

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No.2 DATED 07-08-2019

DATE AND TIME OF BID OPENING: **JULY 16, 2019 AT 2:00 PM**

CONTRACT ID C204266
WBS 36030.3.GV4

FEDERAL-AID NO. NHPP-026-1(199)6
COUNTY BUNCOMBE, HENDERSON
T.I.P. NO. I-4700
MILES 7.490
ROUTE NO. I 26
LOCATION I-26 FROM NC-280 (EXIT 40) TO I-40.

TYPE OF WORK GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

IMPACT ATTENUATOR UNITS, TYPE TL-2:

(4-20-04) (Rev. 12-18-18)

SP8 R75(Revised)

Description

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

Materials

Furnish impact attenuator units listed on the Approved Products List at <https://apps.dot.state.nc.us/vendor/approvedproducts/> or approved equal. Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of the Manual for Assessing Safety Hardware (MASH-16), Test Level 2, in accordance with Article 106-2 of the *2018 Standard Specifications*.
- (B) Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the *2018 Standard Specifications*.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans and details and assembling instructions furnished by the manufacturer.

Construction Methods

If the median width is 40 feet or less, the Contractor shall supply NON-GATING Impact Attenuator Units.

If the median width is greater than 40 feet, the Contractor may use GATING or NON-GATING Impact Attenuator Units.

Measurement and Payment

Impact Attenuator Unit, Type TL-2 will be measured and paid at the contract unit price per each. Such prices and payment will be full compensation for all work covered by this provision including, but not limited to, furnishing, installing and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Impact Attenuator Units, Type TL-2

Pay Unit

Each

PROJECT SPECIAL PROVISIONS

GEOTECHNICAL

ROCK EMBANKMENT (SPECIAL)	GT-1.1 - GT-1.2
SCARIFY/MIX EXISTING ABC AND SAND LAYERS (SPECIAL)	GT-2.1 - GT-2.1
GEOTEXTILE FOR PAVEMENT STABILIZATION (SPECIAL)	GT-3.1 - GT-3.2
STANDARD SHORING - (1/16/2018)	GT-4.1 - GT-4.4
TEMPORARY SOIL NAIL WALLS - (1/16/2018)	GT-5.1 - GT-5.9
ARCHTECTURAL CONCRETE SURFACE TREATMENT (SPECIAL)	GT-6.1 - GT-6.6
MSE RETAINING WALLS (LRFD) - (1/16/2018)	GT-7.1 - GT-7.12
SOIL NAIL RETAINING WALLS (SPECIAL)	GT-8.1 - GT-8.12

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Geotechnical Engineering Unit
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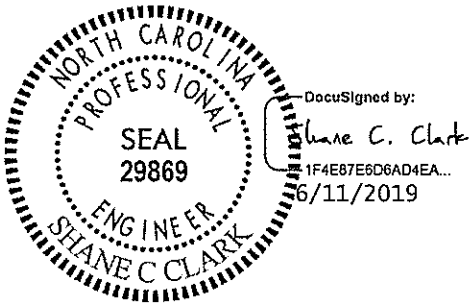
6/11/2019

5.0 MEASUREMENT AND PAYMENT

Architectural concrete surface treatment as described in this Special Provision will be paid for at the contract unit price bid for "Architectural Concrete Surface Treatment". The payment quantity will be equal to the final installed wall quantity. Payment will include the furnishing and use of all form liners, the construction, finishing, staining, anti-graffiti coating and removal of all sample panels, and all equipment, materials, labor, and incidentals necessary to complete the work in conformance with the Contract Documents.

Payment will be made under:

Architectural Concrete Surface Treatment.....Square Feet



County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0000900000-N	SP	GENERIC MISCELLANEOUS ITEM UTILITY COORDINATOR	Lump Sum	L.S.	
0004	0000910000-N	SP	GENERIC MISCELLANEOUS ITEM EQUIPMENT OPERATING RATE FOR SNOW AND ICE REMOVAL	3,840 HR		
0005	0000915000-N	SP	GENERIC MISCELLANEOUS ITEM OUTFITTING FEE	4 EA		
0006	0000915000-N	SP	GENERIC MISCELLANEOUS ITEM RESPONSE FOR SNOW AND ICE REMOVAL	80 EA		
0007	0001000000-E	200	CLEARING & GRUBBING .. ACRE(S)	Lump Sum	L.S.	
0008	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB- BING	4 ACR		
0009	0022000000-E	225	UNCLASSIFIED EXCAVATION	717,100 CY		
0010	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION ***** (1050+63.05 -L-)	Lump Sum	L.S.	
0011	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION ***** (1163+08.56 -L-)	Lump Sum	L.S.	
0012	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ***** (912+89.86 -EBL-)	Lump Sum	L.S.	
0013	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ***** (913+34.69 -WBL-)	Lump Sum	L.S.	
0014	0036000000-E	225	UNDERCUT EXCAVATION	10,100 CY		
0015	0106000000-E	230	BORROW EXCAVATION	91,400 CY		
0016	0134000000-E	240	DRAINAGE DITCH EXCAVATION	18,000 CY		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0017	0141000000-E	240	BERM DITCH CONSTRUCTION	11,000 LF		
0018	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	360,000 SY		
0019	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	190,000 SY		
0020	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	7,300 SY		
0021	0185000000-E	250	BREAKING OF EXISTING CONCRETE PAVEMENT	7,600 SY		
0022	0195000000-E	265	SELECT GRANULAR MATERIAL	8,000 CY		
0023	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	728,300 SY		
0024	0199000000-E	SP	TEMPORARY SHORING	24,450 SF		
0025	0225000000-E	SP	REINFORCED SOIL SLOPES	1,900 SY		
0026	0241000000-E	SP	GENERIC GRADING ITEM GEOTEXTILE, TYPE 4	9,000 SY		
0027	0241000000-E	SP	GENERIC GRADING ITEM GEOTEXTILE, TYPE 5	4,250 SY		
0028	0241000000-E	SP	GENERIC GRADING ITEM OBLITERATION OF EXISTING MOUNTAIN TO SEA TRAIL	270 SY		
0029	0255000000-E	SP	GENERIC GRADING ITEM SELECT MATERIAL, CLASS IV	5,000 TON		
0030	0255000000-E	SP	GENERIC GRADING ITEM SELECT MATERIAL, CLASS VII	104,000 TON		
0031	0255000000-E	SP	GENERIC GRADING ITEM TOPSOIL	1,350 TON		
0032	0262000000-N	SP	GENERIC GRADING ITEM STONE HEADWALL REMOVAL	4 EA		
0033	0264000000-E	SP	GENERIC GRADING ITEM VACUUM SWEEPING	30 SMI		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0034	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	4,880 TON		
0035	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	15,330 SY		
0036	0335300000-E	305	18" DRAINAGE PIPE	110 LF		
0037	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	320 LF		
0038	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	405 LF		
0039	0448000000-E	310	***** RC PIPE CULVERTS, CLASS IV (48")	1,132 LF		
0040	0448000000-E	310	***** RC PIPE CULVERTS, CLASS IV (54")	158 LF		
0041	0448000000-E	310	***** RC PIPE CULVERTS, CLASS IV (60")	24 LF		
0042	0448000000-E	310	***** RC PIPE CULVERTS, CLASS IV (66")	284 LF		
0043	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	20,350 LF		
0044	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	8,008 LF		
0045	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	5,684 LF		
0046	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	3,064 LF		
0047	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	1,320 LF		
0048	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	808 LF		
0049	0576000000-E	310	*** CS PIPE CULVERTS, ***** THICK (66", 0.109")	32 LF		
0050	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	3,064 LF		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0051	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	1,138	LF	
0052	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	684	LF	
0053	0600000000-E	310	30" CS PIPE CULVERTS, 0.079" THICK	212	LF	
0054	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")	86	EA	
0055	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (18", 0.064")	27	EA	
0056	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (24", 0.064")	21	EA	
0057	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (30", 0.079")	9	EA	
0058	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (66", 0.109")	2	EA	
0059	0973100000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B IN SOIL (36", 0.500")	332	LF	
0060	0973100000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B IN SOIL (42", 0.625")	100	LF	
0061	0973100000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B IN SOIL (48", 0.625")	152	LF	
0062	0973100000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B IN SOIL (66", 0.875")	162	LF	
0063	0973300000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B NOT IN SOIL (36", 0.500")	333	LF	
0064	0973300000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B NOT IN SOIL (42", 0.625")	100	LF	

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0065	0973300000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B NOT IN SOIL (48", 0.625")	152 LF		
0066	0973300000-E	330	*** WELDED STEEL PIPE, ***** THICK, GRADE B NOT IN SOIL (66", 0.875")	163 LF		
0067	0986000000-E	SP	GENERIC PIPE ITEM 15" CS SLOTTED DRAIN 0.064" THICK	1,768 LF		
0068	0995000000-E	340	PIPE REMOVAL	15,319 LF		
0069	0996000000-N	350	PIPE CLEAN OUT	3 EA		
0070	0999000000-E	462	4" SLOPE PROTECTION	130 SY		
0071	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0072	1099500000-E	505	SHALLOW UNDERCUT	179,400 CY		
0073	1099700000-E	505	CLASS IV SUBGRADE STABILIZATION	460,000 TON		
0074	1110000000-E	510	STABILIZER AGGREGATE	1,000 TON		
0075	1115000000-E	SP	GEOTEXTILE FOR PAVEMENT STABILIZATION	63,807 SY		
0076	1121000000-E	520	AGGREGATE BASE COURSE	8,400 TON		
0077	1220000000-E	545	INCIDENTAL STONE BASE	5,000 TON		
0078	1275000000-E	600	PRIME COAT	3,900 GAL		
0079	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***** DEPTH (1-1/2")	34,647 SY		
0081	1330000000-E	607	INCIDENTAL MILLING	70,000 SY		
0082	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	150,477 TON		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0083	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	85,576 TON		
0084	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	33,032 TON		
0085	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	40,000 TON		
0086	1524200000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5D	27,846 TON		
0087	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	15,500 TON		
0088	1577000000-E	620	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	1,600 TON		
0089	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,000 TON		
0090	1840000000-E	665	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)	160,000 LF		
0091	1847000000-E	710	***** PORT CEM CONC PAVEMENT, THROUGH LANES (WITH DOWELS) (13-1/2")	449,500 SY		
0092	1880000000-E	SP	GENERIC PAVING ITEM AGGREGATE TOPSOIL	425 TON		
0093	1891000000-E	SP	GENERIC PAVING ITEM DIAMOND GRINDING PORT CEM CONC PAVEMENT	449,500 SY		
0094	1891000000-E	SP	GENERIC PAVING ITEM STAMPED CONCRETE	250 SY		
0095	1920000000-E	724	NONWOVEN GEOTEXTILE INTERLAYER	460,000 SY		
0096	2000000000-N	806	RIGHT-OF-WAY MARKERS	3 EA		
0097	2022000000-E	815	SUBDRAIN EXCAVATION	1,008 CY		
0098	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	4,500 SY		
0099	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	756 CY		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0100	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	4,500 LF		
0101	2070000000-N	815	SUBDRAIN PIPE OUTLET	67 EA		
0102	2077000000-E	815	6" OUTLET PIPE	402 LF		
0103	2099000000-E	816	SHOULDER DRAIN	112,000 LF		
0104	2110000000-E	816	4" SHOULDER DRAIN PIPE	112,000 LF		
0105	2121000000-E	816	4" OUTLET PIPE FOR SHOULDER DRAINS	5,200 LF		
0106	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	100 EA		
0107	2190000000-N	828	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE	177 EA		
0108	2209000000-E	838	ENDWALLS	36 CY		
0109	2220000000-E	838	REINFORCED ENDWALLS	121 CY		
0110	2275000000-E	SP	FLOWABLE FILL	665 CY		
0111	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	550 EA		
0112	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	84 CY		
0113	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	857 LF		
0114	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	404 EA		
0115	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	100 EA		
0116	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	5 EA		
0117	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	1 EA		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0118	2396000000-N	840	FRAME WITH COVER, STD 840.54	28 EA		
0119	2473000000-N	SP	GENERIC DRAINAGE ITEM ENERGY DISSIPATOR	20 EA		
0120	2473000000-N	SP	GENERIC DRAINAGE ITEM STONE MASONRY HEADWALL FOR 18" PIPE CULVERT	3 EA		
0121	2473000000-N	SP	GENERIC DRAINAGE ITEM STONE MASONRY HEADWALL FOR 24" PIPE CULVERT	7 EA		
0122	2476000000-E	SP	GENERIC DRAINAGE ITEM GROUTING	3,150 GAL		
0123	2484000000-E	SP	GENERIC DRAINAGE ITEM 24" PIPE REHABILITATION CIPP LINER	133 LF		
0124	2484000000-E	SP	GENERIC DRAINAGE ITEM 30" PIPE REHABILITATION CIPP LINER	810 LF		
0125	2484000000-E	SP	GENERIC DRAINAGE ITEM 36" OD PIPE REHABILITATION SOLID WALL THERMOPLASTIC SLIP LINER	1,433 LF		
0126	2484000000-E	SP	GENERIC DRAINAGE ITEM 36" PIPE REHABILITATION CIPP LINER	624 LF		
0127	2484000000-E	SP	GENERIC DRAINAGE ITEM 42" OD PIPE REHABILITATION SOLID WALL THERMOPLASTIC SLIP LINER	574 LF		
0128	2484000000-E	SP	GENERIC DRAINAGE ITEM 48" OD PIPE REHABILITATION SOLID WALL THERMOPLASTIC SLIP LINER	168 LF		
0129	2484000000-E	SP	GENERIC DRAINAGE ITEM 54" OD PIPE REHABILITATION SOLID WALL THERMOPLASTIC SLIP LINER	570 LF		
0130	2484000000-E	SP	GENERIC DRAINAGE ITEM 63" OD PIPE REHABILITATION SOLID WALL THERMOPLASTIC SLIP LINER	190 LF		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0131	2484000000-E	SP	GENERIC DRAINAGE ITEM PRE-INSTALLATION INSPECTION	4,502 LF		
0132	2484000000-E	SP	GENERIC DRAINAGE ITEM SEALANT	841 LF		
0133	2486000000-E	SP	GENERIC DRAINAGE ITEM TEMPORARY SHORING FOR DRAINAGE PIPE CONSTRUCTION	30,000 SF		
0134	2535000000-E	846	***X *** CONCRETE CURB (6" X 18")	35 LF		
0135	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	70 LF		
0136	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	1,900 LF		
0137	2556000000-E	846	SHOULDER BERM GUTTER	58,000 LF		
0138	2577000000-E	846	CONCRETE EXPRESSWAY GUTTER	210 LF		
0139	2591000000-E	848	4" CONCRETE SIDEWALK	750 SY		
0140	2605000000-N	848	CONCRETE CURB RAMPS	14 EA		
0141	2619000000-E	850	4" CONCRETE PAVED DITCH	6,350 SY		
0142	2627000000-E	852	4" CONCRETE ISLAND COVER	400 SY		
0143	2647000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)	280 SY		
0144	2703000000-E	854	CONCRETE BARRIER, TYPE ***** (I SINGLE SLOPE)	12,000 LF		
0145	2703000000-E	854	CONCRETE BARRIER, TYPE ***** (T1)	320 LF		
0146	2710000000-N	854	CONCRETE BARRIER TRANSITION SECTION	11 EA		
0147	2717000000-E	854	VARIABLE HEIGHT CONCRETE BAR- RIER, TYPE ***** (II SINGLE SLOPE)	14,300 LF		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0148	2724000000-E	857	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED	13,000 LF		
0149	2738000000-E	SP	GENERIC PAVING ITEM PAVED WATERWAY, TYPE 5, AS-PHALT	1,400 SY		
0150	2752000000-E	SP	GENERIC PAVING ITEM CONCRETE CAP FOR SINGLE FACED BARRIER FILL	384 LF		
0151	2752000000-E	SP	GENERIC PAVING ITEM GRANITE CURB	380 LF		
0152	2752000000-E	SP	GENERIC PAVING ITEM MEDIAN HAZARD PROTECTION	119 LF		
0153	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	5 EA		
0154	2850000000-N	858	GENERIC DRAINAGE ITEM ADJUSTMENT OF JUNCTION BOX	1 EA		
0155	2893000000-N	859	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX WITH MANHOLE	3 EA		
0156	2938000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE	4 EA		
0157	3030000000-E	862	STEEL BEAM GUARDRAIL	70,000 LF		
0158	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	100 EA		
0159	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	26 EA		
0160	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	22 EA		
0161	3317000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE B-77	44 EA		
0162	3360000000-E	863	REMOVE EXISTING GUARDRAIL	95,030 LF		
0163	3380000000-E	862	TEMPORARY STEEL BEAM GUARDRAIL	500 LF		
0164	3387000000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ***** (B-77)	18 EA		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0165	3387000000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ***** (III)	8 EA		
0166	3420000000-E	SP	GENERIC GUARDRAIL ITEM GUARDRAIL SYSTEM, STEEL-BACKED TIMBER, TYPE A (SBTA)	1,200 LF		
0167	3420000000-E	SP	GENERIC GUARDRAIL ITEM STONE MASONRY GUARDWALL	655 LF		
0168	3435000000-N	SP	GENERIC GUARDRAIL ITEM GUARDRAIL TERMINAL SECTION, TYPE SBT TANGENT	4 EA		
0169	3435000000-N	SP	GENERIC GUARDRAIL ITEM RESPONSE FOR GUARDRAIL/ GUIDERAIL MAINTENANCE	200 EA		
0170	3503000000-E	866	WOVEN WIRE FENCE, 47" FABRIC	80,000 LF		
0171	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	5,100 EA		
0172	3515000000-E	866	5" TIMBER FENCE POSTS, 8'-0" LONG	1,200 EA		
0173	3557000000-E	866	ADDITIONAL BARBED WIRE	1,000 LF		
0174	3559000000-E	866	** STRAND BARBED WIRE FENCE WITH POSTS (4)	1,000 LF		
0175	3563000000-E	SP	TEMP *** WOVEN WIRE FENCE, COMPLETE W/POSTS (47")	300 LF		
0176	3578000000-N	SP	GENERIC FENCING ITEM 16' STEEL PIPE GATE	1 EA		
0177	3628000000-E	876	RIP RAP, CLASS I	4,175 TON		
0178	3635000000-E	876	RIP RAP, CLASS II	790 TON		
0179	3649000000-E	876	RIP RAP, CLASS B	2,315 TON		
0180	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	37,259 SY		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0181	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	30 SF		
0182	4048000000-E	902	REINFORCED CONCRETE SIGN FOUN- DATIONS	36 CY		
0183	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDA- TIONS	7 CY		
0184	4057000000-E	SP	OVERHEAD FOOTING	245 CY		
0185	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	30,539 LB		
0186	4066000000-E	903	SUPPORTS, SIMPLE STEEL BEAM	10,134 LB		
0187	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	1,420 LF		
0188	4079000000-N	903	SUPPORTS, BARRIER (SMALL)	5 EA		
0189	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1001+50 -L-)	Lump Sum	L.S.	
0190	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1025+50 -L- LT)	Lump Sum	L.S.	
0191	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1068+00 -L- LT)	Lump Sum	L.S.	
0192	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1131+50 -EBL- LT)	Lump Sum	L.S.	
0193	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1171+00 -L-)	Lump Sum	L.S.	
0194	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (1225+00 -L-)	Lump Sum	L.S.	
0195	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (20+50 -Y15- RPA)	Lump Sum	L.S.	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0196	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (21+50 -Y15- RPC)	Lump Sum	L.S.	
0197	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (838+75 -L-)	Lump Sum	L.S.	
0198	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (860+50 -L-)	Lump Sum	L.S.	
0199	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (911+00 -WBL-)	Lump Sum	L.S.	
0200	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (916+00 -EBL)	Lump Sum	L.S.	
0201	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (951+00 -WBL-)	Lump Sum	L.S.	
0202	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (966+50 -EBL- LT)	Lump Sum	L.S.	
0203	4096000000-N	904	SIGN ERECTION, TYPE D	11 EA		
0204	4102000000-N	904	SIGN ERECTION, TYPE E	29 EA		
0205	4108000000-N	904	SIGN ERECTION, TYPE F	6 EA		
0206	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	32 EA		
0207	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	11 EA		
0208	4114000000-N	904	SIGN ERECTION, MILEMARKERS	30 EA		
0209	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (A)	28 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0210	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (B)	4 EA		
0211	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (D)	4 EA		
0212	4116200000-N	904	SIGN ERECTION, REPOSITION OVERHEAD	1 EA		
0213	4138000000-N	907	DISPOSAL OF SUPPORT, STEEL BEAM	60 EA		
0214	4141000000-N	907	DISPOSAL OF SUPPORT, WOOD	4 EA		
0215	4149000000-N	907	DISPOSAL OF SIGN SYSTEM, OVER- HEAD	2 EA		
0216	4152000000-N	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	24 EA		
0217	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U- CHANNEL	80 EA		
0218	4158000000-N	907	DISPOSAL OF SIGN SYSTEM, WOOD	7 EA		
0219	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	8 EA		
0220	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	295 SF		
0221	4402000000-E	SP	HIGH VISIBILITY STATIONARY SIGNS	216 SF		
0222	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	146 SF		
0223	4407000000-E	SP	HIGH VISIBILITY PORTABLE SIGNS	3,394 SF		
0224	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	270 SF		
0225	4415000000-N	1115	FLASHING ARROW BOARD	25 EA		
0226	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	18 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0227	4422000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN (SHORT TERM)	50 DAY		
0228	4424000000-N	SP	WORK ZONE PRESENCE LIGHTING	18 EA		
0229	4430000000-N	1130	DRUMS	148 EA		
0230	4432000000-N	SP	HIGH VISIBILITY DRUMS	2,000 EA		
0231	4434000000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	36 EA		
0232	4435000000-N	1135	CONES	80 EA		
0233	4445000000-E	1145	BARRICADES (TYPE III)	384 LF		
0234	4447000000-E	SP	PEDESTRIAN CHANNELIZING DEVICES	48 LF		
0235	4455000000-N	1150	FLAGGER	117 DAY		
0236	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	64 EA		
0237	4470000000-N	1160	REMOVE & RESET TEMPORARY CRASH CUSHION	12 EA		
0238	4480000000-N	1165	TMA	15 EA		
0239	4485000000-E	1170	PORTABLE CONCRETE BARRIER	148,394 LF		
0240	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	57,482 LF		
0241	4500000000-E	1170	REMOVE & RESET PORTABLE CONCRETE BARRIER	60,293 LF		
0242	4505000000-E	1170	REMOVE & RESET PORTABLE CONCRETE BARRIER (ANCHORED)	9,687 LF		
0243	4510000000-N	1190	LAW ENFORCEMENT	1,000 HR		
0244	4589000000-N	SP	GENERIC TRAFFIC CONTROL ITEM WATERCRAFT SAFETY	Lump Sum	L.S.	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0245	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM CONNECTED LANE CLOSURE DEVICE	8 EA		
0246	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM FLASHING BEACONS AND DETECTION SYSTEM	16 EA		
0247	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM RTMC/STOC MANAGED PCMS	20 EA		
0248	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM TEMPORARY RIVER TRAFFIC WARN- ING SIGNS	16 EA		
0249	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	4,844 EA		
0250	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	221 LF		
0251	4720000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)	364 EA		
0252	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	64 EA		
0253	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	4,680 LF		
0254	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	11,450 LF		
0255	4815000000-E	1205	PAINT PAVEMENT MARKING LINES (6")	3,445 LF		
0256	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	125 LF		
0257	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	51 LF		
0258	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	51 EA		
0259	4847010000-E	1205	POLYUREA PAVEMENT MARKING LINES (4", 20 MILS)	10,445 LF		
0260	4847030000-E	1205	POLYUREA PAVEMENT MARKING LINES (6", 20 MILS)	245,426 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0261	4847050000-E	1205	POLYUREA PAVEMENT MARKING LINES (8", 20 MILS)	533 LF		
0262	4847070000-E	1205	POLYUREA PAVEMENT MARKING LINES (12", 20 MILS)	6,800 LF		
0263	4847500000-E	SP	WORK ZONE PERFORMANCE PAVEMENT MARKING LINES, 6"	628,376 LF		
0264	4847600000-E	SP	WORK ZONE PERFORMANCE PAVEMENT MARKING LINES, 12"	16,900 LF		
0265	4855000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (6")	61,511 LF		
0266	4865000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (12")	4,113 LF		
0267	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	7 EA		
0268	4891000000-E	1205	GENERIC PAVEMENT MARKING ITEM THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	400 LF		
0269	4895000000-N	SP	GENERIC PAVEMENT MARKING ITEM NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKERS	3,827 EA		
0270	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	135 EA		
0271	5070000000-N	SP	STANDARD FOUNDATION ***** (R1)	12 EA		
0272	5070000000-N	SP	STANDARD FOUNDATION ***** (R2)	3 EA		
0273	5155000000-E	1409	ELECTRICAL DUCT, TYPE BD, SIZE ***** (1.5")	180 LF		
0274	5170000000-E	1410	** #8 W/G FEEDER CIRCUIT (2)	300 LF		
0275	5175000000-E	1410	** #6 W/G FEEDER CIRCUIT (2)	220 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0276	5185000000-E	1410	** #2 W/G FEEDER CIRCUIT (2)	100 LF		
0277	5205000000-E	1410	** #8 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5")	4,660 LF		
0278	5210000000-E	1410	** #6 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5")	250 LF		
0279	5240000000-N	1411	ELECTRICAL JUNCTION BOXES ***** (LS18)	5 EA		
0280	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0281	5270000000-N	SP	GENERIC LIGHTING ITEM RELOCATE LIGHT STANDARD	15 EA		
0282	6000000000-E	1605	TEMPORARY SILT FENCE	126,325 LF		
0283	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	6,015 TON		
0284	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	42,960 TON		
0285	6012000000-E	1610	SEDIMENT CONTROL STONE	24,920 TON		
0286	6015000000-E	1615	TEMPORARY MULCHING	225 ACR		
0287	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	10,500 LB		
0288	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED- ING	55 TON		
0289	6024000000-E	1622	TEMPORARY SLOPE DRAINS	10,200 LF		
0290	6029000000-E	SP	SAFETY FENCE	37,000 LF		
0291	6030000000-E	1630	SILT EXCAVATION	95,155 CY		
0292	6036000000-E	1631	MATTING FOR EROSION CONTROL	500,000 SY		
0293	6037000000-E	SP	COIR FIBER MAT	14,025 SY		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0294	6042000000-E	1632	1/4" HARDWARE CLOTH	37,300	LF	
0295	6045000000-E	SP	*** TEMPORARY PIPE (18")	15	LF	
0296	6045000000-E	SP	*** TEMPORARY PIPE (36")	580	LF	
0297	6048000000-E	SP	FLOATING TURBIDITY CURTAIN	645	SY	
0298	6070000000-N	1639	SPECIAL STILLING BASINS	70	EA	
0299	6071010000-E	SP	WATTLE	1,000	LF	
0300	6071012000-E	SP	COIR FIBER WATTLE	9,000	LF	
0301	6071014000-E	SP	COIR FIBER WATTLE BARRIER	1,400	LF	
0302	6071020000-E	SP	POLYACRYLAMIDE (PAM)	14,100	LB	
0303	6071030000-E	1640	COIR FIBER BAFFLE	22,630	LF	
0304	6071050000-E	SP	*** SKIMMER (1-1/2")	48	EA	
0305	6071050000-E	SP	*** SKIMMER (2")	12	EA	
0306	6071050000-E	SP	*** SKIMMER (2-1/2")	3	EA	
0307	6084000000-E	1660	SEEDING & MULCHING	225	ACR	
0308	6087000000-E	1660	MOWING	135	ACR	
0309	6090000000-E	1661	SEED FOR REPAIR SEEDING	2,700	LB	
0310	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	8.25	TON	
0311	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	4,075	LB	
0312	6102000000-E	1664	SODDING	3,870	SY	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0313	6105000000-E	1664	WATER	109	M/G	
0314	6108000000-E	1665	FERTILIZER TOPDRESSING	122.25	TON	
0315	6111000000-E	SP	IMPERVIOUS DIKE	685	LF	
0316	6114500000-N	1667	SPECIALIZED HAND MOWING	350	MHR	
0317	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	150	EA	
0318	6123000000-E	1670	REFORESTATION	2	ACR	
0319	6132000000-N	SP	GENERIC EROSION CONTROL ITEM CONCRETE WASHOUT	22	EA	
0320	6132000000-N	SP	GENERIC EROSION CONTROL ITEM RISER BASIN, 1170 CF VOLUME CAPACITY	1	EA	
0321	6132000000-N	SP	GENERIC EROSION CONTROL ITEM RISER BASIN, 2510 CF VOLUME CAPACITY	1	EA	
0322	6132000000-N	SP	GENERIC EROSION CONTROL ITEM TEMPORARY INLET PROTECTION, TYPE C	5	EA	
0323	6132000000-N	SP	GENERIC EROSION CONTROL ITEM TEMPORARY INLET PROTECTION, TYPE D	5	EA	
0324	6135000000-E	SP	GENERIC EROSION CONTROL ITEM BLRI REFORESTATION	9	ACR	
0325	6135000000-E	SP	GENERIC EROSION CONTROL ITEM BLRI SEEDING & MULCHING	9	ACR	
0326	6135000000-E	SP	GENERIC EROSION CONTROL ITEM BLRI TEMPORARY MULCHING	9	ACR	
0327	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 2.A	2,900	SY	
0328	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 2.B	950	SY	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0329	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 2.C	4,300 SY		
0330	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 2.D	15,600 SY		
0331	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 3.B	130 SY		
0332	6141000000-E	SP	GENERIC EROSION CONTROL ITEM MATTING FOR EROSION CONTROL, RECP TYPE 4	2,050 SY		
0333	6144000000-E	SP	GENERIC EROSION CONTROL ITEM BLRI TEMPORARY SEEDING	220 LB		
0334	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	8 EA		
0335	7060000000-E	1705	SIGNAL CABLE	6,880 LF		
0336	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	10 EA		
0337	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	1 EA		
0338	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	2 EA		
0339	7204000000-N	1705	LOUVER	2 EA		
0340	7252000000-E	1710	MESSENGER CABLE (1/4")	300 LF		
0341	7264000000-E	1710	MESSENGER CABLE (3/8")	155 LF		
0342	7279000000-E	1715	TRACER WIRE	50,860 LF		
0343	7288000000-E	1715	PAVED TRENCHING (***** (2, 2")	150 LF		
0344	7300000000-E	1715	UNPAVED TRENCHING (***** (1, 2")	4,110 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0345	7300000000-E	1715	UNPAVED TRENCHING (*****) (1,1")	130 LF		
0346	7300000000-E	1715	UNPAVED TRENCHING (*****) (2, 2")	46,010 LF		
0347	7300100000-E	1715	UNPAVED TRENCHING FOR TEMP- ORARY LEAD-IN	40 LF		
0348	7301000000-E	1715	DIRECTIONAL DRILL (*****) (1, 2")	1,470 LF		
0349	7301000000-E	1715	DIRECTIONAL DRILL (*****) (2, 2")	5,590 LF		
0350	7312000000-N	1716	JUNCTION BOX (*****) (SPECIAL OVER-SIZED, HEAVY DUTY)	17 EA		
0351	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	51 EA		
0352	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEA- VY DUTY)	77 EA		
0353	7360000000-N	1720	WOOD POLE	4 EA		
0354	7372000000-N	1721	GUY ASSEMBLY	4 EA		
0355	7396000000-E	1722	1/2" RISER WITH WEATHERHEAD	1 EA		
0356	7408000000-E	1722	1" RISER WITH WEATHERHEAD	1 EA		
0357	7420000000-E	1722	2" RISER WITH WEATHERHEAD	2 EA		
0358	7432000000-E	1722	2" RISER WITH HEAT SHRINK TUBING	2 EA		
0359	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	2,300 LF		
0360	7456000000-E	1726	LEAD-IN CABLE (*****) (14-2)	8,820 LF		
0361	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (144)	54,970 LF		
0362	7528000000-E	1730	DROP CABLE	6,520 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0363	7540000000-N	1731	SPLICE ENCLOSURE	14 EA		
0364	7541000000-N	1731	MODIFY SPLICE ENCLOSURE	4 EA		
0365	7552000000-N	1731	INTERCONNECT CENTER	12 EA		
0366	7566000000-N	1733	DELINEATOR MARKER	90 EA		
0367	7575160000-E	1734	REMOVE EXISTING COMMUNICATIONS CABLE	5,110 LF		
0368	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	2 EA		
0369	7613000000-N	SP	SOIL TEST	14 EA		
0370	7614100000-E	SP	DRILLED PIER FOUNDATION	60 CY		
0371	7631000000-N	SP	MAST ARM WITH METAL POLE DESIGN	2 EA		
0372	7636000000-N	1745	SIGN FOR SIGNALS	3 EA		
0373	7642200000-N	1743	TYPE II PEDESTAL WITH FOUNDATION	7 EA		
0374	7708000000-N	1751	DETECTOR CARD (*****) (2070-E)	5 EA		
0375	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	3 EA		
0376	7972000000-N	SP	METAL POLE REMOVAL	3 EA		
0377	7980000000-N	SP	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE	77 EA		
0378	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV CAMERA ASSEMBLY	8 EA		
0379	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV CAMERA METAL POLE	8 EA		
0380	7980000000-N	SP	GENERIC SIGNAL ITEM DMS ACCESS LADDER	4 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0381	7980000000-N	SP	GENERIC SIGNAL ITEM DMS PEDESTAL STRUCTURE	4 EA		
0382	7980000000-N	SP	GENERIC SIGNAL ITEM DYNAMIC MESSAGE SIGN	4 EA		
0383	7980000000-N	SP	GENERIC SIGNAL ITEM EQUIPMENT CABINET DISCONNECT	9 EA		
0384	7980000000-N	SP	GENERIC SIGNAL ITEM ETHERNET EDGE SWITCH	11 EA		
0385	7980000000-N	SP	GENERIC SIGNAL ITEM FIELD EQUIPMENT CABINET (WITH INVERTER)	2 EA		
0386	7980000000-N	SP	GENERIC SIGNAL ITEM FIELD EQUIPMENT CABINET (WITH UPS)	5 EA		
0387	7980000000-N	SP	GENERIC SIGNAL ITEM FIELD EQUIPMENT SHELL CABINET	1 EA		
0388	7980000000-N	SP	GENERIC SIGNAL ITEM ICM PORTABLE TRAILER MOUNTED CCTV CAMERA	4 EA		
0389	7980000000-N	SP	GENERIC SIGNAL ITEM METER BASE / DISCONNECT COMBI- NATION PANEL	6 EA		
0390	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTION SYSTEM - MULTIPLE ZONES	4 EA		
0391	7980000000-N	SP	GENERIC SIGNAL ITEM MODIFY ELECTRICAL SERVICE	3 EA		
0392	7980000000-N	SP	GENERIC SIGNAL ITEM PORTABLE CHANGEABLE MESSAGE SIGN	3 EA		
0393	7980000000-N	SP	GENERIC SIGNAL ITEM PORTABLE TRAILER MOUNTED CCTV CAMERA	4 EA		
0394	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SIGNAL PEDESTAL, TYPE II (BLACK)	7 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0395	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SINGLE MAST ARM POLE (BLACK)	2 EA		
0396	7980000000-N	SP	GENERIC SIGNAL ITEM REMOVE EXISTING DMS AND STRUCTURE	3 EA		
0397	7980000000-N	SP	GENERIC SIGNAL ITEM REMOVE WOOD POLE	2 EA		
0398	7980000000-N	SP	GENERIC SIGNAL ITEM SOLAR POWER ASSEMBLY	2 EA		
0399	7980000000-N	SP	GENERIC SIGNAL ITEM STEP-UP STEP-DOWN TRANSFORMER	2 EA		
0400	7985000000-N	SP	GENERIC SIGNAL ITEM INTEGRATION AND CONFIGURATION	Lump Sum	L.S.	
0401	7990000000-E	SP	GENERIC SIGNAL ITEM #4 SOLID BARE GROUNDING CON- DUCTOR	900 LF		
0402	7990000000-E	SP	GENERIC SIGNAL ITEM 3 WIRE COPPER FEEDER CONDUCT- TORS	2,000 LF		
0403	7990000000-E	SP	GENERIC SIGNAL ITEM 3 WIRE COPPER SERVICE ENTRANCE CONDUCTORS	180 LF		
0404	7990000000-E	SP	GENERIC SIGNAL ITEM 4 WIRE COPPER FEEDER CONDUCT- TORS	3,120 LF		
0405	7992000000-E	SP	GENERIC SIGNAL ITEM DMS FOUNDATION	24 CY		
0488	4848000000-E	SP	WORK ZONE TRAFFIC PATTERN MASKING	5,979,745 SF		
0490	3001500000-N	SP	IMPACT ATTENUATOR UNITS, TYPE TL-2	4 EA		
0491	3215000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE III	2 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
CULVERT ITEMS						
0406	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (1019+28.18 -L-)	Lump Sum	L.S.	
0407	8126000000-N	414	CULVERT EXCAVATION, STA ***** (1019+28.18 -L-)	Lump Sum	L.S.	
0408	8126000000-N	414	CULVERT EXCAVATION, STA ***** (887+89.20 -WBL-)	Lump Sum	L.S.	
0409	8126000000-N	414	CULVERT EXCAVATION, STA ***** (982+96.44 -WBL-)	Lump Sum	L.S.	
0410	8126000000-N	414	CULVERT EXCAVATION, STA ***** (984+16.39 -WBL-)	Lump Sum	L.S.	
0411	8133000000-E	414	FOUNDATION CONDITIONING MATER- IAL, BOX CULVERT	130 TON		
0412	8196000000-E	420	CLASS A CONCRETE (CULVERT)	512.6 CY		
0413	8245000000-E	425	REINFORCING STEEL (CULVERT)	82,223 LB		
WALL ITEMS						
0414	8801000000-E	SP	MSE RETAINING WALL NO **** (14)	14,640 SF		
0415	8801000000-E	SP	MSE RETAINING WALL NO **** (18)	3,340 SF		
0416	8801000000-E	SP	MSE RETAINING WALL NO **** (19)	17,670 SF		
0417	8801000000-E	SP	MSE RETAINING WALL NO **** (20)	13,880 SF		
0418	8801000000-E	SP	MSE RETAINING WALL NO **** (22)	23,270 SF		
0419	8801000000-E	SP	MSE RETAINING WALL NO **** (23)	3,060 SF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0420	8801000000-E	SP	MSE RETAINING WALL NO **** (3)	7,360 SF		
0421	8801000000-E	SP	MSE RETAINING WALL NO **** (4)	5,620 SF		
0422	8801000000-E	SP	MSE RETAINING WALL NO **** (5)	4,820 SF		
0423	8801000000-E	SP	MSE RETAINING WALL NO **** (6)	4,990 SF		
0424	8802010000-E	SP	SOIL NAIL RETAINING WALLS	115,610 SF		
0425	8802015100-N	SP	SOIL NAIL VERIFICATION TESTS	32 EA		
0426	8802015110-N	SP	SOIL NAIL PROOF TESTS	282 EA		
0427	8847000000-E	SP	GENERIC RETAINING WALL ITEM ARCHITECTURAL SURFACE TREAT- MENT	53,482 SF		
0428	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW6.1-	30,058 SF		
0492	8847000000-E	SP	GENERIC RETAINING WALL ITEM ARCHITECTURAL CONCRETE SURFACE TREATMENT	214,260 SF		
0493	8504000000-E	460	CONCRETE BARRIER RAIL WITH MOMENT SLAB	5,260 LF		
STRUCTURE ITEMS						
0429	1308000000-E	607	MILLING ASPHALT PAVEMENT, **** TO ***** (7-1/2" TO 1/4")	603 SY		
0430	8017000000-N	SP	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP ACCESS AT STA ***** (1163+08.56 -L-)	Lump Sum	L.S.	
0431	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (1050+63.05 -L-)	Lump Sum	L.S.	

