

MEMORANDUM

(R-001-2024)

TO: Adam Ulrich, PE
Transportation Engineer Specialist
Division of Highway Design

FROM: Adam Ross, PE
Geotechnical Services Branch Manager
Division of Structural Design

BY: Tyler Sheffield, PE
Geotechnical Services Branch

DATE: April 3, 2024

SUBJECT: Franklin County
I-64 WB Ramps to US 127
Ramp G Station 13+00 to 30+44.61
Ramp FF Station 18+84.87 to 28+83.24
Item # 5-80212.00
Mars # 15005701D
Project # 1100 FD52 037 0000 000-000D
Geotechnical Engineering Roadway Report

CC: T. Lovell
S. Tipton
B. Kidd
T. Owens (Qk4)
C. Davis (Qk4)
T. Kelly (Qk4)

Location and Description

An abbreviated geotechnical engineering report has been completed for the subject project. The purpose of this project is to provide new ramps from I-64 WB to US 127 to reduce congestions. The drilling and sampling were performed by a KYTC Geotechnical drill crew. The laboratory testing was performed by the KYTC Geotechnical Office. The purpose of this report is to identify potential geotechnical concerns based on the subsurface information obtained, a review of the project plans, the drilling, and prior experience with the project area. Reduced size geotechnical symbols, notes, profile, and embankment stability sheets are attached. The CADD input, in DGN format, is being e-mailed to the district and design consultant, Qk4, for incorporation into the roadway plans.

Geology

The proposed roadway alignment is located along the eastern edge of the Frankfort West Geologic 7.5-minute Quadrangle (GQ-1221). Geologic mapping indicates the alignment to be underlain by the Lexington Limestone and Clays Ferry Formation.

Based on project geometry, an insufficient amount of rock from roadway excavation will be available for rock roadbed construction. Therefore, other means of subgrade stabilization will be recommended.

Drilling and Sampling

Drilling operations for this project were performed in March of 2024. The drilling operations consisted of 4 embankment stability borings, 6 profile borings, and 2 pavement core borings. Boring depths ranged from 0.3 to 33.7 feet. Of the 12 borings, 10 met refusal. When encountered, the refusal depth varied from 0.3 to 33.7 feet. As expected, the refusal lithology was limestone.

Laboratory Testing

Soil testing for the project showed the most common soil types for the project to be lean clay and clayey gravel (CL and GC in the Unified Soil Classification System).

Three Resilient Modulus tests were performed on samples obtained from soils at the proposed cuts and near the proposed subgrade. The results of the testing ranged from 6,300 psi to 12,400 psi with an average of 9,400 psi.

Engineering Analysis

Stability analyses were required for this project based on the slope heights and configurations. Based on the current slope configurations shown in the cross-sections, the construction of the embankments using material from roadway excavation and offsite borrow location should meet the required safety factors unless otherwise noted. All embankment side slopes shall be designed 2H:1V or flatter unless otherwise noted. All soil cut slopes should be 2H:1V or flatter and should be constructed according to the current edition of the Standard Specifications for Road and Bridge Construction.

Soil Stabilization

Based on review of the drilling for the project, it appears durable rock will not be of sufficient quantity to construct a rock roadbed. Chemical stabilization may not be viable for this project given the location, project geometry, and maintenance of traffic concerns. The project team has chosen to construct a mechanically stabilized roadbed using 6 inches of additional aggregate base (DGA or CSB) underlain with High Strength Geotextile Fabric Class 1A between the aggregate and the soil subgrade.

Subgrade problems may occur in areas where the existing pavement will be removed or where the roadway template is in a shallow fill or in a cut condition. Therefore, thickening of the aggregate base stabilization or a 2-foot working platform consisting of Kentucky Coarse Aggregate No. 2's, 3's, or 23's underlain with Class 1 Geotextile Fabric (Stabilization) may be required for these areas. The thickness of the working platform may need to be greater than two feet in areas as determined by the Engineer on construction and may depend on seasonal fluctuations in the water table. The working platform shall daylight horizontally to the edge of embankment in fills and to the ditchline in cuts, to ensure positive drainage. For quantity estimation purposes only, a 2-foot working platform for 200 linear feet of roadway may be assumed.

The embankment foundation construction may require a working platform where soft and/or saturated soils are encountered. The extent of these problems will depend on weather conditions during embankment construction and seasonal water table fluctuations. The recommendations below provide for the use of Non-Erodible Granular Embankment underlain with Fabric-Geotextile Class 2 (Separation) for any such wet areas encountered during construction. For quantity estimation purposes only, a 2-foot embankment working platform for 200 linear feet of roadway may be assumed.

