

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0035	1	

CAUTION NOTICE

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GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

J. SWARTLEY

T.J. WILLIAMS

INVESTIGATED BY S&ME. INC.

DRAWN BY C. CHANDLER

CHECKED BY L. CAMPOS

SUBMITTED BY S. MITCHELL

DATE OCTOBER, 2024



8848 RED OAK BLVD
SUITE A
CHARLOTTE, NC 28217
(704) 523-4726

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY ROCKINGHAM

PROJECT DESCRIPTION REPLACE BRIDGE #780177 ON
SR 1535 (PRICE ROAD) OVER MATRIMONY CREEK
IN EDEN

INVENTORY

CONTENTS

LINE	STATION	PLAN
-L-	17+00 - 30+00	4

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	17+50	X-5
-L-	19+00 - 20+00, 21+15	X-6 - X-8
-L-	23+35	X-9
-L-	24+25	X-10
-L-	24+50 - 25+27	X-11
-L-	27+00	X-12

APPENDICES

APPENDIX	SHEETS
BORE LOG(S) & CORE REPORT(S)	13 - 20
LAB RESULTS	21

REFERENCE: HB-0035

PROJECT: 50639



DocuSigned by:

Stacie Mitchell, PE 10/25/2024

BBC611B64F19458...

SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical specifications, classification charts, and symbols for soil and rock analysis.

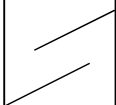

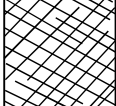





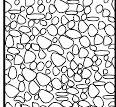



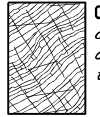

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT**

SUBSURFACE INVESTIGATION

**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

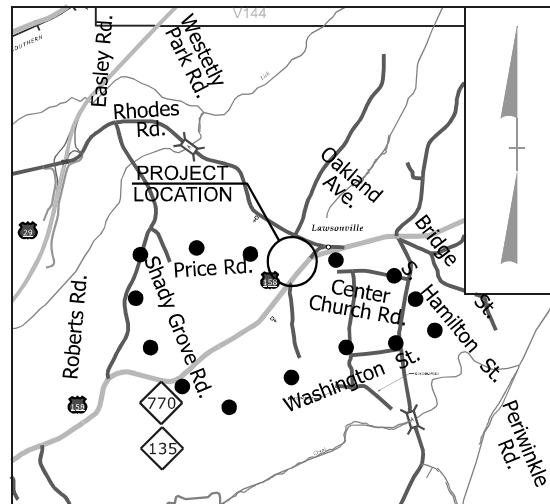
<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>	SURFACE CONDITIONS	VERY GOOD Very rough, fresh unweathered surfaces	GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	<p>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</p> <p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>	SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings
<p>STRUCTURE</p>	DECREASING SURFACE QUALITY →						<p>COMPOSITION AND STRUCTURE</p>						
 <p>INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p>	90				N/A	N/A	 <p>A. Thick bedded, very blocky sandstone. The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.</p>	70					
 <p>BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p>	80						 <p>B. Sandstone with thin inter-layers of siltstone</p>	60					
 <p>VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p>		70					 <p>C. Sandstone and siltstone in similar amounts</p>	60					
 <p>BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p>			50				 <p>D. Siltstone or silty shale with sandstone layers</p>	50					
 <p>DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p>				40			 <p>E. Weak siltstone or clayey shale with sandstone layers</p>	40					
 <p>LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>				30			 <p>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</p>	30					
				20			 <p>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</p>	20					
				10			 <p>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</p>	10					
		N/A	N/A				<p>— Means deformation after tectonic disturbance</p>						

