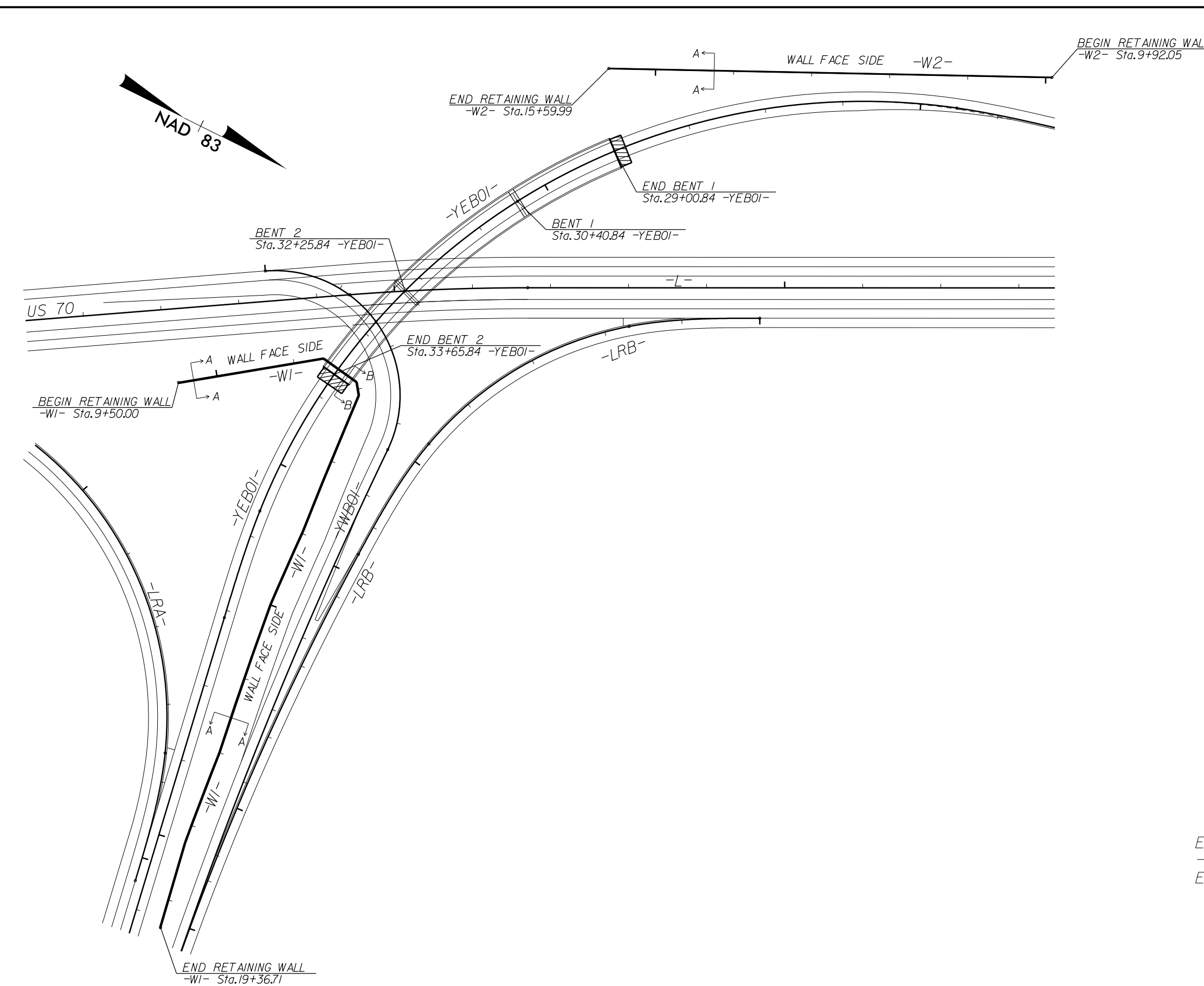


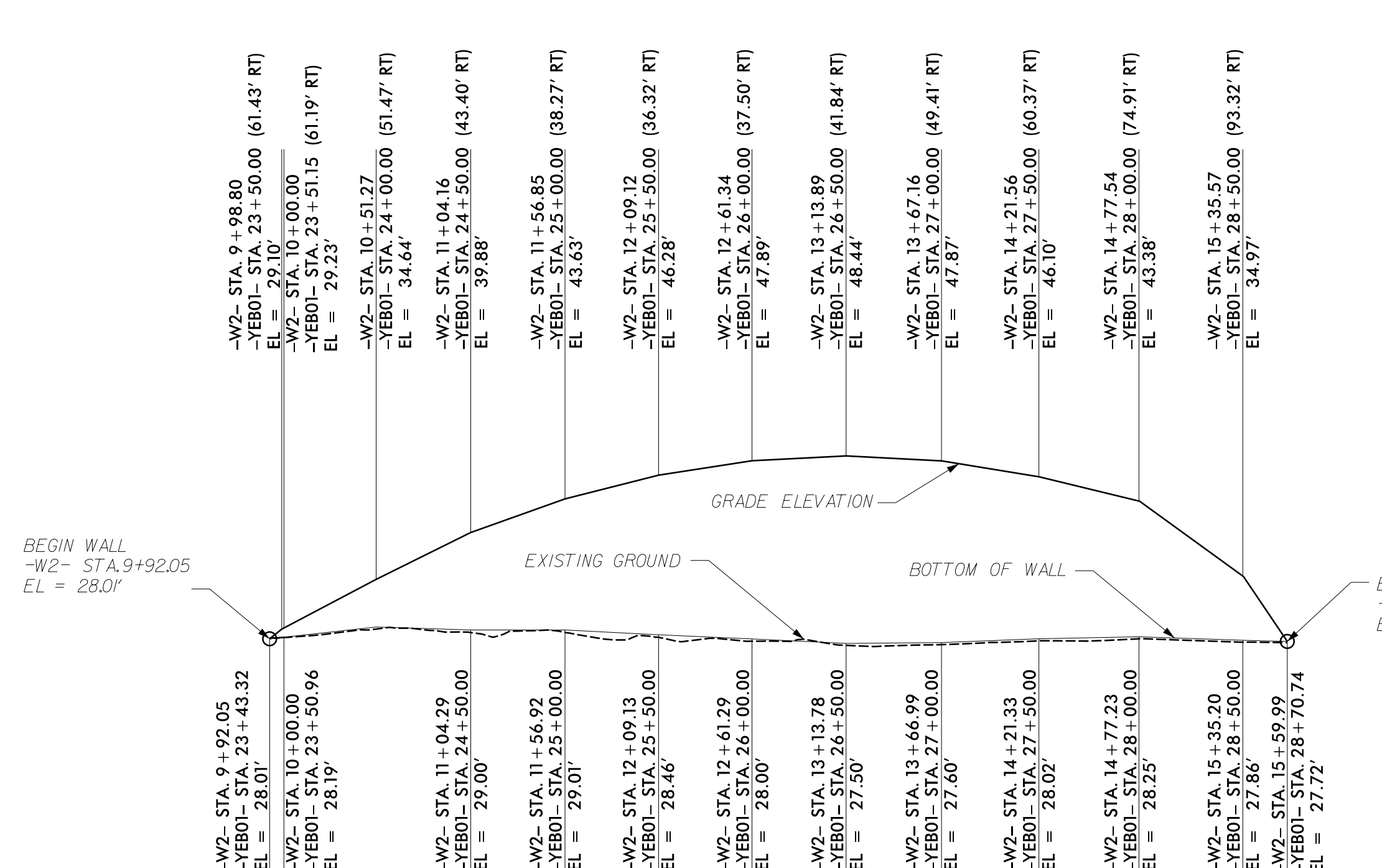
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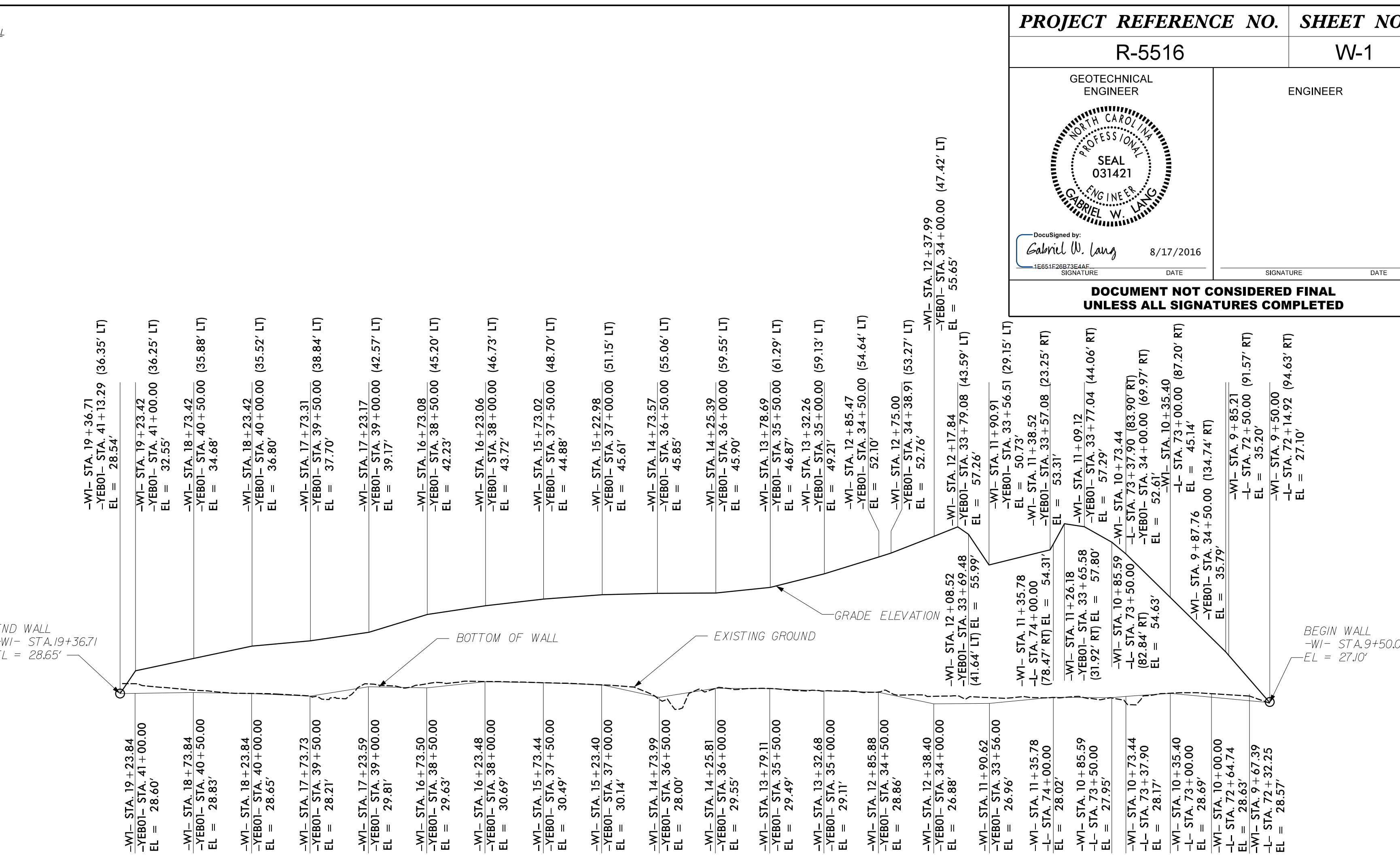
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PLAN VIEW FOR MSE RETAINING WALLS NO.1 AND NO. 2  
N.T.S.




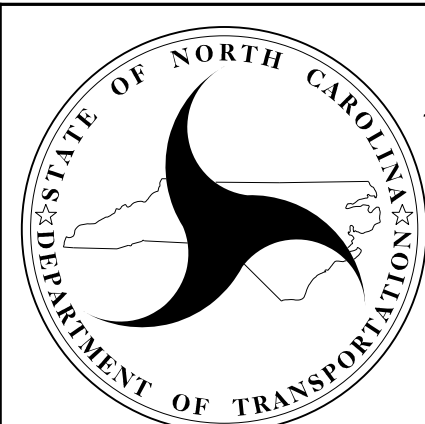
MSE RETAINING WALL NO.2 - EXPOSED WALL FACE ENVELOPE  
N.T.S.



MSE RETAINING WALL NO.1 - EXPOSED WALL FACE ENVELOPE  
N.T.S.

PREPARED BY: S. CROCKETT	DATE: 8-4-16
REVIEWED BY: G. LANG	DATE: 8-4-16







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

**GEOTECHNICAL  
ENGINEERING UNIT**

**MSE RETAINING WALLS 1 & 2  
PLAN VIEW &  
WALL ENVELOPE**

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

<b>PROJECT REFERENCE NO.</b> R-5516	<b>SHEET NO.</b> W-1
<p>GEOTECHNICAL ENGINEER</p>  <p>DocuSigned by: <i>Gabriel W. Lang</i> 8/17/2016</p>	<p>ENGINEER</p>
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>	

<b>PROJECT REFERENCE NO.</b> R-5516		<b>SHEET NO.</b> W-2	
GEOTECHNICAL ENGINEER  SEAL 031421 GABRIEL W. LANG		ENGINEER	
DocuSigned by: Gabriel W. Lang 8/17/2016		SIGNATURE DATE SIGNATURE DATE	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.  
 FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.  
 AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALLS NO.1 AND NO.2.  
 CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR THE VERTICAL EDGES WHERE WALL NO.1 AND NO.2 TIE TO BACKWALL  
 A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALLS NO.1 AND NO.2, PROVIDED COARSE AGGREGATE IS USED IN THE REINFORCED ZONE.  
 A DRAIN IS REQUIRED FOR RETAINING WALLS NO.1 AND NO.2.  
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS NO.1 AND 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 WALLS NO.1 AND NO.2 FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 100 YEARS
- 3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL SHALL BE AS SHOWN BELOW.
- 4) MINIMUM REINFORCEMENT LENGTH (L) SHALL BE AS SHOWN BELOW OR 6 FT, WHICHEVER IS LONGER
- 5) MINIMUM EMBEDMENT DEPTH FOR ABUTMENT FRONT FACE = H/10 OR 2 FT BELOW PROPOSED GRADE, WHICHEVER IS GREATER.

