

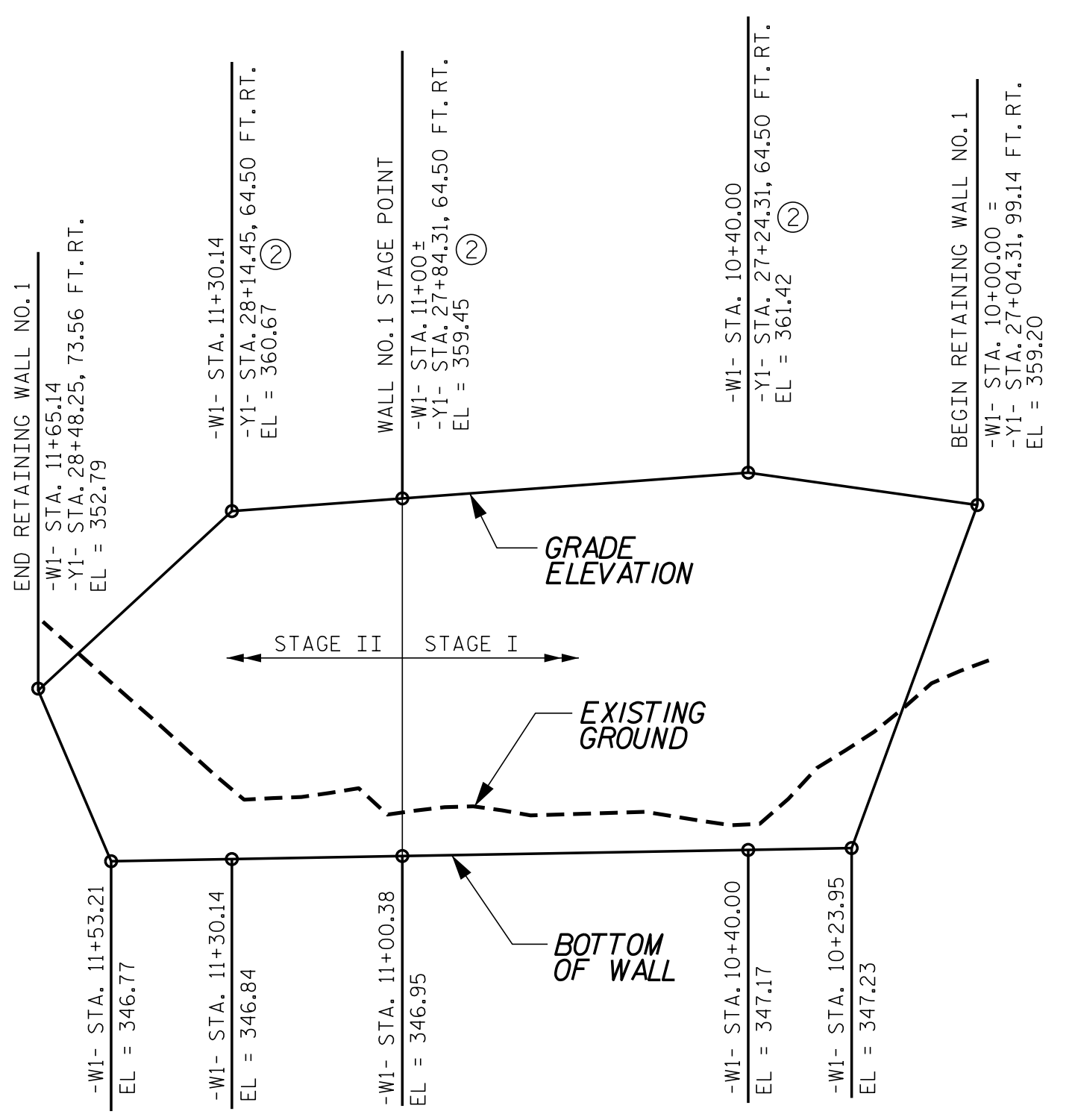
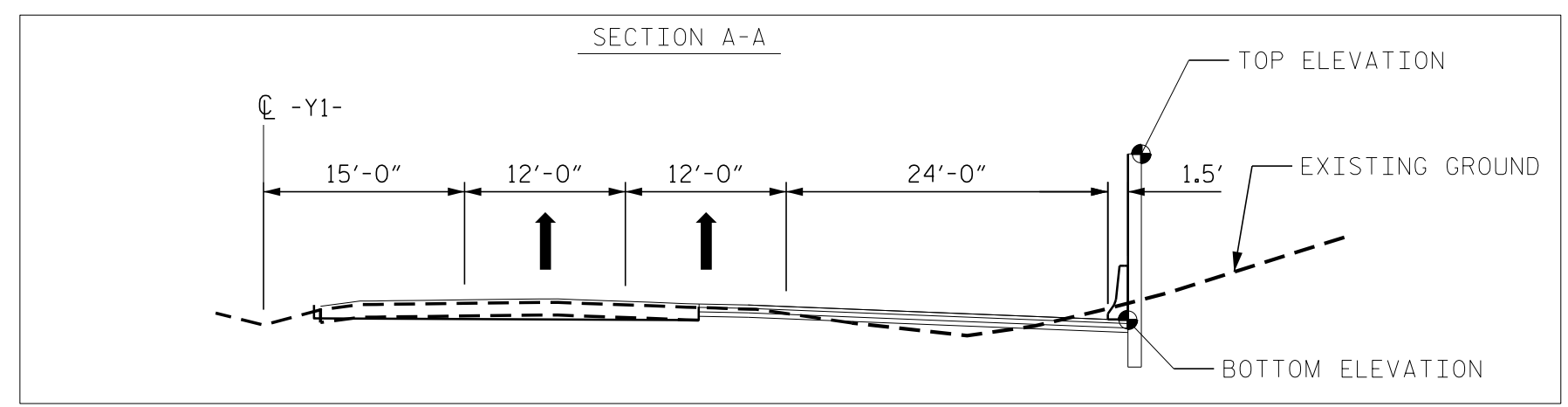