09/08/99

TIP PROJECT: HB-0035

CONTRACT: XXXXXX

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

● OFFSITE DETOUR ROUTE

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

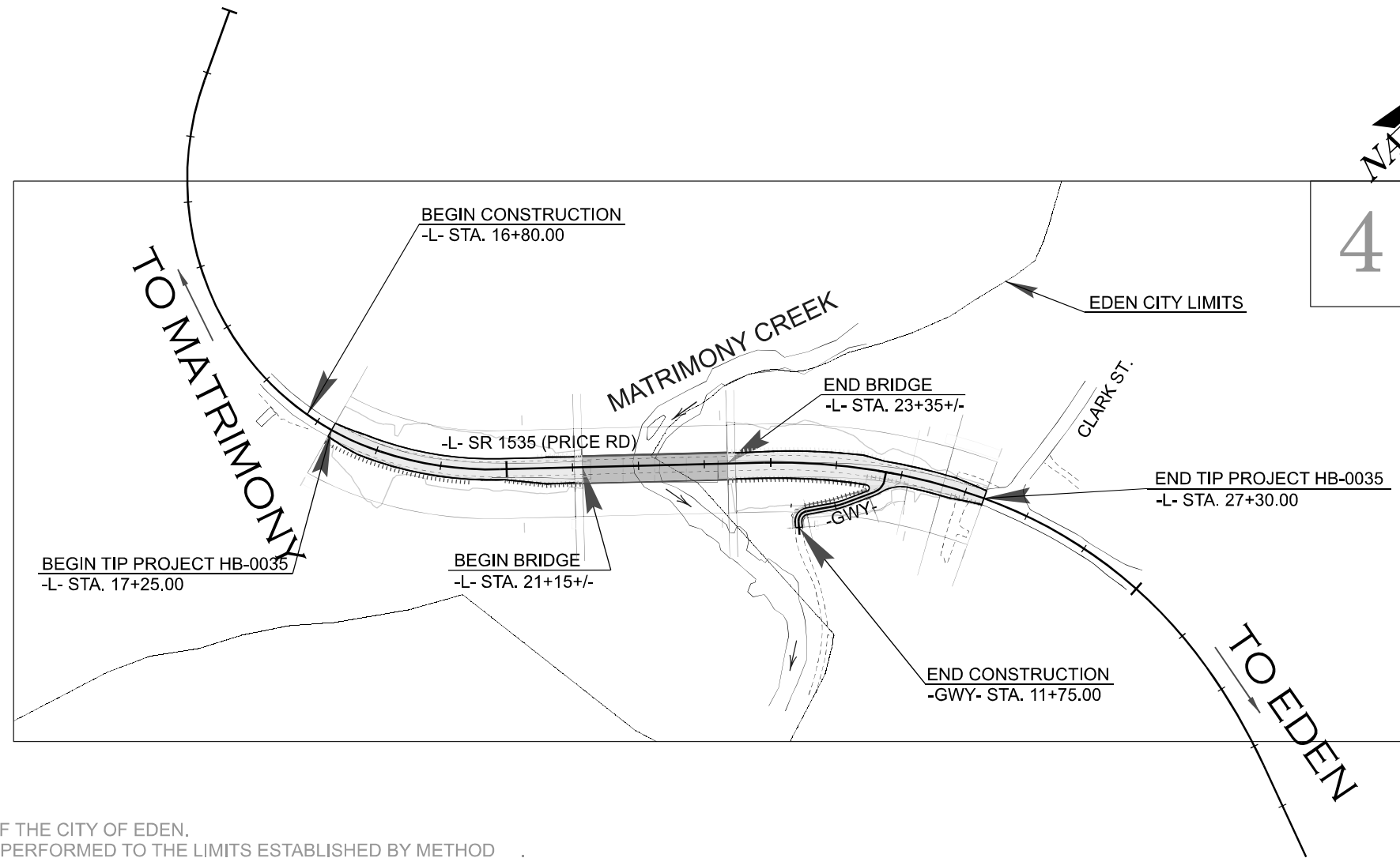
ROCKINGHAM COUNTY

LOCATION: REPLACE BRIDGE #780177 ON SR 1535 (PRICE ROAD) OVER
MATRIMONY CREEK IN EDEN

TYPE OF WORK: GRADING, DRAINAGE, PAVING, & STRUCTURE

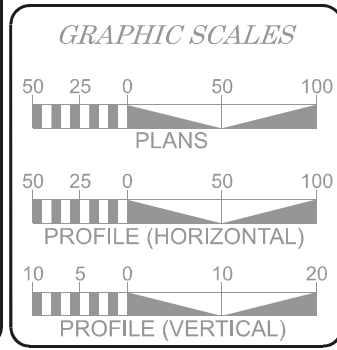
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0035	3	13
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
50639.1.1	N/A	PE	

DESIGN RECOMMENDATION
PLAN SET



THIS IS NOT A CONTROLLED ACCESS PROJECT.
THIS PROJECT IS WITHIN THE JURISDICTIONAL LIMITS OF THE CITY OF EDEN.
CLEARING AND GRUBBING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



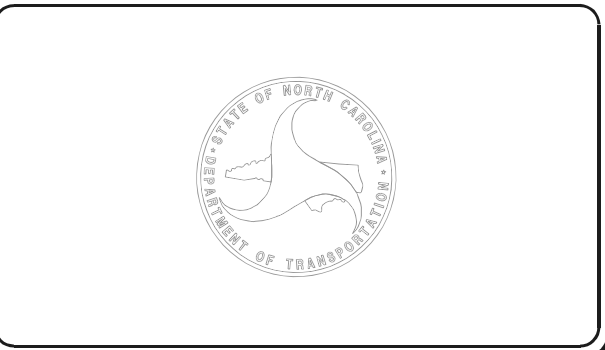
DESIGN DATA
 ADT 2026 = 3100
 ADT 2046 = 5600
 V = 40 MPH
 FUNC CLASS = MINOR COLLECTOR
 SUBREGIONAL TIER

PROJECT LENGTH
 LENGTH ROADWAY TIP PROJECT HB-0035 = 0.157 MILES
 LENGTH STRUCTURE TIP PROJECT HB-0035 = 0.042 MILES
 TOTAL LENGTH TIP PROJECT HB-0035 = 0.199 MILES
 NCDOT CONTACT: SARA SHERMAN, PE
 PROJECT MANAGER - NCDOT PMU

PREPARED IN THE OFFICE OF:

 320 Executive Ct.
 Hillsborough, NC 27278-8551
 Voice: (919) 732-3883
 Fax: (919) 732-6776
 www.summitde.net
 2024 STANDARD SPECIFICATIONS
 RIGHT OF WAY DATE: OCTOBER 18, 2024
 LETTING DATE: NOVEMBER 18, 2025
 FAITH JAHNKE, PE
 PROJECT ENGINEER
 JOSHUA JERNIGAN, EI
 PROJECT DESIGNER

HYDRAULICS ENGINEER
 SIGNATURE: _____ P.E.
 ROADWAY DESIGN ENGINEER
 SIGNATURE: _____ P.E.





October 23, 2024

STATE PROJECT: 50639.1.1
FEDERAL PROJECT: N/A
COUNTY: Rockingham
DESCRIPTION: Replace Bridge No. 177 on SR 1535 over Matrimony Creek

SUBJECT: Geotechnical Report – Inventory

S&ME, Inc. has completed a reconnaissance and subsurface investigation for the above roadway project and presents the following inventory. Plans and cross-sections are included in this report.

Project Description

This project is located in the town of Eden, NC in Rockingham County. This project consists of replacing Bridge No. 177 and minor widening to Price Road/Center Church Road (SR 1535). The project begins just west of Bridge 177 and extends to the east for approximately 0.20 miles. The type of work being performed consists of grading, drainage, paving, and minor widening to accommodate the new structure over Matrimony Creek.

Fieldwork was conducted in August of 2024 by S&ME. Standard Penetration Tests were performed at selected locations along the project. A CME-550 ATV-mounted drill machine with an automatic hammer was used to perform the SPT borings. Thirteen SPT borings were performed at various locations along -L- alignment. Representative soil samples were collected for visual classification in the field.

The following alignments were investigated. Subsurface profiles and/or cross-sections of these alignments are included in this report.

<u>Line</u>	<u>Station</u>
-L-	17+25 to 27+30

Physiography and Geology

The project corridor is located within the Piedmont Physiographic Province of North Carolina. More specifically, the project is within the Dan River Triassic Basin. The project corridor is predominately rural with few single-family homes. Topography along the project is generally gently to moderately sloping with some steeply sloping areas. Elevations along the project range from 535± to 590± feet above sea level.

The area is underlain by roadway embankment, recent alluvial sediments and Triassic residual soils. The Triassic residual soils are derived from the weathering of underlying Triassic Basin bedrock most likely consisting of mudstones, sandstones and conglomerates. The alluvial soils were deposited and transported during fluctuating periods of river elevation rise and fall and channel migration. These soils are closely confined to the creek channel and northeast floodplain. In addition, alluvial sediments were deposited near the site, upstream of a historical dam.

Water Bodies

Matrimony Creek flows from north to south passing underneath Bridge No. 177. This creek flows into the Dan River and is part of the Dan River Basin. Channel migration appears to be to the south and west. Evidence of a former stone and concrete dam structure is located approximately 200 feet downstream of the existing bridge. Based on available information, the dam was originally constructed around 1764 in an area with an approximate 5 ft waterfall and likely impounded variable amounts of water over its 200 year lifespan. The stone dam failed around 1970.

Soil Properties

Soils encountered during this investigation are separated into 3 categories: Roadway Embankment, Alluvial and Triassic Residual soils.

Roadway Embankment soils are semi-granular to granular in nature and may be derived from nearby sources. These soils consist of tan and brown, loose silty sand (A-2-4) and sand with gravel (A-1-b), and medium stiff to stiff sandy clay (A-6) and sandy silt (A-4) with gravel. PI of the tested roadway embankment cohesive soil was 7.

Alluvial soils consist of soft to very stiff, orange, gray and brown sandy silt (A-4), sandy clay (A-6), and silty clay (A-7-5). PI of the tested alluvial soil was 26.

Triassic Residual soils consist of gray, tan and orange, loose to dense silty sand (A-2-4) with little clay, and stiff to hard sandy silt (A-4) with little clay. PI of the tested Triassic residual soils ranged from 4 to 10.

Rock Properties

Weathered rock and non-crystalline rock occur throughout the project. The weathered rock is derived from the underlying Triassic Basin bedrock and begins at elevations ranging from 586± feet to 539± feet and ranges from 1± to 14± feet in thickness. Non-crystalline rock occurs at elevations ranging from 583± to 535± feet. Rock coring was performed at one End Bent for this investigation. Recovery and RQD values are 96% and 78% respectively.