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0432	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (1163+08.56 -L-)	Lump Sum	L.S.	
0433	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (514+86.3)	Lump Sum	L.S.	
0434	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (912+89.86 -EBL-)	Lump Sum	L.S.	
0435	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (913+34.69 -WBL-)	Lump Sum	L.S.	
0436	8065000000-N	SP	ASBESTOS ASSESSMENT	Lump Sum	L.S.	
0437	8084000000-N	410	FOUNDATION EXCAVATION FOR END BENT ** AT STATION ***** (1, 514+86.3)	Lump Sum	L.S.	
0438	8084000000-N	410	FOUNDATION EXCAVATION FOR END BENT ** AT STATION ***** (2, 514+86.3)	Lump Sum	L.S.	
0439	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ***** (1, 1050+65.05 -L-)	Lump Sum	L.S.	
0440	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ***** (1, 514+86.3)	Lump Sum	L.S.	
0441	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ***** (2, 514+86.3)	Lump Sum	L.S.	
0442	8105500000-E	411	***-***" DIA DRILLED PIERS IN SOIL (5'-0")	156.6 LF		
0443	8105600000-E	411	***-***" DIA DRILLED PIERS NOT IN SOIL (5'-0")	300 LF		
0444	8111000000-E	411	PERMANENT STEEL CASING FOR ***-***" DIA DRILLED PIER (5'-0")	200.6 LF		
0445	8112730000-N	450	PDA TESTING	2 EA		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0446	8115000000-N	411	CSL TESTING	4 EA		
0447	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION ***** (1050+63.05 -L-)	Lump Sum	L.S.	
0448	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION ***** (1163+08.56 -L-)	Lump Sum	L.S.	
0449	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	102,210 SF		
0450	8161000000-E	420	GROOVING BRIDGE FLOORS	114,643 SF		
0451	8175000000-E	420	CLASS AA CONCRETE (BRIDGE)	490 CY		
0452	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	1,863.3 CY		
0453	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (1050+63.05 -L-)	Lump Sum	L.S.	
0454	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (1163+08.56 -L-)	Lump Sum	L.S.	
0455	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (514+86.3)	Lump Sum	L.S.	
0456	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (912+89.86 -EBL-)	Lump Sum	L.S.	
0457	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (913+34.69 -WBL-)	Lump Sum	L.S.	
0458	8217000000-E	425	REINFORCING STEEL (BRIDGE)	533,185 LB		
0459	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	32,327 LB		
0460	8262000000-E	430	45" PRESTRESSED CONCRETE GIRDERS	1,156.5 LF		
0461	8265000000-E	430	54" PRESTRESSED CONCRETE GIRDERS	2,986.5 LF		

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0462	8280000000-E	440	APPROX LBS STRUCTURAL STEEL	2,787,684	LS	
0463	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 12 X 53)	178	EA	
0464	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 14 X 73)	54	EA	
0465	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 14 X 89)	52	EA	
0466	8355000000-E	450	HP ***X*** STEEL PILES (HP 14 X 89)	2,912	LF	
0467	8364000000-E	450	HP12X53 STEEL PILES	8,745	LF	
0468	8384000000-E	450	HP14X73 STEEL PILES	1,350	LF	
0469	8503000000-E	460	CONCRETE BARRIER RAIL	1,715.33	LF	
0470	8510000000-E	460	CONCRETE MEDIAN BARRIER	734.58	LF	
0471	8531000000-E	462	4" SLOPE PROTECTION	1,337.9	SY	
0472	8573000000-E	SP	LATEX MODIFIED CONC OVERLAY	110	CY	
0473	8580000000-E	SP	PLACING & FINISHING OF LATEX MODIFIED CONC OVERLAY	1,970	SY	
0474	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	2,243.4	TON	
0475	8622000000-E	876	GEOTEXTILE FOR DRAINAGE	2,492.7	SY	
0476	8654000000-N	SP	DISC BEARINGS	Lump Sum	L.S.	
0477	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0478	8706000000-N	SP	EXPANSION JOINT SEALS	Lump Sum	L.S.	
0479	8713000000-N	SP	MODULAR EXPANSION JOINT SEALS	Lump Sum	L.S.	

County : Buncombe, Henderson

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0480	8860000000-N	SP	GENERIC STRUCTURE ITEM SOUND BARRIER WALL (BRIDGE MOUNTED)	Lump Sum	L.S.	
0481	8867000000-E	SP	GENERIC STRUCTURE ITEM CALTRANS BARRIER RAIL	1,210 LF		
0482	8881000000-E	SP	GENERIC STRUCTURE ITEM HIGH STRENGTH CONCRETE	170 CY		
0483	8881000000-E	SP	GENERIC STRUCTURE ITEM PRECAST SEGMENTAL BRIDGE	2,225 CY		
0484	8881000000-E	SP	GENERIC STRUCTURE ITEM STONE MASONRY FOR WINGWALL, PARAPET, AND ABUTMENT	31 CY		
0485	8889000000-E	SP	GENERIC STRUCTURE ITEM POST-TENSIONING STEEL	147,300 LB		
0486	8893000000-E	SP	GENERIC STRUCTURE ITEM DIAMOND GRINDING	3,316 SY		
0487	8893000000-E	SP	GENERIC STRUCTURE ITEM SILANE DECK TREATMENT	3,340 SY		
0489	8860000000-N	SP	GENERIC STRUCTURE ITEM APPLICATION OF BRIDGE COATING	Lump Sum	L.S.	
1524/Jul03/Q18656406.51/D2335092266210/E492			Total Amount Of Bid For Entire Project :			

8/17/19

GENERAL NOTES:

2018 SPECIFICATIONS EFFECTIVE: 01-16-2018 REVISED:

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018 REV.



PROJECT REFERENCE NO. 1-4700 SHEET NO. 1A

R/W SHEET NO.

Professional Engineer Seal for North Carolina, Seal No. 046784, dated 8/20/2019.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL. IN LOCATIONS WHERE

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

CHARTER - COMMUNICATIONS

PSNC - GAS

MSD ENGINEERING - SEWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

CURB RAMPS:

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

FENCING:

ALL EXISTING C/A FENCE TO BE REMOVED.

ROCK:

ROCK MAY BE ENCOUNTERED 925+50 THRU 929+50, 944+50 THRU 949+00, 992+50 THRU 998+50 AND 1032+50 THRU 1047+00 RIGHT. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

TEMPORARY SHORING:

ESTIMATED SHORING QUANTITIES FOR DRAINAGE PIPE INSTALLATIONS HAVE BEEN ADDED.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

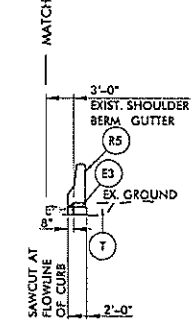
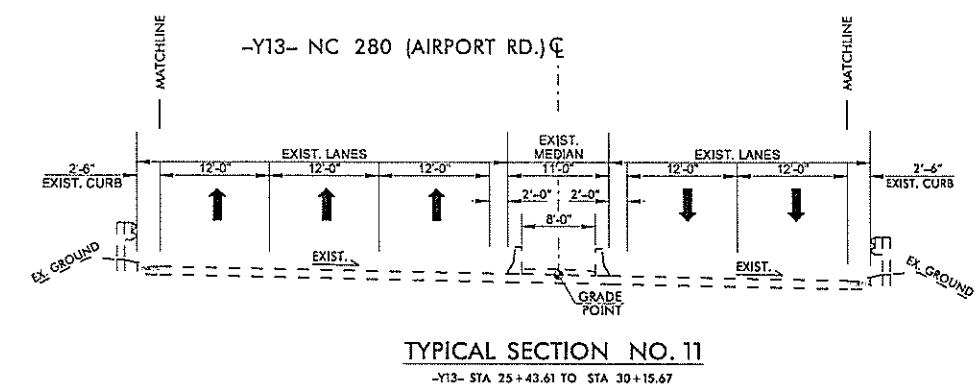
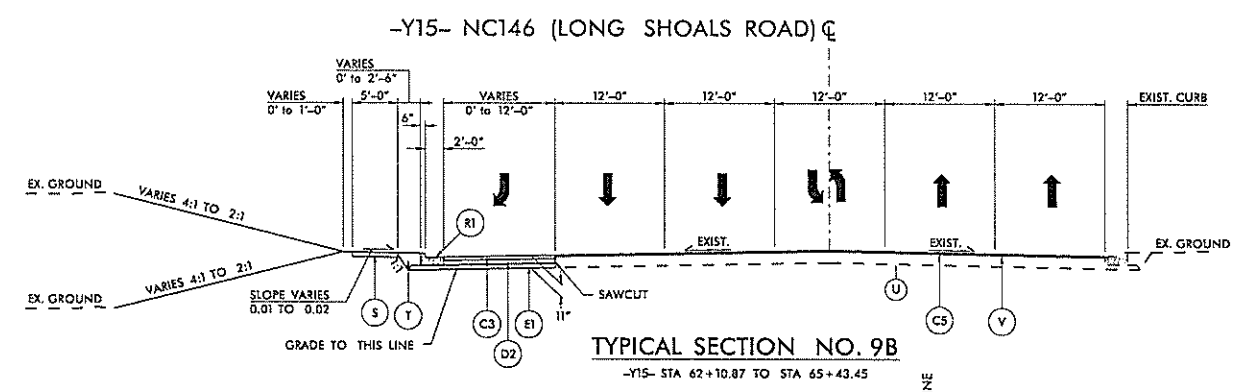
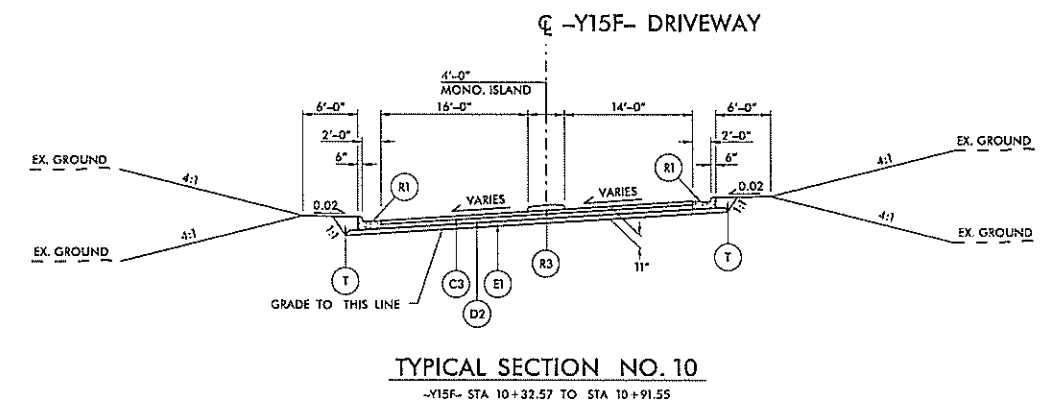
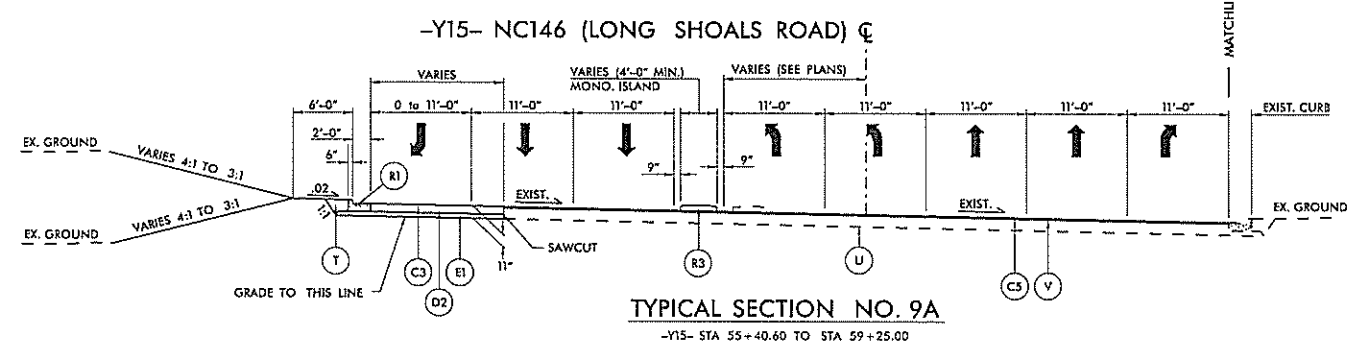
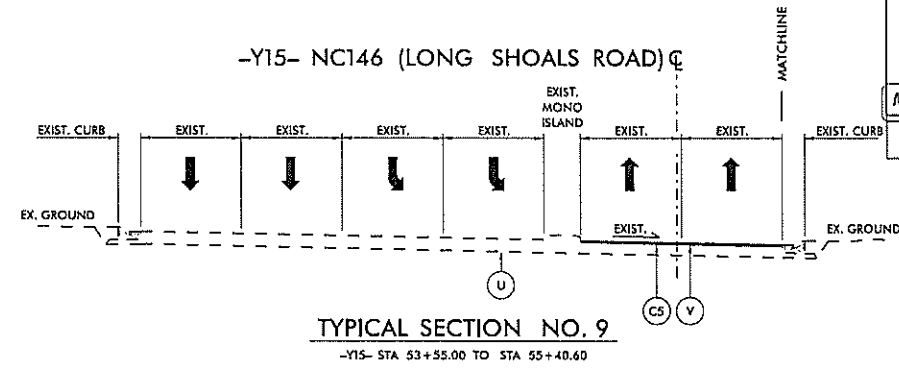
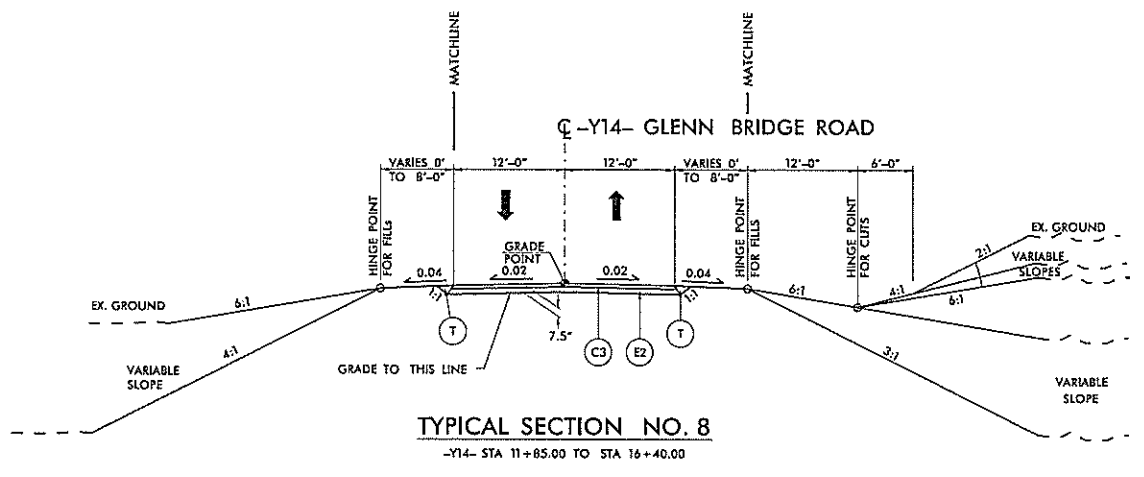
Table with columns: STD. NO., TITLE, and description of roadway standards across various divisions like Earthwork, Major Structures, etc.

INDEX OF SHEETS

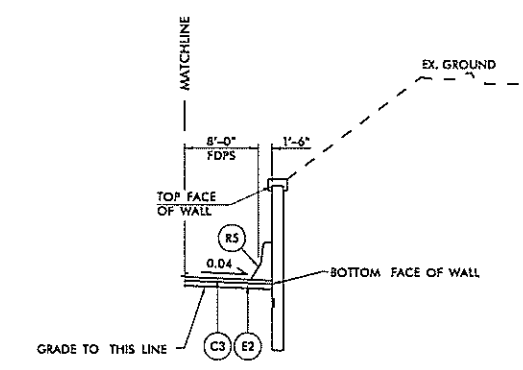
Table mapping sheet numbers to titles and descriptions, including Title Sheet, Typical Sections, and various detail sheets.

REVISIONS

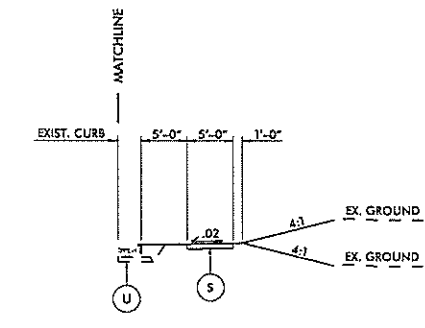
20-JUN-2019 10:12:14 14782_RBY_15H1A.dgn



USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.11
 -Y13- STA 26+22.70 TO STA 26+37.78 LT (INVERT)
 -Y13RPA_SPUR_LT- STA 11+85.78 TO STA 12+78.31 LT (INVERT)
 -Y13- STA 28+72.94 TO STA 29+58.59 RT
 -Y13RPA_SPUR_LT- STA 11+66.31 TO STA 12+46.21 LT (INVERT)



USE IN CONJUNCTION WITH TYPICAL SECTION NO.8
 -Y14- STA 12+50.00 TO STA 15+80.00 RT
 -Y14- STA 12+90.00 TO STA 16+00.00 LT (INVERT)



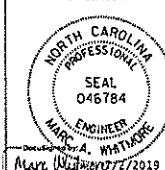
USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 9 & 9A
 -Y15- STA 47+58.00 TO STA 48+38.39 RT
 -Y15- STA 48+73.03 TO STA 49+42.84 RT
 -Y15- STA 50+95.17 TO STA 53+47.11 RT
 -Y15- STA 53+94.42 TO STA 57+37.58 RT

A	13.5" PCCP
C1	1.25" S9.5B
C2	2.5" S9.5B
C3	3" S9.5B
C4	3" S9.5C
C5	1.5" S9.5B
C6	1.5" S9.5C
C7	VARIABLE S9.5D
C8	3" S9.5D
D1	2.5" I19.0C
D2	4" I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	6.5" OR 7.75" B25.0C *SEE SHOULDER DRAIN DETAIL SHEET 2A-1
E4	5" B25.0C
K	12" CLASS IV SUBGRADE STABILIZATION
N1	NONWOVEN GEOTEXTILE INTERLAYER
N2	GEOTEXTILE FOR SOIL STABILIZATION
R1	2'-6" C & G
R2	CONC. SHOULDER BERM GUTTER
R3	5" MONO. CONC. ISLAND (SURFACE MOUNTED)
R4	SINGLE SLOPE CONC. BARRIER
R5	PRECAST REINFORCED CONC. BARRIER
R6	CONCRETE BARRIER RAIL W/MOMENT SLAB
R7	EXPRESSWAY GUTTER
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	MILLING 1.5" DEPTH
Y	MILLED RUMBLE STRIP
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE	

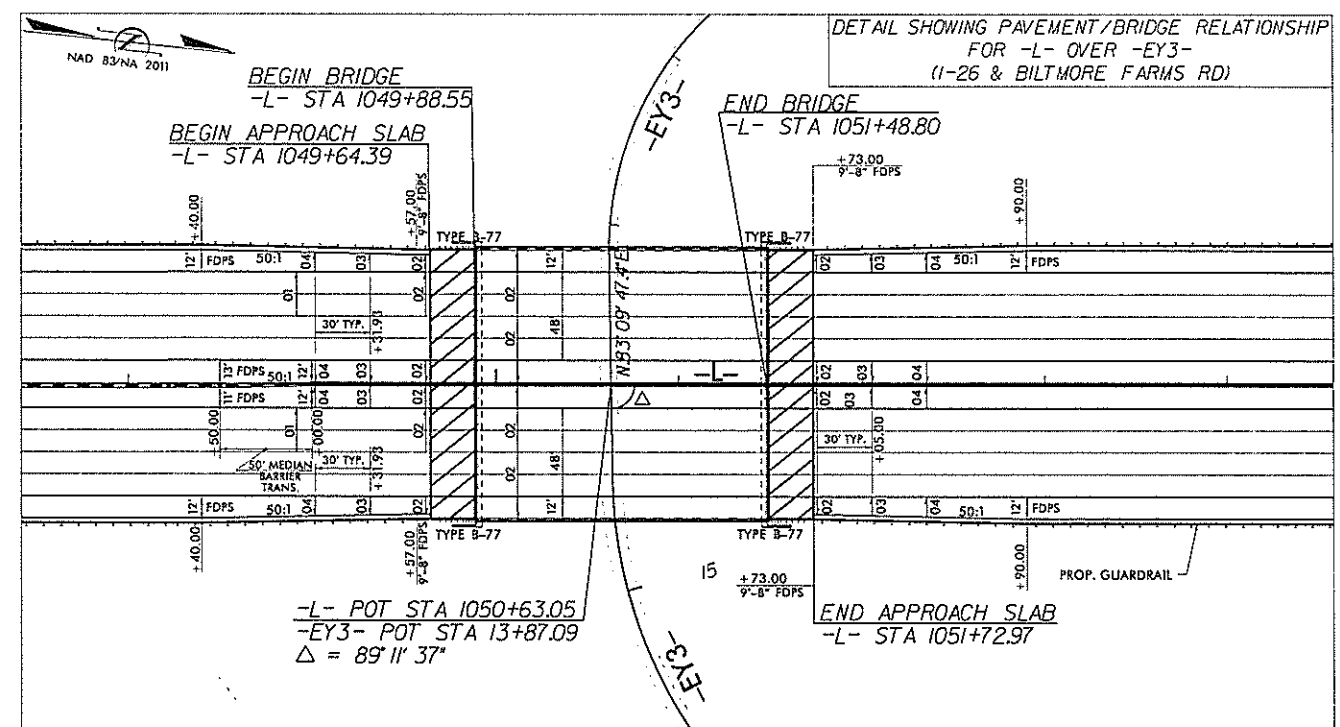
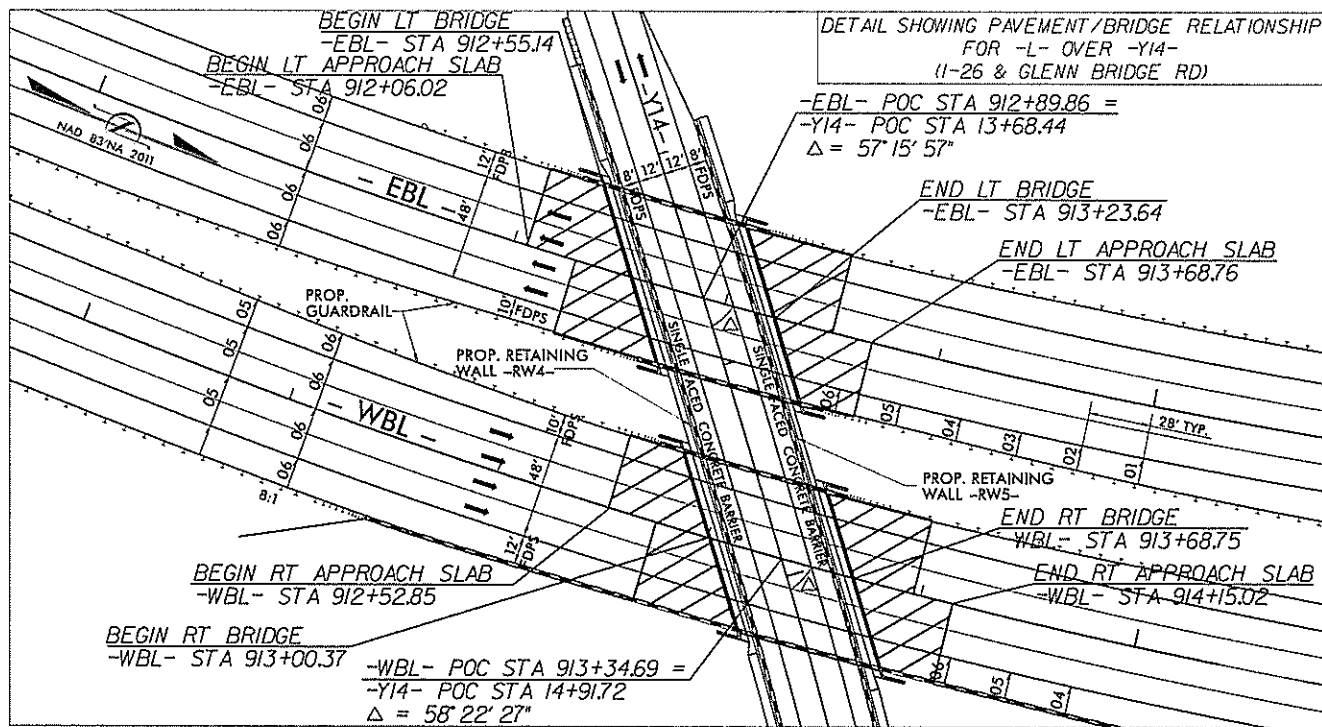
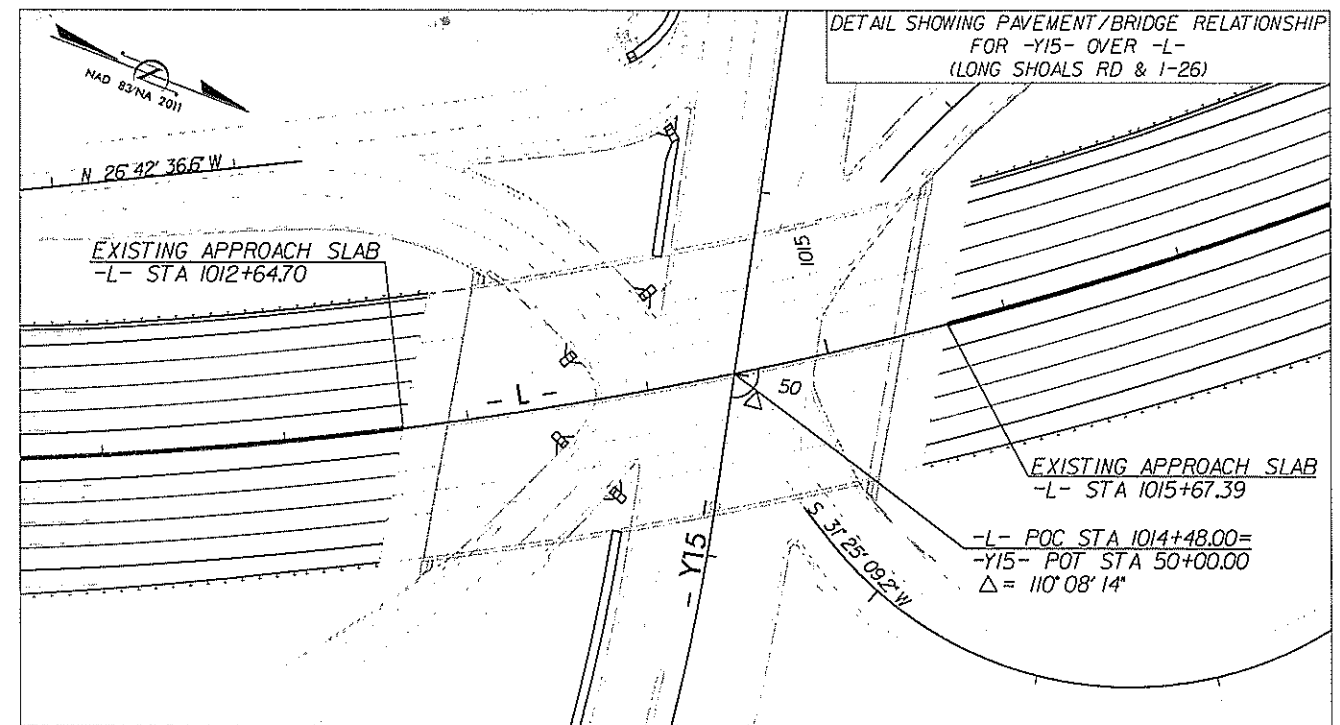
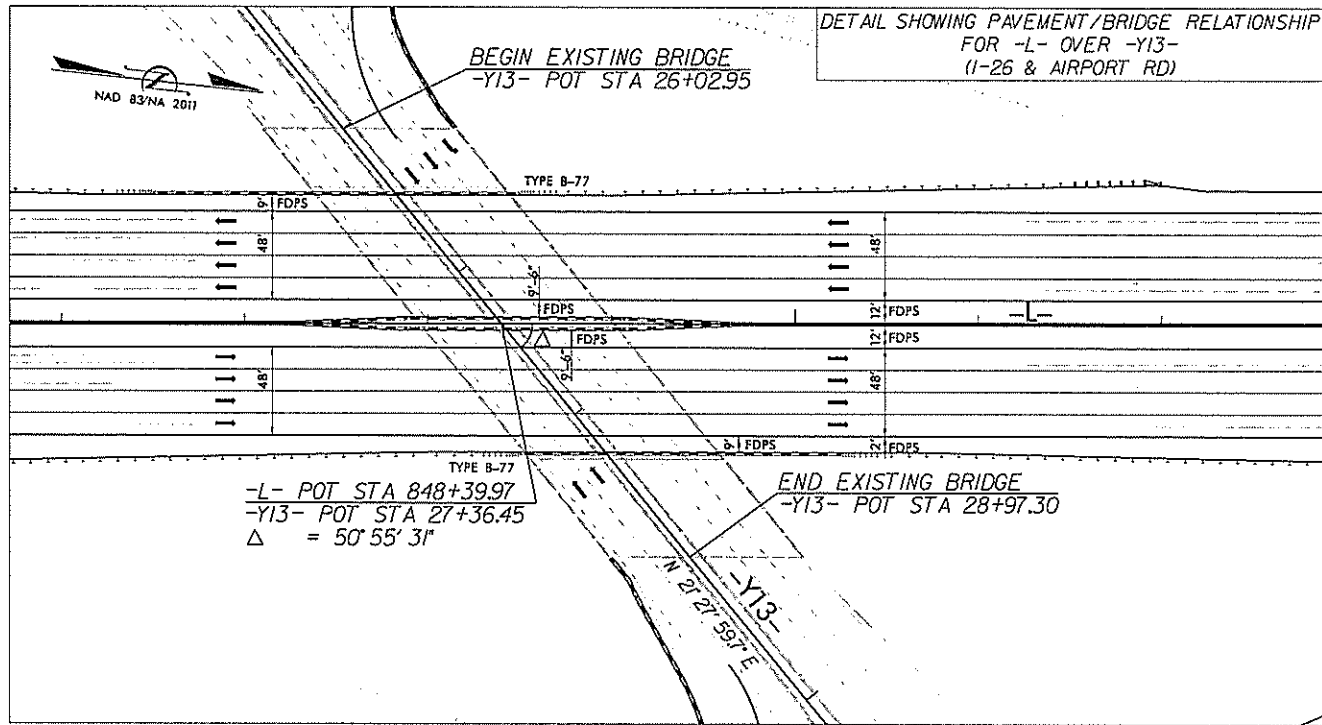
NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, MONOLITHIC ISLANDS, CURB AND GUTTER, AND LANE TAPER LOCATIONS.