WALL NO.	STATION		ALIGNMENT	REINFORCEMENT LENGTH RATIO	MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL (KSF)
	FROM	TO			
1	9+50	13+00	W1	0.9H	6.8
	13+00	19+36	W1	0.9H	5.0
2	9+92	15+60	W2	0.9H	5.1

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 - WALL NO.1 STATION 9+50 TO 13+00	120	30	0
FOUNDATION - WALL NO.1 STATION 13+00 TO 19+36	120	29	0
FOUNDATION - WALL NO.2	120	30	0

DESIGN RETAINING WALLS NO.1 AND NO.2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L<sub>d</sub>) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.2 LOCATED AT STATION 33+65.84 -YEB01-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR SIGNS OR LIGHTING MAY BE LOCATED BEHIND RETAINING WALLS NO.1 AND NO.2 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 RETAINING WALLS NO.1 AND NO.2.

CONSTRUCT RETAINING WALL NO.1 BEFORE INSTALLING FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 33+65.84 -YEB01-.

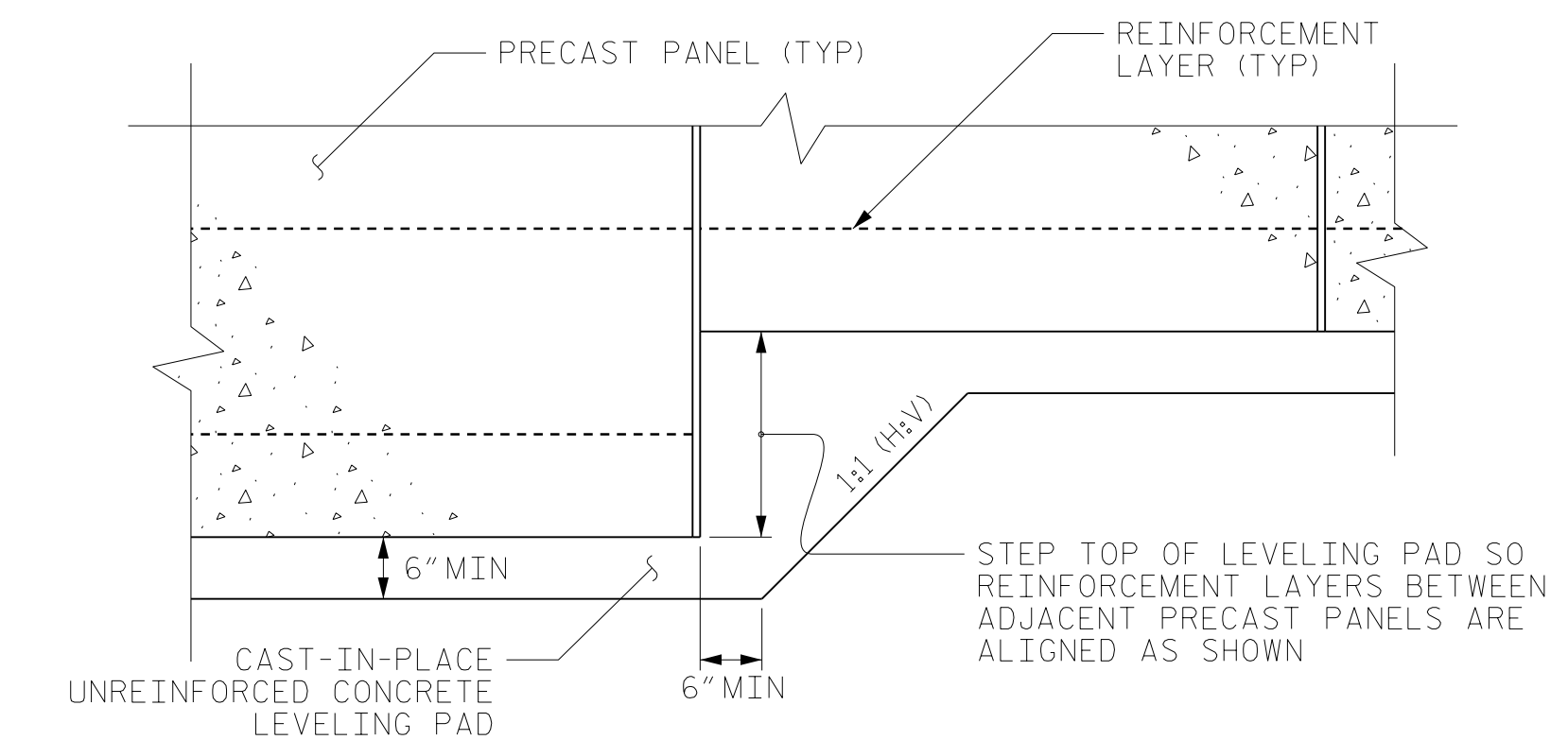
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS NO.1 AND 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

INSTALL A 16 GAGE, 24 INCH DIAMETER CORRUGATED STEEL PIPE FOR END BENT NO.2 LOCATED AT STATION 33+65.84 -YEB01- FOR RETAINING WALL NO.1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

THE COST FOR THE 16 GAGE, 24 INCH DIAMETER CORRUGATED STEEL PIPES FOR END BENT NO.2 LOCATED AT STATION 33+65.84 -YEB01- IS INCIDENTAL TO MSE RETAINING WALL NO.1.

UNDERCUT DEEPER THAN WALL EXCAVATION WILL BE REQUIRED AT MSE RETAINING WALLS NO.1 AND NO.2. SEE ROADWAY PLANS FOR THE UNDERCUT LIMITS. THE UNDERCUT WILL BE MEASURED BY ENGINEER AND PAID AS ROADWAY EXCAVATION.

