

Davis Coal and Coke

Requisition # DEP

Contractor's Bid Sheet

Company Name: _____

Address: _____

The DEP reserves the right to request additional information and supporting documentation regarding unit prices when the unit price appears to be unreasonable.

ITEM NO.	Qty	Unit	DESCRIPTION	UNIT PRICE	AMOUNT
1.0	1	LS	Mobilization and Demobilization (Limited to 10% of Total Bid)	LS	\$30,000.00
2.0	1	LS	Construction Layout (Limited to 5% of Total Bid)	LS	\$15,000.00
3.0	1	LS	Quality Control (Limited to 3% of Total Bid)	LS	\$9,000.00
4.1	1	LS	Site Preparation (Limited to 10% of Total Bid)	LS	\$28,000.00
4.2	35	TN	Access Road Stone	\$55.00	\$1,925.00
4.3	205	TN	Gravel Drive Rehabilitation	\$55.00	\$11,275.00
5.1	1,300	LF	Silt Fence Sediment Control	\$3.50	\$4,550.00
5.2	185	LF	Straw Wattle Erosion Control	\$4.00	\$740.00
5.3	25	TN	Stablized Construction Entrance (70' x 12' Width)	\$65.00	\$1,625.00
5.4	4	EA	Rock Check Dam	\$800.00	\$3,200.00
6.0	1.7	AC	Revegetation	\$2,000.00	\$3,400.00
7.1	375	LF	8' Grouted Riprap Channel (Channel "C")	\$95.00	\$35,625.00
7.2	360	LF	8' Riprap Lined Channel (Channel "A" and "B")	\$80.00	\$28,800.00
7.3	345	LF	8' Grass Lined Channel w/Type I Curlex (Channel "D")	\$55.00	\$18,975.00
7.4	20	LF	6' Riprap Lined Channel (Channel "E")	\$70.00	\$1,400.00
7.5	680	LF	Ditch Rehabilitation	\$3.00	\$2,040.00
7.6	265	LF	24" HDPE Culvert	\$85.00	\$22,525.00
7.7	670	LF	18" HDPE Culvert	\$65.00	\$43,550.00
7.8	100	LF	15" HDPE Culvert	\$55.00	\$5,500.00
7.9	8	EA	Type "A" Manhole	\$3,500.00	\$28,000.00
7.10	7	EA	Type "G" Drop Inlet	\$2,500.00	\$17,500.00
7.11	2	EA	Concrete L-Wall	\$4,000.00	\$8,000.00
7.12	1	EA	Concrete Wingwall	\$2,500.00	\$2,500.00
7.13	1	LS	Concrete Sidewalk/Access Replacement	LS	\$1,500.00
7.14	12	CY	500 psi Flowable Fill Pipe Encasement	\$110.00	\$1,320.00
7.15	340	LF	4' x 8' Underdrain	\$100.00	\$34,000.00
7.16	30	LF	Underdrain Conveyance Pipe	\$35.00	\$1,050.00
7.17	4	EA	Piezometer Abandonment	\$800.00	\$3,200.00
8.0	1	LS	Unclassified Excavation	LS	\$2,500.00
9.1	2	EA	Wet/Modified Mine Seals	\$4,500.00	\$9,000.00
9.2	12	LF	Mine Seal Conveyance Pipe	\$35.00	\$420.00
9.3	10	EA	Soda Ash Briquettes (50 LB Bags)	\$65.00	\$650.00
11.1	20	TN	Asphalt Pavement Wearing Course	\$150.00	\$3,000.00
11.2	20	TN	Shoulder Stone	\$45.00	\$900.00
			TOTAL		\$380,670.00

Davis Coal and Coke

Requisition # DEP

Contractor's Bid Sheet

Company Name: _____

Address: _____

The DEP reserves the right to request additional information and supporting documentation regarding unit prices when the unit price appears to be unreasonable.

ITEM NO.	Qty	Unit	DESCRIPTION	UNIT PRICE	AMOUNT
1.0	1	LS	Mobilization and Demobilization (Limited to 10% of Total Bid)	LS	\$
2.0	1	LS	Construction Layout (Limited to 5% of Total Bid)	LS	\$
3.0	1	LS	Quality Control (Limited to 3% of Total Bid)	LS	\$
4.1	1	LS	Site Preparation (Limited to 10% of Total Bid)	LS	\$
4.2	35	TN	Access Road Stone	\$	\$
4.3	205	TN	Gravel Drive Rehabilitation	\$	\$
5.1	1,300	LF	Silt Fence Sediment Control	\$	\$
5.2	185	LF	Straw Wattle Erosion Control	\$	\$
5.3	25	TN	Stablized Construction Entrance (70' x 12' Width)	\$	\$
5.4	4	EA	Rock Check Dam	\$	\$
6.0	1.7	AC	Revegetation	\$	\$
7.1	375	LF	8' Grouted Riprap Channel (Channel "C")	\$	\$
7.2	360	LF	8' Riprap Lined Channel (Channel "A" and "B")	\$	\$
7.3	345	LF	8' Grass Lined Channel w/Type I Curlex (Channel "D")	\$	\$
7.4	20	LF	6' Riprap Lined Channel (Channel "E")	\$	\$
7.5	680	LF	Ditch Rehabilitation	\$	\$
7.6	265	LF	24" HDPE Culvert	\$	\$
7.7	670	LF	18" HDPE Culvert	\$	\$
7.8	100	LF	15" HDPE Culvert	\$	\$
7.9	8	EA	Type "A" Manhole	\$	\$
7.10	7	EA	Type "G" Drop Inlet	\$	\$
7.11	2	EA	Concrete L-Wall	\$	\$
7.12	1	EA	Concrete Wingwall	\$	\$
7.13	1	LS	Concrete Sidewalk/Access Replacement	LS	\$
7.14	12	CY	500 psi Flowable Fill Pipe Encasement	\$	\$
7.15	340	LF	4' x 8' Underdrain	\$	\$
7.16	30	LF	Underdrain Conveyance Pipe	\$	\$
7.17	4	EA	Piezometer Abandonment	\$	\$
8.0	1	LS	Unclassified Excavation	LS	\$
9.1	2	EA	Wet/Modified Mine Seals	\$	\$
9.2	12	LF	Mine Seal Conveyance Pipe	\$	\$
9.3	10	EA	Soda Ash Briquettes (50 LB Bags)	\$	\$
11.1	20	TN	Asphalt Pavement Wearing Course	\$	\$
11.2	20	TN	Shoulder Stone	\$	\$
			TOTAL		\$

TEST BORING LOG

Sheet 1 of 1

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-1**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/30/14

Drill/Method: CME-550X/HSA

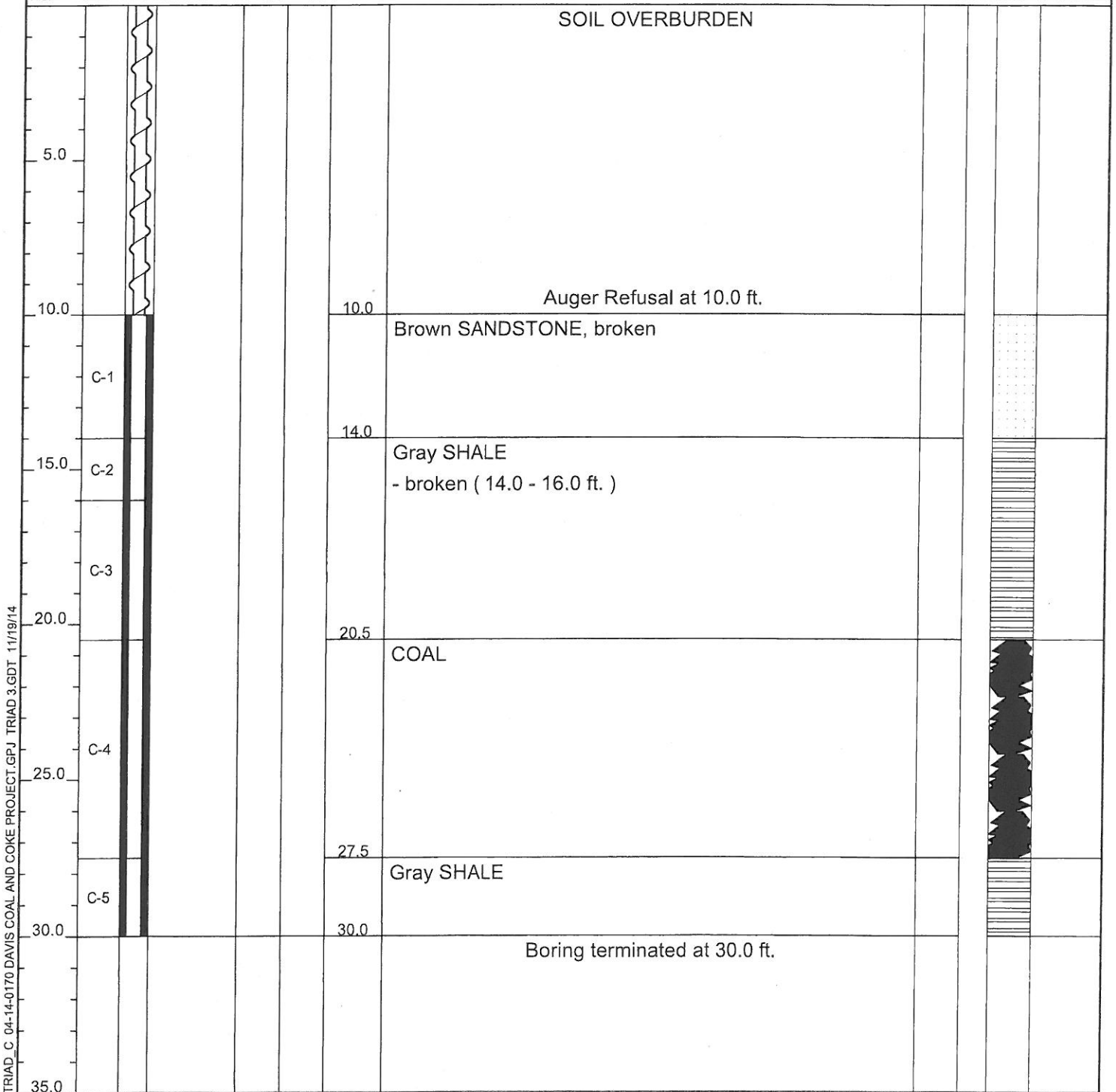
Date Completed: 10/30/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>■ Shelby Tube</p> <p>□ Core Sample</p> </div> <div style="width: 45%;"> <p>⊗ Standard Split Spoon</p> <p>⊔ Auger Probe</p> </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					

SOIL OVERBURDEN



TRIAD_C_04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-2**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							SOIL OVERBURDEN					
5.0												
10.0						10.0	Auger Refusal at 10.0 ft.					
							Brown SANDSTONE, broken					
15.0	C-1											
						16.0	Gray SHALE					
	C-2						- broken (16.0 - 19.0 ft.)					
20.0												
	C-3											
25.0						24.0	COAL					
	C-4											
30.0												

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks:

TEST BORING LOG

Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-2**

Logger:

Boring Location: See Boring Location Plan



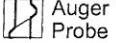
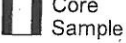
Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						31.0	COAL (continued)				
							Gray SHALE				
						35.0	Boring terminated at 35.0 ft.				
35.0											
40.0											
45.0											
50.0											
55.0											
60.0											

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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**
 Logger:
 Date Started: 10/30/14
 Date Completed: 10/30/14

Project Name: **Davis Coal and Coke Project**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-550X/HSA
 Driller: TRIAD

Boring No.: **B-2B**
 Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							SOIL OVERBURDEN				
5.0											
10.0						10.0	Auger Refusal at 10.0 ft.				
							Brown SANDSTONE, broken				
15.0	C-1										
17.0						17.0	Gray SHALE				
20.0	C-2						- broken (17.0 - 20.0 ft.)				
25.0	C-3										
25.0						25.0	COAL				
30.0	C-4										

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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-2B**

Logger:

Boring Location: See Boring Location Plan


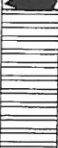
Date Started: 10/30/14

Drill/Method: CME-550X/HSA

Date Completed: 10/30/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							COAL (continued)				
						32.0	Gray SHALE				
35.0	C-5					35.0	Boring terminated at 35.0 ft.				
40.0											
45.0											
50.0											
55.0											
60.0											

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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
SOIL OVERBURDEN											
5.0											
10.0						10.0	Auger Refusal at 10.0 ft.				
15.0	C-1						Brown SANDSTONE, broken				
20.0	C-2					17.0	Gray SHALE - broken (17.0 - 20.0 ft.)				
25.0	C-3										
30.0						27.0	COAL				

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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3**

Logger:

Boring Location: See Boring Location Plan



Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> ■ Shelby Tube ⊗ Standard Split Spoon </div> <div style="display: flex; justify-content: space-between; font-size: small;"> ▨ Core Sample ⊏ Auger Probe </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
	C-4						COAL (continued)					
						34.0	Gray SHALE					
35.0												
	C-5											
40.0						40.0	Boring terminated at 40.0 ft.					
45.0												
50.0												
55.0												
60.0												

TRIAD_C_04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3A**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
SOIL OVERBURDEN											
5.0											
10.0						10.0	Auger Refusal at 10.0 ft.				
15.0	C-1						Brown SANDSTONE, broken				
17.0						17.0	Gray SHALE, weathered - broken (17.0 - 21.0 ft.)				
25.0	C-3										
26.0						26.0	COAL				
30.0	C-4										

TRIAD_C_04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3A**

Logger:

Boring Location: See Boring Location Plan





Date Started: 10/29/14

Drill/Method: CME-550X/HSA

Date Completed: 10/29/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							COAL (continued)				
						33.0	Gray SHALE				
35.0	C-5					35.0	Boring terminated at 35.0 ft.				
40.0											
45.0											
50.0											
55.0											
60.0											

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3B**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/28/14

Drill/Method: CME-550X/HSA

Date Completed: 10/28/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							SOIL OVERBURDEN					
5.0												
10.0						10.0	Auger Refusal at 10.0 ft.					
							Brown SANDSTONE, broken					
15.0	C-1											
16.0						16.0	Gray SHALE, weathered					
	C-2						- broken (16.0 - 20.0 ft.)					
20.0												
	C-3											
							- clay seam between (20.0 - 22.5 ft.)					
25.0												
	C-4											
27.5						27.5	COAL					
30.0												

TRIAD_C_04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks:

TEST BORING LOG

Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-3B**

Logger:

Boring Location: See Boring Location Plan


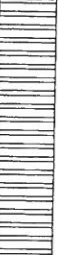
Date Started: 10/28/14

Drill/Method: CME-550X/HSA

Date Completed: 10/28/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Core Sample </div> <div style="text-align: center;"> <input checked="" type="checkbox"/> Standard Split Spoon <input type="checkbox"/> Auger Probe </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
35.0	C-5					34.5	COAL (continued)					
40.0	C-6					40.0	Gray SHALE					
							Boring terminated at 40.0 ft.					
45.0												
50.0												
55.0												
60.0												

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks:

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-4**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/28/14

Drill/Method: CME-550X/HSA

Date Completed: 10/28/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							SOIL OVERBURDEN				
						10.0	Auger Refusal at 10.0 ft.				
	C-1						Brown SANDSTONE, weathered, broken				
	C-2					20.0	Gray SHALE, broken				
	C-3					23.0	VOID				
	C-4					29.0					
	C-5					30.0	Gray SHALE, weathered				
							Boring terminated at 30.0 ft.				

TRIAD_C_04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							SOIL OVERBURDEN					
5.0												
10.0												
15.0						15.0	Auger Refusal at 15.0 ft.					
							Brown SANDSTONE, broken					
20.0												
25.0												
30.0												

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14

C-1



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						31.0	Brown SANDSTONE, broken (continued)				
	C-2						Gray SHALE				
	C-3						- broken (31.0 - 32.0 ft.)				
35.0						34.5	COAL				
	C-4										
40.0											
	C-5					42.0	Gray SHALE				
45.0						45.0	Boring terminated at 45.0 ft.				
50.0											
55.0											
60.0											

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks: A temporary piezometer was installed in this boring.

TEST BORING LOG

Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5A**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/28/14

Drill/Method: CME-550X/HSA

Date Completed: 10/28/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> Shelby Tube Core Sample </div> <div style="text-align: center;"> Standard Split Spoon Auger Probe </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
MATERIAL DESCRIPTION											
SOIL OVERBURDEN											
5.0											
10.0											
15.0						15.0	Auger Refusal at 15.0 ft.				
							Brown SANDSTONE, broken				
20.0	C-1										
25.0						26.0	Gray SHALE				
30.0	C-2						- broken (26.0 - 32.0 ft.)				

TRIAD_C 04-14-0170 DAVIS COAL AND COKE PROJECT.GPJ TRIAD 3.GDT 11/19/14



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Remarks:

TEST BORING LOG

Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5A**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/28/14

Drill/Method: CME-550X/HSA

Date Completed: 10/28/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> ■ Shelby Tube ⊠ Standard Split Spoon </div> <div style="display: flex; justify-content: space-between; font-size: small;"> ▨ Core Sample ⤴ Auger Probe </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
							Gray SHALE (continued)					
35.0	C-3					34.5	COAL					
40.0	C-4					42.0	Gray SHALE					
45.0	C-5					45.0	Boring terminated at 45.0 ft.					
50.0												
55.0												
60.0												

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Remarks:

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Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5B**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Core Sample </div> <div style="text-align: center;"> <input checked="" type="checkbox"/> Standard Split Spoon <input type="checkbox"/> Auger Probe </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
MATERIAL DESCRIPTION												
SOIL OVERBURDEN												
5.0												
10.0												
15.0						15.0	Auger Refusal at 15.0 ft.					
							Brown SANDSTONE, broken					
20.0												
25.0												
30.0												

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C-1



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Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5B**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Shelby Tube</p> <p><input type="checkbox"/> Core Sample</p> </div> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Standard Split Spoon</p> <p><input type="checkbox"/> Auger Probe</p> </div> </div>				
						31.0	Brown SANDSTONE, broken (continued)				
	C-2						Gray SHALE				
							- broken (31.0 - 33.0 ft.)				
35.0	C-3										
						36.0	COAL				
40.0	C-4										
						43.5	Gray SHALE				
45.0	C-5					45.0	Boring terminated at 45.0 ft.				
50.0											
55.0											
60.0											

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Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5C**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div style="text-align: center;"> Shelby Tube Core Sample </div> <div style="text-align: center;"> Standard Split Spoon Auger Probe </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
MATERIAL DESCRIPTION											
SOIL OVERBURDEN											
5.0											
10.0											
15.0						15.0	Auger Refusal at 15.0 ft.				
20.0	C-1						Brown SANDSTONE, broken				
25.0											
30.0	C-2					26.0	Gray SHALE - broken (26.0 - 32.5 ft.)				

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Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-5C**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/27/14

Drill/Method: CME-550X/HSA

Date Completed: 10/27/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Shelby Tube</p> <p><input type="checkbox"/> Core Sample</p> </div> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Standard Split Spoon</p> <p><input type="checkbox"/> Auger Probe</p> </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
35.0	C-3						Gray SHALE (continued)			[Hatched Pattern]		
37.0							COAL			[Solid Black]		
40.0	C-4									[Hatched Pattern]		
43.5							Gray SHALE			[Hatched Pattern]		
45.0	C-5						Boring terminated at 45.0 ft.			[Hatched Pattern]		
50.0												
55.0												
60.0												

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Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/22/14

Drill/Method: CME-550X/HSA

Date Completed: 10/22/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Shelby Tube</p> <p><input type="checkbox"/> Core Sample</p> </div> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Standard Split Spoon</p> <p><input type="checkbox"/> Auger Probe</p> </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
							SOIL OVERBURDEN					
5.0												
10.0												
15.0												
20.0												
25.0	C-1					24.0	Auger Refusal at 24.0 ft.					
30.0							Brown SANDSTONE, broken					

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Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/22/14

Drill/Method: CME-550X/HSA

Date Completed: 10/22/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Shelby Tube</p> <p><input type="checkbox"/> Core Sample</p> </div> <div style="width: 45%;"> <p><input checked="" type="checkbox"/> Standard Split Spoon</p> <p><input type="checkbox"/> Auger Probe</p> </div> </div>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION					
35.0	C-2						Gray SHALE					
							- broken (30.0 - 33.0 ft.)					
40.0	C-3					39.0	COAL					
45.0	C-4											
46.0						46.0	Gray SHALE					
48.0	C-5					48.0	Boring terminated at 48.0 ft.					
50.0												
55.0												
60.0												

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Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6A**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/23/14

Drill/Method: CME-550X/HSA

Date Completed: 10/24/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							SOIL OVERBURDEN				
5.0											
10.0											
15.0						15.0	Auger Refusal at 15.0 ft.				
							Brown SANDSTONE, broken				
20.0											
25.0	C-1										
30.0											

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Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6A**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/23/14

Drill/Method: CME-550X/HSA

Date Completed: 10/24/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							Brown SANDSTONE, broken (continued)				
35.0	C-2					35.0	Gray SHALE				
						37.5	COAL				
40.0	C-3										
						45.0	Gray SHALE				
45.0	C-4										
						50.0	Boring terminated at 50.0 ft.				
50.0											
55.0											
60.0											

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Sheet 1 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6B**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/23/14

Drill/Method: CME-550X/HSA

Date Completed: 10/23/14

Driller: TRIAD

Ground Elev.:

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							SOIL OVERBURDEN					
5.0												
10.0												
15.0						15.0	Auger Refusal at 15.0 ft.					
							Brown SANDSTONE, broken					
20.0												
25.0	C-1											
30.0												

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Sheet 2 of 2

Project Number: **04-14-0170**

Project Name: **Davis Coal and Coke Project**

Boring No.: **B-6B**

Logger:

Boring Location: See Boring Location Plan

Date Started: 10/23/14

Drill/Method: CME-550X/HSA

Date Completed: 10/23/14

Driller: TRIAD

Ground Elev.: _____

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							Brown SANDSTONE, broken (continued)				
35.0	C-2					35.0	Gray SHALE				
	C-3					40.0	- broken (35.0 - 37.5 ft.)				
40.0						40.0	COAL				
	C-4					47.0	Gray SHALE				
45.0						50.0	Boring terminated at 50.0 ft.				
	C-5										
50.0											
55.0											
60.0											

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CONSTRUCTION SPECIFICATIONS

Davis Coal and Coke

TUCKER COUNTY, WEST VIRGINIA

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ABANDONED MINE LANDS AND RECLAMATION

February 2015

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Davis Coal and Coke

I. SPECIAL PROVISIONS

I. LOCATION / SITE DESCRIPTION

The problem areas are located at three different locations. The portals are located below Quality Hill Road. The mine portals are releasing water at various location across the bench at the coal seam elevation. The water is then going into houses located below the bench and then goes to the Francis Grade and is affecting house on the slope below the grade. The water then drains to the roadway at Douglas Road and is overloading the road ditch and causing water to over flow onto Douglas road. This water is causing problems to residents who use the Douglas Road.

Directions to site:

In Thomas, turn west on Douglas Road, CR 27, and drive for 0.5 miles to the Buxton and Landstreet building (formerly Mountain Made). Turn into parking lot on left and follow Quality Hill Road, CR 27/6 (unmarked), up steep grade on the left side of the parking area to Western Pocahontas gate #13. Park outside gate and walk downhill and towards the NE for about 150 feet. The collapsed portals are below the paved road and above the Francis Grade.

The GPS location is as follows: 39° 08' 14.8" 79° 31' 00.2"

II. REFERENCE SPECIFICATIONS / DEFINITIONS

All references to "Owner" in these Specifications shall mean West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation (WVDEP).

All references to "Regional Engineer" in these Specifications shall mean the Owner's Engineer or authorized representative.

All references to "ASTM" shall mean the American Society of Testing and Material Specifications, Latest Edition unless otherwise noted.

All references to "AASHTO Specifications" shall mean the Standard Specifications for Transportation Materials and Methods of Sampling and Testing by the American Association of State Highway and Transportation Officials, latest edition, and all subsequent addenda thereto.

All references to "WVDOH Standard Specifications" shall mean State of West Virginia Department of Transportation, Division of Highways Standard Specifications for Roads and Bridges, adopted 2010, and all-subsequent addenda thereto.

All references to the “Contractor” shall be understood to mean the successful bidder and/or firm or corporation undertaking the execution of the work under the terms of these Specifications.

All references to “OSHA” shall be understood to mean The Occupational Safety and Health Administration and the standards set in the Occupational Safety and Health Act of 1970.

All references to “refuse” and/or “mine spoil” shall be understood to mean all coal refuse, shale, sandstone and other rock fragments that were generated and disposed of as such within the project area during mining and processing of coal.

All references to “AMD” shall be understood to mean all acid mine drainage discharges from the project site.

All references to “OSMRE” shall be understood to mean Office of Surface Mining Reclamation and Enforcement.

All references to “NEPA” shall be understood to mean National Environmental Policy Act.

All reference to “NPDES” shall be understood to mean National Pollutant Discharge Elimination System

III. SCOPE OF WORK

The work covered by the Special Provisions and Technical Specifications consists of furnishing all labor, plant, power, equipment and supplies, and performing all operations necessary for the completion of the project. The Contractor shall perform all operations necessary for:

- Install Sediment Control and Stabilized Construction Entrance
- Install 340 LF of 4x8 Underdrain w/40 mil liner below Bunker Hill Road
- Install 360 LF of 8’ Riprap Channel
- Install 345 LF of 8’ Grouted Channel
- Install 20 LF 6’ Riprap Channel
- Install 15”, 18” and 24” HDPE Culverts
- Install 8 Type A Manhole and 7 Type G Inlets
- Install 2 Wet Mine Seals
- Regrade and revegetated all disturbed areas

The Contractor shall also be responsible for surveying, including establishing construction baseline, measuring and developing all completed quantities on the job, and the ordering, purchase and delivery of any and all materials required for construction or

required for development of support areas. The Contractor shall perform all other operations as incidental to the program as specified herein.

IV. BIDDERS TO EXAMINE LOCATION

Prospective bidders are required to examine the locations of the proposed work and to determine, each in their own way, the difficulties which may be encountered in the prosecution of the same. The submission of a bid shall be prima facie evidence that such examination and determinations have been made by the Bidder. No claims for additional compensation will be considered by the Owner based on obstruction or conditions at the location of the work, which may add to the difficulties or costs of construction, even though such obstructions or conditions are not shown on the contract plans or indicated in the other construction documents. Prospective bidders are advised that should they deem it necessary to obtain any subsurface samples of test borings etc. at the site, they should obtain their own permission from the landowners.

V. SCHEDULE OF WORK

Before commencing work on this project, the Contractor shall prepare and submit a schedule of construction activities for approval by the Owner.

The Contractor shall provide adequate supervision, labor, tools, equipment, and materials to prosecute the work energetically and complete the work within the time specified.

It is the intention not to delay the work for the checking of lines or grades, but if necessary, working operations shall be suspended for such reasonable time as the Engineer may require for the purpose. No special compensation shall be paid for the cost to the Contractor for any of the work or delay occasioned by checking lines and grades, by making other necessary measurements, or by inspection.

The work hours on this project shall be between 7:00 am and 7:00 pm Monday through Saturday. Work on Sundays and major holidays will not be allowed on this project.

VI. MEASUREMENT OF QUANTITIES

The Contractor shall be responsible for providing all necessary volumetric, dimension, and weight measurement equipment necessary to prosecute the work as shown on the Construction Drawings and to accurately determine quantities for payment of Contract Bid Items as approved by the Engineer. Such measurements and equipment shall be subject to the approval of the Engineer for use in this project.

VII. BORROW (DISPOSAL) AREAS

All borrow (disposal) areas must be approved by WVDEP. Should the Contractor decide to obtain and utilize any borrow areas outside of construction limits, or move material from one property owner to another, unless designated on the plans, the Contractor shall be responsible to obtain from the property owner(s) of the borrow areas, all necessary rights of entry, including rights of entry for WVDEP and OSMRE for inspection purposes. The said rights of entry agreement must state that the property owner(s) indemnify and hold harmless the WVDEP for Contractor's action for any injury or damages whatsoever resulting from the use of the property.

The Contractor also shall submit a borrow/disposal area reclamation plan for prior approval by WVDEP. The Contractor shall observe the following NEPA compliance schedule relative to selecting and utilizing any off site borrow areas and/or any waste disposal areas.

- a. No borrow (disposal) site operations will affect a site listed in, eligible for or proposed to be listed in the National Register of Historic Places.
- b. No borrow (disposal) operations will be located within one-quarter mile of any federally listed established or prospective component of the National Wild and Scenic River System under 16 USC 1274 and 1276.
- c. Borrow (disposal) site operations will not cause a significant encroachment within the base floodplain (CE.O. 11988: Floodplain Management).
- d. Borrow (disposal) site operations will not be located in or affect a critical habitat of a Federally listed endangered or threatened species under 16 USC 1531, et. seq.
- e. No borrow (disposal) operations will occur in wetland areas which are designated by appropriate agencies.
- f. Borrow (disposal) site operations will be consistent with any approved plans governing ambient air quality.
- g. Adherence to these mitigation measures does not relieve the Contractor of the obligation or responsibility to obtain any other federal, state, or local approvals required to use borrow (disposal) areas and conduct such activities.
- h. Documentation: Copies of borrow (disposal) site approvals and concurrences will be submitted to the WVDEP prior to the commencement of reclamation activities.

- i. Site Monitoring: Borrow (disposal) activities will be monitored by the state to ensure compliance with contractual requirements, applicable federal, state, and local laws, and any permit conditions.

VIII. DISPOSAL OF UNSUITABLE MATERIAL

All waste areas shall be obtained in accordance with Special Provisions Section VII (Borrow/Disposal Areas) of these specifications. All unsuitable materials (wood, trash, debris, and garbage) as determined by the Engineer shall be wasted by the Contractor, at his/her expense, outside the limits of work conforming to the requirements of Sections 4.3.8 of these Specifications. Wood may be burned in conformity with Sections 4.3.7 of these Specifications.

The Contractor shall observe the NEPA compliance schedule relative to selecting and utilizing any off-site disposal areas in accordance with Special Provisions Section VII of these Specifications.

IX. INTERPRETATION OF APPROXIMATE ESTIMATE OF QUANTITIES

The estimate of quantities of work to be done and/or materials to be furnished under the Special Provisions and Technical Specifications, as shown on the Contract Bid Schedule, is approximate and is given only as a basis of calculation upon which the award of the Contract is to be made. DEP may omit any item or items in the contract, provided that the notice of intent to omit such item or items is given to the Contractor before any material has been purchased or labor involved has been performed, and such omission shall not constitute grounds of any claim for damages or loss of anticipated profits. DEP may omit any item or items shown on the estimate, at any time, by agreeing to compensate the Contractor for the reasonable expense already incurred and to take over at actual cost any unused material purchased in good faith for use for the item or items omitted.

X. SAFETY

All regulations of the Occupational Safety and Health Act of 1970 (OSHA) are in effect for this Contract. WVDEP shall not be liable for any citations received by the Contractor as a result of failure to comply with applicable OSHA standards. Compensation is to be included in the various items of the contract for the expense involved in complying with these standards. In addition, the Contractor shall comply with Section 107.7 of the WVDOH Standard Specifications regarding public convenience and safety.

XI. REGULATIONS

All appropriate townships, county, state, and federal regulations shall apply to this Contract. It shall be the Contractor's sole responsibility to be aware of these regulations

and to comply with them. WVDEP shall not be liable for any citations received by the Contractor. The Contractor shall keep the existing roads open and safe to public vehicular traffic as shown on the DOH approved Traffic Control Plan and Permit. The contractor shall provide appropriate barriers and warning devices as directed by the Engineer.

XII. LAWS TO BE OBSERVED

The Contractor shall at all times, observe, comply with, and post as required all federal, state, and local laws, ordinances, and regulations in any manner affecting the conduct of the work or applying to employees on the project as well as all orders or decrees which have been or may be promulgated or enacted by any legal bodies or tribunals having authority or jurisdiction over the work, materials, employees, or contract. The Contractor shall protect and indemnify WVDEP and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree whether by the Contractor or by the Contractor's employees.

XIII. PERMITS, LICENSES AND FEES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. Permits required for this project may include but not be limited to: Water Quality Certification from WVDEP and burning permits from WVDNR and WVDEP Office of Air Quality. A copy of the permit/permits as procured shall be furnished to the Owner prior to initiation of the work under this Contract. The WVDEP will obtain the Permits (MM 109 Form) from WVDOH and NPDES from WVDEP. Contractor shall be responsible for any Public Lands Permits necessary to complete the project work.

XIV. ELECTRICITY, WATER SUPPLY AND SANITARY FACILITIES

Arrangements for connecting to electric service, water supply and sanitary facilities shall be made by the Contractor, and all costs for such arrangements shall be borne by the Contractor at no additional cost to the Department.

XV. UTILITIES AND OTHER OBSTRUCTIONS

The Contractor shall be solely responsible to correctly locate all existing active underground and overhead utilities at the project sites and take precautions to avoid damage to them. Any existing utility lines damaged by the Contractor shall be replaced by the Contractor or repaired at no cost to the Owner. The Contractor shall notify the utility companies likely to be affected well in advance and before beginning any work within the project sites. In the event of damage to the existing utilities or other facilities, the Contractor shall notify the affected utility Owner(s) and the Engineer immediately and make, or have made, all necessary repairs and bear the expense thereof and resulting

damages caused thereby. It shall be the responsibility of the Contractor to arrange for relocating the utility lines, where required and as directed by the Engineer, in accordance with the guidelines set forth by the utility company, prior to beginning construction. The Contractor will be reimbursed for actual charges invoiced by the utility company. The utility companies (and WVMIS) must be contacted by the Contractor at least one week prior to commencement of construction activities for the purpose of field locating and marking utility owned facilities within the project area. The name and phone number of the WVMIS Utility location service and of the utility companies are as follows: WVMIS1-800-245-4848

XVI. SITE CLEANUP

Before the project shall be considered as having been satisfactorily completed, the Contractor shall clean and remove, from the project site, all surplus and discarded materials, and equipment and shall further remove all debris and objectionable materials of any kind from areas used or disturbed by the construction operations within or within sight of the project area.

XVII. ROCK BLASTING

All blasting operations shall be conducted in strict accordance with applicable state and federal laws relating to rock blasting and the storage and use of explosives. The contractor shall maintain and keep in full force and effect blasting insurance to protect and indemnify the Owner and/or his agents or representative from claims for damages and shall defend all suits at law. The Contractor shall submit to the Owner a request for permission to blast rock, a reclamation plan for the area to be disturbed, and proof of blasting insurance coverage prior to initiating blasting operations. Failure to obtain approval for blasting prior to initiating the work will result in no payment for items utilizing this rock.

XVIII. TEMPORARY ACCESS ROADS

The Contractor shall construct and maintain temporary access roads for convenient access to the various parts of the work, and for other necessary purposes incidental to the performance of this contract. The location of access roads shall be approved by the Engineer prior to construction. No separate payment for construction and maintenance of such roads will be made. The Contractor shall erect such temporary fences or guards as may be necessary to keep unauthorized persons away from the work. Grading and surfacing of temporary access roads, excavations, fills and embankments for purposes of construction, or for convenience, beyond the limits of ordered excavations and all temporary fences and guards, shall be provided by the Contractor and shall be maintained in good condition. The Contractor shall be required to maintain all roads used by his hauling equipment in a dust controlled condition. Upon completion, the Contractor shall return the disturbed areas to the approximate original condition as approved by the Engineer.

XIX. SITE CONDITIONS AND ENVIRONMENTAL PROTECTION

Conditions at the site shall be examined by the Contractor, and he shall assume responsibility as to the contours and the character of the earth, rock, water and other items that may be encountered during the excavation and filling operations. Ground water may be encountered at various locations within the proposed work areas.

The Contractor shall be responsible for the operation and maintenance of any required diversion or pumping facilities for removing ground water from work areas during progress of the work under this contract.

The Contractor shall take any necessary steps to prevent erosion or silting problems from occurring and to minimize pollution or sedimentation of the stream. If any such problems develop, the Contractor shall be responsible for taking immediate corrective action.

The Contractor shall be responsible for the repair or replacement of streets or driveways (blacktop, gravel & concrete), trees, shrubs, fences, or any other physical features disturbed by construction under this contract to original condition or better.

The Contractor shall be responsible for the replacement of any existing boundary or survey corner markers disturbed by construction activities.

XX. CONTROL AND REVIEW OF WORK BY THE REGIONAL ENGINEER

All services rendered by the Regional Engineer consist of professional opinions and recommendations made in accordance with generally accepted engineering practice. Under no circumstances is it the intent of the Regional Engineer to directly control the physical activities of the Contractor or the Contractor's workmen's accomplishment of work on this project.

The presence of the Department's Field Representative and/or Regional Engineer at the site is to provide the Department a continuing source of professional advice, opinions and recommendations based upon the Field Representative's and/or Regional Engineer's observations of the Contractor's work and does not include any superintending, supervision or direction of the actual work of the Contractor or the Contractor's workmen.

Any construction review of the Contractor's performance conducted by the Regional Engineer is not intended to include review of the adequacy of the Contractor's safety measures in or near the construction site.

XXI. CITATION OF OTHER SPECIFICATIONS

Whenever the Specifications for this contract refer to the specifications of any society, institute, association or government organization, then such specifications cited shall become a part of this contract as if written in full. Commonly used abbreviations have the following meanings:

ASTM - American Society for Testing Materials

ASA - American Standards Association

AWWA - American Water Works Association

AASHTO - American Association of State Highway and Transportation Officials

ACI - American Concrete Institute

Where reference is made to a Specification, it shall be the latest revision at the time called for bids, except as noted on the Plans or elsewhere herein.

II. TECHNICAL SPECIFICATIONS

1.0 MOBILIZATION AND DEMOBILIZATION

1.1 Description

This work shall consist of the performance of construction preparatory operations, including the movement of personnel and equipment to the project sites and for the establishment of the Contractor's offices, buildings and other facilities including the construction of all temporary access roads as necessary to begin work on a substantial phase of the contract. The location of the Contractor's office to be established shall be approved by WVDEP. It also shall include all demobilization activities involving the removal from the sites of all plant, equipment, supplies and personnel after completion of the work including cleanup of all rubbish and waste materials generated during the construction of this project and restoration of any damage to existing site improvements resulting from the Contractor's activities at the site. This item shall also include the installation of the project sign at the beginning of the project and the removal of the sign prior to the Final Inspection. All equipment and material storage areas shall be approved by WVDEP.

Upon receipt of a notice to proceed, the Contractor shall initiate and complete measures necessary to commence the work. Mobilization shall also consist of delivering to the site and assembling in working order all necessary equipment, materials, and supplies to be furnished by the Contractor to complete the work.

Demobilization shall consist of the removal from the site of all the Contractor's equipment and materials after completion of the work and cleanup of the site. Work shall be done to the satisfaction of the Regional Engineer.

1.2 Method of Measurement

The method of measurement will be per lump sum.

1.3 Basis of Payment

The bid for "Mobilization and Demobilization" shall be a lump sum and cannot be more than 10% of the TOTAL AMOUNT BID for the project. Partial payments will be as follows:

- (a) One-half of the amount bid will be released to the Contractor with the first estimate payable, not less than 15 days after the start of work at the project site.

- (b) The final one-half of the amount bid shall be released with the last estimate payable after the work is accepted by the WVDEP and after all Final Inspection submittals are received and approved by WVDEP.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided for by the contract. **No deduction will be made nor will any increase be made, in the lump sum mobilization and demobilization item amount regardless of decreases or increases in the final total contract amount or for any other cause.**

1.4 Pay Item

Item 1.0 "Mobilization and Demobilization" per lump sum cannot be more than 10% of the TOTAL AMOUNT BID for the project.

2.0 CONSTRUCTION LAYOUT

2.1 Description

This item consists of furnishing, placing, and maintaining construction layout stakes, **(based on the original baselines in the plans)**, necessary for the proper performance of the work under this contract including borrow/waste areas. It shall further consist of determining the exact units of measure for payment. It also consists of checking and making any field adjustment to the plan alignment, grades and elevations as considered necessary by the Engineer. Additionally, this item shall also include the preparation of "As-Built" Plans including the Reclamation Plan and any others specifically requested by the WVDEP. All of these "As-Built" Plans shall be provided prior to the Final Inspection Meeting. This item will be paid according to the following schedule: up to fifty percent of the total bid amount of this item will be released for payment when all required layout work is completed. The remaining 50% will be paid on the final invoice once the As-Builts are submitted and approved.

