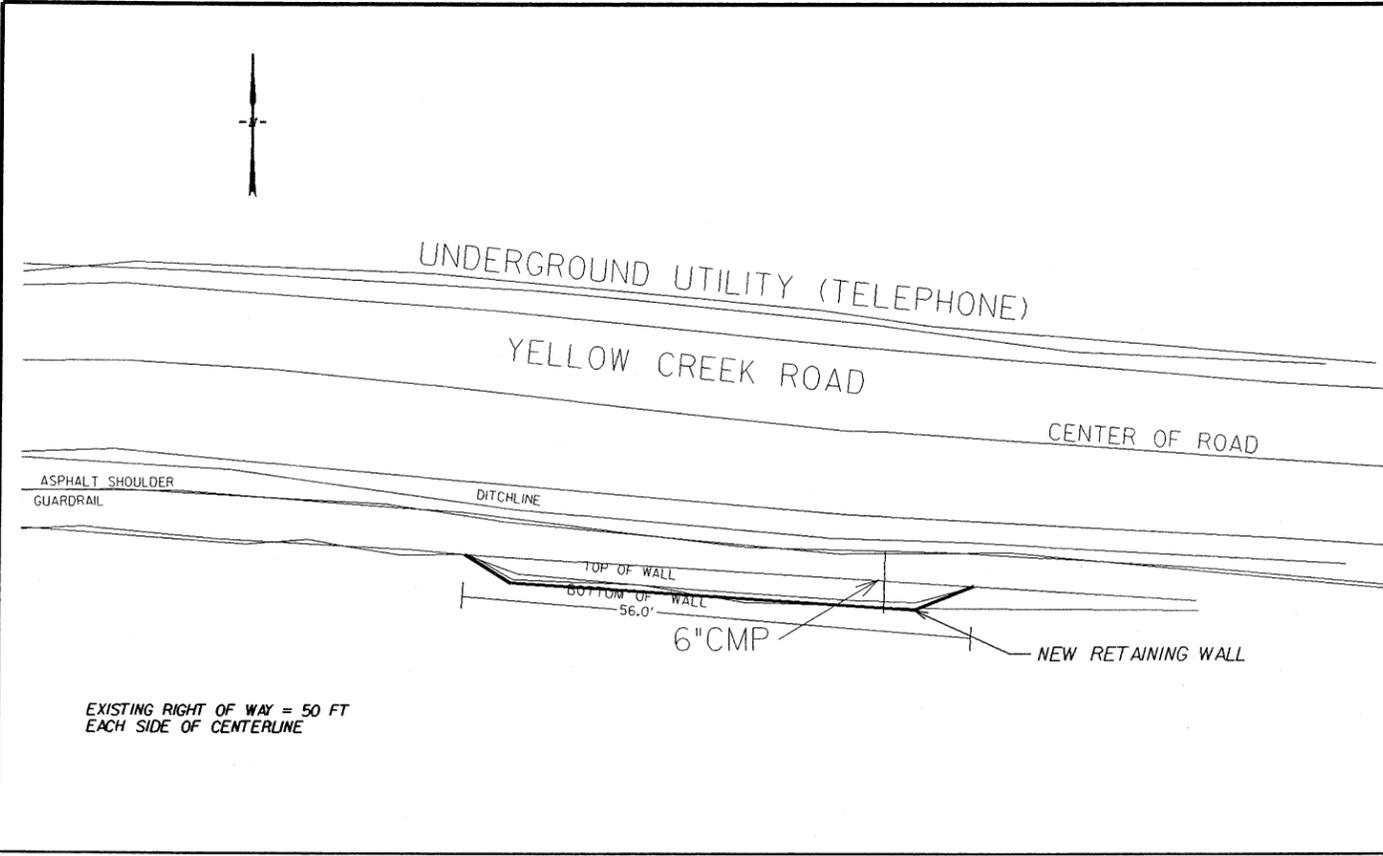


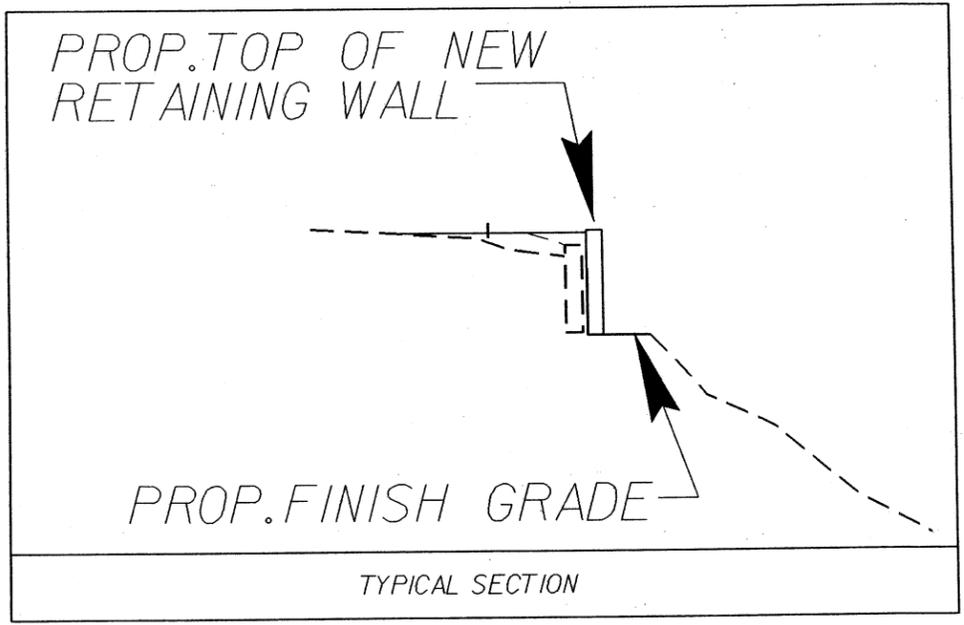
GEOTECHNICAL ENGINEER

ENGINEER

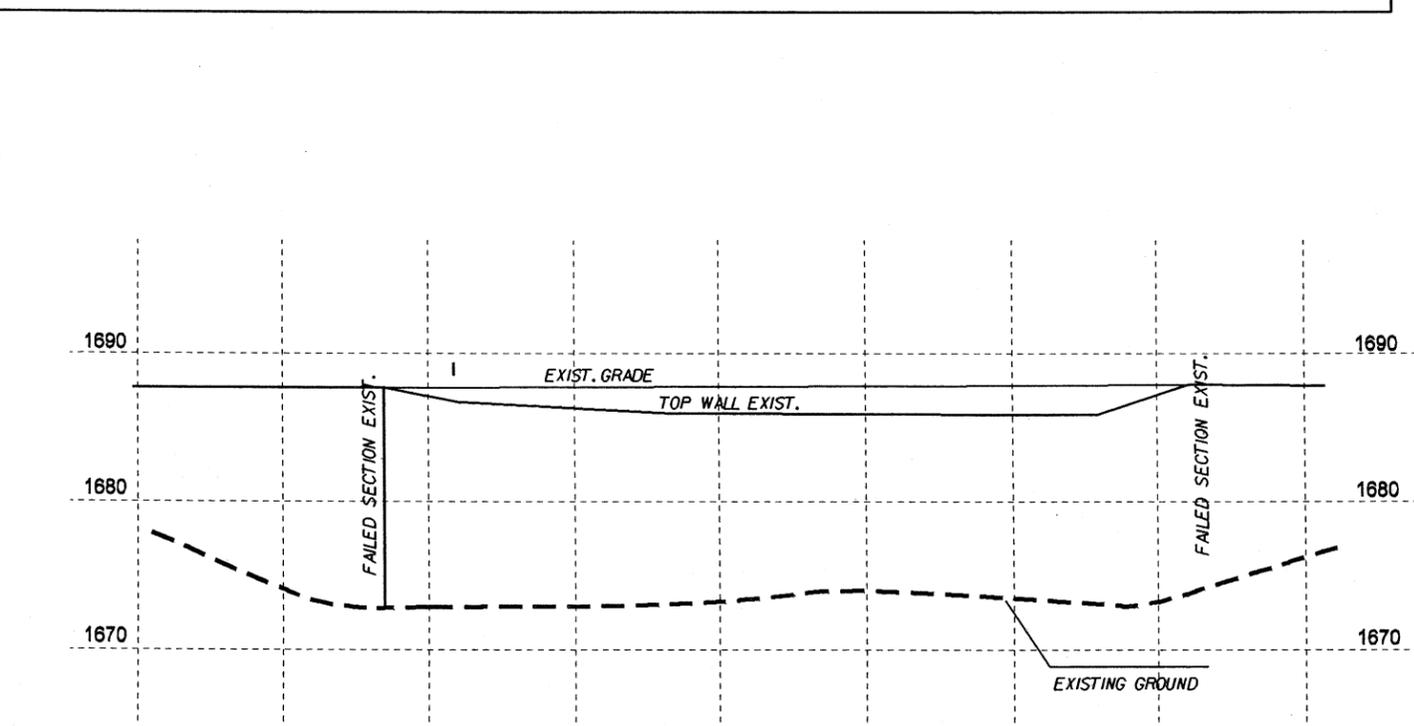
Shane C. Clark
 SIGNATURE DATE 8/17/13



LOCATION SKETCH



TYPICAL SECTION



PROJECT NO.: 13914.1030814
