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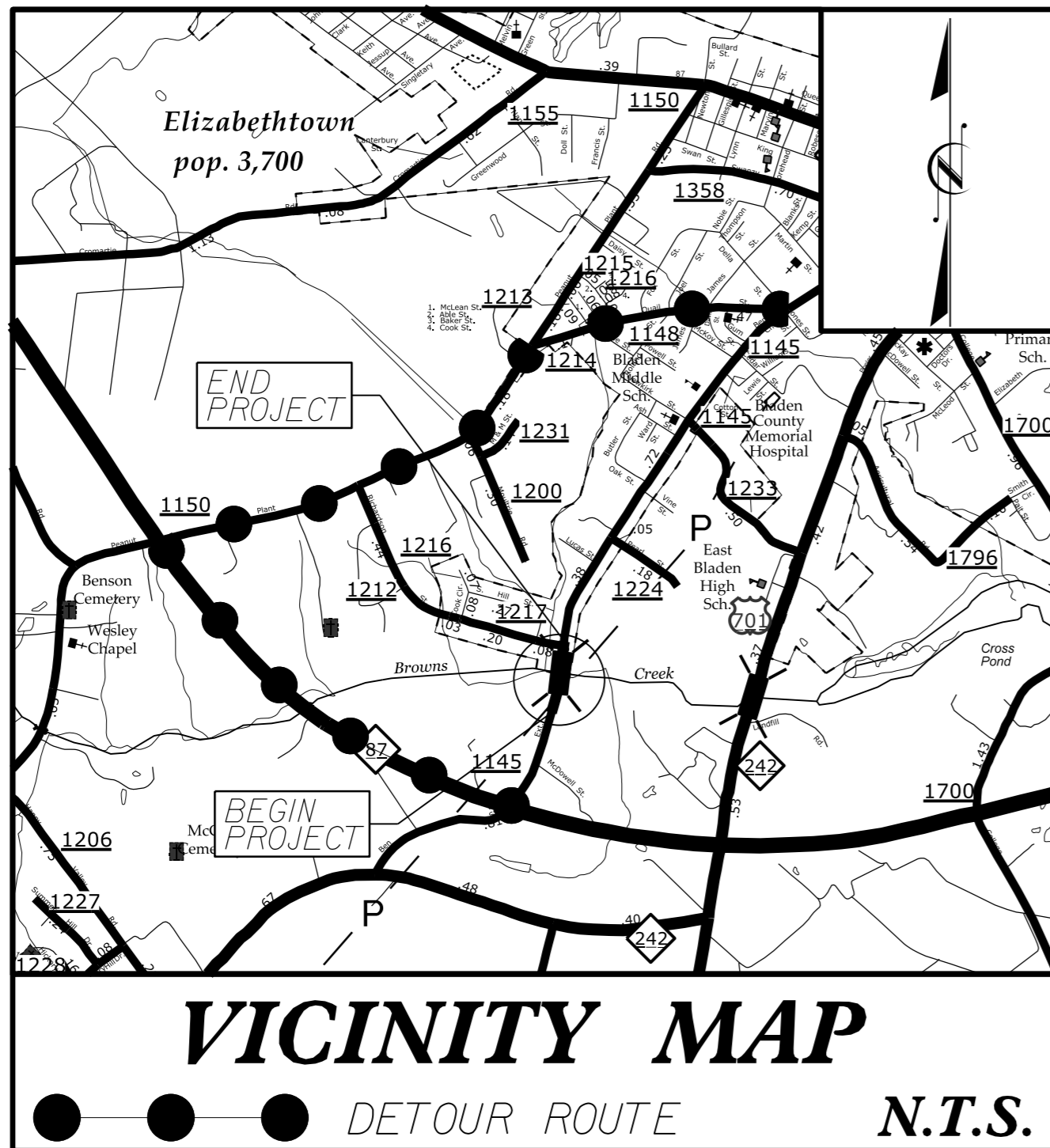
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09/08/19

PROJECT: 17BP.6.R.90

CONTRACT: DF00245

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

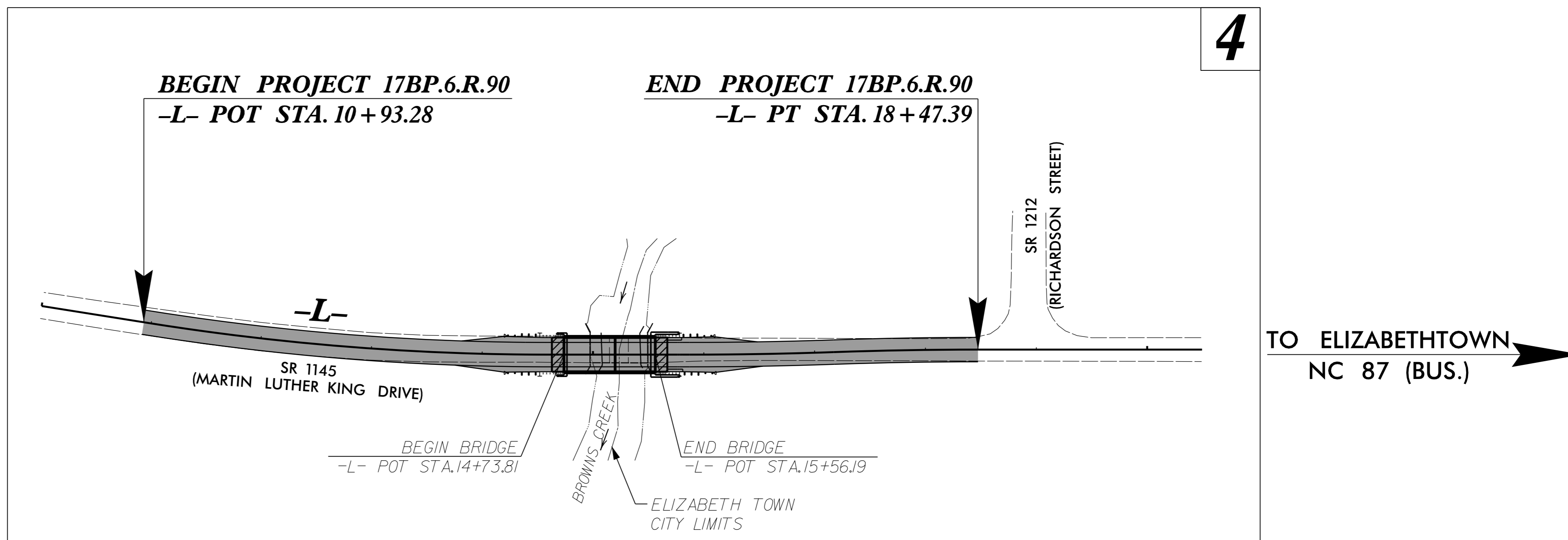


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BLADEN COUNTY

**LOCATION: REPLACE BRIDGE 178 OVER BROWNS CREEK
ON SR 1145 (MARTIN LUTHER KING DRIVE)**

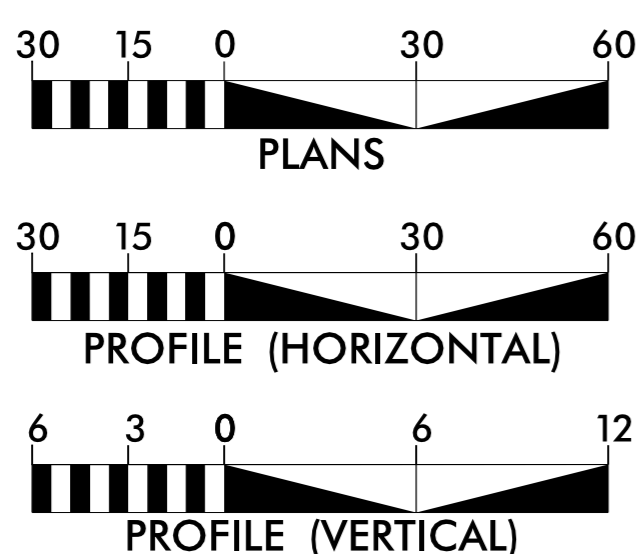
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.90	1	56
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.6.R.90	N/A	PE	
17BP.6.R.90	N/A	ROWUTIL.	
17BP.6.R.90	N/A	CONST.	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 800 VPD
ADT 2040 = 1000 VPD
DHV =
D =
T = 6%
V = 35 MPH
FUNC CLASS =
LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.6.R.90 = 0.127 MILES
LENGTH BRIDGE PROJECT 17BP.6.R.90 = 0.016 MILES
TOTAL LENGTH PROJECT 17BP.6.R.90 = 0.143 MILES

Prepared in the Office of:
CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC CDA No. F-1255

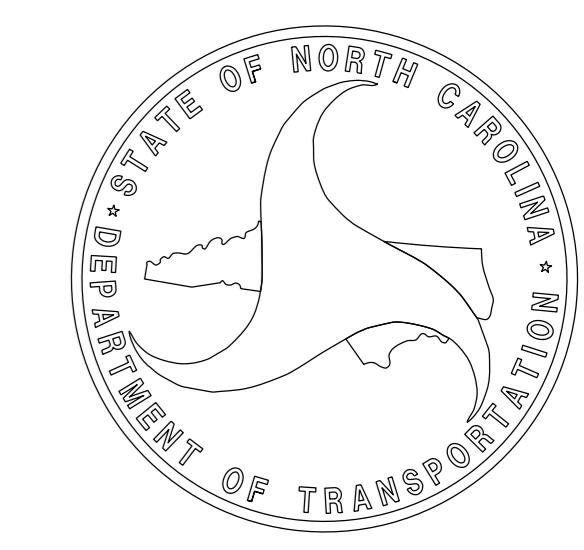
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE:
AUGUST 31, 2018
LETTING DATE:
MARCH 20, 2019
DAVID J. CLODGO, PE
PROJECT ENGINEER
ADAM M. CONRAD, PE
PROJECT DESIGN ENGINEER
CHRISTY W. HUFF, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

2/26/2019
SEAL 18533
ANDREW T. NOTTINGHAM
NOTTINGHAM
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

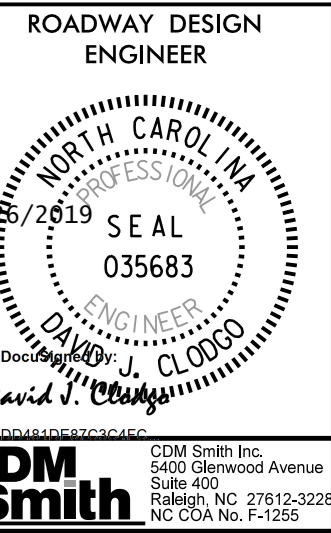
2/26/2019
SEAL 035683
DAVID J. CLODGO
CLODGO
P.E.
SIGNATURE:



-SYSTEM: 17BP.6.R.90_Rdy.tsh.dgn
USER: CYANTMN

8/17/19

PROJECT REFERENCE NO.	SHEET NO.
17BP6.R.90	1-A
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SHEET NUMBER	INDEX OF SHEETS
SHEET	
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEET
1D-1	CENTERLINE COORDINATE LIST
1E-1	RIGHT OF WAY CONTROL SHEET
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	DETAIL MODIFIED METHOD OF CLEARING II
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
U0-1 THRU U0-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-6	CROSS-SECTION INDEX SHEET AND CROSS-SECTIONS
S-1 THRU S-21	STRUCTURE PLANS

EFF. 01-16-2018
REV. 09-11-2017

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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	
200.02	Method of Clearing - Modified Method II (Use detail in Lieu of Standard)
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 8 - INCIDENTALS	
840.20	Frames and Wide Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
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

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED: 09-11-2017

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 MODIFIED METHOD II.

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.

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 - POWER DISTRIBUTION AND TRANSMISSION
ELIZABETHTOWN PUBLIC WORKS - WATER AND SEWER DISTRIBUTION
STAR - TELECOMMUNICATION
CHARTER - TELECOMMUNICATION

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS AND PERMANENT EASEMENT MARKERS ARE TO BE PLACED BY L&S. THE CONTRACT SURVEYOR WILL BE RESPONSIBLE FOR RESETTING ANY POINTS DISTURBED DURING CONSTRUCTION.

-SYSTEMS B.00_Rdy_psh_1A.dgn

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

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ _{EP}
Computed Property Corner	→
Property Monument	□ _{EDM}
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- _{MLB}
Proposed Wetland Boundary	----- _{MLB}
Existing Endangered Animal Boundary	----- _{EAB}
Existing Endangered Plant Boundary	----- _{EPB}
Existing Historic Property Boundary	----- _{HPB}
Known Contamination Area: Soil	---S---S---
Potential Contamination Area: Soil	---S---S---
Known Contamination Area: Water	---W---W---
Potential Contamination Area: Water	---W---W---
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ _S
Well	○ _W
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	○ _{MILEPOST 35}
Switch	□ _{SWITCH}
RR Abandoned	-----
RR Dismantled	-----

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	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite RW Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- _C
Proposed Slope Stakes Fill	----- _F
Proposed Curb Ramp	----- _{CR}
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----

VEGETATION:

Single Tree	○
Single Shrub	○

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	----- _{Vineyard}

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- _{CONC}
Bridge Wing Wall, Head Wall and End Wall	----- _{CONC WW}
MINOR:	
Head and End Wall	----- _{CONC HW}
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ _{CB}
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ _S
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}

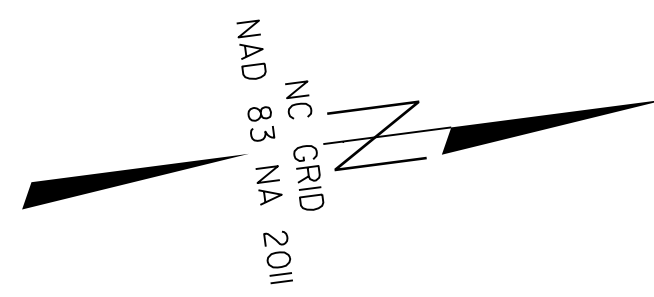
SANITARY SEWER:

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.*)	----- _{UTIL}
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕ _{UST}
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.

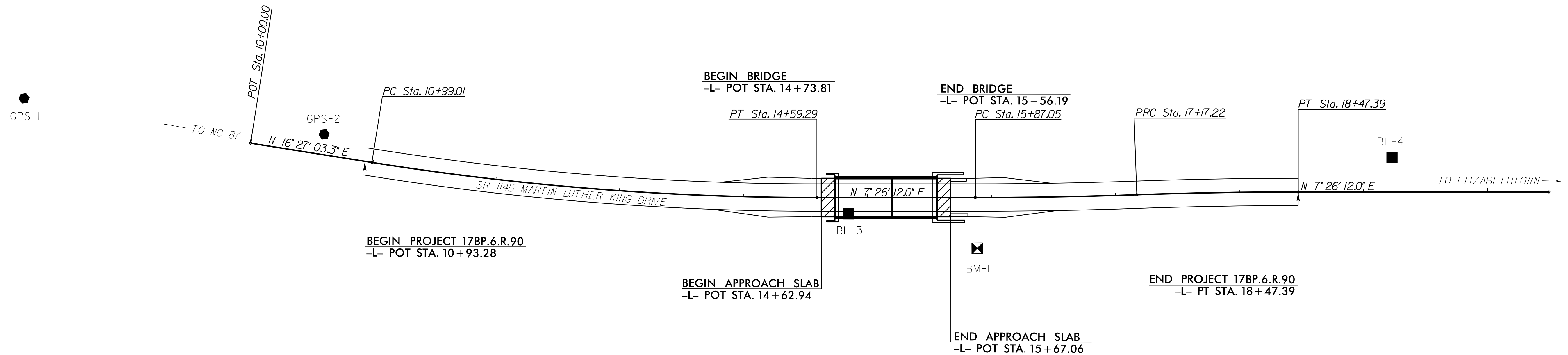
SURVEY CONTROL SHEET 080178



BL	POINT	DESC.	NORTH	EAST	ELEVATION
1	080178-GPS 1		312109.4038	2112687.8981	114.19
2	080178-GPS 2		312774.4680	2112859.1230	83.91
3	080178-BL3		313185.7251	2112977.2536	70.53
4	080178-BL4		313625.7912	2112989.1632	70.60

 6 ELEVATION = 70.17
 N 313285 E 2113018
 L STATION 15+89.00 41 RIGHT
 TBM#1 RR SPIKE SET IN 19" SWEET GUM

REVISIONS



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS 080178-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 312774.4680(ft) EASTING: 2112859.1230(ft) ELEVATION: 83.91(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999936538

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "080178-GPS 2" TO -L- STATION 10+00.00 IS S 0°40'17.68" W 59.2954'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/95

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.90	1D-1
Location and Surveys	

PROPOSED ALIGNMENT CONTROL SHEET 080178

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	312715.1767	2112858.4280
PC	10+99.01	312810.1344	2112886.4673
PT	14+59.29	313162.2524	2112960.9513
PC	15+87.05	313288.9389	2112977.4875
PRC	17+17.22	313418.2792	2112992.0797
PT	18+47.39	313547.6195	2113006.6720
POT	20+49.49	313748.0170	2113032.8295

REVISIONS

-SYTIME 7789.6 P. 90.LS.psh_ID.dgn
11:56:00 AM '95

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/95

RIGHT OF WAY CONTROL SHEET 080178

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.90	1E-1
Location and Surveys	

PROJECT
SURVEYOR

REVISIONS

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+66.00	-51.00	313175.5049	2112911.2485
L	15+16.00	-51.00	313225.0843	2112917.7200
L	14+66.00	-34.54	313173.3747	2112927.5680
L	15+16.00	-34.54	313222.9542	2112934.0395
L	14+65.00	25.46	313164.6173	2112986.9339
L	14+65.00	56.00	313160.6642	2113017.2190
L	15+86.00	56.00	313280.6465	2113032.8801
L	15+86.00	25.46	313284.5995	2113002.5950

NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

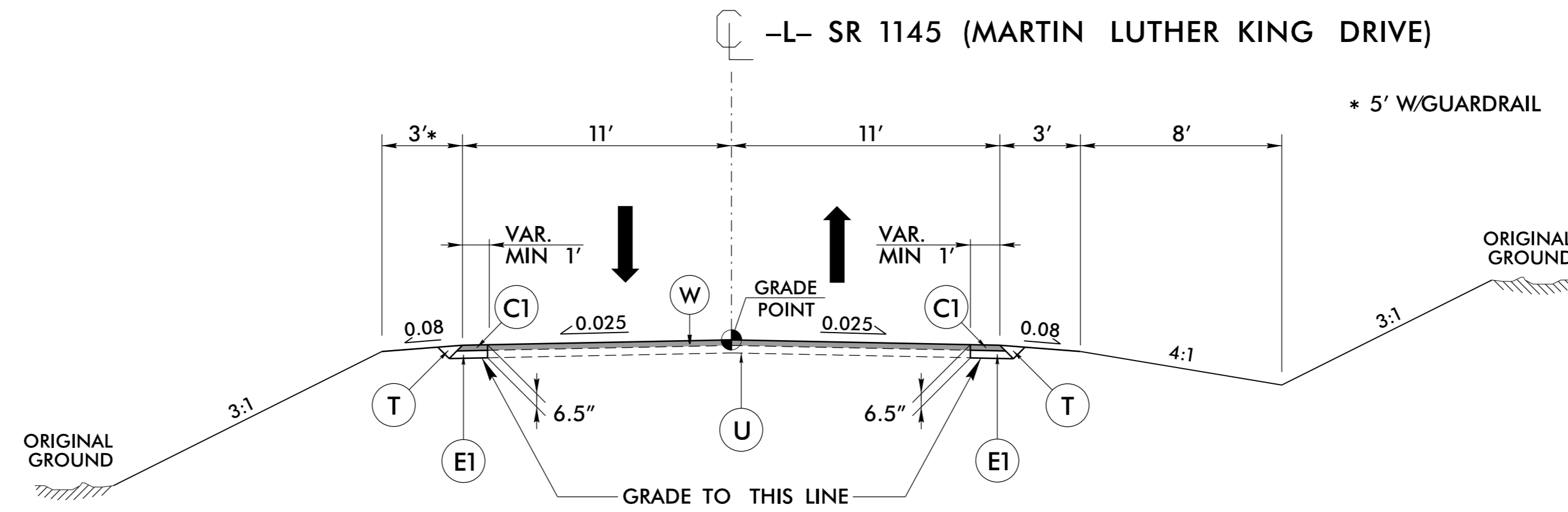
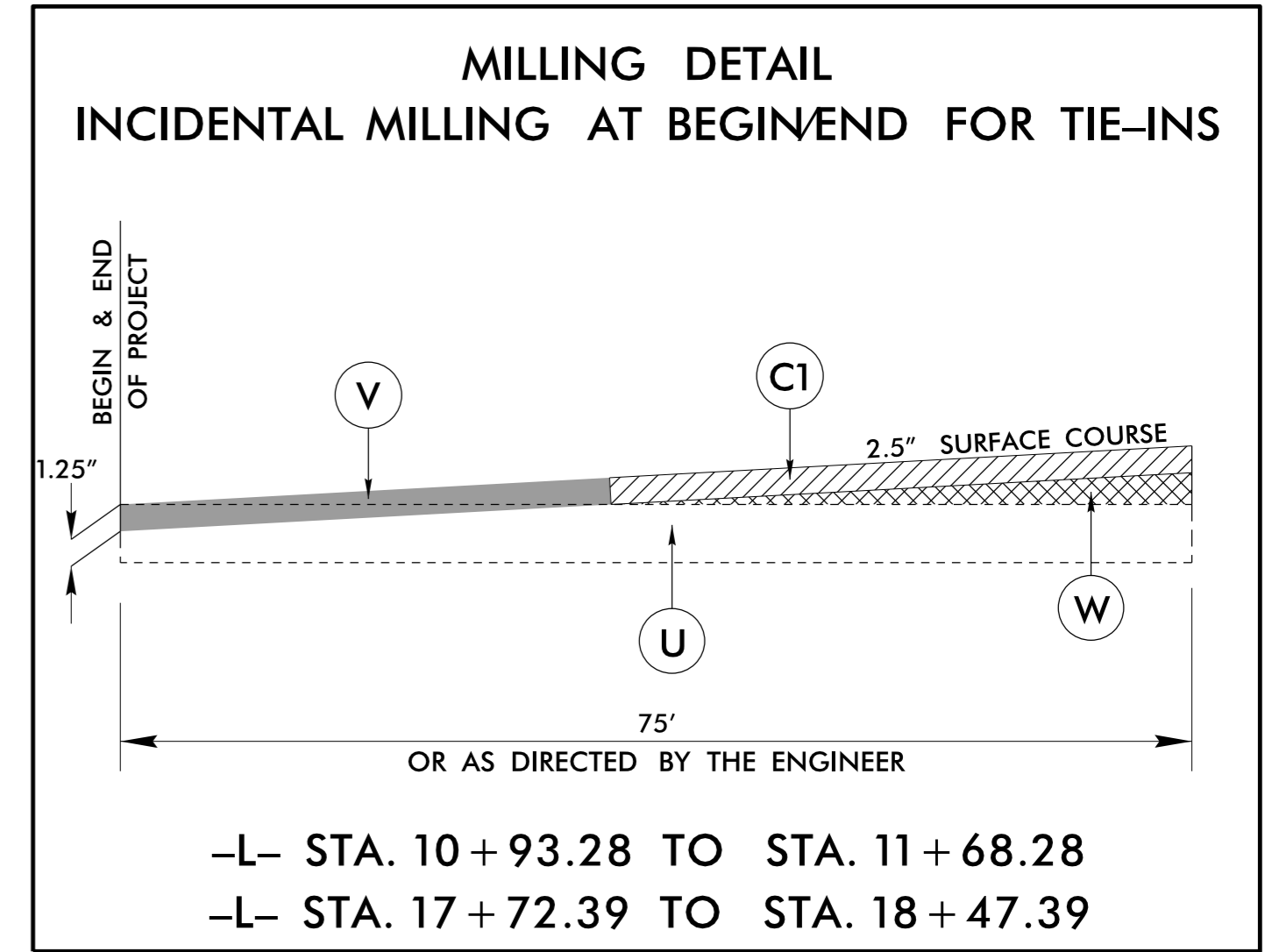
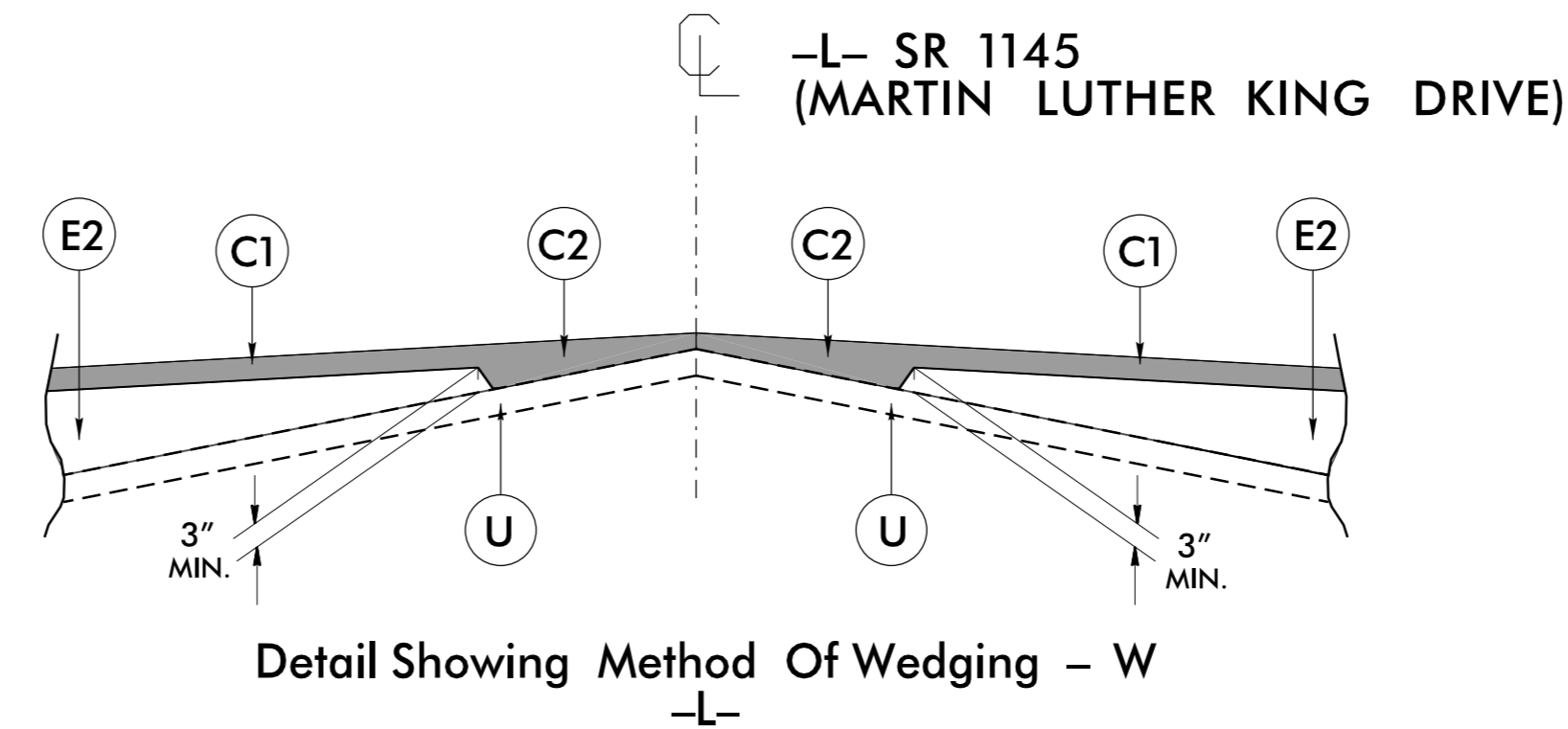
-SYTIME 77BP.6.P.90.LS.psh-1E.dgn
11:56:00 AM '95

6/2/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	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 LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" 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 5 1/2" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)

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

PROJECT REFERENCE NO. 17BP.6.R.90	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

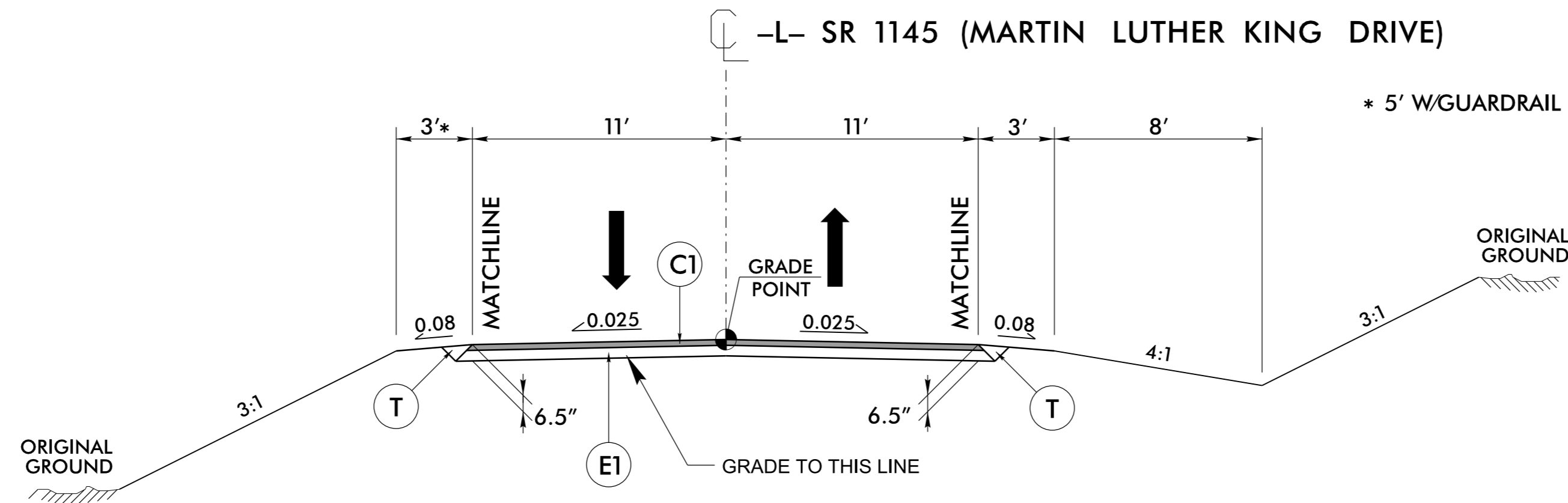


TYPICAL SECTION NO. 1
 USE TYPICAL SECTION NO. 1
 -L- STA. 10+93.28 TO STA. 13+75.00
 -L- STA. 16+55.00 TO STA. 18+47.39

-SYTIME: 7/17/99, 6:11:00, Rdy: typ.dgn

6/2/2019

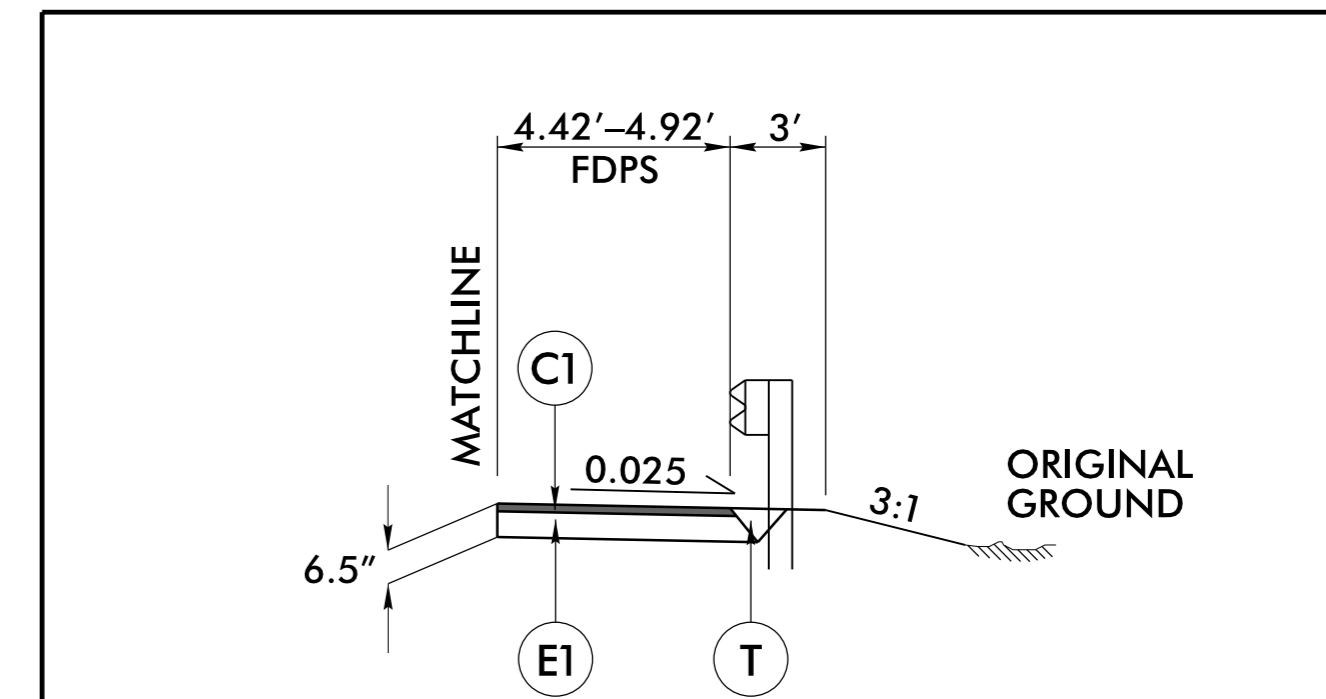
PROJECT REFERENCE NO. 17BP.6.R.90	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

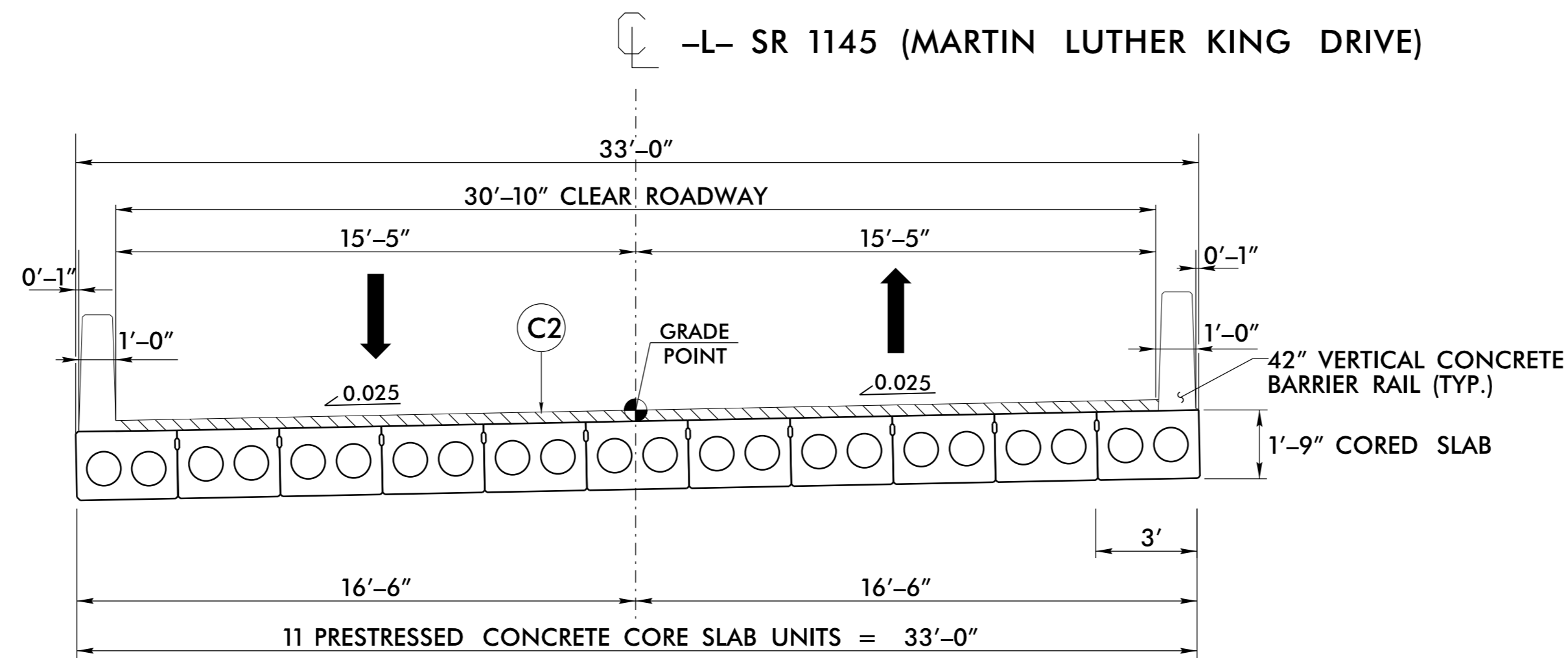
- L- STA. 13+75.00 TO STA. 14+73.81 (BEGIN BRIDGE)
- L- STA. 15+56.19 (END BRIDGE) TO STA 16+55.00



