



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Friday, March 14, 2025
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

HG ENERGY II APPALACHIA, LLC
5260 DUPONT ROAD

PARKERSBURG, WV 26101

Re: Permit Modification Approval for Van Wie 1221 N-11H
47-041-05770-00-00

Adding an access road

HG ENERGY II APPALACHIA, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

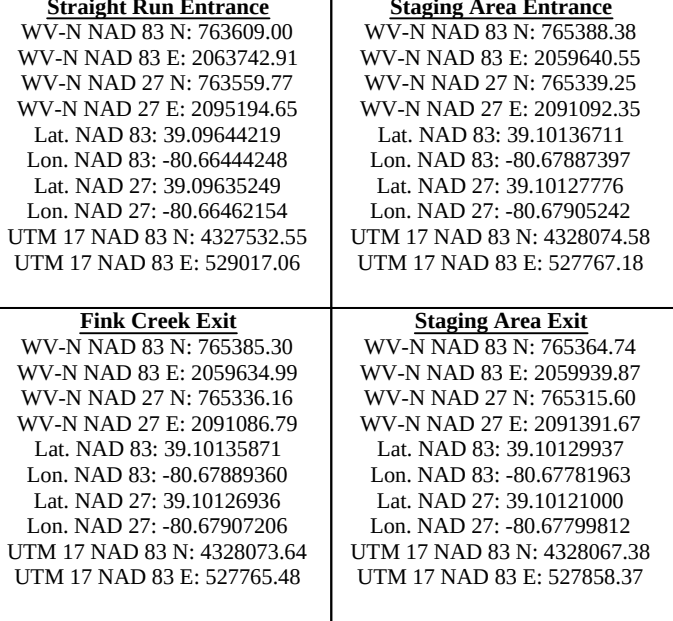


James A. Martin
Chief

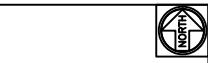
Operator's Well Number: Van Wie 1221 N-11H
Farm Name: HG Energy II Appalachia, LLC
U.S. WELL NUMBER: 47-041-05770-00-00
Horizontal 6A New Drill
Date Modification Issued: 3/14/2025

Promoting a healthy environment.

03/14/2025



consist of (2) 10,000 bbl (76' diameter)
secondary containment 12,000 bbl
) for processed water

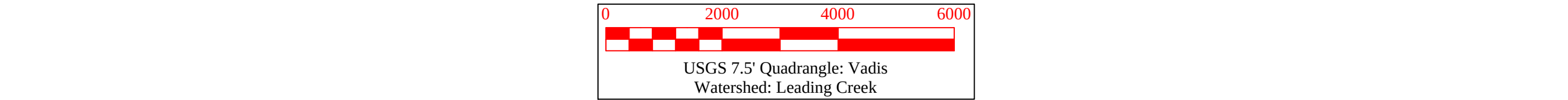


S-HI	S-HI
D 83 N: 763052.14	WV-N NAD 83 N: 763061.98
D 83 E: 2062633.11	WV-N NAD 83 E: 2062644.43
D 27 N: 763002.93	WV-N NAD 27 N: 763012.77
D 27 E: 2094048.85	WV-N NAD 27 E: 2094096.17
D 83 N: 763049.2456	Lon. NAD 83: 39.09495126
D 83 E: -80.66835948	Lon. NAD 83: -80.66831947
D 27 N: 760948.638	Lon. NAD 27: 39.09486159
D 27 E: -80.66853842	Lon. NAD 27: -80.66849841
D 83 (m): N: 4327362.87	UTM 17 NAD 83 (m): 4327365.87
D 83 (m): E: 252678.96	UTM 17 NAD 83 (m): 252682.41
S-HI	S-HI
D 83 N: 762940.37	WV-N NAD 83 N: 762950.44
D 83 E: 2062649.37	WV-N NAD 83 E: 2062659.69
D 27 N: 763091.40	WV-N NAD 27 N: 763091.24
D 27 E: 2093857.11	WV-N NAD 27 E: 2093864.44
D 83 N: 39.09462039	Lon. NAD 83: 39.09464729
D 83 E: -80.66916322	Lon. NAD 83: -80.66912321
D 27 N: 39.09453072	Lon. NAD 27: 39.09453765
D 27 E: -80.66932413	Lon. NAD 27: -80.66930213
D 83 (m): N: 4327328.88	UTM 17 NAD 83 (m): 4327331.88
D 83 (m): E: 252609.57	UTM 17 NAD 83 (m): 252613.02



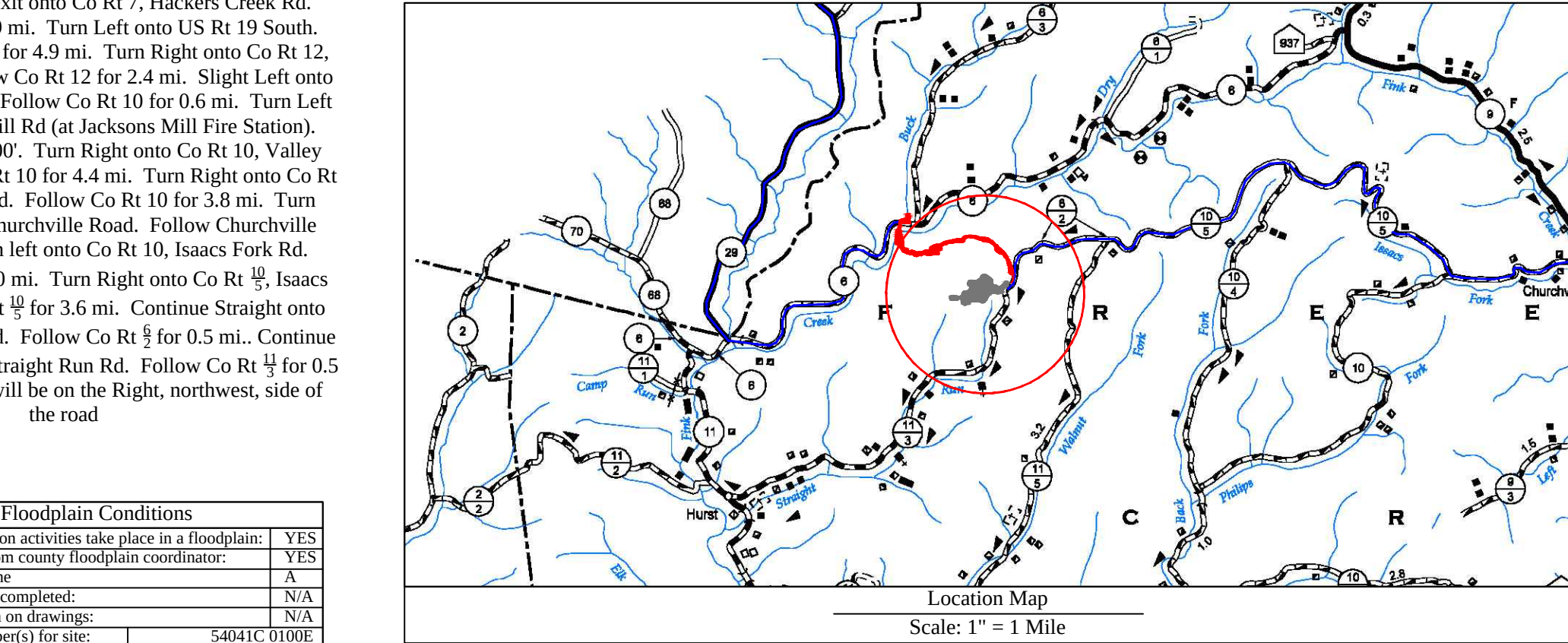
From I-79 North, turn left at the end of Follow Co Rt 10, Follow US Rt 10, Jackson Mill Rd, Co Rt 10, Old Mo on Co Rt 10, Follow Co Rt 10, Chapel Rd. Follow 10, Freemans Co Right onto Co road for 0.2 mi. Follow Co Rt 10, Fork Rd. Follow Co Rt 5, Straight onto Co Rt 10, Straight onto Co mi. The site enters

Site Design, Construction Plan, &
Erosion and Sediment Control Plans
HG Energy LLC
Lewis County
Freemans Creek District
Latitude 39.09467556°
Longitude -80.66867393°
Leading Creek Watershed

[illegible]

Approach Routes:

ane Lew, WV. Take Exit 99 and turn
right onto Rt 7, Hackers Creek Rd.
0.1 mi. Turn Left onto US Rt 19 South.
0.7 for 4.9 mi. Turn Right onto Co Rt 12
0.7 for Co Rt 12 for 2.4 mi. Slight Left onto
Follow Co Rt 10 for 0.6 mi. Turn Left
0.1 rd (at Jacksons Mill Fire Station).
0.00. Turn Right onto Co Rt 10, Valley
0.10 for 4.4 mi. Turn Right onto Co Rt
0.10. Follow Co Rt 10 for 3.8 mi. Turn
Churchville Road. Follow Churchville
left onto Co Rt 10, Isaacs Fork Rd.
0.1 mi. Turn Right onto Co Rt $\frac{1}{2}$, Isaacs
0.1 for 3.6 mi. Continue Straight onto
1. Follow Co Rt $\frac{1}{2}$ for 0.5 mi. Continue
Straight Run Rd. Follow Co Rt $\frac{1}{2}$ for 0.5
will be on the Right, northwest, side of
the road



1221 Site
Emergency Number: 304-269-8241
Freemans Creek District, Lewis County, WV
Watershed: Leading Creek Watershed
Site 911 Address:

Property Owner Information - 1221 Well Site							
Freemans Creek District - Lewis County							
Owner	TM - Parcel	Well Pad	AST Pad	Access Road	Stockpiles	Add. Clearing	Total Disturbed
HG Energy II Appalachia, LLC	D2D-31	0.00	0.00	0.00	0.03	0.10	0.13
HG Energy II Appalachia, LLC	D2D-3	4.94	0.75	0.14	2.65	5.49	13.97
Anthony & Dawn Van Wie	D2D-29	4.56	1.59	0.67	0.00	2.48	9.30
Site Totals (Ac)		9.50	2.34	0.81	2.68	8.07	23.40

Property Owner Information - 1221 Fink Creek Access							
Freemans Creek District - Lewis County							
Owner	TM - Parcel	Staging Area	Access Road	Topsoil/Access	Add. Clearing	Total	
Geely et al	2D-48	1.09	0.23	0.24	1.19		
Sheila Gum	2D-3.4	0.00	5.32	3.37	7.47		
Sheila Gum	2C-7	0.00	3.31	0.47	3.81		
	Site Totals (Ac)	1.09	8.86	2.08	12.47		2

Fink Creek Access Road			
Surface Owner	TM - Parcel	Road Length	Type
Alice Keely et al	2D-48	286.52'	New Access Road Construction
James II & Sheila Gum	2D-3.4	3,108.37'	New Access Road Construction
James II & Sheila Gum	2C-7	2,555.68'	New Access Road Construction

Disturbed Area - Fink Creek Rd	
Staging Area Construction	1.09 Ac
New Access Road Construction	8.86 Ac
Topsoil / Excess Material	2.08 Ac
Additional Clearing	12.47 Ac
Total Disturbed Area	24.50 Ac
Additional Information	
Total Wooded Acres Disturbed	22.50 Ac
Total Linear Feet of Access Road	5,950.57

1221 Well Site Quantities - Well Site							
Description	Cut (CY)	Fill (CY)	Spill (CY)	Borrow (CY)	Max. Slope	Length of Slope	Est Topsoil (CY)
Well Pad	127,216.61	75,685.35	51,531.56	-	N/A	N/A	15,000.00
AST Pad	146.27	263.30	-	26,160.93	N/A	N/A	3,800.00
Well Pad Access Road	39.40	7,064.50	-	7,025.10	13:64%	156.48'	-
AST Pad Access Road	3.04	1,730.01	-	1,726.97	14:55%	169.46'	-
Landowner Access Road							
Excess Material Stockpiles							
Totals	127,425.12	136,456.68	51,531.56	26,160.93	N/A	N/A	-
	Total Spill (CY) =	-9,031.56			(Excess Spill Capacity)		

1221 Fink Creek Access Quantities						
Description	Cut (CY)	Fill (CY)	Spill (CY)	Borrow (CY)	Max. Slope	Length of Slope
Bypass Access Road	22,252.02	18,886.63	3,365.39	-	-20.38	78.83
Staging Area	2,420.28	819.95	1,500.00	-	N/A	N/A
Staging Area East Access	0.00	216.65	N/A	29.32	N/A	N/A
Staging Area West Access	2.21	6.93	-	4.72	N/A	N/A
Staging Area Stockpile	0.00	3,000.00	-	3,000.00	N/A	N/A
Bypass Access Road Stockpiles	0.00	19,000.00	-	19,000.00	N/A	N/A
Totals	24,674.84	41,743.16	4,865.72	22,034.04		
	Total Spill (CY)	= -17,168.32 (Excess Stockpile Capacity)				

Ephemeral Stream Impact (Linear Feet) - Fink Creek Access Road					
Stream and Impact Cause	Culvert (LF)	Inlet/Outlet Structures Fill (LF)	Slope Fill (LF)	Const. Disturb. to LOD (LF)	Total Impact (LF)
Watercourse FE (Access Road)	-	10.00	86.60	12.43	109.03
Watercourse FA (Access Road)	-	12.21	45.95	5.00	63.16
				Total Stream Impacts	172.19

human or domestic animals.

0 SF used for poultry or dairy

ing trout stream.

er supply.

Design Certification

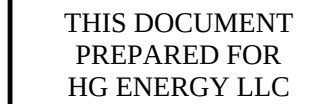
struction notes and reference diagrams attached hereto have been prepared in
West Virginia Code of State Rules, Division of Environmental Protection, Office of
08

and/or Reference Diagrams included in this design constitutes a complete set of plans.
Plans is necessary to construct the site in accordance with the design.

field  Date: 02-04-2025

L.C.

Date 02-04-2025



Kelly Surveying
P.O. Box 254
Dailey, WV 26259
(304) 338-6984

Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 1 of 32

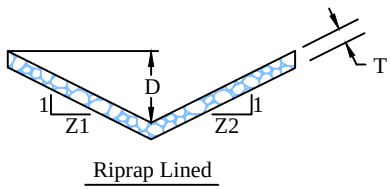
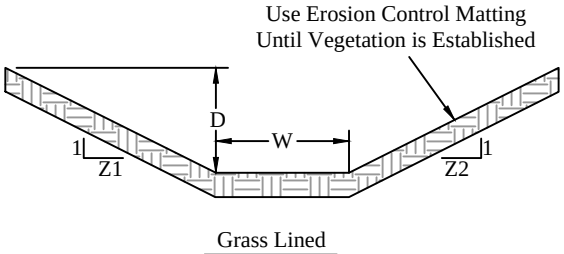
Schedule of Quantities

Fink Access Road Pipe Schedule					
Pipe Crossing	Station	Length (ft)	Diameter (ft)	Type	Slope (%)
1	3+62	35	1.5	HDPE	2
2	7+26	35	1.5	HDPE	2
3	9+36	35	1.5	HDPE	2
4	12+37	30	1.5	HDPE	2
5	15+63	35	1.5	HDPE	2
6	18+68	35	1.5	HDPE	2
7	24+93	38	1.5	HDPE	2
8	28+25	40	1.5	HDPE	2
9	34+05	45	1.5	HDPE	2
10	39+30	30	1.5	HDPE	2
11	41+30	35	1.5	HDPE	2
12	46+00	35	1.5	HDPE	2
13	50+39	30	1.5	HDPE	2
14	51+95	32	1.5	HDPE	2
15	53+50	40	1.5	HDPE	2
16	56+83	45	1.5	HDPE	2
17	46+98	80	1.5	HDPE	2
18	51+27	55	1.5	HDPE	2
19	0+14	60	1.5	HDPE	2
20	0+10	80	1.5	HDPE	2

18" Filter Sock			1875
FS18 #1	19	FS18 #22	74
FS18 #2	25	FS18 #23	60
FS18 #3	45	FS18 #24	29
FS18 #4	35	FS18 #25	21
FS18 #5	50	FS18 #26	55
FS18 #6	63	FS18 #27	92
FS18 #7	45	FS18 #28	27
FS18 #8	36	FS18 #29	28
FS18 #9	26	FS18 #30	31
FS18 #10	41	FS18 #31	22
FS18 #11	69	FS18 #32	31
FS18 #12	71	FS18 #33	47
FS18 #13	65	FS18 #34	61
FS18 #14	56	FS18 #35	59
FS18 #15	26	FS18 #36	56
FS18 #16	54	FS18 #37	56
FS18 #17	22	FS18 #38	79
FS18 #18	42	FS18 #39	34
FS18 #19	30	FS18 #40	39
FS18 #20	31	FS18 #41	52
FS18 #21	23	FS18 #42	48

Belted Silt Retention Fence			1757
BSRF #1	27	BSRF #17	31
BSRF #2	30	BSRF #18	35
BSRF #3	49	BSRF #19	129
BSRF #4	39	BSRF #20	216
BSRF #5	55	BSRF #21	41
BSRF #6	68	BSRF #22	37
BSRF #7	50	BSRF #23	42
BSRF #8	37	BSRF #24	35
BSRF #9	31	BSRF #25	26
BSRF #10	46	BSRF #26	69
BSRF #11	127	BSRF #27	58
BSRF #12	54	BSRF #28	58
BSRF #13	41	BSRF #29	48
BSRF #14	68	BSRF #30	50
BSRF #15	48	BSRF #31	29
BSRF #16	58	BSRF #32	25

Super Silt Fence			3918
SSF #1	34	SSF #23	63
SSF #2	36	SSF #24	67
SSF #3	27	SSF #25	52
SSF #4	52	SSF #26	51
SSF #5	57	SSF #27	43
SSF #6	137	SSF #28	35
SSF #7	77	SSF #29	27
SSF #8	104	SSF #30	33
SSF #9	216	SSF #31	34
SSF #10	39	SSF #32	32
SSF #11	52	SSF #33	36
SSF #12	58	SSF #34	33
SSF #13	41	SSF #35	98
SSF #14	39	SSF #36	57
SSF #15	83	SSF #37	33
SSF #16	60	SSF #38	63
SSF #17	61	SSF #39	82
SSF #18	88	SSF #40	30
SSF #19	121	SSF #41	30
SSF #20	58	SSF #42	38
SSF #21	64	SSF #43	47
SSF #22	38	SSF #44	32



Rock Lined Channel						
Channel ID	Min Depth (D) (ft)	Width (W) (ft)	z1	z2	T (ft)	Riprap Size D50 (in)
Sump A Outlet	2	4	2	2	1	R4
Sump B Outlet	2	4	2	2	1	R4
Sump C Outlet	2	4	2	2	1	R4
Bench 1 Outlet	2	0	2	2	0.75	R3
AST Drain A	2	0	2	2	1	R4
AST Drain B	2	0	2	2	1	R4
AST Drain C	2	0	2	2	1	R4

Toe Keys	
Toe Key	Toe Key Length (ft)
A	383
B	2037
C	237
D	287
E	255
F	430
G	137
H	340
J	183
K	313
L	1394
M	306
N	470
O	87

Surface Areas			
Area Name	Area (Ac.)	Area (SF)	Area (SY)
Well Pad	5.62	244,841	27,205
Well Pad Access Road	0.40	17,596	1,956
AST Pad	1.05	45,567	5,063
AST Pad Access Road	0.14	6,306	701

Earthwork & Capacity Reports

The earthwork quantities provided are an estimate for consideration. The quantities shown are calculated using a 1:1 Cut / Swell & Shrink factor. The quantities shown may be greater or less than actually excavated. The engineer is not responsible for variances from the estimated quantities and does not certify to their accuracy.

<u>Well Pad Report</u> Top of pad elevation: 1251.77 Cut Slope: 50.00% 2.00:1 Fill Slope: 50.00% 2.00:1 Pad Earthwork Volumes Total cut : 3,434,856.5 C.F., 127,216.91 C.Y. Total fill: 2,043,504.5 C.F., 75,685.35 C.Y.	<u>Stockpile #1 Pad Report</u> Cut Slope: 50.00% 2.00:1 Fill Slope: 50.00% 2.00:1 Pad Earthwork Volumes Total cut : 0.0 C.F., 0.00 C.Y. Total fill: 216,002.9 C.F., 8,000.11 C.Y.
<u>AST Pad Report</u> Top of pad elevation: 1229.00 Cut Slope: 50.00% 2.00:1 Fill Slope: 50.00% 2.00:1 Pad Earthwork Volumes Total cut : 3,849.3 C.F., 142.57 C.Y. Total fill: 710,194.6 C.F., 26,303.50 C.Y.	<u>Stockpile #2 Pad Report</u> Cut Slope: 50.00% 2.00:1 26.57° Fill Slope: 50.00% 2.00:1 26.57° Pad Earthwork Volumes Total cut : 35.1 C.F., 1.30 C.Y. Total fill: 135,399.7 C.F., 5,014.80 C.Y.
<u>Well Pad Access Road Report</u> Processing 0+00.000 to 5+08.218 Total Cut : 991.983 C.F., 36,740 C.Y. Total Fill: 144042.971 C.F., 5334.925 C.Y.	<u>Stockpile #3 Pad Report</u> Cut Slope: 50.00% 2.00:1 26.57° Fill Slope: 50.00% 2.00:1 26.57° Pad Earthwork Volumes Total cut : 0.0 C.F., 0.00 C.Y. Total fill: 22,588.2 C.F., 836.60 C.Y.
<u>AST Access Road Report</u> Processing 0+00.000 to 2+47.299 Total Cut : 81.956 C.F., 3.035 C.Y. Total Fill: 46710.155 C.F., 1730.006 C.Y.	<u>Stockpile #4 Pad Report</u> Cut Slope: 50.00% 2.00:1 26.57° Fill Slope: 50.00% 2.00:1 26.57° Pad Earthwork Volumes Total cut : 1.2 C.F., 0.05 C.Y. Total fill: 243,167.5 C.F., 9,006.20 C.Y.
	<u>Stockpile #5 Pad Report</u> Cut Slope: 50.00% 2.00:1 26.57° Fill Slope: 50.00% 2.00:1 26.57° Pad Earthwork Volumes Total cut : 0.0 C.F., 0.00 C.Y. Total fill: 121,529.5 C.F., 4,501.09 C.Y.

1221 Fink Bypass Access Road Report

Processing 0+00.00 to 58+33.53
Total Cut : 600804.45 C.F., 22252.02 C.Y.
Total Fill: 509939.04 C.F., 18886.63 C.Y.

Staging Area Pad Report

Cut Slope: 50.00% 2.00:1
Fill Slope: 50.00% 2.00:1

Pad Earthwork Volumes
Total cut : 62,647.5 C.F., 2,320.28 C.Y.
Total fill: 22,138.6 C.F., 819.95 C.Y.

Staging Area East Access Road Report

Processing 0+00.00 to 0+72.40
Total Cut : 8.81 C.F., 0.33 C.Y.
Total Fill: 800.61 C.F., 29.65 C.Y.

Staging Area West Access Road Report

Processing 0+00.00 to 0+44.64
Total Cut : 59.78 C.F., 2.21 C.Y.
Total Fill: 187.21 C.F., 6.93 C.Y.

Staging Area Stockpile Pad Report

Cut Slope: 50.00% 2.00:1
Fill Slope: 50.00% 2.00:1

Pad Earthwork Volumes
Total cut : 0.0 C.F., 0.00 C.Y.
Total fill: 81,002.5 C.F., 3,000.09 C.Y.

Stockpile #1 Report

Cut Slope: 50.00% 2.00:1
Fill Slope: 50.00% 2.00:1

Pad Earthwork Volumes
Total cut : 0.0 C.F., 0.00 C.Y.
Total fill: 215,999.4 C.F., 8,000.00 C.Y.

Stockpile #2 Report

Cut Slope: 50.00% 2.00:1
Fill Slope: 50.00% 2.00:1

Pad Earthwork Volumes
Total cut : 0.0 C.F., 0.00 C.Y.
Total fill: 162,000.2 C.F., 6,000.01 C.Y.

Stockpile #3 Report

Cut Slope: 50.00% 2.00:1
Fill Slope: 50.00% 2.00:1

Pad Earthwork Volumes
Total cut : 0.5 C.F., 0.02 C.Y.
Total fill: 135,003.2 C.F., 5,000.12 C.Y.

03/14/2025

1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification



Revision
Design
Date
02-04-2025



THIS DOCUMENT
PREPARED FOR
HG ENERGY LLC



Schedule of Quantities
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet V1 of V1

1. WORK INCLUDED, BUT NOT LIMITED TO: EXCAVATE, GRADE, CUT, INSTALL OR ANY ACTIVITY ASSOCIATED WITH THE GRADING, EXCAVATION, CUTTING OR INSTALLATION OF EARTH MATERIAL TO DEVELOP A SITE ACCEPTABLE TO PERFORM WITHOUT DETRIMENTAL IMPACTS TO THE ENVIRONMENT AND OPERATE/FUNCTION SAFELY AS A WELL DRILL PAD OR ASSOCIATED FRESH WATER IMPOUNDMENT OR ANY ASSOCIATED FACILITY OR MAINTENANCE OF SUCH FACILITIES. ALL THE NOTES SHALL APPLY TO WORK ASSOCIATED WITH ACTIVITIES RELATED TO THE OIL AND GAS INDUSTRY, AS SHOWN ON THE PROJECT PLAN SET AND WITHIN THE WELL SITE BOUNDARIES, SPECIFIED THEREOF AND HEREIN, WHICH SHALL INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING: EXCAVATION AND SITE PREPARATION, INCLUDING INSTALLATION OF E&S CONTROLS, INSTALLATION OF SUBSURFACE DRAINAGE FEATURES, GRADING TO ESTABLISH SUBGRADES, AND FINAL GRADES, PAVEMENTS, GRAVEL SURFACES, AND GRASSED AREAS. EXCAVATION, FILLING AND BACKFILLING AND COMPACTION. DEWATERING OR ADDITION OF WATER AS REQUIRED. ADDITIONAL WORK AS SPECIFIED BY THE OWNER PLACING OF TOPSOIL AND FINISH GRADING. 2. PROJECT CONDITION: a. INCLEMENT WEATHER: WHEN FILL OPERATIONS ARE CEASED DUE TO WEATHER (RAIN, FREEZING, SNOW, ETC.), CONSTRUCTION SHALL NOT BE RESUMED UNTIL THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE HAS VERIFIED SOIL STRENGTH HAS NOT BEEN ADVERSELY AFFECTED. IF SOIL STRENGTH HAS BEEN DECREASED, THE AFFECTED PORTION OF FILL SHALL BE RESCARIFIED, MOISTENED, OR DRIED AS REQUIRED AND RECOMPACTED TO THE SPECIFIED DENSITY. b. UTILITIES: PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES WHICH MAY BE IN THE AREA. SHOULD UNCHARTED, INCORRECTLY CHARTED, UNMARKED IN FIELD, OR INCORRECTLY MARKED IN THE FIELD, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONTRACTOR SHALL CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. CONTRACTOR SHALL COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATION, AND SHALL REPAIR OR ARRANGE FOR REPAIR, DAMAGED UTILITIES TO SATISFACTION OF UTILITY OWNER. c. DRAINAGE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DRAINAGE OF THE SITE DURING CONSTRUCTION OF THE PROJECT. WATER SHALL NOT BE ALLOWED TO ACCUMULATE IN ANY OF THE EXCAVATED AREAS. STORM OR GROUND WATER COLLECTING ON SITE DURING CONSTRUCTION SHALL BE REMOVED BY PUMPING, DITCHING, OR OTHER SUITABLE MEANS. d. COORDINATION: THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE BY NOTIFYING THE INSPECTOR OF SCHEDULED WORK IN ADVANCE. THE CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES WHOSE WORK WILL BE AFFECTED ON THE SITE. 3. DEFINITIONS: a. GEOTECHNICAL ENGINEER: A LICENSED INDEPENDENT GEOTECHNICAL ENGINEER AND TEST LABORATORY APPROVED BY THE OWNER WORKING WITH THE DESIGN ENGINEER TO ENSURE THAT EARTHWORK AND THE PROJECT PLAN SET REFLECTS THE AVAILABLE ONSITE MATERIAL. THAT THE AVAILABLE ONSITE MATERIAL AND COMMERCIAL MATERIAL IS TESTED TO MEET OR EXCEED THE SPECIFICATIONS FOR DENSITY AND MOISTURE CONTENT AND THE PARTICLE SIZE IS MAINTAINED OR APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. THE GEOTECHNICAL ENGINEER SHALL PREPARE A REPORT OF THEIR FINDINGS AND RECOMMENDATIONS, IT IS THE CONTRACTORS RESPONSIBILITY TO READ THE GEOTECHNICAL REPORT BEFORE BIDDING THE PROJECT, THE GEOTECHNICAL REPORT AND THE RECOMMENDATIONS PROVIDED SHALL GOVERN ALL ENGINEERED FILL OR CONTROLLED FILLS THE GEOTECHNICAL ENGINEER SHALL ATTEND THE PRE-CONSTRUCTION CONFERENCE ENGINEERED FILL, CONTROLLED FILL: CONTROLLED FILL IS DEFINED AS MATERIAL REQUIRED IN ALL AREAS ON WHICH FINAL GRADE IS NOT PLACED ON ORIGINAL OR EXCAVATED SOIL. MATERIAL SHALL BE PLACED OR MAXIMUM LOOSE LIFT THICKNESS 15 INCHES COMPACTED TO 12 INCHES. b. ROCK: FOR THE PURPOSES OF CLASSIFIED EXCAVATION, ROCK SHALL BE DEFINED AS MATERIAL THAT CANNOT BE DISLODGED BY A CATERPILLAR MODEL NO. D-8N, HEAVY DUTY TRACK-TYPE TRACTOR, OR OF EQUALLY RATED AT NOT LESS THAN 285 HP FLYWHEEL POWER AND EQUIPPED WITH A SINGLE SHANK HYDRAULIC RIPPER, CAPABLE OF EXERTING NOT LESS THAN 45,000 LBS BREAKOUT FORCE. THIS DEFINITION OF ROCK DOES NOT INCLUDE MATERIALS SUCH AS HARDPAN, LOOSE ROCK, OR OTHER MATERIALS THAT CAN BE REMOVED BY MEANS OTHER THAN DRILLING AND BLASTING, BUT WHICH FOR REASONS OF ECONOMY IN EXCAVATING THE CONTRACTOR CHOOSES TO REMOVE BY DRILLING AND BLASTING. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE ROCK AND IF BLASTING IS REQUIRED FOR THIS PROJECT. IF THE CONTRACTOR DETERMINES THAT BLASTING IS NECESSARY OR FOR REASONS OF ECONOMY DETERMINES TO BLAST THE MATERIAL, THE CONTRACTOR SHALL PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, TREES AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY BLASTING OPERATIONS. c. UNSUITABLE MATERIAL: UNSUITABLE MATERIAL SHALL BE DEFINED AS MATERIAL THAT EXHIBITS EXCESSIVE PUMPING OR THAT DOES NOT MEET DENSITY REQUIREMENTS, THE MATERIAL CAN NOT MEET THE COMPACTION REQUIREMENTS OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE d. SATISFACTORY MATERIALS: MATERIALS ARE SATISFACTORY AS FILL MATERIAL WHEN THEY CAN MEET THE STANDARD PROCTOR FOR THE MATERIAL CLASSIFICATION IN THE GEOTECHNICAL REPORT, CLASS A, CLASS B, CLASS C, USED AS PER THE GEOTECHNICAL REPORT, (THE MOST DURABLE MATERIAL FOUND ON THE PROJECT SHALL BE PLACED IN THE TOE KEY AREAS, WORKING UPWARDS TO FINISHED GRADE WITH THE LOWER CLASS MATERIAL) MEET THE DENSITY REQUIREMENT, SATISFACTORY MATERIAL SHALL BE ABLE TO COMPACT TO 95 PERCENT OF THE STANDARD PROCTOR PER ASTM D 698 SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698, BE THE CORRECT PARTICLE SIZE PER THE PROJECT PLAN SET OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. e. UNSATISFACTORY MATERIALS: INCLUDE THOSE MATERIALS CONTAINING ROOTS AND OTHER ORGANIC MATTER, TRASH, DEBRIS, FROZEN MATERIALS, EXCESSIVELY WET MATERIAL, MATERIAL THAT EXCEEDS THE PARTICLE SIZE OR MATERIAL DETERMINE UNSATISFACTORY BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. f. DEGREE OF COMPACTION: IS A PERCENTAGE OF THE MAXIMUM DENSITY OBTAINED BY THE TEST PROCEDURE PRESENTED IN ASTM D 698, AS A PERCENT OF LABORATORY MAXIMUM DENSITY, OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE g. OPTIMUM MOISTURE: MAXIMUM DENSITY CURVE FOR EACH TYPE OF SOIL USED FOR ENGINEERED CONTROLLED FILL. h. TOPSOIL: MATERIAL OBTAINED FROM EXCAVATIONS, SUITABLE FOR TOP SOILS SHALL CONSIST OF FRIABLE CLAY LOAM, FREE FROM ROOTS, STONES, OTHER UNDESIRABLE MATERIAL AND SHALL BE CAPABLE OF SUPPORTING A GOOD GROWTH OF GRASS. i. SOIL BEARING CAPACITY: SOIL UNDERNEATH ALL FOOTINGS AND STRUCTURES SHALL HAVE A MINIMUM BEARING CAPACITY OF 2000 POUNDS PER SQUARE FOOT. AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE. 4. TEST BORINGS: A SUBSURFACE INVESTIGATION HAS BEEN MADE AT THE SITE OF THE PROJECT IN ORDER TO ASCERTAIN CHARACTER OF MATERIALS TO BE EXCAVATED. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION ONLY. ATTENTION IS DIRECTED TO THE FACT THAT THESE LOGS INDICATE MATERIALS ENCOUNTERED AT BORING LOCATIONS ONLY. NOTHING IN THE PLANS OR SPECIFICATIONS SHALL BE TAKEN AS A GUARANTEE THAT MATERIALS OTHER THAN THOSE DISCLOSED BY BORINGS WILL BE ENCOUNTERED OR THAT PROPORTIONS OF VARIOUS MATERIALS WILL NOT VARY FROM THOSE INDICATED. IF THE CONTRACTOR HAS ANY QUESTIONS OR DESIRES ADDITIONAL INFORMATION IT IS HIS RESPONSIBILITY TO ACQUIRE THIS INFORMATION AT HIS OWN EXPENSE. ALL EXCAVATION FOR PROJECT IS TO BE CONSIDERED AS BID AND NO ALLOWANCES WILL BE MADE FOR ROCK ENCOUNTERED OR REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL. 5. CONSTRUCTION: a. CONSERVATION OF TOPSOIL: TOPSOIL SHALL BE REMOVED AS REQUIRED WITHOUT CONTAMINATION WITH SUBSOIL AND STOCKPILED AT CONVENIENT AREAS FOR LATER APPLICATION OR AT LOCATIONS SPECIFIED IN THE PROJECT PLAN SET. ANY SURPLUS OF TOPSOIL FROM EXCAVATIONS AND GRADING SHALL BE STOCKPILED IN A LOCATION APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE b. PLACING TOPSOIL: ON AREAS TO RECEIVE TOPSOIL, THE COMPACTED AREA SHALL BE SCARIFIED TO A 2 INCH DEPTH FOR BONDING OF TOPSOIL WITH SUBSOIL. TOPSOIL THEN SHALL BE SPREAD EVENLY AND GRADED TO THE ELEVATIONS AND SLOPES SHOWN. TOPSOIL SHALL NOT BE SPREAD WHEN FROZEN OR EXCESSIVELY WET OR DRY OR EXCEED FOUR (4) INCHES IN DEPTH ON SLOPES STEEPER THAN THREE TO ONE (3:1) c. EXCAVATION: EXCAVATION SHALL BE FOR THOSE ITEMS SPECIFICALLY INDICATED IN THE PROJECT PLAN SET, AFTER TOPSOIL REMOVAL HAS BEEN COMPLETED, EXCAVATION OF EVERY DESCRIPTION, REGARDLESS OF MATERIAL ENCOUNTERED, WITHIN THE GRADING LIMITS OF THE PROJECT SHALL BE PERFORMED TO REASONABLE CONFORMANCE TO THE LINES AND GRADES INDICATED IN THE PROJECT PLAN SET. SATISFACTORY EXCAVATED MATERIAL SHALL BE TRANSPORTED TO AND PLACED IN FILL AREAS WITHIN THE LIMITS OF THE WORK. UNSATISFACTORY MATERIAL SOFT OR OTHERWISE UNSATISFACTORY MATERIAL SHALL BE REPLACED WITH SATISFACTORY MATERIAL EXCAVATED MATERIAL OR OTHER APPROVED MATERIALS. ALL UNSUITABLE MATERIAL INCLUDING ANY SOIL WHICH IS DISTURBED BY THE CONTRACTOR'S OPERATIONS AND SURPLUS MATERIAL SHALL BE REGRADED SEEDED AND MULCHED EXCAVATION AND FILLING SHALL BE PERFORMED IN A MANNER AND SEQUENCE THAT WILL PROVIDE DRAINAGE AT ALL TIMES. EXCAVATIONS SHALL BE KEPT FREE FROM WATER WHILE CONSTRUCTION THEREIN IS IN PROGRESS. IF THE CONTRACTOR FAILS TO PROVIDE ADEQUATE DRAINAGE AND THE MATERIAL BECOMES SOFT OR OTHERWISE UNSUITABLE AS A RESULT, SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SATISFACTORY ON SITE MATERIAL OR BORROW MATERIAL FROM APPROVED LOCATIONS, OR SHALL BE DRIED AND RECOMPACTED AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE d. DITCHES, GUTTERS, AND CHANNEL CHANGES: DITCHES, GUTTERS, AND CHANNEL CHANGES OR ANY SIMILAR CONSTRUCTED CONVEYANCE SHALL BE CUT ACCURATELY TO THE CROSS SECTIONS AND GRADES INDICATED. ALL ROOTS, STUMPS, ROCK, AND FOREIGN MATTER IN THE SIDES AND BOTTOM OF DITCHES, GUTTERS, AND CHANNEL CHANGES SHALL BE TRIMMED AND DRESSED OR REMOVED TO CONFORM TO THE SLOPE, GRADE, AND SHAPE OF THE SECTION INDICATED. CARE SHALL BE TAKEN TO EXCAVATE DITCHES AND GUTTERS TO THE GRADES INDICATED. EXCESSIVE DITCH AND GUTTER EXCAVATION SHALL BE BACKFILLED TO GRADE EITHER WITH COMPACTED TO SPECIFIED DENSITIES MATERIAL OR WITH SUITABLE STONE OR AGGREGATE TO FORM AN ADEQUATE CONVEYANCE STRUCTURE AS DIRECTED. ALL DITCHES AND GUTTERS EXCAVATED SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK. SATISFACTORY MATERIAL EXCAVATED FROM DITCHES AND CHANNEL CHANGES SHALL BE PLACED IN FILL AREAS OR AREAS APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE UNSUITABLE AND EXCESS MATERIAL SHALL BE DISPOSED OF IN DESIGNATED WASTE AREAS OR AS DIRECTED THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE e. STABILITY OF EXCAVATIONS: MAINTAIN SIDES AND SLOPES OF EXCAVATIONS IN A MANNER SUCH THAT THE EXCAVATION PROVIDES SAFETY OF PERSONNEL, CFR 29 PART 1926 SUBPART P PROTECTION OF WORK, AND COMPLIANCE WITH REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES. f. PREPARATION OF GROUND SURFACE FOR FILL: ALL VEGETATION SUCH AS ROOTS, BRUSH, HEAVY SODS, HEAVY GROWTH OF GRASS, AND ALL DECAYED VEGETATIVE MATTER, RUBBISH, AND OTHER UNSATISFACTORY MATERIAL WITHIN THE AREA UPON WHICH FILL IS TO BE PLACED, SHALL BE STRIPPED OR OTHERWISE REMOVED BEFORE THE FILL IS STARTED. IN NO CASE WILL UNSATISFACTORY MATERIAL REMAIN IN OR UNDER THE FILL AREA. THE AREAS SHALL THEN BE EXCAVATED TO DURABLE MATERIAL CAPABLE OF ACCEPTING SUPPORTING THE FILL. THE DEPTH SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE ALL AREAS TO RECEIVE FILL SHALL BE COMPACTED WITH VIBRATORY ROLLERS, PNEUMATIC ROLLERS, SHEEPSFOOT ROLLERS OR OTHER MECHANICAL MEANS ACCEPTABLE TO THE GEOTECHNICAL ENGINEER OR SITE INSPECTOR. GROUND SURFACES ON WHICH FILL IS TO BE PLACED SHALL BE PLOWED, STEPPED, BENCHED, OR BROKEN UP, AS DIRECTED, IN SUCH MANNER THAT THE FILL MATERIAL WILL BOND WITH THE EXISTING SURFACE. PREPARED SURFACES ON WHICH COMPACTED FILL IS TO BE PLACED SHALL BE WETTED OR DRIED AS MAY BE REQUIRED TO OBTAIN THE SPECIFIED MOISTURE CONTENT AND DENSITY. BEFORE ANY AREA CAN RECEIVE FILL IT MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE g. FILLS AND EMBANKMENTS: FILLS AND EMBANKMENTS SHALL BE CONSTRUCTED AT THE LOCATIONS AND TO LINES AND GRADES INDICATED. THE COMPLETED FILL SHALL CONFORM TO THE PROJECT PLAN SET. APPROVED MATERIAL OBTAINED DURING EXCAVATION MAY BE USED IN FORMING REQUIRED FILL. FILL SHALL BE CONSTRUCTED WITH SATISFACTORY MATERIAL AND SHALL BE FREE FROM ROOTS, OTHER ORGANIC MATERIAL. NO FROZEN MATERIAL WILL BE PERMITTED IN THE FILL. ALL FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE h. COMPACTION: EACH LAYER OF THE FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY ASTM D 698. MOISTURE CONTENT SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698. i. FINISHED GRADE : ALL AREAS COVERED BY THE PROJECT PLAN SET, INCLUDING EXCAVATED AND FILLED SECTIONS AND ADJACENT TRANSITION AREAS, SHALL BE UNIFORMLY SMOOTH-GRADED. THE FINISHED SURFACE SHALL BE REASONABLY SMOOTH, COMPACTED, AND FREE FROM IRREGULAR SURFACE CHANGES. THE DEGREE OF FINISH SHALL BE WITHIN THE TOLERANCES LISTED IN THE PROJECT PLAN SET EXCEPT AS APPROVED BY THE THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE DITCHES AND GUTTERS SHALL BE FINISHED TO PERMIT ADEQUATE DRAINAGE AND WITHIN THE TOLERANCES LISTED IN THE PROJECT PLAN SET LOW AREAS RESULTING FROM REMOVAL OF UNSUITABLE MATERIAL OR FROM EXCAVATION OF ROCK SHALL BE BROUGHT UP TO REQUIRED GRADE WITH SATISFACTORY MATERIALS, AND THE ENTIRE AREA SHALL BE SHAPED TO LINE, GRADE, AND CROSS SECTION AND SHALL BE COMPACTED AS SPECIFIED j. PROTECTION SITE PRESERVATION: THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE OF THE WORK SHALL MAINTAIN GRADE OR REPAIR ALL AREAS TO THE LINES, GRADES, AND CROSS SECTIONS SHOWN IN THE PROJECT PLAN SET AND PROTECT FROM TRAFFIC, WIND, WATER EROSION, WASHOUTS, SETTLEMENT, SUBSIDENCE, OR OTHER MISHAPS WHICH MAY OCCUR, REPAIR ANY SLIDES, AND ANY SETTLEMENT OR WASHING AWAY THAT MAY OCCUR FROM ANY CAUSE, PRIOR TO THE ACCEPTANCE, k. TESTING: THE CONTRACTOR SHALL GIVE THE OWNER OR HIS REPRESENTATIVE AT LEAST 48 HOURS NOTICE PRIOR TO OPENING ANY NEW SOIL EXCAVATION AND/OR BARROW AREAS TO BE USED IN EMBANKMENT/FILL CONSTRUCTION. SAID NOTICE IS REQUIRED TO GIVE THE OWNER ADEQUATE TIME TO OBTAIN SOIL SAMPLES FOR MOISTURE DENSITY TESTING (COMPACTION TEST) TO MONITOR FILL PLACEMENT. IF REQUIRED, THE CONTRACTOR SHALL SUPPLY THE NECESSARY EQUIPMENT AND OPERATOR TO OBTAIN THE SOIL SAMPLES. TEST SHALL BE MADE BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE h. TESTING FREQUENCY: A MINIMUM OF ONE MOISTURE-DENSITY TEST SHALL BE PERFORMED FOR EACH CLASSIFICATION OF FILL MATERIAL, A MINIMUM OF ONE TEST PER LIFT OR PER 1000 SQUARE FEET OR FRACTION THEREOF IS REQUIRED FOR FILL MATERIAL OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER. i. VISUAL INSPECTION: UPON COMPLETION OF AND DURING THE INSTALLATION OF ANY PRODUCT OR MATERIAL OR ALL EARTH WORK OPERATIONS, CUTTING, FILLING ETC. THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE SHALL VISUALLY INSPECT ALL MATERIALS AND EXCAVATIONS. THE VISUAL INSPECTION SHALL BE CONDUCTED TO ASSURE THAT THE DATA OBTAINED FROM THE TEST RESULTS AND THE PROJECT PLAN SET ARE REPRESENTATIVE OF THE SITE CONDITIONS. 6 PARTICLE SIZE USED IN FILL AREAS: THE MATERIAL SHALL BE PLACED IN SUCCESSIVE HORIZONTAL LAYERS OF 15 INCHES IN LOOSE DEPTH, 12 INCHES COMPACTED FOR THE FULL WIDTH OF THE CROSS SECTION AND SHALL BE COMPACTED AS SPECIFIED. EACH LAYER SHALL BE COMPACTED AND TESTED BEFORE THE OVERLAYING LIFT IS PLACED. MOISTURE CONTENT OF THE FILL OR BACKFILL MATERIAL SHALL BE ADJUSTED BY WETTING OR AERATING AS NECESSARY TO PROVIDE THE MOISTURE CONTENT SPECIFIED, OR AS DETERMINED BY GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC INSPECTOR. a. CONSTRUCTION OF FRESH WATER IMPOUNDMENTS: CONSTRUCT THE EMBANKMENT USING MAXIMUM PARTICLE SIZES (IN ANY DIMENSION) AS IN TOP 36 INCHES: 3 INCHES (IN ANY DIMENSION). 36 TO 48 INCHES: 6 INCHES (IN ANY DIMENSION). IN THE DEPTH BELOW 24 INCHES: NOT TO EXCEED 12 INCHES (IN ANY DIMENSION), THE ENTIRE LIFT SHALL NOT BE CONSTRUCTED WITH 12 INCH MATERIAL OR THE COMPACTED THICKNESS OF THE LAYER BEING PLACED, WHICHEVER IS LESS, THE 12 INCH MATERIAL SHALL BE MIXED WITH SMALLER PARTICLES TO PRODUCE A UNIFORM VOID FREE LIFT SPREAD ALL MATERIAL SO THAT THE LARGER PARTICLES ARE SEPARATED FROM EACH OTHER TO MINIMIZE VOIDS BETWEEN THEM DURING COMPACTION. COMPACT AROUND THESE ROCKS IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS. EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSIONS CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS ALL MATERIAL WILL BE AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. b. CONSTRUCTION OF THE WELL DRILL PAD OR FACILITY PAD: CONSTRUCT THE PAD BASE USING MAXIMUM PARTICLE SIZES (IN ANY DIMENSION) AS IN TOP 48 INCHES: 3 INCHES (IN ANY DIMENSION). 48 INCHES AND BELOW : 6 TO 12 INCHES (IN ANY DIMENSION). IN THE DEPTH BELOW 48 INCHES: NOT TO EXCEED 12 INCHES (IN ANY DIMENSION), THE ENTIRE LIFT SHALL NOT BE CONSTRUCTED WITH 12 INCH MATERIAL OR THE COMPACTED THICKNESS OF THE LAYER BEING PLACED, WHICHEVER IS LESS, THE 12 INCH MATERIAL SHALL BE MIXED WITH SMALLER PARTICLES TO PRODUCE A UNIFORM VOID FREE LIFT SPREAD ALL MATERIAL SO THAT THE LARGER PARTICLES ARE SEPARATED FROM EACH OTHER TO MINIMIZE VOIDS BETWEEN THEM DURING COMPACTION. COMPACT AROUND THESE ROCKS IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS. EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSION CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS ALL MATERIAL WILL BE AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. c. ENGINEERED ADDITIONAL FILL AREAS: 3 TO 12 INCHES OR SMALLER EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSION CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND. WHEN AND WHERE APPROVED BY THE ENGINEER, LARGER ROCKS (NOT TO EXCEED 18 INCHES IN ANY DIMENSION) MAY BE PLACED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. COMPACT AROUND THESE ROCKS TO A FIRMNESS EQUAL TO THAT OF THE SUPPORTING SOIL. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS 7. PROOF ROLLING: IMMEDIATELY FOLLOWING THE COMPLETION OF EARTH WORK OR COMPLETION OF THE LIFT IN THE AREA TO BE PROOF ROLLED AND ONLY FOR THE LIFT THAT THE GEOTECHNICAL ENGINEER OR KELLY SURVEYING PLLC HAVE GRANTED A WAIVER ON THE MATERIAL PARTICLE SIZE FOLLOWING A VISUAL INSPECTION, CONTRACTOR SHALL DEMONSTRATE THE FINISHED LIFT DOES NOT CONTAIN PREVIOUSLY UNIDENTIFIED SOFT AREAS, OBSERVING THE SURFACE FOR DISPLACEMENT OR DEFORMATION. THE COVERAGE AREAS AND METHODS SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE THE LIFT SHALL THEN BE PROOF ROLLED. PROOF ROLLING SHALL BE DONE WITH ONE PASS OF A FULLY LOADED TANDEM DUMP TRUCK EQUAL TO OR EXCEEDING 50,000 LBS OR EQUALLY SIZED APPROVED CONSTRUCTION EQUIPMENT THE EQUIPMENT SHALL BE OPERATED AT A SPEED THAT THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE CAN COMFORTABLY AND SLOWLY WALK ALONG SIDE THE EQUIPMENT; ANY AREAS WHICH DEFLECT, RUT OR PUMP UNDER THE LOADED DUMP TRUCK SHALL BE UNDERCUT AND REPLACED WITH COMPACTED FILL MATERIAL OR OR SMALLER MATERIAL WORKED UNTIL A RELATIVELY UNYIELDING SURFACE IS ACHIEVED										1221 Well Site Fink Creek Access HG Energy LLC Exhibit A: As-Built Modification		Revision Design	Date 02-04-2025			THIS DOCUMENT PREPARED FOR HG ENERGY LLC	 P.O. Box 254 Biller, WV 26209 606338-0965	Construction and Earth Work General Notes 1221 Well Site Freemans Creek District Lewis County, WV	Date: 02/04/2025 Scale: As Shown Designed By: ZS File No. Sheet N3 of N4
APPROVED WVDEP OOG Modification 3/14/2025																			

1. OBJECTIVES

VEGETATIVE COVER OF 70% OR GREATER WOULD GENERALLY MEET THIS REQUIREMENT. CONSIDERATIONS FOR THE IMPROVEMENT OF WATER QUALITY AND WILDLIFE HABITAT ARE INCORPORATED INTO THIS SECTION. WITH PRIOR AND DOCUMENTED APPROVAL, THESE STANDARDS MAY BE ADJUSTED AND MODIFIED TO MEET INDIVIDUAL SITE REQUIREMENTS.

1. WATER CONTROL

2. SEEDBED PREPARATION

THE SEEDBED MUST BE LOOSE AT THE TIME OF SEEDING. APPLICATIONS OF SEED ON HARD GROUND WILL RESULT IN A POOR STAND OF VEGETATION. THE SOIL SURFACE MUST BE LOOSENEED (MINIMUM OF 3 INCHES) BY DISKING ON THE CONTOUR, OR BY BULLDOZER TRACKING UP AND DOWN THE SLOPE. BACKLAPPING IS ACCEPTABLE ON GENTLE SLOPES SUCH AS THE BENCH OR ROAD BED. IF SEEDING PLOTS ARE TO BE AVAILABLE, 50% MORE SEED SHALL BE ADDED TO THE RECOMMENDED RATES SHOWN IN TABLES 3-4. WHERE HYDROSEEDING OF SEEDBEDS FEASIBLE MAY NOT BE NECESSARY IF ADEQUATE SITE PREPARATION WAS PERFORMED. APPLY ALL NUTRIENT REQUIREMENTS IMMEDIATELY PRIOR TO SEEDING. SOIL FERTILITY AND pH LEVELS SHOULD BE TESTED AND ADJUSTED ACCORDING TO THE SEED SPECIES PLANTED. WHERE SAMPLING IS IMPRACTICAL OR NOT FEASIBLE, AN ALL-INCLUSIVE FERTILIZER RECOMMENDATION MAY BE USED AS SHOWN IN TABLE 1.

APPLY LIME TO BRING SOIL pH TO A RANGE SUITABLE (pH 6.0) FOR THE PLANNED SPECIES. IN ABSENCE OF A SOIL TEST, 3 TONS / ACRE OF LIME MAY BE APPLIED (150 LBS / 1,000 SF). INCORPORATE THE APPROPRIATE AMOUNT OF LIME AND/OR FERTILIZER IN THE SLURRY MIX WHEN HYDROSEEDING.

1. TEMPORARY SEEDING

WITH SEDIMENT CONTROLS MUST BE ESTABLISHED WHERE RUNOFF WILL GO DIRECTLY INTO A STREAM. IMMEDIATELY UPON CONSTRUCTION OF THE SITE (SITE INCLUDES ROADS AND LOCATION), VEGETATION MUST BE ESTABLISHED ON ROAD BANK AND LOCATION SLOPES. A PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL AREAS THAT WILL BE LEFT UNWORKED FOR A PERIOD OF MORE THAN 6 MONTHS.