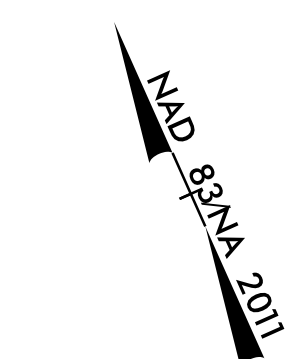
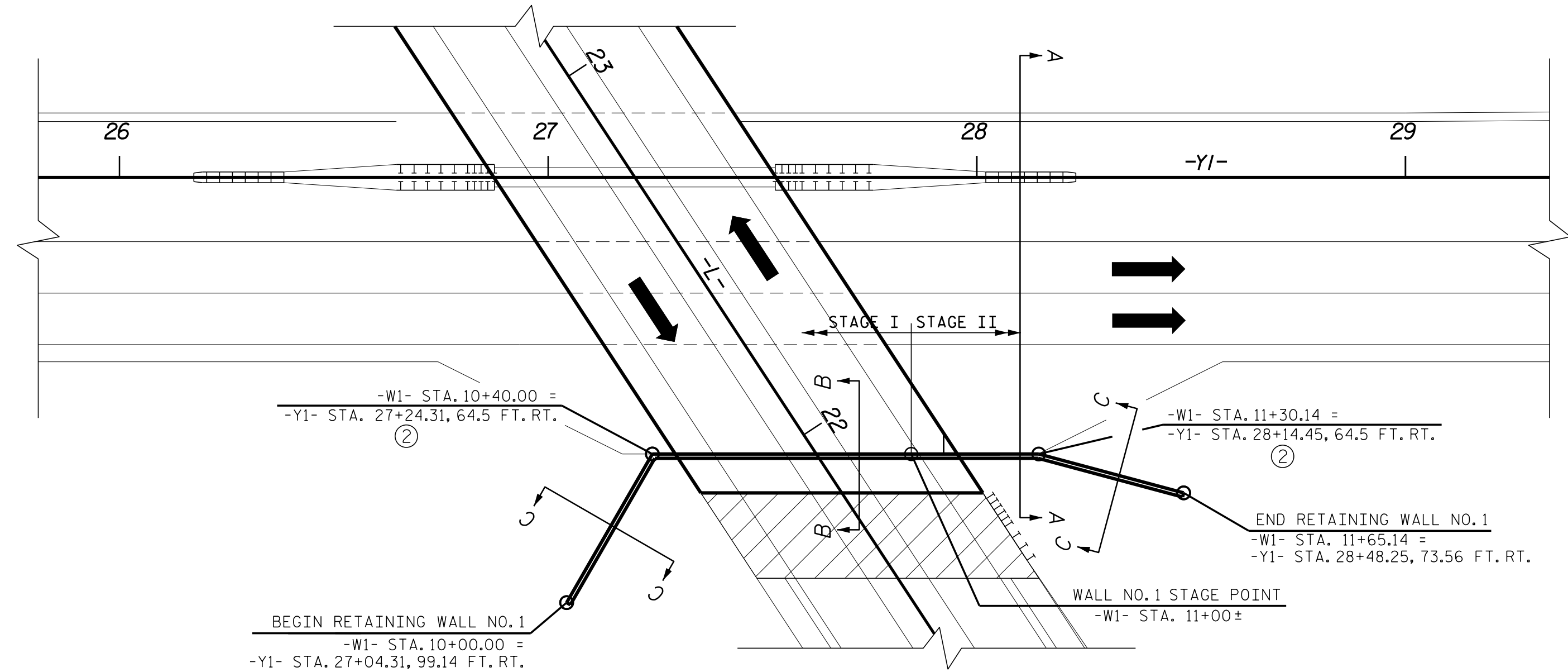
GEOTECHNICAL ENGINEER

