall be installed in accordance with WATER BAR, TYPICAL SLOPE BREAKER (SB), Std. & Spec. MVP-17 and MVP-18.
2. Permanent water bars are required at all stream, river and other waterbody crossings, as well as upslope from roadway and roadbed cut slopes.
3. Construct permanent water bars with compost filter sock after completion of grading in accordance with the water bar spacing and sizing requirements shown on plan and in table on Plate 3.
4. Water bar closest to stream top of bank shall be located twenty-five (25) feet maximum upslope from top of bank.
5. Water bars shall have a slope of one to four percent.
6. Water bars on retired roadways, skidtrails, and right-of-ways shall be left in place after permanent stabilization has been achieved.

Compost Filter Socks

1. Compost filter socks shall be installed in accordance with COMPOST FILTER SOCK, Std. & Spec. MVP ES-3.
2. Compost filter socks shall extend at least ten feet upslope from the uppermost limit of the sump filter.

Sump Filters

1. Sump filters to be installed at end of water bars. Refer to sump filter detail on Plate 2.
2. Sump filter shall be located entirely within the permanent right-of-way.
3. Sediment storage area shall be excavated to a minimum dimension of one-foot-deep by three-feet-wide by six-feet-long. Additional storage, if required due to a larger contributing drainage area, will either be added through increasing the sump filter dimension or stacking compost filter sock to increase BMP height.

Streambank Swales

Streambank swales shall be installed at locations determined by MVP Design Engineering and the MVP Environmental Inspector based on their visual observation of the post-construction field conditions.

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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.

1. 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.
2. 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

1. 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.
2. Damaged or eroded water bars shall be restored to original dimensions within 24-hours of inspection.
3. 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.
4. 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.
5. 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 inspection.
7. 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.

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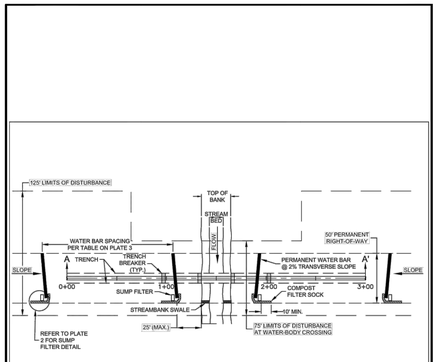
JOB NO.			
PROJECT ID: MVP – VA PORTION			



PLAN VIEW
NOT TO SCALE

POST-CONSTRUCTION STREAM CROSSING STABILIZATION DETAIL PLATE 1

DRAWN	DATE	Mountain Valley PIPELINE	ENVIRONMENTAL DETAIL
CHECKED	DATE		POST CONSTRUCTION STREAM CROSSING STABILIZATION
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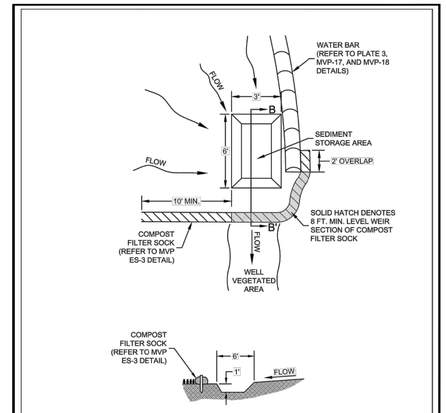
JOB NO.			
PROJECT ID: MVP – VA PORTION			



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SUMP FILTER DETAIL
NOT TO SCALE

POST-CONSTRUCTION STREAM CROSSING STABILIZATION DETAIL PLATE 2

DRAWN	DATE	Mountain Valley PIPELINE	ENVIRONMENTAL DETAIL
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REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

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GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
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DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
SHT. NO.	0.08JNF OF 13.06JNF

REVISION

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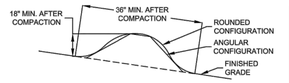
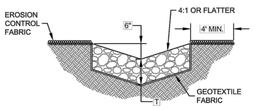


MINIMUM SPACING FOR PERMANENT WATER BARS	
PIPELINE GRADE	DISTANCE (FEET)
<2%	[2]
2-5%	400
6-15%	200
16-30%	100
>31%	50

NOTES:
1. REFER TO MVP-17 AND MVP-18 DETAILS (WATER BAR, TYPICAL SLOPE BREAKERS).
2. PERMANENT WATER BARS WILL BE INSTALLED AS NEEDED BASED ON FIELD CONDITIONS.
3. PERMANENT WATER BARS WILL BE INSTALLED 25 FEET FROM EACH WATERBODY BOUNDARY REGARDLESS OF SLOPE CONDITIONS.
4. SLOPES GREATER THAN 65% MAY REQUIRE SITE SPECIFIC STABILIZATION MEASURES BASED ON FIELD CONDITIONS AS APPROVED BY MVP DESIGN ENGINEERING AND MVP ENVIRONMENTAL INSPECTOR.

PERMANENT WATER BAR DETAIL
NOT TO SCALE



NOTES:
1. IF THE CONTRIBUTING DRAINAGE AREA IS GREATER THAN 1 ACRE OR IF THE SWALE IS STEEPER THAN 1:1 (1.0 FT/FT), THE PLANS SHALL PROVIDE CALCULATIONS TO DETERMINE AN APPROPRIATE SIZE STONE, MINIMUM THICKNESS, AND CHANNEL SIZE.
2. MINIMUM THICKNESS, T, SHALL BE TWO TIMES THE D50.
3. FOR DRAINAGE AREAS 1 ACRE OR LESS, D50 = 6 INCHES AND T = 12 INCHES.
4. SWALE SIDE SLOPES SHALL BE 4:1 OR FLATTER.

STREAMBANK SWALE TYPICAL CROSS SECTION
NOT TO SCALE

POST-CONSTRUCTION STREAM CROSSING STABILIZATION DETAIL PLATE 3

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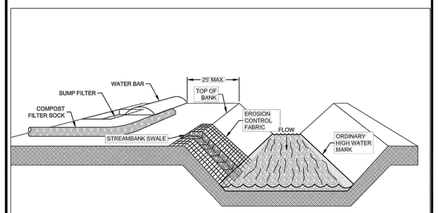
Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
POST CONSTRUCTION STREAM CROSSING STABILIZATION

DRAWING NO. MVP–ES44.8 REV. P



PERSPECTIVE VIEW
NOT TO SCALE

POST-CONSTRUCTION STREAM CROSSING STABILIZATION DETAIL PLATE 4

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
POST CONSTRUCTION STREAM CROSSING STABILIZATION

DRAWING NO. MVP–ES44.9 REV. P

When used alone, chemical mulches do not have the capability to insulate the soil or retain soil moisture that organic mulches have. This soil protection is also easily damaged by traffic. Application of these mulches is usually more expensive than organic mulching, and the mulches decompose in 60-90 days.

Blankets and Matting

Field experience has shown that plastic netting, when used alone, does not retain soil moisture or modify soil temperature. In some cases it may stabilize the soil surface while grasses are being established, but is primarily used in grassed waterways and on slopes to hold straw or similar mulch in place.

Jute mesh and other soil stabilization blankets are good choices for mulching on difficult slopes and in minor drainage swales. Most of the soil stabilization mattings (used to create a permanent matrix for root growth within the soil) must receive mulching in order to properly stabilize an area. Notably, some manufacturers have recently developed permanent mattings which include self-contained, temporary mulching materials; however, these measures will have to meet the requirements noted in Std. & Spec. 3.36, SOIL STABILIZATION BLANKETS AND MATTING, before they can be recommended for use on steep slopes and in channel flow situations.

The most critical aspect of installing blankets and mats is obtaining firm, continuous contact between the material and the soil. Without such contact, the material may fail and thereby allow erosion to occur. It is important to use an adequate number of staples and make sure the material is installed properly in order to maximize soil protection. These products are discussed in more detail in Std. & Spec. 3.36, SOIL STABILIZATION BLANKETS & MATTING.

MVP will utilize hydraulically applied soil stabilization blankets and matting (i.e. Earthguard, Flexterra, or equivalent) as an alternate to the rolled ESC blanket material identified under STD & SPEC 3.36. Information regarding the hydraulically applied blankets is provided under Appendix B MVP-ES40 and MVP-ES40.1.

Specifications

Organic Mulches

Organic mulches may be used in any area where mulch is required, subject to the restrictions noted in Table 3.35-A.

Materials: Select mulch material based on site requirements, availability of materials, and availability of labor and equipment. Table 3.35-A lists the most commonly used organic mulches. Other materials, such as peanut hulls and cotton burs, may be used with the permission of the local Plan-Approving Authority.

Prior to mulching: Complete the required grading and install needed sediment control practices.

Lime and fertilizer should be incorporated and surface roughening accomplished as needed. Seed should be applied prior to mulching except in the following cases:

a. Where seed is to be applied as part of a hydroseeder slurry containing fiber mulch.

b. Where seed is to be applied following a straw mulch spread during winter months.

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
MULCHING

DRAWING NO. MVP–ES45.2 REV. P

TOPSOILING & SOIL HANDLING FOR M.V.P.

Definition

Methods of preserving and using the surface layer of undisturbed soil, often enriched in organic matter, in order to obtain a more desirable planting and growth medium.

Purposes

To provide a suitable growth medium for final site stabilization with vegetation and promote successful reforestation.

Conditions Where Practice Applies

1. Where the preservation or importation of topsoil is determined to be the most effective method of providing a suitable growth medium.
2. Where the subsoil or existing soil presents the following problems:
   a. The texture, pH, or nutrient balance of the available soil cannot be modified by reasonable means to provide an adequate growth medium.
   b. The soil material is too shallow to provide an adequate root zone and to supply necessary moisture and nutrients for plant growth.
   c. The soil contains substances potentially toxic to plant growth.
3. Only on slopes that are 2:1 or flatter unless other measures are taken to prevent erosion and sloughing.

Planning Considerations

Topsoil is the surface layer of the soil profile, generally characterized as being darker than the subsoil due to the presence of organic matter. It is the major zone of root development, carrying much of the nutrients available to plants, and supplying a large share of the water used by plants.

Although topsoil provides an excellent growth medium, there are disadvantages to its use. Stripping, stockpiling, and reapplying topsoil, or importing topsoil, may not always be cost-effective. Topsoiling can delay seeding or sodding operations, increasing the exposure time of denuded areas. Most topsoil contains weed seeds, and weeds may compete with desirable species.

Advantages of topsoil include its high organic matter content and friable consistence, water-holding capacity, and nutrient content.

In site planning, the option of topsoiling should be compared with that of preparing a seedbed in subsoil. The clay content of subsoils does provide high moisture availability and deter leaching of nutrients and, when properly limed and fertilized, subsoils may provide a good growth medium which is generally free

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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
TOPSOILING & SOIL HANDLING

DRAWING NO. MVP–ES46 REV. P

of weed seeds. In many cases topsoiling may not be required for the establishment of less demanding, lower maintenance plant material. Topsoiling is strongly recommended where ornamental plants or high-maintenance turf will be grown. Topsoiling is a required procedure when establishing vegetation on shallow soils, soils containing potentially toxic materials, and soils of critically low pH (high acid) levels.

If topsoiling is to be done, the following items should be considered:

1. Whether an adequate volume of topsoil exists on the site. Topsoil will be spread at a compacted depth of 2 to 4 inches (depths closer to 4 inches are preferred).
2. Location of the topsoil stockpile so that it meets specifications and does not interfere with work on the site.
3. Allow sufficient time in scheduling for topsoil to be spread and bonded prior to seeding or planting.
4. Care must be taken not to apply topsoil to subsoil if the two soils have contrasting textures. Clayey topsoil over sandy subsoil is a particularly poor combination, as water may creep along the junction between the soil layers, causing the topsoil to slough. Sandy topsoil over a clay subsoil is equally as likely to fail.
5. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to establish vegetation. Topsoiling of steep slopes should be discouraged unless good bonding of soils can be achieved.

Specifications

Materials

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

In areas where revegetation is of concern based on existing soil conditions and determined by the MVP Environmental Inspector (EI), topsoil samples shall be taken for analysis. Samples will be collected by the MVP EI and sent to a recognized laboratory for analysis of the following criteria:

Organic matter content shall be not less than 1.5% by weight.

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

Soluble salts shall not exceed 500 ppm.

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

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ENVIRONMENTAL DETAIL
TOPSOILING & SOIL HANDLING

DRAWING NO. MVP–ES46.1 REV. P

Topsoil Importing

Topsoil would be imported as needed in residential areas only. If additional off-site topsoil is needed, it must meet the standards stated above.

Stripping

Topsoil operations should not be performed when the soil is wet or frozen. Stripping shall be confined to the immediate construction area. A 4-to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All perimeter dikes, basins, and other sediment controls shall be in place prior to stripping.

Stockpiling

Topsoil shall be stockpiled in such a manner that natural drainage is not obstructed and no off-site sediment damage shall result. Stabilize or protect stockpiles in accordance with MS #2.

Excavated subsoil shall be stockpiled separately from topsoil.

Side slopes of the stockpile shall not exceed 2:1.

Perimeter controls must be placed around the stockpile immediately; seeding of stockpiles shall be completed within 7 days of the formation of the stockpile, in accordance with Std. & Spec. 3.31, TEMPORARY SEEDING if it is to remain dormant for longer than 14 days (refer to MS #1 and MS #2).

Site Preparation Prior to and Maintenance During Topsoiling and Excavation

Before topsoiling or excavation, establish needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, level spreaders, waterways, sediment basins, etc. These practices must be maintained during topsoiling and excavation.

Grading: Previously established grades on the areas to be topsoiled shall be maintained according to the approved plan.

Liming: Where the pH of the subsoil is 6.0 or less, or the soil is composed of heavy clays, agricultural limestone shall be spread in accordance with the soil test or the vegetative establishment practice being used.

Bonding: After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by disking or scarifying to a depth of at least 4-6 inches to ensure bonding of the topsoil and subsoil. Refer to 2.8.3 Soil Compaction Mitigation within the Project Standards and Specifications for additional information.

Applying Topsoil

Topsoil shall not be placed while in a frozen or muddy condition, when topsoil or subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or seeding. The topsoil shall be uniformly distributed to a minimum compacted depth of 2 inches on 3:1 or steeper slopes and 4 inches on flatter slopes or to mimic existing conditions present in the adjacent undisturbed areas. (See Table 3.30-A to determine volume of topsoil required for application to various depths). Any irregularities in the surface, resulting from topsoiling or other operations, shall be corrected in order to prevent the formation of depressions or water pockets.

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ENVIRONMENTAL DETAIL
TOPSOILING & SOIL HANDLING

DRAWING NO. MVP–ES46.2 REV. P

EARTHEN LEVEL SPREADER

LOCATION - Earthen level spreaders are normally used where diversion ditches or dikes outlet onto areas of established vegetation — grass, typically not brush or forested. They are **not** to be used below sediment traps, sediment basins, or stormwater pipes.

Earthen level spreaders may be used for drainage areas less than or equal to 1 acre where sediment-free stormwater runoff can be released in sheet flow down a stabilized slope without causing erosion. Where the downstream slope is stabilized with grass, a minimum uniform cover of 90% is required. Wooded areas, with little or no grass cover, are not considered stabilized areas for this purpose. Earthen level spreaders should only be used where there will be no construction traffic over the level spreader.

To avoid reconcentrating flow downstream of the spreader, the maximum distance from the earthen level spreader to an existing or constructed defined drainage course is 100 feet with a 6% maximum slope and where very uniform and very stable site conditions exist. Greater distances may be considered on a case-by-case basis for very mild slopes and heavily vegetated areas but should not normally exceed 150 feet.

Earthen level spreaders should be constructed on soil, not on fill.

MAXIMUM DRAINAGE AREA - Maximum drainage area to an earthen level spreader should not exceed 1 acre.

MAXIMUM DISCHARGE and MINIMUM LENGTH - The maximum discharge for earthen level spreaders should be 1 cfs per foot of length based on the peak rate of flow from a ten-year frequency rainfall event. An acceptable simplified method to determine the length (L_{min}) is that L_{min} is equal to five feet per acre of drainage area.

DESIGN - The grade of the last 20 feet of the diversion channel that feeds the earthen level spreader should create a smooth transition from the channel grade to the earthen level spreader and, where possible, should be less than or equal to 1 percent. Construct earthen level spreaders on zero percent grades to insure uniform spreading of sediment-free runoff. Minimum width of earthen level spreaders should be 6 feet. A transition section should be constructed between the diversion channel and the earthen level spreader if the widths are different.

Protect the lip of an earthen level spreader with an erosion-resistant material, such as a reinforced erosion control blanket or TRM, to prevent erosion and enable vegetation to become established. For a permanent installation, a rigid lip of non-erodible material, such as pressure-treated timbers or concrete curbing, should be used. A smooth transition should be provided between the level spreader and the native ground downslope.

For a vegetated lip, the erosion-control matting should be a minimum of 4 feet wide and extend 6 inches over the level lip. The upstream edge should be buried at least six inches deep in a vertical trench. The downstream edge should be securely held in place with closely spaced, heavy-duty staples, at least 12 inches long. A rigid level lip should be entrenched at least 2 inches below the ground surface and securely anchored to prevent displacement. Immediately after the earthen level spreader is constructed, the entire area of the spreader should be appropriately seeded and mulched.

Typical details of earthen level spreaders are shown on Standard Construction Detail MVP-ES24.2.

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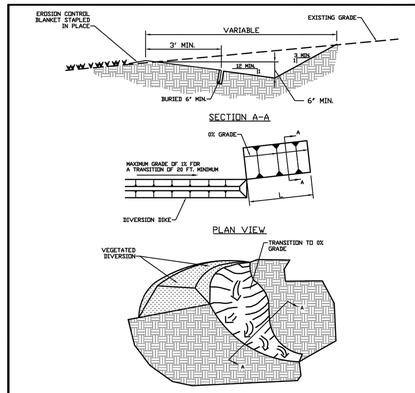
Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
EARTHEN LEVEL SPREADER

DRAWING NO. MVP–ES24.1 REV. P



Level Spreader Schedule		
Drainage Area	ID No.	Design Length (ft)
DA-GI-021	LS-GI8-001	14

DRAWN	DATE
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Mountain Valley PIPELINE
DESIGN ENGINEERING

ENVIRONMENTAL DETAIL
EARTHEN LEVEL SPREADER

DRAWING NO. MVP–ES24.2 REV. P

NO.:	DATE:	DWN.:	CHK'D:	APP'D.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

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661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.09JNF OF 13.06JNF

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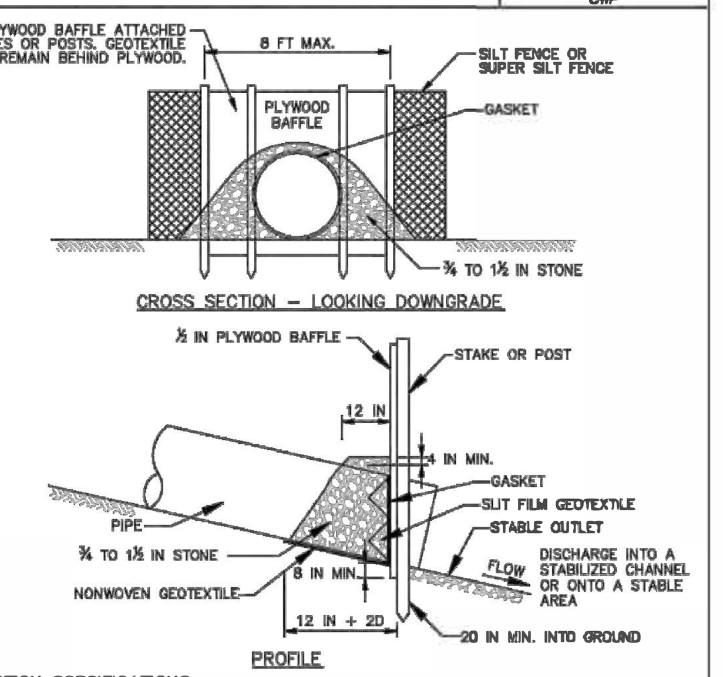
DETAIL E-4 CLEAR WATER PIPE THROUGH SILT FENCE OR SUPER SILT FENCE

STANDARD SYMBOL
CWP



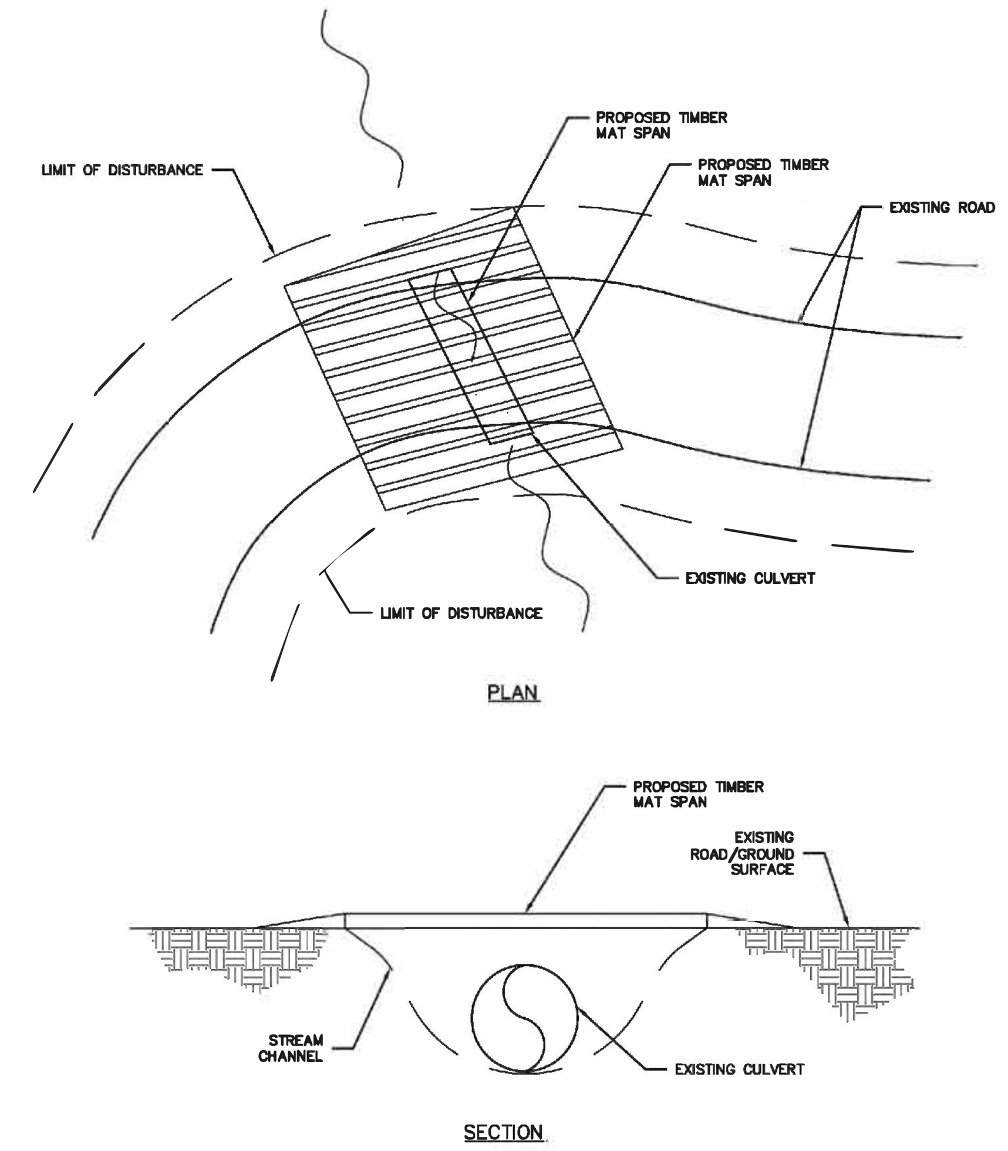
CONSTRUCTION SPECIFICATIONS

1. INSTALL SILT FENCE OR SUPER SILT FENCE IN ACCORDANCE WITH DETAIL E-1 OR DETAIL E-2.
2. AT THE PIPE LOCATION, CUT AND PULL BACK THE WOVEN SLIT FILM GEOTEXTILE AND CHAIN LINK FENCING. SECURE GEOTEXTILE TO PIPE WITH GASKET. INSTALL ADDITIONAL STAKES OR POSTS IF NECESSARY TO ACCOMMODATE THE INSTALLATION OF THE BAFFLE BOARD.
3. ENTRENCH ½ INCH PLYWOOD BAFFLE A MINIMUM OF 8 INCHES AND SECURE TO THE UPGRADE SIDE OF THE FENCE STAKES OR POSTS. BAFFLE SHOULD BE AT LEAST THE HEIGHT OF THE FENCE.
4. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE BEHIND THE PLYWOOD BAFFLE ON NONWOVEN GEOTEXTILE AND EXTEND 12 INCH MIN. ALONG TOP OF PIPE AND TO A HEIGHT OF 4 INCHES ABOVE THE TOP OF PIPE.
5. USE NONWOVEN AND WOVEN SLIT FILM GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
6. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN SEDIMENT REACHES 6 INCHES IN HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL BAFFLE, CHAIN LINK, AND GEOTEXTILE. REPLACE STONE IF DISPLACED. KEEP POINT OF DISCHARGE FREE OF EROSION.

