



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

Wednesday, April 12, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for CIDER RUN UNIT 1H
47-095-02839-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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.

A handwritten signature in blue ink, appearing to read "James A. Martin", is written over a faint blue circular stamp.

James A. Martin
Chief

Operator's Well Number: CIDER RUN UNIT 1H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02839-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

Promoting a healthy environment.

04/14/2023



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Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for CIDER RUN UNIT 2H
47-095-02840-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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: CIDER RUN UNIT 2H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02840-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

Promoting a healthy environment.

04/14/2023



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PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for PEACH FORK UNIT 1H
47-095-02841-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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: PEACH FORK UNIT 1H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02841-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

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PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for PEACH FORK UNIT 2H
47-095-02842-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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: PEACH FORK UNIT 2H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02842-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

Promoting a healthy environment.

04/14/2023



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Wednesday, April 12, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for SPILI UNIT 1H
47-095-02843-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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: SPILI UNIT 1H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02843-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

Promoting a healthy environment.

04/14/2023



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Wednesday, April 12, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for SPILI UNIT 2H
47-095-02844-00-00

Expanded LOD for surface owner access

ANTERO RESOURCES CORPORATION

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: SPILI UNIT 2H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02844-00-00
Horizontal 6A New Drill
Date Modification Issued: 4/12/2023

Promoting a healthy environment.

04/14/2023

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
 LATITUDE: 39.555311 LONGITUDE: -80.823601 (NAD 83)
 N 4378417.80 E 515154.61 (UTM ZONE 17 METERS)
 LATITUDE: 39.555232 LONGITUDE: -80.823776 (NAD 27)

CENTER OF TANK
 LATITUDE: 39.550796 LONGITUDE: -80.830994 (NAD 83)
 N 4377915.59 E 514520.37 (UTM ZONE 17 METERS)
 LATITUDE: 39.550718 LONGITUDE: -80.831169 (NAD 27)

CENTROID OF PAD
 LATITUDE: 39.548024 LONGITUDE: -80.836246 (NAD 83)
 N 4377607.01 E 514069.68 (UTM ZONE 17 METERS)
 LATITUDE: 39.547945 LONGITUDE: -80.836421 (NAD 27)

GENERAL DESCRIPTION:

THE ACCESS ROAD(S), WATER CONTAINMENT PAD, AND WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

FLOODPLAIN NOTES:

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #540950075C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION HAS NOTIFIED MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION HAVE OBTAINED AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN JUNE/JULY, 2021 BY GAI TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE JULY 28, 2021 POTENTIALLY JURISDICTIONAL WATERS MAP WAS PREPARED BY GAI AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USAGE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES BE CONSULTED IN AN EFFORT TO GAIN WRITTEN CONFIRMATION OF THE DELINEATION SHOWN ON THIS EXHIBIT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

GEOTECHNICAL NOTES:

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. BETWEEN JULY 19, 2021 - AUGUST 04, 2021 AND FEBRUARY 21-22 2022. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED SEPTEMBER 03, 2021 REVISED MARCH 03, 2022, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

PROJECT CONTACTS:

ROBERT EDDY - UTILITY COORDINATOR
 CELL: (304) 719-5199

MARK HUTSON - LAND AGENT
 CELL: (304) 669-8315

ENGINEER/SURVEYOR:
 NAVITUS ENGINEERING, INC.
 CYRUS S. KUMP, PE - PROJECT
 MANAGER/ENGINEER
 OFFICE: (888) 662-4185 CELL: (540) 686-6747

ENVIRONMENTAL:
 GAI CONSULTANTS, INC.
 JASON A. COOK - SENIOR ENVIRONMENTAL
 SPECIALIST
 OFFICE: (304) 926-8100 CELL: (303) 709-3306

GEOTECHNICAL:
 PENNSYLVANIA SOIL & ROCK, INC.
 CHRISTOPHER W. SAMIOS - PROJECT ENGINEER
 OFFICE: (412) 372-4000 CELL: (412) 589-0662

OPERATOR:
 ANTERO RESOURCES CORPORATION
 535 WHITE OAKS BLVD.
 BRIDGEPORT, WV 26330
 PHONE: (304) 842-4100
 FAX: (304) 842-4102

ELI WAGONER - ENVIRONMENTAL ENGINEER &
 REGULATORY MANAGER
 OFFICE: (304) 842-4068 CELL: (304) 476-9770

JON McEVERS - SVP OPERATIONS
 OFFICE: (303) 357-6799

AARON KUNZLER - CONSTRUCTION MANAGER
 CELL: (304) 842-4191

ROBERT WIRKS - DESIGN MANAGER
 OFFICE: (304) 842-4100 CELL: (304) 627-7405

NOTES:

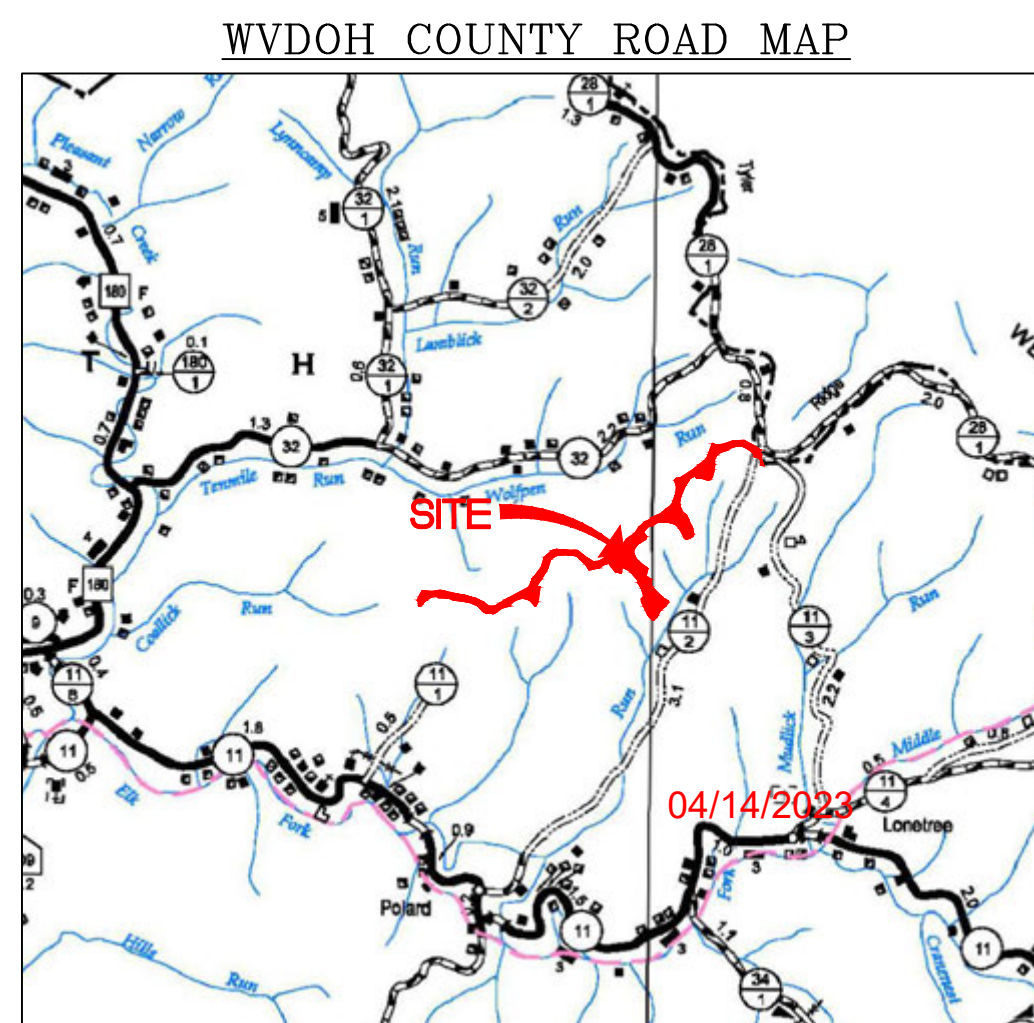
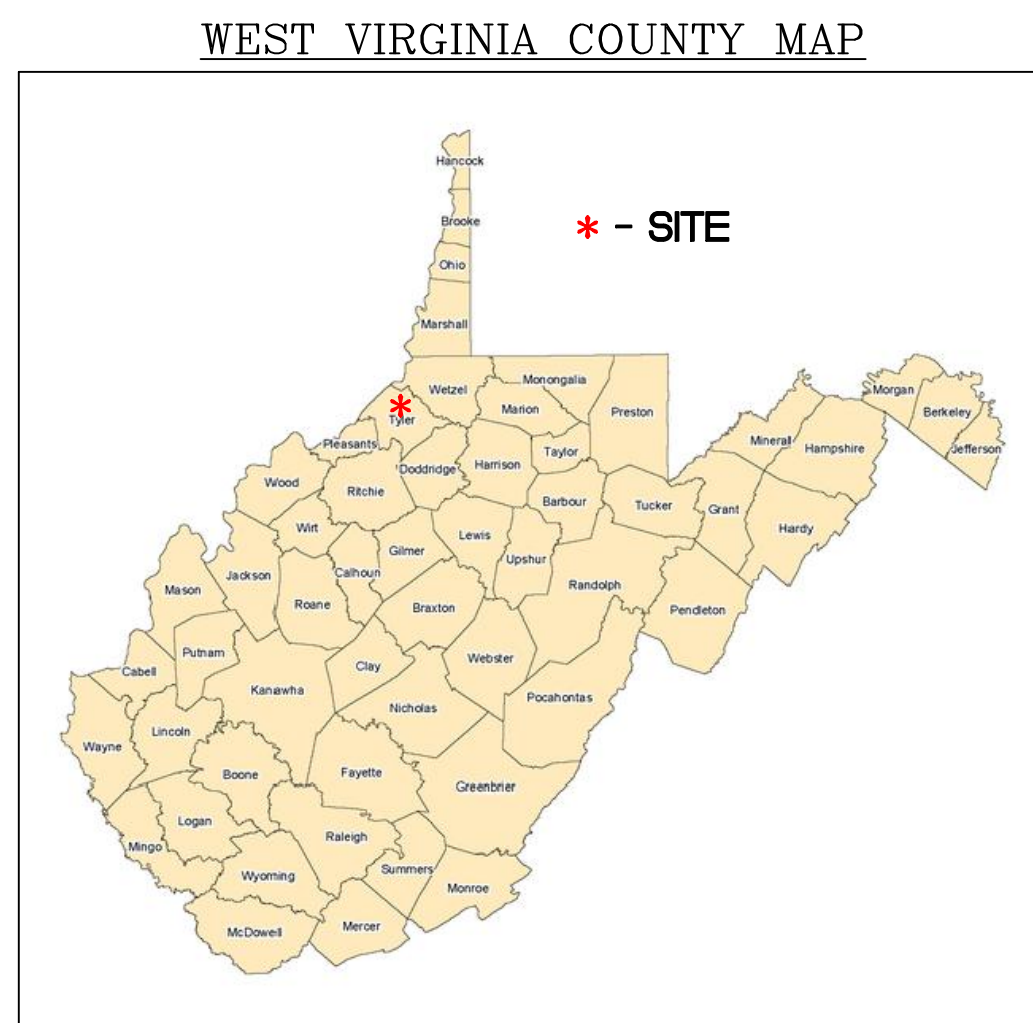
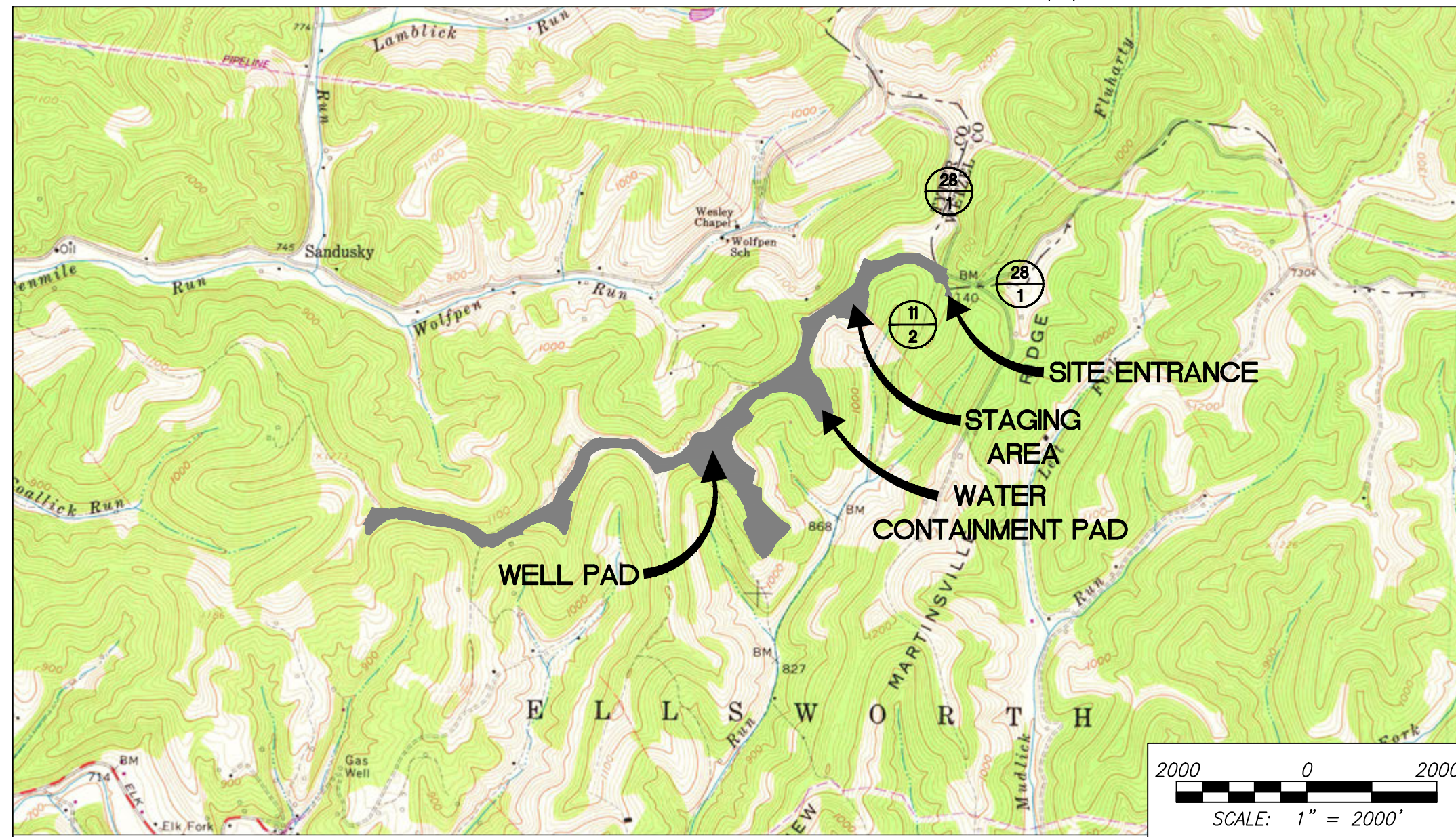
- ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A BIWEEKLY BASIS.
- THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
- ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
- ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
- THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF JANUARY 19, 2023. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATES.
- THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
- THE EXISTING EGREGESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.



ED YOST WELL PAD & WATER CONTAINMENT PAD AS-BUILT EROSION & SEDIMENT CONTROL IMPROVEMENT PLANS

ELLSWORTH DISTRICT, TYLER COUNTY, WV
 POINT PLEASANT CREEK WATERSHED

PORTERS FALLS USGS 7.5 QUAD MAP(S)



| ED YOST LIMITS OF DISTURBANCE AREA (AC) | | | |
|--|--------------|--------------|--------------|
| Total Site | Permitted | Modification | Total |
| Access Road "A" (115') | 0.79 | 0.00 | 0.79 |
| Access Road "B" (4618') | 18.11 | 0.23 | 18.34 |
| Access Road "C" (5946') | 23.25 | 0.00 | 23.25 |
| Staging Area | 4.06 | 0.00 | 4.06 |
| Well Pad | 8.91 | 0.00 | 8.91 |
| Water Containment Pad | 4.76 | 0.00 | 4.76 |
| Excess/Topsoil Material Stockpiles | 21.94 | 0.00 | 21.94 |
| Total Affected Area | 81.82 | 0.23 | 82.05 |
| Total Wooded Acres Disturbed | 76.63 | 0.23 | 76.86 |
| Impacts to Josh Amos TM 07-5 | | | |
| Access Road "A" (115') | 0.48 | 0.00 | 0.48 |
| Total Affected Area | 0.48 | 0.00 | 0.48 |
| Total Wooded Acres Disturbed | 0.28 | 0.00 | 0.28 |
| Impacts to Charles E. & Martha Gump TM 07-4 | | | |
| Access Road "A" | 0.31 | 0.00 | 0.31 |
| Access Road "B" (1672') | 6.94 | 0.00 | 6.94 |
| Staging Area | 1.36 | 0.00 | 1.36 |
| Total Affected Area | 8.61 | 0.00 | 8.61 |
| Total Wooded Acres Disturbed | 7.59 | 0.00 | 7.59 |
| Impacts to Lucille & David Guilley TM 07-18 | | | |
| Access Road "B" (102') | 1.90 | 0.00 | 1.90 |
| Water Containment Pad | 0.05 | 0.00 | 0.05 |
| Total Affected Area | 1.95 | 0.00 | 1.95 |
| Total Wooded Acres Disturbed | 1.95 | 0.00 | 1.95 |
| Impacts to Albert Est & Laura B. Rice TM 07-19 | | | |
| Access Road "B" (1395') | 3.46 | 0.00 | 3.46 |
| Staging Area | 2.70 | 0.00 | 2.70 |
| Water Containment Pad | 0.62 | 0.00 | 0.62 |
| Total Affected Area | 6.78 | 0.00 | 6.78 |
| Total Wooded Acres Disturbed | 6.78 | 0.00 | 6.78 |
| Impacts to Beatty Wash Et Al TM 07-20 | | | |
| Water Containment Pad | 1.44 | 0.00 | 1.44 |
| Excess/Topsoil Material Stockpiles | 3.25 | 0.00 | 3.25 |
| Total Affected Area | 4.69 | 0.00 | 4.69 |
| Total Wooded Acres Disturbed | 4.69 | 0.00 | 4.69 |
| Impacts to Edward Yost Estate TM 07-29 | | | |
| Access Road "B" (403') | 1.04 | 0.00 | 1.04 |
| Water Containment Pad | 0.26 | 0.00 | 0.26 |
| Total Affected Area | 1.30 | 0.00 | 1.30 |
| Total Wooded Acres Disturbed | 1.30 | 0.00 | 1.30 |
| Impacts to Yost Edward Estate & Flode & Minks Dale Adams & Minks Mike C/O Ernest E Yost TM 07-31 | | | |
| Access Road "B" (1046') | 4.56 | 0.23 | 4.79 |
| Access Road "C" (70') | 0.14 | 0.00 | 0.14 |
| Well Pad | 7.00 | 0.00 | 7.00 |
| Water Containment Pad | 2.39 | 0.00 | 2.39 |
| Excess/Topsoil Material Stockpiles | 15.69 | 0.00 | 15.69 |
| Total Affected Area | 29.78 | 0.23 | 30.01 |
| Total Wooded Acres Disturbed | 29.78 | 0.23 | 30.01 |

| Impacts to Flode Yost Estate & Roy D. & Betty L. Hadley TM 07-30 | | | |
|--|--------------|-------------|--------------|
| Access Road "B" | 0.21 | 0.00 | 0.21 |
| Access Road "C" | 0.14 | 0.00 | 0.14 |
| Well Pad | 1.91 | 0.00 | 1.91 |
| Total Affected Area | 2.26 | 0.00 | 2.26 |
| Total Wooded Acres Disturbed | 2.26 | 0.00 | 2.26 |
| Impacts to Gary A. Midcap TM 07-33 | | | |
| Access Road "C" (19') | 0.17 | 0.00 | 0.17 |
| Total Affected Area | 0.17 | 0.00 | 0.17 |
| Total Wooded Acres Disturbed | 0.17 | 0.00 | 0.17 |
| Impacts to Robert A. Mercer TM 07-32 | | | |
| Access Road "C" (3812') | 14.13 | 0.00 | 14.13 |
| Excess/Topsoil Material Stockpiles | 2.88 | 0.00 | 2.88 |
| Total Affected Area | 17.01 | 0.00 | 17.01 |
| Total Wooded Acres Disturbed | 14.41 | 0.00 | 14.41 |
| Impacts to James Burl Rice Estate TM 07-34 | | | |
| Access Road "C" | 0.35 | 0.00 | 0.35 |
| Excess/Topsoil Material Stockpiles | 0.12 | 0.00 | 0.12 |
| Total Affected Area | 0.47 | 0.00 | 0.47 |
| Total Wooded Acres Disturbed | 0.40 | 0.00 | 0.40 |
| Impacts to Rutter Family Revocable Trust TM 10-6 | | | |
| Access Road "C" (255') | 0.10 | 0.00 | 0.10 |
| Total Affected Area | 0.10 | 0.00 | 0.10 |
| Total Wooded Acres Disturbed | 0.10 | 0.00 | 0.10 |
| Impacts to Brian E. & Barbara J. Courtney TM 10-5 | | | |
| Access Road "C" (492') | 2.51 | 0.00 | 2.51 |
| Total Affected Area | 2.51 | 0.00 | 2.51 |
| Total Wooded Acres Disturbed | 2.29 | 0.00 | 2.29 |
| Impacts to Larry M. & Amy B. Adams TM 06-30.1 | | | |
| Access Road "C" (969') | 4.01 | 0.00 | 4.01 |
| Total Affected Area | 4.01 | 0.00 | 4.01 |
| Total Wooded Acres Disturbed | 3.55 | 0.00 | 3.55 |
| Impacts to Stefan L. & Alberta B. Smolski TM 10-4 | | | |
| Access Road "C" (241') | 0.96 | 0.00 | 0.96 |
| Total Affected Area | 0.96 | 0.00 | 0.96 |
| Total Wooded Acres Disturbed | 0.95 | 0.00 | 0.95 |
| Impacts to Dennis R. & Clista A. Heintzman TM 06-36 | | | |
| Access Road "C" (87') | 0.74 | 0.00 | 0.74 |
| Total Affected Area | 0.74 | 0.00 | 0.74 |
| Total Wooded Acres Disturbed | 0.13 | 0.00 | 0.13 |

| Well Name | WV North NAD 27 | NAD 27 Lat & Long | UTM (METERS) ZONE 17 | | NAD 83 Lat & Long |
|-----------------------------|-----------------------------|--|-----------------------------|--|--|
| | | | Permitted Location | | |
| CIDER RUN UNIT 1H | N 384450.89 E 1623086.55 | LAT 39-32-52.2385 LONG -80-50-11.9580 | N 4377595.75 E 514049.60 | | LAT 39-32-52.5206 LONG -80-50-11.3292 |
| CIDER RUN UNIT 2H | N 384460.98 E 1623097.66 | LAT 39-32-52.3398 LONG -80-50-11.8182 | N 4377598.88 E 514052.94 | | LAT 39-32-52.6219 LONG -80-50-11.1893 |
| PEACH FORK UNIT 1H | N 384471.06 E 1623108.76 | LAT 39-32-52.4411 LONG -80-50-11.6784 | N 4377602.01 E 514056.27 | | LAT 39-32-52.7232 LONG -80-50-11.0495 |
| PEACH FORK UNIT 2H | N 384481.14 E 1623119.87 | LAT 39-32-52.5424 LONG -80-50-11.5385 | N 4377605.14 E 514059.60 | | LAT 39-32-52.8245 LONG -80-50-10.9096 |
| SPLI UNIT 1H | N 384491.23 E 1623130.97 | LAT 39-32-52.6437 LONG -80-50-11.3987 | N 4377608.27 E 514062.93 | | LAT 39-32-52.9257 LONG -80-50-10.7698 |
| SPLI UNIT 2H | N 384501.31 E 1623142.08 | LAT 39-32-52.7449 LONG -80-50-11.2589 | N 4377611.39 E 514066.26 | | LAT 39-32-53.0270 LONG -80-50-10.6299 |
| ED YOST UNIT 5H (PERMITTED) | N 384388.94 E 1623073.18 | LAT 39-32-51.6243 LONG -80-50-12.1170 | N 4377576.81 E 514045.84 | | LAT 39-32-51.9064 LONG -80-50-11.4881 |
| Well Pad Elevation | | | 1,233.0 | | |

| ED YOST EPHEMERAL STREAM IMPACT (LINEAR FEET) | | | | | |
|---|---------------------|--------------------------------|-----------------------------|--|-------------------|
| Stream and Impact Cause | Permanent Impacts | | Temp. Impacts | | Total Impact (LF) |
| | Culvert / Fill (LF) | Inlets/Outlets Structures (LF) | Cofferdam/E&S Controls (LF) | | |
| Stream 006 (Access Road) | 51 | 16 | 16 | | 83 |
| Stream 003 (Access Road) | 0 | 0 | 36 | | 36 |
| Stream 023 (Well Pad) | 110 | 0 | 62 | | 172 |
| Stream 024 (Well Pad) | 0 | 0 | 52 | | 52 |
| Stream 032 (Access Road) | 0 | 0 | 10 | | 10 |

AS-BUILT CERTIFICATIONS:
 THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

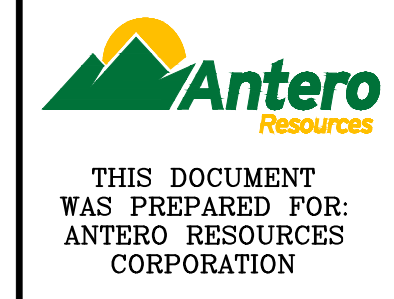
MISS Utility of West Virginia
 1-800-245-4848
 West Virginia State Law
 (Section XIV: Chapter 24-C)
 Requires that you call two
 business days before you dig in
 the state of West Virginia.
 IT'S THE LAW!!

WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
 NORTH ZONE, NAD83
 ELEVATION BASED ON NAVD83
 ESTABLISHED BY SURVEY GRADE GPS & OPUS
 POST-PROCESSING

SHEET INDEX:

- 1 - COVER SHEET
- 2 - NOTES
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- 4 - OVERALL PLAN SHEET INDEX
- 5 - ACCESS ROAD AS-BUILT PLAN
- 6 - ACCESS ROAD & STAGING AREA AS-BUILT PLAN
- 7 - ACCESS ROAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT PLAN
- 8 - ACCESS ROAD & WATER CONTAINMENT PAD AS-BUILT PLAN
- 9 - ACCESS ROAD, WELL PAD & STOCKPILE AS-BUILT PLAN
- 10 - STOCKPILE AS-BUILT PLAN
- 11 - ACCESS ROAD AS-BUILT PLAN
- 12 - ACCESS ROAD & STOCKPILE AS-BUILT PLAN
- 13-14 - ACCESS ROAD AS-BUILT PLAN
- 15-19 - ACCESS ROAD AS-BUILT PROFILES
- 20 - WELL PAD, WATER CONTAINMENT PAD, STAGING AREA & STOCKPILE AS-BUILT SECTIONS
- 21 - STOCKPILE AS-BUILT SECTIONS
- 22-24 - CONSTRUCTION DETAILS

| DATE | REVISION |
|------------|------------------------------------|
| 03/13/2023 | REVISED PER LANDOWNER ROAD LOD MOD |



ED YOST
 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
 SCALE: AS SHOWN
 SHEET 1 OF 24

LEGEND

| LEGEND | | | |
|--|--|---|--|
| EX. INDEX CONTOUR & CONTOUR LABEL | | PR. INDEX CONTOUR (10' INTERVAL) & CONTOUR LABEL | |
| EX. INTERMEDIATE CONTOUR | | PR. INTERMEDIATE CONTOUR (2' INTERVAL) | |
| EX. PROPERTY LINE | | PR. INTERMEDIATE CONTOUR (1' INTERVAL) | |
| EX. TOP OF BERM | | PR. INDEX ROAD CONTOUR (10' INTERVAL) & CONTOUR LABEL | |
| EX. ROAD EDGE OF GRAVEL/DIRT | | PR. INTERMEDIATE ROAD CONTOUR (2' INTERVAL) | |
| EX. ROAD EDGE OF PAVEMENT | | PR. PADS/STOCKPILE TOPO LIMITS | |
| EX. ROAD CENTERLINE | | PERMITTED LIMITS OF DISTURBANCE | |
| EX. GUARDRAIL | | MODIFICATION LIMITS OF DISTURBANCE | |
| EX. BRIDGE | | PR. ROAD/IMPOUNDMENT EDGE OF GRAVEL | |
| EX. DITCHLINE/DRAINAGE FEATURE | | PR. ROAD EDGE OF PAVEMENT | |
| EX. RIP-RAP | | PR. ROAD CENTERLINE | |
| EX. CULVERT | | PR. GUARDRAIL | |
| EX. TREELINE | | PR. ROCK CONSTRUCTION ENTRANCE | |
| EX. BUILDING | | PR. AIR BRIDGE | |
| EX. MISCELLANEOUS FEATURE | | PR. CULVERT | |
| EX. 100 YR FEMA FLOODPLAIN | | PR. DITCH | |
| EX. DELINEATED STREAM | | PR. RIP-RAP TRAPEZOIDAL DITCH | |
| EX. DELINEATED WETLAND/POND | | PR. OUTLET PROTECTION | |
| 100' WETLAND/STREAM BUFFER | | PR. ROCK LEVEL SPREADER | |
| STREAM/WETLAND DELINEATION STUDY AREA | | PR. COMPOST FILTER SOCK | |
| EX. FENCELINE | | PR. SMART FENCE HD | |
| EX. GATE | | PR. WELL HEAD | |
| EX. PERIMETER SAFETY FENCE | | PR. PAD DEWATERING SYSTEM | |
| EX. ACCESS GATE WITH EMERGENCY LIFELINE | | PR. TOP OF PAD CONTAINMENT BERM | |
| EX. WELL HEAD ON DESIGNED PAD | | PR. 220' X 320' PAD FOOTPRINT | |
| EX. GAS WELL | | PR. SPOT SHOT | |
| EX. PIPELINE | | PR. PERIMETER SAFETY FENCE | |
| EX. PIPELINE R/W | | PR. ACCESS GATE WITH EMERGENCY LIFELINE | |
| EX. PIPELINE METER | | PR. PIPELINE | |
| EX. PIPELINE VALVE | | PR. PIPELINE R/W | |
| EX. PIT | | PR. OVERHEAD UTILITY | |
| EX. OVERHEAD UTILITY | | PR. POWER POLE/GUY WIRE | |
| EX. POWER POLE/GUY WIRE | | PR. OVERHEAD UTILITY R/W | |
| EX. UNDERGROUND ELECTRIC | | PR. WATERLINE | |
| EX. UNDERGROUND TELEPHONE | | BORING LOCATION | |
| EX. UNDERGROUND FIBER OPTIC | | X-SECTION/PROFILE GRID INDEX | |
| EX. UTILITY R/W | | X-SECTION/PROFILE GRID INTERMEDIATE | |
| EX. WATERLINE | | X-SECTION/PROFILE PROPOSED GRADE | |
| EX. WATER WELL/EX. SPRING | | X-SECTION/PROFILE EXISTING GRADE | |
| EX. COMPOST SOCK | | X-SECTION/PROFILE WATER SURFACE | |
| EX. SMART FENCE HD | | X-SECTION/PROFILE CULVERT | |
| EX. SILT FENCE | | MATCHLINE | |
| APPROX. LOCATION OF SLIDE AREA | | EX. METER | |
| APPROX. LOCATION OF BORROW/ SPOIL AREA | | EX. TANK | |
| PR. TOE BENCH | | EX. COMBUSTOR | |
| EX. APPROX. SURFACE & SUB-SURFACE ELECTRIC LINE AREA | | EX. GPU | |
| EX. APPROX. SURFACE & SUB-SURFACE DUMP LINE AREA | | EX. SEPARATOR | |
| EX. APPROX. SURFACE & SUB-SURFACE WELL LINE AREA | | EX. VRT | |
| EX. APPROX. SURFACE & SUB-SURFACE SALES LINE AREA | | EX. KNOCK-OUT VESSEL | |
| | | EX. STAIRS/CATWALK | |
| | | EX. DEWATERING SYSTEM | |
| | | EX. PIG LAUNCHER | |
| | | EX. SECONDARY CONTAINMENT | |
| | | EX. ABOVE-GND VAPOR LINE | |
| | | EX. ESD | |
| | | EX. MAILBOX | |
| | | EX. CONTROL PT. | |
| | | EX. MUSTER AREA | |

APPROVED
WVDEP OOG
 MODIFICATION
 4/12/2023

| DATE | REVISION |
|------------|------------------------------------|
| 03/13/2023 | REVISED PER LANDOWNER ROAD LOD MOD |
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Antero Resources
 THIS DOCUMENT WAS PREPARED FOR:
 ANTERO RESOURCES CORPORATION

LEGEND
ED YOST
 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



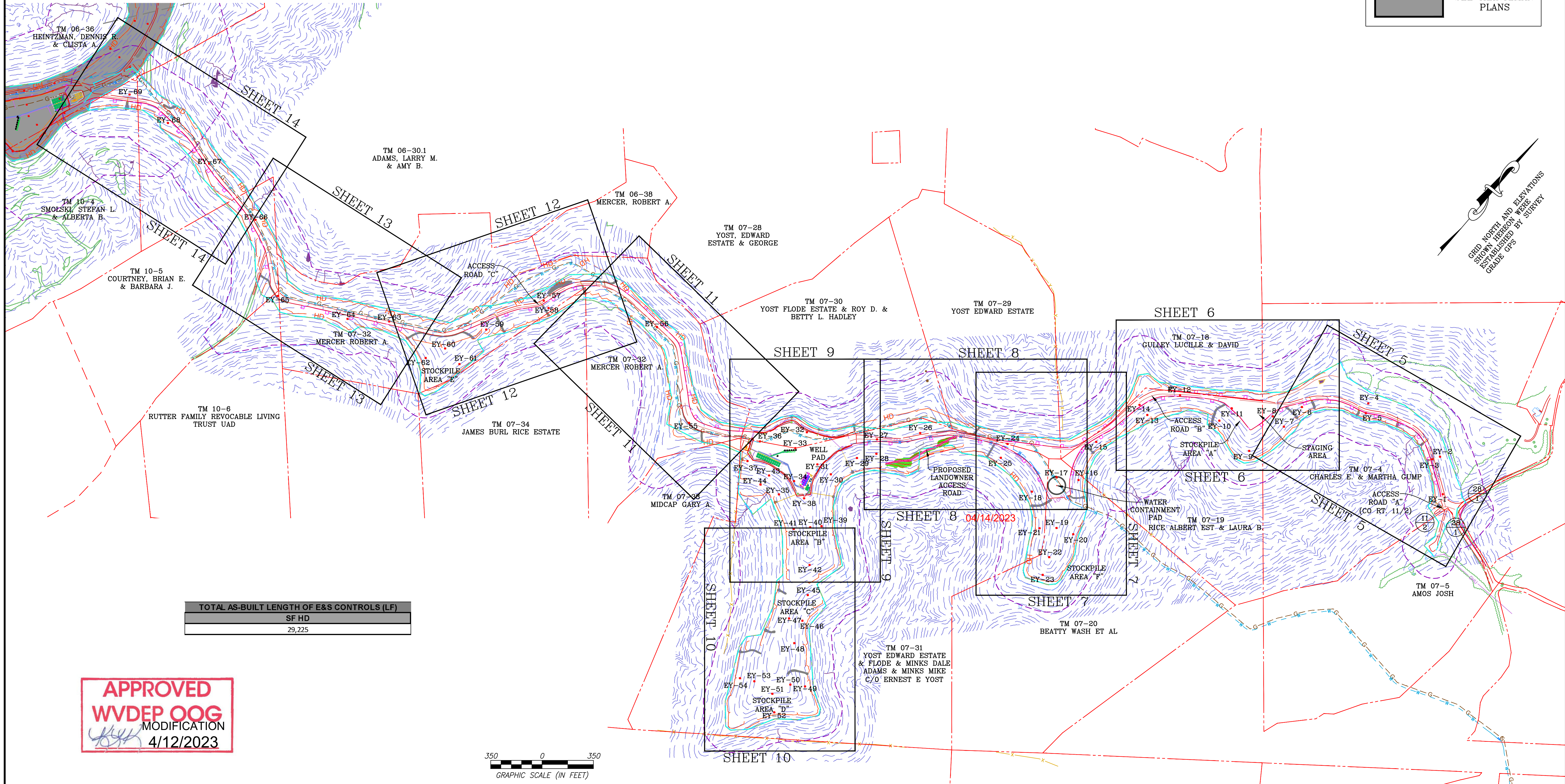
OVERALL PLAN SHEET INDEX

GENERAL NOTES:

1. THE TOPOGRAPHIC AND PROPERTY LINE INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY ANTERO MAY, 2021.
2. AS-BUILT INFORMATION SHOWN HEREON IS BASED ON FIELD SURVEY PERFORMED BY NAVITUS ENGINEERING, INC. ON JANUARY 19, 2023.
3. THE PROPERTY LINES SHOWN HEREON DO NOT REPRESENT A BOUNDARY SURVEY ON ANY OF THE PARCELS SHOWN. PROPERTY CORNERS AND LINES PERTINENT TO WELL LOCATION ARE BASED ON A FIELD SURVEY. THE REMAINDER OF THE PROPERTY LINES ARE BASED ON COUNTY REAL ESTATE TAX MAPS, GIS INFORMATION AND DEEDS OF RECORD.
4. UTILITIES AND THEIR LOCATIONS AS SHOWN HEREON ARE BASED ON: A) OBSERVABLE EVIDENCE OF THOSE VISIBLE, ABOVE-GROUND FACILITIES, FEATURES, AND MARKERS WHICH WERE FOUND ON THE SUBJECT PROPERTY AT THE TIME OF SURVEY PERFORMED BY NAVITUS ENGINEERING AND B) FIELD MARKINGS PLACED BY UTILITY COMPANIES IN RESPONSE TO THE WV 811 TICKET SUBMITTED BY NAVITUS ENGINEERING. NAVITUS ENGINEERING CANNOT GUARANTEE THE ACCURACY OF THE UTILITY MARKINGS PERFORMED BY OTHERS OR THAT ALL UTILITIES EXISTING WITHIN THE LIMITS OF THIS PLAN ARE SHOWN. ANY UTILITIES ENCOUNTERED SUBSEQUENT TO PLAN APPROVAL OR DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE PLAN SHOULD BE REPORTED TO NAVITUS ENGINEERING AND ANTERO RESOURCES CORPORATION.

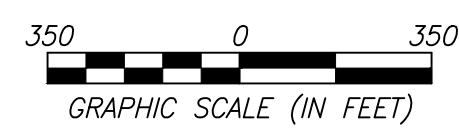
**LIMITS OF DISTURBANCE
LEGEND**

SEE HEINTZMAN
PLANS



| TOTAL AS-BUILT LENGTH OF E&S CONTROLS (LF) | |
|--|--------|
| SF HD | 29,225 |

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WVDEP OOG
MODIFICATION
4/12/2023



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ENERGY ENGINEERING
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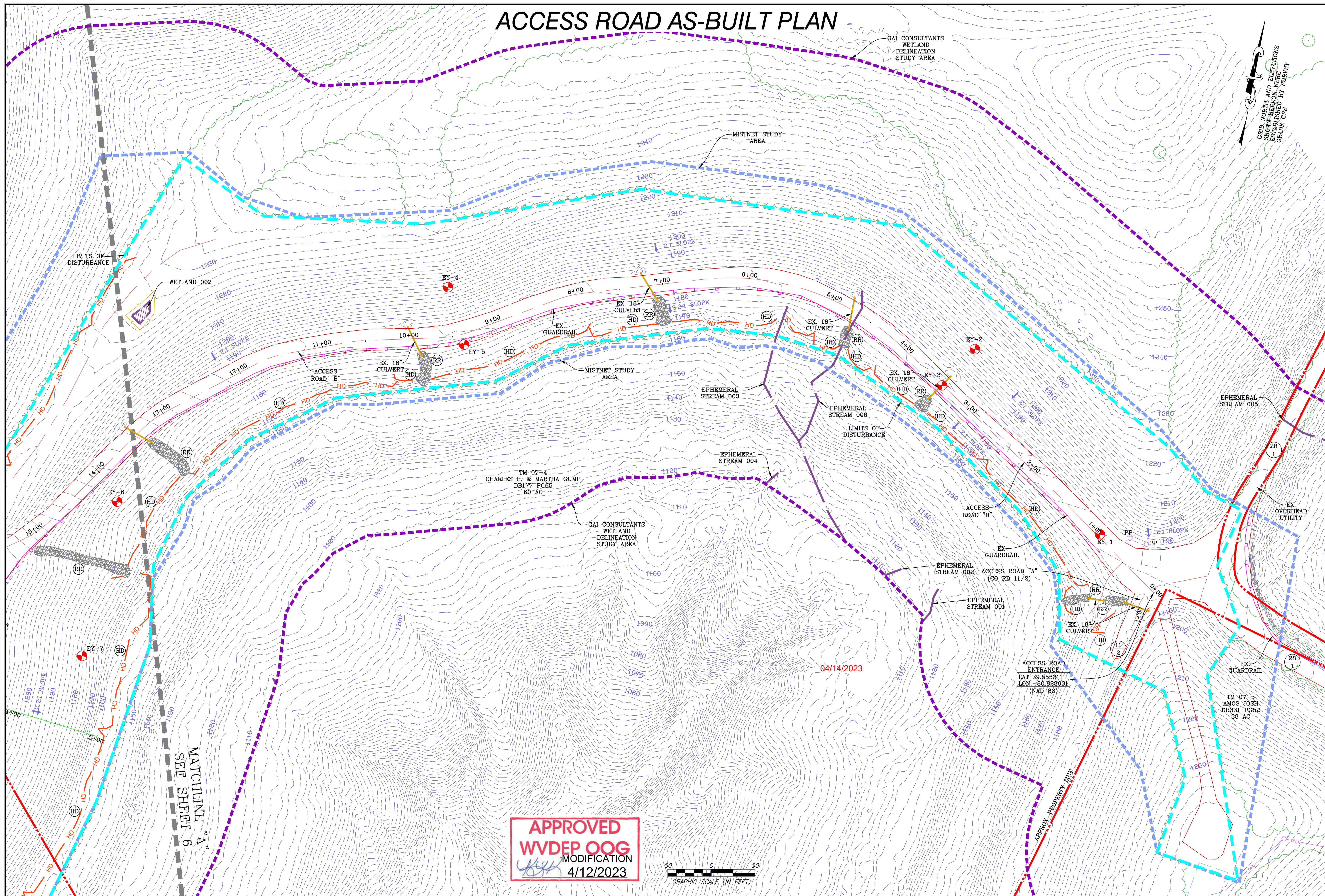
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ANTERO RESOURCES
CORPORATION

OVERALL PLAN SHEET INDEX
ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: 1" = 350'
SHEET 4 OF 24

ACCESS ROAD AS-B-BUILT PLAN



GAI CONSULTANTS
WETLAND
DELINEATION
STUDY AREA

GRID NORTH AND ELEVATIONS
SHOWN HEREON WERE
ESTABLISHED BY SURVEY
GRADE GPS

MISTNET STUDY
AREA

LIMITS OF
DISTURBANCE

WETLAND 002

EY-4

EX 18" CULVERT

EX 18" CULVERT

EX 18" CULVERT

EY-2

ACCESS ROAD "B"

EX 18" CULVERT

EX GUARDRAIL

EPHEMERAL STREAM 003

EPHEMERAL STREAM 006

LIMITS OF DISTURBANCE

EPHEMERAL STREAM 005

TM 07-4
CHARLES E. & MARTHA GUMP
DB177 PG65
60 AC

GAI CONSULTANTS
WETLAND
DELINEATION
STUDY AREA

EPHEMERAL STREAM 004

ACCESS ROAD "B"

ACCESS ROAD "A"
(CO RD 11/2)

EPHEMERAL STREAM 002

EPHEMERAL STREAM 001

EX 18" CULVERT

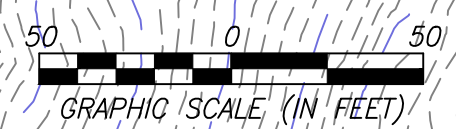
ACCESS ROAD
ENTRANCE
LAT: 39.555311
LON: -80.823601
(NAD 83)

TM 07-5
AMOS JOSH
DB331 PG52
39 AC

EX GUARDRAIL

MATCHLINE
SEE SHEET 6

APPROVED
WVDEP OOG
MODIFICATION
4/12/2023

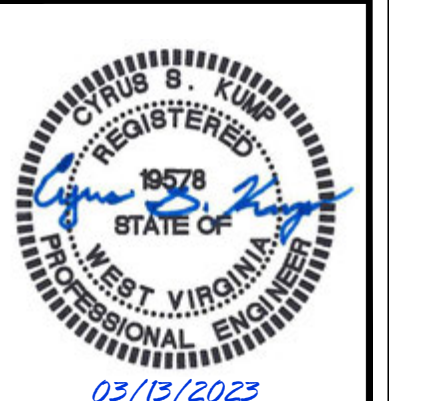


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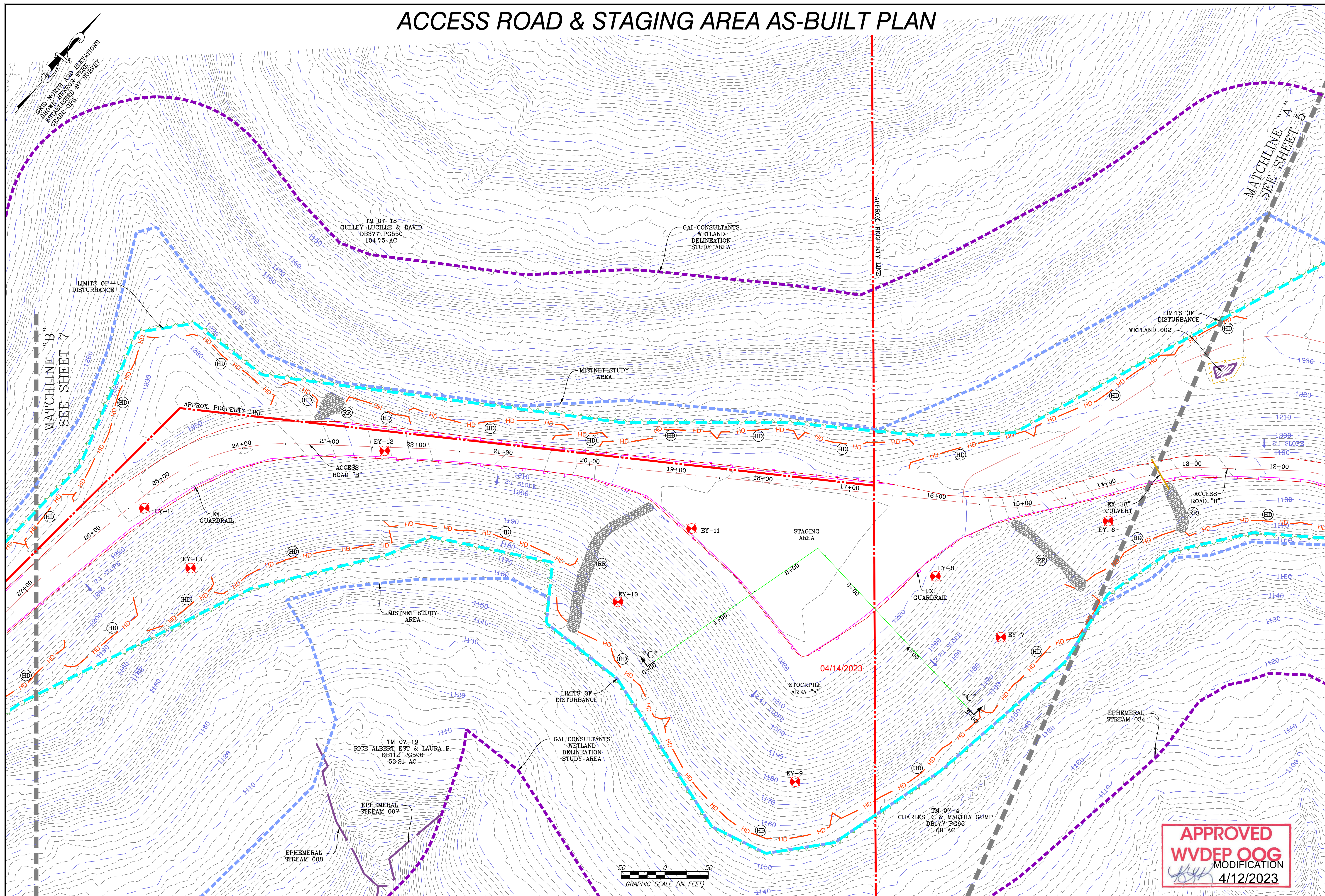
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ACCESS ROAD AS-B-BUILT PLAN
ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 5 OF 24

ACCESS ROAD & STAGING AREA AS-BUILT PLAN



| DATE | REVISION |
|------------|------------------------------------|
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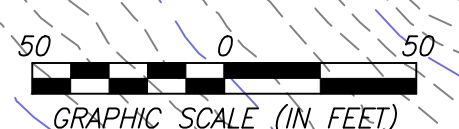
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ACCESS ROAD & STAGING AREA AS-BUILT PLAN
ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA

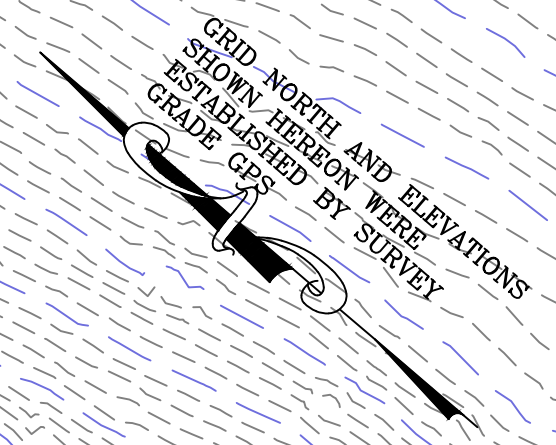


DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 6 OF 24

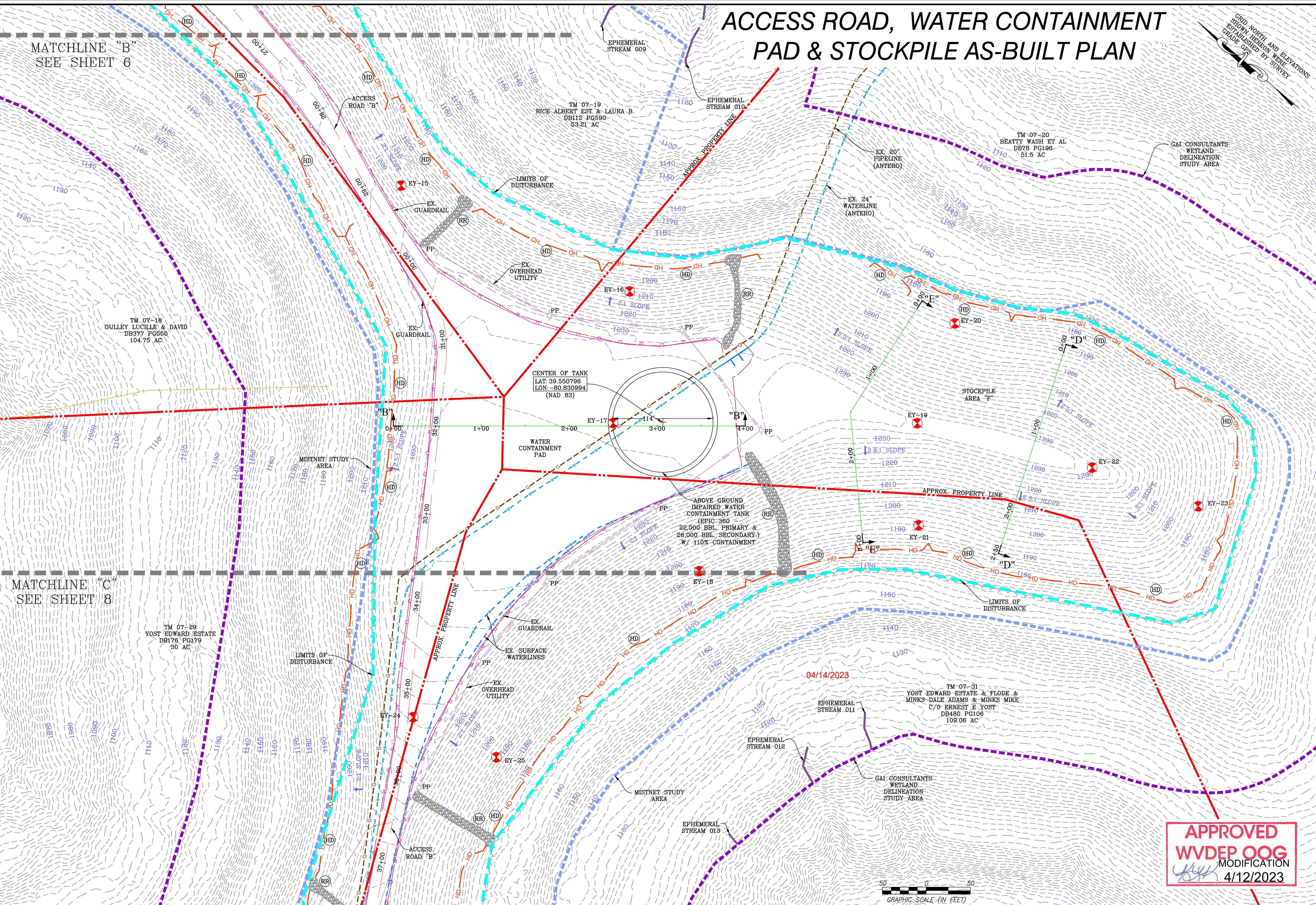
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MODIFICATION
4/12/2023



ACCESS ROAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT PLAN



MATCHLINE "B"
SEE SHEET 6



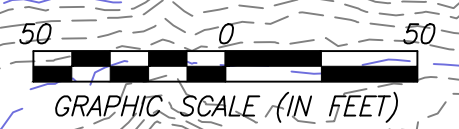
MATCHLINE "C"
SEE SHEET 8

CENTER OF TANK
LAT: 39.550796
LON: -80.830994
(NAD 83)

ABOVE GROUND IMPAIRED WATER CONTAINMENT TANK (EPIC-360)
22,000 BBL. PRIMARY & 26,000 BBL. SECONDARY
W/ 110% CONTAINMENT

TM 07-31
YOST EDWARD ESTATE & FLODE & MINKS DALE ADAMS & MINKS MIKE
C/O ERNEST E YOST
DB480 PG106
109.06 AC

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4/12/2023



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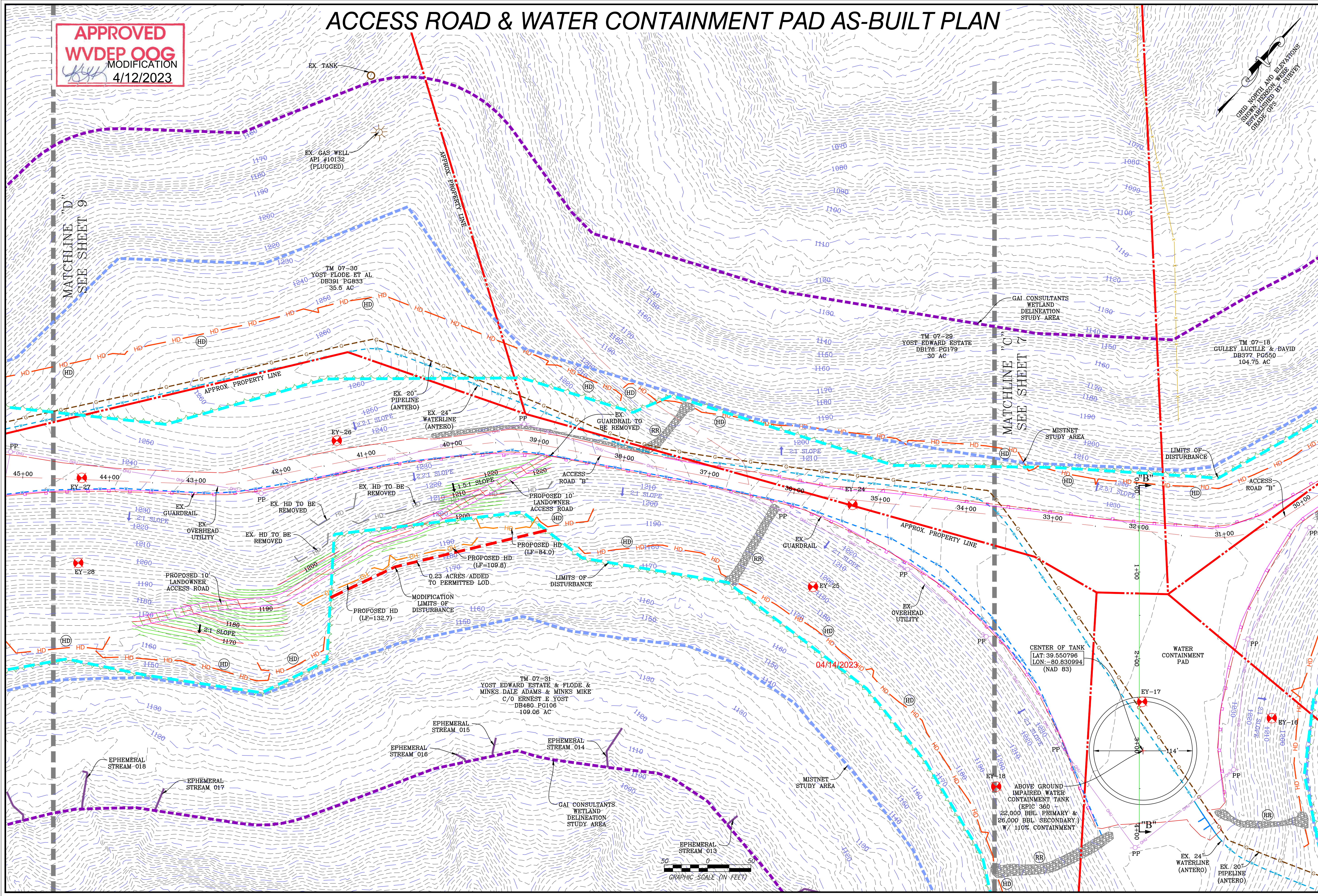
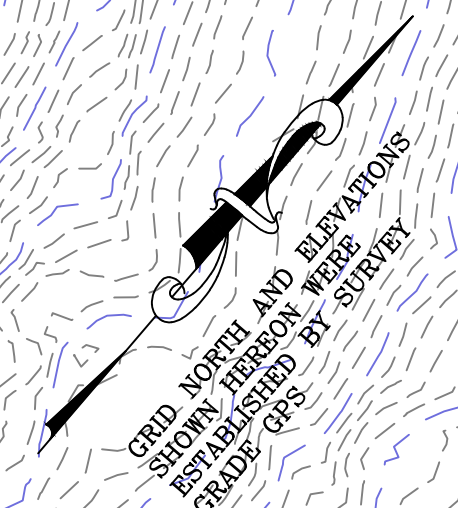
ACCESS ROAD, WATER CONTAINMENT PAD & STOCKPILE AS-BUILT PLAN
ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 7 OF 24