ENGINEER

SEAL 032171

04/02/2024

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ESTIMATED MSE WALL NO. 1 QUANTITIES

MSE RETAINING WALL NO. 1*	2,300 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT**	1,750 SF

* QUANTITY INCLUDES EMBEDMENT AND EXTENSION
** QUANTITY BASED ON EXPOSED AREA

PROJECT NO.: 38454.1.1 (B-4654)
WAKE COUNTY
STATION: -L- 21+80.00
SHEET 1 OF 5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

RETAINING WALL NO. 1
PLAN VIEW AND
WALL ENVELOPE

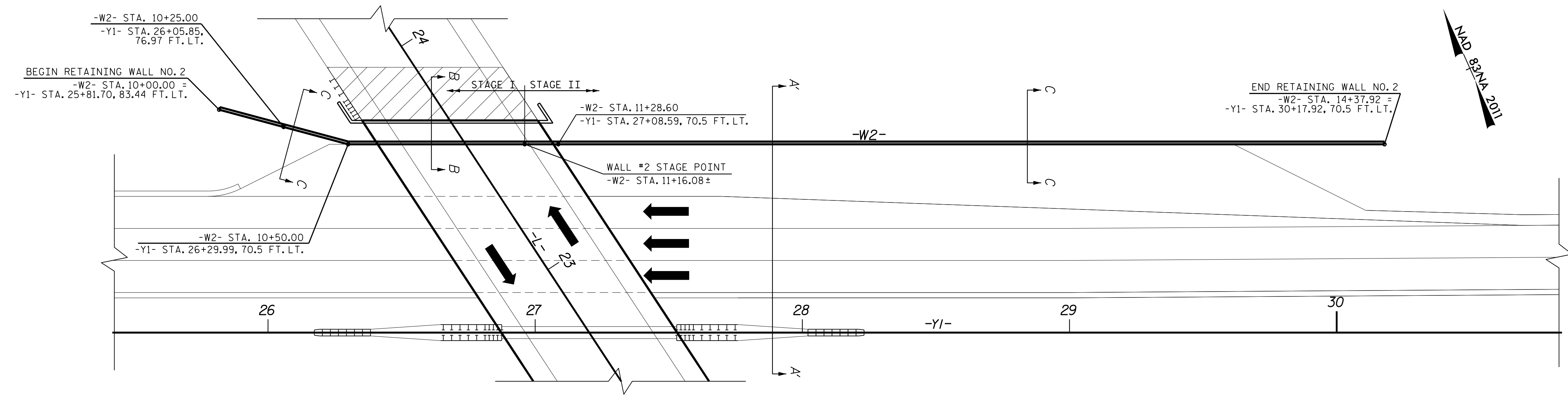
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	J. PARK	5/16/19	3		
2	J. PARK	4/2/24	4		