DETAIL A

USE DETAIL A IN CONJUNCTION WITH TYPICAL SECTION NO. 2

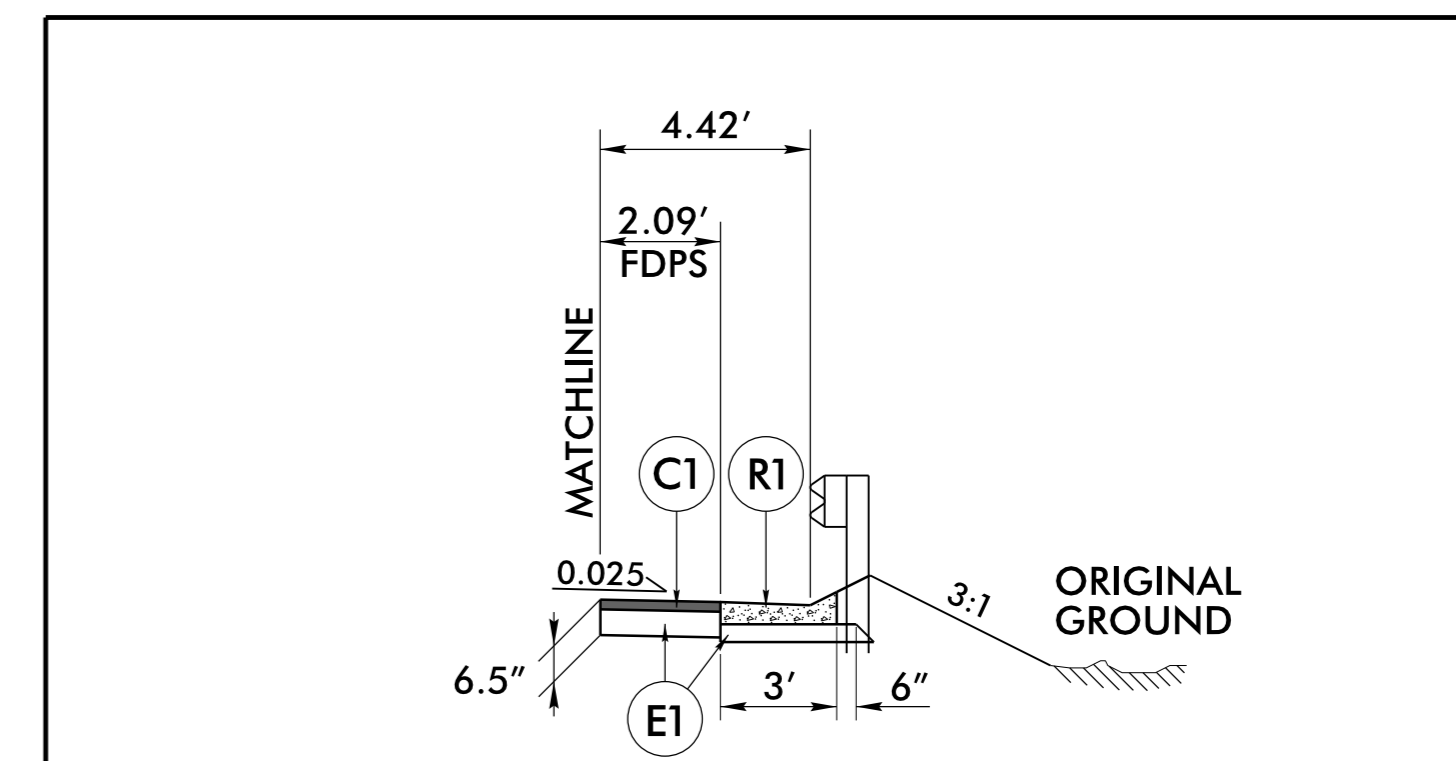
- L- STA. 14+19.59 TO STA. 14+73.81 (LT)
- L- STA. 14+20.13 TO STA 14+73.81 (RT)
- L- STA. 15+56.19 TO STA. 16+10.24 (LT)
- L- STA. 15+56.19 TO STA. 16+11.04 (RT)



BRIDGE TYPICAL SECTION

USE BRIDGE TYPICAL SECTION

- L- STA. 14+73.81 (BEGIN BRIDGE) TO STA. 15+56.19 (END BRIDGE)



DETAIL B

USE DETAIL B IN CONJUNCTION WITH TYPICAL SECTION NO. 2

- L- STA. 15+67.06 TO STA. 15+80.00 (LT)
- L- STA. 15+67.06 TO STA. 15+81.00 (RT)

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	2.5' S9.5B
C2	VAR. S9.5B
E1	4" B25.0C
E2	VAR. B25.0C
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

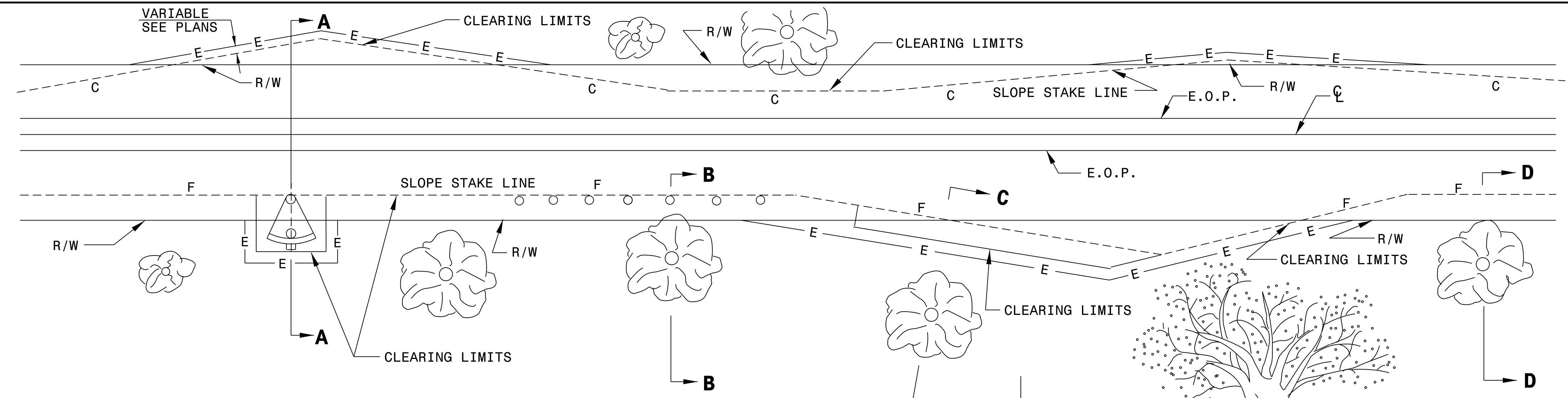
PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

-SYTIME: 7/17/19 6:11:00 -Redy- typ.dgn

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - II

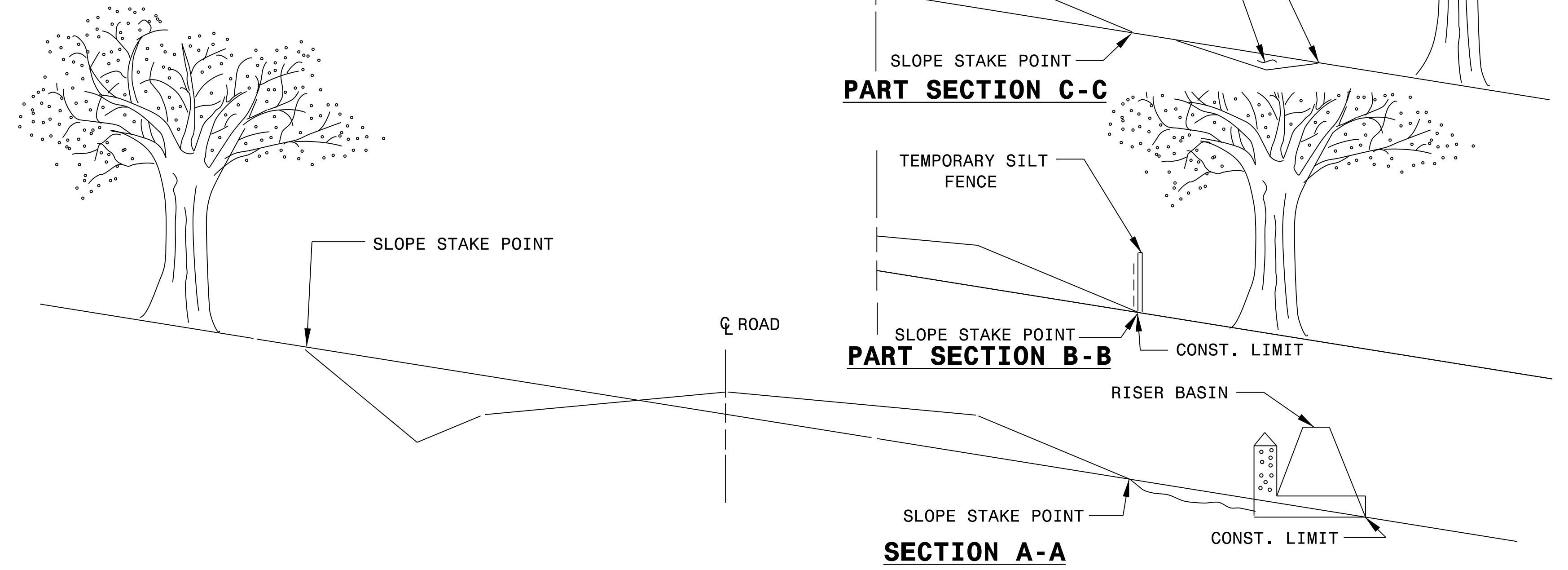
SHEET 1 OF 1
200d02



GENERAL NOTES:

1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.
3. FOR SECTIONS WITH WIDE MEDIANS WHERE TREES ARE TO REMAIN, CLEAR THE MEDIAN SIDE IN THE SAME MANNER AS ON THE OUTSIDE.
4. HAND CLEAR AS NEEDED TO 5' OUTSIDE THE SLOPE STAKE LINES FOR INSTALLATION OF EROSION CONTROL DEVICES.

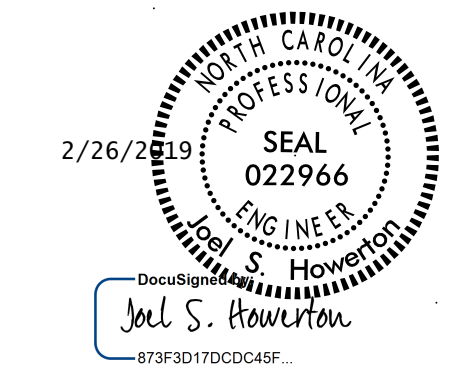
CLEAR TO SLOPE STAKE LINE OR CONSTRUCTION LIMITS



STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - II

SHEET 1 OF 1
200d02



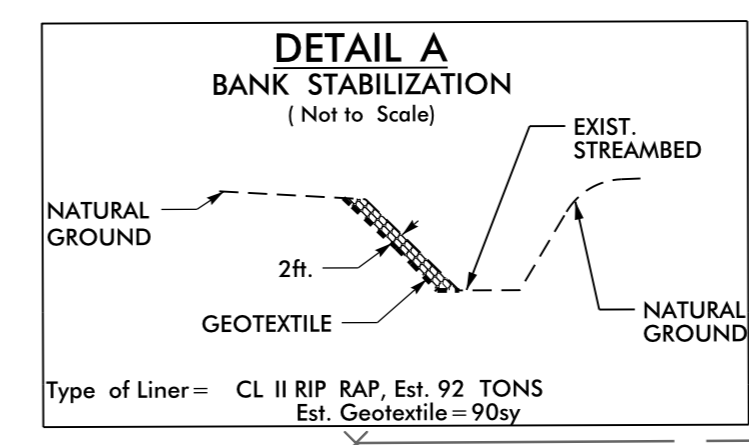
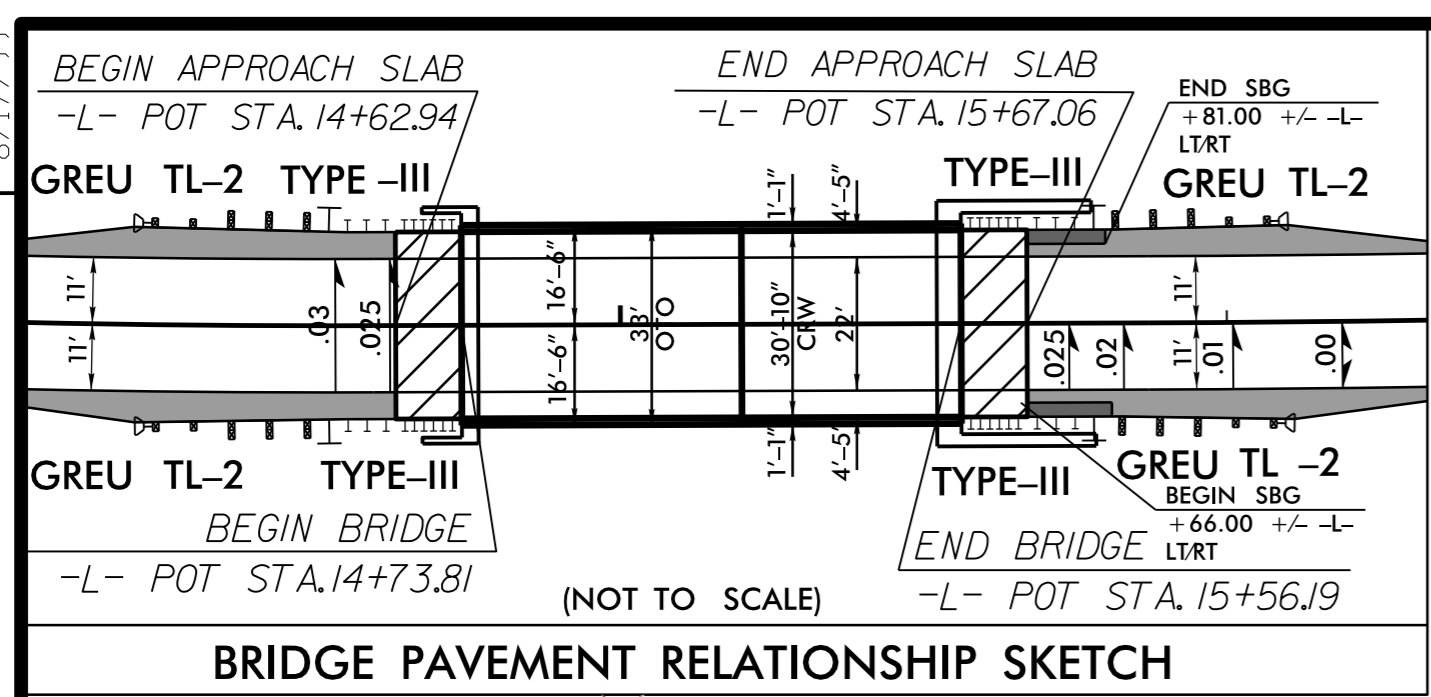
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
 Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

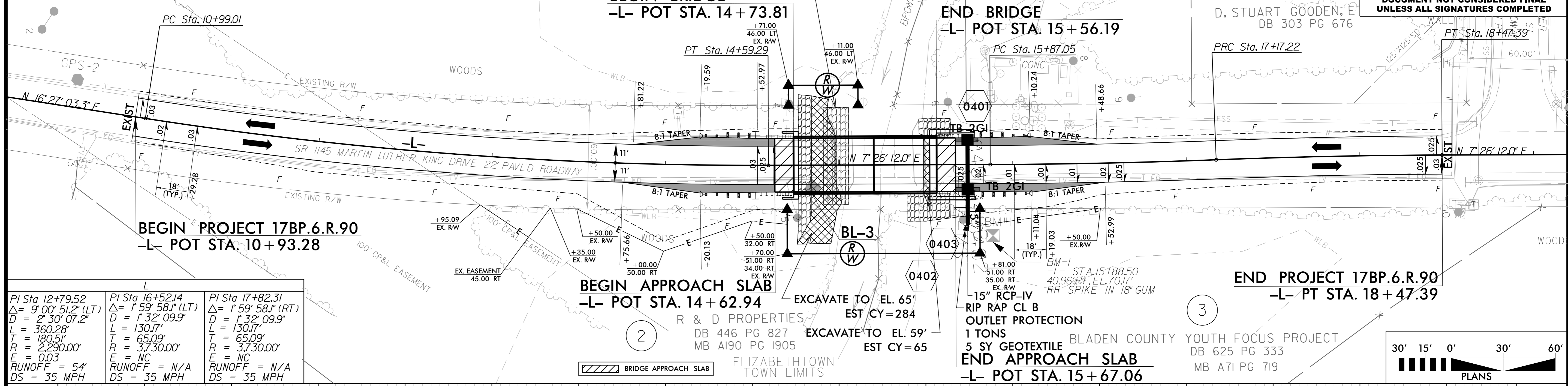
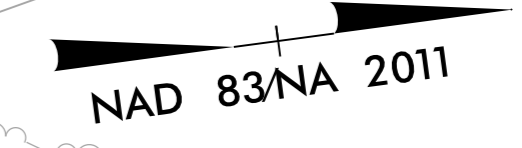
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DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

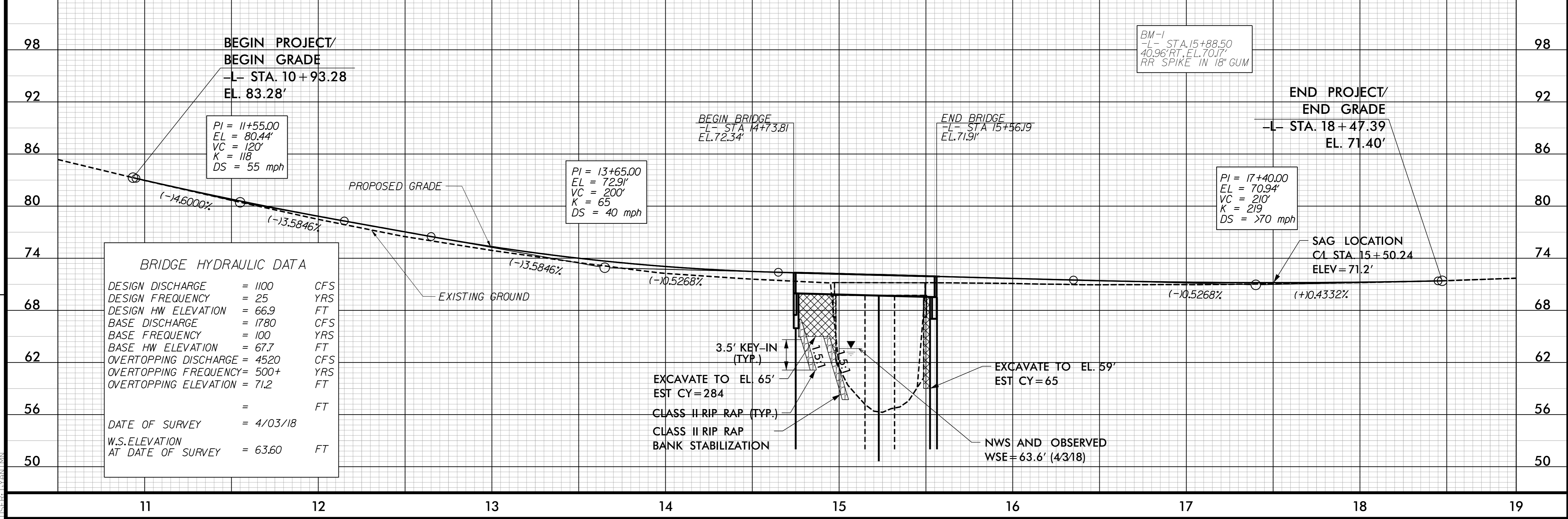
PROJECT REFERENCE NO. 17BP.6.R.90		SHEET NO. 4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



TOWN OF ELIZABETHTOWN
DB 243 PG 250
MB A2 PG 18



L	L	L
PI Sta 12+79.52 Δ = 9° 00' 51.2" (LT) D = 2° 30' 07.2" L = 360.28' T = 180.51' R = 2290.00' E = 0.03 RUNOFF = 54' DS = 35 MPH	PI Sta 16+52.14 Δ = 1° 59' 58.1" (LT) D = 1° 32' 09.9" L = 130.17' T = 65.09' R = 3730.00' E = NC RUNOFF = N/A DS = 35 MPH	PI Sta 17+82.31 Δ = 1° 59' 58.1" (RT) D = 1° 32' 09.9" L = 130.17' T = 65.09' R = 3730.00' E = NC RUNOFF = N/A DS = 35 MPH



DESIGN DISCHARGE	= 1100	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 66.9	FT
BASE DISCHARGE	= 1780	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 67.7	FT
OVERTOPPING DISCHARGE	= 4520	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 71.2	FT
	=	FT
	=	FT
DATE OF SURVEY	= 4/03/18	
W.S. ELEVATION AT DATE OF SURVEY	= 63.60	FT

EXCAVATE TO EL. 65'
EST CY = 284
CLASS II RIP RAP (TYP.)
CLASS II RIP RAP BANK STABILIZATION

EXCAVATE TO EL. 59'
EST CY = 65
NWS AND OBSERVED WSE = 63.6' (4/3/18)

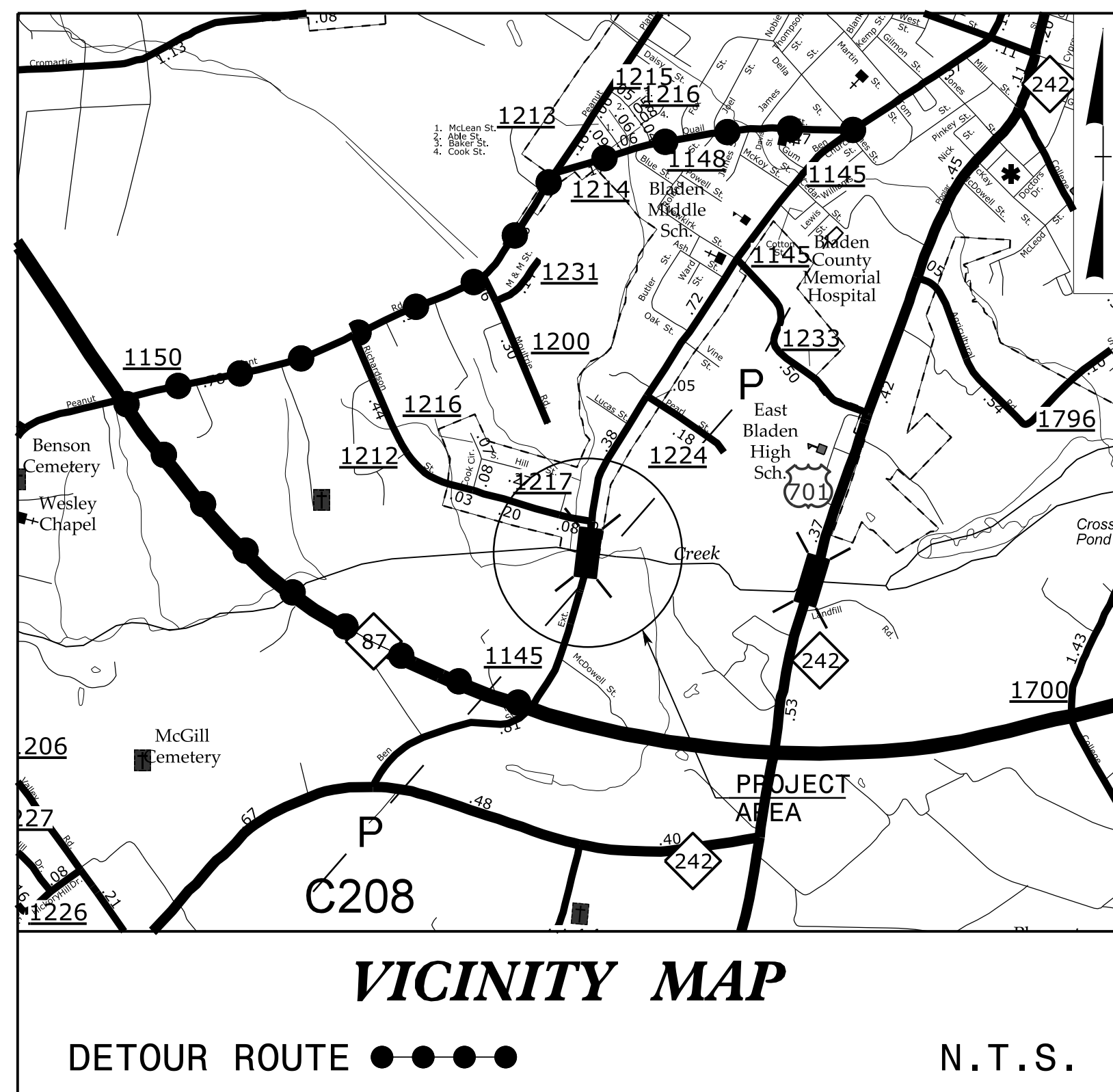
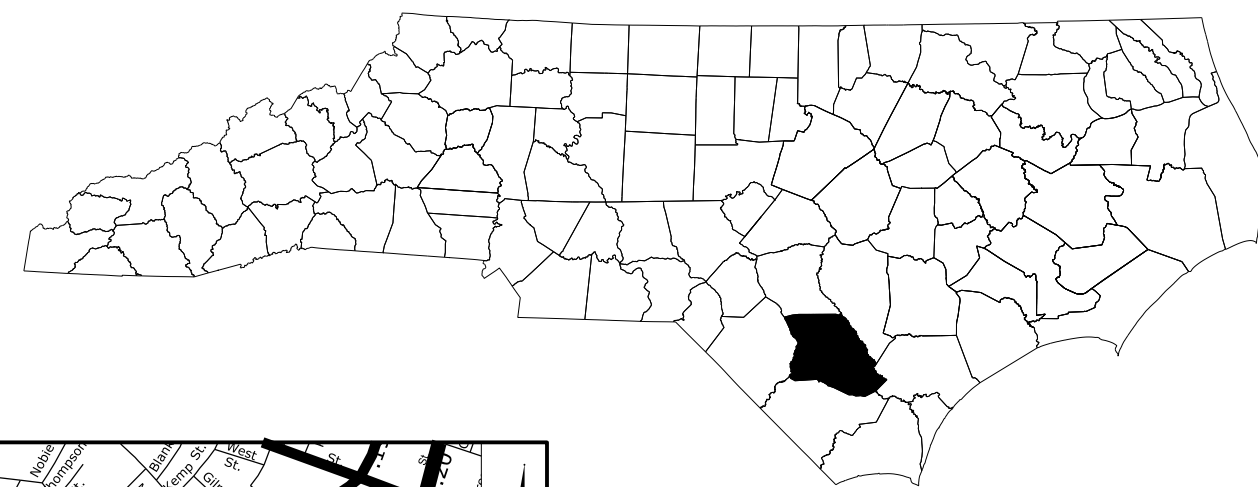
REVISIONS

SYSTEM: 17BP.6.R.90_rdw_psh_04.dgn
USER: GWANTMAN

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BLADEN COUNTY



**LOCATION: REPLACE BRIDGE 178 OVER BROWNS CREEK
ON SR 1145 (MARTIN LUTHER KING DRIVE)**

INDEX OF SHEETS

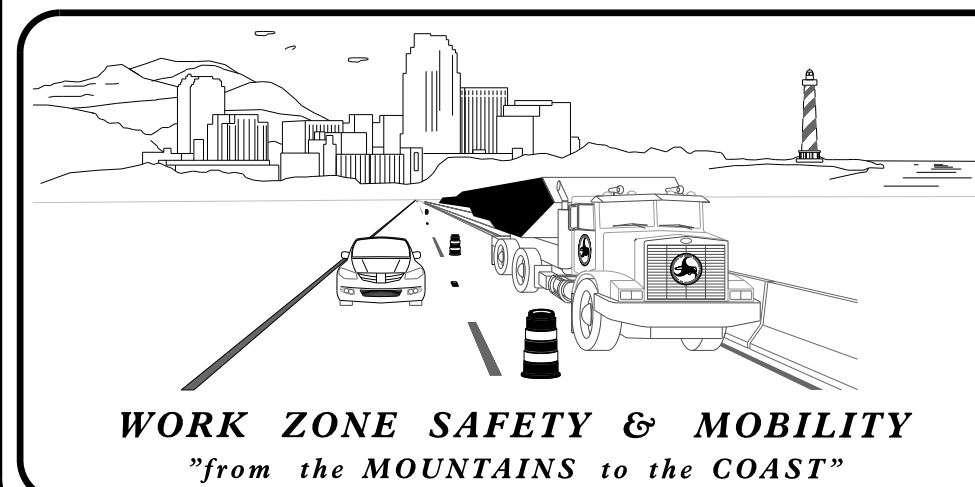
SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-2	OFF-SITE DETOUR
TMP-3	SIGN DESIGN

SHEET NO.

TMP-1

PROJECT: 17BP.6.R.90

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



PLANS PREPARED BY:

ADAM CONRAD, P.E.
PROJECT ENGINEER

MONIQUE GYANT, E.I.
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

J. S. KITE, P.E.
PROJECT ENGINEER

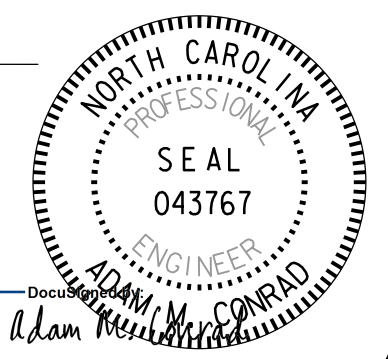
MATTHEW SPRINGER, P.E.
PROJECT DESIGN ENGINEER



CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

APPROVED: _____
DATE: 2/26/2019

SEAL



\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

2/9/2019 2:04:10 PM User: JAYANTM User: JAYANTM

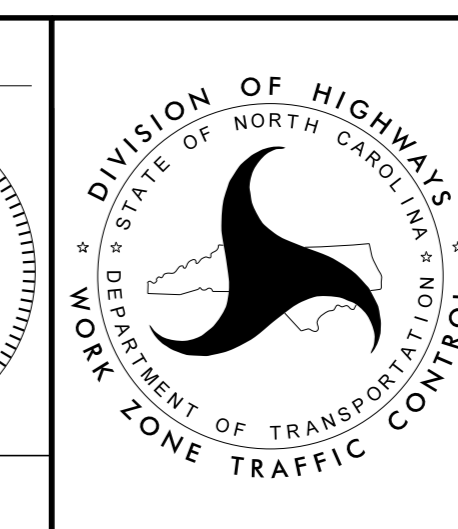


CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

APPROVED: _____
DATE: 2/26/2019

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ROADWAY STANDARD DRAWINGS & LEGEND

MANAGEMENT STRATEGIES

- 1- CLOSE SR 1145 (MARTIN LUTHER KING DRIVE) TO TRAFFIC AND DETOR TRAFFIC OFF-SITE.
- 2- LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING 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 UNDESIRE 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.

SIGNING

- B) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- C) 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.

- D) 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.

- E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PHASING

- STEP 1: USING RSD 1101.03 (SHEET 1 OF 9), INSTALL DETOUR ROUTE SIGNING TO CLOSE SR 1145 (MARTIN LUTHER KING DRIVE) FROM STA. 10+93+/- TO STA. 18+47+/- -L-.
- STEP 2: AWAY FROM TRAFFIC, COMPLETE CONSTRUCTION OF PROPOSED BRIDGE AND ROADWAY APPROACHES, INCLUDING DRAINAGE, GUARDRAIL, FINAL PAVEMENT MARKINGS AND MARKERS ON PROPOSED -L- FROM STA. 10+93+/- TO STA. 18+47+/-.
- STEP 3: REMOVE TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO PROPOSED 2-LANE, 2-WAY TRAFFIC PATTERN.

LOCAL NOTES

- 1- NOTIFY BLADEN COUNTY EMERGENCY SERVICES AND PUBLIC SCHOOLS AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE.