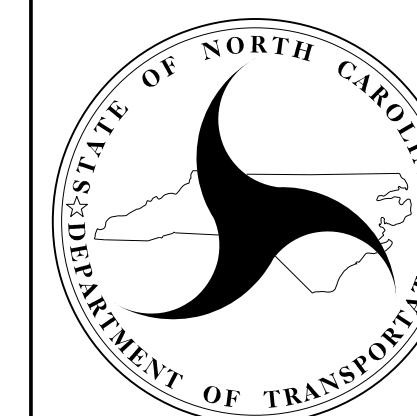
ESTIMATED MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL NO.1	17,700 SF
MSE RETAINING WALL NO.2	9,200 SF



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: S. CROCKETT	DATE: 8-4-16
REVIEWED BY: G. LANG	DATE: 8-4-16

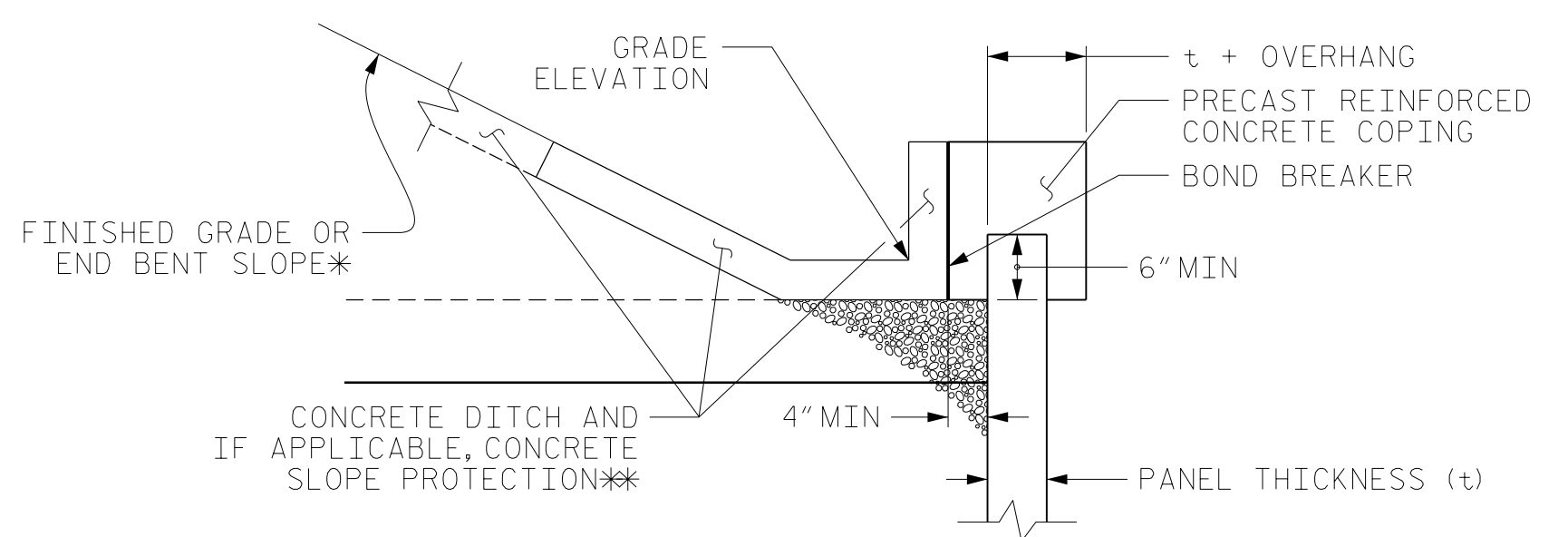
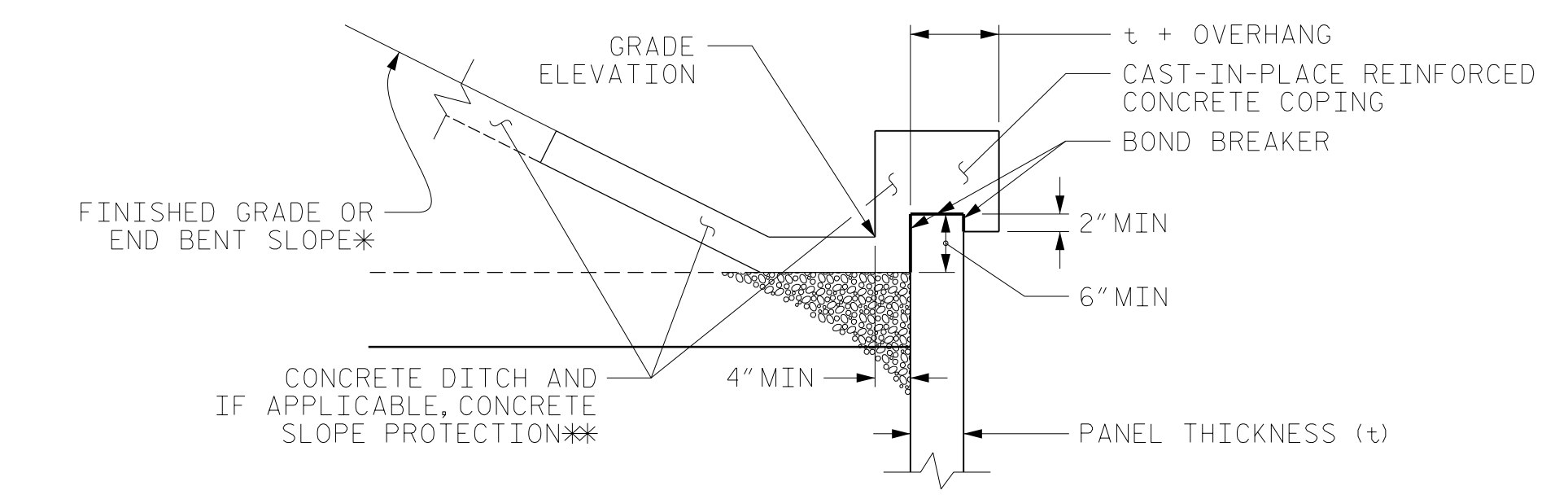
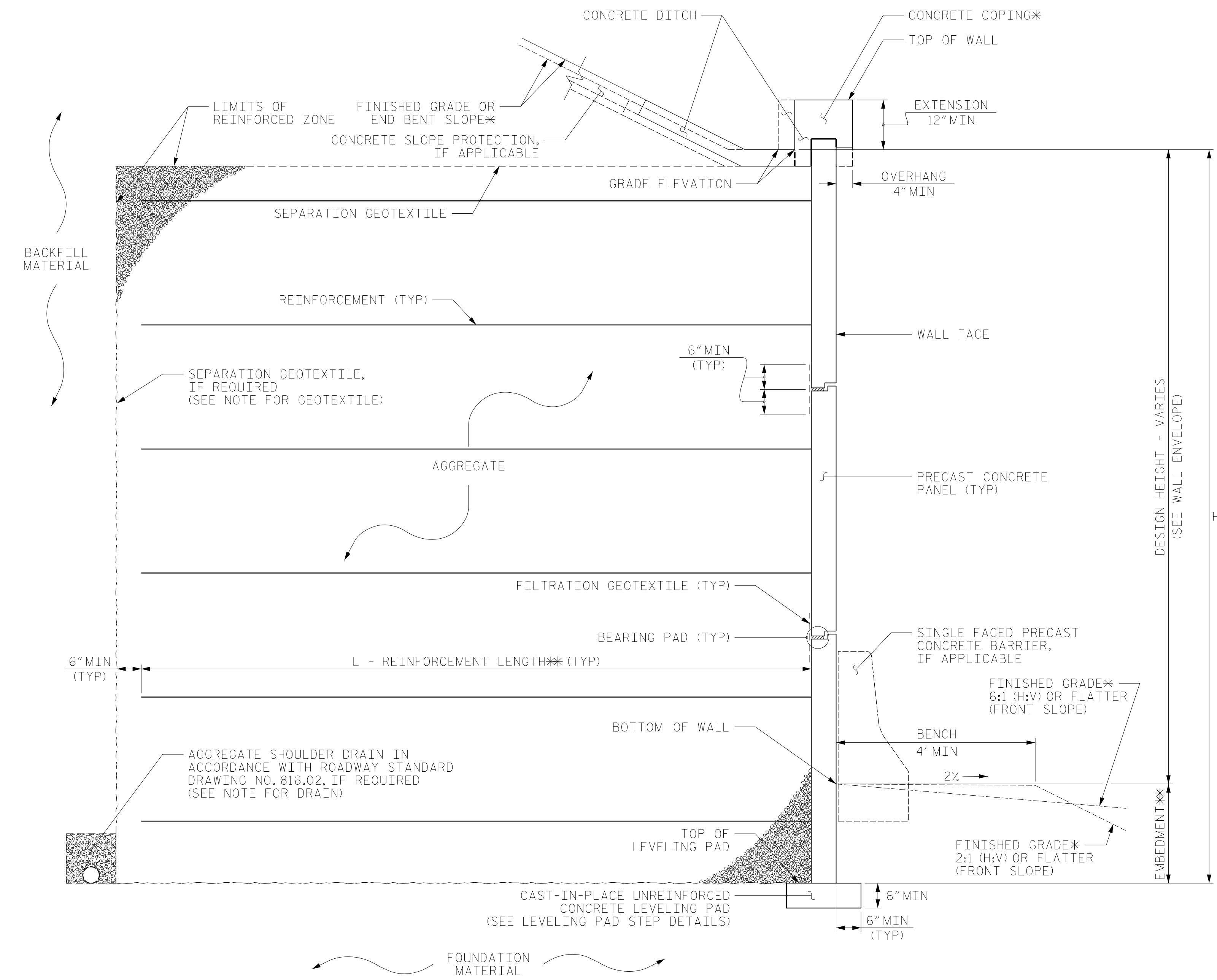


