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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

DocuSigned by: Michael Valiquette EAF206B34A5A4DE... 8/17/2021

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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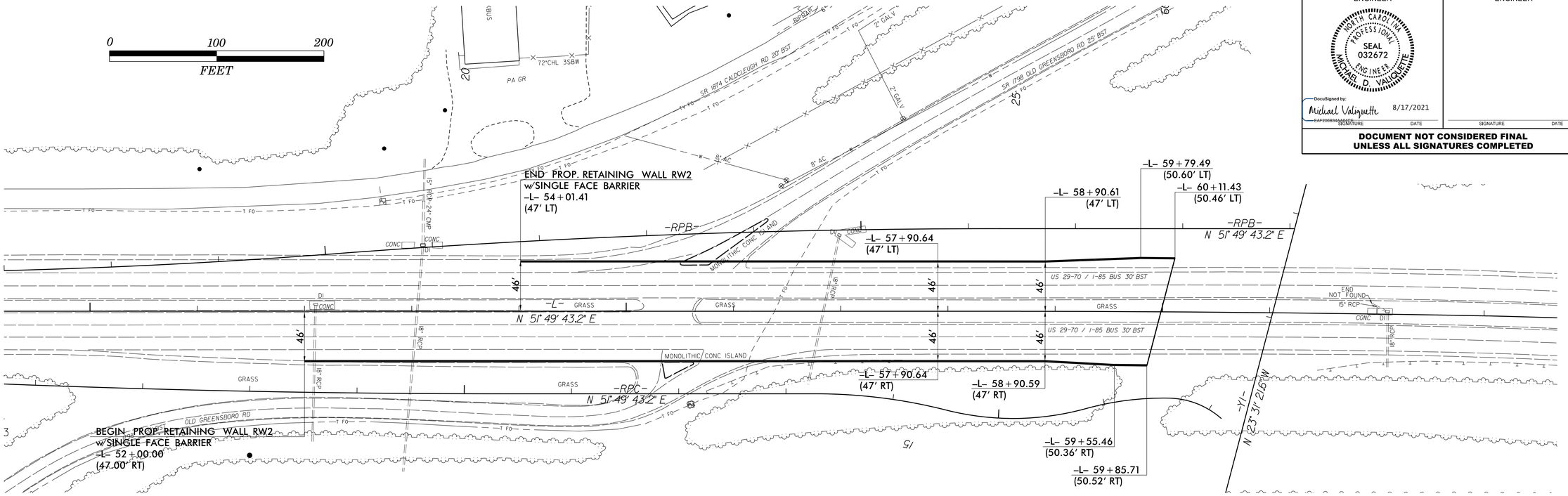
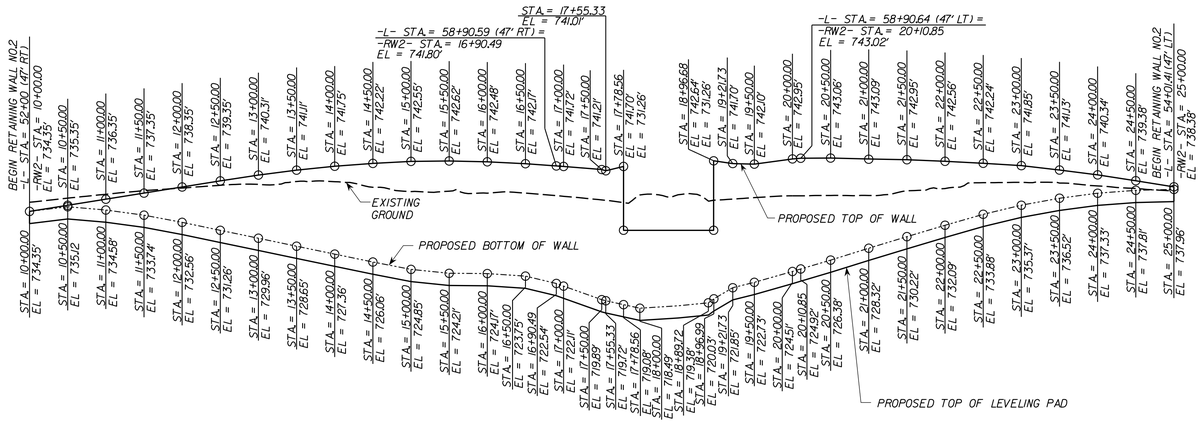


RETAINING WALL RW2 PLAN



ESTIMATED MSE WALL QUANTITY
(SQUARE FEET)

MSE RETAINING WALL NO. 2	20,319 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	20,319 SF

RETAINING WALL NO. 2 ENVELOPE

VE 2:1

0 50 100
FEET

ICE of CAROLINAS, PLLC

PREPARED BY: SGT | DATE: 07/19

REVIEWED BY: MDV | DATE: 07/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 52+00,47' RT TO 54+01,47' LT

SHEET 1 OF 5

RETAINING WALL NO. 2 DETAILS US 29/US 70/BUSINESS 85 AT SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1	MRS	12/19	3	MRS	4/21	
2	MRS	1/20	4	MRS	8/21	

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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NOTES:

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

FOR TYPE III REINFORCED BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY DETAIL DRAWING NO. 422D10.

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 NO. 2. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 2.

AN ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 2. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COLOR APPLICATION ARTIST AS NEEDED FOR THE PROJECT. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 2.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 2.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. 1 LOCATED AT STATION 59+91.64 -L-.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 2, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. RW2 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 7000 PSF
4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER
5) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
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) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	30	0

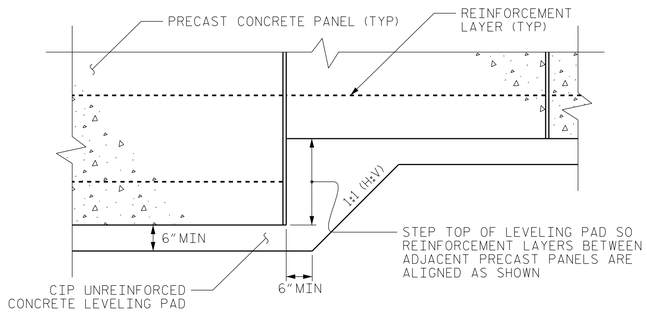
DESIGN RETAINING WALL NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR SIGNS, LIGHTING or SIGNALS MAY BE LOCATED BEHIND RETAINING WALL NO. 2 AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 59+91.64 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

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

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 52+00,47' RT TO 54+01,47' LT

SHEET 2 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 2 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MRS	4/21	3		
2			4		

SHEET NO. W-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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ENGINEER