GEOTECHNICAL RECOMMENDATIONS:

- 1.) In accordance with Section 206 of the current Standard Specifications, the moisture content of embankment material shall not vary from the optimum moisture content as determined by the current version of KM 64-511 by more than +2 percent or less than -2 percent. This moisture content requirement shall have equal weight with the density requirement when determining the acceptability of embankment construction. Refer to the Family of Curves for moisture/density correlation.
- 2.) All soils, whether from roadway or borrow, may require manipulation to obtain proper moisture content prior to compaction. Direct payment shall not be permitted for rehandling, hauling, stockpiling, and/or manipulating soils.
- 3.) Excavation of surface ditches and channel changes adjacent to embankment areas shall be performed prior to the placement of the adjacent embankments. The material excavated for the channel changes and surface ditches is suitable for embankment construction if dried to proper moisture content in accordance with Section 206 of the current Standard Specifications for Road and Bridge Construction.
- 4.) The Contractor is responsible for conducting any operations necessary to excavate the cut areas to the required typical section. These operations shall be incidental to Roadway Excavation or Embankment-in-Place and no additional compensation shall be made for this work.
- 5.) Some of the soil horizons and slopes on the project are subject to erosion. Necessary procedures in accordance with Sections 212 and 213 of the current Standard Specifications for Road and Bridge Construction shall be followed on construction.
- 6.) Removal of existing structures and other obstructions shall be completed in accordance with Section 203 of the current Standard Specifications for Road and Bridge Construction.
- 7.) Clearing and grubbing of roadway areas shall be completed in accordance with the requirements of Section 202 of the current Standard Specifications for Road and Bridge Construction before embankment placement.
- 8.) Borrow material, if required for subgrade, shall meet the minimum CBR value of 3.
- 9.) Foundation embankment benches shall be constructed in accordance with Standard

Drawing RGX-010 at the locations listed below and/or as directed by the Engineer. Contrary to Standard Drawing RGX-010, the typical rise height for benching into soil/earth slopes shall be 4 to 6 feet. Benches in soil/earth slopes shall be constructed one at a time beginning with the lowest bench and each bench shall be backfilled prior to excavation of the next bench.

US 127

118+75 to 123+00, Right

Ramp G

Station 18+75 to 19+75, Left

Station 24+75 to 26+75, Both Sides

- 10.) If groundwater is encountered during construction of embankment benches, construct a trench underdrain in accordance with Standard Drawing RDP-006 Detail B, except the trench shall have a minimum 2 ft. X 2 ft. cross-section and shall be placed in both soil or bedrock benches. The trench backfill shall consist of Kentucky Coarse Aggregate No. 2 in accordance with Section 805 of the current Standard Specifications or other durable, non-erodible material deemed suitable by the Engineer. The rock trench shall be graded to allow for positive drainage. The rock trench shall be wrapped in Fabric-Geotextile Class 2 (Subsurface Drainage) in accordance with Sections 214 and 843 of the current Standard Specifications. Contrary to Standard Drawing RDP-006, outlet underdrains (perpendicular to the roadway) shall follow Detail B with the same backfill and fabric materials given above. Spacing of outlet underdrains shall be approximately 300 ft along the roadway, or as directed by the Engineer.
- 11.) Perforated pipe for subgrade drainage shall be placed in vertical sags and cut to fill transitions in accordance with KY Standard Drawing RDP-005 at the following approximate locations and/or where designated by the Engineer.

Ramp G

Station 26+78

Ramp FF

Station 22+57

- 12.) Transverse benching shall be installed at the following approximate locations in accordance with Standard Drawing RDP-006 and any others designated by the Engineer.

Ramp G

Station 24+80 to 26+78

- 13.) In areas where pavement is not to be overlaid, existing bituminous concrete located at a distance less than three feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be removed entirely. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.

- 14.) As directed by the Engineer, existing bituminous concrete located at a distance greater than three feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be scarified or broken until all cleavage planes are destroyed, or the pavement shall be removed entirely as conditions demand. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.
- 15.) In order to provide a working platform for embankment construction, Non-Erodible Granular Embankment in accordance with the current edition of Section 805 of the Standard Specifications for Road and Bridge Construction shall be placed over all soft and/or saturated areas that may be detected during construction, as directed by the Engineer. The required thickness is estimated to be 2 foot, but the actual locations and thickness shall be determined by the Engineer during construction and may depend on seasonal fluctuations in the water table. This material shall be wrapped with Geotextile Fabric Class 2 (Separation) in accordance with Sections 214 and 843 of the Standard Specifications for Road and Bridge Construction, current edition.
- 16.) Construct a mechanically stabilized roadbed using 6 inches of aggregate base (DGA or CSB) underlain with High Strength Geotextile Fabric Class 1A between the aggregate and the soil subgrade. Where soft and/or wet subgrade is encountered during construction, the thickness of the stabilization may be increased or a 2-foot working platform consisting of Kentucky Coarse Aggregate No. 2's, 3's, or 23's underlain with Class 1 Geotextile Fabric (Stabilization). These adjustments shall be as directed by the Engineer.
- 17.) Where durable rock is encountered at the top of subgrade, the bedrock should be undercut to accommodate the 6 inches of mechanical stabilization.