2019 JUN 20 10:42 AM
 14700-2A-7-01-08
 HNTB

8/17/99

HNTB	PROJECT REFERENCE NO.	SHEET NO.
	1-4700	2B-3
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		
		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PAVEMENT / BRIDGE RELATIONSHIP SKETCHES



REVISIONS

70: JUL 20 9 15:15
17:08:40Y-2883-2884-Br: dge@a.e.dgn
HNTB

12/05/07

COMPUTED BY: ELK DATE: 09/2018
 CHECKED BY: DDS DATE: 10/2018

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 1-4700
 SHEET NO. 3B-3

SUMMARY OF CONCRETE BARRIER
 (IN LINEAR FEET AND EACH)

SURVEY LINE	STATION	STATION	LOCATION L/R/MED	PRECAST REINFORCED CONC. BARRIER (LF)	SINGLE SLOPE CONC. BARRIER TYPE I (LF)	SINGLE SLOPE CONC. BARRIER TYPE II (VAR. HEIGHT) (LF)	SINGLE SLOPE CONC. BARRIER TYPE T1 (VAR. HEIGHT) (LF)	CONC. BARRIER TRANSITION SECTION (EA)	IMPACT ATTENUATOR UNIT, TL-2 (EA)	MEDIAN HAZARD PROTECTION (LF) (SEE DETAIL 2C-10)	CONCRETE CAP SINGLE FACED BARRIER FILL (LF) (SEE DETAIL 2C-13)	CONCRETE BARRIER RAIL W/AGGMENT SLAB (LF) (STRUCT. PAY ITEM)
-L-	832+00.00	847+25.00	MED		1525.00							
-Y13RPC-	11+25.00	16+25.00	RT	491.13								
-L-	846+50.00	848+50.00	LT	200.00								
-L-	847+25.00	847+68.00	MED					1				
-L-	847+88.00	849+07.00	MED	119.00						119.00		
-L-	849+07.00	849+70.00	MED					1				
-L-	848+50.00	850+25.00	RT	175.00								
-Y13-	25+56.25	26+37.78	LT	86.80					1			
-Y13-	28+72.94	30+04.10	RT	141.99					1			
-L-	849+70.00	854+00.00	MED									
-L-	854+00.00	866+43.75	MED			1243.75						
-L-	846+43.75	883+69.98	MED		1726.23							
-WBL-	883+70.00	898+70.00	MED			1514.68						
-EBL-	886+00.00	891+50.00	LT									552.58
-WBL-	911+50.00	923+75.00	RT	1174.60								
-WBL-	943+75.00	950+00.00	RT	624.14								
-WBL-	960+00.00	980+00.00	RT	1998.76								
-EBL-	980+00.00	996+99.52	RT			1692.85						
-L-	997+00.00	1012+64.70	MED		1549.70			1				
-L-	1015+67.38	1049+88.55	MED		3390.51			2				
-L-	1051+48.80	1055+00.00	MED		336.20			1				
-Y15RPD-	10+00.00	12+39.56	LT								258.27	
-Y15RPD-	12+39.56	13+55.00	LT	94.16								
-L-	1024+07.96	1025+35.58	RT								125.61	
-L-	1025+35.58	1026+50.00	RT	114.42								
-Y14-	12+50.00	15+80.00	RT	328.57					1			
-Y14-	12+90.00	16+00.00	LT	311.56					1			
-L-	1055+00.00	1079+00.00	MED			2399.50						
-WBL-	1079+00.00	1084+36.41	LT			523.71		1				
-WBL-	1084+36.41	1088+50.00	LT	416.32								
-L-	1069+00.00	1079+00.00	RT	1014.22								
-WBL-	1079+00.00	1081+00.00	RT	199.70								
-EBL-	1081+00.00	1093+00.00	LT	1200.00								
-WBL-	1093+89.00	1100+50.00	RT	656.90								
-EBL-	1094+75.00	1102+25.00	LT									759.11
-EBL-	1123+99.90	1127+93.92	RT	403.40								
-EBL-	1127+93.92	1132+40.49	RT			435.01		1				
-L-	1133+00.00	1160+87.52	MED		2772.52			1				
-L-	1165+35.37	1165+80.00	MED		29.63			1				
-L-	1165+80.00	1230+43.72	MED			8463.72						
-L-	1230+43.72	1230+57.72	MED					1				
-L-	1140+75.00	1161+19.96	LT	2044.98								
-L-	1164+95.81	1170+00.00	RT									499.84
-L-	1165+79.34	1175+00.00	LT									941.65
-L-	1172+00.00	1181+30.00	RT									899.10
-L-	1184+00.00	1195+25.00	LT	1113.48								
-L-	1195+25.00	1198+25.00	LT									292.12
-L-	1193+75.00	1206+75.00	RT									1314.12
-L-	1234+70.00	1237+80.00	MED				310.00					
			TOTAL:	12909.14	11329.79	14273.22	310.00	11	4	119.00	383.88	5258.51
			SAY:	13000	12000	14300	320	11	4	119	384	STRUCT. PAY ITEM

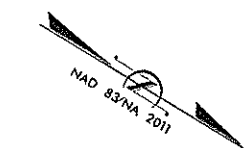
NOTE:
 THESE QUANTITIES DO NOT INCLUDE
 BURLI OVER 1-26 QUANTITIES. SEE
 SHEETS C01-C11 IN BURLI OVER 1-26 PLANS.

12/05/07
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 14780 RDY-3807-3805-Summary.dgn
 HHTB

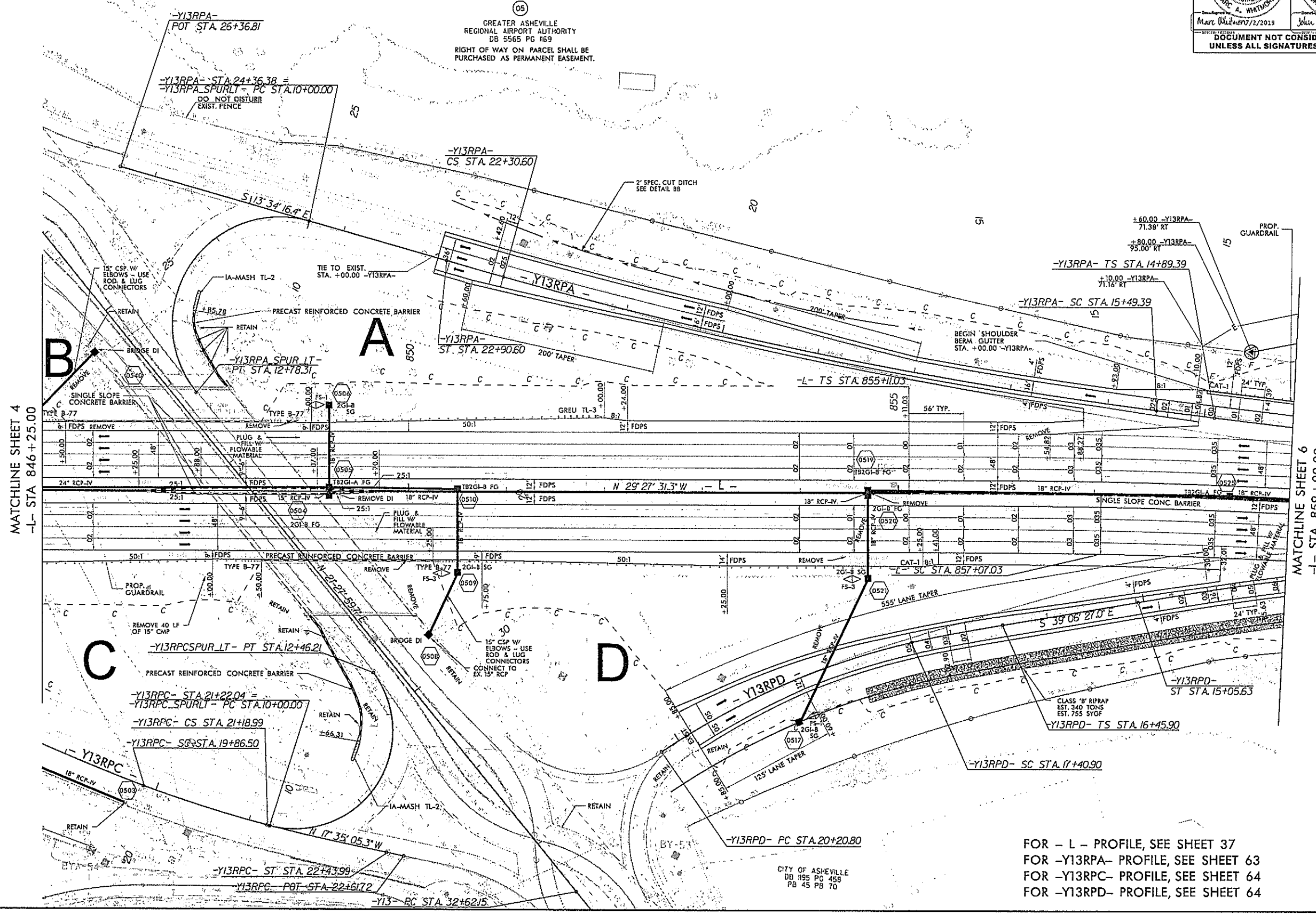
8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	5
R/W SHEET NO.	1-4700A - 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Marc Whitmore 7/2/2019	John Blankett 7/2/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



05
GREATER ASHEVILLE
REGIONAL AIRPORT AUTHORITY
DB 5565 PG #69
RIGHT OF WAY ON PARCEL SHALL BE
PURCHASED AS PERMANENT EASEMENT.



MATCHLINE SHEET 4
-L- STA 846 +25.00

MATCHLINE SHEET 6
-L- STA 859 +00.00

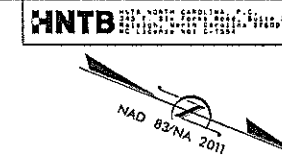
REVISIONS

20-MIN-2019-06-26
HNTB

FOR - L - PROFILE, SEE SHEET 37
FOR -Y13RPA- PROFILE, SEE SHEET 63
FOR -Y13RPC- PROFILE, SEE SHEET 64
FOR -Y13RPD- PROFILE, SEE SHEET 64

CITY OF ASHEVILLE
DB 195 PG 45B
PB 45 PB 70

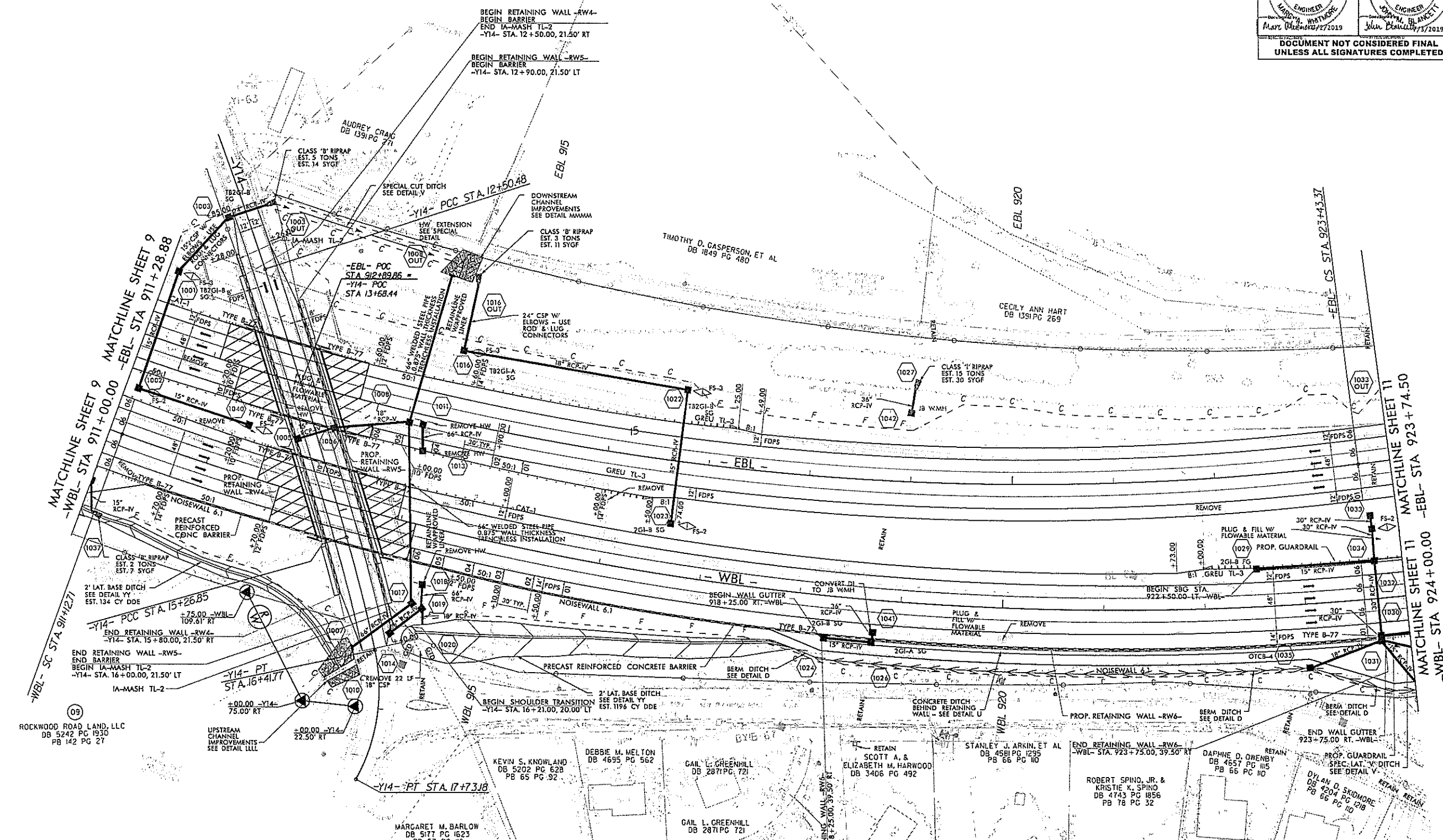
8/17/99



PROJECT REFERENCE NO. 1-4700		SHEET NO. 10	
RW SHEET NO. 1-4700A - 21		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

REVISIONS

2017-08-20 15:42:23
2017-08-20 15:42:23
2017-08-20 15:42:23



ROCKWOOD ROAD LAND, LLC
DB 5242 PG 1930
PB 142 PG 27

MARGARET M. BARLOW
DB 5177 PG 1623
PB 53 PG 10

KEVIN S. KNOWLAND
DB 5202 PG 628
PB 65 PG 92

DEBBIE M. MELTON
DB 4695 PG 562

GAIL L. GREENHILL
DB 2871 PG 721

SCOTT A. & ELIZABETH M. HARWOOD
DB 3406 PG 492

STANLEY J. ARKIN, ET AL
DB 4581 PG 1295
PB 66 PG 10

ROBERT SPINO, JR. & KRISTIE K. SPINO
DB 4743 PG 1856
PB 78 PG 32

DAAPHNE D. OWENBY
DB 4657 PG 115
PB 66 PG 10

DYLAN D. SKIDMORE
DB 4204 PG 1218
PB 66 PG 10

FOR -EBL- PROFILE, SEE SHEET 41 & 42
FOR -WBL- PROFILE, SEE SHEET 41 & 42
FOR -Y14- PROFILE, SEE SHEET 65
FOR RETAINING WALL -RW4-, SEE SHEET W-3
FOR RETAINING WALL -RW5-, SEE SHEET W-4
FOR RETAINING WALL -RW6-, SEE SHEET W-5

GENERAL NOTES

T) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED IMPACT ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS:

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

- U) SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPENED TRAVELWAY, WHEN LANE CLOSURES ARE NOT IN EFFECT. WHEN SKINNY DRUMS ARE ALLOWED, REFER TO SECTION 1180 OF STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OR AS SHOWN IN THE PLANS.
- V) REFER TO HIGH VISIBILITY DEVICES SPECIAL PROVISION FOR DRUMS, STATIONARY WORK ZONE SIGNS AND PORTABLE WORK ZONE SIGNS USED ON I-26, RAMPS AND LOOPS.
- W) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
- X) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES (DRUMS) PERPENDICULAR TO THE EDGE OF THE TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.
- Y) PROVIDE 20 CHANGEABLE MESSAGE SIGNS FOR THE PURPOSE OF INCIDENT MANAGEMENT WITHIN THE I-26 WORK ZONE. SEE RTMC/STOC MANAGED PORTABLE CHANGEABLE MESSAGE SIGNS SPECIAL PROVISION.

PAVEMENT MARKINGS AND MARKERS

- Z) REFER TO WORK ZONE PERFORMANCE PAVEMENT MARKINGS SPECIAL PROVISION FOR TEMPORARY MARKINGS ON I-26 AND RAMPS.
- AA) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL Y-LINES	PAINT	TEMPORARY RAISED
I-26	HIGH PERFORMANCE MARKINGS	TEMPORARY RAISED
ALL RAMPS	HIGH PERFORMANCE MARKINGS	TEMPORARY RAISED
FINAL CONCRETE SURFACES	COLD APPLIED PLASTIC (TYPE 4)	TEMPORARY RAISED
BRIDGES	COLD APPLIED PLASTIC (TYPE 4)	

- BB) PLACE ONE APPLICATION OF PAINT FOR NON-INTERSTATE TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR INTERSTATE TEMPORARY MARKING APPLICATIONS.
- CC) PATTERN MASKING SHALL BE APPLIED TO ALL UNUSED EXISTING OR TEMPORARY MARKINGS WHEN MAKING TRAFFIC PATTERN CHANGES ON ASPHALT PAVEMENT. REFER TO WORK ZONE TRAFFIC PATTERN MASKING SPECIAL PROVISION.
- DD) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- EE) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.
- FF) TRACE THE PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO INSTALLATION. PLACE DRUMS TO DELINEATE ANY PROPOSED MONOLITHIC ISLANDS BEFORE INSTALLATION.

MISCELLANEOUS

- GG) LAW ENFORCEMENT SHALL BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.
- HH) ALL CURB RAMP LOCATIONS SHALL BE DERIVED FROM STATIONING SHOWN ON PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER IN COORDINATION WITH THE SIGNING AND DELINEATION UNIT.
- II) CONTRACTOR SHALL MAINTAIN SIDEWALK ACCESS ON LONG SHOALS RD AT ALL TIMES AS STATED IN THE PHASING. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY SIDEWALKS (CONCRETE, ASPHALT, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER) OR REASONABLE PEDESTRIAN DETOUR AT ALL LOCATIONS WHERE THE OPEN PEDESTRIAN TRAVELWAY HAS BEEN REMOVED FOR CONSTRUCTION OPERATIONS (UTILITIES, DRAINAGE, ETC.).

LOCAL NOTES

- LN-1 PLACE TMA AS NEEDED TO PROTECT MOTORIST FROM UNFINISHED GUARDRAIL OR PCB INSTALLATION. (MAXIMUM 72 HOURS)
- LN-2 SHOULD THE TIMING OF PHASED CONSTRUCTION ACTIVITIES CAUSE CONDITIONS THAT DO NOT MATCH WHAT IS DETAILED IN THE PLANS AT AREA BOUNDARY LINES, CONTRACTOR SHALL FIELD ADJUST TO EXISTING CONDITIONS WITH ENGINEER APPROVAL.
- LN-3 TWO WEEKS PRIOR TO GLENN BRIDGE RD SHORT DURATION TRAFFIC STOPPAGE, PLACE CMS BOARDS (FOR EACH DIRECTION) AT STOPPAGE POINT NOTIFYING THE PUBLIC OF SCHEDULED STOPPAGE AND DELAYS. DURING STOPPAGE, RELOCATE CMS BOARDS AND REVISE MESSAGE TO INDICATE DURATION OF OPERATION.
- LN-4 THE FOLLOWING APPLIES TO ALL TEMPORARY LANE CLOSURES ON I-26:
 1. REFER TO THE HIGH VISIBILITY DEVICES SPECIAL PROVISIONS FOR DRUMS AND PORTABLE WORK ZONE SIGNS.
 2. REFER TO THE CONNECTED LANE CLOSURE DEVICE SPECIAL PROVISION FOR THE PURPOSE OF TRANSMITTING THE LOCATION OF THE LANE CLOSURE TO NAVIGATION COMPANIES.
 3. REFER TO THE SEQUENTIAL FLASHING WARNING LIGHTS SPECIAL PROVISION FOR DRUMS USED IN MERGING TAPERS.
 4. REFER TO THE WORK ZONE PRESENCE LIGHTING SPECIAL PROVISION TO SUPPLEMENT CONSTRUCTION/TASK AND EQUIPMENT LIGHTING.
- LN-5 PLACE TEMPORARY APPROACH GUARDRAIL ANCHORS (GREU) AND LAP GUARDRAIL FOR TEMPORARY PATTERN.
- LN-6 REMOVE TEMPORARY GUARDRAIL ANCHOR(S), PLACE FINAL GUARDRAIL ANCHORS AND CORRECT GUARDRAIL LAPPING.
- LN-7 INSTALL ITS POLES, CAMERAS, AND DMS ACCORDING TO ITS PLANS.
- LN-8 PARTIALLY CONSTRUCT DRAINAGE STRUCTURE WITH STEEL PLATE TO MATCH TEMPORARY PAVEMENT OR TEMPORARY GRADING ELEVATION.
- LN-9 PARTIALLY CONSTRUCT DRAINAGE STRUCTURE WITH TEMPORARY GRATE TOP TO MATCH TEMPORARY DITCH OR PAVEMENT ELEVATION.
- LN-10 EXTEND PIPE TO DRAIN.
- LN-11 USE STEEL PLATE ON END OF PIPE STUB OR USE STEEL PLATE TO BLOCK PIPE OPENING IN STRUCTURE.
- LN-12 CONSTRUCT TEMPORARY INLET AND PIPE. CONNECT AND DRAIN TO NEAREST STRUCTURE.

MANAGEMENT STRATEGIES

PROJ. REFERENCE NO.	SHEET NO.
I-4700	TMP-001C

WHILE EACH AREA HAS IT'S OWN UNIQUE CHALLENGES, THE GENERAL PROJECT APPROACH TO MAINTAIN TRAFFIC DURING CONSTRUCTION CAN BE SUMMARIZED AS FOLLOWS WITH SPECIFIC VARIATIONS PROVIDED FOR EACH AREA.

PHASE I INCLUDES PLACING TEMPORARY PAVEMENT AND SHIFTING TRAFFIC TO 11' LANES ALLOWING FOR THE PCB TO BE PLACED ALONG THE TEMPORARY MEDIAN EDGE. CONSTRUCT TEMPORARY MEDIAN PAVEMENT BEHIND BARRIER. PHASE II BEGINS WITH THE EB TRAFFIC SHIFTED TO THE TEMPORARY MEDIAN AND USING A SERIES OF TEMPORARY RAMP ALIGNMENTS WHERE NECESSARY, CONSTRUCTS THE PROPOSED OUTERMOST EB LANES. IN PHASE III, THE EB LANES ARE SHIFTED TO THE NEWLY CONSTRUCTED LANES AND THE WB LANES ARE SHIFTED TO THE MEDIAN WHILE THE WB LANES ARE CONSTRUCTED USING A SERIES OF TEMPORARY RAMP ALIGNMENTS WHERE NECESSARY. IN PHASE IV, THE WB IS PLACED IN THE OUTERMOST WB LANES AND REMAINING ROADWAY AND MEDIAN CONSTRUCTION IS COMPLETED.

AREA 1 (I-26 AT AIRPORT RD) - NO VARIATION.

AREA 2 (I-26 BRIDGE OVER GLENN BRIDGE RD) - PHASE I MEDIAN CONSTRUCTION INCLUDES CONSTRUCTION OF TEMPORARY PAVEMENT AND PROPOSED EB LANES IN THE MEDIAN INCLUDING THE EB BRIDGE OVER GLENN BRIDGE RD (SHORING REQUIRED). PHASE II SHIFTS EB LANES TO NEW PATTERN WHILE THE REMAINDER OF THE EB LANES ARE COMPLETED. PHASE III SHIFTS BOTH THE EB AND WB TRAFFIC TO EB LANES ALLOWING THE WB LANES AND BRIDGE TO BE COMPLETED AWAY FROM TRAFFIC. PHASE IV PLACES EB AND WB IN FINAL OUTSIDE LANES ALLOWING MEDIAN CONSTRUCTION TO BE COMPLETED AWAY FROM TRAFFIC.

AREA 3 (-L- FROM STA 930+00 TO STA 980+00) - NO VARIATION (SHORING REQUIRED).

AREA 4 (I-26 AT LONG SHOALS RD) - DUE TO VERTICAL DIFFERENCES IN PROPOSED PAVEMENT COMPARED TO EXISTING NEAR THE RAMPS, PHASE I TEMPORARY PAVEMENT MEDIAN CONSTRUCTION BEGINS ALONG THE EXISTING WB LANES. WB LANES SHIFT TO NEW PATTERN WHILE OUTSIDE WB LANES ARE CONSTRUCTED. PHASE II SHIFTS WB LANES TO NEW PAVEMENT AND INSIDE WB LANES ARE CONSTRUCTED. PHASE IIB AND IIC SHIFTS EB TRAFFIC TO WB LANES AND CONSTRUCTS OUTSIDE EB LANES. PHASE III SHIFTS EB TRAFFIC TO NEW EB LANES AND COMPLETES RAMP CONSTRUCTION. PHASE IV SHIFTS TRAFFIC TO OUTSIDES AND CONSTRUCTS THE I-26 MEDIAN.

AREA 5 (I-26 BRIDGE OVER BILTMORE ACCESS RD) - PHASE I SHIFTS BOTH EB AND WB TRAFFIC TO OUTSIDE SHOULDERS TO BUILD MIDDLE OF NEW BILTMORE BRIDGE AND TEMPORARY PAVEMENT APPROACHING THE BRIDGE IN THE MEDIAN. NO FURTHER VARIATIONS TO COMPLETE BRIDGE CONSTRUCTION.