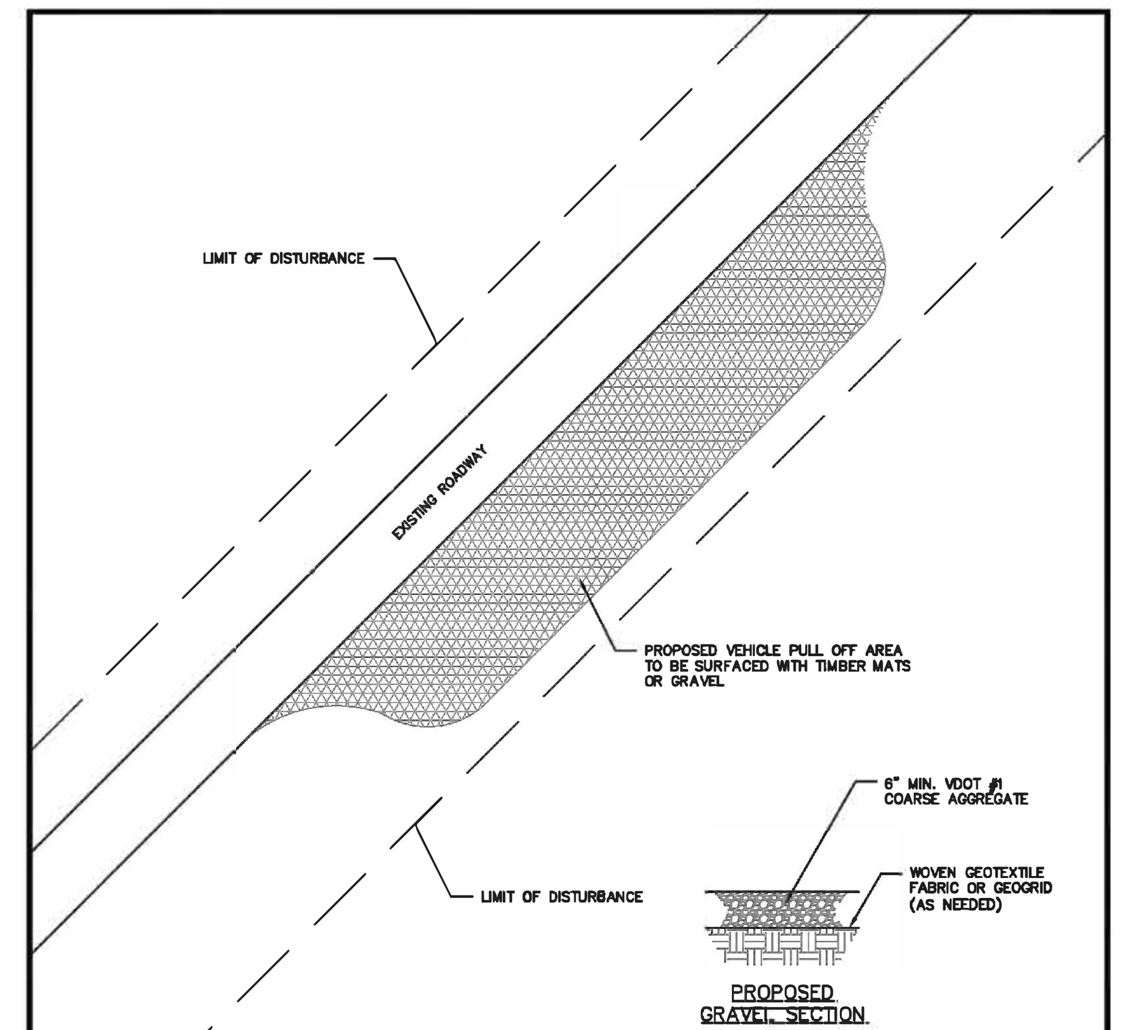
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DRAWN	DATE	Mountain Valley PIPELINE DESIGN ENGINEERING	ENVIRONMENTAL DETAIL
CHECKED	DATE		CLEAR WATER PIPE THROUGH SILT FENCE OR SUPER SILT FENCE
APP'D	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION			DRAWING NO. MVP-ES48 REV. P



DRAWN	DATE 10/13/17	Mountain Valley PIPELINE DESIGN ENGINEERING	ENVIRONMENTAL DETAIL
CHECKED	DATE 10/13/17		TEMPORARY TIMBER MAT WIDENING DETAIL
APP'D	DATE 10/13/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION			DRAWING NO. MVP-ES53 REV. P



NOTE:

1. NO GRADING ANTICIPATED. IMPROVEMENTS LIMITED TO TEMPORARY GRAVEL PLACEMENT AND TREE REMOVAL WITHIN LOD.
2. WOVEN GEOTEXTILE FABRIC OR GEOGRID MAY BE PLACED UNDER THE GRAVEL PULL OFF AS NEEDED.

DRAWN	DATE 10/13/17	Mountain Valley PIPELINE DESIGN ENGINEERING	ENVIRONMENTAL DETAIL
CHECKED	DATE 10/13/17		TEMPORARY VEHICLE PULL OFF DETAIL
APP'D	DATE 10/13/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION			DRAWING NO. MVP-ES54 REV. P

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

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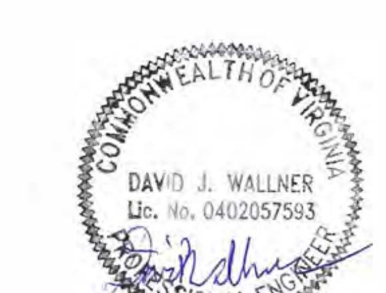
GENERAL DETAIL SET



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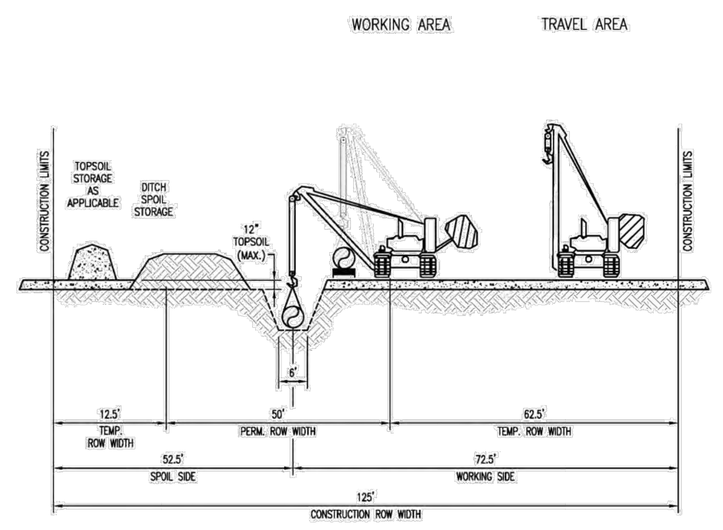
MVP-2 — Typical Construction Detail

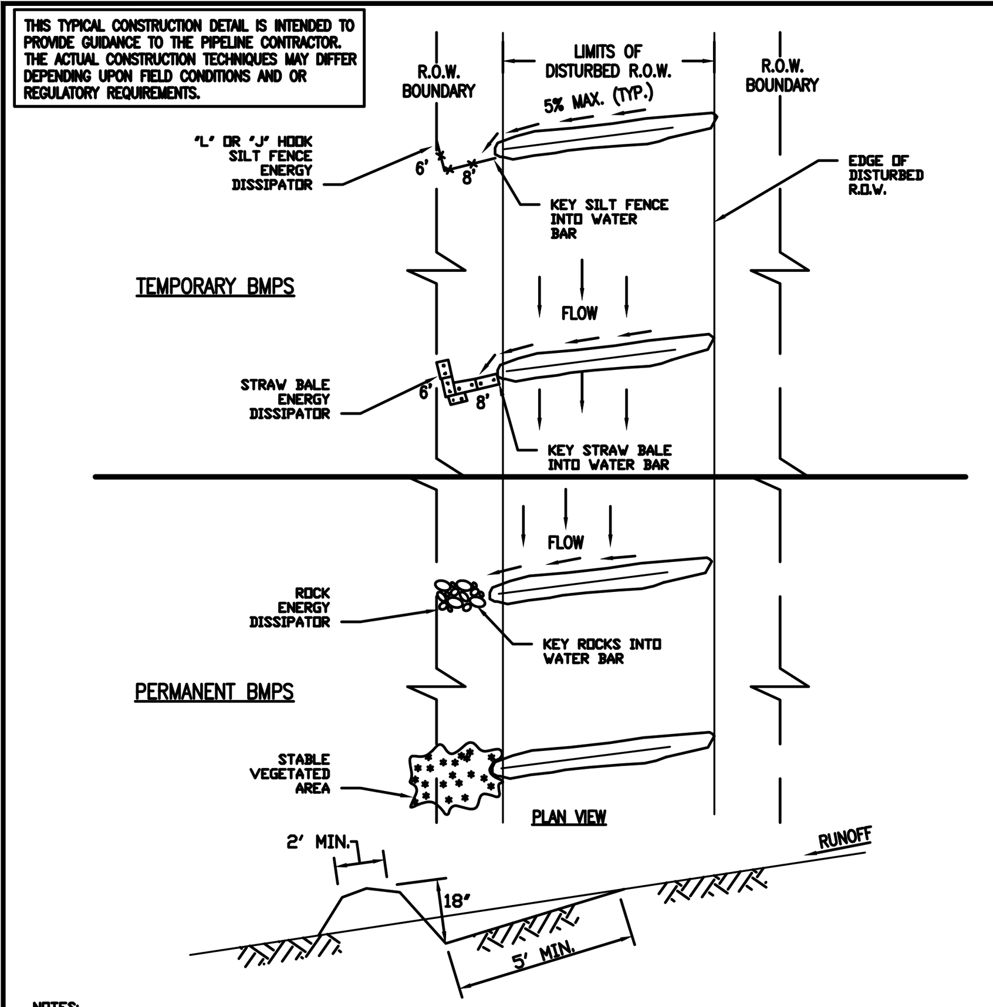


THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN JL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	MAINLINE CONSTRUCTION NON-PARALLEL CONSTRUCTION WITH TOPSOIL SEGREGATION	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-2	REV. 0

MVP-17 — Typical Construction Detail

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

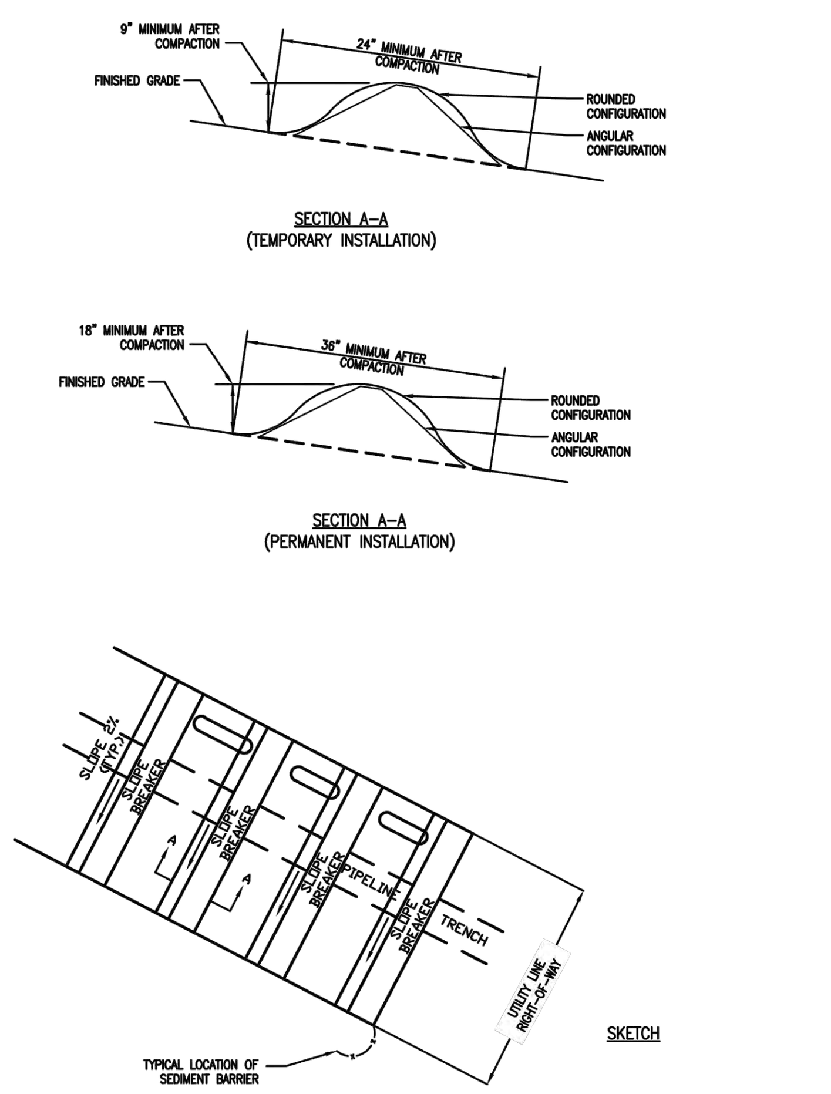


NOTES:

1. SLOPE BREAKERS SHALL BE CONSTRUCTED OF COMPACTED NATIVE SOIL AND INSTALLED AT LOCATIONS AS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE COMPANY'S INSPECTOR.
2. SLOPE BREAKERS SHALL BE ORIENTED AS SHOWN OR OTHER PATTERN AS DIRECTED BY THE COMPANY'S INSPECTOR TO DIRECT THE WATER OFF THE R.O.W.
3. SLOPE BREAKERS SHALL BE CONSTRUCTED AT A 5% MAXIMUM GRADIENT ACROSS THE SLOPE.
4. THE SLOPE BREAKERS SHALL BE 18" DEEP (AS MEASURED FROM THE TROUGH TO THE TOP OF THE SLOPE BREAKER). THE TROUGH WILL BE A MINIMUM OF 5' WIDE ACROSS THE WIDTH OF THE RIGHT-OF-WAY.
5. THE OUTLET OF THE SLOPE BREAKER MUST FREELY DISCHARGE RUNOFF OFF FROM THE DISTURBED RIGHT-OF-WAY INTO A STABLE, WELL VEGETATED AREA OR INTO AN ENERGY DISSIPATER.
6. WHERE SLOPE BREAKERS EXTEND BEYOND THE EDGE OF THE CONSTRUCTION R.O.W. DIRECT RUNOFF INTO STABLE, WELL VEGETATED AREAS, THESE LOCATIONS MUST BE APPROVED BY THE COMPANY'S INSPECTOR.

DRAWN JL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	SLOPE BREAKER/RIGHT-OF-WAY DIVERSION/WATERBAR	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-17	REV. 0

MVP-17.1 — Typical Construction Detail



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DRAWN JL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	SLOPE BREAKER/RIGHT-OF-WAY DIVERSION/WATERBAR	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-17.1	REV. 0

MVP-17.2 — Typical Construction Detail

RECOMMENDED MAXIMUM SPACING FOR PERMANENT SLOPE BREAKERS

PIPELINE GRADE	DISTANCE (FEET)
<2%	- 1, 2
2-5%	400
6-15%	200
16-30%	100
>31%	50 3

1 PERMANENT SLOPE BREAKERS WILL BE INSTALLED AS NEEDED BASED ON FIELD CONDITIONS.

2 PERMANENT SLOPE BREAKERS WILL BE INSTALLED 25 FEET FROM EACH WATERBODY BOUNDARY REGARDLESS OF SLOPE CONDITIONS.

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

NOTES:

WATERBARS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RUNOFF EVENT. DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION

MAINTENANCE OF WATERBARS SHALL BE PROVIDED UNTIL ROADWAY, SKIDTRAIL, OR RIGHT-OF-WAY HAS ACHIEVED PERMANENT STABILIZATION

WATERBARS ON RETIRED ROADWAYS, SKIDTRAILS, AND RIGHT-OF-WAYS SHALL BE LEFT IN PLACE AFTER PERMANENT STABILIZATION HAS BEEN ACHIEVED

SUMP FILTERS TO BE INSTALLED AT END OF WATERBARS. REFER TO SUMP FILTER DETAIL ON SHEET 0.09 FOR MORE DETAIL.

OUTLET PROTECTION/COMPOST FILTER SOCK SHOULD BE INSTALLED AT THE OUTLET OF ALL WATERBARS.

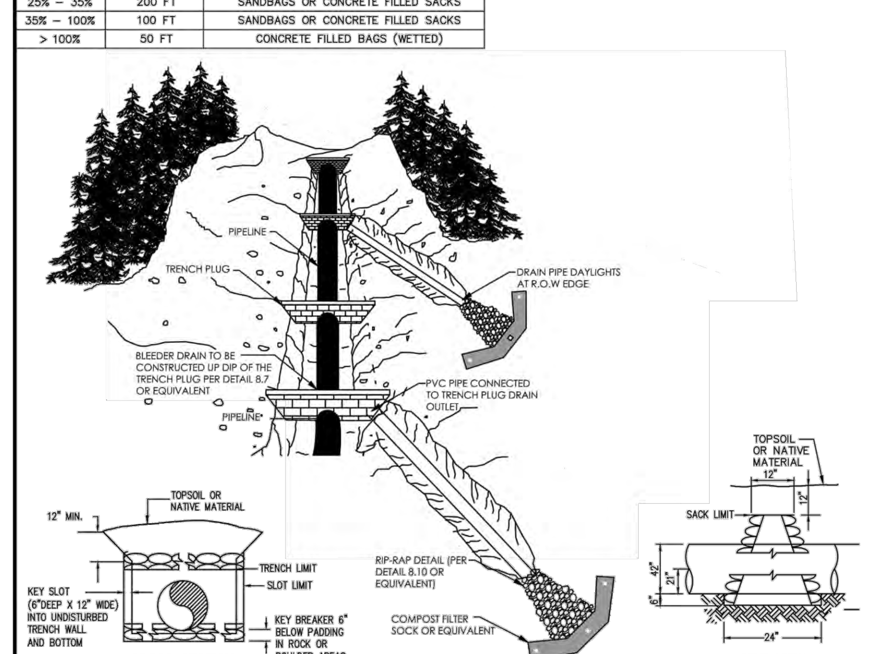
THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN JL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	SLOPE BREAKER/RIGHT-OF-WAY DIVERSION/WATERBAR	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-17.2	REV. 0

MVP-20 — Typical Construction Detail

SLOPE %	DISTANCE	PLUG MATERIAL
0% – 5%	SEE NOTE 6	CONCRETE FILLED SACKS
5% – 15%	500 FT	SANDBAGS OR CONCRETE FILLED SACKS
15% – 25%	300 FT	SANDBAGS OR CONCRETE FILLED SACKS
25% – 35%	200 FT	SANDBAGS OR CONCRETE FILLED SACKS
35% – 100%	100 FT	SANDBAGS OR CONCRETE FILLED SACKS
> 100%	50 FT	CONCRETE FILLED BAGS (WETTED)

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.



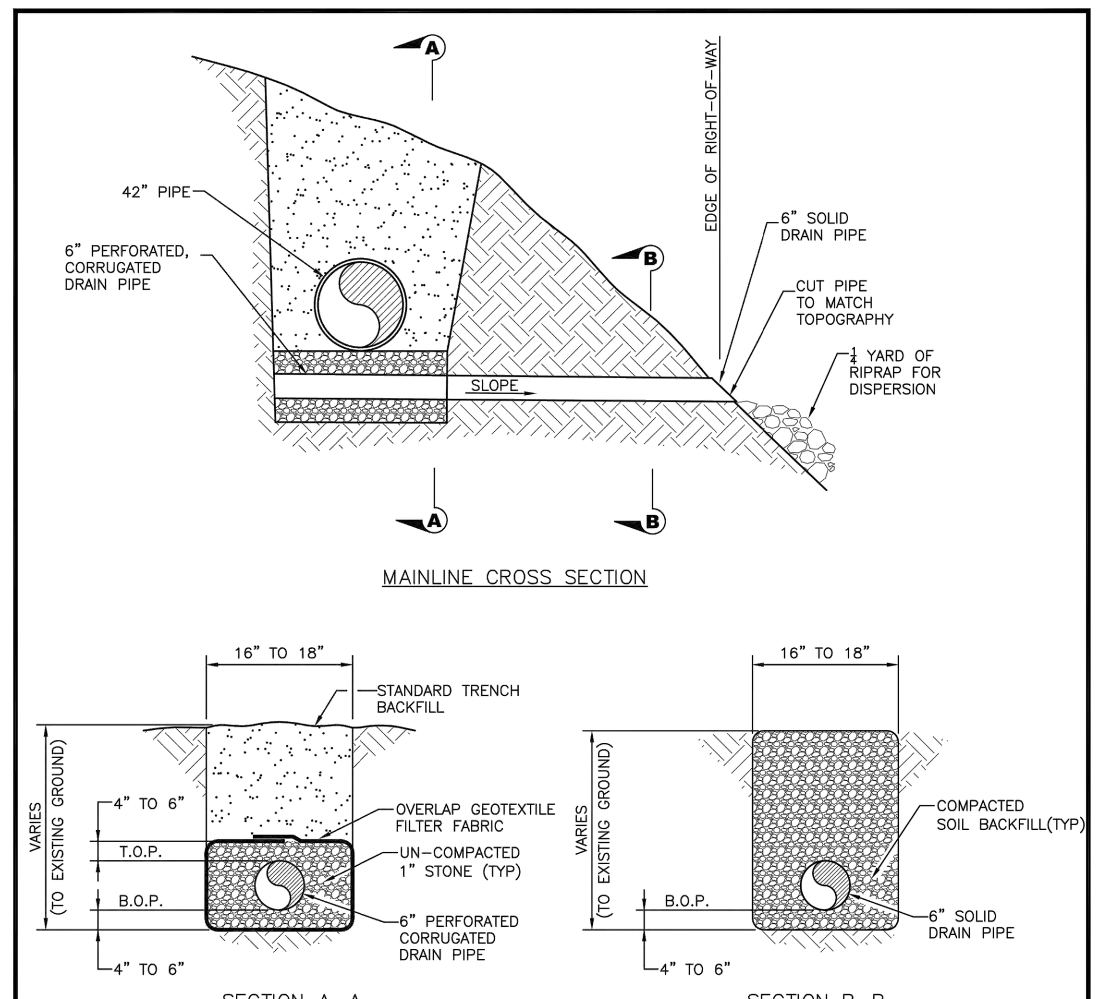
NOTES:

1. TRENCH BREAKERS SHALL BE INSTALLED:
   - ON SLOPES ALONG THE TRENCH LINE WHERE THE NATURAL DRAINAGE PATTERN, PROFILE, AND TYPE OF BACKFILL MATERIAL MAY RESULT IN LOSS OF BACKFILL MATERIAL OR ALTERATION OF THE NATURAL PATTERN;
   - AT THE BASE OF SLOPES ADJACENT TO WATERBODIES AND WETLANDS;
   - WHERE NEEDED TO AVOID DRAINING A WETLAND;
   - ON UPLAND SLOPES, AT THE SAME SPACING AS SLOPE BREAKERS AND UP SLOPE OF SLOPE BREAKERS;
   - IN CULTIVATED LAND AND RESIDENTIAL AREAS WHERE PERMANENT SLOPE BREAKERS ARE NOT TYPICALLY INSTALLED, AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WHERE REQUIRED.
2. MATERIALS APPROPRIATE FOR USE AS PERMANENT TRENCH BREAKERS INCLUDE SANDBAGS OR CONCRETE FILLED SACKS. TOPSOIL SHALL NOT BE USED FOR TRENCH BREAKERS.
3. TRENCH BREAKERS INSTALLED AT WATERBODY AND WETLAND CROSSINGS SHALL BE CONSTRUCTED OF IMPERVIOUS MATERIALS (CONCRETE FILLED SACKS).
4. BREAKER SPACING AND CONFIGURATION MAY BE CHANGED AS DIRECTED BY MVP. DEPTH OF DITCH MAY VARY WITH SITE CONDITIONS.
5. ALL MATERIALS SHALL BE SUPPLIED BY CONTRACTOR.
6. TRENCH BREAKERS ARE REQUIRED AT ALL WATERBODY CROSSINGS REGARDLESS OF TRENCH SLOPE. OTHERWISE NOTE REQUIRED AT SLOPES < 5%.
7. SINGLE TRENCH BREAKERS WILL BE A MINIMUM WIDTH OF 24" AND DOUBLE TRENCH BREAKERS WILL BE A MINIMUM WIDTH OF 36".
8. FOR SUBSURFACE AND TRENCH BREAKER DRAINAGE DETAILS INCLUDING THOSE FOR STEEP SLOPES, SEE LANDSLIDE MITIGATION TYPICAL DETAILS.
9. FOR SLOPES EXCEEDING 50%, CONCRETE FILLED SACKS ARE REQUIRED UNLESS OTHERWISE APPROVED BY MVP.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN JIL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	TYPICAL TRENCH BREAKER REQUIREMENTS	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-20	REV. 0

MVP-24 — Typical Construction Detail



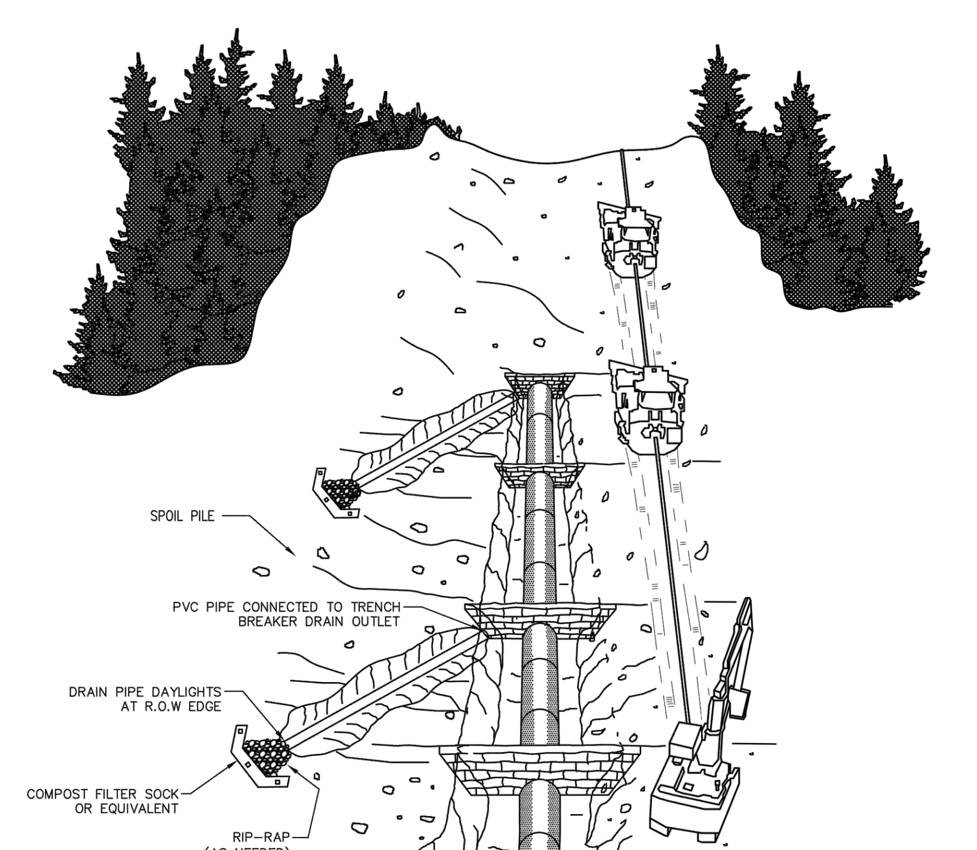
NOTES

1. LOW POINT DITCH DRAINS SHALL BE INSTALLED AT LOCATIONS SPECIFIED IN THE APPROVED EROSION & SEDIMENTATION CONTROL PLAN, AND AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. FILL STONE SHOULD BE 1" AGGREGATE WITHOUT FINES, CRUSHER RUN WITHOUT FINES, OR EQUIVALENT.
3. DRAIN PIPE TO BE CONNECTED USING STANDARD PIPE COLLARS.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN JIL	DATE 10/6/2016	TYPICAL CONSTRUCTION DETAIL	
CHECKED MMF	DATE 10/6/2016	SIDEHILL LOW-POINT DRAIN TYPICAL	
APP'D XXX	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-24	REV. 0

MVP-31 — Typical Construction Detail



NOTES:

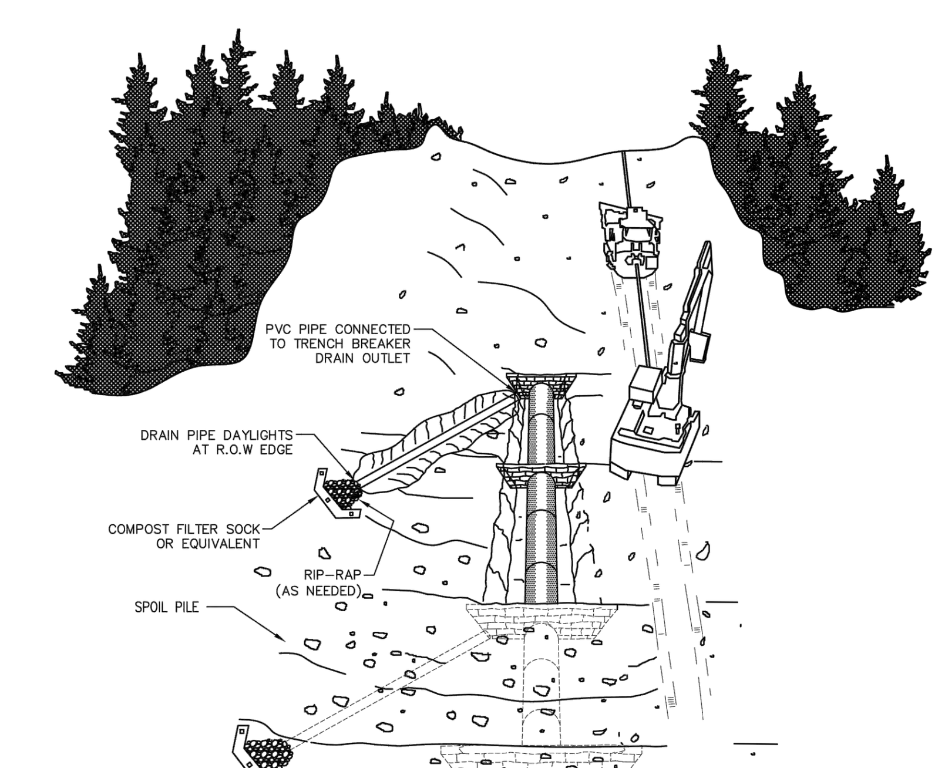
1. WINCHES MAY BE REQUIRED FOR MOVING EQUIPMENT AND MATERIAL, AND DURING CONSTRUCTION ON STEEP LONGITUDINAL SLOPES.
2. WINCHES WILL EITHER BE FIXED WINCHES OR TRACKED EQUIPMENT WITH WINCHES.
3. WINCHES WILL TYPICALLY BE REQUIRED FOR SLOPES OF 30% (17°) AND UP.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWING ASSUMES TYPE "B" SOIL

DRAWN JDM	DATE 03/28/16	TYPICAL CONSTRUCTION DETAIL	
CHECKED RRR	DATE 04/06/16	MAINLINE CONSTRUCTION STEEP HILL PARALLEL CONSTRUCTION NO TOP SOIL SEGREGATION	
APP'D RLM	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-31	REV. 0

MVP-32 — Typical Construction Detail



NOTES:

1. WINCHES MAY BE REQUIRED FOR MOVING EQUIPMENT AND MATERIAL, AND DURING CONSTRUCTION ON STEEP LONGITUDINAL SLOPES.
2. WINCHES WILL EITHER BE FIXED WINCHES OR TRACKED EQUIPMENT WITH WINCHES.
3. WINCHES WILL TYPICALLY BE REQUIRED FOR SLOPES OF 30% (17°) AND UP.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWING ASSUMES TYPE "B" SOIL

DRAWN JIL	DATE 06/23/16	TYPICAL CONSTRUCTION DETAIL	
CHECKED RRR	DATE 06/23/16	MAINLINE CONSTRUCTION STEEP HILL STOVE PIPE CONSTRUCTION JEFFERSON NATIONAL FOREST NO TOP SOIL SEGREGATION	
APP'D RLM	DATE 08/11/17		
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID: MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-32	REV. 0

Sheet Title Block

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

TETRA TECH
complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

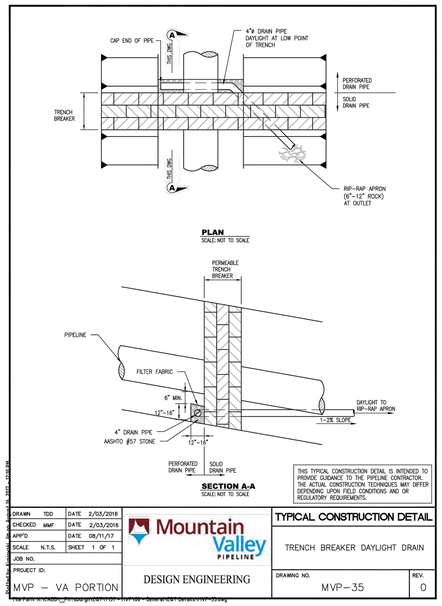
GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
SHT. NO.	0.11JNF OF 13.06JNF

REVISION

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\00 – General\JNF\7157ES011.dwg PLOTTED ON: 10/26/2017 7:50 AM PLOTTED BY: Rickabough, Greg PLOT FILE: ENVIRONMENTAL_COLOR.ctb



THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		TRENCH BREAKER DAYLIGHT DRAIN
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–35 / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:18 PM
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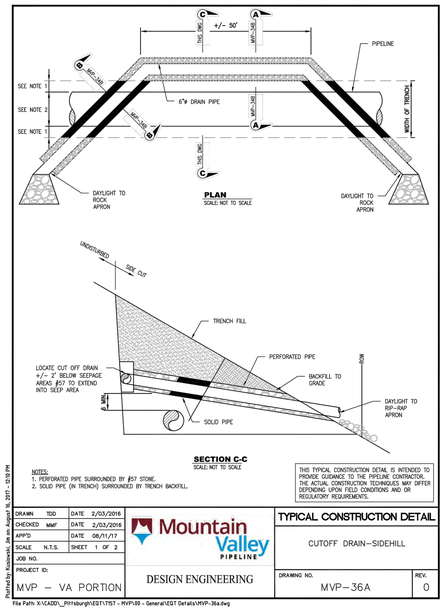
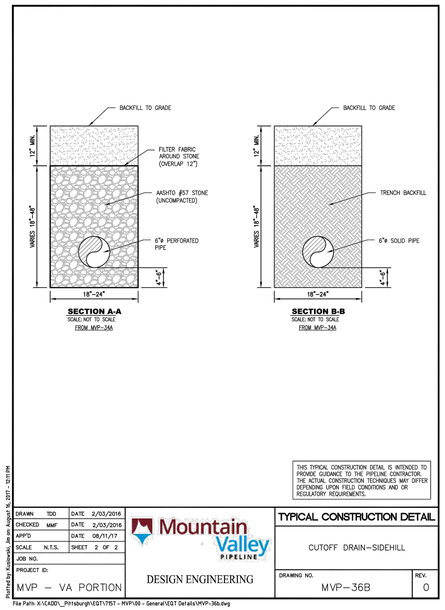


NOTES:
1. PERFORATED PIPE SURROUNDED BY #57 STONE.
2. SOLID PIPE (IN TRENCH) SURROUNDED BY TRENCH BACKFILL.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		CUTOFF DRAIN–SIDEHILL
SCALE N.T.S.	SHEET 1 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–36A / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:19 PM
File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\EQT Details\MVP-36a.dwg



THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		CUTOFF DRAIN–SIDEHILL
SCALE N.T.S.	SHEET 2 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–36B / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:19 PM
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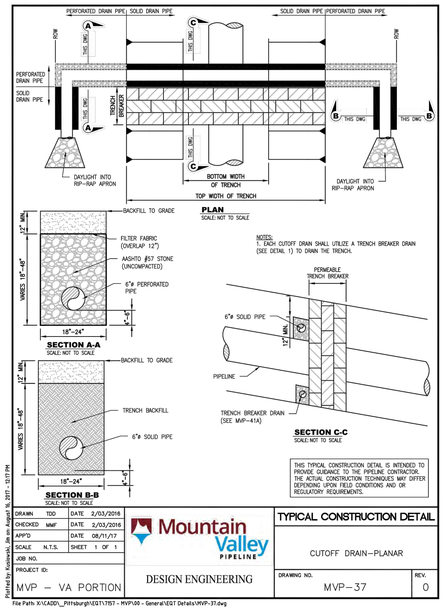

NOTES:
1. EACH CUTOFF DRAIN SHALL UTILIZE A TRENCH BREAKER DRAIN (SEE DETAIL 1) TO DRAIN THE TRENCH.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		CUTOFF DRAIN–PLANAR
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–37 / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:17 PM
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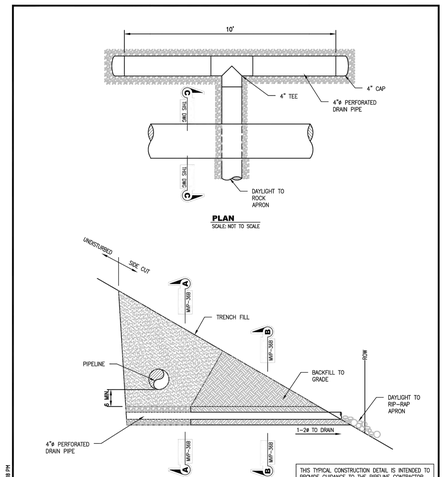
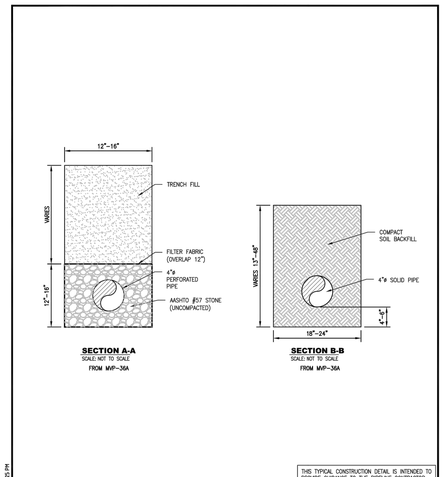


THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		TRANSVERSE TRENCH DRAIN
SCALE N.T.S.	SHEET 1 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–38A / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:18 PM
File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\EQT Details\MVP-38A.dwg



THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		TRANSVERSE TRENCH DRAIN
SCALE N.T.S.	SHEET 2 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–38B / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:20 PM
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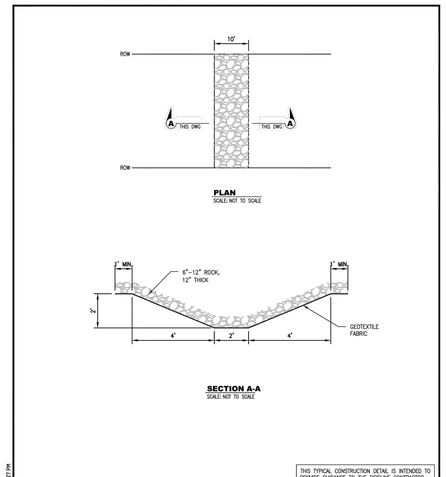
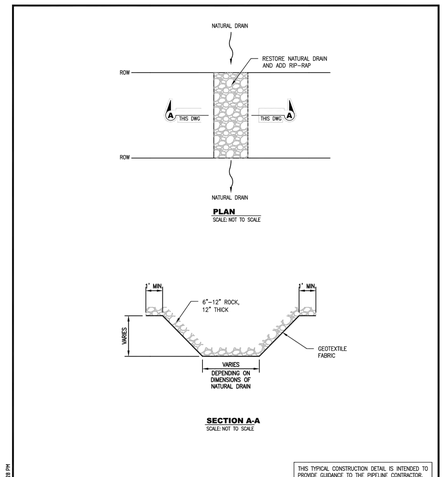


THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		ROCK LINED SWALE
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–39 / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:21 PM
File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\References\10-12-16 Added to Set - Copy\MVP-39.dwg



THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		RIP–RAP NATURAL DRAIN
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION		DESIGN ENGINEERING	DRAWING NO. MVP–40 / REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:28 PM
File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\References\10-12-16 Added to Set - Copy\MVP-40.dwg

NO.	DATE:	DWN.:	CHKD:	APPD.:	DESCRIPTION:
					REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

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complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
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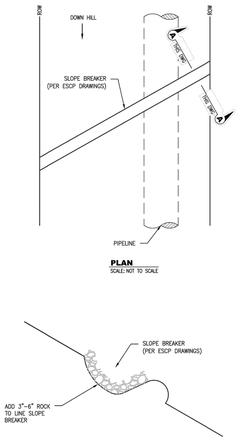
PITTSBURGH, PA 15220

GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.12JNF OF 13.06JNF

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\00 – General\JNF\7157ES012.dwg PLOTTED ON: 10/26/2017 7:50 AM PLOTTED BY: Rickabough, Greg PLOT FILE: ENVIRONMENTAL_COLOR.ctb



PLAN
SCALE: NOT TO SCALE

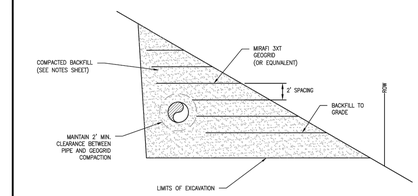
SECTION A-A
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		RIP-RAP SLOPE BREAKERS
SCALE N.T.S.	SHEET 1 OF 1		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-41	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:03 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\References\10-12-16 Added to Set - Copy\MVP-41.dwg

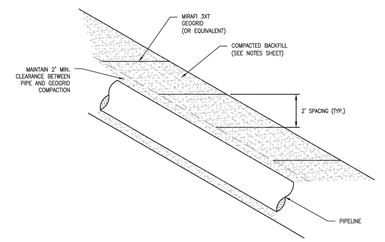


THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		GEOGRID–SIDEHILL
SCALE N.T.S.	SHEET 1 OF 3		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-42A	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:04 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\References\10-12-16 Added to Set - Copy\MVP-42A.dwg



SECTION VIEW
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	SLIDE MITIGATION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		GEOGRID–PLANAR
SCALE N.T.S.	SHEET 2 OF 3		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-42B	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 12:04 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\References\10-12-16 Added to Set - Copy\MVP-42B.dwg

COMPACTION NOTES

1) ALL ROCKS LARGER THAN 6 INCHES IN SIZE, AND MORE THAN 10 PERCENT BY VOLUME SHOULD BE REMOVED AND PROPERLY DISPOSED FROM THE BACKFILL MATERIAL.
2) THE SUBGRADE AT THE BASE OF THE EXCAVATION SHOULD BE PROOFROLLED WITH A PNEUMATIC TIRED ROLLER OR VEHICLE.
3) THE EXCAVATED AREA SHALL BE BACKFILLED WITH THE CLEANED EXCAVATED SOIL MATERIAL AND COMPACTED IN PLACE.
4) BACKFILL OPERATIONS SHALL BE PERFORMED WHEN SOIL IS SUITABLE FOR COMPACTION (I.E., NOT IMMEDIATELY FOLLOWING A LARGE RAIN, SNOW, OR ICE EVENT). FROZEN FILL SHALL NOT BE USED.
5) THE BACKFILL SHALL BE PLACED IN COMPACTED LIFTS NO GREATER THAN 12 INCHES.
6) MAINTAIN A MINIMUM 2FT CLEARANCE BETWEEN COMPACTION ACTIVITY AND THE GAS PIPELINE.

GRAVEL DRAIN NOTES

1) GEOTEXTILE FABRIC SHALL BE TENCATE MIRAFI 140N OR APPROVED EQUIVALENT.
2) THE GEOTEXTILE FABRIC SHALL BE STORED UNDAMAGED PURSUANT TO MANUFACTURERS RECOMMENDATIONS.
3) DO NOT OPERATE CONSTRUCTION EQUIPMENT DIRECTLY ON THE GEOTEXTILE FABRIC.
4) DRAINAGE AGGREGATE SHALL MEET THE REQUIREMENTS OF AASHTO NO. 57 STONE.
5) DRAINAGE AGGREGATE SHALL NOT BE COMPACTED.

GEOGRID NOTES

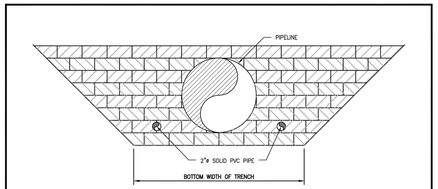
1) GEOGRID REINFORCEMENT SHALL BE TENCATE MIRAFI 3XT OR APPROVED EQUIVALENT.
2) THE GEOGRID MATERIAL SHALL BE STORED UNDAMAGED PURSUANT TO MANUFACTURERS RECOMMENDATIONS.
3) GEOGRID SHALL BE PLACED HORIZONTALLY ON THE BACKFILL WITH THE PRINCIPAL STRENGTH DIRECTION PERPENDICULAR TO THE FACE OF THE SLOPE. ADJACENT PIECES OF PRIMARY GEOGRID SHALL NOT OVERLAP BUT ARE TO BE BUTTED SIDE TO SIDE.
4) REMOVE ALL SLACK IN THE GEOGRID MATERIAL AND ANCHOR AS NECESSARY WITH PINS, OR BAGS TO PREVENT SLACK FROM DEVELOPMENT DURING FILL PLACEMENT AND COMPACTION.
5) FILL IS TO BE PLACED AND SPREAD DIRECTLY ON THE GEOGRID MATERIAL WITH RUBBER TIRED EQUIPMENT ONLY. SPEEDS ARE TO BE KEPT SLOW WITH AS FEW STOPS AND TURNS AS PRACTICAL.
6) DO NOT OPERATE TRACKED EQUIPMENT DIRECTLY ON THE GEOGRID MATERIAL.
7) MAINTAIN A MINIMUM 2FT CLEARANCE BETWEEN GEOGRID MATERIAL AND THE GAS PIPELINE.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

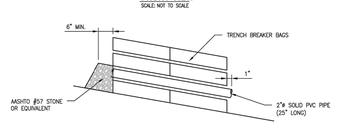
DRAWN TDD	DATE 2/03/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 2/03/2016		
APP'D	DATE 08/11/17		GEOGRID NOTES
SCALE N.T.S.	SHEET 3 OF 3		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-42C	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 1:55 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\EQT Details\MVP-42C.dwg



FRONT VIEW
SCALE: NOT TO SCALE



SECTION VIEW
SCALE: NOT TO SCALE

NOTES:
1. PLACE PVC DRAIN PIPE ON FIRST LAYER OF TRENCH BREAKER BAGS.
2. PLACE PVC DRAIN PIPE EQUIDISTANT FROM THE OUTSIDE EDGE OF THE 30" GAS PIPE AND THE BOTTOM LIMITS OF THE TRENCH.
3. EXTEND PVC PIPE THROUGH ENTIRE TRENCH BREAKER AND EXTEND APPROX. 1' PAST END OF BREAKER.
4. AASHTO#57 STONE SHALL BE PLACED TO A MINIMUM 6" THICKNESS UPSLOPE OF THE DRAIN PIPE.