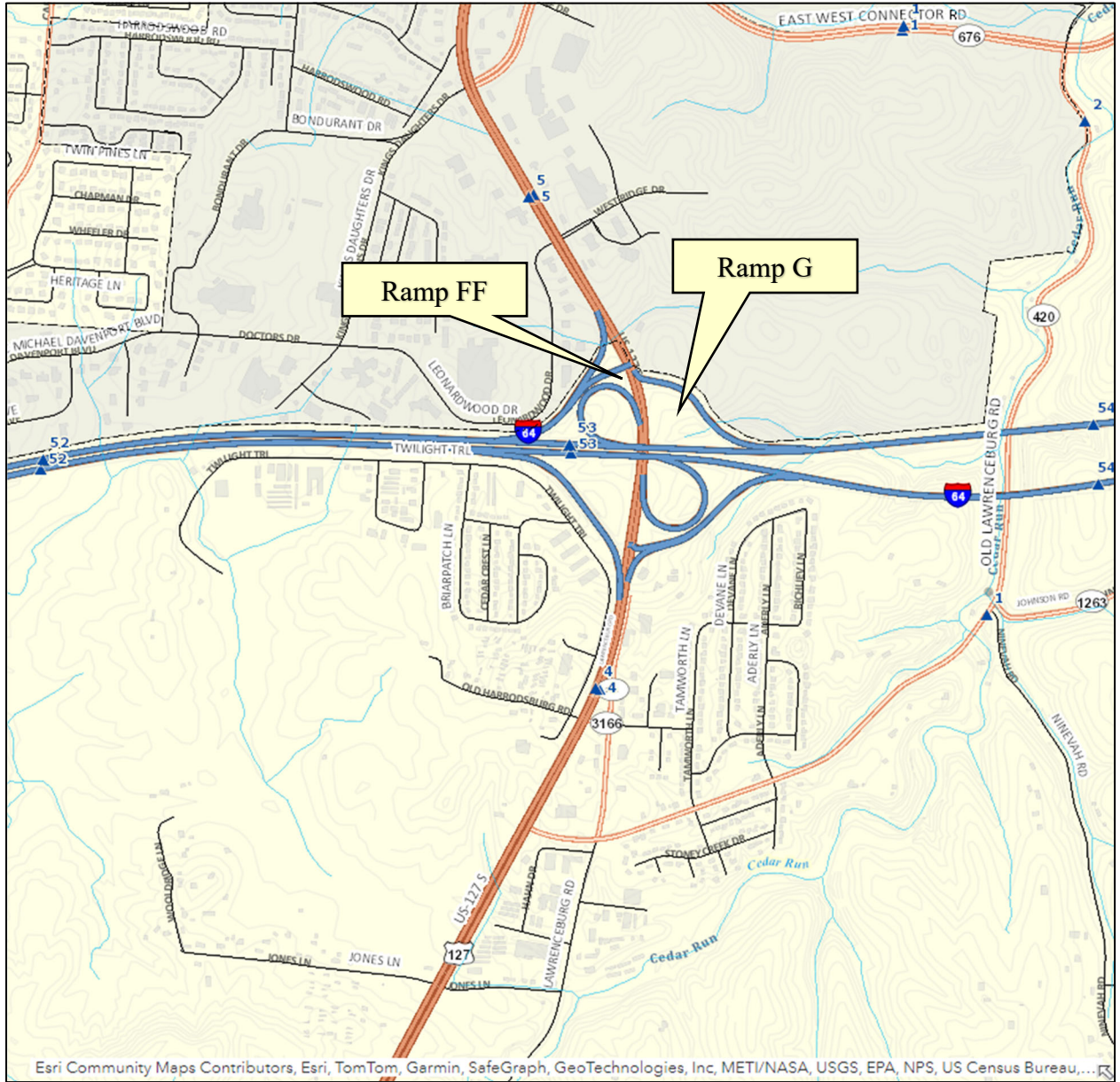
DESIGN RECOMMENDATIONS:

- 1.) This project should be designed for a 2-foot soil subgrade with a CBR design value of 3.
- 2.) An average soil shrinkage value of two (2) percent is estimated for this project. This value should be applied to the formula for calculating the Apparent Shrinkage as outlined in the Design Manual.

cc: Division of Design (Plan Processing Section)
TEBM for Pavement Design
Division of Construction
TEBM for Project Delivery & Preservation (District)
TEBM for Project Development (District)
Project Manager (District)
Design Consultant (QK4)

Attachments:

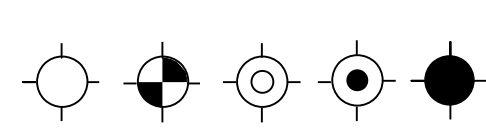
SITE MAP



GEOTECHNICAL SYMBOLS

AASHTO Classification of Soils and Soil-Aggregate Mixtures

General Classification	Granular Materials (35% or less passing 0.075 mm)							Silt-Clay Materials (More than 35% passing 0.075 mm)			
	A-1		A-3	A-2				A-4	A-5	A-6	A-7
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				
Sieve Analysis, Percent Passing											
2.00 mm (No. 10)	50 max	---	---	---	---	---	---	---	---	---	---
0.425 mm (No. 40)	30 max	50 max	51 min	---	---	---	---	---	---	---	---
0.075 mm (No. 200)	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
Characteristics of Fraction Passing 0.425 mm (No. 40)											
Liquid Limit	---	---	40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min	41 min
Plasticity Index	6 max	N.P.	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min	11 min

- AI Activity Index
- LI Liquidity Index
- S+C Silt + Clay (% finer than No.200 Sieve)
- Rockline Soundings
- ⊗ Disturbed Sample Boring
- ⊙ Undisturbed Sample Boring
- ⊙ Undisturbed Sample Boring & Rock Core
- Rock Core
- ⊙ Slope inclinometer Installation
typical applications: 
- OW Observation Well
- ➔ Approximate Footing Elevation
- ▼ (Date) Water Elevation