PERMANENT PLANT SPECIES, AND PLANTING RATES. TABLE 3 GIVES RECOMMENDED TYPES OF TEMPORARY VEGETATION, RATES OF APPLICATION, AND OPTIMUM SEEDING DATES. IN SITUATIONS WHERE ANOTHER COVER IS DESIRED, CONTACT THE LOCAL SOIL CONSERVATION DISTRICT FOR SEEDING RECOMMENDATIONS.

APPLIED BY BROADCASTING, DRILLING, OR BY HYDROSEEDING ACCORDING TO THE RATES INDICATED IN TABLE 1. FERTILIZER ALL PLANTING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. NECESSARY SITE PREPARATION, ROUGHENING OF THE SOIL SURFACE, SHOULD BE PERFORMED JUST PRIOR TO SEEDING. SEEDBED PREPARATION MAY NOT BE REQUIRED ON NEWLY DISTURBED AREAS.

Species	N (lb/ac)	P2O5 (lb/ac)	K2O (lb/ac)	Example Rec. (per ac)
Cool Season Grass	40.00	80.00	80.00	400 lbs. 10-20-20
Cool Season Grass & Legume	30.00	60.00	60.00	300 lbs. 10-20-20
Temporary Cover	40.00	40.00	40.00	200 lbs. 19-19-19

Note: These rates should be increased by 50% if planted Apr 15 - Aug 1 and Oct 1 - Mar 1

PERMANENT VEGETATIVE COVER WILL BE ESTABLISHED WHERE NO FURTHER SOIL DISTURBANCE IS ANTICIPATED OR NEEDED. SOIL FERTILITY AND pH LEVEL SHOULD BE TESTED AND ADJUSTED ACCORDING TO THE SEED SPECIES PLANTED. PLANTING OF PERMANENT VEGETATIVE COVERS MUST BE PERFORMED ON ALL DISTURBED AREAS AFTER THE COMPLETION OF THE DRILLING PROCESS. ANY SITE THAT CONTAINS SIGNIFICANT AMOUNTS OF TOPSOIL SHALL HAVE THE TOPSOIL REMOVED AND STOCKPILED WHEN FEASIBLE. TOPSOIL SHOULD NOT BE ADDED TO SLOPES STEEPER THAN 2:1 UNLESS A GOOD BONDING TO THE SUB-LAYER CAN BE ACHIEVED. AFTER PROPER GRADING AND SEEDBED PREPARATION, THE VEGETATION WILL REESTABLISH GROUND COVER FOR THE CONTROL OF SURFACE WATER RUNOFF AND EROSION.

ALL REQUIRED SEEDBED PREPARATION, LOOSENING OF SOIL BY DISKING OR DOZER TRACKING, SHOULD BE PERFORMED JUST PRIOR TO SEEDING. IF SEEDBED PREPARATION IS NOT FEASIBLE, 50% MORE SEED SHALL BE ADDED TO THE RECOMMENDED RATES SHOWN IN TABLES IV 3-4.

WHEN HYDROSEEDING, SEEDBED PREPARATIONS MAY NOT BE NECESSARY IF ADEQUATE SITE PREPARATION WAS PERFORMED. INCORPORATE THE APPROPRIATE AMOUNT OF LIME AND/OR FERTILIZER IN THE SLURRY MIX WHEN HYDROSEEDING. WHEN HYDROSEEDING, FIRST MIX THE LIME, FERTILIZER, AND HYDRO-MULCH IN THE RECOMMENDED AMOUNT OF WATER. MIX THE SEED AND INOCULANT TOGETHER WITHIN ONE HOUR PRIOR TO PLANTING, AND ADD THE SLURRY JUST BEFORE SEEDING. APPLY THE SLURRY UNIFORMLY OVER THE PREPARED SITE. ASSURE THAT AGITATION IS CONTINUOUS THROUGHOUT THE SEEDING OPERATION AND THAT THE MIX IS APPLIED WITHIN ONE HOUR OF INITIAL MIXING.

1. LIME SHALL BE APPLIED TO ALL PERMANENT SEEDINGS. THE pH OF THE SOIL IS TO BE DETERMINED AND LIME APPLIED ACCORDINGLY. ONCE THE pH IS KNOWN, SELECT THE AMOUNT OF LIME TO BE APPLIED FROM TABLE IV-5.
2. FERTILIZER SHALL BE APPLIED IN ALL PERMANENT SEEDINGS. APPLY THE EQUIVALENT OF 500 LBS MINIMUM 10-20-20 FERTILIZER PER ACRE OR USE THE AMOUNT OF FERTILIZER AND LIME RECOMMENDED BY A CERTIFIED SOIL TEST.
3. APPLICATION: FOR BEST RESULTS AND MAXIMUM BENEFITS, THE LIME AND FERTILIZER ARE TO BE APPLIED AT THE TIME OF SEEDBED PREPARATION.

PLANNERS SHOULD TAKE INTO CONSIDERATION THE SPECIES MAKEUP OF THE EXISTING PASTURE AND THE LANDOWNER'S FUTURE PASTURE MANAGEMENT PLANS WHEN RECOMMENDING SEED MIXTURES. SELECTION: FROM TABLES IV 4a AND b. PERMANENT SEEDING MIXTURES SHALL BE SUITABLE FOR ESTABLISHMENT IN WEST VIRGINIA.

2. 'LATHCO' FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK
3. ONLY ENDOPHYTE FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWN VETCH ARE ALSO A VERY INVASIVE SPECIES NON-NATIVE TO WEST VIRGINIA.
4. FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD 50% MORE SEED TO THE SPECIFIED RATE. MIXTURES IN TABLE 4b ARE MORE WILDLIFE AND FARM-FRIENDLY; THOSE LISTED IN BOLD ARE SUITABLE FOR USE IN SHADED WOODLAND SETTINGS. MIXTURES IN ITALIC ARE SUITABLE FOR USE IN FILTER STRIPS.

CONSIDER THE USE OF NATIVE PLANTS OR LOCALLY ADAPTED PLANTS WHEN SELECTING COVER TYPES AND SPECIES FOR WILDLIFE HABITAT. WILDLIFE FRIENDLY SPECIES OR MIXES THAT HAVE MULTIPLE VALUES SHOULD BE CONSIDERED. SEE WILDLIFE FRIENDLY SPECIES/MIXTURES IN TABLE IV-4b. CONSIDER SELECTING NO OR LOW MAINTENANCE LONG-LIVED PLANTS ADAPTABLE TO SITES WHICH MAY BE DIFFICULT TO MAINTAIN WITH EQUIPMENT.

THE APPLICATION OF STRAW, HAY, OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE TO PREVENT EROSION. STRAW MADE FROM WHEAT OR OATS IS THE PREFERRED MULCH, THE USE OF HAY IS PERMISSIBLE, BUT NOT ENCOURAGED DUE TO THE RISK OF SPREADING INVASIVE SPECIES. MULCH MUST BE APPLIED TO ALL TEMPORARY AND PERMANENT SEEDING ON ALL DISTURBED AREA. DEPENDING ON SITE CONDITIONS, IN CRITICAL AREAS SUCH AS WATERWAYS, OR STEEP SLOPES, ADDITIONAL OR SUBSTITUTE SOIL PROTECTIVE MEASURES MAY BE USED IF DEEMED NECESSARY. EXAMPLES INCLUDE JUTE MESH AND SOIL STABILIZATION BLANKETS OR EROSION CONTROL MATTING.

AREAS THAT HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING. MULCHES CONSERVE DESIRABLE SOIL PROPERTIES, REDUCE SOIL MOISTURE LOSS, PREVENT CRUSTING AND SEALING OF THE SOIL SURFACE AND PROVIDE A SUITABLE MICROCLIMATE FOR SEED GERMINATION.

AREAS THAT CANNOT BE SEEDED BECAUSE OF THE SEASON SHOULD BE MULCHED TO PROVIDE SOME PROTECTION TO THE SOIL SURFACE. AN ORGANIC MULCH, STRAW OR HAY, SHOULD BE USED AND THE AREA THEN SEEDED AS SOON AS WEATHER OR SEASONAL CONDITIONS PERMIT. DO NOT USE FIBER MULCH (CELLULOSE-HYDROSEED) ALONE FOR THIS PRACTICE; AT NORMAL APPLICATION RATES IT WILL NOT GIVE THE SOIL PROTECTION OF OTHER TYPES OF MULCH.

WOOD CELLULOSE FIBER MULCH, IS USED IN HYDROSEEDING APPLICATIONS AND APPLIED AS PART OF THE SLURRY. IT CREATES THE BEST SEED-SOIL CONTACT WHEN APPLIED OVER TOP OF (AS A SEPARATE OPERATION) NEWLY SEEDED AREAS. FIBER MULCH DOES NOT ALONG PROVIDE SUFFICIENT PROTECTION ON HIGHLY ERODIBLE SOILS, OR DURING LESS THAN FAVORABLE GROWING CONDITIONS. FIBER MULCH SHOULD NOT BE USED ALONE DURING THE DRY SUMMER MONTHS OR WHEN USED FOR LATE FALL MULCH COVER. USE STRAW MULCH DURING THESE PERIODS, AND FIBER MULCH MAY BE USED TO TACK (ANCHOR) THE STRAW MULCH. FIBER MULCH IS WELL SUITED FOR STEEP SLOPES, CRITICAL AREAS, AND AREAS SUSCEPTIBLE TO WIND.

A WIDE RANGE OF SYNTHETIC, SPRAY-ON MATERIALS IS MARKETING TO STABILIZE AND PROTECT THE SOIL SURFACE. THESE ARE MIXED WITH WATER AND SPRAYED OVER THE MULCH AND THE SOIL. THEY MAY BE USED ALONE IN SOME CASES AS TEMPORARY STABILIZERS, OR IN CONJUNCTION WITH FIBER MULCH, STRAW OR HAY.

FROM TABLE IV-6 SELECT THE TYPE OF MULCH AND THE RATE OF APPLICATION THAT WILL BEST SUIT THE CONDITIONS AT THE SITE

DEPENDING ON THE FIELD SITUATION, MULCH MAY NOT STAY IN PLACE BECAUSE OF WIND ACTION OR RAPID WATER RUNOFF. IN SUCH CASES, MULCH IS TO BE ANCHORED MECHANICALLY OR WITH MULCH NETTING.

APPLY MULCH AND PULL ANCHORING TOOL OVER THE MULCH. WHEN A DISK IS USED, SET THE DISK STRAIGHT AND PULL ACROSS THE SLOPE. MULCH MATERIAL SHOULD BE TUCKED INTO THE SOIL ABOUT THREE INCHES.

FOLLOW MANUFACTURER'S RECOMMENDATIONS WHEN POSITIONING AND STAKING THE MOLEC NETTING IN THE SOIL.

Material	Minimum Rates per Acre	Coverage	Remarks
Hay or Straw	2 to 3 Tons	Cover 75% to	Subject to Wind blowing
	100 to 150 Bales	90% of Surface	or washing unless tied down
Wood Fiber		Cover all	For Hydroseeding
Pulp Fiber	1,000 to 1,500 lbs	Disturbed Areas	03/14/2025
Wood-Cellulose			
Recirculated Paper			

Species/Mixture	Seeding Rate (lbs/ac)	Soil Drainage Preference	pH Range
KY Bluegrass/	20.00	Well - Mod. Well	5.5 - 7.5
Redtop/	3.00		
Ladino Clover or Birdsfoot Trefoil	2/10		
Timothy/	5	Well - Mod. Well	6.5 - 8.0
Alfalfa	12		
Timothy/	5	Well - Poorly	5.5 - 7.5
Birdsfoot Trefoil	8		
Orchardgrass/	10	<i>Well - Mod. Well</i>	5.5 - 7.5
Ladino Clover/	2		
Redtop	3		
Orchardgrass/	10	<i>Well - Mod. Well</i>	5.5 - 7.5
Ladino Clover	2		
Orchardgrass/	20	<i>Well - Mod. Well</i>	5.5 - 7.5
Perennial Ryegrass	10		
Creeping Red Fescue/	30	Well - Mod. Well	5.5 - 7.5
Perennial Ryegrass	10		
Orchardgrass or KY Bluegrass	20	Well - Mod. Well	6.0 - 7.5
Birdsfoot Trefoil/	10	Well - Mod. Well	5.5 - 7.5
Redtop/	5		
Orchardgrass	20		
Lathco Flat Pea/	30	Well - Mod. Well	5.5 - 7.5
Perennial Ryegrass	20		
Lathco Flat Pea/	30	Well - Mod	5.5 - 7.5
Orchardgrass	20		

Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips

*"Lathco" Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframes, add 50% more seed to the specified rate



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Construction and Earth Work General Notes

1221 Well Site

Freemans Creek District
Lewis County, WV

Lewis County, WV

Date: 02/04/2025

Scale: As Shown

Designed By: ZS
File No

Sheet N4 of N4



1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification



Revision
Design

Date
02-04-2025

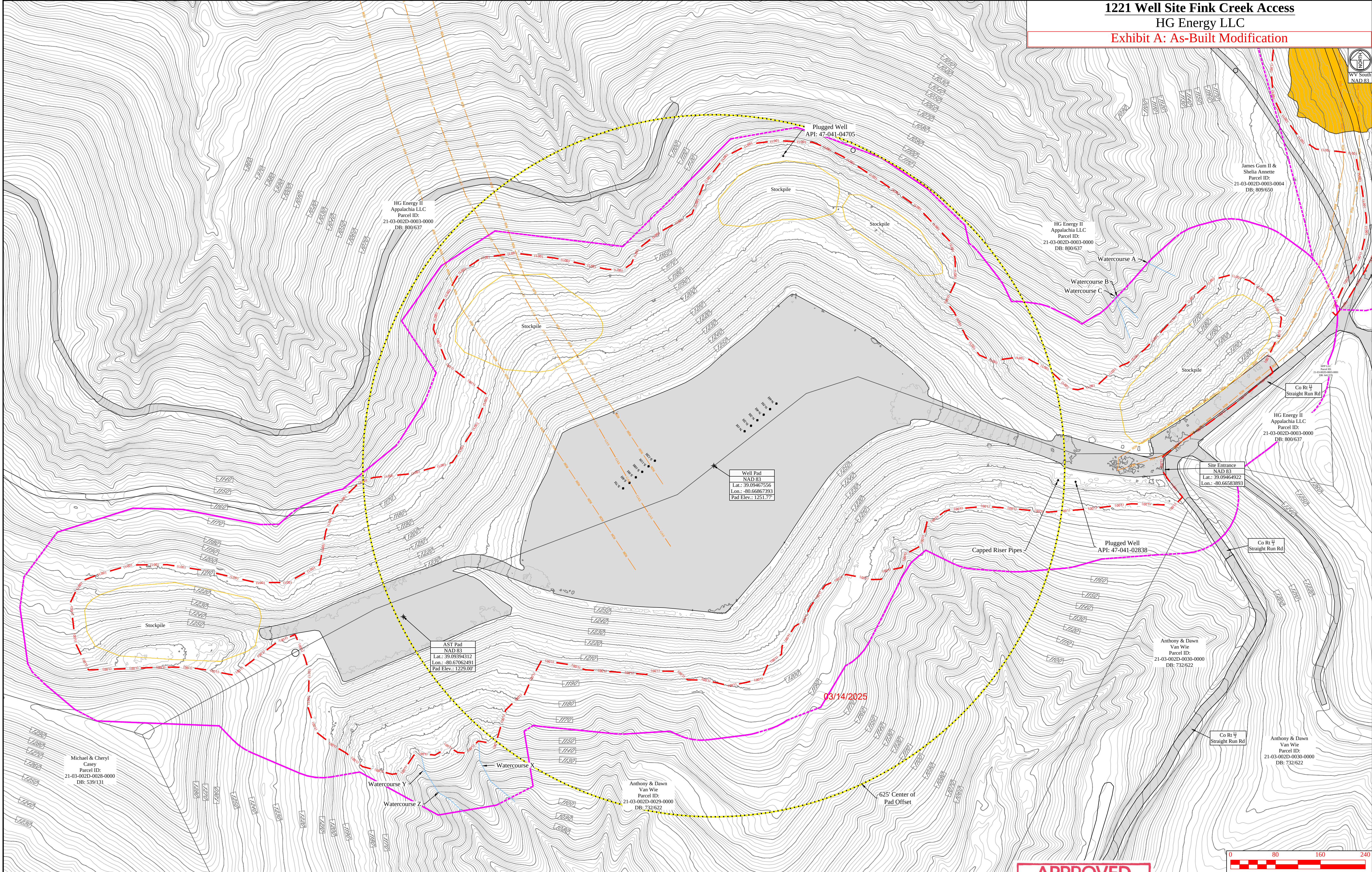


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Pre-Construction Site Conditions
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
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Sheet 2 of 32

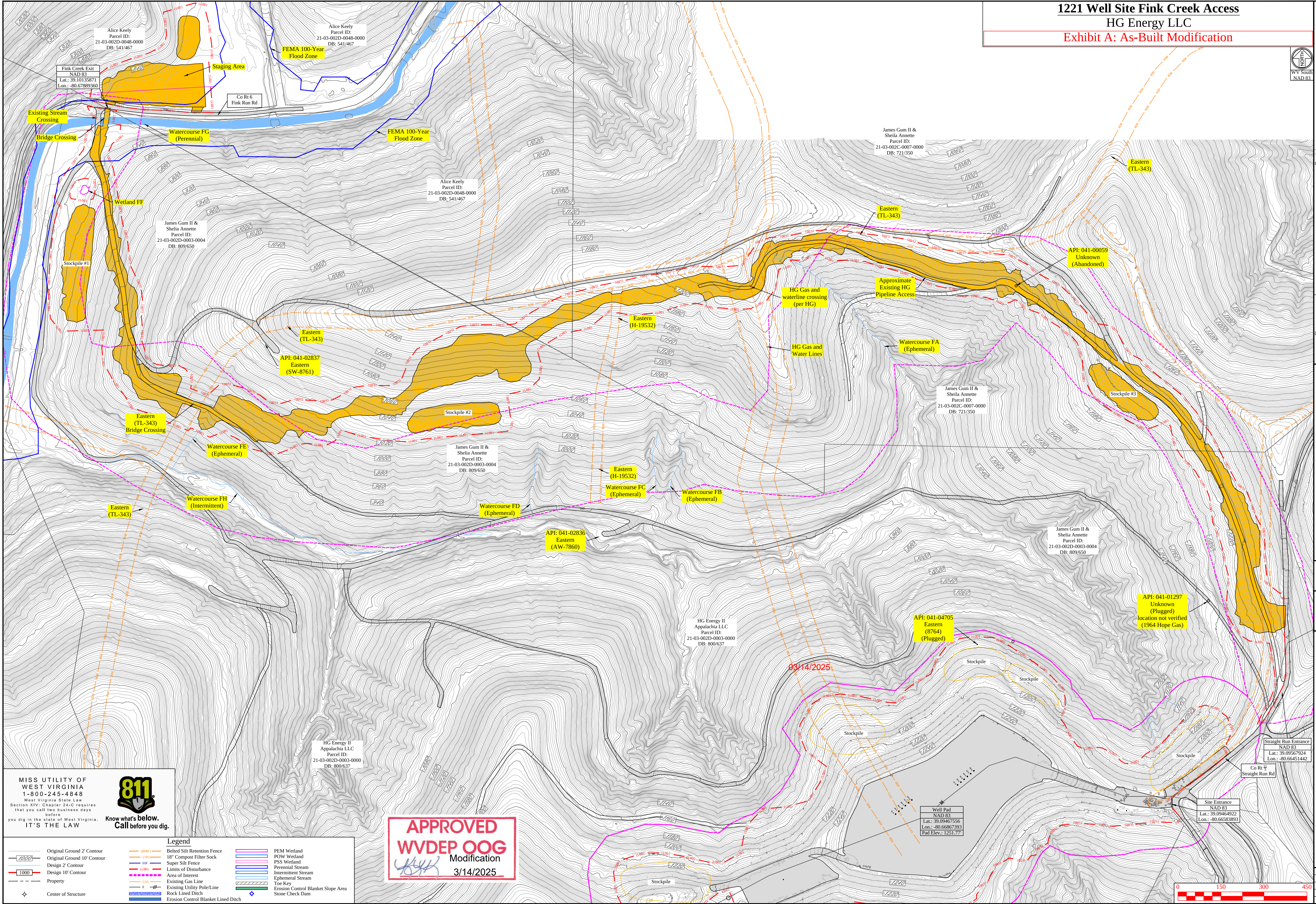


Legend			
	Original Ground 2' Contour		Belted Silt Retention Fence
	Original Ground 10' Contour		18' Composite Filter Sock
	Design 2' Contour		Super Silt Fence
	Design 10' Contour		Limits of Disturbance
	Property		Area of Interest
	Center of Structure		Existing Gas Line
			Existing Utility Pole/Line
			Rock Lined Ditch
			Erosion Control Blanket Lined Ditch
			PEM Wetland
			PDW Wetland
			PSS Wetland
			Perennial Stream
			Intermittent Stream
			Ephemeral Stream
			Toe Key
			Erosion Control Blanket Slope Area
			Stone Check Dam

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WEST VIRGINIA
1-800-245-4848
West Virginia State Law
Section XIV, Chapter 24-C requires
that you call two business days
before
you dig in the state of West Virginia.
IT'S THE LAW





1221 Well Site Fink Creek Access
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Pre-Construction Site Conditions - Bypass Access Road
1221 Well Site
Freemans Creek District
Lewis County, WV

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IT'S THE LAW



Legend	
	Original Ground 2' Contour
	Original Ground 10' Contour
	Design 2' Contour
	Design 10' Contour
	Property
	Center of Structure
	Belted Silt Retention Fence
	18' Composite Filter Sock
	Super Silt Fence
	Limits of Disturbance
	Area of Interest
	Existing Gas Line
	Existing Utility Pole/Line
	Rock Lined Ditch
	Erosion Control Blanket Lined Ditch
	PEM Wetland
	POW Wetland
	PSS Wetland
	Perennial Stream
	Intermittent Stream
	Ephemeral Stream
	Toe Key
	Erosion Control Blanket Slope Area
	Stone Check Dam

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1221 Well Site Fink Creek Access

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Site Soil Map
1221 Well Site
Freemans Creek District
Lewis County, WV

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Legend

- Center of Structure
- Property Line
- Limits of Disturbance
- Area of Interest

- PEM Wetland
- POW Wetland
- PSS Wetland
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream

Soil Key

- Cu Chargin silt loam, 0 to 3 percent slopes, occasionally flooded
- GuD Gilpin-Upshur silt loams, 15 to 25 percent slopes
- GuE Gilpin-Upshur silt loams, 25 to 35 percent slopes
- GwF3 Gilpin-Upshur silt loams, 35 to 70 percent slopes, severely eroded
- Ha Hackers silt loam, 0 to 3 percent slopes, rarely flooded
- Su Sensenbrough silt loam, 0 to 3 percent slopes, occasionally flooded
- VaD Vandalia silt loam, 15 to 25 percent slopes
- VaE Vandalia silt loam, 25 to 35 percent slopes

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3/14/2025



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1-800-245-4848

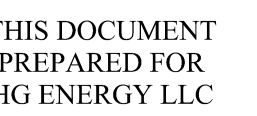
West Virginia State Law
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Lewis County, WV

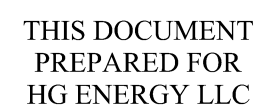
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1221 Well Site
Freemans Creek District
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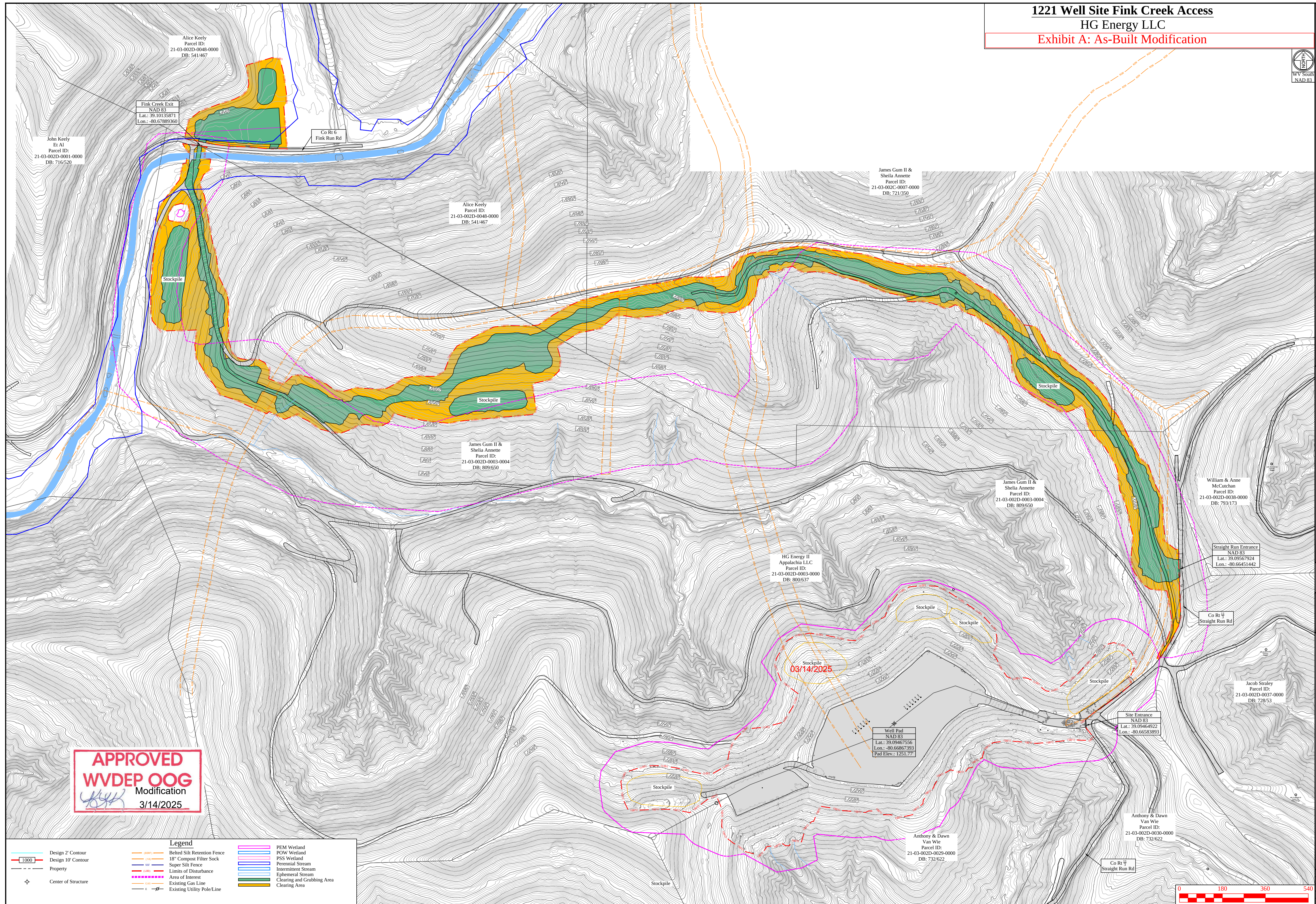


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The contractor shall not deviate from the above listed construction sequence without the written consent of the design engineer. The contractor must provide a written explanation and provide an updated construction sequence when requesting permission to deviate from the construction sequence.

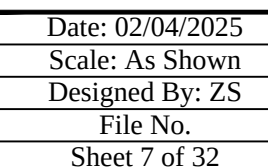


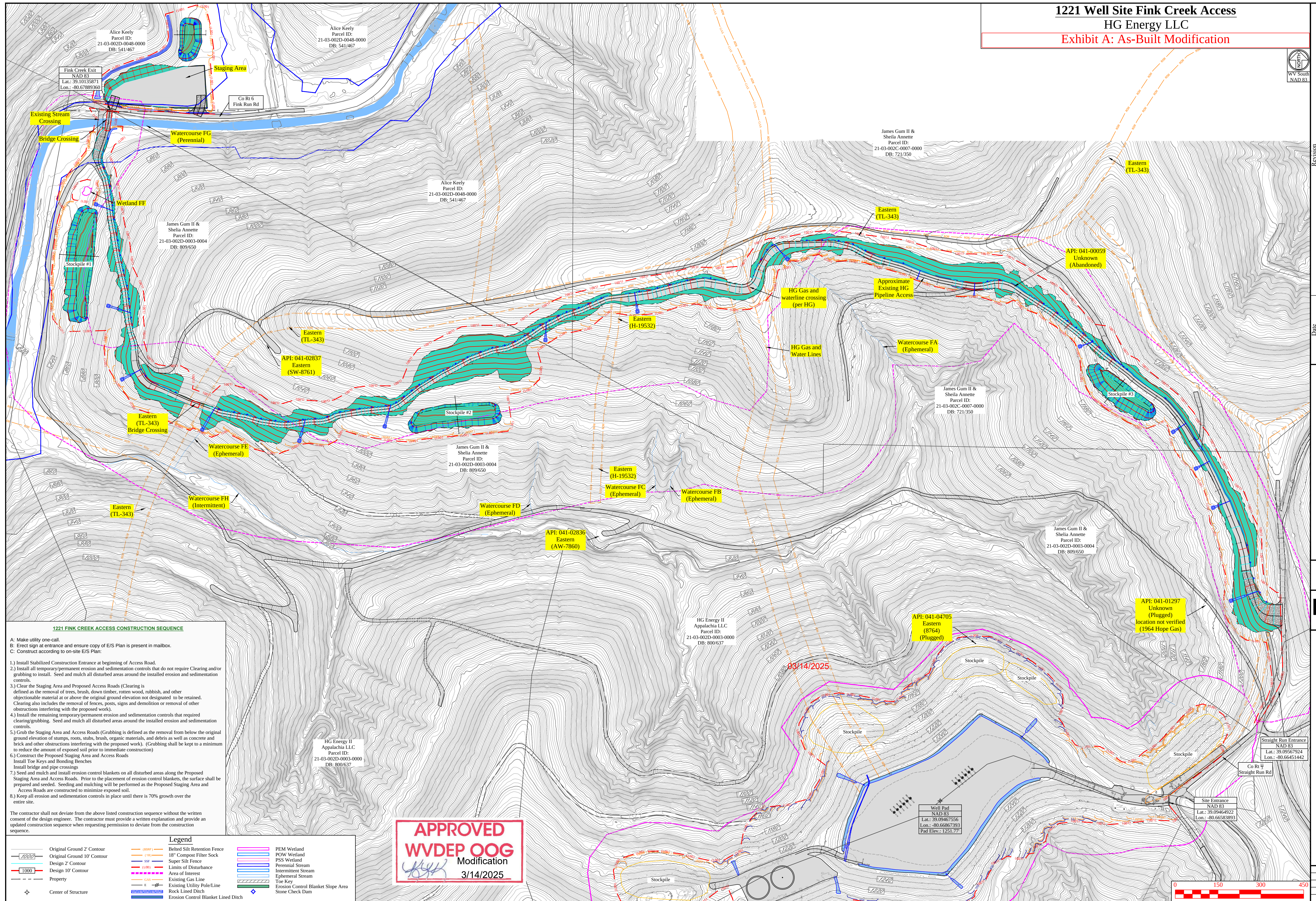
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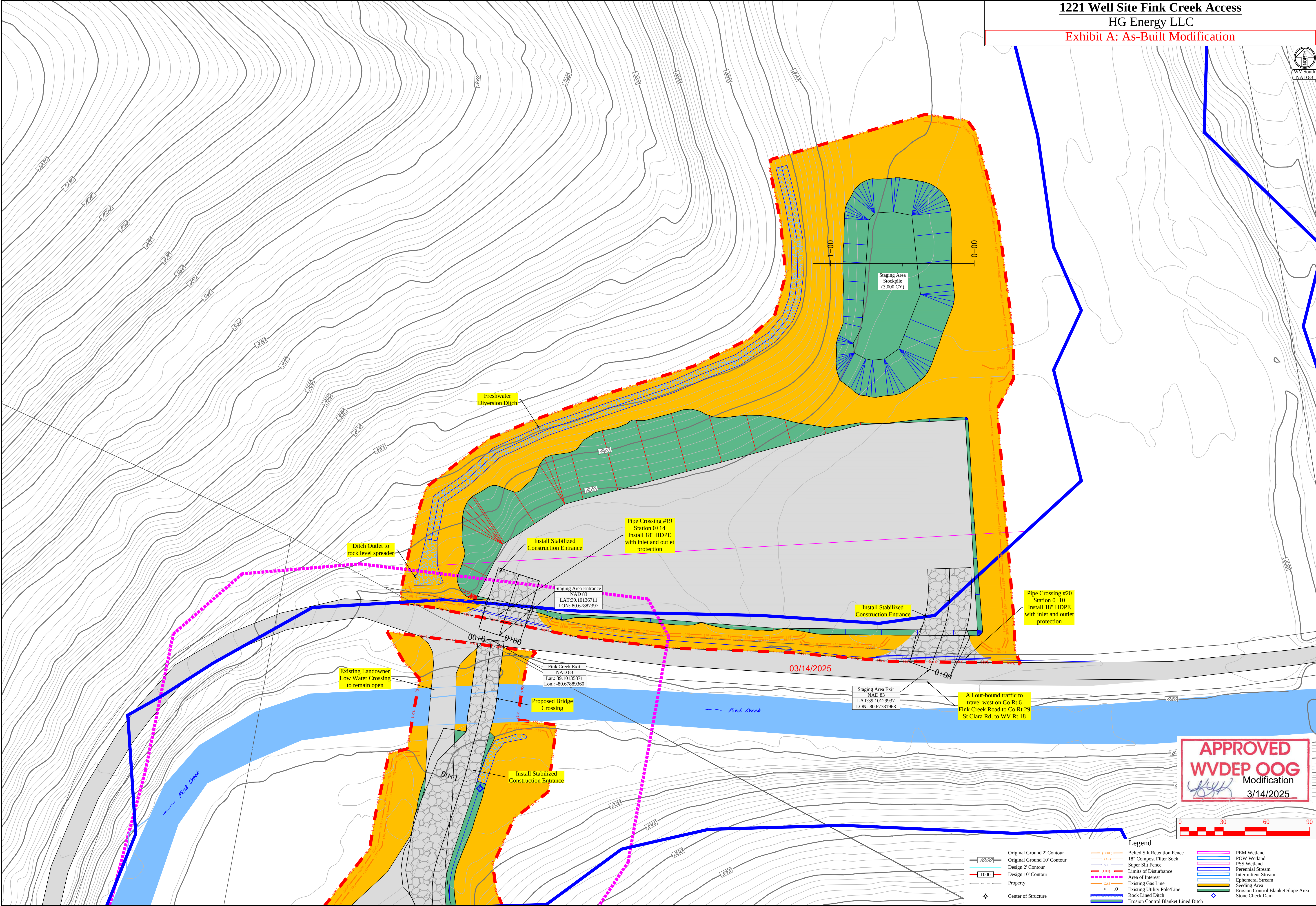


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Kelly Surveying
P.O. Box 254
Dallies, WV 26028

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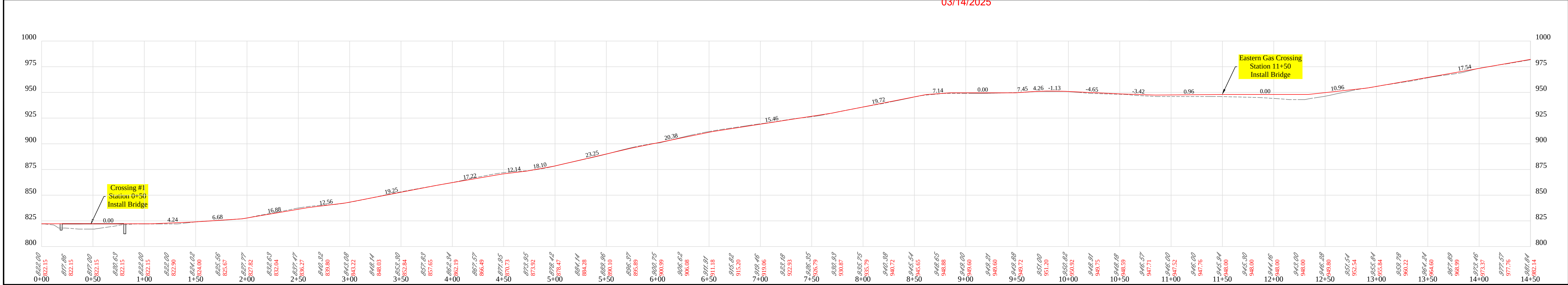
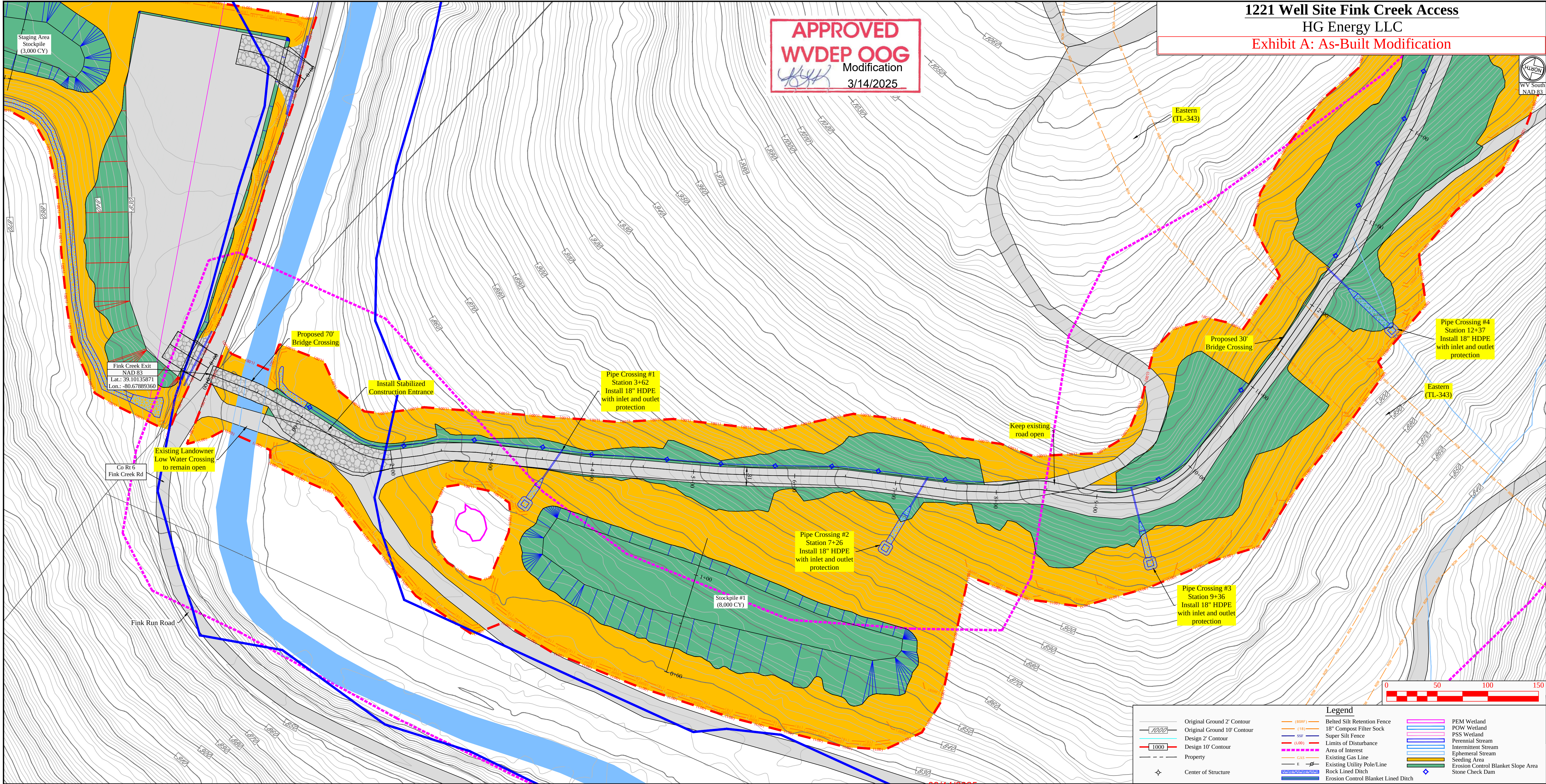
Erosion and Sediment Control Plan

1221 Fink Creek Access

Freemans Creek District
Lewis County, WV

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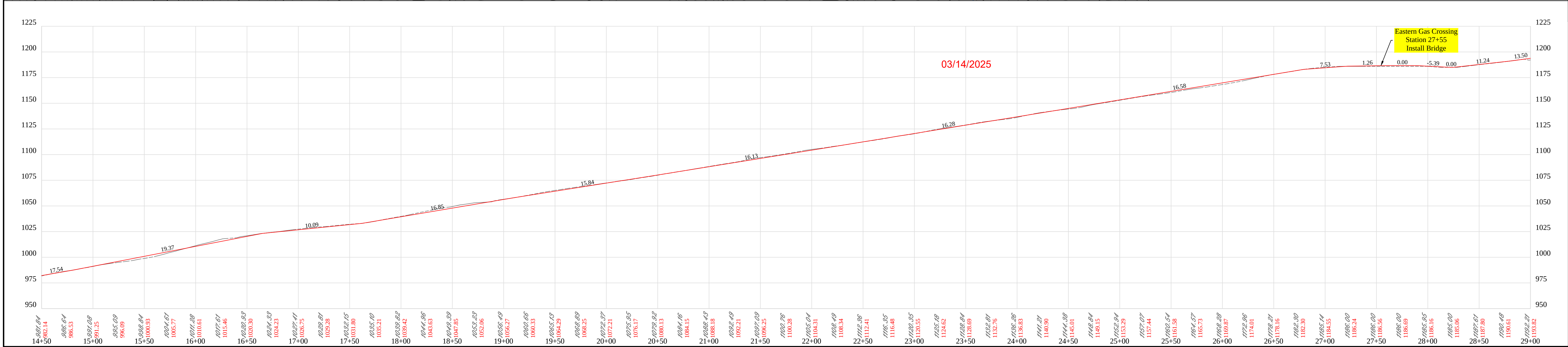
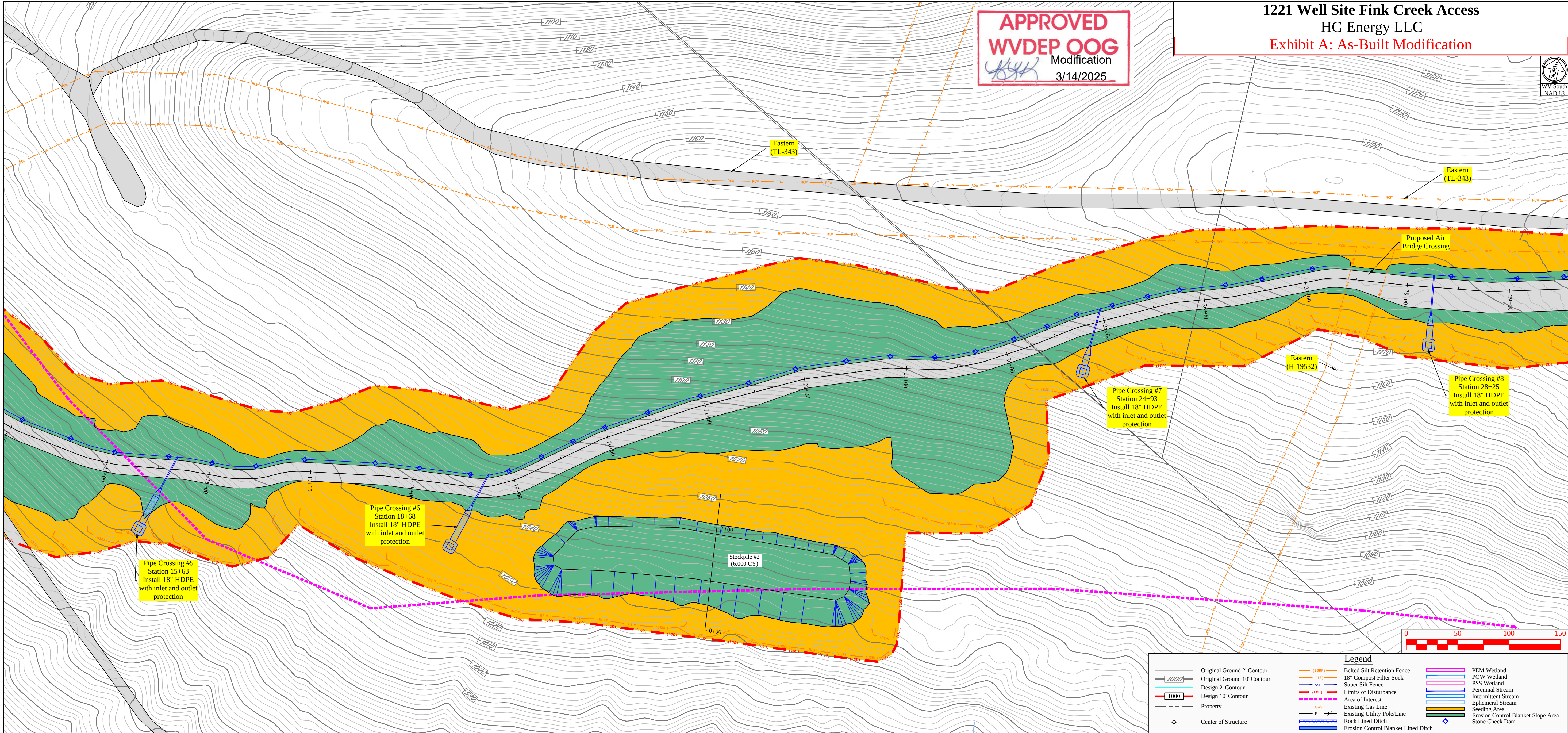
Kelly Surveying
150 West 25th
Martinsburg, WV 26159
(304) 538-0965

Erosion and Sediment Control Plan

1221 Fink Creek Access

Freemans Creek District
Lewis County, WV

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HG Energy LLC
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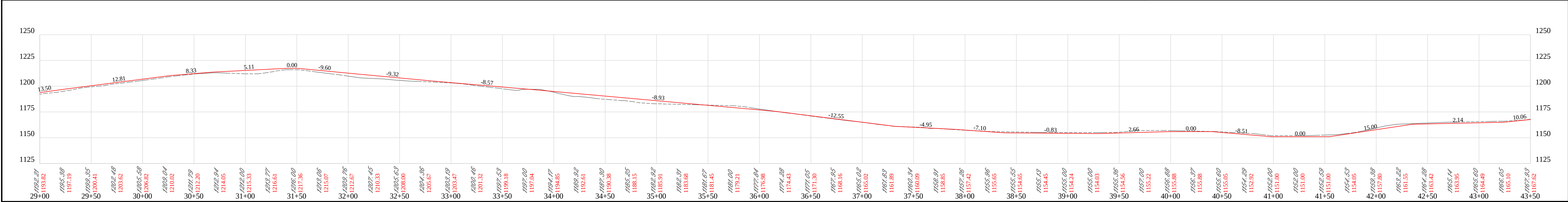
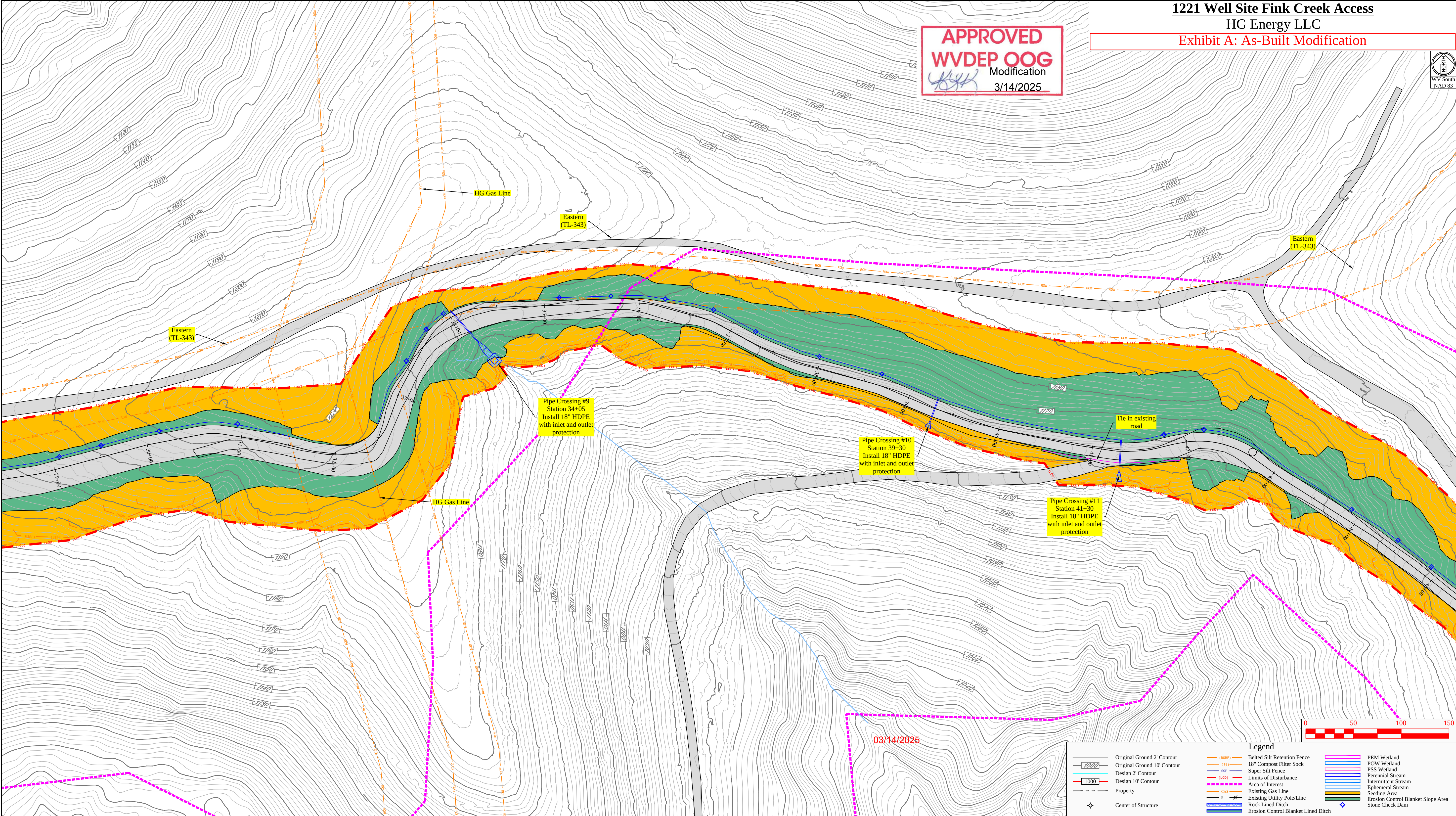


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1221 Fink Creek Access
Freemans Creek District
Lewis County, WV

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1221 Fink Creek Access
Freemans Creek District
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WV South
NAD 83

2025-04-02



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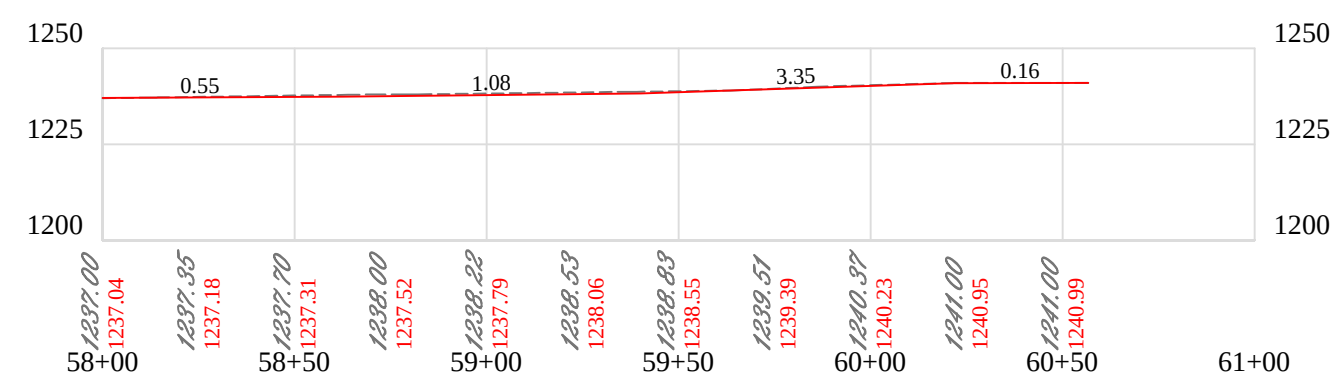