Groundwater

Groundwater measurements were taken in August of 2024 during average rainfall conditions. Groundwater was not encountered in any boring but is anticipated to be close to the surface water elevation of Matrimony Creek at about 538± feet in elevation. Groundwater is not expected to cause significant impacts during construction.

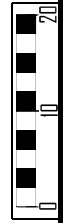
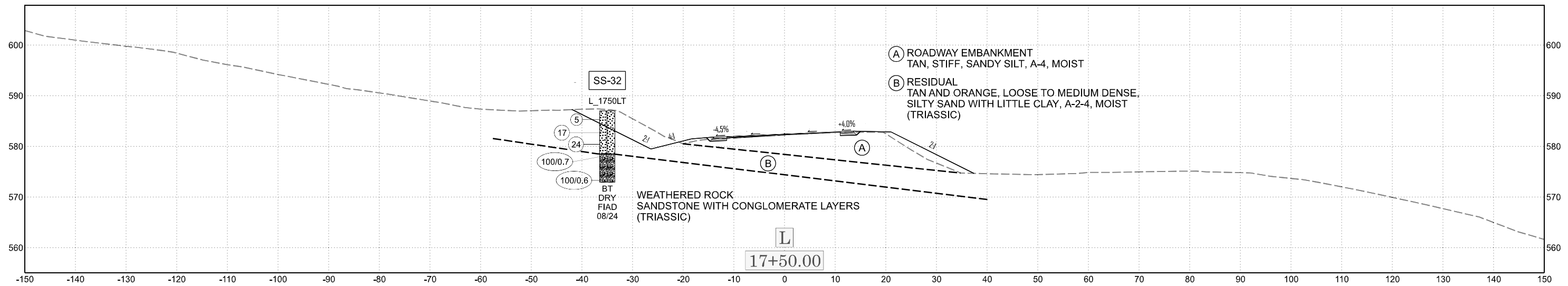
Areas of Special Geotechnical Interest

- 1) Non-crystalline Rock: Non-crystalline rock was encountered above or within 6 feet of proposed grade at the following location:

