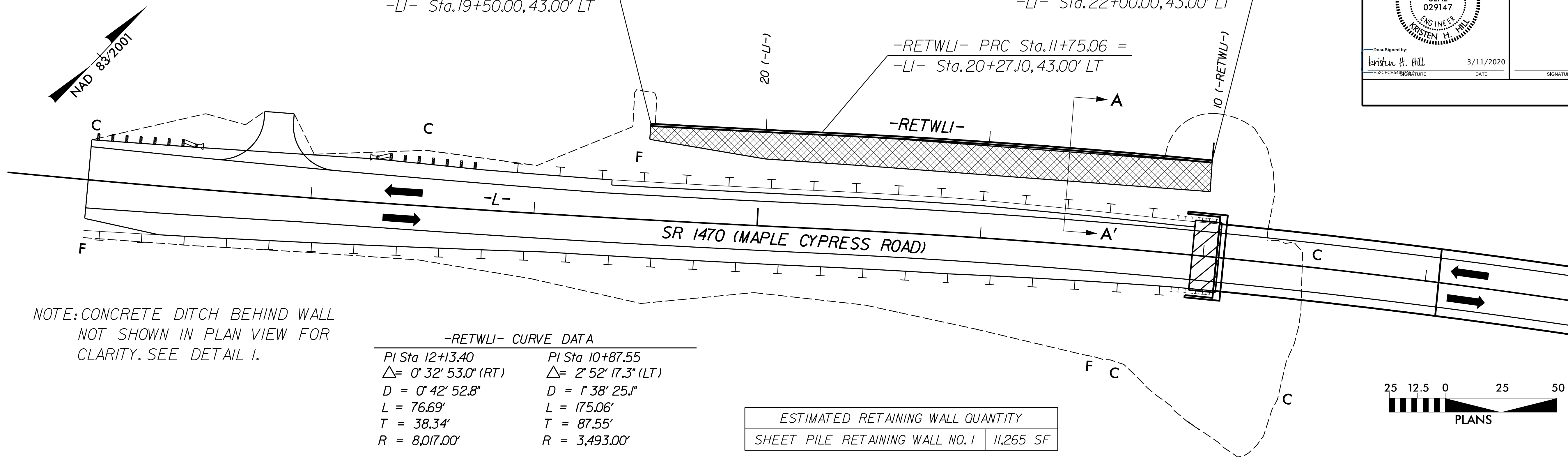


-RETWL1- DETAIL

END RETAINING WALL 1
 -RETWL1- PT Sta.12+51.74 =
 -LI- Sta.19+50.00, 43.00' LT

BEGIN RETAINING WALL 1
 -RETWL1- PC Sta.10+00.00 =
 -LI- Sta.22+00.00, 43.00' LT



NOTE: CONCRETE DITCH BEHIND WALL NOT SHOWN IN PLAN VIEW FOR CLARITY. SEE DETAIL 1.

-RETWL1- CURVE DATA

PI Sta 12+13.40	PI Sta 10+87.55
$\Delta = 0^\circ 32' 53.0''$ (RT)	$\Delta = 2^\circ 52' 17.3''$ (LT)
$D = 0^\circ 42' 52.8''$	$D = 1^\circ 38' 25.1''$
$L = 76.69'$	$L = 175.06'$
$T = 38.34'$	$T = 87.55'$
$R = 8,017.00'$	$R = 3,493.00'$