Erosion and Sediment Control Plan

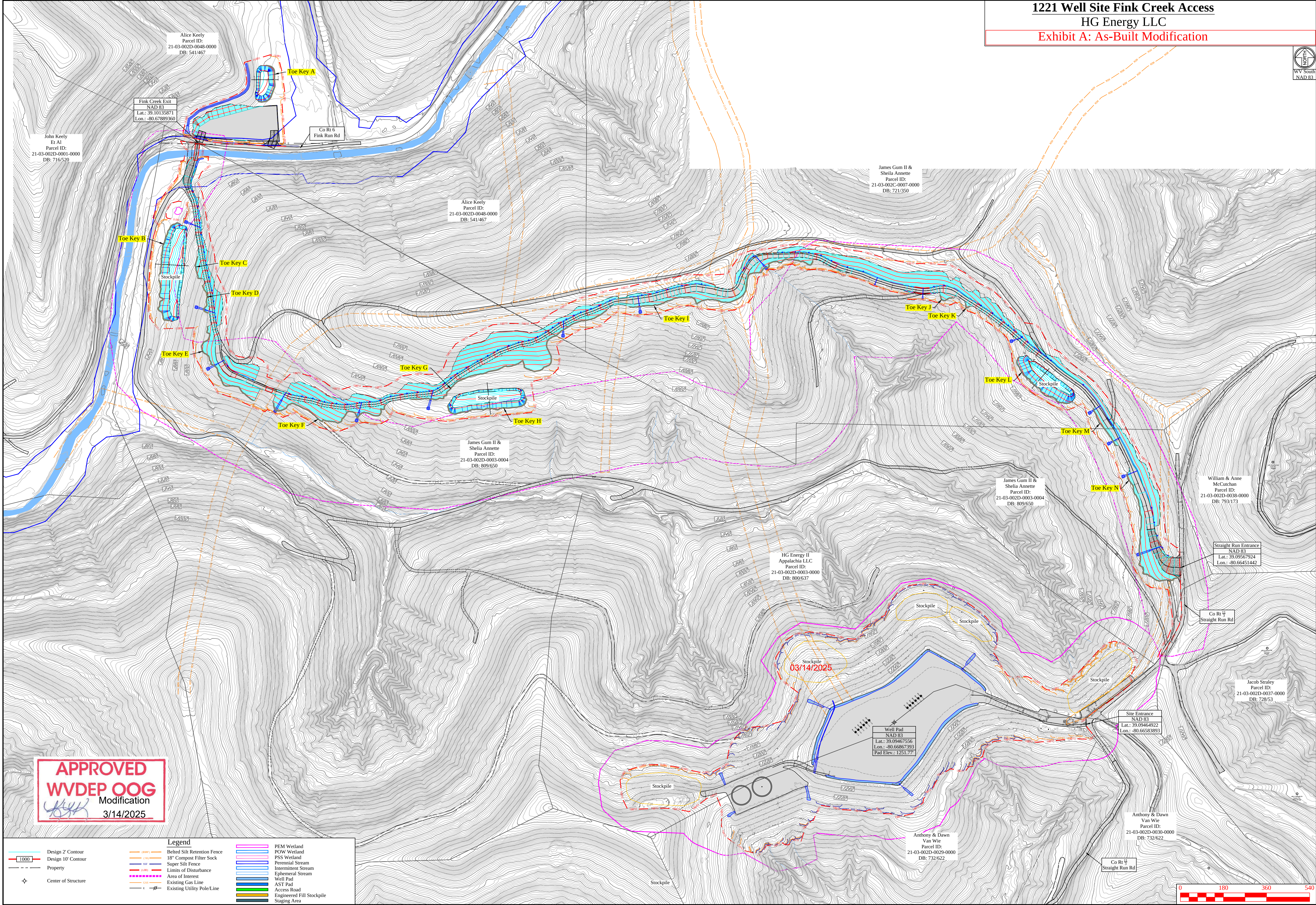
1221 Fink Creek Access

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Lewis County, WV

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1221 Well Site Fink Creek Access
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3/14/2025

Legend

- | | | | |
|---------------------------|----------------------------|-----------------------|---------------------------|
| Design 2' Contour | Design 10' Contour | Property | Center of Structure |
| 18" Composite Filter Sock | Super Silt Fence | Limits of Disturbance | Area of Interest |
| Existing Gas Line | Existing Utility Pole/Line | PEM Wetland | POW Wetland |
| PSS Wetland | Perennial Stream | Intermittent Stream | Ephemeral Stream |
| Well Pad | AST Pad | Access Road | Engineered Fill Stockpile |
| Staging Area | | | |

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Freemans Creek District
Lewis County, WV

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WV South
NAD 83

Anthony & Dawn
Van Wie
Parcel ID:
21-03-002D-0029-0000
DB: 732/622

Watercourse X

Design

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P.O. Box 254
Dalley, WV 26259
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Site Plan

1221 Well Site

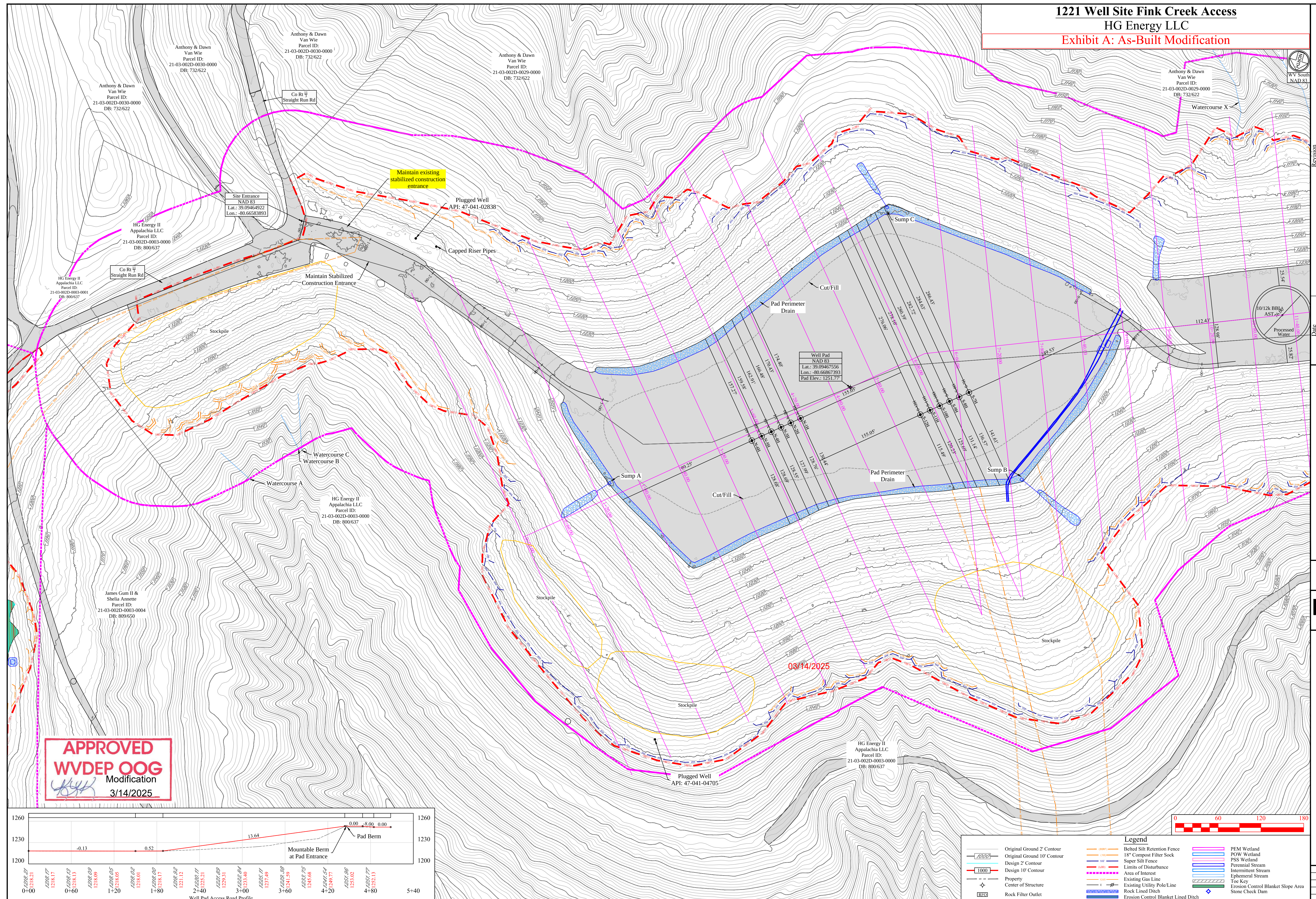
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1221 Well Site Fink Creek Access
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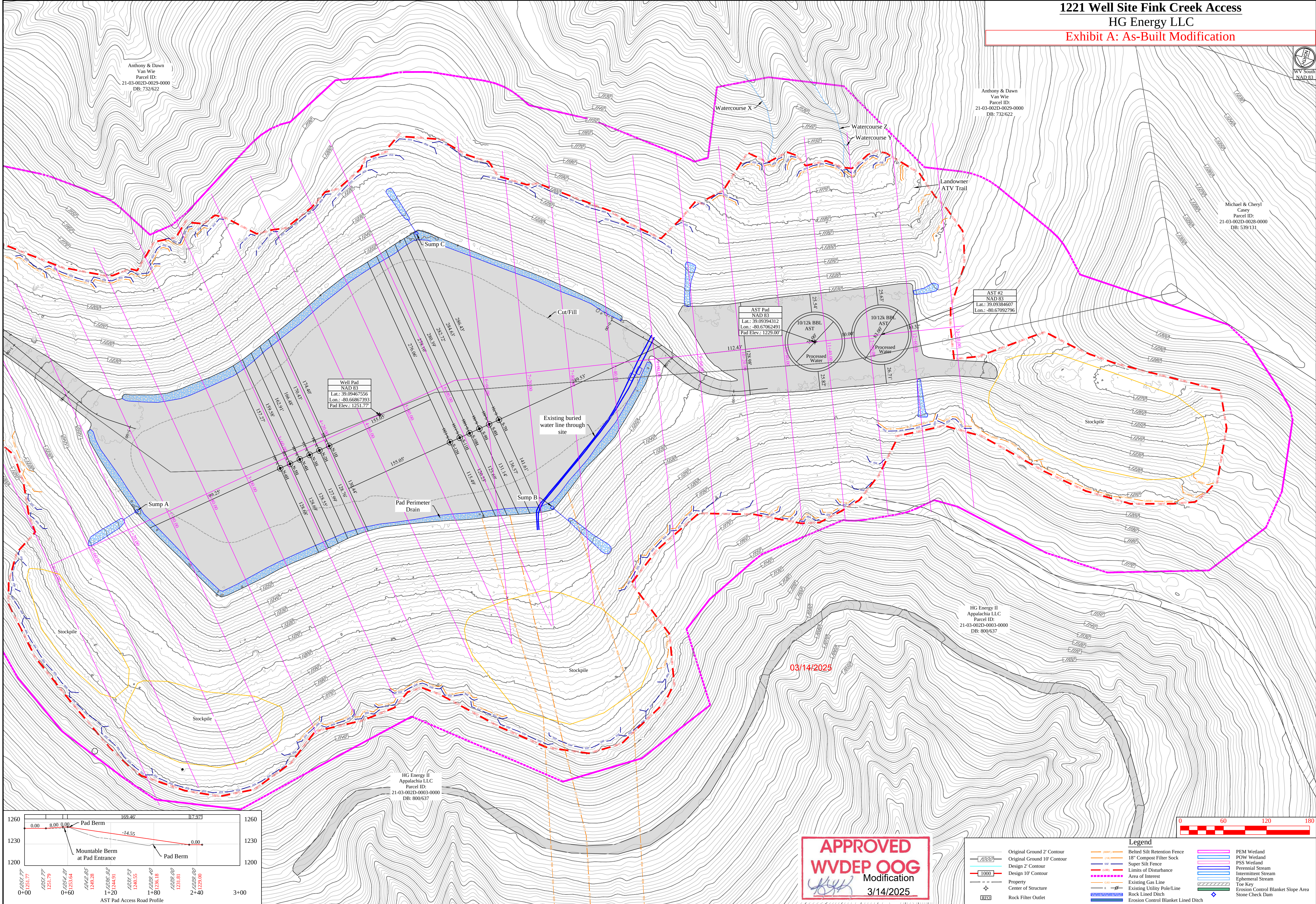


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Site Plan
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Freemans Creek District
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1221 Well Site Fink Creek Access
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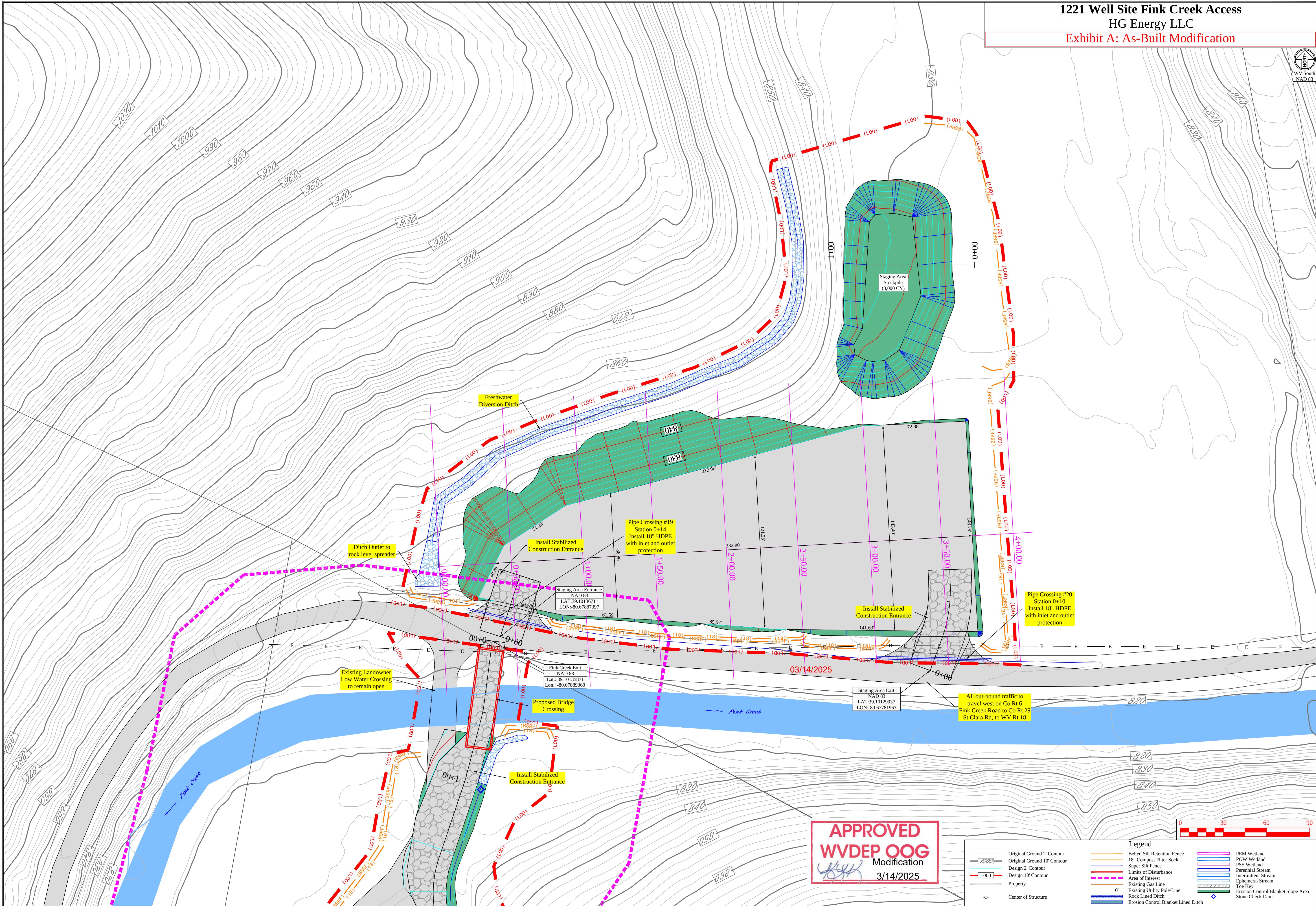


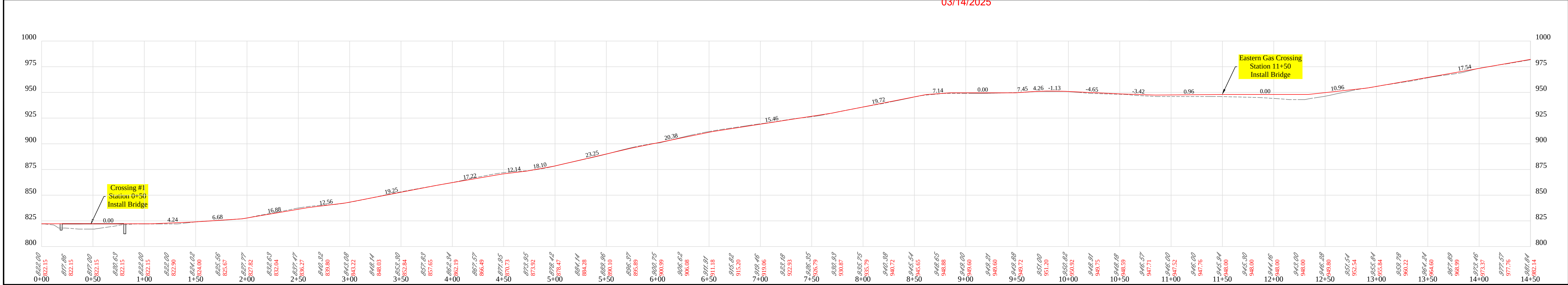
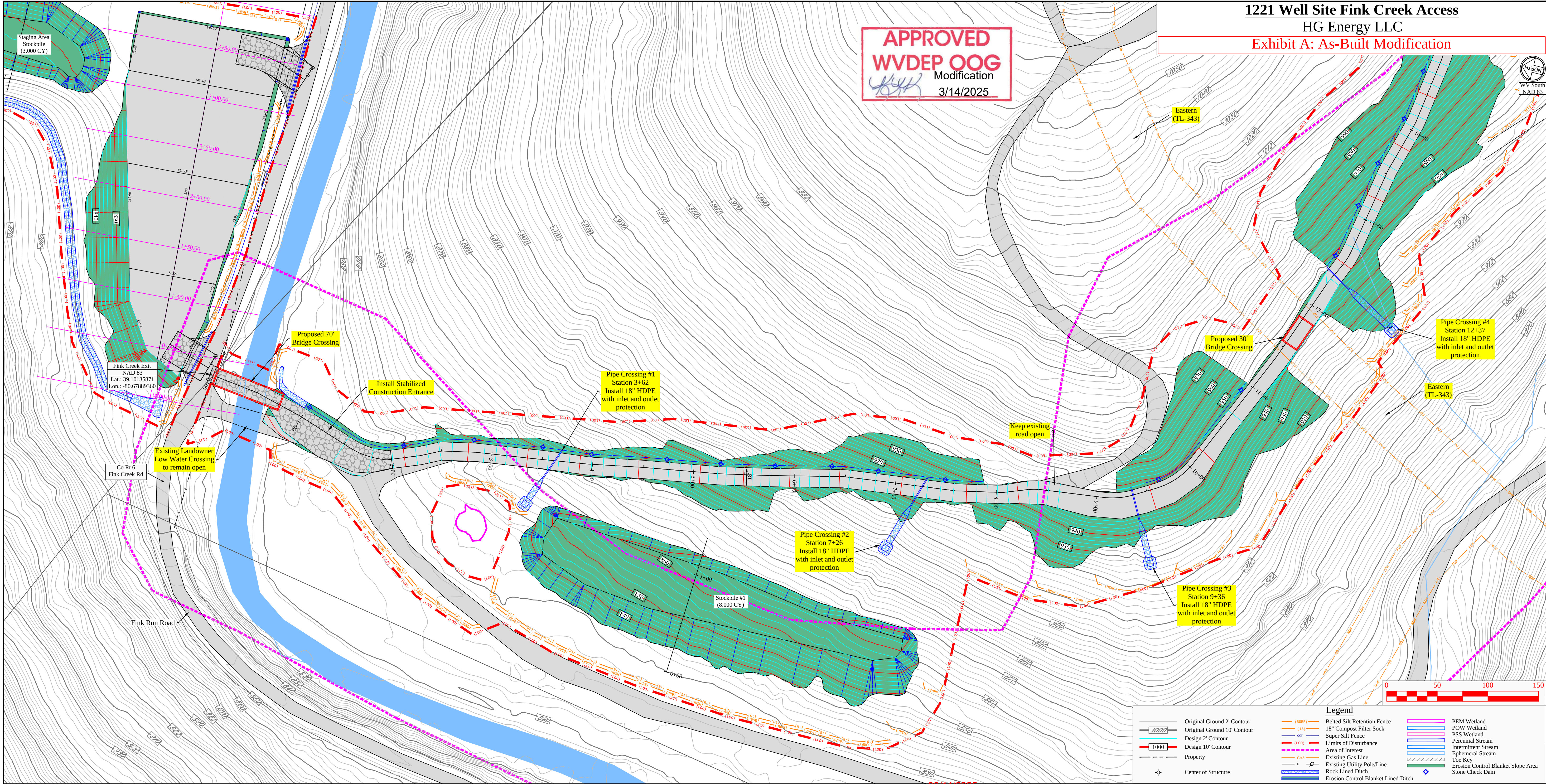
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Site Plan - Fink Creek Existing Access
1221 Fink Creek Access
Freemans Creek District
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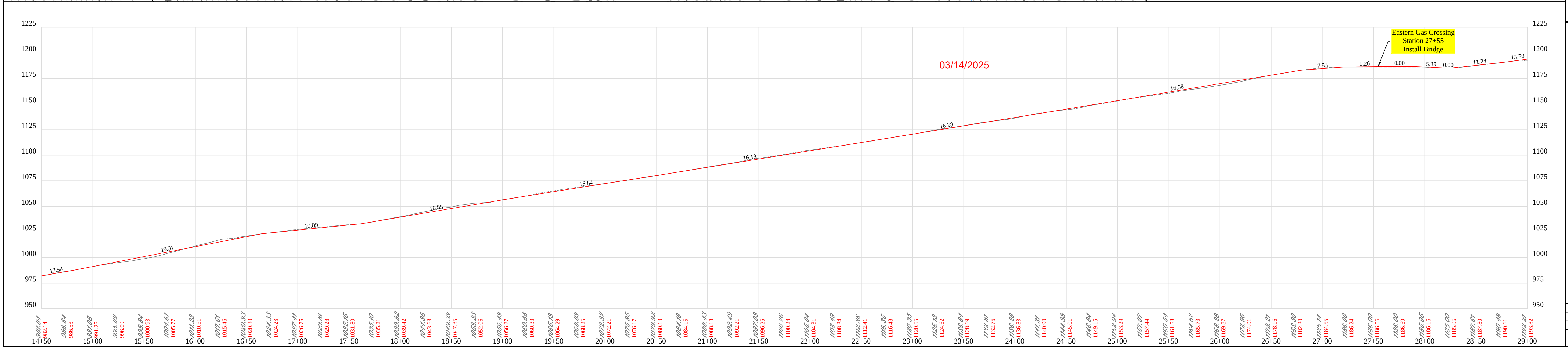
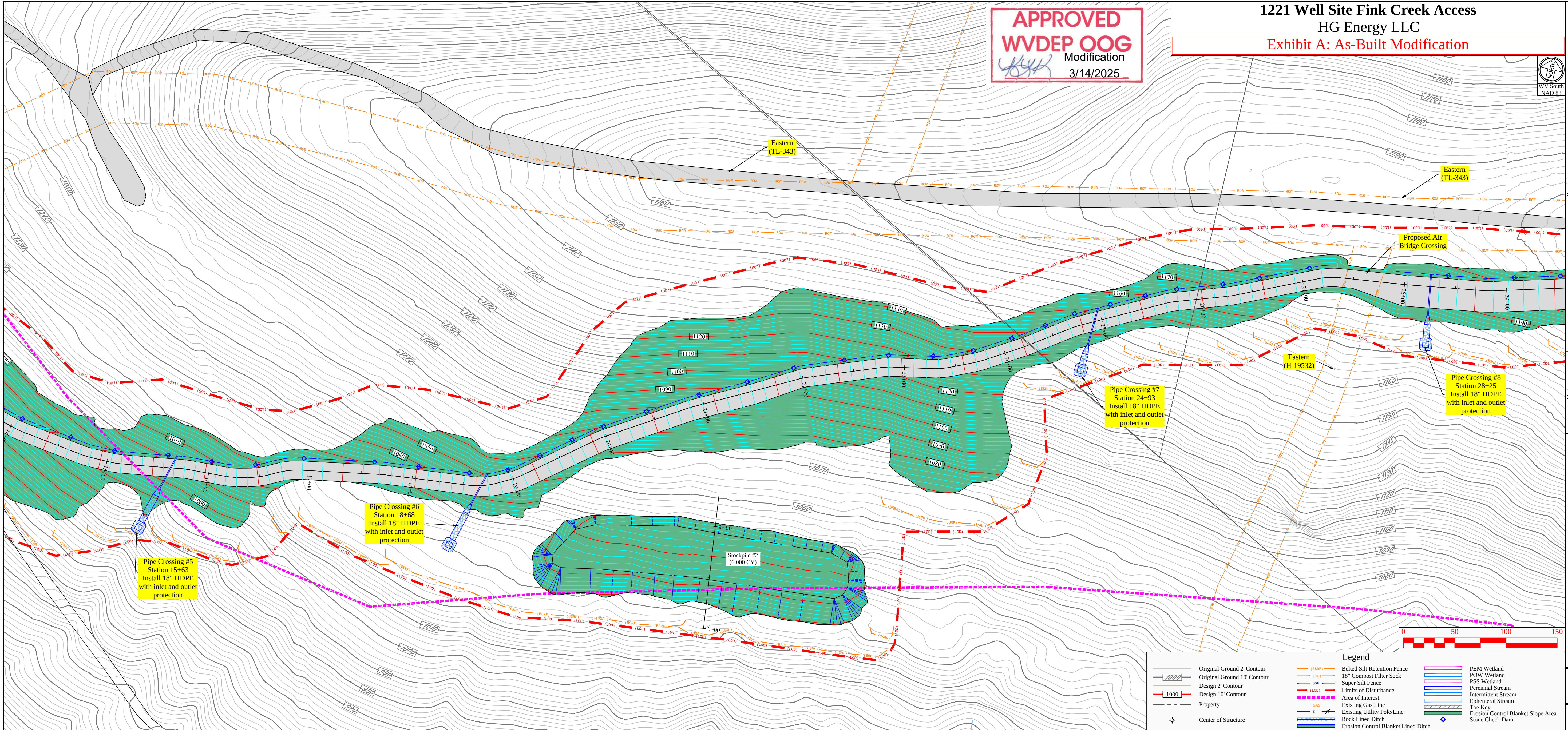
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Kelly Surveying
150 West 25th
Martinsburg, WV 26159
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Site Plan - Fink Creek Access Road

1221 Well Site
Freemans Creek District
Lewis County, WV

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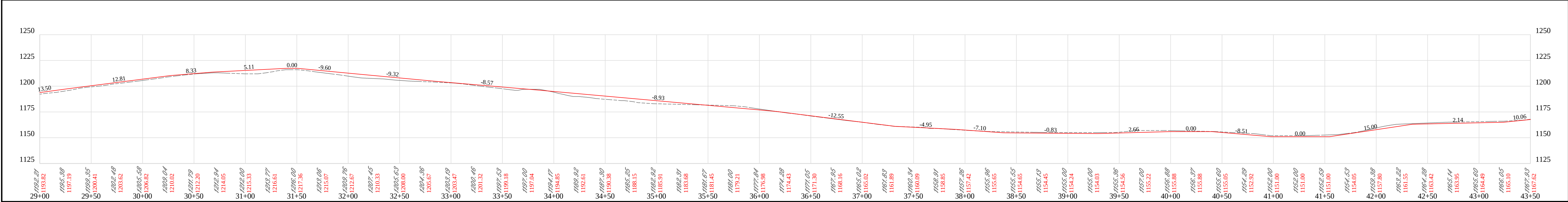
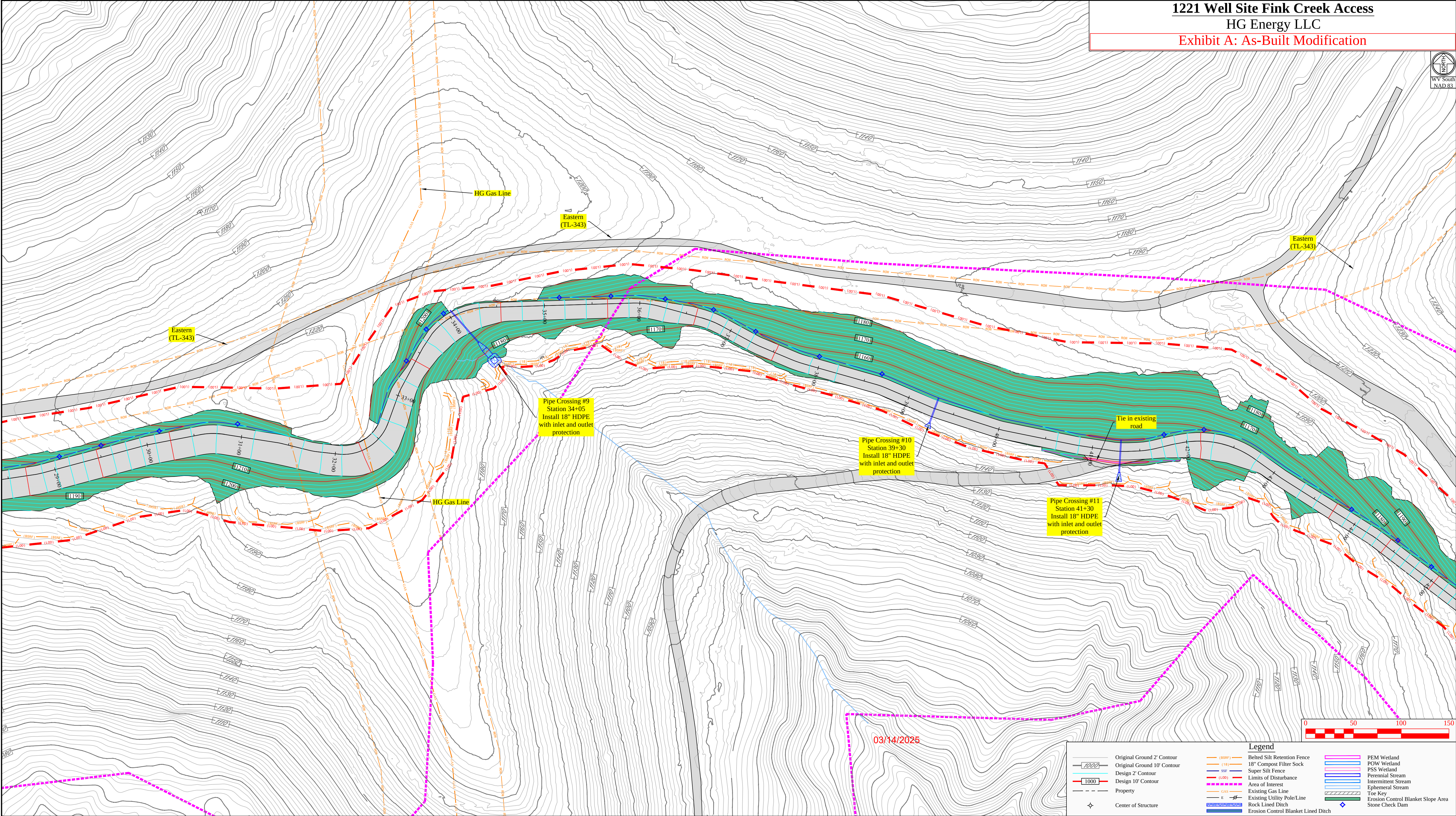
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Site Plan - Fink Creek Access Road

1221 Well Site
Freemans Creek District
Lewis County, WV

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1221 Well Site Fink Creek Access
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Exhibit A: As-Built Modification



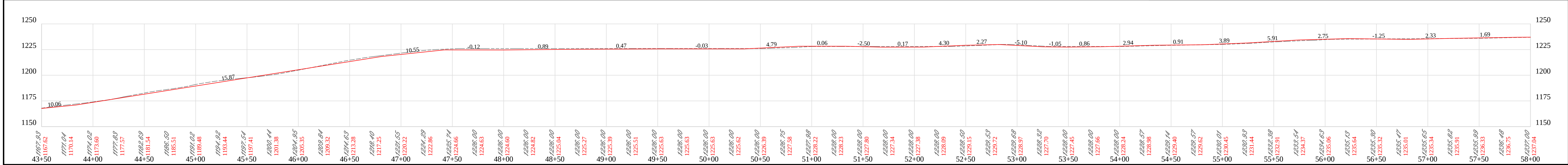
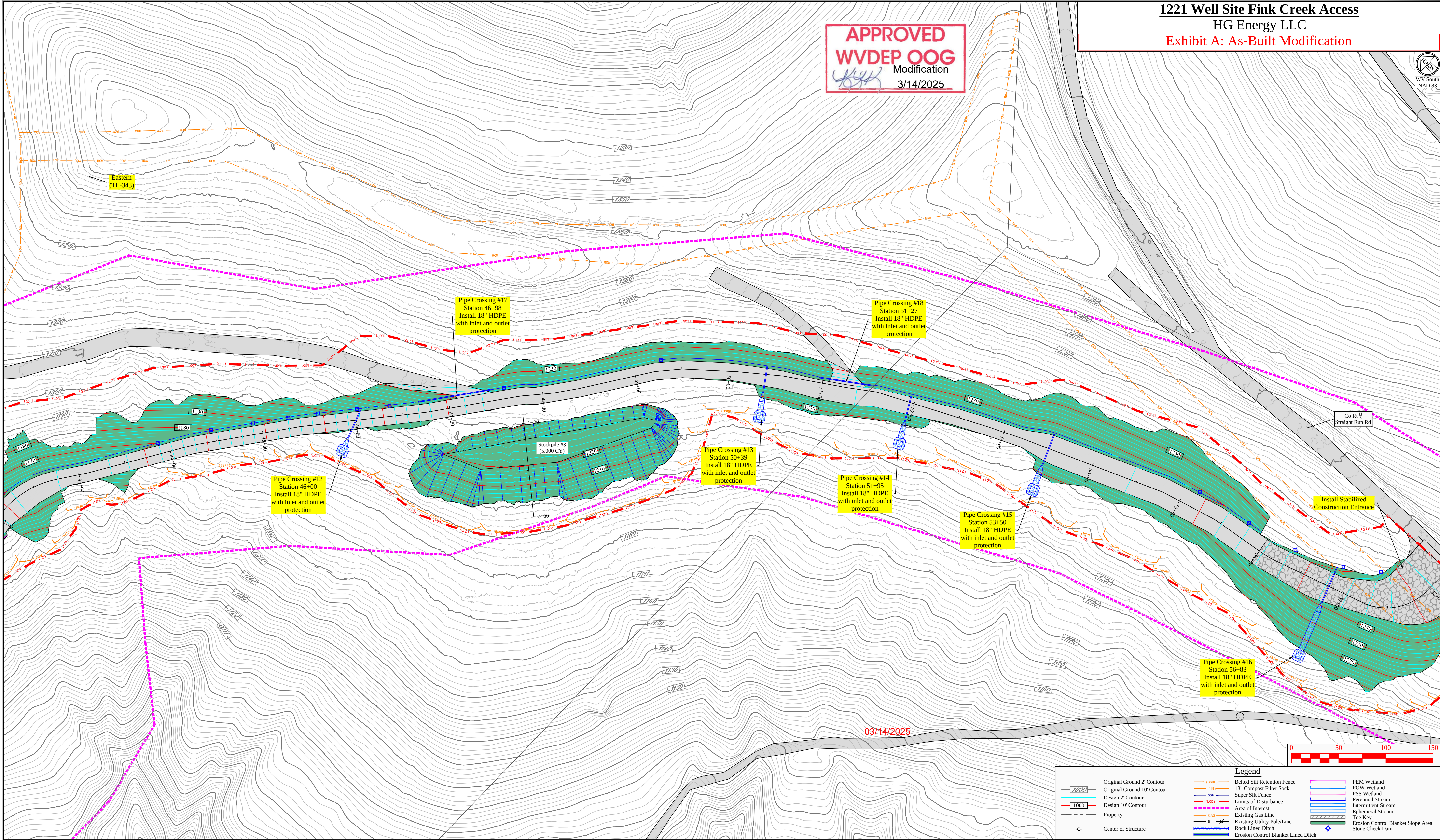
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Design	02-04-2025



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Site Plan - Fink Creek Access Road
1221 Well Site
Freemans Creek District
Lewis County, WV
Date: 02/04/2025
Scale: As Shown
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Sheet 21 of 32



1221 Well Site Fink Creek Access
HG Energy LLC
Exhibit A: As-Built Modification

APPROVED
WVDEP OOG
Modification
3/14/2025

WV South
NAD83

02-04-2025

Design

03/14/2025

0 50 100 150

Legend

Original Ground 2' Contour
Original Ground 10' Contour
Design 2' Contour
Design 10' Contour
Property
Center of Structure

(18SF)
(18)
SSP
(L00)
Area of Interest
Existing Gas Line
Existing Utility Pole/Line
Rock Lined Ditch
Erosion Control Blanket Lined Ditch

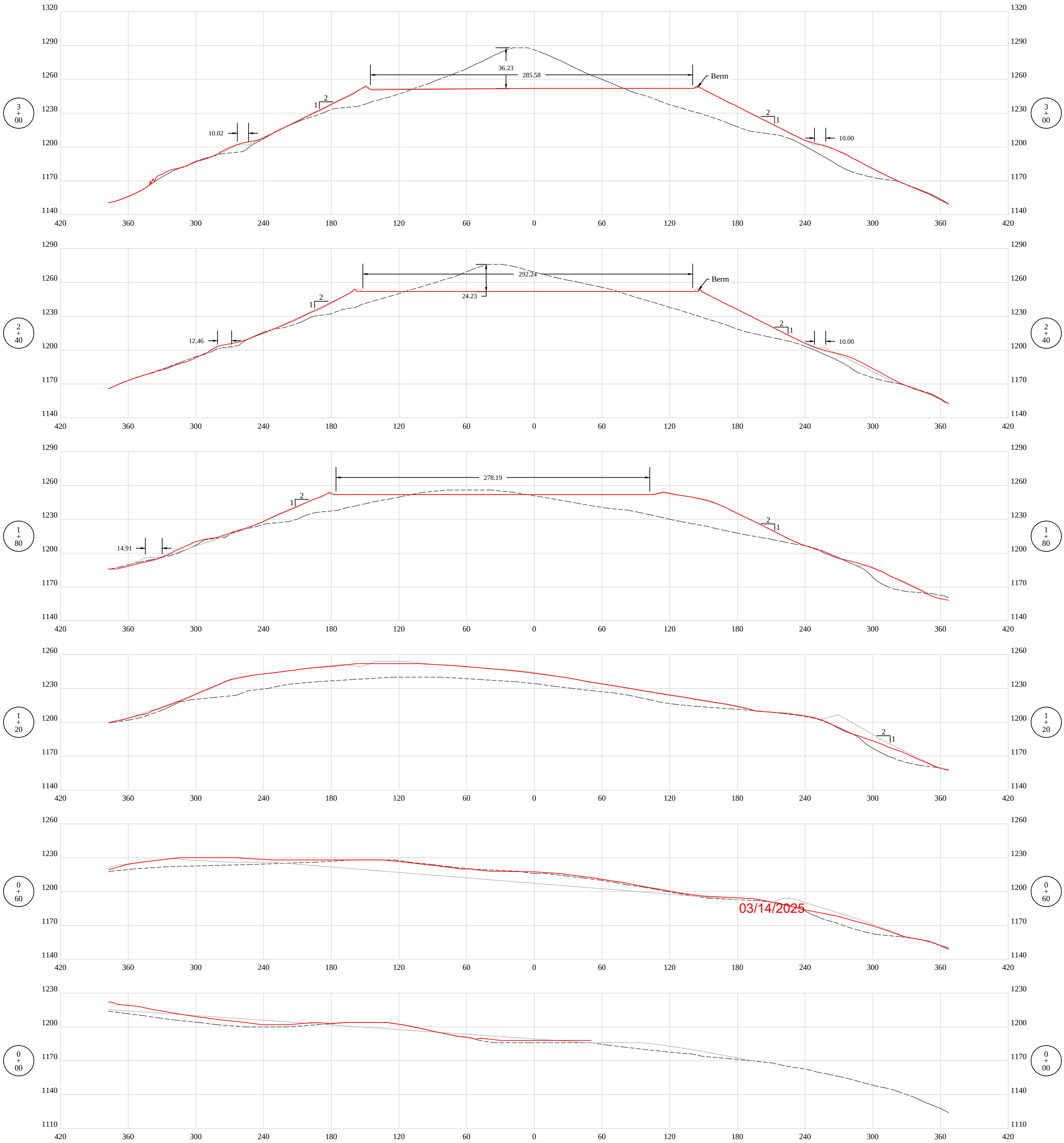
PEM Wetland
POW Wetland
PSS Wetland
Perennial Stream
Intermittent Stream
Ephemeral Stream
Toe Key
Erosion Control Blanket Slope Area
Stone Check Dam

Site Plan - Fink Creek Access Road

1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 22 of 32

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Modification
3/14/2025



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Design

Date
02-04-2025



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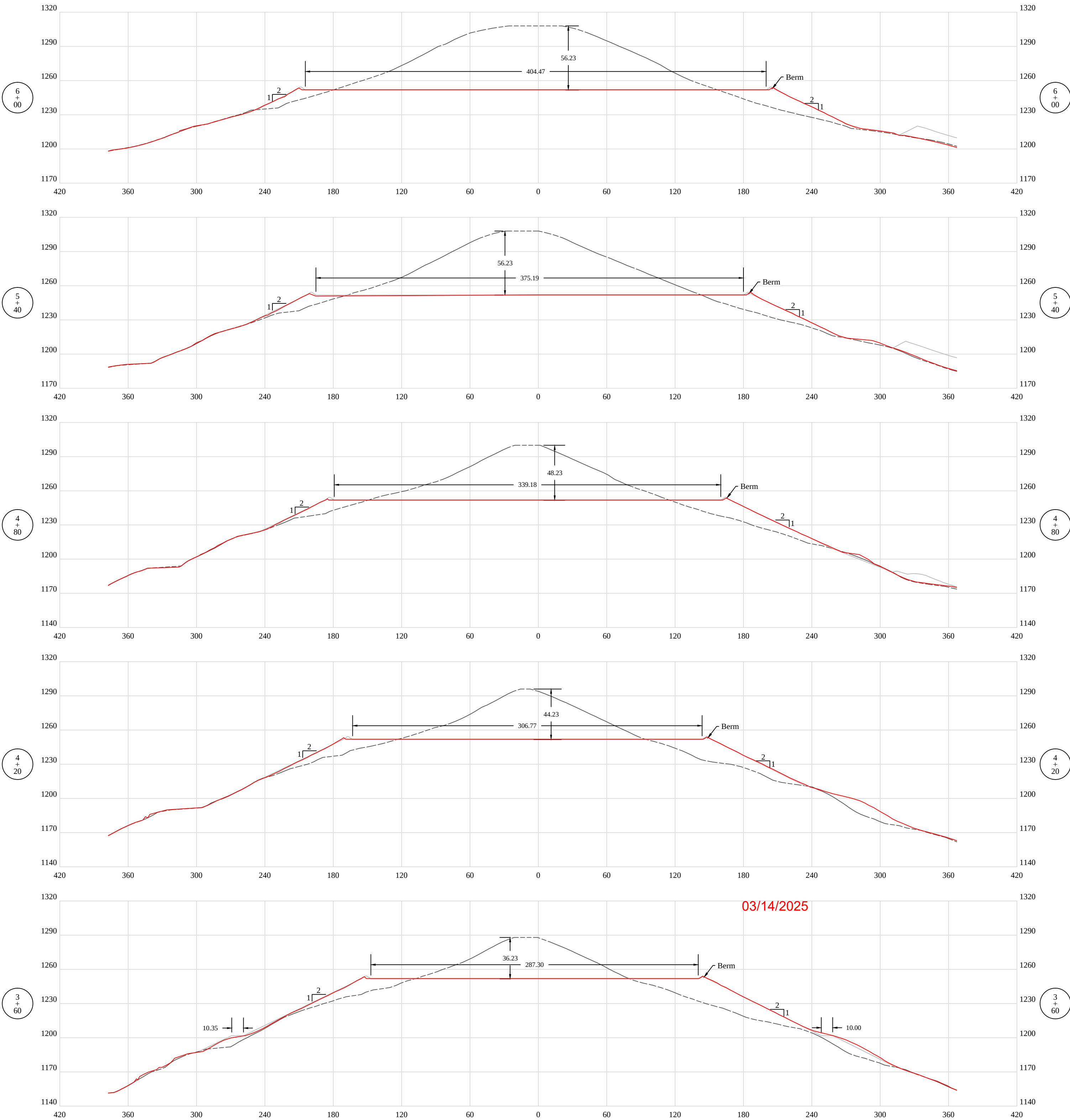
Cross Sections - Well Pad
1221 Well Site
Freemans Creek District
Lewis County, WV

Legend

Design
Original Ground
As-Built



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WVDEP OOG
Modification
3/14/2025



Legend

- Design
- Original Ground
- As-Built



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02-04-2025	Design

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Cross Sections - Well Pad
1221 Well Site
Freemans Creek District
Lewis County, WV

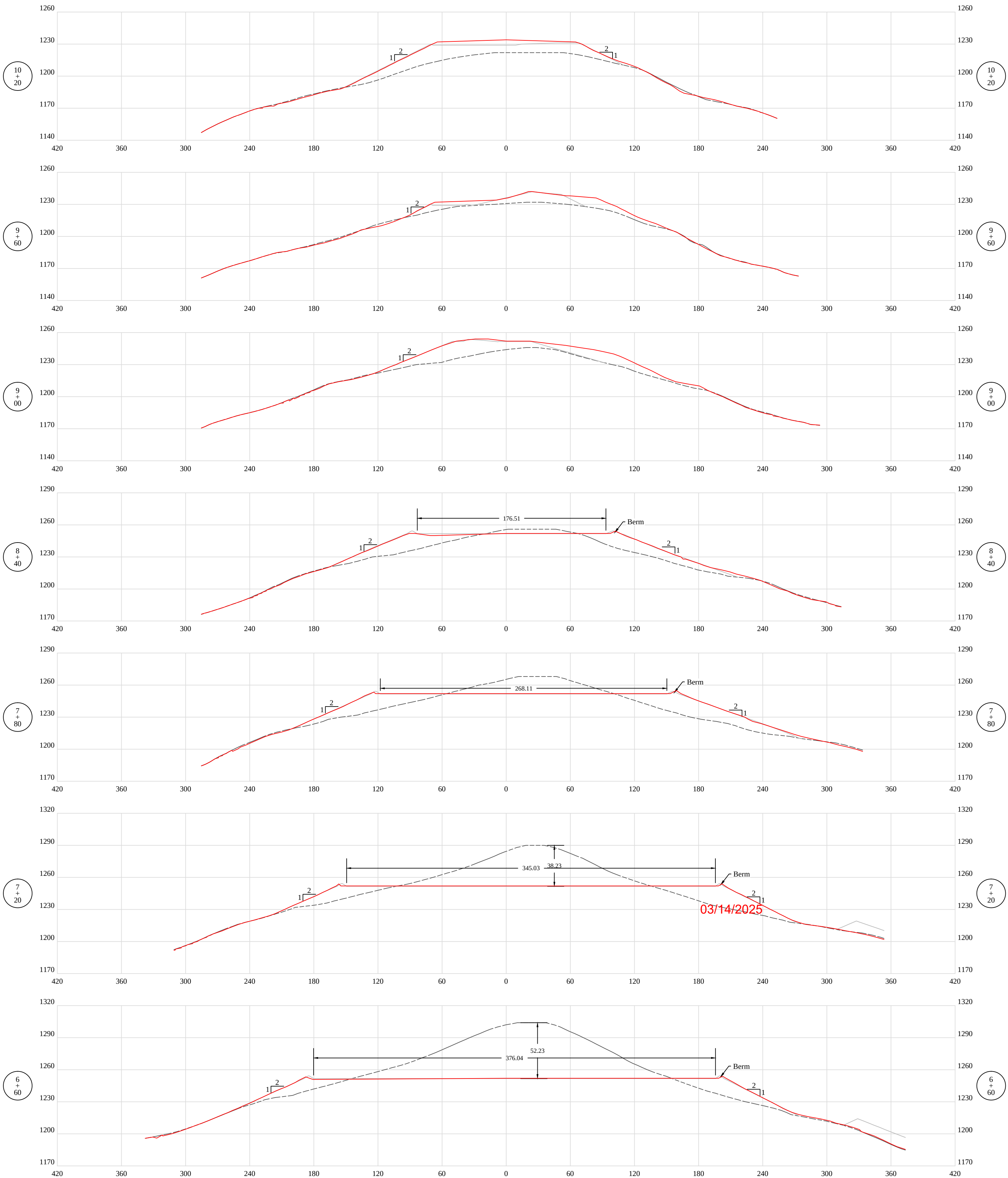
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Sheet 25 of 32

1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification

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WVDEP OOG
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Legend

- Design
- Original Ground
- As-Built

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Design

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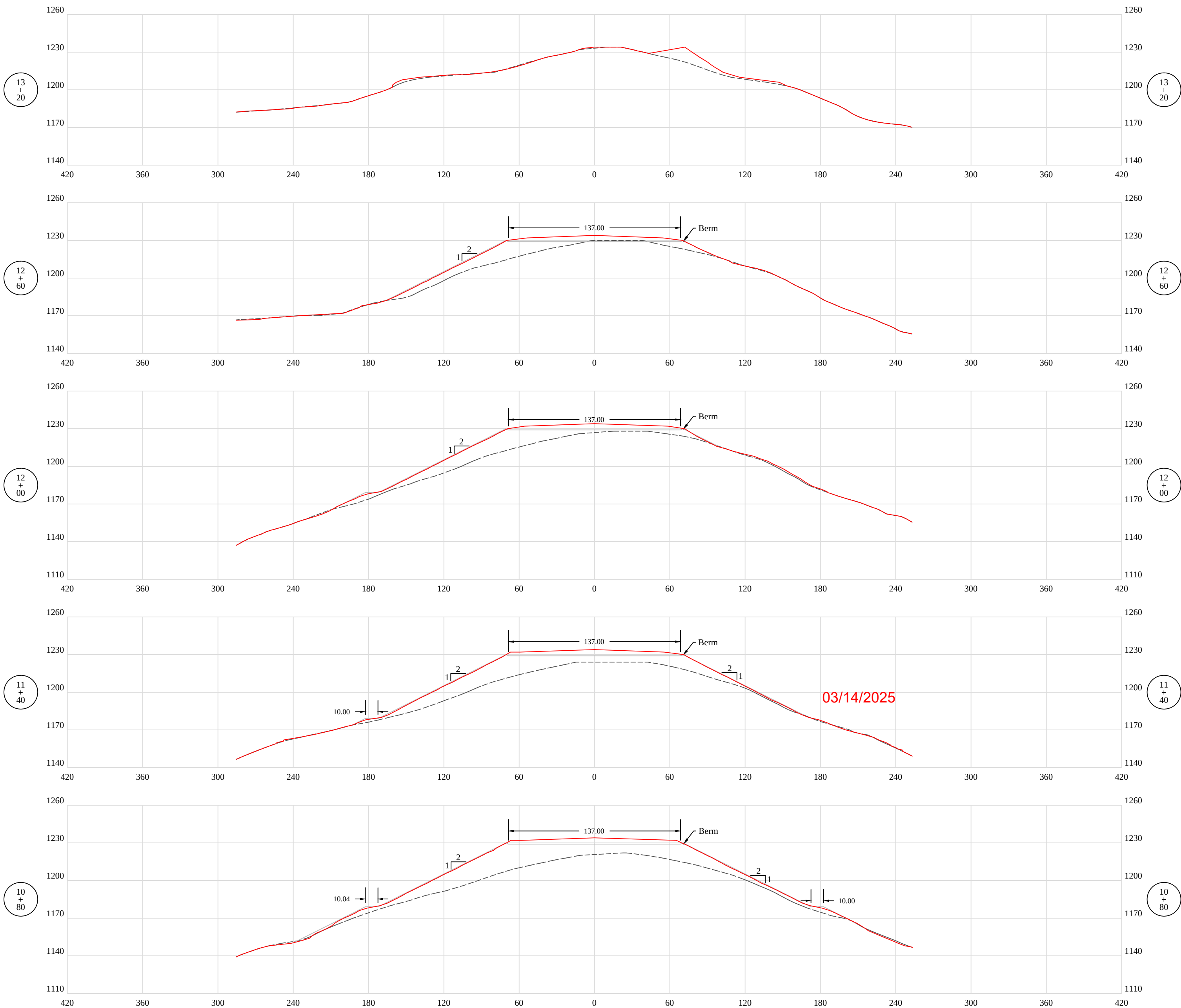
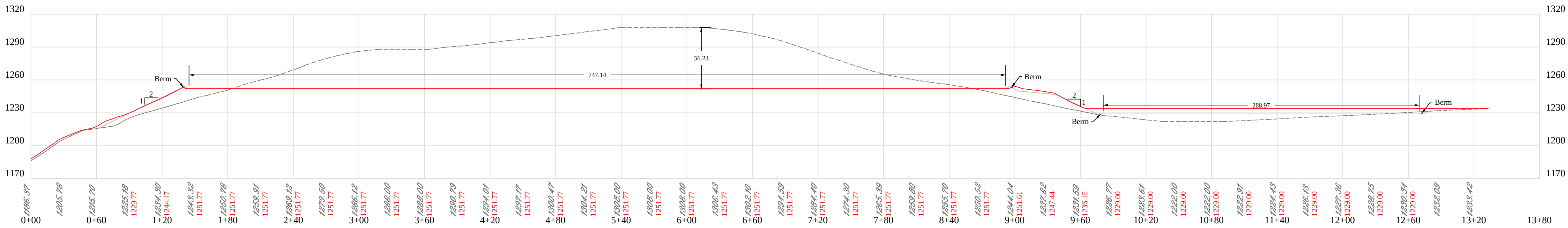
Cross Sections - Well Pad
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 26 of 32

