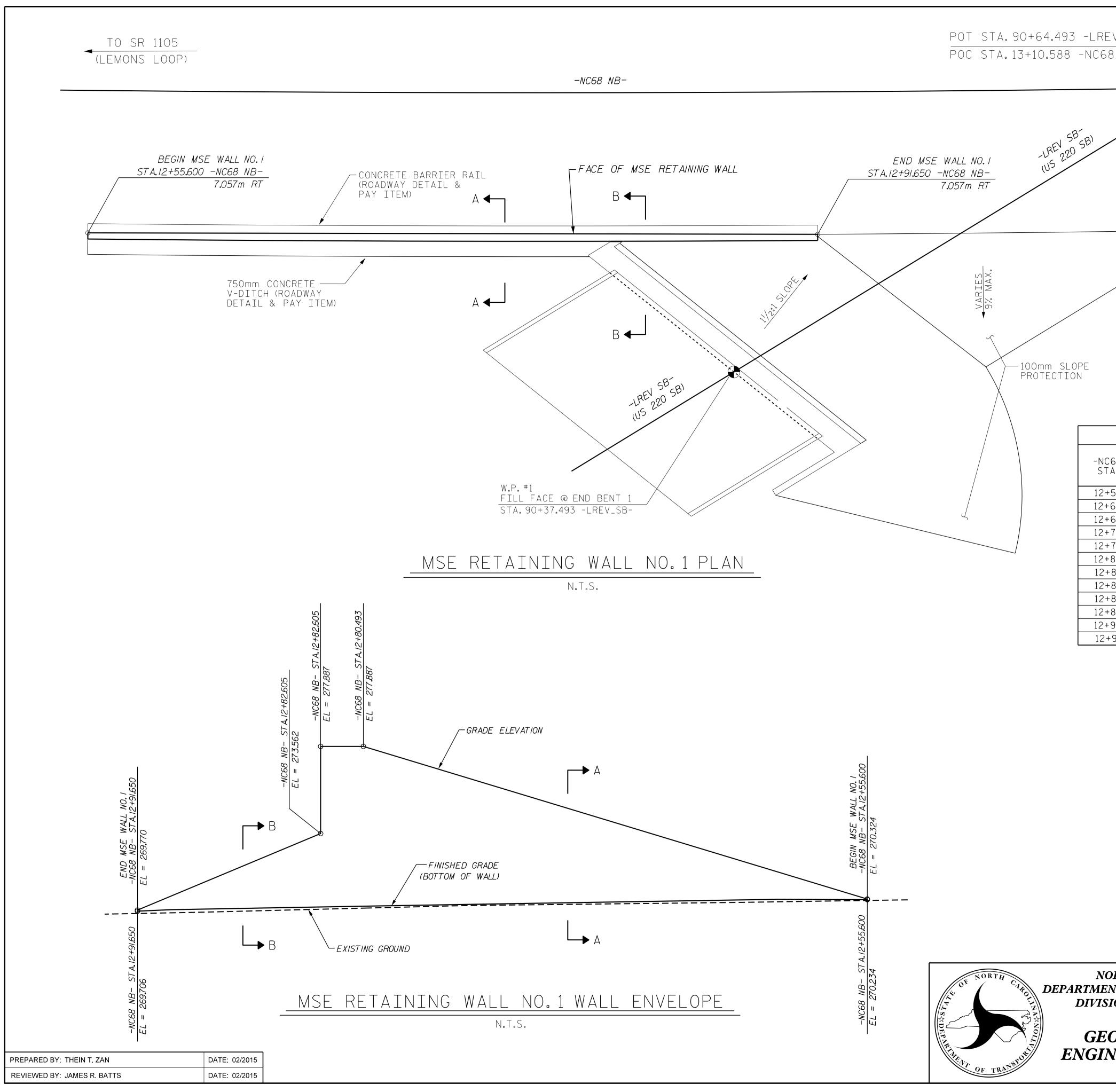
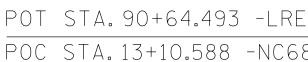
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EV_SB- =	GEOTECH ENGINE HOR H CAR OF ESS/ SEAL 03092	ER 0///// 0///// 13 13	ENGINEEF	3
TO NEWMAN ROAD	Their Tun Zan A43688COBC19472 SIGNATURE	2/18/2015 	SIGNATURE	DATE
	NAD 83	NOF	ΥН	

MSE WALL NO.1 OFFSETS & ELEVATIONS						
C68 NB- TATION	OFFSET (m)	GRADE ELEVATION	BOTTOM OF WALL ELEVATION	EXISTING GROUND ELEVATION		
+55.600	7.057 (RT)	270.324	270.234	270.1		
+60.000	7.057 (RT)	271.661	270.252	270.1		
+65.000	7.057 (RT)	273.180	270.170	270.0		
+70.000	7.057 (RT)	274.699	270.088	270.0		
+75.000	7.057 (RT)	276.218	270.005	269.9		
+80.000	7.057 (RT)	277.737	269.919	269.8		
+80.493	7.057 (RT)	277.887	269.910	269.8		
+82.605	7.057 (RT)	277.887	269.873	269.7		
+82.605	7.057 (RT)	273.562	269.873	269.7		
+85.000	7.057 (RT)	272.557	269.829	269.6		
+90.000	7.057 (RT)	270.461	269.737	269.5		
+91.650	7.057 (RT)	269.770	269.706	269.5		

