US Army Corps
of Engineers
Alaska District

Regulatory Division (1145)
CEPOA-RD
Post Office Box 6898
JBER, Alaska 99506-0898

Public Notice of Application for Permit

PUBLIC NOTICE DATE:	**March 10, 2022**
EXPIRATION DATE:	**April 8, 2022**
REFERENCE NUMBER:	**POA-2018-00075**
WATERWAY:	**Ikalukrok Creek**

Interested parties are hereby notified that a Department of the Army permit application has been received for work in waters of the United States as described below and shown on the enclosed project drawings.

All comments regarding this Public Notice should be sent to the address noted above. If you desire to submit your comments by email, you should send it to the Project Manager's email as listed below or to regpagemaster@usace.army.mil. All comments should include the Public Notice reference number listed above.

All comments should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact Janet Post at (907) 753-2831, toll free from within Alaska at (800) 478-2712, by fax at (907) 753-5567, or by email at janet.l.post@usace.army.mil if further information is desired concerning this notice.

APPLICANT: Teck America Inc., Ms. Leslie Olmstead, 501 N. Riverpoint #300, Spokane, WA 99202, Phone: 509-747-611, Email: leslie.olmstead@teck.com.

AGENT: Teck America Inc., Ms. Emily Hart, 2525 C St. Suite 310, Anchorage, AK 99503, Phone: 907-754-3800, Email: emily.hart@teck.com.

LOCATION: The project site is located within T. 31N. R.18W. Section 18; T. 32N. R. 18W. Sections 18, 19, 30, 31; T. 31N. R. 19W. Sections 1, 12, 13; T. 32N. R. 19W. Sections 11, 12, 13, 14, 15, 22, 23, 36; Kateel River Meridian; USGS Quad Map Delong Mountains A-2; Exploration Access Road Origin Latitude 68.0826º N., Longitude 162.8839º W.; Exploration Access Road Terminus Latitude 68.1596º N., Longitude 162.9570º W.; Support Facilities Area Latitude 68.1795º N., Longitude 162.9567º W; Project begins at the Red Dog Mine; near Kivalina, Alaska, and Noatak, Alaska.

PURPOSE: The applicant's stated purpose is to develop a gravel road and work pads, to provide safe year-round overland access and foundations for support facilities to allow a multi-year exploration drilling campaign to assess the technical characteristics and economic viability of the Aktigiruq and Anarraaq mineral deposits.

PROPOSED WORK: Teck America Inc.'s proposed project includes: 6 gravel pads in 37.20 acres to construct an exploration camp, water treatment plant, equipment laydown areas, an underground access mining exploration portal, underground vents, and associated infrastructure; 55 culverts; 5 bridges; 5 gravel roads totaling 12.34 miles in 101.60 acres; 4 material sites in 43.5 acres.

In total, there would be 182.3 acres of impacts for this project, of which 162.68 are in uplands and 19.62 are in wetlands. Approximately 177,896 cubic yards of fill would be discharged into 19.62 acres of wetlands and 2,412 linear feet of rivers/streams. Attached please find Teck America Inc's permit application. All work would be performed in accordance with the enclosed plan (sheets 1-37), dated December 16, 2021.

ADDITIONAL INFORMATION:

AGENCY	TYPE APPROVAL	APPLICATION DATE
ADF&G	Fish Habitat Permits	Received 2018
ADEC	Waste Management Permit	June 2022
ADEC	401 Certification of 404 Permit	February 2022
ADEC	APDES MSGP Storm Water Permit	Received 2018
ADEC	Title I Air Permit	Received 2019
ADEC	APDES Non-Domestic Wastewater Discharge Permit	June 2022
ADNR	Phase I Plan of Operations Approval Incl. Reclamation Plan and Reclamation Bond	February 2022
ADNR	Phase II Plan of Operations Approval Incl. Reclamation Plan and Reclamation Bond	July 2022
ADNR	Temporary Water Use Authorizations	February 2022
NAB	Title 9 Conditional Use Permit	July 2022

APPLICANT PROPOSED MITIGATION: The applicant proposes the following mitigation measures to avoid, minimize, and compensate for impacts to waters of the United States from activities involving discharges of dredged or fill material.

Avoidance: The applicant stated, “Due to the linear nature of the proposed project and the abundance of WOTUS within the project area, total avoidance is not practicable. Where practicable, facilities were located to avoid impacts to WOTUS. These include routing the proposed exploration access roads on uplands to the extent practicable and locating material sites; vent raises pads; laydown pads; and the portal and camp area pad in uplands.”

Minimization: The applicant stated, “The proposed project minimizes impacts to WOTUS to the maximum extent practicable by reducing the project footprint, maximizing the use of uplands, and controlling the materials after the discharge. The road corridor was located on drier ground with less WOTUS and greater use of uplands, where practicable. The road was designed as a single lane road with vehicle pullouts, as opposed to a wider two-lane road, reducing WOTUS impacts where crossings could not be avoided. The proposed road corridor maximized, to the extent practicable the use of flat terrain, reducing the need for fill material and side cut construction, reducing impacts where crossings WOTUS could not be avoided. At some locations, the road alignment was designed to impact edges of wetlands rather than bisecting the entire wetland habitat, where practicable. Stream crossings were designed to be perpendicular to flow direction, to the extent practicable. Natural flow patterns would be maintained using culverts and bridges. Sediment barriers would be installed around the perimeter of the construction areas at water crossings. Alaska Department of Fish and Game - Fish Habitat Permit restrictions and best management practices for in-water work and bridge abutment designs would be adhered to, to minimize potential impacts to fish and other aquatic species. The construction contractor would develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to address erosion and sediment control as required by the Alaska Department of Environmental Conservation (ADEC) – Alaska Pollutant Discharge Elimination System (APDES) Multi-Sector General (MSGP).”

Compensatory Mitigation: The applicant stated, “There are no existing mitigation banks, or In-lieu fee programs with service areas in the watershed that can satisfy the mitigation needs for the proposed project. Permittee-responsible mitigation is the only practical mechanism to provide compensatory mitigation for the unavoidable loss of 19.62 acres, and 2,412 linear feet of permanent impacts to WOTUS. Teck is proposing preservation of WOTUS within the Red Dog Creek watershed at a 1:1 ratio, by means of a deed restriction that would protect aquatic resources from future development. Teck will submit a Compensatory Mitigation Plan for the proposal, under separate cover, that will include timelines and designs, maintenance plans, performance standards, monitoring requirements, long-term management plan, and adaptive management plan.”

WATER QUALITY CERTIFICATION: A permit for the described work will not be issued until a certification or waiver of certification, as required under Section 401 of the Clean Water Act (Public Law 95-217), has been received from the Alaska Department of Environmental Conservation.

CULTURAL RESOURCES: The latest published version of the Alaska Heritage Resources Survey (AHRS) has been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the National Register of Historic Places. The applicant, Teck America Inc. has provided several cultural resource reports. There are cultural resources within the vicinity of the permit area, and the Corps has not made an effects determination for the proposed project. This application is being coordinated with the State Historic Preservation Office (SHPO), federally recognized tribes, and other consulting parties. Any comments SHPO, federally recognized tribes, and other consulting parties may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: No threatened or endangered species are known to use the project area. Therefore, no consultation with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (NMFS) is required. However, any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH).

The project area is within the known range of anadromous fish per the Anadromous Waters Atlas Quad No. 136 De Long Mts Index.

We are currently gathering information regarding the anadromous species and have yet to make a determination of effect. Should we find that the described activity may affect the species listed above, we will follow the appropriate course of action under Section 305(b)(2) of the Magnuson-Stevens Act. Any comments the National Marine Fisheries Service may have concerning essential fish habitat will be considered in our final assessment of the described work.

TRIBAL CONSULTATION: The Corps fully supports tribal self-governance and government-to-government relations between Federally recognized Tribes and the Federal government. Tribes with protected rights or resources that could be significantly affected by a proposed Federal action (e.g., a permit decision) have the right to consult with the Alaska District on a government-to-government basis. Views of each Tribe regarding protected rights and resources will be accorded due consideration in this process. This Public Notice serves as notification to the Tribes within the area potentially affected by the proposed work and invites their participation in the Federal decision-making process regarding the protected Tribal right or resource. Consultation may be initiated by the affected Tribe upon written request to the District Commander during the public comment period.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, reasons for holding a public hearing.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts, which the proposed activity may have on the public interest, requires a careful weighing of all the factors that become relevant in each particular case. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. The outcome of the general balancing process would determine whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur. The decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered including the cumulative effects thereof. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(l) guidelines. Subject to the preceding sentence and any other applicable guidelines or criteria (see Sections 320.2 and 320.3), a permit will be granted unless the District Commander determines that it would be contrary to the public interest.

The Corps is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

AUTHORITY: This permit will be issued or denied under the following authority:

(X) Discharge dredged or fill material into waters of the United States – Section 404 Clean Water Act (33 U.S.C. 1344). Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).

Project drawings and a Notice of Application for State Water Quality Certification are enclosed with this Public Notice.

District Commander
U.S. Army, Corps

Enclosures

PUBLIC NOTICE

Alaska Department of Environmental Conservation (DEC)
Wastewater Discharge Authorization Program/401 Certification
555 Cordova Street, Anchorage AK 99501-2617
Phone: 907-269-6285|Email: DEC-401Cert@alaska.gov

Notice of Application for State Water Quality Certification

Any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters, in accordance with Section 401 of the Clean Water Act (CWA) of 1977 (PL95-217), also must apply for and obtain certification from the Alaska Department of Environmental Conservation that the discharge will comply with the CWA, the Alaska Water Quality Standards, and other applicable State laws.

Notice is hereby given that a request for a CWA §401 Water Quality Certification of a Department of the Army Permit application, Corps' Reference Number **POA-2018-00075, Ikalukrok Creek**, has been received for the discharge of dredged and/or fill materials into waters of the United States (WOUS), including wetlands, as described in the Corps public notice and project figures/drawings (18 AAC 15.180).

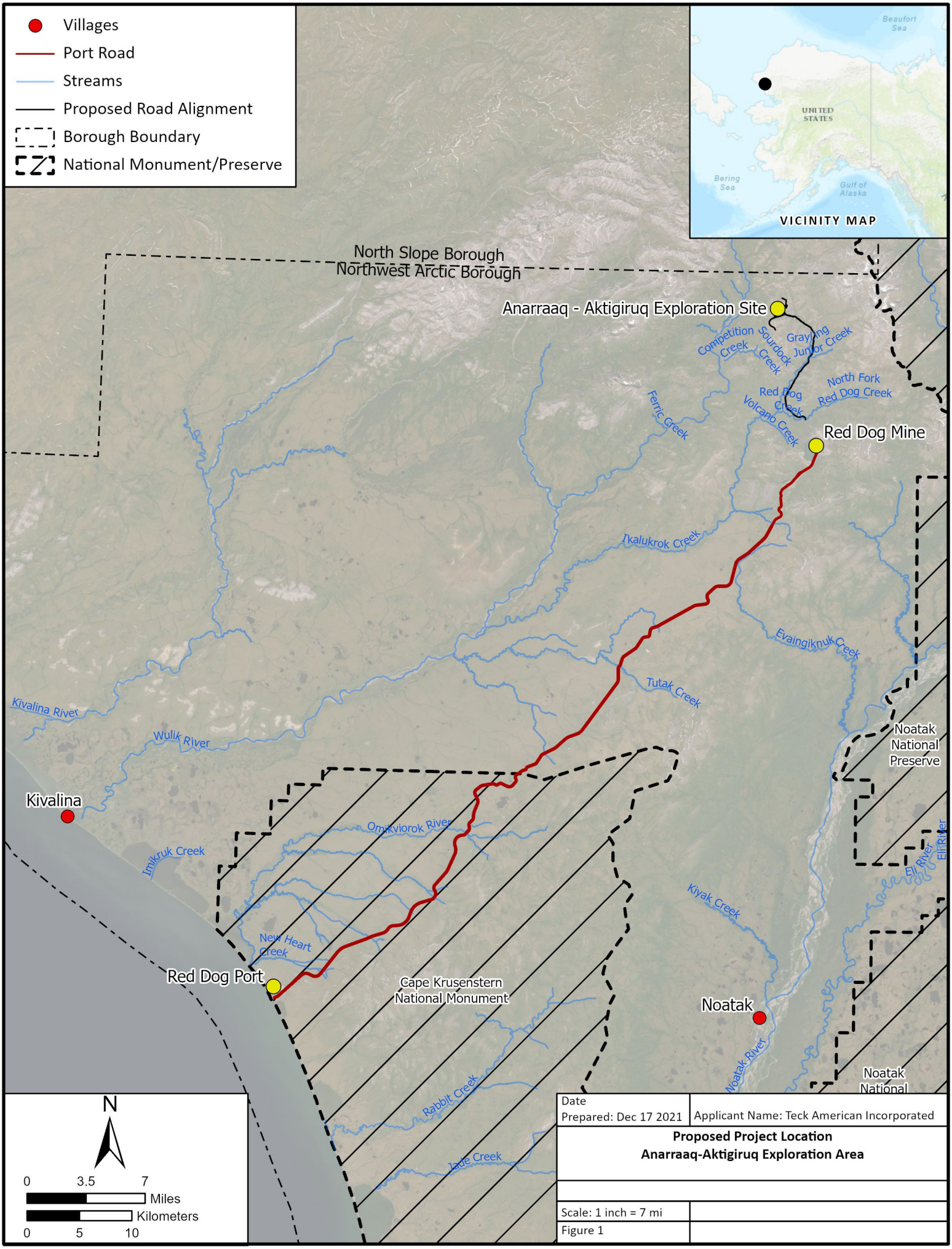
Any person desiring to comment on the project with respect to water quality, may submit comments electronically via email to DEC-401cert@alaska.gov by the expiration date of the Corps of Engineer's public notice. All comments need to include the Corps public notice reference number in the subject heading. Physically mailed comments must be postmarked on or before the expiration date of the public notice.

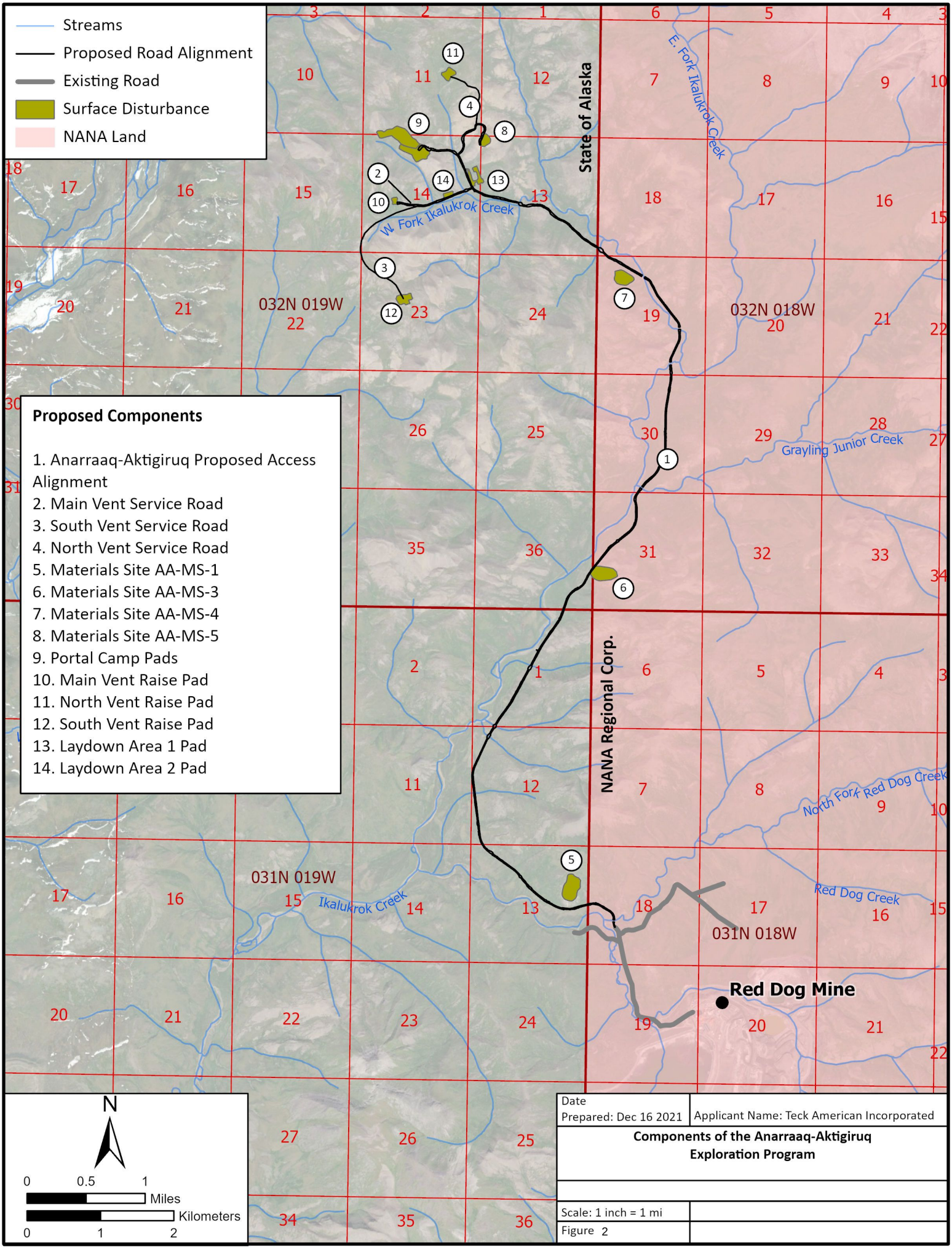
After reviewing the application, the Department may certify there is reasonable assurance the activity, and any discharge that might result, will comply with the CWA, the Alaska Water Quality Standards, and other applicable State laws. The Department also may deny or waive certification.

The permit application and associated documents are available for review. For inquires or to request copies of the documents, contact dec-401cert@alaska.gov, or call 907-269-6285.

Disability Reasonable Accommodation Notice

The State of Alaska, Department of Environmental Conservation complies with Title II of the Americans with Disabilities Act (ADA) of 1990. If you are a person with a disability who may need special accommodation in order to participate in this public process, please contact ADA Coordinator Brian Blessington at 907-269-6272 or TDD Relay Service 1-800-770-8973/TTY or dial 711 within 5 days of the expiration date of this public notice to ensure that any necessary accommodations can be provided.


Villages
Port Road
Streams
Proposed Road Alignment
Borough Boundary
National Monument/Preserve
VICINITY MAP
Beaufort Sea
UNITED STATES
Bering Sea
Gulf of Alaska
North Slope Borough
Northwest Arctic Borough
Anarraaq - Aktigiruq Exploration Site
Competition Creek
Sourdock Creek
Grayling Junior Creek
North Fork Red Dog Creek
Red Dog Creek
Volcano Creek
Ferric Creek
Red Dog Mine
Ikalukrok Creek
Evaingiknuk Creek
Tutak Creek
Kivalina River
Wulik River
Noatak National Preserve
Kivalina
Omikviorok River
Imikruk Creek
Eli River
Kiyak Creek
New Heart Creek
Red Dog Port
Cape Krusenstern National Monument
Noatak
Noatak River
Noatak National
Rabbit Creek
Jade Creek
N
0 3.5 7
Miles
0 5 10
Kilometers
Date Prepared: Dec 17 2021
Applicant Name: Teck American Incorporated
Proposed Project Location
Anarraaq-Aktigiruq Exploration Area
Scale: 1 inch = 7 mi
Figure 1



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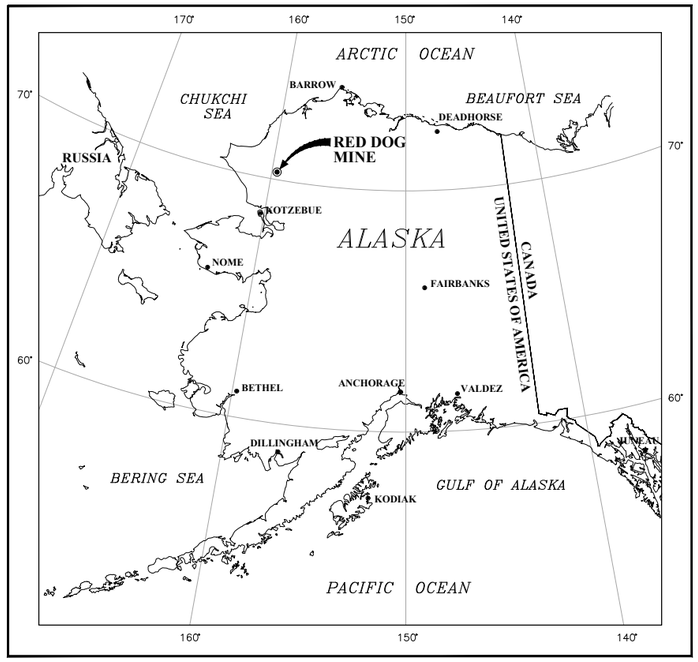


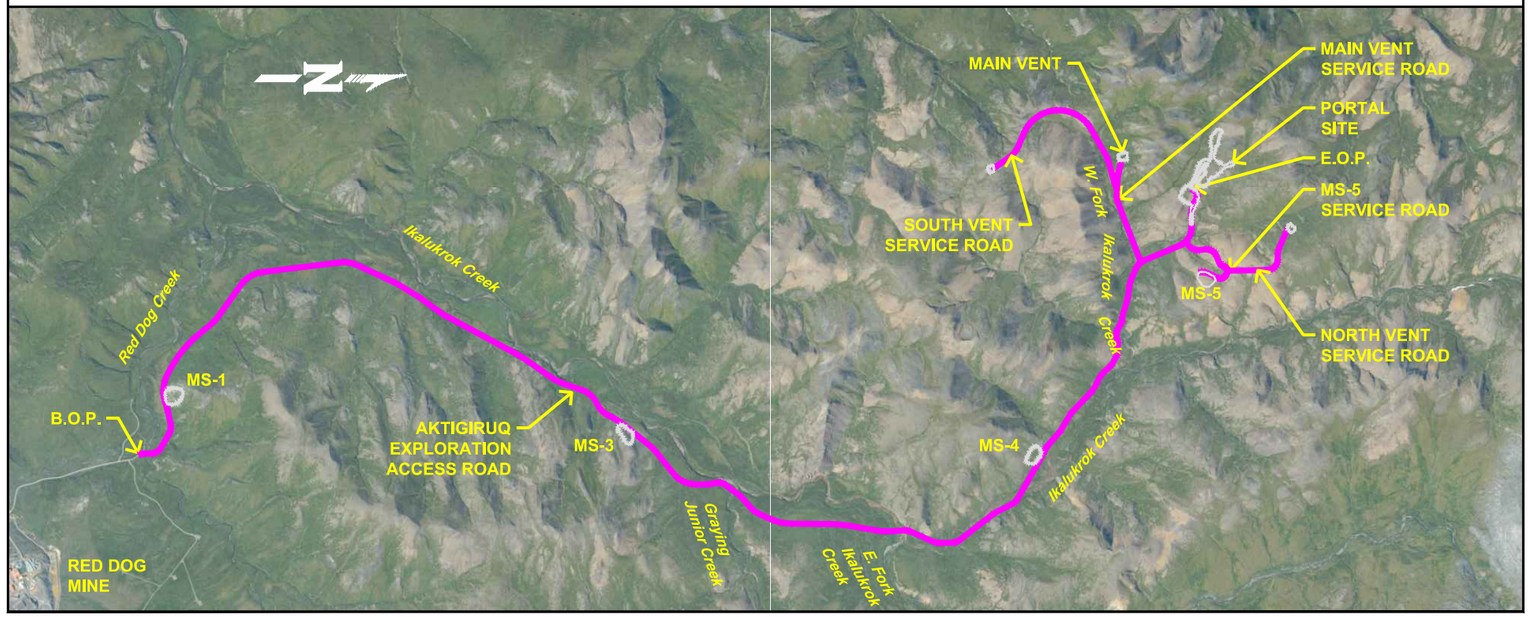
AKTIGIRUQ & ANARRAAQ EXPLORATION PROGRAM RED DOG MINE, ALASKA

TECK AMERICAN INCORPORATED
501 N. RIVERPOINT BLVD., SUITE 300
SPOKANE, WASHINGTON 99202

DECEMBER 28, 2021

INDEX OF SHEETS

VICINITY MAP



PROJECT SUMMARY

ROADWAY	WIDTH	LENGTH
AKTIGIRUQ EXPLORATION ACCESS ROAD	20 FT	48,942 FT (9.27 MI)
MAIN VENT SERVICE ROAD	20 FT	3,540 FT (0.67 MI)
MS-5 SERVICE ROAD	20 FT	3,024 FT (0.57 MI)
NORTH VENT SERVICE ROAD	20 FT	2,979 FT (0.56 MI)
SOUTH VENT SERVICE ROAD	20 FT	6,601 FT (1.25 MI)

ISSUED FOR PERMITTING

No.	Revision Description	Revised By		Checked By		Approved By
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021	
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020	
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19	

No.	Dwg. No.	Reference Drawings
9		
8		
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Teck AMERICAN INCORPORATED

KUNA ENGINEERING
4300 B Street, Suite 605
Anchorage, AK 99503
907-339-6500 Fax 907-339-5327
www.kunaeng.com License #:AELS129381

Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
COVER SHEET

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2010	1	C

DESIGN CRITERIA

ROADWAY	EXPLORATION ROAD	SERVICE ROADS
DESIGN LIFE	9 YRS	9 YRS
MAINTENANCE LEVEL	HIGH	HIGH
AVERAGE DAILY TRAFFIC (PEAK)	148 VPD	8 VPD
DESIGN SPEED	30 MPH	15 MPH
GRADES, MAX.	10%	12%
STOPPING SIGHT DISTANCE	270 FT	130 FT
HORIZONTAL CURVE CRITERIA		
MINIMUM CURVE RADIUS	316 FT	79 FT
MAXIMUM SUPERELEVATION RATE (e)	4%	4%
VERTICAL CURVE CRITERIA, K = L/A		
K (SAG), MIN.	55	20
K (CREST), MIN.	30	7
ROADWAY SECTION CRITERIA		
WIDTH (ONE LANE, TWO-WAY TRAFFIC)	20 FT	20 FT
ROADWAY CROSS-SLOPE	3%	3%
EMBANKMENT SIDE SLOPES, TYP.	3H:1V	3H:1V
EMBANKMENT SIDE SLOPES, MAX.	2H:1V	2H:1V
CUT SECTION BACK SLOPES	1.5H:1V	1.5H:1V
PULL-OUT FREQUENCY	APPR. 0.5 MILE	NONE

GENERAL NOTES

1. THE MATERIAL SITES SHOWN IN THE PLANS ARE "FUTURE POTENTIAL" SOURCES OF GRAVEL, AND ARE NOT PART OF THE ROAD CONSTRUCTION WORK.
2. CONSTRUCTION PROCEDURES SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES' (ADOT&PF) "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION."
3. THE CONTOUR LINES ON THE PLAN AND PROFILE SHEETS ARE SHOWN AT 5-FOOT INTERVALS.

LEGEND

EXISTING	PROPOSED	DESCRIPTION
94		CONTOUR LINE
		CENTER LINE
		EDGE OF GRAVEL ROAD
		EXTENT OF CUT SECTION
		EXTENT OF FILL SECTION
		CULVERT
		CREEK
		BRIDGE
		WETLANDS
		NO ENTRY AREA

BUBBLE LEGEND

P1 — XX LF, DIA=XX" — INSTALL CHANNEL CULVERT, SEE CULVERT SUMMARY TABLE, SHEET 3000-CE-2017

C1 — XX LF, DIA=XX" — INSTALL CROSS CULVERT, SEE CULVERT SUMMARY TABLE, SHEET 3000-CE-2017

501 — SURVEY CONTROL POINT, SEE SURVEY CONTROL TABLES, SHEET 3000-CE-2014

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE IN GRADE (%)
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ADOT&PF	ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
APPR	APPROXIMATE
B.O.P.	BEGINNING OF PROJECT
BTM	BOTTOM
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
CCW	COUNTER CLOCKWISE
CL, ℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
CW	CLOCKWISE
CY	CUBIC YARD
DIA	DIAMETER
E	EAST
ELEV	ELEVATION
E.O.P.	END OF PROJECT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EXIST	EXISTING
EXPL	EXPLORATION
FT	FEET, FOOT
GALV	GALVANIZED
H	HORIZONTAL
IN	INCHES
K	RATE OF VERTICAL CURVATURE
L	LENGTH
LT	LEFT
LF	LINEAR FOOT
LVC	LENGTH OF VERTICAL CURVE
MAX	MAXIMUM
MI	MILE
MIN	MINIMUM
MPH	MILES PER HOUR
N	NORTH
N.I.S.	NOT IN SCOPE
NO, #	NUMBER
NTS	NOT TO SCALE
PC	POINT OF CURVATURE
PT	POINT, POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RT	RIGHT
S	SOUTH, SLOPE
SF	SQUARE FOOT
STA	STATION
SY	SQUARE YARD
TEMP	TEMPORARY
TYP	TYPICAL
V	VERTICAL
VPD	VEHICLES PER DAY
W	WEST, WIDTH
X	BY
YRS	YEARS
&	AND
°	DEGREE
'	MINUTE, FOOT
"	SECOND, INCH
%	PERCENT
=	EQUALS

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C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
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Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
LEGEND, ABBREVIATIONS, & GENERAL NOTES

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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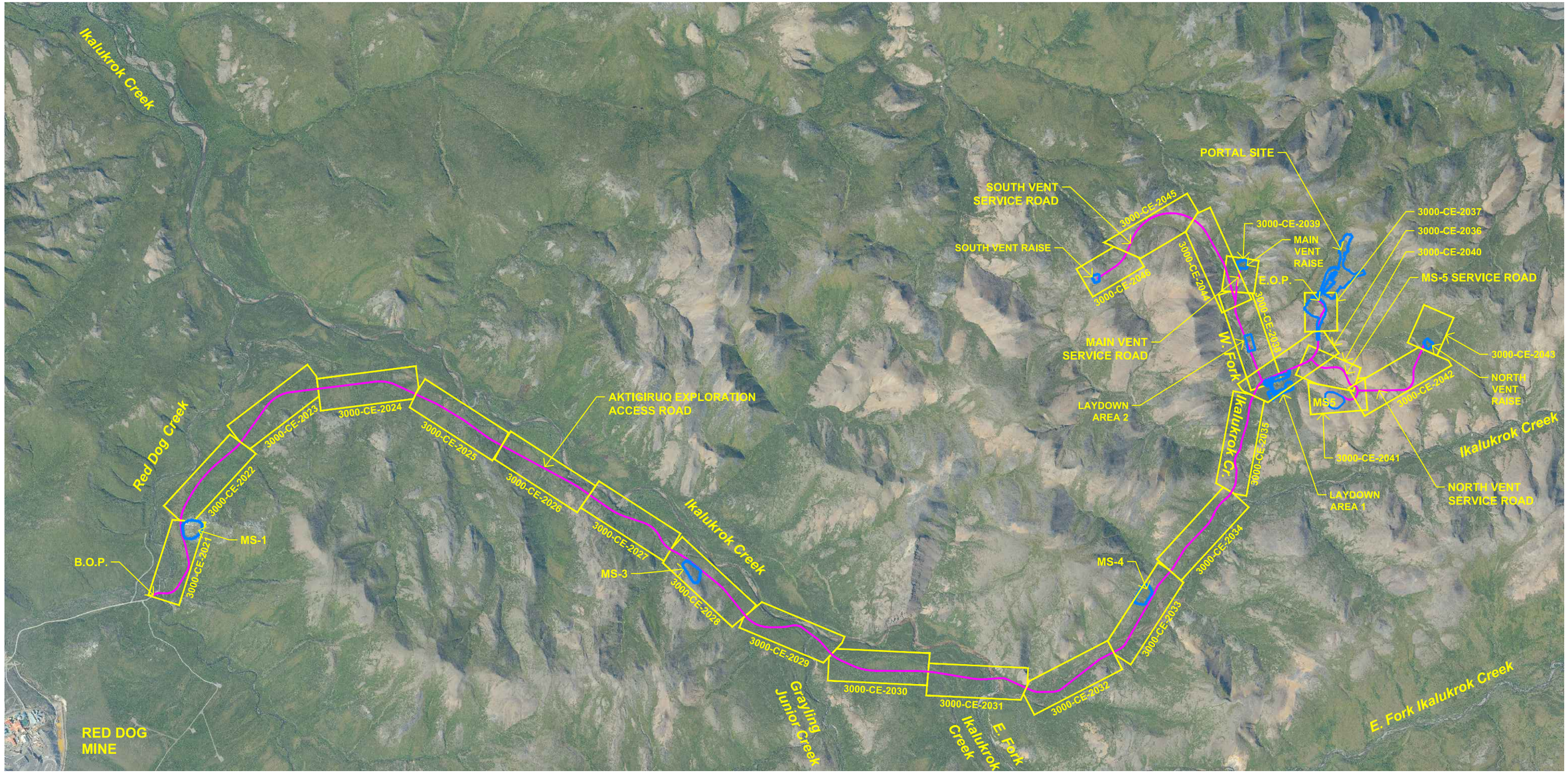

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No.	Revision Description	Revised By		Checked By		Approved By	
E	ISSUED FOR PERMITTING	SEC	2/7/2022	SEC	2/7/2022		
D	ISSUED FOR PERMITTING	BJD	1/26/2022	SEC	1/27/2022		
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
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Title:
AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
SHEET LAYOUT KEY MAP
OVERALL PROJECT AREA

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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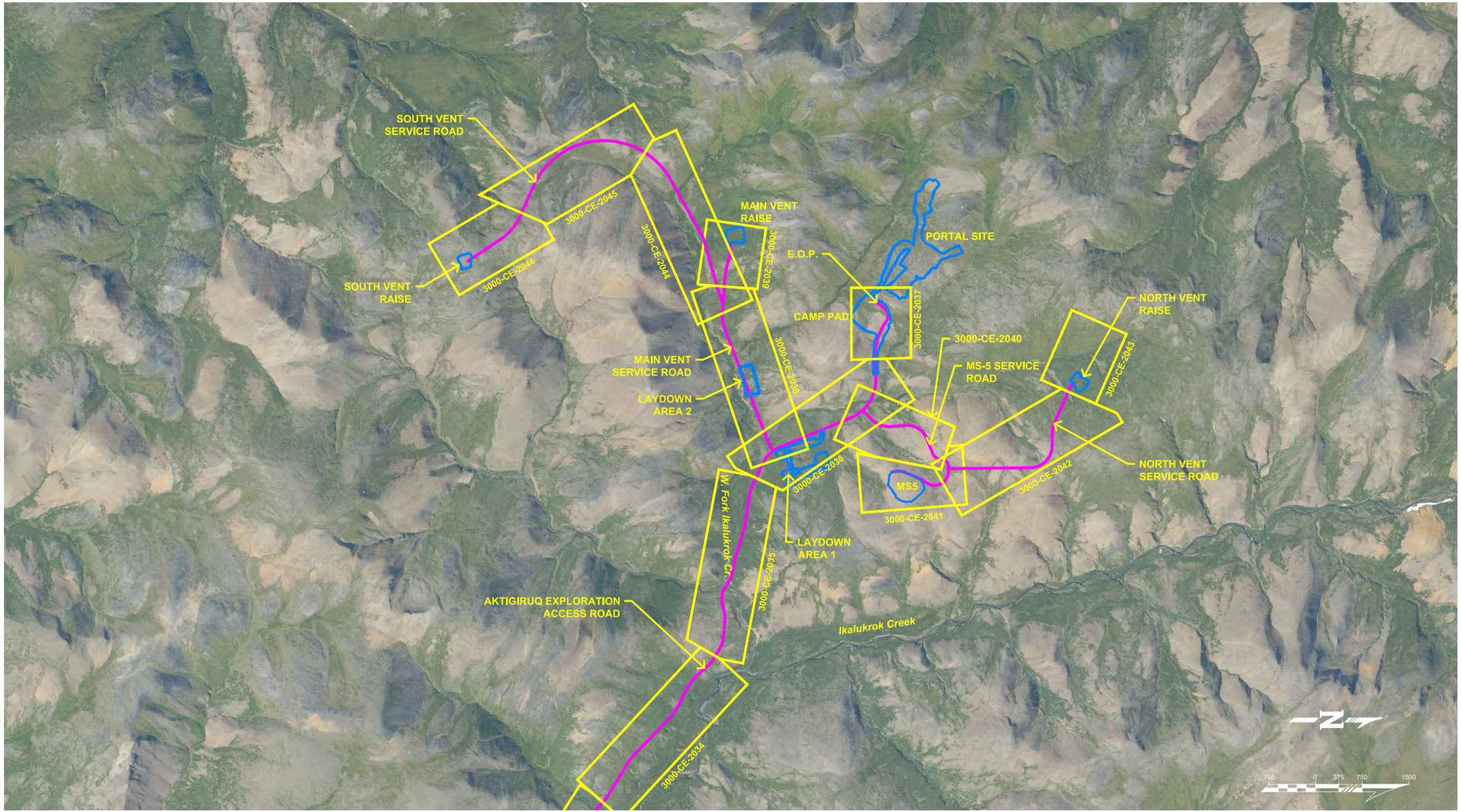

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www.kunaeng.com License #:AELS129381

Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
SHEET LAYOUT KEY MAP
PORTAL AREA

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004	AS SHOWN	D	3000-CE-2013	1	E

HORIZONTAL & VERTICAL CONTROL STATEMENT

HORIZONTAL CONTROL:
VALUES ARE NAD83 (2011), ALASKA STATE PLANE ZONE 7, US SURVEY FEET.