SIGNATURE DATE

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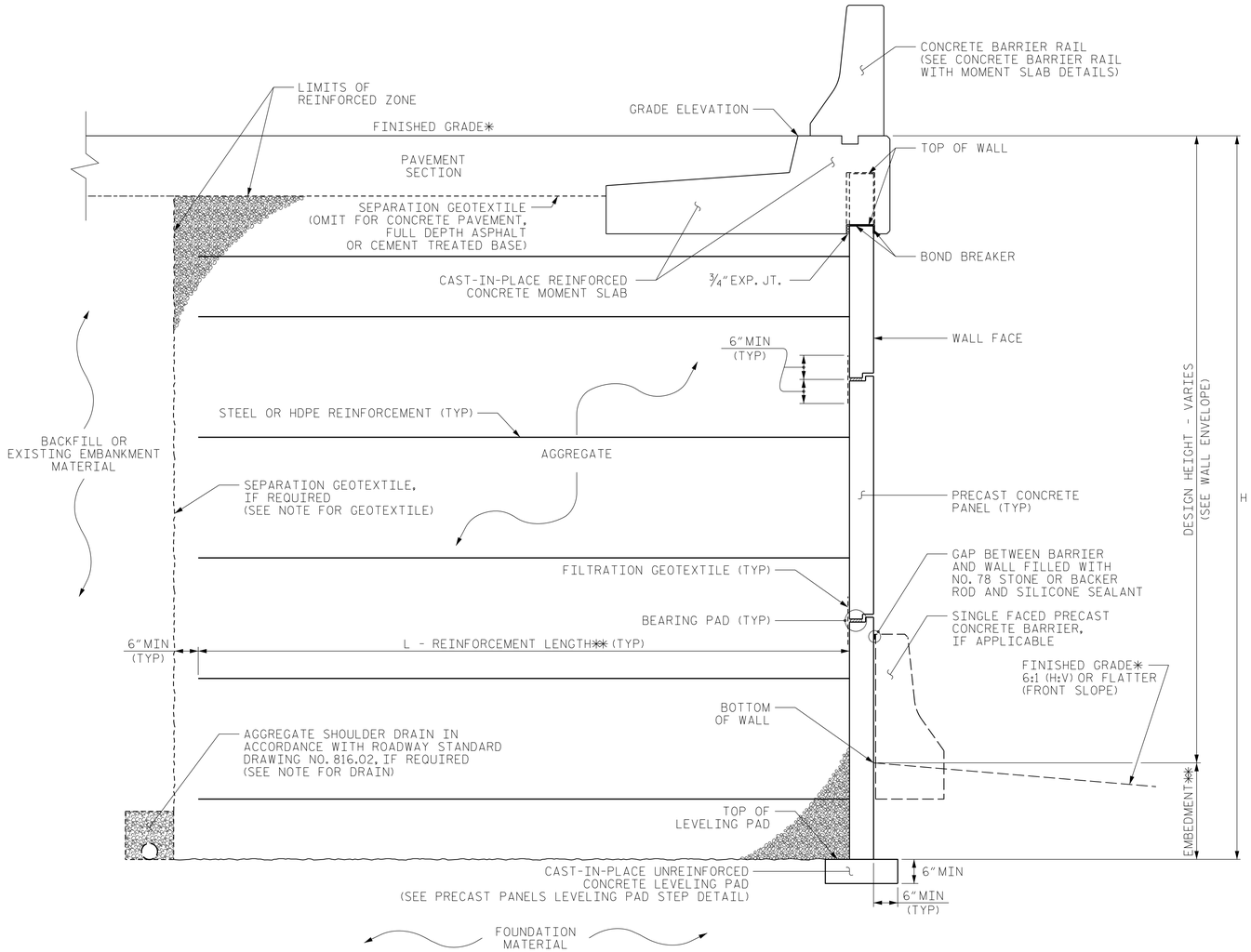

MSE WALL WITH PRECAST PANELS - TYPICAL SECTION -RW2- 10+00 TO 17+78.56 AND -RW2- 18+96.68 TO 25+00

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 52+00,47' RT TO 54+01,47' LT

SHEET 3 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 2 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MRS	4/21	3			W-3
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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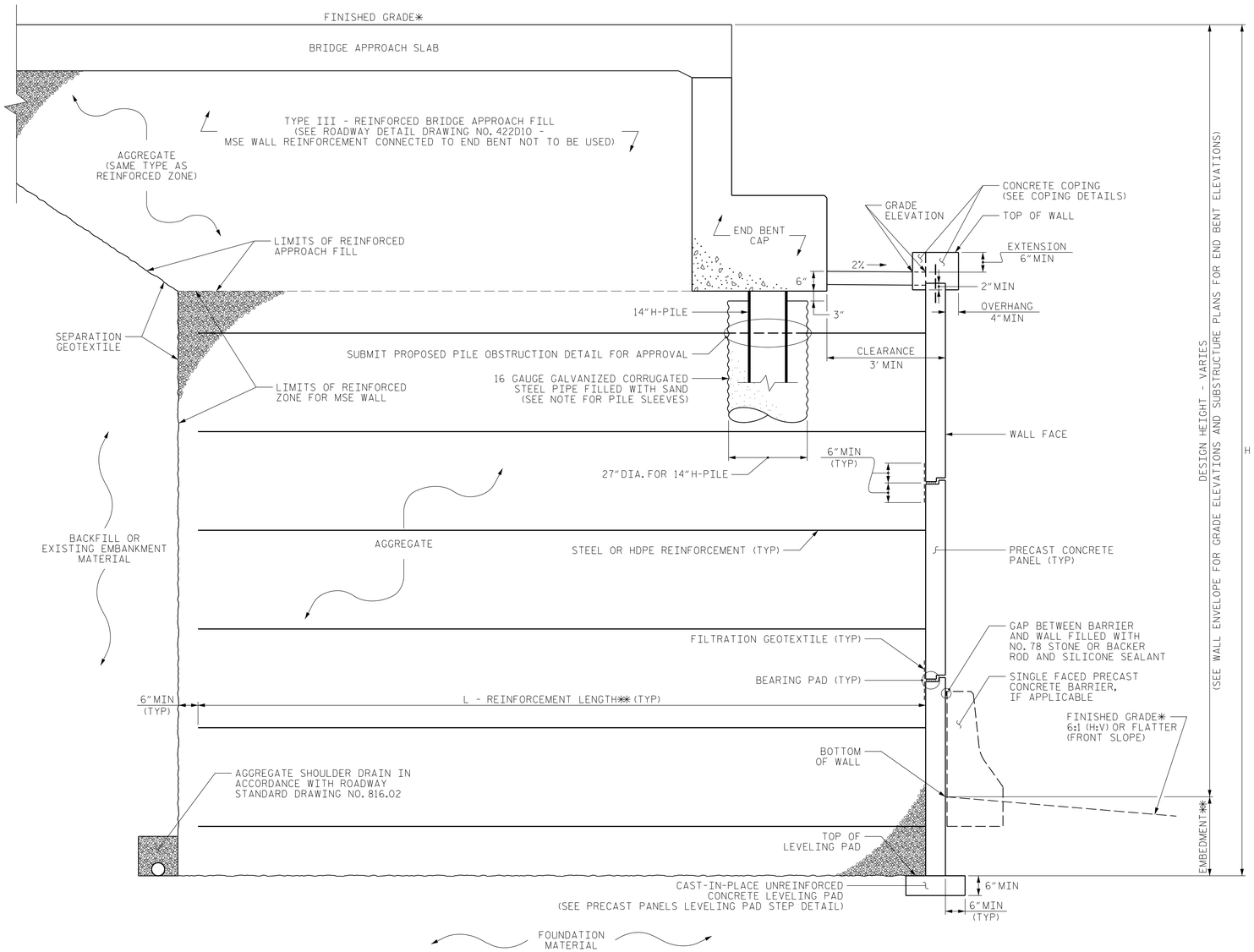
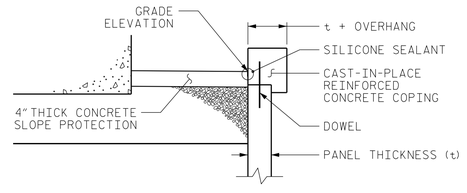
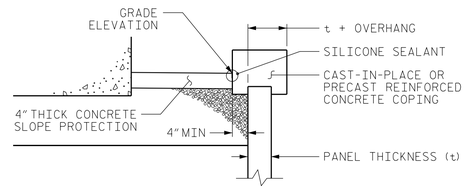


MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION -RW2- 17+78.56 TO 18+96.68

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE,
MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.





COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 52+00,47' RT TO 54+01,47' LT

SHEET 4 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

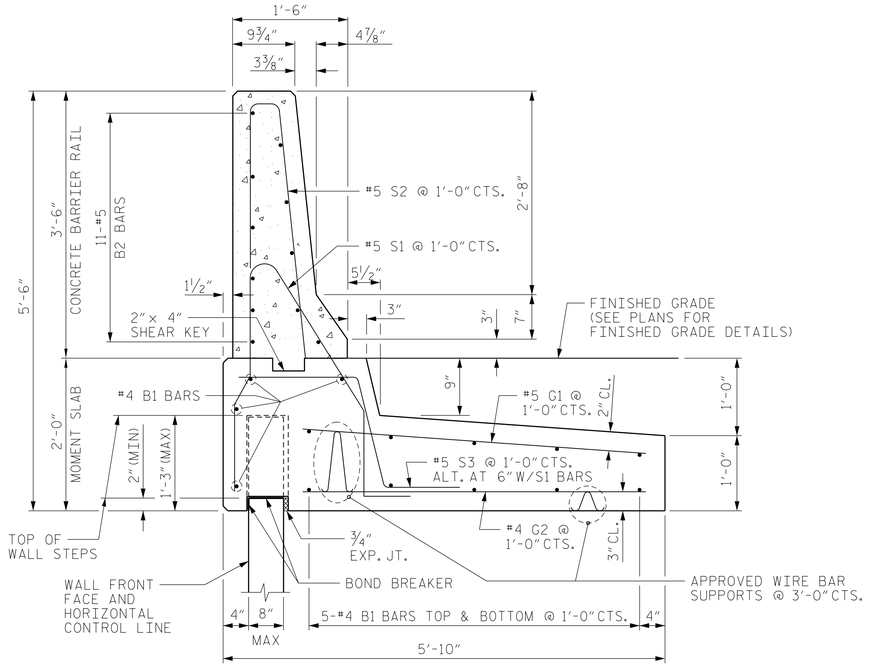
ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

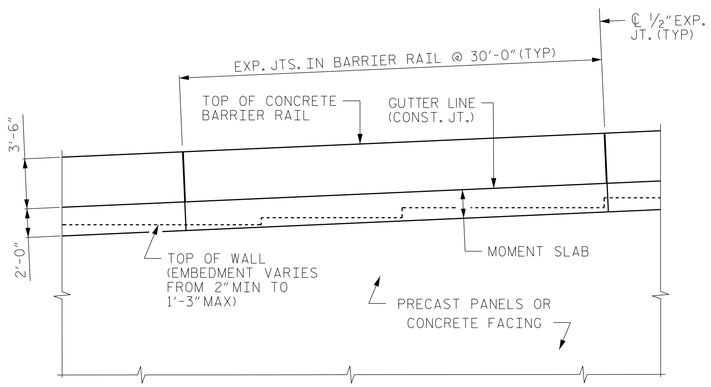
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 2 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MRS	4/21	3			W-4
2			4			



CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE SECTION 460 OF THE STANDARD SPECIFICATIONS.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

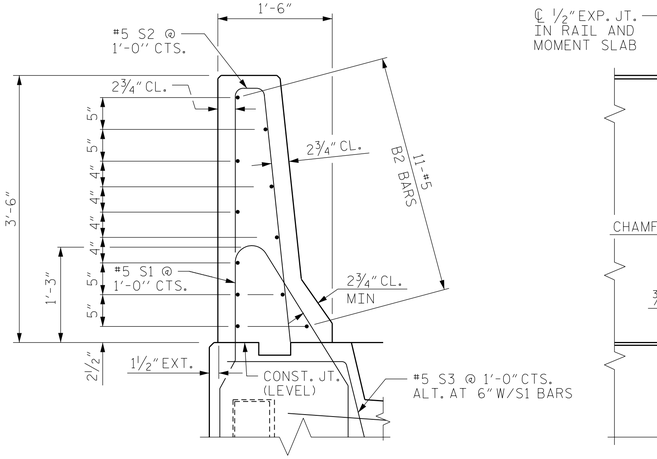
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

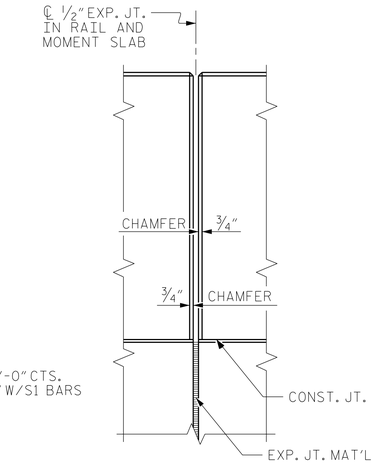
ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

CONCRETE BARRIER RAIL WITH MOMENT SLAB
PAY LENGTH = 1,395 LIN FT



SECTION THRU RAIL



ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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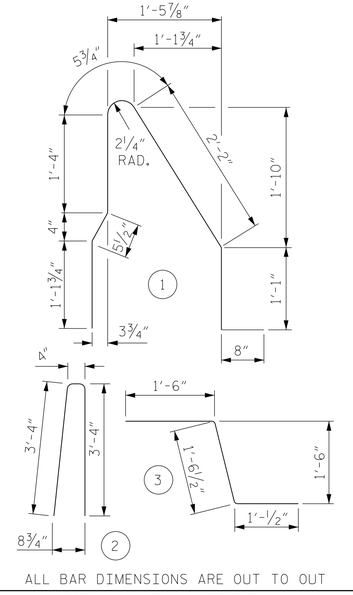
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE 30'-0" SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#4	STR	29'-7"	277
✳ B2	11	#5	STR	29'-7"	339
G1	31	#5	STR	4'-4"	140
G2	31	#4	STR	4'-4"	90
✳ S1	31	#5	1	7'-4"	237
✳ S2	31	#5	2	7'-0"	226
S3	30	#5	3	4'-1"	128
REINFORCING STEEL					635 LB
✳ EPOXY COATED REINFORCING STEEL					802 LB
CLASS AA CONCRETE BARRIER RAIL					4.1 CY
CLASS A CONCRETE MOMENT SLAB					9.1 CY
CONCRETE BARRIER RAIL WITH MOMENT SLAB					30 LIN FT