ESTIMATED I WALL QUANTI (square meter)	
MSE RETAINING WALL NO.1	162 SQ.METER

PROJECT NO.: R-2413CA

ROCKINGHAM COUNTY

STATION: 12+56.000 -NC68 NB- RT

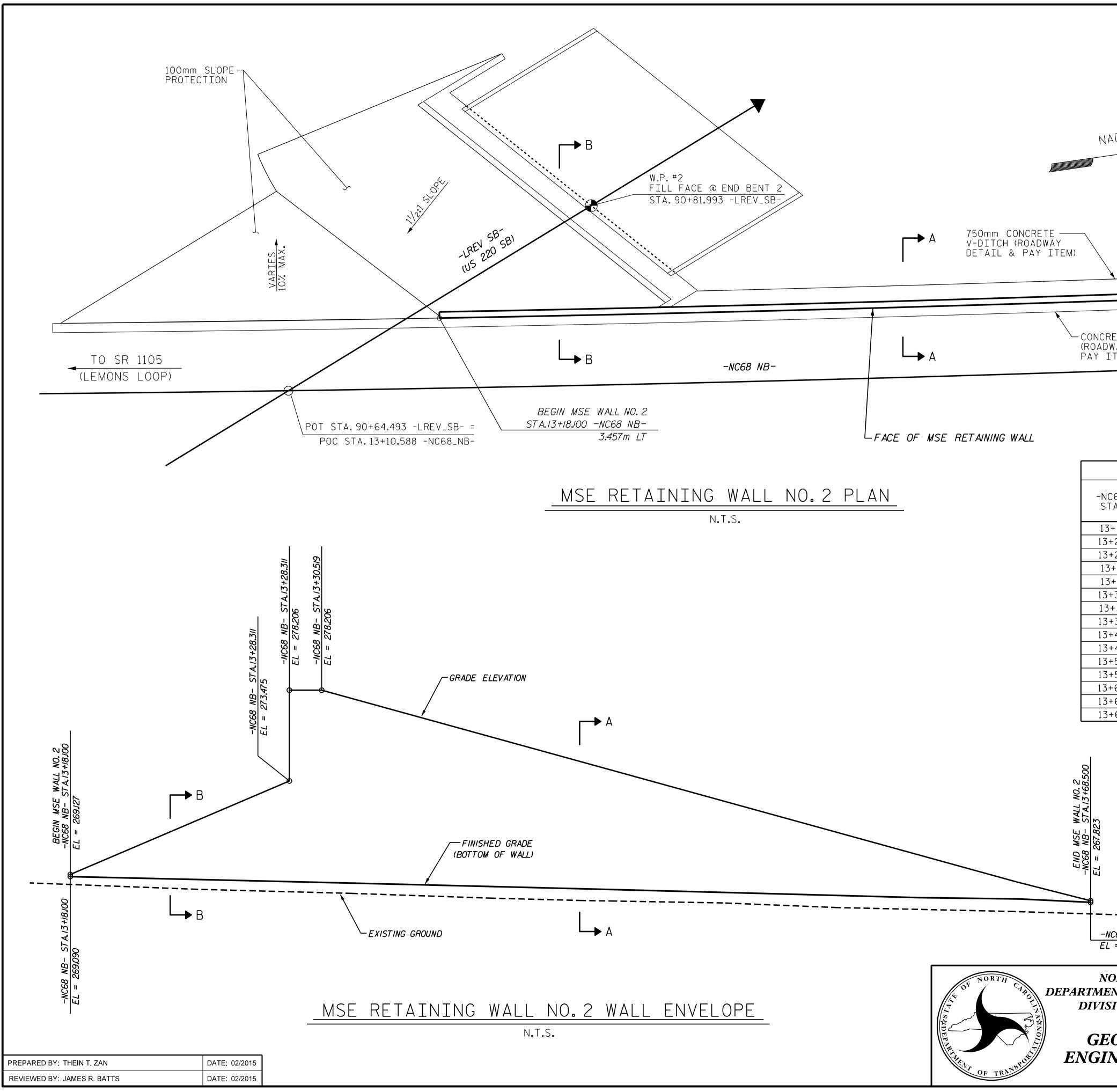
SHEET 1 OF 7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