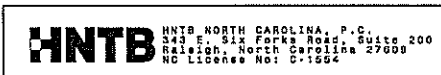
AREA 6 (-L- FROM STA 1055+00 TO STA 1085+00) (I-26 UNDER BLUE RIDGE PKWY) - PHASE I INCLUDES SHIFTING EB TRAFFIC TO BUILD EB I-26 RETAINING WALLS, A BLUE RIDGE PKWY BRIDGE PIER AND PORTIONS OF EB I-26 PERMANENT PAVEMENT. PRIOR TO PHASE 2, WB TRAFFIC IS SHIFTED TO CONSTRUCT THE WB I-26 RETAINING WALL, A BLUE RIDGE PKWY BRIDGE PIER, AND PORTIONS OF WB I-26 PERMANENT PAVEMENT. IN PHASE II, WB TRAFFIC IS SHIFTED TO CONSTRUCT MEDIAN PAVEMENT. EB TRAFFIC IS THEN SHIFTED ADJACENT TO WB TRAFFIC FOR CONSTRUCTION OF THE BLUE RIDGE PKWY SEGMENTAL BRIDGE AND ADDITIONAL EB I-26 PAVEMENT. IN PHASE III, EB & WB TRAFFIC IS SHIFTED TO I-26 EB PAVEMENT FOR FINAL CONSTRUCTION OF THE BLUE RIDGE PKWY SEGMENTAL BRIDGE AND ADDITIONAL WB I-26 PAVEMENT. REMOVAL OF THE EXISTING BRIDGE AND EXISTING PIERS BEGINS. IN PHASE IV, TRAFFIC IS SHIFTED FOR REMOVAL OF AN EXISTING BRIDGE PIER AND TO COMPLETE PAVEMENT IN CROSS-OVER LOCATIONS.

AREA 7 (-L- FROM STA 1085+00 TO STA 1135+00) - PHASE IA AND IB SHIFTS EB TRAFFIC TO INSIDE, THEN OUTSIDE, IN ORDER TO CONSTRUCT ALL OF PROPOSED EB LANES. PHASE II SHIFTS WB TRAFFIC TO NEW EB LANES AND CONSTRUCTS ALL OF WB LANES. PHASE III COMPLETES MEDIAN PAVEMENT ON NORTH END OF AREA.

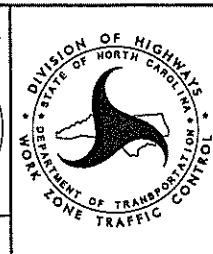
AREA 8 (I-26 BRIDGE OVER FRENCH BROAD RIVER) - PHASE I INCLUDES SHIFTING WB TRAFFIC TO OUTSIDE ON TEMPORARY PAVEMENT NORTH OF FRENCH BROAD RIVER. PHASE II CONSTRUCTS REMAINDER OF EB PAVEMENT AND MIDDLE OF BRIDGE. PHASE III THEN SHIFTS WB TRAFFIC TO NEW EB LANES TO CONSTRUCT WB LANES AND BRIDGE. PHASE IV SHIFTS EB AND WB TRAFFIC TO WB LANES AND CONSTRUCTS REMAINDER OF EB PAVEMENT ON NORTH END OF AREA.

AREA 9 (-L- FROM STA 1184+00 TO STA 1230+58) - NO VARIATION EXCEPT WB IS CONSTRUCTED PRIOR TO EB.

19-JUN-2019 15:31 I-4700-1c-TMP-010c Notes.dgn HNTB



APPROVED: *Derek Eugene Vap*
 DATE: 6/19/2019
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER 047639
 DEREK EUGENE VAP



TRANSPORTATION MANAGEMENT PLAN
 GENERAL NOTES, LOCAL NOTES & MANAGEMENT STRATEGIES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY BUILDING
PO BOX 25201
RALEIGH, NORTH CAROLINA 27611

**RETAINING WALL
SUMMARY**

SUBJECT: I-26 FROM NC 280 (EXIT 40) TO I-40 AT ASHEVILLE
0.3 MILES EAST OF NC 280 (AIRPORT RD.) TO 0.5
MILES EAST OF NC 191 (BREVARD RD.)

PREPARED BY: MHS PROJECT: 36030.1.1
DATE: 1/22/19 TIP: I-4700A/B
CHECKED BY: -- COUNTY: Buncombe

SNW Soil Nail Wall MSE w/ MS Mechanically Stabilized Earth Retaining Wall with Moment Slab
MSE Mechanically Stabilized Earth Retaining Wall

Retaining Wall No.	Begin Alignment	Begin Station	Offset (LT / RT)	End Alignment	End Station	Offset (LT / RT)	Length (ft)	Excavation Type (Cut or Fill)	Exposed Wall Area (sft)	Minimum Embedment (ft)	Installed Area (sft)*	Avg. Height (ft)	Max. Design Height (ft)	Back Slope (Yes or No)	Wall Type
RW0	-Y13RPC-	11+25.	27.5' (RT)	-Y13RPC-	16+25.	27.5' (RT)	500.0	Cut	3185	1.0	3685	7.4	10.3	Yes	SNW
RW3	-EBL-	886+00.	39.29' (LT)	-EBL-	891+50.	39.29' (LT)	550.0	Fill	5162	4.0	7362	13.4	19.7	No	MSE w/ MS
RW4	-Y14-	12+50.	21.5' (RT)	-Y14-	15+80.	21.5' (RT)	330.0	Fill	4957	2.0	5617	17.0	20.1	Yes	MSE
RW5	-Y14-	12+90.	21.5' (LT)	-Y14-	16+00.	21.5' (LT)	310.0	Fill	4204	2.0	4824	15.6	18.5	Yes	MSE
RW6	-WBL-	918+25.	39.5' (RT)	-WBL-	923+75.	39.5' (RT)	550.0	Fill	3890	2.0	4990	9.1	13.1	Yes	MSE
RW7	-WBL-	948+75.	39.5' (RT)	-WBL-	950+00.	39.5' (RT)	125.0	Cut	552	1.0	677	5.4	6.2	Yes	SNW
RW8	-WBL-	960+00.	39.5' (RT)	-WBL-	975+00.	39.5' (RT)	1500.0	Cut	11165	1.0	12665	8.4	12.4	Yes	SNW
RW9	-WBL-	976+00.	39.5' (RT)	-WBL-	980+00.	39.5' (RT)	400.0	Cut	3327	2.0	4127	10.3	13.4	Yes	SNW
RW10	-L-	1069+00.	76.5' (RT)	-L-	1070+40.	76.5' (RT)	140.0	Cut							
	-L-	1070+40.	76.5' (RT)	-L-	1070+55.	91.0' (RT)	15.0	Cut							
	-L-	1070+55.	91.0' (RT)	-L-	1077+20.	91.0' (RT)	665.0	Cut							
	-L-	1077+20.	91.0' (RT)	-L-	1077+35.	76.5' (RT)	15.0	Cut							
	-L-	1077+35.	76.5' (RT)	-WBL-	1081+00.	39.5' (RT)	365.0	Cut							
						TOTAL	1200.0	Cut	16025	1.0	17225	14.4	22.5	Yes	SNW
RW11	-L-	1070+60.	91.0' (LT)	-L-	1078+00.	91.0' (LT)	740.0	Cut	14813	1.0	15553	21.0	25.7	Yes	SNW
RW12	-EBL-	1081+00.	39.5' (LT)	-EBL-	1084+50.	39.5' (LT)	350.0	Cut	2581	1.0	2931	8.4	12.5	Yes	SNW
RW13	-EBL-	1086+00.	39.5' (LT)	-EBL-	1093+00.	39.5' (LT)	700.0	Cut	8771	1.0	9471	13.5	16.6	Yes	SNW
RW14	-EBL-	1094+75.	39.29' (LT)	-EBL-	1102+25.	39.29' (LT)	750.0	Fill	10886	5.0	14636	19.5	24.9	No	MSE w/ MS
RW15	-WBL-	1093+89.	39.5' (RT)	-WBL-	1100+50.	39.5' (RT)	661.0	Cut	4974	1.0	5635	8.5	10.6	Yes	SNW
RW16	-L-	1140+75.	76.5' (LT)	-L-	1146+58.	76.5' (LT)	583.0	Cut	7409	1.0	7992	13.7	17.1	Yes	SNW
RW17	-L-	1148+06.	76.5' (LT)	-L-	1161+65.	105' (LT)	1359.0	Cut	25949	1.0	27308	20.1	31.8	Yes	SNW
RW18	-L-	1164+99.	74.29 (RT)	-L-	1170+00.	76.29' (RT)	501.0	Fill	2425	2.0	3427	6.8	8.6	No	MSE w/ MS
RW19	-L-	1165+82.7	74.29 (LT)	-L-	1175+00.	76.29 (LT)	917.3	Fill	13080	5.0	17667	19.3	24.7	No	MSE w/ MS
RW20	-L-	1172+00.	76.29 (RT)	-L-	1181+30.	76.29 (RT)	930.0	Fill	10156	4.0	13876	14.9	19.1	No	MSE w/ MS
RW21	-L-	1184+00.	76.5' (LT)	-L-	1194+92.	76.5' (LT)	1092.0	Cut	7689	1.0	8781	8.0	15.6	Yes	SNW
RW22	-L-	1193+75.	76.29 (RT)	-L-	1206+75.	76.29 (RT)	1300.0	Fill	17419	4.5	23269	17.9	22.5	No	MSE w/ MS
RW23	-L-	1195+25.	76.29 (LT)	-L-	1198+25.	76.29 (LT)	300.0	Fill	2313	2.5	3063	10.2	14.0	No	MSE w/ MS

* Beginning with the 2018 Standard Specifications, retaining walls are paid for on a per square foot of installed facing, which now includes the embedded portion. For estimating purposes, we have included an embedded quantity based on the slopes in the provided cross sections. The minimum embedment listed was determined from a global stability analysis. It is the Contractor and Designer's responsibility to evaluate site conditions and adjust embedment as required while maintaining the minimum values, or deeper if warranted, along the length of the wall.

GEOTECHNICAL ENGINEER SEAL 028893
ENGINEER
6/11/2019
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WALL EMBEDMENT

SLOPE IN FRONT OF STRUCTURES		MINIMUM EMBEDMENT DEPTH
HORIZONTAL	FOR WALLS	H/20
	FOR ABUTMENTS	H/10
3.0H:1.0V	WALLS	H/10
2.5H:1.0V	WALLS	H/8.5
2.0H:1.0V	WALLS	H/7
1.5H:1.0V	WALLS	H/5
1.25H:1.0V	WALLS	H/4
1.0H:1.0V	WALLS	H/3

NOTE:
1) MAINTAIN A MINIMUM BENCH WIDTH OF 4.0 IN FRONT OF THE WALL FOR ITS ENTIRE LENGTH.
2) MINIMUM EMBEDMENT DEPTH OF 2 FT FOR MSE WALLS AND 1 FT FOR SOIL NAIL WALLS, UNLESS LARGER DEPTHS DICTATED BY THE ABOVE TABLE.
3) MAXIMUM SLOPE OF 1H:1V WILL BE MAINTAINED ON FRONT SLOPES FOR THE ENTIRE LENGTH OF THE WALL.
4) SUBMIT WITH THE WALL DESIGN INTERNAL, EXTERNAL, AND GLOBAL STABILITY ANALYSES.

PROJECT NO.: 36030.1.1 (I-4700A/I-4700B)
BUNCOMBE COUNTY
STATION: -
SHEET 1 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL SUMMARY

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

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

GEOTECHNICAL ENGINEER

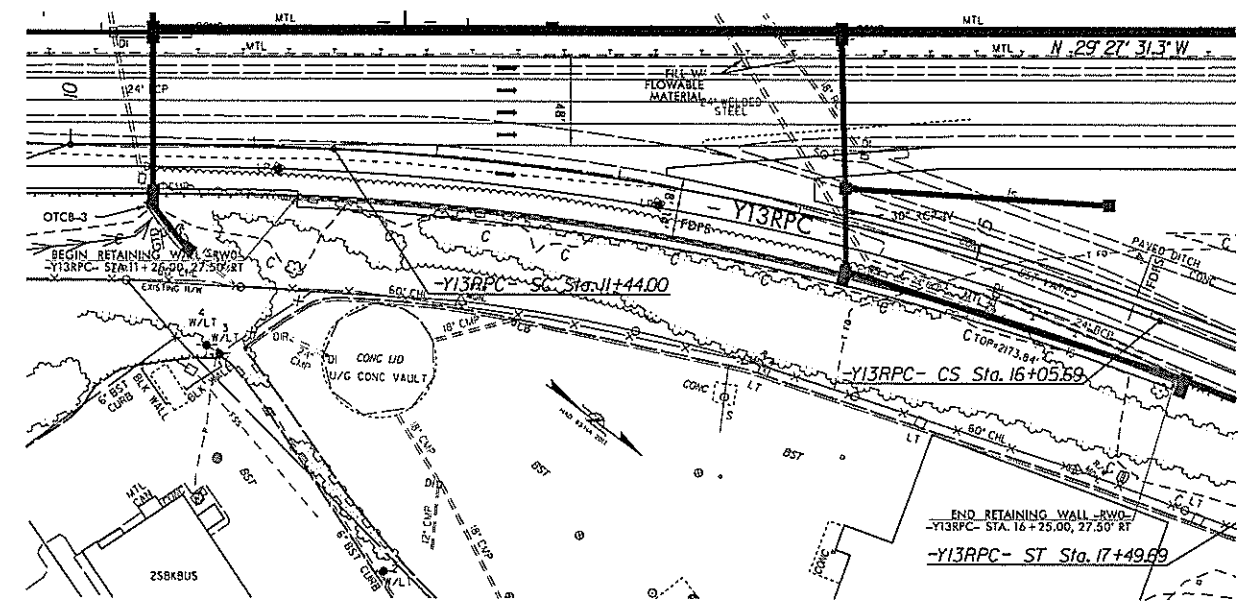
ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028893 MICHAEL H. STEPHENS

Designed by: *M.H.S.* DATE: 5/11/2019

DATE: _____ SIGNATURE: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



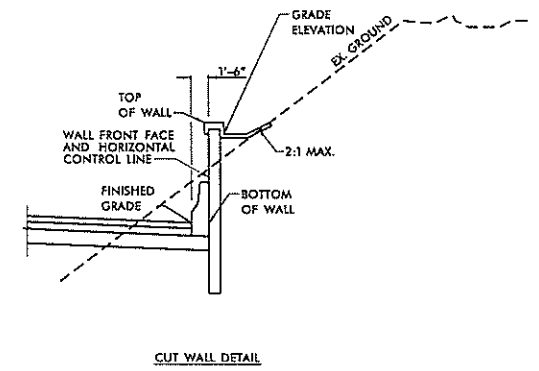
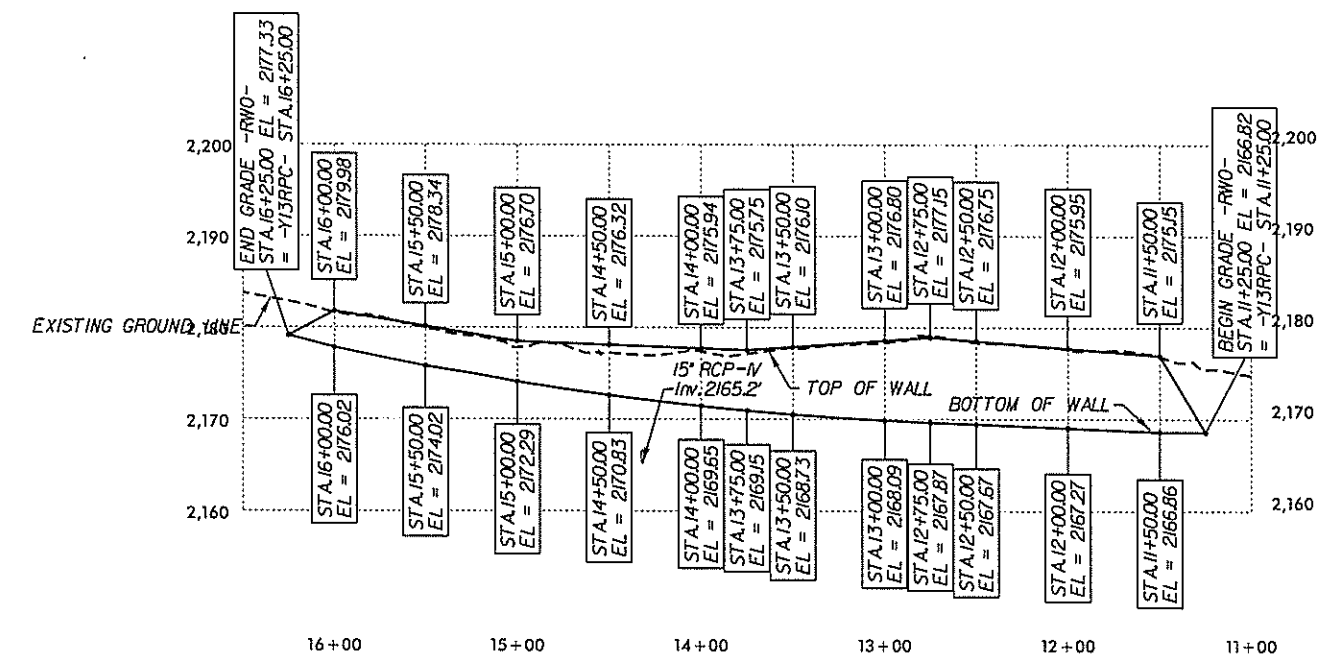
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RWO	3,685	2	11
ARCHITECTURAL CONCRETE SURFACE TREATMENT		3,685 SQ. FT.	

IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
EMBANKMENT FILL	115	28	0
RESIDUAL	115	28	0
WEATHERED ROCK	135	36	0

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
 2) RETAINING WALL -RWO- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.



RETAINING WALL -RWO-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -Y13RPC- 11+25
 SHEET 2 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RWO- SOIL NAIL WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	8/10/19	3		
2			4		

SHEET NO. W-2

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

GEOTECHNICAL ENGINEER

ENGINEER

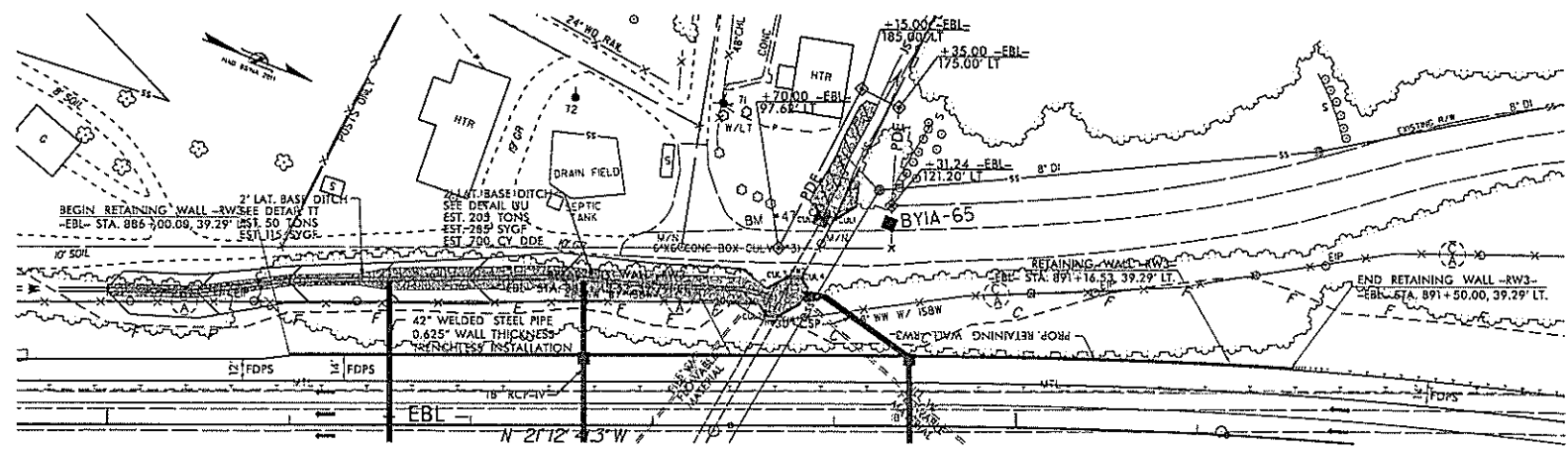
Date Signed: 6/11/2019

DATE

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. RW3	7,360 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	7,360 SF

DESIGN RETAINING WALL NO. RW3 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 4,600 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
- 6) REINFORCED ZONE AGGREGATE PARAMETERS:

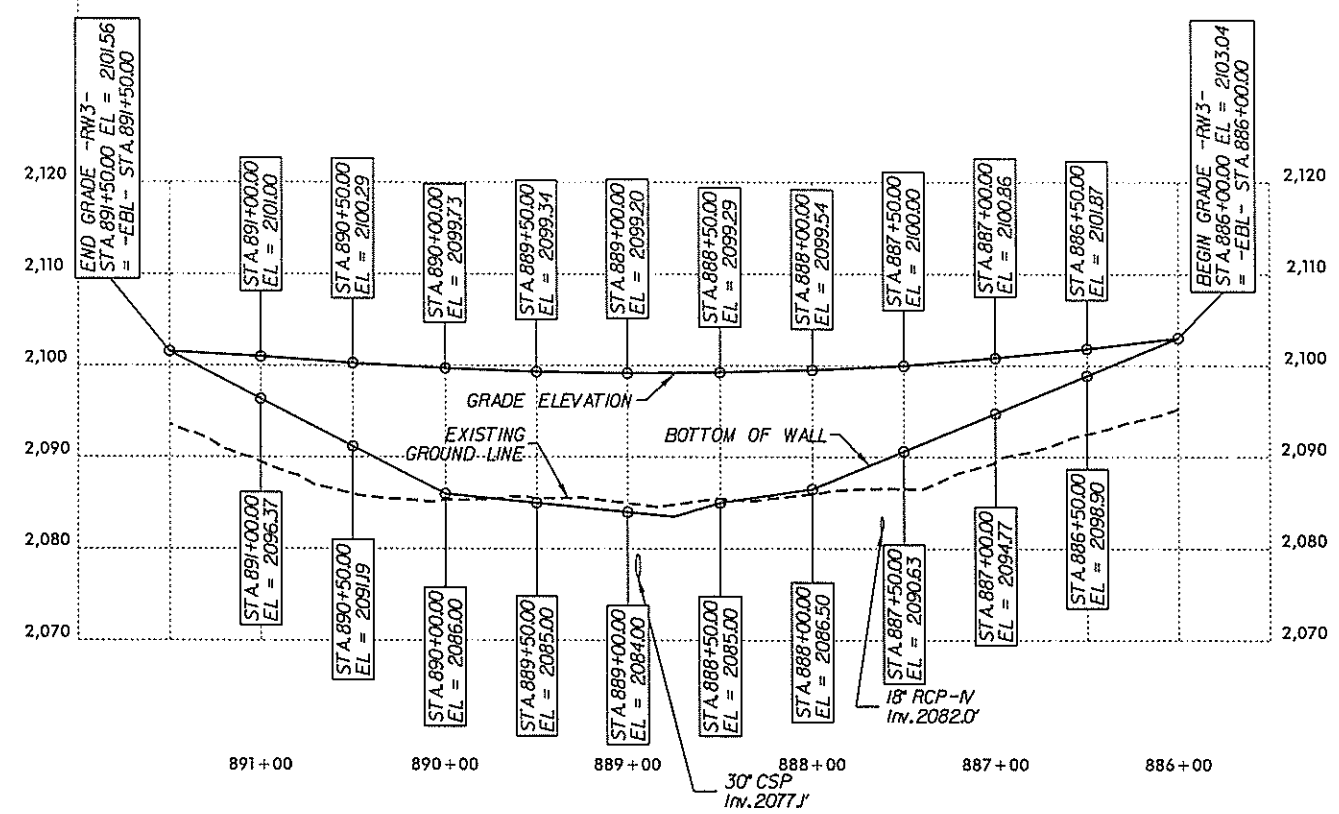
AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

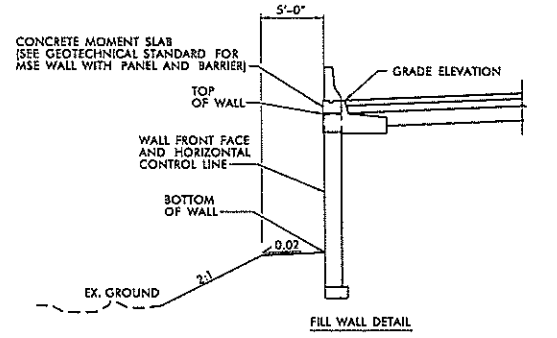
7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0

NOTES:
1) RETAINING WALL -RW3- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW3-
RETAINING WALLS -RW1- AND -RW2- HAVE BEEN ELIMINATED

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -EBL- 886+00
SHEET 3 OF 29

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

REVISIONS						SHEET NO. W-3
NO.	BY	DATE	NO.	BY	DATE	
1	SCC	6/10/19	3			
2			4			

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

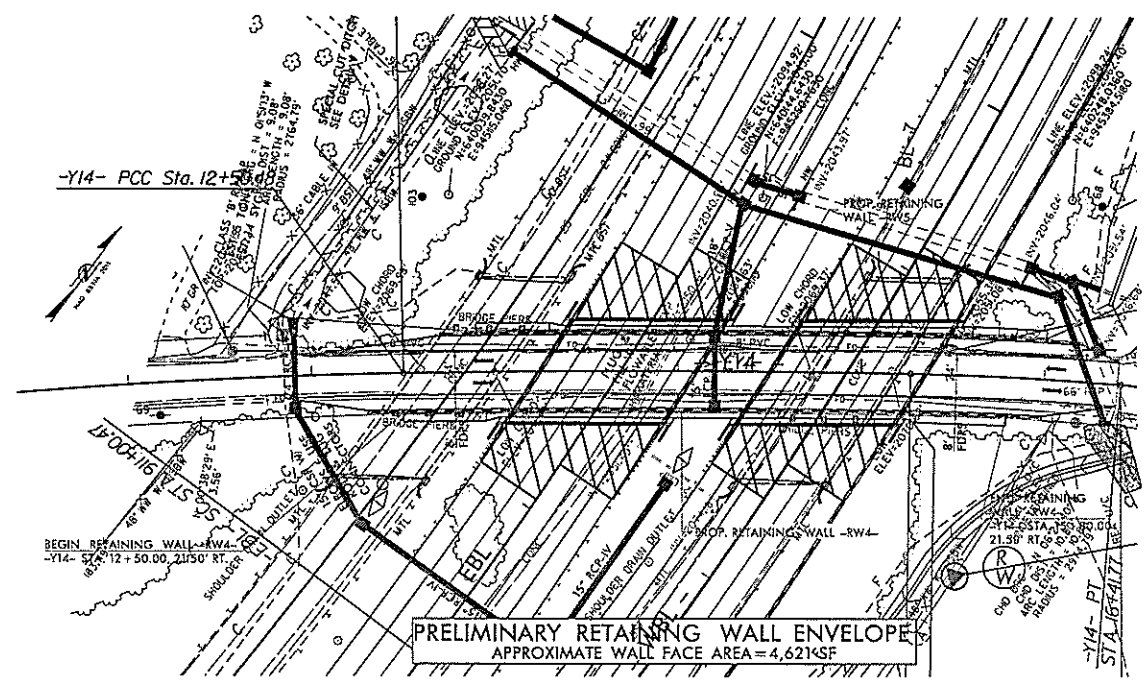
GEOTECHNICAL ENGINEER

ENGINEER

Designed by: *Michael H. Sternfels* DATE: 6/11/2019

SIGNATURE DATE

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UNLESS ALL SIGNATURES COMPLETED**



PRELIMINARY RETAINING WALL ENVELOPE
APPROXIMATE WALL FACE AREA = 4,621 SF

ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. RW4	5,620 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	5,620 SF

1

- DESIGN RETAINING WALL NO. RW4 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,000 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = SEE WALL EMBEDMENT TABLE
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

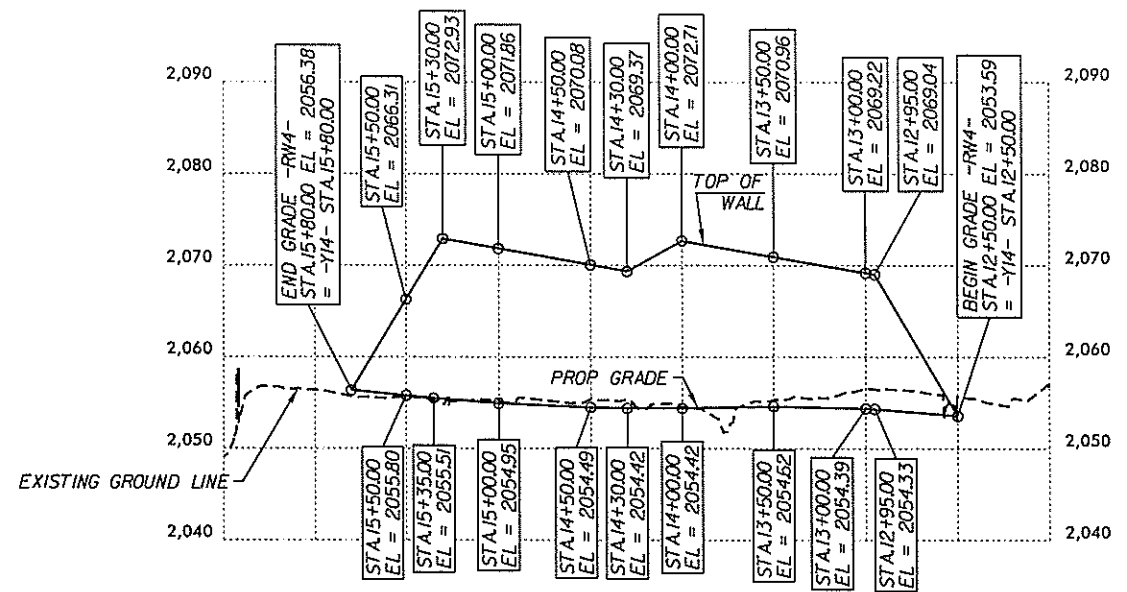
AGGREGATE TYPE#	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

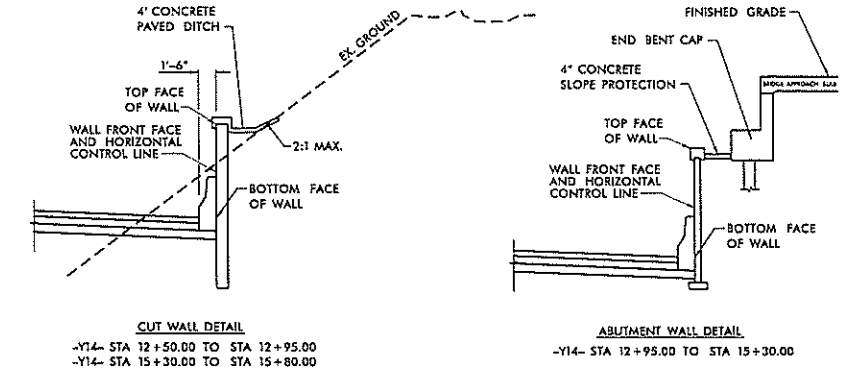
7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0

RETAINING WALL -RW4- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW4-

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -Y14- 12+50
SHEET 4 OF 29

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

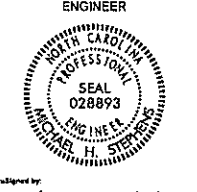
**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W4

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

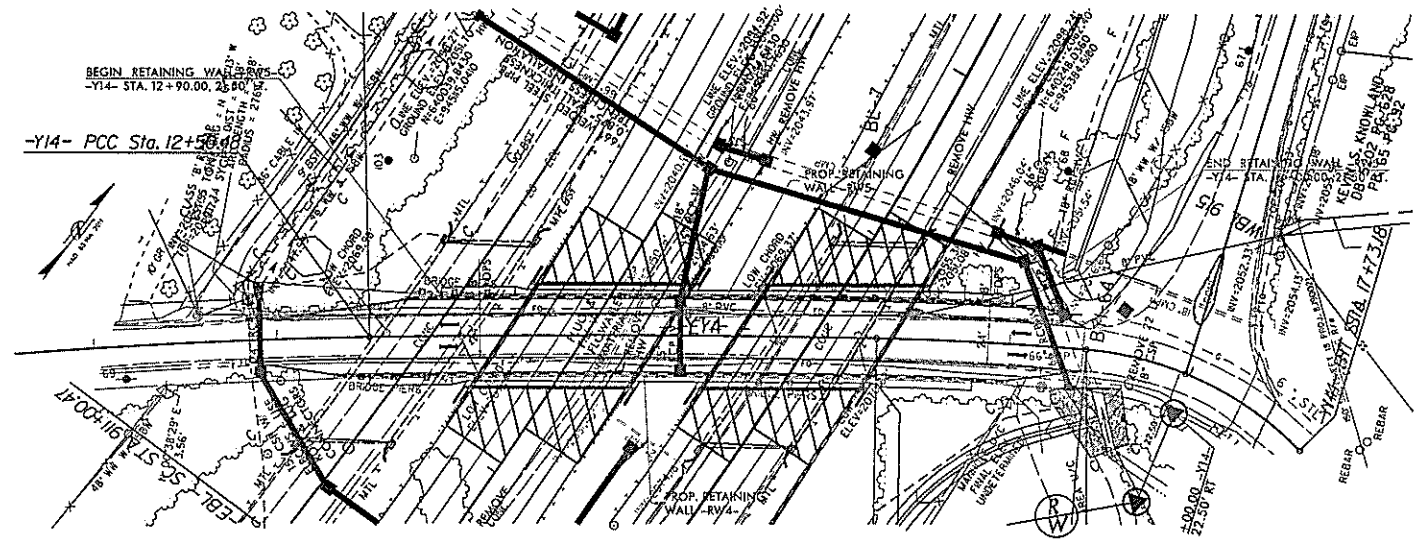
ENGINEER



6/11/2019

DATE

**DOCUMENT NOT CONSIDERED FINAL
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ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. RW5	4,820 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	4,820 SF