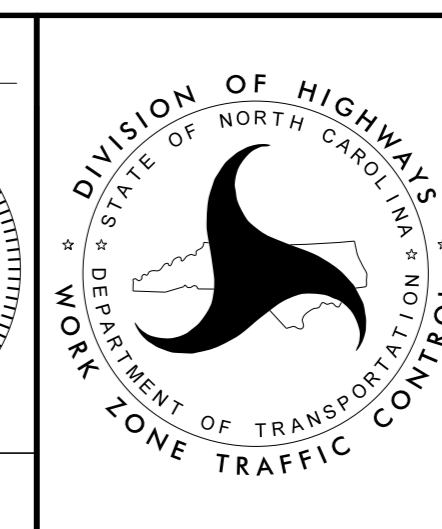
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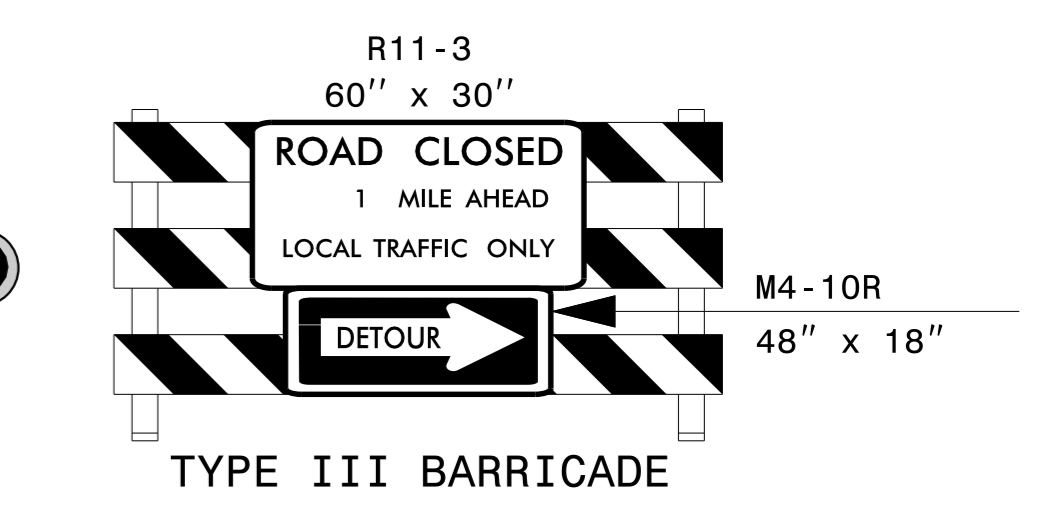
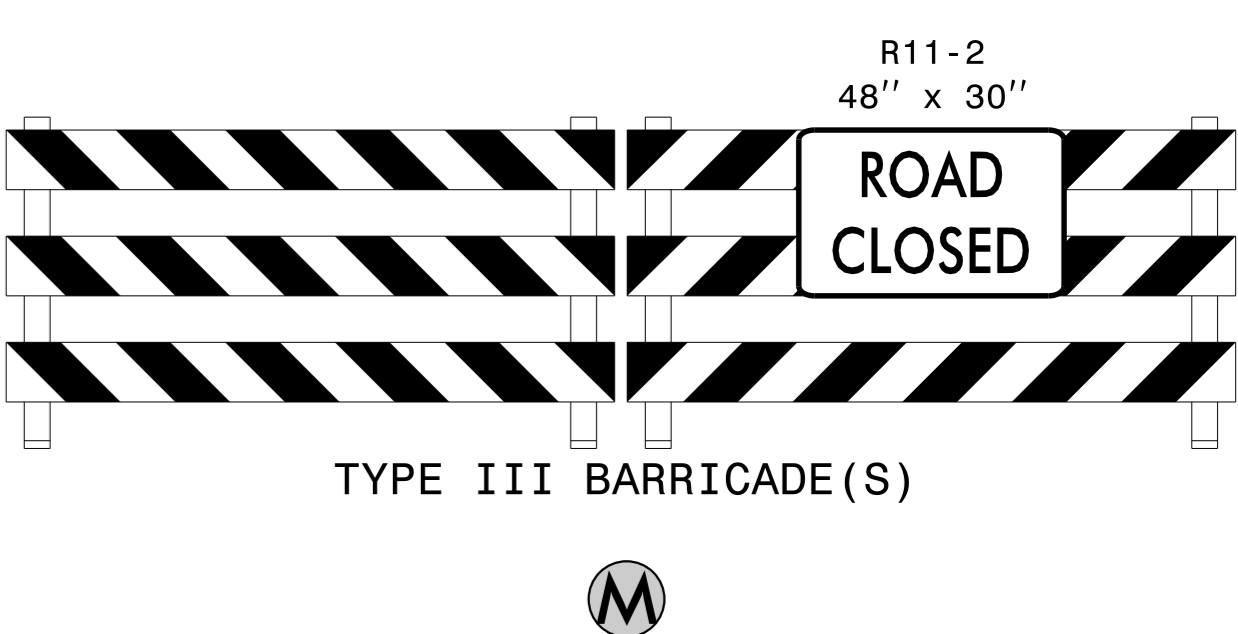
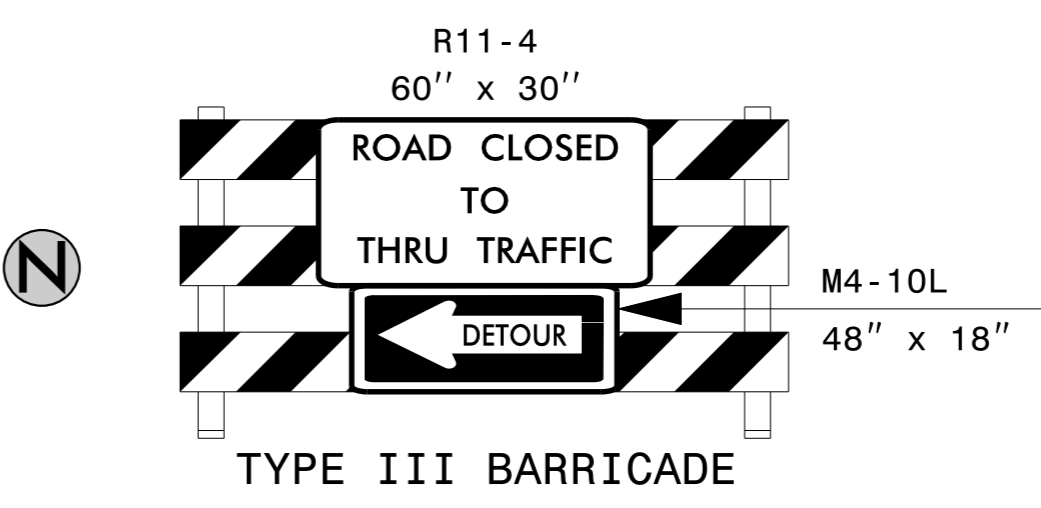
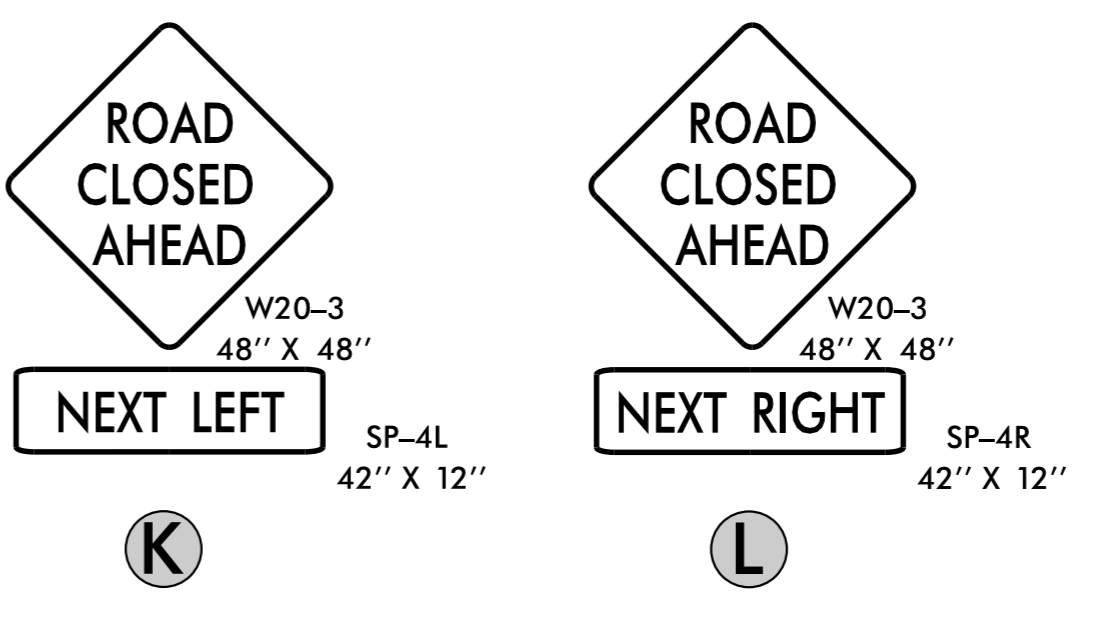
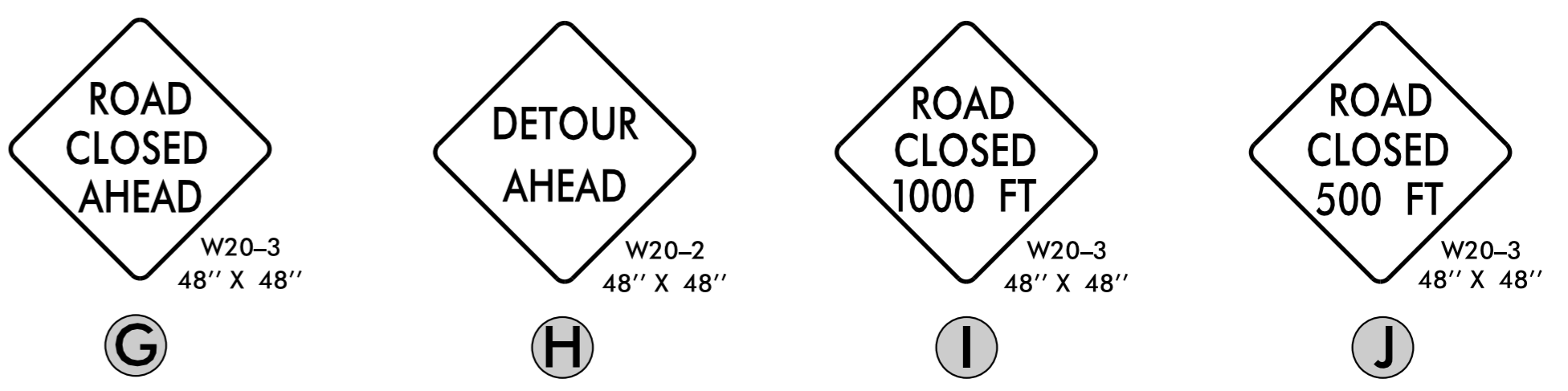
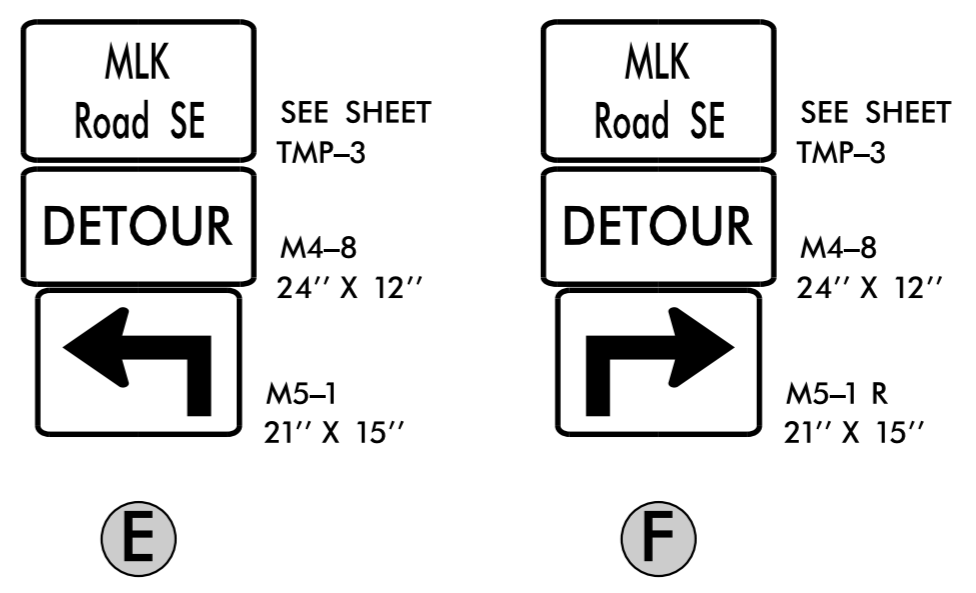
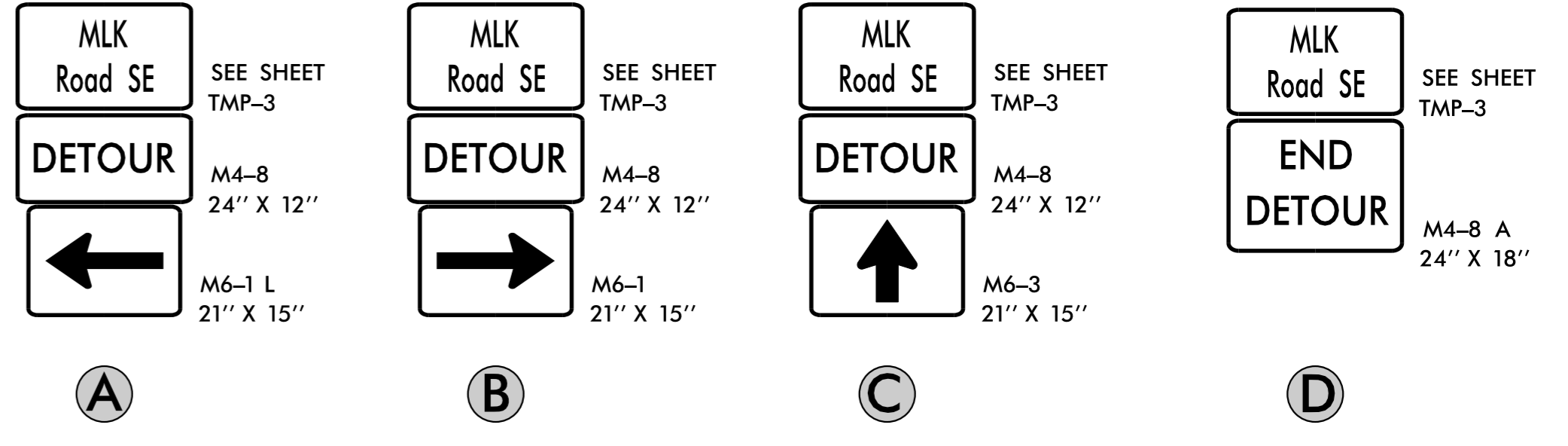
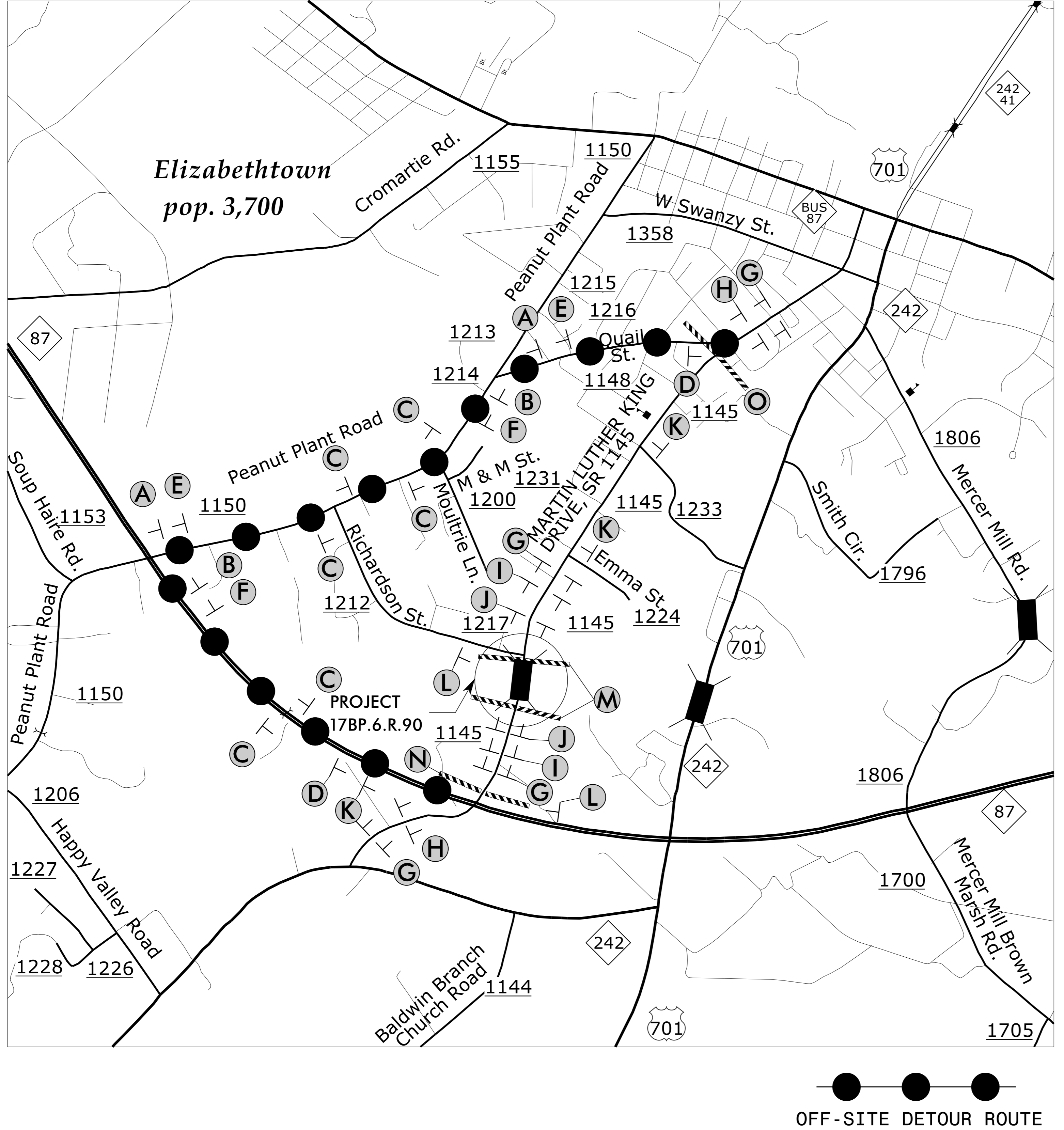
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 DATE: 2/26/2019

SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TRANSPORTATION OPERATIONS PLAN

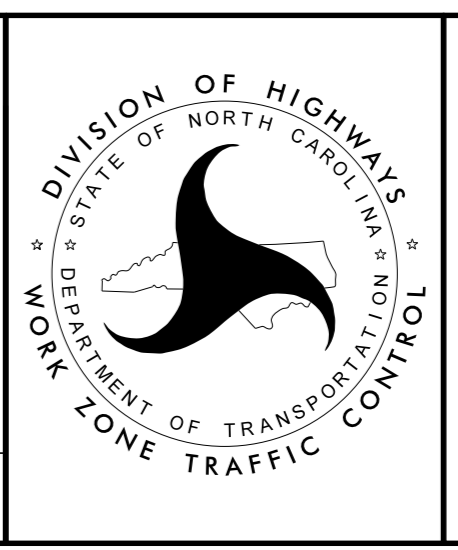


OFF-SITE DETOUR ROUTE

2/9/2019 10:45:10 AM User: JYANTMN

CDM Smith
 CDM Smith Inc.
 5400 Glenwood Avenue
 Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

APPROVED: _____
 DATE: 2/26/2019
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 043767
 Alan M. [Signature]
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



OFF-SITE DETOUR

<p>SIGN NUMBER: 1 TYPE: D QUANTITY: 1</p> <p>SIGN WIDTH: 2'-6" HEIGHT: 1'-6" TOTAL AREA: 3.8 Sq.Ft.</p> <p>BORDER TYPE: FLUSH RECESS: 0.38" WIDTH: 0.63" RADII: 1.5"</p> <p>NO. Z BARS: LENGTH:</p>	<p>BACKG COLOR: Orange COPY COLOR: Black</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>MAT'L: 0.063" (1.6 mm) ALUMINUM</p>	SYMBOL	X	Y	WID	HT																																														<p>DESIGN BY: MNG PROJECT ID: 17BP.6.R.90</p> <p>CHECKED BY: AMC LOCATION: BLADEN</p> <p style="text-align: right;">Ju1 13, 2018 DIV: 6</p> <div style="text-align: center;"> <p style="font-size: small;">BORDER R=1.5" TH=0.63" IN=0.38"</p> <p style="font-size: x-small;">Panel Style: Traffic Control.ssi M.U.T.C.D.: 2009 Edition</p> </div> <p style="text-align: right; font-size: small;">Spacing Factor is 1 unless specified otherwise</p>
SYMBOL	X	Y	WID	HT																																																
<p>USE NOTES:</p> <ol style="list-style-type: none"> Legend and border(except those that are colored black) shall be direct applied Grade C sheeting. Background shall be Grade B reflective sheeting. Shields; A, B, and C type arrows shall be on 0.032" (0.8mm) aluminum with Grade C reflective sheeting and demountable. Bottom panel shall be yellow Grade C sheeting. Legend shall be direct applied black non-reflective sheeting. Arrow shall be on 0.032" aluminum, black non-reflective sheeting an demountable. Yellow panel is: 																																																				

LETTER POSITIONS

Letter locations are panel edge to lower left corner

													Series/Size
													Text Length
M	L	K											D 2000
10	14.1	17.2											10
R	o	a	d		S	E							D 2000
4.4	7.6	10.4	13.3	15.7	19.7	23.1							21.2

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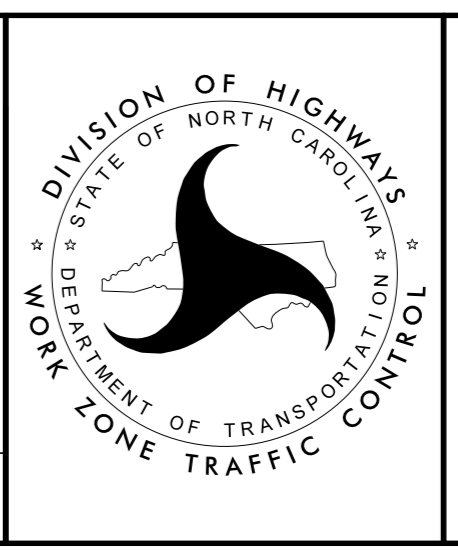
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APPROVED: _____
 DATE: 2/26/2019

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SIGN DESIGN

PROJECT: 17BP.6.R.90

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN
BLADEN COUNTY**

LOCATION: SR 1145 (MARTIN LUTHER KING DRIVE) OVER BROWNS CREEK

<small>TIP NO.</small> 17BP.6.R.90	<small>SHEET NO.</small> PMP-1
<small>APPROVED:</small> _____	
<small>DATE:</small> 2/26/2019	
	
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ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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>
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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.

- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

<small>ROAD NAME</small>	<small>MARKING</small>	<small>MARKER</small>
MARTIN LUTHER KING DRIVE	PAINT	PERMANENT RAISED
- B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.
- C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- E) MARKERS SHALL BE INSTALLED ACCORDING TO THE NCDOT ROADWAY STANDARD DRAWING 1250.01.

SUMMARY OF QUANTITIES

<u>ITEM NO.</u>		<u>ITEM DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>
<u>DESC. NO.</u>	<u>SECT. NO.</u>			
4810000000	1205	PAINT PAVEMENT MARKING LINES (4")	6,032	L.F.
4900000000	1251	PERMANENT RAISED PAVEMENT MARKERS	10	EA.

INDEX

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
PMP-1	PAVEMENT MARKING PLAN TITLE SHEET
PMP-2	PAVEMENT MARKING DETAIL

PLAN PREPARED BY: CDM SMITH, INC.

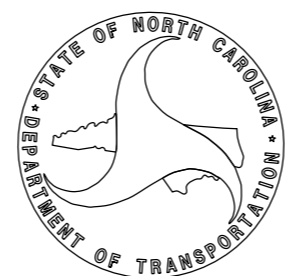
DAVID J. CLODGO, PE PROJECT MANAGER
ADAM M. CONRAD, PE PROJECT DESIGN ENGINEER



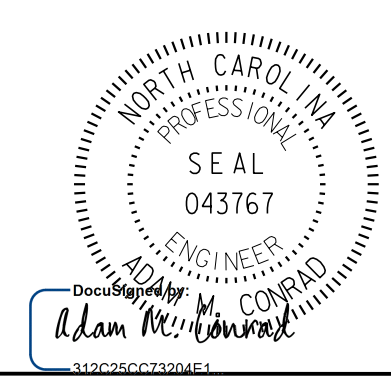
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

PLAN REVIEWED BY: N.C.D.O.T. DIVISION 6

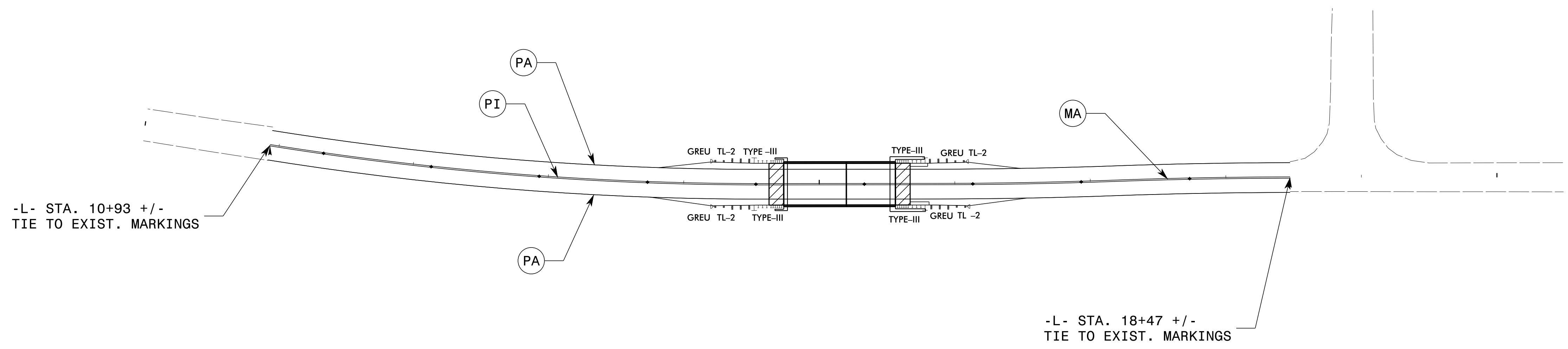
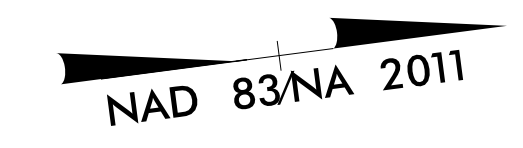
FRANK D. WEST, JR. DIVISION TRAFFIC ENGINEER
RANDY K. WISE, PE DIVISION CONSTRUCTION ENGINEER



17BP.6.R.90
 PMP-1
 2/26/2019
 ADAM M. CONRAD
 PE
 043767

TIP NO. 17BP.6.R.90	SHEET NO. PMP-2
APPROVED: _____	
DATE: 2/27/2019	
SEAL	
	
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<p>CDM Smith <small>CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255</small></p>	

PAVEMENT MARKING SCHEDULE	
SYMBOL	DESCRIPTION
	PAINT (4")
PA	WHITE EDGELINE
PI	YELLOW DOUBLE CENTER
	PERMANENT RAISED PAVEMENT MARKERS
MA	YELLOW & YELLOW

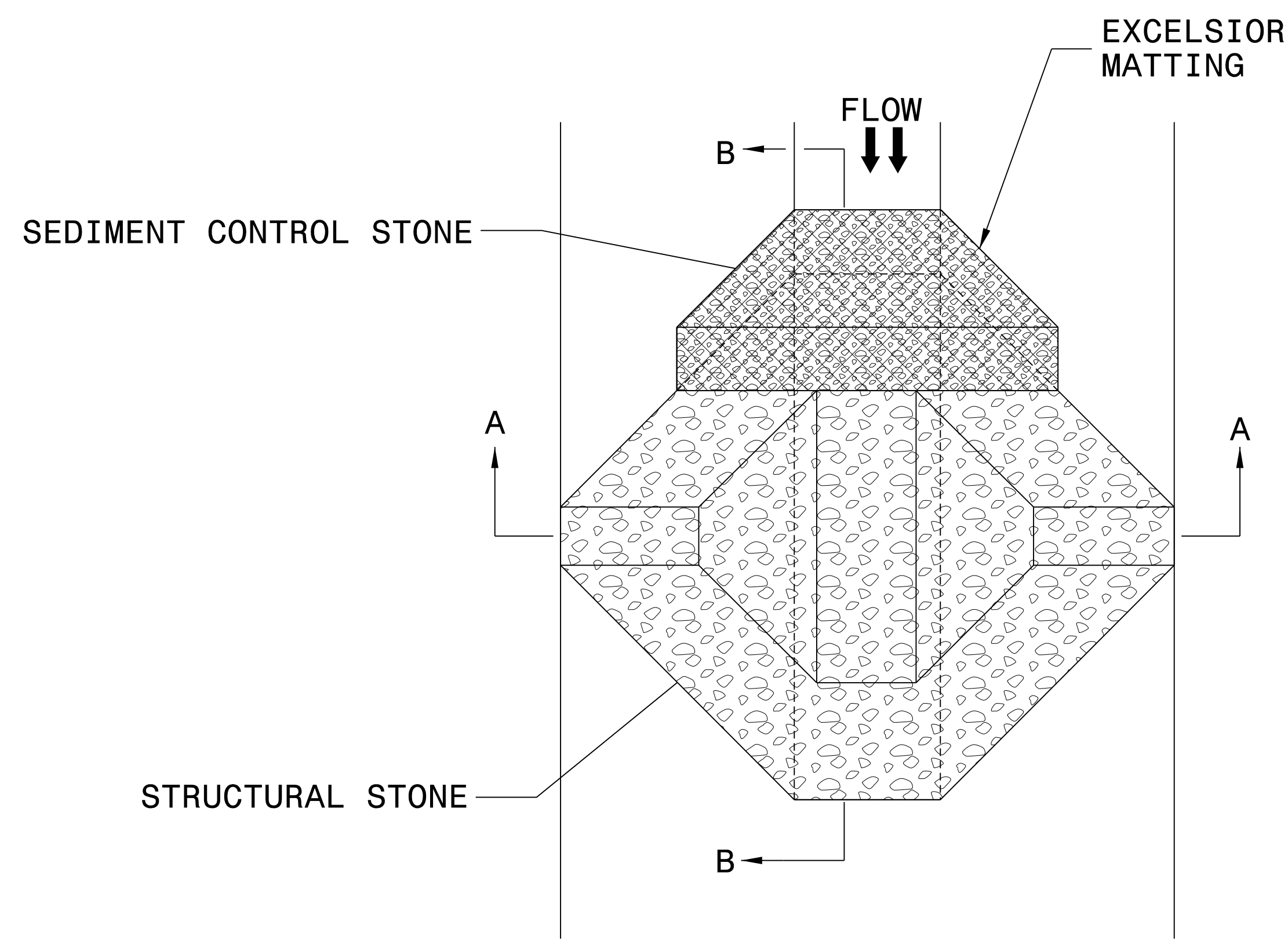


2/19/2019 P:\p\cdmsmith.com\Fw_P\1\Documents\17240\226119\10 Transportation\04 Client Folder Structure\17BP.6.R.90\Traffic\Signing\CADD\17BP.6.R.90_TMP_PMP-2.dgn
 User: BRYAN MN

PAVEMENT MARKING DETAIL

PROJECT REFERENCE NO. 17BP.6.R.90	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

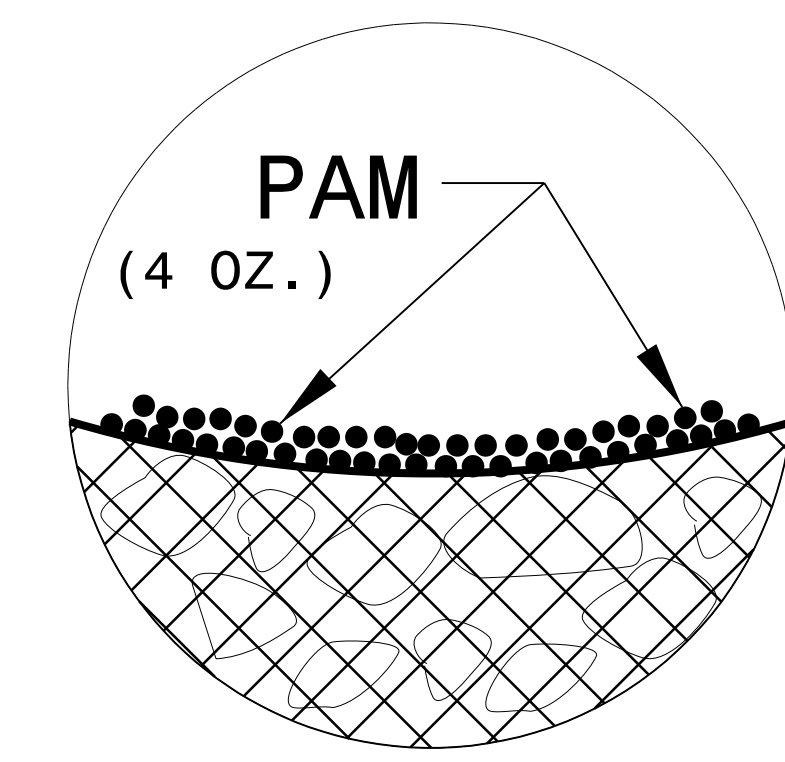
NOTES:

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

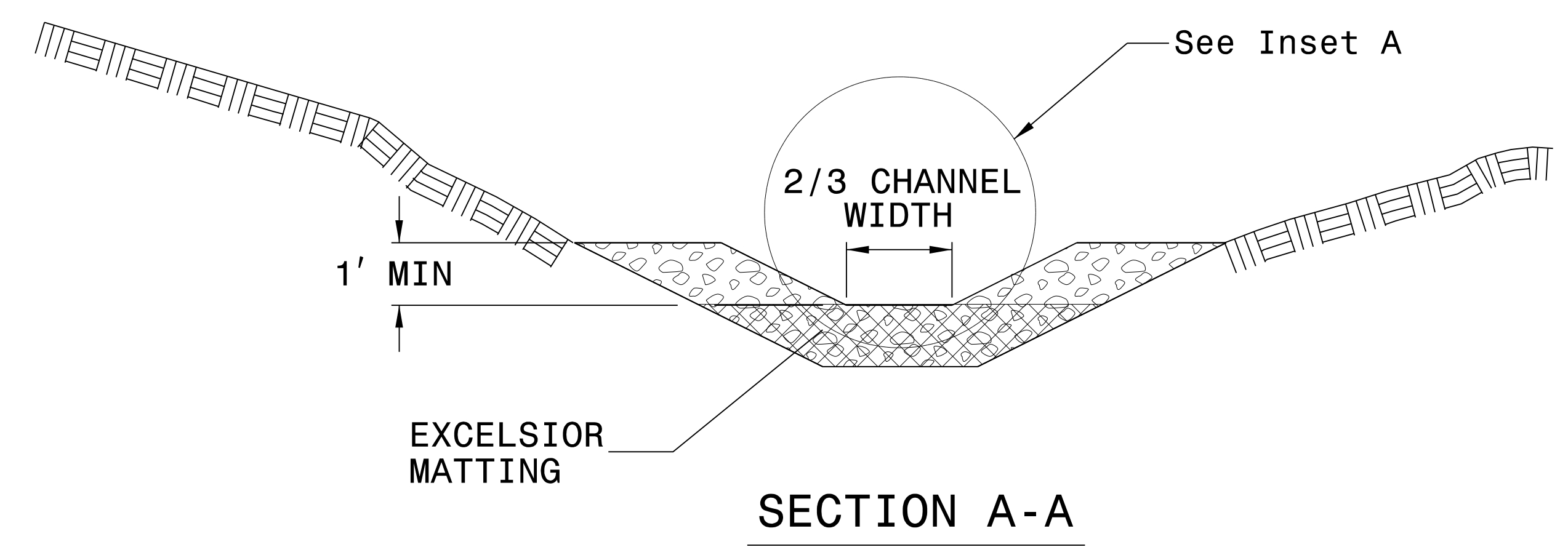
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.

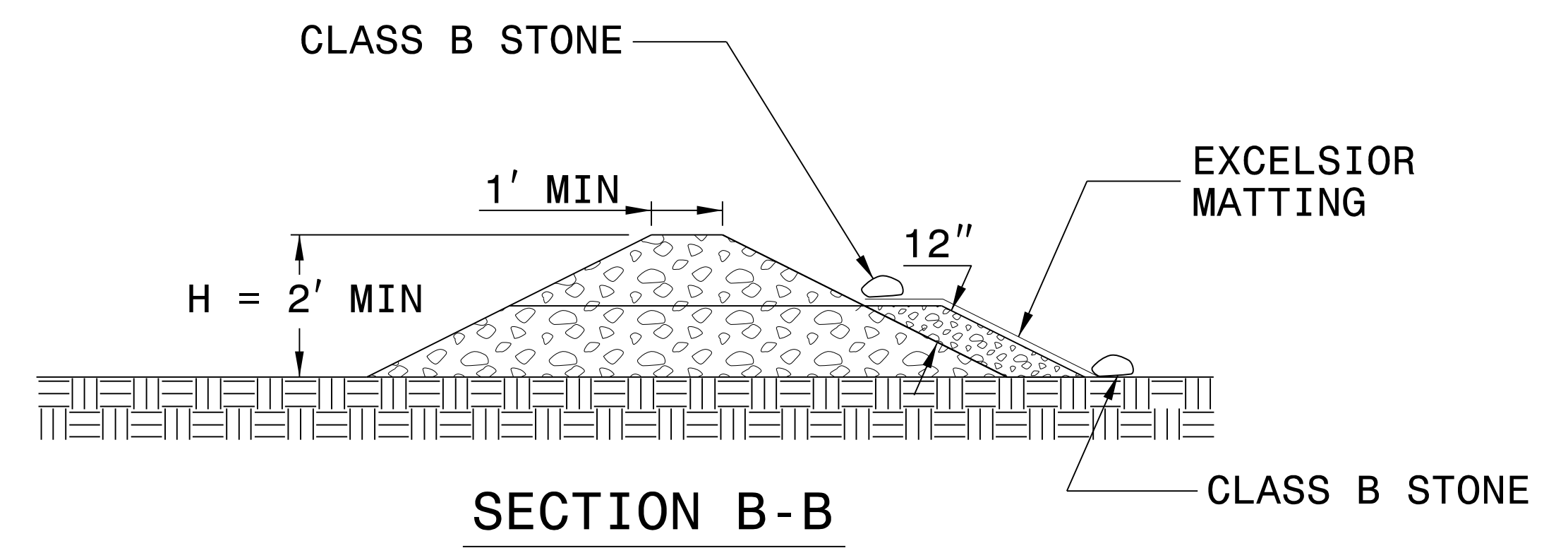
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A

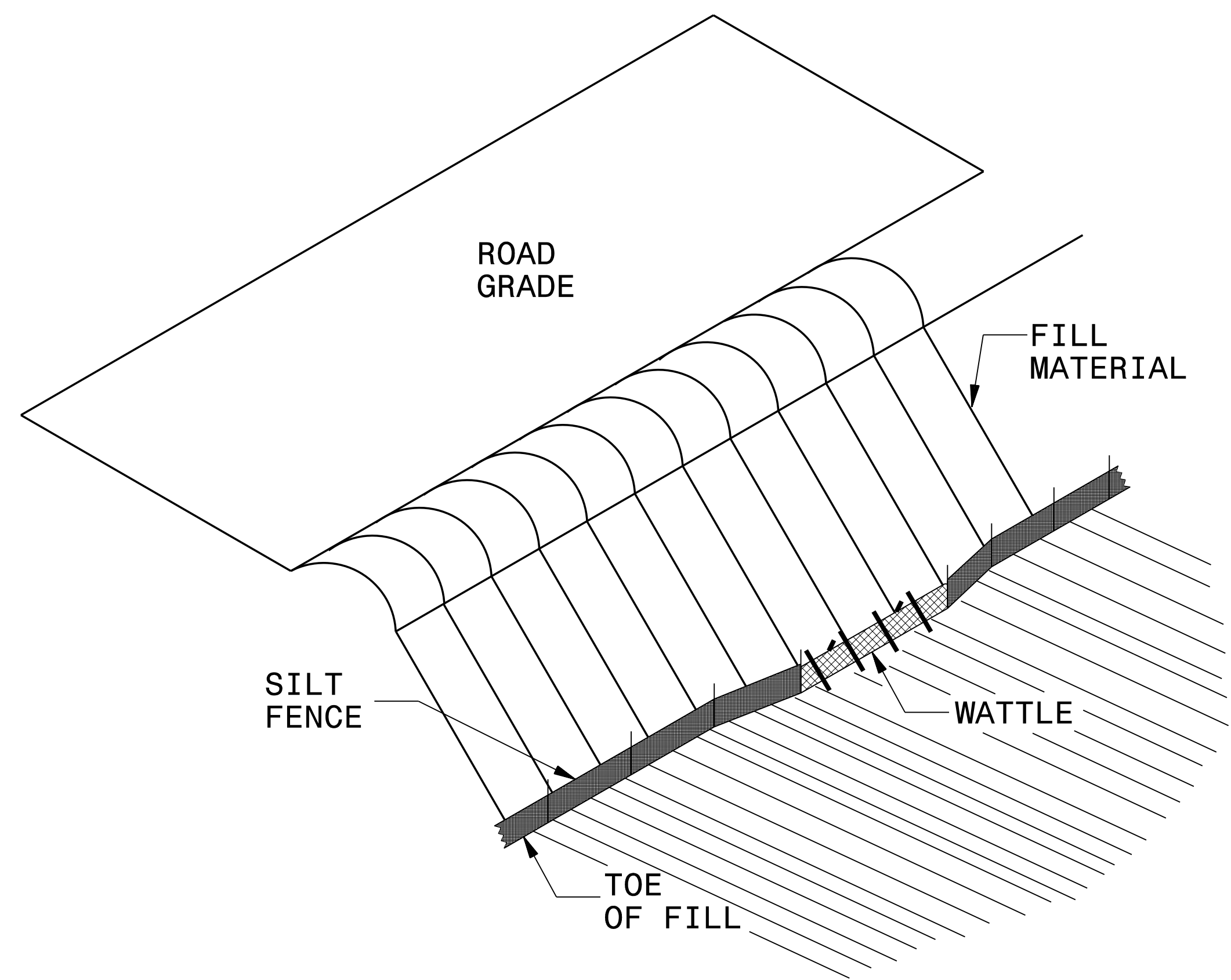


SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO. 17BP.6.R.90	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE WATTLE BREAK DETAIL