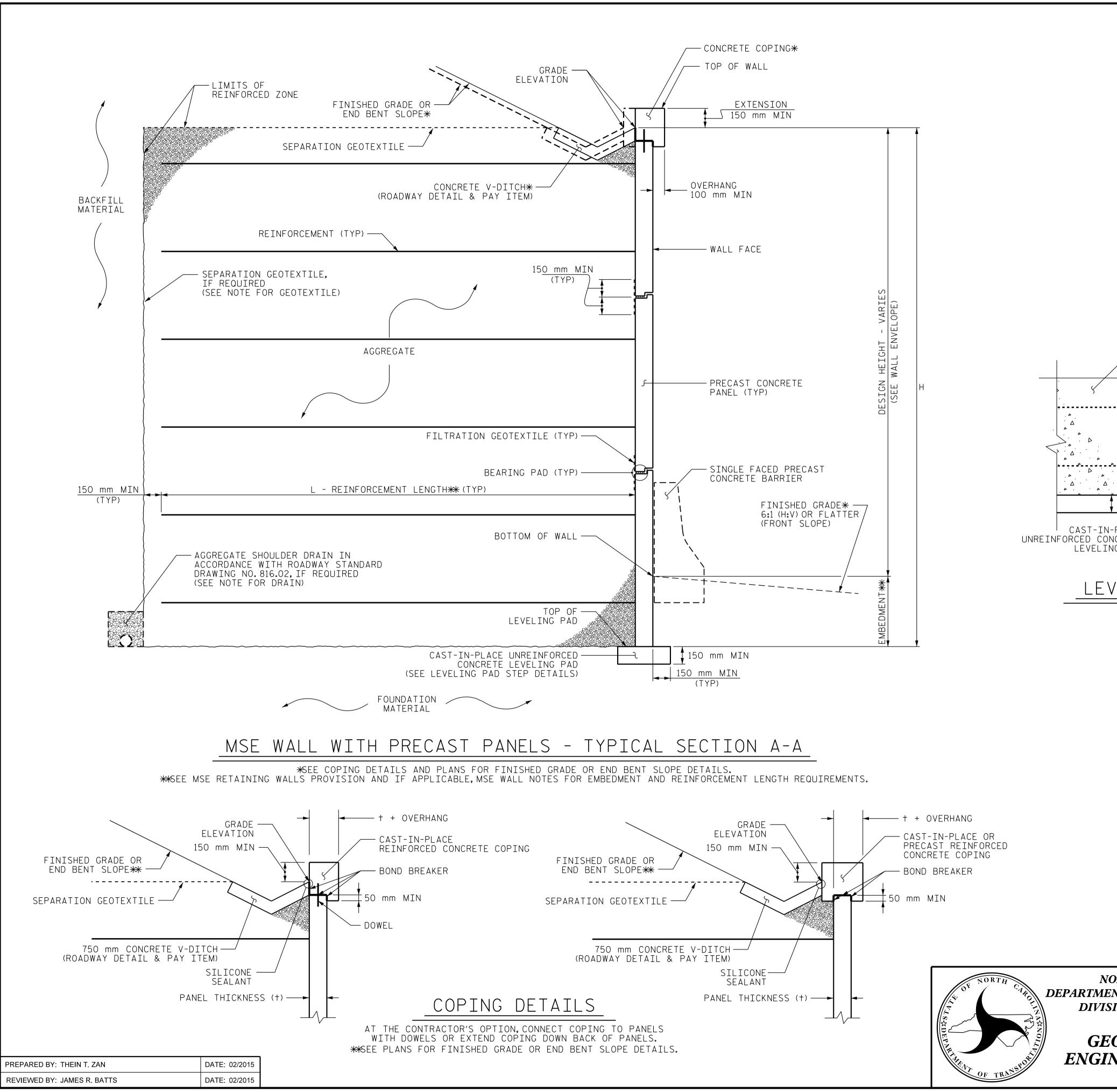
GEOTECHNICAL ENGINEERING UNIT

MSE RETAINING WALL NO. 1 PLAN & WALL ENVELOPE

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



LEND MSE WALL NO. 2 STA/3568500 - NC68 NB- 3457m LT MSE WALL NO. 2 OFFSETS & ELEVATIONS GR NB- 0 (m) BOTTOM OF WALL EVATION ENISTING ELEVATION 18.100 3.457 (LT) 269.047 266.67 20.000 3.457 (LT) 278.206 268.934 266.4 28.311 3.457 (LT) 278.206 268.857 266.4 28.311 3.457 (LT) 278.206 268.857 266.4 28.311 3.457 (LT) 278.206 268.857 266.4 28.311 3.457 (LT) 278.206 268.4005 268.3 30.519 3.457 (LT) 278.206 268.405 268.2 40.000 3.457 (LT) 276.972 268.405 267.5 55.000 3.457 (LT) 276.204 266.305 267.5 55.000 3.457 (LT) 276.2823 267.23 267.3 S5.000 3.457 (LT) 276.2823 267.23 267.3 S5.000 3.457 (LT) 268.712 267.998 267.4 68.500 3.457 (LT) 268.712 267.3 267.3 STOTION: R-2413C	D 83	NO	RTH Their	GEOTECHNICAL ENGINEER WH CARO OFESSION SEAL 030943 MG INE Tun Zan 2/18/2019 208C19472 SIGNATURE DATE	5	GINEER		
ROAD ROAD END MSE WALL NO. 2 STAI34683500 - MC68 MB- 3.457 m LT MSE WALL NO. 2 OFFSETS & ELEVATIONS G6 MB- OFFSET LEVATION OF WALL CTISTING CMOUND MSE WALL NO. 2 OFFSETS & ELEVATIONS ELEVATION OF WALL CONSTRUCTION ELEVATION ELEVATION OF WALL CONSTRUCTION ELEVATION ELEVATION 18.100 3.457 (LT) 278.206 268.934 268.4 25.000 3.457 (LT) 278.206 268.957 268.4 26.30.000 3.457 (LT) 278.206 268.957 268.4 30.000 3.457 (LT) 276.972 268.638 268.2 35.000 3.457 (LT) 276.972 268.6450 267.9 55.000 3.457 (LT) 271.455 268.157 268.0 45.000 3.457 (LT) 271.455 268.159 267.6 55.000 3.457 (LT) 271.455 268.159 267.4 66.500 3.457 (LT) 271.455 268.189 267.6 66.500 3.457 (LT) 266.712 267.923 267.83 267.83 267.4 66.500 3.457 (LT) 266.712 267.923 267.85 267.4 66.500 3.457 (LT) 271.465 268.189 267.6 66.500 3.457 (LT) 271.465 268.189 267.6 66.500 3.457 (LT) 266.712 267.923 267.85 267.3								
MSE WALL NO. 2 OFFSETS & ELEVATION EXISTING ELEVATION EXISTING ELEVATION 68 NB- 01100 0.457 (L1) 269.090 268.7 20.000 3.457 (L1) 2269.097 268.6 28.000 3.457 (L1) 272.065 268.934 268.4 28.311 3.457 (L1) 278.206 268.857 268.4 28.311 3.457 (L1) 276.372 268.698 268.2 30.000 3.457 (L1) 276.972 268.698 268.2 30.000 3.457 (L1) 276.972 268.698 267.9 30.000 3.457 (L1) 276.872 268.931 267.6 50.000 3.457 (L1) 271.465 268.189 267.4 65.000 3.457 (L1) 276.823 267.823 267.3 55.000 3.457 (L1) 276.823 267.4 265.00 50.000 3.457 (L1) <td< th=""><th></th><th></th><th>STA</th><th>ROAD END MSE WALL 13+68.500 -NC68</th><th>NO. 2 NB-</th><th></th></td<>			STA	ROAD END MSE WALL 13+68.500 -NC68	NO. 2 NB-			
$ \frac{68 \text{ NB-}}{4110\text{ N}} = \frac{0\text{ FFSET}}{(m)} = \frac{6\text{ RADE}}{\text{ELEVATION}} = \frac{\text{BOTTOM OF WALL}}{\text{ELEVATION}} = \frac{\text{EXISTING}}{\text{GROUND}} = \frac{\text{EXISTING}}{\text{GROUND}} = \frac{1000000}{10000000000000000000000000000$				5.757				
Box MB- (m) OFFSE1 ELEVATION BOTTOW VALL ELEVATION CROUND ELEVATION 18.100 3.457 (LT) 269.127 269.090 268.7 20.000 3.457 (LT) 269.932 269.047 268.6 22.000 3.457 (LT) 272.065 268.931 268.4 28.311 3.457 (LT) 278.206 268.857 268.4 28.311 3.457 (LT) 278.206 268.857 268.4 30.000 3.457 (LT) 278.206 268.857 268.0 30.519 3.457 (LT) 276.972 268.685 268.2 40.000 3.457 (LT) 271.465 268.189 267.6 50.000 3.457 (LT) 271.465 268.189 267.4 65.000 3.457 (LT) 267.8823 267.3 267.3 CHAPTION MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER CESTIMATED MSE WALL QUANTITIES (SOUARE METER) MEET AINING WALL NO. 2 REMATION WALL NO. 2 VERTAINING WALL NO. 2	MSE	WALL NO. 2	2 OFFSETS	5 & ELEVA	TIONS			
