


RW SHEET NO.		ROADWAY DESIGN ENGINEER  11/7/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

SHEET NUMBER	INDEX OF SHEETS SHEET
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1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
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X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-16	STRUCTURE PLANS
SSN	STANDARD NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 III.

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 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. 560.01

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.

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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 Duke Energy Progress, TWC/Charter Communication/Spectrum, Aqua America, PSNC
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.






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

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:





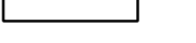



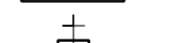


STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class B Rip Rap

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS







BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	—X—X—X—
Proposed Woven Wire Fence	—○—
Proposed Chain Link Fence	—□—
Proposed Barbed Wire Fence	—◇—
Existing Wetland Boundary	—WLB—
Proposed Wetland Boundary	—WLB—
Existing Endangered Animal Boundary	—EAB—
Existing Endangered Plant Boundary	—EPB—
Existing Historic Property Boundary	—HPB—
Known Contamination Area: Soil	—S—S—S—S—
Potential Contamination Area: Soil	—S—S—S—S—
Known Contamination Area: Water	—W—W—W—W—
Potential Contamination Area: Water	—W—W—W—W—
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	
Jurisdictional Stream	—JS—
Buffer Zone 1	—BZ 1—
Buffer Zone 2	—BZ 2—
Flow Arrow	
Disappearing Stream	—>—
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	


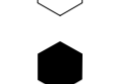
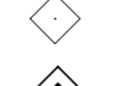


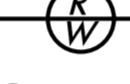



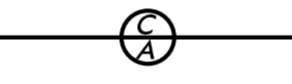


RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	—+—+—+—+—
RR Dismantled	—-—-—-—-—-—


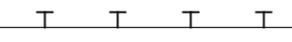
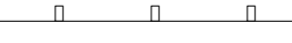




Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering



RIGHT OF WAY & PROJECT CONTROL:


Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easement Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	—R/W—
New Right of Way Line	—R/W—
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete RW Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	—E—
New Temporary Construction Easement	—E—
New Temporary Drainage Easement	—TDE—
New Permanent Drainage Easement	—PDE—
New Permanent Drainage / Utility Easement	—DUE—
New Permanent Utility Easement	—PUE—
New Temporary Utility Easement	—TUE—
New Aerial Utility Easement	—AUE—

ROADS AND RELATED FEATURES:


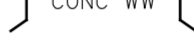

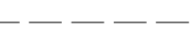



Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	—C—
Proposed Slope Stakes Fill	—F—
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:










Single Tree	
Single Shrub	

Hedge	
Woods Line	
Orchard	
Vineyard	







EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	_____
Storm Sewer Manhole	
Storm Sewer	—S—





UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	—P—
U/G Power Line LOS C (S.U.E.*)	—P—
U/G Power Line LOS D (S.U.E.*)	—P—




TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	—T—
U/G Telephone Cable LOS C (S.U.E.*)	—T—
U/G Telephone Cable LOS D (S.U.E.*)	—T—
U/G Telephone Conduit LOS B (S.U.E.*)	—TC—
U/G Telephone Conduit LOS C (S.U.E.*)	—TC—
U/G Telephone Conduit LOS D (S.U.E.*)	—TC—
U/G Fiber Optics Cable LOS B (S.U.E.*)	—T FO—
U/G Fiber Optics Cable LOS C (S.U.E.*)	—T FO—
U/G Fiber Optics Cable LOS D (S.U.E.*)	—T FO—



WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	—W—
U/G Water Line LOS C (S.U.E.*)	—W—
U/G Water Line LOS D (S.U.E.*)	—W—
Above Ground Water Line	—A/G Water—



TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	—TV—
U/G TV Cable LOS C (S.U.E.*)	—TV—
U/G TV Cable LOS D (S.U.E.*)	—TV—
U/G Fiber Optic Cable LOS B (S.U.E.*)	—TV FO—
U/G Fiber Optic Cable LOS C (S.U.E.*)	—TV FO—
U/G Fiber Optic Cable LOS D (S.U.E.*)	—TV FO—










GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	—G—
U/G Gas Line LOS C (S.U.E.*)	—G—
U/G Gas Line LOS D (S.U.E.*)	—G—
Above Ground Gas Line	—A/G Gas—

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	—SS—
Above Ground Sanitary Sewer	—A/G Sanitary Sewer—
SS Forced Main Line LOS B (S.U.E.*)	—FSS—
SS Forced Main Line LOS C (S.U.E.*)	—FSS—
SS Forced Main Line LOS D (S.U.E.*)	—FSS—

MISCELLANEOUS:

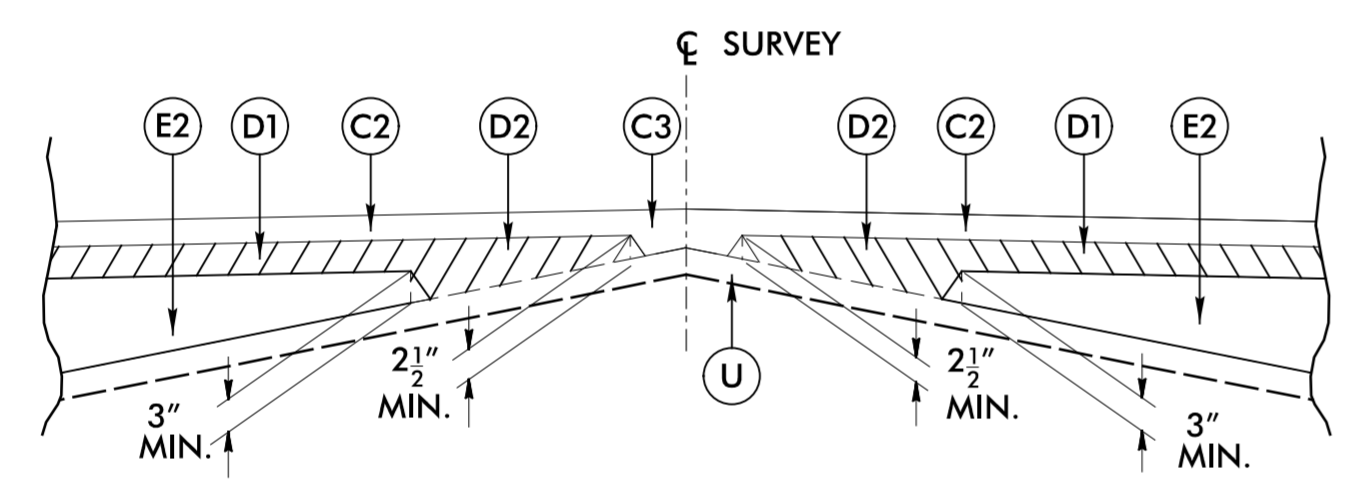
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	—TUTL—
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

6/22/99

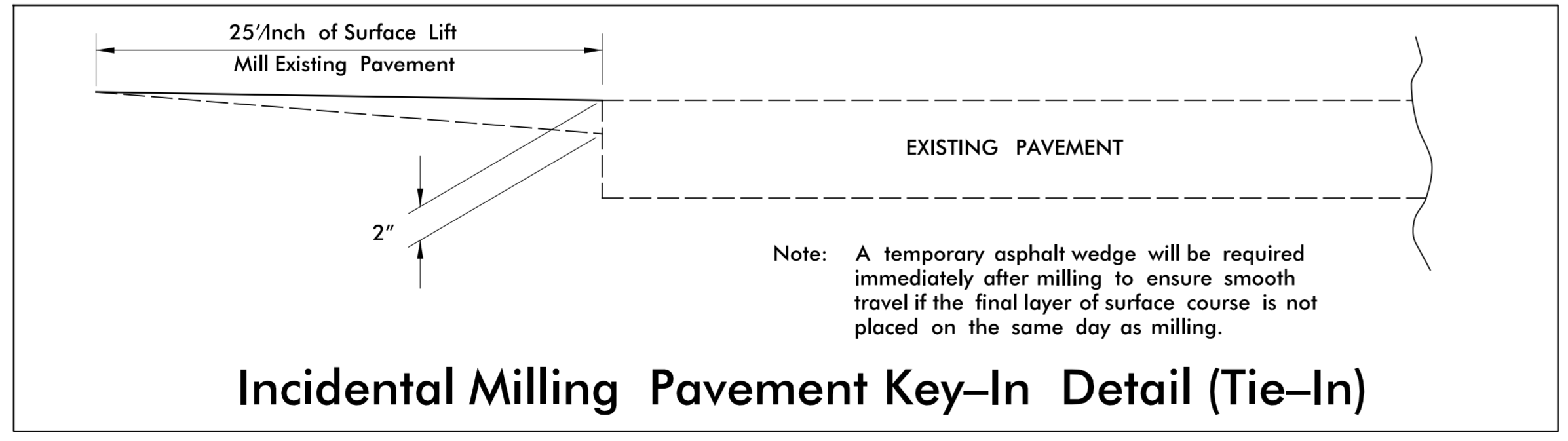
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING)

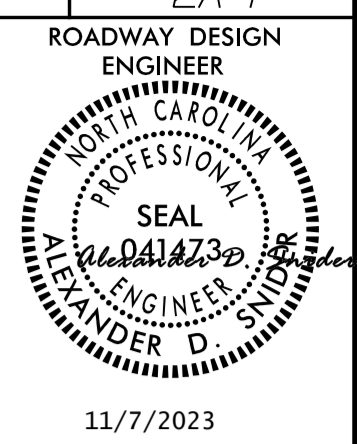
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



Detail Showing Method of Wedging
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

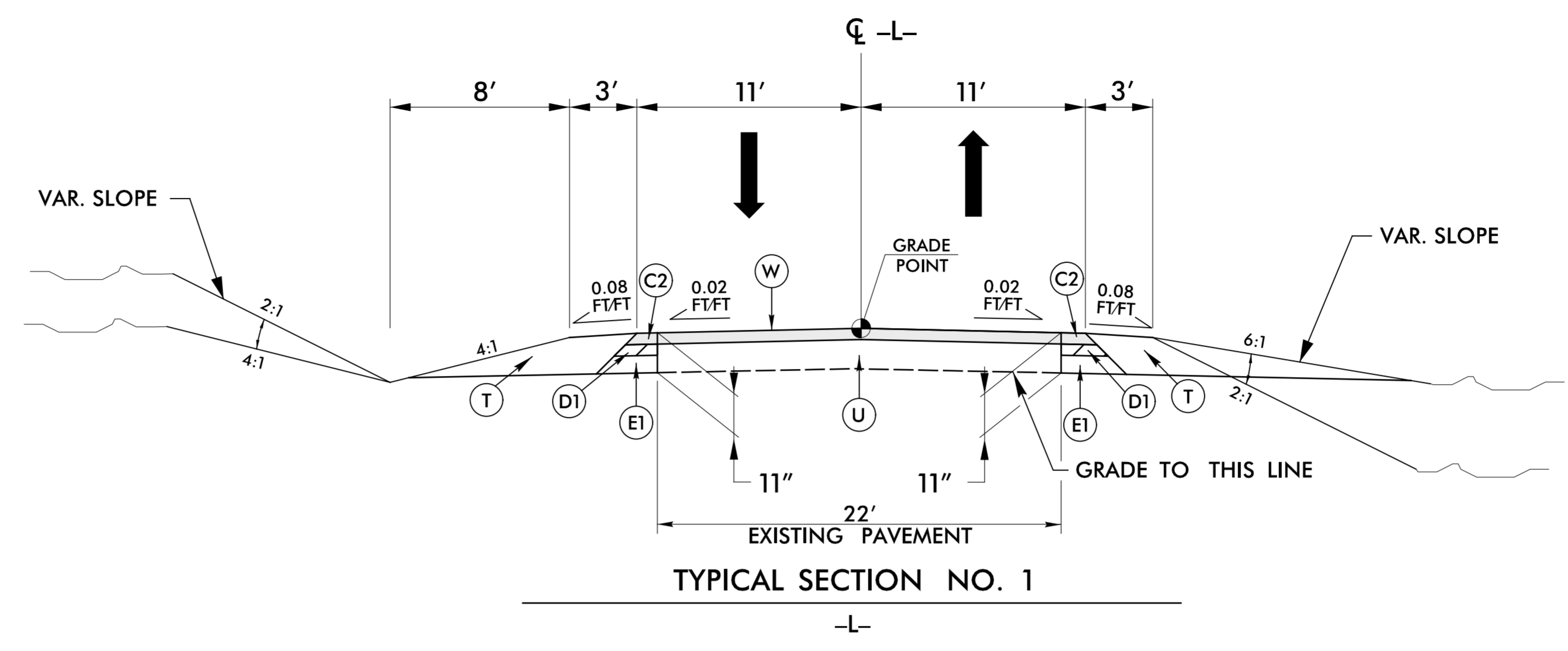


Incidental Milling Pavement Key-In Detail (Tie-In)



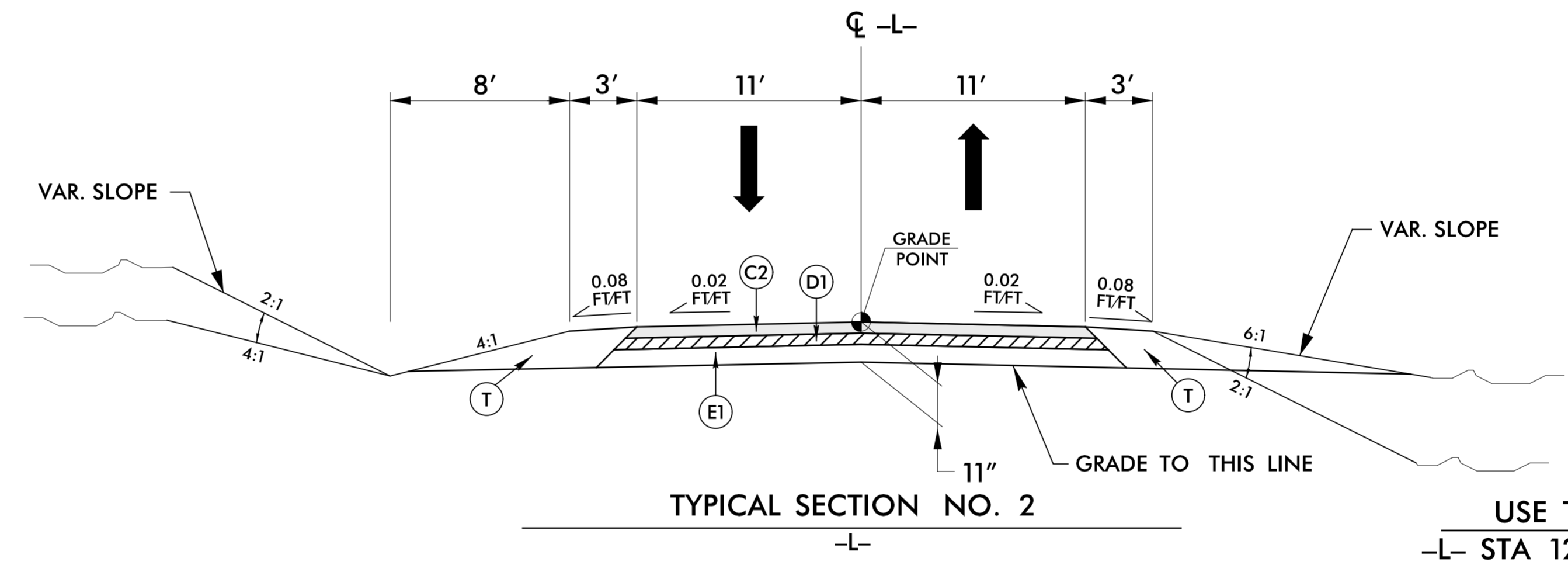
11/7/2023

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TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FROM:
-L- STA 11+40.00 TO -L- STA 12+40.00
-L- STA 15+50.00 TO -L- STA 16+45.00



TYPICAL SECTION NO. 2

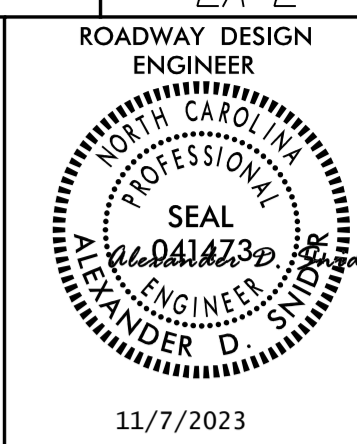
USE TYPICAL SECTION NO. 2 FROM:
-L- STA 12+40.00 TO -L- STA 12+77.00 RT/LT
-L- STA 15+27.00 TO -L- STA 15+50.00 RT/LT

8/14/2023 09:50:11 AM C:\ENGINTECH\PROJECTS\101\00249211\CHATHAM_094_RDY_TYP.dgn

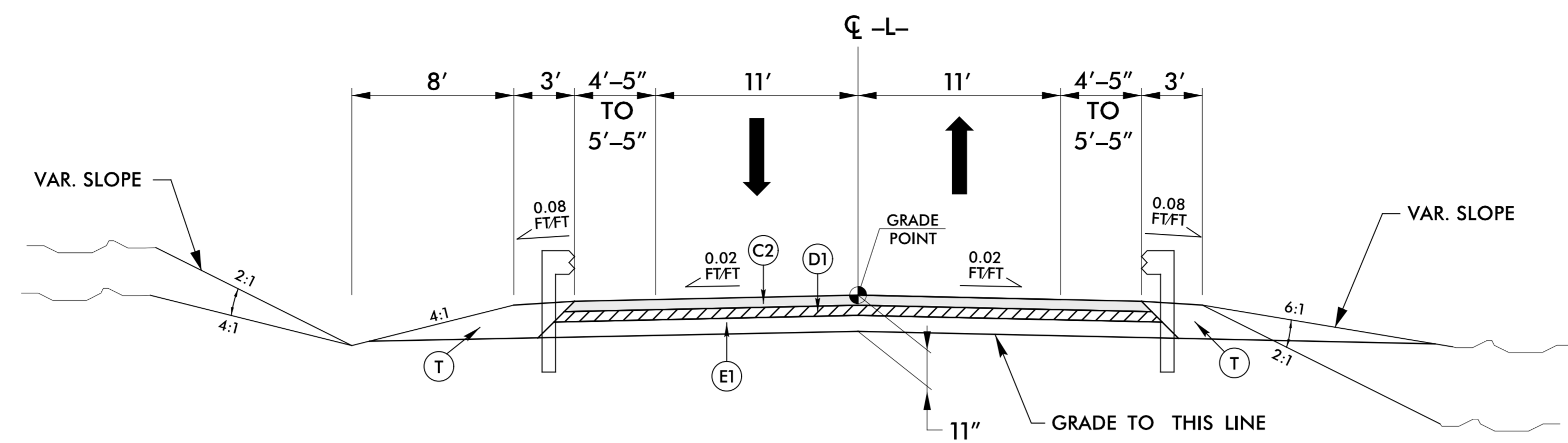
6/2/99

8/14/2023
CHATHAM RDY, TYP.dgn
TCA ENGINEERING, INC.

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	4" I19.0C
D2	VAR I19.0C
E1	4" B25.0C
E2	VAR B25.0C
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING

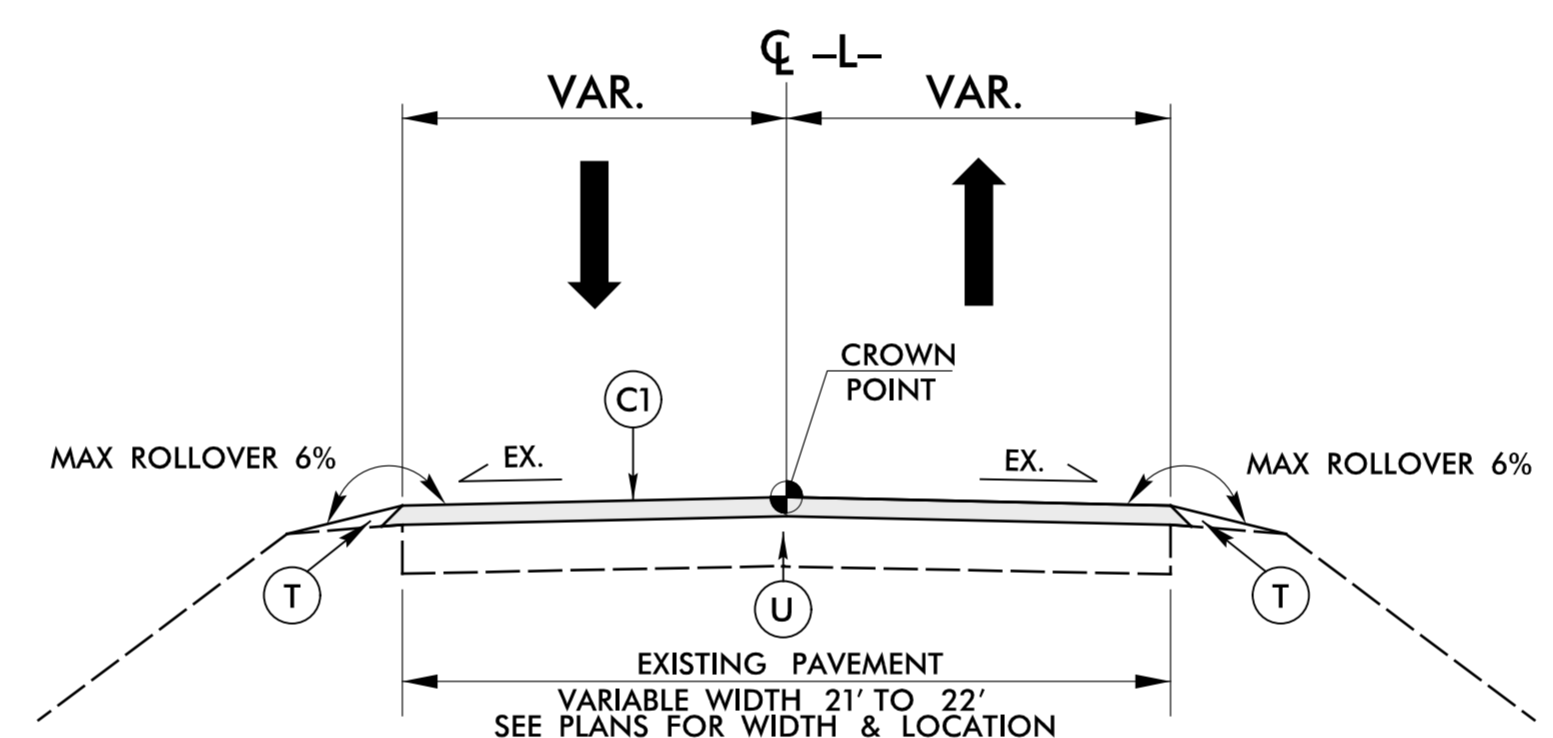


ROADWAY DESIGN ENGINEER
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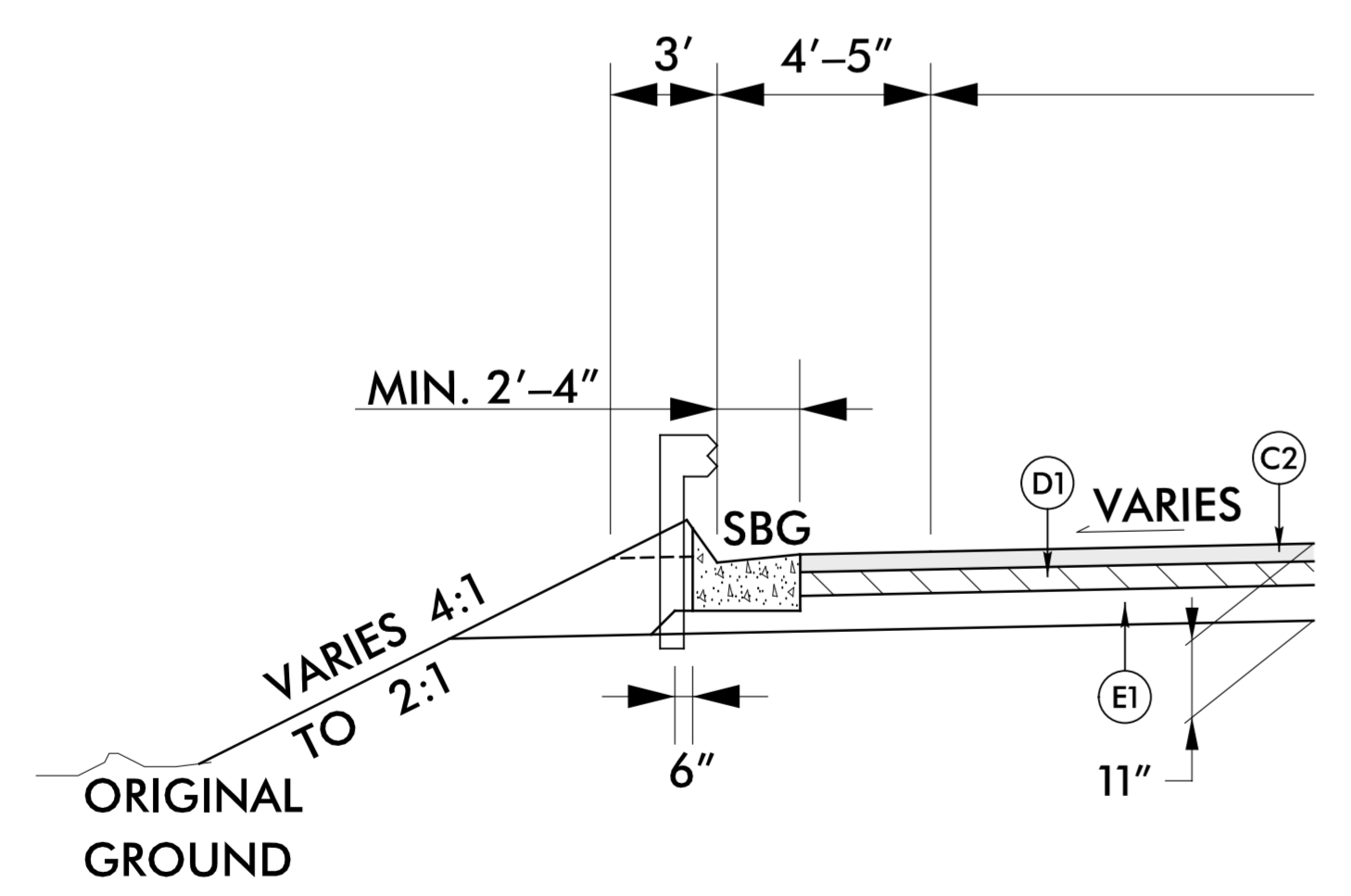
TYPICAL SECTION NO. 3
-L-

USE TYPICAL SECTION NO. 3 FROM:
-L- STA 12+77.00 TO -L- STA 13+40.00 RT/LT (BEGIN APPROACH SLAB)
-L- STA 14+64.00 (END APPROACH SLAB) TO -L- STA 15+27.00 RT/LT



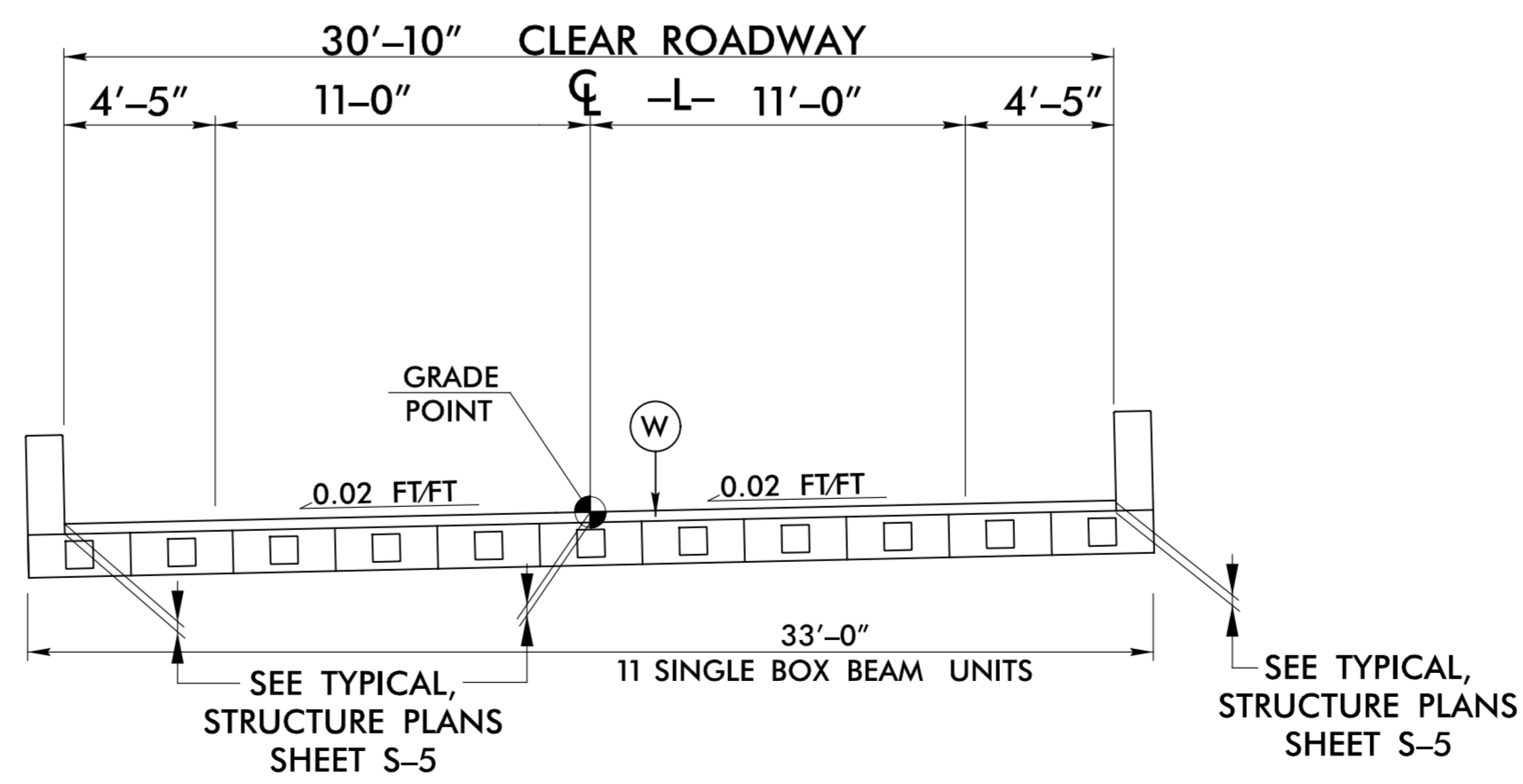
TYPICAL SECTION NO. 4
-L-

USE TYPICAL SECTION NO. 3 FROM:
-L- STA 16+45.00 TO -L- STA 18+70.00



PARTIAL TYPICAL SECTION NO. 3A

USE PARTIAL TYPICAL SECTION NO. 3A
IN CONJUNCTION WITH TYPICAL SECTION NO. 3 AS FOLLOWS:
-L- STA 14+64.00 TO -L- STA 14+82.00 LT

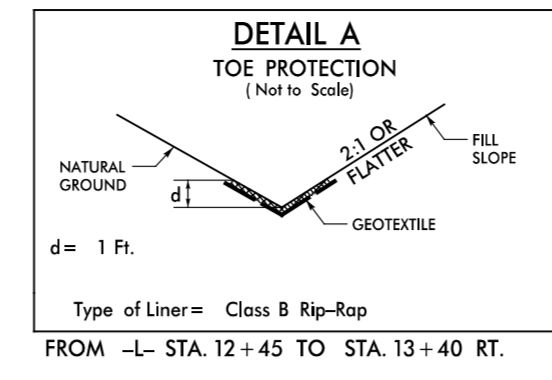
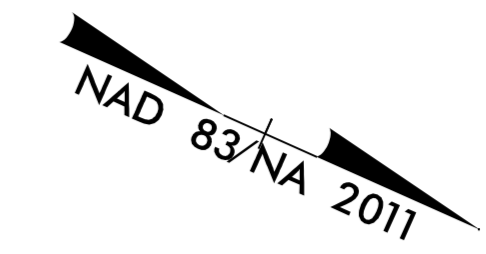


TYPICAL SECTION NO. 5
-L-

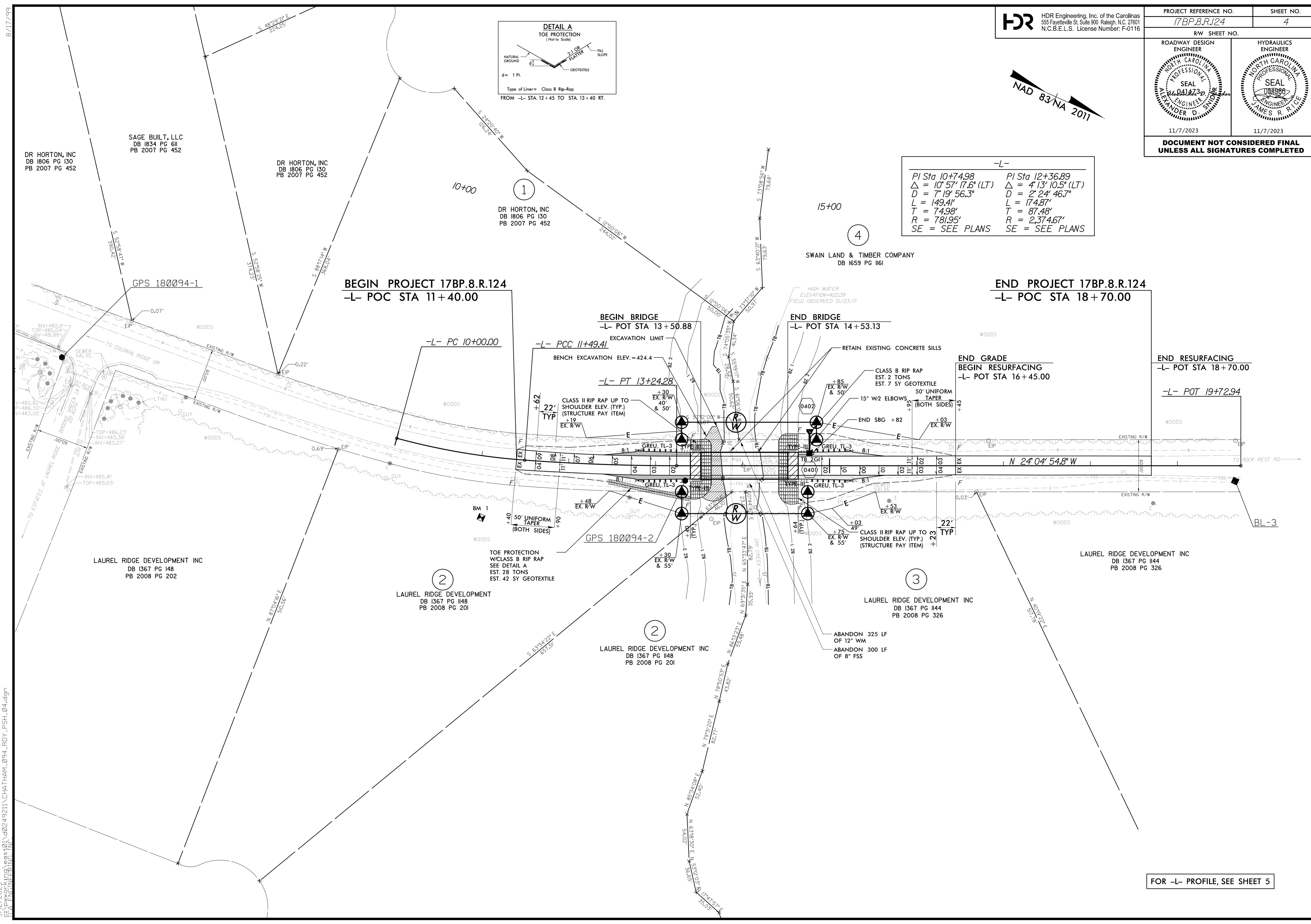
USE TYPICAL SECTION NO. 5 FROM:
-L- STA 13+50.88 (BEGIN BRIDGE) TO 14+53.13 (END BRIDGE)