ESTIMATED RETAINING WALL QUANTITY

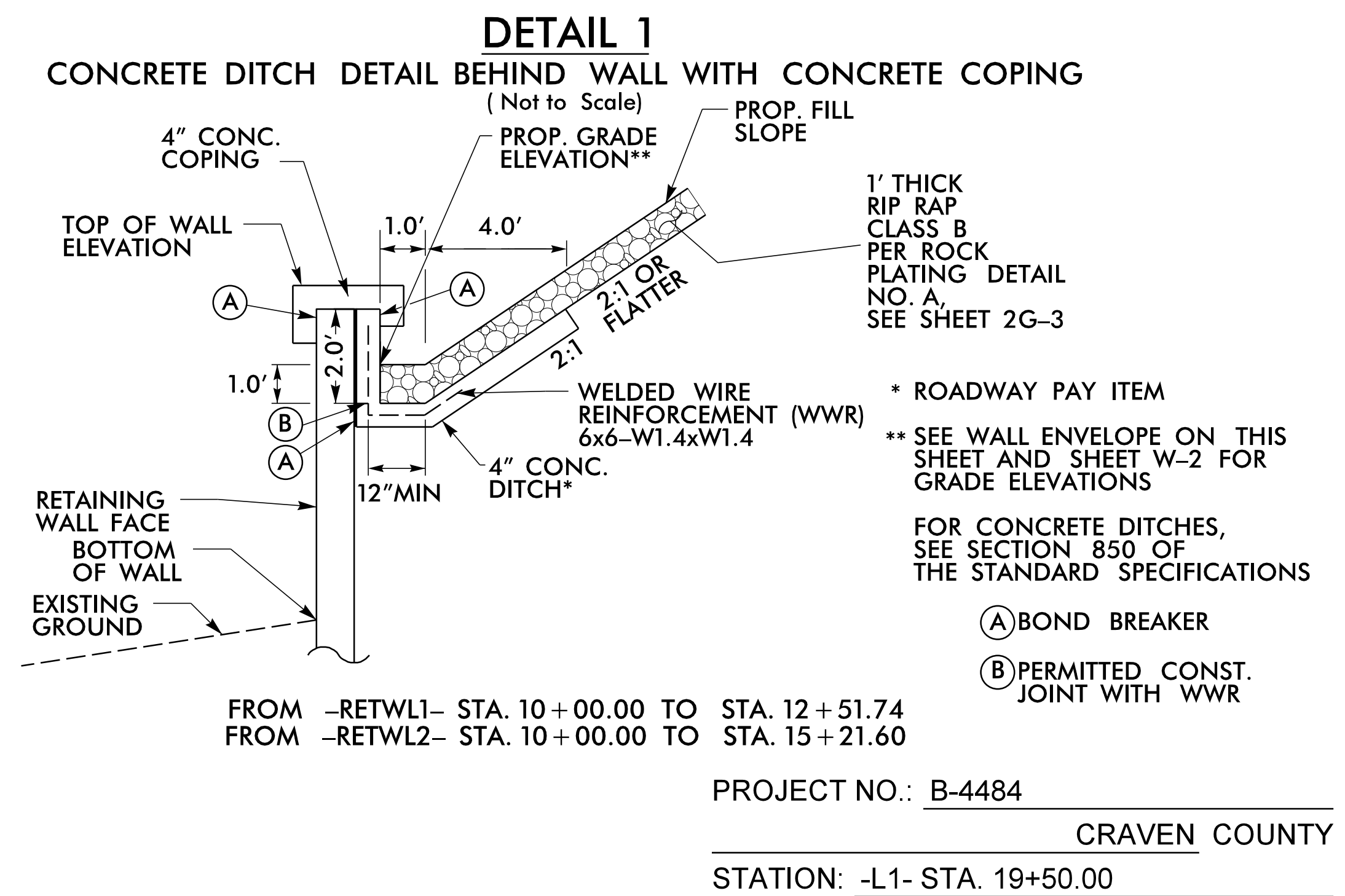
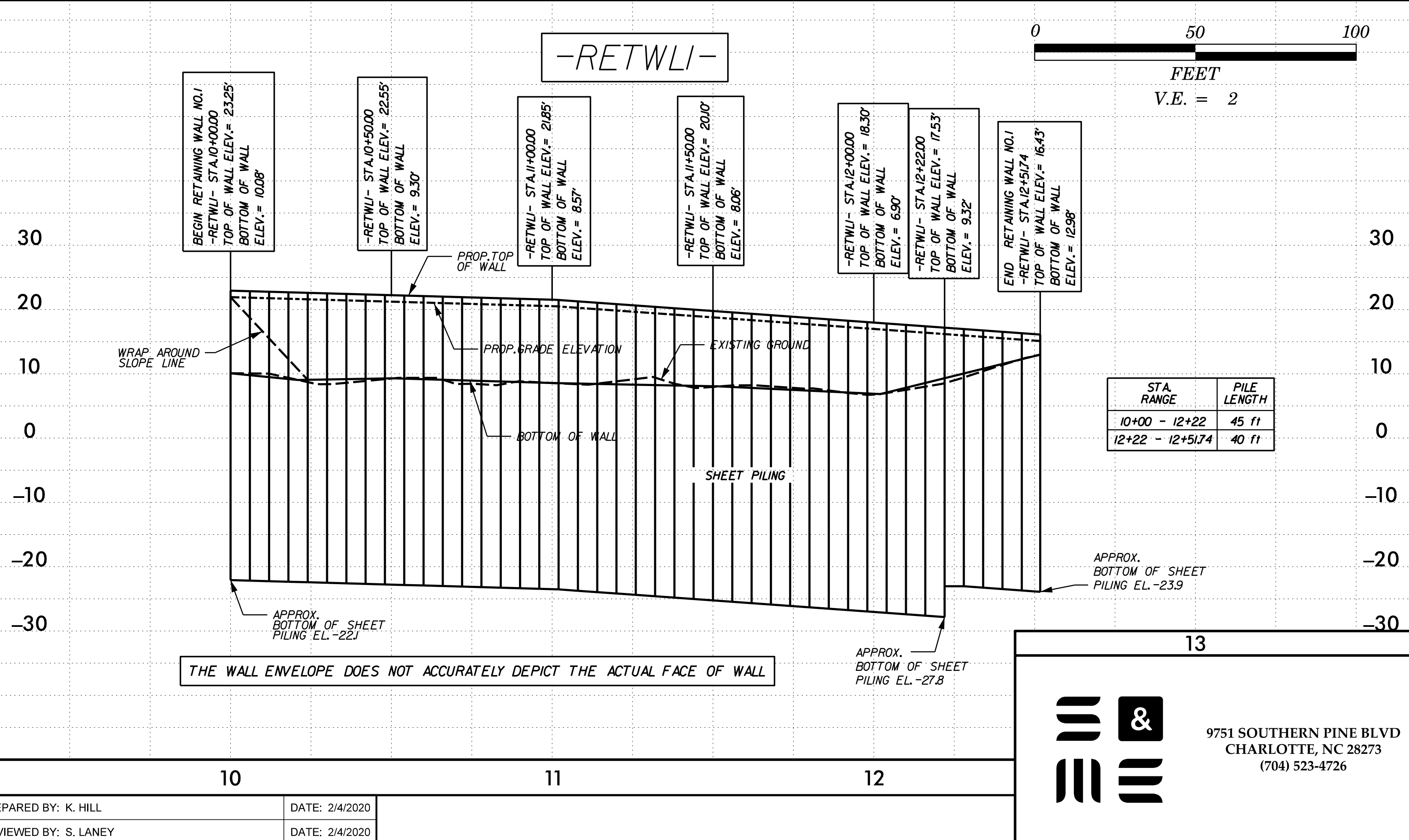
SHEET PILE RETAINING WALL NO.1	11,265 SF
--------------------------------	-----------

GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by:
 Kristen H. Hill
 3/11/2020

SEAL 029147
 ENGINEER
 KRISTEN H. HILL



10	11	12
PREPARED BY: K. HILL	DATE: 2/4/2020	
REVIEWED BY: S. LANEY	DATE: 2/4/2020	

13

9751 SOUTHERN PINE BLVD
 CHARLOTTE, NC 28273
 (704) 523-4726

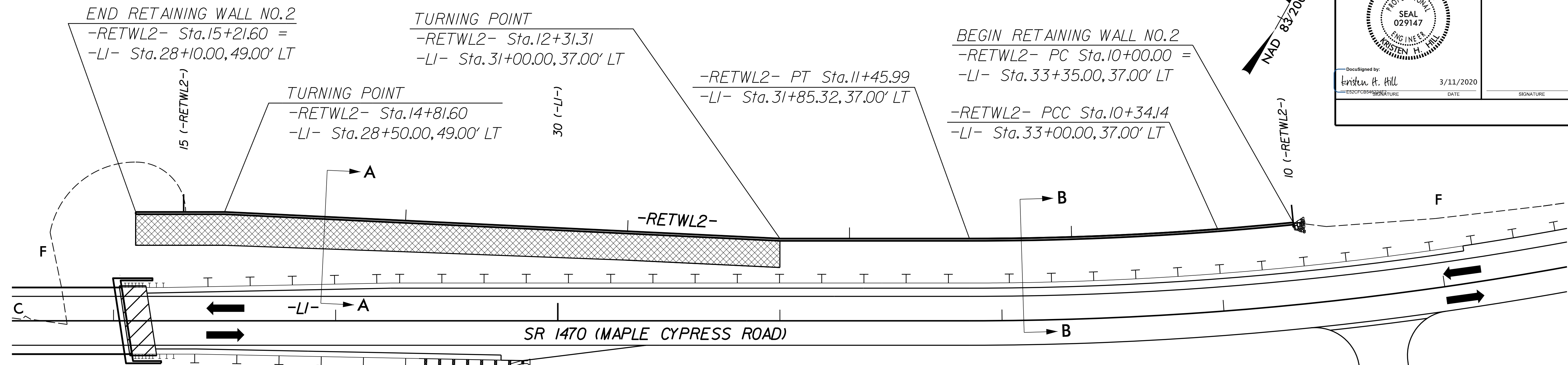
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