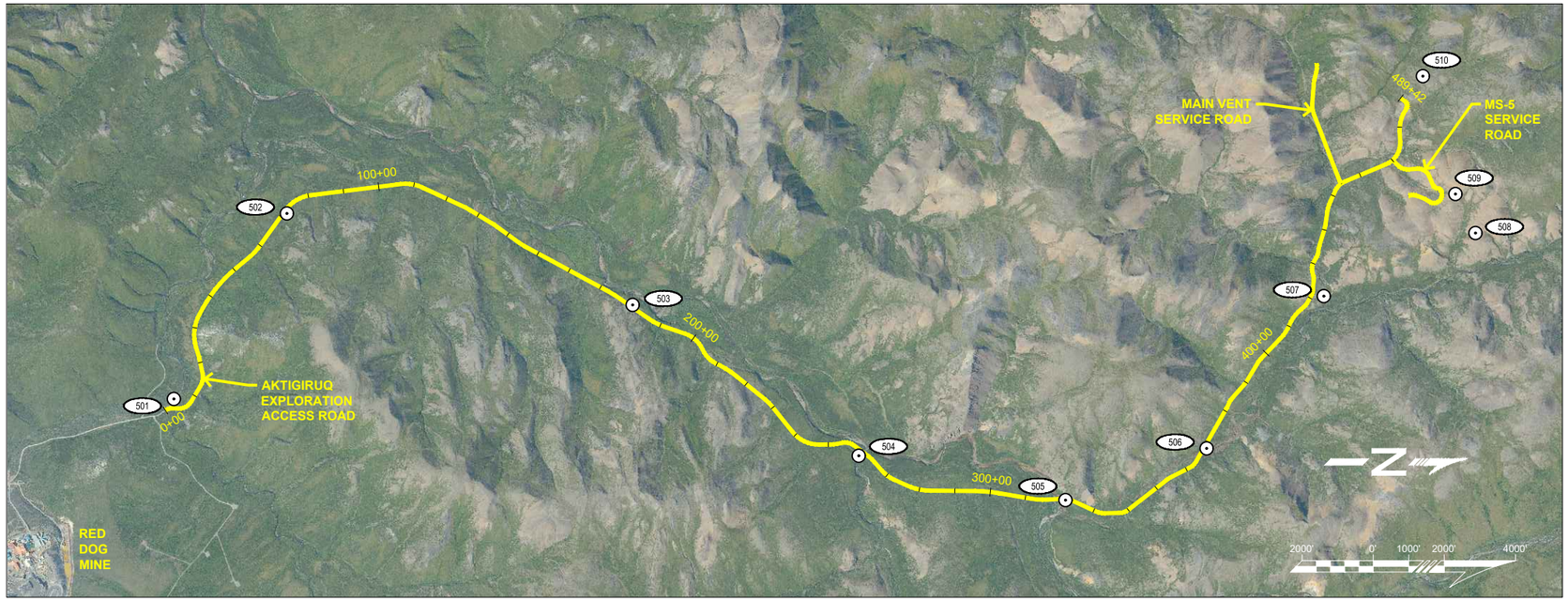
VERTICAL CONTROL:
VALUES ARE NAVD88 (GEIOD12B).

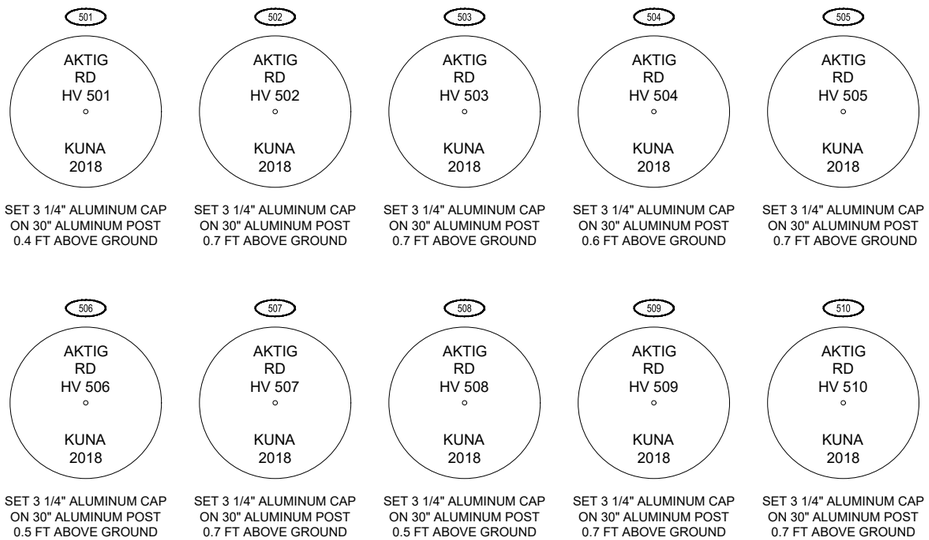
BASIS OF COORDINATES:
STATIC OBSERVATION OF MONUMENT "REENA"
NAD83(2011) COORDINATES: 5145108.73' N, 1523622.03' E, ELEVATION= 992.54'

METHODOLOGY:
HORIZONTAL CONTROL WAS ESTABLISHED BY GPS STATIC OBSERVATIONS.

SET 3 1/4" ALUMINUM CAP MONUMENTS ON 30" x 2 3/8" POST. FIELD SURVEY PERFORMED FROM 8/3/2018 TO 8/12/2018.

FILED NOTES LOCATED IN SURVEY FIELD BOOK "WHP MINE OPS BOOK #2 2018", PAGES 18-30.





NAD 83 STATE PLANE ZONE 7 (FEET) - HORIZONTAL AND VERTICAL CONTROL

POINT	NORTHING (FT)	EASTING (FT)	ELEVATION (FT)	STATION (FT)	OFFSET (FT)
501	5148817.96	1519260.59	726.12	2+38.49	263.00 LT
502	5151998.37	1514048.48	820.11	71+70.50	90.53 RT
503	5161723.91	1516617.57	776.60	180+29.95	59.55 LT
504	5168083.08	1520857.32	802.36	260+26.74	151.43 RT
505	5173900.88	1522103.00	848.29	321+37.42	43.86 RT
506	5177868.16	1520650.88	900.20	368+23.81	75.27 RT
507	5181166.59	1516371.65	972.00	421+55.32	336.95 RT
508	5185433.26	1514598.45	1232.77	470+71.93	3103.66 RT
509	5184869.83	1513501.82	1315.83	471+78.28	1982.93 RT
510	5183952.50	1510189.03	1320.62	488+25.25	869.48 RT

NOTES

1. ALL DIMENSIONS AND COORDINATES SHOWN ARE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.

LEGEND

⊙ SET SURVEY CONTROL POINT

(###) POINT NUMBER

No.	Revision Description	Revised By		Checked By		Approved By
B	ISSUED FOR APPROVAL	BJL	1/23/2020	TM	1/24/2020	
A	ISSUED FOR REVIEW	BJL	12/2/19	TM	12/2/2019	

No.	Dwg. No.	Reference Drawings
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
SURVEY CONTROL SHEET

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2014	1	B

ESTIMATE OF QUANTITIES

ITEM DESCRIPTION	UNIT	AKTIGIRUQ EXPL. ACCESS ROAD	MAIN VENT SERVICE ROAD	MS-5 SERVICE ROAD	NORTH VENT SERVICE ROAD	SOUTH VENT SERVICE ROAD
CLEARING	ACRE	15.3	1.2	1.0	1.1	2.4
UNCLASSIFIED EXCAVATION	CUBIC YARD	64,897	4,336	19,589	16,833	57,930
GENERAL EMBANKMENT FILL (PIT RUN, 12-INCH MINUS)	CUBIC YARD	407,687	31,918	11,298	22,087	39,755
PIPE BEDDING, 2-INCH MINUS	CUBIC YARD	6,895	355		213	219
SURFACING MATERIAL, 2-INCH MINUS	CUBIC YARD	37,346	2,614	2,240	1,165	2,724
PRECAST CONCRETE ABUTMENT BLOCKS, 3' x 3' x 8'	EACH	210				
TEMPORARY BAILEY-TYPE STEEL BRIDGE, 101.21 LF	EACH	3				
TEMPORARY BAILEY-TYPE STEEL BRIDGE, 141.21 LF	EACH	2				
24-INCH PIPE	LINEAR FOOT	668				180
30-INCH PIPE	LINEAR FOOT	317				
36-INCH PIPE	LINEAR FOOT	531	90			
42-INCH PIPE	LINEAR FOOT	513				
48-INCH PIPE	LINEAR FOOT	194	113			
84-INCH PIPE	LINEAR FOOT	268				
96-INCH PIPE	LINEAR FOOT	269,537				
24-INCH PIPE FOR CROSS CULVERTS	LINEAR FOOT	1,396			175	
CULVERT MARKER POSTS	EACH	96	4		2	4
STANDARD SIGNS	SQUARE FOOT	7.50				
DELINEATOR, SNOW	EACH	980	72	62	60	132
GEOTEXTILE, SEPARATION, CLASS 1	SQUARE YARD	210,000				

QUANTITY ESTIMATION NOTES:

1. CLEARING QUANTITIES WERE ESTIMATED AS 25% OF THE ROAD EMBANKMENT FOOTPRINT.
2. UNCLASSIFIED EXCAVATION VOLUMES SHOWN ARE IN-PLACE BANK VOLUMES.
3. UNCLASSIFIED EXCAVATION INCLUDES EXCAVATION OF ALL KINDS.
4. UNCLASSIFIED EXCAVATION SHOULD BE REUSED IF IT MEETS MATERIAL SPECIFICATIONS.
5. ALL BORROW AND AGGREGATE SURFACE COURSE MATERIAL QUANTITIES SHOWN ARE IN-PLACE COMPACTED FINAL VOLUMES.
6. NO ALLOWANCE HAS BEEN MADE FOR THAW SETTLEMENT OF THE SUBGRADE OR POORLY COMPACTED FROZEN MATERIAL.
7. PIPE BEDDING QUANTITY WAS ESTIMATED AS THE CROSS-SECTION OF A SQUARE (2 FEET LARGER THAN THE CULVERT, BUT NOT INCLUDING THE PIPE) TIMES THE CULVERT LENGTH.
8. BORROW (PIT RUN AND PIPE BEDDING) QUANTITIES SHOWN DO NOT INCLUDE ANY REUSE OF USABLE EXCAVATION.
9. TEMPORARY BRIDGES INCLUDE ALL ITEMS REQUIRED, EXCEPT THE CONCRETE BLOCK ABUTMENTS.
10. 24-INCH PIPE CROSS CULVERTS WILL NEED TO BE FIELD FIT TO MEET THE DRAINAGE NEEDS OF THE PROJECT. THE STATIONS IN THE DESIGN ARE APPROXIMATE BASED ON SURFACE DATA.
11. CULVERT MARKER POSTS WERE ASSUMED TO BE LOCATED AT EACH END OF THE CULVERTS.
12. SNOW DELINEATORS WERE ASSUMED TO BE SPACED AT 100 FEET AND LOCATED ON BOTH SIDES OF THE ROADS.
13. GEOTEXTILE QUANTITIES WERE ESTIMATED AS 120% OF THE ROAD FOOTPRINT AREA TO BE COVERED.
14. FILL QUANTITIES SHOWN ON THE PLAN AND PROFILE SHEETS IS GENERAL EMBANKMENT AND SURFACING MATERIAL COMBINED.

No.	Revision Description	Revised By		Checked By		Approved By
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021	
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020	
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19	

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Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
ESTIMATE OF QUANTITIES

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2015	1	C

SIGN SUMMARY

SHEET	POST NO.	CENTERLINE STATION	TYPE	LEGEND	SIZE (IN)	AREA (SF)	SIGN FACES
3000-CE-2021	1	0+00 RT	R2-1	SPEED LIMIT 30	30 x 36	7.50	SE
						7.50	

BRIDGE SUMMARY

CREEK CROSSING	SHEET	START STATION	END STATION	BRIDGE LENGTH (FT)	NO. OF CONCRETE BLOCKS AT NEAR ABUTMENT 'A'	NO. OF CONCRETE BLOCKS AT FAR ABUTMENT 'B'
RED DOG CREEK	3000-CE-2021	2+39.48	3+40.69	101.21	61	88
GRAYLING JUNIOR CREEK	3000-CE-2029	260+48.83	261+50.04	101.21	124	61
IKALUKROK CREEK NO. 1	3000-CE-2031	319+45.36	320+86.57	141.21	61	61
IKALUKROK CREEK NO. 2	3000-CE-2032	336+24.72	337+25.93	101.21	124	61
IKALUKROK CREEK NO. 3	3000-CE-2033	364+87.48	366+28.69	141.21	61	88
ALL BRIDGES				586.05	431	359

EARTHWORK SUMMARY

SHEET	START STATION	END STATION	CUT VOLUME (CY)	GENERAL EMBANKMENT FILL (CY)	SURFACE COURSE (CY)	REMARKS
AKTIGIRUQ EXPLORATION ROAD						
3000-CE-2021	0+00	29+00	574	20,796	2,073	
3000-CE-2022	29+00	59+00	1,382	19,488	2,393	
3000-CE-2023	59+00	89+00	6,891	13,720	2,308	
3000-CE-2024	89+00	119+00	0	20,582	2,308	
3000-CE-2025	119+00	149+00	6	37,138	2,308	
3000-CE-2026	149+00	179+00	1	35,744	2,308	
3000-CE-2027	179+00	209+00	336	25,278	2,393	
3000-CE-2028	209+00	239+00	240	24,487	2,304	
3000-CE-2029	239+00	269+00	0	34,000	2,233	
3000-CE-2030	269+00	299+00	0	21,581	2,308	
3000-CE-2031	299+00	329+00	0	25,891	2,203	
3000-CE-2032	329+00	359+00	0	23,686	2,233	
3000-CE-2033	359+00	389+00	2,532	40,679	2,204	MOST CUT IS USABLE
3000-CE-2034	389+00	419+00	17,856	10,579	2,369	MOST CUT IS USABLE
3000-CE-2035	419+00	77*+00	13,748	29,769	2,321	MOST CUT IS USABLE
3000-CE-2036	449+00	479+00	336	20,916	2,308	MOST CUT IS USABLE
3000-CE-2037	479+00	489+42	20,995	3,353	772	MOST CUT IS USABLE
MAIN VENT SERVICE ROAD						
3000-CE-2038	0+00	29+00	4,325	24,565	2,074	
3000-CE-2039	29+00	35+30	11	7,353	540	
MS-5 SERVICE ROAD						
3000-CE-2040	0+00	18+00	7,879	10,497	1,259	MOST CUT IS USABLE
3000-CE-2041	18+00	30+24	11,710	801	981	MOST CUT IS USABLE
NORTH VENT SERVICE ROAD						
3000-CE-2042	0+00	28+00	16,832	17,588	1,039	MOST CUT IS USABLE
3000-CE-2043	28+00	29+79	1	4,499	126	MOST CUT IS USABLE
SOUTH VENT SERVICE ROAD						
3000-CE-2044	0+00	28+00	15,807	22,505	1,403	MOST CUT IS USABLE
3000-CE-2045	28+44	54+00	16,273	14,334	1,066	MOST CUT IS USABLE
3000-CE-2046	54+00	66+01	25,850	2,916	255	MOST CUT IS USABLE
			88,822	450,903	42,200	TOTALS

NOTE: FILL QUANTITIES SHOWN ON THE PLAN AND PROFILE SHEETS ARE GENERAL EMBANKMENT FILL VOLUMES AND SURFACE COURSE VOLUMES COMBINED.

No.	Revision Description	Revised By		Checked By		Approved By	
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020		
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19		

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Title:
AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
SUMMARY TABLES - 1

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2016	1	C

CHANNEL CULVERT SUMMARY

SHEET	CULVERT NO.	CENTERLINE STATION	24-INCH Ø (LF)	30-INCH Ø (LF)	36-INCH Ø (LF)	42-INCH Ø (LF)	48-INCH Ø (LF)	84-INCH Ø (LF)	96-INCH Ø (LF)	REMARKS
AKTIGIRUQ EXPLORATION ACCESS ROAD										
3000-CE-2021	P1	11+04			68					SKEW CCW
3000-CE-2022	P2	54+29		93						
3000-CE-2023	P3	85+24	89							SKEW CW
3000-CE-2024	P4	100+20		52						
3000-CE-2025	P5	127+33				122				SKEW CCW
3000-CE-2025	P6	127+43	118							SKEW CCW; OVERFLOW
3000-CE-2025	P7	132+24				144				
3000-CE-2025	P8	132+34	133							OVERFLOW
3000-CE-2026	P9	162+78				116				
3000-CE-2026	P10	162+88	116							OVERFLOW
3000-CE-2027	P11	188+27		81						SKEW CW
3000-CE-2027	P12	202+34			58					SKEW CCW
3000-CE-2028	P13	232+71	104							SKEW CCW
3000-CE-2029	P14	243+76		91						SKEW CW
3000-CE-2031	P15	317+91					81			SKEW CCW; BRIDGE OVERFLOW
3000-CE-2032	P16	335+54			83					BRIDGE OVERFLOW
3000-CE-2033	P17	367+29			80					SKEW CCW; BRIDGE OVERFLOW
3000-CE-2033	P18	387+58			152					SKEW CCW
3000-CE-2035	P24	430+95						133		OVERFLOW
3000-CE-2035	P25	431+07							134	EMBED 2 FT BELOW EXIST. GRADE
3000-CE-2035	P26	431+19							135	EMBED 2 FT BELOW EXIST. GRADE
3000-CE-2035	P27	431+31						135		OVERFLOW
3000-CE-2036	P19	464+39	50							SKEW CW
3000-CE-2036	P20	469+18	58							
3000-CE-2036	P21	471+95				131				SKEW CCW
MAIN VENT SERVICE ROAD										
3000-CE-2038	P22	3+24					113			SKEW CCW
3000-CE-2038	P23	16+89			90					SKEW CCW
SOUTH VENT SERVICE ROAD										
3000-CE-2044	P24	12+36	86							SKEW CW
3000-CE-2044	P25	19+74	94							SKEW CW
			848	317	531	513	194	268	269	SUB TOTALS

CROSS-CULVERT SUMMARY

SHEET	CULVERT NO.	CENTERLINE STATION	24-INCH Ø (LF)	REMARKS
AKTIGIRUQ EXPLORATION ACCESS ROAD				
3000-CE-2021	C1	4+79	48	
3000-CE-2021	C2	9+67	50	
3000-CE-2021	C3	24+72	72	
3000-CE-2022	C4	42+15	51	
3000-CE-2023	C5	64+15	51	
3000-CE-2024	C6	109+17	48	
3000-CE-2025	C7	138+17	58	
3000-CE-2025	C8	141+08	52	
3000-CE-2025	C9	146+22	73	
3000-CE-2026	C10	152+43	60	
3000-CE-2026	C11	173+93	52	
3000-CE-2027	C12	193+28	58	
3000-CE-2027	C13	198+54	57	
3000-CE-2028	C14	215+61	47	
3000-CE-2028	C15	224+70	54	
3000-CE-2029	C16	256+12	66	
3000-CE-2030	C17	295+54	47	
3000-CE-2031	C18	302+55	48	
3000-CE-2031	C19	308+17	75	
3000-CE-2031	C20	313+24	62	
3000-CE-2032	C21	343+13	47	
3000-CE-2032	C22	351+99	57	
3000-CE-2032	C23	357+09	47	
3000-CE-2034	C24	401+00	62	
3000-CE-2034	C25	409+00	54	
NORTH VENT SERVICE ROAD				
3000-CE-2042	C26	27+42	175	
			1396	SUB TOTALS

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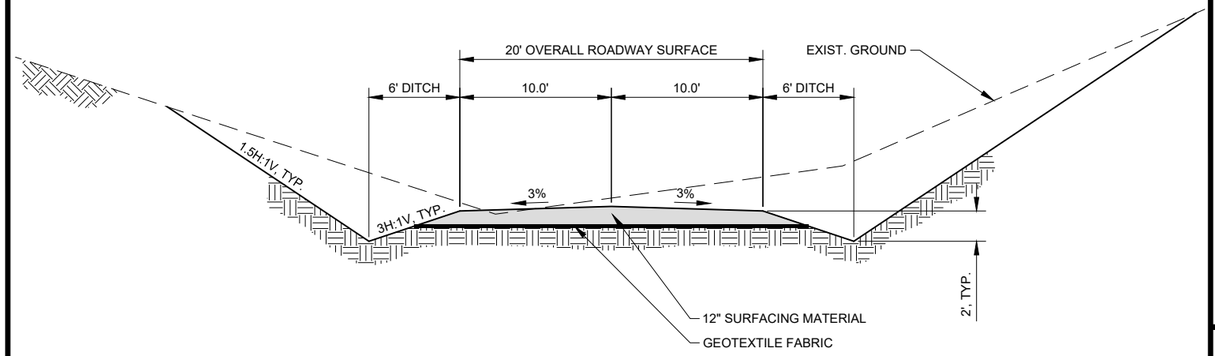
Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
SUMMARY TABLES - 2

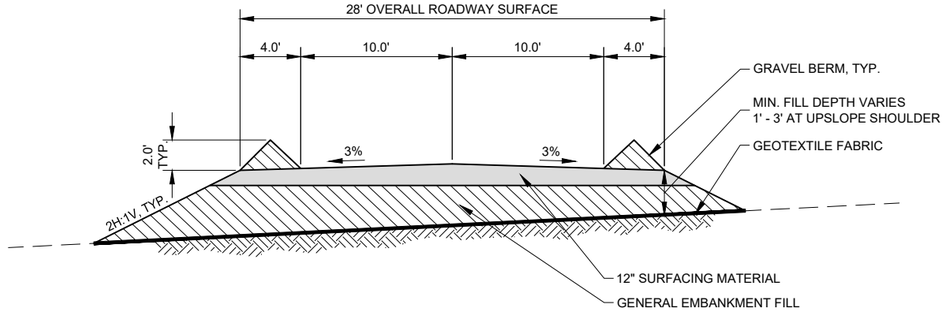
MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2017	1	C



TYPICAL ROAD SECTION
AT CUT SECTION

SCALE: 1" = 5'

1
3000-CE-2018



TYPICAL ROAD SECTION
AT FILL SECTION

SCALE: 1" = 5'

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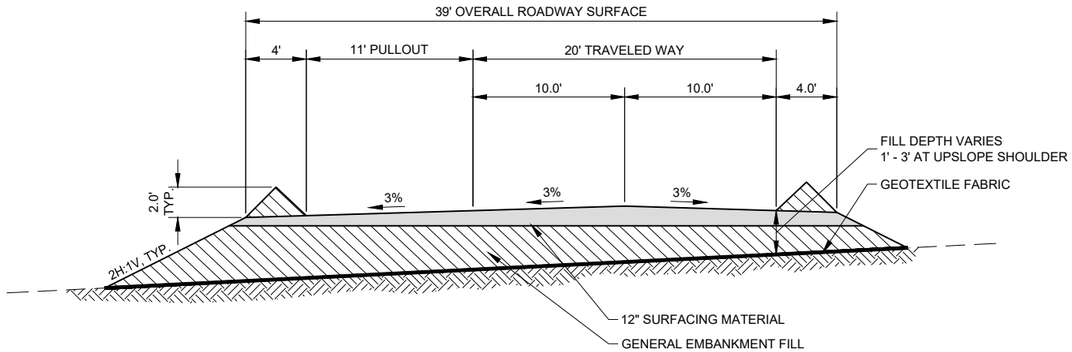
3000-CE-2018



TYPICAL ROAD SECTION
AT PULLOUT SECTION

SCALE: 1" = 5'

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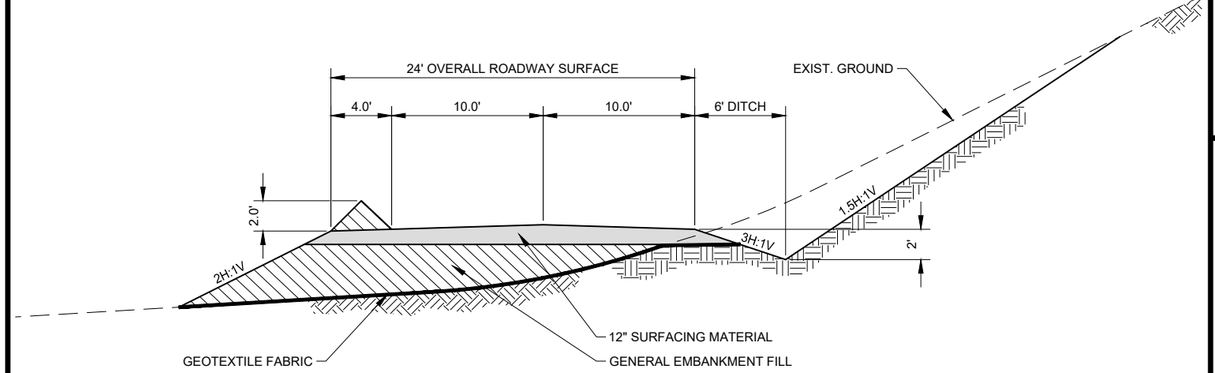
3000-CE-2018



TYPICAL ROAD SECTION
AT CUT AND FILL SECTION

SCALE: 1" = 5'

2
3000-CE-2018

NOTES:

1. SURFACING MATERIAL TO BE 2" MINUS MATERIAL WITH 0-6% PASSING THE NO. 200 SIEVE (SIMILAR TO ADOT&PF SUBBASE, GRADING B.)
2. GENERAL EMBANKMENT FILL TO BE 12" MINUS PIT RUN MATERIAL WITH 0-10% PASSING THE NO. 200 SIEVE (SIMILAR TO ADOT&PF SELECTED MATERIAL, TYPE B.)
3. EXCAVATED MATERIAL SHOULD BE REUSED IF IT CONFORMS TO THE ABOVE MATERIAL REQUIREMENTS.
4. GEOTEXTILE FABRIC TO BE CLASS 1 SEPARATION GEOTEXTILE, AS DEFINED IN AASHTO M 288. IN AREAS, WHERE CLEAN GRAVELS ARE PRESENT, THE GEOTEXTILE CAN BE OMITTED.

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TYPICAL SECTIONS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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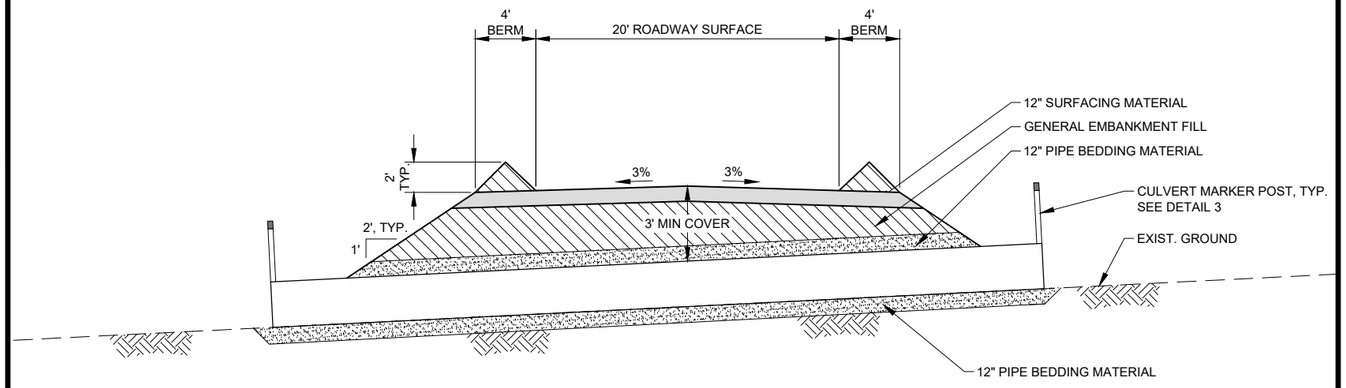
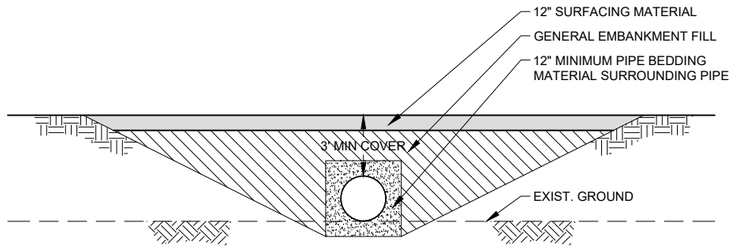


CULVERT SECTION 1

SCALE: 1" = 5'

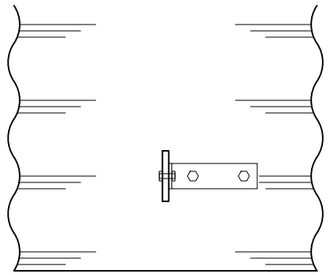
3000-CE-2019



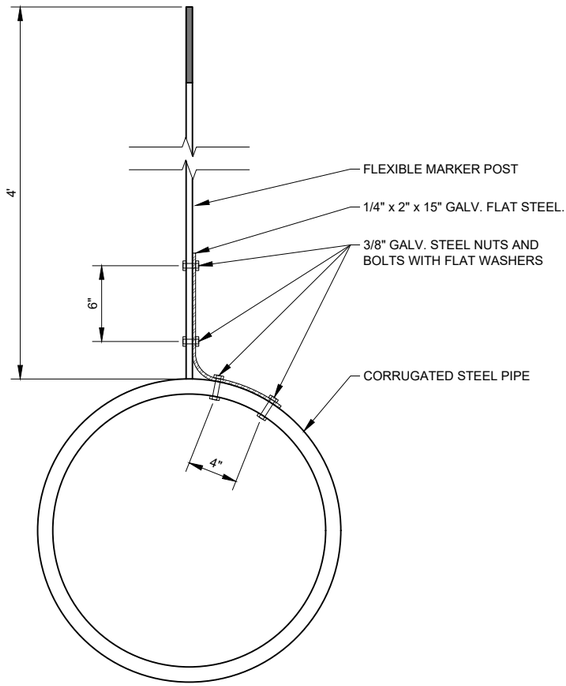
CULVERT SECTION 2

SCALE: 1" = 5'

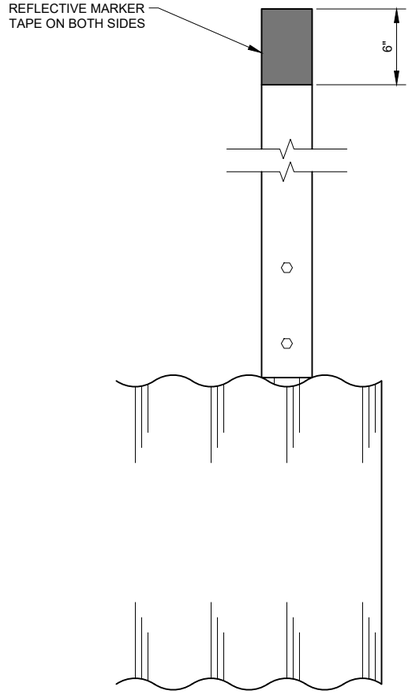
3000-CE-2019



TOP VIEW



END VIEW



SIDE VIEW

CULVERT MARKER POST INSTALLATION 3

SCALE: 2" = 1'