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900, Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO. 17BP.8.R.124	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-	
PI Sta 10+74.98	PI Sta 12+36.89
$\Delta = 10' 57" 17.6" (LT)$	$\Delta = 4' 13" 10.5" (LT)$
$D = 7' 19" 56.3"$	$D = 2' 24" 46.7"$
$L = 149.4'$	$L = 174.87'$
$T = 74.98'$	$T = 87.48'$
$R = 781.95'$	$R = 2,374.67'$
SE = SEE PLANS	SE = SEE PLANS



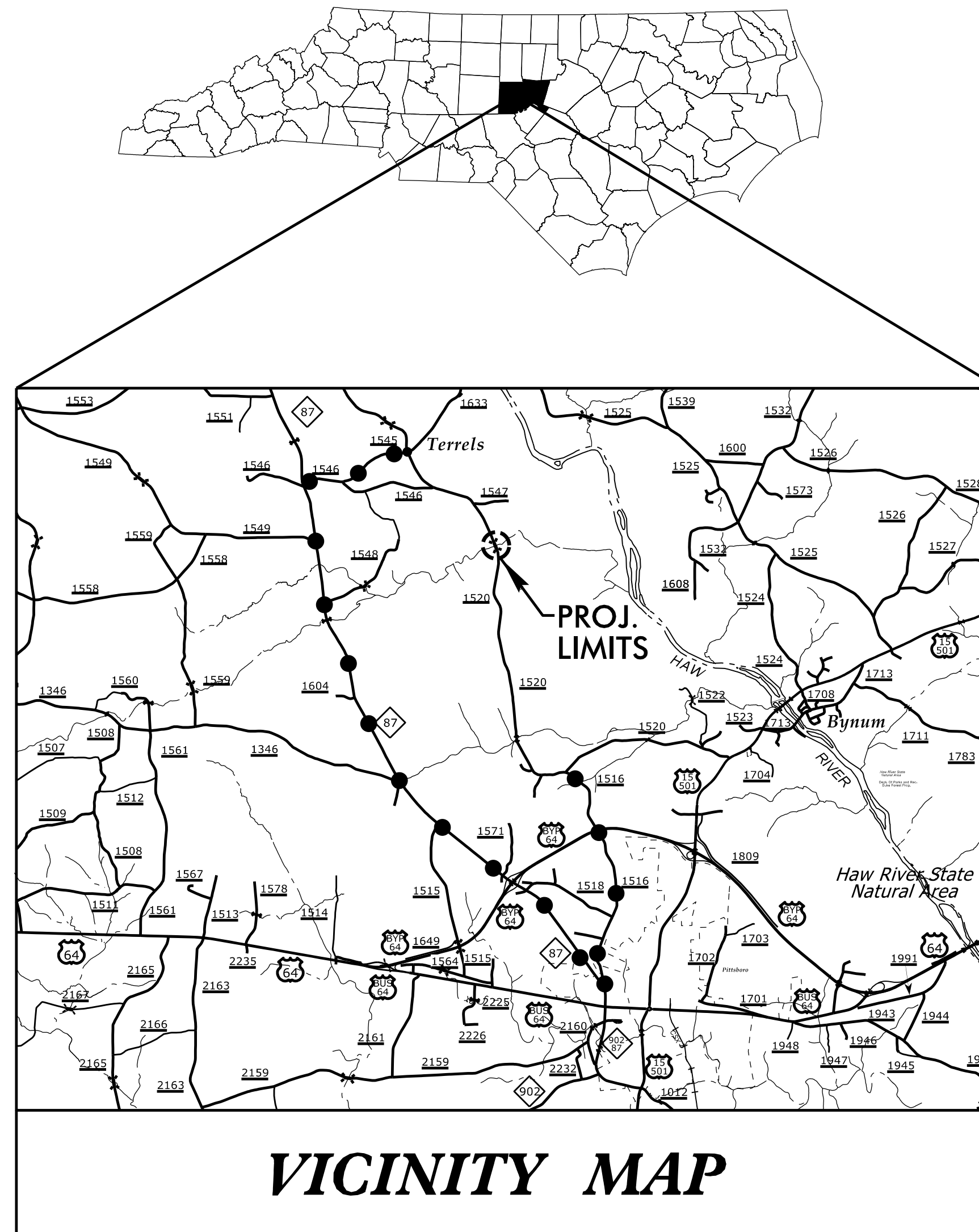
9/12/2023 9:11:01 AM C:\Users\jrd\OneDrive\Documents\17BP.8.R.124\CHATTAM_094_RDY_PSH_04.dgn

FOR -L- PROFILE, SEE SHEET 5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

CHATHAM COUNTY



**LOCATION: REPLACE BRIDGE NO. 94 OVER DRY CREEK
ON SR 1520 (OLD NC 87)**

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

INDEX OF SHEETS

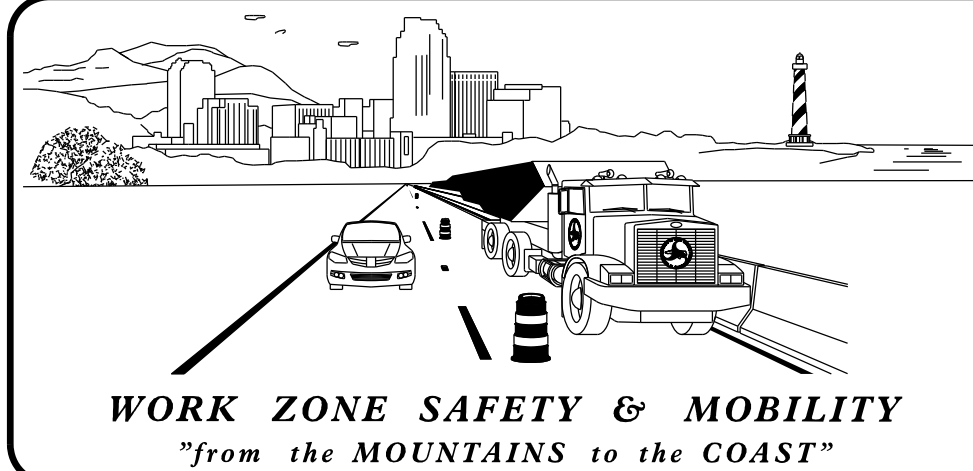
SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGY GENERAL NOTES, LOCAL NOTES AND PHASING)
TMP-3	DETOUR FOR OLD GRAHAM ROAD CLOSURE
TMP-4	ROAD CLOSURE SIGNS, DETOUR SIGNS AND SIGN DESIGN

SHEET NO.
TMP-1

17BP.8.R.124

PROJECT:

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PLANS PREPARED BY:

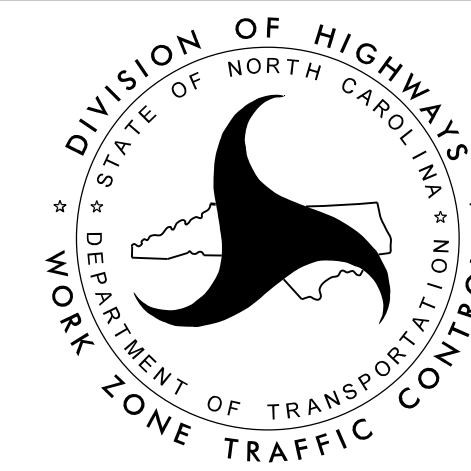
**M. RZEPKA, P.E.
PROJECT ENGINEER**

**C. HARDEN
PROJECT DESIGN ENGINEER**

NCDOT CONTACTS:

**T. WELCH, P.E.
DIV. 8 BRIDGE PROGRAM MANAGER**

PROJECT DESIGN ENGINEER



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

PLAN PREPARED BY:



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

APPROVED: *Michael T. Rzepka*

DATE: 9/13/2023

SEAL



PROJ. REFERENCE NO.	SHEET NO.
17BP.8.R.124	TMP-1A

HR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116


ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - 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:

<u>STD. NO.</u>	<u>TITLE</u>
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

LEGEND

GENERAL

 NORTH ARROW

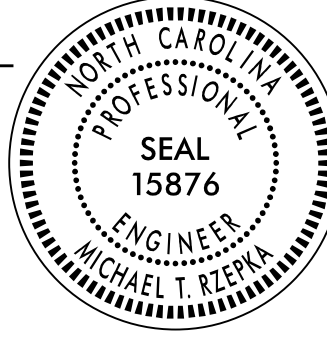
TRAFFIC CONTROL DEVICES

 BARRICADE (TYPE III)

TEMPORARY SIGNING

 STATIONARY SIGN

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APPROVED: <i>Michael T. Ryepka</i> DATE: 9/13/2023 		ROADWAY STANDARD DRAWINGS & LEGEND
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PROJ. REFERENCE NO.	SHEET NO.
17BP.8.R.124	TMP-2

HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

MANAGEMENT STRATEGY

THIS PROJECT CONSISTS OF REPLACING BRIDGE NO. 94 OVER DRY CREEK ON SR 1520 (OLD GRAHAM RD). DURING CONSTRUCTION, SR 1520 (OLD GRAHAM RD) WILL BE CLOSED AT THE CONSTRUCTION LIMITS AND TRAFFIC WILL BE PLACED ON AN OFF-SITE DETOUR ALONG NC 87 AND SR 1546/1545 (CHICKEN BRIDGE RD).

SR 1520 (OLD GRAHAM RD) WILL BE REOPENED TO 2-LANE/2-WAY TRAFFIC UPON COMPLETION OF CONSTRUCTION.

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION. THE ENGINEER WILL NOTIFY THE PROPER AUTHORITIES AND OTHER AFFECTED PARTIES AS NECESSARY.

SIGNING

- B) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

 PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- C) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

 COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- D) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

LOCAL NOTES

- 1) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

PHASING

STEP 1

USING ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9), INSTALL ROAD CLOSURE AND DETOUR SIGNS. CLOSE SR 1520 (OLD GRAHAM RD) AND DETOUR TRAFFIC (SEE LOCAL NOTE 1).

STEP 2

REMOVE EXISTING BRIDGE.

STEP 3

CONSTRUCT PROPOSED STRUCTURE AND ROADWAY.

STEP 4

PLACE FINAL PAVEMENT MARKINGS AND MARKERS ON SR 1520 (OLD GRAHAM RD) AND OPEN ROAD TO TRAFFIC.

STEP 5

REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

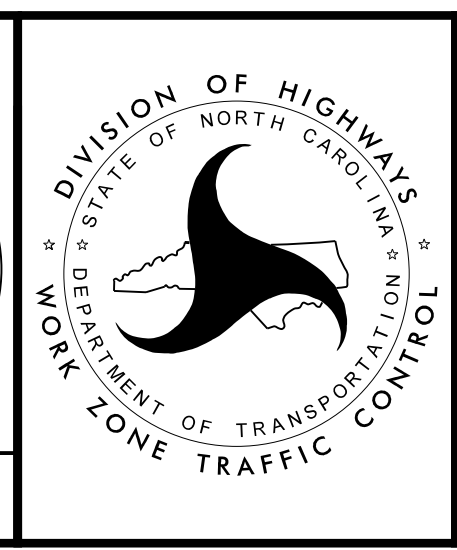
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APPROVED: *Michael T. Repka*

DATE: 9/13/2023

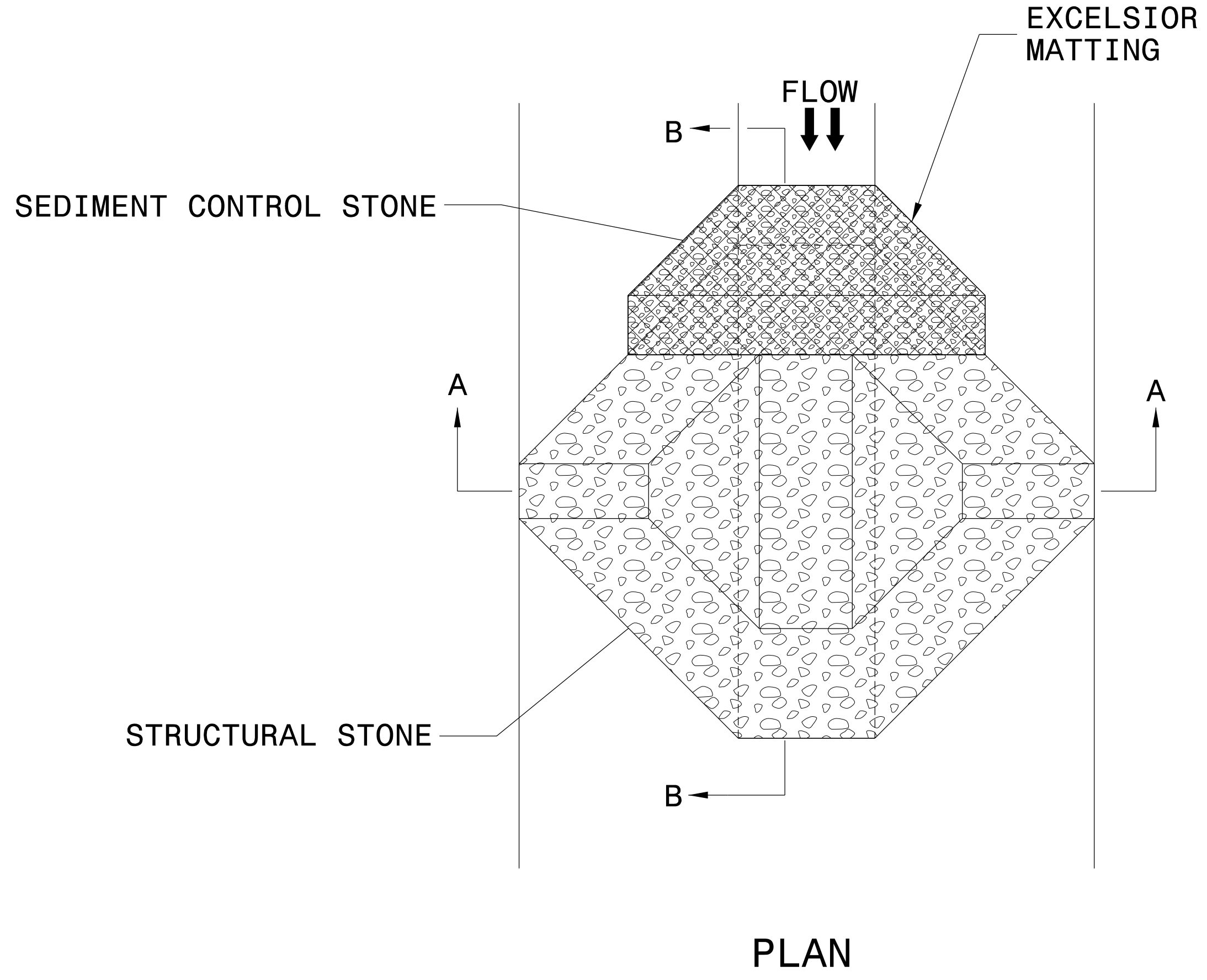
SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**TRANSPORTATION OPERATIONS PLAN:
 (MANAGEMENT STRATEGY, GENERAL NOTES, LOCAL NOTES, AND PHASING)**

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



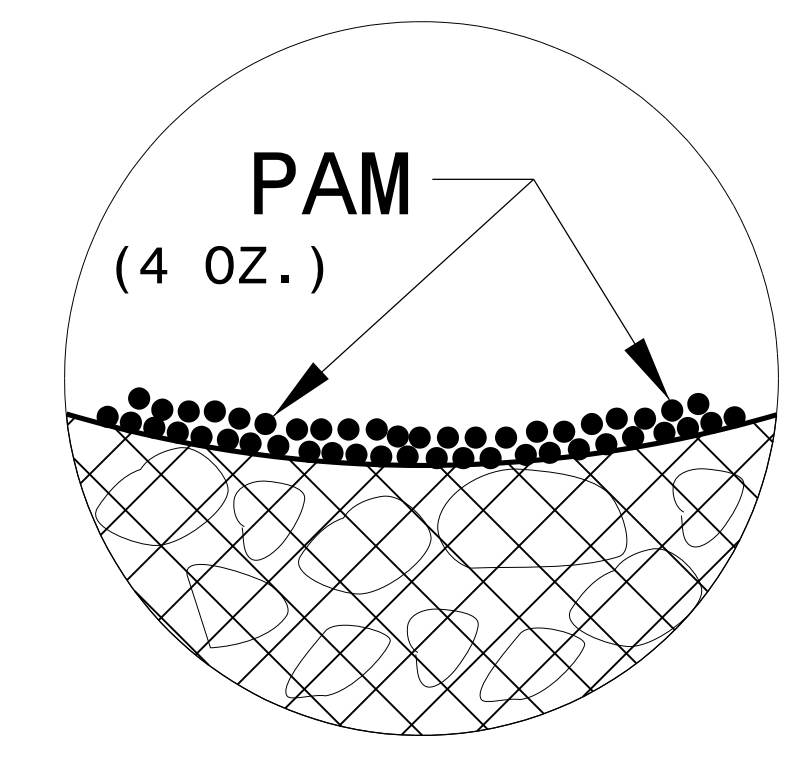
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

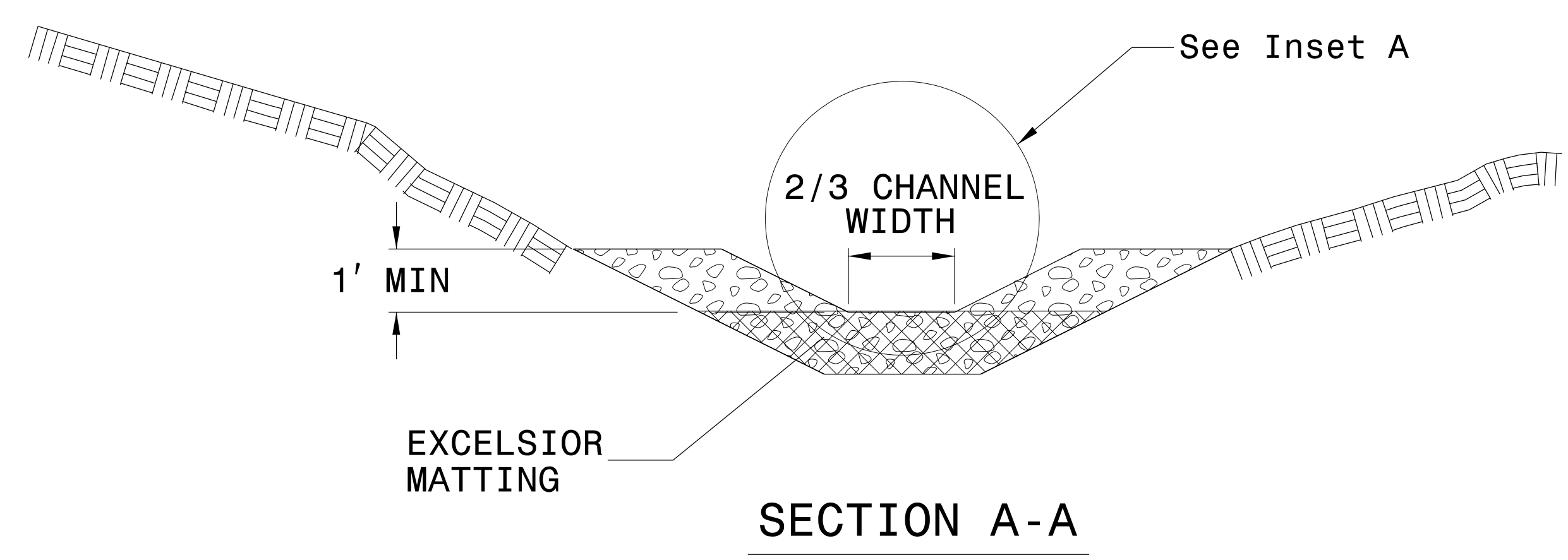
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

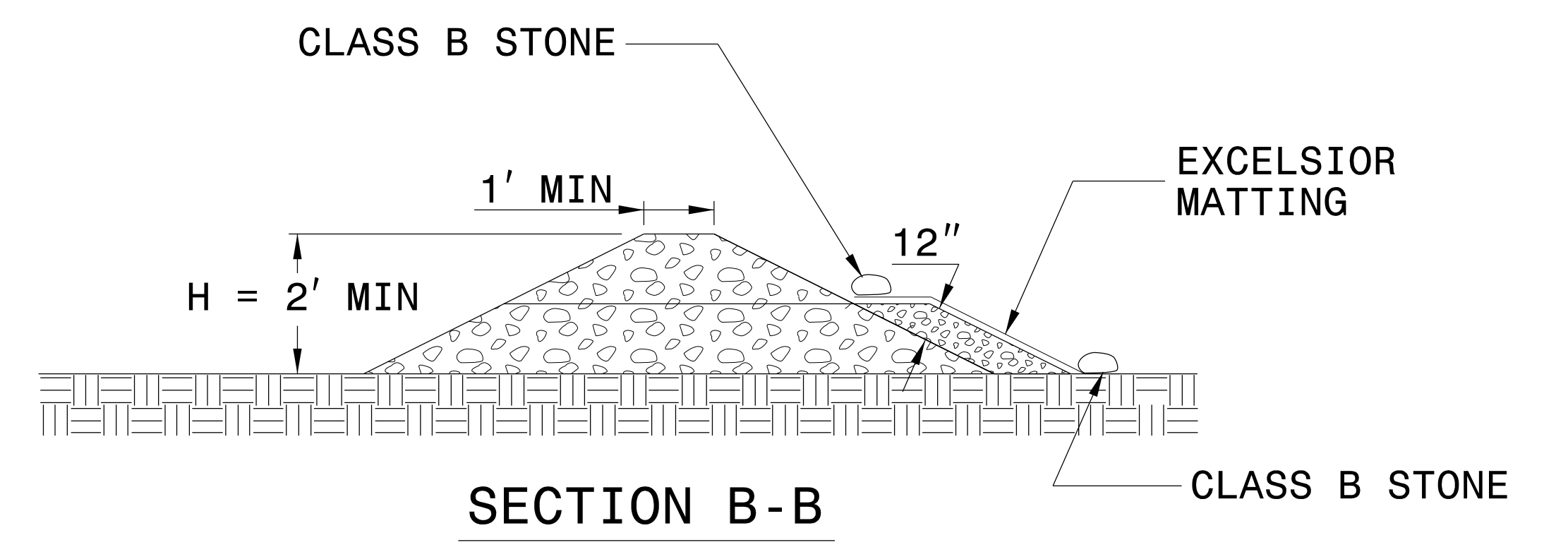
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

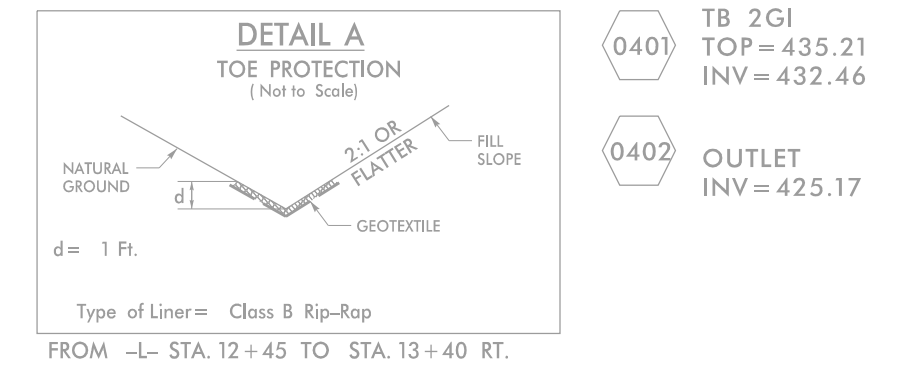
SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	-7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH AND WITH SLOPES STEEPER THAN 4:1 -7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND HQW ZONES -10 DAYS FOR THE FALLS LAKE WATERSHED
AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	-7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND HQW ZONES -10 DAYS FOR THE FALLS LAKE WATERSHED UNLESS THERE IS ZERO SLOPE.

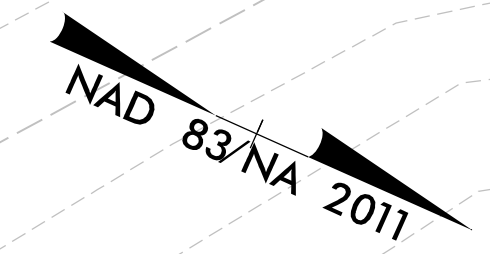
8/17/99

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900, Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
17BP.8.R.124	EC-04/CONST.04
RW SHEET NO.	



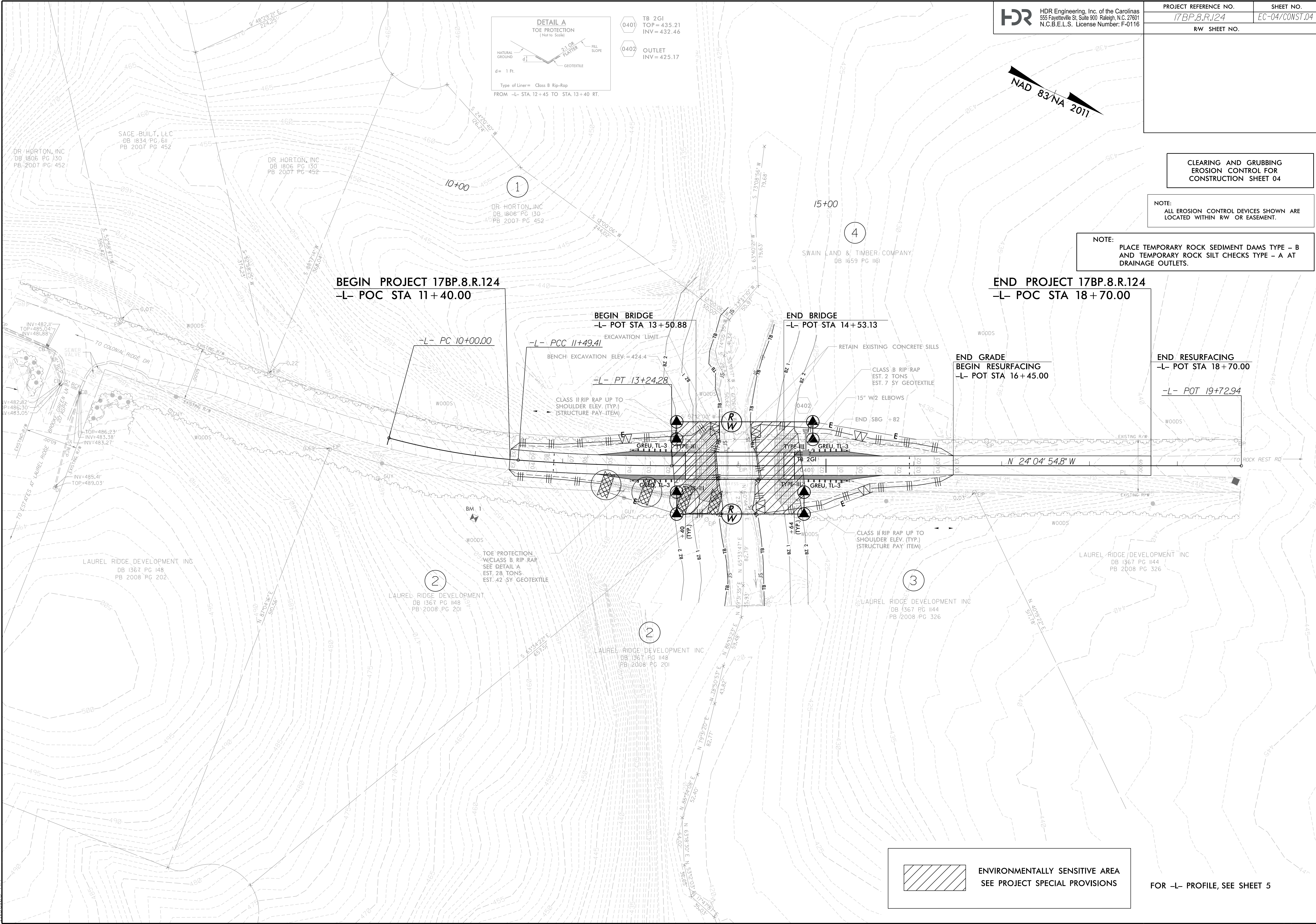
- (0401) TB 2GI
TOP = 435.21
INV = 432.46
- (0402) OUTLET
INV = 425.17



**CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04**

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE
LOCATED WITHIN RW OR EASEMENT.

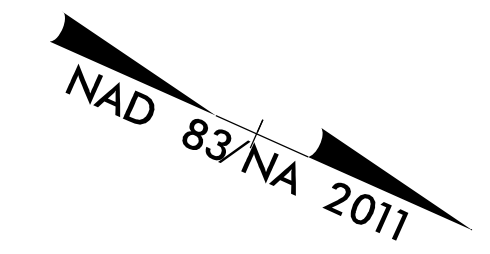
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

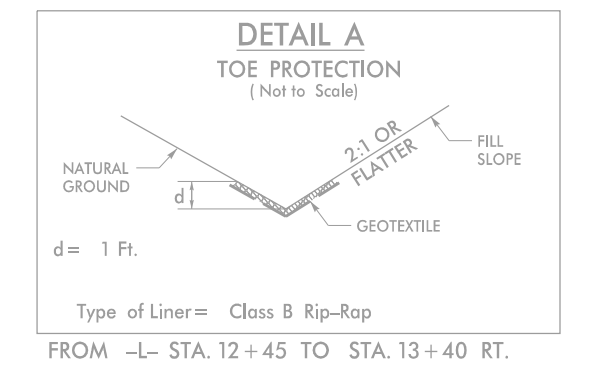
FOR -L- PROFILE, SEE SHEET 5

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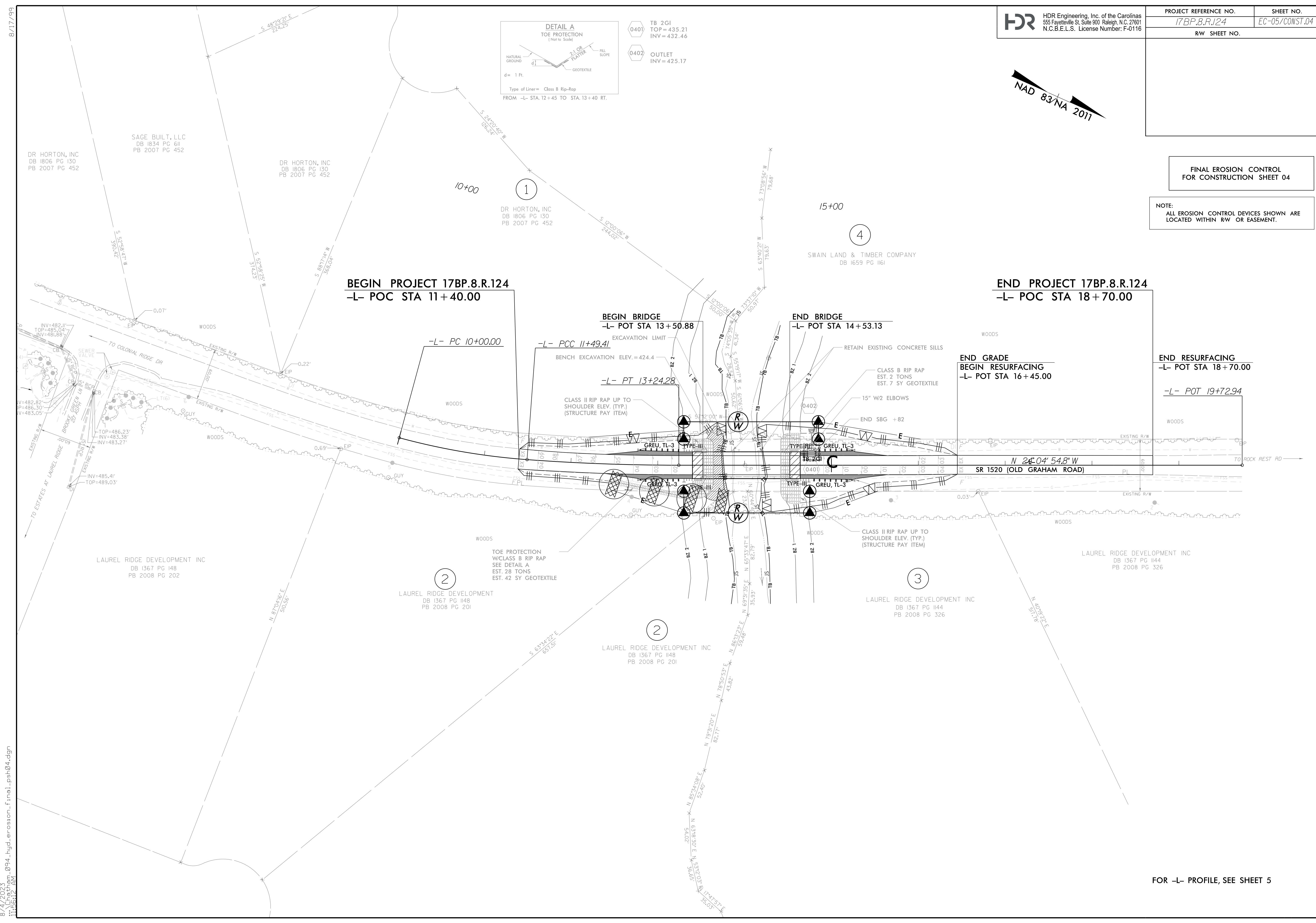


**FINAL EROSION CONTROL
FOR CONSTRUCTION SHEET 04**

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE
LOCATED WITHIN RW OR EASEMENT.



