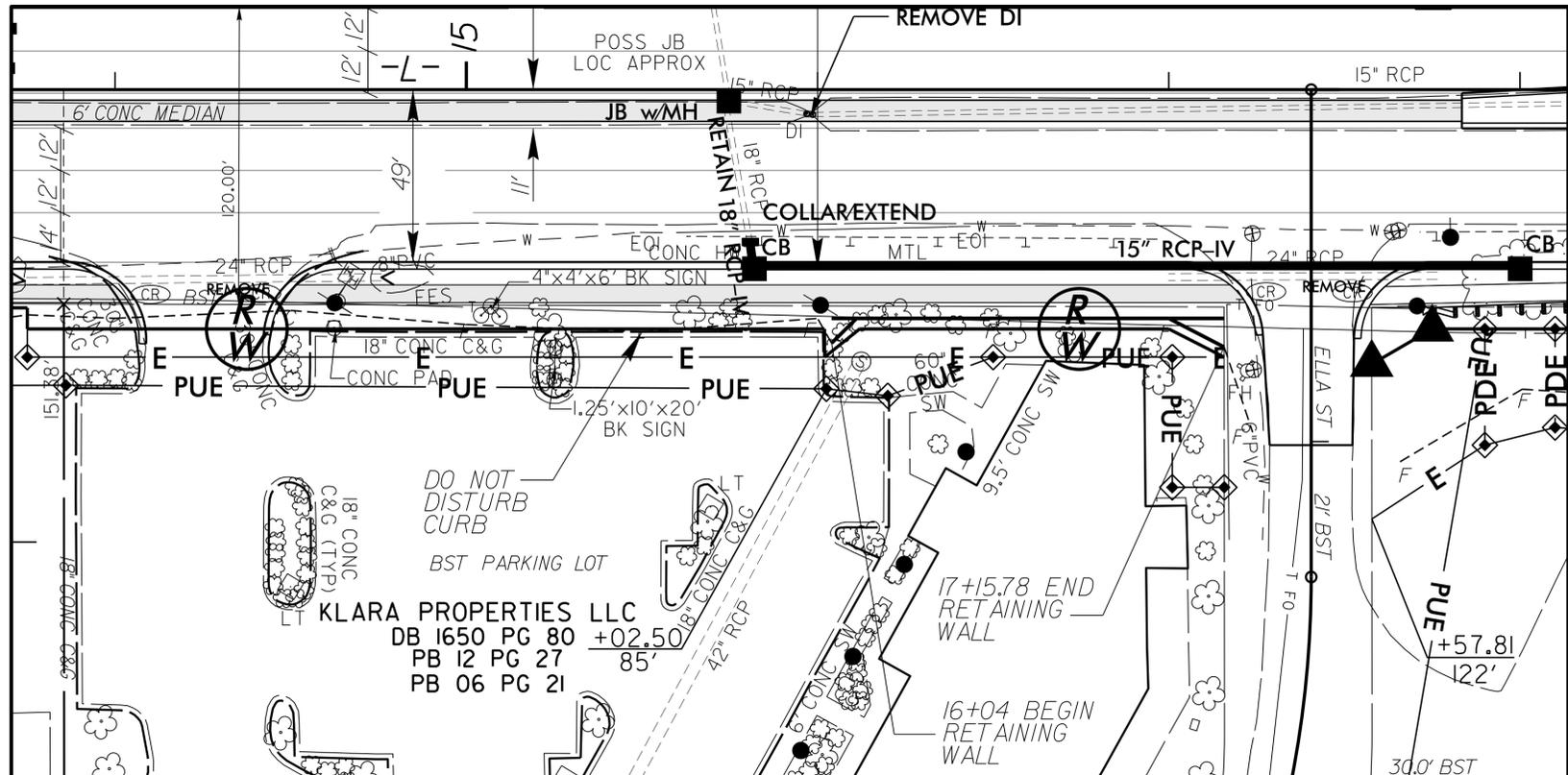


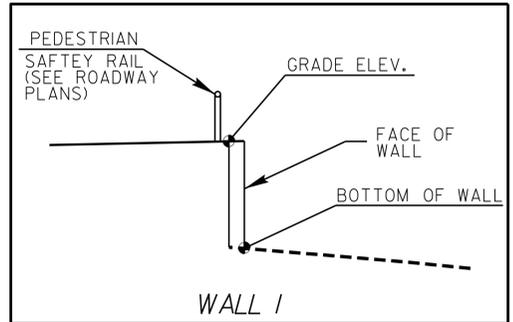
**This electronic collection of documents is provided  
for the convenience of the user  
and is Not a Certified Document –**

**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

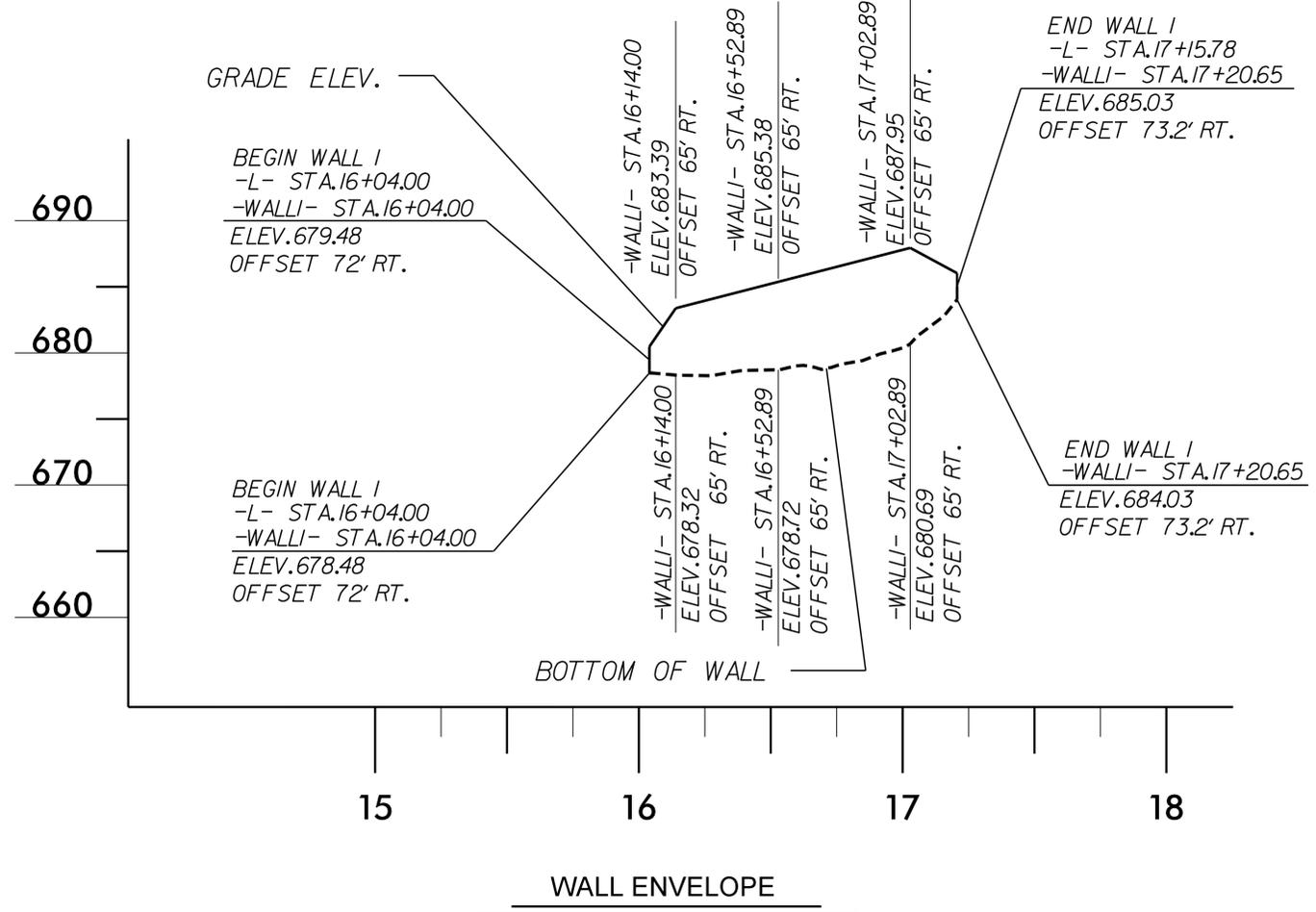
**This file or an individual page  
shall not be considered a certified document.**