 GRAHAM COUNTY
 STATION: SEE SITE MAP
 SHEET 1 OF 1

PREPARED BY: J SALVO DATE: 8/2013
 REVIEWED BY: S CLARK DATE: 8/2013

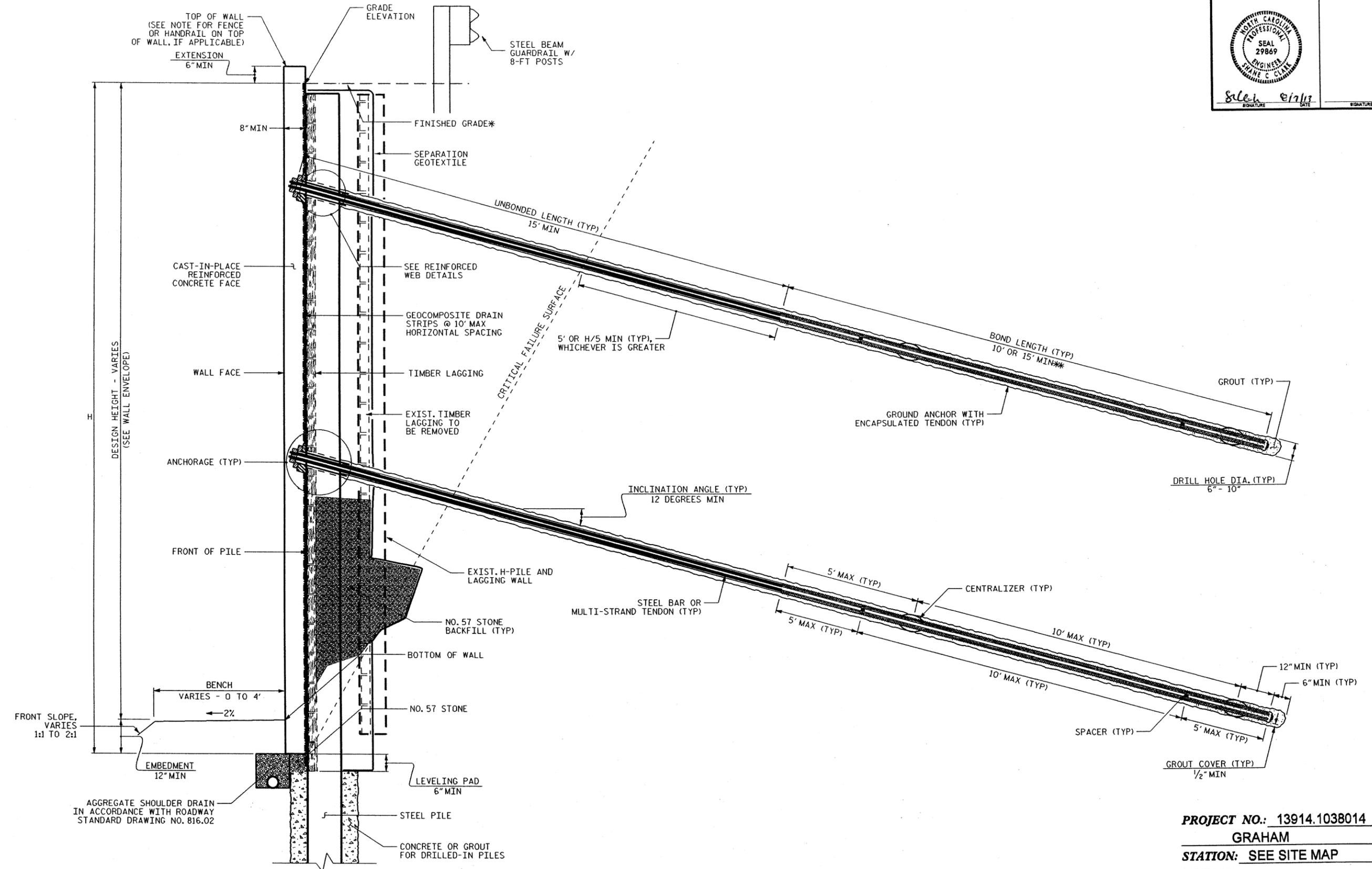
GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

REVISIONS						SHEET NO. 1
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 4
2			4			

RETAINING WALL NO. 1



ANCHORED WALL - TYPICAL SECTION
(DOUBLE ROW OF GROUND ANCHORS SHOWN, AS NEEDED.)
*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.
**SEE ANCHORED RETAINING WALLS PROVISION FOR BOND LENGTH REQUIREMENTS.