<u>Line</u>	<u>Station</u>	<u>Offset</u>
-L-	18+25 to 19+75	LT

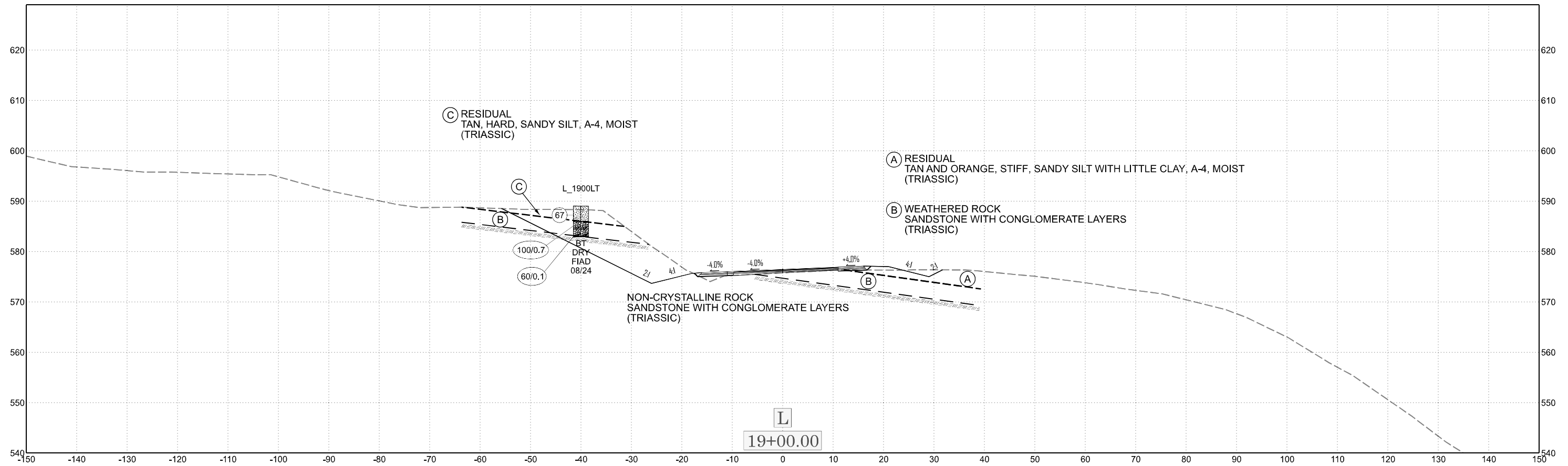
Respectfully Submitted,

Jarett Swartley, PG
Senior Geologist



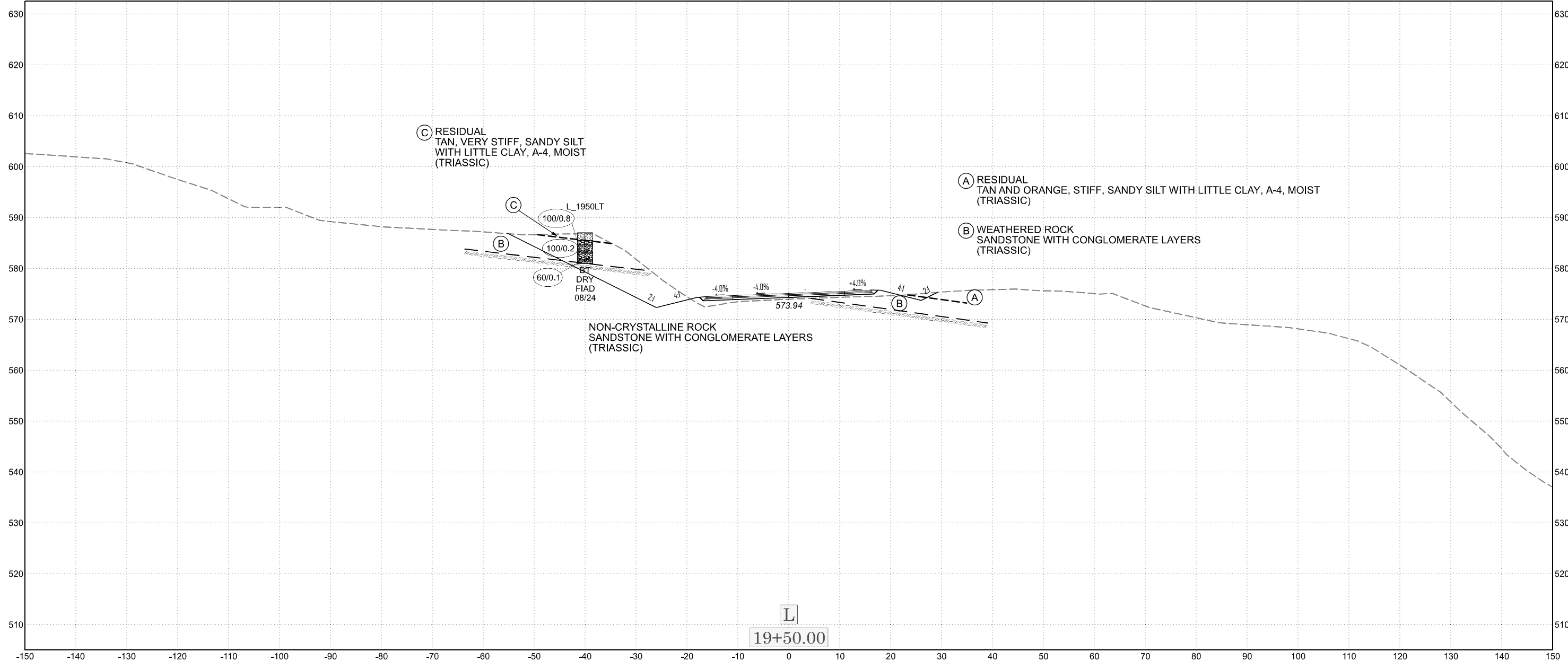
-L- X-5

HB-0035



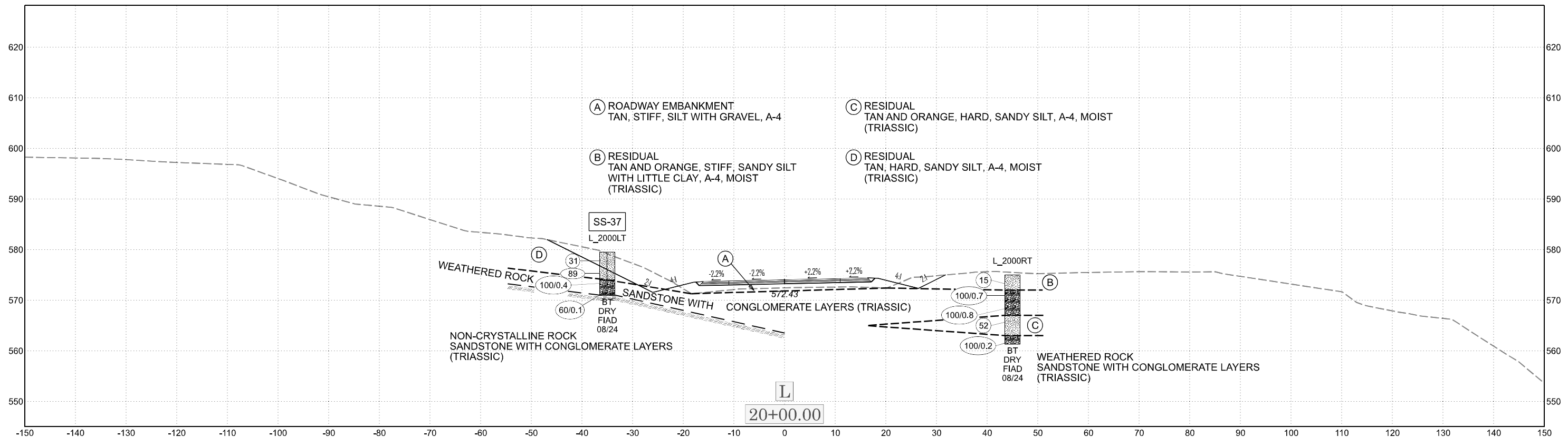
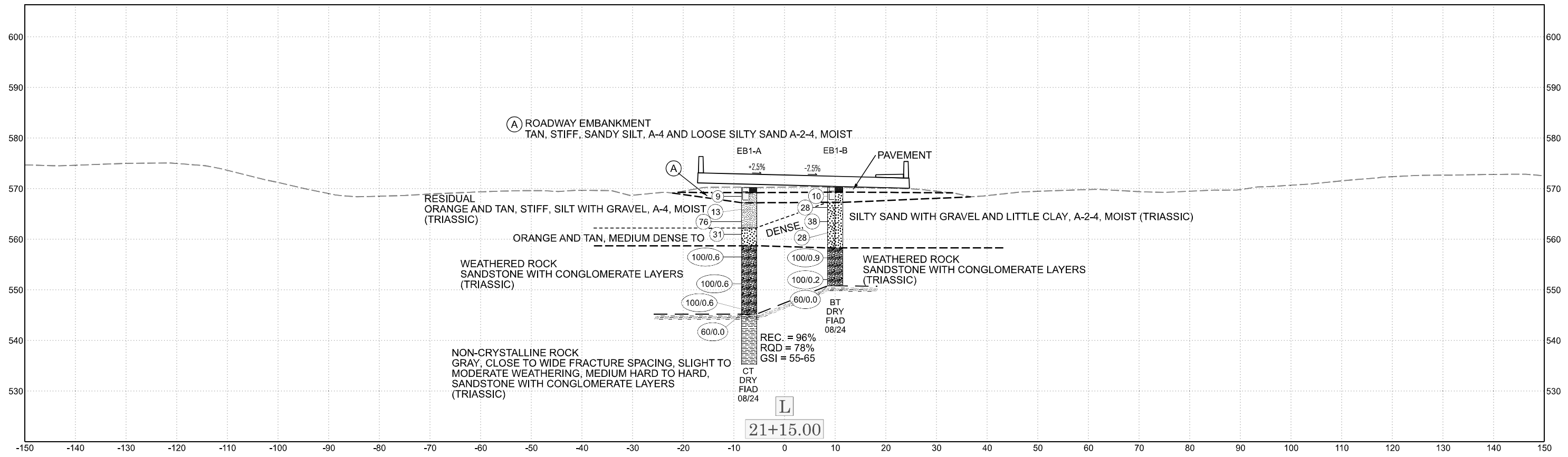
-L- X-6