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 4/14/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 4/14/2016		
APP'D	DATE 08/11/17		TRENCH BREAKER PASS-THROUGH DRAIN
SCALE N.T.S.	SHEET 1 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-43A	REV. 0

Plotted by: Rickabaugh, Greg on August 16, 2017 - 10:50 AM

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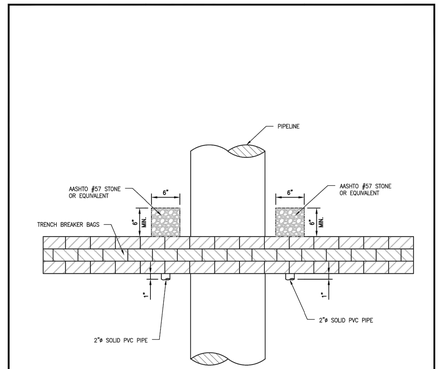

PLAN VIEW
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN TDD	DATE 4/14/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE 4/14/2016		
APP'D	DATE 08/11/17		TRENCH BREAKER PASS-THROUGH DRAIN
SCALE N.T.S.	SHEET 2 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-43B	REV. 0

Plotted by: Rickabaugh, Greg on August 16, 2017 - 10:55 AM

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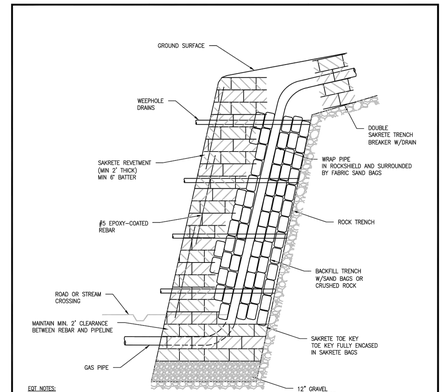


EQT NOTES:
1. SAKRETE BAGS SHOULD EXTEND 4 BAGS DEEP PIPE SHOULD BE COMPLETELY SURROUNDED BY SAND BAGS, OR CRUSHED ROCK (MAX 4").
2. SAKRETE BAGS SHOULD BE STAGGERED IN A MASONRY FASHION. THE FACE OF THE WELL SHALL BE INCLINED 8"-10" FROM VERTICAL.
3. #5 REBAR SHOULD BE DRIVEN THROUGH THE SAKRETE BAGS (SEE DETAIL 1).
4. 2"ø PVC WEEPHOLE DRAINS SHALL BE INSTALLED EVERY 15 FT.

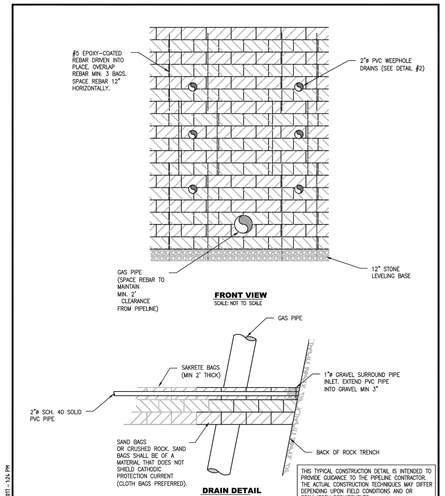
SIDE VIEW
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN OL	DATE 8/29/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE –		
APP'D	DATE 08/11/17		SLIDE MITIGATION HIGHWALL REVETMENT SIDE VIEW
SCALE N.T.S.	SHEET 1 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-44A	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 1:23 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\EQT Details\MVP-44A.dwg



FRONT VIEW
SCALE: NOT TO SCALE

DRAIN DETAIL
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN OL	DATE 8/29/2016	Mountain Valley PIPELINE	TYPICAL CONSTRUCTION DETAIL
CHECKED MMF	DATE –		
APP'D	DATE 08/11/17		SLIDE MITIGATION HIGHWALL REVETMENT FRONT VIEW AND DRAIN DETAIL
SCALE N.T.S.	SHEET 2 OF 2		
JOB NO.			
PROJECT ID:			
MVP – VA PORTION	DESIGN ENGINEERING	DRAWING NO. MVP-44B	REV. 0

Plotted by: Kozlowski, Jim on August 16, 2017 - 1:24 PM

File Path: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\EQT Details\MVP-44B.dwg

NO.:	DATE:	DWN.:	CHKD:	APPD.:	DESCRIPTION:
					REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

TETRA TECH
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661 ANDERSEN DRIVE
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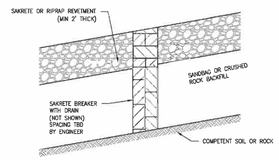
PITTSBURGH, PA 15220

GENERAL DETAIL SET

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 0.13JNF OF 13.06JNF	

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\00 – General\JNF\7157ES013.dwg PLOTTED ON: 10/26/2017 7:50 AM PLOTTED BY: Rickabaugh, Greg PLOT FILE: ENVIRONMENTAL_COLOR.ctb



SIDE VIEW
SCALE: NOT TO SCALE

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN	TDD	DATE	2/03/2016
CHECKED	MAF	DATE	2/03/2016
APP'D		DATE	08/11/17
SCALE	N.T.S.	SHEET	1 OF 1
JOB NO.			
PROJECT ID:			
MVP – VA PORTION			

Mountain Valley PIPELINE — DESIGN ENGINEERING

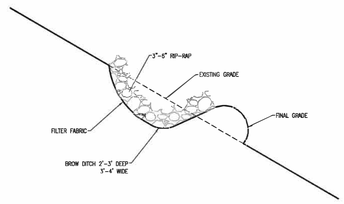
TYPICAL CONSTRUCTION DETAIL

STEEP SLOPE REVETMENT

DRAWING NO. MVP-45 — REV. 0

Plotted by Rickabaugh, Gene on August 14, 2017 - 1:27 PM

File Path: X:\CADD_Pittsburgh\EGT\7157 - MVP\00 - General\EGT Details\MVP-45.dwg



THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND OR REGULATORY REQUIREMENTS.

DRAWN	TDD	DATE	7/12/2016
CHECKED	MAF	DATE	7/12/2016
APP'D		DATE	08/11/17
SCALE	N.T.S.	SHEET	1 OF 1
JOB NO.			
PROJECT ID:			
MVP – VA PORTION			

Mountain Valley PIPELINE — DESIGN ENGINEERING

TYPICAL CONSTRUCTION DETAIL

BROW DITCH DETAIL

DRAWING NO. MVP-46 — REV. 0

Plotted by Rickabaugh, Gene on August 14, 2017 - 1:28 PM

File Path: X:\CADD_Pittsburgh\EGT\7157 - MVP\00 - General\EGT Details\MVP-46.dwg

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – E&S DETAILS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
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GENERAL DETAIL SET

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SHT. NO.	0.14JNF OF 13.06JNF

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EGT\7157 – MVP\00 – General\JNF\7157ES014(SS8).dwg PLOTTED ON: 5/12/2021 12:56 PM PLOTTED BY: Rickabaugh, Gene PLOT FILE: ENVIRONMENTAL_COLOR.ctb

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.

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 TEMPORARY 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.

5. 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. SEGREGATION OF TOPSOIL AND SUBSOIL WILL BE PERFORMED WHERE TRENCH EXCAVATION TAKES PLACE IN AN AGRICULTURAL, WETLAND, OR RESIDENTIAL AREA.

6. 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.

7. 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.

8. INSTALL TRENCH BREAKERS AT LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY MVP AND AS SPECIFIED ON THE DETAIL SHEET (DETAIL MVP-20).

9. 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.

10. 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 14 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.

11. 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.

12. 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).

13. REVEGETATE DISTURBED AREA PER TABLES ON THIS SHEET 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).

14. RE-ESTABLISH APPROPRIATE DRAINAGE IN EXISTING ROAD CHANNELS PRIOR TO SEEDING AND MULCHING.

15. 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 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.

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.

16. 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 CHOPPED AND SPREAD ON-SITE.

FOR STREAM CROSSINGS WHERE DRY CROSSING TECHNIQUES PROPOSED, 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.

FOR STREAM CROSSINGS WHERE CONVENTIONAL BORE TECHNIQUES PROPOSED, REFER TO THE FOLLOWING STEPS:

1. EXCAVATE LAUNCHING AND RECEIVING PITS LOCATED IN WORKSPACE ON EACH SIDE OF THE FEATURE BEING CROSSED.

2. STABILIZE AND/OR PROVIDE APPROPRIATE E&S CONTROLS AROUND THE RESULTING SPOIL PILES IN ACCORDANCE WITH THE REQUIREMENTS APPLICABLE TO SOIL STOCKPILES.

3. LOWER BORING MACHINE INTO LAUNCHING PIT, AND BORE HORIZONTAL HOLE TO A DIAMETER EQUAL TO THE DIAMETER OF THE PIPE (OR CASING, IF REQUIRED) AT THE DEPTH OF THE PIPELINE INSTALLATION.

4. PUSH THE PIPELINE SECTION AND/OR CASING THROUGH THE BORE FROM THE LAUNCHING PIT TO THE RECEIVING PIT. IF ADDITIONAL PIPELINE SECTIONS ARE REQUIRED TO SPAN THE LENGTH OF THE BORE, THEY WILL BE WELDED TO THE FIRST SECTION OF THE PIPELINE IN THE LAUNCHING PIT BEFORE BEING PUSHED THROUGH THE BORE.

5. DEWATER LAUNCHING AND RECEIVING PITS UTILIZING PUMP WATER FILTER BAGS AS NEEDED DURING BORE OPERATIONS.

6. BACKFILL AND STABILIZE LAUNCHING AND RECEIVING PITS UPON COMPLETION OF THE BORE.

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 SHOULD 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 INHABIT 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 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
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TEMPORARY BMPS 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.

- 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.

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - E&S DETAILS

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GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

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SCALE:	AS SHOWN
REVISION	
SHT. NO.	0.15JNF OF 13.06JNF

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\JNF\7157ES015.dwg PLOTTED ON: 4/16/2021 1:53 PM PLOTTED BY: Zeigler, Justin PLOT FILE: ENVIRONMENTAL_COLOR.ctb

BEST MANAGEMENT PRACTICES (BMP) INSTALLATION & REMOVAL NOTES

TEMPORARY AND PERMANENT BMPS WILL BE USED DURING CONSTRUCTION ACTIVITIES TO AVOID AND/OR MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS OF CONSTRUCTION ACTIVITIES.

THE FOLLOWING ARE GENERAL BMP INSTALLATION NOTES FOR PIPELINE CONSTRUCTION ACTIVITIES.

- A STONE CONSTRUCTION ENTRANCE, SHOWN ON DETAIL SHEET, SHALL BE PROVIDED AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC WILL BE ACCESSING A PAVED ROAD DIRECTLY FROM A DISTURBED AREA.
- TEMPORARY SEDIMENT BARRIERS, INCLUDING APPROPRIATELY SIZED SILT FENCE OR COMPOST FILTER SOCK WILL BE PLACED AROUND SOIL STOCKPILES, AS NEEDED.
- APPROPRIATELY SIZED COMPOST FILTER SOCK WILL BE PLACED AROUND WETLANDS AND WATERBODIES IN AND ADJACENT TO THE WORK AREA PRIOR TO ANY TRENCHING ACTIVITIES.
- STOCKPILE SLOPES WILL BE 2:1 OR FLATTER, AND STOCKPILES WILL NOT EXCEED 35 FEET IN HEIGHT.
- TEMPORARY STREAM CROSSINGS SHALL BE INSTALLED AS INDICATED ON THE E&S PLAN SHEETS AND AS PER THE E&S DETAIL SHEETS.
- 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.
- 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.
- 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. 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.

STREAM CROSSING PROCEDURES

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

- MINIMIZE CLEARING AND GRUBBING OF VEGETATION UP TO STREAMS, AS POSSIBLE, UNTIL THE TIME OF THE PIPELINE INSTALLATION;
- ONLY THAT AREA WHICH IS REQUIRED FOR PIPELINE INSTALLATION SHALL BE DISTURBED WITHIN THE PROPOSED LIMIT OF DISTURBANCE OR RIGHT-OF-WAY AT STREAM CROSSINGS; LOCATING STAGING AREAS 50 FEET AWAY FROM THE STREAM, WHERE POSSIBLE;
- STORING CHEMICALS, STORING EQUIPMENT, WASHING EQUIPMENT, OR REFUELING EQUIPMENT MUST BE DONE IN AREAS THAT ARE GREATER THAN 100 FEET AWAY FROM THE STREAM;
- SPOIL PILE PLACEMENT AND BMPS WILL BE MONITORED AT ALL TIMES DURING STREAM CROSSING PROCEDURES; ONCE WORK WITHIN A STREAM AREA IS STARTED, IT WILL BE CONDUCTED CONTINUOUSLY TO COMPLETION; EMPHASIS WILL BE PLACED ON MINIMIZING TIME OF DISTURBANCE;
- SPOILS 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.

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 ADDRESSED IF NECESSARY IMMEDIATELY AFTER DISTURBANCE OF THE WATERBODY.

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.

CONVENTIONAL BORE TECHNIQUES:
TO COMPLETE A CONVENTIONAL BORE OR GUIDED CONVENTIONAL BORE, TWO PITS WILL BE EXCAVATED, ONE ON EACH SIDE OF THE FEATURE TO BE BORED. A BORING MACHINE WILL BE LOWERED INTO ONE PIT, AND A HORIZONTAL HOLE WILL BE BORED TO A DIAMETER EQUAL TO THE DIAMETER OF THE PIPE (OR CASING, IF REQUIRED) AT THE DEPTH OF THE PIPELINE INSTALLATION. THE PIPELINE SECTION AND/OR CASING WILL THEN BE PUSHED THROUGH THE BORE TO THE OPPOSITE PIT. IF ADDITIONAL PIPELINE SECTIONS ARE REQUIRED TO SPAN THE LENGTH OF THE BORE, THEY WILL BE WELDED TO THE FIRST SECTION OF THE PIPELINE IN THE BORE PIT BEFORE BEING PUSHED THROUGH THE BORE (MVP-51-TYPICAL WATERBODY CONVENTIONAL BORE).

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

LEGEND

- EXISTING CULVERT
- STREAM
- US FOREST SERVICE (NATIONAL FOREST) LANDS
- AMST — AMST — APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- SF — SF — PROPOSED SILT FENCE (SEE NOTE 5)
- SSF — SSF — PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)
- RFD — RFD — PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- OCSF — ORANGE CONSTRUCTION SAFETY FENCE
- 12 — 12 — 12 — 12 — PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- 18 — 18 — 18 — 18 — PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- 24 — 24 — 24 — 24 — PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- PROPOSED CULVERT WITH OUTLET PROTECTION (SEE DETAILS MVP-ES7, 7.1)
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

ACCESS ROAD LEGEND

1. ROCK CONSTRUCTION ENTRANCE (VADEQ STD & SPEC 3.02)
2. WETLAND CROSSING (DETAIL MVP-ES37)
3. STREAM CROSSING (VADEQ STD & SPEC 3.24)

NOTES:

1. TOPSOIL SEGREGATION TO BE CONDUCTED THROUGHOUT THE JEFFERSON NATIONAL FOREST.
2. FLEXTERRA, EARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL BLANKET AS DIRECTED BY MVP.
3. 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.
4. SLOPES OF 30° OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPLELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. IMPROVEMENTS TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE SPECIFIC ACCESS ROAD DETAILS.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS.
8. ALL NON VMRC STREAM CROSSINGS WILL BE PERFORMED AS DESCRIBED IN THE STREAM CROSSING TABLE INCLUDED IN THIS PACKAGE.

REVISIONS:

NO.:	DATE:	DWN.:	CHKD:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - E&S DETAILS
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
GILES COUNTY THROUGH MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15317

TETRA TECH
complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

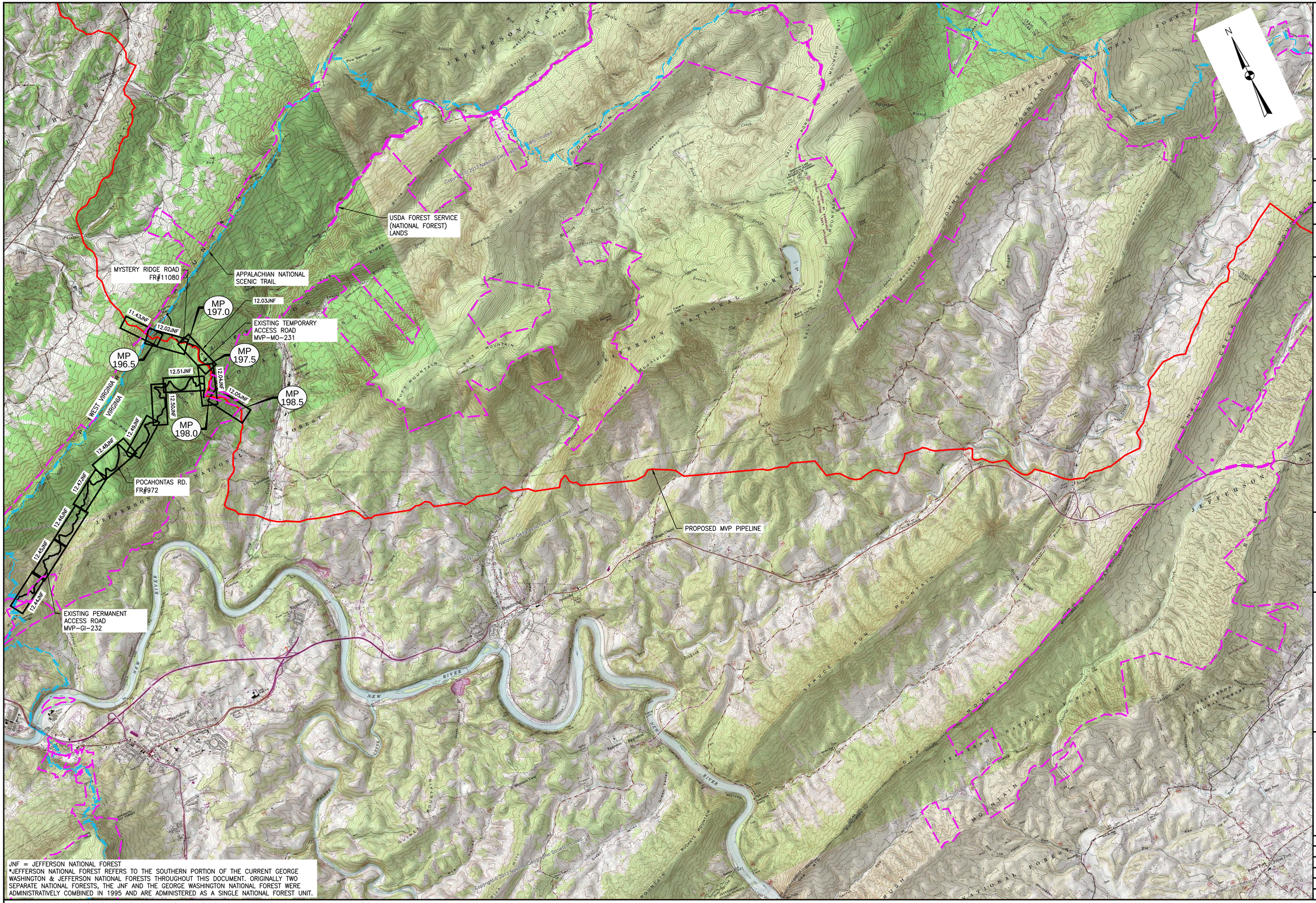
GENERAL DETAIL SET

COMMONWEALTH OF PENNSYLVANIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	10/26/2017
SCALE:	AS SHOWN
SHT. NO.	0.16JNF OF 13.06JNF

REVISION

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 - MVP\00 - General\JNF\7157ES016.dwg PLOTTED ON: 4/19/2021 8:03 AM PLOTTED BY: Zeigler, Justin PLOT FILE: ENVIRONMENTAL_COLOR.ctb



JNF = JEFFERSON NATIONAL FOREST
*JEFFERSON NATIONAL FOREST REFERS TO THE SOUTHERN PORTION OF THE CURRENT GEORGE WASHINGTON & JEFFERSON NATIONAL FORESTS THROUGHOUT THIS DOCUMENT. ORIGINALLY TWO SEPARATE NATIONAL FORESTS, THE JNF AND THE GEORGE WASHINGTON NATIONAL FOREST WERE ADMINISTRATIVELY COMBINED IN 1995 AND ARE ADMINISTERED AS A SINGLE NATIONAL FOREST UNIT.