$\frac{18.100}{20,000} = \frac{3.457 (LT)}{269,127} = \frac{269,090}{268,077} = \frac{268.7}{268,687} = \frac{269,037}{268,647} = \frac{268.41}{268,117} = \frac{268.42}{268,005} = \frac{268.42}{268,005} = \frac{268.42}{268,000} = \frac{268.457}{268,117} = \frac{268.450}{268,117} = \frac{262.50}{268,117} = 26$	68 NB- ATION				-L GROUND			
$\frac{25,000}{2,857} (LT) 272,065 268,934 268.4 \\ (-28,311 3,457 (LT) 273,475 268,857 268.4 \\ (-28,311 3,457 (LT) 278,206 268,857 268.4 \\ (-28,311 3,457 (LT) 278,206 268,805 268.3 \\ (-30,000 3,457 (LT) 278,206 268,805 268.5 \\ (-30,000 3,457 (LT) 276,972 268,698 268,2 \\ (-40,000 3,457 (LT) 274,219 268,450 267.9 \\ (-50,000 3,457 (LT) 274,219 268,055 267.5 \\ (-50,000 3,457 (LT) 270,089 268,055 267.5 \\ (-50,000 3,457 (LT) 270,089 268,055 267.5 \\ (-50,000 3,457 (LT) 268,712 267,988 267.4 \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ ESTIMATED MSE \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ (-50,000 3,457 (LT) 267,823 267,823 267.3 \\ \hline \\ WALL QUANTITIES \\ \hline \\ WALL QUANT \\ \hline \\ WALL \\ \hline \\ WALL QUANT \\ \hline \\ WALL \\ \hline \\ \\ WALL \\ \hline \\ WALL $	+18.100				268.7			
$\frac{28.311}{268.311} = \frac{3.457 (LT)}{3.457 (LT)} = \frac{273.475}{278.206} = \frac{268.857}{268.857} = \frac{268.4}{268.3} \\ \frac{30.000}{3.457 (LT)} = \frac{278.206}{278.206} = \frac{268.857}{268.3} = \frac{268.3}{268.3} \\ \frac{30.519}{3.500} = \frac{3.457 (LT)}{276.972} = \frac{268.698}{268.698} = \frac{268.2}{268.05} \\ \frac{40.000}{3.457 (LT)} = \frac{276.972}{275.595} = \frac{268.575}{268.575} = \frac{268.0}{267.8} \\ \frac{45.000}{3.457 (LT)} = \frac{271.465}{276.823} = \frac{267.8}{267.8} \\ \frac{267.8}{25000} = \frac{3.457 (LT)}{3.457 (LT)} = \frac{271.465}{267.823} = \frac{267.8}{267.8} \\ \frac{267.8}{267.823} = \frac{267.823}{267.823} = \frac{267.823}{267.323} = \frac{267.3}{267.3} \\ \hline \\ $						-		
30.000 3.457 (LT) 278.206 268.817 268.3 30.519 3.457 (LT) 278.206 268.805 268.2 35.000 3.457 (LT) 276.972 268.698 268.2 40.000 3.457 (LT) 275.595 268.055 268.0 45.000 3.457 (LT) 271.219 268.450 267.9 50.000 3.457 (LT) 271.465 268.321 267.5 50.000 3.457 (LT) 271.465 268.055 267.5 50.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 268.712 267.988 267.4 68.500 3.457 (LT) 268.712 267.988 267.4 68.500 3.457 (LT) 267.823 267.3 267.3 ESTIMATED MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER 262 SO. METER STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 RTH CAROLINA VO OF TRANSPORTATION ION OF HIGHWAYS NO. BY DATE NO.	+28.311				268.4			
30.519 3.457 (LT) 278.206 268.805 268.3 35.000 3.457 (LT) 275.955 268.698 268.2 40.000 3.457 (LT) 272.595 268.575 268.0 45.000 3.457 (LT) 274.219 268.450 267.9 50.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 267.823 267.823 267.3 ESTIMATED MSE WALL QUANTITIES (SQUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STA13+68.500 EVENUE PROJECT NO.: R-2413CA WALL QUANTITIES (SQUARE METER) MSE RETAINING WALL NO. 2 STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 WRTH CAROLINA WT OF TRANSPORTATION ION OF HIGHWAYS OTECHNICAL NEERING UNIT NO <	+28.311					-		