GEOTECHNICAL
 ENGINEERING UNIT

RETAINING WALL NO 1
 LOCATION PLAN & ENVELOPE

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

-RETWL2- DETAIL



GEOTECHNICAL ENGINEER

ENGINEER

SEAL 029147
 KRISTEN H. HILL

DocuSigned by:
 Kristen H. Hill 3/11/2020

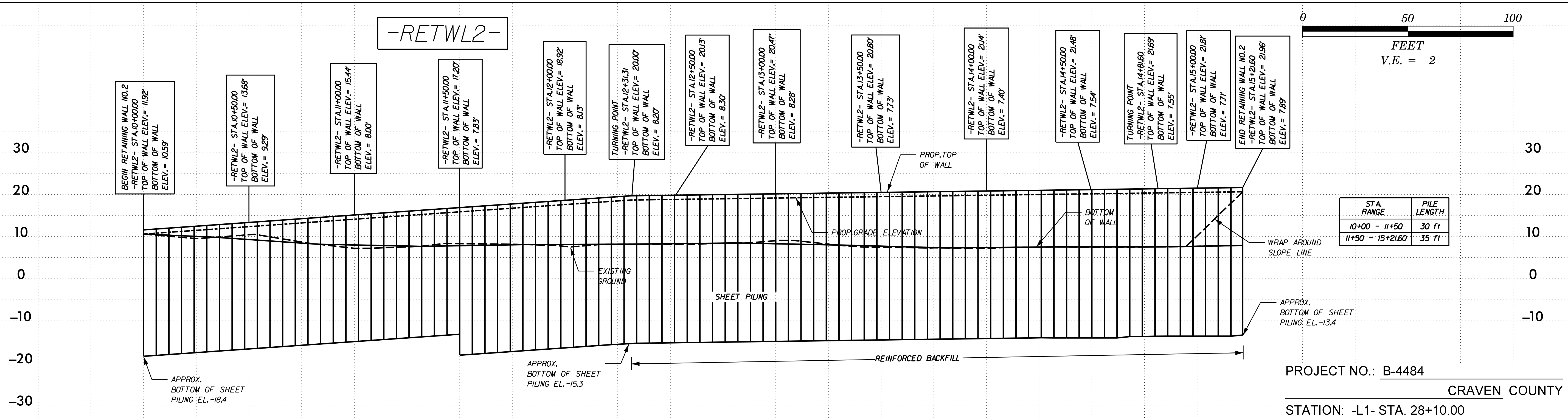
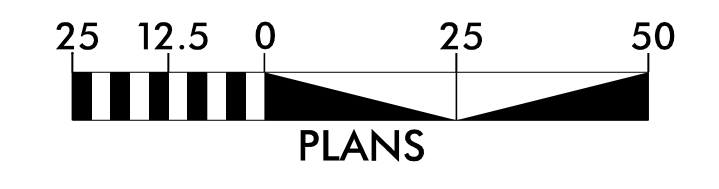
SIGNATURE DATE SIGNATURE DATE

NOTE: CONCRETE DITCH BEHIND WALL NOT SHOWN IN PLAN VIEW FOR CLARITY. SEE DETAIL 1 ON SHEET W-1.

ESTIMATED RETAINING WALL QUANTITY	
SHEET PILE RETAINING WALL NO. 2	17680 SF

-RETWL2- CURVE DATA

PI Sta 10+90.09	PI Sta 10+17.07
$\Delta = 4^{\circ} 22' 50.1''$ (RT)	$D = 1^{\circ} 20' 12.8''$ (RT)
$D = 3^{\circ} 54' 58.8''$	$D = 3^{\circ} 54' 58.8''$
$L = 111.85'$	$L = 34.14'$
$T = 55.95'$	$T = 17.07'$
$R = 1,463.00'$	$R = 1,463.00'$



THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL

13 & 14

9751 SOUTHERN PINE BLVD
 CHARLOTTE, NC 28273
 (704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

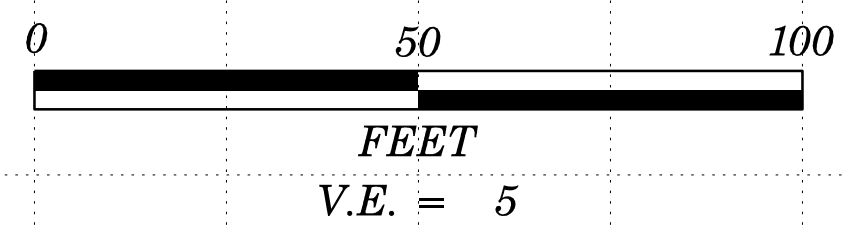
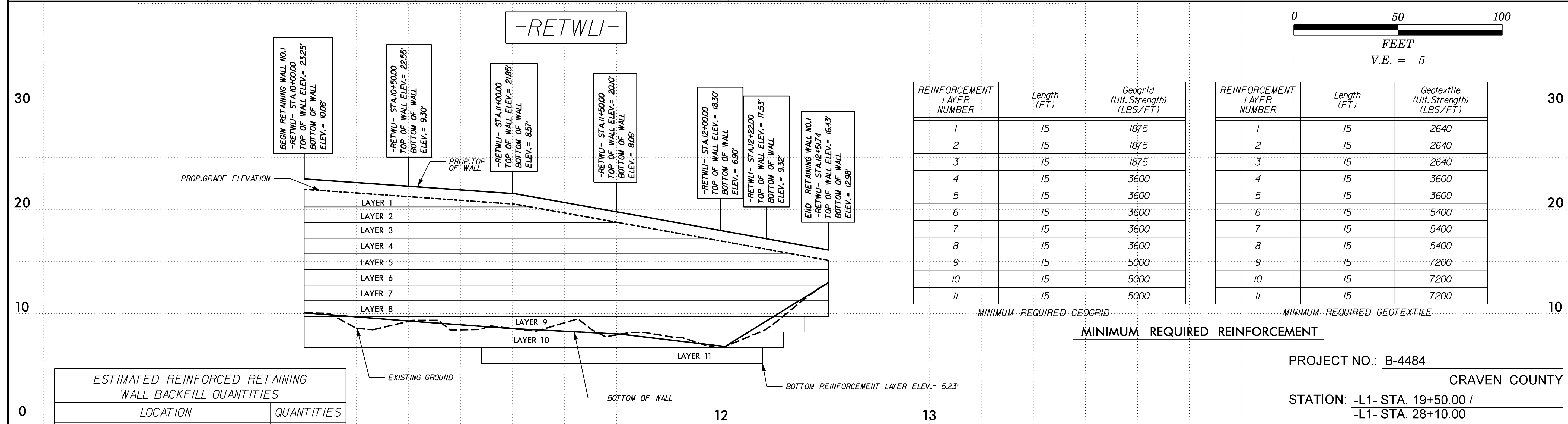
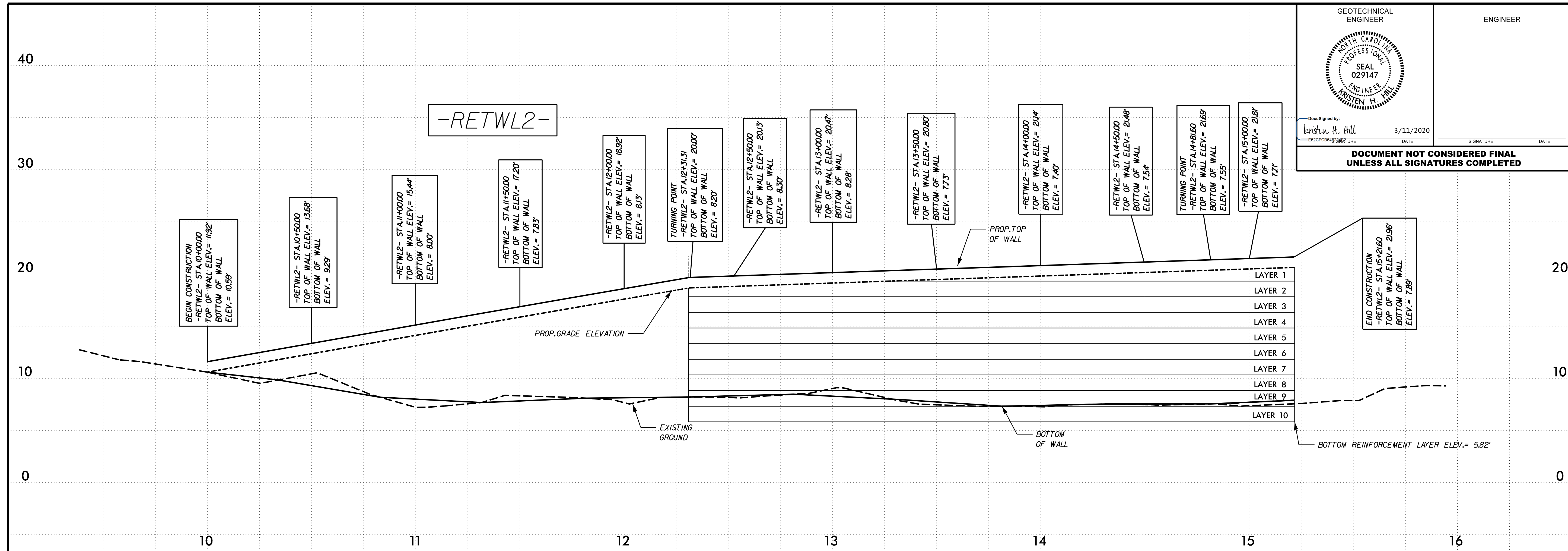
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO 2 LOCATION PLAN & ENVELOPE