3000-CE-2019

No.	Revision Description	Revised By	Checked By	Approved By
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Title:
AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
CULVERT DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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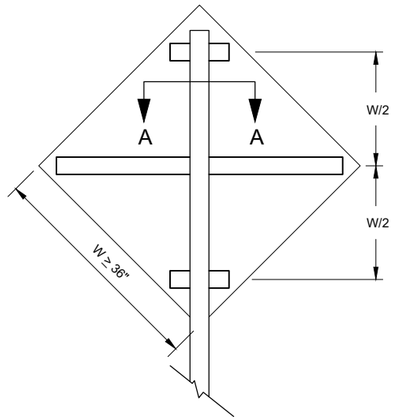
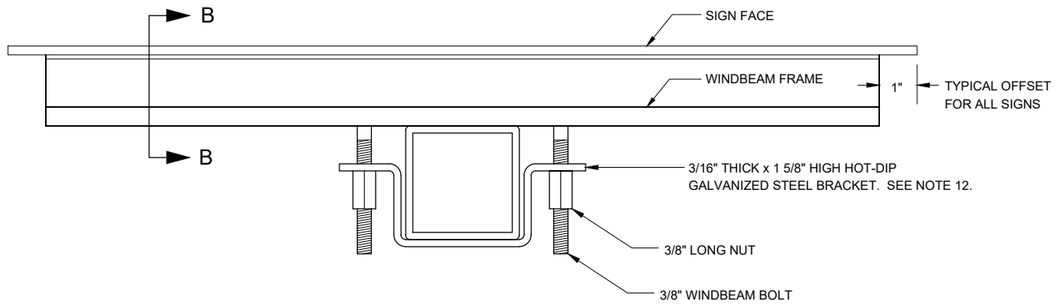
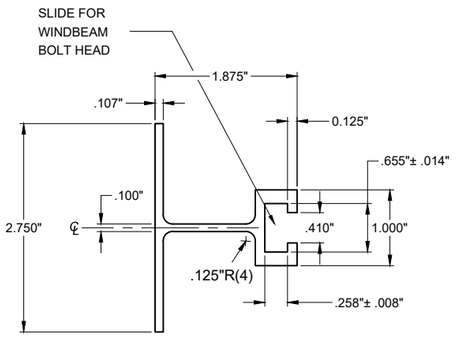


WINDBEAM LOCATIONS

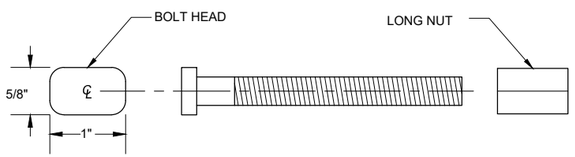
ELEVATION VIEW



SECTION A - A TYPICAL SIGN ATTACHMENT DETAILS AT EACH WINDBEAM



SECTION B - B WINDBEAM CROSS SECTION



3/8" WINDBEAM BOLT AND LONG NUT

NOTES:

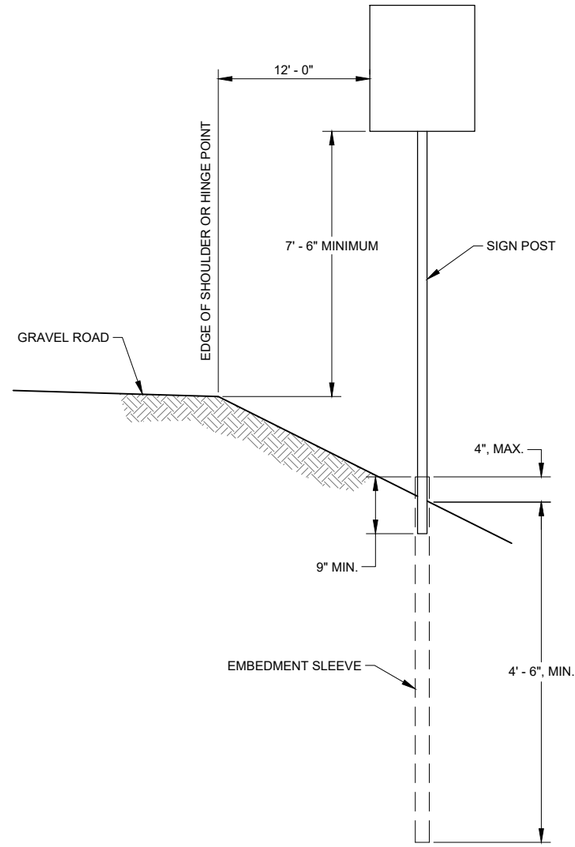
1. FABRICATE ALL SIGNS FROM 0.125-INCH THICK ALUMINUM SHEETING.
2. USE FRAMING MEMBERS MADE FROM ALUMINUM ALLOY 6061-T6.
3. EACH FRAMING MEMBER SHALL BE ONE CONTINUOUS PIECE.
4. ATTACH FRAMING MEMBERS TO THE SIGN PANELS WITH RIVETS OR AN ENGINEER APPROVED, DOUBLE SIDED, HIGH STRENGTH, ADHESIVE TAPE.
5. WITH THE ADHESIVE TAPE, INSTALL TWO RIVETS IN BOTH ENDS OF EACH FRAMING MEMBER, AND ATTACH THE FRAMING MEMBERS TO THE SIGN PANELS ACCORDING TO THE TAPE MANUFACTURER'S WRITTEN INSTRUCTIONS, INCLUDING:
   A. THE CLEANING AND HANDLING OF THE SIGN PANELS AND FRAMING MEMBERS.
   B. THE APPLICATION OF THE ADHESIVE TAPE.
10. WHEN RIVETS ARE USED TO ATTACH FRAMING MEMBERS, INSTALL 2 RIVETS IN EACH END AND THE BALANCE ON 8" MAXIMUM CENTERS.
11. USE 3/16" DIAMETER RIVETS CONFORMING TO ALUMINUM ALLOY 6061-T6 FOR COLD DRIVEN RIVETS, OR ALUMINUM ALLOY 6061-T43 FOR HOT DRIVEN RIVETS.

SIGN FRAMING DETAILS — 1

SCALE: NTS — 3000-CE-2020

NOTES:

1. SIGN POSTS SHALL BE 2.5" PERFORATED STEEL TUBE.
2. EMBEDMENT SLEEVES SHALL BE 3"x3"x$\frac{3}{16}$" STEEL TUBE, EMBEDDED A MINIMUM OF 4' - 6" INTO THE GROUND.
3. SIGN POSTS SHALL BE MOUNTED IN THE STEEL TUBE EMBEDMENT SLEEVES USING 3/8" DIA. BOLTS, NUTS AND FLAT WASHERS. SIGN POST SHALL HAVE AT LEAST A 9" OVERLAP INTO THE EMBEDMENT SLEEVE.



POST OFFSET AND HEIGHT — 2

SCALE: NTS — 3000-CE-2020

No.	Revision Description	Revised By		Checked By		Approved By	
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020		
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19		

No.	Dwg. No.	Reference Drawings
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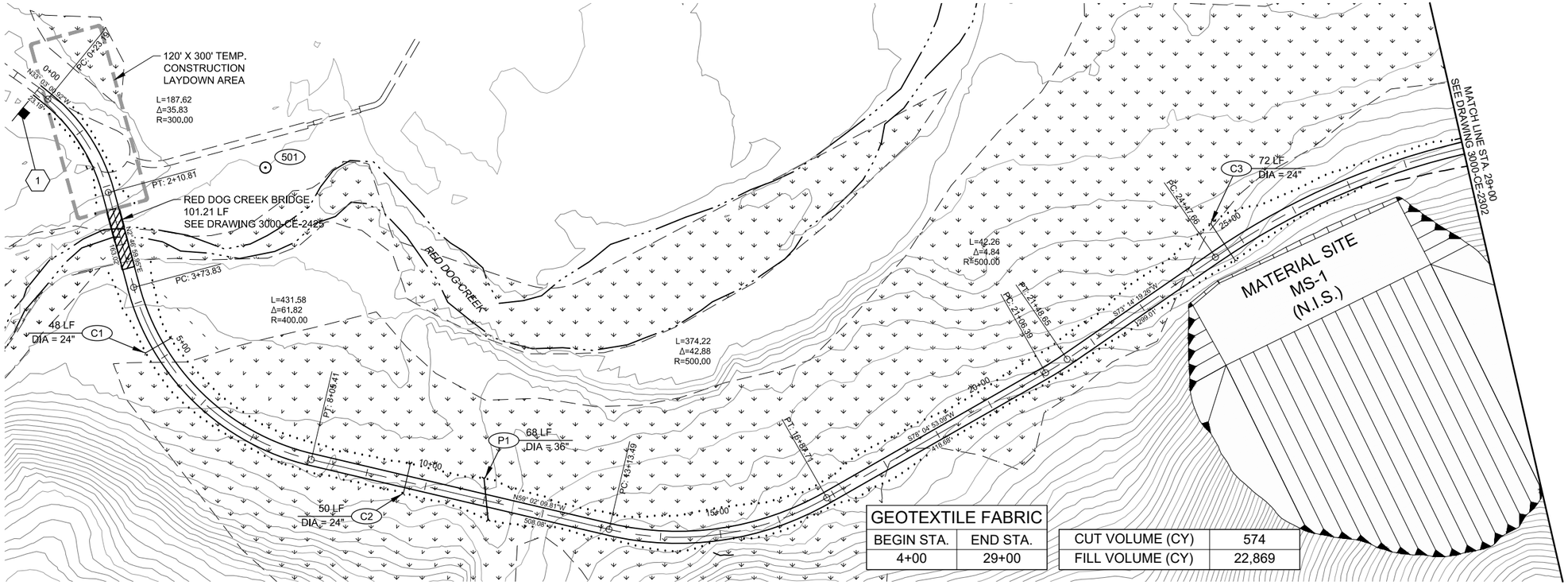
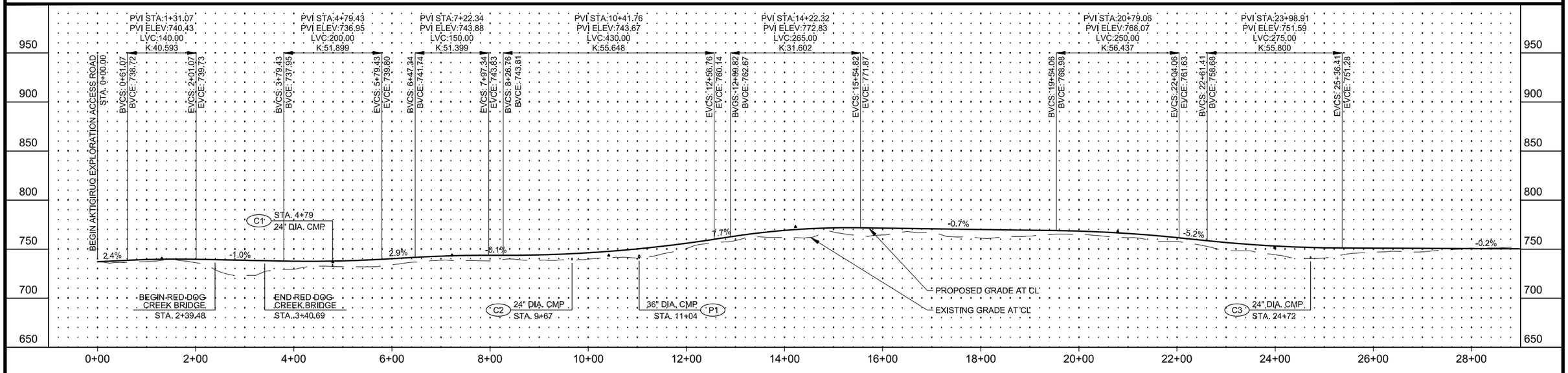
Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
SIGN DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2020	1	C





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Title:
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PLAN AND PROFILE
AKTIGIRUQ EXPLORATION ACCESS ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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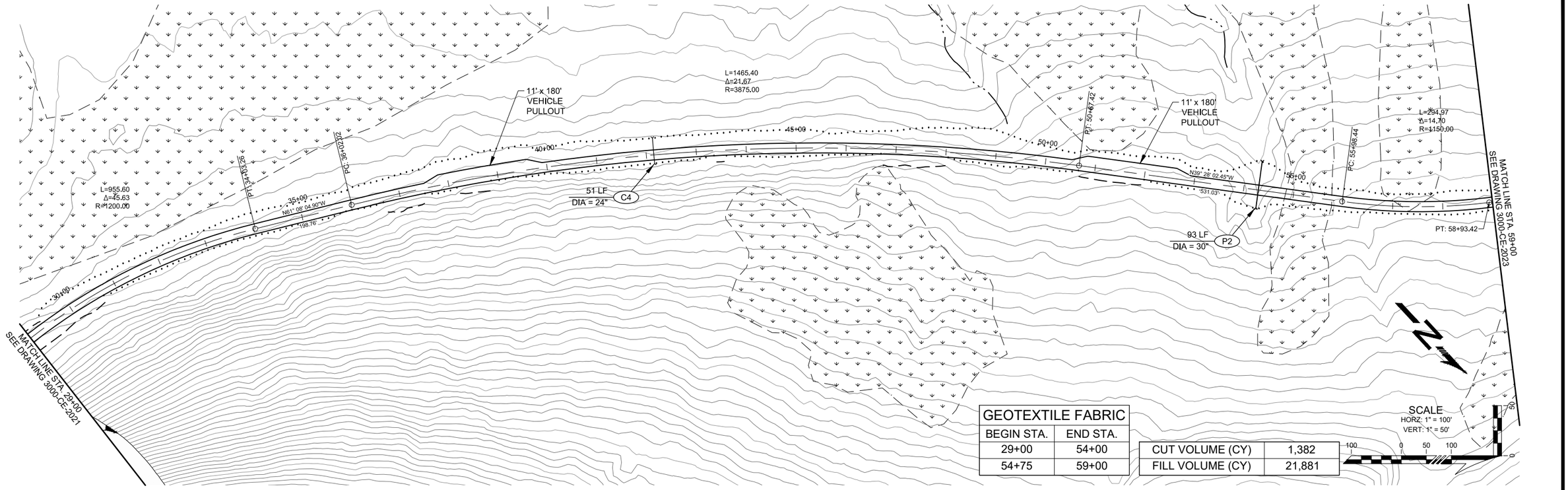
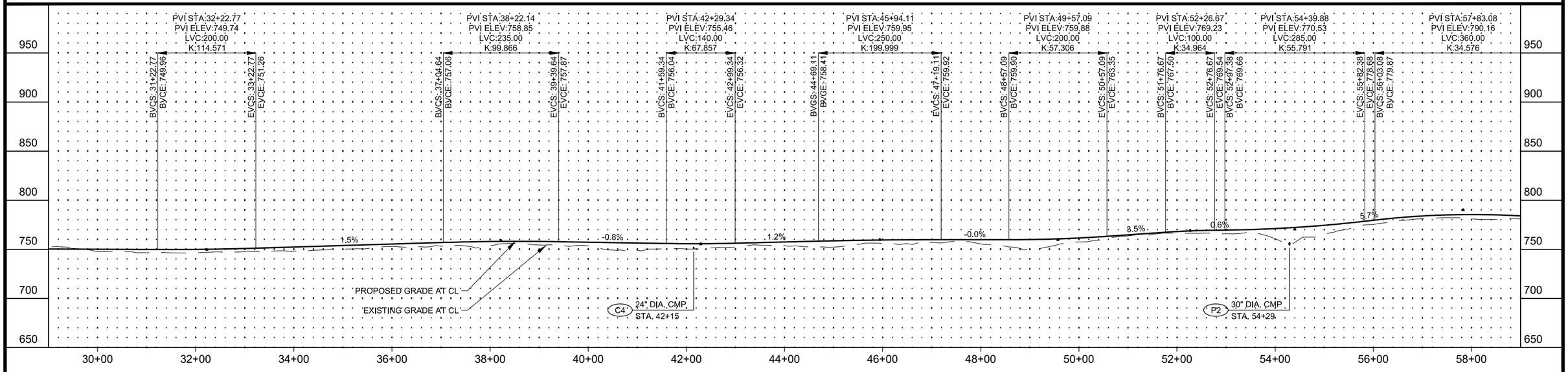


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
29+00	54+00
54+75	59+00

CUT VOLUME (CY)	1,382
FILL VOLUME (CY)	21,881



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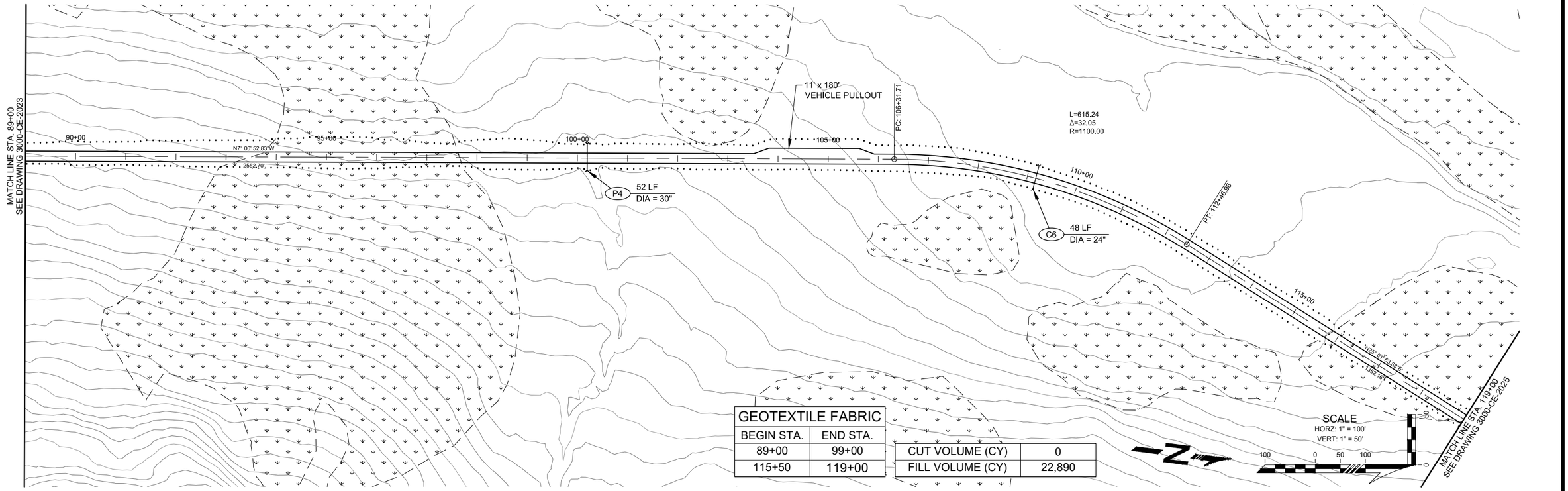
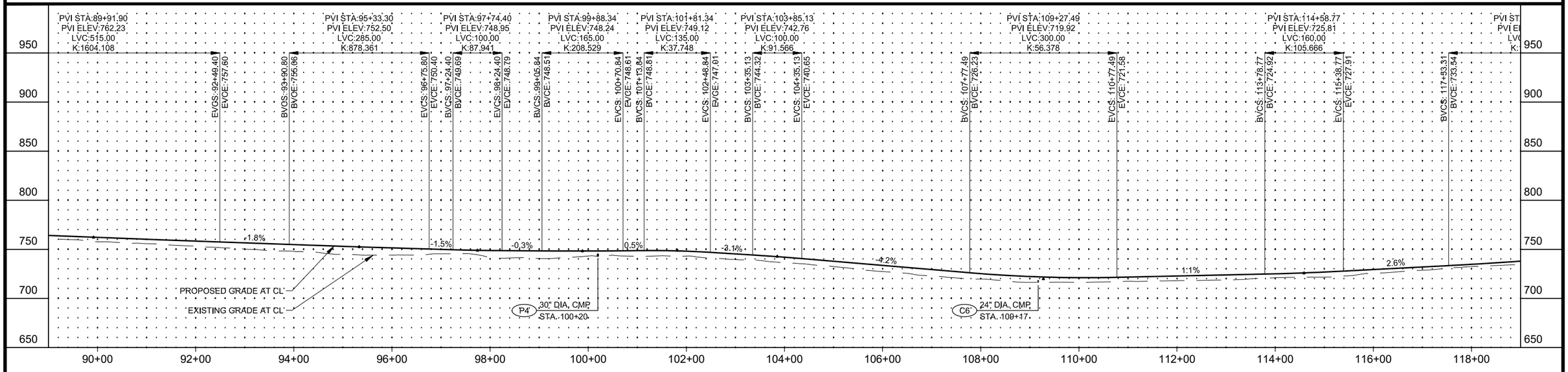


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
89+00	99+00
115+50	119+00

CUT VOLUME (CY)	0
FILL VOLUME (CY)	22,890



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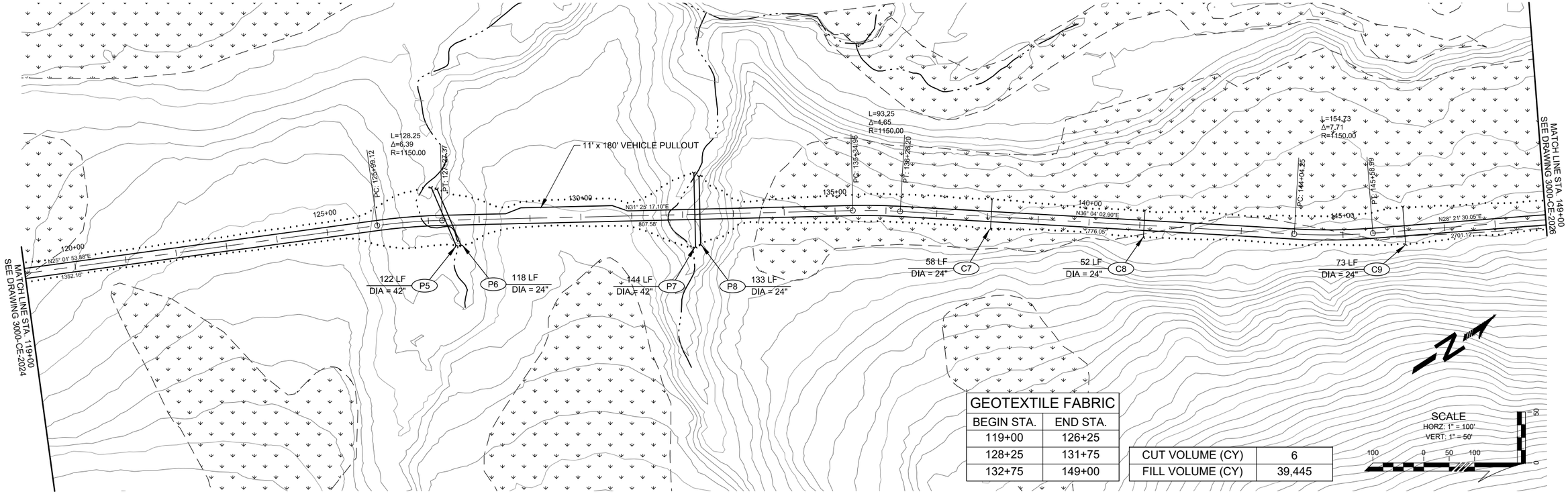
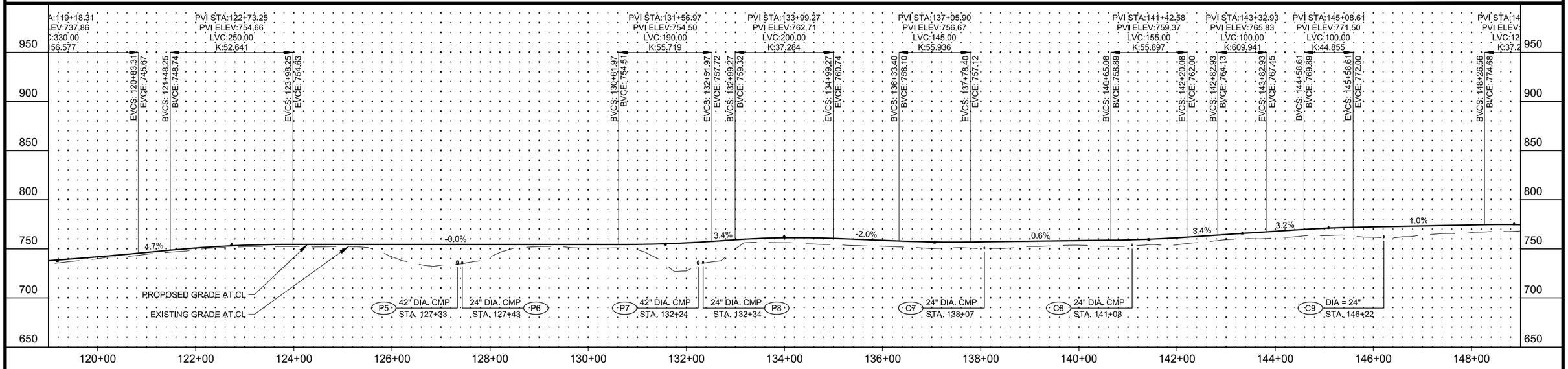


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
119+00	126+25
128+25	131+75
132+75	149+00

CUT VOLUME (CY)	6
FILL VOLUME (CY)	39,445



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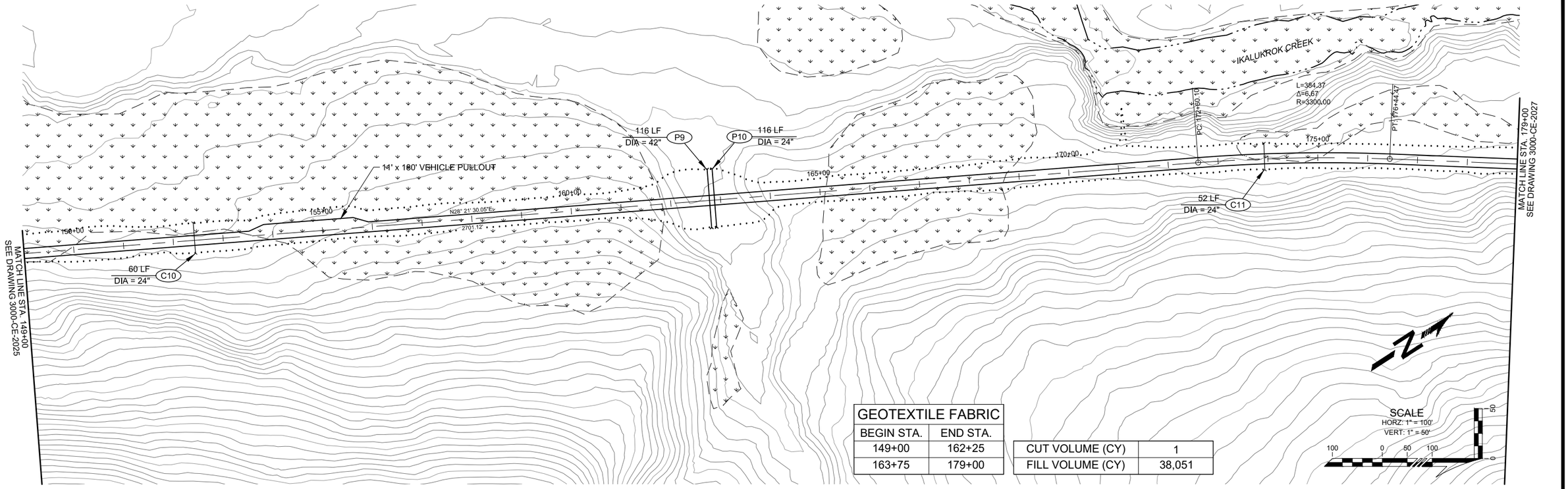
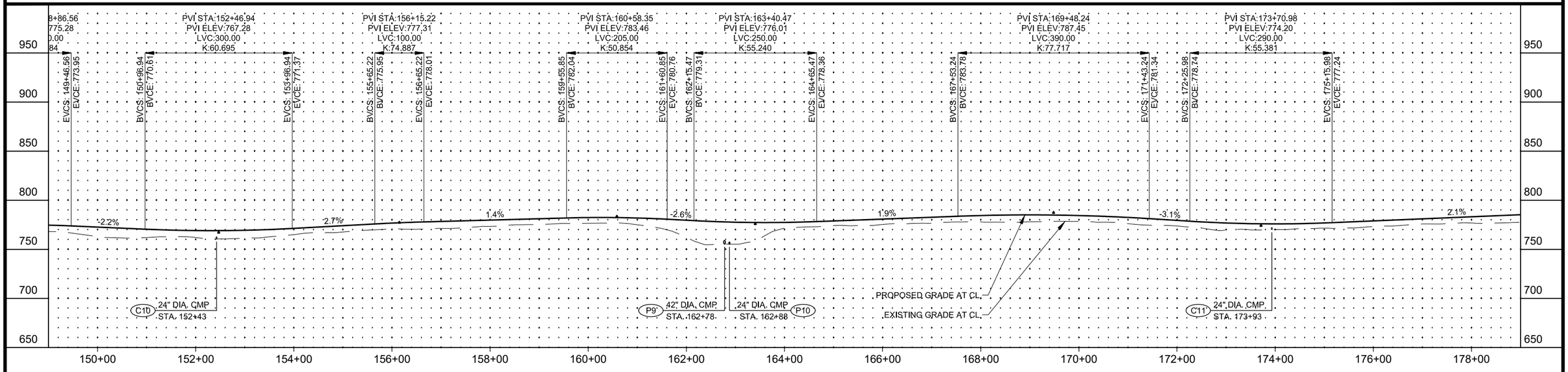


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
149+00	162+25
163+75	179+00

CUT VOLUME (CY)	1
FILL VOLUME (CY)	38,051

SCALE
HORZ: 1" = 100'
VERT: 1" = 50'



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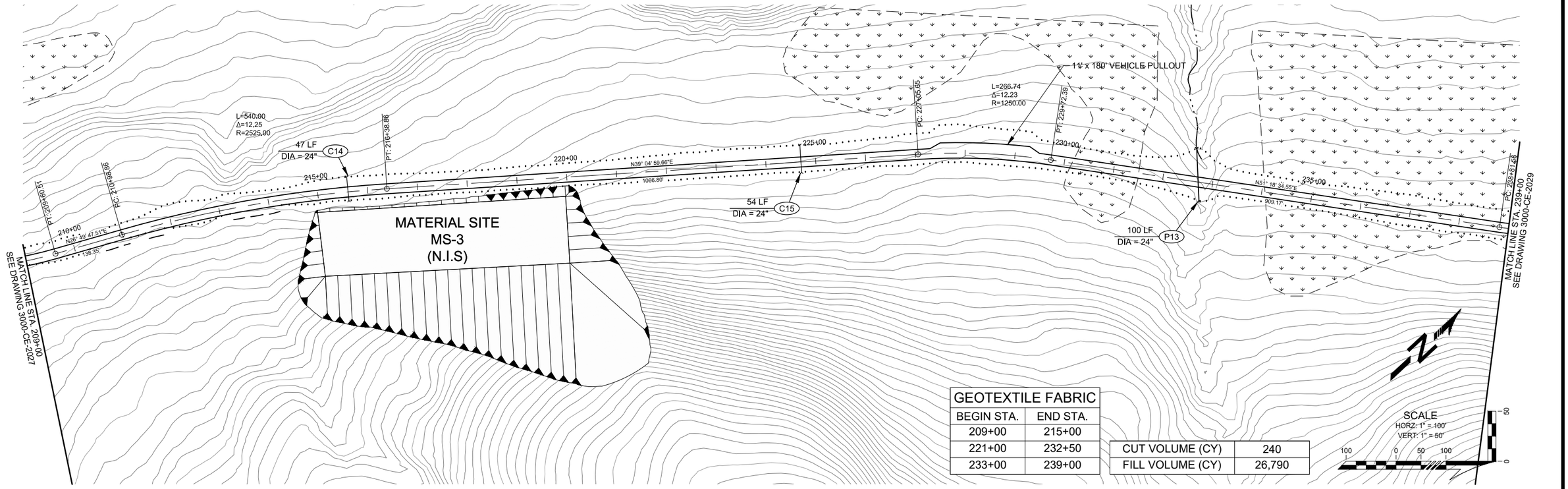
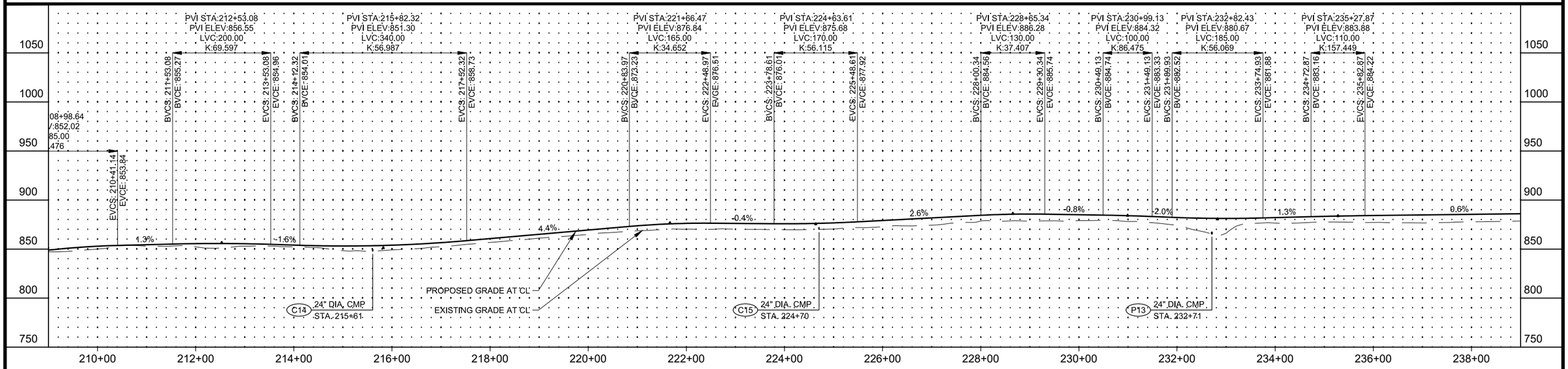


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
209+00	215+00
221+00	232+50
233+00	239+00