40.000 3.457 (LT) 275.595 268.575 268.0 45.000 3.457 (LT) 274.219 268.450 267.9 50.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 268.112 267.988 267.4 68.500 3.457 (LT) 267.823 267.3 267.3 PROJECT NO.: R-2413CA WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER MEET 2 OF 7 RTH CAROLINA NT OF TRANSPORTATION (NO F HIGHWAYS OTECHNICAL NO. BY DATE NO. BY DATE NO. 1	+30.519					_		
45.000 3.457 (LT) 274.219 268.450 267.9 50.000 3.457 (LT) 272.842 268.321 267.8 55.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 267.823 267.823 267.3 ESTIMATED MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STATION: MALL NO. 2 262 SO. METER MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STATION: 13+19.000 -NC68 NB- LT STATION: 13+10.000 -NC68 NB- LT STATION: 13+10.000 -NC68 NB-	35.000							
50.000 3.457 (LT) 272.842 268.321 267.8 55.000 3.457 (LT) 271.465 268.189 267.6 60.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 267.823 267.823 267.4 68.000 3.457 (LT) 266.712 267.823 267.3 ESTIMATED MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER METAINING WALL NO. 2 STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 ORTH CAROLINA NT OF TRANSPORTATION ION OF HIGHWAYS OTECHNICAL NEERING UNIT SETENSIONS OTECHNICAL NEERING UNIT						_		
60.000 3.457 (LT) 270.089 268.055 267.5 65.000 3.457 (LT) 268.712 267.988 267.4 68.500 3.457 (LT) 267.823 267.3 267.3 ESTIMATED MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 ORTH CAROLINA NO OF HIGHWAYS MSE RETAINING WALL NO. 2 PLAN & WALL ENVELOPE OTECHNICAL NEERING UNIT	·50.000							
65.000 3.457 (LT) 268.712 267.988 267.4 68.500 3.457 (LT) 267.823 267.823 267.3 ESTIMATED MSE WALL QUANTITIES (SQUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER MSE RETAINING WALL NO. 2 262 SO. METER STA13+68.500 TATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 ORTH CAROLINA NO OF HIGHWAYS MSE RETAINING WALL NO. 2 PLAN & WALL ENVELOPE OTECHNICAL NEERING UNIT	55.000					-		
68.500 3.457 (LT) 267.823 267.3 ESTIMATED MSE WALL QUANTITIES (SOUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 ORTH CAROLINA NO OF HIGHWAYS MSE RETAINING WALL NO. 2 PLAN & WALL ENVELOPE OTECHNICAL NEERING UNIT						_		
WALL QUANTITIES (SQUARE METER) MSE RETAINING WALL NO. 2 262 SO. METER MSE RETAINING WALL NO. 2 262 SO. METER PROJECT NO.: R-2413CA ROCKINGHAM COUNTY STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 PRTH CAROLINA NO OF HIGHWAYS OTECHNICAL NEERING UNIT NO. BY DATE NO. BY DATE NO. BY DATE NO. BY DATE NO. BY DATE NO. BY DATE NO.	-68.500]		
ROCKINGHAM COUNTY Station: 13+19.000 -NC68 NB- LT SHEET 2 OF 7 SHEET 2 OF 7 ORTH CAROLINA MSE RETAINING WALL NO. 2 NO OF HIGHWAYS PLAN & WALL ENVELOPE OTECHNICAL REVISIONS NO. BY DATE NO. 1 3	WALL QUANTITIES (square meter)							
1 3 W-2	C68 NB- STA.13+68.500 = 267.823ROCKINGHAM COUNTY STATION: 13+19.000 -NC68 NB- LT SHEET 2 OF 7ORTH CAROLINA NT OF TRANSPORTATION ION OF HIGHWAYSMSE RETAINING WALL NO. 2 PLAN & WALL ENVELOPEOTECHNICAL NEEDINC LINUTREVISIONSSHEETSHEET							

