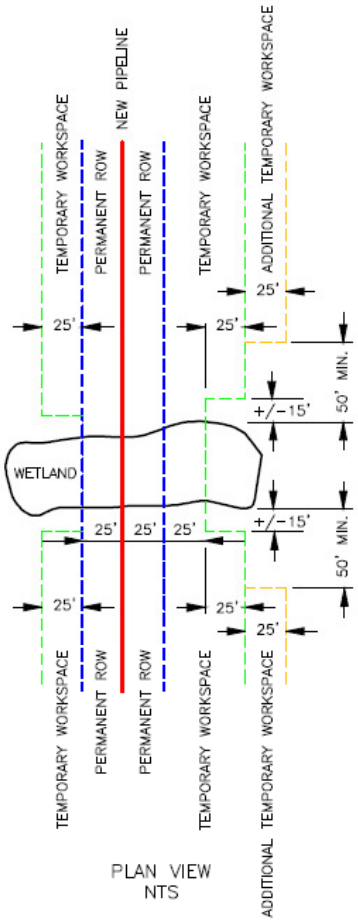
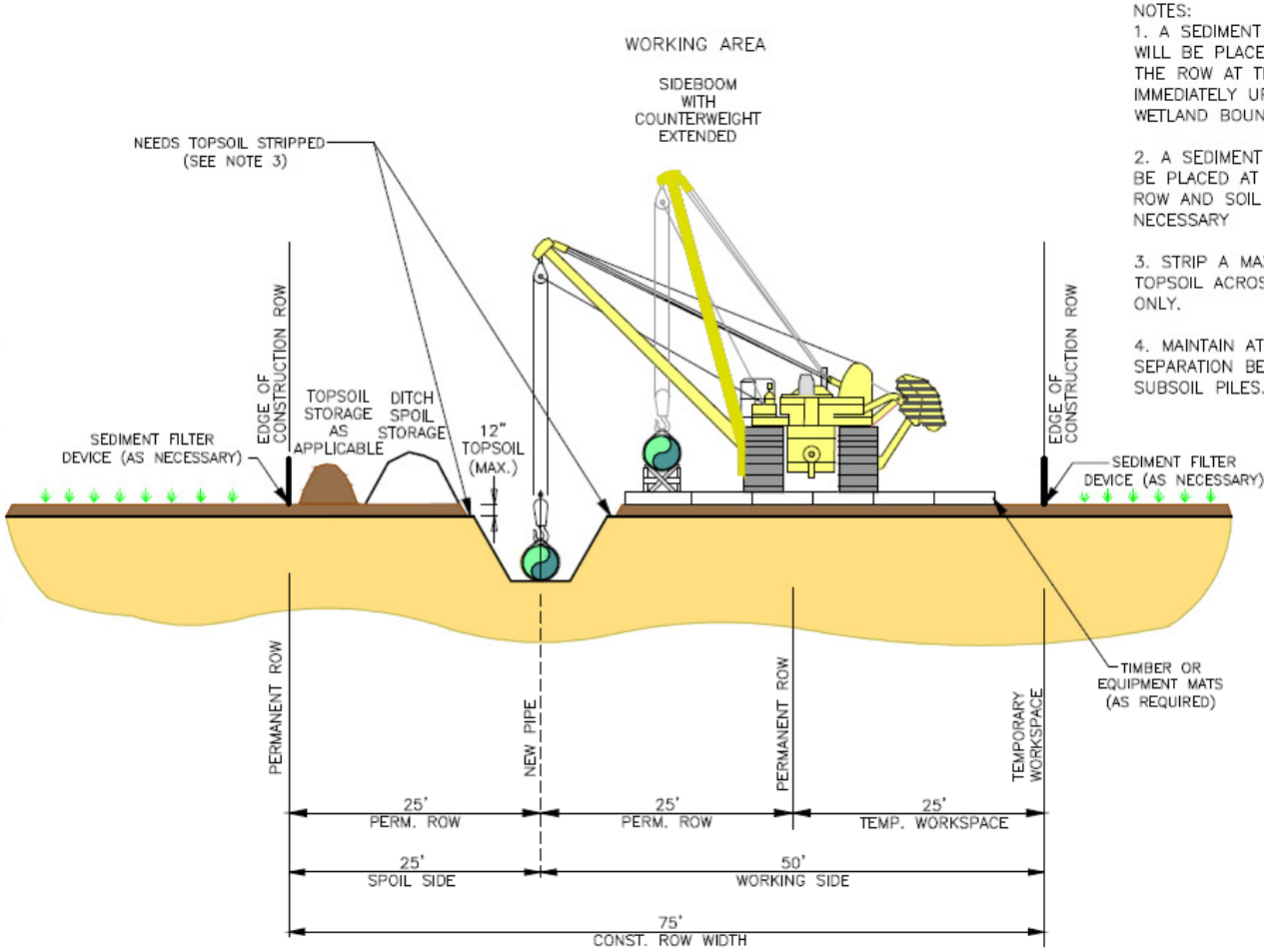
APPENDIX C
Typical Construction Right-of-way Configurations





NOTES:
1. A SEDIMENT FILTER DEVICE WILL BE PLACED ACROSS THE ROW AT THE WETLAND'S EDGE, IMMEDIATELY UPSLOPE FROM THE WETLAND BOUNDARY

2. A SEDIMENT FILTER DEVICE WILL BE PLACED AT THE EDGE OF THE ROW AND SOIL AND SPOIL PILES AS NECESSARY

3. STRIP A MAXIMUM OF 12" OF TOPSOIL ACROSS THE DITCHLINE ONLY.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIIL & SUBSOIL PILES.

ASSUMES NON-SATURATED WETLAND CONDITIONS

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

Columbia Gas Transmission

TRC

PL-MXP-100 & PL-MXP-200

TYPICAL WETLAND ROW CONFIGURATION

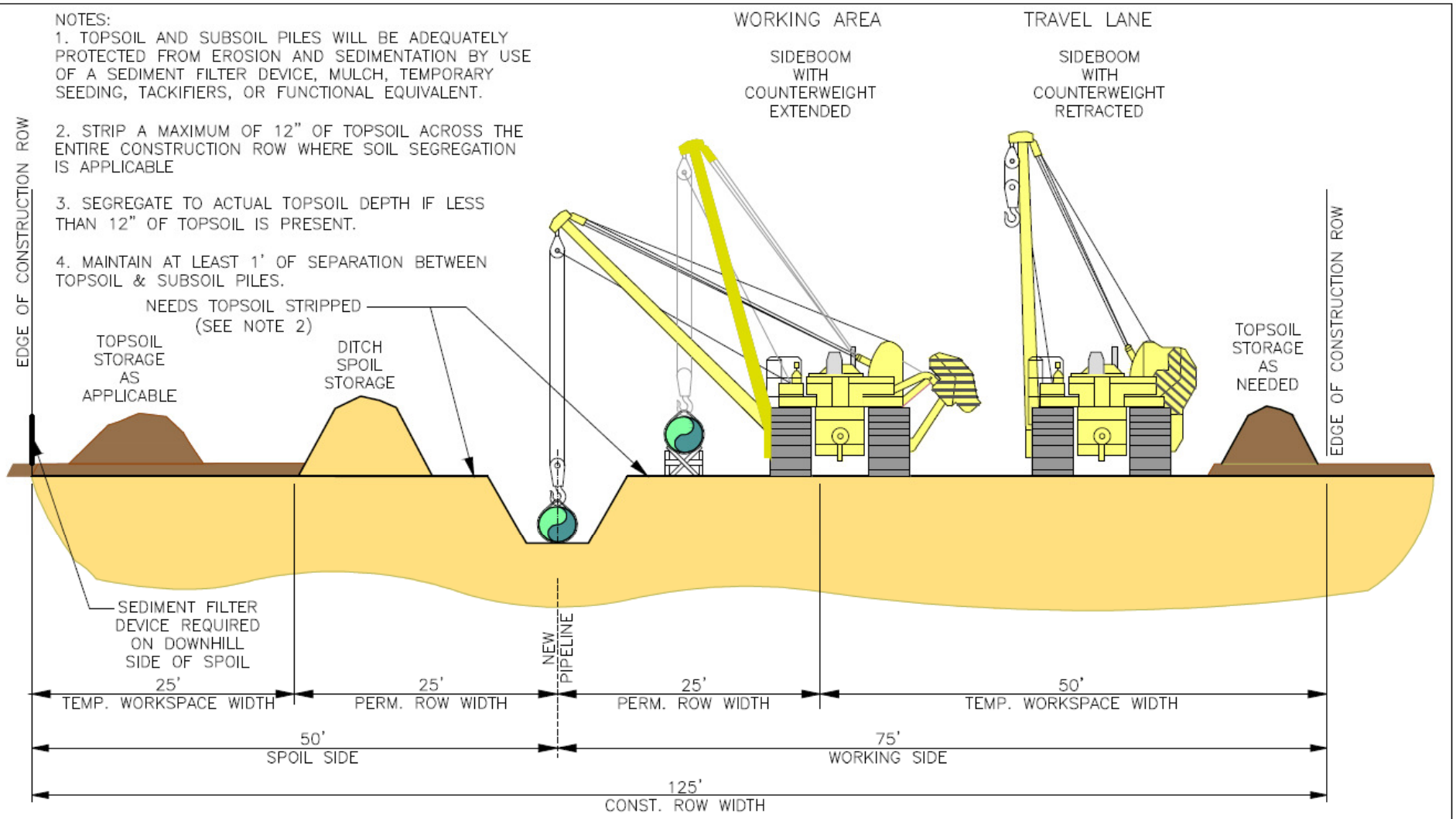
DRAWN BY	PM	DATE 07/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-1
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL ACROSS THE ENTIRE CONSTRUCTION ROW WHERE SOIL SEGREGATION IS APPLICABLE

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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PL-MXP-100

TYPICAL ROW CONFIGURATION GREENFIELD-FULL TOPSOIL SEGREGATION

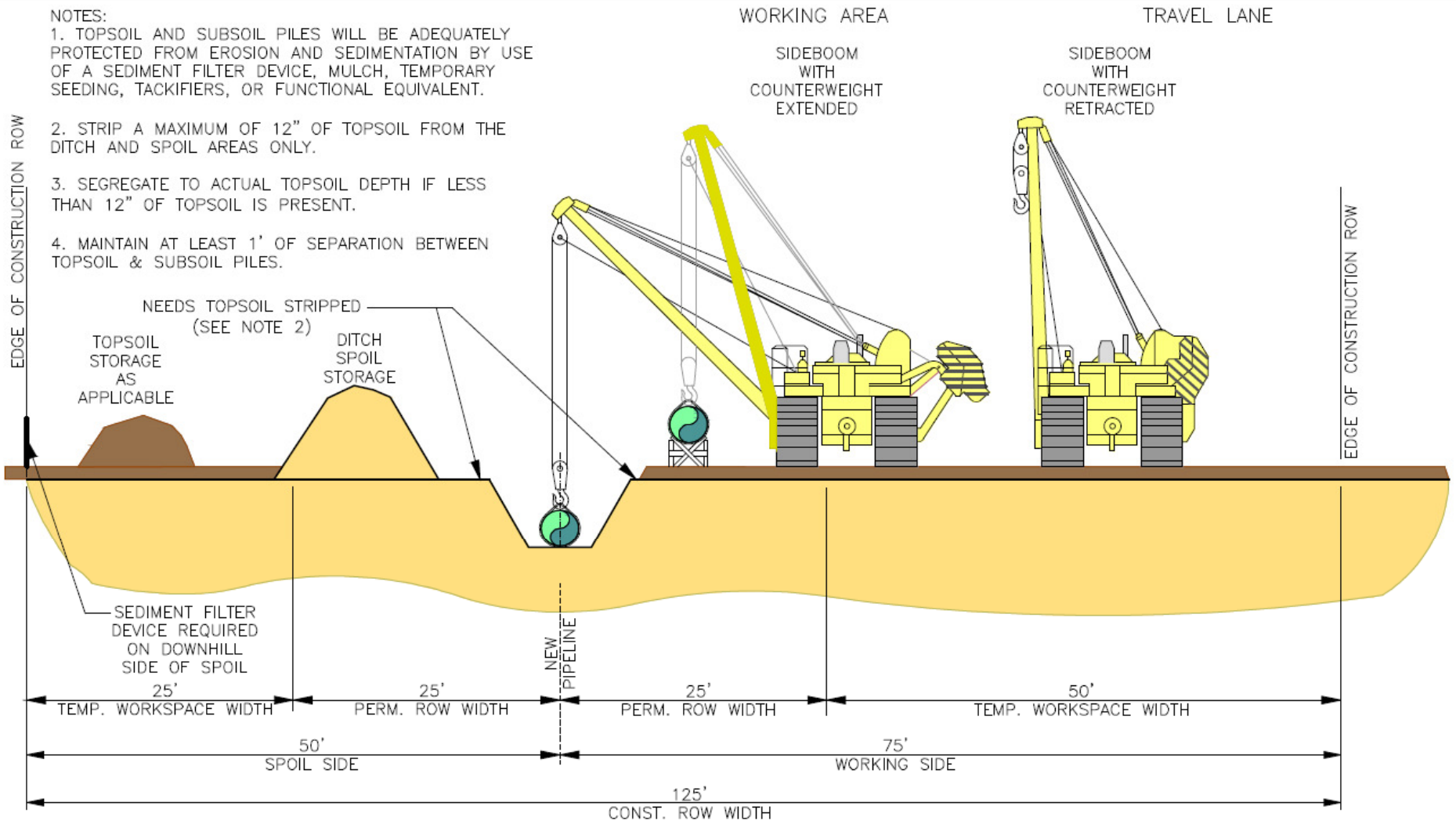
DRAWN BY	PM	DATE 07/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-2
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH AND SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

Columbia Gas Transmission

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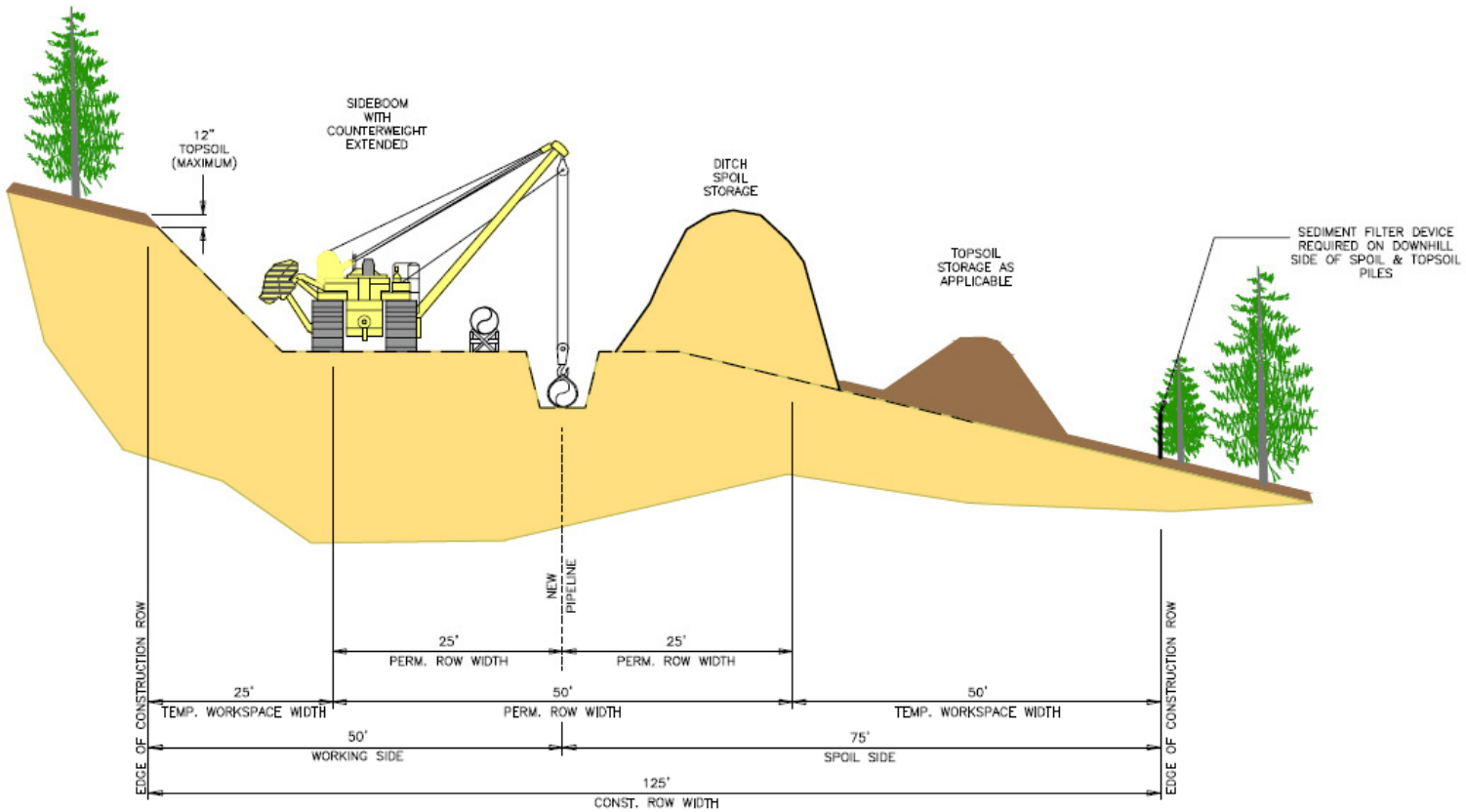
PL-MXP-100

TYPICAL ROW CONFIGURATION GREENFIELD-DITCH/SPOIL TOPSOIL SEGREGATION

DRAWN BY	PM	DATE 07/17/2015	SCALE: NTS		
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER		ISSUE
ENGINEERS REVIEW	SJO	07/30/2015	A6987-TYP-3		P3



NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL ACROSS THE ENTIRE CONSTRUCTION ROW WHERE SOIL SEGREGATION IS APPLICABLE

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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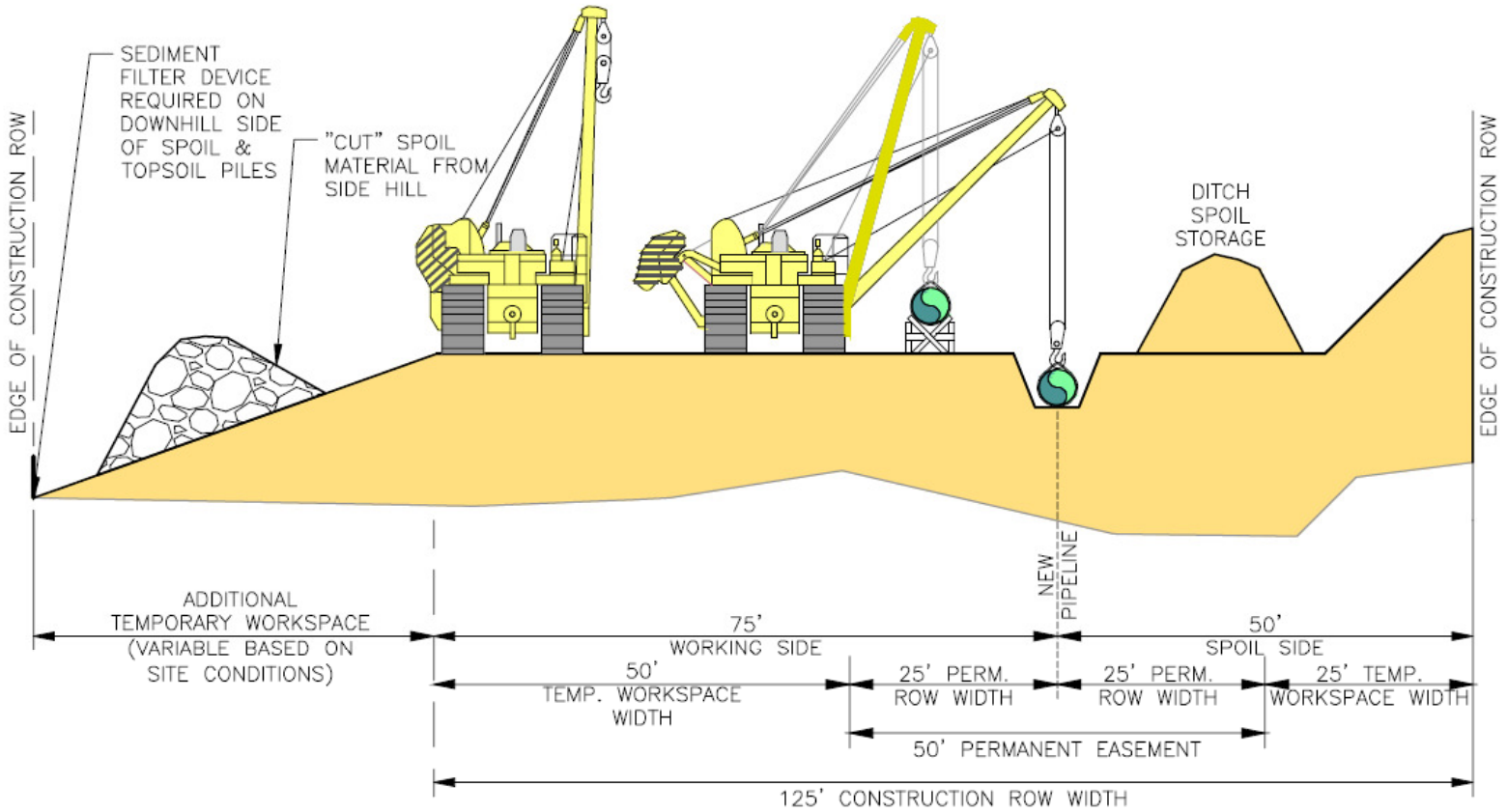
MAINLINE CONSTRUCTION GREENFIELD
CONSTRUCTION TYPICAL SIDE HILL RIGHT-OF-WAY

DRAWN BY	PM	DATE 07/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-4
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.
2. STRIP TOPSOIL IN ACCORDANCE WITH THE ECS AND LANDOWNER/LAND MANAGING AGENCY AGREEMENTS.
3. RESTORE CUT SLOPE USING NATIVE MATERIAL OR SUITABLE MATERIAL IN ACCORDANCE WITH COLUMBIA SPECIFICATIONS WHERE NATIVE MATERIAL HAS BEEN DETERMINED TO BE INAPPROPRIATE. DISPOSE OF ANY EXCESS MATERIAL IN ACCORDANCE WITH APPLICABLE LANDOWNER AND PERMIT CONDITIONS.
4. ON STEEP SIDE SLOPES CENTERLINE OF PIPE MAY BE ADJUSTED WITHIN PERM. ROW TO MEET FIELD CONDITIONS.

NO.	REVISION	APP'D	DATE
2			
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/04/16

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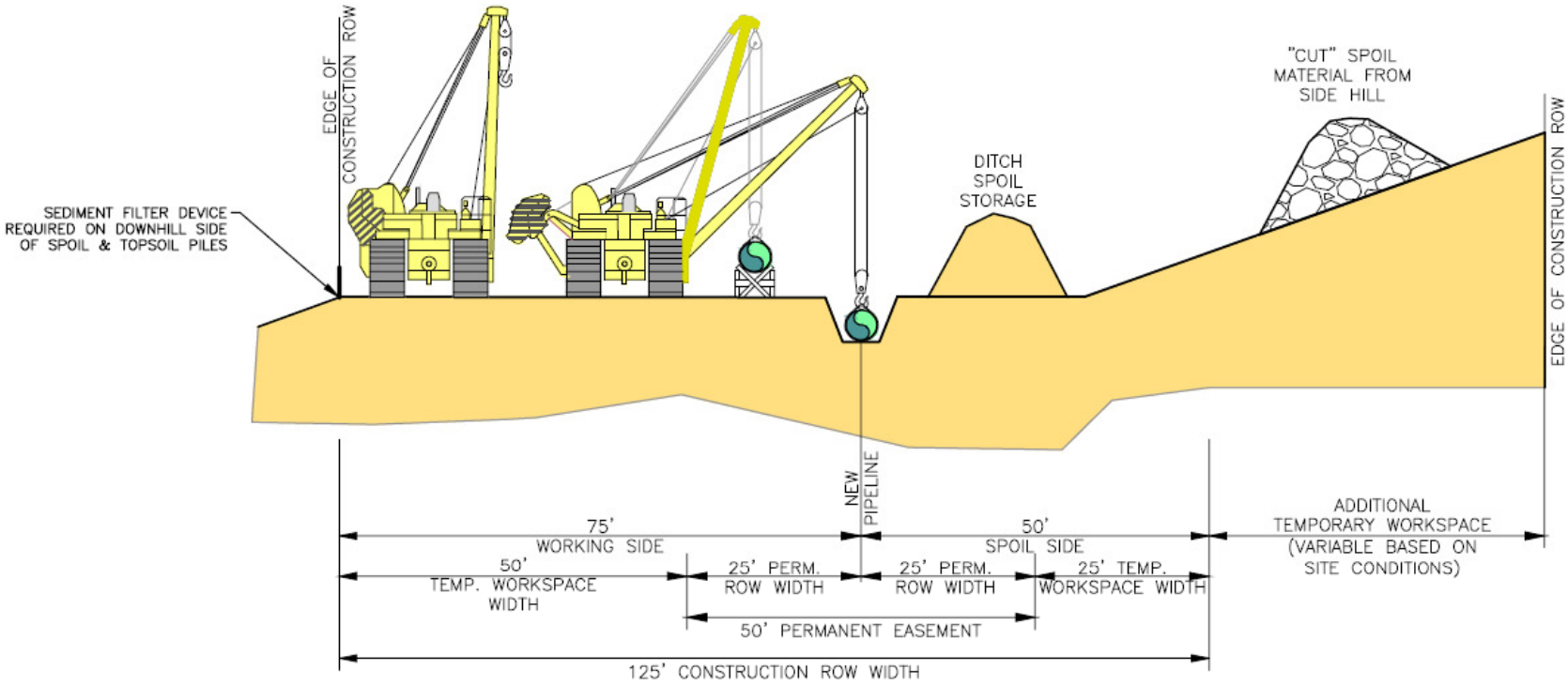
PL-MXP-100

TYPICAL STEEP SIDE SLOPE WITH ATWS ON WORKING SIDE

DRAWN BY	TBH	DATE 03/02/2016	SCALE: NTS
DRAFTING CHECK	TJ	03/02/2016	DRAWING NUMBER: A6987-TYP-5
ENGINEERS REVIEW	MLT	03/02/2016	ISSUE: P1



NOTES:

1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.
2. STRIP TOPSOIL IN ACCORDANCE WITH THE ECS AND LANDOWNER/LAND MANAGING AGENCY AGREEMENTS.
3. RESTORE CUT SLOPE USING NATIVE MATERIAL OR SUITABLE MATERIAL IN ACCORDANCE WITH COLUMBIA SPECIFICATIONS WHERE NATIVE MATERIAL HAS BEEN DETERMINED TO BE INAPPROPRIATE. DISPOSE OF ANY EXCESS MATERIAL IN ACCORDANCE WITH APPLICABLE LANDOWNER AND PERMIT CONDITIONS.
4. ON STEEP SIDE SLOPES CENTERLINE OF PIPE MAY BE ADJUSTED WITHIN PERM. ROW TO MEET FIELD CONDITIONS.

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PL-MXP-100

TYPICAL STEEP SIDE SLOPE WITH ATWS ON SPOIL SIDE

NO.	REVISION	APP'D	DATE
1			
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/04/16

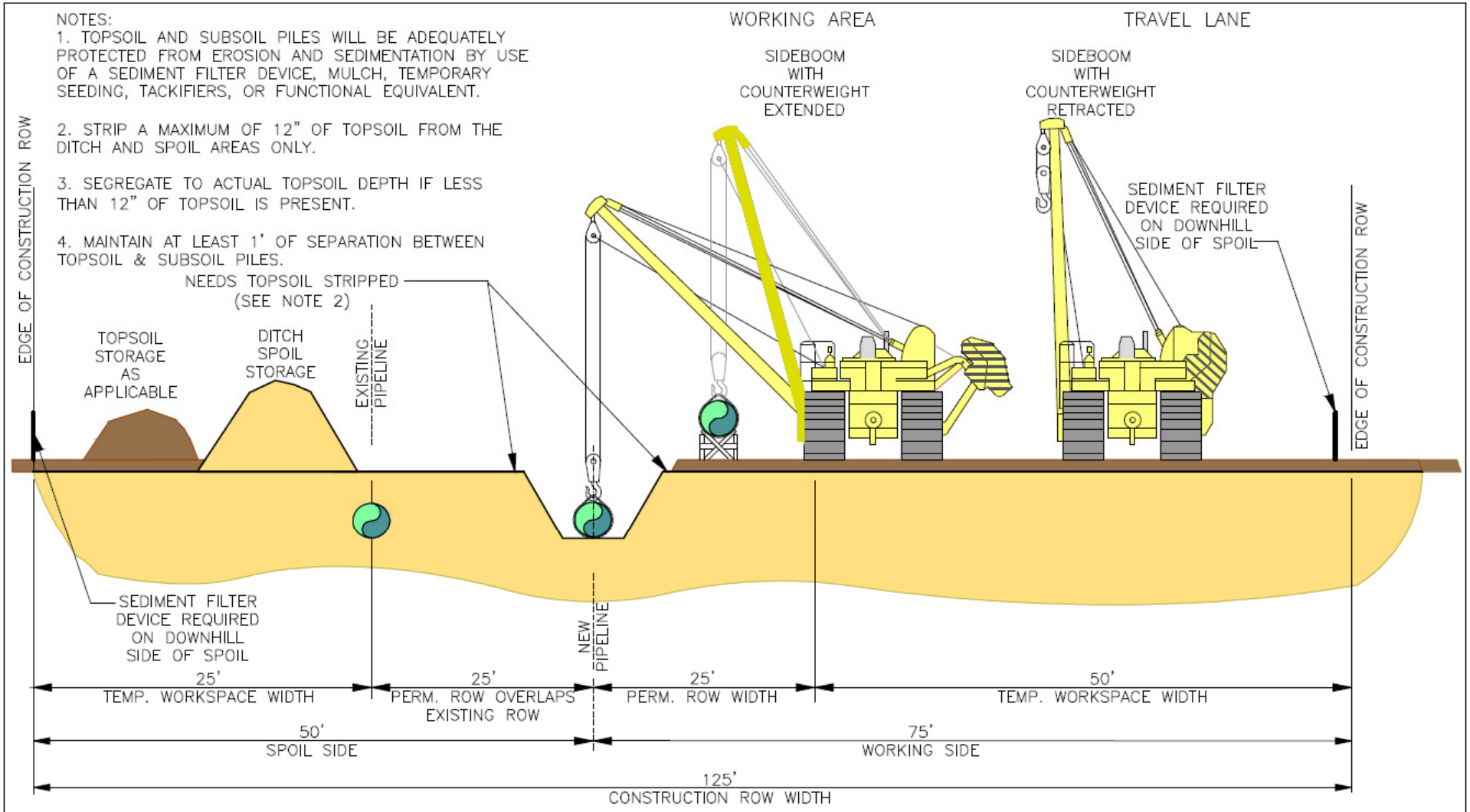
DRAWN BY	TBH	DATE 03/02/2016	SCALE: NTS
DRAFTING CHECK	TJ	03/02/2016	DRAWING NUMBER: A6987-TYP-6
ENGINEERS REVIEW	MLT	03/02/2016	ISSUE: P1

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH AND SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



NO.	REVISION	APP'D	DATE
2			
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/04/16

Columbia Gas Transmission

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PL-MXP-100

TYPICAL ROW CONFIGURATION
ABUT EXISTING PIPELINES WITH TEMP OVERLAP

DRAWN BY	TBH	DATE 03/02/2016
DRAFTING CHECK	TJ	03/02/2016
ENGINEERS REVIEW	MLT	03/02/2016

SCALE: NTS

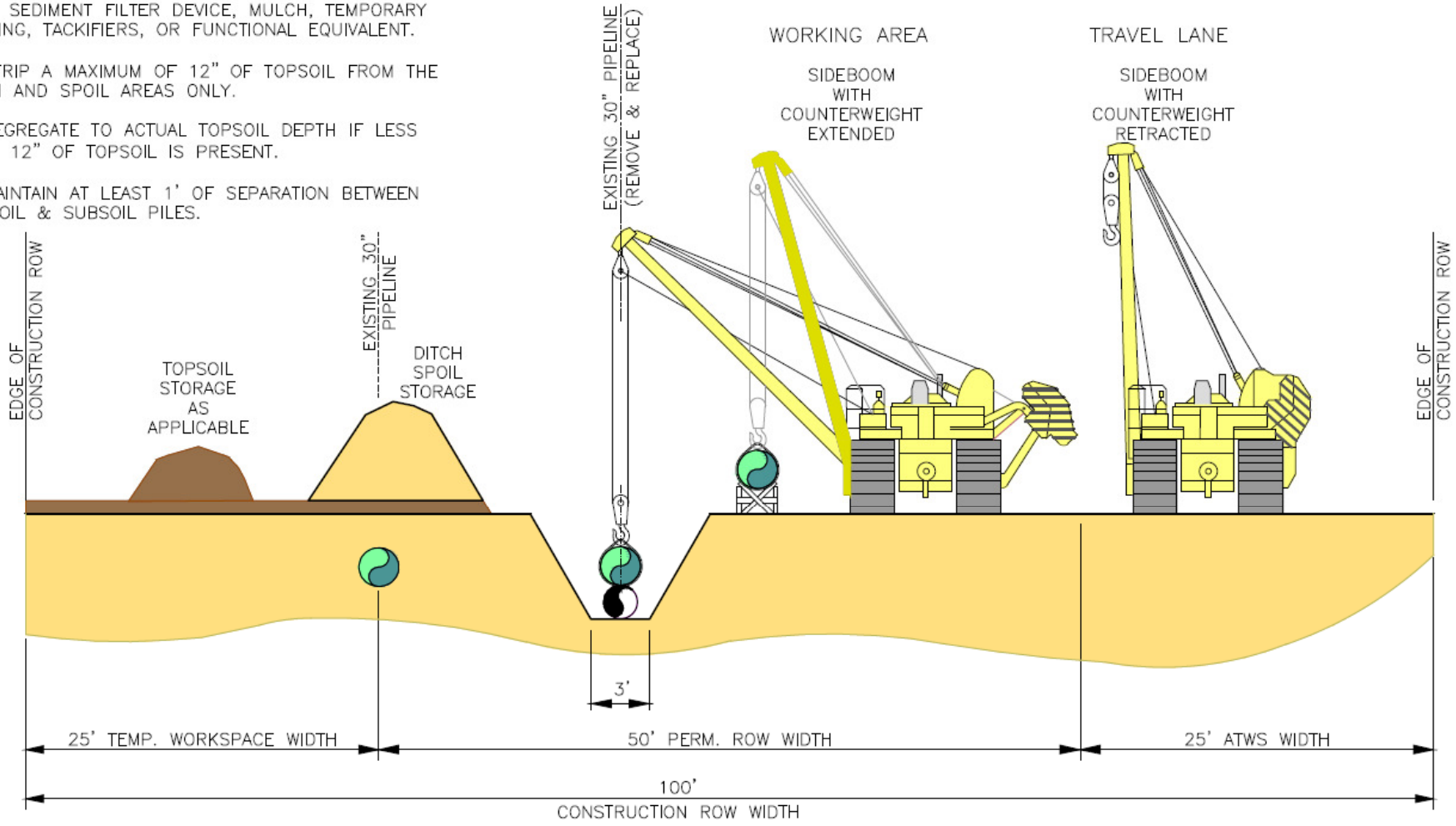
DRAWING NUMBER	ISSUE
A6987-TYP-7	P1

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH AND SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



Columbia Gas Transmission

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MXP SM-80/SM-80 LOOP REPLACEMENT

PIPELINE REPLACEMENT

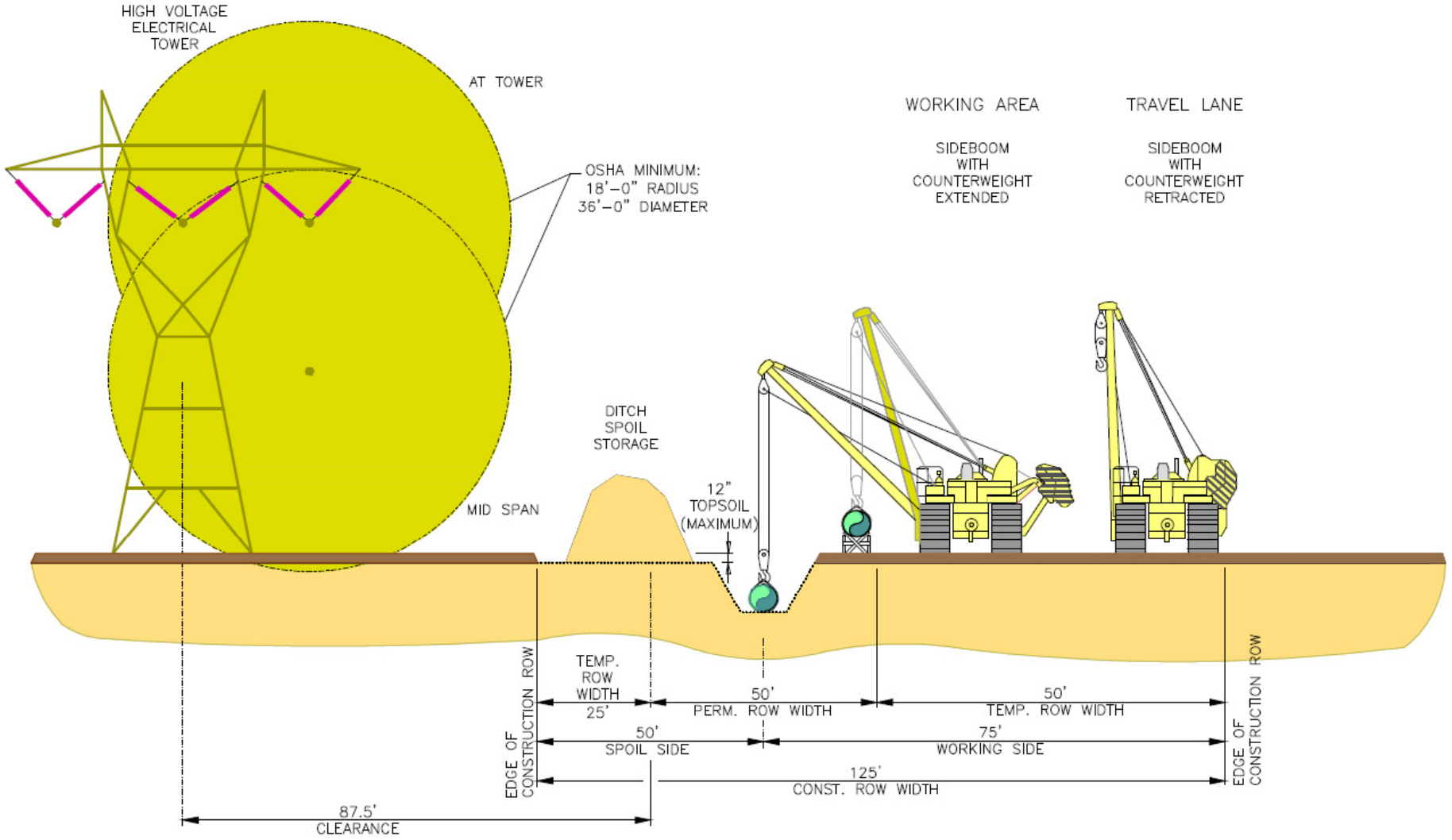
NO.	REVISION	APP'D	DATE
△			
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/31/16

DRAWN BY	TBH	03/15/2016
DRAFTING CHECK	PAD	03/21/2016
ENGINEERS REVIEW	MLT	03/21/2016

SCALE: NTS

DRAWING NUMBER: A6989-TYP-8

ISSUE: P1



POWER LINE VOLTAGE	OSHA MINIMUM APPROACH DISTANCE
0 – 69,000 VOLTS	10 FEET
115,000–138,000 VOLTS	11 FEET
230,000 VOLTS	13 FEET
500,000 VOLTS	18 FEET

NO.	REVISION	APP'D	DATE
1			
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/31/16

Columbia Gas Transmission

TRC

PL–MXP–100

MAINLINE CONSTRUCTION PARALLEL TO POWERLINES RIGHT-OF-WAY

		DATE
DRAWN BY	SJS	03/28/2016
DRAFTING CHECK	TJ	03/29/2016
ENGINEERS REVIEW	MLT	03/29/2016

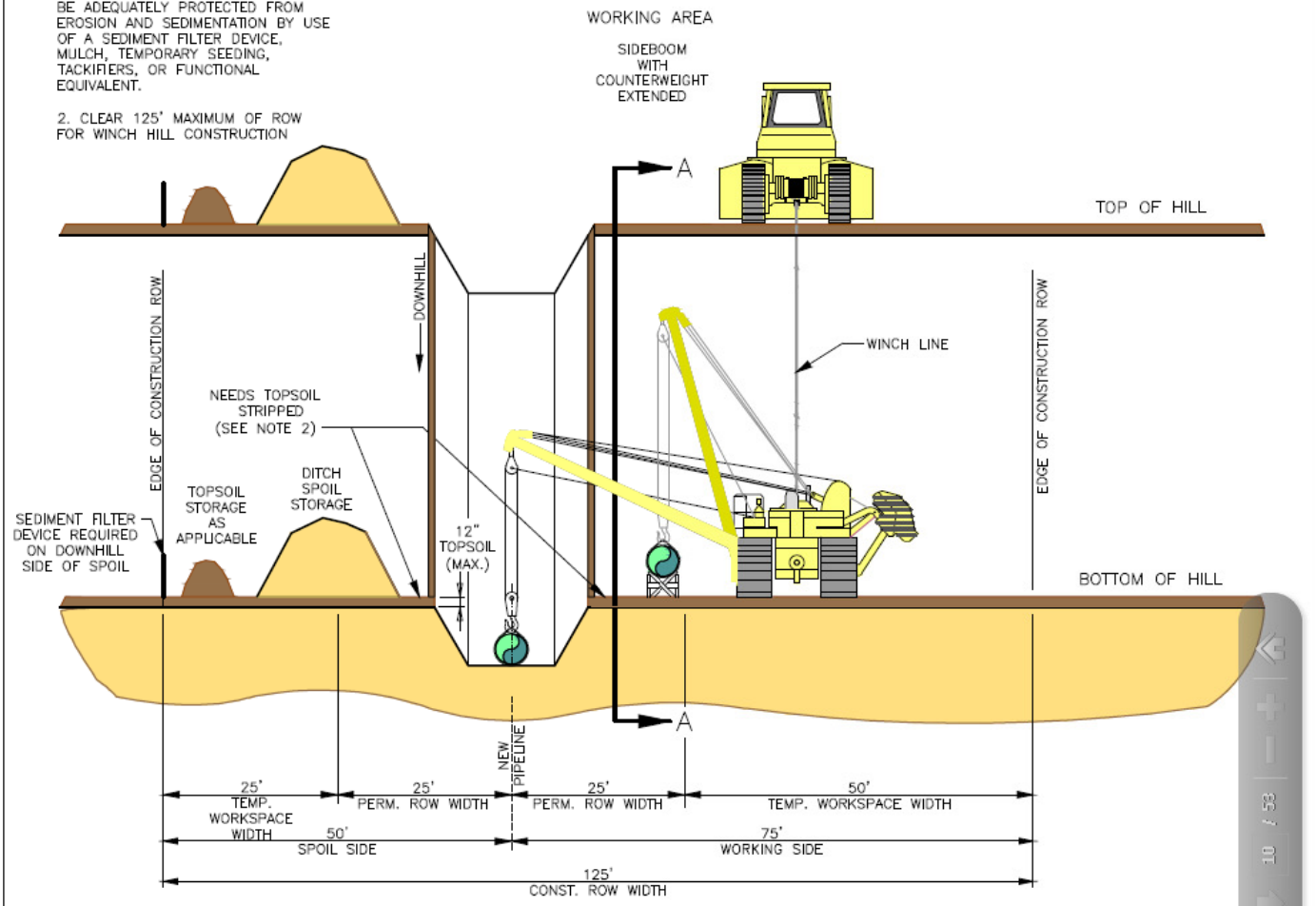
SCALE: NTS

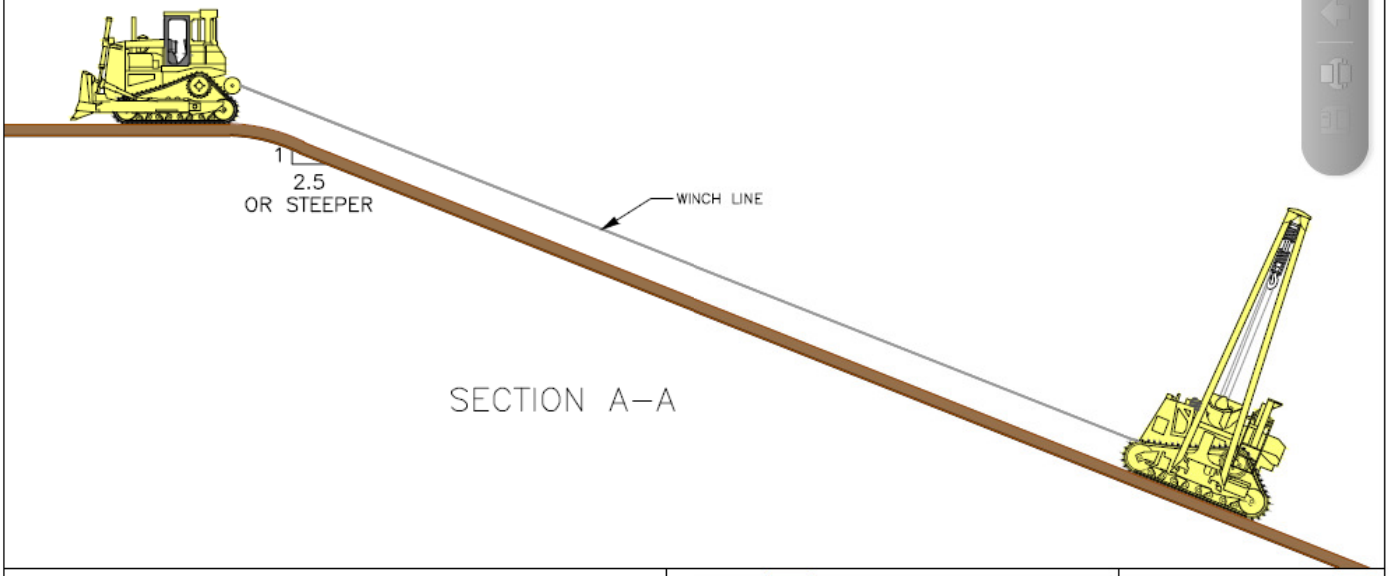
DRAWING NUMBER: A6987-TYP-9

ISSUE: P1

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. CLEAR 125' MAXIMUM OF ROW FOR WINCH HILL CONSTRUCTION





SECTION A–A

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	04/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	FERC PRE–FILE	JHE	01/21/16

Columbia Gas Transmission

TRC

PL–MXP–100

TYPICAL RIGHT OF WAY CONFIGURATION
WINCH HILL

DRAWN BY	BBS	DATE 12/14/2015
DRAFTING CHECK	TJ	09/22/2015
ENGINEERS REVIEW	SJO	09/22/2015

SCALE: NTS

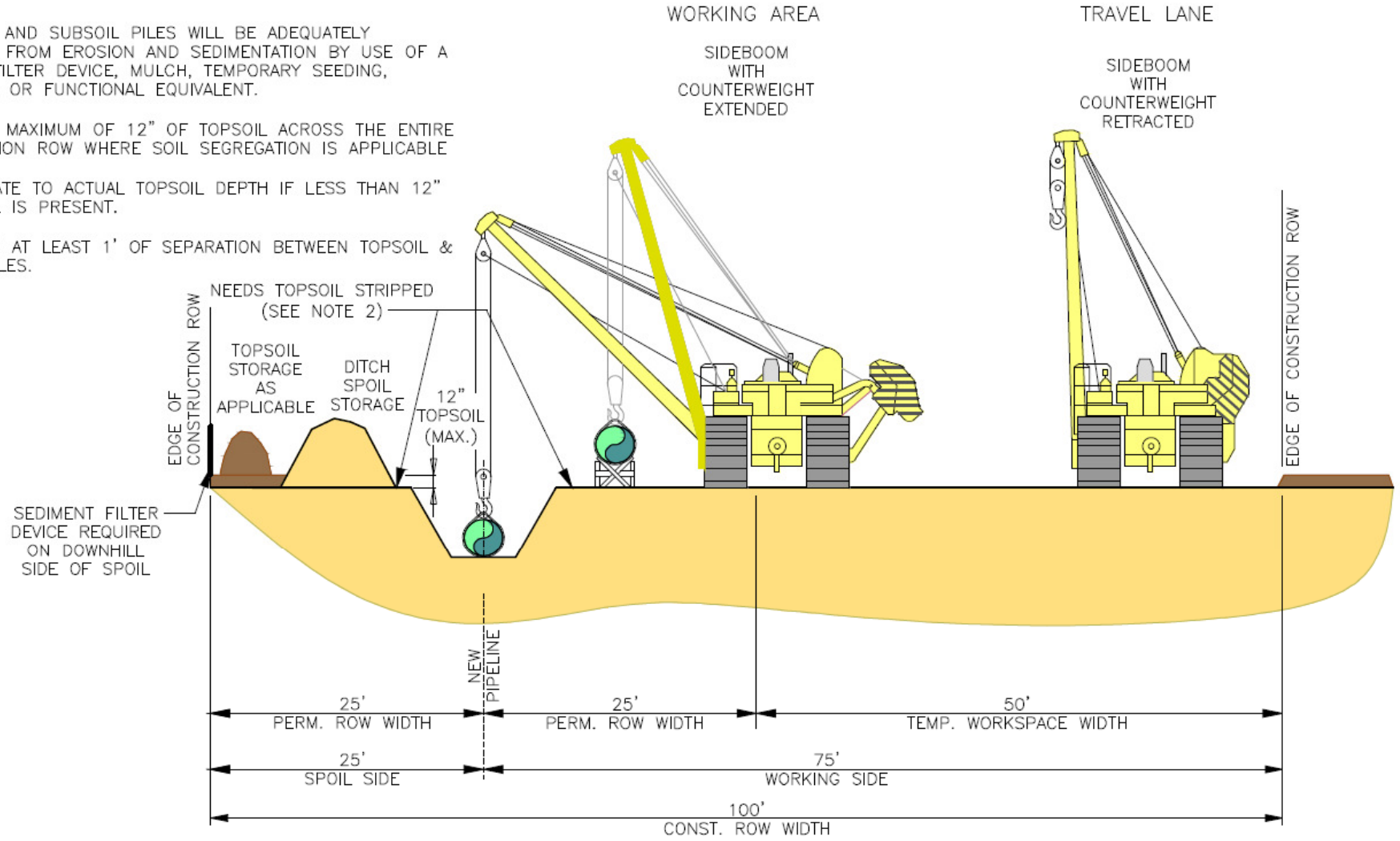
DRAWING NUMBER	ISSUE
A6987-TYP-10	P3

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL ACROSS THE ENTIRE CONSTRUCTION ROW WHERE SOIL SEGREGATION IS APPLICABLE

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



Columbia Gas Transmission

TRC

PL-MXP-200

TYPICAL ROW CONFIGURATION
24" SHERWOOD LATERAL-FULL TOPSOIL SEGREGATION

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	04/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	FERC PRE-FILE	JHE	09/25/15

DRAWN BY	PM	07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6988-TYP-11

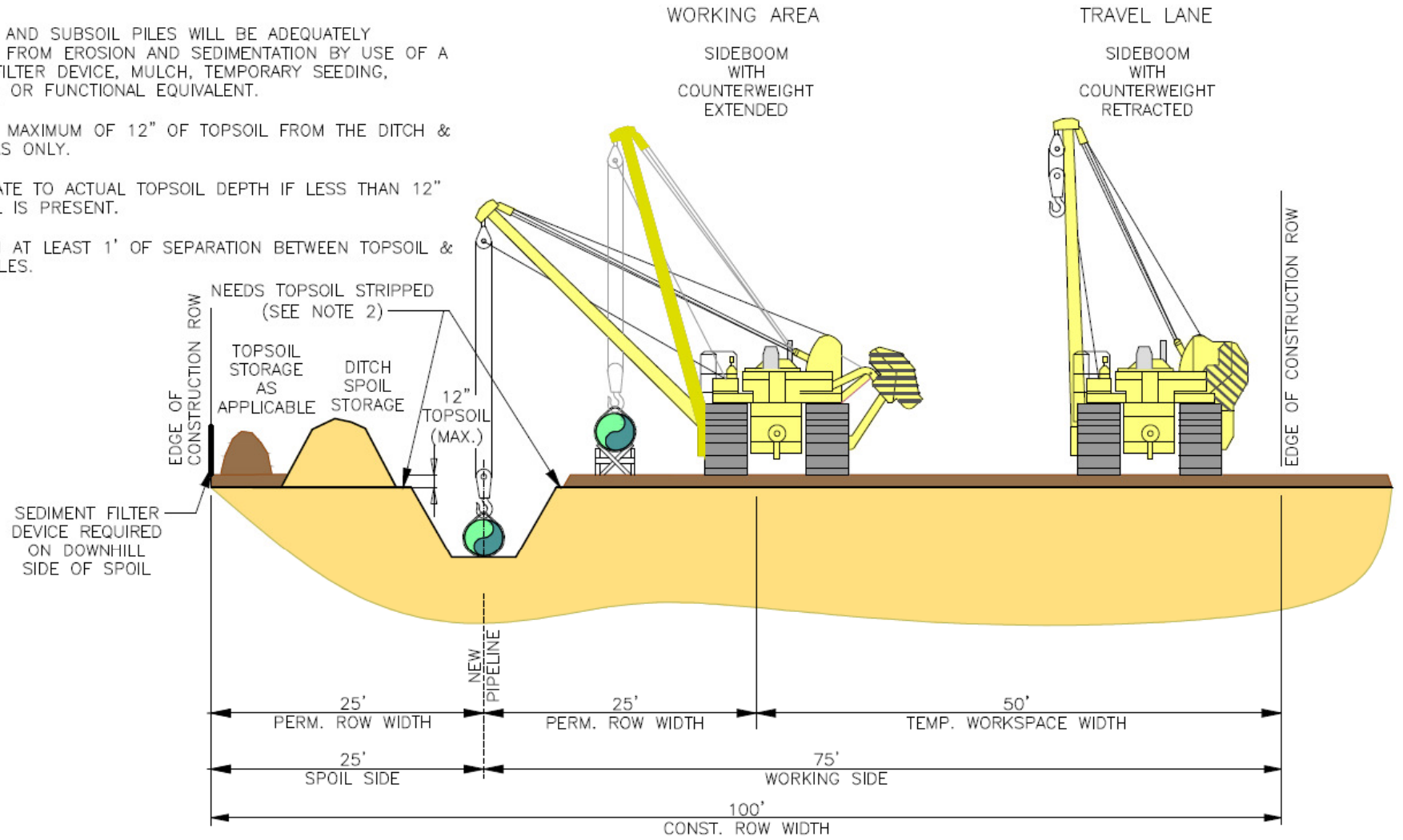
ISSUE: P3

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH & SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



Columbia Gas Transmission

TRC

PL-MXP-200

TYPICAL ROW CONFIGURATION
24" SHERWOOD LATERAL-DITCH/SPOIL TOPSOIL SEGREGATION

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	04/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	FERC PRE-FILE	JHE	09/25/15

DRAWN BY	PM	DATE 07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6988-TYP-12

ISSUE: P3

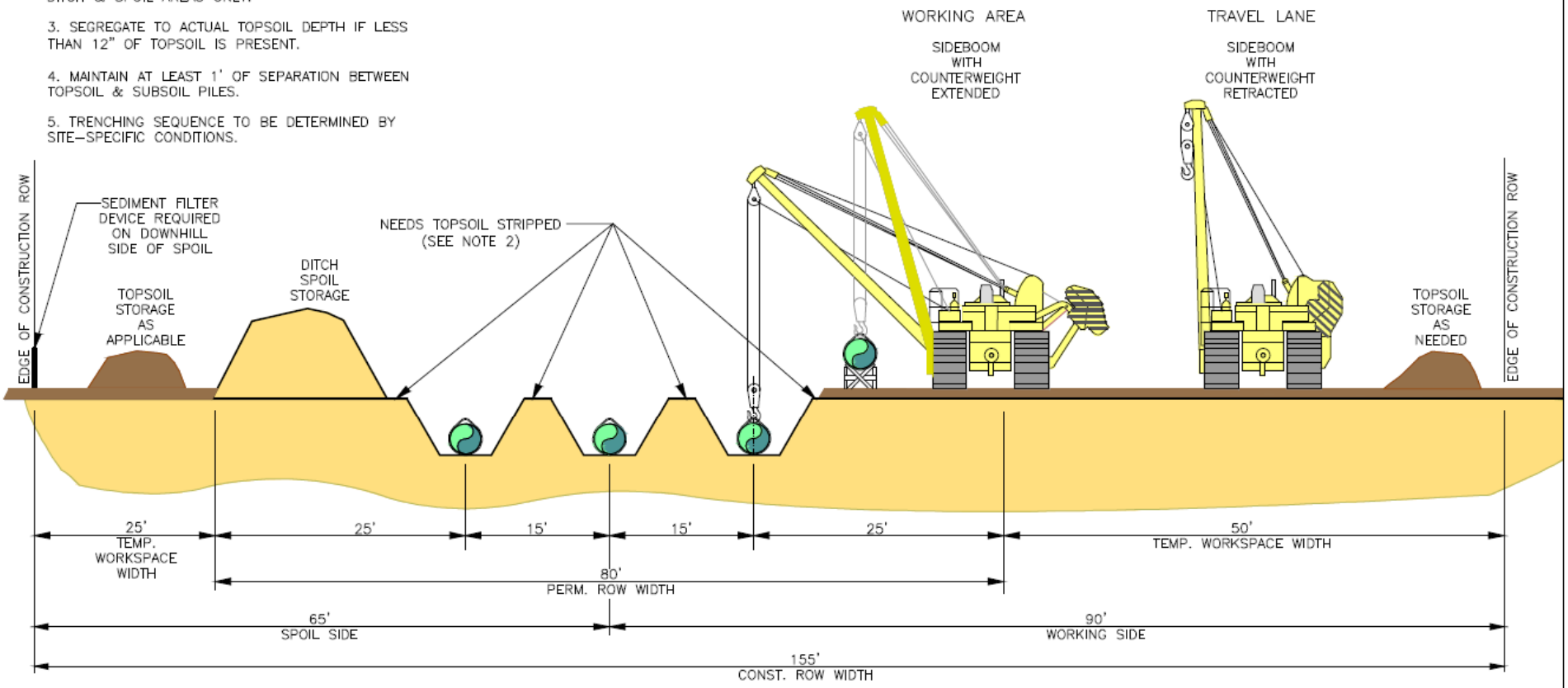
NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH & SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.

5. TRENCHING SEQUENCE TO BE DETERMINED BY SITE-SPECIFIC CONDITIONS.



NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	04/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	FERC PRE-FILE	JHE	01/21/16

Columbia Gas Transmission

TRC

PL-MXP-100 & PL-MXP-200

TYPICAL ROW CONFIGURATION 3 PARALLEL CPG PIPELINES

DRAWN BY	PM	DATE 07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-13

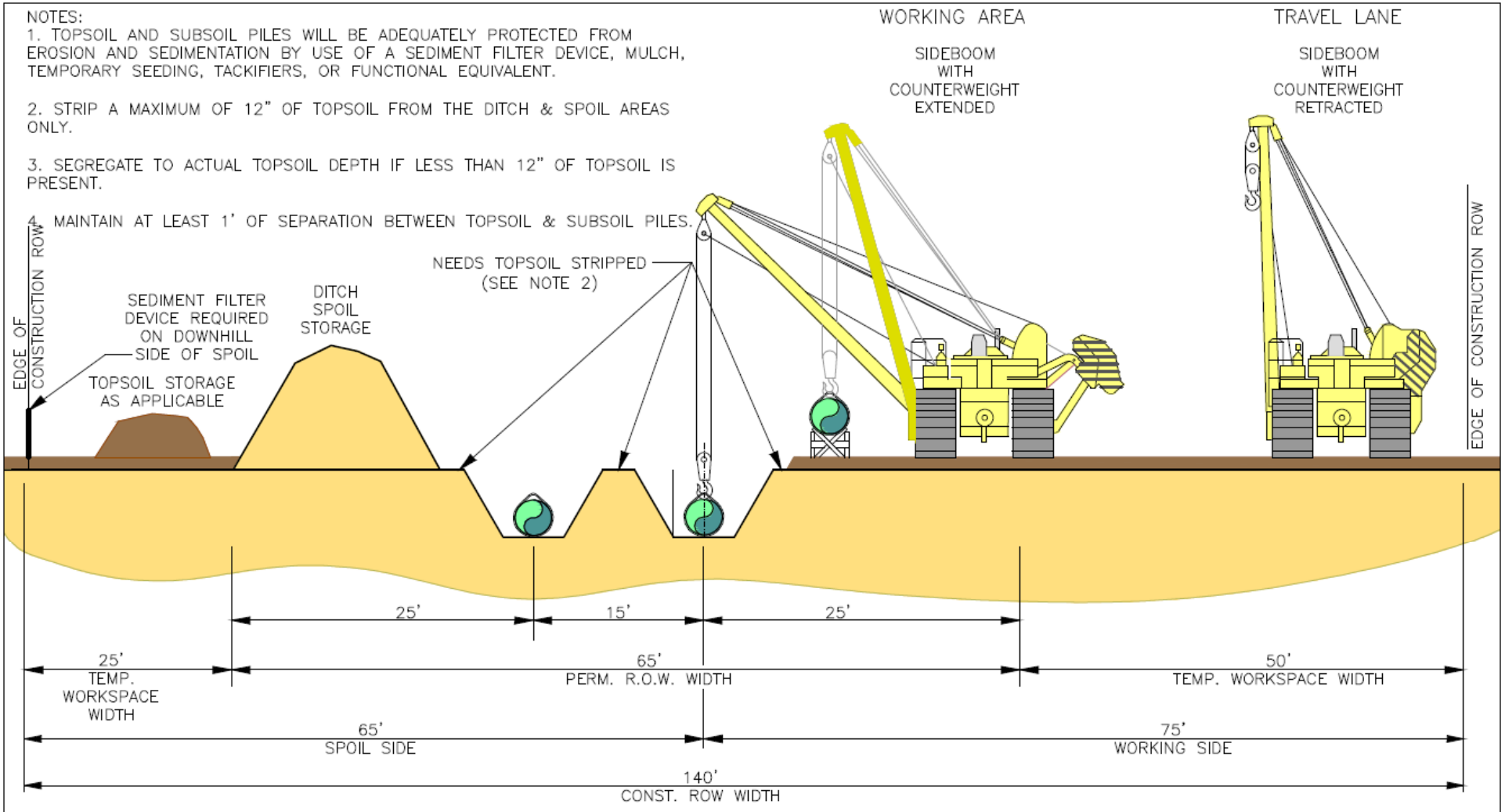
ISSUE: P3

NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH & SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.



NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	04/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	FERC PRE-FILE	JHE	01/21/15

Columbia Gas Transmission

TRC

PL-MXP-100 & PL-MXP-200

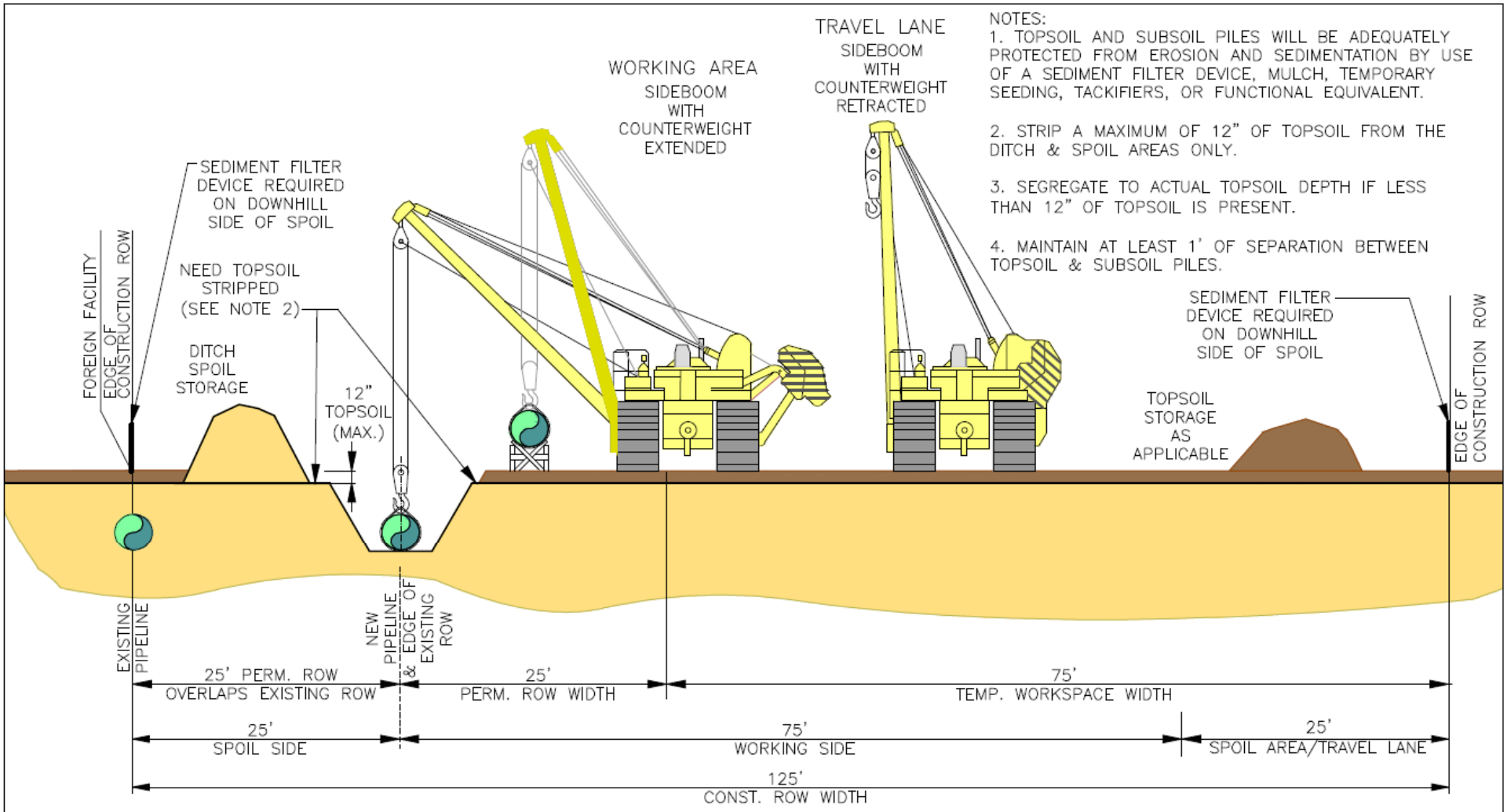
TYPICAL ROW CONFIGURATION
2 PARALLEL CPG PIPELINES

DRAWN BY	PM	DATE 07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-14

ISSUE: P3



NOTES:
1. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF A SEDIMENT FILTER DEVICE, MULCH, TEMPORARY SEEDING, TACKIFIERS, OR FUNCTIONAL EQUIVALENT.

2. STRIP A MAXIMUM OF 12" OF TOPSOIL FROM THE DITCH & SPOIL AREAS ONLY.

3. SEGREGATE TO ACTUAL TOPSOIL DEPTH IF LESS THAN 12" OF TOPSOIL IS PRESENT.

4. MAINTAIN AT LEAST 1' OF SEPARATION BETWEEN TOPSOIL & SUBSOIL PILES.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

Columbia Gas Transmission

TRC

PL-MXP-100

TYPICAL ROW CONFIGURATION OVERLAP ABUT EXISTING PIPELINES

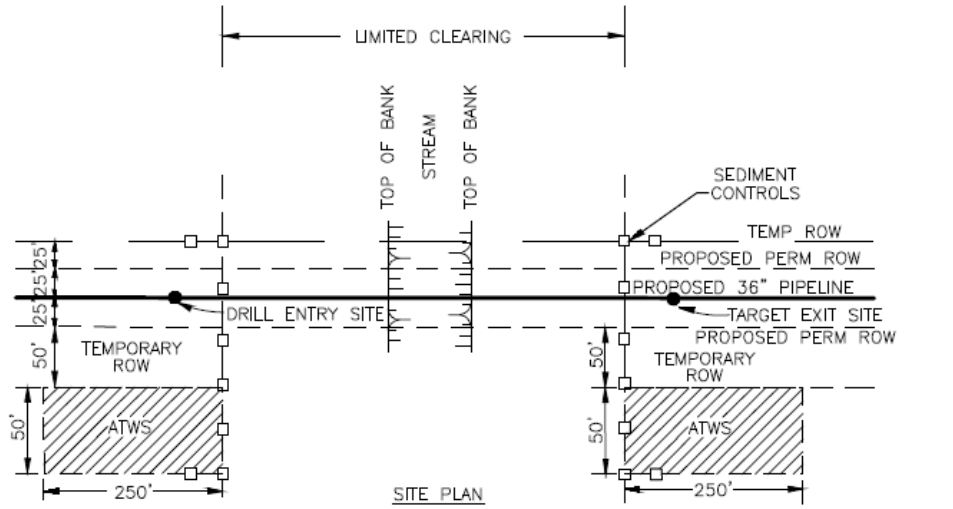
DRAWN BY	PM	DATE 07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-15

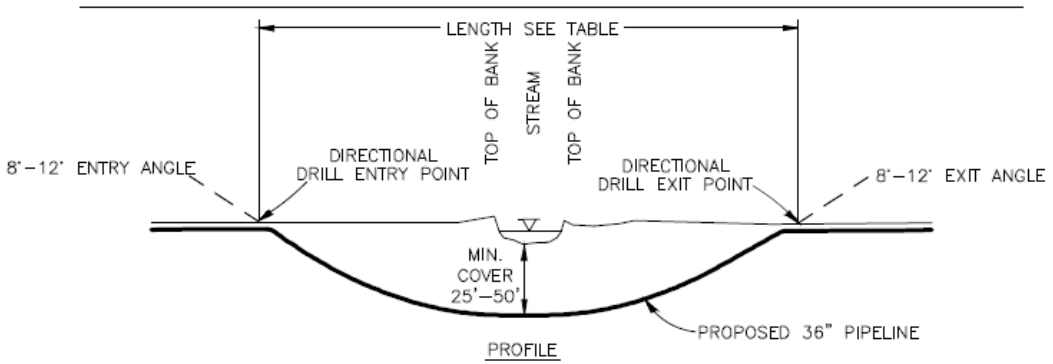
ISSUE: P3

1. INSTALL SEDIMENT CONTROLS BASED ON SITE SPECIFIC CONDITIONS.
2. LIMIT CLEARING BETWEEN ENTRANCE AND EXIT FOR HAND PLACEMENT OF HDD TRACKING WIRES.



SITE PLAN

N.T.S.



PROFILE

RIVER/CREEK	MP	LENGTH	RADIUS
1. KANAWHA	142.5	1800'	3600'

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

Columbia Gas Transmission

TRC

PL–MXP–100

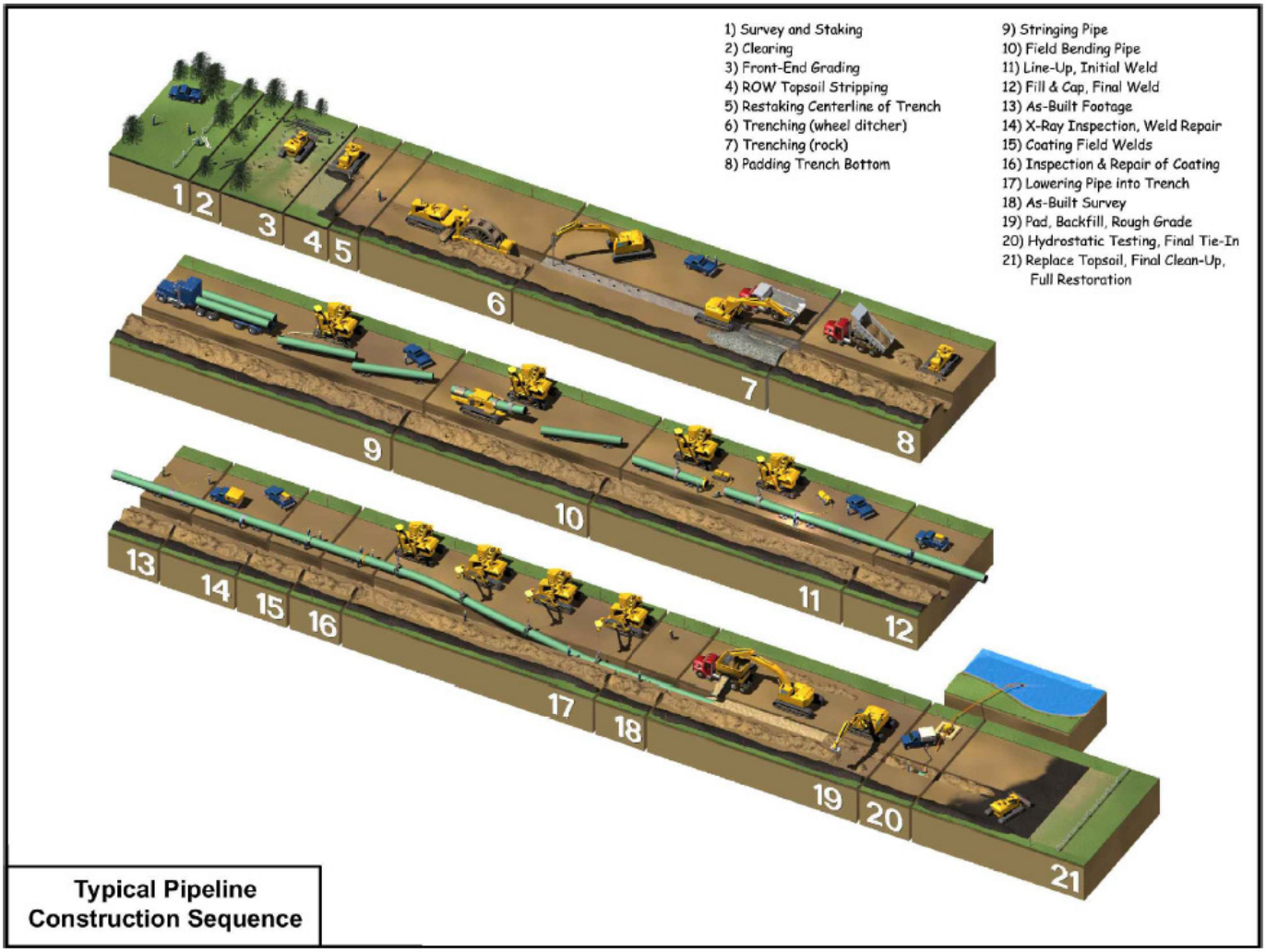
TYPICAL WORKSPACE LAYOUT FOR DIRECTIONAL DRILL

DRAWN BY	PM	DATE 07/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-16

ISSUE: P3



Typical Pipeline Construction Sequence

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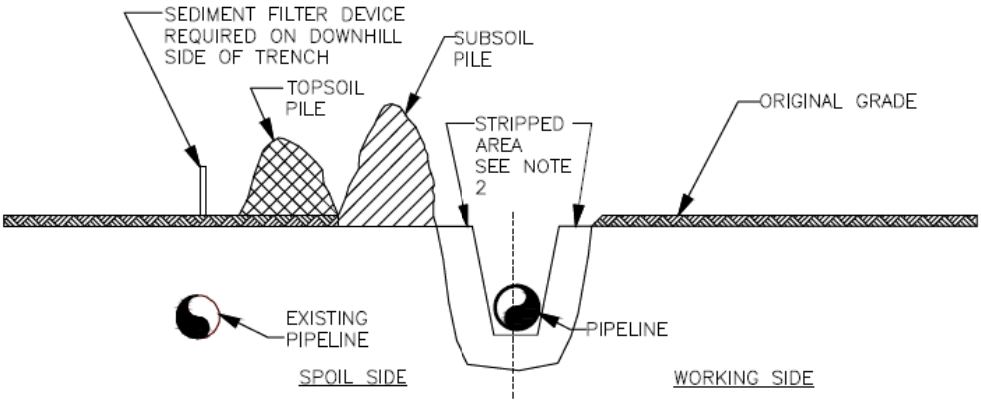
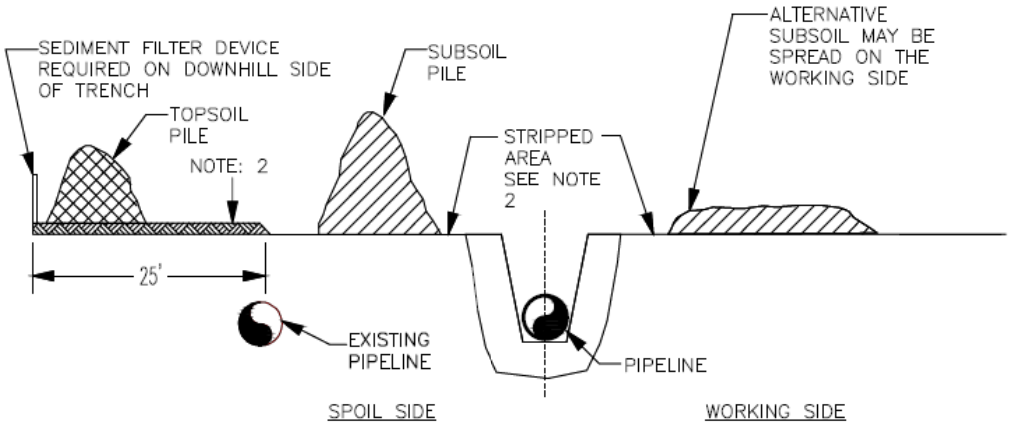
TYPICAL PIPELINE CONSTRUCTION SEQUENCE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

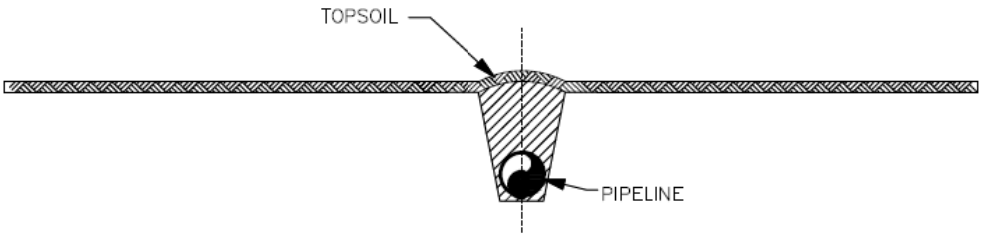
DRAWN BY	PM	DATE 07/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/21/2015	DRAWING NUMBER: A6987-TYP-17
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3



TRENCHLINE AND SPOIL SIDE METHOD



ENTIRE CONSTRUCTION ROW METHOD



REPLACED

NOTES:

1.) OTHER CONFIGURATIONS OF TOPSOIL AND SUBSOIL ARE ACCEPTABLE PROVIDED THEY ARE KEPT SEPARATE.