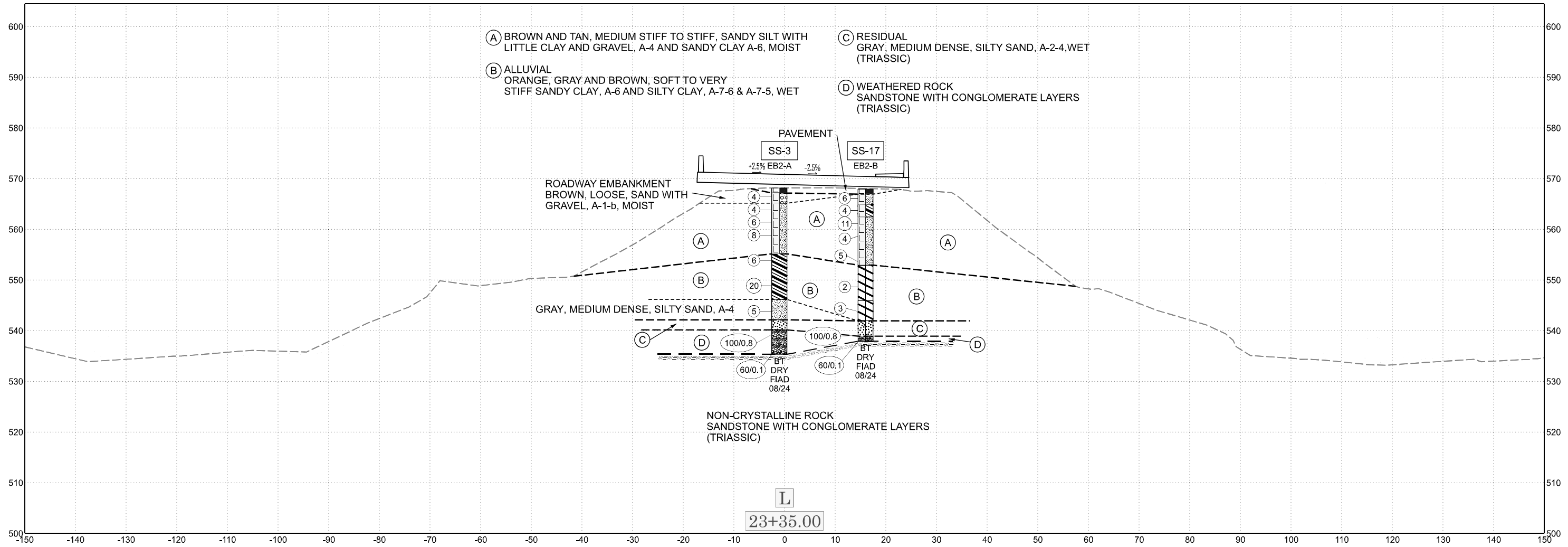
HB-0035



-L- X-7

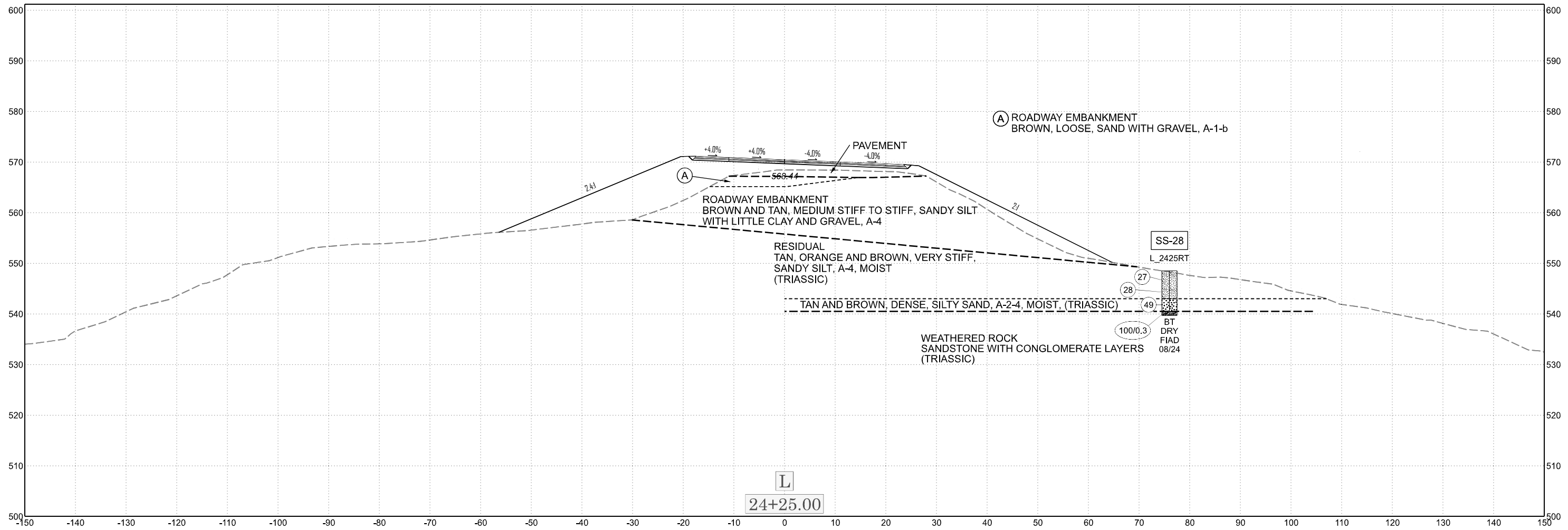
HB-0035





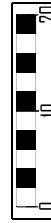
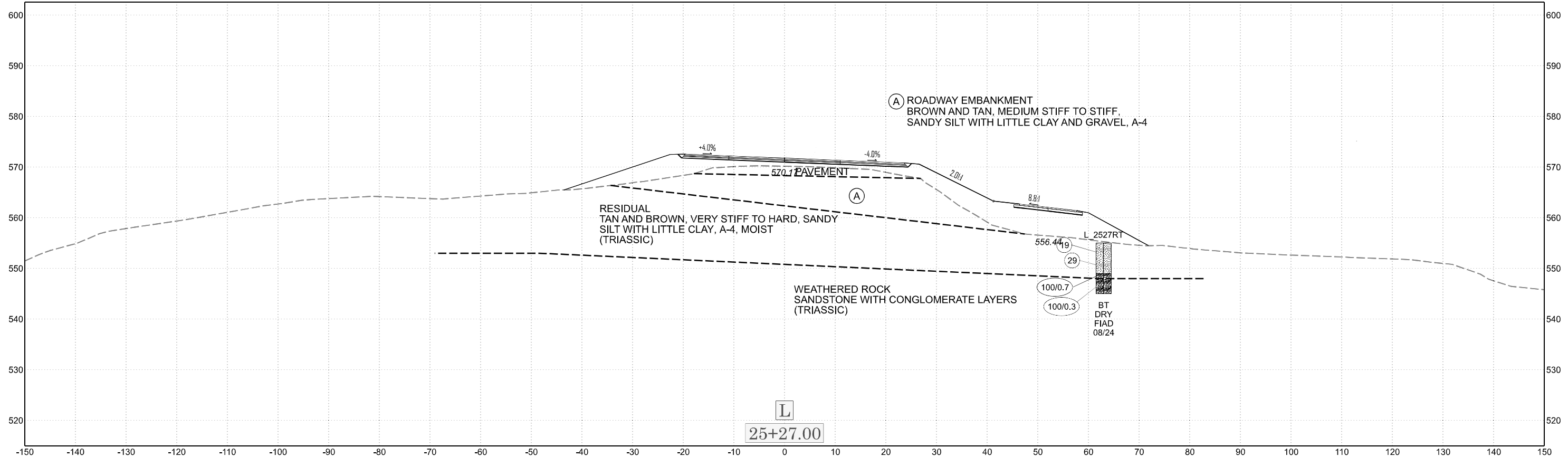
-L- X-9