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

SHEET NO. W-2

PREPARED BY: K. HILL	DATE: 1/14/20
REVIEWED BY: S. LANEY	DATE: 1/14/20



REINFORCEMENT LAYER NUMBER	Length (FT)	Geogrid (Ult. Strength) (LBS/FT)
1	15	1875
2	15	1875
3	15	1875
4	15	3600
5	15	3600
6	15	3600
7	15	3600
8	15	3600
9	15	5000
10	15	5000
11	15	5000

MINIMUM REQUIRED GEOGRID

REINFORCEMENT LAYER NUMBER	Length (FT)	Geotextile (Ult. Strength) (LBS/FT)
1	15	2640
2	15	2640
3	15	2640
4	15	3600
5	15	3600
6	15	5400
7	15	5400
8	15	5400
9	15	7200
10	15	7200
11	15	7200

MINIMUM REQUIRED GEOTEXTILE

MINIMUM REQUIRED REINFORCEMENT

LOCATION	QUANTITIES
RETAINING WALL NO 1	3,290 SF
RETAINING WALL NO 2	4,025 SF

PROJECT NO.: B-4484
 CRAVEN COUNTY
 STATION: -L1- STA. 19+50.00 /
 -L1- STA. 28+10.00

PREPARED BY: K. HILL
 REVIEWED BY: S. LANEY
 DATE: 1/14/20
 DATE: 1/14/20

U & M

9751 SOUTHERN PINE BLVD
 CHARLOTTE, NC 28273
 (704) 523-4726

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

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

SHEET NO. W-3

GEOTECHNICAL ENGINEER

ENGINEER

SEAL 029147
KRISTEN H. HILL

DocuSigned by:
Kristen H. Hill

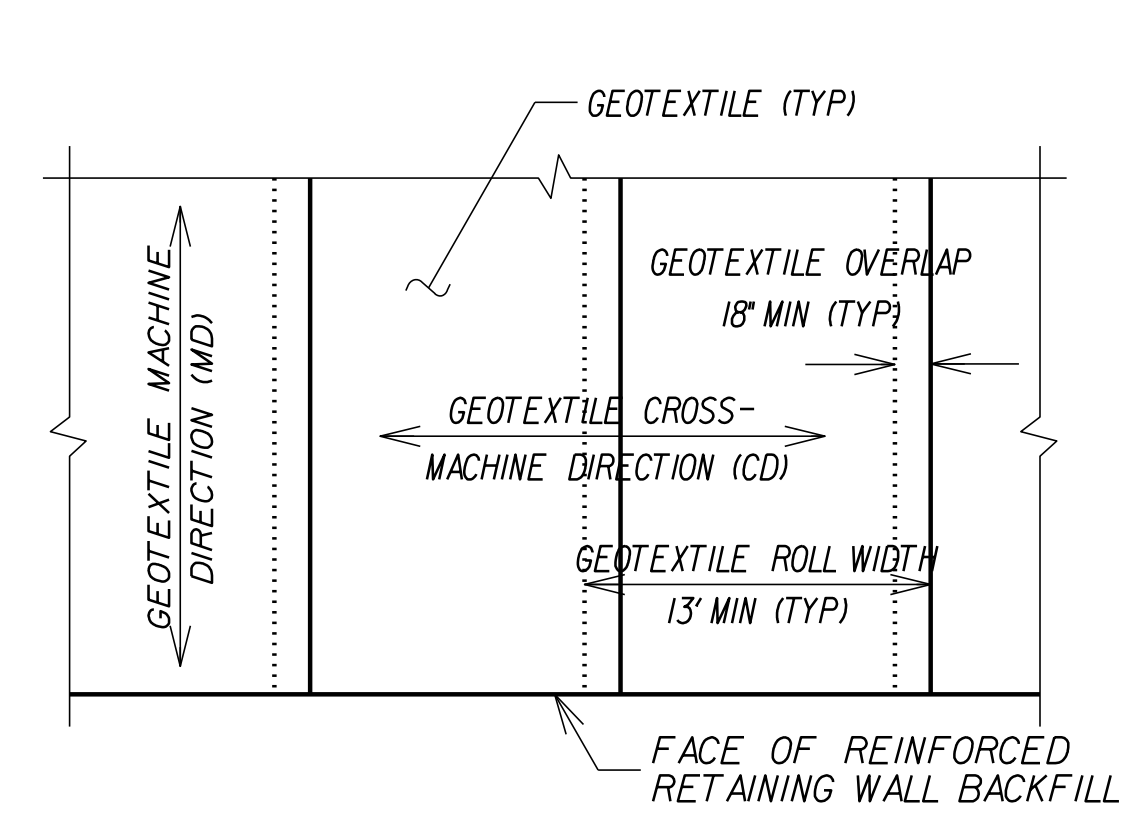
3/11/2020

DATE

SIGNATURE

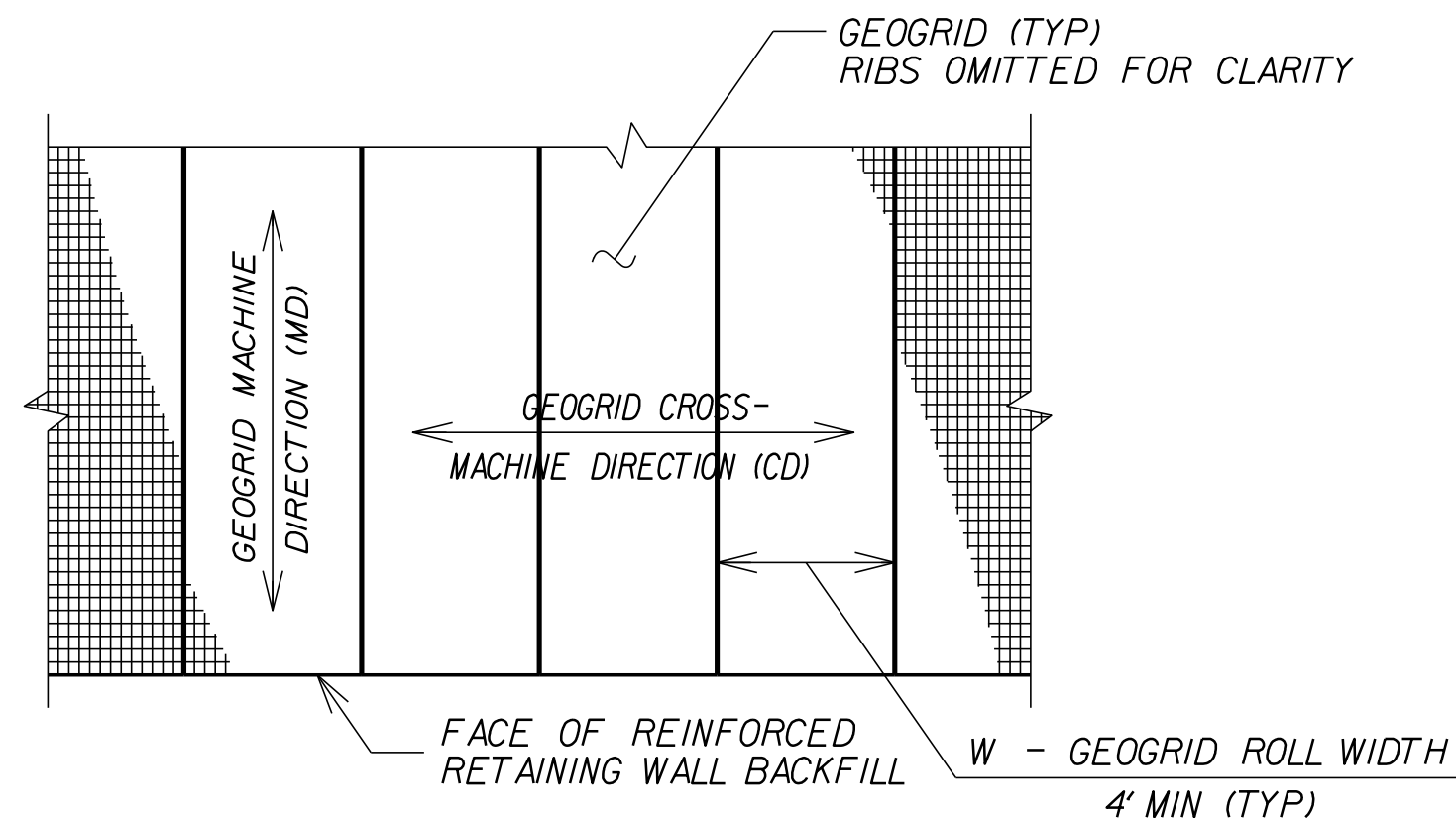
DATE

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



GEOTEXTILE PLACEMENT (PLAN VIEW)

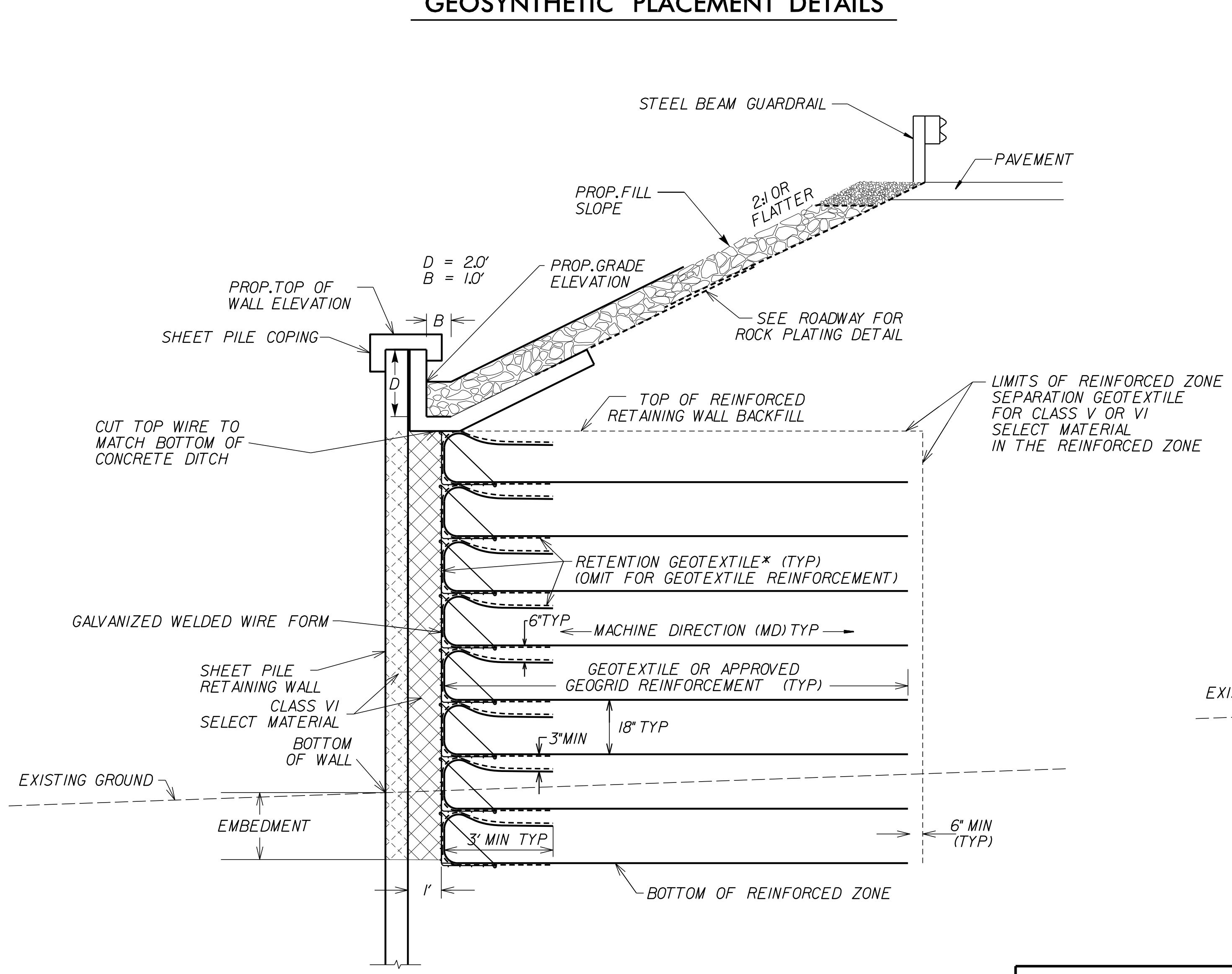
(100% COVERAGE MIN FOR
GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT

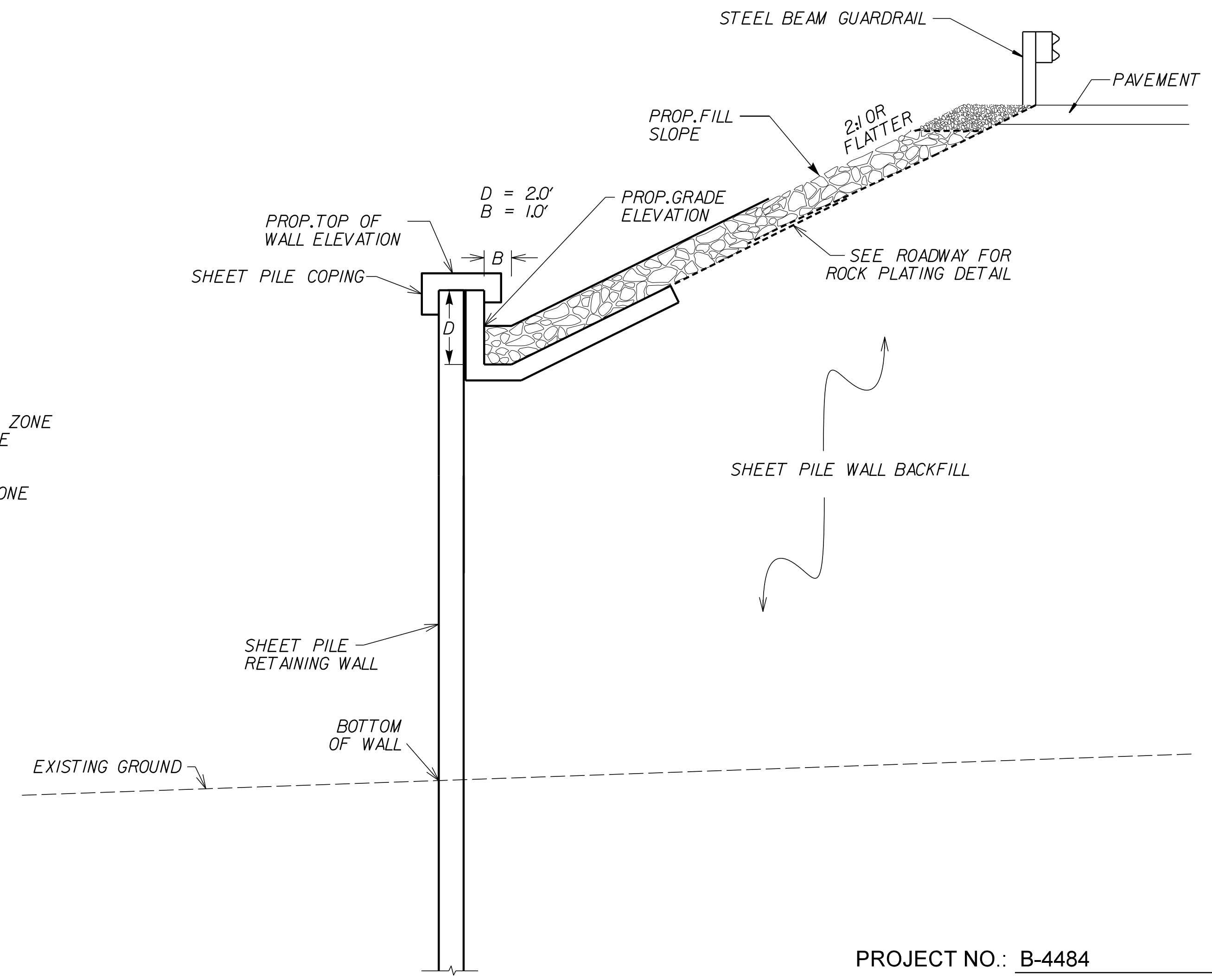
(100% COVERAGE MIN FOR
GEOGRID REINFORCEMENT)

GEOSYNTHETIC PLACEMENT DETAILS



TYPICAL SECTION AT RETAINING WALLS A-A'

*SEE GEOSYNTHETIC PLACEMENT DETAILS AND REINFORCEMENT TABLES ON SHEET W-3.
FROM -L1- STA. 19+50 TO -L1- STA. 22+00
FROM -L1- STA. 28+10 TO -L1- STA. 31+00