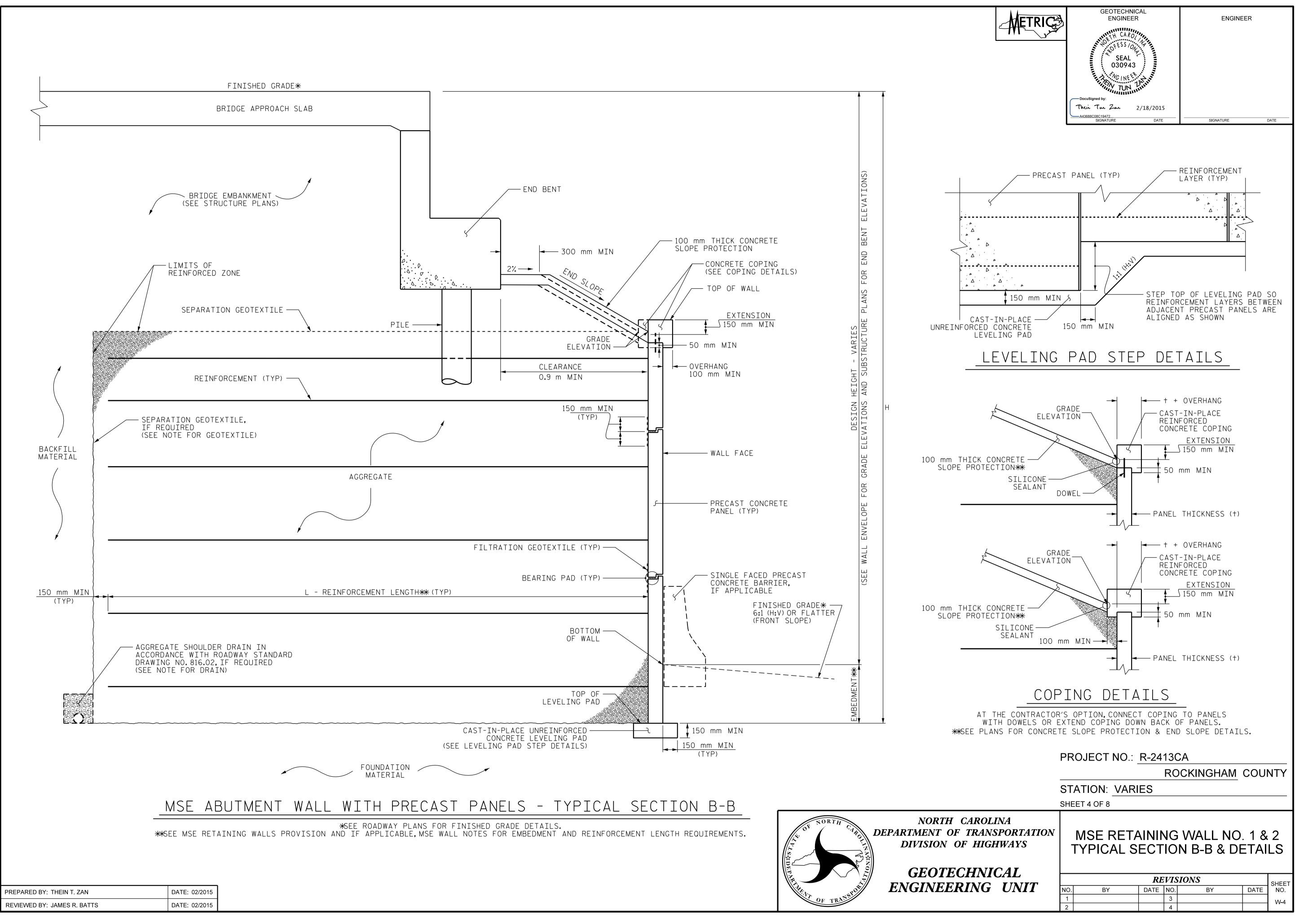


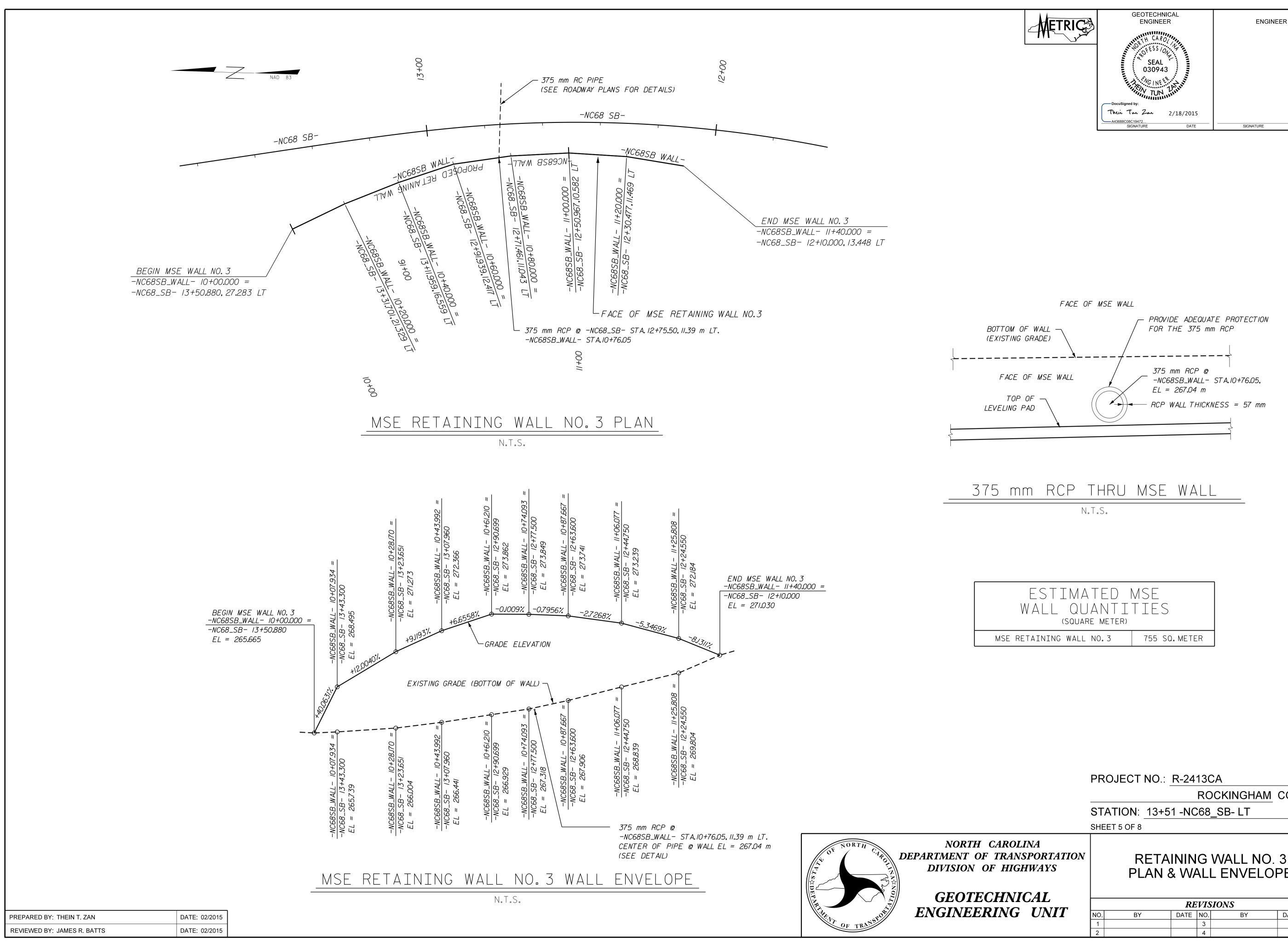
HETRIC	GEOTECHNICAL ENGINEER	ENGINEER
	SEAL 030943	
	030943	
	DocuSigned by: Their Tun Zan 2/18/2015 A43688C08C19472	
	SIGNATURE DATE	SIGNATURE DATE
PRECAST PANEL (TYP)	REINFORCEMENT LAYER (TYP)	
		-
····· K		
150 mm MIN 5	- STEP TOP OF LEVELING PA REINFORCEMENT LAYERS BE	TWEEN
PLACE 150 mm MIN	ADJACENT PRECAST PANELS ALIGNED AS SHOWN	ARE
IG PAD		
ELING PAD STE	P DETAILS	
	PROJECT NO.: R-2413C	
	RO STATION: VARIES	CKINGHAM COUNTY
	SHEET 3 OF 7	
ORTH CAROLINA NT OF TRANSPORTATION ION OF HIGHWAYS	MSE RETAINING TYPICAL SECTIOI	
OTECHNICAL	REVIS	IONS
NEERING UNIT	NO. BY DATE NO.	BY DATE NO.