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 - MVP\12 - Giles\E&S\E&S Version 5.0.0\JNF\7157JNF12.01.dwg PLOTTED ON: 10/5/2017 12:02 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
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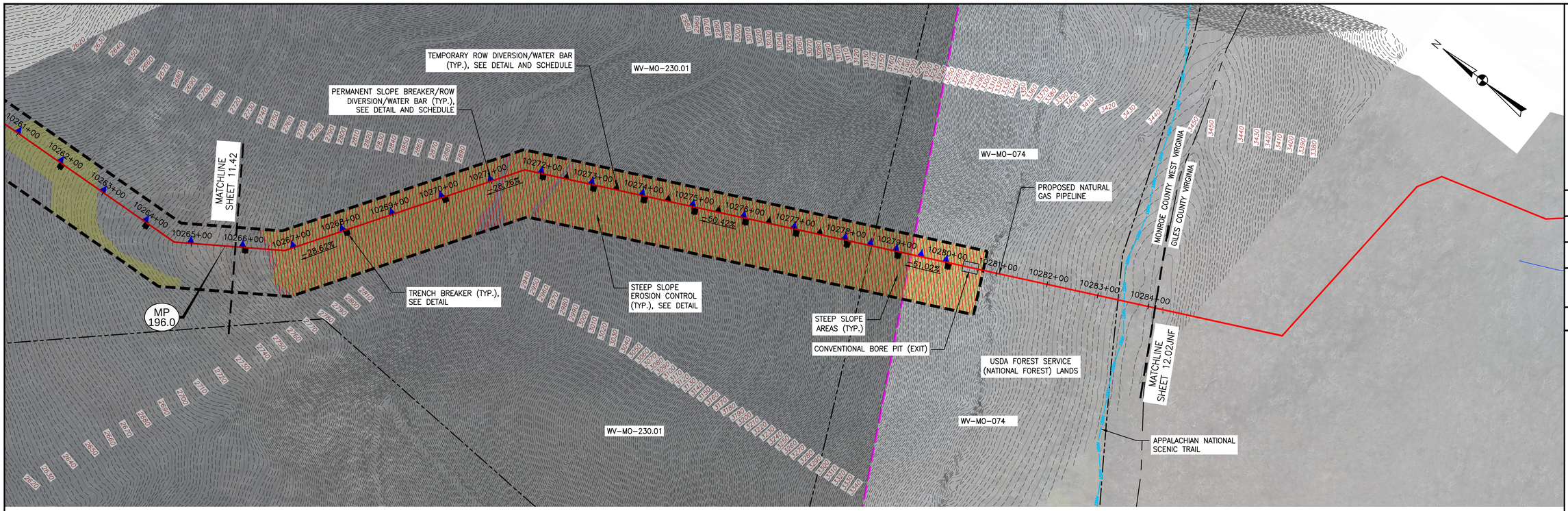
EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402025753
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	

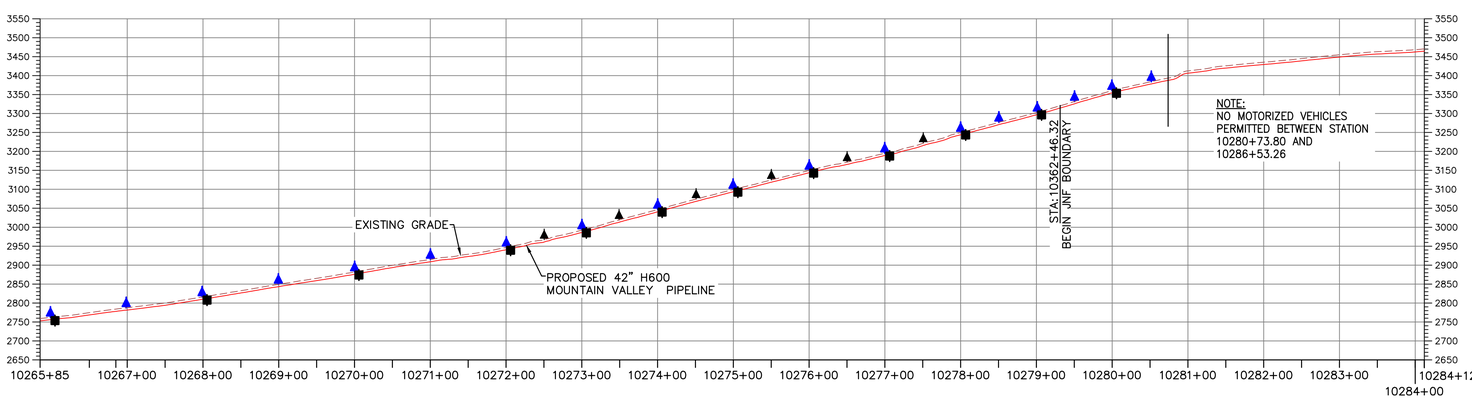
SHT. NO. 12.01JNF OF 13.06JNF



PLAN

SCALE: 1" = 100'

100 0 100 200



PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'

200 0 200 400

LEGEND

- CLEAN WATER DIVERSION DIKE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL (ANST)
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL (AFM)
- AGRICULTURAL LAND USE BOUNDARY (AGR)
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SF) (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SSF) (SEE DETAIL MVP-ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (RFD) (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE (OCSF)
- PROPOSED COMPOST FILTER SOCK (12) (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (18) (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (24) (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

ACCESS ROAD LEGEND

1. ROCK CONSTRUCTION ENTRANCE (VADEQ STD & SPEC 3.02)
2. WETLAND CROSSING (DETAIL MVP-ES37)
3. STREAM CROSSING (VADEQ STD & SPEC 3.24)

NOTES:

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3. 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.
4. SLOPES OF 30' OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPLELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. IMPROVEMENTS TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE SPECIFIC ACCESS ROAD DETAILS.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS.
8. 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 AN ACCEPTABLE 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)

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NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:
					REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
MONROE COUNTY, WEST VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
CHECKED BY:	JDO
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
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GENERAL DIRECTION FOR EROSION CONTROL AND SEEDING

Project plans must specify how each of these guidelines will be met.

- Placement of sequestered topsoil prior to seeding.
- Seed shall be Virginia or West Virginia certified seed (bag tags attached; seed certification shall meet each state's standards for their certified seed classification) or alternative seed sourced from approved distributers.
- USFS approval of treatments outside normal seeding seasons.
- All leguminous seed shall be either be pre-inoculated from a supplier, or mixed with inoculant specified for use on that particular seed according to manufacturer's directions. Inoculants shall be manually applied at double the manufacturer's rate. Inoculant shall be mixed with legume seed prior to mixing with other seeds. For hydro-seeding, use a minimum of five times the dry seeding rate of inoculant. (Flynn, 2015; Monsanto 2015)
- A minimum of 100 lbs/ac of seed will be applied when seeding for permanent erosion control (VA BMP) unless otherwise specified by the seed mix provider.
- A success standard/threshold, such as 70-85% ground cover, must be delineated, and provisions to monitor and report on site conditions. Please describe plans for implementing mitigation measures (in case of planting failures) to ensure planting success.
- Describe how subsoil will be tested for compaction, and loosened prior to topsoil replacement if necessary.
- Dry fertilizer and lime may need to be incorporated into the top 2-5 inches of soil after application, at rates indicated by the results of site-specific soil tests. Please describe plans for doing so. (FERC 2013, Virginia DEQ)
- All seeding must occur promptly after construction halts, either temporarily or permanently. Erosion control seed mixtures must be sufficient to stabilize sites for varying lengths of time, and seed mixes may need to vary depending on that timeframe. Please describe how quickly seeding will occur, and the decision thresholds for applying temporary versus permanent erosion control seed mixtures.
- Areas to be planted with species beneficial for wildlife after pipeline installation will be treated with temporary erosion control mix during a normal seeding season.
- Areas not to be treated with wildlife seed species will be treated with permanent erosion control seeding during a normal seeding season.
- Seeding rates should be doubled when hydroseeding (Steinfeld et. al., 2007)

NORMAL SEEDING SEASONS

Appropriate seasons for seeding can vary dramatically depending on elevation. Spring seeding can be conducted from March 15th – June 1st, and fall seeding can be done from August 15th – October 15th, but neither timeframe is appropriate in its entirety at all elevations.
Please describe the timeframe in which seeding is proposed according to site specific elevations. Seeding windows should allow time for application, germination, and survival.

NUTRIENT ADDITIONS

In the absence of soil chemistry tests, the following guidelines can be used to develop fertilizer and liming rates**. Whenever possible, nutrient additions should be based on soil chemistry data in the interpretations provided with the order 1 soil survey.**

Fertilizer: 600-800 lbs/ac, 10-20-10 (Nitrogen, Phosphorous, Potassium), 400 lbs/ac 15-30-15, 800-1000 lbs/ac 10-10-10.

Lime: 1500-4000 lbs/ac (pelletized or dust), 4000 lbs/ac, Hydro Lime (2.5 gal container is equivalent to 1000 lbs limestone)—5-10 containers /ac.

MULCH AND BINDERS

Use of mulch materials and binders will be needed. Use of hay is prohibited on National Forest land due to invasive species concerns. Below are some guidelines that apply when selecting these materials for various sections of the ROW. Please describe how each of these issues will be addressed. All techniques must be appropriate for the % slope on which they will be applied. Please describe how mulching, seeding, and binding techniques will be adjusted to accommodate different slope classes (for example, 0-8%, 8-15%, 15-30%, 30-50%, etc.)

- Materials must be certified weed free or be accompanied by vendor's test results for noxious weed content.
- Seeded areas can be mulched with weed free straw at a rate of 2-4K lbs/ac, hand spread or blown, fiber mulch hydro-seeded at 1500-2000 lbs/ac., or other appropriate material.
- Natural biodegradable products are preferred. Materials must be demonstrated to be free of invasive species, including but not limited to plants, pests, and pathogens.
- Hydraulic erosion control products (HEPC) must be suitable for wildlife.
- 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 an acceptable 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)
- Avoid the use of silt fences reinforced with metal or plastic mesh.
- When no longer required, (after soils are stable and the vegetative cover is established), temporary erosion control and sediment control products should be promptly removed.
- Any products that require mixing with water need to have a Forest Service-approved water source. The source of water must not be contaminated with non-native invasive organisms that could spread into streams.

Hydroseeding

- Wood-fiber hydraulic mulches are generally short-lived and require a 24-hour period to dry before rainfall occurs.
- Wood fiber naturally has tackifying properties, but fiber alone may not be sufficient on steep slopes. In those cases the addition of a tackifier will help keep the seeds in contact with the soil. Describe plans to assess when this will be necessary, and describe the tackifier and application methods to be used.
- As wood chips, shredded woody materials, and other high-carbon materials decompose, they remove plant nutrients such as nitrogen from the soil. This can reduce soil fertility and make it difficult for grasses to grow. This should be taken into account when planning restoration seeding.

Binders

- The use of hydroseeding with binders will most likely be required in many areas on FS lands due to the steep terrain. Please describe site conditions where this will be used.
- The success of soil binders are somewhat dependent on the soil type present. If soil is compacted or high in clay and silt, soil binders may not penetrate soil surfaces.
- Whether short-life or long-life, soil binders should be non-toxic and organic based, such as guar, psyllium, or pitch and rosin emulsions. Please describe type of binder to be used under what circumstances, and specific application rates and methods.
- Materials or additives used as binders or emulsifiers cannot be toxic to soil organisms or otherwise prevent or inhibit seed germination.

Upland Area Seed Mixes within the Jefferson National Forest

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 laxum[a]	Slender woodoats	Graminoid	4.5 – 7.0
Eragrostis spectabilis[a]	Purple lovegrass	Graminoid	4.0 – 7.5
Panicum virgatum	Switchgrass	Graminoid	4.5 – 8.0
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Tridens flavus[a]	Purpletop	Graminoid	4.5 – 6.5
Apocynum cannabinum[a]	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[b]	Virginia wildrye	Graminoid	5.0 – 7.4
Geum canadense[a]	White avens	Forb	4.5 – 7.5
Heliopsis helianthoides	Oxeye sunflower; Smooth oxeye	Forb	unknown
Monarda fistulosa[b]	Wild bergamot	Forb	6.0 – 8.0
Pycnanthemum spp.[b]	Mountain mint	Forb	unknown
Rubus allegheniensis[a]	Common blackberry; Allegheny blackberry	Forb/ Subshrub	4.6 – 7.5
Rudbeckia hirta	Blackeyed Susan	Forb	6.0 – 7.0
Solidago canadensis[a]	Canada goldenrod	Forb	4.8 – 7.5
Tradescantia virginiana[a]	Virginia spiderwort	Forb	4.0 – 8.0

Riparian Seed Mixes within Jefferson National Forest

Scientific Name	Common Name	Habit	pH Preference
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
Native Species			
Agrostis perennans	Autumn bentgrass; upland bentgrass	Graminoid	5.5 – 7.5
Elymus virginicus	Virginia Wildrye	Graminoid	5.0 - 7.4
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Asclepias incarnata	Swamp milkweed	Forb	5.0 – 8.0
Chamaecrista fasciculata	Partridge pea	Forb	5.5 – 7.5
Eutrochium fistulosum (Eupatorium fistulosum)	Joe pye weed	Forb	4.5 – 7.0
Eupatorium maculatum	Spotted joe pye weed	Forb	5.5 – 7.0
Eupatorium perfoliatum	Boneset	Forb	unknown
Helenium autumnale	Common sneezeweed	Forb	4.0 – 7.5
Senna hebecarpa	Wild senna; American senna	Forb	unknown
Senna marilandica	Maryland senna	Forb / Subshrub	4.0 – 7.0
Vernonia noveboracensis	New York ironweed	Forb	4.5 -8.0

Species for hydroseed mixes within the Jefferson National Forest.

Scientific Name	Common Name	Growth Habit	pH Preference
Non-native Species for Temporary 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
Native – Highly Preferred			
Sorghastrum nutans	Indiangrass	Graminoid	5.0 – 7.8
Tridens flavus	Purpletop	Graminoid	4.5 – 6.5
Native – Preferred			
Agrostis perennans	Autumn bentgrass; Upland bentgrass	Graminoid	5.5 – 7.5
Dichanthelium clandestinum	Deertongue	Graminoid	4.0 – 7.5
Elymus canadensis	Canada wildrye	Graminoid	5.0 – 7.9
Desmodium canadense	Showy ticktrefoil	Forb	wide tolerance
Heliopsis helianthoides	Oxeye sunflower; Smooth oxeye	Forb	unknown
Lespedeza virginica	Slender bushclover; Slender lespedeza	Forb	acid tolerant
Liatris spicata	Dense blazing star; Spiked gayfeather	Forb	5.6 - 7.5
Senna hebecarpa	Wild senna; American senna	Forb	unknown
Native – Moderately Preferred			
Panicum virgatum	Switchgrass	Graminoid	4.5 – 8.0
Chamaecrista fasciculata	Partridge pea	Forb	5.5 – 7.5
Rudbeckia hirta	Blackeyed Susan	Forb	6.0 – 7.0

Name	Ph preference	Wetland Indicator Status
Annual Ryegrass (Lolium Multiflorum (L. perenne var. italicum))	5.0–7.9	NI/moderate
German/Foxtail Millet (Setaria italica)	5.3–6.9	FACU
Cereal Rye (Secale cereale)	5.2–8.0	NI/damp
Browntop Millet (Panicum ramosum) (introduced in VA & south; possibly ok for WV?)	5.5–6.9	FACU

NOTES:

1): A MINIMUM OF (2) OF THE ABOVE LISTED SPECIES SHALL BE UTILIZED
2): APPLY WHENEVER EROSION CONTROL IS NEEDED OUTSIDE OF NORMAL (PERMANENT) SEEDING SEASONS
3): APPLY CONCURRENT WITH PERMANENT EROSION CONTROL
4): APPLY PRIOR TO PERMANENT SEEDING WITH WILDLIFE MIXES

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

JEFFERSON NATIONAL FOREST – PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
MONROE COUNTY, WEST VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
CHECKED BY:	JDO
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 11.43AJNF OF	13.06JNF

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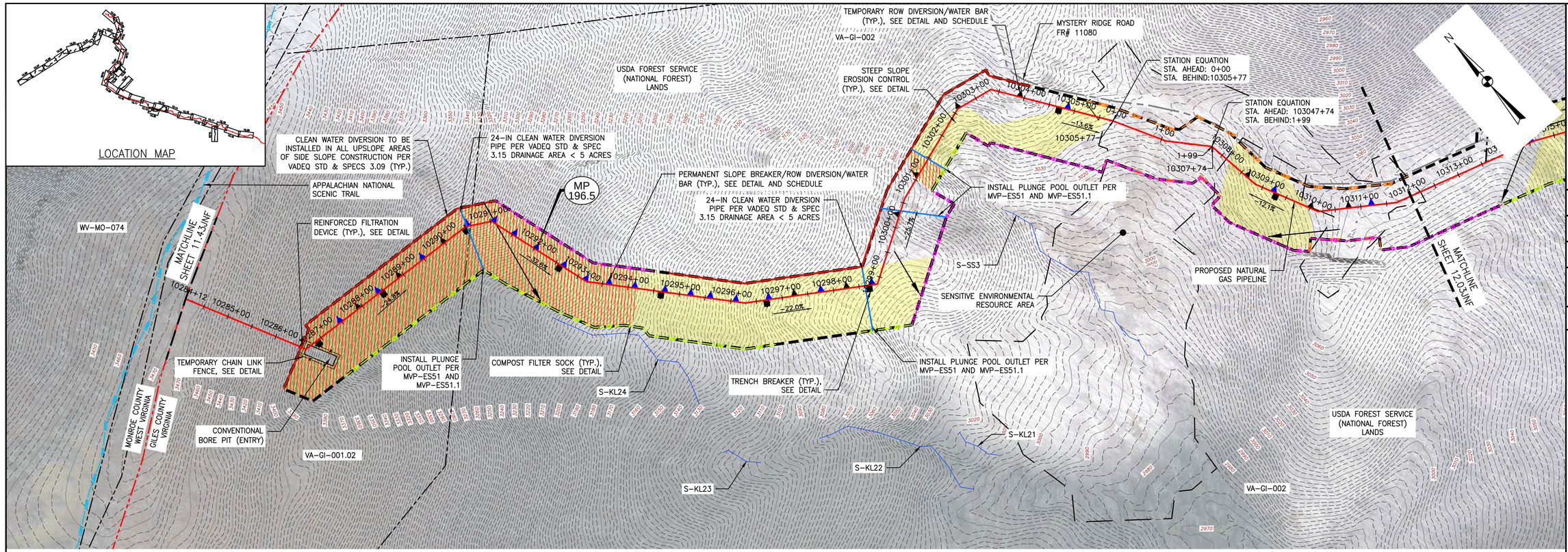

PLAN

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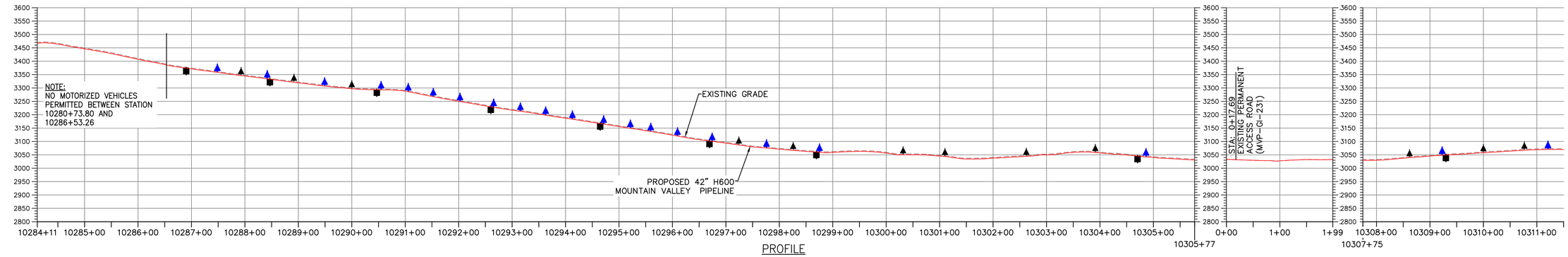

PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'

200 0 200 400

LEGEND

- CLEAN WATER DIVERSION DIKE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
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- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
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- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

ACCESS ROAD LEGEND

1. ROCK CONSTRUCTION ENTRANCE (VADEQ STD & SPEC 3.02)
2. WETLAND CROSSING (DETAIL MVP-ES37)
3. STREAM CROSSING (VADEQ STD & SPEC 3.24)

NOTES:

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4. SLOPES OF 30' OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPELINE PROJECT.
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NO.	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
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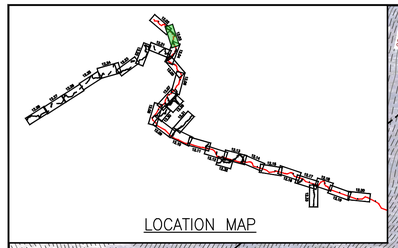
EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
SHT. NO. 12.02JNF OF	13.06JNF

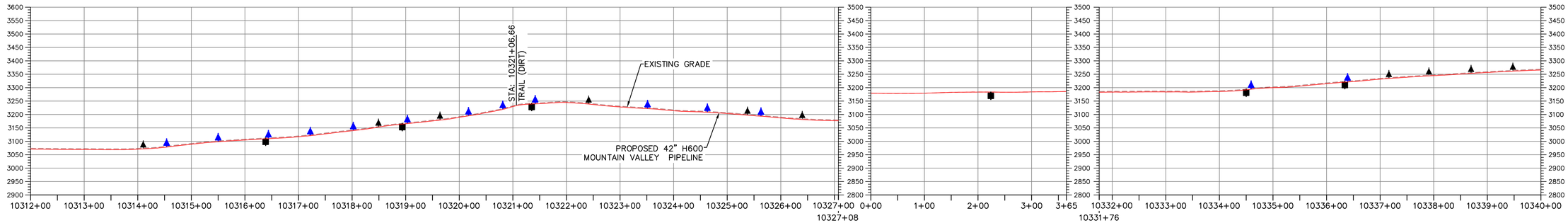
REVISION



LOCATION MAP

PLAN

SCALE: 1" = 100'



PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

VERTICAL SCALE: SCALE: 1" = 200'

LEGEND

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- STREAM
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ACCESS ROAD LEGEND

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COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
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APPROVED BY:	RE
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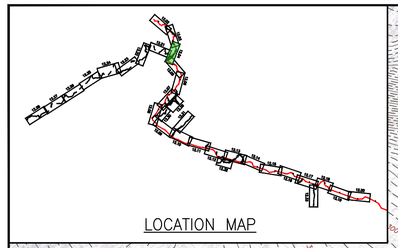

PLAN

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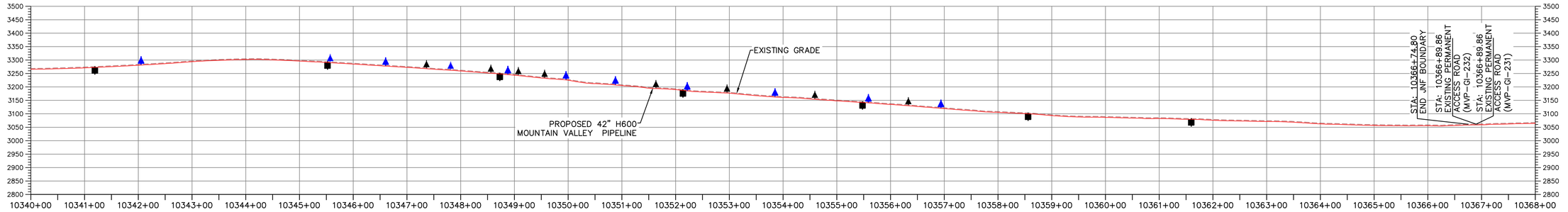

PROFILE

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100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'

200 0 200 400

LEGEND

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ACCESS ROAD LEGEND

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6. IMPROVEMENTS TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE SPECIFIC ACCESS ROAD DETAILS.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS.
8. 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 AN ACCEPTABLE 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)

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 - MVP\12 - Giles\E&S\E&S Version 5.0.0\JNF\7157JNF12.04.dwg PLOTTED ON: 10/25/2017 4:38 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
GILES COUNTY, VIRGINIA

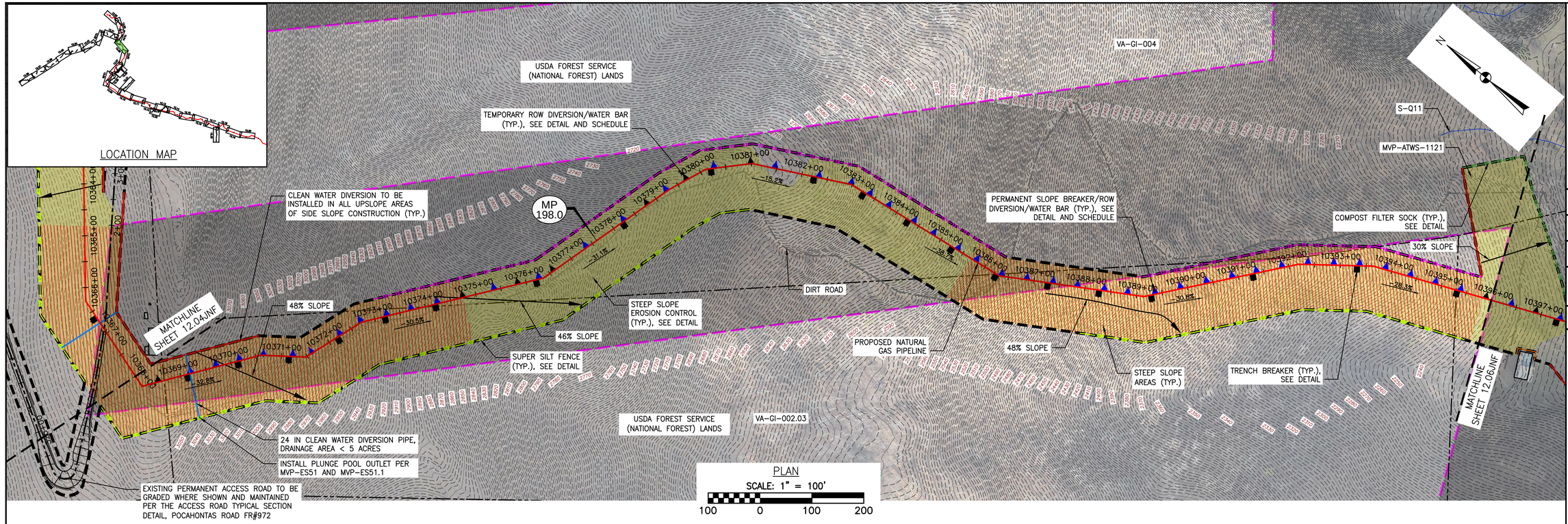
MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