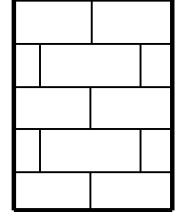
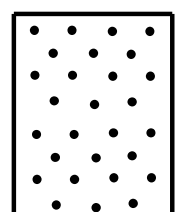
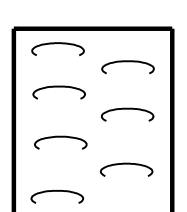
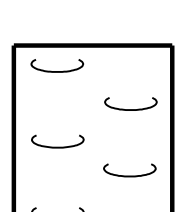
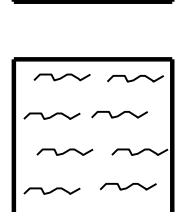
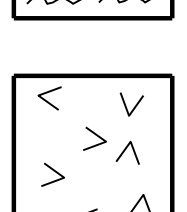
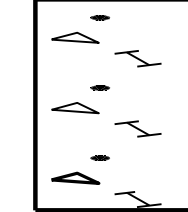

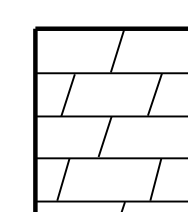
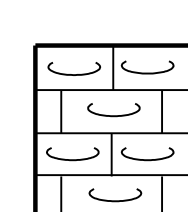
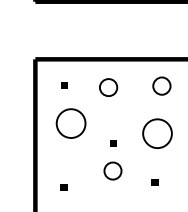
- VS (psf) Field Vane Shear Strength
- Thin-walled Tube Sample
- < Standard Penetration Test Sample
- N Penetration Resistance
- Qu (psf) Unconfined Compressive Strength
- UU (psf) Unconsolidated Undrained Triaxial Strength
- w% Moisture Content
- KY RQD Rock Quality Designation (Kentucky Method)
- STD RQD Rock Quality Designation (Standard Method)
- SDI(JS) Slake Durability Index (Jar Slake Test)
- REC Core Recovery
- φ Angle of Internal Friction (Total Stress)
- φ̄ Angle of Internal Friction (Effective Stress)
- c (psf) Cohesion (Total Stress)
- c̄ (psf) Cohesion (Effective Stress)
- γ (pcf) Total Unit Weight
- RDZ Rock Disintegration Zone
- OB Overburden Bench
- IB Intermediate Bench
- R Refusal
- NR Refusal Not Encountered

Unified Soil Classifications

MAJOR DIVISIONS	SYMBOL	NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GM Silty gravels, gravel-sand-silt mixtures.
		GC Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW Well graded sands or gravelly sands, little or no fines.
		SP Poorly graded sands or gravelly sands, little or no fines.
		SM Silty sands, sand-silt mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LESS THAN 50	ML Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		ML-CL Silty clay-silty clay with sand and or gravel, sandy silty clay, sandy silty clay with gravel, gravelly silty clay, gravelly silty clay with sand
	SILTS AND CLAYS LL IS GREATER THAN 50	MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH Inorganic clays of high plasticity, fat clays.

Unified Soil Classifications - Continued

MAJOR DIVISIONS	SYMBOL	NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GP-GC Poorly graded gravel with clay (or silty clay), poorly graded gravel with clay and sand (or silty clay & sand)
		GP-GM Poorly graded gravel with silt, poorly graded gravel with silt and sand
		GW-GC Well graded gravel with clay (or silty clay), well graded gravel with clay and sand (or silty clay and sand)
		GW-GM Well graded gravel with silt, well graded gravel with silt and sand
		GC-GM Silty clayey gravel, silty clayey gravel with sand
	SAND AND SANDY SOILS	SW-SC Well graded sand with clay (or silty clay), well graded sand with clay and gravel (or silty clay & gravel)
		SP-SC Poorly graded sand with clay (or silty clay), poorly graded sand with clay and gravel (or silty clay and gravel)
		SP-SM Poorly graded sand with silt, poorly graded sand with silt and gravel
		SC-SM Silty clayey sand, silty clayey sand with gravel
		SW-SM Well graded sand with silt, well graded sand with silt and gravel
UNCLASSIFIED MATERIAL	OH Organic (High Plasticity)	
	OL Organic (Low Plasticity)	

-  LIMESTONE
-  SANDSTONE
-  DURABLE SHALE (SDI ≥95)
-  NONDURABLE SHALE (SDI <95)
-  GRANULAR EMBANKMENT
-  STRUCTURE GRANULAR BACKFILL
-  TALUS, MINE WASTE, FILL MATERIAL, BOULDERS, & ETC.
-  COAL
-  DOLOMITE
-  LIMESTONE (ARGILLACEOUS)
-  SLOPE PROTECTION



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS



REVISION

DATE

PREPARED BY

DATE:

CHECKED BY

Division of Structural Design
Geotechnical Branch

DESIGNED BY:

DETAILED BY:

GEOTECHNICAL SYMBOL SHEET

ROUTE

US 127

ITEM NO.

05-80212.00

SHEET NO.