- (0401) TB 2GI
TOP = 435.21
INV = 432.46
- (0402) OUTLET
INV = 425.17



8/17/99
8/4/2023
11:56:12 AM
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FOR -L- PROFILE, SEE SHEET 5

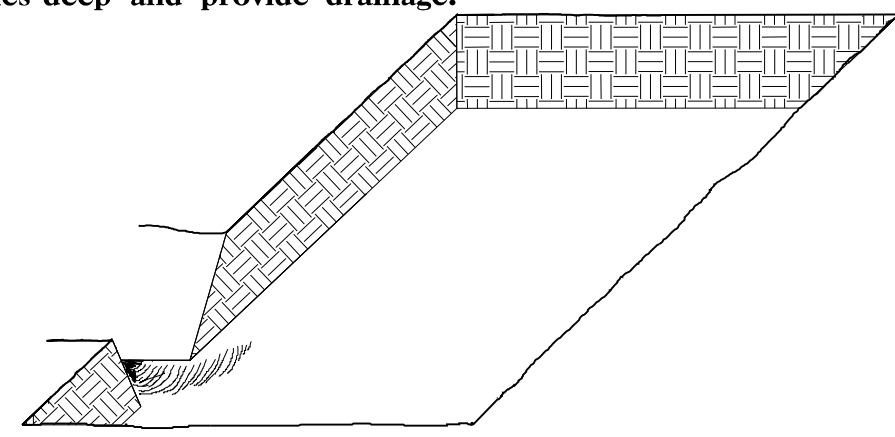
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N.C.	17BP.8.R.124	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

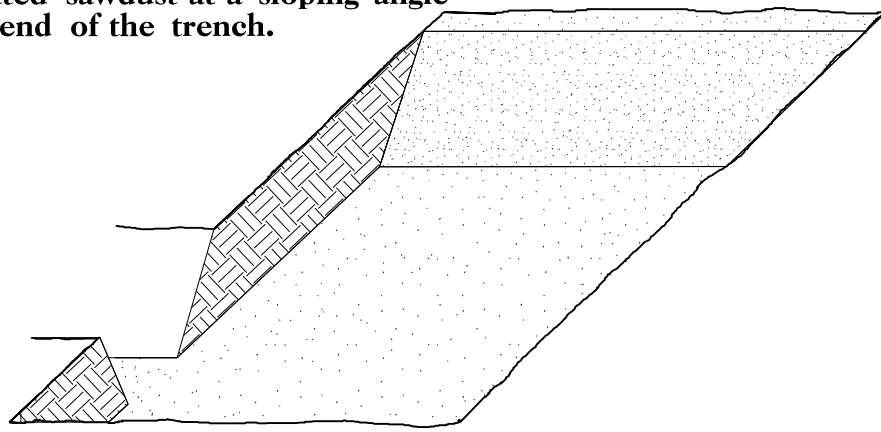
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

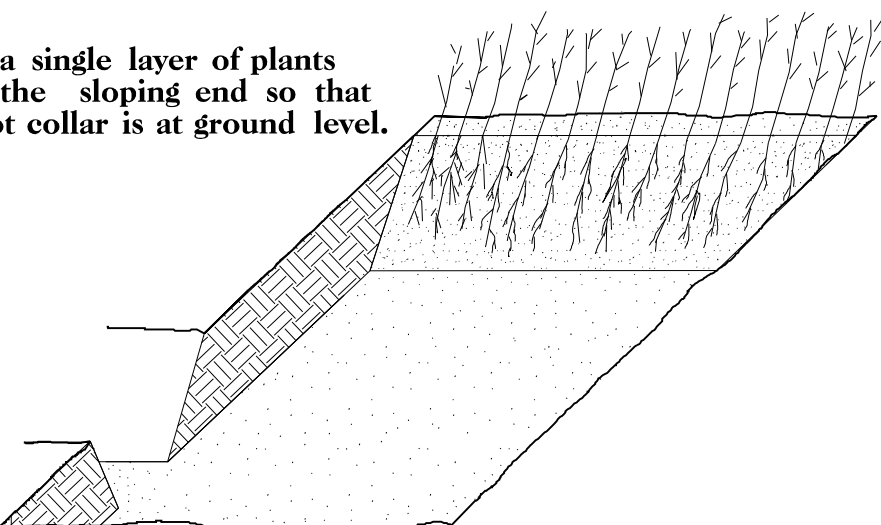
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



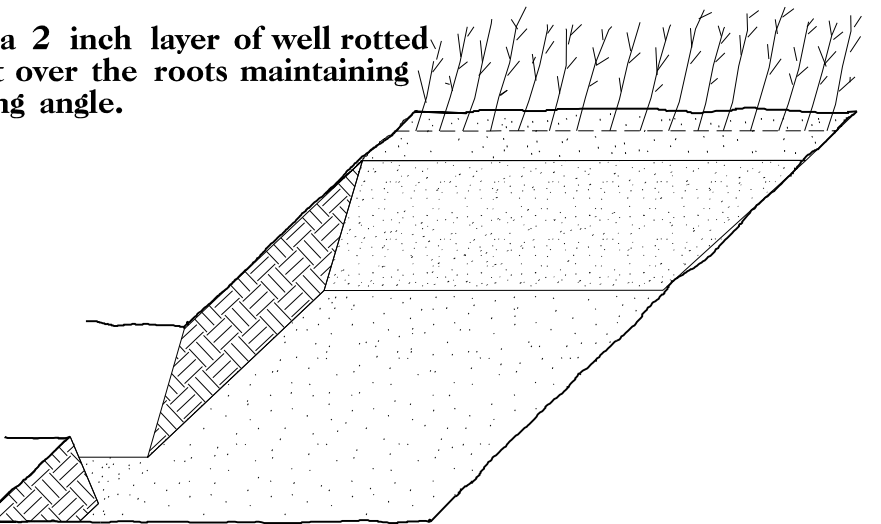
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

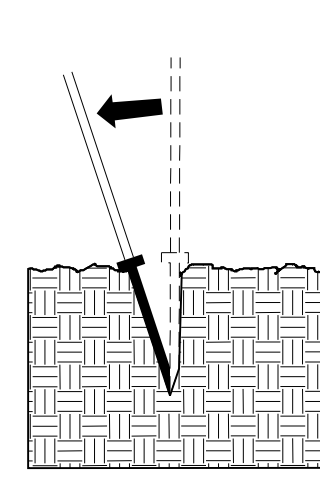


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

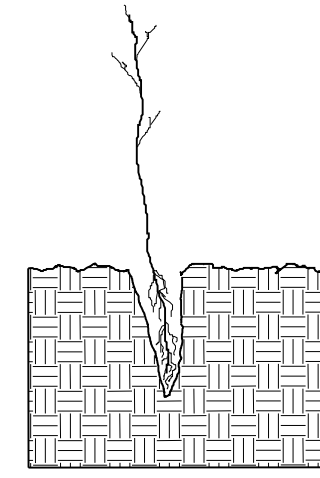


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

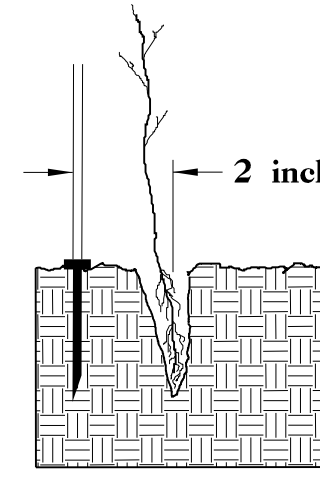
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



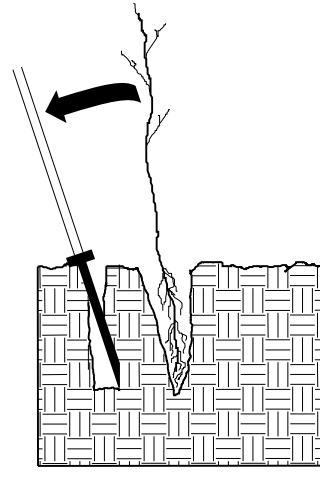
1. Insert planting bar as shown and pull handle toward planter.



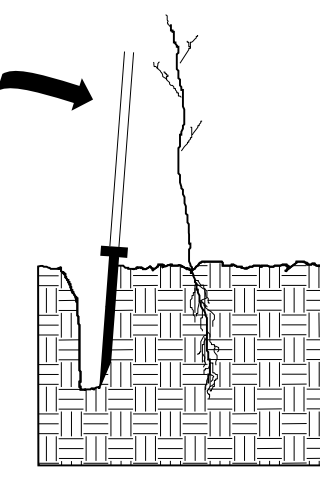
2. Remove planting bar and place seedling at correct depth.



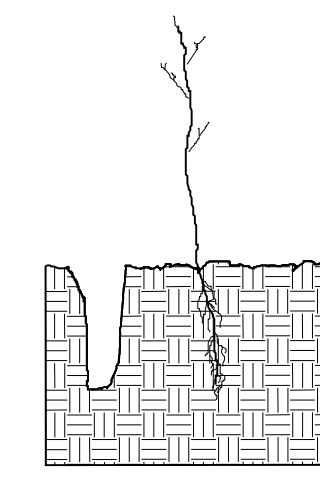
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



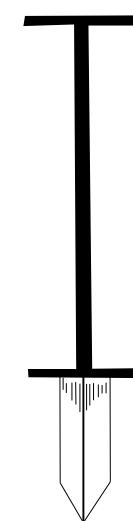
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

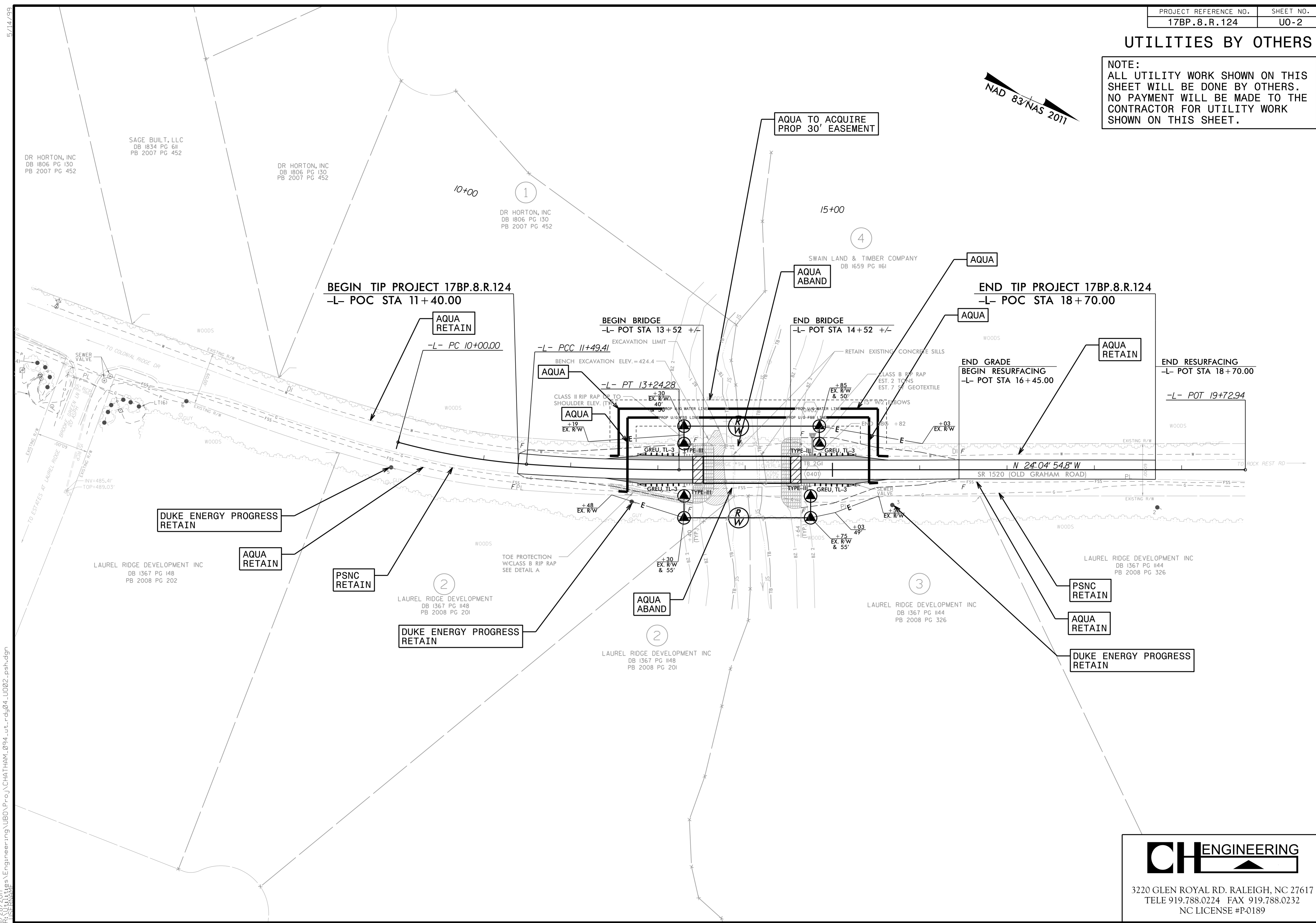
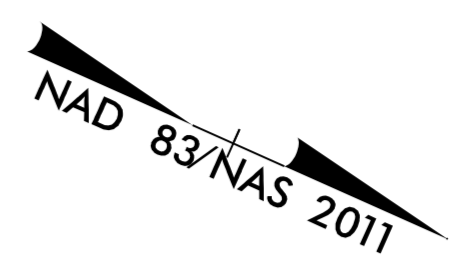
25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in 3R
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in 3R
25% BETULA NIGRA	RIVER BIRCH	12 in - 18 in 3R

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

UTILITIES BY OTHERS

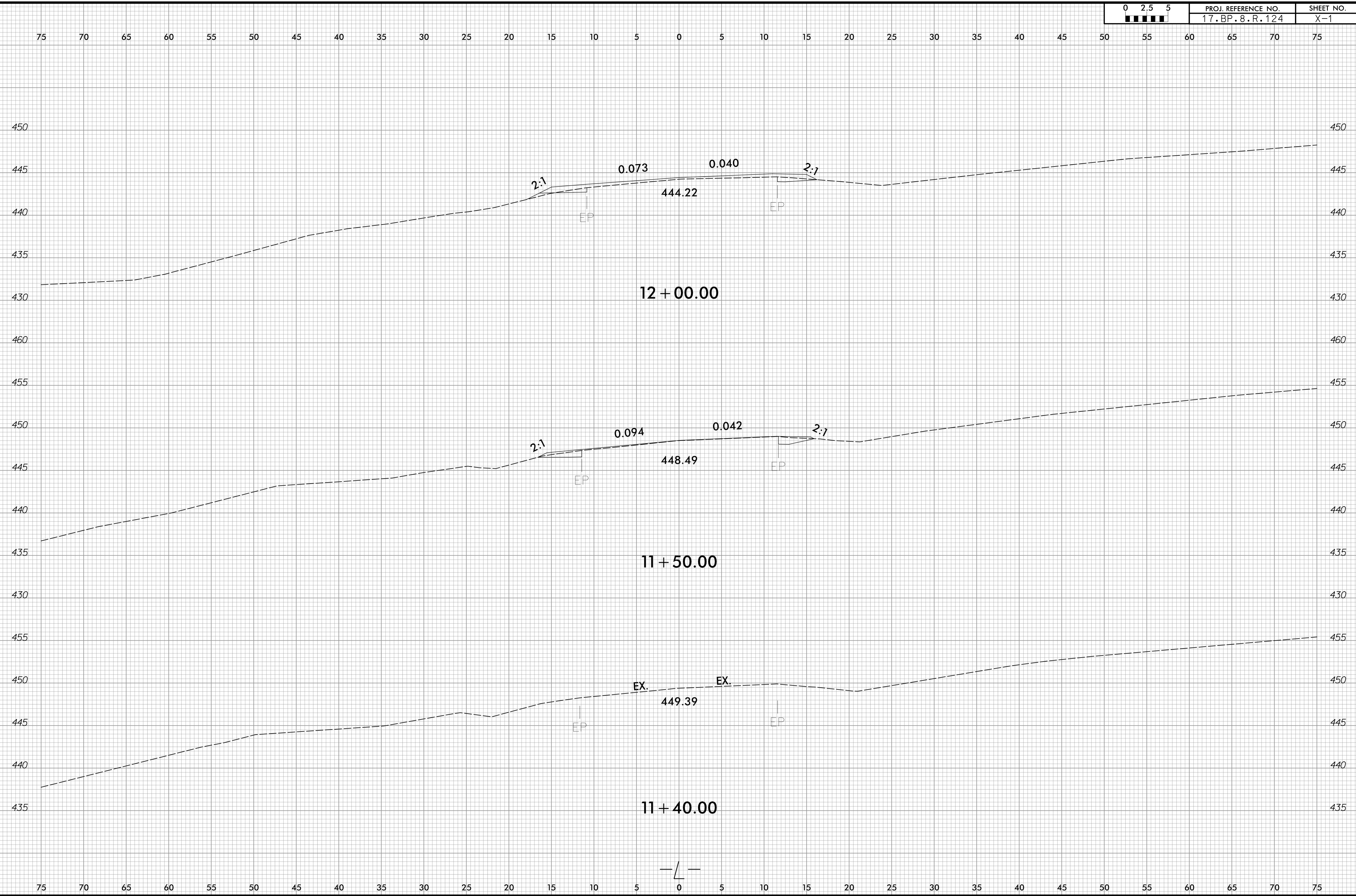
NOTE:
 ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



5/14/09
 I:\28\2017\Projects\17BP.8.R.124\Engineering\UBD\Pro\CHATHAM_094_ut_r.dwg
 04_U002_psh.dgn

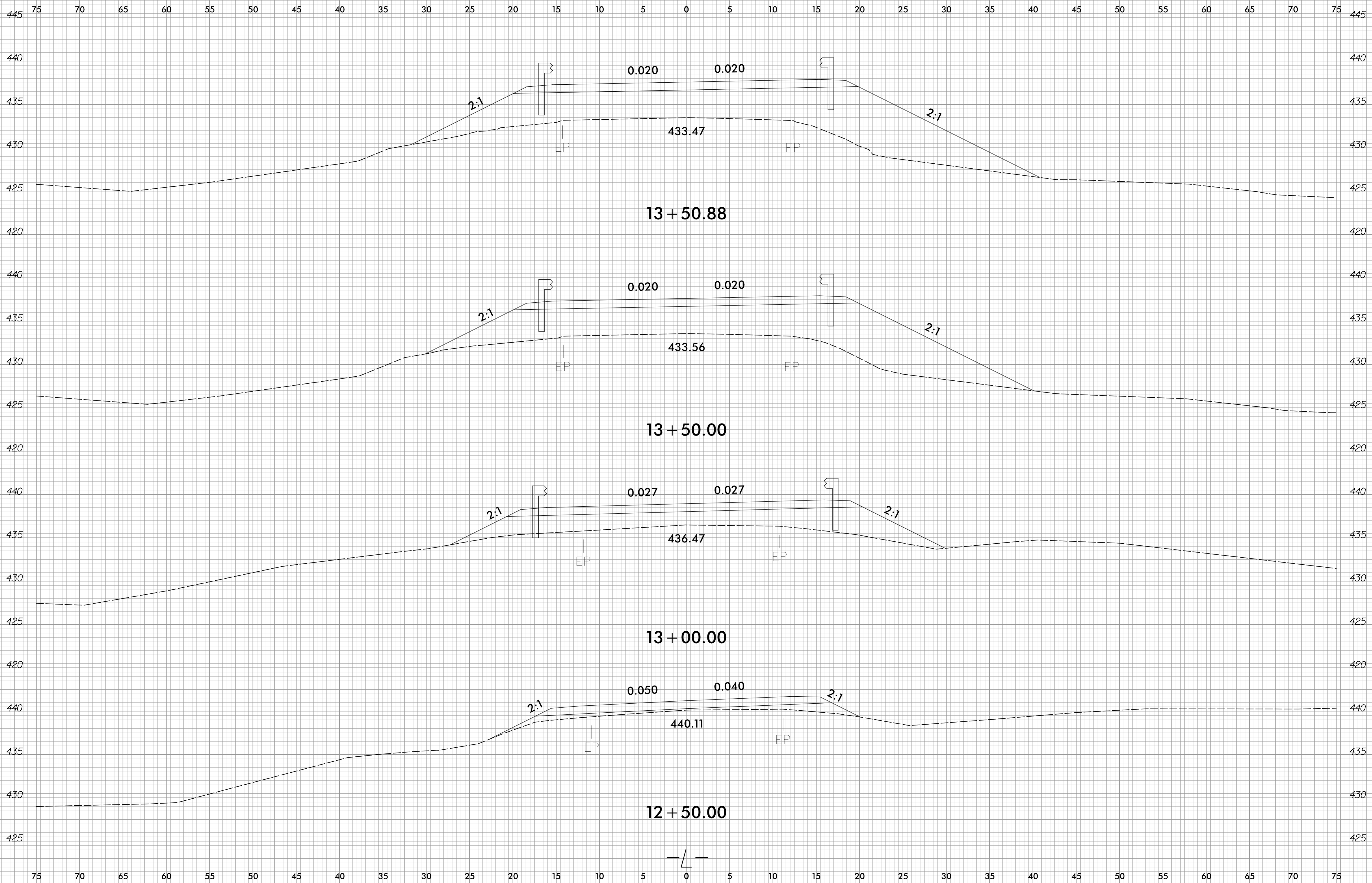
CH ENGINEERING

3220 GLEN ROYAL RD. RALEIGH, NC 27617
 TELE 919.788.0224 FAX 919.788.0232
 NC LICENSE #P-0189



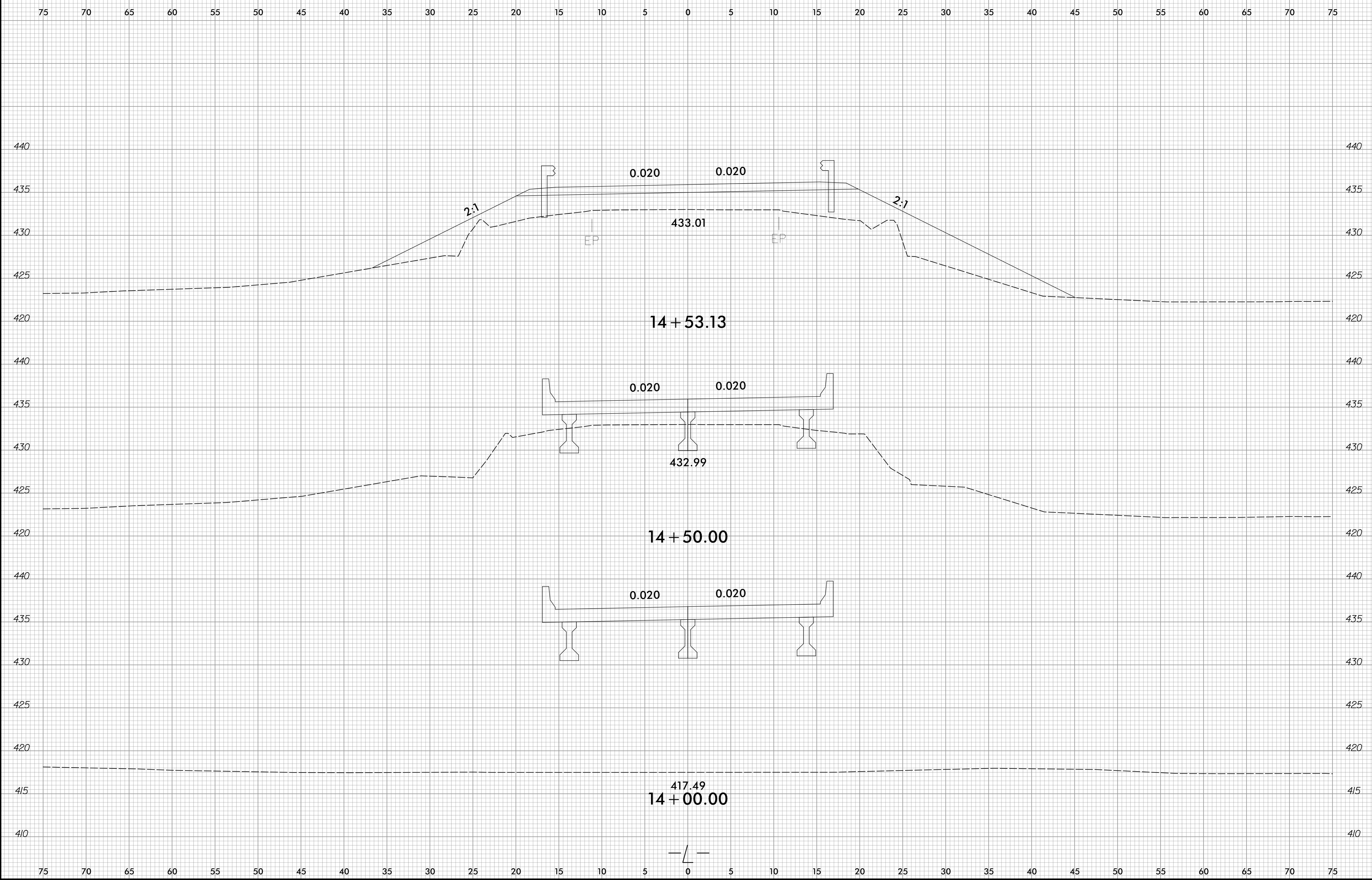
6/23/16

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	17.BP.8.R.124	X-2



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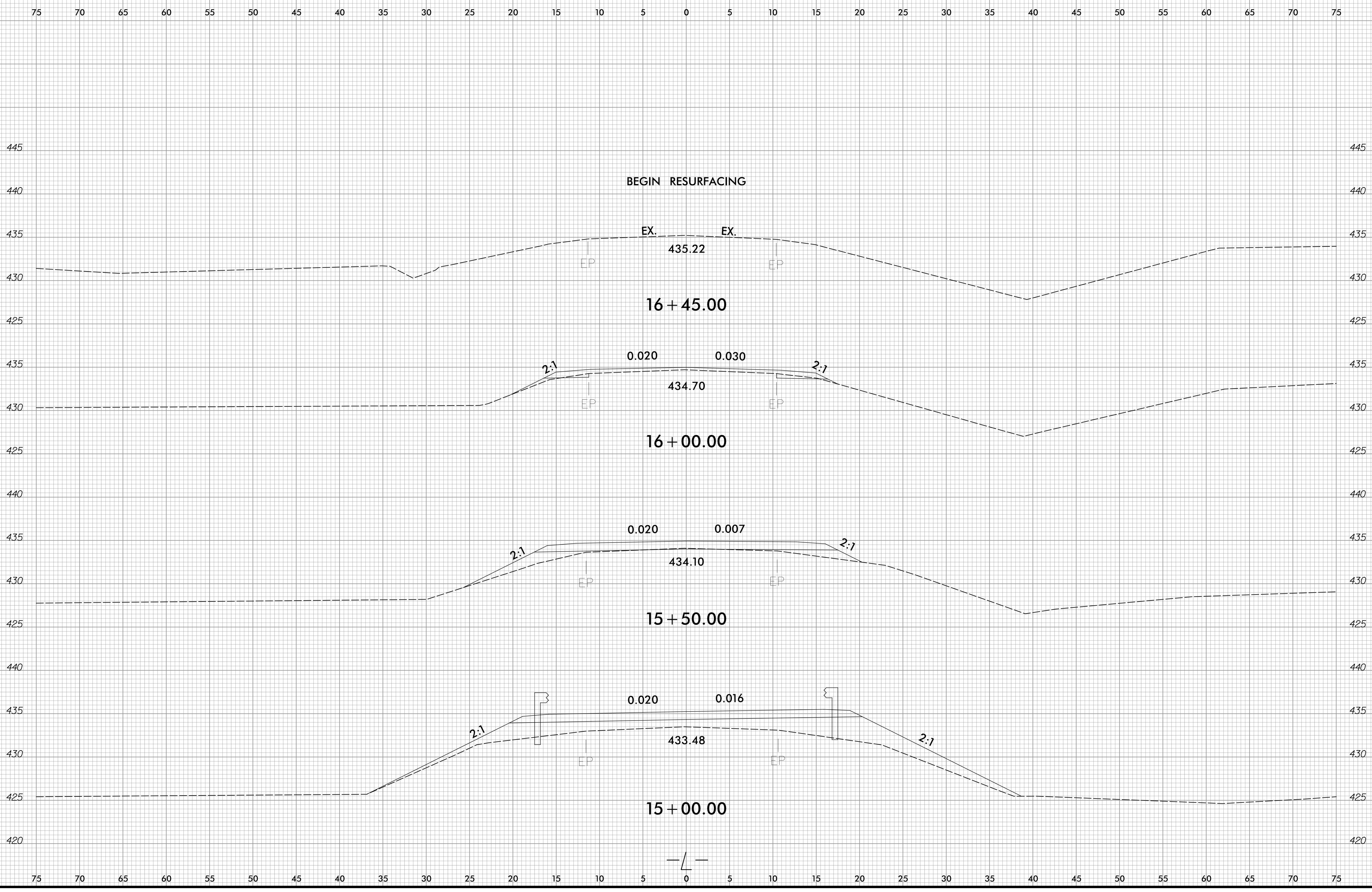
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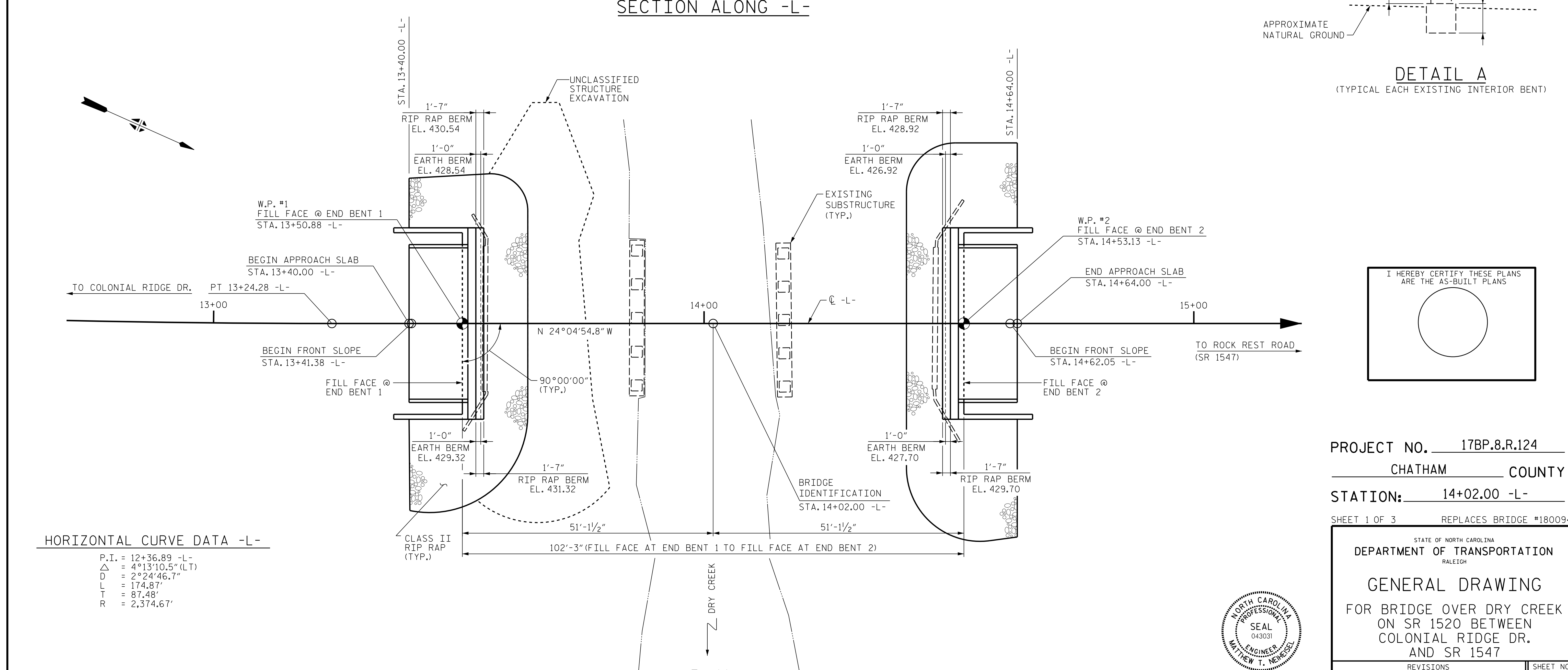
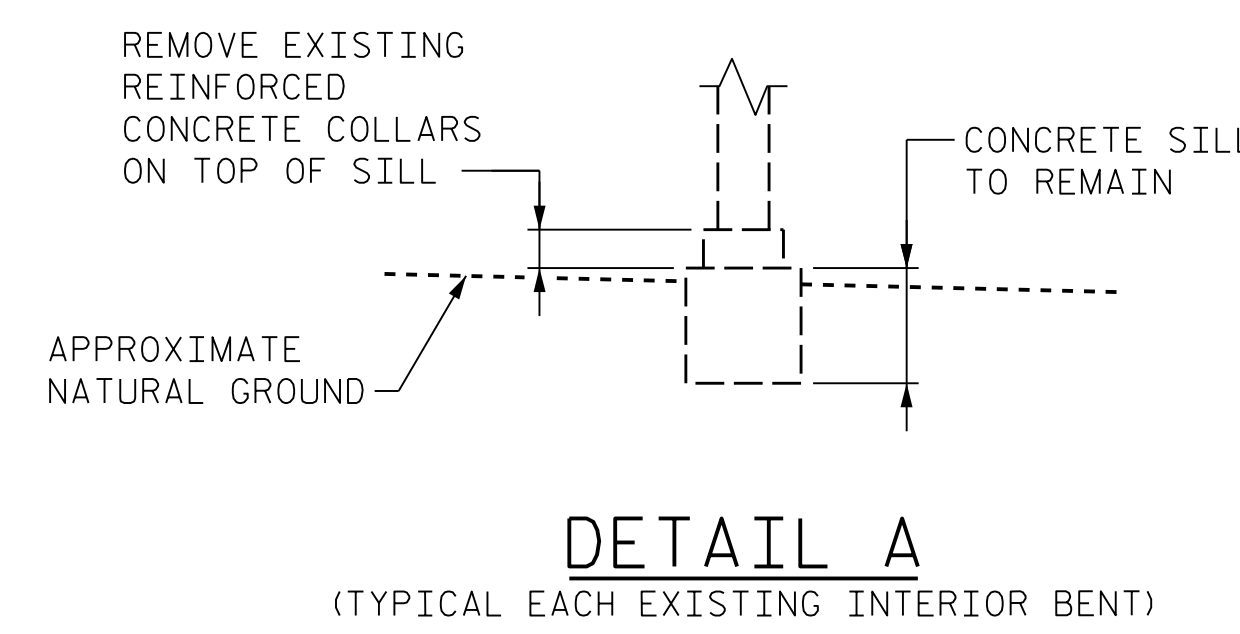
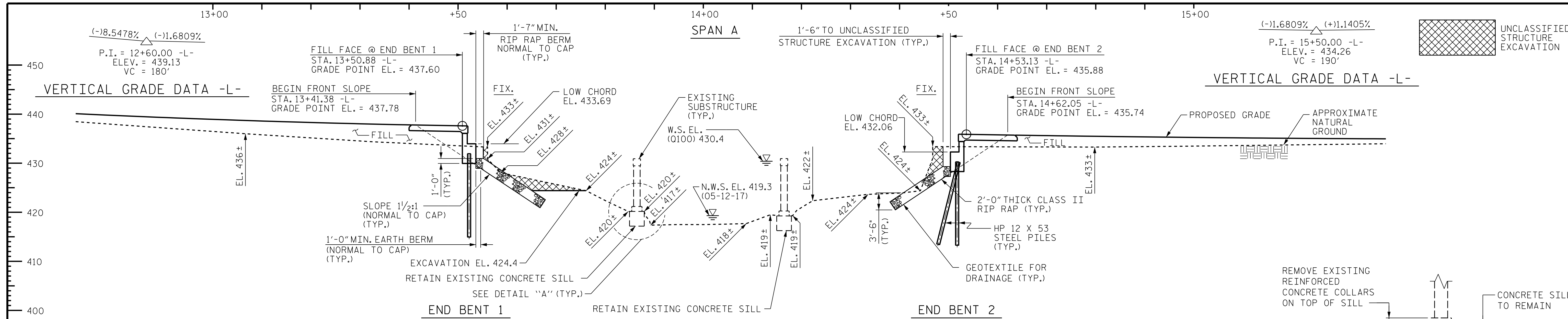
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CH ENGINEERING, INC.

6/23/16

0 2.5 5	PROJ. REFERENCE NO. 17.BP.8.R.124	SHEET NO. X-4
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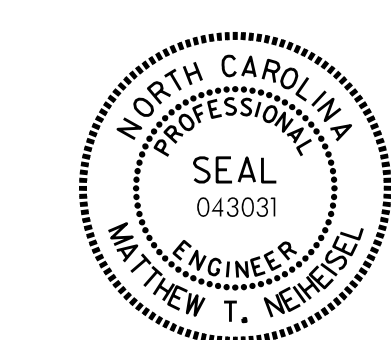


8/14/2023 9:12:07 AM C:\pwworking\chatham\eggs\17\170249189\Chatham_094_cm_xpl.dgn CH ENGINEERING, INC.