1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification



Legend

- Design
- Original Ground
- As-Built

Revision

Design

Date

02-04-2025



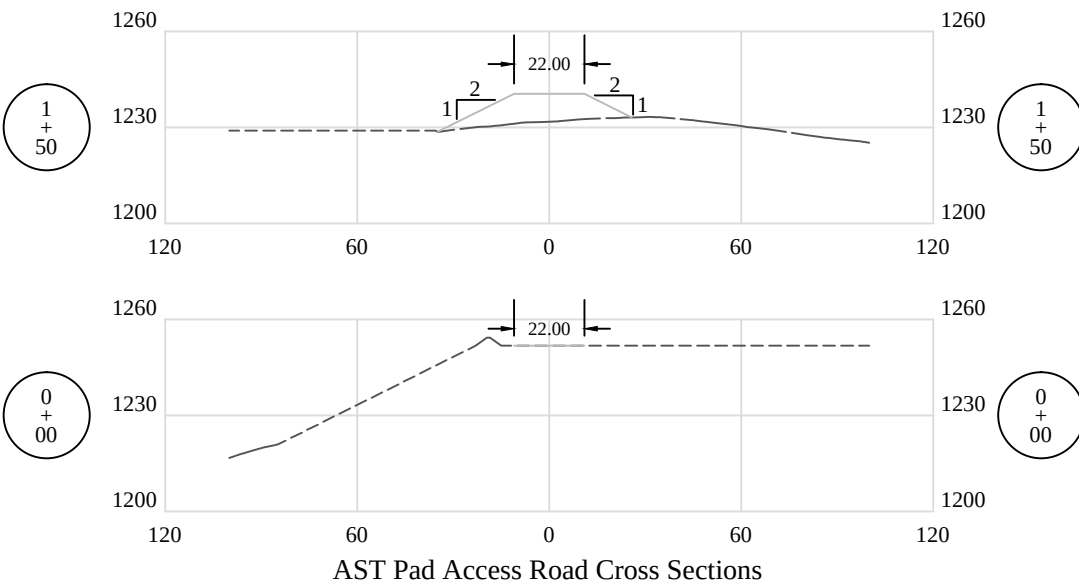
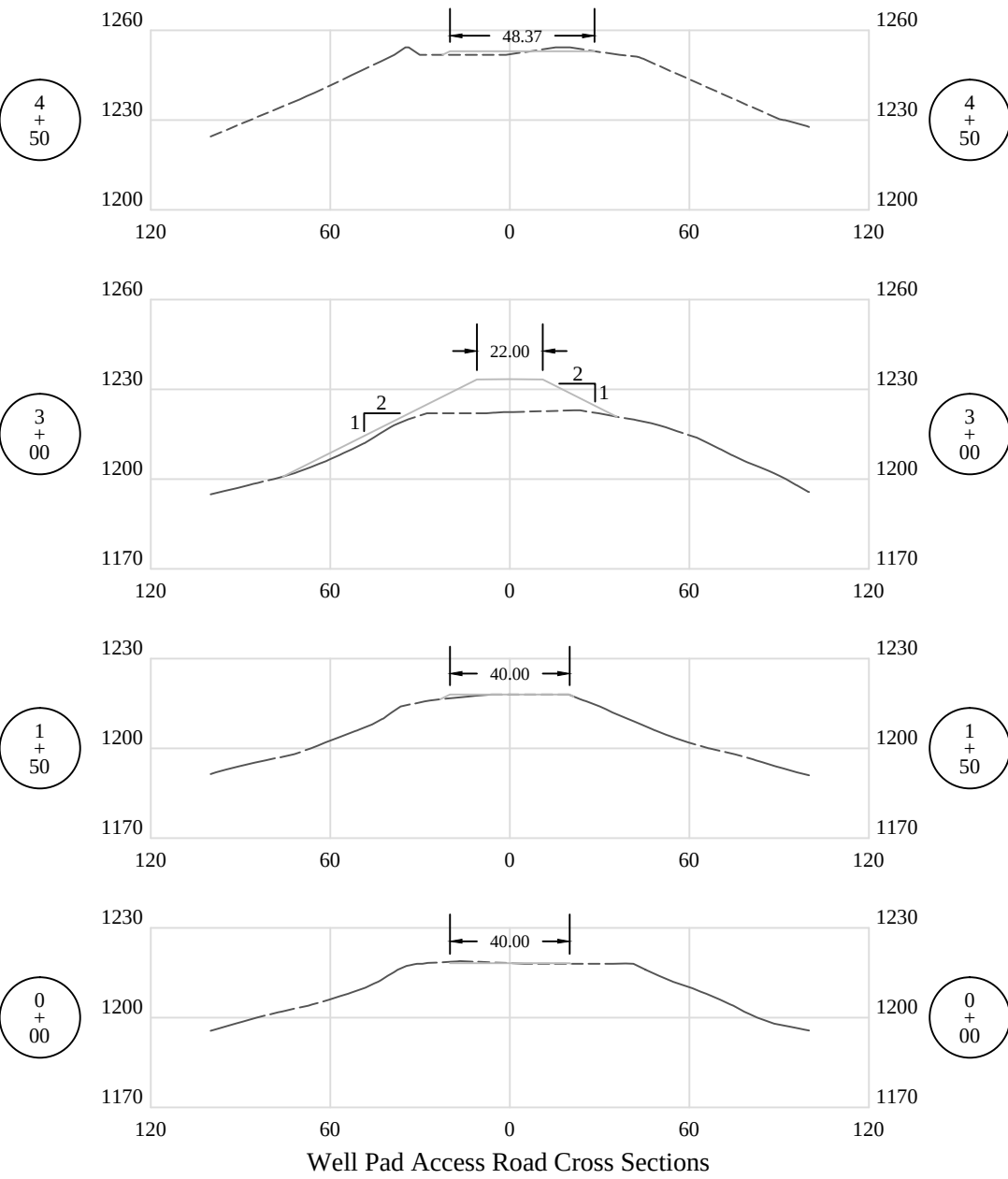
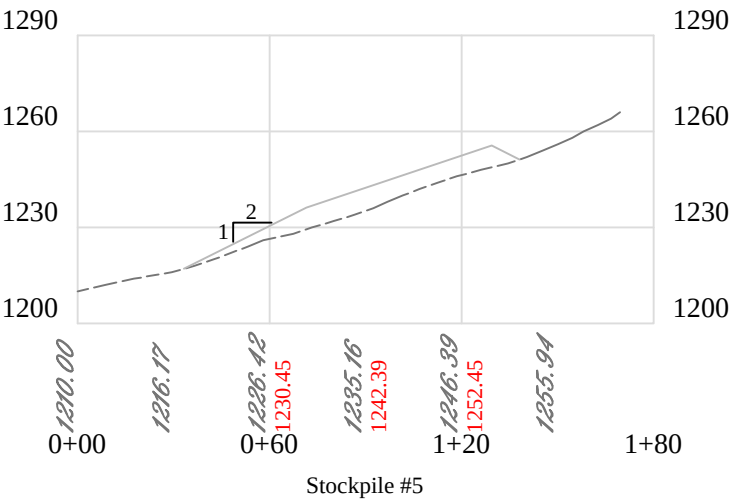
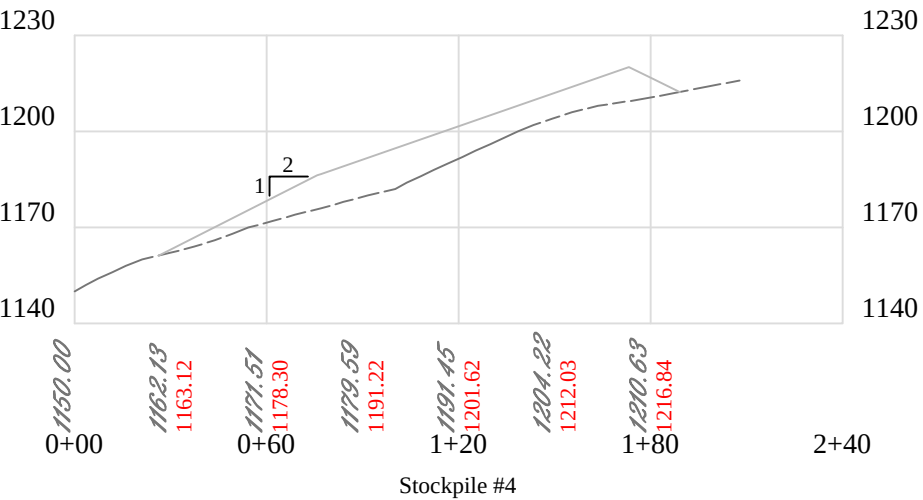
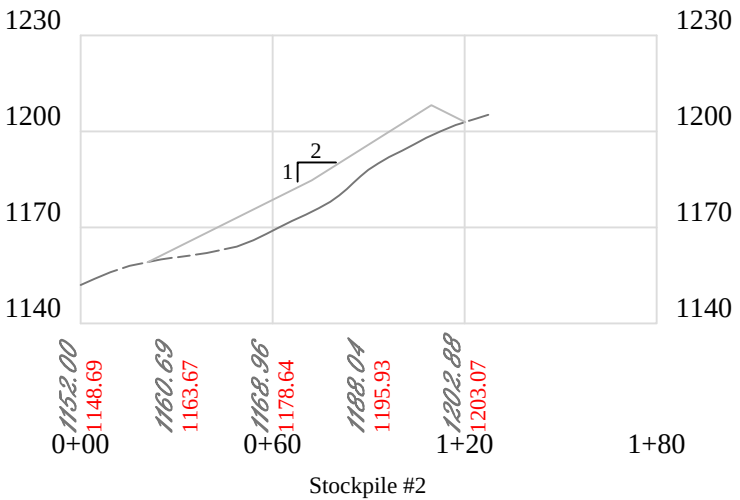
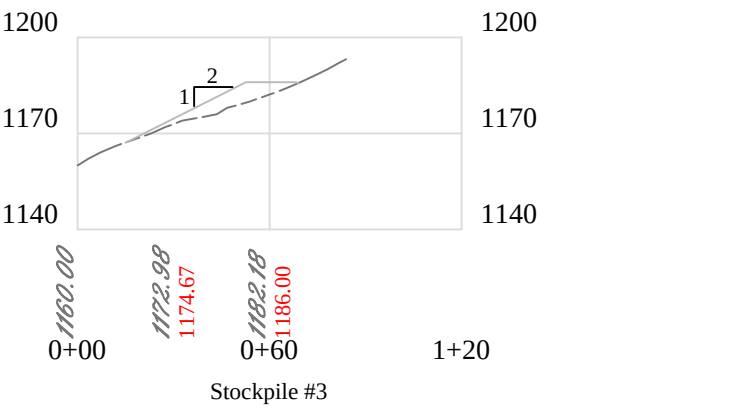
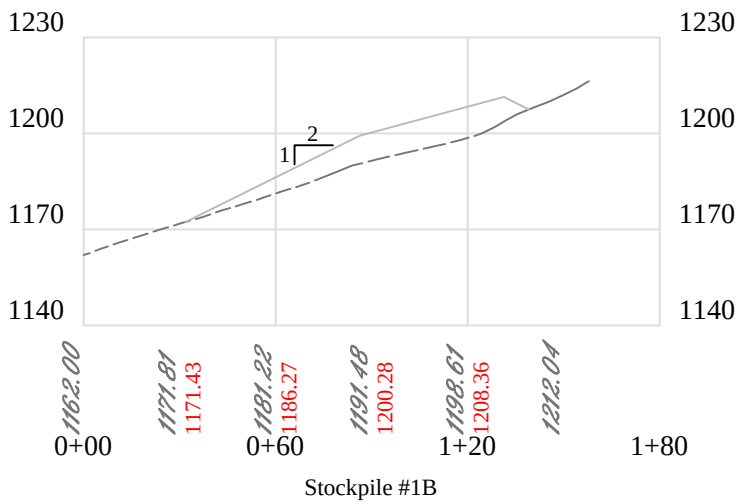
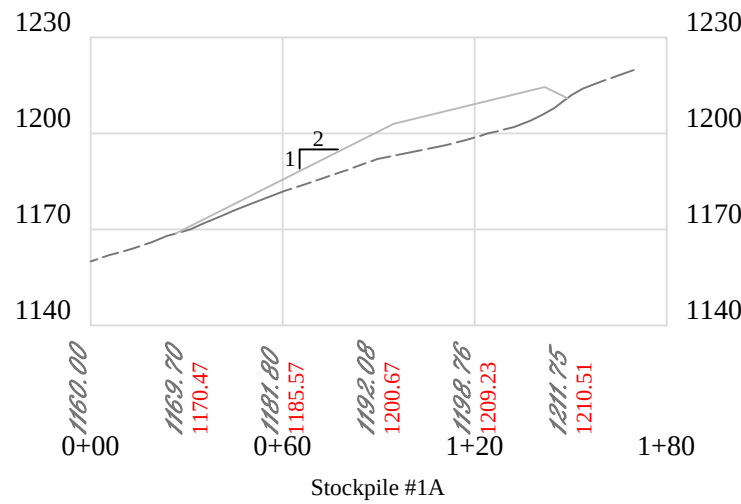
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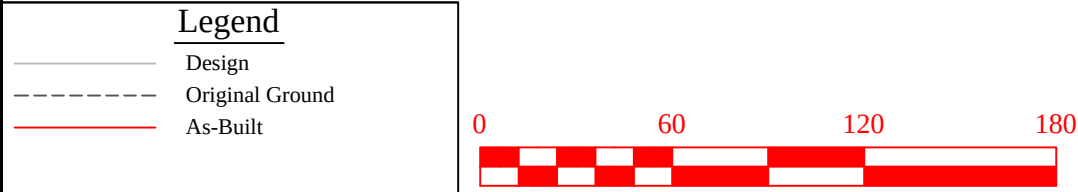
Cross Sections - Well Pad
1221 Well Site
Freemans Creek District
Lewis County, WV

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WVDEP OOG
Modification
3/14/2025

Date: 02/04/2025
Scale: As Shown
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Sheet 27 of 32



03/14/2025



Revision
Design

Date
02-04-2025

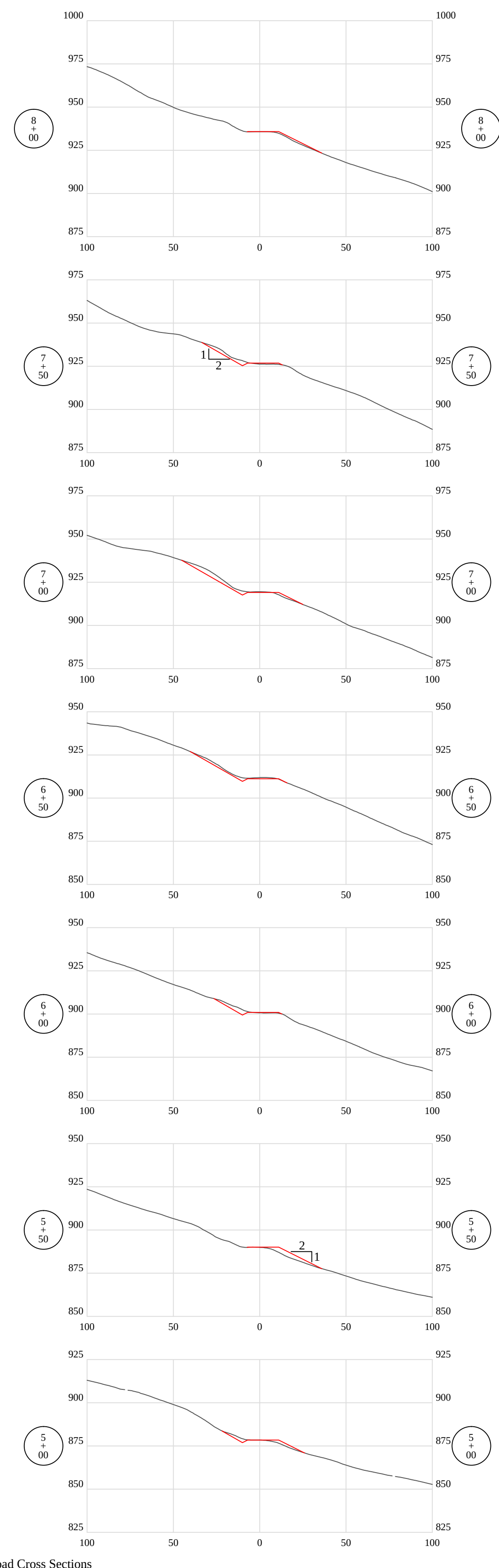
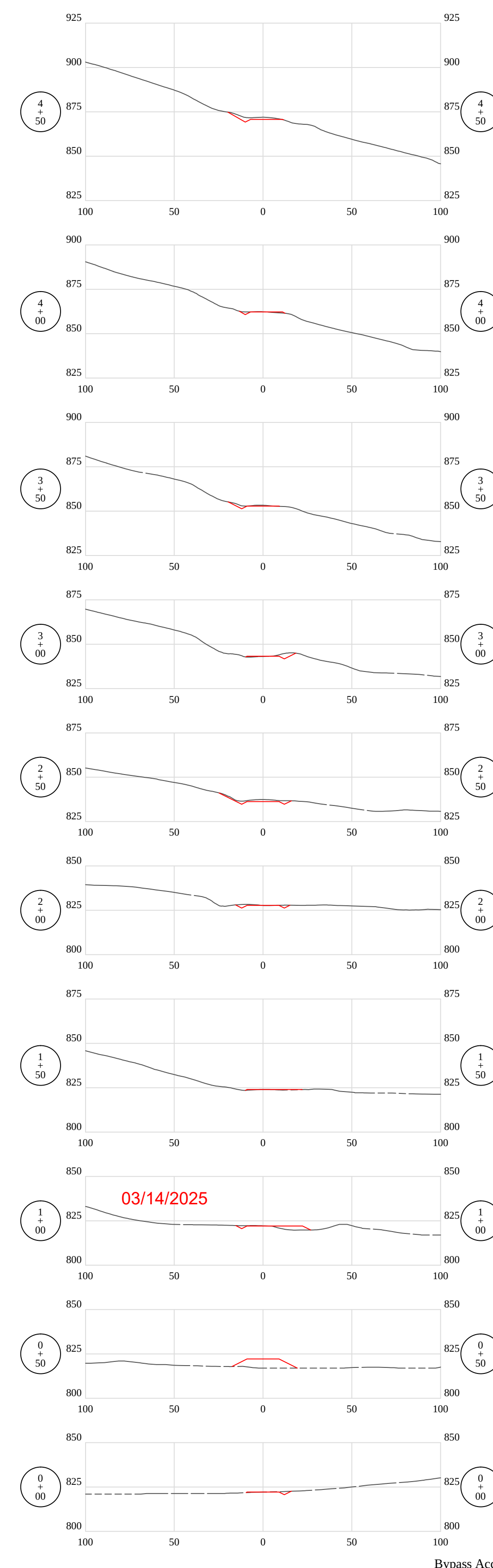
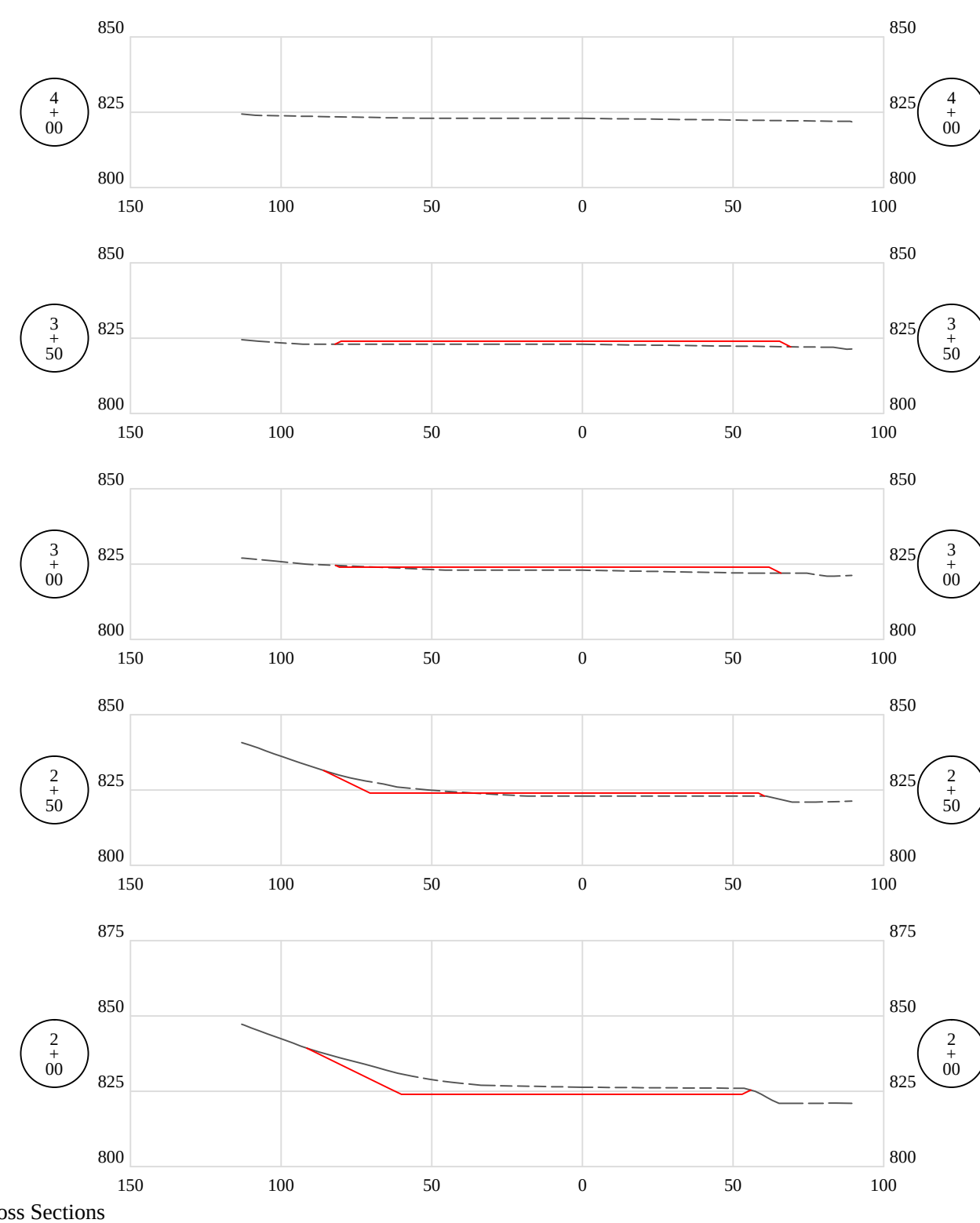
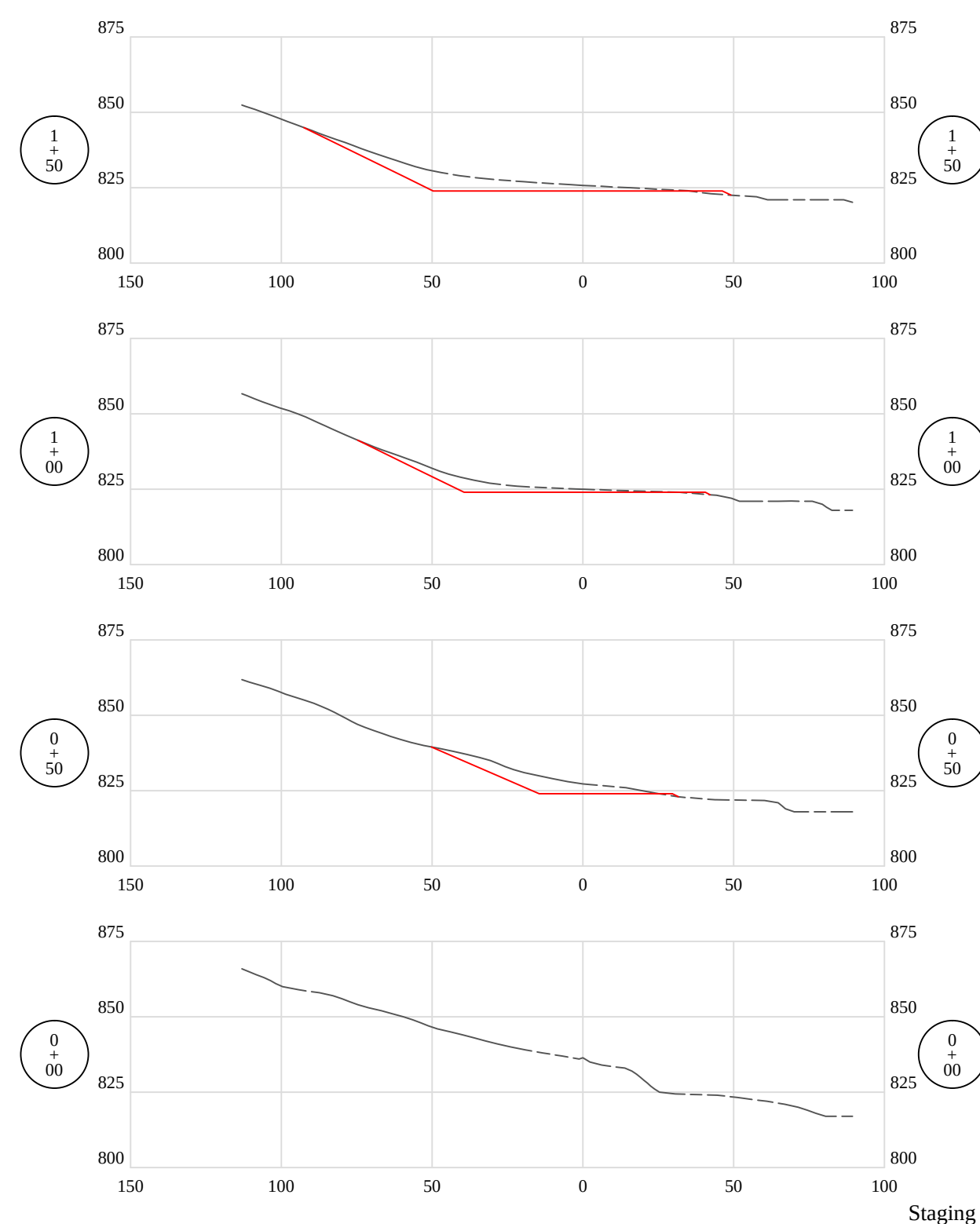
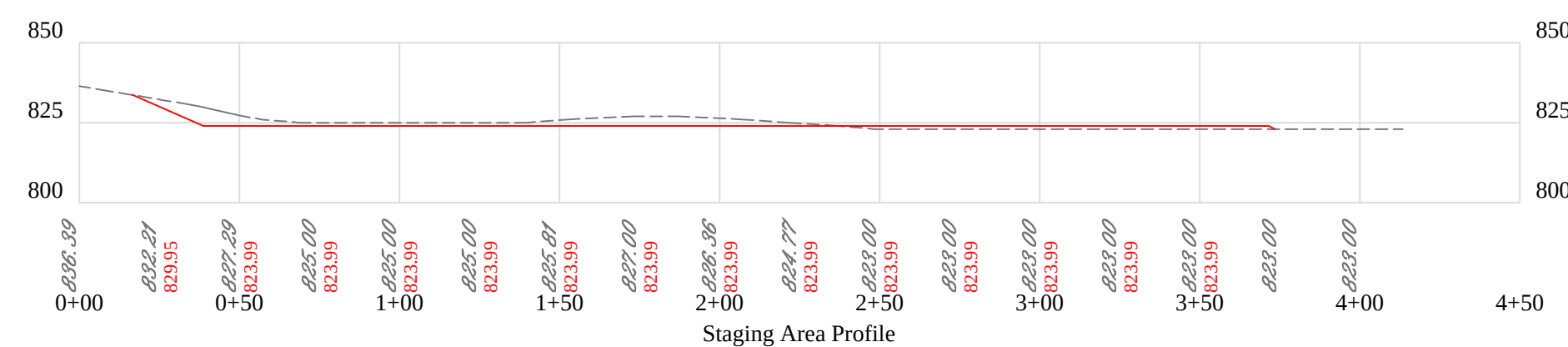
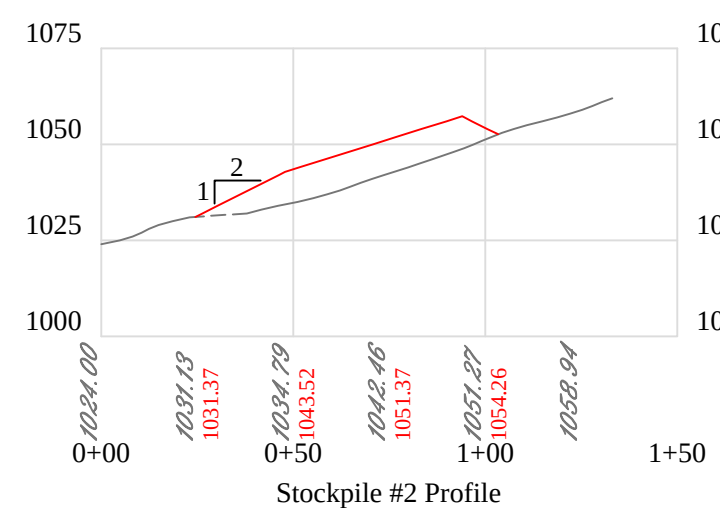
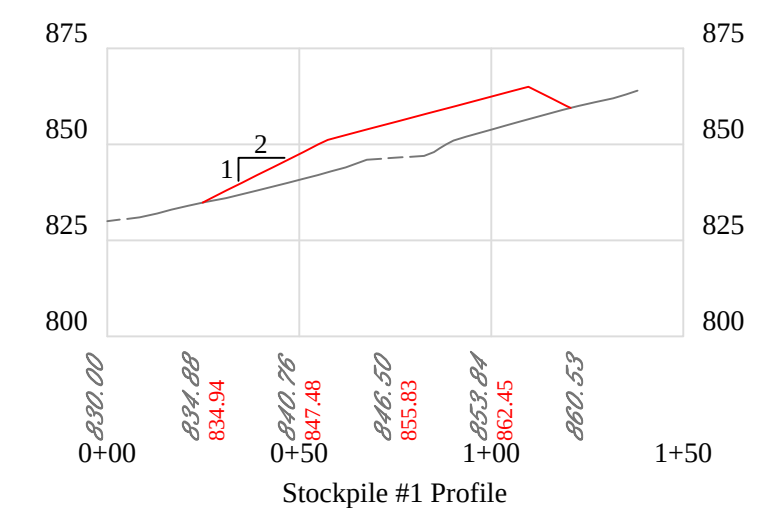
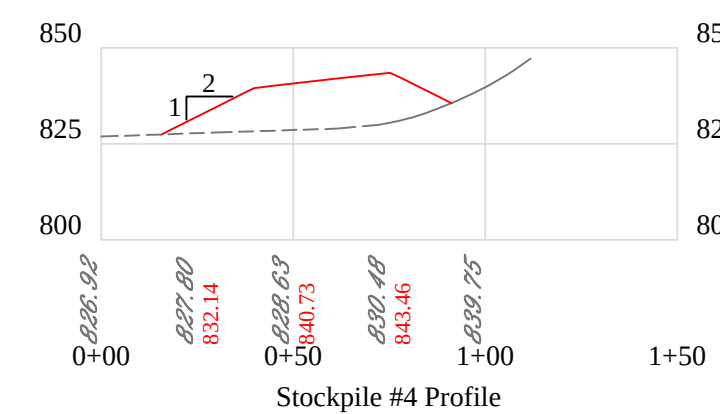
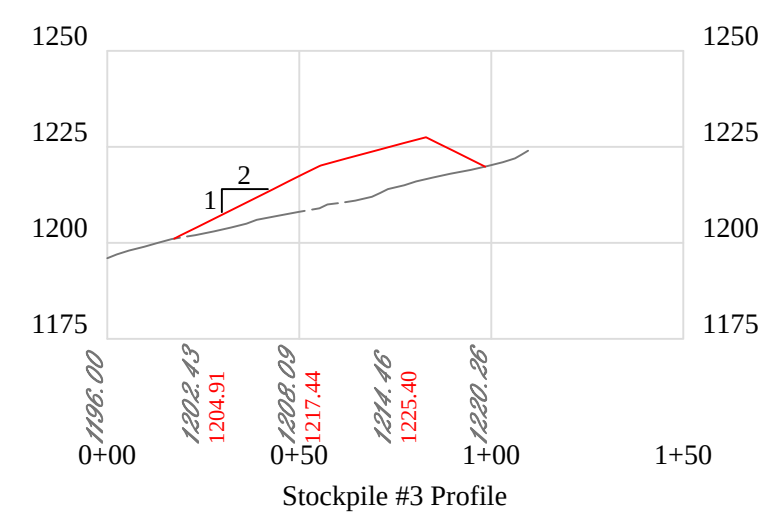
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Cross Sections - Access Road

1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 28 of 32



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Modification
3/14/2025

1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification

Date	Revision
02-04-2025	Design

Date 02-04-2025

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Cross Sections - Staging Area
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 29 of 32

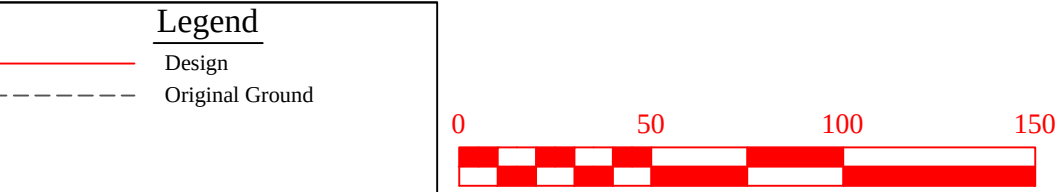
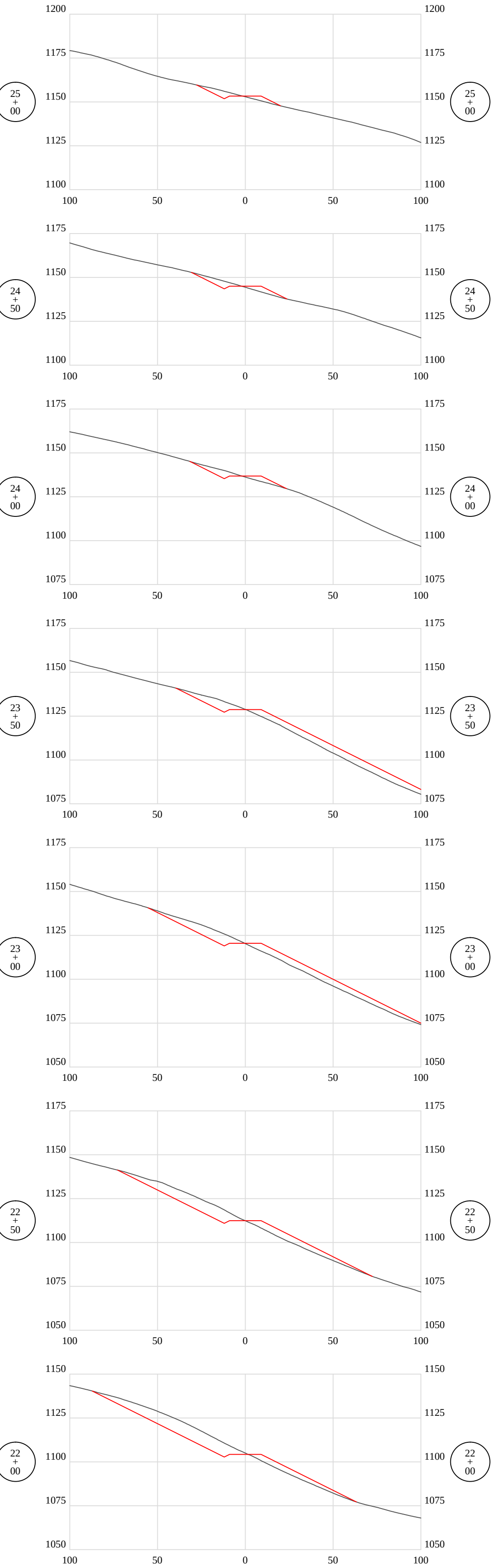
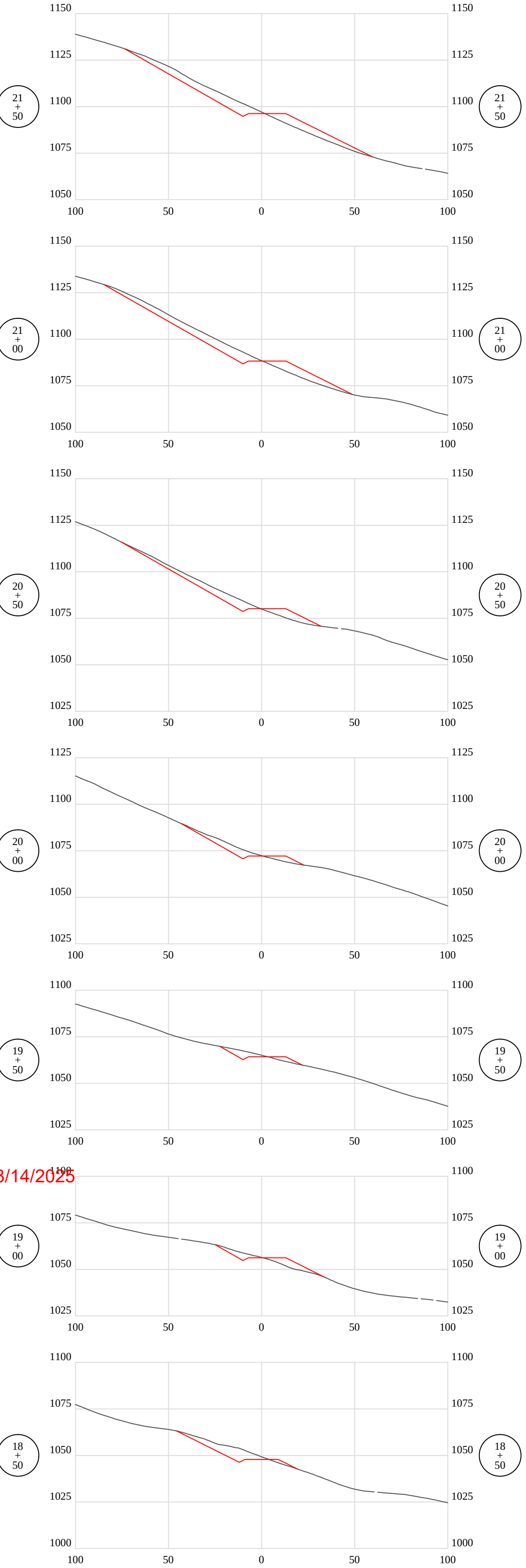
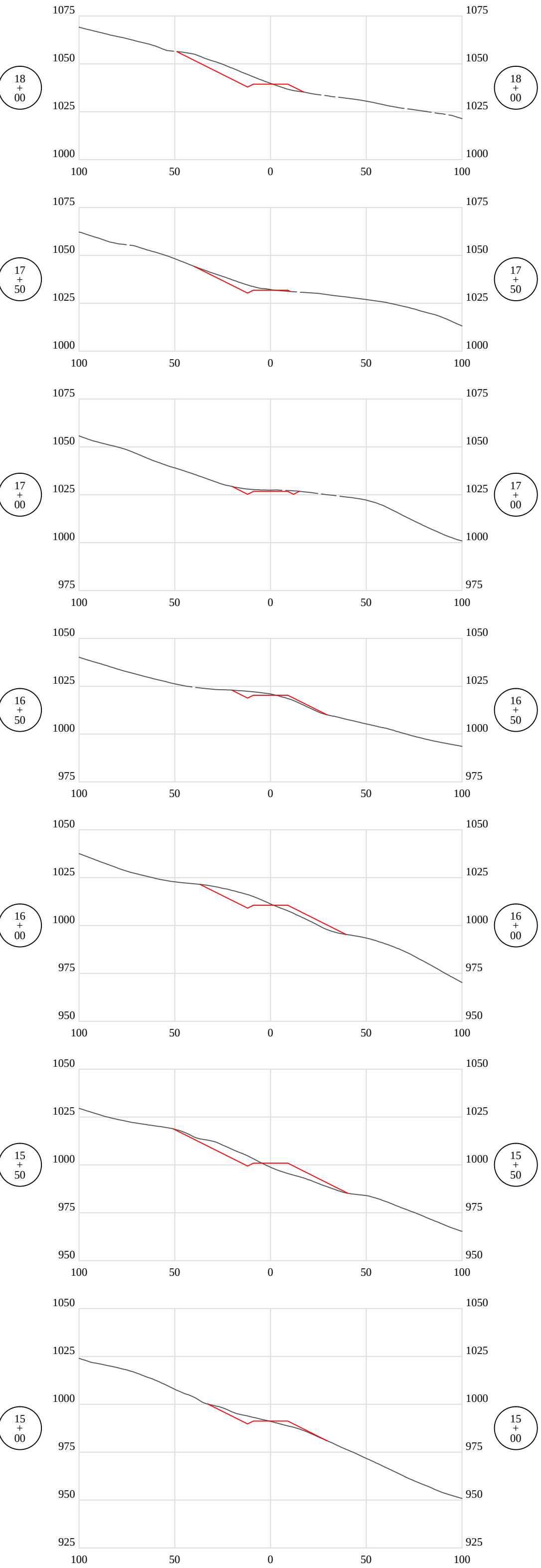
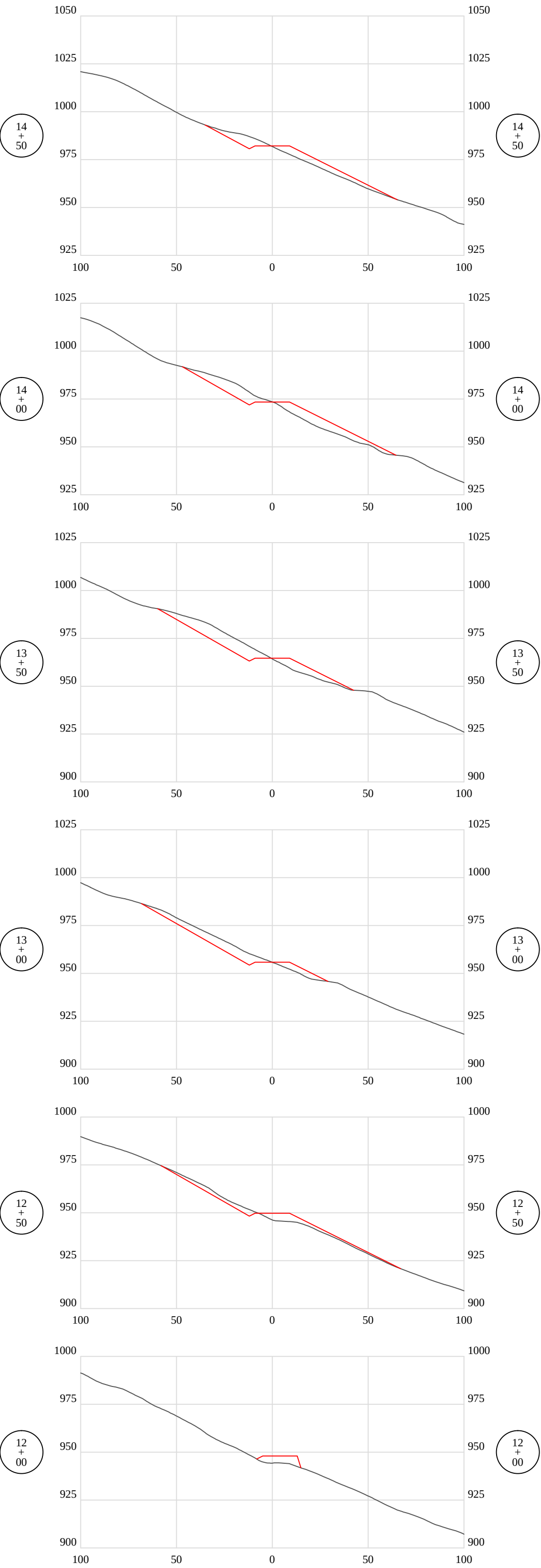
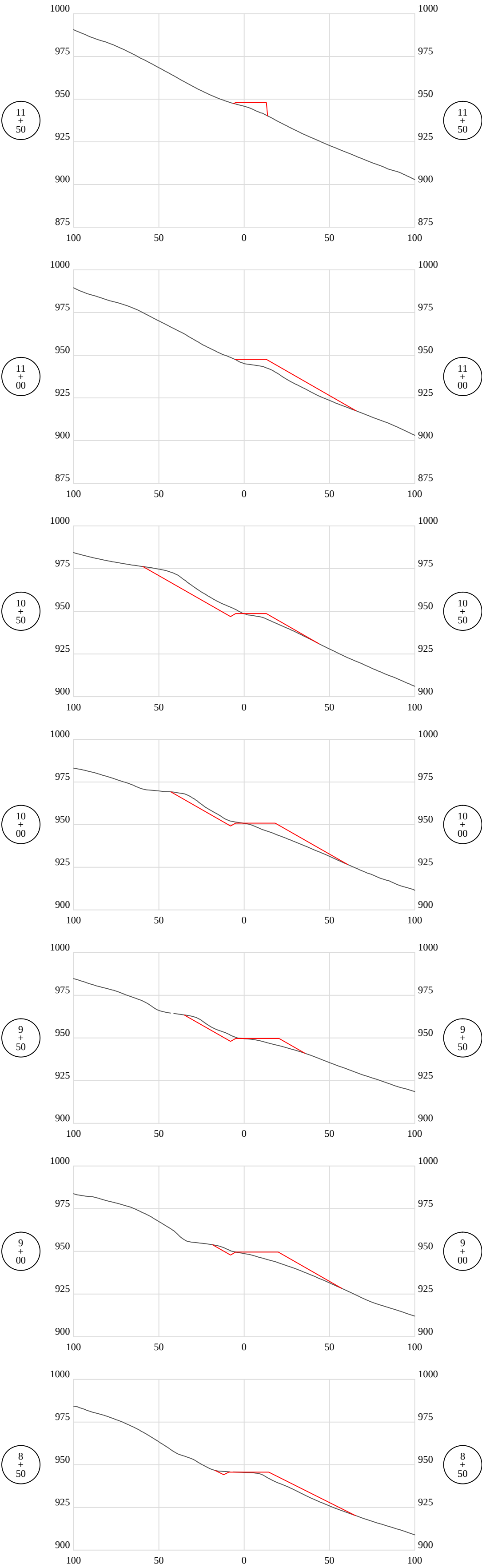


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Modification
3/14/2025

1221 Well Site Fink Creek Access

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Exhibit A: As-Built Modification



Date	Revision
02-04-2025	Design



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Cross Sections - Bypass Access Road
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 30 of 32

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WVDEP OOG
Modification
3/14/2025

1221 Well Site Fink Creek Access

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Exhibit A: As-Built Modification

Revision
Design

Date
02-04-2025

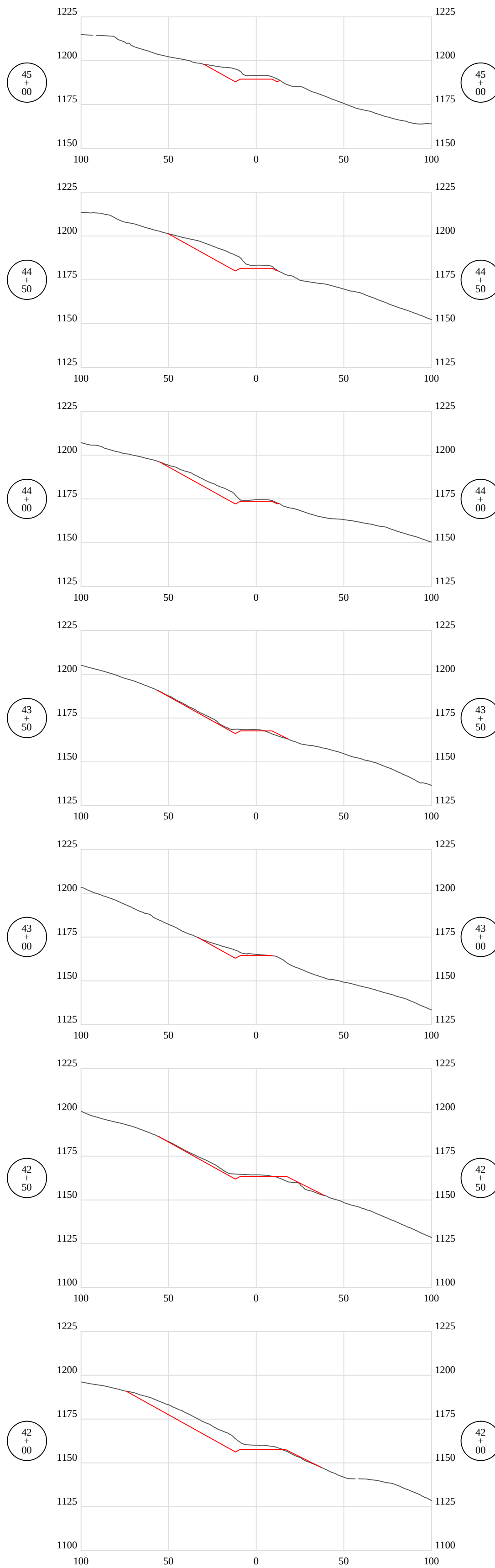
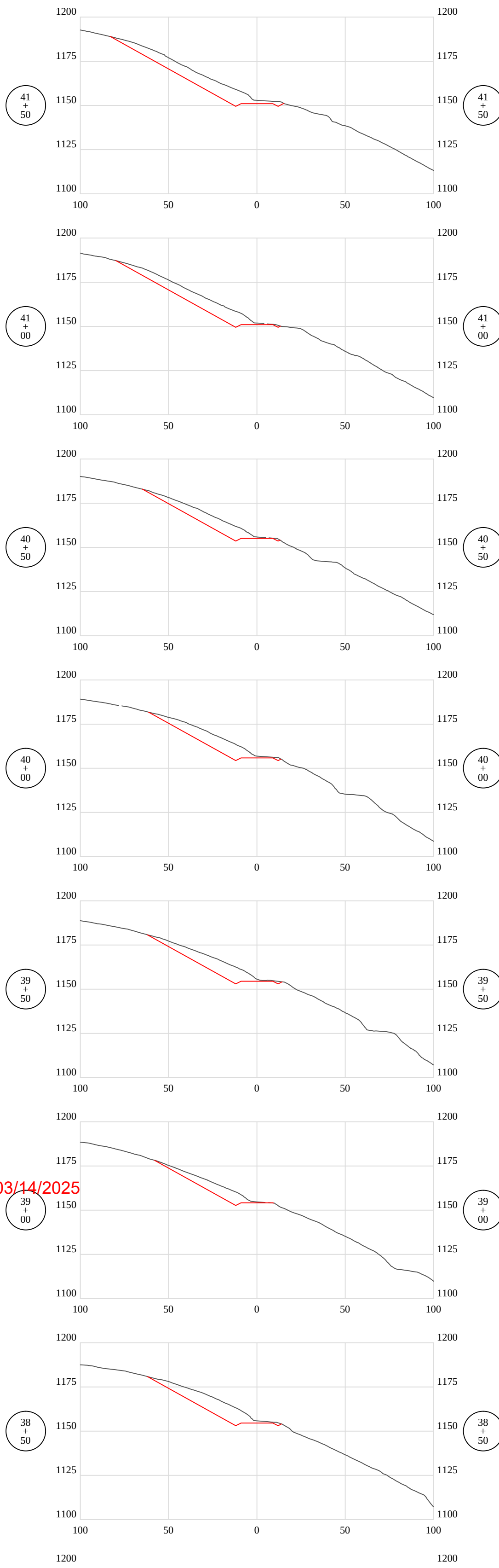
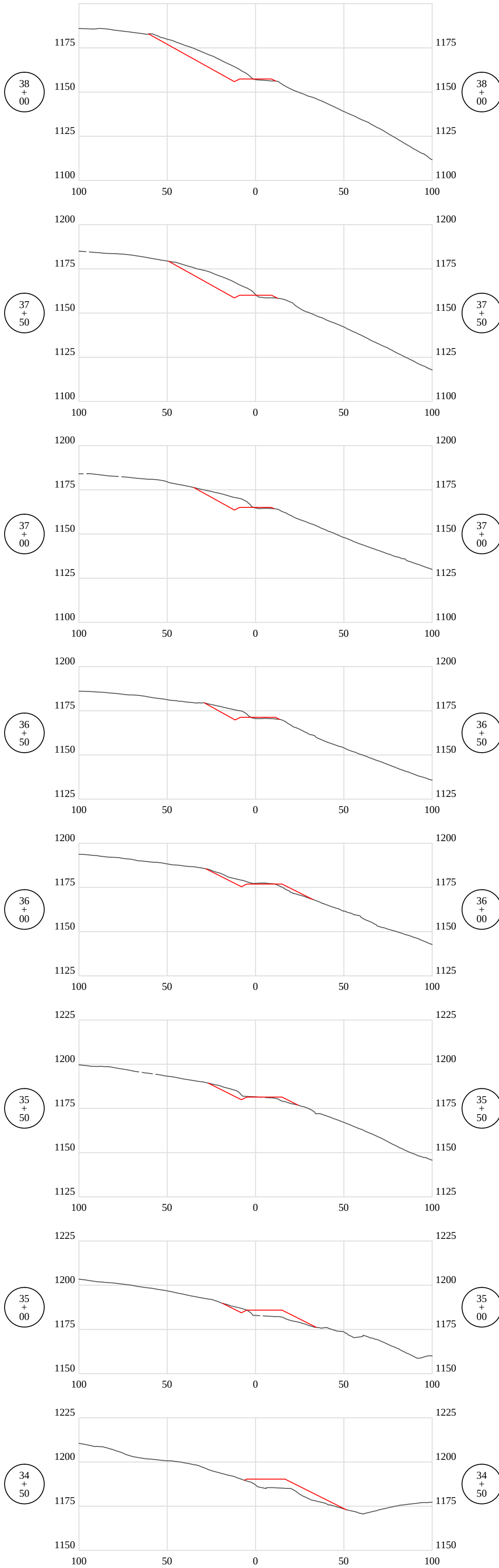
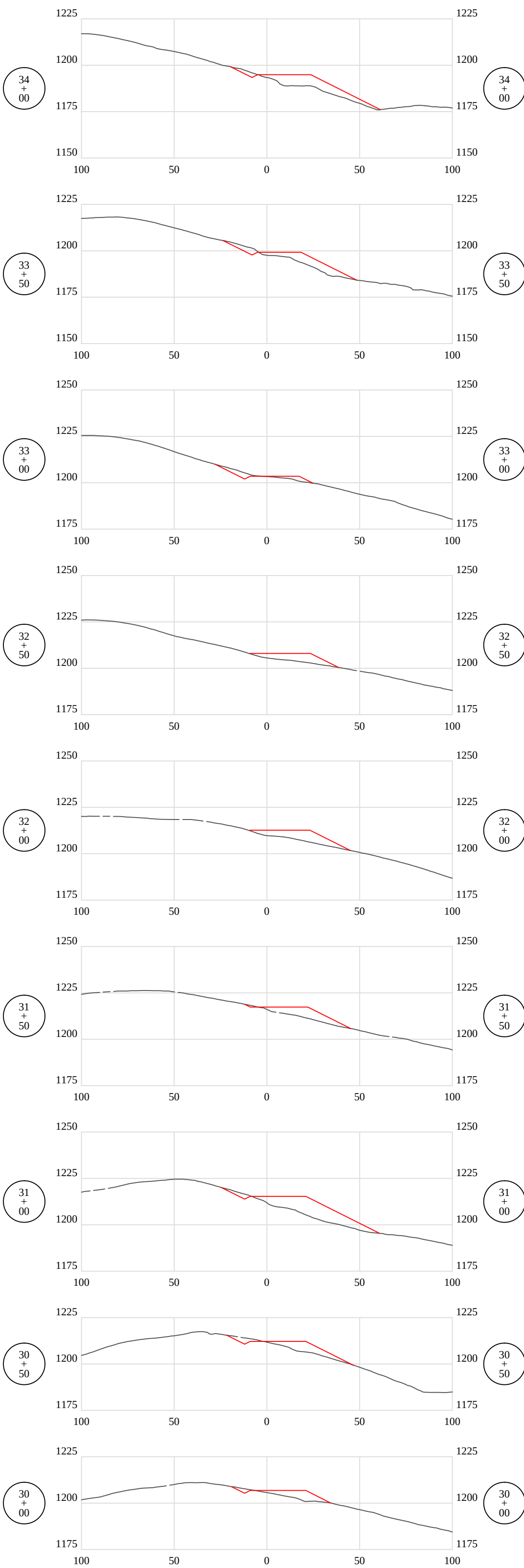
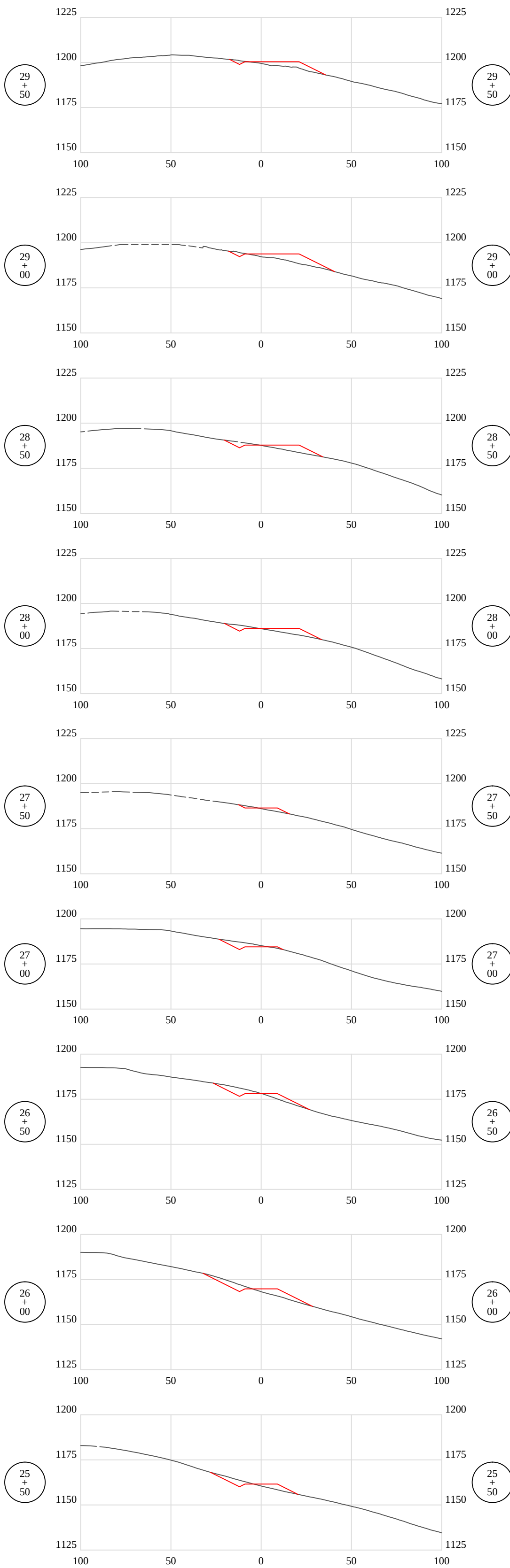