LOCATION SKETCH



SECTION THRU WALL



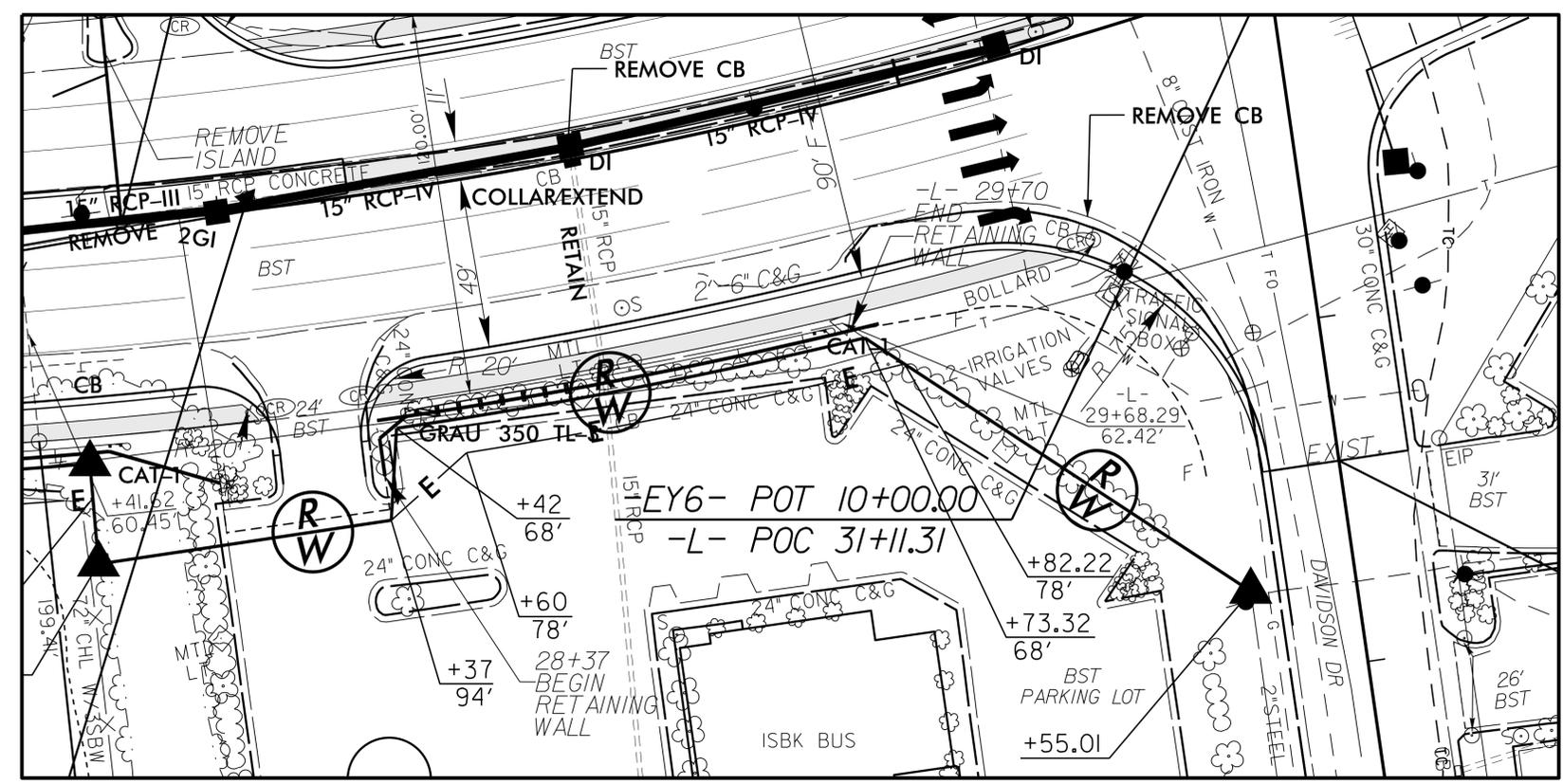
ESTIMATED MSE WALL QUANTITIES	
MSE RETAINING WALL #1	* 930 SQ. FT.

\* THIS QUANTITY ASSUMES A 2' MIN. EMBEDMENT

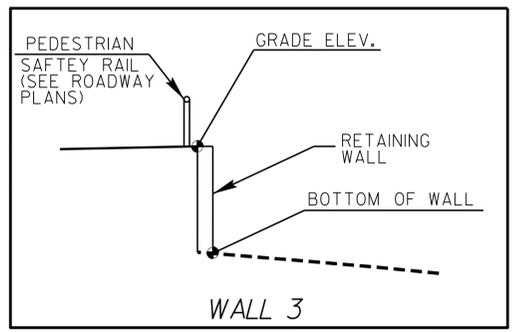
PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: 16+04.00 -L- TO 17+15.78 -L-  
 SHEET 1 OF 6

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

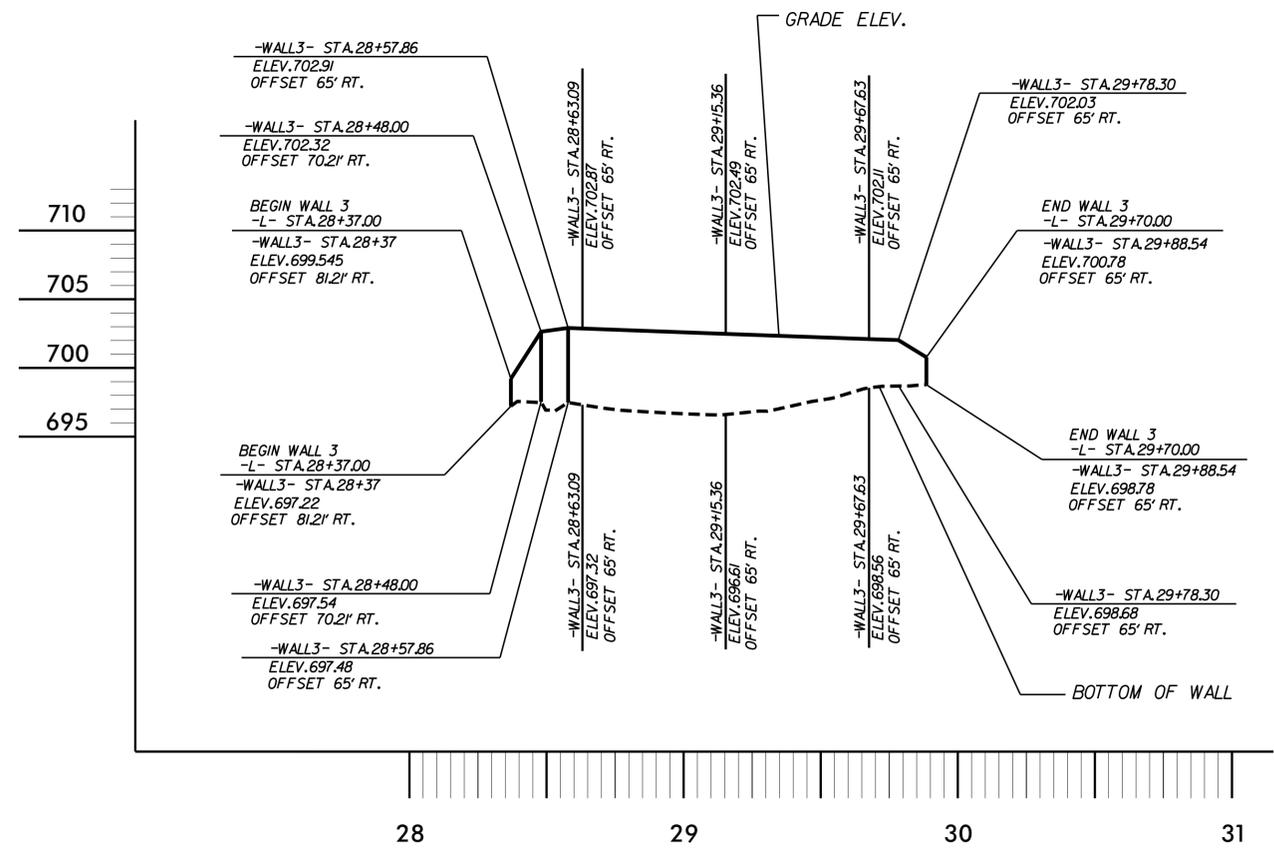
MSE RETAINING WALL WALL #1						SHEET NO. W-1 TOTAL SHEETS 13
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			