2.2 Materials

Conventional survey stakes, hubs, batter boards, flagging, templates, straightedges and other devices necessary for laying out all parts of the work.

2.3 Construction Methods

2.3.1 The Contractor shall be responsible for the proper layout of the work. The Owner will provide the Contractor with survey information regarding the baselines and the existing surface features shown on the Construction Drawings. The Contractor shall make all calculations involved and shall furnish and place all layout stakes.

2.3.2 The Contractor shall provide field forces and shall set all additional stakes as needed, such as offset stakes, reference point stakes, slope stakes, grade stakes, stakes for drainage, or other structures, supplementary bench marks, and any other horizontal or vertical controls necessary to secure a correct layout of the work including the re-establishment of the survey and construction baselines (as necessary), as shown on the Construction Drawings.

2.3.3 The Contractor shall be responsible for assuring the layout staking work is in conformance to the lines, grades, elevations, dimensions, and locations shown on the Construction Drawings or as required by the Engineer. The Contractor shall furnish a copy of his/her survey records for review by the Engineer and for the Owner's permanent file. These records shall be furnished as they are completed during the progress of the work.

Any inspection or review of the Contractor's layout by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work.

2.3.4 The Contractor shall exercise care in the preservation of stakes and benchmarks, including existing property line markers, and shall have them reset at his/her expense when any are damaged, lost, displaced or removed.

The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be done under the supervision of, or directed by, a Licensed Land Surveyor registered in the State of West Virginia. Once the initial survey is completed the Licensed Land Surveyor shall certify that the site layout is complete for all necessary grades (both cut and fill), location and grades of all ditches, all cross-sections related to cut-fill where grade lines are necessary for construction and or billing. This layout shall include location stakes and cut-fill lines marked on the stakes for each pre-manufactured or formed on site structures (manholes, drop inlets, headwalls, etc.). The layout shall also include centerline stake with cut-fill lines for each channel and any areas of excavation and re-grade. The certified layout and cross-sections from the initial survey must be submitted to the WVDEP for approval prior to beginning construction.

2.3.5 As-Built plans shall be provided to the WVDEP prior to the Final Inspection Meeting. The As-Builts shall include two discs each of the plans in PDF and AutoCAD 2007-2014 format on CD-ROM or DVD and one paper copy of the plans with the same size and scale as contained on the original plans. The As-Builts Shall include the following:

1. The As-Builts shall show all pay items remaining on site post construction.
2. The As-Builts shall show all horizontal and vertical dimensions of all installed components (i.e. pipes, drop inlets, mine seals, drainage channels, splash pads and manholes) as well as surveyed locations of the installed structures..
3. Cut-fill sections shall have the area of the section marked by the section for easier calculation.
4. The As-Builts shall have the lines on the plans shown in either color or line type to distinguish between our original plan lines, the contractor's original survey lines and the final grade lines. This will apply for all cross-sections on the project.
5. All waste and borrow areas shown on the As-Builts.
6. All work completed by the Licensed Land Surveyor on the As-Builts must be certified by the Licensed Land Surveyor as to completeness and accuracy of the plan submittal.

2.4 Measurement and Payment

Measurement and payment for furnishing, setting, maintaining, and resetting the stakes when necessary, and for furnishing all engineering personnel, equipment, materials, and all incidentals thereto, shall be by the lump sum bid for “Construction Layout”. The lump sum payment also shall include the cost for providing the Engineer pre- and post-construction ground line cross-sections for all disturbed or re-graded areas including borrow areas and “As-Built” Plans as described herein. Said lump sum bid cannot be more than 5% of the TOTAL AMOUNT BID for the project. **Neither deduction nor increase will be made in the lump sum “Construction Layout” item amount regardless of decreases or increases in the final total contract amount or for any other cause. This item will be paid according to the following schedule: up to fifty percent of the total bid amount of this item will be released for payment when all required layout work is completed. The remaining fifty percent will be paid on the final invoice once the As-Builts are submitted and approved.**

2.5 Pay Item

Item 2.0, “Construction Layout”, per lump sum cannot be more than 5% of the TOTAL AMOUNT BID for the project.

3.0 QUALITY CONTROL

3.1 Description

This work shall consist of testing for verification that the materials supplied and the work performed are in accordance with these specifications. When there is a discrepancy between the Plans and Specifications on this project the following hierarch of documents shall apply:

1. Any and all addendums that were generated for the project either before or after construction began.
2. Plans shall be the document that shall be used in places where discrepancies occur between the Plans and Specifications.
3. The Specifications shall apply in all areas of agreement with the Plans.

3.2 Materials

3.2.1 The Contractor shall submit a minimum of two (2) copies of shop drawings, catalog cuts and material certifications (as applicable) to the Engineer for all offsite materials to be incorporated into the work. **Written approval from the Engineer will be required prior to incorporation of these items into the work.**

3.2.2 The Contractor shall submit at least two (2) copies of the results of all tests conducted on in-situ material, concrete and grout to be used in this project.

1. As a minimum, the compaction tests will include moisture content & density tests of the soil in accordance with the provisions of ASTM D698 (Standard Proctor) field density tests following compaction. A new Standard Proctor will be run when soil type changes occur on site and/or at the direction of the Engineer or his representative.
2. Soil tests to determine the lime and nutrient requirements of the areas to be re-vegetated.
3. Compressive strength test for grout in accordance with ASTM C109, and for concrete in accordance with ASTM C31 & C39.

3.2.3 Tests Required

Concrete Pour	As Specified in Plans and Specifications
Grouted Ditch	As Specified in Plans and Specifications
Pipe line Compaction	As Specified in Plans and Specifications
Slope fill Compaction	As Specified in Plans and Specifications
Soil Test	As needed to determine Nutrient tests NPK
Material Certification	Manufacture certification on all materials on project
Sandstone Riprap	Certification that rock is non acid producing

3.3 Construction Methods

3.3.1 The Contractor shall furnish the services of his own testing laboratory or select an independent testing laboratory, as long as the laboratory is under the direct supervision of a Registered Professional Civil Engineer. The laboratory must be approved by the Owner.

The Contractor shall furnish a certified technician to perform the required testing at the project site. The technician shall submit a copy of his certification and a copy of that certification shall be submitted WVDEP at the Pre-Construction Conference. The technician shall be responsible for chain of custody of any samples that must leave the site.

3.3.2 Testing for compaction, soil nutrient and lime requirements for soil, compressive strength tests for concrete and grout, shall be performed as required by these specifications and/or ordered by the Engineer or his representative in writing. The Engineer will determine the locations and time of any testing herein specified and the need and extent of any testing in addition to that which is herein specified.

3.3.3 The contractor shall be responsible for performing laboratory tests of the coal, mine spoil, and any natural soil to identify the compaction requirements for their use as fill and cover material, respectively. In addition, field density tests shall be performed in accordance with the Construction Specifications. All test results shall be submitted to the Engineer for approval of compaction criteria prior to compacting the fill material and after fill material is placed to verify that the required compaction is obtained.

3.3.4 Only new and first class materials, which conform to the requirements of these Specifications, shall be used unless specified otherwise. When requested by the Owner, the Contractor shall furnish a written statement of the origin, composition, and manufacturer of any or all materials (manufactured or produced) that are to be used in the work. **The sources of supply of each material used shall be approved by the Engineer before delivery is started. If, at any time, sources previously approved fail to produce materials acceptable to the Owner, the Contractor shall furnish materials from other approved sources.**

3.4 Method of Measurement

The method of measurement for quality control work done as described above will be on a lump sum basis.

3.5 Basis of Payment

The quantity of quality control work done will be paid at the contract lump sum price bid for this item. Said lump sum bid cannot be more than 3% of the TOTAL AMOUNT BID for the project. Nothing herein shall be construed to limit or preclude partial payments on this item up to 100% of the bid amount. **No deduction or increase shall be made in the lump sum “Quality Control”** item amount regardless of decreases or increases in the final total contract amount or for any other cause.

3.6 Pay Item

Item 3.0, “Quality Control”, per lump sum cannot be more than 3% of the TOTAL AMOUNT BID for the project.

4.0 SITE PREPARATION

4.1 Description

4.1.1 Clearing & Grubbing

Work performed under this section shall include the removal and disposal of all trees, stumps, shrubs and any other vegetation, wood, debris, garbage of any nature from those areas specified below and/or shown on the plans and/or any other areas as approved by WVDEP. This work shall also include the preservation from injury to all vegetation, utilities or other objects to remain as well as all other ancillary work as described.

4.1.2 Demolition of Structures

This work shall consist of complete demolition and removal of such buildings, mining related structures, equipment and materials, existing ruins and foundation structures, as are specifically designated on the Plans for removal. Demolished concrete and cinder block structures and foundation ruins (all steel residue and wood (burned) must be removed from the site) can be disposed of on-site.

4.1.3 Asbestos Material

This work shall consist of doing a thorough search of all existing structures on the project to ensure that there are no asbestos materials present. If there are any areas that are suspected then an inspection by a certified asbestos removal company will be required. If asbestos is found, an estimate for removal and proper disposal will be obtained and submitted for the engineer's approval. No work shall be allowed at the location of the asbestos until the removal process is completed.

4.1.4 Access Road Construction

Access roads constructed to gain access to, travel between or otherwise required for equipment/vehicular site access shall be kept to a minimum and only constructed where necessary upon approval from the WVDEP, where applicable. If the Contractor constructs such travel routes, they shall be reclaimed and revegetated according to Section 6 upon completion of the construction activities, as deemed necessary by the WVDEP, with associated costs being incidental. Any additional access shall require the Contractor to obtain written permission from the respective land owner. The existing access roads shall be maintained during construction (except when culvert, ditch and road construction are being performed), and shall be left in a condition equal to, or better than, the existing condition upon completion of construction.

Any re-grading necessary for the construction of the Vegetated Access Road will

be incidental to the cost of the work described herein.

Final grading, stabilization, and providing final drainage control for existing access roads shall be performed after reclamation operations for the project have been completed.

4.1.5 Access Road Rehabilitation

Any regrading or resurfacing necessary to restore existing roads or driveways used during construction to a condition that is equal to or better than the condition encountered before construction activities.

4.1.6 Gravel Drive Rehabilitation

The Gravel Drive Rehabilitation roads shall be covered with a layer of Class I crusher run stone. In areas that will not support the stone due to soft conditions, stabilization fabric will be required. Re-grading of any areas where stone is not required but inside of the construction limits.

4.1.7 Permanent Access Road

Permanent Access Road shall be any access road that is labeled on the plans to remain after construction is completed.

4.1.8 Stabilization Fabric

Stabilization fabric shall be woven fabric that is used to stabilize any soft areas on a road surface prior to stone application.

4.1.9 Spill Containment Area

Spill containment measures shall be used for fuel and lubricant storage areas. All containers, barrels, buckets, cans, etc., are to be legally disposed of offsite. Used lubricants are to be disposed of according to state law to minimize pollution to the local surface and ground water supplies. Spills are the responsibility of the Contractor and need immediate clean up and maintained at no expense to the State. Fuel tanks manufactured with secondary containment are desirable; the minimum secondary containment shall be 110 percent.

4.2 Materials

4.2.1 Any equipment and construction materials required for clearing, grubbing, grading and stone placement.

4.2.2 Fencing material shall be of type and quality equal to or better than the existing fence unless a different type of fence material is specified on the plans

- 4.2.3** Gates shall be hot-dipped galvanized as per ASTM A153 specifications for zinc coating (hot dip) on iron and steel hardware. Gates shall be painted Forest Green. Gate width shall be as shown on the plans. All gates shall be two inch (2-inch) diameter 19 Gage heavy duty 7 bar bull gates or approved equivalent. Gate width shall be provided on plans. Provide a lockable latch, which includes protection from the elements for the lock. All gates 10' and longer shall have a 5' X 4" X 4" (2' burial) post installed at 90° to the gate in the closed position to allow the gate to be anchored in the open position. The post shall be installed a distance equal to the length of the gate, from the hinge post and located on the same side of the roadway as the hinges. The post shall have a latch to lock the gate. All hardware and/or accessories necessary for installation of gates shall be incidental to and included in the installation of each gate as part of this bid item.

Wood posts and braces shall be pressure-preservative treated according to Federal Specification TT-W-571, Wood Preservation: Treating Practices, latest revision and may be round or square. Decay-resistant species may be used untreated with prior approval from WVDEP Engineer. Gate posts shall be a minimum 6-inch top diameter or square and 8-feet long. Postholes shall be a minimum of three feet (3-feet) deep and twelve inches (12-inches) in diameter or square. Sides shall be nearly vertical.

- 4.2.4** Stone to be placed for "Gravel Drive Rehabilitation" shall conform to the requirements for Class 1 Aggregate. The Gravel Drive Rehabilitation shall be covered with a layer of 1 ½" crusher run stone as shown on the plans or as designated by the Engineer.
- 4.2.5** Stone to be placed for "Access Road Stone" shall conform to the requirements for Class 1 Aggregate. The Access Road Stone shall be covered with a layer of crusher run stone. In areas that will not support the stone due to soft conditions, stabilization fabric will be required as directed by the Engineer.
- 4.2.6** Pipe Gate installed across access roads to the project sites shall be constructed of 2-inch and 4-inch seamless Type "S" tubular Grade "B" steel. 2-inch tubular steel shall have an outside diameter of 2.375-inch; inside diameter of 1.939-inch; wall thickness of 0.218-inch and weigh 5.02 pounds per foot or approved equal. 4-inch tubular steel shall have an outside diameter of 4.5-inch; an inside diameter of 3.826-inch; wall thickness of 0.337-inch; and weigh 14.98 pounds per foot or approved equal. Also required will be 1/4" grade 50 steel plate, field mixed sakrete, locking mechanism, and gate fabrication including welding. Color will be determined by landowner and Engineer.

4.3 Construction Methods

- 4.3.1** The specific areas to be cleared and grubbed are as shown on the Contract Drawings and are generally described as, but not limited to, those specific areas of excavation, backfill, soil borrow or drainage structure installation.
- 4.3.2** The Contractor shall clear the site within the limits of the areas to be regraded.

The WVDEP shall exercise control over clearing and shall designate all trees, plants and other objects to be removed or to remain.

- 4.3.3** Clearing and grubbing shall be completed prior to initiation of earthwork operations only to the extent necessary to complete the work. The Contractor shall confine his operations strictly to required areas. If he clears and grubs beyond the required areas, whether knowingly or accidentally, he shall, at his expense, replant and otherwise restore all areas outside the limit lines to a condition equal to that existing prior to start of work.
- 4.3.4** All timber eight (8) inches in diameter and larger at stump height shall be saw cut prior to grubbing operations. Timber shall be topped with the branches removed and stacked and stockpiled in an appropriate manner in an accessible location approved by the WVDEP on the property from which it was cut. Timber to be stockpiled shall not be pushed down by equipment prior to being cut nor can it be indiscriminately shoved into a stockpile.
- 4.3.5** All stumps, roots, buried logs and brush shall be removed. Grass, however, may be incorporated into the resoiling material. Taproots and other projections over 1½ inches in diameter shall be grubbed out to a depth of at least ten (10) inches below the planned subgrade or slope elevation. All holes remaining after the grubbing operation shall have the sides broken down to flatten out the slopes, and shall be filled with suitable materials, moistened and properly compacted.
- 4.3.6** Cleared and grubbed areas shall be worked such that positive drainage is provided to prevent ponding of water except for the purpose of sediment control sumps as approved by the WVDEP.
- 4.3.7** All organic material shall be burned completely to ash or otherwise removed from the site and disposed of in a manner approved by the WVDEP. Burning of the combustible material will not be permitted on or near refuse, mine portals or within close proximity to coal seams, residence, structures or utilities. The Contractor shall obtain all permits and licenses required prior to burning the material. A plan showing the location of material to be burned and all fire control measures to be implemented, including copies of permits and licenses, shall be submitted to the WVDEP's representative at the site for approval. If a permit cannot be obtained because of the conditions stated above the tree top and stumps can be chipped or disposed of offsite to an approved location.
- 4.3.8** All other materials generated from required clearing and grubbing operations shall be removed and disposed of by the Contractor. All garbage, construction debris, mining debris, etc., shall be disposed of in approved waste areas or landfills (disposal tickets must be furnished to WVDEP). It shall be the responsibility of the Contractor to obtain, at no expense to the WVDEP, all necessary waste and

borrow areas or landfills for the disposal of waste materials in accordance with any applicable local, state, and/or federal regulations including compliance with NEPA requirements (See Section VII for NEPA Compliance Schedule). All waste and borrow areas must be approved by the WVDEP and the Contractor must provide a reclamation plan for approval. In addition, for all waste and borrow areas outside the construction limits, the Contractor must obtain from the property owner a right-of-entry agreement in which the property owner indemnifies and holds the WVDEP harmless from any injury or damages whatsoever resulting from the use of the property.

- 4.3.9** It shall be the sole responsibility of the Contractor to correctly locate and avoid all underground, on-ground, and overhead utilities, facilities and other structures and constructions, and for that purpose, shall employ all necessary precautions and methods to insure avoidance of and damage to such constructions. In the event damage does occur, the Contractor shall notify the affected Owner and the WVDEP immediately and make or have made all necessary repairs and bear the expense thereof and resulting damage caused thereby. See “Special Provisions”, Section XV “Utilities and Other Obstructions”, of these specifications for more information on utilities.
- 4.3.10** Buildings, mining related structures, existing ruins and foundation structures, shall be removed to the existing ground level, which operation shall include removal of concrete slabs or any other type of floors and/or walls resting upon the ground. Basement floors shall be shattered. Pits, trenches, holes or basements shall be backfilled. Coal and/or refuse spillage, concrete, cinder blocks, and foundation ruins shall be excavated and/or removed and incorporated into the fill material. Demolished concrete, cinder blocks and foundation ruins to be incorporated into the fill shall be of size less than 2 feet in any dimension. Boulders, structures, concrete pads and foundations shall be broken and buried in the deepest portion of the fill areas. Broken pieces shall not be consolidated in one area, but shall be dispersed throughout the fill areas to ensure that compaction requirements are achieved.
- 4.3.11** Trash, garbage, railroad ties, roofing shingles, tires, plastic, metal and other unsuitable material resulting from demolition shall be disposed of by the Contractor at his/her own responsibility and expense outside the work limits in an approved landfill, as approved by the Engineer, unless otherwise directed (disposal tickets must be furnished to WVDEP). Bricks and stone blocks shall be disposed as per Section 4.3.10 of these specifications.
- 4.3.12** In the area where structures and buildings are demolished and removed, the removal operation shall extend to 1 foot below finished grade. The area shall then be regraded as necessary to blend into adjacent finished grades. Regrading shall be such that all areas are free draining and surface runoff will not pool or impound as directed by the Engineer.
- 4.3.13** Should offsite disposal or borrow be necessary, the Contractor shall observe the

NEPA Compliance Schedule as per Section VII of the Special Provisions.

- 4.3.14** Existing site access roads shall provide safe, all-weather access to the site. These existing roads, including stoned and paved roads, shall be maintained during construction and left in a better than or equal to condition. The Contractor is responsible for locating and avoiding all underground and overhead utilities and constructions during access road grading and maintenance.
- 4.3.15** Stone to be placed for “Access Road Stone” shall conform to the requirements from Class 1 Aggregate. The Access Road Stone shall be covered with a layer of crusher run stone.
- 4.3.16** Stone to be placed for “Gravel Drive Rehabilitation” shall conform to the requirements for Class 1 Aggregate. The Gravel Drive Rehabilitation shall be covered with a layer of crusher run stone.
- 4.3.17** Any existing property markers encountered during construction activities shall be replaced accurately and to an “as good as” or “better than” condition and as approved by the WVDEP. This work will be paid under Section 2.0 Construction Layout of these Specifications.

4.4 Method Of Measurement

- 4.4.1** There shall be no measurement of the “Site Preparation” item as it is a lump sum.
- 4.4.2** Access Road Stone shall be based upon weigh tickets from the commercial supplier of the stone that is delivered and placed at the locations identified on the plan drawings.
- 4.4.3** Gravel Drive Rehabilitation shall be based upon weigh tickets from the commercial supplier of the stone that is delivered and placed at the locations identified on the plan drawings.

4.5 Basis Of Payment

- 4.5.1** The “Site Preparation” item shall be paid at the bid lump sum price. The amount shall not exceed 10% of the TOTAL AMOUNT BID for each bid. Payment shall be full compensation for doing all the work herein prescribed in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies, and incidental necessary to complete the work. This includes all clearing grubbing, demolition, temporary and vegetated access road construction with water breaks and water break outlet protection (final revegetation at completion of job).

No deduction will be made, nor will any increase be made, in the lump sum “Site Preparation” amount regardless of decreases or increases in the final total contract amount or for any other cause.

4.5.2 The “Access Road Stone” item shall be paid per unit bid and shall include the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work.

4.5.3 The “Gravel Road Rehabilitation” item shall be paid per unit bid and shall include the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work.

4.6 **Pay Items**

Item 4.1, “Site Preparation”, per lump sum. Cannot be more than 10% of the “Total Amount Bid” for the project.

Item 4.2, “Access Road Stone”, per ton.

Item 4.3, “Gravel Drive Rehabilitation”, per ton.

5.0 EROSION & SEDIMENT CONTROL

5.1 Description

This item shall consist of furnishing all materials, equipment, labor and incidentals necessary for the installation of Straw Wattles, Sediment Control Barrier (e.g. silt fence or super silt fence) structures, and Stabilized Construction Entrances as designated in the Drawings. Sediment control shall be placed on regraded outslope areas concurrent with construction and prior to revegetation. Additional quantities may be added at the discretion of the WVDEP.

The CONTRACTOR shall be given a NPDES Permit with an approved erosion and sediment control plan at the pre-construction meeting. This plan shall include measures to be utilized for temporary and permanent sediment and erosion control. This plan shall also include the measures as outlined herein. The NPDES approved plan **does not** relieve the CONTRACTOR of his/her responsibility to be in compliance with any and all permits. All costs associated with meeting the federal and/or state regulations shall be the sole responsibility of the Contractor.

NOTE: Sediment Control Measures shall be required on the perimeter of the project site for sediment control in accordance with the NPDES requirements. The silt fence for sediment control shall be placed before any construction work begins. This fence shall remain and be maintained during the entire construction process.

The following are the minimum requirements of the NPDES Permit and/or the NPDES BMP Manual.

VEGETATIVE PRACTICES

- Except as noted below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen days after the construction activity in that portion of the site has permanently ceased.
- Where the initiation of stabilization measures by the fourth day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as conditions allow.
- Where construction activity will resume on a portion of the site within 14 days from when activities ceased, (e.g., the total time period that construction activity is temporarily halted is less than 14 days) then stabilization measures do not have to be initiated on that portion of the site by the seventh day after construction activities have temporarily ceased.
- Areas where the seed has failed to germinate adequately (uniform perennial vegetative cover with a density of 70%) within 30 days after seeding and mulching must be reseeded immediately, or as soon as weather conditions allow.
- Diversions must be stabilized prior to becoming functional.

EROSION & SEDIMENT CONTROL CONSTRUCTION SEQUENCE

- Install stabilized construction entrance as shown on site plans.
- Install perimeter sediment control devices as shown on site plans.
- Clear and grub site.
- Provide sediment control for any topsoil stockpiles.
- Commence rough grading of site. Continue to maintain and inspect all erosion and sediment controls.
- Install additional erosion and sediment controls as shown on site plans.
- Fine grade site.
- Permanently seed and mulch all disturbed areas within 7 days of reaching final grade and install erosion control wattles.
- Upon completion of project including adequate stabilization, remove all remaining erosion and sediment controls.

Erosion Silt Dike - This work shall consist of furnishing, installing, maintaining, and, when required, removal of the Temporary Silt Dike. The dikes shall be used as a continuous line barrier at the toe of slope or R/W line to contain sediment or as a ditch barrier placed perpendicular to the flow of water in a defined drainage ditch to minimize erosion and contain sediment. These dikes shall be installed and located as soon as construction will allow or as directed by the Engineer.

5.2 Materials

5.2.1 Sediment Control Barriers: silt fencing and super silt fencing materials and installation shall meet all applicable requirements of the manufacturer's specifications.

Even with the specific prior approval of the WVDEP, the use of silt fence shall be limited to relatively flat areas and the toe of selected slopes.

5.2.2 Stabilized Construction Entrances shall consist of coarse 3-6 inch stone over a geotextile fabric.

5.2.3 Silt Dikes – Temporary Silt Dikes shall be triangular-shaped, having a height of at least eight to ten inches (8" - 10") in the center with equal sides and a sixteen- to twenty-inch (16" - 20") base. The triangular-shaped inner material shall be urethane foam. The outer cover shall be a woven geotextile fabric placed around the inner material and allowed to extend beyond both sides of the triangle two to three (2' - 3') feet. Standard length of each dike will be seven feet (7') unless otherwise indicated on the plans. The Dikes shall be attached to the ground with Wire Staples. The Staples shall be No. 11 gauge wire and be at least six to eight (6" - 8") inches long. Staples shall be placed as indicated on the installation detail.

The Contractor shall inspect all dikes after each rainfall event of at least 0.5 inches or greater. Any deficiencies or damage shall be repaired by the Contractor.

Accumulated silt or debris shall be removed and relocated as directed by the

Engineer. If the Dikes are damaged or inadvertently moved during the silt removal process, the contractor shall immediately replace Dikes after damage occurs.

- 5.2.4** Erosion Control Wattles: Straw wattles or approved equals, shall be installed at locations shown on the plans. Straw wattles shall be 12 inches in diameter and 25 feet in length. Straw wattles shall consist of an internal fill material of straw and an exterior encasement of a heavy duty biodegradable knitted cylindrical tube. The wattles shall be installed as shown on the typical detail. The wattles shall be staked with 1" x 1" x 24" wooden stakes. The stakes will be placed one stake at the beginning and 4' on center along the entire length of the wattle. One stake will be placed at the end of each section on wattle.
- 5.2.5** Rolled Erosion Control Product (RECP): The erosion control blankets for slope stabilization, Rolled Erosion Control Products, shall consist of Excelsior Type I Curlex lining or an approved equal.
- 5.2.6** Rock Check Dams: Rock check dams shall be required at the locations as shown on the plans. The rock check dams shall be constructed with 3"-6" stone. The stone shall extend from side to side of the drainage channel and shall at each edge to the top of the existing ground. The center height of the check dam shall be 6" lower than the outer edge height. The rock check dam shall be wrapped in filter fabric to enhance the sediment trapping capabilities. The fabric shall meet the standards of Thrace-Linq 140X or Engineer approved equal.
- 5.2.7** Priority One Silt Saver Silt Fence The BSRF® Priority 1 green band or equal is a 36" wide, non-woven spun-bond polyester fabric with an internal scrim. The system utilizes wood stakes and a specific method of attachment.

5.3 **Maintenance**

- 5.3.1** During the course of the project, sediment control barriers shall be maintained in sound condition and accumulations of silt which may threaten their effectiveness shall be removed. Silt removed from the sediment control structures shall be taken to an approved disposal area.
- 5.3.2** The Stabilized Construction Entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.

Wheels on all vehicles shall be cleaned to remove sediment prior to entrance onto public rights-of-way. If washing is required, it shall be done on an area stabilized with stone and which drains into approved sediment trapping device. If the street is washed, precautions must be taken to prevent muddy water from running into waterways or storm sewers.

- At a minimum, 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 of greater than 0.5 inches of rain per 24-hour period.
- All controls should be cleaned out when sediment reaches one half the sediment capacity of that control.
- Inspection and maintenance records must be kept onsite.

5.4 Installation

5.4.1 Sediment Control Barrier:

Silt Fence: Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1-1/2" x 1-1/2" square (minimum) cut, or 1-3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the requirements for Geotextile Class F. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

Super Silt Fence: Chain link fence shall be constructed in accordance with manufacturer's specifications. Chain link fence shall be fastened securely to the posts with wire ties or staples. Posts need not be set in concrete. The filter fabric shall be fastened to the chain link fence with ties every 24" at the top and mid-section. Fabric and fence shall be embedded 12", minimum, into the ground. 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. 4" by 4" pressure treated posts may be substituted for metal fence posts with the approval of the engineer.

5.4.2 Stabilized Construction Entrance: A stabilized construction entrance shall be required at the access point of the construction site. The stabilized construction entrance shall consist of filter fabric and a minimum of six (6) inches of 3" to 6" stone. The stone entrance shall be a minimum of seventy (70) foot long and twelve (12) foot in width. This stone construction access must conform to the detail drawings shown in the plans.

5.4.3 Silt Dikes shall be installed according to the manufacture's specification and at the location shown on the plans.

5.4.4 Rock Check Dams w/Optional Sediment Trap: Shall be installed in constructed channel per the sequence of construction. The top of dam shall have a low center section and with the same width as the channel bottom and 6" lower than the outer edges. Rock Check Dams w/ Sediment Traps consist of over excavating the channel behind (up-slope) from the rock check dam and shall be constructed per the typical section on Plans. Standard rock check dams and rock check dam

w/sediment traps shall be removed after the first growing season and the channel brought up to the lines and grades as depicted in the channel profile and stabilized with erosion control matting per the typical detail for vegetated channels.

- 5.4.5** Wattle Installation: Lay the first Straw Wattle snugly in the excavated trench. **No daylight should be seen under the Wattle.** Pack soil from trenching against the Wattle on the uphill side. When installing running lengths of Straw Wattles, butt the second Wattle tightly against the first. **DO NOT overlap the ends.** Stake the Straw Wattles at each end and four foot on center. For example:

A 25 foot Wattle uses 6 stakes

A 20 foot Wattle uses 5 stakes

A 12 foot Wattle uses 4 stakes

Stakes should be driven through the middle of the Wattle, leaving 2 - 3 inches of the stake protruding above the Wattle. A heavy sediment load will tend to pick the Wattle up and could pull it off the stakes if they are driven down too low. It may be necessary to make a hole in the Wattle with the pick end of your maddox in order to get the stake through the straw. When Straw Wattles are used for flat ground applications, drive the stakes straight down; when installing Wattles on slopes, drive the stakes perpendicular to the slope.

Drive the first end stake of the second Wattle at an angle toward the first Wattle in order to help abut them tightly together. If you have difficulty driving the stake into extremely hard or rocky slopes, a pilot bar may be needed to begin the stake hole.

- 5.4.6** Rolled Erosion Control Products (RECP): At the top of slope, anchor the RECP's according to manufacturer's recommendation. Securely fasten all RECP's to the soil by installing stakes/staples at a minimum rate of 1.5/yds. For the most effective RECP installation use stake/staple patterns and densities as recommended by the manufacturer. For adjacent and consecutive rolls of RECP's follow seeming instructions detailed in the Plan or by manufacturer's recommendations. Additional wooden stakes and varying patterns may be required and must be approved by the WVDEP.

- 5.4.7** Priority One Silt Saver Silt Fence: Installation Specifications: Four foot stakes are driven to a depth which allows 24" of fabric to be above ground. The fabric is then stretched along the perimeter of the stakes, pulled tightly and held in place with bonding strips. The bonding strips (typically 1" x 3/8" x 24") are attached to the stake with 1" x 1 1/4" staples. Five staples are used to secure the fabric in place against the 1 1/4" x 1 3/4" oak posts. This installation bonds the fabric and support system (scrim) to the vertical support post. The remaining fabric is now tucked into the trench forming a "J" and when filled with dirt creates a "ground bite". With its firm attachment to each post, the load is now spread to the total linear strength of all the posts within the system.

5.5 Removal

Upon completion of the project including adequate stabilization, all temporary erosion and sediment controls shall be removed from the site, including but not limited to water breaks, water break outlet protection, check dams and silt fencing. The site should be left with a clean/neat appearance and any disturbed areas shall be revegetated. Rock outlet protection for permanent drainage structures shall not be removed once the project is complete.

5.6 Method Of Measurement

5.6.1 The method of measurement for “Super Silt Fence” installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per linear foot basis to include stakes, all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal.

5.6.2 The method of measurement for “Silt Fence” installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per linear foot basis to include stakes, all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal.

5.6.3 The method of measurement for “Straw Wattles” installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per linear foot basis to include all stakes/staples, all necessary materials, supplies, labor and equipment for installation and maintenance including repairing any damaged slopes and replacing matting, as described under the maintenance section.

5.6.4 The method of measurement for “Rolled Erosion Control Products” installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per square yard basis to include all stakes/staples, all necessary materials, supplies, labor and equipment for installation and maintenance including repairing any damaged slopes, rills and replacing matting, as described under the maintenance section.

5.6.5 The method of measurement for “Stabilized Construction Entrance” installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on per ton and shall be based upon weigh tickets from the commercial supplier of the stone that is delivered and placed at the locations identified on the plan drawings. This item shall include all necessary materials, stabilized fabric, supplies, labor and equipment for installation and maintenance including periodic top dressing with additional stone.

5.6.6 The method of measurement for “Rock Check Dam” (w/optional sediment trap) installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on per each and shall include all necessary materials,

supplies, labor and equipment for installation and maintenance including sediment removal/disposal and removal of rock check dams and rock check dams with sediment traps after the first growing season.

5.6.7 Any additional sediment control, i.e. sumps etc., installed by the contractor to meet any applicable State or Federal Law or Regulation shall be the Contractor's sole responsibility and all costs pursuant thereto shall be born fully by the Contractor. This also includes the removal and disposal of sediment from the existing Sediment Basins. However, any additional sediment control approved by the WVDEP prior to placement shall be included for measurement.

5.6.8 The Silt Dike will be measured by the linear foot in place as directed by the Engineer.

5.6.9 The method of measurement for "Priority One Silt Saver Silt Fence" installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per linear foot basis to include stakes, all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal.

5.7 Basis Of Payment

5.7.1 Super Silt Fence payment shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, sediment removal and disposal.

5.7.2 Silt Fence payment shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, sediment removal and disposal.

5.7.3 Straw Wattles payment shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, slope repair, matting replacement and disposal.

5.7.4 Rolled Erosion Control Products payment shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, slope repair, matting replacement and disposal.

5.7.5 Stabilized Construction Entrances payment shall be based on the contract unit price bid for the following items, which price and payment shall be full

compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance including periodic top dressing with additional stone.

5.7.6 Rock Check Dams (w/optional sediment trap) shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, sediment removal/disposal and removal of rock check dams and rock check dams with sediment traps after the first growing season.

5.7.7 Accepted Silt Dike, measured as provided above, will be paid for at the contract unit price bid for Silt Dike. Price bid will include the cost of furnishing the Dikes, installation, maintenance, and removal when directed by the Engineer.

5.7.8 Priority One Silt Saver Silt Fence or equal payment shall be based on the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, sediment removal and disposal.

5.8 Pay Items

Item 5.1, "Silt Fence", per linear foot.

Item 5.2, "Straw Wattles", per linear foot.

Item 5.3, "Stabilized Construction Entrance", per ton.

Item 5.4, "Rock Check Dam", per each.

6.0 REVEGETATION

6.1 Description

This work shall cover all operations incidental to the establishment of vegetation within the limits of construction as shown on the Drawings and any other areas as approved by the WVDEP. This work also includes the furnishing and the application of fertilizer, agricultural limestone and mulch and the furnishing and sowing of seed, all in accordance with these Specifications and as designated herein.

No areas outside the limits of construction shall be disturbed without prior approval from the WVDEP in order to ensure that Right-of-Entry has been obtained.

Any areas outside the limits of construction, disturbed by the Contractor shall be re-vegetated by the Contractor at no expense to the WVDEP.

6.2 Materials

6.2.1 Fertilizer

The commercial fertilizer to be used shall consist of 10-20-20 grade of uniform composition and furnished in standard containers. These containers, in accordance with applicable state and federal laws, must be clearly marked with the following information:

- a. Weight
- b. Name of Plant Nutrients
- c. Guaranteed Nutrients Percentages

Fertilizer shall be applied at a minimum rate of 1,000 lbs/acre. Fertilizer shall be applied immediately to all areas reaching final grade by one of the two following methods:

6.2.2 Limestone

The lime to be used will be an agricultural grade pulverized limestone containing a minimum of 75% total carbonates or calcium carbonate equivalent. Fineness will be such that no less than 70% will pass through a #100 sieve and 100% will pass through a #20 sieve.

Lime shall be applied immediately to all areas requiring seeding reaching final grade by 1 of the 2 methods listed in Section 6.2.1, "Fertilizer".

6.2.3 Seed Mixtures

The variety of grass and legume seed furnished for the project shall bear a tag, in

accordance with applicable state and federal laws, with the following information listed:

1. Lot Number
2. Seed Producers Name
3. Percent Purity
4. Percent Germination
5. Date of Germination Testing
6. Weed Seed Content (should be <0.25% by weight)

All leguminous seed shall be inoculated with the specified strain of rhizobia which shall be a pure culture of bacteria selected for maximum vitality. No rhizobia shall be used which has passed the expiration date on each package. The inoculant shall be applied at five times the recommended rate except when used in a hydroseeding mixture when the rate will be ten times the recommended rate.

6.2.3.1 Temporary Seed Mixture

All stockpiles or other disturbed areas which will require further disturbance in which the additional disturbance will be delayed for a period of two (2) weeks or longer shall be vegetated according to the following guidelines.

Variety of Seed	SPRING	SUMMER	FALL	WINTER
	3/15-5/15	5/15-8/15	8/15-10/15	10/15-11/15
	-----lbs/acre-----			
Annual Ryegrass (Lolium multiflorum)	40	40		
German Millet * (Setaria italica)	40			
Cereal Rye (Secale cereale)			170	

*Do not use Japanese Millet

All areas to be temporarily seeded which are to be re-disturbed shall be fertilized with 500 lbs/acre of 10-20-20. All areas reaching final grade to be temporarily seeded shall be fertilized according to Section 6.2.1. Lime shall be applied according to Section 6.2.2 and mulched according to Section 6.2.4.

6.2.3.2 Lawn Seed Mixture

Existing lawn areas disturbed by construction shall be reseeded using the following mixture:

Rate lb/1000 sq. ft.	Seed Variety	Minimum Specifications	
		0% Purity	%Total Germination
0.45	Red Fescue (Pennlawn)	98	85
0.90	Kentucky Bluegrass	85	75
0.70	Merion Bluegrass	90	75
0.20	Annual Ryegrass*	95	85

*Use Annual Ryegrass only in mixtures seeded after August 1 and prior to May 15.

6.2.3.3 Permanent Seed Mixture

Permanent vegetation shall be established on all areas reaching final grade or other areas not likely to be destroyed by further construction activities. Any areas which reach final grade between March 15 - May 15 or August 15 - October 15 shall be seeded with the appropriate temporary seed mixture according to Section 6.2.3.1. These areas shall then be reseeded with a permanent seed mixture, without Annual Ryegrass, during the next defined seeding period according to this section. The actual date of permanent seeding will require the Engineer's approval.

Variety of Seed *	SPRING	FALL
	3/15 - 5/15	8/15 - 10/15
	-----lbs/acre-----	
Orchardgrass (Dactylis glomerata)	30	30
Birdsfoot Trefoil (1) (Lotus corniculatus)	15	15
Red Clover (Trifolium pratense)	10	10
Annual Ryegrass (2) (Lolium multiflorum)	25	25
Spring Oats or Winter Wheat	35 0	0 90

(1) Herbaceous legumes must be treated with the appropriate bacterium before seeding. On areas which are steeply sloping (steeper than 1.7:1) or slide prone, substitute Crownvetch (*Coronilla varia*) at 20 lbs./acre for Birdsfoot Trefoil.

(2) Use Annual Ryegrass only in mixtures seeded after August 1 and before May 1.

*Use only certified “blue tag” seed. Seed-rate suggested is for pure live seed (PLS) in lbs/acre.

***For shaded areas add the following quantity of seed to the standard mix:**

Lawn Seed Mixture Add 4 lbs/1000ft² of Red Fescue.

Permanent Seed Mixture Add 3 lbs/acre of White Clover
Add 10 lbs/acre of Perennial Rye
Add 10 lbs/acre of Blue Grass
Add 50 lbs/acre Cover Grain (Wheat or Rye)

6.2.4 Mulch Material

Mulching procedures shall take place immediately following seeding. Mulch material shall consist of erosion matting, straw, or wood cellulose fiber.

6.2.4.1 Straw

Straw mulch shall include baled wheat or oats straw, or baled grass hay. Straw mulch shall be dry and reasonably free of weed, seeds, sticks, or other foreign material. Straw mulch shall be applied at a rate of 2 tons/acre. **(No baled grass hay shall be used in yard areas.)** The straw mulch shall be anchored with 100 gallons/acre asphalt emulsion or 750 lbs/acre wood cellulose fiber.