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE #180094



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER DRY CREEK
 ON SR 1520 BETWEEN
 COLONIAL RIDGE DR.
 AND SR 1547

DRAWN BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE : NOV 2023

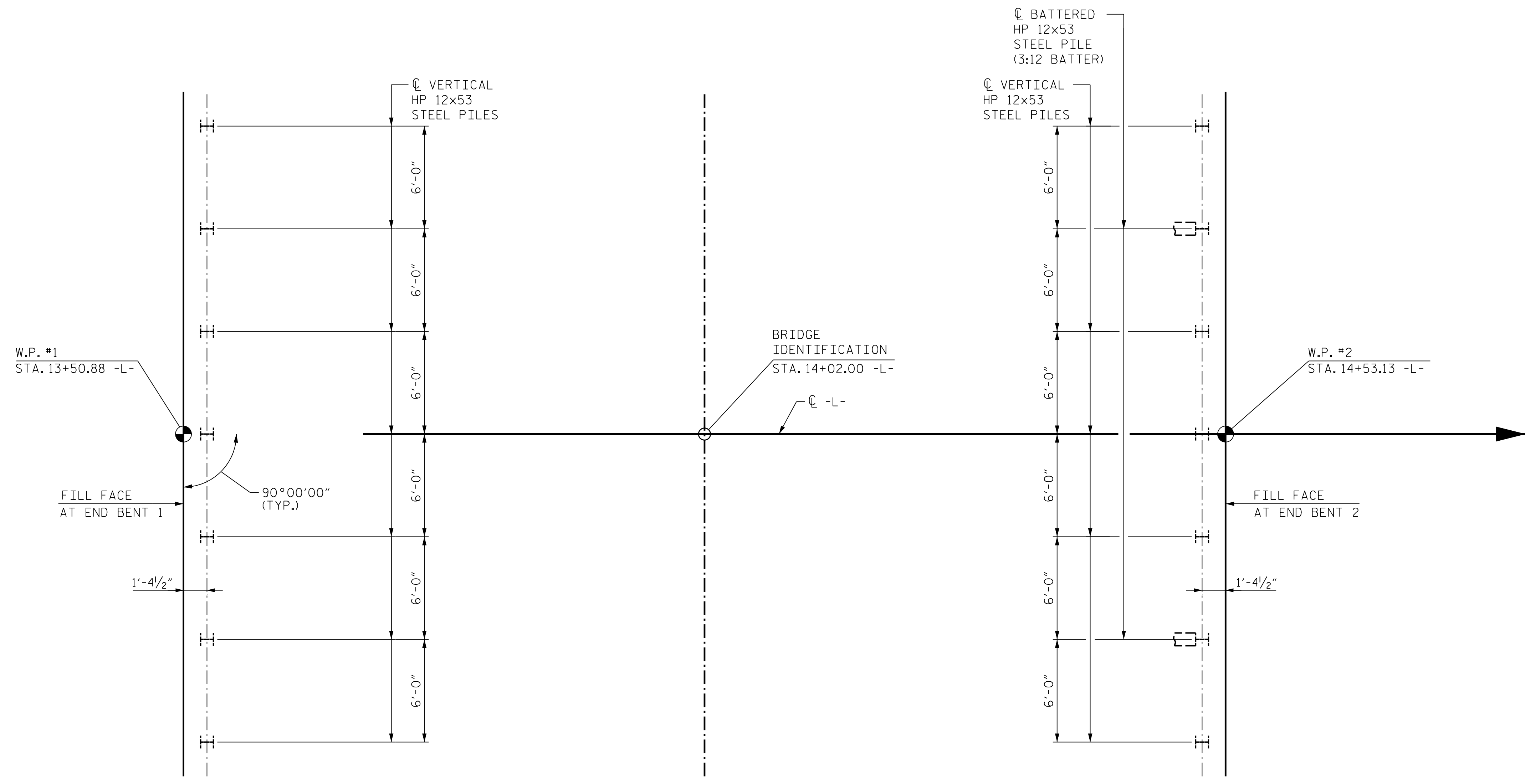
HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

11/7/2023
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S-1
 TOTAL SHEETS 16

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END BENT 1

FOUNDATION LAYOUT

ALL PILES ARE HP 12x53 STEEL PILES.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

END BENT 2

LEGEND

- VERTICAL HP 12x53 STEEL PILE
- BATTERED HP 12x53 STEEL PILE (3:12 BATTER)

FOUNDATION NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 113 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE.
- DRILLED-IN PILES ARE REQUIRED FOR END BENT NO.1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 420 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.1.

- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 113 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20 TO 45 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NOS.1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1 AND END BENT NO.2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.8.R.124

CHATHAM COUNTY

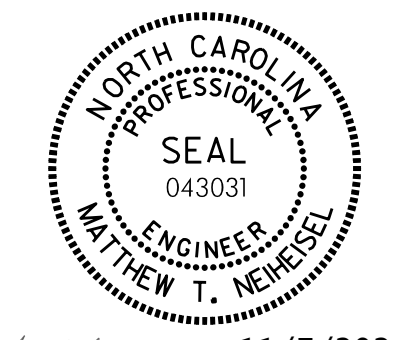
STATION: 14+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

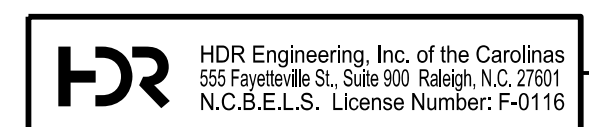
GENERAL DRAWING

FOUNDATION LAYOUT



11/7/2023

DRAWN BY :	D. H. CARTER	DATE :	JUL 2023
CHECKED BY :	M. T. NEIHEISEL	DATE :	JUL 2023
DESIGN ENGINEER OF RECORD :	M. T. NEIHEISEL	DATE :	NOV 2023



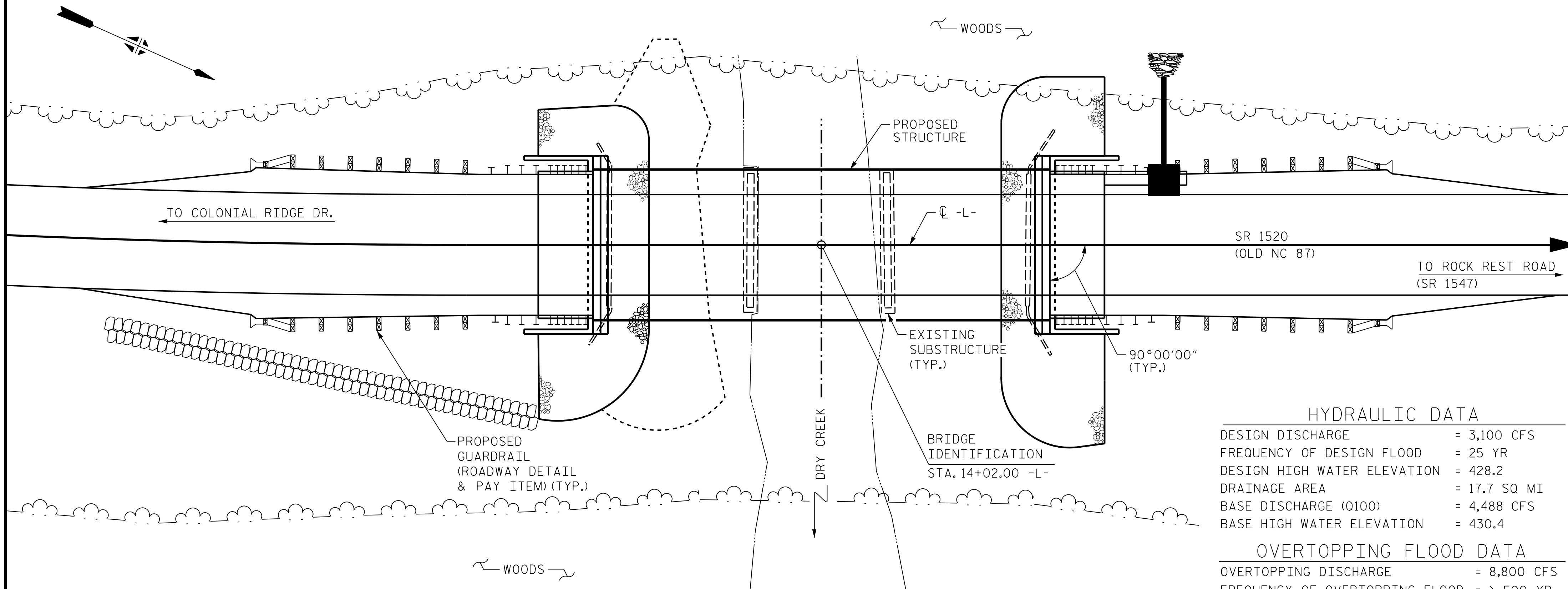
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S-2
TOTAL SHEETS 16

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 USER: MNEIHEIS
 DATE: 11/6/2023
 TIME: 1:47:45 PM
 FILE: ... \401.005.17BP.8.R.124_SMU.FL_S02.180094.dgn

BENCH MARK #1 : BENCH TIE SPIKE IN 16" SWEET GUM, 71' RT. OF STA. 11+08.00 -L-, EL. 459.23



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE	= 3,100 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR
DESIGN HIGH WATER ELEVATION	= 428.2
DRAINAGE AREA	= 17.7 SQ MI
BASE DISCHARGE (Q100)	= 4,488 CFS
BASE HIGH WATER ELEVATION	= 430.4

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 8,800 CFS
FREQUENCY OF OVERTOPPING FLOOD	= > 500 YR
OVERTOPPING FLOOD ELEVATION	= 434.9 *

* OVERTOPPING OCCURS AT STA. 15+68.20 -L- (ROADWAY SAG)

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES"
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE STANDARD NOTES SHEET.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 30'-4", 1 @ 30'-0", 1 @ 30'-4") WITH A STEEL PLANK DECK ON STEEL I-BEAMS AND A CLEAR ROADWAY OF 28'-0" ON TIMBER CAPS, POSTS AND CONCRETE SILLS, AND STEEL BULKHEADS AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE WILL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THE INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 14+02.00."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT LEFT AND 41 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

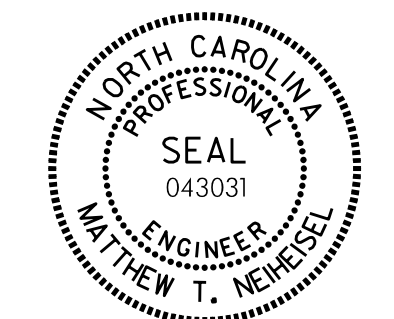
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 14+02.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 14+02.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS AT STATION 14+02.00 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS		
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU.YDS.	LUMP SUM	LBS.	EA.	NO.	LIN.FT.	EA.	LIN.FT.	TONS	SO.YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE							LUMP SUM					200			LUMP SUM	11	1,100	
END BENT NO. 1			42	28		29.0		4,610	7	7	105	7	165	180				
END BENT NO. 2						29.0		4,610	7	7	140	7	190	210				
TOTAL	LUMP SUM	LUMP SUM	42	28	LUMP SUM	58.0	LUMP SUM	9,220	14	14	245	14	200	355	390	LUMP SUM	11	1,100

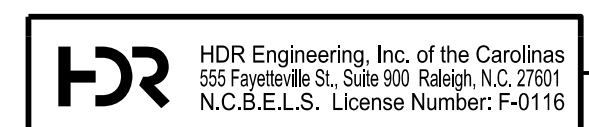
PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER DRY CREEK
 ON SR 1520 BETWEEN
 COLONIAL RIDGE DR.
 AND SR 1547

DRAWN BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DESIGN ENGINEER OF RECORD : M. T. NEIHEISEL DATE : NOV 2023



11/7/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
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2			4			

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	1	1.035	-	1.75	0.272	1.26	100'	EL	49.25	0.489	1.34	100'	EL	4.925	0.80	0.272	1.04	100'	EL	49.25		
	HL-93 (OPERATING)	N/A	-	1.633	-	1.35	0.272	1.63	100'	EL	49.25	0.489	1.73	100'	EL	4.925	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.440	51.840	1.75	0.272	1.75	100'	EL	49.25	0.489	1.81	100'	EL	4.925	0.80	0.272	1.44	100'	EL	49.25		
	HS-20 (OPERATING)	36.000	-	2.271	81.756	1.35	0.272	2.27	100'	EL	49.25	0.489	2.35	100'	EL	4.925	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.413	46.079	1.4	0.272	5.19	100'	EL	49.25	0.489	5.59	100'	EL	4.925	0.80	0.272	3.41	100'	EL	49.25	
		SNGARBS2	20.000	--	2.473	49.452	1.4	0.272	3.76	100'	EL	49.25	0.489	3.91	100'	EL	4.925	0.80	0.272	2.47	100'	EL	49.25	
		SNAGRIS2	22.000	--	2.313	50.885	1.4	0.272	3.52	100'	EL	49.25	0.489	3.60	100'	EL	4.925	0.80	0.272	2.31	100'	EL	49.25	
		SNCOTTS3	27.250	--	1.696	46.228	1.4	0.272	2.58	100'	EL	49.25	0.489	2.78	100'	EL	4.925	0.80	0.272	1.70	100'	EL	49.25	
		SNAGGRS4	34.925	--	1.390	48.556	1.4	0.272	2.11	100'	EL	49.25	0.489	2.26	100'	EL	4.925	0.80	0.272	1.39	100'	EL	49.25	
		SNS5A	35.550	--	1.361	48.398	1.4	0.272	2.07	100'	EL	49.25	0.489	2.27	100'	EL	4.925	0.80	0.272	1.36	100'	EL	49.25	
		SNS6A	39.950	--	1.238	49.456	1.4	0.272	1.88	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.24	100'	EL	49.25	
	SNS7B	42.000	--	1.178	49.496	1.4	0.272	1.79	100'	EL	49.25	0.489	2.00	100'	EL	4.925	0.80	0.272	1.18	100'	EL	49.25		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.506	49.709	1.4	0.272	2.29	100'	EL	49.25	0.489	2.46	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT4A	33.075	--	1.510	49.942	1.4	0.272	2.30	100'	EL	49.25	0.489	2.41	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT6A	41.600	--	1.224	50.926	1.4	0.272	1.86	100'	EL	49.25	0.489	2.09	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7A	42.000	--	1.225	51.442	1.4	0.272	1.86	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7B	42.000	--	1.254	52.657	1.4	0.272	1.91	100'	EL	49.25	0.489	1.96	100'	EL	4.925	0.80	0.272	1.25	100'	EL	49.25	
		TNAGRIT4	43.000	--	1.203	51.711	1.4	0.272	1.83	100'	EL	49.25	0.489	1.91	100'	EL	4.925	0.80	0.272	1.20	100'	EL	49.25	
TNAGT5A		45.000	--	1.139	51.236	1.4	0.272	1.73	100'	EL	49.25	0.489	1.87	100'	EL	4.925	0.80	0.272	1.14	100'	EL	49.25		
TNAGT5B	45.000	3	1.129	50.805	1.4	0.272	1.72	100'	EL	49.25	0.489	1.82	100'	EL	4.925	0.80	0.272	1.13	100'	EL	49.25			
EMERGENCY VEHICLE (EV)	EV2	28.750	--	2.129	61.213	1.3	0.272	2.87	100'	EL	49.25	0.489	3.06	100'	EL	4.925	0.80	0.272	2.13	100'	EL	49.25		
	EV3	43.000	4	1.403	60.325	1.3	0.272	1.89	100'	EL	49.25	0.489	2.06	100'	EL	4.925	0.80	0.272	1.40	100'	EL	49.25		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ DC	γ DW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

-
-
-
-

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

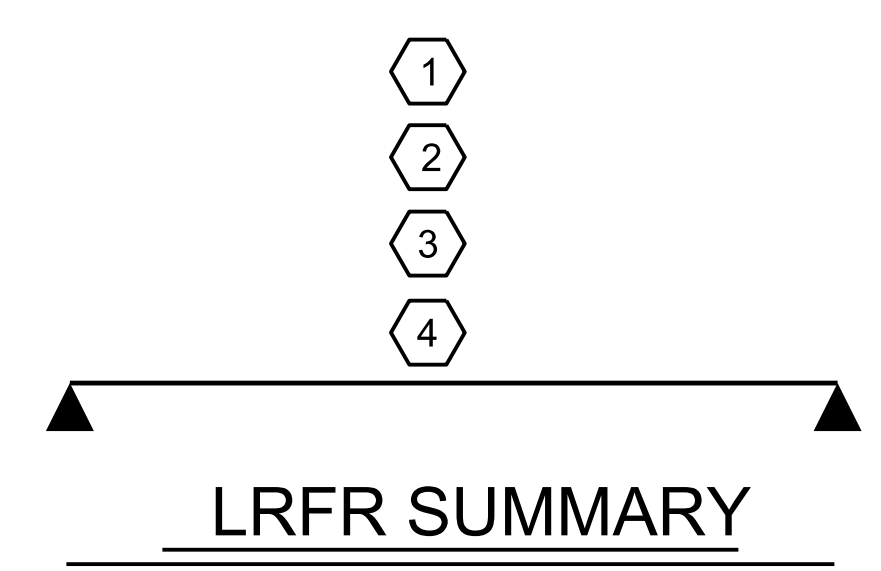
3 LEGAL LOAD RATING **

4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

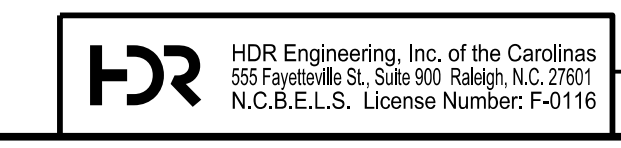
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. 17BP.8.R.124
CHATHAM COUNTY
STATION: 14+02.00 -L-

PLOT DRIVER: \$PLTDVRS\$
 USER: \$USERS\$ DATE: \$DATE\$
 FILE: \$FILES\$

ASSEMBLED BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEHEISEL DATE : JUL 2023
 DRAWN BY : TMG 11/11 REV. 06/23 AKP/AAI
 CHECKED BY : AAC 11/11



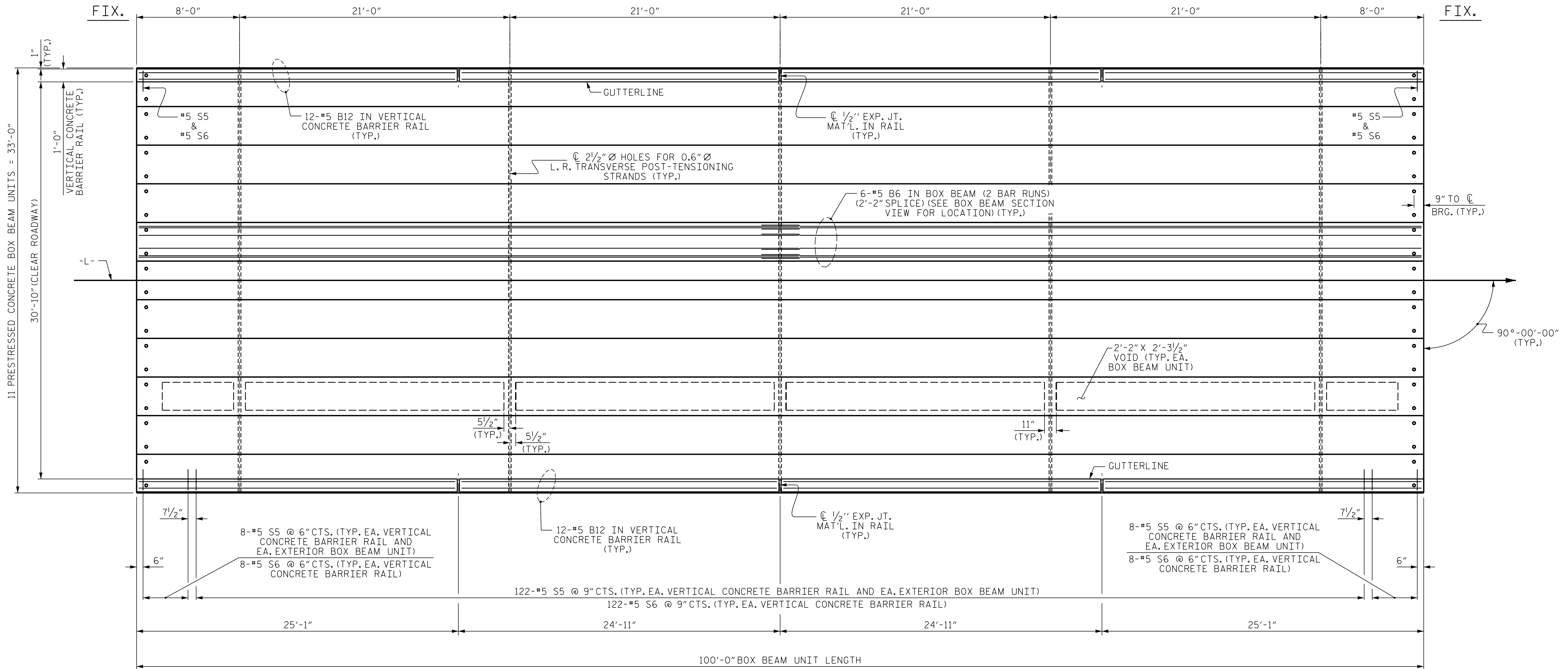
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR
100' BOX BEAM UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

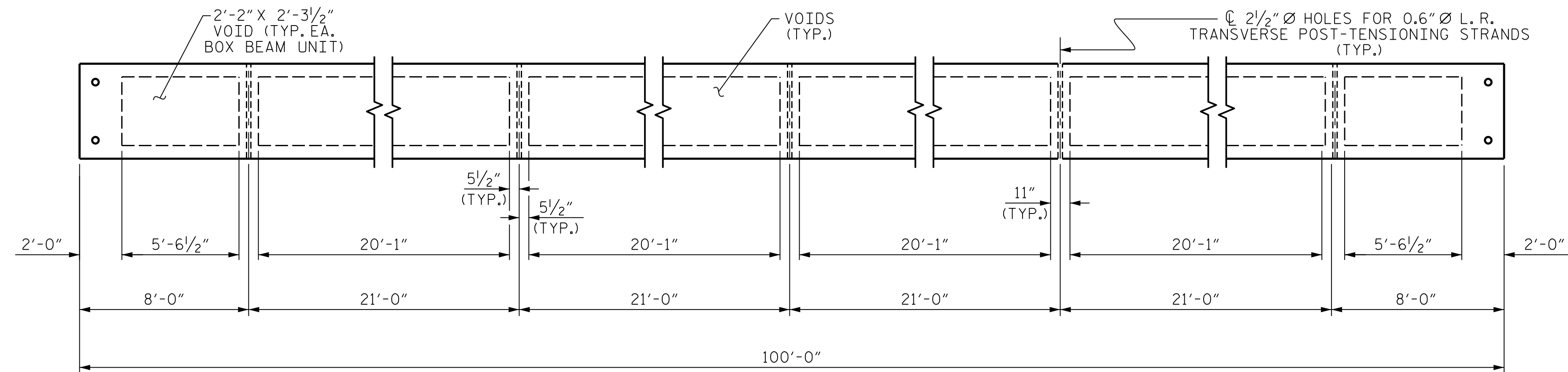
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1			3			TOTAL SHEETS
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11/7/2023

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PLAN OF UNIT



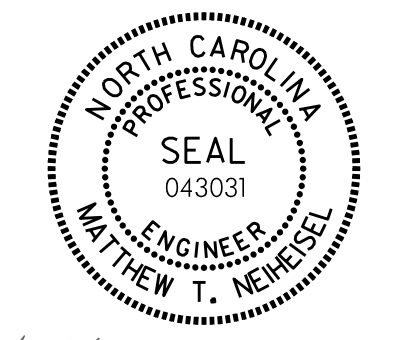
DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

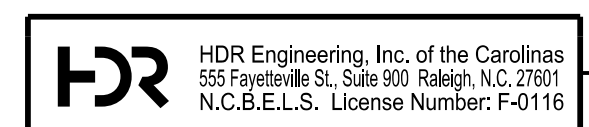
STANDARD

PLAN OF 100' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW



11/7/2023
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

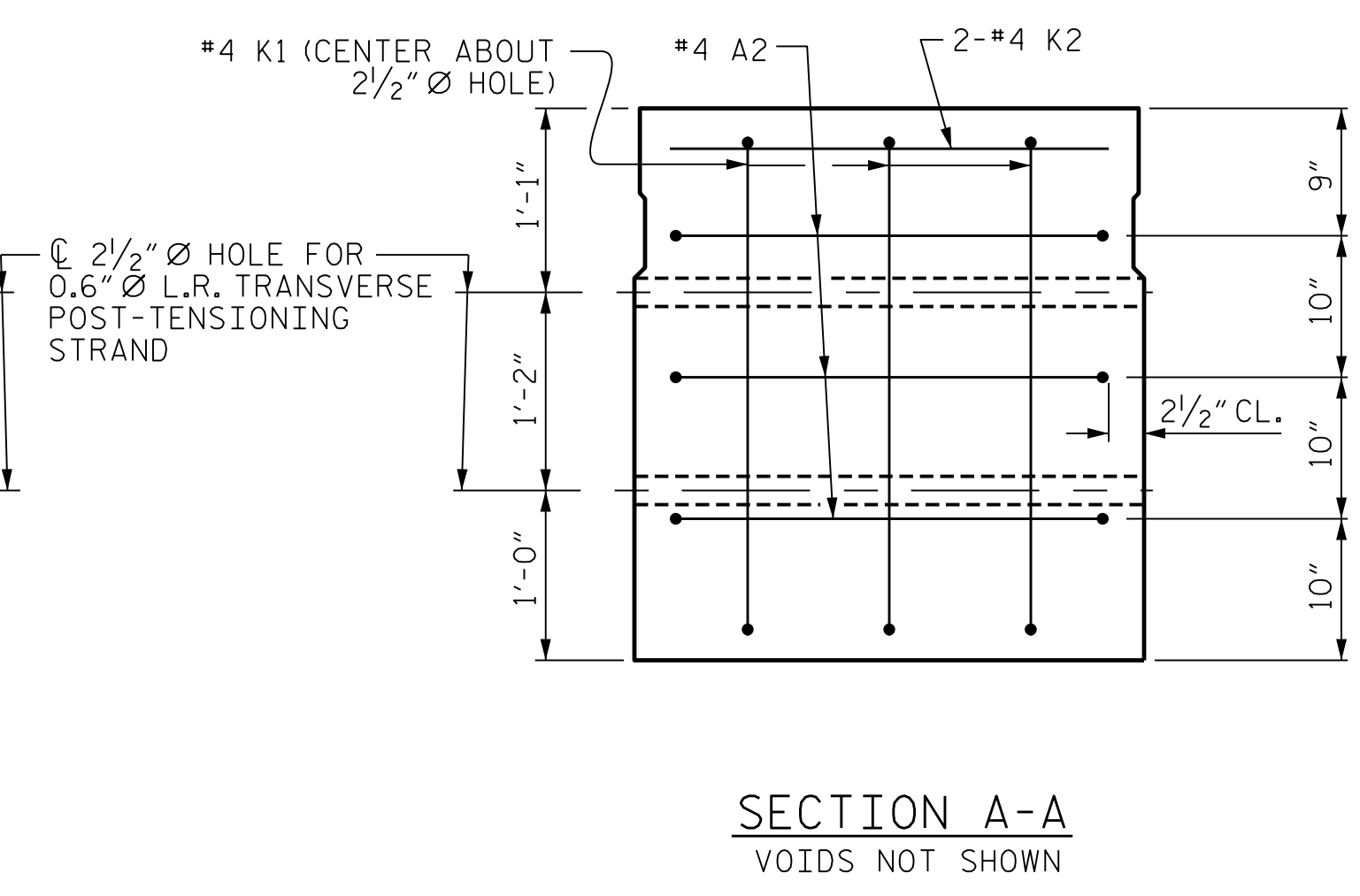
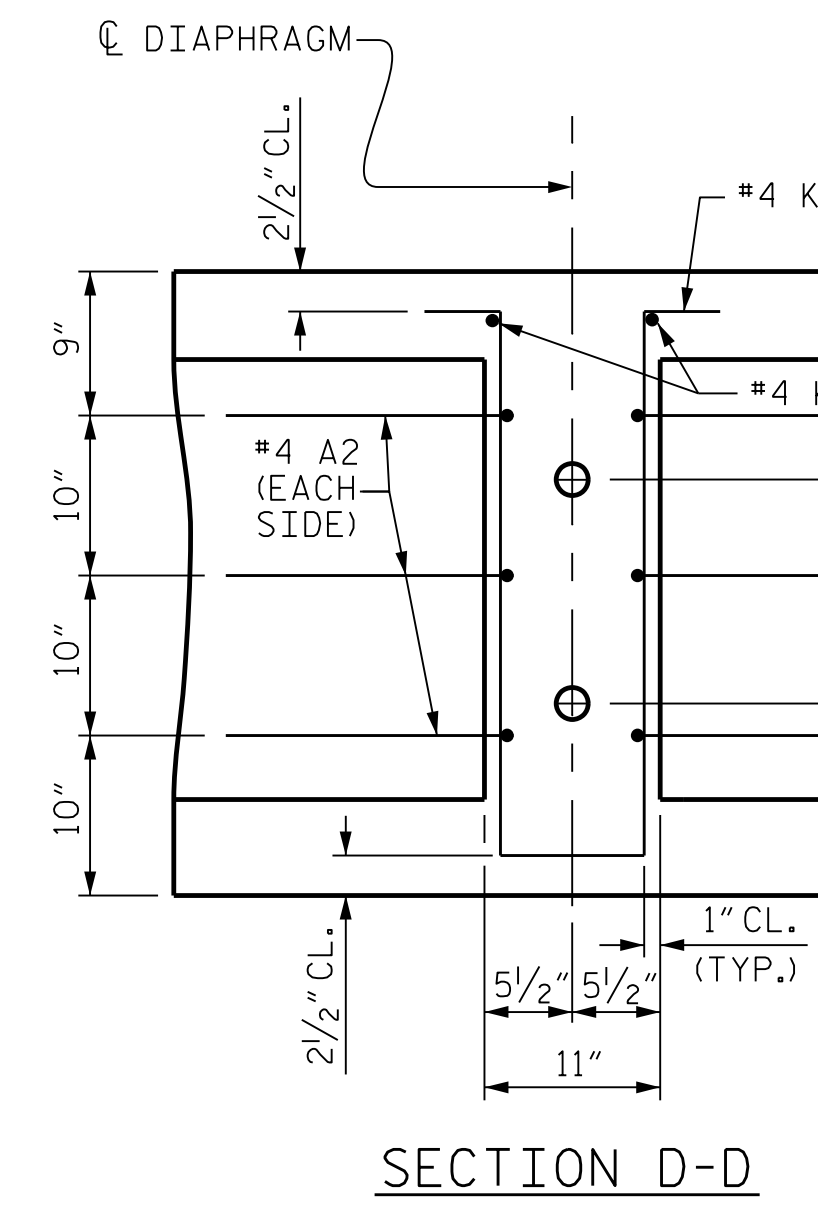
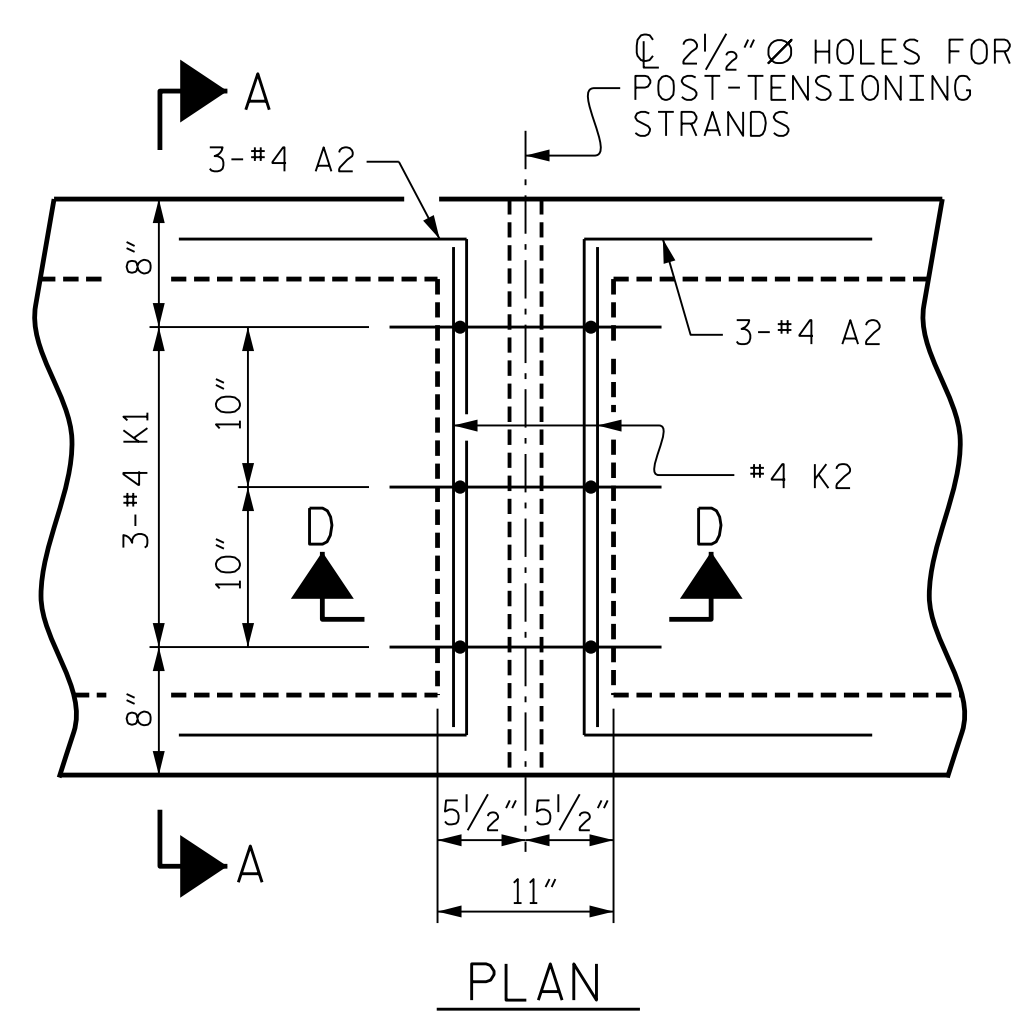
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CHECKED BY : M. T. NEIHEISEL	DATE : JUL 2023
DRAWN BY : DCE 8/10	REV. 8/14
CHECKED BY : TMG 11/11	MAA/TMG