ACCESS ROAD & WATER CONTAINMENT PAD AS-BUILT PLAN

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WVDEP OOG
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 4/12/2023



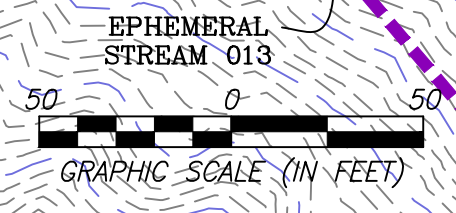
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ED YOST
 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
 SCALE: 1" = 50'
 SHEET 8 OF 24

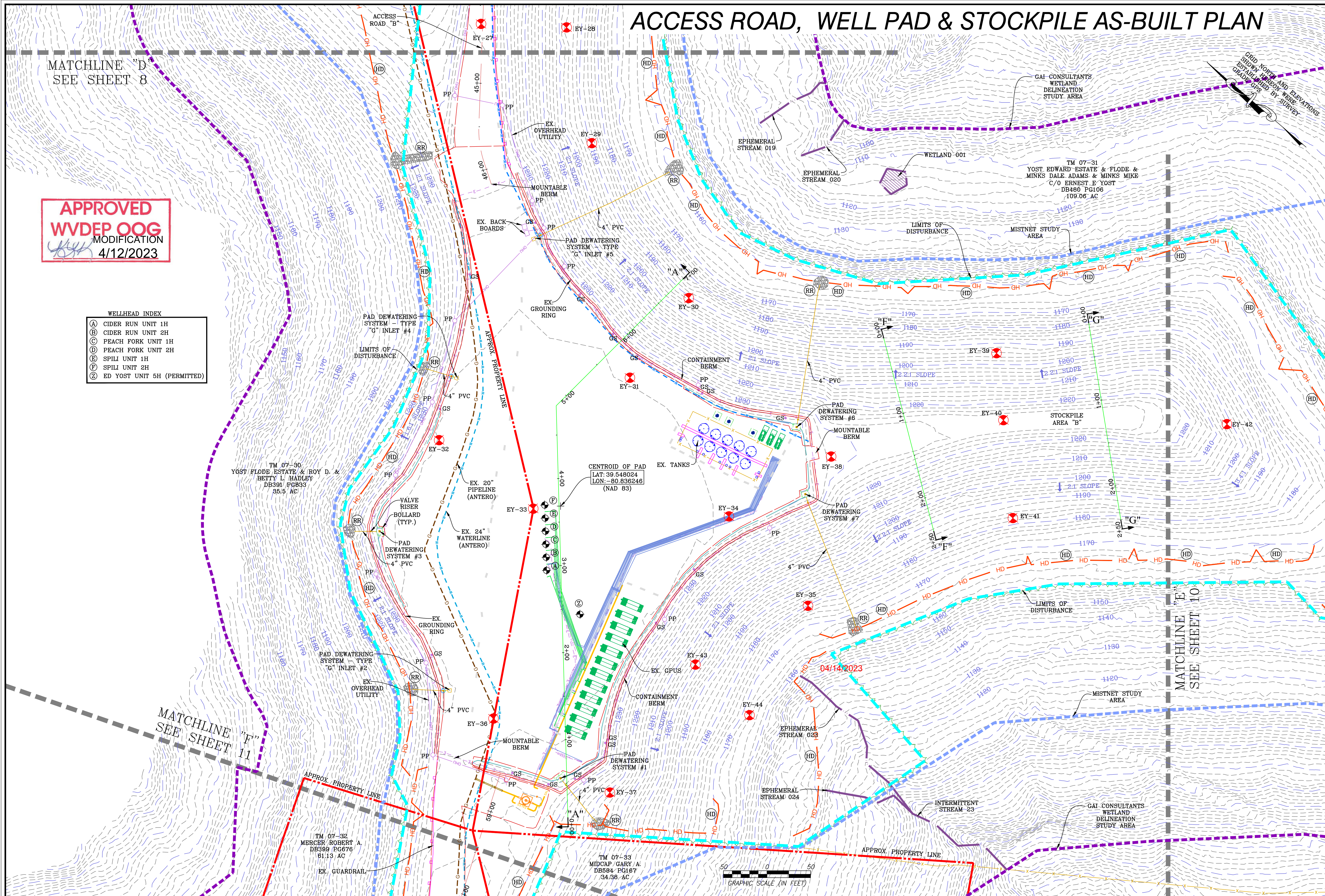


ACCESS ROAD, WELL PAD & STOCKPILE AS-BUILT PLAN

MATCHLINE "D"
SEE SHEET 8

APPROVED
WVDEP OOG
MODIFICATION
4/12/2023

- WELLHEAD INDEX**
- (A) CIDER RUN UNIT 1H
 - (B) CIDER RUN UNIT 2H
 - (C) PEACH FORK UNIT 1H
 - (D) PEACH FORK UNIT 2H
 - (E) SPILL UNIT 1H
 - (F) SPILL UNIT 2H
 - (Z) ED YOST UNIT 5H (PERMITTED)



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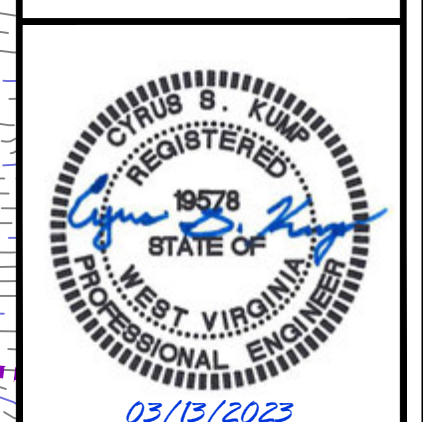
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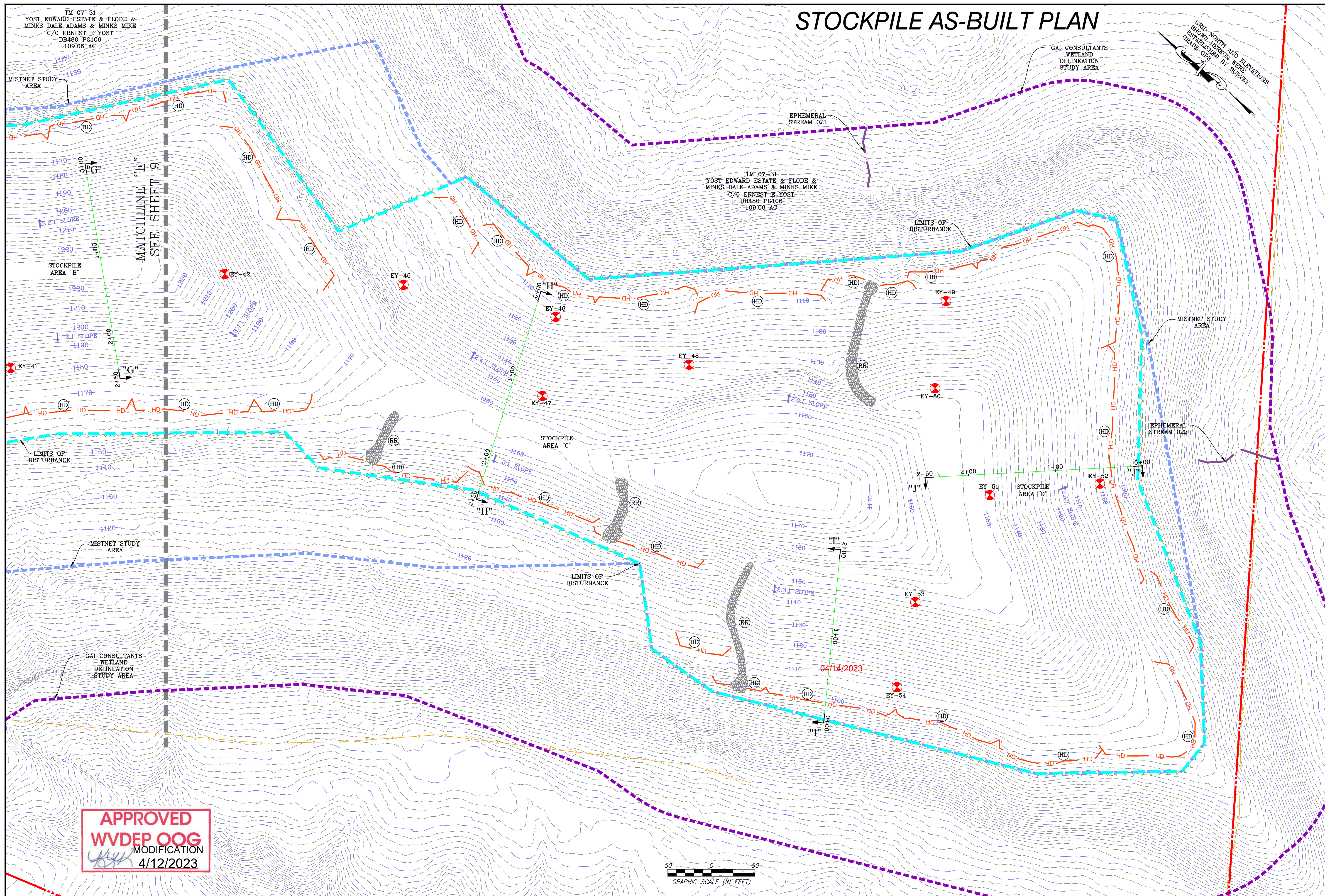
ACCESS ROAD & WELL PAD & STOCKPILE AS-BUILT PLAN

ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 9 OF 24

STOCKPILE AS-BUILT PLAN



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CORPORATION

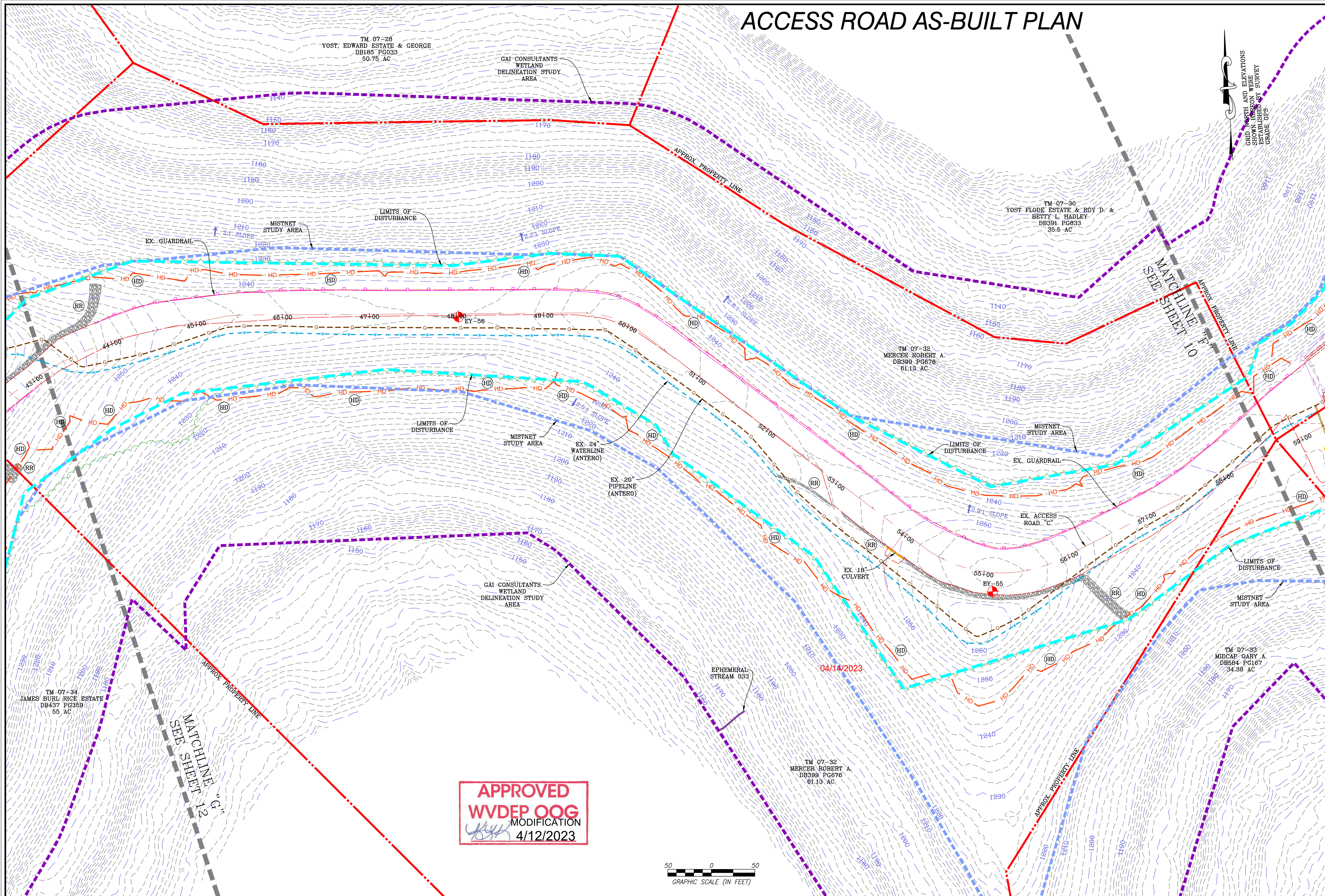
STOCKPILE AS-BUILT PLAN

ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 10 OF 24

ACCESS ROAD AS-BUILT PLAN



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ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA

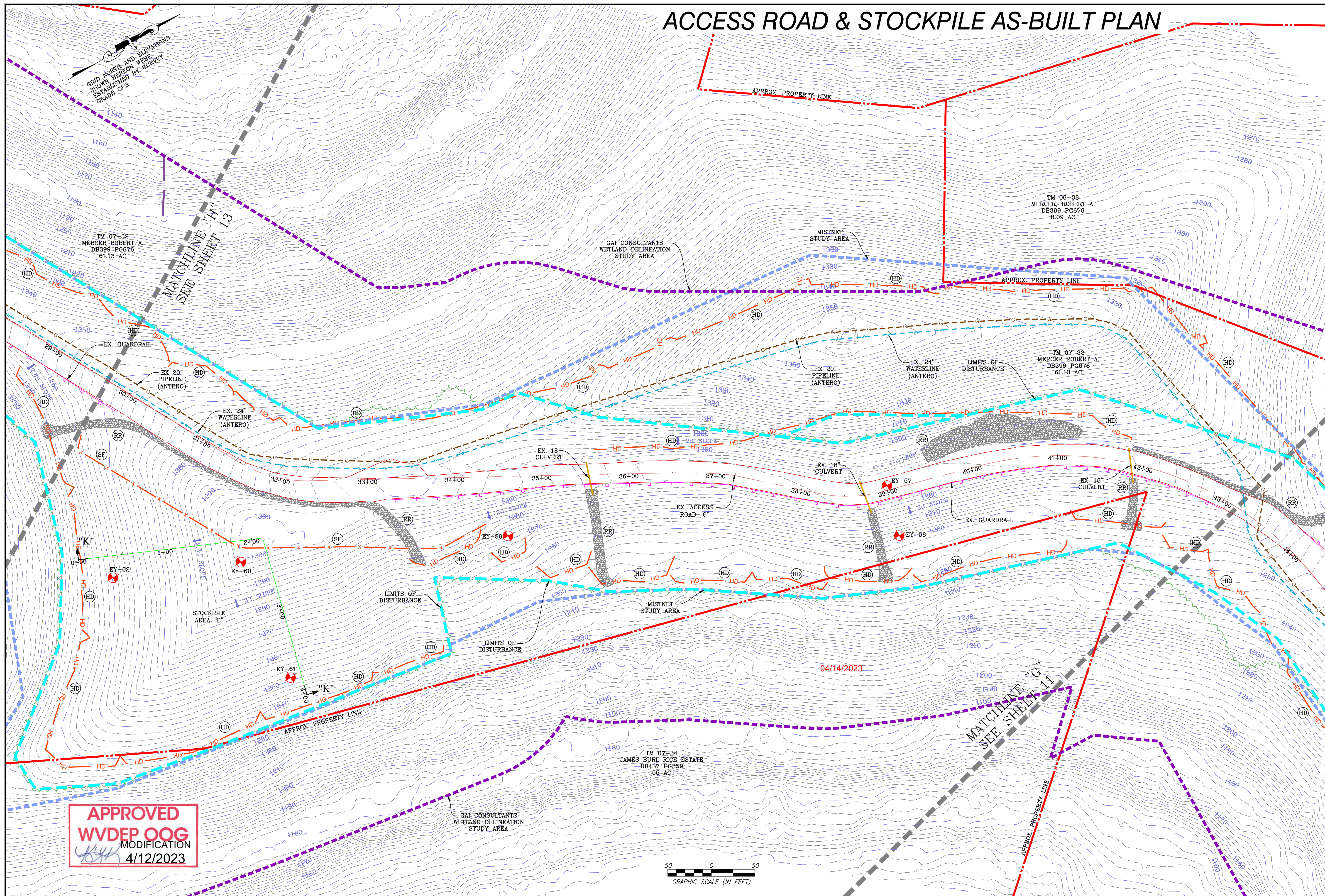


DATE: 01/27/2023
SCALE: 1" = 50'
SHEET 11 OF 24

APPROVED WVDEP OOG
MODIFICATION
4/12/2023



ACCESS ROAD & STOCKPILE AS-BUILT PLAN



APPROVED WVDEP OOG MODIFICATION
 4/12/2023



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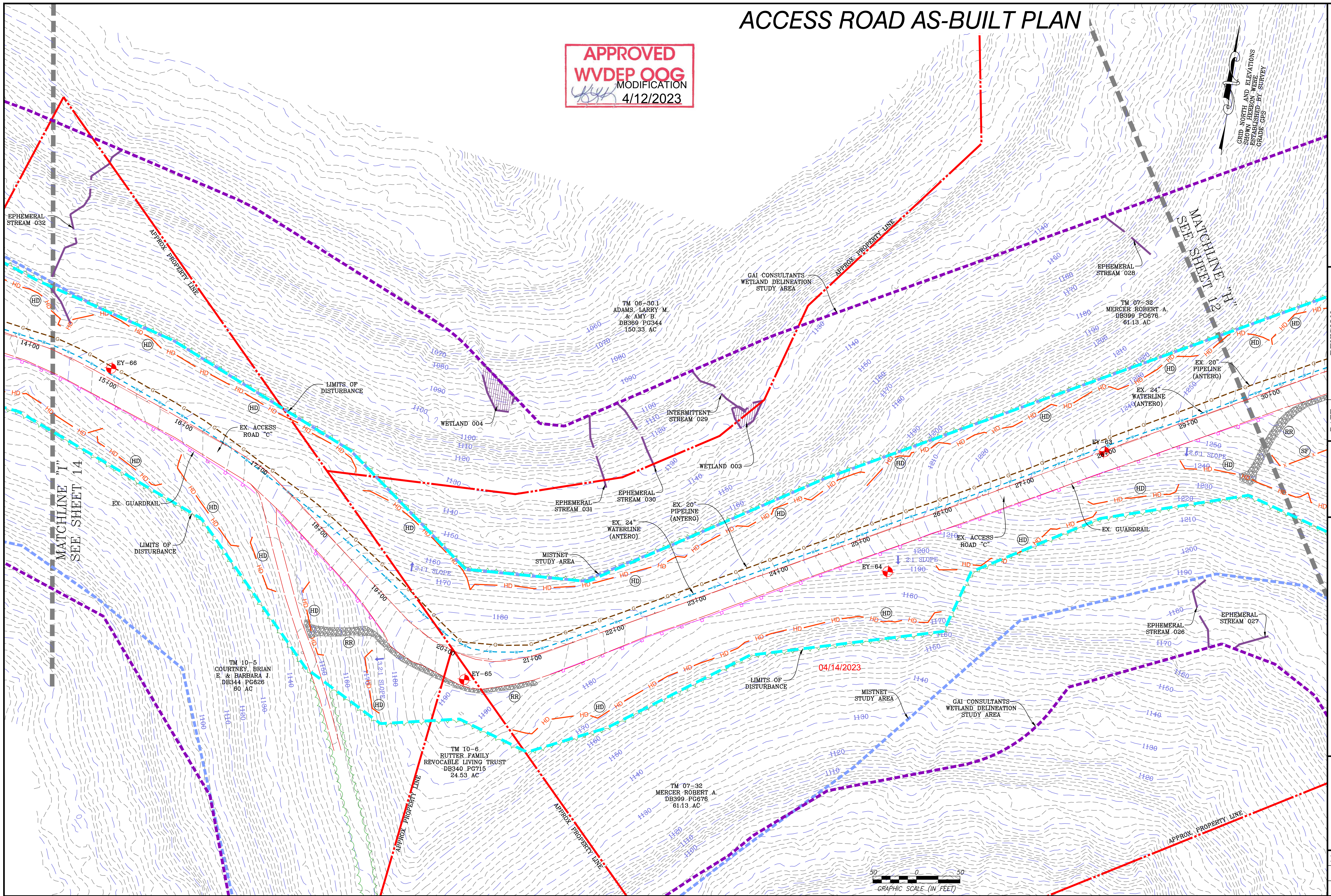
WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA

DATE: 01/27/2023
 SCALE: 1" = 50'
 SHEET 12 OF 24

ACCESS ROAD AS-BUILT PLAN

APPROVED
WVDEP OOG
 MODIFICATION
 4/12/2023

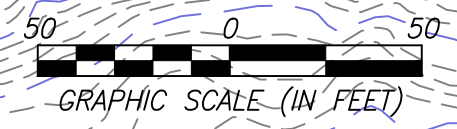
GRID NORTH AND ELEVATIONS
 SHOWN HERE AROUND WERE
 ESTABLISHED BY SURVEY
 GRADE GPS



| DATE | REVISION |
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 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA

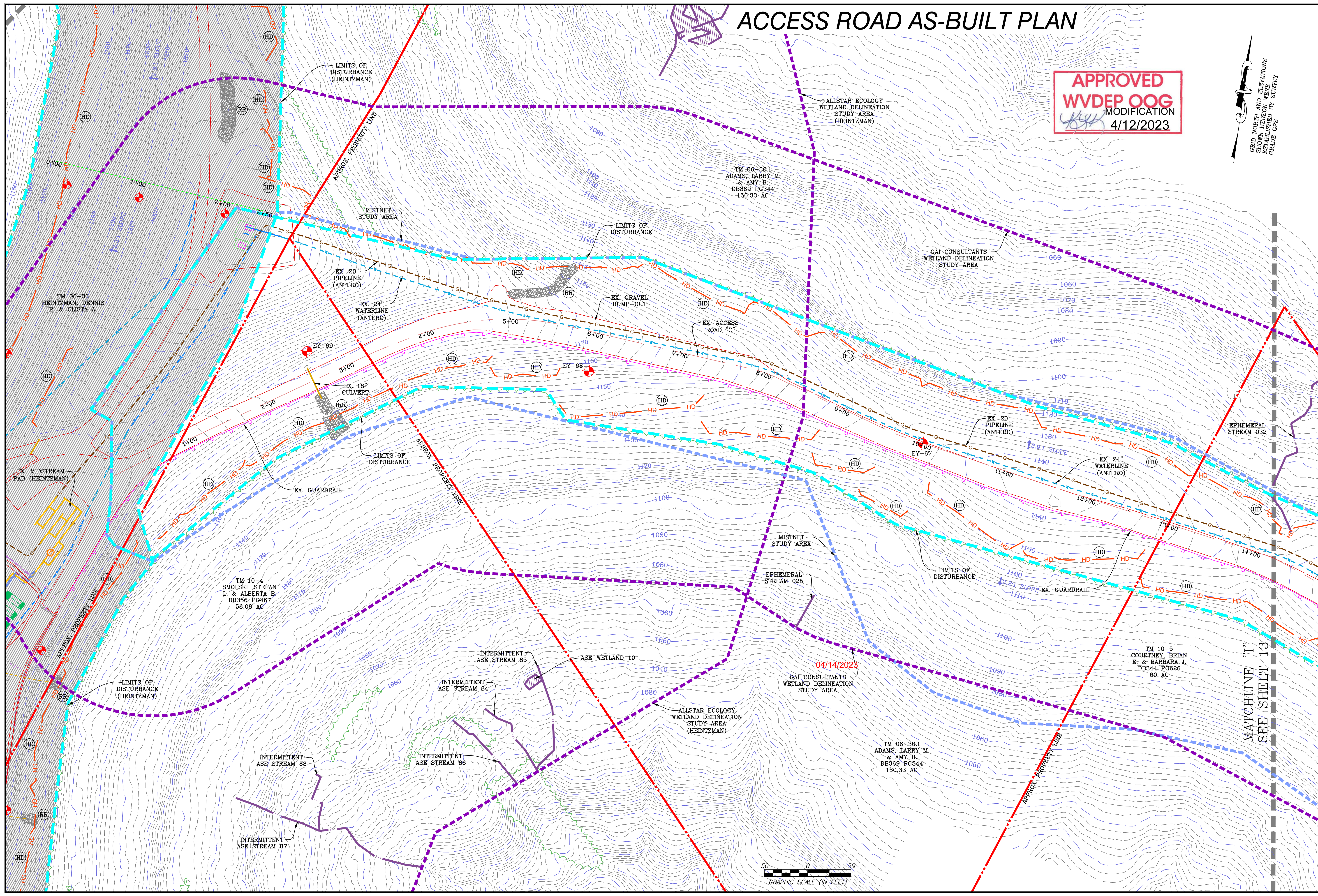


ACCESS ROAD AS-BUILT PLAN

APPROVED
WVDEP OOG
 MODIFICATION
 4/12/2023

GRID NORTH AND ELEVATIONS
 SHOWN HEREON WERE
 ESTABLISHED BY SURVEY
 GRADE GPS

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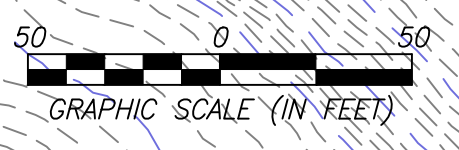
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ED YOST
 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
 SCALE: 1" = 50'
 SHEET 14 OF 24

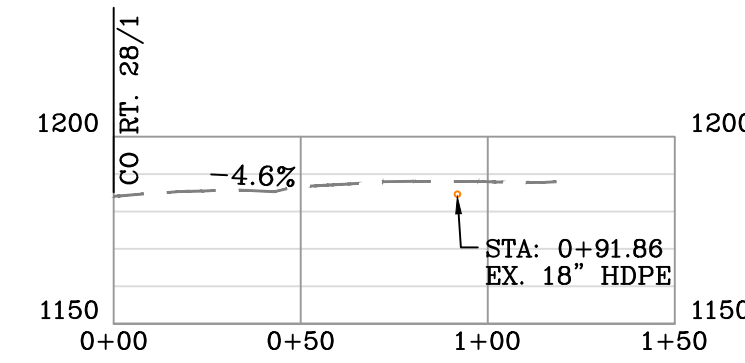


MATCHLINE "1"
 SEE SHEET 13

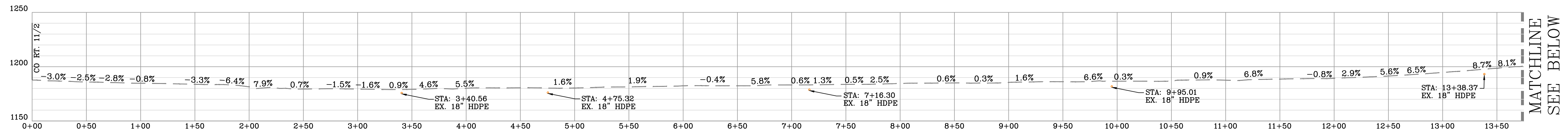
04/14/2023

ACCESS ROAD AS-BUILT PROFILES

APPROVED
WVDEP OOG
 MODIFICATION
 4/12/2023

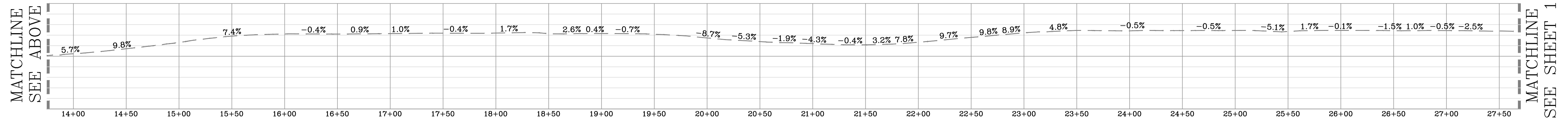


ACCESS ROAD "A" (CO RT. 11/2) AS-BUILT PROFILE
 SCALE: HORIZ. 1" = 50' VERT. 1" = 50'