HB-0035

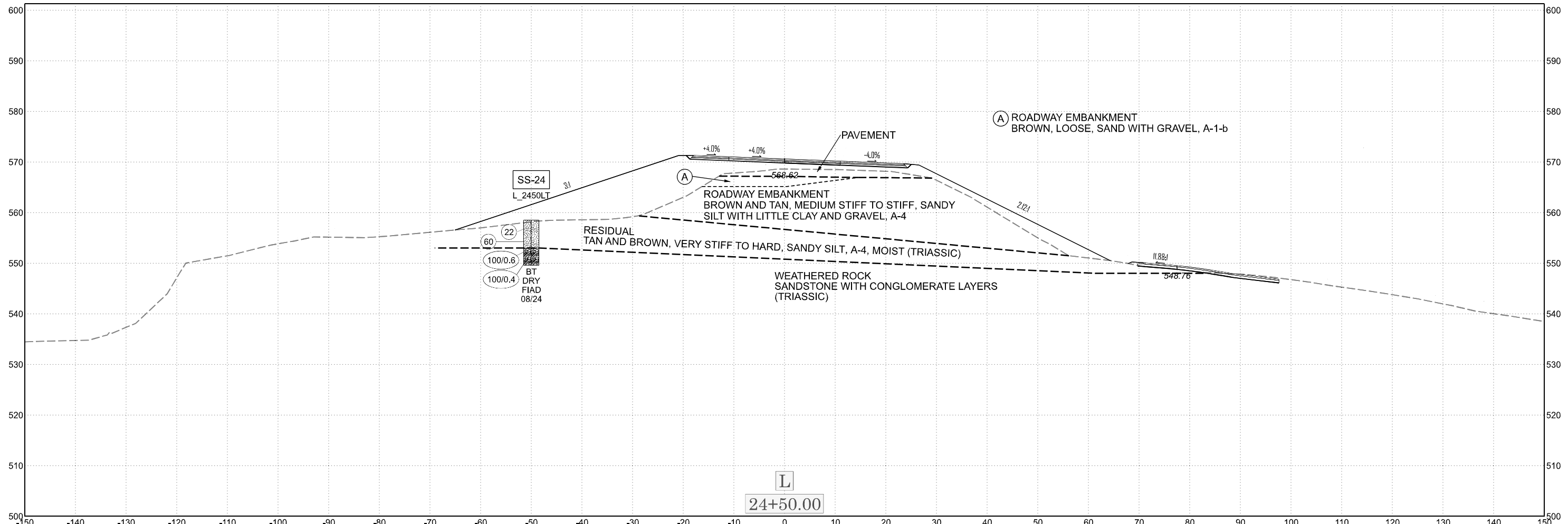


-L- X-10

HB-0035



-L- X-11

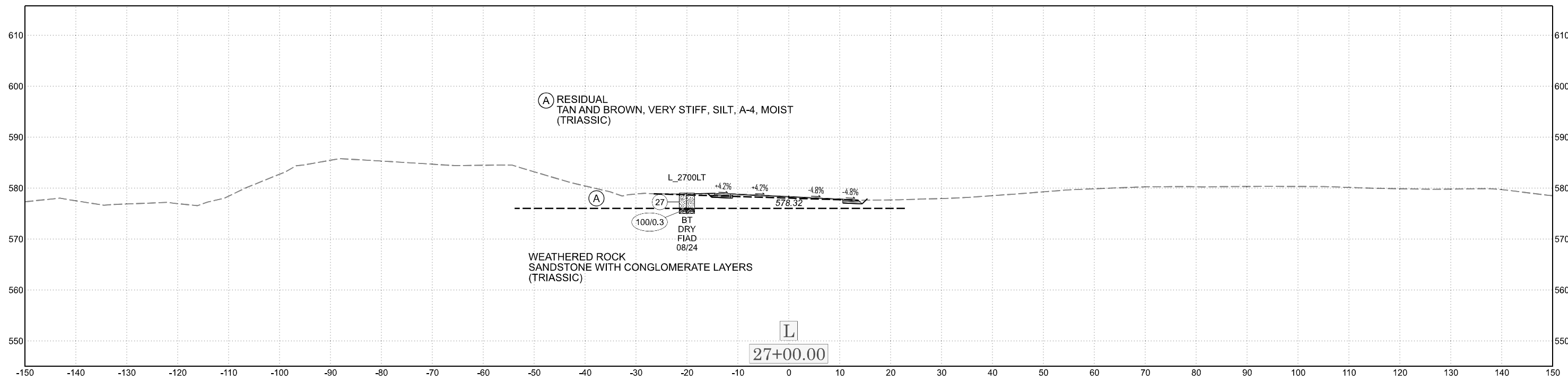


HB-0035



-L- X-12

HB-0035



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.	
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)
BORING NO. L_1950LT		STATION 19+50		OFFSET 40 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 587.0 ft		TOTAL DEPTH 6.1 ft		NORTHING 1,000,081		EASTING 1,768,765	
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER Shearin, T.		START DATE 08/12/24		COMP. DATE 08/12/24		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
590															
586.0	586.0	1.0													587.0 GROUND SURFACE 0.0
585	585.5	3.5	30	50	50/0.3									585.5 TRIASSIC RESIDUAL TAN, VERY STIFF, SANDY SILT WITH LITTLE CLAY, A-4 1.5	
	583.5	3.5												100/0.8 WEATHERED ROCK (SANDSTONE WITH CONGLOMERATE LAYERS) 6.0	
	581.0	6.0	100/0.2											100/0.2 581.0 NON-CRYSTALLINE ROCK (SANDSTONE WITH CONGLOMERATE LAYERS) 6.0	
			60/0.1											580.9 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 580.9 ft IN NON-CRYSTALLINE ROCK (SANDSTONE/CONGLOMERATE) 6.1	

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.	
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)
BORING NO. L_2000LT		STATION 20+00		OFFSET 35 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 579.5 ft		TOTAL DEPTH 8.6 ft		NORTHING 1,000,111		EASTING 1,768,801	
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER Shearin, T.		START DATE 08/12/24		COMP. DATE 08/12/24		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
580															
	578.5	1.0													579.5 GROUND SURFACE 0.0
	576.0	3.5	6	10	21									SS-37 18% TRIASSIC RESIDUAL TAN, HARD, SANDY SILT, A-4 5.5	
575	573.5	6.0	26	38	51									89 WEATHERED ROCK (SANDSTONE WITH CONGLOMERATE LAYERS) 5.5	
	571.0	8.5	100/0.4											100/0.4 571.0 NON-CRYSTALLINE ROCK (SANDSTONE WITH CONGLOMERATE LAYERS) 8.5	
			60/0.1											570.9 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 570.9 ft IN NON-CRYSTALLINE ROCK (SANDSTONE/CONGLOMERATE) 8.6	