6.2.4.2 Wood Cellulose Fiber

Wood cellulose fiber may be used only on slopes steeper than 2H:1V at a rate of 1,500 lbs/acre. A mulch for use with the hydraulic application of seed, fertilizer, and lime shall consist of wood cellulose fiber. It shall be processed in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed green. It shall be manufactured in such a manner the (1) after addition and agitation in slurry tanks with fertilizers, lime seeds, and water, the fibers in the material will become uniformly suspended to form a homogeneous slurry and (2) the material, when hydraulically sprayed on the ground, will form a blotter-like ground cover impregnated uniformly with seed, will allow rainfall to percolate to the underlying soil. Wood cellulose shall only be used on areas that have been approved by WVDEP.

The wood cellulose fiber shall be supplied in packages having a gross weight not to exceed 100 pounds. Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight

of the fiber material. Air dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for Wood Cellulose and is considered equivalent to 10 percent moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

6.2.5 Water

Water shall be reasonably free of injurious and other toxic substances harmful to plant life. The source of water is subject to the approval of the WVDEP.

6.3 Construction Methods

6.3.1 All revegetation activities shall be conducted immediately following completion of final grading so as to utilize the fine soil material as a seedbed before this material is lost via subsequent rainfall.

6.3.2 On sites where appropriate equipment can operate the seedbed shall be prepared by breaking up surface crusts and loosening the soil material to a minimum of three (3) inches. Disking, harrowing, cultipacking or other acceptable tillage operations may be used to prepare the seedbed. On sites where appropriate equipment cannot operate, the seedbed shall be prepared by “tracking in” with a dozer with a minimum of 1 ½”grouser depth or scarifying by other approved methods.

6.3.3 Seedbed preparation and seeding shall take place progressively as various re-graded areas are brought to final grade.

6.3.4 All seeding operations shall be performed immediately following seedbed preparation in such a manner that the seed is applied in the specified quantities uniformly on the designated areas.

6.3.5 Seed Application shall consist of approved hydro seeding methods where feasible. Any seed left in hydro seeder overnight shall be re-inoculated before that seed shall be applied. Other methods of seed application may be utilized for site-specific reasons when approved by the WVDEP.

- a. Apply and incorporate fertilizer during seedbed preparation.
- b. Apply fertilizer in hydro seeding mixture following seedbed preparation.

6.3.6 Any area failing to establish a vegetative stand due to weather or adverse soil conditions shall be reseeded, re-limed, re-fertilized and re-mulched as approved by the WVDEP.

6.3.7 The Contractor shall maintain all seeded areas until final acceptance of the project. All areas shall be protected from any further equipment traffic and any damaged areas shall be repaired and reseeded. Maintaining seeded areas shall

consist of watering, refilling, re-fertilizing, re-liming, re-seeding, and re-mulching erosion gullies and all bare areas.

6.3.8 Lime rate shall be formulated from soil test results. In the absence of soil testing, a rate of three (3) tons per acre will serve as a preferred minimum.

6.3.9 Satisfactory soil is considered to be reasonably free of subsoil, clay clumps, stones and other objects over four (4) inches in one dimension, and shall be free of objectionable material.

6.3.10 A second and third seeding will be applied as needed, or as approved by the WVDEP.

6.3.10.1 Second Step Seeding

The second step seeding will take place during the first defined seeding period following the initial seeding. No payment shall be made for second step seeding, this work is part of the contract if completed before the final inspection or shall be considered warranty if completed after the final inspection. The following shall be used as a guide for second step application.

- a. For areas with less than a 50 percent stand or subject to severe erosion, apply the complete amount of seed, fertilizer, lime much as specified.
- b. For areas with over 50 percent stand apply one half the original fertilizer, lime and seed. If erosion is a problem, apply one half of the original mulch specified in Section 6.2.4.

6.3.10.2 Third Step Seeding

The third step seeding shall consist of spot applications on areas not showing a satisfactory stand. The seeding shall take place at the next defined seeding period following the second step application. The quantity of material to be used shall be determined on the same basis as the second step application in Section 6.3.10.1.

6.4 Method of Measurement

The method of measurement for re-vegetation will be per plan view acre. Payment to include all temporary seeding, lime, fertilizer, seed and mulch for the first seeding only. Subsequent seeding will not be measured or paid for but will be considered incidental to initial seeding.

The Contractor shall be paid only for those areas disturbed and re-vegetated during operations necessary for completion of the work. The quantity shall not include areas disturbed for storage facilities and staging areas unless prior approval was obtained

from the WVDEP. No payment shall be made for any seeding conducted after the final inspection; this work is considered warranty.

6.5 Basis of Payment

6.5.1 Payment will be made at the contract per acre bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work. Payment for seeding includes all seeding (i.e. – temporary, first and second seeding). No additional payment will be made for second or third seeding.

6.5.2 Temporary seeding will be incidental to the seeding item and no separate measurement or payment will be made for temporary seeding. There will be no separate payment for maintaining seeded areas. No payment will be made for seeding after the final inspection. All work performed after the final inspection will be done under warranty.

6.6 Pay Items

Item 6.0 “Revegetation”, per plan view acre.

7.0 DRAINAGE STRUCTURES

7.1 Description

This work shall consist of furnishing all labor, equipment and materials necessary to construct the drainage structures shown on the drawings and as specified herein. The work shall include, but not be limited to, the following:

Channels, culverts, pipes, manholes, drop inlets, wingwalls, L walls, underdrains, and sidewalk/access replacement.

7.2 Materials

7.2.1 Excavated Materials shall consist of in place natural ground and rock. All excavation shall be considered incidental to placement of drainage structures.

7.2.2 Riprap for Ditches shall consist of sound, non-acid producing, durable limestone or sandstone from a WVDEP approved source. Shale is not acceptable.

7.2.3 Rock for riprap channels and hand placed riprap shall consist of hard durable limestone or approved sandstone and shall have a D_{50} of 12 inches. The rock shall range in size from 6 inches minimum to 18 inches maximum diameter with no more than 15 percent by weight less than 6 inches. The use of sandstone or limestone will be determined by the plans.

All rock riprap used throughout the project site shall consist of commercially purchased calcareous stone (except as noted otherwise) meeting the following requirements. The rock riprap shall have a maximum weighted loss of thirty percent when subjected to five (5) cycles of the Sodium Sulfate Soundness Test – ASTM C88 (ASTM C88-05 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate), as modified by the American Association of State Highway and Transportation Officials (AASHTO) T-104. The use of on-site rock materials for riprap, must have approval from the WVDEP and meet all standard for the riprap installation.

Limestone riprap stone required for the drainage channels shall be commercially supplied and have a calcium carbonate equivalency of 70% or greater. A certification on calcium carbonate equivalency shall be submitted to the WVDEP prior to delivery.

The sandstone rock for riprap shall consist of sound, durable D_{50} 12” non-calcareous sandstone. The sandstone shall consist of particles of clean, hard, tough, durable rock, free from adherent coating. Stone shall have a maximum weighted loss of thirty (30) percent when subjected to five (5) cycles of the Sodium Sulfate Soundness Test – ASTM C88 (ASTM C88-05 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium

Sulfate), as modified by the American Association of State Highway and Transportation Officials (**AASHTO T-104**). Sandstone must be certified to be non-acid producing material. A laboratory certification of soundness and acidity shall be submitted to the WVDEP prior to delivery.

- 7.2.4** Grout to be used in the grouted riprap ditches shall consist of a mixture of one part Sulfate Resistant Type II Portland Cement and three parts sand, using water to produce a workable consistency. The amount of water shall be as approved or as designated by the WVDEP.

The minimum required compressive strength of the grout shall be 2000 psi @ 28 days. All testing shall be the responsibility of the contractor as part of Section 3 of these specifications. Two sets (4 cylinders) of test cylinder per day shall serve as a minimum. Grout test cylinders shall be made and tested in general accordance with ASTM C-31 and C-39 respectively. One cylinder shall be tested at 7 days age, one test cylinder shall be tested at 14 days age, one test cylinder shall be tested at 28 days age and one cylinder shall be held as a spare.

- 7.2.5** HDPE Pipes: The HDPE pipes shall consist of corrugated high density polyethylene pipe, such as ADS's Hi-Q pipe, or approved equal.

- 7.2.6** Backfill for the pipes extending beneath the paved roads shall be Controlled Low Strength Material (Flowable Fill) in accordance with **Section 219** of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010. The Controlled Low Strength Material composition and mixture shall also comply with **Section 219** of the WVDOT Specifications. The Controlled Low Strength Material shall have a minimum 28 day compressive strength as specified in the MM-109.

- 7.2.7** Pipe bedding shall consist of fine aggregate meeting the requirements of Section 704.6 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2010, except that the gradation shall meet the requirements of Section 702.6 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2010. Select aggregate bedding and backfill for HDPE culverts beneath gravel road shall consist of $\frac{3}{4}$ " crusher run.

- 7.2.8** Pre-manufactured drainage structures.

7.2.8.1 A Type "A" Manhole shall be installed at each of the locations shown on the Plans or as directed by the engineer. The manhole requires Neenah lid number 1915-S1, or approved equal.

7.2.8.2 A Type "G" Drop Inlet shall be installed at each of the locations shown on the Plans or as directed by the engineer. The Type "G" Drop Inlet shall have a Type I grate installed at grade

- 7.2.9** The stone for underdrain shall consist of sound, durable 3" to 6" non-calcareous sandstone or River Gravel. The stone shall consist of particles of clean, hard,

tough, durable rock, free from adherent coating. Stone shall have a maximum weighted loss of thirty (30) percent when subjected to five (5) cycles of the Sodium Sulfate Soundness Test – **ASTM C88** (ASTM C88-05 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate), as modified by the American Association of State Highway and Transportation Officials (**AASHTO**) **T-104**. Non-calcareous stone shall have an acid base accounting test to show the potential for acid producing material in the stone. A laboratory certification of soundness and acid base shall be submitted to the WVDEP prior to delivery.

Filter fabric for the underdrain shall be non-woven type, meeting the requirements of Section 9.2.2 of these specifications.

Pipe shall consist of perforated 12-inch diameter PVC SDR 35 grade within the underdrain.

7.3 Construction Methods

7.3.1 The channels shall be constructed to the approximate line, grade, and templates as shown on the plans or as directed by the WVDEP. Excess material from channel and pipe trench excavation that is suitable for soil cover may be segregated, stockpiled and utilized to supplement “Revegetation” operations. Otherwise, excess material from ditch and pipe trench excavation will be required to be disposed of by the Contractor in an offsite disposal area obtained by the Contractor in accordance with Section VIII of the Special Provisions for these specifications. Sections of channels that are cut to rock shall not require lining but shall be paid the appropriate size riprap ditch.

7.3.2 Grouted Riprap, Riprap, Flexamat or approved equal, and Fabriform or approved equal shall be placed and constructed as shown on the plans.

7.3.3 Grout, where required to be placed on riprap, shall be applied as soon as possible after placement of riprap. The stone shall be thoroughly wet immediately before grout is applied. As soon as grout is deposited on the surface it shall be thoroughly worked into the joints to achieve 100 percent penetration. The stones shall then be brushed so that their top surfaces are exposed. The grout shall be protected from running water to prevent damage until sufficiently cured.

Cure the grout for at least 3 days by keeping it continuously wet, or applying a transparent membrane curing compound.

A set of four (4) compressive strength test cylinders shall be taken in AM and PM during installation or as directed by the engineer. One seven-day, one fourteen day, one twenty-eight day and one reserve cylinder are required. The sampling for strength tests shall be in accordance with ASTM C 172.

Cylinders for acceptance tests shall be molded and cured in accordance with ASTM C 31. Cylinders shall be tested in accordance with ASTM C 39.

The acceptability of the grout will be determined by laboratory tests and/ or visual inspection as required by the WVDEP. Grout specified on the basis of compressive strength will be considered satisfactory if the average of all strength test results equal or exceed the specified strength and no individual strength test falls below the required strength by more than 200 psi.

A grout key shall be installed at the upstream end of each of the grouted riprap channels or on a cold joint to direct the flow of water into the channel and prevent undercutting of the grouted riprap. The grout key shall be installed to the dimensions depicted by the typical detail in the plans. The grout keys required on the grouted channel shall be incidental to the channel construction.

7.3.4 Pipe backfill for HDPE culverts extending beneath the paved roads shall be Controlled Low Strength Material according to Specification 7.2.4. The Controlled Low Strength Material backfill shall extend 5.0 feet, minimum, upstream and downstream from existing edge of pavements.

7.3.4.1 For every ten (10) cubic yards of Controlled Low Strength Material placed to backfill Pipe, a set of cylinders (4 Cylinders) shall be prepared for unconfined compression testing according to AASHTO T-22 and determination of the flow mixture shall be made. At a minimum, one flow mixture and sample will be prepared for Controlled Low Strength Material placed on each side of the pipe for material over 500 psi. Material below 500 psi will not require test cylinders to be taken. The samples shall be field cured in accordance with AASHTO T-23 and shall meet or exceed a 28 day break of the psi shown on the MM-109 or as shown on the plans.

7.3.4.2 Drop height of the Controlled Low Strength Material shall be limited to the minimum necessary by using chutes or other devices. The Controlled Low Strength Material shall be placed equally along both sides of the pipe to avoid pipe displacement. Prior to placement of successive lifts, the Controlled Low Strength Material shall be allowed to cure until self-supporting.

7.3.4.3 A minimum of two inches compacted of Type I Wearing Hot Mix Asphalt (HMA) shall be placed atop the Controlled Low Strength Material. The HMA shall be placed to blend into existing asphalt grades surrounding the open cut trench.

7.3.5 The SDR-35 pipes shall be installed at the locations shown on the plans. The trench for the pipes shall be excavated in accordance with the detail provided in the plans. Pipe bedding shall conform to the details. Fine aggregate shall be placed in the bottom of the trench to the dimensions indicated by the details for leveling purposes. The outlet end of all conveyance pipes shall have animal guards installed as shown on the plans.

- 7.3.5.1** Trench width for the pipe shall not be less than the outside diameter of the pipe plus 18 inches on each side of the pipe measured to the face of the trench or to the sheeting when used, and shall be excavated to depth, line and grade, as shown on the Construction Drawings. Trenching will involve excavation of in place material including soil. Trench bottom shall be thoroughly cleaned of any rock debris prior to the placement of the pipe. If the pipe is placed at a road crossing see specification section 7.3.7.3.
- 7.3.5.2** Trench excavation exceeding 5 feet in depth shall be supported with suitable shoring or sides of the excavation shall be cut to stable slopes as recommended in the OSHA Publication “Excavating and Trenching Operations”, OSHA 1926 to prevent caving, slipping or cracking of the sides to protect workmen from any injury. Any shoring installed shall be removed following backfilling the trench.
- 7.3.5.3** Pipe bedding and trench backfilling for at least one foot above the top of the pipe and shall be Class B bedding. The bedding shall be placed at the bottom of the trench and shall be properly shaped to receive the pipe providing a minimum of four (4) inches of bedding for the pipe. The trench shall be kept dry during installation of the pipe.
- 7.3.5.4** When the bedding is in place, the pipe shall be positioned in the trench, as shown on the Construction Drawings, and all joints (if any) sealed, as per manufacturer’s recommendations.
- 7.3.5.5** After the pipe is placed, the trench shall be backfilled as shown on the Construction Drawings. The backfill material shall be placed in maximum six (6) inch lifts and shall be compacted using a tamper. The $\frac{3}{4}$ “ aggregate backfill shall extend to at least one (1) foot above the top of the pipe as shown on the Construction Drawings. The remainder of the trench may be backfilled with in place material provided it is not wet. Compaction of the backfill material shall be at least 95 percent of the maximum dry density obtained by ASTM Method D698 (Standard Proctor). Field density testing and testing frequency shall be directed by the WVDEP.
- 7.3.6** The HDPE culvert shall be installed at the location shown on the plans. The trench for the culvert shall be excavated in accordance with the detail provided in the plans. Pipe bedding shall conform to the details. Fine aggregate shall be placed in the bottom of the trench to the dimensions indicated by the details for leveling purposes.
- 7.3.6.1** Trench width for the pipe culvert shall not be less than the outside diameter of the pipe plus 18 inches on each side of the pipe measured to the face of the trench or to the sheeting when used, and shall be excavated to depth, line and grade, as shown on the Construction Drawings. Trenching will involve excavation of in place material including soil.

Trench bottom shall be thoroughly cleaned of any rock debris prior to the placement of the pipe.

- 7.3.6.2** Trench excavation exceeding 5 feet in depth shall be supported with suitable shoring or sides of the excavation shall be cut to stable slopes as recommended in the OSHA Publication “Excavating and Trenching Operations”, OSHA 1926 and approved by the Engineer to prevent caving, slipping or cracking of the sides to protect workmen from any injury. Any shoring installed shall be removed following backfilling the trench.
- 7.3.6.3** Culvert bedding and trench backfilling for at least one foot above the top of the culvert shall be ¾” Crusher Run aggregate. The bedding shall be placed at the bottom of the trench and shall be properly shaped to receive the culvert providing a minimum of four (4) inches of bedding for the culvert. The trench shall be kept dry during installation of the culvert.
- 7.3.6.4** When the bedding is in place, the culvert shall be positioned in the trench, as shown on the Construction Drawings, and all joints (if any) sealed as per manufacturer’s recommendations.
- 7.3.6.5** After the culvert is placed, the trench shall be backfilled as shown on the Construction Drawings. The backfill material shall be placed in maximum six (6) inch lifts and shall be compacted using a tamper. The aggregate backfill shall extend to at least one (1) foot above the top of the culvert as shown on the Construction Drawings. The remainder of the trench may be backfilled with in place material provided it is not wet. Compaction of the backfill material shall be at least 95 percent of the maximum dry density obtained by ASTM Method D698 (Standard Proctor). Field density testing and testing frequency shall be as directed by the WVDEP.
- 7.3.7** Rock for splash pads shall be placed in conformance to the details in the Plans or as directed by the Engineer.
- 7.3.8** The pre-manufactured Type “A” Manholes and Type “G” Drop Inlets and the Concrete Junction Boxes shall be installed at the locations shown on the Plans.
 - 7.3.8.1** Pre-manufactured drainage structures shall be placed on a level, prepared and compacted subgrade as directed and approved by the Engineer. Pre-manufactured structures shall have lifting hooks that will be out of sight after placement and sufficient reinforcement to resist handling stresses.
 - 7.3.8.2** Pipe sections shall extend through the inside of the structure wall sufficiently to allow for proper grouting of the annular space and extend outside of the structure sufficiently to allow for proper connection with the next pipe joint. Masonry shall fit neatly and tight around the pipe both on the inside and outside. The backfill of the structure will not be

permitted until the grout has been applied to both the inside and outside an allowed sufficient time to cure. The flow line of the outlet pipe section shall match the bottom elevation of the inlet or manhole. Inlet pipes shall be higher from the structure bottom and as shown on the Plans. Sufficient mortar shall be placed in the Inlet bottom of the manhole to create a smooth flow line from the inlet pipes to the outlet pipes. The mortar shall be Type II sulfate resistant non shrink Portland cement meeting the requirements of ASTM C150.

7.3.8.3 Backfilling around pre-manufactured drainage structures shall be select, suitable on site material resulting from excavation operations and as directed and approved by the Engineer. Care shall be taken not to displace or disturb the drainage structure from the intended installation site or elevation. Backfilling shall be brought up uniformly around the structure to avoid distortional stress. If in the opinion of the Engineer backfilling operations have caused damage or displaced the drainage structure, the Contractor shall remove the drainage structure, re-prepare the subgrade, and reset the structure and complete backfilling operations to the satisfaction of the Engineer and at no cost to the State. The pre-manufactured drainage structures shall be set flush with the surrounding surfaces as shown on the Plans.

7.3.9 Existing ditches located within the project limits shall be cleaned to conform to the template provided in the plan details to provide positive drainage to the inverts of the downstream structures and ensure free flowing conditions within the ditch as directed by the Engineer, at the locations identified on the plans. The ditch cleanings shall be disposed of on site in a location approved by the Engineer or off site in accordance with Sections VII and VIII of the Special Provisions of these Specifications. The erosion control matting for the ditch shall be installed in accordance with the manufacturer's recommendations.

7.3.10 Wingwalls (headwalls), L Walls and concrete sidewalk/access replacement shall be Class B concrete and reinforcing steel shall be new billet steel. Four concrete test cylinders shall be made and tested in general accordance with ASTM C-31 and C-39 respectively. One test cylinder shall be tested at 7 days age, one test cylinder at 14 days of age, one test cylinder shall be tested at 28 days age, and one test cylinder shall be held as a spare.

7.3.11 The underdrains shall be constructed at the locations and to the lines, grades, and cross-section or as directed by the Engineer based on the field conditions encountered. Cleanouts shall be incidental to the cost of the underdrain. Cleanouts must be installed on mine drainage pipe and conveyance pipes every 150 LF. This will be required on all pipe systems

Trench width for the underdrain shall be not less than four (4) feet, measured at the bottom of the trench for the underdrain. Trenching will involve excavation of in-place material including soil and rock. The stone for the underdrain will be filled to a depth of four (4) feet. This will allow a minimum of one (1) foot soil

cover over the completed underdrain.

Trench exceeding 5 feet in depth shall be supported in compliance with the OSHA requirements. Trench bottom shall be cleared of any loose debris and any standing water.

- 7.3.12** Piezometer Abandonment: Temporary piezometers which have been installed for Contractor use, must be removed and abandoned by a person who has been certified by the State of West Virginia in accordance with 47CSR59 “Monitoring Well Regulations”. This certification is necessary for any person to operate in the State of West Virginia and includes construction, installation, alteration and/or abandonment of any monitoring wells and select boreholes.

7.4 Method of Measurement

- 7.4.1** The method of measurement for the grouted riprap channels shall be on a linear foot basis measured along the flowline of the channel. The unit price shall include excavation, purchase and placement of rock, grout and all equipment and labor necessary for their installation. The grout keys shall be considered part of the channel in which they are located and not as a separate item.
- 7.4.2** The method of measurement for the riprap channels shall be on a linear foot basis measured along the flowline of the channel. The unit price shall include excavation, purchase and placement of rock and all equipment and labor necessary for their installation.
- 7.4.3** The method of measurement for the vegetated channels shall be on a linear foot basis measured along the flowline of the channel. The unit price shall include excavation, seed, lime, fertilizer, purchase and placement of matting if required and all equipment and labor necessary for their installation.
- 7.4.4** The method of measurement for installation of the HDPE Culvert shall be on a linear foot basis measured on the top of the pipe. This unit price shall include the cost of trench excavation and backfilling, including Controlled Low Strength Material (where required), asphalt repair, waste disposal, furnishing and placement of select aggregate bedding, HDPE pipe, culvert outlet riprapped where required and all other items necessary for construction.
- 7.4.5** The method of measurement for constructing underdrain shall be on a linear foot basis measured along the centerline of the underdrain. Excavation necessary to construct the underdrain; furnishing and placement of the 3” to 6” non-calcareous sandstone, filter fabric and all other work necessary for the acceptable installation of the underdrain will not be measured but shall be considered incidental to the construction of the respective underdrains. The cost of these incidental items shall be included in the unit price bid for the underdrain.
- 7.4.6** The method of measurement for the construction of the un-perforated PVC SDR-35 underdrain conveyance pipe shall be on a linear foot basis of the un-perforated

pipe as measured from the end of the last joint of perforated pipe. Trench excavation, furnishing and placement of the pipe and fittings, compacted on-site backfill, minor grading, including all ancillary materials and operations required to construct the drainage conveyance pipes, will not be measured, but shall be considered incidental to this construction.

- 7.4.7** The method of measurement for pre-manufactured drainage structures shall be per each purchased, installed, and approved by the engineer. The unit prices for the Type “A” Manholes shall include the cost for the manhole cover and frame. The unit price bid for Type “G” Drop Inlets shall include the cost of the grate and frame.
- 7.4.8** The method of measurement for the HDPE Pipe shall be on a linear foot basis acceptably installed.
- 7.4.9** The method of measurement for cleaning existing ditches within the project limits shall be per linear foot and shall be paid as “Ditch Rehabilitation.”
- 7.4.10** The method of measurement for constructing the concrete Wingwall, L Wall and sidewalk/access replacement. The unit price shall include cost of any excavation, foundation preparation, furnishing and placement of concrete, reinforcing steel, form work, and all other incidental items necessary to construct the Wingwall, L-wall and concrete sidewalk/access replacement.

7.5 Basis of Payment

- 7.5.1** The unit price for the “Grouted Riprap Channel” shall include excavation, purchase and placement of rock and grout, grout key and all equipment, material and labor necessary for their installation.
- 7.5.2** The unit price for the “Riprap Lined Channel” shall include excavation, purchase and placement of rock and all equipment, material and labor necessary for their installation.
- 7.5.3** The unit price for the “Grass Lined Channel” shall include excavation, purchase and placement of control matting, and all equipment, material and labor necessary for their installation.
- 7.5.4** The unit price for “HDPE Culvert” shall include the cost of trench excavation and backfilling, including waste disposal, furnishing and placement of select aggregate bedding, HDPE pipe and all other items necessary for construction.
- 7.5.5** The unit price for the 4’ x 8’ Underdrain shall include the excavation of the trench, the pipe, stone and filter fabric required to install the underdrain and all the material and equipment necessary to complete the installation.

- 7.5.6** The unit price for the “Underdrain Conveyance Pipe shall include the excavation of the trench, the pipe and all the material and equipment necessary to complete the installation.
- 7.5.7** The unit price for the “Type “A” Manhole” shall include the base stone to level the unit, the manhole unit and lid and all the material and equipment necessary to complete the installation.
- 7.5.8** The unit price for the “Type “G” Inlet” shall include the base stone to level the unit, the drop inlet and grate and all the material and equipment necessary to complete the installation.
- 7.5.8** The unit price for “Ditch Rehabilitation” shall include all the material and equipment necessary to complete the installation.
- 7.5.10** The unit price for “Concrete Wingwall”, L Wall and Sidewalk/Access Replacement shall include the excavation and placement of the cast in place or pre-cast concrete Wingwall and L Wall and poured in place concrete sidewalk/access replacement all the material and equipment necessary to complete the installation.

7.6 Pay Items

- 7.1, "8' Grouted Riprap Channel", per linear foot.
- 7.2, "8' Riprap Lined Channel", per linear foot.
- 7.3, "8' Grass Lined Channel", per linear foot.
- 7.4, "6' Riprap Lined Channel", per linear foot.
- 7.5, "Ditch Rehabilitation", per linear foot
- 7.6, "24" HDPE Culvert", per linear foot.
- 7.7, "18" HDPE Culvert", per linear foot.
- 7.8, "15" HDPE Culvert", per linear foot.
- 7.9, "Type "A" Manhole", per vertical foot.
- 7.10, "Type "G" Inlet", per vertical foot.
- 7.11, "Concrete L Wall", per each.
- 7.12, "Concrete Wingwall", per each.
- 7.13, "Concrete Sidewalk/Access Replacement", per lump sum.
- 7.14, "500 psi Flowable Fill Pipe Encasement", per cubic yard
- 7.15, "4' x 8' Underdrain", per linear foot.
- 7.16, "Underdrain Conveyance Pipe", per linear foot.
- 7.17, "Piezometer Abandonment", per each.

8.0 UNCLASSIFIED EXCAVATION

8.1 Description

This work shall consist of excavating, transporting, stockpiling, placing and compacting mine spoil, soil, rock, coal refuse or other materials encountered in the re-grading, backfill and any other indicated incidental work. Rock and soil shall be classified as unclassified excavation.

8.2 Materials

On-site soil encountered in areas of proposed disturbance should be utilized for later revegetation whenever possible. The soil materials present in all areas to be excavated or filled shall be gathered and stockpiled in a suitable location, at the discretion of the WVDEP. Where required, strip soil to whatever depths encountered in a manner to prevent intermixing with underlying subsoils. Disturbance of the subsoils is to be minimized whenever possible. Remove heavy growths of grass from areas before stripping. Stockpile soil in storage piles in an area that will not create slope instability to provide free drainage of surface water. Cover stockpiles or use temporary seeding if necessary, to prevent erosion.

The regrading plan shall be conducted in a manner such that a 12- inch thick layer of soil material is uniformly spread over any areas of exposed refuse or unsuitable material resulting from the regrading operation. The soil cover shall not be compacted to the specifications stated for fill compaction, but shall be placed in a manner to allow for proper establishment of vegetation as described in the seedbed preparation portion of the Revegetation specifications. The required soil amendments are to be incorporated into this top-dressing material while it is in a loose state, to facilitate proper mixing of these materials within the soil matrix. The soil cover shall then be prepared by tracking-in with a dozer perpendicular to the slope. The WVDEP may require that the soil cover be scarified prior to seeding if compaction is considered excessive or if rills develop.

8.3 Borrow/Disposal Area

It is anticipated that the excavating and/or regrading operations for the coal refuse material will require use of the potential soil borrow areas as per Section 8.4 of these specifications. However, if off site borrow/disposal areas should be necessary to provide for material shortages or excess material disposal, then the Contractor is responsible for locating these areas and obtaining right-of-entry agreements in which the property owner indemnifies and holds WVDEP/OSMRE harmless from any injury or damage whatsoever resulting from the Contractor's use of the property. All prospective Contractors and Bidders must obtain their own permission from the landowner for any subsurface tests, borings, or pits. The Contractor shall be held responsible for compliance with all NEPA and NPDES requirements and shall provide proof of such compliance to the WVDEP. The Contractor shall submit a reclamation plan to the WVDEP and must obtain approval for said plan prior to any disturbance to the disposal site.

8.4 Soil Cover

This work consists of covering all areas having exposed refuse at the final grades with a 1-foot thick layer of suitable soil material. Also, any exposed refuse within the construction limits that is not being regraded shall be covered with a 1-foot thick layer of suitable soil material. The soil shall be obtained in conjunction with clearing and grubbing operations, regrading, drainage feature excavation, and/or from designated or determined soil borrow areas, both on or off-site. A minimum of 12 inches of soil material shall be placed over all refuse encountered during construction. Excavation of soil cover shall be as per Section 8.5.1. It is anticipated an adequate amount of soil cover will be available on-site. However, the Contractor is responsible for securing an off-site borrow area in the event that adequate soil is not available on site at no additional cost to WVDEP. If, during the course of construction, the need for off-site borrow areas becomes evident, the Contractor shall obtain prior approval from the WVDEP for such borrowing and the borrow area must comply with the attached NEPA regulations. The Contractor shall obtain Right-of-Entry Agreements for any soil or rock borrow areas outside the construction limits which provide for entry by the WVDEP and OSM for inspection purposes, with such agreements stating that the property owner(s) indemnifies and holds the WVDEP and OSM harmless from injury or damage whatsoever resulting from the use of the property.

8.5 Construction Methods

8.5.1 Excavation

Material excavation shall consist of the required removal of materials from the areas shown and the sloping and finishing of the areas to the required lines and grades as shown on the drawings. The slopes may be varied only by permission of the WVDEP. Any excavation beyond planned grades will not be paid for unless prior authorization is obtained from the Engineer. Slopes shall be trimmed neatly to present a uniform surface, free from hollows and protrusions and loose or overhanging rocks. The tops of all slopes shall be rounded to form a smooth, uniform transition to the existing ground. Areas cut to grade in refuse are to be undercut one foot below the final grades shown on the reclamation plan with final grades achieved by placing one foot of soil cover material atop the undercut areas.

The reclamation approach described in these construction specifications is intended to provide a lasting, stable configuration. The Contractor is required to exercise care to avoid conditions which may result in unstable conditions during the construction process. The Contractor shall be responsible for protecting residences from damage.

The Contractor must utilize material removal techniques, which are generally considered to be conducive to retaining slope stability. Additionally, disturbed slopes shall be brought to the design template as soon as practical and shall be protected in accordance with Section 6, "Revegetation".

8.5.2 Material Placement

Depositing and compacting fill in layers shall be started at the lowest point in the fill below grade, at the bottom of ravines and at the toe of the slope on side hills fills. Prior to fill placement, existing foundation for the embankment will be proof-rolled and all unsuitable material, as determined by the WVDEP, will be removed. Rock that is found on site can be buried after the rock is broken into 2'x2'x2' sections and then placed at the lowest possible point of the fill. The area around the rock shall be well compacted before proceeding to the next backfill lift.

Excavated material shall be placed in embankments in successive layers not to exceed one (1) foot in thickness before compaction. The layers shall be constructed approximately horizontal. Each layer, before starting the next, shall be leveled and smoothed by means of power driven graders, dozers, or other suitable equipment with adequate weight, capacity, and power to do the work. Layers shall be extended across the entire fill at the level of deposition unless otherwise authorized by the WVDEP. Each layer, before starting the next, shall be compacted.

Fill materials to be used in any area of an embankment shall be free from trash, debris, frozen soil, organic material or other foreign material.

Embankment fill and embankment subgrade materials shall be compacted to at least 90% of Standard Proctor maximum dry density at a moisture content of not less than 2% below nor greater than 3% above optimum. Testing shall be at a frequency approved by the engineer. One lot (5 tests) per day during fill placement shall serve as a minimum. When material on the project has changed and compaction is no longer at 90% a new standard proctor shall be required before using the new material.

Embankment fill material which does not contain sufficient moisture to be compacted to the requirements specified herein shall receive applications of water necessary for compaction. Water shall be applied with suitable sprinkling devices and shall be thoroughly incorporated into the material which is to be compacted. Embankment fill material which contains excess moisture shall be dried prior to compaction. Sufficient discing equipment shall be continuously available at the site and shall be used to add water or remove excess moisture from fill materials.

At the close of each day's work, or when work is to be stopped for a period of time, the entire surface of the compacted fill shall be sealed by a method approved by the engineer. If, after a prolonged rainfall, the top surface of the embankments are too wet and plastic to work properly, the top material shall be removed to expose firm material. Ruts in the surface of any layer shall be suitably filled or eliminated by grading before compaction. The disturbed areas will be revegetated according to Section 6, "Revegetation".

8.6 Method of Measurement

8.6.1 The method of measurement for excavation shall be by lump sum, which shall be the material actually moved and disposed of as herein described, measured in its original location and determined from the certified cross-sections by the method of average end areas. No separate payment will be made for ditch, underdrain, or any other incidental work referred to under “Unclassified Excavation”, or any regrading or excavation where there are no cross-sections.

8.6.2 The method of measurement for liming, fertilizing, seeding and mulching soil borrow areas located within the construction limits as addressed in this item is to be included under Section 6.0, “Revegetation”, as contained elsewhere in these specifications.

8.7 Basis of Payment

8.7.1 Payment for material excavated, transported, and/or backfilled to achieve the final grades will be by the unit price bid for “Unclassified Excavation”.

8.8 Pay Item

Item 8.0, “Unclassified Excavation”, per lump sum.

9.0 MINE SEALS

9.1 Description

This work shall consist of dewatering the existing mine pool, excavating the mine opening, installing the gravel bulkhead wet mine seal, modified wet seal and bat gate seal, and backfilling the opening to near original grade. It shall be constructed in accordance with the typical details at the locations shown on the plans. Materials shall conform to those listed below. The length of the conveyance pipes and associated cleanouts may vary based on the conditions revealed at the time of construction and the final grades that are achieved. The maximum run allowable of conveyance pipe without installation of cleanouts shall be 150 feet.

9.2 Materials

9.2.1 Stone

The stone shall consist of sound, durable 3” to 6” non-calcareous crushed sandstone. Crushed stone shall consist of particles of clean, hard, tough, durable rock, free from adherent coating. Stone shall have a maximum weighted loss of thirty (30) percent when subjected to five (5) cycles of the Sodium Sulfate Soundness Test – **ASTM C88** (ASTM C88-05 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate), as modified by the American Association of State Highway and Transportation Officials (**AASHTO**) **T-104**. Non-calcareous stone shall have an acid base accounting test to show the potential for acid producing material in the stone. A laboratory certification of soundness and acid base shall be submitted to the WVDEP prior to delivery.

9.2.2 Filter Fabric

Filter Fabric shall be as specified in the table below:

PROPERTY	TEST METHOD	ENGLISH	METRIC
Weight – Typical	ASTM D-5261	NA	NA
Tensile Strength	ASTM D-4632	120 lbs	500 N
Elongation @ Break	ASTM D-4632	50%	50%
CBR Puncture	ASTM D-6241	310 lbs	1,380 N
Trapezoidal Tear	ASTM D-4533	50 lbs	200 N
Apparent Opening Size	ASTM D-4751	70 US Sieve	.212 mm
Permittivity	ASTM D-4491	1.7 Sec-1	1.7 Sec-1

Water Flow Rate	ASTM D-4491	135 g/min/sf	5,550 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

9.2.3 Pipe

Wet Mine Seal outlet pipes shall consist of custom perforated 12 inch diameter PVC SDR 35 grade extending a minimum of two (2) joints into the mine and through the stone bulkhead as shown on the Plans. The riser component for two (2) of the seal components (with 18 inch diameter custom perforated end cap) and perforated stub (with 12” diameter custom perforated end cap) and for the other component shall also be custom perforated 12 inch diameter PVC SDR 35. Wet Mine Seal Outlet pipes shall extend from one foot (1.0’) inside the downstream edge of the stone bulkhead to the receiving outlet ditches surrounded by the “best on site clayey material” from subgrade to the bottom of the mine seal. A bat gate shall be installed at the end of the bat gate pipe as detailed on the Plans. Animal guards shall be constructed and installed on the downstream end of each of the outlet pipes as detailed on the Plans. Clean outs, if required, shall be installed along the two (2) outlet pipe alignments and shall consist of necessary wye fittings and connections compatible with SDR 35 PVC pipe and extending from the outlet pipe to final grades shown on the Plans.

9.3 Construction Methods

9.3.1 Excavation of the mine opening shall proceed in a manner which will control the release of the mine pool. The opening shall be cleaned of debris to the satisfaction of the Engineer. Once the opening has been cleaned, a 6" layer of stone shall be placed as pipe bedding. The pipes with risers shall be attached to steel plates and placed in the openings as shown on the attached Plans. The Gravel Bulkhead will be constructed and covered with one layer of Filter Fabric and compacted clay and soil cover as shown on the Plans. Solid pipe shall extend from the mine seal to a riprap channel discharging one foot above the invert of the channel. All pipes shall have a minimum grade of 2 percent.

The Contractor shall be solely responsible for any damages caused by dewatering activities.

9.3.2 A Dewatering Plan shall be submitted and approved by the engineer prior to any work taking place. The Contractor shall install and operate a water treatment system utilizing soda ash briquettes in a manner approved by the engineer to maintain a pH between 6.0 and 9.0 in all water above base flow while dewatering mine. Anytime a mine portal is being dewatered a call must be made to the spill hotline at 1-800-642-3074 to advise of the work being performed. Contractor must get either a confirmation number or a name of the person taking the call.

9.3.3 The wet mine seals, modified mine seals and bat gate seals will require excavation into the mine entries/collapsed portals for proper installation. The Contractor shall perform this work after taking all necessary precautions with regard to

control and treatment of the impounded water, with all work being performed at the risk of the Contractor. The WVDEP accepts no responsibility or liability for any related construction activities. A dewatering plan shall be submitted to the WVDEP for approval prior to seal construction, with pool reduction possibly being provided from above with a well-point system or a similar dewatering scheme.

Construction of wet mine seals, modified mine seals and bat gate seals shall be in accordance with the plan details. Filter fabric shall separate all aggregate/soil interfaces. The clay seal and pipe outlet trenches shall be compacted in accordance with Section 12 of these specifications. The Contractor shall adhere to OSHA Regulation 29 CFR Part 1926 during all excavation and trenching activities.

9.4 METHOD OF MEASUREMENT

9.4.1 Wet Mine Seals shall be measured per mine seal installed and shall include all excavation, dewatering, stone, filter fabric, and pipe necessary to complete the seal. The end of the mine seal shall be considered to be at the end of the outlet pipe where it outlets from the clay seal barrier. If solid pipe is required to convey the mine discharge to the collection channel, then it shall begin at the end of the mine seal and shall be considered to be conveyance pipe.

9.4.2 Modified Mine Seals shall be measured per modified seal installed and shall include excavation, dewatering, stone, filter fabric, and pipe necessary to complete the seal. The mine seal shall be considered to end at a point extending for a length of two (2) pipe joints from where the SDR 35 pipe that lies within the mine seal connects to the 90 degree elbow. Solid pipe extending from the end of the mine seal to the drainage channel shall be considered to be conveyance pipe and shall begin where identified on the plan drawings or as approved by the engineer in the field if field adjustments are necessary.