ACCESS ROAD "B" AS-BUILT PROFILE
 SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

04/14/2023



ACCESS ROAD "B" AS-BUILT PROFILE
 SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

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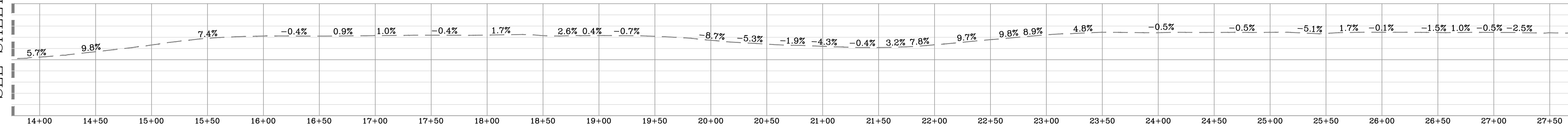
ACCESS ROAD AS-BUILT PROFILES
ED YOST
 WELL PAD & WATER CONTAINMENT PAD
 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



ACCESS ROAD AS-BUILT PROFILES

APPROVED
WVDEP OOG
 MODIFICATION
[Signature] 4/12/2023

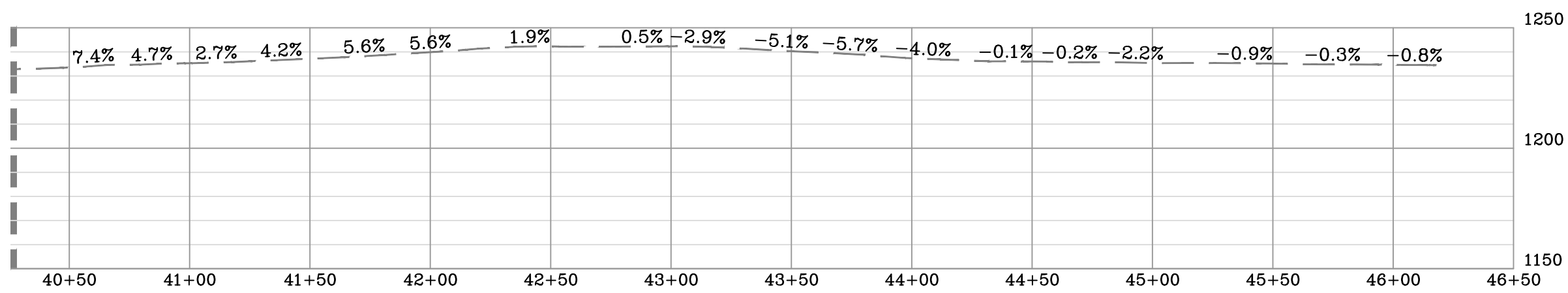
MATCHLINE
SEE SHEET 15



MATCHLINE
SEE BELOW

ACCESS ROAD "B" AS-BUILT PROFILE
 SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

MATCHLINE
SEE ABOVE



ACCESS ROAD "B" AS-BUILT PROFILE
 SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

04/14/2023

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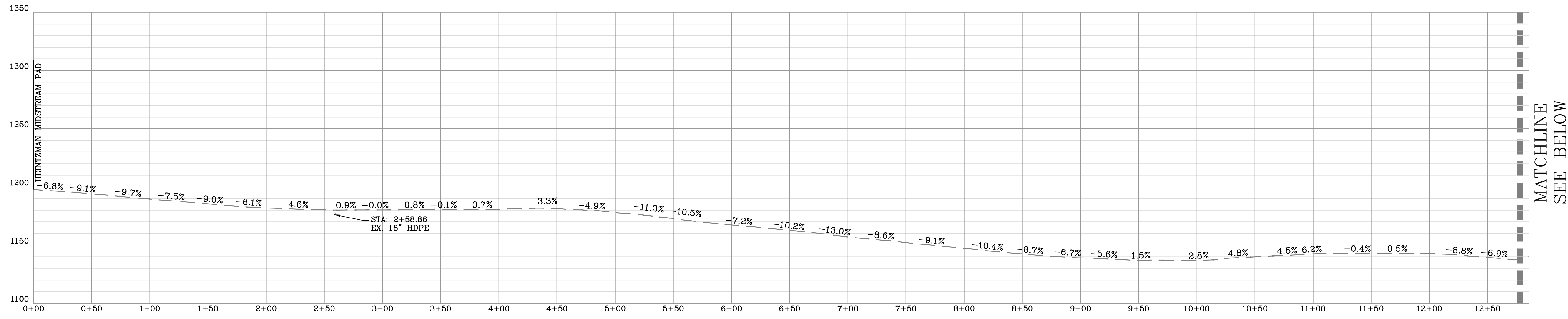
ACCESS ROAD AS-BUILT PROFILES
ED YOST
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 ELLSWORTH DISTRICT
 TYLER COUNTY, WEST VIRGINIA



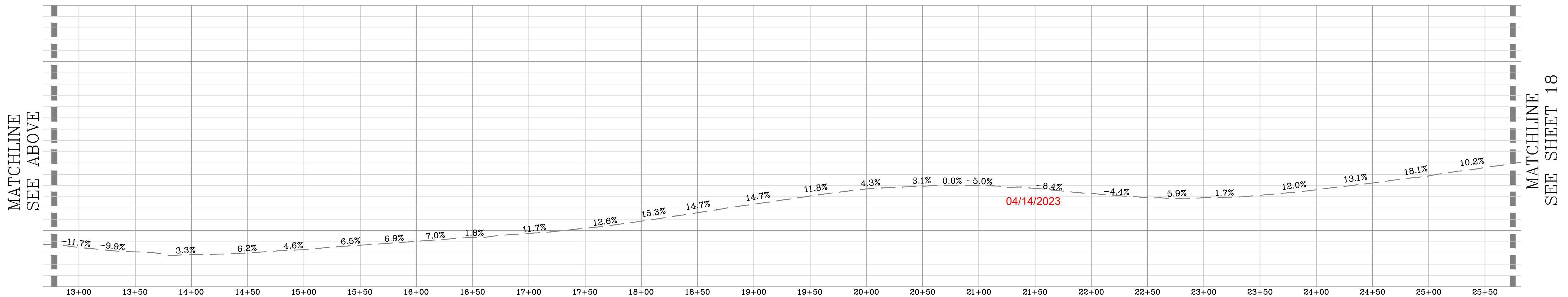
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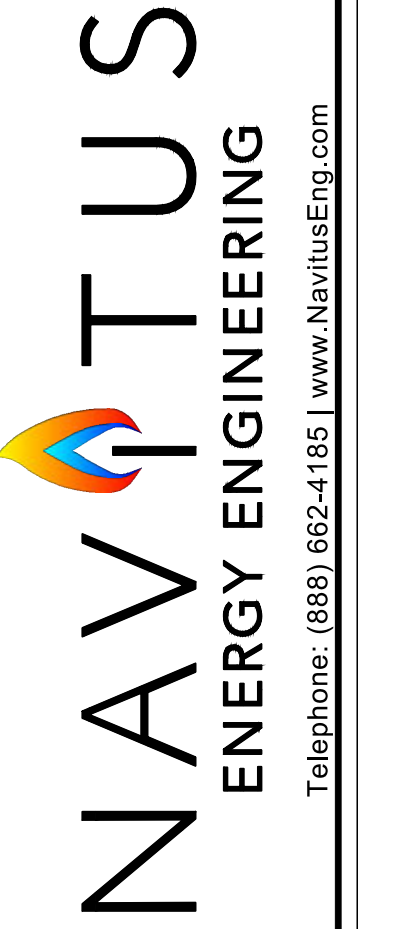
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ACCESS ROAD "C" AS-BUILT PROFILE
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ACCESS ROAD "C" AS-BUILT PROFILE
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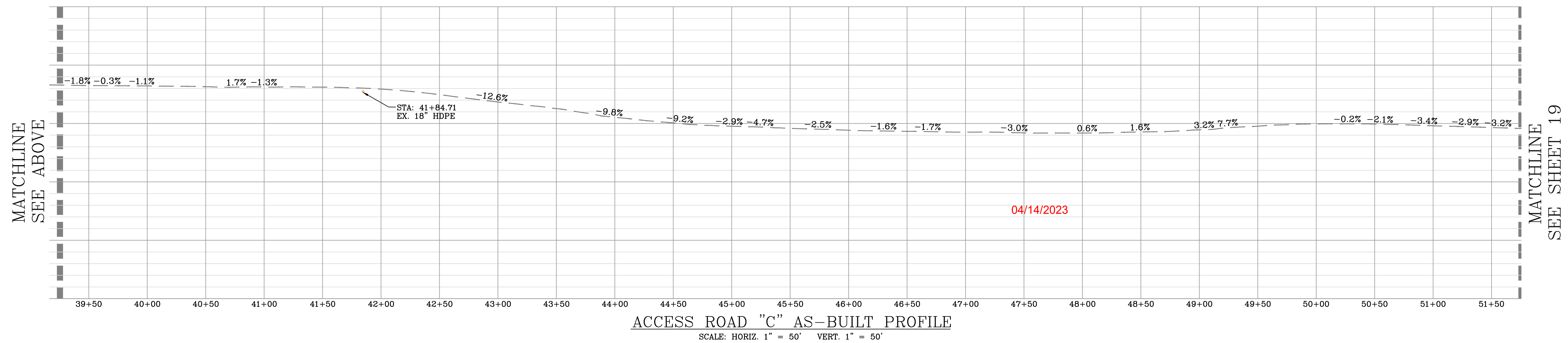
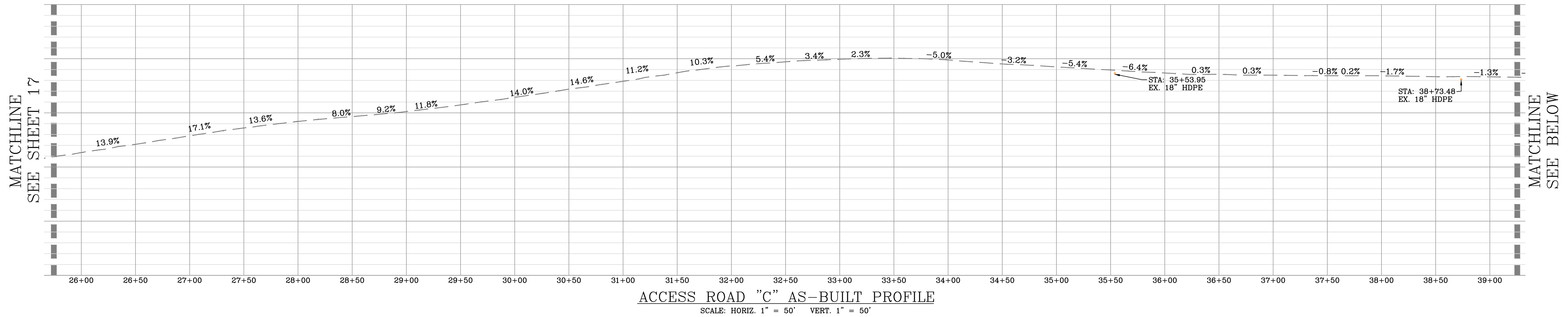
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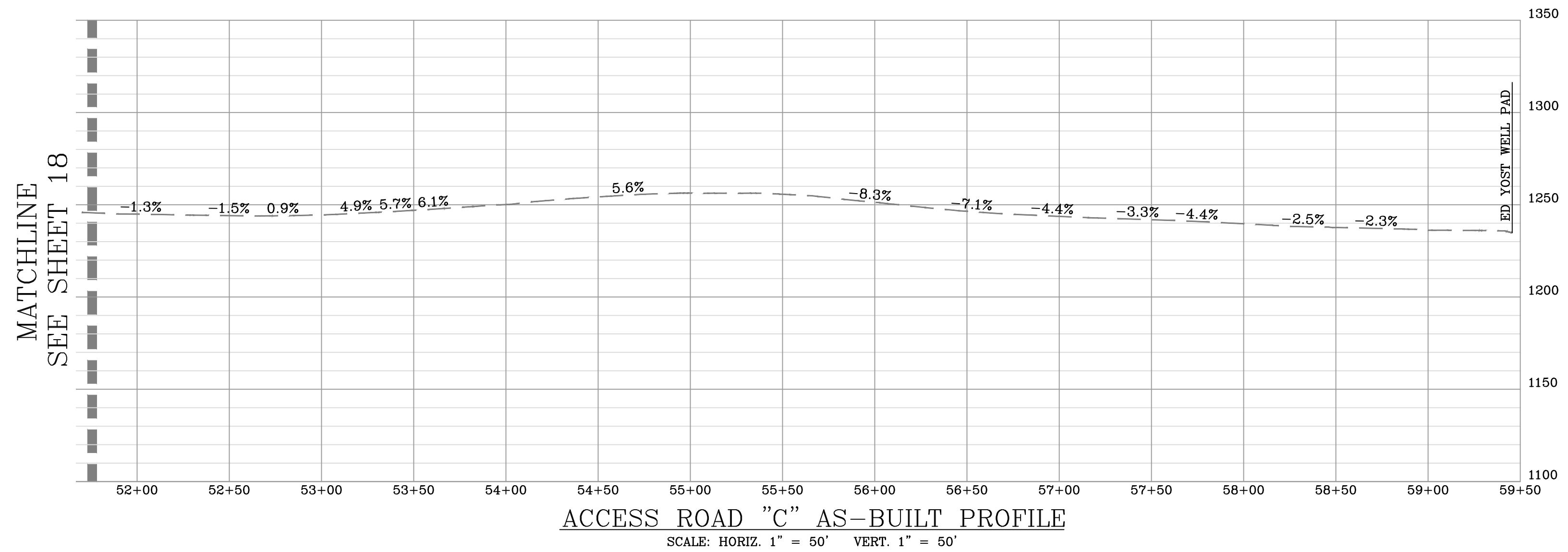
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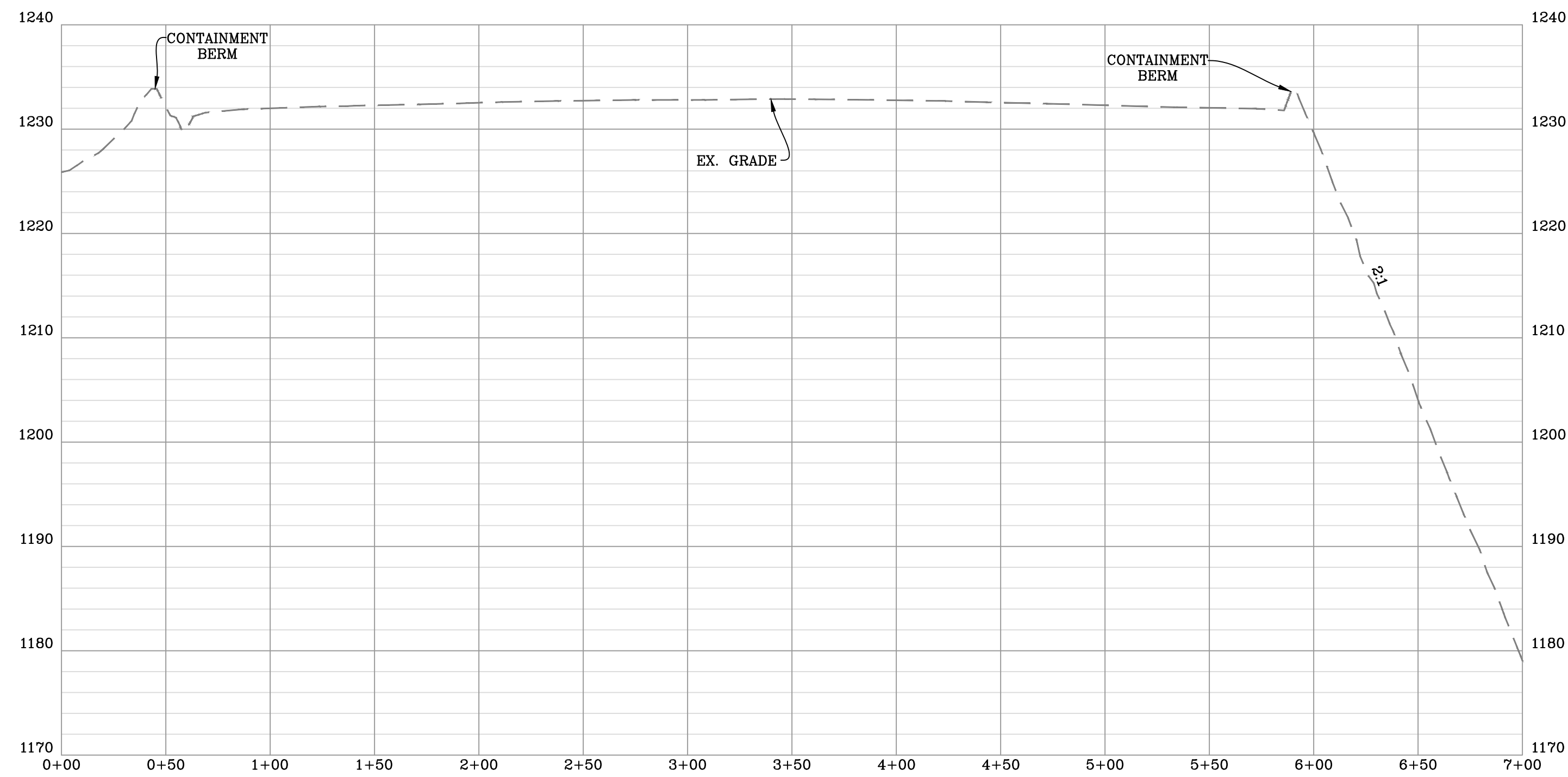
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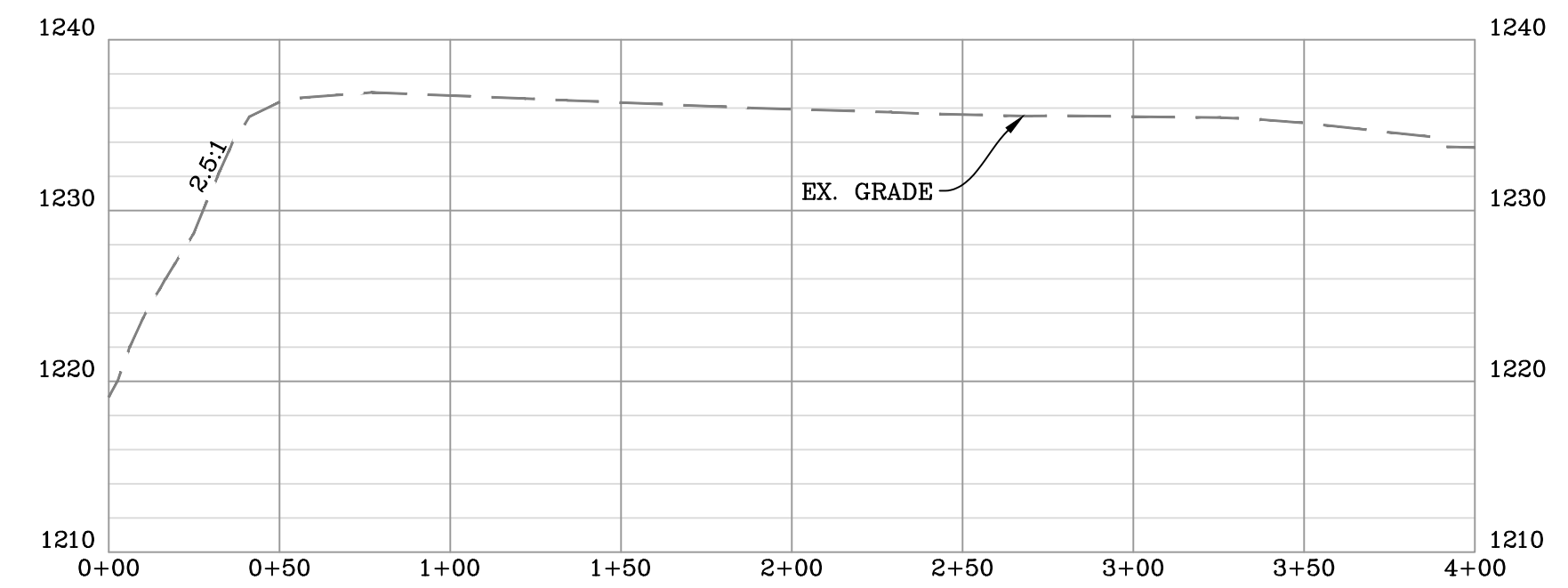
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WELL PAD, WATER CONTAINMENT PAD, STAGING AREA & STOCKPILE AS-BUILT SECTIONS

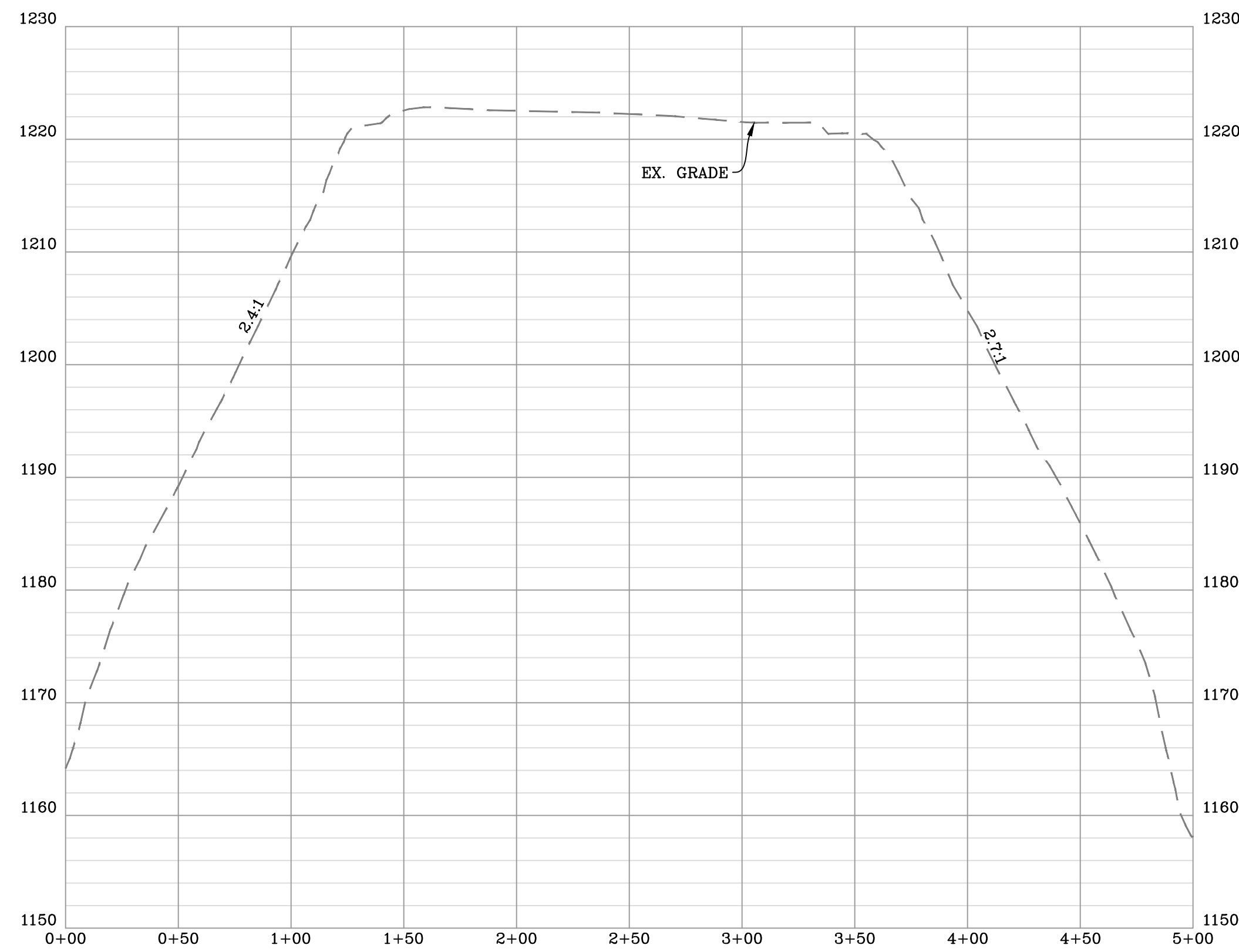
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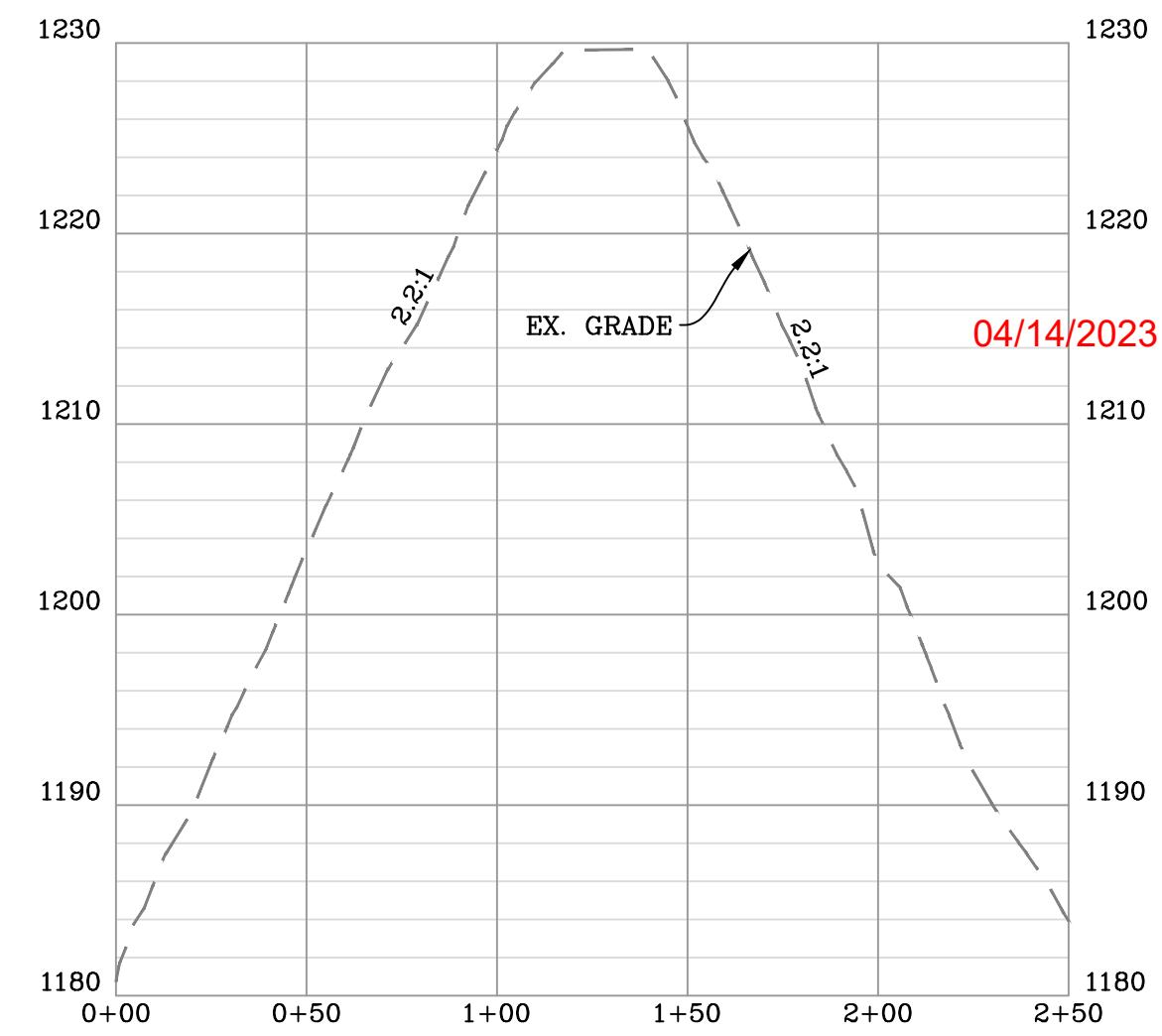
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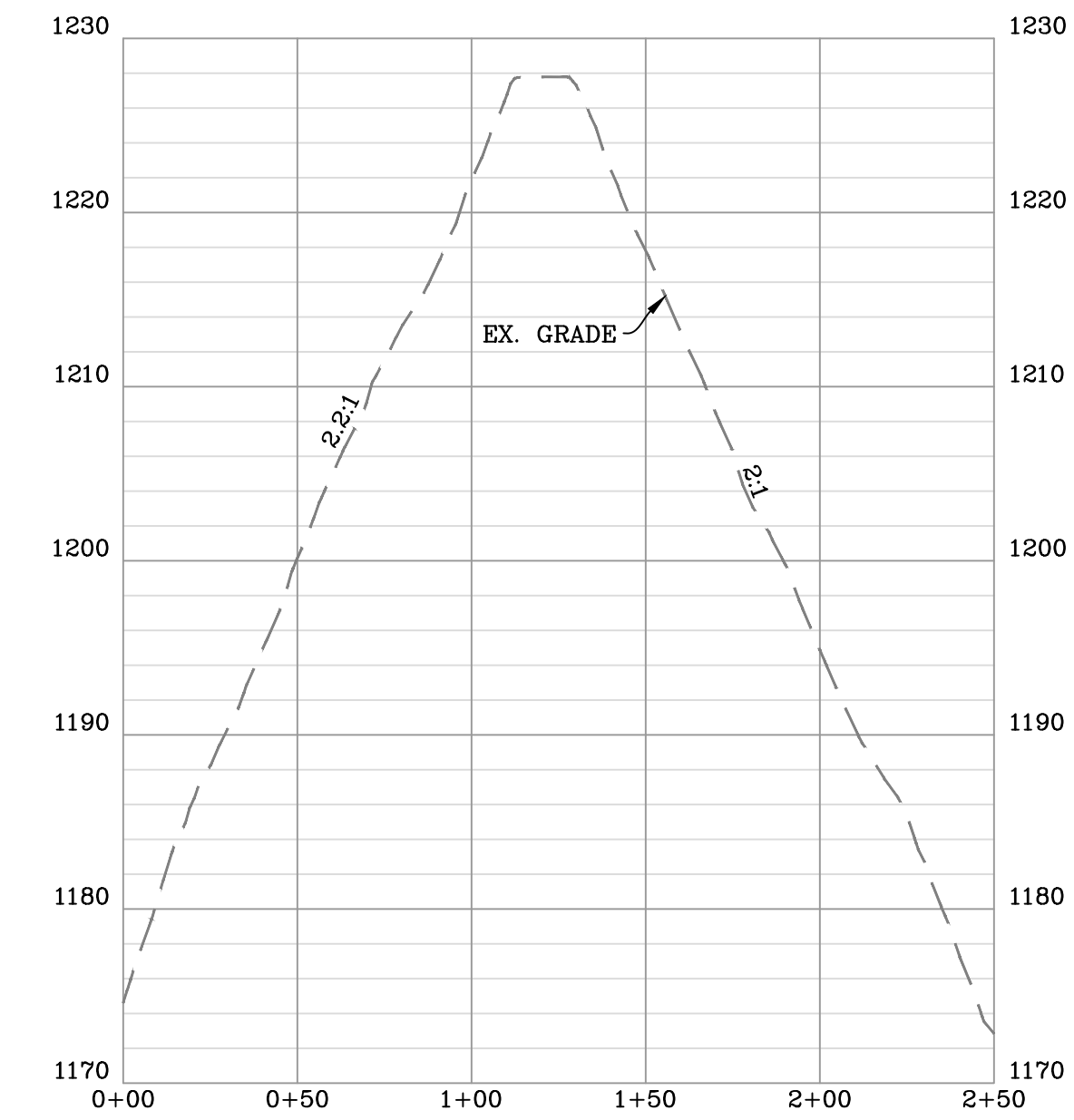
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STOCKPILE AREA "A" & STAGING AREA AS-BUILT CROSS-SECTION "C-C"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "B" AS-BUILT CROSS-SECTION "F-F"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "B" AS-BUILT CROSS-SECTION "G-G"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