2.) UP TO 12 INCHES OF TOPSOIL REMOVED.

3.) TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED TO PREVENT EROSION AND SEDIMENTATION BY USE OF SEDIMENT FILTER DEVICES OR MULCH.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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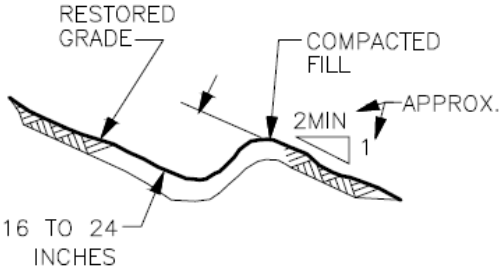
FIGURE NO. 5
TYPICAL TOPSOIL CONSERVATION RIGHT-OF-WAY

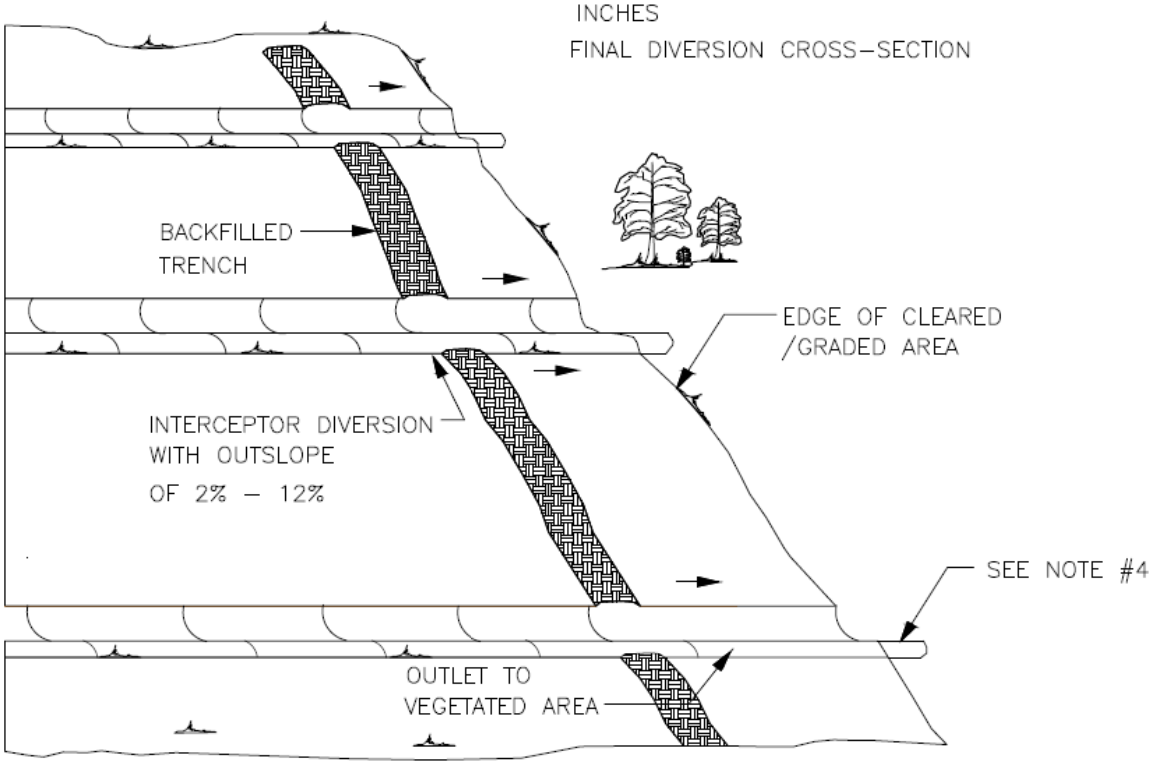
DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/21/2015	DRAWING NUMBER: A6987-TYP-18
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3

NOTE 1 SLOPE	SPACING	AREAS OF SPECIAL CONCERN
< 5%	NONE	
5–15%	300 FEET	
15–30%	200 FEET	100 FEET *
>30%	100 FEET	50 FEET *
INTERCEPTOR SPACING (MINIMUM REQUIRED)		

*AREAS OF LOW STRENGTH/LANDSLIDE PRONE SOILS, THE SPACING OF THE INTERCEPTOR DIVERSION SHALL BE ADJUSTED ACCORDINGLY.



FINAL DIVERSION CROSS–SECTION



NOTES:

1. SPACING USED FOR BOTH TEMPORARY AND FINAL INTERCEPTOR DIVERSIONS.
2. TEMPORARY INTERCEPTOR DIVERSIONS WILL BE MAINTAINED DURING THE CONSTRUCTION PHASE UNTIL FINAL INTERCEPTOR DIVERSIONS ARE INSTALLED.
3. IF EXISTING GROUND COVER IS SPARSE, SECURE SEDIMENT FILTER DEVICE IN OUTLET.
4. THE DIVERSION MAY BE EXTENDED UP TO 5 FEET OFF THE ROW, IF NECESSARY, TO PROVIDE AN ADEQUATE OUTLET.
5. DIVERSION OUTLETS WILL ALTERNATE FROM SIDE TO SIDE WHENEVER POSSIBLE.

NOT TO SCALE

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FIGURE NO. 6A
INTERCEPTOR DIVERSIONS/SLOPE BREAKERS

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-19
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3

INTERCEPTOR DIVERSIONS ARE THE MOST COMMON AND EFFECTIVE DEVICE USED FOR EROSION CONTROL ON CONSTRUCTION ROW. DURING CONSTRUCTION, TEMPORARY DIVERSIONS ARE INSTALLED TO CONTROL WATER ON THE GRADED ROW. DURING RESTORATION FINAL DIVERSIONS ARE INSTALLED TO PROTECT THE ROW FROM EROSION UNTIL THE VEGETATION RE-ESTABLISHES ON THE DISTURBED AREAS.

TEMPORARY DIVERSIONS ARE GENERALLY MADE BY BUILDING A CURB 8 TO 14 INCHES HIGH ACROSS THE ROW. THE CURBS ARE SHAPED TO ALLOW PASSAGE OF CONSTRUCTION EQUIPMENT AND INSPECTOR VEHICLES. THE DIVERSION SHOULD HAVE A GRADIENT OF 2% -12% AND MUST DRAIN EITHER INTO TRENCH OR OFF THE ROW. WHERE WATER IS DIRECTED OFF THE ROW, THE OUTLET WILL BE PROTECTED BY HEAVY VEGETATION. TEMPORARY DIVERSIONS MAY BE BROKEN DOWN BY CONSTRUCTION EQUIPMENT DURING THE WORKDAY, BUT WILL BE RESTORED BY END OF EACH DAY. TEMPORARY DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A. THE ACTUAL NUMBER OF TEMPORARY DIVERSIONS MAY VARY FROM THAT OF FINAL DIVERSIONS BECAUSE THE CONSTRUCTION ROW'S ARTIFICIAL GRADE MAY REDUCE THE SLOPE. POSITION THE OUTFALL OF EACH TEMPORARY SLOPE BREAKER TO PREVENT SEDIMENT DISCHARGE INTO WETLAND, WATERBODIES, OR OTHER SENSITIVE AREAS.

FINAL DIVERSIONS TYPICALLY CONSIST OF A CURB 16 TO 24 INCHES HIGH BELOW A SHALLOW SWALE. THE CURB IS CONSTRUCTED OF COMPACTED EARTH FILL WITH SIDESLOPES OF 2:1 OR FLATTER TO ALLOW PASSAGE OF MAINTENANCE EQUIPMENT. THE DIVERSIONS SHOULD EXTEND ACROSS THE ENTIRE ROW AND DRAIN WATER WITH A 2% TO 12% GRADIENT. THE OUTLETS OF FINAL DIVERSIONS MAY BE STABILIZED WITH SEDIMENT FILTER DEVICES. FINAL DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A (OR AS SHOWN ON THE ENVIRONMENTAL CONSTRUCTION DRAWINGS), AND WILL TIE INTO EXISTING DIVERSIONS WHERE PRESENT. IN PLACES WHERE FINAL GRADE CREATES SIDE SLOPES OR SLOPES WHICH BREAK IN MORE THEN ONE DIRECTION, DIVERSION INSTALLATION MAY NEED TO VARY TO CREATE AN OUTSLOPE OF 2% TO 12% WHICH WILL CARRY WATER OFF THE ROW.

ALTERNATIVE DIVERSION CONSTRUCTION MAY BE USED IN AREAS WHERE AN EARTHEN DIVERSION IS IMPRACTICAL

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FIGURE NO. 6B
INTERCEPTOR DIVERSIONS

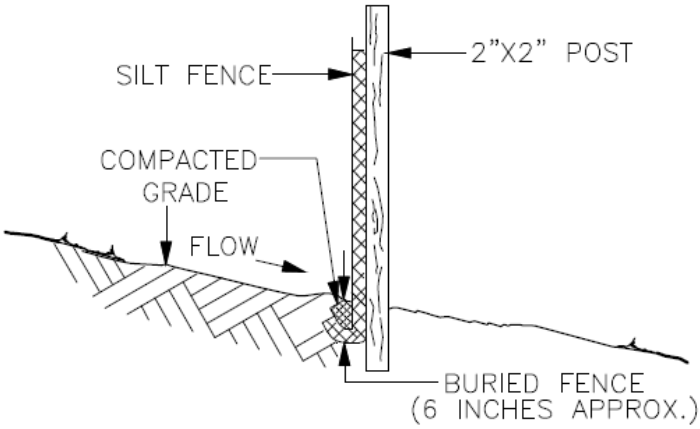
NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

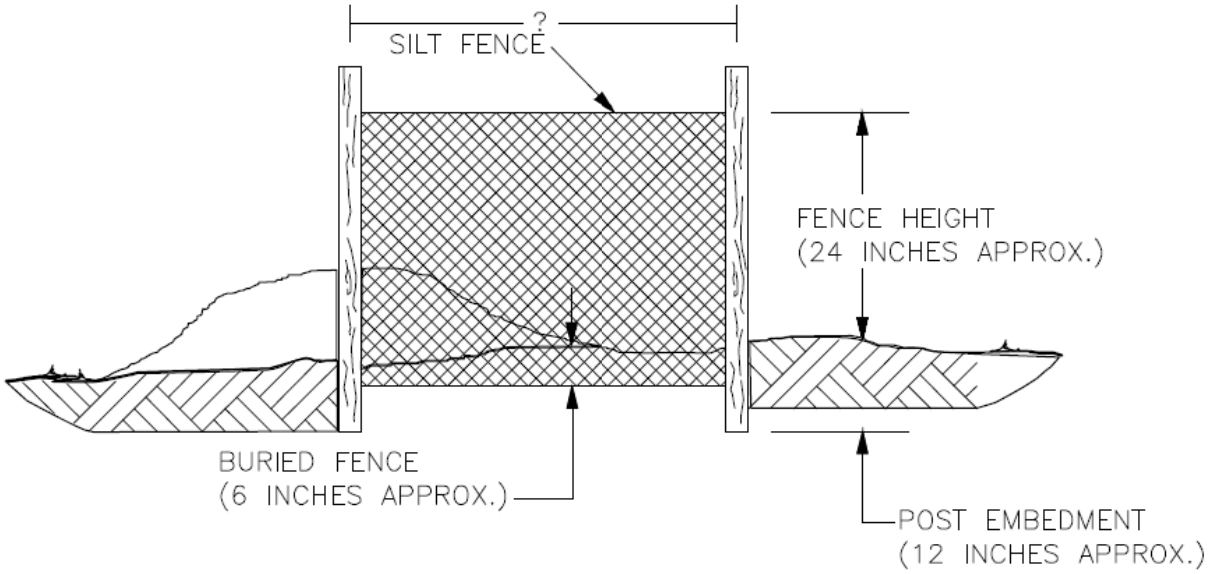
SCALE: NTS

DRAWING NUMBER: A6987-TYP-20

ISSUE: P3



SIDE VIEW



FRONT VIEW

NOTE: SILT FENCE CAN ALSO BE INSTALLED (USING THE SAME SPECIFICATIONS AS PRESENTED ABOVE) IN OTHER SITUATIONS FOR EROSION AND SEDIMENTATION CONTROL.

NOT TO SCALE

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FIGURE NO. 7A
SEDIMENT FILTER DEVICE SILT FENCING

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-21
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3

TABLE 4.3 FABRIC PROPERTIES FOR SILT FENCE

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D 1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D 1682
MULLEN BURST STRENGTH (PSI)	200	ASTM D 3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	
PUNCTURE STRENGTH (LB)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ATSM G-26

TABLE 4.4
Maximum Slope Length for Silt Fence

Slope - Percent	Maximum Slope Length (ft) Above Fence		
	Standard (18" High) Silt Fence	Reinforced (30" High) Silt Fence	Super Silt Fence
2 (or less)	150	500	1000
5	100	250	550
10	50	150	325
15	35	100	215
20	25	70	175
25	20	55	135
30	15	45	100
35	15	40	85
40	15	35	75
45	10	30	60
50	10	25	50

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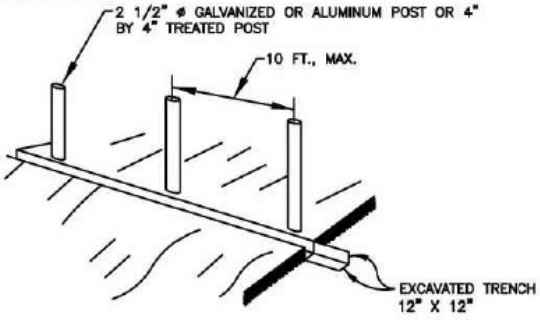
SILT FENCE SPECIFICATIONS
TABLE 4.3, TABLE 4.4

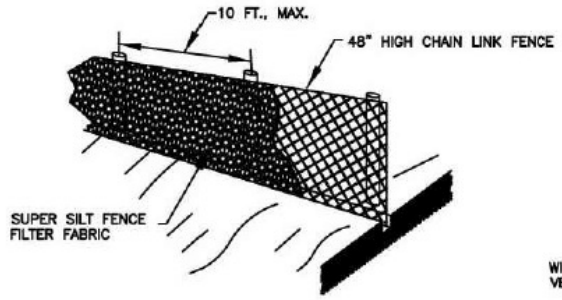
NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-22
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3

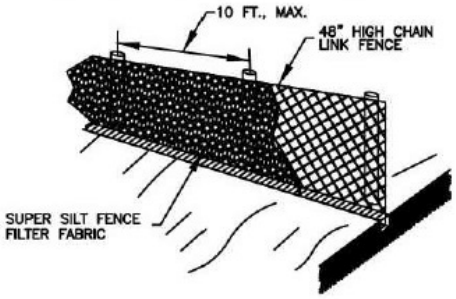
1. SET POSTS ALONG CONTOUR OF THE LAND AND EXCAVATE TRENCH UPSLOPE ALONG THE LINE OF POSTS.

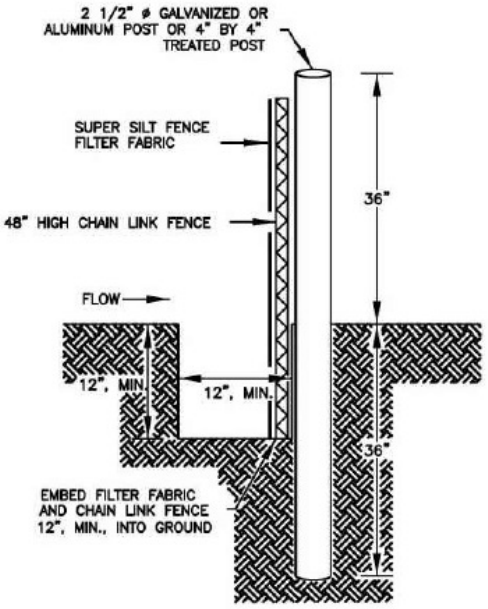


2. ATTACH THE CHAIN LINK FENCE AND FILTER FABRIC TO THE FENCE POSTS AND EXTEND THEM 12", MIN., INTO THE DITCH.

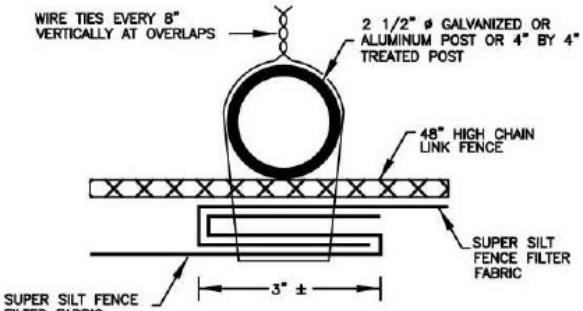


3. BACKFILL AND COMPACT THE TRENCH WITH EXCAVATED SOILS.





SIDE VIEW
NOT TO SCALE



END LAP TOP VIEW
NOT TO SCALE

SUPER SILT FENCE NOTES:

1. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 608 OF THE WVDOH SPECIFICATIONS. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE POSTS WITH WIRE TIES OR STAPLES.
2. POSTS NEED NOT BE SET IN CONCRETE.
3. THE FILTER FABRIC SHALL BE FASTENED TO THE CHAIN LINK FENCE WITH TIES EVERY 24" AT THE TOP AND MID SECTION.
4. FABRIC AND FENCE SHALL BE EMBEDDED 12", MINIMUM, INTO THE GROUND.
5. A 6", MINIMUM, OVERLAP SHALL BE PROVIDED WHERE TWO SECTIONS OF FABRIC ADJOIN. THE OVERLAPPED FABRIC SHALL BE FOLDED TOGETHER AND ATTACHED TO THE CHAIN LINK FENCE.
6. 4" BY 4" PRESSURE TREATED POSTS MAY BE SUBSTITUTED FOR METAL FENCE POSTS WITH THE APPROVAL OF THE ENGINEER.
7. THE LENGTH OF SLOPE ABOVE THE FENCE SHALL NOT EXCEED 400 FEET IN STEEP TERRAIN. IN FLATTER AREAS THE LENGTH CAN BE EXTENDED WITH THE APPROVAL OF THE ENGINEER.

NOT TO SCALE

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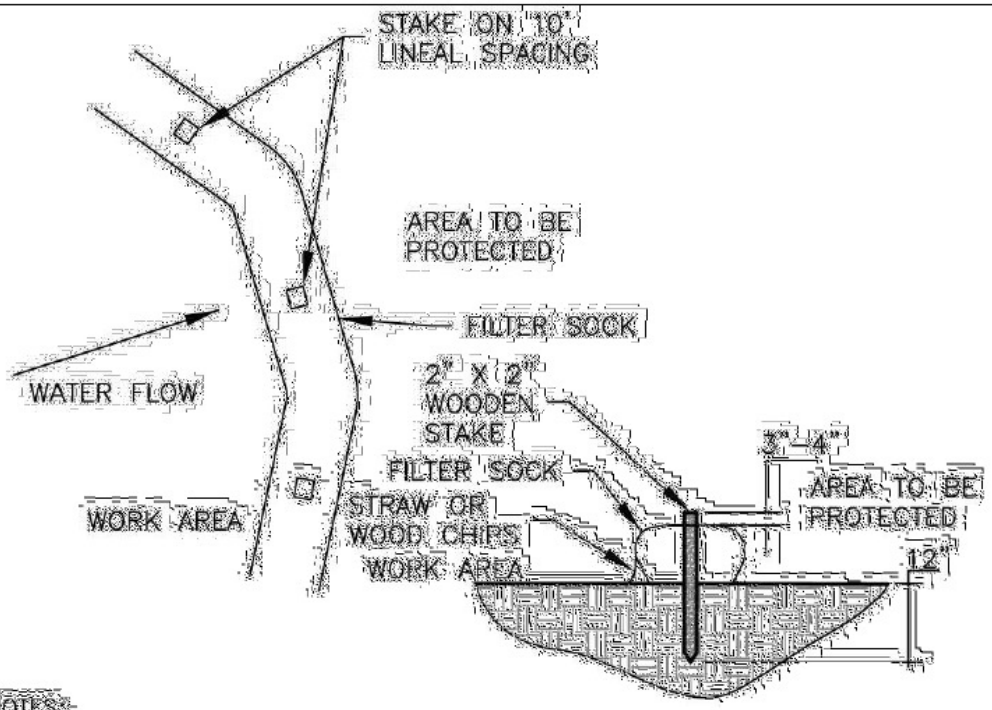
FIGURE NO. 7B SEDIMENT FILTER DEVICE SUPER SILT FENCE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-23
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.
2. 8", 12", 18" AND 24" COMPOST FILTER SOCK TO BE USED. SEE PLAN SHEET FOR SIZES AND LOCATIONS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE COMPOST FILTER SOCK.
4. COMPOST FILTER SOCK SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED COMPOST FILTER SOCK SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

FILTER SOCK SIZING CHART

SLOPE PERCENT	8 IN (200 mm) SiltSoxx™ 6.5 IN (160 mm)**	12 IN (300 mm) SiltSoxx™ 9.5 IN (240 mm)**	18 IN (450 mm) SiltSoxx™ 14.5 IN (360 mm)**	24 IN (600 mm) SiltSoxx™ 19 IN (480 mm)**	32 IN (800 mm) SiltSoxx™ 26 IN (650 mm)**
2 (OR LESS)	600 (180)	750 (225)	1000 (300)	1300 (400)	1850 (900)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (120)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	280 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	95 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	50 (17)	65 (20)	75 (23)

* BASED ON FAILURE POINT OF 36 IN (0.8 m) SUPER SILT FENCE (WIRE REINFORCED) AT 1000 FT. (305 m) OF SLOPE, WATERSHED WIDTH EQUIVALENT TO RECEIVING LENGTH OF SEDIMENT CONTROL DEVICE, 1 IN/24 hr (25 mm/24 hr) RAIN EVENT.

** EFFECTIVE HEIGHT OF SiltSoxx™ AFTER INSTALLATION AND WITH CONSTANT HEAD FROM RUNOFF AS DETERMINED BY OHIO STATE UNIVERSITY.

NTS

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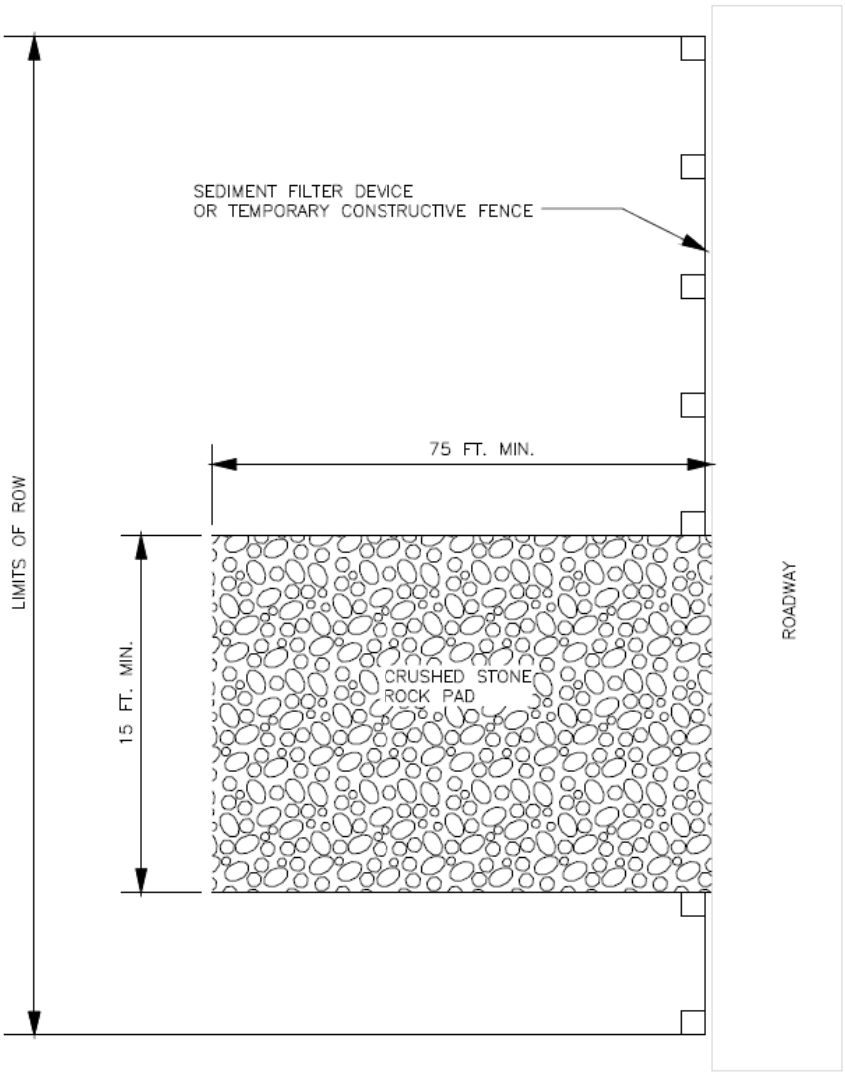
FIGURE NO. 25
TYPICAL COMPOST FILTER SOCK

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-24
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:
1. CRUSHED STONE SIZE WILL BE WASHED NUMBER 1 COARSE AGGREGATE OR EQUIV. (4 INCH DIAMETER MINIMUM.)
2. ROCK PAD WILL BE AT LEAST 6 INCHES THICK.
3. THE ROAD ENTRANCE WILL HAVE A GEOTEXTILE FABRIC BENEATH THE ROCK PAD.
4. IF ROCK PAD BECOMES COVERED WITH MUD SO AS TO BECOME INEFFECTIVE, ADDITIONAL STONE WILL BE ADDED.
5. ALL STONE AND FABRIC MUST BE REMOVED DURING ROW RESTORATION.
6. THE ROCK PAD MAY BE ENLARGED TO INCLUDE A TURNING RADIUS.
7. INSTALL CULVERT AT ROADWAYS IN ACCORDANCE WITH PERMIT CONDITIONS.

NOT TO SCALE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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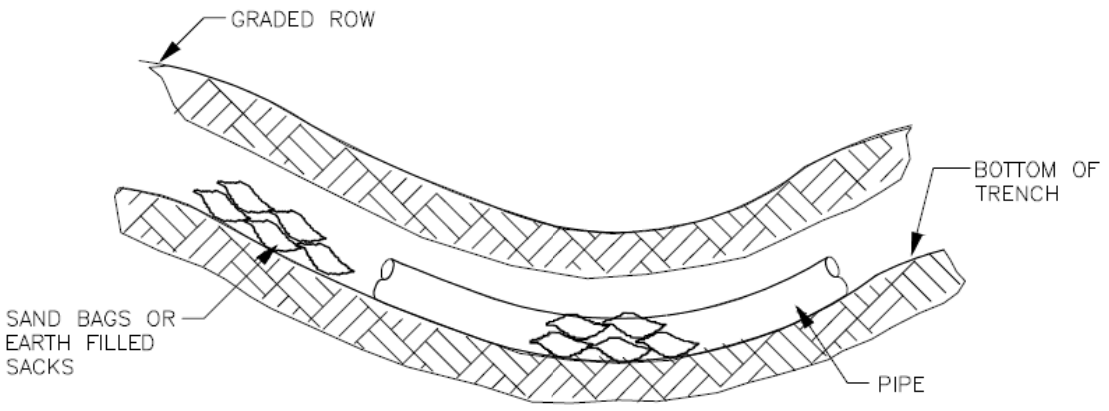
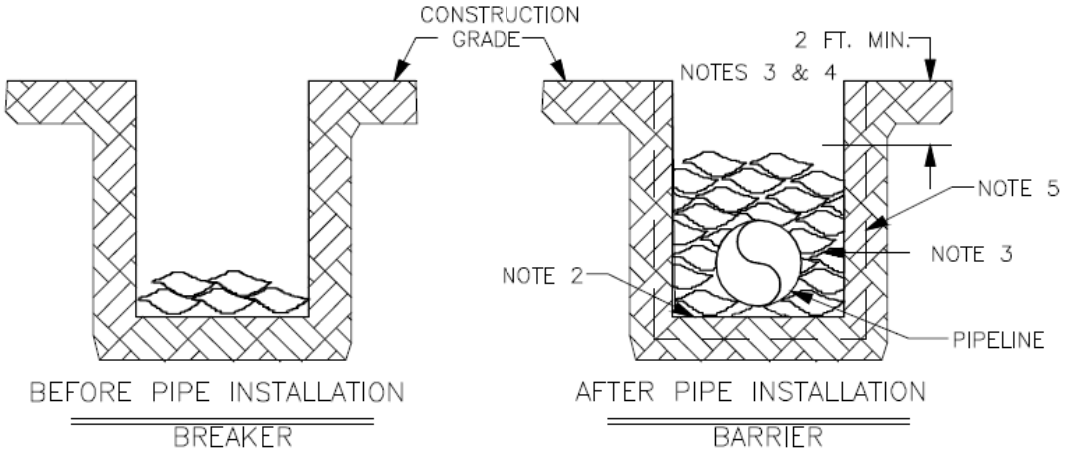
FIGURE NO. 8
TEMPORARY ROAD ENTRANCE ROCK PADS

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-25
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



SIDE VIEW



FRONT VIEW

NOTES:
1. INSTALL AT EVERY SECOND INTERCEPTOR DIVERSION PROMPTLY AS TRENCH IS COMPLETED.(SEE FIGURE 6A)
2. PRIOR TO LOWERING IN, REMOVE ALL DECOMPOSED MATERIAL AND ROCKS.
3. INSTALL SACKS TO TOP OF TRENCH ON STEEP GRADES THAT ARE NOT USED FOR FARMING.
4. TOP OF TRENCHLINE BARRIER WILL BE BELOW PLOW DEPTH IN AGRICULTURAL LAND.
5. SANDBAGS WILL BE KEYED INTO SIDE OF DITCH.

NOT TO SCALE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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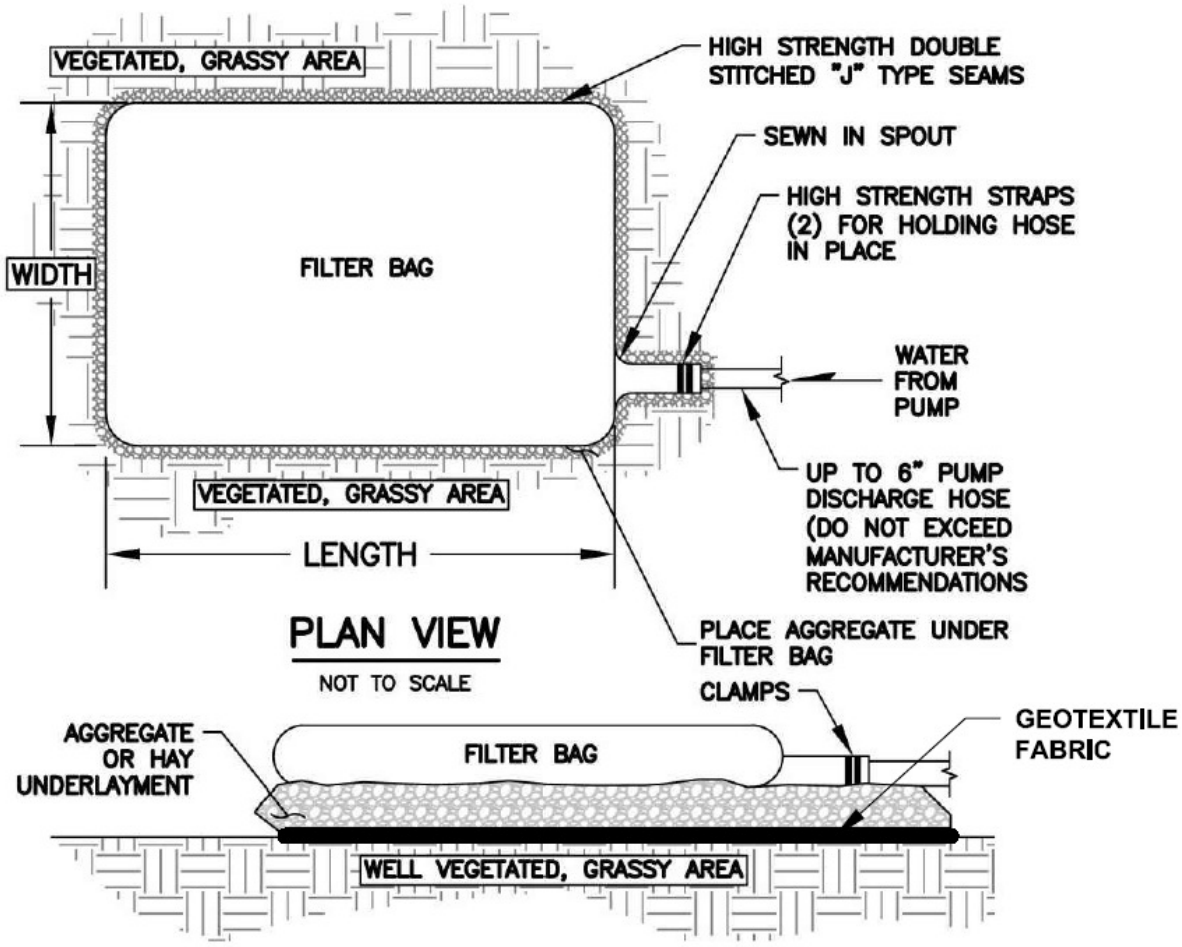
FIGURE NO. 10
TRENCHLINE BARRIERS AND BREAKERS

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-26

ISSUE: P3



PLAN VIEW

NOT TO SCALE

SIDE ELEVATION

NOT TO SCALE

NOTES:

1. 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.
2. BAGS MUST BE PLACED WITHIN THE PERMITTED AREA IF ACCESSING THE BAG WITH MACHINERY IS REQUIRED FOR DISPOSAL PURPOSES. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED.
3. BAGS SHOULD BE LOCATED IN WELL-VEGETATED (GRASSY) AREAS, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH CAN BE PROVIDED OR ALLOW DISCHARGE FROM BAG TO FLOW THROUGH A SERIES OF SEDIMENT LOGS ETC.... BAGS CAN BE USED INSIDE SEDIMENT TRAPS.
4. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. DO NOT ALTER OR CUT BAGS.
6. AGGREGATE OR HAY SHALL BE PLACED UNDERNEATH FILTER BAGS.
7. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, HAY BALE OR APPROVED EQUIVALENT) SHALL BE PLACED WHERE WARRANTED OR AS DETERMINED BY THE EI.

NOT TO SCALE

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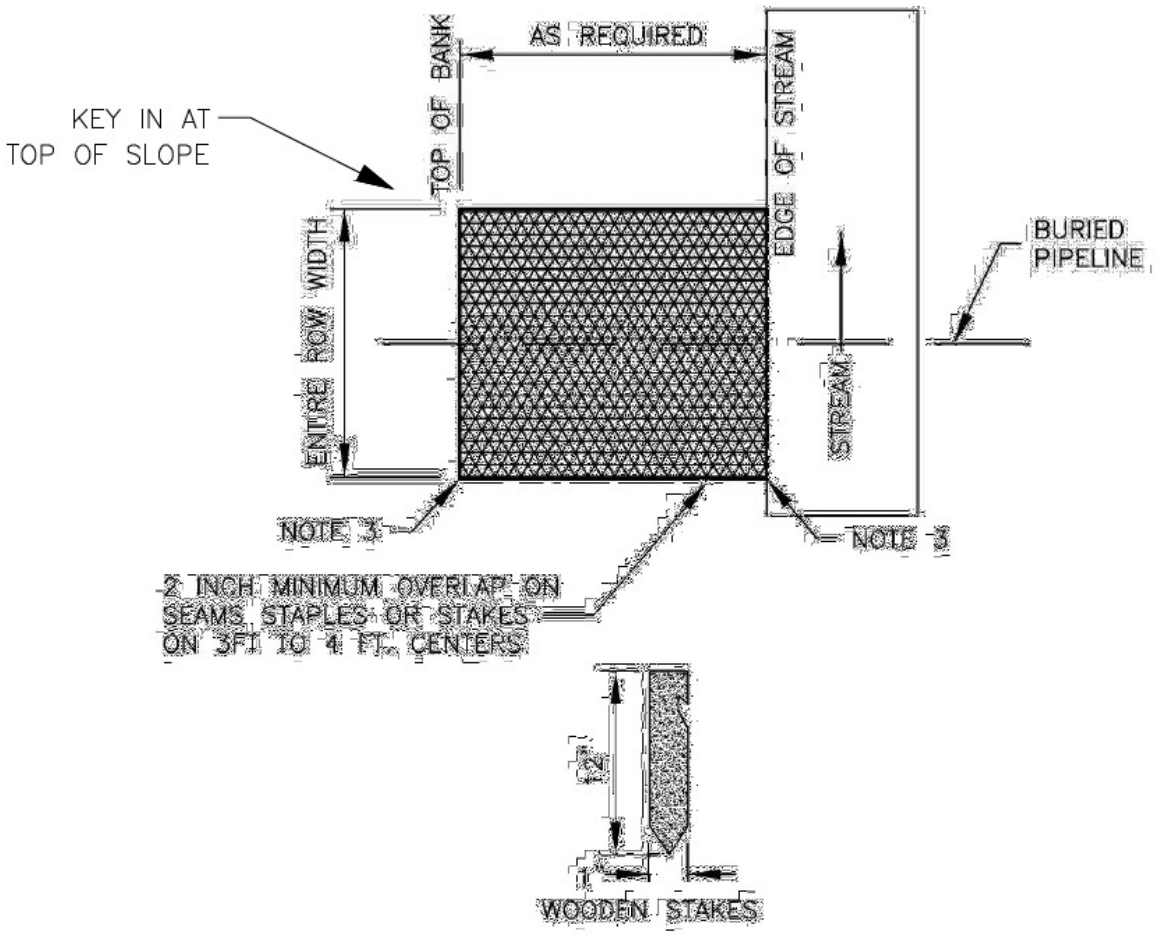
FIGURE NO. 29
TYPICAL WATER FILTER BAG

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-27
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. INSTALL JUTE NETTING DURING RESTORATION.
2. SEED AND MULCH AREA TO BE JUTE NETTED.
3. TRENCH IN AND BURY UPHILL AND UPSTREAM EDGE OF JUTE NETTING.
4. AN INTERCEPTOR DIVERSION WILL BE INSTALLED IMMEDIATELY ABOVE JUTE NETTING ON SLOPED BANKS.
5. ON SHORT BANKS (LESS THAN 10'), JUTE NETTING CAN BE PERPENDICULAR TO BANK SLOPE.
6. INSTALL ON STEEP SLOPES OR ON THE BANKS OF FLOWING STREAMS, OR IN UPLAND AREAS.

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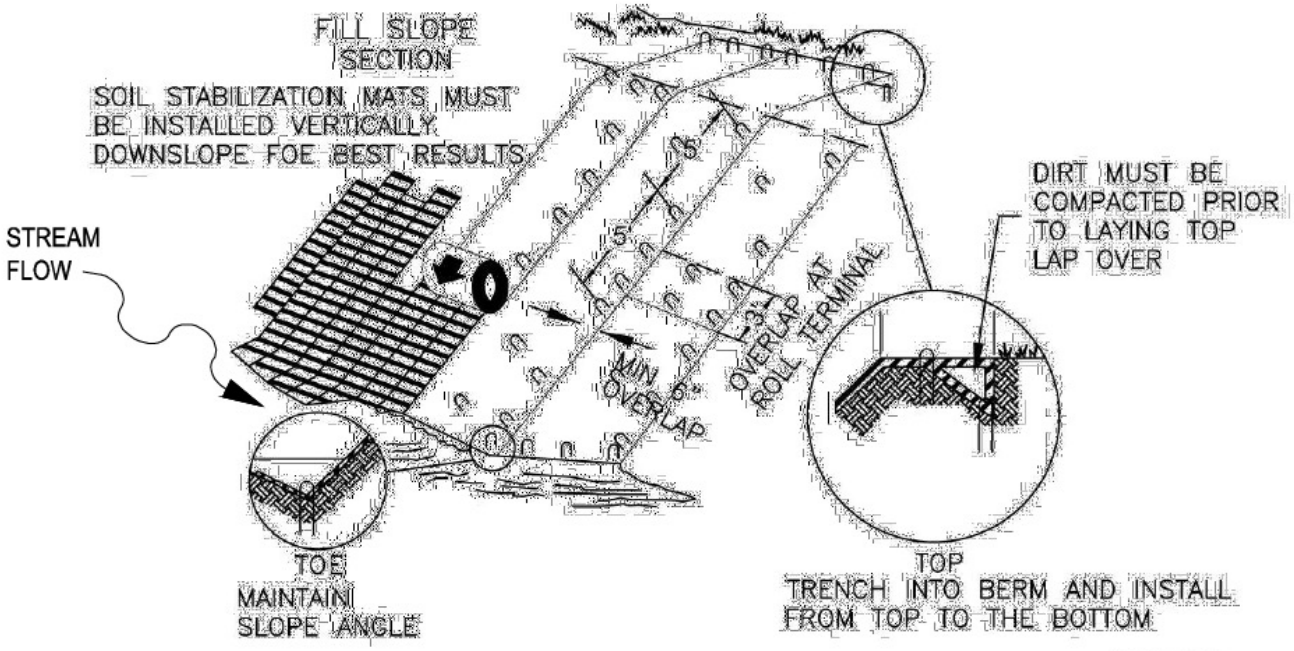
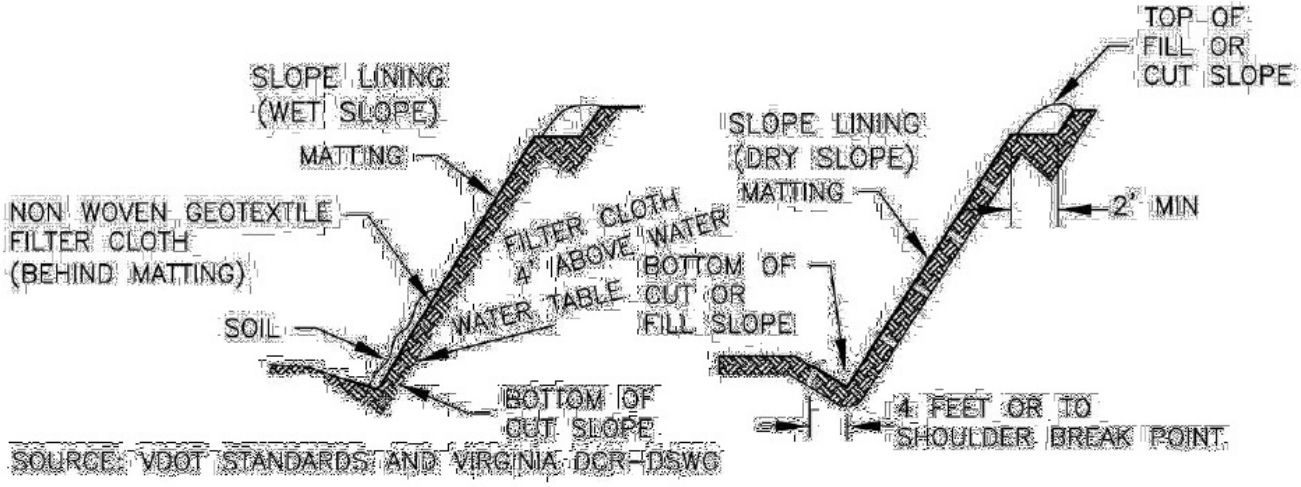
FIGURE NO. 12A
EROSION CONTROL BLANKET

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	0725/2015	DRAWING NUMBER: A6987-TYP-28
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3





SOURCE: VDOT STANDARDS AND VIRGINIA DCR-DSWC

NOTE:
SLOPE SURFACE MUST BE SMOOTH AND FREE OF ROCKS, LUMPS, GRASS, AND STICKS. MAT MUST BE PLACED FLAT ON SURFACE FOR PROPER SOIL CONTACT.

NOT TO SCALE

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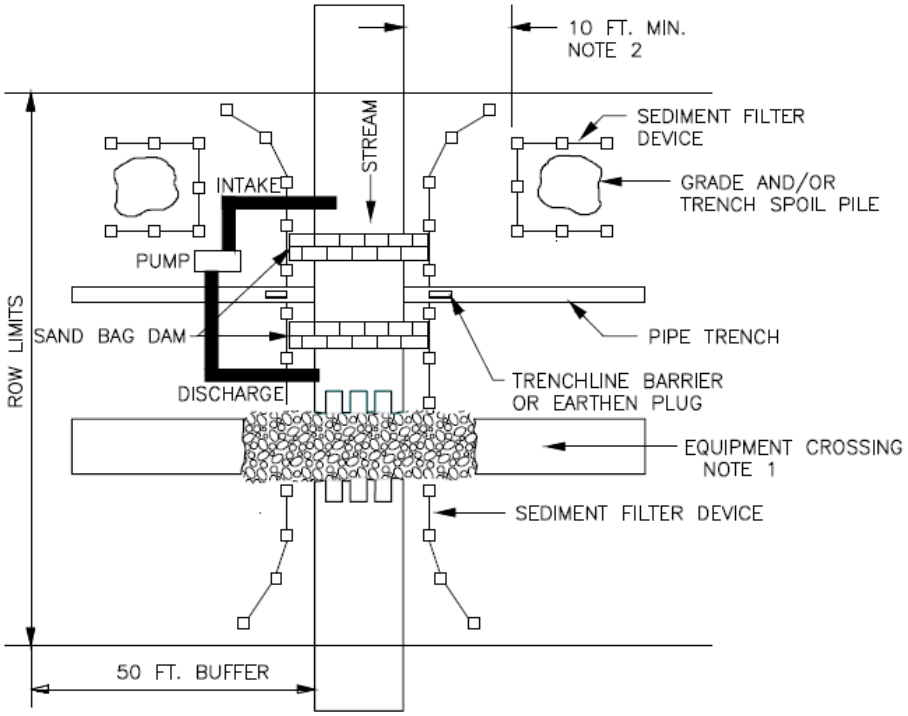
FIGURE NO. 12B
ROLLED EROSION CONTROL PRODUCTS

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-29
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:
1. EQUIPMENT CROSSINGS ARE TO BE INSTALLED AS ILLUSTRATED IN FIGURES 17 OR 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATERS' EDGE OR TOP OF BANK, TOPOGRAPHY PERMITTING
3. PUMP INTAKES WILL BE SCREENED, PREVENT STREAMBED SCOUR AT DISCHARGE
4. SUFFICIENT PUMP CAPACITY WILL BE USED TO MAINTAIN STREAM FLOW AT ALL TIMES UNTIL BACKFILL AND REMOVAL OF SANDBAG DAM.
5. BACKUP PUMPS (AS SAME NUMBER AND CAPACITY AS ACTIVE PUMPS) WILL BE READILY AVAILABLE IN WORKING CONDITION ON SITE AT CROSSING.
6. CONSTRUCT DAMS WITH MATERIAL THAT PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE WATERBODY.
7. MONITOR THE DAM AND PUMPS TO ENSURE PROPER OPERATIONS THROUGHOUT THE WATERBODY CROSSING.
8. SECONDARY CONTAINMENT FOR PUMP.
9. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.

NOT TO SCALE

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PL-MXP-100 & PL-MXP-200

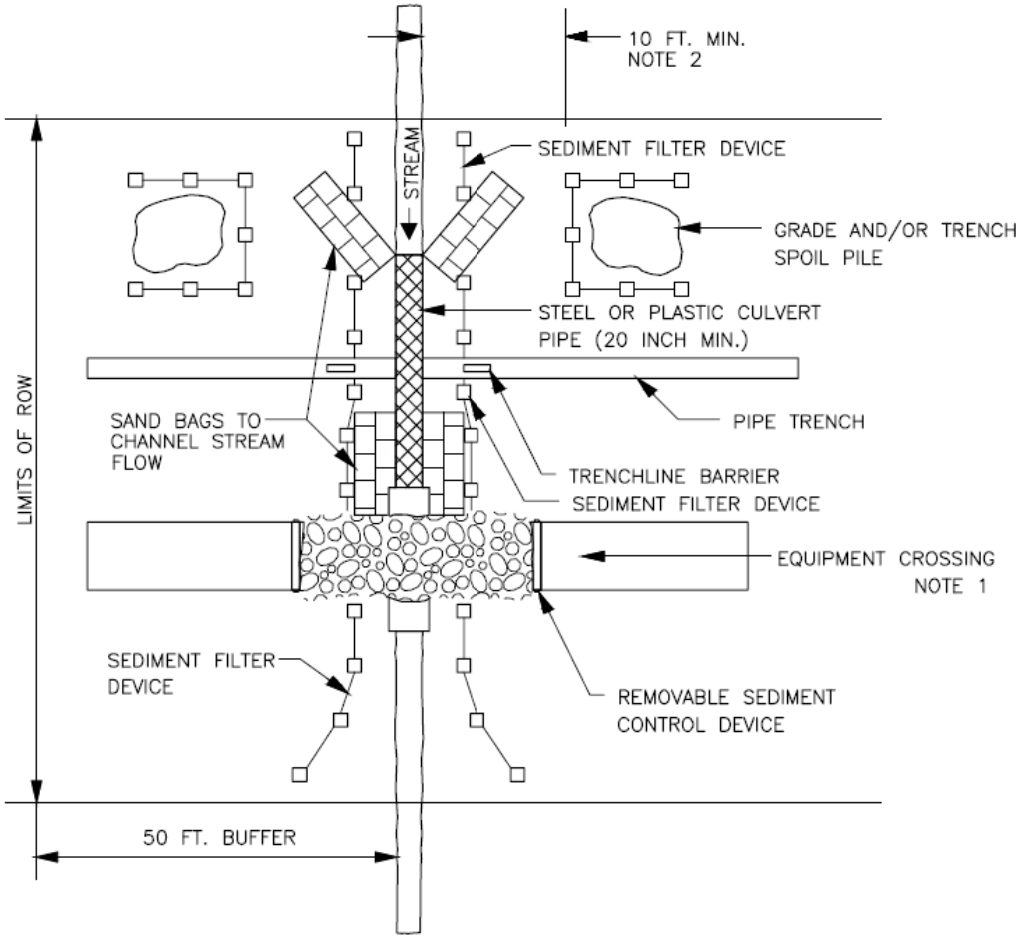
FIGURE NO. 15
TYPICAL STREAM CROSSING DAM AND PUMP

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-30 | ISSUE: P3



NOTES:
1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 & 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE.
3. INSTALL FLUME PIPE AFTER BLASTING (IF NECESSARY), BUT BEFORE TRENCHING.
4. PROPERLY ALIGN FLUME PIPE(S) TO PREVENT BANK EROSION OR STREAM BED SCOUR.
5. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.

NOT TO SCALE

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PL-MXP-100 & PL-MXP-200

FIGURE NO. 14
TYPICAL STREAM CROSSING DRY DITCH

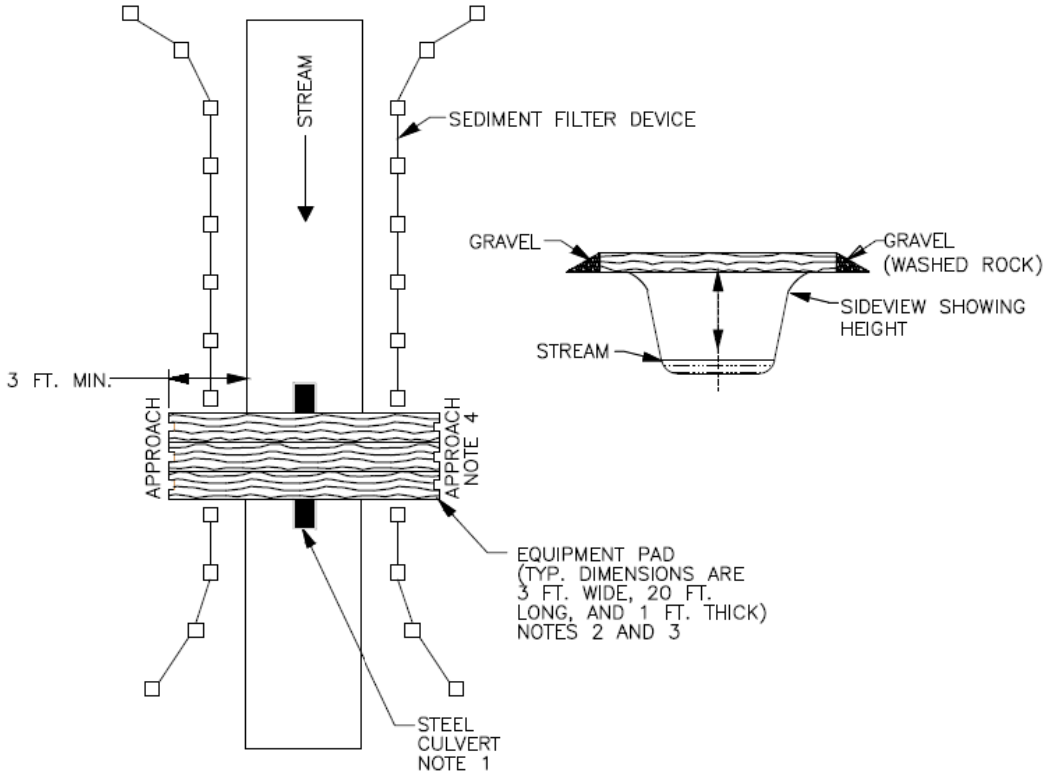
NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-31

ISSUE: P3



NOTES:

1. CULVERT PIPE UTILIZED IF ADDITIONAL SUPPORT IS REQUIRED.
2. ADDITIONAL PADS CAN BE PUT SIDE BY SIDE IF EXTRA WIDTH IS REQUIRED.
3. EQUIPMENT PAD TYPICALLY CONSTRUCTED OF HARD–WOOD; MUST ACCOMMODATE THE LARGEST EQUIPMENT USED.
4. RAMP APPROACHES CAN EITHER BE GRADED OR DUG INTO GROUND. IF NECESSARY, WASHED, CRUSHED STONE WILL BE USED TO RAMP UP TO THE EQUIPMENT PADS.
5. MINIMUM CULVERT DIAMETER 20 INCHES.
6. MAINTAIN PADS SO AS NOT TO ALLOW MUD TO ENTER THE STREAM.
7. EQUIPMENT CANNOT INTERFERE WITH STREAM FLOW.

NOT TO SCALE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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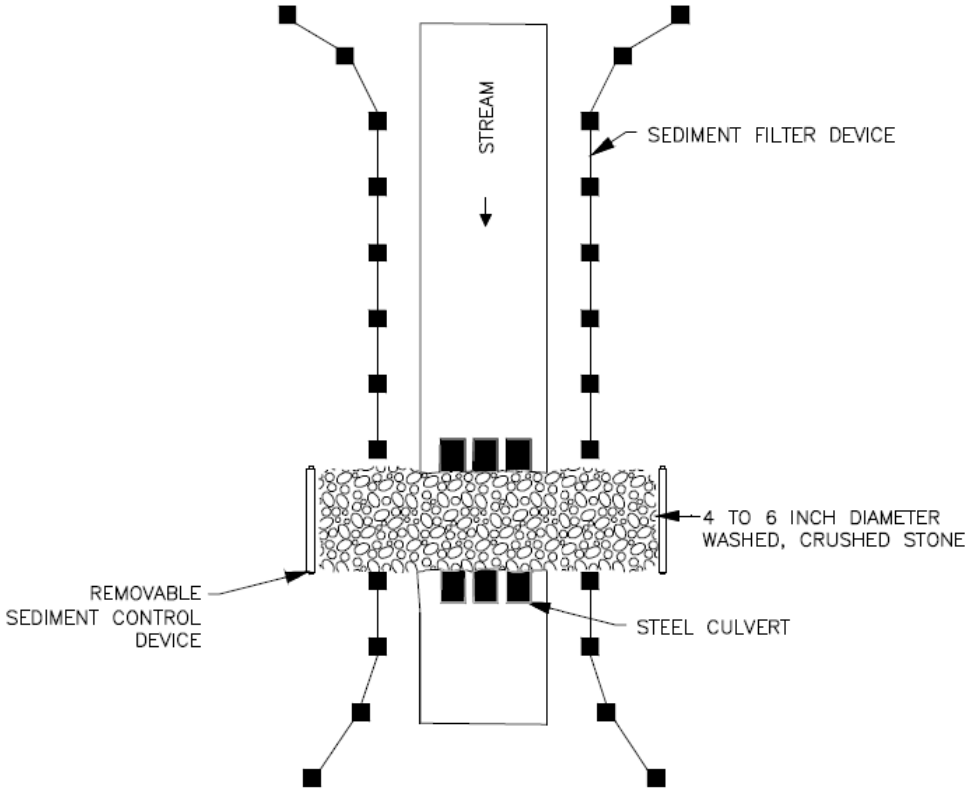
FIGURE NO. 18
TEMP. EQUIPMENT CROSSING W/ EQUIPMENT PADS

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-32
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:
1. MINIMUM CONTOURING OF THE BOTTOM NECESSARY TO LAY THE CULVERTS LEVEL MAY BE DONE.
2. USE AS MANY CULVERTS AS REQUIRED TO SPAN ENTIRE STREAM BED. (CULVERTS SHALL BE PLACED SIDE BY SIDE.)
3. MINIMUM CULVERT DIAMETER 20 INCHES.
4. MAINTAIN ROCK SO AS NOT TO ALLOW MUD TO ENTER THE STREAM.
5. ALIGN CULVERTS TO PREVENT BANK EROSION.

NOT TO SCALE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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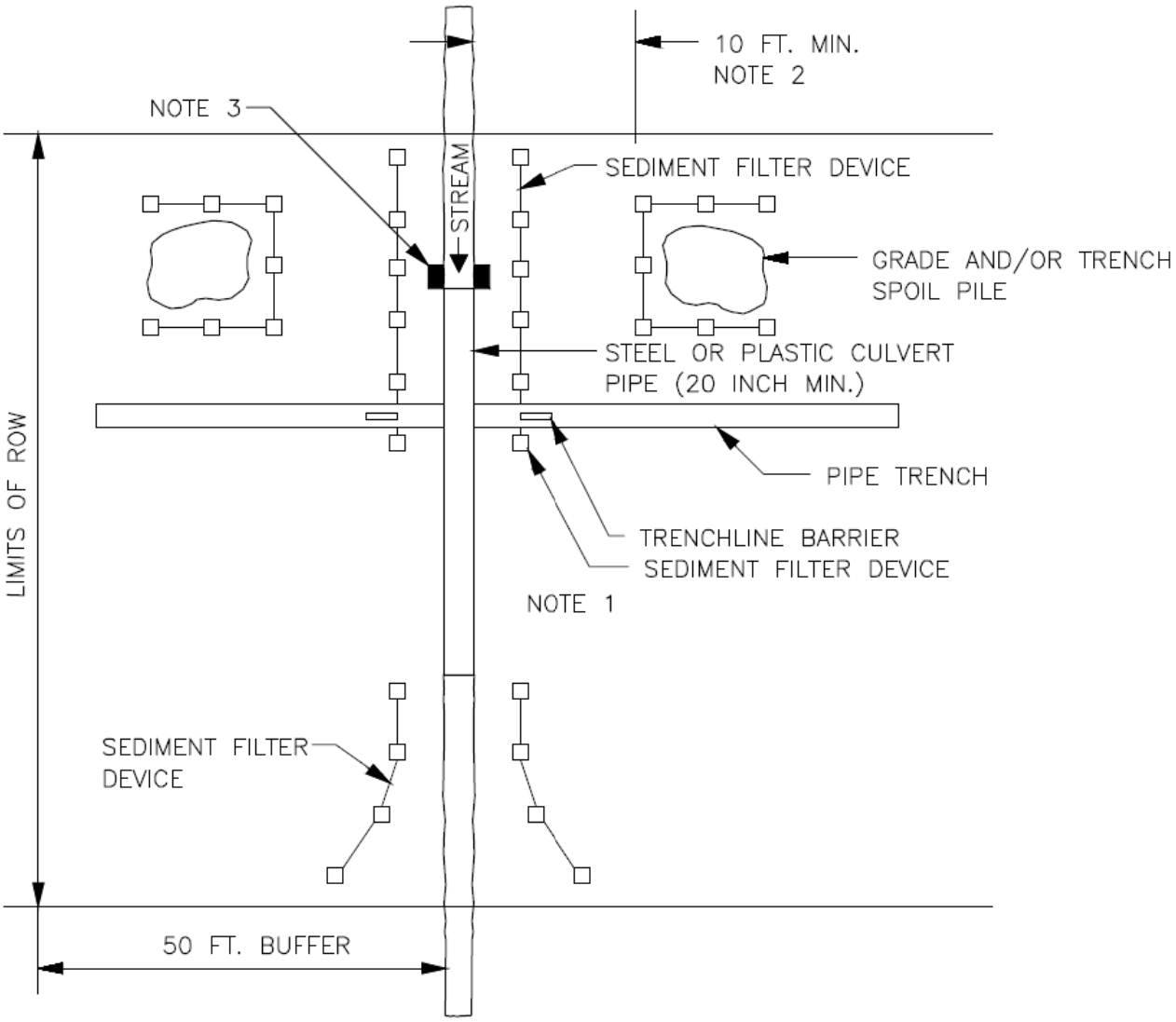
FIGURE NO. 17 TEMPORARY EQUIPMENT CROSSING W/ CULVERT AND STONE

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-33

ISSUE: P3



NOTES:

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 & 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATERS EDGE, TOPOGRAPHY PERMITTING.
3. SAND BAGS OR GRAVEL FILLED SACKS WILL BE PLACED AT UPSTREAM END OF CULVERT TO CHANNEL FLOW.

NOT TO SCALE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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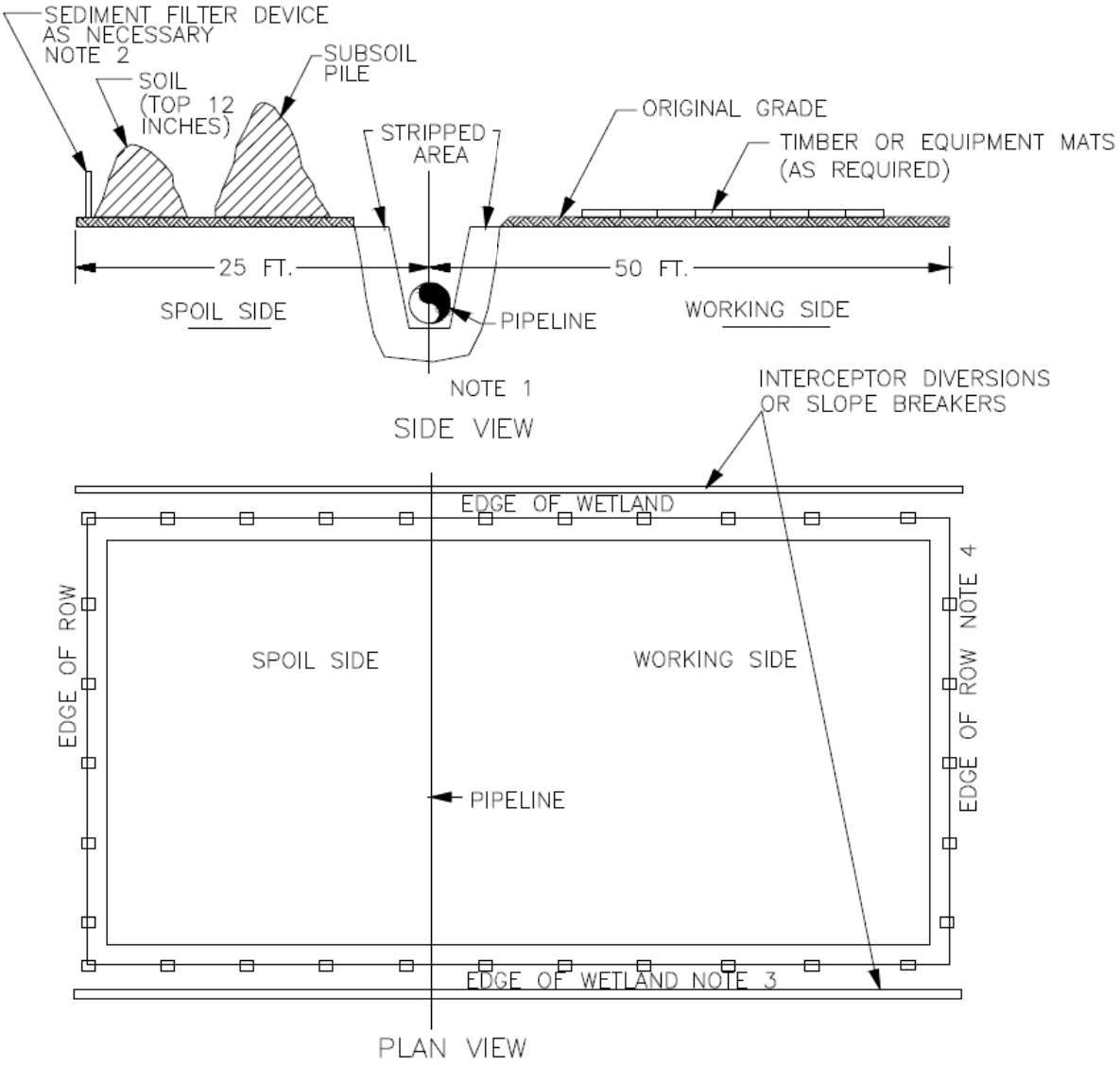
PL-MXP-100 & PL-MXP-200

FIGURE NO. 13 TYPICAL STREAM CROSSING INTERMITTENT STREAM

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-34
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. FOR WETLAND CROSSINGS WITHOUT STANDING WATER OR SATURATED SOILS, UPLAND CONSTRUCTION TECHNIQUES CAN BE USED. IF STANDING WATER OR SATURATED SOILS BECOME PRESENT DURING CONSTRUCTION ACTIVITIES IN WETLANDS THAT WERE INITIALLY DRY, OPERATE PER REQUIRERMENTS IN SECTION III.B.2 OF THIS ECS (SEE NOTE 2).
2. WETLANDS WITH STANDING WATER, SATURATED OR FROZEN SOIL, OPERATE EQUIPMENT PER REQUIREMENTS IN SECTION III.B.2. (ECS)
3. IN WETLAND AREAS WHICH CONTAIN NO STANDING WATER OR IF SOILS ARE SATURATED OR FROZEN, TOPSOIL (TOP 12 INCHES) AND SUBSOIL WILL BE STOCKPILED SEPARATELY WITHIN THE WETLAND CONSTRUCTION ROW.
4. A SEDIMENT FILTER DEVICE WILL BE PLACED ACROSS THE ROW AT THE WETLAND'S EDGE, IMMEDIATELY UPSLOPE OF THE WETLAND BOUNDARY.
5. A SEDIMENT FILTER DEVICE WILL BE PLACED AT THE EDGE OF THE ROW AND AROUND SOIL AND SUBSOIL PILES AS NECESSARY.

NOT TO SCALE

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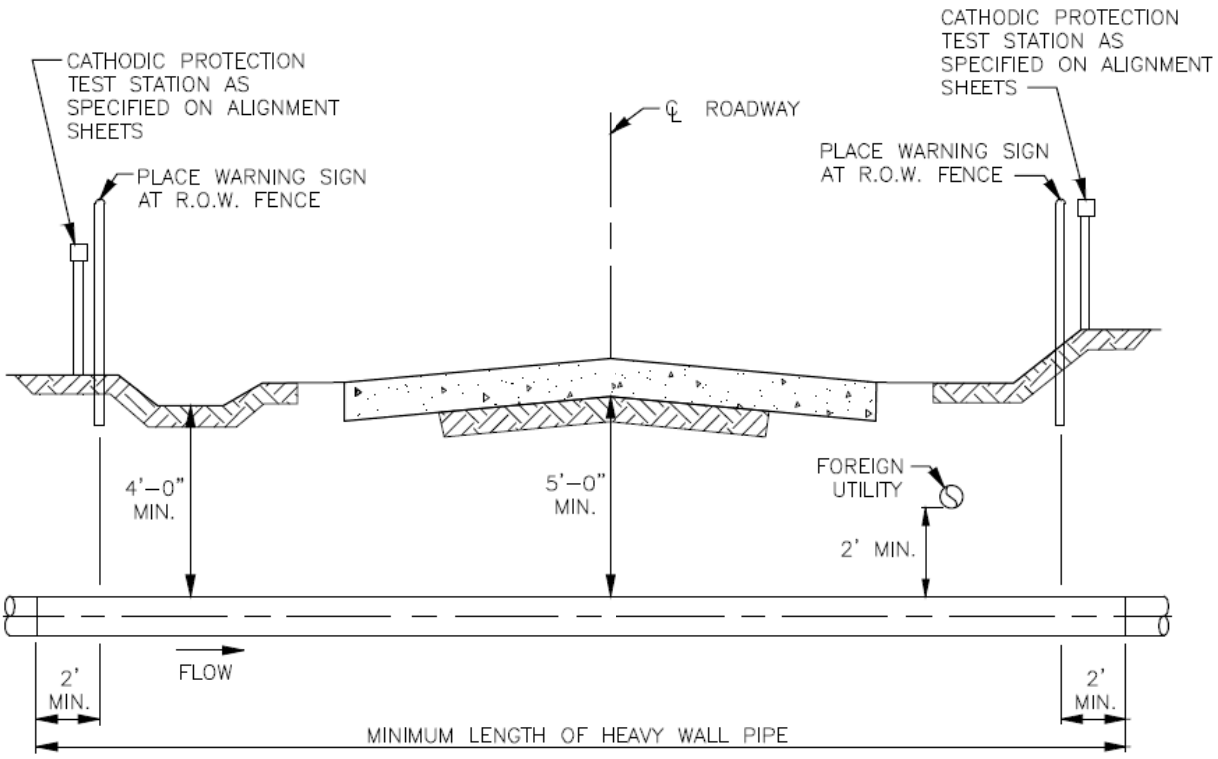
FIGURE NO. 19
TYPICAL WETLAND CROSSING

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-35
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. CONTRACTOR SHALL INSTALL THE HEAVY WALL STEEL PIPE, BACKFILL AND REPLACE ROAD SURFACE IN ACCORDANCE WITH PERMIT ISSUED BY THE GOVERNMENT BODY HAVING JURISDICTION AND/OR IN ACCORDANCE WITH THE SPECIFICATIONS, WHICHEVER IS THE MOST STRINGENT.

2. THE PIPELINE SHALL CROSS AS NEAR TO RIGHT ANGLE AS POSSIBLE AND ECONOMICALLY PRACTICAL.

3. THE HEAVY WALL STEEL PIPE SHALL BE INSTALLED TO EXTEND A MINIMUM OF 2 FEET BEYOND THE R.O.W. LIMITS ON EACH SIDE OF ROAD.

4. THE HEAVY WALL STEEL PIPE WITHIN THE RIGHT–OF–WAY LIMITS SHALL BE FULLY EXTENDED DURING INSTALLATION.

5. ANY OPEN CUT TRENCH SHALL BE IN ACCORDANCE WITH STATE OR COUNTY SPECIFICATIONS AS DEFINED IN THE SPECIFICATION AND STANDARD. THE TRENCH SHALL BE BACKFILLED IN 8" LIFTS AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE PROCTOR COMPACTION TEST (ASTM D698).

6. AS AN ALTERNATE, AND WHEN APPROVED BY ENGINEER, CONCRETE SLURRY (200 PSI CONCRETE) MAY BE USED AS BACKFILL MATERIAL ABOVE THE PIPE.

7. REPLACE SUB–GRADE AND ROAD SURFACE MATERIAL WITH EQUAL OR GREATER THICKNESS AND WITH EQUAL OR GREATER MATERIAL AND SPECIFICATIONS TO PROVIDE A SMOOTH AND CONTINUOUS ROAD SURFACE.

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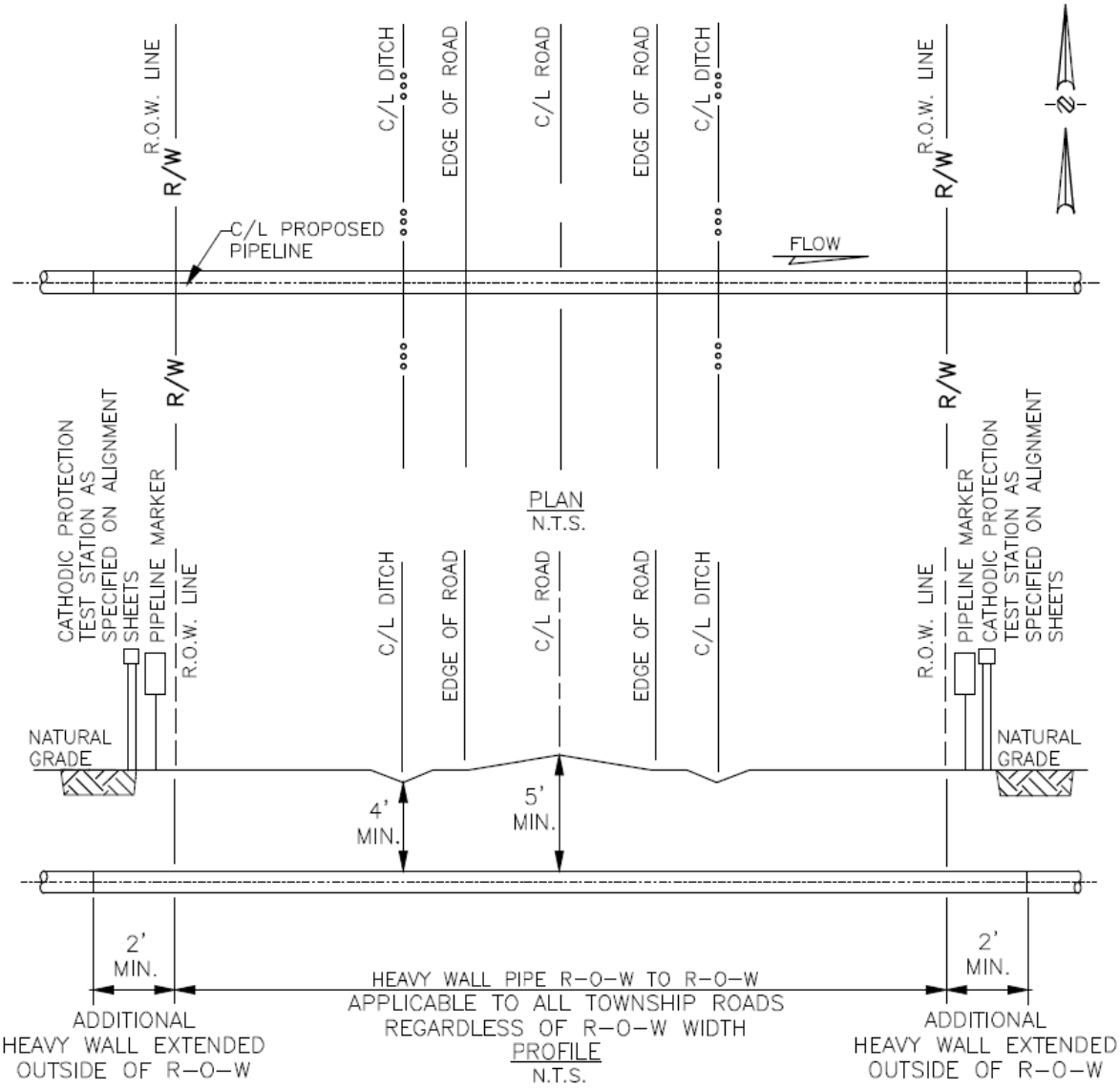
TYPICAL OPEN CUT ROAD

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-36
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NOTES:

1. NO BENDS IN THE R.O.W.
2. PIPELINE CROSSINGS SHALL BE AS NEAR TO PERPENDICULAR TO THE ROADWAY CENTERLINE AS PRACTICAL.
3. MUST BE CATHODICALLY PROTECTED (ENTIRE PIPELINE).
4. WELDED JOINTS INSIDE R.O.W. SHALL BE 100% X-RAYED FOR WELD QUALITY.
5. MARKERS SHALL BE PLACED AT OR NEAR THE R.O.W. LINE.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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TYPICAL
BORED ROAD CROSSING

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/23/2015	DRAWING NUMBER: A6987-TYP-37
ENGINEERS REVIEW	SJO	09/23/2015	ISSUE: P3

TABLE 2A – PERMANENT SEED MIX FOR UPLAND ROW AND WATERBODY CROSSINGS	
TYPE	RATE (lbs./ACRE)
SEED[1]	
ORCHARD GRASS AND/OR TALL FESCUE [2]	29
BIRDSFOOT TREFOIL (EMPIRE) [3]	9
ANNUAL RYE	12
FERTILIZER	
10–10–10 (OR EQUIVALENT)	600 [4] (SHOULD NOT BE APPLIED ON STREAM BANKS)
MULCH	
HAY OR STRAW	4,000
AGRICULTURAL LIME	4,000

[1] PURE LIVE SEED WITHIN 12 MONTHS OF TESTING

[2] IF TALL FESCUE IS USED, PLANT ENDOPHYTE–FREE CERTIFIED SEED

[3] LEGUMES TO BE INOCULATED BY MANUFACTURER'S RECOMMENDATIONS, IF NOT AVAILABLE LEGUMES ARE TO BE INOCULATED AT 4 TIMES RECOMMENDED RATE FOR CONVENTIONAL METHODS AND 10 TIMES RECOMMENDED RATE FOR HYDRO SEEDING.

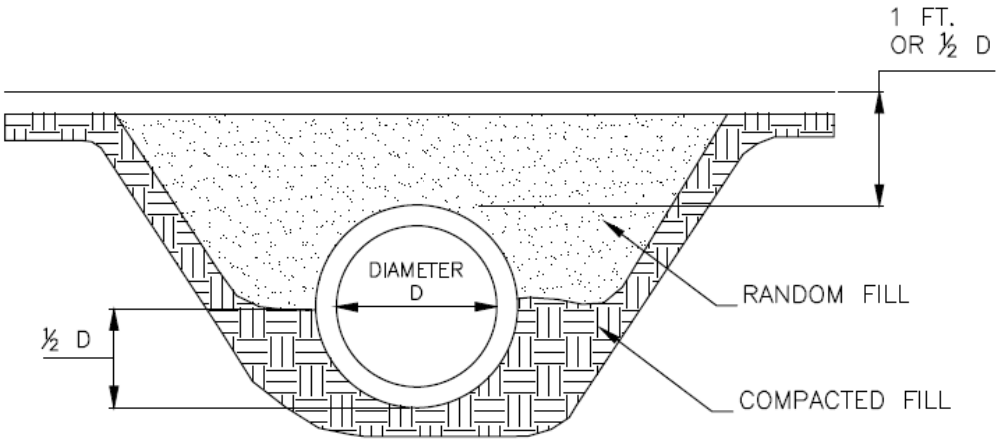
[4] WHERE WOOD CHIPS ARE SPREAD, ADDITIONAL NITROGEN (12 TO 15 lbs./TON OF CHIPS) WILL BE SPREAD.

[5] SEED RATE MUST BE DOUBLED FOR BROADCAST SEEDING.

TABLE 2B – SEED MIX FOR TEMPORARY STABILIZATION	
TYPE	RATE (lbs./ACRE)
SEED	
ANNUAL RYE	40
MULCH	
HAY OR STRAW	6,000

TABLE 2C – SEED MIX REQUIREMENTS IN WETLANDS (FOR STANDING WATER)	
TYPE	RATE (lbs./ACRES)
SEED	
ANNUAL RYE	40

[1] ANNUAL RYE IS USED AS TEMPORARY RE–VEGETATIVE MEASURE UNTIL INDIGENOUS PLANTS RE–ESTABLISH COVER. A MONITORING PROGRAM WILL BE IN EFFECT TO INSURE ADEQUATE COVER IS ESTABLISHED.