CUT VOLUME (CY)	240
FILL VOLUME (CY)	26,790



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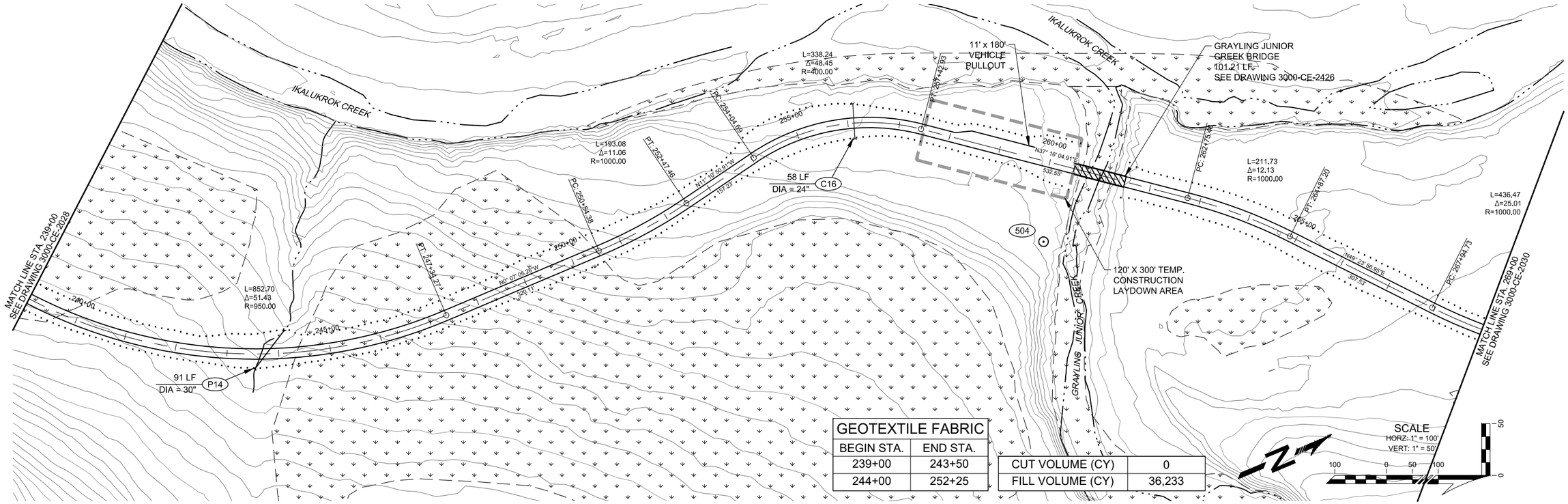
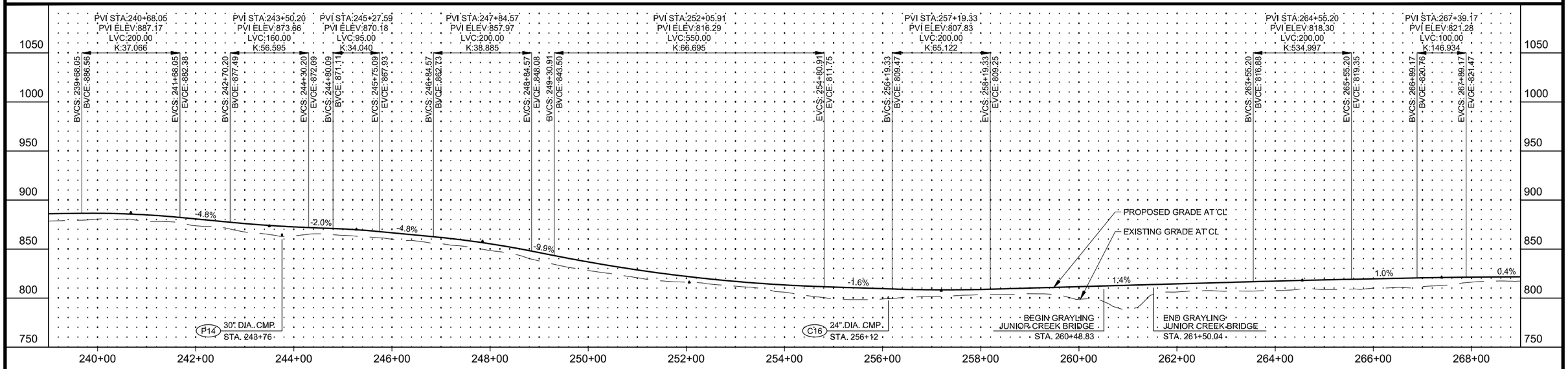


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
239+00	243+50
244+00	252+25

CUT VOLUME (CY)	0
FILL VOLUME (CY)	36,233



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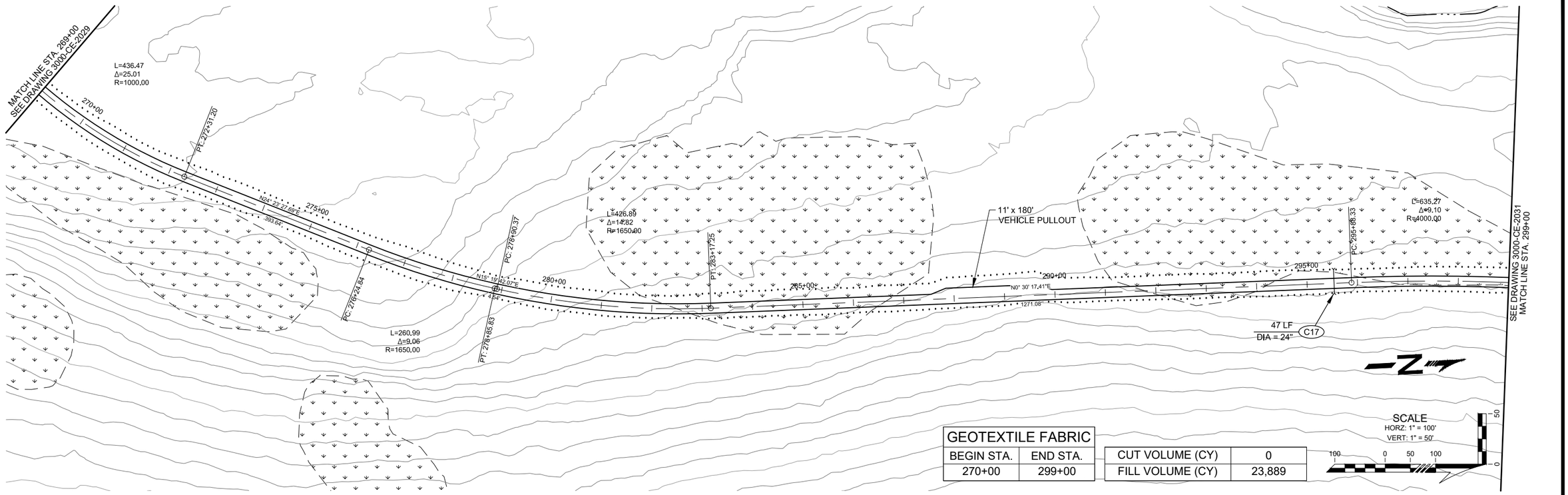
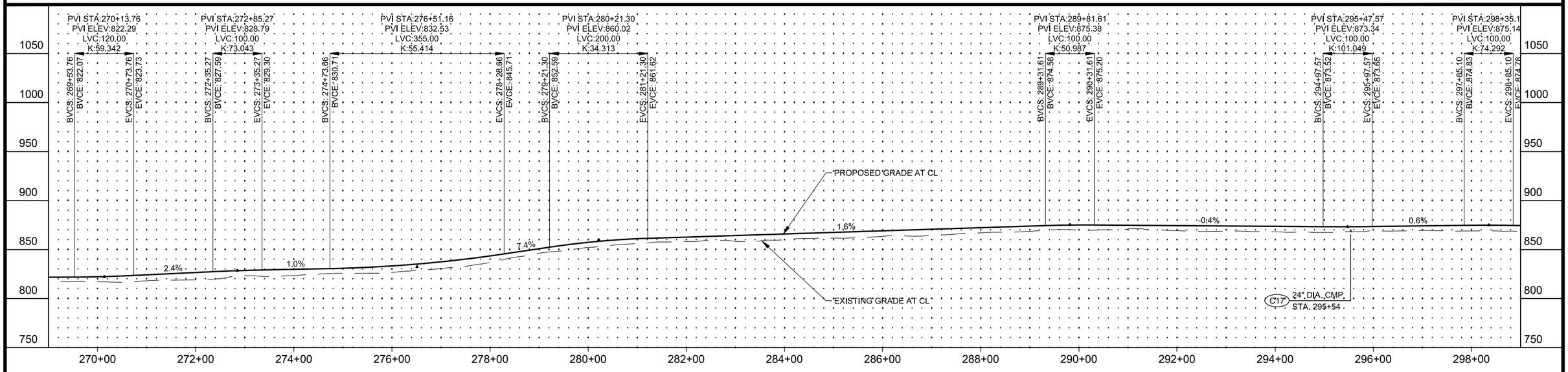
RDM004A1	AS SHOWN	D	3000-CE-2029	1	C



GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
270+00	299+00

CUT VOLUME (CY)	0
FILL VOLUME (CY)	23,889



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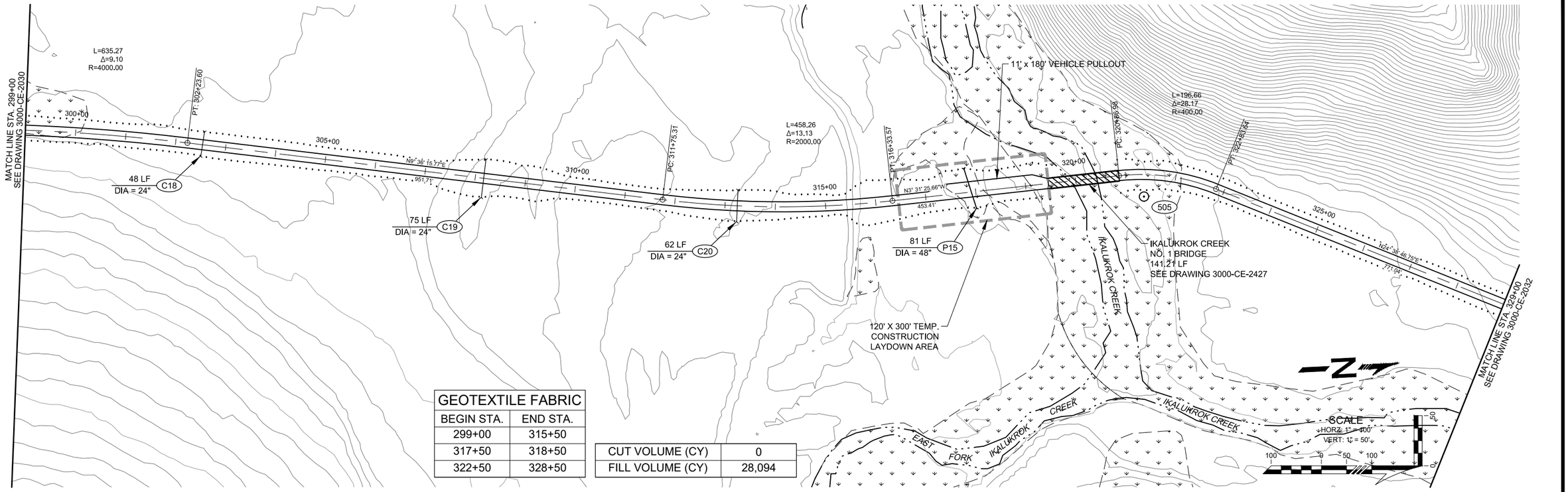
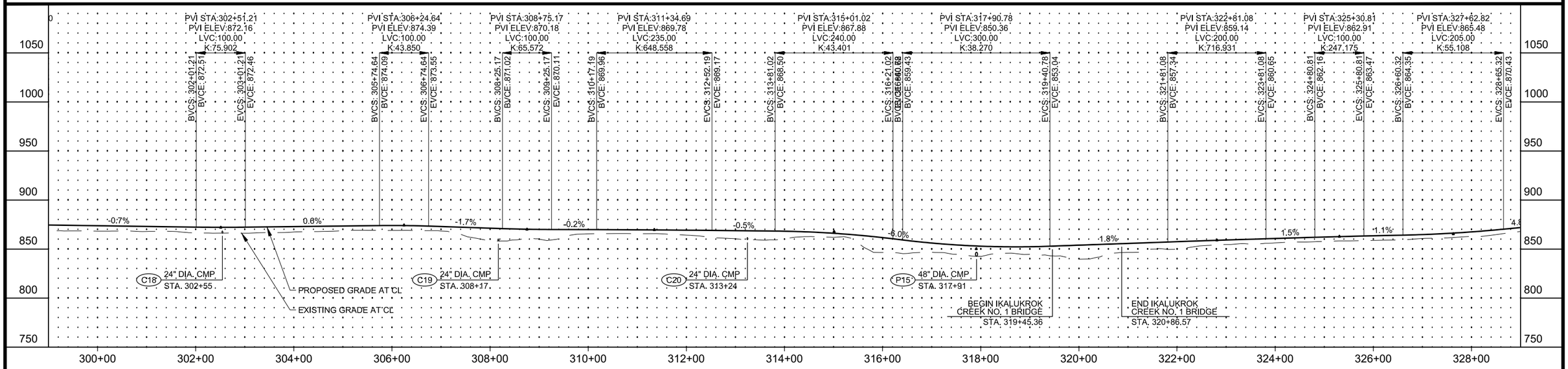


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
299+00	315+50
317+50	318+50
322+50	328+50

CUT VOLUME (CY)	0
FILL VOLUME (CY)	28,094



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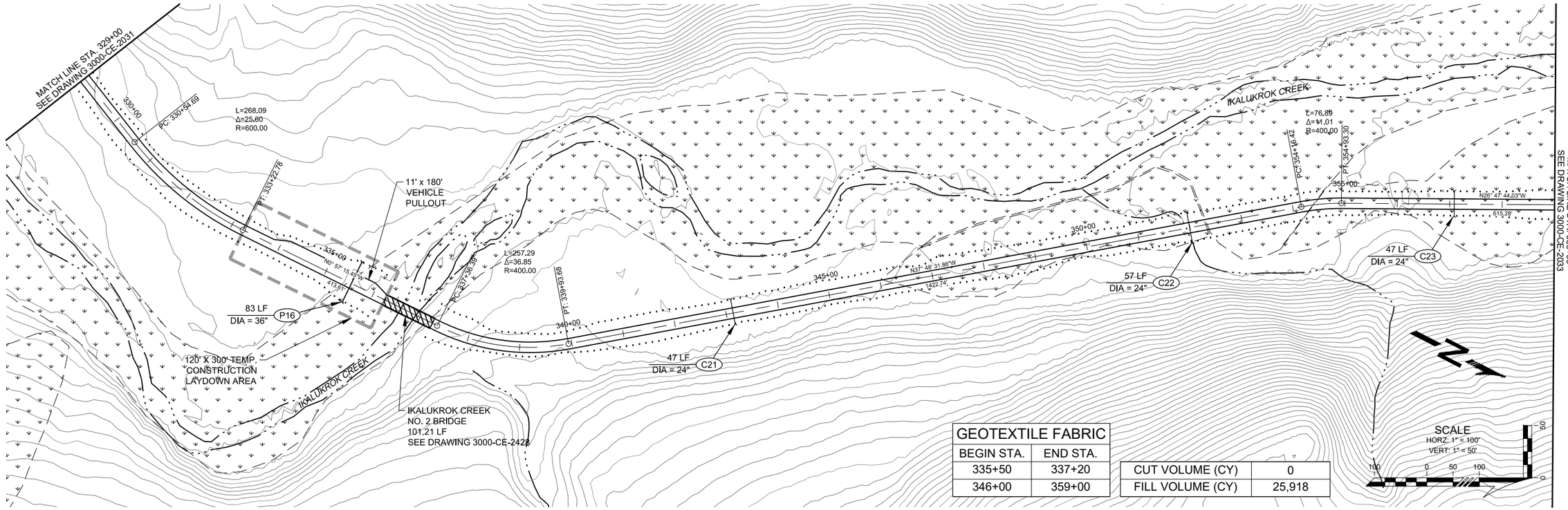
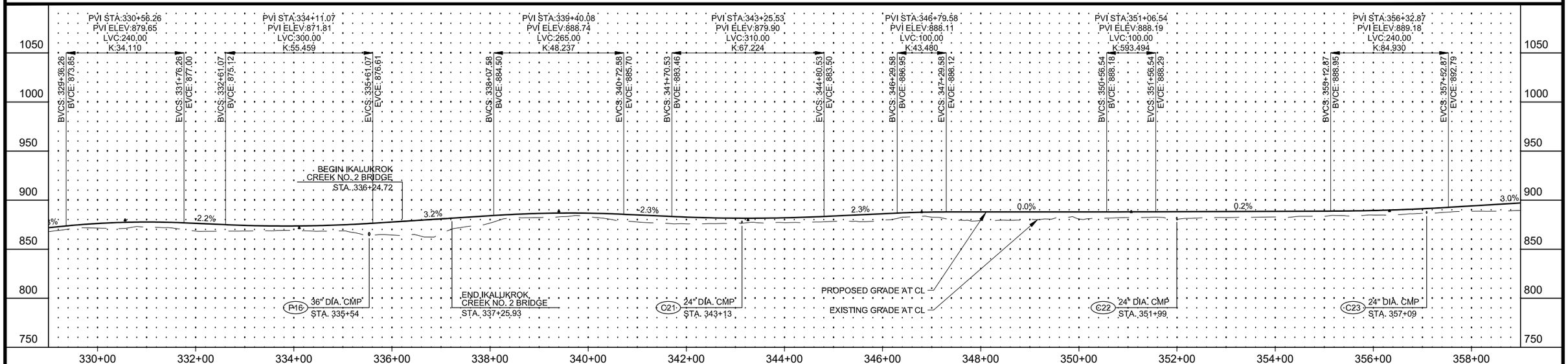


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
335+50	337+20
346+00	359+00

CUT VOLUME (CY)	0
FILL VOLUME (CY)	25,918



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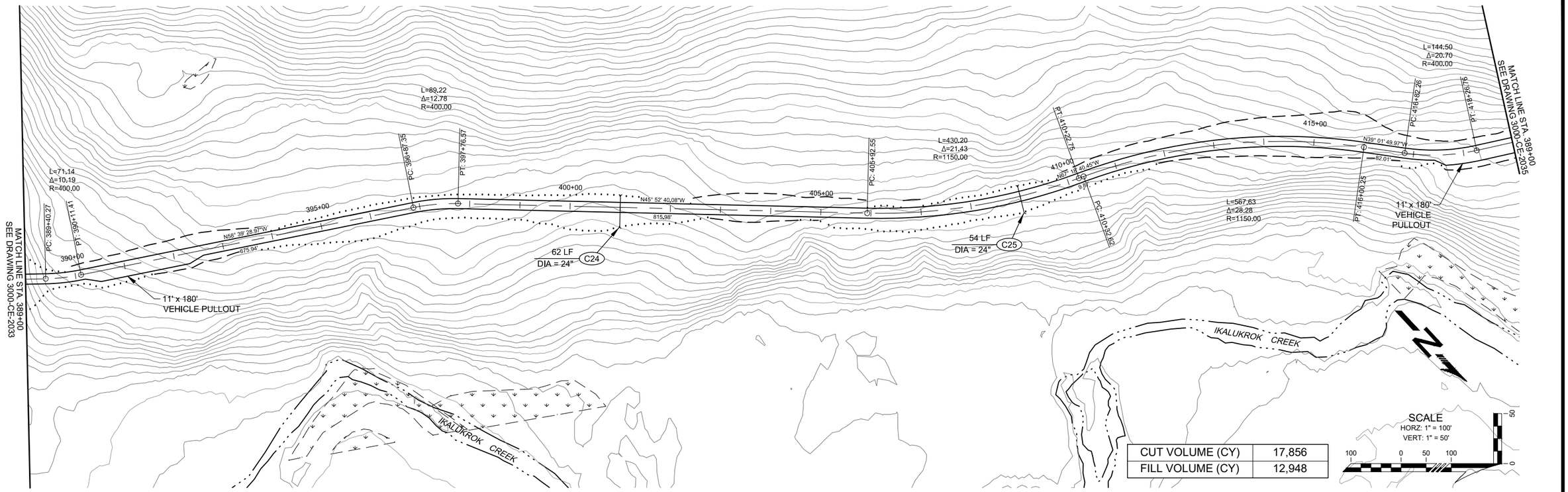
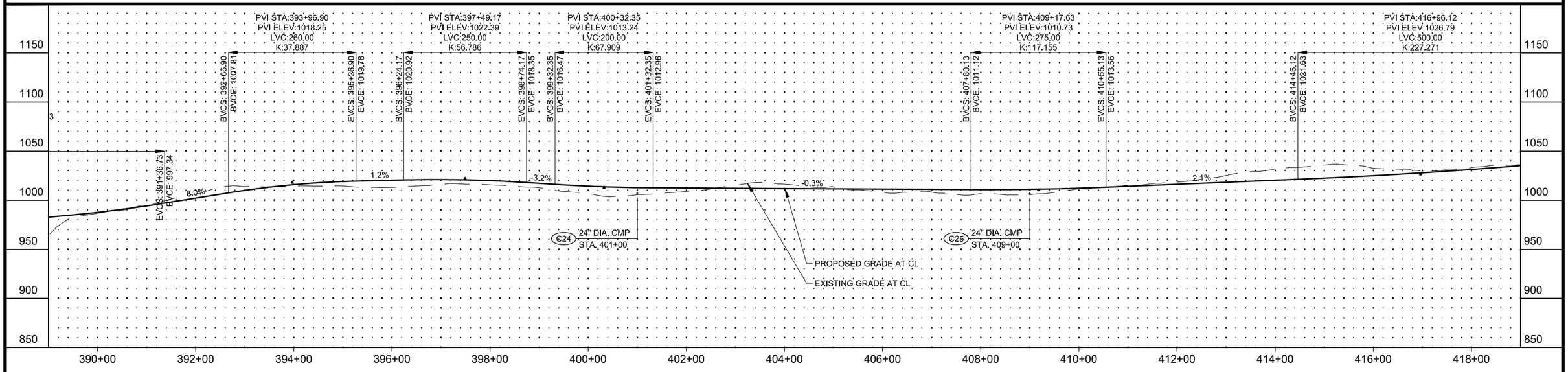


CUT VOLUME (CY)	17,856
FILL VOLUME (CY)	12,948



No.	Revision Description	Revised By		Checked By		Approved By	
C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020		
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19		

No.	Dwg. No.	Reference Drawings
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Title:
AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
PLAN AND PROFILE
AKTIGIRUQ EXPLORATION ACCESS ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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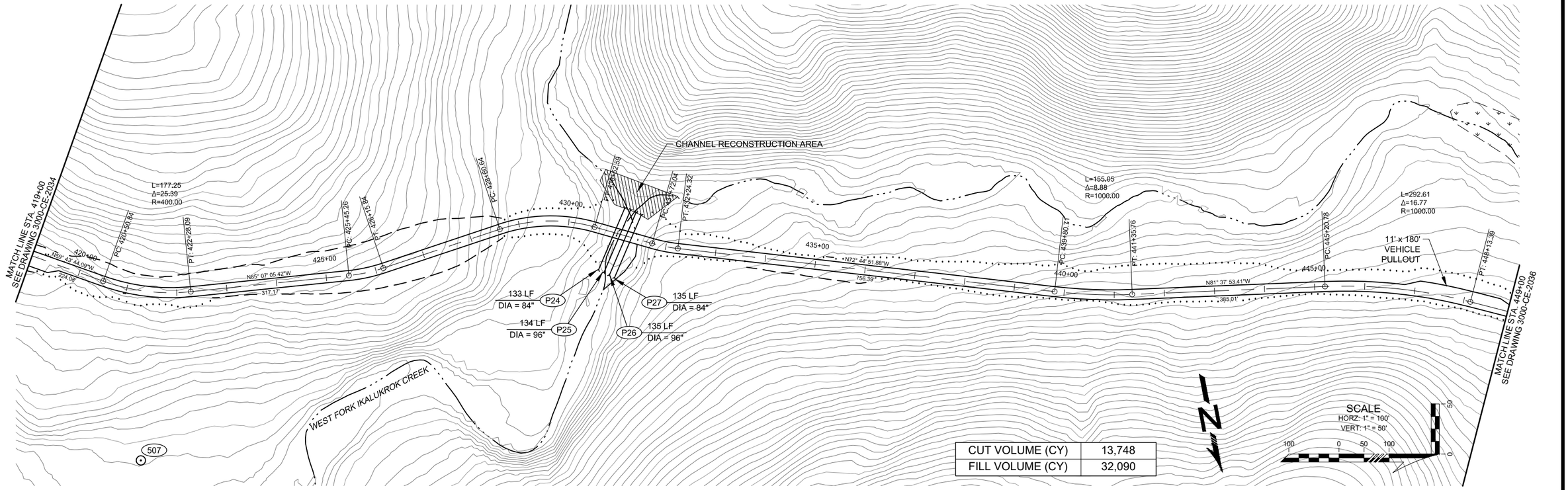

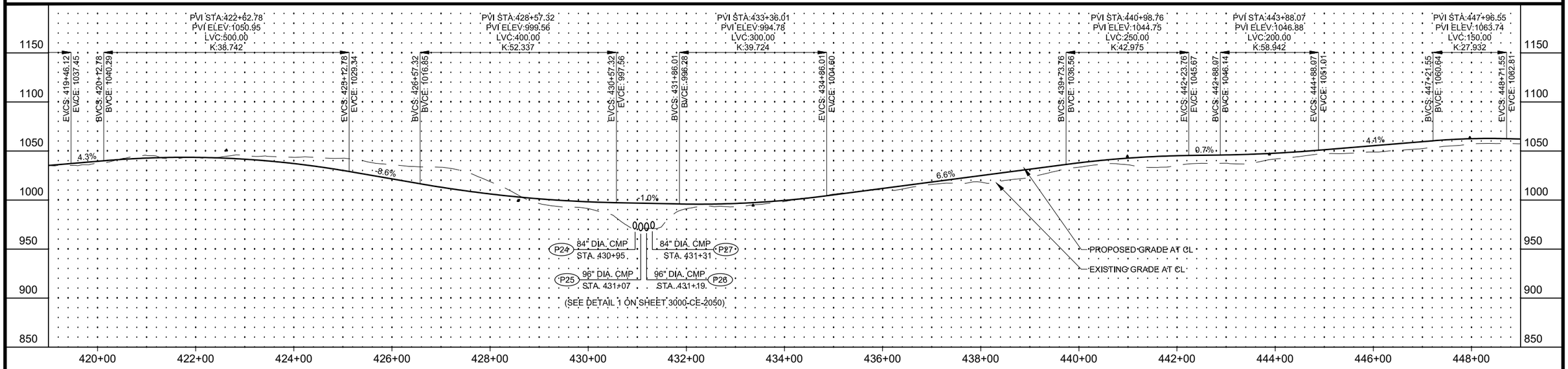

No.	Revision Description	Revised By	Checked By	Approved By
C	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	
B	ISSUED FOR APPROVAL	BJL 1/23/2020	SEC 1/24/2020	
A	ISSUED FOR REVIEW	BJL 12/2/19	SEC 12/2/19	

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MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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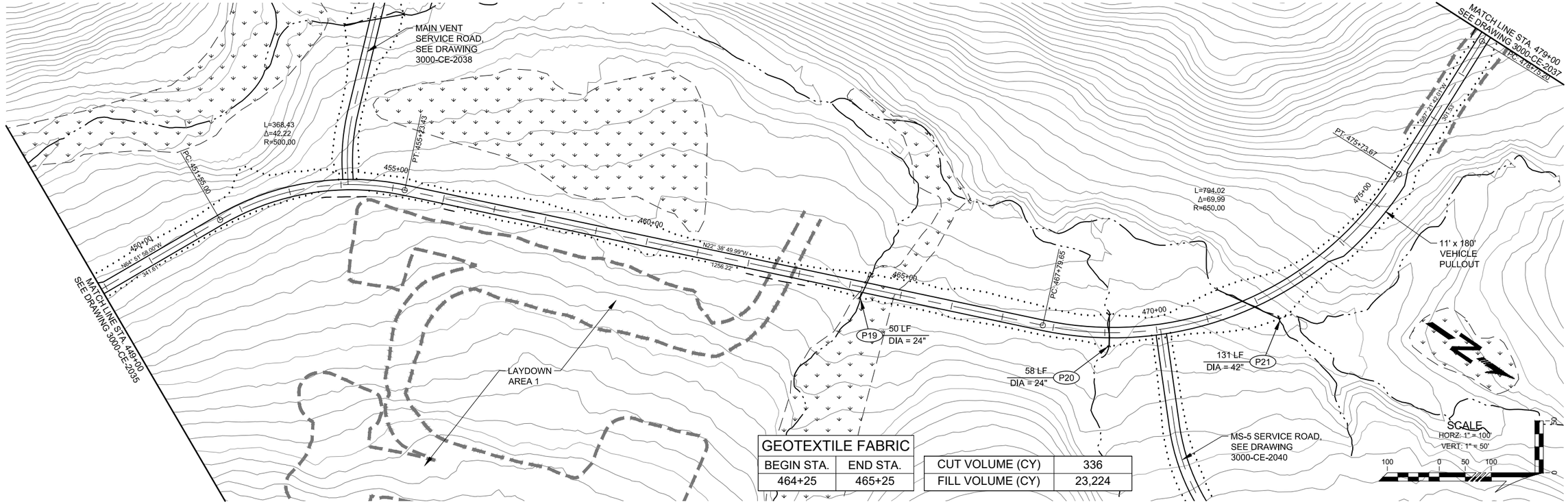
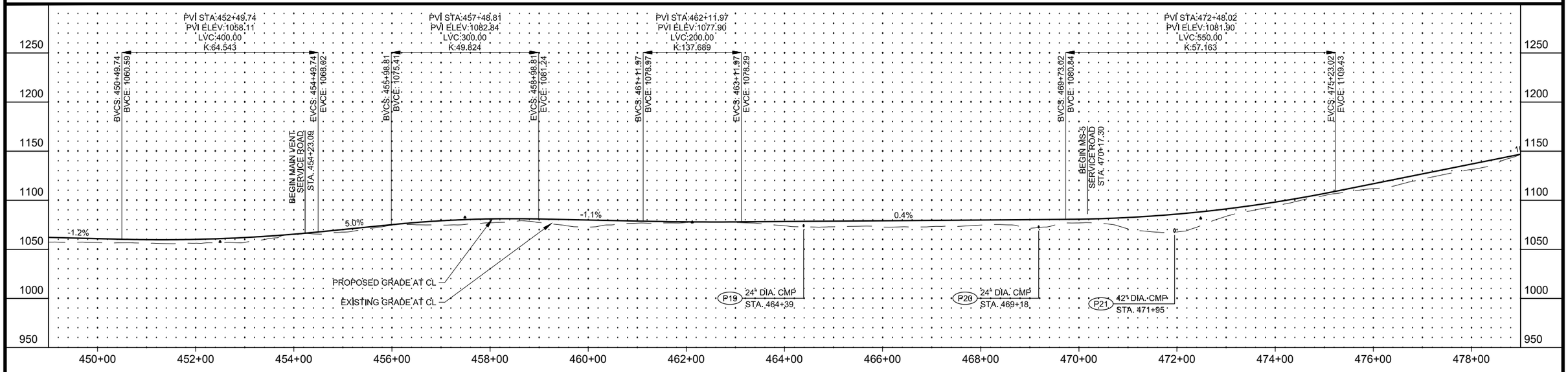


GEOTEXTILE FABRIC	
BEGIN STA.	END STA.
464+25	465+25

CUT VOLUME (CY)	336
FILL VOLUME (CY)	23,224



No.	Revision Description	Revised By	Checked By	Approved By
C	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	
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MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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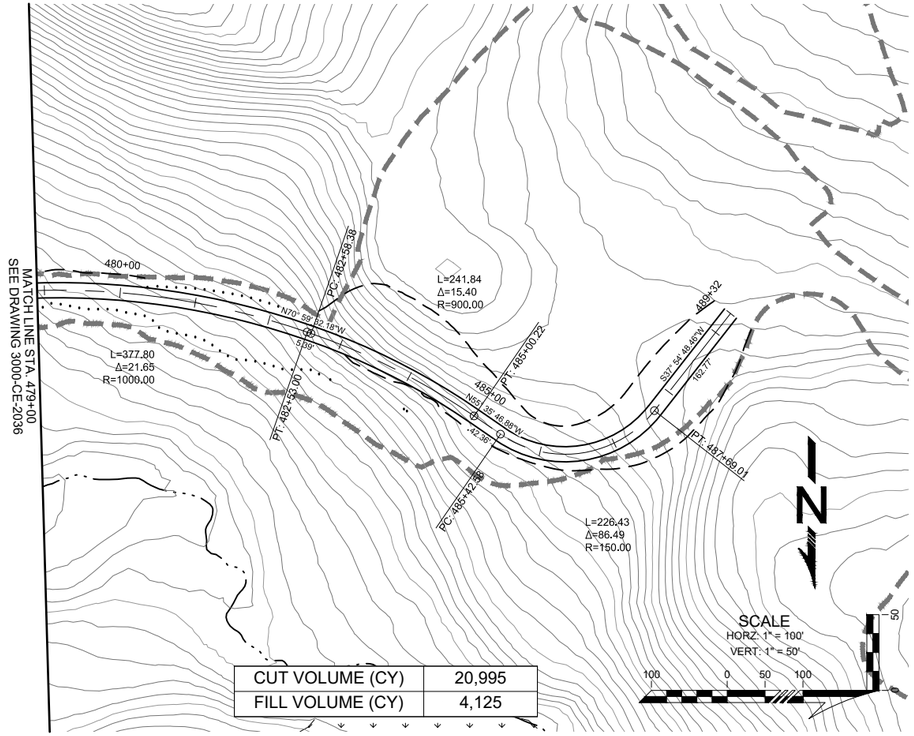

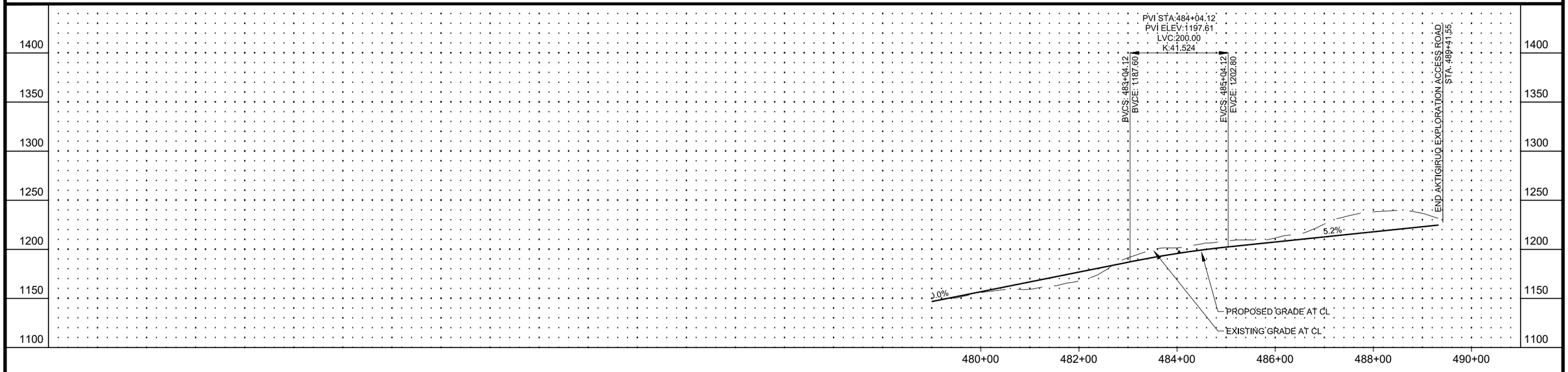

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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C	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021			3		
B	ISSUED FOR APPROVAL	BJL	1/23/2020	SEC	1/24/2020			2		
A	ISSUED FOR REVIEW	BJL	12/2/19	SEC	12/2/19			1		