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 52+00,47' RT TO 54+01,47' LT

SHEET 5 OF 5

PREPARED BY: MRS	DATE: 05/21
REVIEWED BY: MDV	DATE: 05/21

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

CONCRETE BARRIER RAIL WITH MOMENT SLAB FOR PRECAST PANELS AND CONCRETE FACING

REVISIONS

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

SHEET NO. W-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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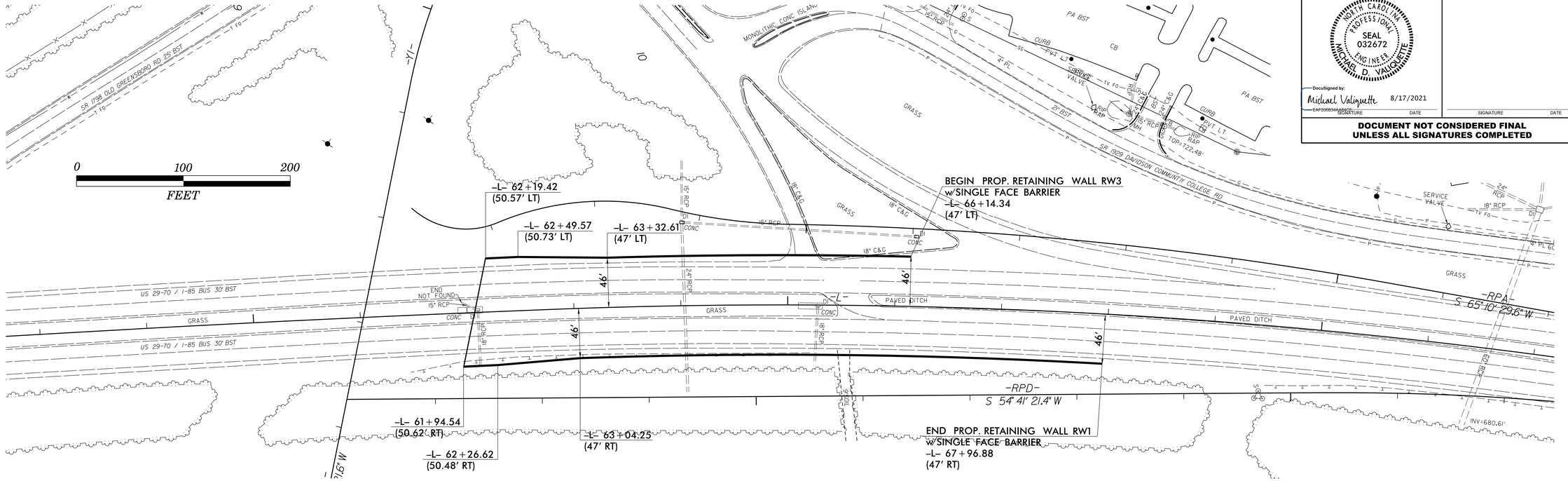
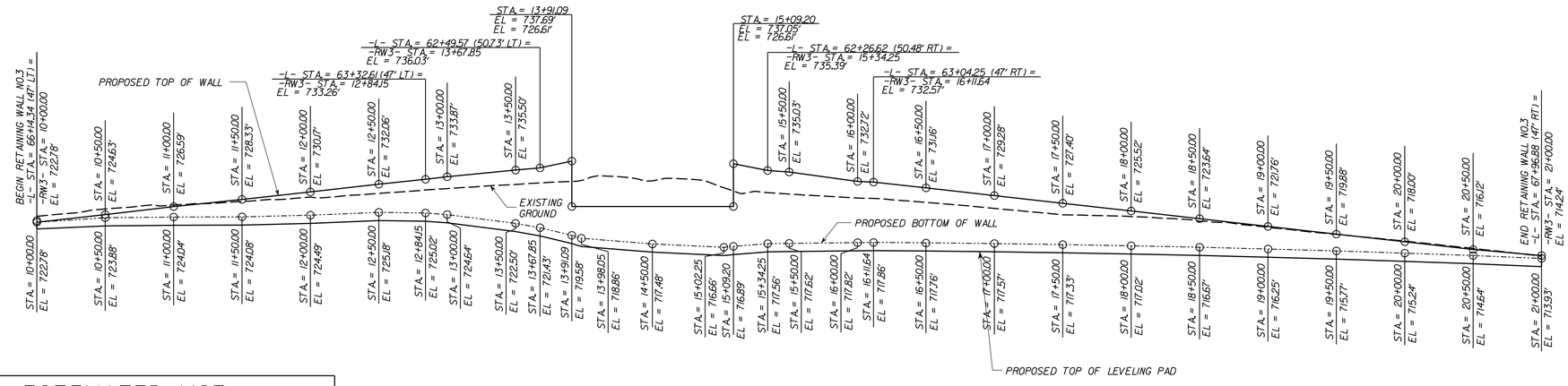


RETAINING WALL NO. 3 PLAN



RETAINING WALL NO. 3 ENVELOPE

VE 3:1

ESTIMATED MSE WALL QUANTITY (SQUARE FEET)	
MSE RETAINING WALL NO. 3	10,842 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	10,842 SF

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 66+14,47' LT TO 67+97,47' RT

SHEET 1 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 DETAILS US 29/US 70/BUSINESS 85 AT SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	MRS	12/19	3	MRS	4/21	W-6
2	MRS	1/20	4	MRS	8/21	

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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NOTES:

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

FOR TYPE III REINFORCED BRIDGE APPROACH FILL, SEE BRIDGE APPROACH FILLS PROVISION AND ROADWAY DETAIL DRAWING NO. 422D10.

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 NO. 3. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO. 3.