**NORTH CAROLINA  
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DIVISION OF HIGHWAYS**

**GEOTECHNICAL  
ENGINEERING UNIT**

**MSE RETAINING WALLS -  
NOTES**

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




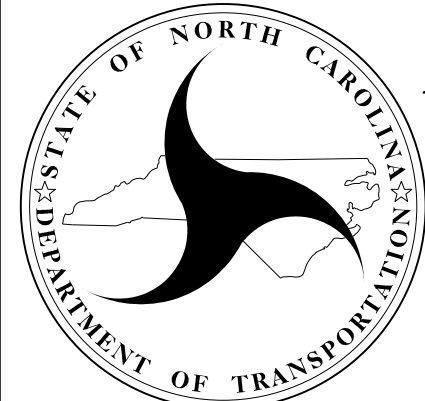
**MSE WALL WITH PRECAST PANELS - TYPICAL SECTION A-A (N.T.S)**

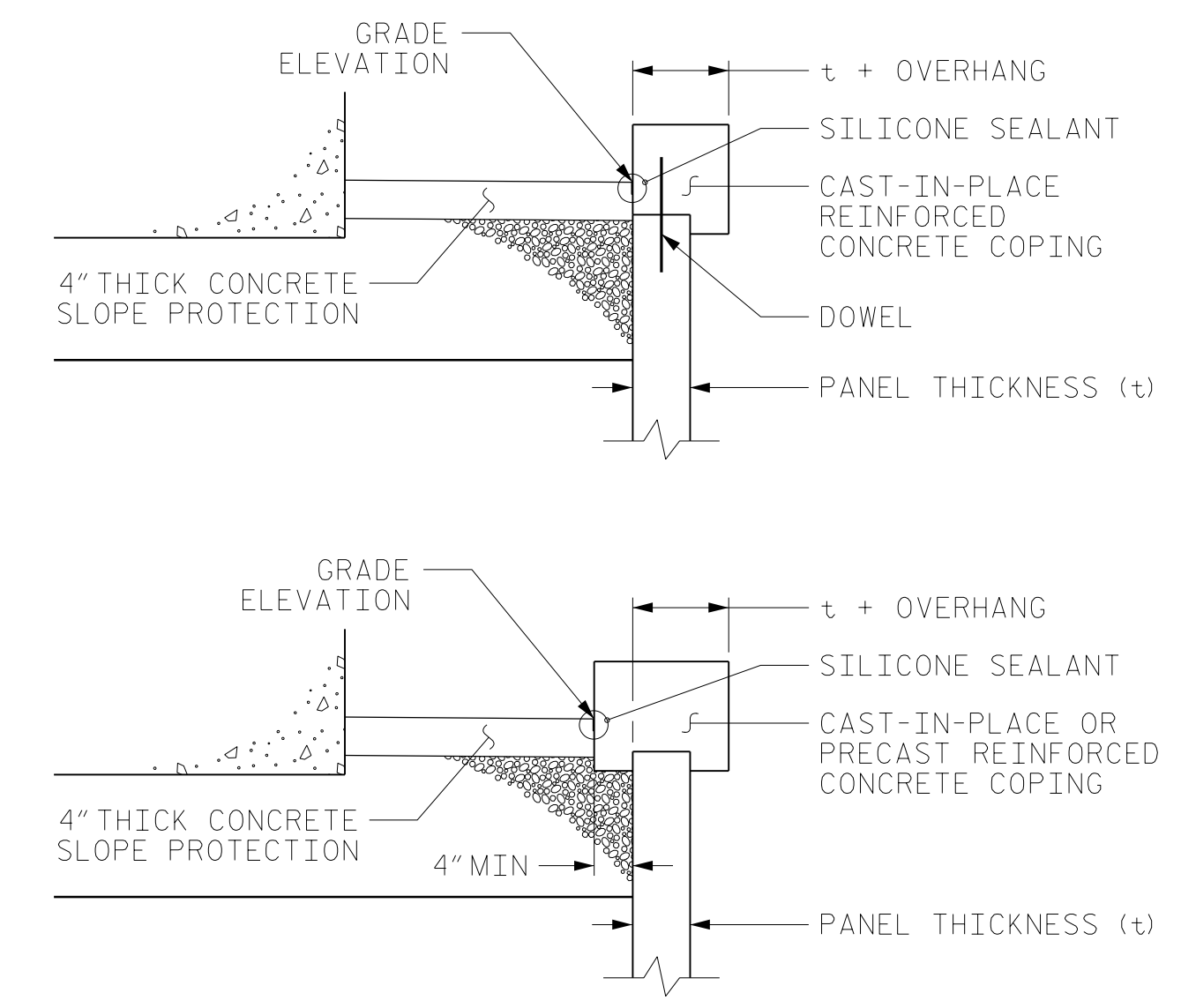
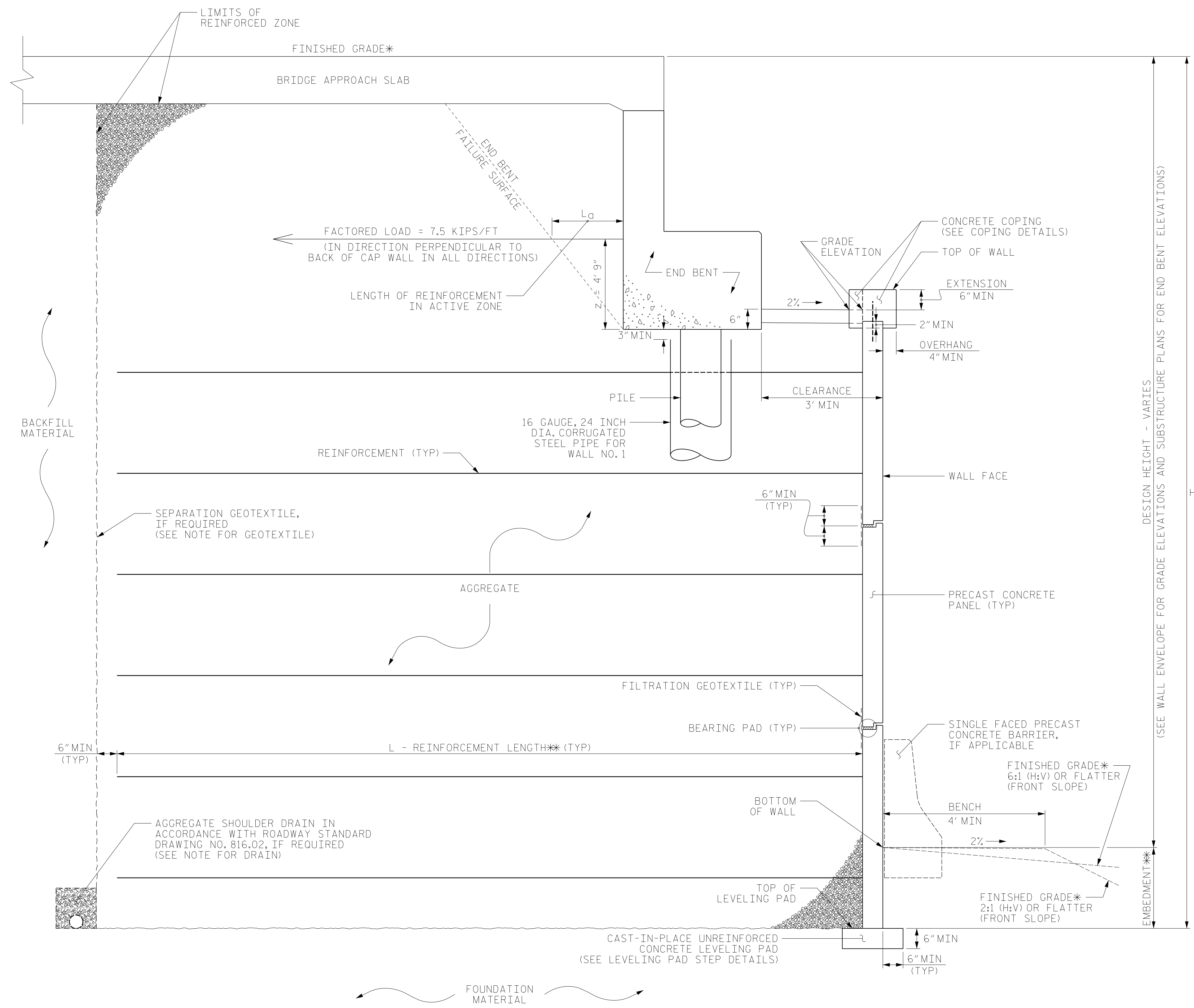
\*SEE COPING DETAILS AND PLANS FOR FINISHED GRADE OR END BENT SLOPE DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

**COPING DETAILS**

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

PREPARED BY: S. CROCKETT	DATE: 8-4-16
REVIEWED BY: G. LANG	DATE: 8-4-16

		NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	MSE RETAINING WALLS - TYPICAL SECTION A-A		
		GEOTECHNICAL ENGINEERING UNIT			
<b>REVISIONS</b>					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



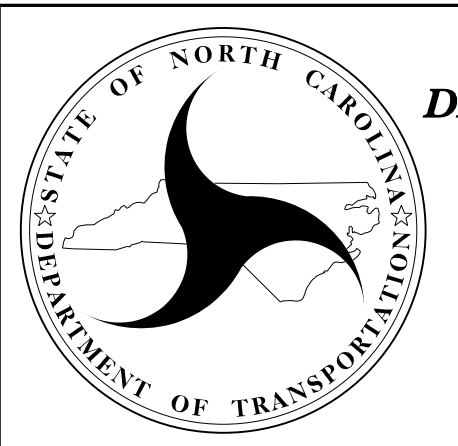
**COPING DETAILS**

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

**MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION B-B (N.T.S.)**

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

PREPARED BY: S. CROCKETT	DATE: 8-4-16
REVIEWED BY: G. LANG	DATE: 8-4-16



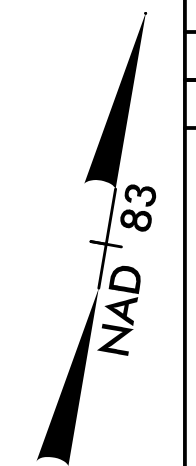
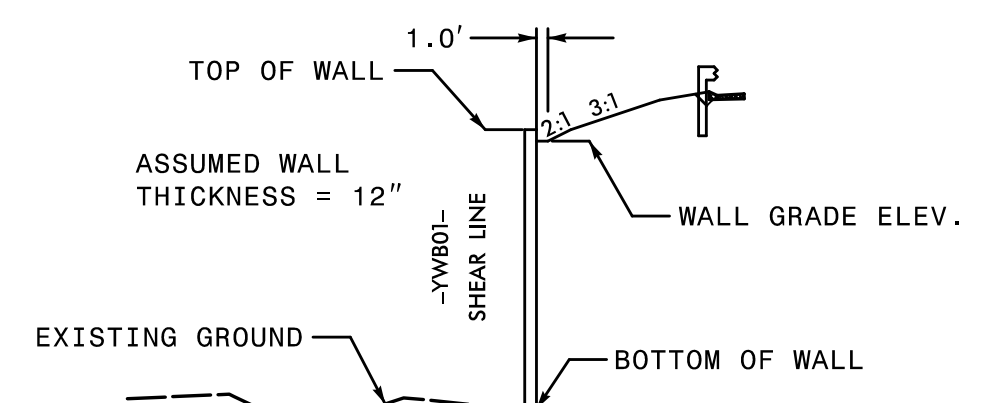
**NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS**