9.4.3 The method of measurement for the construction of the PVC SDR-35 drainage conveyance pipe shall be on a linear foot basis of the un-perforated pipe as measured from clay cut-off to the downstream pipe outlet acceptably installed and measured in place per single run of pipe. Trench excavation, furnishing and placement of the pipe and fittings, any necessary cleanouts, compacted on-site backfill, riprap apron where required at pipe outlet or ultimate drainage discharge, and minor grading, including all ancillary materials and operations required to construct the drainage conveyance pipes, will not be measured, but shall be considered incidental to this construction.

9.4.4 Soda Ash Briquettes shall be measured per 50# bag used.

9.5 Basis of Payment

9.5.1 The unit price for Wet/Modified Mine Seal with foam backfill shall include the excavation, stone, filter fabric and all equipment, material and labor necessary for their installation.

9.5.2 The unit price for the “Mine Seal Conveyance Pipe shall include the excavation of the trench, the pipe and all the material and equipment necessary to complete the installation.

9.5.3 The unit price for Soda Ash Briquettes shall be for each 50 pound bag used.

9.6 PAY ITEMS

Item 9.1, "Wet/Modified Mine Seal", per each.

Item 9.2, “Mine Seal Conveyance Pipe”, per linear foot.

Item 9.3, “Soda Ash Briquettes (50 lb bag)", per each.

10.0 UTILITIES

10.1 Description

This work shall consist of all necessary measures to relocate, maintain and protect all utilities within the limits of work specified herein and on the construction drawings.

The contractor shall notify the utility in writing at least fifteen (15) but preferably thirty (30) days prior to the time work within the area will be done.

The Contractor shall be responsible for making all necessary arrangements and/or performing all necessary work to the satisfaction of the affected utility company and/or the West Virginia Department of Highways in connection with any disturbances within their right-of-way or services.

The Contractor shall be solely responsible for locating all utilities within the limits of work. All damage made to existing utilities by the Contractor shall be the sole responsibility of the Contractor. In the event damage does occur, the Contractor shall notify the affected utility and the WVDEP immediately and make or have made all necessary repairs and bear the expenses thereof and resulting damage caused thereby.

The Contractor shall obtain right-of-entry and/or any necessary permits for repairs or relocation.

Utility Companies Contacts

Miss Utility of West Virginia 1-800-245-4848

10.2 Materials

All materials used for utility related disturbance shall be in accordance with these specifications or as indicated by the affected utility.

10.3 Construction Methods

All work shall be in accordance with these specifications or in accordance with those methods as indicated by the affected utility.

10.4 Method of Measurement

The Contractor will not bid on utility work but will be reimbursed the actual approved payed invoice cost. The Contractor shall submit an estimate for utility relocation to the WVDEP for approval from the utilities affected by the proposed reclamation will be reimbursed.

11.0 Asphalt Pavement Wearing Course

11.1 Description

Bituminous paving materials for repair of streets, parking lots, or driveways shall be provided in accordance with this Section.

11.2 Materials

11.2.1 Asphalt cement and aggregate shall be provided by a plant meeting the requirements of Section 401 of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010. The materials provided shall meet the requirements of Item 401002 hot-mix asphalt wearing course in Table 401.14 of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010.

11.3 Method of Construction

Site preparation and placement of asphalt pavement will be in accordance with the requirements of Section 401.10.1 of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010.

11.4 Method of Measurement

11.4.1 The method of measurement for Asphalt Pavement Wearing Course shall be on a per ton basis based on weigh tickets. There will be a 2" compacted Type I Wearing course required on all areas designated on the plans. The unit price bid per ton shall include all asphalt, site preparation, placement, and compaction. Only areas designated on the Plans for pavement repairs shall be included for payment. Other areas requiring repair as a result of the Contractors use and actions as determined and directed by the Engineer shall not be included for payment, rather all costs associated with these repairs shall be borne by the Contractor.

11.4.2 The method of measurement for Asphalt Base Course shall be on a per ton basis based on weigh tickets. There will be a base course required on all areas designated on the plans. The unit price bid per ton shall include all asphalt, site preparation, placement, and compaction. Only areas designated on the Plans for pavement repairs shall be included for payment. Other areas requiring repair as a result of the Contractors use and actions as determined and directed by the Engineer shall not be included for payment, rather all costs associated with these repairs shall be borne by the Contractor.

11.4.3 Shoulder Stone

Shoulder stone shall be placed along the outer edges of the newly laid asphalt. The stone shall be Class I Crusher Run and shall be placed to the width as shown on the plans. The stone shall be compacted with a rubber tire roller. The stone will be paid the tonnage taken from the weigh tickets.

11.6 Basis of Payment

11.6.1 The basis of payment will be at the unit price bid per ton for the area of asphalt material placed at the site and as directed and approved by the Engineer. The unit cost shall be full compensation for all work as described in the specifications and detailed on the Plans in a workmanlike and acceptable manner, including all labor, equipment, tools, materials, and all incidentals required to complete the work.

11.6.2 The basis of payment will be at the unit price bid per ton for the area of shoulder stone placed at the site and as directed and approved by the Engineer. The unit cost shall be full compensation for all work as described in the specifications and detailed on the Plans in a workmanlike and acceptable manner, including all labor, equipment, tools, materials, and all incidentals required to complete the work.

11.7 Pay Item

Item 11.1, “Asphalt Pavement Wearing Course”, per ton.

Item 11.2, “Shoulder Stone”, per ton.

17.0 TRAFFIC CONTROL

17.1 Description

This work shall consist of all necessary measures to maintain and to protect traffic; to protect the work in progress; to protect adjacent property from excess dust resulting from the construction area, and to maintain traffic through, around, or adjacent to the construction area, in accordance with these specifications or as directed by WVDEP.

17.2 Materials

All materials used for traffic control shall be in accordance with the current WV Division of Highways Manual “**Traffic Control for Streets and Highway Construction and Maintenance Operations.**”

17.3 Construction Methods

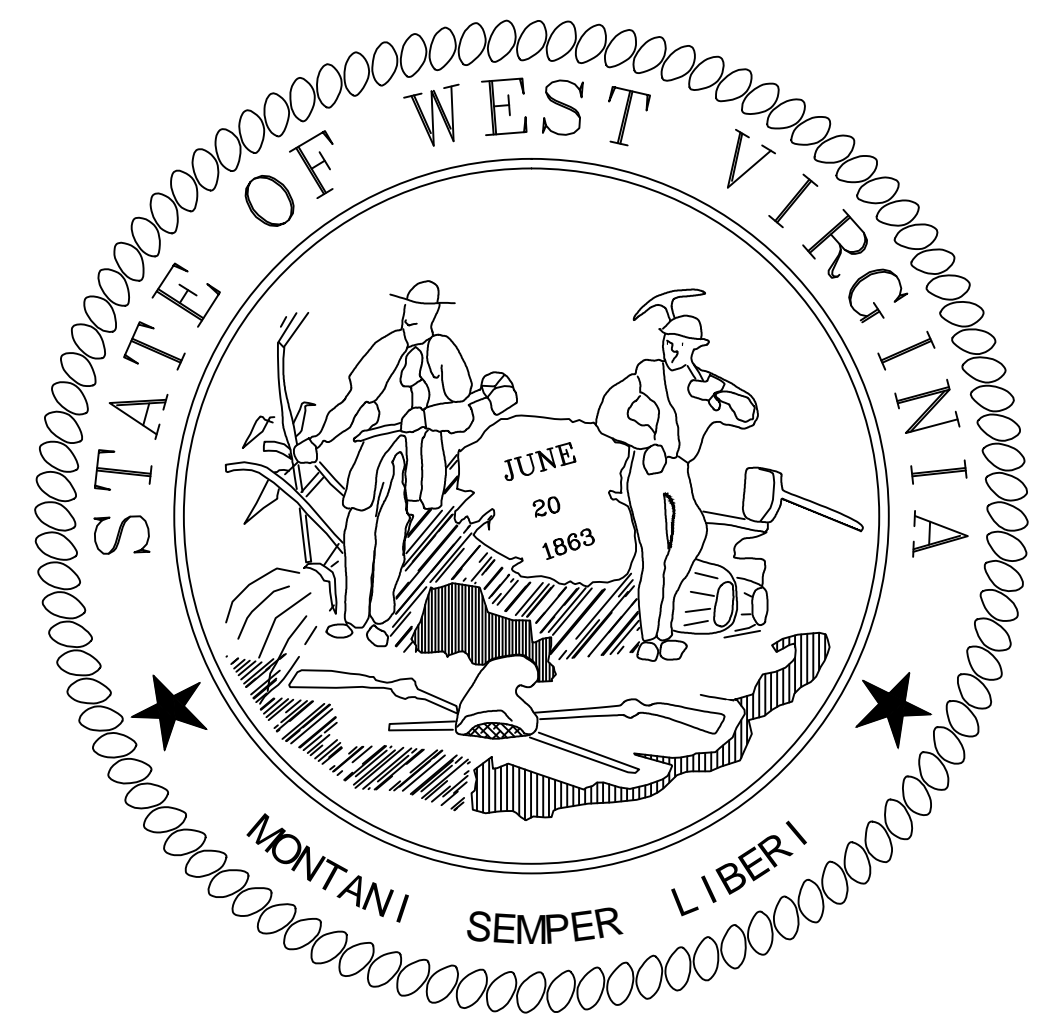
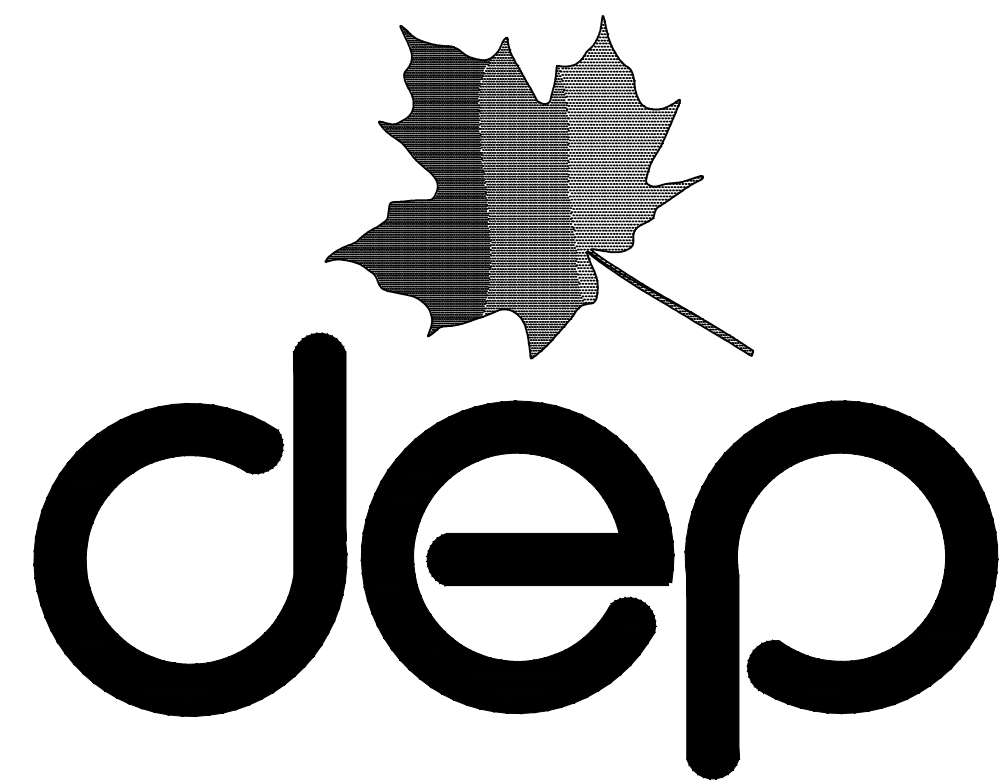
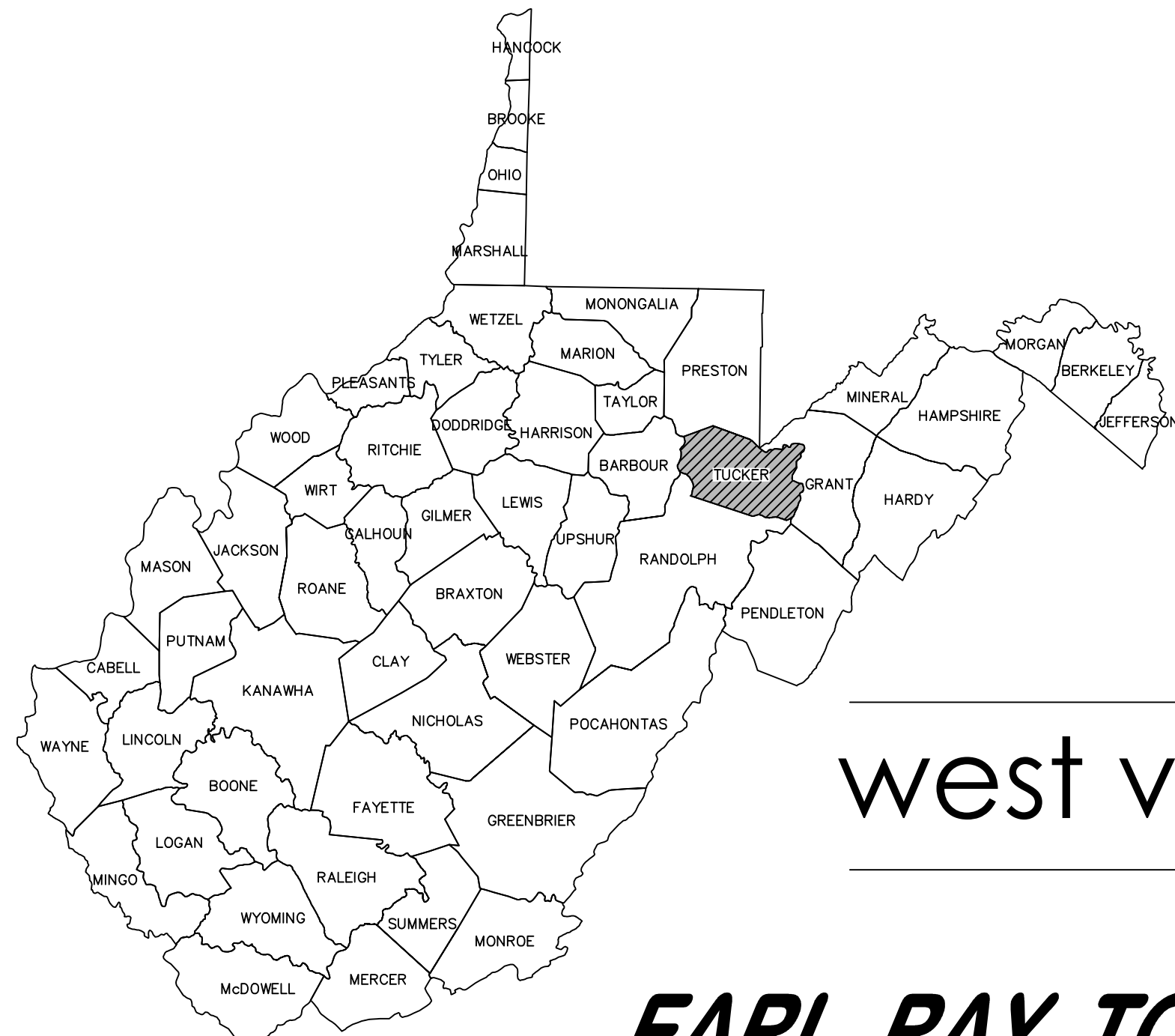
Control and protection of traffic through work areas shall comply with the current WV Division of Highways Manual “**Traffic Control for Streets and Highway Construction and Maintenance Operations**”. All traffic plans must be coordinated through the WVDOH.

The Contractor shall be responsible for developing a traffic control plan that complies with the WVDOH requirements. A copy of the traffic control operational plan and WVDOH’s approval of said plan shall be submitted to the WVDEP Representative for approval prior to its implementation. Access to residences shall be maintained during construction. The Contractor shall give the WVDOH seven (7) working days notice prior to the beginning of work so the public can be made aware of forthcoming construction activities.

17.4 Method of Measurement

The method of measurement for determining the quantity of work done as described above for Traffic Control work will not be a separate pay item, but will be considered incidental to all other work associated with the construction of this Project as described in these Specifications, and as shown on the Plans.

Permit fees and other miscellaneous associated costs associated with and required for any Traffic Control work shall also be considered incidental to all other work associated with the construction of this Project as described in these Specifications, and as shown on the Plans. No separate pay item exists for Traffic Control work.

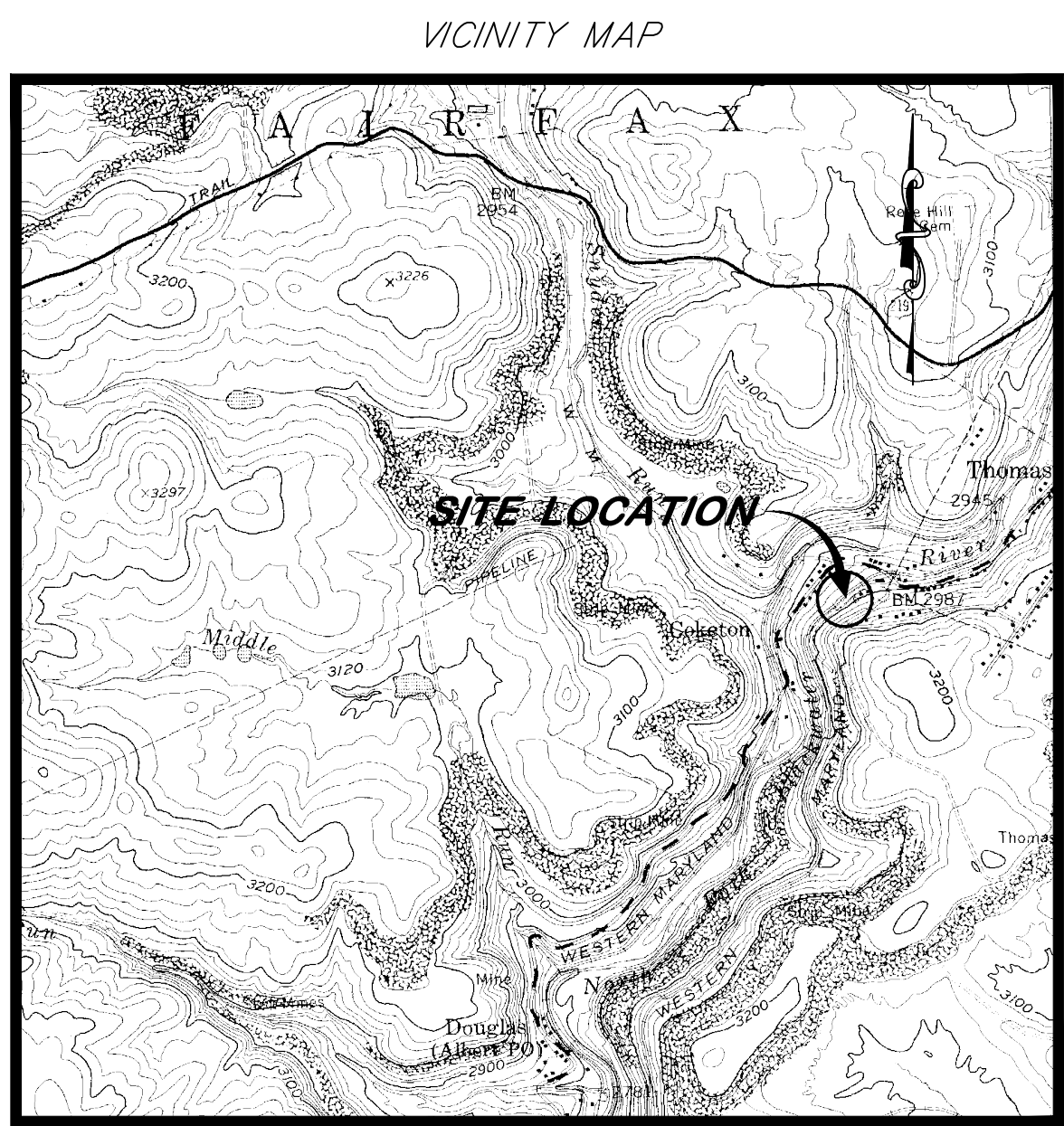


west virginia department of environmental protection

EARL RAY TOMBLIN, GOVERNOR RANDY C. HUFFMAN, CABINET SECRETARY
OFFICE OF ABANDONED MINE LANDS AND RECLAMATION

DAVIS COAL AND COKE

NEAR COKETON
 TUCKER COUNTY, WEST VIRGINIA



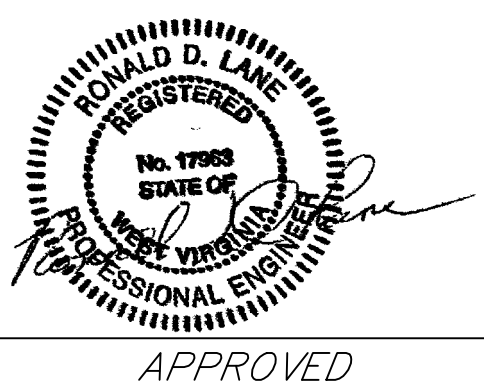
USGS 7.5' QUAD (LEAD MINE)

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
2	EXISTING CONDITIONS AND TAX MAP OVERLAY
3	RECLAMATION PLAN
4	SEDIMENT CONTROL PLAN
5	DRAINAGE PROFILES
6	TYPICAL DETAILS (1) AND TYPICAL SECTIONS
7	TYPICAL DETAILS (2)
8	TYPICAL DETAILS (3)
9	SEDIMENT CONTROL DETAILS

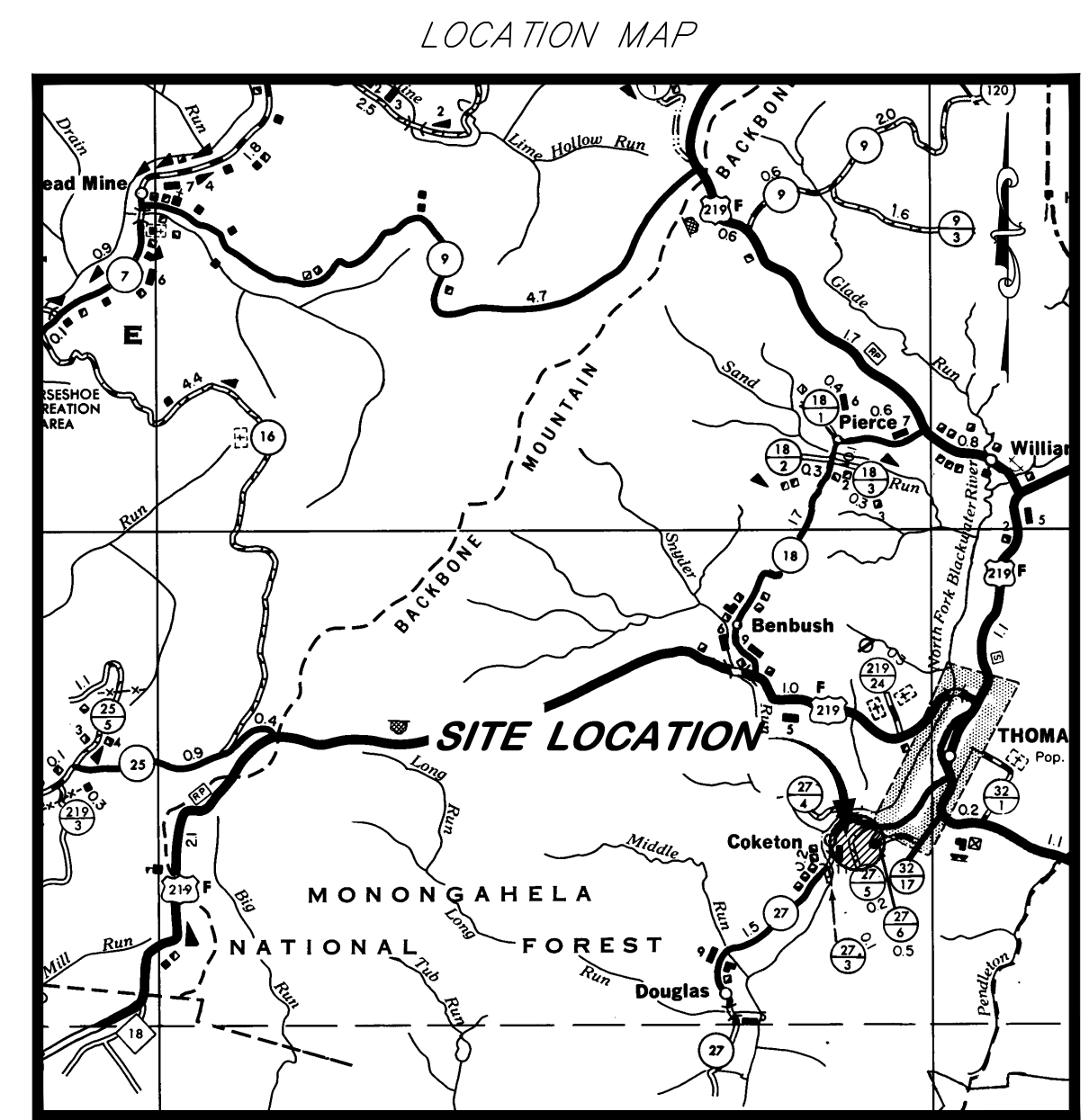
BID SCHEDULE

ITEM NO.	DESCRIPTION	QUANTITY
1.0	MOBILIZATION AND DEMOBILIZATION (LIMITED TO 10% OF TOTAL BID)	LS
2.0	CONSTRUCTION LAYOUT (LIMITED TO 5% OF TOTAL BID)	LS
3.0	QUALITY CONTROL (LIMITED TO 3% OF TOTAL BID)	LS
4.1	SITE PREPARATION (LIMITED TO 10% OF TOTAL BID)	LS
4.2	ACCESS ROAD STONE	35 TONS
4.3	GRAVEL DRIVE REHABILITATION	205 TONS
5.1	SILT FENCE SEDIMENT CONTROL	1300 LF
5.2	STRAW WATTLE EROSION CONTROL	185 LF
5.3	STABILIZED CONSTRUCTION ENTRANCE (70 LF x 12' WIDTH)	25 TONS
5.4	ROCK CHECK DAM	4 EA.
6.0	REVEGETATION	1.7 AC.
7.1	8" GROUTED RIPRAP CHANNEL (CHANNEL "C")	375 LF
7.2	8" RIPRAP CHANNEL (CHANNELS "A" AND "B")	360 LF
7.3	8" GRASS LINED CHANNEL W/CURLEX TYPE 1 (CHANNEL "D")	345 LF
7.4	6" RIPRAP CHANNEL (CHANNEL "E")	20 LF
7.5	ROAD DITCH REHABILITATION	680 LF
7.6	24" HDPE CULVERT PIPE	265 LF
7.7	18" HDPE CULVERT PIPE	670 LF
7.8	15" HDPE CONVEYANCE PIPE	100 LF
7.9	TYPE "A" MANHOLE	8 EA.
7.10	TYPE "G" INLET	7 EA.
7.11	CONCRETE "L" WALL	2 EA.
7.12	CONCRETE WINGWALL	1 EA.
7.13	CONCRETE SIDEWALK/ACCESS REPLACEMENT	LS
7.14	500 PSI FLOWABLE FILL PIPE ENCASUREMENT	12 CY
7.15	4' X 8" UNDERDRAIN (12" PVC SDR-35) W/40 MIL PVC LINER	340 LF
7.16	UNDERDRAIN CONVEYANCE PIPE (12" PVC SDR-35)	30 LF
7.17	MONITORING WELL/PIEZOMETER ABANDONMENT	4 EA.
8.0	UNCLASSIFIED EXCAVATION (REGRADE AREAS)	LS
9.1	WET/MODIFIED MINE SEAL	2 EA.
9.2	MINE SEAL CONVEYANCE PIPE	12 LF
9.3	SODA ASH BRIQUETTES (50 LB BAG)	10 EA.
11.1	ASPHALT PAVEMENT WEARING COURSE	20 TONS
11.2	SHOULDER STONE	20 TONS



APPROVED

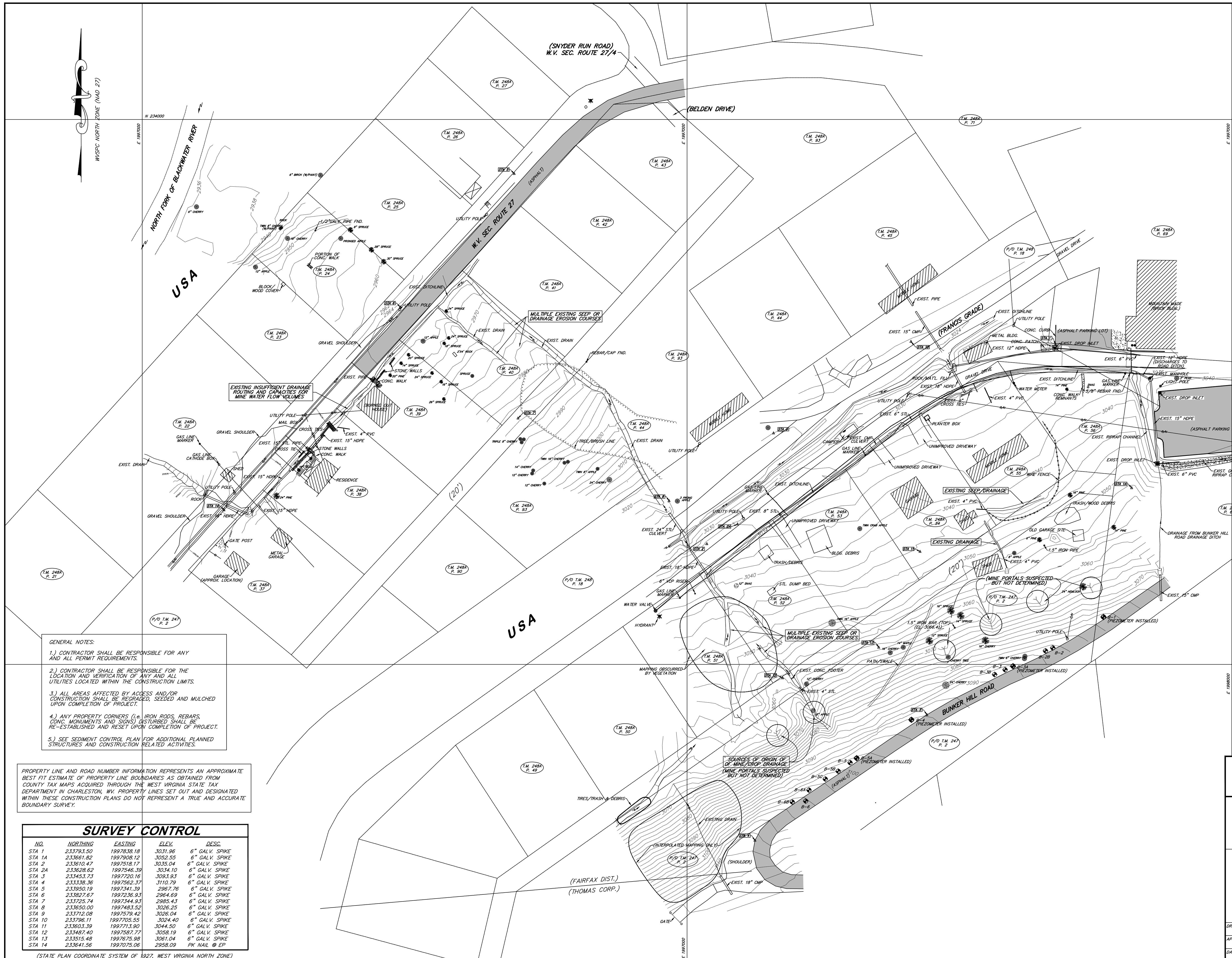
DATE



COUNTY HIGHWAY MAP, 1" = 1 MI.

LEGEND

- APPROX. PROPERTY LINE
- EXIST. DRAIN OR WATER COURSE
- EXISTING UTILITY LINE
- EXISTING WATER LINE(S)
- EXISTING GAS LINE(S)
- DIRECTION OF FLOW
- TAX MAP AND PARCEL NO.
- EXISTING UTILITY OR LIGHT POLE
- EXISTING WATER METER
- EXISTING SURVEY CONTROL
- EXISTING CULVERT OR PIPE
- EXISTING OR PROBABLE MINE OPENING



- GENERAL NOTES:**
- 1.) CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL PERMIT REQUIREMENTS.
 - 2.) CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND VERIFICATION OF ANY AND ALL UTILITIES LOCATED WITHIN THE CONSTRUCTION LIMITS.
 - 3.) ALL AREAS AFFECTED BY ACCESS AND/OR CONSTRUCTION SHALL BE REGRADED, SEEDED AND MULCHED UPON COMPLETION OF PROJECT.
 - 4.) ANY PROPERTY CORNERS (i.e. IRON RODS, REBARS, CONC. MONUMENTS AND SIGNS) DISTURBED SHALL BE RE-ESTABLISHED AND RESET UPON COMPLETION OF PROJECT.
 - 5.) SEE SEDIMENT CONTROL PLAN FOR ADDITIONAL PLANNED STRUCTURES AND CONSTRUCTION RELATED ACTIVITIES.

PROPERTY LINE AND ROAD NUMBER INFORMATION REPRESENTS AN APPROXIMATE BEST FIT ESTIMATE OF PROPERTY LINE BOUNDARIES AS OBTAINED FROM COUNTY TAX MAPS ACQUIRED THROUGH THE WEST VIRGINIA STATE TAX DEPARTMENT IN CHARLESTON, WV. PROPERTY LINES SET OUT AND DESIGNATED WITHIN THESE CONSTRUCTION PLANS DO NOT REPRESENT A TRUE AND ACCURATE BOUNDARY SURVEY.

SURVEY CONTROL				
NO.	NORTHING	EASTING	ELEV.	DESC.
STA 1	233793.50	1997638.18	3031.96	6" GALV. SPIKE
STA 1A	233861.82	1997908.12	3052.55	6" GALV. SPIKE
STA 2	233610.47	1997518.17	3035.04	6" GALV. SPIKE
STA 2A	233628.62	1997546.39	3034.10	6" GALV. SPIKE
STA 3	233453.73	1997720.16	3093.93	6" GALV. SPIKE
STA 4	233338.36	1997562.37	3110.79	6" GALV. SPIKE
STA 5	233950.19	1997341.39	2967.76	6" GALV. SPIKE
STA 6	233827.67	1997236.93	2964.69	6" GALV. SPIKE
STA 7	233725.74	1997344.93	2985.43	6" GALV. SPIKE
STA 8	233850.00	1997483.52	3026.25	6" GALV. SPIKE
STA 9	233712.08	1997279.42	3026.04	6" GALV. SPIKE
STA 10	233796.11	1997705.55	3024.40	6" GALV. SPIKE
STA 11	233603.39	1997713.90	3044.50	6" GALV. SPIKE
STA 12	233487.40	1997287.77	3055.19	6" GALV. SPIKE
STA 13	233515.48	1997625.48	3081.04	6" GALV. SPIKE
STA 14	233641.56	1997075.06	2958.09	PK NAIL @ EP

(STATE PLAN COORDINATE SYSTEM OF 1927, WEST VIRGINIA NORTH ZONE)

State of West Virginia
Department of Environmental Protection
Abandoned Mine Lands and Reclamation

DAVIS COAL AND COKE

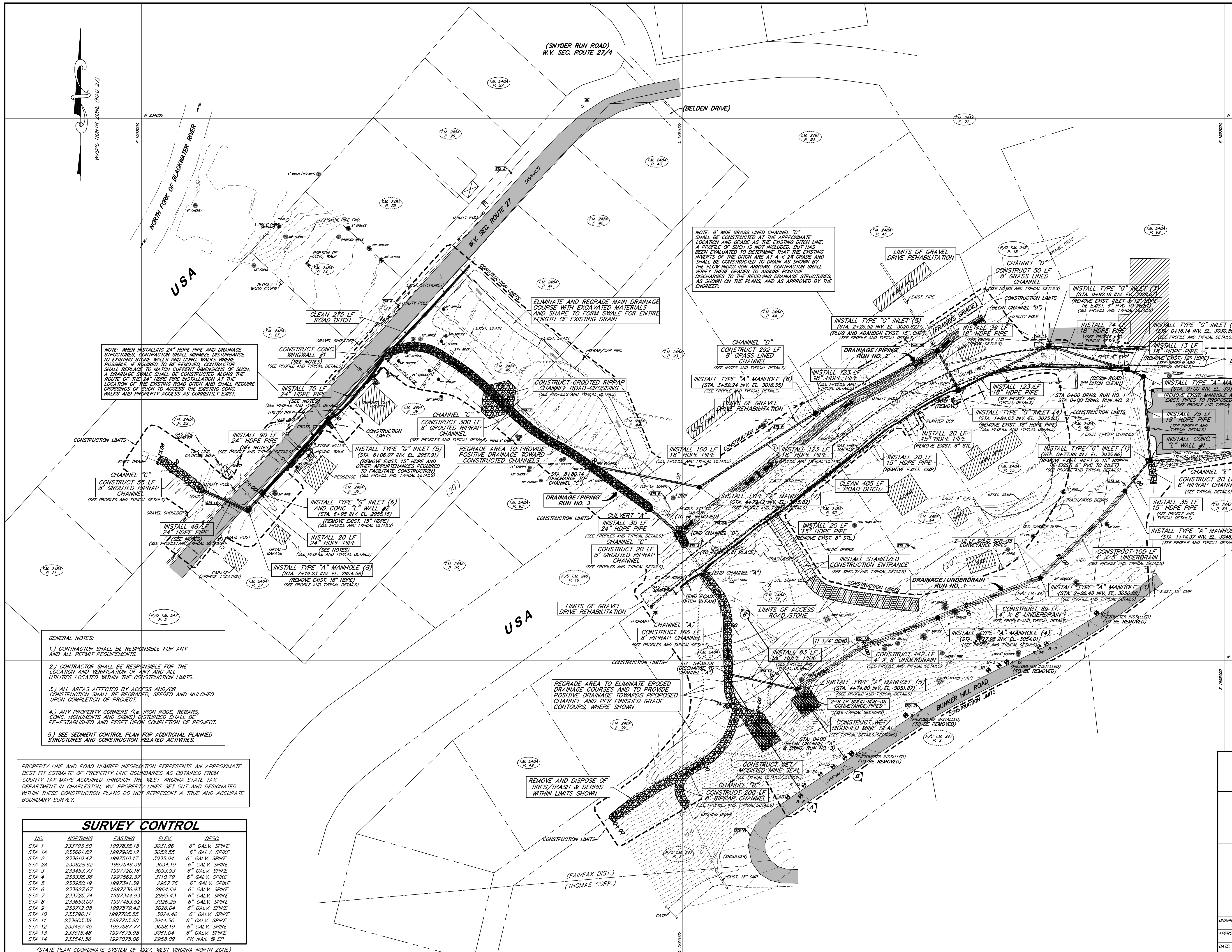
**EXISTING CONDITIONS AND
TAX MAP OVERLAY**

DRAWN BY: DWH
APPROVED BY: RL
DATE: 12/30/2014

SCALE: 1" = 40'
SHEET NO. **2**
OF 9

LEGEND

- APPROX. PROPERTY LINE
- EXIST. DRAIN OR WATER COURSE
- EXISTING UTILITY LINE
- EXISTING WATER LINE(S)
- EXISTING GAS LINE(S)
- DIRECTION OF FLOW
- TAX MAP AND PARCEL NO.
- EXISTING UTILITY OR LIGHT POLE
- EXISTING WATER METER
- EXISTING SURVEY CONTROL
- EXISTING CULVERT OR PIPE
- PROPOSED TYPE "G" INLET
- PROPOSED TYPE "A" MANHOLE
- PROPOSED HDPE PIPE
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED ROCK CHECK DAM
- PROPOSED 4' W X 8' UNDERDRAIN
- PROPOSED RIPRAP OR GROUDED RIPRAP CHANNEL
- PROPOSED 8' GRASS LINED SWALE



NOTE: 8' WIDE GRASS LINED CHANNEL "D" SHALL BE CONSTRUCTED AT THE APPROXIMATE LOCATION AND GRADE AS THE EXISTING DITCH LINE. A PROFILE OF SUCH IS NOT INCLUDED, BUT HAS BEEN EVALUATED TO DETERMINE THAT THE EXISTING INVERTS OF THE DITCH ARE AT A < 2% GRADE AND SHALL BE CONSTRUCTED TO DRAIN AS SHOWN BY THE FLOW INDICATION ARROWS. CONTRACTOR SHALL VERIFY THESE GRADES TO ASSURE POSITIVE DISCHARGES TO THE RECEIVING DRAINAGE STRUCTURES, AS SHOWN ON THE PLANS, AND AS APPROVED BY THE ENGINEER.