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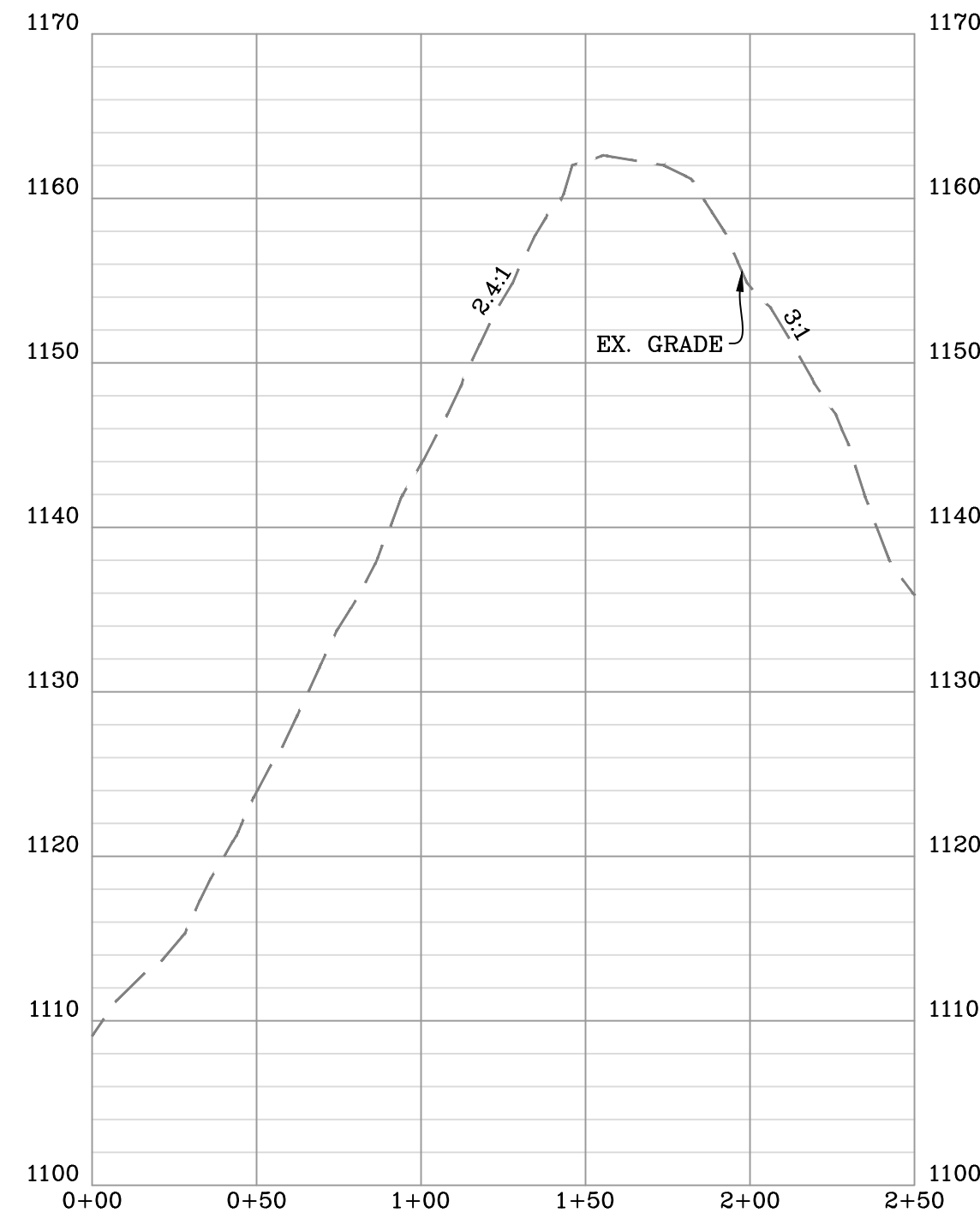
WELL PAD & WATER CONTAINMENT PAD
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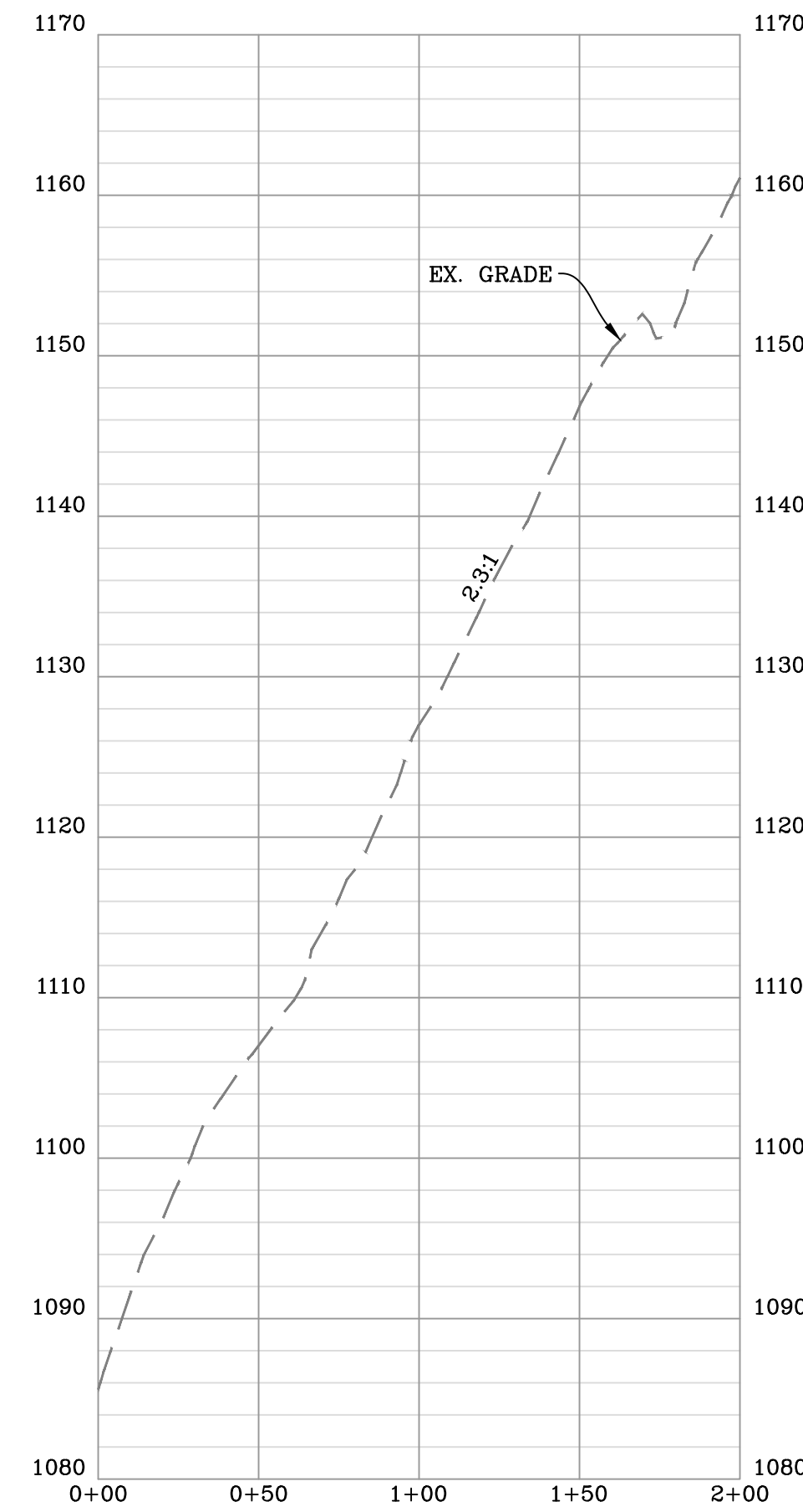
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STOCKPILE AS-BUILT SECTIONS

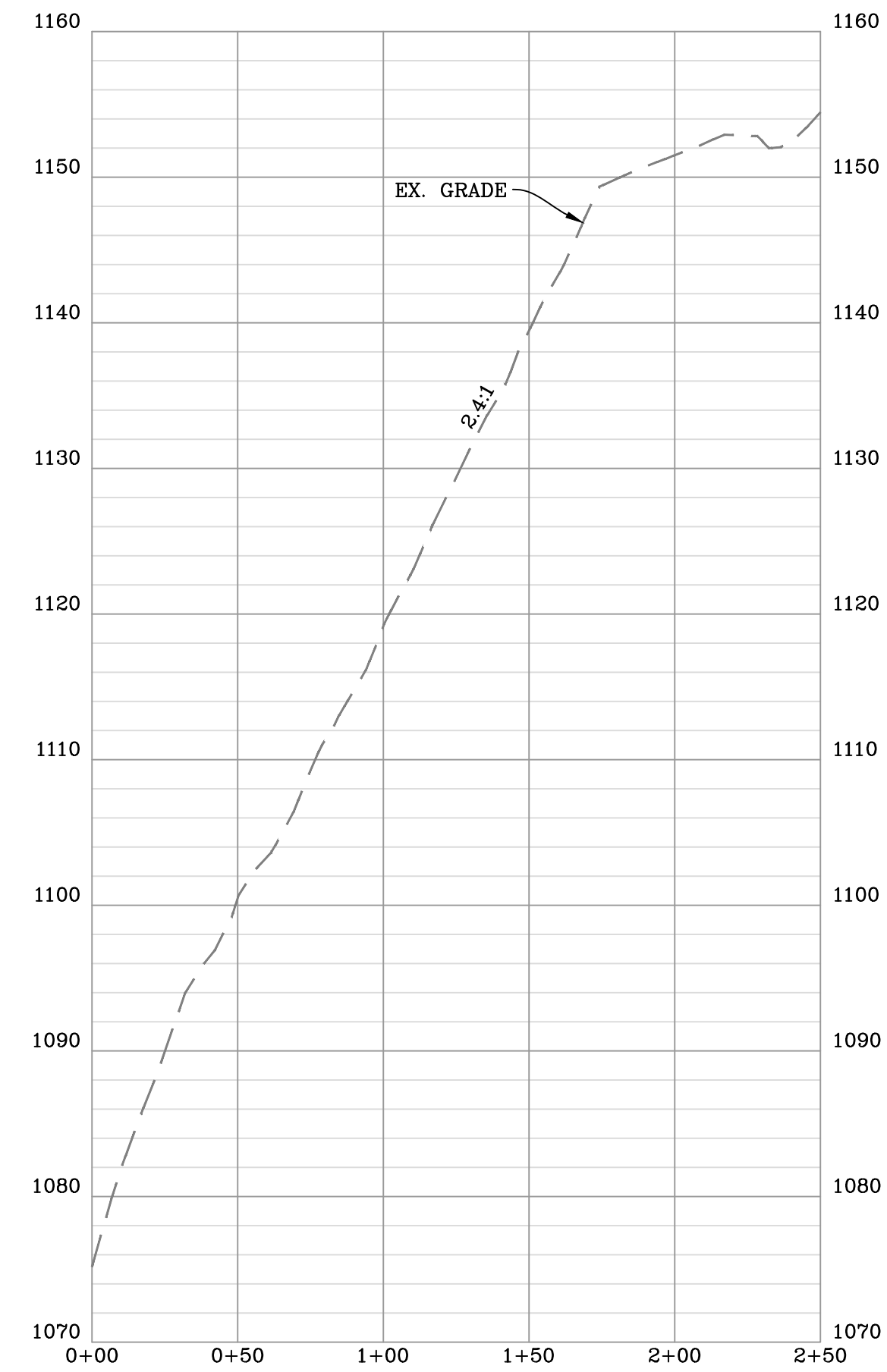
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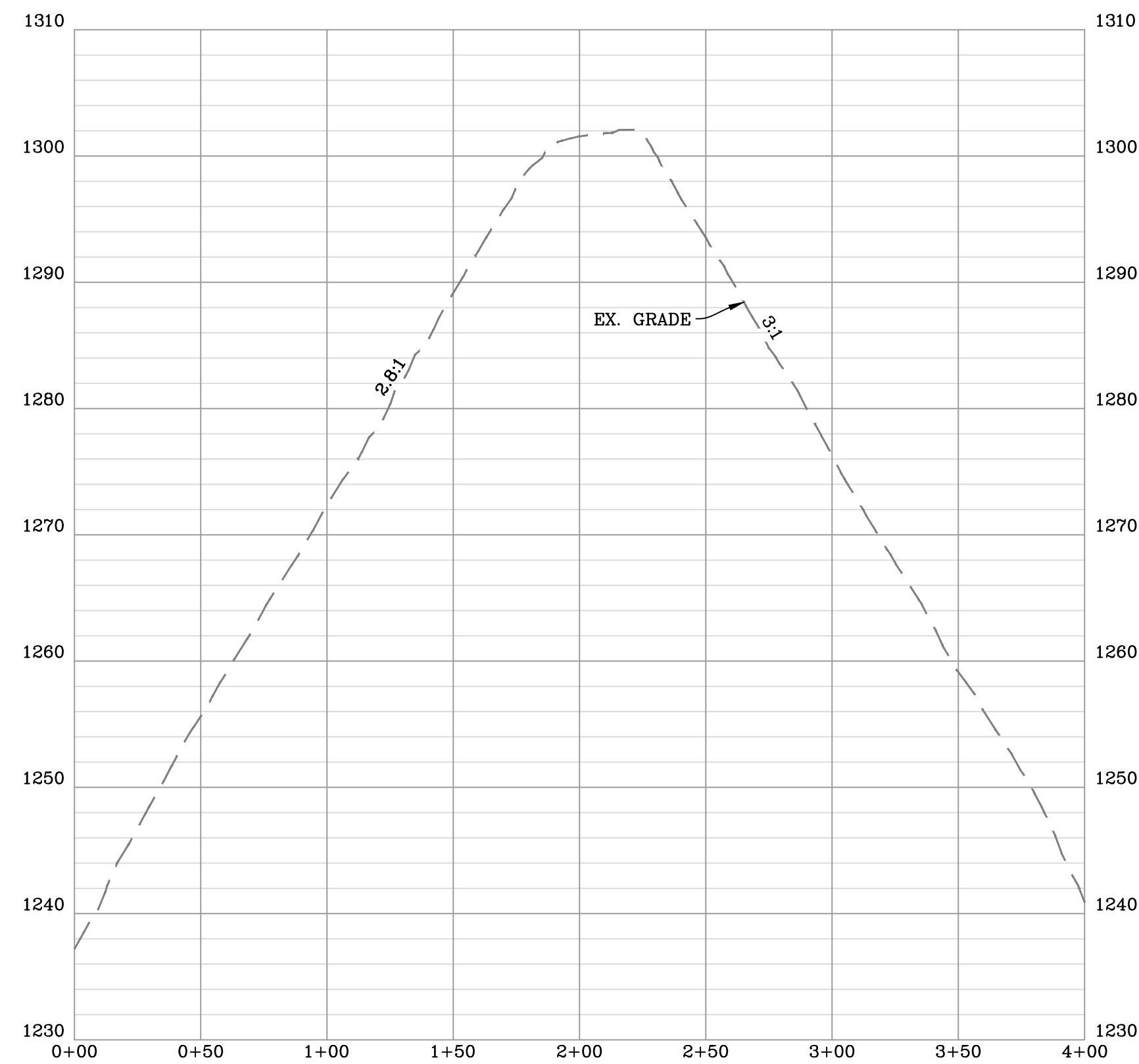
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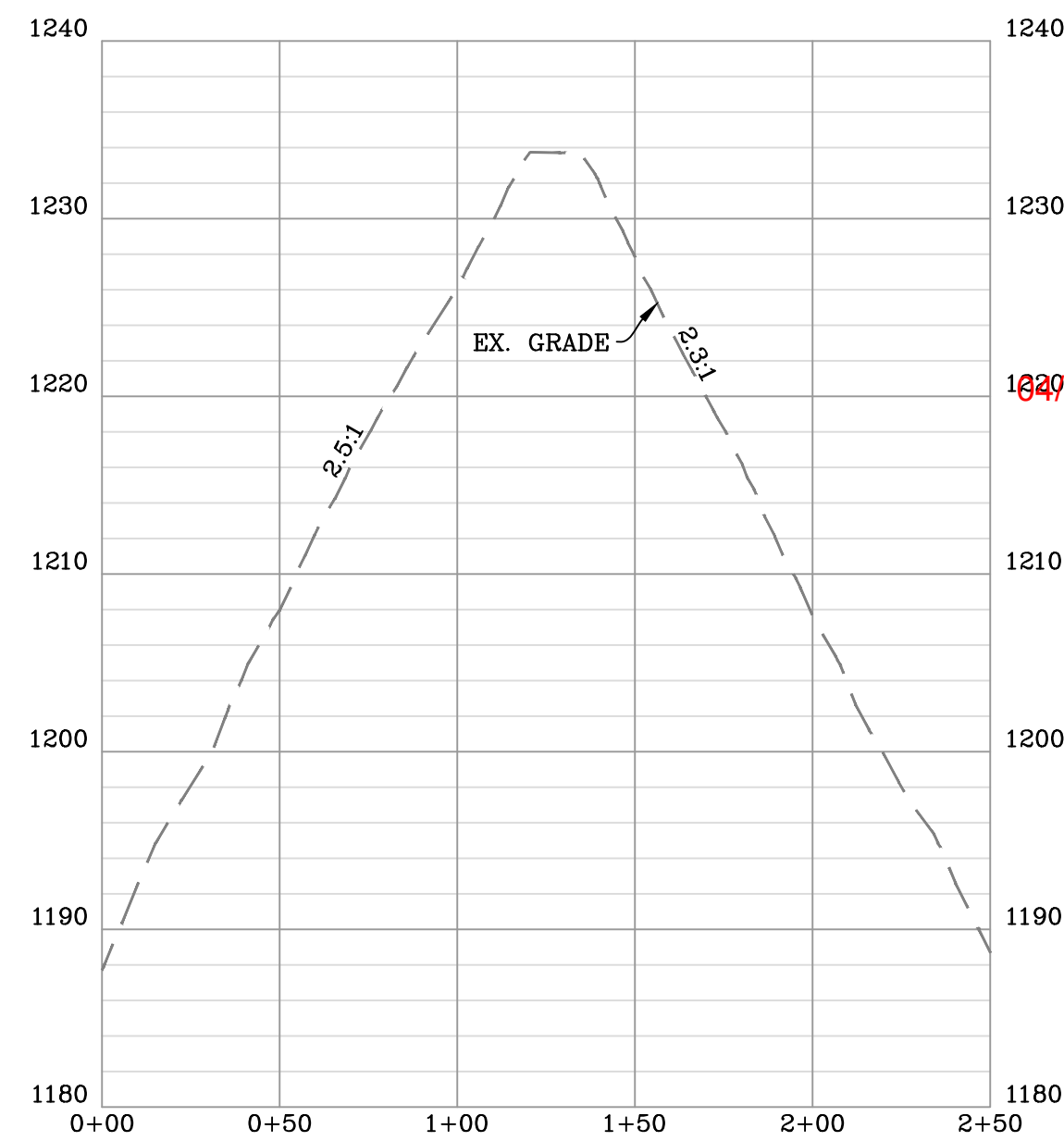
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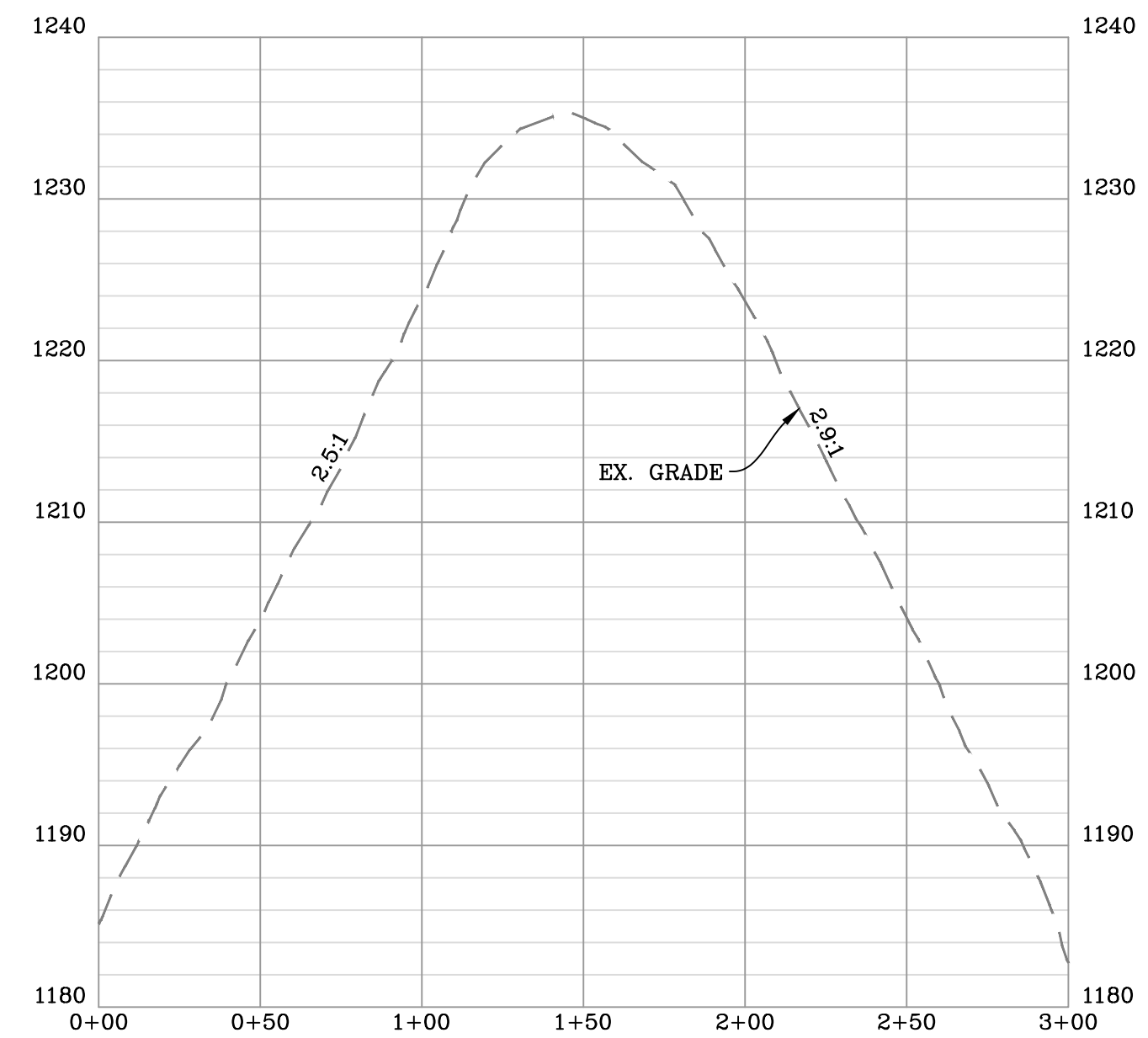
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 SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "E" AS-BUILT CROSS-SECTION "K-K"
 SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