LOCATION SKETCH



SECTION THRU WALL



WALL ENVELOPE

\* NOTE: WALL IS 65' RT. OF -L- LINE

ESTIMATED MSE WALL QUANTITIES

MSE RETAINING WALL #3	* 995	SO. FT.
-----------------------	-------	---------

\* THIS QUANTITY ASSUMES A 2' MIN. EMBEDMENT

PROJECT NO.: B-5136  
CABARRUS COUNTY  
STATION: 28+37.00 -L- TO 29+70.00 -L-  
SHEET 2 OF 6

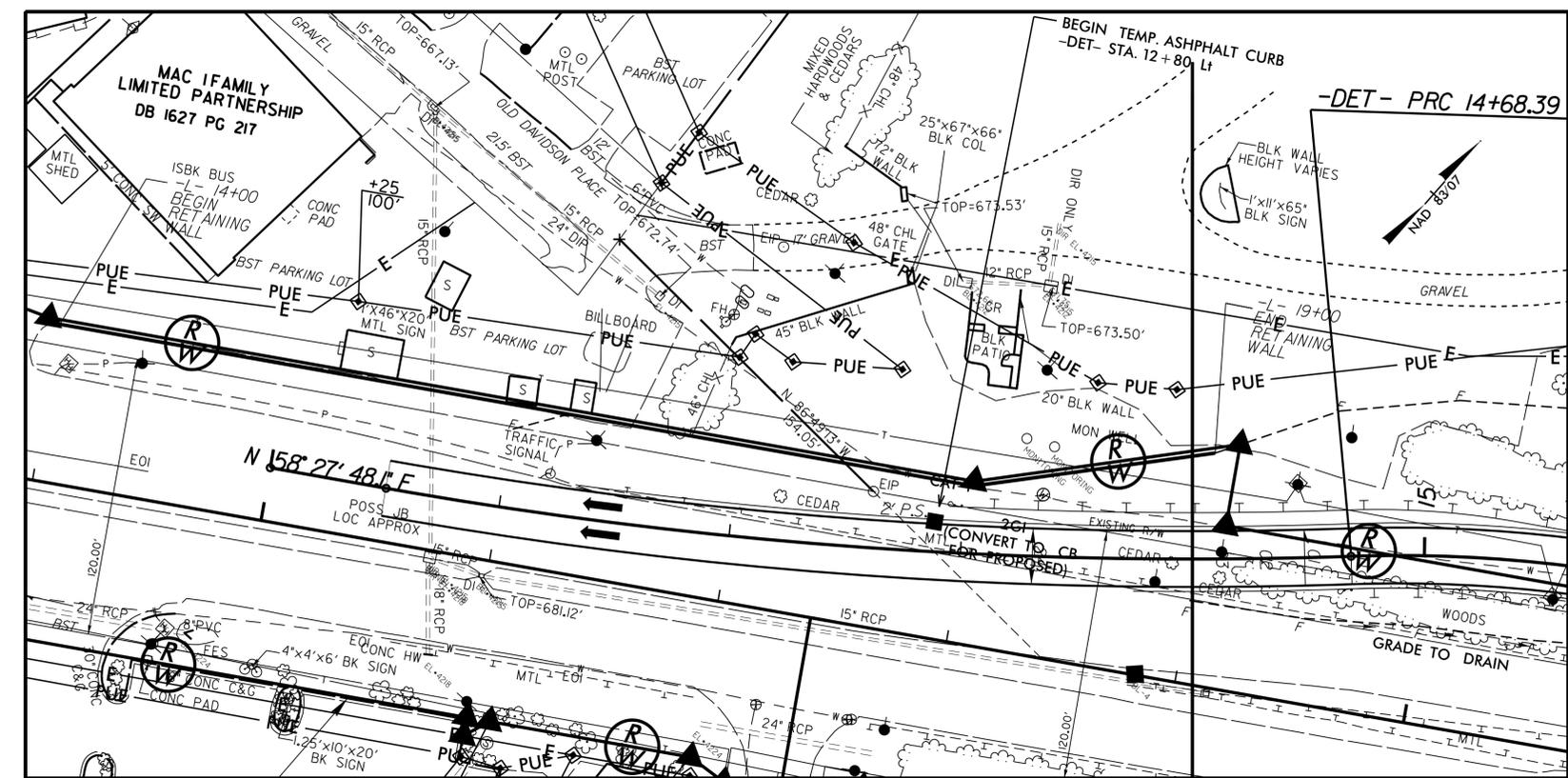
**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

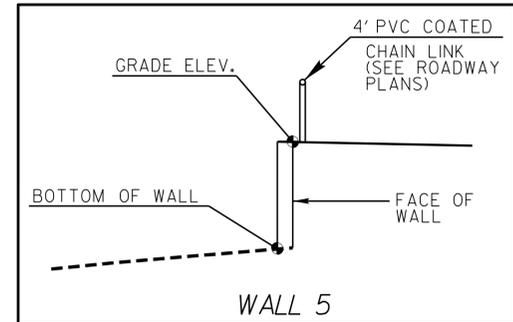
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

MSE RETAINING WALL  
WALL #3

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-2
1			3			TOTAL SHEETS
2			4			13



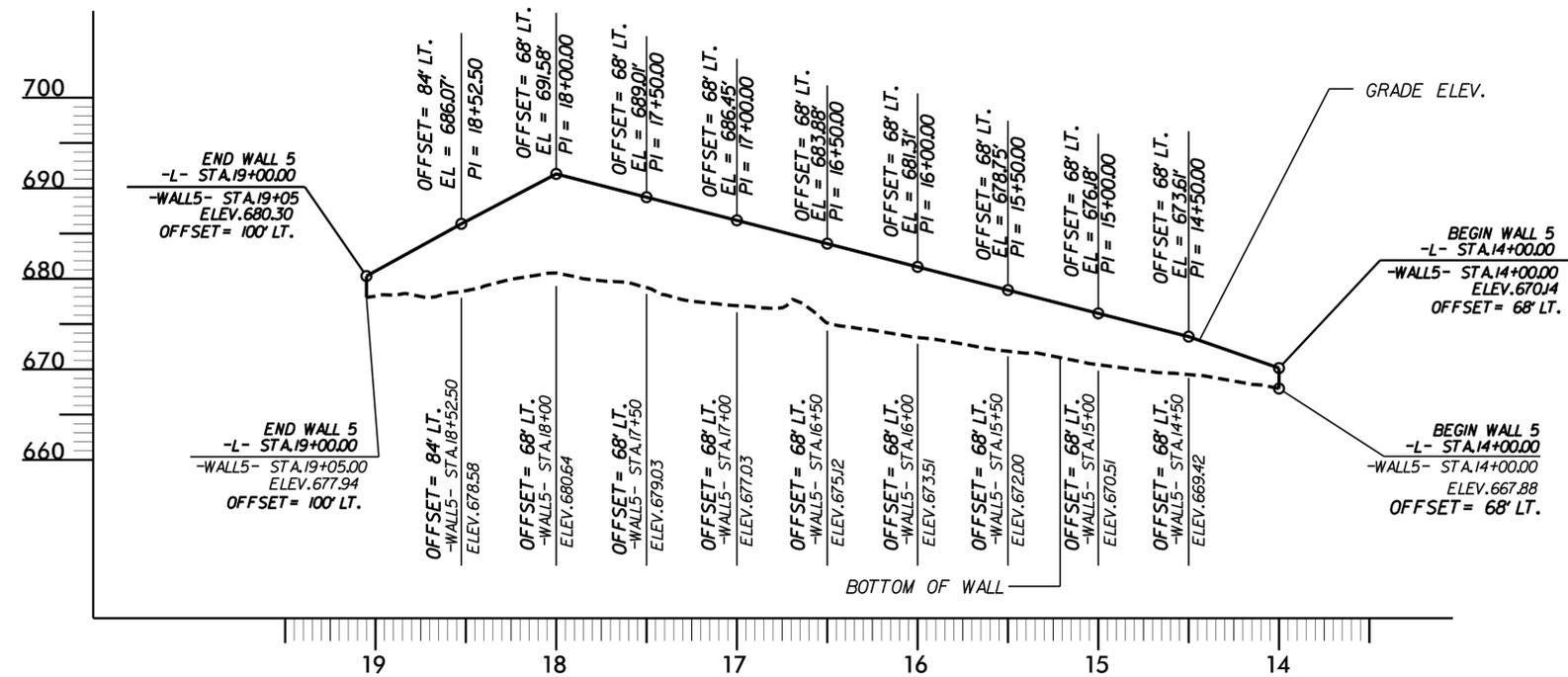
**LOCATION SKETCH**



**SECTION THRU WALL**

ESTIMATED MSE WALL QUANTITIES	
MSE RETAINING WALL #5	*5460 SQ. FT.

\* THIS QUANTITY ASSUMES A 2' MIN. EMBEDMENT



**WALL ENVELOPE**

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: 14+00.00 -L- TO 19+05.00 -L-  
 SHEET 3 OF 6

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

MSE RETAINING WALL WALL #5					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