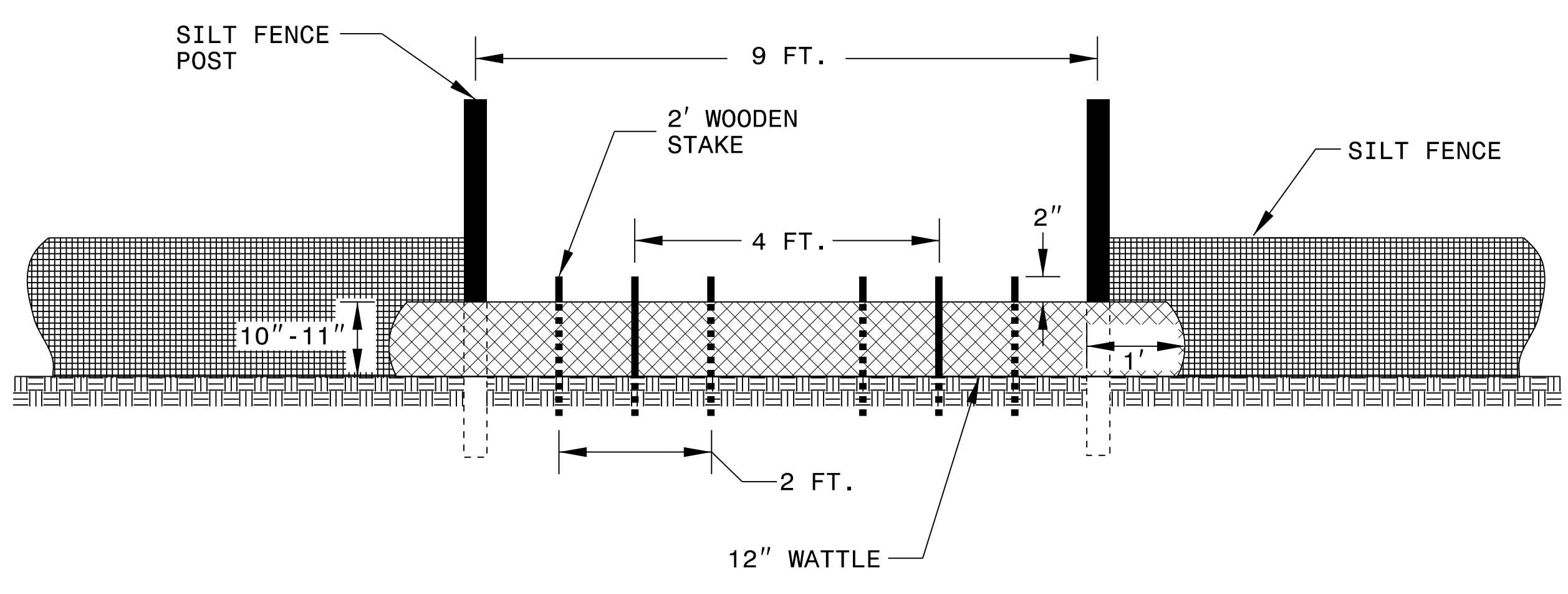
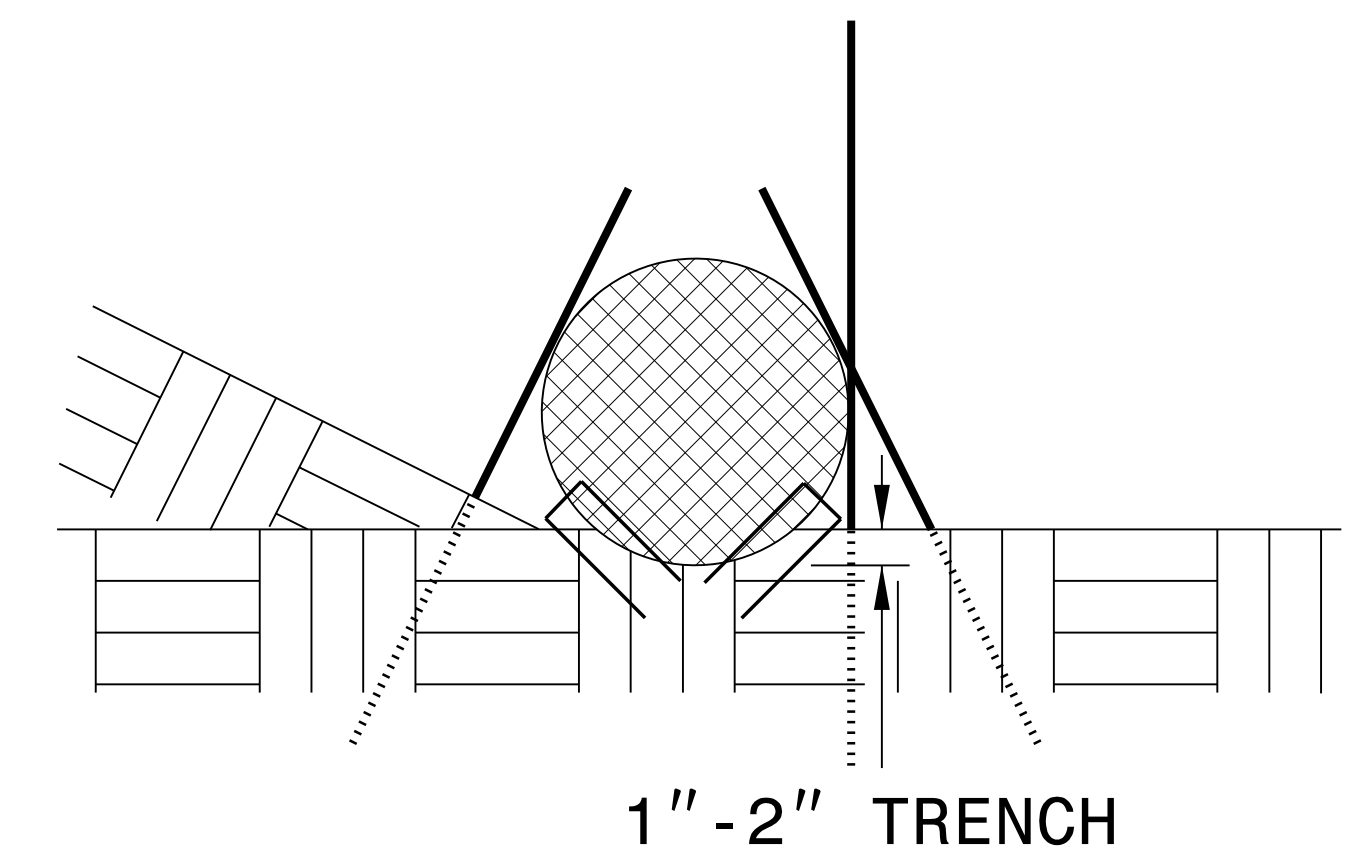


ISOMETRIC VIEW

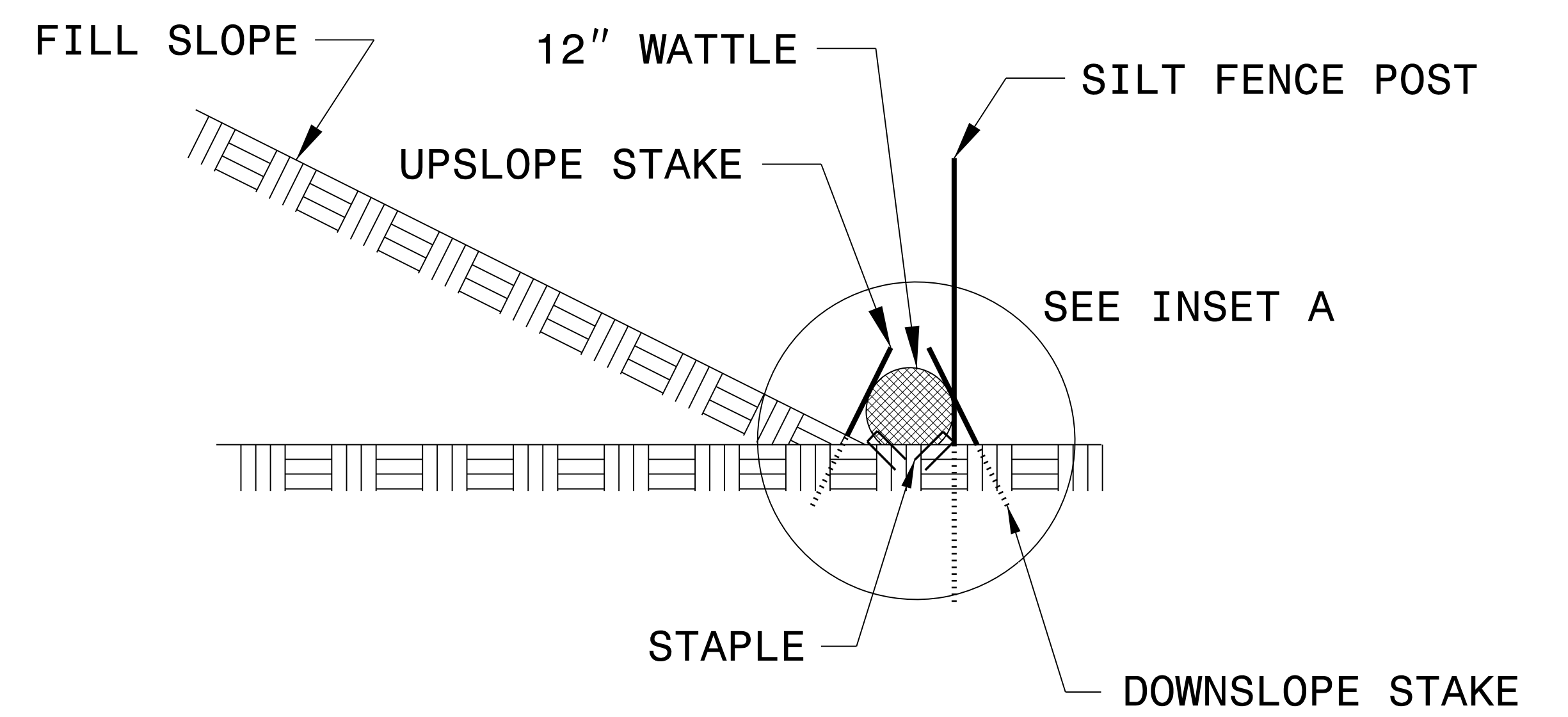
NOTES:

- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



VIEW FROM SLOPE



SIDE VIEW

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>17BP.6.R.90</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

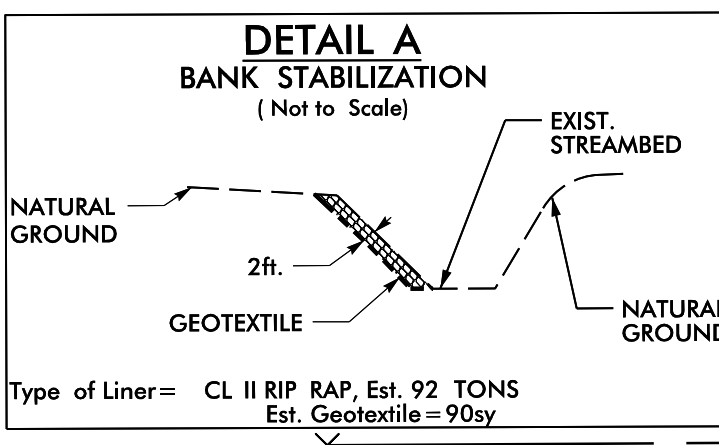
8/17/99

Utilized Special Stilling Basin, Where Applicable

Impervious Dikes May Be Modified and/or Eliminated As Needed.

NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

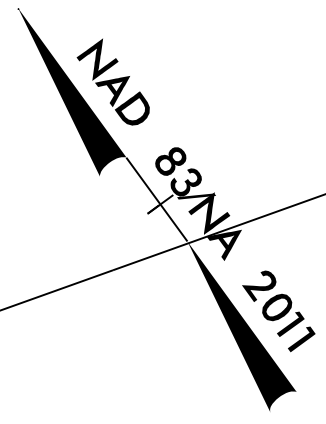
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.



CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4.

PROJECT REFERENCE NO. 17BP.6.R.90	SHEET NO. EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CDM Smith CDM Smith Inc. 3400 Glenwood Avenue Suite 400 Raleigh, NC 27613-3228 NC CDA No. F-1255	M Engineering, PLLC 1011 Schaub Drive Suite 100 Raleigh, NC 27608 NC CDA No. P-0971

TOWN OF ELIZABETHTOWN
DB 243 PG 250
MB A2 PG 18



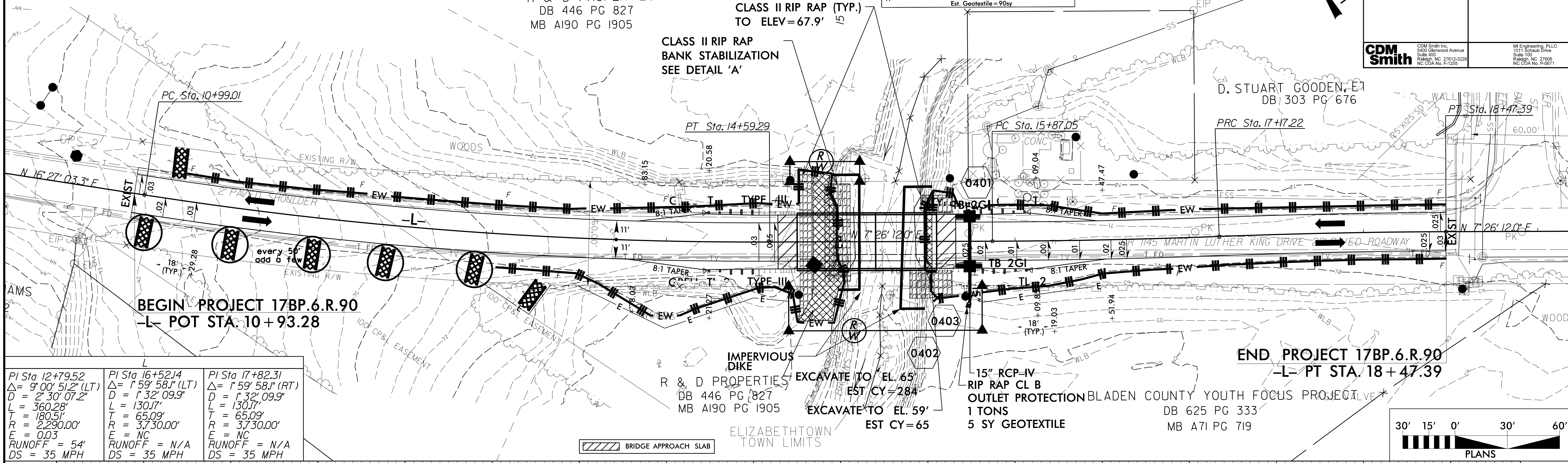
R & D PROPERTIES
DB 446 PG 827
MB A190 PG 1905

HIGH WATER MARK=65.28'

CLASS II RIP RAP (TYP.)
TO ELEV=67.9'

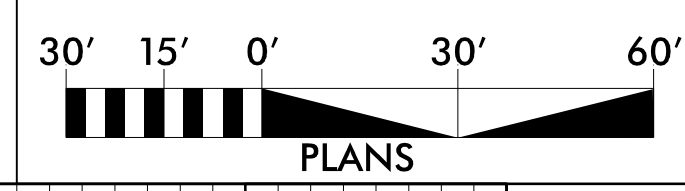
CLASS II RIP RAP
BANK STABILIZATION
SEE DETAIL 'A'

D. STUART GOODEN, E1
DB 303 PG 676

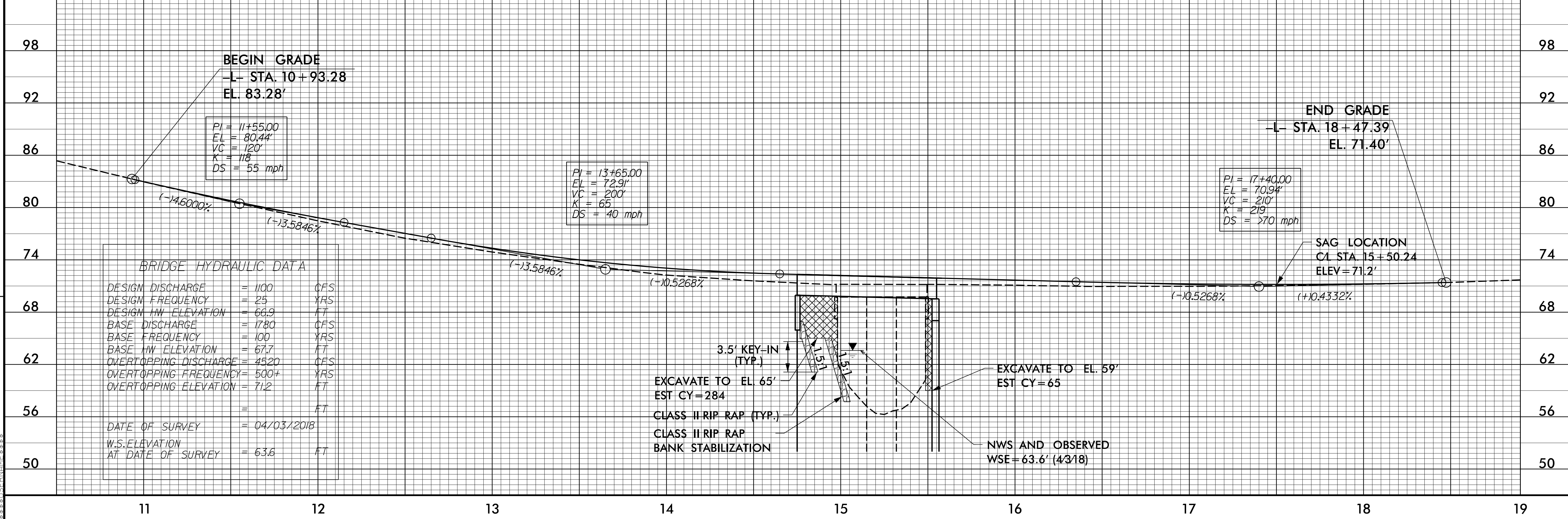


PI Sta 12+79.52 Δ= 9'00" 51.2" (LT) D = 2'30" 07.2" L = 360.28' T = 180.51' R = 2,290.00' E = 0.03 RUNOFF = 54' DS = 35 MPH	PI Sta 16+52.14 Δ= 1'59" 58.1" (RT) D = 1'32" 09.9" L = 130.17' T = 65.09' R = 3,730.00' E = NC RUNOFF = N/A DS = 35 MPH	PI Sta 17+82.31 Δ= 1'32" 09.9" (RT) D = 1'32" 09.9" L = 130.17' T = 65.09' R = 3,730.00' E = NC RUNOFF = N/A DS = 35 MPH
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BRIDGE APPROACH SLAB



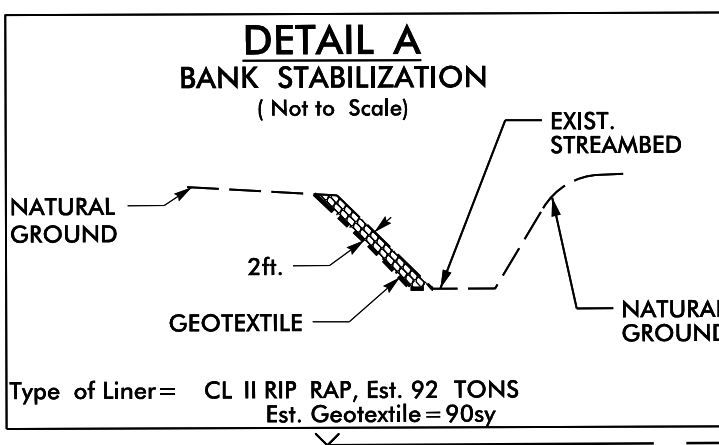
REVISIONS



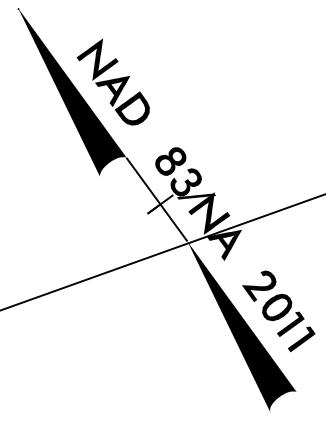
Utilized Special Stilling Basin, Where Applicable

Impervious Dikes May Be Modified and/or Eliminated As Needed.

Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.



TOWN OF ELIZABETHTOWN
DB 243 PG 250
MB A2 PG 18



8/17/99

70

AMS

GPS-2

EXIST

EIP

WOODS

WLB

PC Sta. 10+99.01

EXIST

EXISTING R/W

WOODS

WLB

PT Sta. 14+59.29

WOODS

WLB

PC Sta. 15+87.05

WOODS

WLB

PRC Sta. 17+17.22

WOODS

WLB

PT Sta. 18+47.39

WOODS

WLB

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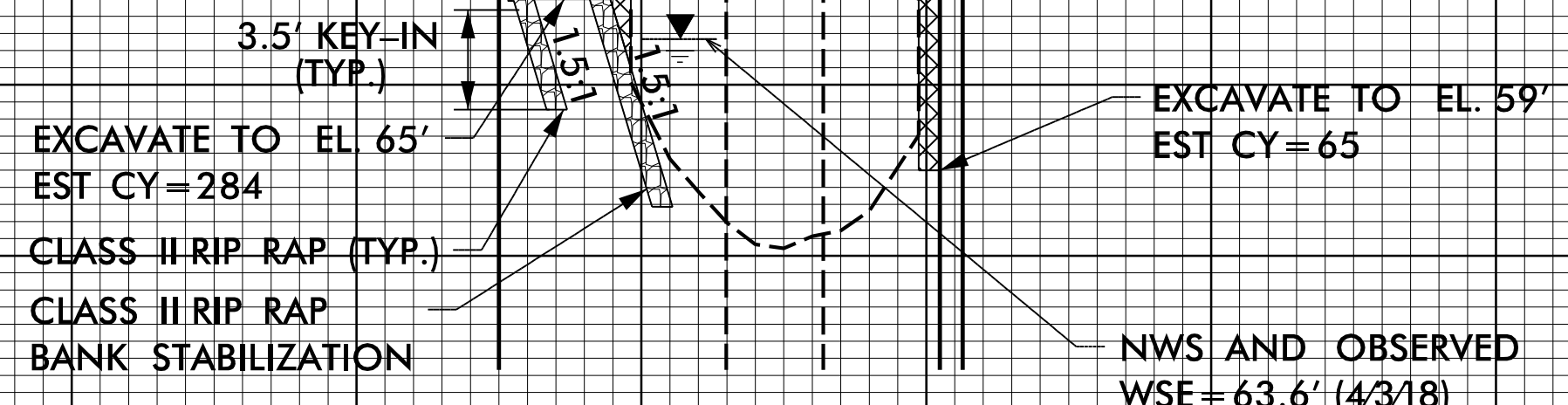
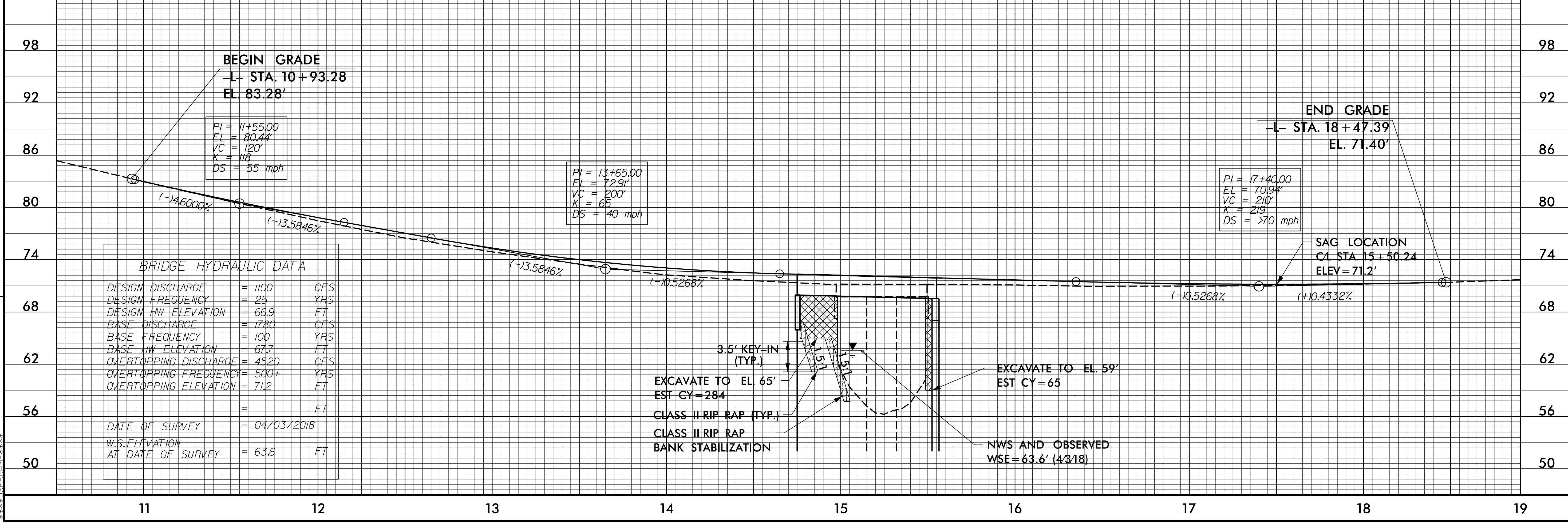
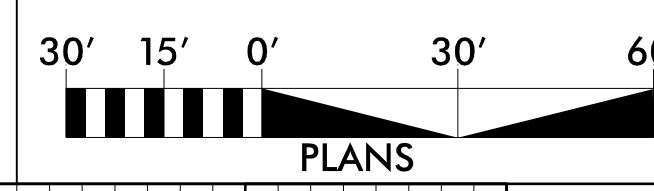
REVISIONS

BEGIN PROJECT 17BP.6.R.90
-L- POT STA. 10+93.28

END PROJECT 17BP.6.R.90
-L- PT STA. 18+47.39

PI Sta 12+79.52 Δ = 9' 00" 51.2" (LT) D = 2' 30" 07.2" L = 360.28' T = 180.51' R = 2290.00' E = 0.03 RUNOFF = 54' DS = 35 MPH	PI Sta 16+52.14 Δ = 1' 59" 58.1" (LT) D = 1' 32" 09.9" L = 130.17' T = 65.09' R = 3730.00' E = NC RUNOFF = N/A DS = 35 MPH	PI Sta 17+82.31 Δ = 1' 59" 58.1" (RT) D = 1' 32" 09.9" L = 130.17' T = 65.09' R = 3730.00' E = NC RUNOFF = N/A DS = 35 MPH
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BRIDGE APPROACH SLAB



09, 08, 99

PROJECT: 17BP.6.R.90

T.I.P. NO.	SHEET NO.
17BP.6.R.90	UO-1

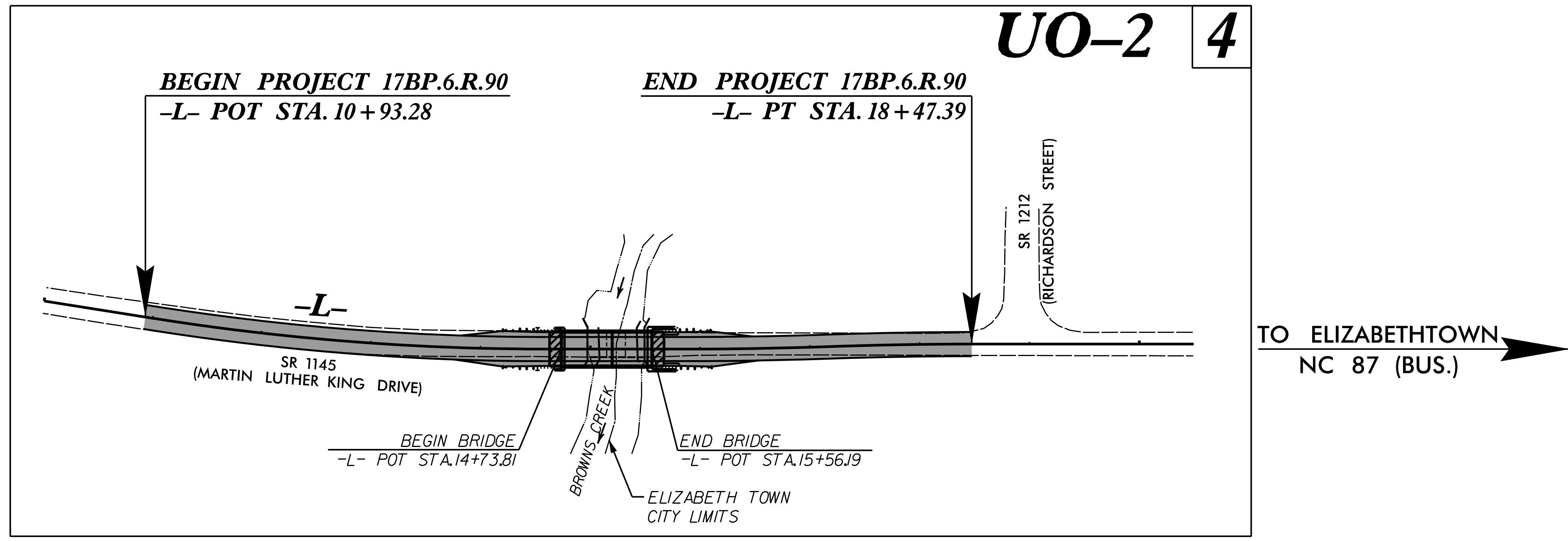
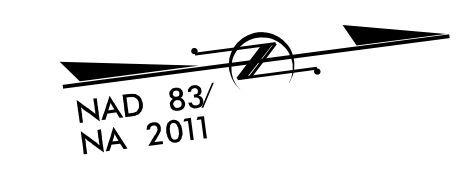
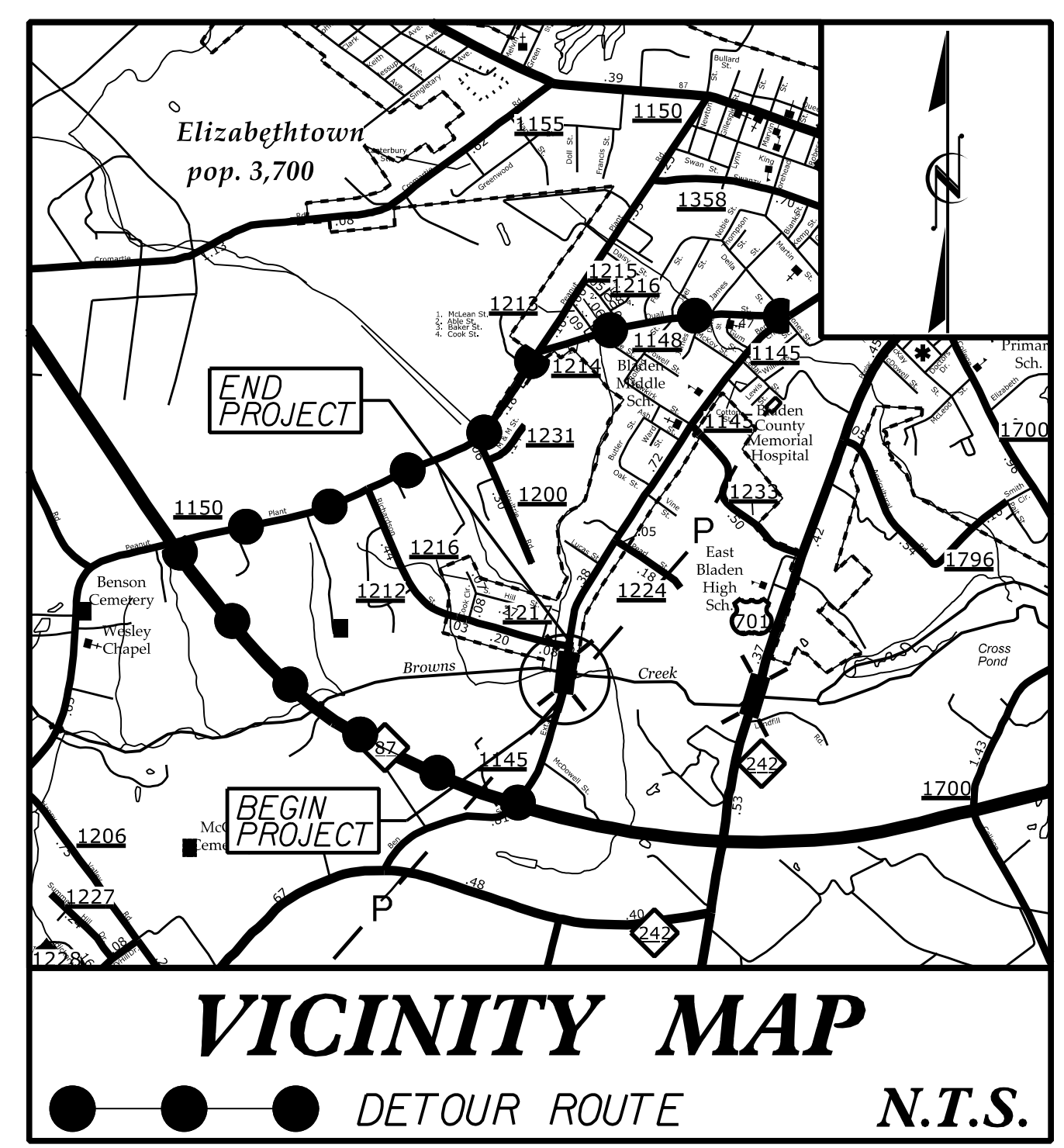
NOTE:
 ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

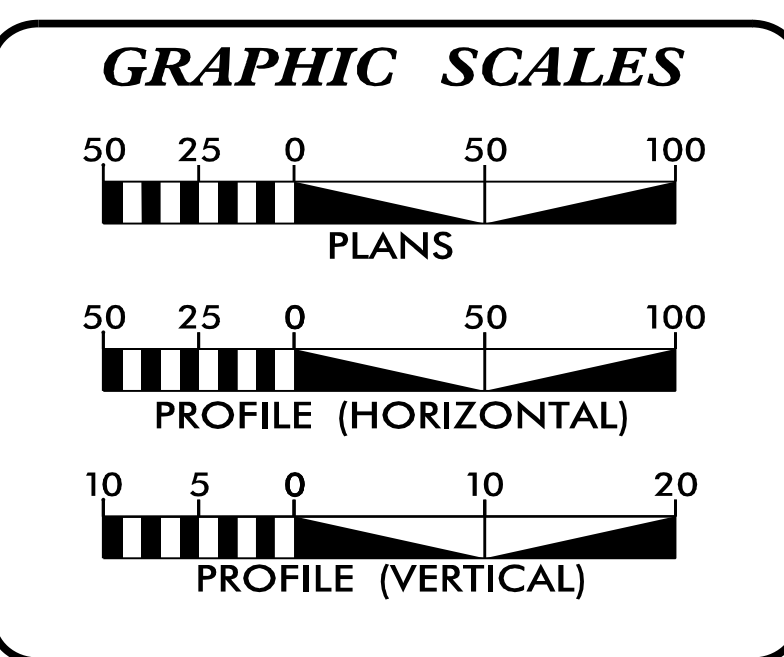
**UTILITIES BY OTHERS PLANS
 BLADEN COUNTY**

**LOCATION: REPLACE BRIDGE 178 OVER BROWNS CREEK
 ON SR 1145 (MARTIN LUTHER KING DRIVE)**

TYPE OF WORK: COMMUNICATIONS



\$\$\$\$\$ SYSTEM \$\$\$\$\$\$
 \$\$\$ DDN \$\$\$
 \$\$\$ USERNAME \$\$\$



SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET


UTILITY OWNERS WITH CONFLICTS

(A) COMMUNICATIONS - STAR TELEPHONE
 (B) COMMUNICATIONS - SPECTRUM

PREPARED IN THE OFFICE OF:

SO-DEEP | SAM NC
 A SAM COMPANY
 2800-154 Sumner Boulevard, Raleigh, NC 27616 Tel 919-878-7466