PROJECT NO.: 13914.1038014
GRAHAM COUNTY
STATION: SEE SITE MAP
SHEET 1 OF 2

PREPARED BY: J SALVO
REVIEWED BY: S CLARK
DATE: 8/2013
DATE: 8/2013

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**RETAINING WALL NO. 1
OPTION #1
ANCHORED RETAINING WALL**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	2
1			3			TOTAL SHEETS
2			4			4

NOTES:

FOR ANCHORED RETAINING WALLS, SEE ANCHORED RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

A FENCE IS REQUIRED ON TOP OF RETAINING WALL NO. 1. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.

DESIGN RETAINING WALL NO. 1 FOR INTERNAL, EXTERNAL, AND GLOBAL STABILITY.

BEFORE BEGINNING ANCHORED WALL DESIGN FOR RETAINING WALL NO. 1, 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 NO. 1 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS (SOIL):
 UNIT WEIGHT, $\gamma = 120$ LB/CF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ LB/SF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS (WEATHERED ROCK):
 UNIT WEIGHT, $\gamma = 135$ LB/CF
 FRICTION ANGLE, $\phi = 40$ DEGREES
 COHESION, $c = 50$ LB/SF

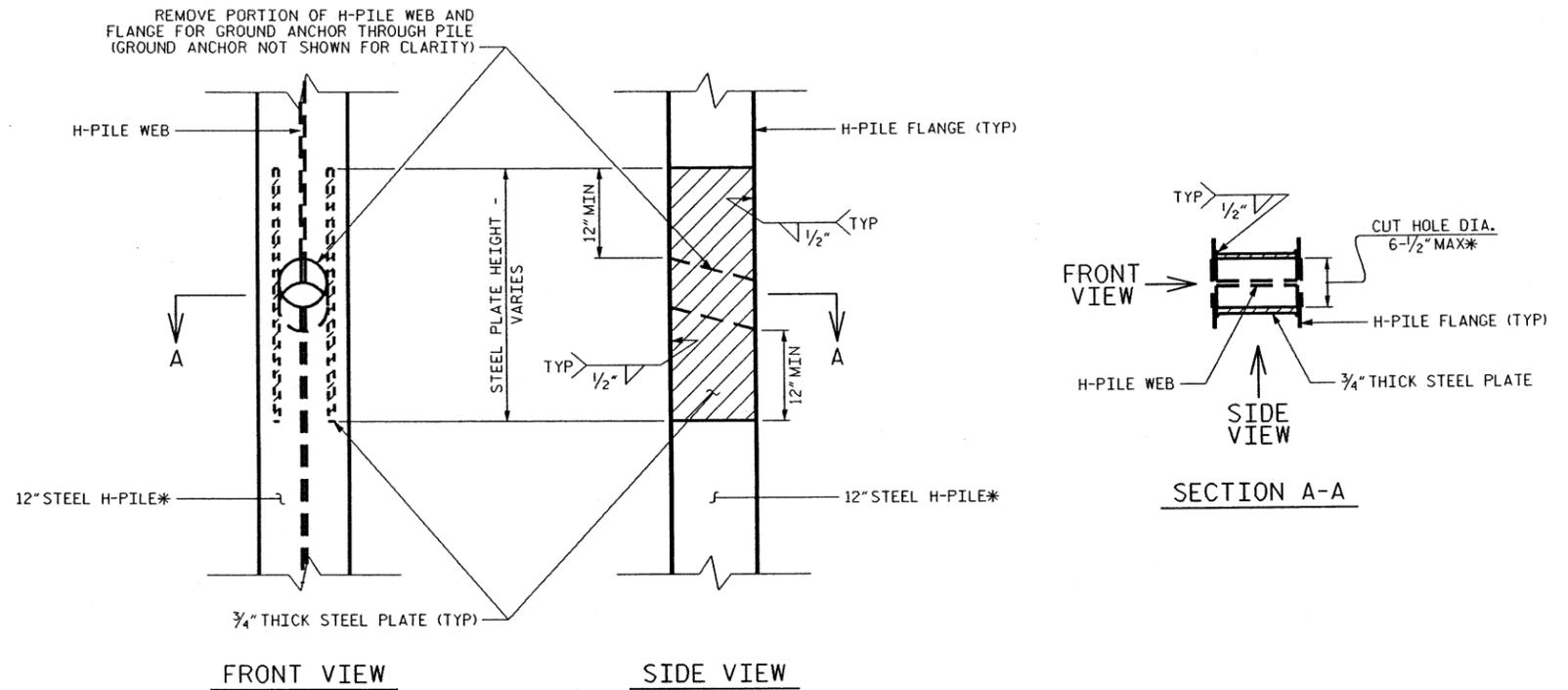
DESIGN RETAINING WALL NO. 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL NO. 1 FOR A PIPE EXTENDING UNDER OR THROUGH THE WALL. VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING ANCHORED WALL DESIGN OR CONSTRUCTION.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH GROUND ANCHORS FOR RETAINING WALL NO. 1.