SHEET NO. W-1

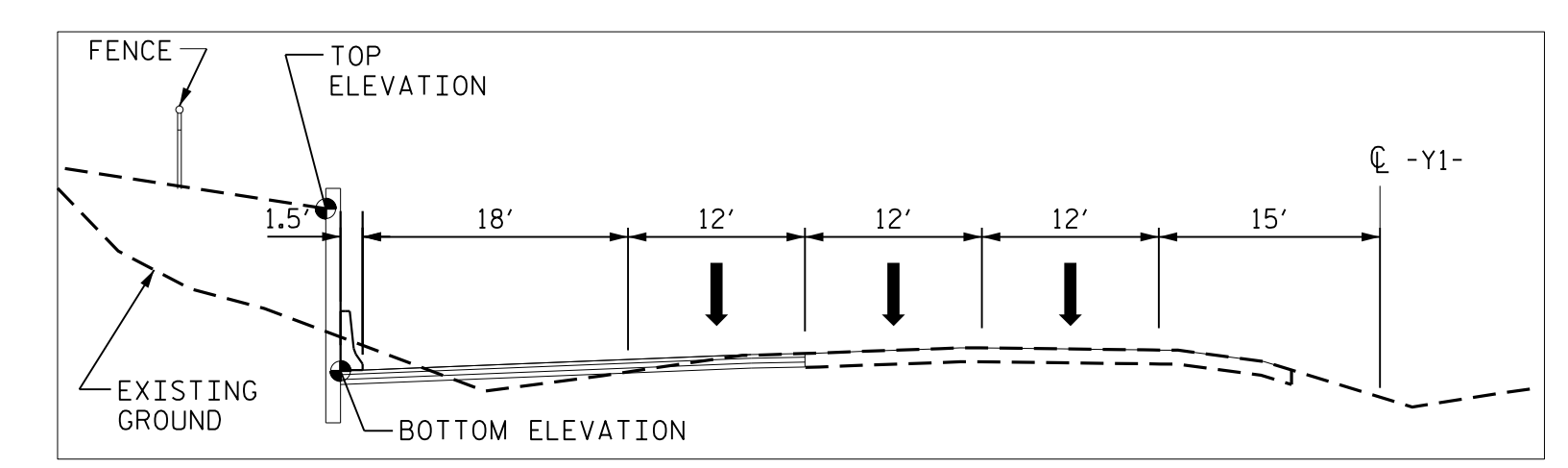
PREPARED BY: J. PARK DATE: 02 / 2019
REVIEWED BY: J. BATTS DATE: 02 / 2019

GEOTECHNICAL ENGINEER
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 032171
 ENGINEERS WINYOUNG PARK
 Documented by: *[Signature]* DATE: 5/20/2019
 DATE: SIGNATURE: DATE:

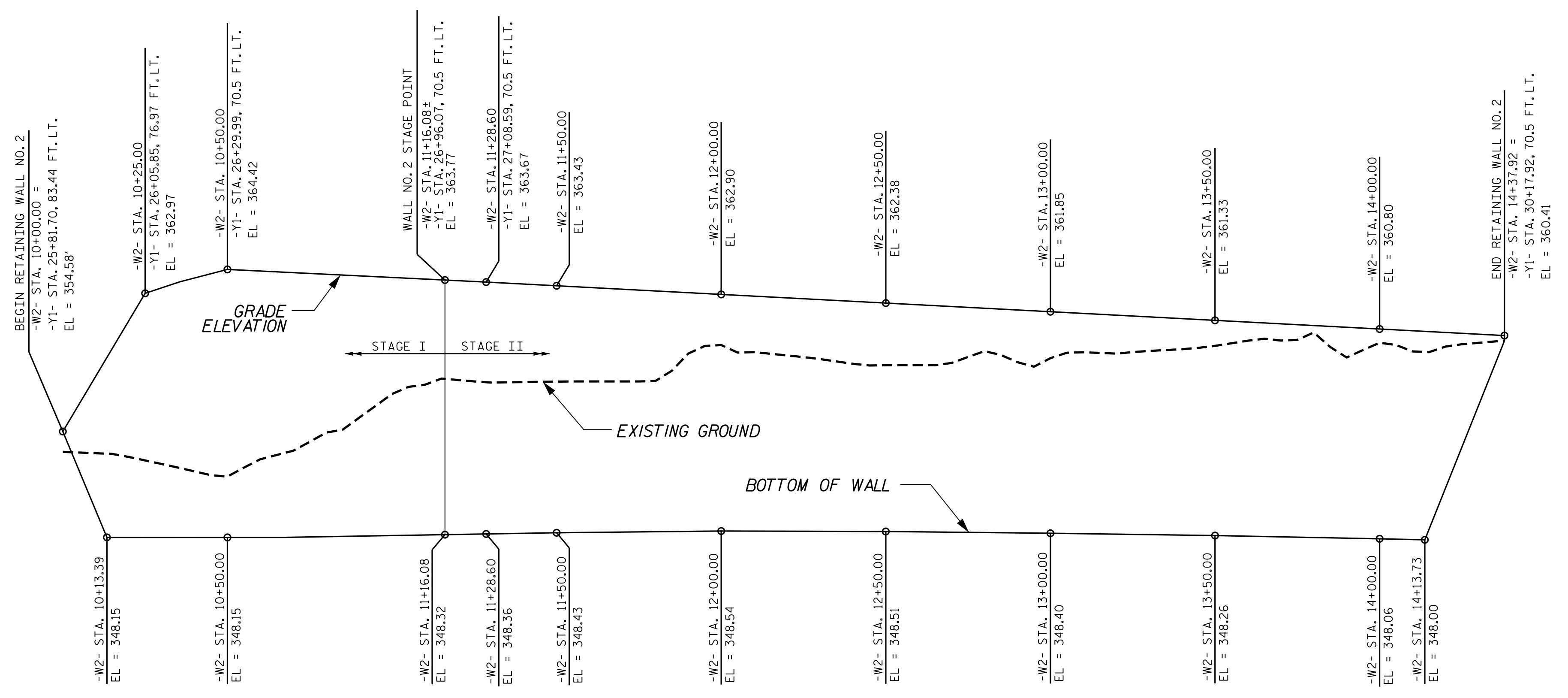
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PLAN VIEW FOR RETAINING WALL NO. 2