SECTION VIEW

NOTES:

MINIMUM DIAMETER FOR ANY CULVERT IS 12"; OTHERWISE CULVERT SHALL BE SIZED FOR ANTICIPATED PEAK FLOW. PLACE CULVERT SO BOTTOM IS AT SAME LEVEL AS BOTTOM OF DITCH OR ADJOINING SLOPE. CULVERTS SHALL BE PLACED WITH A SLOPE OF 2 TO 4%. LOWER END SHALL BE AT LEAST 2" BELOW UPPER END.

EXTEND CULVERT 12" BEYOND BASE OF ROAD FILL ON BOTH SIDES. FIRMLY PACK FILL AROUND CULVERT, ESPECIALLY THE BOTTOM HALF.

PROVIDE SUITABLE OUTLET PROTECTION* AND, WHERE APPROPRIATE, INLET PROTECTION.

INSPECT CULVERT WEEKLY: REMOVE ANY FLOW OBSTRUCTIONS AND MAKE NECESSARY REPAIRS IMMEDIATELY.

THIS DETAIL MAY BE USED FOR DITCH RELIEF CULVERTS AND FOR CROSSINGS OF ROADSIDE DITCHES. IT IS NOT APPROPRIATE FOR STREAM CROSSINGS.

INSTALL ECDS AS NEEDED ON DIRT AT ENDS OF CULVERTS (MULCH OR BLANKET).

* FOR STEEP SLOPE (>2H:1V) OUTFALLS, A MINIMUM 20 FOOT LONG R–5 APRON IS RECOMMENDED FOR TEMPORARY ACCESS ROADS WHERE THE RECOMMENDED CULVERT SPACING IS USED. FOR PERMANENT ACCESS ROADS, A MINIMUM R–6 ROCK SIZE IS RECOMMENDED.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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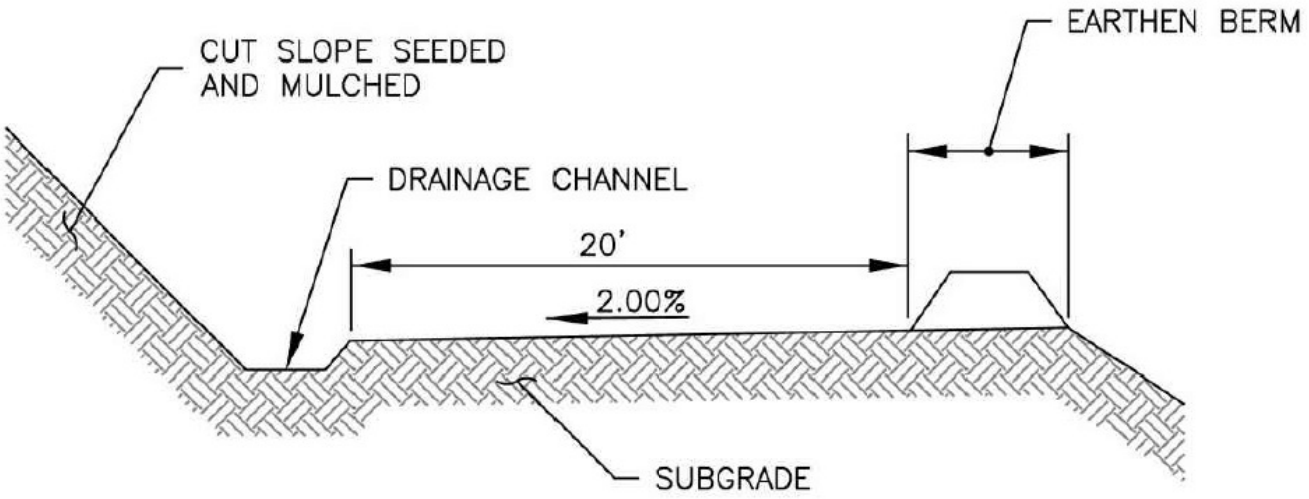
STANDARD CONSTRUCTION DETAIL #3-10
DITCH RELIEF CULVERT

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	07/25/2015	DRAWING NUMBER: A6987-TYP-39
ENGINEERS REVIEW	SJO	07/30/2015	ISSUE: P3



NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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FIGURE NO. 23
TYPICAL NEWLY CONSTRUCTED ACCESS ROAD

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER / ISSUE
ENGINEERS REVIEW	SJO	09/22/2015	A6987-TYP-40 / P3

STABILIZED CONSTRUCTION ENTRANCE:

1. USE TWO TO FOUR INCH (2–4") WASHED STONE LOW VOLUME ENTRANCES. STONE (4-6") FOR HEAVY USE OR MATERIAL DELIVERY ENTRANCES.

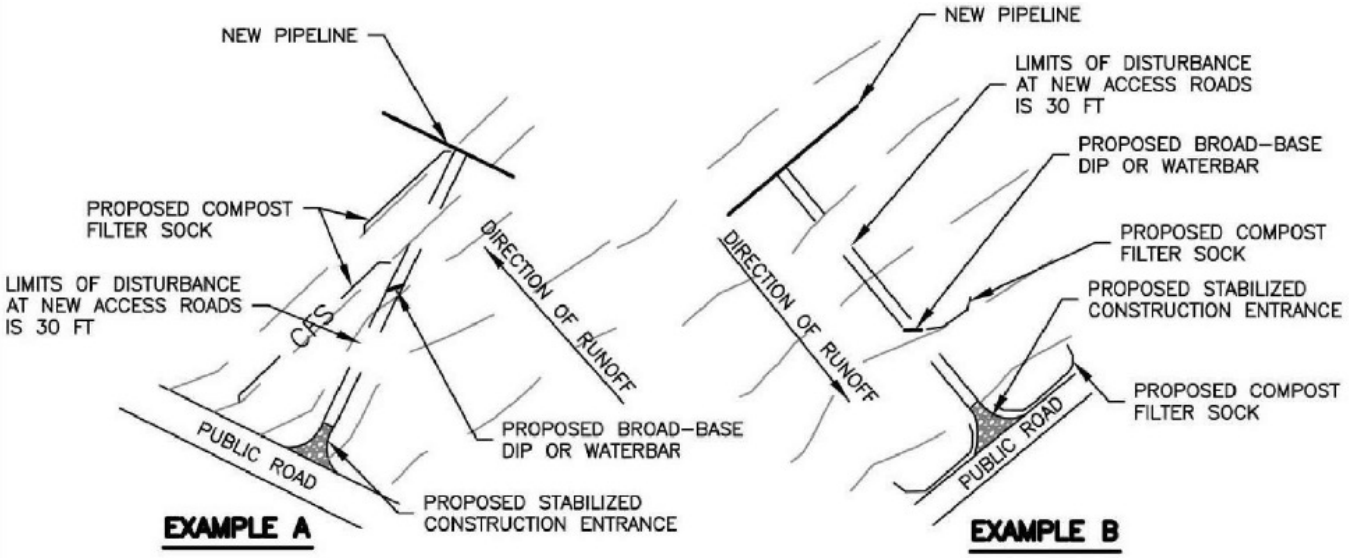
2. LENGTH IS AS REQUIRED, BUT NOT LESS THAN FIFTY (50') (EXCEPT ON SINGLE RESIDENCE LOT WHERE A THIRTY FOOT (30') MINIMUM LENGTH WOULD APPLY).

3. THICKNESS SHOULD NOT BE LESS THAN SIX INCHES (6").

4. THE WIDTH SHALL BE A MINIMUM OF TWENTY FEET (20') BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.

5. GEOTEXTILE FABRICS SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO THE PACING OF STONE.

6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF A CULVERT IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE USED.



NOTES:

1. NO SILT FENCE REQUIRED IF CRITERIA FOR A NATURAL VEGETATIVE FILTER (BUFFER) STRIP IS MET AND LOCATED DOWN SLOPE OF CONSTRUCTION. THE VEGETATIVE FILTER (BUFFER) STRIP SHALL BE IN ACCORDANCE WITH VEGETATIVE FILTER (BUFFER) STRIP DETAIL.

2. REGULAR SILT FENCE WILL BE USED WHERE DRAINAGE AREA IS NO MORE THAN 1/4 ACRE PER 100' OF SILT FENCE AND THE MAXIMUM GRADIENT ABOVE FENCE IS 2:1. BELTED SILT RETENTION FENCE SHALL BE UTILIZED WHERE CONDITIONS EXCEED SILT FENCE REQUIREMENTS. SLOPE LENGTH ABOVE BELTED SILT RETENTION FENCE SHALL NOT EXCEED 400'.

3. USE THIS DETAIL FOR ALL PROPOSED/NEW AND UPGRADED EXISTING ACCESS ROADS.

NOT TO SCALE

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FIGURE NO. 24
TYPICAL ACCESS ROAD E&S CONTROL

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

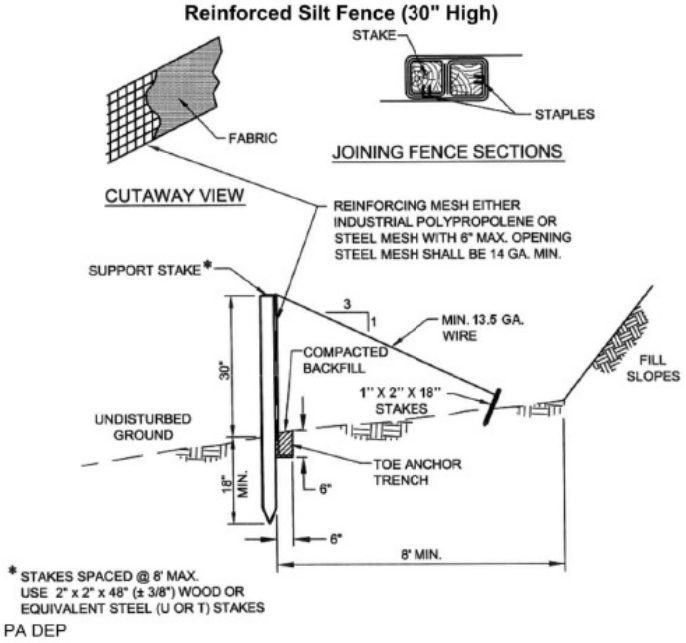
DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	07/25/2015
ENGINEERS REVIEW	SJO	07/30/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-41

ISSUE: P3

STANDARD CONSTRUCTION DETAIL # 4-8
Reinforced Silt Fence (30" High)



PA DEP

FABRIC SHALL HAVE THE MINIMUM PROPERTIES AS SHOWN IN TABLE 4.3.

FABRIC WIDTH SHALL BE 42" MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (U OR T) STAKES. AN 18" SUPPORT STAKE SHALL BE DRIVEN 12" MINIMUM INTO UNDISTURBED GROUND.

SILT FENCE SHALL BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION SHALL BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT (FIGURE 4.1).

SEDIMENT SHALL BE REMOVED WHERE ACCUMULATIONS REACH HALF THE ABOVEGROUND HEIGHT OF THE FENCE.

ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL #4.6).

FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.

*STAKES SPACED @ 8' MAX.
USE 2"x2"x48" (± 3/8") WOOD OR
EQUIVALENT STEEL (U OR T) STAKES

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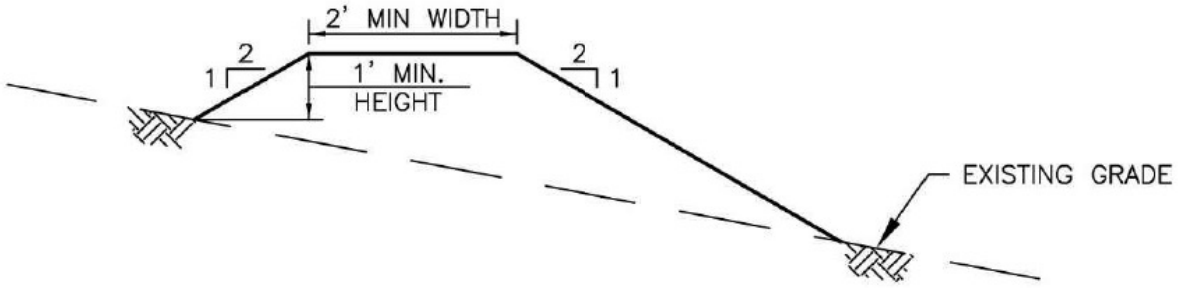
STANDARD CONSTRUCTION DETAIL #4-8
REINFORCED SILT FENCE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/23/2015	DRAWING NUMBER: A6987-TYP-42
ENGINEERS REVIEW	SJO	09/23/2015	ISSUE: P3



NOT TO SCALE

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FIGURE NO. 22
TYPICAL EARTHEN BERM

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-43
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3

IDENTIFICATION MARKER PLACEMENT

THE ROW INSPECTOR WILL IDENTIFY ANY OF THE FOLLOWING LOCATIONS WITHOUT A REQUIRED IDENTIFICATION MARKER:

- BOTH SIDES OF HIGHWAY CROSSINGS
- BOTH SIDES OF COUNTY ROAD CROSSINGS
- BOTH SIDES OF RAILROAD CROSSINGS
- BOTH SIDES OF ASPHALT/GRAVEL ROAD CROSSINGS
- BOTH SIDES OF WATERWAYS
- BOTH SIDES OF ABOVEGROUND PIPE SECTIONS
- BOTH SIDES OF EXPOSED UNDERGROUND PIPE SECTIONS (A TWO-SIDED IDENTIFICATION MARKER MAY BE APPROPRIATE ON SHORT SECTIONS.)
- FENCE LINES
- LOCATIONS WHERE A PIPELINE ENTERS OR EXITS A PUMP, BOOSTER, OR VALVE STATION
- WHEN A PIPELINE IS IN SHARED ROW AND DOES NOT HAVE AN IDENTIFICATION MARKER AT EVERY MARKED LOCATION OF THE OTHER PIPELINE(S).

ALSO IDENTIFY ANY OF THE FOLLOWING AREAS WITH LESS THAN LINE-OF-SIGHT IDENTIFICATION MARKER PLACEMENT. THESE AREAS WILL BE EVALUATED TO DETERMINE WHETHER ADDITIONAL IDENTIFICATION MARKERS ARE NECESSARY TO INFORM THE PUBLIC AND/OR REDUCE THE HAZARDS OF THIRD PARTY DAMAGE.

- RESIDENTIAL AREAS
- COMMERCIAL AREAS
- INDUSTRIAL AREAS
- GRAVEL PITS
- STRIP MINES
- OTHER AREAS OF FREQUENT CONSTRUCTION OR EXCAVATION ACTIVITY

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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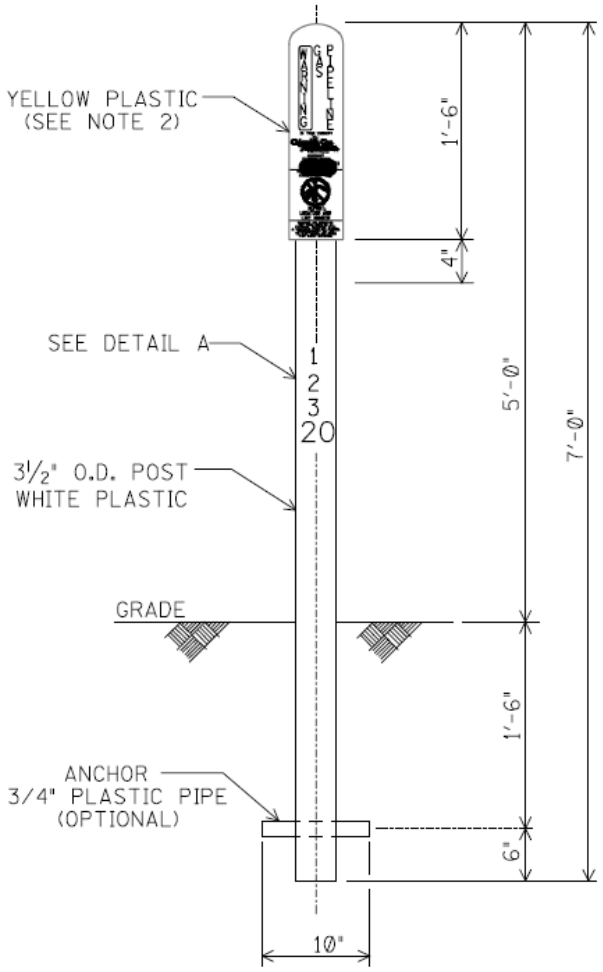
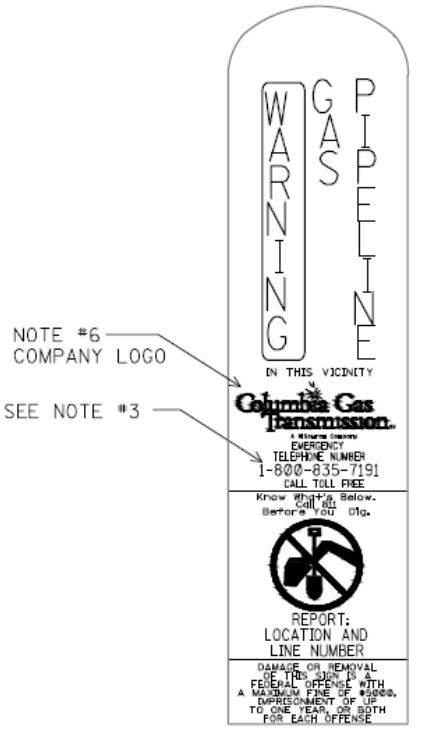
PIPELINE STD PERMANENT LINE MARKER FOR ROADS, FENCES, FOREIGN LINE CROSSINGS, ETC.

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-44
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3

OEP 150
05/01/2010



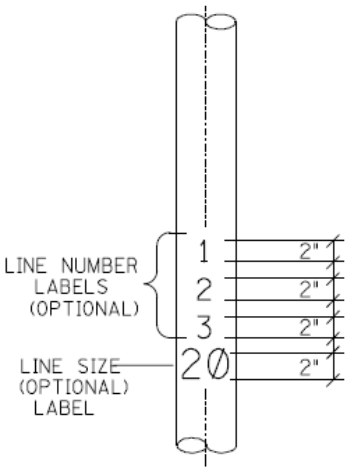
ROUND LINE MARKER



WARNING MESSAGE

NOTES:

1. REFER TO TYPICAL TA-8646 FOR REQUIRED LOCATIONS.
2. WARNING MESSAGE SHOULD BE PERMANENTLY AFFIXED BY VENDOR.
3. MONITORING CENTER TOLL FREE NUMBER.
4. MARKER IS ALSO AVAILABLE AS:
   A) VENT TOP (WITH OR WITHOUT TEST STATION)
   B) TEST STATION
5. LETTER FOR "WARNING GAS PIPELINE" SHALL BE AT LEAST 1" TALL AND 1/4" STROKE IN ACCORDANCE WITH 192.707.
6. USE APPROVED COMPANY LOGO AS PER THE ACTUAL OPERATING COMPANY.
7. A WRAP AROUND STICKER IS ALSO AVAILABLE FOR OLDER TOPS THAT ARE ORANGE.



DETAIL A

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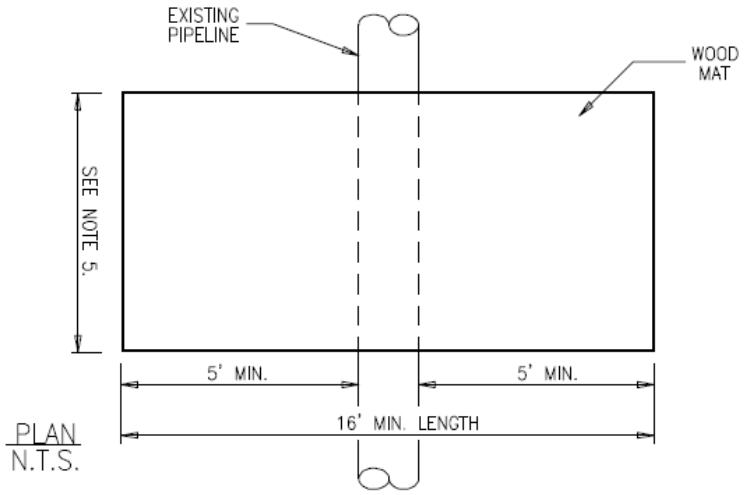
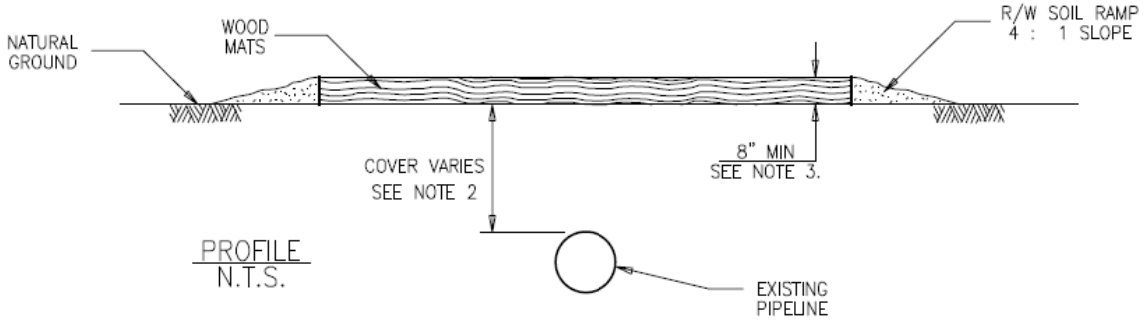
TYPICAL
PERMANENT PIPELINE MARKER

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-45
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3



PLAN
N.T.S.



PROFILE
N.T.S.

NOTES:

1. THE COMPANY REPRESENTATIVE SHALL BE NOTIFIED OF EACH PROPOSED CROSSING SO THAT THE EXISTING PIPELINE(S) CAN BE STAKED. CONTRACTOR SHALL VERIFY THE COVER DEPTH BY HAND EXCAVATING AT THE CROSSING LOCATION. THE PASSING OF EQUIPMENT OVER THE CROSSING WILL NOT BE MADE UNTIL IT HAS BEEN APPROVED BY THE COMPANY REPRESENTATIVE.
2. IF COVER IS LESS THAN 2', OR WHEEL LOAD IS GREATER THAN 16000 LB/AXLE, ADDITIONAL COVER SHALL BE PLACED IN A TRAPEZOIDAL CONFIGURATION WITH THE BERM AT LEAST 10' WIDER THAN THE WIDTH OF THE EQUIPMENT CROSSING THE WOOD MATS OVER THE PIPELINE TO CREATE 3' OVER THE EXISTING PIPE.
3. THE WOOD MAT(S) OVER THE EXISTING LOADED PIPELINE SHALL BE COMPOSED OF TWO LAYERS OF THREE PLY MATS 8' WIDE X 16' LONG. THREE PLY MATS SHALL CONSIST OF THREE ALTERNATIING LAYERS OF 2" X 12" DIMENSIONAL LUMBER. THE TOP LAYER OF THE TOP MAT SHALL BE REPLACED WHEN DAMAGED AS DIRECTED BY COMPANY.
4. THE WOOD MAT SHALL EXTEND A MINIMUM OF 5' BEYOND THE OUTER EDGE OF THE PIPELINE THAT WILL BE CROSSED.
5. THE COMBINED WIDTHS OF THE WOOD MATS SHALL BE A MINIMUM OF 5' WIDER THAN THE WIDTH OF THE WEIGHT BEARING PORTION OF THE CONSTRUCTION EQUIPMENT. MULTIPLE MATS MAY BE REQUIRED.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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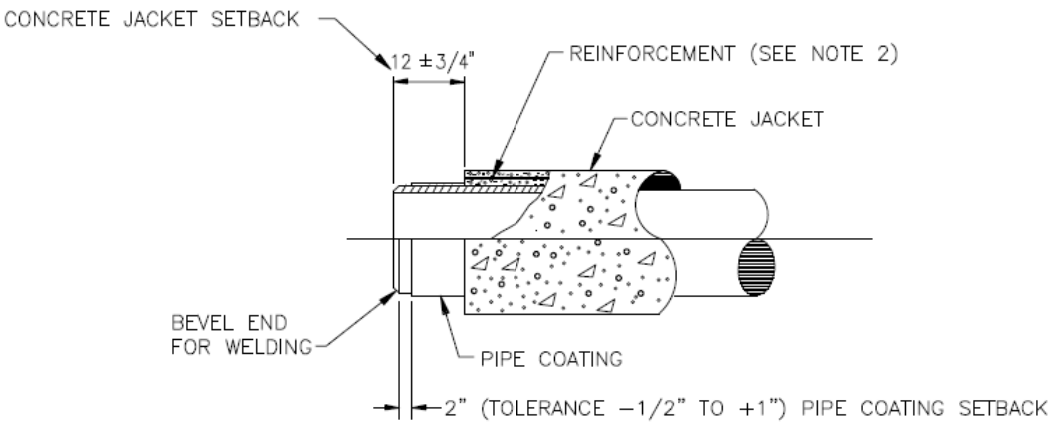
EQUIPMENT CROSSING
EXISTING LOADED PIPELINES

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-46
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3



CONCRETE COATING END DETAIL

PIPE DIAMETER	WALL THICKNESS	CONCRETE THICKNESS
26"	0.500"	3.0"
20"	0.375"	2.5"
20"	0.281"	3.0"

1. CONCRETE COATING WITH COMPRESSIVE STRENGTH OF 2500 PSI TO BE INSTALLED OVER FBE COATED PIPE AT LOCATIONS INDICATED ON THE ALIGNMENT SHEETS.
2. REINFORCEMENT WILL CONSIST OF GALVANIZED 6"x6" 10 GAUGE WELDED WIRE MESH. CONCRETE SPACERS SHALL BE USED TO SUPPORT THE WIRE MESH 2" ABOVE THE PIPE. EDGE AND END LAPS SHALL BE A MINIMUM OF 12" AND TIED 12" O.C. STAGGERED.
3. THICKNESS OF CONCRETE SHALL HAVE A TOLERANCE OF −1/4" TO +1/2".
4. CONCRETE TO BE CURED TO 2500 PSI COMPRESSIVE STRENGTH BEFORE MOVING OR LOWERING THE PIPE IN THE DITCH.
5. CONCRETE COATING OF FIELD JOINTS AND FACTORY FURNISHED ELLS IS NOT REQUIRED. FIELD BENDS WILL REQUIRE CONCRETE COATING.
6. CONTRACTOR SHALL FURNISH ALL CONCRETE COATING MATERIALS.

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

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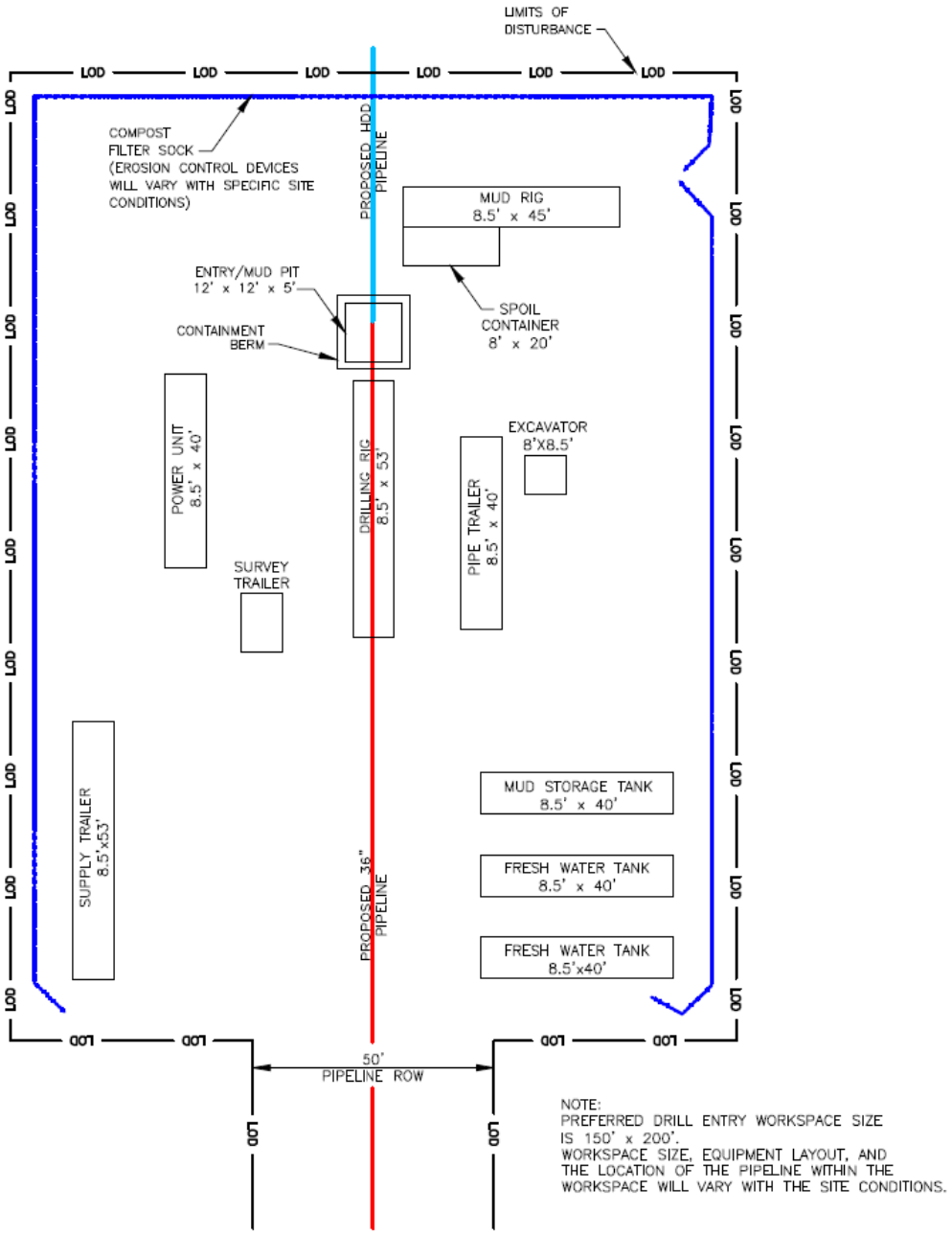
PL−MXP−100 & PL−MXP−200

PIPELINE STANDARD
CONCRETE PROTECTIVE COATING

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-47
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3



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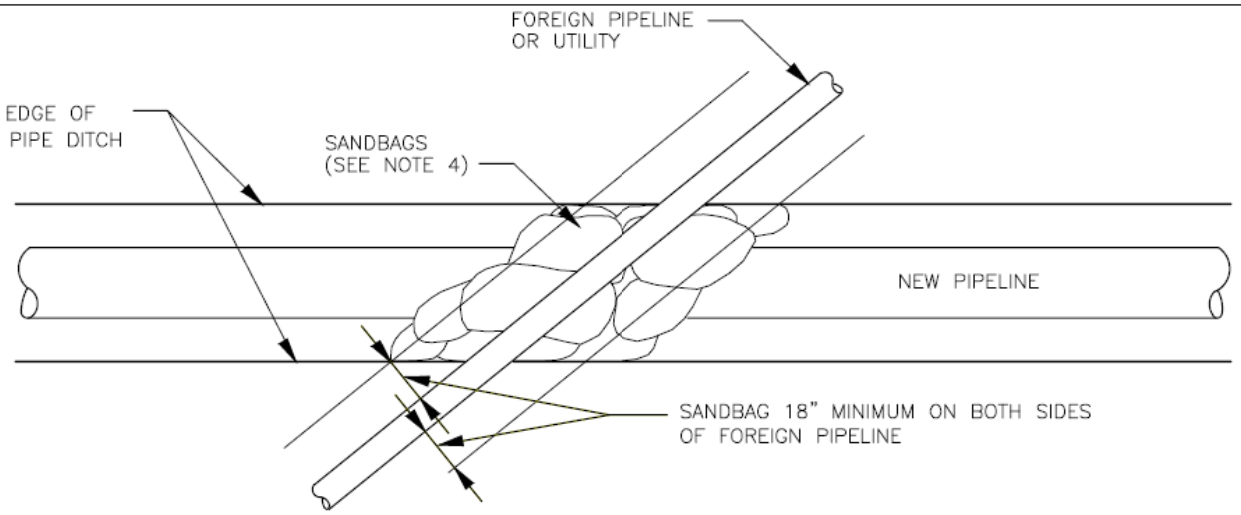
PL-MXP-100 & PL-MXP-200

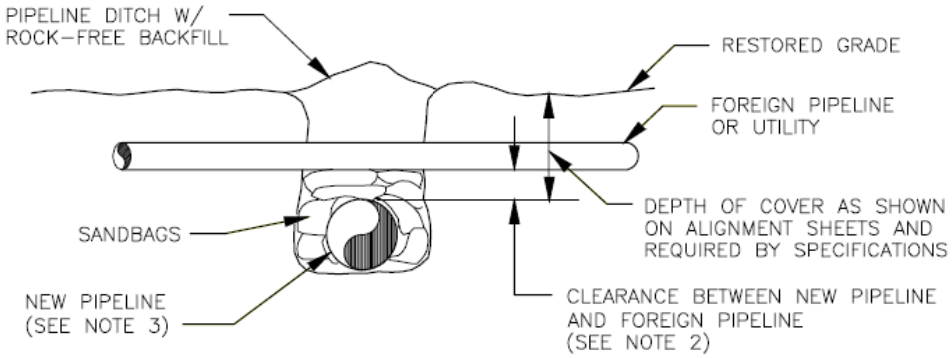
TYPICAL HDD ENTRY WORKSPACE

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015	SCALE: NTS
DRAFTING CHECK	TJ	09/22/2015	DRAWING NUMBER: A6987-TYP-48
ENGINEERS REVIEW	SJO	09/22/2015	ISSUE: P3



PLAN



END VIEW

CROSS SECTION

NOTES:

1. TYPE CP-2 CATHODIC PROTECTION TEST STATION SHALL BE INSTALLED AT FOREIGN PIPELINE CROSSINGS, WHEN INDICATED ON THE ALIGNMENT SHEETS.
2. MAINTAIN 2' MINIMUM CLEARANCE WHEN CROSSING OVER OR UNDER FOREIGN PIPELINES.
3. THE NEW PIPELINE IS TO BE PLACED ABOVE THE FOREIGN PIPELINE OR UTILITY IF IT IS BURIED AT A DEPTH SUCH THAT 2' SEPARATION AND MINIMUM REQUIRED COVER OF 36" CAN BE MAINTAINED. OTHERWISE, THE NEW PIPELINE IS TO BE PLACED UNDER THE FOREIGN PIPELINE OR UTILITY.
4. SANDBAGS CONSIST OF BURLAP BAGS FILLED WITH EARTH FREE OF SHARP ROCKS, TWIGS, AND OTHER OBJECTIONABLE MATERIALS (TOP SOIL SHALL NOT BE USED). USE OF SYNTHETIC MATERIALS FOR BAGS IS NOT ACCEPTABLE.

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PL-MXP-100 & PL-MXP-200

FOREIGN PIPELINE
UTILITY CROSSING DETAIL

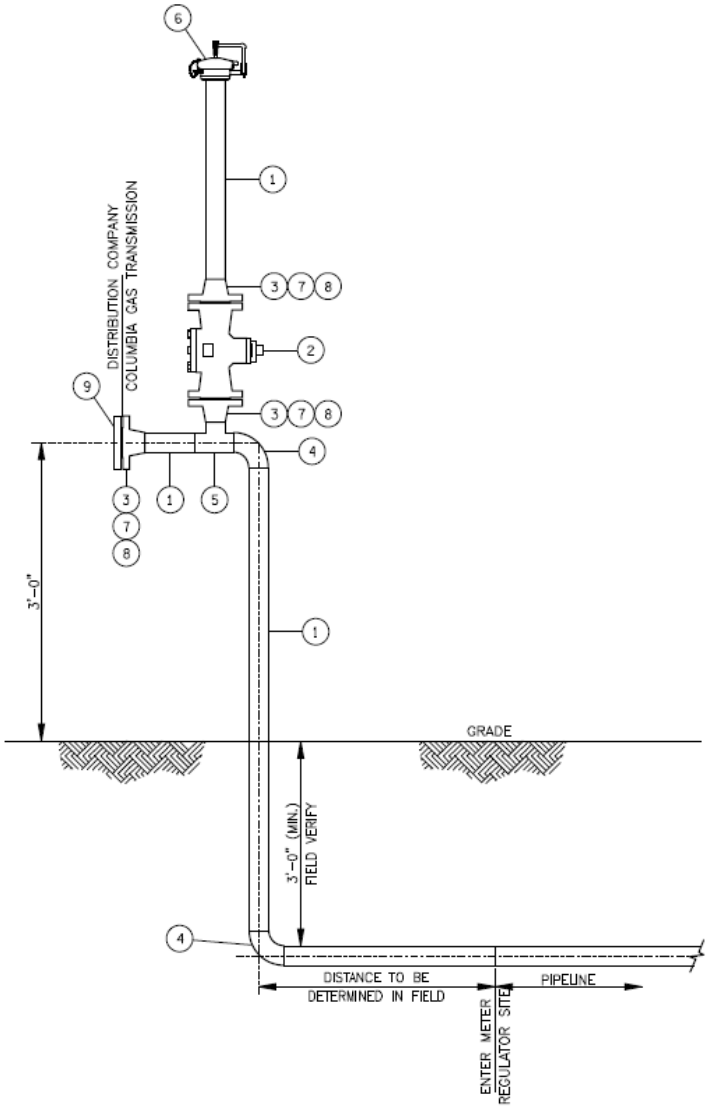
NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PM	DATE 06/17/2015
DRAFTING CHECK	TJ	09/22/2015
ENGINEERS REVIEW	SJO	09/22/2015

SCALE: NTS

DRAWING NUMBER: A6987-TYP-49

ISSUE: P3



MATERIAL LISTING				
ITEM	QTY	UNIT	SIZE	DESCRIPTION
1	30	FT	2"	2⅜" O.D. STEEL LINE PIPE, 0.218" W.T., GRADE X-42, SEAMLESS, PLAIN END, BEVELED FOR WELDING, BARE
2	1	EA	2"	VALVE, PLUG, F.E., NORD, FIG. 2245, R.F.,1440#, C.S., LUB RP, A600, F/F = 11-1/2"
3	3	EA	2"	FLANGE, WELD NECK, R.F., ANSI 600, F.S. BORED TO 0.218"
4	2	EA	2"	ELL, WELDED, 90°, L.R., Y-52, 0.218" W.T.
5	1	EA	2"	TEE, STRAIGHT, WELDED, Y-52, 0.218" W.T.
6	1	EA	2"	CLOSURE, YALE, FIGURE 500R, ANSI 600, 0.218" W.T., 1.939" BORE, HORIZONTAL
7	24	EA	5/8"	BOLT, STUD, 5/8" DIA. x 4-1/4" LG., ASTM A-193, GR B7, THREADED ENTIRE LENGTH, WITH 2-2H NUTS
8	3	EA	2"	GASKET, SPIRAL WOUND, ANSI 600, MFG. FLEXITALLIC, STYLE CGI, 316L/FLEXITE SUPER, 1/8" THK, ID = 2-3/4" x OD = 4-3/8"
9	1	EA	2"	FLANGE, BLIND, R.F., ANSI 600

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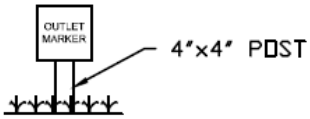
HIGH PRESSURE
DOMESTIC METER

NO.	REVISION	APP'D	DATE
P3	ISSUED FOR FERC FILING	SJO	4/29/16
P2	ISSUED FOR FERC REVIEW	SJO	03/04/16
P1	ISSUED FOR 30% REVIEW	JHE	11/17/15

DRAWN BY	PD	DATE 01/__/2016	SCALE: NTS
DRAFTING CHECK	TJ	__/__/2016	DRAWING NUMBER: A6987-TYP-50
ENGINEERS REVIEW		__/__/2016	ISSUE: P3



PROJECT NAME

REGISTRATION NO.

OUTLET NO.

NOTES:

1. THE SIGN WILL BE AT LEAST 24" X 24".
2. THE LETTERS WILL BE 1.6" AND 0.8" IN TEXT HEIGHT.

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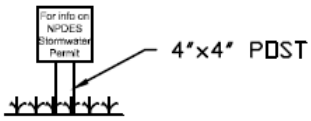
TYPICAL OUTLET MARKER

NO.	REVISION	APP'D	DATE
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/31/16

DRAWN BY	TBH	DATE 03/16/2016
DRAFTING CHECK	PAD	03/21/2016
ENGINEERS REVIEW	SJO	03/21/2016

SCALE: NTS

DRAWING NUMBER	ISSUE
A6987-TYP-51	P1



For info on NPDES
Stormwater Permit
To Comment on Sediment Control Plan
Call: 800-654-5227
OR
DEP.Plan@wv.gov
DEP 601 57th Street SE, Charleston, WV 25304
Application Date: XX/XX/XX
Name of Project,
Project Description
(area code) Tele. No.

NOTES:

1. THE SIGN WILL BE AT LEAST 24" X 24".
2. THE LETTERS WILL BE 1.6" AND 0.8" IN TEXT HEIGHT.

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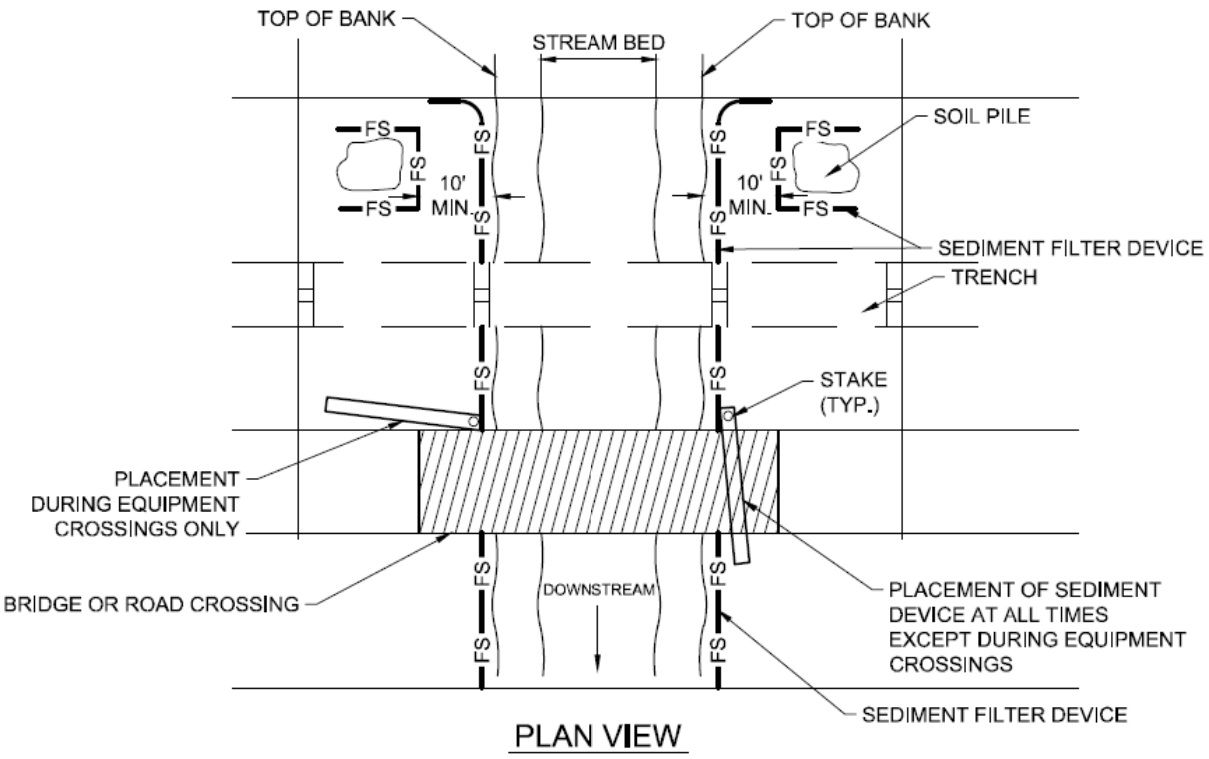
PL–MXP–100 & PL–MXP–200

TYPICAL PUBLIC NOTICE/ENTRANCE SIGN

NO.	REVISION	APP'D	DATE
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/31/16

DRAWN BY	TBH	DATE 03/16/2016	SCALE: NTS
DRAFTING CHECK	PAD	03/21/2016	DRAWING NUMBER: A6987-TYP-52
ENGINEERS REVIEW	SJO	03/21/2016	ISSUE: P1



PLAN VIEW

NOTES:

1. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, SILT FENCE, OR OTHER APPROVED EQUIVALENT), SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SEDIMENT FILTER DEVICE SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

2. SEDIMENT FILTER DEVICE AT ENTRANCES SHALL BE IN PLACE FROM START OF DAY, DURING CONSTRUCTION ACTIVITIES AND AT END OF DAY. SEDIMENT FILTER DEVICE MAY BE TEMPORARILY MOVED AS SHOWN ON THE LEFT DURING EQUIPMENT CROSSING ACTIVITIES BUT MUST BE REPLACED IMMEDIATELY UPON COMPLETION OF CROSSING.

3. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.

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PL-MXP-100 & PL-MXP-200

TYPICAL REMOVABLE SEDIMENT FILTER DEVICE

NO.	REVISION	APP'D	DATE
P1	ISSUED FOR FERC FILING	SJO	04/29/16
P	ISSUED FOR FERC REVIEW	SJO	03/31/16

DRAWN BY	TBH	03/16/2016
DRAFTING CHECK	PAD	03/21/2016
ENGINEERS REVIEW	SJO	03/21/2016

SCALE: NTS

DRAWING NUMBER	ISSUE
A6987-TYP-53	P1

APPENDIX D-1
Columbia Gas' Environmental Construction Standards

Columbia Gas Transmission SM

A NiSource Company

ENVIRONMENTAL CONSTRUCTION STANDARDS

WEST VIRGINIA PROJECTS - 2015

March 2015

Columbia Pipeline Group
Charleston, West Virginia

Table of Contents

I. Introduction

Columbia is committed to complying with the applicable environmental rules and regulations of federal, state, and local governments. Columbia's goal is to meet these requirements in the pursuit of a cleaner, safer environment for future operations.

Recognizing this goal, it is Columbia's policy that all construction, operation and maintenance activities be conducted in a safe manner that minimizes impacts on stream and wetland ecosystems, wildlife habitat, cultural resources and the human environment.

To this end, Columbia has prepared these Environmental Construction Standards (ECS). The ECS provides the minimum requirements to be applied to all construction, operation and maintenance activities.

The general objective of this ECS is to provide Columbia personnel and Columbia's contractors with instructional information, complete with a practical approach to environmental concerns which can arise before, during and after facility construction. More specific objectives include:

- Minimize impacts to environmentally sensitive areas;
- Use the minimum land required for safe and efficient construction, operation, and maintenance of the facilities;
- Prevent erosion and sedimentation during construction; and
- Complete construction in a safe and timely manner.

Words and/or phrases which have special meaning (shown in **bold** at first occurrence in text) and acronyms have been defined in Section IX (Definition of Terms).

The intent of the ECS is to confine project-related disturbance to the identified **construction work areas (CWA)** and to minimize erosion and enhance re-vegetation in those areas. Any project-related ground disturbance (including erosion) outside of these areas is subject to compliance with all applicable survey[1] (see superscript note in Section VII) and mitigation requirements.

The ECS is focused primarily on pipeline related construction, operation, and maintenance. However, it can be equally applied to all Columbia facilities, for example, storage facilities including well locations, compressor stations, horizontal directional drill locations and measurement/regulation stations. This ECS shall be used as the base document from which Columbia will build individual project-specific Environmental Management and Construction Plans (EM&CP) as called for in Columbia's Policy and Procedure, Plan 120-10. The EM&CP may include written recommendations from the local soil conservation authorities or land management agencies for both temporary and permanent erosion control and re-vegetation specifications. Federal, State, and local agencies with regulations more stringent than this ECS shall supercede[2] (see

superscript in Section VII).

II. Upland Construction

A. General

This chapter describes typical upland pipeline construction.

The upland pipeline construction spread operates as a moving assembly line performing specialized procedures in an efficient, planned sequence. Figure 1 presents the typical upland pipeline construction sequence. In addition, special construction crews install and alter fences, bore under roads and railroads, install stream and wetland crossings that are not done by conventional upland techniques, and construct valve settings and meter/regulator stations.

While construction work is ongoing, the construction work area will be kept clean of all rubbish and debris resulting from the work. Excess construction materials and debris will be collected, contained, and disposed of at regular intervals. This includes timber, slash, mats, garbage, drill cuttings and fluids, as well as excess rock. Non-hazardous materials and waste shall be disposed of in an approved landfill. Hazardous waste shall be disposed of in accordance with Columbia policies (Plan 120.03 and 120.04) and federal, state and local regulations.

The required public notice/entrance sign will be posted at or near the entrance to the site within 24 hours of submitting the application, and kept posted for the duration of the project. Given the linear nature of most of Columbia's construction, one point along the project will be chosen to install and maintain the public notice/entrance sign. See Figure 27 for public notice/entrance sign template.

B. Right-of-Way Width

For 14-inch or larger diameter pipelines on new alignments, Columbia typically utilizes a 50-foot wide permanent right-of-way (ROW plus a 25-foot wide temporary construction ROW as illustrated in Figure 2). After the construction work area is restored, the temporary work areas are allowed to revert to their previous uses. The permanent ROW is maintained as Columbia's permanent ROW for the facility. Figure 2 also illustrates the typical pipeline construction work area when paralleling existing facilities.

In addition, there may be instances where extra work areas are needed for topsoil conservation, side hill construction, equipment staging, pipe and material storage, borrow and disposal areas, temporary and permanent access, and related construction activities. Such areas will be identified in the project plan and will undergo all required environmental and cultural resources reviews prior to use. In contrast, pipelines may be constructed through confined areas such as extremely steep and narrow ridges. Alternate construction methods may be required in narrow

construction work area situations to safeguard workers, equipment, the pipeline, and the environment.

For 12-inch and smaller diameter pipelines, a 50-foot wide ROW is typically used due to a narrower trench and the use of smaller equipment. The typical 50-foot ROW is illustrated in Figure 3. In addition, there may be areas where extra construction work areas are needed as described above.

For non-pipeline construction activities, such as storage well locations and station projects, the construction work area and permanent ROW may vary and can be dependent on property lease, property owner agreements, and/or local topography. For example, the construction work area for a typical storage well is 200 feet by 200 feet and the permanent ROW is a 300 foot radius around the well.

All project-related ground disturbances shall be limited to the construction right-of-way, extra workspace areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the FERC's Orders, and/or other federal/state/local environmental permits. This does not apply to activities needed to comply with the FERC Plan and Procedures (i.e. slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) or minor field realignments and workspace shifts per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas. All construction or restoration activities outside of the approved limit of disturbance detailed in the EM&CP are subject to all applicable survey and permit requirements, as well as landowner easement agreements and must be cleared through the Natural Resource Permitting Group prior to that activity.

C. Clearing

The construction work area is cleared to the width specified in the ROW agreements or EM&CP, whichever is less. During clearing operations, all brush and trees will be felled into the construction work area to prevent off-construction work area damage to trees and structures.

The clearing crew and related equipment, as well as equipment necessary for installation of equipment crossings, will be permitted a single pass through streams prior to equipment crossing installation. Federal, State and local agencies having regulations more stringent than this shall supercede[2] (see superscript note 2).

Should substantial soil disturbance take place during clearing, install temporary erosion and sedimentation controls as described in section D-3.

1. Wood Products

Wood Products (i.e., saw logs, pulpwood or cordwood) are the property of the landowner unless otherwise specified. They will not be used for any purpose

unless permission is first obtained from the landowner. When the landowner requests the salvage of these materials or approves wood products to be stockpiled and left on site, they will be stockpiled just off the edge of the construction work area, but not within 50 feet of streams, floodplains, or wetlands. Equipment stacking the wood products will not leave the construction work area. Usable timber that measures at least 10 inches in diameter at the butt will be cut into pole lengths (12-14ft) or as otherwise negotiated with the landowner. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey; landowner approval and mitigation requirements.

2. **Brush**

All cleared brush will be disposed of by one of the following methods:

- Brush may be piled just off the edge of the construction work area but not within 50 feet of streams, floodplains or wetlands. Equipment stacking the brush will not leave the construction work area. Brush piles will be constructed a maximum of 12 feet wide and compacted to approximately 4 feet high, with periodic breaks at a minimum of every 200 feet to permit wildlife travel. Breaks should be no smalle4r then 4ft wide to allow wildlife travel. Brush piles will be kept separate from usable timber and care will be taken to prevent mixing of soil and brush. The landowner should be consulted to determine acceptable brush pile locations along the construction work area. Landowner approval is required for this method.

- Brush may be burned where permitted by law. The necessary burning permits will be obtained. Fires will be of reasonable size and located and patrolled so that they will not spread off the construction work area.

- The brush may be chipped and given away, buried, or thinly spread (less than 2 inches thick) over the construction work area or blown off the construction work area (per landowner agreement and approvals) except in **agricultural lands** or within 50 feet of streams, floodplains, or wetlands. Chipping will be limited to those areas where agreed to with the landowner. If wood chips are used as mulch, do not use more than 1 ton/acre (One ton of chips spread 1 inch thick cover approximately $^{1}/_{4}$ acre.). During **restoration**, soil will be augmented by the addition of 11 pounds of nitrogen per ton of chips to aid re-vegetation, at least half of which must be slow release.

- Brush may be hauled off-site; off-site disposal in other than

commercially operated disposal locations is subject to compliance with all applicable survey; landowner approval and mitigation requirements.

3. Fence Crossings

Where it is necessary to remove fences, adequate temporary fences or gates as illustrated in Figure 4 will be installed **immediately** or in accordance with landowner agreement. Such temporary fences or gates will be kept closed, except when necessary for construction purposes per landowner agreement. Once construction is completed, permanent fence repairs will be completed. All fences that have been cut or removed will be permanently repaired during restoration to match the original type of the fence as much as possible. Where there is any doubt as to the usability of old fence material, new material will be used in making repairs. Fence repairs will be subject to the approval of the landowner.

D. Grading

Grading is necessary to provide a smooth and even surface for safe and efficient operation of construction equipment. Grading will be the minimum amount necessary and includes installation of erosion control devices such as interceptor diversions, **sediment filter devices**, and equipment crossings at streams to minimize soil loss and subsequent sedimentation.

1. Tree Stump and Rock Removal and Disposal

Tree stumps and large rocks will be cut, graded or removed as necessary to permit construction and to provide adequate clearance for mechanical equipment and other vehicles. Tree stumps that are adjacent to roads will be cut close to the ground or removed.

Stumps and large rocks will be disposed of in the following manner with landowner approval. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval, and mitigation requirements.

- Buried within the construction work area except in agricultural, residential, or wetland areas;
- Windrowed just off the edge of the construction work area with landowners' permission. windrows will be a maximum of 12 feet wide with periodic breaks a minimum of 200 feet apart;
- Hauled from the site and disposed of in an approved landfill or other suitable area.

2. Topsoil Conservation

Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus soil side method) in:

- Actively cultivated or rotated croplands and pastures;
- Residential areas;
- Hayfields; and
- Other areas at the landowner's or land managing agency's request.

In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every effort to segregate the entire topsoil layer. Segregated topsoil may not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as fill material. Figure 5 illustrates topsoil conservation techniques.

The topsoil will be stockpiled separately from all subsoil and will be replaced last during backfilling and **final grading**. Where topsoil is stripped from the entire construction ROW, an additional 25-foot wide temporary work area may be used for topsoil storage with landowners' permission and appropriate environmental approvals. The controls used along the right-of-way will also serve these additional areas, where practicable. The **Environmental Inspector** will determine if additional erosion control devices, aside from those indicated in the details, are needed in topsoil storage areas. Stabilize topsoil piles and minimize loss due to wind and water erosion with the use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary and/or required by environmental permits.

In residential areas, topsoil replacement (i.e., importation of topsoil) is an acceptable alternative to topsoil segregation.

3. Erosion Control Devices

Temporary erosion controls will be installed prior to or during the initial disturbance of soil. The most effective and versatile erosion control devices are interceptor diversions (temporary slope breakers) and sediment filter devices as illustrated and described in Figures 6A, 6B, 7A, and 7B, as well as other approved devices. Temporary diversions will be maintained during the construction phase until final diversions are installed. Where required grading has significantly reduced the slope, the Environmental Inspector may require fewer temporary diversions consistent with the table on Figure 6A. On steep slopes or other areas of special

concern which may be prone to landslides, the spacing of the interceptor diversion shall be adjusted in accordance with the table on Figure 6A.

Jute netting as illustrated in Figures 12A and 12B or equivalent approved by the Environmental Inspector may be used on **steep slopes** to help stabilize the construction work area. Do not use coconut fiber erosion control blanket/netting.

Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive environmental resource areas. Slope breakers may extend slightly (about 4ft) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area if the appropriate state or local governing agency allows the extension.

Sediment barriers may also be necessary and are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until vegetation is successful. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary, to prevent sediment flow into the wetland or waterbody.

For silt fence installation, the bottom will be buried 4-6 inches deep, backfilled and compacted with stakes placed 8 feet apart (see Figure 7A). Silt fence will be cleaned out when sediment builds up to half its height or maintained/ replaced if damaged. Super silt fence installation and maintenance will be in accordance with Figure 7B.

All temporary erosion control devices, including roadside ditches, will be inspected near the end of each work day or after each storm (rain) event of 1/2 inch or greater, to ensure proper functioning. Any devices damaged beyond functioning will be repaired **promptly**.

4. Temporary Road Entrances

Temporary road entrances illustrated in Figure 8 will be installed during grading where the construction work area crosses paved public roads when needed to maintain safe conditions and to prevent tracking soil and mud onto public roads. These installations are designed to remove mud from vehicle tires and tracks before accessing the road. Minimize the use of tracked equipment on public

roadways. Geotextile fabric will be used as illustrated in Figure 8. The roadbed should be cleared of small stubs which tend to puncture the fabric, thereby allowing fine particles to mix with the gravel. If necessary, up to 6 inches of soil will be removed prior to installation of the temporary road entrance to ensure a hard base for geotextile fabric and rock placement. Geotextile fabric is not required at existing, graveled access road entrances. If gravel is to be left after construction, landowner approval is required. In addition, public roads will be inspected, swept, shoveled and/or scraped as necessary to keep the road surface safe and remove any debris originating from the project. If the public road is gravel, the temporary entrance is still required to be graveled. Any damages to roadway surfaces, shoulders, and bar ditches will be repaired. Typical erosion control measures at road crossings are illustrated in Figure 9. If no access is required onto the roadway the installation of a construction entrance is not required, however, safety fencing may be installed across the ROW and signs designating “no entrance” may be erected to avoid any unintentional entrances.

E. Access Roads

Typically, Columbia requires access roads to the construction and staging areas. New access roads will be built only if existing access is inadequate. The access roads will be a maximum 25 feet wide with additional width in tight turns and at intersections with public roads (this additional width must be included in the environmental surveys). Approximate location and alignment of these access roads will be shown on the project map submitted with the application. These roads will either be temporary (used for access during construction only) or permanent (used during and after construction for operation and maintenance of the facilities). All public roads are available for use as access roads without further environmental review however; all private access roads intended for use are subject to environmental reviews. Safe and accessible conditions will be maintained at all roadway crossings and access points during construction and restoration.

If tree clearing is needed for access road use, trees will be felled into the CWA of the access road itself. All trees and brush will be windrowed at the edge of the access road, with usable timber kept separate. Access road gradient will be as flat as local topography will practically allow. By breaking or changing grade frequently, fewer erosion problems will be encountered than on long, straight, continuous gradients. Interceptor diversions and/or other erosion and sediment control devices will be installed where practicable. All access roads will be maintained to provide safe access, as well as sediment control.

Roads will cross streams and wetlands as close as possible to right angles. Road gradients approaching these crossings may be flattened to decrease runoff velocity. Runoff may be dispersed just prior to the crossing by means of an interceptor diversion with a sediment filter device (compost filter sock) at the outlet. See Figures 25 and 30 for detail. Where conditions permit, new roads will be located at least 25 feet from any stream or wetland except at crossing locations. Culverts will be sized and

placed to permit water flow under the access road.

After construction, temporary access roads (including any additional width used for construction) will be graded and left intact for the landowner's benefit or removed and the area restored using the same specifications as applied to the rest of the construction work area.

F. Residential Areas

The following mitigation measures will be implemented for all residences within 50 feet of the construction work area:

- Mature trees and landscaping will not be removed from within the edge of the construction work area unless necessary for safe operation of construction equipment or as specified in landowner agreements;
- Immediately after backfilling the trench, all lawn and landscaping will be restored to final restoration, or temporary restoration pending weather and soil conditions;
- While the trench is open, the edge of the construction work area adjacent to the residence will be safety fenced for a distance of 100 feet on either side of the residence to ensure that equipment, materials and spoil remain within the construction work area;
- A minimum of 25 feet will be maintained between the residence and construction work area for a distance of 100 feet on either side of the residence. If the facility must be within 25 feet of a residence, it must be installed such that the trench does not remain open overnight.

If seasonal or weather conditions prevent compliance with these time frames, temporary erosion controls must be monitored and maintained until conditions allow completion of restoration.

G. Trenching

1. Trenching Specifications

Typically, the trench will not remain open for more than 30 days in any area unless authorized by the Environmental Inspector (additional restrictions for stream and wetland areas are provided in Section III).

- As the trench is completed, trench line breakers, as illustrated in

Figure 10, will be installed promptly at every second temporary interceptor diversion at a minimum, or at increased intervals as approved by the Environmental Inspector. Top soil will not be used to construct the breakers. The breakers reduce water velocity and erosion of the trench bottom. The breakers will be maintained promptly.

- Sediment filter devices will be installed around spoil storage areas before digging bore pits, stream crossings, and wetland crossings.

- If it is necessary to pump water from the trench or bore pits, the water will be pumped into a heavily vegetated upland area where the water will filter back into the ground, a sediment filter bag as illustrated in Figure 28, and/or through a sediment filter device such as a series of sediment logs at least 10 feet from any stream or wetland in order to minimize erosion and subsequent sedimentation of streams or wetlands. If little vegetation is present, filter sock containment will be added around the filter bag for additional sediment control. Water impounded in the trench will not be released directly or by overland flow into any **waterbody** or wetland. Dewater the trench in a manner that does not cause erosion and does not result in silt laden water flowing into a waterbody or wetland.

When the trench must remain open for a greater length of time, appropriate erosion controls and safety measures will be employed as directed by the Environmental Inspector.

2. Blasting

All drilling and blasting will be done in a cautious manner. Suitable precautions will be taken to avoid injury or damage to persons, livestock, or other property.

If blasting is necessary within 150 feet of residential or commercial buildings, an independent contractor will be hired to perform pre- and post-blast structural inspections and, if necessary, seismographic monitoring.

In those instances where blasting has the potential to affect water quantity/quality from domestic or agricultural wells or springs in the proximity of the construction work area, Columbia will conduct pre- and post-blasting (within two months of construction work restoration) testing of water wells within an appropriate distance (typically 150 feet) of the pipeline with landowner permission. These tests may include a pump inspection, flow rate, and bacteriological cultures. If a water well is damaged as a result of Columbia's activities, Columbia will provide a temporary source of water and/or compensate the owner.

3. Temporary Construction Access over the Trench Line

Where access across the trench line is required, temporary facilities such as trench plugs and fences, wooden mats or steel plates will be constructed or installed to permit safe crossing of livestock, vehicles, equipment, and persons from one side of the trench to the other.

4. Drainage Tile and Irrigation Facilities

Attempt to locate existing drain tiles and irrigation systems. Columbia personnel will contact landowners and/or the local National Resource Conservation Service (NRCS) to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction, if planned, the pipeline will be installed at a sufficient depth to accommodate the drainage tile. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s) and within US Department of Transportation (DOT) specifications. Mark locations of drain tiles damaged during construction.

Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available. Drainage tile removed, cut, broke, or otherwise damaged during construction will be repaired or replaced as illustrated in Figure 11. Temporary measures approved by the Inspector will be taken to provide suitable drainage until permanent repairs are made. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and landowner agrees.

Water flow will be maintained in crop irrigation systems unless shutoff is coordinated with affected parties.

H. Backfilling Specifications

Backfilling will follow pipe lowering as closely as practical. Topsoil will not be used to pad the pipe. Soil that has been excavated during construction and not used for backfill will be evenly spread over the cleared construction work area or removed from the site and properly disposed of at an approved disposal area. All waste materials such as barrels, cans, drums, stumps, coating and wrap, rubbish, or other refuse will not be placed in the trench.

Trench line barriers, as illustrated in Figure 10, will be placed in the trench prior to backfilling to prevent water movement and subsequent erosion. An engineer or similarly qualified professional shall determine the need for and spacing of trench line barriers. Otherwise, trench line barriers shall be installed at the spacing illustrated in Figure 10 and up-slope of any permanent interceptor diversions. Trench line barriers may be constructed of materials such as sand bags or polyurethane foam. Foam

barriers can be used if the appropriate State or Local governing agencies allow.

Excess rock, including blast rock, may be used to backfill the trench to the top of the existing bedrock profile. Care should be taken to not damage the pipeline.

I. Final Grading, Restoration and Stabilization

After construction activities, all disturbed areas will be stabilized with either (1) final grading and restoration; or (2) **temporary stabilization** measures, in order to prevent erosion and sedimentation until final grading and restoration can be completed. If construction or restoration unexpectedly continues into the winter season when conditions could delay successful de-compaction, topsoil replacement, or seeding until the following spring, file with the Secretary for review and written approval of the Director, a winter construction plan. This does not apply to projects constructed under the automatic authorization provisions of FERC's regulation.

1. Final Grading

Final grading will be completed within 20 calendar days of backfilling (10 days in residential areas), weather and soil conditions permitting. Should unsuitable soil conditions persist, or be expected to persist, for more than 20 calendar days (10 days in residential areas), the Environmental Inspector will record the conditions and require the installation of temporary stabilization measures, and final grading and restoration will be delayed. In no case shall final grading be delayed beyond the end of the next recommended seeding season.

If final grade can be established, but conditions are not ideal for permanent seeding, the Environmental Inspector will specify application of temporary stabilization measures (including temporary seeding and mulching), and may also consider concurrent application of final seed mix and mulch as provided in Table 2A, or per the local conservation authority. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed, inspected, and maintained. When access is no longer needed, the travel lane must be removed and the right-of- way restored to pre-construction contours.

During final grading, soil over the trench may be mounded to allow for future settling. Where fill in the trench or major depressions have settled below ground level, additional fill will be added as needed, and the area brought to final grade. The Environmental Inspector may approve a temporary travel lane in the construction work area, where needed, to facilitate the remainder of construction and/or restoration. This travel lane must be restored when access through the area is no longer required.

Conserved topsoil will be returned during final grading.

Excess rock will be removed from at least the top 12 inches of soil, to the extent

practicable, in all actively cultivated or rotated agricultural land, hayfields, pastures, residential areas, and other areas at the landowner's request. The size, density, and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. Diligent efforts will be made to remove rocks greater than 4 inches if off- construction work areas do not contain rocks greater than 4 inches. The landowner may approve other rock size provisions in writing. Rock that is not returned to the trench is considered construction debris, unless approved for use as mulch or for some other use on the construction work area by the landowner or land managing agency. All construction debris from all work areas must be removed unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.

Final erosion control devices including interceptor diversion/slope breakers will be installed during final grading. Sediment filter devices needed to protect off-construction work area resources will be re-installed or rebuilt promptly after final grading. See figures 6A and 6B for installation and spacing details. Final diversions will be constructed such that water does not pond in them and is conveyed off the right-of-way. Final interceptor diversions will not be installed in agricultural or pasture land without landowner's consent.

2. Soil Compaction Testing

Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to identify approximate preconstruction conditions. Use U.S. Army Corps of Engineers-style cone penetrometers or other appropriate devices to conduct tests.

Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. Alternatively, make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

Perform appropriate soil compaction mitigation in severely compacted residential areas.

3. Restoration

Restoration as defined in Section VIII (Definition of Terms), will begin within 6days of final grading, weather and soil conditions permitting. Fertilizer and lime will be disked into the soil (except rocky soils) to a depth of 3 to 4 inches to prepare a seedbed. In rocky soils, fertilizer and lime may be incorporated into the soil with tracked equipment. Seeding and mulching the construction work area will promptly

follow seedbed preparation. Ensure that mulch is adequately anchored to minimize loss due to wind and water. Mulch tackifiers used in accordance with the manufacturers recommendations may be used as an alternative. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.

The typical application rates for lime, fertilizer, seed, and mulch are listed in Table 2A. They will be used unless the right-of-way agreement, permit or local NRCS provides project-specific recommendations. If tall fescue is used, plant endophyte free certified seed.

If hydroseeding is utilized, lime and fertilizer applications should be equivalent to Table 2A unless ROW agreement, permit or the local NRCS provides project specific recommendations.

Hay or straw mulch shall be applied in accordance with Table 2A over hydroseeding. Hydromulch can be used in conjunction with (for texture purposes) but not substituted for hay or straw mulch. **Scarify** the seedbed to facilitate lodging and germination of seed.

Uniformly apply and cover seed in accordance with the written recommendations of the local soil conservation authorities or land management agencies.

Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing. Treat legume seed with an inoculate specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method. If the above recommendations are not available for conventional seeding, use 4 times the manufacturers recommended rate of inoculate. For hydroseeding, use 10 times the manufacturer's recommended rate of inoculate.

In the absence of recommendations from the local conservation authority, a seed drill equipped with a cultipacker is preferred for application, but broadcast or hydroseeding can be used at double the recommended seeding rates.
Where seed is broadcast, firm the seedbed with a cultipacker, roller or other suitable means after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be approved by the Environmental Inspector.

Restoration will not be performed in agricultural lands from the beginning of the spring thaw through May 15 unless requested by the landowner. Restoration will be coordinated with the landowner's planting schedule. Grazing deferment plans will be developed with willing landowners, grazing permittees, and land management agencies as appropriate to minimize grazing disturbance of re- vegetation efforts.

Permanent seeding, liming, and fertilizing may be performed by the landowner. The Environmental Inspector will ensure that the restoration is satisfactory and consistent with the regulatory requirements.

Restore all turf, ornamental shrubs, and specialized landscaping in accordance with

the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

Jute netting as illustrated in Figures 12A and 12B or equivalent approved by the Environmental Inspector may be used on **steep slopes** to help stabilize the construction work area. Do not use coconut fiber erosion control blanket/netting.

Synthetic monofilament mesh/netted erosion control materials should not be used in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris removed (unless requested otherwise by the landowner or land managing agency), re- vegetation is successful, and proper drainage has been restored.

Re-vegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, re-vegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

4. Temporary Stabilization

Seeding and mulching rates are provided in Table 2B. Consideration will be given to the following when determining if temporary stabilization measures are to be implemented:

- If final grading and installation of permanent interceptor diversions or slope breakers will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas);
- Anticipated weather conditions;
- Resources on and off the construction work area to be protected. If temporary stabilization measures are utilized, final grading and/or restoration must commence once weather and soil conditions permit;
- Construction or restoration activity is interrupted or won't take place for extended periods (greater than 21 days).

Apply mulch in accordance with the specifications outlined in this section, however; during temporary restoration increase mulch application on all slopes

(8 percent or more) within 100 feet of waterbodies and wetlands to a rate of 6,000 lbs./acre (3 tons).

5. **Restoring Man-Made Structures**

All existing man-made installations that are disturbed or damaged during construction along new ROW will be repaired or replaced and left in equivalent or better condition than they were found prior to construction, unless alternative arrangements made with landowners dictate otherwise. Man-made installations on existing ROW that are disturbed or damaged during construction will be addressed consistent with Columbia's encroachment policy.

6. **Off-Road Vehicle (ORV) Control**

Columbia will discuss with each landowner and park manager along new ROW (not adjacent to existing ROW) in forest lands the need for ORV control. If requested, one or more of the following ORV control measures will be installed:

- Plant conifers (pine trees) across the construction work area. The spacing of trees and length of construction work area planted should provide for adequate facility maintenance, but should be sufficient to limit access and to screen the ROW from view. Trees will not be planted directly over the pipeline.
- Install a slash and timber barrier, a pipe barrier, or a line of boulders across the construction work area to restrict vehicle access.
- Install a locking gate with fencing extending a reasonable distance to prevent bypass.
- Install "No Trespass" signs.

J. Noise Impact Mitigation and Dust Control

Construction equipment will be properly muffled and maintained to avoid producing excessive noise near **noise sensitive areas**.

Efforts will be made to control fugitive dust along all portions of the project including at sensitive areas such as residential areas and road crossings. Water trucks will be used, at a minimum, to dampen the work area if dust becomes a problem.

K. Other Controls

All projects will be maintained as clean and orderly. All solid wastes and construction/demolition, material will be disposed of in accordance with the Code of West Virginia and Legislative Rule Title 33, Series 1 (Solid Waste Management Rule).

All erosion and sediment controls on the site will be inspected at least once every seven calendar days and within 24 hours after any storm event greater than 0.5 inches of rain per 24-hour period. Inspections will be documented. Records of these inspections will be kept on-site and made available for review by regulatory personnel.

Employees will be trained on the components and goals of the SWPPP including spill response, housekeeping, and routine inspection of E&S controls.

L. Hydrostatic Testing

Typically, Columbia verifies a facility's integrity by hydrostatic testing. Water can be drawn from local sources (streams, ponds, public water supplies) in a manner that will minimize impacts to the environment and other existing users, while maintaining adequate stream flow. Water from state designed *high quality streams* or *exceptional value waters*, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies will not be used unless other water sources are not readily available and the appropriate federal, state or local agency permits its use.

Intake hoses will be screened.

Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

All required federal, state and local approvals for the withdrawal and/or discharge of hydrostatic test water will be obtained prior to such activities.

Comply with all approval/permit conditions which may include notifying the appropriate state agency of withdraw/discharge, collection of samples in accordance with permit conditions where required, and discharging in a manner to meet all discharge parameters where required.

Maintain adequate flow rates to protect aquatic life and provide water for downstream withdrawals by existing users.

All welds will be radiographically inspected or hydrostatically tested before pipe installation under waterbodies or wetlands.

The discharge of the hydrostatic test water will be performed in a manner that minimizes erosion. The energy of the released test water will be dissipated by discharging the water:

- Into a well-vegetated upland area;
- Into a tank(s)

- Into a body of water (with all required permits and meeting all conditions); or

- Through a sediment filter device and/or a sediment trap to filter out various particulate matter or allow it to infiltrate through the soil. If necessary, regulate the water discharge rate, use energy dissipation device(s); and/or install sediment barriers to prevent erosion, scour, suspension of sediments, or excessive stream flow. During the discharge, the Environmental Inspector must ensure that erosion and sedimentation are properly controlled.

Do not discharge into waters from state designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies unless the appropriate federal, state or local agency grants permission.

Methanol may be injected after discharging the water, to dry the pipe. Excess methanol will be retrieved from the facility and used during subsequent operation of Columbia's facilities.

This guidance is for hydrostatic testing of new pipe. Permitting requirements associated with hydrostatic testing of used pipe can be extensive. Contact the NRP Group prior to testing any used pipe.

M. Post Construction Activities and Reporting

Follow up inspections must be conducted of all disturbed areas, as necessary, to determine the success of re-vegetation and address landowner concerns, at a minimum, follow up inspections must be conducted after the first and second growing seasons. If re-vegetation is unsuccessful, continue re-vegetation efforts until adequately restored.

Quarterly reports must be filed with the Secretary documenting the results of follow up inspections; any problem areas, including those identified by the landowner; and corrective actions taken for at least 2 years following construction. This does not apply to project construction under automatic authorization, prior notice, or advanced notification provisions in the FERC's regulations.

III. Stream and Wetland Crossings

A. Stream Crossings

1. General

The main objective of any waterbody crossing is to construct the pipeline in a manner which minimizes erosion and subsequent sedimentation into the waterbody. Crossings will be constructed as close as possible to right angles with the waterbody channel. Adequate downstream flow rates will be maintained at all times to protect aquatic life and prevent the interruption of existing downstream uses. Each waterbody crossing will be treated as a separate construction entity, such that trenching, pipe installation, backfilling and temporary stabilization or final restoration are completed in the minimum number of consecutive calendar days possible.

Whenever a time limit is imposed on a crossing procedure, that time limit is only applicable to trenching (except blasting), lowering in, and backfilling. Clearing, grading and equipment crossing installation and removal activities are not included as part of the separate construction entity. Construction equipment will not be allowed in the water except as provided in this Section.

Unless expressly permitted or further restricted by the appropriate federal or state agency in writing on a site-specific basis, in-stream work, except that required to install or remove equipment bridges, must occur during the following time windows:

- Coldwater Fisheries: June 1 through September 30
- Coolwater and Warmwater Fisheries: June 1 through November 30

Columbia will notify authorities responsible for potable water supply intakes located within 3 miles downstream, at least one week before beginning work in the waterbody, or as required by state or local regulation.

When water levels are temporarily high, the Environmental Inspector will direct that starting any waterbody crossing be postponed until water levels subside.

Any extra work areas will be located at least 50 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. Where topographic conditions do not permit a fifty-foot setback, contact the Natural Resources Permitting Group for approval. All extra work areas must be located at least 10 feet from the water's edge and limited to the size needed to construct the crossing. Pipe assembly for the waterbody crossing is usually performed in the extra work areas prior to or concurrently with trenching.

Standards relating to spill prevention at waterbodies are contained in Section IV, (Spill Prevention).

If the facility parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody and the right-of-way except at the crossing location. Where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right- of-way to contain spoil and sediment within the right-of-way.

Waterbody buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction related ground disturbing activities are completed.

2. Crossing Techniques

Columbia typically utilizes either the dry-ditch (flume pipe), dam and pump, or wet ditch techniques to install pipelines across waterbodies. Figures 14, 15, and 16 illustrate these methods. **Upland construction** techniques may be used for **intermittent waterbody** crossings without perceptible flow at the time of the crossing, provided that a culvert is **promptly** installed to carry stormwater flow across the trench area and the erosion and sediment control devices illustrated in Figure 13 are installed.

The wet ditch method may be used when the following conditions are met:

- When the distance across the flume pipes becomes too wide for a backhoe to dig from both sides and connect the trench underneath the pipes. This measurement would vary according to the number of flume pipes, the height of the stream banks, the size and digging angle of the backhoe, the depth to bed rock, and ease of digging.

- When the crossing can be accomplished within 72 hours, however; every effort should be made to complete the crossing in one working day. All disturbed stream banks will be stabilized the same day the construction is finished.

- When the crossing is at right angles (±5º) to the stream channel.

- If water is pumped during the installation of the pipe it must be treated as per the dewatering specifications indicated in detail on Figure 29.

a) Minor Waterbodies

Minor waterbodies will be considered those which are 10 feet wide or smaller at the top of the bank. For crossings of coldwater fisheries and

coolwater and warmwater fisheries considered significant by the state, install the pipeline using the dry-ditch method or dam and pump method, unless approved otherwise, in writing, by the appropriate state agency.

For other **minor waterbody** crossings, complete in-stream construction in the waterbody using the wet ditch method within 24 hours (except for blasting and pneumatic chipping; see Section III.A.6). Limit use of equipment operating in the waterbody to that needed to construct the crossing.

b) Intermediate Waterbodies

Intermediate waterbodies will be considered those which are 10-100 feet wide at the top of the bank. The wet ditch method will be used for all **intermediate waterbody** crossings. Only the equipment necessary for excavating the trench, lowering-in the pipe, and backfilling the trench is allowed in the waterbody. Columbia will attempt to complete trenching and backfill work in the waterbody within 48 hours, unless site-specific conditions make completion within 48 hours infeasible.