NOTE: WHEN INSTALLING 24" HDPE PIPE AND DRAINAGE STRUCTURES, CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING STONE WALLS AND CONC. WALKS WHERE POSSIBLE. IF REQUIRED TO BE REMOVED, CONTRACTOR SHALL REPLACE TO MATCH CURRENT DIMENSIONS OF SUCH. A DRAINAGE SWALE SHALL BE CONSTRUCTED ALONG THE ROUTE OF THE 24" HDPE PIPE INSTALLATION AT THE LOCATION OF THE EXISTING ROAD DITCH AND SHALL REQUIRE CROSSINGS OF SUCH TO ACCESS THE EXISTING CONC. WALKS AND PROPERTY ACCESS AS CURRENTLY EXIST.

ELIMINATE AND REGRADE MAIN DRAINAGE COURSE WITH EXCAVATED MATERIALS AND SHAPE TO FORM SWALE FOR ENTIRE LENGTH OF EXISTING DRAIN

REGRADE AREA TO PROVIDE POSITIVE DRAINAGE TOWARD CONSTRUCTED CHANNELS

REGRADE AREA TO ELIMINATE ERODED DRAINAGE COURSES AND TO PROVIDE POSITIVE DRAINAGE TOWARDS PROPOSED CHANNEL AND PER FINISHED GRADE CONTOURS, WHERE SHOWN

REMOVE AND DISPOSE OF TIRES, TRASH & DEBRIS WITHIN LIMITS SHOWN

- GENERAL NOTES:**
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STA 2A	233628.62	1997546.39	3034.10	6" GALV. SPIKE
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(STATE PLAN COORDINATE SYSTEM OF 1927, WEST VIRGINIA NORTH ZONE)

State of West Virginia
Department of Environmental Protection
Abandoned Mine Lands and Reclamation

DAVIS COAL AND COKE

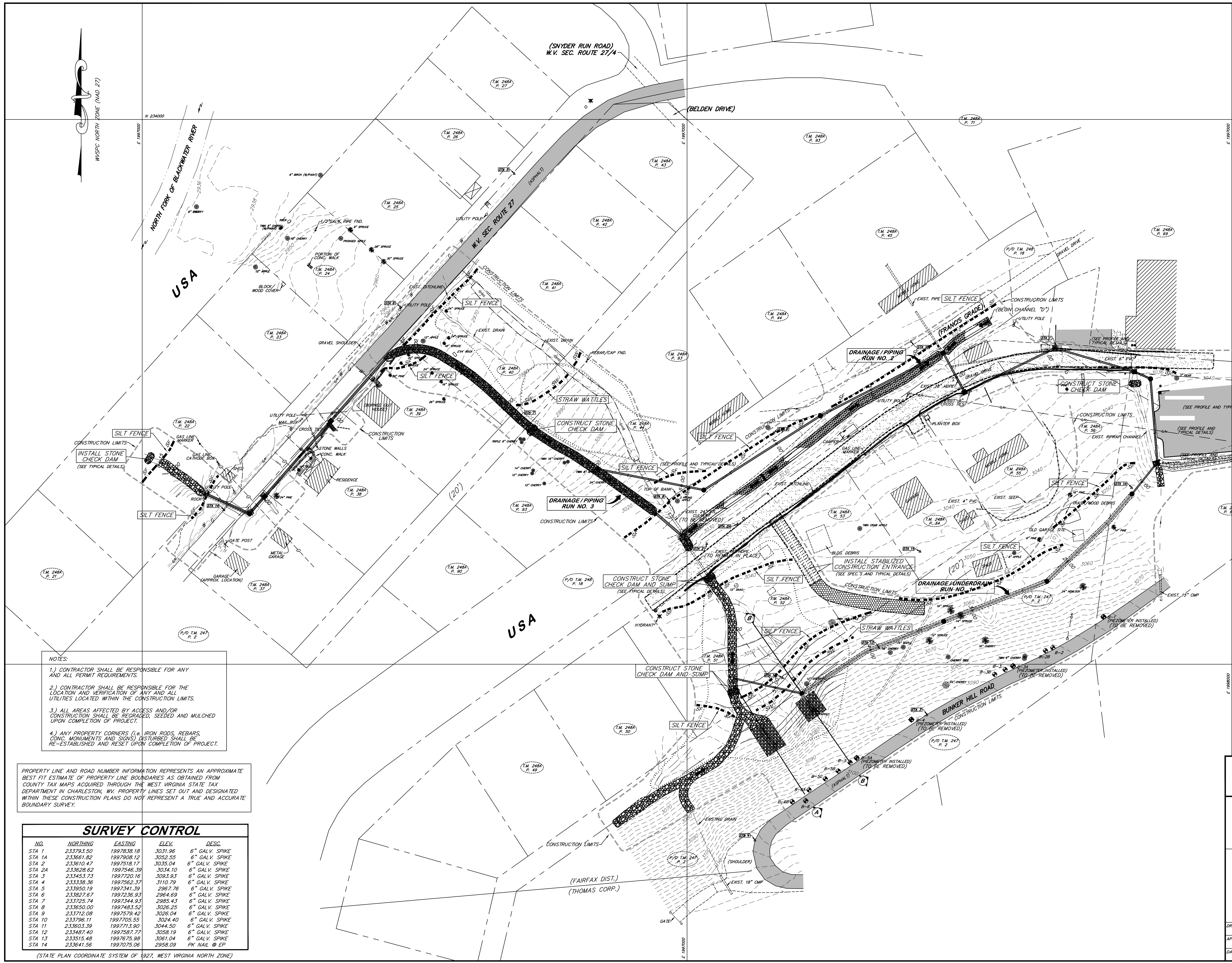
RECLAMATION PLAN

DRAWN BY: DWH
APPROVED BY: RL
DATE: 11/21/2014

SCALE: 1" = 40'
SHEET NO. **3**
OF 5

LEGEND

- APPROX. PROPERTY LINE
- EXIST. DRAIN OR WATER COURSE
- EXISTING UTILITY LINE
- EXISTING WATER LINE(S)
- EXISTING GAS LINE(S)
- DIRECTION OF FLOW
- TAX MAP AND PARCEL NO.
- EXISTING UTILITY OR LIGHT POLE
- EXISTING WATER METER
- EXISTING SURVEY CONTROL
- EXISTING CULVERT OR PIPE
- PROPOSED TYPE "G" INLET
- PROPOSED TYPE "A" MANHOLE
- PROPOSED HDPE PIPE
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED ROCK CHECK DAM
- PROPOSED 4' X 8' UNDERDRAIN
- PROPOSED RIPRAP OR GROUTED RIPRAP CHANNEL
- PROPOSED 8' GRASS LINED SWALE
- SILT FENCE SEDIMENT CONTROL
- STRAW WATTLE EROSION CONTROL



- NOTES:**
- 1.) CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL PERMIT REQUIREMENTS.
 - 2.) CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND VERIFICATION OF ANY AND ALL UTILITIES LOCATED WITHIN THE CONSTRUCTION LIMITS.
 - 3.) ALL AREAS AFFECTED BY ACCESS AND/OR CONSTRUCTION SHALL BE REGRADED, SEEDED AND MULCHED UPON COMPLETION OF PROJECT.
 - 4.) ANY PROPERTY CORNERS (i.e. IRON RODS, REBARS, CONC. MONUMENTS AND SIGNS) DISTURBED SHALL BE RE-ESTABLISHED AND RESET UPON COMPLETION OF PROJECT.

PROPERTY LINE AND ROAD NUMBER INFORMATION REPRESENTS AN APPROXIMATE BEST FIT ESTIMATE OF PROPERTY LINE BOUNDARIES AS OBTAINED FROM COUNTY TAX MAPS ACQUIRED THROUGH THE WEST VIRGINIA STATE TAX DEPARTMENT IN CHARLESTON, WV. PROPERTY LINES SET OUT AND DESIGNATED WITHIN THESE CONSTRUCTION PLANS DO NOT REPRESENT A TRUE AND ACCURATE BOUNDARY SURVEY.

SURVEY CONTROL				
NO.	NORTHING	EASTING	ELEV.	DESC.
STA 1	233793.90	1997938.18	3031.96	6" GALV. SPIKE
STA 1A	233861.82	1997908.12	3052.55	6" GALV. SPIKE
STA 2	233610.47	1997518.17	3035.04	6" GALV. SPIKE
STA 2A	233628.62	1997546.39	3034.10	6" GALV. SPIKE
STA 3	233453.73	1997720.16	3093.93	6" GALV. SPIKE
STA 4	233338.36	1997562.37	3110.79	6" GALV. SPIKE
STA 5	233950.19	1997341.39	2967.76	6" GALV. SPIKE
STA 6	233827.67	1997236.93	2964.69	6" GALV. SPIKE
STA 7	233725.74	1997344.93	2985.43	6" GALV. SPIKE
STA 8	233850.00	1997383.52	3026.25	6" GALV. SPIKE
STA 9	233712.08	1997279.42	3026.04	6" GALV. SPIKE
STA 10	233796.11	1997705.55	3024.40	6" GALV. SPIKE
STA 11	233603.39	1997713.90	3044.50	6" GALV. SPIKE
STA 12	233487.40	1997287.77	3055.19	6" GALV. SPIKE
STA 13	233515.48	1997675.48	3081.04	6" GALV. SPIKE
STA 14	233641.56	1997075.06	2958.09	PK NAIL @ EP

(STATE PLAN COORDINATE SYSTEM OF 1927, WEST VIRGINIA NORTH ZONE)

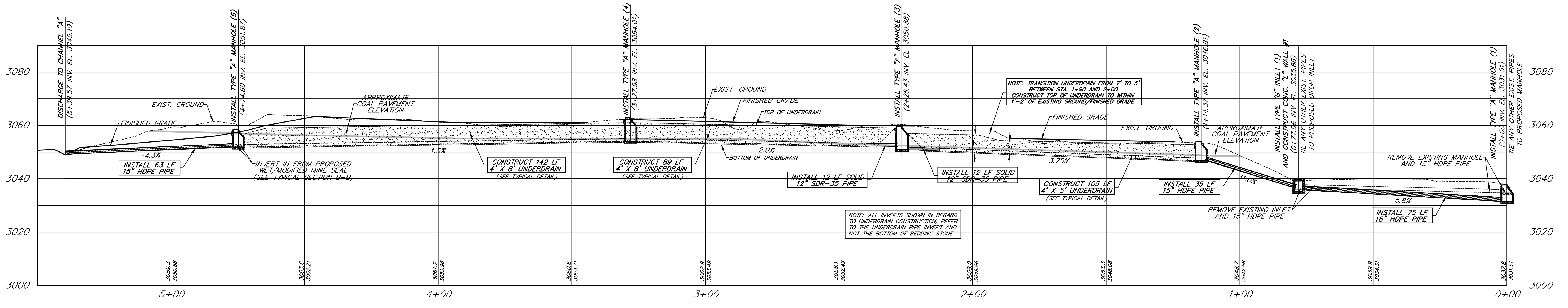
State of West Virginia
Department of Environmental Protection
Abandoned Mine Lands and Reclamation

DAVIS COAL AND COKE

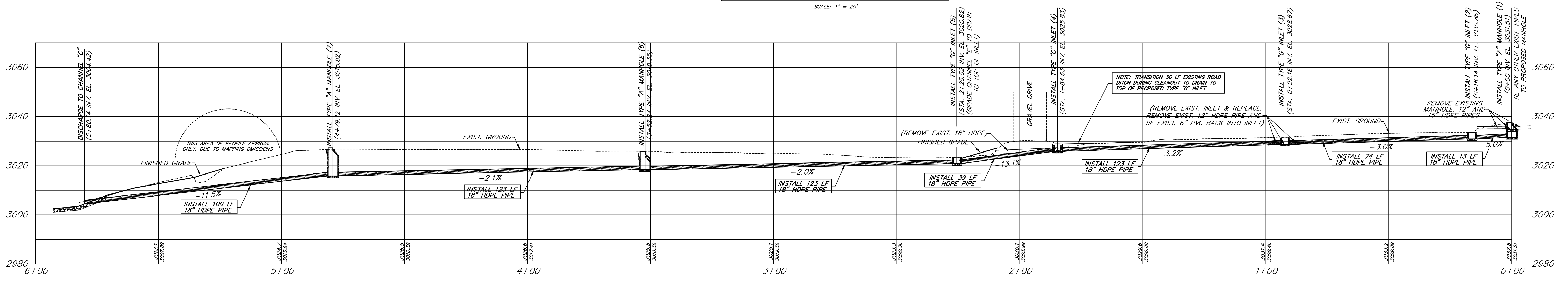
SEDIMENT CONTROL PLAN

DRAWN BY: DWH
APPROVED BY: RL
DATE: 11/21/2014

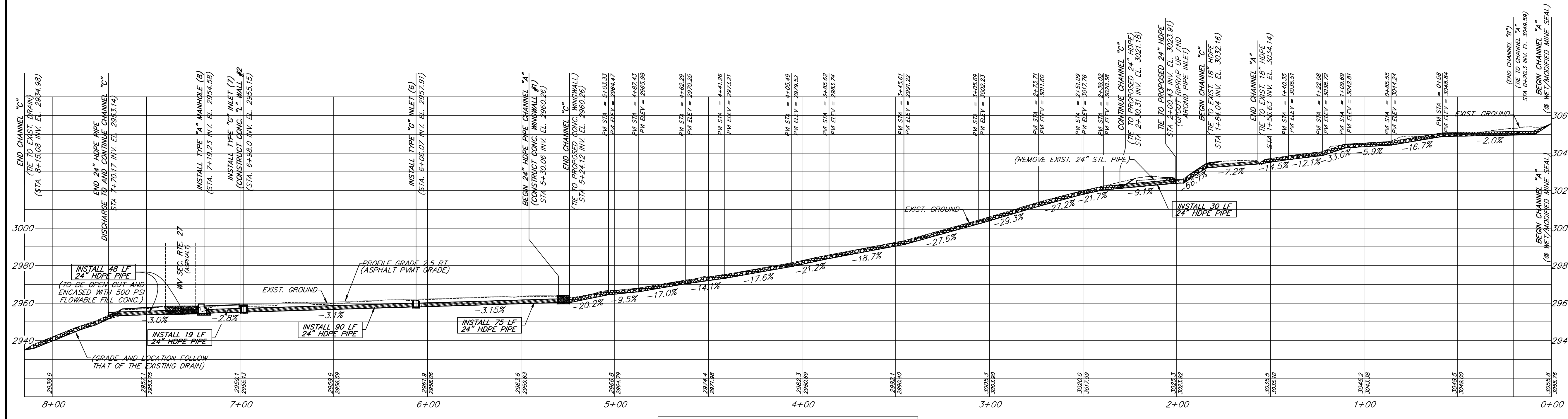
SCALE: 1" = 40'
SHEET NO. 4
OF 5



**PROFILE - DRAINAGE / UNDERDRAIN
RUN NO. 1**
SCALE: 1" = 20'



**PROFILE - DRAINAGE / PIPING
RUN NO. 2**
SCALE: 1" = 20'



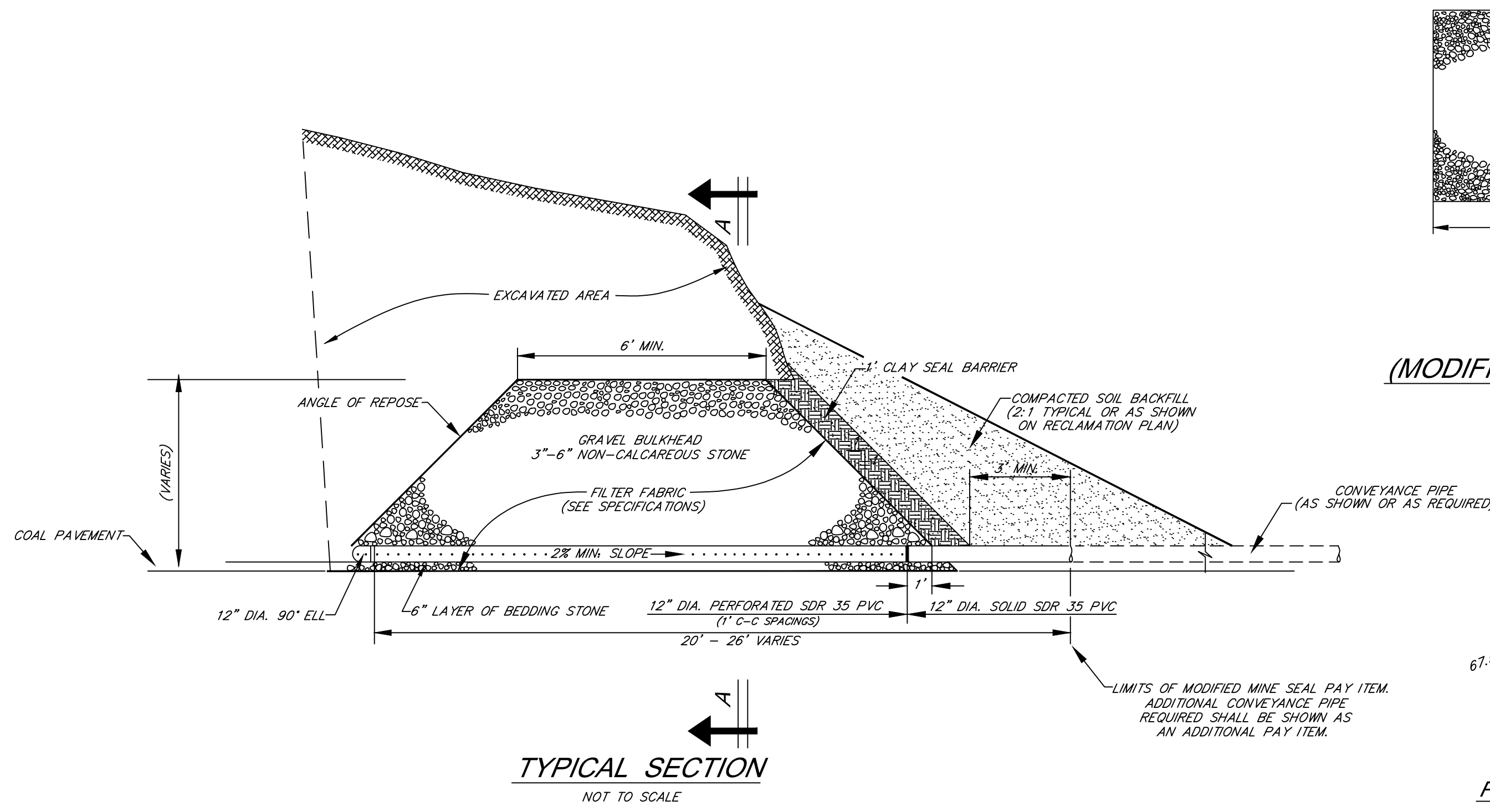
**PROFILE - DRAINAGE / PIPING
RUN NO. 3**
SCALE: 1" = 30'

State of West Virginia
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Abandoned Mine Lands and Reclamation

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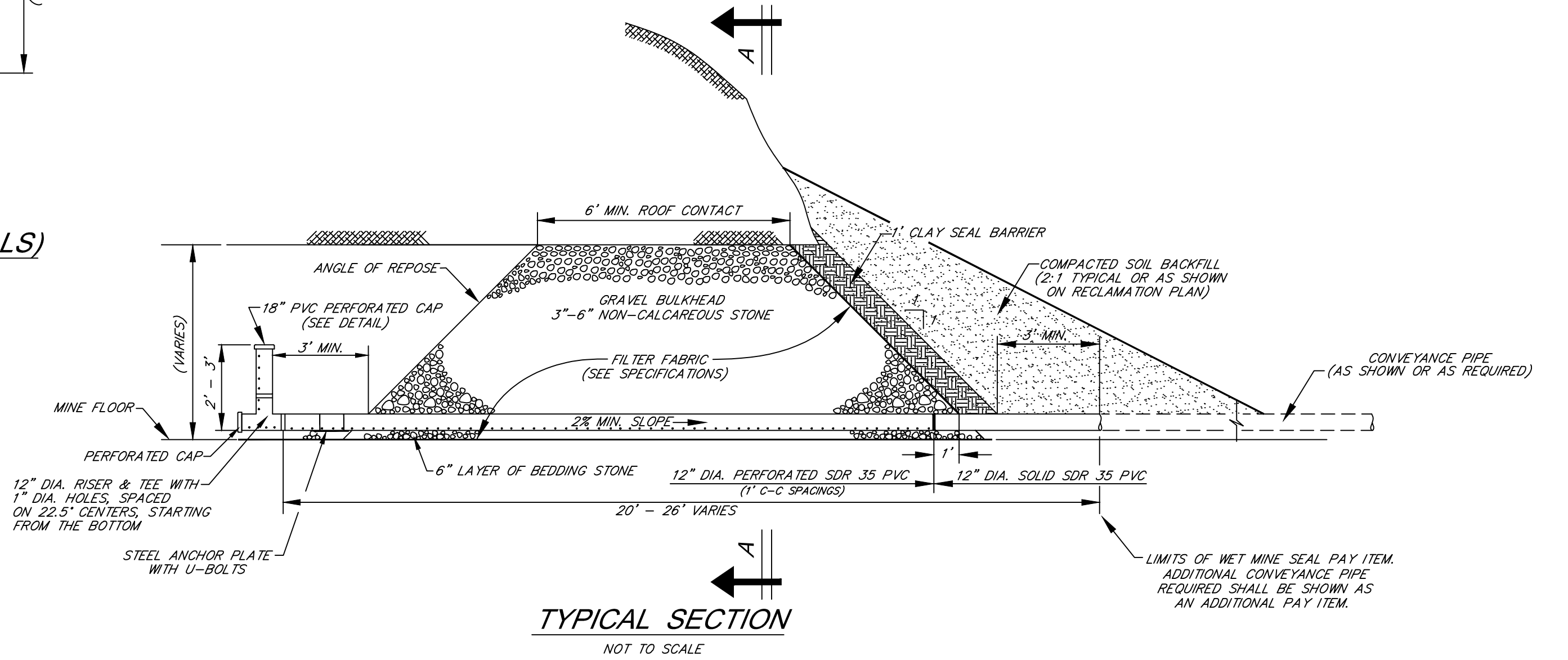
DRAINAGE PROFILES

DRAWN BY: DWH	SCALE: AS SHOWN
APPROVED BY: RL	SHEET NO. 5
DATE: 12/30/2014	OF 9

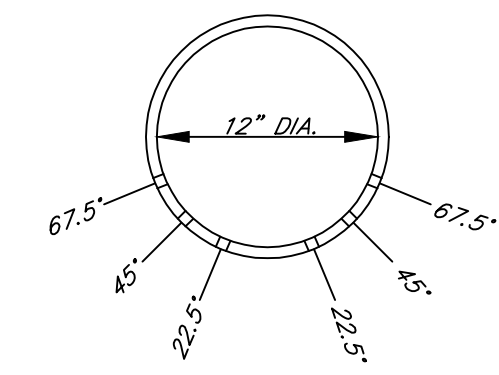


TYPICAL SECTION
NOT TO SCALE

SECTION A-A
STONE BULKHEAD
(MODIFIED AND WET MINE SEALS)
NOT TO SCALE

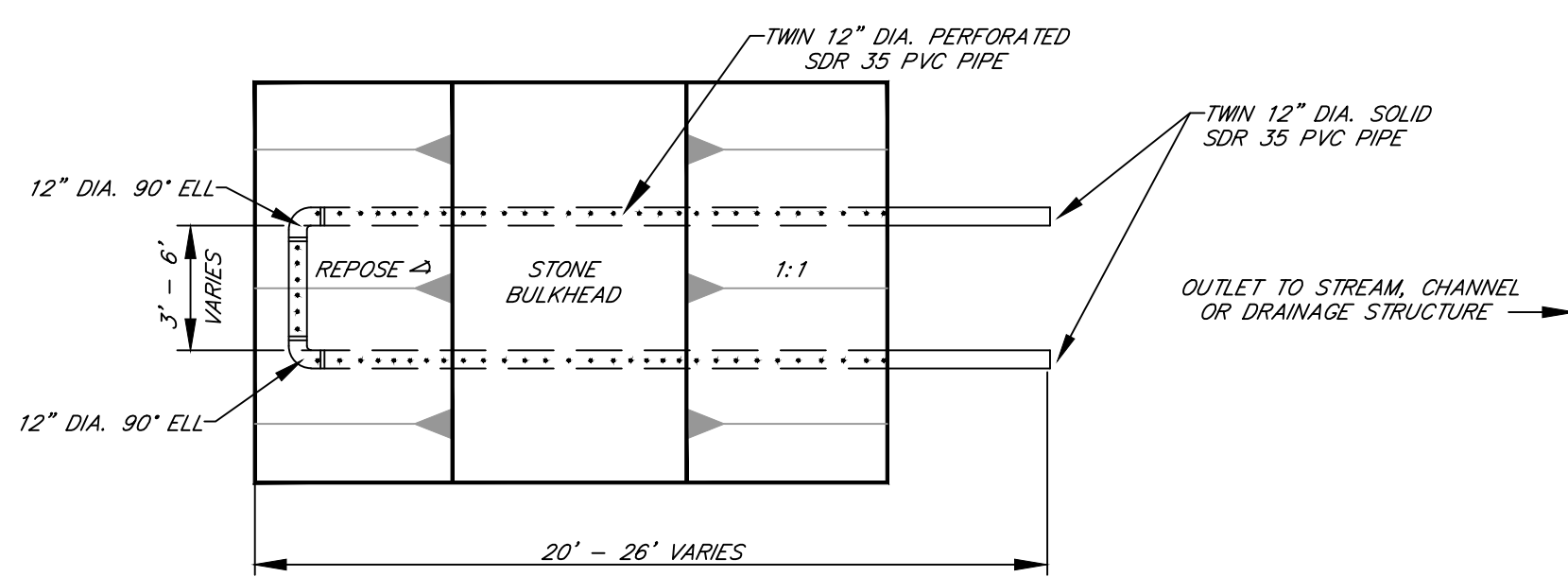


TYPICAL SECTION
NOT TO SCALE

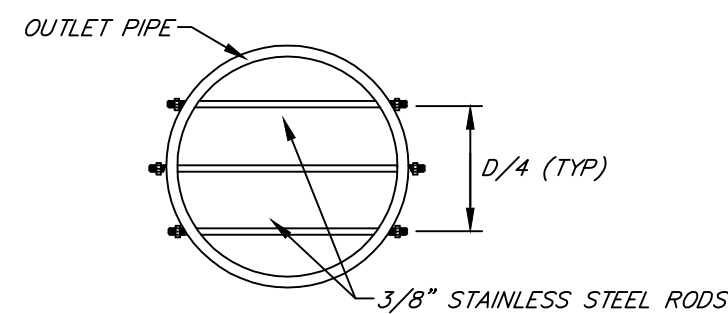


PIPE PERFORATIONS
DETAIL

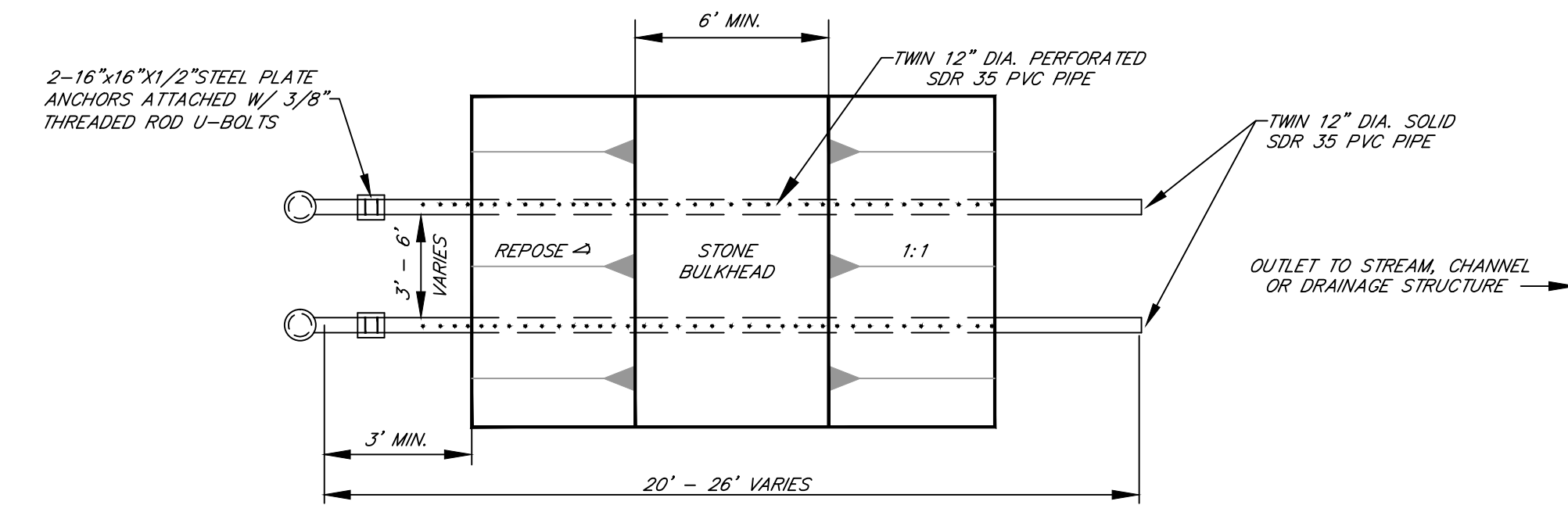
(ALL PIPE PERFORATIONS TO BE 1" DIA. ON 12" C-C ALONG LENGTH OF PIPE)



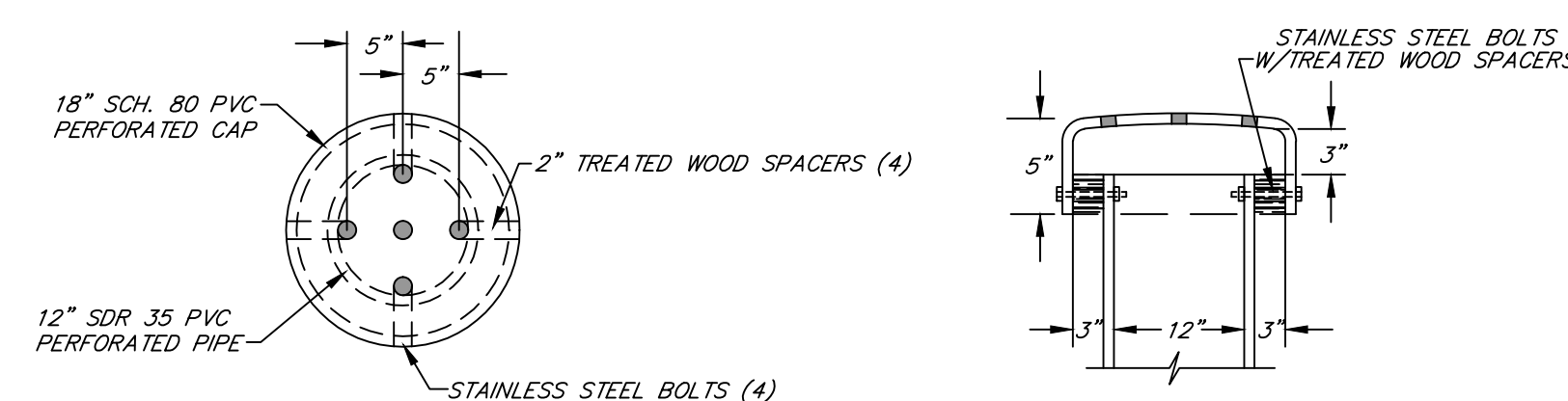
PLAN
MODIFIED WET MINE SEAL DETAIL
NOT TO SCALE



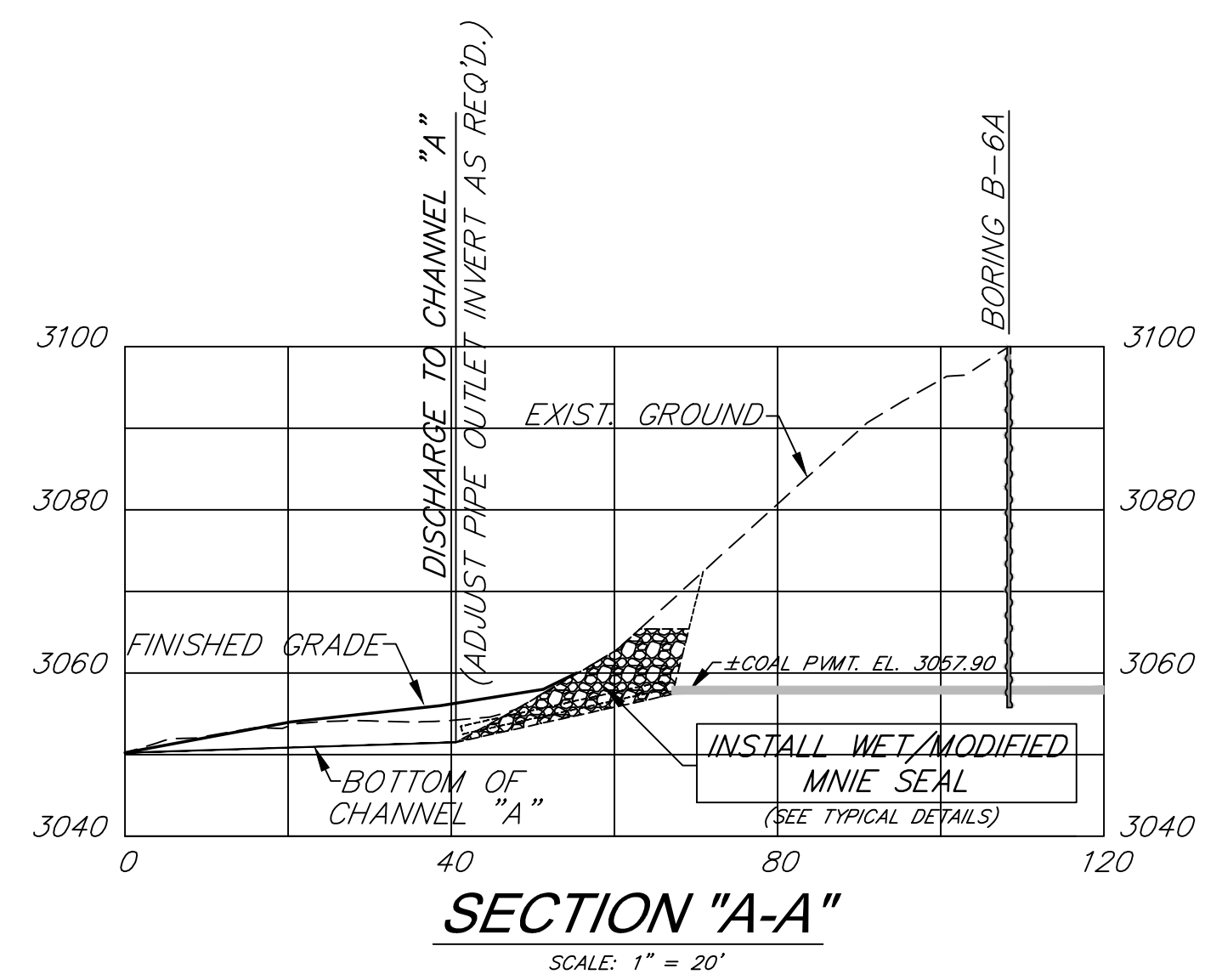
TYPICAL ANIMAL GUARD
DETAIL



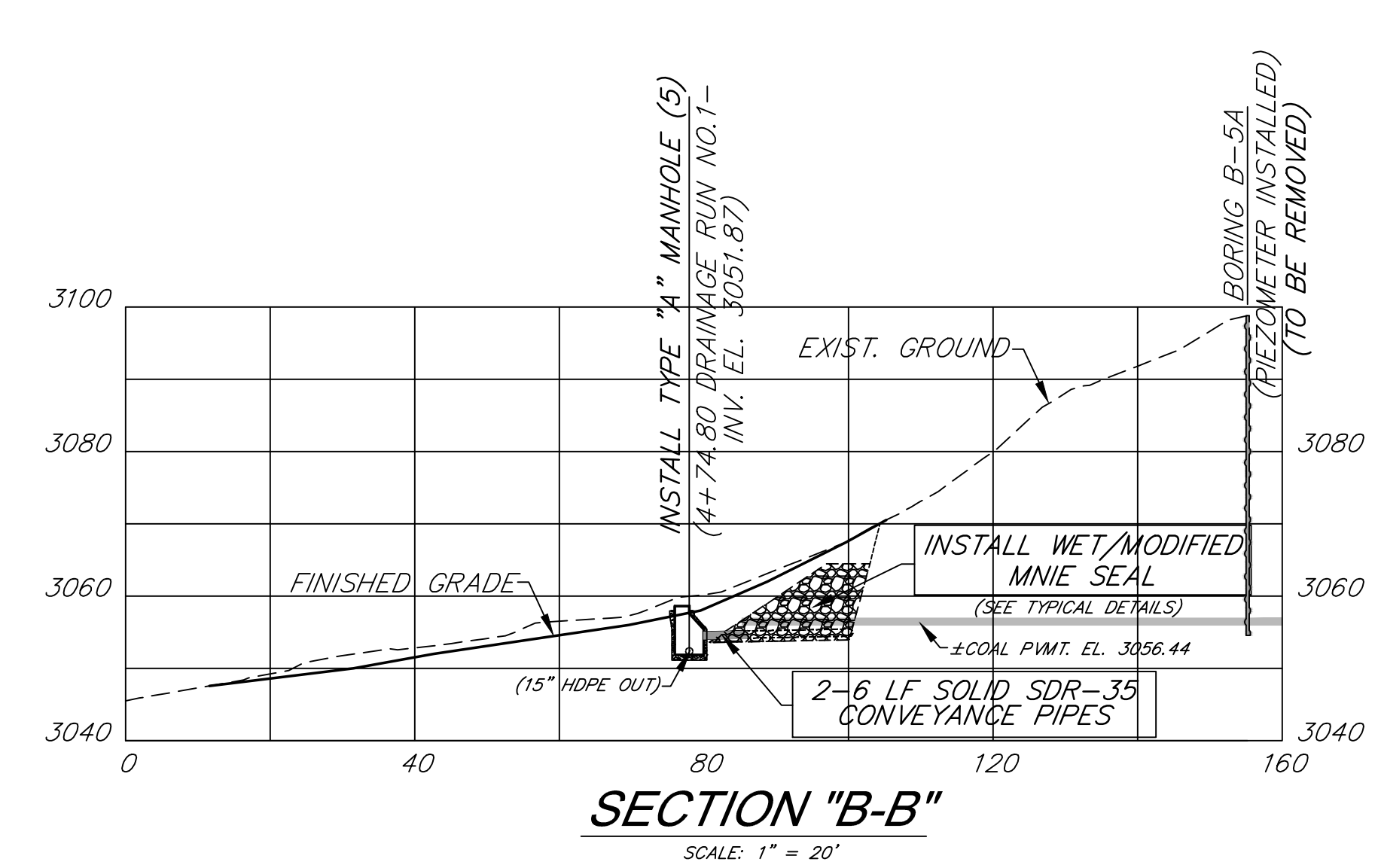
PLAN
WET MINE SEAL DETAIL
NOT TO SCALE



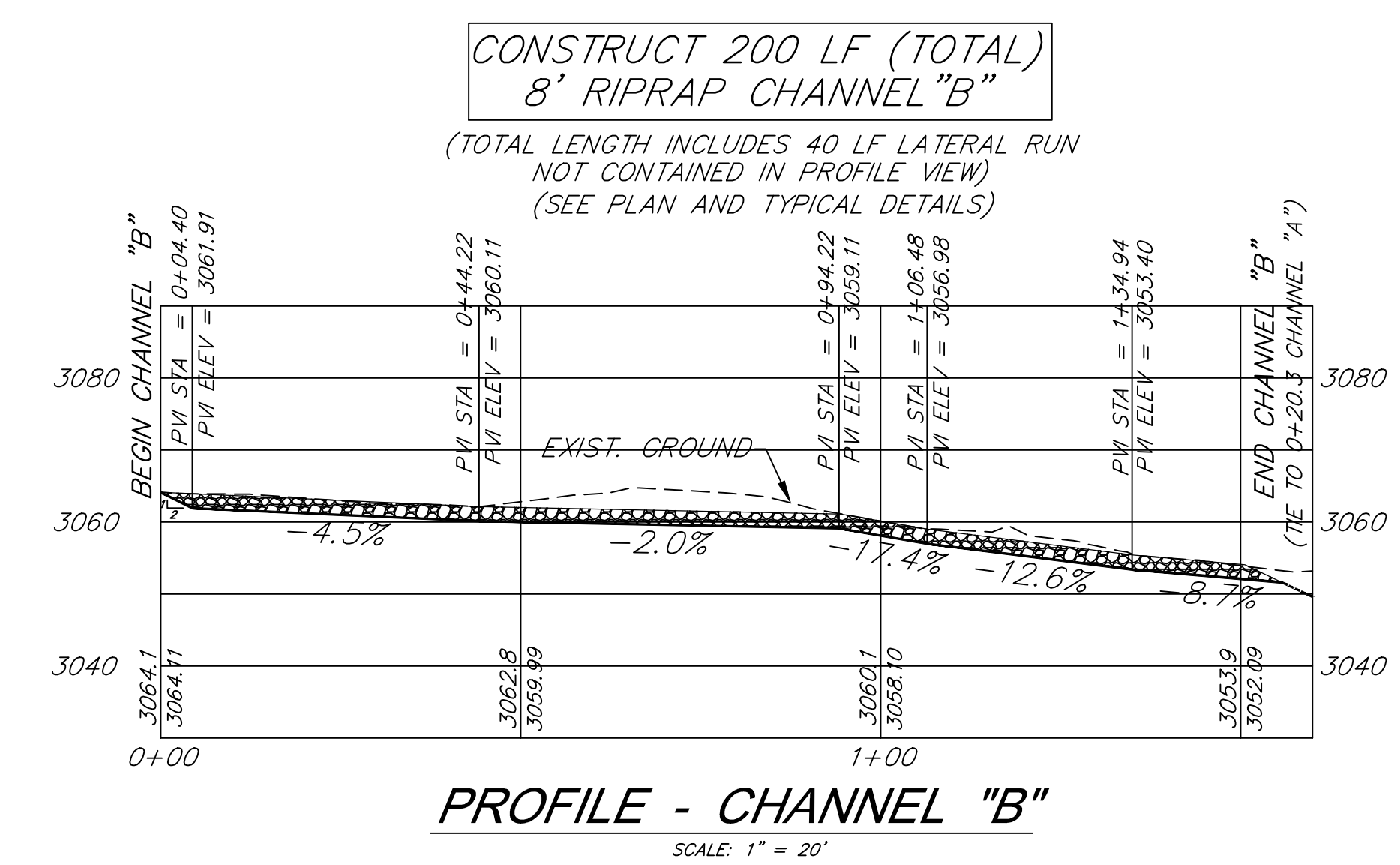
PERFORATED CAP DETAIL
NOT TO SCALE



SECTION "A-A"
SCALE: 1" = 20'