AN ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 3. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COLOR APPLICATION ARTIST AS NEEDED FOR THE PROJECT. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO. 3.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 3.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO. 2 LOCATED AT STATION 62+13.96 -L-.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 3, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 3 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 6000 PSF
4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER
5) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
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) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	30	0

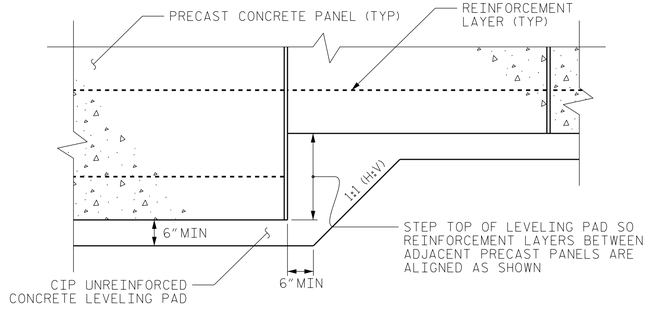
DESIGN RETAINING WALL NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR SIGNS, LIGHTING or SIGNALS MAY BE LOCATED BEHIND RETAINING WALL NO. RW3 AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 62+13.96-L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. RW3. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. RW3 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. RW3. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.



PRECAST PANELS
LEVELING PAD STEP DETAIL

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 66+14,47' LT TO 67+97,47' RT

SHEET 2 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

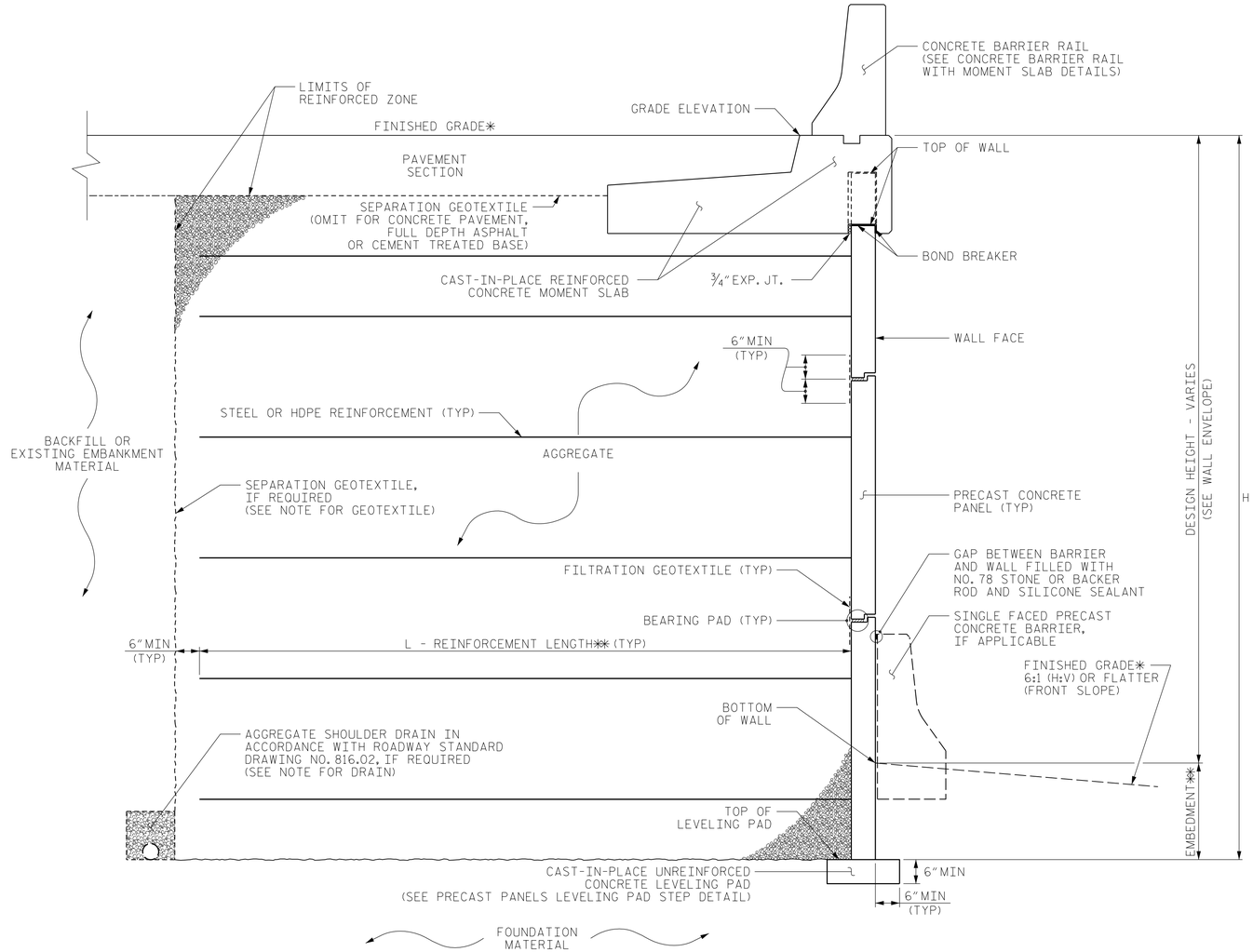
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MRS	11/19	3		
2	MRS	4/21	4		

SHEET NO. W-7



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION
-RW3- 10+00 TO 13+91.09 AND -RW3- 15+09.20 TO 21+00

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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EAF206B34A8A4CE...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 66+14,47' LT TO 67+97,47' RT

SHEET 3 OF 5

PREPARED BY: SGT	DATE: 07/19
REVIEWED BY: MDV	DATE: 07/19

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MRS	11/19	3		
2	MRS	4/21	4		

SHEET NO. W-8

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

DocuSigned by: Michael Valiquette 8/17/2021
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ENGINEER