For crossings of coldwater fisheries and coolwater and warmwater fisheries considered significant by the state 10 to 30 feet in width, install the pipeline using the dry-ditch method or dam and pump method, unless approved otherwise in writing by the appropriate state agency.

c) Major Waterbodies

Major waterbodies will be considered those which are 100ft wide or larger at the top of bank. Major waterbodies could also include waterbodies that are smaller, if there are special conditions that warrant a site-specific plan be created, such as threatened or endangered species habitat, stream classification, or other factors. Due to their sensitive nature, **major waterbody** crossings will have site-specific construction plans approved by the Natural Resource Permitting group. Horizontal Directional Drilling may be considered as an alternative for these crossings.

3. Clearing

Tree and brush clearing will be performed as previously described in Section II, “Upland Construction”. All cleared materials will be disposed of at least 50 feet from the water’s edge.

4. Grading

Grading equipment will not enter the water to grade the banks. Waterbody banks

will be graded only where, and as much as, necessary to permit safe and efficient operation of construction equipment. During grading operations, sediment filter devices will be installed across the entire construction right-of-way promptly and as close to the water as practical. Removable sediment filter devices must be installed across the travel lane. These removable sediment filter devices, if removed during the day, must be re-installed by the end of the work day or when precipitation is imminent. All disturbed areas within 50 feet of the water's edge will be promptly mulched. The mulch will be maintained until the waterbody crossing restoration is complete. Spoil from grading will be piled at least 10 feet from the stream banks and immediately protected with sediment filter devices so that it will not erode into the waterbody. On waterbody crossings with approaches sloped 5 percent or greater, interceptor diversions will be installed 50 feet from the water's edge to divert surface runoff into adjacent vegetation. If vegetation is sparse or nonexistent, a sediment filter device (not including silt fence) will be installed at the discharge of the diversion. Install a sediment filter device across the entire construction right-of-way at the base of slopes 5 percent or greater where the base of the slope is less than 50 feet from a stream. Leave adequate room between the sediment filter device and base of the slope for sediment deposition.

Construction equipment bridges consisting of culvert(s) with clean rock fill of non-erodible material or equipment pads/timber mats, as illustrated in Figures 18 and 19, will be installed during grading operations at all waterbodies. For proper culvert installation, the Environmental Inspector may permit grading/excavating equipment to enter the water. Equipment bridges are not required at minor waterbodies that do not have a state-designed fishery classification (for example, agricultural or intermittent drainage ditches). However, if an equipment bridge is used, it must be constructed in accordance with this ECS. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the stream.

5. Trenching

Notifications to applicable jurisdictional agencies will be made at least 2 days prior to any trenching in waterbodies, or as specified in permits.

Prior to trenching within the waterbody, water impounded in the upland trench will be pumped into a properly installed filter bag (Figure 29) and/or a series of sediment logs, or a heavily vegetated upland area where the water can filter back into the ground. Prevent the flow of spoil or silt-laden water into any waterbody.

Sediment filter devices for trench spoil will be installed prior to or during commencing trenching activities. Sediment filter devices can be temporarily removed from the trench line to allow trenching activities to proceed and then promptly replaced.

All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction ROW at least 10

feet from the water's edge or in additional extra work areas. For all new construction activities, the minimum depth of cover for all waterbody crossings is 48 inches in normal soils and 24 inches in consolidated rock.

Trench plugs will be used at all non-flumed waterbody crossings to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs must be of sufficient size to withstand upslope water pressure.

For dry ditch method crossings, use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in order to achieve an effective seal). In addition, do not remove flume pipe during trenching, pipe laying, backfilling activities, or initial streambed restoration efforts.

6. Blasting

During the pre-planning of waterbody crossings, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the waterbody bed will be tested for consolidated rock prior to trenching.

Blasting will not be done within waterbody channels without prior approval from applicable government authorities having jurisdiction and at least 2 day notice to the authority, or as specified in permits.

If the waterbody bottom is consolidated rock, it can be drilled and shot at any time prior to commencing the crossing. However, removal of shot rock, and any additional drilling, shooting and material removal, must be completed within the minimum number of consecutive calendar days practical. The time frame for completing the crossing will immediately commence once a trench of appropriate dimensions is established.

7. Backfilling

Waterbody bottoms will be returned as near as practical to their original contours. Spoil from the trench will be used as backfill. Clean gravel or native cobbles will be used for the final one foot of fill in the backfilled trench in all coldwater fisheries.

The sediment filter devices removed at the stream, during active construction activity, will be promptly reinstalled after backfilling.

8. Restoration

The preferred restoration method is to achieve final grade and restore the waterbody, its banks, and 50 foot buffers within 24 hours of backfilling. In the absence of site-specific seeding recommendations, the specifications listed in

Table 2A will be used. If conditions do not permit the preferred method, the construction work area not in use for access will be promptly rough graded and stabilized in accordance with Table 2B. Stabilize waterbody banks and install permanent sediment barriers/sediment filter devices within 24 hours of completing the crossing. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.

Liquid mulch binders will not be used within 100 feet of waterbodies. For each waterbody crossed, install a permanent interceptor diversion/slope breaker and a trench breaker at the base of slopes near the waterbody. Locate the trench breaker immediately upslope of the interceptor diversion/slope breaker. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

All equipment bridges will be removed once access in the area is no longer required.

Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector. If the waterbody banks are such that an unstable final soil grade would result and vegetative stabilization is inadequate, the Environmental Inspector will require mechanical stabilization of the waterbody banks. Mechanical stabilization includes riprap, gabions, jute netting, etc.

Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques, such as seeded erosion control fabric.

Re-vegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferable woody species.

Application of riprap must comply with the US Army Corps of Engineers (COE) or its delegated agency permit terms and conditions. In general, riprap will be of field or quarry run stone, which is hard and durable. The riprap will be large enough to prevent normal waterbody current from moving it, typically 6-inch rock for slow moving waterbodies and 12-inch or larger rock for others. The riprap will be placed at least 18-inches thick and generally thicker at the base. The riprap slope will be no steeper than 1:1 and should conform to the remainder of the waterbody bank slopes where they are flatter than 1:1.

Install erosion control fabric, Figures 12A and 12B, such as jute netting or bonded fiber blankets at a minimum, on waterbody banks at the time of final bank re-contouring. Synthetic monofilament mesh/netted erosion control blanket cannot be used in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife. Anchor the erosion control fabric with staples or other appropriate devices.

Sediment filter devices will be removed once permanent re-vegetation is successful.

B. Wetland Crossings

1. General

The main objective of any wetland crossing is to construct the pipeline and restore the original contour of the wetland. Wetlands will be marked in the field by a knowledgeable person prior to the start of construction with signs and/or highly visible flagging until construction is complete. The Environmental Inspector will maintain these field markings during construction. A maximum 75-foot wide construction work area may be used through wetlands. Mulch will not be used as a temporary erosion control measure in wetlands.

Aboveground facilities will not be located in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with US DOT regulations.

When water levels are temporarily high, the Environmental Inspector will direct that starting construction in the wetland will be postponed until after the water levels subside.

Standards relating to spill prevention at wetlands are contained in Section IV, (Spill Prevention).

2. Crossing Techniques

For wetland crossings without standing water or saturated soils, upland construction techniques can be used provided the top 12 inches of soil taken from the trench is stockpiled separately from the remaining excavated material. If standing water or saturated soils become present during construction activities in wetlands that were initially dry, construction will revert back to standard wetland crossing techniques as outlined in this section. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap or matting), In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way.

Wetland crossings in non-saturated soil wetlands will be constructed in a manner that will minimize the amount of time construction activities are occurring in the wetland, such as the length of time the topsoil is segregated and the trench is open.

Wetland crossings with standing water or saturated soils will be constructed as separate construction entities, such that trenching, pipe installation, backfilling, and restoration are completed in the minimum number of consecutive calendar

days necessary. Clearing, grading and equipment crossing installations are not included as part of the separate construction entity. The “push-pull” or “float” technique of pipe installation will be utilized whenever water and other site conditions permit. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

If standing water or saturated soils are present or if construction equipment causes ruts or mixing of the topsoil and subsoil, use **low- ground-weight** construction equipment, or operate normal equipment on timber matting (only 2 layers), or mats. Timber matting must be in good condition and not have large holes in it where sediment could enter the wetland. Tree stumps, rock, gravel, soil imported from outside the wetland or brush will not be used to stabilize the construction work area or as equipment pads in wetlands. Remove all equipment mats, and timber matting during restoration of the wetland.

Staging areas will be located at least 50 feet from the wetland edge except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land and will be limited to the minimum necessary to construct the crossing. If topographic conditions do not permit a 50-foot setback, these areas must be located at least 10 feet from the wetland’s edge with prior approval from the Natural Resources Permitting group.

The only access roads, other than the construction work area, that can be used in wetlands without FERC approval are those existing roads that can be used with no modification and no impact on the wetland.

Limit construction equipment operating in wetland areas to that needed to clear the construction work area, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practicable. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction work area.

A typical wetland crossing is illustrated in Figure 19.

3. Clearing

Tree and brush clearing will be performed as previously described in Section II, (Upland Construction). Cut vegetation off at ground level, leaving existing root systems in place, and remove (vegetation) from the wetland for disposal.

4. Grading

Grading in wetlands will consist of the minimum necessary for safe and efficient equipment operation. Limit pulling of tree stumps and grading activities to directly over the trench line. Do not grade or remove stumps or root systems

from the rest of the construction work area in wetlands unless the Chief Inspector and **Environmental Inspector** determine that safety- related construction constraints require removal of tree stumps from under the working side of the construction work area. Areas where stumps are removed will be noted by the Inspector so, if necessary, those areas can be replanted with woody vegetation as described in wetland restoration.

Where wetlands are adjacent to the construction right-of-way and right-of-way slopes towards the wetland, install sediment barriers along the edge of the construction work area to prevent sediment flow into the wetland. Remove these sediment barriers after successful restoration has occurred.

Sediment filter devices will be installed promptly across the construction work area prior to or during grading at any wetland edge and maintained until construction work area re-vegetation is complete. Temporary interceptor diversions will be installed adjacent to wetlands. Locations for these devices are illustrated in Figure 19.

5. Trenching

Sediment filter devices can be temporarily removed from the trench line to allow trenching activities to proceed. Spoil piles will be protected with sediment filter devices to prevent the flow of spoil off the construction work area.

6. Blasting

During the pre-planning of crossing wetlands with standing water or saturated soils, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the wetland will be tested for consolidated rock prior to trenching. If the wetland has consolidated rock, it must be drilled and shot as part of the single construction entity.

7. Backfilling

If trench dewatering is required, the water will be filtered and discharged through a sediment filter bag (Figure 29) and/or a series of sediment logs or into a heavily vegetated area outside of the wetland (where the water will filter back into the ground), so that no silt-laden water enters directly into a wetland or waterbody. Remove any dewatering structure as soon as possible after the completion of dewatering activities. Spoil from the trench will be used as backfill. The surface will be re-contoured as closely as practical to the original so that drainage patters will not be changed. In wetlands without standing water or saturated soils, the conserved top soil layer will be returned to the surface during backfilling.

Sediment filter devices will be promptly re-installed after backfilling. Where the pipeline trench may drain a wetland, construct trench line barriers and/or

seal the trench bottom as necessary to maintain the original wetland hydrology. For each wetland crossed, install a permanent interceptor diversion and trench line barriers at the base of slopes near the boundary between the wetland and adjacent upland areas. Locate the trench line barriers immediately upslope of the interceptor diversion.

Concrete coating activities will not take place within 100 feet of any wetland.

8. Restoration

For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker/interceptor diversion across the construction right-of-way at the base of a slope greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers/sediment filter devices as shown in Figure 19. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

Consult with the appropriate land management or state agency to develop a project-specific wetland restoration plan. The restoration plan should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species (e.g., purple loosestrife and phragmites), and monitoring the success of the re-vegetation and weed control efforts.

Upon completion of construction in wetland areas with standing water or saturated soils, all access improvements will be promptly removed. In the absence of specific recommendations from conservation authorities, the seed mix and rate specified in Table 2B will be used. Fertilizer, lime or mulch will not be used, unless required in writing by a jurisdictional agency.

Fertilizer, lime, or mulch will not be used in wetlands unless required in writing by the appropriate federal or state agency. Asphaltic emulsions will not be used to stabilize mulch within 100 feet of wetlands. Liquid mulch binders will not be used within 100 feet of wetlands.

IV. Spill Prevention, Containment and Control

A. General

Spills of any amount of petroleum products or polluting materials are to be prevented. All employees handling fuels and other hazardous materials must be properly trained. All equipment must be in good operating order. Fuel trucks transporting fuel to on-site equipment must travel on approved access roads. The following will be followed to help avoid spills and minimize the impact of spills which accidentally occur:

- Bulk quantities up to 5,000 gallons of diesel fuel and 5,000 gallons of gasoline will be stored in one location (the fuel depot) for the Project. Adequate spill containment measures, such as containment dikes, combined with impervious lining will be installed before fuel storage tanks are filled, and will be maintained throughout the Project. Bulk quantities of hazardous liquids (e.g., solvents and lubricants) will be stored at the fuel depot locations.

- Fuel can be stored at the equipment staging areas and as much equipment as practical will be refueled there. Any equipment that must be refueled in the field will be fueled from tanks carried to the work site. Fuel carriers (greater than 110 gallons capacity) will not be permitted to cross wetlands or ford waterbodies. Equipment refueling will not be performed within 100 feet of any body of water or wetland, except by hand-carried cans (5 gallon maximum capacity), when necessary. If construction equipment must be refueled within 100 feet of a waterbody, follow the procedures outlined in the project-specific SPCC Plan. Care will be taken during refueling not to overfill or spill fuel onto the housing of equipment.

- Lesser quantities of fuel (up to 500 gallons) and solvents and lubricants (e.g., motor oils, hydraulic fluid) may be stored along the construction work area as necessary to service equipment used on the Project (quantities vary depending on the size of the construction spread being used), provided that this storage does not conflict with other parts of this plan. Sorbent booms and clean-up kits will be kept at all storage locations and will be readily available at all times.

- All fuel storage areas will be located at least 100 feet from streams, ponds, or wetlands; at least 200 feet from active private water wells, and at least 400 feet from municipal water wells, unless using an operational fuel storage area established on Columbia property. All fuel storage areas will not be located within any designated municipal watershed area (except at locations designated for these purposes by an appropriate governmental authority): Equipment servicing, lubricating and refueling will also be in accordance with these requirements whenever possible (i.e., except when stationary equipment such as drilling rigs is being used). Where these conditions cannot be met, the Environmental Inspector will prepare a supplemental SPCC plan, based on field conditions, to protect these resources.

- Use of hazardous materials for vehicle maintenance will follow the same requirements mentioned above for equipment refueling. Impervious or sorbent materials will be placed under the work area before the work begins. Additional sorbent materials will also be readily available. Waste materials created during maintenance (e.g., used oil) will be collected for proper disposal. The work site and the vehicle will be checked by a

Columbia inspector after the maintenance work is complete to ensure that all hazardous materials are properly contained. All waste material, including partially used or empty containers, discarded parts, clean up rags, and used sorbent materials, as well as discarded hazardous materials containers (e.g., oil cans, grease tubes), will be collected for proper disposal.

- All motor fuel, lube oil, chemicals, and other polluting substances will be tightly sealed and clearly labeled during transportation and storage.

- Fuel trucks, pumps, mechanic's vehicles, the contractor's foremen's vehicles, Columbia Environmental Inspector vehicles, and each construction crew will be equipped with appropriately sized spill kits containing absorbent materials approved for petroleum products and have sufficient tools and material to stop leaks.

- Construction equipment will not be washed in any body of water or wetland, nor will runoff resulting from washing operations be permitted to directly enter any body of water or wetland area.

- Construction equipment, vehicles, materials, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products will not be parked, stored, or serviced within 100 feet of all bodies of water and wetlands. These activities can occur closer if the Environmental Inspector determines there are no reasonable alternatives and appropriate steps are taken to prevent spills and provide prompt cleanup in the event of a spill.

- Pumps operating within 100 feet of a waterbody or wetland boundary must utilize appropriate secondary containment systems.

- Concrete coating activities cannot be performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use. These activities can occur closer only if the Environmental Inspector determines there is no reasonable alternative and appropriate steps (including secondary containment structures) are used to prevent spills and provide for prompt cleanup in the event of a spill.

- All equipment will be checked, by a Columbia inspector, daily for leaks prior to beginning work in bodies of water or wetlands. Steps will be taken to repair leaks or remove the equipment from service, if necessary.

If barge mounted equipment is to be employed, the contractor will develop specific spill-prevention plans to be reviewed and approved by Natural Resource Permitting group.

B. Spill Cleanup

Spills occurring during construction, operation and maintenance are to be reported immediately to the Monitoring Center at 1-800-835-7191 in accordance with Columbia policies, plans and procedures (Plan Number 120.02.01). Columbia's Environmental Health and Safety department will be responsible for contacting the appropriate agencies, except as provided for below.

If the call to the Monitoring Center is not returned within 30 minutes ***and*** the spill has impacted water, the person discovering the spill or release will contact the National Response Center at 1-800-424-8802 and the West Virginia Department of Environmental Protection at 1-800-642-3074 and report the release. That person will continue calling the Monitoring Center until a representative is reached.

If a spill should occur, Columbia will ensure immediate action is taken to minimize the impact of the spill, and see that appropriate cleanup action is immediately undertaken.

In the event of a spill into or in the vicinity of bodies of water or wetlands, the following will occur immediately:

- Source will be immediately stopped;
- Spill will be contained by placing sorbing booms or constructing dikes;
- Spill will be collected with sorbing materials, skimmed off water surfaces with booms, and/or the contaminated soil will be excavated;
- Waste materials will be properly stored and disposed in accordance with Columbia policy.

The affected areas will be restored as closely as possible to their previous condition.

If the spill is such that Columbia personnel or the on-site contractor cannot immediately and effectively respond, Columbia's environmental contractor, who specializes in spill cleanup, will be employed.

V. Environmental Construction Management and Inspection

A. General

Columbia is responsible for compliance with the environmental conditions contained in the project's EM&CP, which include all permits and other approvals. One or more Environmental Inspectors will be assigned to every project and will report to the Natural Resources Permitting group. At least one Environmental Inspector is required for each construction spread during active construction or restoration. Environmental Inspectors shall have peer status with all other activity inspectors.

B. Environmental Inspector

The Environmental Inspector is responsible for assuring that the construction activity is performed in accordance with the environmental conditions of the EM&CP and landowner requirements and has the authority to stop work and order appropriate corrective action as outlined in Section VI.E. For construction activities that are found by the Natural Resource Permitting group to have minimal environmental impacts, the Environmental Inspector may also serve to monitor other construction functions. At a minimum, the Environmental Inspector(s) shall be responsible for:

- Inspecting construction activities for compliance and ensuring compliance with the requirements of the EM&CP, ECS, and any permits, landowner agreements or FERC certificates obtained for the Project;
- Identifying, documenting and overseeing corrective actions, as necessary to bring an activity back into compliance;
- Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing and maintained throughout construction;
- Verifying the location of drainage and irrigation systems;
- Identifying erosion/sediment control and stabilization needs in all areas;
- Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetlands, waterbodies, and sensitive species habitat;
- Verifying that trench dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment near the point of discharge into wetlands or waterbodies, cultural resource sites, and sensitive habitats. If such deposition is occurring, the dewatering activity shall be stopped and the design of the discharge shall be changed to prevent reoccurrence; and verify that dewatering structures are removed after completion of dewatering activities;
- Verifying the testing of subsoil and topsoil in agricultural and residential areas to measure compaction and determine the need for corrective action;
- Advising the Chief Inspector when conditions (such as wet weather or frozen soils) make it advisable to restrict construction activities in agricultural areas;
- Ensuring restoration of contours and topsoil;
- Verifying that the soils imported for agricultural or residential use are

noxious weed and soil pest free, unless otherwise approved by the landowner;

- Ensuring that temporary erosion controls are properly installed and maintained; Inspecting temporary erosion control measures at least on a daily basis in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation, and within 24 hours of each 0.5 inch of rainfall. This responsibility may be transferred to field operations after construction is complete but before restoration is successful;

- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;

- Keeping records of compliance with the environmental conditions of the (EM&CP and any certificates) and other federal or state environmental permits during active construction and restoration;

- Keeping records of the mitigation measures proposed or approved as part of the FERC Order, and/or other federal, state, or local environmental permits during active construction and restoration;

- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

- Establishing a program to monitor the success of restoration;

- Implementation of this program may be transferred to (Field Services) upon completion of construction and restoration activities;

- Looking for evidence of contamination and, if found, cease activities in that area and notify the Environmental Health & Safety department and the Natural Resource Permitting group and wait for further instruction. If the contamination is determined to be hazardous, an experienced hazardous waste contractor will be mobilized to handle the waste; the hazardous waste contractor will follow a site-specific health and safety plan and standard operating procedures for working in hazardous environments, which is maintained by the Environmental Health & Safety department;

- Verifying the location of signs and visible flagging marking the boundaries of wetlands, waterbodies other sensitive resource areas, or areas with special requirements along the construction work area; and

- Verifying the locations for any disposal of excess construction materials for beneficial reuse comply with applicable laws and regulations.

C. Environmental Training

The Engineering & Construction Project Manager assigned to the construction activity and/or the Columbia employee in responsible charge, will be responsible for assuring that the Environmental Inspector(s), other inspectors and any contractor's foreman have been trained in all environmental aspects of the activity, and fully understands the environmental conditions contained in the activity's EM&CP.

The Natural Resource Permitting group staff will conduct training for construction personnel when sensitive resources are present, when permit/certificate conditions mandate, or when requested by the Team Leader.

D. Contractor's Environmental Compliance Specialist (Environmental Foreman)

For construction activities that utilize an outside contractor, the contractor will be required to provide at least one qualified environmental compliance specialist. This specialist will become thoroughly familiar with Columbia's EM&CP for the activity.

The specialist will be responsible for the contractor's efforts to correctly install and maintain environmental control devices and for construction in environmentally sensitive areas. Contractor's specialist will work in cooperation with Columbia's employees responsible for environmental compliance.

The Contractor's Environmental Foreman must be available at all times during the project and have the appropriate number of available employees to adequately implement the project's EM&CP.

E. Environmental Construction Management

The Environmental Inspector and each functional inspector shall have the authority to stop work on a particular construction function to which they are assigned if it deviates from the environmental conditions of the activity's EM&CP, as well as FERC Orders, stipulations of other environmental permits or approvals, or landowner easement agreements. The deviation shall be reported immediately to the Columbia employee in responsible charge of the activity and the Environmental Inspector. The Columbia employee in responsible charge, the Engineering & Construction Team Leader and the Natural Resource Permitting group department will be responsible for the resolution of the deviation. The Environmental Inspector shall also have the authority to order appropriate corrective action.

Stop work authority for the entire construction activity rests with the Columbia employee in responsible charge or the Engineering & Construction Team Leader.

The Natural Resource Permitting group may, from time to time, perform inspections of construction activities to review the implementation of the EM&CPs. The Natural Resource Permitting group will have stop work authority during these inspections should deviations from the activity's EM&CP occur. Any corrective actions that are

required shall be taken as directed by the Natural Resources Permitting Group.

F. Environmental Variances/Modifications

Unapproved variances from or modifications to the EM&CP and this ECS are not permitted. Any proposed variance from the EM&CP will require approval from the EM&CP preparer, prior to commencing the activity. The approval for a variance will be in writing. In instances where written approval is not practical (i.e., emergencies and weekends), verbal approval may be given provided that written confirmation is provided as soon as possible.

Any proposed variance from this ECS will require approval from the Natural Resource Permitting group prior to commencing the activity.

VI. Emergency Construction

In the event of an emergency, the Company employee in responsible charge will take such action as is necessary to contain the emergency giving due regard to minimizing environmental impact. In conjunction with other Columbia policies, the requirements contained in this ECS will be followed as close as possible. Columbia will notify DEP if such circumstances arise.

[1]Will include all environmental and regulatory mandated surveys such as but not limited to, threatened and endangered species surveys, archeology surveys, wetland delineations etc.

[2]Deviations that involve measures different from those contained in this ECS will only' be permitted by written approval from the Natural Resource Permitting group. The Natural Resource Permitting group may be required to obtain written approval from the Director of the Office of Pipeline Regulation (OPR) (Federal Energy Regulatory Commission), or his/her designee, unless specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land. The Natural Resource Permitting group shall coordinate the filing of other agency requirements with the Secretary of the Commission (Secretary). This filing shall be prior to construction.

VII. Winter Season Construction Plan

A. General

Columbia will typically initiate a winter season construction plan for projects taking place on or after November 1 of each season, as well as projects where all construction activities (including restoration) have not been completed prior to November 1 of each season. For the purposes of this plan, the winter season will be defined as from November 1 – March 15 of each year. The Natural Resource Permitting group, in conjunction with the Environmental Inspector, will determine if soil

temperatures, depth of soil freezing, snow accumulation, historical regional conditions, or pending weather forecast dictate initiating the winter season construction plan prior to these dates, or allow for extending these dates. If a project's primary regulatory agency has winter construction regulations or permit conditions, Columbia will defer to those, rather than this winter season construction plan. The winter season construction plan will apply to projects taking place within the portions of the Columbia's pipeline system where adverse winter conditions could be expected. Typically, this will include New York, New Jersey, Pennsylvania, Maryland, Delaware, West Virginia, Ohio, and Kentucky.

1. Snow Removal and Storage

Removal of snow from the construction workspace may be necessary to provide safe and efficient working conditions, as well as to expose soils for grading and excavation. Snow may also need to be removed along access roads to allow safe access to the ROW.

Snow storage will take place within ROW or approved workspace. Care will be taken to avoid mixing snow with soil. Gaps will be provided in snow stockpiles to allow for site drainage or existing drainage patterns, with the appropriate erosion and sediment control devices installed. Snow can also be blown off ROW, with landowner approval, and spread evenly to minimize damage to woody vegetation or other resources off ROW.

Snow may be used for beneficial uses, such as insulation over the trench line prior to excavation, if practical, or to reduce frost penetration along the trench line. Snow can also be used to build frost roads through wetlands and other saturated or otherwise unstable areas. Temp gates/fence crossings will occur prior to or concurrent with snow removal activities and in accordance with landowner requirements.

Construction signage will be used to designate sensitive areas, cultural resource sites, protected species habitat, or other avoidance areas to prevent inadvertent damage during snow removal activities.

2. Temporary Erosion and Sediment Control

In areas where there is shallow freezing that occurs in the morning and evening followed by a daytime thaw, different construction activities may be approved or restricted by the Chief Inspector or Environmental Inspector, depending on the time of day. Columbia will attempt to install the necessary temporary erosion and sediment control devices in advance of the winter season, where possible. All erosion and sediment controls will be inspected on a weekly basis, within 24 hours of a 0.5 inch rainfall event, and within 24 hours of a large snowmelt event. Columbia will keep an Environmental Inspector and environmental labor crew on site or on call through the winter season and periods of thaw to monitor erosion control structures and stabilization efforts and make adjustments or repairs as

necessary and as ROW conditions allow. Crews will have the proper equipment available to allow access to the ROW under soft soil conditions, such as all-terrain vehicles with oversized tires, to prevent rutting, topsoil mixing, and damage to other temporary erosion controls such as drivable berms.

3. Topsoil Segregation

Topsoil will be segregated during winter construction in the same locations and manner as during non-winter construction. Long-term topsoil stockpiling to manage the topsoil and accomplish more effective seeding and restoration may be necessary after the spring thaw.

When topsoil is frozen at the time of topsoil stripping, multiple passes (vs. a single pass) with a bulldozer or other specialized equipment may be necessary to remove only the topsoil and not the subsoil.

Restoration of topsoil will ideally occur after both the stockpiled topsoil and the exposed subsoil have thawed, the ground has dried following the spring melt, and the soils are more easily worked. Right-of-way stabilization measures will be implemented regardless of whether topsoil restoration occurs under frozen conditions or is delayed until spring thaw. Some options for temporary stabilization of the ROW and segregated topsoil pile include mulching and dormant seeding. Frozen topsoil may be placed over the disturbed areas if the Environmental Inspector determines it reasonable to do so.

If a landowner requests permanent stabilization be initiated within the winter season, Columbia will comply with the landowner request and/or relevant terms of the landowner agreement.

4. Backfilling

The longer time that excavated materials from the trench are exposed to freezing ambient air temperatures, the more difficult it can become to properly backfill the trench with these materials. This may give the perception that there is significant excess spoil material left after trench backfill is completed. Rather than removing the “excess” material, a slight crown could be created over the trench line to allow for subsidence once the material has thawed.

Crowning material over the trench or ditch line may be a suitable practice where trench subsidence is anticipated. The crown will be constructed directly over the backfilled trench with native material. Subsoil used to build the crown should not extend above natural surface grade. The crown will be capped with native topsoil material to ensure elevations will be restored with topsoil at the surface. If the topsoil layer has been removed as a block of frozen material, the blocks will be placed on top of the trench line as part of the crown and be pieced together to the extent practicable to prevent large gaps following thawing of the material. Small gaps will be left in the crown to allow for natural surface drainage before the

material is fully settled during spring and summer thaw. Columbia will monitor for subsidence and excessive crowning conditions.

Columbia will minimize the amount of open trench during frozen conditions to reduce the risk of freezing excavated spoil materials. Outer layers of a frozen spoil pile will be stripped of in order to use unfrozen inner subsoil first during backfilling. The remaining frozen subsoil will be broken into smaller pieces prior to backfilling to reduce the size of voids in the backfilled trench. Specialized equipment may be needed to break up frozen backfill material to minimize future subsidence.

5. **Restoration**

The Natural Resource Permitting department, in conjunction with the Project Manager and Environmental Inspector, will determine whether the project can be completely restored during the winter season or if permanent restoration activities will be delayed until after the spring thaw. If permanent restoration will take place during the winter season, the steps shown in the upland portion of this ECS will be followed, along with Table 2A. If permanent restoration will be delayed, subsoil will be left in a roughened condition to slow the sheet flow of water. All open areas will be backfilled or provided safety fencing for protection. The exception to this practice will be pipelines left uncovered for longwall mining activities.

All disturbed areas that are unable to have permanent restoration completed will be mulched or have soil tackifiers applied. See Table 2B for temporary stabilization application rate.

To ensure adequate vegetation growth when seeding during the winter season, higher seeding rates will be considered, to account for lower germination success, on a case by case basis. Cold weather grasses will also be utilized.

B. Wetland and Waterbody Crossing

Wetland and waterbody crossings during winter construction will be constructed in the same manner as non-winter construction. Spoil material with high water content (e.g., non-cohesive soils) can freeze to the ground surface in its storage location. If this occurs, separation of wetland and other soils will take place to the maximum extent practicable.

The environmental inspector can delay wetland or waterbody crossings when winter conditions warrant such delay.

C. Dewatering

When dewatering activities are necessary during freezing conditions, pumps may have to be installed in small, heated shelters to prevent the pumps from freezing and becoming non-operational or causing damage to the pumps that could result in a spill or leak of lubricants or fuel. Dewatering activities performed during frozen conditions should be continuously monitored and adjusted as necessary. Discharge

locations will be carefully evaluated and selected based on site conditions including vegetation cover, soil type, and topography. Columbia will attempt to install dewatering structures (e.g., filter bags) earlier in the construction process when ground conditions are favorable for installation, where feasible. Dewatering structures will be promptly removed after use to prevent freezing and proper cleanup. All spill prevention measures described in Section III (Spill Prevention, Containment, and Control) of this ECS will also be followed during winter season construction.

VIII. Definition of Terms

AGRICULTURAL LANDS: Permanent or rotated croplands, hayfields, and pastures.

COLUMBIA: Columbia Gas Transmission Corporation

COE: U.S. Army Corps of Engineers

CONSTRUCTION WORK AREA (CWA) Construction work areas include permanent and temporary ROW, contractor's yards, pipe and materials storage yards, staging areas, and access roads.

ECS: Environmental Construction Standards

ENVIRONMENTAL INSPECTOR: The Inspector responsible for environmental compliance on a construction project.

EPA: Environmental Protection Agency

FWS: U.S. Fish and Wildlife Service

EM&CP: Environmental Management and Construction Plan

FINAL GRADING: Includes returning the construction work area as closely as practical to its original contour, redistributing conserved topsoil, soil compaction testing in agricultural lands, and installing final interceptor diversions.

IMMEDIATELY: Without interval of time; "right now".

INSPECTOR: Collectively: the Chief Inspector, Environmental Inspector, Environmental Coordinator, Utility Inspector, or any other inspector assigned to do an environmental task.

INTERMITTENT WATERBODY: A waterbody channel which generally carries water in the spring or immediately after a rain event; designated on topographic maps and environmental construction drawings with a broken line.

INTERMEDIATE WATERBODY: A waterbody greater than 10 feet at the water's edge at the time of construction but less than or equal to 100 feet wide.

LOW-GROUND-WEIGHT: Construction equipment that is designed “specifically for” or “frequently used in” areas where compaction and sinking is to be minimized. This equipment can be less than 5lbs/in^2 or contain wider tracks than the standard minimum size width tracks for the model equipment to be used.

MAJOR WATERBODY: A waterbody greater than 100 feet wide at the water's edge at the time of construction.

MINOR WATERBODY: A waterbody less than or equal to 10 feet wide at the water's edge at the time of construction.

MSDS: Material Safety Data Sheet

NRCS: Natural Resource Conservation Service

NOISE SENSITIVE AREA: Includes residences, schools, churches, cemeteries, hospitals, farms, camping facilities and outdoor amphitheaters and playgrounds.

ORV: Off-road vehicle.

PERENNIAL WATERBODY: A waterbody which generally flows all year in years of normal rainfall; waterbody level is generally lowest in the fall, highest in the spring; designated with a solid line on topographic maps and environmental construction drawings.

PROMPTLY: By the end of the work day.

REMOVABLE SEDIMENT FILTER DEVICES: Compost filter socks, Erosion Eels, straw wattles, or other similar BMPs.

RESTORATION: Includes fertilizing, liming, disking, seeding and mulching, and crimping mulch.

RIVER: A waterbody which is 100 feet wide or more.

ROW: Right-of-way.

SCARIFY: To make shallow cuts into the soil surface. This should be accomplished with a disk, rake, tracked equipment (grousers) or other suitable means.

SEDIMENT FILTER DEVICE: Properly embedded silt fence, erosion control logs, or other approved device.

SPCC: Spill Prevention Control and Countermeasure Plan

STEEP SLOPE: Slope of approximately 33% or greater.

TEMPORARY STABILIZATION: Includes installing temporary interceptor diversions and sediment filter devices, mulching critical areas and at times, seeding to hold soil in place

until final grading and restoration can be accomplished.

UPLAND CONSTRUCTION: All areas which are not waterbodies, rivers, streams, or wetlands.

WATERBODY: Includes any natural or artificial waterbody, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes.

WETLAND: An area of special concern with soils prone to holding water for long periods of time, generally also characterized by distinctive plants such as rushes, sedges, cattails, or certain trees. Includes any area that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

IX. **Tables**

X. **Table 2A – Permanent Seed Mix for Upland Row and Waterbody Crossings**
Table 2B – Seed Mix for Temporary Stabilization
Table 2C – Seed Mix Requirements in Wetlands

TABLE 2A – PERMANENT SEED MIX FOR UPLAND ROW AND WATERBODY CROSSINGS	
TYPE	RATE (lbs/ACRE)
SEED[1]	
ORCHARD GRASS AND/OR TALL FESCUE[2]	29
BIRDSFOOT TREFOIL (EMPIRE)[3]	9
ANNUAL RYE	12
FERTILIZER	
10–10–10 (OR EQUIVALENT)	600[4]
MULCH	
HAY OR STRAW	4,000
AGRICULTURAL LIME	4,000

[1] PURE LIVE SEED WITHIN 12 MONTHS OF TESTING

[2] IF TALL FESCUE IS USED, PLANT ENDOPHYTE–FREE CERTIFIED SEED

[3] LEGUMES TO BE INOCULATED BY MANUFATURER'S RECOMMENDATIONS, IF NOT AVAILABLE LEGUMES ARE TO BE INOCULATED AT 4 TIMES RECOMMENDED RATE FOR CONVENTIONAL METHODS AND 10 TIMES RECOMMENDED RATE FOR HYDRO SEEDING

[4] WHERE WOOD CHIPS ARE SPREAD, ADDITIONAL NITROGEN (12 TO 15 lbs/TON OF CHIPS) WILL BE SPREAD

[5] SEED RATE MUST BE DOUBLED FOR BROADCAST SEEDING.

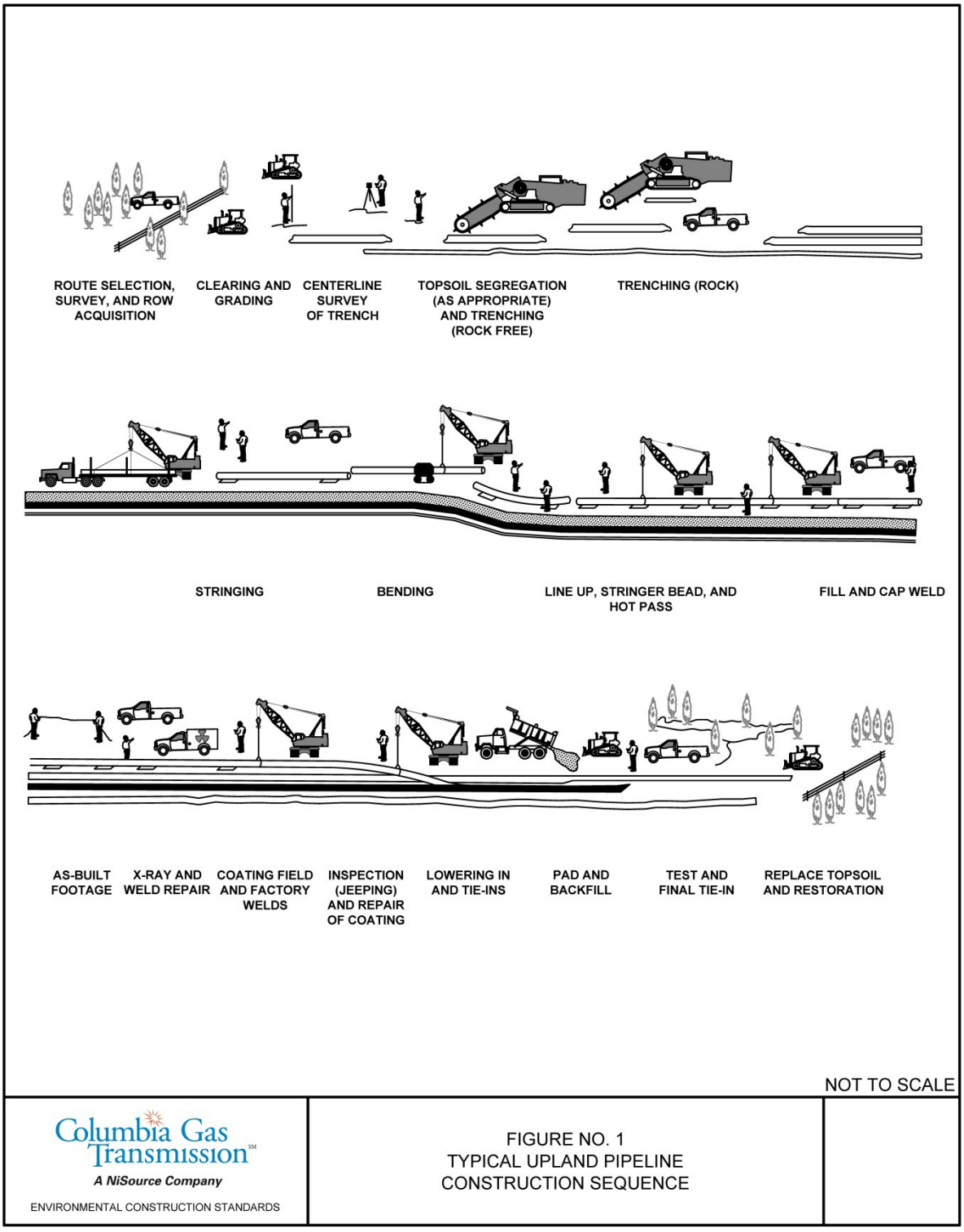
TABLE 2B – SEED MIX FOR TEMPORARY STABILIZATION	
TYPE	RATE (lbs/ACRE)
SEED	
ANNUAL RYE	40
MULCH	
HAY OR STRAW	6,000

TABLE 2C – SEED MIX REQUIREMENTS IN WETLANDS	
TYPE	RATE (lbs/ACRE)
SEED[1]	
ANNUAL RYE	40

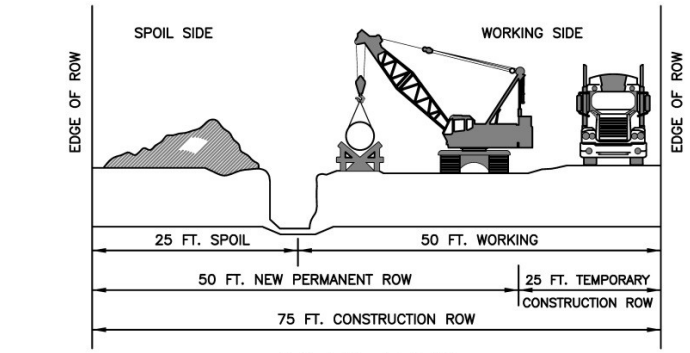
[1] ANNUAL RYE IS USED AS TEMPORARY RE–VEGETATIVE MEASURE UNTIL INDIGENOUS PLANTS RE–ESTABLISH COVER. A MONITORING PROGRAM WILL BE IN EFFECT TO INSURE ADEQUATE COVER IS ESTABLISHED.

XI. Figures

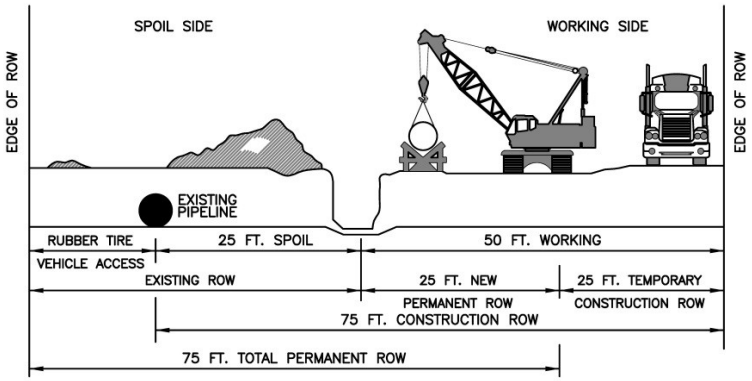
XII. Figure 1 – Typical Upland Pipeline Construction Sequence



XIII. **Figure 2 – Typical 75ft. Construction Right-of-Way**



NEW ROW



PARALLEL TO EXISTING ROW

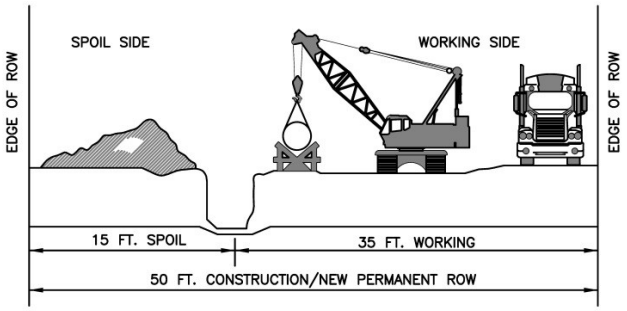
NOTES:

1. USE FOR 14–INCH OR GREATER DIAMETER PIPELINE.
2. THE DIMENSIONS SHOWN ON THIS FIGURE ARE TYPICAL.
3. VARIATIONS FOR STAGING AREAS MAY BE NECESSARY DUE TO SITE–SPECIFIC TERRAIN FEATURES; HOWEVER, UNLESS OTHERWISE INDICATED IN COLUMBIA'S ENVIRON–MENTAL MANAGEMENT & CONSTRUCTION PLANS, THE MAXIMUM WIDTH OF CONSTRUCTION ROW WILL BE 75 FEET.

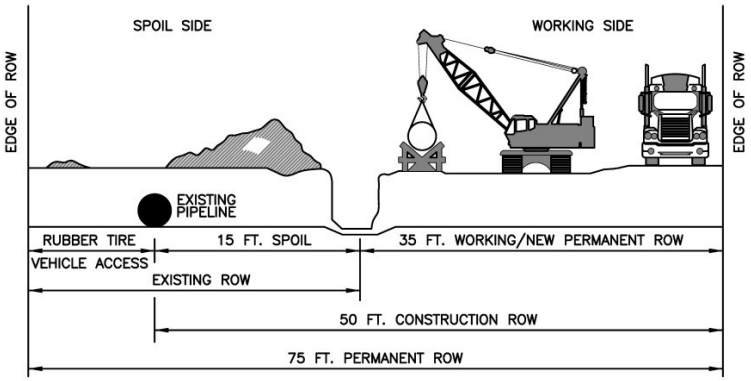
NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 2 TYPICAL 75 FT. CONSTRUCTION RIGHT-OF-WAY	

XIV. **Figure 3 – Typical 50ft. Construction Right-of-Way**



NEW ROW



PARALLEL TO EXISTING ROW

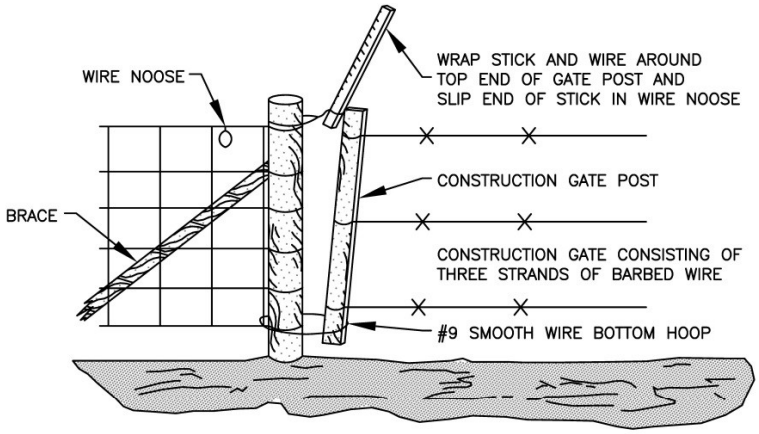
NOTES:

1. USE FOR 12–INCH OR LESS DIAMETER PIPELINE.
2. THE DIMENSIONS SHOWN ON THIS FIGURE ARE TYPICAL.
3. VARIATIONS FOR STAGING AREAS MAY BE NECESSARY DUE TO SITE–SPECIFIC TERRAIN FEATURES; HOWEVER, UNLESS OTHERWISE INDICATED IN COLUMBIA'S ENVIRON–MENTAL MANAGEMENT & CONSTRUCTION PLANS, THE MAXIMUM WIDTH OF CONSTRUCTION ROW WILL BE 50 FEET.

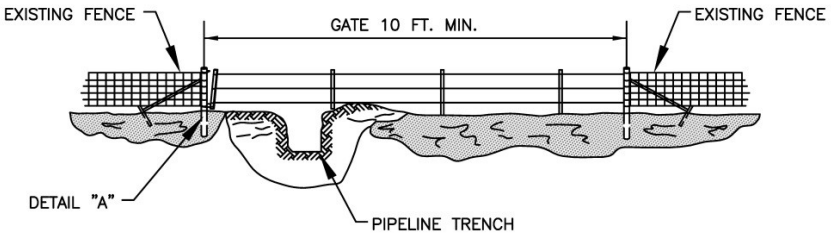
NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 3 TYPICAL 50 FT. CONSTRUCTION RIGHT-OF-WAY	

XV. Figure 4 – Temporary Construction Gate



DETAIL "A"



NOTES:

1. IF EXISTING FENCE POSTS ARE STEEL "T" BAR TYPE, THEN REMOVE THE STEEL "T" BAR POST ON BOTH SIDES OF THE GATE OPENING AND REPLACE WITH TEMPORARY WOODEN POSTS, BRACED AS SHOWN.
2. SUITABLE SUBSTITUTES FOR STICK AND WIRE GATE FASTENER ARE PERMISSIBLE.

NOT TO SCALE

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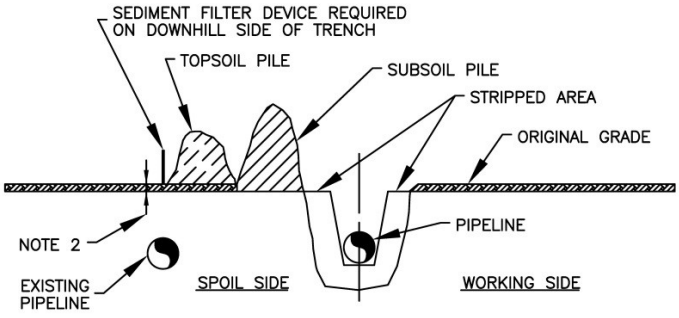
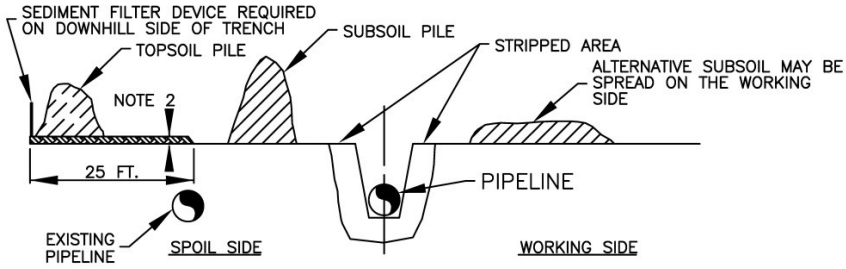
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 4
TEMPORARY CONSTRUCTION GATE
RIGHT-OF-WAY

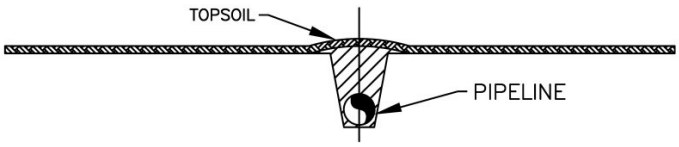
XVI. Figure 5 – Typical Topsoil Conservation



TRENCHLINE AND SPOIL SIDE METHOD



ENTIRE CONSTRUCTION ROW METHOD



REPLACED

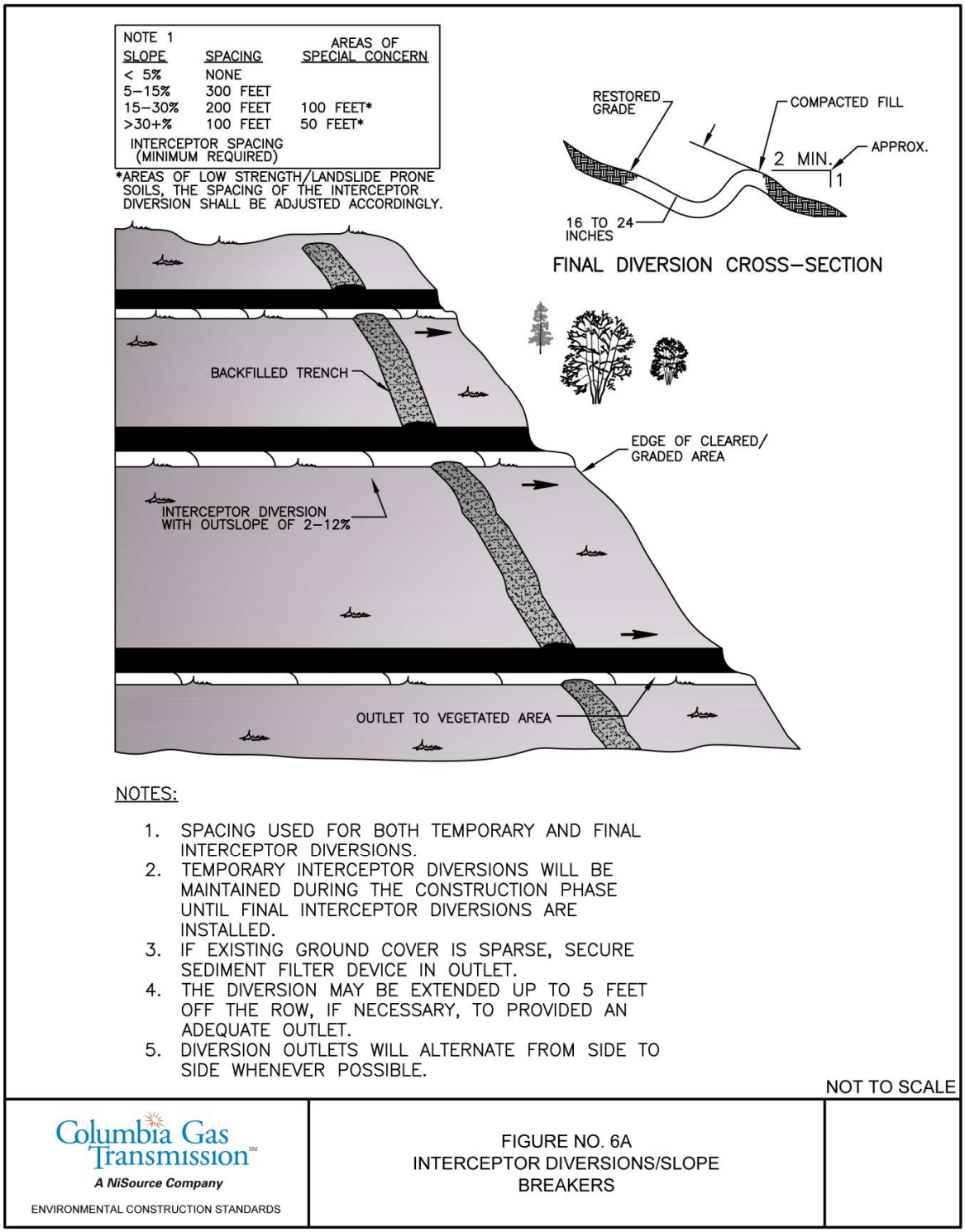
NOTES:

1. OTHER CONFIGURATIONS OF TOPSOIL AND SUBSOIL ARE ACCEPTABLE PROVIDED THEY ARE KEPT SEPARATE.
2. UP TO 12 INCHES OF TOPSOIL REMOVED.
3. TOPSOIL AND SUBSOIL PILES WILL BE ADEQUATELY PROTECTED FROM EROSION AND SEDIMENTATION BY USE OF SEDIMENT FILTER DEVICE OR MULCH.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 5 TYPICAL TOPSOIL CONSERVATION RIGHT-OF-WAY	

XVII. Figure 6A – Interceptor Diversions/Slope Breakers



NOTES:

1. SPACING USED FOR BOTH TEMPORARY AND FINAL INTERCEPTOR DIVERSIONS.
2. TEMPORARY INTERCEPTOR DIVERSIONS WILL BE MAINTAINED DURING THE CONSTRUCTION PHASE UNTIL FINAL INTERCEPTOR DIVERSIONS ARE INSTALLED.
3. IF EXISTING GROUND COVER IS SPARSE, SECURE SEDIMENT FILTER DEVICE IN OUTLET.
4. THE DIVERSION MAY BE EXTENDED UP TO 5 FEET OFF THE ROW, IF NECESSARY, TO PROVIDED AN ADEQUATE OUTLET.
5. DIVERSION OUTLETS WILL ALTERNATE FROM SIDE TO SIDE WHENEVER POSSIBLE.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 6A
INTERCEPTOR DIVERSIONS/SLOPE BREAKERS

XVIII. Figure 6B – Interceptor Diversions

INTERCEPTOR DIVERSIONS ARE THE MOST COMMON AND EFFECTIVE DEVICE USED FOR EROSION CONTROL ON CONSTRUCTION ROW. DURING CONSTRUCTION, TEMPORARY DIVERSIONS ARE INSTALLED TO CONTROL WATER ON THE GRADED ROW. DURING RESTORATION FINAL DIVERSIONS ARE INSTALLED TO PROTECT THE ROW FROM EROSION UNTIL THE VEGETATION RE–ESTABLISHES ON THE DISTURBED AREAS.

TEMPORARY DIVERSIONS ARE GENERALLY MADE BY BUILDING A CURB 8 TO 14 INCHES HIGH ACROSS THE ROW. THE CURBS ARE SHAPED TO ALLOW PASSAGE OF CONSTRUCTION EQUIPMENT AND INSPECTOR VEHICLES. THE DIVERSION SHOULD HAVE A GRADIENT OF 2% – 12%, AND MUST DRAIN EITHER INTO THE TRENCH OR OFF THE ROW. WHERE WATER IS DIRECTED OFF THE ROW, THE OUTLET WILL BE PROTECTED BY HEAVY VEGETATION. TEMPORARY DIVERSIONS MAY BE BROKEN DOWN BY CONSTRUCTION EQUIPMENT DURING THE WORKDAY, BUT WILL BE RESTORED BY THE END OF EACH DAY. TEMPORARY DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A. THE ACTUAL NUMBER OF TEMPORARY DIVERSIONS MAY VARY FROM THAT OF FINAL DIVERSIONS BECAUSE THE CONSTRUCTION ROW'S ARTIFICIAL GRADE MAY REDUCE THE SLOPE. POSITION THE OUTFALL OF EACH TEMPORARY SLOPE BREAKER TO PREVENT SEDIMENT DISCHARGE INTO WETLAND, WATERBODIES, OR OTHER SENSITIVE AREAS.

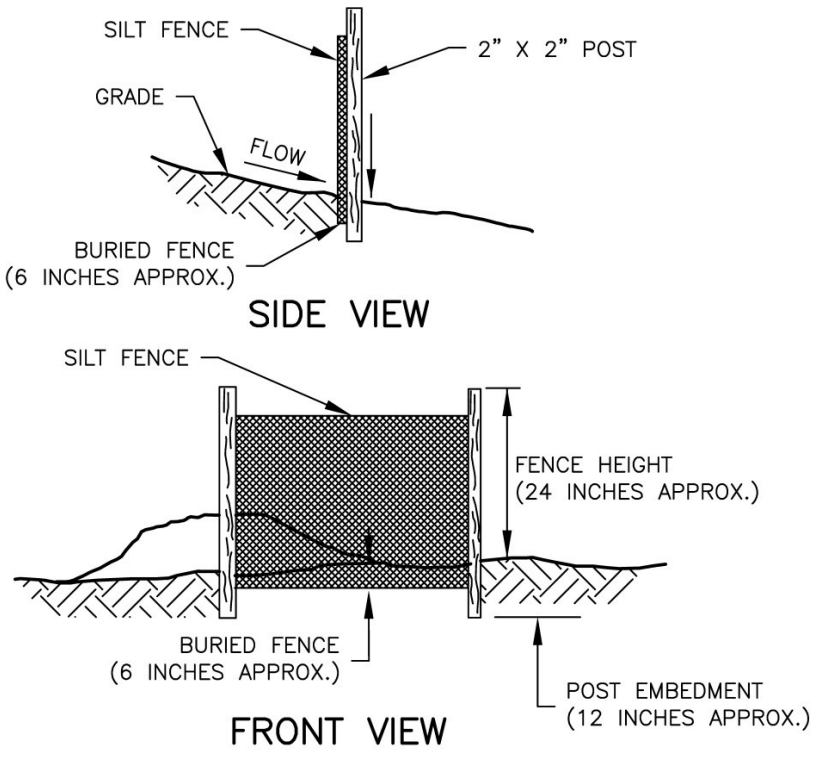
FINAL DIVERSIONS TYPICALLY CONSIST OF A CURB 16 TO 24 INCHES HIGH BELOW A SHALLOW SWALE. THE CURB IS CONSTRUCTED OF COMPACTED EARTH FILL WITH SIDE SLOPES OF 2:1 OR FLATTER TO ALLOW PASSAGE OF MAINTENANCE EQUIPMENT. THE DIVERSIONS SHOULD EXTEND ACROSS THE ENTIRE ROW AND DRAIN WATER WITH A 2% TO 12% GRADIENT. THE OUTLETS OF FINAL DIVERSIONS MAYBE STABILIZED WITH SEDIMENT FILTER DEVICES. FINAL DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A (OR AS SHOWN ON THE ENVIRONMENTAL CONSTRUCTION DRAWINGS), AND WILL TIE INTO EXISTING DIVERSIONS WHERE PRESENT. IN PLACES WHERE FINAL GRADE CREATES SIDE SLOPES OR SLOPES WHICH BREAK IN MORE THAN ONE DIRECTION, DIVERSION INSTALLATION MAY NEED TO VARY TO CREATE AN OUTSLOPE OF 2% TO 12% WHICH WILL CARRY WATER OFF THE ROW.

ALTERNATIVE DIVERSION CONSTRUCTION MAY BE USED IN AREAS WHERE AN EARTHEN DIVERSION IS IMPRACTICAL

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 6B INTERCEPTOR DIVERSIONS	

XIX. **Figure 7A – Sediment Filter Device Silt Fencing**



NOTE:

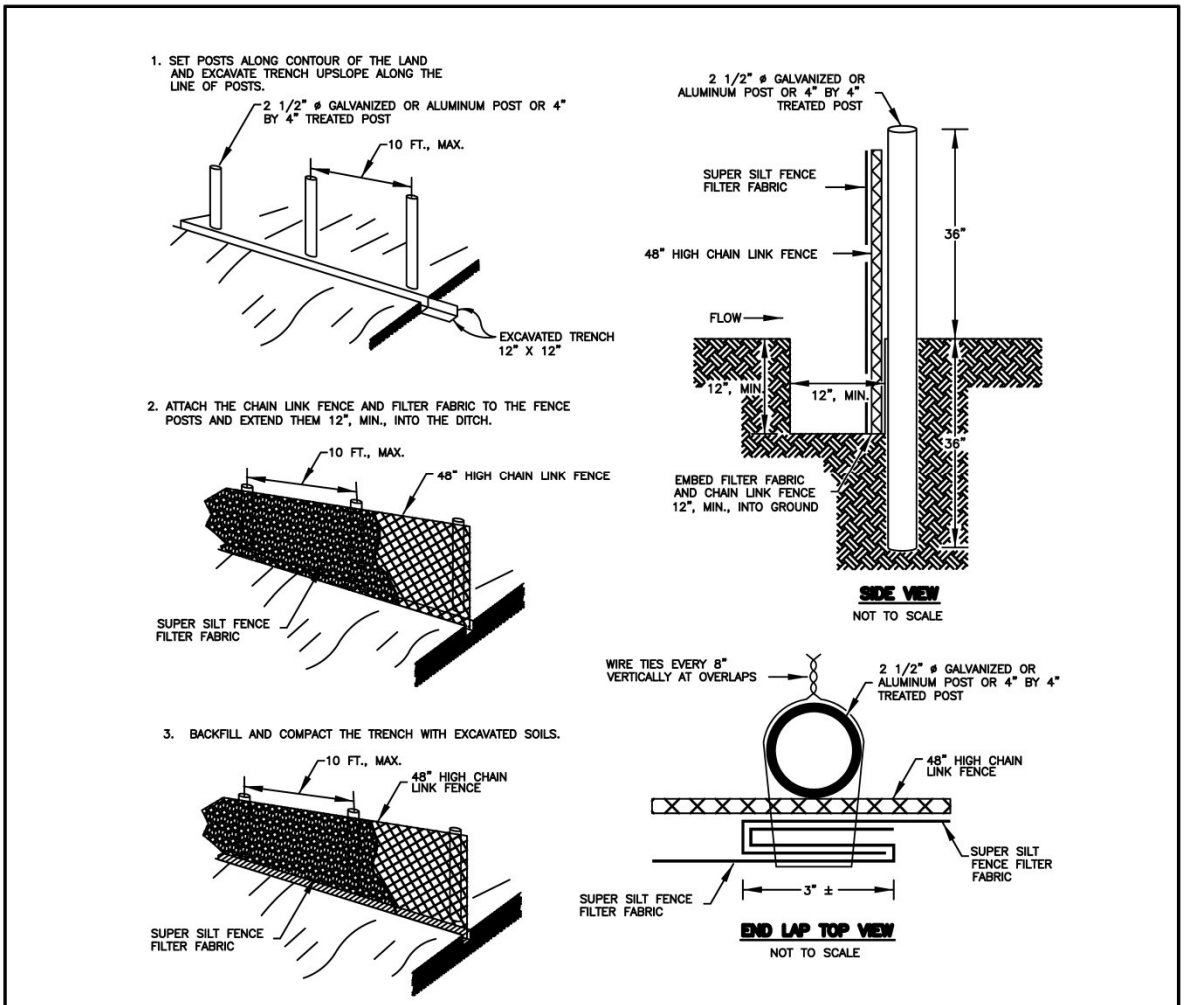
SILT FENCE CAN ALSO BE INSTALLED (USING THE SAME SPECIFICATIONS AS PRESENTED ABOVE) IN OTHER SITUATIONS FOR EROSION AND SEDIMENT CONTROL.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 7A
SEDIMENT FILTER DEVICE
SILT FENCING

XX. Figure 7B – Sediment Filter Device Super Silt Fencing



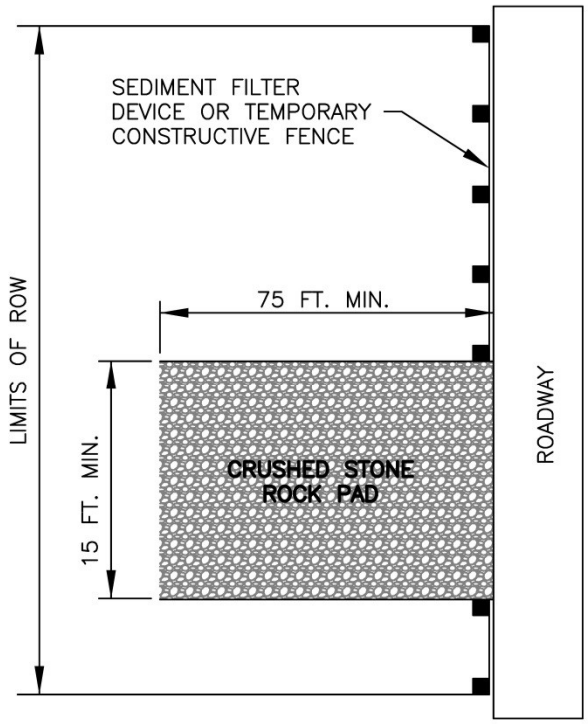
SUPER SILT FENCE NOTES:

1. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 608 OF THE WVDOH SPECIFICATIONS. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE POSTS WITH WIRE TIES OR STAPLES.
2. POSTS NEED NOT BE SET IN CONCRETE.
3. THE FILTER FABRIC SHALL BE FASTENED TO THE CHAIN LINK FENCE WITH TIES EVERY 24" AT THE TOP AND MID SECTION.
4. FABRIC AND FENCE SHALL BE EMBEDDED 12", MINIMUM, INTO THE GROUND.
5. A 6", MINIMUM, OVERLAP SHALL BE PROVIDED WHERE TWO SECTIONS OF FABRIC ADJOIN. THE OVERLAPPED FABRIC SHALL BE FOLDED TOGETHER AND ATTACHED TO THE CHAIN LINK FENCE.
6. 4" BY 4" PRESSURE TREATED POSTS MAY BE SUBSTITUTED FOR METAL FENCE POSTS WITH THE APPROVAL OF THE ENGINEER.
7. THE LENGTH OF SLOPE ABOVE THE FENCE SHALL NOT EXCEED 400 FEET IN STEEP TERRAIN. IN FLATTER AREAS THE LENGTH CAN BE EXTENDED WITH THE APPROVAL OF THE ENGINEER.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 7B SEDIMENT FILTER DEVICE SUPER SILT FENCE	

XXI. Figure 8 – Temporary Road Entrance Rock Pads



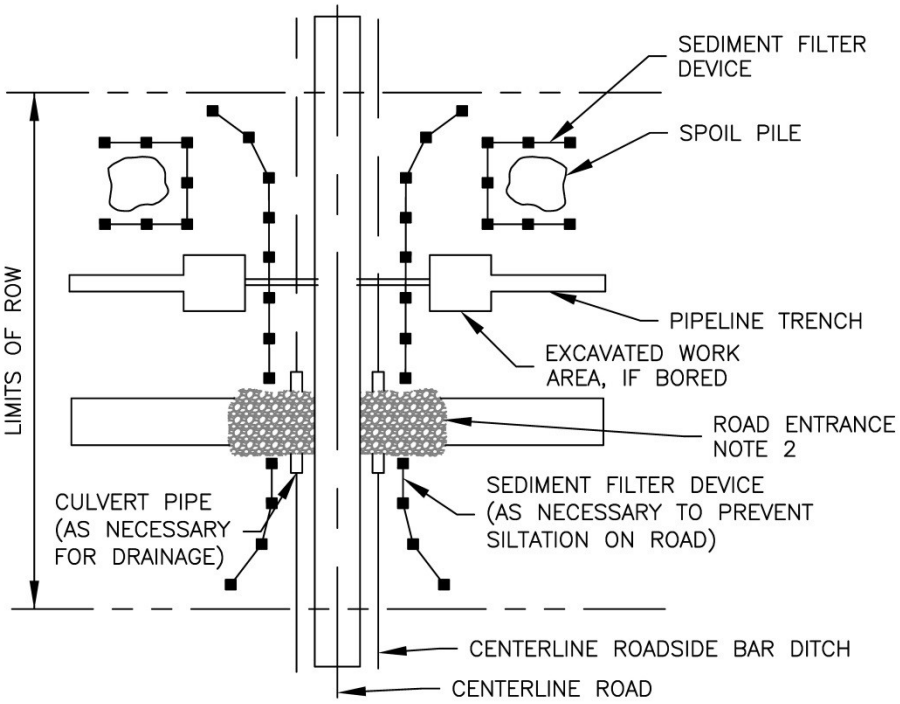
NOTES:

1. CRUSHED STONE SIZE WILL BE AASHTO NUMBER 1 COARSE AGGREGATE OR EQUIV. (4 INCH DIAMETER MIN.)
2. ROCK PAD WILL BE AT LEAST 6 INCHES THICK.
3. THE ROAD ENTRANCE WILL HAVE A GEOTEXTILE FABRIC BENEATH THE ROCK PAD.
4. IF ROCK PAD BECOMES COVERED WITH MUD SO AS TO BECOME INEFFECTIVE, ADDITIONAL STONE WILL BE ADDED.
5. ALL STONE AND FABRIC MUST BE REMOVED DURING ROW RESTORATION.
6. THE ROCK PAD MAY BE ENLARGED TO INCLUDE A TURNING RADIUS.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 8 TEMPORARY ROAD ENTRANCE ROCK PADS	

XXII. Figure 9 – Typical Erosion Control Measures at Road Crossings



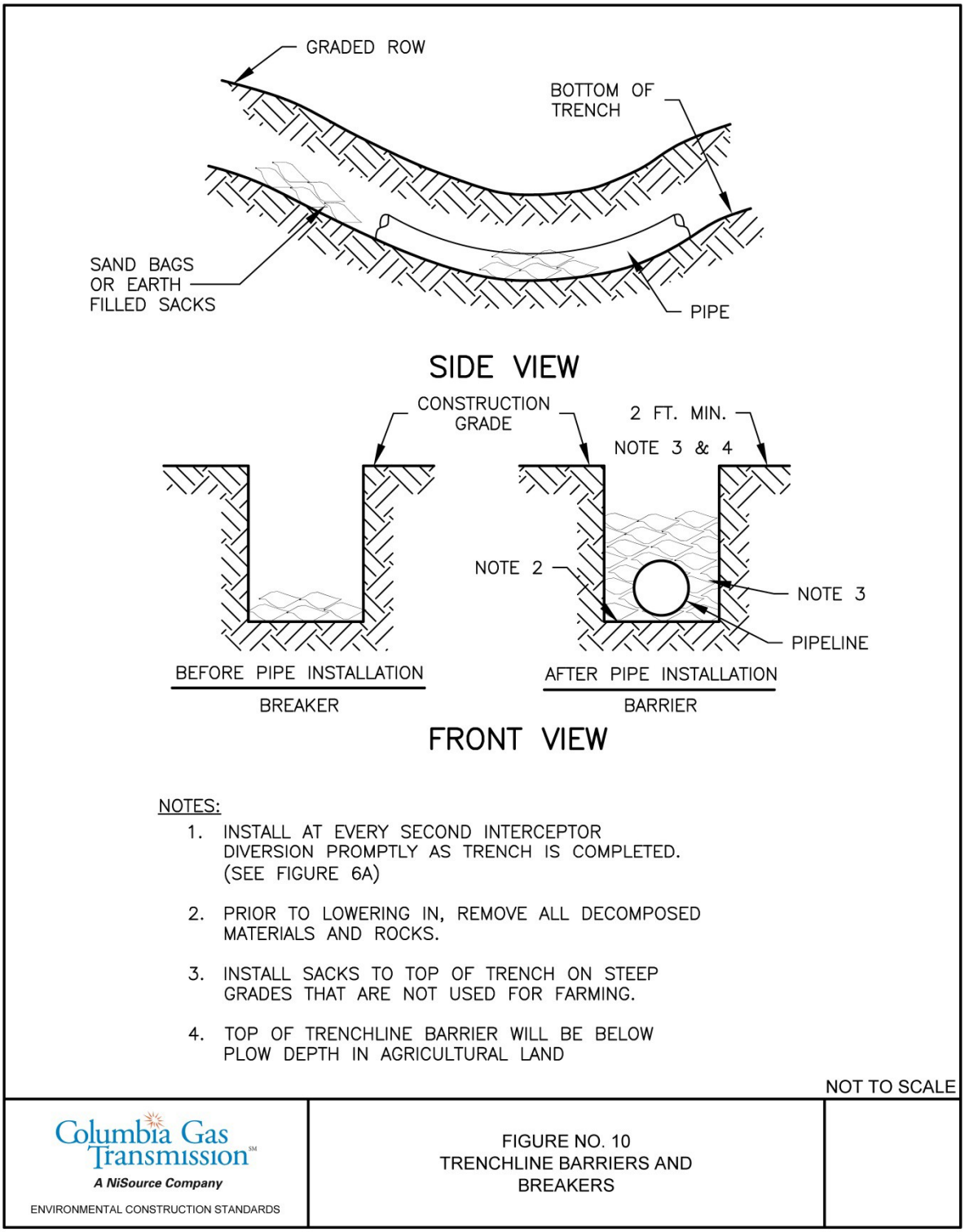
NOTES:

1. SIMILAR PROCEDURES WILL BE USED AT RAILROAD CROSSINGS.
2. REFER TO FIGURE 8.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 9 TYPICAL EROSION CONTROL MEASURES AT ROAD CROSSINGS	

XXIII. **Figure 10 – Trench Line Barriers and Breakers**



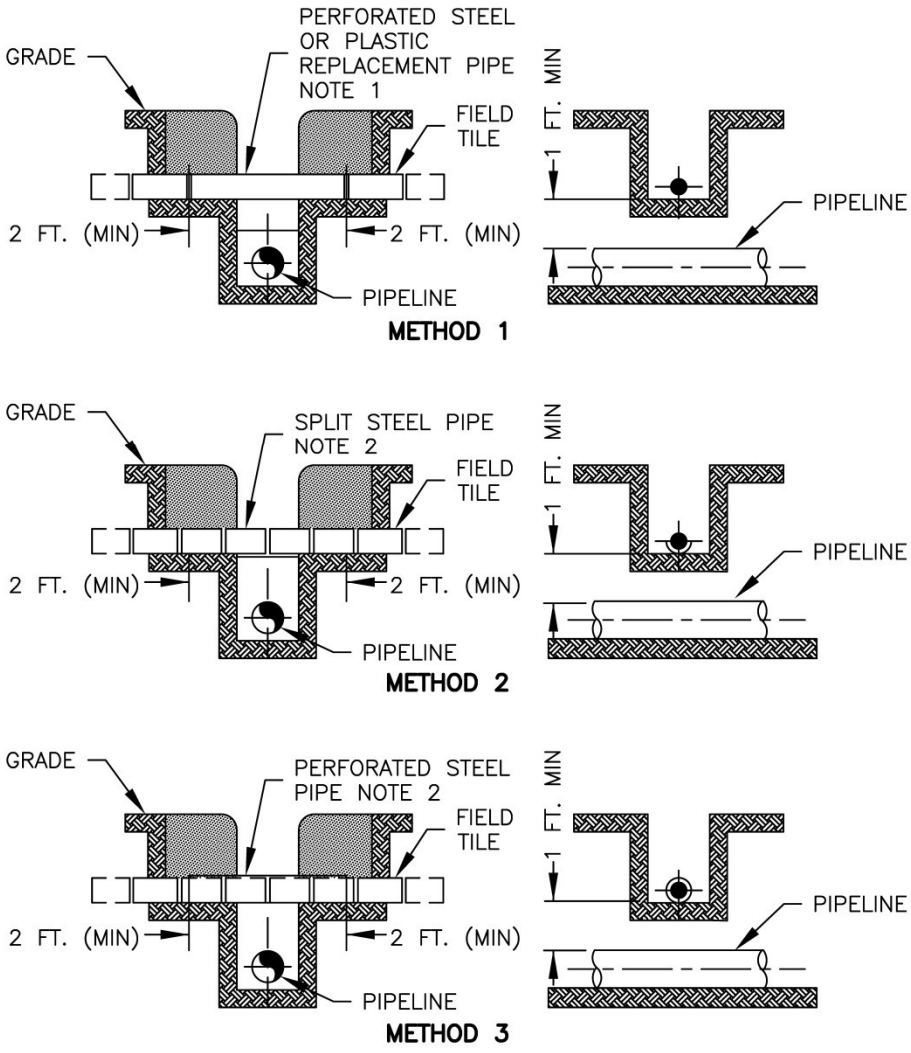
NOTES:

1. INSTALL AT EVERY SECOND INTERCEPTOR DIVERSION PROMPTLY AS TRENCH IS COMPLETED. (SEE FIGURE 6A)
2. PRIOR TO LOWERING IN, REMOVE ALL DECOMPOSED MATERIALS AND ROCKS.
3. INSTALL SACKS TO TOP OF TRENCH ON STEEP GRADES THAT ARE NOT USED FOR FARMING.
4. TOP OF TRENCHLINE BARRIER WILL BE BELOW PLOW DEPTH IN AGRICULTURAL LAND

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 10 TRENCHLINE BARRIERS AND BREAKERS	

XXIV. **Figure 11 – Field Tile Replacement Method**



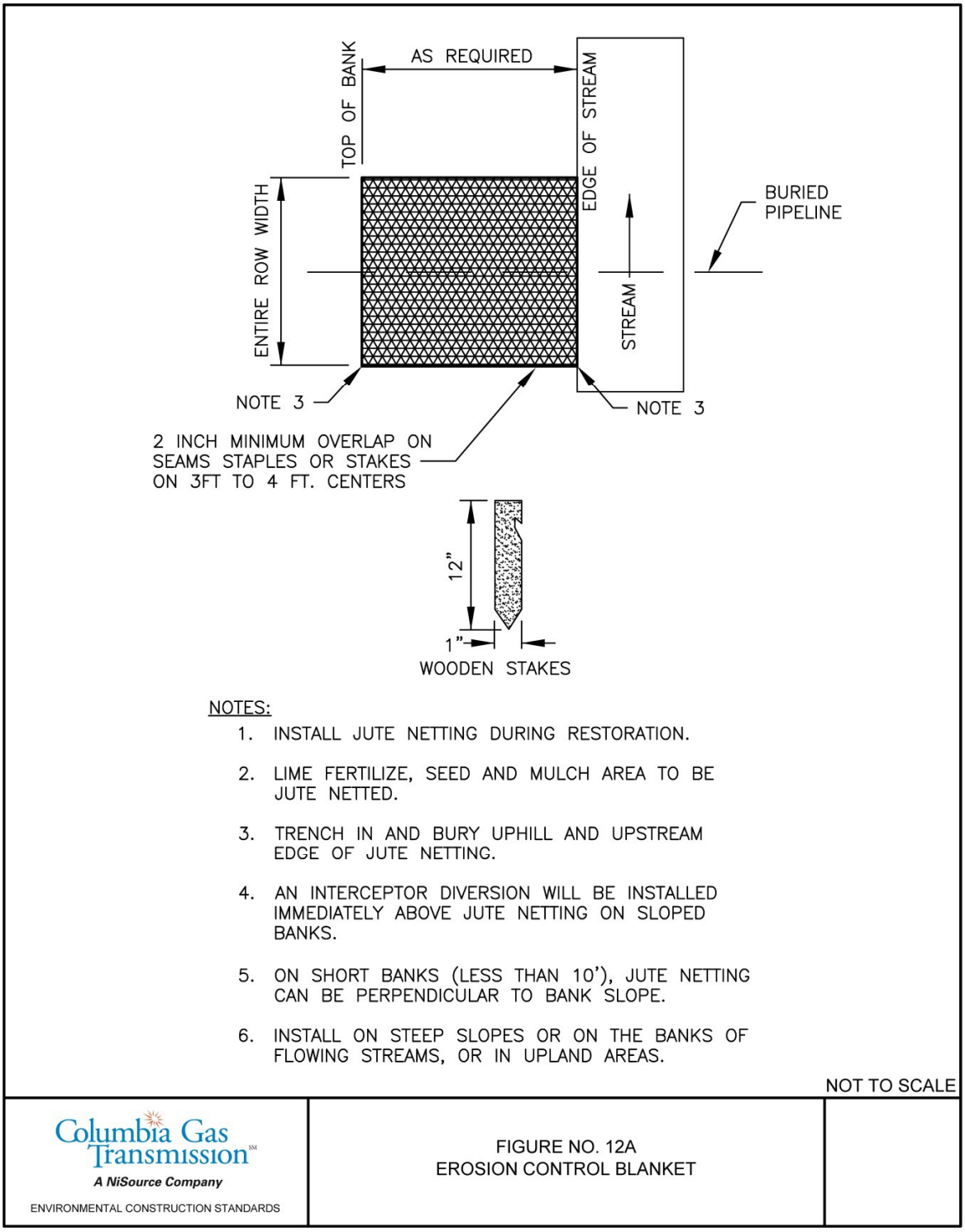
NOTES:

1. REPLACEMENT PIPE TO BE AS NEAR AS POSSIBLE TO DIAMETER OF THE FIELD TILE.
2. STEEL CARRIER PIPE TO HAVE INSIDE DIAMETER AS NEAR AS POSSIBLE THE OUTSIDE DIAMETER OF THE FIELD TILE.
3. MAINTAIN ORIGINAL FLOW LINE OF FIELD TILE IN ALL METHODS.