TYPICAL SECTION AT RETAINING WALL B-B'
FROM -L1- STA. 31+00 TO -L1- STA. 33+35

PROJECT NO.: B-4484
CRAVEN COUNTY
STATION: -L1- STA. 19+50.00 /
-L1- STA. 28+10.00

PREPARED BY: K. HILL	DATE: 02/4/2020
REVIEWED BY: S. LANEY	DATE: 02/4/2020

9751 SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
(704) 523-4726

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

**SHEET PILE RETAINING WALL
TYPICAL SECTIONS**

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

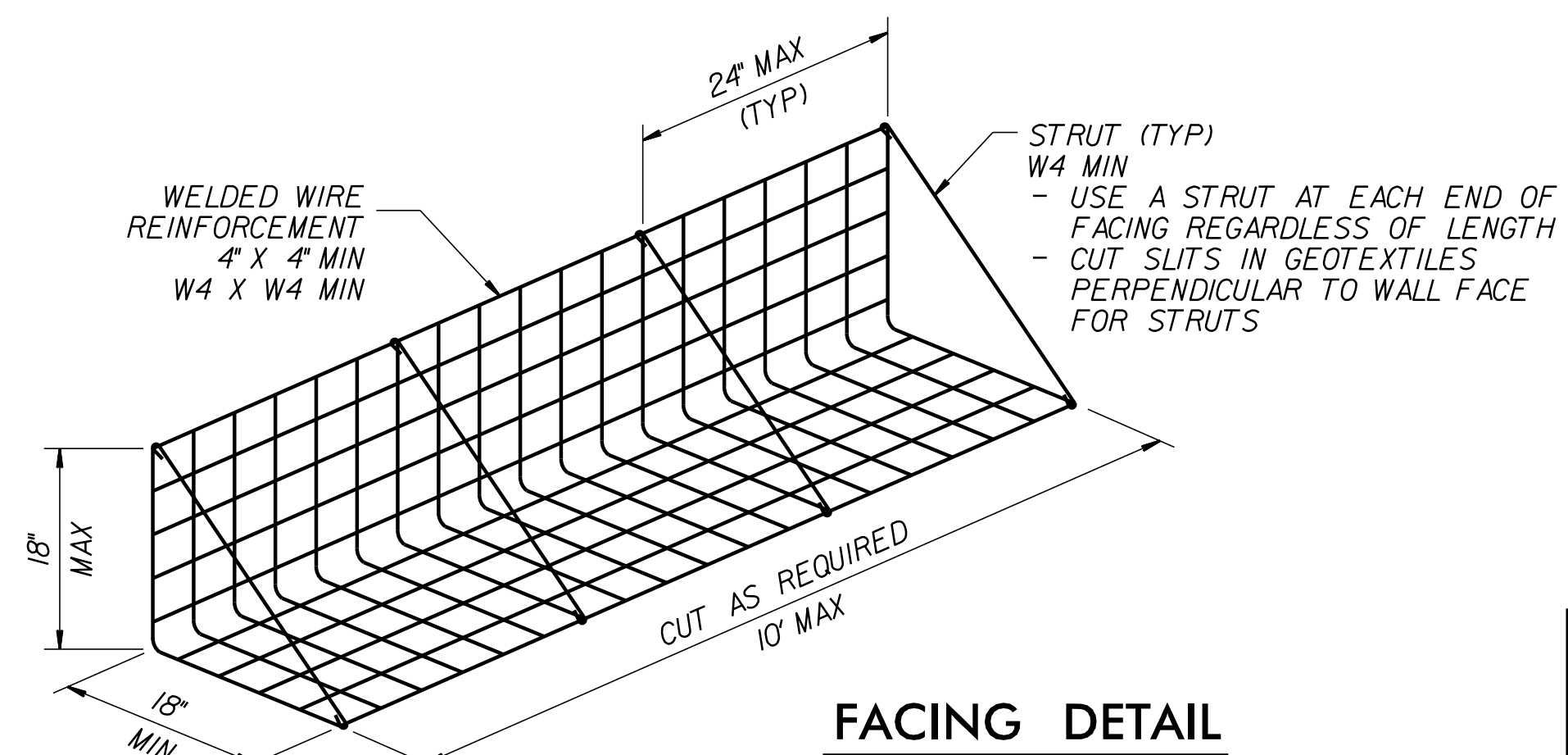
SHEET NO. W-4

CONSTRUCTION SEQUENCE FOR REINFORCED RETAINING WALL BACKFILL:

1. INSTALL GALVANIZED PZ27 OR EQUIVALENT SHEET PILES PRIOR TO CONSTRUCTING REINFORCED RETAINING WALL BACKFILL.
2. CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE REINFORCED RETAINING WALL BACKFILL.
3. COLLECT AND DIRECT RUNOFF AWAY FROM THE RETAINING WALL BACKFILL.
4. EXCAVATE AS NECESSARY TO CONSTRUCT BOTTOM OF REINFORCED RETAINING WALL BACKFILL TO THE ELEVATION SHOWN ON THE PLANS, UNDERCUT AS SHOWN ON ROADWAY PLANS. PLACE GEOTEXTILE OR GEOGRID REINFORCEMENT AT LOCATIONS SHOWN ON SHEETS W-1 AND W-2 AND ELEVATIONS SHOWN ON SHEET W-3 AND IN SLIGHT TENSION FREE KINKS, FOLDS, WRINKLES OR CREASES.
5. INSTALL TEMPORARY SHORING BETWEEN STATIONS -L1- 19+50 AND -L1- 20+75.
6. RETENTION GEOTEXTILE SHALL MEET THE REQUIREMENTS OF TYPE 2 GEOTEXTILE AS SHOWN IN TABLE 1056-1 OF THE STANDARD SPECIFICATIONS.
7. ERECT WELDED WIRE FORMS AS SHOWN ON SHEET W-4 AND W-5.
8. STAGGER VERTICAL JOINTS OF WELDED WIRE FORMS TO CREATE A RUNNING BOND.
9. PLACE WELDED WIRE FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT REINFORCED RETAINING WALL BACKFILL WITH A MAXIMUM VERTICAL AND HORIZONTAL TOLERANCE OF 3" WHEN MEASURED WITH A 10'-0" STRAIGHT EDGE AND AN OVERALL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6".
10. DO NOT SPLICE OR OVERLAP GEOTEXTILE REINFORCEMENT IN THE MACHINE DIRECTION (MD), i.e., PERPENDICULAR TO THE REINFORCED RETAINING WALL BACKFILL FACE. OVERLAPS ONLY ARE ALLOWED IN THE CROSS-MACHINE DIRECTIONS (CMD).
11. PLACE BACKFILL WITHIN RETAINING WALL IN 8" TO 10" THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-3(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" OF THE REINFORCED RETAINING WALL BACKFILL FACE.
12. WRAP GEOTEXTILE OR GEOGRID REINFORCEMENT AT VERTICAL CORNERS AS DIRECTED BY THE ENGINEER.
13. DO NOT DAMAGE GEOTEXTILE OR GEOGRID REINFORCEMENT OR WELDED WIRE FORMS WHEN PLACING AND COMPACTING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON GEOTEXTILE OR GEOGRID REINFORCEMENT UNTIL IT IS COVERED WITH AS LEAST 8" OF BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.
14. CONSTRUCT RETAINING WALL THE TOP OF WALL ELEVATION SHOWN ON THE PLANS AND ALLOW THEM TO SIT IDLE FOR A MINIMUM OF 30 DAYS PRIOR TO FILLING SPACE BETWEEN FACE OF THE RETAINING WALL AND BACK OF SHEET PILING WITH CLASS VI SELECT MATERIAL.