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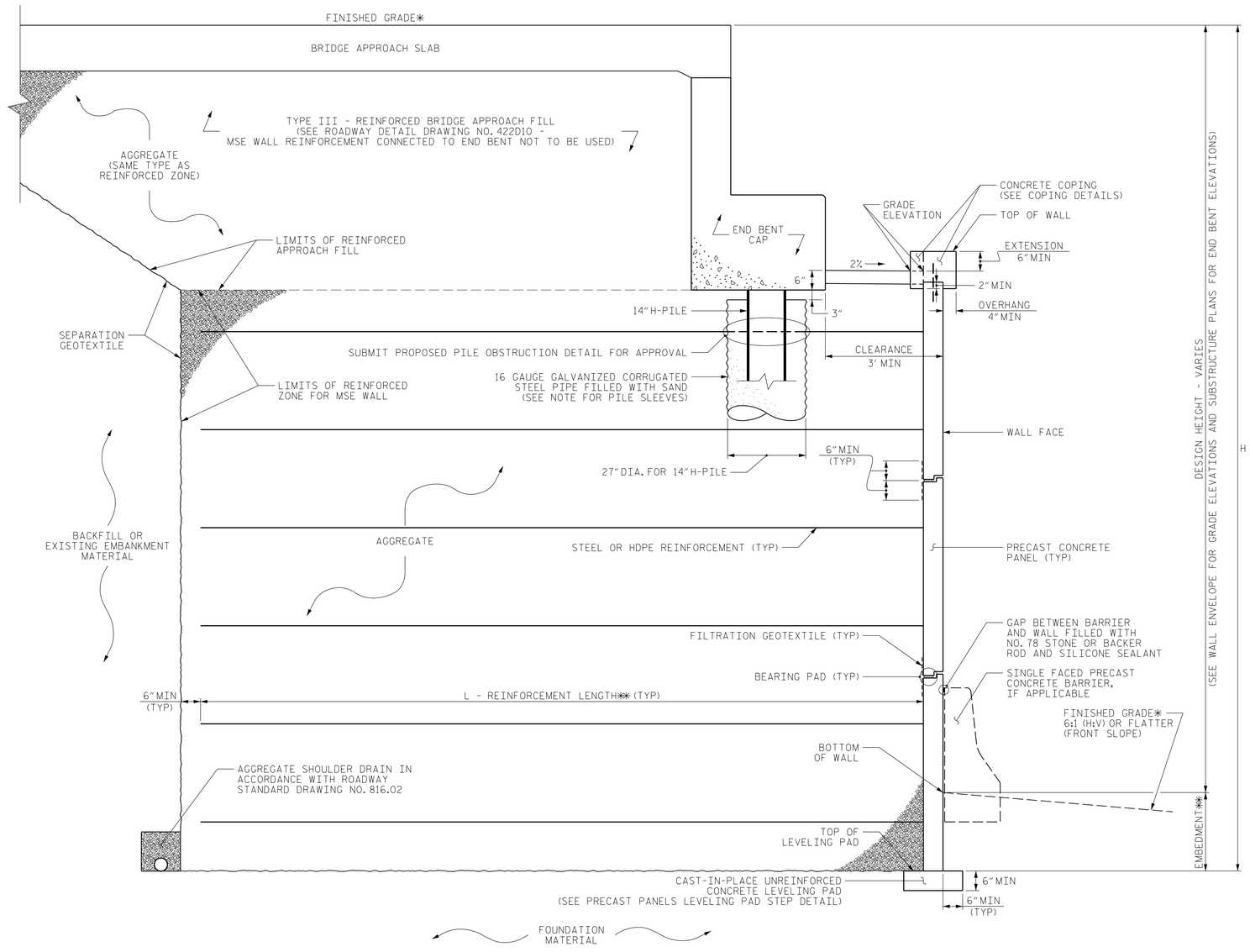
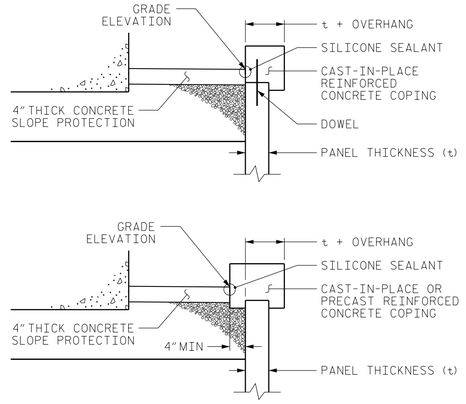


MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION -RW3- 13+91.09 TO 15+09.20

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 66+14,47' LT TO 67+97,47' RT

SHEET 4 OF 5

PREPARED BY: SGT	DATE: 07/19
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ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

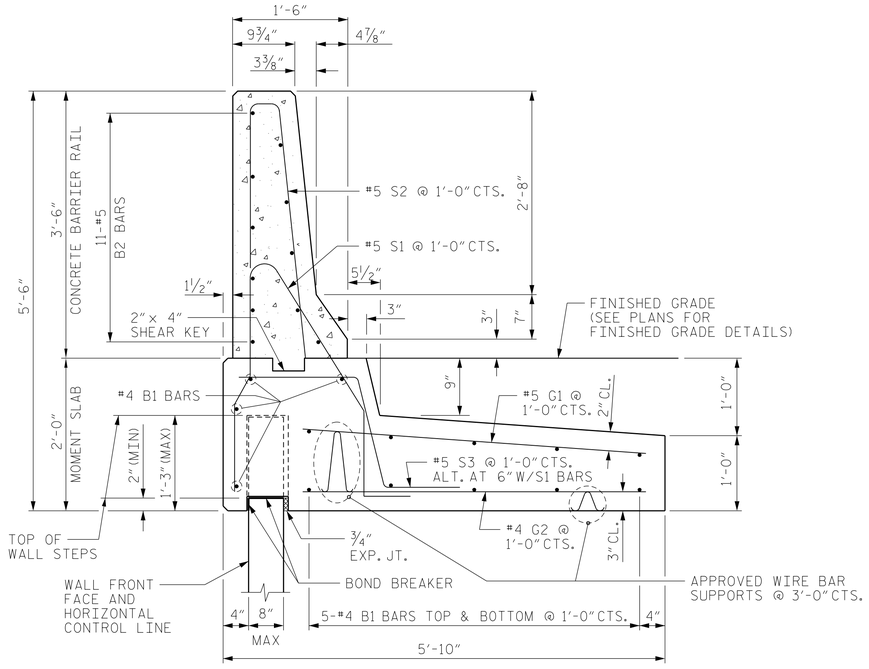
GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 3 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

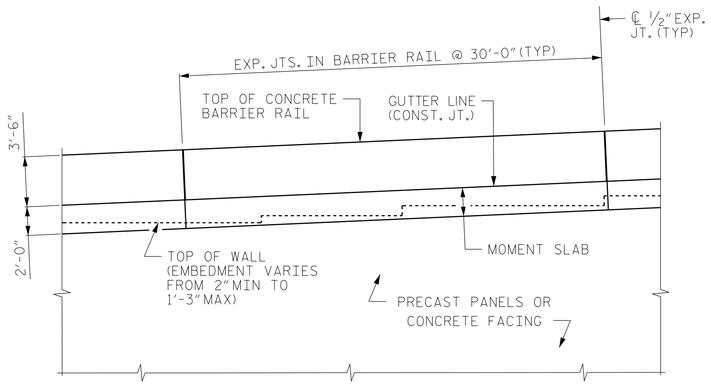
REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	MRS	11/19	3		
2	MRS	4/21	4		

SHEET NO. W-9



CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE SECTION 460 OF THE STANDARD SPECIFICATIONS.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

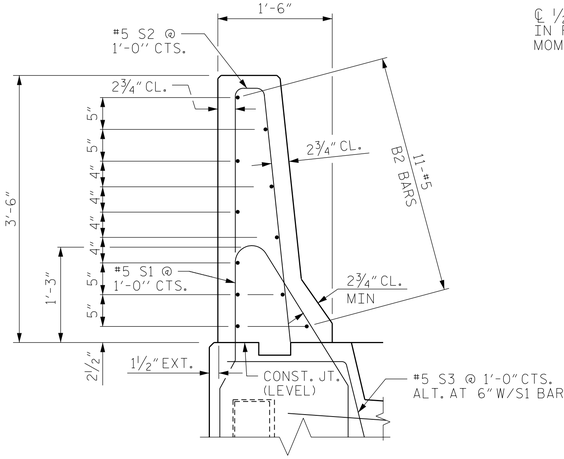
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