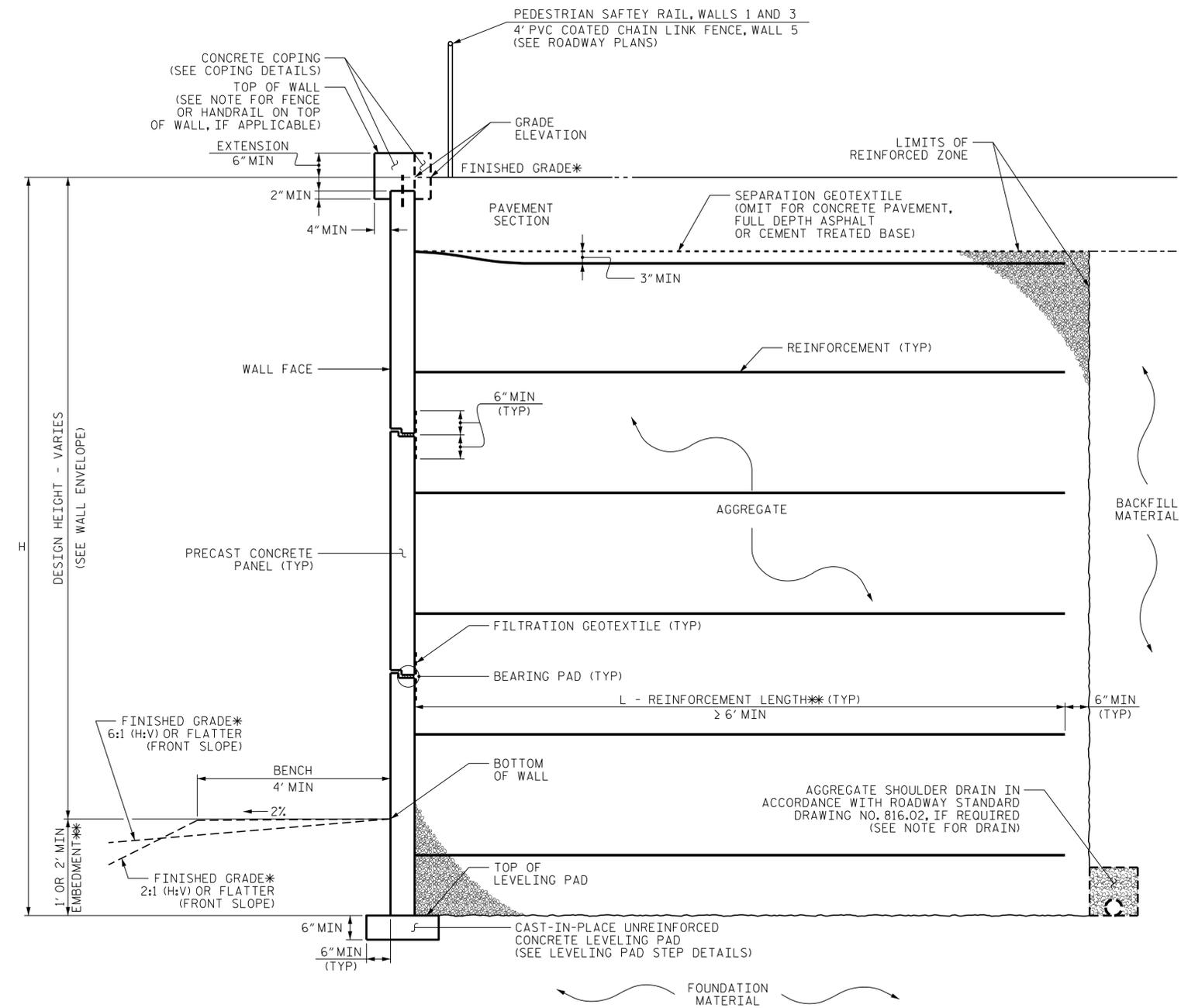
SHEET NO. W-3 TOTAL SHEETS 13

GEOTECHNICAL ENGINEER

ENGINEER

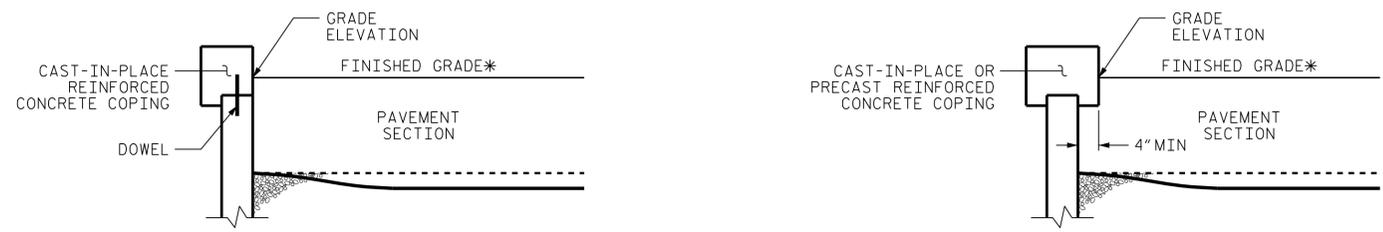
DocuSigned by:  
Shane C. Clark 7/15/2015

1F4E27E03AD4EA SIGNATURE DATE SIGNATURE DATE



**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION 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.  
 \*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

**PROJECT NO.:** B-5136  
**CABARRUS COUNTY**  
**STATION:** VARIES  
 SHEET 4 OF 6

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

**STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-4
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS	DATE: 1/15
REVIEWED BY: SCC	DATE: 1/15

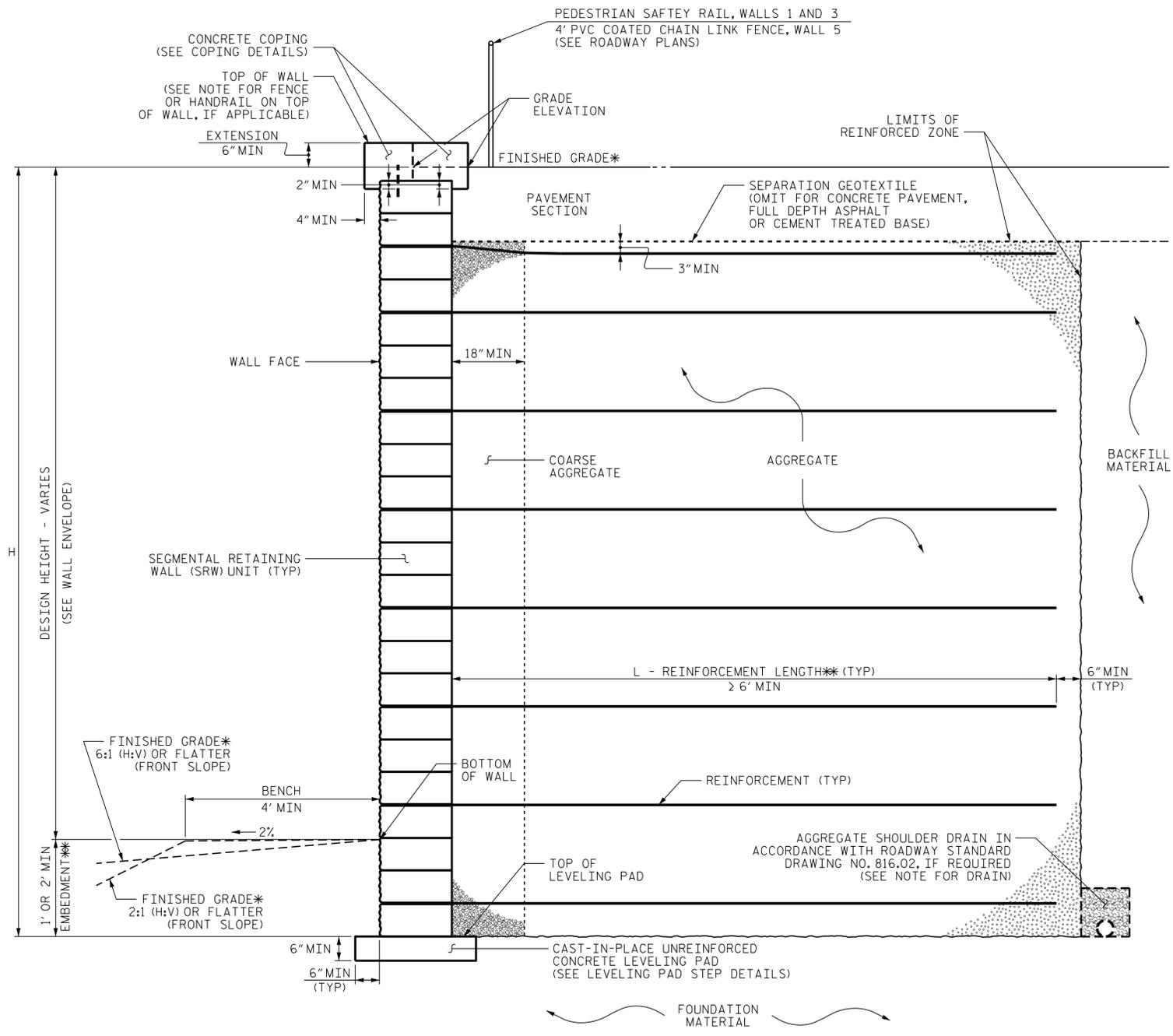
GEOTECHNICAL ENGINEER

ENGINEER

SEAL 29869

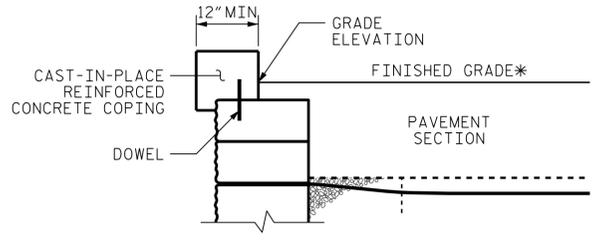
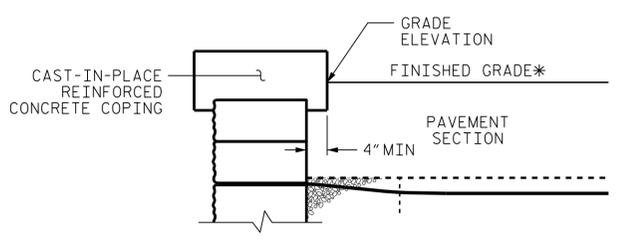
Shane C. Clark 7/15/2015

SIGNATURE DATE SIGNATURE DATE



**MSE WALL WITH SRW UNITS - TYPICAL SECTION**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



**COPING DETAILS**

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO SRW UNITS WITH DOWELS OR EXTEND COPING DOWN BACK OF SRW UNITS.  
 \*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: VARIES  
 SHEET 5 OF 6

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

MSE RETAINING WALL WITH SRW UNITS WALLS #1, #3, AND #5

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-5
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by:  
Shane C. Clark 7/15/2015

1FAE87ED3DA4EA

SIGNATURE DATE SIGNATURE DATE

**NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS No. 1, 3, and 5, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

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

A FENCE OR HANDRAIL IS REQUIRED BEHIND RETAINING WALLS No. 1, 3, and 5. SEE ROADWAY PLANS FOR DETAILS.

AT THE CONTRACTOR'S OPTION FOR WALLS No. 1, 3, and 5, USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS OR A MSE WALL SYSTEM WITH SRW UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS.

WHEN USING AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL (SRW) UNITS FOR RETAINING WALLS, FREEZE-THAW DURABLE SRW UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS ARE REQUIRED.

IF SRW UNITS ARE USED FOR RETAINING WALLS, USE SRW UNITS WITH A GRAY COLOR WITH AND A TEXTURED FACE.

A DRAIN IS REQUIRED FOR RETAINING WALLS.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL No. 1, 3, and 5, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPES ARE ACCEPTED.

DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:  
 1) H = DESIGN HEIGHT + EMBEDMENT  
 2) DESIGN LIFE = 100 YEARS  
 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 2750 LB/SF  
 4) MINIMUM REINFORCEMENT LENGTH (L) = 7 FT

DESIGN RETAINING WALL NO. 3 FOR THE FOLLOWING:  
 1) H = DESIGN HEIGHT + EMBEDMENT  
 2) DESIGN LIFE = 100 YEARS  
 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 2660 LB/SF

DESIGN RETAINING WALL NO. 5 FOR THE FOLLOWING:  
 1) H = DESIGN HEIGHT + EMBEDMENT  
 2) DESIGN LIFE = 100 YEARS  
 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 2630 LB/SF

AGGREGATE PARAMETERS FOR WALLS 1, 3, and 5:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0

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

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

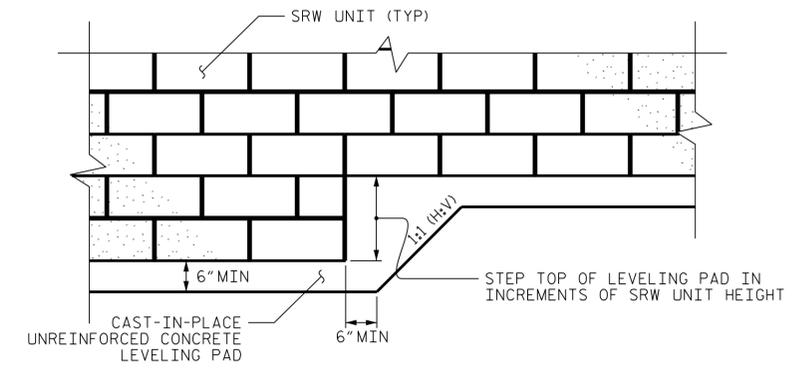
MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	32	0
FOUNDATION	120	32	0

DESIGN RETAINING WALL No. 1, 3, and 5 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

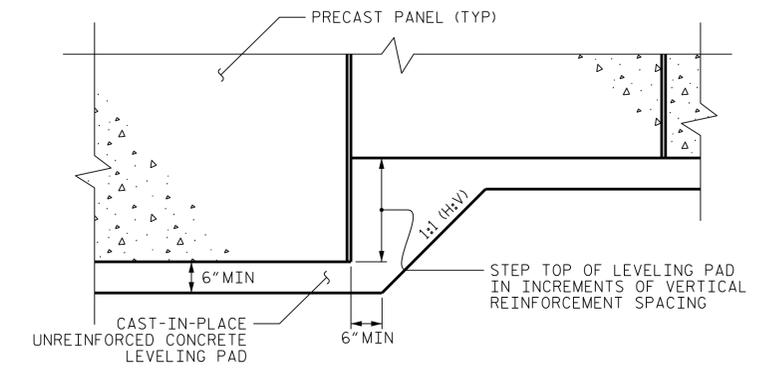
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL No. 1, 3, and 5.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL No. 1, 3, and 5 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. 1, 3, and 5. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.



SEGMENTAL RETAINING WALL (SRW) UNITS OPTION



PRECAST CONCRETE PANELS OPTION

LEVELING PAD STEP DETAIL OPTIONS

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: VARIES  
 SHEET 6 OF 6

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

MSE  
 RETAINING WALL  
 WALLS #1, #3, AND #5

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-6
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

GEOTECHNICAL ENGINEER ENGINEER

SEAL 29869  
THANE C. CLARK

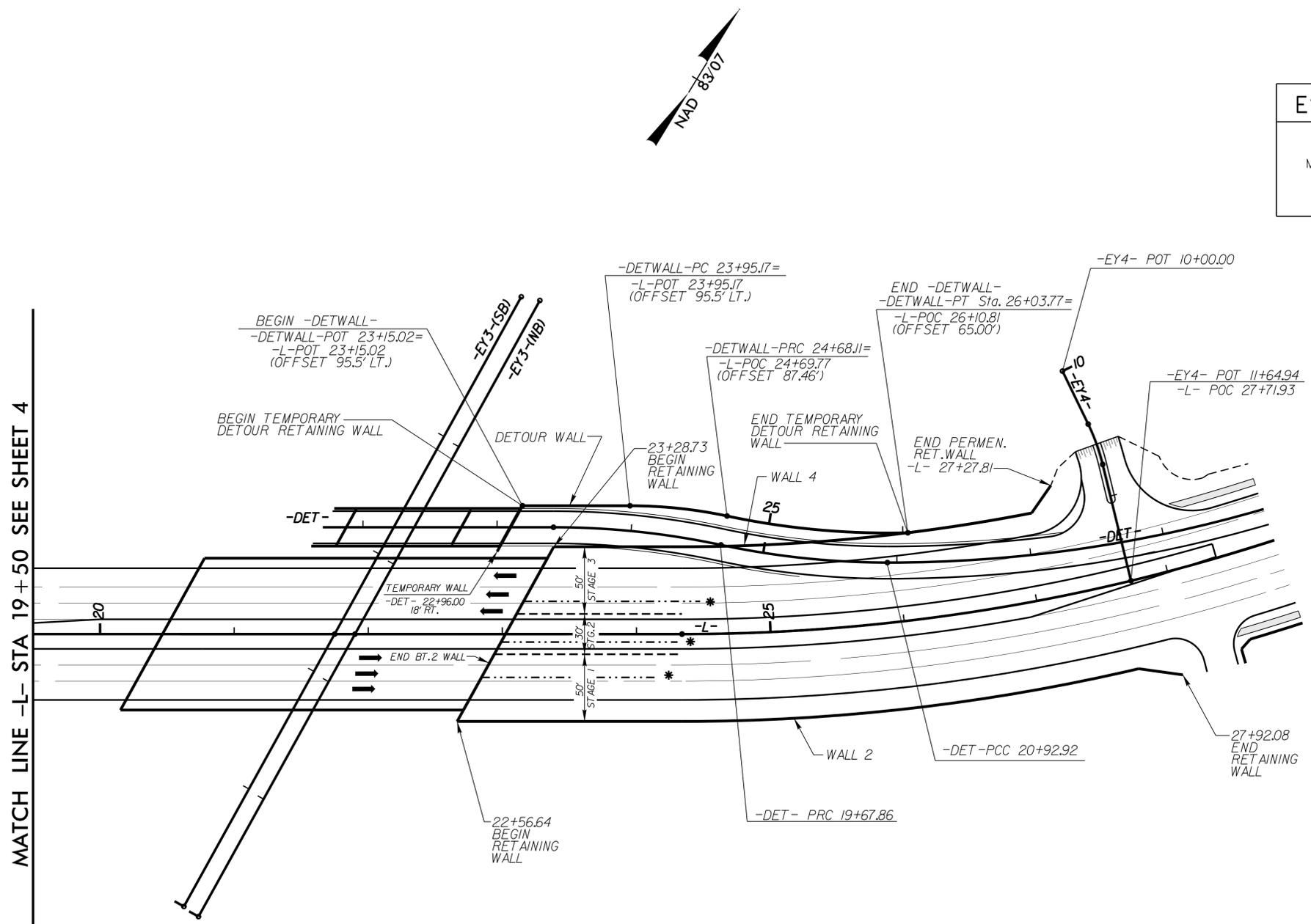
Shane C. Clark 7/15/2015

SIGNATURE DATE SIGNATURE DATE

**ESTIMATED MSE WALL QUANTITIES**

MSE RETAINING WALLS 2, 4, AND END BENT 2 ABUTMENT 22,750 SQ. FT.

\* THIS QUANTITY ASSUMES A 2' MIN. EMBEDMENT



MATCH LINE -L- STA 19+50 SEE SHEET 4

**WALL LAYOUT FOR WALLS NEAR RAILROAD BRIDGE**

- WALL 2 STA.22+56.64 -L- TO 27+92.08 -L-
- WALL 4 STA.23+28.73 -L- TO 27+27.81 -L-
- WALL AT END BT.2 STA.22+56.64 -L- TO 23+28.73 -L-
- DETOUR WALL STA.23+15.02 -L- TO 26+10.81 -L-
- \* STAGING WALLS FOR ABUTMENT CONSTRUCTION WILL BE NEEDED AT THESE LOCATIONS