COUNTY OF

FRANKLIN

DRAWING NUMBER

R-001-2024

GEOTECHNICAL NOTES

- 1.) IN ACCORDANCE WITH SECTION 206 OF THE CURRENT STANDARD SPECIFICATIONS, THE MOISTURE CONTENT OF EMBANKMENT MATERIAL SHALL NOT VARY FROM THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE CURRENT VERSION OF KM 64-511 BY MORE THAN +2 PERCENT OR LESS THAN -2 PERCENT. THIS MOISTURE CONTENT REQUIREMENT SHALL HAVE EQUAL WEIGHT WITH THE DENSITY REQUIREMENT WHEN DETERMINING THE ACCEPTABILITY OF EMBANKMENT CONSTRUCTION. REFER TO THE FAMILY OF CURVES FOR MOISTURE/DENSITY CORRELATION.
- 2.) ALL SOILS, WHETHER FROM ROADWAY OR BORROW, MAY REQUIRE MANIPULATION TO OBTAIN PROPER MOISTURE CONTENT PRIOR TO COMPACTION. DIRECT PAYMENT SHALL NOT BE PERMITTED FOR REHANDLING, HAULING, STOCKPILING, AND/OR MANIPULATING SOILS.
- 3.) EXCAVATION OF SURFACE DITCHES AND CHANNEL CHANGES ADJACENT TO EMBANKMENT AREAS SHALL BE PERFORMED PRIOR TO THE PLACEMENT OF THE ADJACENT EMBANKMENTS. THE MATERIAL EXCAVATED FOR THE CHANNEL CHANGES AND SURFACE DITCHES IS SUITABLE FOR EMBANKMENT CONSTRUCTION IF DRIED TO PROPER MOISTURE CONTENT IN ACCORDANCE WITH SECTION 206 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 4.) THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING ANY OPERATIONS NECESSARY TO EXCAVATE THE CUT AREAS TO THE REQUIRED TYPICAL SECTION. THESE OPERATIONS SHALL BE INCIDENTAL TO ROADWAY EXCAVATION OR EMBANKMENT-IN-PLACE AND NO ADDITIONAL COMPENSATION SHALL BE MADE FOR THIS WORK.
- 5.) SOME OF THE SOIL HORIZONS AND SLOPES ON THE PROJECT ARE SUBJECT TO EROSION. NECESSARY PROCEDURES IN ACCORDANCE WITH SECTIONS 212 AND 213 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE FOLLOWED ON CONSTRUCTION.
- 6.) REMOVAL OF EXISTING STRUCTURES AND OTHER OBSTRUCTIONS SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 203 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 7.) CLEARING AND GRUBBING OF ROADWAY AREAS SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 202 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION BEFORE EMBANKMENT PLACEMENT.
- 8.) BORROW MATERIAL, IF REQUIRED FOR SUBGRADE, SHALL MEET THE MINIMUM CBR VALUE OF 3.
- 9.) FOUNDATION EMBANKMENT BENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING RGX-010 AT THE LOCATIONS LISTED BELOW AND/OR AS DIRECTED BY THE ENGINEER. CONTRARY TO STANDARD DRAWING RGX-010, THE TYPICAL RISE HEIGHT FOR BENCHING INTO SOIL/EARTH SLOPES SHALL BE 4 TO 6 FEET. BENCHES IN SOIL/EARTH SLOPES SHALL BE CONSTRUCTED ONE AT A TIME BEGINNING WITH THE LOWEST BENCH AND EACH BENCH SHALL BE BACKFILLED PRIOR TO EXCAVATION OF THE NEXT BENCH.

 US 127
 118+75 TO 123+00, RIGHT

 RAMP G
 STATION 18+75 TO 19+75, LEFT
 STATION 24+75 TO 26+75, BOTH SIDES
- 10.) IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION OF EMBANKMENT BENCHES, CONSTRUCT A TRENCH UNDERDRAIN IN ACCORDANCE WITH STANDARD DRAWING RDP-006 DETAIL B, EXCEPT THE TRENCH SHALL HAVE A MINIMUM 2 FT. X 2 FT. CROSS-SECTION AND SHALL BE PLACED IN BOTH SOIL OR BEDROCK BENCHES. THE TRENCH BACKFILL SHALL CONSIST OF KENTUCKY COARSE AGGREGATE NO. 2 IN ACCORDANCE WITH SECTION 805 OF THE CURRENT STANDARD SPECIFICATIONS OR OTHER DURABLE, NON-ERODIBLE MATERIAL DEEMED SUITABLE BY THE ENGINEER. THE ROCK TRENCH SHALL BE GRADED TO ALLOW FOR POSITIVE DRAINAGE. THE ROCK TRENCH SHALL BE WRAPPED IN FABRIC-GEOTEXTILE CLASS 2 (SUBSURFACE DRAINAGE) IN ACCORDANCE WITH SECTIONS 214 AND 843 OF THE CURRENT STANDARD SPECIFICATIONS. CONTRARY TO STANDARD DRAWING RDP-006, OUTLET UNDERDRAINS (PERPENDICULAR TO THE ROADWAY) SHALL FOLLOW DETAIL B WITH THE SAME BACKFILL AND FABRIC MATERIALS GIVEN ABOVE. SPACING OF OUTLET UNDERDRAINS SHALL BE APPROXIMATELY 300 FT ALONG THE ROADWAY, OR AS DIRECTED BY THE ENGINEER.
- 11.) PERFORATED PIPE FOR SUBGRADE DRAINAGE SHALL BE PLACED IN VERTICAL SAGS AND CUT TO FILL TRANSITIONS IN ACCORDANCE WITH KY STANDARD DRAWING RDP-005 AT THE FOLLOWING APPROXIMATE LOCATIONS AND/OR WHERE DESIGNATED BY THE ENGINEER.