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AKTIGIRUQ EXPLORATION ACCESS ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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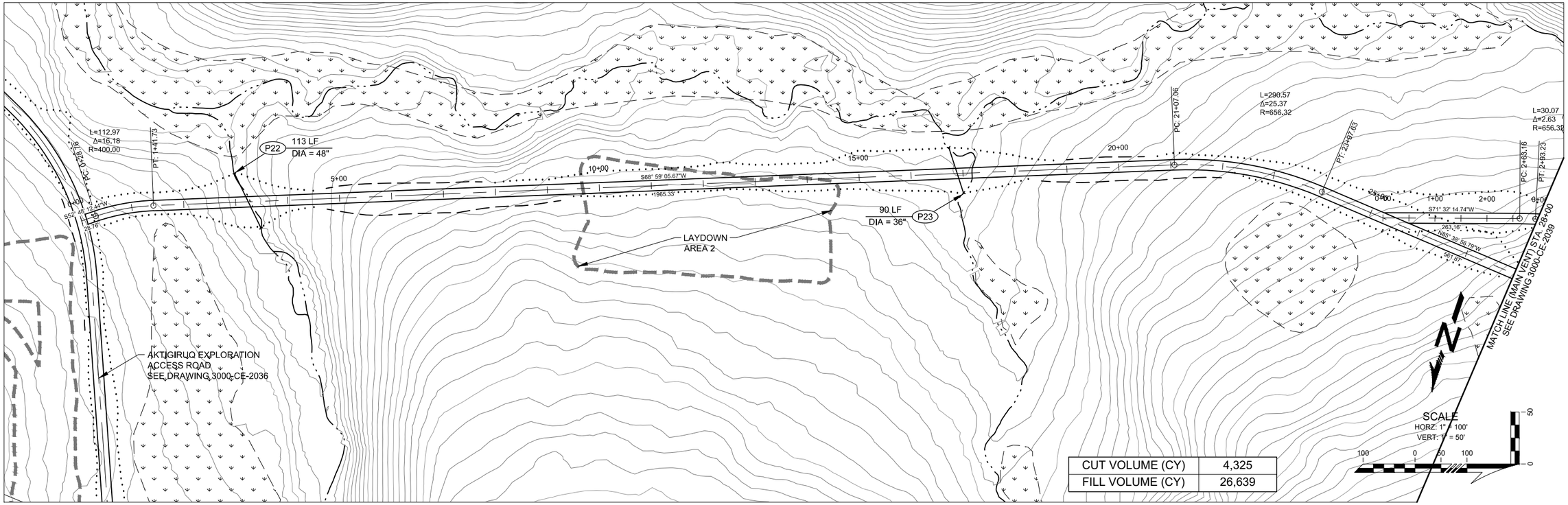
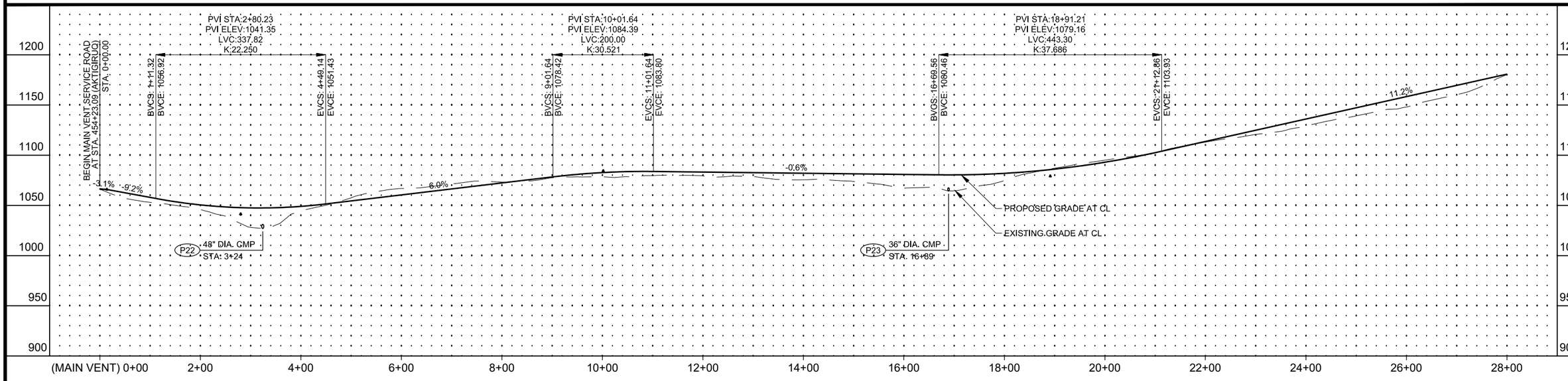


CUT VOLUME (CY)	4,325
FILL VOLUME (CY)	26,639



No.	Revision Description	Revised By	Checked By	Approved By
C	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	
B	ISSUED FOR APPROVAL	BJL 1/23/2020	SEC 1/24/2020	
A	ISSUED FOR REVIEW	BJL 12/2/19	SEC 12/2/19	

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Title:
AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
PLAN AND PROFILE
MAIN VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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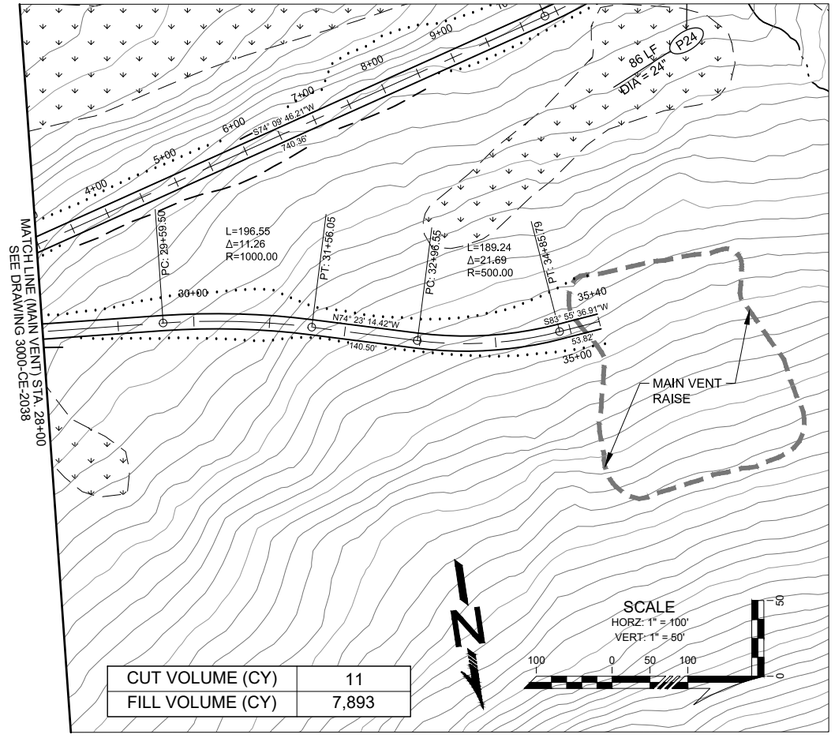
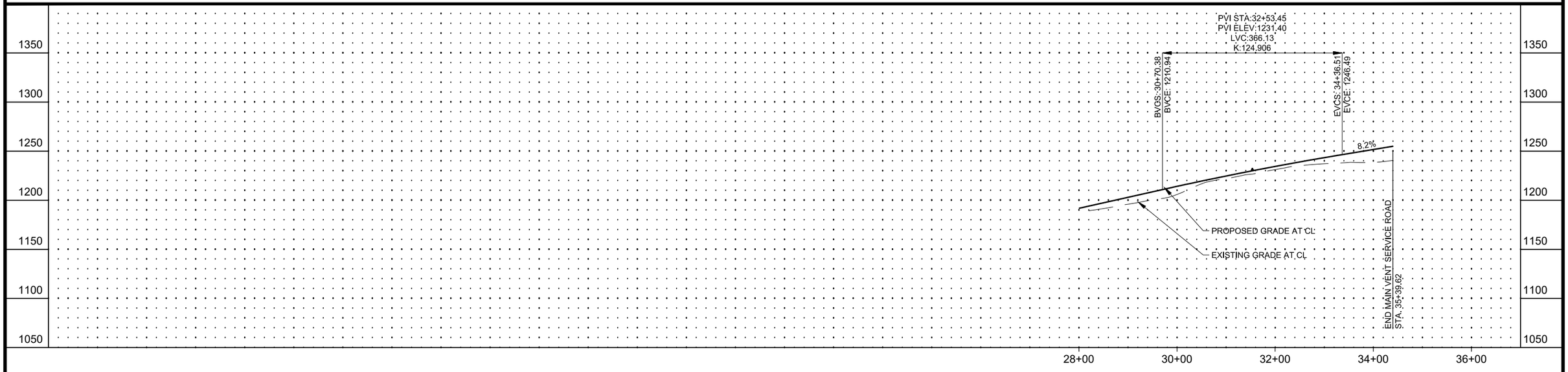


CUT VOLUME (CY)	11
FILL VOLUME (CY)	7,893



No.	Revision Description	Revised By	Checked By	Approved By
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PLAN AND PROFILE
MAIN VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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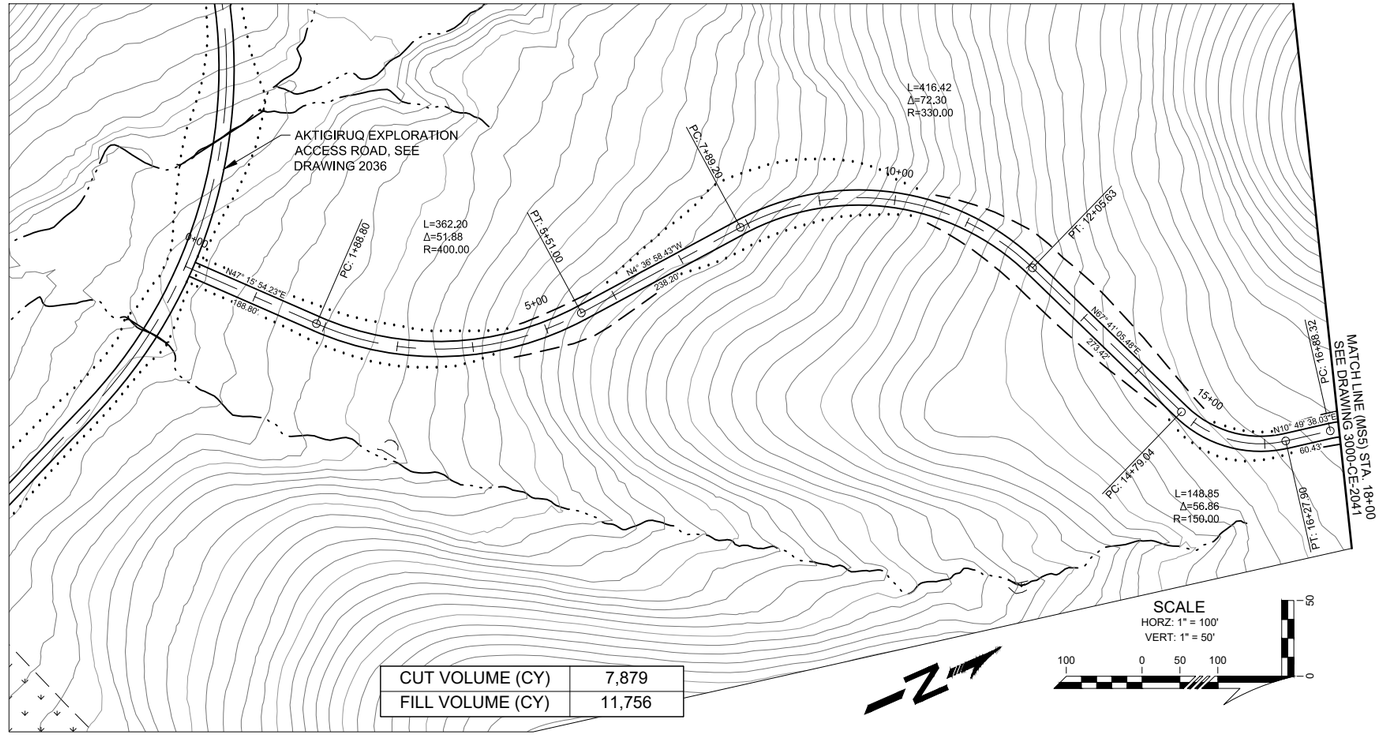

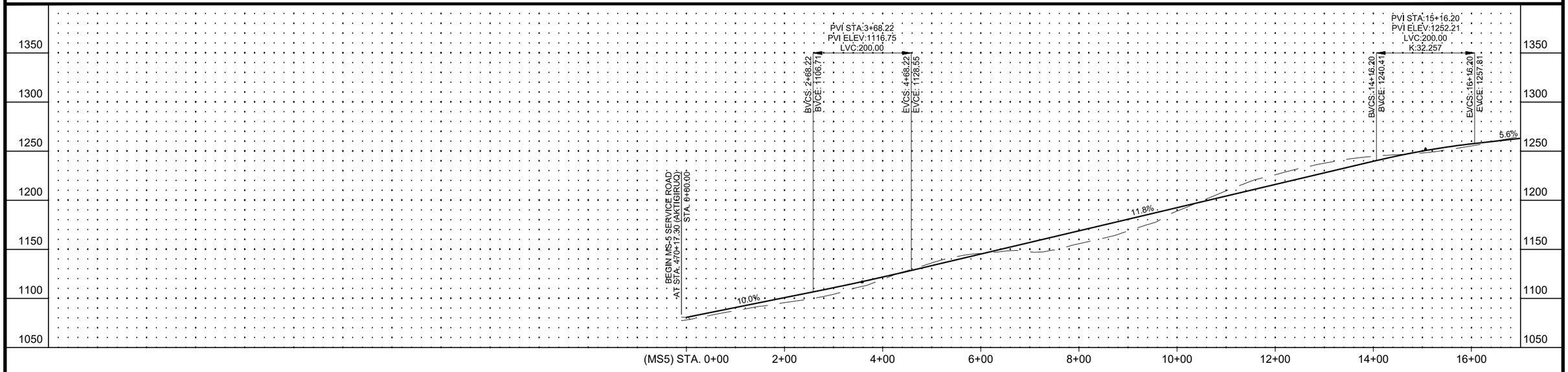

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C	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	
B	ISSUED FOR APPROVAL	BJL 1/23/2020	SEC 1/24/2020	
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PLAN AND PROFILE
MS-5 SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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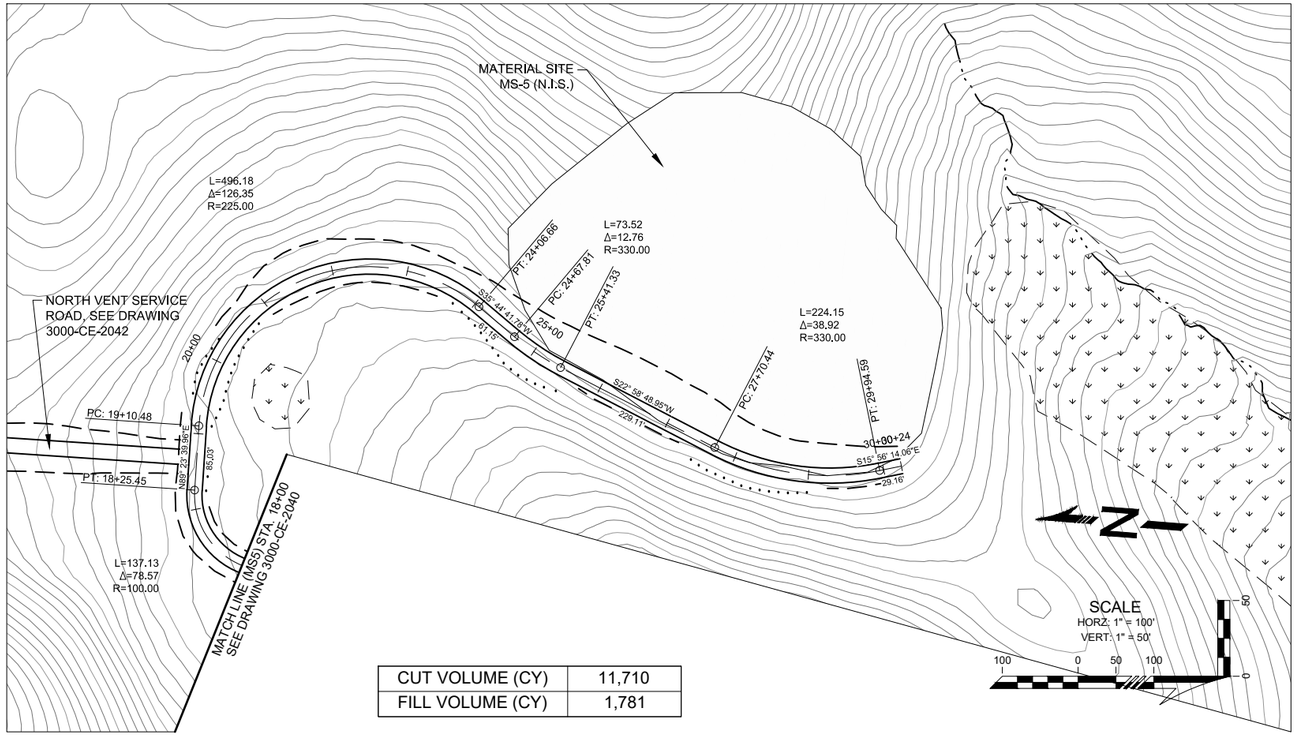
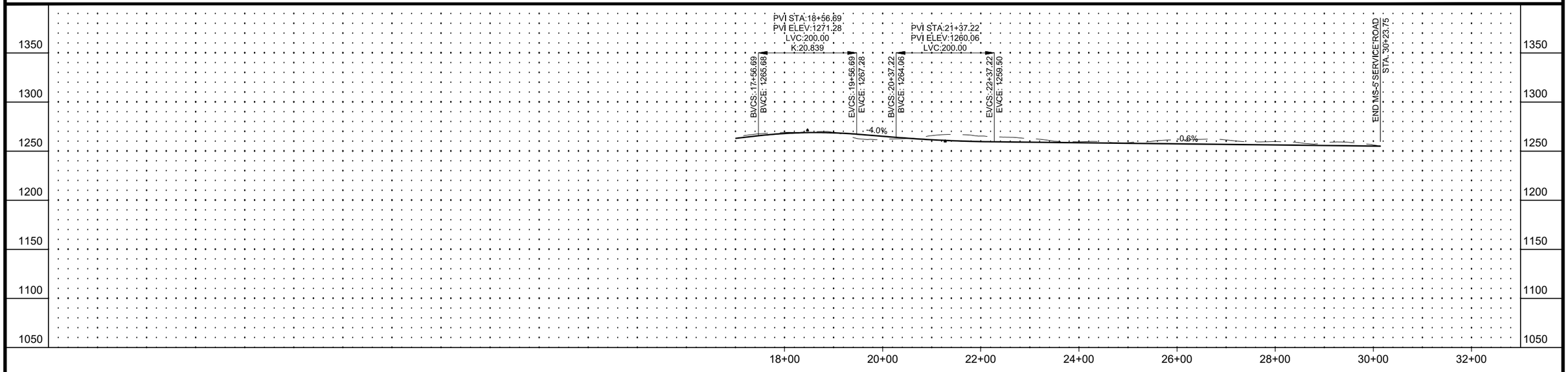


CUT VOLUME (CY)	11,710
FILL VOLUME (CY)	1,781



No.	Revision Description	Revised By	Checked By	Approved By
C	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	
B	ISSUED FOR APPROVAL	BJL 1/23/2020	SEC 1/24/2020	
A	ISSUED FOR REVIEW	BJL 12/2/19	SEC 12/2/19	

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PLAN AND PROFILE
MS-5 SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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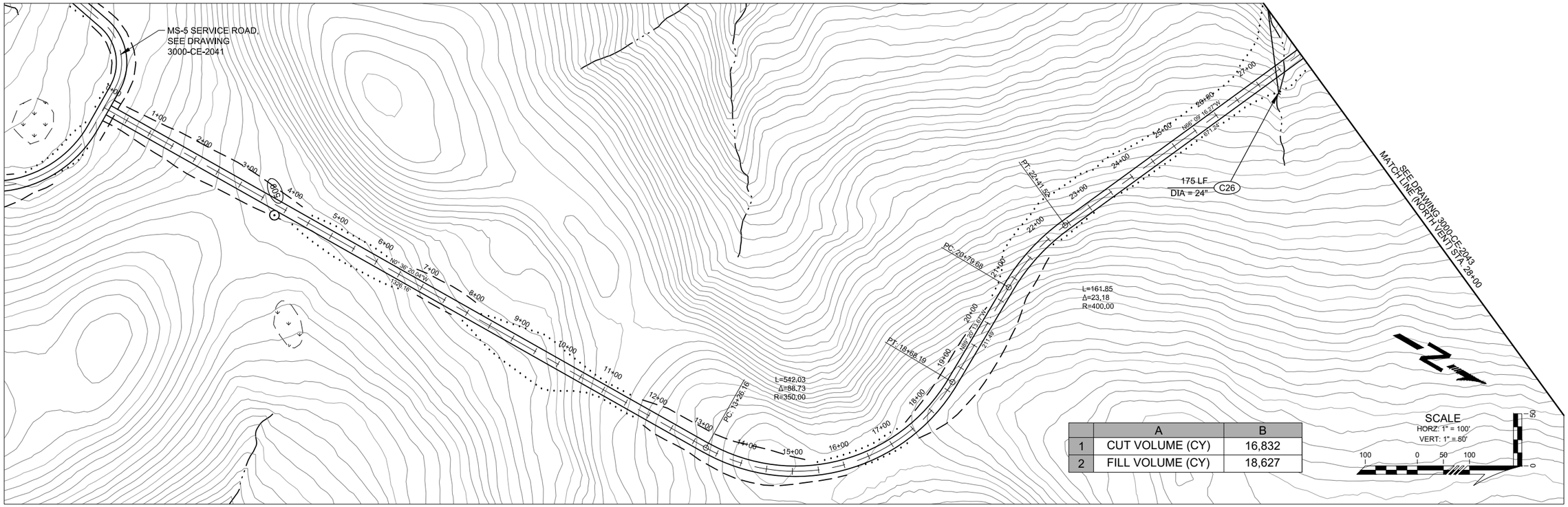
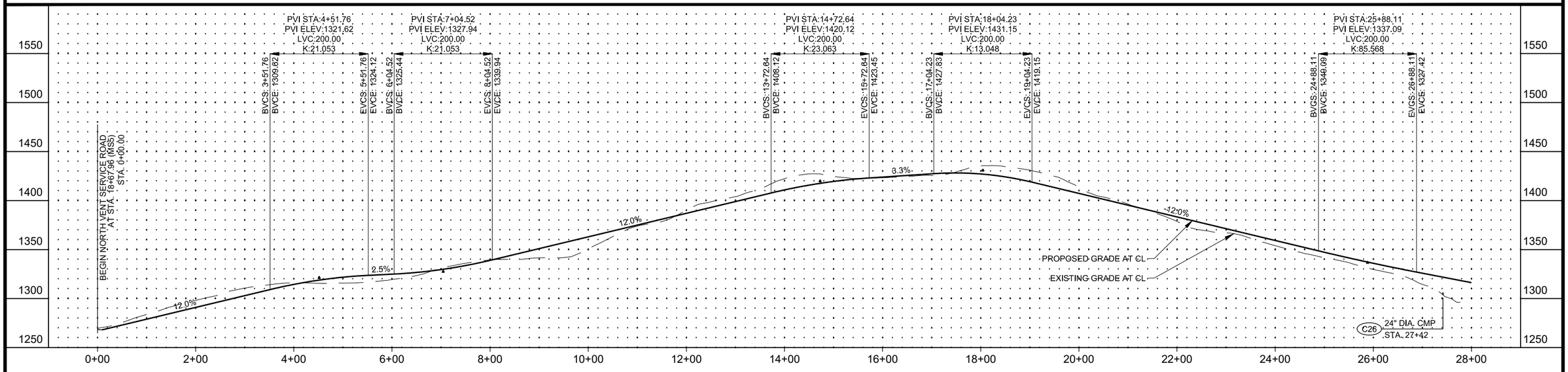


	A	B
1	CUT VOLUME (CY)	16,832
2	FILL VOLUME (CY)	18,627



No.	Revision Description	Revised By	Checked By	Approved By
A	ISSUED FOR PERMITTING	BJD 12/23/21	SEC 12/28/21	

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Title:
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PLAN AND PROFILE
NORTH VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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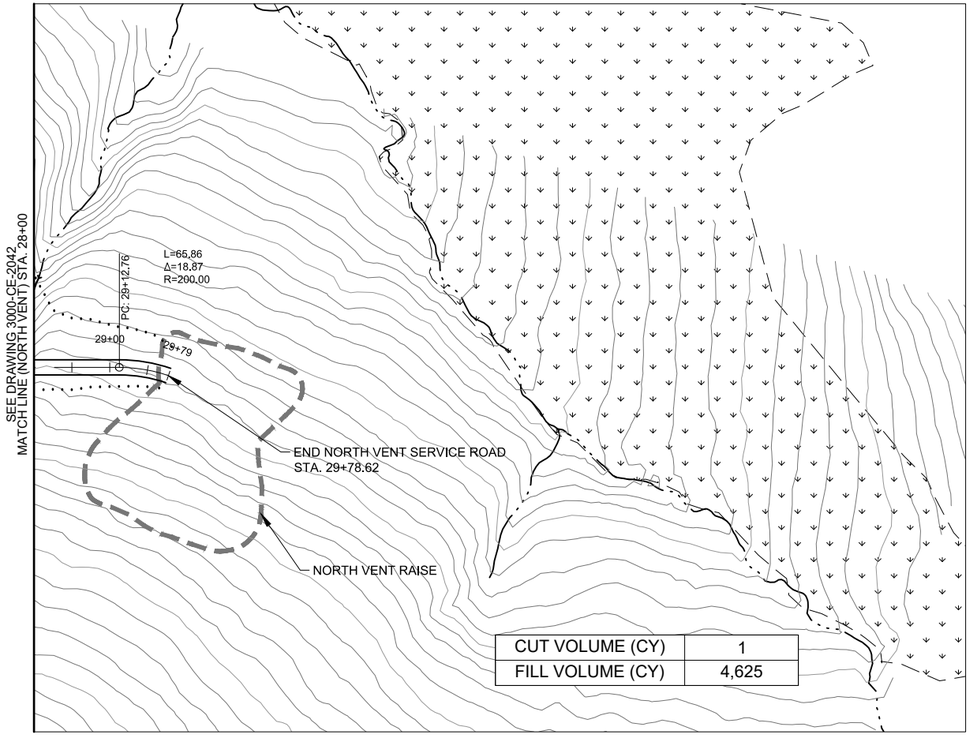
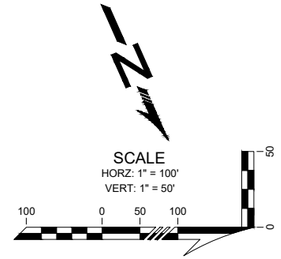
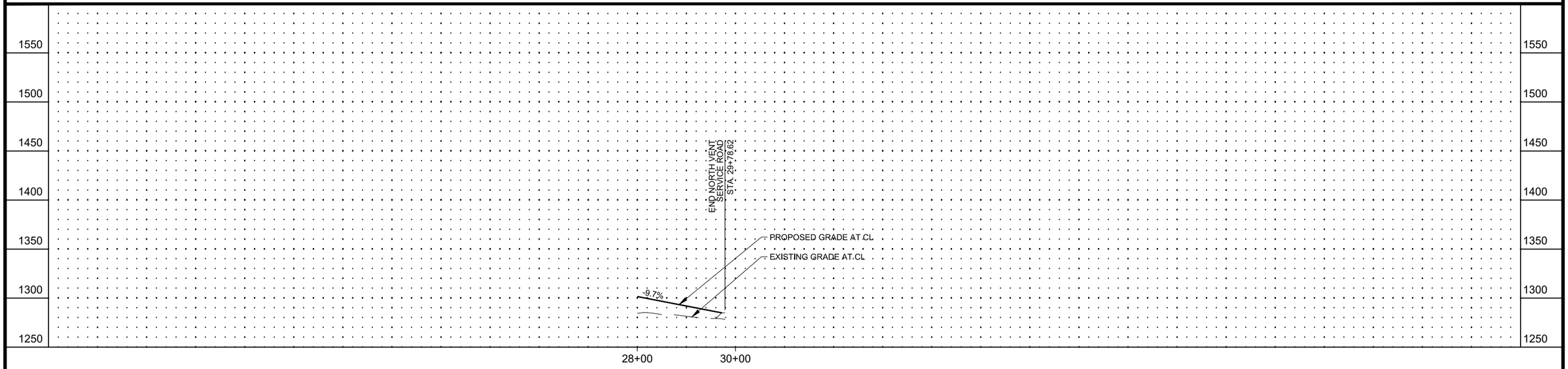


CUT VOLUME (CY)	1
FILL VOLUME (CY)	4,625





No.	Revision Description	Revised By	Checked By	Approved By
A	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	

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PLAN AND PROFILE
NORTH VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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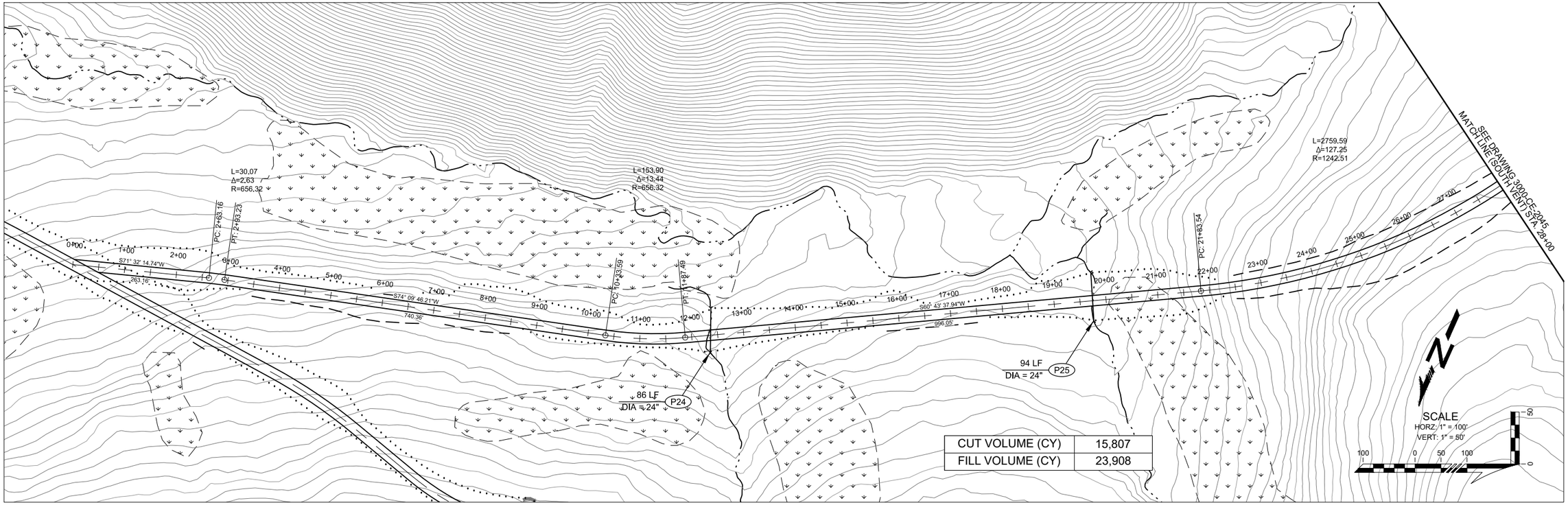
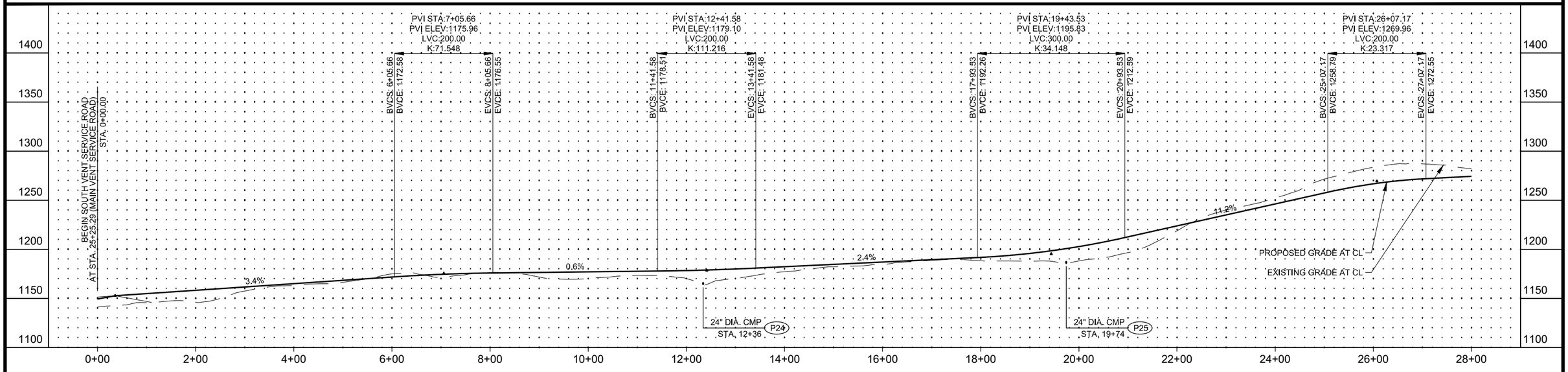


CUT VOLUME (CY)	15,807
FILL VOLUME (CY)	23,908



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A	ISSUED FOR PERMITTING	BJD 12/23/2021	SEC 12/28/2021	

