

DETAIL FOR WALL #35

NOT TO SCALE
-Y2- STA. 77+94.00 TO -Y2- STA. 88+25.00, LT

ESTIMATED SOIL NAIL WALL QUANTITIES			
RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
35	15,690*	5	35
HORIZONTAL DRAINS (CONTIGENCY)			520 LF

* INCLUDES RETAINING WALL EMBEDMENT

SOIL NAIL RETAINING WALL #35						
STA. -Y2-	OFFSET FROM -Y2- (LT) FT.	ELEV. @ TOP OF WALL	BOW FINISHED GRADE	TOP OF LEVELING PAD	ESTIMATED WALL EMBEDMENT FT.	WALL DESIGN HEIGHT "H"
77+94.00	33.50	2095.83	2095.83	2094.83	1.00	1.00
78+00.00	33.50	2098.90	2095.42	2094.42	1.00	3.48
78+50.00	33.50	2099.39	2092.10	2091.10	1.00	7.29
79+00.00	33.32	2101.78	2088.83	2087.83	1.00	12.95
79+50.00	33.05	2096.30	2085.72	2084.72	1.00	10.58
80+00.00	32.76	2091.88	2083.20	2082.20	1.00	8.68
80+12.00	32.69	2091.50	2082.68	2081.68	1.00	8.82
80+50.00	32.47	2095.68	2081.07	2080.07	1.00	14.61
81+00.00	32.17	2099.80	2079.13	2078.13	1.00	20.67
81+50.00	31.87	2099.55	2077.37	2076.37	1.00	22.18
82+00.00	31.56	2099.30	2075.79	2074.79	1.00	23.51
82+18.00	31.45	2097.50	2075.25	2074.25	1.00	22.25
82+50.00	31.25	2100.32	2074.24	2073.24	1.00	26.08
82+70.00	31.12	2095.62	2073.63	2072.63	1.00	21.99
83+00.00	30.93	2092.51	2072.71	2071.71	1.00	19.80
83+50.00	30.61	2092.26	2071.17	2070.17	1.00	21.09
84+00.00	30.28	2092.01	2069.63	2068.63	1.00	22.38
84+50.00	29.96	2087.43	2068.09	2067.09	1.00	19.34
85+00.00	29.63	2085.10	2066.55	2065.55	1.00	18.55
85+50.00	29.30	2080.14	2065.01	2064.01	1.00	15.13
86+00.00	28.97	2075.16	2063.47	2062.47	1.00	11.69
86+50.00	28.65	2069.24	2061.91	2060.91	1.00	7.33
87+00.00	28.33	2064.89	2060.29	2059.29	1.00	4.60
87+50.00	28.00	2062.27	2058.74	2057.74	1.00	3.53
88+00.00	27.69	2062.11	2057.38	2056.38	1.00	4.73
88+25.00	27.53	2057.45	2057.45	2056.45	1.00	1.00

BOW = BOTTOM OF WALL
ALL MEASUREMENTS ARE IN FEET

NOTES:

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

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

RETAINING WALL #35 HAS SADDLES THAT REQUIRE DRAINAGE STRUCTURES TO BE INSTALLED BEHIND THE WALL. SEE ROADWAY AND HYDRAULIC PLANS FOR STRUCTURE TYPE AND LOCATION.

A HANDRAIL IS REQUIRED ON TOP OF RETAINING WALL #35. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL #35, 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 #35 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 LOOSE TO MEDIUM DENSE RESIDUAL SOIL PARAMETERS:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 0 PSF
- 5) 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
- 6) IN-SITU ASSUMED SOFT TO MEDIUM STIFF RESIDUAL SOIL PARAMETERS:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 0 PSF
- 7) IN-SITU ASSUMED MEDIUM STIFF TO VERY STIFF RESIDUAL SOIL PARAMETERS:
UNIT WEIGHT, γ = 125 PCF
FRICTION ANGLE, ϕ = 34 DEGREES
COHESION, c = 0 PSF
- 8) IN-SITU ASSUMED WEATHERED ROCK PARAMETERS:
UNIT WEIGHT, γ = 135 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 500 PSF
- 9) IN-SITU ASSUMED CRYSTALLINE ROCK PARAMETERS:
UNIT WEIGHT, γ = 170 PCF
FRICTION ANGLE, ϕ = 34 DEGREES
COHESION, c = 1,000 PSF
- 10) WHERE ROCK IS ENCOUNTERED IN THE WALL ENVELOPE, DESIGNERS SHOULD REFER TO THE FHWA PRESUMPTIVE STRENGTH PARAMETERS OR OTHER REPRESENTATIVE AND REPEATABLE VALUES AND PROVIDE SOURCE REFERENCES IN THEIR DESIGN SUBMITTAL.

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 #35.


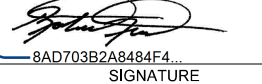
THE PROPOSED PERMANENT EASEMENT (PE) BOUNDARY IS 57 FT FROM THE FACE OF RETAINING WALL #35. SOIL NAILS MAY NOT BE INSTALLED BEYOND THE PROPOSED PE BOUNDARY. SEE "SOIL NAIL WALL - TYPICAL SECTION" DETAIL.

IF GROUNDWATER IS ENCOUNTERED BEHIND THE FACE OF RETAINING WALL #35, HORIZONTAL DRAINS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER. FOR HORIZONTAL DRAINS, SEE THE RETAINING WALL HORIZONTAL DRAIN DETAIL.

WHERE ROCK IS PRESENT IN THE WALL ENVELOPE, CONTROLLED BLASTING IS RECOMMENDED, BUT NOT REQUIRED, TO MAINTAIN THE NEAT EXCAVATION LINE. VOIDS, RESULTING FROM BLASTING OR EXCAVATING, THAT EXTEND BEYOND THE NEAT LINES ARE TO BE FILLED WITH A COMBINATION OF SHORT SOIL NAILS, WELDED WIRE, AND SHOTCRETE, AT THE DISCRETION OF THE ENGINEER. THE COSTS ASSOCIATED WITH THIS WORK WILL BE CONSIDERED INCIDENTAL TO WALL CONSTRUCTION AND NO ADDITIONAL COMPENSATION WILL BE MADE. FOR BLASTING, SEE THE BLASTING PROVISION.

WHERE CONSTRUCTION VOIDS EXIST ALONG THE TOP OF RETAINING WALL #35, 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.

GEOTECHNICAL ENGINEER  SEAL 042642 ROBERT E. KRAL	ENGINEER
DocuSigned by:  SIGNATURE	08/01/2022 DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PROJECT NO.: A-0009CC

GRAHAM COUNTY

RETAINING WALL #35: -Y2- 77+94, 34' LT TO 88+25, 28' LT


SHEET 2 OF 4

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

Prepared in the Office of:



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**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

**RETAINING WALL #35
SOIL NAIL RETAINING WALL**

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO.
W35-2