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION:  
 SHEET 1 OF 5

**GEOTECHNICAL ENGINEERING UNIT**

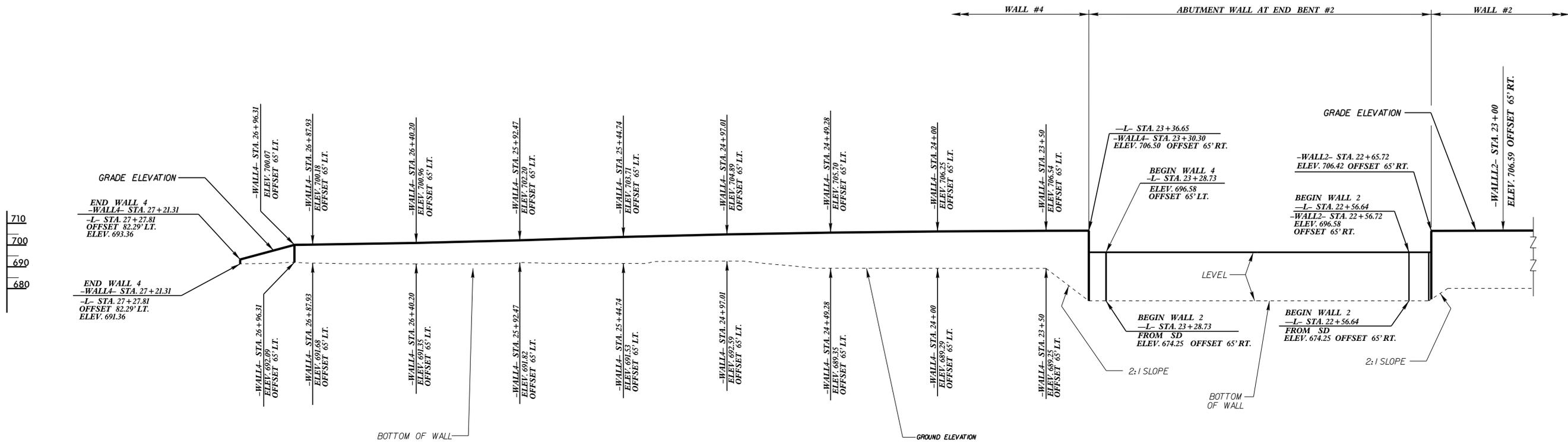
EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PLAN OF RETAINING WALLS NEAR RAILROAD BRIDGE**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-7
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS	DATE: 1/15
REVIEWED BY: SCC	DATE: 1/15



# WALL ENVELOPE

FOR WALL #4 AND WALL AT END BENT #2  
(LOOKING AT EXPOSED FACE)

**PROJECT NO.:** B-5136  
**CABARRUS COUNTY**  
**STATION:** 27+92.08 -L- TO 27+27.81 -L-  
 SHEET 2 OF 5

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

**GEOTECHNICAL ENGINEERING UNIT**  
 EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE  
**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

LAYOUT OF MSE RETAINING WALLS #2, #4, AND AT END BENT #2

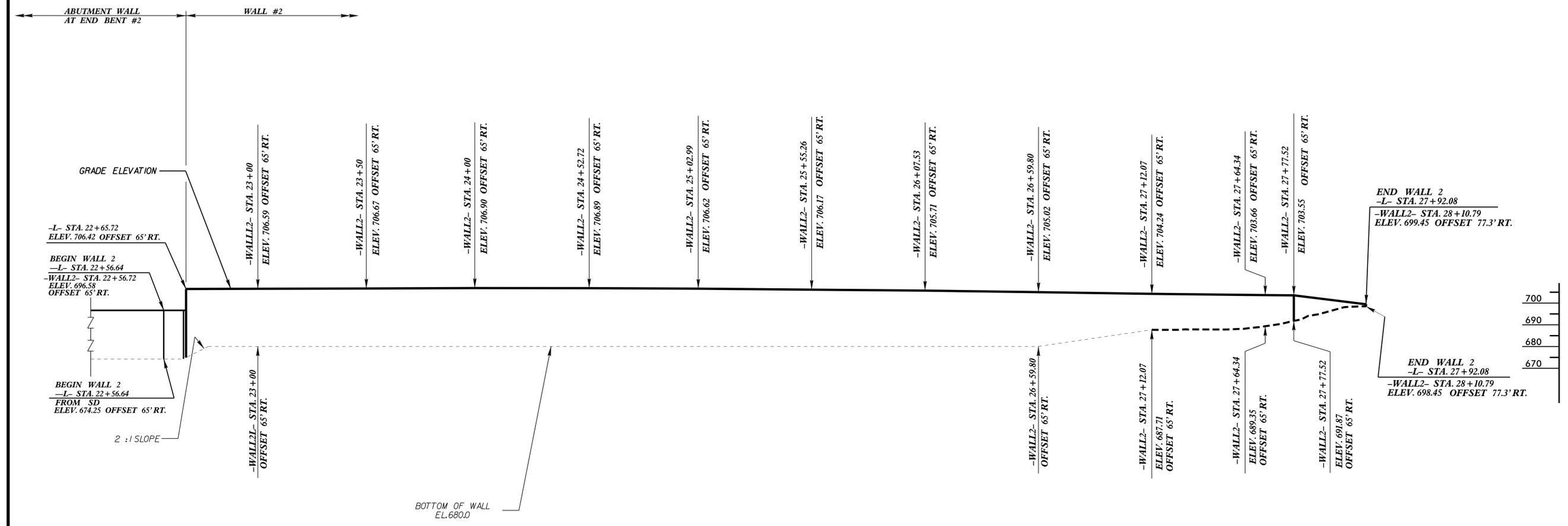
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-8
1			3			TOTAL SHEETS
2			4			13

GEOTECHNICAL ENGINEER

ENGINEER

Slane C. Clark 7/15/2015

SIGNATURE DATE SIGNATURE DATE



# WALL ENVELOPE

FOR WALL #2 AND WALL AT END BENT #2  
(LOOKING AT EXPOSED FACE)

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION:  
 SHEET 3 OF 5

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

LAYOUT OF MSE RETAINING WALLS #2, #4, AND AT END BENT #2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-9
1			3			TOTAL SHEETS
2			4			13

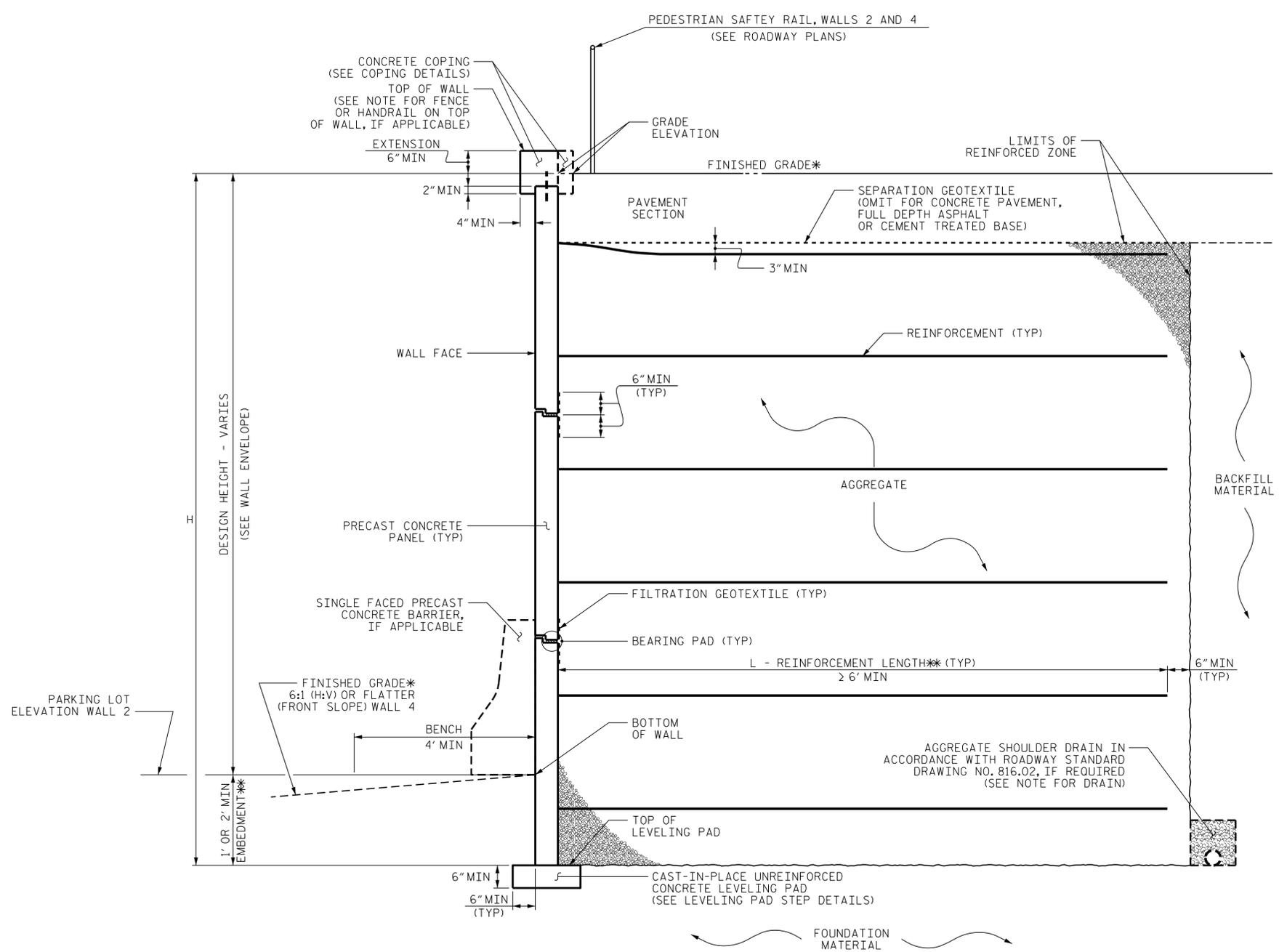
PREPARED BY: EJS	DATE: 1/15
REVIEWED BY: SCC	DATE: 1/15