STOCKPILE AREA "F" AS-BUILT CROSS-SECTION "D-D"
 SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



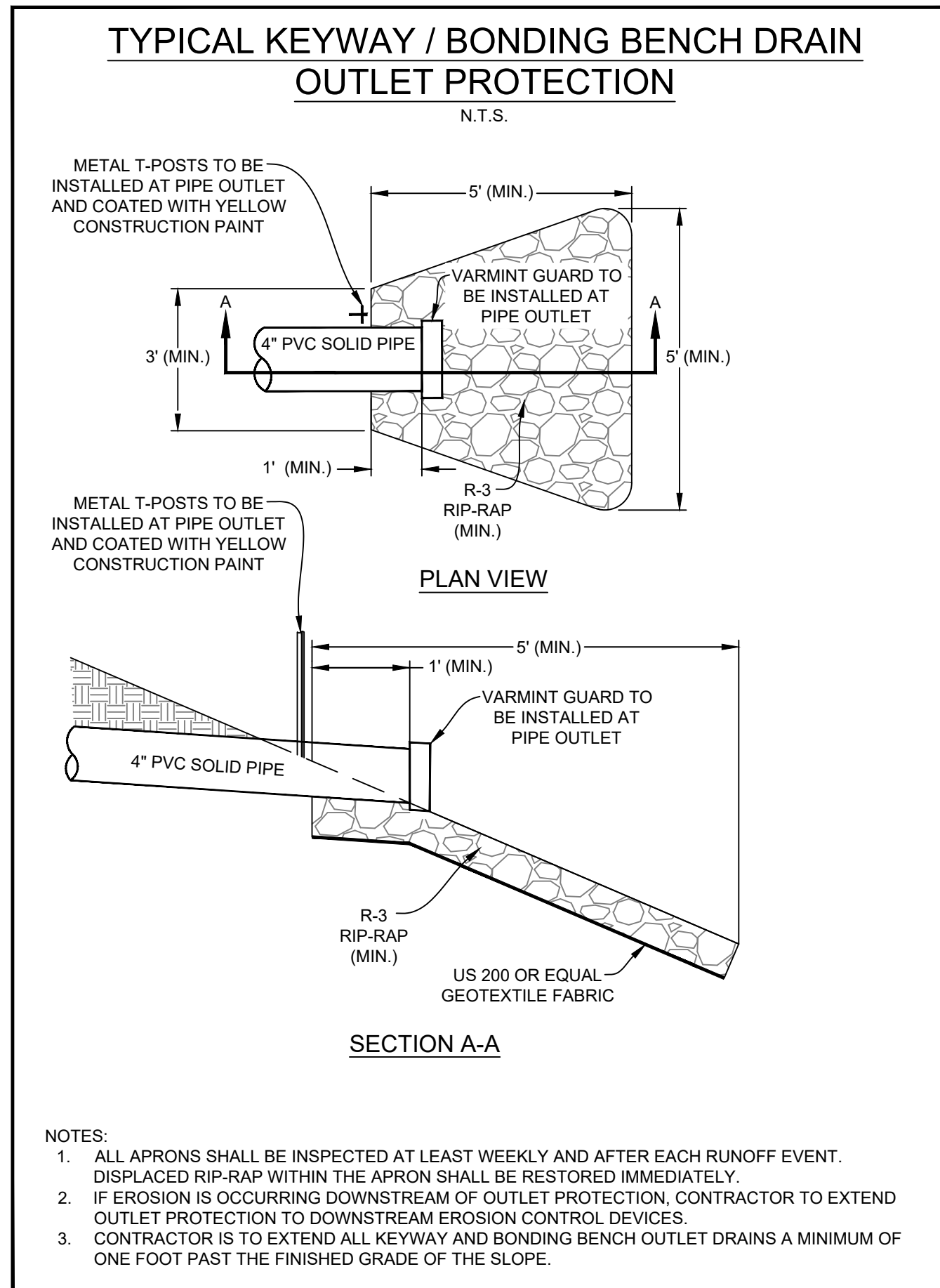
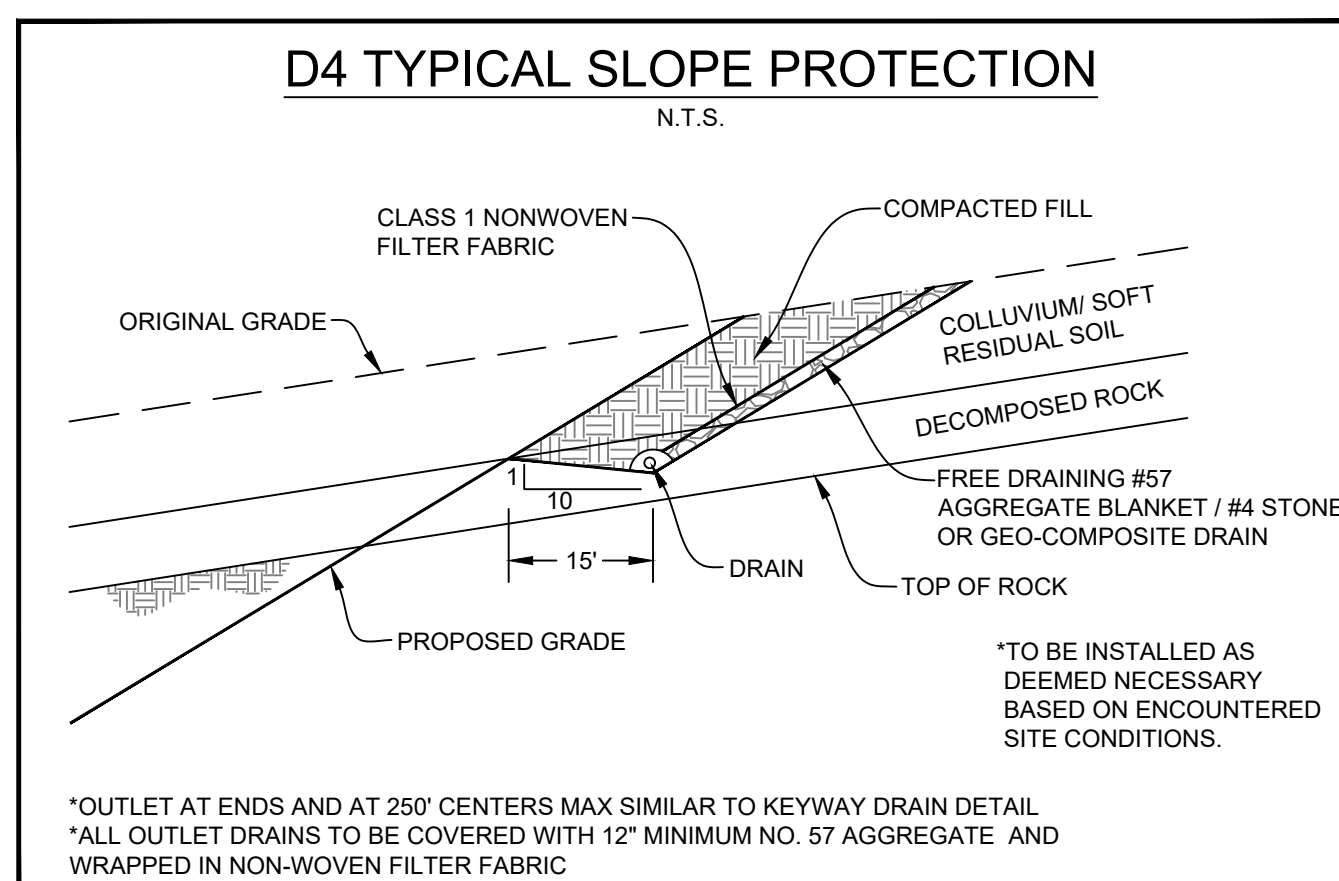
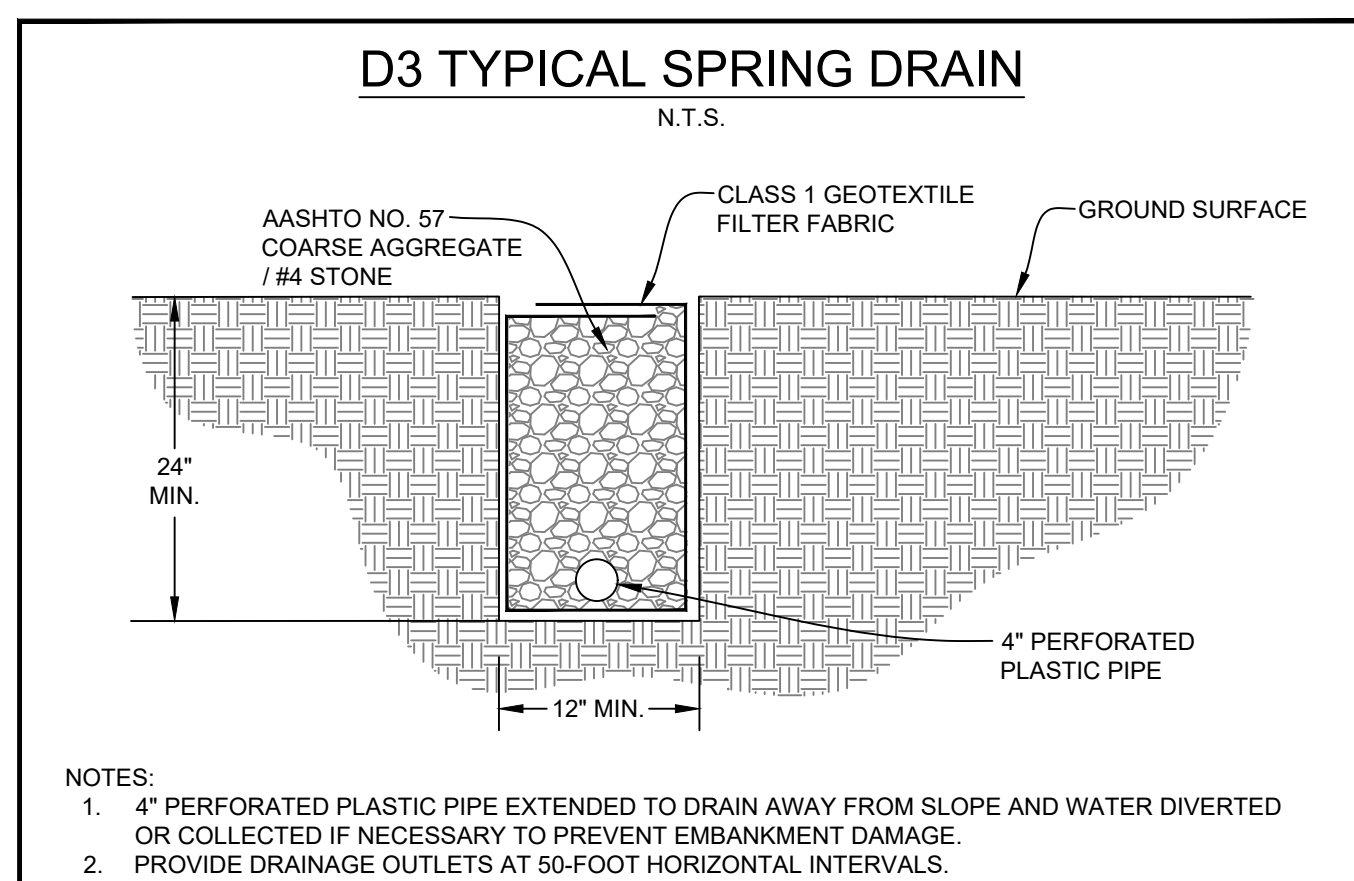
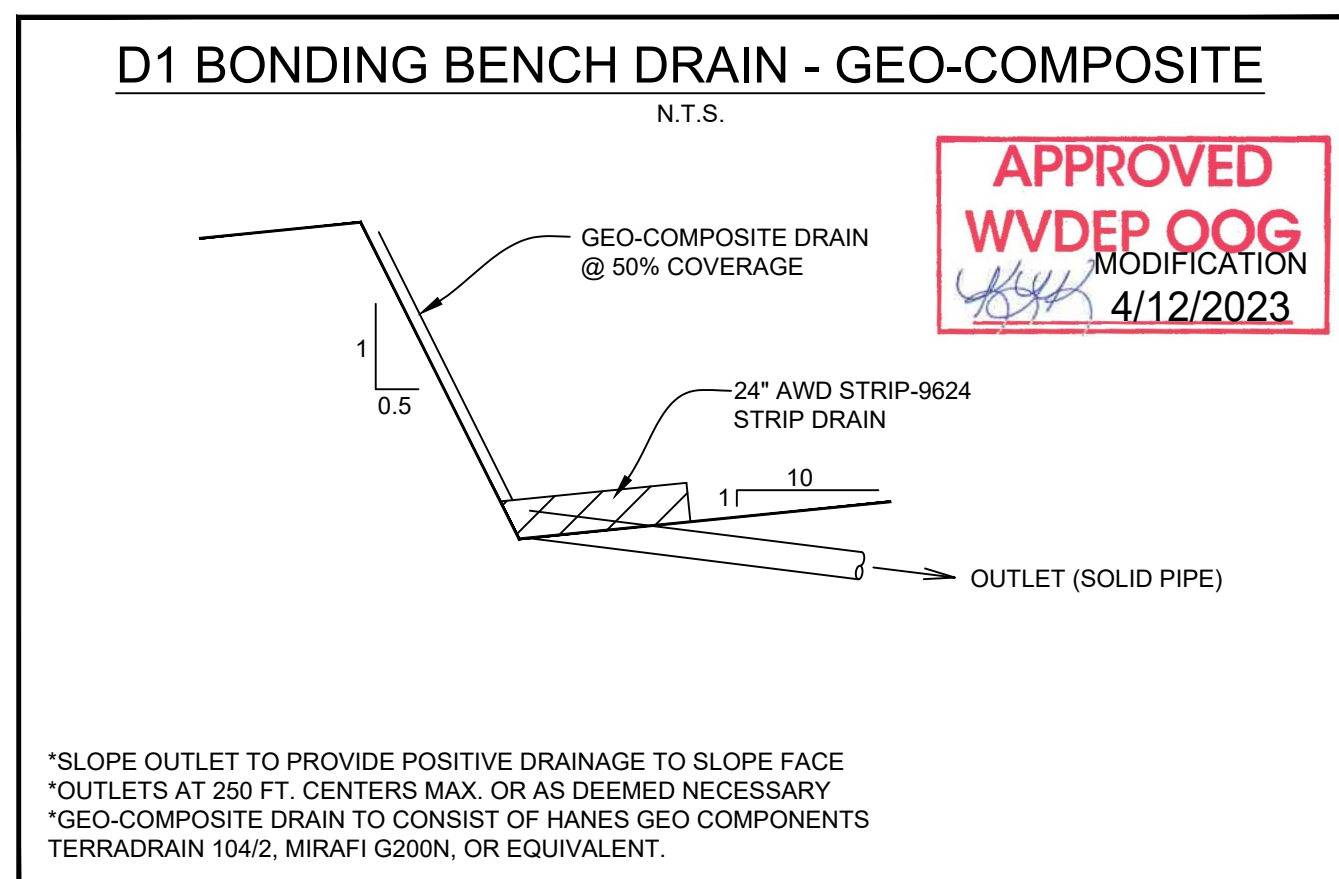
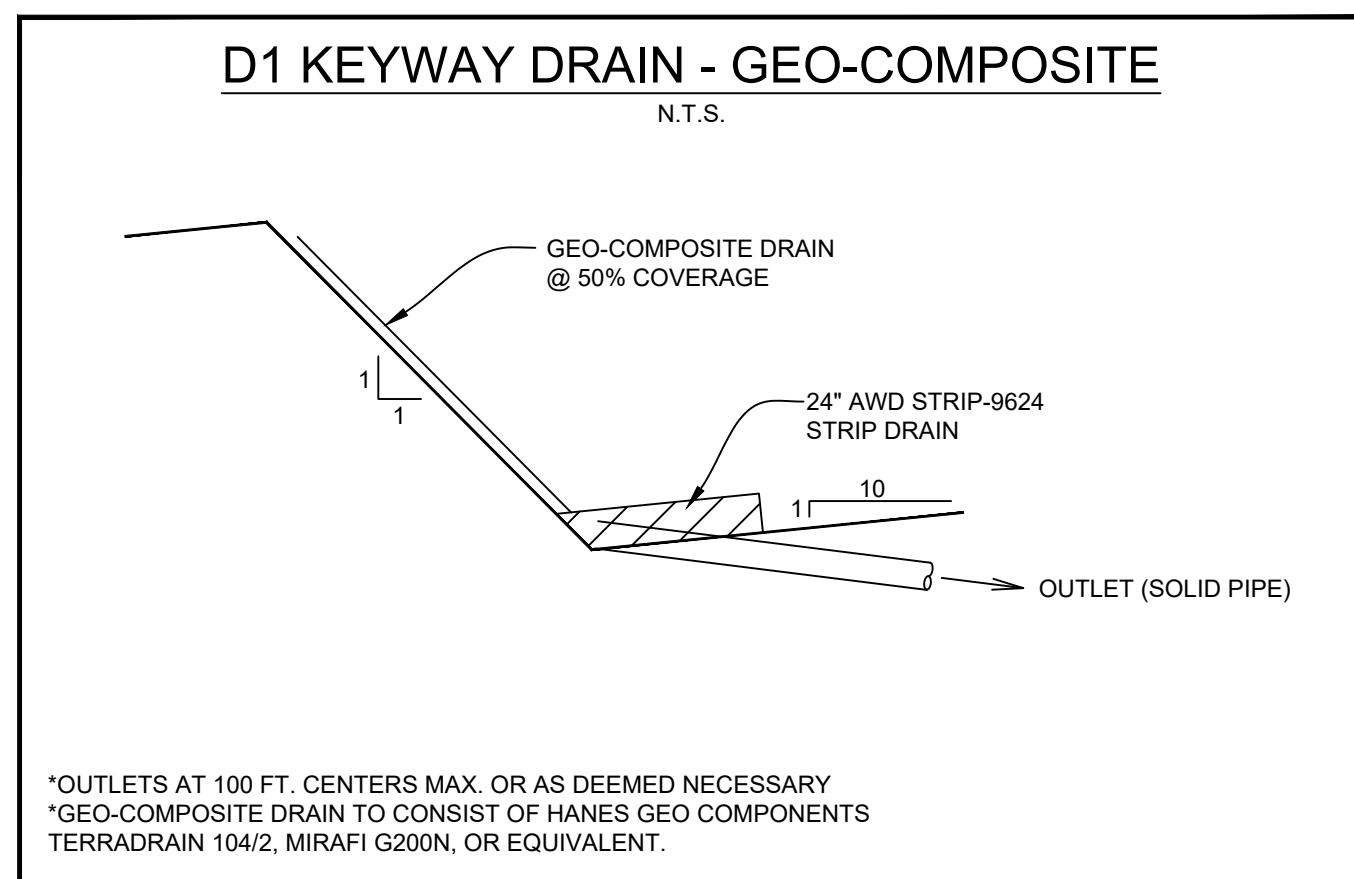
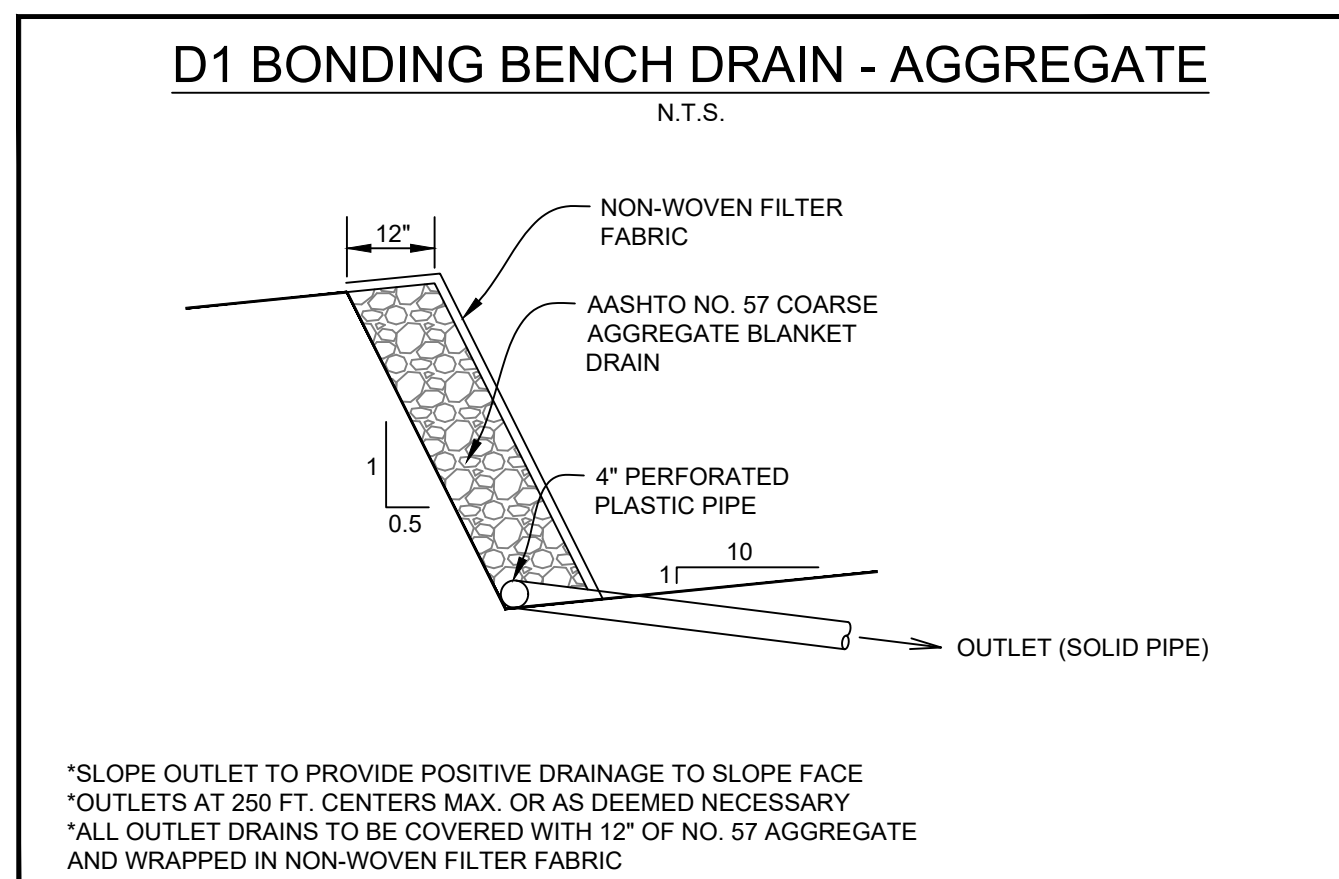
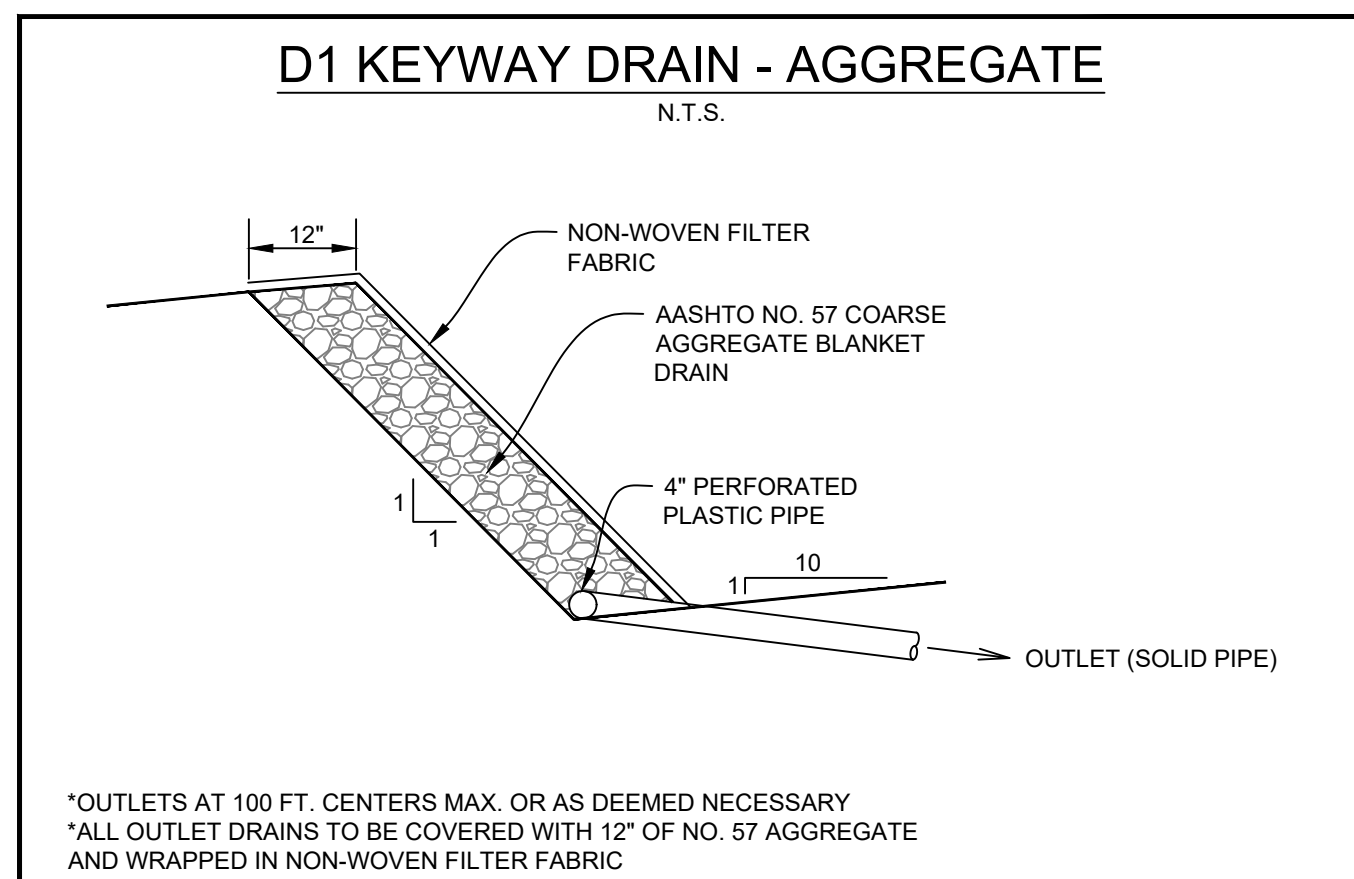
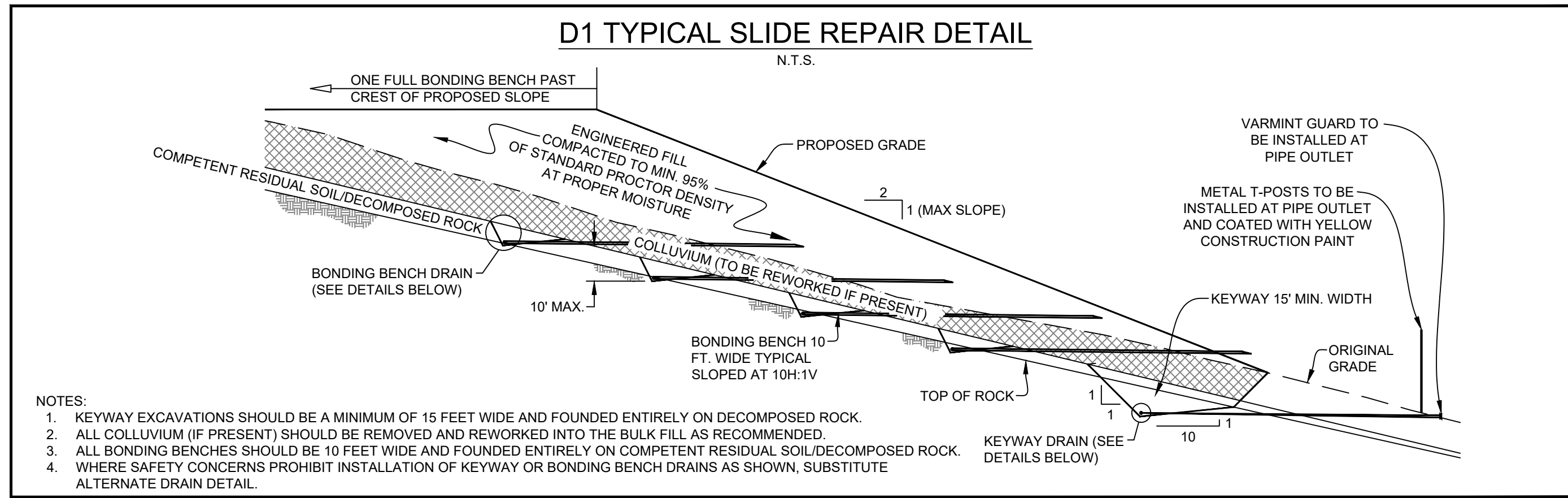
STOCKPILE AREA "F" AS-BUILT CROSS-SECTION "E-E"
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STOCKPILE AS-BUILT SECTIONS
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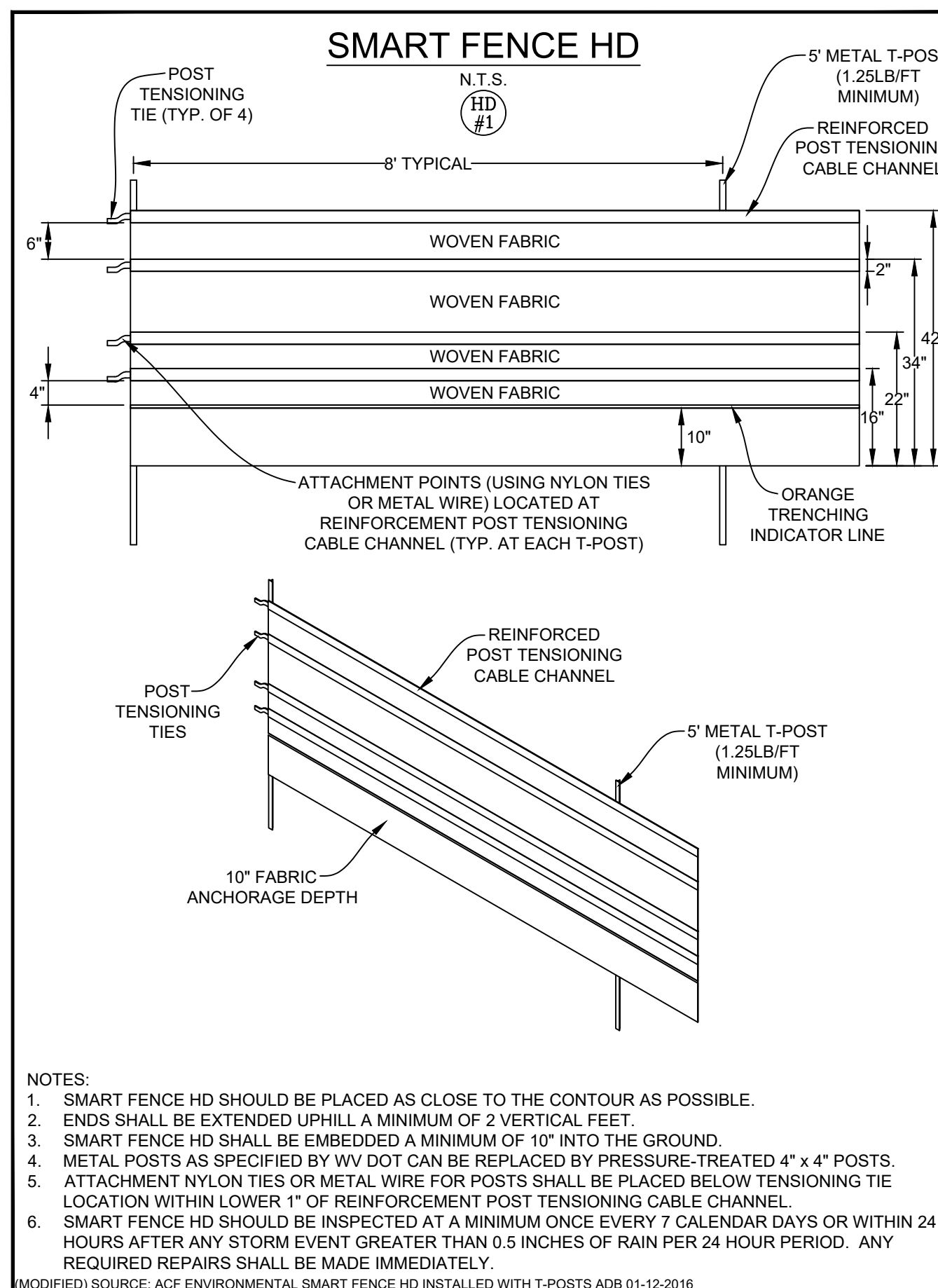
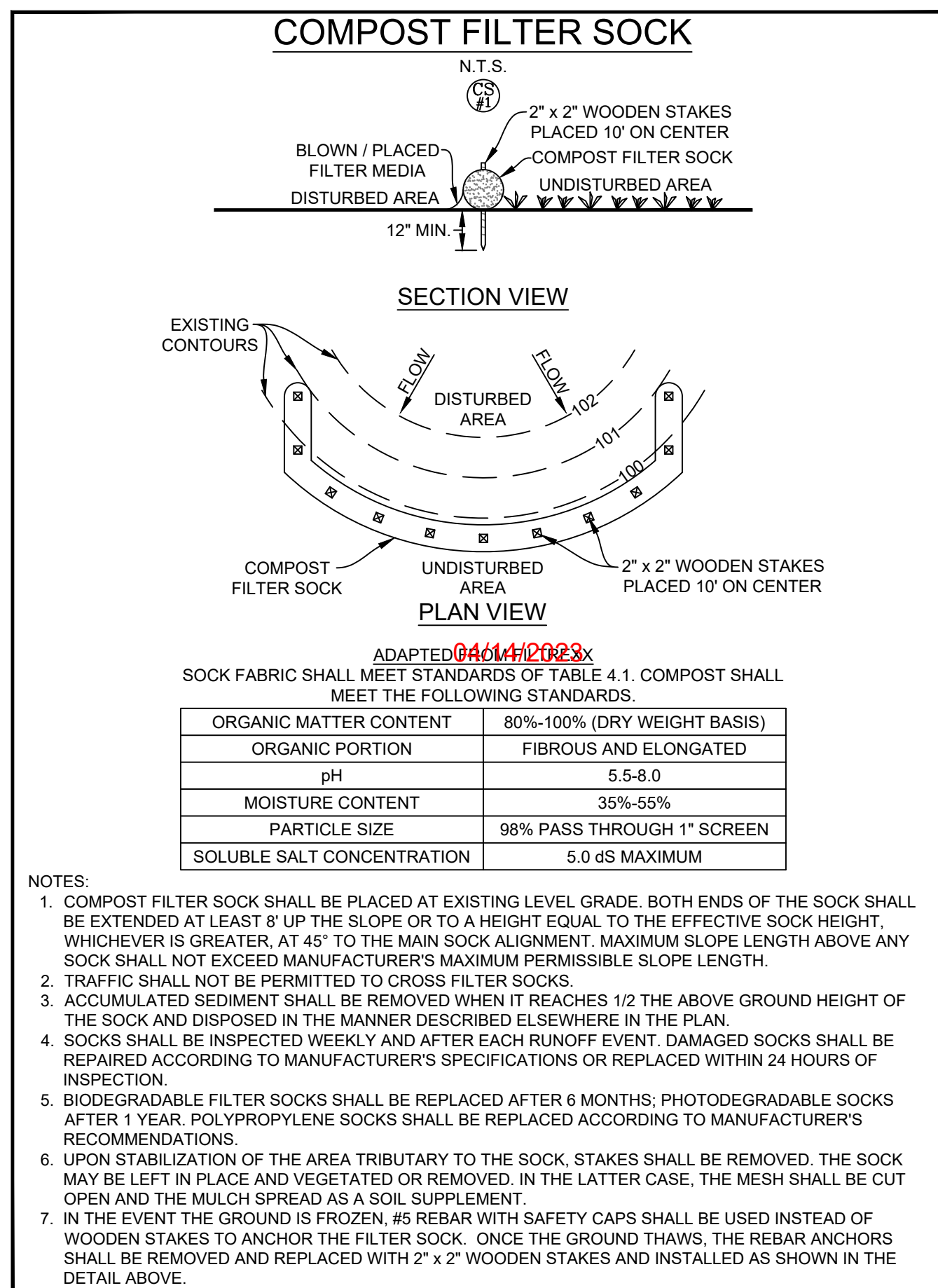