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Cross Sections - Bypass Access Road
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 31 of 32



Legend
Design
Original Ground

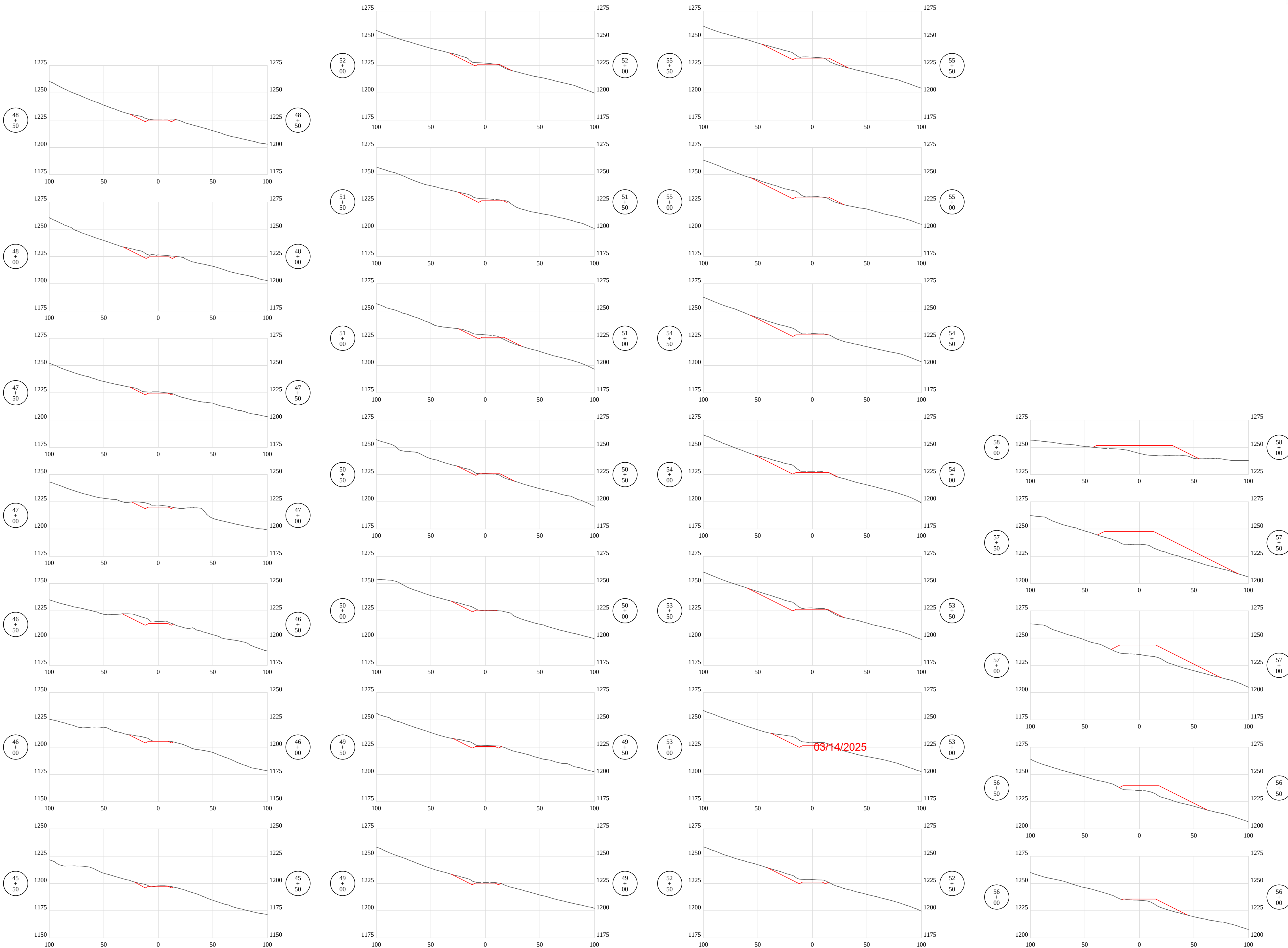


1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification

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WVDEP OOG
Modification
3/14/2025



Legend
Design
Original Ground

Date	Revision
02-04-2025	Design

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Cross Sections - Bypass Access Road
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet 32 of 32



Wrapped Stone "Burrito" Drain Notes:
If at any point there needs to be a splice and/or overlap of the Non-woven Geotextile Fabric, a minimum of 24" overlap shall be provided to each side of the splice and /or overlap to allow for potential movement of the fabric.

Engineered Fill Note:
The depicted toe key, bonding bench, and drainage system shall be utilized for the full length of all fill areas exceeding four feet (4') in height. The drainage blanket(s) shall be graded to drain to a core drain. At the engineer's discretion, a minimal amount of fill may be installed prior to drainage blanket installation to allow proper drainage of the toe key and/or bonding bench.

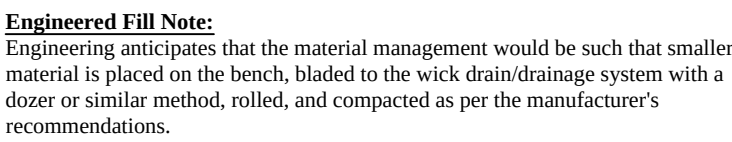
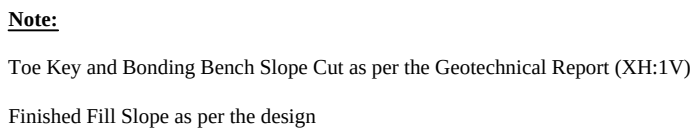
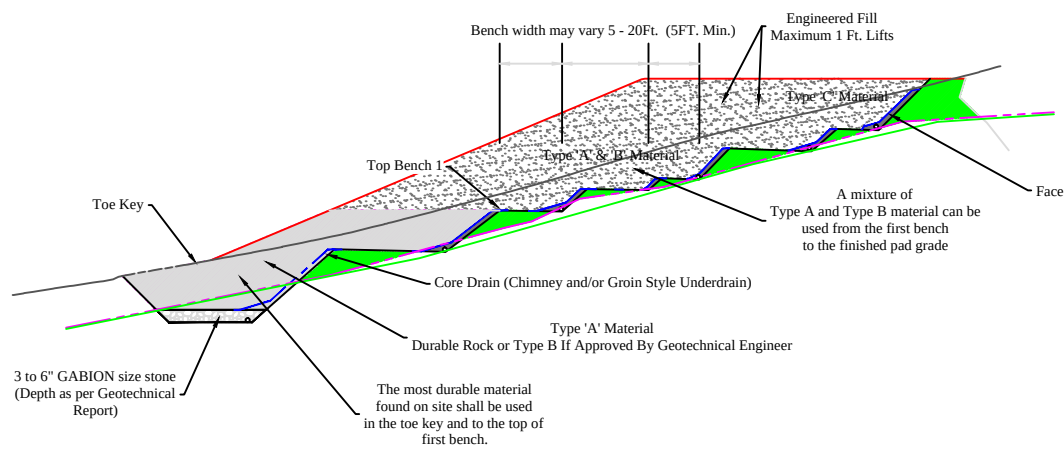


Figure 1 illustrates the dimensions and components of the gabion structure. The top diagram shows a 3D perspective view of an L-shaped structure with dimensions 6' (length), 3' (width), and 2' (height). The bottom diagram shows a cross-section of the structure, indicating the 'Geotextile Fabric Overlapped at top of Core Drain' and 'Gabion Size Stone'.

G3 Typical Core Drain Detail



G4 Typical Engineered Fill Detail



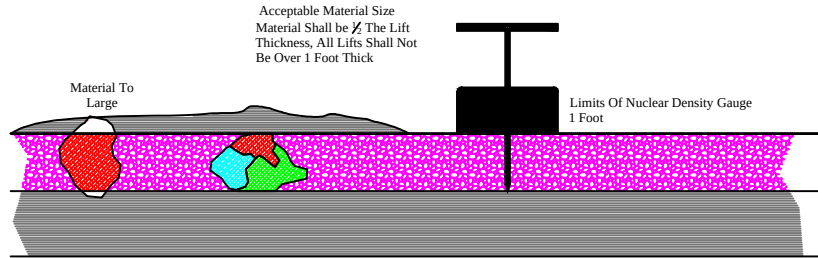
Material Management Details
Scale = NTS

It is the contractors responsibility to review all available information; make a site visit and contact the design engineer prior to starting the project.

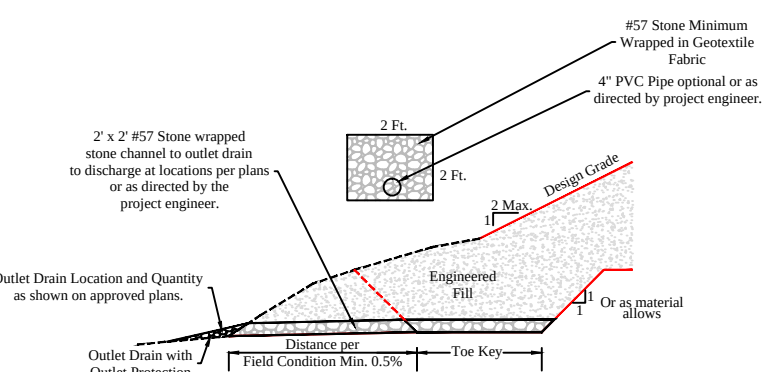
Material management will be strictly in accordance with the most durable material or rock available being used in the toe key construction and up to the first bench. The proctor used for testing in the toe key and up to the first bench will be for the material available on site classified as Type 'A' or a more durable Type 'B', the project may require an import material to meet the project specifications.

At no time shall the contractor excavate the toe key and replace with the same material unless it is durable rock or approved by the design engineer or geotechnical engineer.

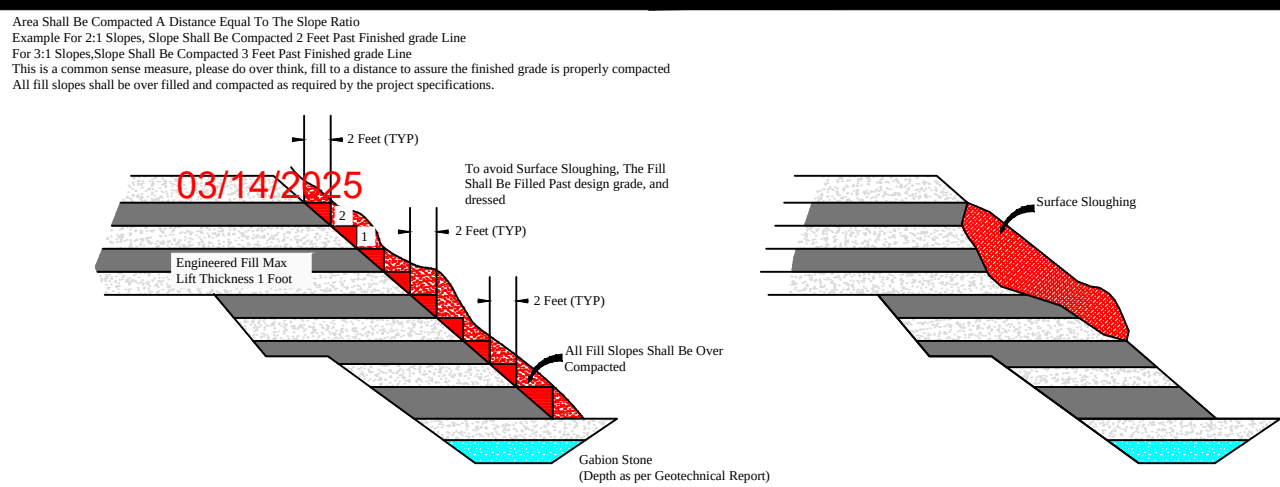
G5 Material Management Detail
Scale: NTS



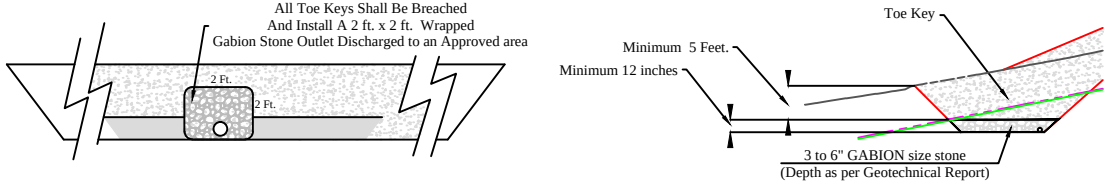
G9 Compaction Testing Detail



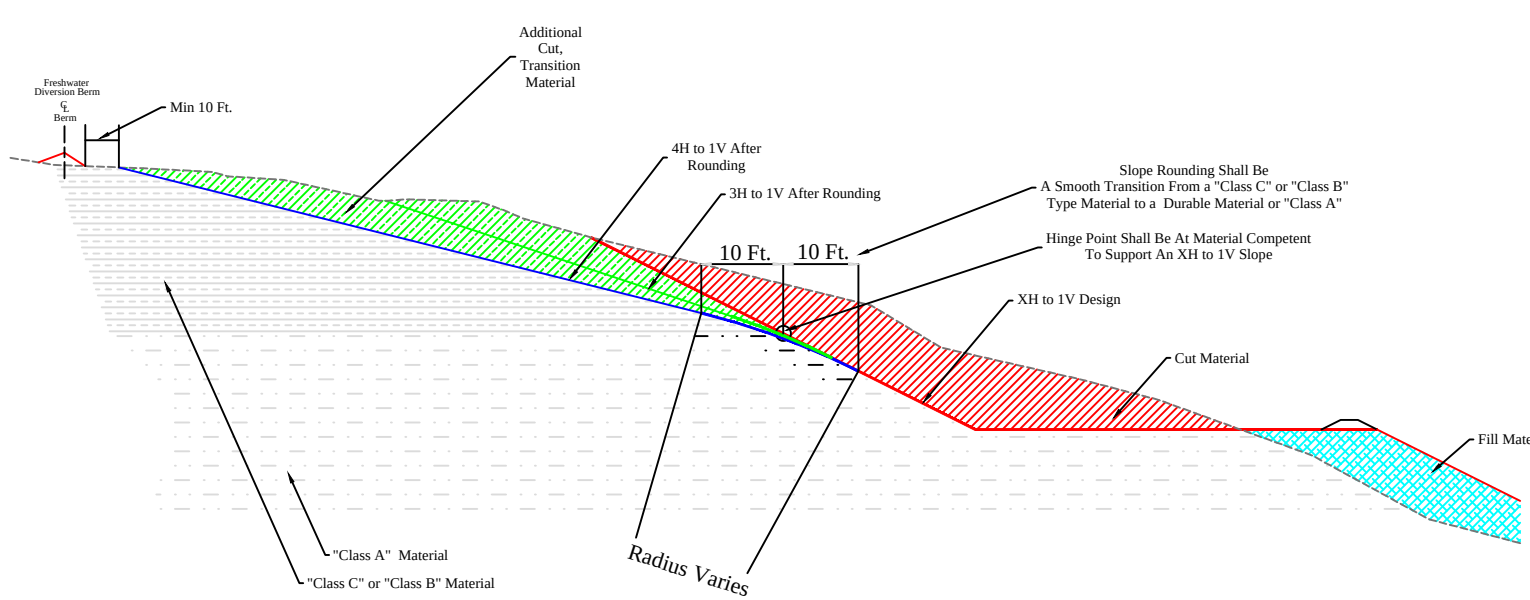
G11 Minimum Toe Key Outlet Drain Detail



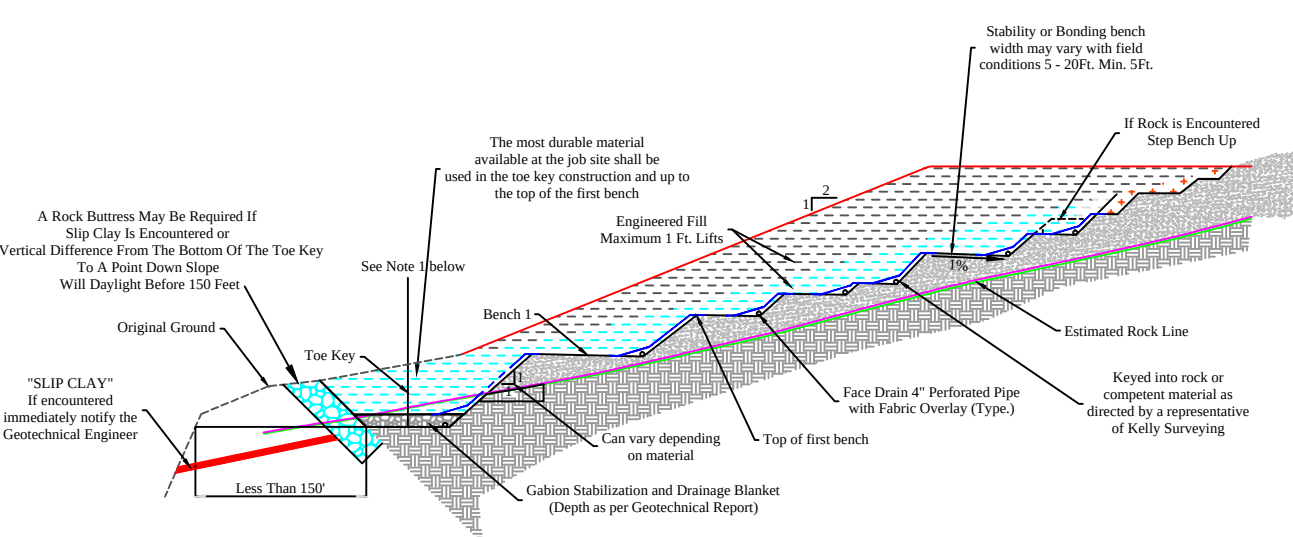
G8 Fill Slope Over-Compaction Detail



G10 Minimum Typical Toe Key Detail
Scale: NTS



G7 Unstable Slope Management: Slope Rounding



G6 Typical Fill Section at Maximum Fill Height

1. Design slope intersect with ground line. The toe key width is centered about this point.
2. Extend this point to the bottom of the toe key. This will be the contour of the toe key.
3. Construct toe key drain(s) (see Toe Key Outlet Drain Detail)
4. Approved fill materials (including rock) shall be placed in lifts of maximum loose depth of 12 inches. The material shall be compacted to at least 95% of the maximum dry density at a moisture content within +/3% of the optimum moisture as determined by ASTM D698.
5. Grade outer top of the toe key to allow for positive drainage and blend to original ground begin engineered fill.



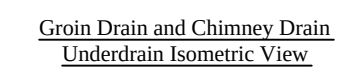
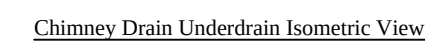
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Typical Geotechnical Details
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet G1 of G2

Exhibit A: As-Built Modification



Scale: NTS



Notes:

The Toe Key outlets can be field adjusted depending on the material horizon. The toe key outlet locations are conceptual as shown on the plan with the intent of providing a location that shall guarantee positive drainage away from the Toe Key without impacting environmental or similar resources.

Fill to be Class A Material at 98% Compaction of
ASTM D 698 or as approved by the site
Geotechnical Engineer



Scale: NTS



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Typical Geotechnical Details

1221 Well Site

Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet G2 of G2

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Modification
3/14/2025

1221 Well Site Fink Creek Access

HG Energy LLC

Exhibit A: As-Built Modification



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WVDEP OOG
Modification
3/14/2025

Revision
Design

Date
02-04-2025

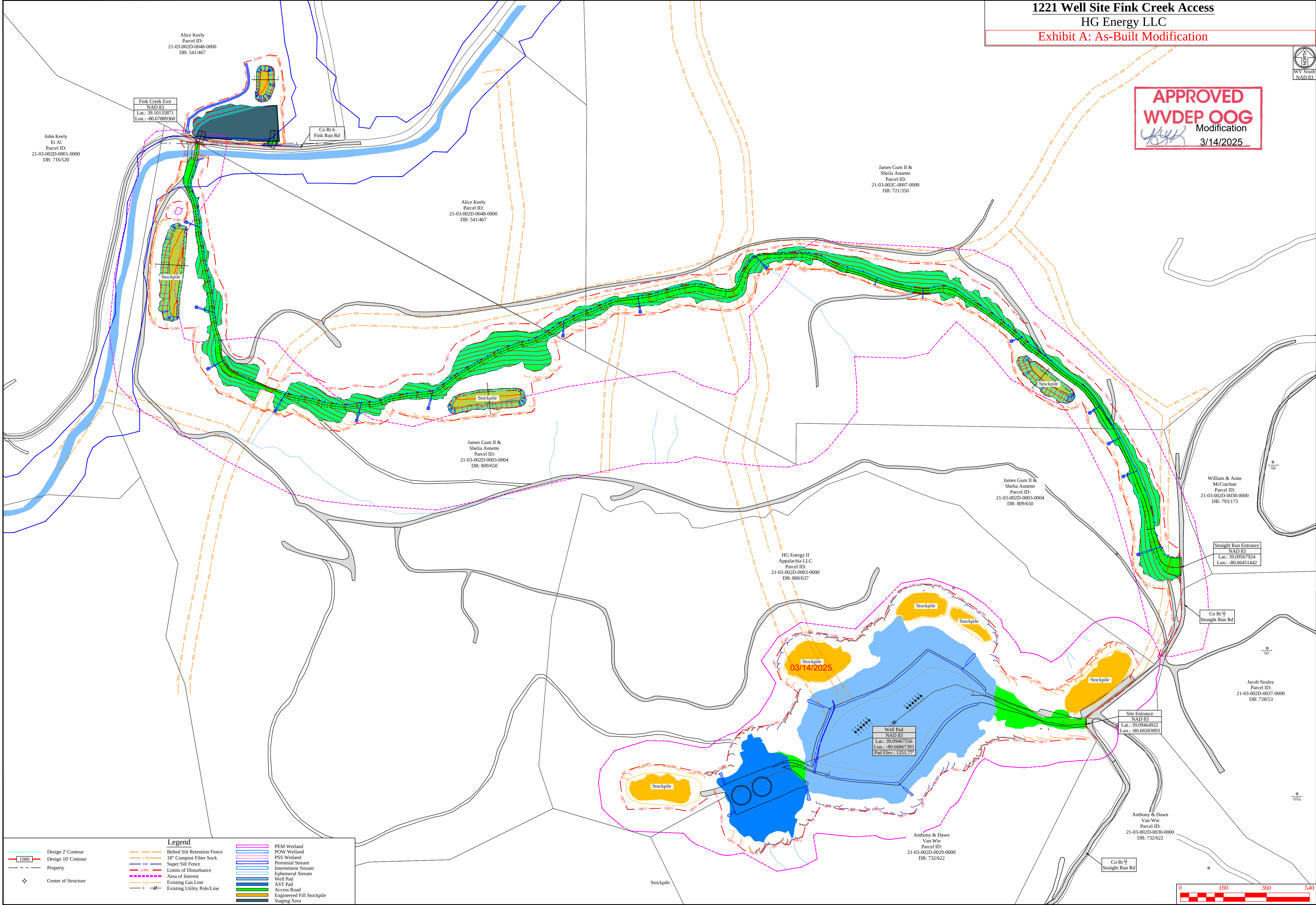
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Landowner Exhibit

1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet L1 of L1



Legend

- Design 2' Contour
- Design 10' Contour
- Property
- Center of Structure
- Belts Silt Retention Fence
- 18" Compust Filter Sock
- Super Silt Fence
- Limits of Disturbance
- Area of Interest
- Existing Gas Line
- Existing Utility Pole/Line
- PEM Wetland
- PDW Wetland
- PSS Wetland
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Well Pad
- AST Pad
- Access Road
- Engineered Fill Stockpile
- Staging Area

Exhibit A: As-Built Modification

Modification
3/14/2025



DB: 809/650

21-03-002D-0003-0000
DB: 800/637

course B
course C

Parcel ID:
1-03-002D-0003-0000
DB: 800/637

21-03-002D-0030-000
DB: 732/622

DB: 732/622

The Contractor shall re-spread a minimum of 4" of topsoil over all disturbed areas and slopes prior to seeding and mulching or erosion control blanket installation.

All BMP's shall be inspected after every major storm event. All debris and sediment affecting the proper function of the BMP's shall be removed so not to have an impact in the future. All vegetated areas of the BMP's and surrounding drainage area shall be reseeded and stabilized when weather is conducive if erosion or disturbance impacts the area.

1. The contractor shall re-spread a minimum of 4" of topsoil over all disturbed areas and slopes prior to seeding and mulching or erosion control blanket installation. During site reclamation, all fill areas shall be compacted in maximum 24" lifts and compacted to 90% compaction per ASTM D-698.
2. Seed and mulch or install erosion control blankets on all disturbed areas. Keep all erosion and sedimentation controls in place until there is 70% growth over the entire site.
3. All non-essential structures, tanks, etc. shall be removed from the site.

pH of Soil	Lime in Tons per Acre	Fertilizer, Lbs Per Acre 10-20-20 or Equivalent
Above 6.0	2.00	500.00
5.0 to 6.0	3.00	500.00
Below 5.0	4.00	500.00

laboratory. When 4 tons of lime per acre are applied it must be incorporated into the soil by disking, backblading, or tracking up and down the slope.



Revision

Design

Date 02-04-2025

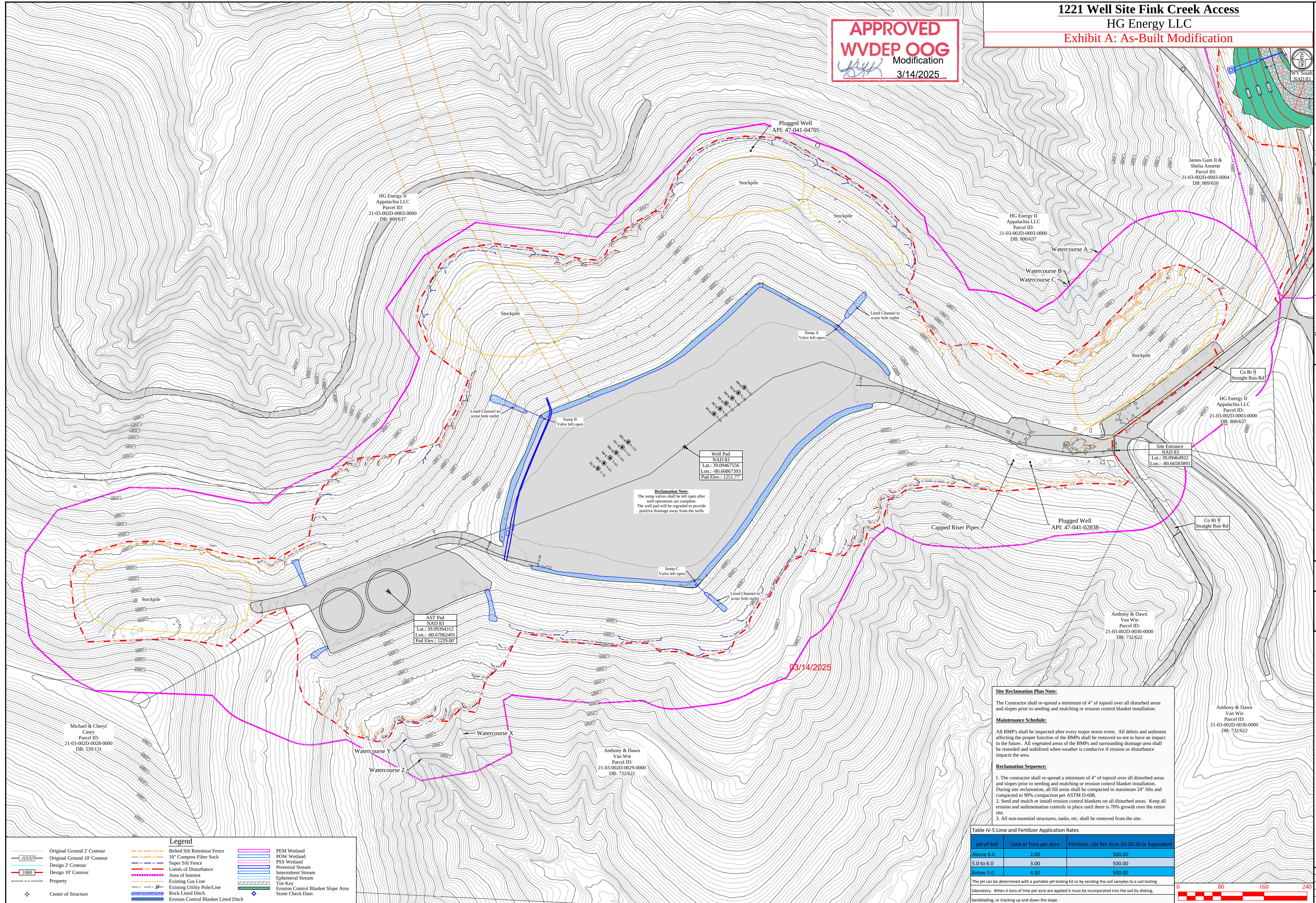


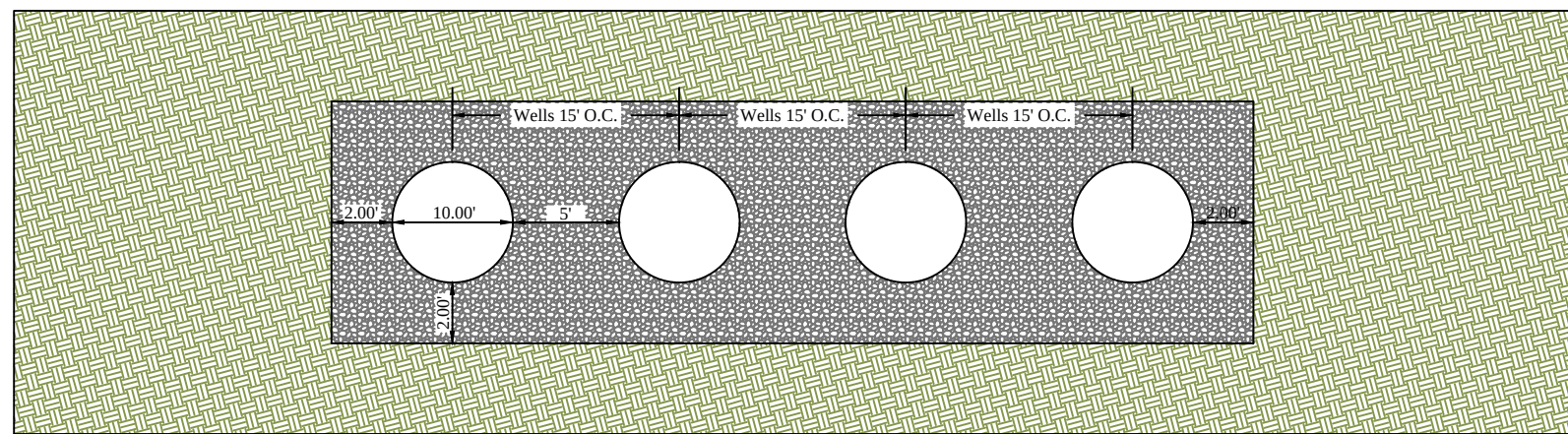
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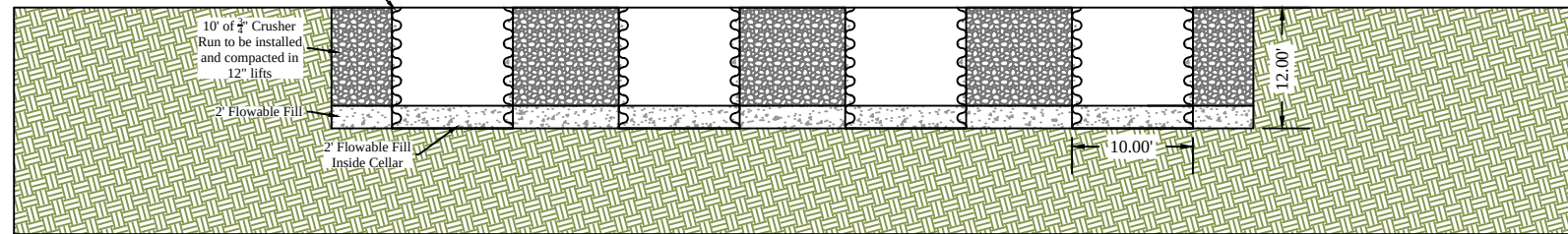
Site Reclamation Plan
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet S1 of S1





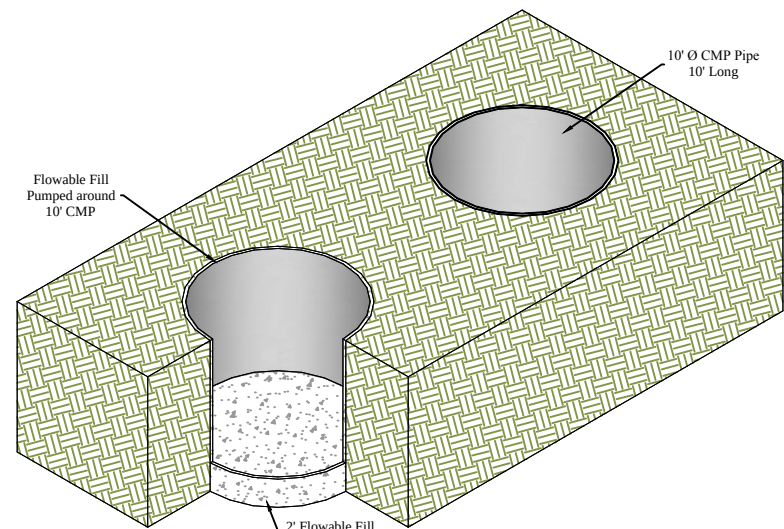
Trench Cellar Plan View



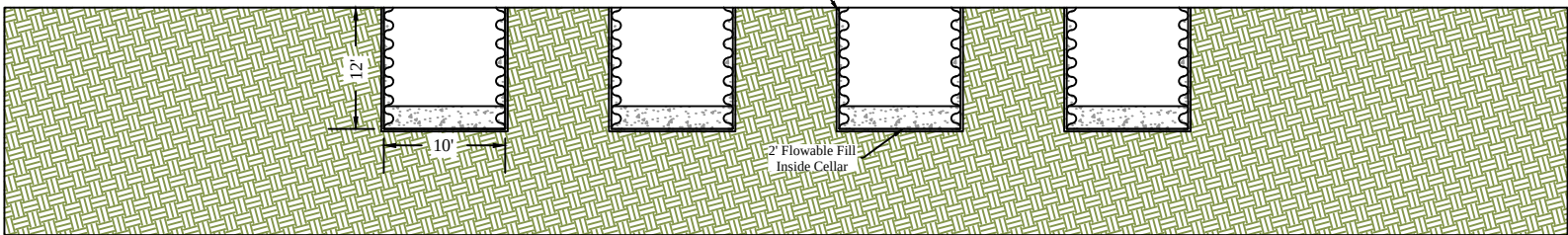
Trench Cellar Section View

M1 Typical Trenched Cellar Detail
Scale: NTS

Note:
All stone placed on the pad and around the cellars shall be compacted.



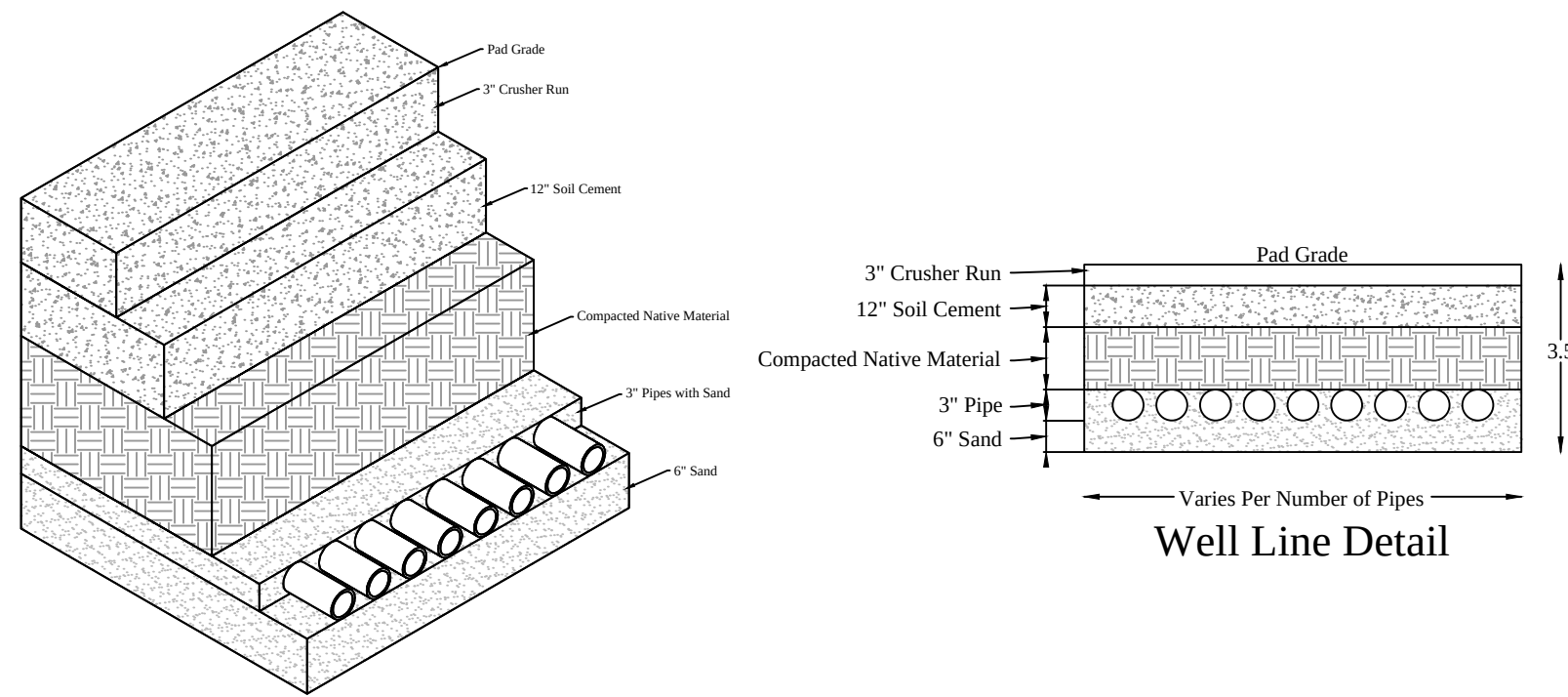
Auger Cellar Plan View



Auger Cellar Section View

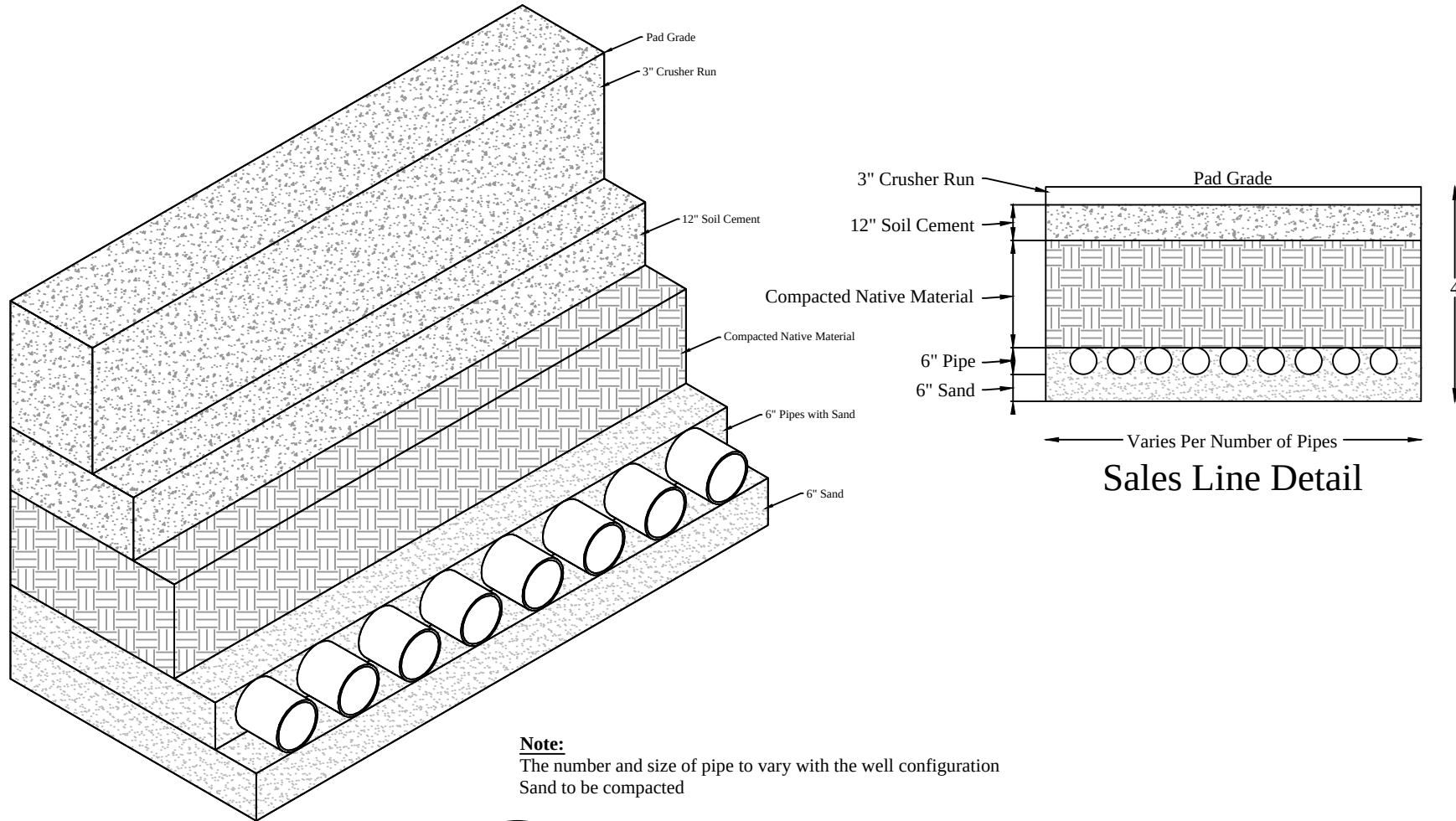
M2 Typical Augered Cellar Detail
Scale: NTS

Note:
All stone placed on the pad and around the cellars shall be compacted.



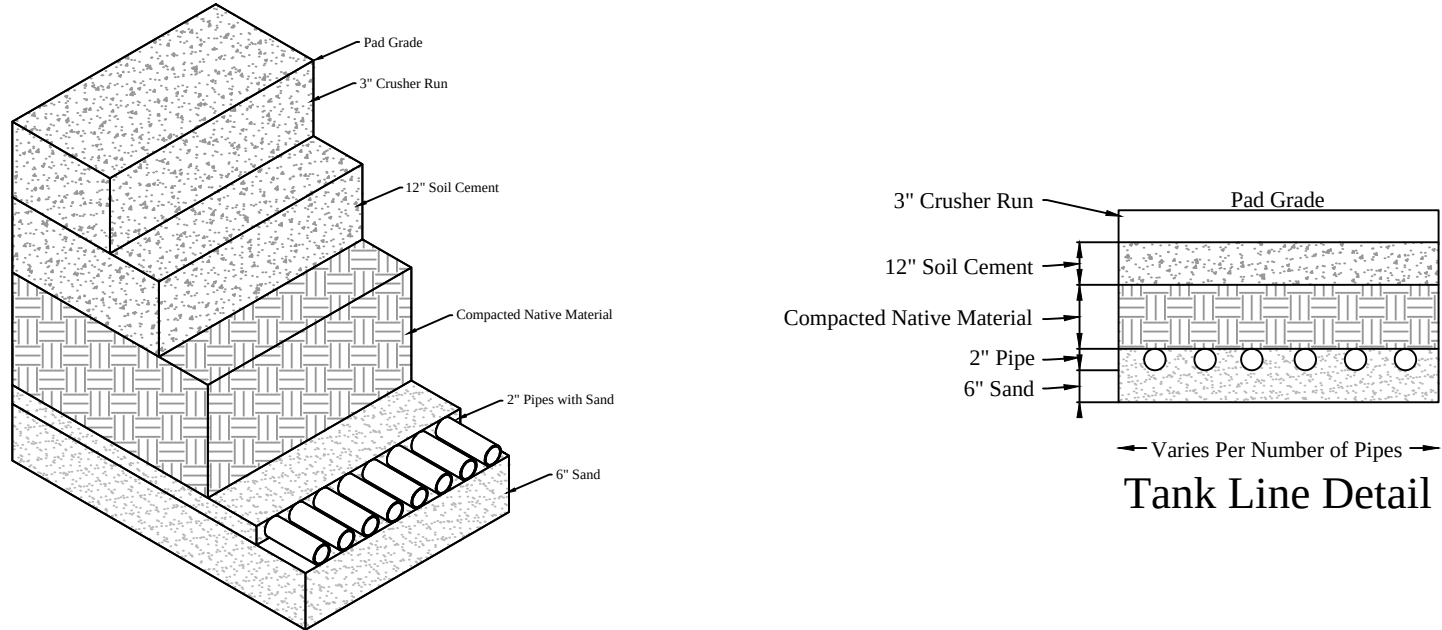
Note:
The number and size of pipe to vary with the well configuration
Sand to be compacted

M3 Typical Well Line Detail
Scale: NTS



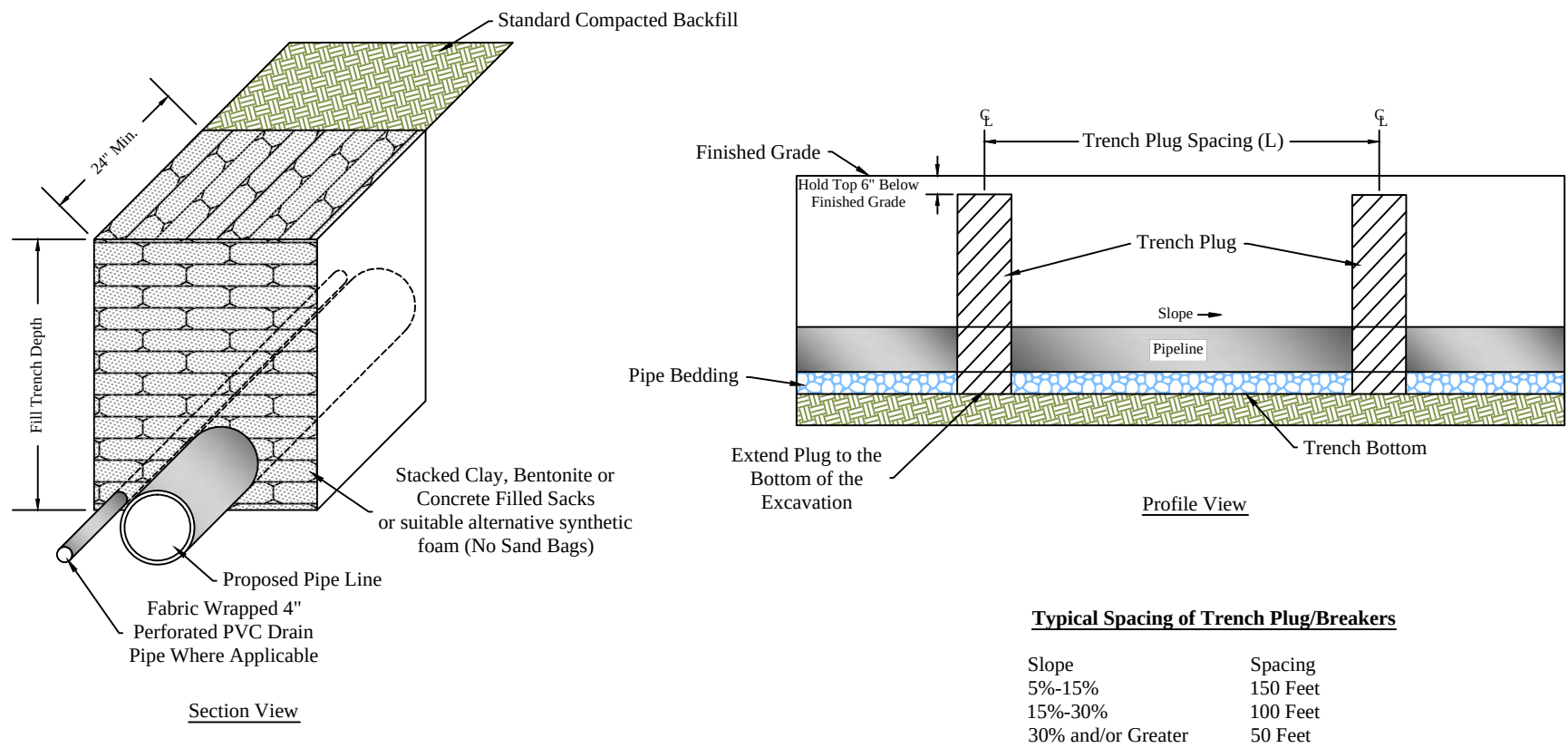
Note:
The number and size of pipe to vary with the well configuration
Sand to be compacted

M4 Typical Sales Line Detail
Scale: NTS



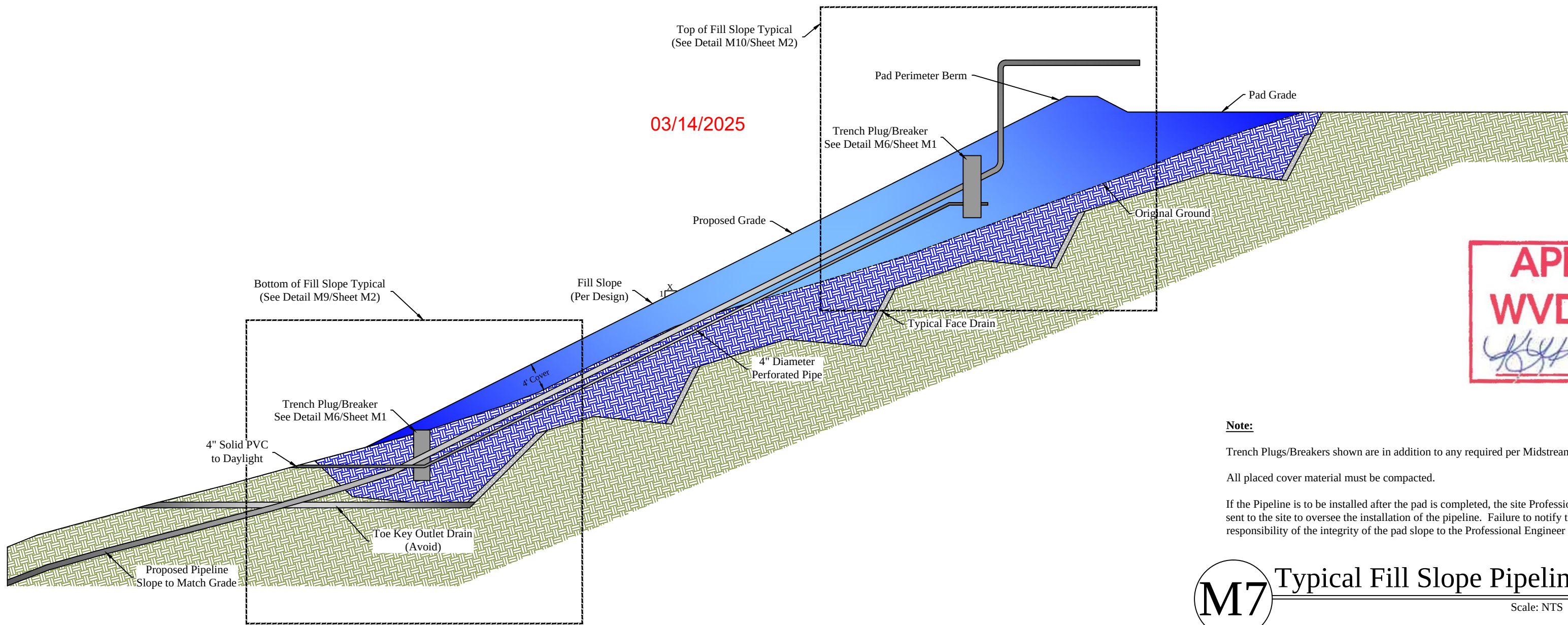
Note:
The number and size of pipe to vary with the well configuration
Sand to be compacted

M5 Typical Tank Line Detail
Scale: NTS



Typical Spacing of Trench Plug/Breakers	
Slope	Spacing
5%-15%	150 Feet
15%-30%	100 Feet
30% and/or Greater	50 Feet

M6 Typical Impervious Trench Plug/Breaker
Scale: NTS



Note:
Trench Plugs/Breakers shown are in addition to any required per Midstream Plans/Details for the Proposed Pipeline.
All placed cover material must be compacted.