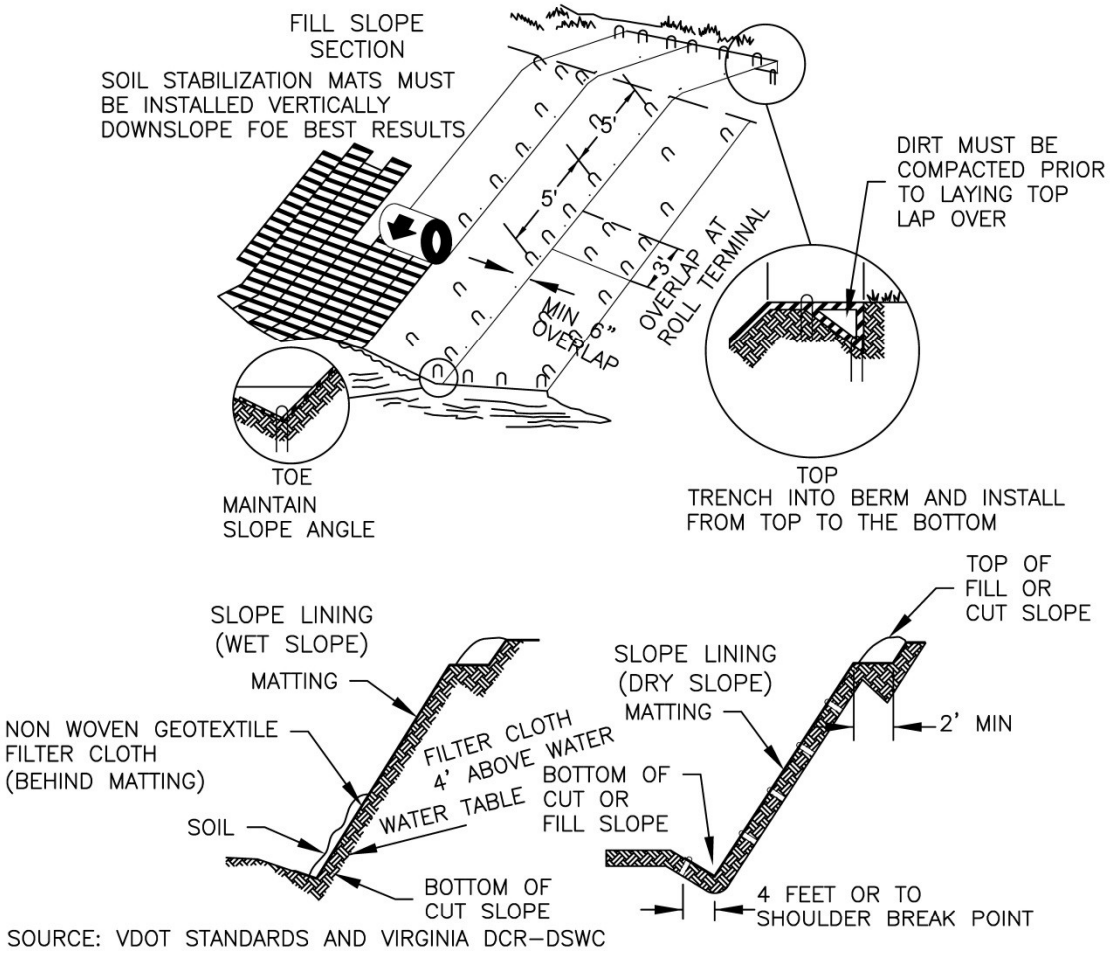
NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 11 FIELD TILE REPLACEMENT METHODS	

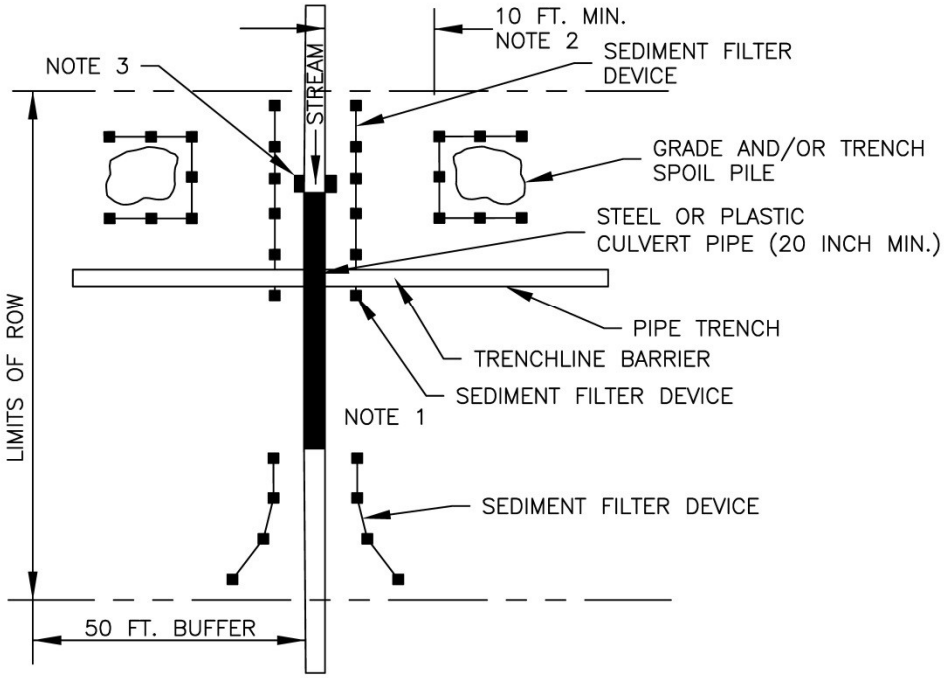
XXV. **Figure 12A – Erosion Control Blanket**



XXVI. **Figure 12B – Rolled Erosion Control Products**



XXVII. **Figure 13 – Typical Stream Crossing Intermittent Stream**



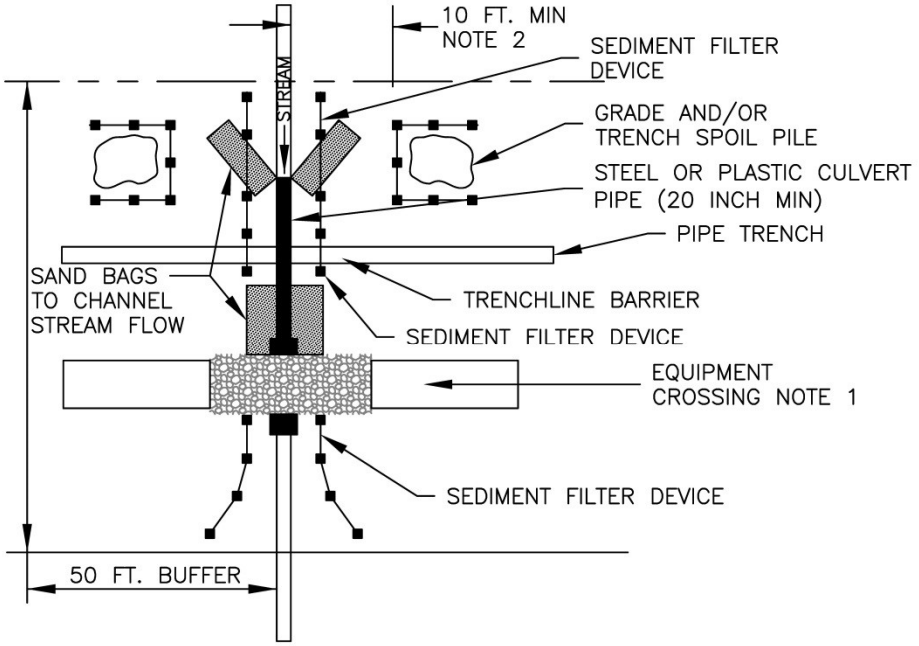
NOTES:

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE, TOPOGRAPHY PERMITTING.
3. SAND BAGS OR EARTH FILLED SACKS WILL BE PLACED AT UPSTREAM END OF CULVERT TO CHANNEL FLOW.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 13 TYPICAL STREAM CROSSING INTERMITTENT STREAM	

XXVIII. Figure 14 – Typical Stream Crossing Dry-Ditch



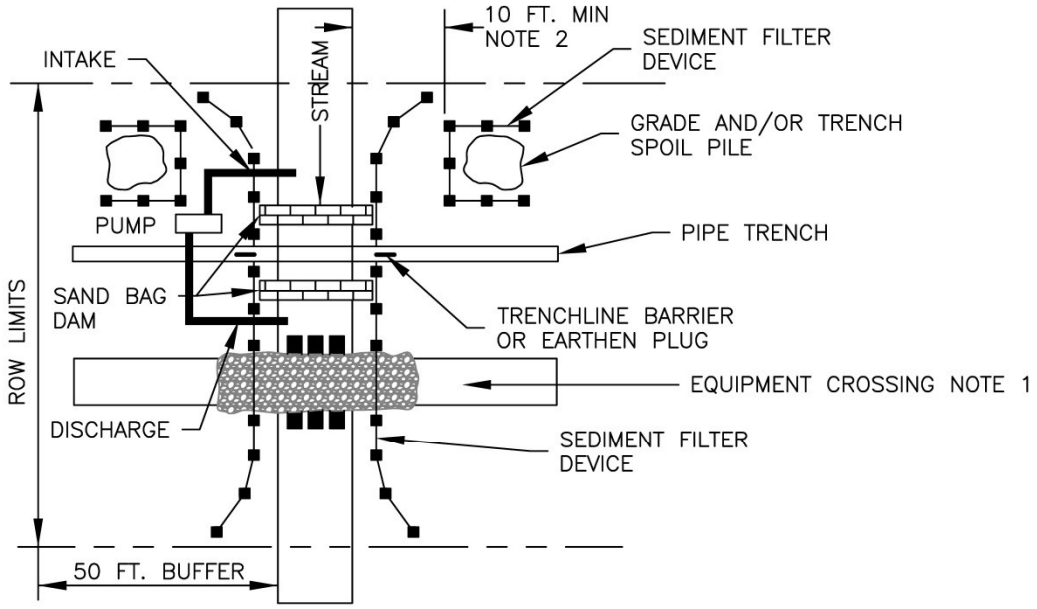
NOTES:

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE.
3. INSTALL FLUME PIPE AFTER BLASTING(IF NECESSARY), BUT BEFORE TRENCHING.
4. PROPERLY ALIGN FLUME PIPE(S) TO PREVENT BANK EROSION OR STREAM BED SCOUR.
5. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 14 TYPICAL STREAM CROSSING DRY DITCH	

XXIX. **Figure 15 – Typical Stream Crossing Dam and Pump**



NOTES:

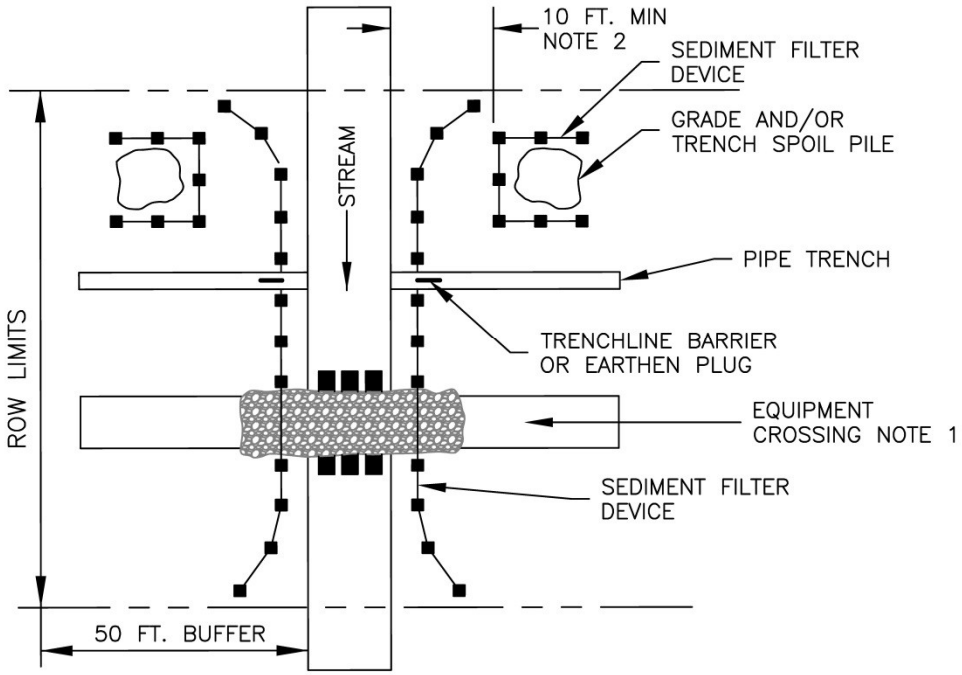
1. EQUIPMENT CROSSINGS ARE TO BE INSTALLED AS ILLUSTRATED IN FIGURES 17 OR 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATERS' EDGE, TOPOGRAPHY PERMITTING.
3. PUMP INTAKES WILL BE SCREENED PREVENT STREAMBED SCOUR AT DISCHARGE.
4. SUFFICIENT PUMP CAPACITY WILL BE USED TO MAINTAIN STREAM FLOW AT ALL TIMES UNTIL BACKFILL AND REMOVAL OF SANDBAG DAM.
5. BACKUP PUMPS (AS SAME NUMBER AND CAPACITY AS ACTIVE PUMPS) WILL BE READILY AVAILABLE IN WORKING CONDITION ON SITE AT CROSSING.
6. CONSTRUCT DAMS WITH MATERIAL THAT PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE WATERBODY.
7. MONITOR THE DAM AND PUMPS TO ENSURE PROPER OPERATIONS THROUGHOUT THE WATERBODY CROSSING.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 15
TYPICAL STREAM CROSSING
DAM AND PUMP

XXX. **Figure 16 – Typical Stream Crossing Wet-Ditch**



NOTES:

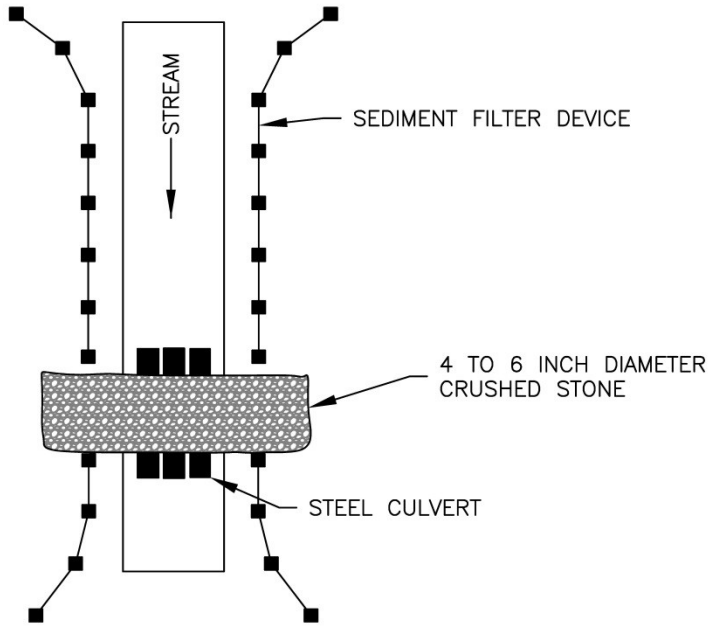
1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATERS' EDGE.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 16
TYPICAL STREAM CROSSING
WET-DITCH

XXXI. **Figure 17 – Temporary Equipment Crossing Culvert and Stone**



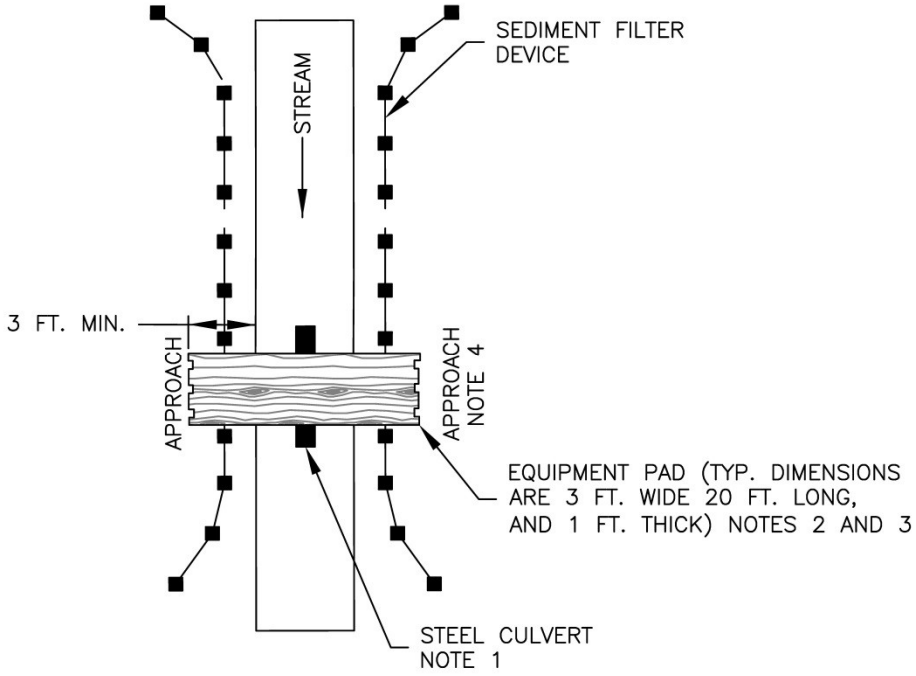
NOTES:

1. MINIMUM CONTOURING OF THE BOTTOM NECESSARY TO LAY THE CULVERTS LEVEL MAY BE DONE.
2. USE AS MANY CULVERTS AS REQUIRED TO SPAN ENTIRE STREAM BED. (CULVERTS SHALL BE PLACED SIDE BY SIDE.)
3. MINIMUM CULVERT DIAMETER 20 INCHES.
4. MAINTAIN ROCK AS NOT TO ALLOW MUD TO ENTER THE STREAM.
5. ALIGN CULVERTS TO PREVENT BANK EROSION.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 17 TEMPORARY EQUIPMENT CROSSING CULVERT AND STONE	

XXXII. **Figure 18 – Temporary Equipment Crossing Equipment Pads**



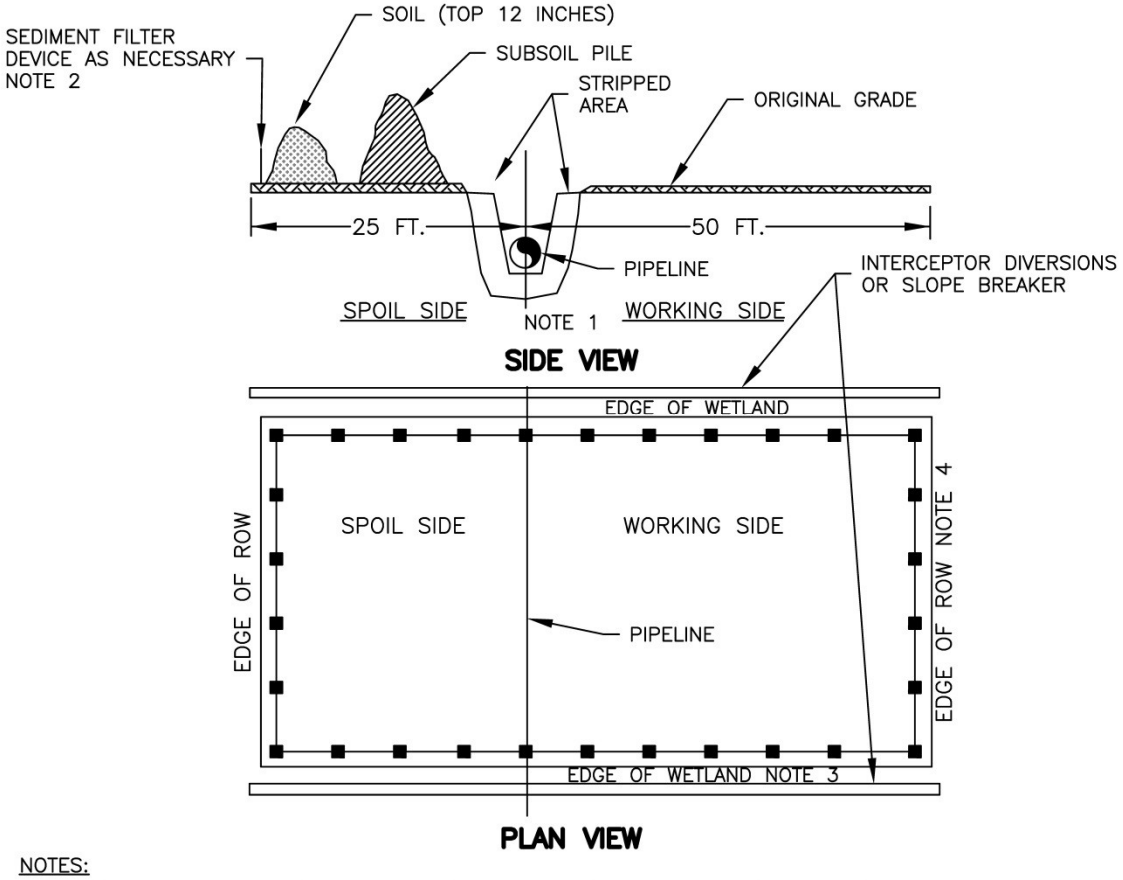
NOTES:

1. CULVERT PIPE UTILIZED IF ADDITIONAL SUPPORT IS REQUIRED
2. ADDITIONAL PADS CAN BE PUT SIDE BY SIDE IF EXTRA WIDTH IS REQUIRED
3. EQUIPMENT PAD TYPICALLY CONSTRUCTED OF HARDWOOD; MUST ACCOMMODATE THE LARGEST EQUIPMENT USED.
4. RAMP APPROACHED CAN EITHER BE GRADED OR DUG INTO GROUND. IF NECESSARY, CRUSHED STONE WILL BE USED TO RAMP UP TO THE EQUIPMENT PADS.
5. MINIMUM CULVERT DIAMETER 20 INCHES.
6. MAINTAIN PADS SO AS NOT TO ALLOW MUD TO ENTER THE STREAM

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 18 TEMPORARY EQUIPMENT CROSSING EQUIPMENT PADS	

XXXIII. Figure 19 – Typical Wetland Crossing



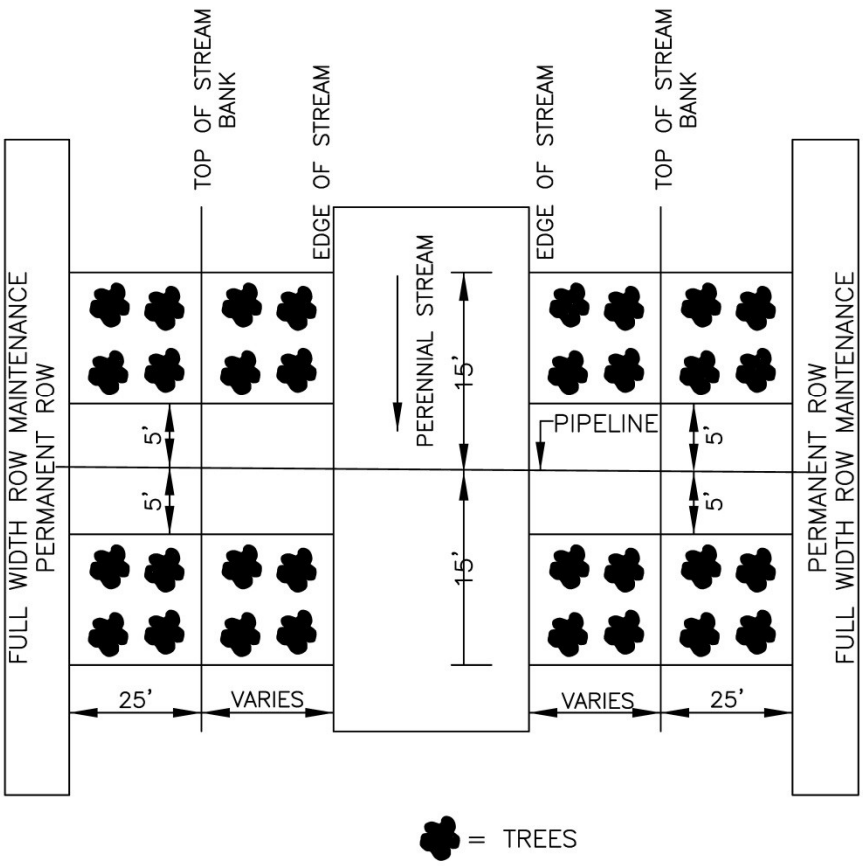
NOTES:

1. FOR WETLAND CROSSINGS WITHOUT STANDING WATER OR SATURATED SOILS, UPLAND CONSTRUCTION TECHNIQUES CAN BE USED. IF STANDING WATER OR SATURATED SOILS BECOME PRESENT DURING CONSTRUCTION ACTIVITIES IN WETLANDS THAT WERE INITIALLY DRY, OPERATE PER REQUIREMENTS IN SECTION III.B.2. OF THIS ECS (SEE NOTE 2).
2. WETLANDS WITH STANDING WATER, SATURATED OR FROZEN SOIL, OPERATE EQUIPMENT PER REQUIREMENTS IN SECTION III.B.2. (ECS).
3. IN WETLAND AREAS WHICH CONTAIN NO STANDING WATER OR IF SOILS ARE SATURATED OR FROZEN, TOPSOIL (TOP 12 INCHES) AND SUBSOIL WILL BE STOCKPILED SEPARATELY WITHIN THE WETLAND CONSTRUCTION ROW.
4. A SEDIMENT FILTER DEVICE WILL BE PLACED ACROSS THE ROW AT THE WETLAND'S EDGE, IMMEDIATELY UPSLOPE OF THE WETLAND BOUNDARY.
5. A SEDIMENT FILTER DEVICE WILL BE PLACED AT THE EDGE OF THE ROW AND AROUND SOIL AND SUBSOIL PILES AS NECESSARY.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 19 TYPICAL WETLAND CROSSING	

XXXIV. **Figure 20 – ROW Maintenance Perennial Streams**



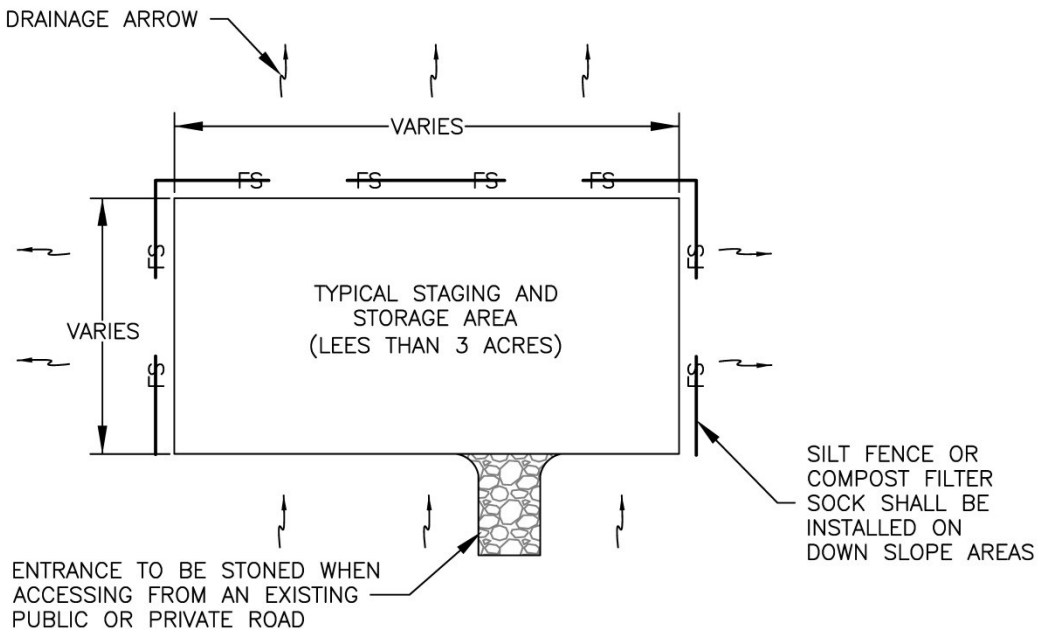
NOTES:

1. FULL WIDTH ROW MAINTENANCE PRACTICES WITHIN 25 FEET OF PERENNIAL STREAMBANKS ARE PROHIBITED.
2. A CORRIDOR UP TO 10 FEET WIDE CENTERED ON THE PIPELINE OR APPURTENANCES MAY BE MAINTAINED IN A HERBACEOUS STATE.
3. TREES LOCATED WITHIN 15 FEET OF THE PIPELINE AND GREATER THAN 15 FEET TALL MAY BE SELECTIVELY CUT AND REMOVED FROM THE ROW.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 20 ROW MAINTENANCE PERENNIAL STREAMS	

XXXV. **Figure 21 – Typical Staging/Storage Area**



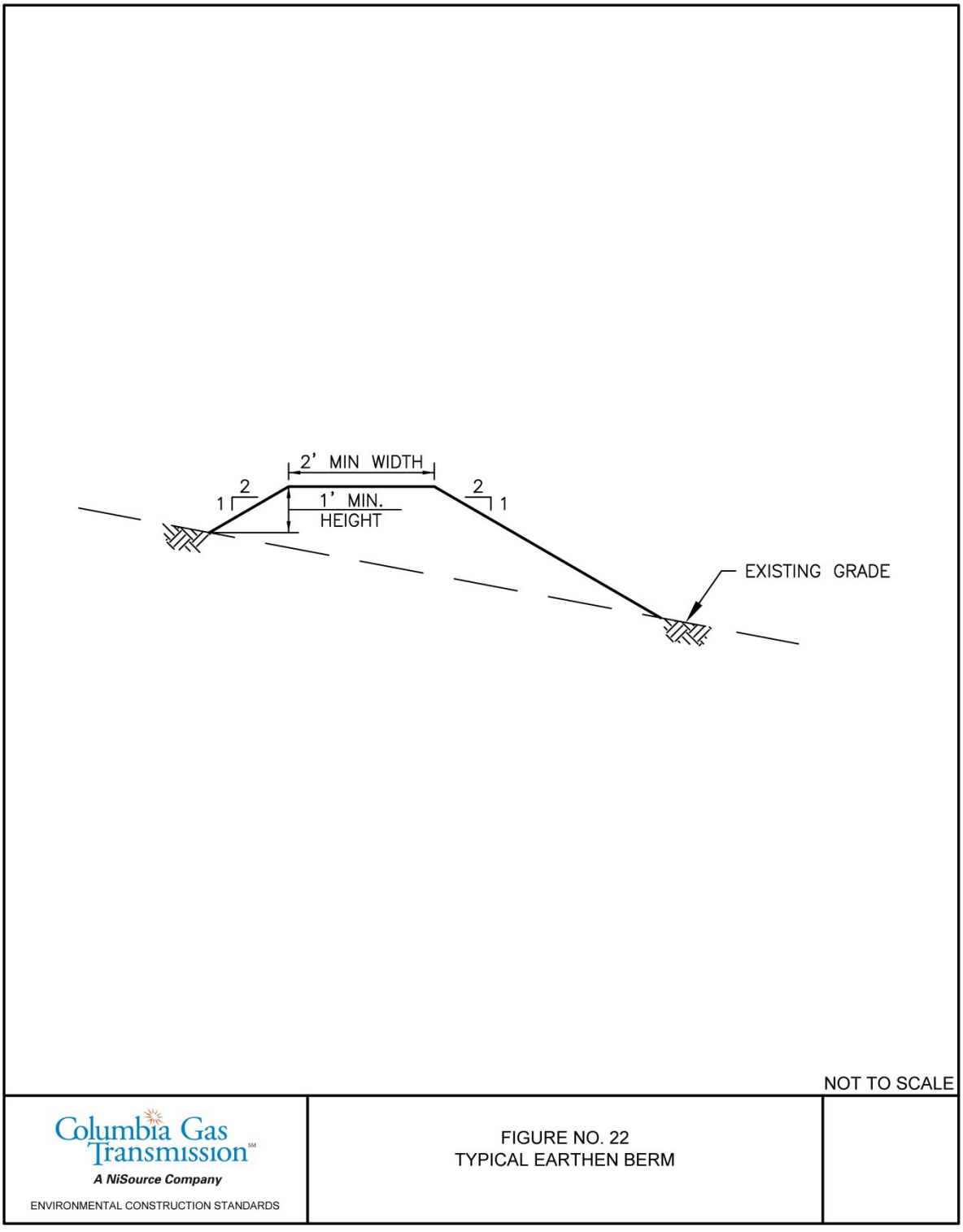
NOTES:

1. FOR STAGING AREAS GREATER THAN OR EQUAL TO 3 ACRES, AN INDIVIDUAL PLAN WILL NEED TO BE PROVIDED.

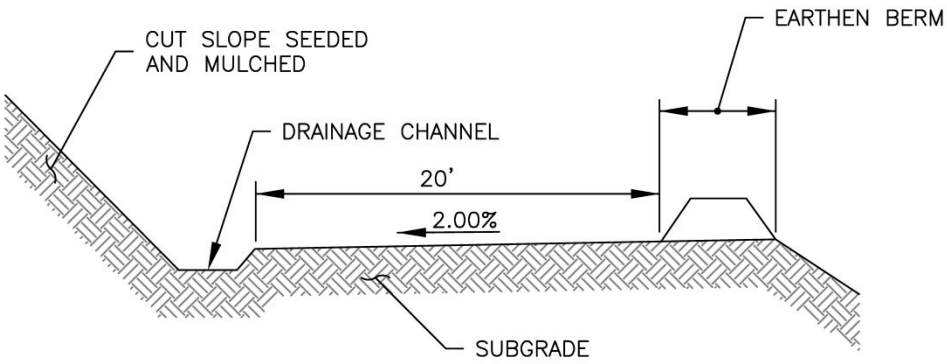
NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 21 TYPICAL STAGING/STORAGE AREA	

XXXVI. **Figure 22 – Typical Earthen Berm**



XXXVII. **Figure 23 – Typical Newly Constructed Access Road**



NOT TO SCALE

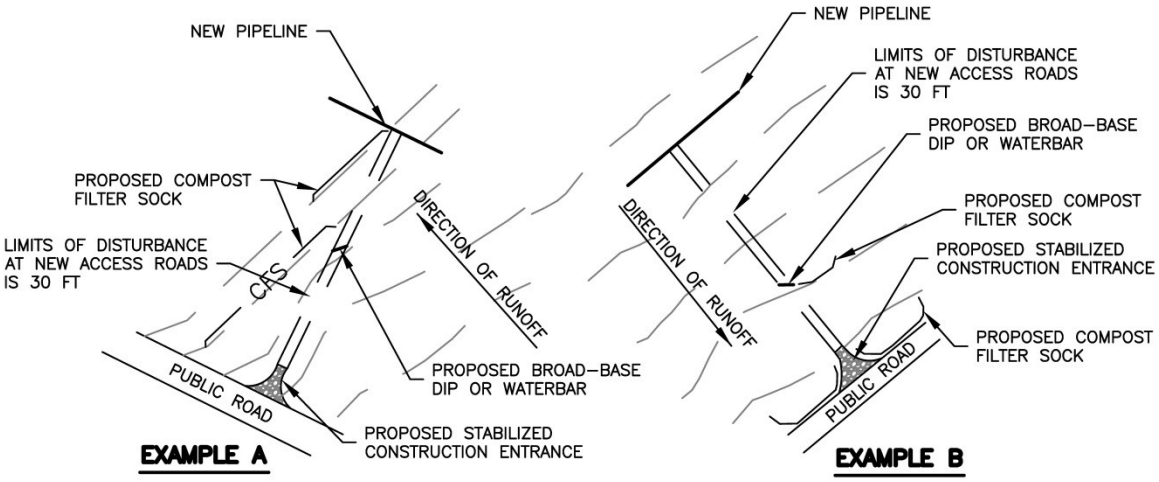
Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 23
TYPICAL NEWLY CONSTRUCTED
ACCESS ROAD

XXXVIII. Figure 24 – Typical Access Road E&S Control

STABILIZED CONSTRUCTION ENTRANCE:

1. USE TWO TO FOUR INCH (2–4") STONE LOW VOLUME ENTRANCES. LARGER STONE (4–6") FOR HEAVY USE OR MATERIAL DELIVERY ENTRANCES.
2. LENGTH IS AS REQUIRED, BUT NOT LESS THAN FIFTY (50') (EXCEPT ON SINGLE RESIDENCE LOT WHERE A THIRTY FOOT (30') MINIMUM LENGTH WOULD APPLY).
3. THICKNESS SHOULD NOT BE LESS THAN SIX INCHES (6").
4. THE WIDTH SHALL BE A MINIMUM OF TWENTY FEET (20') BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE FABRICS SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO THE PACING OF STONE.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF A CULVERT IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE USED.



NOTES:

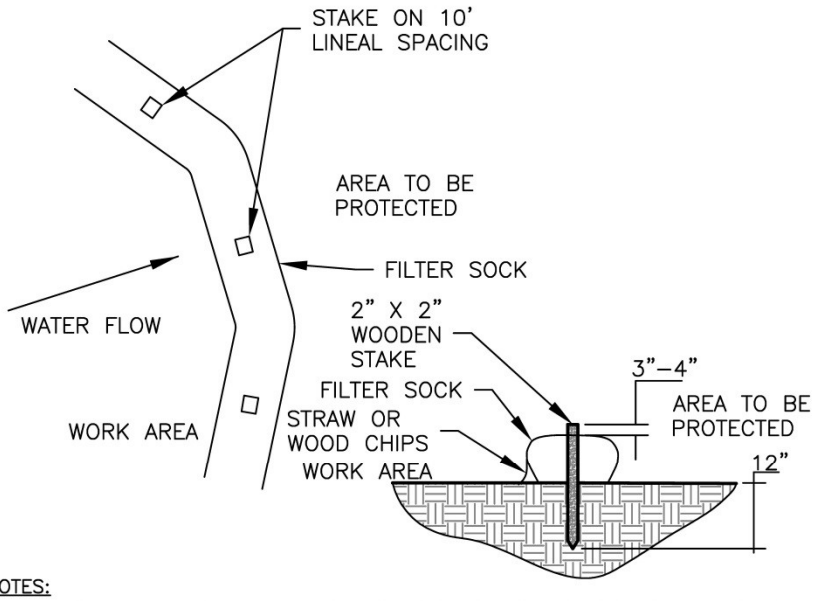
1. NO SILT FENCE REQUIRED IF CRITERIA FOR A NATURAL VEGETATIVE FILTER (BUFFER) STRIP IS MET AND LOCATED DOWN SLOPE OF CONSTRUCTION. THE VEGETATIVE FILTER (BUFFER) STRIP SHALL BE IN ACCORDANCE WITH VEGETATIVE FILTER (BUFFER) STRIP DETAIL.
2. REGULAR SILT FENCE WILL BE USED WHERE DRAINAGE AREA IS NO MORE THAN 1/4 ACRE PER 100' OF SILT FENCE AND THE MAXIMUM GRADIENT ABOVE FENCE IS 2:1. BELTED SILT RETENTION FENCE SHALL BE UTILIZED WHERE CONDITIONS EXCEED SILT FENCE REQUIREMENTS. SLOPE LENGTH ABOVE BELTED SILT RETENTION FENCE SHALL NOT EXCEED 400'.
3. USE THIS DETAIL FOR ALL PROPOSED/NEW AND UPGRADED EXISTING ACCESS ROADS.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 24
TYPICAL ACCESS ROAD
E & S CONTROL

XXXIX. **Figure 25 – Typical Compost Filter Sock**



NOTES:

1. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.
2. 8", 12" 18" AND 24" COMPOST FILTER SOCK TO BE USED. SEE PLAN SHEET FOR SIZES AND LOCATIONS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE COMPOST FILTER SOCK.
4. COMPOST FILTER SOCK SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED COMPOST FILTER SOCK SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

FILTER SOCK SIZING CHART

SLOPE PERCENT	8 IN (200 mm) SiltSoxx™	12 IN (300 mm) SiltSoxx™	18 IN (450 mm) SiltSoxx™	24 IN (600 mm) SiltSoxx™	32 IN (800 mm) SiltSoxx™
	6.5 IN (160 mm)**	9.5 IN (240 mm)**	14.5 IN (360 mm)**	19 IN (480 mm)**	26 IN (650 mm)**
2 (OR LESS)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (120)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* BASED ON FAILURE POINT OF 36 IN (0.9 m) SUPER SILT FENCE (WIRE REINFORCED) AT 1000 FT. (303 m) OF SLOPE, WATERSHED WIDTH EQUIVALENT TO RECEIVING LENGTH OF SEDIMENT CONTROL DEVICE, 1 IN/24 hr (25 mm/24 hr) RAIN EVENT.

** EFFECTIVE HEIGHT OF SiltSoxx ™AFTER INSTALLATION AND WITH CONSTANT HEAD FROM RUNOFF AS DETERMINED BY OHIO STATE UNIVERSITY.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 25
TYPICAL COMPOST FILTER SOCK

XL. **Figure 26 – Typical Outlet Marker**

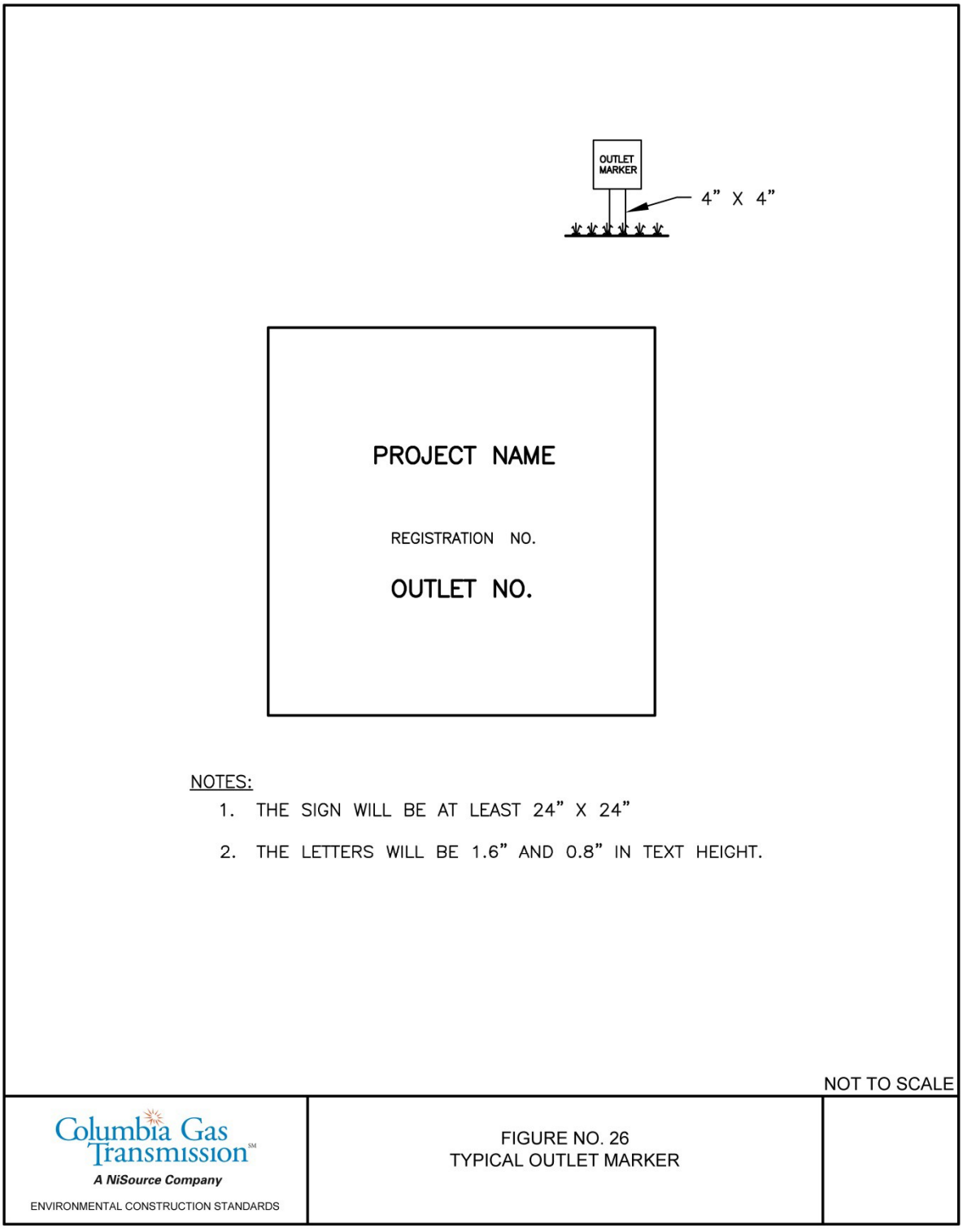
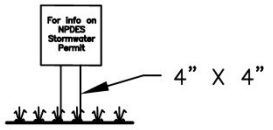


Figure 27 – Typical Public Notice/Entrance Sign



For info on NPDES
Stormwater Permit

To Comment on Sediment Control Plan

Call: 800–654–5227

OR

DEP.Plan@wv.gov

DEP 601 57TH Street SE, Charleston, WV. 25304

Application Date: XX/XX/XX

Name of Project,
Project Description

(area code) Tele. No.

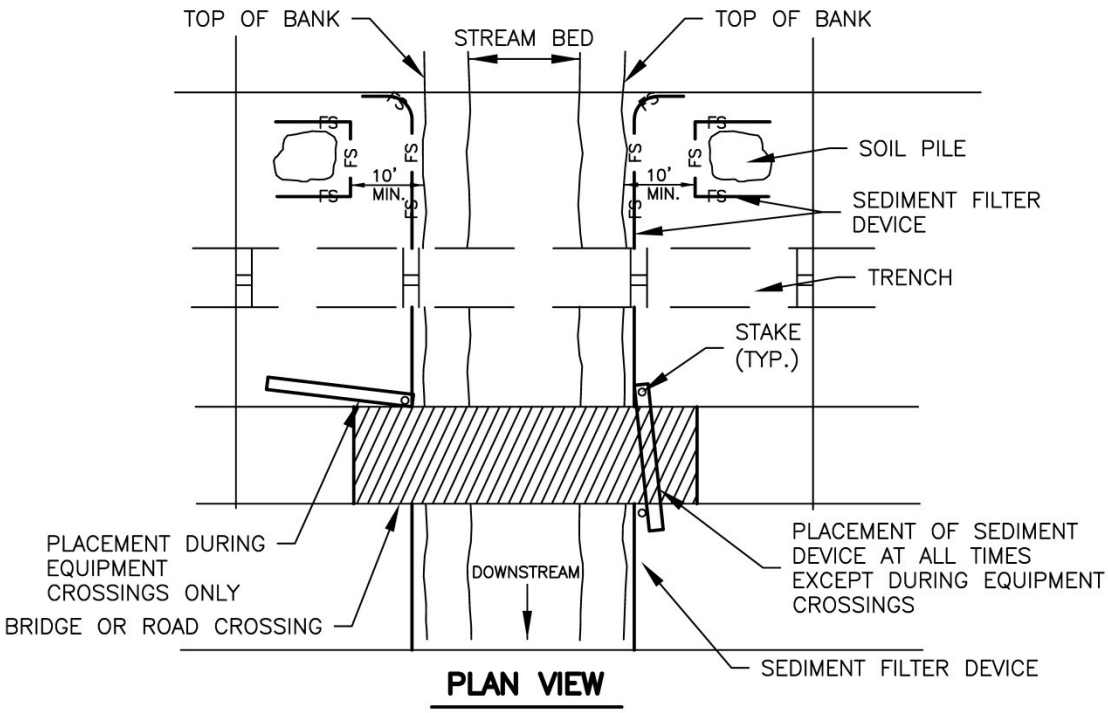
NOTES:

1. THE SIGN WILL BE AT LEAST 24" X 24"
2. THE LETTERS WILL BE 1.6" AND 0.8" IN TEXT HEIGHT.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 27 TYPICAL PUBLIC NOTICE/ENTRANCE SIGN	

Figure 28 – Typical Removable Sediment Filter Device



PLAN VIEW

NOTES:

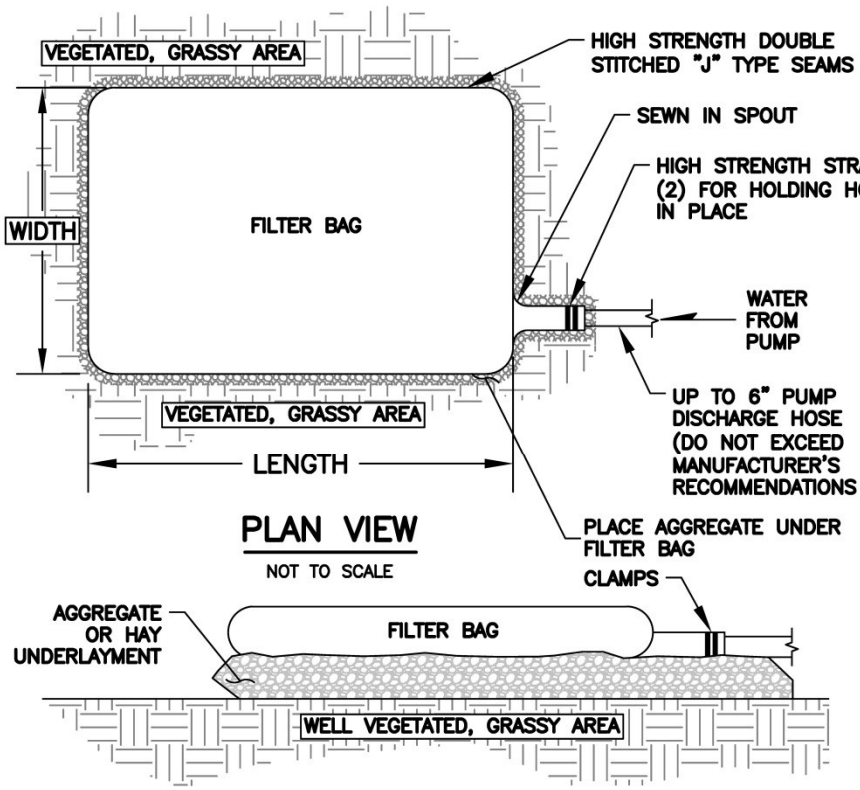
1. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, SILT FENCE, OR OTHER APPROVED EQUIVALENT), SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SEDIMENT FILTER DEVICE SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
2. SEDIMENT FILTER DEVICE AT ENTRANCES SHALL BE IN PLACE FROM START OF DAY, DURING CONSTRUCTION ACTIVITIES AND AT END OF DAY. SEDIMENT FILTER DEVICE MAY BE TEMPORARILY MOVED AS SHOWN ON THE LEFT DURING EQUIPMENT CROSSING ACTIVITIES BUT MUST BE REPLACED IMMEDIATELY UPON COMPLETION OF CROSSING.
3. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 28
TYPICAL REMOVABLE SEDIMENT FILTER DEVICE

XLI. Figure 29 – Typical Water Filter Bag



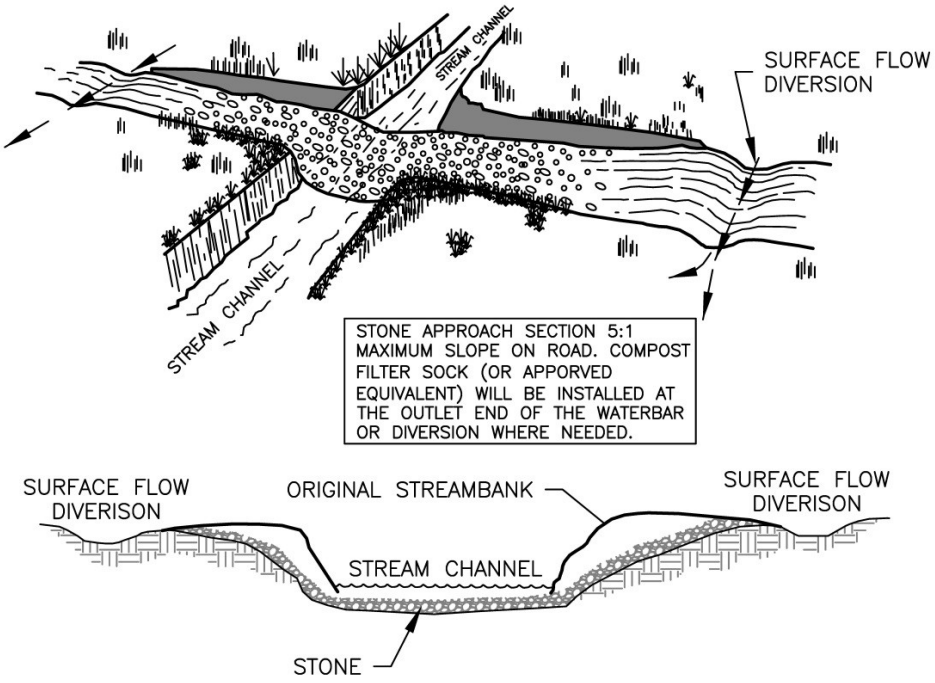
NOTES:

1. 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.
2. BAGS MUST BE PLACED WITHIN THE PERMITTED AREA IF ACCESSING THE BAG WITH MACHINERY IS REQUIRED FOR DISPOSAL PURPOSES. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED.
3. BAGS SHOULD BE LOCATED IN WELL–VEGETATED (GRASSY) AREAS, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH CAN BE PROVIDED OR ALLOW DISCHARGE FROM BAG TO FLOW THROUGH A SERIES OF SEDIMENT LOGS ETC.... BAGS CAN BE USED INSIDE SEDIMENT TRAPS.
4. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. DO NOT ALTER OR CUT BAGS.
6. AGGREGATE OR HAY SHALL BE PLACED UNDERNEATH FILTER BAGS.
7. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, HAY BALE OR APPROVED EQUIVALENT) SHALL BE PLACED WHERE WARRANTED OR AS DETERMINED BY THE EI.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 29 TYPICAL WATER FILTER BAG	

Figure 30 – Typical Stream Crossing Surface Flow Diversion



NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 30
TYPICAL STREAM CROSSING WITH
SURFACE FLOW DIVERSION

APPENDIX D-2
Columbia Gulf's Environmental Construction Standards

ENVIRONMENTAL CONSTRUCTION STANDARDS

January 2016

Columbia Gulf Transmission, LLC

TABLE OF CONTENTS

I. INTRODUCTION

Columbia is committed to complying with the applicable environmental rules and regulations of federal, state, and local governments. Columbia's goal is to meet these requirements in the pursuit of a cleaner, safer environment for future operations.

Recognizing this goal, it is Columbia's policy that all construction, operation and maintenance activities be conducted in a safe manner that minimizes impacts on stream and wetland ecosystems, wildlife habitat, cultural resources and the human environment. To this end, Columbia has prepared these Environmental Construction Standards (ECS). The ECS provides the minimum requirements to be applied to all construction, operation and maintenance activities.

The general objective of this ECS is to provide Columbia personnel and Columbia's contractors with instructional information, complete with a practical approach to environmental concerns, which can arise before, during and after facility construction. More specific objectives include:

- minimize impacts to environmentally sensitive areas;
- use the minimum land required for safe and efficient construction, operation, and maintenance of the facilities;
- prevent erosion and sedimentation during construction; and
- complete construction in a safe and timely manner.

Words and/or phrases which have special meaning (shown in **bold** at first occurrence in text) and acronyms have been defined in Definition of Terms Section VIII.

The intent of the ECS is to confine project-related disturbance to the identified **construction work areas** and to minimize erosion and enhance revegetation in those areas. Any project-related ground disturbance (including erosion) outside of these areas is subject to compliance with all applicable survey[1] (see superscript note 1) and mitigation requirements.

The ECS is focused primarily on pipeline related construction, operation, and maintenance. However, it can be equally applied to all Columbia facilities, for example, storage facilities including well locations, compressor stations, horizontal directional drill locations and measurement/regulation stations. This ECS shall be used as the base document from which Columbia will build individual project-specific Environmental Management and Construction Plans (EM&CP) as called for in Columbia's Policy and Procedure, Plan 120-10. The EM&CP may include written recommendations from the local soil conservation authorities or land management agencies for both temporary and permanent erosion control and revegetation specifications. Federal, State and local agencies having regulations more stringent than this ECS shall supercede[2] (see superscript note 2).

II. UPLAND CONSTRUCTION

A. General

This chapter describes typical upland pipeline construction.

The upland pipeline construction spread operates as a moving assembly line performing specialized procedures in an efficient, planned sequence. Figure 1 presents this typical upland pipeline construction sequence. In addition, special construction crews install and alter fences, bore under roads and railroads, install stream and **wetland** crossings that are not done by conventional upland techniques, and construct valve settings and meter/regulator stations.

While construction work is on going, the construction work area will be kept clean of all rubbish and debris resulting from the work. Excess construction materials and debris must be collected, contained, and disposed of at regular intervals. This includes timber, slash, mats, garbage, drill cuttings and fluids, as well as excess rock. Non-hazardous materials and waste shall be disposed of in an approved landfill. Hazardous waste shall be disposed of in accordance with Columbia policies (Plan 120.03 and 120.04) and federal, state and local regulations.

B. Right-of-Way Width

For 14-inch or larger diameter pipelines on new alignments, Columbia typically utilizes a 50-foot wide permanent right-of-way (ROW plus a 25-foot wide temporary construction ROW as illustrated in Figure 2). After the construction work area is restored, the temporary work areas are allowed to revert to its previous uses. The permanent ROW is maintained as Columbia's permanent ROW for the facility. Figure 2 also illustrates the typical pipeline construction work area when paralleling existing facilities.

In addition, there may be instances where extra work areas are needed for topsoil conservation, side hill construction, equipment staging, pipe and material storage, borrow and disposal areas, temporary and permanent access, and related construction activities. Such areas will be identified in the project plans and will undergo all required environmental and cultural resources reviews prior to use. In contrast, pipelines may be constructed through confined areas such as extremely steep and narrow ridges. Alternate construction methods may be required in narrow construction work area situations to safeguard workers, equipment, the pipeline, and the environment.

For 12-inch and smaller diameter pipelines, a 50-foot wide ROW is typically used due to a narrower trench and the use of smaller equipment. The typical 50-foot ROW is illustrated in Figure 3. In addition, there may be areas where extra construction work areas are needed as described above.

For non-pipeline construction activities, such as storage well locations and station projects, the construction work area and permanent ROW may vary and can be

dependent on property lease, property owner agreements, and/or local topography. For example, the construction work area for a typical storage well is 200 feet by 200 feet and the permanent ROW is a 300-foot radius around the well.

All project-related ground disturbance shall be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the FERC's Orders, and/or other federal/state/local environmental permits. This does not apply to activities needed to comply with the FERC Plan and Procedures (i.e. slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) or minor field realignments and workspace shifts per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas. All construction or restoration activities outside of the approved limit of disturbance detailed in the EM&CP are subject to all applicable survey and permit requirements, as well as landowner easement agreements and must be cleared through the Natural Resource Permitting Group prior to that activity.

C. Clearing

The construction work area is cleared to the width specified in the ROW agreements or EM&CP, whichever is less, during clearing operations, all brush and trees will be felled into the construction work area to prevent off-construction work area damage to trees and structures.

The clearing crew and related equipment and equipment necessary for installation of equipment crossings will be permitted a single pass through streams prior to equipment crossing installations unless the stream is a **high quality stream** or designated as **exceptional value water**. Federal, State and local agencies having regulations more stringent than this shall supercede[2] (see superscript note 2).

Should substantial soil disturbance take place during clearing install temporary erosion and sedimentation controls as described in section D-3.

1. Wood Products

Wood Products (i.e., sawlogs, pulpwood or cordwood) are the property of the landowner unless otherwise specified. They will not be used for any purpose unless permission is first obtained from the landowner. When the landowner requests salvage of these materials or approves wood products to be stockpiled and left on site, they will be stockpiled just off the edge of the construction work area, but not within 50 feet of streams, floodplains, or wetlands. Equipment stacking the wood products will not leave the construction work area. Usable timber that measures at least 10 inches in diameter at the butt will be cut into pole lengths (12-14ft) or as otherwise negotiated with the landowner. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval and mitigation requirements.

2. Brush

All cleared brush will be disposed of by one of the following methods:

- Brush may be piled just off the edge of the construction work area but not within 50 feet of streams, floodplains or wetlands. Equipment stacking the brush will not leave the construction work area. Brush piles will be constructed a maximum of 12 feet wide and compacted to approximately 4 feet high, with periodic breaks at a minimum of every 200 feet to permit wildlife travel. Breaks should be no smaller than 4ft wide to allow wildlife travel. Brush piles will be kept separate from usable timber and care will be taken to prevent mixing of soil and brush. The landowner should be consulted to determine acceptable brush pile locations along the construction work area. Landowner approval is required for this method.

- Brush may be burned where permitted by law. The necessary burning permits will be obtained. Fires will be of reasonable size and located and patrolled so that they will not spread off the construction work area.

- The brush may be chipped and given away, buried, or thinly spread (less than 2 inches thick) over the construction work area or blown off the construction work area (per landowner agreement and approvals) except in **agricultural lands** or within 50 feet of streams, floodplains, or wetlands. If wood chips are used as mulch, do not use more than 1 ton/acre*. Chipping will be limited to those areas where agreed to with the landowner. During **restoration**, soil will be augmented by the addition of 11 pounds of nitrogen per ton of chips to aid re-vegetation, at least half of which must be slow release.

- Brush may be hauled off-site. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval and mitigation requirements.

  *One ton of chips spread 1 inch thick cover approximately $^{1}/_{4}$ acre.

3. Fence Crossings

Where it is necessary to remove fences, adequate temporary fences or gates as illustrated in Figure 4 will be installed **immediately** or in accordance with landowner agreement. Such temporary fences or gates will be kept closed, except when necessary for construction purposes per landowner agreement. Once construction is completed, permanent fence repairs will be completed. All fences that have been cut or removed will be permanently repaired during restoration to match the original type of

the fence as much as possible. Where there is any doubt as to the usability of old fence material, new material will be used in making repairs. Fence repairs will be subject to the approval of the landowner.

D. Grading

Grading is necessary to provide a smooth and even surface for safe and efficient operation of construction equipment. Grading will be the minimum amount necessary and includes prompt installation of erosion control devices such as interceptor diversions, **sediment filter devices**, and equipment crossings at streams to minimize soil loss and subsequent sedimentation.

1. Tree Stump and Rock Removal and Disposal

Tree stumps and large rocks will be cut, graded or removed as necessary to permit construction and to provide adequate clearance for mechanical equipment and other vehicles. Tree stumps that are adjacent to roads will be cut close to the ground or removed.

Stumps and large rocks will be disposed of in the following manner with landowner approval. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval and mitigation requirements.

- buried within the construction work area except in agricultural, residential, or wetland areas;
- windrowed just off the edge of the construction work area with landowners' permission. Windrows will be a maximum of 12 feet wide with periodic breaks a minimum of 200 feet apart;
- hauled from the site and disposed of in an approved landfill or other suitable area.

2. Topsoil Conservation

Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus soil side method) in:

a. actively cultivated or rotated croplands and pastures;
b. residential areas;
c. hayfields; and
d. other areas at the landowner's or land managing agency's request.

In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every

effort to segregate the entire topsoil layer. Segregated topsoil may not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as fill material. Figure 5 illustrates topsoil conservation techniques.

The topsoil will be stockpiled separately from all subsoil and will be replaced last during backfilling and **final grading**. Where topsoil is stripped from the entire construction ROW, an additional 25-foot wide temporary work area may be used for topsoil storage with landowners' permission and appropriate environmental approvals. The **Inspector** will determine if additional erosion control devices are needed in topsoil storage areas. Stabilize topsoil pile and minimize loss due to wind and water erosion with the use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary and/or required by environmental permits.

In residential areas, topsoil replacement (i.e., importation of topsoil) is an acceptable alternative to topsoil segregation.

3. Erosion Control Devices

Temporary erosion controls will be installed immediately after or during the initial disturbance of soil. The most effective and versatile erosion control devices are interceptor diversions (temporary slope breakers) and sediment filter devices as illustrated and described in Figures 6A, 6B, 7, 8, 25 and other approved devices. Temporary diversions will be maintained during the construction phase until final diversions are installed. Where required grading has significantly reduced the slope, the Inspector may require fewer temporary diversions consistent with the table on Figure 6.

At a minimum, install and maintain temporary sediment barriers (silt fence, staked hay or straw bales, compacted earth, sand bags, or other appropriate materials) across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment disposition.

Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive environmental resource areas. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed, if the appropriate State or Local governing agency allows this extension.

Sediment barriers may also be necessary and are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until vegetation is successful. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

For silt fence installation, the bottom will be buried 4-6 inches deep, backfilled and compacted, with stakes placed 8 feet apart. See Figure 7. Silt fence will be cleaned out when sediment builds up to half its height or maintained/replaced if damaged.

All temporary erosion control devices, including roadside ditches, will be inspected near the end of each work day or after each storm (rain) event of 1/2 inch or greater, to ensure proper functioning. Any devices damaged beyond functioning will be repaired **promptly**.

4. Temporary Road Entrances

Temporary road entrances will be installed during grading where the construction work area crosses public roads when needed to maintain safe conditions and to prevent tracking soil and mud onto public roads. These installations are designed to remove mud from vehicle tires and tracks before accessing the road. Minimize the use of tracked equipment on public roadways. Geotextile fabric will be used as illustrated in Figures 9, 10 and 11. The roadbed should be cleared of small stubs because these tend to puncture the fabric, thereby allowing fine particles to mix with the gravel. If necessary, up to 6 inches of soil will be removed prior to installation of the temporary road entrance to ensure a hard base for geotextile fabric and rock placement. Geotextile fabric is not required at existing, graveled access road entrances, if gravel is to be left after construction landowner approval is required.

In addition, public roads will be swept, shoveled or scraped as necessary to keep the road surface safe. Any damages to roadway surfaces, shoulders, and bar ditches will be repaired. If the public road is gravel, the temporary entrance is not required to be graveled. Typical erosion control measures at road crossings are illustrated in Figure 12. If no access is required onto the roadway the installation of a construction entrance is not required, however, safety fencing should be installed across the ROW and signs designating “no entrance” can be erected to avoid any unintentional entrances.

E. Access Roads

Typically, Columbia requires access roads to the construction and staging areas. New access roads will be built only if existing access is inadequate. The access roads will be a maximum 25-foot wide with additional width in tight turns and at intersections with public roads (this additional width must be included in the environmental surveys). The roads will either be temporary (used for access during construction only) or permanent (used during and after construction for operation and maintenance of the facilities). All public roads are available for use as access roads without further environmental review. However, all private access roads intended for use are subject to environmental reviews. Safe and accessible conditions will be maintained at all roadway crossings and access points during construction and restoration.

If tree clearing is needed for access road use, trees will be felled into the CWA of the access road itself. All trees and brush will be windrowed at the edge of the access road, with usable timber kept separate. Access road gradient will be as flat as local topography will practically allow. By breaking or changing grade frequently, fewer erosion problems will be encountered than on long, straight, continuous gradients. Interceptor diversions and/or other erosion and sediment control devices will be installed as needed. All access roads will be maintained to provide safe access, as well as sediment control.

Roads will cross streams and wetlands as close as possible to right angles. Road gradients approaching these crossings will be flattened to decrease runoff velocity. Runoff will be dispersed just prior to the crossing by means of an interceptor diversion with a sediment filter device at the outlet. Where conditions permit, new roads will be located at least 25 feet from any stream or wetland except at crossing locations. Culverts will be sized and placed to permit water flow under the access road.

After construction, temporary access roads (including any additional width used for construction) will be graded and left intact for the landowner's benefit, or removed and the area restored using the same specifications as applied to the rest of the construction work area.

F. Residential Areas

The following mitigation measures will be implemented for all residences within 50 feet of the construction work area:

- Mature trees and landscaping will not be removed from within the edge of the construction work area unless necessary for safe operation of construction equipment or as specified in landowner agreements;

- Immediately after backfilling the trench, all lawn and landscaping will be restored to final restoration, or temporary restoration pending weather and soil conditions;

- The edge of the construction work area adjacent to the residence will be safety fenced for a distance of 100 feet on either side of the residence to ensure that equipment, materials and spoil remain within the construction work area;

- A minimum of 25 feet will be maintained between the residence and construction work area for a distance of 100 feet on either side of the residence. If the facility must be within 25 feet of a residence, it must be installed such that the trench does not remain open overnight.

If seasonal or weather conditions prevent compliance with these time frames, temporary erosion controls must be monitored and maintained until conditions allow completion of restoration.

G. Trenching

1. Trenching Specifications

Typically, the trench will not remain open for more than 30 days in any area unless authorized by the Inspector (additional restrictions for stream and wetland areas are provided in Section III).

- As the trench is completed, trench line breakers as illustrated in Figure 13 will be installed promptly at every second temporary interceptor diversion at a minimum, or at increased intervals as approved by the Environmental Inspector. Topsoil will not be used to construct the breakers. The breakers reduce water velocity and erosion of the trench bottom. The breakers will be maintained promptly.

- Sediment filter devices will be installed around spoil storage areas before digging bore pits, stream crossings, and as necessary wetland crossings.

- If it is necessary to pump water from the trench or bore pits, the water will be pumped into a heavily vegetated upland area where the water will filter back into the ground, a sediment trap as illustrated in Figure 14A, a sediment filter bag as illustrated in figure 14B, or through a sediment filter device such as a series of terra tubes, filter sock, or flocculent logs at least 10 feet from any stream or wetland in order to minimize erosion and subsequent sedimentation of streams or wetlands. If little vegetation is present, straw bales or filter sock containment will be added around the filter bag for additional sediment control. Water impounded in the trench will not be released directly or by overland flow into any **waterbody** or wetland. Dewater the trench in a manor that does not cause erosion and does not result in heavily silt laden water flowing into a waterbody or wetland.

When the trench must remain open for a greater length of time, appropriate erosion controls and safety measures will be employed as directed by the Inspector.

2. Blasting

All drilling and blasting will be done in a cautious manner, and suitable precautions will be taken to avoid injury or damage to persons, livestock, or other property.

If blasting is necessary within 150 feet of residential or commercial buildings, an independent contractor will be hired to perform pre- and post-blast structural inspections and, if necessary, seismographic monitoring.

In those instances where blasting has the potential to affect water quantity/quality from domestic or agricultural wells or springs in the proximity of the construction work area, Columbia will conduct pre- and post-blasting (within two months of construction work restoration) testing of water wells within an appropriate distance (typically 150 feet) of the pipeline with landowner permission. These tests may include a pump inspection, flow rate, and bacteriological cultures. If a water well is damaged as a result of Columbia's activities, Columbia will provide a temporary source of water and/or compensate the owner.

3. Temporary Construction Access over the Trench Line

Where access across the trench line is required, temporary facilities such as trench plugs and fences, wooden mats or steel plates will be constructed or installed to permit safe crossing of livestock, vehicles, equipment, and persons from one side of the trench to the other.

4. Drainage Tile and Irrigation Facilities

Attempt to locate existing drain tiles and irrigation systems. Columbia personnel will contact landowners and/or the local National Resource Conservation Service (NRCS) to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction, if planned the pipeline will be installed at a sufficient depth to accommodate the drainage tile. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s) and within US Department of Transportation (DOT) specifications. Mark locations of drain tiles damaged during construction.

Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available. Drainage tile removed, cut, broke, or otherwise damaged during construction will be repaired or

replaced as illustrated in Figure 15. Temporary measures approved by the Inspector will be taken to provide suitable drainage until permanent repairs are made. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and landowner agrees.

Water flow will be maintained in crop irrigation systems unless shutoff is coordinated with affected parties.

H. Backfilling Specifications

Backfilling will follow pipe lowering as closely as practical. Topsoil will not be used to pad the pipe. Soil that has been excavated during construction and not used for backfill will be evenly spread over the cleared construction work area or removed from the site and properly disposed. All waste materials such as barrels, cans, drums, stumps, coating and wrap, rubbish, waste, or other refuse will not be placed in the trench.

Trench line barriers as illustrated in Figure 13 will be placed in the trench prior to backfilling to prevent water movement and subsequent erosion. An engineer or similarly qualified professional shall determine the need for and spacing of trench line barriers. Otherwise, trench line barriers shall be installed at the spacing illustrated in Figure 13 and up-slope of any permanent interceptor diversions. Trench line barriers may be constructed of materials such as sand bags or polyurethane foam. Foam barriers can be used if the appropriate State or Local governing agency allows.

Excess rock, including blast rock, may be used to backfill the trench to the top of the existing bedrock profile. Care should be taken to not damage the pipeline.

I. Final Grading, Restoration and Stabilization

After construction activities, all disturbed areas will be stabilized with either (1) final grading and restoration; or (2) **temporary stabilization** measures in order to prevent erosion and sedimentation until final grading and restoration can be completed. If construction or restoration unexpectedly continues into the winter season when conditions could delay successful de-compaction, topsoil replacement, or seeding until the following spring, file with the Secretary for review and written approval of the Director, a winter construction plan. This does not apply to projects constructed under the automatic authorization provisions of FERC's regulation.

1. Final Grading

Final grading will be completed within 20 calendar days of backfilling (10 days in residential areas), weather and soil conditions permitting. Should unsuitable soil conditions persist, or be expected to persist, for more than

20 calendar days (10 days in residential areas), the Inspector will record the conditions and require the installation of temporary stabilization measures, and final grading and restoration will be delayed until conditions allow. In no case shall final grading be delayed beyond the end of the next recommended seeding season.

If final grade can be established, but conditions are not ideal for permanent seeding, the Inspector will specify application of temporary stabilization measures (including temporary seeding), and may also consider concurrent application of final seed mix and mulch as provided in Table 2a or per the local conservation authority. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed, inspected, and maintained. When access is no longer needed, the travel lane must be removed and the right-of-way restored.

Grade the construction right-of-way to restore pre-construction contours.

During final grading, soil over the trench may be mound to allow for future settling. Where fill in the trench or major depressions have settled below ground level, additional fill will be added as needed, and the area brought to final grade. The Inspector may approve a temporary travel lane in the construction work area where needed to facilitate the remainder of construction and/or restoration. This travel lane must be restored when access through the area is no longer required.

Conserved topsoil will be returned during final grading.

Excess rock will be removed from at least the top 12 inches of soil to the extent practicable in all actively cultivated or rotated agricultural land, hayfields, pastures, residential areas, and other areas at the landowner's request. The size, density and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. Diligent efforts will be made to remove rocks greater than 4 inches if, off-construction work areas do not contain rocks greater than 4 inches. The landowner may approve other rock size provisions in writing. Rock that is not returned to the trench is considered construction debris, unless approved for use as mulch or for some other use on the construction work area by the landowner or land managing agency. All construction debris from all work areas must be removed unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.

Final erosion control devices including interceptor diversion/slope breakers will be installed during final grading. See Figures 6A and 6B for installation and spacing details. Final diversion will be constructed such that water does not pond in them and is conveyed off the ROW. Sediment filter devices needed to protect off-construction work area resources will be installed or rebuilt promptly after final grading. Final

interceptor diversions will not be installed in agricultural or pasture land without landowner's consent.

2. Soil Compaction Testing

Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to identify approximate preconstruction conditions. Use U.S. Army Corps of Engineers-style cone penetrometers or other appropriate devices to conduct tests.

Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. Alternatively, make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

Perform appropriate soil compaction mitigation in severely compacted residential areas.

3. Restoration

Restoration as defined in Definition of Terms – Section VIII, will begin within 6 days of final grading, weather and soil conditions permitting. Fertilizer and lime will be disked into the soil (except rocky soils) to a depth of 3 to 4 inches to prepare a seedbed. In rocky soils, fertilizer and lime may be incorporated into the soil with tracked equipment. Seeding and mulching the construction work area will promptly follow seedbed preparation. Ensure that mulch is adequately anchored to minimize loss due to wind and water. Mulch tackifiers used in accordance with the manufacturers recommendations may be used as an alternative. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.

The typical application rates for lime, fertilizer, seed and mulch are listed in Table 2a. They will be used unless the ROW agreement, permit or local NRCS provides project-specific recommendations. If Tall Fescue is used, plant endophyte free certified seed. If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.