- DESIGN RETAINING WALL NO. RW5 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6,000 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = SEE WALL EMBEDMENT TABLE
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

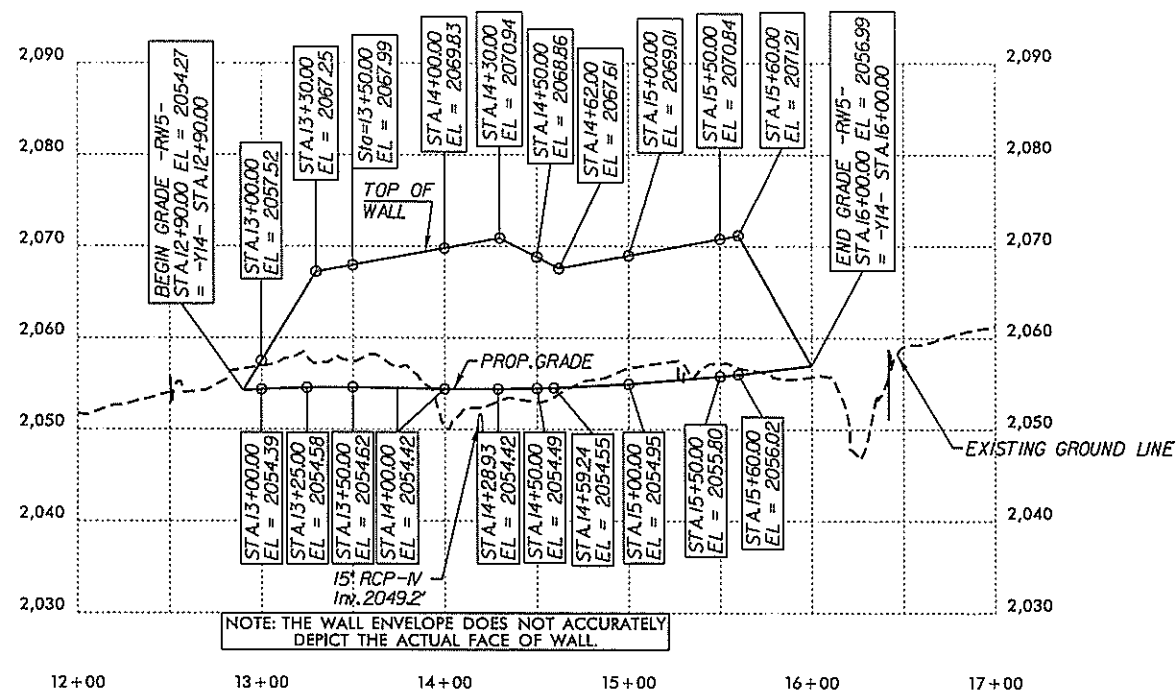
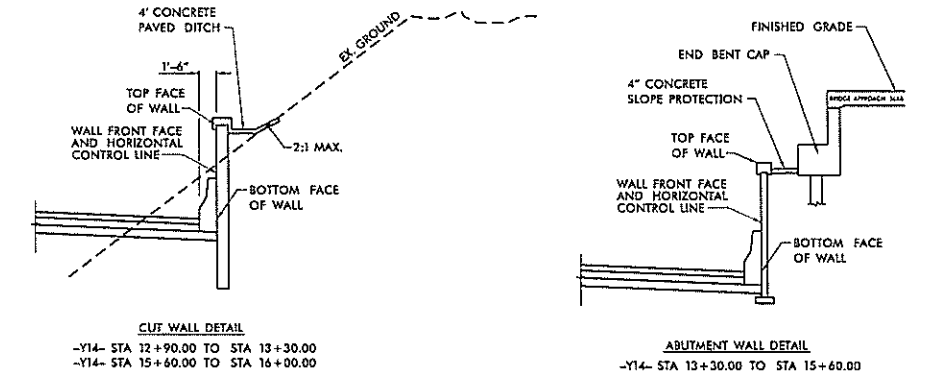
AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

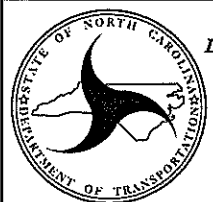
MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0

RETAINING WALL -RW5- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.



RETAINING WALL -RW5-

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -Y14- 12+90
SHEET 5 OF 29



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

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS					SHEET NO. W-5
NO.	BY	DATE	NO.	BY	
1	SCC	6/10/19	3		
2			4		

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

GEOTECHNICAL ENGINEER

ENGINEER

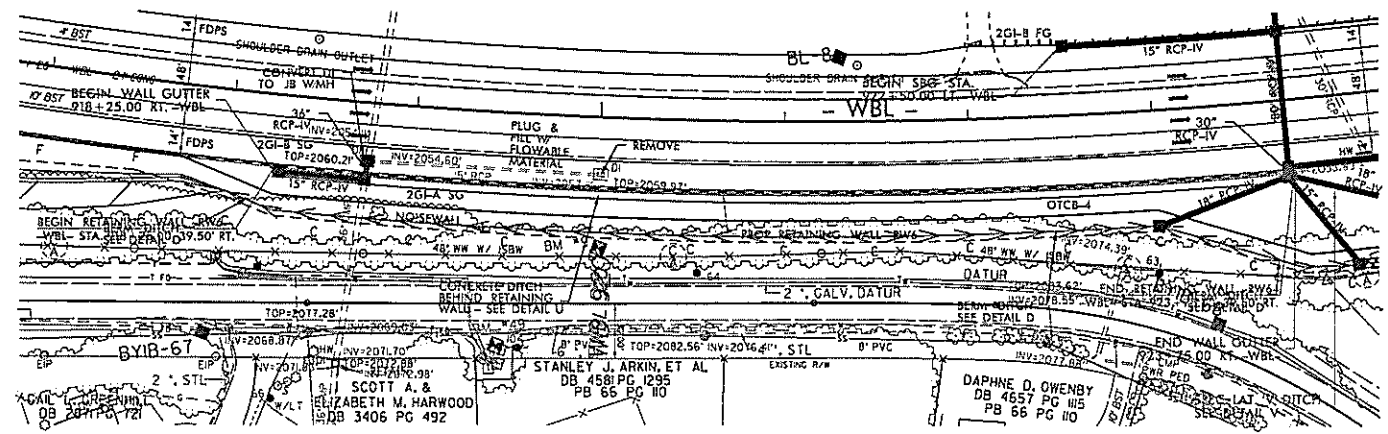
SEAL 028893

6/11/2019

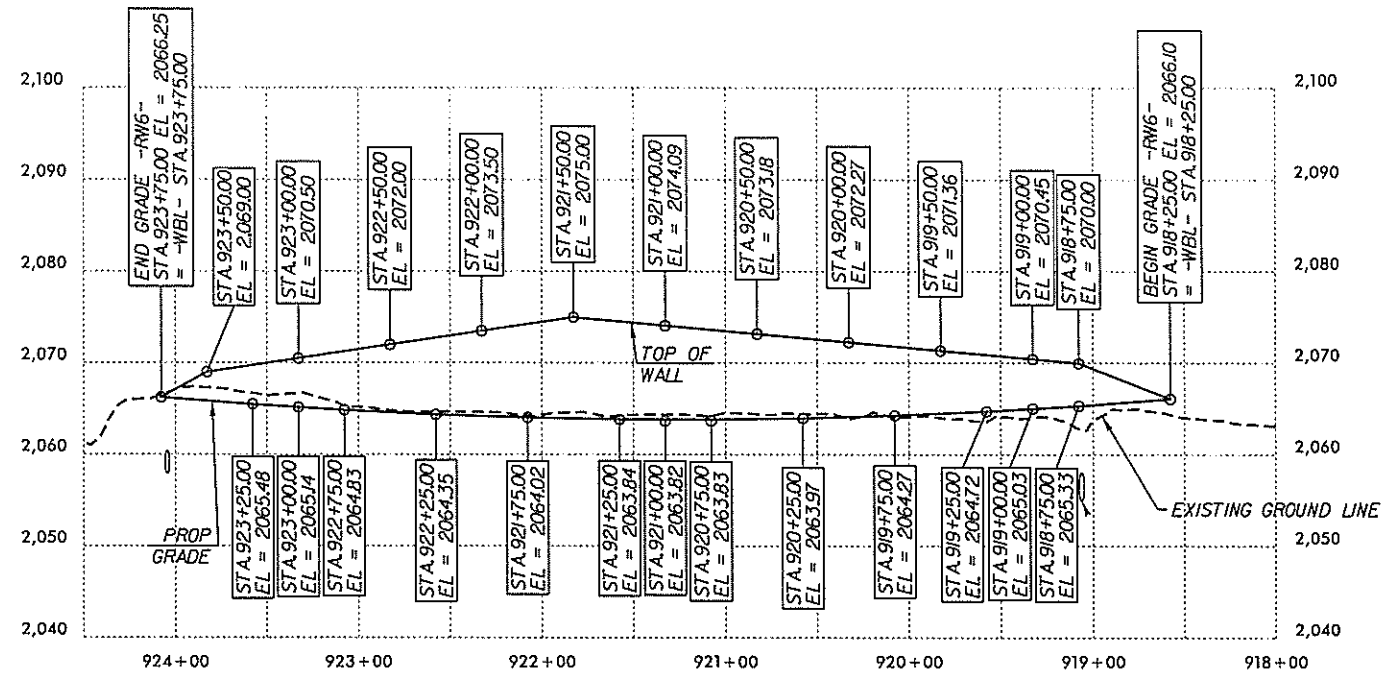
DATE

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PRELIMINARY RETAINING WALL ENVELOPE
APPROXIMATE WALL FACE AREA = 3,890 SF



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)

MSE RETAINING WALL NO. RW6	4,990 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	4,990 SF

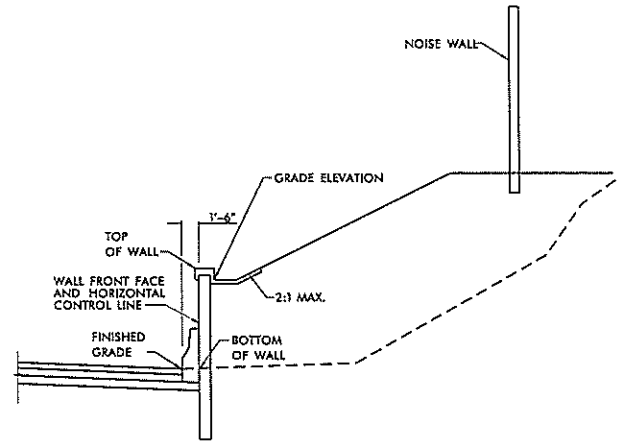
- DESIGN RETAINING WALL NO. RW6 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,600 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.1 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = SEE WALL EMBEDMENT TABLE
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	27	0



FILL WALL DETAIL
RETAINING WALL -RW6-

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -WBL- 918+25
SHEET 6 OF 28

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW6- MSE NAIL WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-6

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

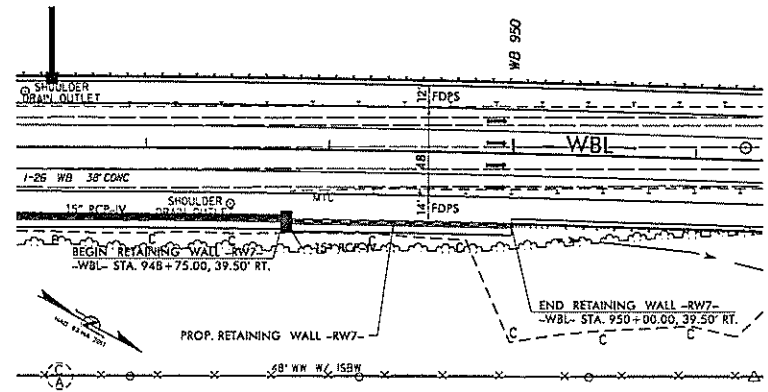
GEOTECHNICAL ENGINEER

ENGINEER

SEAL 028893

6/11/2019

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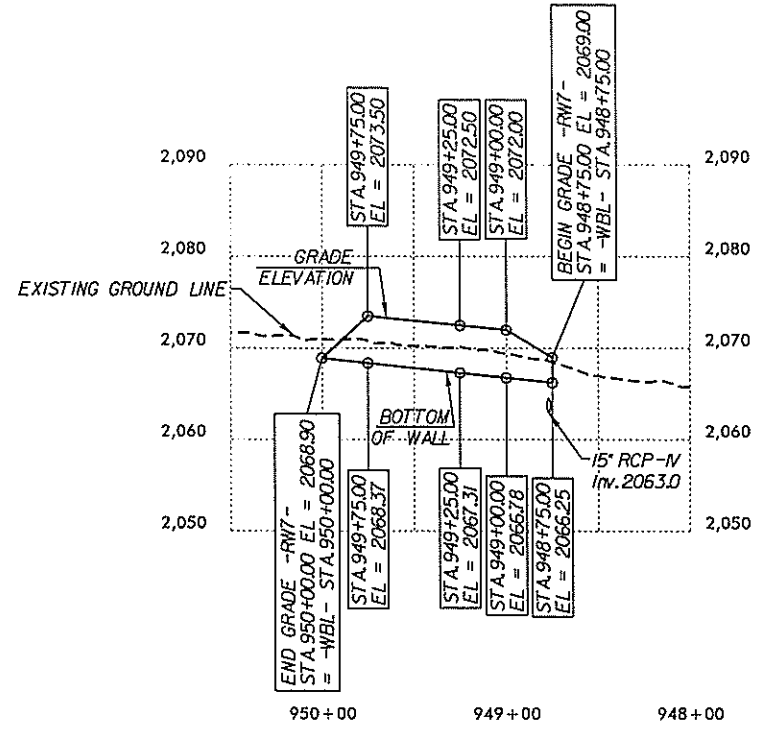
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW7	680	2	3
ARCHITECTURAL CONCRETE SURFACE TREATMENT		680 SF	

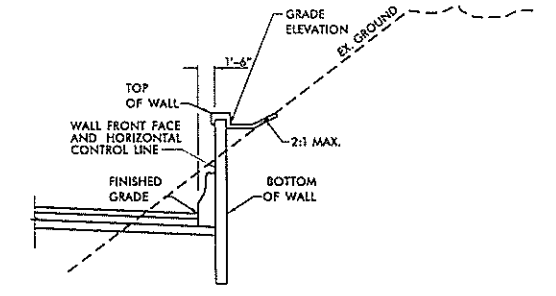
IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
EMBANKMENT FILL	120	30	0
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0
ROCK	165	45	1,000

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
 SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



CUT WALL DETAIL
 RETAINING WALL -RW7-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -WBL- 948+75
 SHEET 7 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

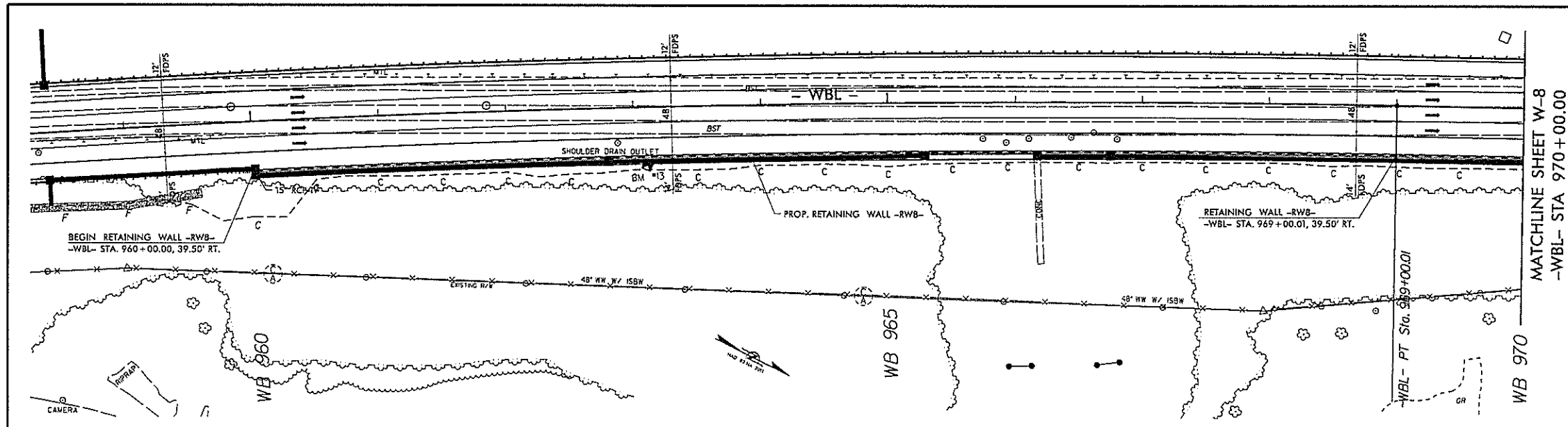
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW7- SOIL NAIL WALL

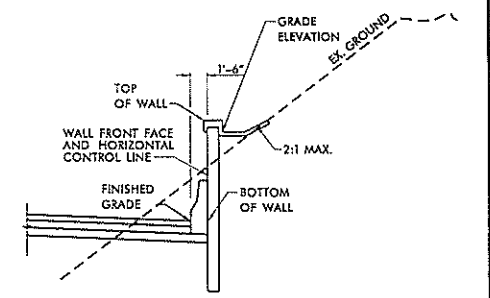
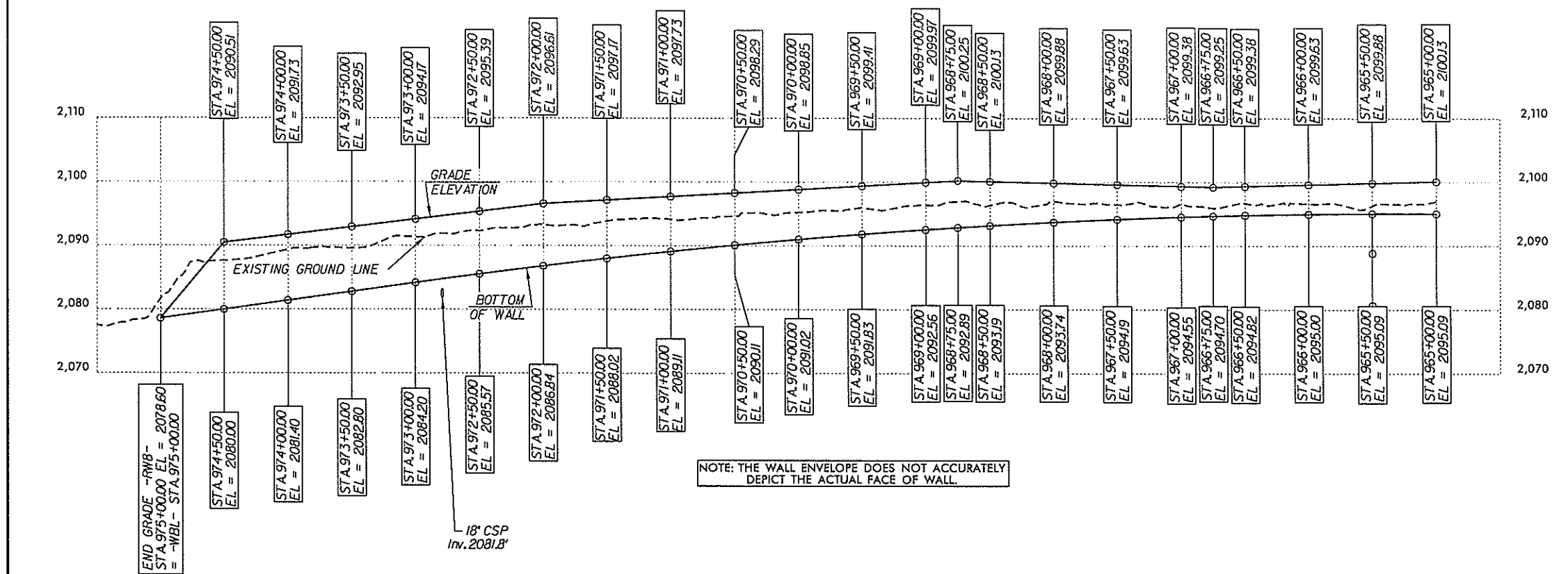
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-7

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19



GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 028893
 MICHAEL H. STEPHENS
 6/11/2019
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CUT WALL DETAIL
RETAINING WALL -RW8-

NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RWB	12,665	4	31
ARCHITECTURAL CONCRETE SURFACE TREATMENT		12,665 SF	

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
 2) RETAINING WALL -RW8- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.

IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	120	30	0
ROCK	165	45	1,000

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -WBL- 960+00
 SHEET 8 OF 29


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENGINEERING UNIT

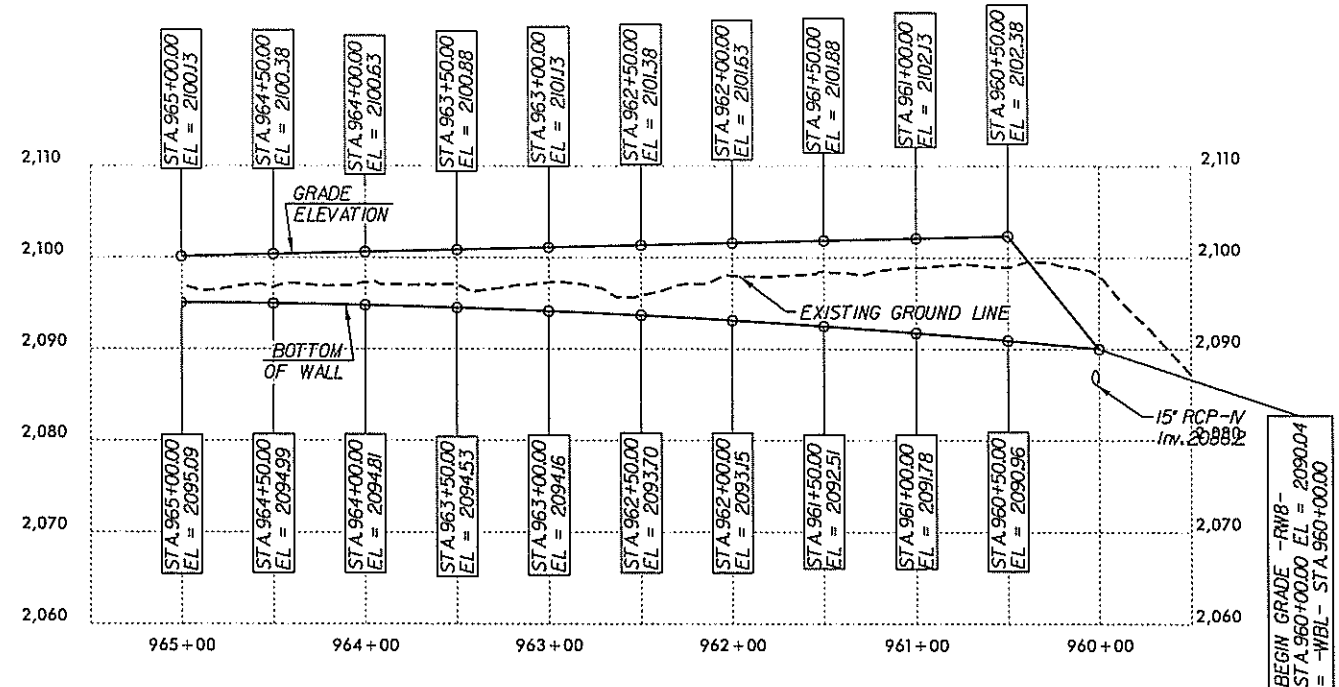
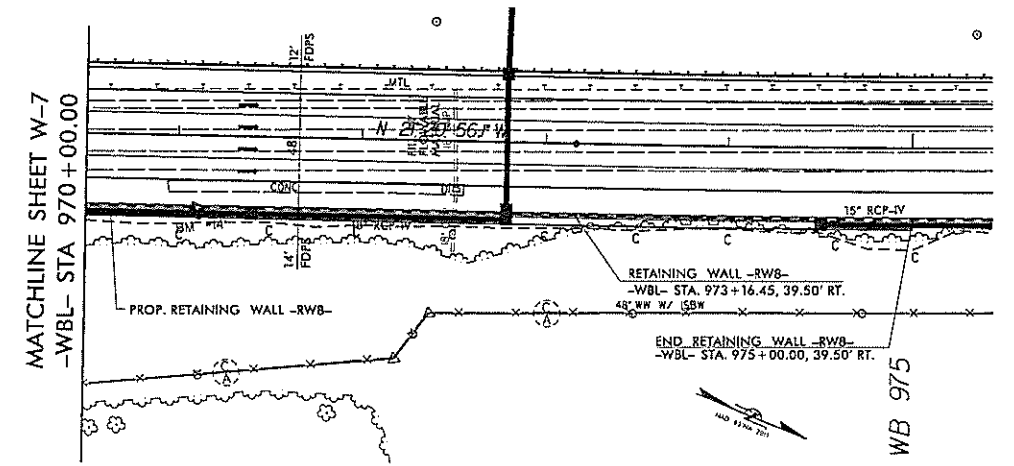
RETAINING WALL NO. -RW8- SOIL NAIL WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

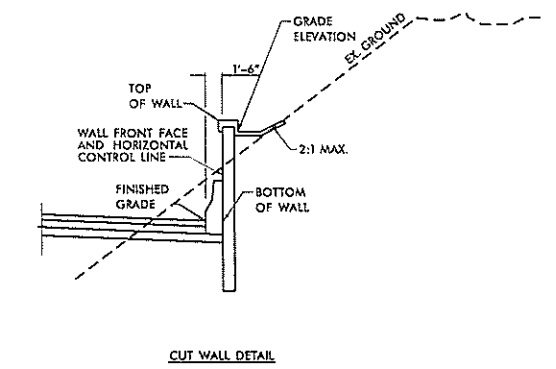
SHEET NO. W-8

PREPARED BY: MHS
 REVIEWED BY: SCC
 DATE: 3/1/19

GEOTECHNICAL ENGINEER
 ENGINEER

 Date Signed by: *Michael H. Stephens* 6/11/2019
 SIGNATURE DATE
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED




NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW8-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -WBL- 960+00
 SHEET 9 OF 29

PREPARED BY: MHS DATE: 3/1/10
 REVIEWED BY: SCC DATE: 3/1/10


 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**GEOTECHNICAL
 ENGINEERING UNIT**

RETAINING WALL NO. -RW8-
SOIL NAIL WALL

REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	
1			3		W9
2			4		

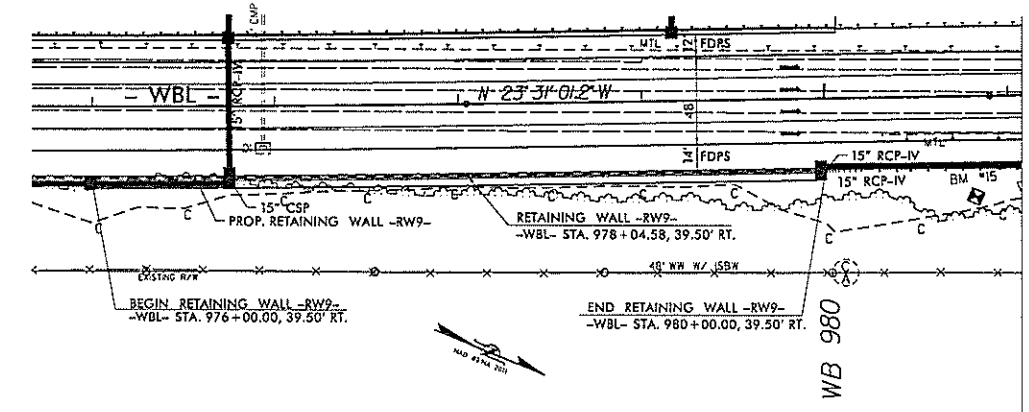
GEOTECHNICAL ENGINEER

SEAL
028893
ENGINEER
MICHAEL H. STEPEN

ENGINEER

6/11/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



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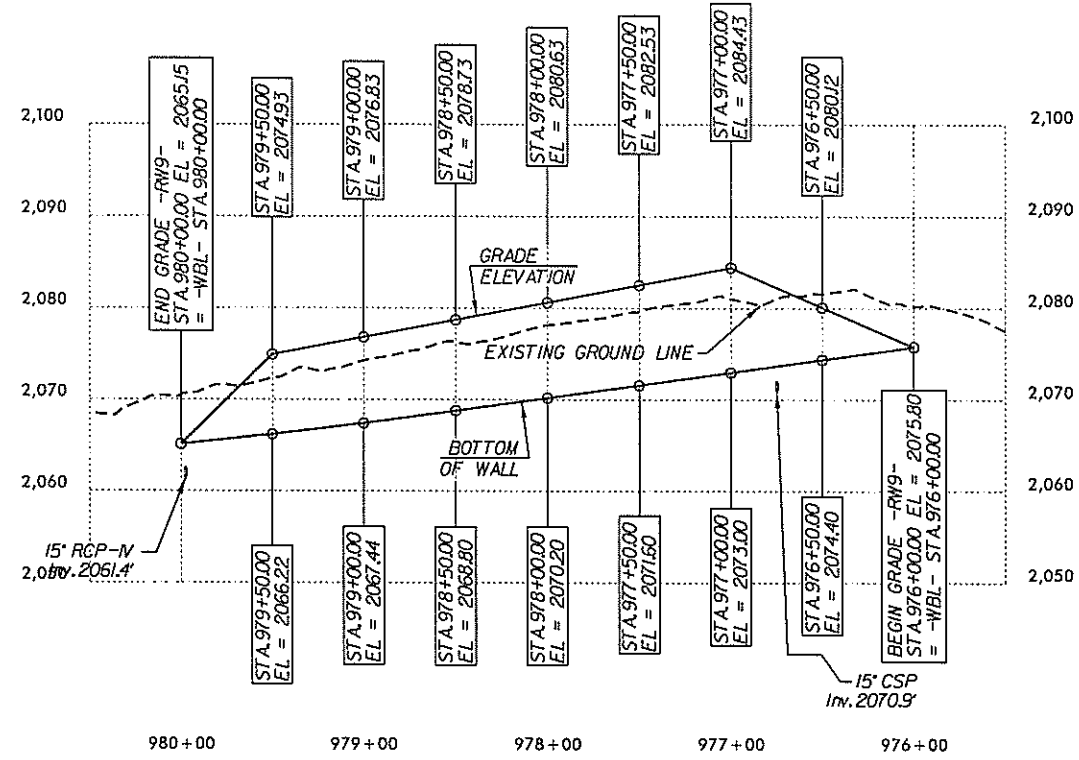
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW9	4,130	2	13
ARCHITECTURAL CONCRETE SURFACE TREATMENT		4,130 SF	

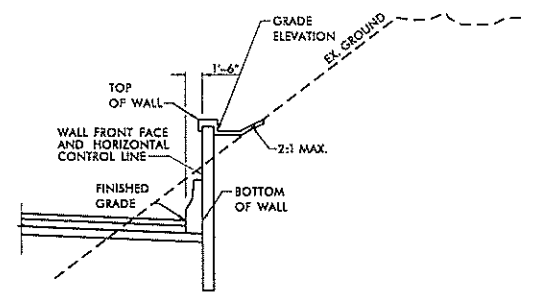
IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0