**GEOTECHNICAL  
 ENGINEERING UNIT**

MSE RETAINING WALLS - TYPICAL SECTION B-B					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

8/17/09

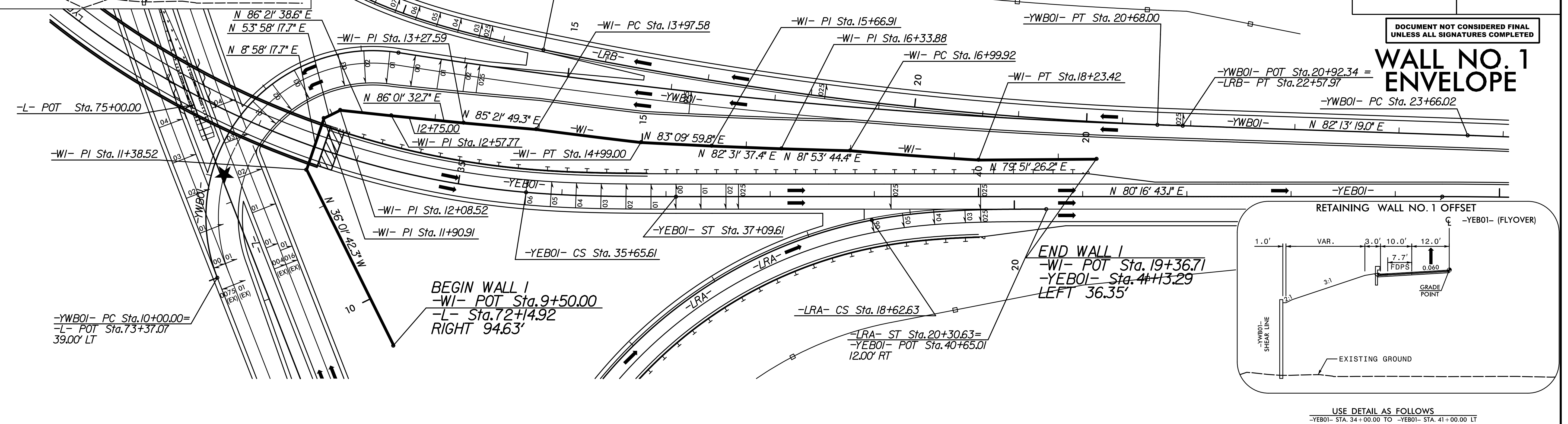
**TYPICAL RETAINING WALL SECTION**



PROJECT REFERENCE NO. R-5516	SHEET NO. W1
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	ENGINEER