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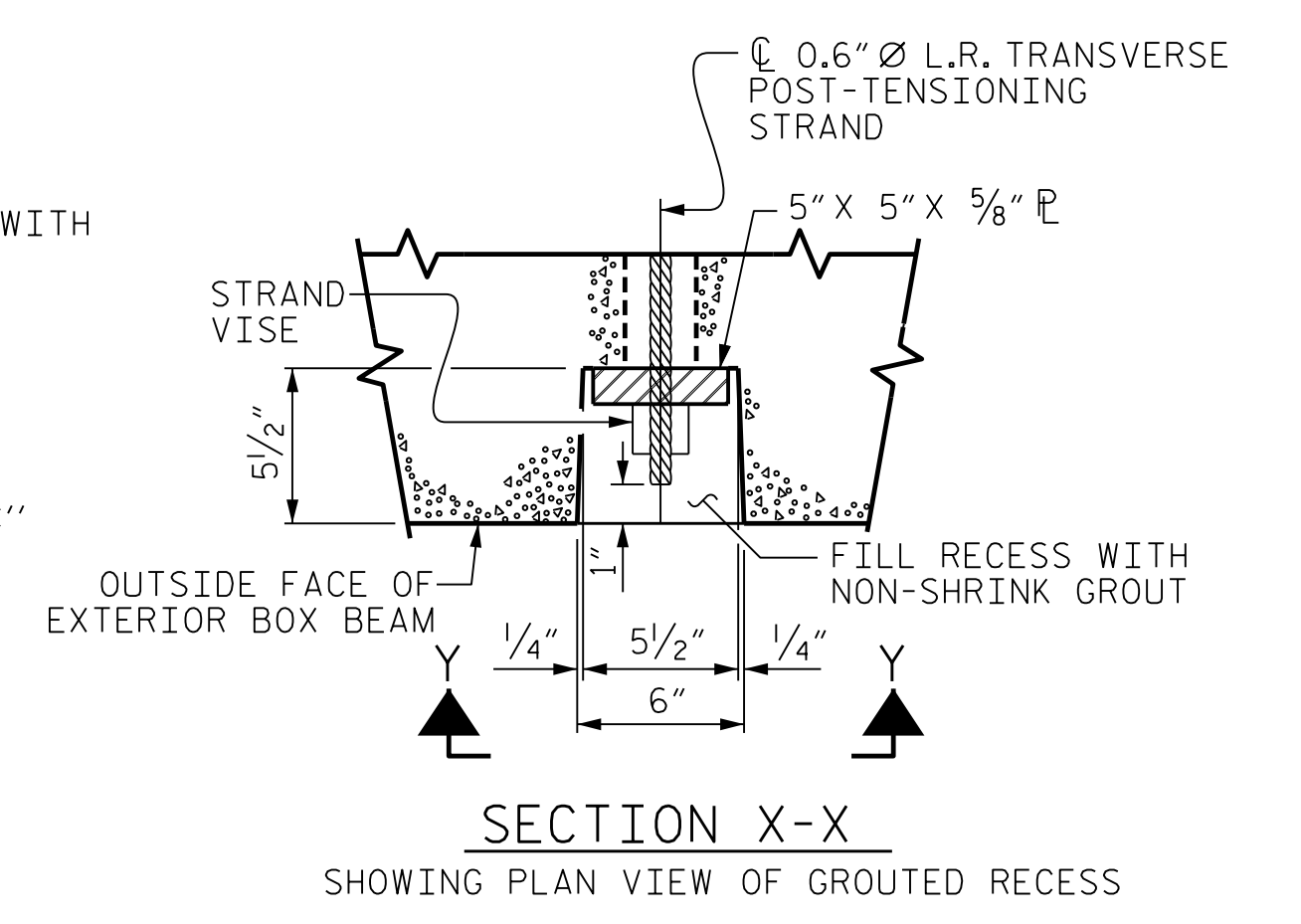
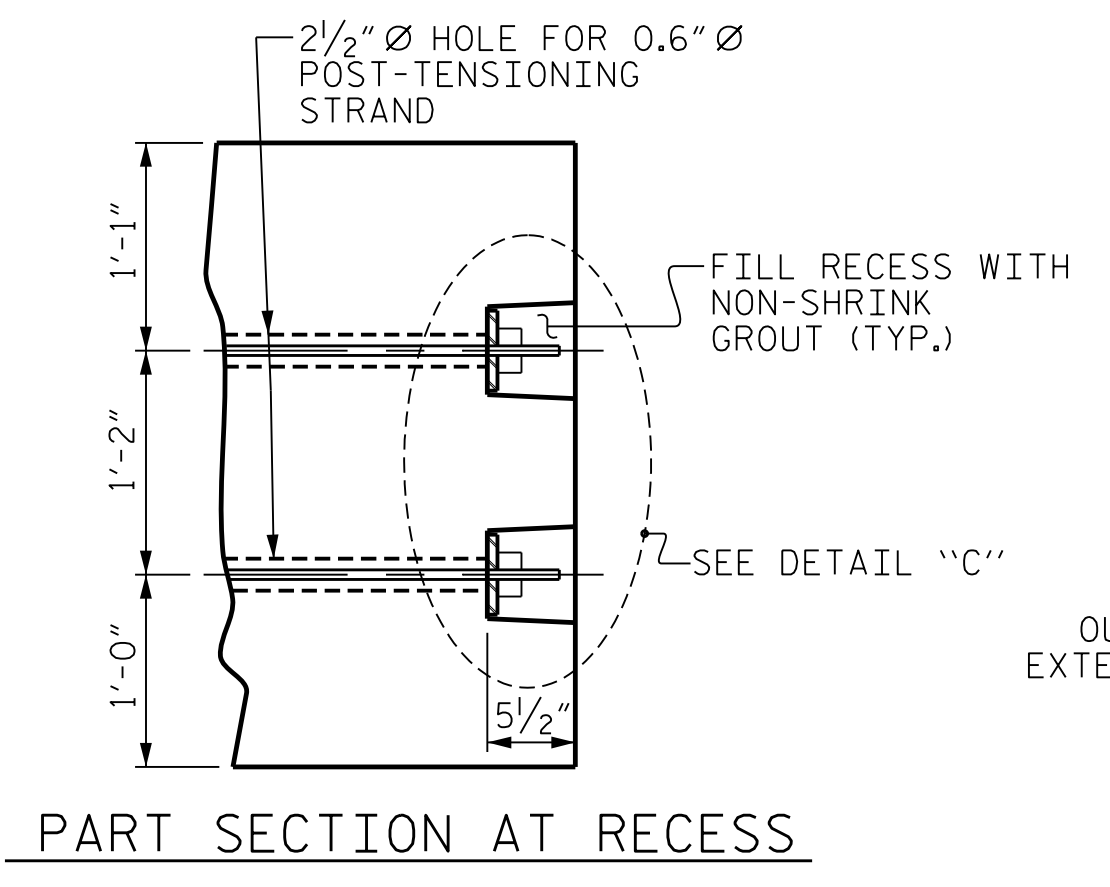
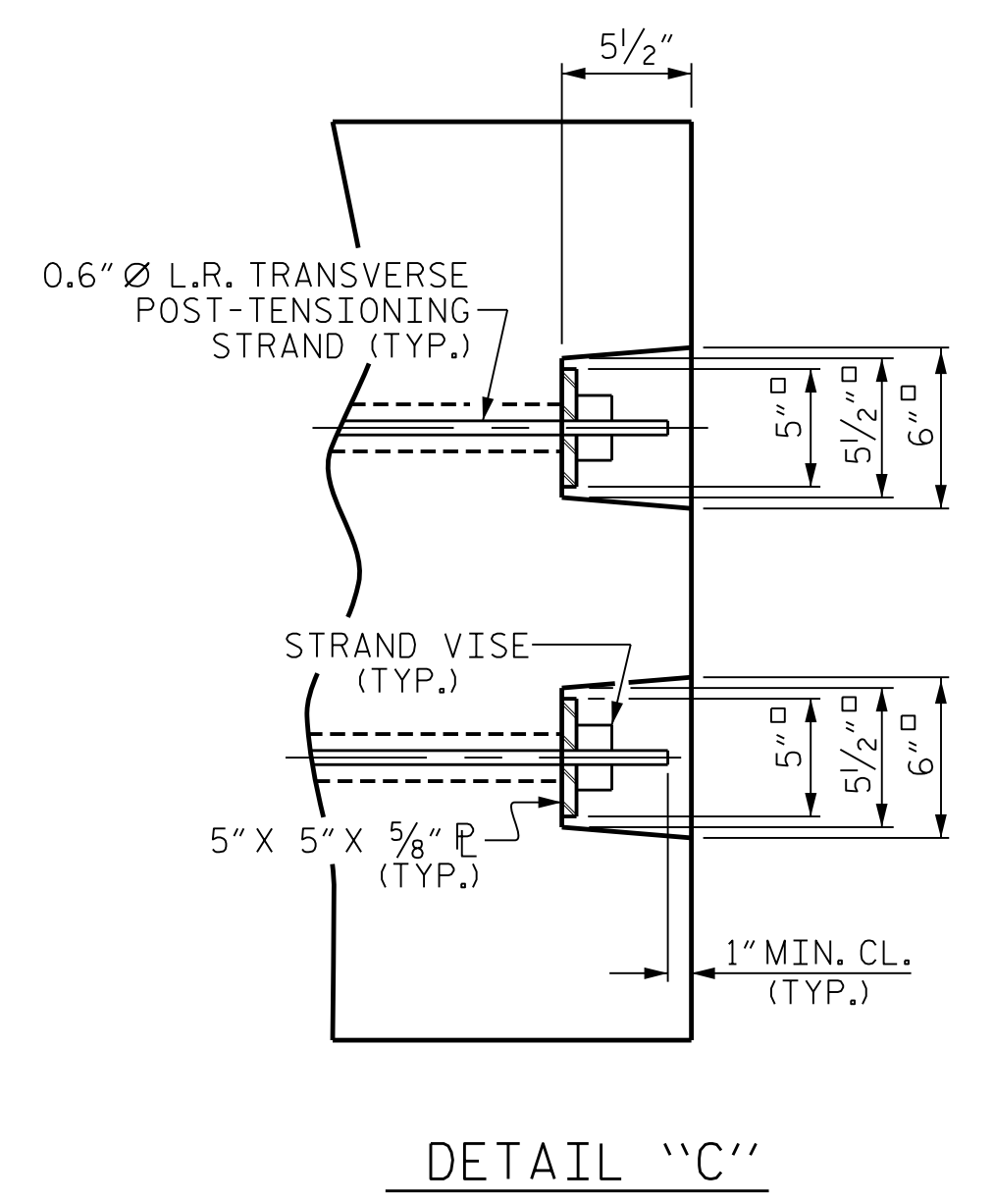
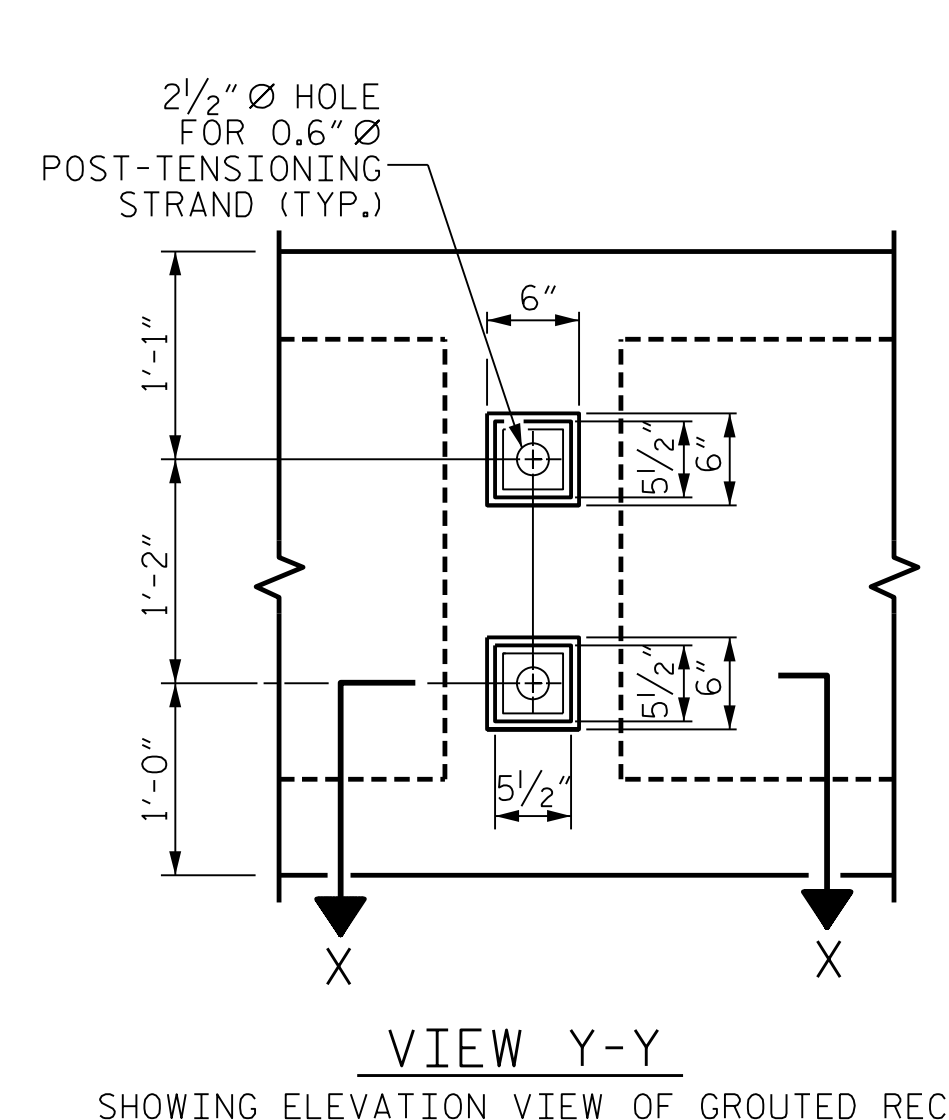
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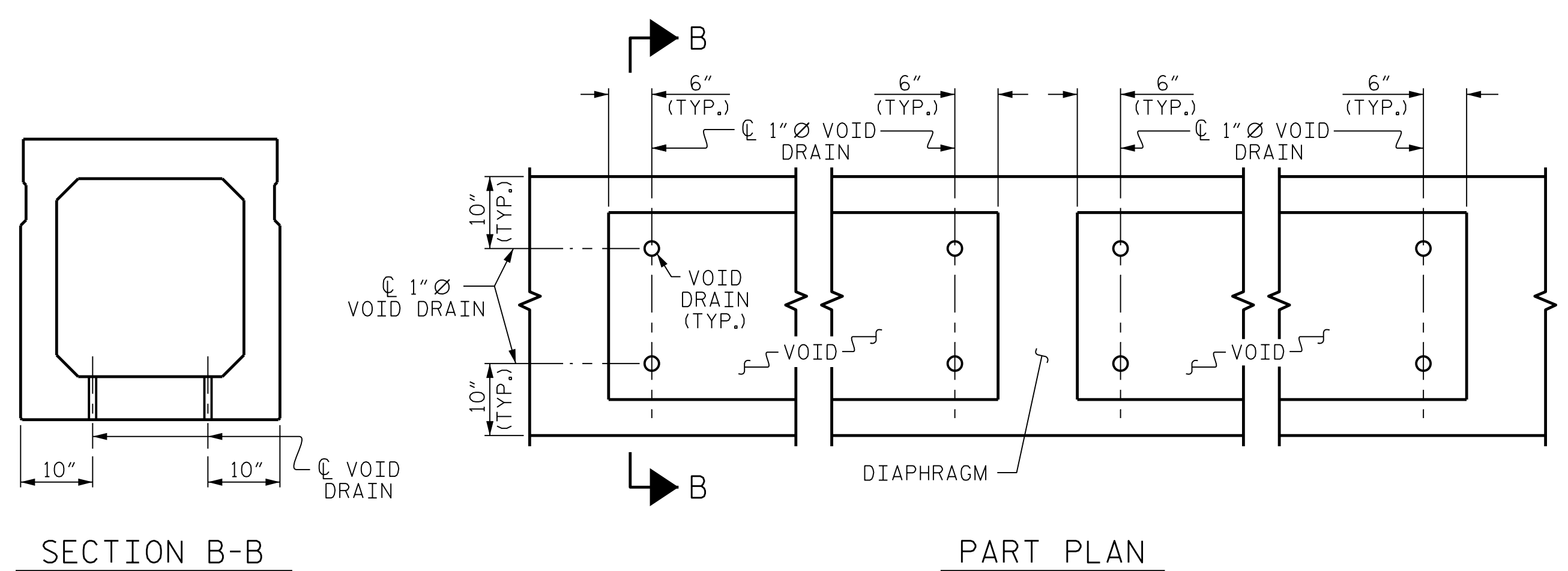


DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



GROUDED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM



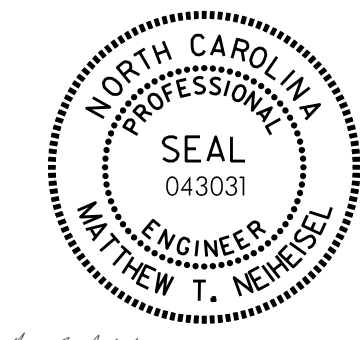
VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
100' BOX BEAM UNIT (SE)	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	7/8" ↓
FINAL CAMBER	1 1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-
 SHEET 4 OF 5



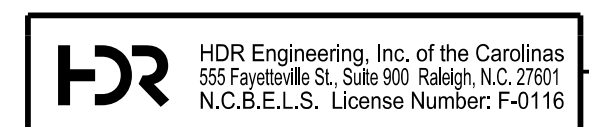
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

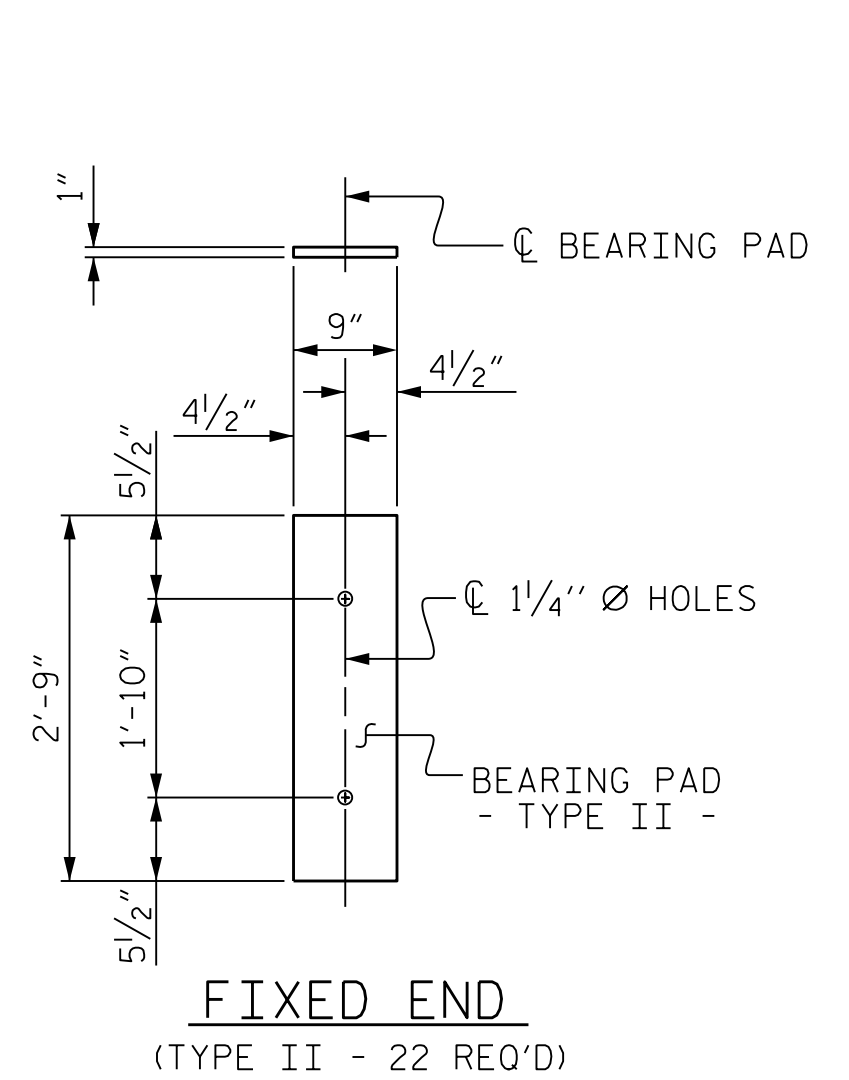
3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

ASSEMBLED BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DRAWN BY : DGE II/II REV. 8/14 MAA/TMG
 CHECKED BY : TMG II/II



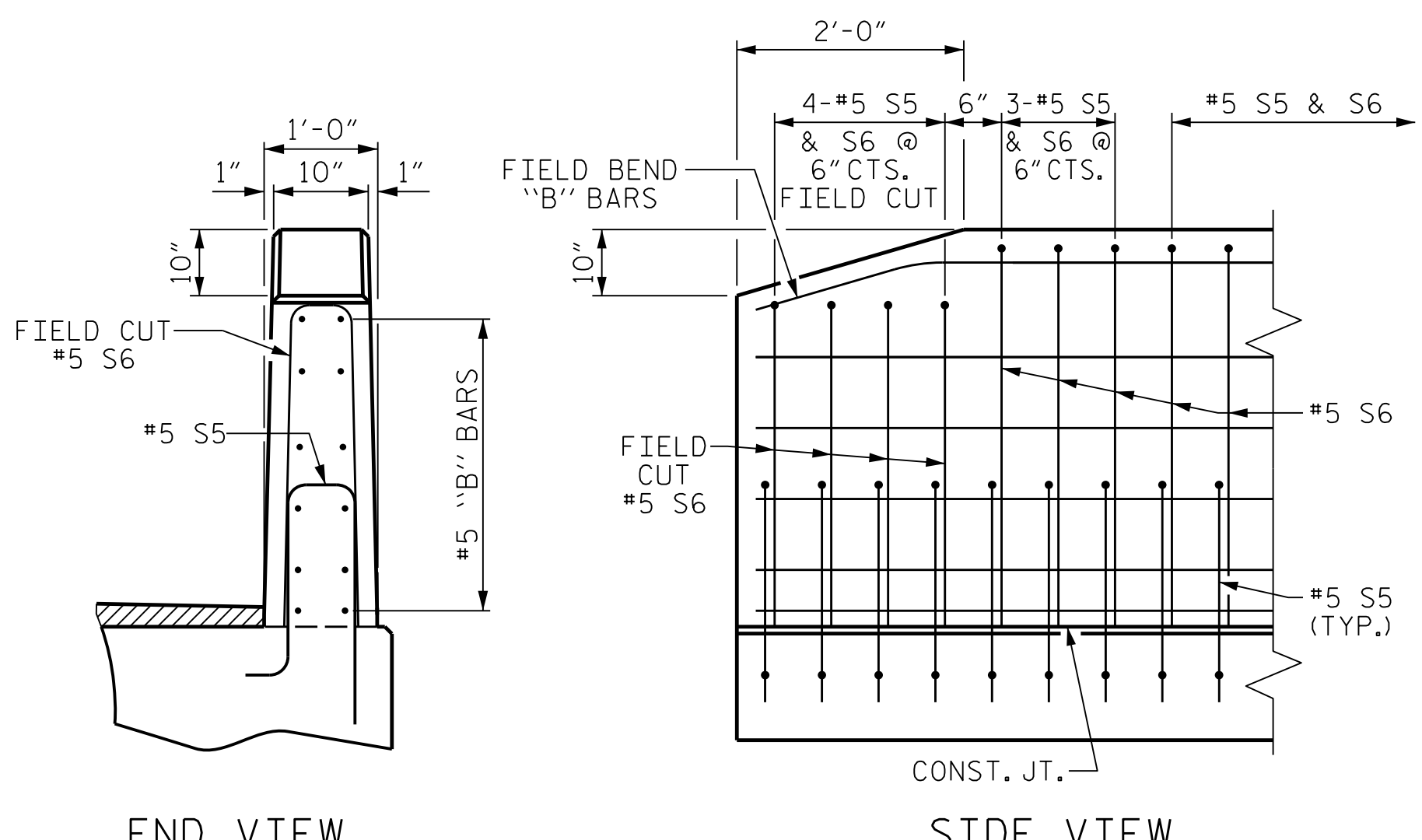
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 16



ELASTOMERIC BEARING DETAILS

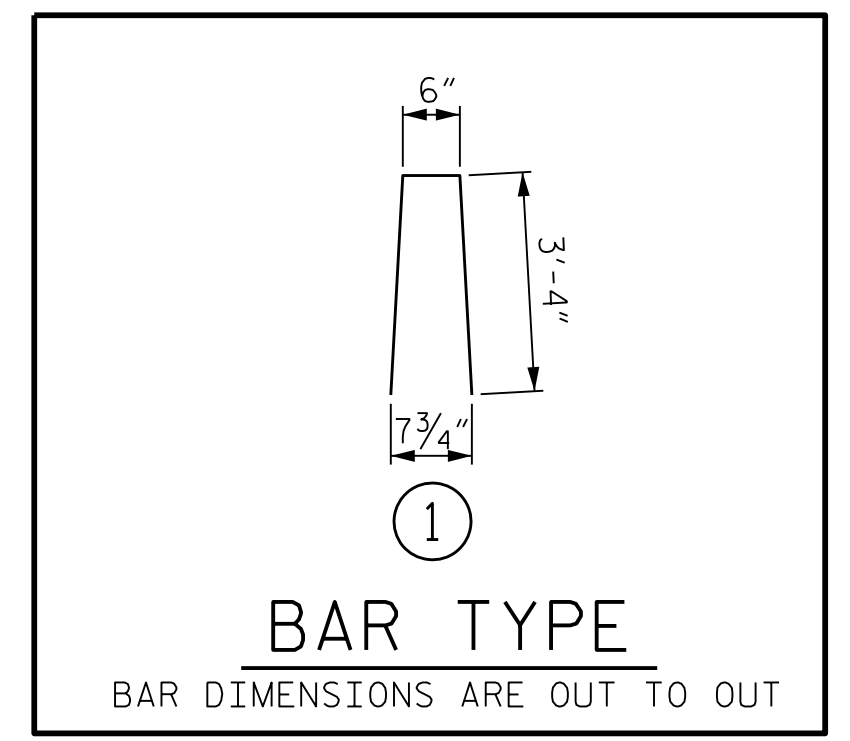
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



END OF RAIL DETAILS

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11		1100'-0"

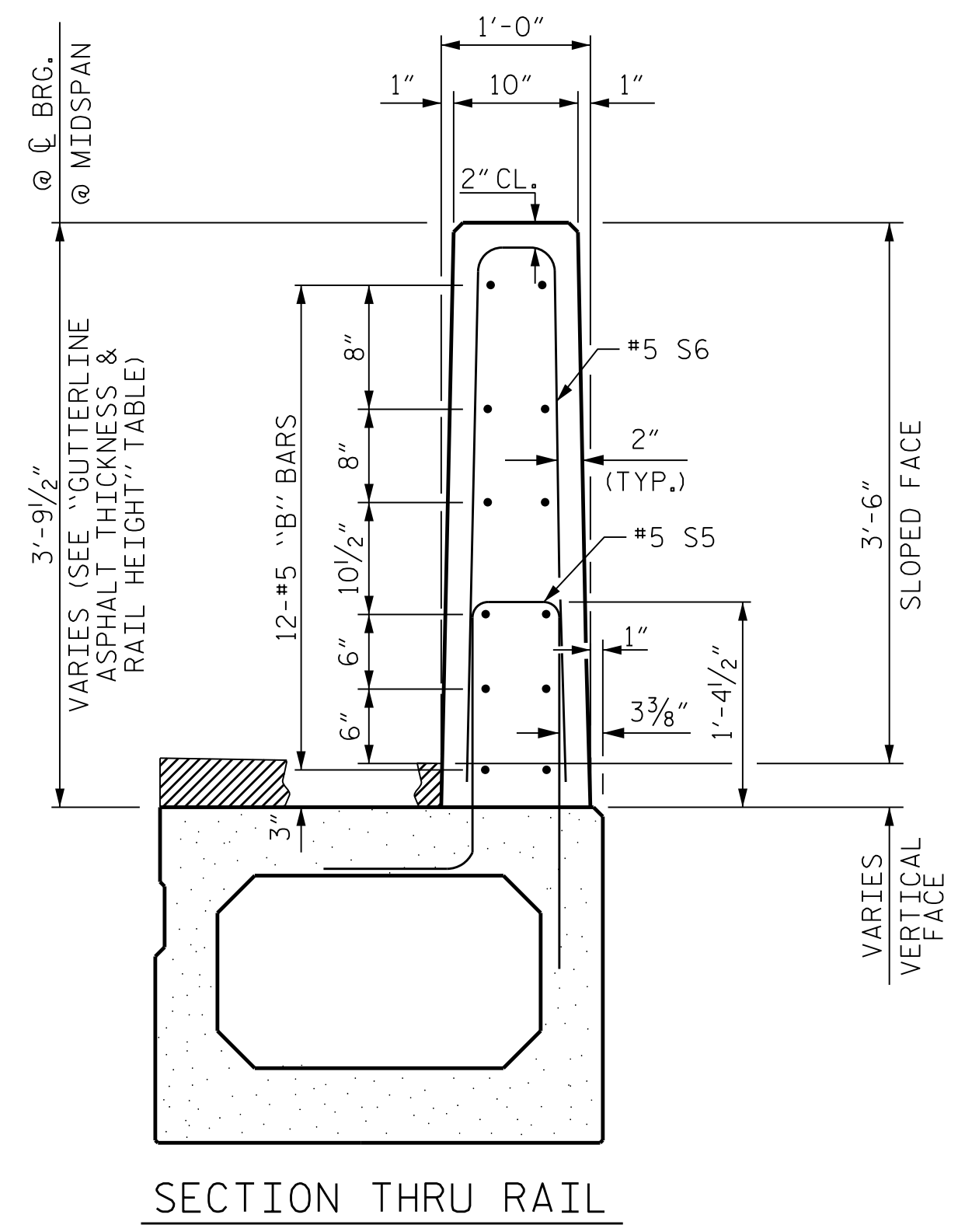


BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

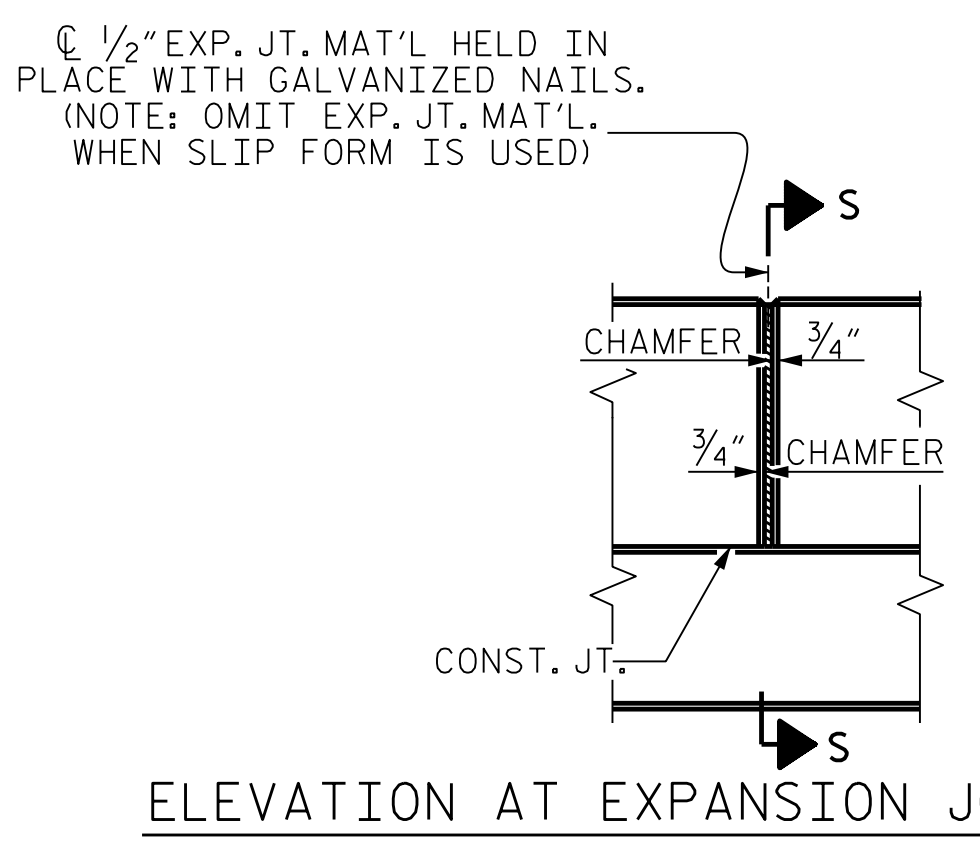
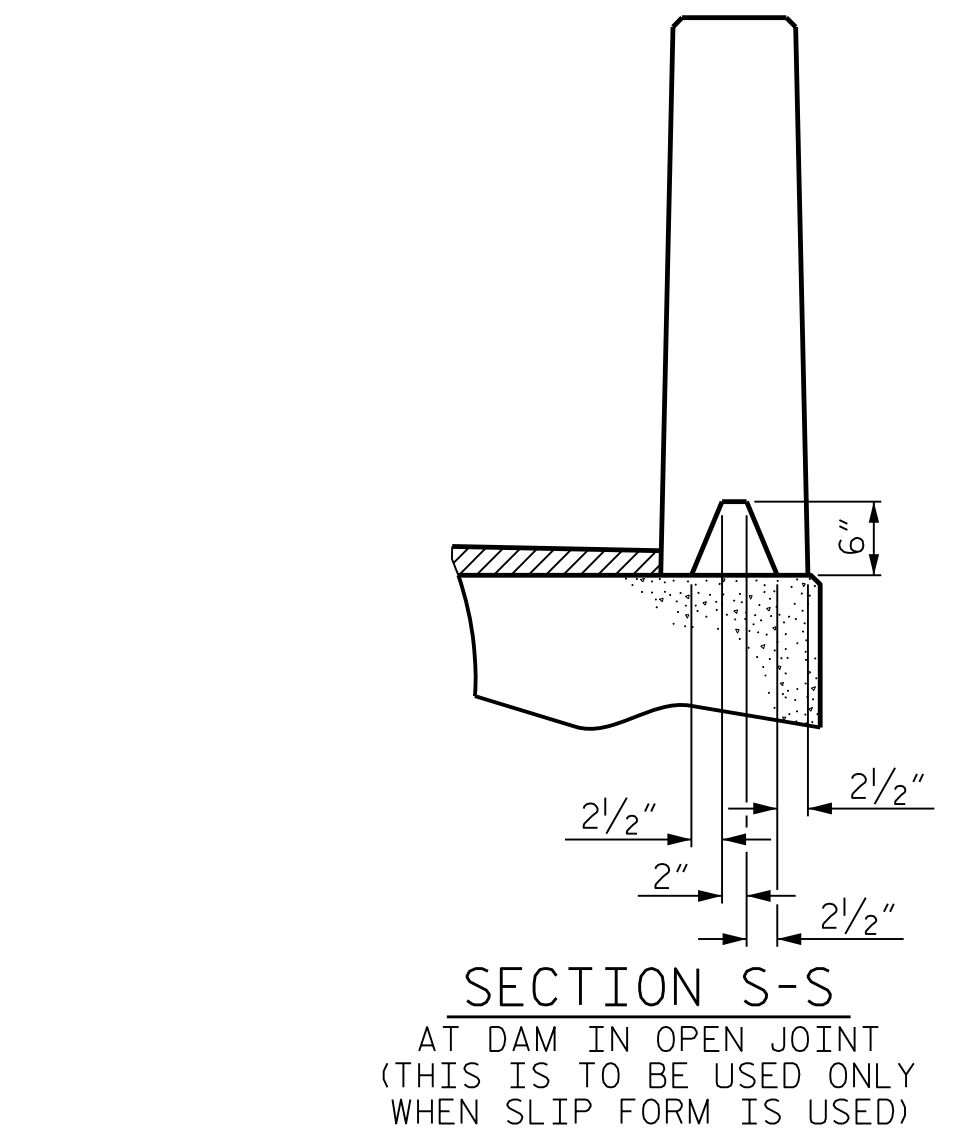
BAR	BARS PER PAIR OF EXTERIOR UNITS 100' UNIT	SIZE	TYPE	LENGTH	WEIGHT
*B12	96	#5	STR	24'-7"	2461
*S6	276	#5	1	7'-2"	2063
* EPOXY COATED REINFORCING STEEL				LBS.	4524
CLASS AA CONCRETE				CU.YDS.	25.9
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	200.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2 3/8"	3'-8 3/8"



VERTICAL CONCRETE BARRIER RAIL DETAILS



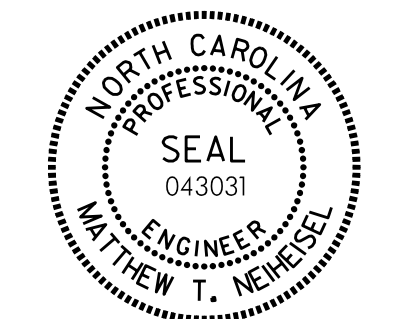
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED)

PROJECT NO. 17BP.8.R.124
CHATHAM COUNTY
STATION: 14+02.00 -L-
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

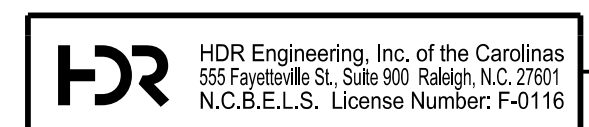
STANDARD

3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT



11/7/2023

ASSEMBLED BY : D. H. CARTER	DATE : JUL 2023
CHECKED BY : M. T. NEIHEISEL	DATE : JUL 2023
DRAWN BY : DGE 10/11	REV. 4/15
CHECKED BY : TMG 11/11	MAA/TMG