If hydroseeding is utilized, lime and fertilizer applications should be equivalent to Table 2a unless ROW agreement, permit or the local NRCS provides project specific recommendations. Hay or straw mulch shall be applied in accordance with Table 2a over hydroseeding. Hydromulch can be used in conjunction with (for texture purposes) but not substituted for

hay or straw mulch. **Scarify** the seedbed to facilitate lodging and germination of seed.

Uniformly apply and cover seed in accordance with the written recommendations of the local soil conservation authorities or land management agencies.

Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing. Treat legume seed with an inoculate specific to the species using the manufacturer's recommended rate of inoculent appropriate for the seeding method. If the above recommendations are not available for conventional seeding, use 4 times the manufactures recommended rate of inoculate. For hydroseeding, use 10 times the recommended rate of inoculate.

In the absence of recommendations from the local conservation authority, a seed drill equipped with a cultipacker is preferred for application, but broadcast or hydroseeding can be used at double the seeding rates shown in Table 2a. Where seed is broadcast, firm the seedbed with a cultipacker, roller or other suitable means after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be approved by the environmental inspector.

Restoration will not be performed in agricultural lands from the beginning of the spring thaw through May 15 unless requested by the landowner. Restoration will be coordinated with the landowner's planting schedule. Grazing deferment plans will be developed with willing landowners, grazing permittees, and land management agencies as appropriate to minimize grazing disturbance of revegetation efforts.

Permanent seeding, liming, and fertilizing may be performed by the landowner. The Inspector will ensure that the restoration is satisfactory and consistent with the regulatory requirements.

Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

Jute netting as illustrated in Figure 16 or equivalent approved by the Inspector may be used on **steep slopes** to help stabilize the slope. Do not use coconut fiber erosion control blanket/netting.

Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the landowner or land managing agency), revegetation is successful, and proper drainage has been restored.

Synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise.

4. Temporary Stabilization

When the Inspector determines that temporary stabilization measures are required, they will be completed as soon as possible. The seeding and mulching rates are provided in Table 2b. Consideration will be given to the following when determining if temporary stabilization measures are to be implemented:

- if final grading and installation of <u>permanent</u> interceptor diversions or slope breakers will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas);
- anticipated weather conditions; and
- resources on and off the construction work area to be protected.
- Construction or restoration activity is interrupted for extended periods.

If temporary stabilization measures are utilized, final grading and/or restoration must commence once weather and soil conditions permit.

Apply mulch in accordance with the specifications outlined in this section however, during temporary restoration; increase mulch application on all slopes (8 percent or more) within 100 feet of waterbodies and wetlands to a rate of 6,000 lbs/acre (3 tons).

5. Restoring Man-Made Structures

All existing man-made installations that are disturbed or damaged during construction along new ROW will be repaired or replaced and left in equivalent or better condition than they were found prior to construction, unless alternative arrangements with landowners dictate otherwise.

Man-made installations on existing ROW that are disturbed or damaged during construction will be addressed consistent with Columbia's encroachment policy.

6. Off-Road Vehicle (ORV) Control

Columbia will discuss with each landowner and park manager along new ROW (not adjacent to existing ROW) in forest lands the need for ORV control. If requested, one or more of the following ORV control measures will be installed:

- Plant conifers (pine trees) across the construction work area. The spacing of trees and length of construction work area planted should provide for adequate facility maintenance, but should be sufficient to limit access and to screen the ROW from view. Trees will not be planted directly over the pipeline.

- Install a slash and timber barrier, a pipe barrier, or a line of boulders across the construction work area to restrict vehicle access.

- Install a locking gate with fencing extending a reasonable distance to prevent bypass.

- Install "No Trespass" signs.

J. Noise Impact Mitigation and Dust Control

Construction equipment will be properly muffled and maintained to avoid producing excessive noise near **noise sensitive areas**.

Efforts will be made to control dust at sensitive areas such as residential areas and road crossings. Water trucks will be used at a minimum to dampen the work area if dust becomes a problem.

K. Hydrostatic Testing

Typically, Columbia verifies a facility's integrity by hydrostatic testing. Water can be drawn from local sources (streams, ponds, public water supplies) and in a manner that will minimize impacts to the environment and other existing users, while maintaining adequate stream flow. Water from state designed *high quality streams* or *exceptional value waters*, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies will not be used unless other water sources are not readily available and the appropriate federal, state or local agency permits its use.

Intake hoses will be screened.

Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

All required federal, state and local approvals for the withdrawal and/or discharge of hydrostatic test water will be obtained prior to such activities.

Maintain adequate flow rates to protect aquatic life and provide water for downstream withdrawals by existing users.

Comply with all approval/permit conditions which may include notifying the appropriate state agency of withdraw/discharge, collection of samples in accordance with permit conditions where required, and discharging in a manner to meet all discharge parameters where required.

All welds will be radiographically inspected or hydrostatically tested before pipe installation under waterbodies or wetlands.

The discharge of the hydrostatic test water will be performed in a manner that minimizes erosion. The energy of the released test water will be dissipated by discharging the water:

- into a well-vegetated upland area;
- into a tank(s)
- into a body of water (with all required permits and meeting all conditions); or
- through sediment filter devices or a sediment trap to filter out various particulate matter or allow it to infiltrate through the soil.

If necessary, regulate the water discharge rate, use energy dissipation device(s); and/or install sediment barriers to prevent erosion, scour, suspension of sediments, or excessive streamflow. During the discharge, the Inspector must ensure that erosion and sedimentation are properly controlled.

Do not discharge into waters from state designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies unless the appropriate federal, state or local agency grants permission.

Methanol may be injected, after discharging the water, to dry the pipe. Excess methanol will be retrieved from the facility and used during subsequent operation of Columbia's facilities.

This guidance is for hydrostatic testing of new pipe. Permitting requirements associated with hydrostatic testing of used pipe can be extensive. Contact the NRP Group prior to testing any used pipe.

L. POST-CONSTRUCTION ACTIVITIES AND REPORTING

Follow up inspections must be conducted of all disturbed areas, as necessary, to determine the success of re-vegetation and address landowner concerns. At a minimum, follow up inspections must be conducted after the first and second growing seasons. If re-vegetation is unsuccessful, continue re-vegetation efforts until adequately restored.

Quarterly reports must be filed with the Secretary documenting the results of follow up inspections; any problem areas, including those identified by the landowner; and corrective actions taken for at least 2 years following construction. This does not apply to projects construction under automatic authorization, prior notice, or advanced notification provisions in the FERC's regulations.

III. STREAM AND WETLAND CROSSINGS

A. Stream Crossings

1. General

The main objective of any waterbody crossing is to construct the pipeline in a manner, which minimizes erosion and subsequent sedimentation into the waterbody. Crossings will be constructed as close as possible to right angles with the waterbody channel. Adequate downstream flow rates will be maintained at all times to protect aquatic life and prevent the interruption of existing downstream uses. Each waterbody crossing will be treated as a separate construction entity, such that trenching, pipe installation, backfilling and temporary stabilization or final restoration are completed in the minimum number of consecutive calendar days possible.

Whenever a time limit is imposed on a crossing procedure, that time limit is only applicable to trenching (except blasting), lowering in, and backfilling. Clearing, grading and equipment crossing installation and removal activities are not included as part of the separate construction entity. Construction equipment will not be allowed in the water except as provided in this Section.

Unless expressly permitted or further restricted by the appropriate federal or state agency in writing on a site-specific basis, in-stream work, except that required to install or remove equipment bridges, must occur during the following time windows:

- Coldwater Fisheries - June 1 through September 30
- Coolwater and Warmwater Fisheries - June 1 through November 30

Columbia will notify in writing authorities responsible for potable water supply intakes located within 3 miles downstream, at least one week before beginning work in the waterbody, or as required by state or local regulation.

When water levels are temporarily high, the Inspector will direct that starting any waterbody crossing be postponed until water levels subside.

Any extra work areas will be located at least 50 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. Where topographic conditions do not permit a fifty-foot setback, contact the Natural Resources Permitting group for approval. All extra work areas must be located at least 10 feet from the water's edge and limited to the size needed to construct the crossing. Pipe assembly for the waterbody crossing is usually performed in the extra work areas prior to or concurrently with trenching.

Standards relating to spill prevention at waterbodies are contained in Section IV, "Spill Prevention".

If the facility parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody and the right-of-way except at the crossing location. Where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the right-of-way.

Waterbody buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction related ground disturbing activities are completed.

2. Crossing Techniques

Columbia typically utilizes either the dry-ditch (flume pipe) wet-ditch; or Dam and Pump techniques to install pipelines across waterbodies. Figures 18, 19 and 20 illustrate these methods. **Upland construction** techniques may be used for **intermittent waterbody** crossings without perceptible flow at the time of the crossing, provided that a culvert is **promptly** installed to carry stormwater flow across the trench area and the erosion and sediment control devices illustrated in Figure 17 are installed.

a) Minor Waterbodies

Minor waterbodies will be considered those which are 10 feet wide or smaller, at the top of bank. For crossings of coldwater fisheries and coolwater and warmwater fisheries considered significant by the state, install the pipeline using the dry-ditch method or Dam

and Pump method, unless approved otherwise in writing by the appropriate state agency.

For other **minor waterbody** crossings, complete instream construction in the waterbody using the wet-ditch method within 24 hours (except for blasting and pneumatic chipping; see Section III.6.). Limit use of equipment operating in the waterbody to that needed to construct the crossing. Wet-ditch method will only be used if approved.

b) Intermediate Waterbodies

Intermediate waterbodies will be considered those which are 10-100 feet wide, at the top of bank. The wet-ditch method can be used for **intermediate waterbody** crossings, where approved. Only the equipment necessary for excavating the trench, lowering-in the pipe, and backfilling the trench is allowed in the waterbody. Columbia will attempt to complete trenching and backfill work in the waterbody within 48 hours, unless site-specific conditions make completion within 48 hours infeasible.

For crossings of coldwater fisheries, coolwater fisheries, and warmwater fisheries considered significant by the state which are 10 to 30 feet in width, install the pipeline using the dry-ditch method or Dam and Pump method, unless approved otherwise in writing by the appropriate state agency.

c) Major Waterbodies

Major waterbodies will be considered those which are 100ft wide or larger, at the top of bank. Major waterbodies could also include waterbodies that are smaller, if there are special conditions that warrant a site-specific plan be created, such as threatened or endangered species habitat, stream classification, or other factors. Due to their sensitive nature, **major waterbody** crossings will have site-specific construction plans approved by the Natural Resource Permitting group. Horizontal Directional Drilling may be considered as an alternative for these crossings.

3. Equipment Bridges

Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the numer of such crossings of each waterbody to one per piece of equipment. Equipment bridges will be constructed to allow unrestricted flow and to prevent soil from entering the waterbody. See Figures 21 and 22. Soil cannot be used to construct or stabilize equipment bridges. If timber mats are used as equipment bridges, the mats must be in good

condition, with no large holes that could allow sediment to enter the waterbody.

Equipment bridges must be able to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion and streambed scour.

Temporary equipment bridges must be removed as soon as practicable after permanent seeding. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, remove temporary equipment bridges as soon as practicable after final cleanup.

4. Clearing

Tree and brush clearing will be performed as previously described in Section II, "Upland Construction". All cleared materials will be disposed of at least 50 feet from the water's edge.

5. Grading

Grading equipment will not enter the water to grade the banks. Waterbody banks will be graded only where, and as much as, necessary to permit safe and efficient operation of construction equipment. During grading operations, sediment filter devices will be installed across the entire construction right-of-way promptly and as close to the water as practical. Removable sediment filter devices must be installed across the travel lane. These removable sediment filter devices, if removed during the day, must be re-installed by the end of the work day or when heavy precipitation is imminent. All disturbed areas within 50 feet of the water's edge will be promptly mulched. The mulch will be maintained until the waterbody crossing restoration is complete. Spoil from grading will be piled at least 10 feet from the stream banks and immediately protected with sediment filter devices so that it will not erode into the waterbody. On waterbody crossings with approaches sloped 5 percent or greater, interceptor diversions will be installed 50 feet from the water's edge to divert surface runoff into adjacent vegetation. If vegetation is sparse or nonexistent, a sediment filter device will be installed at the discharge of the diversion. Install a sediment filter device across the entire construction right-of-way at the base of slopes 5 percent or greater where the base of the slope is less than 50 feet from a stream. Leave adequate room between the sediment filter device and base of the slope for sediment deposition.

Construction equipment bridges consisting of culvert(s) with clean rock fill of non-erodable material or equipment pads as illustrated in Figures 21 and 22 will be installed during grading operations at all waterbodies. For proper culvert installation, the Inspector may permit grading/excavating equipment to enter the water. Equipment bridges are not required at

minor waterbodies that do not have a state-designed fishery classification (for example, agricultural or intermittent drainage ditches). However, if an equipment bridge is used, it must be constructed in accordance with this ECS. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the stream.

6. Trenching

Notifications to applicable jurisdictional agencies will be made at least 2 days prior to any trenching in waterbodies, or as specified in permits

Prior to trenching within the waterbody, water impounded in the upland trench will be pumped into a sediment trap (Figure 14A) and/or properly installed filter bag (Figure 14B) and/or a series of terra tubes, sediment logs or flocculent logs, or a heavily vegetated upland area where the water can filter back into the ground. Prevent the flow of spoil or heavily silt-laden water into any waterbody. If little vegetation is present, add a straw bale or filter sock containment around the filter bag for additional sediment control.

Sediment filter devices for trench spoil will be installed prior to commencing trenching activities. Sediment filter devices can be temporarily removed from the trench line only to allow trenching activities to proceed.

All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas.

For all new construction activities, the minimum depth of cover for all waterbody crossings is 48 inches in normal soils and 24 inches in consolidated rock.

Trench plugs will be used at all non-flumed waterbody crossings to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs must be of sufficient size to withstand upslope water pressure.

For dry ditch method crossings, use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in to achieve an effective seal). In addition, do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts.

7. Blasting

During the pre-planning of waterbody crossings, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the waterbody bed will be tested for consolidated rock prior to trenching. Blasting will not be done within waterbody channels without prior approval from applicable government authorities having jurisdiction and at least 2-day notice to the authority, or as specified in permits

If the waterbody bottom is consolidated rock, it can be drilled and shot at any time prior to commencing the crossing. However, removal of shot rock, and any additional drilling, shooting and material removal, must be completed within the minimum number of consecutive calendar days practical. The time frame for completing the crossing will immediately commence once a trench of appropriate dimensions is established.

8. Backfilling

Waterbody bottoms will be returned as near as practical to their original contours. Spoil from the trench will be used as backfill. Clean gravel or native cobbles will be used for the final one-foot of fill in the backfilled trench in all coldwater fisheries.

The sediment filter devices removed at the stream will be promptly reinstalled after backfilling.

9. Restoration

The preferred restoration method is to achieve final grade and restore the waterbody, its banks, and 50-foot buffers within 24 hours of backfilling. In the absence of site-specific seeding recommendations, the specifications listed in Table 2a will be used. If conditions do not permit the preferred method, the construction work area not in use for access will be promptly rough graded and stabilized in accordance with Table 2b.

Stabilize waterbody banks and install permanent sediment barriers/sediment filter devices within 24 hours of completing the crossing. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.

Liquid mulch binders will not be used within 100 feet of waterbodies.

For each waterbody crossed, install a permanent interceptor diversion/slope breaker and a trench breaker at the base of slopes near the waterbody. Locate the trench breaker immediately upslope of the interceptor diversion/slope breaker. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

All equipment bridges will be removed once access in the area is no longer required.

Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector. If the waterbody banks are such that an unstable final soil grade would result and vegetative stabilization is inadequate, the Inspector will require mechanical stabilization of the waterbody banks. Mechanical stabilization includes riprap, gabions, jute netting, etc.

Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques, such as seeded erosion control fabric.

Revegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferably woody species.

Application of riprap must comply with the US Army Corps of Engineers, or its delegated agency, permit terms and conditions. In general, riprap will be of field or quarry run stone, which is hard and durable. The riprap will be large enough to prevent normal waterbody current from moving it, typically 6-inch rock for slow moving waterbodies and 12 inch or larger rock for others. The riprap will be placed at least 18 inches thick and generally thicker at the base. The riprap slope will be no steeper than 1:1 and should conform with the remainder of the waterbody bank slopes where they are flatter than 1:1.

Install erosion control fabric, Figure 16, such as jute netting or bonded fiber blankets at a minimum, on waterbody banks at the time of final bank re-contouring. Synthetic monofilament mesh/netted erosion control blanket cannot be used in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife. Anchor the erosion control fabric with staples or other appropriate devices.

Sediment filter devices will be removed once permanent revegetation is successful.

B. Wetland Crossings

1. General

The main objective of any wetland crossing is to construct the pipeline and restore the original contour of the wetland. Wetlands will be clearly marked in the field by a knowledgeable person prior to the start of construction with signs and/or highly visible flagging until construction is complete. The Inspector will maintain these field markings during construction. A maximum 75-foot wide construction work area may be used through wetlands.

Mulch will not be used as a temporary erosion control measure in wetlands.

Aboveground facilities will not be located in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with US DOT regulations.

When water levels are temporarily high, the Environmental Inspector will direct that starting construction in the wetland will be postponed until after the water levels subside.

Standards relating to spill prevention at wetlands are contained in Section IV, "Spill Prevention".

2. Crossing Techniques

For wetland crossings without standing water or saturated soils, upland construction techniques can be used provided the top 12 inches of soil taken from the trench is stockpiled separately from the remaining excavated material. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber matting, prefabricated equipment mats, or terra mats), In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way.

Wetland crossings in non-saturated soil wetlands will be constructed in a manner that will minimize the amount of time construction activities are occurring in the wetland, such as the length of time the topsoil is segregated and the trench is open.

Wetland crossings with standing water or saturated soils will be constructed as separate construction entities, such that trenching, pipe installation, backfilling, and restoration are completed in the minimum number of consecutive calendar days necessary. Clearing, grading and equipment crossing installations are not included as part of the separate construction entity. The "push-pull" or "float" technique of pipe installation will be utilized whenever water and other site conditions permit. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

If standing water or saturated soils are present or if construction equipment causes ruts or mixing of the topsoil and subsoil, use **low-ground-weight** construction equipment, or operate normal equipment on

timber matting (only 2 layers), prefabricated equipment mats or terra mats. Timber matting must be in good conditions and not have large holes in it where sediment could enter the wetland. Tree stumps, rock, gravel, soil imported from outside the wetland or brush will not be used to stabilize the construction work area or as equipment pads in wetlands. Remove all equipment mats, and timber matting during restoration of the wetland.

Staging areas will be located at least 50 feet from the wetland edge except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land and will be limited to the minimum necessary to construct the crossing. If topographic conditions do not permit a 50-foot setback, these areas must be located at least 10 feet from the wetland's edge with prior approval from the Natural Resources Permitting group.

The only access roads, other than the construction work area, that can be used in wetlands without FERC approval are those existing roads that can be used with no modification and no impact on the wetland.

Limit construction equipment operating in wetland areas to that needed to clear the construction work area, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practicable. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction work area.

A typical wetland crossing is illustrated in Figure 23.

3. Clearing

Tree and brush clearing will be performed as previously described in Section II, "Upland Construction". Cut vegetation off just above ground level, leaving existing root systems in place, and remove (vegetation) from the wetland for disposal.

4. Grading

Grading in wetlands will consist of the minimum necessary for safe and efficient equipment operation. Limit pulling of tree stumps and grading activities to directly over the trench line. Do not grade or remove stumps or root systems from the rest of the construction work area in wetlands unless the Chief Inspector and Environmental Inspector determine that safety-related construction constraints require removal of tree stumps from under the working side of the construction work area. Areas where stumps are removed will be noted by the Inspector so, if necessary, those areas can be replanted with woody vegetation as described in wetland restoration.

Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, install sediment barriers along the edge of the construction work area as necessary to prevent sediment flow into the wetland. Remove these sediment barriers after successful restoration has occurred.

Sediment filter devices will be installed promptly across the construction work area during grading at any wetland edge and maintained until construction work area revegetation is complete. Temporary interceptor diversions will be installed adjacent to wetlands. Locations for these devices are illustrated in Figure 23.

5. Trenching

Sediment filter devices can be temporarily removed from the trench line to allow trenching activities to proceed. Spoil piles will be protected with sediment filter devices, if determined necessary by the Inspector, to prevent the flow of spoil off the construction work area.

6. Blasting

During the pre-planning of crossing wetlands with standing water or saturated soils, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the wetland will be tested for consolidated rock prior to trenching. If the wetland has consolidated rock, it must be drilled and shot as part of the single construction entity.

7. Backfilling

If trench dewatering is required, the water will be filtered and discharged through a sediment trap (Figure 14A) and/or filter bag (Figure 14B) and/or a series of terra tubes, sediment logs or flocculent logs or into a heavily vegetated area outside the wetland (where the water will filter back into the ground), so that no heavily silt-laden water enters directly into a wetland or waterbody. Remove any dewatering structure as soon as possible after the completion of dewatering activities. Spoil from the trench will be used as backfill. The surface will be recontoured as closely as practical to the original condition so that drainage patters will not be changed. The conserved topsoil layer will be returned to the surface after backfilling.

Sediment filter devices will be promptly installed after backfilling.

Where the pipeline trench may drain a wetland, construct trench line barriers and/or seal the trench bottom as necessary to maintain the original wetland hydrology. For each wetland crossed, install a permanent interceptor diversion and trench line barriers at the base of slopes near the boundary between the wetland and adjacent upland

areas. Locate the trench line barriers immediately upslope of the interceptor diversion.

Concrete coating activities will not take place within 100 feet of any wetland.

8. Restoration

For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker/interceptor diversion across the construction right-of-way at the base of a slope greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers/sediment filter devices as shown in Figure 23. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

Consult with the appropriate land management or state agency to develop a project-specific wetland restoration plan. The restoration plan should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species (e.g., purple loosestrife and phragmites), and monitoring the success of the revegetation and weed control efforts.

Upon completion of construction in wetland areas with standing water or saturated soils, all access improvements will be promptly removed. In the absence of specific recommendations from conservation authorities, the seed mix and rate specified in Table 2c will be used. Fertilizer, lime or mulch will not be used, unless required in writing by a jurisdictional agency.

Fertilizer, lime, or mulch will not be used in wetlands unless required in writing by the appropriate federal or state agency. Asphaltic emulsions will not be used to stabilize mulch within 100 feet of wetlands. Liquid mulch binders will not be used within 100 feet of wetlands.

IV. SPILL PREVENTION, CONTAINMENT AND CONTROL

A. General

Spills of any amount of petroleum products or polluting materials are to be prevented. All employees handling fuels and other hazardous materials must be properly trained. All equipment must be in good operating order. Fuel trucks transporting fuel to on-site equipment must travel on approved access roads. The following will be followed to help avoid spills and minimize the impact of spills, which accidentally occur:

- Bulk quantities up to 5,000 gallons of diesel fuel and 5,000 gallons of gasoline will be stored in one location (the fuel depot) for the Project. Adequate spill containment measures, such as containment dikes, combined with impervious lining will be installed before fuel storage tanks are filled, and will be maintained throughout the Project. Bulk quantities of hazardous liquids (e.g., solvents and lubricants) will be stored at the fuel depot locations.

- Fuel can be stored at the equipment staging areas and as much equipment as practical will be refueled there. Any equipment that must be refueled in the field will be fueled from tanks carried to the work site. Fuel carriers (greater than 110 gallons capacity) will not be permitted to cross wetlands or ford waterbodies. Equipment refueling will not be performed within 100 feet of any body of water or wetland except by hand-carried cans (5 gallon maximum capacity) when necessary. If construction equipment must be refueled within 100 feet of a waterbody, follow the procedures outlined in the project-specific SPCC Plan. Care will be taken during refueling not to overfill or spill fuel onto the housing of equipment.

- Lesser quantities of fuel (up to 500 gallons) and solvents and lubricants (e.g., motor oils, hydraulic fluid) may be stored along the construction work area as necessary to service equipment used on the Project (quantities vary depending on the size of the construction spread being used), provided that this storage does not conflict with other parts of this plan. Sorbent booms and clean-up kits will be kept at all storage locations and will be readily available at all times.

- All fuel storage areas will be located at least 100 feet from streams, ponds, or wetlands; at least 200 feet from active private water wells, and at least 400 feet from municipal water wells, unless using an operational fuel storage area established on Columbia property. All fuel storage areas will not be located within any designated municipal watershed area (except at locations designated for these purposes by an appropriate governmental authority): Equipment servicing, lubricating and refueling will also be in accordance with these requirements whenever possible (i.e., except when stationary equipment such as drilling rigs is being used). Where these conditions cannot be met, the Environmental Inspector will prepare a supplemental SPCC plan, based on field conditions, to protect these resources.

- Use of hazardous materials for vehicle maintenance will follow the same requirements mentioned above for equipment refueling. Impervious or sorbent materials will be placed under the work area before the work begins. Additional sorbent materials will also be readily available. Waste materials created during maintenance (e.g., used oil) will be collected for proper disposal. The work site and the vehicle will be checked by a Columbia inspector after the maintenance work is complete to ensure that all hazardous materials are properly contained. All waste material,

including partially used or empty containers, discarded parts, clean up rags, and used sorbent materials, as well as discarded hazardous materials containers (e.g., oil cans, grease tubes), will be collected for proper disposal.

- All motor fuel, lube oil, chemicals, and other polluting substances will be tightly sealed and clearly labeled during transportation and storage.

- Fuel trucks, pumps, mechanics' vehicles, the contractor's foremen's vehicles and Columbia Inspectors' vehicles, and each construction crew will be equipped with appropriate sized spill kits containing absorbent materials approved for petroleum products and have sufficient tools and material to stop leaks.

- Construction equipment will not be washed in any body of water or wetland, nor will runoff resulting from washing operations be permitted to directly enter any body of water or wetland area.

- Construction equipment, vehicles, materials, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products will not be parked, stored, or serviced within 100 feet of all bodies of water and wetlands. These activities can occur closer if the Environmental Inspector determines there are no reasonable alternatives and appropriate steps are taken to prevent spills and provide prompt cleanup in the event of a spill.

- Pumps operating within 100 feet of a waterbody or wetland boundary must utilize appropriate secondary containment systems.

- Concrete coating activities cannot be performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use. These activities can occur closer only if the Environmental Inspector determines there is no reasonable alternative and appropriate steps (including secondary containment structures) are used to prevent spills and provide for prompt cleanup in the event of a spill.

- All equipment will be checked, by a Columbia inspector, daily for leaks prior to beginning work in bodies of water or wetlands. Steps will be taken to repair leaks or remove the equipment from service, if necessary.

If barge mounted equipment is to be employed, the contractor will develop specific spill-prevention plans to be reviewed and approved by Natural Resource Permitting group.

B. Spill Cleanup

Spills occurring during construction, operation and maintenance are to be reported immediately to the Monitoring Center at 1-800-835-7191 in accordance

with Columbia policies, plans and procedures (Plan Number 120.02.01). Columbia's Environmental Health and Safety department will be responsible for contacting the appropriate agencies, except as provided for below.

If the call to the Monitoring Center is not returned within 30 minutes ***and*** the spill has impacted water, the person discovering the spill or release will contact the National Response Center at 1-800-424-8802 and report the release. That person will continue calling the Monitoring Center until a representative is reached.

If a spill should occur, Columbia will ensure immediate action is taken to minimize the impact of the spill, and see that appropriate cleanup action is immediately undertaken.

In the event of a spill into or in the vicinity of bodies of water or wetlands, the following will occur immediately:

- the source will be immediately stopped;
- the spill will be contained by placing sorbing booms or constructing dikes;
- the spill will be collected with sorbing materials, skimmed off water surfaces with booms, and/or the contaminated soil will be excavated;
- the waste materials will be properly stored and disposed in accordance with Columbia policy.

The affected areas will be restored as closely as possible to their previous condition.

If the spill is such that Columbia personnel or the on-site contractor cannot immediately and effectively respond, Columbia's environmental contractor, who specializes in spill cleanup, will be employed.

V. MAINTENANCE

A. General

Maintenance of Columbia's ROWs is an ongoing process, which is governed by Columbia policy, certificate and permit conditions and landowner agreements. Full width vegetation maintenance clearing shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in a herbaceous state. In no case shall full width vegetation maintenance clearing occur between April 15 and August 1 of any year.

Maintenance activities will be performed with emphasis on preservation and enhancement of the environment. All applicable certificate and permit conditions will be incorporated into the future maintenance plan of the facility.

Specific procedures when required by regulations will be developed in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds and soil pests resulting from construction and restoration activities.

B. Upland Areas

Plant growth on the ROW will be inspected regularly and maintained for the life of the facility. Follow-up inspections will occur after the first and second growing season.

Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

Continue revegetation efforts until revegetation is successful.

Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in active agricultural areas until restoration is successful.

ROW are generally maintained by mowing or other mechanical means, and through the use of herbicides. Use of herbicides will follow Columbia policy. Only those herbicides approved by the EPA will be used. Herbicide use will be in accordance with existing regulations and label instructions.

If revegetation is not successful, the area will be restored as soon as practical.

Problems with drainage and irrigation systems resulting from construction activities will be reported to the local Operations Team Leader. Corrective measures will be performed as needed.

Erosion problems on the facility ROW and access roads will be reported to the local Operations Team Leader or the Natural Resource Permitting group. Corrective measures will be performed as needed. Erosion control devices that are no longer required must be removed. Removal of the erosion control devices will be at the discretion of the local Operations Team Leader and the Engineering & Construction department. Similarly, additional erosion control devices will be installed as required.

Maintain all temporary sediment barriers in place until permanent revegetation measures are successful or the upland areas adjacent to wetlands, waterbodies, or roads are stabilized. Remove temporary sediment barriers from an area once that area is successfully restored.

Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary.

C. Waterbodies, Wetlands, and Environmentally Sensitive Areas

Columbia will work cooperatively with appropriate government agencies in an effort to minimize the impacts of ROW maintenance in waterbodies, wetlands, and other environmentally sensitive areas.

Limit vegetation maintenance adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to grow. Figure 24 illustrates ROW maintenance standards near waterbodies.

Do not use herbicides or pesticides in or within 100 feet of a waterbody or wetland except as specified by the appropriate land management or state agency.

In wetlands, a corridor up to 10 feet wide centered on the pipeline will be maintained in a herbaceous state. In addition, trees that are located within 15 feet of the pipeline and greater than 15 feet tall may be selectively cut. All felled trees will be removed from the wetland.

Attempts will be made to prevent the invasion or spread of undesirable exotic vegetation (i.e., purple loosestrife and phragmites) within wetland areas disturbed during construction. Typically, these efforts include Columbia's wetland construction techniques and the use of approved herbicides.
Monitor the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is successful. Revegetation should be considered successful if the cover of native herbaceous and/or woody species is at last 80 percent of the total area, and the diversity of native species is at least 50 percent of the diversity originally found in the wetland. If revegetation is not successful at the end of 3 years, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate the wetland with native wetland herbaceous and woody plant species. Continue revegetation efforts until wetland revegetation is successful.

For certain locations through Columbia's system listed threatened, endangered, or special concern species and their habitats have been identified. In addition, eligible cultural resources, wetlands, and other environmentally sensitive areas may also have been identified. In these instances, permits normally include maintenance provisions that must be adhered to for the life of the facility.

VI. ENVIRONMENTAL CONSTRUCTION MANAGEMENT AND INSPECTION

A. General

Columbia is responsible for compliance with the environmental conditions contained in a Projects' EM&CP, which include all permits and other approvals. One or more Environmental Inspectors will be assigned to every Project and will report to the Natural Resources Permitting group. At least one Environmental Inspector is required for each construction spread during active construction or restoration. Environmental Inspectors shall have peer status with all other activity inspectors.

B. Environmental Inspector

The Environmental Inspector is responsible for assuring that the construction activity is performed in accordance with the environmental conditions of the EM&CP and landowner requirements and have the authority to stop work and order appropriate corrective action as outlined in Section VI.E. For construction activities that are found by the Natural Resource Permitting group to have minimal environmental impacts, the Environmental Inspector may also serve to monitor other construction functions.

At a minimum, the Environmental Inspector(s) shall be responsible for:

- Inspecting construction activities for compliance and ensuring compliance with the requirements of the EM&CP, ECS, and any permits, landowner agreements or FERC certificates obtained for the Project;
- Identifying, documenting and overseeing corrective actions, as necessary to bring an activity back into compliance;
- Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing, and maintained throughout construction;
- Verifying the location of drainage and irrigation systems;
- Identifying erosion/sediment control and stabilization needs in all areas;
- Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetland, waterbodies, and sensitive species habitat;
- Verifying that trench dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetlands or waterbodies, cultural resource sites, and sensitive habitats. If such deposition is occurring, the dewatering activity shall be stopped and the design of the discharge shall be changed to

prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities;

- Verifying the testing of subsoil and topsoil in agricultural and residential areas to measure compaction and determine the need for corrective action;

- Advising the Chief Inspector when conditions (such as wet weather or frozen soils) make it advisable to restrict construction activities in agricultural areas;

- Ensuring restoration of contours and topsoil;

- Verifying that the soils imported for agricultural or residential use are noxious weed and soil pest free, unless otherwise approved by the landowner;

- Ensuring that erosion controls are properly installed to prevent sediment flow into sensitive environmental resource areas (wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices; ensuring erosion controls are maintained, daily if necessary;

- Inspecting temporary erosion control measures at least on a daily basis in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation, and within 24 hours of each 0.5 inch of rainfall; This responsibility may be transferred to field operations after construction is complete but before restoration is successful;

- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;

- Keeping records of compliance with the environmental conditions of the (EM&CP and any certificates) and other federal or state environmental permits during active construction and restoration; Keeping records of the mitigation measures proposed or approved as part of the FERC Order, and/or other federal/state/local environmental permit during active construction and restoration;

- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

- Establishing a program to monitor the success of restoration. Implementation of this program may be transferred to (Field Services) upon completion of construction and restoration activities;

- Looking for evidence of contamination and, if found, cease activities in that area and notify the Environmental Health & Safety department and the Natural Resource Permitting group and wait for further instruction. If the contamination is determined to be hazardous, an experienced hazardous waste contractor will be mobilized to handle the waste; the hazardous waste contractor will follow a site-specific health and safety plan and standard operating procedures for working in hazardous environments, which is maintained by the Environmental Health & Safety department; and

- Verifying the location of signs and visible flagging marking the boundaries of wetlands, waterbodies other sensitive resource areas, or areas with special requirements along the construction work area;

- Verifying the locations for any disposal of excess construction materials for beneficial reuse comply with applicable laws and regulation.

C. Environmental Training

The Engineering & Construction Project Manager assigned to the construction activity and/or the Columbia employee in responsible charge, will be responsible for assuring that the Environmental Inspector(s), other inspectors and any contractor's foreman have been trained in all environmental aspects of the activity, and fully understands the environmental conditions contained in the activity's EM&CP.

The Natural Resource Permitting group staff will conduct training for construction personnel when sensitive resources are present or when permit/certificate conditions mandate, or when requested by the Team Leader.

D. Contractor's Environmental Compliance Specialist (Environmental Foreman)

For construction activities that utilize an outside contractor, the contractor will be required to provide at least one qualified environmental compliance specialist. This specialist will become thoroughly familiar with Columbia's EM&CP for the activity. The specialist will be responsible for the contractor's efforts to correctly install and maintain environmental control devices and for construction in environmentally sensitive areas. Contractor's specialist will work in cooperation with Columbia's employees responsible for environmental compliance.

The Contractor's Environmental Foreman must be available at all times during the project and have the appropriate number of available employees to adequately implement the project's EM&CP.

E. Environmental Construction Management

The Environmental Inspector and each functional inspector shall have the authority to stop work on a particular construction function to which they are

assigned if it deviates from the environmental conditions of the activity's EM&CP, as well as FERC Orders, stipulations of other environmental permits or approvals, or landowner easement agreements. The deviation shall be reported immediately to the Columbia employee in responsible charge of the activity and the Environmental Inspector. The Columbia employee in responsible charge, the Engineering & Construction Team Leader and the Natural Resource Permitting group department will be responsible for the resolution of the deviation. The Environmental Inspector shall also have the authority to order appropriate corrective action.

Stop work authority for the entire construction activity rests with the Columbia employee in responsible charge or the Engineering & Construction Team Leader.

The Natural Resource Permitting group may, from time to time, perform inspections of construction activities to review the implementation of the EM&CPs. The Natural Resource Permitting group will have stop work authority during these inspections should deviations from the activity's EM&CP occur. Any corrective actions that are required shall be taken as directed by the Natural Resources Permitting group.

F. Environmental Variances

Unapproved variances from an EM&CP and this ECS are not permitted. Any proposed variance from an EM&CP will require approval from the EM&CP preparer, prior to commencing the activity. The approval for a variance will be in writing. In instances where written approval is not practical (i.e., emergencies and weekends), verbal approval may be given provided that written confirmation is provided as soon as possible.

Any proposed variance from this ECS will require approval from the Natural Resource Permitting group prior to commencing the activity.

VII. EMERGENCY CONSTRUCTION

In the event of an emergency, the Company employee in responsible charge will take such action as is necessary to contain the emergency giving due regard to minimizing environmental impact. In conjunction with other Columbia policies, the requirements contained in this ECS will be followed as close as possible.

[1] Will include all environmental and regulatory mandated surveys such as but not limited to, threatened and endangered species surveys, archeology surveys, wetland delineations etc.

[2] Deviations that involve measures different from those contained in this ECS will only' be permitted by written approval from the Natural Resource Permitting group. The Natural Resource Permitting group may be required to obtain written approval from the Director of the Office of Pipeline Regulation (OPR) (Federal Energy Regulatory Commission), or his/her designee, unless specifically required in writing by another

Federal, state, or Native American land management agency for the portion of the project on its land. The Natural Resource Permitting group shall coordinate the filing of other agency requirements with the Secretary of the Commission (Secretary). This filing shall be prior to construction.

VIII. WINTER SEASON CONSTRUCTION PLAN

A. General

Columbia will typically initiate a winter season construction plan for projects taking place on or after November 1 of each season, as well as projects where all construction activities (including restoration) have not been completed prior to November 1 of each season. For the purposes of this plan, the winter season will be defined as from November 1 – March 15 of each year. The Natural Resource Permitting group, in conjunction with the Environmental Inspector, will determine if soil temperatures, depth of soil freezing, snow accumulation, historical regional conditions, or pending weather forecast dictate initiating the winter season construction plan prior to these dates, or allow for extending these dates. If a project's primary regulatory agency has winter construction regulations or permit conditions, Columbia will defer to those, rather than this winter season construction plan.

The winter season construction plan will apply to projects taking place within the portions of the Columbia's pipeline system where adverse winter conditions could be expected. Typically, this will include New York, New Jersey, Pennsylvania, Maryland, Delaware, West Virginia, Ohio, and Kentucky.

1. Snow Removal and Storage

Removal of snow from the construction workspace may be necessary to provide safe and efficient working conditions, as well as to expose soils for grading and excavation. Snow may also need to be removed along access roads to allow safe access to the ROW.

Snow storage will take place within ROW or approved workspace. Care will be taken to avoid mixing snow with soil. Gaps will be provided in snow stockpiles to allow for site drainage or existing drainage patterns, with the appropriate erosion and sediment control devices installed. Snow can also be blown off ROW, with landowner approval, and spread evenly to minimize damage to woody vegetation or other resources off ROW.

Snow may be used for beneficial uses, such as insulation over the trench line prior to excavation, if practical, or to reduce frost penetration along the trench line. Snow can also be used to build frost roads through wetlands and other saturated or otherwise unstable areas. Temp gates/fence crossings will occur prior to or concurrent with snow removal activities and in accordance with landowner requirements.

Construction signage will be used to designate sensitive areas, cultural resource sites, protected species habitat, or other avoidance areas to prevent inadvertent damage during snow removal activities.

2. Temporary Erosion and Sediment Control

In areas where there is shallow freezing that occurs in the morning and evening followed by a daytime thaw, different construction activities may be approved or restricted by the Chief Inspector or Environmental Inspector, depending on the time of day. Columbia will attempt to install the necessary temporary erosion and sediment control devices in advance of the winter season, where possible. All erosion and sediment controls will be inspected on a weekly basis, within 24 hours of a 0.5 inch rainfall event, and within 24 hours of a large snowmelt event. Columbia will keep an Environmental Inspector and environmental labor crew on site or on call through the winter season and periods of thaw to monitor erosion control structures and stabilization efforts and make adjustments or repairs as necessary and as ROW conditions allow. Crews will have the proper equipment available to allow access to the ROW under soft soil conditions, such as all-terrain vehicles with oversized tires, to prevent rutting, topsoil mixing, and damage to other temporary erosion controls such as drivable berms.

3. Topsoil Segregation

Topsoil will be segregated during winter construction in the same locations and manner as during non-winter construction. Long-term topsoil stockpiling to manage the topsoil and accomplish more effective seeding and restoration may be necessary after the spring thaw.

When topsoil is frozen at the time of topsoil stripping, multiple passes (vs. a single pass) with a bulldozer or other specialized equipment may be necessary to remove only the topsoil and not the subsoil.

Restoration of topsoil will ideally occur after both the stockpiled topsoil and the exposed subsoil have thawed, the ground has dried following the spring melt, and the soils are more easily worked. Right-of-way stabilization measures will be implemented regardless of whether topsoil restoration occurs under frozen conditions or is delayed until spring thaw. Some options for temporary stabilization of the ROW and segregated topsoil pile include mulching and dormant seeding. Frozen topsoil may be placed over the disturbed areas if the Environmental Inspector determines it reasonable to do so.

If a landowner requests permanent stabilization be initiated within the winter season, Columbia will comply with the landowner request and/or relevant terms of the landowner agreement.

4. Backfilling

The longer time that excavated materials from the trench are exposed to freezing ambient air temperatures, the more difficult it can become to properly backfill the trench with these materials. This may give the perception that there is significant excess spoil material left after trench backfill is completed. Rather than removing the "excess" material, a slight crown could be created over the trench line to allow for subsidence once the material has thawed.

Crowning material over the trench or ditch line may be a suitable practice where trench subsidence is anticipated. The crown will be constructed directly over the backfilled trench with native material. Subsoil used to build the crown should not extend above natural surface grade. The crown will be capped with native topsoil material to ensure elevations will be restored with topsoil at the surface. If the topsoil layer has been removed as a block of frozen material, the blocks will be placed on top of the trench line as part of the crown and be pieced together to the extent practicable to prevent large gaps following thawing of the material. Small gaps will be left in the crown to allow for natural surface drainage before the material is fully settled during spring and summer thaw. Columbia will monitor for subsidence and excessive crowning conditions.

Columbia will minimize the amount of open trench during frozen conditions to reduce the risk of freezing excavated spoil materials. Outer layers of a frozen spoil pile will be stripped of in order to use unfrozen inner subsoil first during backfilling. The remaining frozen subsoil will be broken into smaller pieces prior to backfilling to reduce the size of voids in the backfilled trench. Specialized equipment may be needed to break up frozen backfill material to minimize future subsidence.

5. Restoration

The Natural Resource Permitting department, in conjunction with the Project Manager and Environmental Inspector, will determine whether the project can be completely restored during the winter season or if permanent restoration activities will be delayed until after the spring thaw. If permanent restoration will take place during the winter season, the steps shown in the upland portion of this ECS will be followed, along with Table 2A. If permanent restoration will be delayed, subsoil will be left in a roughened condition to slow the sheet flow of water. All open areas will be backfilled or provided safety fencing for protection. The exception to this practice will be pipelines left uncovered for longwall mining activities.

All disturbed areas that are unable to have permanent restoration completed will be mulched or have soil tackifiers applied. See table 2b for temporary stabilization application rate.

To ensure adequate vegetation growth when seeding during the winter season, higher seeding rates will be considered, to account for lower germination success, on a case by case basis. Cold weather grasses will also be utilized.

B. Wetland and Waterbody Crossing

Wetland and waterbody crossings during winter construction will be constructed in the same manner as non-winter construction. Spoil material with high water content (e.g., non-cohesive soils) can freeze to the ground surface in its storage location. If this occurs, separation of wetland and other soils will take place to the maximum extent practicable.

The environmental inspector can delay wetland or waterbody crossings when winter conditions warrant such delay.

C. Dewatering

When dewatering activities are necessary during freezing conditions, pumps may have to be installed in small, heated shelters to prevent the pumps from freezing and becoming non-operational or causing damage to the pumps that could result in a spill or leak of lubricants or fuel. Dewatering activities performed during frozen conditions should be continuously monitored and adjusted as necessary. Discharge locations will be carefully evaluated and selected based on site conditions including vegetation cover, soil type, and topography. Columbia will attempt to install dewatering structures (e.g., filter bags and straw bale structures) earlier in the construction process when ground conditions are favorable for installation, where feasible. Dewatering structures will be promptly removed after use to prevent freezing and proper cleanup. All spill prevention measures described in Section III (Spill Prevention, Containment, and Control) of this ECS will also be followed during winter season construction.

IX. DEFINITION OF TERMS*

AGRICULTURAL LANDS: Permanent or rotated croplands, hayfields, and pastures.

COLUMBIA: Columbia Gas Transmission Corporation

COE: U.S. Army Corps of Engineers

CONSTRUCTION WORK AREA: Construction work areas include permanent and temporary ROW, contractor's yards, pipe and materials storage yards, staging areas, and access roads.

ECS: Environmental Construction Standards

ENVIRONMENTAL INSPECTOR: The Inspector responsible for environmental compliance on a construction project.

EPA: Environmental Protection Agency

FWS: U.S. Fish and Wildlife Service

EM&CP: Environmental Management and Construction Plan

EXCEPTIONAL VALUE WATER(S): A stream or waterbody which constitutes an outstanding national, State, regional or local resource, such as waters of national, State or county parks or forests, or waters which are used as a source of unfiltered potable water supply, or waters of wildlife refuges or State game lands, or waters which have been characterized by the Fish Commission as "Wilderness Trout Streams." and other waters of substantial recreational or ecological significance.

FINAL GRADING: Includes returning the construction work area as closely as practical to its original contour, redistributing conserved topsoil, soil compaction testing in agricultural lands, and installing final interceptor diversions.

HIGH QUALITY STREAM: A cold water fishery or significant warm water fishery as designated by a state resource agency.

IMMEDIATE: Without interval of time; "right now".

INSPECTOR: Collectively: the Chief Inspector, Environmental Inspector, Utility Inspector, or any other inspector assigned to do an environmental task.

INTERMITTENT WATERBODY: A waterbody channel which generally carries water in the spring or immediately after a rain event; designated on topographic maps and environmental construction drawings with a broken line.

INTERMEDIATE WATERBODY: A waterbody greater than 10 feet wide at the water's edge at the time of construction but less than or equal to 100 feet wide.

LOW-GROUND-WEIGHT: Construction equipment that is designed "specifically for" or "frequently used in" areas where compaction and sinking is to be minimized. This

equipment can be less than 5 lbs/in^2 or contain wider tracks than the standard minimum size width tracks for the model equipment to be used.

MAJOR WATERBODY: A waterbody greater than 100 feet wide at the water's edge at the time of construction.

MINOR WATERBODY: A waterbody less than or equal to 10 feet wide at the water's edge at the time of construction.

MSDS: Material Safety Data Sheet

NRCS: Natural Resource Conservation Service

NOISE SENSITIVE AREA: Includes residences, schools, churches, cemeteries, hospitals, farms, camping facilities and outdoor amphitheaters and playgrounds.

ORV: Off-road vehicle.

PERENNIAL WATERBODY: A waterbody which generally flows all year in years of normal rainfall; waterbody level is generally lowest in the fall, highest in the spring; designated with a solid line on topographic maps and environmental construction drawings.

PROMPTLY: By the end of the work day.

RESTORATION: Includes fertilizing, liming, disking, seeding and mulching, and crimping mulch.

RIVER: A waterbody which is 100 feet wide or more.

ROW: Right-of-way.

SCARIFY: To make shallow cuts into the soil surface. This should be accomplished with a disk, rake, tracked equipment (grousers) or other suitable means.

SEDIMENT FILTER DEVICE: Properly embedded silt fence, erosion control logs, terra tubes, staked bales or other approved device.

SPCC: Spill Prevention Control and Countermeasure Plan

STEEP SLOPE: Slope of approximately 33% or greater.

TEMPORARY STABILIZATION: Includes installing temporary interceptor diversions and sediment filter devices, mulching critical areas and at times, seeding to hold soil in place until final grading and restoration can be accomplished.

UPLAND CONSTRUCTION: All areas which are not waterbodies, rivers, streams, or wetlands.

WATERBODY: Includes any natural or artificial waterbody, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes.

WETLAND: An area of special concern with soils prone to holding water for long periods of time, generally also characterized by distinctive plants such as rushes, sedges, cattails, or certain trees. Includes any area that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

*Includes all grammatical variations of each term.

X. TABLES

TABLE 2A
SEED MIX REQUIREMENTS FOR UPLAND ROW AND WATERBODY CROSSINGS

Type		Rate (lbs/acre)
Seed[1]	Orchard Grass and/or Tall Fescue[2]	29
	Birdsfoot-trefoil (Empire) [3]	9
	Annual Rye	12
Fertilizer	10-10-10 (or equivalent)	600[4]
Agricultural Lime		4000
Mulch	Hay or Straw	4000

[1] Pure live seed within 12 months of testing.

[2] If tall fescue is used, plant endophyte-free certified seed.

[3] Legumes to be inoculated by manufacturer's recommendations, if not available legumes are to be inoculated at 4 times recommended rate for conventional methods. 10 times recommended rate for hydro seeding.

[4] Where wood chips are spread, additional nitrogen (11lbs per ton of chips) will be spread.

- Seed mixes other than that shown above need to be approved by the NRP group, Environmental Inspector, and/or the appropriate governing agency prior to using.

- Refer to restoration section of ECS when broadcasting seed or hydroseeding. Application rate will be doubled.

TABLE 2B
SEED MIX FOR TEMPORARY STABILIZATION

Type		Rate (lbs/acre)
Seed	Annual Rye	40
Mulch	Hay or Straw	6000

TABLE 2C
SEED MIX REQUIREMENTS IN WETLANDS

Type		Rate (lbs/acre)
Seed*	Annual Rye	40

* Annual Rye is used as a temporary revegetative measure until indigenous plants re-establish cover. A monitoring program will be in effect to insure adequate cover is established.

XI. FIGURES

Figure 1 – Typical Upland Pipeline Construction Sequence

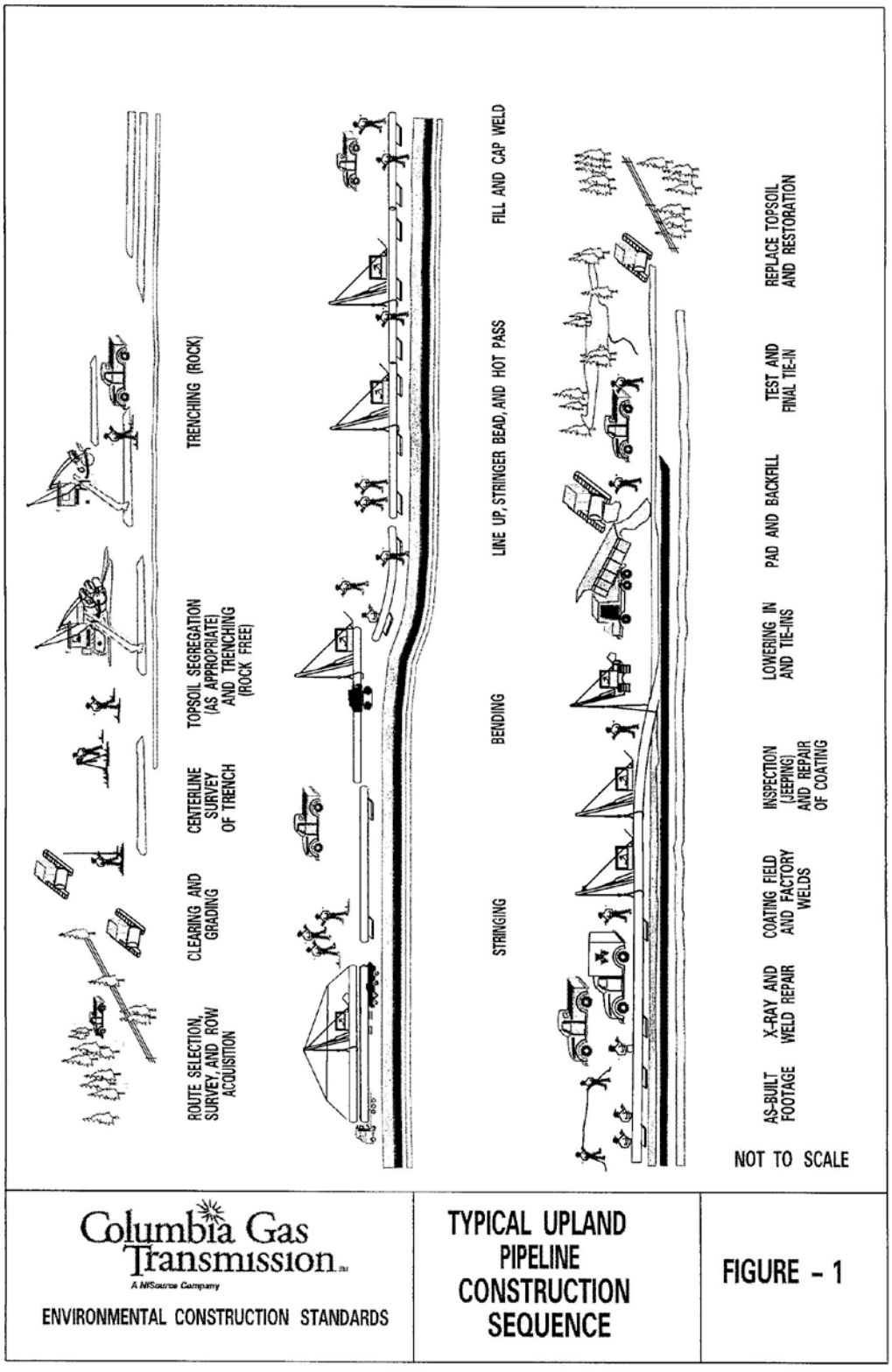


Figure 2 – Typical 75ft. Construction Right-of-Way

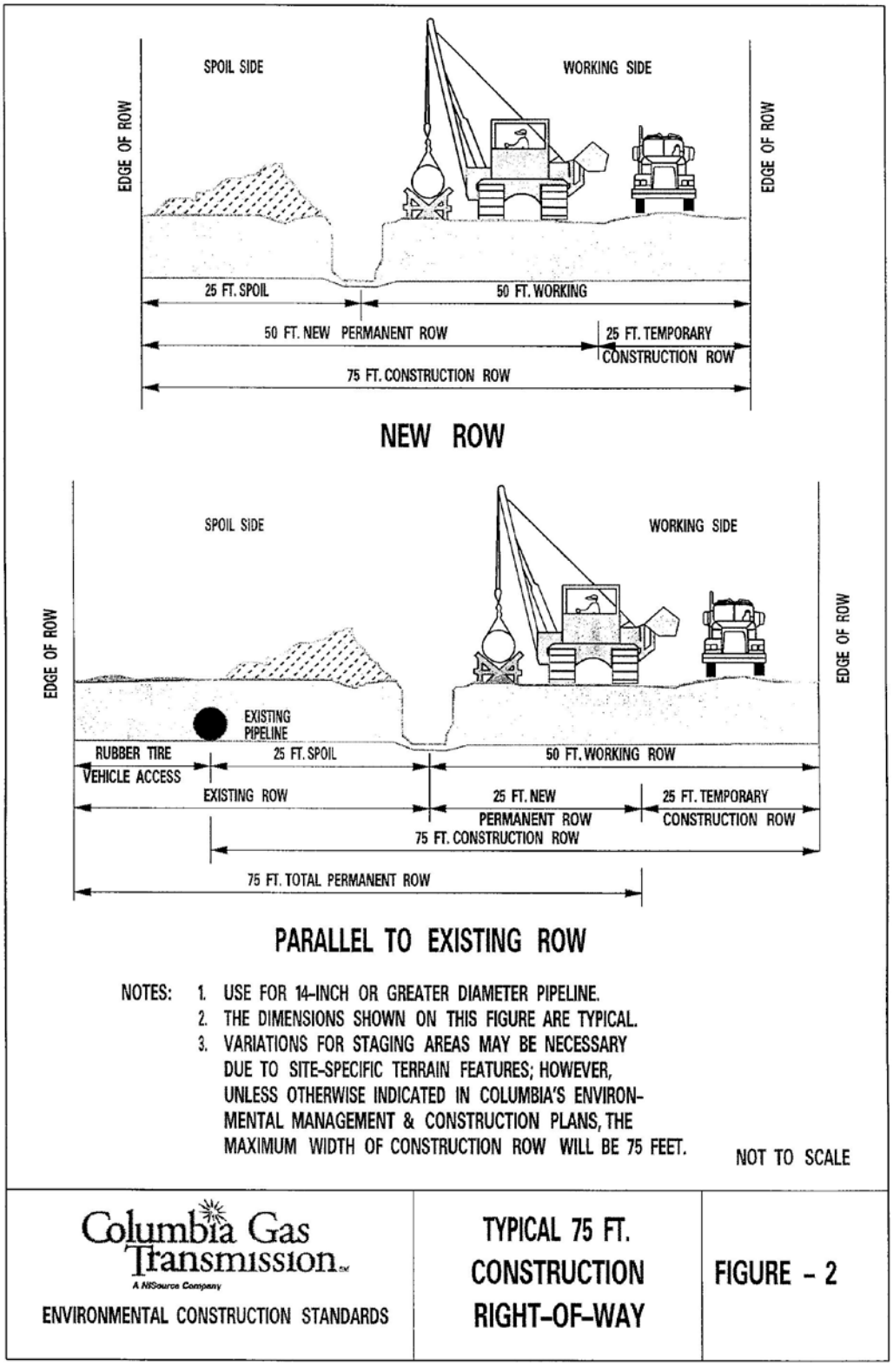


Figure 3 – Typical 50ft. Construction Right-of-Way

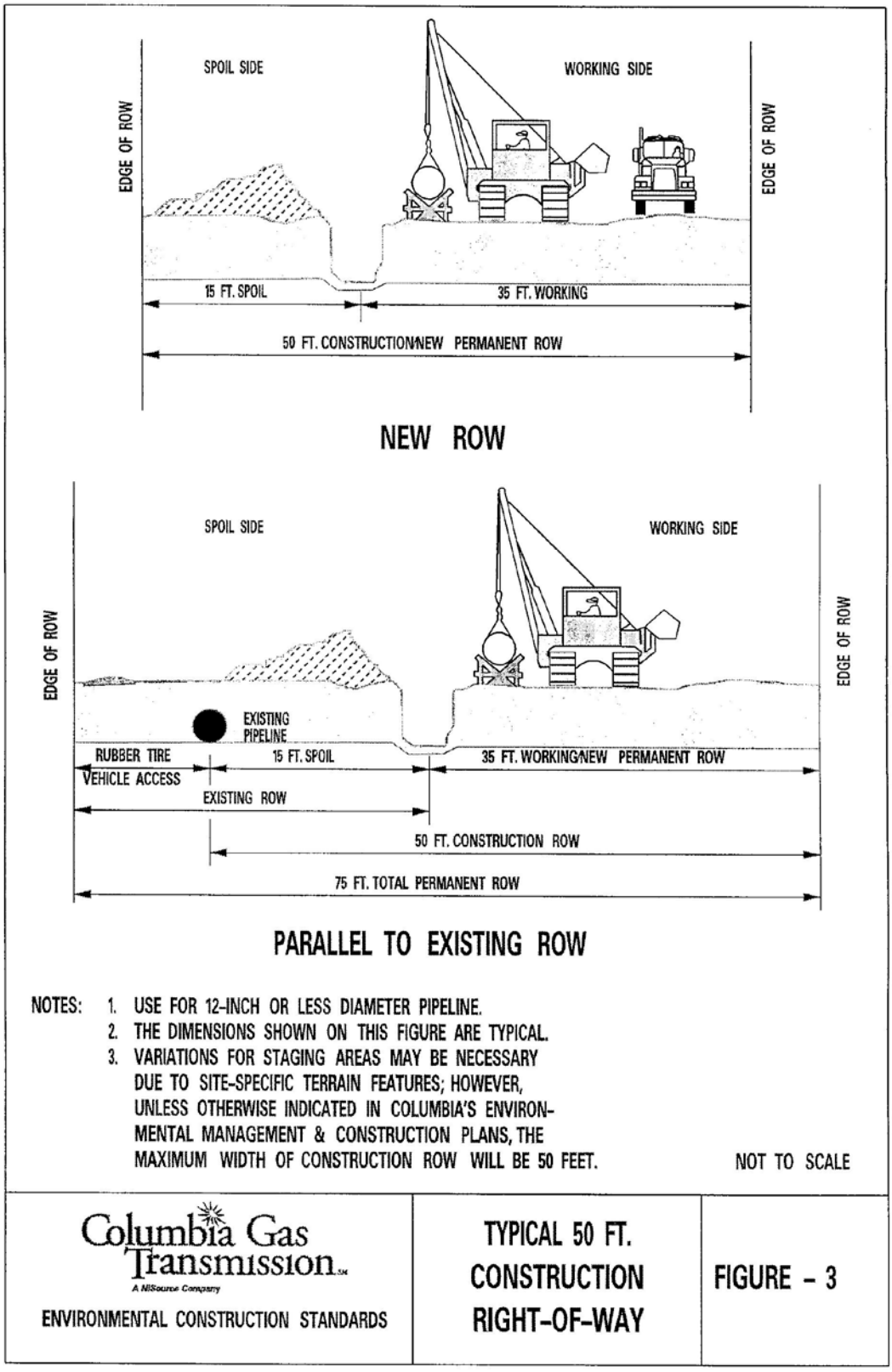


Figure 4 – Temporary Construction Gate

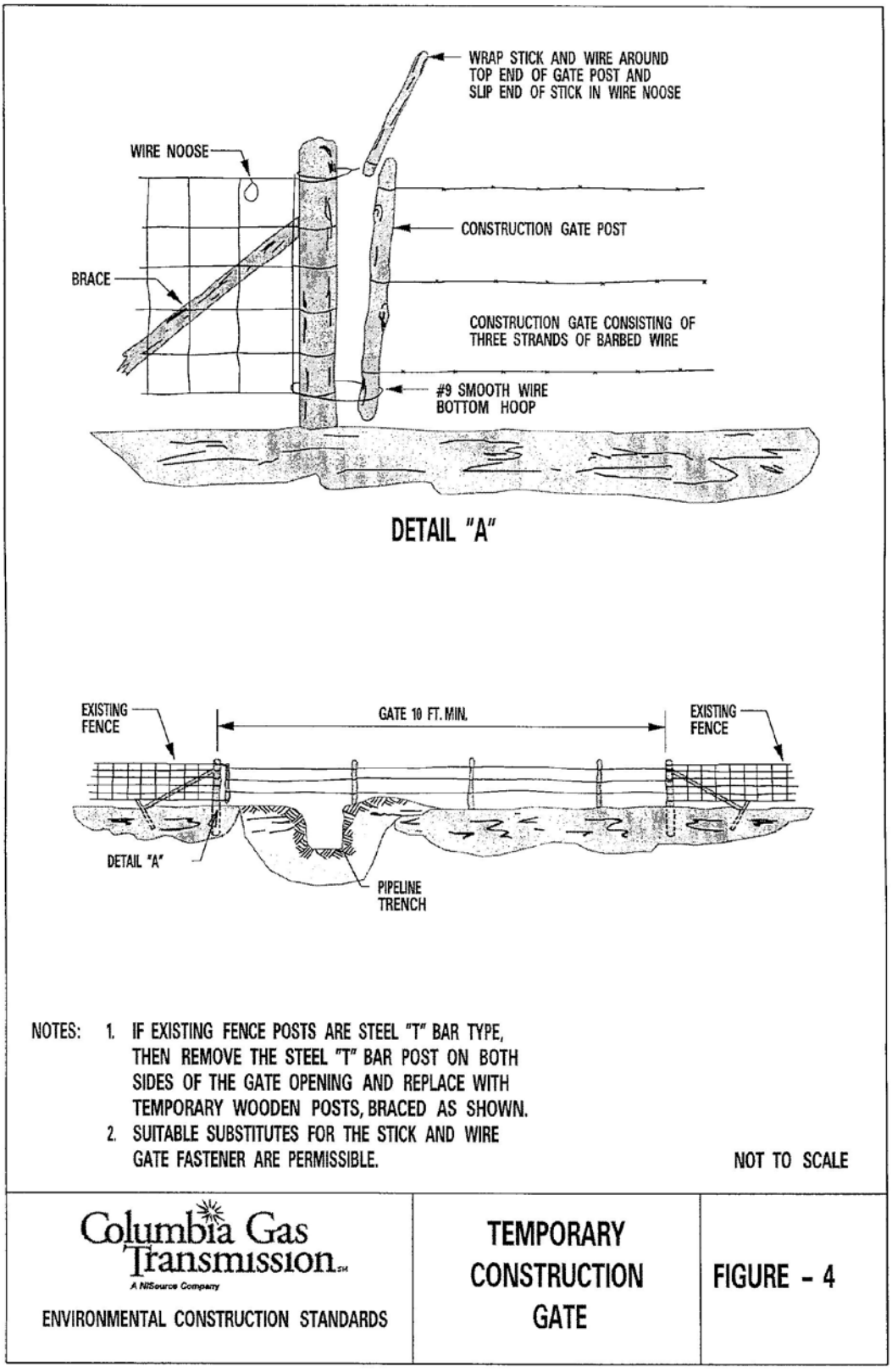


Figure 5 – Typical Soil Conservation

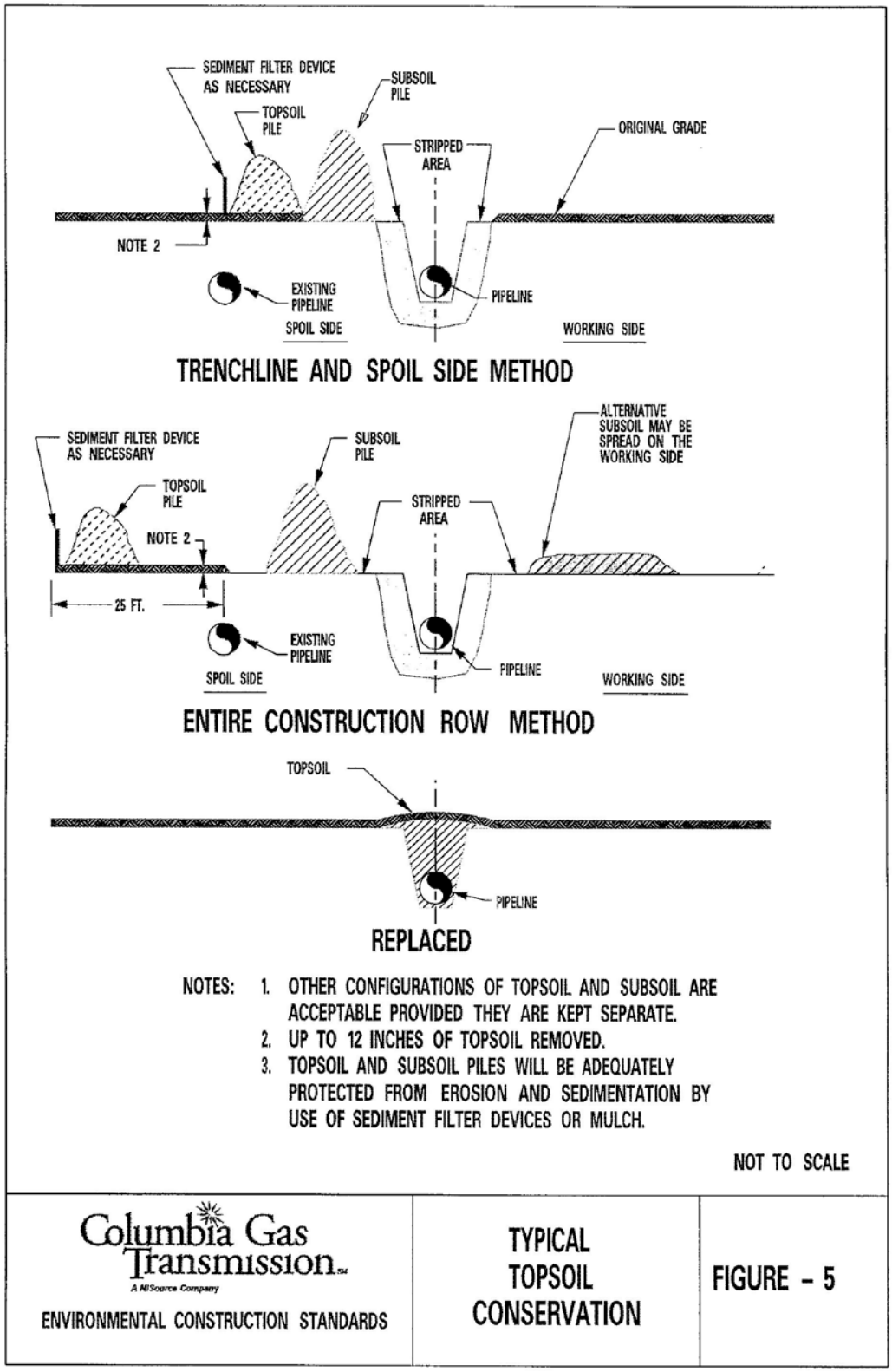


Figure 6A - Interceptor Diversions/Slope Breakers

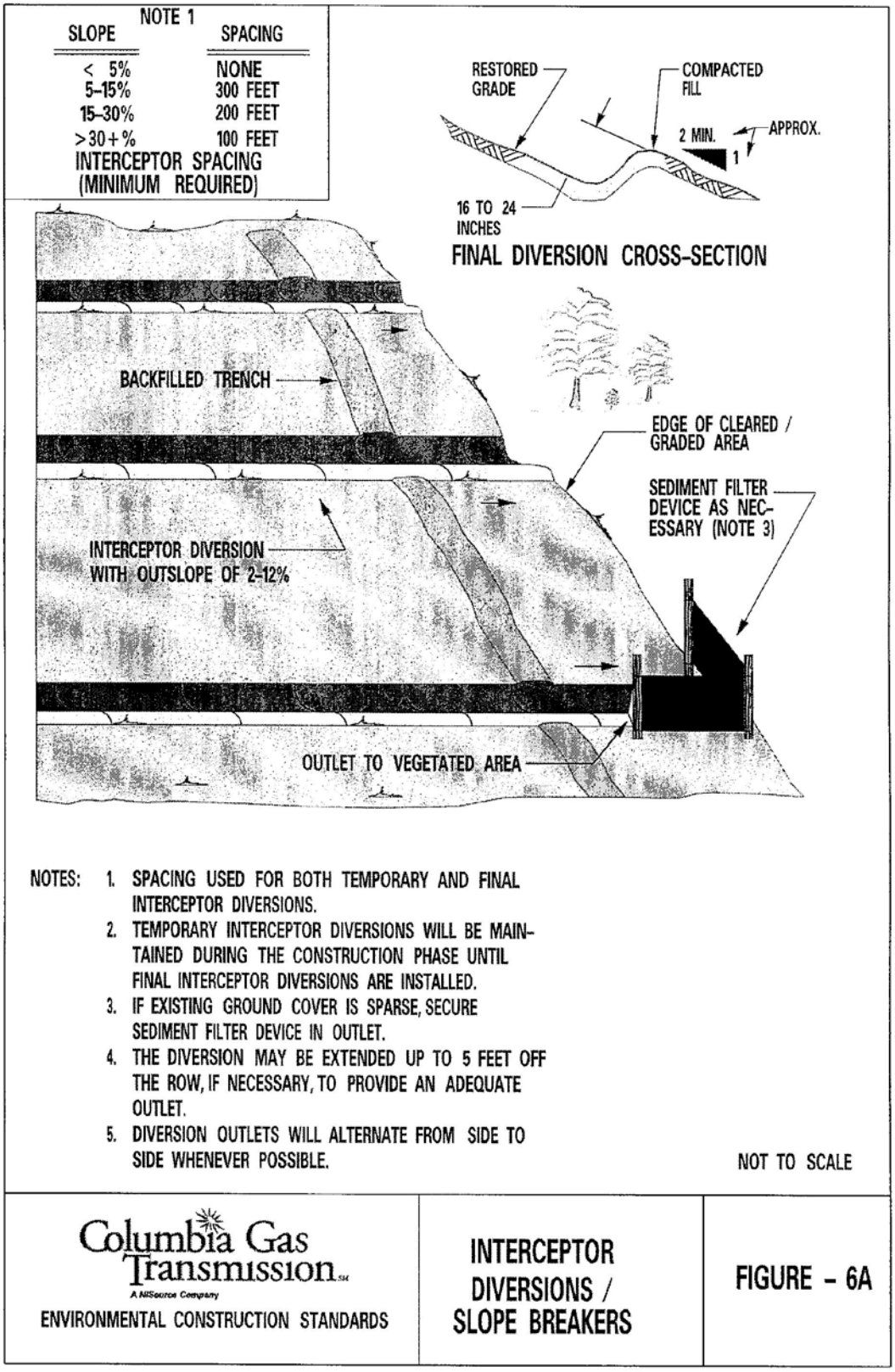


Figure 6B – Interceptor Diversions

INTERCEPTOR DIVERSIONS /SLOPE BREAKERS

Interceptor diversions are the most common and effective device used for erosion control on construction ROW. During construction, temporary diversions are installed to control water on the graded ROW. During restoration final diversions are installed to protect the ROW from erosion until the vegetation reestablishes on the disturbed areas.

Temporary diversions are generally made by building a curb 8 to 14 inches high across the ROW. The curbs are shaped to allow passage of construction equipment and inspector vehicles. The diversion should have a gradient of 2%– 12%, and must drain either into the trench or off the ROW. Where water is directed off the ROW, the outlet will be protected by a sediment filter device or heavy vegetation. Temporary diversions may be broken down by construction equipment during the workday, but will be restored by the end of each day. Temporary diversions will be spaced along the ROW in accordance with Figure 6A. The actual number of temporary diversions may vary from that of final diversions because the construction ROW's artificial grade may reduce the slope. Temporary diverisons may be conctructed out of silt fence, staked hay or straw bales or sand bags with the Environmental Inspectors approval. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetland, waterbodies, or other sensitive areas.

Final diversions typically consist of a curb 16 to 24 inches high below a shallow swale. The curb is constructed of compacted earth fill with side slopes of 2:1 or flatter to allow passage of maintenance equipment. The diversions should extend across the entire ROW and drain water with a 2% to 12% gradient. The outlets of final diversions are stabilized with sediment filter devices, rock, brush, or heavy vegetation. Final diversions will be spaced along the ROW in accordance with Figure 6A (or as shown on the Environmental Construction Drawings), and will tie into existing diversions where present. In places where final grade creates side slopes or slopes which break in more than one direction, diversion installation may need to vary to create an outslope of 2% to 12% which will carry water off the ROW.

Alternative diversion construction may be used in areas where an earthen diversion is impractical. In these instances, temporary diversions may be constructed with sediment filter devices as noted above.