NCDOT BORE DOUBLE HB-0035_GEO_RDWY.GPJ NC_DOT.GDT 10/23/24

GEOTECHNICAL BORING REPORT

BORE LOG

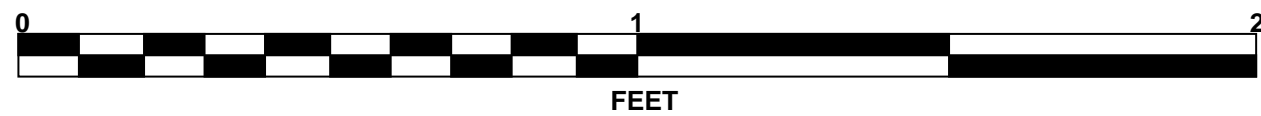
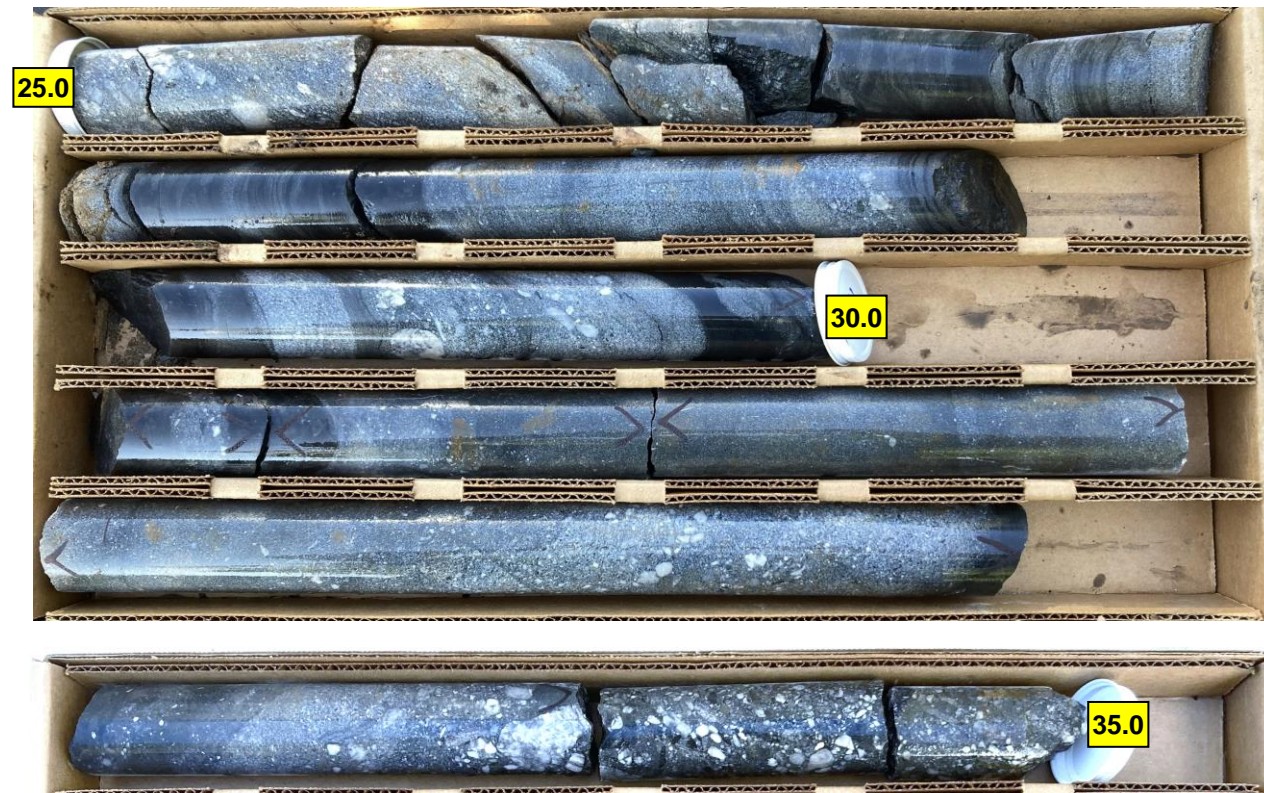
WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.									
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)								
BORING NO. L_2000RT		STATION 20+00		OFFSET 45 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 575.0 ft		TOTAL DEPTH 13.7 ft		NORTHING 1,000,057		EASTING 1,768,860									
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Shearin, T.		START DATE 08/12/24		COMP. DATE 08/12/24		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
575														575.0	0.0
	574.0	1.0	6	6	9										
	571.5	3.5	55	45/0.2										572.0	3.9
570	569.0	6.0	19	48	52/0.3									567.0	8.0
	566.5	8.5	41	21	31									563.0	12.0
565	561.5	13.5	100/0.2											561.3	13.7
														Boring Terminated at Elevation 561.3 ft IN WEATHERED ROCK (SANDSTONE/CONGLOMERATE)	

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.									
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 21+15		OFFSET 10 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 570.3 ft		TOTAL DEPTH 19.5 ft		NORTHING 1,000,165		EASTING 1,768,913									
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD Wash Boring		HAMMER TYPE Automatic										
DRILLER Shearin, T.		START DATE 08/06/24		COMP. DATE 08/06/24		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
575														570.3	0.0
														569.3	1.0
														567.1	3.2
570	569.3	1.0	4	4	6									567.0	3.0
	567.1	3.2	12	14	14									564.3	6.0
565	564.3	6.0	15	14	24									562.1	8.2
	562.1	8.2	16	16	12									557.1	13.2
560														555.8	19.5
														Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 550.8 ft ON NON-CRYSTALLINE ROCK (SANDSTONE/CONGLOMERATE)	

NCDOT BORE DOUBLE HB-0035_GEO_RDWY.GPJ NC_DOT.GDT 10/23/24

CORE PHOTOGRAPHS

EB1-A
BOXES 1 & 2: 25.0 - 35.0 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.									
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 23+35		OFFSET 1 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 568.2 ft		TOTAL DEPTH 32.9 ft		NORTHING 1,000,334		EASTING 1,769,054									
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Shearin, T.		START DATE 08/05/24		COMP. DATE 08/05/24		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
570															
	567.2	1.0	4	2	2								M	568.2 GROUND SURFACE 0.0 567.2 (PAVEMENT) 1.0	
565	564.7	3.5	2	2	2								M	565.2 ROADWAY EMBANKMENT 3.0 BROWN, LOOSE, SAND WITH GRAVEL, A-1-b	
	562.2	6.0	4	2	4								M	562.2 BROWN AND TAN, MEDIUM STIFF, SANDY SILT, A-4	
560	559.7	8.5	2	3	5								M	559.7	
	554.7	13.5	2	3	3								W	555.2 ALLUVIAL 13.0 ORANGE, MEDIUM STIFF TO VERY STIFF, SANDY CLAY, A-6	
550	549.7	18.5	8	5	15								W	549.7	
545	544.7	23.5	3	2	3								W	546.2 BROWN AND GRAY, MEDIUM STIFF, SANDY SILT, A-4 22.0	
540	539.7	28.5	27	73/0.3									W	542.2 TRIASSIC RESIDUAL 26.0 GRAY, MEDIUM DENSE, SILTY SAND, A-2-4	
	535.4	32.8	60/0.1											540.2 WEATHERED ROCK 28.0 (SANDSTONE WITH CONGLOMERATE LAYERS)	
														535.4 NON-CRYSTALLINE ROCK 32.8 (SANDSTONE WITH CONGLOMERATE LAYERS)	
														535.3	

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 535.3 ft IN NON-CRYSTALLINE ROCK (SANDSTONE/CONGLOMERATE)