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

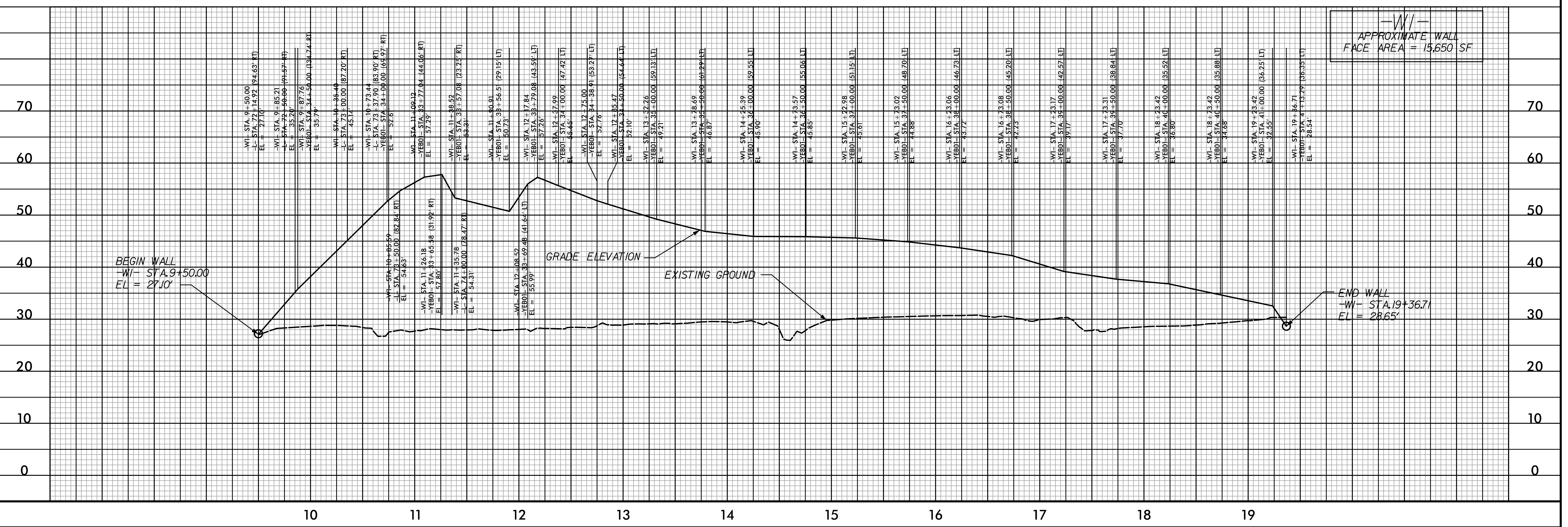
**WALL NO. 1 ENVELOPE**



USE DETAIL AS FOLLOWS  
-YEB01- STA. 34+00.00 TO -YEB01- STA. 41+00.00 LT

-WI-  
APPROXIMATE WALL  
FACE AREA = 13,650 SF

REVISIONS

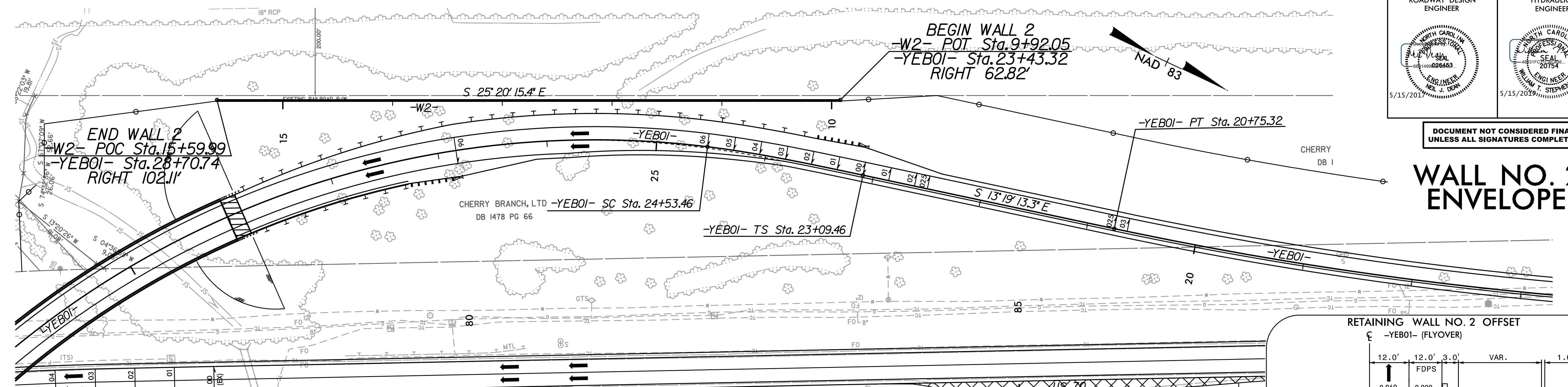


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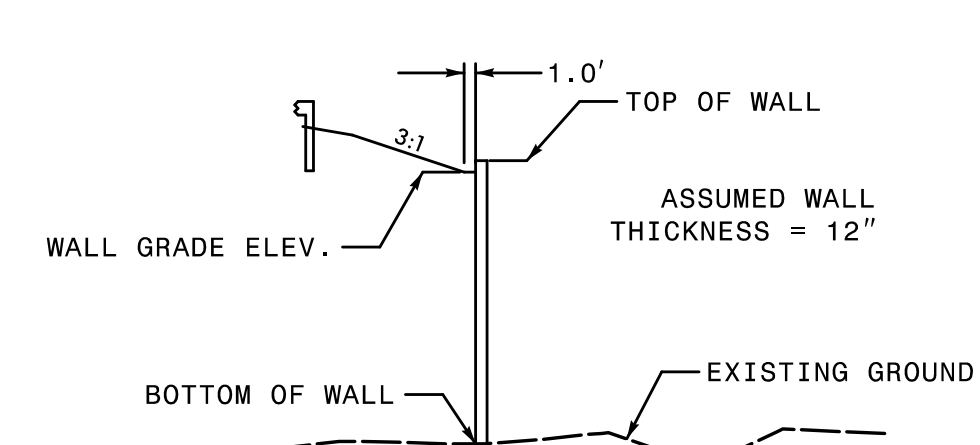
PROJECT REFERENCE NO. R-5516	SHEET NO. W2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

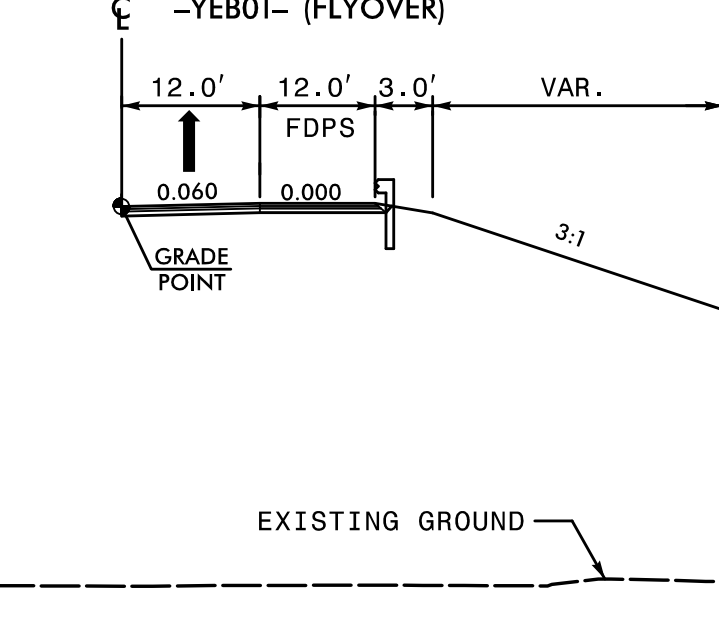
# WALL NO. 2 ENVELOPE



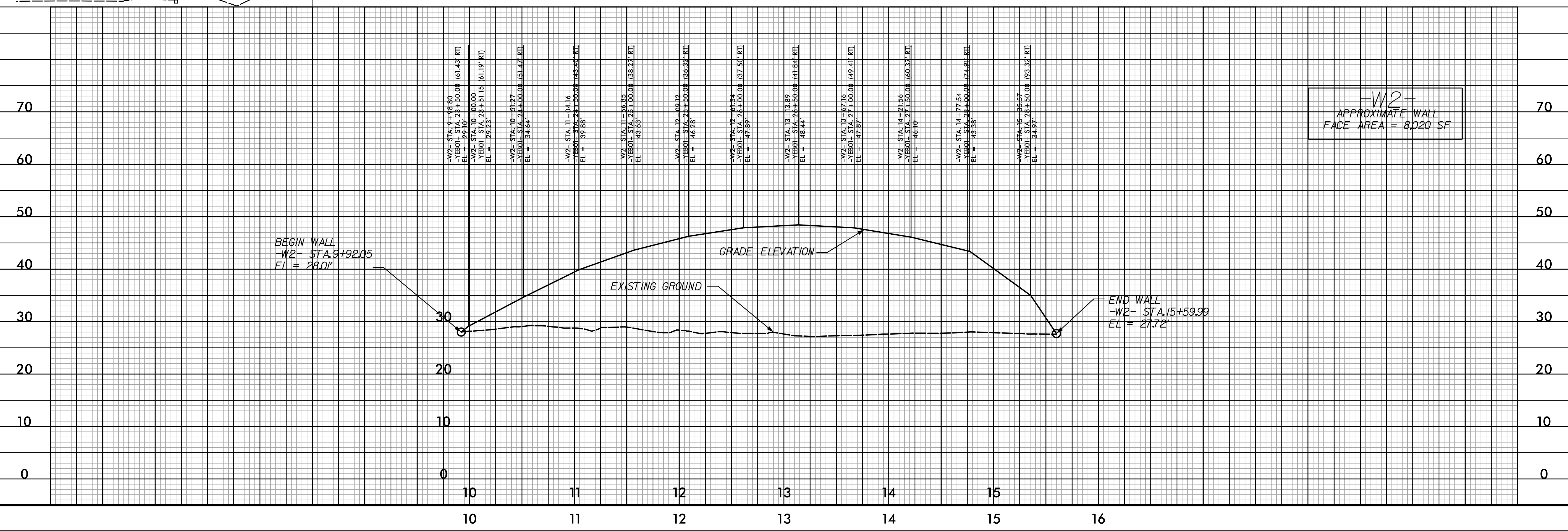
TYPICAL RETAINING WALL SECTION



RETAINING WALL NO. 2 OFFSET



USE DETAIL AS FOLLOWS  
-YEBOI- STA. 23+50.96 TO -YEBOI- STA. 29+00.00 RT



REVISIONS

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8/17/09