If the Pipeline is to be installed after the pad is completed, the site Professional Engineer must be contacted and an inspector sent to the site to oversee the installation of the pipeline. Failure to notify the site Professional Engineer will transfer the responsibility of the integrity of the pad slope to the Professional Engineer who designed the pipeline.

M7 Typical Fill Slope Pipeline Installation Section
Scale: NTS

Revision
Design

Date
02-04-2025



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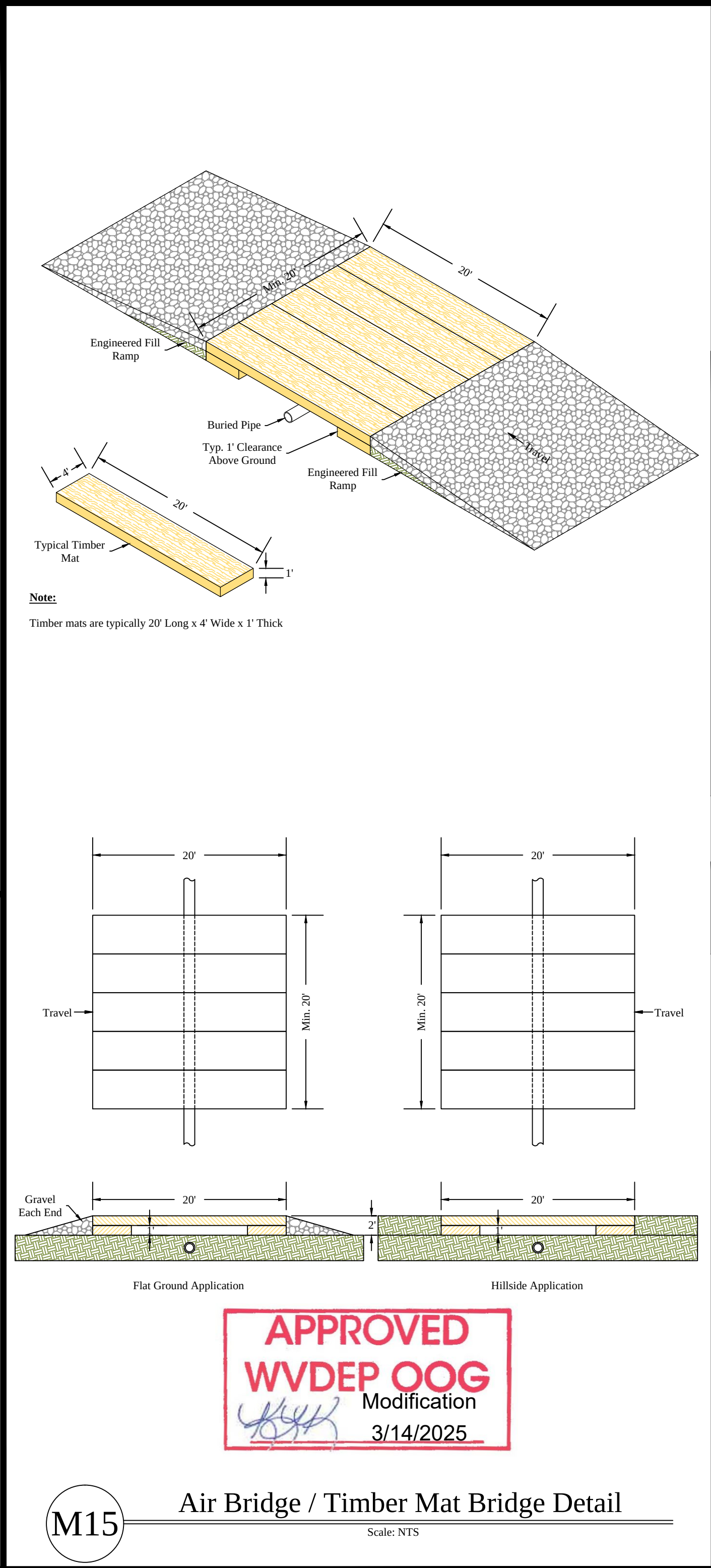
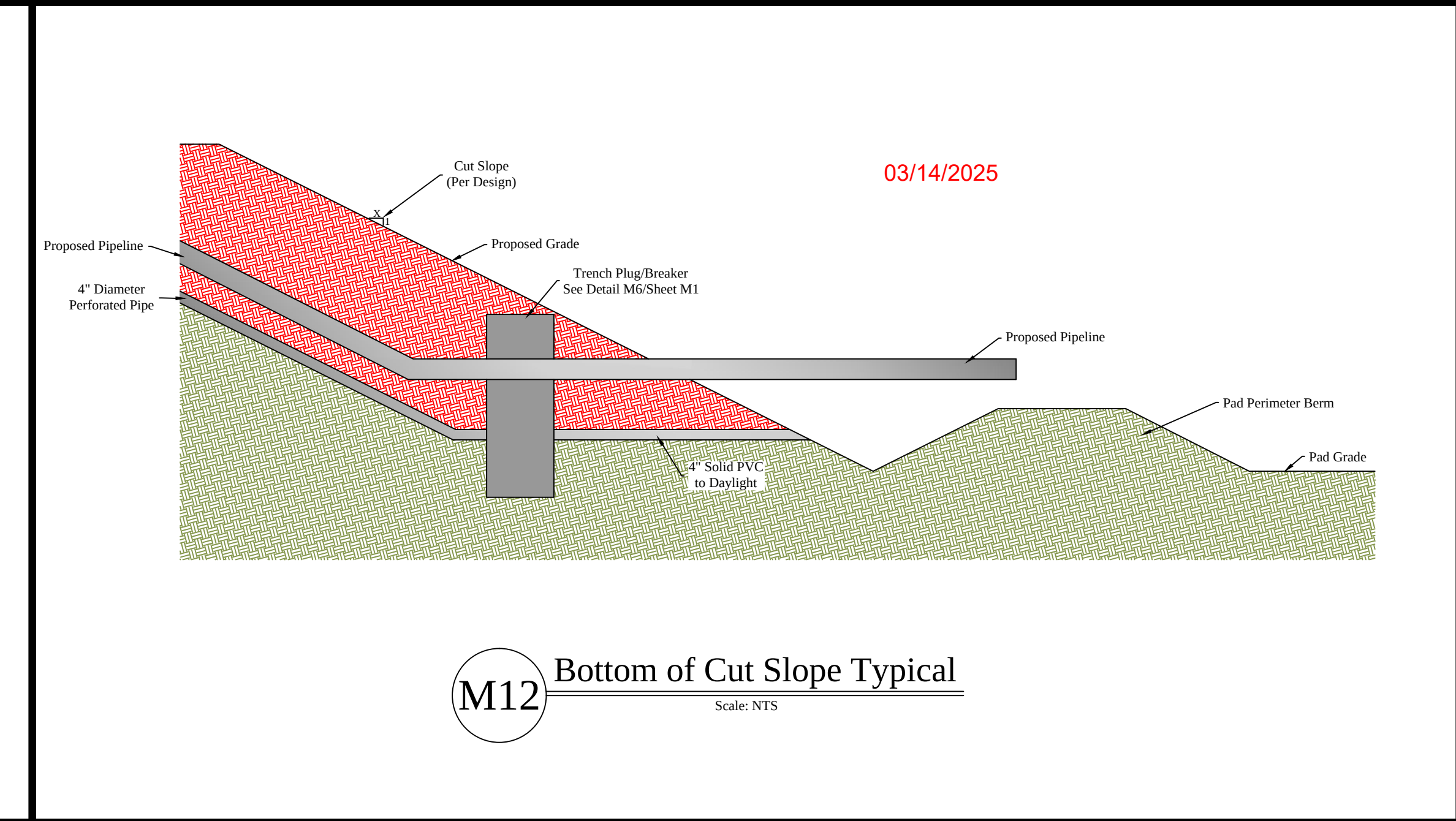
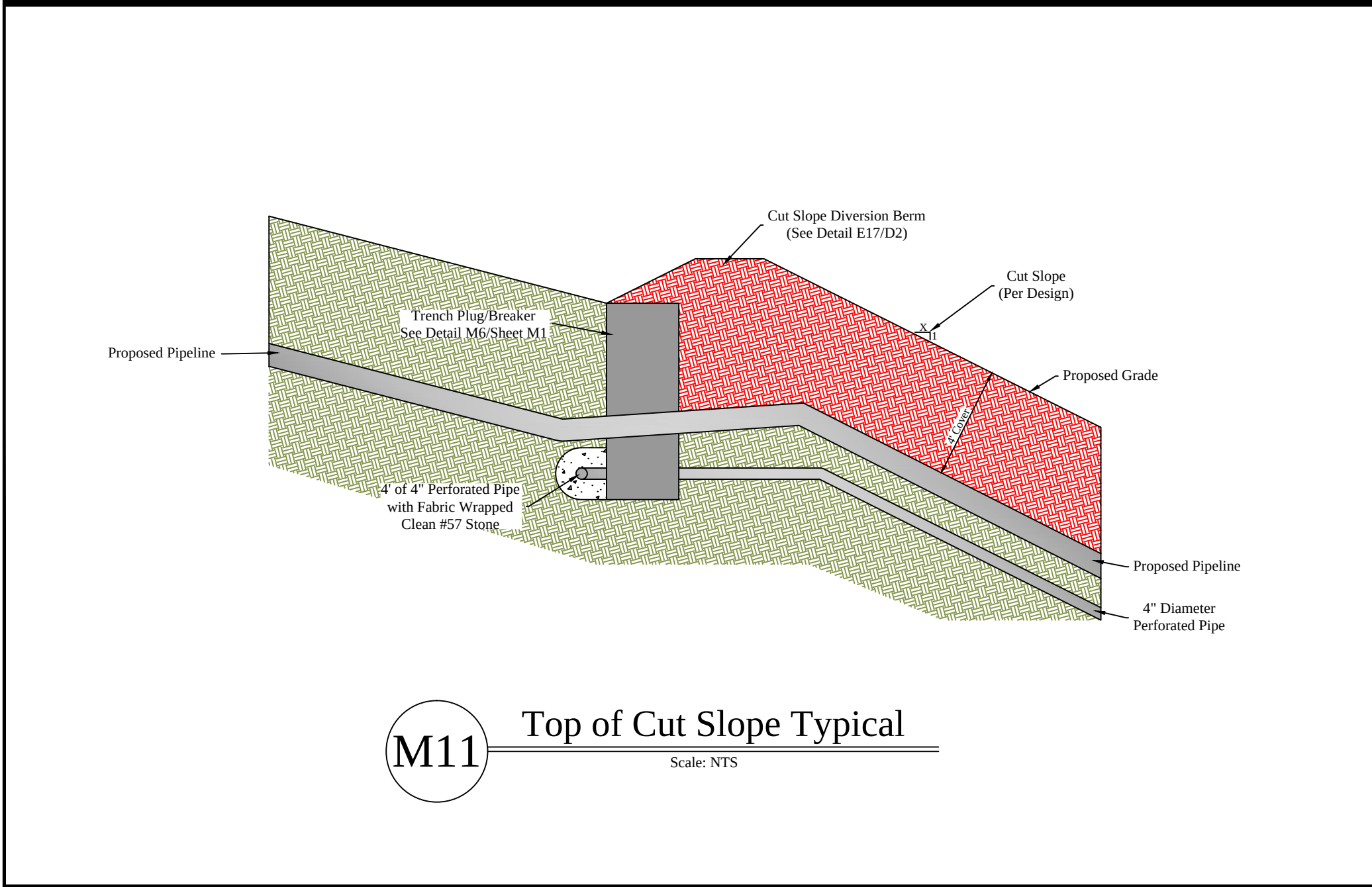
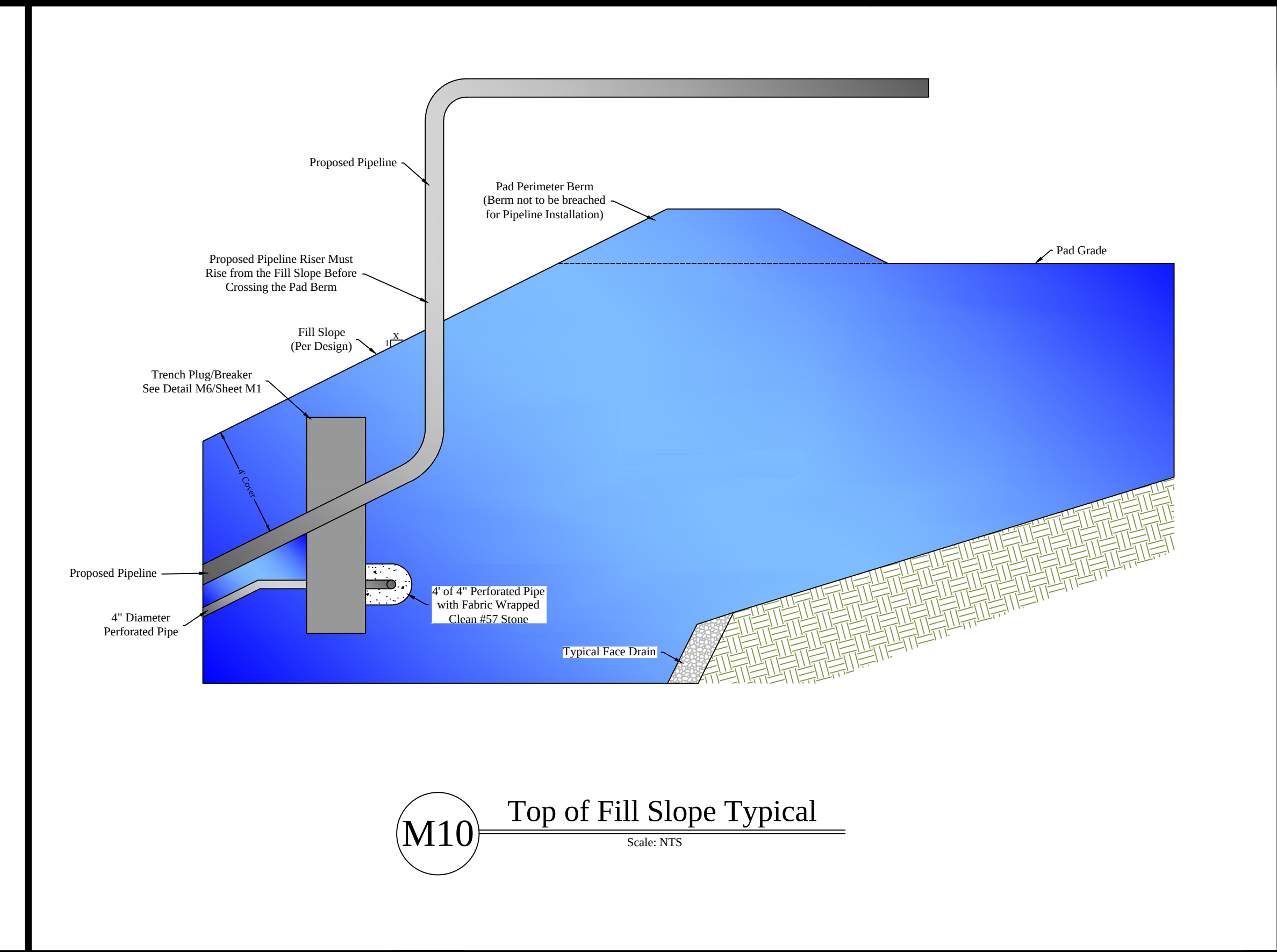
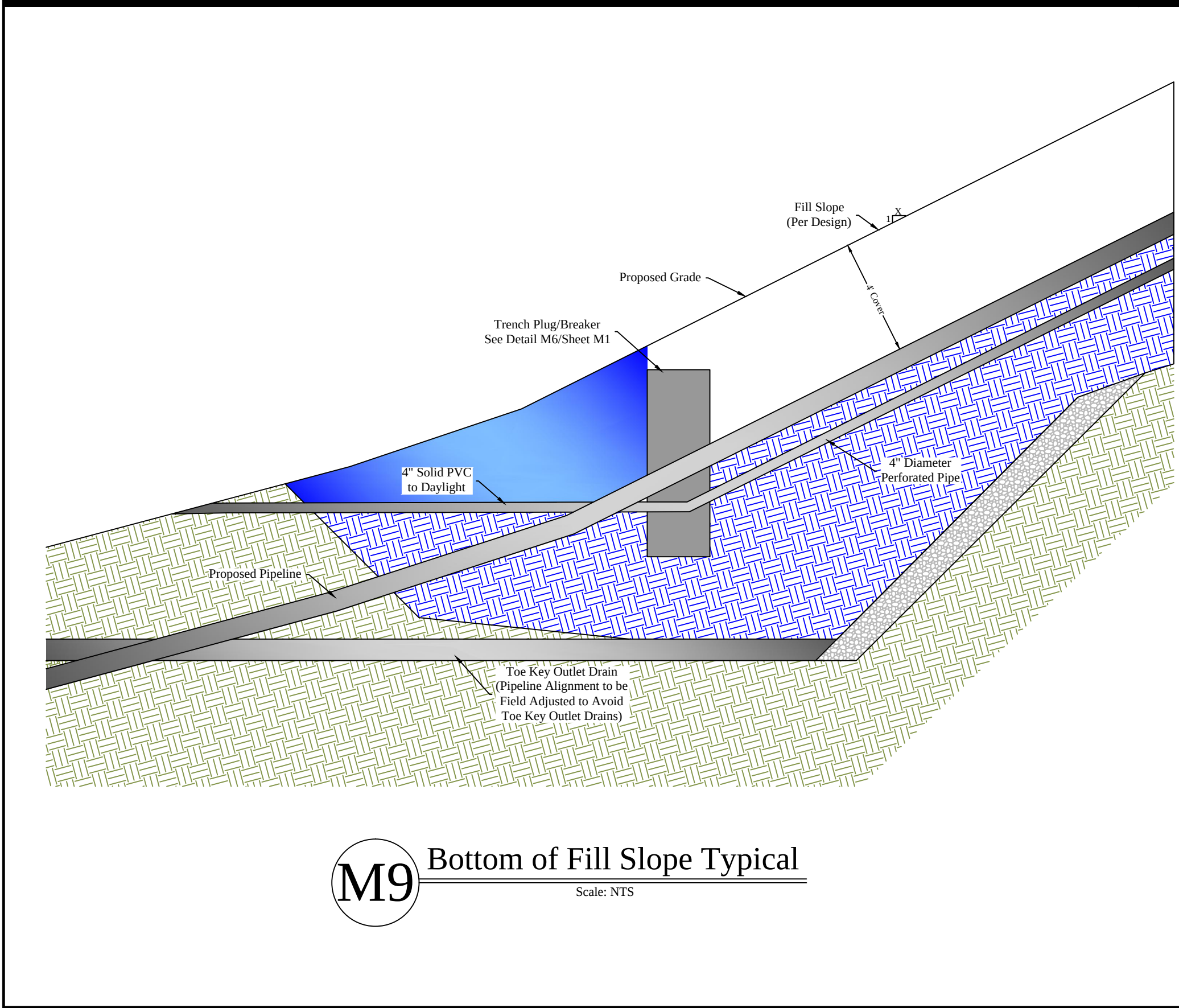
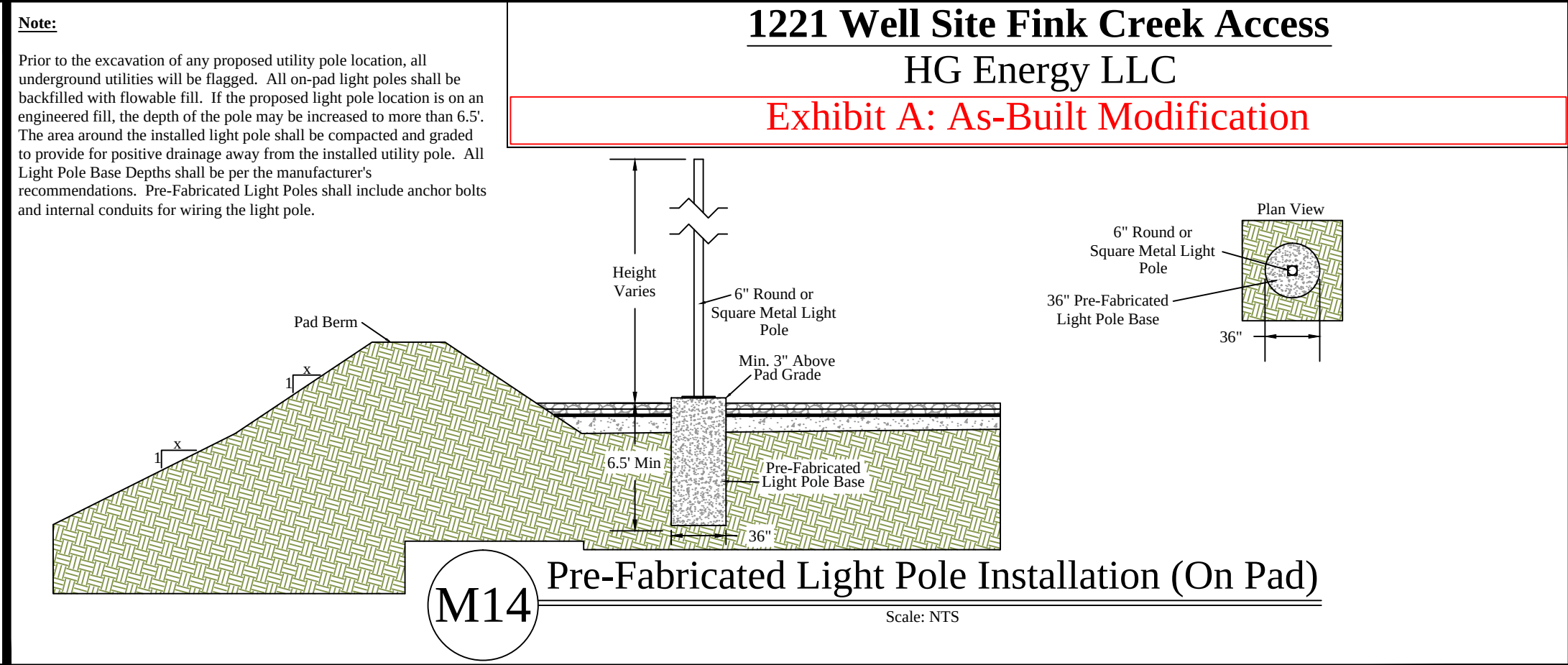
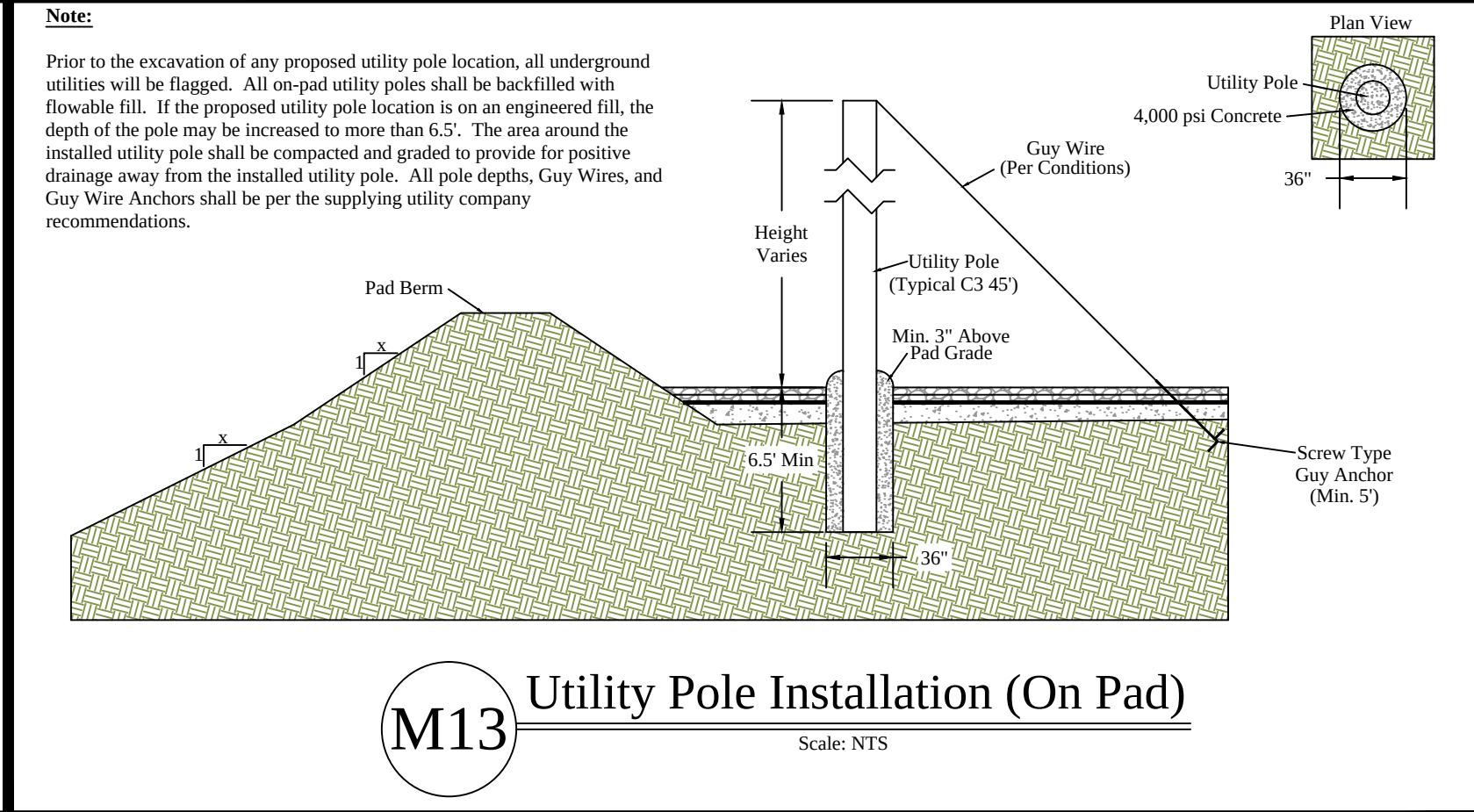
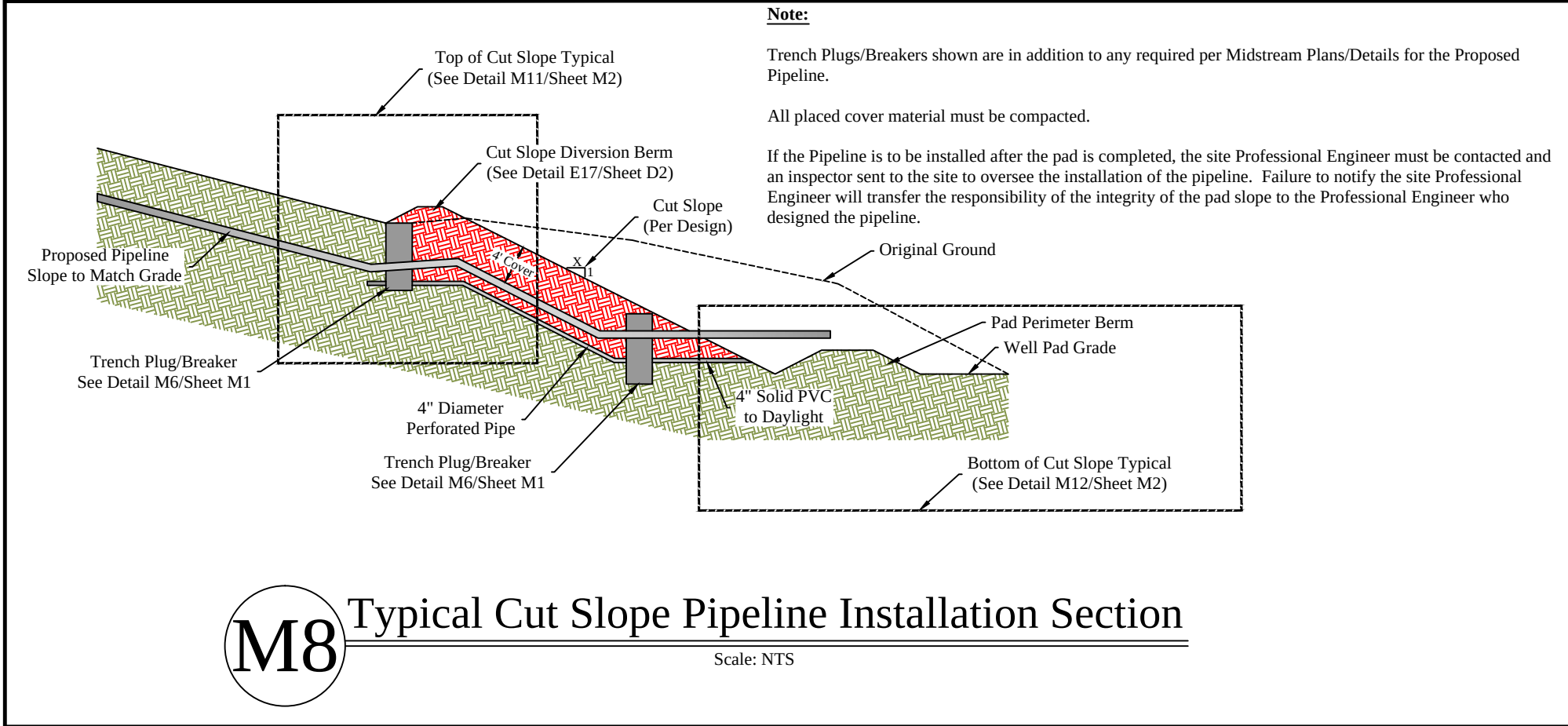


Typical Midstream Production Details

1221 Well Site

Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet M1 of M2



Revision

Design

Date

02-04-2025

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HG ENERGY LLC

P.O. Box 254
Dallman, WV 26029
(304) 338-0965

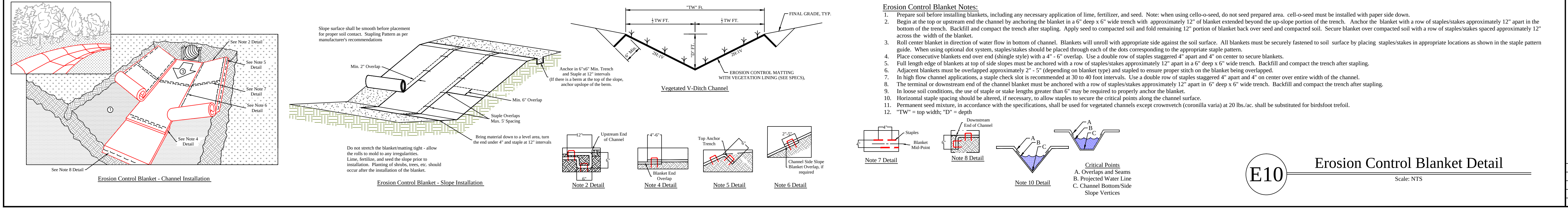
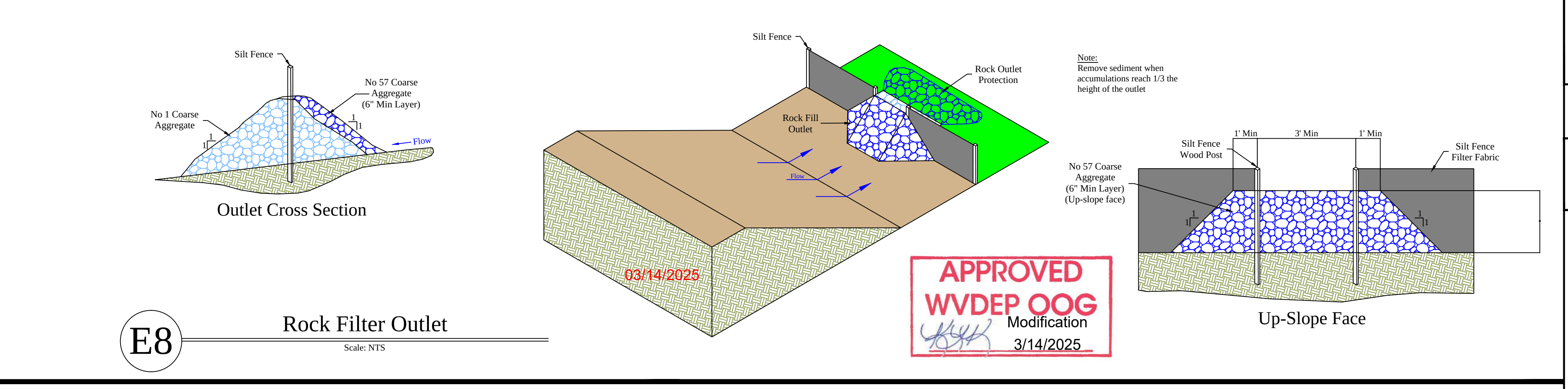
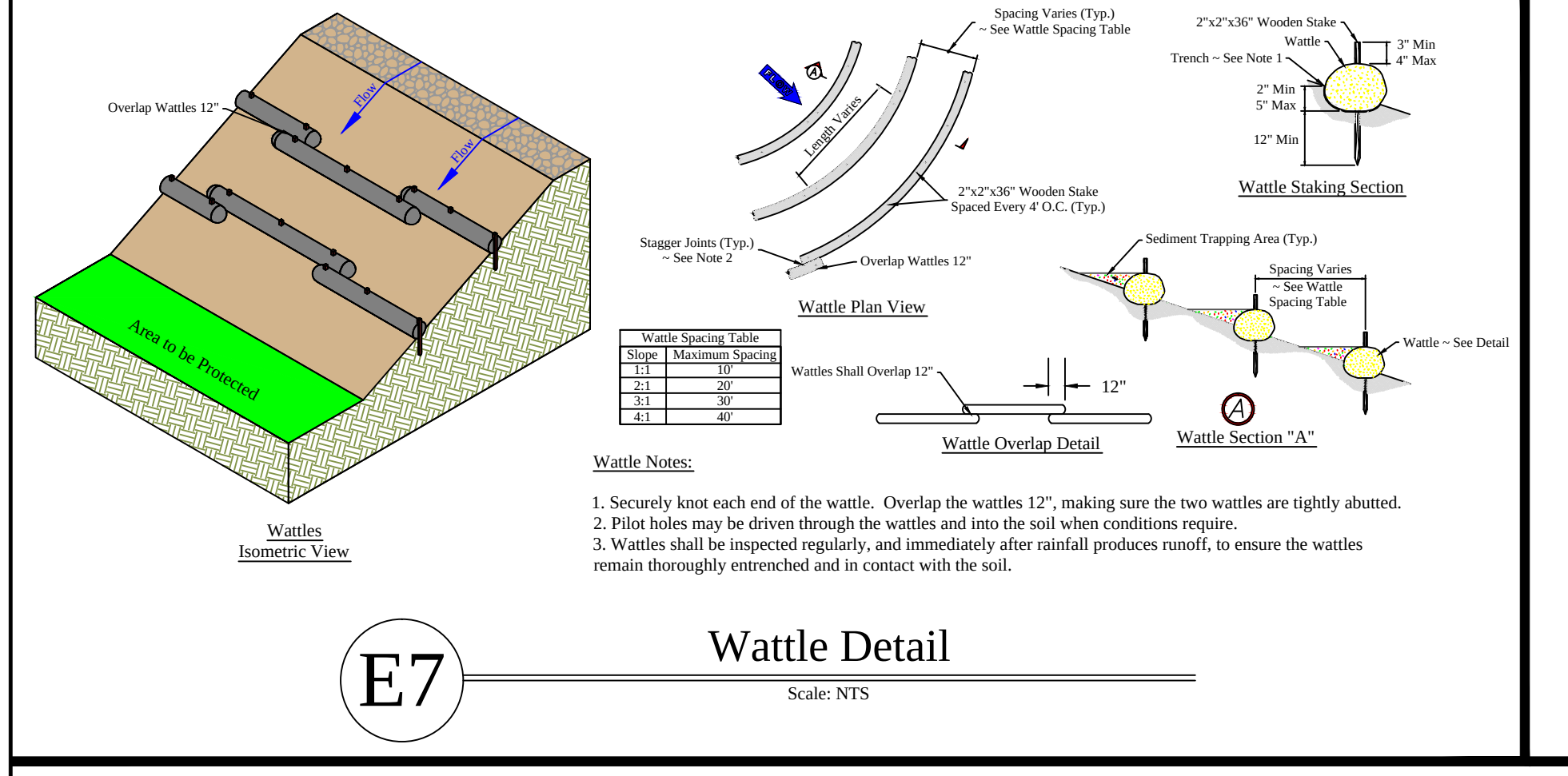
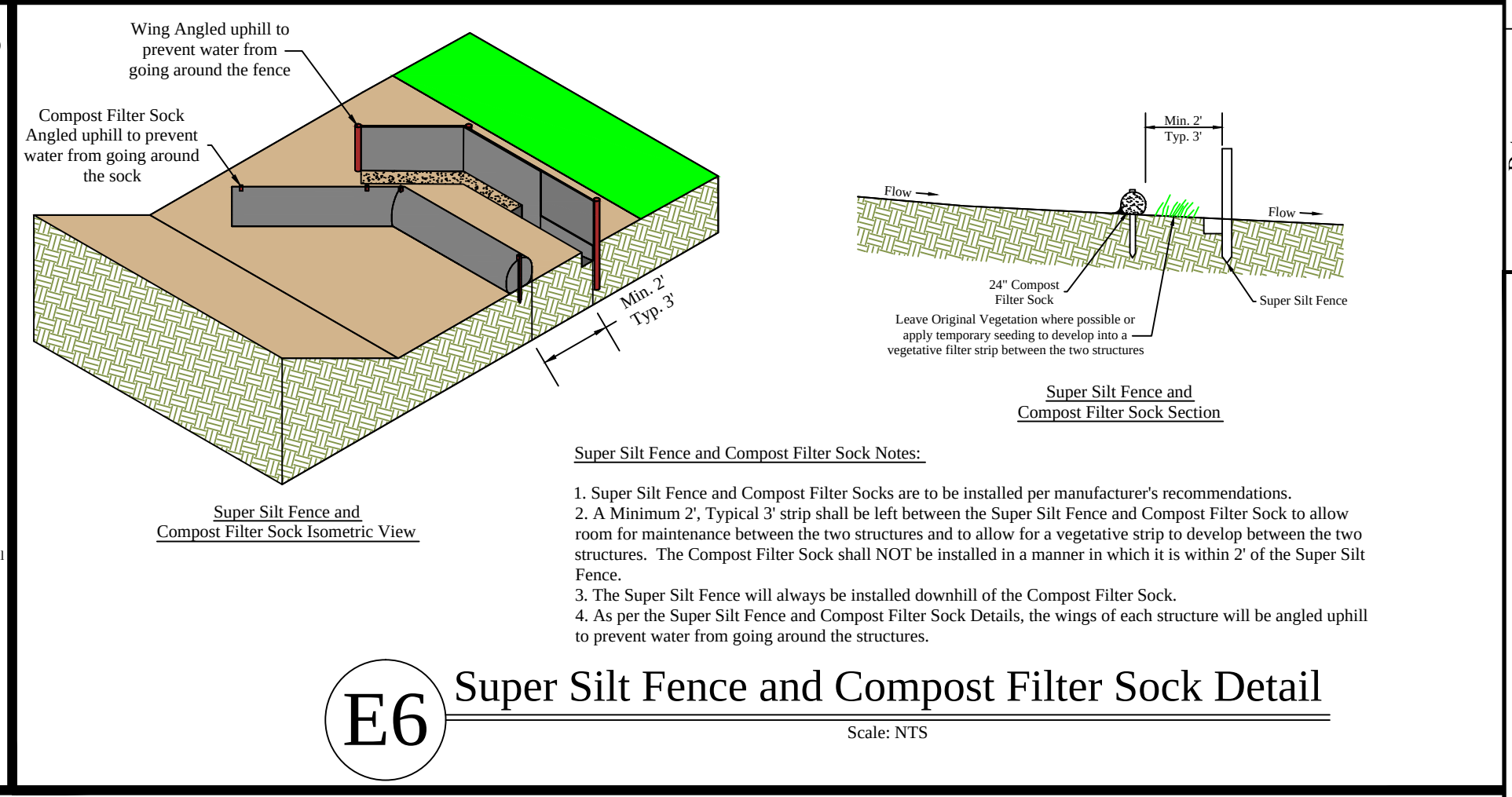
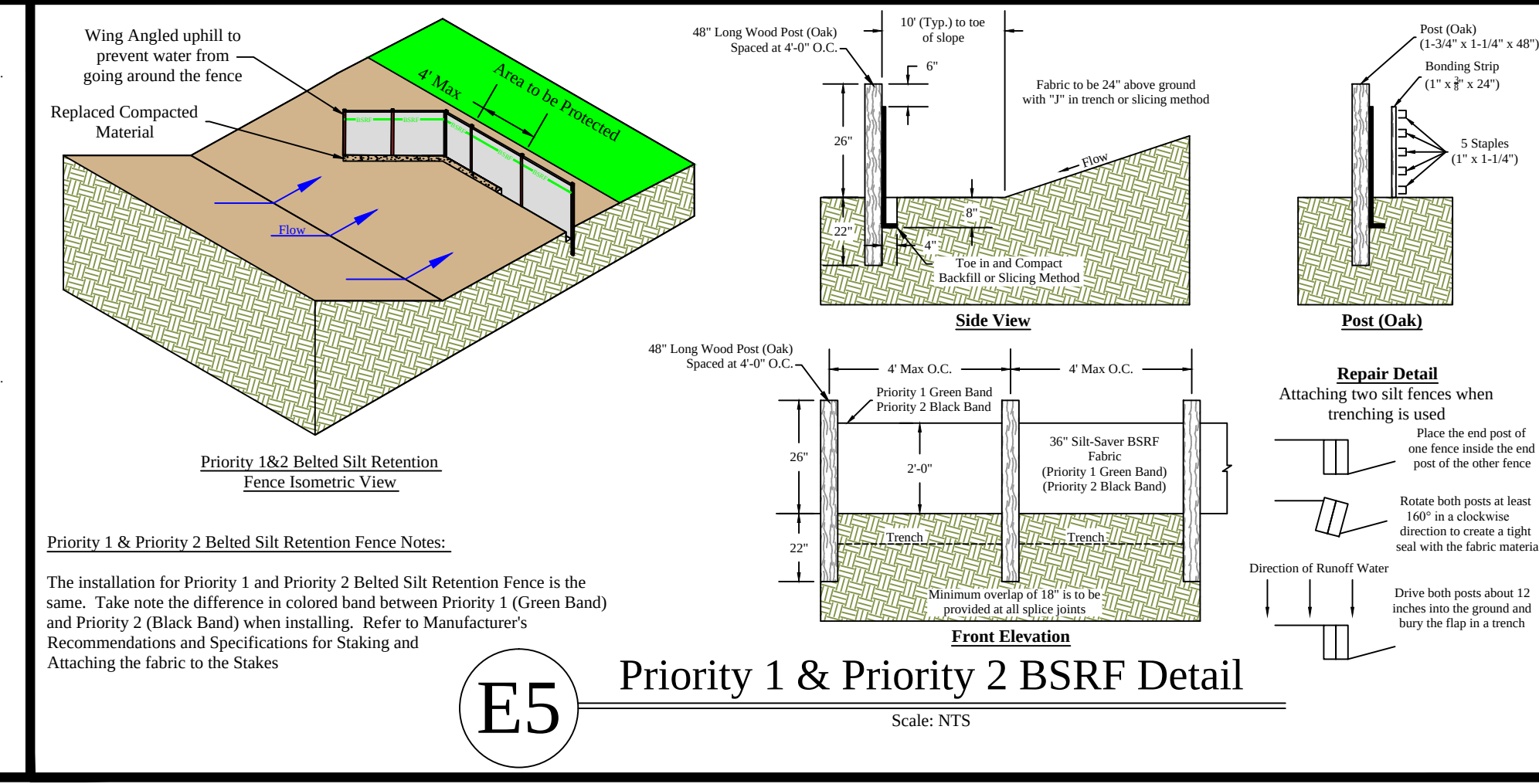
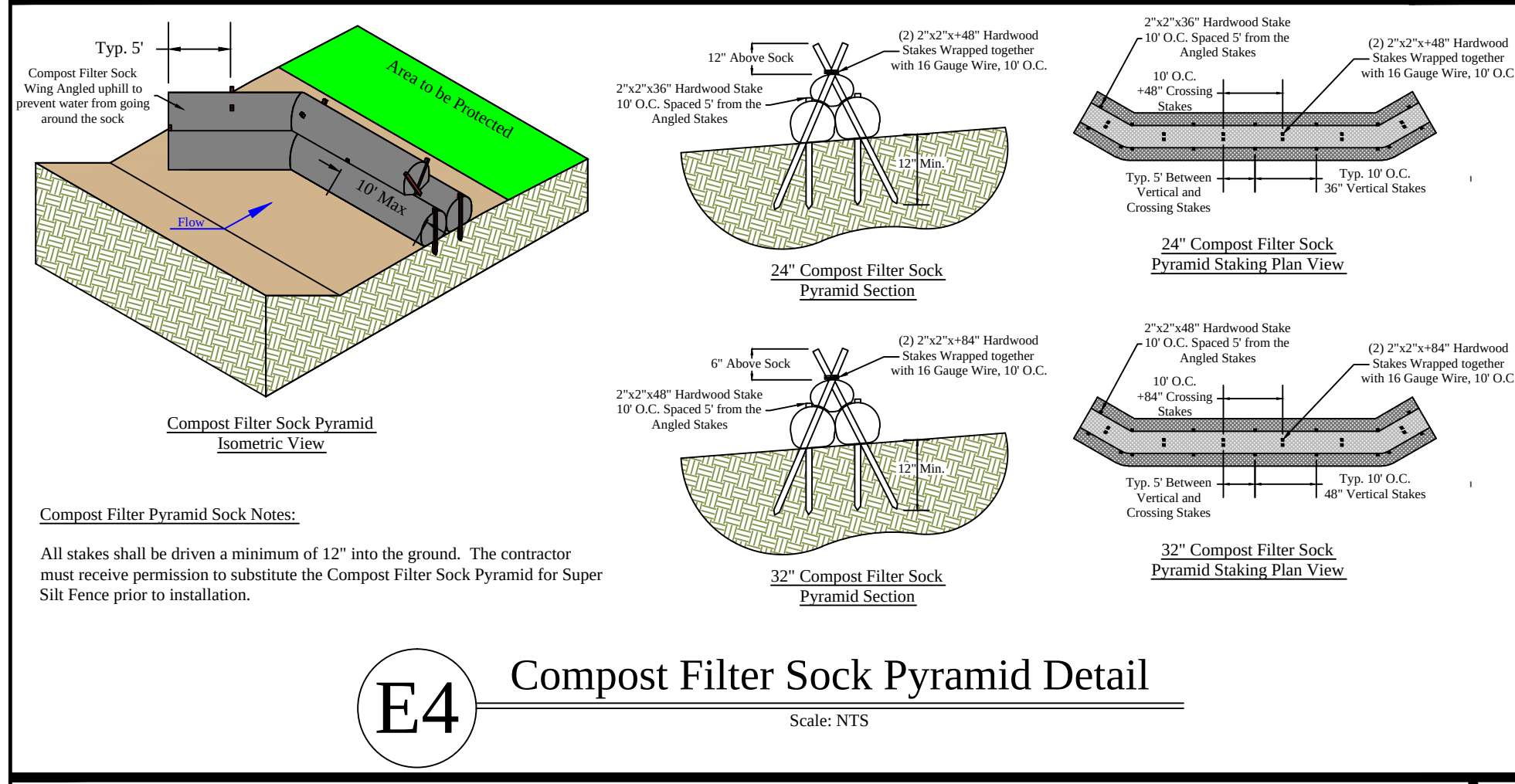
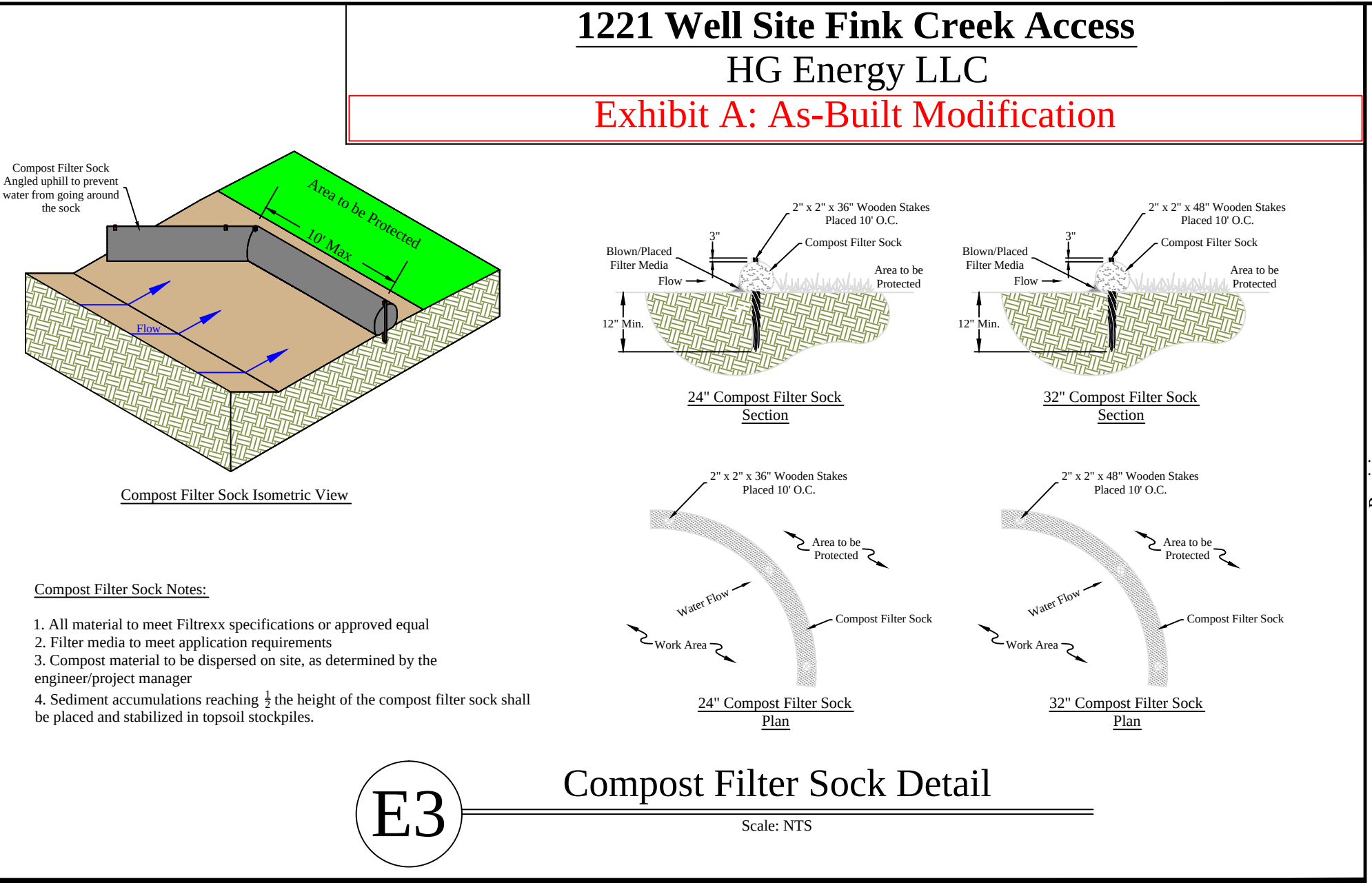
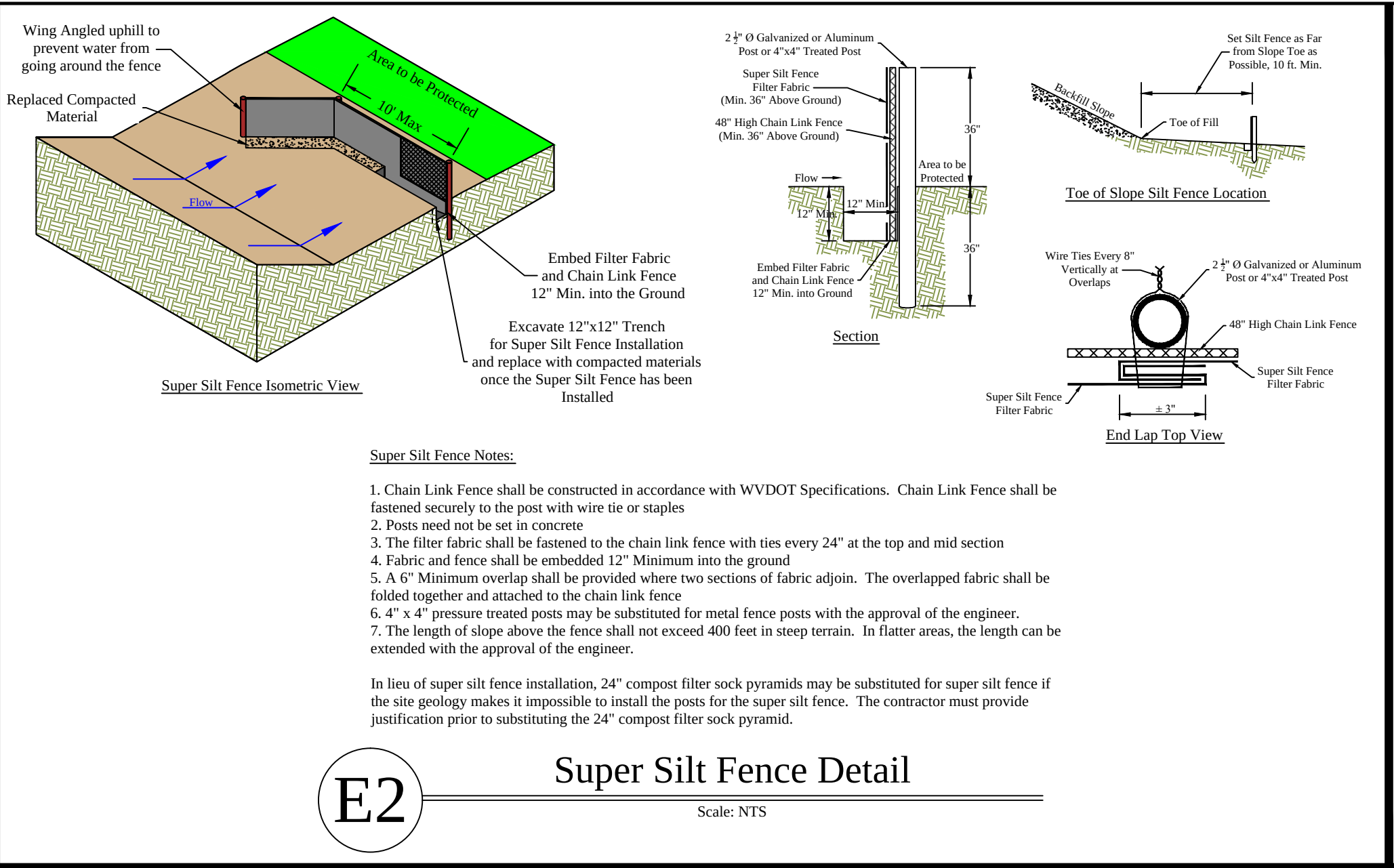
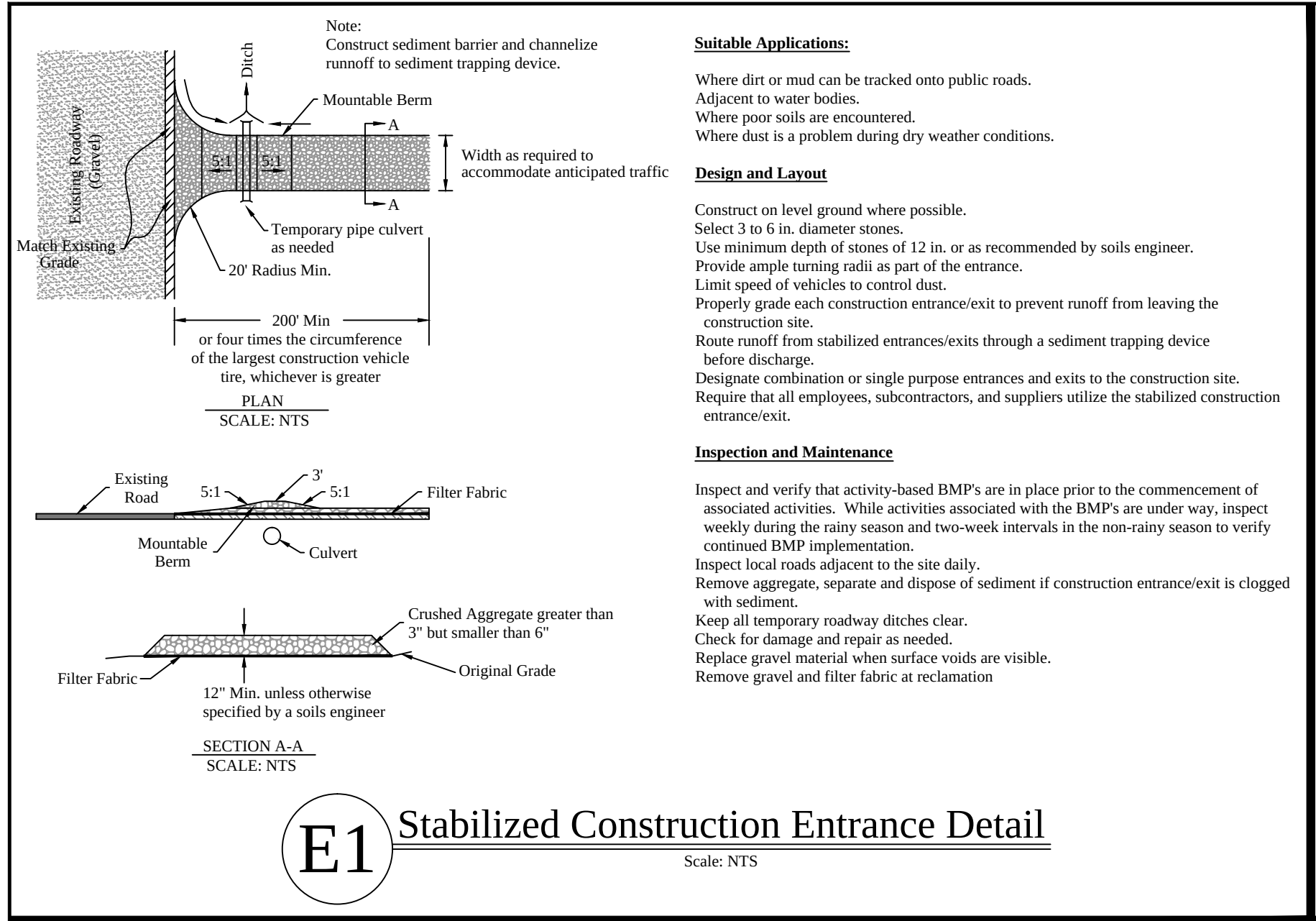
Typical Midstream Production Details