Columbia Gas Transmission A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	INTERCEPTOR DIVERSIONS	FIGURE – 6B

Figure 7 – Sediment Filter Device Silt Fencing

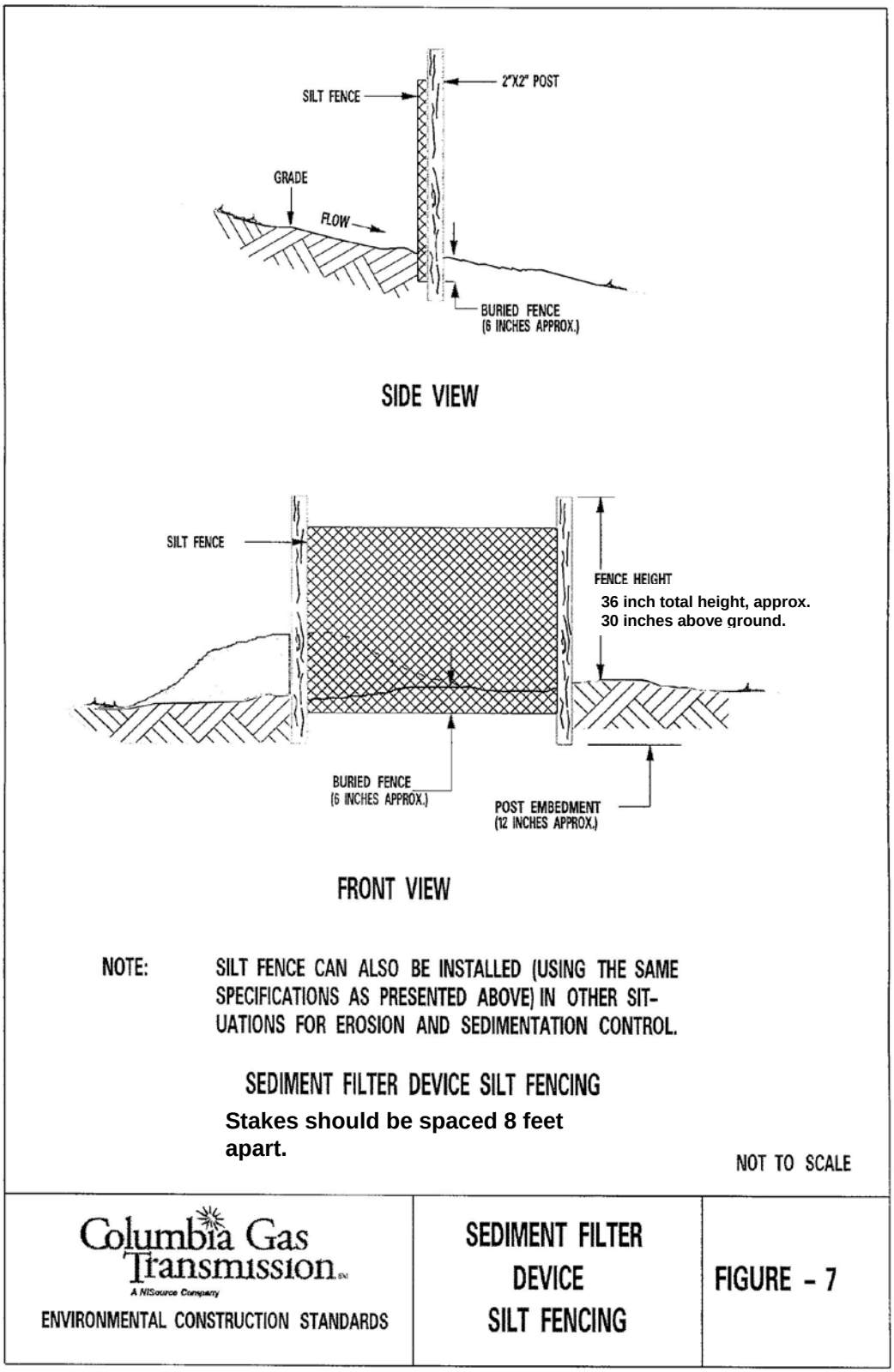


Figure 8 – Sediment Filter Device Staked Bales

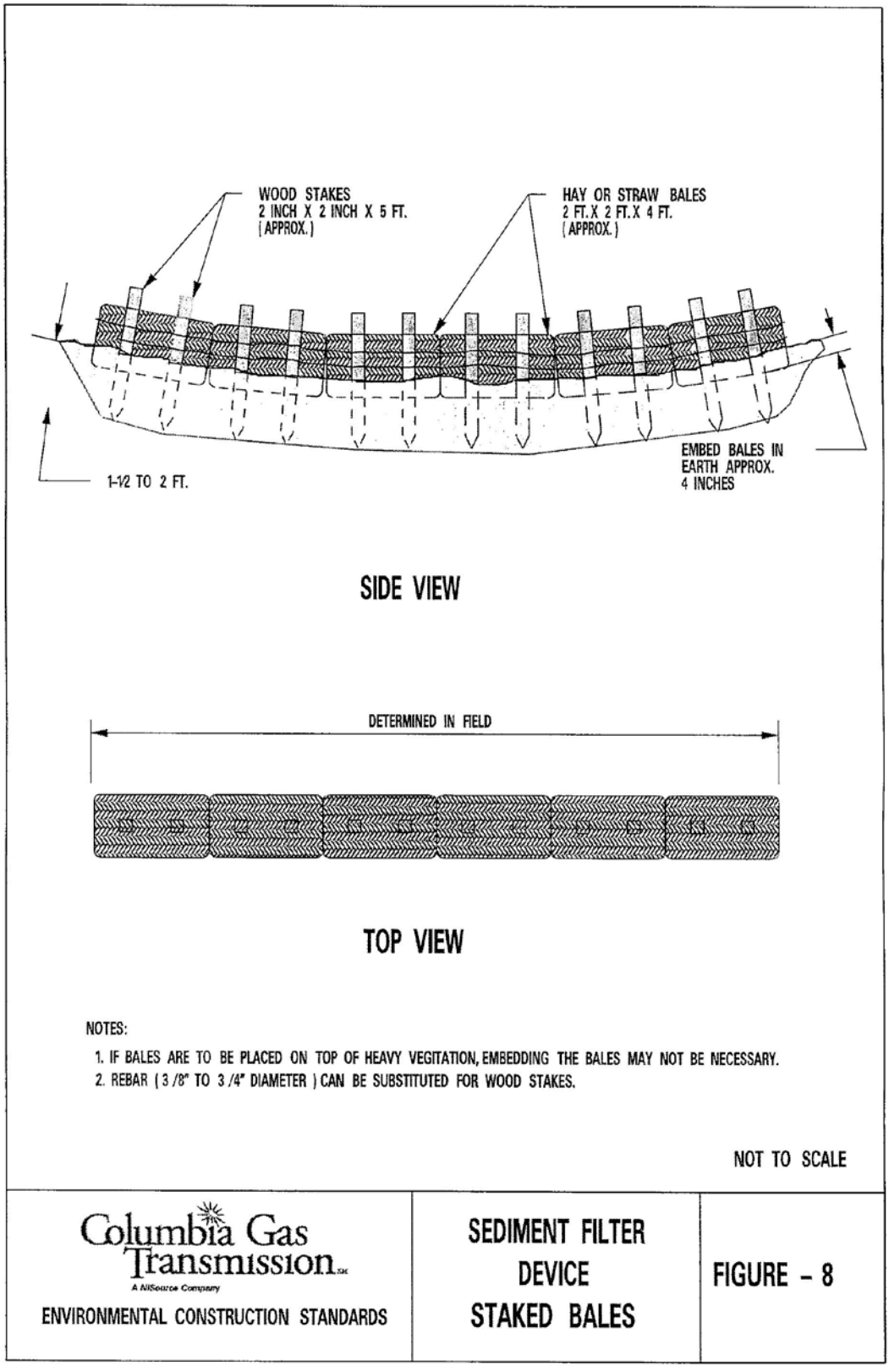
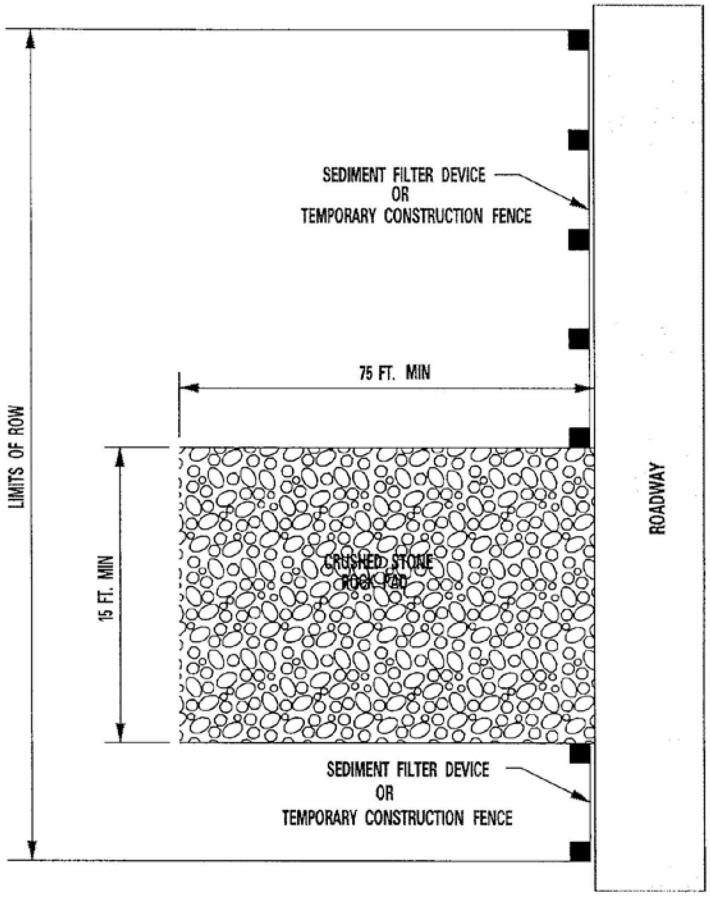


Figure 9 – Temporary Road Entrance Rock Pads

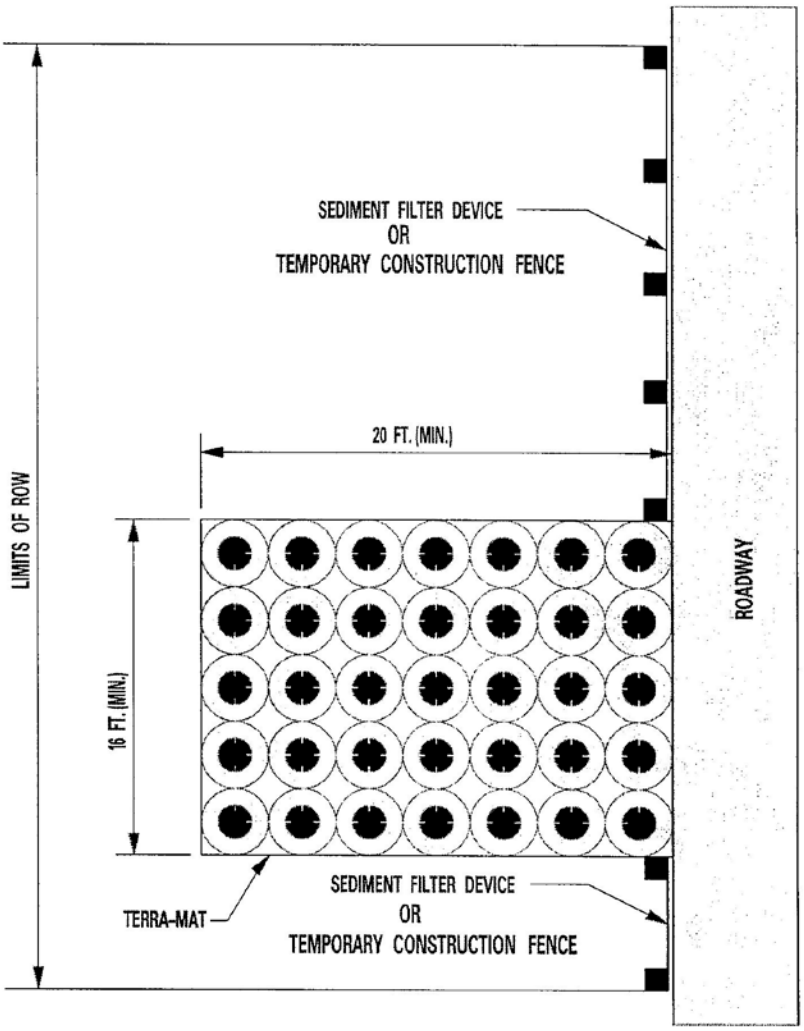


NOTES:
1. CRUSHED STONE SIZE WILL BE AASHTO NUMBER 1 COARSE AGGREGATE OR EQUIV. (4 INCH DIAMETER MINIMUM.)
2. ROCK PAD WILL BE AT LEAST 6 INCHES THICK.
3. THE ROAD ENTRANCE SHOULD HAVE A GEOTEXTILE FABRIC BENEATH THE ROCK PAD. (SEE SECTION II.E)
4. IF ROCK PAD BECOMES COVERED WITH MUD SO AS TO BECOME INEFFECTIVE, ADDITIONAL STONE WILL BE ADDED.
5. ALL STONE AND FABRIC MUST BE REMOVED DURING ROW RESTORATION.
6. THE ROCK PAD MAY BE ENLARGED TO INCLUDE A TURNING RADIUS.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	TEMPORARY ROAD ENTRANCE ROCK PADS	FIGURE - 9

Figure 10 – Temporary Road Entrance Terra-Mats



NOTES:
1. TERRA-MATS ARE CONSTRUCTED BY OVERLAPPING TIRES AND INTERCONNECTED CABLE.
2. TERRA-MATS WILL BE UNDERLAIN WITH GEOTEXTILE FABRIC.
3. TERRA-MATS SHOULD BE MAINTAINED SO AS NOT TO ALLOW EXCESS MUD TO ACCUMULATE.

NOT TO SCALE

Columbia Gas Transmission SM A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	TEMPORARY ROAD ENTRANCE TERRA-MATS	FIGURE - 10

Figure 11 – Temporary Road Entrance Board Road

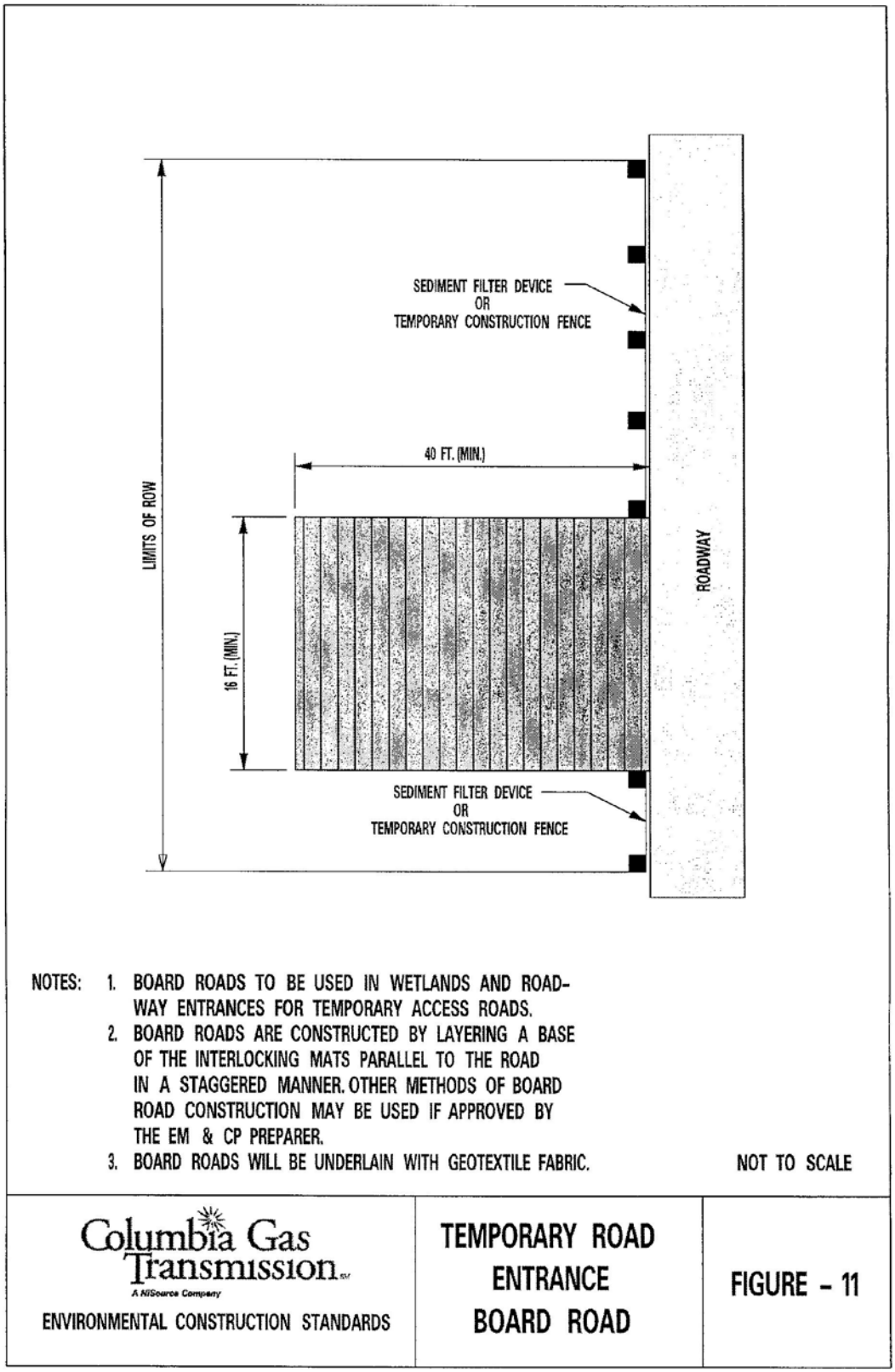


Figure 12 – Typical Erosion Control Measures at Road Crossings

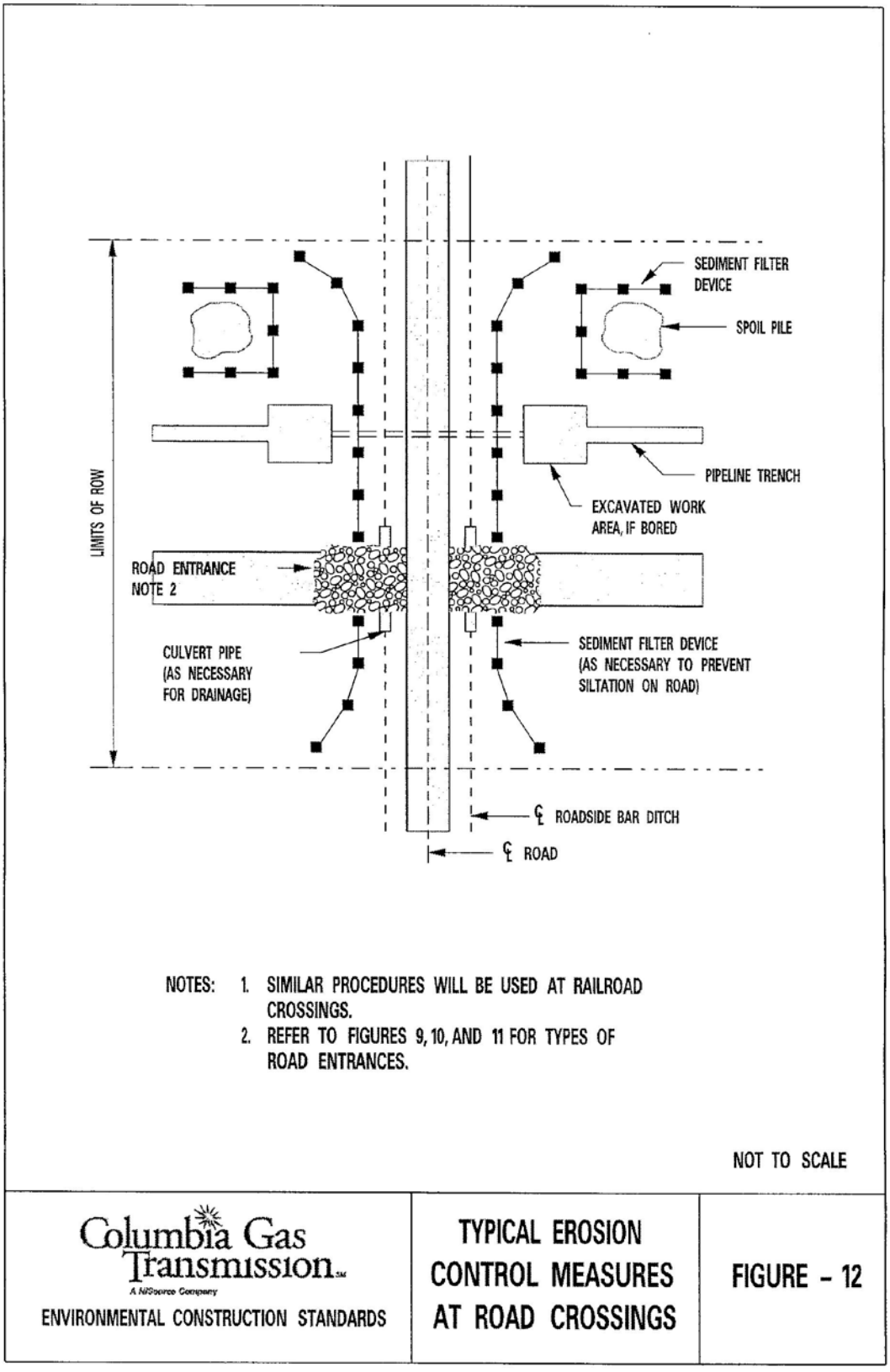


Figure 13 – Trench Line Barriers and Breakers

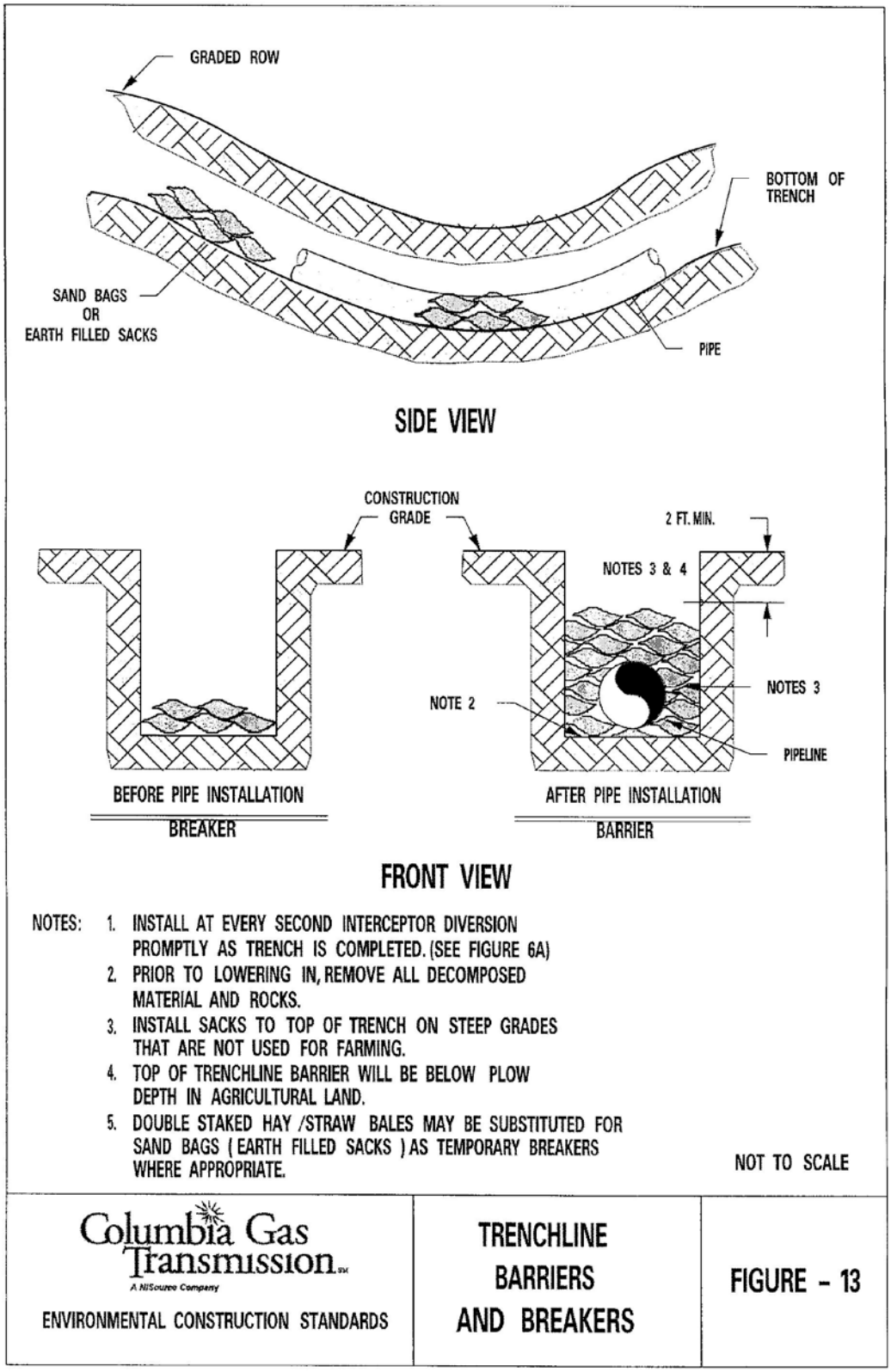


Figure 14A – Sediment Trap

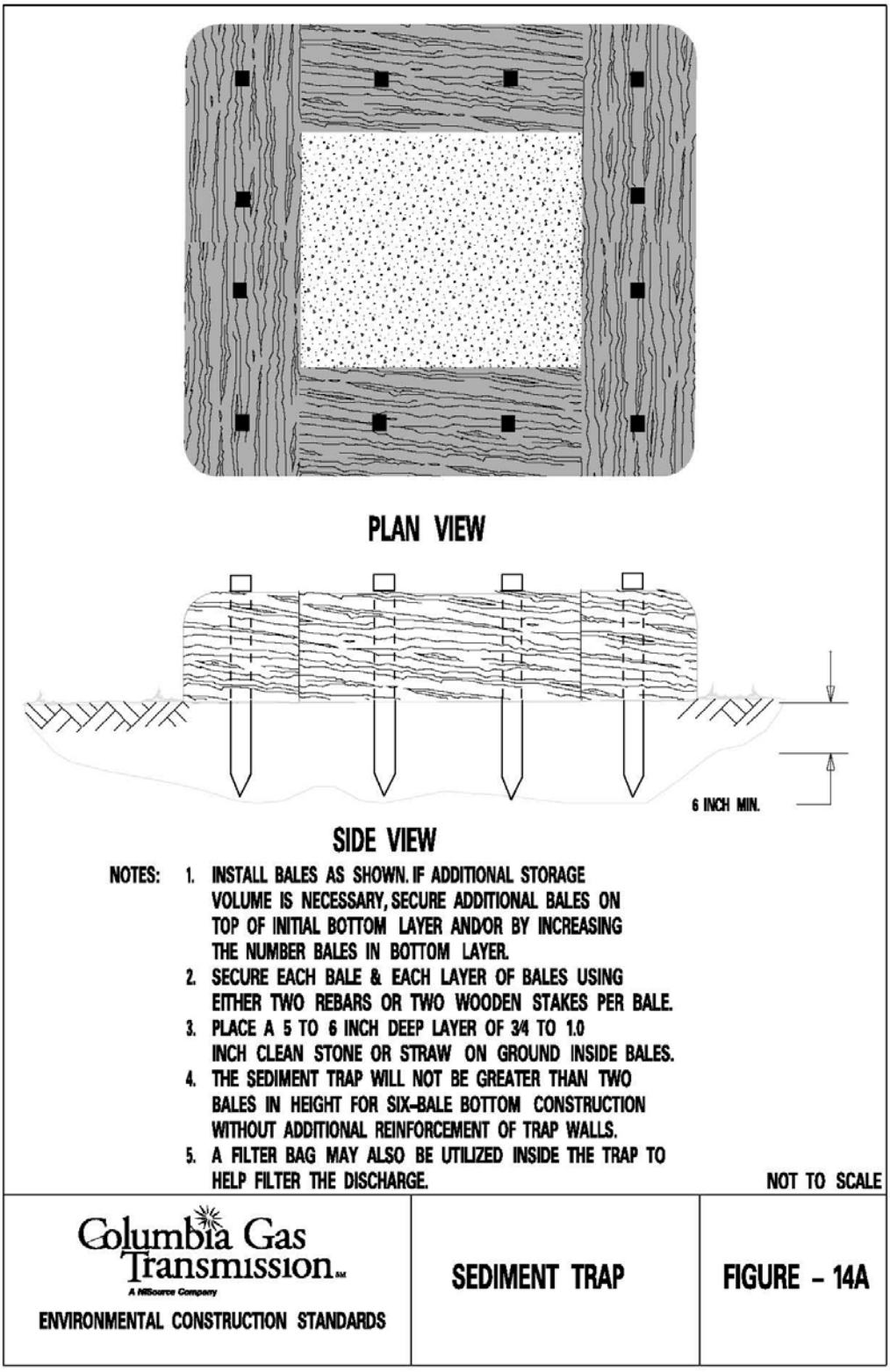
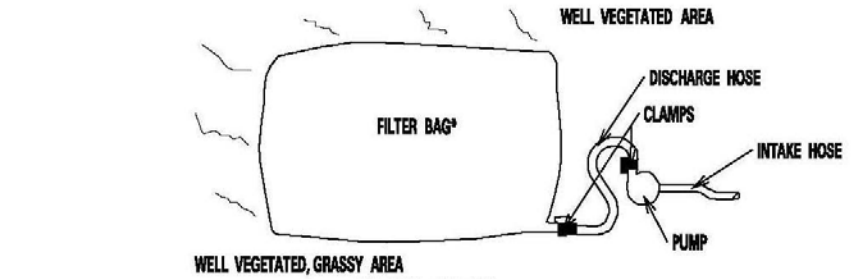
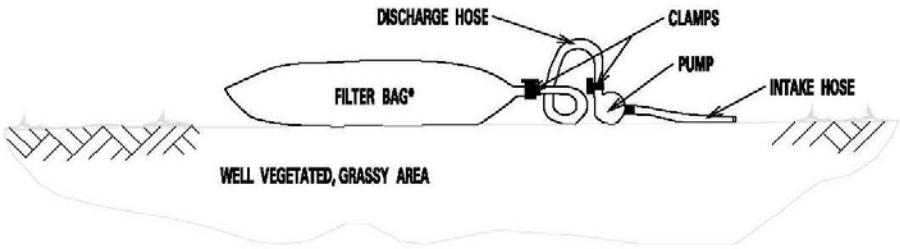


Figure 14B – Filter Bag



PLAN VIEW



SIDE VIEW

NOTES:
1. 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.
2. BAGS MUST BE PLACED WITHIN THE PERMITTED AREA IF ACCESSING THE BAG WITH MACHINERY IS REQUIRED FOR DISPOSAL PURPOSES. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED.
3. BAGS SHOULD BE LOCATED IN WELL-VEGETATED (GRASSY) AREAS, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH CAN BE PROVIDED OR ALLOW DISCHARGE FROM BAG TO FLOW THROUGH A SERIES OF SEDIMENT LOGS ETC... BAGS CAN BE USED INSIDE SEDIMENT TRAPS (FIGURE 14A).
4. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. DO NOT ALTER OR CUT BAGS.

NOT TO SCALE

Columbia Gas Transmission, A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FILTER BAG (DIRT BAG)	FIGURE - 14B

Figure 15 – Field Tile Replacement Methods

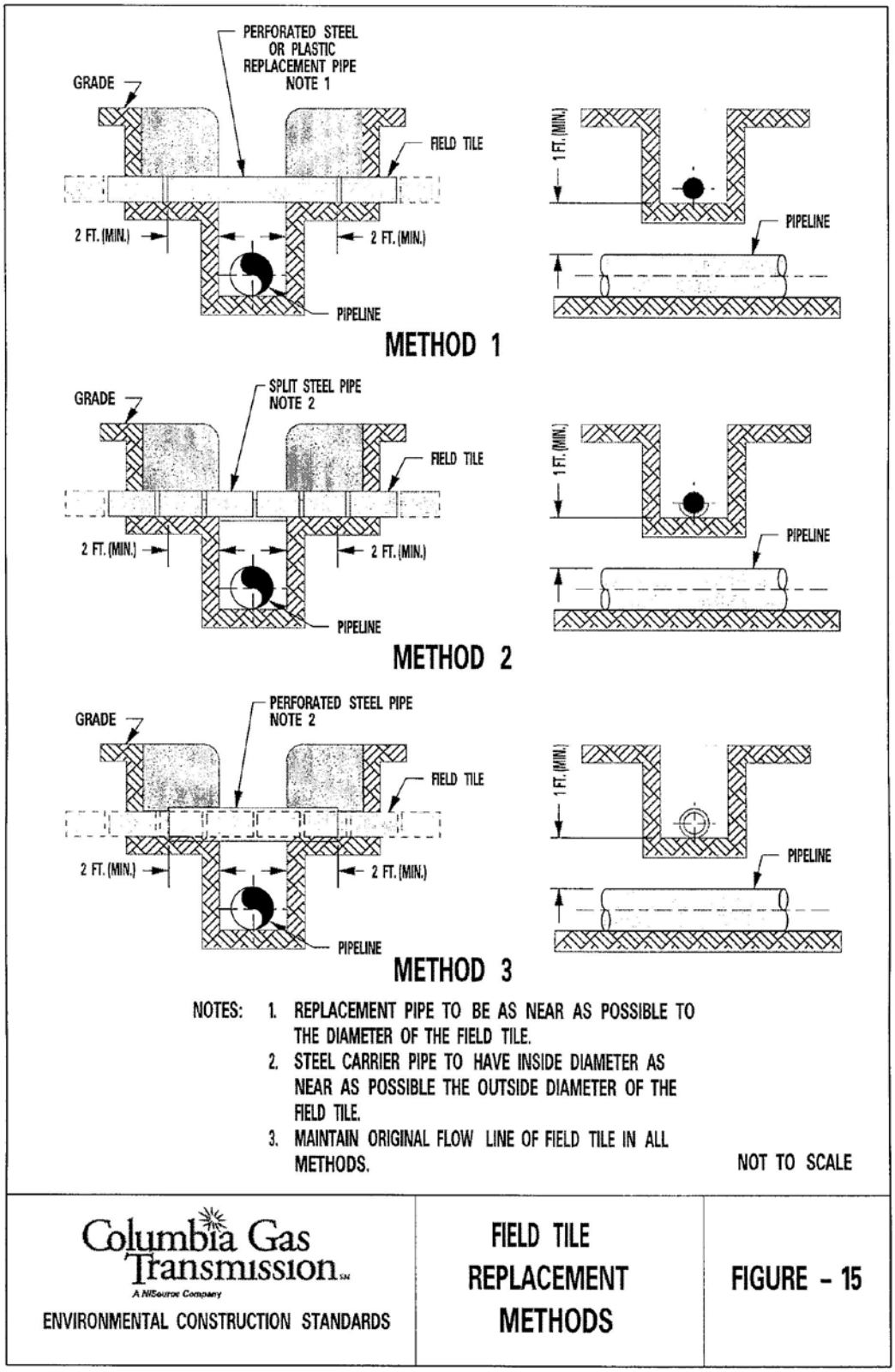


Figure 16 – Erosion Control Blanket

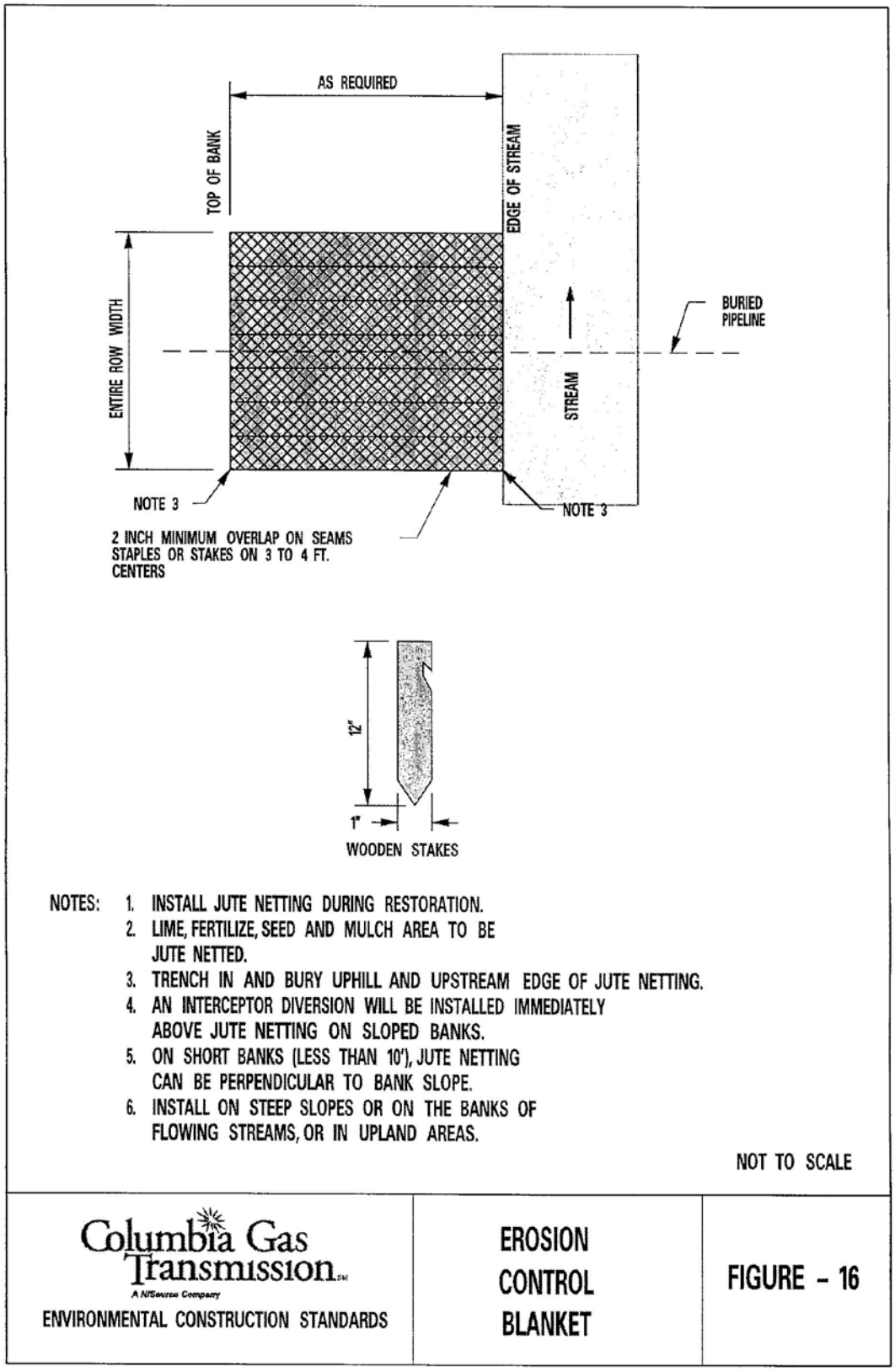


Figure 17 – Typical Stream Crossing Intermittent Streams

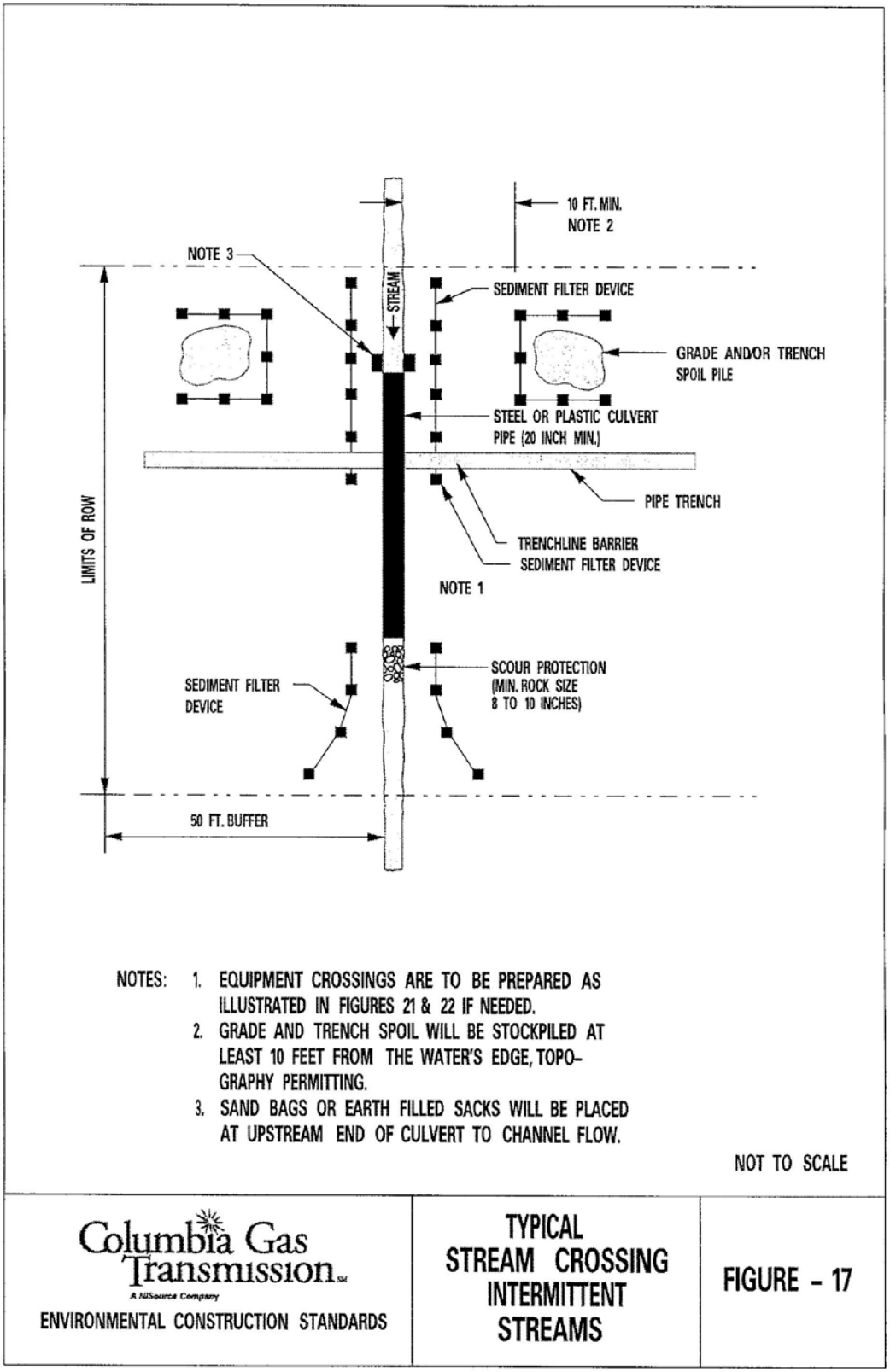
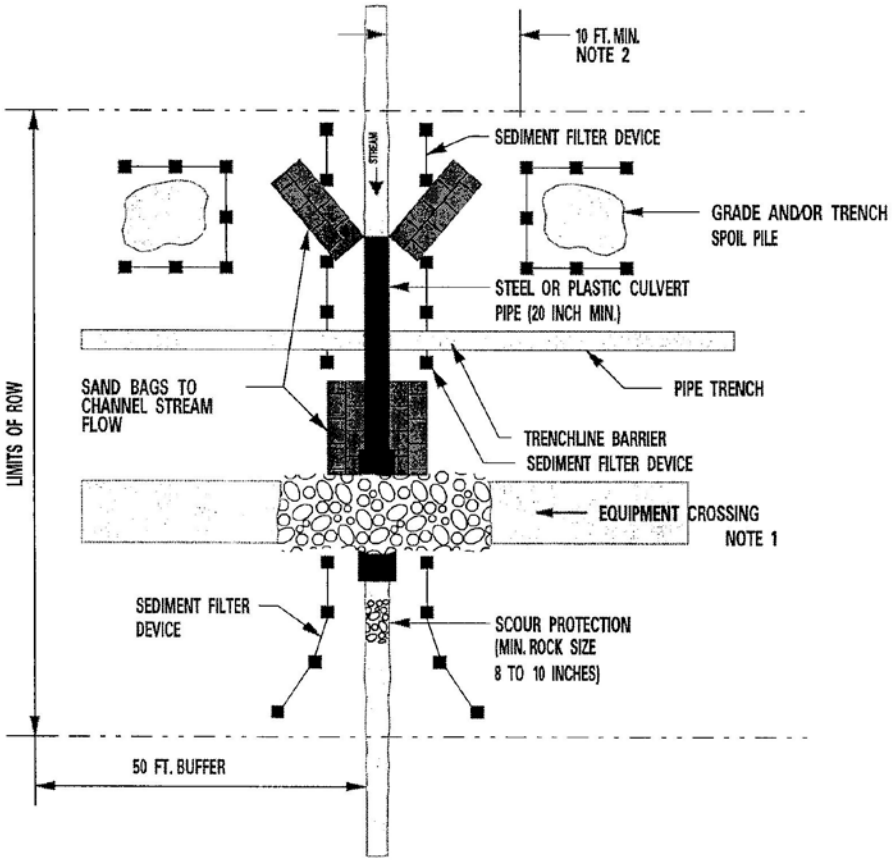


Figure 18 – Typical Stream Crossing Dry-Ditch

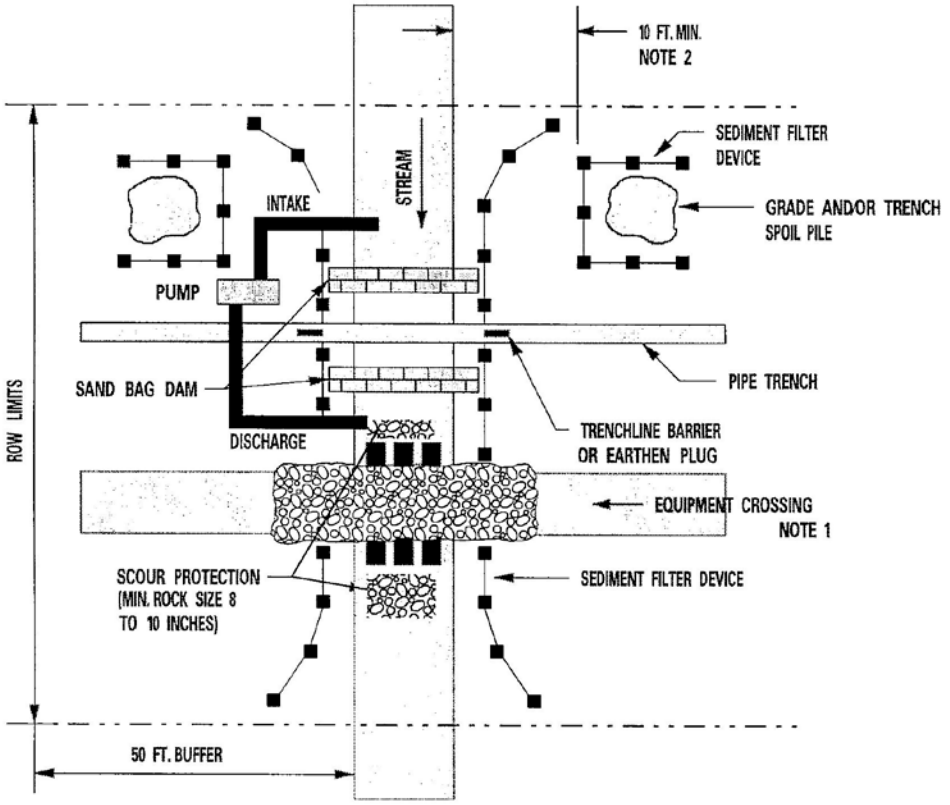


NOTES:
1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 21 & 22.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE.
3. INSTALL FLUME PIPE AFTER BLASTING (IF NECESSARY), BUT BEFORE TRENCHING.
4. PROPERLY ALIGN FLUME PIPE(S) TO PREVENT BANK EROSION OR STREAM BED SCOUR.
5. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.

NOT TO SCALE

Columbia Gas Transmission SM A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	TYPICAL STREAM CROSSING DRY-DITCH	FIGURE – 18

Figure 19 – Typical Stream Crossing Dam and Pump



NOTES:
1. EQUIPMENT CROSSINGS ARE TO BE INSTALLED AS ILLUSTRATED IN FIGURES 21 OR 22.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATERS' EDGE, TOPOGRAPHY PERMITTING.
3. PUMP INTAKES WILL BE SCREENED. PREVENT STREAMBED SCOUR AT DISCHARGE.
4. SUFFICIENT PUMP CAPACITY WILL BE USED TO MAINTAIN STREAM FLOW AT ALL TIMES UNTIL BACKFILL AND REMOVAL OF SANDBAG DAM.
5. BACKUP PUMPS (AS SAME NUMBER AND CAPACITY AS ACTIVE PUMPS) WILL BE READILY AVAILABLE IN WORKING CONDITION ON SITE AT CROSSING.
6. CONSTRUCT DAMS WITH MATERIAL THAT PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE WATERBODY.
7. MONITOR THE DAM AND PUMPS TO ENSURE PROPER OPERATIONS THROUGHOUT THE WATERBODY CROSSING.

NOT TO SCALE

Columbia Gas Transmission, A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	TYPICAL STREAM CROSSING DAM AND PUMP	FIGURE – 19

Figure 20 – Typical Stream Crossing Wet-Ditch

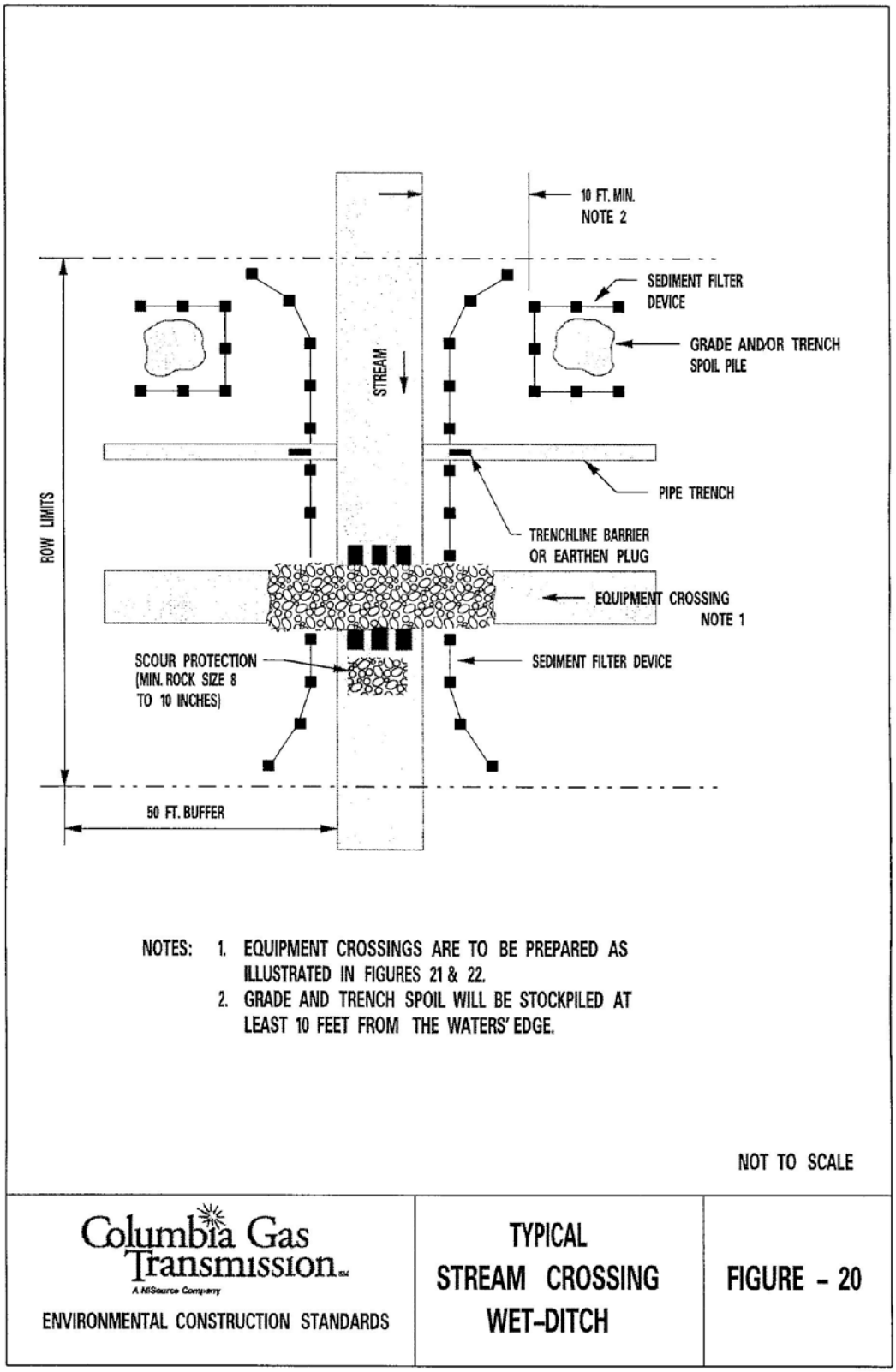


Figure 21 – Temporary Equipment Crossing Culvert and Stone

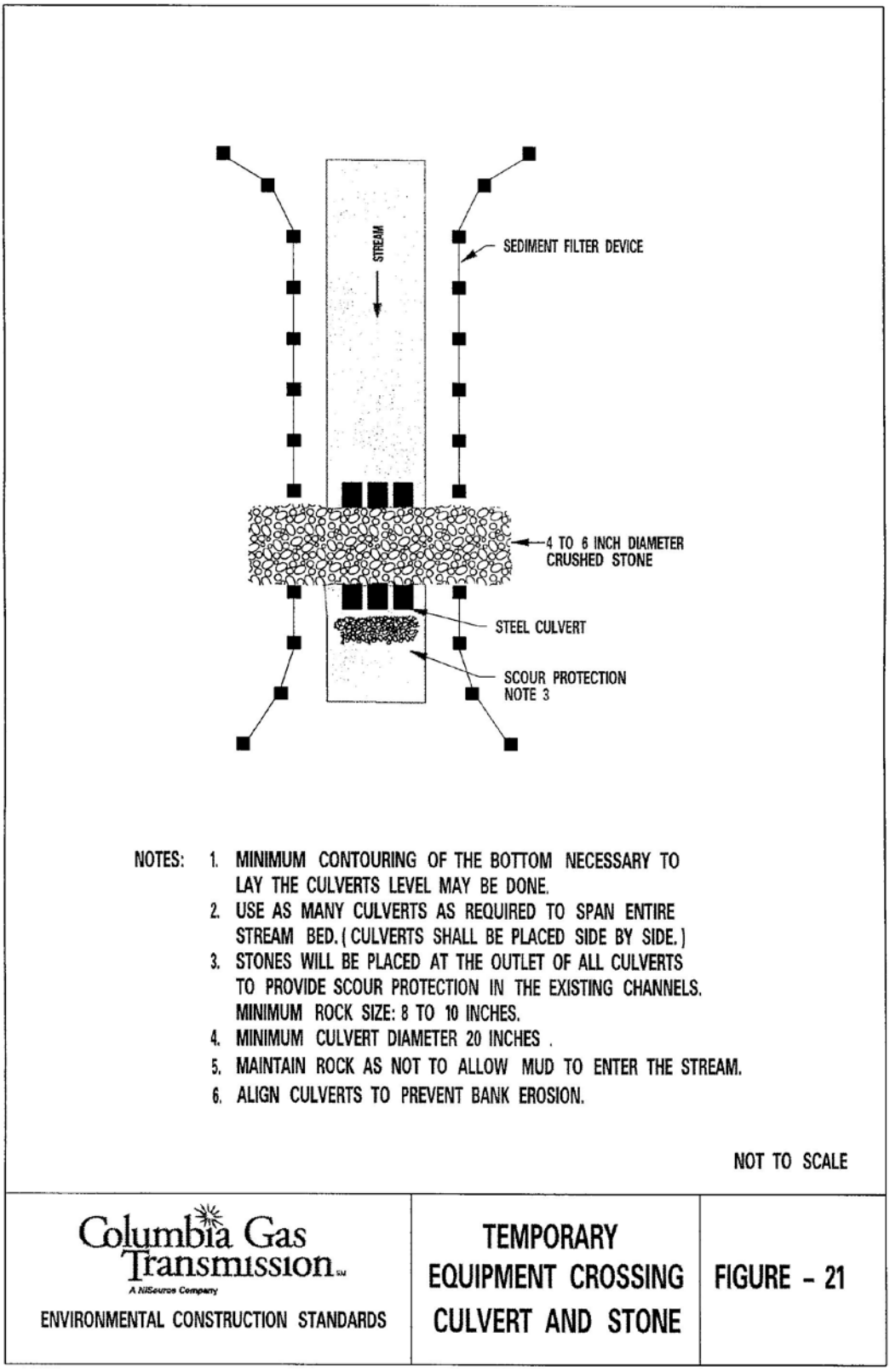


Figure 22 – Temporary Equipment Crossing Equipment Pads

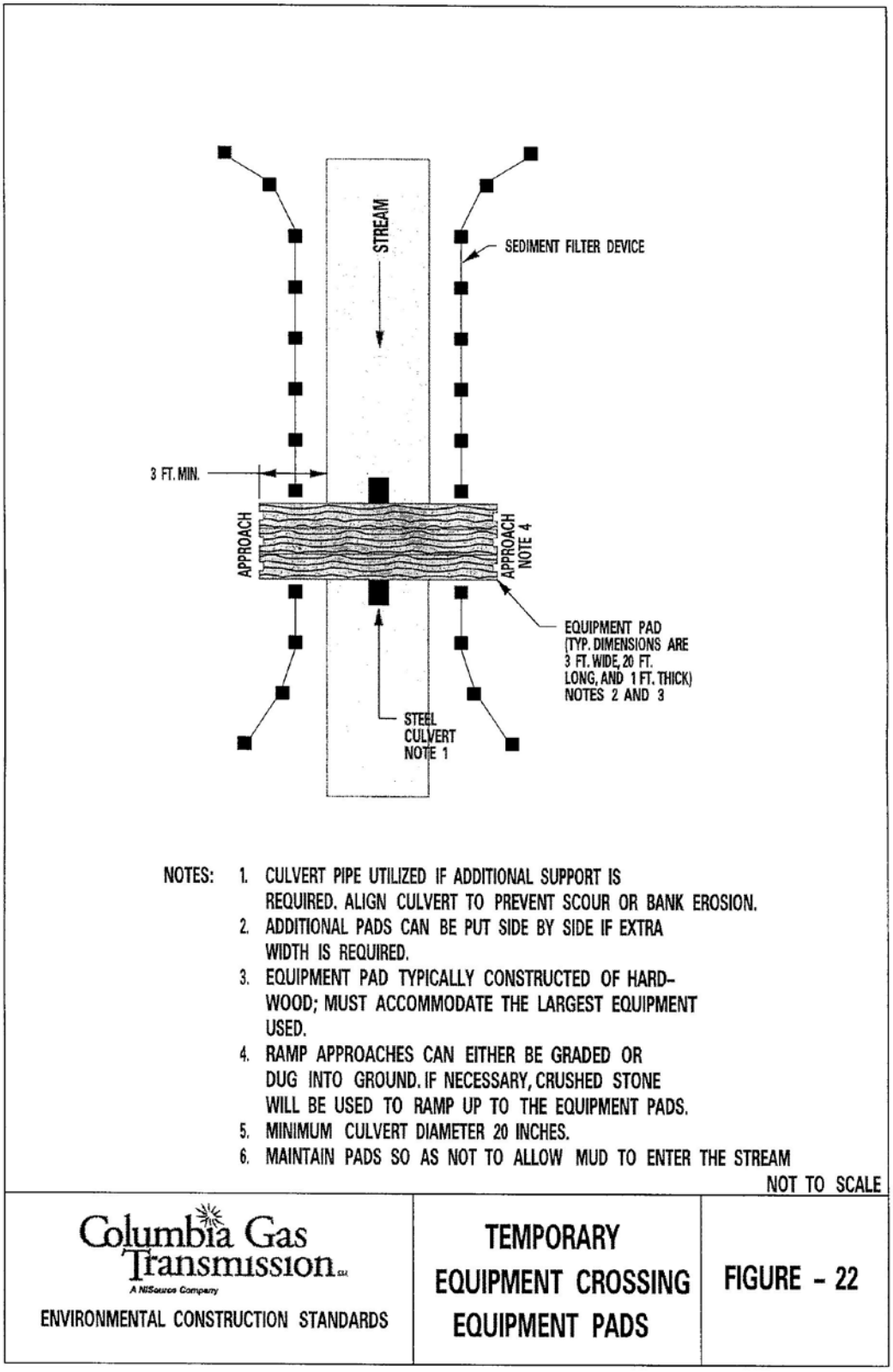


Figure 23 – Typical Wetland Crossing

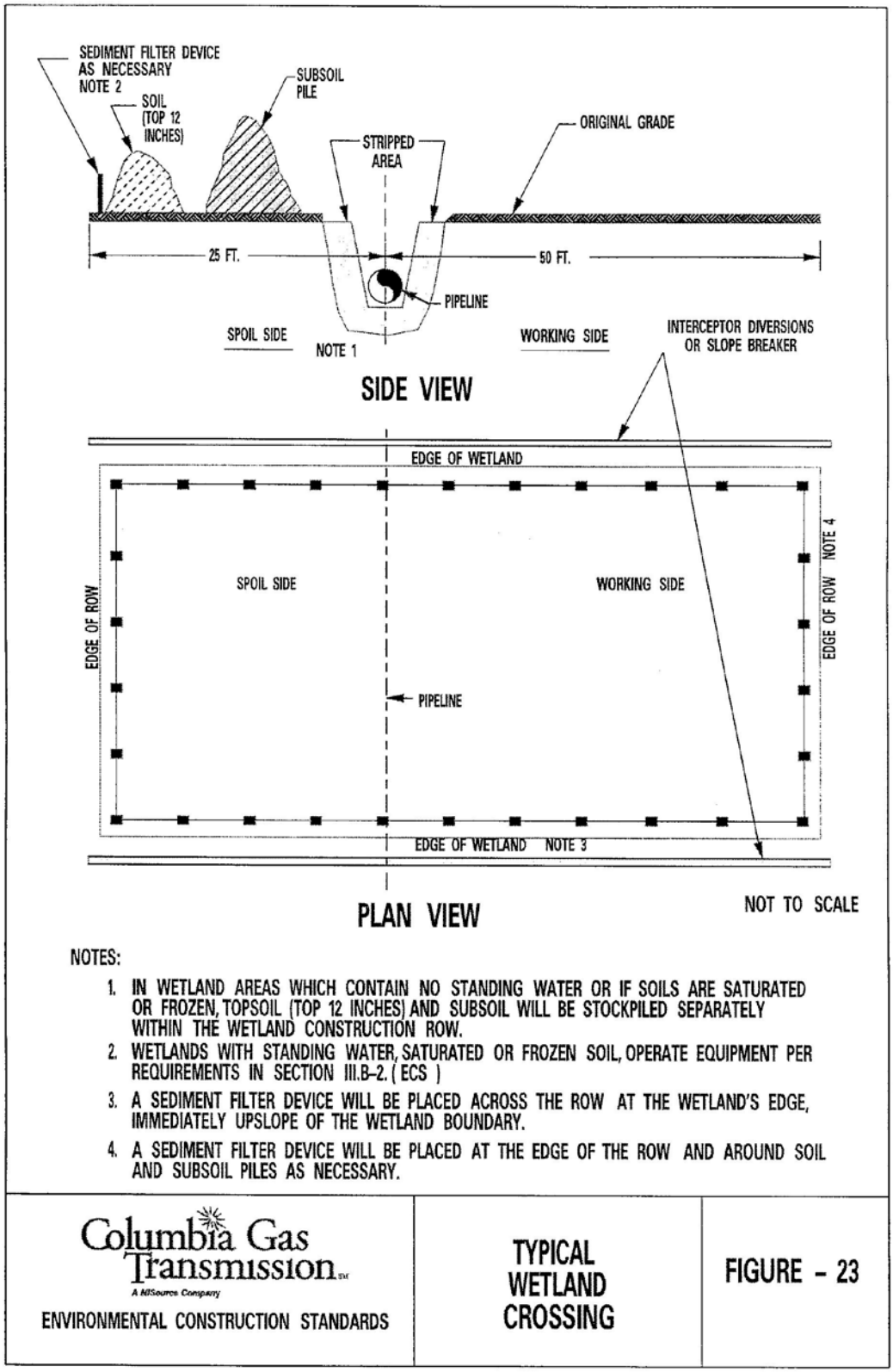


Figure 24 – ROW Maintenance Perennial Streams

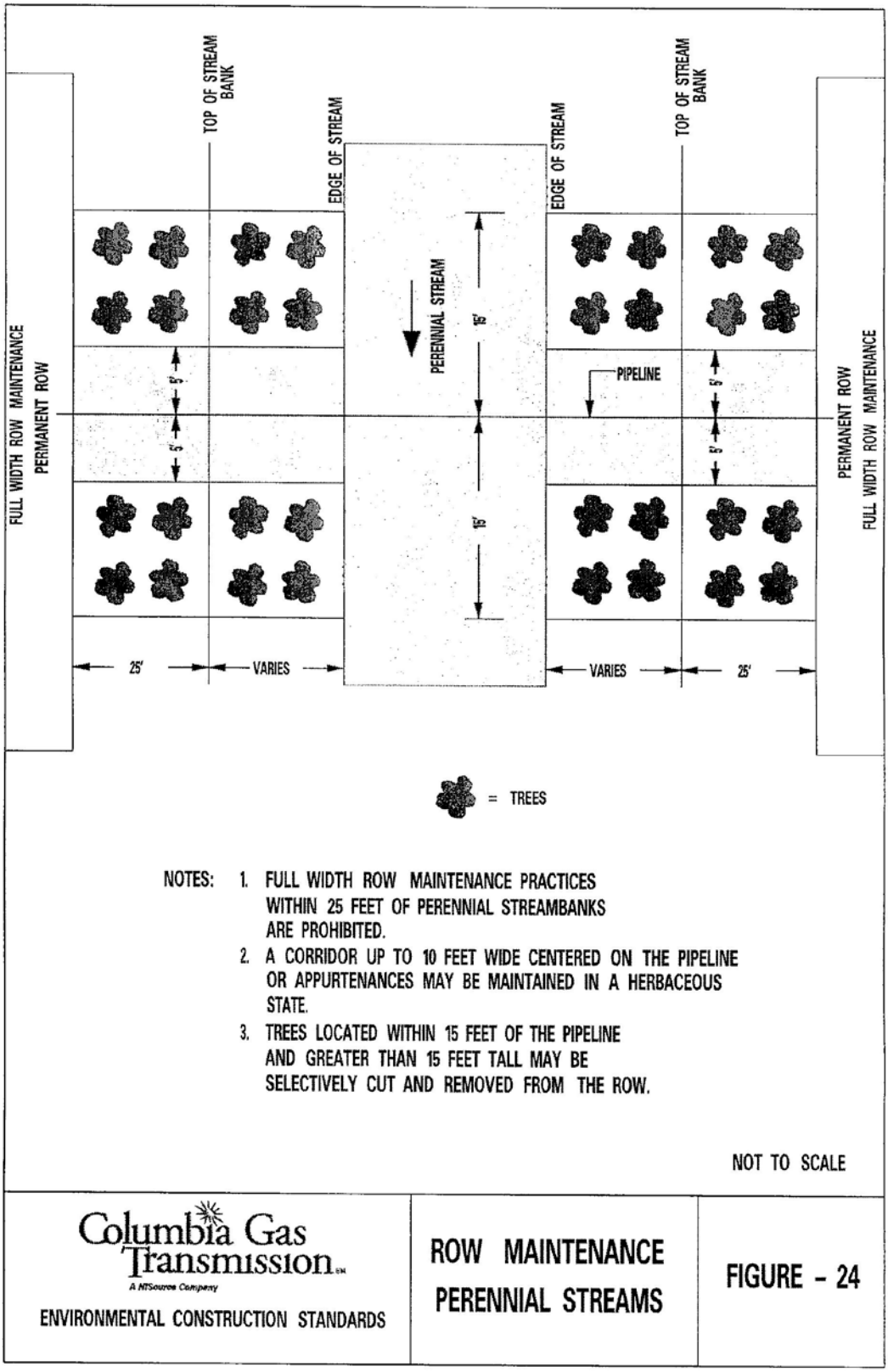


Figure 25 - Typical Compost Filter Sock

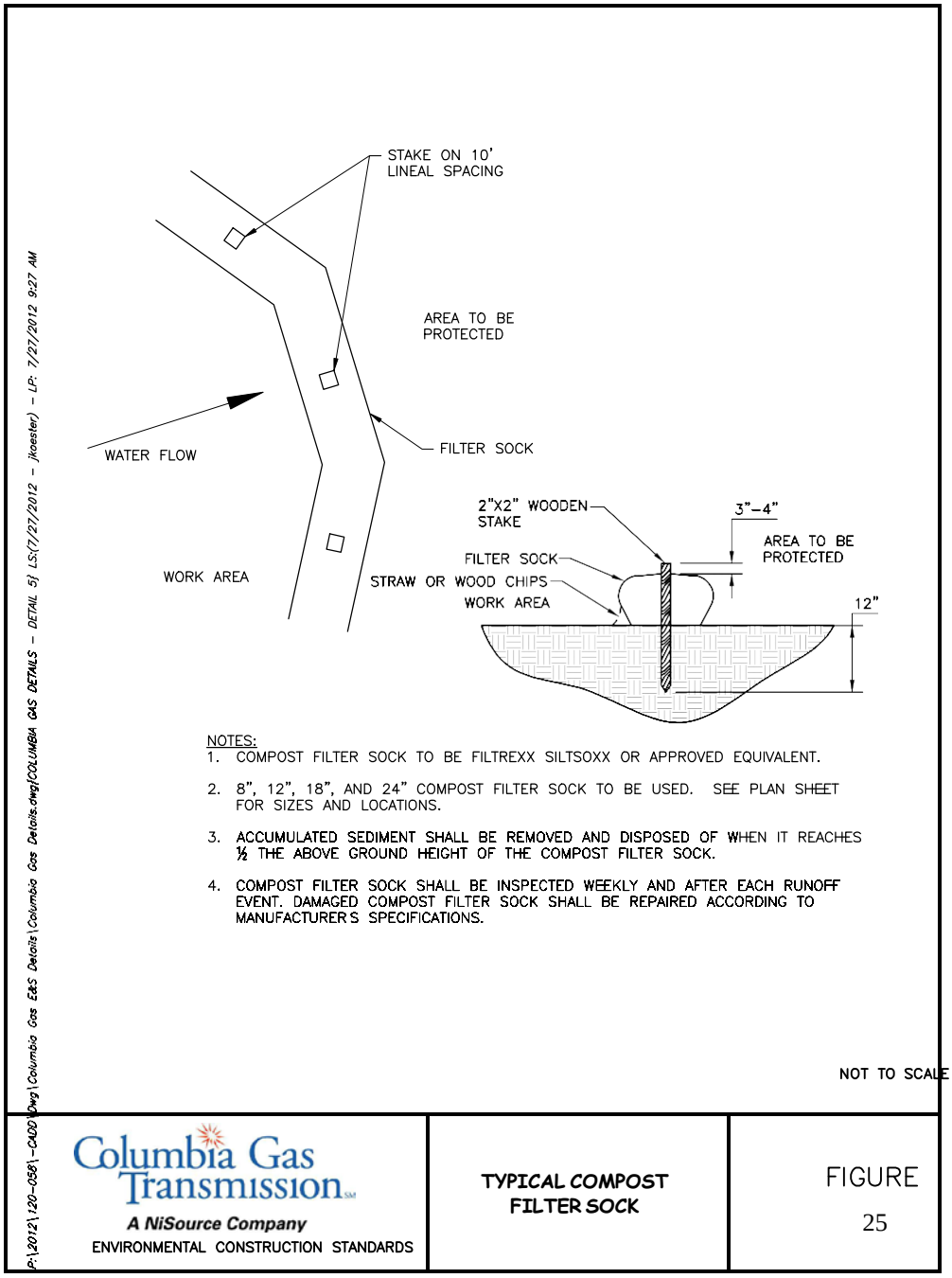


Figure 26 – Hydrostatic Test Dewatering Pit

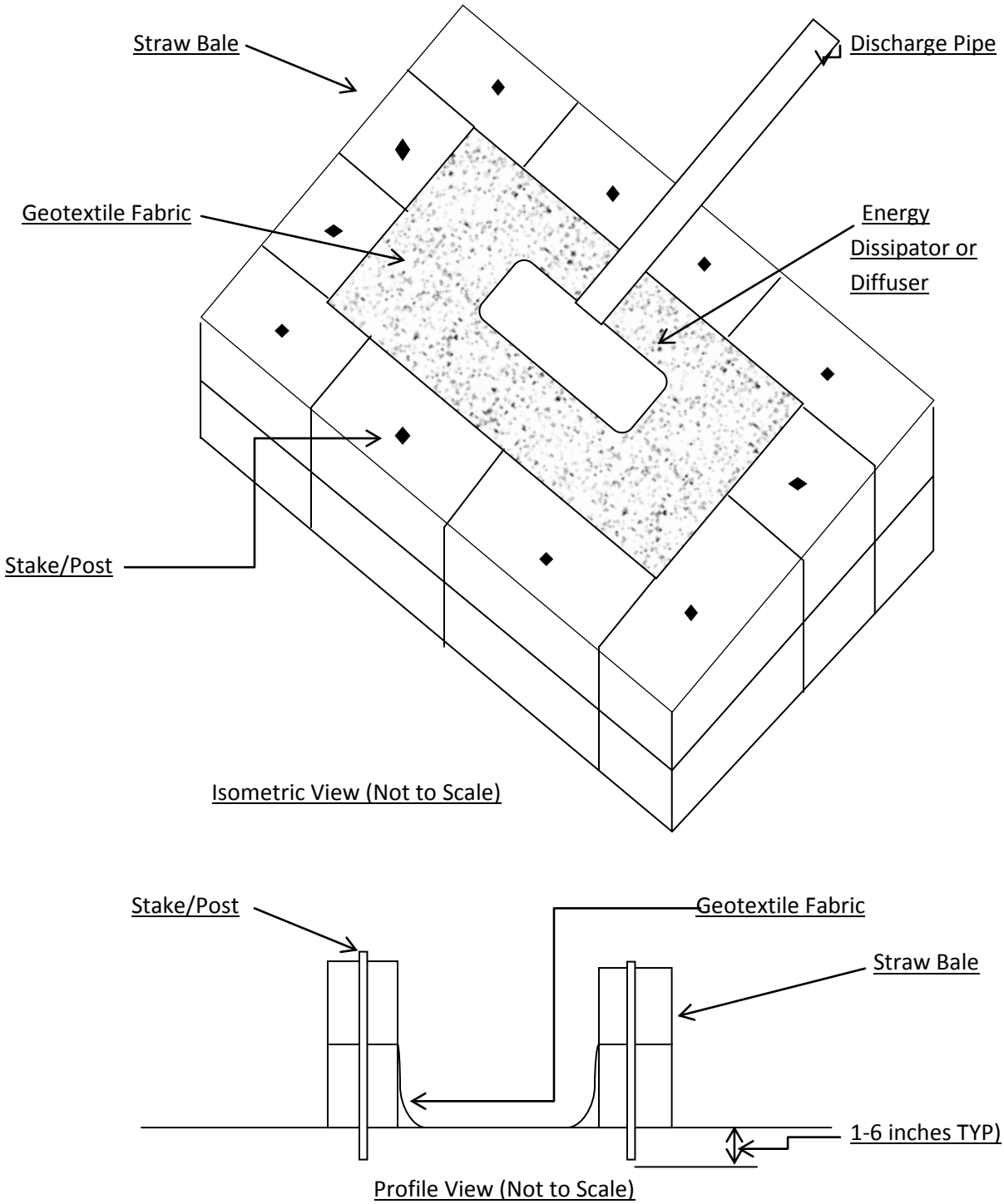


Figure 26 – Hydrostatic Test Dewatering Pit

Notes:

- All dewatering activities will be conducted in accordance with permit conditions.

- Discharge site should be well vegetate, where possible, and located at least 50ft from any waterbody. The topography of the site should be such that water will flow into the dewatering structure and away from any work areas.

- Direct the pumped water onto a stable spill pad constructed of straw bales or geotextile fabric staked to the ground surface.

- Discharge rates should be such that the structure will not overflow.

- Drive two stakes or posts into each bale to anchor them in place.

- Filter bags are a suitable alternative to straw bale structures for trench dewatering. Straw bales or filter sock can be added around the filter bag to provide additional sediment control where needed.

- Stakes or posts should be 2x2 wood or suitable alternative.

- Size of dewatering structure will be determined based on volume of discharge.

APPENDIX E-1
ATWS for the Mountaineer XPress Project Located within 50 feet of Wetlands and Waterbodies
and
Deviations from FERC's Plan and Procedures

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
MXP-100					
1.08	ATWS #6	Waterbody crossing	21	25x100	Location restricted by topography and proximity to feature.
1.12	ATWS #7	Waterbody crossing	19	25x99	ATWS needed for waterbody crossing.
6.25	ATWS #59	Truck turnaround area	25	25x74	Vehicle turn-around at intersection of ROW and access road.
6.40	ATWS #60A	Pipe bend location	25	25x100	ATWS location restricted by topography and proximity to pipe bend.
6.44	ATWS #60B	Wetland crossing	47	25x100	ATWS location restricted by topography.
6.55	ATWS #60D	Waterbody crossing	46	25x100	ATWS location restricted by topography and proximity to features.
6.60	ATWS #60E	Wetland crossing	27	25x100	ATWS location restricted by proximity to wetland workspace reduction area.
11.40	ATWS #96	Side slope	22	25x492	ATWS location restricted by topography and proximity to waterbody crossing.
11.47	ATWS #97	Waterbody crossing	15	106x76	ATWS needed for road and waterbody crossings. Located restricted by area between the features.
14.96	ATWS #140	Road crossing	20	100x74	ATWS needed for road and waterbody crossing. Location maintains greater than 15 feet offset from adjacent off right-of-way feature.
22.42	ATWS #222	Side slope	45	25x466	ATWS needed for side slope construction. Waterbody is within construction workspace.
24.04	ATWS #252	Waterbody crossing	28	25x100	ATWS needed for pipe bend location and side slope construction. Location maintains greater than 15 foot offset from adjacent resource.
24.54	ATWS#258	Railroad crossing	44	50x215	ATWS location restricted between the two features.
26.33	ATWS #271	Waterbody crossing	33	25x99	ATWS needed for pipe bend location and waterbody. Location maintains greater than 15-foot offset from adjacent resource.
28.47	ATWS #290	Waterbody crossing	46	25x99	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
29.26	ATWS #293	Pipe bend location	22	25x87	ATWS location restricted by proximity to pipe bend.
30.24	ATWS #304	Waterbody crossing	48	25x100	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
34.84	ATWS #343	Road Crossing	37	25x53	ATWS location restricted by topography.
35.21	ATWS #350	Waterbody Crossing	48	25x50	ATWS location restricted by topography.
38.18	ATWS #372	Road crossing	18	25x172	ATWS location restricted by topography.
38.19	ATWS #373	Road crossing	39	25x105	ATWS location restricted by topography.
38.46	ATWS #373A	Waterbody Crossing	0	25x200	ATWS location restricted by topography.
47.80	ATWS #428B	Truck Turnaround	24	25x164	ATWS location restricted by topography.
48.54	ATWS #431	Road Crossing	16	25x230	ATWS location restricted by topography.

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
48.66	ATWS #431A	Road crossing	8	25x51	Direct Pipe workspace for Highway 50 crossing between highway and Buckeye Creek
53.17	ATWS #455	Road crossing	26	25x111	ATWS needed for road crossing. ATWS location restricted by topography and proximity to road.
53.48	ATWS #456	Waterbody crossing	28	25x101	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
53.81	ATWS #463	Waterbody Crossing	32	25x101	ATWS location restricted by topography.
53.94	ATWS #465	Road Crossing	48	25x101	ATWS location restricted by topography.
54.55	ATWS #479	Foreign utility crossover	42	25x99	ATWS needed for foreign utility line crossing. Location restricted by topography and proximity to feature.
59.41	ATWS #495	Pipe bend location	44	25x109	ATWS needed for pipe bend locations. Location maintains greater than 15 foot offset from adjacent feature.
59.54	ATWS #496B	Road crossing	18	25x100	ATWS location restricted by topography and proximity to features.
67.36	ATWS #547	Road crossing	31	37x152	ATWS location restricted by proximity to features.
68.23	ATWS #554	Waterbody crossing	45	49x50	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
71.11	ATWS #579	Waterbody crossing	17	25x99	ATWS needed wetland avoidance neck down. ATWS maintains greater than 15 foot offset from adjacent feature.
71.35	ATWS #583	Pipe bend location	30	25x126	ATWS needed for pipe bend location. Location maintains greater than 15 foot offset from adjacent feature.
72.16	ATWS #588	Wetland crossing	36	50x200	ATWS needed for wetland, road, and waterbody crossing. Location restricted by proximity to all features.
72.17	ATWS #589	Wetland crossing	45	52x355	ATWS location restricted by proximity to features.
72.29	ATWS #589A	Waterbody crossing	2	25x246	ATWS location restricted by proximity to features.
72.42	ATWS #591	Waterbody crossing	5	25x363	ATWS for pipe bend and waterbody crossing. Location restricted by topography and adjacent resources.
72.63	ATWS #594	Waterbody crossing	39	25x137	ATWS needed for road and waterbody crossing. Location restricted by proximity to these features.
73.11	ATWS #597	Waterbody crossing	43	459x79	ATWS needed for two waterbody and one wetland crossing. Location restricted by topography and proximity to features.
74.38	ATWS #612	Waterbody crossing	10	50x570	ATWS needed for waterbody crossing.
74.86	ATWS #619	Waterbody crossing	42	50x148	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
75.39	ATWS #629	Waterbody crossing	9	25x99	ATWS needed for waterbody crossing.
76.27	ATWS #639A	Waterbody crossing	9	25x30	ATWS location restricted by proximity to features.
76.94	ATWS #646	Waterbody crossing	46	50x169	ATWS needed for pipe bend location and waterbody crossing.