GENERAL SITE EARTHWORK RECOMMENDATIONS

- ALL FILL AREAS SHOULD BE CLEARED OF TREES, STUMPS, AND VEGETATION AND STRIPPED OF TOPSOIL/ORGANIC SOILS PRIOR TO THE START OF FILL PLACEMENT.
- THE DISTRIBUTION AND GRADATION OF FILL MATERIALS SHALL BE SUCH THAT THE FILL WILL BE FREE OF LENSES, POCKETS, OR LAYERS OF MATERIALS DIFFERING SUBSTANTIALLY IN GRADATION FROM THE SURROUNDING MATERIALS WITHIN THE DESIGNATED FILL AREAS.
- FILL SHALL BE PLACED AND SPREAD IN SUCCESSIVE AND APPROXIMATE HORIZONTAL LAYERS OF UNIFORM THICKNESS BASED ON THE NOMINAL PARTICLE SIZE OF MATERIAL AND THE SIZE AND TYPE OF THE AVAILABLE COMPACTION EQUIPMENT. IN GENERAL, SOIL SHOULD BE PLACED IN NOMINAL 12 INCH MAXIMUM LOOSE LIFTS. LARGER ROCK INCORPORATED INTO THE FILL SHOULD TYPICALLY BE LIMITED TO 12 INCHES THICK X 3 FEET X 3 FEET, WITH ALL VOID SPACE CHOKED WITH SMALLER PARTICLE SIZE MATERIAL.
- ADEQUATE COMPACTIVE EFFORT IS APPLIED BY UTILIZING THE PROPER COMPACTION EQUIPMENT FOR THE COMPOSITION OF THE FILL MATERIALS BEING PLACED. SEGMENTED, SHEEPSFOOT, AND/OR PADFOOT ROLLERS SHOULD BE USED WHEN PLACING PREDOMINATELY CLAYEY (COHESIVE) FILL MATERIALS. THESE TYPES OF ROLLERS ARE ALSO EFFECTIVE ON CLAYEY SHALES, CLAYSTONE, AND SOFTER SANDSTONE TO BREAK DOWN THE ROCK PARTICLES. SMOOTH DRUM VIBRATORY ROLLERS SHOULD BE UTILIZED ON PREDOMINATELY GRANULAR FILL MATERIALS AND TO SEAL CLAYEY SOILS TO HELP PREVENT SURFACE WATER INFILTRATION AND/OR TO PROMOTE DRAINAGE.
- ALL FILL MATERIALS SHALL BE COMPACTED BY A SUFFICIENT NUMBER OF COMPLETE TRIPS (I.E. PASSES) OF THE APPROPRIATE COMPACTION EQUIPMENT TO ATTAIN A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM TEST DESIGNATION D698 (STANDARD PROCTOR). MAINTAIN THE MOISTURE CONTENT OF THE FILL MATERIALS AS NECESSARY TO ATTAIN THE DESIRED COMPACTION DENSITY.
- UNDISTURBED AND/OR FILL MATERIALS PLACED WITHIN THE UPPER 12 INCHES OF FINAL GRADE SHOULD BE COMPACTED TO ATTAIN A MINIMUM OF 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM TEST DESIGNATION D698 (STANDARD PROCTOR) AT AN IN-PLACE MOISTURE WITHIN 3% OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT. THE ENTIRE SUBGRADE SURFACE SHOULD BE THOROUGHLY SEALED USING A VIBRATORY SMOOTH DRUM ROLLER.
- TO VERIFY THE SPECIFIED DEGREE OF COMPACTION AND TO DETERMINE THE IN-PLACE MOISTURE CONTENT AS STATED ABOVE, IN-PLACE FIELD DENSITY TESTS SHOULD BE PERFORMED IN ACCORDANCE TO THE PROCEDURES OF ASTM D2922 (NUCLEAR DENSOMETER).
- IN ADDITION TO IN-PLACE FIELD DENSITY TESTING, ACCEPTANCE SHOULD ALSO BE PREDICATED ON A VISUAL PERFORMANCE CRITERIA. OBVIOUS SURFACE RUTTING AND/OR DEFLECTION THAT ARE JUDGED TO BE DETRIMENTAL TO THE OVERALL STABILITY OF THE FILL AREA SHOULD BE REMOVED, MOISTURE CONDITIONED AND RECOMPACTED, OR OTHERWISE ADDRESSED PRIOR TO ACCEPTING THE LIFT.
- WHERE PREDOMINATELY "ROCKY" FILL MATERIALS ARE PLACED OR WHERE REPRESENTATIVE NUCLEAR DENSOMETER TESTS CANNOT BE OBTAINED, A VISUAL NON-DEFLECTION CRITERIA SHOULD BE DEVELOPED IN CONJUNCTION WITH AN ADEQUATE NUMBER OF ROLLER PASSES FOR ACCEPTANCE.

NOTE:

- THE GEOTECHNICAL NOTES AND DETAILS SHOWN ON THIS SHEET ARE FOR THE GENERAL EARTHWORK AND SUBSURFACE DRAINAGE ASSOCIATED WITH THE CONSTRUCTION OF THIS SITE. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL INVESTIGATION REPORT FOR ADDITIONAL GUIDANCE AND RECOMMENDATIONS.



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CONSTRUCTION DETAILS

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WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA

03/13/2023

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REVEGETATION
TAKEN FROM THE
WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL
WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS
CHARLESTON, W.VA.
SECTION IV



TEMPORARY SEEDING:

- a. GENERAL CONDITIONS WHERE PRACTICE APPLIES
WHERE EXPOSED SOIL SURFACES ARE NOT TO BE FINE-GRADED OR WORKED FOR PERIODS LONGER THAN 21 DAYS. TEMPORARY VEGETATIVE COVER WITH SEDIMENT CONTROLS MUST BE ESTABLISHED WHERE RUNOFF WILL GO DIRECTLY INTO A STREAM. IMMEDIATELY UPON CONSTRUCTION OF THE SITE (SITE INCLUDES ROAD AND LOCATION), VEGETATION MUST BE ESTABLISHED ON ROAD BANK AND LOCATION SLOPES. A PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO AREAS THAT WILL BE LEFT UN-WORKED FOR A PERIOD OF MORE THAN SIX MONTHS.
- b. SEED MIXTURES AND PLANTING DATES
REFER TO TABLES IV-2 THROUGH IV-4 FOR RECOMMENDED DATES TO ESTABLISH VEGETATIVE COVER AND THE APPROVED LISTS OF TEMPORARY AND PERMANENT PLANT SPECIES AND PLANTING RATES. TABLE IV-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.
- c. SEED APPLICATION
APPLY SEED BY BROADCASTING, DRILLING, OR BY HYDROSEED ACCORDING TO THE RATES INDICATED IN TABLE IV-3. PERFORM ALL PLANTING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. NECESSARY SITE PREPARATION AND ROUGHENING OF THE SOIL SURFACE SHOULD BE DONE JUST PRIOR TO SEEDING. SEEDBED PREPARATION MAY NOT BE REQUIRED ON NEWLY DISTURBED AREAS.

PERMANENT SEEDING:

- a. GENERAL
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 SEED SPECIES PLANTED. PLANTING OF PERMANENT VEGETATIVE COVERS MUST BE PERFORMED ON ALL DISTURBED AREAS AFTER 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 EROSION. ALL REQUIRED SEEDBED PREPARATION AND 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 AND IV-4. WHEN HYDROSEEDING, SEEDBED PREPARATION 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 INOCULANTS TOGETHER WITHIN ONE HOUR PRIOR TO PLANTING, AND ADD TO THE SLURRY JUST BEFORE SEEDING. APPLY THE SLURRY UNIFORMLY OVER THE PREPARED SITE. ASSURE THAT AGITATION IS CONTINUOUS THROUGHOUT THE SEEDING OPERATION AND THE MIX IS APPLIED WITHIN ONE HOUR OF INITIAL MIXING.
- b. LIME AND FERTILIZER
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 FOR 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.
- c. PERMANENT SEED MIXTURES
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 IV-4B, PERMANENT SEEDING MIXTURES SUITABLE FOR ESTABLISHMENT IN WEST VIRGINIA.
NOTES:
1. ALL LEGUMES MUST BE PLANTED WITH THE PROPER INOCULANTS PRIOR TO SEEDING.
2. LATHCO FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK.
3. ONLY ENDOPHYTE FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWNVEATCH ARE ALSO VERY INVASIVE SPECIES, NON-NATIVE TO WV.
4. FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD 50% MORE SEED TO THE SPECIFIED RATE. MIXTURES IN TABLE IV-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.
- d. SEEDING FOR WILDLIFE HABITAT
CONSIDER THE USE OF THE 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.

MULCHING

- a. GENERAL ORGANIC MULCHES
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 AREAS. 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 SEEDING 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 SEEDING 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 SEEDING 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 OPERATIONS AND APPLIED AS PART OF THE SLURRY. IT CREATES THE BEST SEED-SOIL CONTACT WHEN APPLIED OVER THE TOP OF (AS A SEPARATE OPERATION) NEWLY SEEDING AREAS. FIBER MULCH DOES NOT ALONE 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.
- b. CHEMICAL MULCHES, SOIL BINDERS, AND TACKIFIERS
A WIDE RANGE OF SYNTHETIC SPRAY ON MATERIALS ARE MARKETED TO STABILIZE AND PROTECT THE SOIL SURFACE. THESE ARE MIXED WITH WATER AND SPRAYED OVER THE MULCH AND TO THE SOIL. THEY MAY BE USED ALONE IN SOME CASES AS TEMPORARY STABILIZERS, OR IN CONJUNCTION WITH FIBER MULCH, STRAW, OR HAY.
WHEN USED ALONE, MOST CHEMICAL MULCHES DO NOT HAVE THE CAPABILITY TO INSULATE THE SOIL OR RETAIN SOIL MOISTURE THAT ORGANIC MULCHES HAVE.
- c. SPECIFICATIONS
FROM TABLE IV-6 SELECT THE TYPE OF MULCH AND RATE OF APPLICATION THAT WILL BEST SUIT THE CONDITIONS AT THE SITE.
- d. ANCHORING
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.
1. MECHANICAL ANCHORING
APPLY MULCH AND PULL MULCH ANCHORING TOOL OVER THE MULCH. WHEN A DISK IS USED, SET THE DISK STRAIGHT AND PULL ACROSS SLOPE. MULCH MATERIAL SHOULD BE TUCKED INTO THE SOIL ABOUT 3".
2. MULCH NETTING
FOLLOW MANUFACTURER'S RECOMMENDATION WHEN POSITIONING AND STAPLING THE MULCH NETTING IN THE SOIL.

ANTERO'S PREFERRED SEED MIXTURE

| Species/Contains | Pure Seed | Germ | Origin |
|-------------------------------|-----------|------|----------------------|
| Bestfor Intermediate Ryegrass | 29.95% | 90% | OR |
| Climax Timothy | 24.96% | 90% | CAN |
| Annual Ryegrass * | 24.92% | 90% | OR |
| Medium Red Clover * | 9.99% | 90% | OR |
| Potomac Orchardgrass | 9.46% | 90% | OR |
| Other Crop Seeds: | 0.01% | | * Variety Not Stated |
| Inert Matter: | 0.69% | | AMS: 5143 |
| Weed Seeds: | 0.02% | | |

| Planting Dates | Suitability |
|---|--|
| March 1 - April 15 and August 1 - October 1 | Best Seeding Periods |
| April 15 - August 1 | HIGH RISK - moisture stress likely |
| October 1 - December 1 | HIGH RISK - freeze damage to young seedlings |
| December 1 - March 1 | Good seeding period. Dormant seeding |

| Species | N (lbs/ac) | P2O5 (lbs/ac) | Example Rec. (per acre) |
|-------------------|------------|---------------|-------------------------|
| Cool Season Grass | 40 | 80 | 400 lbs. 10-20-20 |
| CS Grass & Legume | 30 | 60 | 300 lbs. 10-20-20 |
| Temporary Cover | 40 | 40 | 200 lbs. 19-19-19 |

| Species | Seeding Rate (lbs/acre) | Optimum Seeding Dates | Drainage | pH Range |
|------------------|-------------------------|-----------------------|------------------|----------|
| Annual Ryegrass | 40 | 3/1-6/15 or 8/15-9/15 | Well - Poorly | 5.5-7.5 |
| Field Bromegrass | 40 | 3/1-6/15 or 8/15-9/15 | Well - Mod. Well | 6.0-7.0 |
| Spring Oats | 96 | 3/1-6/15 | Well - Poorly | 5.5-7.0 |
| Sundagrass | 40 | 5/15-8/15 | Well - Poorly | 5.5-7.5 |
| Winter Rye | 168 | 8/15-10/15 | Well - Poorly | 5.5-7.5 |
| Japanese Millet | 180 | 8/15-11/15 | Well - Mod. Well | 5.5-7.0 |
| Redtop | 30 | 6/15-8/15 | Well | 4.5-7.0 |
| Annual Ryegrass | 5 | 3/1-6/15 | Well | 4.0-7.5 |
| Spring Oats | 26 | 3/1-6/15 | Well - Poorly | 5.5-7.5 |
| Spring Oats | 64 | 3/1-6/15 | Well - Poorly | 5.5-7.5 |

NOTE: These rates should be increased by 50% if planted April 15 - August 1 and October 1 - March 1.

| Species/Mixture | Seeding Rate (lbs/acre) | Soil Drainage preference | pH Range |
|---|-------------------------|--------------------------|------------------|
| Crownvetch / Tall Fescue | 10 - 15 | Well - Mod. Well | 5.0 - 7.5 |
| Crownvetch / Perennial Ryegrass | 10 - 15 | Well - Mod. Well | 5.0 - 7.5 |
| Flatpea or Perennial Pea / Tall Fescue | 20 | Well - Mod. Well | 4.0 - 8.0 |
| Ladino Clover / Serecia Lespedeza / Tall Fescue | 30 | Well - Mod. Well | 4.5 - 7.5 |
| Tall Fescue / Ladino Clover / Redtop | 2 | Well - Mod. Well | 5.0 - 7.5 |
| Crownvetch / Tall Fescue / Redtop | 10 | Well - Mod. Well | 5.0 - 7.5 |
| Tall Fescue / Birdsfoot Trefoil / Redtop | 20 | Well - Mod. Well | 5.0 - 7.5 |
| Serecia Lespedeza / Tall Fescue / Redtop | 25 | Well - Mod. Well | 4.5 - 7.5 |
| Tall Fescue / Redtop | 30 | Well - Mod. Well | 4.5 - 7.5 |
| Tall Fescue / Creeping Red | 3 | Well - Mod. Well | 5.0 - 7.5 |
| Tall Fescue | 50 | Well - Poorly | 4.5 - 7.5 |
| Perennial Ryegrass / Tall Fescue / Lathco Flatpea * | 10 | Well - Poorly | 5.8 - 8.0 |
| | 15 | | |
| | 20 | | |

* 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 timeframe, add 50% more seed to the specified rate.
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

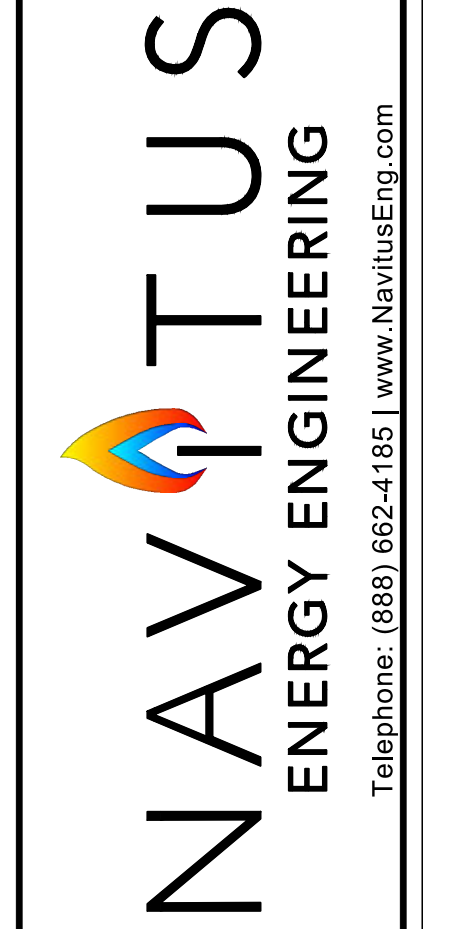
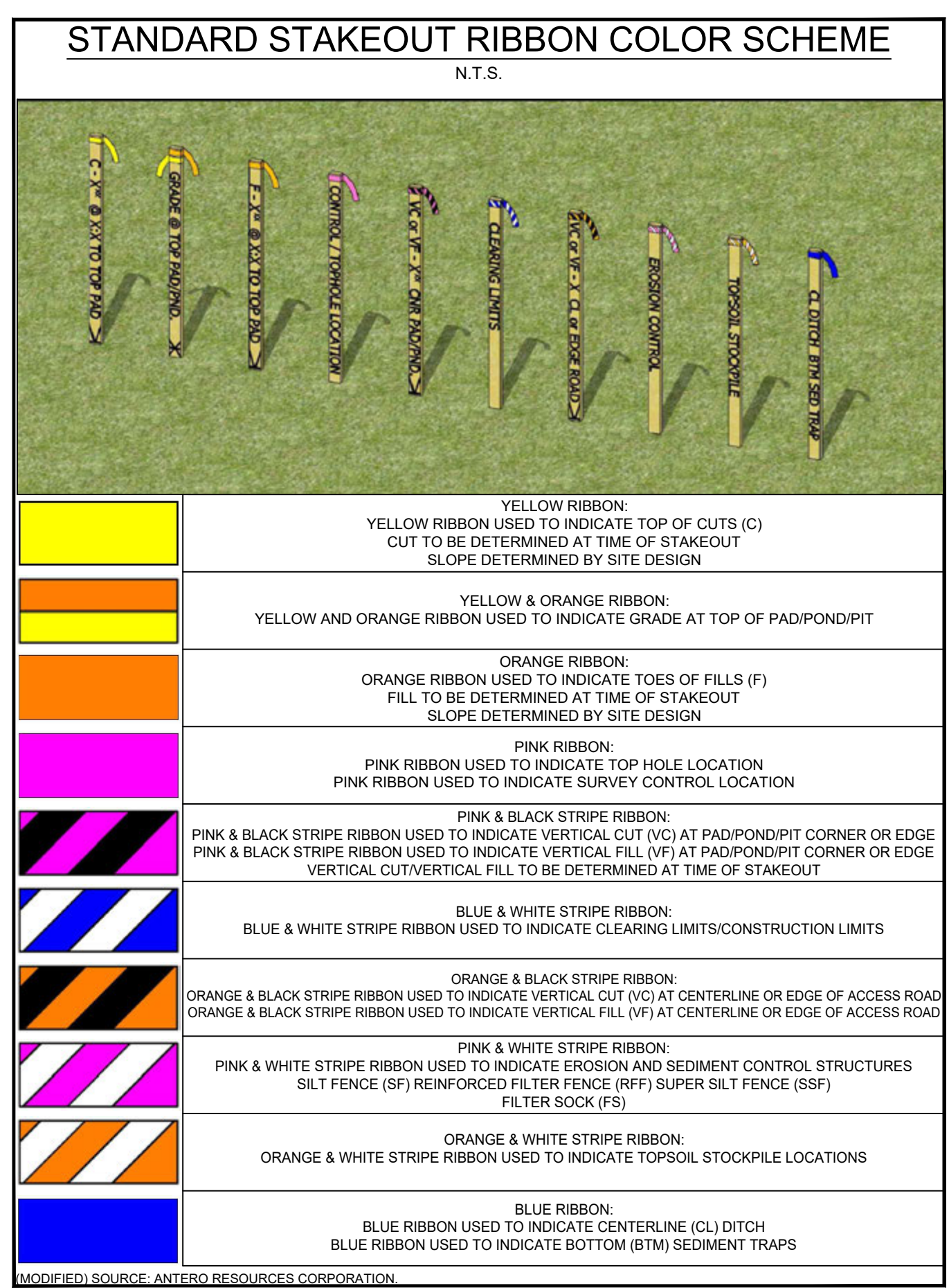
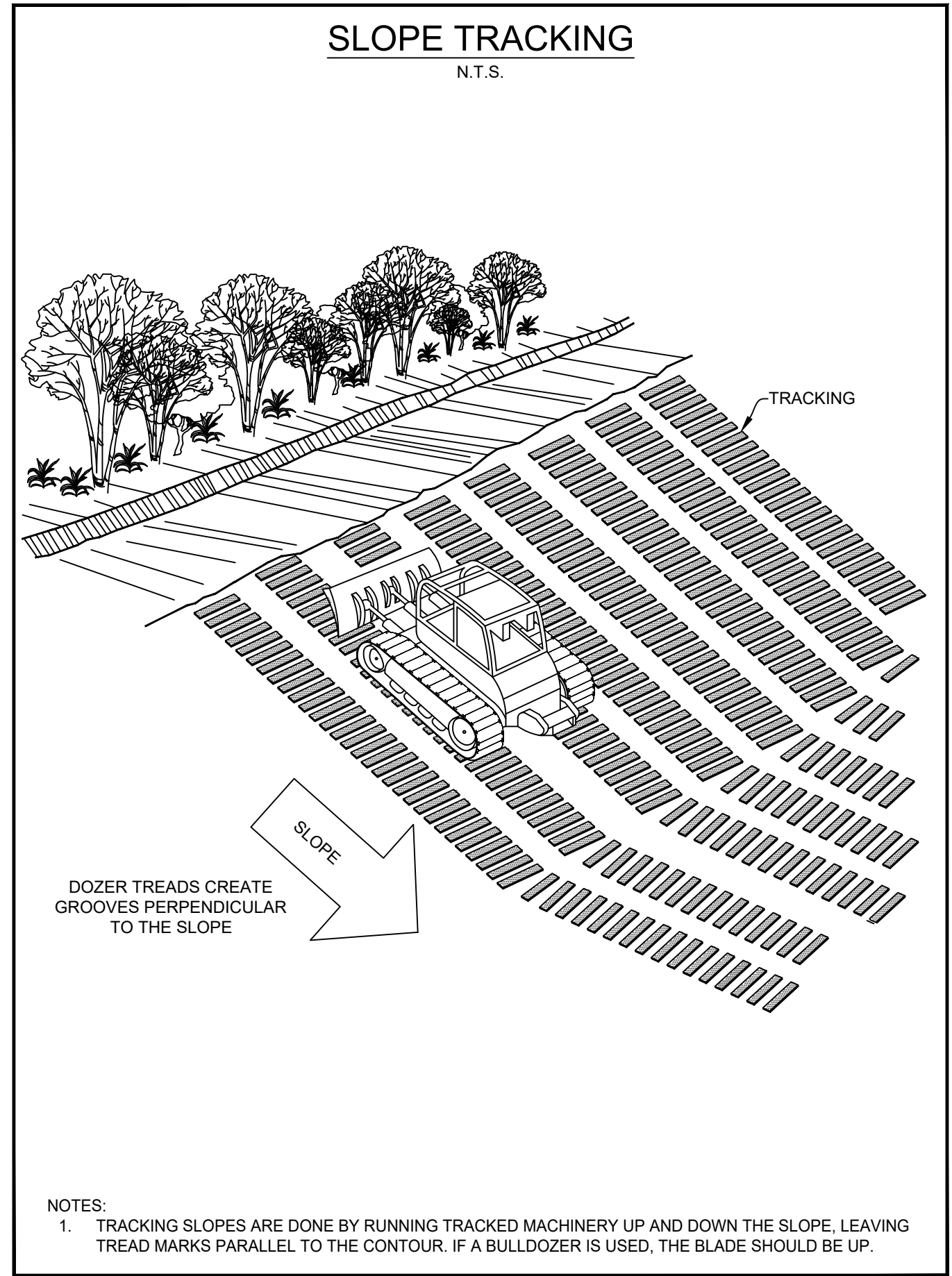
| Species/Mixture | Seeding Rate (lbs/acre) | Soil Drainage preference | pH Range |
|---|-------------------------|--------------------------|------------------|
| KY Bluegrass / Redtop | 20 | Well - Mod. Well | 5.5 - 7.5 |
| Ladino Clover or Birdsfoot Trefoil | 2 / 10 | | |
| Timothy / Alfalfa | 5 | Well - Mod. Well | 6.5 - 8.0 |
| Timothy / Birdsfoot Trefoil | 12 | Well - Poorly | 5.5 - 7.5 |
| Orchardgrass / Ladino Clover / Redtop | 10 | Well - Mod. Well | 5.5 - 7.5 |
| Orchardgrass / Ladino Clover | 3 | Well - Mod. Well | 5.5 - 7.5 |
| Orchardgrass / Perennial Ryegrass | 10 | Well - Mod. Well | 5.5 - 7.5 |
| Creeping Red Fescue / Perennial Ryegrass | 30 | Well - Mod. Well | 5.5 - 7.5 |
| Orchardgrass or KY Bluegrass | 10 | Well - Mod. Well | 6.0 - 7.5 |
| Birdsfoot Trefoil / Redtop / Orchardgrass | 20 | Well - Mod. Well | 5.5 - 7.5 |
| Lathco Flatpea * / Perennial Ryegrass | 30 | Well - Mod. Well | 5.5 - 7.5 |
| Lathco Flatpea * / Orchardgrass | 30 | Well - Mod. Well | 5.5 - 7.5 |
| | 20 | | |