SECTION "B-B"
SCALE: 1" = 20'



PROFILE - CHANNEL "B"
SCALE: 1" = 20'

State of West Virginia
Department of Environmental Protection
Abandoned Mine Lands and Reclamation

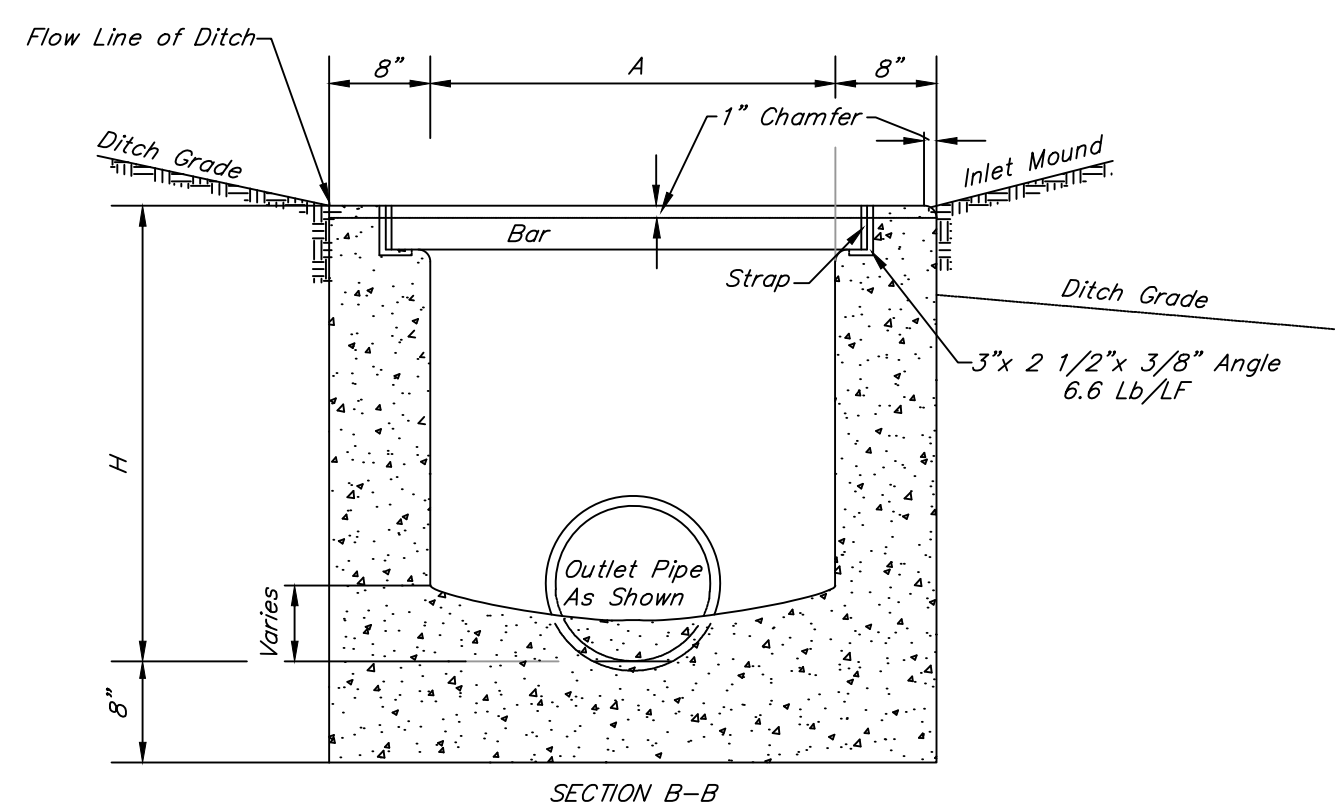
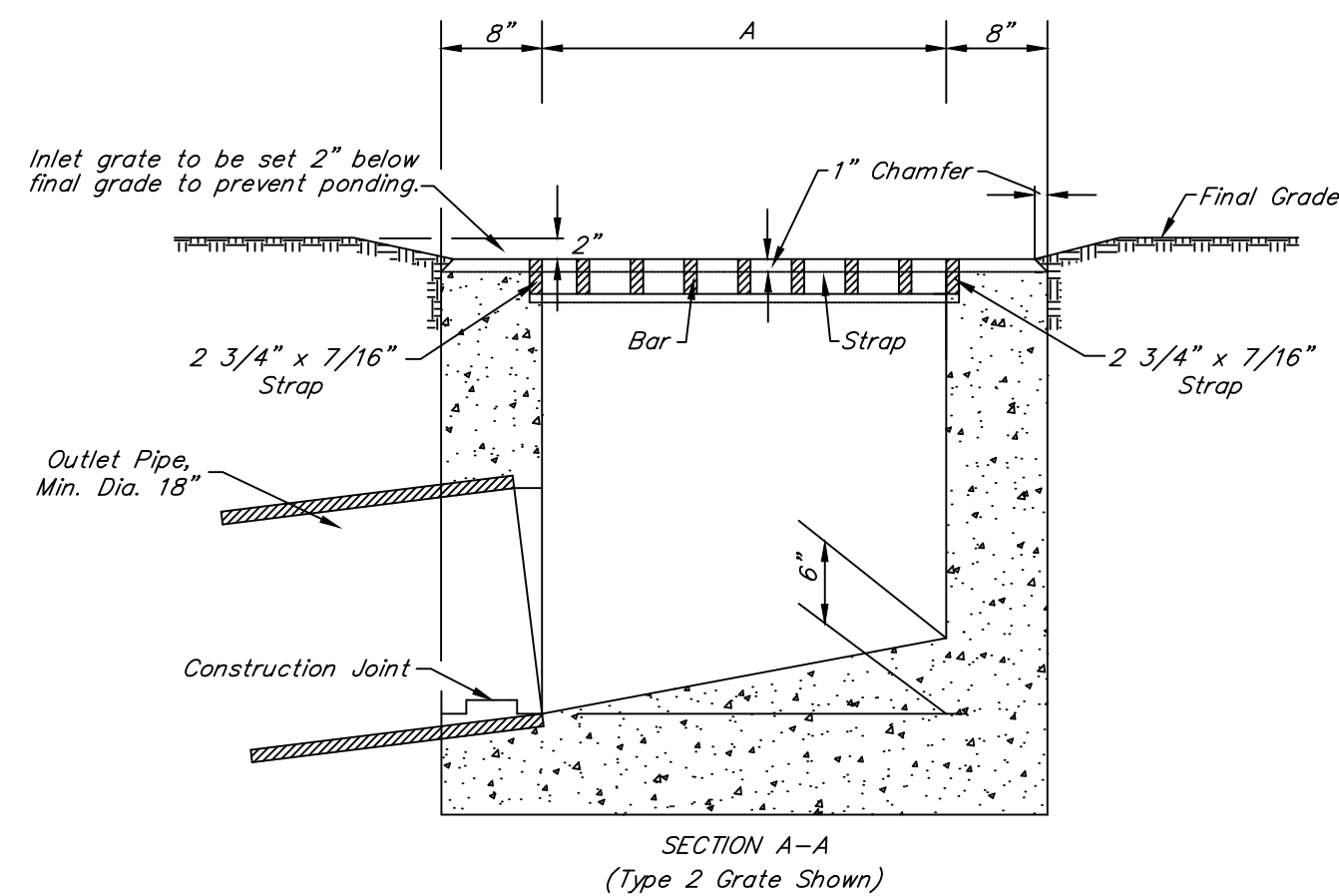
DAVIS COAL AND COKE

**TYPICAL DETAILS (1),
TYPICAL SECTIONS AND
PROFILE - CHANNEL "B"**

DRAWN BY: DWH
APPROVED BY: RL
DATE: 12/30/2014

SCALE: AS SHOWN
SHEET NO. **6**
OF 9

** 2 3/4" x 1/2" straps for frame and grate are considered acceptable substitutes.



INLET MOUNDING TABLE		
DITCH GRADE (%)	L	HORIZONTAL LENGTH (FT)
FROM	TO	
0	3	10
3	5	9
5	7.5	8
7.5	UP	SPECIAL DESIGN

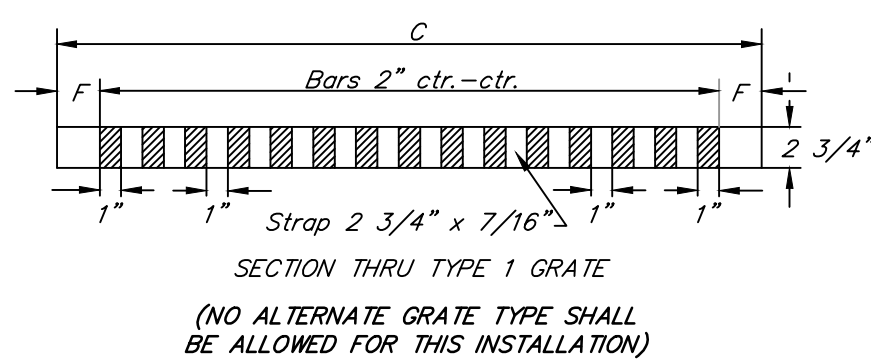
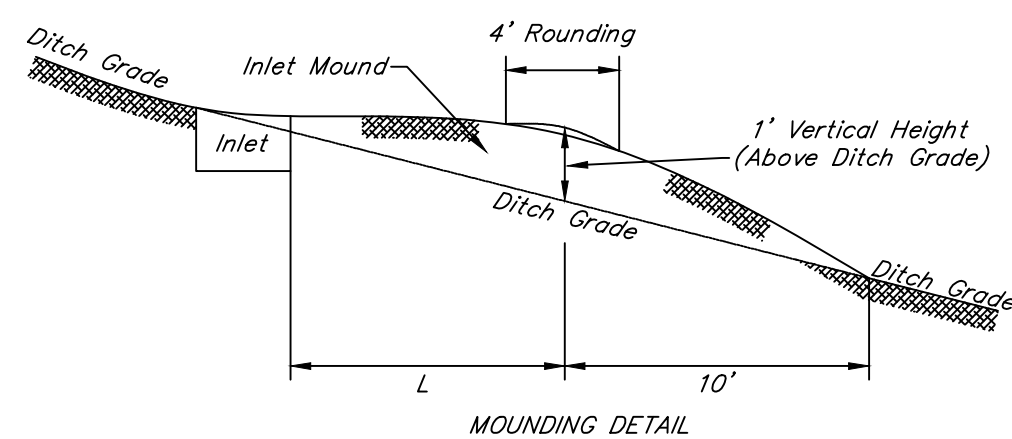
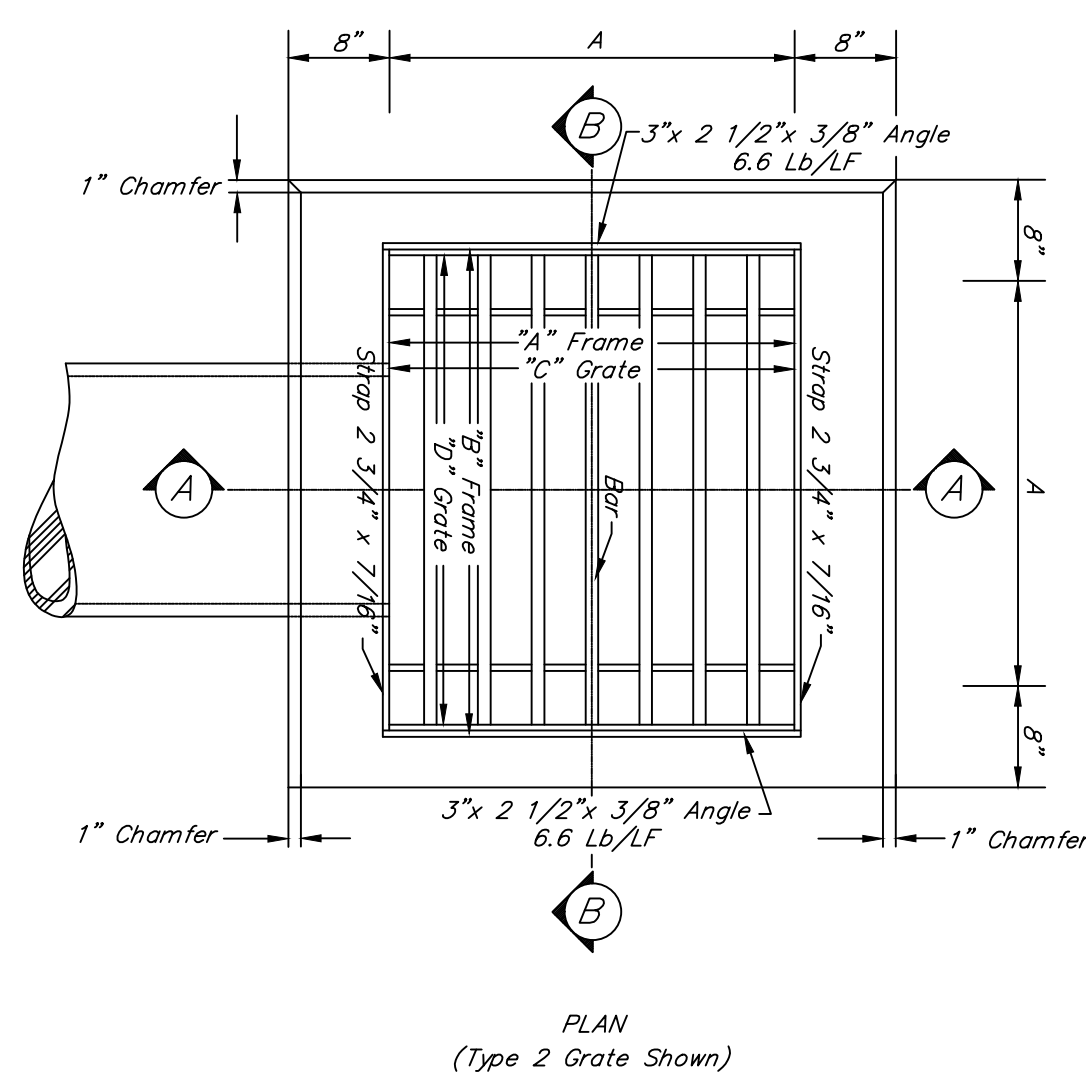
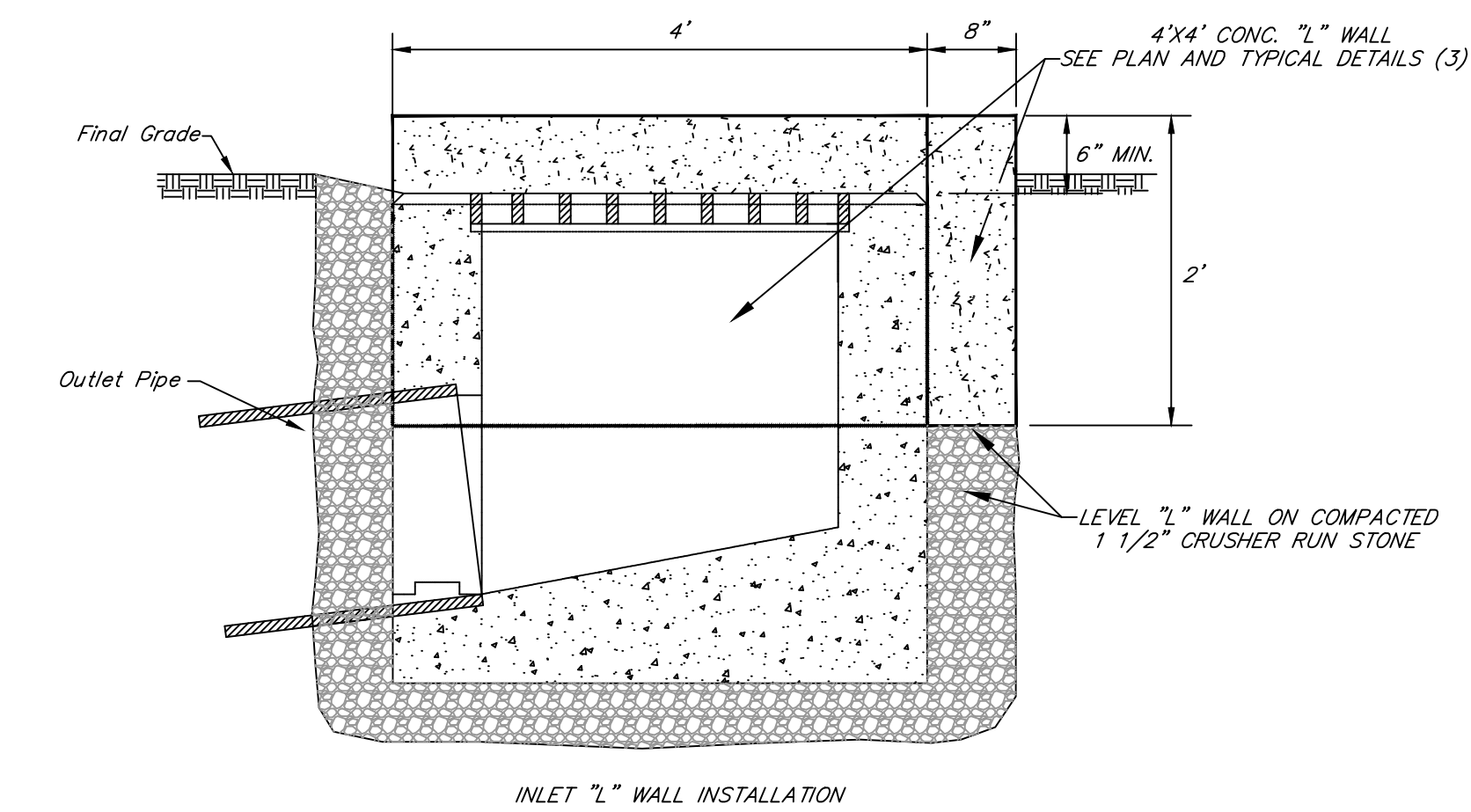


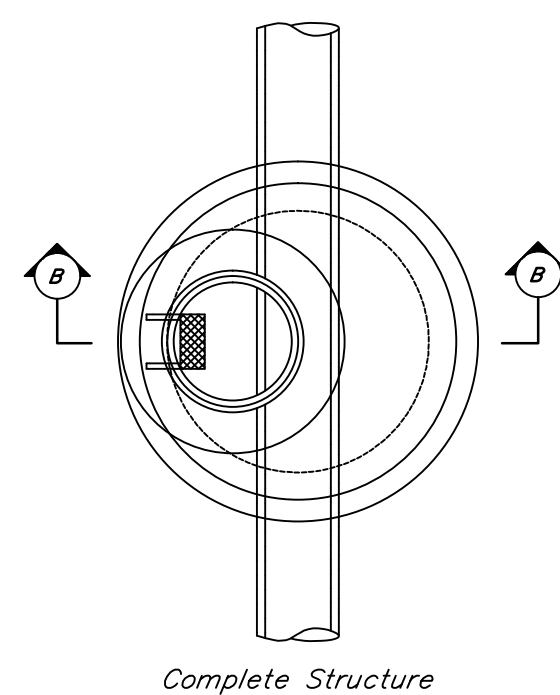
TABLE OF DIMENSIONS AND WEIGHTS												
PIPE SIZE	A	B	C	D	H(Min)	F	No. X	Wt. Grate	Wt. Frame	*F	No. X	*Wt. Grate
18"	2'-8"	3'-2"	2'-7 3/4"	3'-1 3/4"	2'-0"	3 3/8"	7	223	62	1 3/8"	15	453
24"	2'-8"	3'-2"	2'-7 3/4"	3'-1 3/4"	2'-6"	3 3/8"	7	223	62	1 3/8"	15	453

NOTES

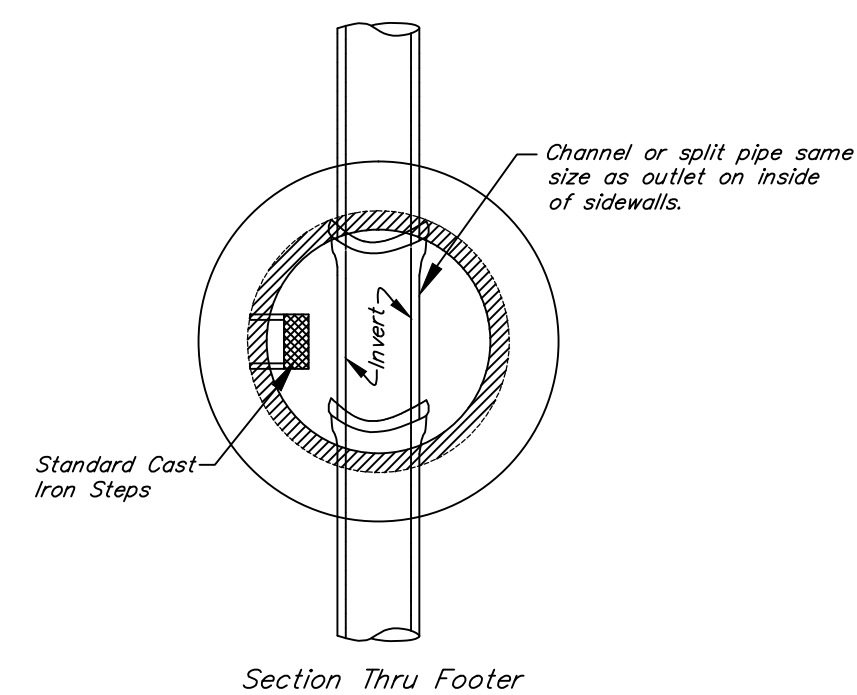
Wall and footer thickness is eight (8) inches. Construction between the footer and the top of the pipe may be of brick or precast concrete block. All other construction shall be of Class B concrete. Inlet may be precast, with lifting hooks out of sight after placing. Sufficient reinforcement will be included in precast inlets to resist handling stresses. Inverts shall be shaped for self-cleaning, and shall be monolithic with footer. A construction joint, approximately 2" x 4", will be used at the top of the self-cleaning invert. When precast construction is used, this construction joint will be omitted. When the inlet is used for more than one pipe, the invert shall be shaped to provide smooth transitions for the flow line. Type 1 Grate is for use in urban areas and Type 2 Grate is for use in rural areas, unless otherwise specified. Grate to be used, either Type 1 or Type 2, will be as specified on plans. All concrete is to be Class "B" Concrete. The type and size of pipe to be used with the inlet is to be the type and size as called for on the plans. Drawing shows pipe entering one side of the inlet; however, pipes may enter any or all sides of the inlet as called for on the plans. When the bell end of concrete pipe is placed in the inlet, the inside of the bell shall be filled with concrete up to the flow line. Omit inlet mound when inlet is placed at the low point in sag of vertical curve. Typical "keyed" construction joint is shown in Section A-A herein. Other "keyed" or "doweled" type construction joints may be used if acceptable to the Engineer. Grate and frame members may be galvanized in accordance with ASTM Specifications A123 in lieu of the painting specified below. Galvanized surfaces which have been abraded so that the base metal is exposed, and all field welded surfaces, shall be protected with zinc rich primer, meeting the requirements of Subsection 711.21 of the Specifications, or by field galvanizing. All grate and frame members shall meet the requirements for structural steel of Subsection 709.12 of the Standard Specifications. X members shall be joined to the end straps with 3/8" welds on both sides of each end. Frame members shall be joined with 3/8" welds at the outsides of the corners. The upper portion of the inlet shall be cast with frame in place or placed in fresh concrete immediately after casting. The grate and the inside of the frame shall be painted with Type "A" Asphalt-Base Emulsion meeting the requirements of ASTM Specification D 1187, or with Vinyl-Type Paint in accordance with the requirements of Section 615 of the Specifications except that the blast cleaning requirements prior to painting are waived. The color of the top coat of vinyl paint shall meet the requirements of Federal Standard 595, No. 14062. Members and welds shall be cleaned before painting. Unit price bid for Type "G" inlet will be for all depths, unless otherwise specified, and shall be paid for per each, also unless otherwise noted or specified.



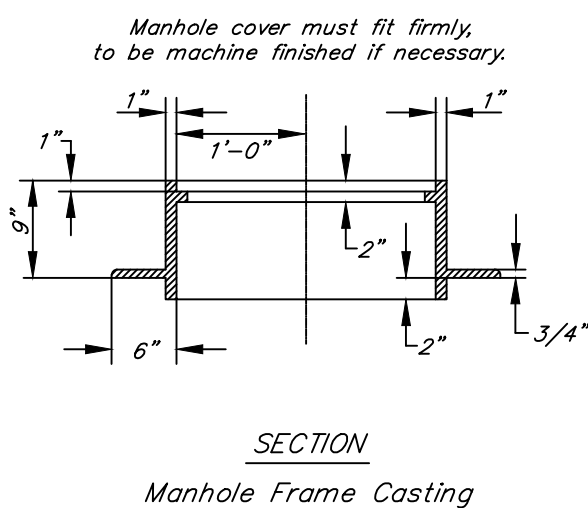
STANDARD DETAIL
TYPE G INLET



Complete Structure

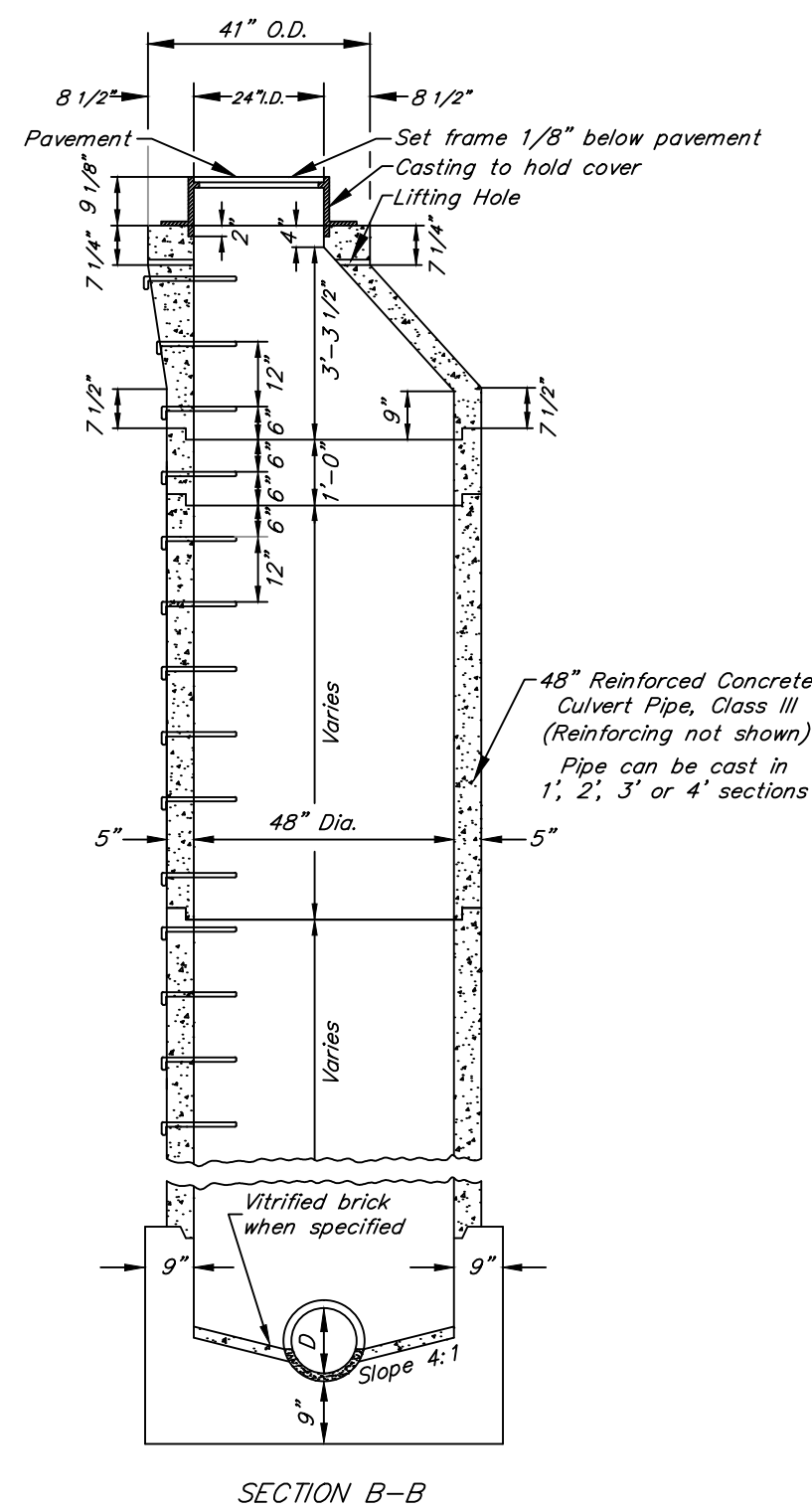


Section Thru Footer

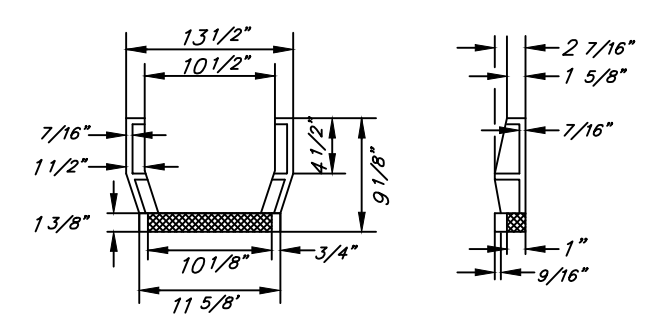


SECTION
Manhole Frame Casting

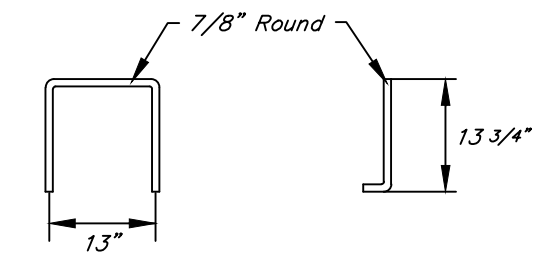
NOTES
All concrete pipe to be used as sidewall for the manhole shall meet the requirements for Class III pipe of Subsection 714.2 of the Standard Specifications. Concrete pipe sections may be used in any combination to produce a manhole of desired depth, except the tapered top section shall be tapered as shown. The tapered top sections shall be manufactured and meet the same requirements as the concrete pipe. Lifting hole in the tapered top section and the circumferential notches in the manhole cover are for handling purposes only. Drawing shows pipe entering and leaving manhole in a straight line. However, the pipes may enter or leave at any angle or place as called for or shown on the plans. The footer up to the joint shown shall be Class B concrete. Castings are to be of the design shown and are to be of Gray-Iron meeting the requirements of Subsection 709.10 of the Standard Specifications. Steps may be either the Cast Iron Step or the Wrought Iron Step as shown and shall conform to the requirements of Subsections 709.10 and 709.11, respectively, of the Standard Specifications. The precast sections of pipe shall be set in joint mortar. The forming of the seat in the footing may be by the use of a section of the precast pipe or by means of a jig. Pipe at elevations of than shown may be joined to the manhole by cutting a hole the size of the connecting pipe in the manhole, inserting the pipe the thickness of the manhole wall and closing all openings around the connecting pipe with joint mortar. Either this manhole or the cast in place manhole on Standard M.S. 3-A may be furnished when Type A manhole is called for in the contract. Minimum height of bench wall above flow line of pipe is 25% of the diameter of the pipes. The bearing area of the frame and cover shall be so fitted and finished as to provide a firm and even seat for the entire cover in the frame. No projections shall exist on bearing areas of wither casting, and the cover shall seat in its frame without rocking.



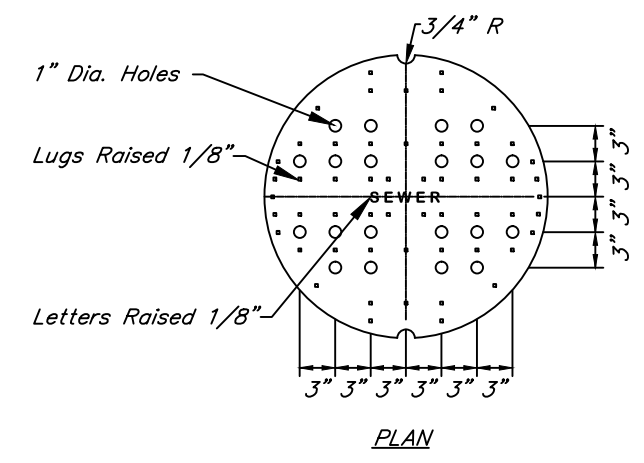
SECTION B-B



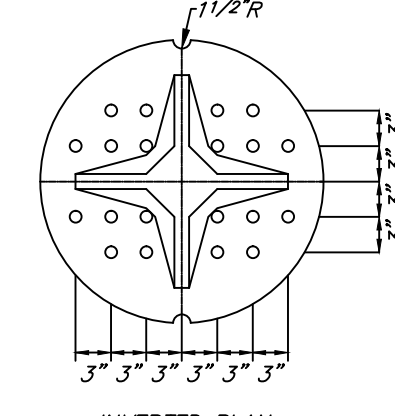
STEP
(Cast Iron)



STEP
(Wrought Iron)



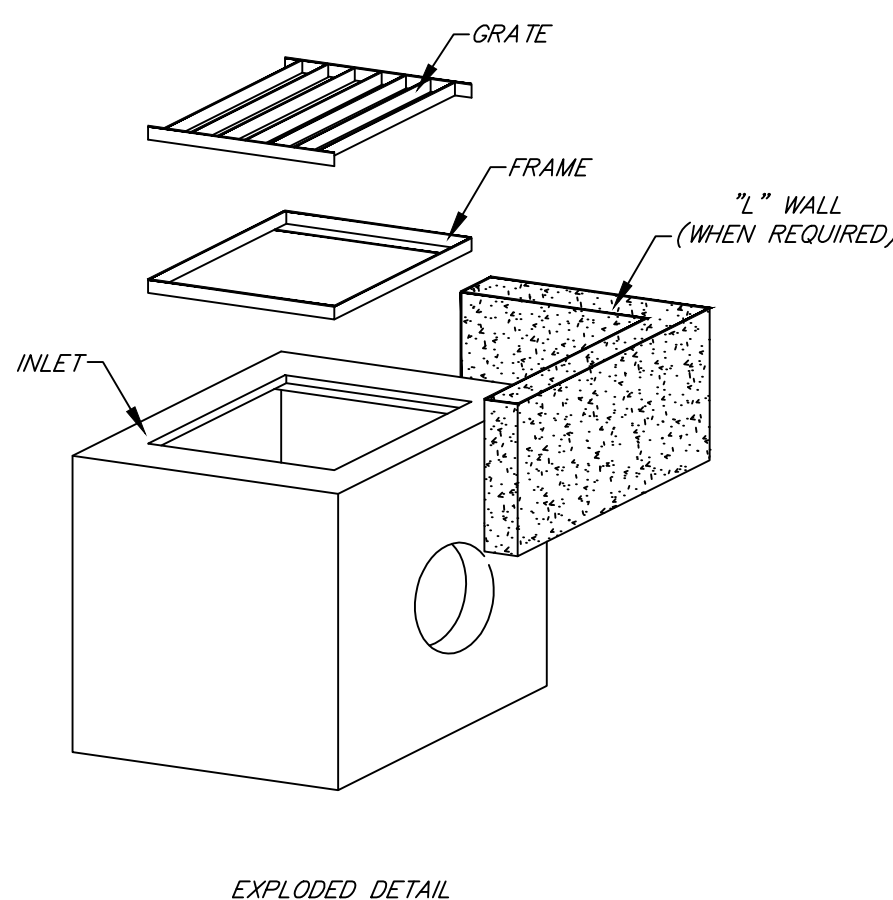
MANHOLE COVER



INVERTED PLAN

**STANDARD DETAIL
TYPE "A" MANHOLE
(PRECAST)**

** 2 3/4" x 1/2" straps for frame and grate are considered acceptable substitutes.



EXPLODED DETAIL

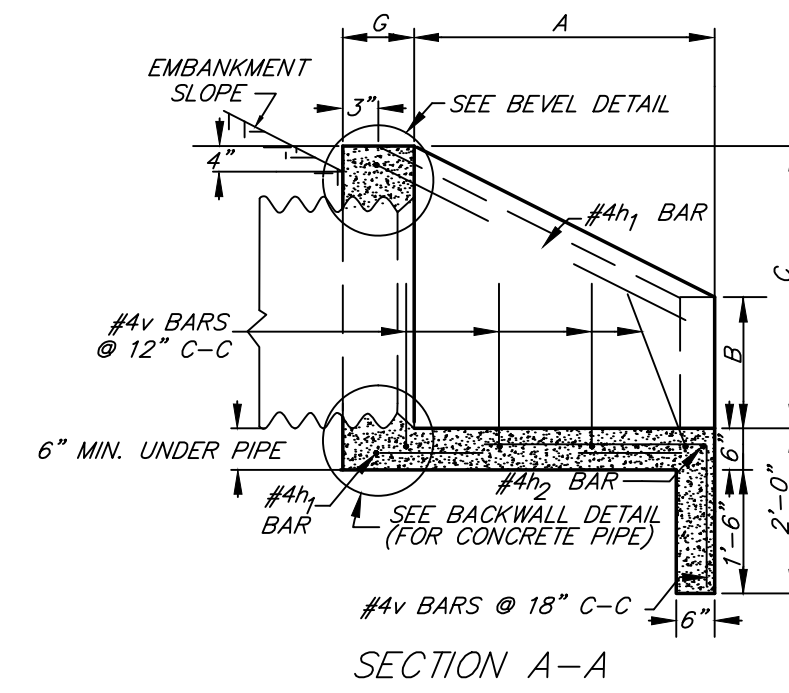
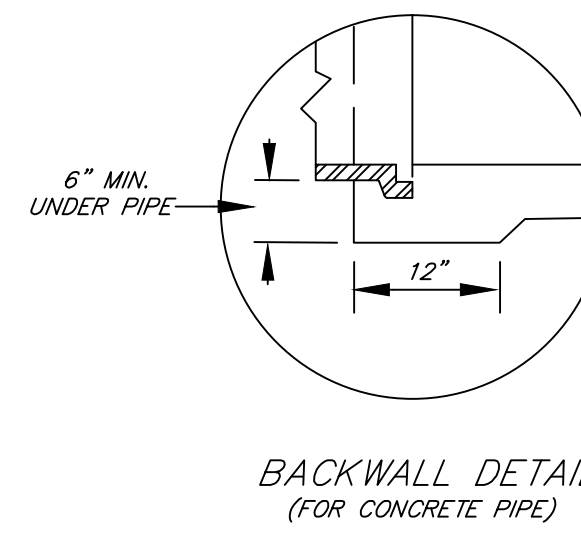
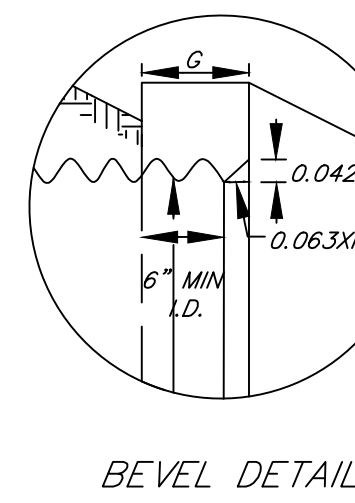
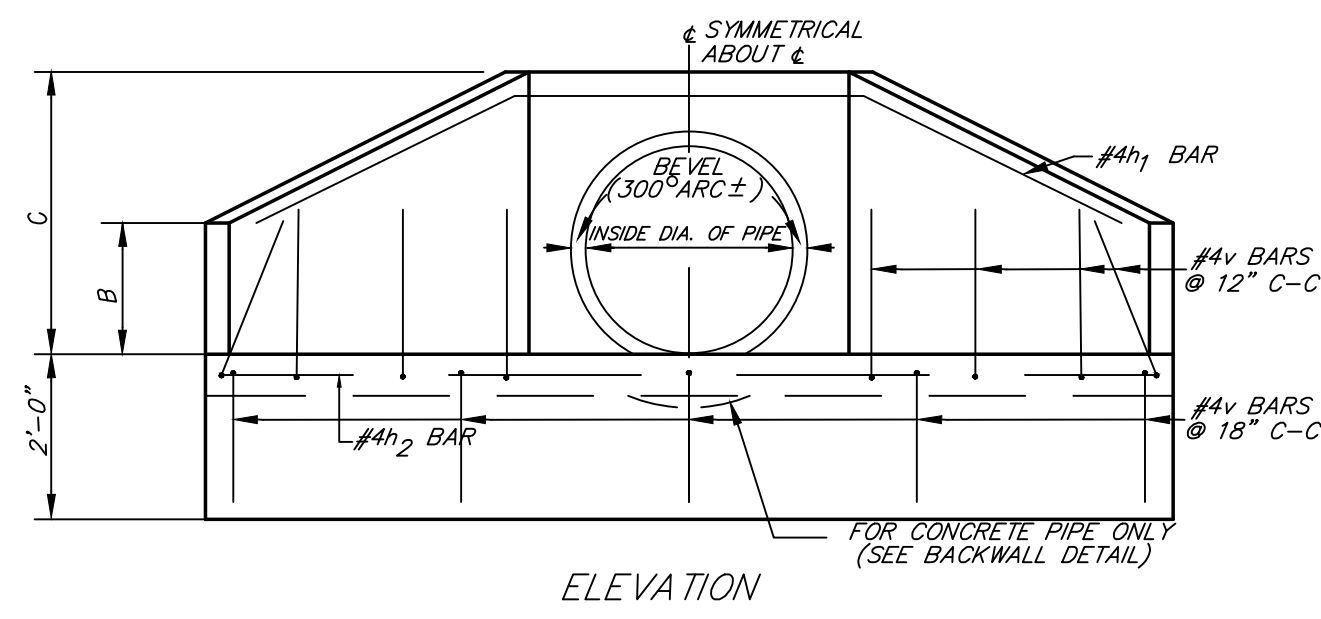
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TYPICAL DETAILS (2)