NOTES:
1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW9-

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -WBL- 976+00
SHEET 10 OF 29

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

RETAINING WALL NO. -RW9-
SOIL NAIL WALL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

SHEET NO.
W-10

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW10	17,225	3	37
ARCHITECTURAL CONCRETE SURFACE TREATMENT		17,225 SF	

NOTES:
 1. A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
 SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

IN-SITU ASSUMED MATERIAL PARAMETERS:

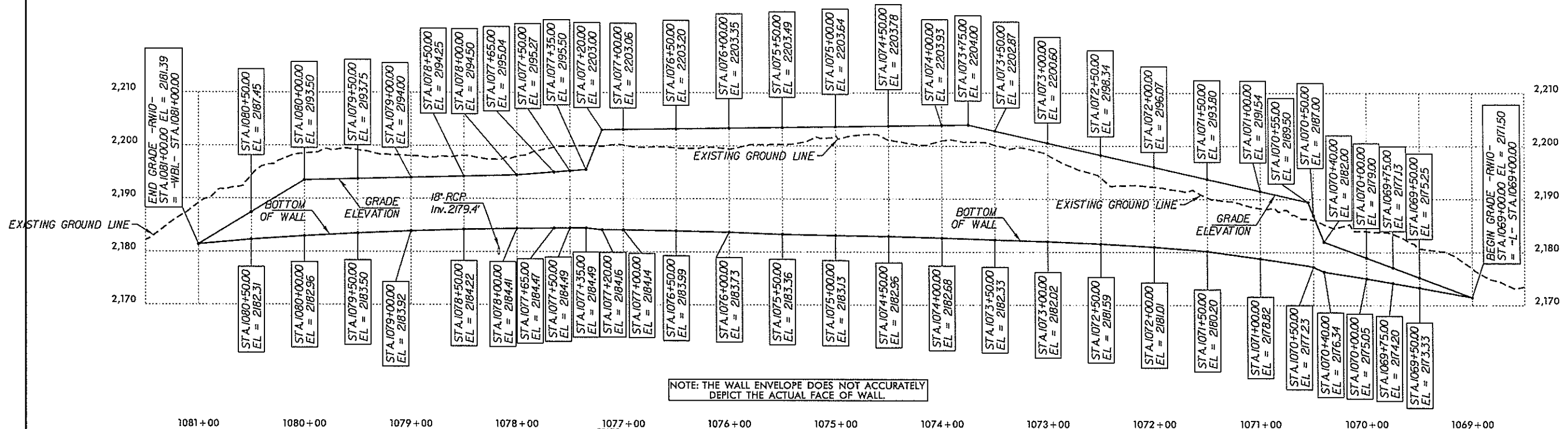
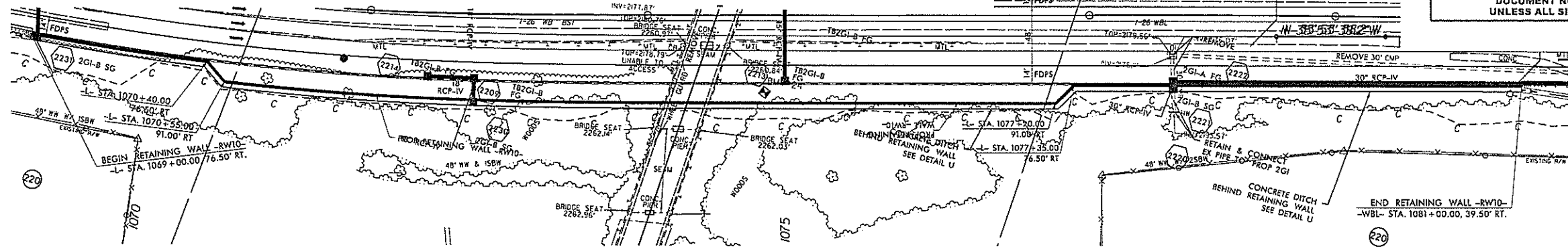
MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0
ROCK	165	45	1,000

GEOTECHNICAL ENGINEER

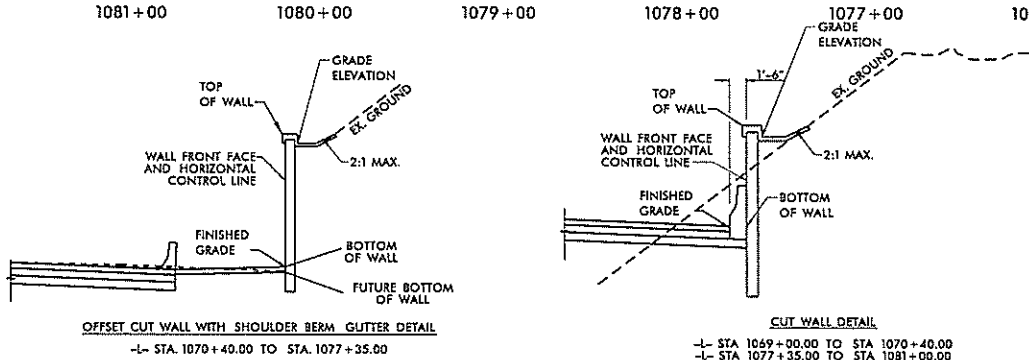
ENGINEER

6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW10-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1069+00
 SHEET 11 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW10- SOIL NAIL WALL

REVISIONS				
NO.	BY	DATE	NO.	BY
1	SCC	6/10/19	3	
2			4	

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

SHEET NO. W-11

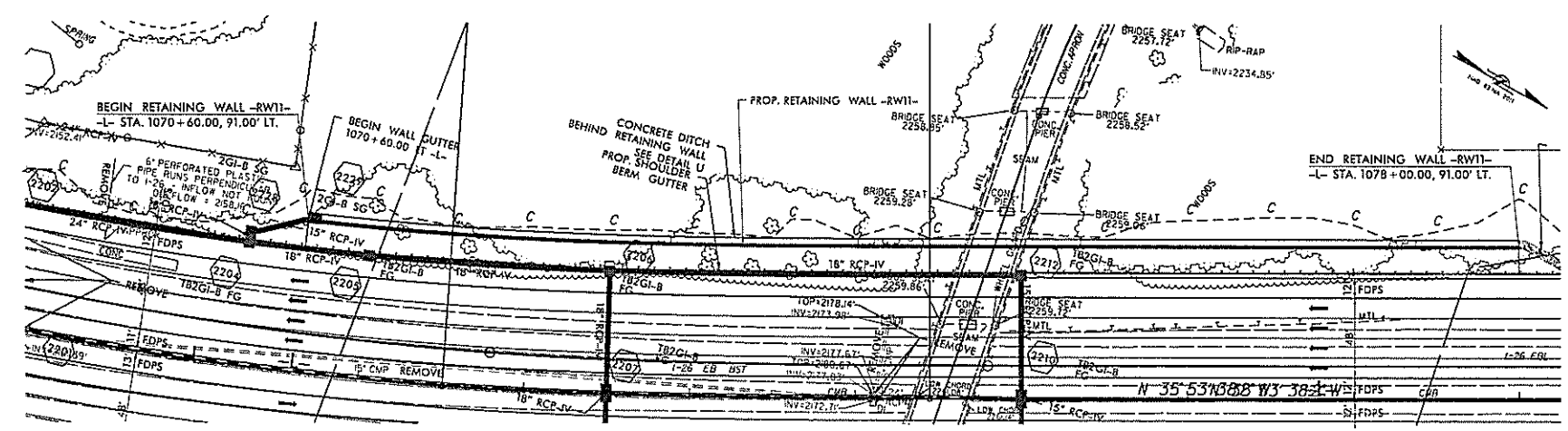
GEOTECHNICAL ENGINEER

SEAL
028893
MICHAEL H. STURGES

ENGINEER

DATE: 6/11/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



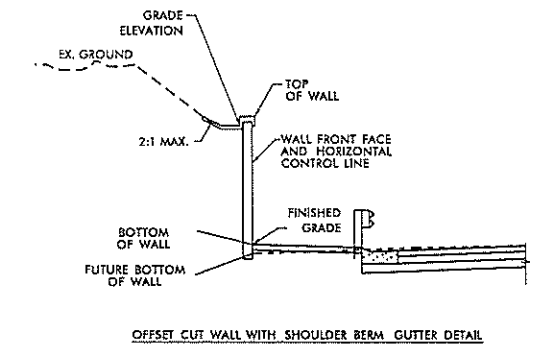
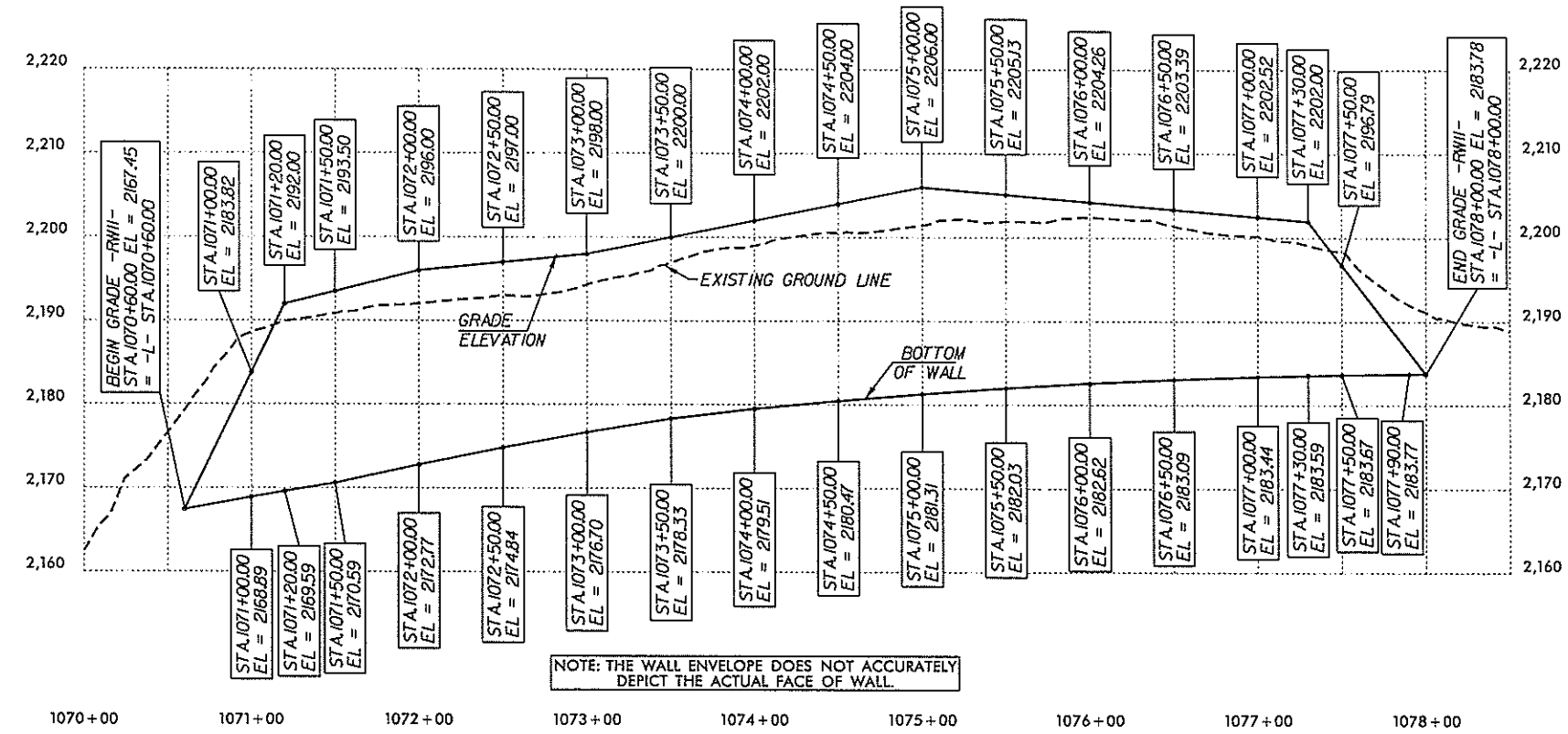
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQ. FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW11	15,555	3	38
ARCHITECTURAL CONCRETE SURFACE TREATMENT		15,555 SF	

IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0
ROCK	165	45	1,000

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
 SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



RETAINING WALL -RW11-

NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1070+60
 SHEET 12 OF 29

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS						SHEET NO. W-12
NO.	BY	DATE	NO.	BY	DATE	
1	SCC	6/10/19	3			
2			4			

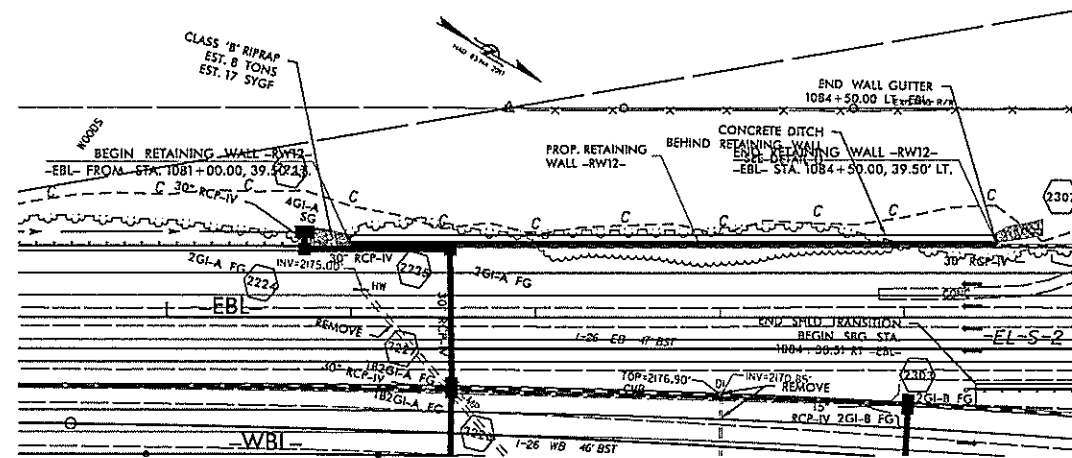
GEOTECHNICAL ENGINEER

ENGINEER

PROFESSIONAL SEAL
029869
ENGINEER
SHANE C. CLARK

Drawn by: Shane C. Clark DATE: 7/8/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



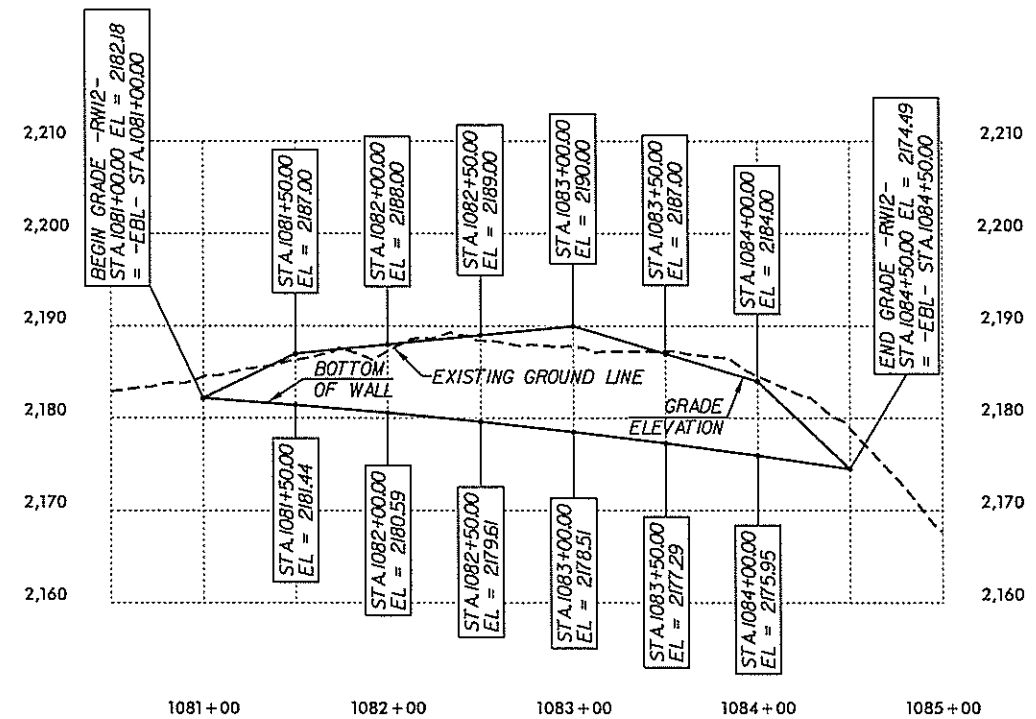
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW12	2,395	2	8
ARCHITECTURAL CONCRETE SURFACE TREATMENT		2,395 SF	

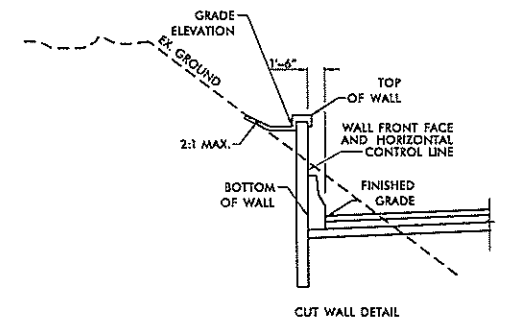
IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
FILL	115	28	0
RESIDUAL	130	30	0
WEATHERED ROCK	135	36	0

NOTES:
1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW12-

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: -EBL- 1081+00
SHEET 13 OF 29

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW12-
SOIL NAIL WALL

REVISIONS				
NO.	BY	DATE	NO.	BY
1	SCC	6/10/19	3	
2			4	

SHEET NO. W-13

GEOTECHNICAL ENGINEER

ENGINEER

SEAL 028893

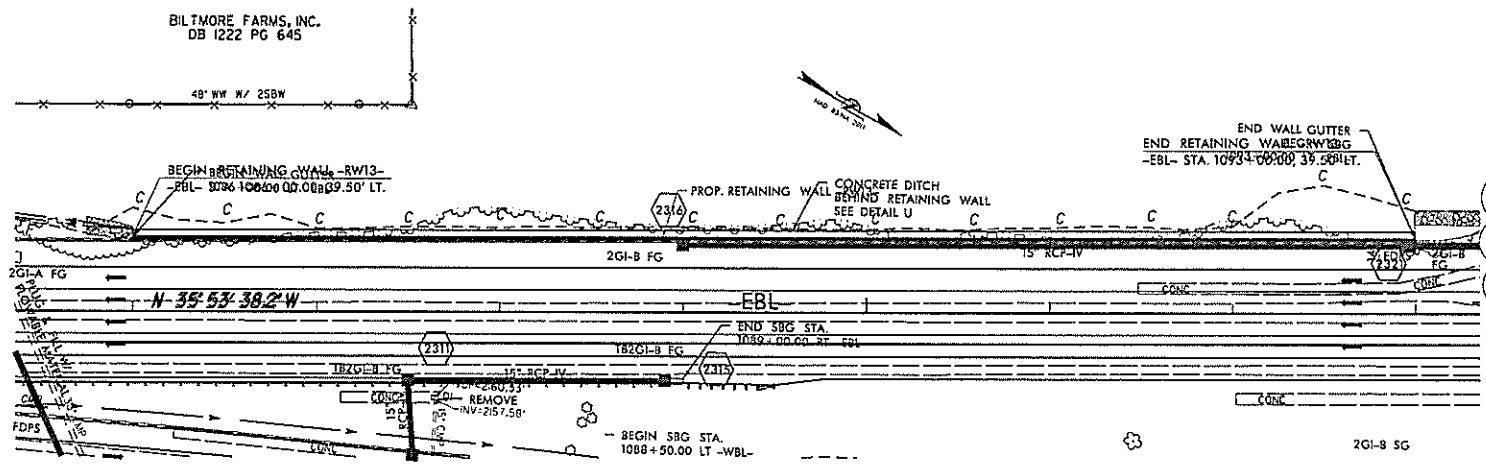
6/11/2019

DATE

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



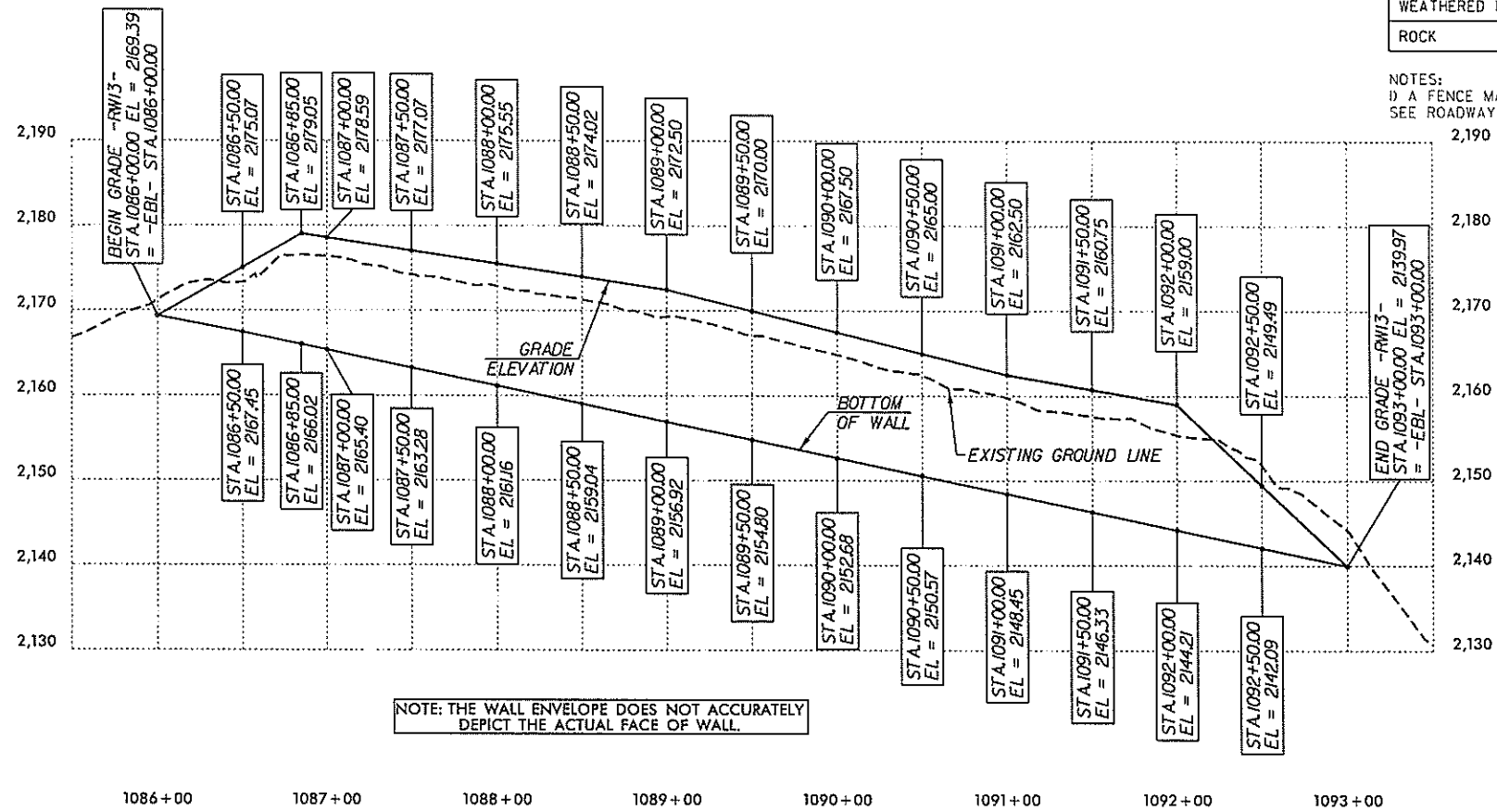
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW13	9,470	2	22
ARCHITECTURAL CONCRETE SURFACE TREATMENT		9,470 SF	

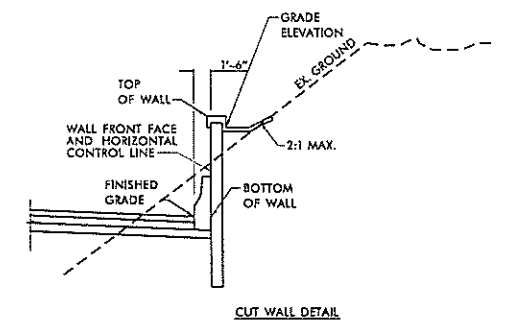
IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
EMBANKMENT FILL	115	28	0
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0
ROCK	165	45	1,000

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW13-

PROJECT NO.: 36030.1.1 (I-4700)

BUNCOMBE COUNTY

STATION: -EBL- 1086+00

SHEET 14 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW13-
SOIL NAIL WALL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-14

PREPARED BY: MHS DATE: 3/1/19

REVIEWED BY: SCC DATE: 3/1/19

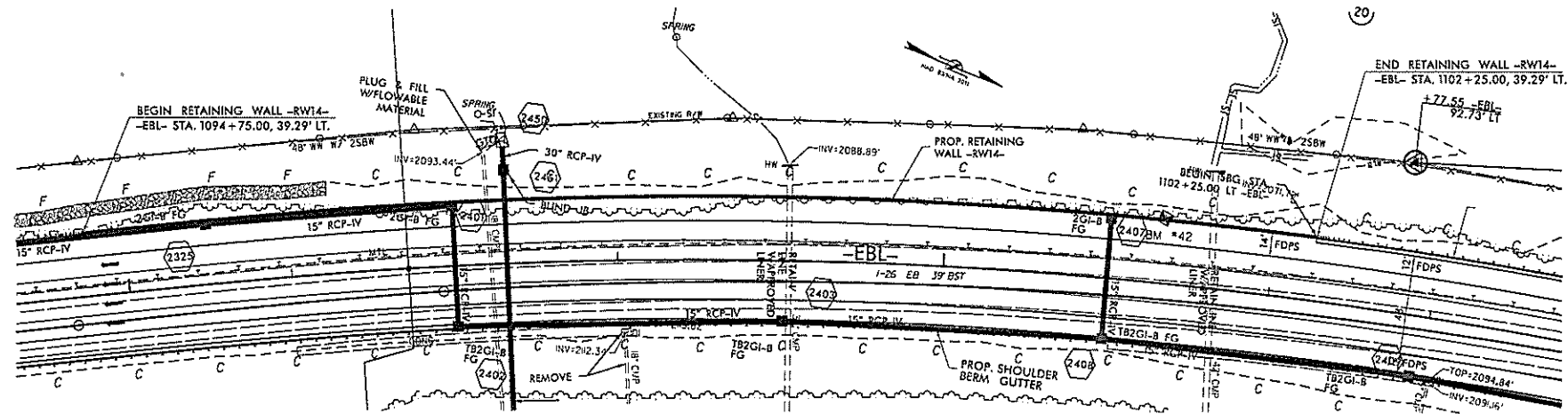
GEOTECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

DATE: 6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. RW14	14,640 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	14,640 SF

DESIGN RETAINING WALL NO. RW14 FOR THE FOLLOWING:

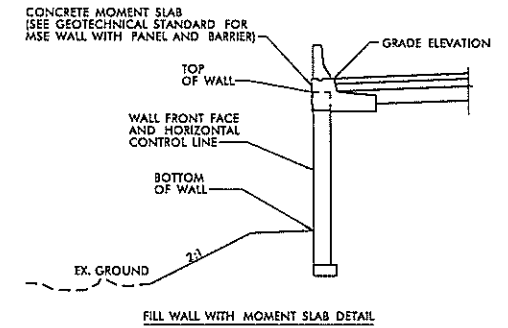
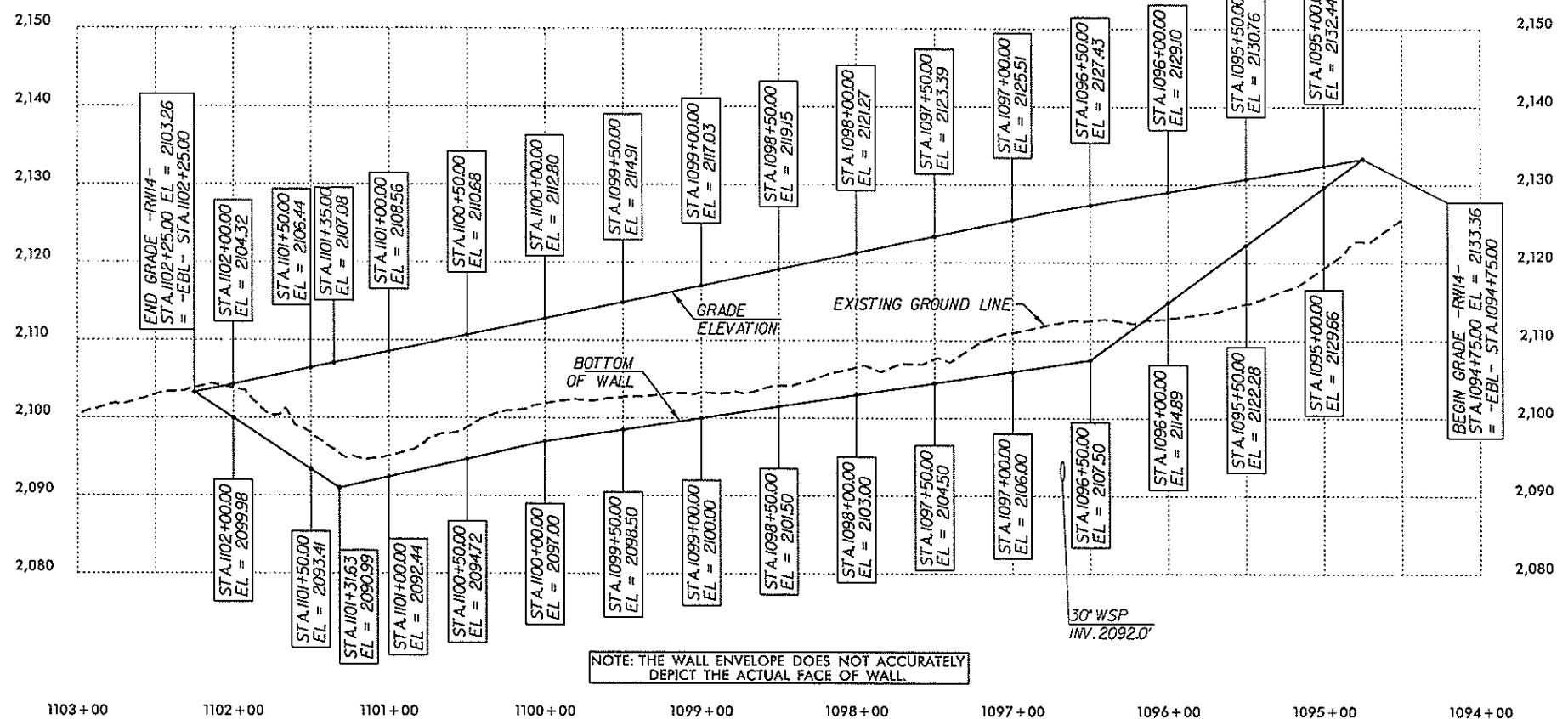
- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,600 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 3.5 H OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
- 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0



RETAINING WALL -RW14-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -EBL- 1094+75
 SHEET 15 OF 29

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

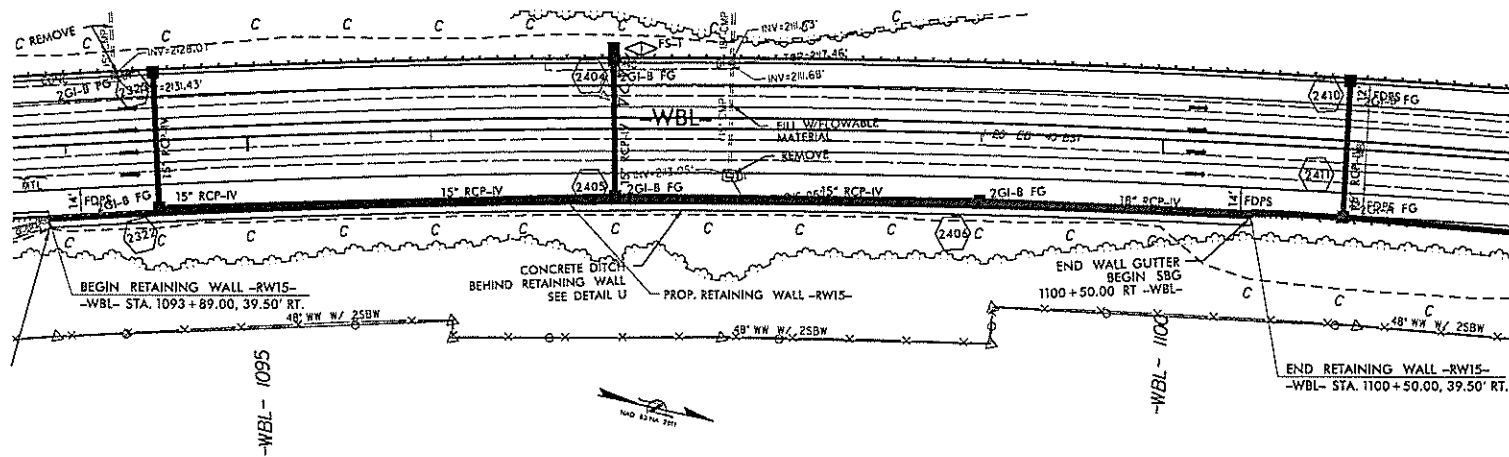
GEOTECHNICAL
 ENGINEERING UNIT

RETAINING WALL NO. -RW14-
 MSE WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-15