 RAMP G
 STATION 26+78

 RAMP FF
 STATION 22+57
- 12.) TRANSVERSE BENCHING SHALL BE INSTALLED AT THE FOLLOWING APPROXIMATE LOCATIONS IN ACCORDANCE WITH STANDARD DRAWING RDP-006 AND ANY OTHERS DESIGNATED BY THE ENGINEER.

 RAMP G
 STATION 24+80 TO 26+78
- 13.) IN AREAS WHERE PAVEMENT IS NOT TO BE OVERLAID, EXISTING BITUMINOUS CONCRETE LOCATED AT A DISTANCE LESS THAN THREE FEET BELOW THE PROPOSED SUBGRADE ELEVATION WITHIN THE LIMITS OF NEW ROADWAY EMBANKMENTS, SHALL BE REMOVED ENTIRELY. THIS SHALL BE PERFORMED IN COMPLIANCE WITH SECTION 206 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 14.) AS DIRECTED BY THE ENGINEER, EXISTING BITUMINOUS CONCRETE LOCATED AT A DISTANCE GREATER THAN THREE FEET BELOW THE PROPOSED SUBGRADE ELEVATION WITHIN THE LIMITS OF NEW ROADWAY EMBANKMENTS, SHALL BE SCARIFIED OR BROKEN UNTIL ALL CLEAVAGE PLANES ARE DESTROYED, OR THE PAVEMENT SHALL BE REMOVED ENTIRELY AS CONDITIONS DEMAND. THIS SHALL BE PERFORMED IN COMPLIANCE WITH SECTION 206 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 15.) IN ORDER TO PROVIDE A WORKING PLATFORM FOR EMBANKMENT CONSTRUCTION, NON-ERODIBLE GRANULAR EMBANKMENT IN ACCORDANCE WITH THE CURRENT EDITION OF SECTION 805 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE PLACED OVER ALL SOFT AND/OR SATURATED AREAS THAT MAY BE DETECTED DURING CONSTRUCTION, AS DIRECTED BY THE ENGINEER. THE REQUIRED THICKNESS IS ESTIMATED TO BE 2 FOOT, BUT THE ACTUAL LOCATIONS AND THICKNESS SHALL BE DETERMINED BY THE ENGINEER DURING CONSTRUCTION AND MAY DEPEND ON SEASONAL FLUCTUATIONS IN THE WATER TABLE. THIS MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC CLASS 2 (SEPARATION) IN ACCORDANCE WITH SECTIONS 214 AND 843 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
- 16.) CONSTRUCT A MECHANICALLY STABILIZED ROADBED USING 6 INCHES OF AGGREGATE BASE (DGA OR CSB) UNDERLAIN WITH HIGH STRENGTH GEOTEXTILE FABRIC CLASS 1A BETWEEN THE AGGREGATE AND THE SOIL SUBGRADE. WHERE SOFT AND/OR WET SUBGRADE IS ENCOUNTERED DURING CONSTRUCTION, THE THICKNESS OF THE STABILIZATION MAY BE INCREASED OR A 2-FOOT WORKING PLATFORM CONSISTING OF KENTUCKY COARSE AGGREGATE NO. 2'S, 3'S, OR 23'S UNDERLAIN WITH CLASS 1 GEOTEXTILE FABRIC (STABILIZATION). THESE ADJUSTMENTS SHALL BE AS DIRECTED BY THE ENGINEER.
- 17.) WHERE DURABLE ROCK IS ENCOUNTERED AT THE TOP OF SUBGRADE, THE BEDROCK SHOULD BE UNDERCUT TO ACCOMMODATE THE 6 INCHES OF MECHANICAL STABILIZATION.

Field Drilling and Sampling were performed in March 2024.

Detailed data and interpretation of subsurface conditions encountered in individual borings are shown on the soil profile. Soil and rock strata descriptions and indicated boundaries are based on engineering interpretation of available subsurface information obtained at selected locations, and may not necessarily reflect the actual variation in subsurface conditions between borings and samples.

The observed water levels and/or subsurface conditions indicated on the soil profile are as recorded at the time of exploration. These water levels and/or subsurface conditions may vary considerable with time, according to the prevailing climate, rainfall or other factors and are otherwise dependent on the duration of and methods used in the exploration program.