TYPICAL A'-A' SECTION



WALL ENVELOPE FOR RETAINING WALL NO. 2
EXPOSED WALL FACE VIEW, N.T.S.

ESTIMATED MSE WALL NO. 2 QUANTITIES	
MSE RETAINING WALL NO. 2*	7,300 SF
ARCHITECTURAL CONCRETE SURFACE TREATMENT**	6,000 SF

* QUANTITY INCLUDES EMBEDMENT AND EXTENSION
 ** QUANTITY BASED ON EXPOSED AREA

PROJECT NO.: 38454.1.1 (B-4654)
 WAKE COUNTY
 STATION: -L- 23+60.00
 SHEET 2 OF 5

NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL
 ENGINEERING UNIT

REVISIONS						SHEET NO. W-2
NO.	BY	DATE	NO.	BY	DATE	
1	J. PARK	5/16/19	3			
2			4			

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 REVIEWED BY: J. BATTS DATE: 02/2019

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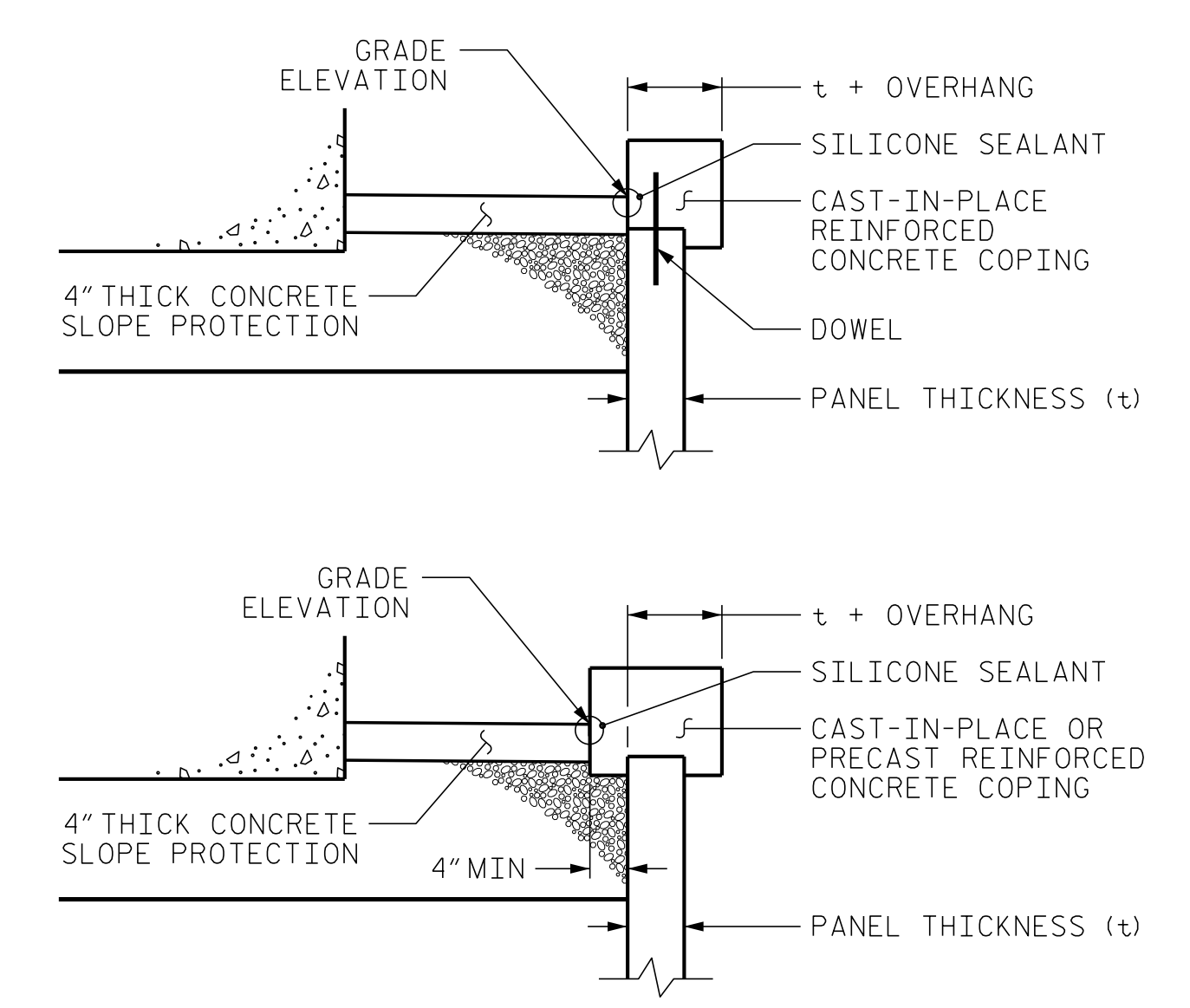
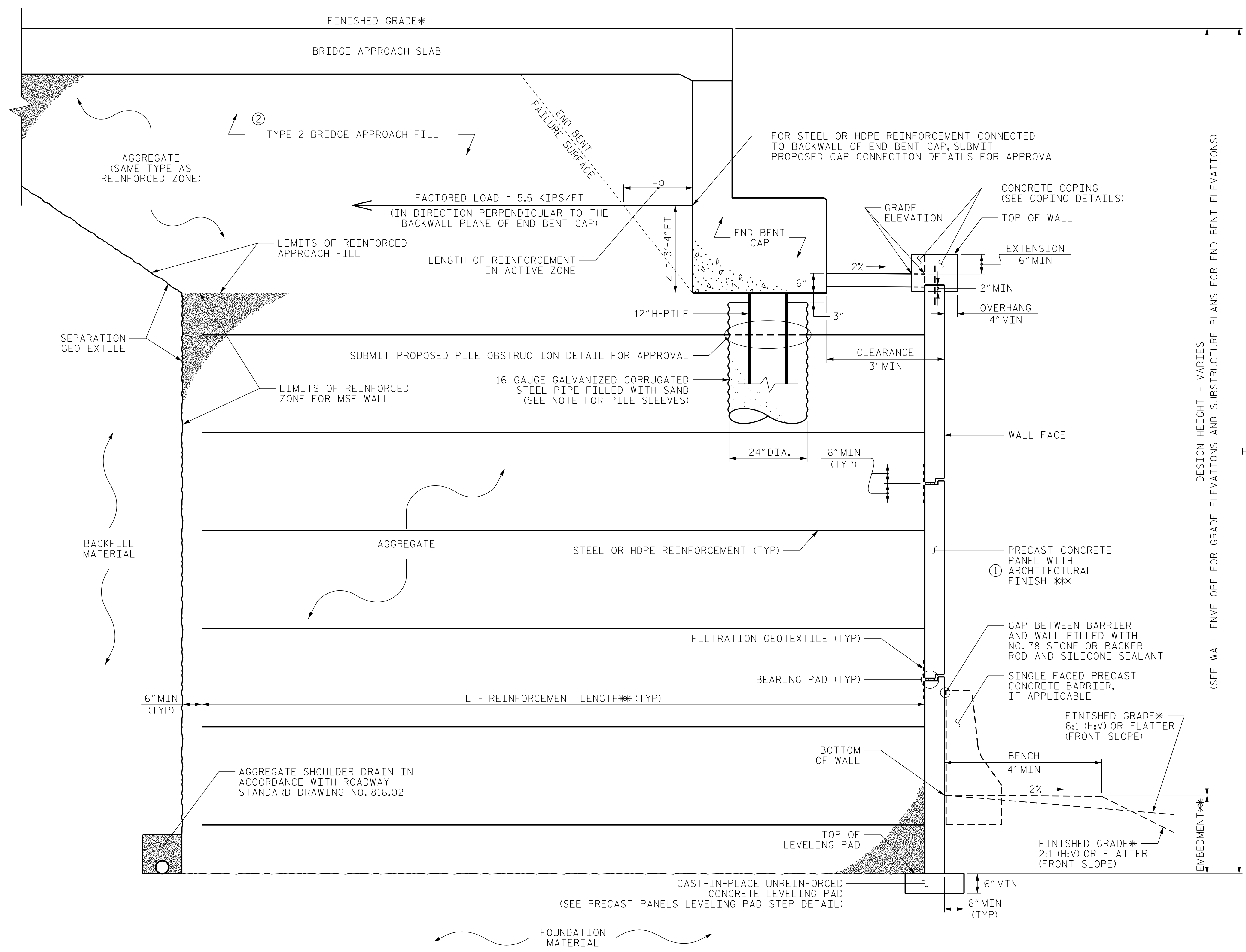
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SEAL 032171