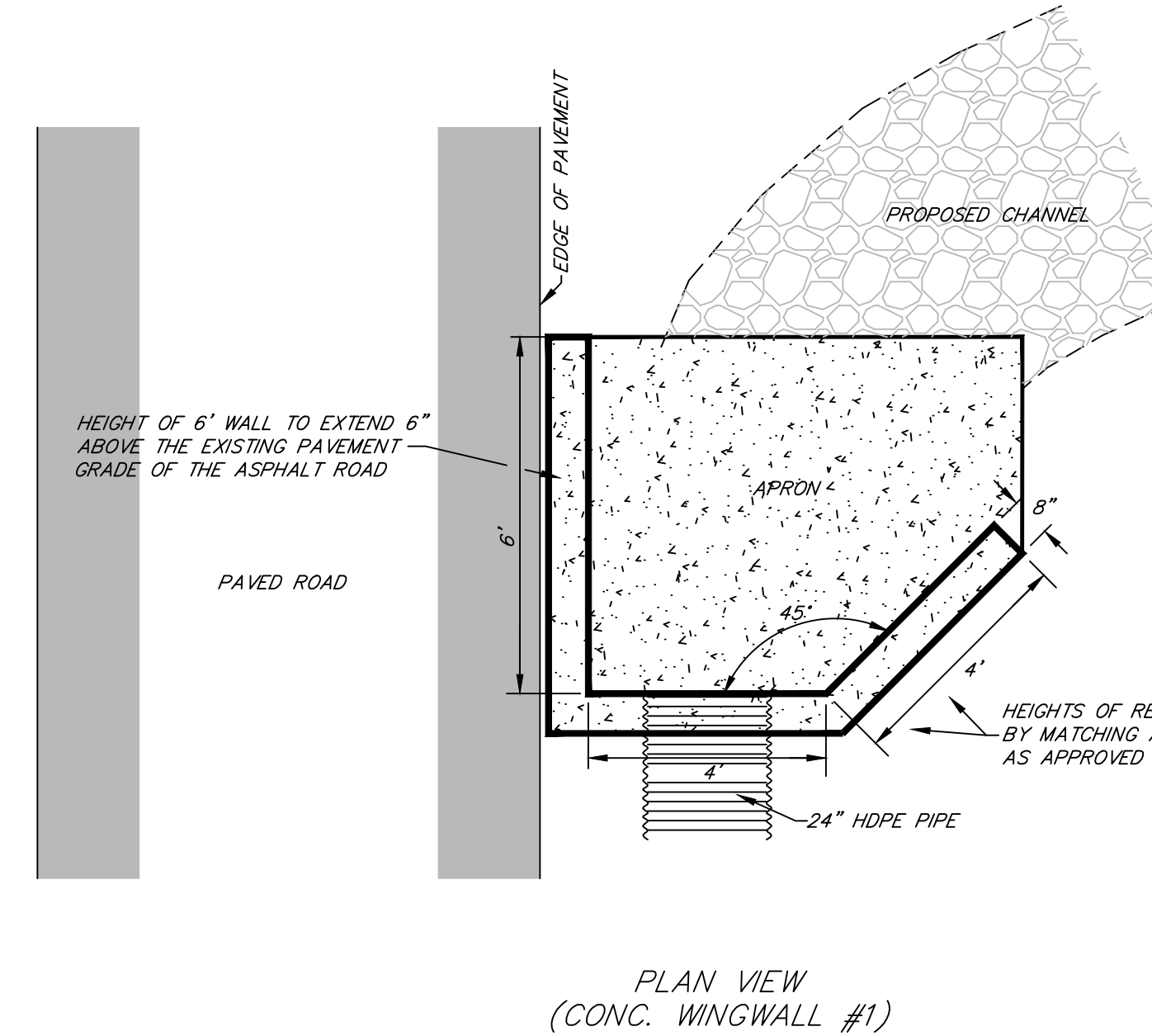
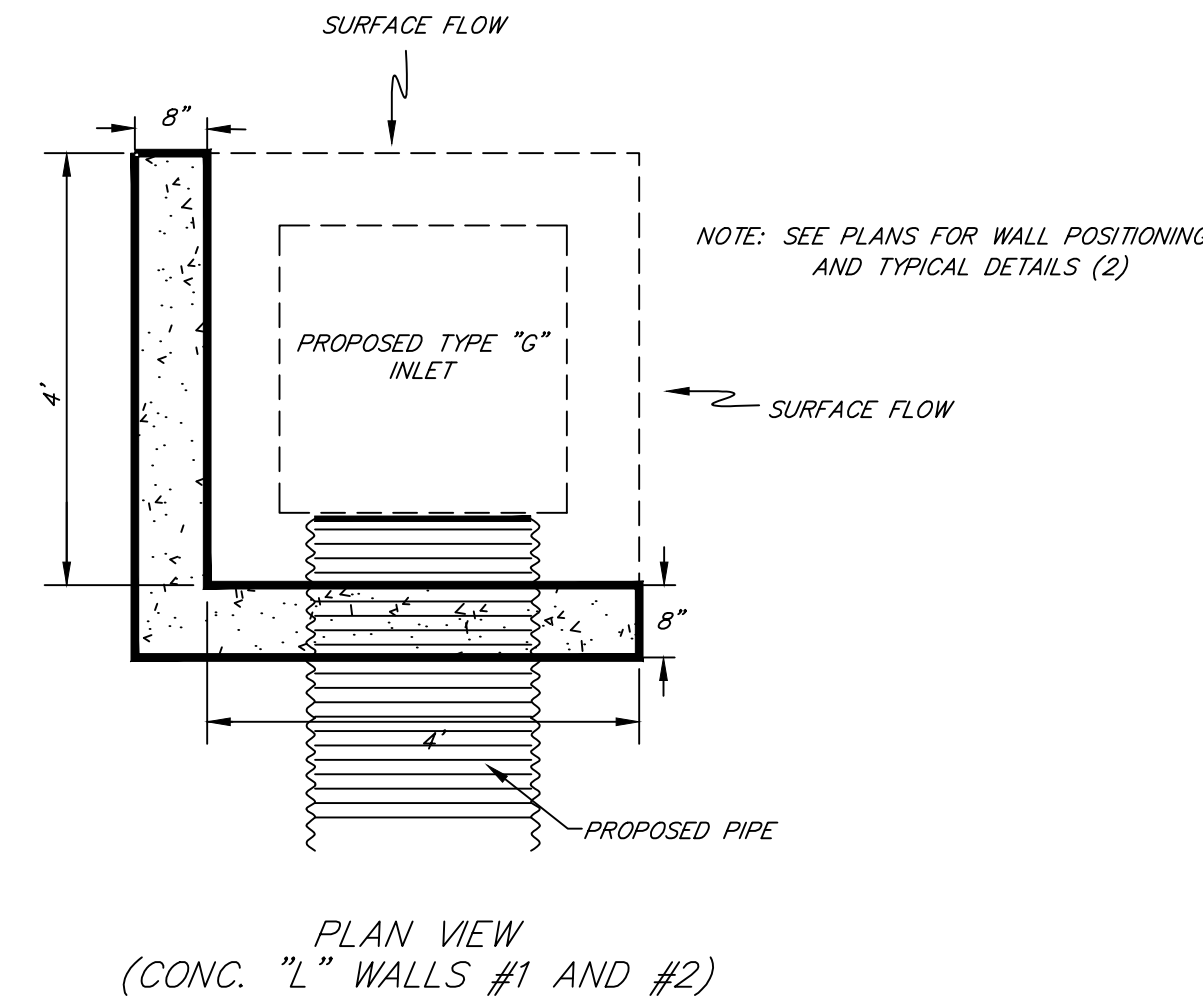
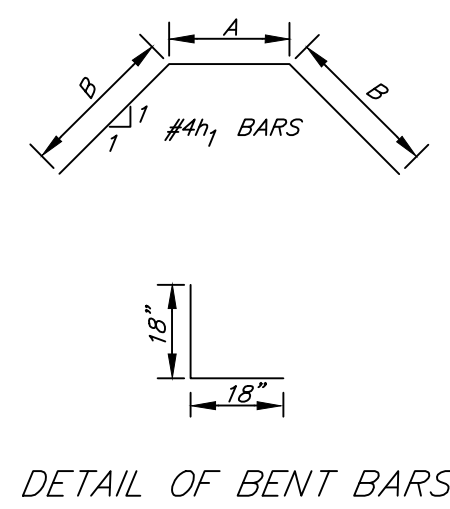
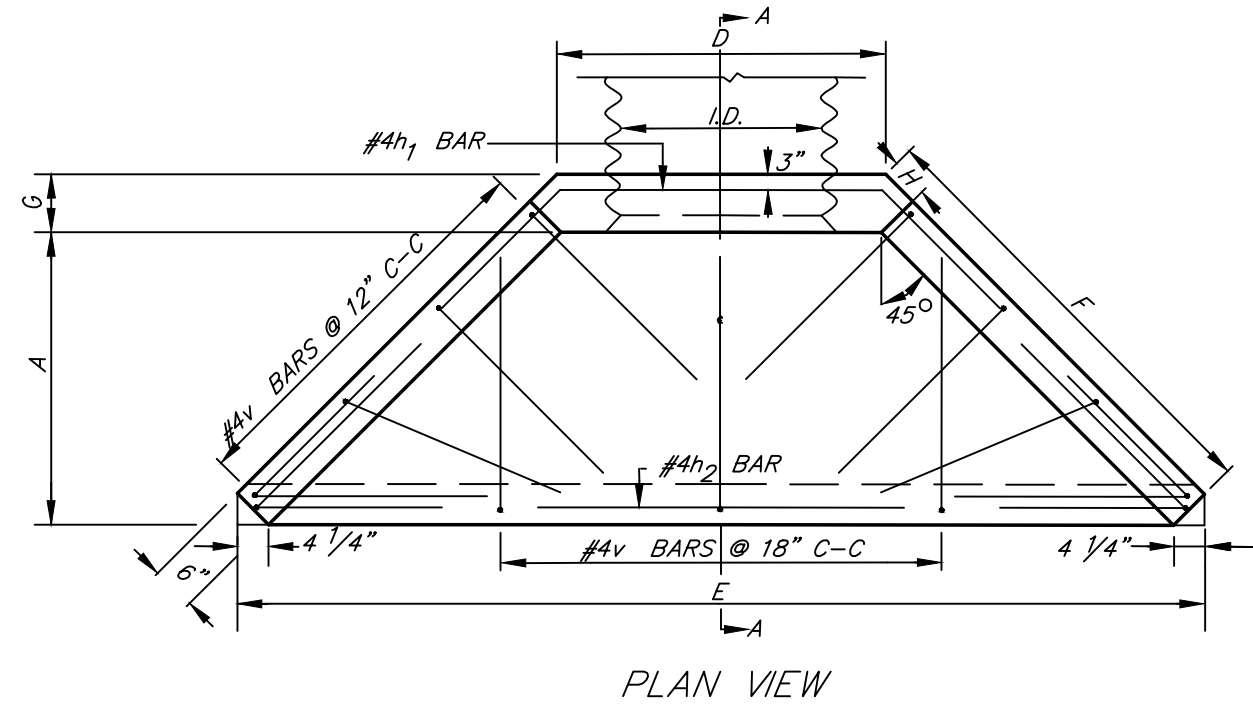
DRAWN BY: DWH
APPROVED BY: RL
DATE: 12/30/2014

SCALE: NONE
SHEET NO. 7
9



INSIDE DIA. OF PIPE	SLOPE OF FILL	DIMENSIONS								REINFORCEMENT				QUANTITIES					
		A	B	C	D	E	F	G	H	MARK	SIZE	NO. OF BARS	LENGTH	TYPE	CONC. (R.C.P.) C.Y.	CONC. (R.C.P.) C.Y.	STEEL LBS.		
15"	2:1	2'-0"	0'-10"	1'-11"	2'-0"	6'-7/2"	3'-3/4"	+0'-8"	+0'3/8"	h1	#4	2	1'-10"	3'-2/2"	8'-3"	BENT	0.61	0.62	41.2
		+2'-2"						+0'-6"	+0'2/2"	h2	#4	1			6'-1"	ST.			
											v	#4	13			3'-0"	BENT		
		BEVEL DEPTH = 3/4" LENGTH = 1"																	
18"	2:1	2'-0"	1'-1"	2'-2"	2'-3"	6'10/2"	3'-3/4"	+0'-8"	+0'3/8"	h1	#4	2	2'-1"	3'-2/2"	8'-6"	BENT	0.67	0.68	41.8
		+2'-2"						+0'-6"	+0'2/2"	h2	#4	1			6'-4"	ST.			
											v	#4	13			3'-0"	BENT		
		BEVEL DEPTH = 3/4" LENGTH = 1 1/4"																	
24"	2:1	2'-8"	1'-4"	2'-9"	2'-11"	8'10/2"	4'-2/2"	+0'-8"	+0'3/8"	h1	#4	2	2'-9"	4'-1/2"	11'-0"	BENT	1.01	1.02	52.4
		+2'-10"						+0'-6"	+0'2/2"	h2	#4	1			8'-4"	ST.			
											v	#4	13			3'-0"	BENT		
		BEVEL DEPTH = 3/4" LENGTH = 1 1/4"																	

* DIMENSIONS FOR INLET WINGWALLS ON CORRUGATED METAL PIPE (TO ACCOMMODATE THE BEVEL).
+ DIMENSIONS FOR INLET WINGWALLS ON CONCRETE PIPE AND ALL OUTLET WINGWALLS.



NOTES

ALL CONCRETE SHALL BE CLASS B CONCRETE. REINFORCING STEEL SHALL BE NEW BILLET STEEL OF INTERMEDIATE GRADE. COST OF ALL REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS B CONCRETE.

THE COVERING FOR REINFORCING STEEL SHALL BE 2" MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF THE BAR, UNLESS OTHERWISE NOTED ON THE PLANS. REINFORCEMENT IN MEMBERS WHERE CONCRETE IS DEPOSITED ON THE GROUND SHALL HAVE 3" OF CONCRETE FROM THE FACE OF THE BAR TO THE GROUND CONTACT SURFACE.

ALL EXPOSED EDGES SHALL HAVE A 3/4" X 45° CHAMFER. CHAMFER ON VERTICAL EDGES SHALL BE CONTINUED A MINIMUM OF ONE FOOT BELOW FINISHED GROUND LINE.

WHEN WINGWALLS ARE PLACED ON THE INLET END OF CORRUGATED METAL OR STRUCTURAL PLATE PIPE, A BEVEL SHALL BE USED AT THE INLET OPENING. THE END OF THE PIPE SHALL BE SET IN FROM THE FACE OF THE WALL AS SHOWN ON THE "BEVEL DETAIL", AND THE BEVEL CONSTRUCTED FROM THE END OF THE PIPE TO THE FACE OF THE WALL.

WHEN WINGWALLS ARE PLACED ON THE INLET END OF CONCRETE PIPE, THE "BELL" OR THE "GROOVE" OF THE PIPE SHALL BE PLACED IN THE WALL, AND THE INSIDE OF THE "BELL" OR "GROOVE" SHALL BE FILLED WITH CONCRETE UP TO THE FLOW LINE.

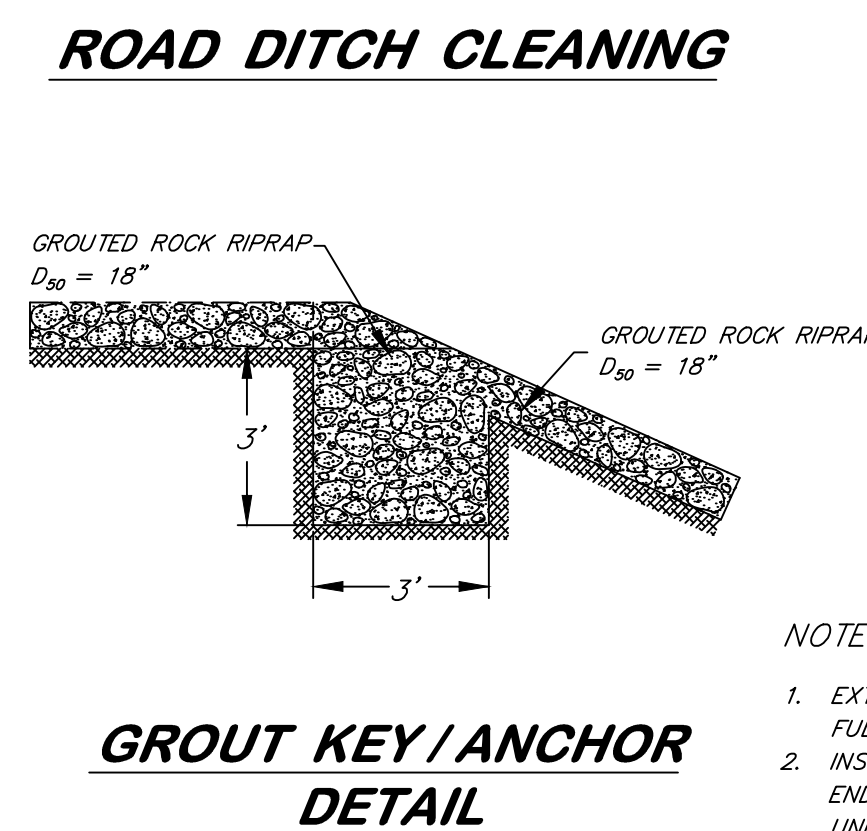
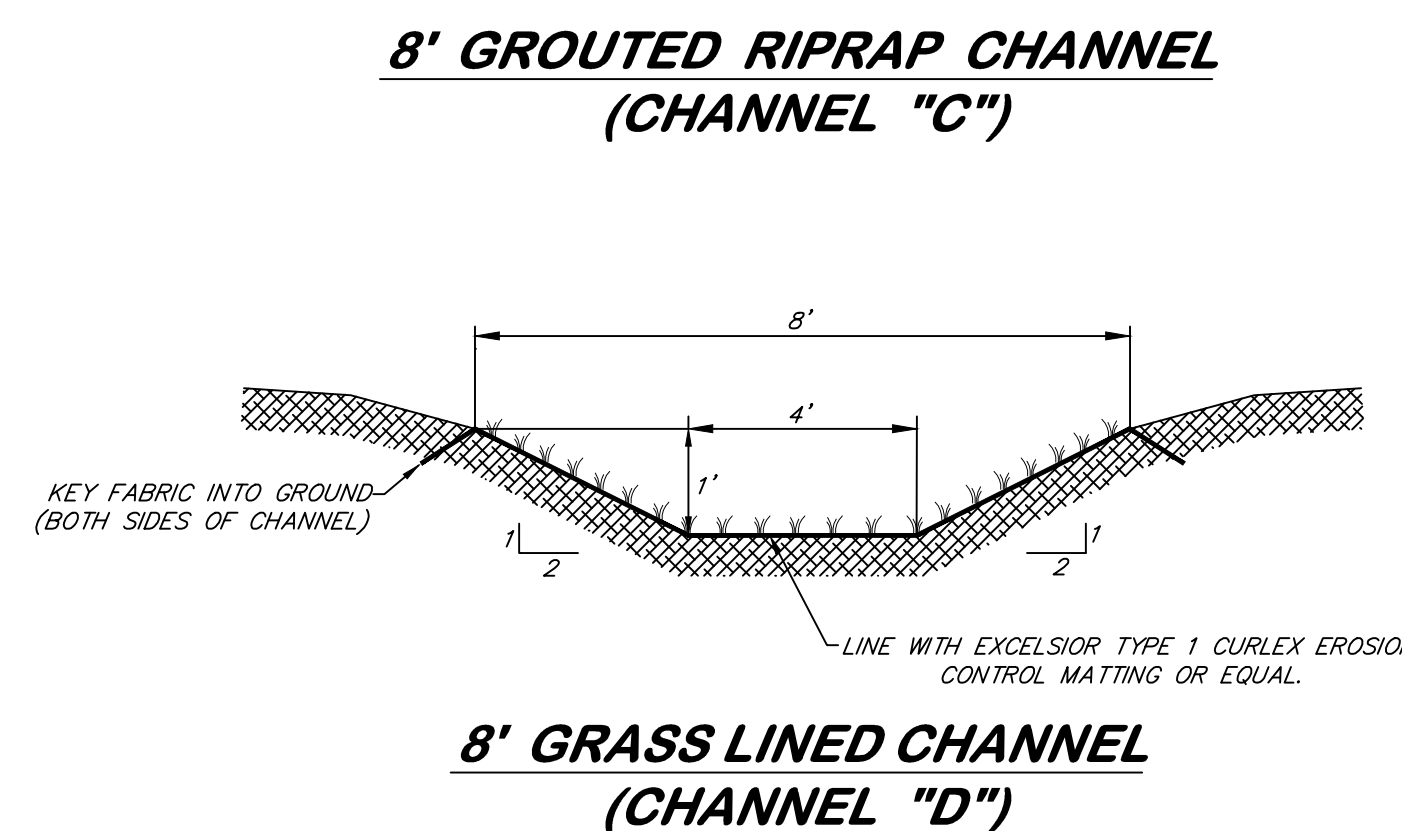
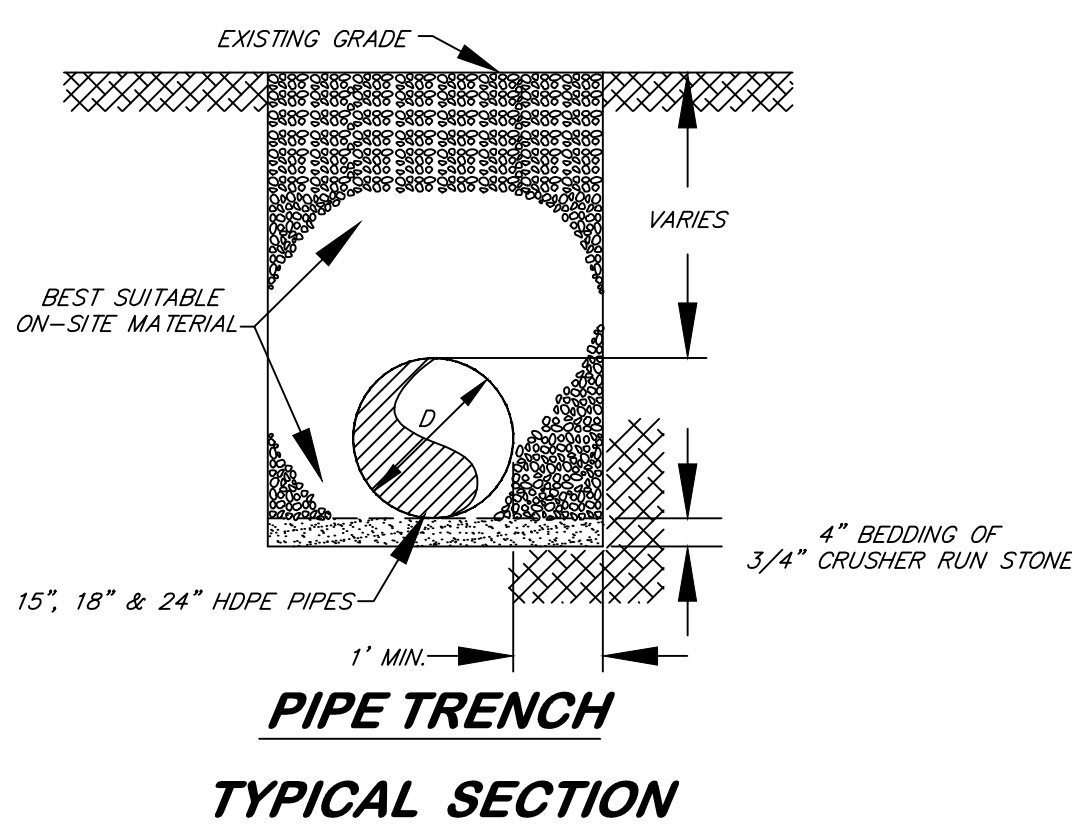
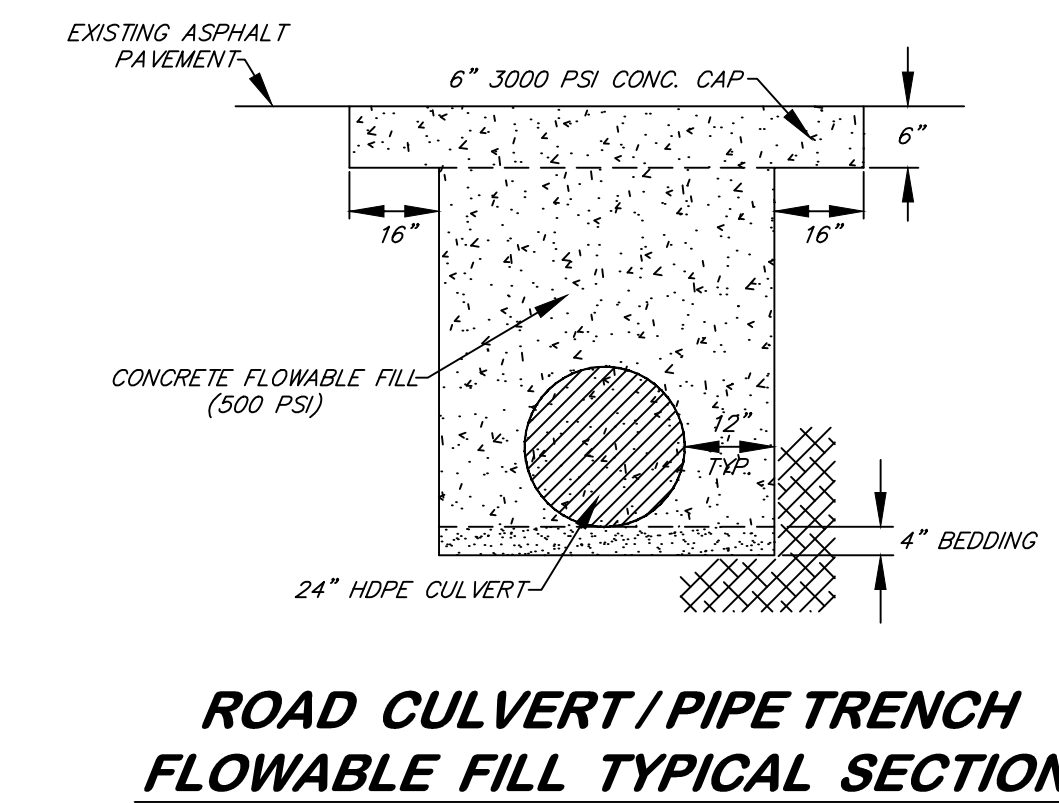
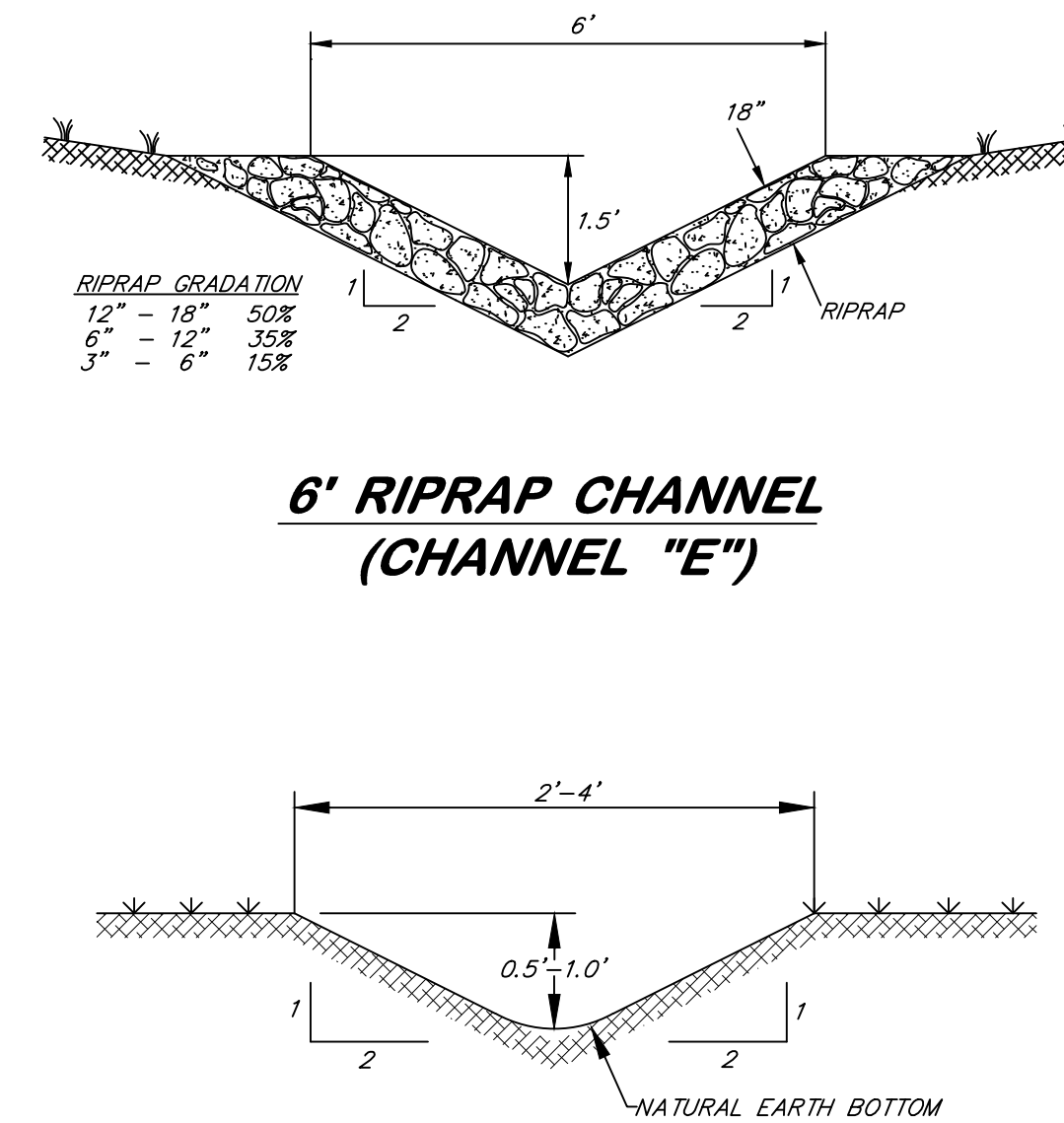
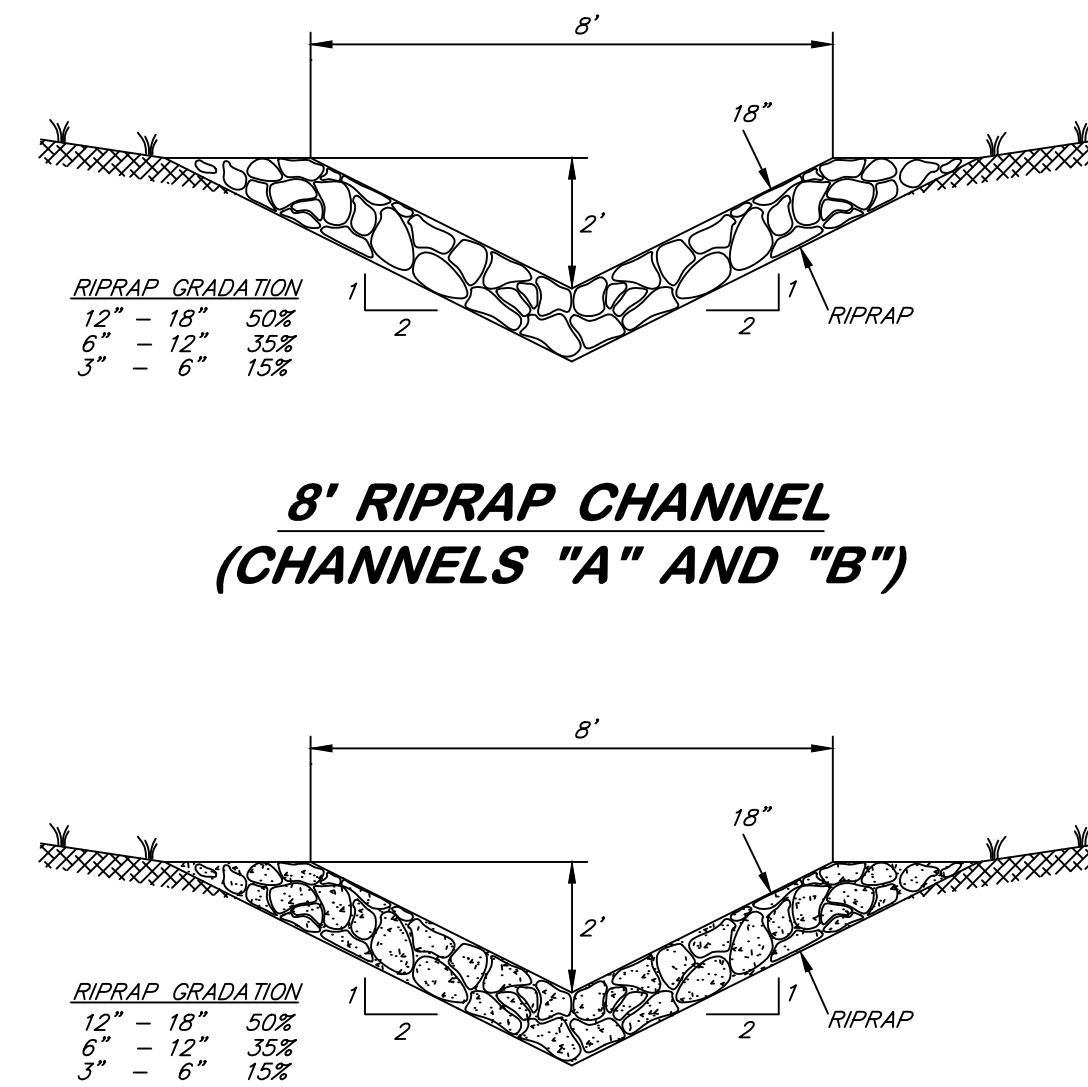
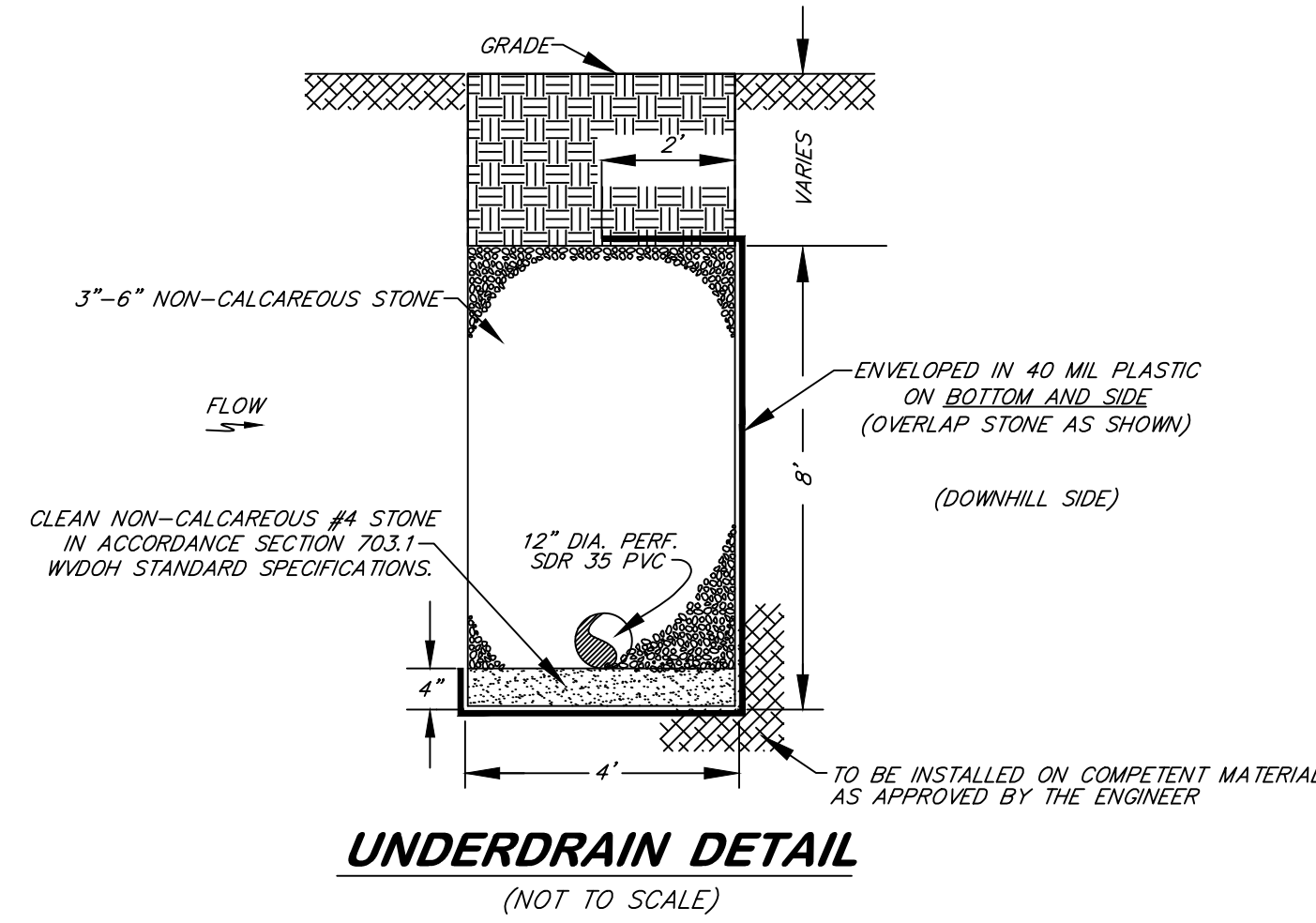
BEVELS ARE NOT REQUIRED ON ALL OUTLET WINGWALLS OR ON INLET WINGWALLS FOR CONCRETE PIPE.