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19



GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 028893
 MICHAEL H. STEPHENS
 Date: 6/11/2019
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

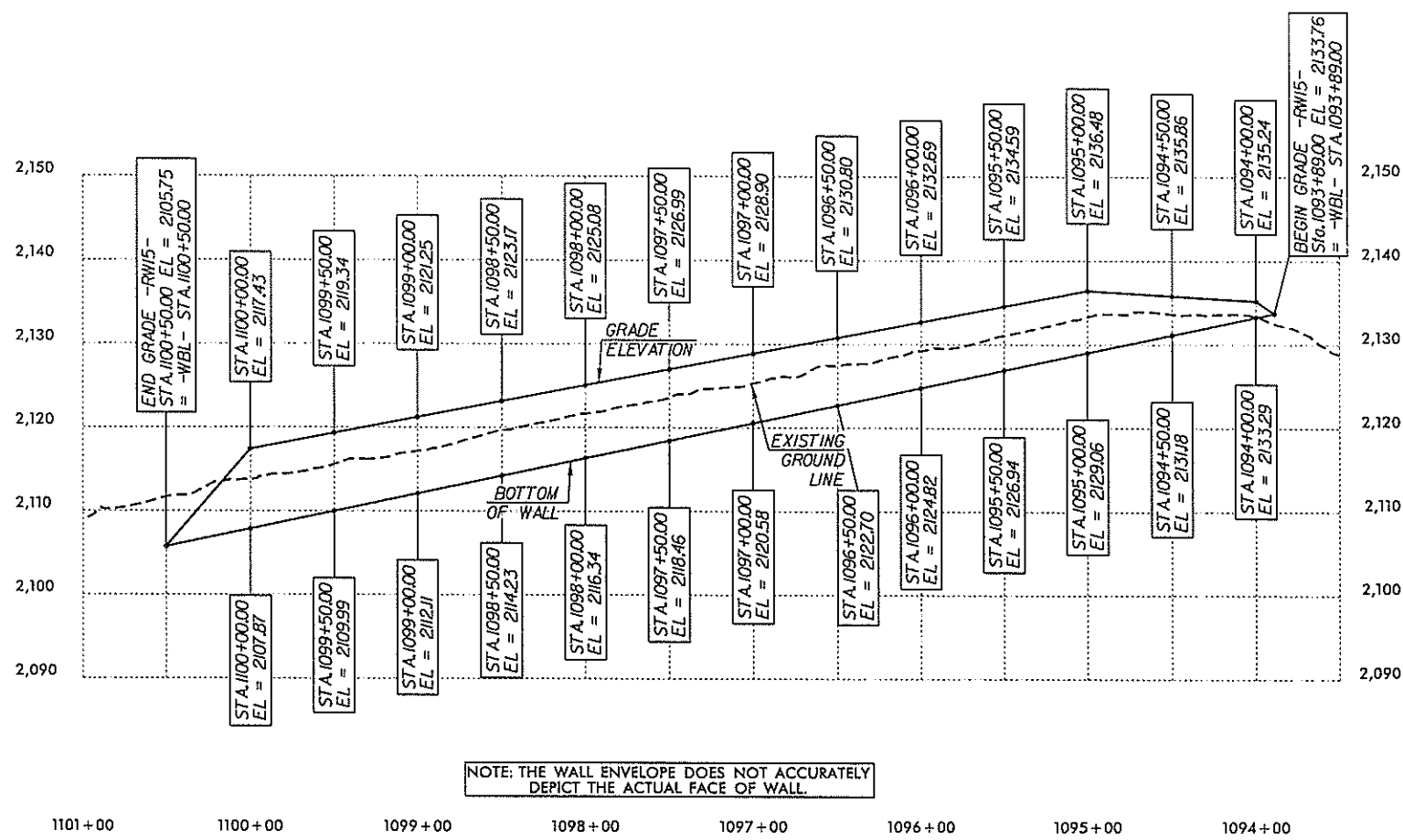
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW15	5,635	2	14
ARCHITECTURAL CONCRETE SURFACE TREATMENT		5,635 SF	

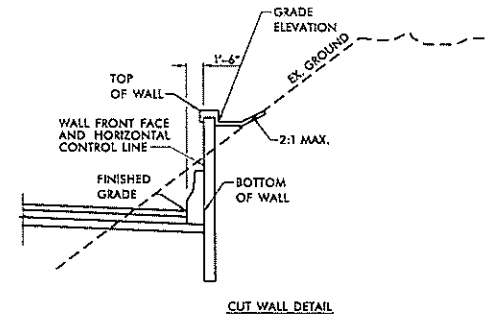
IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
EMBANKMENT FILL	115	28	0
RESIDUAL	130	30	0

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
 SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW15-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -WBL- 1093+89
 SHEET 16 OF 29

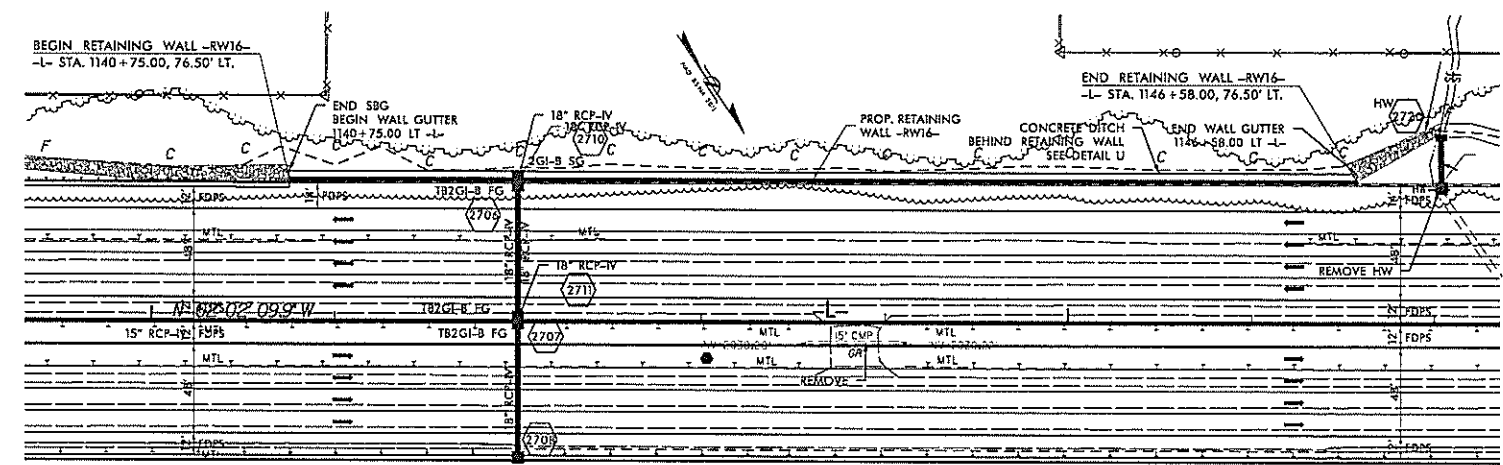
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
 GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW15- SOIL NAIL WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	SCC	8/10/19	3			W-16
2			4			

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 028893
 MICHAEL H. STERNES
 Designated by: *MHS* 6/11/2019
 DATE: DATE SIGNATURE: DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



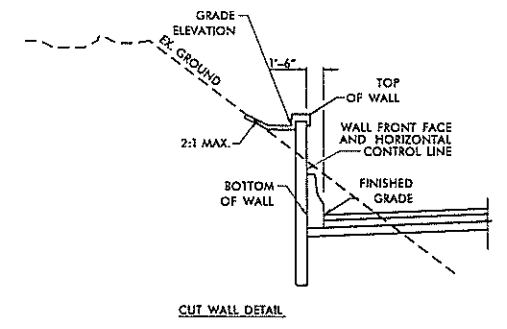
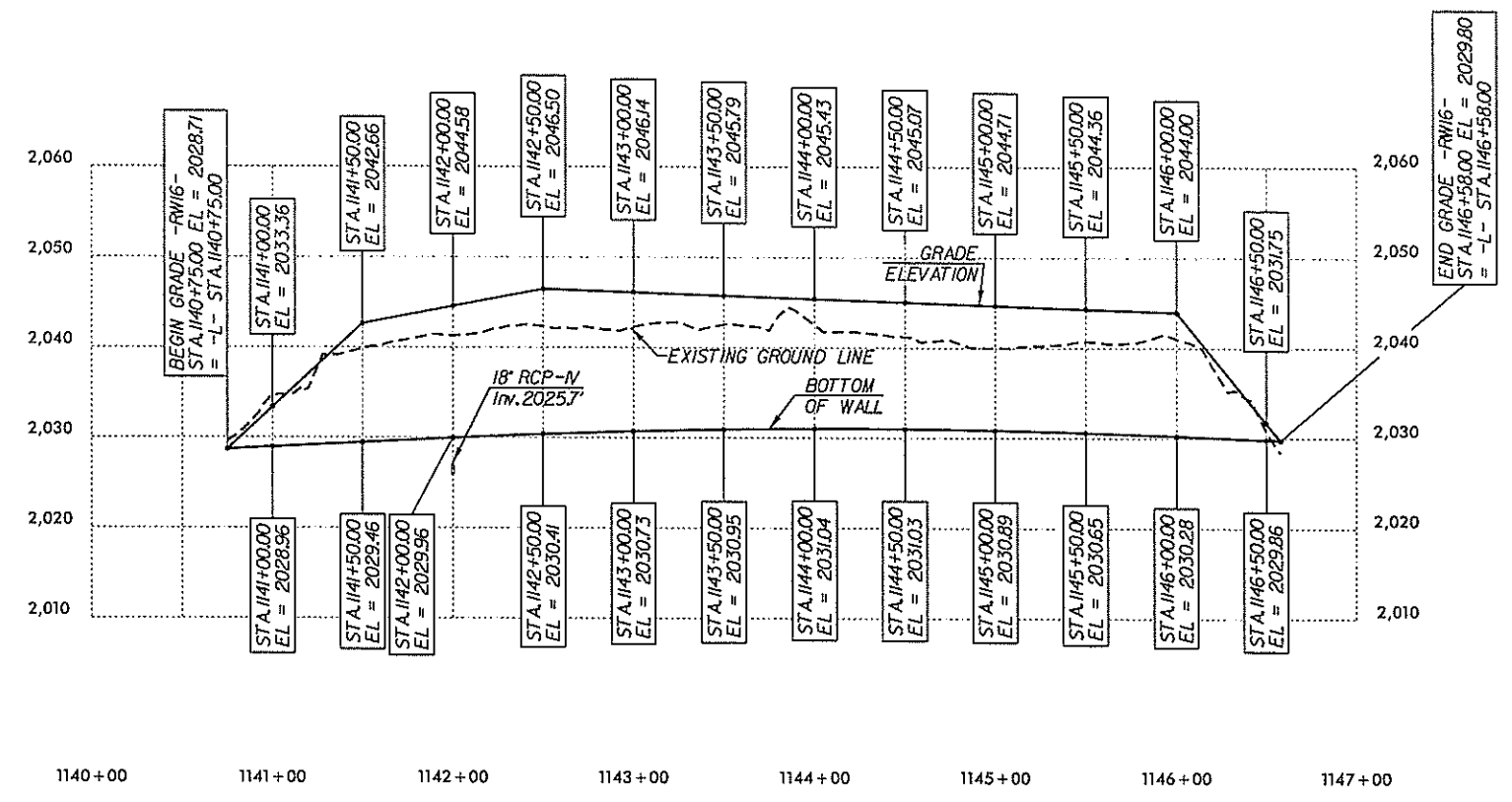
ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW16	7,990	2	18
ARCHITECTURAL CONCRETE SURFACE TREATMENT		7,990 SF	

IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	130	30	0
ROCK	165	45	1,000

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS.
 SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.



RETAINING WALL -RW16-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1140+75
 SHEET 17 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

**RETAINING WALL NO. -RW16-
 SOIL NAIL WALL**

REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1	SCC	8/10/19	3			W-17
2			4			

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW17	27,310	6	69
ARCHITECTURAL CONCRETE SURFACE TREATMENT		27,310 SF	

NOTES:
 1) A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
 2) RETAINING WALL -RW17- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.

IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
EMBANKMENT FILL	115	28	0
RESIDUAL	130	30	0
ROCK	165	45	1,000

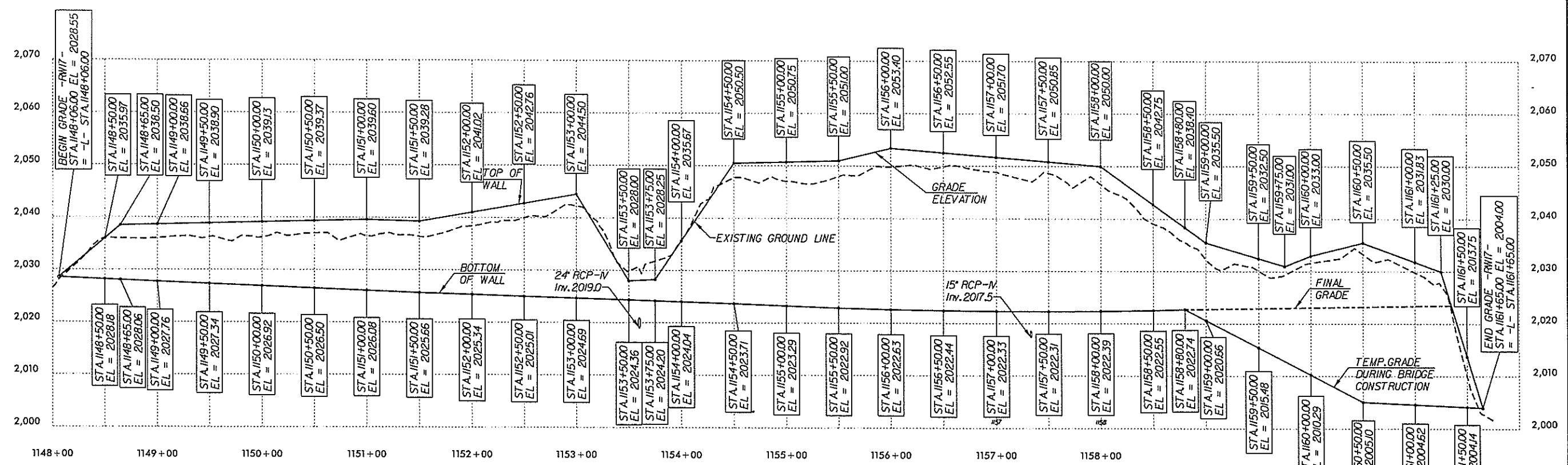
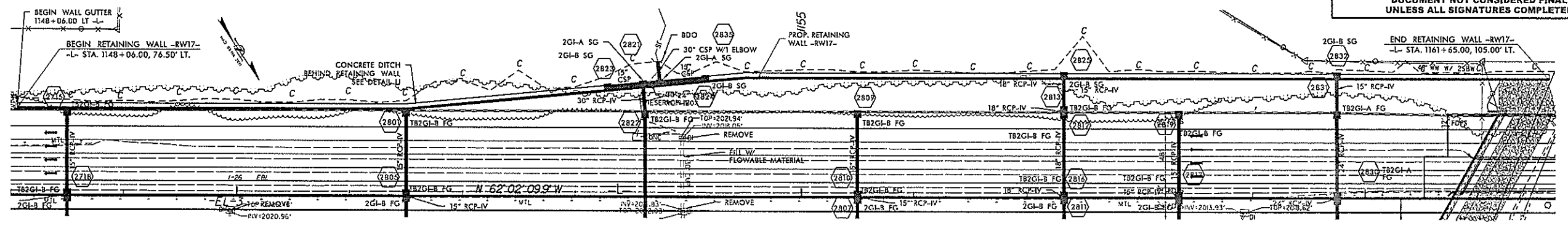
GEOTECHNICAL ENGINEER

ENGINEER

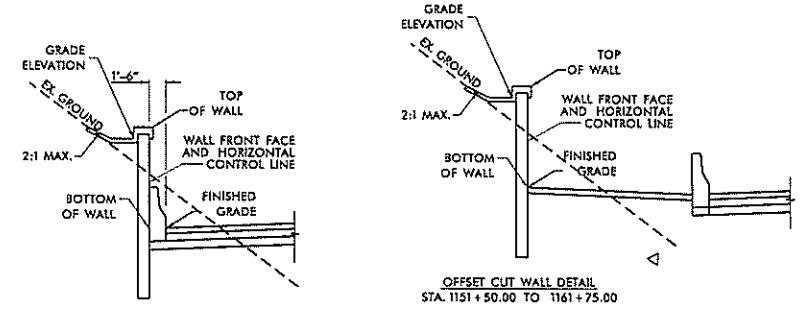
SEAL 028893

6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



RETAINING WALL -RW17-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.: 36030.1.1 (I-4700)

BUNCOMBE COUNTY

STATION: -L- 1148+06

SHEET 18 OF 29

RETAINING WALL NO. -RW17- MSE WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

PREPARED BY: MHS DATE: 3/1/19

REVIEWED BY: SCC DATE: 3/1/19

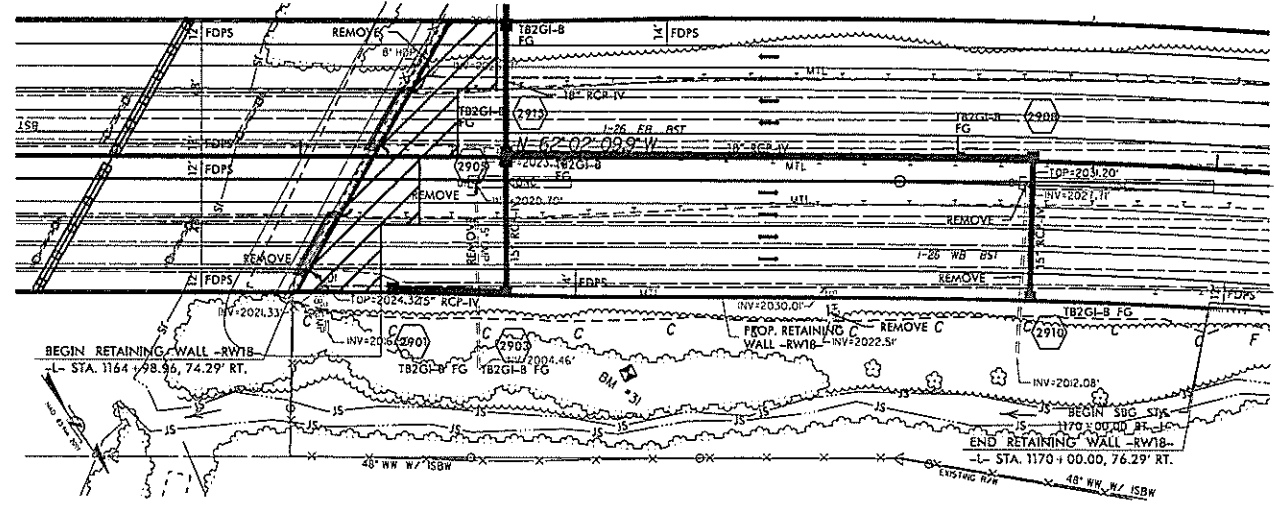
GEOTECHNICAL ENGINEER

ENGINEER

SEAL 028893

6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)

MSE RETAINING WALL NO. RW18	3,340 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	3,340 SF

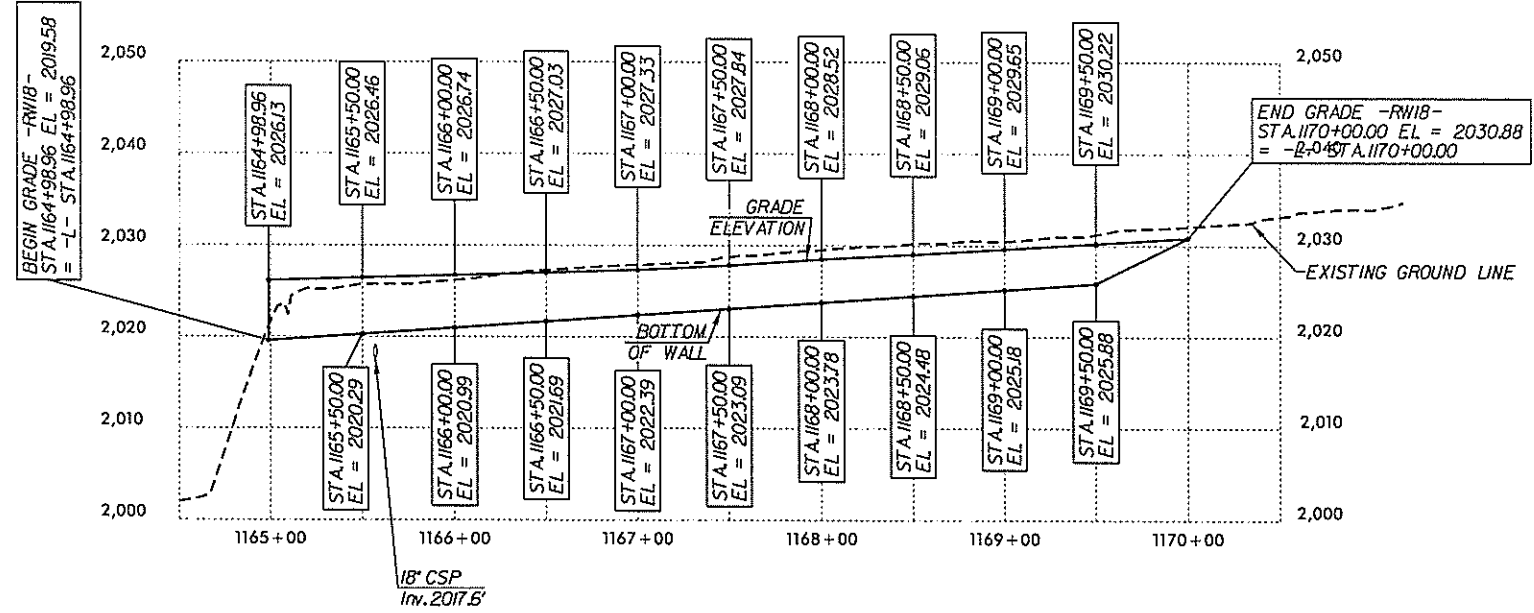
- DESIGN RETAINING WALL NO. RW18 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100-YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 2,100 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

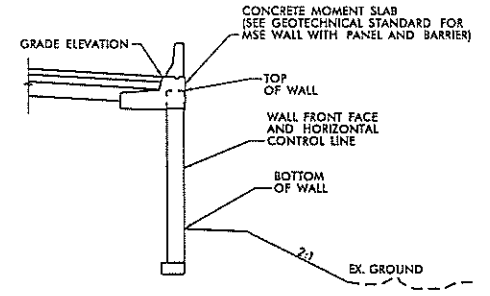
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	115	28	0
FOUNDATION	115	28	0



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



NOTE: BOTTOM OF WALL IS LOWER THAN NECESSARY FOR CONSTRUCTION ACCESS TO THE FRENCH BROAD RIVER.

RETAINING WALL -RW18-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1164+99
 SHEET 19 OF 29

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW18- MSE WALL

REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	
1	SCC	6/10/19	3		W-19
2			4		

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

ENGINEER

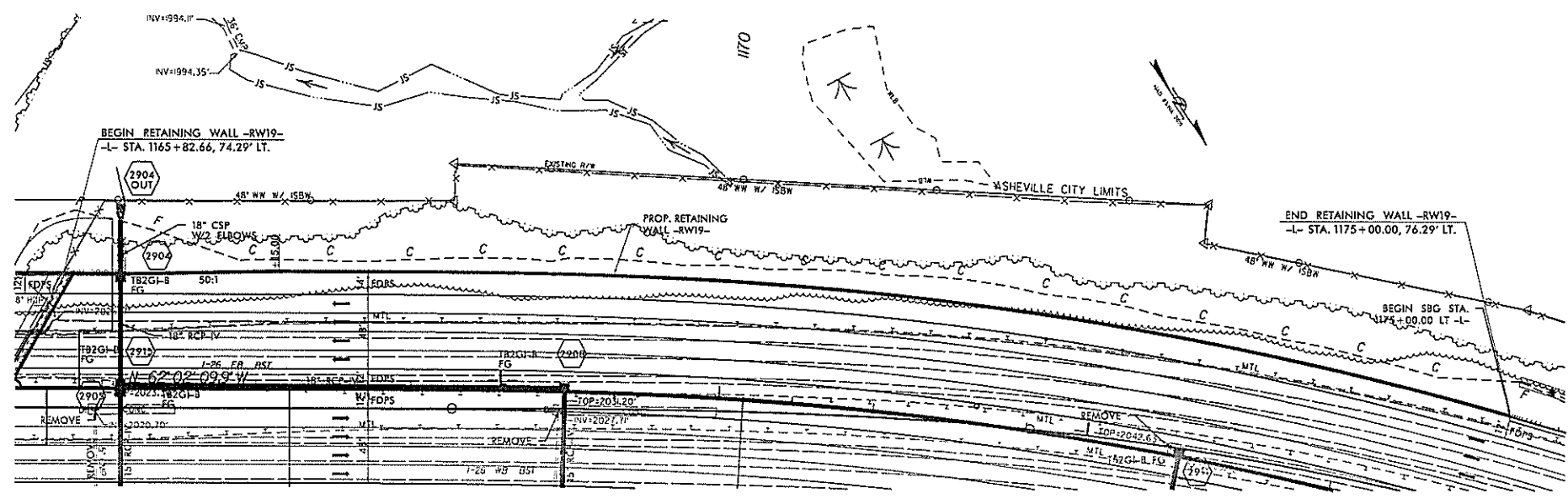
SEAL
028893
MICHAEL H. STEPHENS
ENGINEER

ENGINEER

DATE: 6/11/2019

SIGNATURE: _____

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES
(SQURE FEET)

MSE RETAINING WALL NO. RW19	17,670 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	17,670 SF

DESIGN RETAINING WALL NO. RW19 FOR THE FOLLOWING:

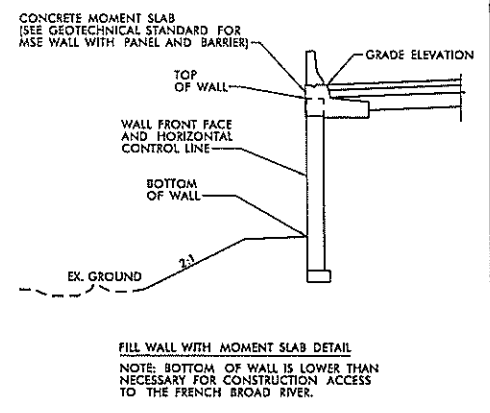
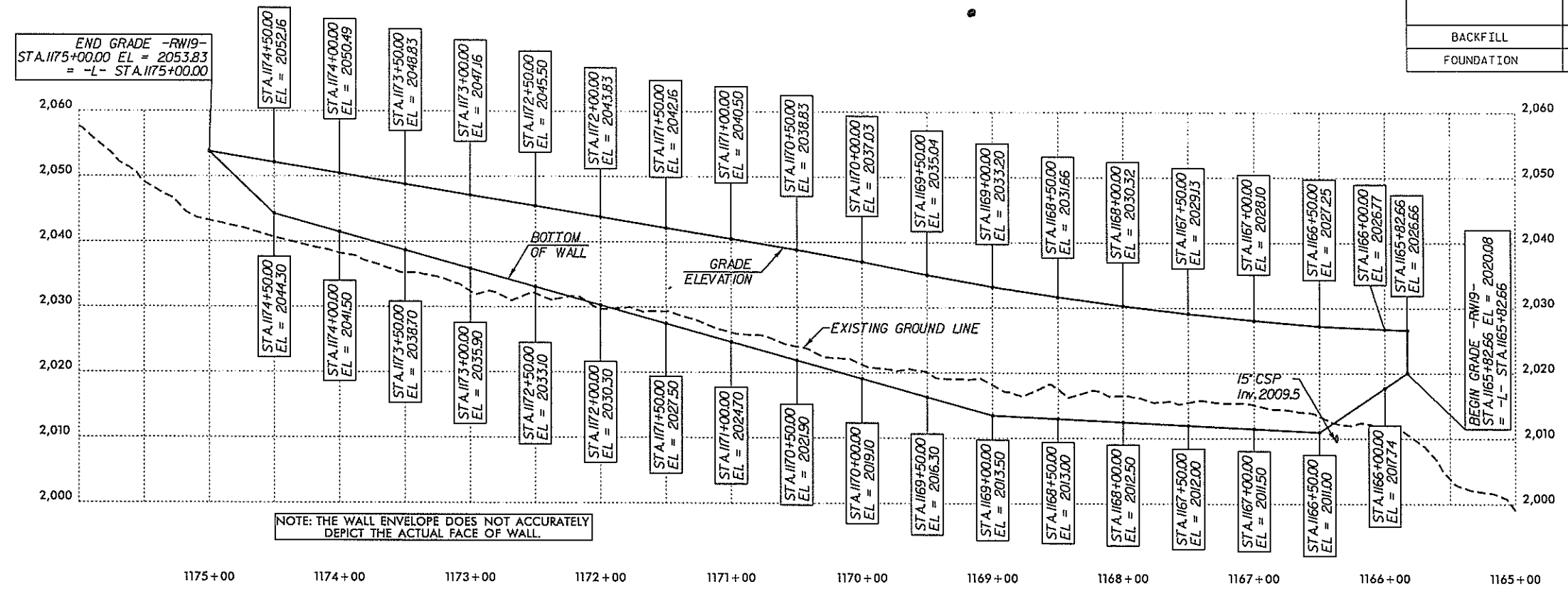
- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LTPF = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,700 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 5 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
- 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0



RETAINING WALL -RW19-

PROJECT NO.: 36030.1.1 (I-4700)

BUNCOMBE COUNTY

STATION: -L- 1165+82.7

SHEET 20 OF 29

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

PREPARED BY: MHS DATE: 3/1/19
REVIEWED BY: SCC DATE: 3/1/19

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	SCC	6/10/19	3			W-20
2			4			

ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO. RW20	13,880 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	13,880 SF

1

DESIGN RETAINING WALL NO. RW20 FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT - EMBEDMENT
 2) DESIGN LIFE = 100 YEARS
 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,100 LB/SF
 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 6 FT, WHICHEVER IS LONGER
 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
 6) REINFORCED ZONE AGGREGATE PARAMETERS:

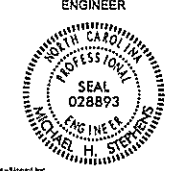
AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