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PLAN AND PROFILE
SOUTH VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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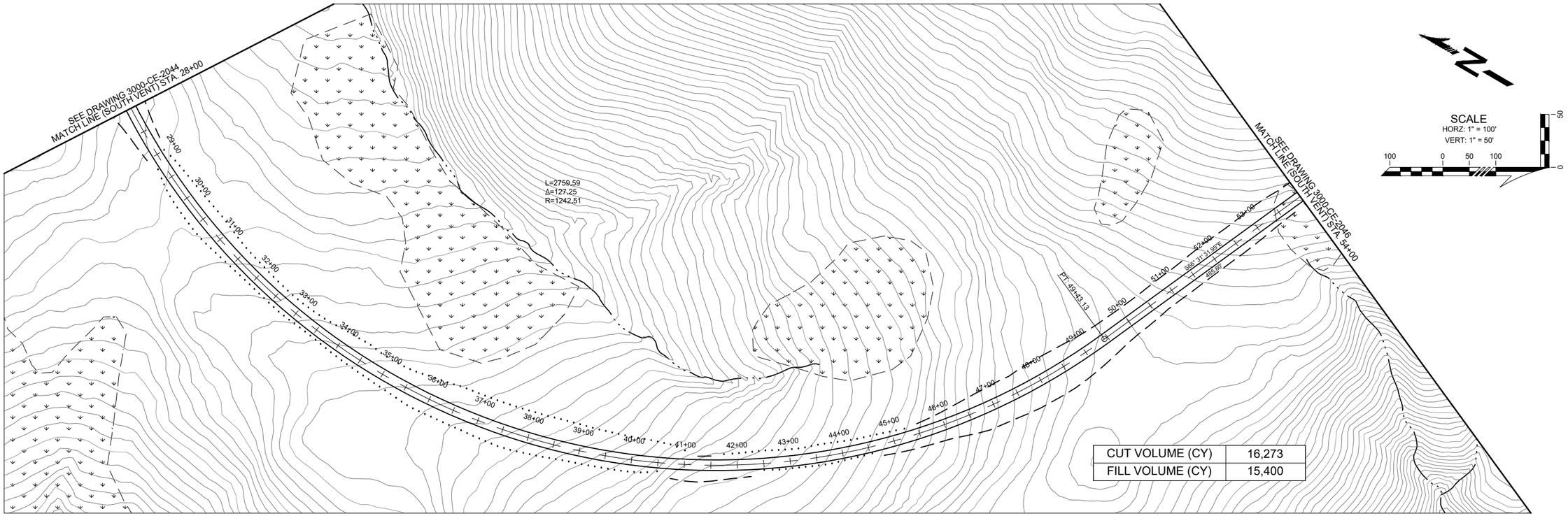
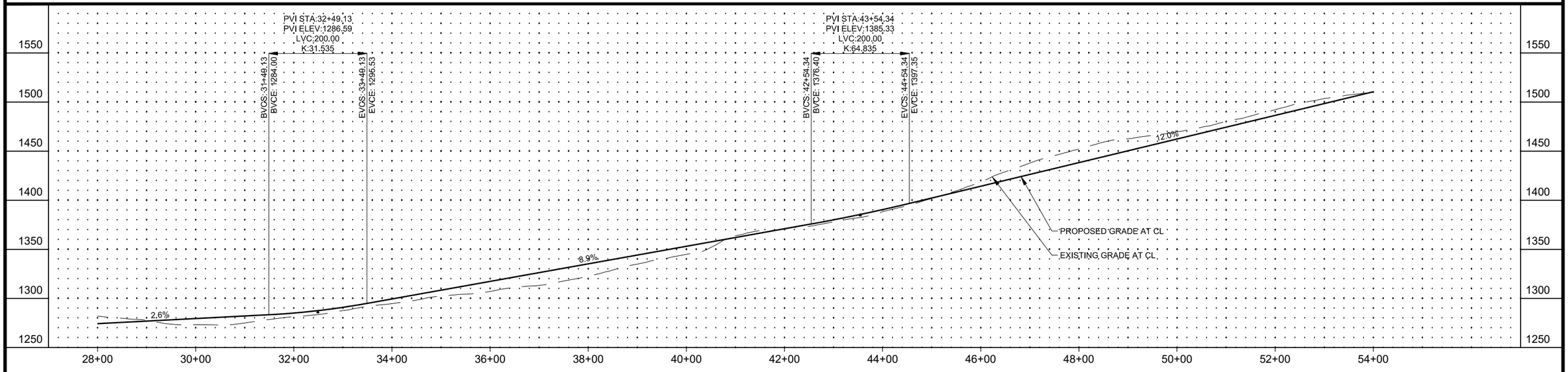


CUT VOLUME (CY)	16,273
FILL VOLUME (CY)	15,400



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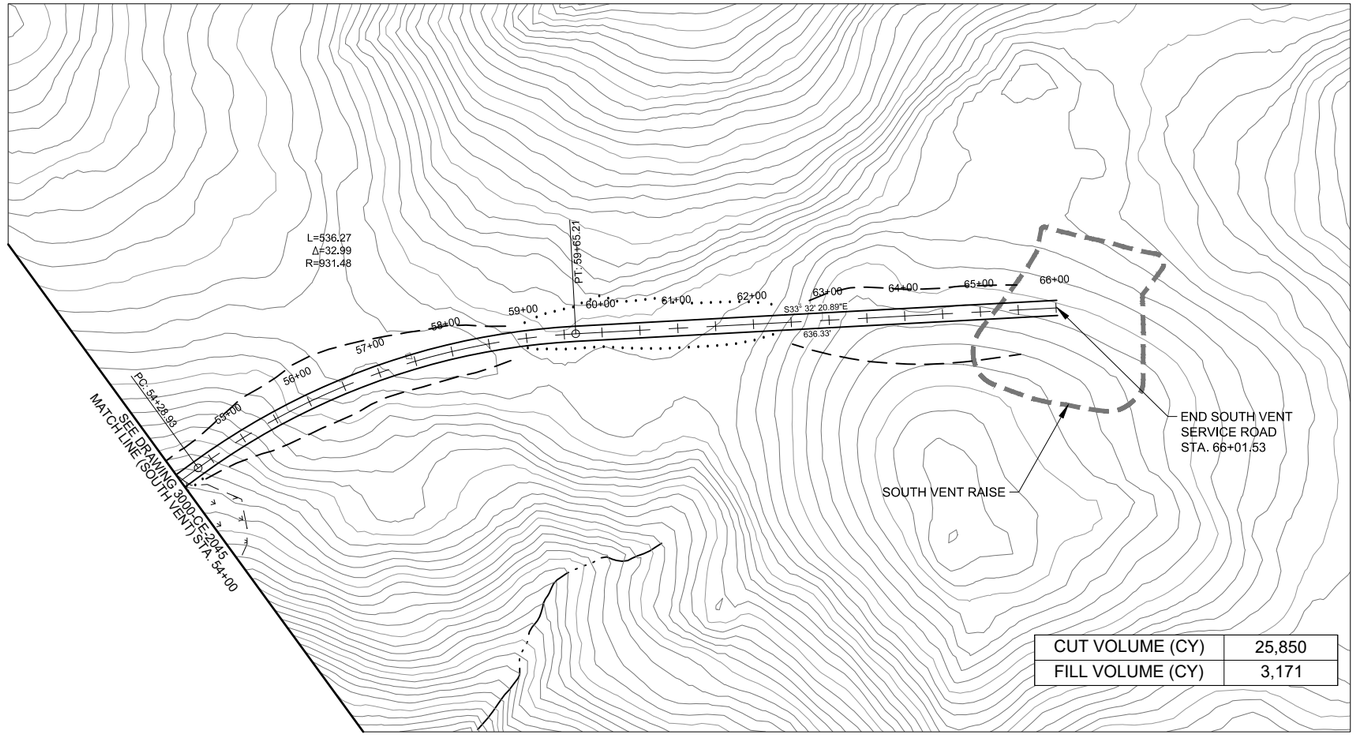
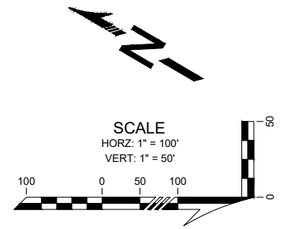
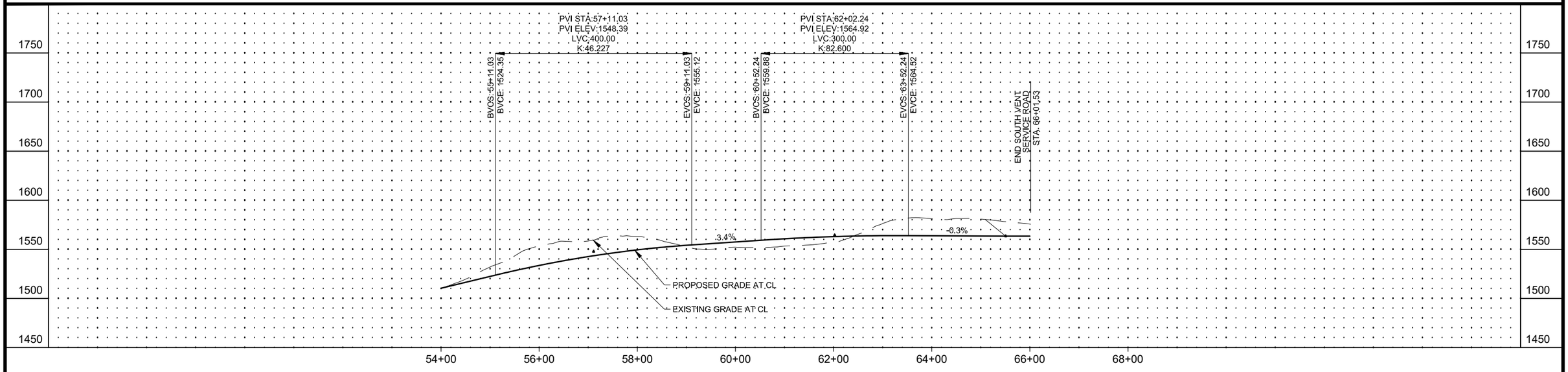


CUT VOLUME (CY)	25,850
FILL VOLUME (CY)	3,171





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SOUTH VENT SERVICE ROAD

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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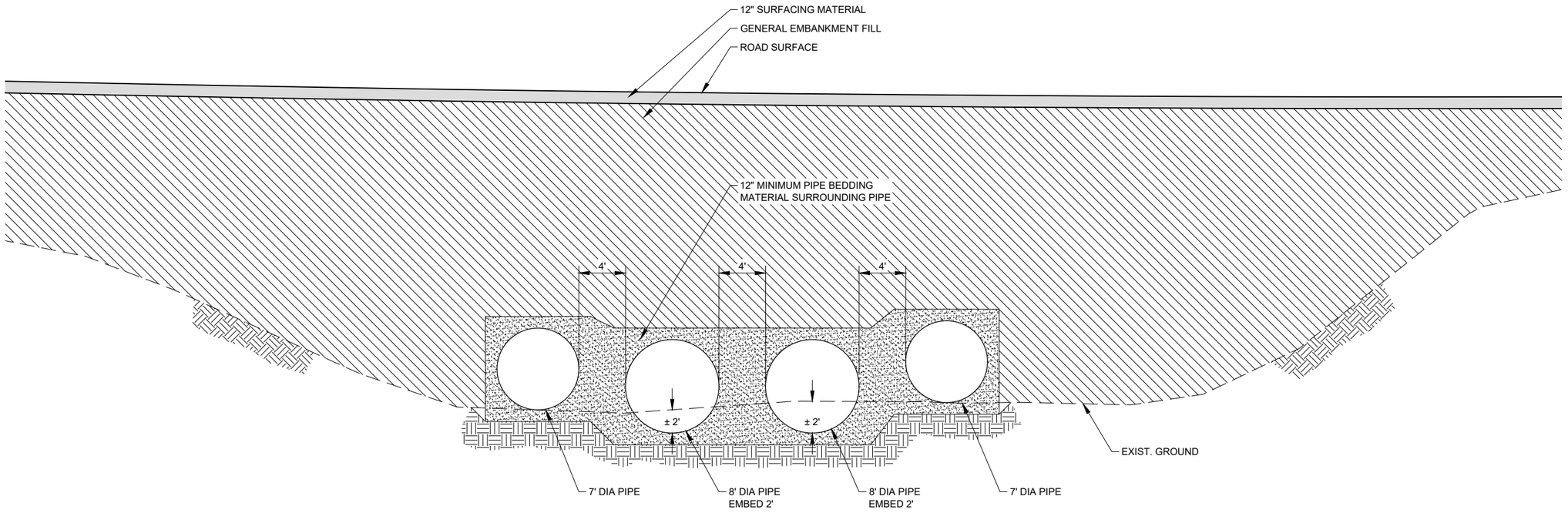

CULVERT SECTION AT WEST FORK — 1

SCALE: 1" = 5' — 3000-CE-2050

No.	Revision Description	Revised By		Checked By		Approved By	
B	ISSUED FOR PERMITTING	BJD	12/23/2021	SEC	12/28/2021		
A	ISSUED FOR REVIEW	BJL	1/23/2020	SEC	1/24/2020		

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Title: AKTIGIRUQ & ANARRAAQ EXPL. PROGRAM
WEST FORK CULVERT DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2050	1	B

GENERAL BRIDGE NOTES

MATERIALS:

MODULAR BLOCK FACING UNITS

ULTRABLOCK SEGMENTAL CONCRETE UNIT (ULTRABLOCK) - SEE SPECIFICATIONS
BLOCK NOMINAL DIMENSIONS:
- HEIGHT = 29.5 INCHES
- LENGTH = 59 INCHES
- DEPTH = 29.5 INCHES
- BATTER = 0 DEGREES
- COMPRESSIVE STRENGTH UNDER BEARINGS AND BOLSTERS = 4000 PSI
- COMPRESSIVE STRENGTH OTHER = 3000 PSI

LAYOUT WALL TO ACCOMMODATE THE SELECTED RANGE OF BLOCK DIMENSIONS TO MEET REQUIRED VERTICAL AND HORIZONTAL CLEARANCES.

REINFORCED BACKFILL GRADATION

USE WELL GRADED MATERIAL FOR REINFORCED BACKFILL MATERIAL.

GEOSYNTHETIC REINFORCEMENT PROPERTIES

REINFORCEMENT WITHIN THE GRS ABUTMENT MAY BE A GEOTEXTILE OR GEOGRID MANUFACTURED FROM POLYPROPYLENE, HIGH DENSITY POLYETHYLENE, OR POLYESTER MEETING THE REQUIREMENTS IN SECTION 3.3 OF FHWA-HRT-17-080. SUGGESTED ULTIMATE TENSILE STRENGTH = 4,800 LB/FT BY ASTM D 4595 (GEOTEXTILES) OR ASTM D 6637 (GEOGRIDS)). TENSILE STRENGTH AT 2% STRAIN MUST BE GREATER THAN THE MAXIMUM CALCULATED REQUIRED FORCE (T_{req}) AT THE SERVICE LIMIT STATE.

DESIGN:

DESIGNED BASED ON LRFD METHODS IN ACCORDANCE WITH "DESIGN AND CONSTRUCTION GUIDELINES FOR GEOSYNTHETIC REINFORCED SOIL ABUTMENTS AND INTEGRATED BRIDGE SYSTEMS" FHWA-HRT-17-080 AND PROJECT SPECIFIC SITE CONSIDERATIONS.

1. TYPICAL DESIGN LOAD
   - -BRIDGE DEAD AND LIVE LOADS
   - -ROADWAY LIVE LOAD
   - -SOIL SURCHARGE FROM INTEGRATED APPROACH FILL AND ROADWAY SECTION
   - -LATERAL EARTH PRESSURE
   - -SEISMIC LOADS

2. SOIL PROPERTIES
   REINFORCED FILL: OPEN GRADED OR WELL GRADED FILL MATERIALS
   - MINIMUM FRICTION ANGLE OF 40-DEGREES
   - OPEN GRADED FILL - D_{max} BETWEEN 0.5" AND 1.0", LESS THAN 5% PASSING THE NO. 50 SIEVE
   - WELL GRADED FILL - D_{MAX} BETWEEN 0.5" AND 2.0", LESS THAN 12% PASSING THE NUMBER 200 SIEVE. PLASTIC INDEX (PI) LESS THAN 6 FOR MATERIAL PASSING THE NO. 40 SIEVE.

   RETAINED FILL: USE EFFECTIVE STRENGTH PARAMETER BASED ON SUBSURFACE INVESTIGATION AND MATERIAL TESTING RESULTS.

   REINFORCED SOIL FOUNDATION: USE SAME MATERIAL USED FOR THE REINFORCED FILL.

   FOUNDATION SOILS: PRIMARILY BEDROCK

3. SETTLEMENT DESIGN CRITERIA:
   - TOLERABLE VERTICAL STRAIN = 1.0% OF WALL HEIGHT (H). VERTICAL STRAIN IS WITHIN THE GRS ABUTMENT, AND DOES NOT ACCOUNT FOR FOUNDATION SETTLEMENTS.
   - TOLERABLE LATERAL STRAIN = 2.0% OF BEARING WIDTH PLUS SETBACK.
   - FOUNDATION SETTLEMENTS SHOULD BE CALCULATED FOR PRIMARY AND SECONDARY CONSOLIDATION SETTLEMENT FOR CLAYS AND ELASTIC SETTLEMENT FOR GRANULAR SOILS USING CLASSIC SOIL MECHANICS
     DESCRIBED IN THE SOILS AND FOUNDATIONS REFERENCE MANUAL (FHWA-NHI-06-088).
   - EVALUATE THE MAGNITUDE OF POTENTIAL DIFFERENTIAL SETTLEMENT AS COMPARED TO THE STRUCTURE TOLERABLE SETTLEMENTS.

CONSTRUCTION SPECIFICATIONS:

1. SITE LAYOUT/SURVEY: CONSTRUCT THE BASE OF THE GRS ABUTMENT AND WINGWALLS WITHIN 1.0 INCH OF THE STAKED ELEVATIONS. CONSTRUCT THE EXTERNAL GRS ABUTMENT AND WINGWALLS TO WITHIN ±0.5 INCHES OF THE SURVEYED STAKE DIMENSIONS.

2. EXCAVATION: COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) FOR ALL EXCAVATIONS.

3. COMPACTION: PLACE FILL IN MAXIMUM COMPACTED LIFTS OF 8-INCHES. COMPACT WELL-GRADED AGGREGATE BACKFILL AT LEAST 95 PERCENT OF MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT (±2 PERCENT) PER ASTM D1556 (MODIFIED PROCTOR). FOR AN OPEN GRADED AGGREGATE, USE A METHOD SPECIFICATION BASED ON THE LIFT THICKNESS, EQUIPMENT, AND GRADATION OF AGGREGATE BEING UTILIZED FOR THE ABUTMENT. ONLy HAND-OPERATED COMPACTION EQUIPMENT IS ALLOWED WITHIN 3-FEET OF THE WALL FACE.

4. GEOSYNTHETIC REINFORCEMENT PLACEMENT: INSTALL PER THE MANUFACTURER'S RECOMMENDATIONS. PULL THE GEOSYNTHETIC TAUGHT TO REMOVE ANY WRINKLES AND LAY FLAT PRIOR TO PLACING AND COMPACTING THE BACKFILL MATERIAL. SPLICES SHOULD BE STAGGERED AT LEAST 24-INCHES APART AND SPLICES ARE NOT ALLOWED IN THE BEARING REINFORCEMENT ZONE. NO EQUIPMENT IS ALLOWED DIRECTLY ON THE GEOSYNTHETIC. PLACE A MINIMUM 6-INCH LAYER OF GRANULAR FILL PRIOR TO OPERATING ONLY RUBBER-TIRED EQUIPMENT OVER THE GEOSYNTHETIC AT SPEEDS LESS THAN 5 MILES PER HOUR WITH NO SUDDEN BRAKING OR SHARP TURNING.

5. GRS WALL FACE ALIGNMENT: CHECK FOR LEVEL ALIGNMENT OF THE BLOCK ROW AT LEAST EVERY OTHER LAYER OF THE GRS ABUTMENT. CORRECT ANY ALIGNMENT DEVIATIONS GREATER THAN 0.25 INCHES.

6. SUPERSTRUCTURE PLACEMENT: THE EQUIPMENT USED FOR THE PLACEMENT OF THE SUPERSTRUCTURE CAN BE POSITIONED ON THE GRS ABUTMENT PROVIDED THE OUTRIGGER PADS ARE SIZED FOR LESS THAN 3,000 PSF WITHIN 1 FOOT OF THE ABUTMENT WALL FACE. GREATER LOADS COULD BE SUPPORTED WITH INCREASING DISTANCE FROM THE ABUTMENT FACE IF CHECKED BY THE ENGINEER OF RECORD. SET OR LAUNCH ACROW BRIDGE UNITS SQUARE AND LEVEL WITHOUT DRAGGING ACROSS THE BEAM SEAT SURFACE.

7. APPROACH PLACEMENT: FOLLOWING THE PLACEMENT OF THE SUPERSTRUCTURE, GEOTEXTILE REINFORCEMENT LAYERS ARE PLACED. BACKFILL MATERIAL IS TO BE PLACED IN MAXIMUM COMPACTED LIFTS OF 8-INCHES. COMPACT TO 95% OF MAXIMUM DRY DENSITY (±2 PERCENT OF OPTIMUM MOISTURE) PER ASTM D1556 (MODIFIED PROCTOR). THE REINFORCEMENT SHALL BE EVENLY SPACED WITH A MAXIMUM LIFT THICKNESS OF 15 INCHES. THE TOP LAYER OF GEOTEXTILE SHOULD BE APPROXIMATELY 15-INCHES BELOW THE TOP OF THE SUPERSTRUCTURE.

8. BRIDGE BEARING/SPREADER BEARING INSTALLATION: INSTALL LEVELING PAD TO ESTIMATED GROUND ELEVATION SHOWN. USE SPREADER BEAM AS TEMPLATE FOR CORING HOLES IN BOUND BEARING BLOCKS. ENSURE PROPER DISTANCES FOR BEARING OFFSETS TO REFERENCE LINE. INSTALL BUMPER BLOCKS AT FIXED BEARING ENDS PRIOR TO ERECTION BACKWALL IN FIELD.

ABBREVIATIONS:

RSF- REINFORCED SOIL FOUNDATION
GRS- GEOSYNTHETIC REINFORCED SOIL
ES - DENOTES EACH SIDE
FS - DENOTES FAR SIDE
P/G - PROFILE GRADE
REF - REFERENCE
OHW - ORDINARY HIGH WATER LEVEL
ABUT - ABUTMENT
EXP - EXPANSION
FIX - FIXED
BL - BORING LINE
PSI - POUNDS PER SQUARE INCH
MOD - MODIFIED
PL - PLATE
GR - GRADE

THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:

STRUCTURAL STEEL: SPREADER BEAM AND SHOE

AASHTO M270 GRADE 50 FY = 50,000 PSI

STRUCTURAL STEEL: SHIMS AND MISCELLANEOUS

AASHTO M270 GRADE 36 FY = 36,000 PSI

BOLTS AND HARDWARE:

ASTM F3125 GRADE A325
ASTM A563 GRADE C HEAVY HEX
ASTM F436 WASHERS

No.	Revision Description	Revised By	Checked By	Approved By	No.	Dwg. No.	Reference Drawings
					9		
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A	ISSUED FOR APPROVAL (PREVIOUS DWG# 3000-CE-2420, REV A)	KW 01/23/2020	JZ 01/23/2020		1		

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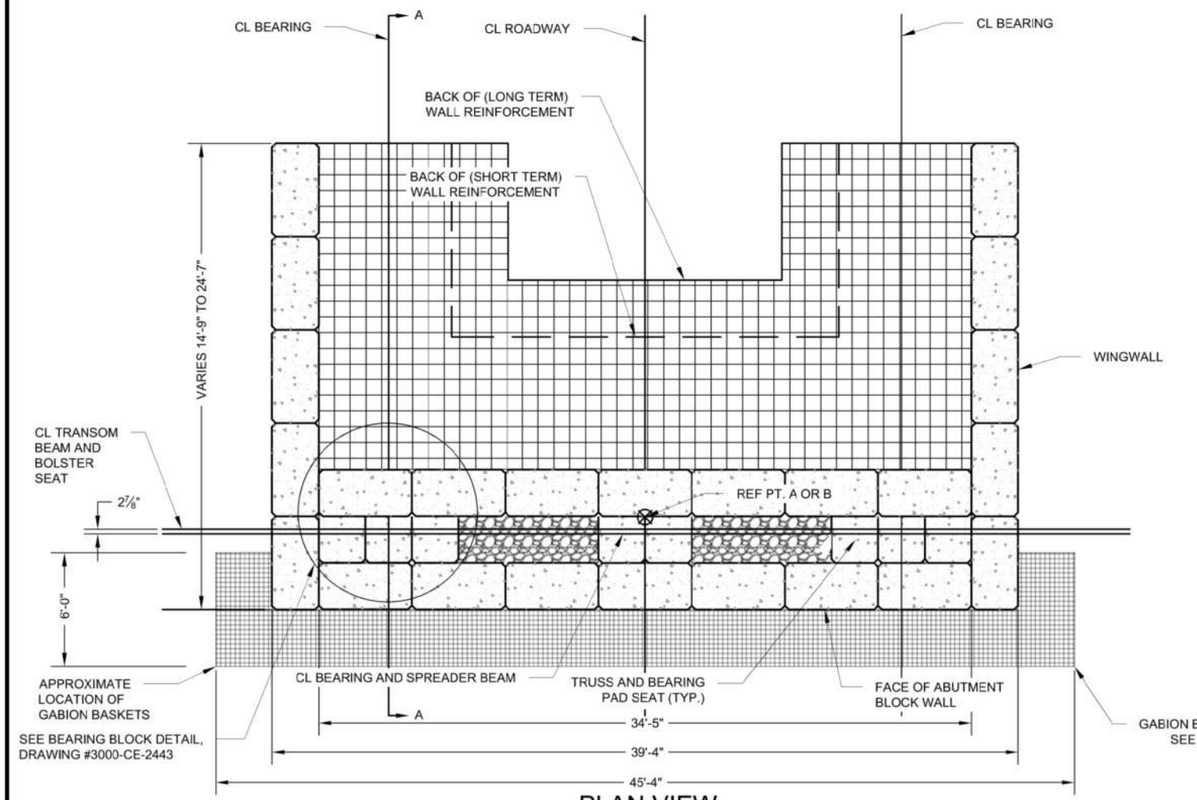
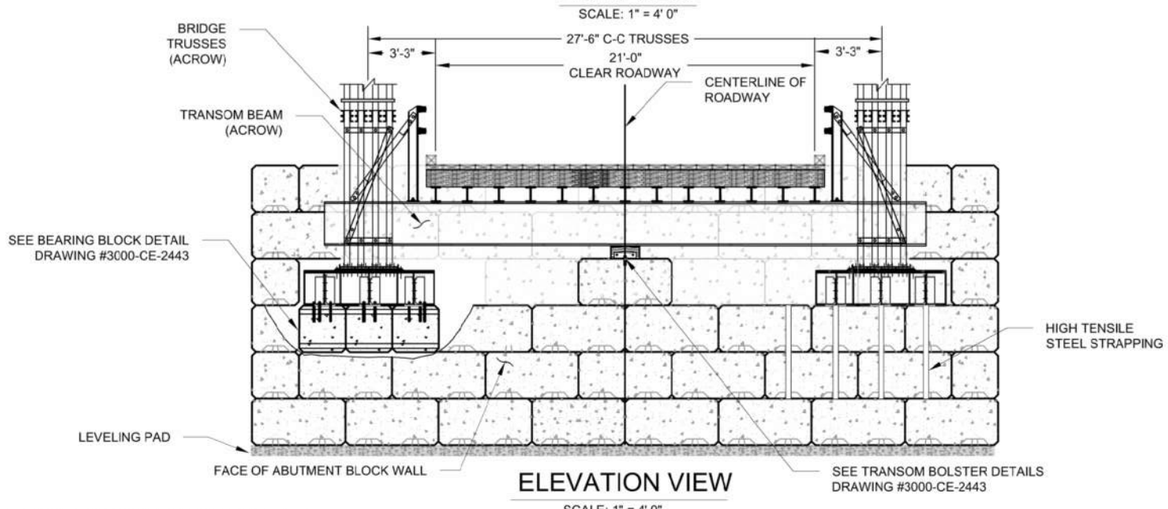
Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
GENERAL BRIDGE NOTES

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2440	1	A



PLAN VIEW

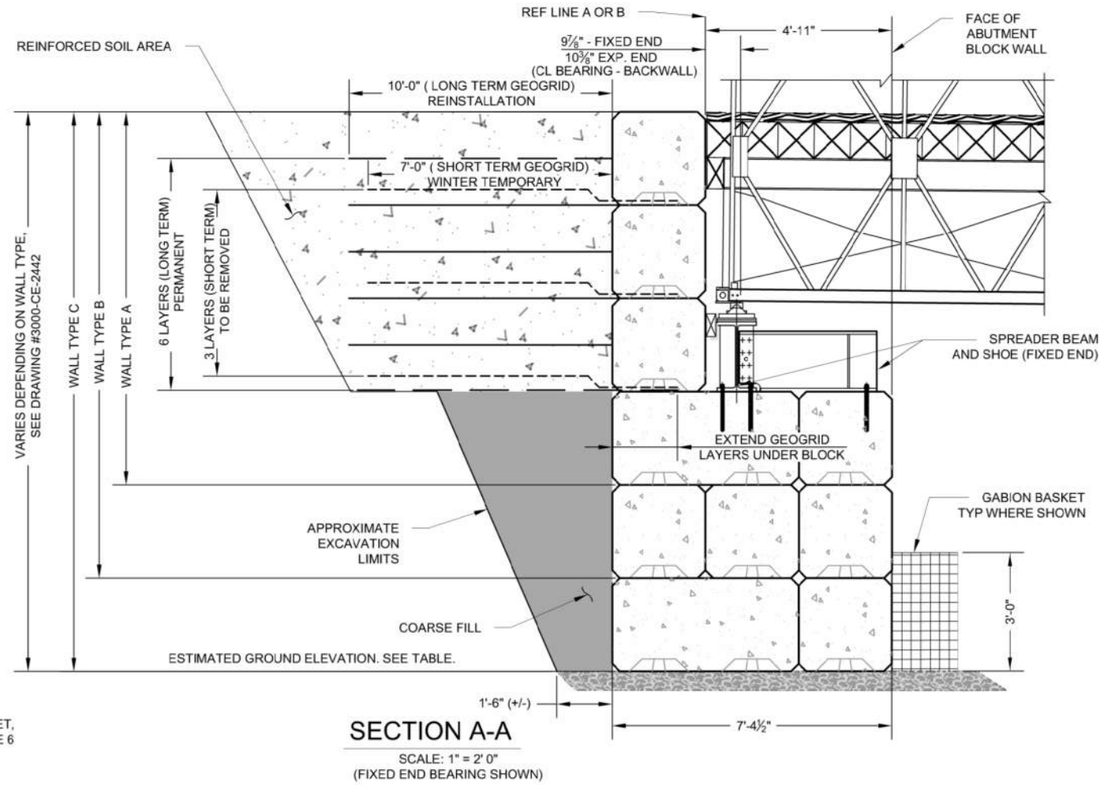
SCALE: 1" = 4' 0"



ELEVATION VIEW

SCALE: 1" = 4' 0"
(WALL TYPE C SHOWN)

NOTE: GABION BASKET NOT SHOWN FOR CLARITY.



SECTION A-A

SCALE: 1" = 2' 0"
(FIXED END BEARING SHOWN)

LEGEND:

REINFORCED BACKFILL MATERIAL

CONCRETE BLOCK (ULTRABLOCK)

GEOGRID LEGEND
MIRAFI 3XT (LONG TERM)
MIRAFI 8XT (LONG TERM)
MIRAFI 3XT (SHORT TERM)

ESTIMATED GROUND ELEVATION TABLE (FT) [EXCAVATION OR FILL]		
	ABUT A	ABUT B
RED DOG CREEK	729.52	726.04
GRAYLING JUNIOR CREEK	797.77	804.12
IKALUKROK CREEK NO.1	843.29	845.82
IKALUKROK CREEK NO. 2	863.90	872.06
IKALUKROK CREEK NO. 3	893.28	892.23
WEST FORK IKALUKROK CREEK		

NOTES:

1. VERTICAL ULTRABLOCK WALL FACE = 0 DEGREES.
2. SHORT TERM GEOGRID REINFORCEMENT WILL UTILIZE MIRAFI 3XT OR EQUIVALENT PLACED IN THREE LAYERS AT THE ULTRABLOCK INTERFACE BEGINNING AT THE ELEVATION OF THE BASE OF THE ABUTMENT BACKWALL (BASE OF SPREADER BEAM). GEOGRID WILL BE SECURED BETWEEN THE ULTRABLOCK LAYERS AND EXTEND 7 FEET OUT FROM BACKWALL AND FROM SIDES (WINGWALLS). VERTICAL SPACING BETWEEN LAYERS WILL BE ONE ULTRBLOCK HEIGHT OR NOMINAL 30 INCHES.
3. LONG TERM GEOGRID REINFORCEMENT WILL UTILIZE MIRAFI 3XT AND MIRAFI 8XT OR EQUIVALENT. MIRAFI 8XT GEOGRID WILL BE PLACED AT THE ULTRABLOCK INTERFACE AT THE ELEVATION OF THE BASE OF THE ABUTMENT BACKWALL (BASE OF SPREADER BEAM). GEOGRID WILL BE SECURED BETWEEN THE ULTRABLOCK LAYERS AND EXTEND 10 FEET OUT FROM THE BACKWALL AND FROM SIDES (WINGWALLS). MIRAFI 3XT GEOGRID WILL BE PLACED IN LAYERS WITH A VERTICAL SPACING OF NOMINALLY 15 INCHES OR ONE HALF ULTRABLOCK HEIGHT. GEOGRID WILL BE SECURED BETWEEN THE ULTRABLOCK LAYERS OR BUTTED AGAINST THE WALL FOR MID-BLOCK LAYERS AND EXTEND 10 FEET OUT FROM BACKWALL AND SIDES. THE TOP LAYER OF GEOGRID REINFORCEMENT WILL BE MIRAFI 8XT AND WILL BE PLACED 15 INCHES BELOW THE TOP OF ROAD ELEVATION.
4. SHORT TERM BACK SLOPE RATIO PER OSHA SAFETY REGULATIONS (29CFR, SHORT PART 1926, SUBPART P, EXCAVATION). SHORING MAY BE REQUIRED IF THE SHORT TERM BACK SLOPE WILL OPEN MORE THAN 30 DAYS OR IF THE REQUIRED SHORT TERM BACK SLOPE RATIO SPECIFIED CANNOT BE OBTAINED. NOTE THAT SLOPE VARIES BASED ON SOIL TYPES.
5. USE THE SAME FILL IN ALL AREAS.
6. GABION SCOUR PROTECTION SHOULD WRAP AROUND UPSTREAM AND DOWNSTREAM ENDS OF ABUTMENT FOR A DISTANCE EQUAL TO TWICE THE CHANNEL FLOW DEPTH IN THE BRIDGE OPENING, OR 25-FEET, WHICHEVER IS LESS.
7. ALL DIMENSIONS SHOWN ARE NOMINAL AND DO NOT ACCOUNT FOR BLOCK TOLERANCES. SEE ULTRA BLOCK SPECIFICATIONS FOR KEY AND CONCRETE TOLERANCES
8. ADDITIONAL ULTRABLOCKS ADDED AS REQUIRED ACCORDING TO GROUND / BEDROCK CONDITIONS.