GEOTECHNICAL ENGINEER

ENGINEER

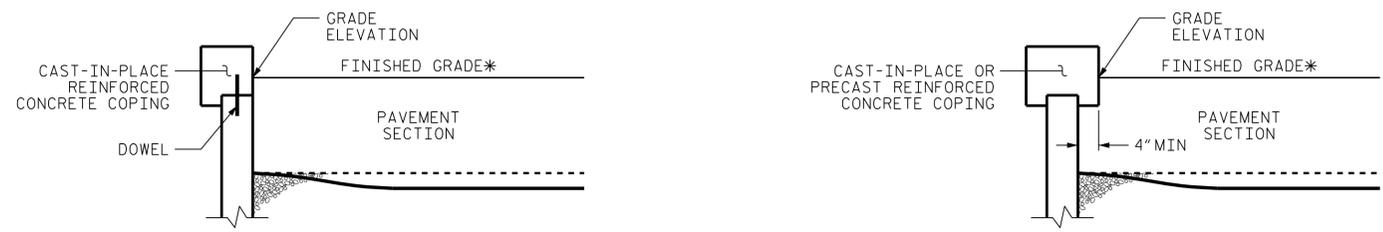
DocuSigned by:  
Shane C. Clark  
7/15/2015

SIGNATURE DATE SIGNATURE DATE



**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION 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.  
 \*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

**PROJECT NO.:** B-5136  
**CABARRUS COUNTY**  
**STATION:**  
 SHEET 4 OF 5

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

**STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-10
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS	DATE: 1/15
REVIEWED BY: SCC	DATE: 1/15

**NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS No. 2, 4, AND AT END BT. 2, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR SINGLE FACED PRECAST CONCRETE BARRIER AT WALL 2, PARKING LOT AREA. SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

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

A FENCE OR HANDRAIL IS REQUIRED ALONG BACK OF RETAINING WALLS No. 2 AND 4. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS No. 2, 4, AND END BENT 2.

A DRAIN IS REQUIRED FOR RETAINING WALLS.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL No. 2, 4, AND END BT. 2, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPES ARE ACCEPTED.

DESIGN RETAINING WALL NO. 2, 4 AND END BENT 2 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 8400 LB/SF

4) AGGREGATE PARAMETERS FOR WALLS 2, 4, and END BT. 2:

AGGREGATE TYPE*	UNIT WEIGHT ( $\gamma$ ) LB/CF	FRICTION ANGLE ( $\phi$ ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0

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

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT ( $\gamma$ ) LB/CF	FRICTION ANGLE ( $\phi$ ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	32	0
FOUNDATION	120	32	0

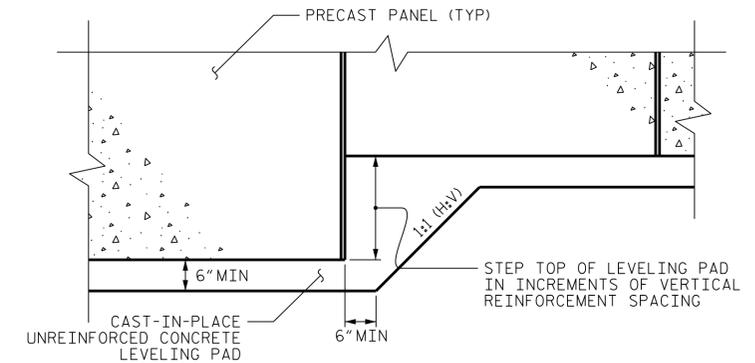
DESIGN RETAINING WALLS No. 2, 4, AND AT END BT. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS No. 2, 4, AND AT END BT. 2.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS No. 2, 4, AND AT END BT. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

TEMPORARY SHORING FOR WALL CONSTRUCTION IS REQUIRED TO CONSTRUCT RETAINING WALLS No. 2, 4, AND AT END BT. 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

GEOTECHNICAL ENGINEER   DocuSigned by: Shane C. Clark 7/15/2015 1FAE87E6D0AD4EA SIGNATURE DATE SIGNATURE DATE	ENGINEER
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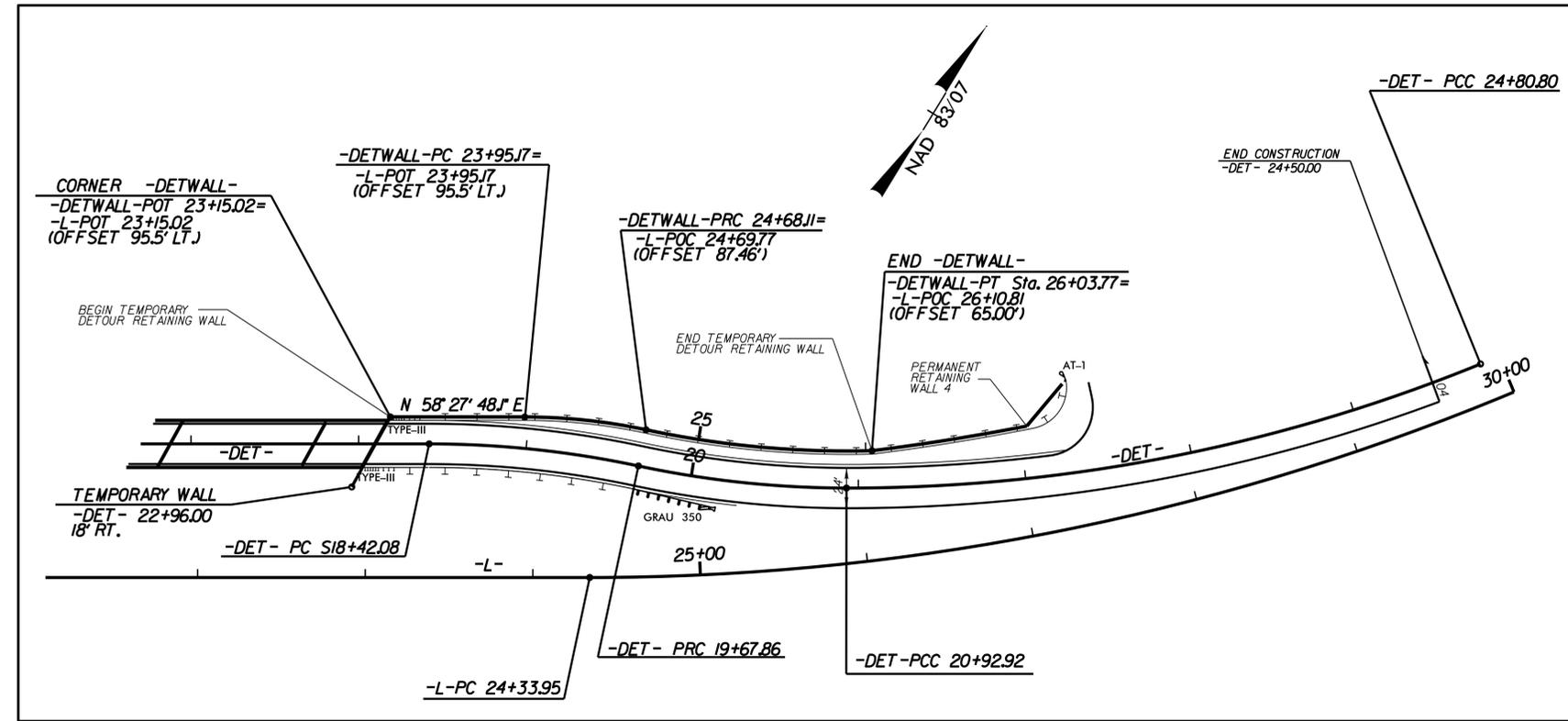
PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