DocuSigned by: *[Signature]* 09/06/2023

DATE SIGNATURE DATE

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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 B-B SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
 **SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.
 ***SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT (SPECIAL) PROVISION.

PROJECT NO.: 38454.1.1 (B-4654)
 WAKE COUNTY
 STATION: -L- 21+80.00 / -L- 23+60.00
 SHEET 3 OF 5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

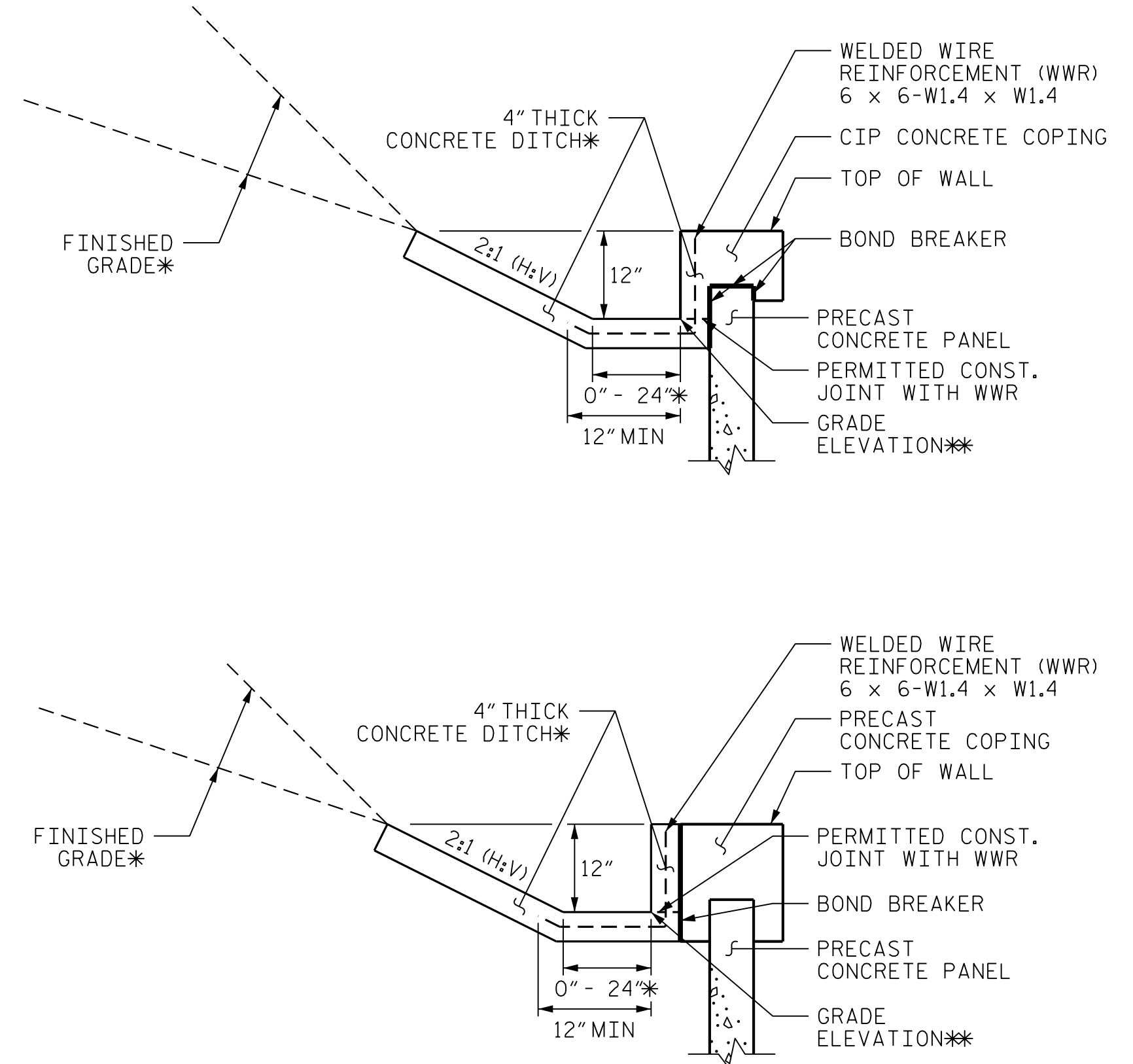
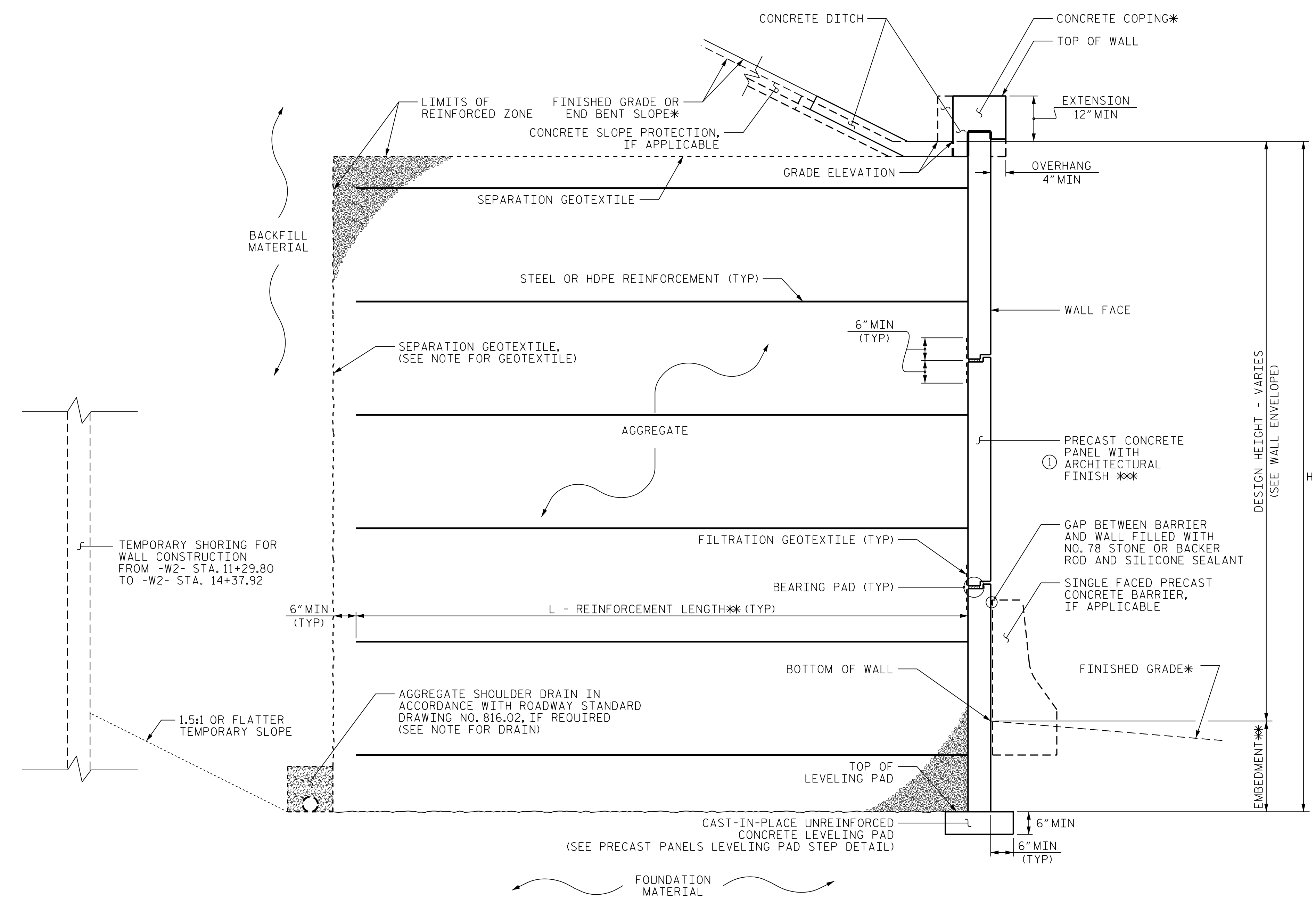
GEOTECHNICAL ENGINEERING UNIT