NOTES FOR SHEET PILE WALLS:

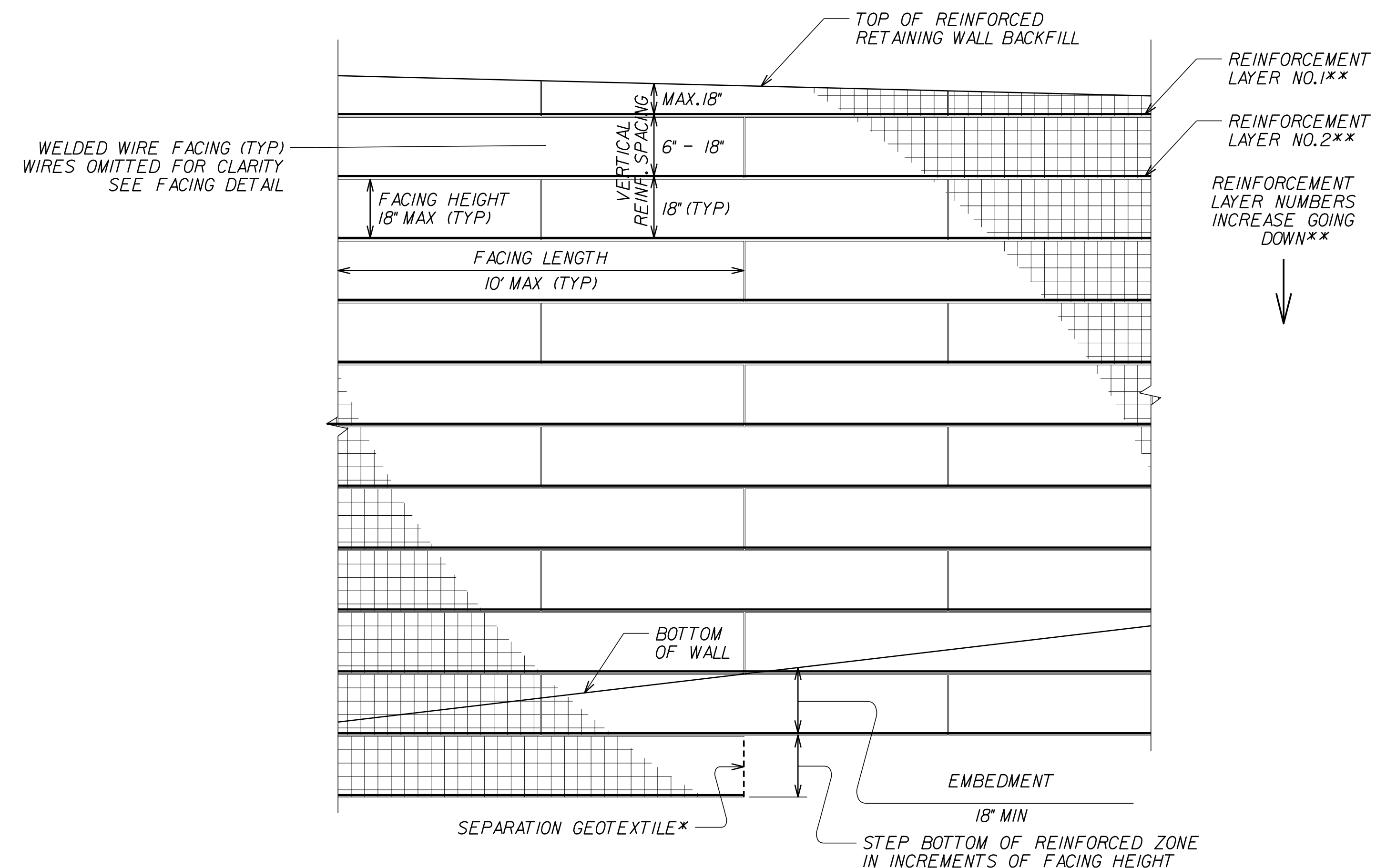
1. FOR STEEL SHEET PILES SEE SHEET PILE WALL SPECIAL PROVISION.
2. INSTALL SHEET PILING TO THE MINIMUM DEPTH SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
3. SHEET PILING SHALL BE PZ-27 OR EQUIVALENT.
4. USE A CONCRETE COPING ON TOP OF THE SHEET PILE RETAINING WALLS AS SHOWN IN THE PLANS AND IN ACCORDANCE WITH SECTION 420 OF THE STANDARD SPECIFICATIONS.
5. STEEL SHEET PILES SHALL MEET ASTM A572 OR A690 SPECIFICATIONS.
6. STEEL SHEET PILES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
7. AFTER FIELD WELDING, OR IF GALVANIZING ON MEMBERS IS DAMAGED, REPAIR DAMAGED GALVANIZED SURFACES IN ACCORDANCE WITH ARTICLE 1076-7 OF THE STANDARD SPECIFICATIONS.



NOTES FOR REINFORCED RETAINING WALL BACKFILL:

1. FOR REINFORCED RETAINING WALL BACKFILL, SEE REINFORCED RETAINING WALL BACKFILL SPECIAL PROVISIONS.
2. RETAINING WALLS ARE DESIGNED FOR MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,700 PSF.
3. USE CLASS II, TYPE I, CLASS III, CLASS V, OR CLASS VI SELECT MATERIAL FOR REINFORCED FILLS. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED RETAINING WALL BACKFILL WITH GEOTEXTILE REINFORCEMENT.
4. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
 - a. W (REINFORCEMENT ROLL WIDTH) \geq 15'
 - b. REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
5. DO NOT PLACE WELDED WIRE FACING, BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
6. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
7. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
8. "TEMPORARY SHORING" IS REQUIRED FOR RETAINING WALL NO. 1 BETWEEN STATIONS 19+50 AND 20+75 AND SHALL BE INSTALLED IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE TRAFFIC CONTROL PLANS.

	ENGINEER
	DocuSigned by: <i>Kristen H. Hill</i> ESCP05826658
3/11/2020	DATE
	SIGNATURE



REINFORCED RETAINING WALL BACKFILL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS
 **SEE REINFORCEMENT TABLES ON SHEET W-3.

PROJECT NO.: B-4484
 CRAVEN COUNTY
 STATION: -L1- STA. 19+50.00 /
 -L1- STA. 28+10.00

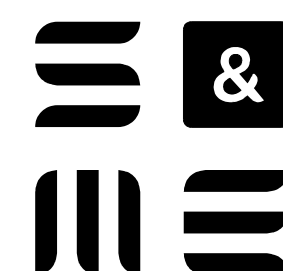
NOTES FOR SHEET PILE WALL AND REINFORCED BACKFILL

REVISIONS

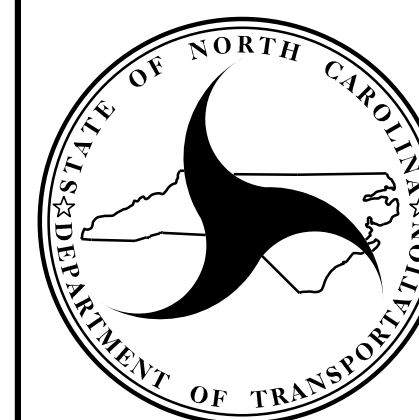
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. W-5

PREPARED BY: K. HILL DATE: 01/14/20
 REVIEWED BY: S. LANEY DATE: 01/14/20



9751 SOUTHERN PINE BLVD
 CHARLOTTE, NC 28273
 (704) 523-4726



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

**GEOTECHNICAL
 ENGINEERING UNIT**