1221 Well Site

Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet M2 of M2

APPROVED
WVDEP OOG
Modification
3/14/2025



Revision
Design
Date
02-04-2025

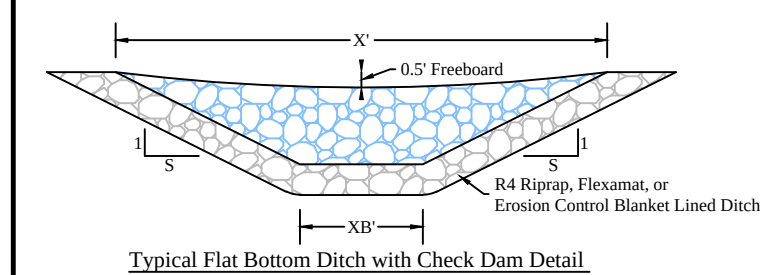
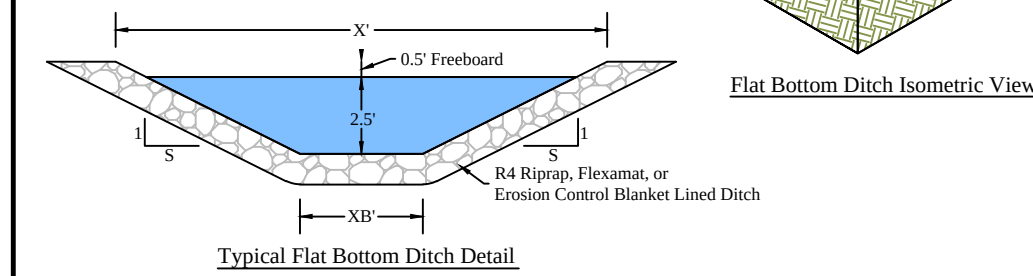
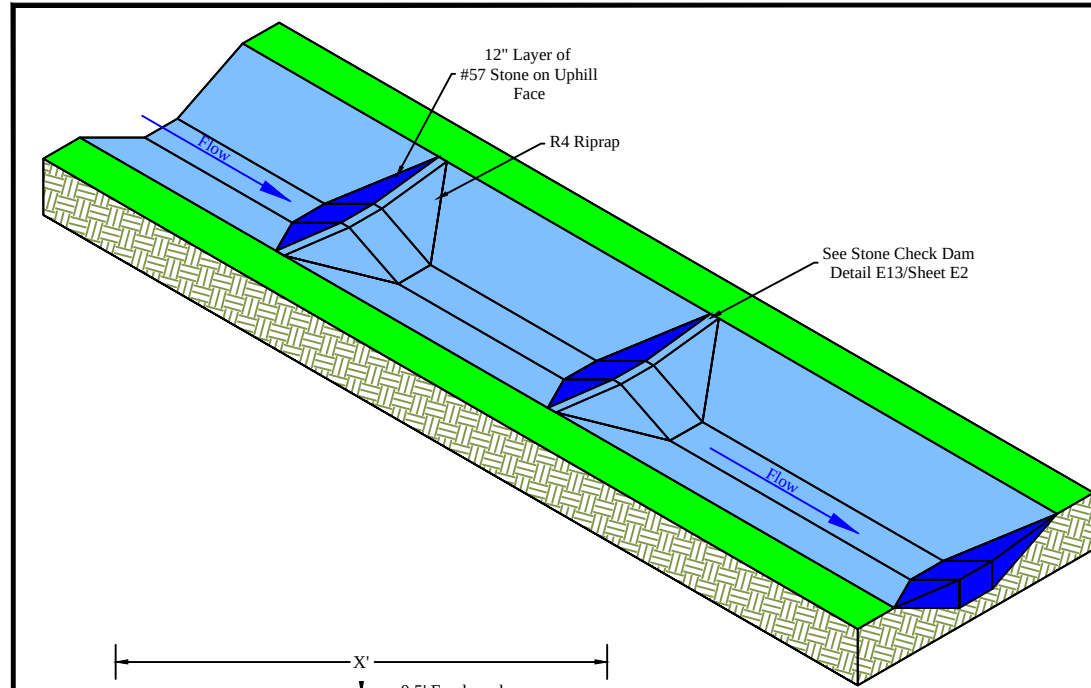
HG ENERGY LLC

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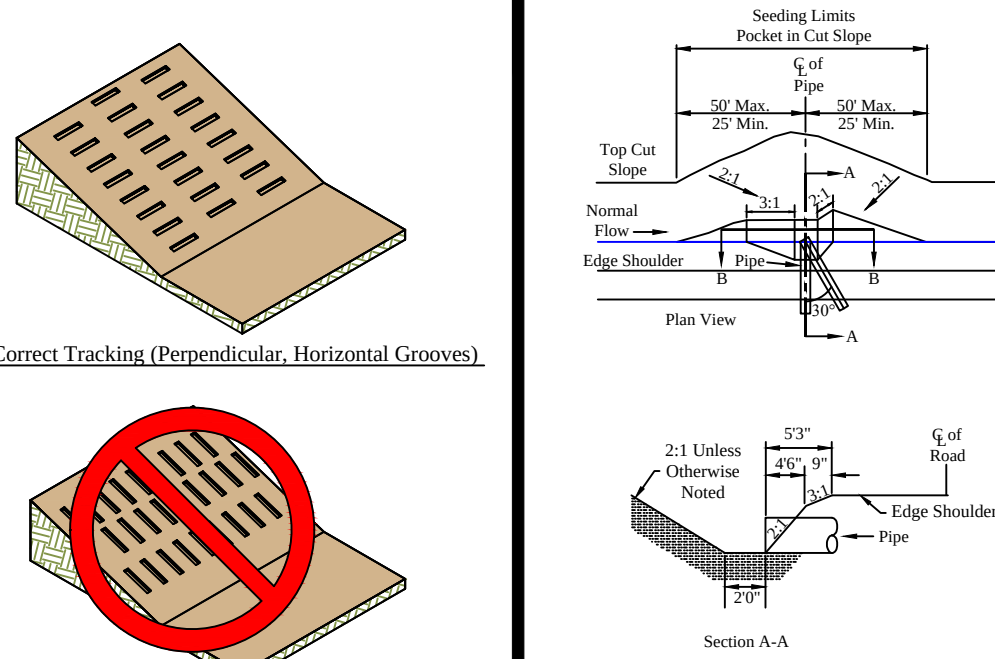
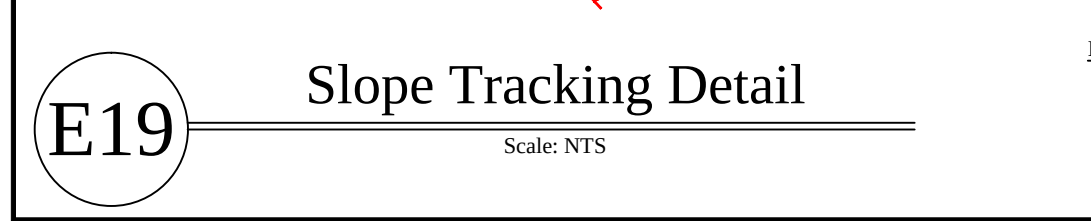
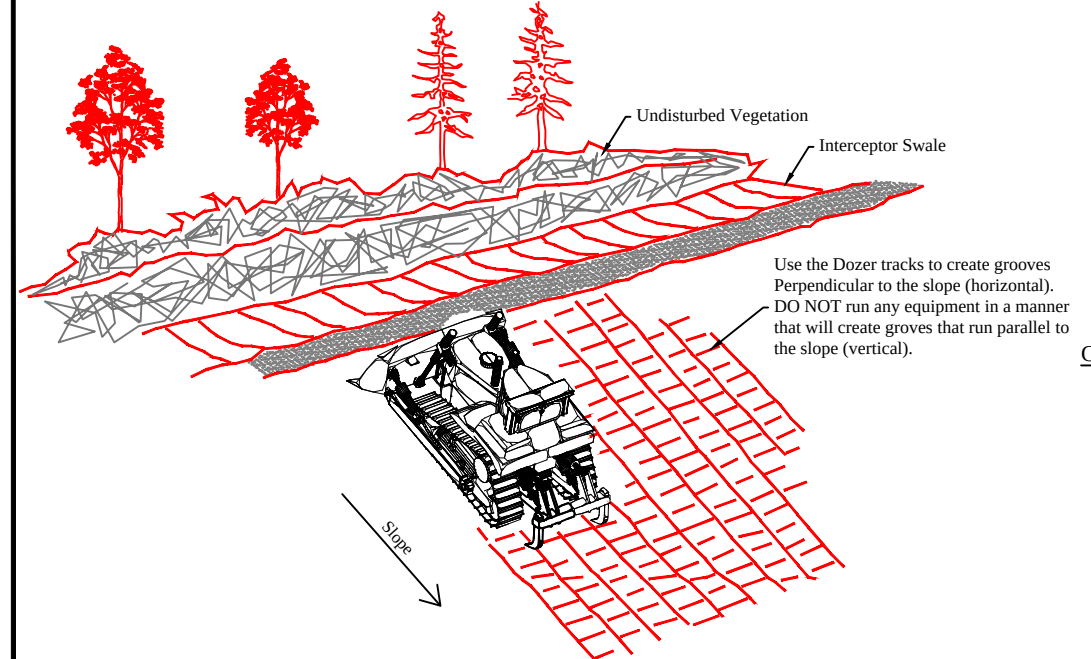
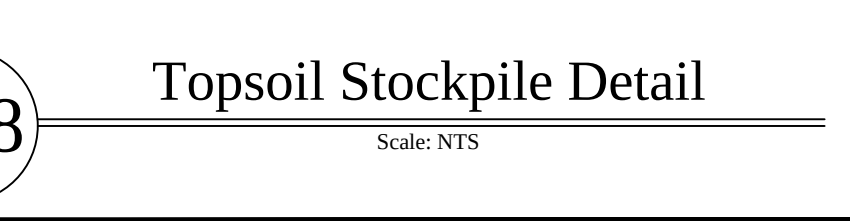
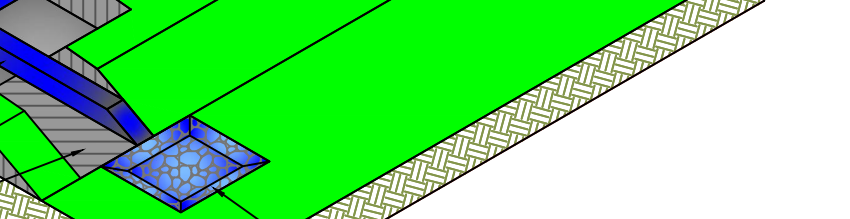
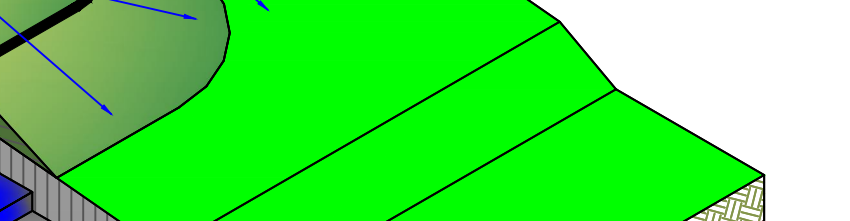
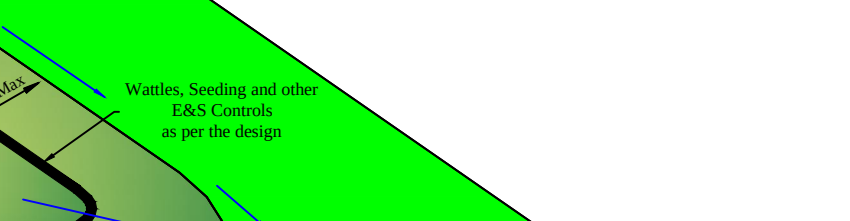
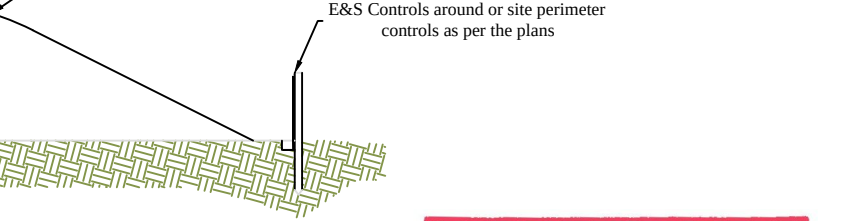
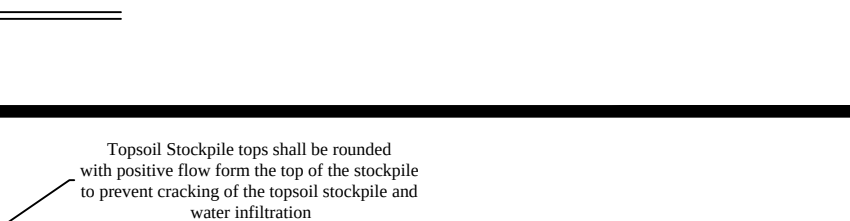
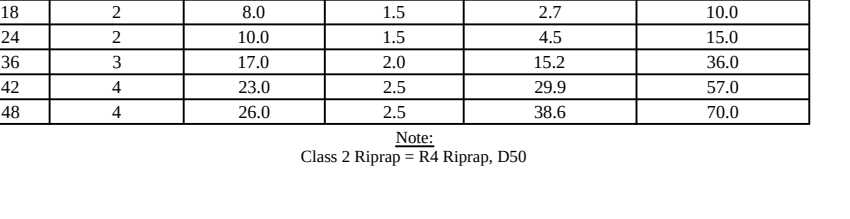
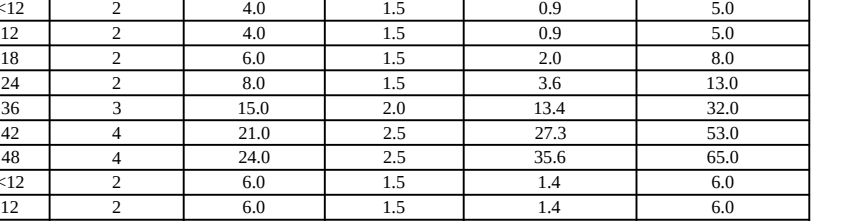
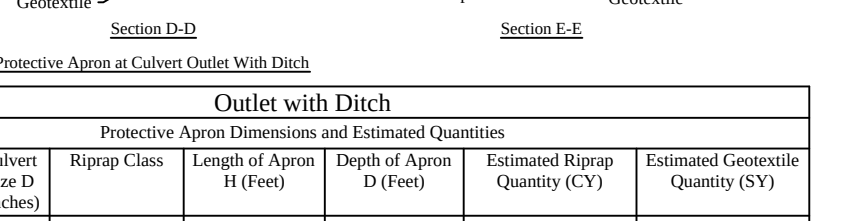
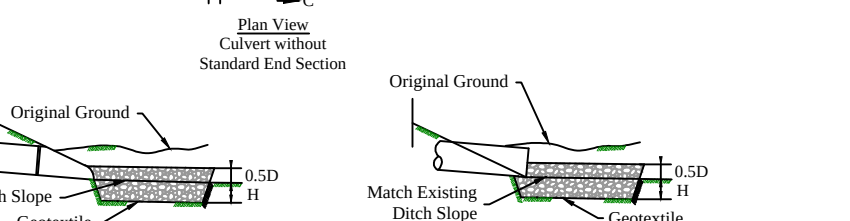
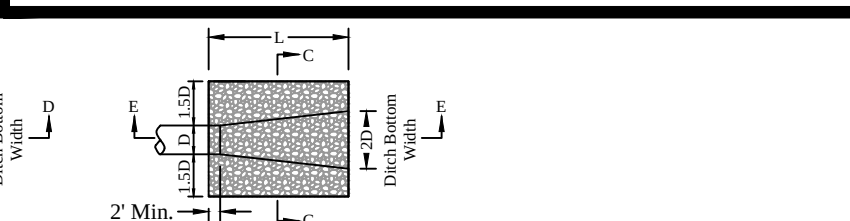
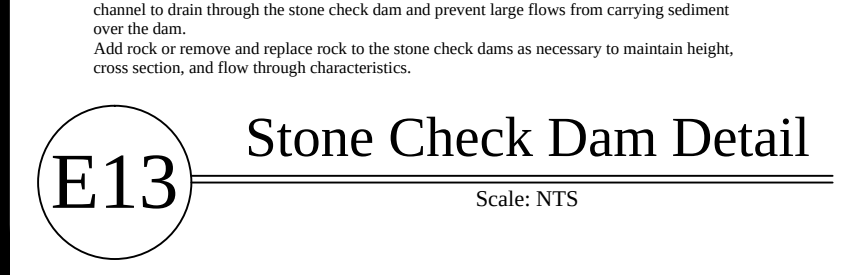
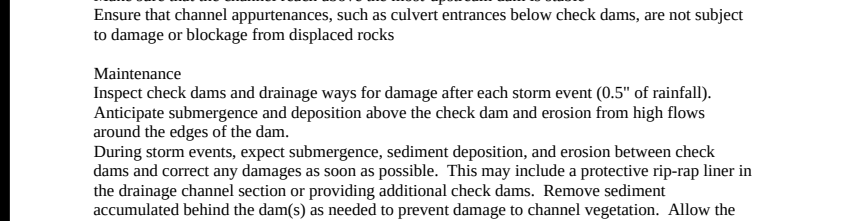
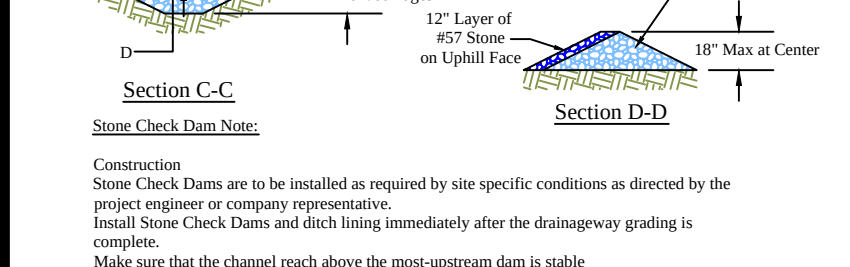
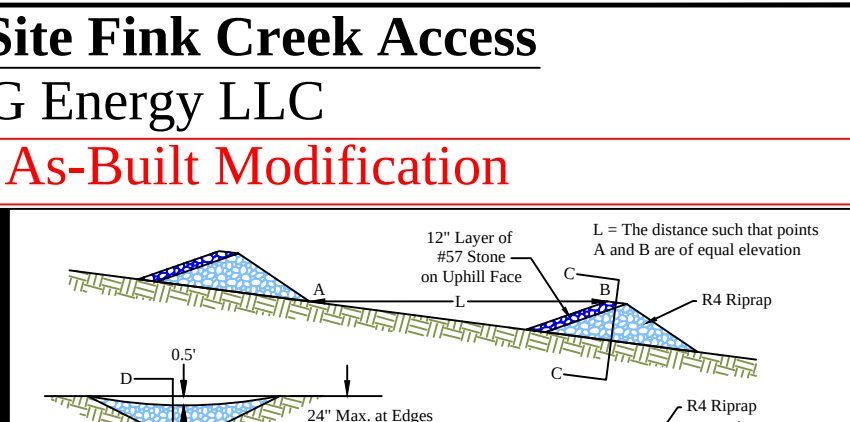
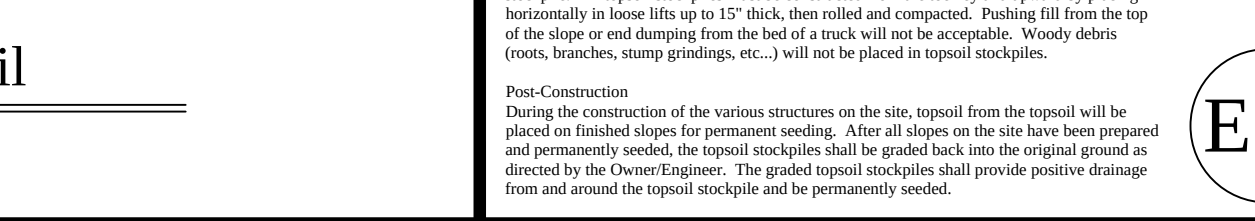
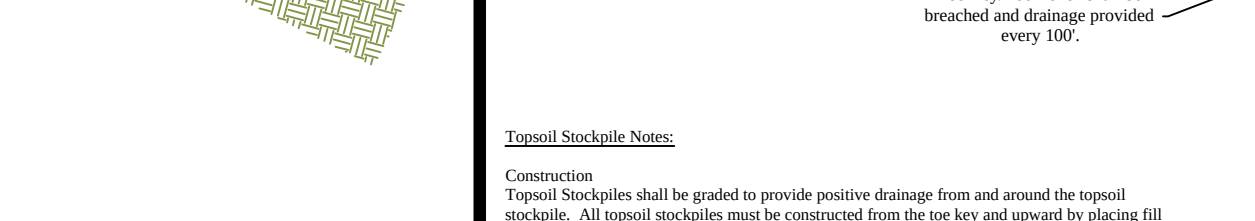
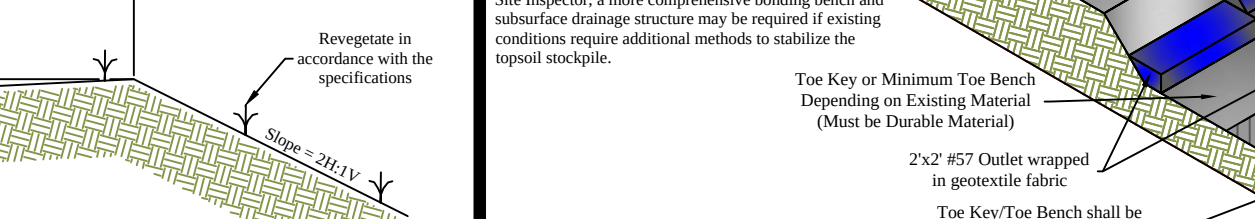
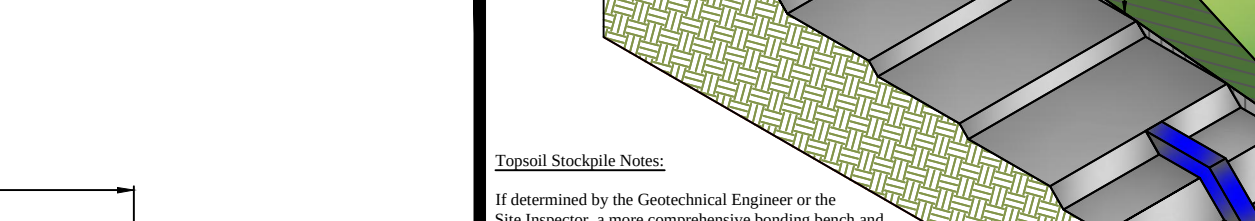
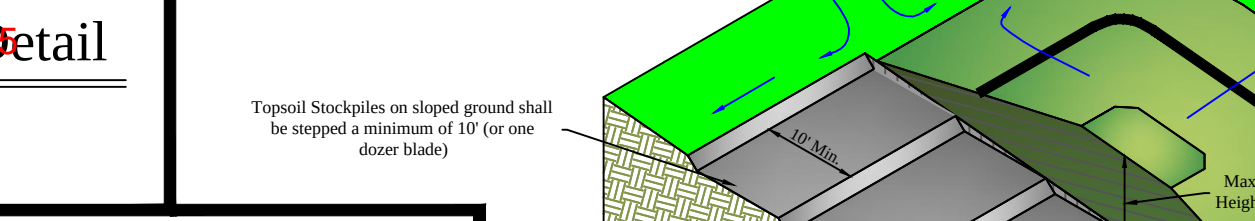
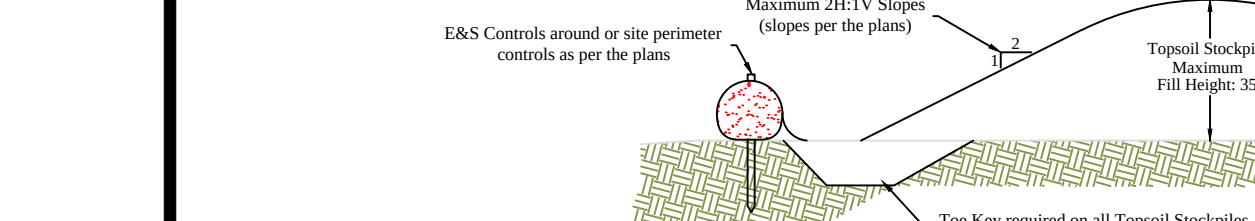
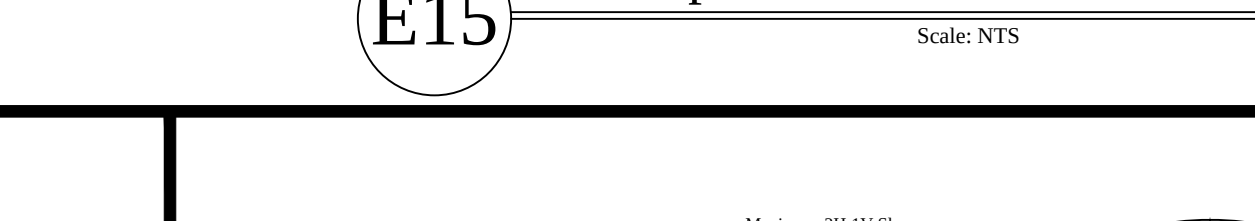
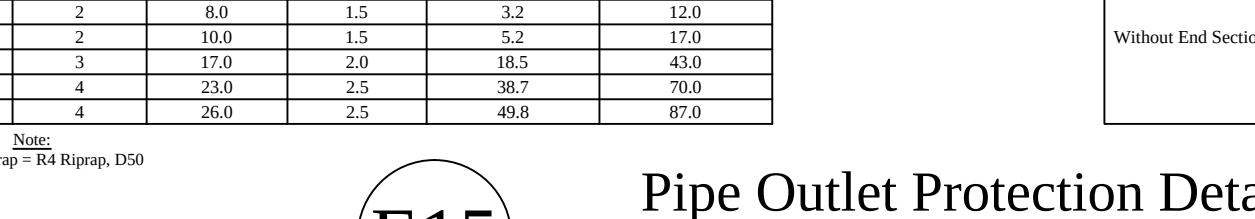
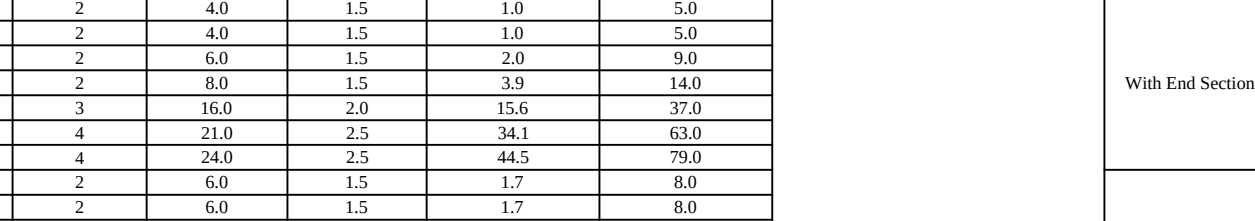
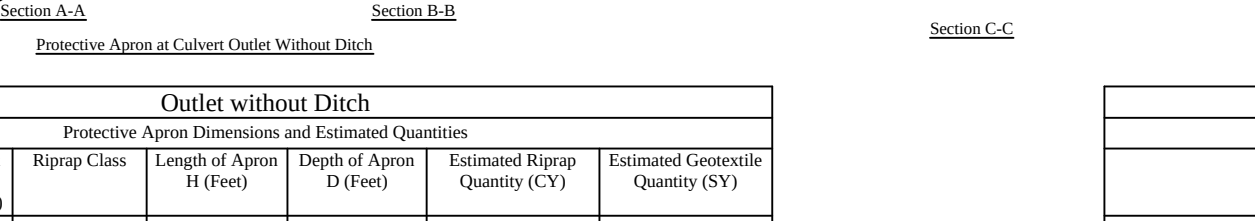
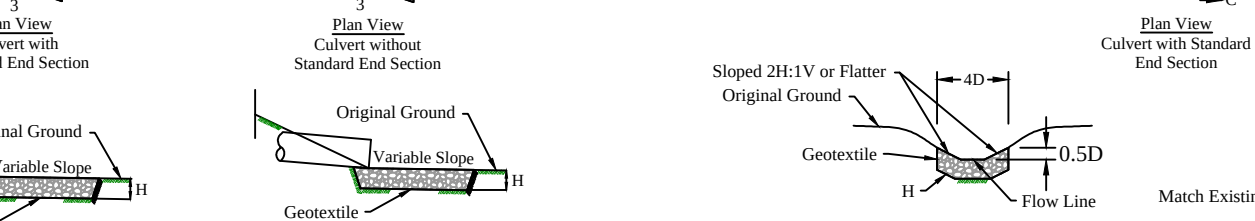
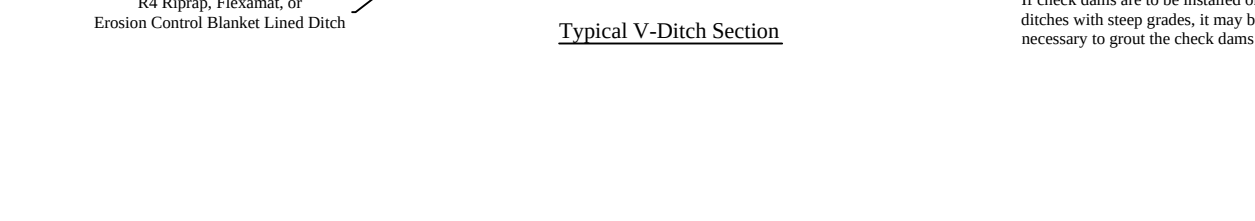
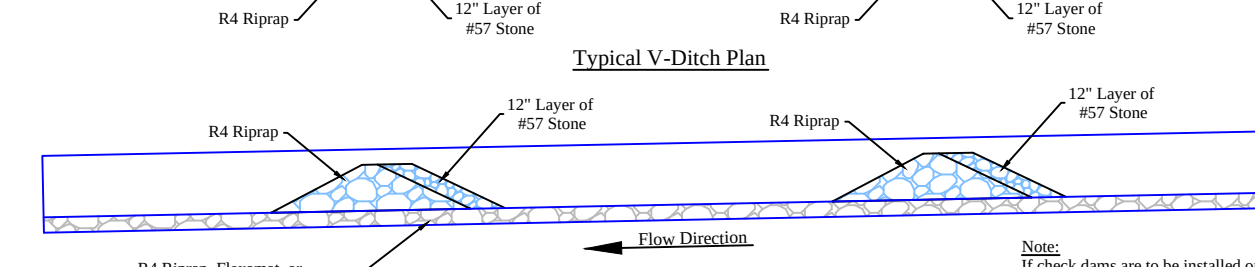
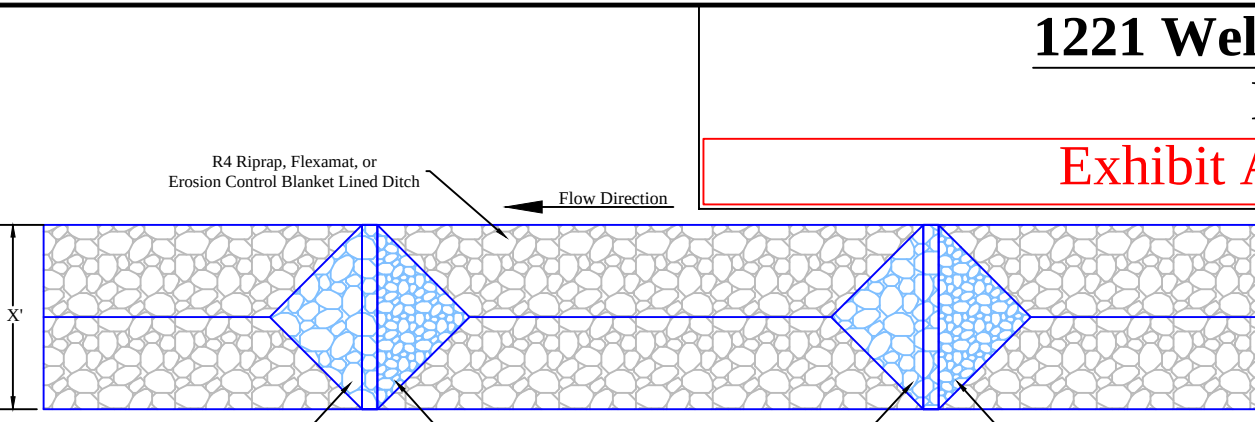
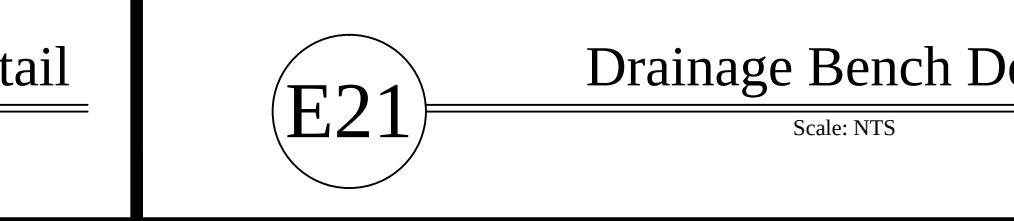
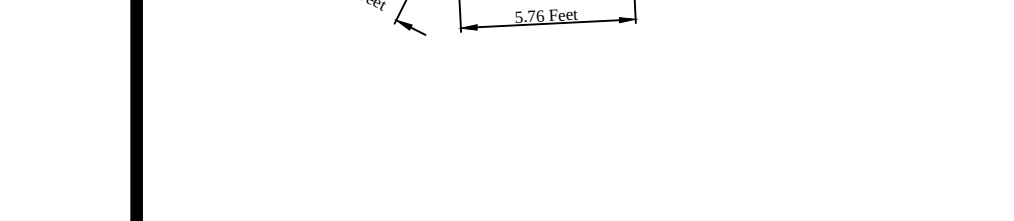
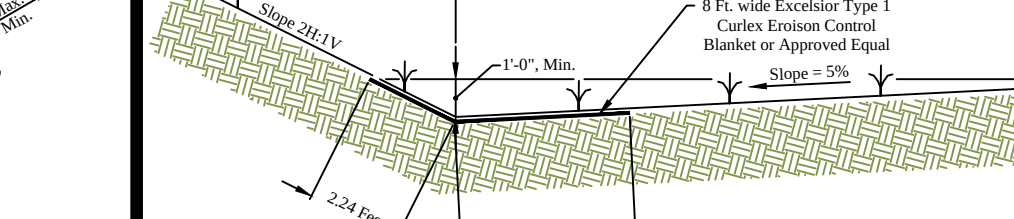
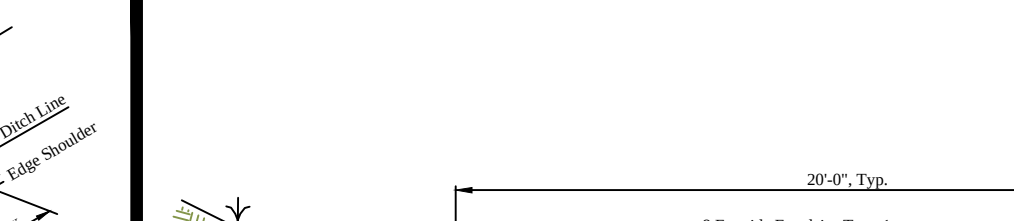
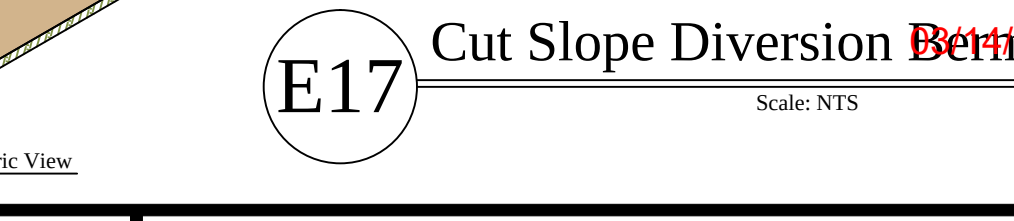
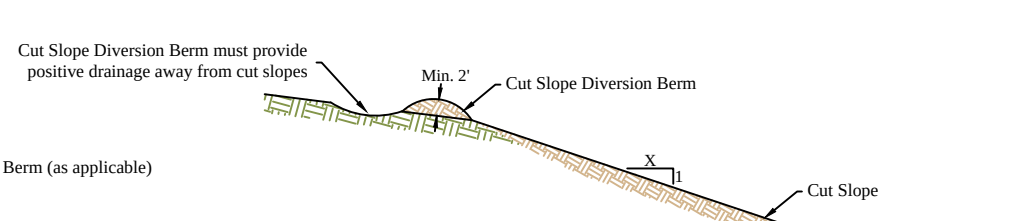
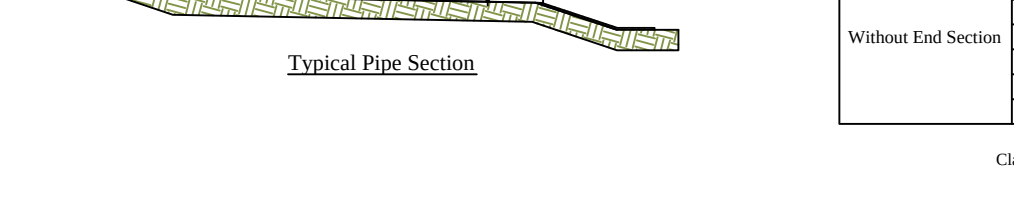
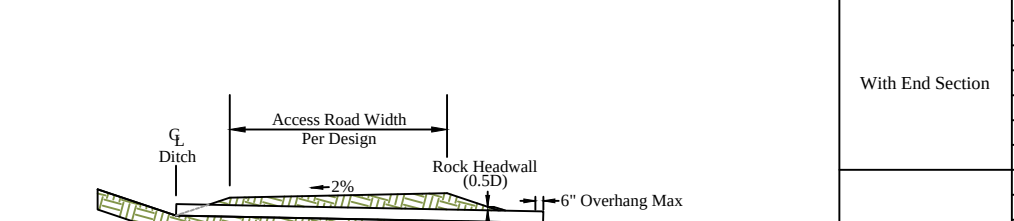
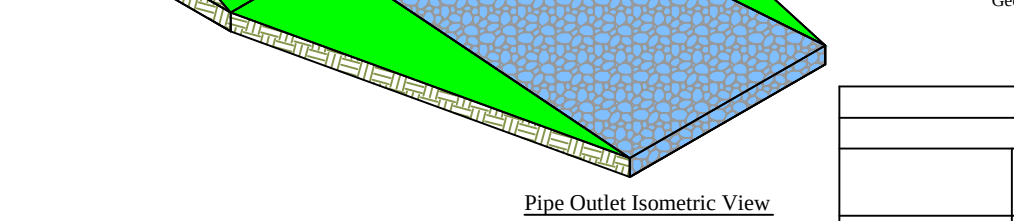
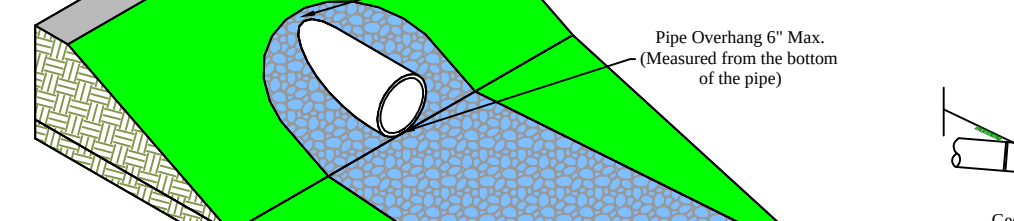
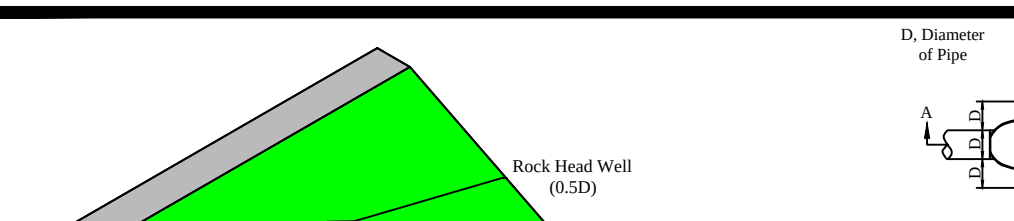
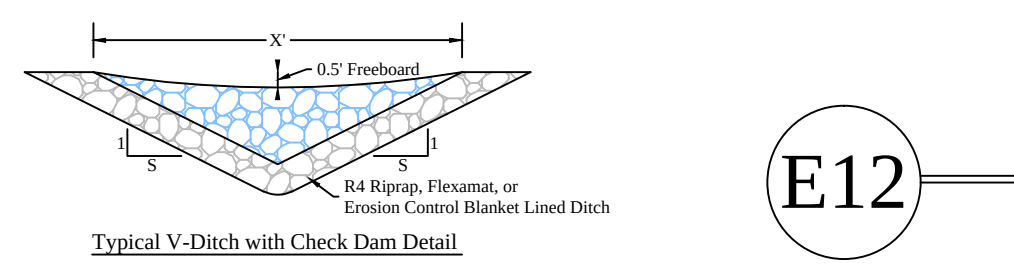
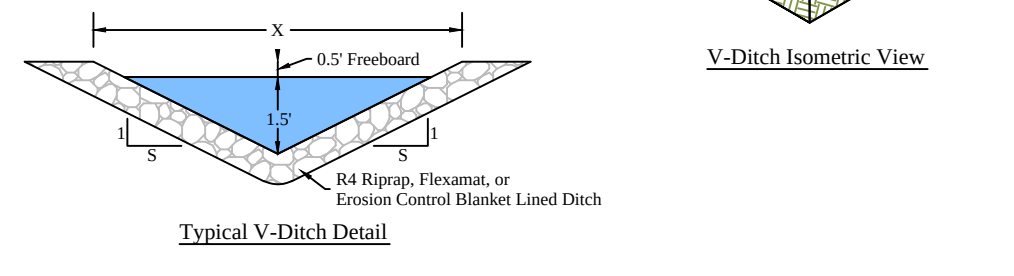
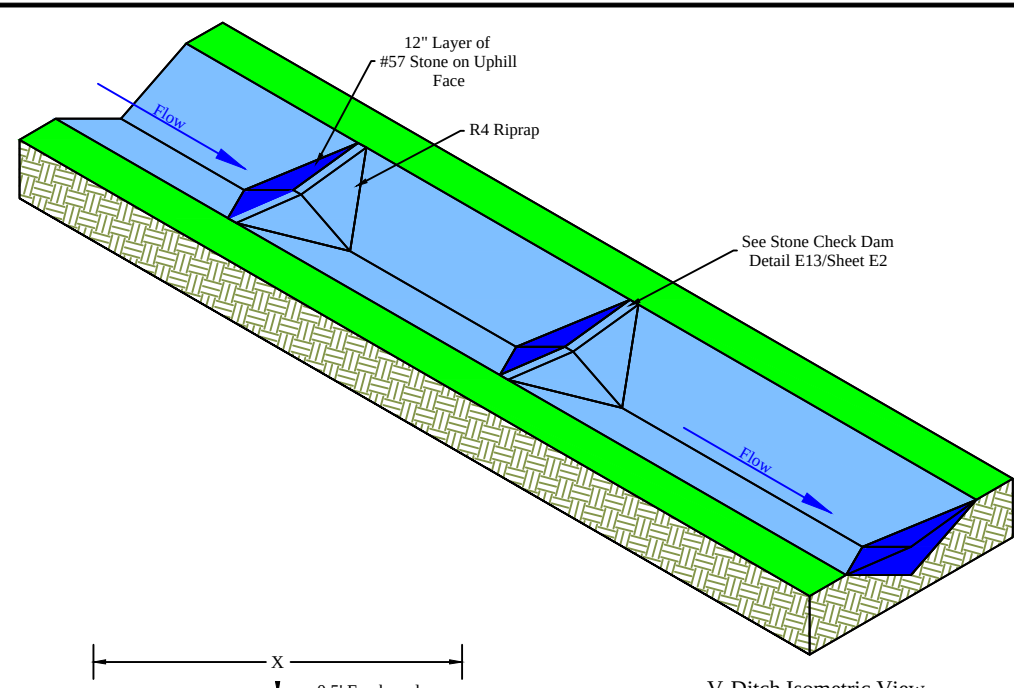
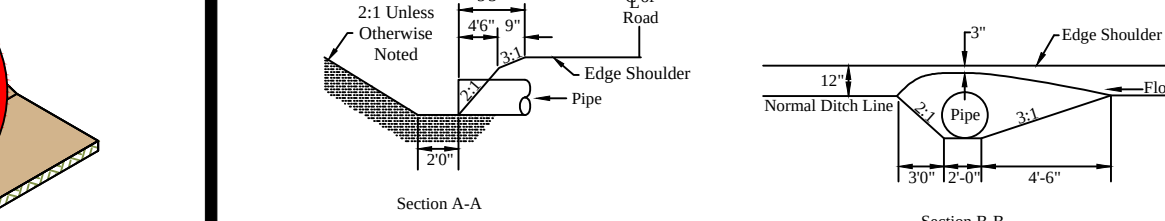
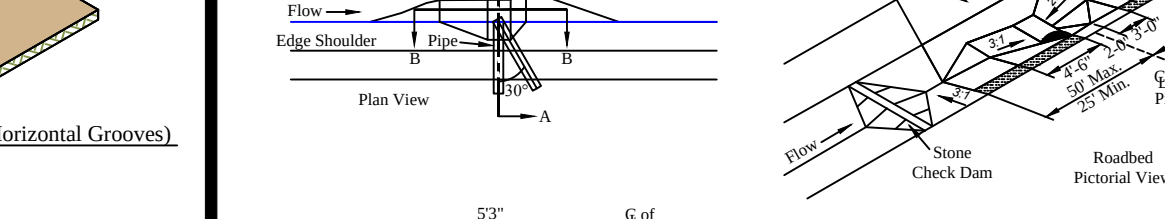
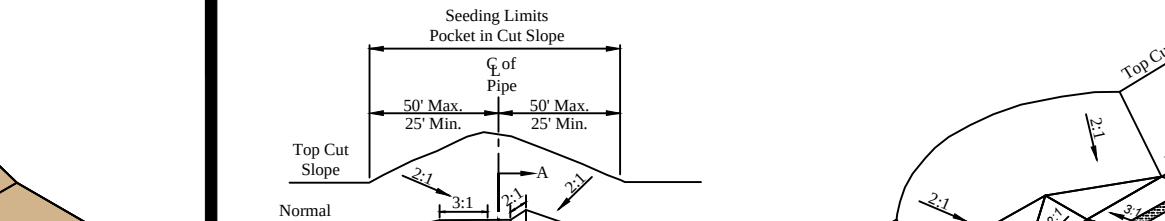
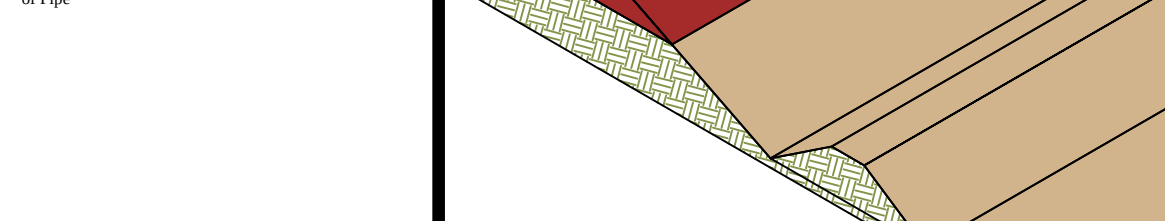
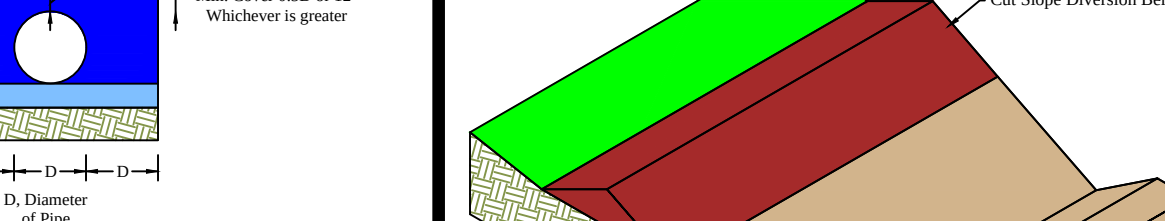
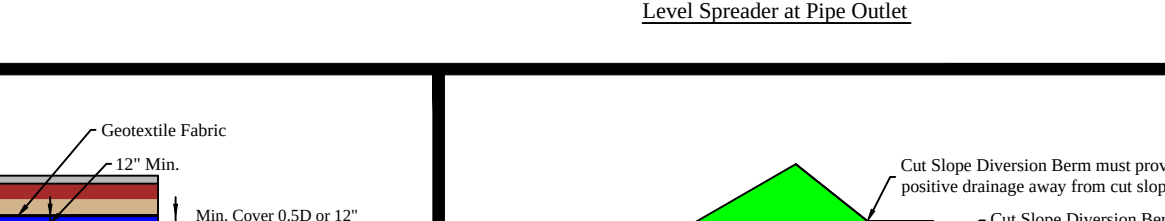
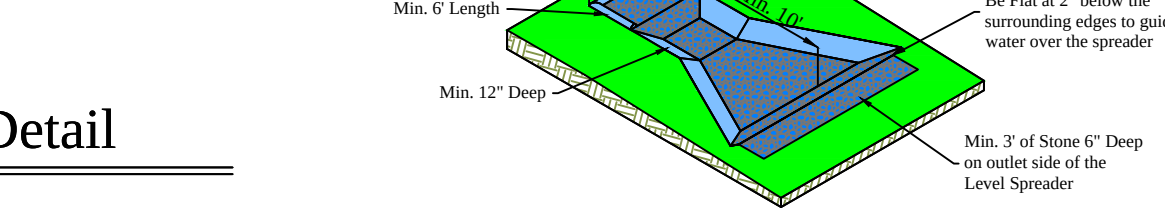
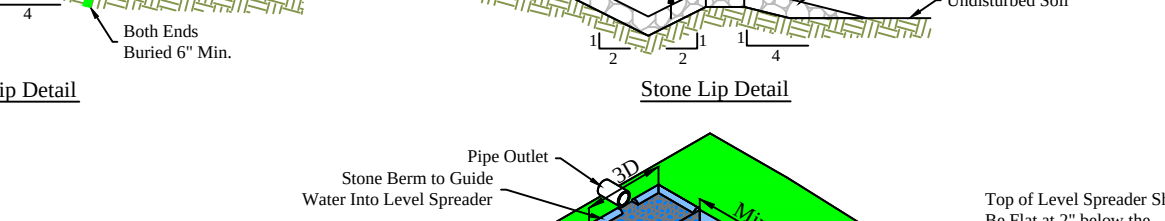
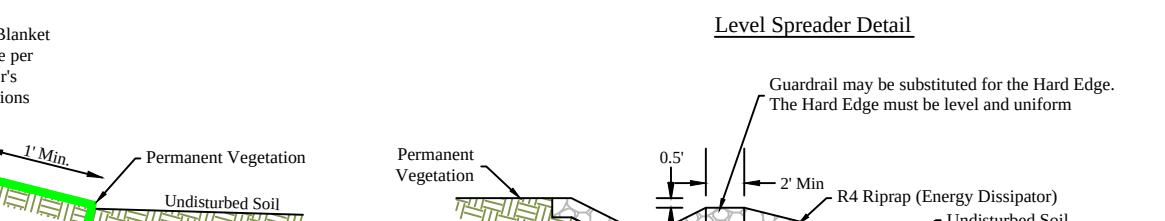
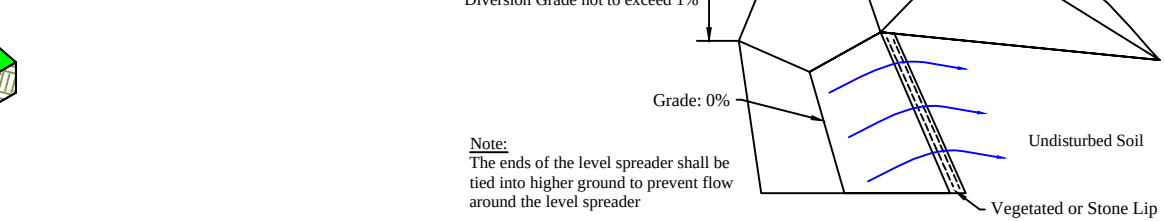
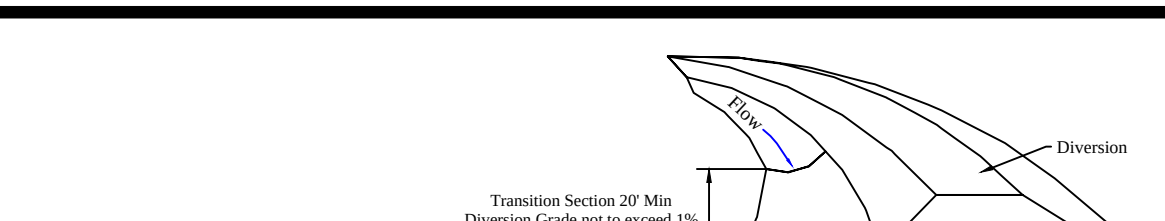
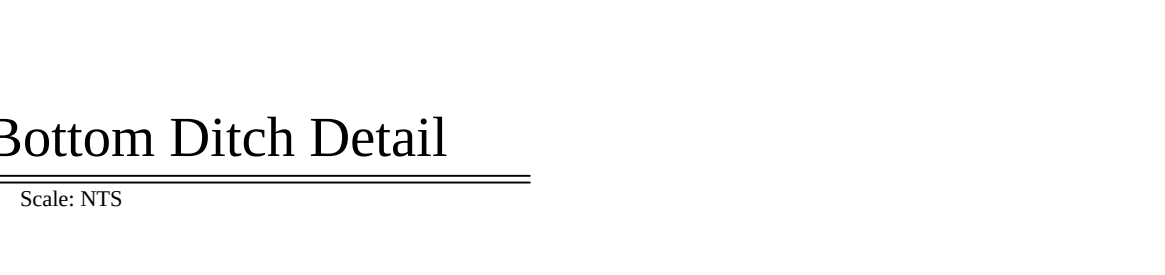
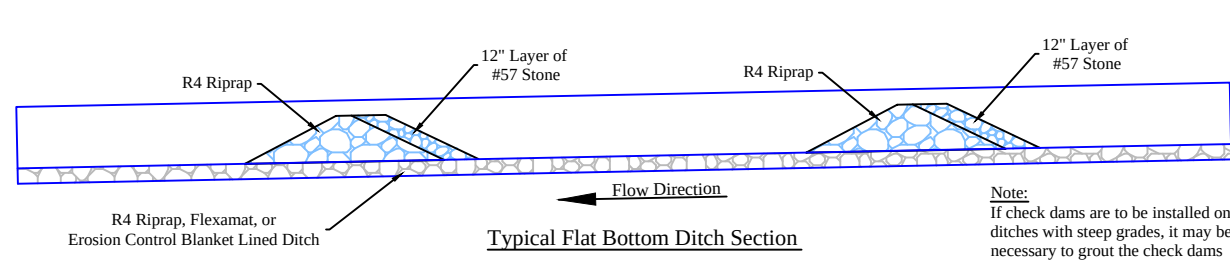
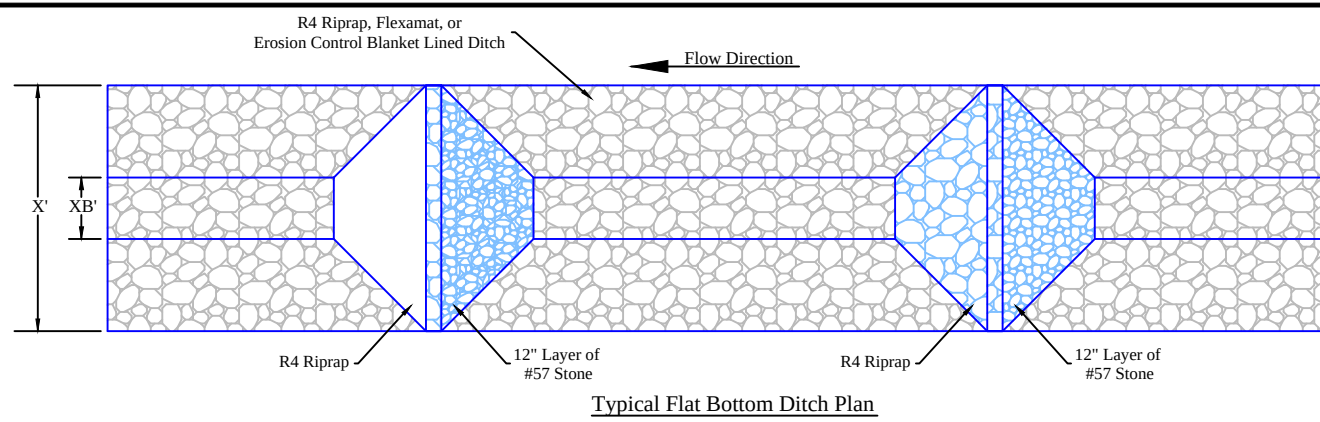
Kelly Surveying
P.O. Box 254
Delmar, WV 26039
304-338-0965