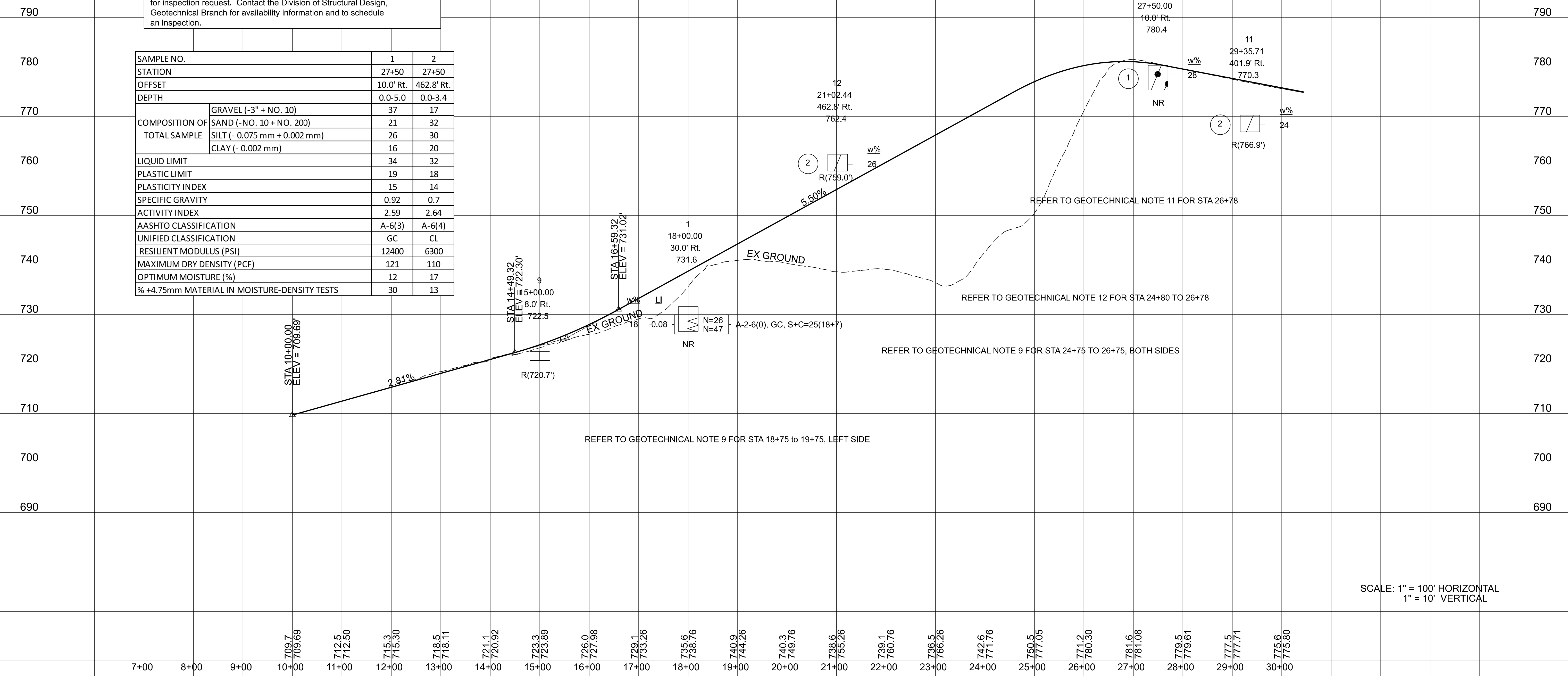
Selected rock cores and all applicable drill logs, are stored at the Division of Structural Design in Frankfort and are available for inspection request. Contact the Division of Structural Design, Geotechnical Branch for availability information and to schedule an inspection.

NOTICE - Without regard to the materials encountered, all roadway and drainage excavation shall be unclassified and shall be designated as Roadway Excavation. It shall be distinctly understood that any reference to rock, earth or any other materials on the plans or cross sections whether in numbers, words, letters, or lines, is solely for the Department's information and is not to be taken as an indication of classified excavation or the quantity of either rock, earth or any other material involved.

The bidder must draw his own conclusions as to the conditions to be encountered. The Department does not give any guarantee as to the accuracy of the data and no claim will be considered for additional compensation when the materials encountered are not in accord with the classification shown

PAVEMENT BORING SUMMARY					
BORING NO.	STATION	OFFSET	ASPHALT THICKNESS (FT)	DGA/CSB THICKNESS (FT)	SUBGRADE SOIL
9	15+00	8' RT	1.3	0.5	Bedrock

SAMPLE NO.	1	2
STATION	27+50	27+50
OFFSET	10.0' Rt.	462.8' Rt.
DEPTH	0.0-5.0	0.0-3.4
COMPOSITION OF TOTAL SAMPLE	GRAVEL (-3" + NO. 10)	37
	SAND (-NO. 10 + NO. 200)	21
	SILT (- 0.075 mm + 0.002 mm)	26
	CLAY (- 0.002 mm)	16
LIQUID LIMIT	34	32
PLASTIC LIMIT	19	18
PLASTICITY INDEX	15	14
SPECIFIC GRAVITY	0.92	0.7
ACTIVITY INDEX	2.59	2.64
AASHTO CLASSIFICATION	A-6(3)	A-6(4)
UNIFIED CLASSIFICATION	GC	CL
RESILIENT MODULUS (PSI)	12400	6300
MAXIMUM DRY DENSITY (PCF)	121	110
OPTIMUM MOISTURE (%)	12	17
% +4.75mm MATERIAL IN MOISTURE-DENSITY TESTS	30	13