* 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 timeframe, add 50% more seed to the specified rate.
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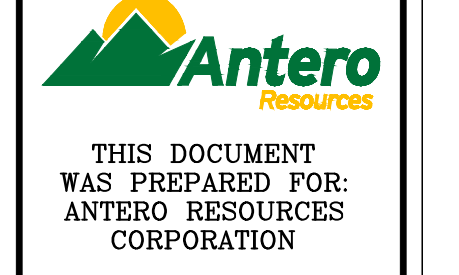
| pH of Soil | Lime in Tons per Acre | Fertilizer, Lbs. per Acre (10-20-20 or Equivalent) |
|------------|-----------------------|--|
| Above 6.0 | 2 | 500 |
| 5.0 to 6.0 | 3 | 500 |
| Below 5.0 | 4 | 500 |

The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing 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.

| Material | Minimum Rates per acre | Coverage | Remarks |
|--------------------|------------------------|-----------------------------|---|
| Hay or Straw | 2 to 3 Tons | Cover 75% to 90% of Surface | Subject to wind blowing or washing unless tied down |
| Wood Fiber | 1000 to 1500 lbs | Cover all | For hydroseeding |
| Pulp Fiber | | Disturbed Areas | |
| Wood - Cellulose | | | |
| Recirculated Paper | | | |



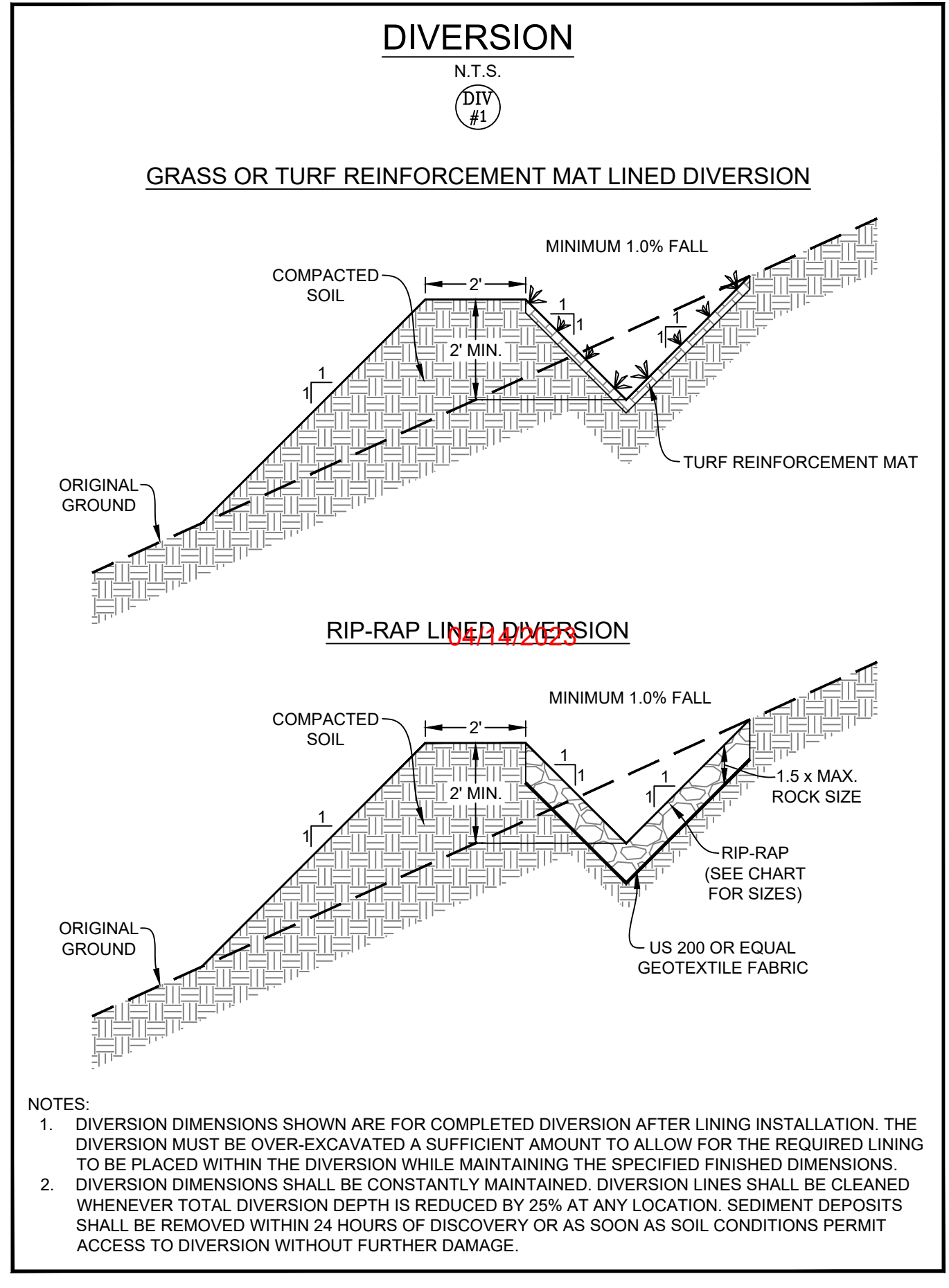
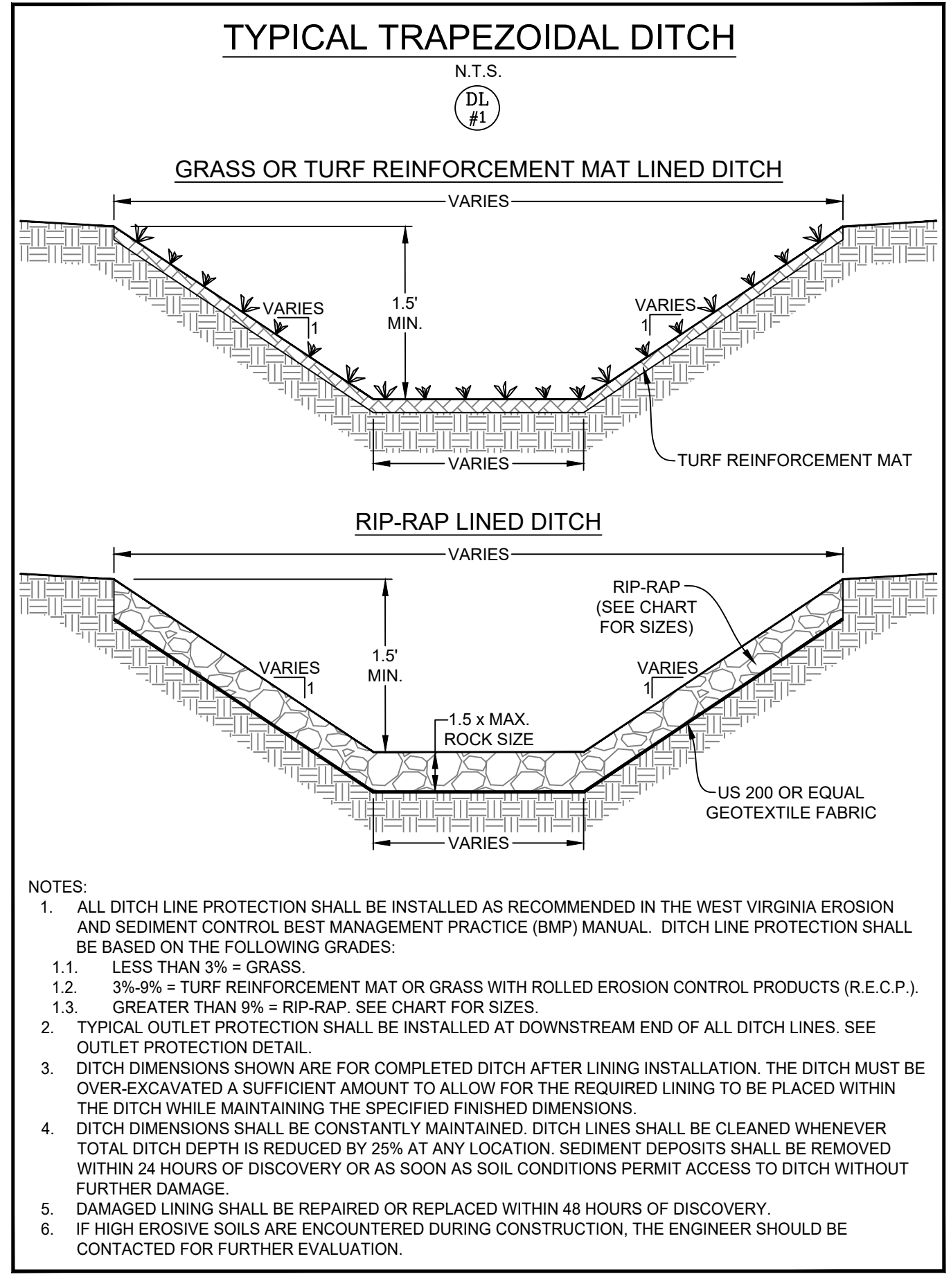
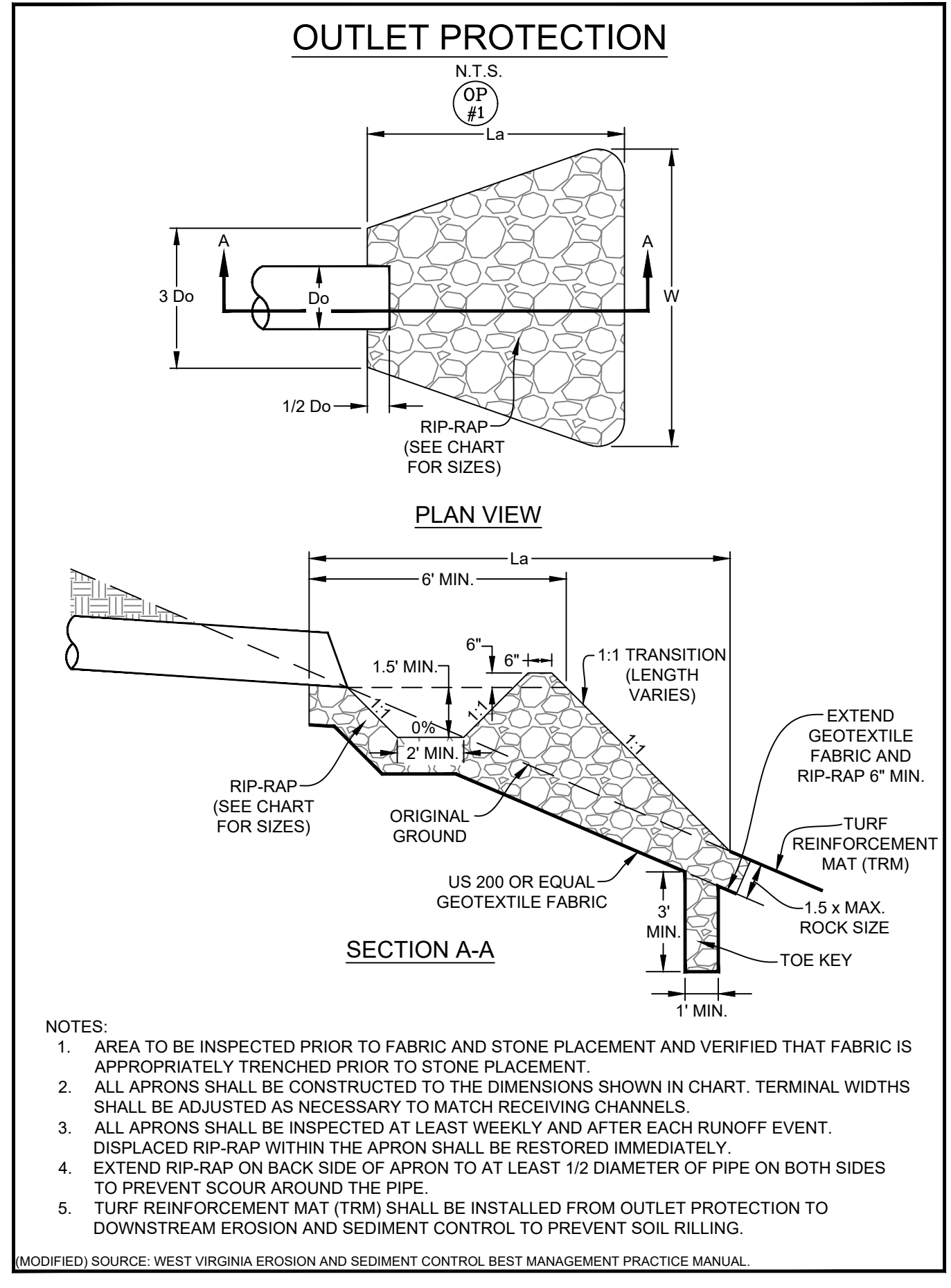
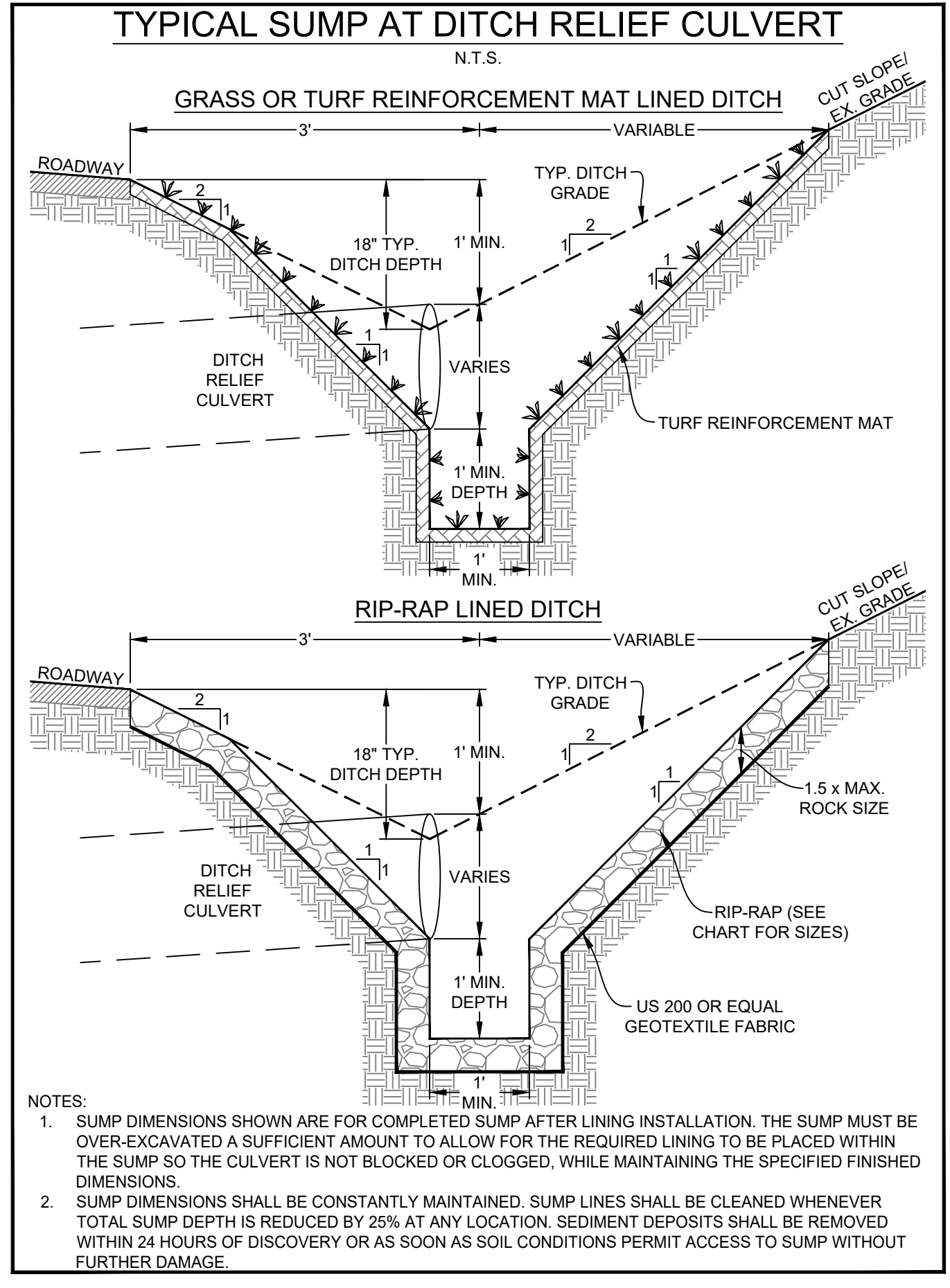
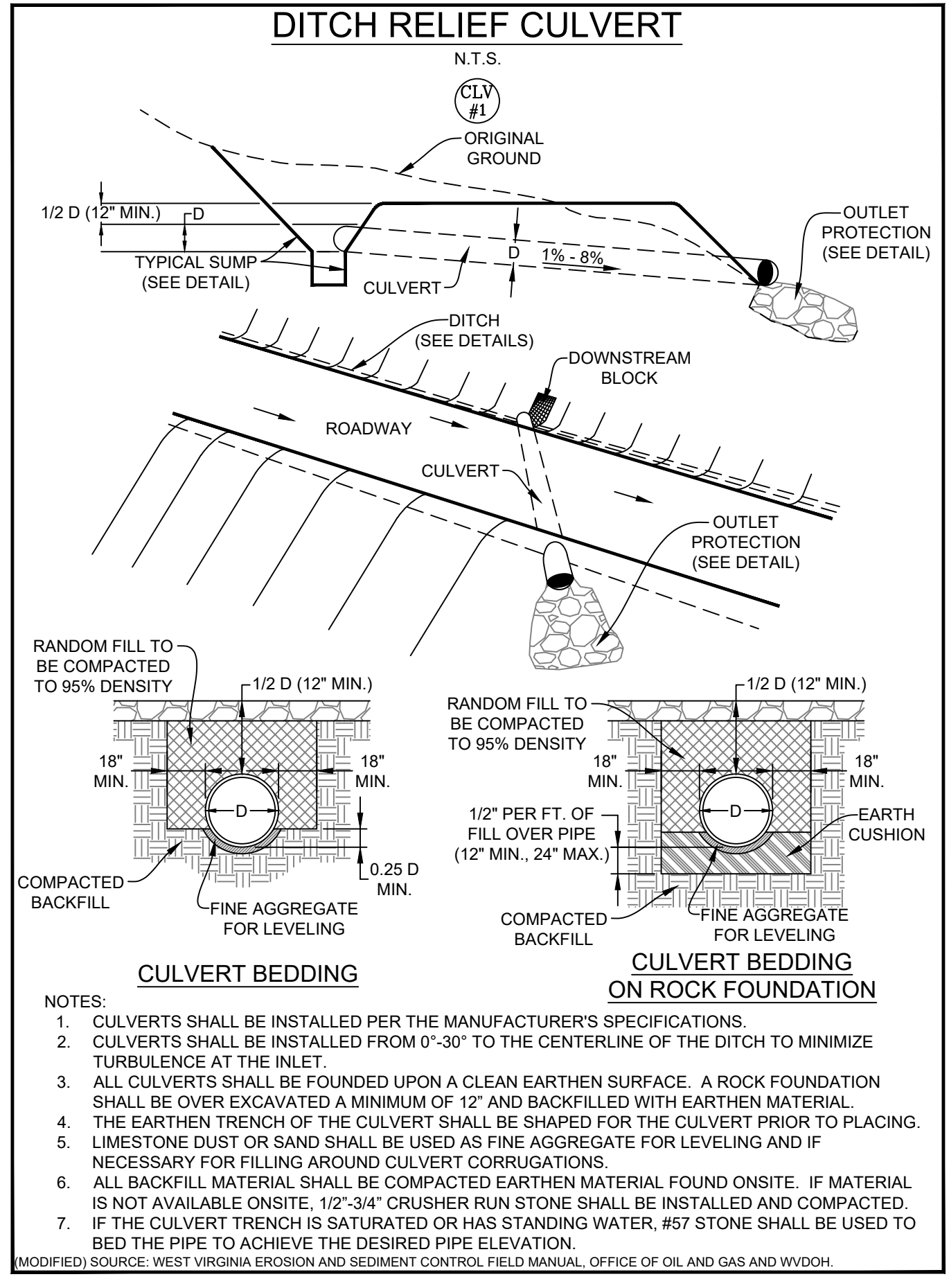
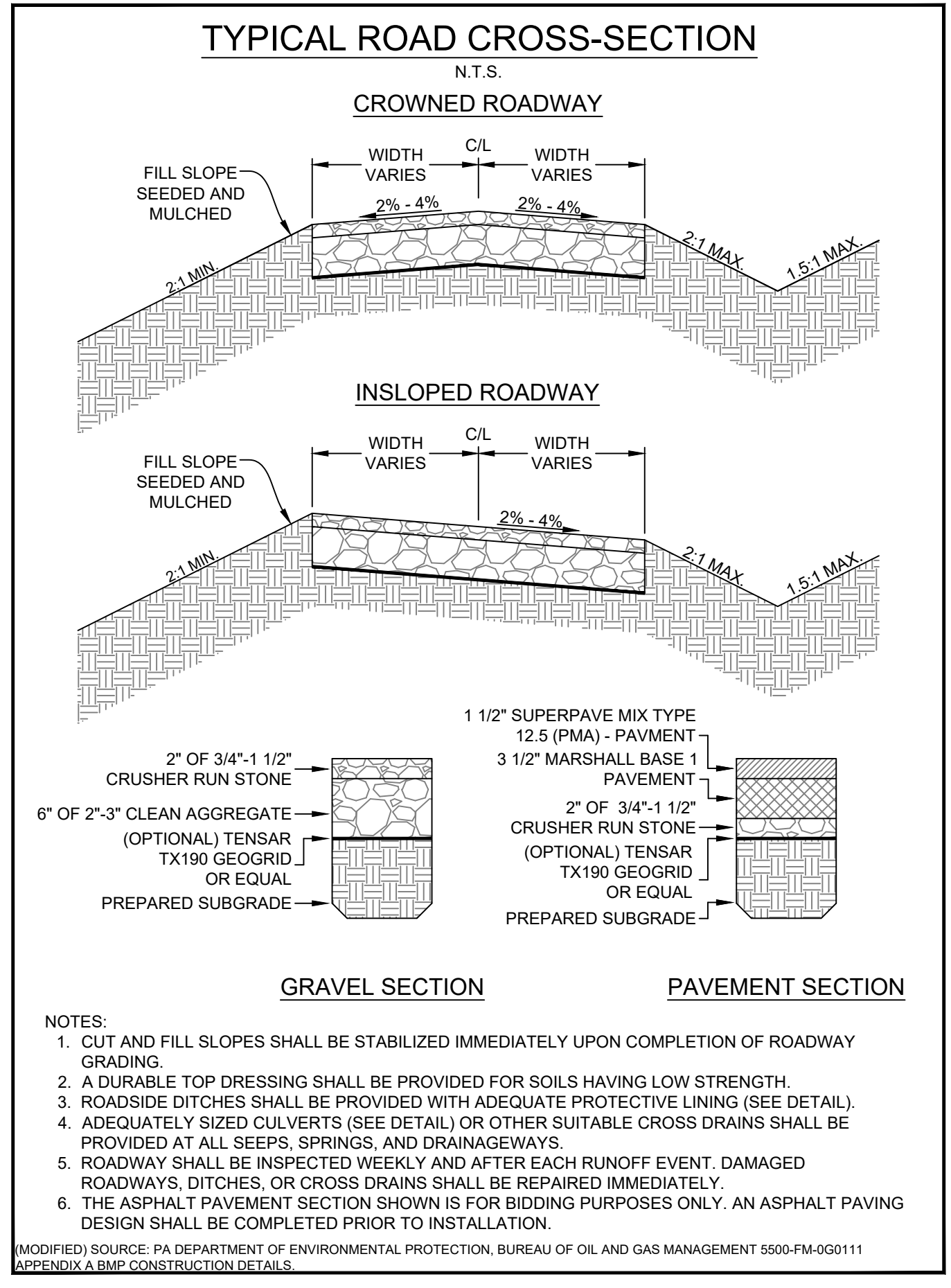
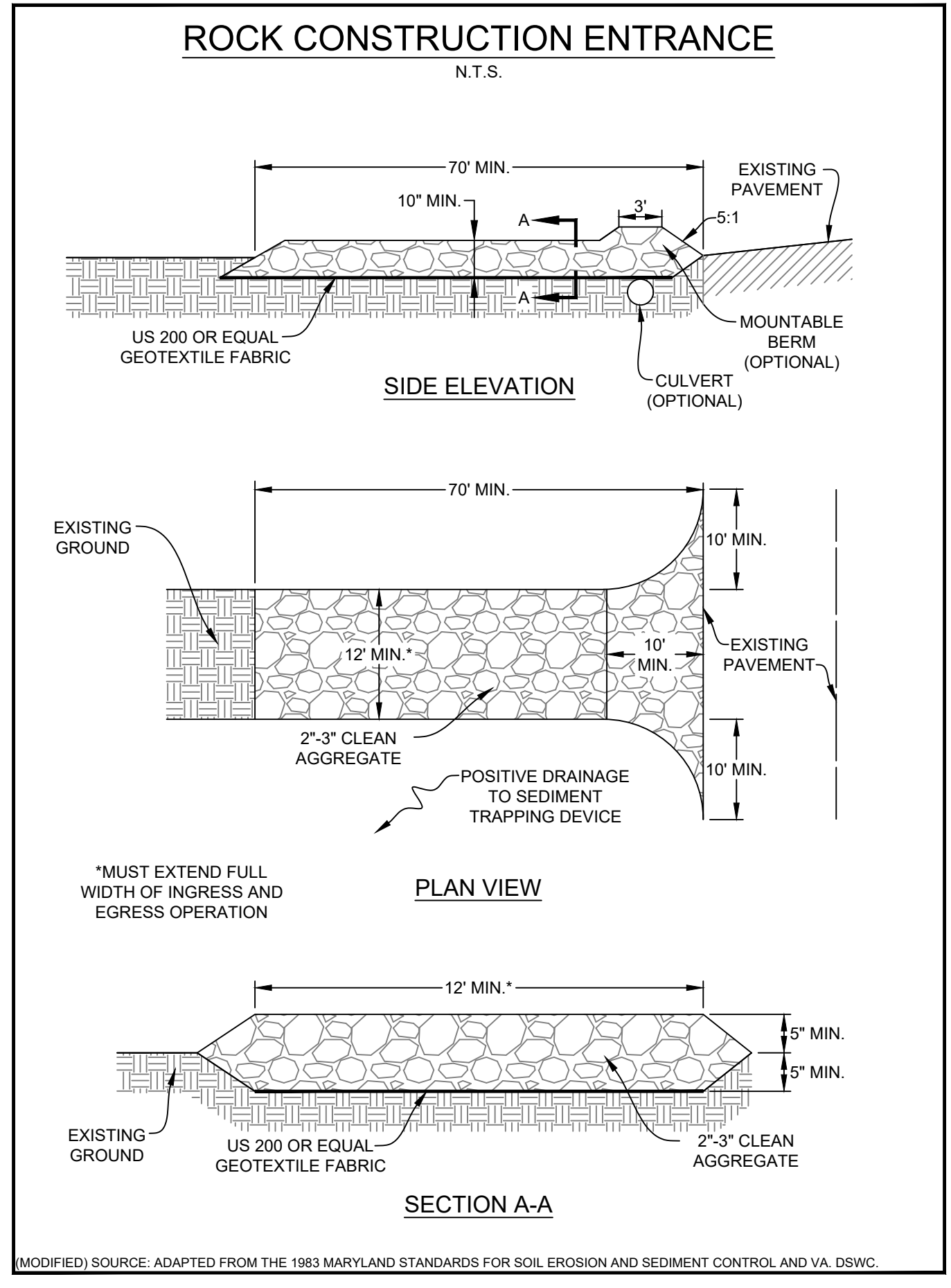
| DATE | REVISION |
|------------|------------------------------------|
| 03/13/2023 | REVISED PER LANDOWNER ROAD LOD MOD |



CONSTRUCTION DETAILS
ED YOST
WELL PAD & WATER CONTAINMENT PAD
ELLSWORTH DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE: 01/27/2023
SCALE: AS SHOWN
SHEET 23 OF 24



APPROVED
WVDEP OOG
 MODIFICATION
 4/12/2023

| DATE | REVISION |
|------------|------------------------------------|
| 03/13/2023 | REVISED PER LANDOWNER ROAD LOD MOD |