Keith Garry UTILITY PROJECT MANAGER
 Doug Joyner PROJECT UTILITY COORDINATOR



**DIVISION OF HIGHWAYS
 DIVISION 06**
 DIV ADDRESS
 558 Gillespie St.
 Fayetteville, NC 28301

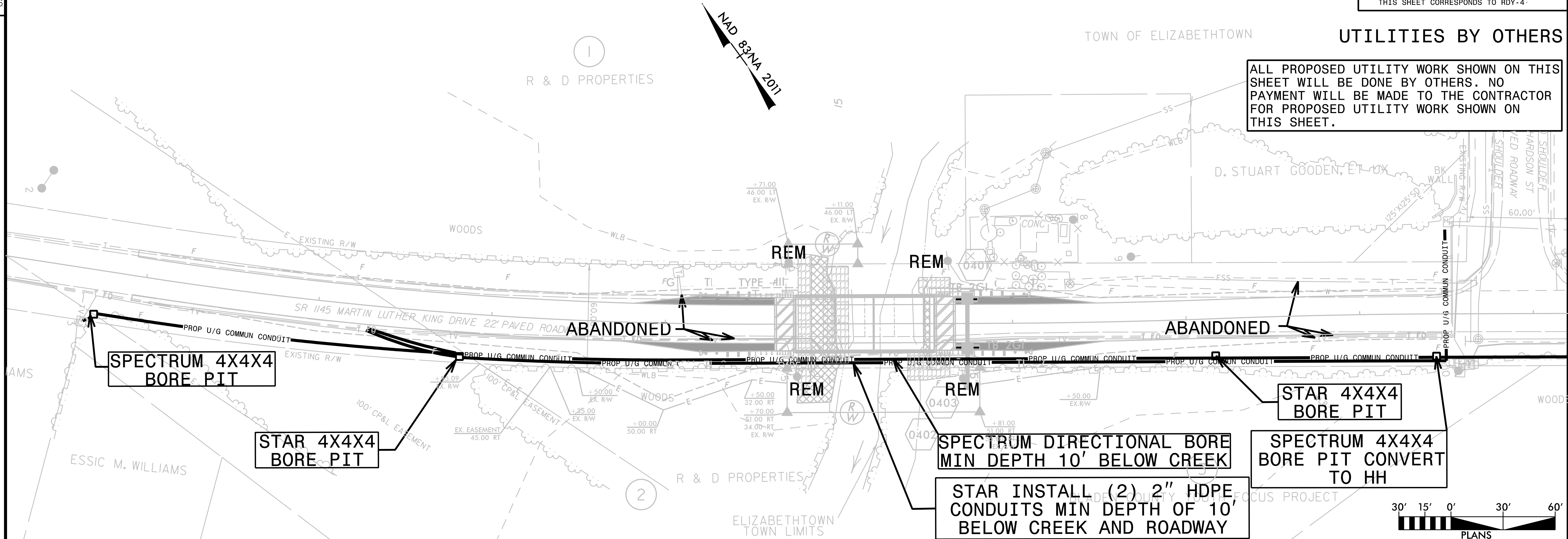
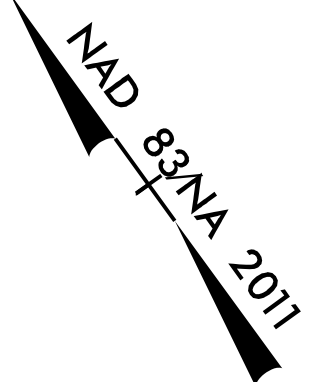
Rick Handlin DIVISION CONTACT #1
 Randy Rogers DIVISION CONTACT #2
 Christy Huff, PE DIVISION CONTACT #3

TOWN OF ELIZABETHTOWN

UTILITIES BY OTHERS

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

8/17/99



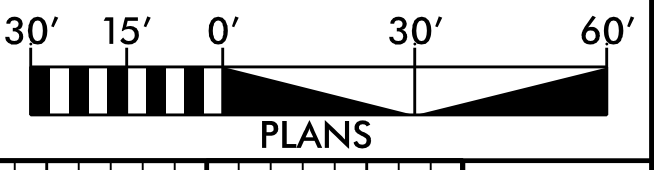
SPECTRUM 4X4X4 BORE PIT

STAR 4X4X4 BORE PIT

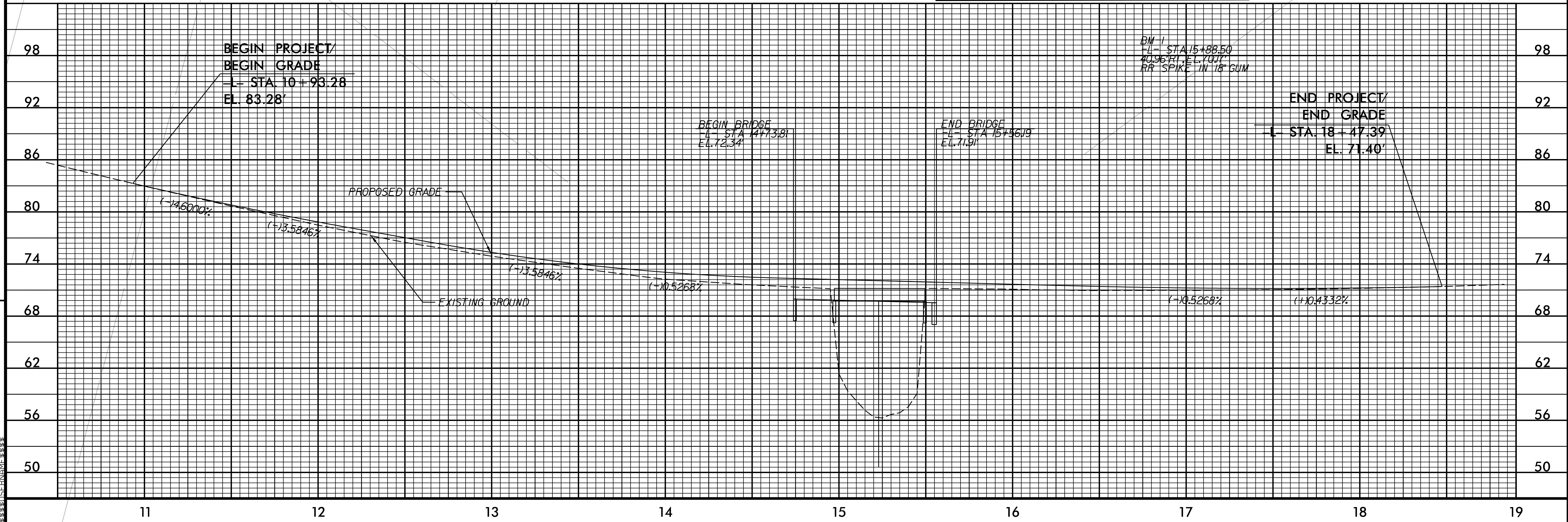
SPECTRUM DIRECTIONAL BORE
MIN DEPTH 10' BELOW CREEK
STAR INSTALL (2) 2" HDPE
CONDUITS MIN DEPTH OF 10'
BELOW CREEK AND ROADWAY

STAR 4X4X4 BORE PIT

SPECTRUM 4X4X4 BORE PIT CONVERT TO HH



REVISIONS



REVISIONS
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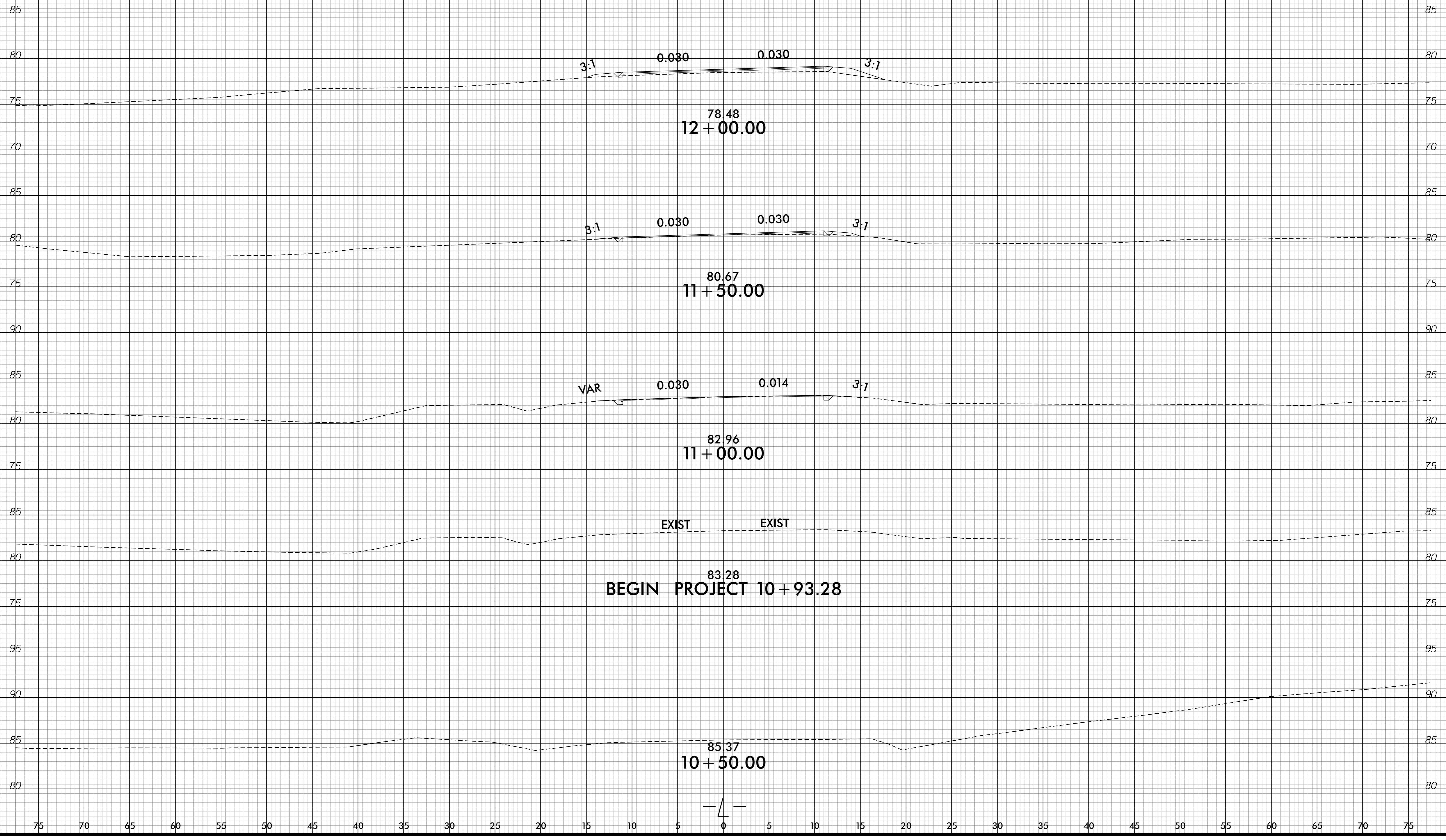
CROSS SECTION SHEET INDEX

X-1 CROSS SECTION SHEET INDEX
X-2 THRU X-6 -L-

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

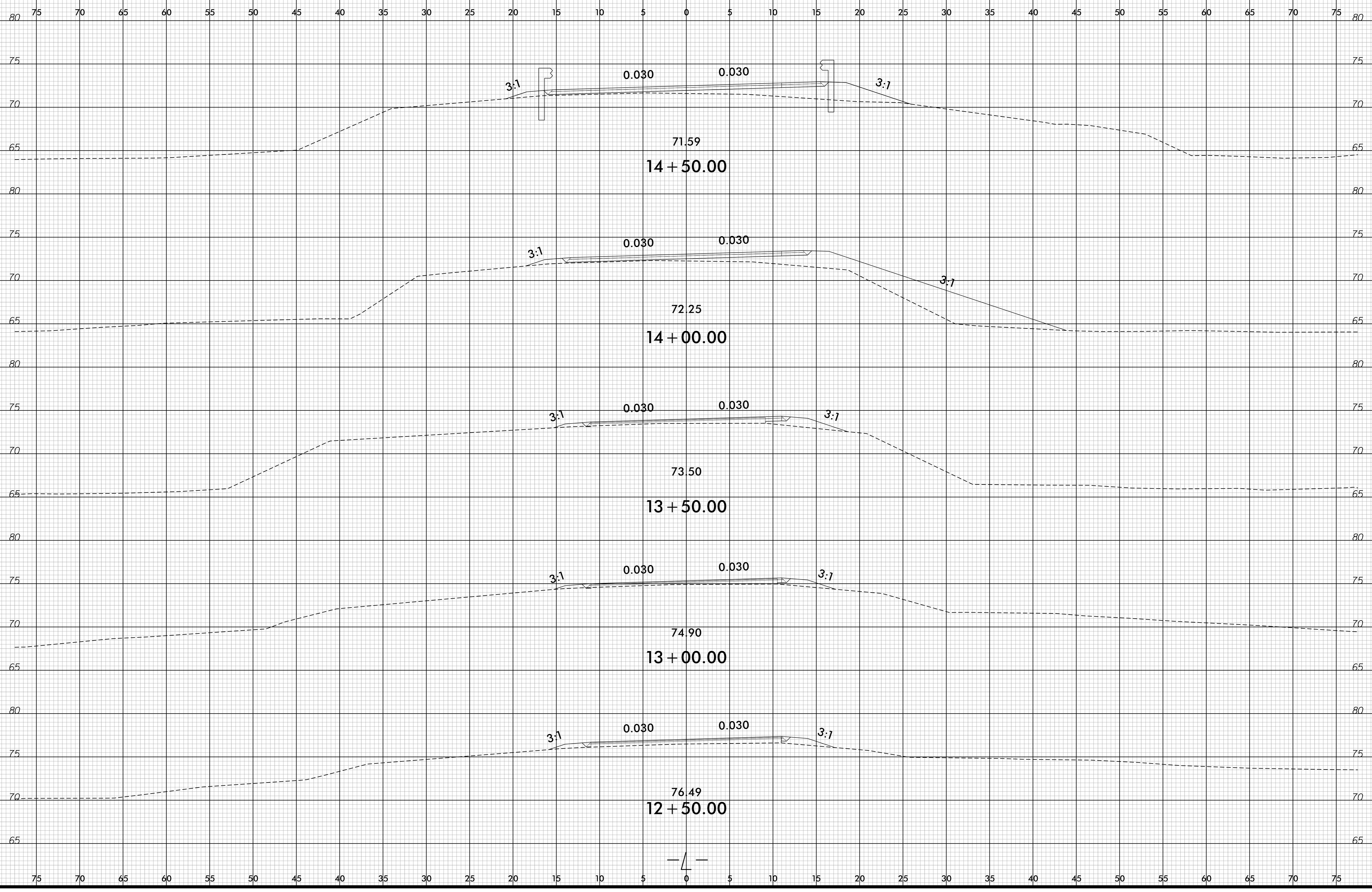
6/23/16

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."



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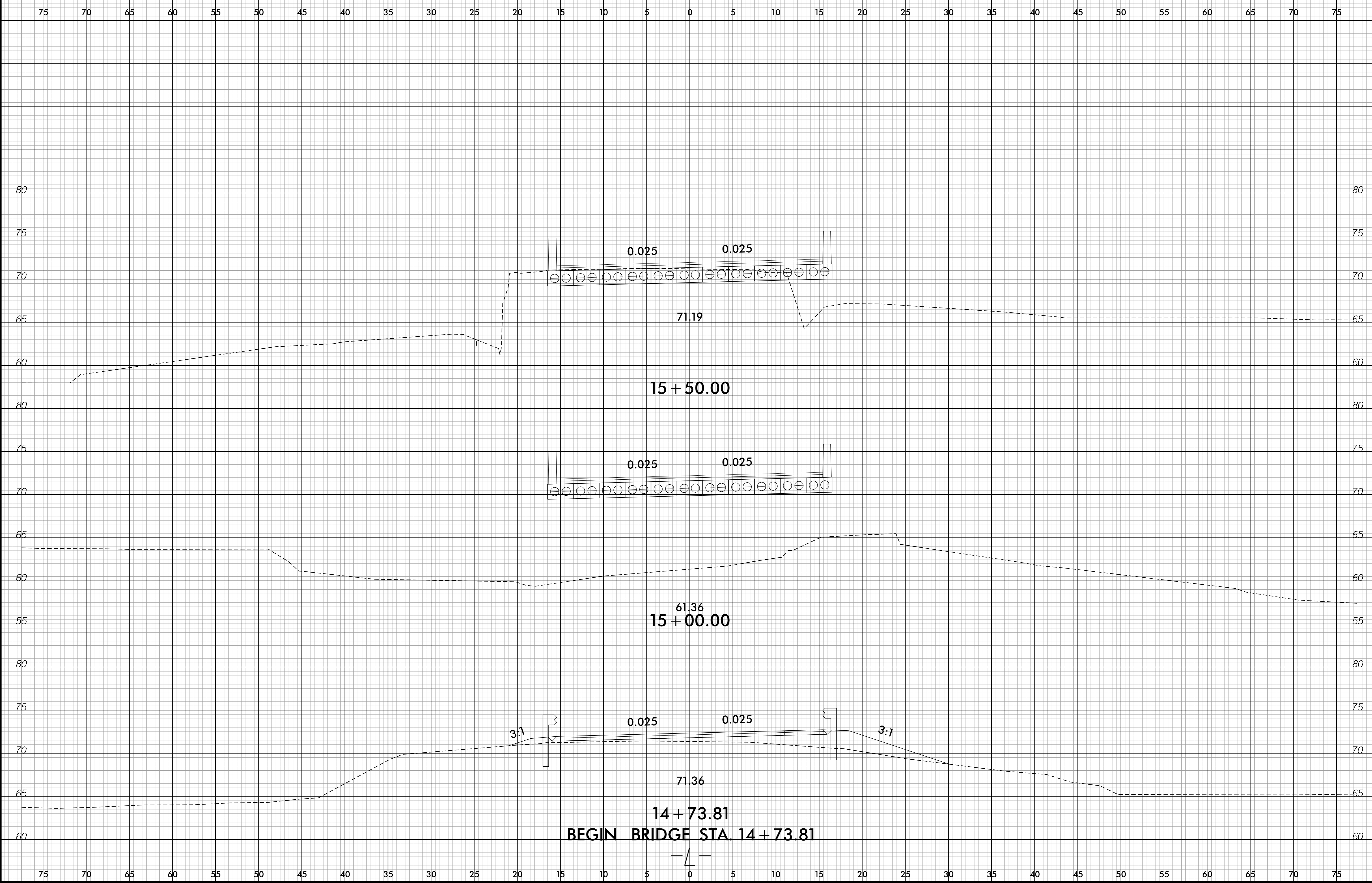
6/23/16



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6/23/16

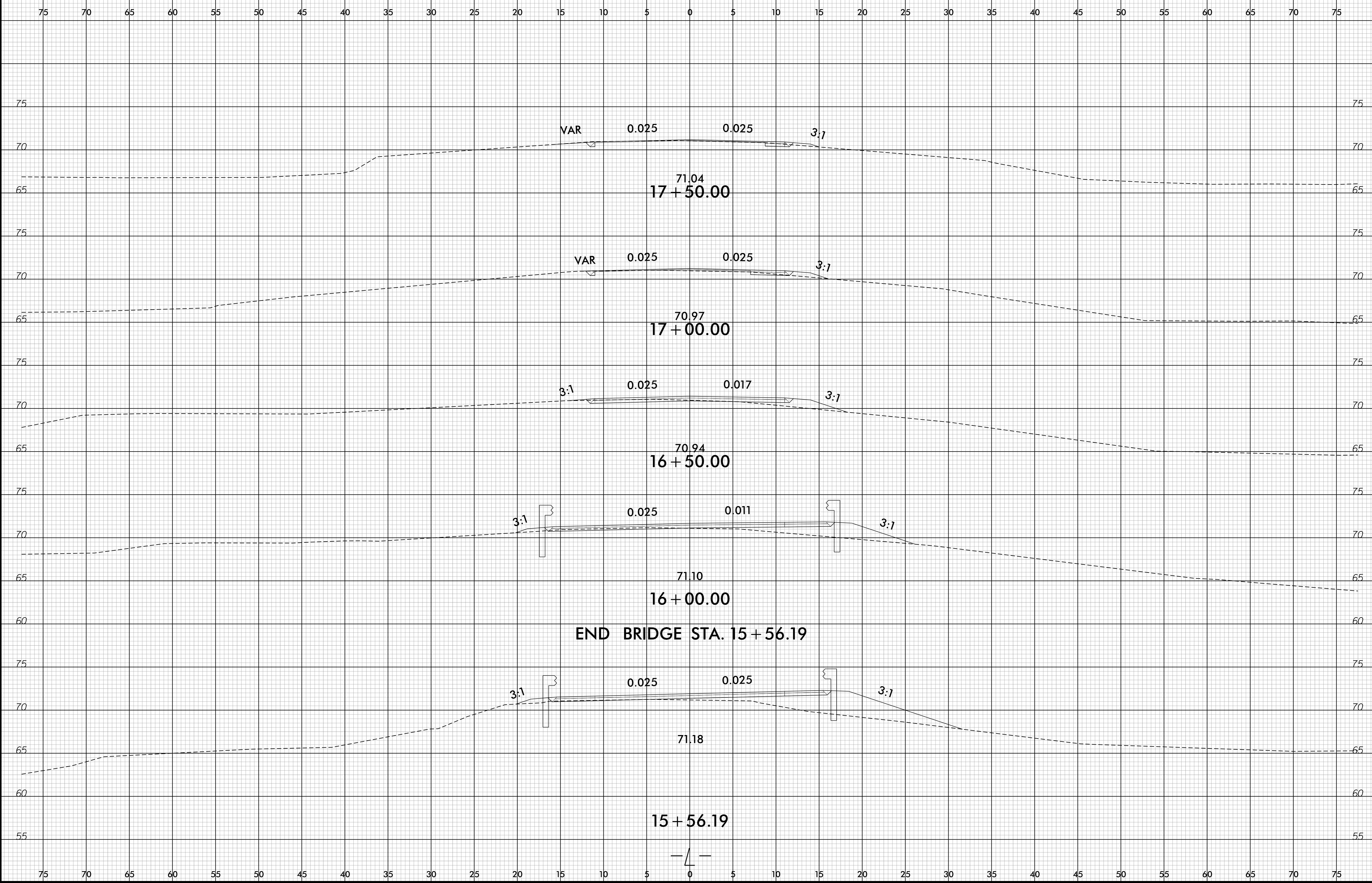
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	17BP.6.R.90	X-4



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6/23/16

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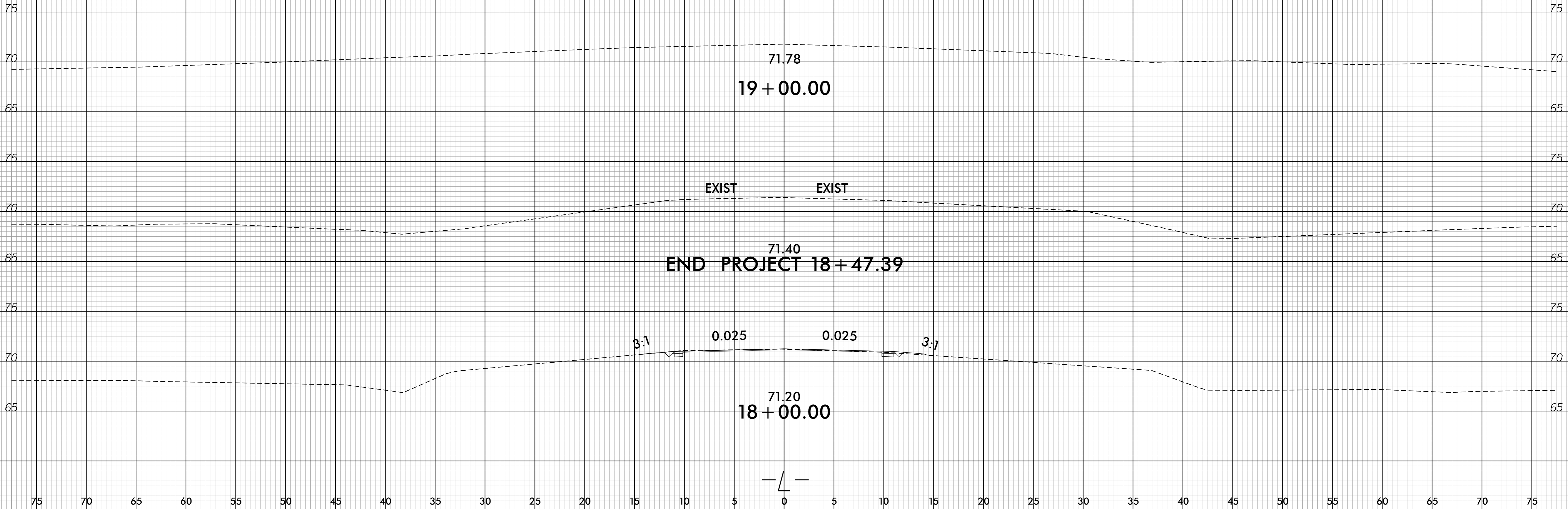


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6/23/16

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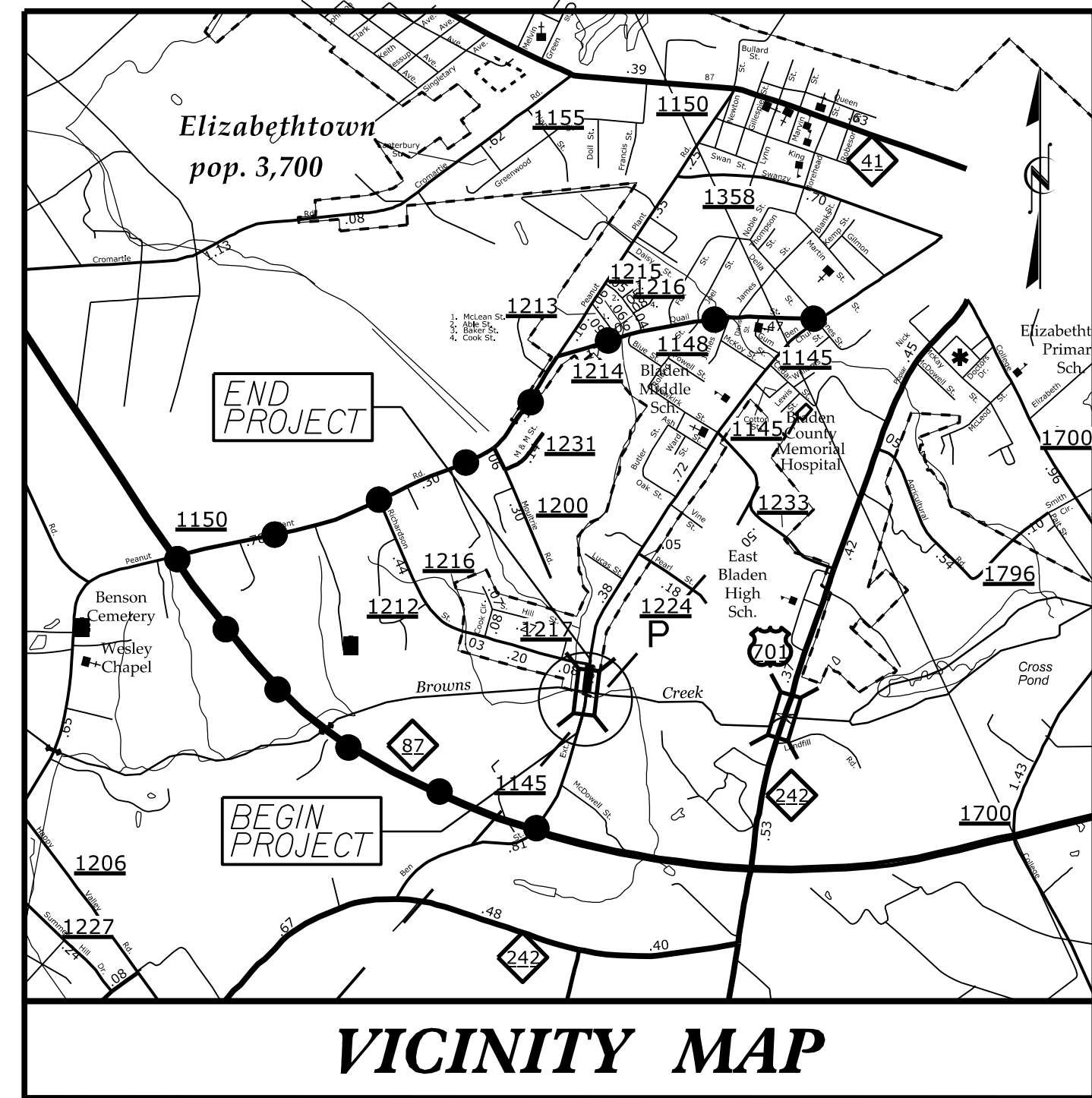
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USER:GJANTMIN

CONTRACT: DF00245 PROJECT: 17BP.6.R.90

STRUCTURE



—●—●—●—●— OFF-SITE DETOUR ROUTE

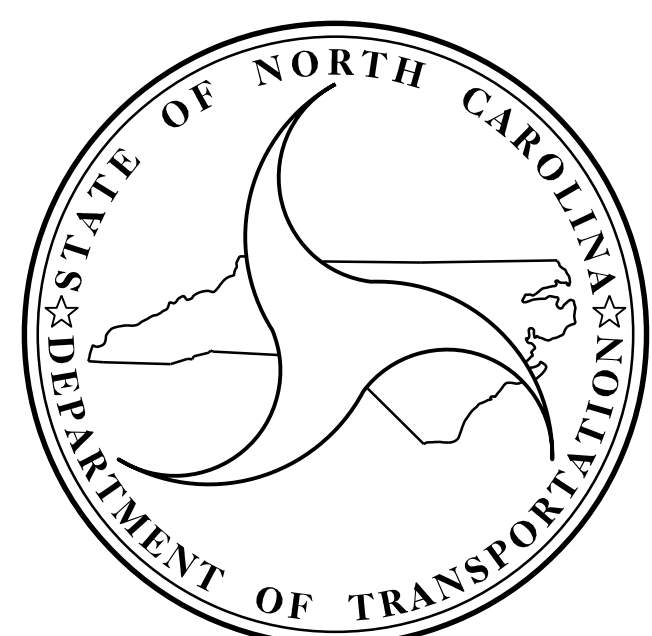
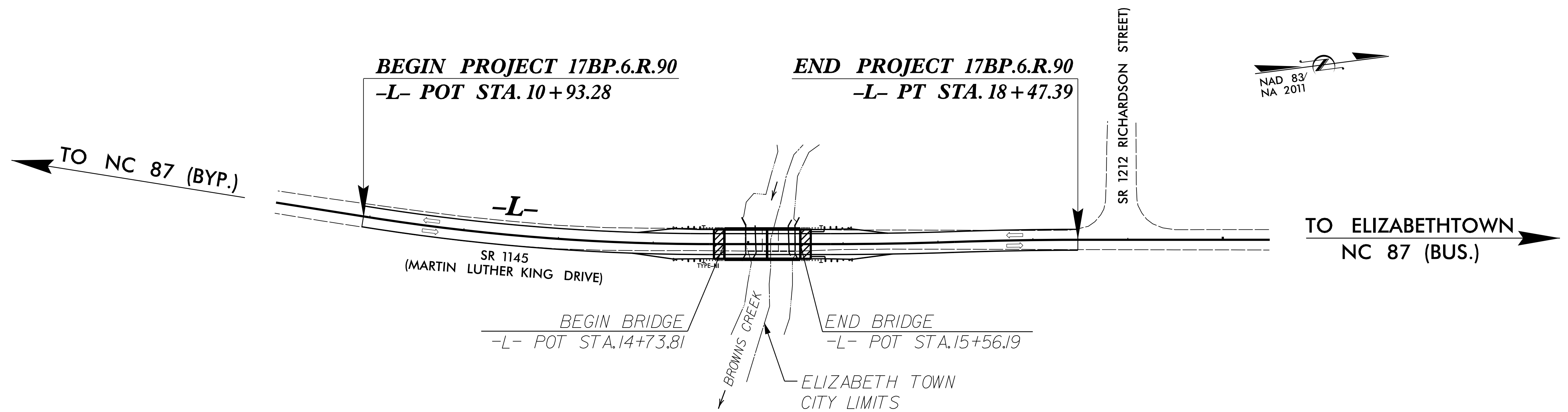
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BLADEN COUNTY

LOCATION: REPLACE BRIDGE 178 OVER BROWNS CREEK ON SR 1145 (MARTIN LUTHER KING DRIVE)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.90		21
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
17BP.6.R.90	N/A	P. E.	
17BP.6.R.90	N/A	UTIL. & RW	
17BP.6.R.90	N/A	CONSTR.	