REINFORCING OF THE EXISTING TIMBER PILE WALL MAY BE REQUIRED TO DRILL NEW PILE LOCATIONS. REINFORCEMENT OF THE WALL WILL BE CONSIDERED INCIDENTAL TO THE NEW RETAINING WALL AND NO ADDITIONAL COMPENSATION WILL BE MADE.

DAMAGE THAT OCCURS TO THE EXISTING WALL OUTSIDE OF THE NEW WALL LIMITS WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.



REINFORCED WEB DETAILS

*DETAILS SHOWN ARE FOR 12" H-PILES WITH 6" DIA. GROUND ANCHORS. FOR DIFFERENT DIAMETER ANCHORS, SUBMIT ALTERNATE REINFORCED WEB DETAILS FOR ACCEPTANCE.

TOTAL STRUCTURE QUANTITIES - OPTION #1	
RETAINING WALL NO. 1	1,050 SQ. FT.

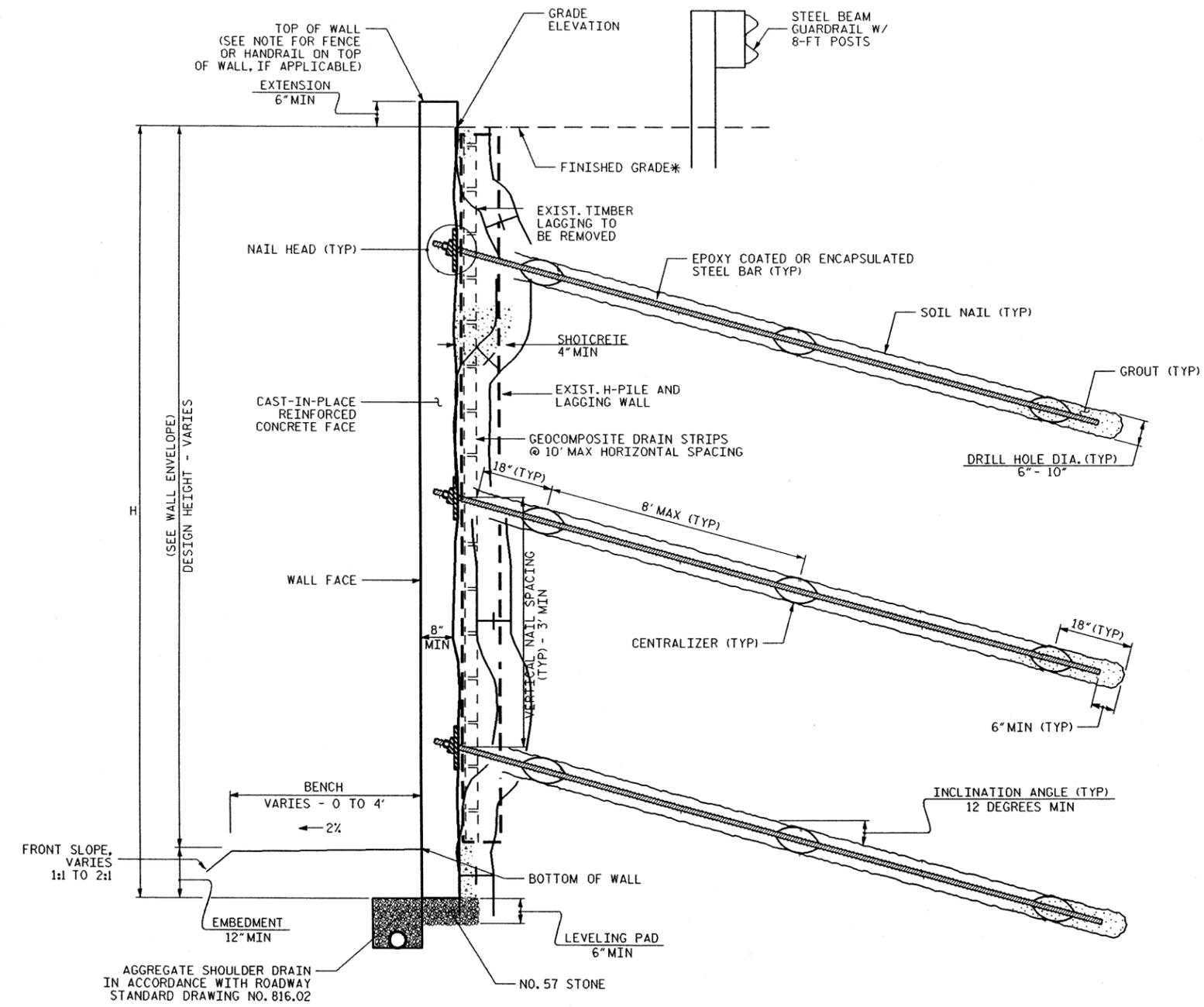
PROJECT NO.: 13914.1038014
 GRAHAM COUNTY
 STATION: SEE SITE MAP
 SHEET 2 OF 2

GEOTECHNICAL ENGINEERING UNIT
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 CONTRACT OFFICE
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	3
1			3			TOTAL SHEETS
2			4			4

RETAINING WALL NO. 1
OPTION #1
ANCHORED RETAINING WALL

PREPARED BY: J SALVO	DATE: 8/2013
REVIEWED BY: S CLARK	DATE: 8/2013



SOIL NAIL WALL - TYPICAL SECTION
 *SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.

NOTES:

- FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- A FENCE IS REQUIRED ON TOP OF RETAINING WALL NO.1. SEE ROADWAY PLANS FOR FENCE ATTACHMENT DETAILS.
- DESIGN RETAINING WALL NO.1 FOR INTERNAL, EXTERNAL, AND GLOBAL STABILITY.
- BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO.1, 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 NO.1 FOR THE FOLLOWING:
 - 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) IN-SITU ASSUMED MATERIAL PARAMETERS (SOIL):
 - UNIT WEIGHT, $\gamma = 120$ LB/CF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ LB/SF
 - 4) IN-SITU ASSUMED MATERIAL PARAMETERS (WEATHERED ROCK):
 - UNIT WEIGHT, $\gamma = 135$ LB/CF
 - FRICTION ANGLE, $\phi = 40$ DEGREES
 - COHESION, $c = 50$ LB/SF
- DESIGN RETAINING WALL NO.1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
- DESIGN RETAINING WALL NO.1 FOR A PIPE EXTENDING THROUGH THE WALL. VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING SOIL NAIL WALL DESIGN OR CONSTRUCTION.
- EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH SOIL NAILS FOR RETAINING WALL NO.1.
- REINFORCING OF THE EXISTING TIMBER PILE WALL MAY BE REQUIRED TO DRILL SOIL NAIL LOCATIONS. REINFORCEMENT OF THE WALL WILL BE CONSIDERED INCIDENTAL TO THE NEW RETAINING WALL AND NO ADDITIONAL COMPENSATION WILL BE MADE.
- DAMAGE THAT OCCURS TO THE EXISTING WALL OUTSIDE OF THE NEW WALL LIMITS WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

TOTAL STRUCTURE QUANTITIES - OPTION #2		
RETAINING WALL NO.1	1,050	SO. FT.
SOIL NAIL VERIFICATION TESTS	1	EA.
SOIL NAIL PROOF TESTS	4	EA.

PROJECT NO.: 13914.1038014
 GRAHAM COUNTY
 STATION: SEE SITE MAP
 SHEET 1 OF 1

PREPARED BY: J SALVO DATE: 8/2013
 REVIEWED BY: S CLARK DATE: 8/2013

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
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 RALEIGH

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

RETAINING WALL NO. 1
 OPTION #2
 SOIL NAIL RETAINING WALL

TOTAL SHEETS: 4