*residual layer from 26.0' - 28.0' is inferred

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.									
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 23+35		OFFSET 16 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 567.9 ft		TOTAL DEPTH 30.1 ft		NORTHING 1,000,323		EASTING 1,769,066									
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Shearin, T.		START DATE 08/06/24		COMP. DATE 08/06/24		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
570															
	566.9	1.0	5	4	2								M	567.9 GROUND SURFACE 0.0 566.9 (PAVEMENT) 1.0	
565	564.4	3.5	2	2	2								M	564.4 ROADWAY EMBANKMENT 3.0 TAN, MEDIUM STIFF, SILT WITH GRAVEL, A-4	
	561.9	6.0	1	4	7								M	562.4 ORANGE, MEDIUM STIFF, SANDY CLAY, A-6 5.5	
560	559.4	8.5	3	2	2								M	559.4 TAN AND ORANGE, MEDIUM STIFF TO STIFF, SANDY SILT WITH LITTLE CLAY, A-4	
	554.4	13.5	2	3	2								M	555.2 ALLUVIAL 15.0 ORANGE, GRAY AND BROWN, SOFT, CLAY AND SILTY CLAY, A-7-6 & A-7-5	
550	549.4	18.5	1	1	1								W	549.4	
545	544.4	23.5	2	1	2								W	546.2 BROWN AND GRAY, MEDIUM STIFF, SANDY SILT, A-4 22.0	
540	539.4	28.5	8	92/0.3									W	542.2 TRIASSIC RESIDUAL 26.0 GRAY, MEDIUM DENSE, SILTY SAND, A-2-4	
	537.9	30.0	60/0.1											540.2 WEATHERED ROCK 28.0 (SANDSTONE WITH CONGLOMERATE LAYERS)	
														537.8 NON-CRYSTALLINE ROCK 30.0 (SANDSTONE WITH CONGLOMERATE LAYERS)	
														537.8	

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 537.8 ft IN NON-CRYSTALLINE ROCK (SANDSTONE/CONGLOMERATE)

NCDOT BORE DOUBLE HB-0035_GEO_RDWY.GPJ NC_DOT.GDT 10/23/24

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.										
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)									
BORING NO. L_2425RT		STATION 24+25		OFFSET 76 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 548.5 ft		TOTAL DEPTH 8.8 ft		NORTHING 1,000,346		EASTING 1,769,170										
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Shearin, T.		START DATE 08/12/24		COMP. DATE 08/12/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
550																
	547.5	1.0	6	13	14										548.5	0.0
545	545.0	3.5	4	8	20							SS-28	11%			
	542.5	6.0	11	19	30							M			543.0	5.5
540	540.0	8.5										M			540.5	8.0
															539.7	8.8

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.										
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)									
BORING NO. L_2450LT		STATION 24+50		OFFSET 50 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 558.5 ft		TOTAL DEPTH 8.9 ft		NORTHING 1,000,453		EASTING 1,769,100										
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Shearin, T.		START DATE 08/07/24		COMP. DATE 08/07/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
560																
	557.5	1.0	5	11	11										558.5	0.0
555	555.0	3.5	6	19	41											
	552.5	6.0	60	40/0.1											553.0	5.5
550	550.0	8.5													549.6	8.9

NCDOT BORE DOUBLE HB-0035_GEO_RDWY.GPJ NC_DOT.GDT 10/23/24

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.									
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)								
BORING NO. L_2527RT		STATION 25+27		OFFSET 63 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 555.0 ft		TOTAL DEPTH 10.0 ft		NORTHING 1,000,418		EASTING 1,769,231									
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Shearin, T.		START DATE 08/12/24		COMP. DATE 08/12/24		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
555														555.0	0.0
	554.0	1.0	6	9	10						M	TRIASSIC RESIDUAL TAN AND BROWN, VERY STIFF, SANDY SILT WITH LITTLE CLAY, A-4			
	551.5	3.5	3	9	20										
550	549.0	6.0	32	54	46/0.2										
	546.5	8.5	100/0.3												
545														545.0	10.0
Boring Terminated BY AUGER REFUSAL at Elevation 545.0 ft IN WEATHERED ROCK (SANDSTONE/CONGLOMERATE)															

WBS 50639.1.1		TIP HB-0035		COUNTY ROCKINGHAM		GEOLOGIST Swartley, J.																
SITE DESCRIPTION BRIDGE NO. 177 ON SR 1535 (-L-) OVER MATRIMONY CREEK							GROUND WTR (ft)															
BORING NO. L_2700LT		STATION 27+00		OFFSET 20 ft LT		ALIGNMENT -L-																
COLLAR ELEV. 579.0 ft		TOTAL DEPTH 4.0 ft		NORTHING 1,000,580		EASTING 1,769,327																
DRILL RIG/HAMMER EFF./DATE SME9403 CME-550X 91% 01/03/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic																	
DRILLER Shearin, T.		START DATE 08/07/24		COMP. DATE 08/07/24		SURFACE WATER DEPTH N/A																
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)								
			0.5ft	0.5ft	0.5ft	0	25	50	75	100												
580														579.0	0.0							
	578.0	1.0	6	11	16						M	TRIASSIC RESIDUAL TAN AND BROWN, VERY STIFF, SILT, A-4										
	575.5	3.5	100/0.3																			
575																					575.0	4.0
Boring Terminated BY AUGER REFUSAL at Elevation 575.0 ft IN WEATHERED ROCK (SANDSTONE/CONGLOMERATE)																						




SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616
 S&ME Project No.: 24350498 S&ME Project Name: Bridge No. 177 on SR 1535 (-L-) over Matrimony Creek Date Report: 9/12/2024
 State Project No.: N/A County: Rockingham Date Tested: 9/5 - 9/12/24
 WBS No.: 50639.1.1 TIP No.: HB-0035
 Client Name: NCDOT Geotechnical Engineering Unit Client Address: Raleigh, NC

Boring No.	Sample No.	Station #:	Offset	Northing	Easting	Alignment	Sample Depth (feet)	AASHTO Classification	Total % Passing Sieve #				Total Mortar Fraction (%)				LL	PL	PI	Moist. %	
									10	40	60	200	Sand	Fine	Silt	Clay					
EB2-A	SS-3	23+35	-1	1,000,334	1,769,054	-L-	6.0-7.5	A-4 (1)	94	83	74	48.9	21	33	25	21	29	22	7	15.4	
EB2-B	SS-17	23+35	16	1,000,323	1,769,066	-L-	18.5-20.0	A-7-6 (19)	99	92	88	71.7	11	21	22	46	55	29	26	38.3	
L_1750LT	SS-32	17+50	-35	999,979	1,768,612	-L-	1.0-2.5	A-2-4 (0)	89	65	55	33.1	38	29	17	16	24	19	5	15.2	
L_2000LT	SS-37	20+00	-35	1,000,111	1,768,801	-L-	1.0-2.5	A-4 (3)	100	100	98	63.4	2	49	39	10	40	36	4	18.2	
L_2450LT	SS-24	24+50	-50	1,000,453	1,769,100	-L-	1.0-2.5	A-4 (2)	96	75	66	45.6	32	26	19	23	34	24	10	18.0	
L_2425RT	SS-28	24+25	76	1,000,345	1,769,170	-L-	1.0-2.5	A-4 (1)	93	77	67	44.1	28	30	19	23	30	20	10	11.3	

References / Comments / Deviations: NP=Not Plastic QNS=Quantity Not Sufficient
 AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT AASHTO T89: Determining the Liquid Limit of Soils
 AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO M145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

Mal Krajan, ET  104-01-0703 Stacie Mitchell, P.E. Project Manager
 Technician Name: Signature Certification # Technical Responsibility: Position

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