DESIGN DATA

ADT 2019	=	800 VPD
ADT 2040	=	1000 VPD
K	=	N/A %
D	=	N/A %
T	=	6 % *
V	=	35 MPH
* TTST	=	DUAL
FUNC CLASS	=	LOCAL SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP.6.R.90	=	0.127 MILES
LENGTH STRUCTURE TIP PROJECT 17BP.6.R.90	=	0.016 MILES
TOTAL LENGTH OF TIP PROJECT 17BP.6.R.90	=	0.143 MILES

Prepared in the Office of:
CDM Smith
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255
 FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

LETTING DATE : MARCH 20, 2019

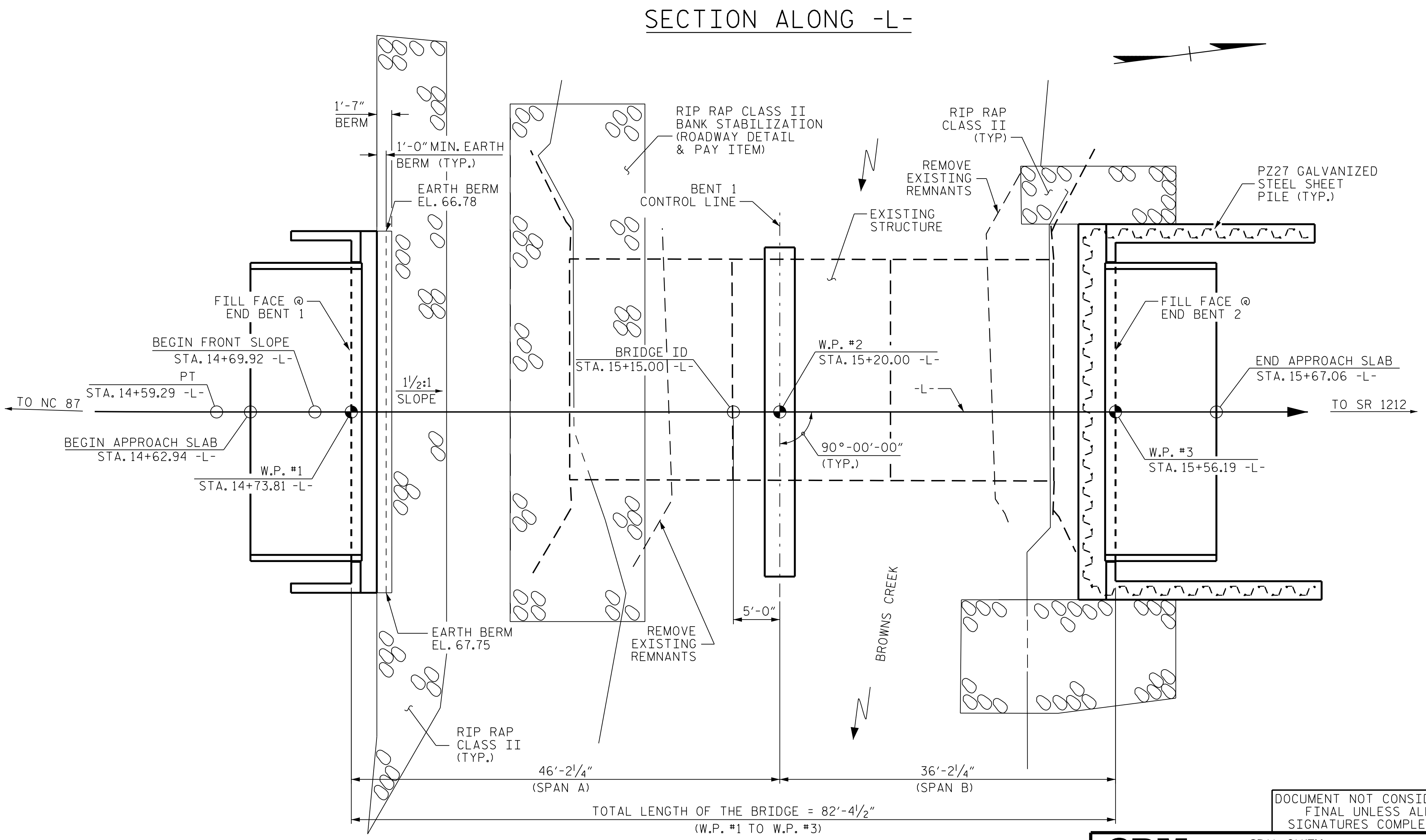
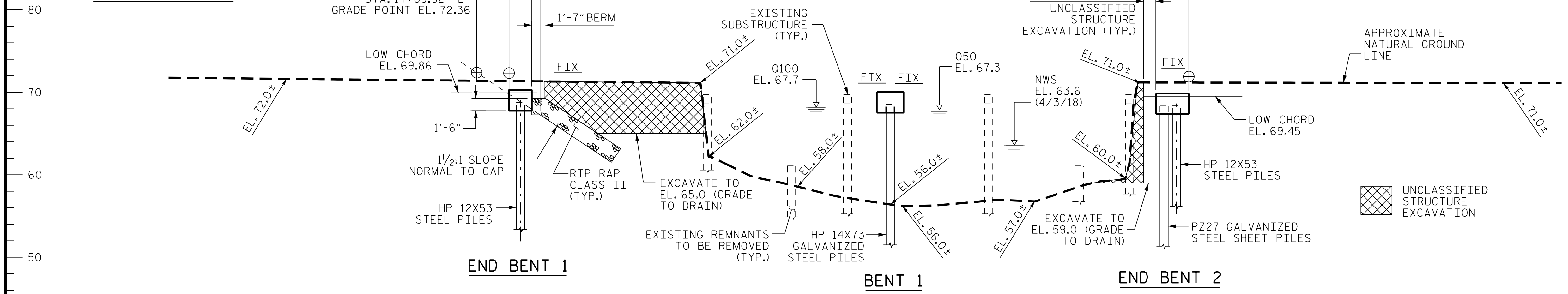
DAVID J. CLODGO, PE
PROJECT ENGINEER

TING H. FANG, P.E.
PROJECT DESIGN ENGINEER

2/19/2019

GRADE DATA -L-
 (-)3.5846% (-)0.5268%
 PVI STA. = 13+65.00 -L-
 PVI EL. = 72.91'
 V.C. = 200'

GRADE DATA -L-
 (-)0.5268% 0.4332%
 PVI STA. = 17+40.00 -L-
 PVI EL. = 70.94'
 V.C. = 210'



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.6.R.90
 BLADEN COUNTY
 STATION: 15+15.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 178

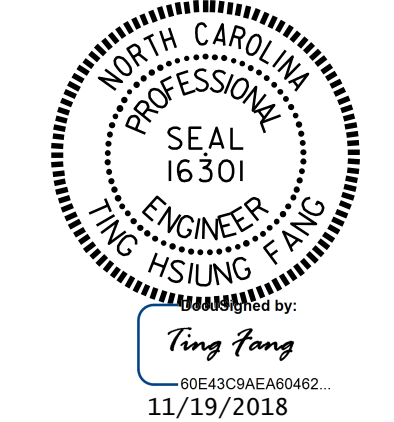
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 BROWNS CREEK ON SR 1145
 BETWEEN NC 87 & SR 1212

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

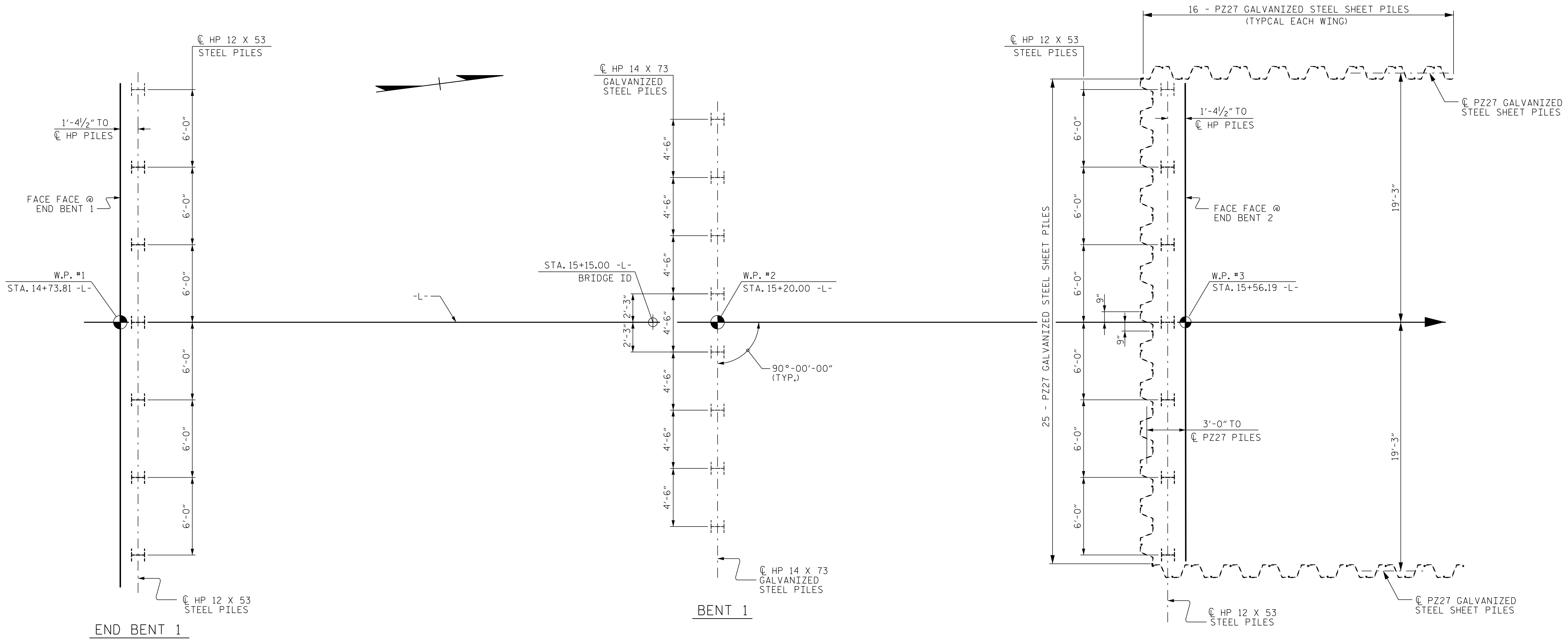
DRAWN BY: VDK DATE: 08/18
 CHECKED BY: THF DATE: 08/18
 DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS 21
2			4			

FILE: c:\pwworking\17BP6R90\17BP6R90_S&U_GDDT_001.dgn
 DATE: 11/12/18 8:15:13 PM



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.
- INSTALL PILES AT END BENT 1 TO A TIP ELEVATION NO HIGHER THAN 20.8 FT.
- INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 36.0 FT.

- INSTALL PILES AT END BENT 2 TO A TIP ELEVATION NO HIGHER THAN 24.4 FT.
- THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 49.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEM DURING THE LIFE OF THE STRUCTURE.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- DRIVING PILES AT END BENT 2 AFTER INSTALLING SHEET PILE ABUTMENT WALL AND WING WALLS.
- INSTALL PZ27 AND PZ90 GALVANIZED SHEET PILES AT END BENT 2 TO EL. 35.0 AND WING WALL GALVANIZED SHEET PILES TO EL. 34.0. LENGTH OF EACH WING WALL GALVANIZED SHEET PILES IS 24 FEET.

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
 BROWNS CREEK ON SR 1145
 BETWEEN NC 87 & SR 1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			21

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

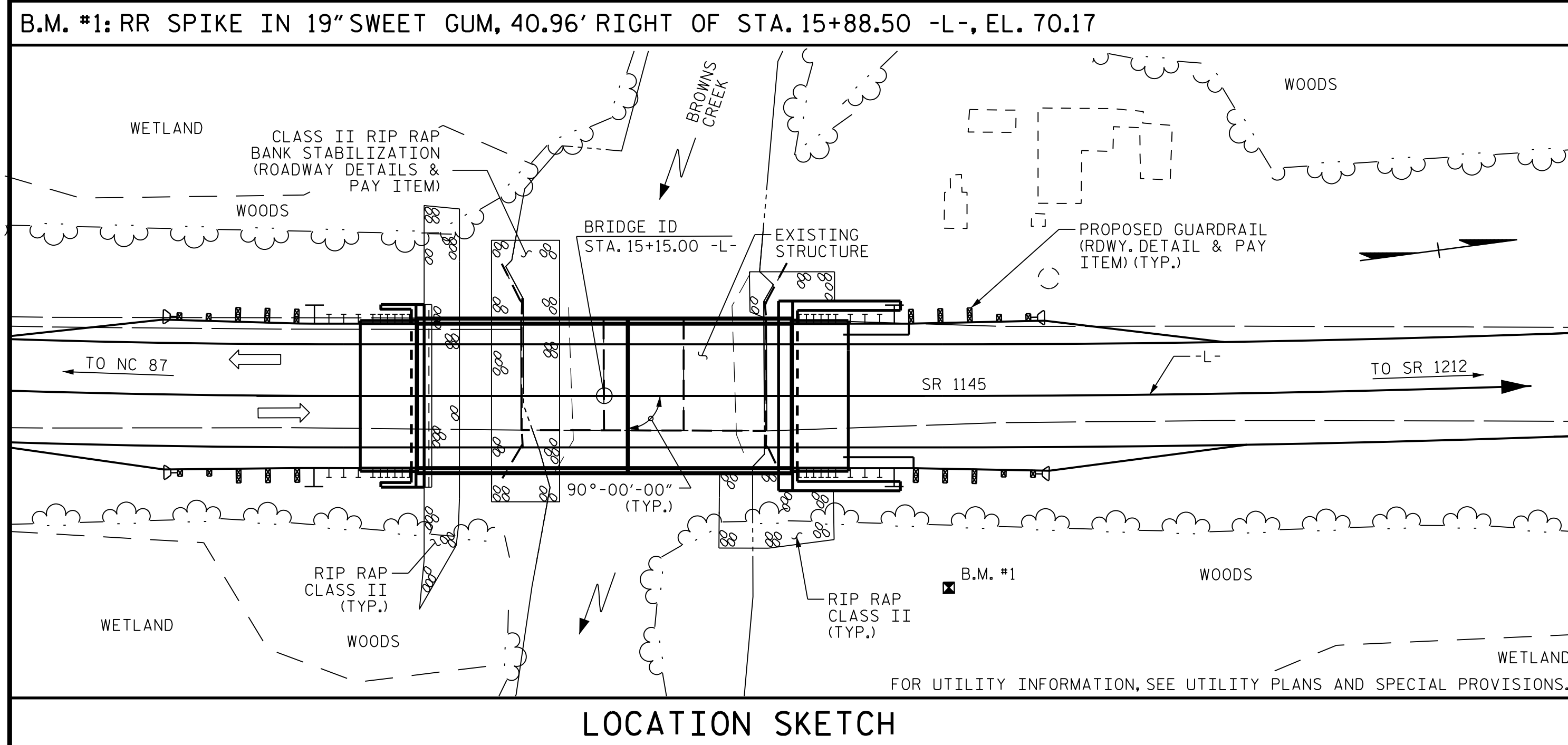
DWG. No. _____

DRAWN BY : VDK DATE : 08/18
 CHECKED BY : THF DATE : 08/18
 DESIGN ENGINEER : VDK DATE : 08/18

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16301
 TUNG FANG
 11/19/2018

FILE: c:\pwworking\17202988\101_003_17BP.R90_SKU_G002_002.dgn
 DATE: 11/12/18 8:15:20 PM

TOTAL BILL OF MATERIAL																				
	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 GALVANIZED STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 GALVANIZED STEEL PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	18" STEEL SHEET PILE SYSTEM			
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TON	SO. YD.	LUMP SUM	NO.	LIN. FT.	SO. FT.
SUPERSTRUCTURE												160.25					LUMP SUM	22	880	
END BENT 1				LUMP SUM	14.2		2,115	7		7	350.0				95	105				
BENT 1					10.7		2,136		8		8	520.0								
END BENT 2				LUMP SUM	22.1		2,708	7		7	315.0				35	40				3,000
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	47.0	LUMP SUM	6,959	14	8	14	665.0	8	520.0	160.25	130	145	LUMP SUM	22	880	3,000



NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

THIS BRIDGE IS LOCATED IN SEISMIC PERFORMANCE ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 EVALUATING SCOUR AT BRIDGES".

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION 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 THIS 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.

FOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE BENT 1 SHEET FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT. LEFT SIDE, 45 FT. RIGHT SIDE AT END BENT 1 AND 15 FT. BOTH SIDES AT END BENT 2 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.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 17'-10", 1 @ 17'-0" & 1 @ 18'-0" WITH A CLEAR ROADWAY WIDTH OF 23'-11" AND RC FLOOR ON TIMBER JOISTS; SUBSTRUCTURE CONSISTING OF TIMBER CAPS ON TIMBER PILES AT END BENTS AND INTERIOR BENTS LOCATED AT THE SITE OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR 18" STEEL SHEET PILE SYSTEM, SEE SPECIAL PROVISIONS.

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

HYDRAULIC DATA

DESIGN DISCHARGE	= 1100 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 66.9 FT.
DRAINAGE AREA	= 12.0 SQ. MI.
BASE DISCHARGE (Q100)	= 1780 CFS
BASE HIGH WATER ELEVATION	= 67.7 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4520 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 71.2 FT. *

* ELEVATION IS TAKEN AT STA. 17+50.24 -L- SAG PT.

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

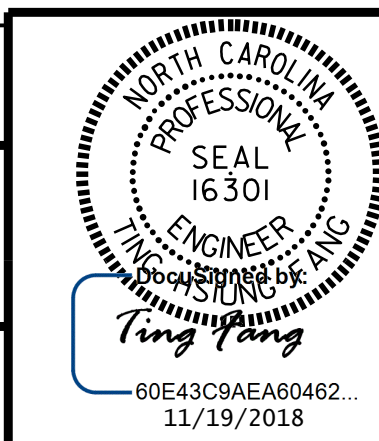
FOR BRIDGE OVER
 BROWNS CREEK ON SR 1145
 BETWEEN NC 87 & SR 1212

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: VDK DATE: 08/18
 CHECKED BY: THF DATE: 08/18
 DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.



REVISIONS

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

SHEET NO.
S-03

TOTAL SHEETS
 21

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLAB UNITS

LEVEL	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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	①	1.088	--	1.75	0.277	1.34	45'	EL	22	0.539	1.23	45'	EL	2.2	0.80	0.277	1.09	45'	EL	22		
	HL-93(0pr)	N/A	--	1.590	--	1.35	0.277	1.74	45'	EL	22	0.539	1.59	45'	EL	2.2	N/A	--	--	--	--	--		
	HS-20(Inv)	36,000	②	1.336	48,104	1.75	0.277	1.65	45'	EL	22	0.539	1.45	45'	EL	2.2	0.80	0.277	1.34	45'	EL	22		
	HS-20(0pr)	36,000	--	1.882	67,763	1.35	0.277	2.14	45'	EL	22	0.539	1.88	45'	EL	2.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	2.611	35,252	1.4	0.277	4.02	45'	EL	22	0.539	4.01	45'	EL	2.2	0.80	0.277	2.61	45'	EL	22	
		SNGARBS2	20,000	--	2.108	42,166	1.4	0.277	3.25	45'	EL	22	0.539	2.94	45'	EL	2.2	0.80	0.277	2.11	45'	EL	22	
		SNAGRIS2	22,000	--	2.067	45,466	1.4	0.277	3.15	45'	EL	17.6	0.539	2.77	45'	EL	2.2	0.80	0.277	2.07	45'	EL	22	
		SNCOTTS3	27,250	--	1.304	35,527	1.4	0.277	2.01	45'	EL	22	0.539	2.01	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		SNAGGRS4	34,925	--	1.150	40,181	1.4	0.277	1.77	45'	EL	22	0.539	1.74	45'	EL	2.2	0.80	0.277	1.15	45'	EL	22	
		SNS5A	35,550	--	1.121	39,841	1.4	0.277	1.73	45'	EL	22	0.539	1.79	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		SNS6A	39,950	--	1.056	42,175	1.4	0.277	1.63	45'	EL	22	0.539	1.67	45'	EL	2.2	0.80	0.277	1.06	45'	EL	22	
	SNS7B	42,000	③	1.006	42,268	1.4	0.277	1.55	45'	EL	22	0.539	1.68	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22		
	TTST	TNAGRIT3	33,000	--	1.296	42,759	1.4	0.277	2.00	45'	EL	22	0.539	1.96	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		TNT4A	33,075	--	1.309	43,305	1.4	0.277	2.02	45'	EL	22	0.539	1.88	45'	EL	2.2	0.80	0.277	1.31	45'	EL	22	
		TNT6A	41,600	--	1.099	45,712	1.4	0.277	1.69	45'	EL	22	0.539	1.83	45'	EL	2.2	0.80	0.277	1.10	45'	EL	22	
		TNT7A	42,000	--	1.120	47,043	1.4	0.277	1.73	45'	EL	22	0.539	1.69	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		TNT7B	42,000	--	1.166	48,975	1.4	0.277	1.80	45'	EL	22	0.539	1.61	45'	EL	2.2	0.80	0.277	1.17	45'	EL	22	
		TNAGRIT4	43,000	--	1.111	47,757	1.4	0.277	1.71	45'	EL	22	0.539	1.55	45'	EL	2.2	0.80	0.277	1.11	45'	EL	22	
TNAGT5A		45,000	--	1.033	46,505	1.4	0.277	1.59	45'	EL	22	0.539	1.59	45'	EL	2.2	0.80	0.277	1.03	45'	EL	22		
TNAGT5B	45,000	--	1.009	45,408	1.4	0.277	1.56	45'	EL	22	0.539	1.47	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22			

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:

-
-
-
-

④ CONTROLLING LOAD RATING

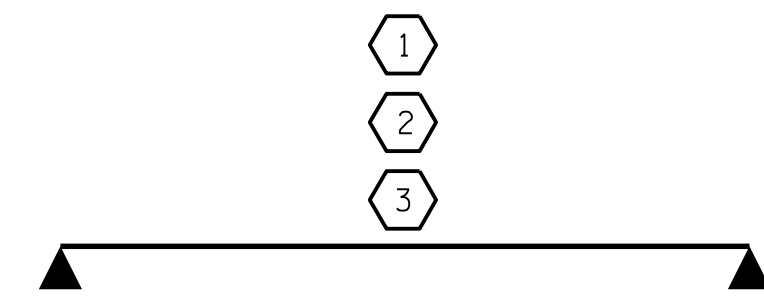
① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN A

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
45' CORED SLAB UNIT
90° SKEW SPAN A
(NON-INTERSTATE TRAFFIC)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY : VDK DATE : 08/18
CHECKED BY : THF DATE : 08/18
DESIGN ENGINEER : VDK DATE : 08/18

DWG. No.

NORTH CAROLINA
PROFESSIONAL
SEAL
16301
60E43C9AAE60462...

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04	
1			3			TOTAL SHEETS	
2			4			21	

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CORED SLAB UNITS

LEVEL	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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	①	1.032	--	1.75	0.28	1.36	35'	EL	17	0.561	1.03	35'	EL	1.7	0.80	0.28	1.05	35'	EL	17		
	HL-93(0pr)	N/A	--	1.338	--	1.35	0.28	1.77	35'	EL	17	0.561	1.34	35'	EL	1.7	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	②	1.189	42.810	1.75	0.28	1.79	35'	EL	13.6	0.561	1.19	35'	EL	1.7	0.80	0.28	1.39	35'	EL	17		
	HS-20(0pr)	36.000	--	1.542	55.494	1.35	0.28	2.32	35'	EL	13.6	0.561	1.54	35'	EL	1.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.400	32.402	1.4	0.28	3.89	35'	EL	17	0.561	3.06	35'	EL	1.7	0.80	0.28	2.40	35'	EL	17	
		SNGARBS2	20.000	--	2.052	41.044	1.4	0.28	3.29	35'	EL	13.6	0.561	2.32	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNAGRIS2	22.000	--	2.053	45.174	1.4	0.28	3.26	35'	EL	13.6	0.561	2.21	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNCOTTS3	27.250	--	1.202	32.744	1.4	0.28	1.95	35'	EL	17	0.561	1.54	35'	EL	1.7	0.80	0.28	1.20	35'	EL	17	
		SNAGGRS4	34.925	--	1.111	38.816	1.4	0.28	1.8	35'	EL	17	0.561	1.38	35'	EL	1.7	0.80	0.28	1.11	35'	EL	17	
		SNS5A	35.550	--	1.079	38.354	1.4	0.28	1.75	35'	EL	17	0.561	1.46	35'	EL	1.7	0.80	0.28	1.08	35'	EL	17	
		SNS6A	39.950	--	1.041	41.601	1.4	0.28	1.69	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.04	35'	EL	17	
	SNS7B	42.000	③	1.000	41.734	1.4	0.28	1.61	35'	EL	17	0.561	1.4	35'	EL	1.7	0.80	0.28	1.00	35'	EL	17		
	TTST	TNAGRIT3	33.000	--	1.286	42.439	1.4	0.28	2.08	35'	EL	17	0.561	1.6	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT4A	33.075	--	1.285	42.512	1.4	0.28	2.08	35'	EL	17	0.561	1.51	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT6A	41.600	--	1.126	46.84	1.4	0.28	1.82	35'	EL	17	0.561	1.48	35'	EL	1.7	0.80	0.28	1.13	35'	EL	17	
		TNT7A	42.000	--	1.163	48.833	1.4	0.28	1.89	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.16	35'	EL	17	
		TNT7B	42.000	--	1.144	48.061	1.4	0.28	1.85	35'	EL	17	0.561	1.33	35'	EL	1.7	0.80	0.28	1.14	35'	EL	17	
		TNAGRIT4	43.000	--	1.158	49.810	1.4	0.28	1.86	35'	EL	13.6	0.561	1.28	35'	EL	1.7	0.80	0.28	1.16	35'	EL	17	
TNACT5A		45.000	--	1.068	48.071	1.4	0.28	1.73	35'	EL	17	0.561	1.35	35'	EL	1.7	0.80	0.28	1.07	35'	EL	17		
TNACT5B	45.000	--	1.031	46.373	1.4	0.28	1.67	35'	EL	17	0.561	1.21	35'	EL	1.7	0.80	0.28	1.03	35'	EL	17			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{oc}	γ_{ow}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

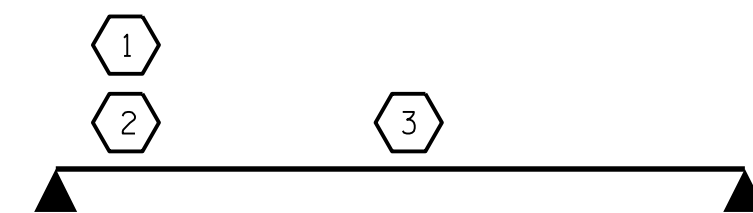
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

③	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY
FOR SPAN 'B'

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 35' CORED SLAB UNIT
 90° SKEW SPAN B
 (NON-INTERSTATE TRAFFIC)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

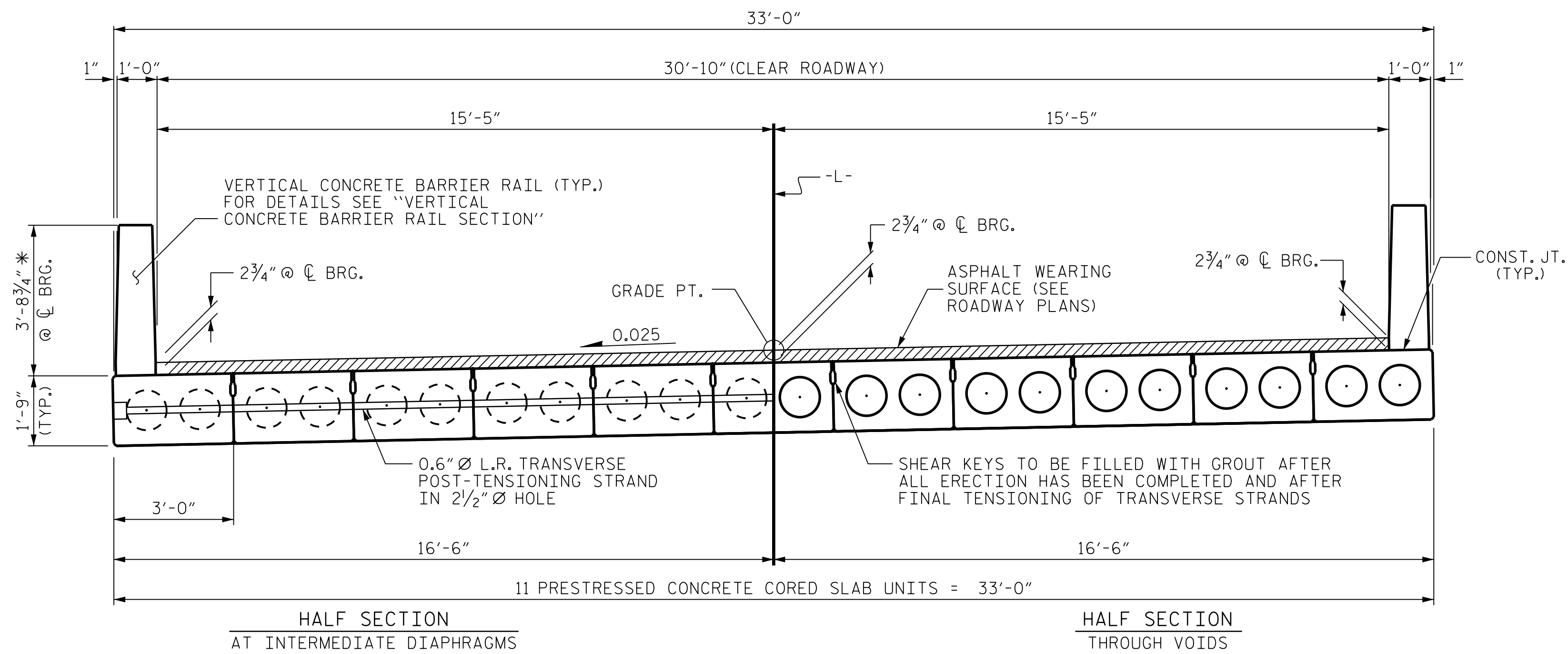
CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DRAWN BY: VDK DATE: 08/18
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 DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.

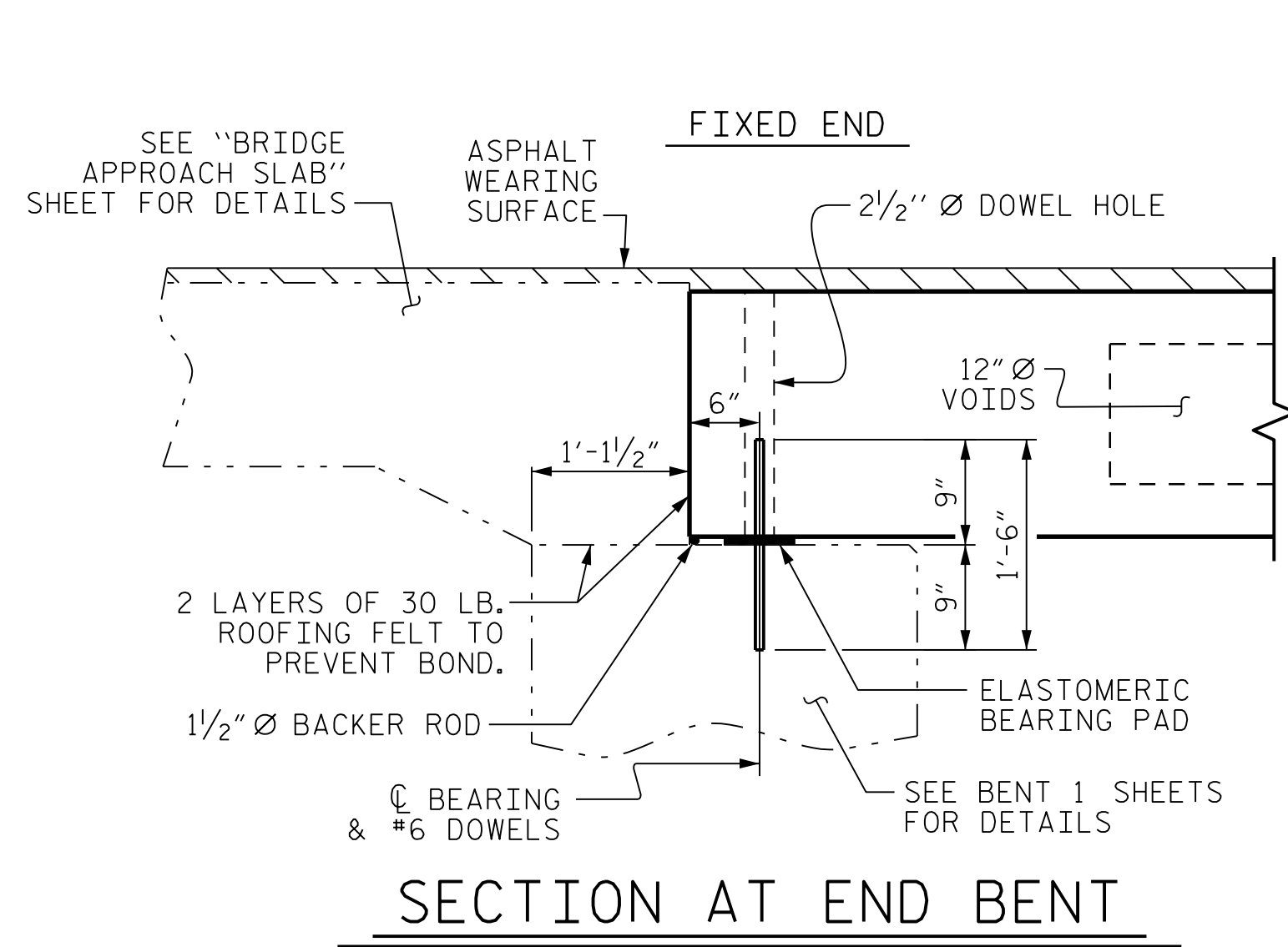
NORTH CAROLINA PROFESSIONAL SEAL 16301
 ENGINEER
 TING FANG
 00E43C9AEAB0402
 11/19/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			21

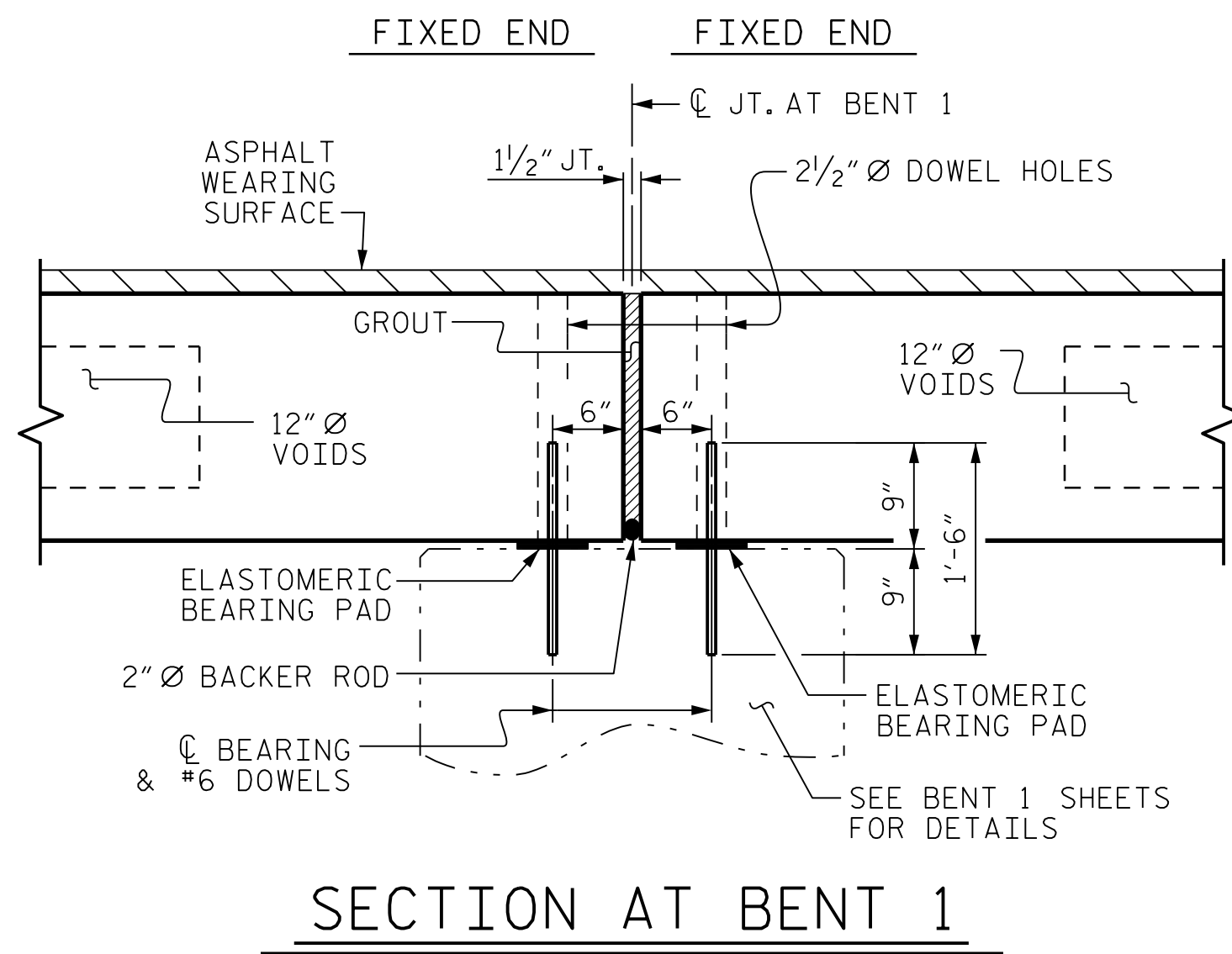


TYPICAL SECTION

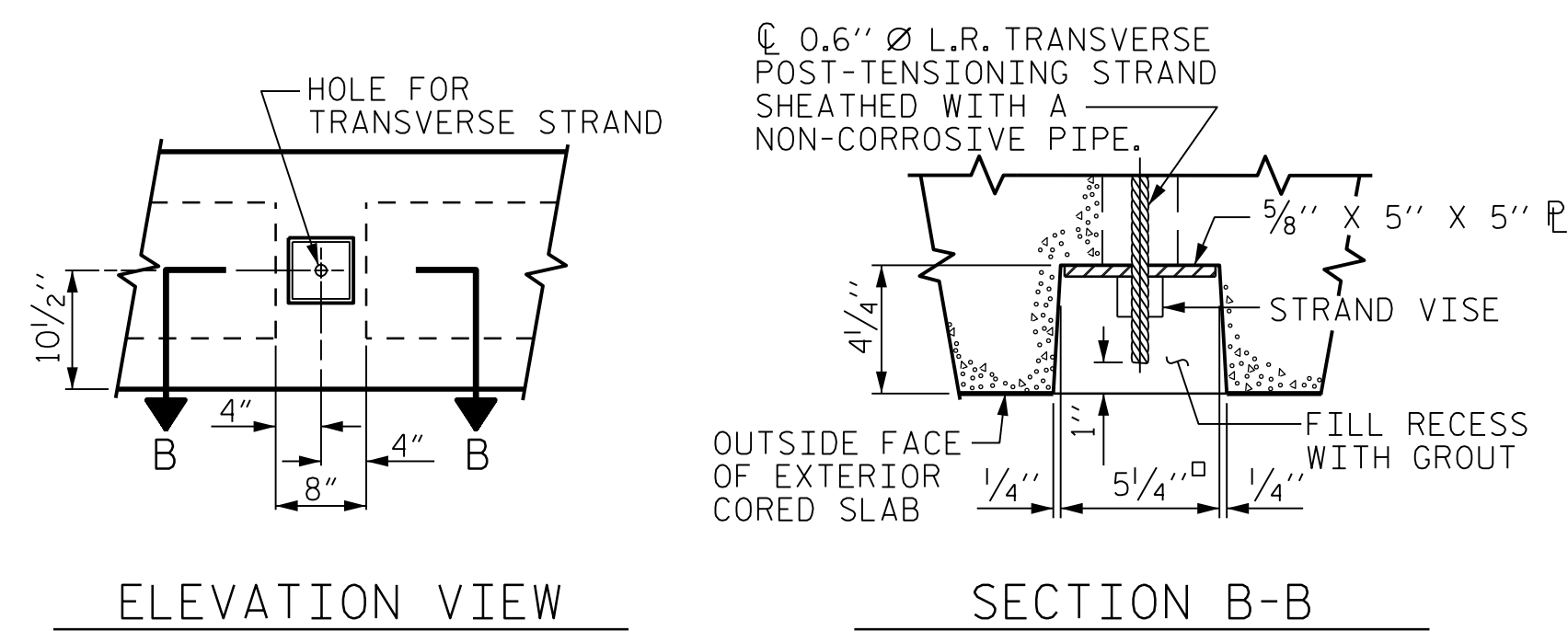
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