3

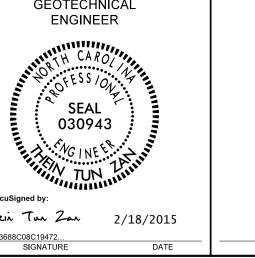
4

W-3





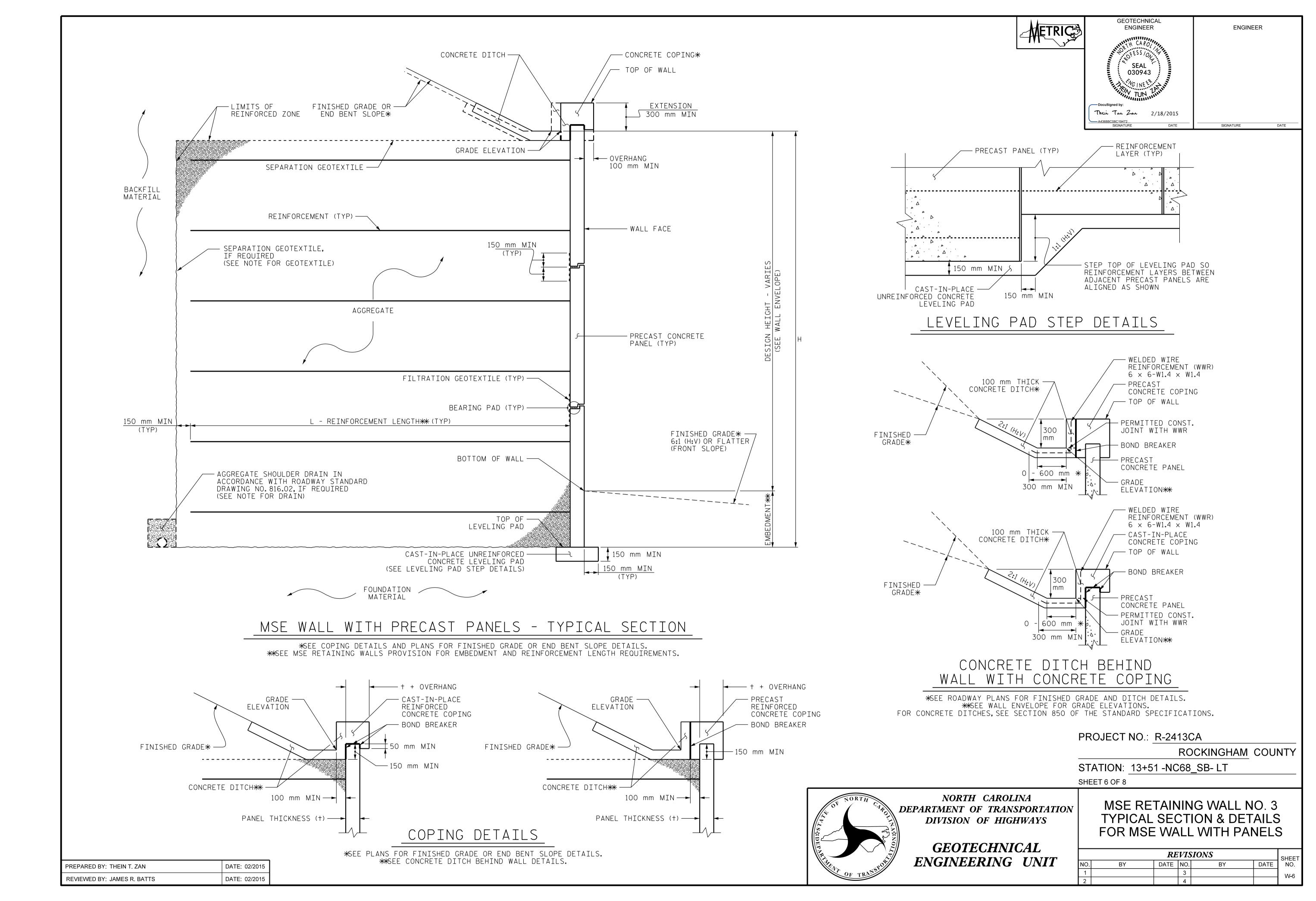


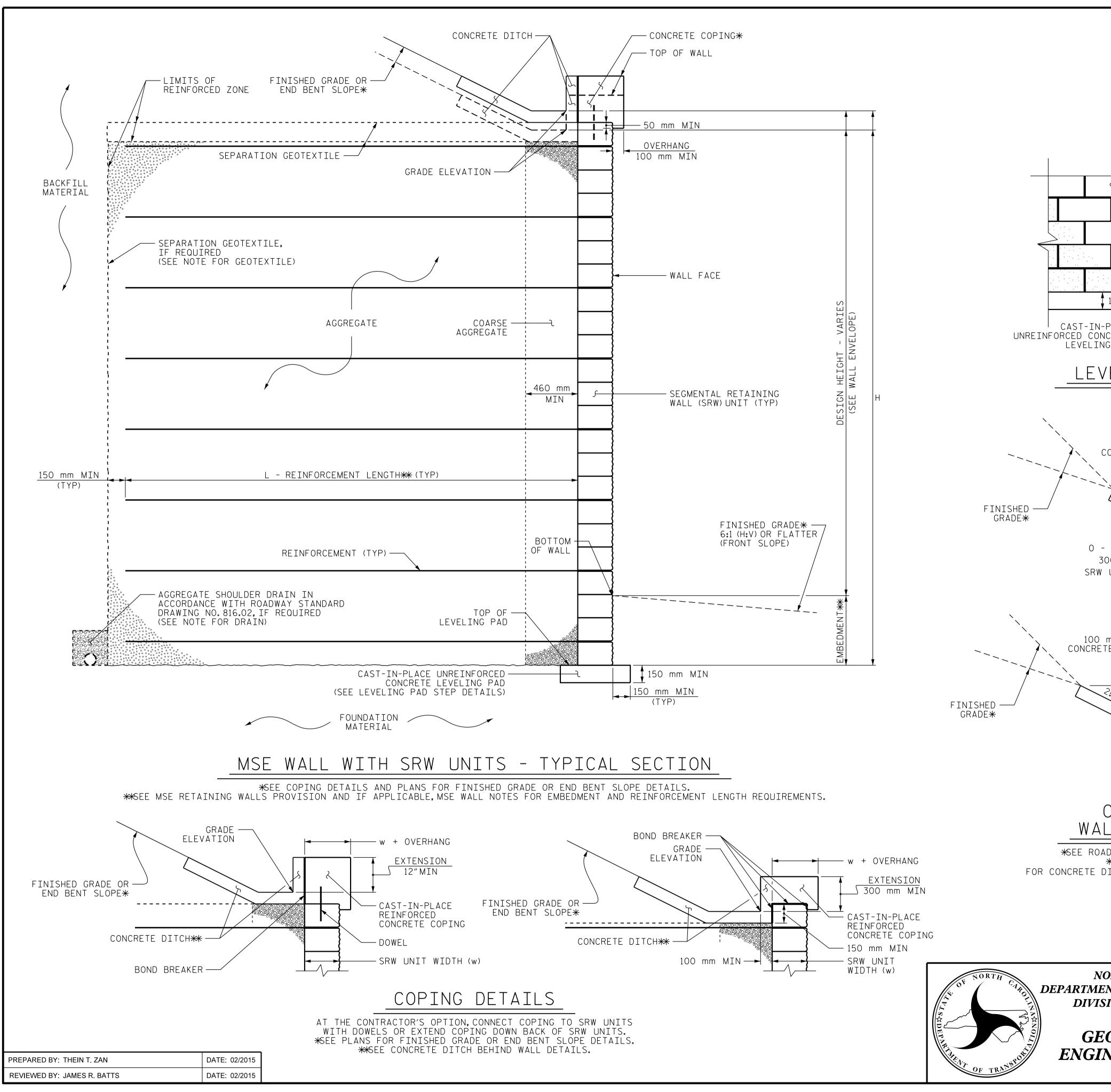


DATE

ESTIMATED I WALL QUANTI (square meter)	
MSE RETAINING WALL NO.3	755 SQ.METER

	PR	OJECT NO.:	R-24	130	CA		
				RC	CKINGHAM	COU	NTY
	ST	ATION: <u>13+5</u>	1 -NC	68	_SB- LT		
	SHE	ET 5 OF 8					
RTH CAROLINA T OF TRANSPORTATION ON OF HIGHWAYS				<u> </u>	WALL NO. L ENVELO	•	
TECHNICAL							
EERING UNIT	NO.	BY	RE DATE	EVIS NO	SIONS BY		SHEET
	1		Ditte	3			W-5