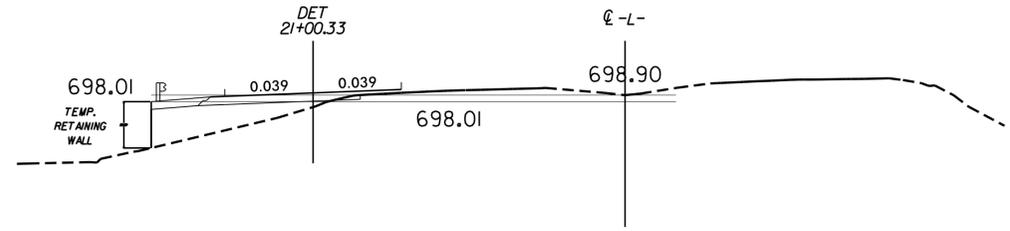
**PROJECT NO.:** B-5136  
**CABARRUS COUNTY**  
**STATION:**  
 SHEET 5 OF 5

PREPARED BY: EJS	DATE: 1/15
REVIEWED BY: SCC	DATE: 1/15

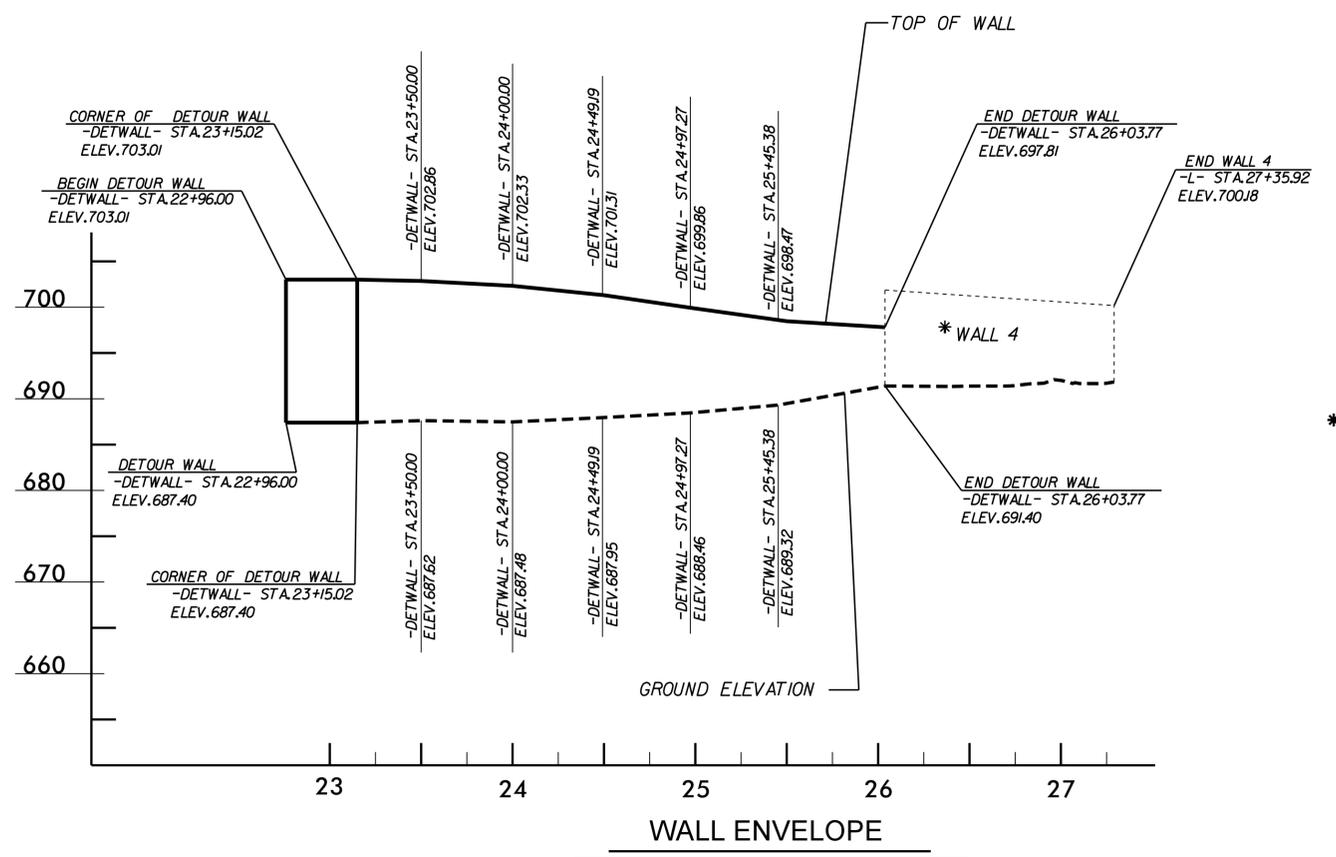
 <b>GEOTECHNICAL ENGINEERING UNIT</b> <input type="checkbox"/> EASTERN REGIONAL OFFICE <input checked="" type="checkbox"/> WESTERN REGIONAL OFFICE <input type="checkbox"/> CONTRACT OFFICE STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	<b>MSE RETAINING WALL WALLS #2, #4, AND END BENT 2</b>					
	<b>REVISIONS</b>					
	NO.	BY	DATE	NO.	BY	DATE
1			3			
2			4			



LOCATION SKETCH



SECTION THRU WALL



WALL ENVELOPE

ESTIMATED TEMPORARY WALL QUANTITY	
TEMPORARY RETAINING WALL	* 4500 SQ. FT.

\* PAID FOR AS TEMPORARY SHORING PER NCDOT STANDARD DWG. 1801.02

\* WALL \*4 IS SHOWN FOR REFERENCE ONLY. WALL \*4 MAY OR MAY NOT BE PART OF THE CONSTRUCTION SEQUENCE OF THE DETOUR WALL.

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: 23+15.02 -L- TO 27+79.03 -L-  
 SHEET 1 OF 2

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-12
1			3			TOTAL SHEETS
2			4			13

TEMPORARY RETAINING WALL

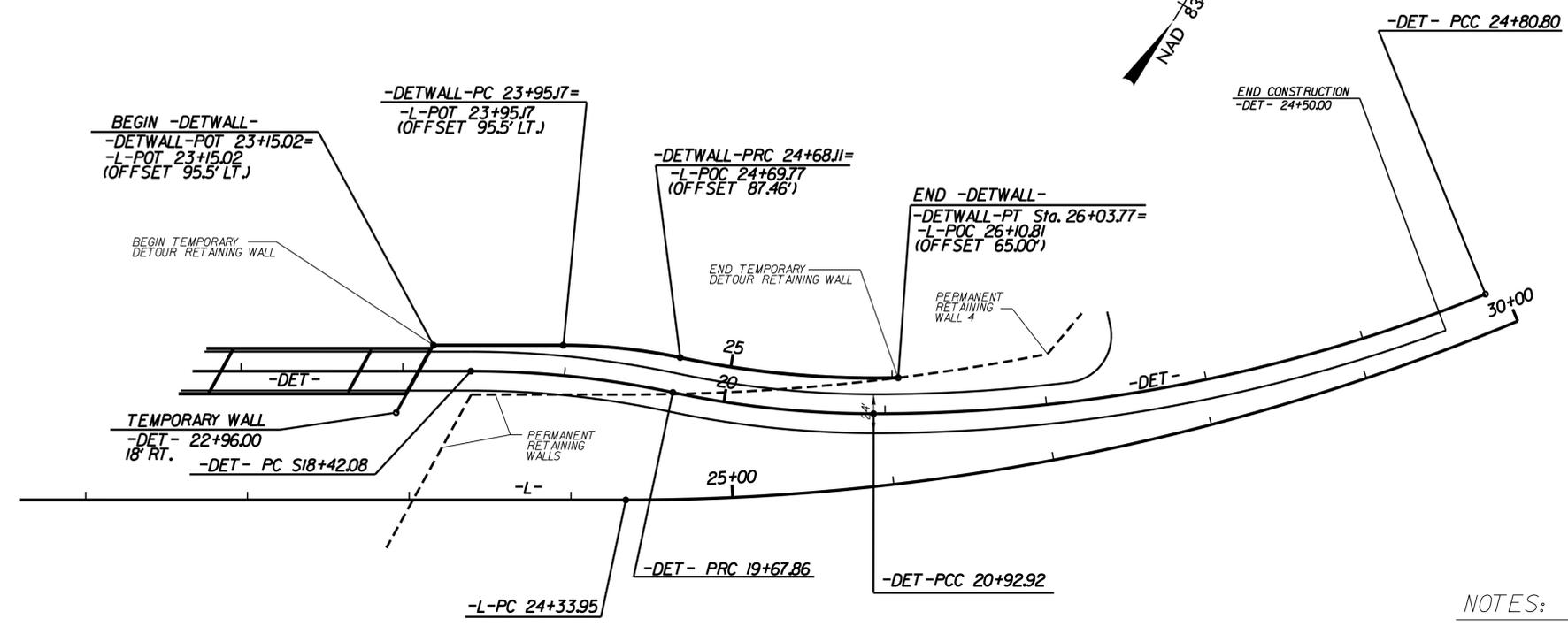
GEOTECHNICAL ENGINEER

ENGINEER

DocuSigned by:  
Shane C. Clark 7/15/2015

SIGNATURE DATE SIGNATURE DATE

# -DET WALL- (DETOUR WALL)

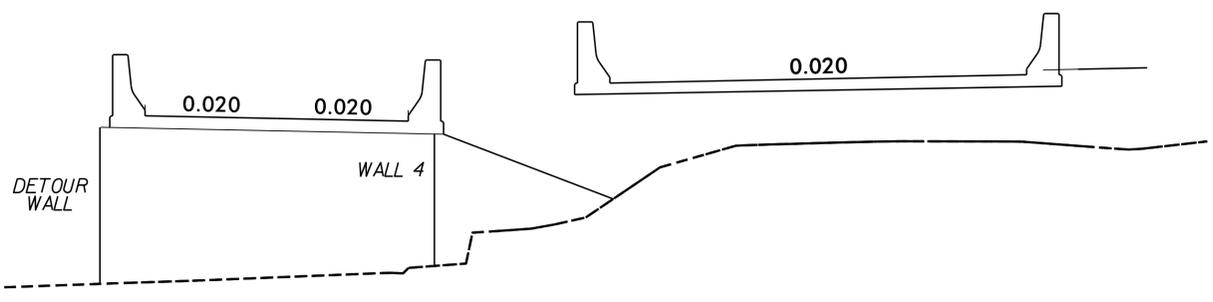


## PLAN

SHOWING RELATIONSHIP BETWEEN  
RETAINING WALL #4 AND TEMPORARY RETAINING WALL

### NOTES:

- FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.
- BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.
- DESIGN TEMPORARY DETOUR SHORING FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:  
 UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
 FRICTION ANGLE ( $\phi$ ) = 30 DEGREES  
 COHESION ( $c$ ) = 0 LB/SF
- LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY DETOUR SHORING. THE INFORMATION PROVIDED FOR TEMPORARY DETOUR SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.
- AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY DETOUR SHORINGS. SEE STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.
- WHEN BACKFILL FOR RETAINING WALLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR RETAINING WALLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.



## ELEVATION

PROJECT NO.: B-5136  
 CABARRUS COUNTY  
 STATION: 23+15.02 -L- TO 27+79.03 -L-  
 SHEET 2 OF 2

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-13
1			3			TOTAL SHEETS
2			4			13

PREPARED BY: EJS DATE: 1/15  
 REVIEWED BY: SCC DATE: 1/15

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

### HANDRAILS AND POSTS:

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990