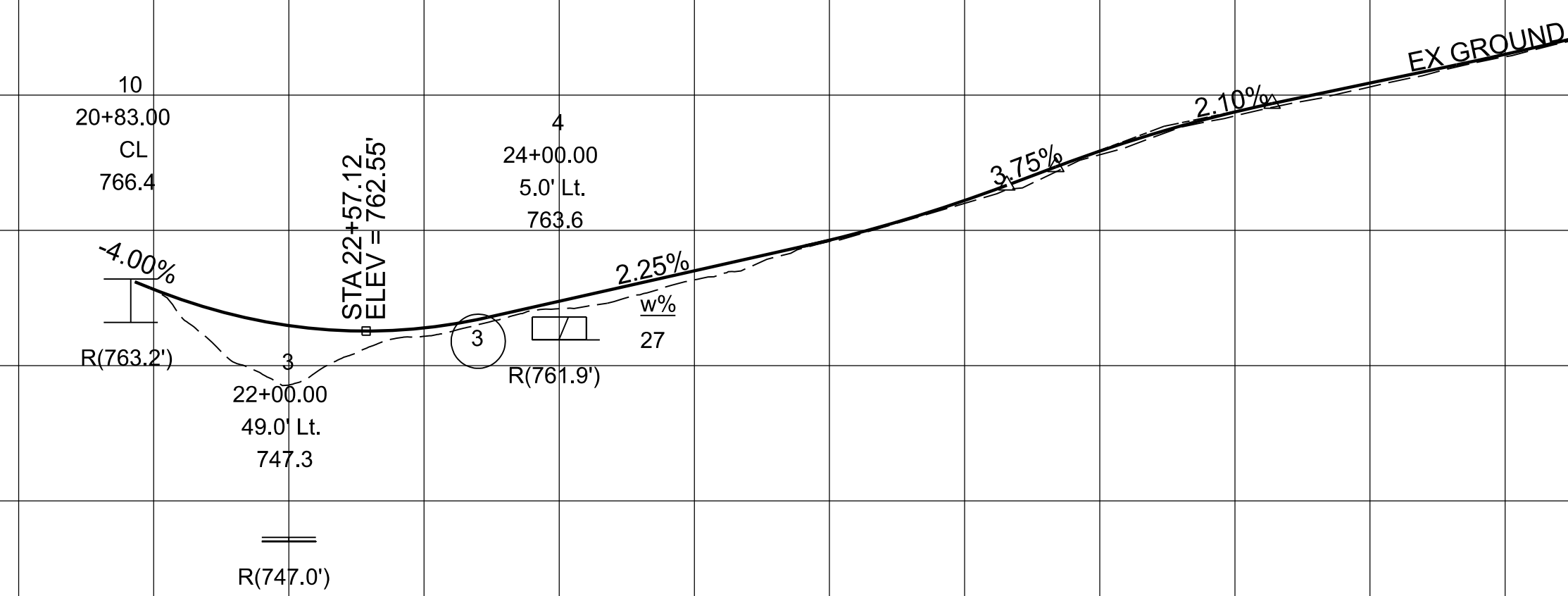
SCALE: 1" = 100' HORIZONTAL
1" = 10' VERTICAL

SAMPLE NO.	3	
STATION	24+00	
OFFSET	5.0' Lt.	
DEPTH	0.0-1.7	
COMPOSITION OF TOTAL SAMPLE	GRAVEL (-3" + NO. 10)	7
	SAND (-NO. 10 + NO. 200)	8
	SILT (- 0.075 mm + 0.002 mm)	45
	CLAY (- 0.002 mm)	40
LIQUID LIMIT	46	
PLASTIC LIMIT	26	
PLASTICITY INDEX	20	
SPECIFIC GRAVITY	0.51	
ACTIVITY INDEX	2.54	
AASHTO CLASSIFICATION	A-7-6(19)	
UNIFIED CLASSIFICATION	CL	
RESILIENT MODULUS (PSI)	9400	
MAXIMUM DRY DENSITY (PCF)	105	
OPTIMUM MOISTURE (%)	20	
% +4.75mm MATERIAL IN MOISTURE-DENSITY TESTS	6	

PAVEMENT BORING SUMMARY					
BORING NO.	STATION	OFFSET	ASPHALT THICKNESS (FT)	DGA/CSB THICKNESS (FT)	SUBGRADE SOIL
10	20+83	CL	1.9	0.4	Silt (ML)

810
800
790
780
770
760
750
740
730

810
800
790
780
770
760
750
740
730



REFER TO GEOTECHNICAL NOTE 11 FOR STA 22+57

SCALE: 1" = 100' HORIZONTAL
1" = 10' VERTICAL

768.5 768.66	765.7 765.64	758.6 762.96	762.2 762.78	764.2 764.76	766.3 767.01	769.2 769.27	772.0 772.21	775.6 775.86	778.5 778.76	780.6 780.90	782.8 783.02	785.3 785.45
20+00	21+00	22+00	23+00	24+00	25+00	26+00	27+00	28+00	29+00	30+00	31+00	32+00



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS



REVISION

DATE

PREPARED BY
Division of Structural Design
Geotechnical Branch

DATE:
DESIGNED BY:
DETAILED BY:

CHECKED BY

STA 20+00 TO 32+00

SOIL PROFILE

ROUTE
RAMP FF

ITEM NO.
05-80212.00
SHEET NO.

COUNTY OF
FRANKLIN
DRAWING NUMBER
R-001-2024