TYPICAL B-B SECTION AND COPING DETAILS FOR MSE ABUTMENT WALL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	J. PARK	5/16/19	3		
2	J. PARK	9/6/23	4		

SHEET NO. W-3

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REVIEWED BY: J. BATTS	DATE: 02 / 2019



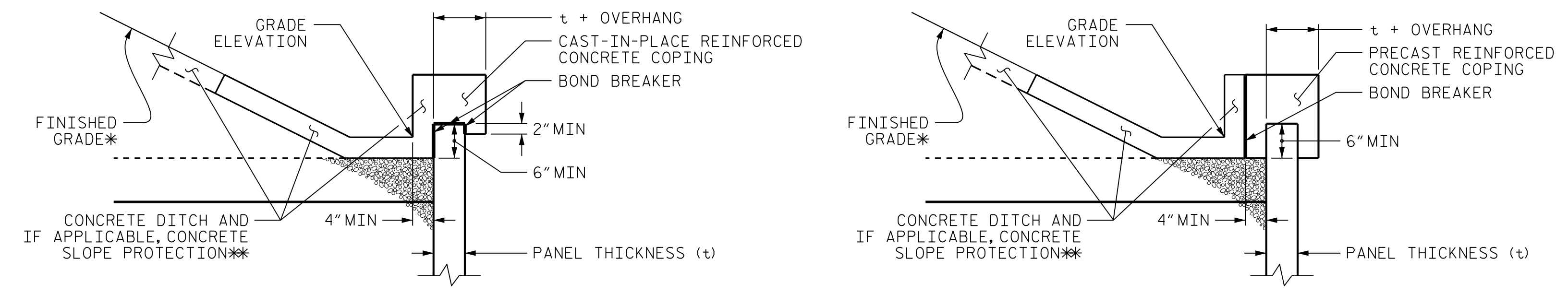
MSE WALL WITH PRECAST PANELS - TYPICAL C-C SECTION

*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.
 ***SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT (SPECIAL) PROVISION.

① CONCRETE DITCH BEHIND WALL WITH CONCRETE COPING

*SEE ROADWAY PLANS FOR CONCRETE DITCH AND FINISHED GRADE DETAILS.
 **SEE WALL ENVELOPE FOR GRADE ELEVATIONS.

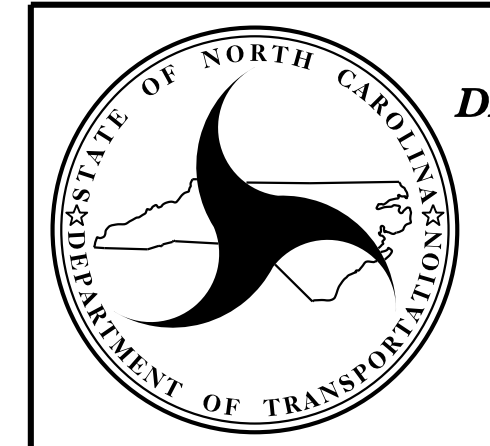
FOR CONCRETE DITCHES, SEE SECTION 850 OF THE STANDARD SPECIFICATIONS.



COPING DETAILS

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

PREPARED BY: J. PARK	DATE: 02/2019
REVIEWED BY: J. BATTS	DATE: 02/2019



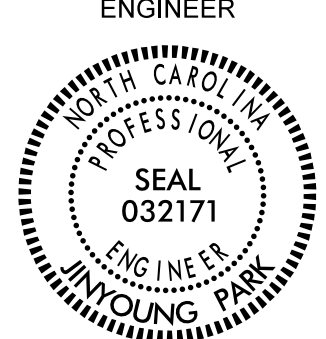
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.: 38454.1.1 (B-4654)
 WAKE COUNTY
 STATION: -L- 21+80.00 / -L- 23+60.00
 SHEET 4 OF 5

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	J. PARK	5/16/19	3			W-4
2			4			

GEOTECHNICAL ENGINEER

ENGINEER



DocuSigned by:
J. Park
09/06/2023

DATE SIGNATURE DATE

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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.

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

① USE AN MSE WALL SYSTEM WITH PRECAST PANELS USING ASHLAR STONE PATTERN AND FS #36176 COLOR STAIN FOR RETAINING WALL NO.1 AND NO.2. MSE CONCRETE COPING DOES NOT RECEIVE STAIN. FOR ARCHITECTURAL FINISH, SEE ARCHITECTURAL CONCRETE SURFACE TREATMENT (SPECIAL) PROVISION.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO.1 AND NO.2.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1 AND NO.2.

A DRAIN IS REQUIRED FOR RETAINING WALL NO.1 AND NO.2.

PILE SLEEVES ARE REQUIRED AROUND PILES FOR END BENT NO.1 LOCATED AT STATION 21+83.80 -L- AND END BENT NO.2 LOCATED AT STATION 23+66.80 -L-.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 AND NO.2, SURVEY WALL LOCATION AND SUBMIT 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.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 = 5,750 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS GREATER FOR B-B SECTION
MINIMUM REINFORCEMENT LENGTH (L) = 0.85H OR 6 FT, WHICHEVER IS GREATER FOR C-C SECTION
- 5) 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.

6) 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

DESIGN RETAINING WALL 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) SHOWN. CAST REINFORCEMENT OR CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 21+83.80 -L- AND END BENT NO.2 LOCATED AT STATION 23+66.80 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN REINFORCEMENT OR CONNECTORS AND REINFORCING STEEL IN CAP.