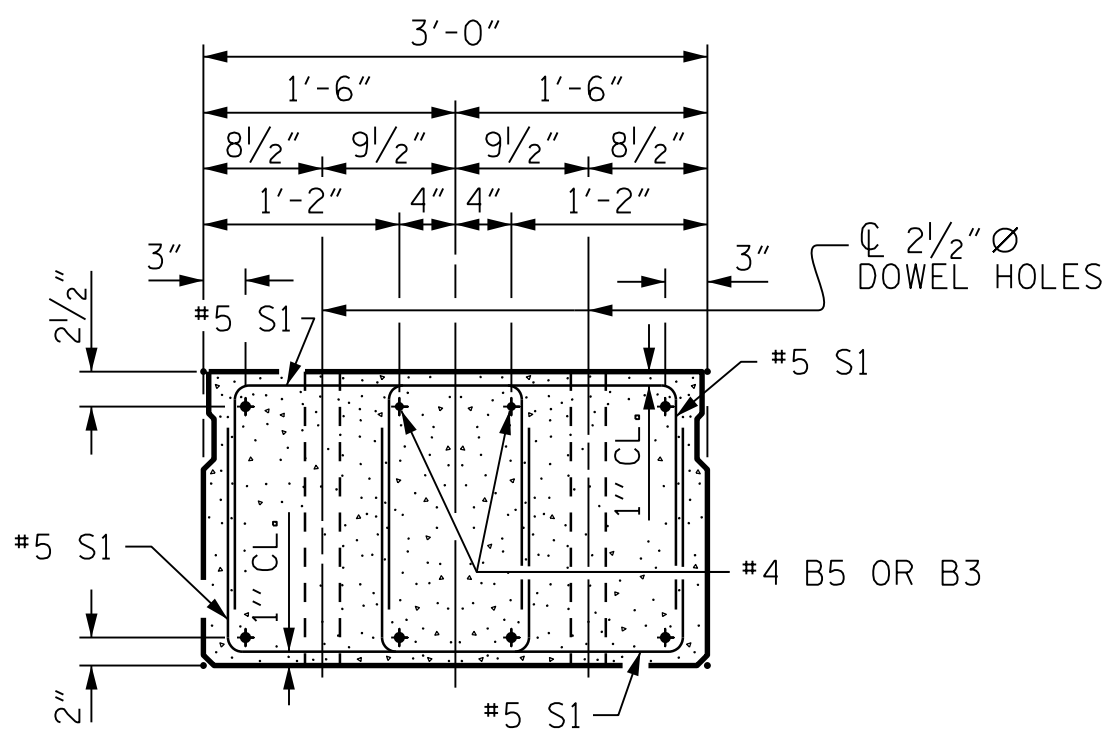
SECTION AT END BENT



SECTION AT BENT 1

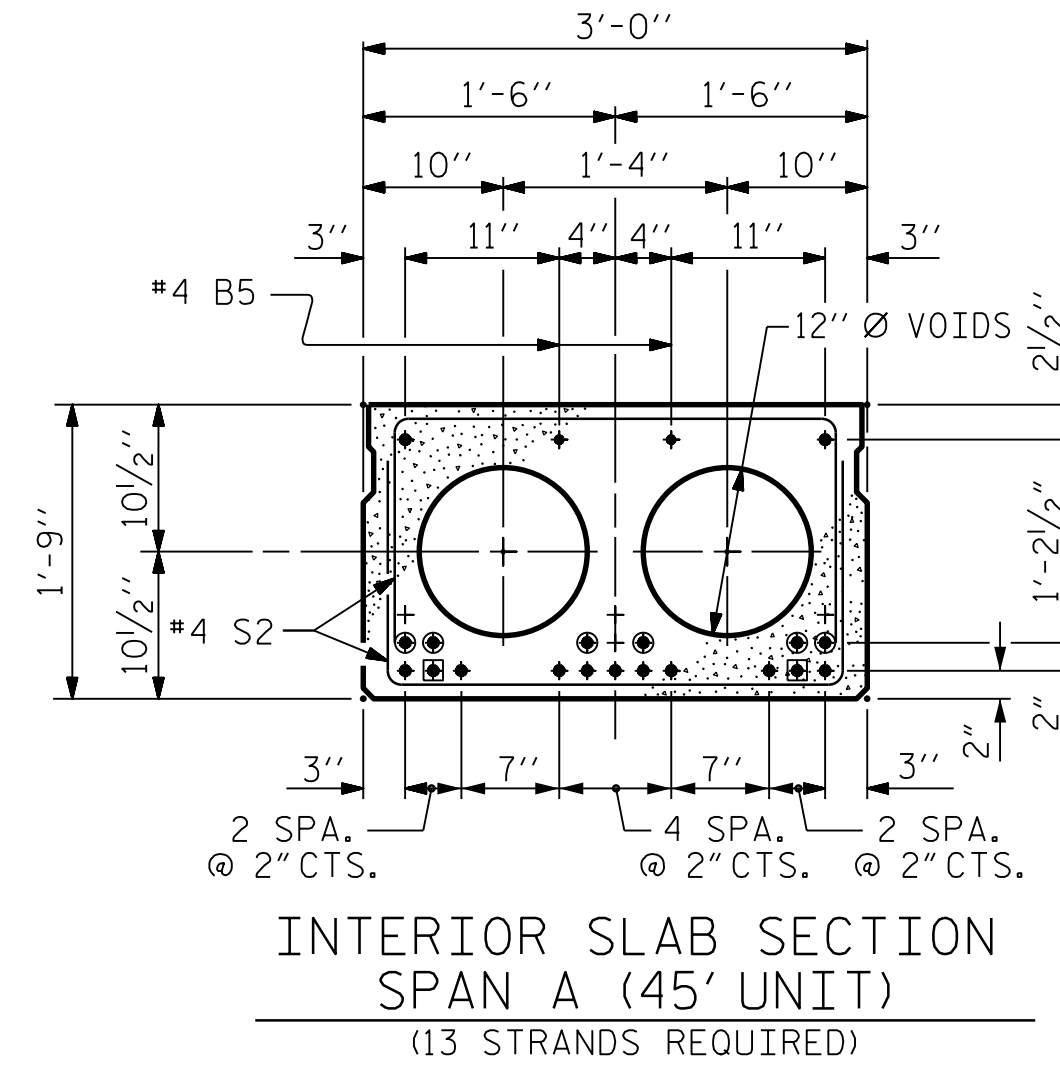


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

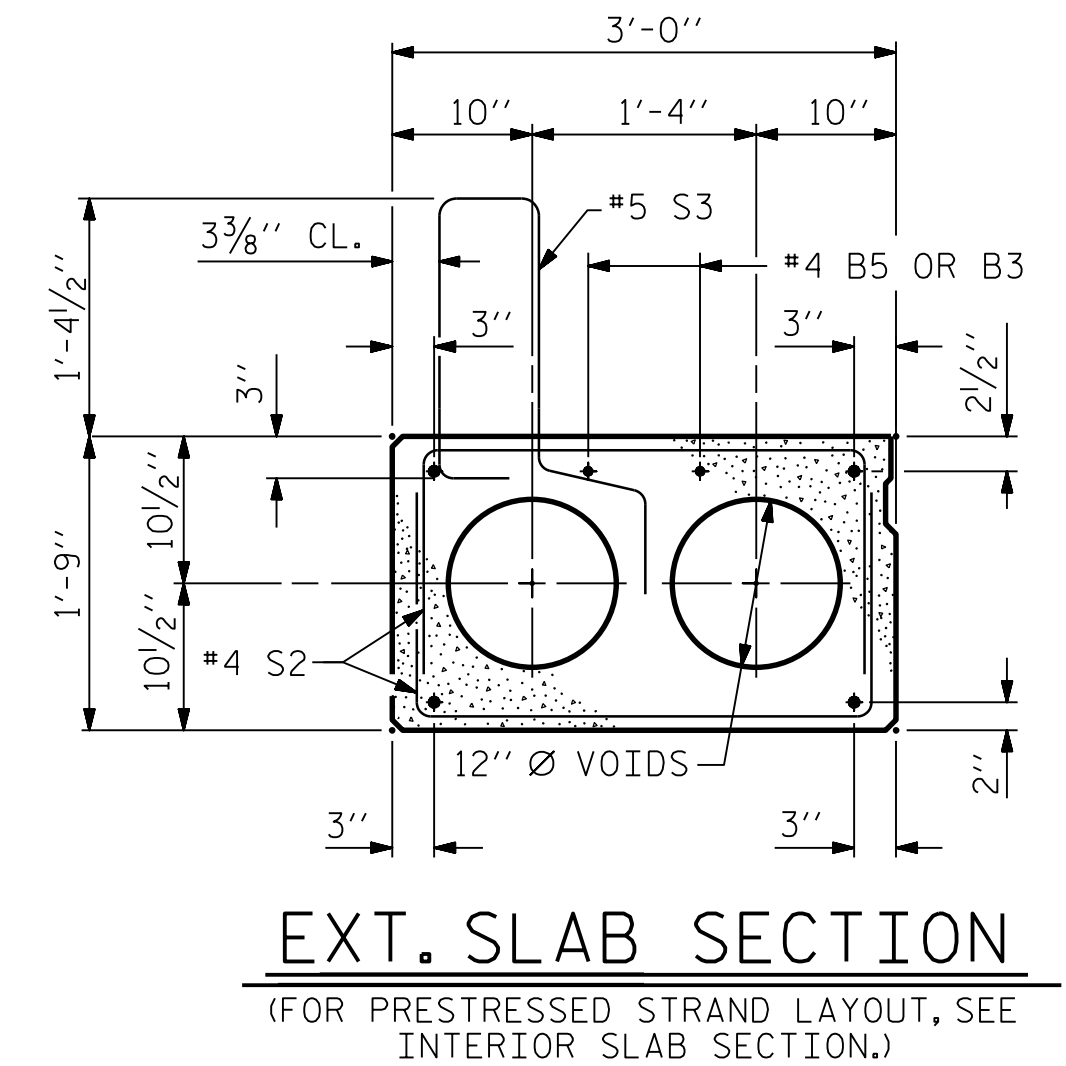


END ELEVATION

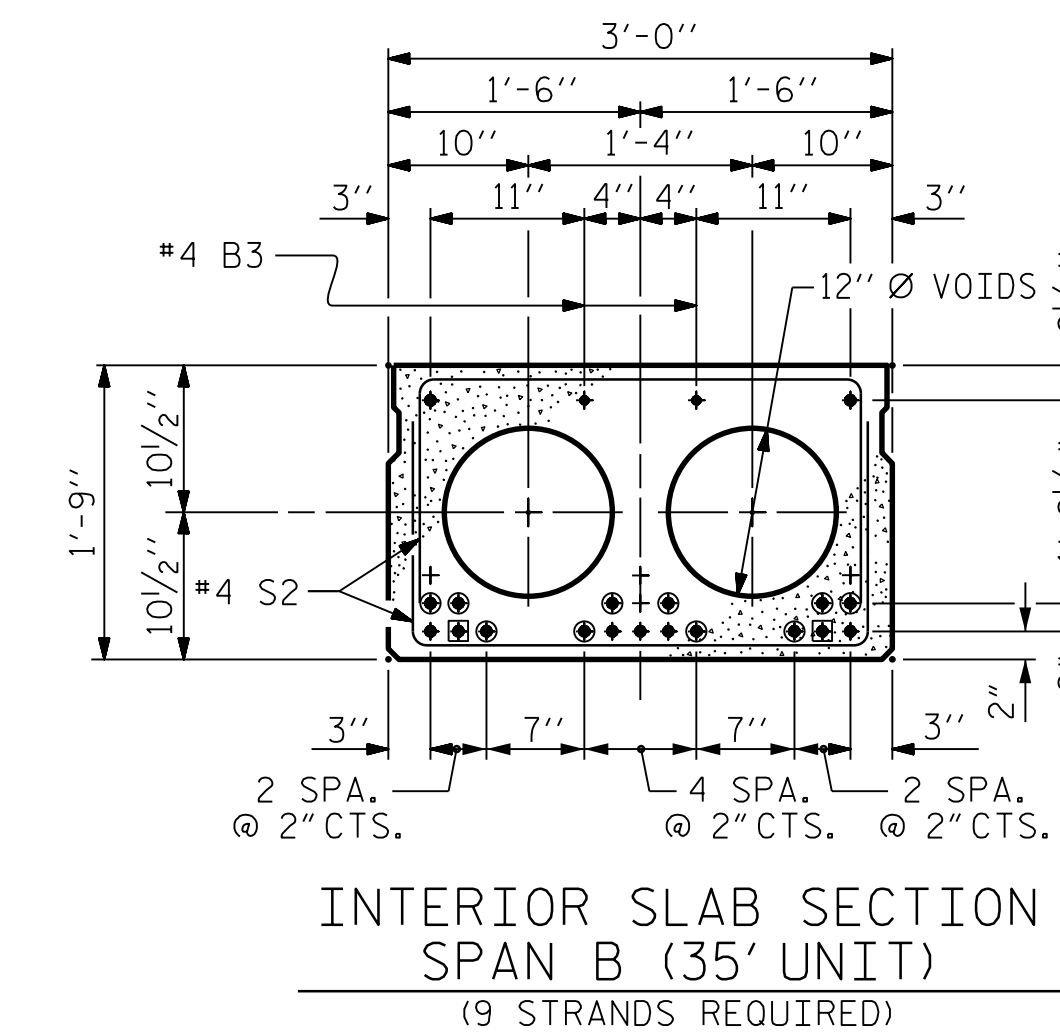
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



INTERIOR SLAB SECTION SPAN A (45' UNIT)
(13 STRANDS REQUIRED)

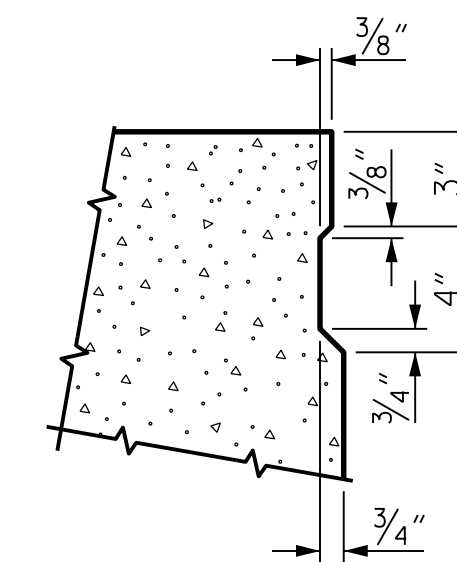


EXT. SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION SPAN B (35' UNIT)
(9 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



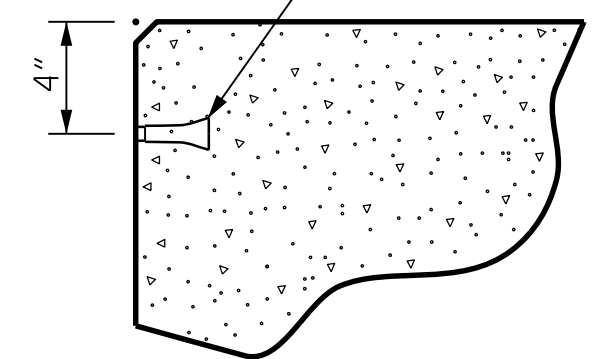
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT
90° SKEW SPANS A & B

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

TOTAL SHEETS: 21

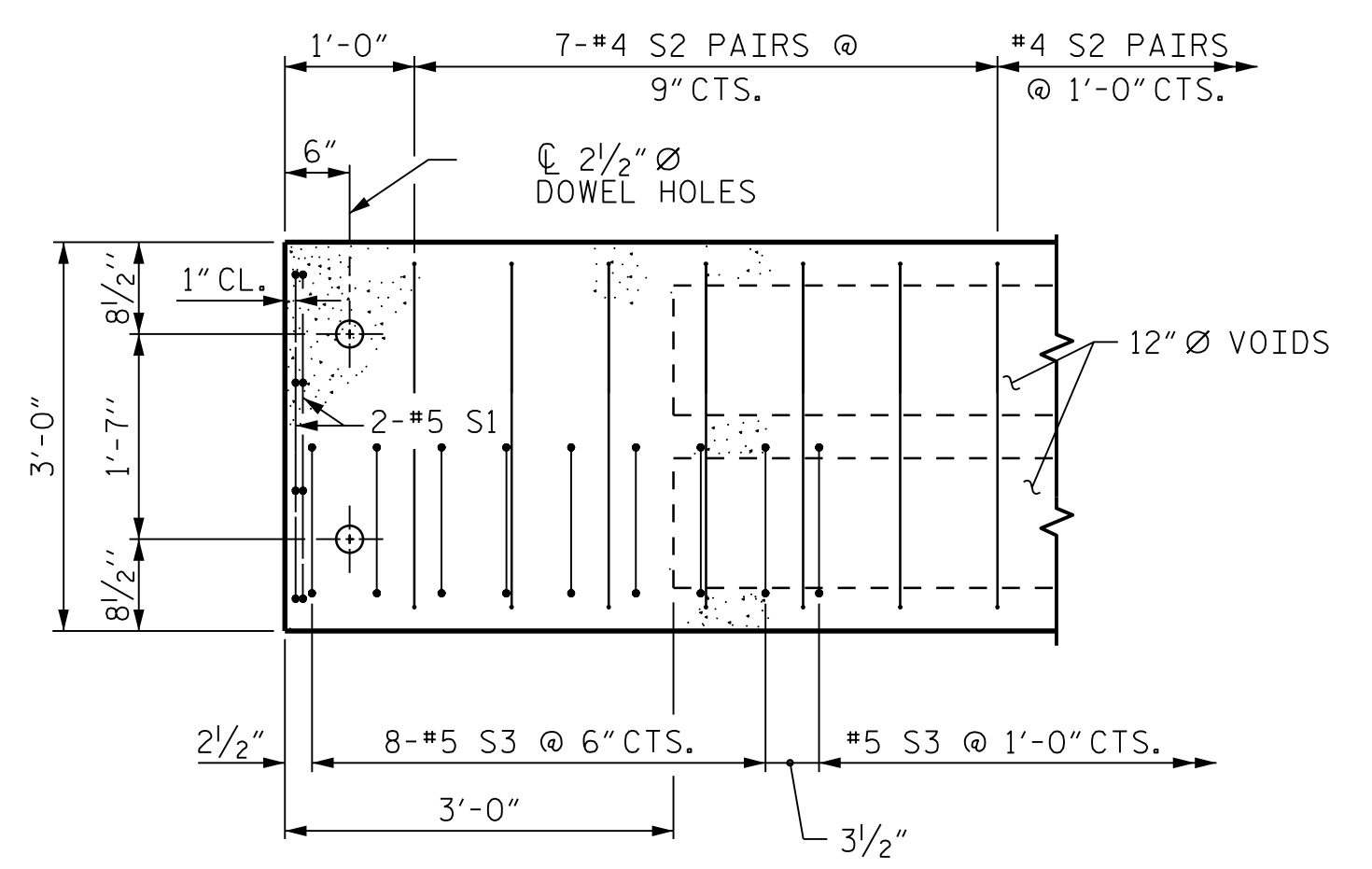
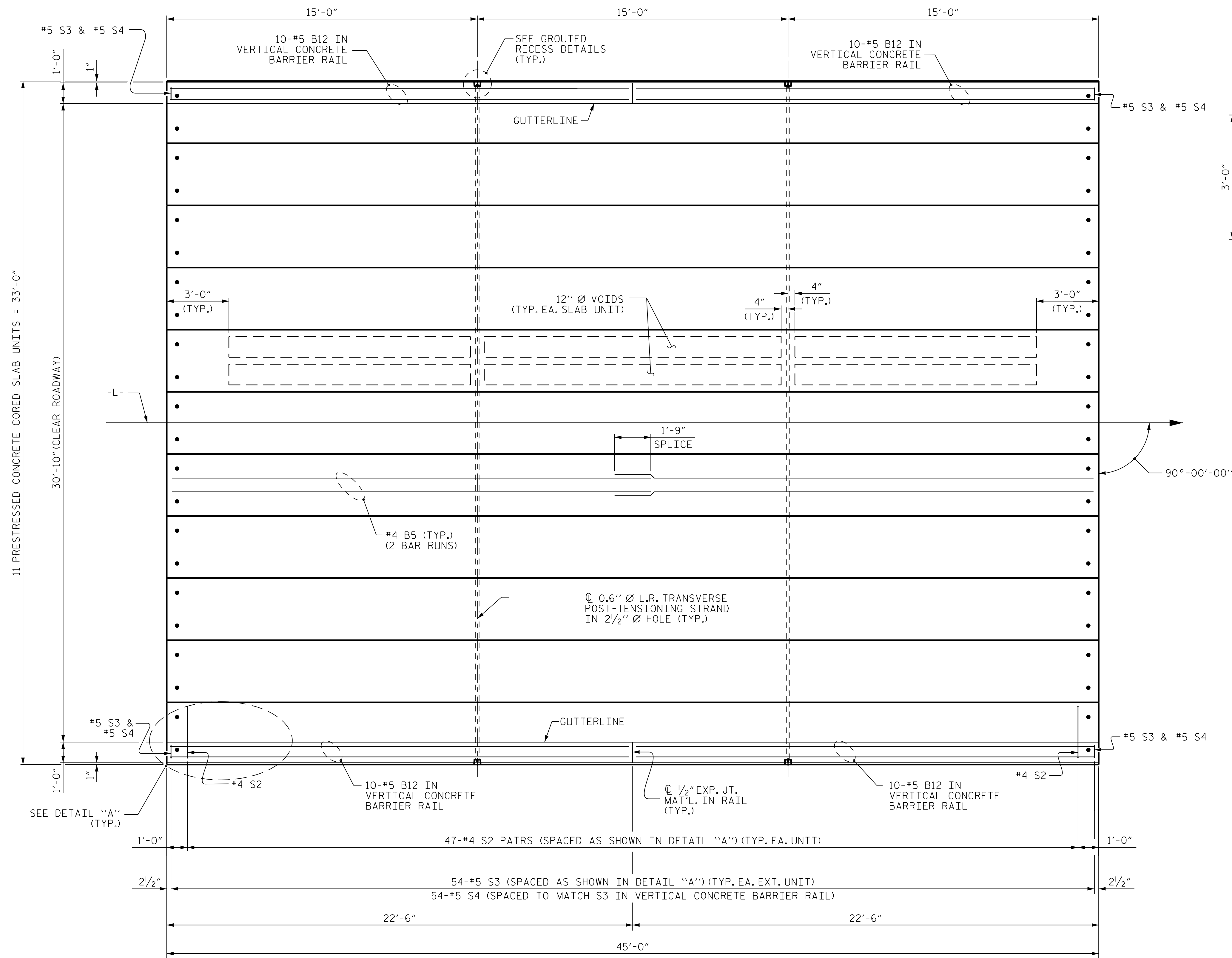
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NC COA No. F-1255

DRAWN BY: VDK DATE: 08/18
CHECKED BY: THF DATE: 08/18
DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301
ENGINEER
TING FANG
6064309AEB0462
11/19/2018



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF SPAN A

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
PLAN OF 45' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
SPAN A

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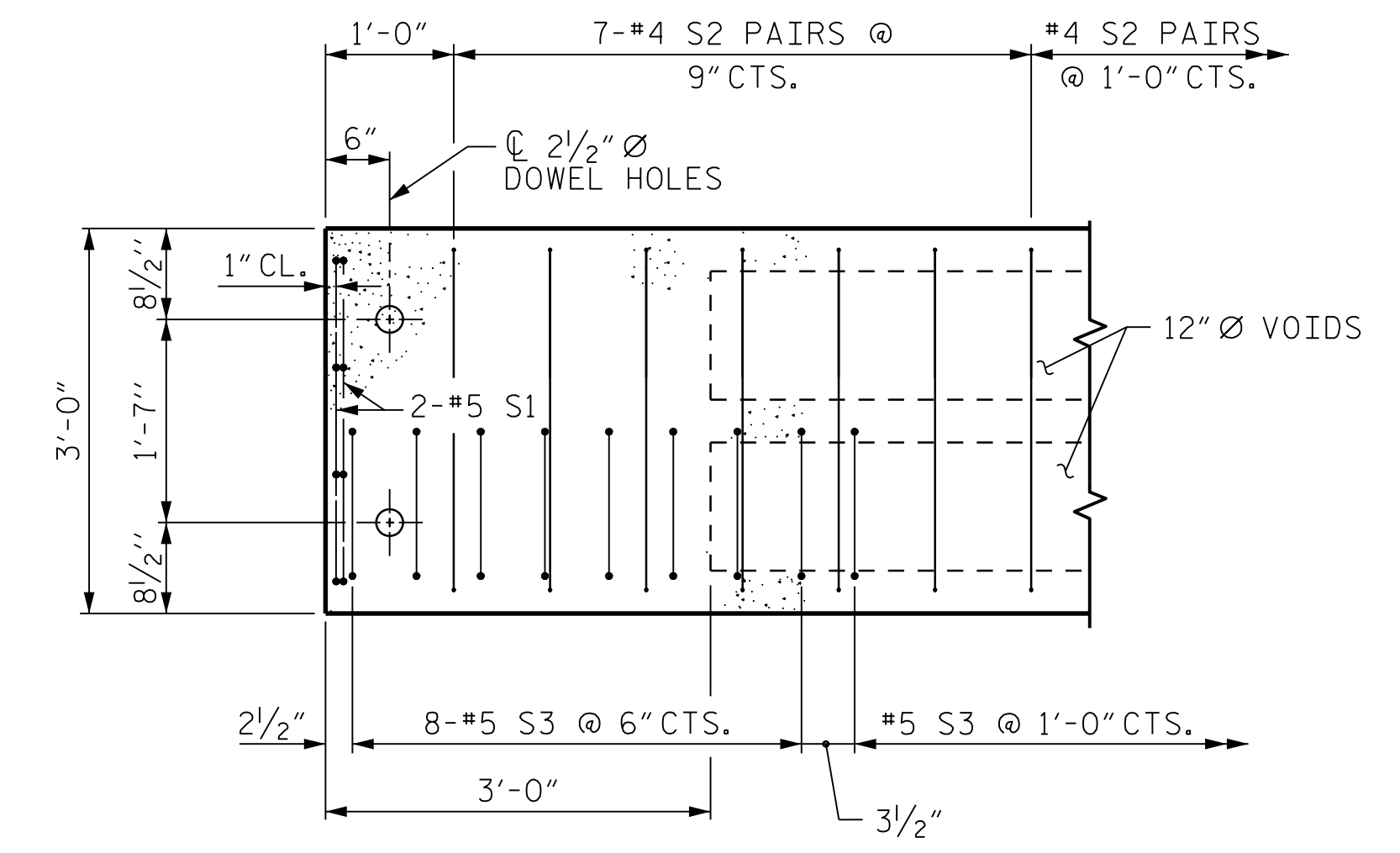
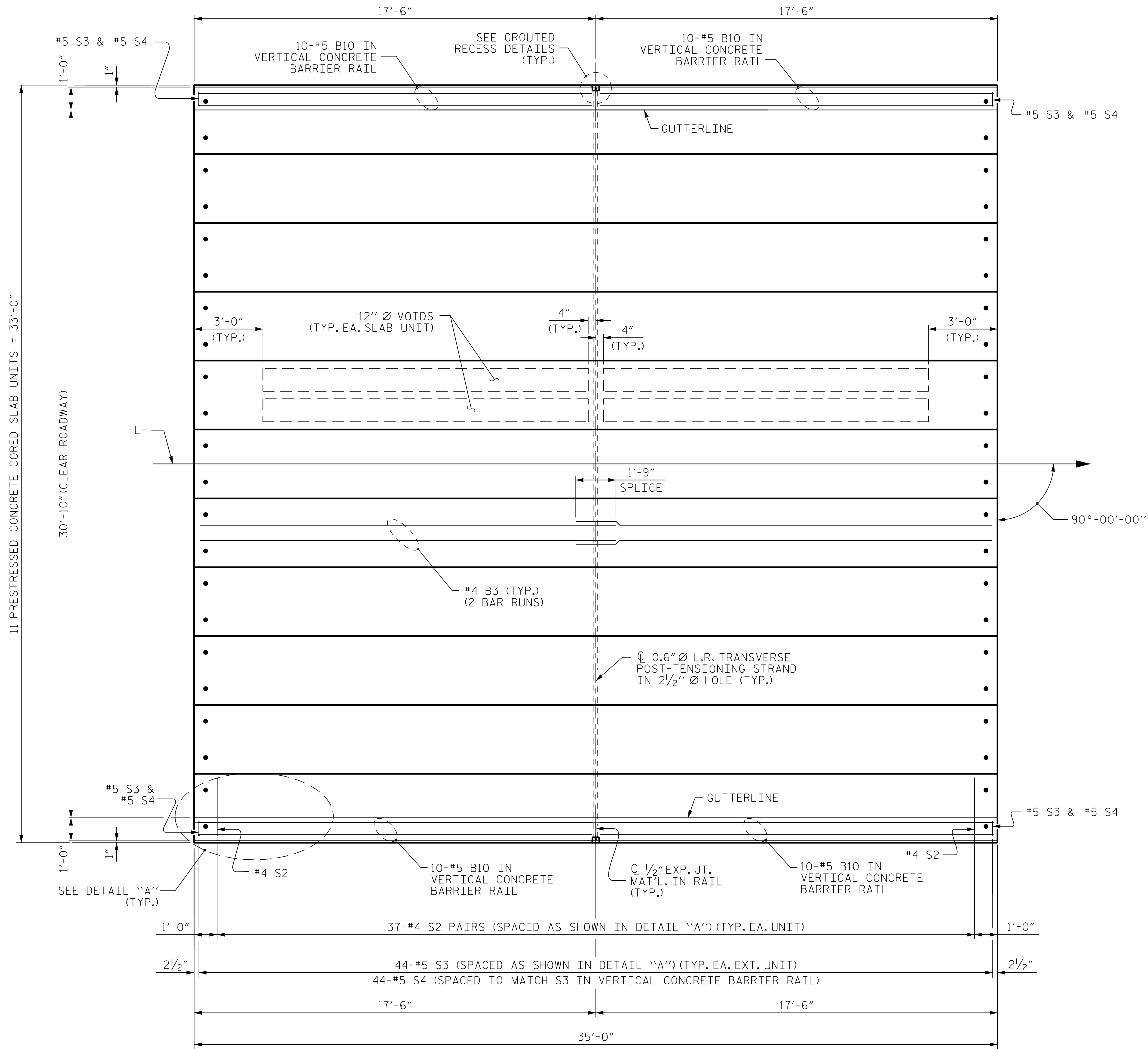
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1			3			TOTAL SHEETS
2			4			21

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DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF SPAN B

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-
 SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**PLAN OF 35' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW
 SPAN B**

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 21
2			4			

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 NC COA No. F-1255

CHECKED BY: THF DATE: 08/18
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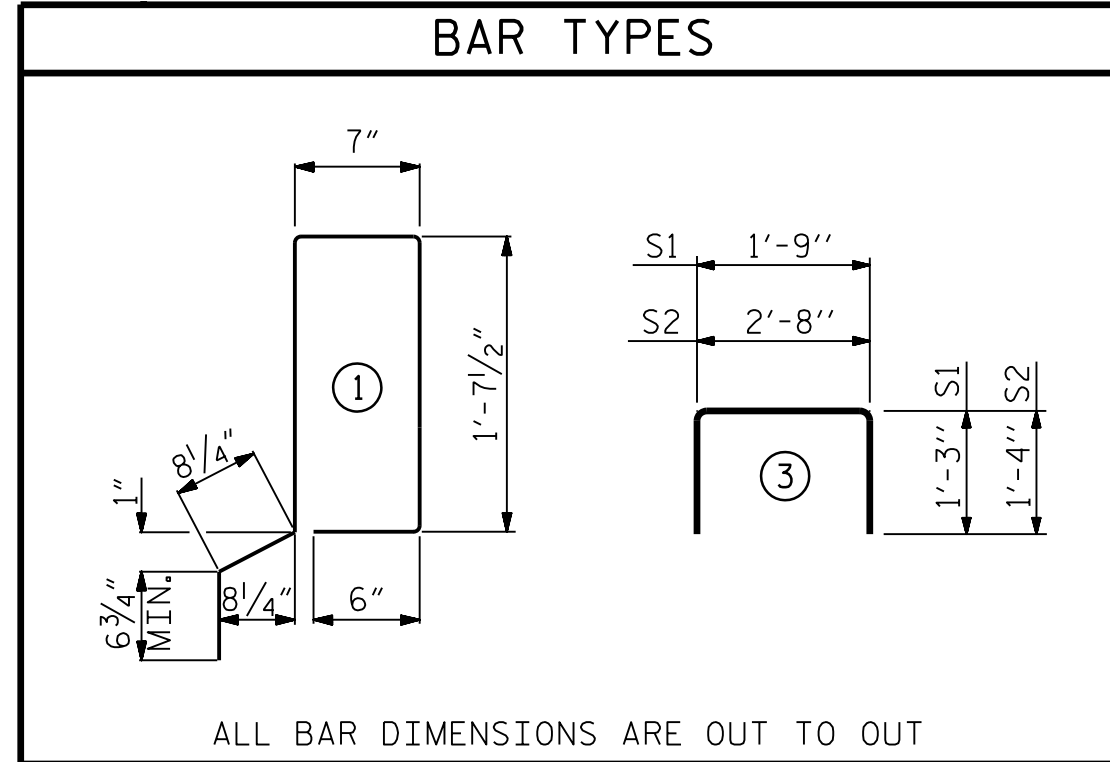
CONCRETE RELEASE STRENGTH	
UNIT	PSI
SPAN A (45' UNITS)	4000
SPAN B (35' UNITS)	4000

DEAD LOAD DEFLECTION AND CAMBER		
ALL UNITS, 0.6" Ø L.R. STRAND	SPAN A 45' - 21" CS UNIT	SPAN B 35' - 21" CS UNIT
CAMBER (SLAB ALONE IN PLACE)	3/8" ↑	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓	1/8" ↓
FINAL CAMBER	3/4" ↑	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

CORED SLABS REQUIRED			
SPAN A (45' UNITS)			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	9	45'-0"	405'-0"
TOTAL			495'-0"
SPAN B (35' UNITS)			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	9	35'-0"	315'-0"
TOTAL			385'-0"



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE CORED SLAB UNIT							
SPAN A (45' - 21" CORED SLAB UNIT)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	94	#4	3	5'-4"	335	5'-4"	335
* S3	54	#5	1	5'-7"	314		
REINFORCING STEEL			LBS.		432		432
* EPOXY COATED REINFORCING STEEL			LBS.		314		
5000 P.S.I. CONCRETE			CU. YDS.		6.5		6.5
0.6" Ø L.R. STRANDS			No.		13		13
SPAN B (35' - 21" CORED SLAB UNIT)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	74	#4	3	5'-4"	264	5'-4"	264
* S3	44	#5	1	5'-7"	256		
REINFORCING STEEL			LBS.		348		348
* EPOXY COATED REINFORCING STEEL			LBS.		256		
5000 P.S.I. CONCRETE			CU. YDS.		5.1		5.1
0.6" Ø L.R. STRANDS			No.		9		9

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

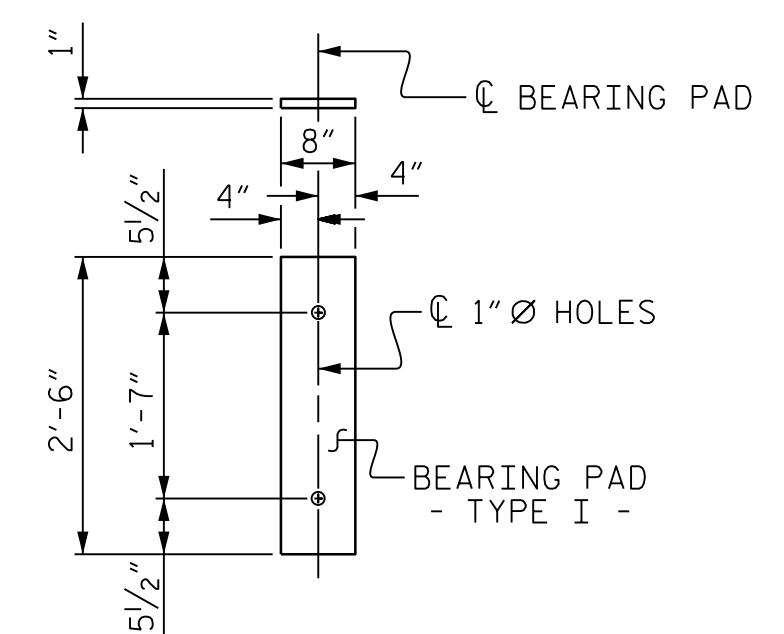
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



FIXED END (TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" x 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW
SPANS A & B

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC COA No. F-1255

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KING FANG
11/19/2018

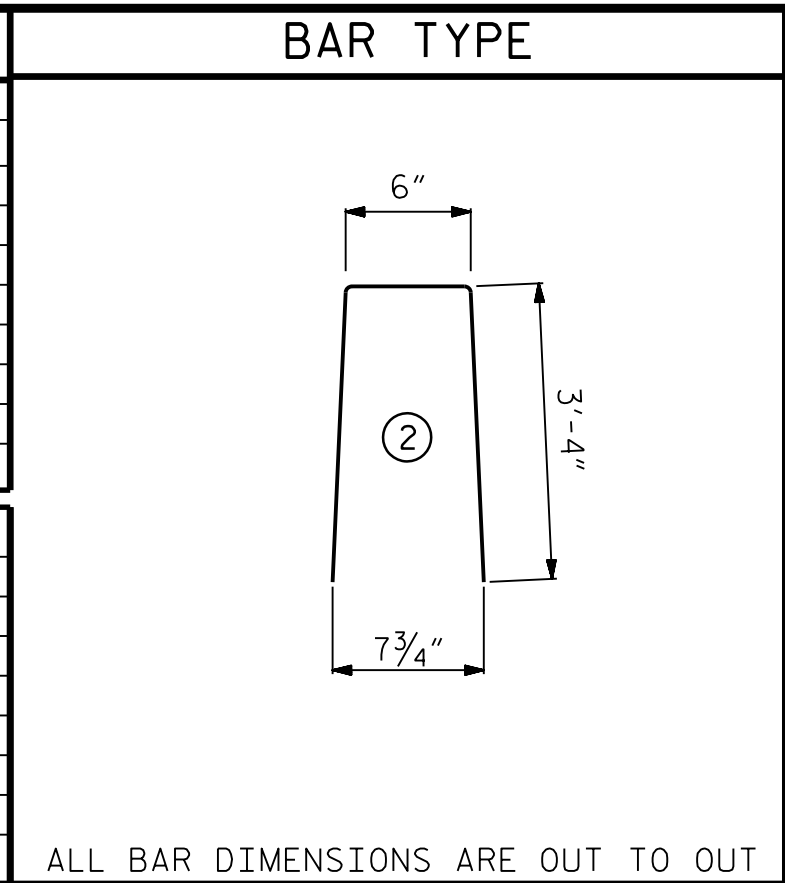
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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TOTAL SHEETS: 21