ETRIC	GEOTECHNICAL ENGINEER	ENGINEER
	OFESS 101	
	SEAL 030943	
	TUN TUN	
	DocuSigned by: Their Tun Zan 2/18/2015 A43688C08C19472 SIGNATURE DATE	
SRW UNIT (TYP)	SIGNATURE DATE	SIGNATURE DATE
S		-
<u></u> 150 mm MIN <u>S</u>	- STEP TOP OF LEVELING PAG) IN
	INCREMENTS OF SRW UNIT	HEIGHT
CRETE 150 mm MIN G PAD		
ELING PAD STEF	PDETAILS	
	/ WELDED WIRE	
100 mm THICK —	/ REINFORCEMENT (WWR) 6 × 6-W1.4 × W1.4	
ONCRETE DITCH*	CAST-IN-PLACE CONCRETE COPING TOP OF WALL	
	- PERMITTED CONST.	
2:1 (H, V) 300 mm	JOINT WITH WWR — BOND BREAKER	
	DOWEL	
DO MM MIN	GRADE	
	ELEVATION **	
	WELDED WIRE REINFORCEMENT (WWR) 6 × 6-W1.4 × W1.4	
mm THICK E DITCH*	CAST-IN-PLACE CONCRETE COPING	
	BOND BREAKER	
300 mm	DUND BREAKER	
0 - 600 mm * 300 mm MIN	PERMITTED CONST. Joint with wwr	
	GRADE Elevation **	
CONCRETE DITCH		
L WITH CONCRE		
**SEE WALL ENVELOPE FOR GRAD ITCHES, SEE SECTION 850 OF T	E ELEVATIONS.	NS.
	PROJECT NO.: R-24130	CA
-		CKINGHAM COUNTY
	STATION: <u>13+51 -NC68</u> SHEET 7 OF 8	<u></u>
ORTH CAROLINA NT OF TRANSPORTATION	MSE RETAININ	G WALL NO. 3
ION OF HIGHWAYS	TYPICAL SECTI FOR MSE WALL V	
OTECHNICAL	REVIS	IONS
NEERING UNIT	NO. BY DATE NO. 1 3	BY DATE NO. W-7
	2 4	

NOTES:

FOR MECHANICALLY STABILIZED RETAINING WALLS SPECIAL PROV
FOR STEEL BEAM GUARDRAIL, SEE
FOR SINGLE FACED PRECAST CON SPECIFICATIONS.
AT THE CONTRACTOR'S OPTION, U MEET ARTICLE 1040-4 OF THE ST
AT THE CONTRACTOR'S OPTION, U RETAINING WALL NO.2 AND RETA
A SEPARATION GEOTEXTILE IS R RETAINING WALL NO.2 AND RETA
A DRAIN IS REQUIRED FOR RETA
BEFORE BEGINNING MSE WALL DE WALL NO.3, SURVEY WALL LOCATI REVIEW. DO NOT START WALL DE
DESIGN RETAINING WALLS FOR T 1) H = DESIGN HEIGHT + EMBEDME

2) DESIGN LIFE = 100 YEARS 5) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT FRICTION ANGLE (γ) (φ) kN/m ³ DEGREE		COHESION (c) kPa		
COARSE	17.2	38	0		
FINE	18.0	34	0		
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.					

5) IN-SITU ASSUMED MATERIAL PARAMETERS:						
MATERIAL TYPE	UNIT WEIGHT (_γ) kN/m ³	FRICTION ANGLE (ф) DEGREE	COHESION (c) kPa			
BACKFILL	18.8	30	0			
FOUNDATION	18.8	28	0			

(TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL NO.3 FOR A PIPE EXTENDING THROUGH THE WALL AS SHOWN.VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING MSE WALL DESIGN OR CONSTRUCTION.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1, RETAINING WALL NO.2 AND RETAINING WALL NO.3.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 90+37.493 -LREV_SB- AND END BENT NO.2 LOCATED AT STATION 90+81.993 -LREV_SB- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2, RESPECTIVELY. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1, RETAINING WALL NO.2 AND RETAINING WALL NO.3, UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

PREPARED BY: THEIN T. ZAN	DATE: 02/2015
REVIEWED BY: JAMES R. BATTS	DATE: 02/2015

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH

VISION.

ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS. NCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD

USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL (SRW) UNITS THAT STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 3.

USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO.1, AINING WALL NO.3.

REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1, AINING WALL NO.3.

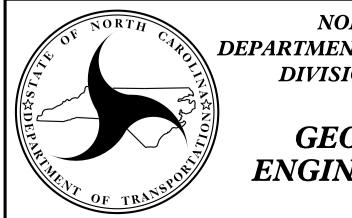
AINING WALL NO.1, RETAINING WALL NO.2 AND RETAINING WALL NO.3.

ESIGN FOR RETAINING WALL NO.1, RETAINING WALL NO.2 AND RETAINING IONS AND SUBMIT REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR ESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

THE FOLLOWING: 1ENT

3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 355 kPa (FOR WALL NO.1 & WALL NO.2) 4) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 340 kPa (FOR WALL NO. 3)

DESIGN RETAINING WALL NO.1, RETAINING WALL NO.2 AND RETAINING WALL NO.3 FOR A LIVE LOAD





ENGINEER

SIGNATURE

DATE

	PROJECT NO.:			CA OCKINGHAM	COUI	NTY
ORTH CAROLINA NT OF TRANSPORTATION ION OF HIGHWAYS	MSE RETAINING WALL NO. 1, 2 & 3 NOTES					
OTECHNICAL NEERING UNIT	NO. BY 1 2	RE DATE	NO. 3	SIONS BY	DATE	SHEET NO. W-8

DESIGN DATA:

+

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SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)	
LIVE LOAD	SEE PLANS	
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.	
STRESS IN EXTREME FIBER OF		
STRESS IN EXTREME TIDER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36 -	20,000 LBS.PER SQ.IN.	
- AASHTO M270 GRADE 50W -	27,000 LBS.PER SQ.IN.	
- AASHTO M270 GRADE 50 -	27,000 LBS.PER SQ.IN.	
REINFORCING STEEL IN TENSION		
GRADE 60	24,000 LBS.PER SQ.IN.	
CONCRETE IN COMPRESSION	1,200 LBS.PER SQ.IN.	
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.	
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	1,800 LBS.PER SQ.IN.	
COMPRESSION PERPENDICULAR TO GRAIN		
OF TIMBER	375 LBS.PER SQ.IN.	
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS.PER CU.FT.	

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 ``STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

(MINIMUM)

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4"FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

STANDARD NOTES

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE. ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER. DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE

AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE $\frac{3}{4}$ " Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-O".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2"OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES.ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH JANUARY, 1990

STD. NO. SN