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 AND NO.2.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 21+83.80 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 23+66.80 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

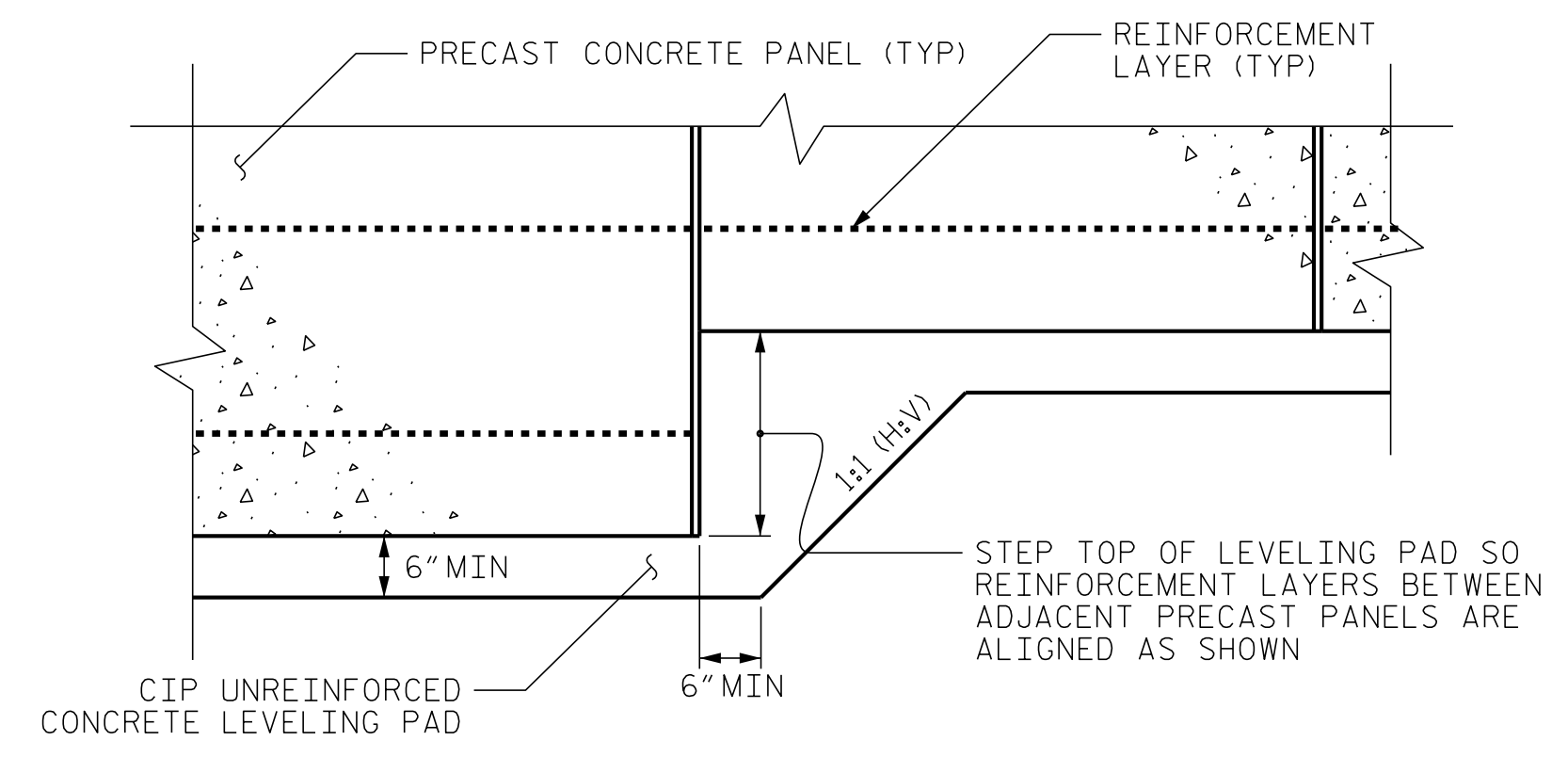
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 AND NO.2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING FOR WALL CONSTRUCTION" IS REQUIRED FOR RETAINING WALL NO.2 FROM -W2- STA. 11+29.80 TO -W2- STA. 14+37.92 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY PLANS.

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC IS REQUIRED FOR RETAINING WALL NO.1 AND NO.2. SEE TRAFFIC CONTROL PLANS.

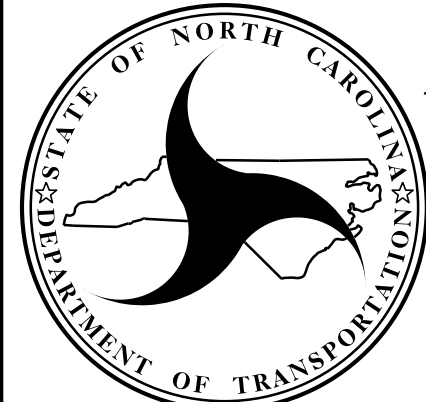
RETAINING WALL NO.1 AND NO.2 FOR STAGE I SHALL BE CONSTRUCTED DURING TRAFFIC PHASE I AND II. RETAINING WALL NO.1 AND NO.2 FOR STAGE II SHALL BE CONSTRUCTED DURING TRAFFIC PHASE III AND IV. FOR TRAFFIC PHASE, SEE TRANSPORTATION MANAGEMENT PLANS.

① DESIGN RETAINING WALL NO.1 AND NO.2 FOR STAGING POINTS LOCATED AS SHOWN ON PLAN.



**PRECAST PANELS
LEVELING PAD STEP DETAIL**

PROJECT NO.: 38454.1.1 (B-4654)
WAKE COUNTY
STATION: -L- 21+80.00 / -L- 23+60.00
SHEET 5 OF 5



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

**GEOTECHNICAL
ENGINEERING UNIT**

REVISIONS						SHEET NO. W-5
NO.	BY	DATE	NO.	BY	DATE	
1	J. PARK	5/16/19	3			
2	J. PARK	9/6/23	4			

PREPARED BY: J. PARK	DATE: 02 / 2019
REVIEWED BY: J. BATTS	DATE: 02 / 2019