Erosion and Sediment Control Details
1221 Well Site
Freemans Creek District
Lewis County, WV

Date: 02/04/2025
Scale: As Shown
Designed By: ZS
File No.
Sheet D1 of D2



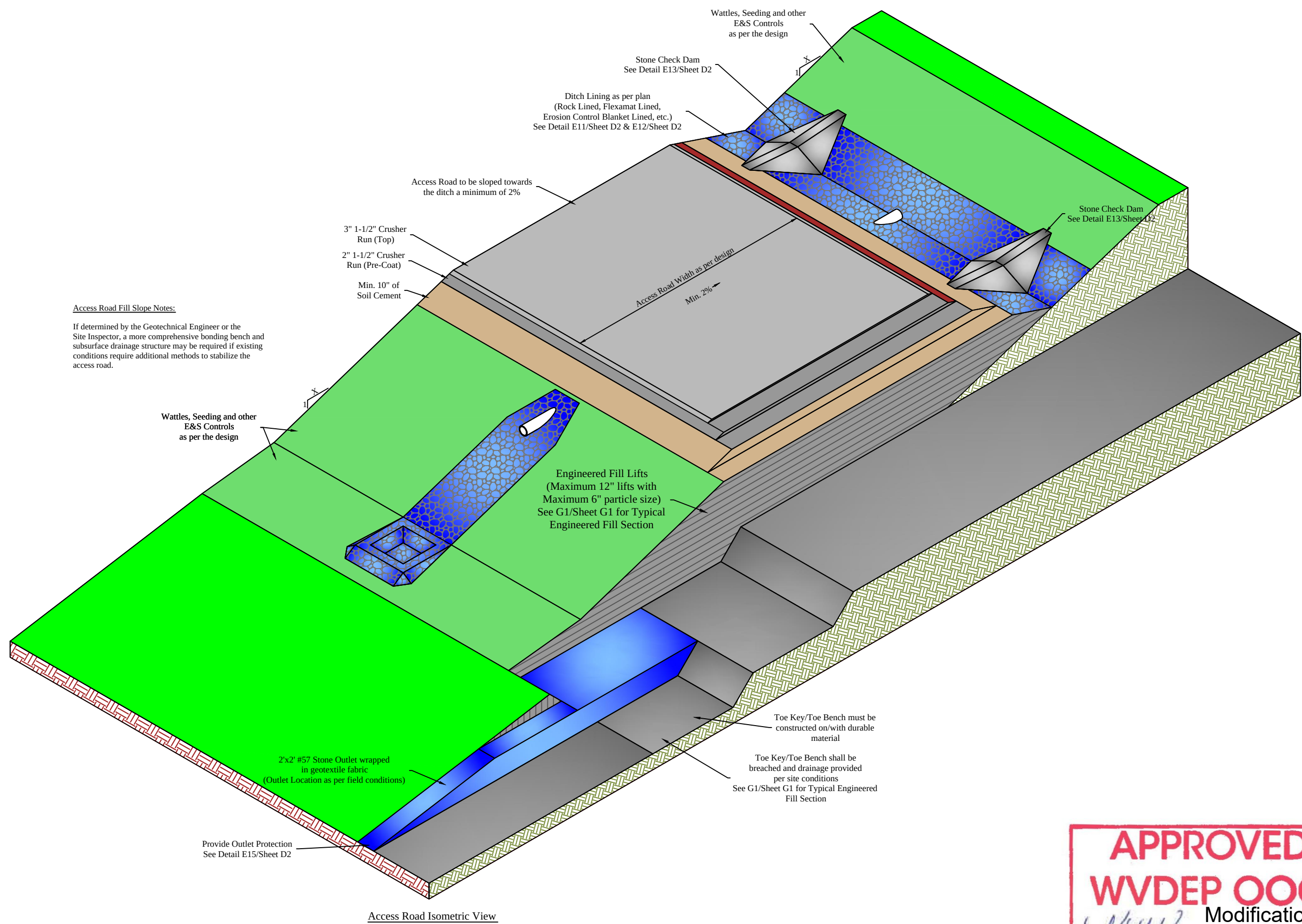
E11 Typical Flat Bottom Ditch Detail



1221 Well Site Fink Creek Access

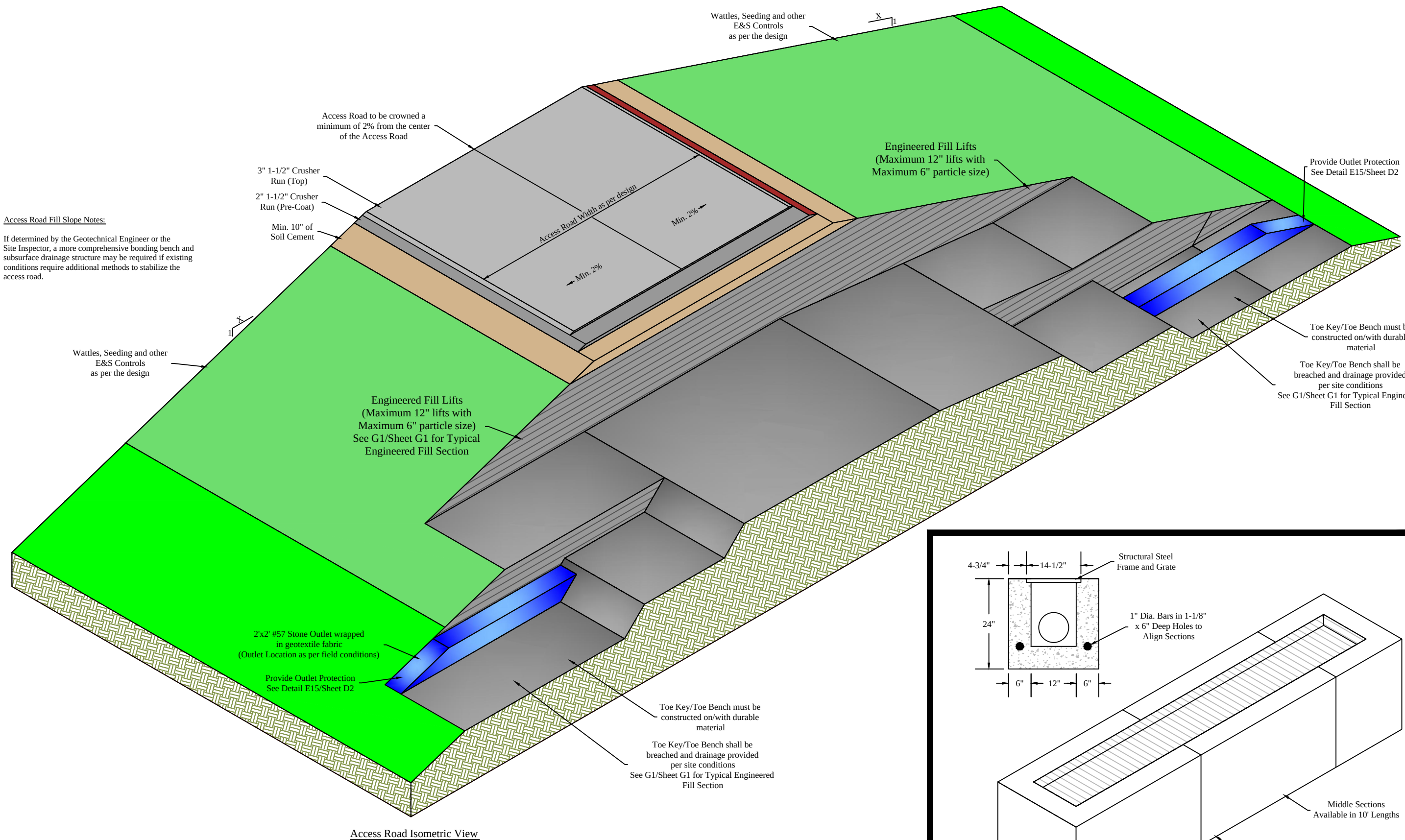
HG Energy LLC

Exhibit A: As-Built Modification



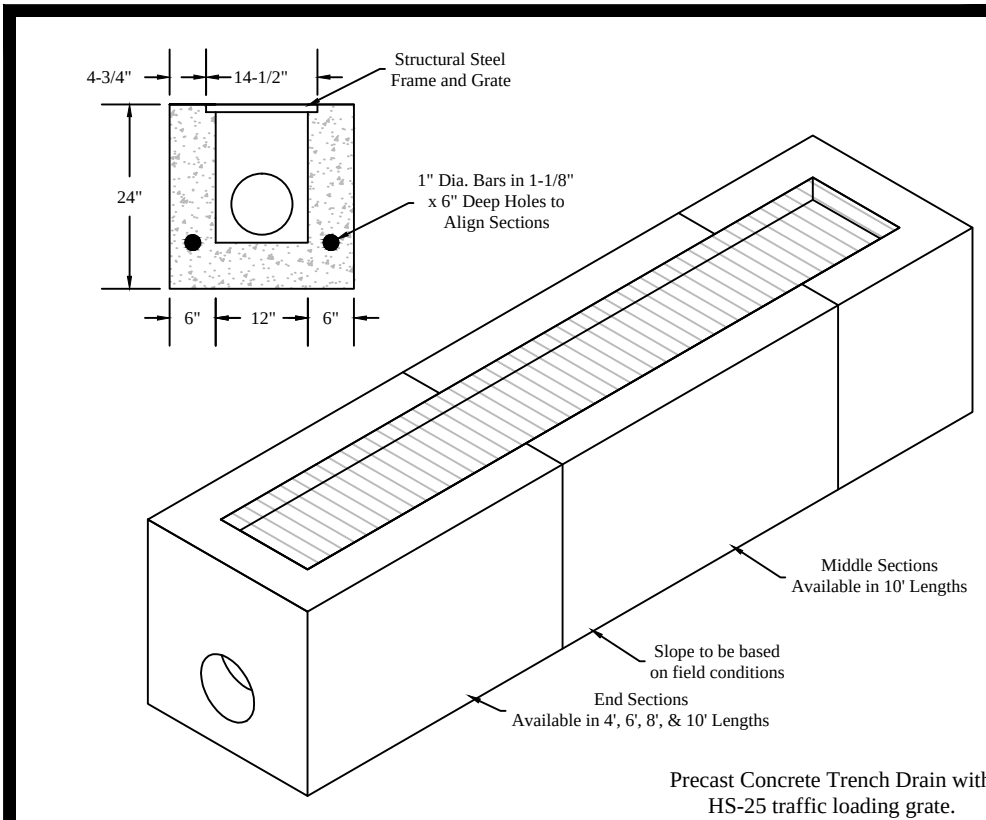
R1 Typical Access Road Cut Section Details

Scale: NTS



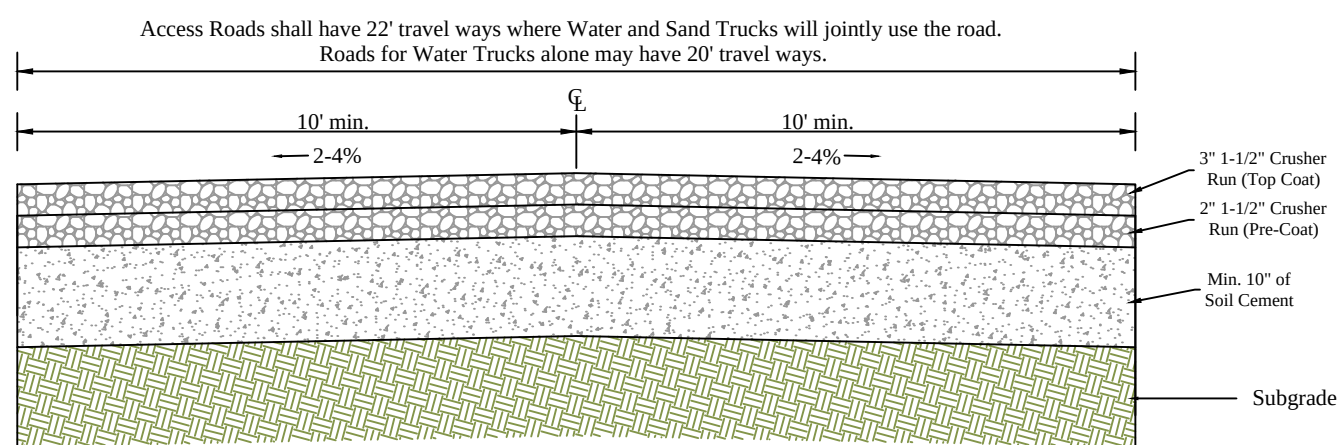
R2 Typical Access Road Fill Section Details

Scale: NTS



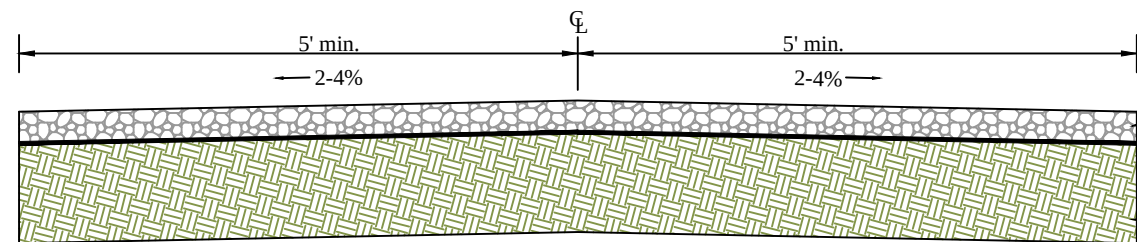
R8 Trench Grate Detail

Scale: NTS



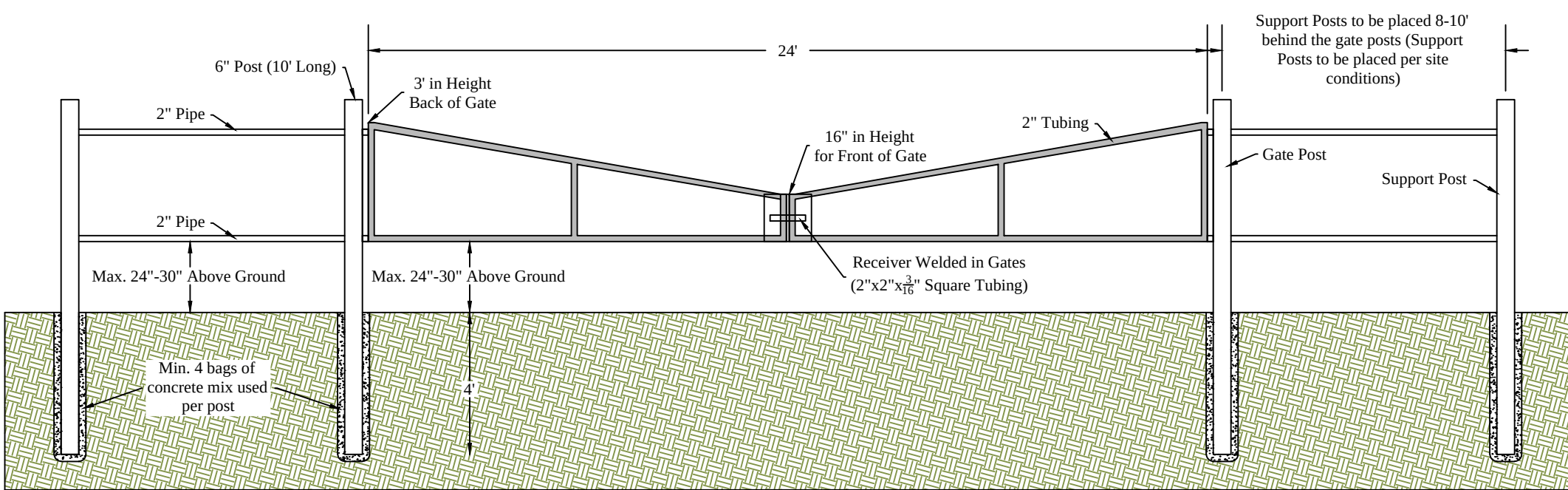
R3 Typical Access Road Surfacing Details

Scale: NTS



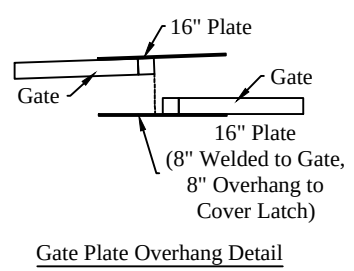
R4 Temporary/Adjacent Access Road Surfacing Details

Scale: NTS



R5 Access Road Gate Detail

Scale: NTS



Gate Specification and Installation

- Prior to any excavation or installation, a "One Call" must be performed
- Gates shall be constructed of Two Inch (2") square tubing
 - Gate posts shall be constructed of Six Inch (6") Steel Pipe, Ten Feet (10') in length
 - Gates are to be Twelve Feet (12') in length each with at least 1 upright brace between the front and rear uprights
 - Two (2) posts will be used to hang gates and an additional Two (2) posts shall be used as supports, approximately 8-10' behind the gate posts
 - Two Inch (2") pipe may be used as bracing between gate posts to secure posts and keep ATV's from going around the gate
 - Gate posts should be installed Four Feet (4') in the ground with a minimum of four (4) bags of concrete mix used per post
 - Gates will have a Sixteen Inch (16") steel plate welded at closure points to secure locks. The plate shall be mounted so that Eight Inches (8") of the plate is welded to the gate and Eight Inches (8") is left to overhang to overlap the other gate
 - The receiver for the latch on the gate needs to be constructed using 2"x2"x 1/8" tubing to allow space for the latch
 - The bottom of the gates shall be between 24"-30" max. above the road surface to prevent ATV's from driving under the gates
 - Gates shall be painted safety yellow and signs shall be provided to attach to the gates
 - A spacing of 1" between the gates needs to be maintained for the latch to fit and operate properly
 - Fabricators shall have freedom to design their hinges to allow adjustability as the gates require precise installation for the latch system to work properly. A typical design is available from HG Energy LLC
 - Proper function of the gates must be verified before leaving the site

CONSTRUCTION STAKING GUIDE & STANDARD RIBBON COLOR SCHEME

03/14/2025

	Yellow Ribbon: Yellow Ribbon used to indicate top of Cuts (C) Cut to be determined at time of stakeout Slope determined by site design		Blue & White Stripe Ribbon: Blue & White Stripe Ribbon used to indicate Limits of Disturbance (LOD) and Clearing Limits
	Yellow and Orange Ribbon: Yellow and Orange Ribbon used to indicate Grade at Top of Pad/Pond/Pit		Orange & Black Stripe Ribbon: Orange & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Centerline or edge of access road Orange & Black Stripe Ribbon used to indicate Vertical Fill (VF) at centerline or edge of access road
	Orange Ribbon: Orange Ribbon used to indicate toes of Fills (F) Fill to be determined at time of stakeout Slope determined by site design		Pink & White Stripe Ribbon: Pink & White Stripe Ribbon used to indicate Erosion and Sediment Control Structures Silt Fence (SF) Reinforced Filter Fence (RFF) Super Silt Fence (SSF) Filter Sock (FS)
	Pink Ribbon: Pink Ribbon used to indicate Top Hole Location Pink Ribbon used to indicate Survey Control Location		Orange & White Stripe Ribbon: Orange & White Stripe Ribbon used to indicate Topsoil Stockpile Locations / Engineered Fill Stockpiles
	Pink & Black Stripe Ribbon: Pink & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Pad/Pond/Pit corner or edge Pink & Black Stripe Ribbon used to indicate Vertical Fill (VF) at Pad/Pond/Pit corner or edge Vertical Cut/Vertical Fill to be determined at time of stakeout		Blue Ribbon: Blue Ribbon used to indicate Centerline (CL) Ditch Blue Ribbon used to indicate Bottom (BTM) Sediment Traps

R6 Construction Staking Guide

Scale: NTS

Revision
Design
Date
02-04-2025

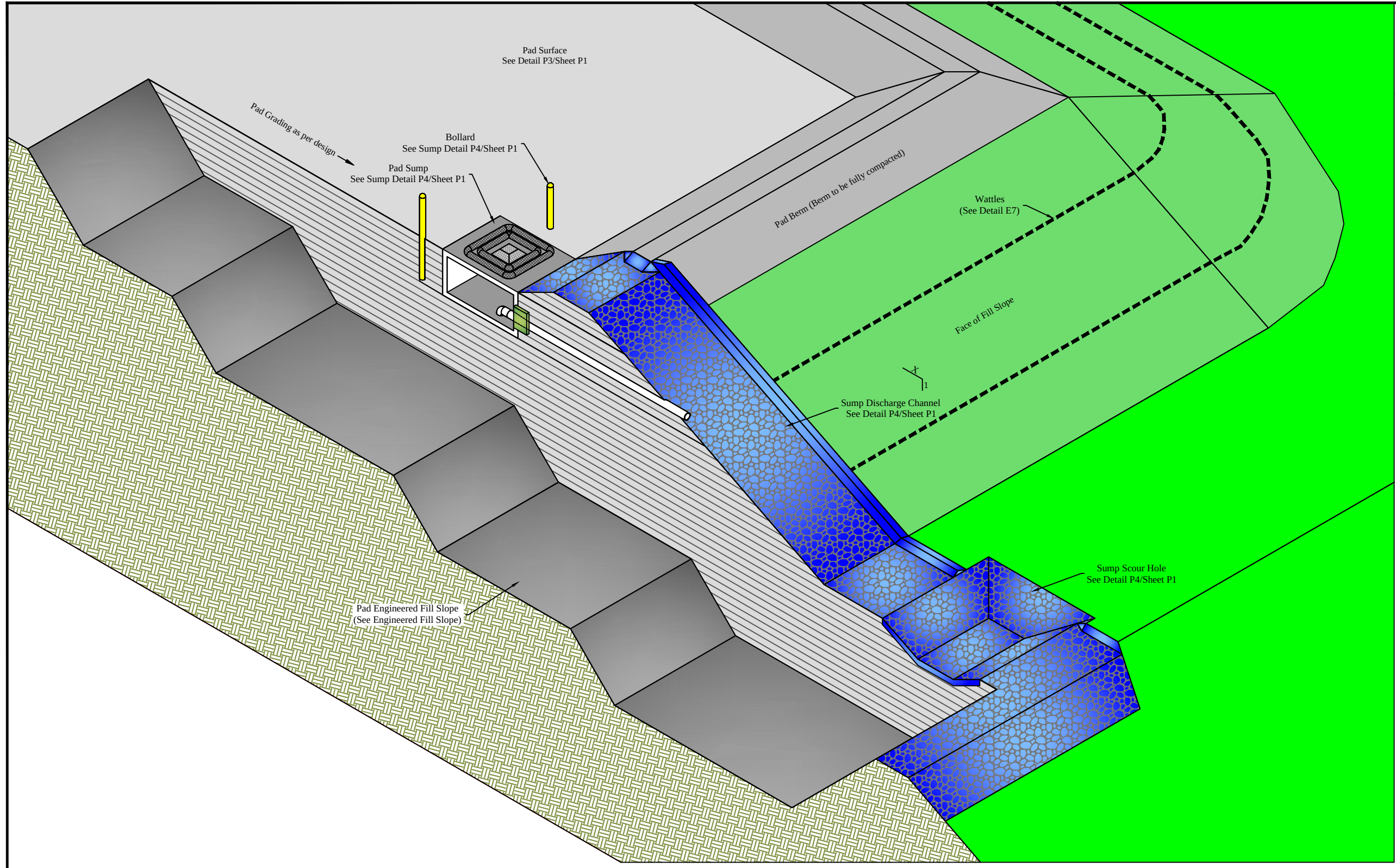


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HG ENERGY LLC

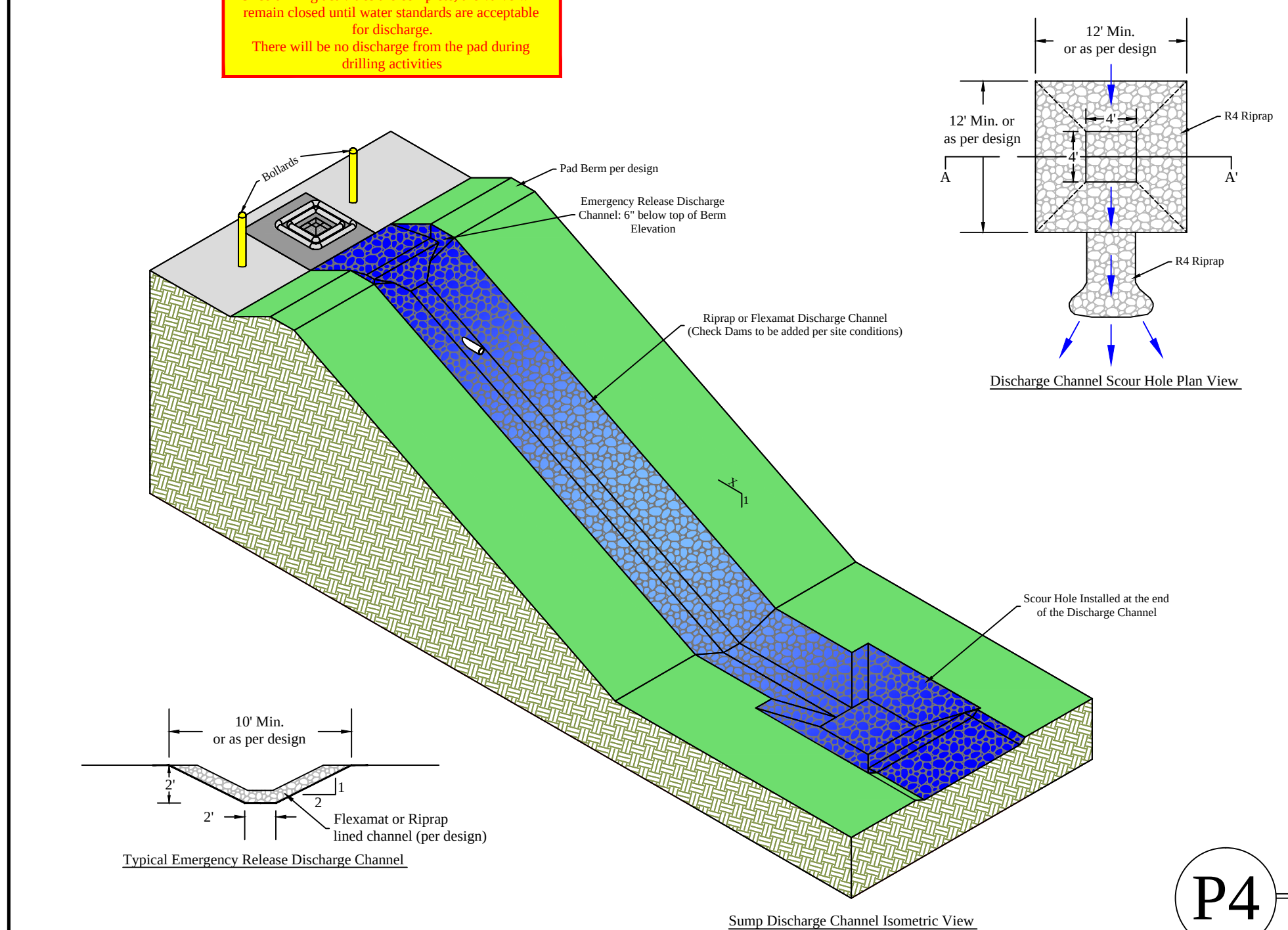
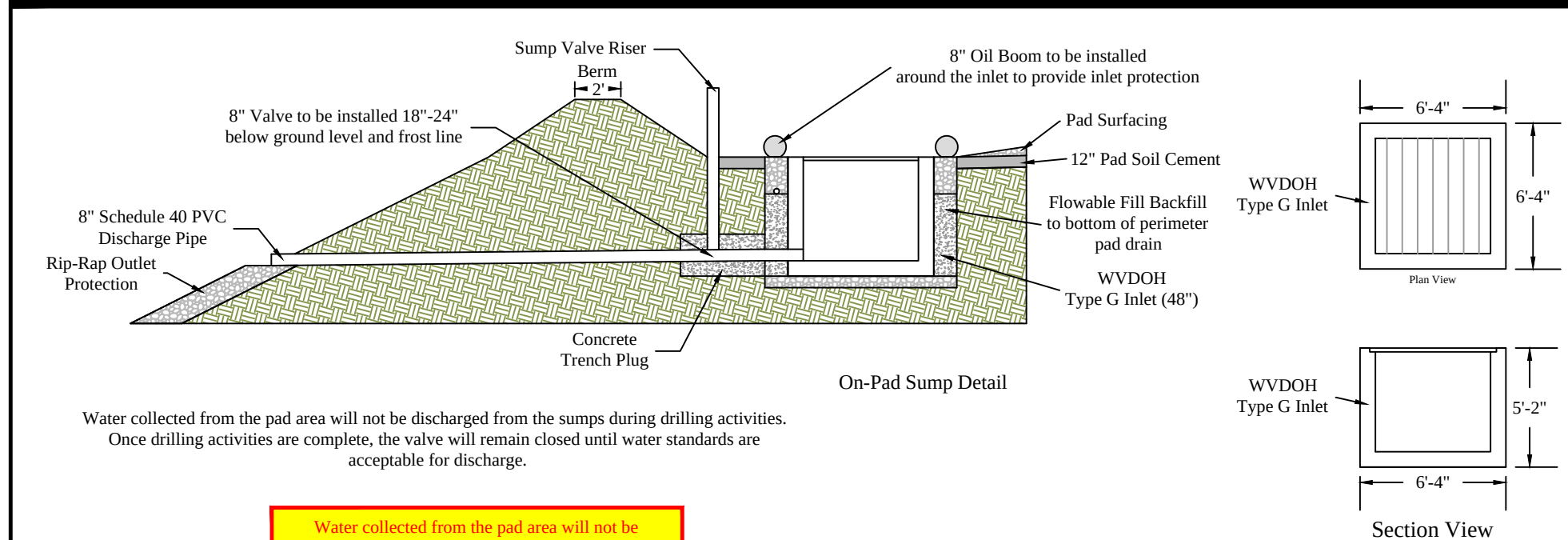


Typical Access Road Details
1221 Well Site
Freemans Creek District
Lewis County, WV

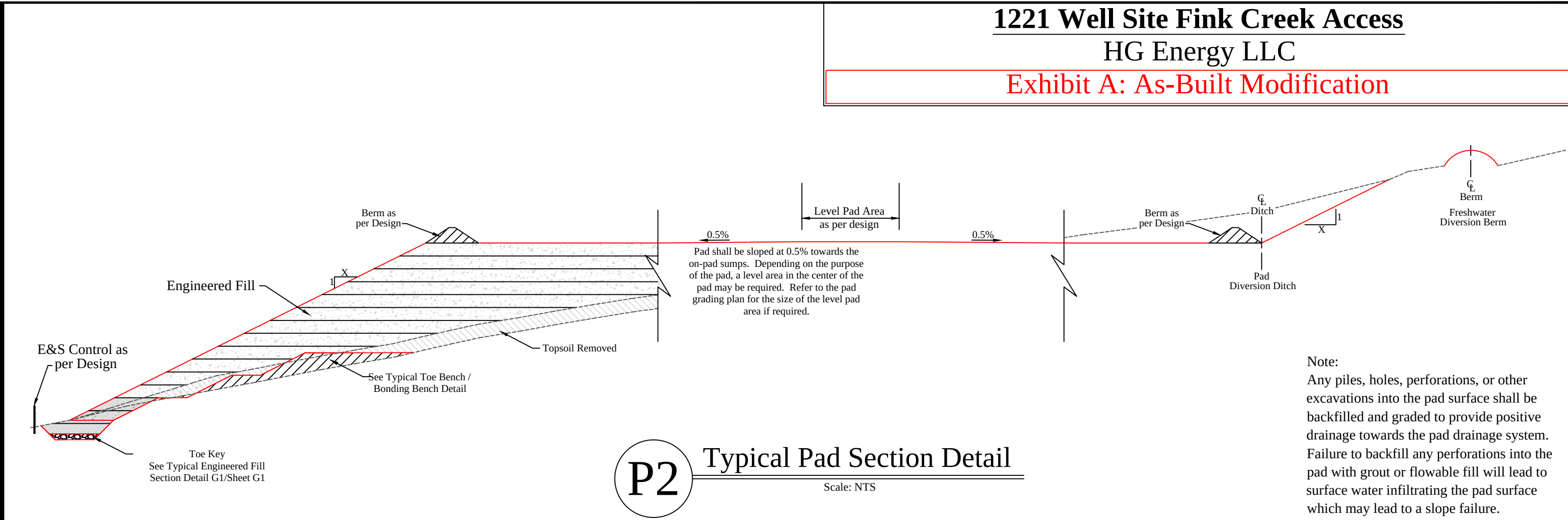
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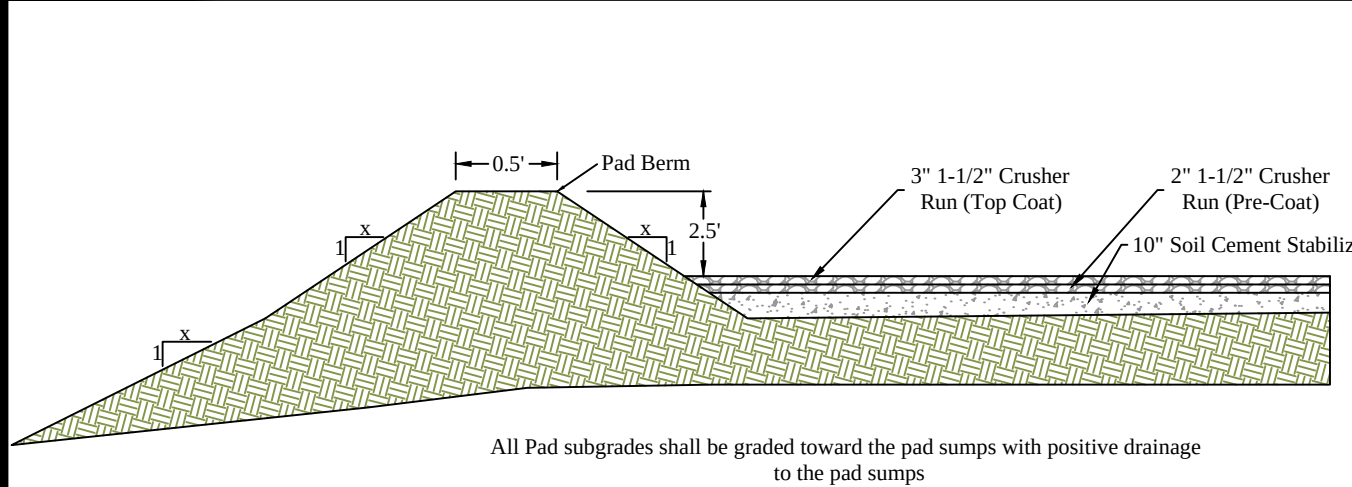
P1 Typical Pad Isometric View Detail
Scale: NTS



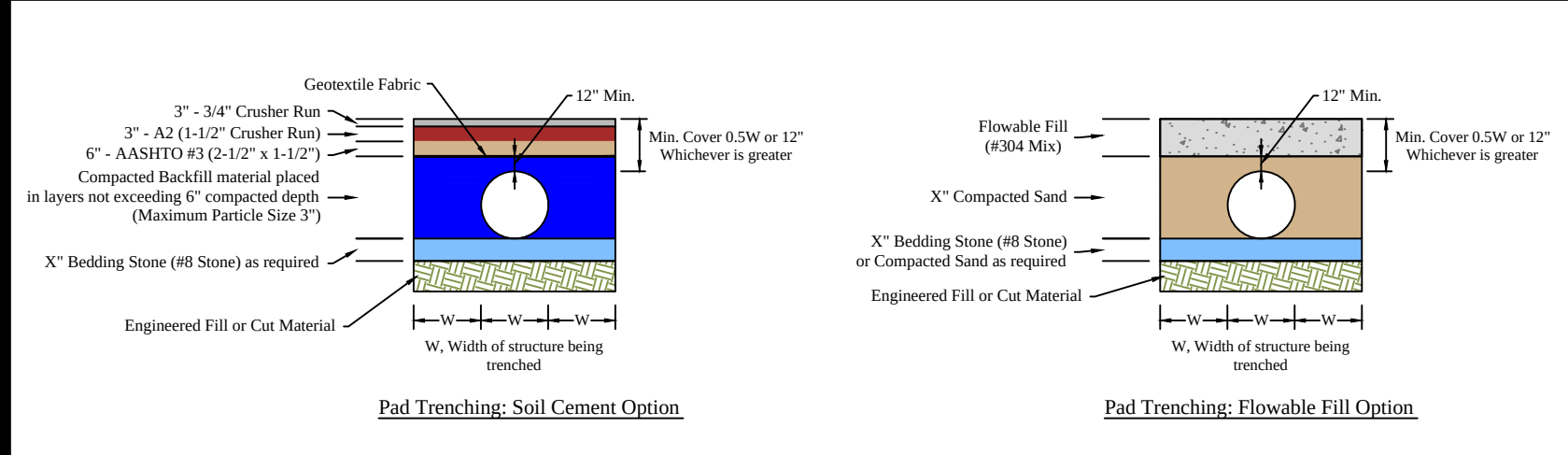
P4 On-Pad Sump Detail
Scale: NTS



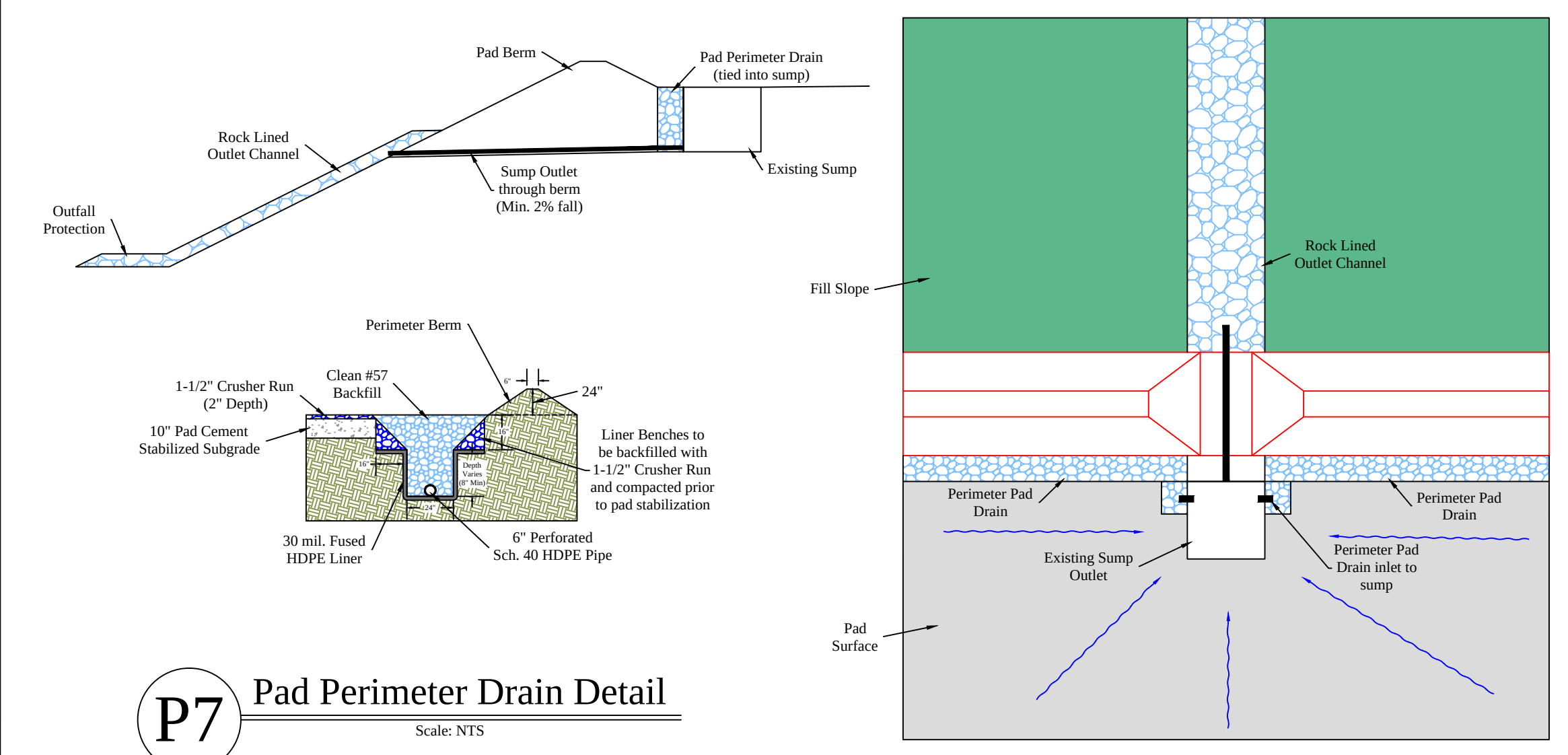
P2 Typical Pad Section Detail
Scale: NTS



P3 Pad Surfacing Detail
Scale: NTS



P6 Typical Pad Trenching Detail
Scale: NTS



P7 Pad Perimeter Drain Detail
Scale: NTS

03/14/2025

APPROVED
WVDEP OOG
Modification
3/14/2025