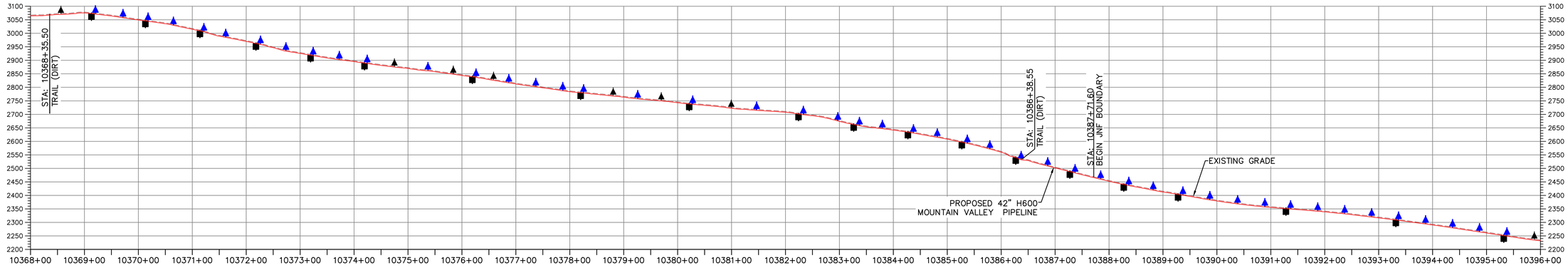
TETRA TECH
complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 12.04JNF OF	13.06JNF





PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'
100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'
200 0 200 400

LEGEND

- CLEAN WATER DIVERSION DIKE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- AGRICULTURAL LAND USE BOUNDARY
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

ACCESS ROAD LEGEND

1. ROCK CONSTRUCTION ENTRANCE (VADEQ STD & SPEC 3.02)
2. WETLAND CROSSING (DETAIL MVP-ES37)
3. STREAM CROSSING (VADEQ STD & SPEC 3.24)

NOTES:

1. TOPSOIL SEGREGATION TO BE CONDUCTED THROUGHOUT THE JEFFERSON NATIONAL FOREST.
2. FLEXTERRA, EARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL BLANKET AS DIRECTED BY MVP.
3. 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.
4. SLOPES OF 30' OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPLELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. IMPROVEMENTS TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE SPECIFIC ACCESS ROAD DETAILS.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS.
8. 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 AN ACCEPTABLE 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)

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

TETRA TECH
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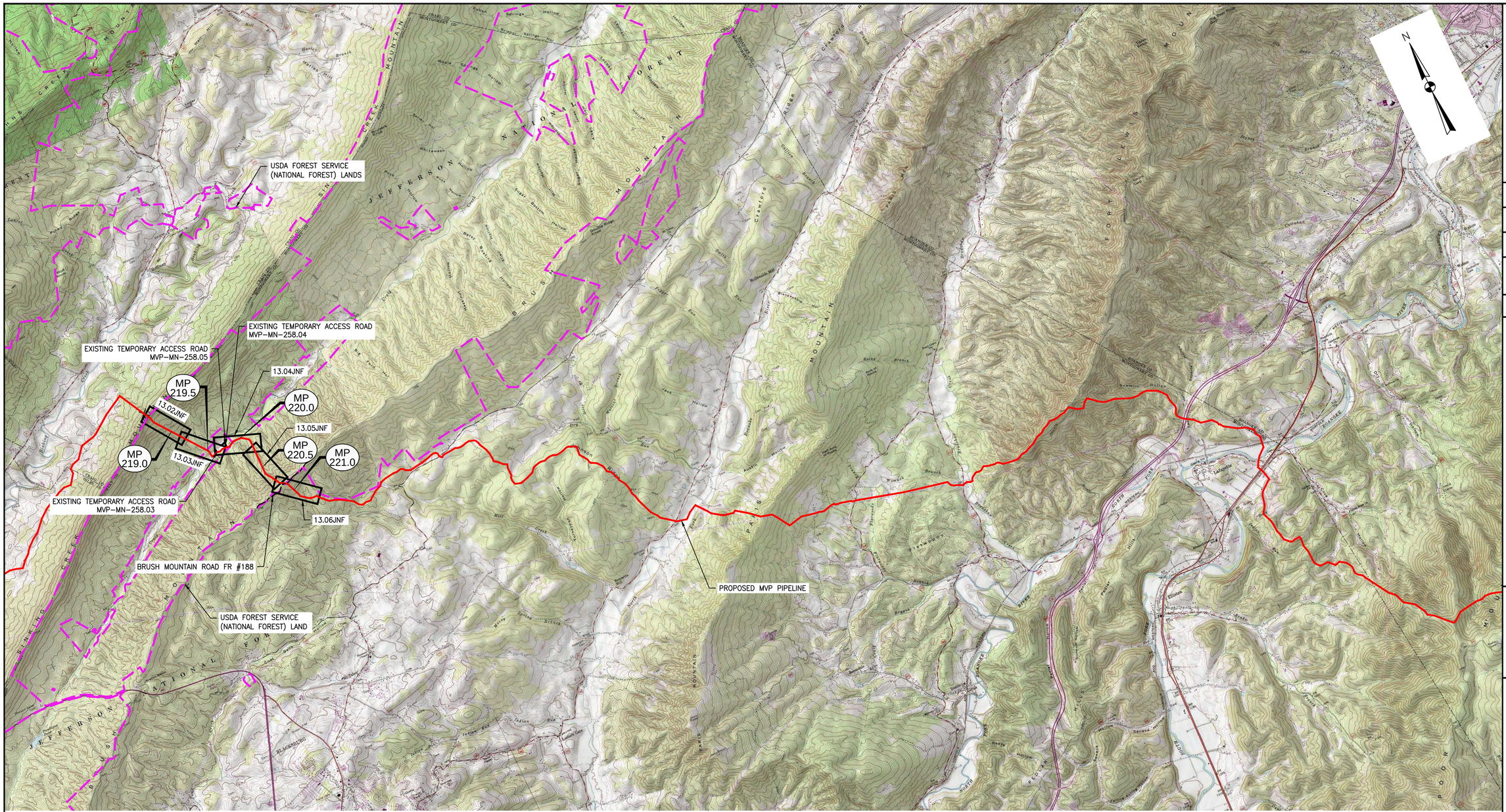
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 12.05JNF OF	13.06JNF

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\12 – Giles\E&S\E&S Version 5.0.0\JNF\7157JNF12.05.dwg PLOTTED ON: 10/25/2017 4:12 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb



NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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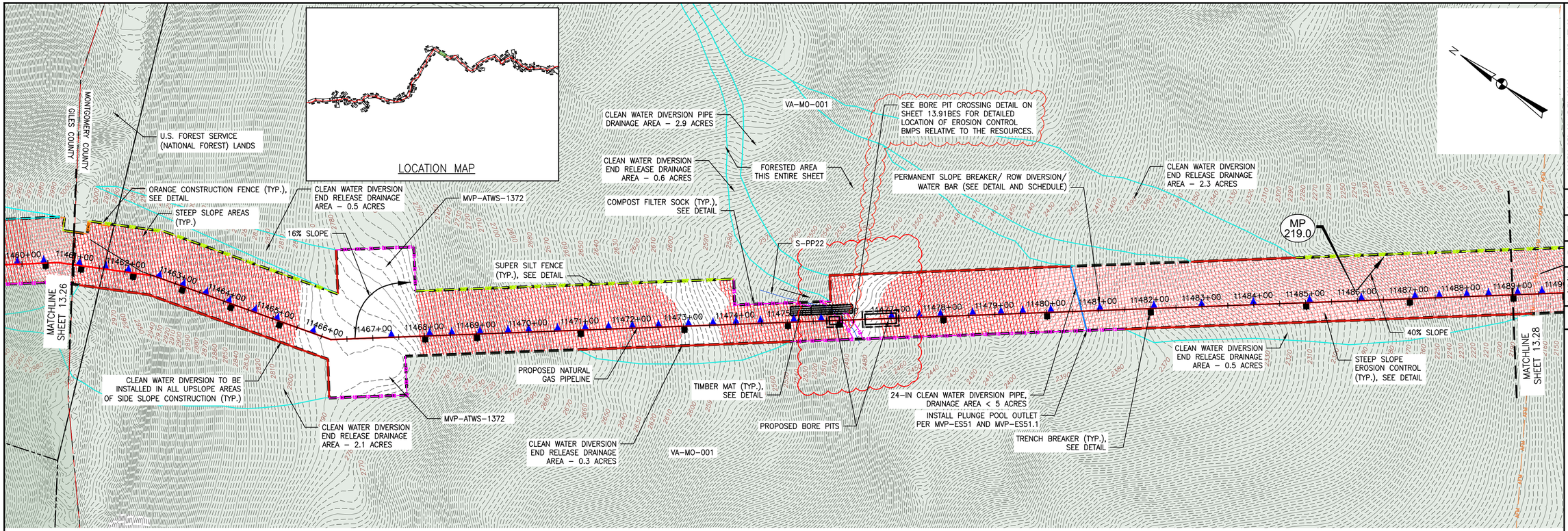
EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 13.01JNF OF 13.06JNF	

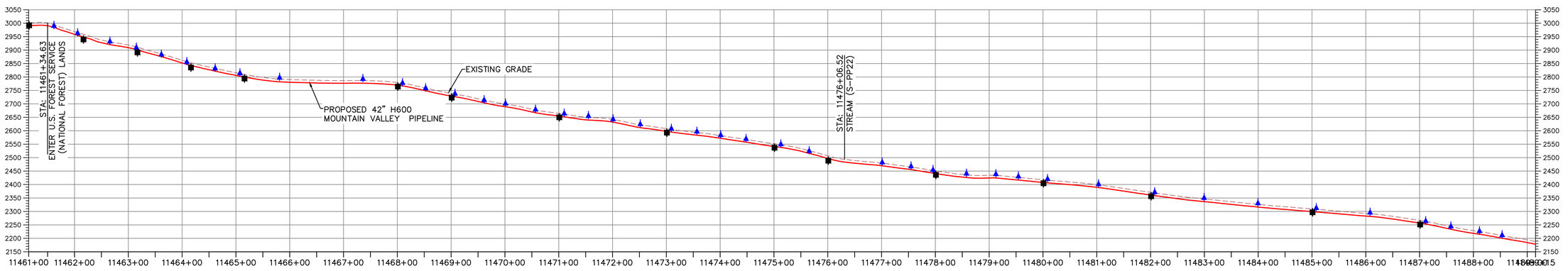
TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EOT\7157 – MVP\13 – Montgomery\E&S\E&S Version 5.0.0\JNF\7157JNF13.01.dwg PLOTTED ON: 10/5/2017 2:49 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb



PLAN

SCALE: 1" = 100'

100 0 100 200



PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'

200 0 200 400

LEGEND

- PROPOSED LIMIT OF DISTURBANCE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- SURFACE WATER FLOW DIRECTION
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP–ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP–ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP–ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP–ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP–ES3, 3.1, 3.2)
- GRASS–LINED CHANNEL (SEE DETAIL MVP–ES39)
- CLEAN WATER DIVERSION PIPE
- CLEAN WATER DIVERSION DIKE (SEE DETAIL MVP–ES50 AND MVP–ES51)
- EXISTING FOREST
- STREAM FLOW DIRECTION
- FEMA 100 YEAR FLOODPLAIN
- DRAINAGE AREA BOUNDARY
- TIMBER MAT (SEE DETAIL MVP–ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP–20)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP–17, ES38, AND SCHEDULE)

COMMONWEALTH OF VIRGINIA
4/7/23
DANIEL C. WITT
Lic. No. 65093
PROFESSIONAL ENGINEER

THIS SEAL APPLIES TO REVISIONS DATED 04/07/2023

NOTES:

1. TOPSOIL SEGREGATION WILL BE PERFORMED IN ALL IMMEDIATE CONSTRUCTION AREAS OF THE PROJECT IN ACCORDANCE WITH DETAIL MVP–ES46.1 THROUGH MVP–ES46.3.
2. FLEXTERRA, EARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL BLANKET AS DIRECTED BY MVP.
3. 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.
4. SLOPES OF 30° OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE–SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH–HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. DRAINAGE FEATURE CROSSINGS TO BE PERFORMED PER DETAIL MVP–ES49.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBER MATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS. NO UNPERMITTED IMPACT TO STREAMS WILL OCCUR AS A RESULT OF ROAD OR PILOT CROSSINGS AND ALL ESC BMP'S WILL BE INSTALLED TO CONTINUE THE STREAM FLOW.
8. ALL NON VMRC STREAM CROSSINGS WILL BE PERFORMED AS DESCRIBED IN THE STREAM CROSSING TABLE INCLUDED IN THIS PACKAGE.

NO.	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:
–	04/07/23	JZ	TD	DCW	ADDRESS DEQ COMMENTS CROSSING CHANGE METHOD
–	7/7/20	BH	JRE	DJW	CHANGES TO AQUATIC RESOURCES DELINEATIONS
5	3/12/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
4	2/23/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
3	1/26/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
2	11/21/17	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
1	9/21/17	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS

REVISIONS:

Mountain Valley PIPELINE

EROSION AND SEDIMENT CONTROL PLANS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

SPREAD 9 – MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
2200 ENERGY DRIVE
CANONSBURG, PA 15317

TETRA TECH
complex world | CLEAR SOLUTIONS™
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

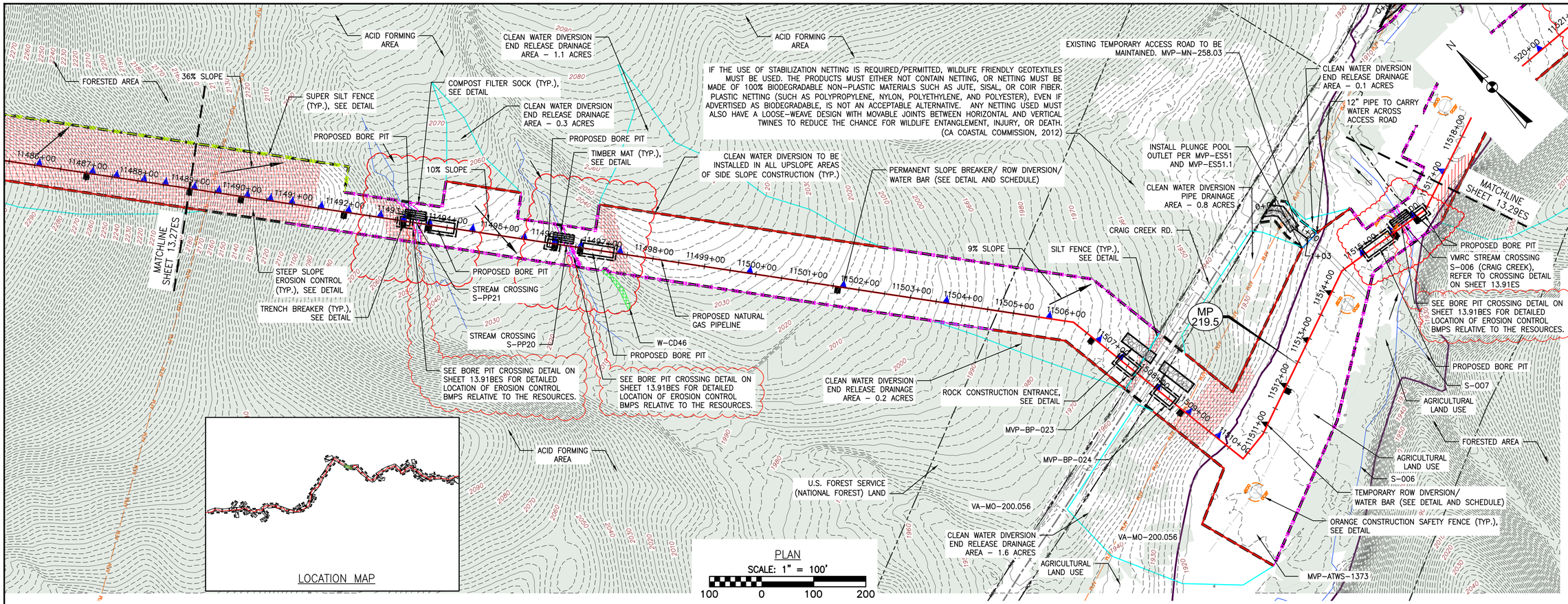
EROSION AND SEDIMENT CONTROL PLANS

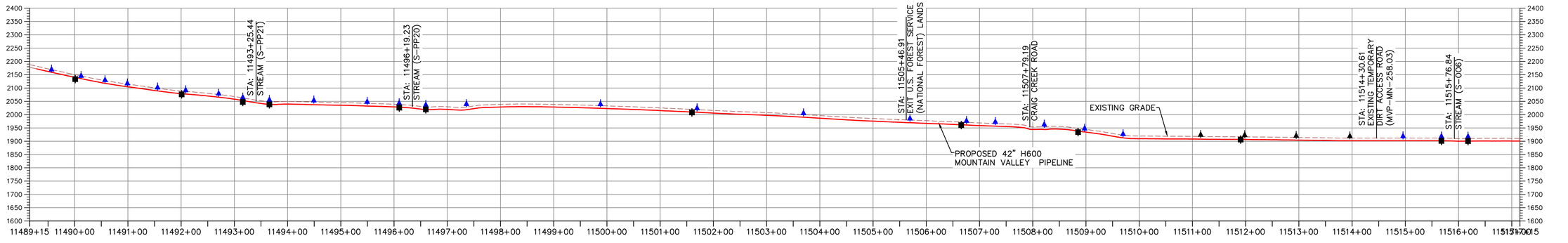
COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JJZ
CHECKED BY:	TD
APPROVED BY:	DCW
DATE:	04/07/23
SCALE:	AS SHOWN
SHT. NO.	13.27ES OF 13.91ES

REVISION

TETRA TECH CAD FILE PATH: R:_Marcellus_Shale_Projects\EQT\7157_–_MVP_Construction_Spread_9\13_–_Montgomery\E&S\7157ES13.27(S9).dwg PLOTTED ON: 3/29/2023 1:24 PM PLOTTED BY: Zeigler, Justin PLOT FILE: ENVIRONMENTAL_COLOR.ctb





LEGEND

- PROPOSED LIMIT OF DISTURBANCE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- SURFACE WATER FLOW DIRECTION
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- CLEAN WATER DIVERSION DIKE (SEE DETAIL MVP-ES50 AND MVP-ES51)
- EXISTING FOREST
- STREAM FLOW DIRECTION
- FEMA 100 YEAR FLOODPLAIN
- DRAINAGE AREA BOUNDARY
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

COMMONWEALTH OF VIRGINIA
4/7/23
DANIEL C. WITT
Lic. No. 65093
PROFESSIONAL ENGINEER
THIS SEAL APPLIES ONLY TO REVISIONS DATED 04-07-23

NOTES:

1. TOPSOIL SEGREGATION WILL BE PERFORMED IN ALL IMMEDIATE CONSTRUCTION AREAS OF THE PROJECT IN ACCORDANCE WITH DETAIL MVP-ES46.1 THROUGH MVP-ES46.3.
2. FLEXTERRA, EARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL BLANKET AS DIRECTED BY MVP.
3. 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.
4. SLOPES OF 30' OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPLELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. DRAINAGE FEATURE CROSSINGS TO BE PERFORMED PER DETAIL MVP-ES49.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBER MATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS. NO UNPERMITTED IMPACT TO STREAMS WILL OCCUR AS A RESULT OF ROAD OR PIPELINE CROSSINGS AND ALL ESC BMP'S WILL BE INSTALLED TO CONTINUE THE STREAM FLOW.
8. ALL NON VMRC STREAM CROSSINGS WILL BE PERFORMED AS DESCRIBED IN THE STREAM CROSSING TABLE INCLUDED IN THIS PACKAGE.

TETRA TECH CAD FILE PATH: R:_Marcellus_Shale_Projects\EQT\7157 – MVP Construction Spread 9\13 – Montgomery\E&S\7157ES13.28(S9).dwg PLOTTED ON: 3/29/2023 1:36 PM PLOTTED BY: Zeigler, Justin PLOT FILE: ENVIRONMENTAL_COLOR.ctb

NO.	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:
3	1/26/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
4	2/23/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
5	3/5/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
6	8/23/18	BH	JRE	DJW	VMRC CROSSING METHOD CHANGE FROM OPEN CUT TO BORE
–	1/11/21	ZM	JRE	DJW	ADDRESS VADEQ COMMENTS
–	–	MJP	JRE	DJW	FIELD MODIFICATIONS
–	04/07/23	JZ	TD	DCW	ADDRESS DEQ COMMENTS ON CROSSING CHANGE METHOD

REVISIONS:

Mountain Valley PIPELINE

EROSION AND SEDIMENT CONTROL PLANS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

SPREAD 9 – MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
2200 ENERGY DRIVE
CANONSBURG, PA 15317

TETRA TECH
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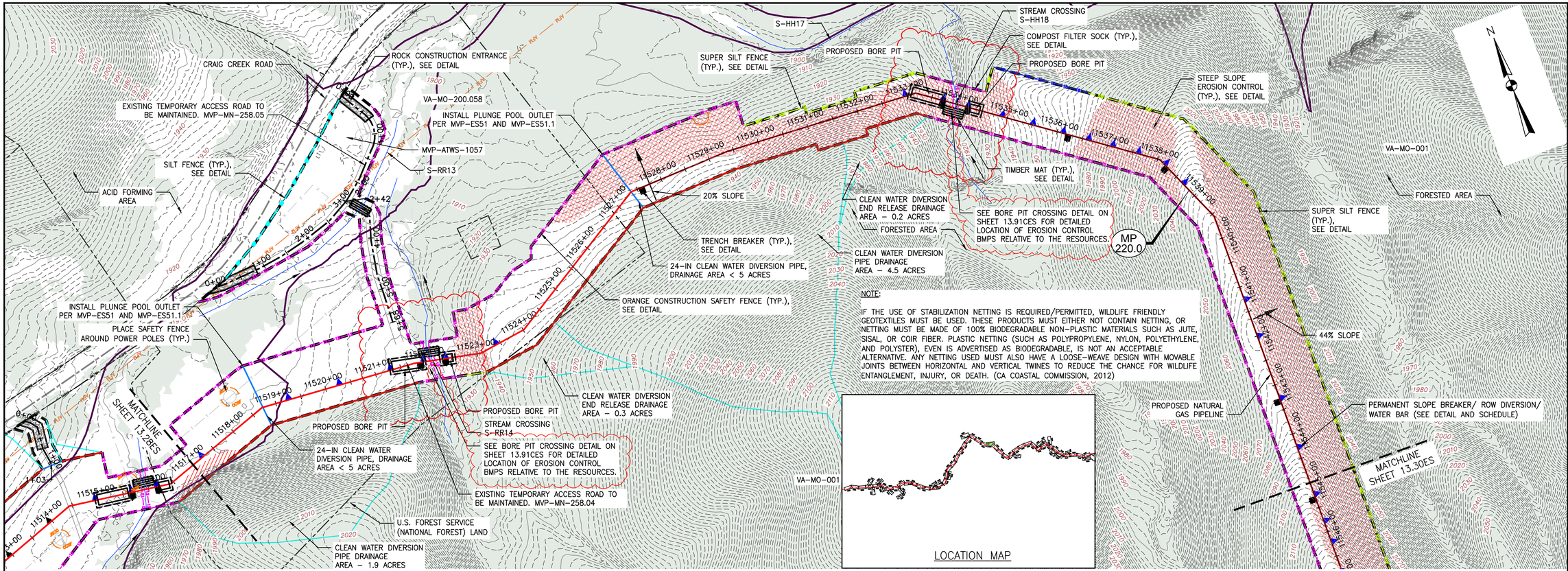
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JJZ
CHECKED BY:	TD
APPROVED BY:	DCW
DATE:	04/07/23
SCALE:	AS SHOWN
SHT. NO.	13.28ES OF 13.91ES