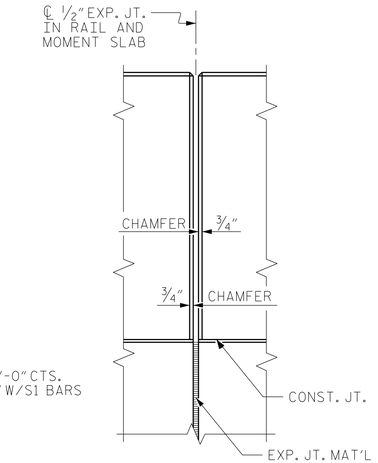
ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

CONCRETE BARRIER RAIL WITH MOMENT SLAB
PAY LENGTH = 995 LIN FT



SECTION THRU RAIL



ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

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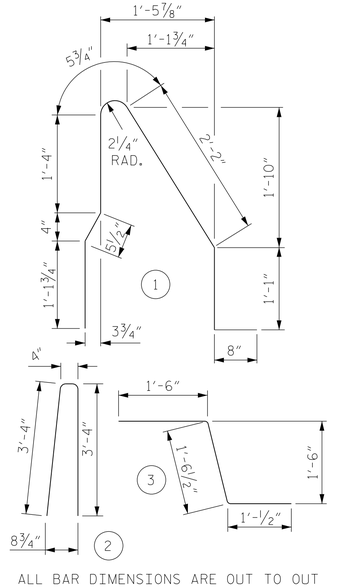
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE 30'-0" SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#4	STR	29'-7"	277
✳ B2	11	#5	STR	29'-7"	339
G1	31	#5	STR	4'-4"	140
G2	31	#4	STR	4'-4"	90
✳ S1	31	#5	1	7'-4"	237
✳ S2	31	#5	2	7'-0"	226
S3	30	#5	3	4'-1"	128
REINFORCING STEEL					635 LB
✳ EPOXY COATED REINFORCING STEEL					802 LB
CLASS AA CONCRETE BARRIER RAIL					4.1 CY
CLASS A CONCRETE MOMENT SLAB					9.1 CY
CONCRETE BARRIER RAIL WITH MOMENT SLAB					30 LIN FT

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 66+14,47' LT TO 67+97,47' RT

SHEET 5 OF 5

PREPARED BY: MRS	DATE: 05/21
REVIEWED BY: MDV	DATE: 05/21

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

CONCRETE BARRIER RAIL WITH MOMENT SLAB FOR PRECAST PANELS AND CONCRETE FACING

REVISIONS

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

SHEET NO. W-10

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

DocuSigned by: Michael Valiquette EAF2006B344A4D6... 8/17/2021
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SIGNATURE DATE

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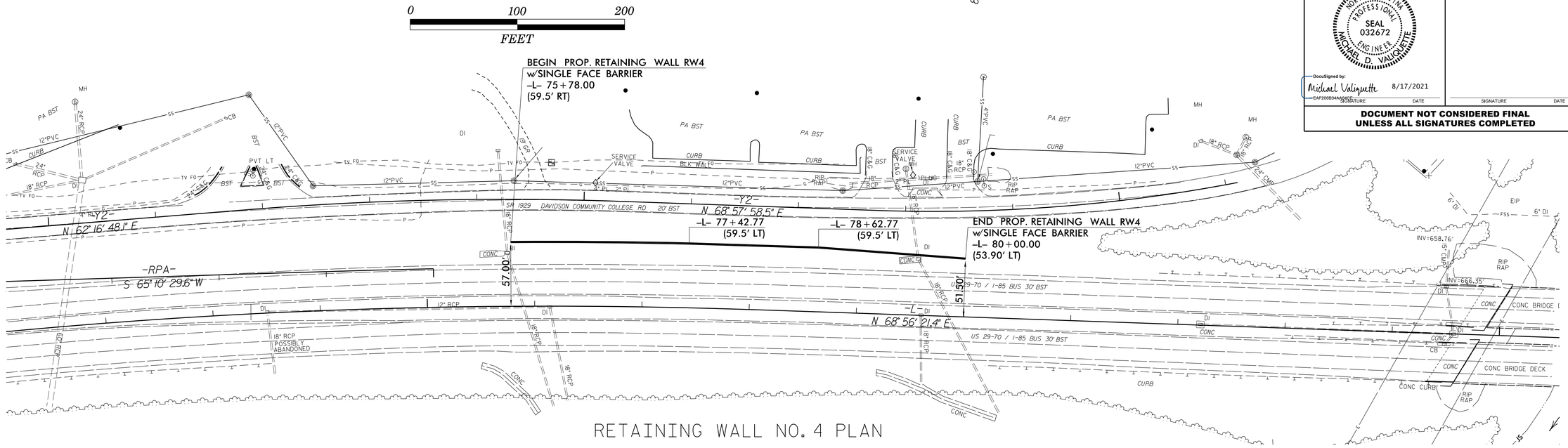
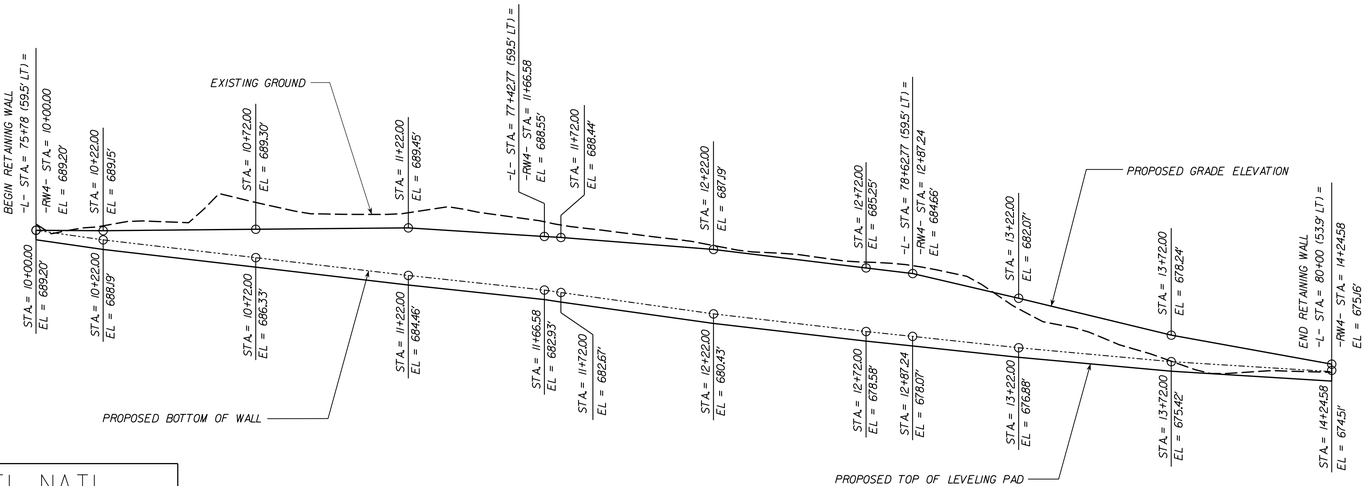