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

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USER: MNEIHEIS DATE: 11/6/2023 TIME: 1:48:37 PM
FILE: ... \401_040_17BP.8.R.124_SMU_BR_509_180094.dgn

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

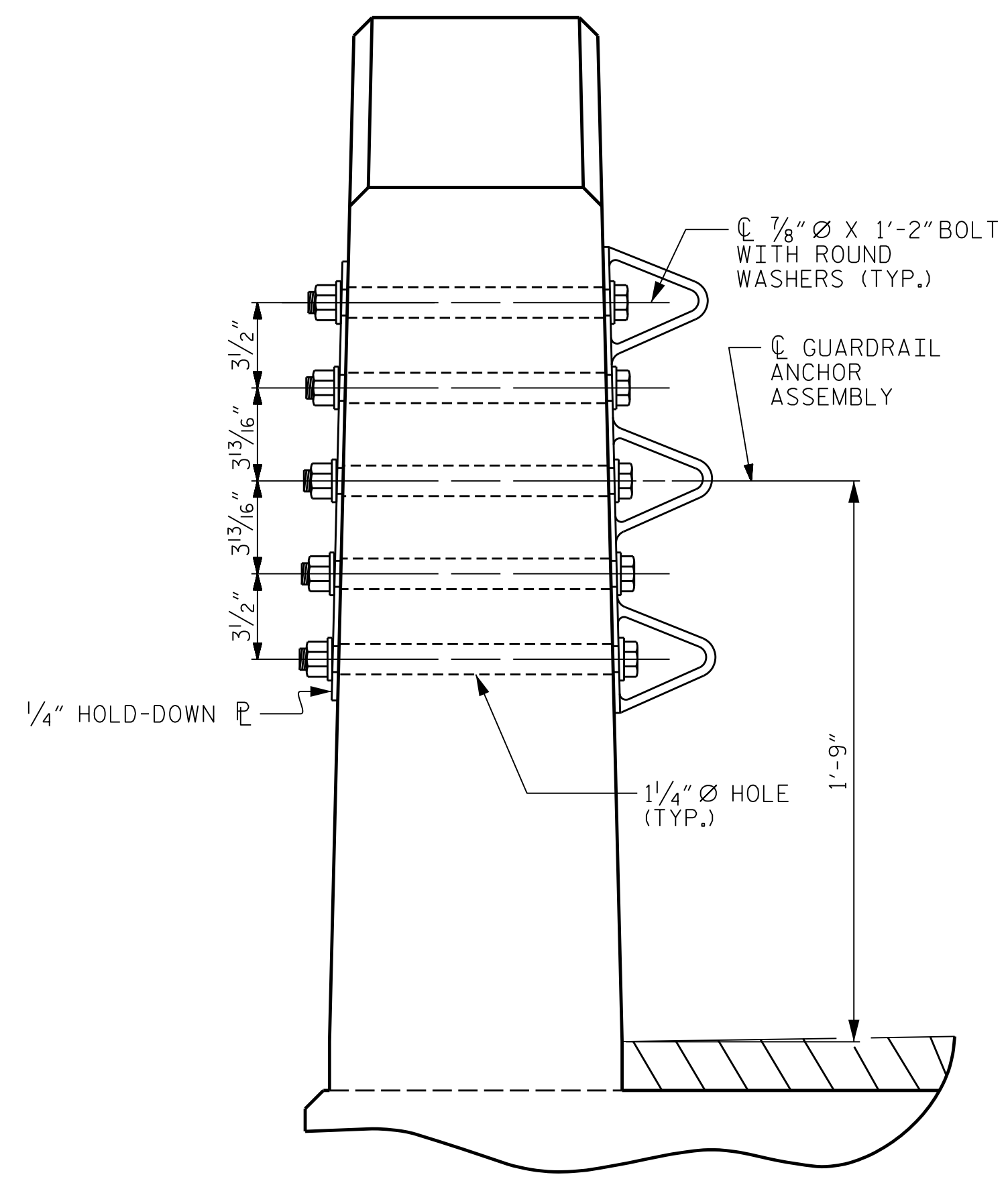
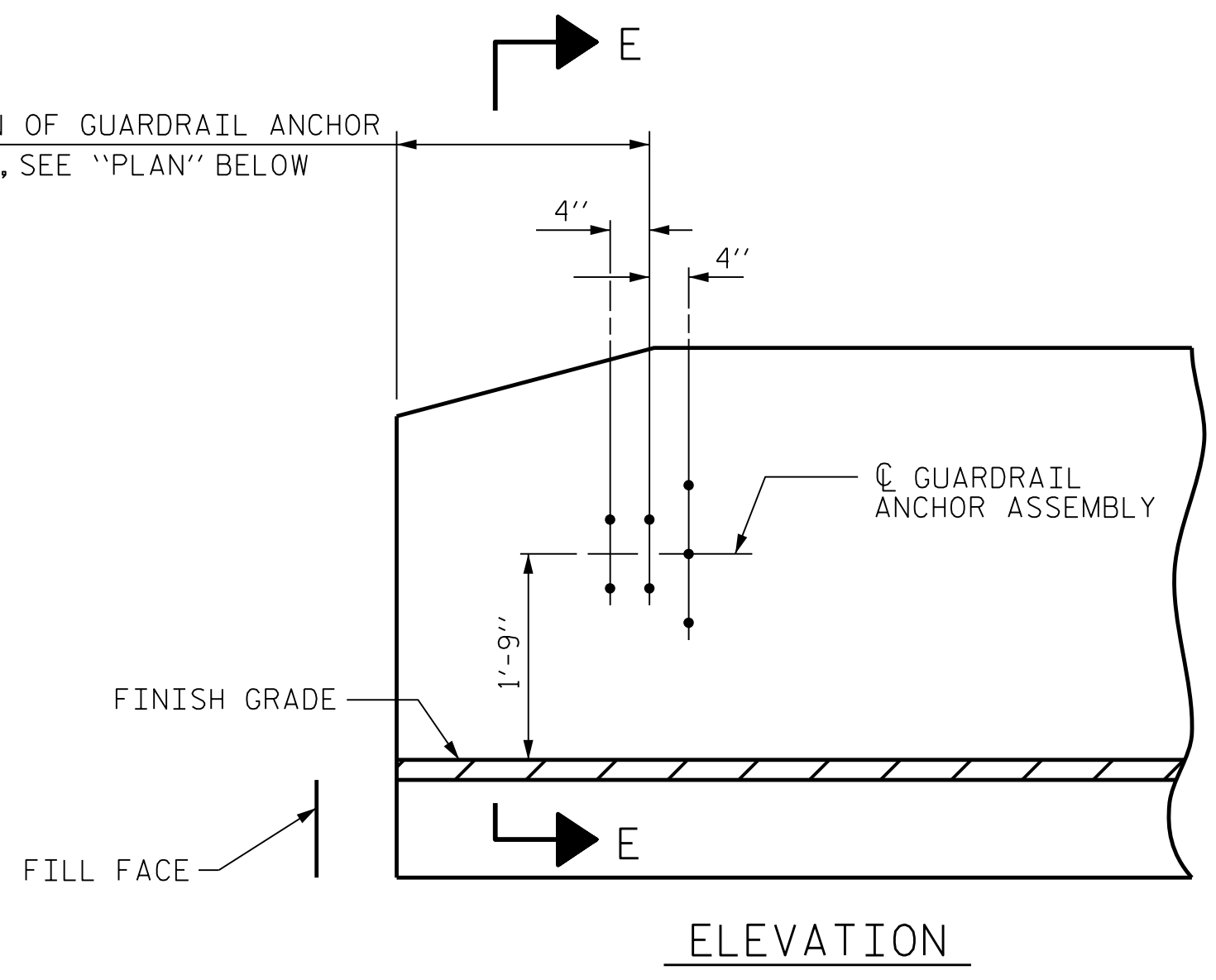
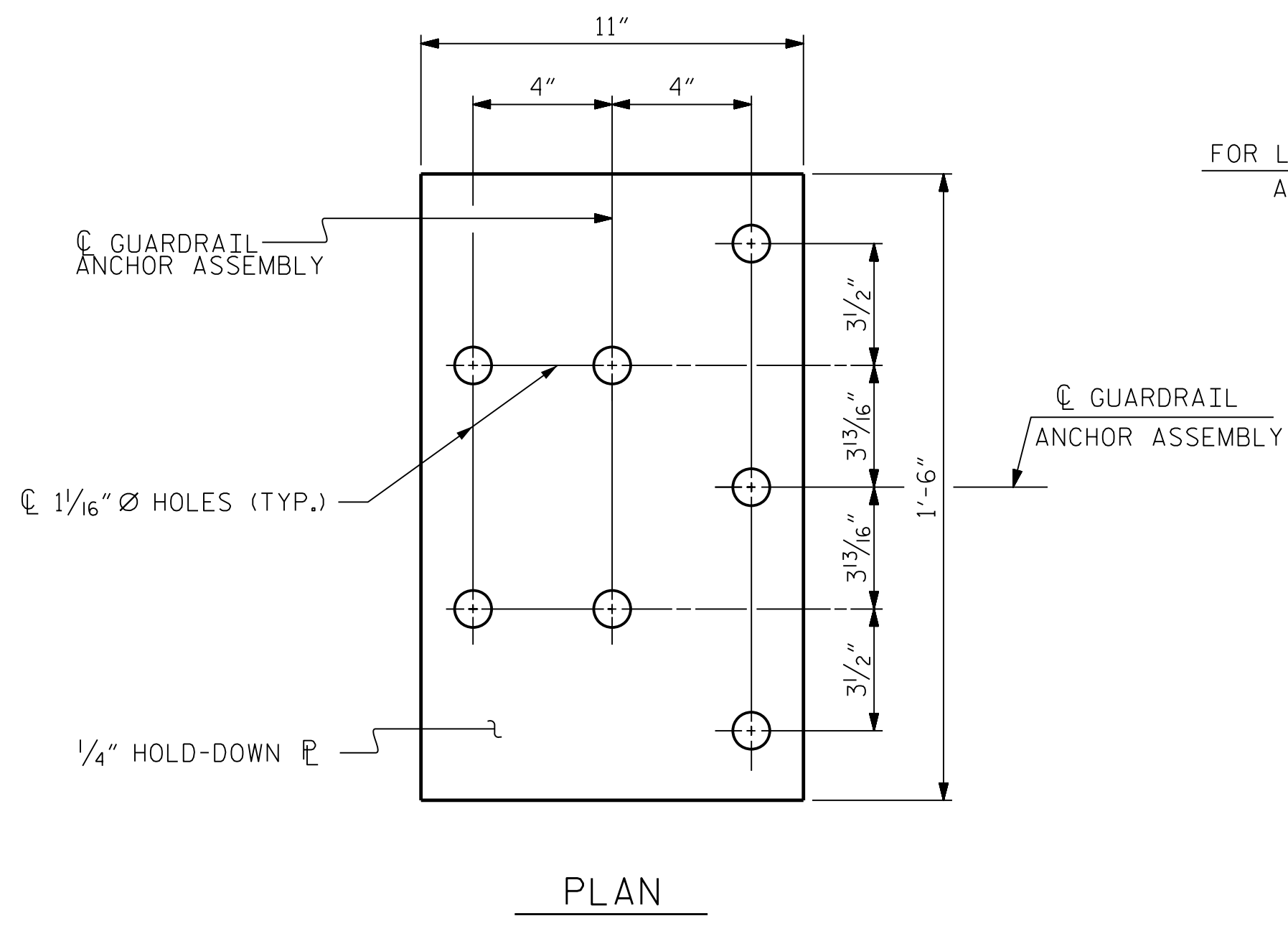
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

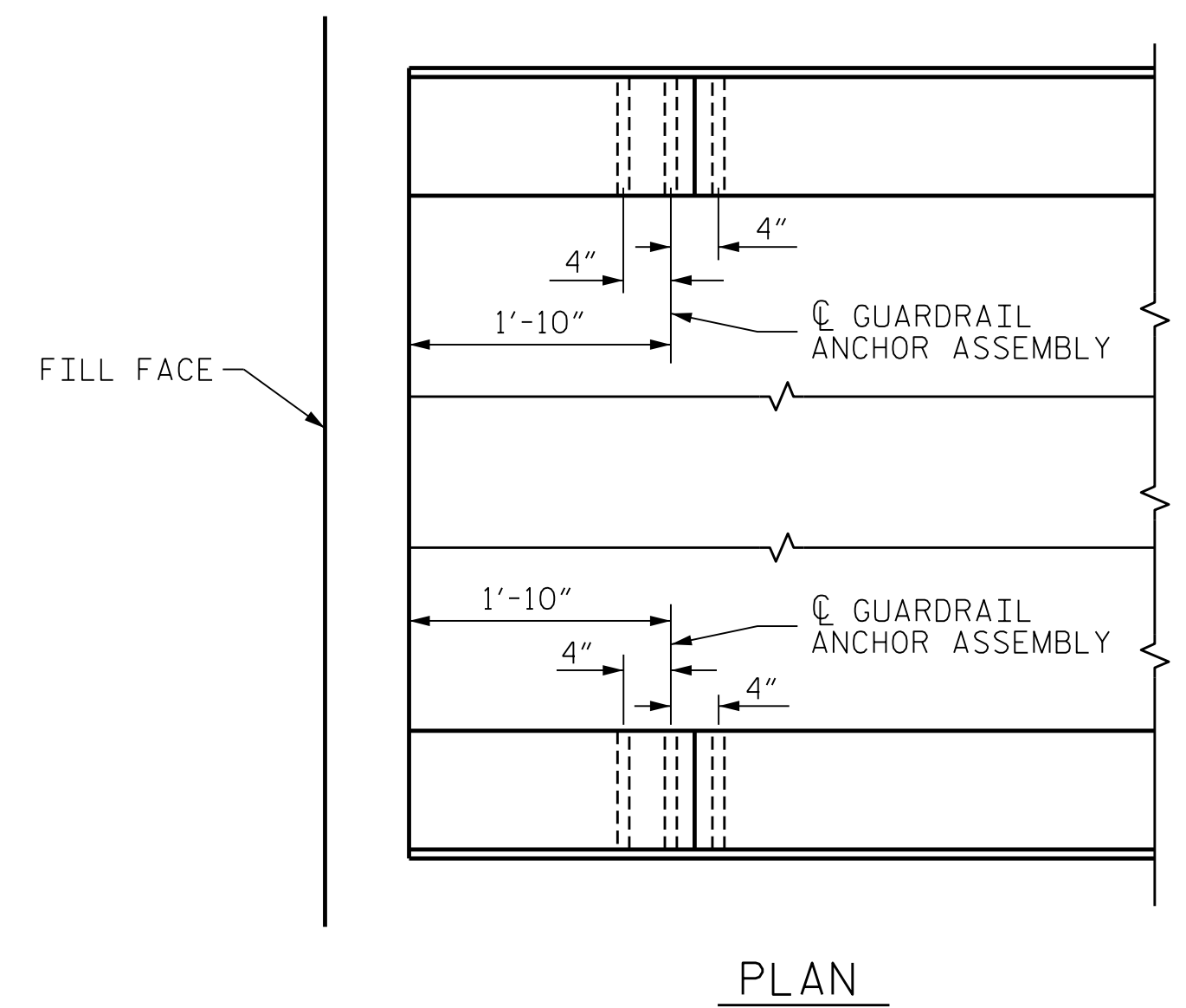
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

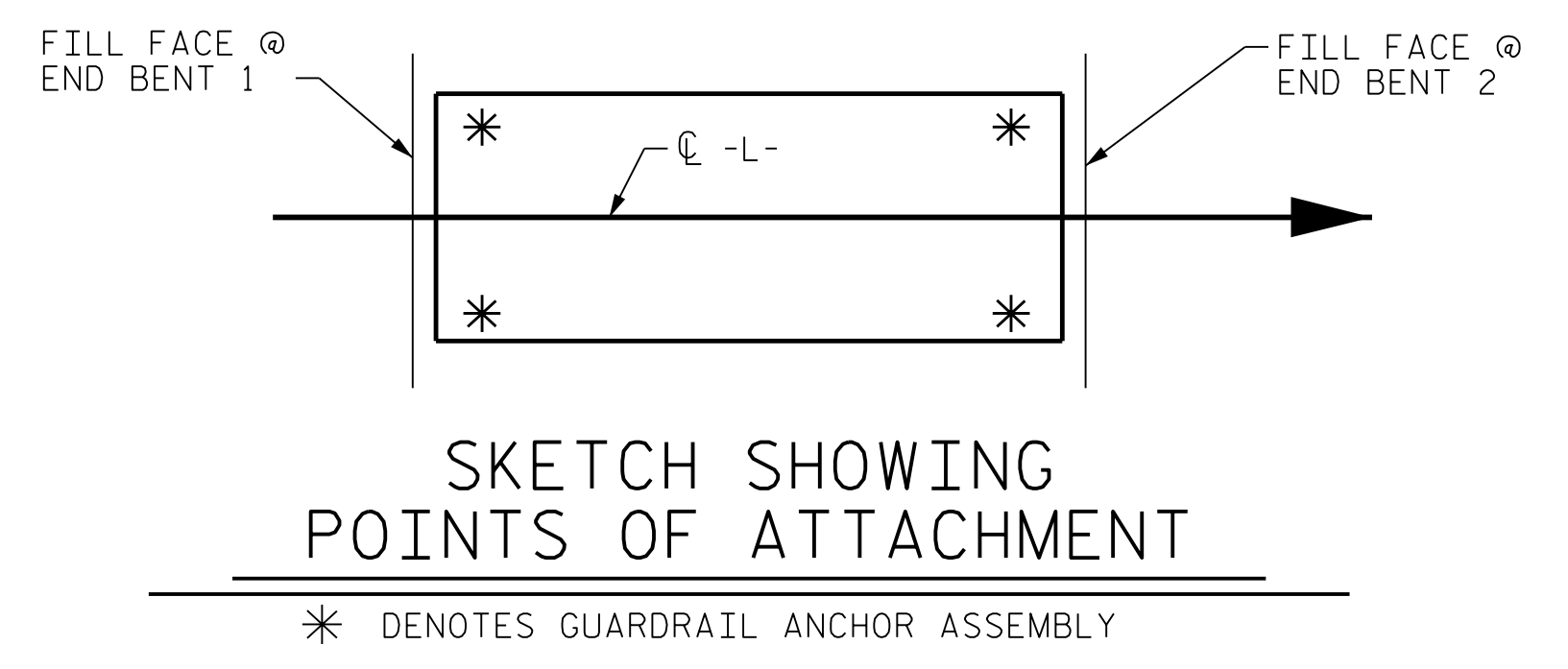


GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-

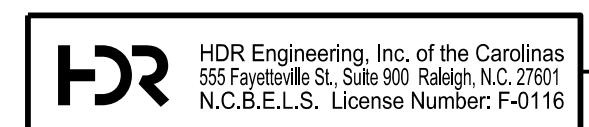
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR VERTICAL CONCRETE
 BARRIER RAIL



11/7/2023

ASSEMBLED BY : D. H. CARTER	DATE : JUL 2023
CHECKED BY : M. T. NEIHEISEL	DATE : JUL 2023
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

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 FILE: ... \401_045_17BP.8.R.124_SMU_GR_510_180094.dgn

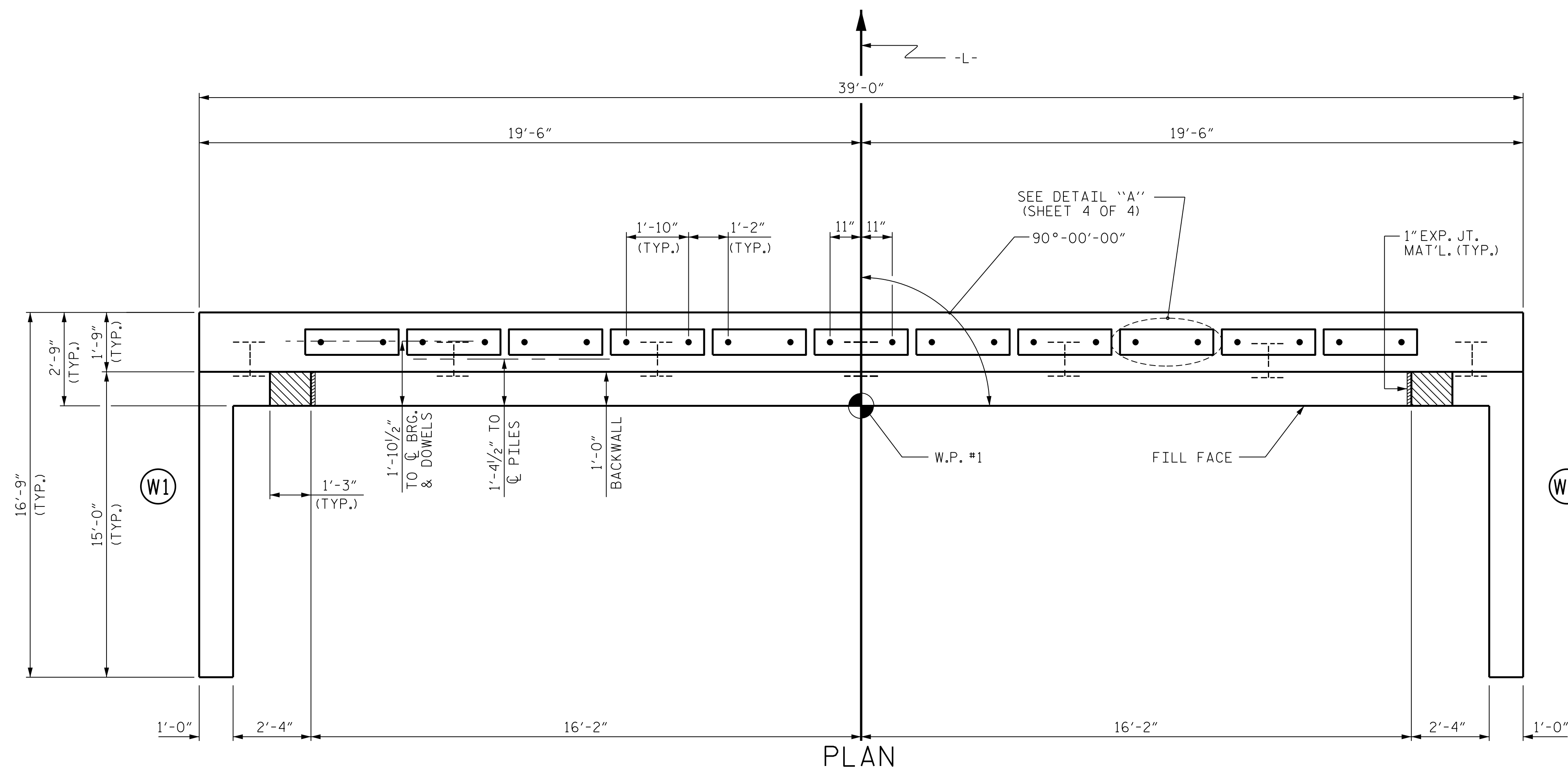
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

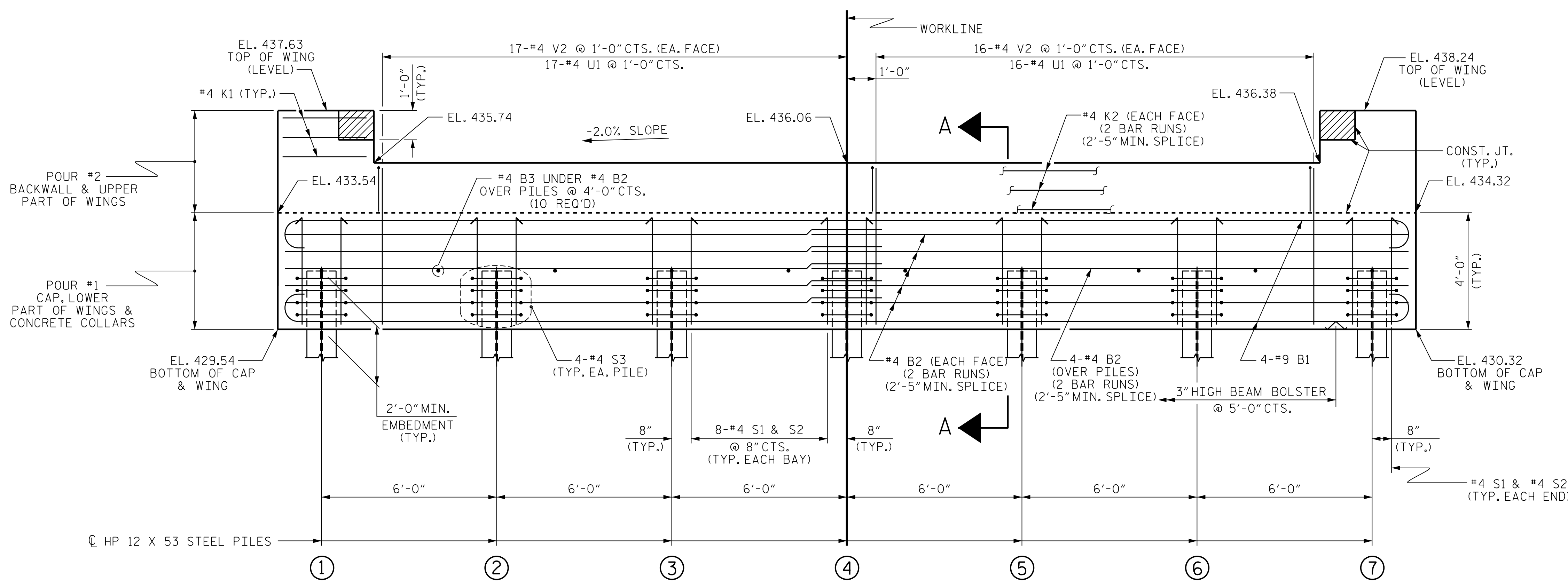
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

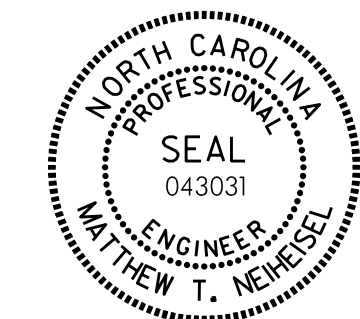
TOP OF PILE ELEVATIONS	
①	431.57
②	431.69
③	431.81
④	431.93
⑤	432.05
⑥	432.17
⑦	432.29

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1



ASSEMBLED BY : D. H. CARTER DATE : NOV 2023
 CHECKED BY : M. T. NEIHEISEL DATE : NOV 2023
 DRAWN BY : WJH 12/11
 CHECKED BY : AAC 12/11

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

11/7/2023
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			16

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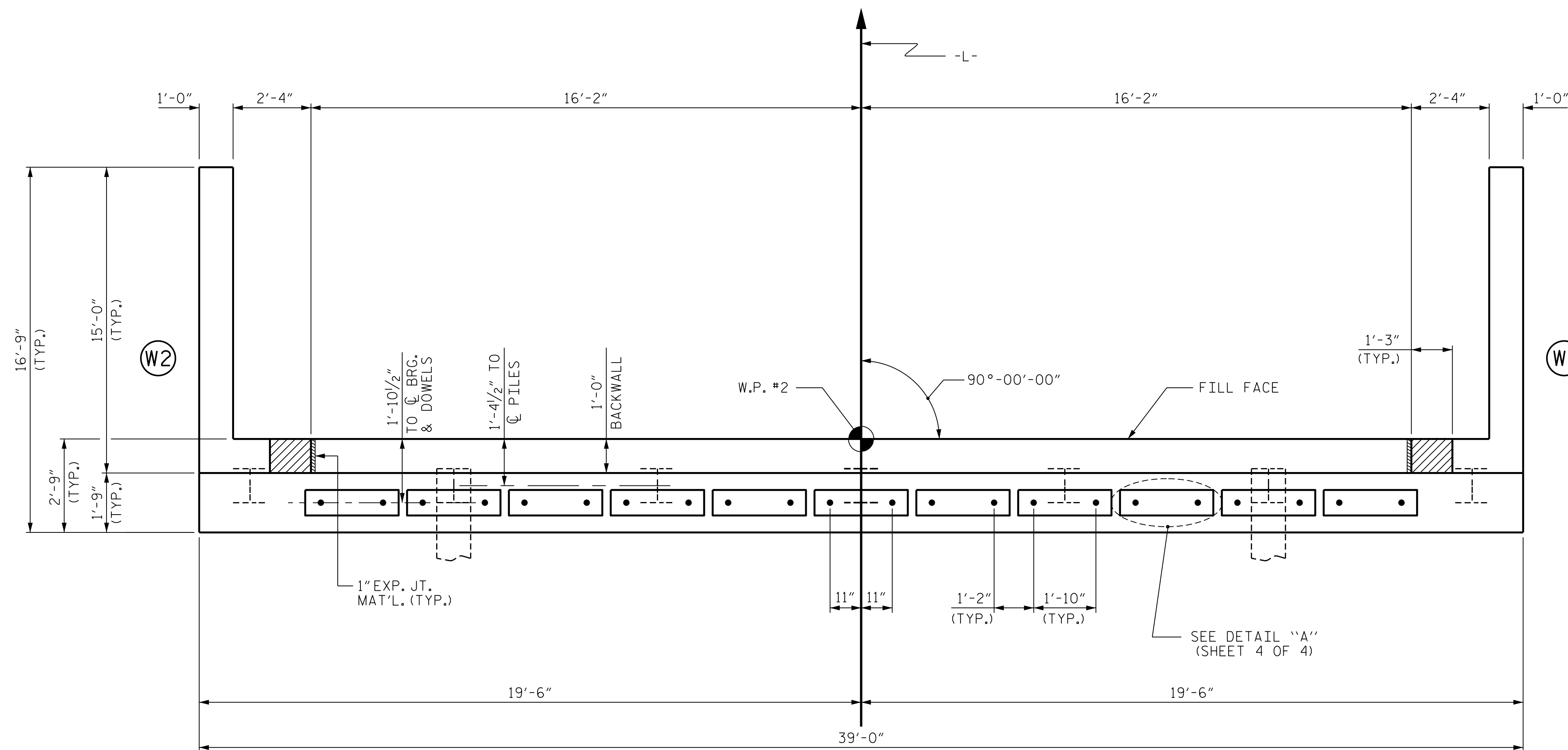
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

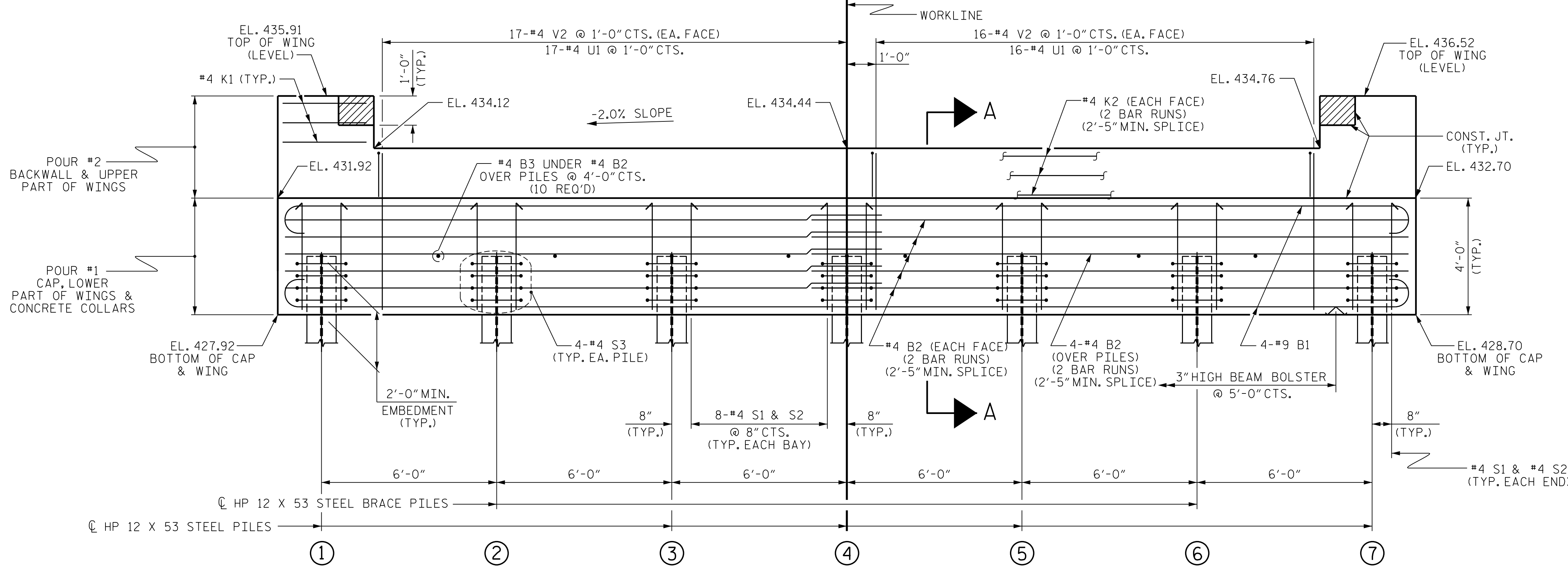
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPlice DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

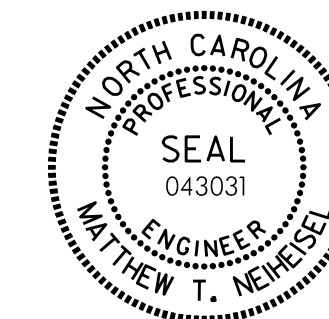
TOP OF PILE ELEVATIONS	
①	429.95
②	430.07
③	430.19
④	430.31
⑤	430.43
⑥	430.55
⑦	430.67

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-

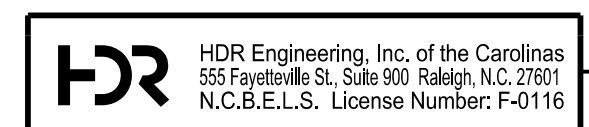
SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