REVISION



PLAN

SCALE: 1" = 100'

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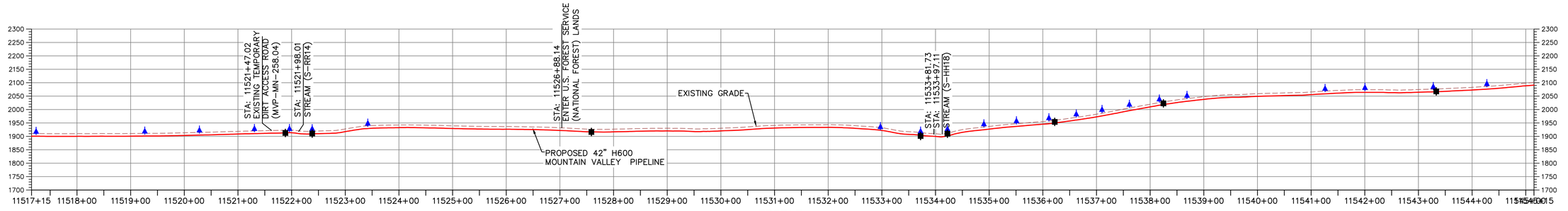

PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

VERTICAL SCALE: SCALE: 1" = 200'

100 0 100 200 200 0 200 400

LEGEND

- PROPOSED LIMIT OF DISTURBANCE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- SURFACE WATER FLOW DIRECTION
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
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- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- CLEAN WATER DIVERSION DIKE (SEE DETAIL MVP-ES50 AND MVP-ES51)
- EXISTING FOREST
- STREAM FLOW DIRECTION
- FEMA 100 YEAR FLOODPLAIN
- DRAINAGE AREA BOUNDARY
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

COMMONWEALTH OF VIRGINIA
4/7/23
DANIEL C. WITT
Lic. No. 65093
PROFESSIONAL ENGINEER

THIS SEAL APPLIES TO REVISIONS DATED 04/07/2023

NOTES:

1. TOPSOIL SEGREGATION WILL BE PERFORMED IN ALL IMMEDIATE CONSTRUCTION AREAS OF THE PROJECT IN ACCORDANCE WITH DETAIL MVP-ES46.1 THROUGH MVP-ES46.3.
2. FLEXTERRA, EARTHGUARD OR EQUIVALENT MAY BE USED AS A SUBSTITUTE TO EROSION CONTROL BLANKET AS DIRECTED BY MVP.
3. 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.
4. SLOPES OF 30° OR GREATER EXIST. CONSTRUCTION FOR STEEP SLOPES TO BE PERFORMED USING STEEP SLOPE TECHNIQUES IDENTIFIED IN THE DETAIL SHEETS. ALSO REFER TO THE SITE-SPECIFIC DESIGN OF STABILIZATION MEASURES IN SELECTED HIGH-HAZARD PORTIONS OF THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPELINE PROJECT.
5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. DRAINAGE FEATURE CROSSINGS TO BE PERFORMED PER DETAIL MVP-ES49.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBER MATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS. NO UNPERMITTED IMPACT TO STREAMS WILL OCCUR AS A RESULT OF ROAD OR PIPELINE CROSSINGS AND ALL ESC BMP'S WILL BE INSTALLED TO CONTINUE THE STREAM FLOW.
8. ALL NON VMRC STREAM CROSSINGS WILL BE PERFORMED AS DESCRIBED IN THE STREAM CROSSING TABLE INCLUDED IN THIS PACKAGE.

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:
–	04/07/23	JZ	TD	DCW	ADDRESS DEQ COMMENTS ON CROSSING CHANGE METHOD
–	–	MJP	JRE	DJW	FIELD MODIFICATIONS
–	1/11/21	ZM	JRE	DJW	ADDRESS VADEQ COMMENTS
6	8/23/18	BH	JRE	DJW	VMRC CROSSING METHOD CHANGE FROM OPEN CUT TO BORE
5	3/5/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
4	2/23/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS
3	1/26/18	KAL	JRE	DJW	ADDRESS VADEQ COMMENTS

REVISIONS:

Mountain Valley PIPELINE

EROSION AND SEDIMENT CONTROL PLANS

MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE

SPREAD 9 – MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
2200 ENERGY DRIVE
CANONSBURG, PA 15317

TETRA TECH
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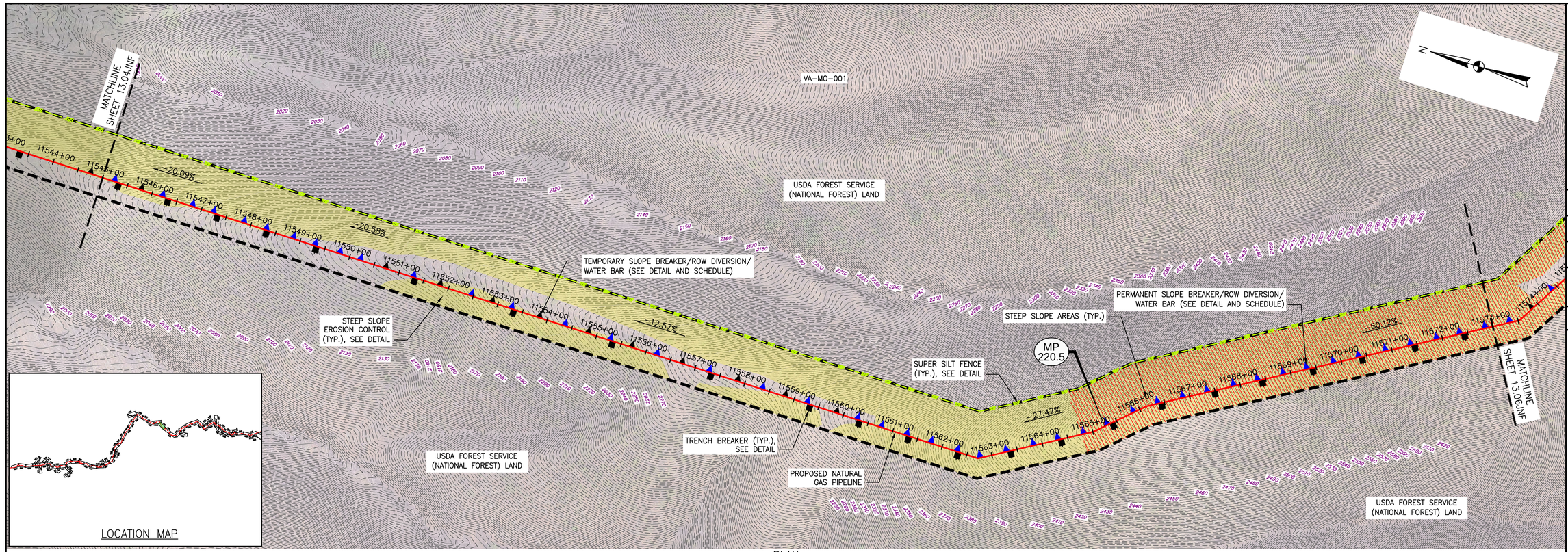
661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JJZ
CHECKED BY:	TD
APPROVED BY:	DCW
DATE:	04/07/23
SCALE:	AS SHOWN
REVISION	6
SHT. NO.	13.29ES OF 13.91ES

TETRA TECH CAD FILE PATH: R:_Marcellus Shale Projects\EQT\7157 – MVP Construction Spread 9\13 – Montgomery\E&S\7157ES13.29(S9).dwg PLOTTED ON: 3/29/2023 1:43 PM PLOTTED BY: Zeigler, Justin PLOT FILE: ENVIRONMENTAL_COLOR.ctb



PLAN

SCALE: 1" = 100'

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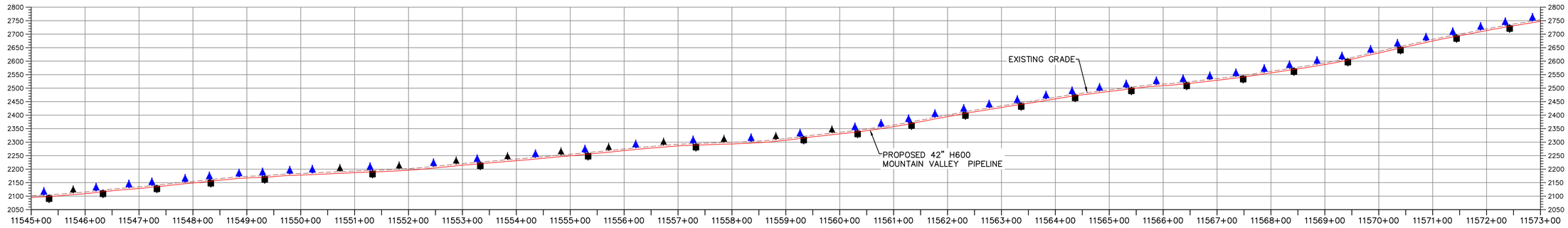

PROFILE

HORIZONTAL SCALE:

SCALE: 1" = 100'

100 0 100 200

VERTICAL SCALE:

SCALE: 1" = 200'

200 0 200 400

LEGEND

- CLEAN WATER DIVERSION DIKE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- AGRICULTURAL LAND USE BOUNDARY
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- PROPOSED SILT FENCE (SEE NOTE 5)
- PROPOSED SUPER SILT FENCE (SEE DETAIL MVP-ES9.2)
- PROPOSED REINFORCED FILTRATION DEVICE (SEE DETAILS MVP-ES9, 9.1, 9.2, 9.3)
- ORANGE CONSTRUCTION SAFETY FENCE
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- PROPOSED COMPOST FILTER SOCK (SEE DETAILS MVP-ES3, 3.1, 3.2)
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- CLEAN WATER DIVERSION PIPE
- TIMBER MAT (SEE DETAIL MVP-ES37)
- STEEP SLOPE EROSION CONTROL (SEE NOTE 2)
- STEEP SLOPE AREAS (SEE NOTE 4)
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED TRENCH BREAKER (SEE DETAIL MVP-20)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

ACCESS ROAD LEGEND

1. ROCK CONSTRUCTION ENTRANCE (VADEQ STD & SPEC 3.02)
2. WETLAND CROSSING (DETAIL MVP-ES37)
3. STREAM CROSSING (VADEQ STD & SPEC 3.24)

NOTES:

1. TOPSOIL SEGREGATION TO BE CONDUCTED THROUGHOUT THE JEFFERSON NATIONAL FOREST.
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5. WHERE CONSTRUCTION CONDITIONS PRECLUDE THE USE OF DIVERSION DITCHES DUE TO SITE CONDITIONS THE CONTRACTOR WILL INSTALL SILT FENCE AT THE DIRECTION OF MVP.
6. IMPROVEMENTS TO PERMANENT AND TEMPORARY ACCESS ROADS WILL BE PERFORMED PER THE SITE SPECIFIC ACCESS ROAD DETAILS.
7. TEMPORARY ACCESS ROAD CROSSING OF STREAMS AND WETLANDS WILL UTILIZE TIMBERMATS. ANY PERMANENT ROAD CROSSINGS WILL BE CONDUCTED VIA CULVERTS.
8. 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 AN ACCEPTABLE 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)

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - PLAN OF DEVELOPMENT
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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661 ANDERSEN DRIVE
FOSTER PLAZA 7
PITTSBURGH, PA 15220

EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
SHT. NO. 13.05JNF OF	13.06JNF

REVISION

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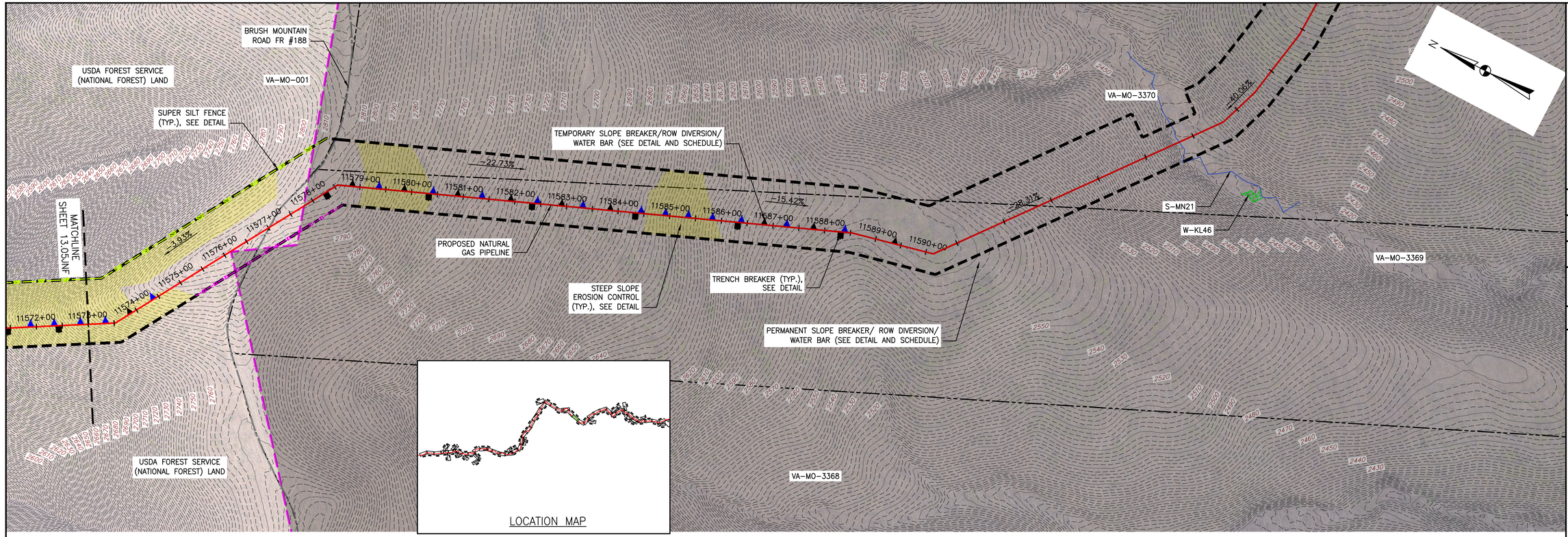

PLAN

SCALE: 1" = 100'

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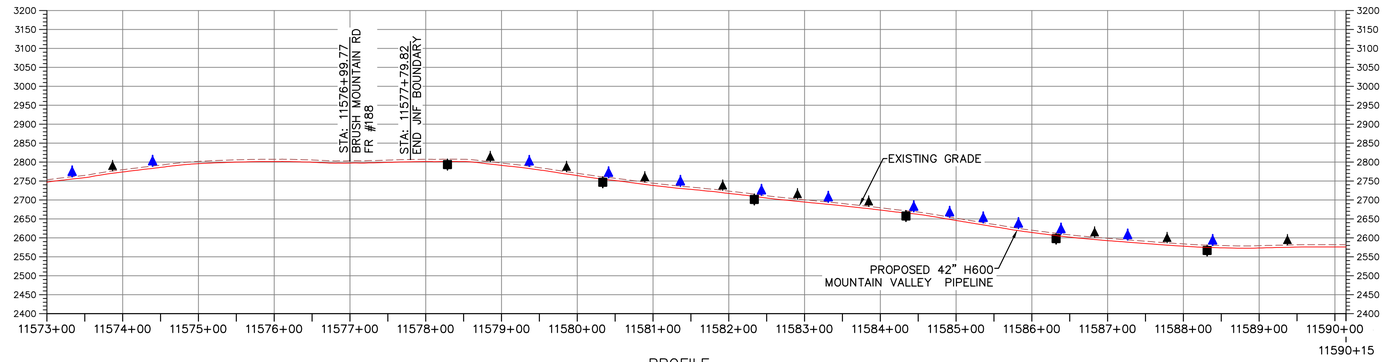

PROFILE

HORIZONTAL SCALE: SCALE: 1" = 100'

100 0 100 200

VERTICAL SCALE: SCALE: 1" = 200'

200 0 200 400

LEGEND

- CLEAN WATER DIVERSION DIKE
- STREAM
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- EXISTING ROAD/TRAIL
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- POND
- WETLAND
- ACID FORMING MATERIAL
- AGRICULTURAL LAND USE BOUNDARY
- PROPOSED LIMIT OF DISTURBANCE
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- TIMBER MAT (SEE DETAIL MVP-ES37)
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- STEEP SLOPE AREAS (SEE NOTE 4)
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- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)
- TEMPORARY ROW DIVERSION/WATER BAR (VADEQ STD & SPEC 3.11)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, ES38, AND SCHEDULE)

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NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - PLAN OF DEVELOPMENT

MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE

MONTGOMERY COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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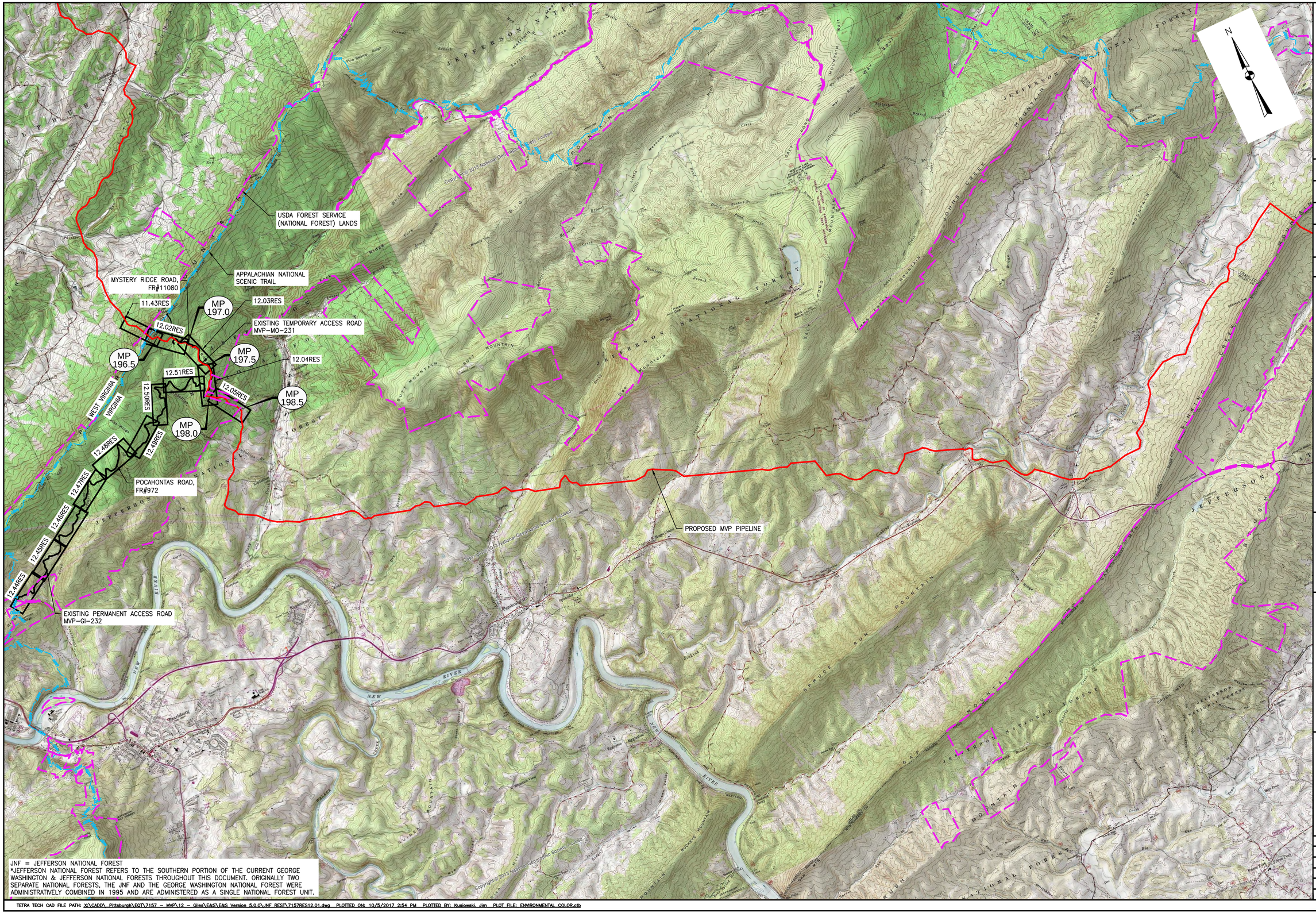
EROSION AND SEDIMENT CONTROL PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	JWK
CHECKED BY:	KAL
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 13.06JNF OF	13.06JNF



JNF = JEFFERSON NATIONAL FOREST
*JEFFERSON NATIONAL FOREST REFERS TO THE SOUTHERN PORTION OF THE CURRENT GEORGE WASHINGTON & JEFFERSON NATIONAL FORESTS THROUGHOUT THIS DOCUMENT. ORIGINALLY TWO SEPARATE NATIONAL FORESTS, THE JNF AND THE GEORGE WASHINGTON NATIONAL FOREST WERE ADMINISTRATIVELY COMBINED IN 1995 AND ARE ADMINISTERED AS A SINGLE NATIONAL FOREST UNIT.