No.	Revision Description	Revised By	Checked By	Approved By
A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2421, REV A)	KW 01/23/2020	JZ 01/23/2020	

No.	Dwg. No.	Reference Drawings
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
TYPICAL WALL DETAILS -1

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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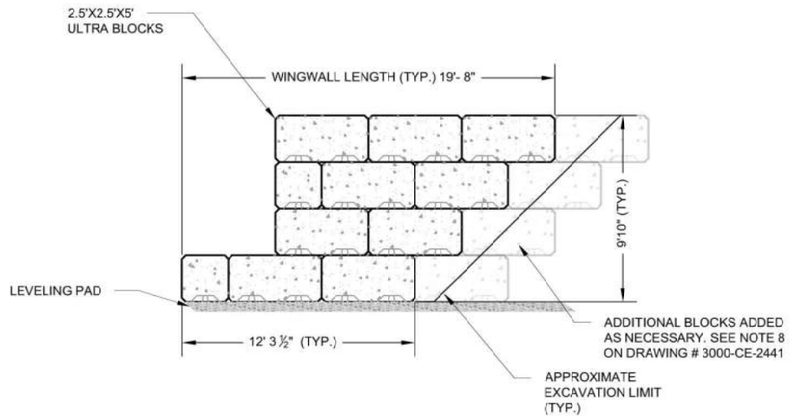
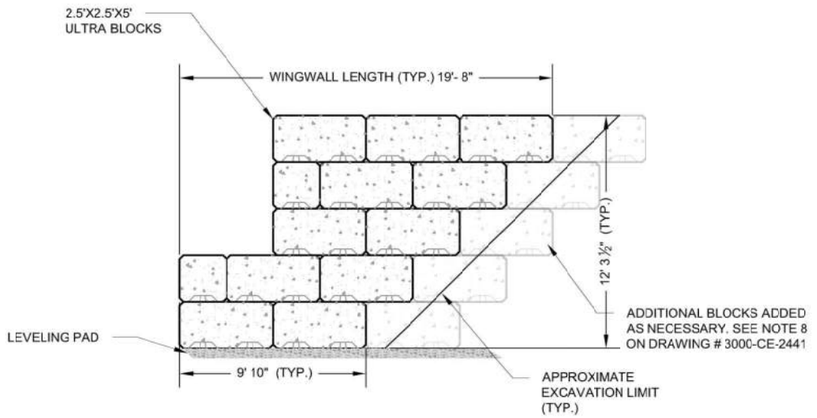


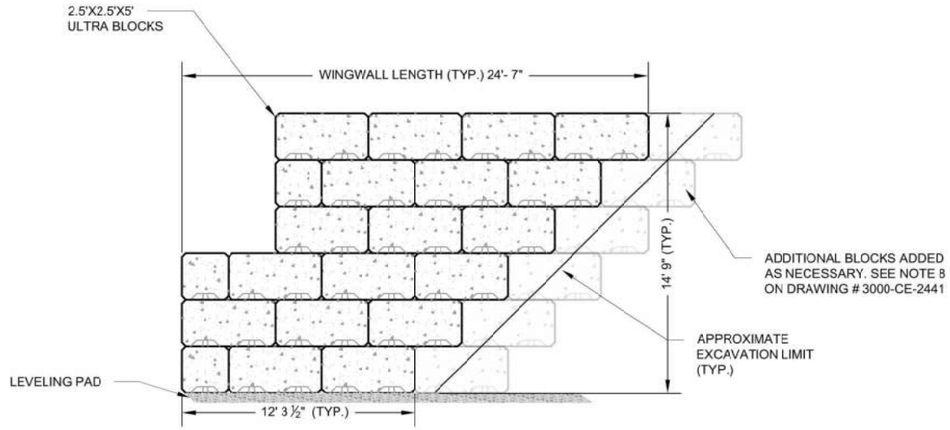
SIDE VIEW - WALL TYPE A

SCALE: 1" = 4' 0"



SIDE VIEW - WALL TYPE B

SCALE: 1" = 4' 0"



SIDE VIEW - WALL TYPE C

SCALE: 1" = 4' 0"

NOTE: GABION BASKET NOT SHOWN FOR CLARITY.

No.	Revision Description	Revised By		Checked By		Approved By	No.	Dwg. No.	Reference Drawings
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A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2421, REV A)	KW	01/23/2020	JZ	01/23/2020		1		

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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
TYPICAL WALL DETAILS -2

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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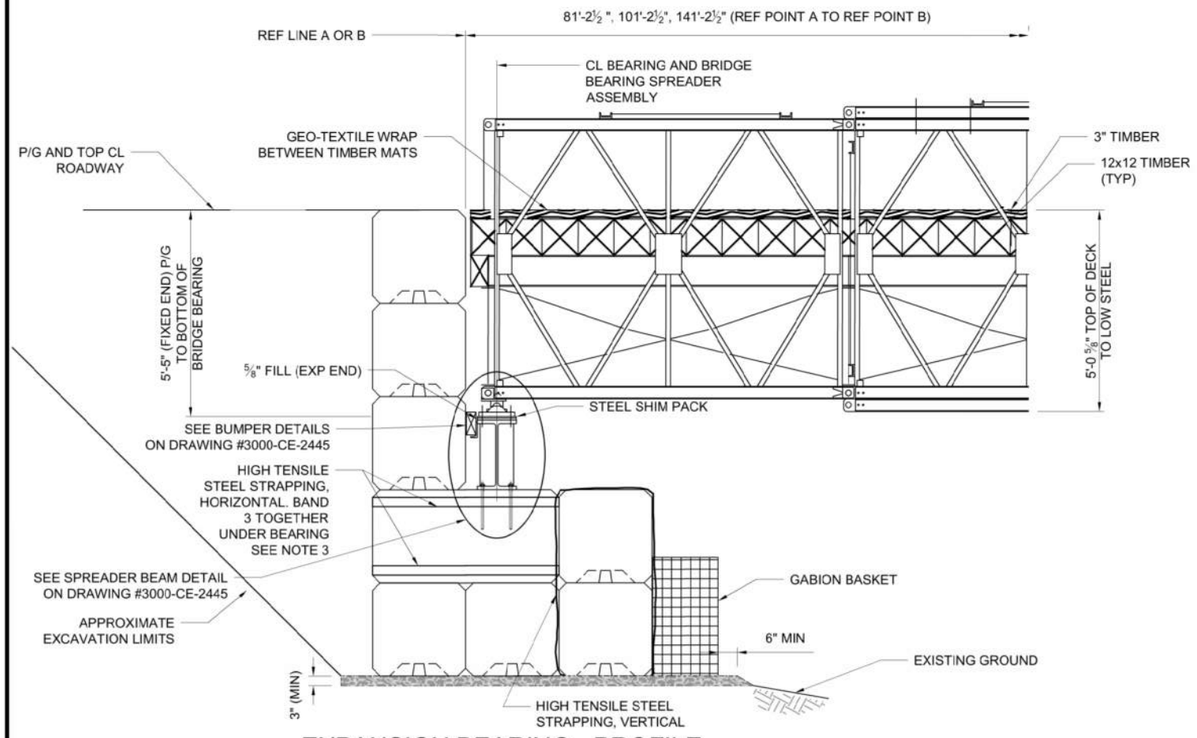
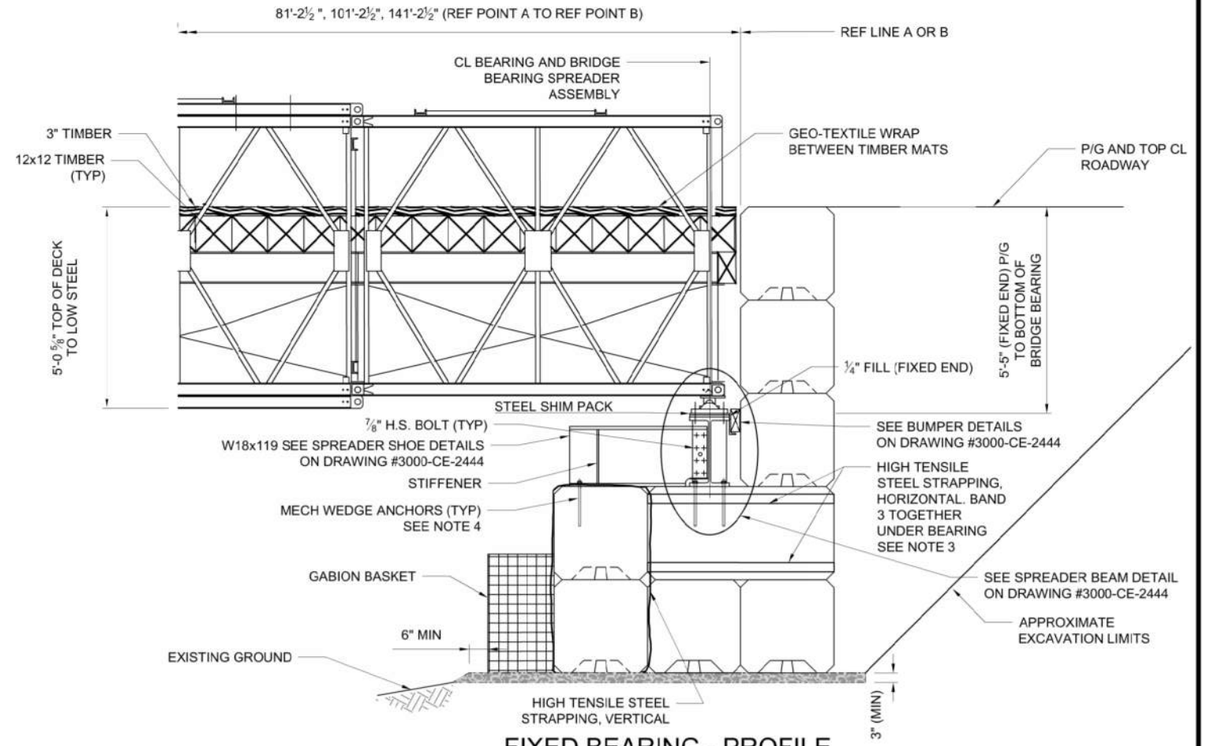


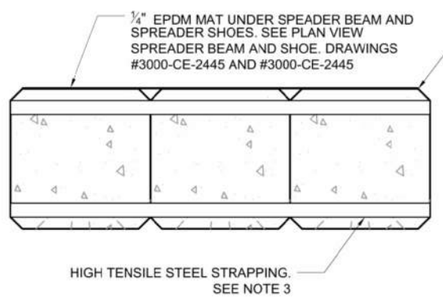
EXPANSION BEARING - PROFILE

SCALE ½ " = 1' 0"
½" NOMINAL SHIM PACK
(1) ¼ " , (1) ⅜ ", (2) 1/16 "



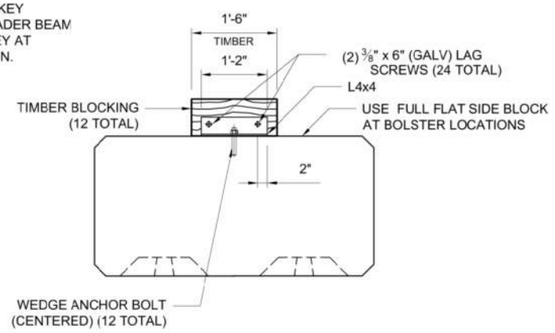
FIXED BEARING - PROFILE

SCALE ½ " = 1' 0"
½" NOMINAL SHIM PACK
(1) ¼" , (1) ⅜", (2) 1/16"



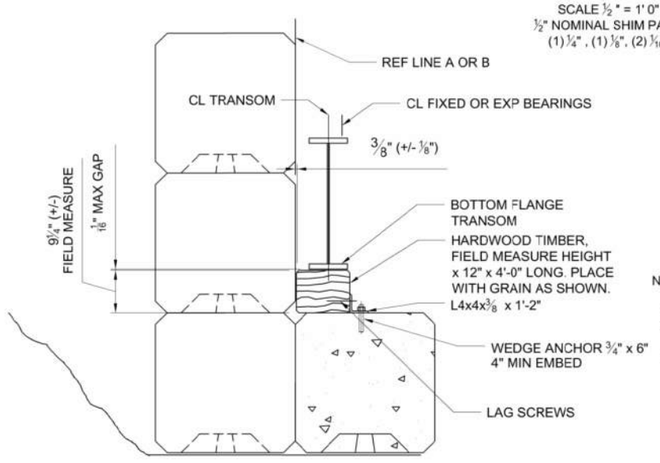
BEARING BLOCK DETAIL

ELEVATION VIEW
SCALE ¾ " = 1' 0"



TRANSOM BOLSTER

FRONT VIEW
SCALE ¾ " = 1' 0"



TRANSOM BOLSTER

SIDE VIEW
SCALE ¾ " = 1' 0"

NOTES:

1. WALL TYPE B SHOWN IN PROFILES.
2. WELDING NOTE: 5 INCH INTERMITTENT WELD AT BACK OF L5 BETWEEN STIFFENERS.
3. HIGH TENSILE STEEL STRAPPING NOTES:
   - 3.1. HIGH TENSILE STRAPPING ULINE S-15310 OR EQUIVALENT 2"x 0.044" HIGH CARBON COLD-ROLLED STEEL HEAT TREATED AAR APPROVED 0.044" THICKNESS 12,300 LB BREAKING STRENGTH MEETS ASTM D3953 CLAMP AND SEAL WITH 2" THREAD-ON METAILS SEALS TENSION STEEL STRAPPNG TO ENGAGE ALL BLOCKS.
4. MECHANICAL WEDGE ANCHOR NOTES:
   - 4.1. ⅝" DIA. x 12" LONG.
   - 4.2. HOT-DIPPED GALVANIZED OR 304 S.S.
   - 4.3. MIN SPECIFIED YIELD STRENGTH Fy = 55 KSI.
   - 4.4. MN SPECIFIED ULTIMATE STRENGTH Fu = 75 KSI.
   - 4.5. 8" MINIMUM EMBEDMENT.

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2422, REV A)	KW	01/23/2020	JZ	01/23/2020			1		

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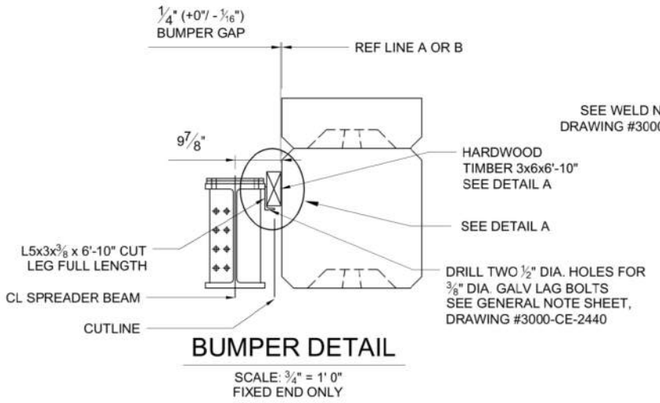
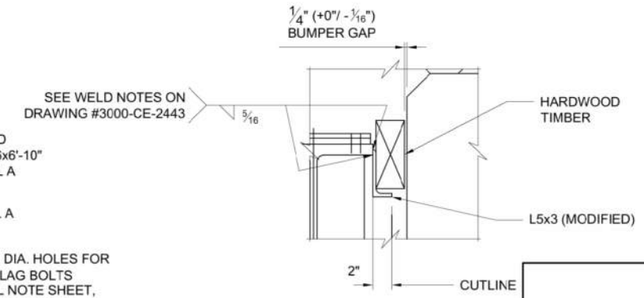
Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
TYPICAL BEARING DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2443	1	A



BUMPER DETAIL

SCALE: 3/4" = 1' 0"
FIXED END ONLY

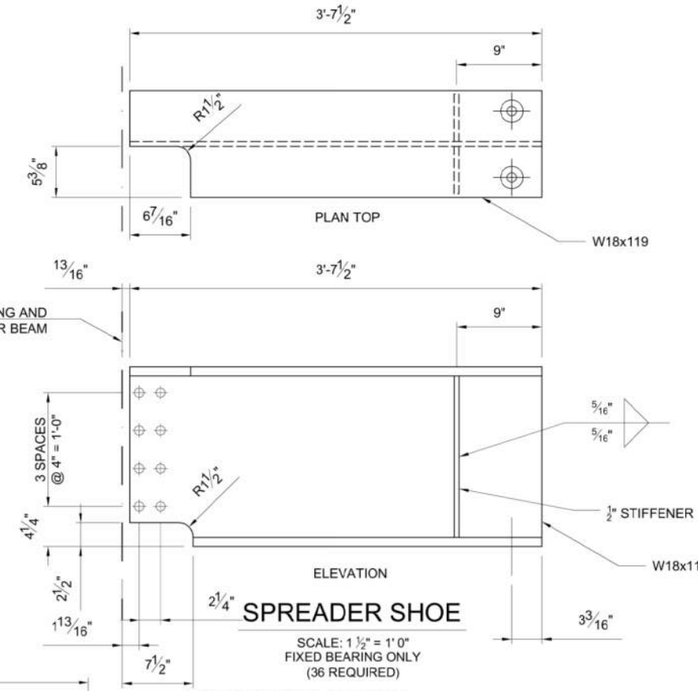


DETAIL A

SCALE: 1 1/2" = 1' 0"

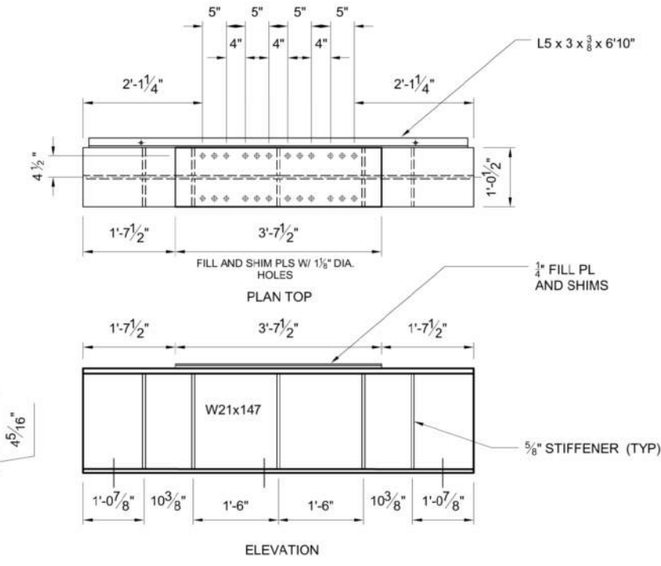
LEGEND

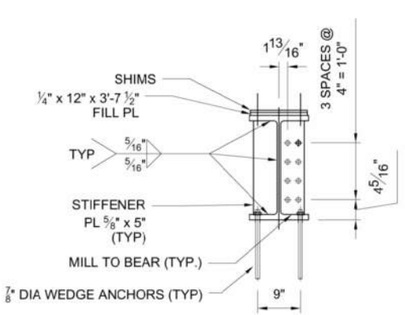
- DENOTES 1" HOLES FOR 7/8" DIA. WEDGE ANCHORS UNLESS NOTED OTHERWISE
- DENOTES 15/16" HOLE WITH 7/8" DIA. H.S. BOLT GR. A325 UNLESS NOTED OTHERWISE.
- DENOTES 1/2" DIA. HOLES FOR 3/8" DIA. GALV LAG BOLTS
- 5/16" / 5/16" DENOTES STIFFENER PL CORNER CUTS



SPREADER SHOE

SCALE: 1 1/2" = 1' 0"
FIXED BEARING ONLY
(36 REQUIRED)

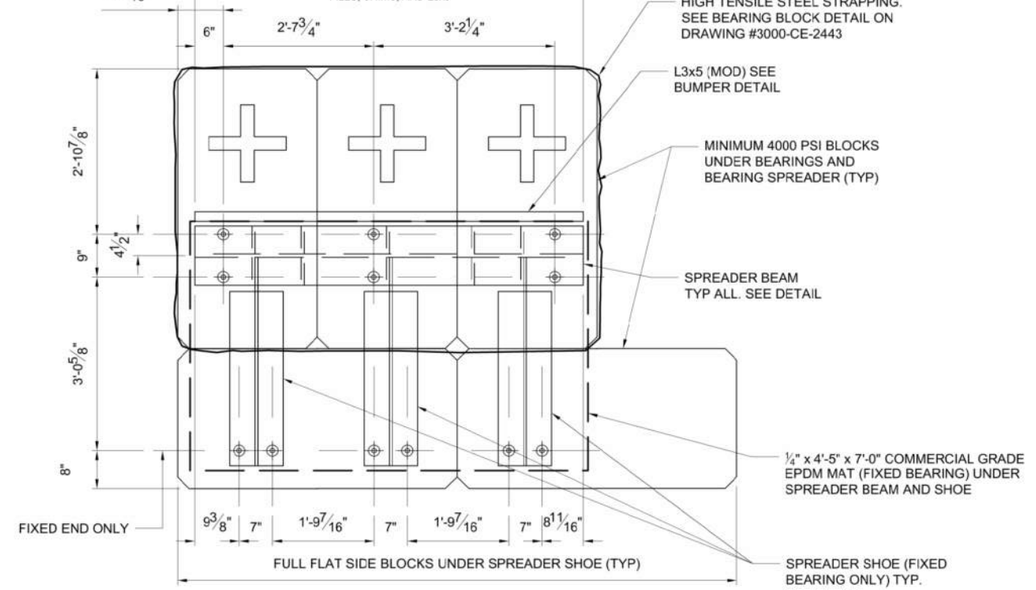




SIDE

SPREADER BEAM ASSEMBLY DETAIL

SCALE: 3/4" = 1' 0"
FIXED END
(12 REQ'D)



SPREADER BEAM AND SHOE

SCALE: 3/4" = 1' 0"
PLAN VIEW - FIXED END

No.	Revision Description	Revised By	Checked By	Approved By	No.	Dwg. No.	Reference Drawings
A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2423, REV A)	KW 01/23/2020	JZ 01/23/2020		1		
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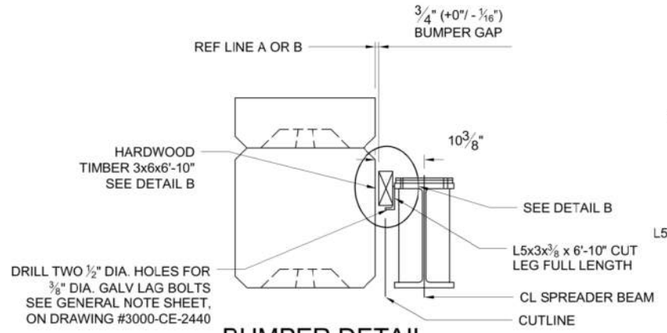
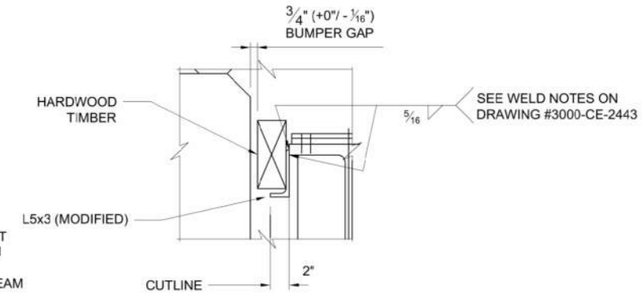
Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
FIXED END BEARING DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
RDM004A1	AS SHOWN	D	3000-CE-2444	1	A



BUMPER DETAIL

SCALE: 1 1/2" = 1' 0"
EXPANSION END ONLY

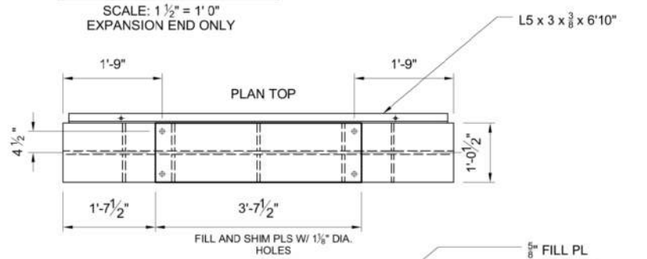


DETAIL B

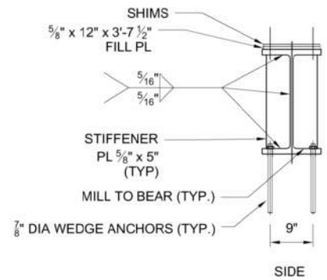
SCALE: 1 1/2" = 1' 0"

LEGEND

- DENOTES 1" HOLES FOR 7/8" DIA. WEDGE ANCHORS UNLESS NOTED OTHERWISE
- DENOTES 15/16" HOLE WITH 7/8" DIA. H.S. BOLT GR. A325 UNLESS NOTED OTHERWISE.
- DENOTES 1/2" DIA. HOLES FOR 3/8" DIA. GALV LAG BOLTS
- 5/16" / 5/16" DENOTES STIFFENER PL CORNER CUTS



ELEVATION



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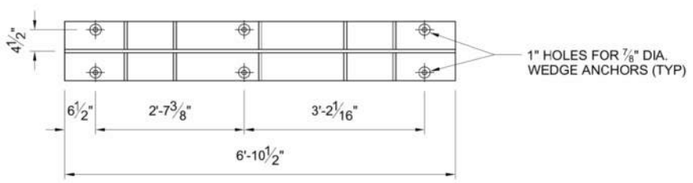
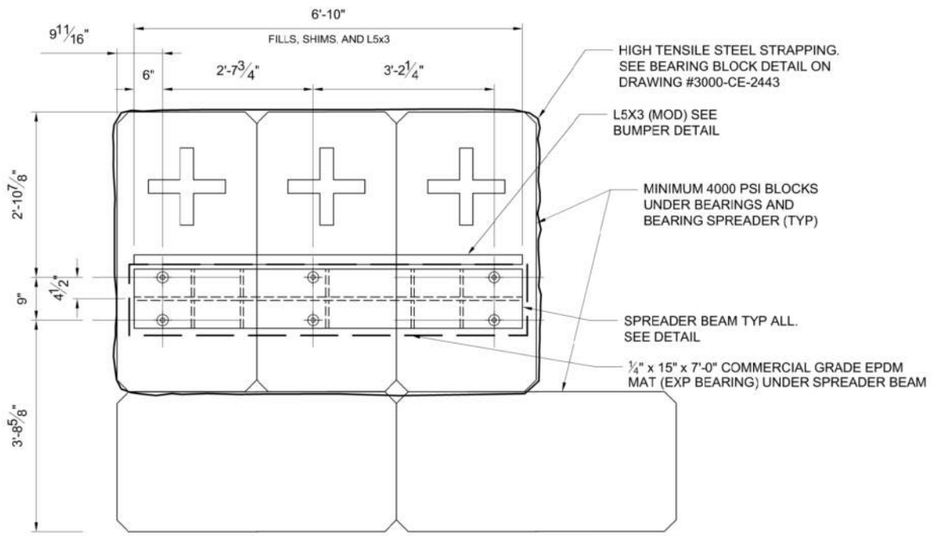


PLAN BOTTOM

SPREADER BEAM ASSEMBLY DETAIL

SCALE: 3/4" = 1' 0"
EXPANSION END
(12 REQ'D)



SPREADER BEAM

SCALE: 3/4" = 1' 0"
PLAN VIEW - EXPANSION END

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2423, REV A)	KW	01/23/2020	JZ	01/23/2020			1		

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ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
EXPANSION END BEARING DETAILS

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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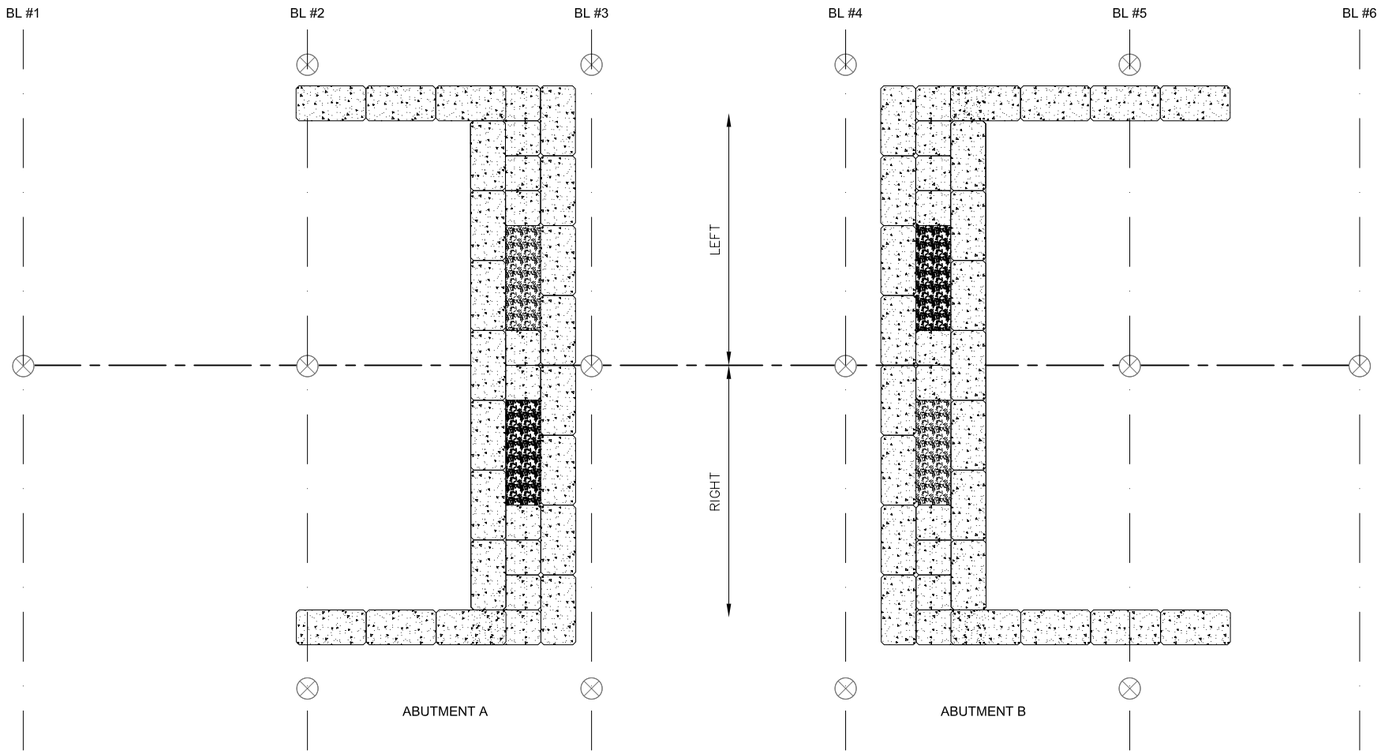

BORING KEY

BORING STATION (FT)	BORING LINE #	OFFSET LT (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **RED DOG CREEK** ELEV (FT) (P/G)	ELEV (FT)	OFFSET RT (FT)
02+04.41	1	NA	-	735.86	-	NA
02+24.41	2	NA	-	733.27	-	NA
02+44.41	3	NA	-	728.83	-	NA
03+35.79	4	NA	-	726.59	-	NA
03+55.79	5	NA	-	728.34	-	NA
03+75.79	6	NA	-	729.10	-	NA

BORING STATION (FT)	BORING LINE #	OFFSET (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **GRAYLING JUNIOR CREEK** ELEV (FT) (P/G)	ELEV (FT)	OFFSET RT (FT)
259+63.02	1		-	798.64	-	
259+82.02	2		-	797.62	-	
260+13.02	3	15	795.40	792.93	794.40	8
261+05.02	4	20	798.71	796.74	799.21	20
261+31.02	5	20	806.88	804.91	806.88	20

BORING STATION (FT)	BORING LINE #	OFFSET (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **IKALUKROK CREEK NO. 1** ELEV (FT) (P/G)	ELEV (FT)	OFFEST RT (FT)
319+05.36	1		-	845.19	-	
319+25.36	2	20	845.42	843.50	845.42	20
319+45.36	3	20	845.51	843.59	845.51	20
320+86.56	4	20	848.36	846.44	848.36	20
321+06.56	5	20	848.30	846.38	848.30	20
321+26.56	6		-	848.58	-	

BORING STATION (FT)	BORING LINE #	OFFSET (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **IKALUKROK CREEK NO. 2** ELEV (FT) (P/G)	ELEV (FT)	OFFEST RT (FT)
335+23.34	1	20	864.64	862.86	864.64	20
336+43.34	2	20	865.68	863.90	865.68	20
337+25.34	3	20	870.41	868.13	869.91	20
337+45.34	4	20	872.09	869.81	872.09	20
337+65.34	5		-	872.32	-	

BORING STATION (FT)	BORING LINE #	OFFSET (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **IKALUKROK CREEK NO. 3** ELEV (FT) (P/G)	ELEV (FT)	OFFEST RT (FT)
364+65.05	1	20	892.94	890.57	892.44	20
364+85.05	2	10	893.72	890.85	891.72	20
365+05.05	3		-	889.42	890.79	20
366+26.05	4	20	-	891.92	-	
366+46.05	5	20	895.54	893.67	895.54	17
366+76.05	6		897.58	894.71	897.58	

BORING STATION (FT)	BORING LINE #	OFFSET (FT)	ELEV (FT)	APPROXIMATE STABLE GROUND ELEVATION **WEST FORK IKALUKROK CREEK** ELEV (FT) (P/G)	ELEV (FT)	OFFEST RT (FT)

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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A	ISSUED FOR APPROVAL (PREVIOUS DWG #3000-CE-2424, REV A)	KW	01/23/2020	JZ	01/23/2020			1		