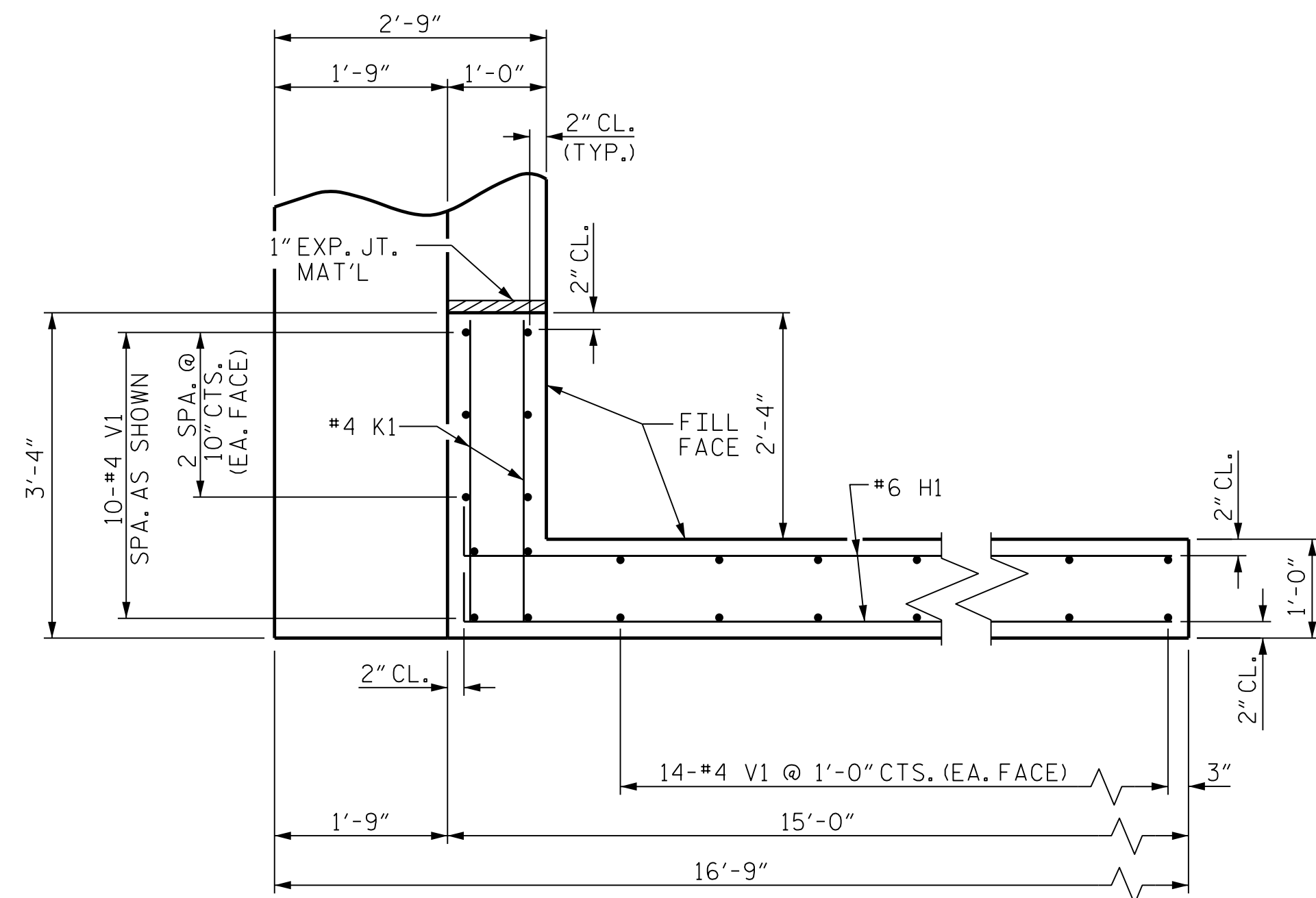


11/7/2023
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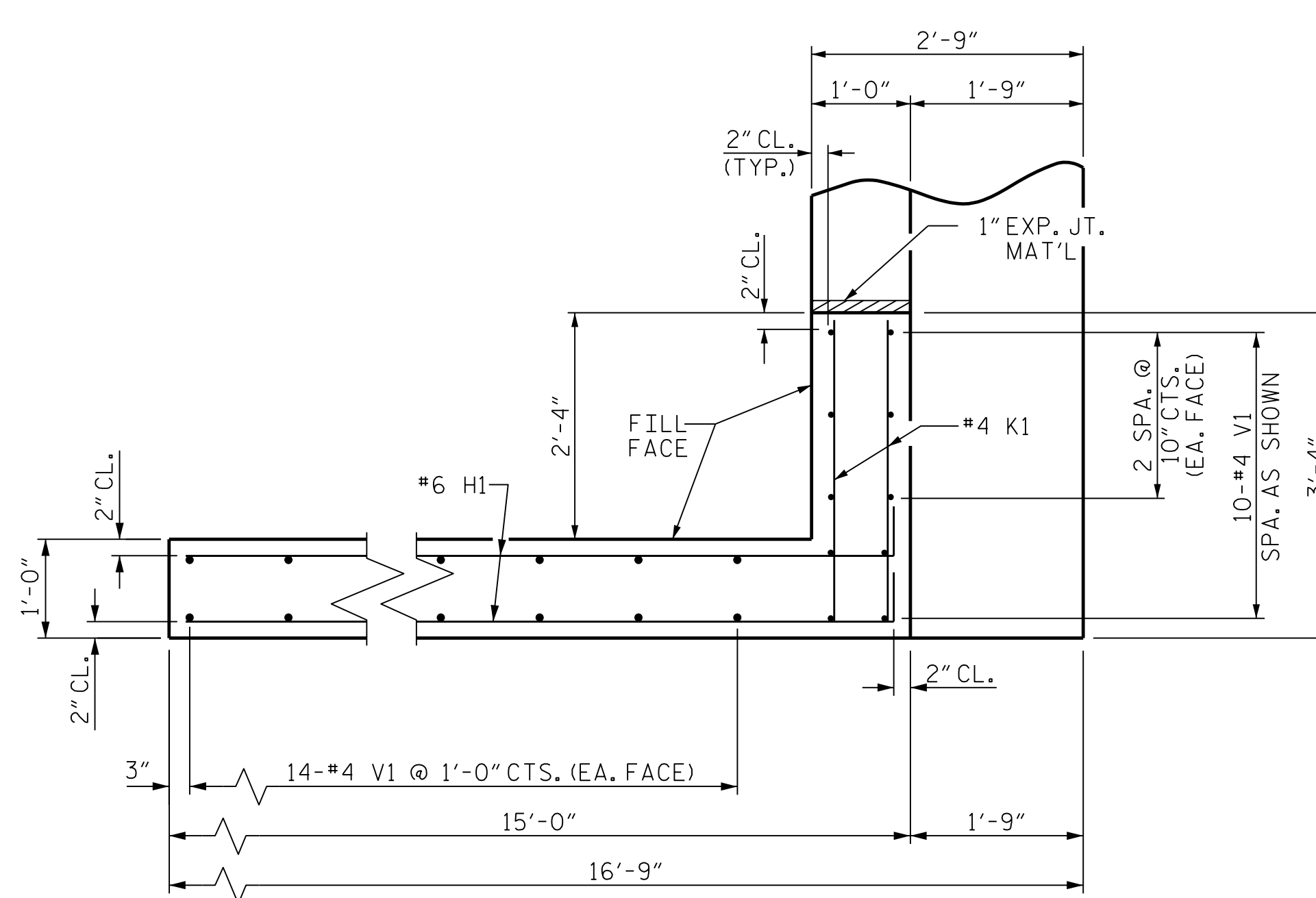
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ASSEMBLED BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DRAWN BY : WJH 12/11
 CHECKED BY : AAC 12/11
 REV. 4/15
 MAA/TMG

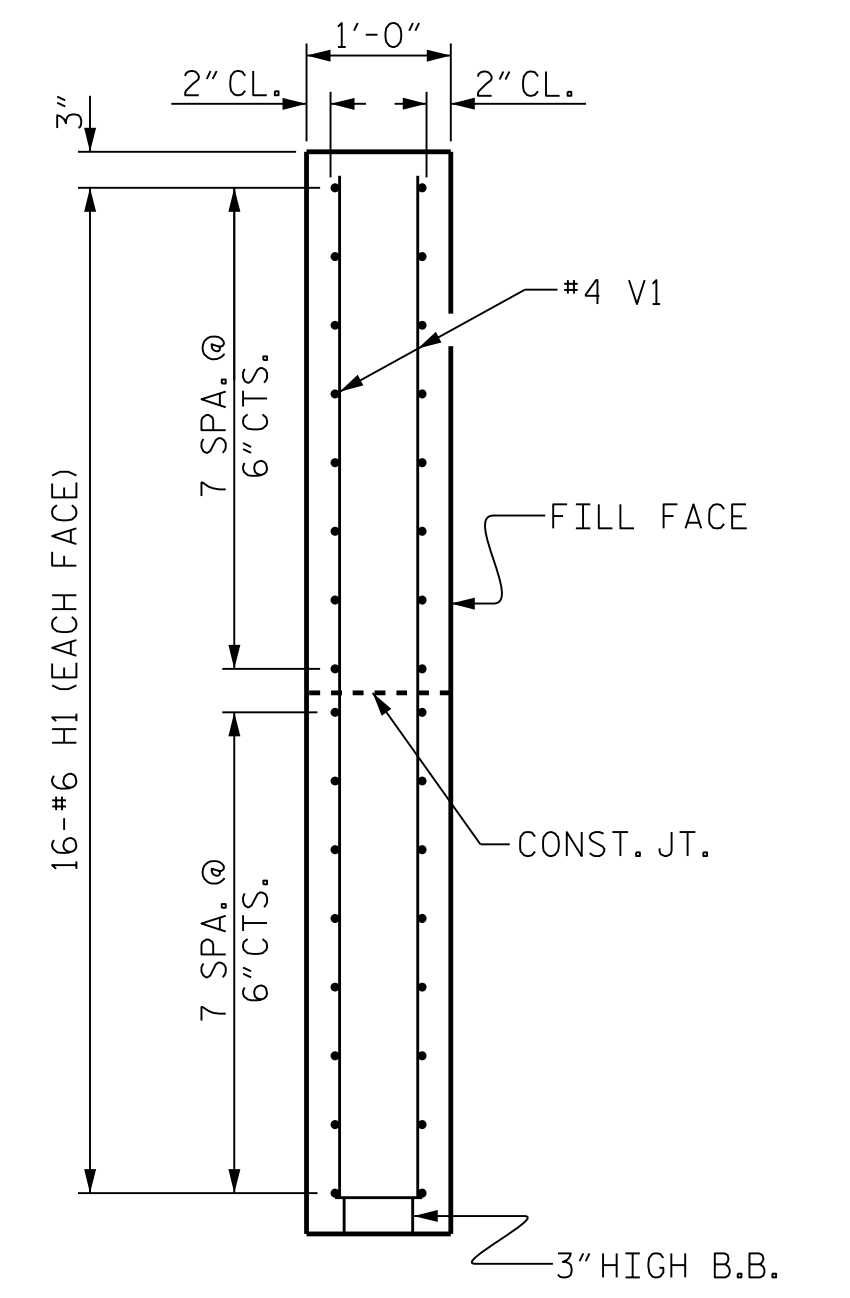
WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.



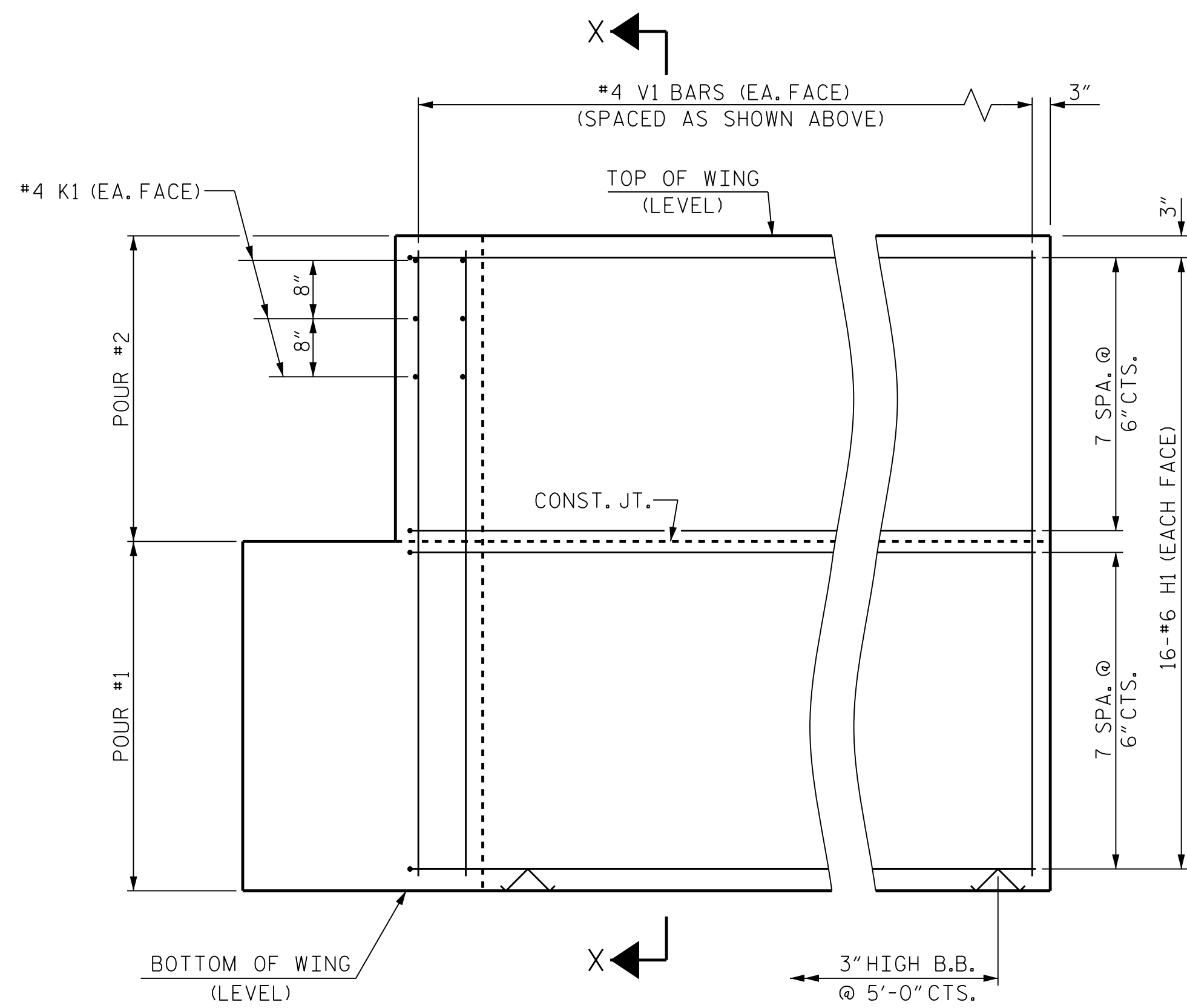
PLAN OF WING (W1)



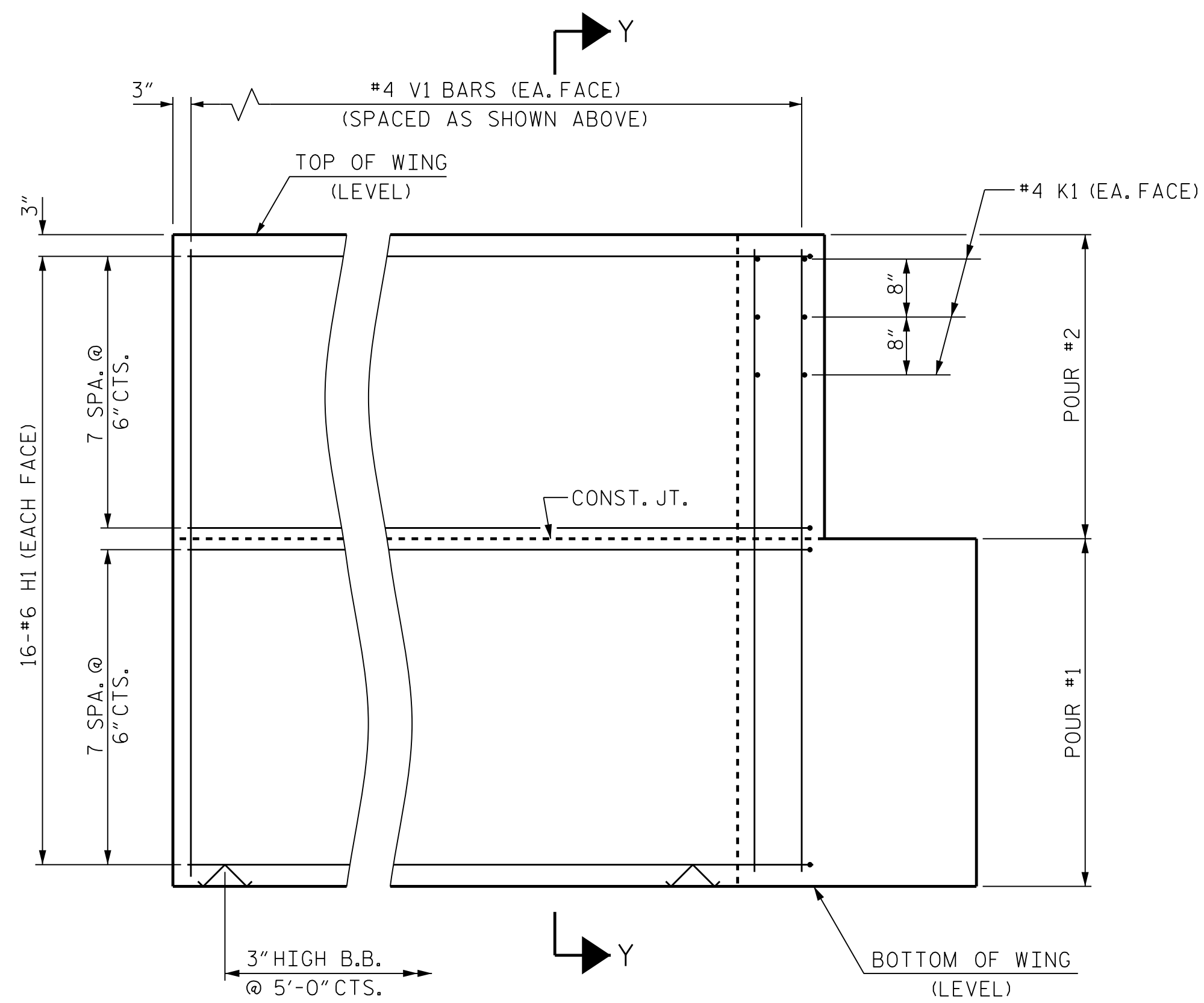
PLAN OF WING (W2)



SECTION X-X

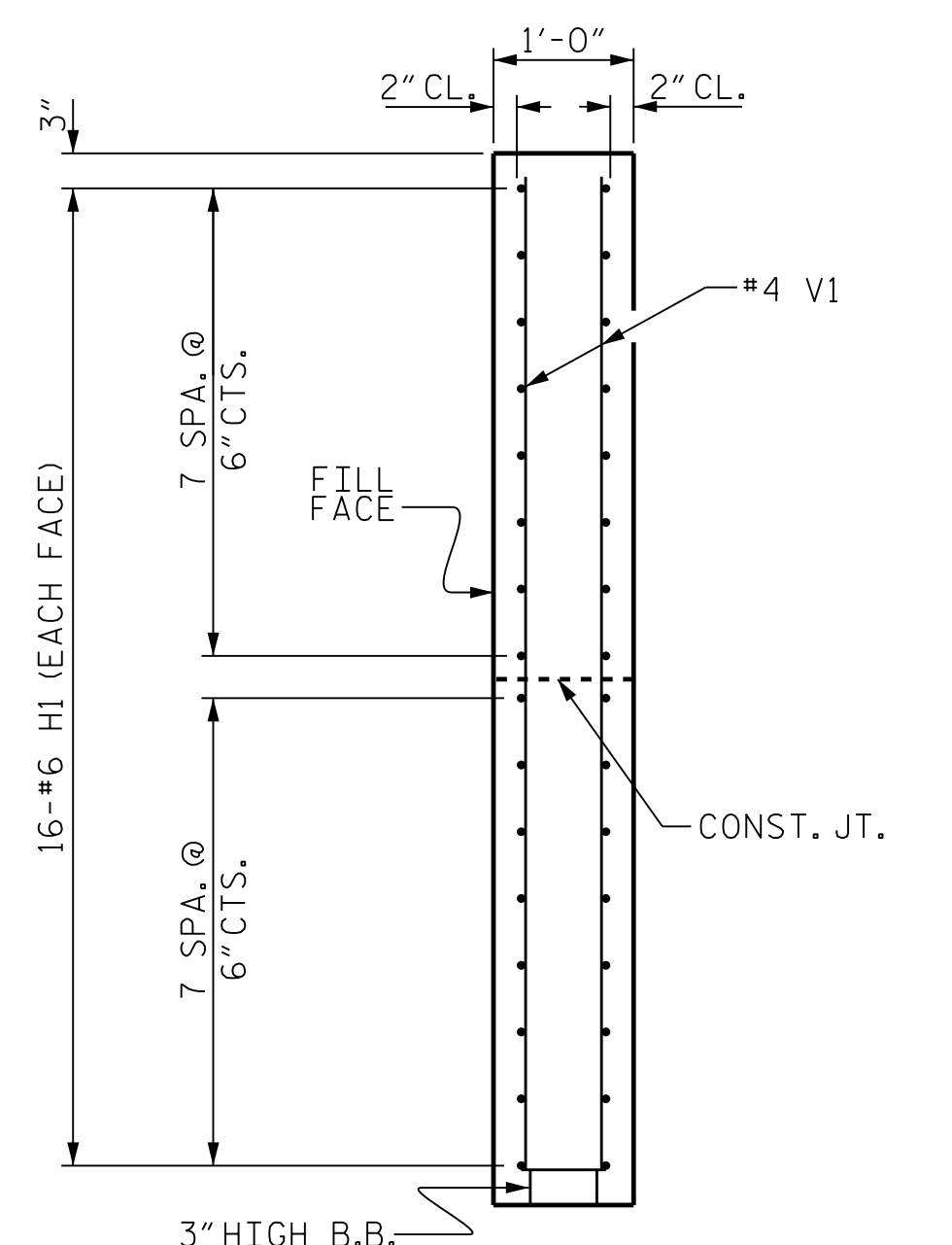


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS



SECTION Y-Y

PROJECT NO. 17BP.8.R.124

CHATHAM COUNTY

STATION: 14+02.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS



11/7/2023
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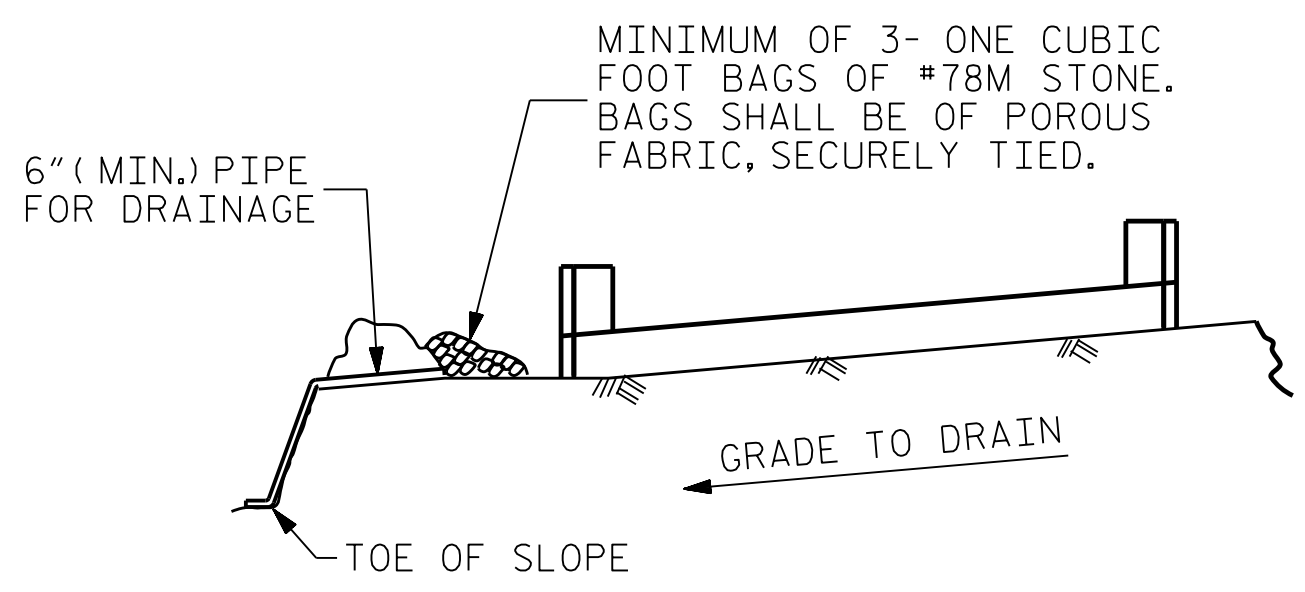
ASSEMBLED BY : D. H. CARTER	DATE : JUL 2023
CHECKED BY : M. T. NEIHEISEL	DATE : JUL 2023
DRAWN BY : WJH 12/11	REV. 4/15
CHECKED BY : AAC 12/11	MAA/TMG



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

TOTAL SHEETS: 16

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USER: MNEIHEIS
DATE: 11/6/2023
TIME: 1:49:09 PM
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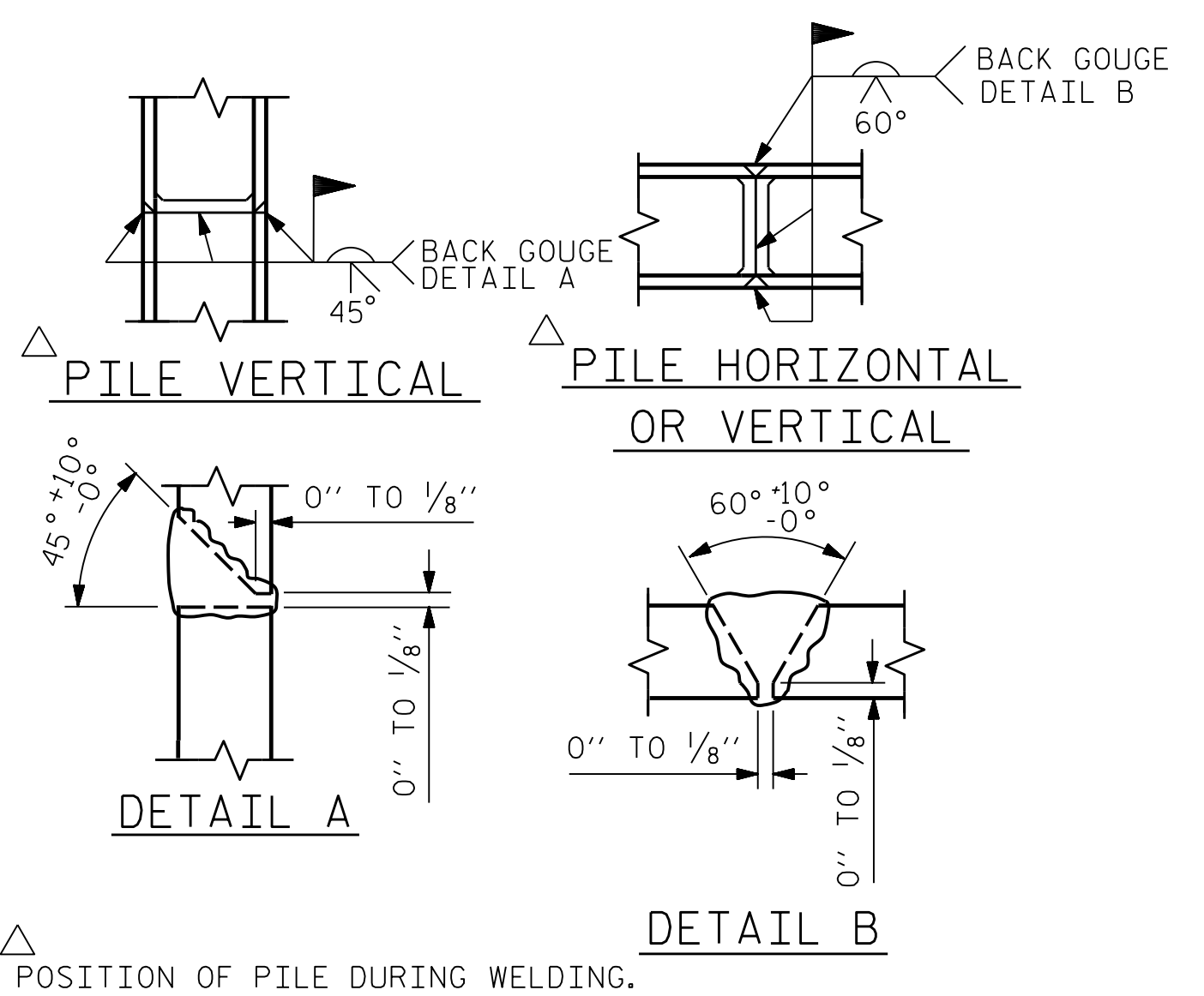


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

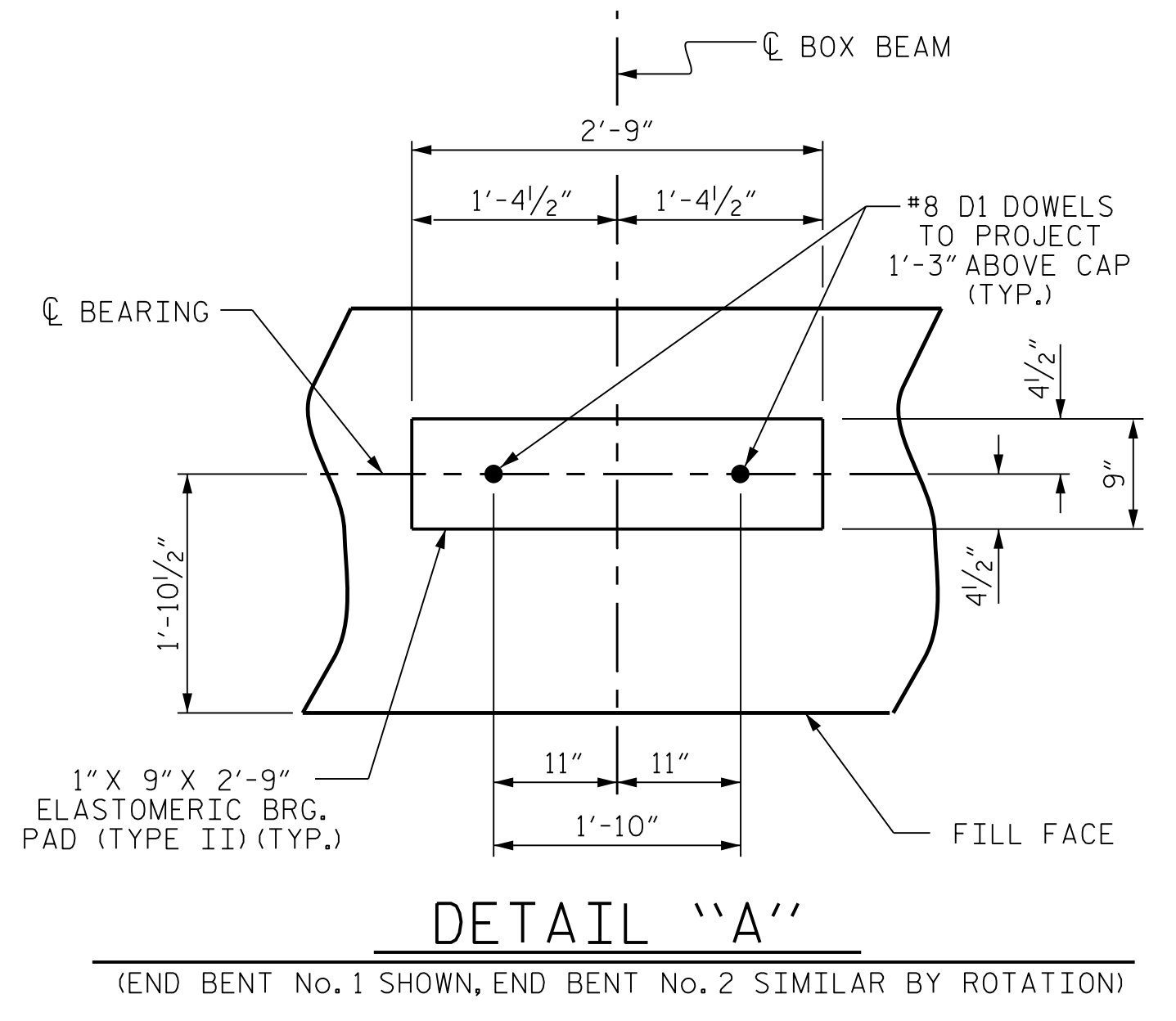
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

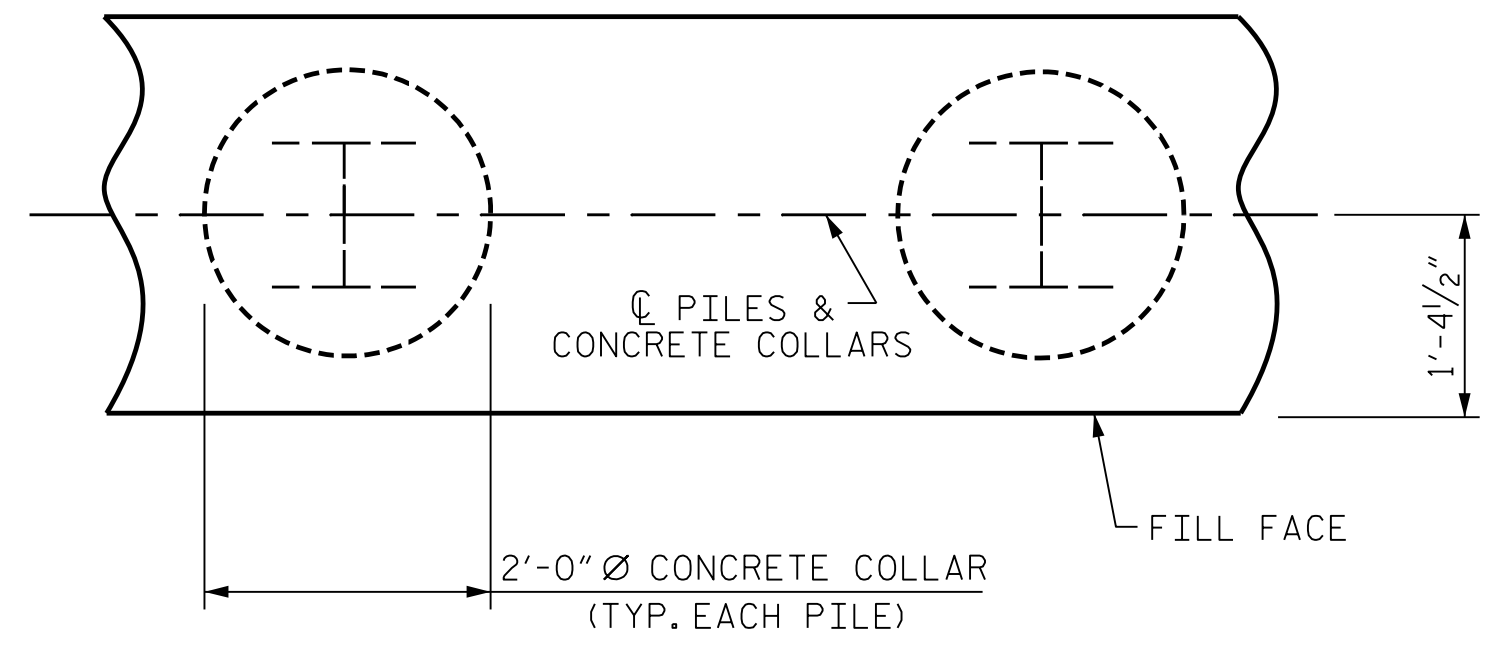


PILE SPLICE DETAILS



DETAIL "A"