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 – MVP\12 – Giles\E&S\E&S Version 5.0.0\JNF REST\7157RES12.01.dwg PLOTTED ON: 10/5/2017 2:54 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST – RESTORATION PLAN
MOUNTAIN VALLEY PIPELINE PROJECT – H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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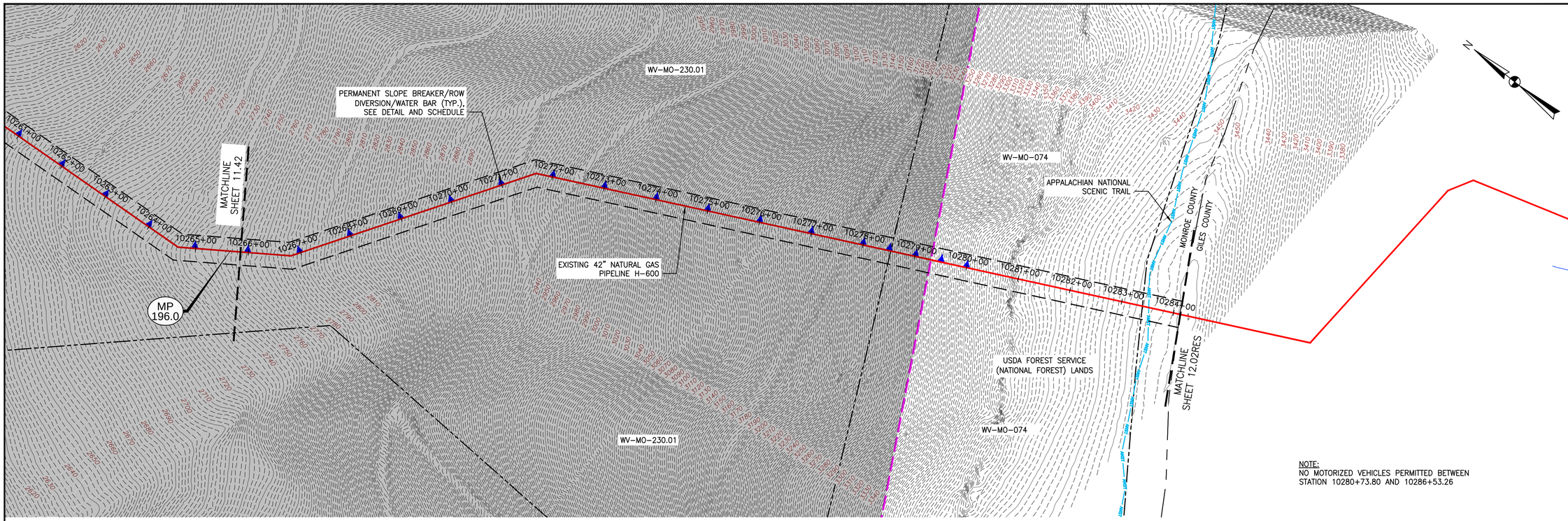
PITTSBURGH, PA 15220

RESTORATION PLANS

COMMONWEALTH OF PENNSYLVANIA
DAVID J. WALLNER
Lic. No. 040202557SS
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
CHECKED BY:	JDO
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 12.01RES OF	13.06RES



NOTE:
NO MOTORIZED VEHICLES PERMITTED BETWEEN STATION 10280+73.80 AND 10286+53.26

PLAN
SCALE: 1" = 100'
100 0 100 200

LEGEND

- EXISTING CULVERT
- STREAM
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- PROPOSED LEVEL SPREADER DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED PERMANENT RIGHT OF WAY
- EXISTING ROAD/TRAIL
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- POND
- WETLAND
- PROPOSED CULVERT WITH OUTLET PROTECTION (SEE DETAILS MVP-ES7, 7.1)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, 18, AND SCHEDULE)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:
					REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
MONROE COUNTY, WEST VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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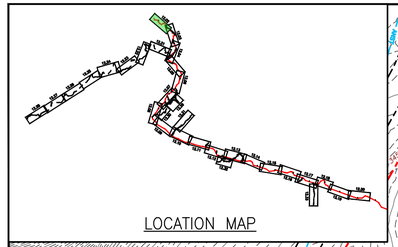
FOSTER PLAZA 7
PITTSBURGH, PA 15220

RESTORATION PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
CHECKED BY:	JDO
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO.	11.43RES OF 13.06RES

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EGT\7157 - MVP\9 - Monroe\E&S\7157RES11.43.dwg PLOTTED ON: 10/5/2017 3:34 PM PLOTTED BY: Kusiowski, Jim PLOT FILE: ENVIRONMENTAL_COLOR.ctb



NOTE:
NO MOTORIZED VEHICLES PERMITTED BETWEEN STATION 10280+73.80 AND 10286+53.26

PLAN
SCALE: 1" = 100'
100 0 100 200

LEGEND

- EXISTING CULVERT
- STREAM
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- PROPOSED LEVEL SPREADER DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED PERMANENT RIGHT OF WAY
- EXISTING ROAD/TRAIL
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- POND
- WETLAND
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- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, 18, AND SCHEDULE)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

REVISIONS:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

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FOSTER PLAZA 7
PITTSBURGH, PA 15220

RESTORATION PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
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APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
REVISION	
SHT. NO. 12.02RES OF	13.06RES

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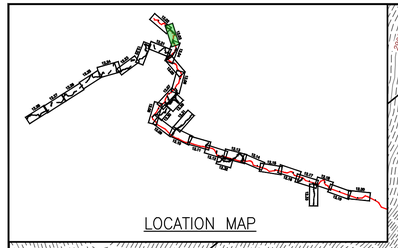

PLAN
SCALE: 1" = 100'
100 0 100 200

LEGEND

- EXISTING CULVERT
- STREAM
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL (ANST)
- PROPOSED LEVEL SPREADER DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED PERMANENT RIGHT OF WAY
- EXISTING ROAD/TRAIL
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- POND
- WETLAND
- PROPOSED CULVERT WITH OUTLET PROTECTION (SEE DETAILS MVP-ES7, 7.1)
- PERMANENT SLOPE BREAKER/ROW DIVERSION/WATER BAR (SEE DETAILS MVP-17, 18, AND SCHEDULE)
- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)

REVISIONS:

NO.:	DATE:	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
555 SOUTHPOINTE BOULEVARD, SUITE 200
CANONSBURG, PA 15311

TETRA TECH
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FOSTER PLAZA 7
PITTSBURGH, PA 15220

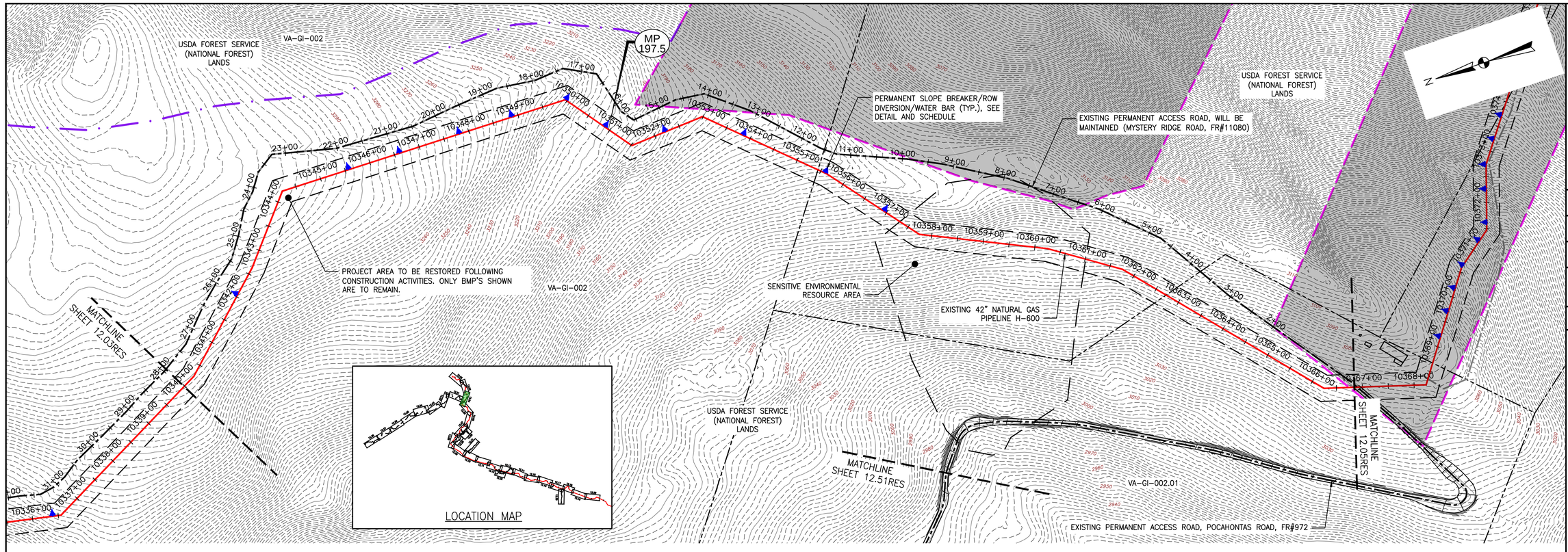
RESTORATION PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
CHECKED BY:	JDO
APPROVED BY:	RE
DATE:	09/25/2017
SCALE:	AS SHOWN
SHT. NO. 12.03RES OF 13.06RES	

REVISION

TETRA TECH CAD FILE PATH: X:\CADD_Pittsburgh\EQT\7157 - MVP\12 - Giles\E&S\E&S Version 5.0.0\JNF REST\7157RES12.03.dwg PLOTTED ON: 10/25/2017 4:50 PM PLOTTED BY: Bradley, Mike PLOT FILE: ENVIRONMENTAL_COLOR.ctb



NOTE:
POCAHONTAS ROAD WILL HAVE A ROADSIDE DITCH AND THE ROAD WILL BE CROWNED AS NEEDED.

PLAN
SCALE: 1" = 100'
100 0 100 200

LEGEND

- EXISTING CULVERT
- STREAM
- EXISTING PROPERTY LINE
- EXISTING STATE LINE
- EXISTING COUNTY LINE
- USDA FOREST SERVICE (NATIONAL FOREST) LANDS
- APPALACHIAN NATIONAL SCENIC TRAIL
- PROPOSED LEVEL SPREADER DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED PERMANENT RIGHT OF WAY
- EXISTING ROAD/TRAIL
- GRASS-LINED CHANNEL (SEE DETAIL MVP-ES39)
- PROPOSED ACCESS ROAD CENTERLINE
- PROPOSED PIPELINE
- POND
- WETLAND
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- PROPOSED BROAD BASED DIP (SEE DETAIL MVP-ES5)

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Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN

MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE

GILES COUNTY, VIRGINIA

MOUNTAIN VALLEY PIPELINE, LLC
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RESTORATION PLANS

COMMONWEALTH OF VIRGINIA
DAVID J. WALLNER
Lic. No. 0402057593
PROFESSIONAL ENGINEER

DRAWN BY:	LJK
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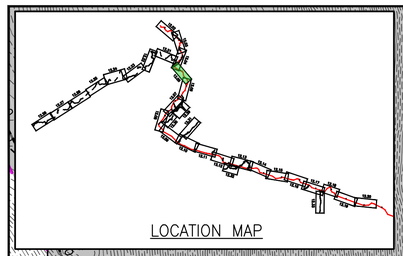

LOCATION MAP

NOTE:
POCAHONTAS ROAD WILL HAVE A ROADSIDE DITCH AND THE ROAD WILL BE CROWNED AS NEEDED.

PLAN
SCALE: 1" = 100'
100 0 100 200

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MONTGOMERY COUNTY, VIRGINIA

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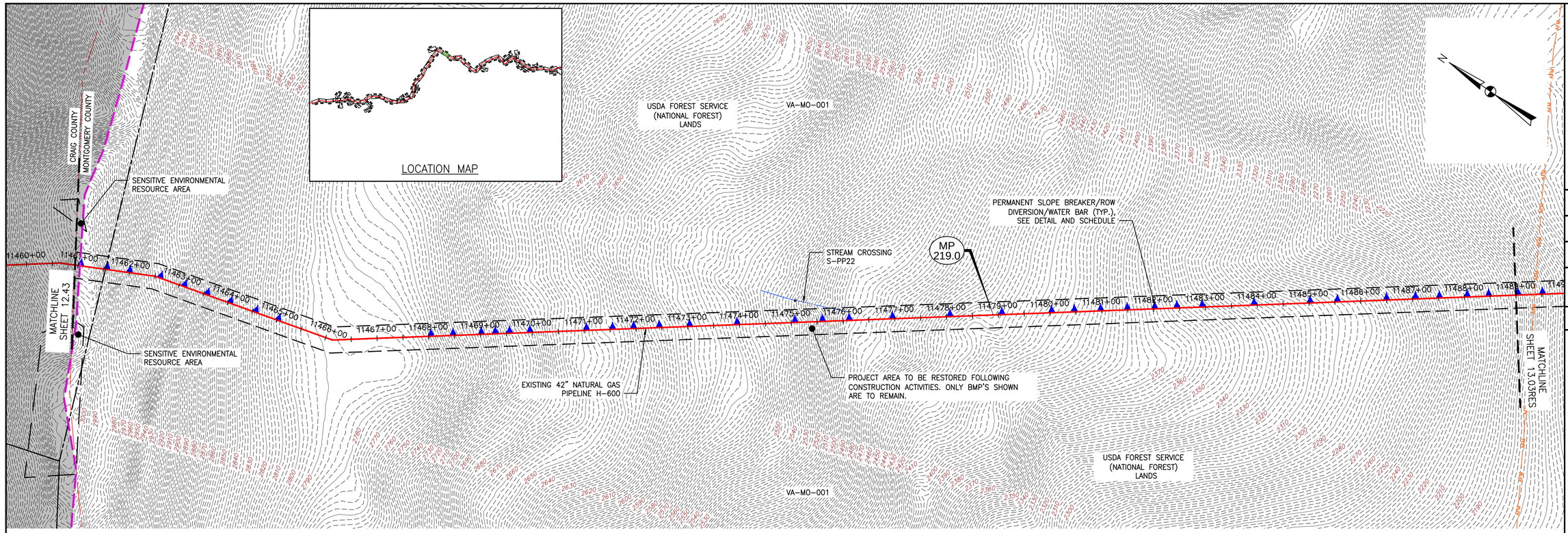

PLAN

SCALE: 1" = 100'

100 0 100 200

LEGEND

- EXISTING CULVERT
- STREAM
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- EXISTING STATE LINE
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Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN

MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE

MONTGOMERY COUNTY, VIRGINIA

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RESTORATION PLANS

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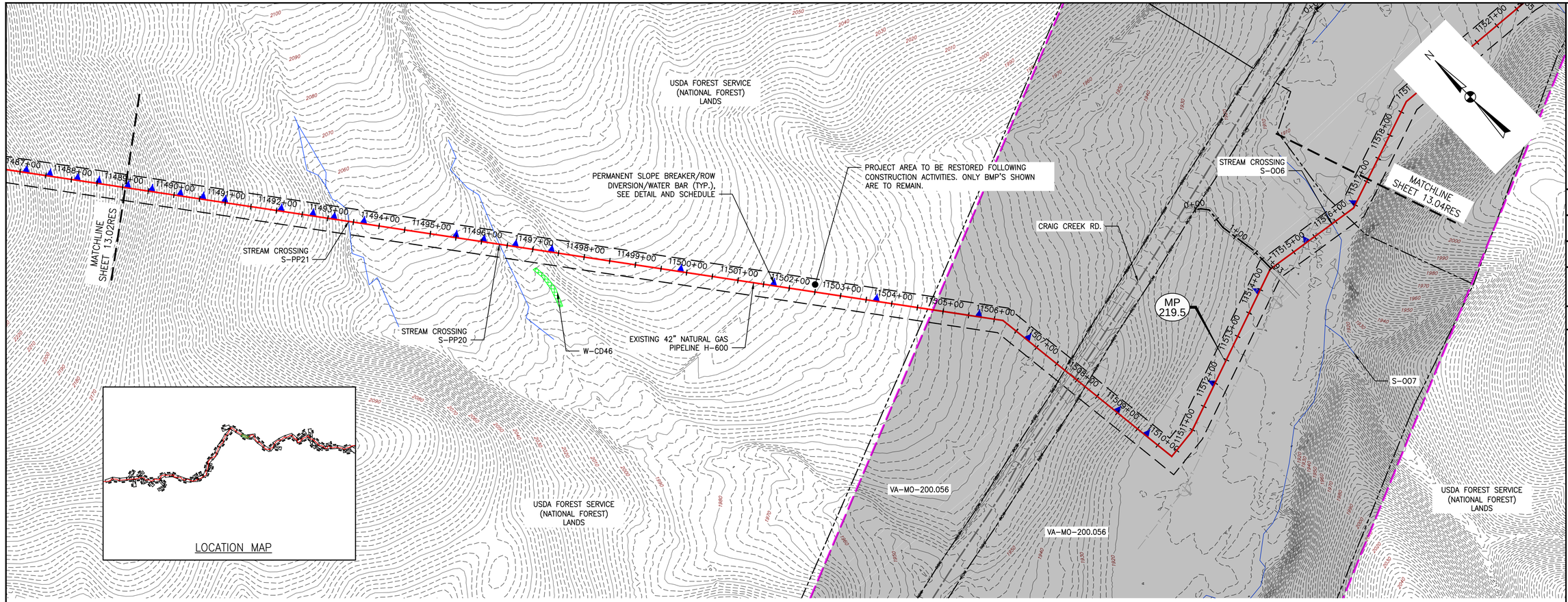

PLAN

SCALE: 1" = 100'

100 0 100 200

LEGEND

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MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE

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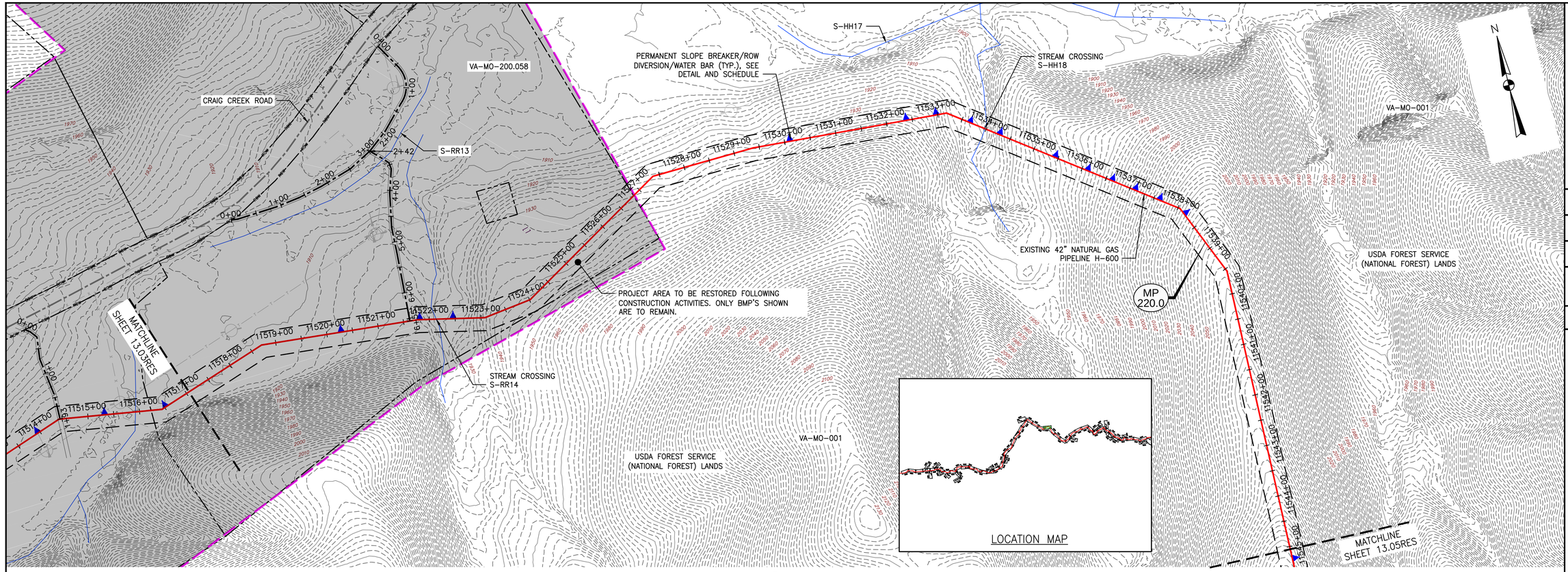

PLAN

SCALE: 1" = 100'

100 0 100 200

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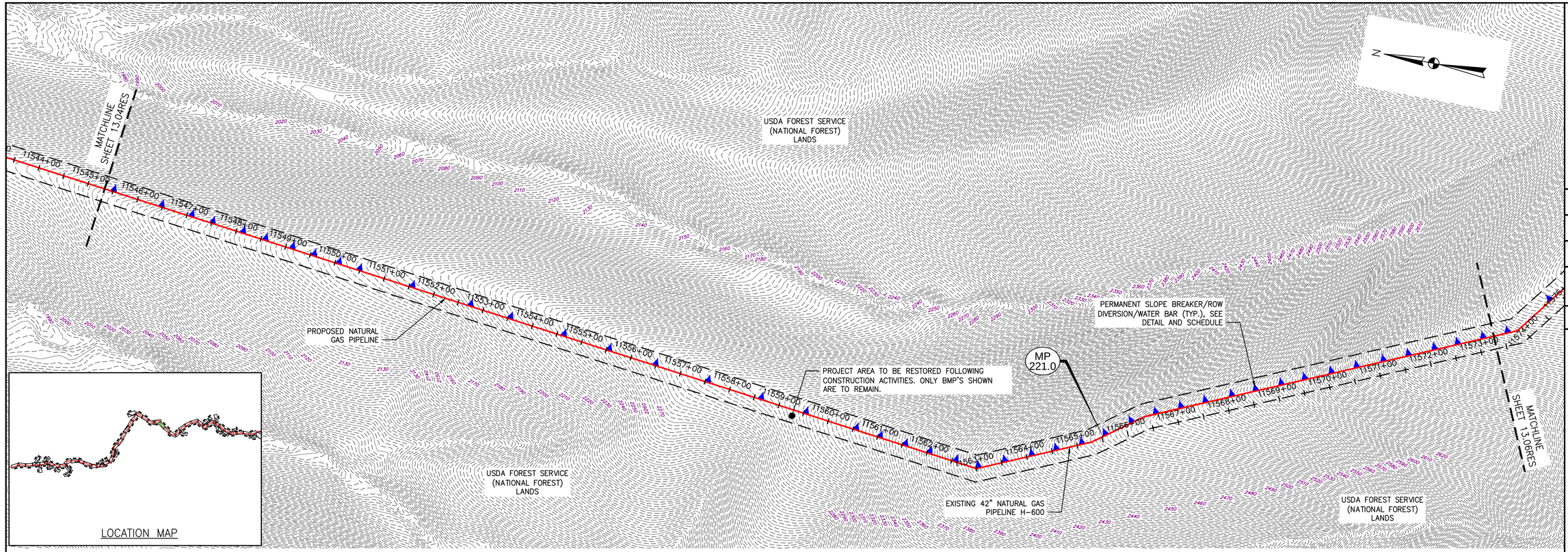

PLAN
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100 0 100 200

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Mountain Valley PIPELINE

JEFFERSON NATIONAL FOREST - RESTORATION PLAN
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE
MONTGOMERY COUNTY, VIRGINIA

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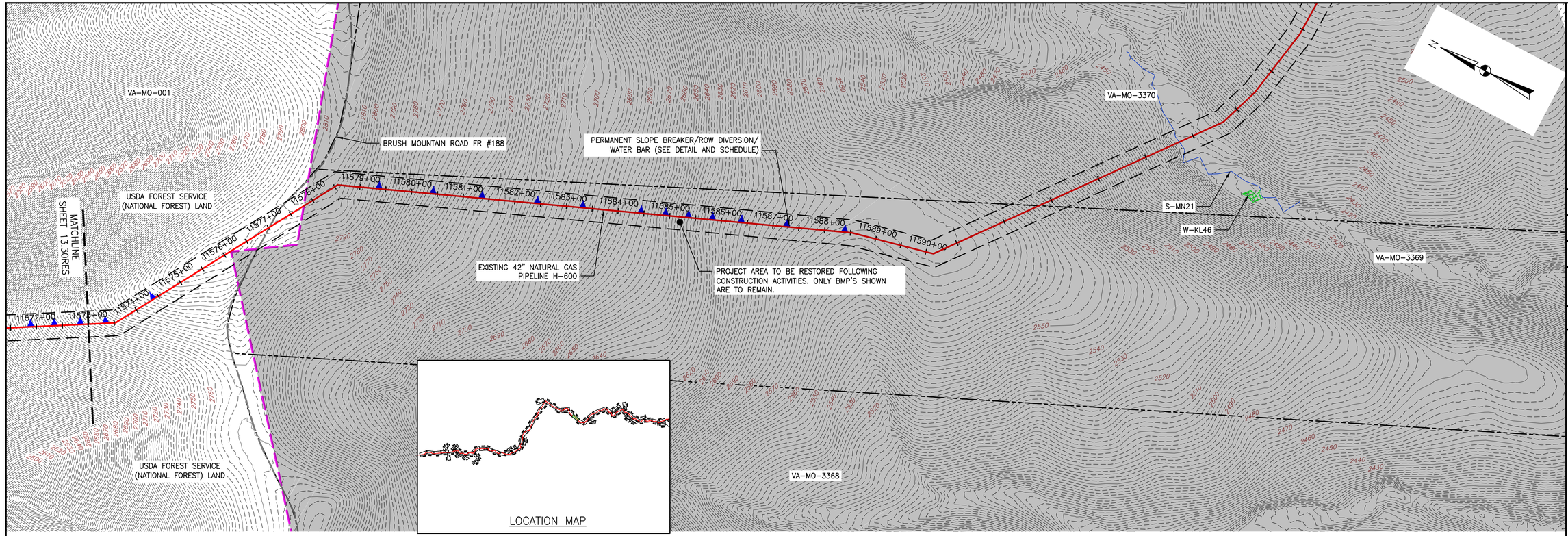

PLAN

SCALE: 1" = 100'

100 0 100 200

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