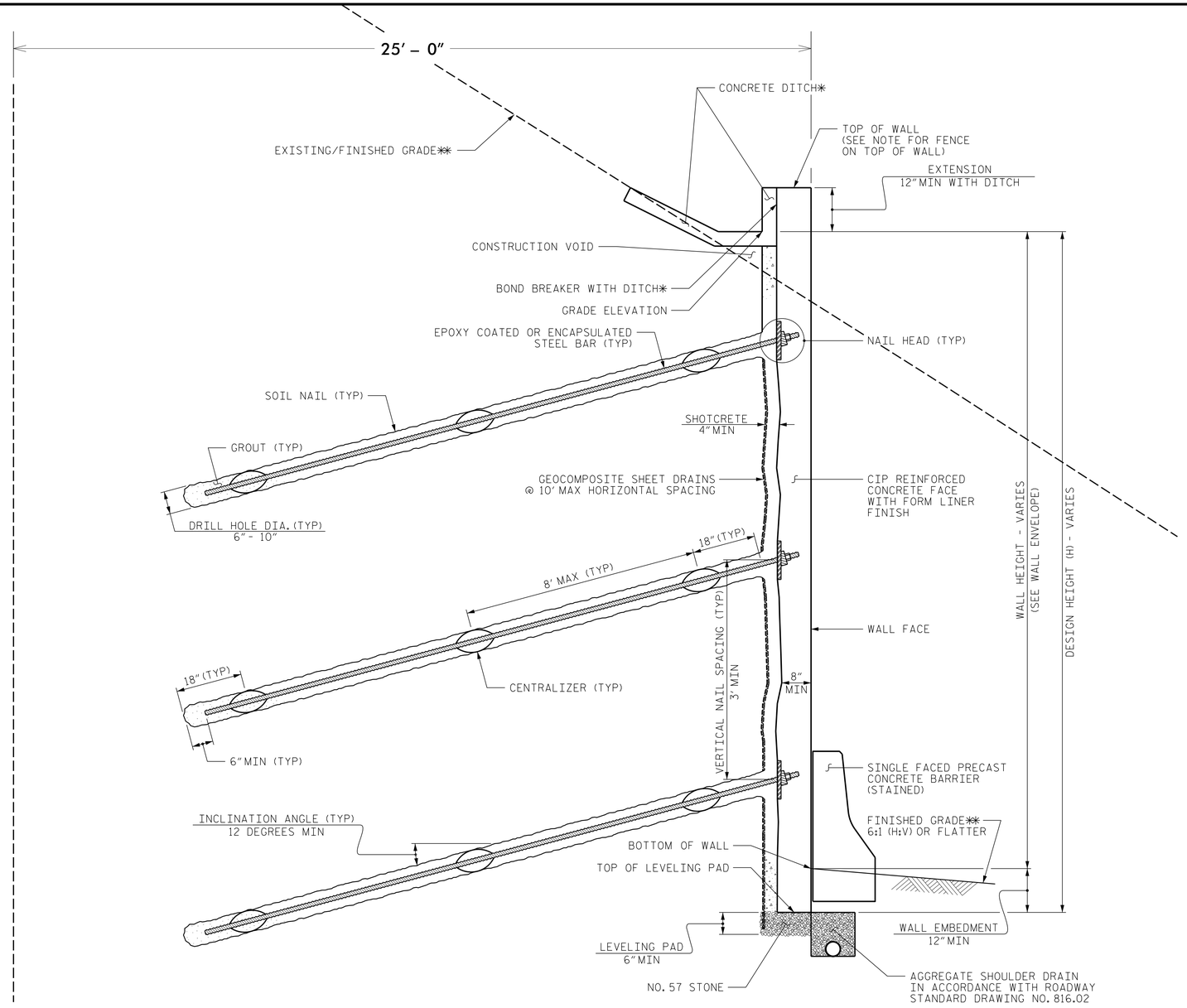
DocuSign Envelope ID: 8A5DB75C-02CD-4367-B5CC-FAF3B7DDC83E

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL DocuSigned by: 8AD7038 2A4484F4 08/01/2022 SIGNATURE DATE	SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMANENT EASEMENT



SOIL NAIL WALL - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL DETAILS.
**SEE PLANS FOR FINISHED GRADE.

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

FOR SINGLE FACED PRECAST CONCRETE BARRIER (STAINED), SEE ROADWAY PLANS, SECTION 857 OF THE STANDARD SPECIFICATION, AND SIMULATED STONE FORM LINER FINISH SPECIAL PROVISION.