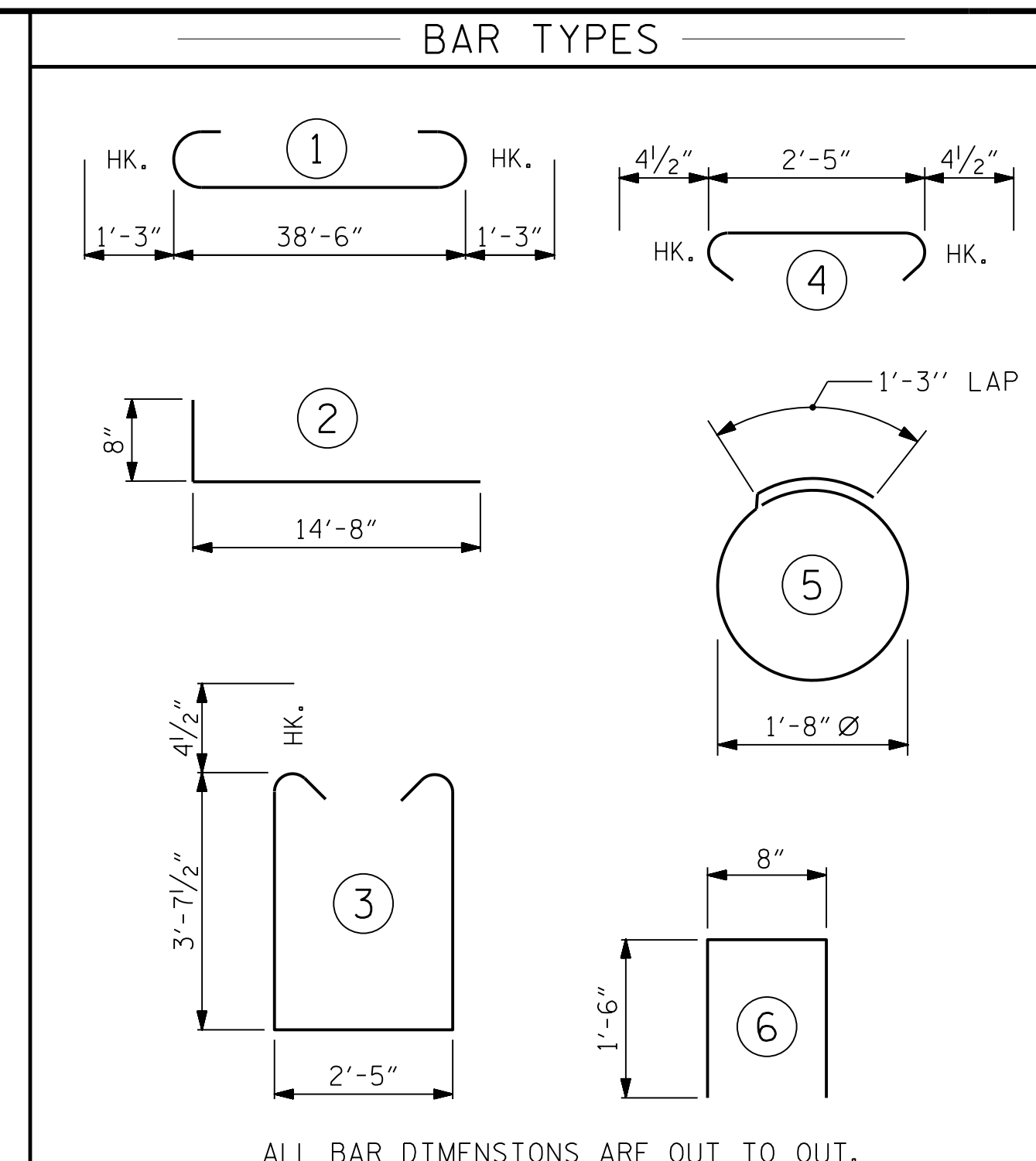
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

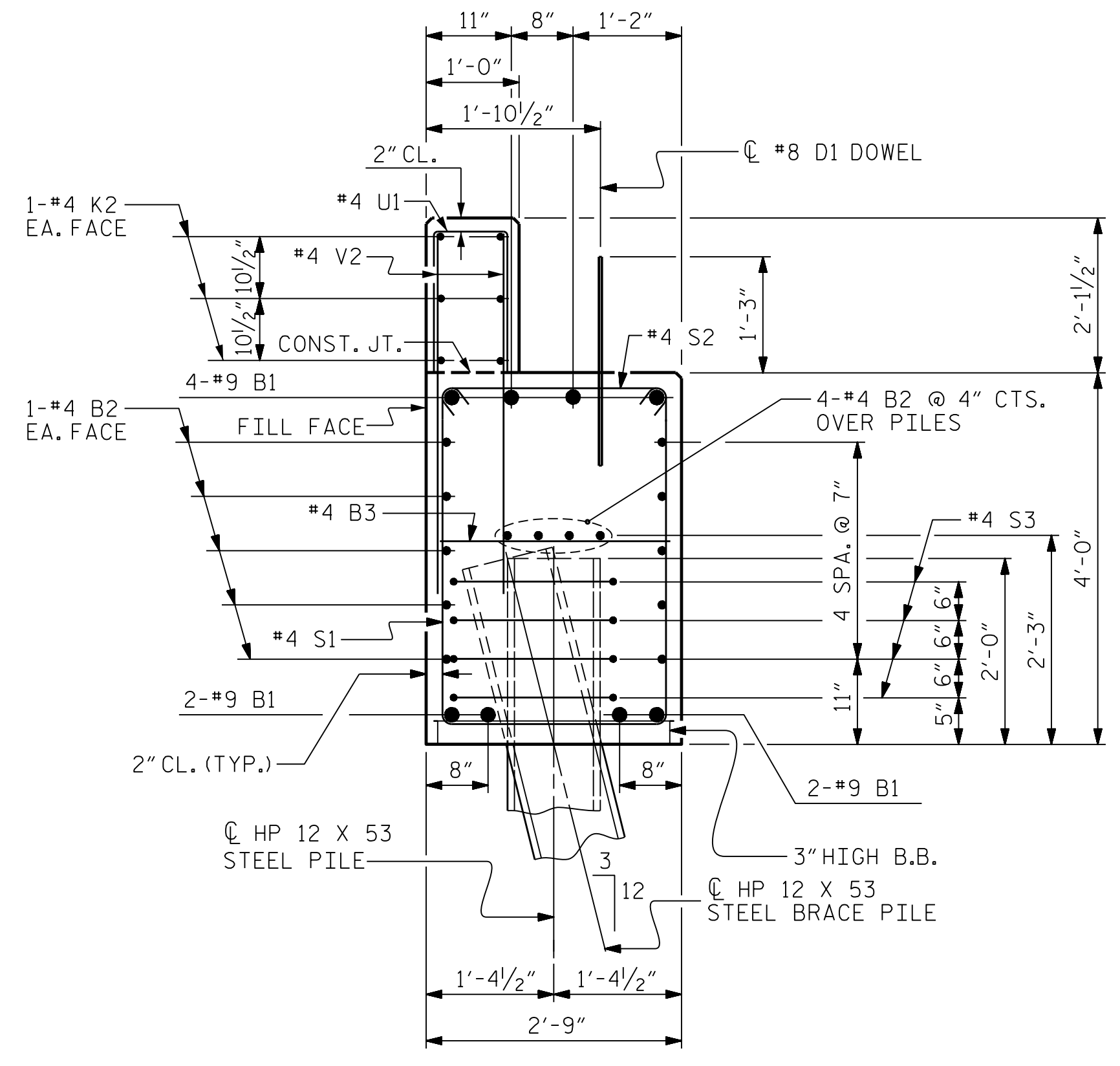
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



ALL BAR DIMENSIONS ARE OUT TO OUT.

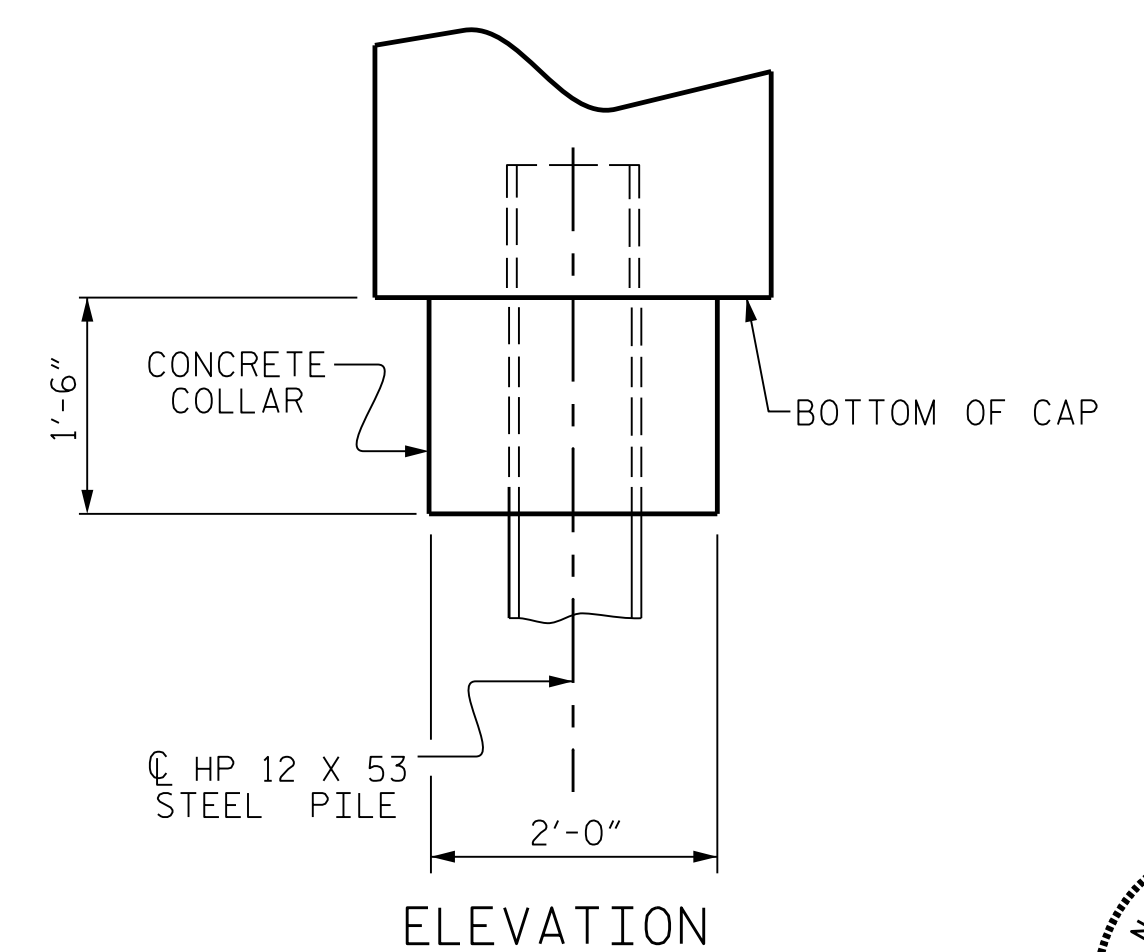
END BENT No. 1		END BENT No. 2	
HP 12 X 53 STEEL PILES	NO: 7	HP 12 X 53 STEEL PILES	NO: 7
STEEL PILE POINTS	NO: 7	STEEL PILE POINTS	NO: 7
PILE EXCAVATION IN SOIL	LIN. FT. = 42	PILE EXCAVATION IN SOIL	LIN. FT. = NONE
PILE EXCAVATION NOT IN SOIL	LIN. FT. = 28	PILE EXCAVATION NOT IN SOIL	LIN. FT. = NONE
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 7

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-8"	81
V1	76	#4	STR	7'-8"	389
V2	66	#4	STR	5'-9"	254
REINFORCING STEEL (FOR ONE END BENT)					4610 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					21.3 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS					7.7 C.Y.
TOTAL CLASS A CONCRETE					29.0 C.Y.

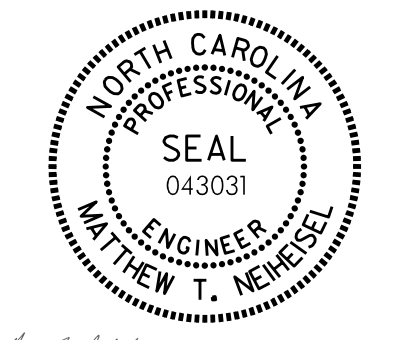


SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



ELEVATION



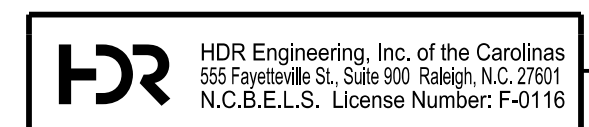
PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

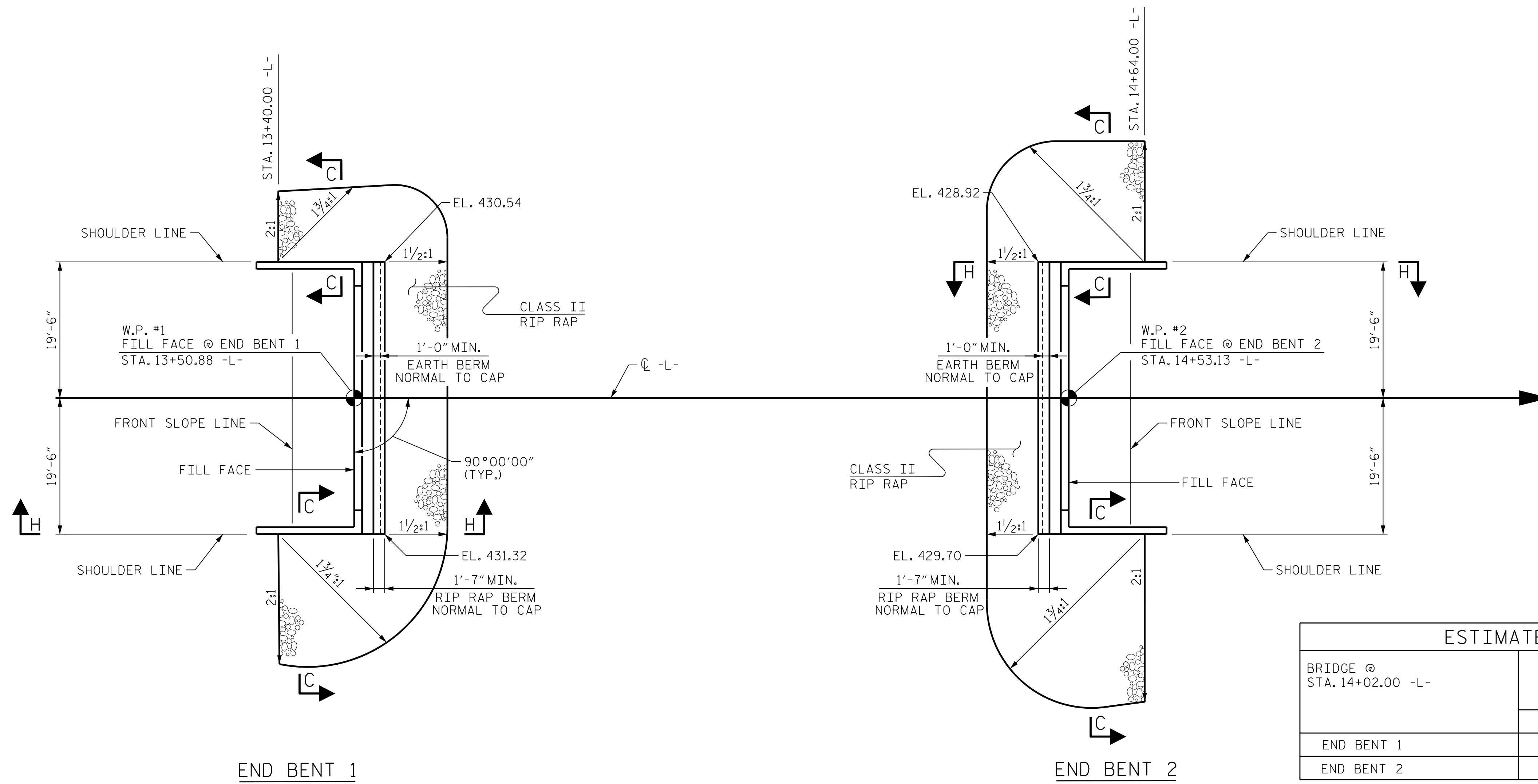
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.PH
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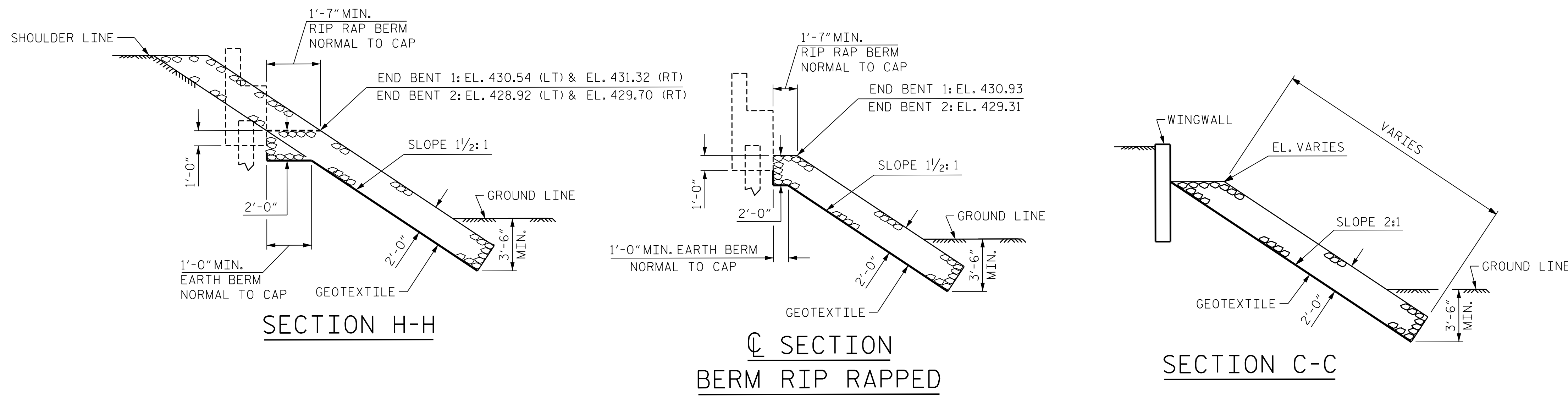
ASSEMBLED BY: D. H. CARTER DATE: JUL 2023
 CHECKED BY: M. T. NEIHEISEL DATE: JUL 2023
 DRAWN BY: WJH 12/11
 CHECKED BY: AAC 12/11
 REV. 4/17 MAA/THC



11/7/2023
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



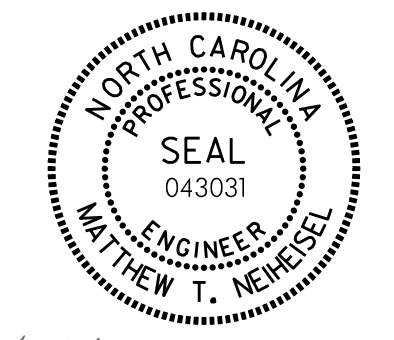
ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+02.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	165	180
END BENT 2	190	210



PROJECT NO. 17BP.8.R.124
CHATHAM COUNTY
 STATION: 14+02.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

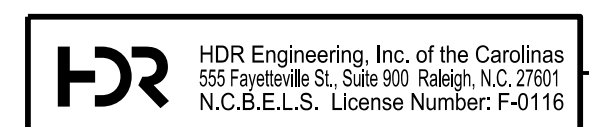
RIP RAP DETAILS



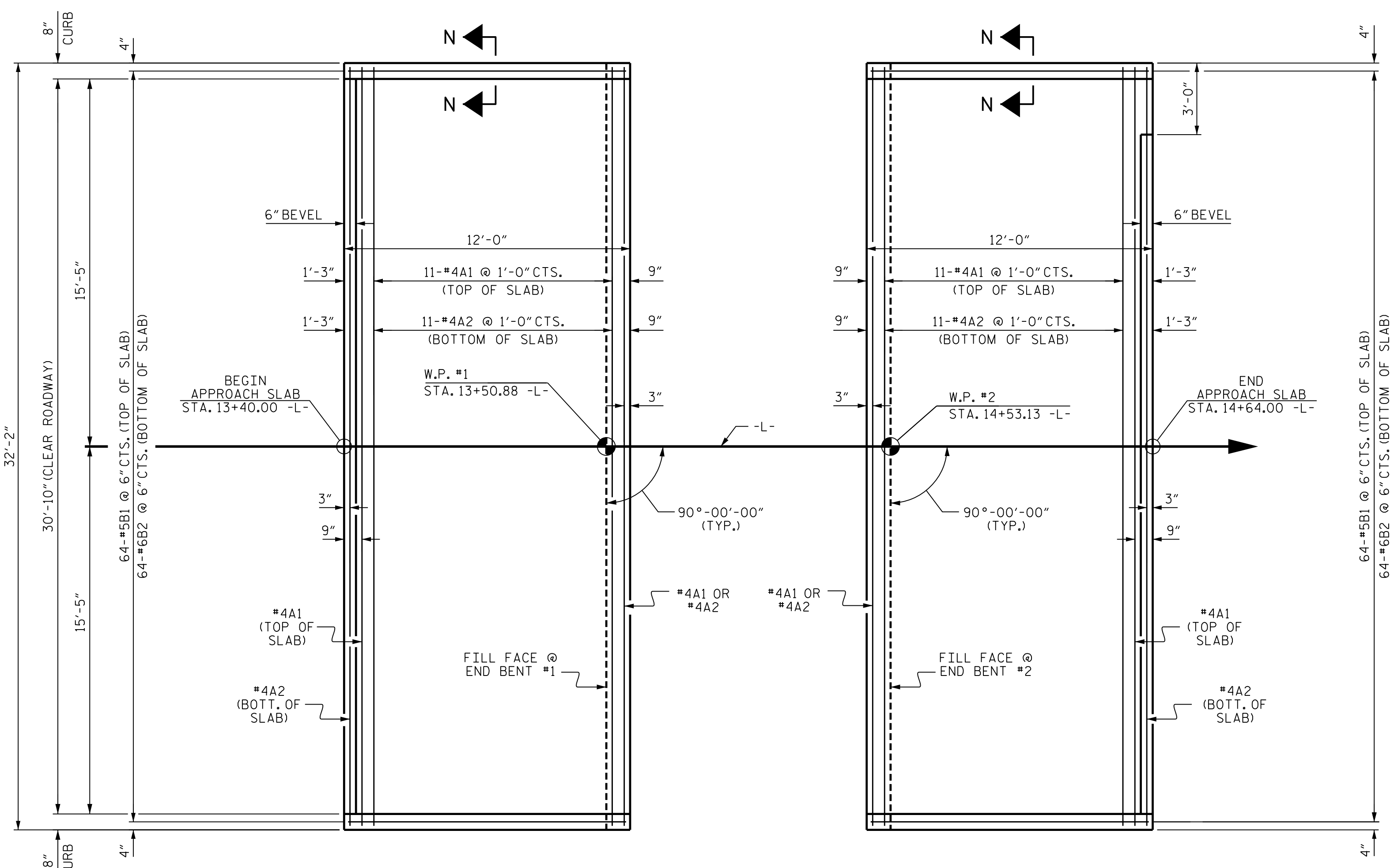
11/7/2023
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS 16
2			4			

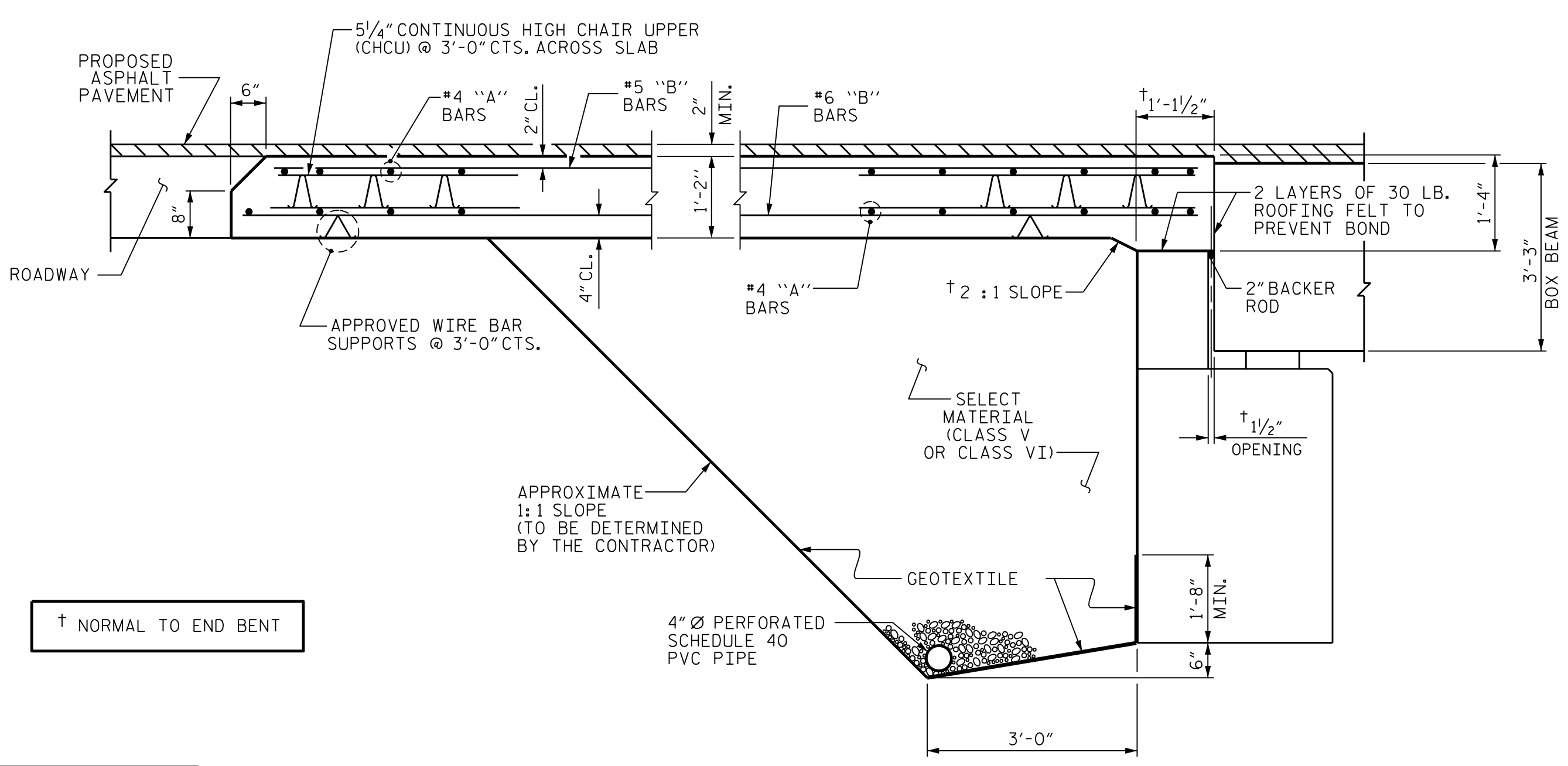
DRAWN BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DESIGN ENGINEER OF RECORD: M. T. NEIHEISEL DATE : NOV 2023



PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt
 USER: MNEIHEIS DATE: 11/6/2023 TIME: 1:49:25 PM
 FILE: ... \401.070.17BP.8.R.124.SMU.RR.S15.180094.dgn



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB
(TYPE II - MODIFIED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

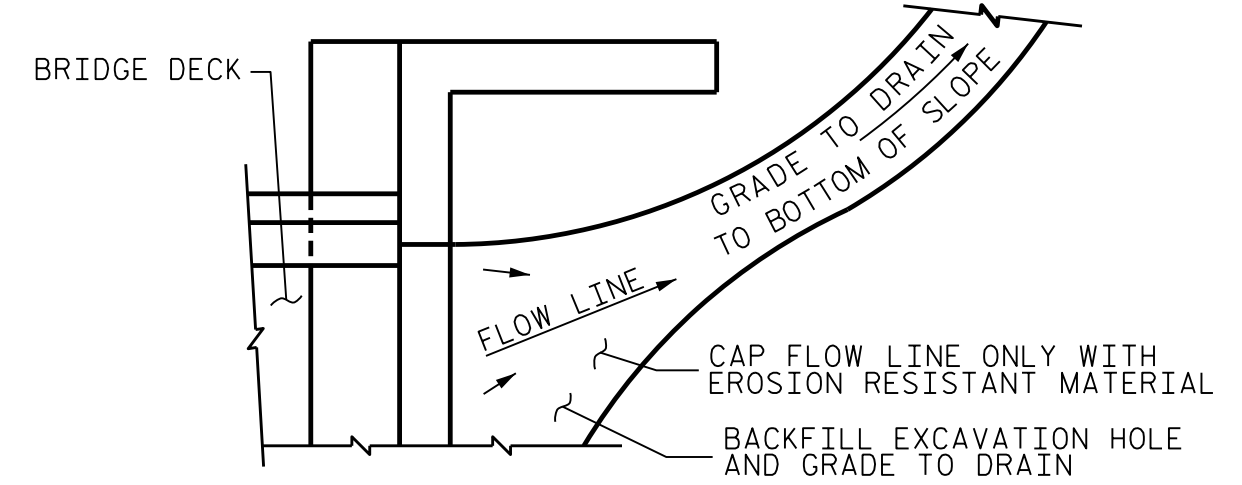
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

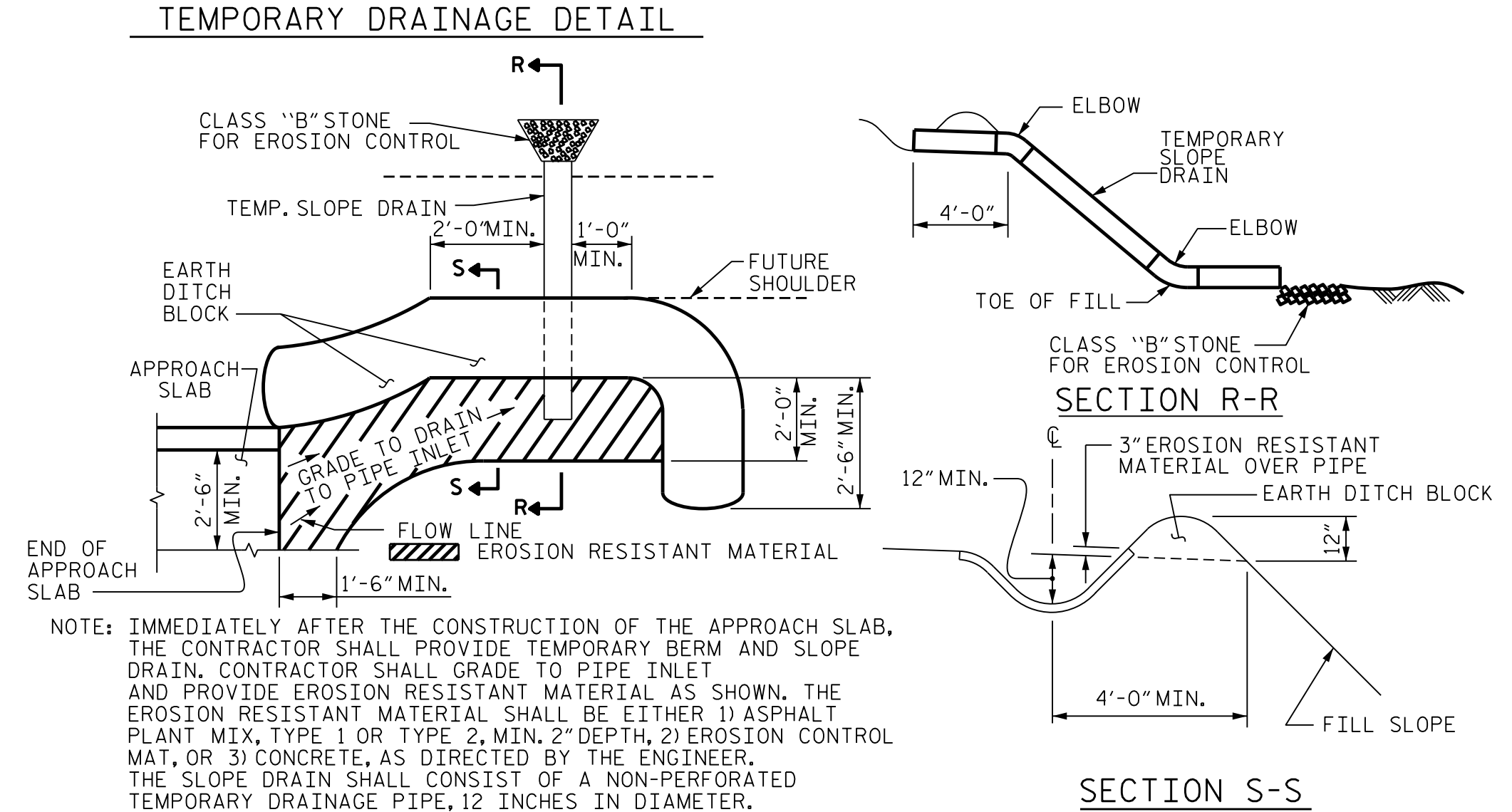
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

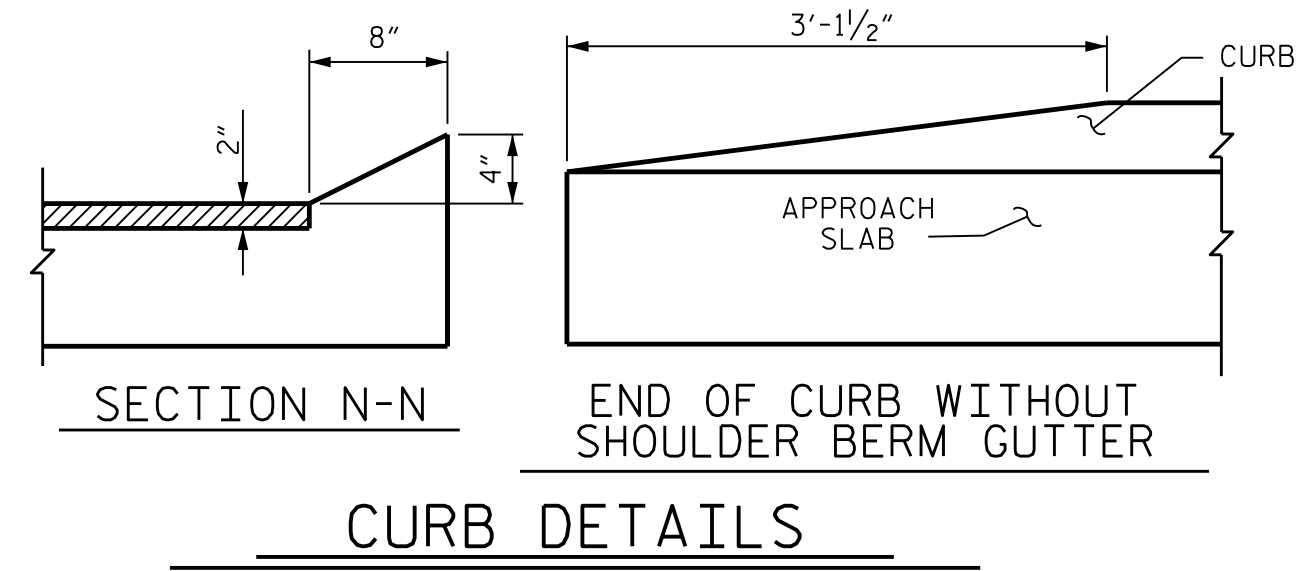
APPROACH SLAB GROOVING IS NOT REQUIRED.



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.



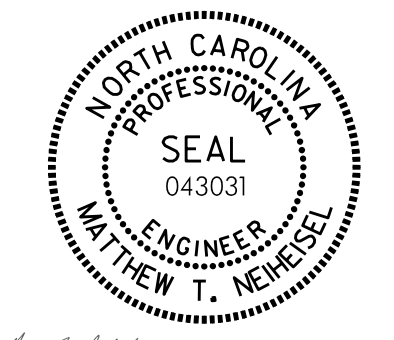
BILL OF MATERIAL

APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.0

APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.0

PROJECT NO. 17BP.8.R.124
 CHATHAM COUNTY
 STATION: 14+02.00 -L-

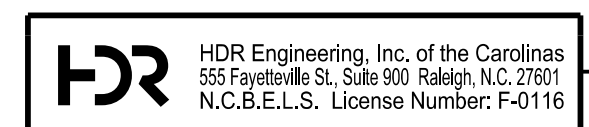
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 BOX BEAM UNIT
 (SUB-REGIONAL TIER)
 90° SKEW



11/7/2023
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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

TOTAL SHEETS: 16



HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

PLOT DRIVER: NCDOT STRUCTURES DEFAULT PLOTTER.plt
 USER: MNEIHEIS
 DATE: 11/6/2023
 TIME: 1:49:33 PM
 FILE: ... \401_075_17BP.8.R.124_SML_AS_516_180094.dgn

ASSEMBLED BY : D. H. CARTER DATE : JUL 2023
 CHECKED BY : M. T. NEIHEISEL DATE : JUL 2023
 DRAWN BY : MAA 11/11
 CHECKED BY : AAC 11/11
 REV. 12-17 MAA/THC
 REV. 08-19 BNB/THC

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 2018 "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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{5}{16}$ " 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 $\frac{1}{16}$ 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