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
77.45	ATWS #654	Waterbody crossing	35	25x228	ATWS needed for pipe bend location and for waterbody crossing. Located greater than 15 feet from adjacent waterbody/resource.
77.82	ATWS #662	Truck Turnaround	24	25x100	ATWS location restricted by Access Road intersection.
79.59	ATWS #683	Waterbody crossing	37	50x149	ATWS needed for waterbody crossing. Location restricted by topography and proximity to waterbody. Closest resource is within construction work area.
79.60	ATWS #684	Waterbody crossing	45	25x229	ATWS needed for waterbody crossing. Location restricted by topography and proximity to waterbody
90.25	ATWS #795	Pipe bend location	44	25x109	ATWS needed for pipe bend location. Location maintains greater than 15 feet separation from adjacent resource.
90.53	ATWS #799	Road crossing	46	25x152	ATWS needed for road and waterbody crossing. Location restricted by topography and proximity to features.
90.59	ATWS #801	Waterbody crossing	44	25x149	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
91.07	ATWS #807	Waterbody crossing	31	25x103	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
93.82	ATWS #835A	Pipe bend location	16	25x157	ATWS location restricted by proximity to pipe bend.
93.87	ATWS #836	Pipe bend location	16	365x31	ATWS needed for side slope construction and pipe bend location.
94.25	ATWS #843	Waterbody crossing	40	32x86	ATWS needed for road and waterbody crossing. ATWS on opposite side of road from waterbody.
94.30	ATWS #845	Pipe bend location	35	25x185	ATWS needed for pipe bend location. Closest feature is within construction work area.
94.65	ATWS #850	Waterbody crossing	43	553x179	ATWS needed for waterbody crossing and pipe bend location.
94.80	ATWS #852	Waterbody crossing	47	167x255	ATWS location restricted by topography and proximity to feature.
95.18	ATWS #856	Truck turnaround	43	25x99	ATWS location restricted by topography.
96.47	ATWS #867	Road Crossing	49	50x263	ATWS needed for road and waterbody crossing. ATWS situated between road and waterbody.
96.47	ATWS #868	Road crossing	20	50x312	ATWS needed for road and waterbody crossing. ATWS situated between road and waterbody.
96.82	ATWS #874	Waterbody crossing	10	102x207	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
97.21	ATWS #879	Waterbody crossing	33	123x129	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
97.25	ATWS #880	Waterbody crossing	25	235x132	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
97.29	ATWS #880A	Road crossing	44	25x89	ATWS location restricted by topography and proximity to features.
97.37	ATWS #882	Waterbody crossing	48	25x379	ATWS location restricted by topography and proximity to feature.
97.58	ATWS #883	Road crossing	35	25x199	ATWS needed for road and waterbody crossing. Location restricted by topography and proximity to features.

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
100.05	ATWS #918	Road crossing	27	137x70	ATWS needed for road and waterbody crossing. ATWS on opposite side of road from closest waterbody.
103.90	ATWS #970	Wetland crossing	49	25x346	ATWS needed for pipe bend location and side slope construction. NOTE: wetland is on opposite side of construction workspace.
104.57	ATWS #978	Road crossing	22	25x99	ATWS needed for road and waterbody crossing. ATWS on opposite side of road from waterbody.
104.61	ATWS #979	Road crossing	29	340x64	ATWS needed for road and waterbody crossing. Location restricted by topography and proximity to features.
105.63	ATWS #991	Pipe bend location	36	25x110	ATWS needed at pipe bend location.
107.06	ATWS #1016	Pipe bend location	30	25x249	ATWS needed for two pipe bend locations. Location maintains a least a 15 foot separation from adjacent features.
107.38	ATWS #1021	Waterbody crossing	41	50x112	ATWS needed for two waterbody crossings. Location restricted by proximity to both waterbodies.
109.75	ATWS #1045	Pipe bend location	36	25x112	ATWS needed for pipe bend location. Closest resource is within construction work area.
110.45	ATWS #1058	Waterbody crossing	31	50x100	ATWS location restricted by topography and proximity to features.
113.20	ATWS #1090	Road crossing	28	199x203	ATWS location restricted by topography and proximity to road.
113.21	ATWS #1091	Road crossing	41	164x160	ATWS needed for highway crossing. Location greater than 15 feet from adjacent, off ROW waterbody.
115.14	ATWS #1103	Road crossing	40	25x175	ATWS needed for road and waterbody crossing. Waterbody is on opposite side of highway.
116.02	ATWS#1116	Road crossing	45	134x249	ATWS location restricted by topography and proximity to feature.
118.38	ATWS #1135A	Road crossing	39	25x125	ATWS location restricted by proximity to road crossing.
122.68	ATWS #1181A	Road crossing	35	25x98	ATWS location restricted by topography and proximity to road crossing.
123.05	ATWS #1187	Pipe bend location	21	25x114	ATWS location restricted by topography and proximity to pipe bend.
123.88	ATWS #1194	Road crossing	9	25x226	ATWS location restricted by proximity to pipe bend and adjacent features. ATWS associated with Highway 77 bore.
123.90	ATWS #1193A	Road crossing	30	115x115	ATWS location restricted by topography and proximity to road bore.
124.40	ATWS #1197	Road crossing	29	216x50	ATWS needed for road crossing. ATWS location restricted by road crossing and proximity to waterbody.
124.91	ATWS #1197A	Waterbody crossing	41	29x284	ATWS location restricted by topography and proximity to feature.
125.05	ATWS #1198	Pipe bend location	36	25x107	ATWS location restricted by topography and proximity to feature.
126.83	ATWS #1216	Pipe bend location	19	25x113	ATWS location restricted by topography and proximity to pipe bend.

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
129.25	ATWS #1235	Road crossing	35	50x54	ATWS needed for road and waterbody crossing. ATWS located on opposite side of road from feature.
129.27	ATWS #1236	Road crossing	10	50x111	ATWS needed for road and waterbody crossing.
129.28	ATWS #1237	Road crossing	10	50x95	ATWS needed for road and waterbody crossing.
130.81	ATWS #1248A	Waterbody crossing	3	50x100	ATWS location restricted by topography and proximity to feature.
131.54	ATWS #1248G	Pipe bend location	17	25x84	ATWS location restricted by topography and proximity to features.
131.67	ATWS #1248L	Side slope	45	25x100	ATWS location restricted by topography.
132.58	ATWS #1269	Pipe bend location	27	15x106	ATWS location restricted by proximity to pipe bend.
132.96	ATWS #1272	Road crossing	25	50x354	ATWS location restricted topography and proximity to features.
132.97	ATWS #1273	Road crossing	26	50x345	ATWS location restricted topography and proximity to features.
134.15	ATWS #1281	Waterbody crossing	36	25x146	ATWS needed for waterbody crossing and pipe bend location. ATWS location maintains at least a 15 foot offset from adjacent resource.
134.50	ATWS #1284	Road crossing	7	50x104	ATWS needed for road crossing.
136.88	ATWS #1309	Waterbody crossing	9	25x100	ATWS location restricted by topography.
137.83	ATWS #1331	Road crossing	15	25x145	ATWS needed for road crossing.
137.84	ATWS #1332	Road crossing	36	25x113	ATWS situated between road and Spring Valley Branch for use on both crossings. Closest resource is within construction ROW.
137.85	ATWS #1331A	Wetland crossing	15	25x31	ATWS location restricted by proximity to road and wetland features.
138.32	ATWS #1343	Road crossing	37	25x123	ATWS needed for road crossing. Waterbody is located on opposite side of road.
141.10	ATWS #1373	Truck turnaround area	38	25x99	ATWS needed for vehicle turn-around at intersection of access road and work area.
141.65	ATWS #1380	Waterbody crossing	46	214x113	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature. Maintains greater than 15 foot separation from off ROW feature.
141.84	ATWS #1383	Road crossing	30	50x179	ATWS needed for road crossing.
143.25	ATWS #1400	Pipe bend location	19	25x110	ATWS needed for pipe bend location.
144.29	ATWS #1420	Pipe bend location	49	25x81	ATWS location restricted by proximity to pipe bend.
144.82	ATWS #1428	Waterbody crossing	40	25x100	ATWS location restricted by topography and proximity to feature.
144.85	ATWS #1429	Truck turnaround area	10	25x99	ATWS needed for vehicle turn-around at intersection of access road and pipeline ROW, in flat terrain
146.08	ATWS #1450	Road crossing	40	171x116	ATWS needed for road and waterbody crossing. ATWS situated between road and waterbody.
146.58	ATWS #1462A	Water appropriation location	0	50x50	Water appropriation site for Kanawha River

APPENDIX E-1
Table 1
Mountaineer XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Additional Temporary Workspace Within 50 Feet of Wetlands or Waterbodies

Facility/ Milepost	ATWS ID	Feature	Distance (feet)	Dimensions (feet)	ATWS Location Justification
146.13	ATWS #1450A	Waterbody crossing	37	25x100	ATWS location restricted by topography and proximity to feature.
146.85	ATWS # 1462B	HDD	22	50x287	ATWS required for Kanawha River HHD.
147.56	ATWS #1462C	HDD	0		ATWS required for Kanawha River HHD pipe assembly.
148.02	ATWS #1467	Road crossing	39	50x104	ATWS location restricted by proximity to road.
149.06	ATWS #1480	Pipe bend location	44	25x147	ATWS needed for pipe bend location. Located more than 15 feet from adjacent waterbody/resource.
150.30	ATWS #1485A	Waterbody crossing	14	50x99	ATWS location restricted by topography and proximity to feature.
153.92	ATWS #1526	Pipe bend location	42	25x117	ATWS required for PI, ATWS greater than 15 feet from adjacent off ROW resource.
154.66	ATWS #1529A	Top of steep slope	47	25x139	ATWS location restricted by topography and proximity to features.
154.74	ATWS #1529B	Road crossing	48	35x50	ATWS location restricted by proximity between features.
156.18	ATWS #1536A	Top of steep slope	43	25x125	ATWS location restricted by adjacent features.
156.75	ATWS #1542	Pipe bend location	16	25x115	Stream is within TWS. ATWS required for PI.
157.60	ATWS #1548	Pipe bend location	43	25x108	ATWS needed for pipe bend location.
160.55	ATWS #1599A	Road crossing	29	75x107	ATWS location restricted by proximity to road and waterbody crossing.
160.69	ATWS #1601	Road crossing	44	25x275	ATWS needed for road, driveway, and waterbody crossing.
161.43	ATWS #1610A	Road crossing	7	41x50	ATWS location restricted by proximity to road and wetland features.
162.64	ATWS #1622	Road crossing	0	50x255	ATWS needed within a wetland for highway bore. No ATWS available on other side of road due to topography.
163.47	ATWS #1626	Road crossing	15	47x71	ATWS needed for road and waterbody crossing.
MXP-200					
1.09	ATWS #SL 3A	Waterbody crossing	29	25x443	ATWS location restricted by proximity to feature.
1.15	ATWS #SL 3B	Waterbody crossing	35	25x125	ATWS location restricted by proximity to feature.
2.21	ATWS #SL 11	Waterbody crossing	44	25x100	ATWS needed for waterbody crossing. Location restricted by topography and proximity to feature.
2.96	ATWS #SL 17A	Truck turnaround	33	25x100	ATWS location restricted by proximity to intersection with access road.
3.07	ATWS #SL 19	Road crossing	41	25x100	ATWS needed for road and waterbody crossing. Location restricted between features.
Ripley Regulator Station					
N/A	ATWS #R1	Ripley tie-in	0	306x13	ATWS location restricted by proximity to Ripley Regulator Station.

Notes: ATWS = additional temporary workspace; ROW = right-of-way; N/A = Not applicable

APPENDIX E-1
Table 2

Comparison of Columbia's West Virginia Environmental Construction Standards with FERC's Upland Erosion Control, Revegetation and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures

Mountaineer XPress Project

Requirement	Source	Status
FERC's Upland Erosion, Control, Revegetation and Maintenance Plan		
TOPSOIL CONSERVATION Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus soil side method) in: Actively cultivated or rotated croplands and pastures.	FERC Plan, Section IV.B.1.a	See DEIS recommendation #16.
FINAL GRADING, RESTORATION, AND STABILIZATION Diligent efforts will be made to remove rocks greater than 4 inches if off-construction work areas do not contain rocks greater than 4 inches.	FERC Plan, Section V.A.4	See DEIS recommendation #15.
APPROVED AREAS OF DISTURBANCE The construction right-of-way width for a project shall not exceed 75 feet or that described in the FERC application unless otherwise modified by a FERC Order. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (e.g., side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.	FERC Plan, Section IV.A.2	Additional construction ROW requested by Columbia Gas. Approved by FERC.
MONITORING AND MAINTENANCE Routine vegetation mowing or clearing over the full width of the permanent right-of-way in uplands shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion/leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In no case shall routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the U.S. Fish and Wildlife Service.	FERC Plan, Section VII.A.5	Adopted for the Project
REPORTING The project sponsor shall maintain records that identify by milepost: a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used; b. acreage treated; c. dates of backfilling and seeding; d. names of landowners requesting special seeding treatment and a description of the follow-up actions; e. the location of any subsurface drainage repairs or improvements made during restoration; and f. any problem areas and how they were addressed.	FERC Plan, Section VII.B.1	Adopted for the Project
FERC's Wetland and Waterbody Construction and Mitigation Procedures		
PRECONSTRUCTION FILING The following information must be filed with the Secretary of the FERC (Secretary) prior to the beginning of construction, for the review and written approval by the Director: 1. site-specific justifications for extra work areas that would be closer than 50 feet from a waterbody or wetland; and 2. site-specific justifications for the use of a construction right-of-way greater than 75-feet-wide in wetlands	FERC Procedures, Section II.A	Provided in Table 1 above. Approved by FERC.
GENERAL CROSSING PROCEDURES Where pipelines parallel a waterbody, maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction right-of-way, except where maintaining this offset will result in greater environmental impact.	FERC Procedures, Section V.B.3.c	Additional construction ROW requested Site-specific crossing plans were provided. Approved by FERC.

APPENDIX E-1
Table 2

Comparison of Columbia's West Virginia Environmental Construction Standards with FERC's Upland Erosion Control, Revegetation and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures

Mountaineer XPress Project

Requirement	Source	Status
GENERAL CROSSING PROCEDURES Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment	FERC Procedures, Section V.B.5.a	Adopted for the Project
GENERAL CROSSING PROCEDURES Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts	FERC Procedures, Section V.B.5.c	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in riparian areas that are between HDD entry and exit points.	FERC Procedures, Section V.D.1	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.	FERC Procedures, Section V.D.2	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE Time of year restrictions specified in section VII.A.5 of the Plan (April 15 – August 1 of any year) apply to routine mowing and clearing of riparian areas.	FERC Procedures, Section V.D.3	Adopted for the Project
RESTORATION Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.4 of the Plan.	FERC Procedures, Section VI.C.8	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Do not conduct routine vegetation mowing or clearing over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in wetlands that are between HDD entry and exit points.	FERC Procedures, Section VI.D.1	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or state agency.	FERC Procedures, Section VI.D.2	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Time of year restrictions specified in section VII.A.5 of the Plan (April 15 – August 1 of any year) apply to routine mowing and clearing of wetland areas.	FERC Procedures, Section VI.D.3	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Monitor and record the success of wetland revegetation annually until wetland revegetation is successful.	FERC Procedures, Section VI.D.4	Adopted for the Project

APPENDIX E-1
Table 2

Comparison of Columbia's West Virginia Environmental Construction Standards with FERC's Upland Erosion Control, Revegetation and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures

Mountaineer XPress Project

Requirement	Source	Status
POST-CONSTRUCTION MAINTENANCE AND REPORTING Wetland revegetation shall be considered successful if all of the following criteria are satisfied: a. the affected wetland satisfies the current federal definition for a wetland (i.e., soils, hydrology, and vegetation); b. vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction; c. if natural rather than active revegetation was used, the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and d. invasive species and noxious weeds are absent, unless they are abundant in adjacent areas that were not disturbed by construction.	FERC Procedures, Section VI.D.5	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Within 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts and documenting success as defined in section VI.D.5, above. The requirement to file wetland restoration reports with the Secretary does not apply to projects constructed under the automatic authorization, prior notice, or advance notice provisions in the FERC's regulations. For any wetland where revegetation is not successful at the end of 3 years after construction, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate wetlands. Continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.	FERC Procedures, Section VI.D.6	Adopted for the Project

APPENDIX E-2
Temporary Workspace for the Gulf XPress Project Located within 50 feet of Wetlands and Waterbodies
and
Deviations from FERC's Plan and Procedures

APPENDIX E-2
Table 1

Gulf XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Workspace Within 50 Feet of Wetlands and Waterbodies

Facility	Feature ID	Flow Regime or Wetland Type	Distance from Workspace	Location Justification
Kentucky				
Leach C Meter Station	S-BOA-001	Ephemeral	0	Located within the temporary workspace required for the meter station facilities. Columbia Gulf would maintain flow across the work area during construction and restore the waterbody to preconstruction contours following construction.
	W-BOA-001	Palustrine Emergent	0	Located within the temporary workspace for the meter station facilities. Columbia Gulf would install construction mats or segregate wetland topsoil to minimize impacts on this feature during construction and restore wetland contours following construction.
	O-BOA-001	Stock Pond	0	Located within the temporary workspace required for the meter station facilities. Columbia Gulf would install erosion controls and maintain a 25-foot buffer around this pond.
Morehead Compressor Station	O-ROA-001	Impoundment/ Stock Pond	0	Located within the permanent workspace of the compressor station facilities.
	W-ROA-001	Palustrine Emergent	0	Located within temporary workspace and footprint of the permanent access road, which are necessary to construct the facilities. The wetland is located within cultivated cropland. Columbia Gulf would install erosion controls and maintain a 25-foot buffer around this feature. Upon restoration, the wetland would be directed into a culvert beneath the permanent access road.
	S-ROA-003	Ephemeral	0	Located within the permanent workspace of the compressor station facilities. Waterbody located in cultivated cropland.
	S-ROA-004	Ephemeral	0	Located within the temporary and permanent workspaces for the compressor station facilities. Waterbody located in cultivated cropland.
Goodluck Compressor Station	S-MEA-002	Ephemeral	0	Located within the temporary workspace required to construct the compressor station facilities.
Tennessee				
Clifton Junction Compressor Station	O-WAA-001	Impoundment/ Stock Pond	0	Located within the permanent workspace for the compressor station facilities. Columbia Gulf would install erosion controls and maintain a 25-foot buffer around this feature.

APPENDIX E-2
Table 1

Gulf XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Workspace Within 50 Feet of Wetlands and Waterbodies

Facility	Feature ID	Flow Regime or Wetland Type	Distance from Workspace	Location Justification
Clifton Junction Compressor Station (continued)	O-WAA-002	Impoundment/ Stock Pond	O	Located within the workspace for the new permanent access road. By impacting this feature, Columbia Gulf would be able to reduce its encroachment on an ephemeral stream (S-WAA-003) and forested area. This feature would not undergo post-construction restoration.
	S-WAA-002	Ephemeral	0	Located within the temporary and permanent workspaces for the compressor station facilities. The portion within the permanent facility footprint would not undergo post-construction restoration.
	S-WAA-003	Ephemeral	0	Located within the temporary and permanent for the permanent access road to the site. Access to facility was routed to avoid multiple waterbody channels; only two waterbodies would now be crossed. Drainage would be restored following construction, directed into a culvert beneath the permanent access road.
	S-WAA-005	Ephemeral	14	Access to facility was routed to avoid multiple waterbody channels. Permanent workspace near this waterbody is needed to maintain electric powerline to the compressor station.
	S-WAA-006	Ephemeral	44	Access to facility was routed to avoid multiple waterbody channels. Permanent workspace near this waterbody is needed to maintain access.
	S-WAA-007	Ephemeral	0	Located within temporary workspace required to construct the permanent access road to the site.
	S-WAA-008	Ephemeral	0	Located within the temporary workspace required to construct the permanent access road to site.
	S-WAA-009	Ephemeral	46	Temporary workspace near this waterbody would be necessary to maintain access to construction work area.
	S-WAA-010	Ephemeral	0	Located within temporary and permanent workspaces necessary to construct the suction and discharge piping.

APPENDIX E-2
Table 1

Gulf XPress Project
Requested Modifications to FERC's Wetland and Waterbody Construction and Mitigation Procedures
Workspace Within 50 Feet of Wetlands and Waterbodies

Facility	Feature ID	Flow Regime or Wetland Type	Distance from Workspace	Location Justification
Mississippi				
New Albany Compressor Station	S-UNA-001	Ephemeral	0	Located within the temporary workspace and permanent access road necessary to construct facility and access the site. The drainage swale is located in cultivated cropland. Post-construction restoration would result in directing the waterbody into a culvert beneath the permanent access road.
	S-UNA-003	Ephemeral	0	Located within temporary and permanent workspaces for the facility. The drainage swale is located within cultivated cropland. The portion of the feature within the permanent facility site would not be restored.
	S-UNA-004	Ephemeral	0	Temporary and permanent workspaces are necessary to construct the facility. The drainage swale is located in cultivated cropland. The portion of the feature within the permanent facility site would not be restored.
	W-UNA-002	Palustrine Emergent	0	Located within temporary workspace necessary to construct the facilities
	W-UNA-003	Palustrine Emergent	0	Located within temporary and permanent workspaces necessary to construct the facilities. Wetland located in cultivated cropland. The portion of the feature within the permanent facility site would not be restored.
	W-UNA-008	Palustrine Emergent	0	Located within temporary workspace necessary to construct the facilities.
Holcomb Compressor Station	S-GRA-013	Ephemeral	0	Temporary workspace is needed to access site. Waterbody is located in upland cultivated cropland. A temporary bridge or culvert would be installed for construction and would be removed during restoration.

APPENDIX E-2
Table 2

Gulf XPress Project
Comparison of Columbia Gulf's Environmental Construction Standards with
FERC's Upland Erosion Control, Revegetation and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures

Requirement	Source	Status
FERC's Upland Erosion, Control, Revegetation and Maintenance Plan (Plan)		
FINAL GRADING, RESTORATION, AND STABILIZATION Diligent efforts will be made to remove rocks greater than 4 inches if off-construction work areas do not contain rocks greater than 4 inches.	FERC Plan, Section V.A.4	See DEIS recommendation #15.
MONITORING AND MAINTENANCE Routine vegetation mowing or clearing over the full width of the permanent right-of-way in uplands shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion/leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In no case shall routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the U.S. Fish and Wildlife Service.	FERC Plan, Section VII.A.5	Adopted for the Project
REPORTING The project sponsor shall maintain records that identify by milepost: a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used; b. acreage treated; c. dates of backfilling and seeding; d. names of landowners requesting special seeding treatment and a description of the follow-up actions; e. the location of any subsurface drainage repairs or improvements made during restoration; and f. any problem areas and how they were addressed.	FERC Plan, Section VII.B.1	Adopted for the Project
FERC's Wetland and Waterbody Construction and Mitigation Procedures (Procedures)		
PRECONSTRUCTION FILING The following information must be filed with the Secretary of the FERC (Secretary) prior to the beginning of construction, for the review and written approval by the Director: 1. site-specific justifications for extra work areas that would be closer than 50 feet from a waterbody or wetland; and 2. site-specific justifications for the use of a construction right-of-way greater than 75-feet-wide in wetlands	FERC Procedures, Section II.A	Provided above in Table 1
GENERAL CROSSING PROCEDURES Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment	FERC Procedures, Section V.B.5.a	Adopted for the Project
GENERAL CROSSING PROCEDURES Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts	FERC Procedures, Section V.B.5.c	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in riparian areas that are between HDD entry and exit points.	FERC Procedures, Section V.D.1	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.	FERC Procedures, Section V.D.2	Adopted for the Project

APPENDIX E-2
Table 2

Gulf XPress Project
Comparison of Columbia Gulf's Environmental Construction Standards with
FERC's Upland Erosion Control, Revegetation and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures

Requirement	Source	Status
POST-CONSTRUCTION MAINTENANCE Time of year restrictions specified in section VII.A.5 of the Plan (April 15 – August 1 of any year) apply to routine mowing and clearing of riparian areas.	FERC Procedures, Section V.D.3	Adopted for the Project
RESTORATION Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.4 of the Plan.	FERC Procedures, Section VI.C.8	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Do not conduct routine vegetation mowing or clearing over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent right-of-way. Do not conduct any routine vegetation mowing or clearing in wetlands that are between HDD entry and exit points.	FERC Procedures, Section VI.D.1	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or state agency.	FERC Procedures, Section VI.D.2	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Time of year restrictions specified in section VII.A.5 of the Plan (April 15 – August 1 of any year) apply to routine mowing and clearing of wetland areas.	FERC Procedures, Section VI.D.3	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Monitor and record the success of wetland revegetation annually until wetland revegetation is successful.	FERC Procedures, Section VI.D.4	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Wetland revegetation shall be considered successful if all of the following criteria are satisfied: a. the affected wetland satisfies the current federal definition for a wetland (i.e., soils, hydrology, and vegetation); b. vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction; c. if natural rather than active revegetation was used, the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and d. invasive species and noxious weeds are absent, unless they are abundant in adjacent areas that were not disturbed by construction.	FERC Procedures, Section VI.D.5	Adopted for the Project
POST-CONSTRUCTION MAINTENANCE AND REPORTING Within 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts and documenting success as defined in section VI.D.5, above. The requirement to file wetland restoration reports with the Secretary does not apply to projects constructed under the automatic authorization, prior notice, or advance notice provisions in the FERC's regulations. For any wetland where revegetation is not successful at the end of 3 years after construction, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate wetlands. Continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.	FERC Procedures, Section VI.D.6	Adopted for the Project

APPENDIX F
Access Roads for the Mountaineer XPress Project

APPENDIX F

Mountaineer XPress Project
Access Roads a/

Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
NEW PIPELINE FACILITIES												
MXP-100												
ARMA001.6	Marshall	1.5	Temporary	444	0.3	0.2	<0.1	0	0	0	0	Existing Private Road - Minor Upgrades
ARMA002	Marshall	2.0	Temporary	270	0.2	<0.1	0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
ARMA005	Marshall	6.3	Temporary	883	0.5	0	0.1	0.3	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARMA005.1	Marshall	6.4	Temporary	3498	2.0	1.2	0.1	0.8	<0.1	0	0	New Road
ARMA005.8	Marshall	6.9	Temporary	332	0.2	0	0	0.2	0	0	0	Existing Private Road - Major Upgrades
ARMA005.9	Marshall	6.9	Temporary	1451	0.8	0.3	<0.1	0.6	0	0	0	Existing Private Road - Major Upgrades
ARMA006	Marshall	7.0	Temporary	365	0.2	0	0.2	<0.1	<0.1	0	0	New Road
ARMA007	Marshall	7.1	Temporary	1108	0.6	<0.1	0.1	0.4	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARMA008	Marshall	10.1	Temporary	329	0.2	0	0.1	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARMA008.29	Marshall	10.4	Temporary	247	0.1	0	<0.1	0.1	<0.1	0	0	Existing Private Road - Major Upgrades
ARMA008.3	Marshall	10.4	Temporary	3410	2.0	0	0	1.8	0	0.1	0	Existing Private Road - Major Upgrades
ARMA008.4	Marshall	10.9	Temporary	5316	3.1	0	0.1	2.8	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWZ001	Wetzel	11.9	Temporary	4835	2.8	0	2.5	0.3	0	<0.1	0	Existing Private Road - Major Upgrades
ARWZ001.1	Wetzel	12.3	Temporary	453	0.3	0	0.2	0	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWZ001.5	Wetzel	12.7	Temporary	601	0.4	0	<0.1	0.1	0.2	0	0	Existing Private Road - Minor Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARWZ002	Wetzel	13.3	Temporary	1207	0.7	0	<0.1	0.7	<0.1	0	0	Existing Private Road - Major Upgrades
ARWZ003	Wetzel	14.4	Temporary	1818	1.1	0.3	0.6	0.1	0	<0.1	0	Existing Private Road - Major Upgrades
ARWZ004	Wetzel	14.8	Temporary	1156	0.7	0	0.6	<0.1	<0.1	0	0	Existing Private Road - Major Upgrades
ARWZ005	Wetzel	16.0	Temporary	1278	0.8	<0.1	0.7	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWZ006	Wetzel	16.4	Temporary	941	0.5	0	0.4	<0.1	0.1	0	0	New Road
ARWZ006.5	Wetzel	17.3	Temporary	2056	1.2	<0.1	0.6	0.5	<0.1	0	0	Existing Private Road - Major Upgrades
ARWZ006.9	Wetzel	18.7	Temporary	2327	1.3	0	0	1.3	0	0	0	Existing Private Road - Major Upgrades
ARWZ008	Wetzel	20.3	Permanent	522	0.3	<0.1	0.3	<0.1	<0.1	0	0	New
ARWZ010	Wetzel	20.6	Temporary	17	0	0	<0.1	<0.1	0	0	0	New Road
ARWZ012	Wetzel	21.7	Temporary	1941	1.1	<0.1	0.2	0.9	0.1	0	0	Existing Private Road - Major Upgrades
ARWZ013	Wetzel	22.5	Temporary	655	0.4	0	<0.1	0.4	0	0	0	Existing Private Road - Minor Upgrades
ARWZ014	Wetzel	22.9	Temporary	479	0.3	0	<0.1	0.3	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWZ015	Wetzel	23.3	Temporary	4051	2.3	0	0.5	0.8	1.0	0	0	Existing Private Road - Minor Upgrades
ARWZ015.8	Wetzel	24.4	Temporary	327	0.2	0	0	0.2	0	0	0	Existing Private Road - Minor Upgrades
ARWZ015.9	Wetzel	24.4	Temporary	94	0.1	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWZ016	Wetzel	24.9	Temporary	1343	0.8	0	<0.1	0.8	0	0	0	Existing Private Road - Minor Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARWZ016.4	Wetzel	26.2	Temporary	256	0.2	0.1	<0.1	<0.1	0	0	0	Existing Private Road - Minor Upgrades
ARWZ016.5	Wetzel	26.8	Temporary	8760	5.0	0	0.9	3.6	0.6	0	0	Existing Private Road - Major Upgrades
ARWZ016.6	Wetzel	27.1	Temporary	1303	0.8	0	<0.1	0.7	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWZ016.7	Wetzel	27.3	Temporary	8797	5.0	0	2.0	2.2	0.9	0	0	Existing Private Road - Major Upgrades
ARWZ017	Wetzel	28.8	Temporary	13842	8.0	0	5.4	1.0	1.5	<0.1	0	Existing Private Road - Minor Upgrades
ARWZ018	Wetzel	28.9	Temporary	1980	1.1	0	0.3	0.9	0	0	0	Existing Private Road - Minor Upgrades
ARWZ020	Wetzel	29.8	Temporary	16417	9.4	0	2.4	6.0	1.1	<0.1	0	Existing Private Road - Minor Upgrades
ARWZ021	Wetzel	31.0	Temporary	15302	8.8	0	<0.1	3.3	5.5	0	0	Existing Private Road - Minor Upgrades
ARWZ021.1	Wetzel	31.3	Temporary	1039	0.6	0	0	0.4	0.2	0	0	Existing Private Road - Major Upgrades
ARWZ021.2	Wetzel	31.4	Temporary	658	0.4	0	<0.1	0.3	0.1	0	0	Existing Private Road - Major Upgrades
ARTY001	Tyler	32.3	Temporary	6207	3.6	0	0.1	2.0	1.5	<0.1	0	Existing Private Road - Major Upgrades
ARTY001.1	Tyler	32.7	Temporary	1863	1.1	0	<0.1	0.4	0.6	0	0	Existing Private Road - Major Upgrades
ARTY001.2	Tyler	32.7	Temporary	3719	2.2	0	0.3	1.5	0.4	0	0	Existing Private Road - Major Upgrades
ARTY002	Tyler	34.7	Temporary	1522	0.9	0	0.1	0.6	0.1	0	0	Existing Private Road - Minor Upgrades
ARTY001.1	Tyler	34.9	Temporary	994	1.1	0	<0.1	0.4	0.6	0	0	Existing Private Road - Major Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARTY001.2	Tyler	35.0	Temporary	987	2.2	0	0.3	1.5	0.4	0	0	Existing Private Road - Minor Upgrades
ARTY002.3	Tyler	35.1	Temporary	192	0.1	0.1	0	<0.1	0	0	0	Existing Private Road - Minor Upgrades
ARDO000.2	Doddridge	36.3	Temporary	5241	1.3	0.1	0	1.2	0	<0.1	0	Existing Private Road - Major Upgrades
ARPY043.2	Doddridge	36.9	Temporary	251	0.1	0	<0.1	0.1	0	0	0	New Road
ARDO000.5	Doddridge	37.2	Temporary	2562	0.5	0	0.2	1.2	<0.1	<0.1	<0.1	Existing Private Road - Major Upgrades
ARDO002.4	Doddridge	40	Temporary	2300	1.3	0.1	0	1.2	0	<0.1	0	Existing Private Road - Major Upgrades
ARDO002.5	Doddridge	41.2	Temporary	4355	2.5	0	<0.1	2.4	0.1	0	0	Existing Private Road - Major Upgrades
ARDO002.7	Doddridge	42.2	Temporary	2510	0.6	0	0.3	0.4	0	<0.1	0	Existing Private Road - No Upgrades
ARDO002.8	Doddridge	42.4	Temporary	367	0.2	0	<0.1	0.2	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARDO002.9	Doddridge	42.9	Temporary	2553	1.5	0	0	0.4	1.0	0	0	Existing Private Road - Minor Upgrades
ARDO003	Doddridge	43.3	Temporary	346	0.2	0.1	<0.1	0.1	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARDO003.9	Doddridge	44.0	Permanent	1940	1.1	0	0.1	1.0	.1	0	0	Existing Private Road - Major Upgrades
ARDO003.8	Doddridge	45.1	Temporary	1424	0.8	0	0.1	0.6	0.2	0	0	Existing Private Road - Minor Upgrades
ARDO004	Doddridge	45.5	Temporary	463	0.3	0	<0.1	0.1	0.2	0	0	Existing Private Road - Major Upgrades
ARDO005	Doddridge	46.1	Temporary	1764	1.0	0.1	0.5	0.4	<0.1	<0.1	0	Existing Private Road - Minor Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARDO006.1	Doddridge	46.5	Temporary	2577	1.5	0	0	1.5	0	0	0	Existing Private Road - Minor Upgrades
ARDO006	Doddridge	46.5	Temporary	5569	3.2	0	<0.1	2.7	0.5	<0.1	0	Existing Private Road - Minor Upgrades
ARDO006.4	Doddridge	47.2	Temporary	1729	1.0	0	<0.1	1.0	0	<0.1	0	Existing Private Road - Major Upgrades
ARDO006.8	Doddridge	47.8	Temporary	6047	3.5	0.3	0.1	2.8	0.2	<0.1	0	Existing Private Road - Minor Upgrades
ARDO007	Doddridge	48.5	Temporary	2659	1.5	0	0	1.5	0	<0.1	0	Existing Private Road - Minor Upgrades
ARDO007.1	Doddridge	48.5	Temporary	1192	0.7	0	0.6	0.1	<0.1	<0.1	0	Existing Private Road - Minor Upgrades
ARDO007.6	Doddridge	49.5	Temporary	7776	4.5	0	<0.1	4.4	<0.1	<0.1	<0.1	Existing Private Road - Major Upgrades
ARDO008.6	Doddridge	53.1	Temporary	515	0.3	0	<0.1	0.3	0	0	0	Existing Private Road - No Upgrades
ARDO008.7	Doddridge	53.1	Temporary	430	0.2	0	<0.1	0.2	0	0	0	Existing Private Road - No Upgrades
ARDO008.8	Doddridge	53.6	Temporary	1267	0.7	0	0.1	0.7	0	0	0	Existing Private Road - Major Upgrades
ARDO008.9	Doddridge	53.9	Temporary	845	0.4	0	0.2	0.3	0	0	0	Existing Private Road - Major Upgrades
ARDO009	Doddridge	54.0	Temporary	4293	2.5	0	0.7	1.7	0	<0.1	0	Existing Private Road - Minor Upgrades
ARDO009.3	Doddridge	54.5	Temporary	7800	4.5	0.6	<0.1	3.6	0.2	<0.1	0	Existing Private Road - No Upgrades
ARDO011	Doddridge	56.0	Temporary	6086	3.5	0.3	0.1	3.1	0.1	<0.1	0	Existing Private Road - No Upgrades
ARDO010	Doddridge	56.6	Temporary	2195	1.3	0	0.1	1.2	0	0	0	Existing Private Road - No Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARDO010.1	Doddridge	56.6	Temporary	2613	1.5	0	<0.1	1.4	0.1	0	0	Existing Private Road - No Upgrades
ARDO012	Doddridge	57.1	Temporary	6260	3.6	0	0.4	3.2	0.1	<0.1	0	Existing Private Road - No Upgrades
ARDO013	Doddridge	57.1	Temporary	281	0.2	0	0	0.2	0	0	0	Existing Private Road - Minor Upgrades
ARDO012.1	Doddridge	57.6	Temporary	11640	6.7	1.8	0.3	4.3	0.3	0	0	Existing Private Road - No Upgrades
ARDO013.1	Doddridge	57.8	Temporary	6936	4.0	0	1.0	2.9	0.1	0	0	Existing Private Road - Minor Upgrades
ARDO015	Doddridge	60.4	Permanent	338	0.2	0	0.1	0.1	0	0	0	Existing Private Road - Minor Upgrades
ARDO015.1	Doddridge	60.7	Temporary	1495	0.9	0.2	<0.1	0.6	<0.1	<0.1	<0.1	Existing Private Road - Major Upgrades
ARRI001.4	Ritchie	63.1	Temporary	6557	4.1	<0.1	<0.1	4.0	0.1	0	0	New Road
ARRI002	Ritchie	67.4	Permanent	123	0.1	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - Major Upgrades
ARRI003	Ritchie	67.5	Temporary	1025	0.6	0	0	0.6	0	<0.1	0	Existing Private Road - Major Upgrades
ARRI004	Ritchie	69.5	Temporary	223	0.1	0	0.1	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARRI004.1	Ritchie	69.6	Temporary	669	0.4	0	0.4	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARRI005	Ritchie	71.2	Temporary	2564	1.5	0	<0.1	1.2	0.3	0	0	Existing Private Road - Major Upgrades
ARRI006	Ritchie	71.4	Temporary	2781	1.6	0	1.1	0.3	<0.1	0.2	0	Existing Private Road - Minor Upgrades
ARRI005.1	Ritchie	71.4	Temporary	82	0.1	0	<0.1	0.1	<0.1	0	0	New Road
ARRI007	Ritchie	72.6	Temporary	231	0.1	<0.1	0.1	<0.1	0	<0.1	0	Existing Private Road - Minor Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARRI007.4	Ritchie	73.6	Temporary	316	0.2	<0.1	<0.1	0.2	<0.1	<0.1	0	Existing Private Road - Minor Upgrades
ARRI007.5	Ritchie	73.9	Temporary	898	0.5	0.2	<0.1	0.3	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARRI008	Ritchie	74.9	Temporary	230	0.1	0	0.1	<0.1	0	<0.1	<0.1	Existing Private Road - Minor Upgrades
ARRI009	Ritchie	75.2	Temporary	842	0.5	<0.1	0.5	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARRI010	Ritchie	75.6	Temporary	77	0.1	0	<0.1	<0.1	0	0	0	Existing Private Road - Minor Upgrades
ARRI011	Ritchie	75.9	Temporary	110	0.1	<0.1	0.1	<0.1	0	0	0	Existing Private Road - Minor Upgrades
ARRI012	Ritchie	76.2	Temporary	1182	0.7	0.2	<0.1	0.2	0.2	<0.1	0	Existing Private Road - Minor Upgrades
ARRI013	Ritchie	76.6	Temporary	1020	0.6	0.1	0.5	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARRI014	Ritchie	77.2	Temporary	1861	1.1	0.1	0.8	<0.1	0.2	<0.1	0	Existing Private Road - Minor Upgrades
ARRI014.4	Ritchie	77.8	Temporary	725	0.4	0	0.4	<0.1	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARRI015	Ritchie	78.7	Temporary	743	0.4	0	0.4	<0.1	0	<0.1	0	Existing Private Road - Minor Upgrades
ARRI016	Ritchie	79.2	Temporary	3029	1.7	0	1.3	0.4	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARRI017	Ritchie	79.7	Temporary	2375	1.4	0	1.1	0.2	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARRI018	Ritchie	80	Temporary	7809	4.5	0	3.8	0.7	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARRI019	Ritchie	80.8	Temporary	238	0.1	0	0.1	<0.1	<0.1	0	0	Existing Private Road - Major Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARRI020	Ritchie	80.9	Temporary	7404	4.3	0	3.8	0.5	<0.1	0	0	Existing Private Road - Major Upgrades
ARCL001	Calhoun	83.1	Temporary	577	0.3	0	<0.1	<0.1	0.3	<0.1	<0.1	New Road
ARWI001	Wirt	84.3	Temporary	5785	3.3	0	2.5	0.8	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWI003	Wirt	85.3	Temporary	4221	2.4	0	0.9	1.1	<0.1	0.4	<0.1	Existing Private Road - Major Upgrades
ARWI005	Wirt	85.5	Temporary	1127	0.6	0	<0.1	0.6	0.1	0	0	Existing Private Road - Major Upgrades
ARWI006	Wirt	85.8	Temporary	1117	0.6	0	<0.1	0.6	0	0	0	Existing Private Road - Major Upgrades
ARWI007	Wirt	86.1	Temporary	1301	0.8	0	<0.1	0.6	0.1	0	0	Existing Private Road - Major Upgrades
ARWI004	Wirt	86.5	Temporary	12162	7.0	0	6.2	0.7	0.1	0	0	Existing Private Road - Major Upgrades
ARWI008	Wirt	88.2	Temporary	7169	4.1	<0.1	3.7	0.4	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWI010	Wirt	88.5	Temporary	3584	2.1	0	1.9	0.1	0.1	0	0	Existing Private Road - Major Upgrades
ARWI011	Wirt	89.0	Temporary	10754	6.2	0	5.5	0.3	0.4	<0.1	0	Existing Private Road - Major Upgrades
ARWI011.1	Wirt	89.4	Temporary	2329	1.3	0	1.2	0.1	0.1	0	0	Existing Private Road - Major Upgrades
ARWI012	Wirt	90	Temporary	6047	3.5	0	3.1	0.1	0.2	0	0	Existing Private Road - Major Upgrades
ARWI013	Wirt	90.3	Temporary	2935	1.7	0	<0.1	0.4	1.3	0	0	Existing Private Road - Major Upgrades
ARWI014.1	Wirt	90.5	Temporary	940	0.6	0	0.4	0.1	0	<0.1	0	Existing Private Road - Major Upgrades

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						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARWI014	Wirt	90.8	Temporary	3453	2.0	0	1.7	0.2	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWI015	Wirt	92.2	Temporary	1510	0.9	0	0.2	0.6	0	<0.1	0	Existing Private Road - Major Upgrades
ARWI016	Wirt	92.5	Temporary	1498	0.9	0	0.5	0.4	0	0	0	Existing Private Road - Major Upgrades
ARWI019	Wirt	94.2	Temporary	62	0	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWI019.1	Wirt	94.2	Temporary	43	0	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWI019.2	Wirt	94.2	Temporary	358	0.2	<0.1	0.2	0	<0.1	0	0	Existing Private Road - Minor Upgrades
ARWI019.6	Wirt	94.8	Temporary	2970	1.7	0.1	0.7	0.4	0.4	<0.1	0	Existing Private Road - Major Upgrades
ARWI020	Wirt	95.1	Temporary	1405	0.8	0	0.3	0.5	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARWI020.1	Wirt	95.2	Temporary	4546	2.6	0.3	0.8	1.3	0.3	0	0	Existing Private Road - Major Upgrades
ARWI022	Wirt	96.9	Temporary	1111	0.6	0	0.6	0.1	0	<0.1	0	Existing Private Road - Major Upgrades
ARRO001	Roane	101.0	Permanent	82	0.1	<0.1	<0.1	0	0	0	0	New Road
ARRO002	Roane	102.8	Temporary	226	0.1	<0.1	0.1	<0.1	0	<0.1	0	Existing Private Road - Major Upgrades
ARRO003	Roane	103.9	Temporary	667	0.4	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	Existing Private Road - Major Upgrades
ARRO003.7	Roane	108.6	Temporary	2011	1.2	0.3	0.8	0.1	<0.1	<0.1	<0.1	Existing Private Road - Major Upgrades
ARRO004.1	Roane	110.6	Temporary	651	0.4	<0.1	0.3	0	0	0	0	Existing Private Road - Minor Upgrades

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Access Roads a/

Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARRO004	Roane	110.6	Permanent	1971	1.1	0.1	1.0	<0.1	0	<0.1	0	Existing Private Road - Minor Upgrades
ARJA001	Jackson	111.9	Temporary	3816	2.2	0	1.7	0.4	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARJA002	Jackson	113.1	Temporary	1188	0.7	0	0	0.3	0.4	0	0	Existing Private Road - Major Upgrades
ARJA002.1	Jackson	113.2	Temporary	326	0.2	0	<0.1	0.1	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARJA003.5	Jackson	116.5	Temporary	1762	1.0	0.4	0	0.3	0.4	0	0	New Road
ARJA003.6	Jackson	117.1	Temporary	2351	1.4	0.1	<0.1	1.2	<0.1	0	0	New Road
ARJA003.9	Jackson	118.5	Temporary	145	0.1	<0.1	0	*0.1*	0	<0.1	0	New Road
ARJA004	Jackson	119.4	Temporary	1681	1.0	0	<0.1	0.9	0.1	0	0	Existing Private Road - Major Upgrades
ARJA005	Jackson	121.1	Temporary	1866	1.1	0.3	<0.1	0.7	0	0	0	Existing Private Road - Major Upgrades
ARJA007	Jackson	126.7	Temporary	1021	0.6	<0.1	<0.1	0.4	0.1	0	0	Existing Private Road - Major Upgrades
ARJA008	Jackson	129.7	Temporary	3257	1.9	0.1	1.4	0.3	<0.1	0	0	Existing Private Road - Minor Upgrades
ARPU001	Putnam	132.4	Temporary	629	0.4	0	0.3	0.1	0	0	0	Existing Private Road - Minor Upgrades
ARPU002	Putnam	133.0	Temporary	765	0.4	<0.1	0.4	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARPU003	Putnam	133.5	Temporary	1118	0.7	0.4	0.1	0.2	<0.1	<0.1	0	Existing Private Road - Minor Upgrades
ARPU006	Putnam	135.3	Temporary	2918	1.7	1.1	0.4	0.1	0	0	0	Existing Private Road - Minor Upgrades
ARPU007	Putnam	135.9	Temporary	2618	1.5	0	<0.1	1.3	0.2	<0.1	0	Existing Private Road - Major Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARPU008	Putnam	136.6	Temporary	3238	1.9	<0.1	1.6	0.1	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARPU008.1	Putnam	137.1	Temporary	1975	1.1	<0.1	0.4	0.7	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARPU009	Putnam	138.3	Temporary	2026	1.2	0.2	0.7	0.2	0	<0.1	0	Existing Private Road - Major Upgrades
ARPU009.3	Putnam	139.3	Temporary	882	0.5	0	<0.1	0.5	0	<0.1	0	Existing Private Road - Major Upgrades
ARPU009.5	Putnam	139.6	Temporary	855	0.5	<0.1	0.4	0.1	<0.1	<0.1	0	Existing Private Road - Minor Upgrades
ARPU011	Putnam	141.1	Temporary	2077	1.2	0.2	<0.1	0.9	0	<0.1	0	Existing Private Road - Major Upgrades
ARPU011.2	Putnam	141.3	Temporary	2048	1.2	0.4	0.6	0.1	0	<0.1	0	Existing Private Road - Minor Upgrades
ARPU013	Putnam	142.8	Temporary	3258	1.9	0	<0.1	1.8	0	<0.1	0	Existing Private Road - Major Upgrades
ARPU013.5	Putnam	143.5	Temporary	284	0.1	0.1	<0.1	0	0	0	0	New Road
ARPU014	Putnam	144.0	Temporary	1613	0.9	<0.1	0.8	0.1	0.1	0	0	Existing Private Road - Minor Upgrades
ARPU014.1	Putnam	144.0	Temporary	9	0	0	<0.1	0	0	0	0	New Road
ARPU015	Putnam	144.5	Temporary	1439	0.8	0	<0.1	0.7	0.1	<0.1	0	Existing Private Road - Major Upgrades
ARPU016	Putnam	144.9	Temporary	221	0.1	0	<0.1	<0.1	0.1	0	0	Existing Private Road - Major Upgrades
ARPU017	Putnam	145.0	Temporary	682	0.4	0	0.3	0.1	<0.1	0	0	Existing Private Road - Major Upgrades
ARPU018	Putnam	146.7	Temporary	156	0.1	0.1	<0.1	<0.1	0	0	0	Existing Private Road - Minor Upgrades
ARPU018.1	Putnam	146.9	Temporary	1277	0.7	0.5	<0.1	0.2	<0.1	<0.1	0	Existing Private Road - Minor Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
ARPU019.6	Putnam	147.6	Temporary	1193	0.7	0.7	<0.1	0	0	0	0	Existing Private Road - Minor Upgrades
ARPU019.7	Putnam	147.8	Temporary	1106	0.6	0	<0.1	0	0.6	0	0	Existing Private Road - Minor Upgrades
ARPU022	Putnam	152.0	Temporary	2681	1.5	0	1.3	0.2	0.1	0	0	Existing Private Road - Major Upgrades
ARPU023	Putnam	152.7	Temporary	861	0.5	<0.1	0.5	<0.1	<0.1	0	0	Existing Private Road - Minor Upgrades
ARPU023.9	Putnam	154.7	Permanent	50	<0.1	0	<0.1	0	<0.1	0	0	Existing Private Road - Minor Upgrades
ARCB000.4	Cabell	156.4	Temporary	2532	1.5	0	0.4	0.5	0.6	<0.1	0	Existing Private Road - Major Upgrades
ARCB000.9	Cabell	157.8	Temporary	1639	0.9	0	<0.1	0.9	<0.1	0	0	Existing Private Road - Major Upgrades
ARCB001	Cabell	158.0	Temporary	3304	1.9	0	0.5	1.0	0.4	0	0	Existing Private Road - Major Upgrades
ARCB003	Cabell	160.4	Temporary	2247	1.3	<0.1	0.2	1.0	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARCB004	Cabell	160.8	Temporary	176	0.1	0	<0.1	0	0.1	0	0	Existing Private Road - Minor Upgrades
ARCB005	Cabell	161.0	Temporary	1377	0.8	0.7	<0.1	<0.1	0	<0.1	0	Existing Private Road - Major Upgrades
ARCB006	Cabell	161.8	Temporary	3464	2.0	0	<0.1	1.6	0.4	<0.1	0	Existing Private Road - Major Upgrades
ARCB006.2	Cabell	162.2	Temporary	717	0.4	0	<0.1	0.4	0	0	0	New Road
Subtotal Acres												
Temporary					***245.4***	**12.9**	**82.9**	**121.3**	**26.6**	**1.7**	**0.1**	
Permanent					***1.4*** [b]	**0.2**	**1.0**	**0.1**	**<0.1**	**<0.1**	**<0.1**	

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
MXP-200												
ARDO008	Doddridge	1.1	Temporary	700	0.4	<0.1	0.4	<0.1	<0.1	0	0	New Road
ARDO200	Doddridge	1.8	Temporary	14204	8.2	0.3	0.9	6.3	0.7	0	0	Existing Private Road - Minor Upgrades
ARDO200.1	Doddridge	2.0	Temporary	723	0.4	0	0.3	0.1	0	0	0	Existing Private Road - Minor Upgrades
ARDO200.2	Doddridge	2.0	Temporary	452	0.3	0	0.2	0.1	0	0	0	New Road
ARDO200.4	Doddridge	3.0	Temporary	1223	0.7	0	0.2	0.5	<0.1	0	0	Existing Private Road - Major Upgrades
ARDO201	Doddridge	3.1	Temporary	3488	2.0	0	1.7	0.1	0.1	0.1	<0.1	Existing Private Road - Major Upgrades
ARDO200.3	Doddridge	3.1	Temporary	7161	4.1	0.2	1.6	2.0	0.2	<0.1	0	Existing Private Road - Major Upgrades
ARDO201.1	Doddridge	3.1	Temporary	688	0.4	0	0.2	0.2	<0.1	0	0	Existing Private Road - Major Upgrades
ARDO201.3	Doddridge	3.3	Temporary	849	0.5	0	<0.1	0.4	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARDO201.2	Doddridge	3.4	Temporary	959	0.6	0	0	0.5	<0.1	<0.1	0	Existing Private Road - Major Upgrades
ARDO201.4	Doddridge	3.5	Temporary	787	0.5	0	0	0.4	<0.1	0	0	Existing Private Road - Major Upgrades
ARDO201.5	Doddridge	3.6	Temporary	118	0.1	<0.1	<0.1	<0.1	0	0	0	New Road
ARDO201.54	Doddridge	4.2	Temporary	3745	2.4	<0.1	0.1	2.2	<0.1	<0.1	0	Existing Private Road - No Upgrades
ARDO201.55	Doddridge	4.7	Temporary	1123	0.7	0	0.1	0.5	0.1	0	0	Existing Private Road - Minor Upgrades
ARDO201.6	Doddridge	5.6	Temporary	9285	5.3	0.4	1.4	2.5	0.9	0	0	Existing Private Road - Major Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Subtotal Acres												
Temporary					***26.3***	***1.1***	***7.1***	***16.0***	***2.1***	***0.2***	***<0.1***	
Permanent					***0 b/***	***0***	***0***	***0***	***0***	***0***	***0***	
Total Acres for New Pipeline Facilities												
Temporary					**273.8**	**14.0**	**90.3**	**137.7**	**29.8**	**1.9**	**0.1**	
Permanent					**1.4 [b]**	**0.2**	**1.0**	**0.1**	**<0.1**	**<0.1**	**<0.1**	
REPLACEMENT PIPELINE FACILITIES												
SM80 Line												
ARCB010	Cabell	21.0	Permanent	471	0.3	0	<0.1	0.1	0.2	<0.1	0	Existing Private Road – Major Upgrades
Subtotal Acres												
Temporary					*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Permanent					*0.3*	*0*	*<0.1*	*0.1*	*0.2*	*<0.1*	*0*	
SM80 Loop Line												
ARCB011	Cabell	20.7	Temporary	434	0.3	0	<0.1	0.1	0.1	0	0	New Road
ARCB012	Cabell	20.6	Permanent	3174	1.8	0	0.1	0.8	0.9	<0.1	0	Existing Private Road – Major Upgrades
Subtotal Acres												
Temporary					*0.3*	*0*	*<0.1*	*0.1*	*0.1*	*0*	*0*	
Permanent b/					*1.8 b/*	*0*	*0.1*	*0.8*	*0.9*	*<0.1*	*0*	
Total Acres for Replacement Pipeline Facilities												
Temporary					**0.3**	**0**	**<0.1**	**0.1**	**0.1**	**0**	**0**	
Permanent					**2.0**	**0**	**0.1**	**1.0**	**1.1**	**<0.1**	**0**	

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
CONTRACTOR/PIPE YARDS												
Yard 16												
ARPY016.1	Putnam	0	Temporary	629	0.4	<0.1	0.2	0	0.1	0	0	Existing Private Road - Minor Upgrades
Yard 17												
ARJA003.8	Jackson	0	Temporary	448	0.3	0.1	<0.1	0.1	0.1	0	<0.1	Existing Private Road - Minor Upgrades
Yard 18												
ARPY018.1	Jackson	0	Temporary	448	0	0	<0.1	0	<0.1	0	0	Existing Private Road - Minor Upgrades
Yard 20												
ARPY020.1	Wetzel	0	Temporary	75	0.1	<0.1	<0.1	<0.1	<0.1	0	0	New Road
ARPY020.2	Wetzel	0	Temporary	29	0	<0.1	<0.1	0	0	0	0	New Road
Yard 23												
ARPY023.2	Wetzel	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road
ARPY023.1	Wetzel	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road
Yard 25												
ARPY025.1	Wetzel	0	Temporary	45	0	0	<0.1	<0.1	0	0	0	New Road
Yard 36												
ARWZ005.1	Wetzel	0	Temporary	1535	0.9	<0.1	0.8	<0.1	0.1	0	0	Existing Private Road - Minor Upgrades
Yard 43												
ARPY043.1	Doddridge	0	Temporary	512	0.3	0.1	0.2	0	<0.1	<0.1	0	New Road
Yard 45												
ARPY045.1	Doddridge	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Yard 47												
ARPY047.1	Doddridge	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	Existing Private Road - Minor Upgrades
ARPY047.2	Doddridge	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road
Yard 49												
ARPY049.1	Doddridge	0	Temporary	32	0	0	<0.1	0	0	0	0	Existing Private Road - Minor Upgrades
Yard 50												
ARPY050.1	Doddridge	0	Temporary	58	0	0	<0.1	<0.1	0	0	0	New Road
Yard 59												
ARPY059.1	Doddridge	0	Temporary	16	0	0	<0.1	<0.1	0	0	0	Existing Private Road - No Upgrades
Yard 69												
ARPY069.1	Jackson	0	Temporary	26	0	0	<0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
Yard 73												
ARPY073.1	Jackson	0	Temporary	5	0	0	<0.1	<0.1	0	0	0	Existing Private Road - Minor Upgrades
Yard 93A												
ARPY093.1	Ritchie	0	Temporary	439	0.3	0	0.2	0	0.1	0	0	Existing Private Road - No Upgrades
Yard 99												
ARPY099.1	Marshall	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road
ARPY099.2	Marshall	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road
Yard 109												
ARPY109.1	Cabell	0	Temporary	5	0	<0.1	<0.1	0	0	0	0	New Road

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Yard 116												
ARPY116.1	Marshall	0	Temporary	134	0.1	0	0.1	0	0	0	0	Existing Private Road - No Upgrades
Yard 118												
ARPY118.1	Wetzel	0	Temporary	15	0	0	<0.1	0	<0.1	0	0	Existing Private Road - Minor Upgrades
ARPY118.2	Wetzel	0	Temporary	10	0	0	<0.1	<0.1	0	0	0	New Road
Yard 122												
ARPY122.1	Pleasants	0	Temporary	17	0	0	<0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
ARPY122.2	Pleasants	0	Temporary	17	0	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - No Upgrades
Yard 123												
ARPY123.1	Wood	0	Temporary	12	0	<0.1	<0.1	0	0	0	0	Existing Private Road - No Upgrades
ARPY123.2	Wood	0	Temporary	29	0	0	<0.1	0	0	0	0	Existing Private Road - No Upgrades
Yard 124												
ARPY124.1	Wood	0	Temporary	105	0.1	0	0.1	0	0.1	0	0	Existing Private Road - Major Upgrades
Yard 125												
ARPY125.1	Wirt	0	Temporary	33	0	0	<0.1	0	0	0	0	Existing Private Road - No Upgrades
Yard 128												
ARPY128.1	Jackson	0	Temporary	9	0	0	<0.1	0	<0.1	0	0	Existing Private Road - No Upgrades

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						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Yard 129												
ARPY129.1	Putnam	0	Temporary	225	0.1	0	0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
Yard 130												
ARPY130.1	Jackson	0	Temporary	13	0	0	<0.1	0	0	0	0	Existing Private Road - No Upgrades
Yard 137												
ARPY137.1	Wood	0	Temporary	1574	1.0	0	0.9	<0.1	<0.1	0	0	Existing Private Road - No Upgrades
Yard 138												
ARPY138.1	Kanawha	0	Temporary	1044	0.6	0	0.6	<0.1	<0.1	0	0	Existing Private Road - No Upgrades
ARPY138.2	Kanawha	0	Temporary	373	0.2	0	0.2	0	0	0	0	Existing Private Road - No Upgrades
Yard 139												
ARPY139.1	Putnam	0	Temporary	17	0	0	<0.1	0	0	0	0	Existing Private Road - No Upgrades
ARPY139.2	Putnam	0	Temporary	17	0	0	<0.1	0	0	0	0	Existing Private Road - No Upgrades
ARPY139.3	Putnam	0	Temporary	330	0.2	0	0.1	0	0.1	0	0	Existing Private Road - No Upgrades
Yard 140												
ARPY140.1	Doddridge	0	Temporary	14	0	<0.1	<0.1	0	0	0	0	New Road
Yard 141												
ARPY141.1	Doddridge	0	Temporary	10	0	<0.1	<0.1	0	0	0	0	Existing Private Road - No Upgrades

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Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Yard 143												
ARPY143.1	Marshall	0	Temporary	28	0	0	<0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
ARPY143.2	Marshall	0	Temporary	21	0	0	<0.1	0	<0.1	0	0	Existing Private Road - No Upgrades
Yard 149												
ARPY149.1	Wetzel	0	Temporary	10	0	<0.1	<0.1	0	0	0	0	New Road
ARPY149.2	Wetzel	0	Temporary	17	0	<0.1	<0.1	0	0	0	0	New Road
Subtotal Acres												
Temporary					*5.2*	*0.2*	*4.1*	*0.2*	*0.6*	*<0.1*	*0.1*	
Permanent					*0*	*0*	*0*	*0*	*0*	*0*	*0*	
STAGING AREAS												
Staging Area 19												
ARPY019.1	Wetzel	18.3	Temporary	18	0	0	<0.1	0	0	0	0	New Road
Staging Area 26												
ARTY003	Tyler	35.6	Temporary	221	0.1	0.1	<0.1	<0.1	0	<0.1	0	Existing Private Road - Major Upgrades
Staging Area 30												
ARMA004	Marshall	4.1	Temporary	466	0.3	0.1	0.2	0	0	0	0	Existing Private Road - Minor Upgrades
Staging Area 32B												
ARPY032.1	Marshall	8.8	Temporary	184	0.1	0.1	<0.1	<0.1	0	0	0	New Road
Staging Area 38A												
ARWZ007	Wetzel	19.3	Temporary	3602	2.1	0.3	1.5	0.2	0	0	0	Existing Private Road - Minor Upgrades

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						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Staging Area 39												
ARWZ010.1	Wetzel	20.6	Temporary	95	0.1	0	<0.1	<0.1	<0.1	0	0	Existing Private Road - Major Upgrades
Staging Area 53												
ARPY053.1	Richie	72.8	Temporary	12	0	0	<0.1	<0.1	0	0	0	New Road
Staging Area 71												
ARJA007.9	Jackson	129.3	Temporary	121	0.1	0	<0.1	0.1	0	<0.1	0	Existing Private Road - Major Upgrades
Staging Area 85												
ARPU013.3	Putnam	143.1	Temporary	976	0.6	0.3	0.2	0	0.1	0	0	Existing Private Road - Minor Upgrades
Staging Area 87												
ARPU009.6	Putnam	140	Temporary	72	0	<0.1	<0.1	0	0	0	0	Existing Private Road - Minor Upgrades
Staging Area 92												
ARRI001.5	Ritchie	63.8	Temporary	367	0.2	0	0	0.2	<0.1	0	0	Existing Private Road - Major Upgrades
Staging Area 95												
ARMA003	Marshall	2.9	Temporary	844	0.5	<0.1	<0.1	0.4	0.1	0	0	Existing Private Road - Major Upgrades
Staging Area 101												
ARWI009	Wirt	88.0	Temporary	552	0.3	<0.1	0.3	<0.1	<0.1	0	0	Existing Private Road - Major Upgrades
Staging Area 110												
ARPY110.1	Doddridge	50.7	Temporary	7	0	0	<0.1	0	<0.1	0	0	Existing Private Road - Minor Upgrades

APPENDIX F

Mountaineer XPress Project
Access Roads a/

Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Staging Area 111												
ARPY111.1	Jackson	124.2	Temporary	1022	0.2	0	<0.1	0.2	0	0	0	Existing Private Road - Major Upgrades
Staging Area 112												
ARPU009.4	Putnam	139.3	Temporary	1053	0.6	0.5	0.1	0.1	0	<0.1	0	Existing Private Road - Major Upgrades
Staging Area 142												
ARPY142.1	Tyler	34.8	Temporary	8	0	0	<0.1	0	0	0	0	Existing Private Road – Minor Upgrades
Staging Area 144												
ARWZ004.4	Wetzel	15.4	Temporary	468	0.3	0.2	0.1	0	0	0	0	New Road
Staging Area 148												
ARCB002	Cabell	160.1	Temporary	1799	1.0	0.9	<0.1	0.1	0	<0.1	0	Existing Private Road - Major Upgrades
Subtotal acres												
Temporary					***6.6***	***2.6***	***2.6***	***1.2***	***0.2***	***<0.1***	***0***	
Permanent					***0***	***0***	***0***	***0***	***0***	***0***	***0***	
Total Acres for Contractor/Pipe Yards And Staging Areas												
Temporary					**11.7**	**2.8**	**6.7**	**1.4**	**0.8**	**<0.1**	**0**	
Permanent					**0**	**0**	**0**	**0**	**0**	**0**	**0**	
NEW ABOVEGROUND FACILITIES												
Sherwood Compressor Station												
ARDO007.8	Doddridge	50.7	Permanent	205	0.1	<0.1	0.1	0	<0.1	<0.1	0	Existing Private Road - Minor Upgrades
White Oak Compressor Station												
ARRI021.1	Ritchie	82.2	Permanent	386	0.2	0.1	<0.1	0.1	0	0	0	New Road

APPENDIX F

Mountaineer XPress Project
Access Roads a/

Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Mount Olive Compressor Station												
ARJA006.4	Jackson	124.2	Permanent	695	0.3	0	0.1	0.2	<0.1	0	0	New Road
ARJA006.3 c/	Jackson	124.2	Permanent	296	0.1	0	0	0.1	<0.1	<0.1	0	New Road
ARJA006.2 c/	Jackson	124.2	Permanent	508	0.2	0	0	0.2	0	0	0	New Road
ARJA006.1 c/	Jackson	124.2	Permanent	453	0.2	0	0	0.2	0	0	0	New Road
Ripley Regulator Station												
Ripley Station Road d/	Jackson	124.7	Permanent	1638	0.5	0.1	0.2	0.1	0.1	<0.1	0	New Road
Saunders Creek Regulator Station												
ARCB007	Cabell	164.3	Permanent	2374	3.1	0.2	0	1.9	1.1	0	0	New Road
MXP-200 Tie-in with Line 1983												
ARDO202	Doddridge	6.0	Permanent	225	0.1	0	<0.1	0.1	0	0	0	New Road
Mainline Valve 01												
ARMA008.2	Marshall	10.1	Permanent	1444	1.5	0	0.3	0.3	1.0	0	0	New Road
Mainline Valve 02												
ARWZ009	Wetzel	20.3	Permanent	518	0.2	0.1	<0.1	<0.1	<0.1	0	0	New Road
Mainline Valve 03												
ARWZ019	Wetzel	29.4	Permanent	66	0	0	<0.1	<0.1	<0.1	0	0	New Road
Mainline Valve 04												
MLV 4 Road d/	Doddridge	38.2	Permanent	85	0.9	0.2	<0.1	<0.1	0	0	0	New Road
Mainline Valve 05												
MLV 5 Road d/	Doddridge	60.3	Permanent	155	<0.1	0	<0.1	0.1	<0.1	0	0	New Road
Mainline Valve 06												
ARRI006.6	Ritchie	72.2	Permanent	156	0.1	0	<0.1	0	0.1	0	0	New Road

APPENDIX F

Mountaineer XPress Project
Access Roads a/

Facility/Access Road Name	County	Milepost	Type b/	Length (feet)	Areas Affected by Construc-tion (acres)	Existing Land Use (acres)						Existing Road Type
						Agricul-ture	Developed	Foreste d	Open Land	Open Water	Wetland	
Mainline Valve 07												
MLV 7 Road d/	Wirt	96.4	Permanent	54	<0.1	0	<0.1	<0.1	0	0	0	New Road
Mainline Valve 08												
MLV 8 Road d/	Roane	113.2	Permanent	64	0.1	0	<0.1	0	0.1	0	0	New Road
Mainline Valve 09												
ARPU005	Putnam	134.6	Permanent	24	0	<0.1	<0.1	0	0	0	0	New Road
Mainline Valve 10												
ARPU020	Putnam	148.2	Permanent	370	0.2	0	0.1	<0.1	0.1	0	0	Existing Private Road - Minor Upgrades
Total Acres for New Aboveground Facilities												
Temporary					*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Permanent					*7.4*	*0.6*	*0.7*	*3.5*	*2.5*	*<0.1*	*0*	
Total Access Roads Impacts					**294.6 [b]**	**17.5**	**98.4**	**143.4**	**33.3**	**1.9**	**0.1**	
Temporary					**283.7**	**16.7**	**96.6**	**138.8**	**29.6**	**1.8**	**0.1**	
Permanent b/					**10.8 [b]**	**0.8**	**1.8**	**4.6**	**3.7**	**0**	**0**	

_____

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the exact sum of the addends in all cases.

b For the purposes of this table, acreages associated with roads to access permanent aboveground facilities have been separated from the facility. Acreage associated with these roads have been grouped or combined with facility acreages in other tables.

c At the Mount Olive Compressor Station, the permanent road comprised of ARJA006.2, ARJA006.3, and ARJA006.4 will be a continuous, graveled, permanent road. It has been accounted for as three segments to present accurate acreage impacts and avoids double counting the permanent impact where it crosses the MXP-100 right-of-way at two separate locations.

d Ripley Regulator Station and Mainline Valve (MLV) 04, MLV 05, MLV 07, and MLV 08 each have a proposed permanent road to the facility that is located entirely within the MXP-100 permanent right-of-way.

APPENDIX G
Columbia Gas' HDD Inadvertent Return Contingency Plan

HORIZONTAL DIRECTIONAL DRILLING CONTINGENCY PLAN

If an inadvertent release of drilling fluid is detected, call the Monitoring Center immediately at 1-800-835-7191.

1.0 INTRODUCTION

Columbia Gas Transmission, LLC (Columbia) is proposing to construct pipeline facilities beneath a as part of its Mountaineer XPress Project (Project). Columbia is proposing to utilize the horizontal directional drilling (HDD) technique for this Project located in County, West Virginia. The purpose of this document is to provide guidance in order to eliminate or minimize adverse effects from directional drilling fluid seepage or drill failure.

2.0 INADVERTENT RETURN DETECTION

The most obvious signs of an inadvertent return are surface seepage or loss of circulation/pressure of the drilling fluid. One of the functions of the drilling fluid is to seal the hole to maintain the downhole pressure. The loss of the returning fluid is a sign that pressure is not being contained in the drill hole and surface seepage is occurring outside the hole. If there is a reduction in the quantity of drilling fluid returning to the drilling site (loss of circulation), this could be a warning sign. However, some loss of drilling fluid is also normal in the drilling process. There can be instances during the drilling process when a small layer of loose sand, a small gravel layer or a small rock fracture is encountered. These occurrences will require minimal, additional drilling fluids to fill in the voids. Consequently, a small drilling fluid loss in and of itself is not an indication of a potential frac-out condition. It is the loss of drilling fluid in combination with other factors, which may indicate a potential frac-out condition. For example, if there is a loss of drilling fluid and the return of cuttings do not show a large quantity of gravel that could indicate a loss of containment pressure within the hole.

Columbia must only use firms who specialize in HDD to perform the proposed stream and wetland crossings. Columbia is responsible for the supervision of the drilling contractor and retains the right to shut down operations.

2.1 GENERAL CORRECTIVE ACTION

Once an inadvertent return is detected, the drilling crew shall take immediate corrective action. The only pressure causing the inadvertent return to occur is the pressure from the drilling fluid pumps. Therefore, the most immediate direct corrective action is:

- To stop the drilling fluid pumps or decrease the pressure (by stopping the pumps or decreasing the pressure, the pressure in the hole will quickly bleed off. With no/reduced pressure in the hole, the inadvertent return will stop or decrease significantly).

- As soon as an inadvertent return is detected, the circulation of mud will only be stopped or reduced temporarily until the response process has been initiated. Once the response/ containment process (Sections 2.1.1, 2.1.2 and 2.2) has been initiated and is under control, the drilling activities will resume.

There is greater potential for an inadvertent return is at the entry and exit locations. In the contingency planning for the pipeline crossing, inadvertent returns at the entry and exit locations have been considered and the following preventive actions have been developed:

- The entry and exit locations on all directionally drilled crossings shall have dry (upland) land segments where an inadvertent return can be easily detected, contained, and remediated.

- To isolate and contain a potential inadvertent return at each of the drill sites, there must be a berm around the downslope side of the drilling rig set-up area. Hay bales or silt fence must be part of the berm on the resource side of the drilling area (see appropriate Erosion and Sediment Control Plans).

2.1.1 In the event of an inadvertent return in an Upland Area, the following corrective actions will be taken immediately:

- The source/pumps will be stopped temporarily or the pressure will be decreased.

- The inadvertent return will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits.

- The drilling fluid will be removed from the ground surface to the greatest extent possible and removed from the site using manual equipment such as shovels and wheel barrows or earth-moving equipment such as backhoes or small bulldozers, portable pumps and/or vacuum trucks.

- If necessary, the affected area will be watered down to further dissipate drilling muds that remain after mechanical efforts have been exhausted.

- The affected areas will be restored within 30 days as closely as possible to their previous condition.

- Documentation must be made and maintained by the contractor and provided to Columbia.

- The Contractor must follow any special instructions from Columbia's Environmental Inspectors (EIs).

2.1.2 In the event of an inadvertent return into wetlands and/or waterbodies, the containment and corrective actions described below must be taken immediately and the Contractor must make the appropriate contacts in accordance with Section 2.2 below.

- The source/pumps will be stopped temporarily or the pressure will be decreased.

- The inadvertent return will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits (do not construct earthen dikes or berms within wetland or stream areas).

- The drilling fluid will be removed from the ground surface and from the site to the greatest extent possible by manual means such as by use of shovels, wheelbarrows and/or vacuum hoses. Earth moving equipment such as backhoes or small bulldozers will be used only if manual means prove to be impractical and only after appropriate measures have been taken to minimize impacts to the resource. These measures will be authorized by Columbia's EI.

- The affected areas will be restored as closely as possible to their previous condition.

- Documentation must be made and maintained by the contractor and provided to Columbia's EI.

- The Contractor must follow any special instructions from Columbia's EI.

Typically, drilling activities will not be suspended unless the inadvertent return creates a threat to public health and safety or unless suspended by Columbia's Chief Inspector or EI.

2.2 Response and Reporting Personnel

If an inadvertent return of drilling fluids is detected, the drilling contractor will immediately notify Columbia's EI and Chief Inspector. The EI has been given "stop work authority" by Columbia and his/her instructions must be followed.

2.3 Response Equipment

The drilling contractor will be responsible for having all response materials and equipment required for containment and remediation of an inadvertent return. Such materials must be stored within the drilling sites.

The materials should include at a minimum: lumber for temporary shoring, equipment mats, sand, portable pumps, hand tools, and hay bales and silt fence. The drilling contractor will also have heavy equipment such as backhoes available, which can be utilized to control and clean up large inadvertent returns.

2.4 Follow-Up

After the inadvertent return has been contained, the drilling contractor and Columbia will make every effort to determine why it occurred. Once Columbia has determined the cause of the inadvertent return, measures will be developed to control the factors causing it and to minimize the chance of

recurrence. Developing the corrective measure will be the joint effort of Columbia and the drilling contractor.

In some cases, the corrective measure may involve a determination that the existing hole encountered a void, which could be bypassed with a slight change in profile. In other cases, it may be determined that the existing hole encountered a zone of unsatisfactory soil material and the hole may have to be abandoned. Any such activity must be documented by the contractor and Columbia.

3.0 DRILL FAILURE

Besides inadvertent return concerns, there is also a potential for failure of the drilling apparatus. If the drilling apparatus becomes inextricably lodged, and cannot be withdrawn without exiting the construction work limits (unless the appropriate approvals are first obtained by the Columbia's Natural Resource Permitting Department), or damaging the resource(s) the directional drill was performed to protect, the apparatus and hole will be abandoned. If the hole is abandoned, it will be filled with cuttings and drilling fluid. Once the abandoned hole is filled, a second attempt will be made to complete the drill. The second attempt must be performed within the confines of the approved construction work limits as shown on the Environmental Construction Drawings. The second attempt will generally be offset slightly from the original entry-hole location.

APPENDIX H
Unexpected Contamination Discovery Plan

ENVIRONMENTAL GUIDANCE DOCUMENT:
UNEXPECTED CONTAMINATION DISCOVERY PLAN

The following environmental guidance applies in the event unexpected contamination (drums, debris, stained soils, contaminated groundwater, etc.) is encountered during construction or maintenance activities at Company facilities and Company Rights of Ways (ROW). This guidance document applies to all employees, contractors, and third party personnel working on behalf of any Columbia Pipeline Group (CPG) company, hereafter referred to as Company. This guidance document should be used in conjunction with the following plans:

Environmental Plans

- 120.02.01 Spill and Release Reporting
- 120.02.02 Spill Cleanup-Remediation Coordination
- 120.03.01 Waste Characterization and Classification
- 120.03.04 Container Management
- 120.03.05 Waste Sampling and Analysis

Construction Standards

- CSC-101 Compressor Station Construction Specification
- CS 220.001 Pipeline Construction Standard

When contamination is encountered:
STOP work, leave the contaminated area and move upwind of the contaminated area. The Chief and Environmental Inspectors and the Project Manager or Team Leader must be notified immediately.

Qualified Responder: The Chief and/or the Environmental Inspector or other qualified responders (Environmental Coordinators, Health and Safety Coordinators, Team Leaders, qualified contractors and consultants) will determine if it is safe to approach the contamination area and conduct the following tasks:

- Mark or rope off the area to prevent unauthorized entry
- Safely gather information regarding the contamination:
    - Determine possible source (Company, third party, or unknown source)
    - Description of the contamination (color, odor, liquid, debris, drums, etc.)
    - Monitor air quality to determine if there is a toxic or explosive atmosphere (if monitoring equipment is available).
    - Provide containment to prevent contaminated liquids and/or solids migrating from the excavation or work area and reaching waterways. Refer to section 3.2 of plan 120.02.02 for additional containment information.

The Project Manager or Team Leader will contact the regional Health & Safety Representative, the Regional Environmental Coordinator and the appropriate Monitoring Center:

- CPG 800-835-7191
- Columbia Gulf 866-485-3427
- Midstream 855-511-4942

Refer to plan 120.02.01 for additional spill and release reporting guidance.

The Environmental Department will conduct the following:

- Notify outside agencies if warranted
- Engage the Legal Department if the contamination is determined to be a third party or unknown source.
- Provide sampling requirements to determine the type of contamination, disposal options, and to aid the Safety Department in determining health & safety concerns.
- Determine remedial response actions and determine if a qualified environmental remediation contractor is required.
- Manage disposal of contaminated material if required.

- Contact the Natural Resources Permitting Group (NRP) to determine if environmental permits associated with the remedial action is required.

The Health & Safety Department will conduct the following:

- Arrange for a safety representative or safety contractor to inspect the work area if warranted.
- Communicate safety requirements to the project team
- Determine if onsite air quality monitoring is required.

The Legal Department in conjunction with the Land Department will notify the third party if the source is suspected or known to be the responsibility of a third party.

Hazard Determination:

The Environmental Department in conjunction with the Safety Department will determine if the contamination presents a hazardous and/or unsafe working condition;

- If the material is non-hazardous and the working environment is not a toxic or explosive atmosphere, then site personnel or contractors can excavate the material for waste disposal.

Note: Site personnel and/or contractors cannot re-enter the contamination area until the following conditions are met:

- Contamination type and its hazards have been identified
- Approval from the Environmental and Safety Departments have been obtained
- The appropriate personal protection equipment (PPE) has been donned.

Waste Containment and Disposal:

If the contamination is from company material, then store the material in waste containers in accordance with Plan 120.03.04 and determine disposal requirements in accordance with Plan 120.03.01.

If the material is from a third Party or unknown source, stockpile the material if possible on plastic sheeting. Place the material in waste containers in accordance with Plan 120.03.04 if stockpiling is not feasible.

Project Records:

All departments will assist as necessary with any follow-up notification/reporting to outside agencies and to complete records for the project file. Refer to section 3.9 of Plan 120.02.02 for the list of information that the record of cleanup should contain.