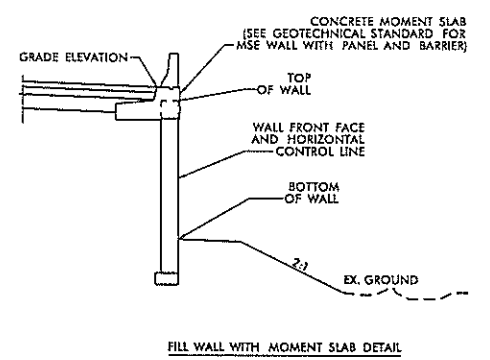
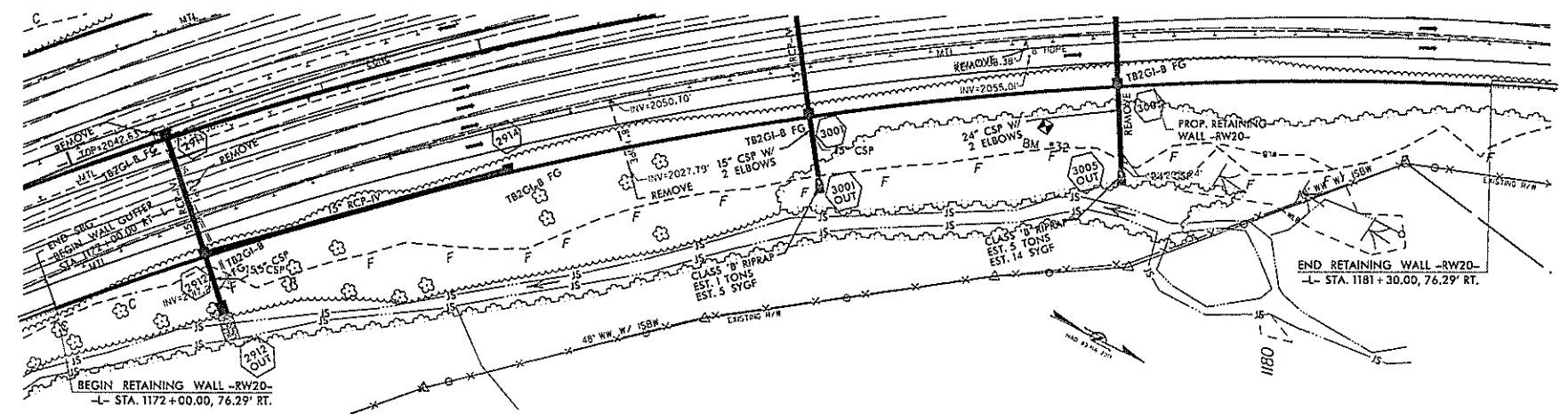
MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0

ENGINEER

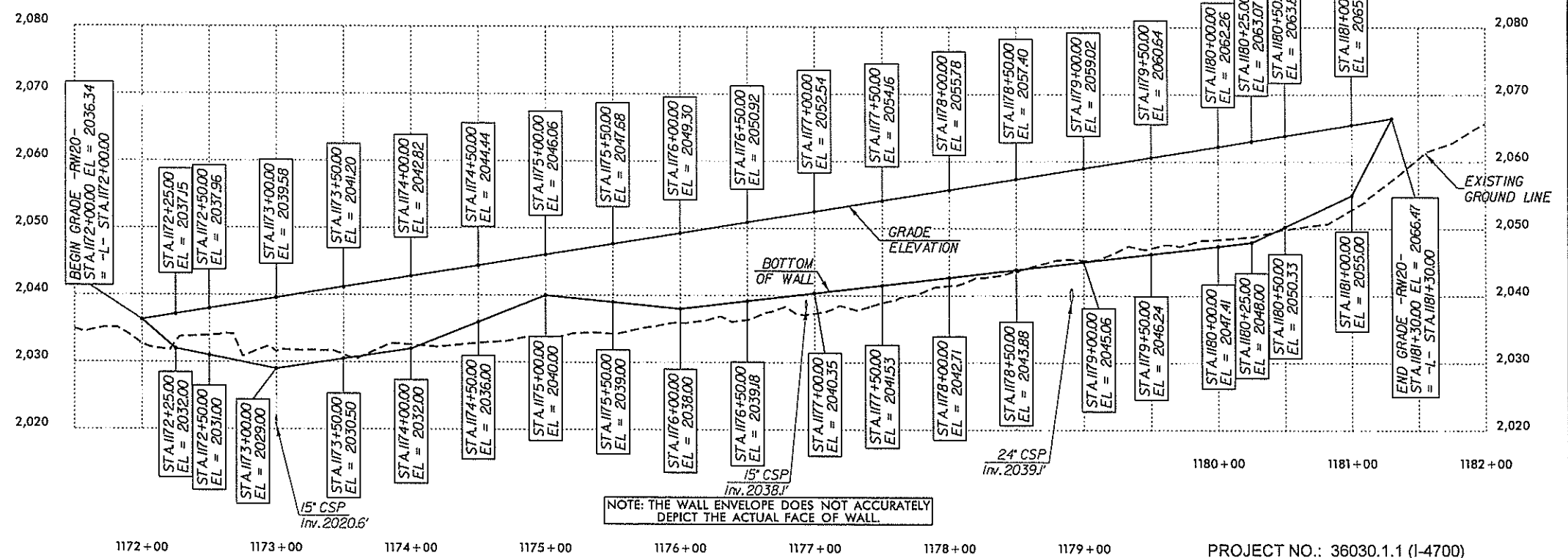


Michael H. Stephens
Professional Engineer
No. 028893
State of North Carolina

Designed by: *[Signature]* DATE: 6/11/2019
 SIGNATURE: _____ DATE: _____
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



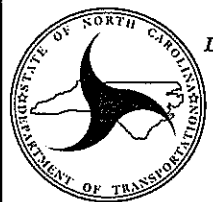
RETAINING WALL -RW20-



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1172+00
 SHEET 21 OF 29

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

RETAINING WALL NO. -RW20- MSE WALL

SHEET NO. W-21

ESTIMATED SOIL NAIL WALL QUANTITIES

RETAINING WALL NO.	SOIL NAIL RETAINING WALLS (SQUARE FEET)	SOIL NAIL VERIFICATION TESTS	SOIL NAIL PROOF TESTS
RW21	8,870	2	18
ARCHITECTURAL CONCRETE SURFACE TREATMENT		8,870 SF	

NOTES:
 1) A FENCE MAY BE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
 2) RETAINING WALL -RW21- HAS A SADDLE THAT REQUIRES A DRAINAGE STRUCTURE BE INSTALLED BEHIND THE RETAINING WALL. SEE ROADWAY AND HYDRO PLANS FOR STRUCTURE TYPE AND LOCATION.

IN-SITU ASSUMED MATERIAL PARAMETERS:

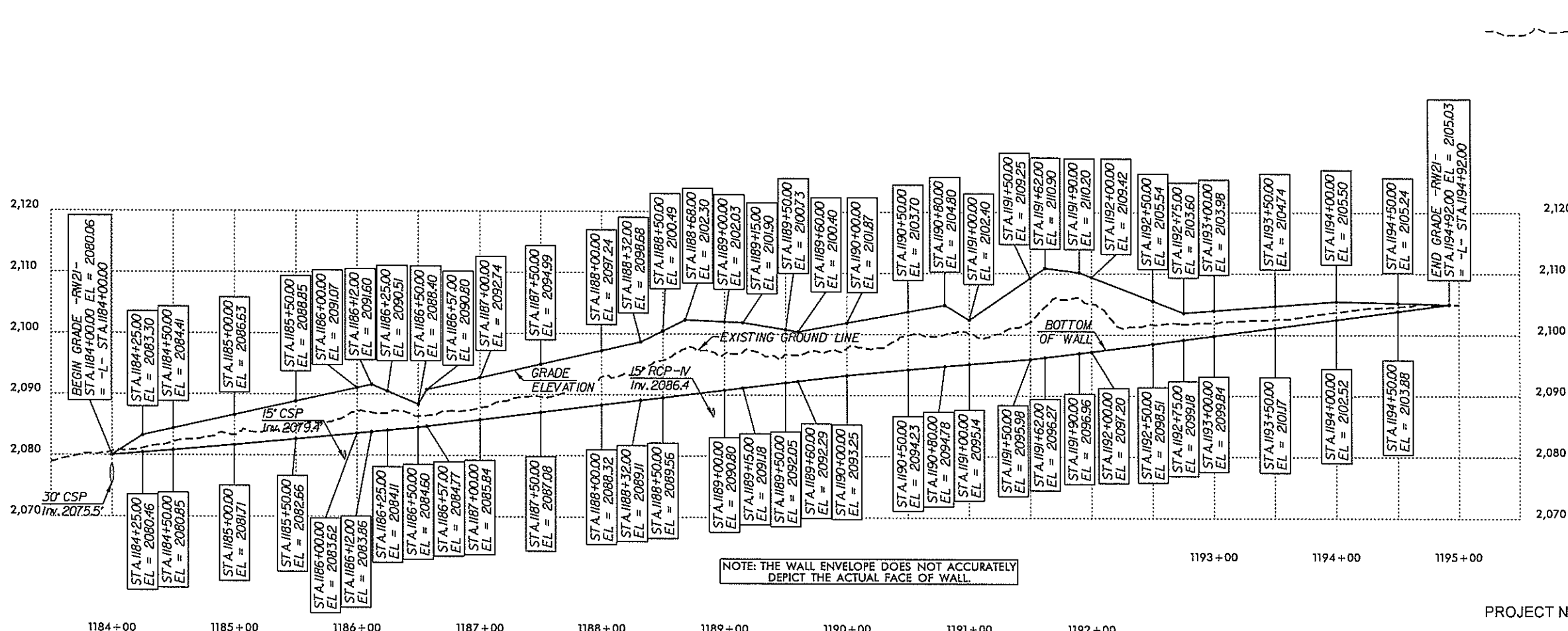
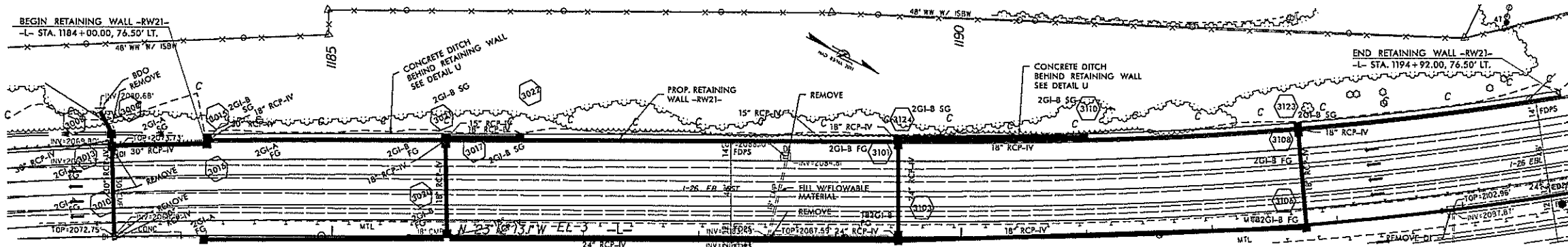
MATERIAL TYPE	UNIT WEIGHT, γ (LB/CF)	FRICTION ANGLE, ϕ DEGREES	COHESION, c (LB/SF)
RESIDUAL	120	30	0
WEATHERED ROCK	135	36	0
ROCK	165	45	1,000

GEOTECHNICAL ENGINEER ENGINEER



Shane C. Clark 7/8/2019

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NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1184+00
 SHEET 22 OF 29

RETAINING WALL -RW21-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. -RW21-
 SOIL NAIL WALL

PREPARED BY: MHS DATE: 3/1/19
 REVIEWED BY: SCC DATE: 3/1/19

REVISIONS				
NO.	BY	DATE	NO.	BY
1	SCC	5/10/19	3	
2			4	

SHEET NO. W-22

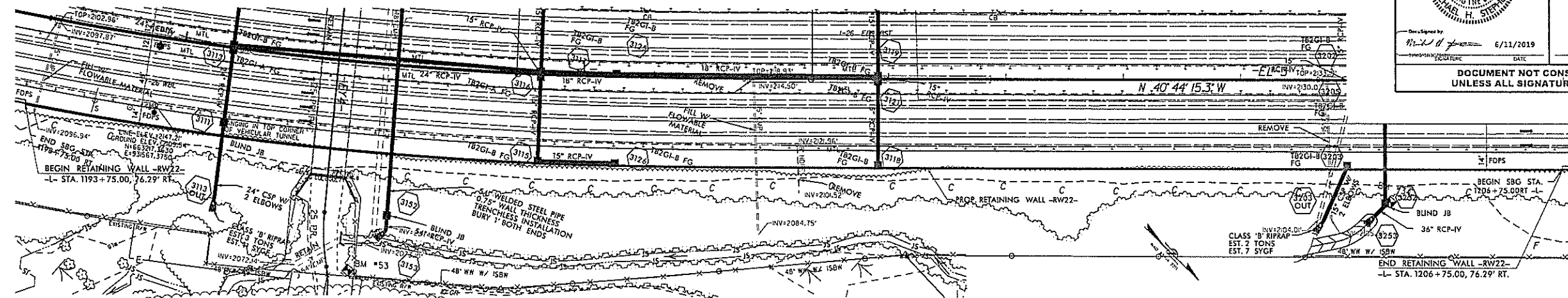
GEO TECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

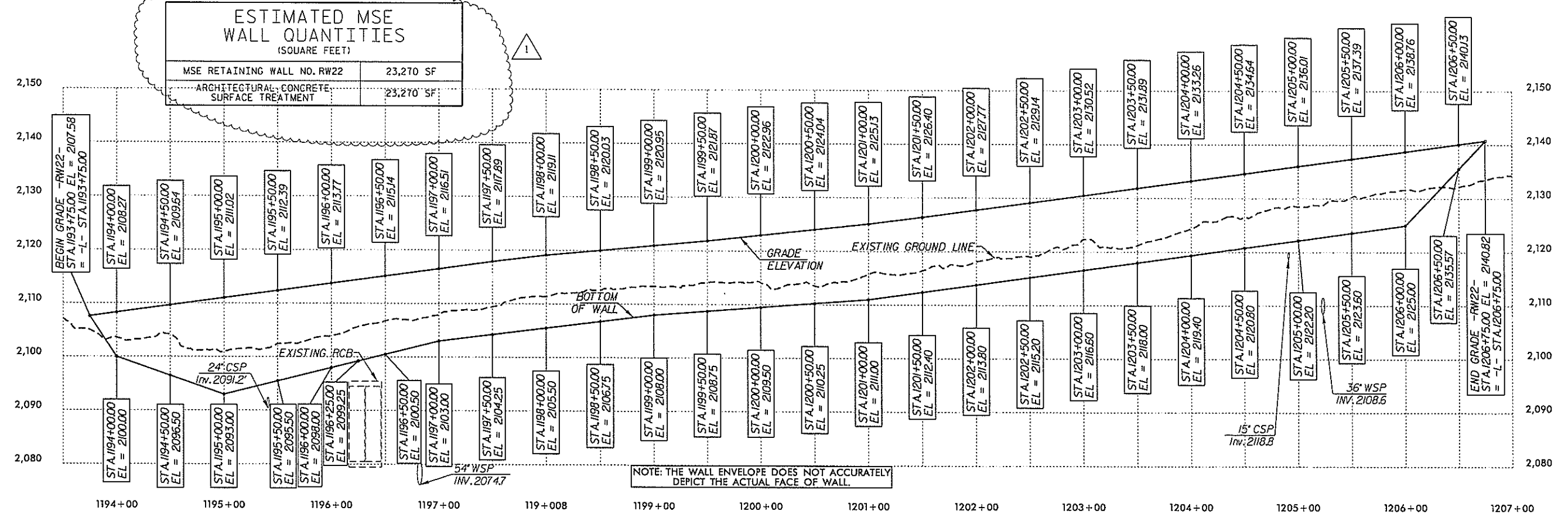
Designed by: *M.H.S.* DATE: 6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

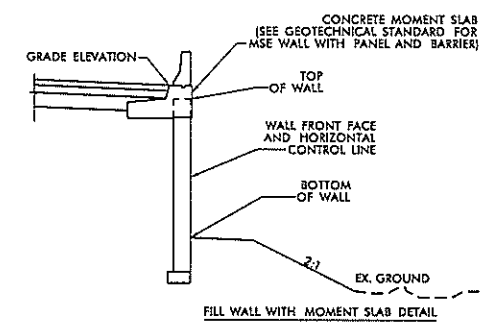


ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. RW22	23,270 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	23,270 SF



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



- DESIGN RETAINING WALL NO. RW22 FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 5,200 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	115	28	0

PROJECT NO.: 36030.1.1 (I-4700)

BUNCOMBE COUNTY

STATION: -L- 1193+75

SHEET 23 OF 29

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEO TECHNICAL ENGINEERING UNIT

**RETAINING WALL NO. -RW22-
MSE WALL**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	SCC	6/10/19	3			W-23
2			4			

PREPARED BY: MHS DATE: 3/1/19

REVIEWED BY: SCC DATE: 3/1/19

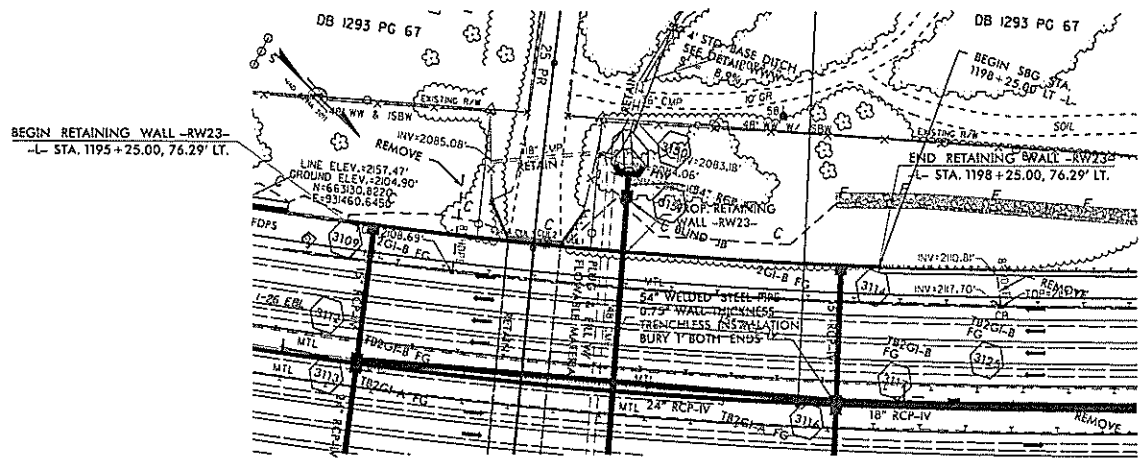
RETAINING WALL -RW22-

GEOTECHNICAL ENGINEER

ENGINEER

Designated by: M.H.S. DATE: 6/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ESTIMATED MSE WALL QUANTITIES
(SQ. FEET)

MSE RETAINING WALL NO. RW23	3,060 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	3,060 SF

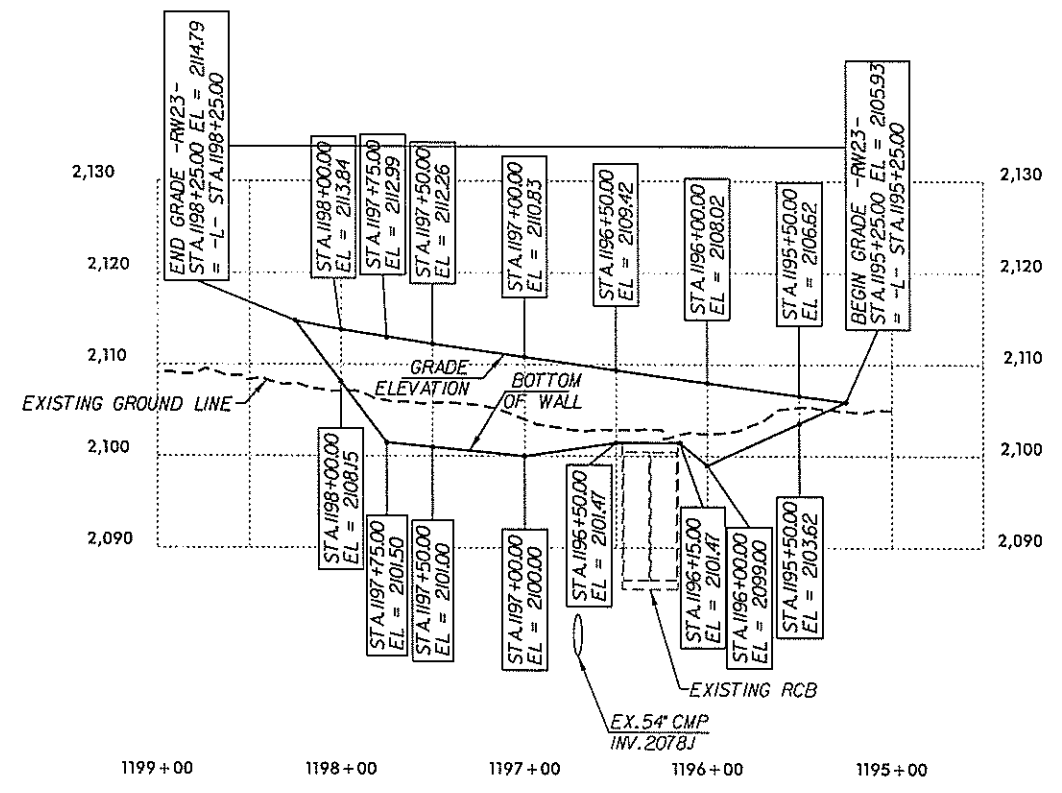
- DESIGN RETAINING WALL NO. FOR THE FOLLOWING:
- 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,700 LB/SF
 - 4) MINIMUM REINFORCEMENT LENGTH (L) = 1.5 H OR 6 FT, WHICHEVER IS LONGER
 - 5) MINIMUM EMBEDMENT DEPTH = H/5 OR 2 FT, WHICHEVER IS DEEPER
 - 6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	115	34	0

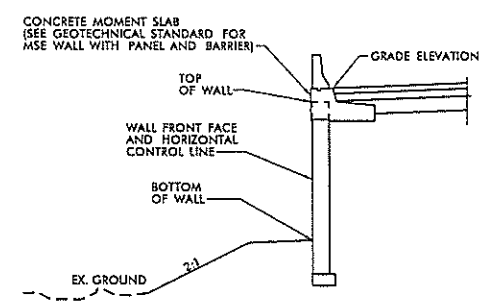
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0



NOTE: THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF WALL.



FILL WALL WITH MOMENT SLAB DETAIL

RETAINING WALL -RW23-

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: -L- 1195+25
 SHEET 24 OF 29

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS


GEOTECHNICAL ENGINEERING UNIT

**RETAINING WALL NO. -RW23-
MSE WALL**

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-24

PREPARED BY: MHS	DATE: 3/1/19
REVIEWED BY: SCC	DATE: 3/1/19

GEOTECHNICAL ENGINEER  SEAL 028893 MICHAEL H. STEFFEN ENGINEER Date signed by: <i>Michael H. Steffen</i> 6/11/2019 Signature: _____ DATE: _____ Signature: _____ DATE: _____	ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION (PAY ITEMS UPDATED WITH 2018 EDITION).

THE FOLLOWING NOTES ARE FOR RETAINING WALL NOS. RW3, RW4, RW5, RW6, RW14, RW18, RW19, RW20, RW22, AND RW23, UNLESS OTHERWISE INDICATED.

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

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

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NOS. RW3, RW18, RW19, RW20, RW22, AND RW23. SEE STRUCTURE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS AND QUANTITIES.

A FENCE OR HANDRAIL IS REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF THE RETAINING WALLS.

~~CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR THE RETAINING WALLS.~~

A SIMULATED STONE FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR THE RETAINING WALLS. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT FINISH SPECIAL PROVISION.

~~A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS CONSTRUCTED WITH COARSE AGGREGATE.~~

A DRAIN IS REQUIRED FOR THE RETAINING WALLS.

BEFORE BEGINNING MSE WALL DESIGN FOR THE RETAINING WALLS, 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 THE RETAINING WALLS FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

AS REQUIRED, DESIGN RETAINING WALLS FOR A PIPE EXTENDING THROUGH THE WALL AS SHOWN. VERIFY PIPE LOCATION AND ELEVATION BEFORE BEGINNING MSE WALL DESIGN OR CONSTRUCTION. SEE HYDRO PLANS FOR ADDITIONAL INFORMATION.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_d) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NOS. 1 LOCATED AT STATION 912+55.14 -EBL- AND 2 LOCATED AT STATION 913+23.64 -EBL- AND WEST BOUND END BENT NOS. 1 LOCATED AT STATION 913+0.37 -WBL- AND 2 LOCATED AT STATION 913+68.75 -WBL-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR SIGNS, LIGHTING AND SIGNALS MAY BE LOCATED BEHIND THE RETAINING WALLS AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR THE RETAINING WALLS.

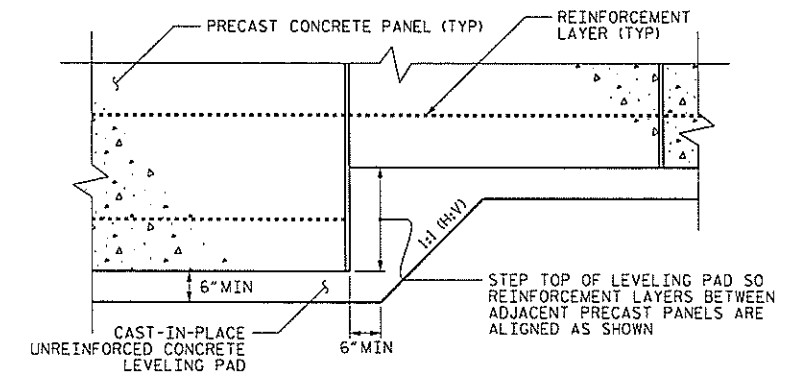
FOUNDATIONS FOR END BENT NOS. 1 LOCATED AT STATION 912+55.14 -EBL- AND 2 LOCATED AT STATION 913+23.64 -EBL- AND WEST BOUND END BENT NOS. 1 LOCATED AT STATION 913+0.37 -WBL- AND 2 LOCATED AT STATION 913+68.75 -WBL- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NOS RW4 AND RW5. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

INSTALL PILE SLEEVES FOR END BENT NOS. 1 LOCATED AT STATION 912+55.14 -EBL- AND 2 LOCATED AT STATION 913+23.64 -EBL- AND WEST BOUND END BENT NOS. 1 LOCATED AT STATION 913+0.37 -WBL- AND 2 LOCATED AT STATION 913+68.75 -WBL- WHILE CONSTRUCTING RETAINING WALL NOS RW4 AND RW5. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR THE RETAINING WALLS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.


"TEMPORARY SHORING" MAY BE REQUIRED FOR SOME OF THE RETAINING WALLS IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY, STRUCTURE AND TRAFFIC CONTROL PLANS. TEMPORARY THAT IS REQUIRED FOR THE CONSTRUCTION OF THE MSE WALLS WILL BE INSIDENTAIL TO THE RETAINING WALLS.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT THE RETAINING WALLS. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 36030.1.1 (I-4700)
 BUNCOMBE COUNTY
 STATION: VARIES
 SHEET 28 OF 29



 NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

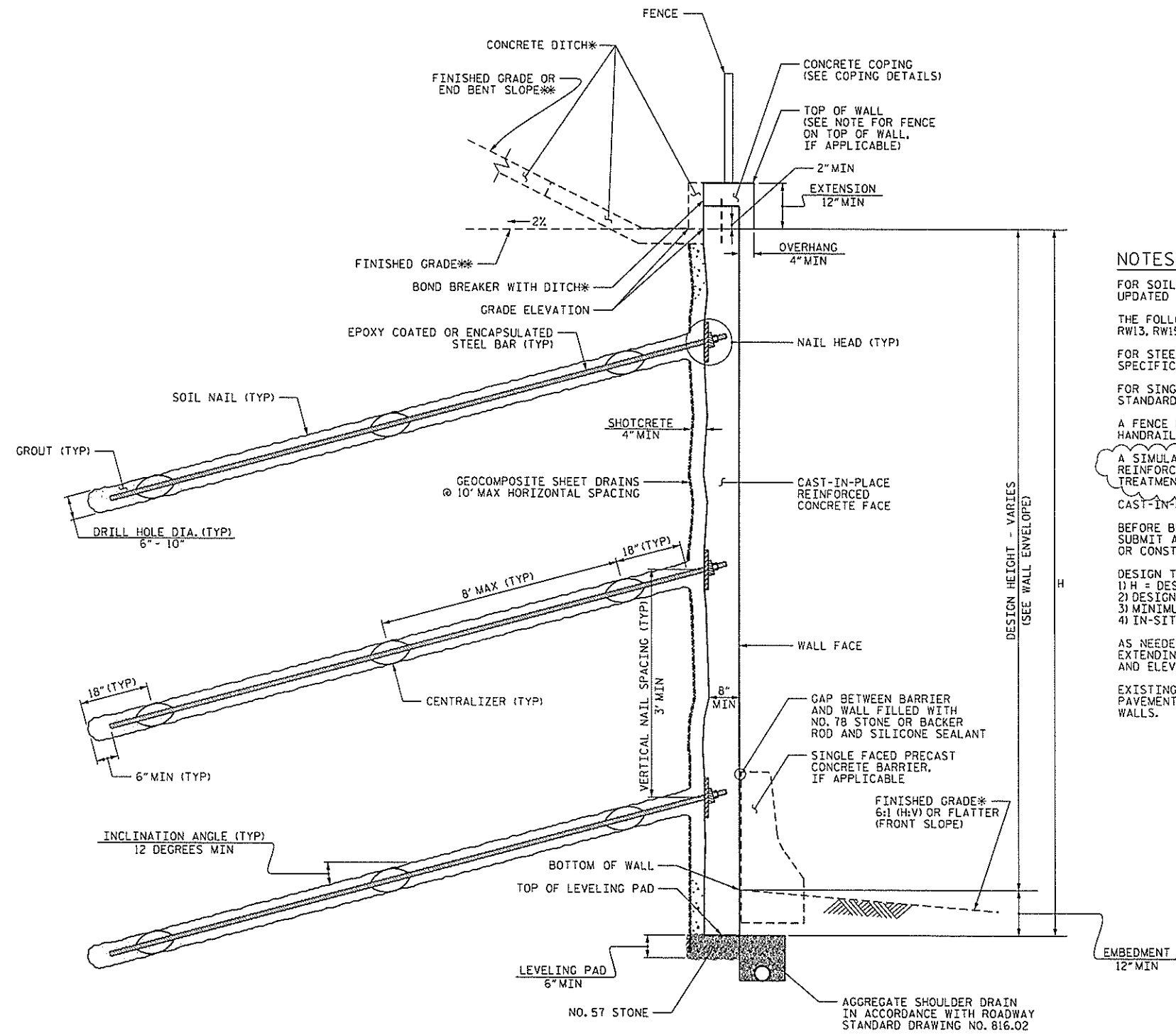
**GEOTECHNICAL
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REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		

SHEET NO. W-28

PREPARED BY: MHS	DATE: 3/1/19
REVIEWED BY: SCC	DATE: 3/1/19

GEOTECHNICAL ENGINEER  Michael H. Steinhilber DATE: 6/11/2019 SIGNATURE: _____ DATE: _____	ENGINEER SIGNATURE: _____ DATE: _____
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NOTES:

- FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION (PAY ITEMS UPDATED WITH 2018 EDITION).
- THE FOLLOWING NOTES ARE FOR RETAINING WALL NOS. RW0, RW7, RW8, RW9, RW10, RW11, RW12, RW13, RW15, RW16, RW17, AND R21 UNLESS OTHERWISE INDICATED.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
- A FENCE MAYBE REQUIRED ON TOP OF THE RETAINING WALLS. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
- A SIMULATED STONE FORM LINER ARCHITECTURAL FINISH IS REQUIRED FOR THE CAST-IN-PLACE REINFORCED CONCRETE FACE FOR THE RETAINING WALLS. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.
- CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR THE RETAINING WALLS.
- BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR THE RETAINING WALLS, 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 THE RETAINING WALLS FOR THE FOLLOWING:
 - 1) H = DESIGN HEIGHT + EMBEDMENT
 - 2) DESIGN LIFE = 100 YEARS
 - 3) MINIMUM EMBEDMENT DEPTH = 1 FT
 - 4) IN-SITU ASSUMED MATERIAL PARAMETERS, SEE PLAN SHEETS
- AS NEEDED, DESIGN RETAINING WALLS NO. RW8, RW17 AND RW21 FOR A PIPE AND DRAINAGE BOX EXTENDING BEHIND AND THROUGH THE WALL AS SHOWN. VERIFY PIPE AND DRAINAGE BOX LOCATIONS 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 MAY INTERFERE WITH SOIL NAILS FOR THE RETAINING WALLS.

SOIL NAIL WALL - TYPICAL SECTION

*SEE CONCRETE DITCH BEHIND WALL DETAILS.
*SEE PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.

PROJECT NO.: 36030.1.1 (I-4700)
BUNCOMBE COUNTY
STATION: VARIES
SHEET 29 OF 29

PREPARED BY: MHS	DATE: 3/1/19
REVIEWED BY: SCC	DATE: 3/1/19

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

SOIL NAIL WALL DETAIL					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	6/10/19	3		
2			4		