RETAINING WALL #22 HAS SADDLES THAT REQUIRE DRAINAGE STRUCTURES TO BE INSTALLED BEHIND THE WALL. SEE ROADWAY AND HYDRAULIC PLANS FOR STRUCTURE TYPE AND LOCATION.

A FENCE IS REQUIRED ON TOP OF RETAINING WALL #22. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

A FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL #22. THE CONTRACTOR SHALL PROVIDE THE REQUESTED FINISH BEFORE BEGINNING CIP REINFORCED CONCRETE FACE CONSTRUCTION. THE APPEARANCE (STONE SIZE AND SHAPE, STONE COLOR, AND STONE TEXTURE, PATTERN, AND RELIEF) SHOULD MATCH NATURAL STONE AND ROCK. FOR FORM LINER ARCHITECHTURAL FINISH, SEE THE SIMULATED STONE FORM LINER FNISH SPECIAL PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL #22, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL #22 FOR THE FOLLOWING:
1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MINIMUM WALL EMBEDMENT ELEVATION = VARIES (MIN. 1 FT BELOW PROPOSED FINISHED GRADE ELEVATION)
4) IN-SITU ASSUMED MEDIUM DENSE TO VERY DENSE RESIDUAL SOIL PARAMETERS:
   UNIT WEIGHT, γ = 125 PCF
   FRICTION ANGLE, ϕ = 36 DEGREES
   COHESION, c = 0 PSF

WHEN ANALYZING FOR INFINITE SLOPE CONDITIONS, DESIGNERS SHOULD ANALYZE UP TO TWO (2) TIMES THE WALL HEIGHT BEHIND THE WALL FACE FOR FAILURE PLANE SEARCHES. THIS INFORMATION SHOULD BE INCLUDED WITH THE DESIGN SUBMITTAL.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL #22.

THE PROPOSED RIGHT OF WAY (ROW) AND PERMANENT EASEMENT (PE) BOUNDARY VARIES FROM THE FACE OF RETAINING WALL #22. SEE THE ROADWAY PLANS FOR OFFSET DISTANCES FROM THE FACE OF RETAINING WALL #22. SOIL NAILS MAY NOT BE INSTALLED BEYOND THE PE BOUNDARY. SEE "SOIL NAIL WALL - TYPICAL SECTION" DETAIL.

IF GROUNDWATER IS ENCOUNTERED BEHIND THE FACE OF RETAINING WALL #22, HORIZONTAL DRAINS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER. FOR HORIZONTAL DRAINS, SEE THE RETAINING WALL HORIZONTAL DRAIN DETAIL.

WHERE CONSTRUCTION VOIDS EXIST ALONG THE TOP OF RETAINING WALL #22, THE CONTRACTOR SHOULD BE PREPARED TO FORM THE CANTILEVERED SECTION OF THE CIP REINFORCED CONCRETE FACE TO THE TOP OF WALL ELEVATION. THE CONSTRUCTION VOID SHOULD BE FILLED WITH CONCRETE OR SHOTCRETE PRIOR TO CONSTRUCTION OF THE CONCRETE DITCH. ADDITIONAL WALL FACE REINFORCEMENT OR SOIL NAILS MAY BE REQUIRED FOR TALLER THAN TYPICAL CANTILEVER FACE HEIGHTS.

GROUND MAY NOT EXIST ABOVE THE BOTTOM OF THE WALL IN SOME PORTIONS OF THE WALL ENVELOPE. USE CONVENTIONAL GRADING, TEMPORARY WALL, OR OTHER METHOD ACCEPTABLE TO THE ENGINEER TO CREATE GROUND ABOVE EXISTING GRADE IN ORDER TO CONSTRUCT THE SOIL NAIL WALL. THE CONTRACT UNIT PRICE FOR SOIL NAIL RETAINING WALLS WILL BE FULL COMPENSATION FOR THIS WORK, IF REQUIRED.

PROJECT NO.: A-0009CC
GRAHAM COUNTY
RETAINING WALL #22: -L- 438+96, 34' LT TO 442+58, 34' LT
SHEET 2 OF 3

PREPARED BY: R. KRAL	DATE: 7/9/2022
REVIEWED BY: M. BREWER	DATE: 7/9/2022

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL #22
SOIL NAIL RETAINING WALL

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		
1			3				W22-2
2			4				