RETAINING WALL NO. 4 PLAN



RETAINING WALL NO. 4 ENVELOPE

VE 2:1

0 50 100
FEET

ESTIMATED SOIL NAIL WALL QUANTITIES
(SQUARE FEET)

SOIL NAIL WALL NO. 4	2,672 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT	2,672 SF

ESTIMATED SOIL NAIL WALL TESTING QUANTITIES
(EACH)

SOIL NAIL VERIFICATION TESTS	2
SOIL NAIL PROOF TESTS	10

PREPARED BY: MRS	DATE: 4/21
REVIEWED BY: MDV	DATE: 4/21

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 75+78 TO -L- 80+00 LT

SHEET 1 OF 2

RETAINING WALL NO. 4 DETAILS US 29/US 70/BUSINESS 85 AT SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			W-11
2			4			

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032672 ENGINEER MICHAEL D. VALIQUETTE

DocuSigned by: Michael Valiquette 8/17/2021
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SIGNATURE DATE

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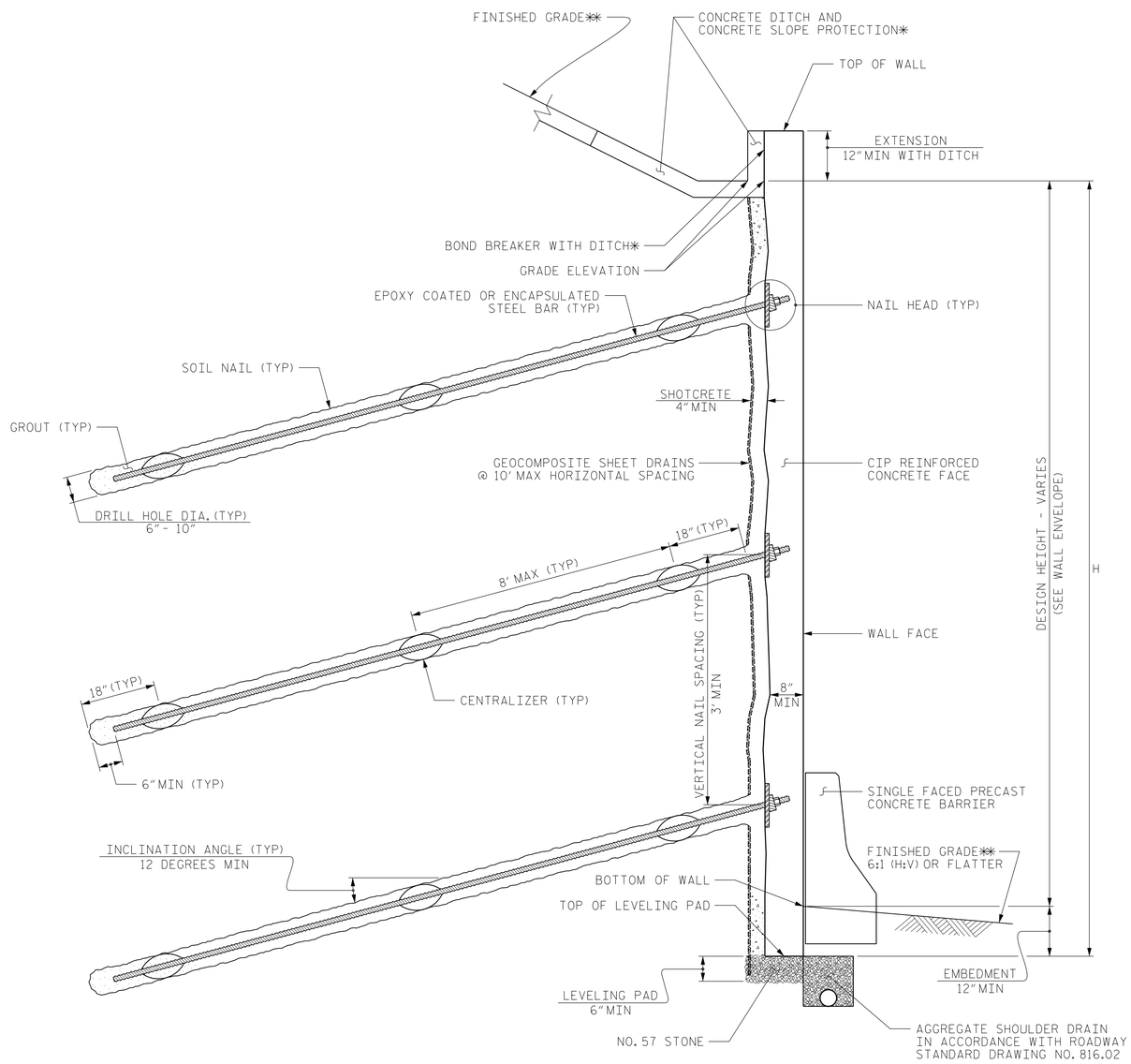

SOIL NAIL WALL - TYPICAL SECTION

* SEE CONCRETE DITCH BEHIND WALL DETAILS.
** SEE PLANS FOR FINISHED GRADE DETAILS.

NOTES:

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

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

AN ARCHITECTURAL FINISH IS REQUIRED FOR THE CIP REINFORCED CONCRETE FACE FOR RETAINING WALL NO. 4. SEE ARCHITECTURAL CONCRETE SURFACE TREATEMENT SPECIAL PROVISION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COLOR APPLICATION ARTIST AS NEEDED FOR THE PROJECT. SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT SPECIAL PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 4, 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.

PERFORM GRADING BEHIND THE TOP OF WALL AND FILL PLACEMENT BEFORE BEGINNING WALL CONSTRUCTION.

DESIGN RETAINING WALL NO. 4 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MINIMUM EMBEDMENT = 1 FT
4) IN-SITU ASSUMED MATERIAL PARAMETERS:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 0 PSF

FOUNDATIONS FOR SIGNS, LIGHTING, OR SIGNALS MAY BE LOCATED BEHIND RETAINING WALL NO. 4 AND MAY INTERFERE WITH SOIL NAILS. SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS WITH THE SOIL NAIL WALL CONSTRUCTION PLAN.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL NO. 4.

PROJECT NO.: R-5737

DAVIDSON COUNTY

STATION: -L- 75+78 TO -L- 80+00 LT

SHEET 2 OF 2

PREPARED BY: MRS	DATE: 4/21
REVIEWED BY: MDV	DATE: 4/21

ICE of CAROLINAS, PLLC

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 4 DETAILS
US 29/US 70/BUSINESS 85 AT
SR 1798 (OLD GREENSBORO RD)

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-12
1			3			
2			4			