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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
BORING KEY

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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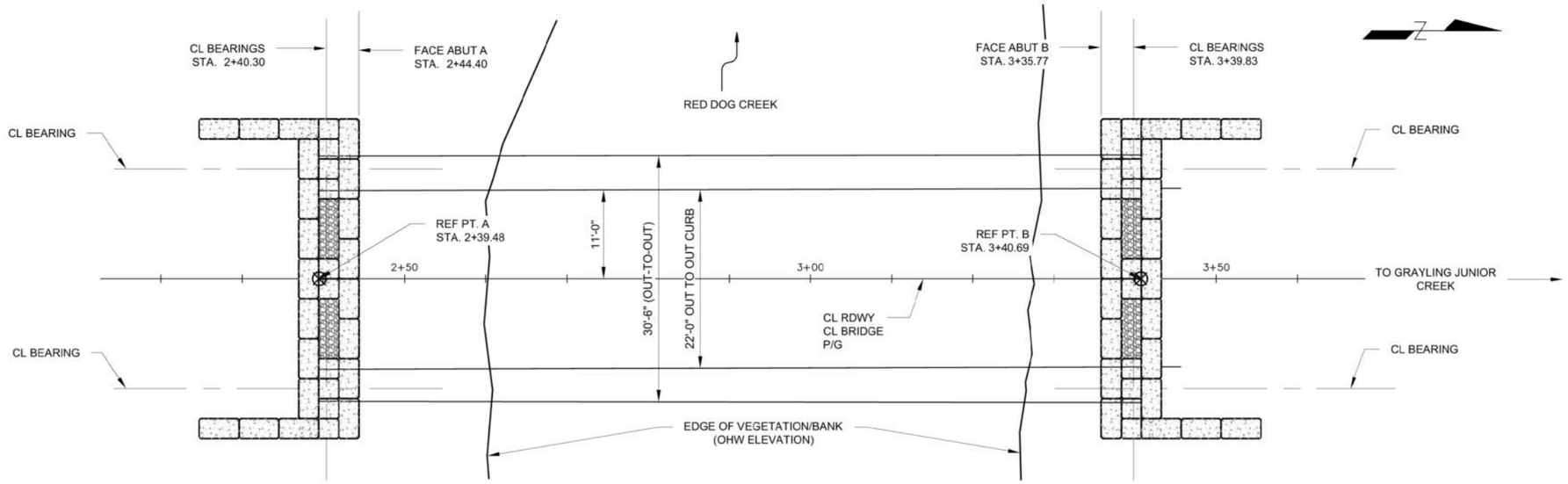
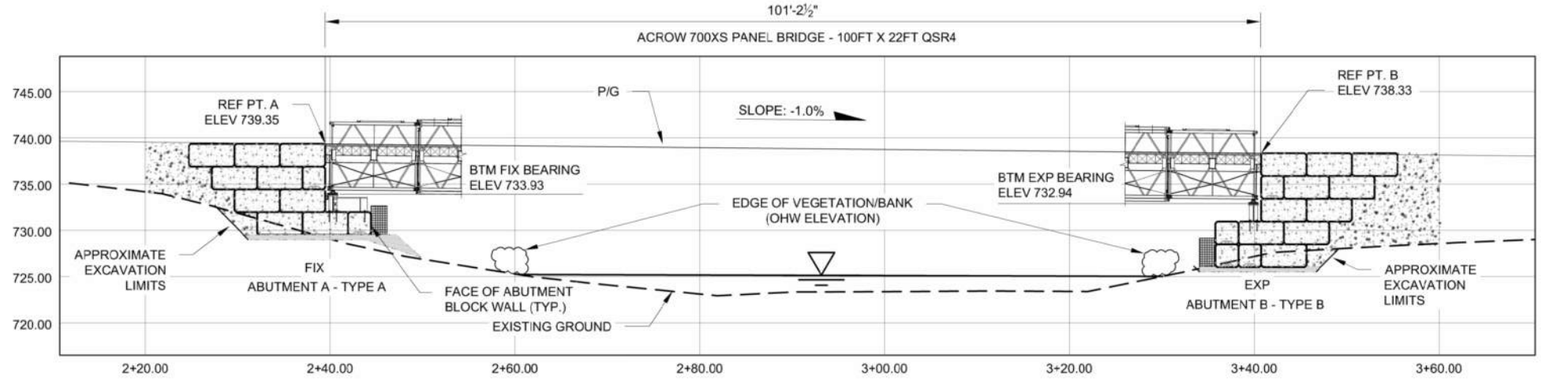


PLAN VIEW



ELEVATION VIEW

No.	Revision Description	Revised By		Checked By		Approved By	
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
RED DOG CREEK

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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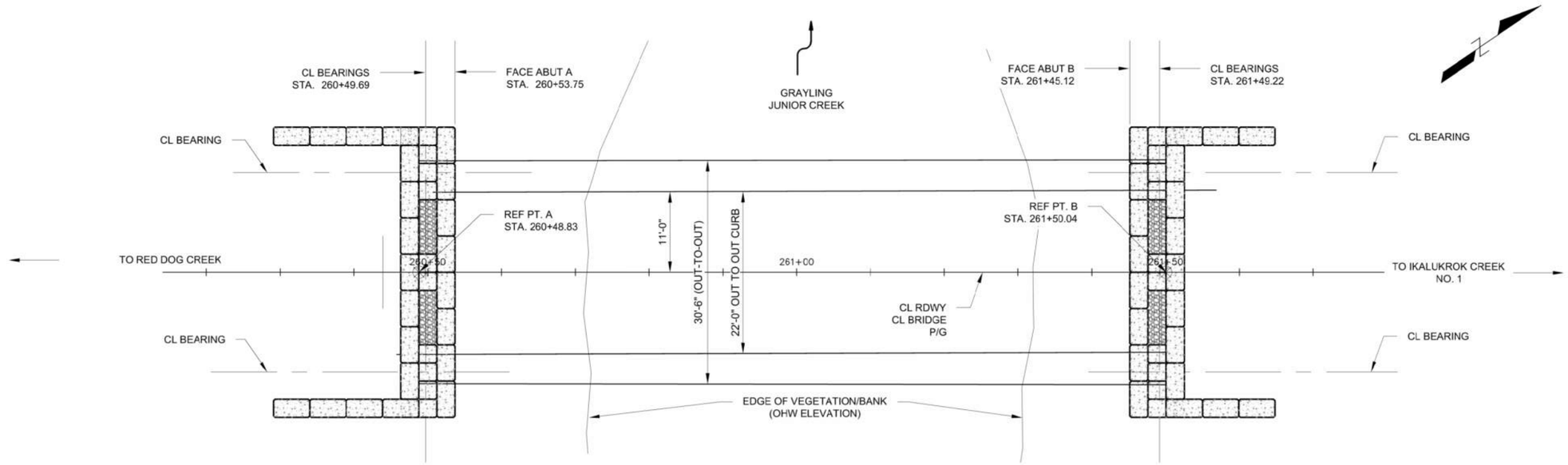
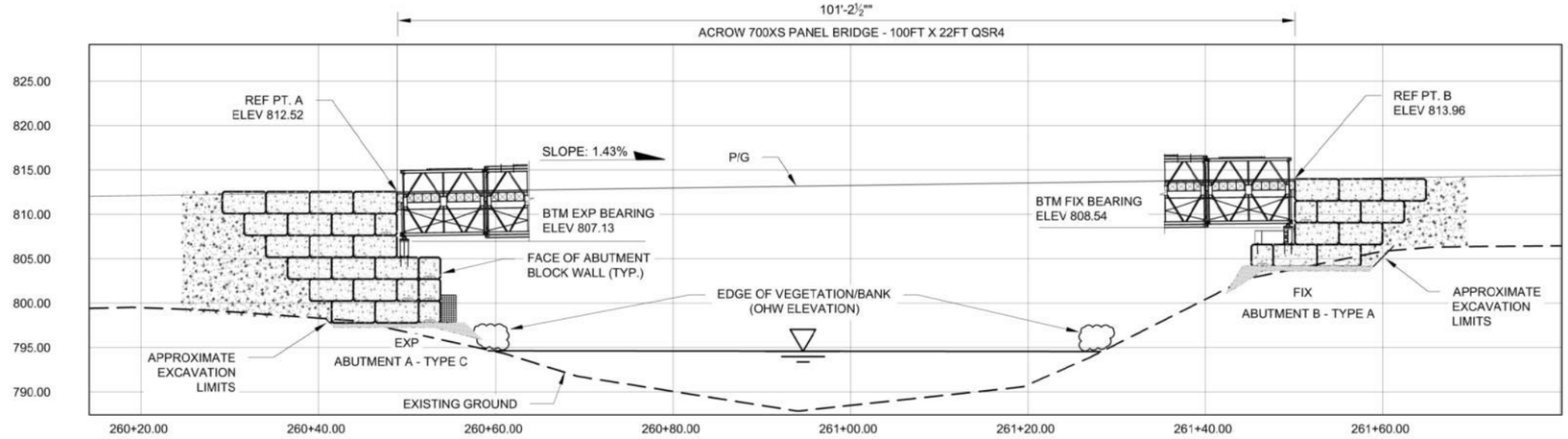


PLAN VIEW



ELEVATION VIEW

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
GRAYLING JUNIOR CREEK

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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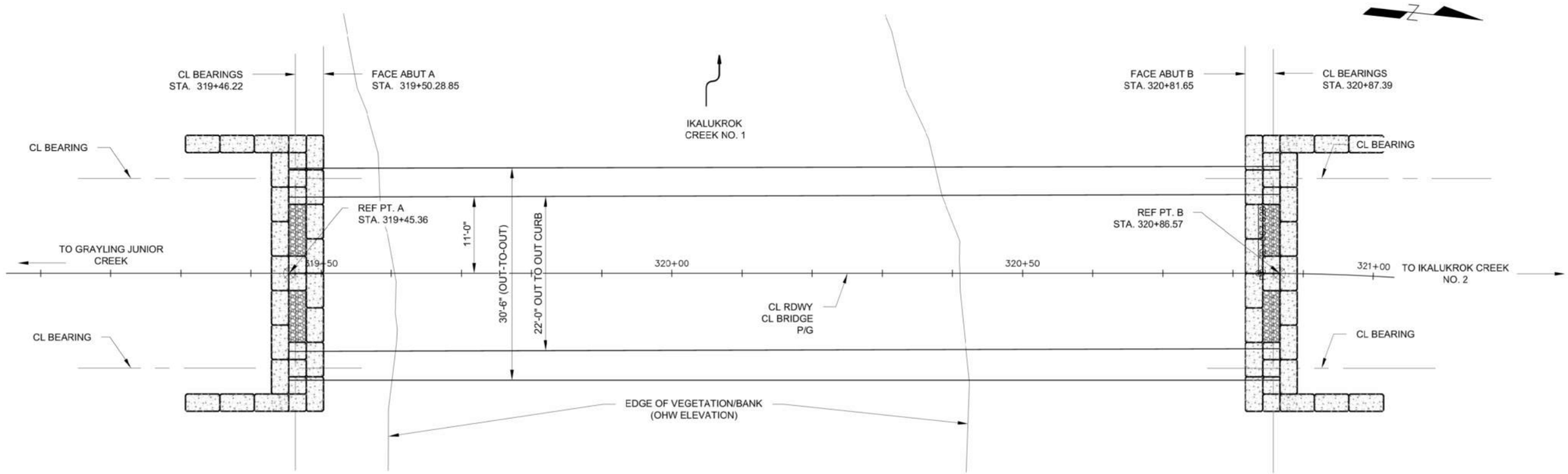

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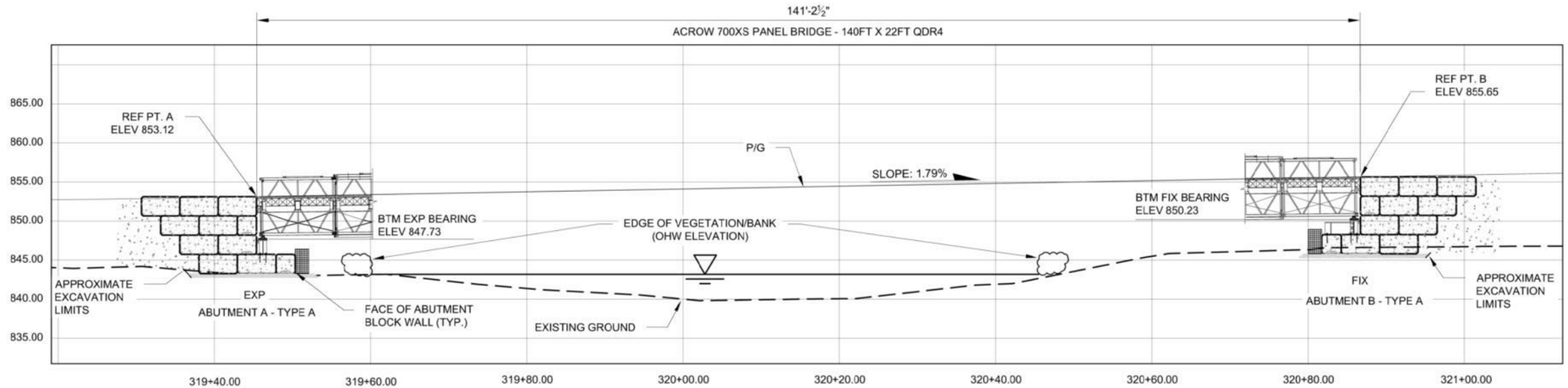

ELEVATION VIEW

No.	Revision Description	Revised By		Checked By		Approved By		No.	Dwg. No.	Reference Drawings
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
IKALUKROK CREEK NO. 1

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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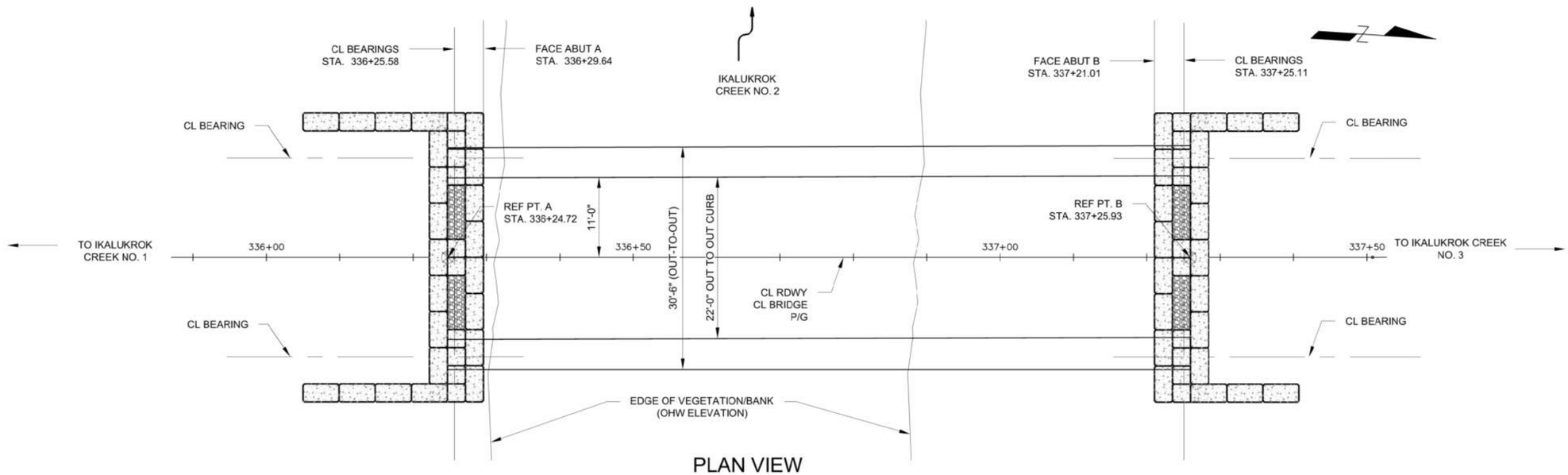
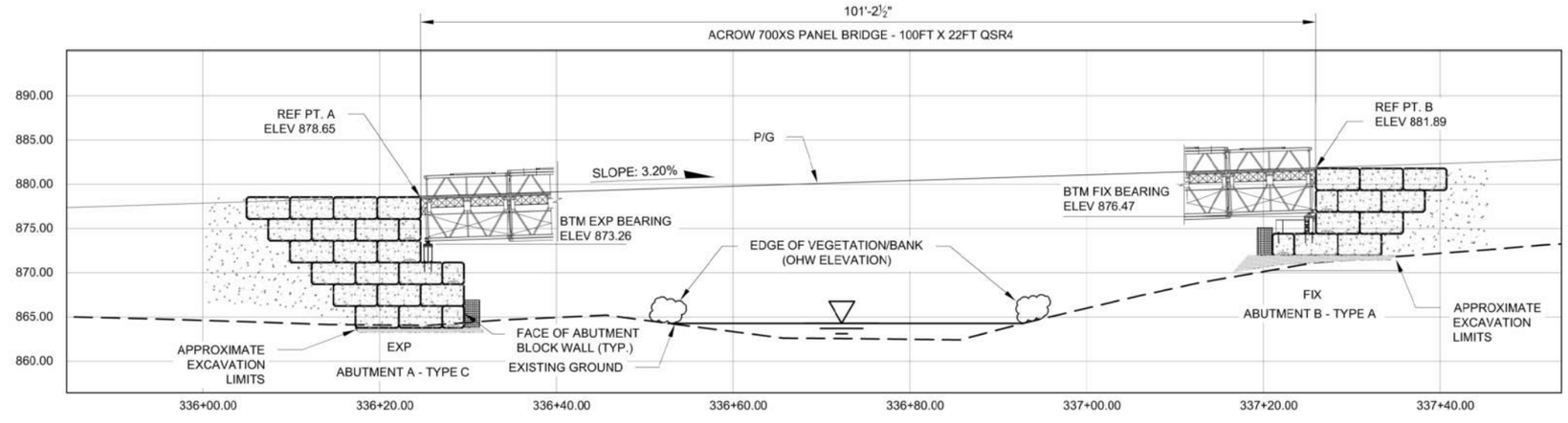


PLAN VIEW



ELEVATION VIEW

No.	Revision Description	Revised By	Checked By	Approved By
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Title:
ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
IKALUKROK CREEK NO. 2

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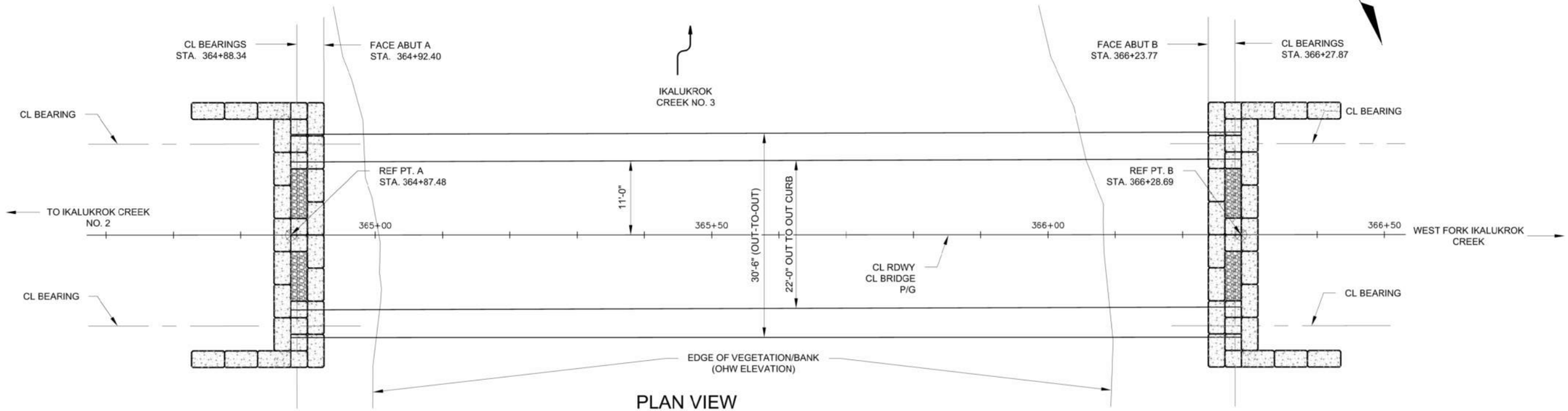

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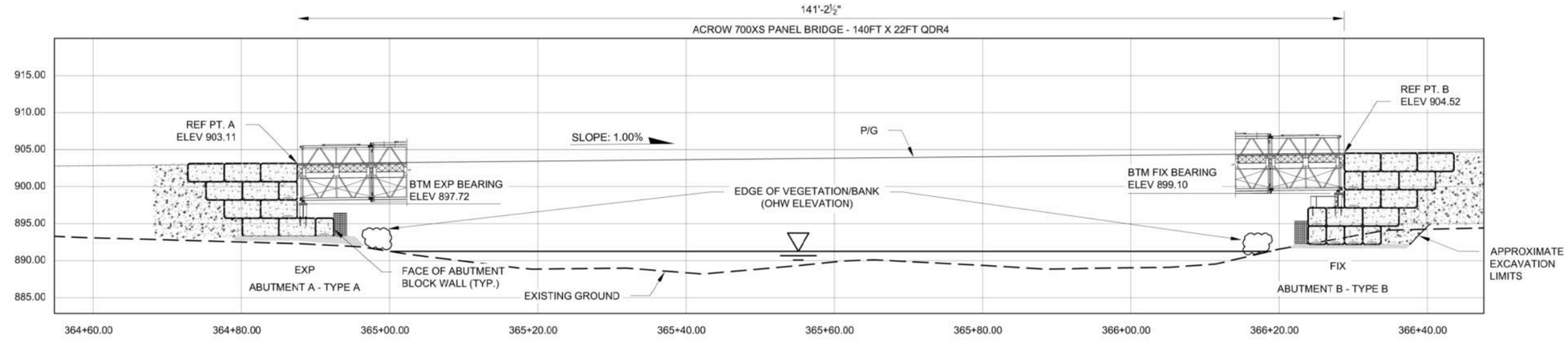

ELEVATION VIEW

No.	Revision Description	Revised By	Checked By	Approved By	No.	Dwg. No.	Reference Drawings
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ANARRAAQ & AKTIGIRUQ EXPL. PROGRAM
BRIDGE ABUTMENTS
IKALUKROK CREEK NO. 3

MWO#/JOB#	Scale:	Dwg Size:	Drawing #:	Sh:	Rev:
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Department of the Army Application for Anarraaq and Aktigiruq Exploration Program (POA-2018-75)

Block 15. Location of Project

Table 1 – Latitude and Longitude Project Location

Project location	Latitude (DD, NAD83)	Longitude (DD, NAD83)
Exploration Access Road Origin	68.0826321	-162.8839214
Exploration Access Road Terminus	68.1596411	-162.957052
Support Facilities Area	68.1795411	-162.9567713

Block 16. Other Location Description if Known

The project site is located within Section 18, T. 31N., R. 18W, Sections 18, 19, 30, 31, T. 32N., R. 18W., Sections 1, 12, 13, T. 31N., R. 19W., Sections 11, 12, 13, 14, 15, 22, 23, 36, T. 32N., R. 19W., Kateel River Meridian; and USGS Quad Map Delong Mountains A-2.

Block 18. Nature of the Activity

Teck American Incorporated (TAI) is proposing the development of exploration access roads, and support facilities, to safely and practically continue mineral exploration of the Aktigiruq and Anarraaq mineral deposits, located approximately 51 miles (mi) east of Kivalina, Alaska and 8 mi north of the existing Red Dog Mine (See Attached Drawings, Sheet 1).

Previous mineral exploration at Aktigiruq and Anarraaq was conducted by helicopter-supported operations with flyable core drill rigs. The project is presently moving into the advanced exploration phase and requires a higher density drilling to define these deep deposits to acceptable engineering standards. The significant increase in the number of drillholes now makes it impractical to continue to drill these deep holes from the surface, particularly considering the short annual field season in which to perform the drilling. The only practical means of completing the definition drilling is to develop an underground ramp (tunnel) system that would provide a drill platform for year-round programs and shorter, more closely spaced drill holes to define the mineral deposits to an acceptable level of certainty to support any decisions about developing them in the future.

The development of an underground ramp system would require the use of specialized heavy equipment that would need to be mobilized overland to and from the project area, and the underground development would surface support facilities such as: personnel camp facilities; equipment laydown areas; an access portal; ventilation openings to surface; core logging facilities, power generating facility, water treatment plant and maintenance facilities. Teck is proposing to develop the following exploration access road, secondary roads, and surface facilities to support the underground exploration of the Anarraaq and Aktigiruq mineral deposits:

- Exploration Access Roads – The exploration access road infrastructure includes the main Anarraaq-Aktigiruq Exploration Access Road, North Vent Service Road, Main Vent Service Road, and the South Vent Service Road. The roads were designed as a single lane with pullouts where necessary to accommodate two-way traffic. The road would be up to 30-feet (ft) wide, with a three percent cross slope, typical embankment side slopes of 3H:1V (Maximum 2H:1V) and cut section back slopes of 1.5H:1V. Pullouts (11-ft-wide x 180-ft-long) would be spaced approximately 0.5 mile apart, to allow safe vehicle passage. The total roadway surface width at pullouts is 41 ft. Typical road construction method includes cut and fill methods. The depth of fill would vary depending on the terrain and construction method. Typical fill includes general embankment fill (pit run gravel < 12 inch [in.]), topped with approximately 12 in. of surface material fill (pit run gravel < 2 in.). A geotextile fabric underlain would be installed where required for road stability.

  The construction of the main Anarraaq-Aktigiruq Exploration Access Road and South Vent Service Road would require the discharge of fill into Waters of the U.S (WOTUS). The fill material would be locally sourced at four proposed material sites located on uplands, adjacent to the proposed main Anarraaq-Aktigiruq Exploration Access Road. Table 2 provides a summary of the exploration road dimensions and associated drawing sheets.

Table 2 - Exploration Access Road Disturbance

Road Name	Length (mi)	Disturbance Area (Acre)	Drawing Sheet #	Linear Impacts to WOTUS	Fills into Wetlands
Exploration Access Road	9.28	79.4	2021 - 2036	Yes	Yes
North Vent Service Road	0.62	4.2	2042 - 2043	Yes	No
Main Vent Service Road	0.66	4.5	2038 - 2039	Yes	No
South Vent Service Road	1.2	9.5	2044 - 2046	Yes	Yes
Material Site AA-MS-5 Road	0.58	4.0	2040	No	No
Total	12.34	101.60			

The proposed road design would maintain natural flow patterns through the placement of six steel bridges and approximately 55 culverts. Each steel bridge spans the width of the creeks, supported by bridge abutments built with precast concrete blocks above ordinary high water. Bridge lengths are provided in Table 3. A bridge construction and maintenance area of 120 ft x 120 ft would be required on one side of the bridge. Culverts would consist of steel pipe spanning the width of the road (toe to toe) and range from 24 to 96 inches in diameter in consideration of seasonal drainage. Culverts would be underlined and surrounded by 1 ft minimum of bedding material. Four larger diameter culverts up to 8

ft in diameter will be used for the single crossing of the West Fork Ikalukrok Creek. Slope protection around the culverts would be placed, as needed, and may consist of a variety of engineered Rolled Erosion Control Product [RECP] or natural materials (Riprap). Culverts installed within potential high water would be embedded by 10% to aid passage and durability during high water events.

Table 3 – Proposed Bridge Length

Creek Crossing	Bridge Length (ft)
Red Dog Creek	100
Grayling Junior Creek	100
Ikalukrok Creek No. 1	140
Ikalukrok Creek No. 2	100
Ikalukrok Creek No. 3	140

- Support Facilities – The proposed support facilities necessary for the advanced exploration of the Anarraaq and Aktigiruq deposits would be constructed on gravel pads: Portal site and camp pad; two laydown pads (Laydown Pad 1, Laydown Pad 2, three vent-raise pads (North Vent-raise, Main Vent-raise, and South Vent-raise)).

  All surface pad facilities would be developed using cut and fill construction methods, with 2 percent cross slope gradients, and 2H:1V side slopes. No pad construction will require discharge of fill to WOTUS.

Table 4 – Support Facility Pad Disturbance

Road Name	Disturbance Area (Acres)	Drawing Sheet #	Linear Impacts to WOTUS	Fills into WOTUS
Main Vent-Raise Pad	1.6	2039	No	No
North Vent-Raise Pad	1.2	2043	No	No
South Vent-Raise Pad	1.0	2046	No	No
Laydown Pad 1	5.5	2036	No	No
Laydown Pad 2	2.2	2038	No	No
Camp and Portal Pad	25.7	2037	No	No
Total	37.2			

Construction of the proposed project is anticipated to start in January 2023, subject to receipt of the necessary Federal, State and Borough authorizations. Exploration activities would occur year-round, for an estimated four years. Construction of the project would require the discharge of approximately 177,896 cubic yards of clean fill into 19.62 acres into wetlands and 2,412 linear feet of impacts to WOTUS.

Once exploration activities are completed, Teck would assess whether to advance mine development, or complete project reclamation as planned. Mine development activities would require additional permits and authorizations. Currently, Teck is planning to reclaim the proposed exploration facilities, per State of Alaska requirements. Proposed reclamation activities include:

- Support facilities and portal – Surface structures would be removed, and the pads would be graded to blend with the surrounding environment, seeded, and allowed to naturally revegetate. Clean stockpiled topsoil would be re-applied where the terrain is suitable for such application.
- Roads – Bridges (spans and abutments), and culverts would be removed, creating low water crossings. The road would be reseeded for stabilization and then allowed to naturally revegetate.

Block 21. Type(s) of Material Being Discharged and the Amount of Each Type of Discharge in Cubic Yards

The following (Table 5) are the types of clean materials, and the amounts of each type in cubic yards, being discharged into Wetlands.

Table 5 – Materials Being Discharged in Wetlands and Estimated Amounts in Cubic Yards

Project Component	General Embankment Fill [1]	Surfacing Material Fill [2]	Total Fill
Anarraaq-Aktigiruq Exploration Road	161,656	12,781	**174,437**
South Vent Service Road	3,070	389	**3,459**
Total	**164,726**	**13,170**	**177,896**

Notes:

1 - General Embankment Fill – Includes pit run gravel < 12 in.

2 - Surfacing Material Fill – Includes pit run gravel < 2 in.

Block 22. Surface Area in Acres of Wetlands or Other Waters Filled

The surface area and linear feet of WOTUS for fill by the proposed project are provided in Table 6. Fills are those that would be restored during, or shortly after construction is complete. Fills would be discharged by mechanized methods using dump trucks, dozers, graders, excavators, cranes, and other typical construction equipment.

Table 6 – Surface Area of Wetlands and Linear Feet of WOTUS to be impacted.

	Permanent Impacts	
Units	Acres	Linear feet
Anarraaq-Aktigiruq Exploration Road	19.37	1,857
Main Vent Service Road		203
North Vent Service Road		175
South Vent Service Road	0.25	177
TOTAL	**19.62**	**2,412**

Block 23. Description of Avoidance, Minimization, and Compensation

The following is a brief explanation on how impacts to WOTUS have been avoided and minimized for the project site.

- Avoidance: Due to the linear nature of the proposed project and the abundance of WOTUS within the project area, total avoidance is not practicable. Where practicable, facilities were located to avoid impacts to WOTUS. These include routing the proposed exploration access roads on uplands to the extent practicable and locating material sites; vent raises pads; laydown pads; and the portal and camp area pad in uplands.
- Minimization: The proposed project minimizes impacts to WOTUS to the maximum extent practicable by reducing the project footprint, maximizing the use of uplands, and controlling the materials after the discharge:
    - The road corridor was located on drier ground with less WOTUS and greater use of uplands, where practicable;
    - The road was designed as a single lane road with vehicle pullouts, as opposed to a wider two-lane road, reducing WOTUS impacts where crossings could not be avoided;
    - The proposed road corridor maximized, to the extent practicable the use of flat terrain, reducing the need for fill material and side cut construction, reducing impacts where crossings WOTUS could not be avoided;
    - At some locations, the road alignment was designed to impact edges of wetlands rather than bisecting the entire wetland habitat, where practicable;
    - Stream crossings were designed to be perpendicular to flow direction, to the extent practicable;
    - Natural flow patterns would be maintained using culverts and bridges;
    - Sediment barriers would be installed around the perimeter of the construction areas at water crossings;
    - Alaska Department of Fish and Game - Fish Habitat Permit restrictions and best management practices for in-water work and bridge abutment designs would be adhered to, to minimize potential impacts to fish and other aquatic species;
    - The construction contractor would develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to address erosion and sediment control as required by the Alaska Department of Environmental Conservation (ADEC) – Alaska Pollutant Discharge Elimination System (APDES) Multi-Sector General (MSGP).
- Compensatory Mitigation: There are no existing mitigation banks, or In-lieu fee programs with service areas in the watershed that can satisfy the mitigation needs for the proposed project. Permittee-responsible mitigation is the only practical mechanism to provide compensatory mitigation for the unavoidable loss of 19.62 acres, and 2,412 linear feet of permanent impacts to WOTUS. Teck is proposing preservation of WOTUS within the Red Dog Creek watershed at a 1:1

ratio, by means of a deed restriction that would protect aquatic resources from future development. Teck will submit a Compensatory Mitigation Plan for the proposal, under separate cover, that will include timelines and designs, maintenance plans, performance standards, monitoring requirements, long-term management plan, and adaptive management plans.

Block 26. List of Other Certificates or Approvals/Denials form other Federal, State, or Local Agencies for Work Described in this Application

The construction and operation of the proposed Anarraaq and Aktigiruq Exploration Program would require a variety of permits and authorizations from Federal, State of Alaska, and the Northwest Arctic Borough (NAB) agencies. At this time, Teck has submitted or will submit shortly the following key permit applications (Table 7):

Table 7 Key Permits Received and Authorizations Pending Approval/Issuance

AGENCY	TYPE APPROVAL	APPLICATION DATE
ADF&G	Fish Habitat Permits	Received 2018
ADEC	Waste Management Permit	June 2022
ADEC	401 Certification of 404 Permit	February 2022
ADEC	APDES MSGP Storm Water Permit	Received 2018
ADEC	Title I Air Permit	Received 2019
ADEC	APDES Non-Domestic Wastewater Discharge Permit	June 2022
ADNR	Phase I Plan of Operations Approval Incl. Reclamation Plan and Reclamation Bond	February 2022
ADNR	Phase II Plan of Operations Approval Incl. Reclamation Plan and Reclamation Bond	July 2022
ADNR	Temporary Water Use Authorizations	February 2022
NAB	Title 9 Conditional Use Permit	July 2022