KEYED OR DOWELED TYPE CONSTRUCTION JOINTS, ACCEPTABLE TO THE ENGINEER, MAY BE USED DURING CONSTRUCTION.

IF ENBANKMENT SLOPE ABOVE WINGWALLS IS FLATTER THAN 2:1, PROVIDE WINGS FOR 2:1 SLOPE AND WARP ENBANKMENT TO 2:1 SLOPE AT WINGWALL.

THE PAY QUANTITY FOR WINGWALLS, CONSTRUCTED IN ACCORDANCE WITH THE DETAILS HEREIN, WILL BE THE CUBIC YARDS OF CLASS B CONCRETE SPECIFIED ON THE SHEET.

CONFIGURATIONS OF PROPOSED WALLS VARY FROM ONE ANOTHER AS WELL AS FROM THE DETAILS SHOWN HEREON. IT IS ANTICIPATED THAT THE PROPOSED WALLS SHALL BE FORMED AND CAST IN PLACE. WALL THICKNESSES, JOINT DETAILS, REBAR SCHEDULES, TYPICAL SECTIONS AND CONST. NOTES SHOWN HEREON SHALL APPLY TO ALL OF THE PROPOSED WALL CONFIGURATIONS. FIELD CONDITIONS MAY WARRANT CHANGES TO WINGWALL LENGTHS AND ANGLES, AS APPROVED BY THE ENGINEER.



NOTES:

1. EXTEND GROUT KEY/ANCHOR LATERALLY FULL WIDTH OF DITCH.
2. INSTALL GROUT KEYS/ANCHORS AT BEGINNING AND END OF GROUTED DITCHES AND AT 100' INTERVALS, UNLESS SHOWN ON PLAN.

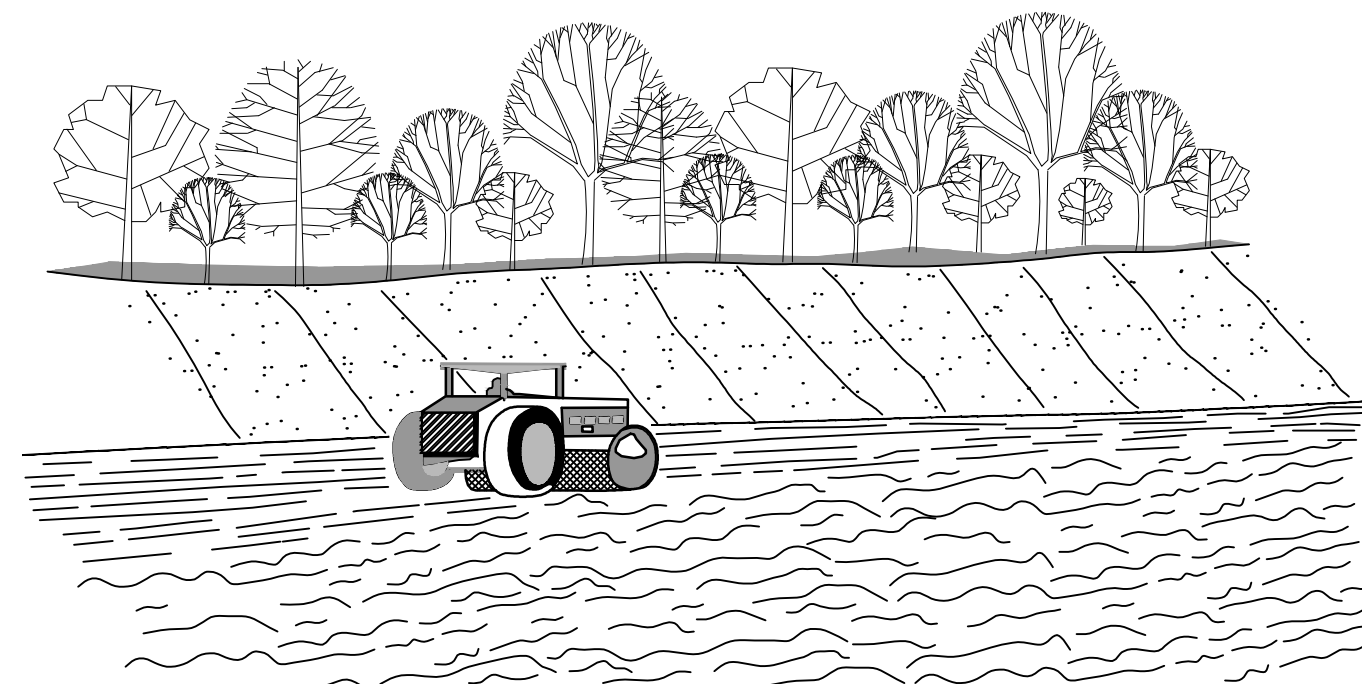
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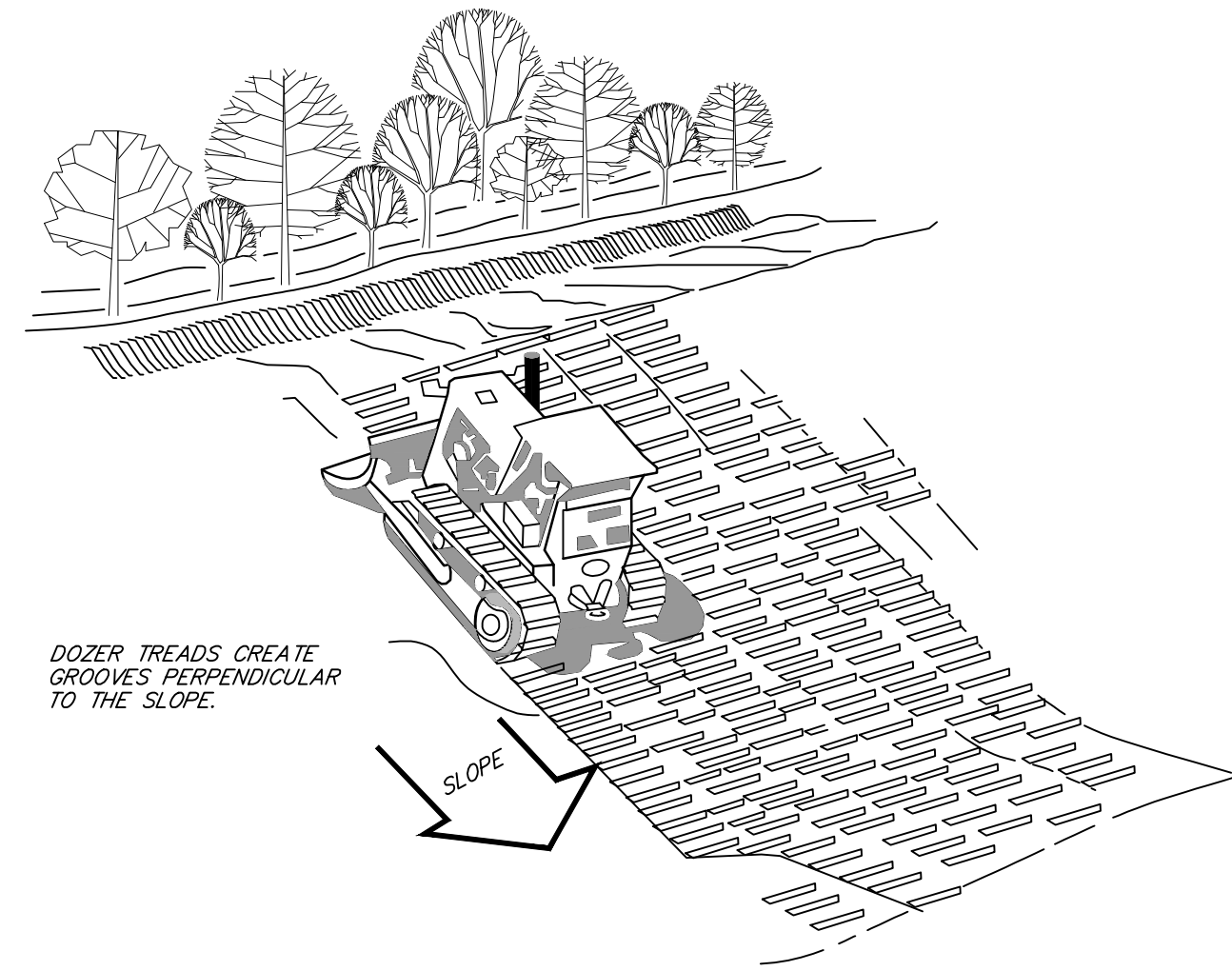
TYPICAL DETAILS (3)

DRAWN BY: DWH
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DATE: 12/30/2014

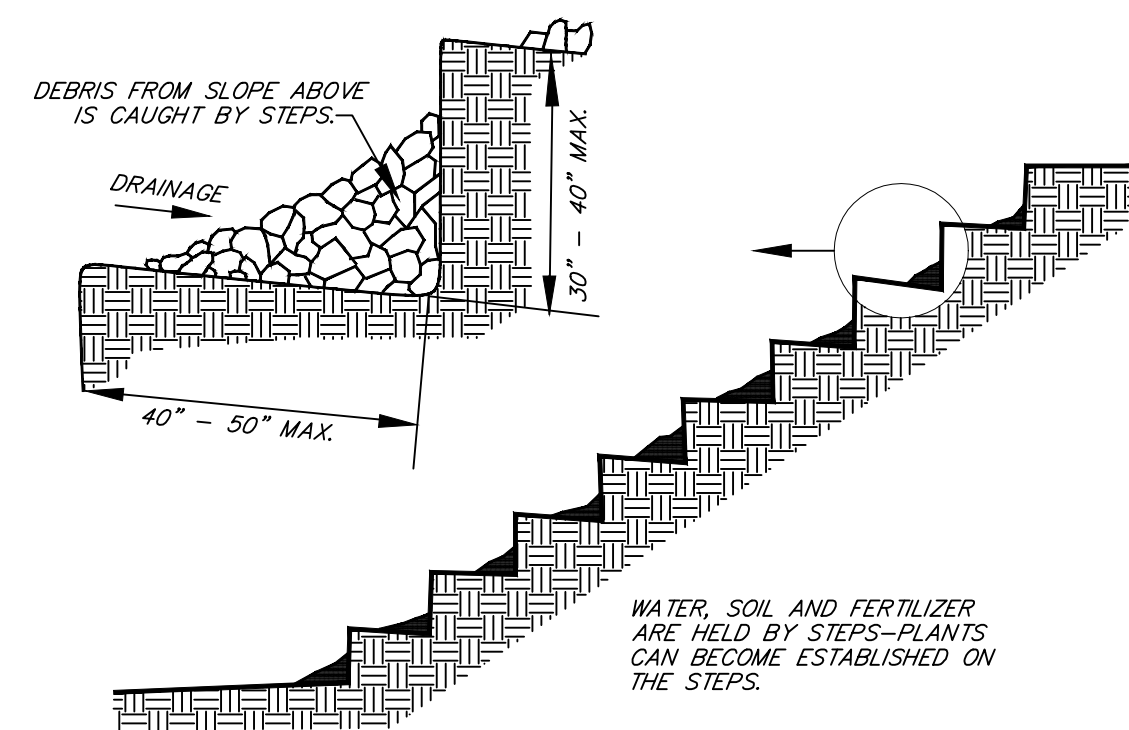
SCALE: NONE
SHEET NO. **8**
OF 9



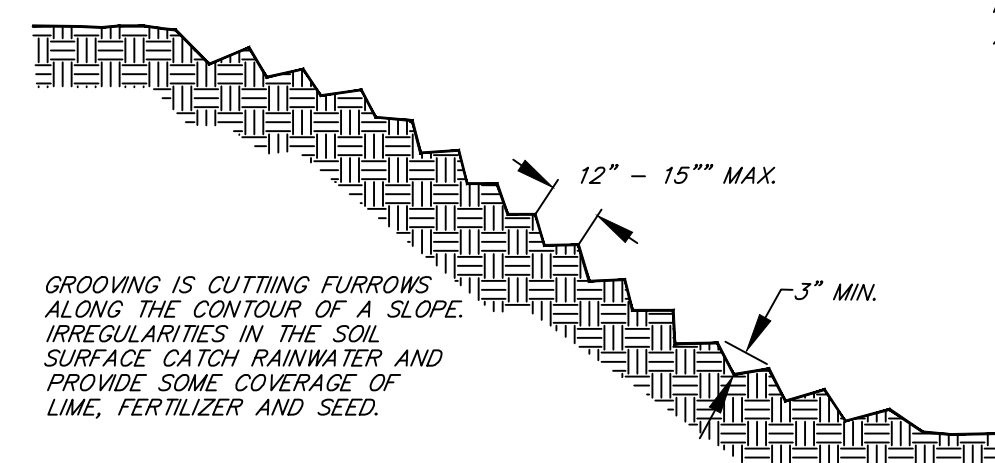
FILL SLOPE TREATMENT



TRACKING

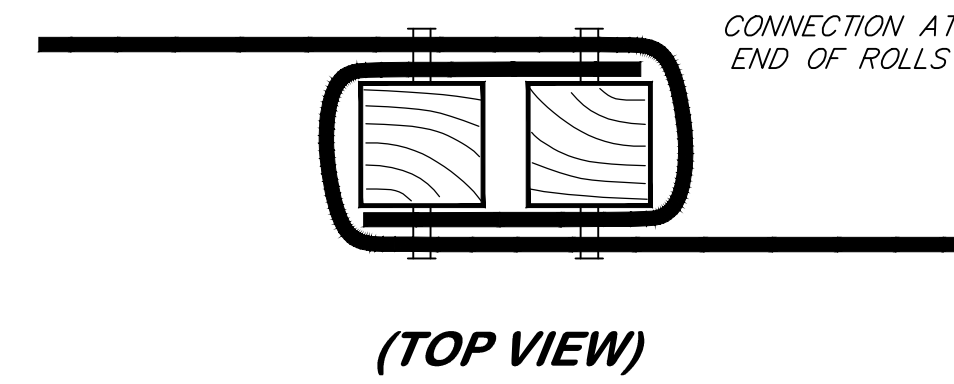
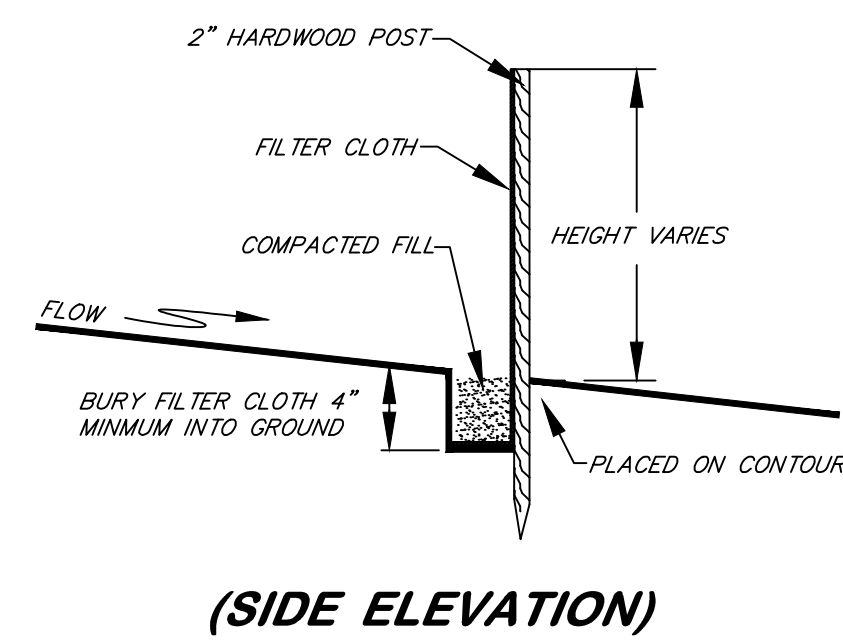
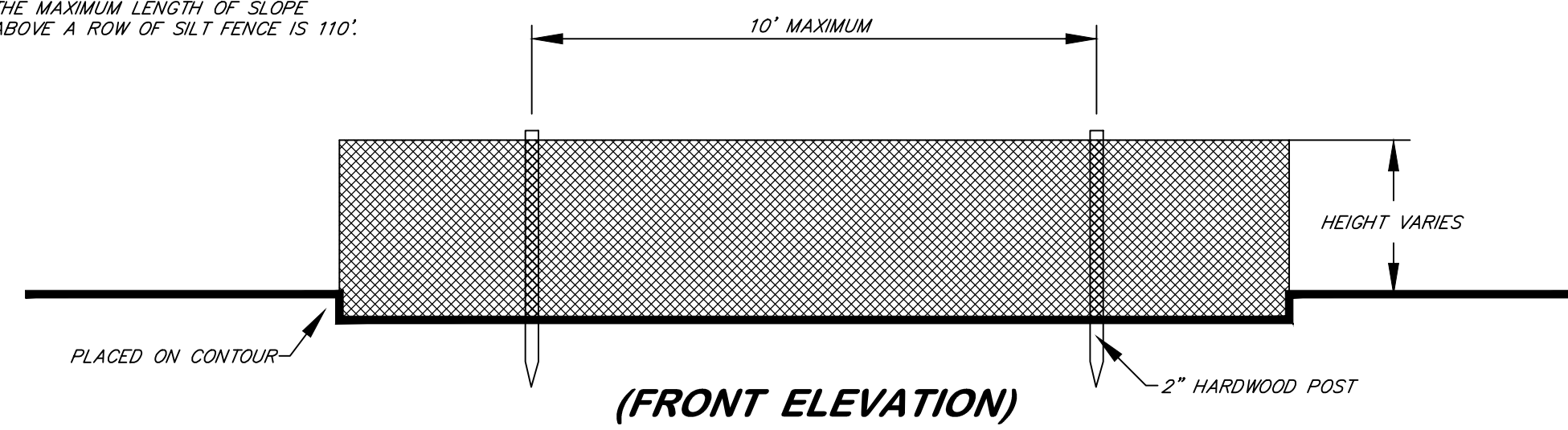


STAIR STEPPING CUT SLOPES

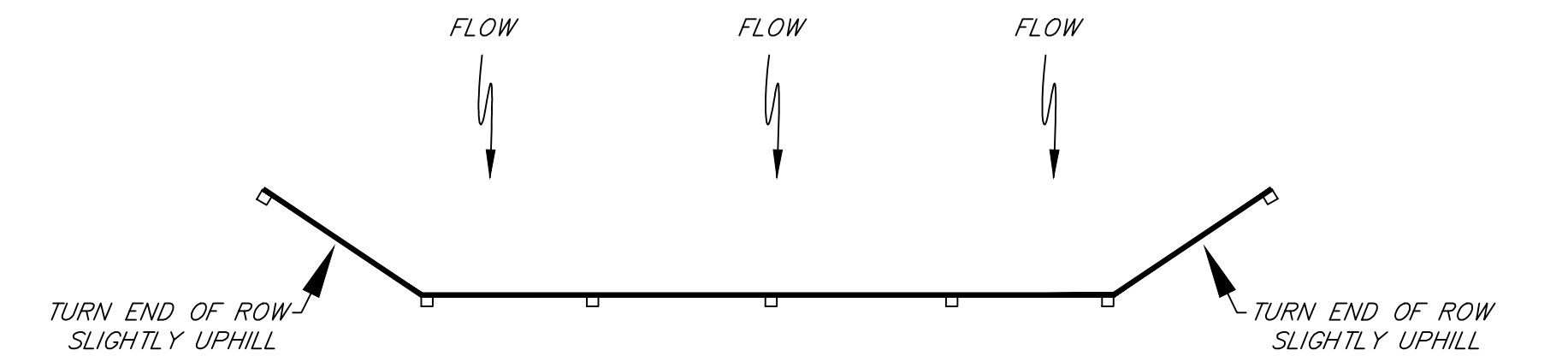
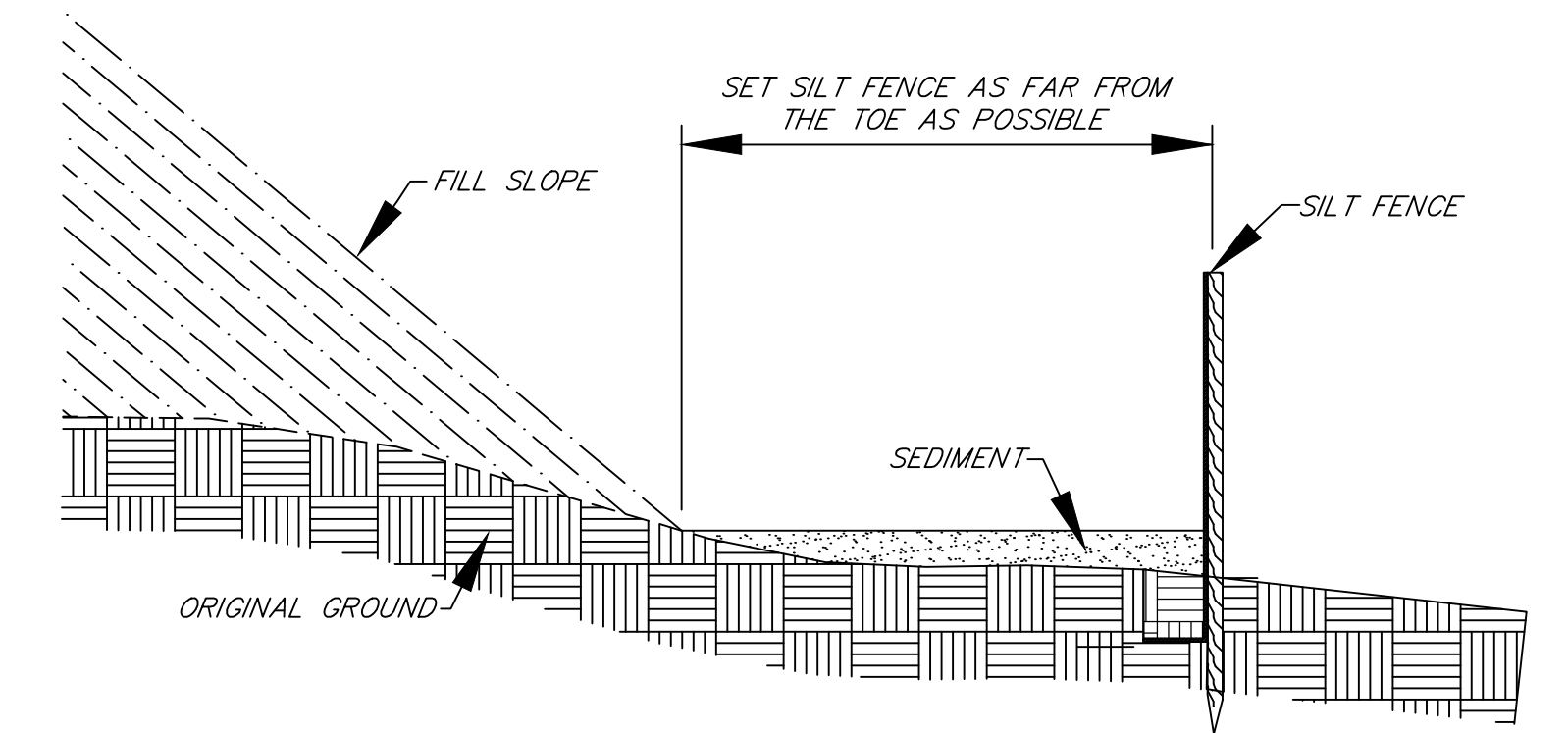


GROOVING SLOPES

NOTE: THE MAXIMUM LENGTH OF SLOPE ABOVE A ROW OF SILT FENCE IS 110'.

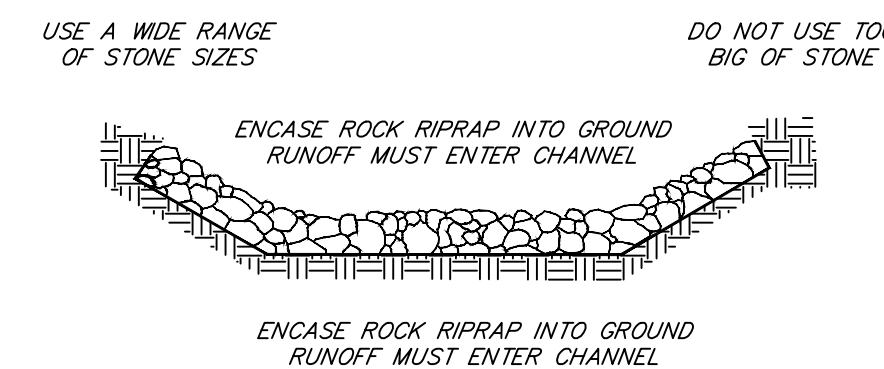


SILT FENCE
(FIG. 3.27.2)

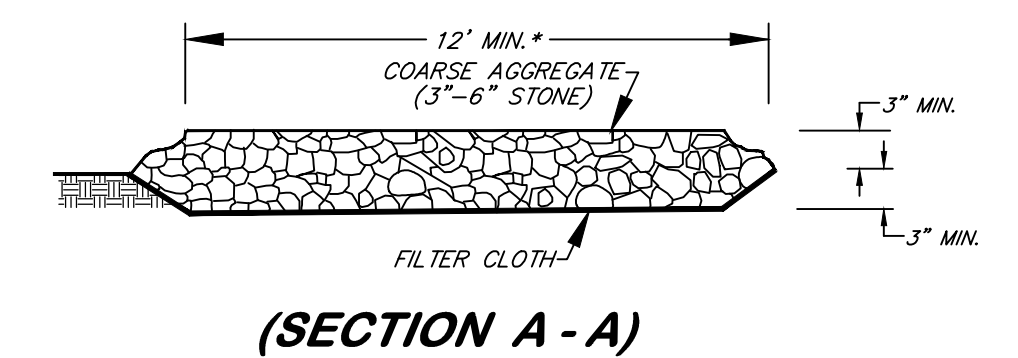
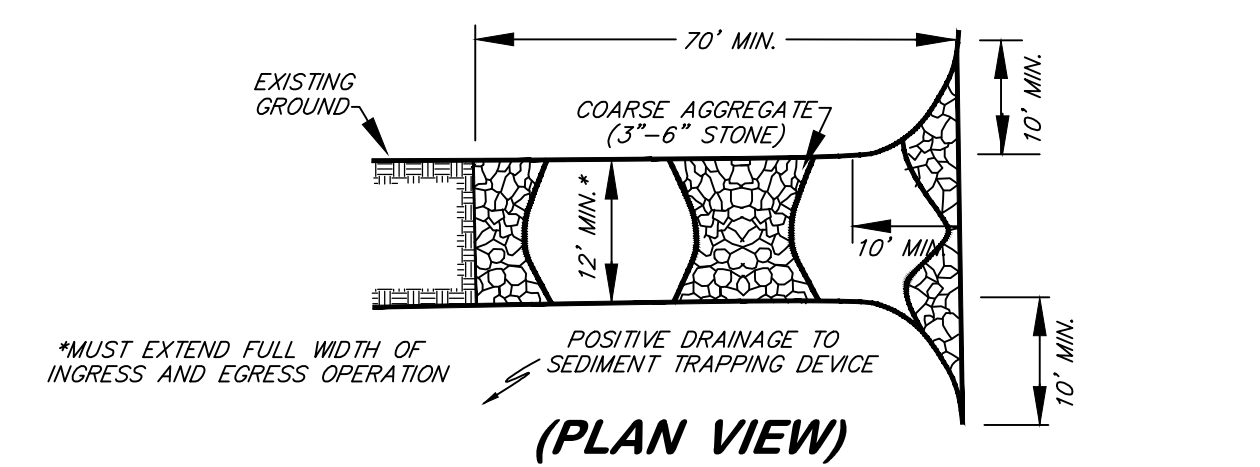
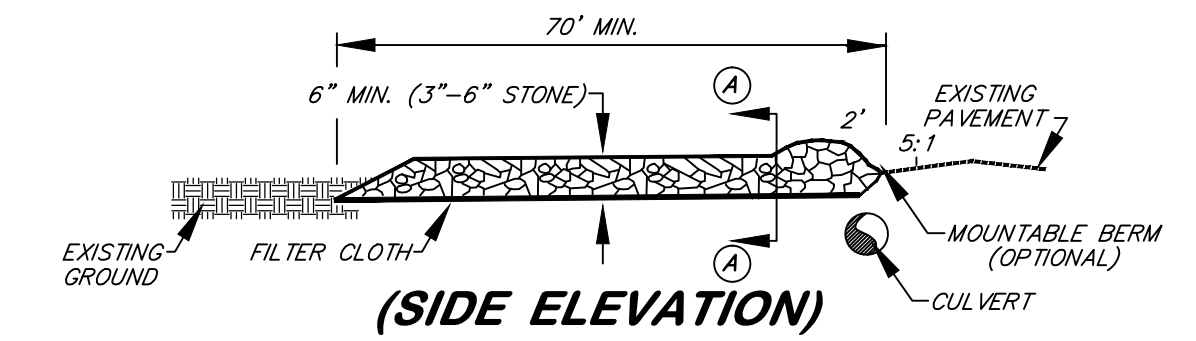
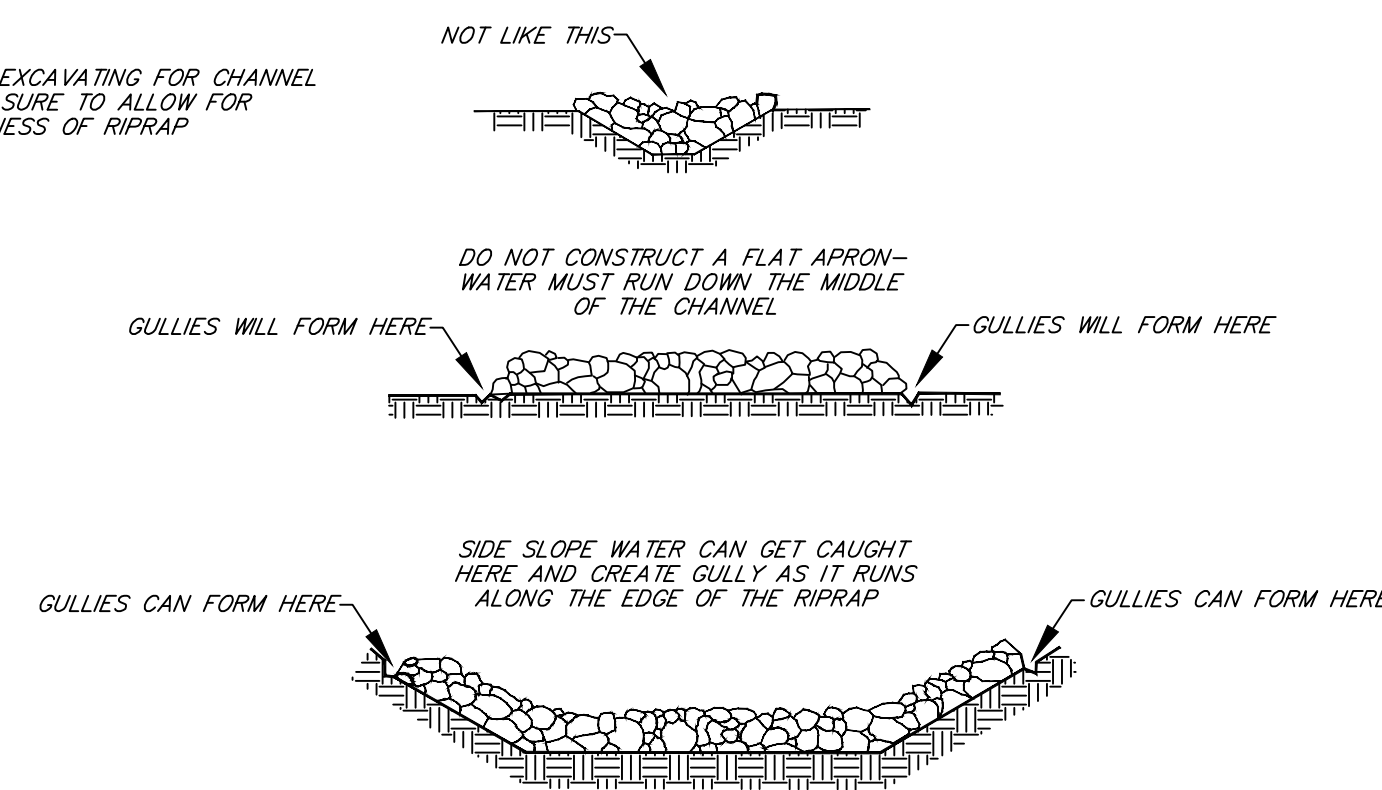


PLACEMENT OF SILT FENCE
(FIG. 3.27.1)

RIPRAP DIVERSION
(FIG. 3.15.3)

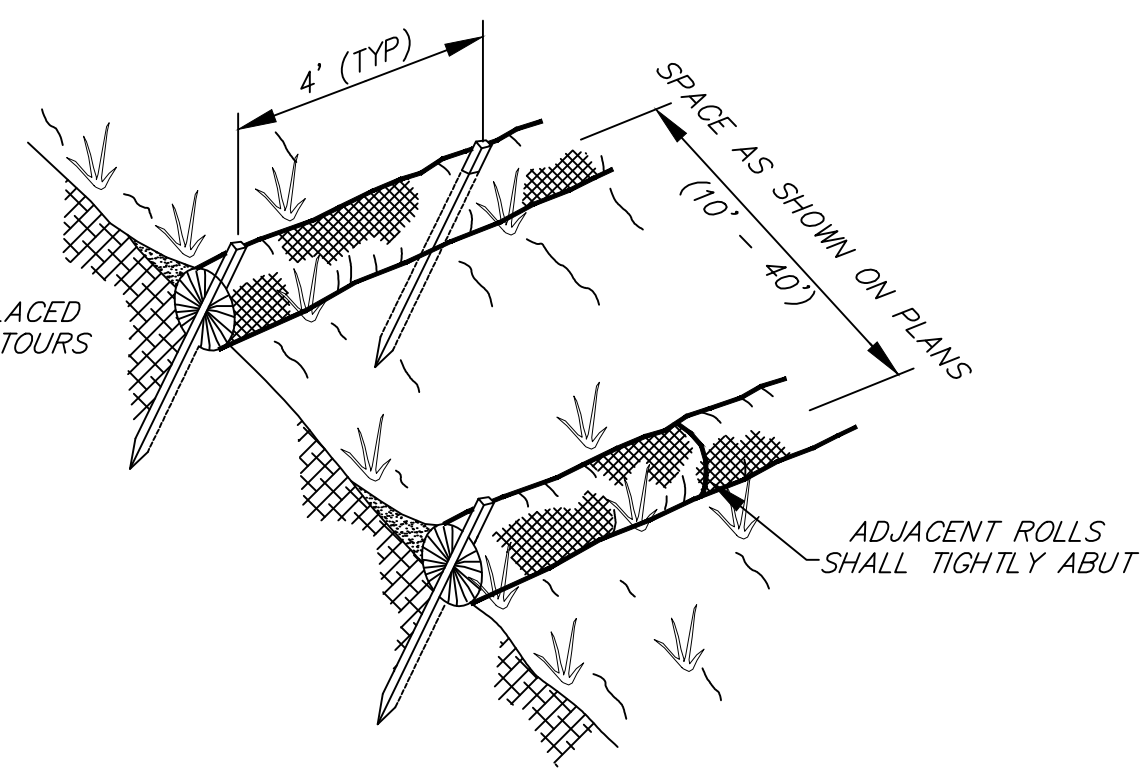


COMMON PROBLEMS

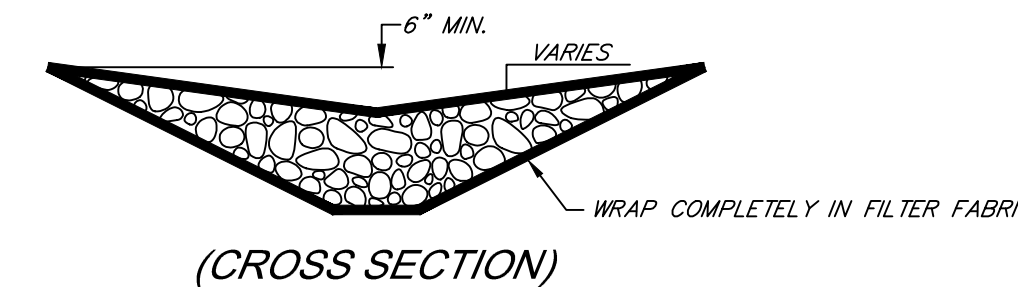
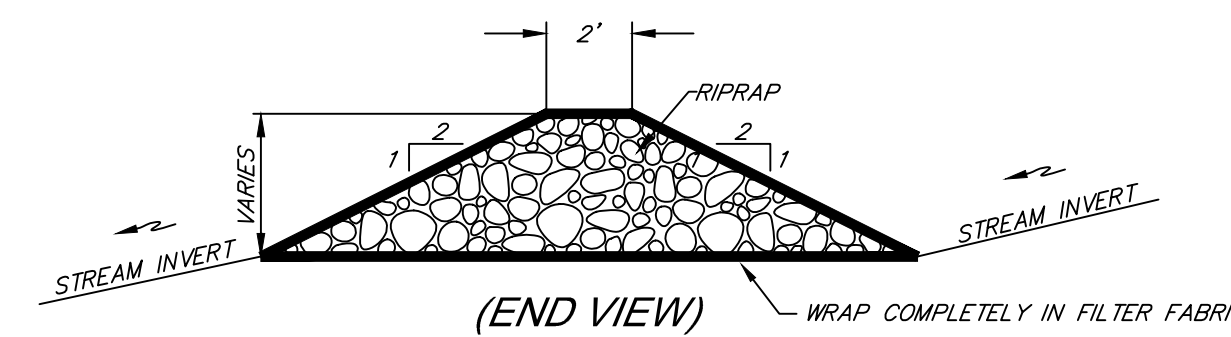
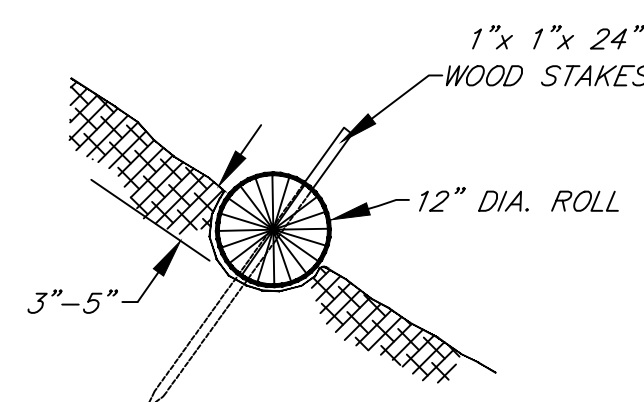


STONE CONSTRUCTION ENTRANCE
(FIG. 3.02.1)

NOTE: STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOURS. RUNOFF MUST NOT BE ALLOWED TO FLOW UNDER OR AROUND THE ROLLS.



12" WATTLE EROSION CONTROL



IN-STREAM ROCK CHECK DAM

State of West Virginia
Department of Environmental Protection
Abandoned Mine Lands and Reclamation

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**SEDIMENT CONTROL
TYPICAL DETAILS**

DRAWN BY: DWH
APPROVED BY: RL
DATE: 10/31/2014

SCALE: NONE
SHEET NO. **9**
OF 9