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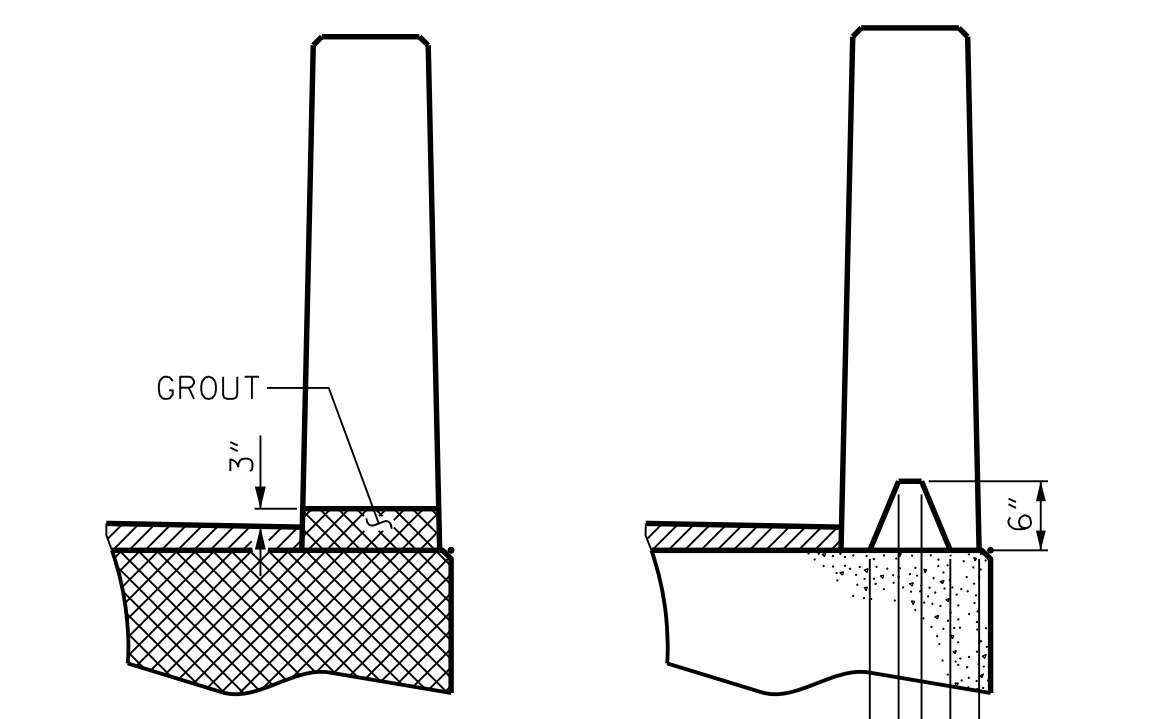
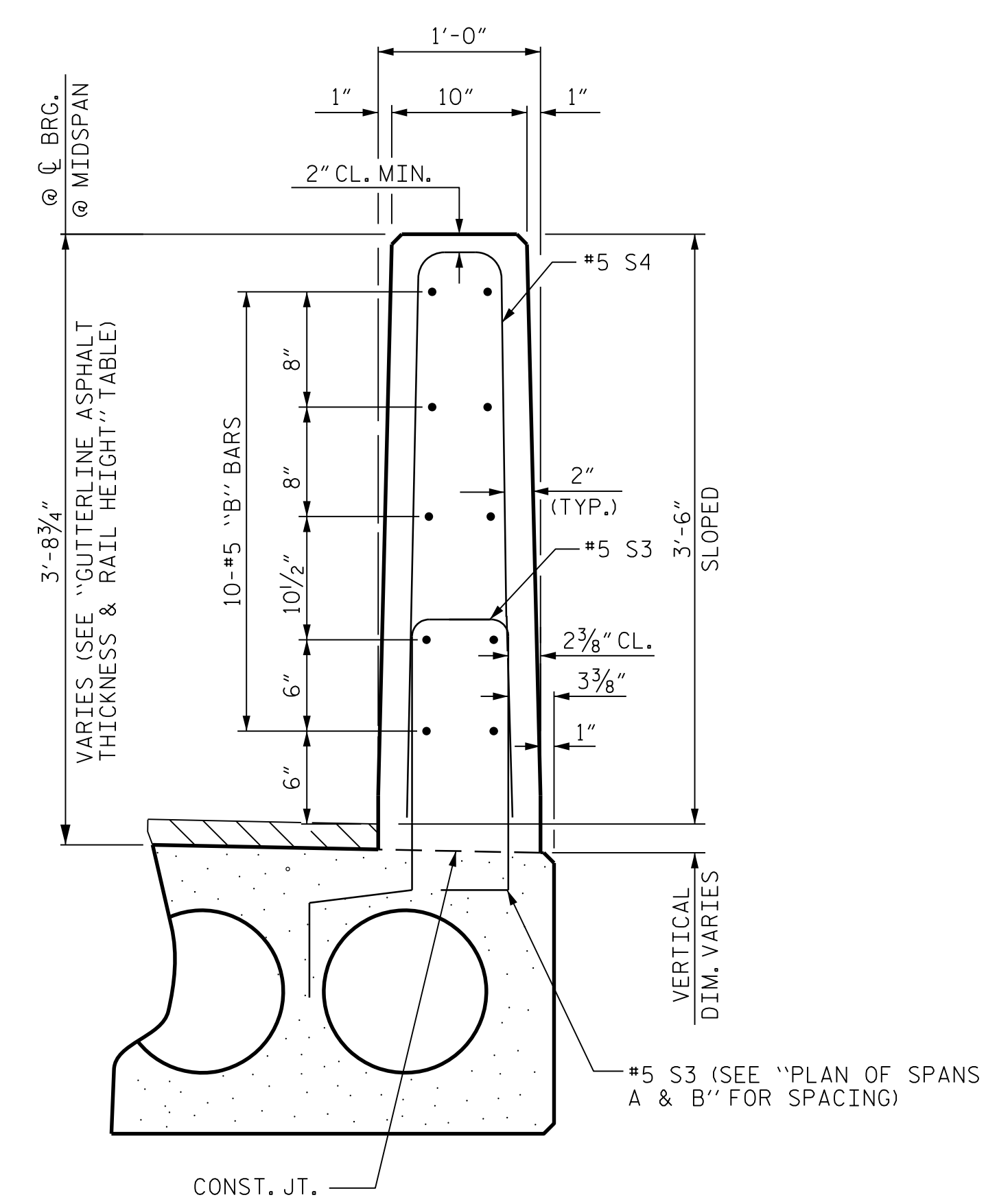
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
SPAN A (45' UNIT)						
*B12	40	40	#5	STR	22'-1"	921
*S4	108	108	#5	2	7'-2"	807
* EPOXY COATED REINFORCING STEEL					LBS.	1728
CLASS AA CONCRETE					CU.YDS.	11.5
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	90.125

SPAN B (35' UNIT)						
*B10	40	40	#5	STR	17'-1"	713
*S4	88	88	#5	2	7'-2"	658
* EPOXY COATED REINFORCING STEEL					LBS.	1371
CLASS AA CONCRETE					CU.YDS.	9.0
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	70.125



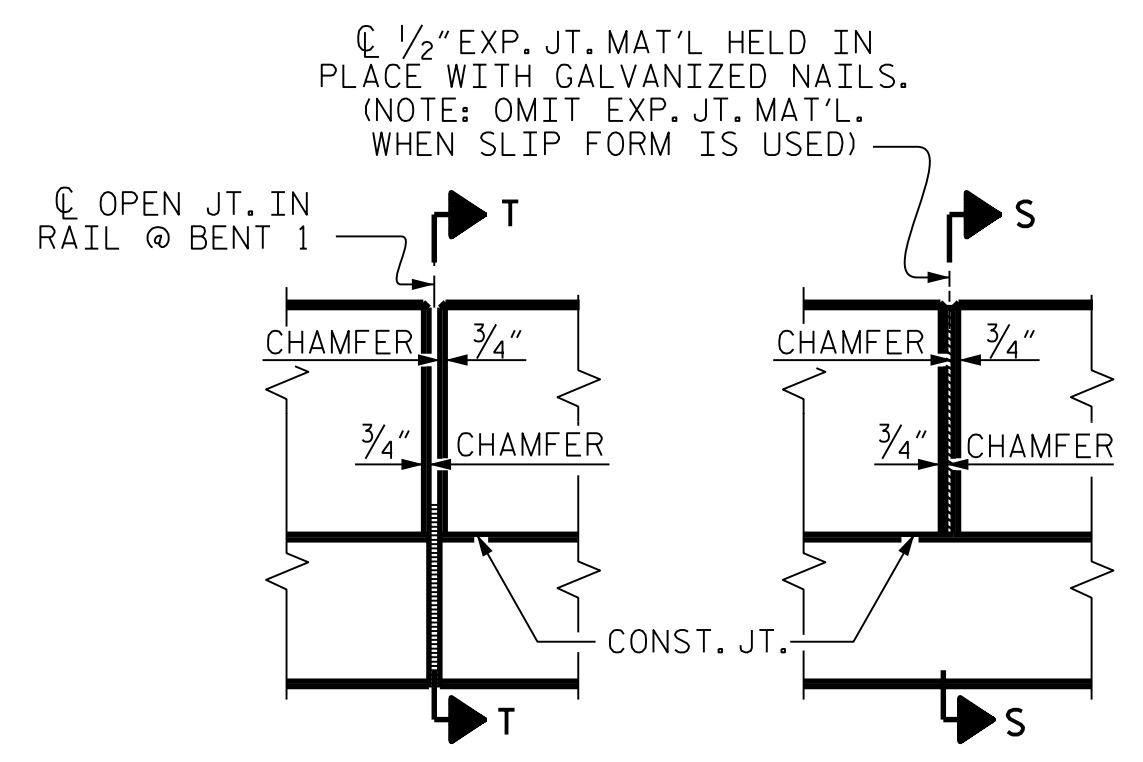
TOTAL VERTICAL CONCRETE BARRIER RAIL FOR ENTIRE BRIDGE: 160.25 LN.FT.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
SPAN A (45' UNITS)	2"	3'-8"
SPAN B (35' UNITS)	2 5/8"	3'-8 5/8"



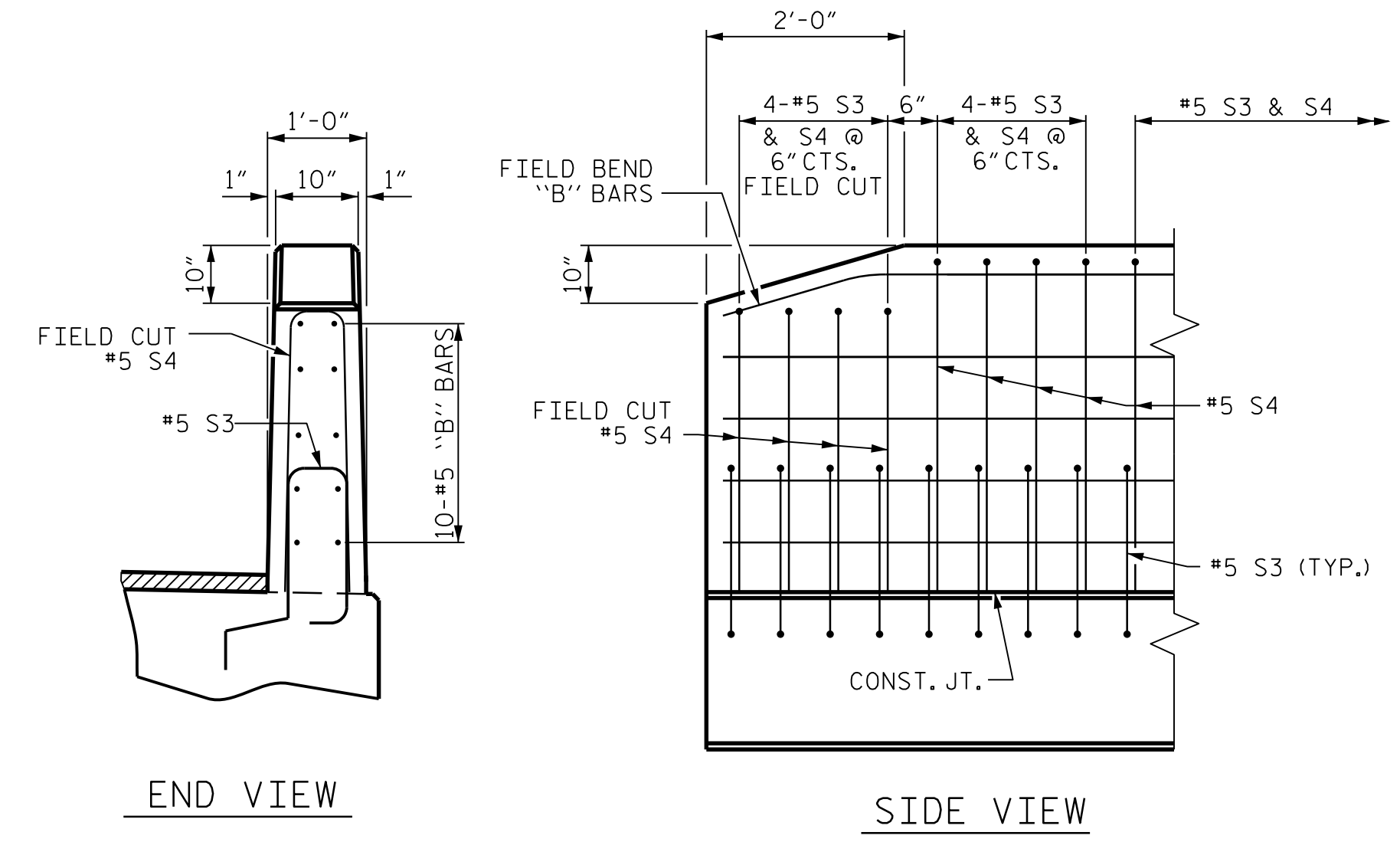
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE
FOAM JOINT IS NOT USED)

SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL SECTION



END OF RAIL DETAILS

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 21
2			4			

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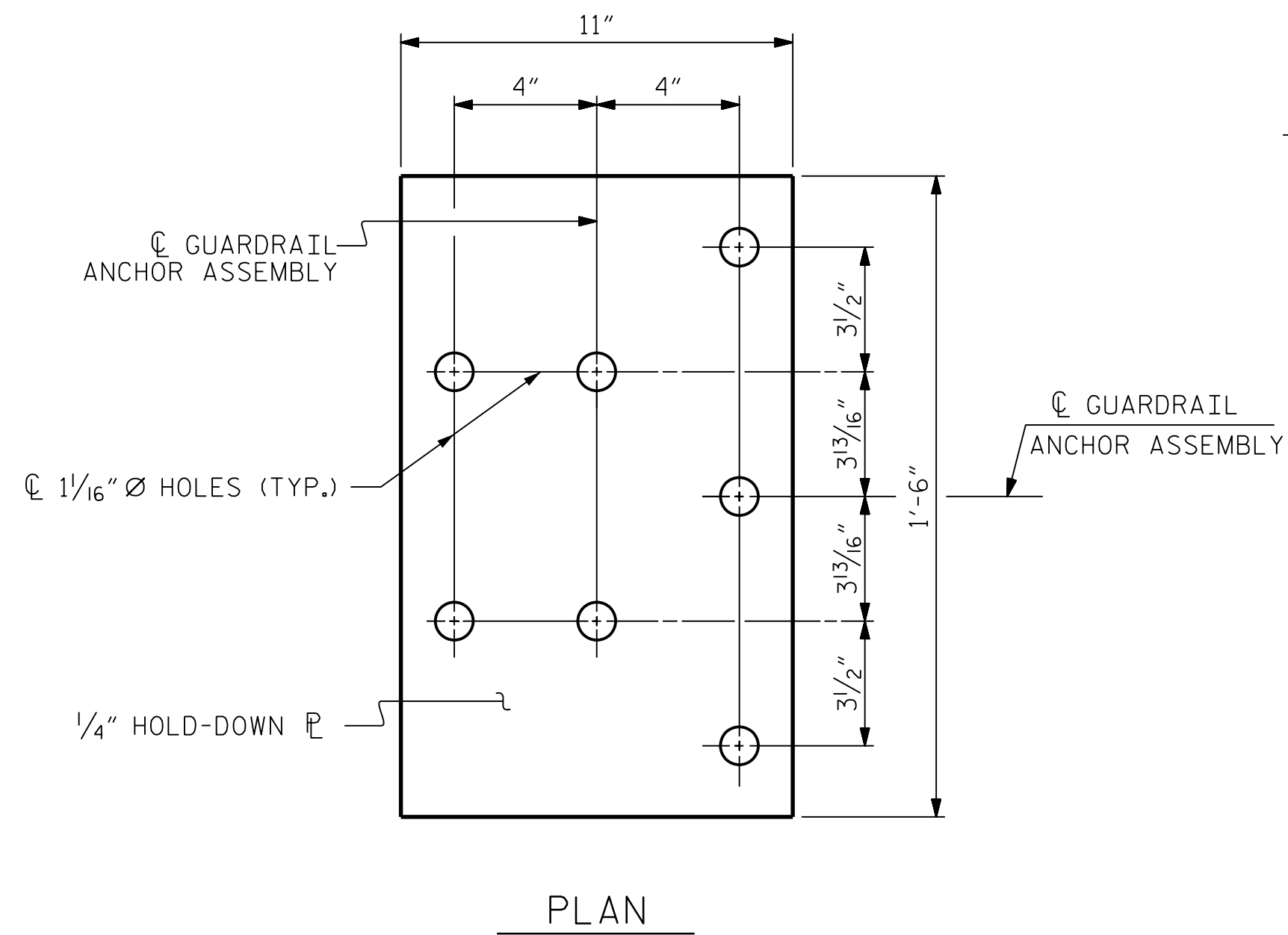
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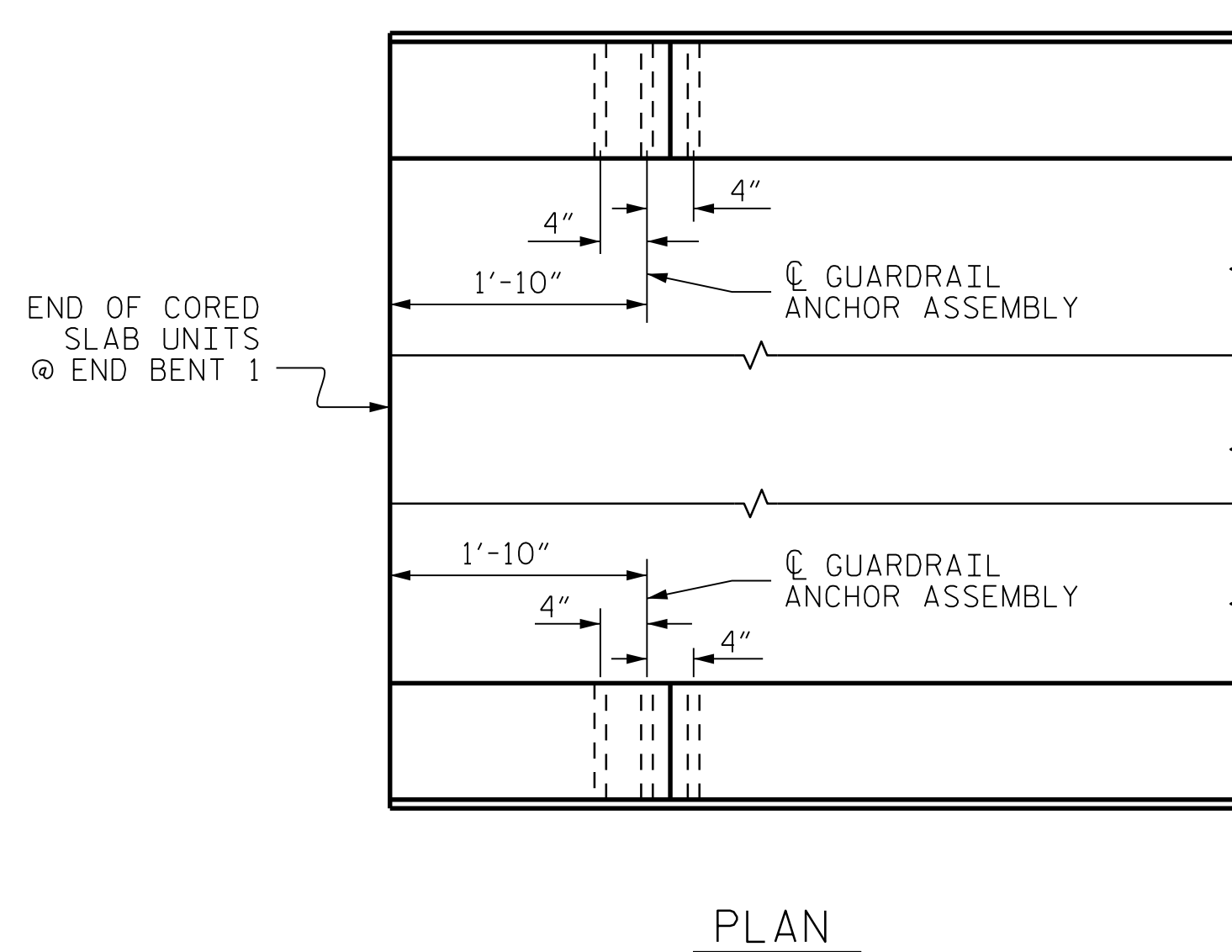
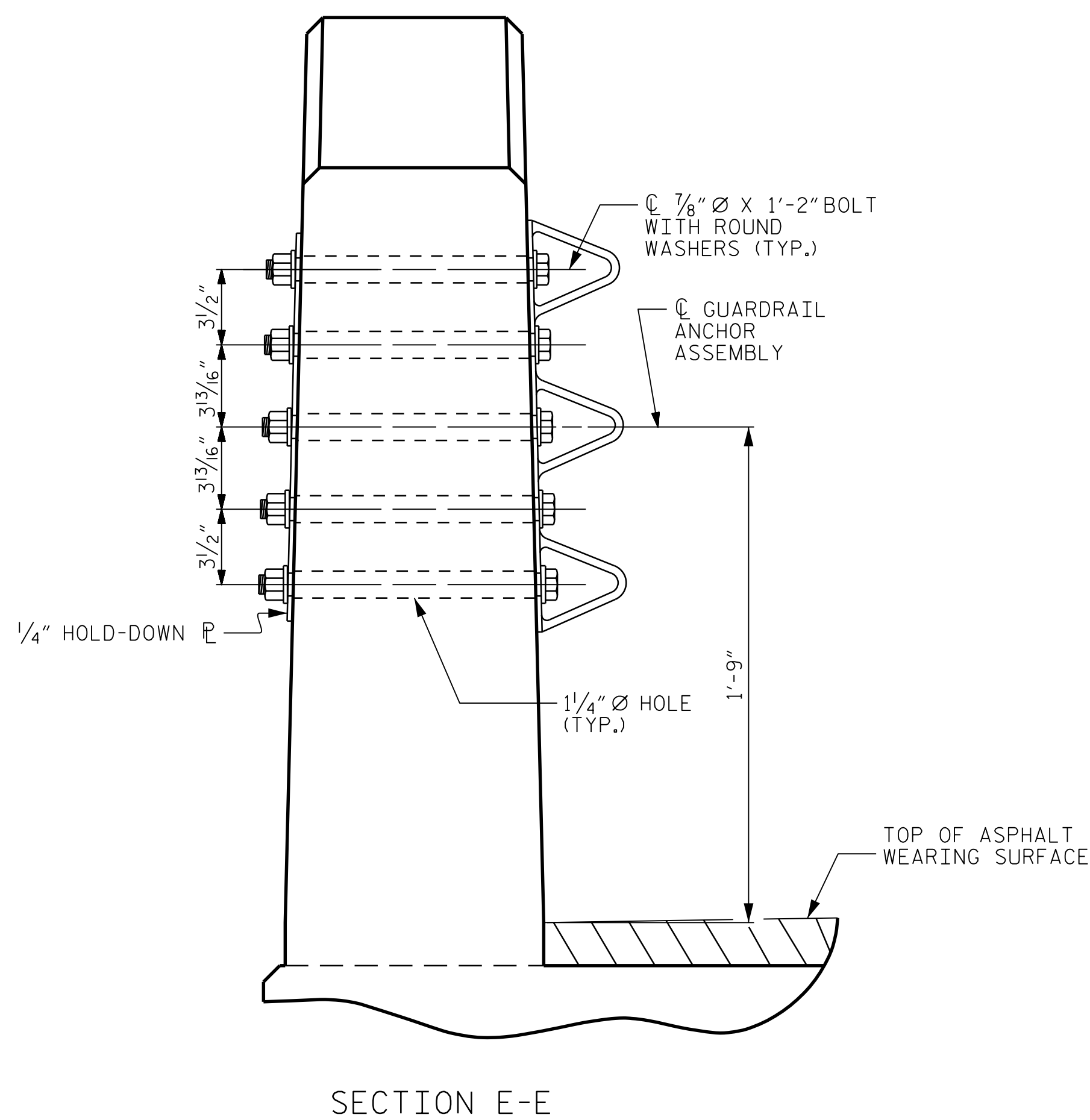
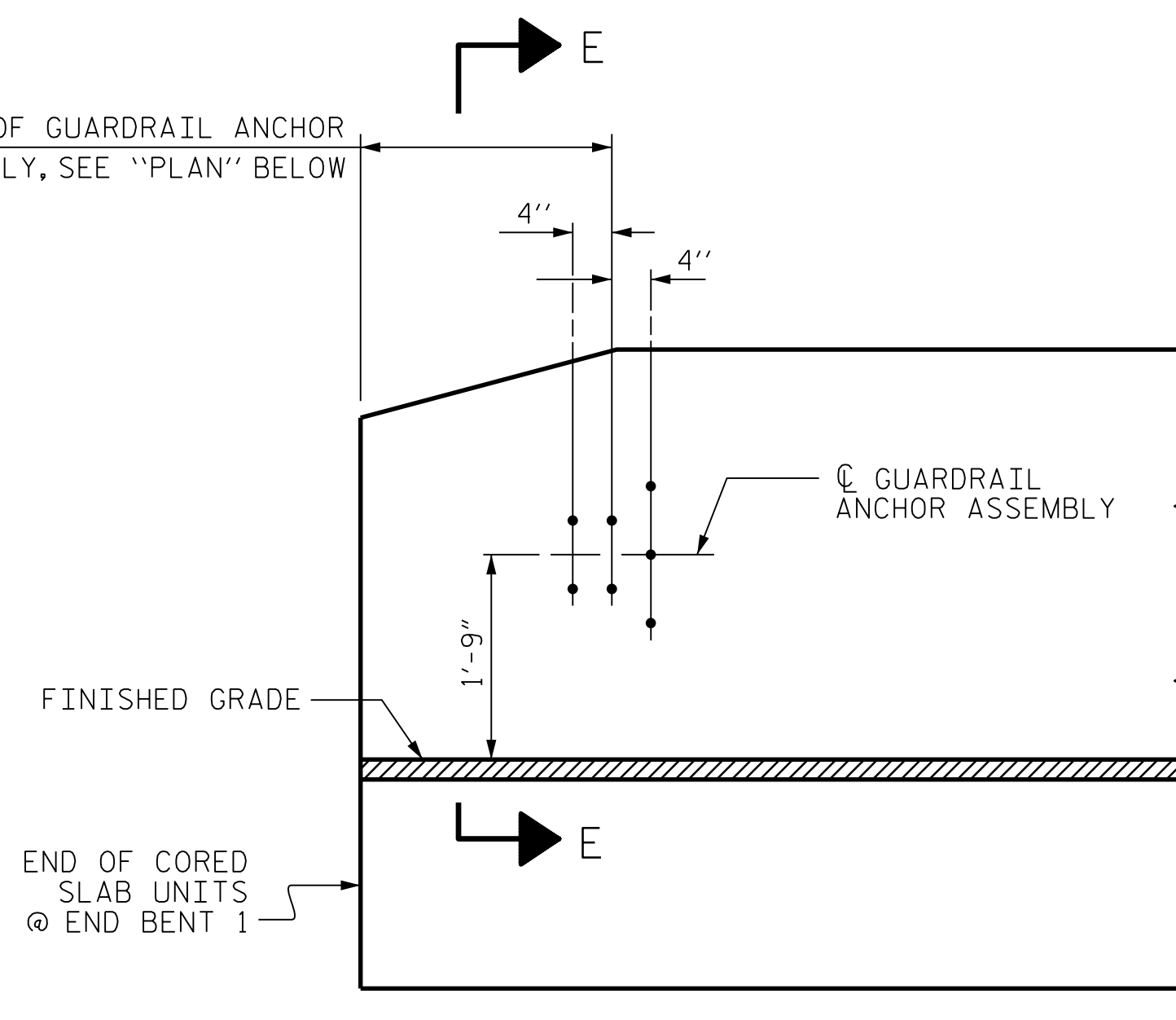
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Ting Tang

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FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

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 BARRIER RAIL TO CLEAR 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.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STANDARD GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

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

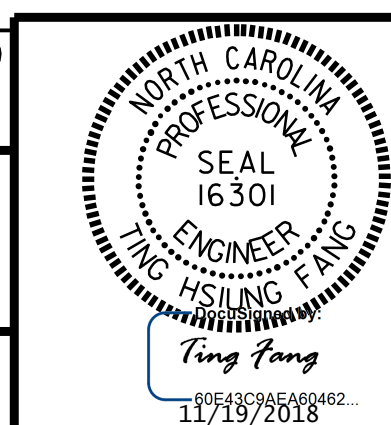
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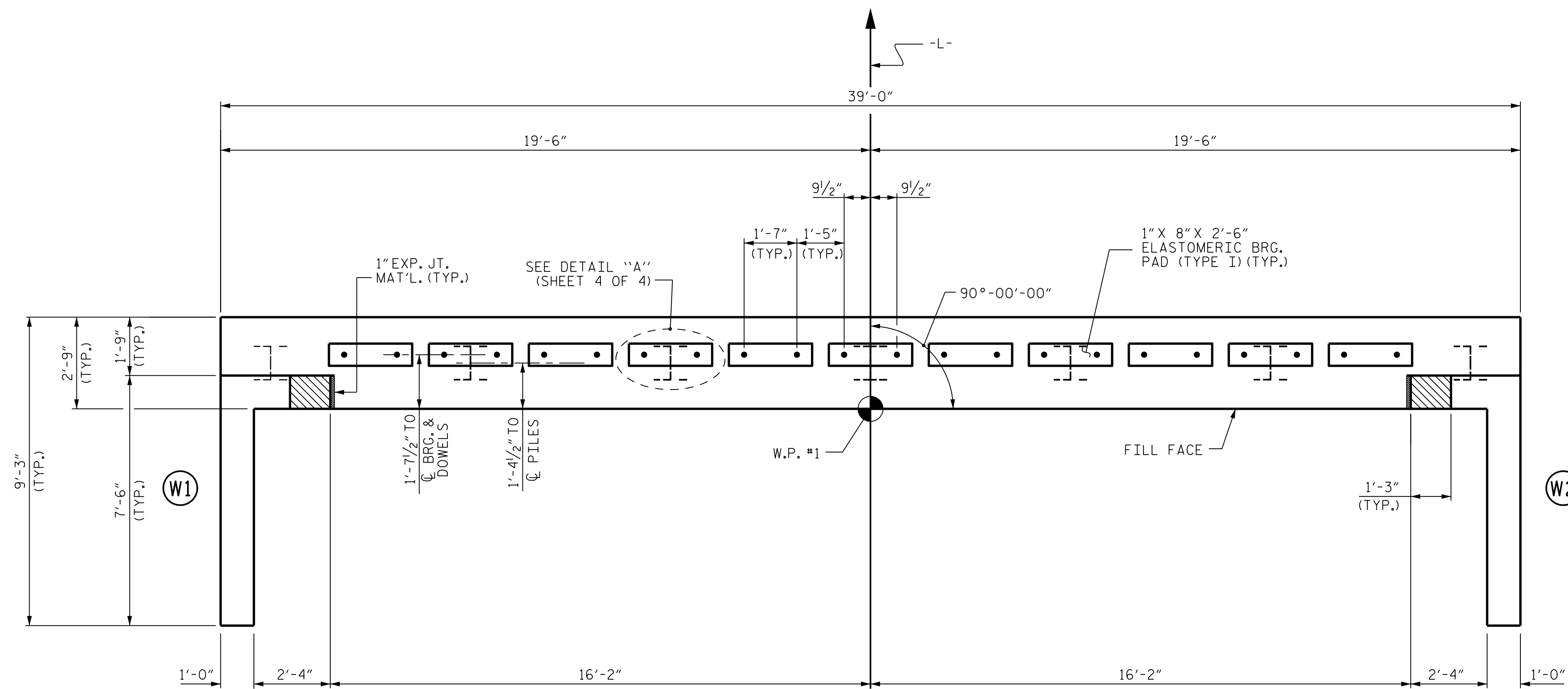
NOTES

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

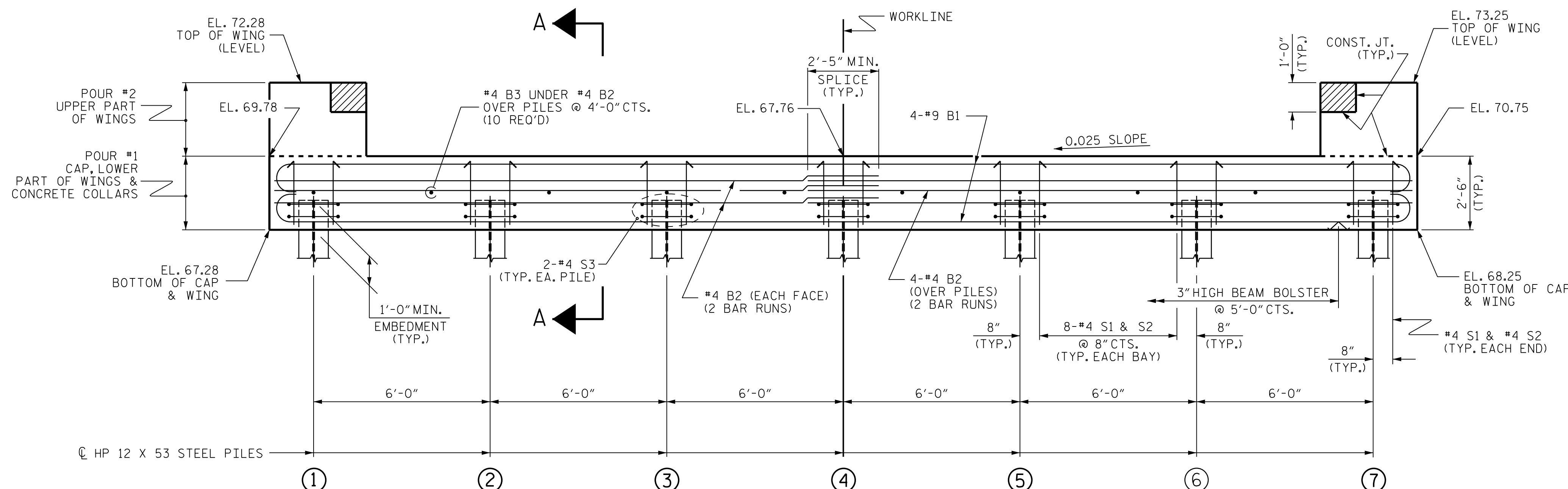
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

TOP OF PILE ELEVATIONS	
①	68.33
②	68.48
③	68.63
④	68.78
⑤	68.93
⑥	69.08
⑦	69.23

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

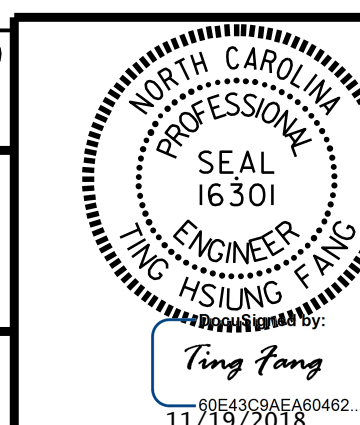
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC COA No. F-1255



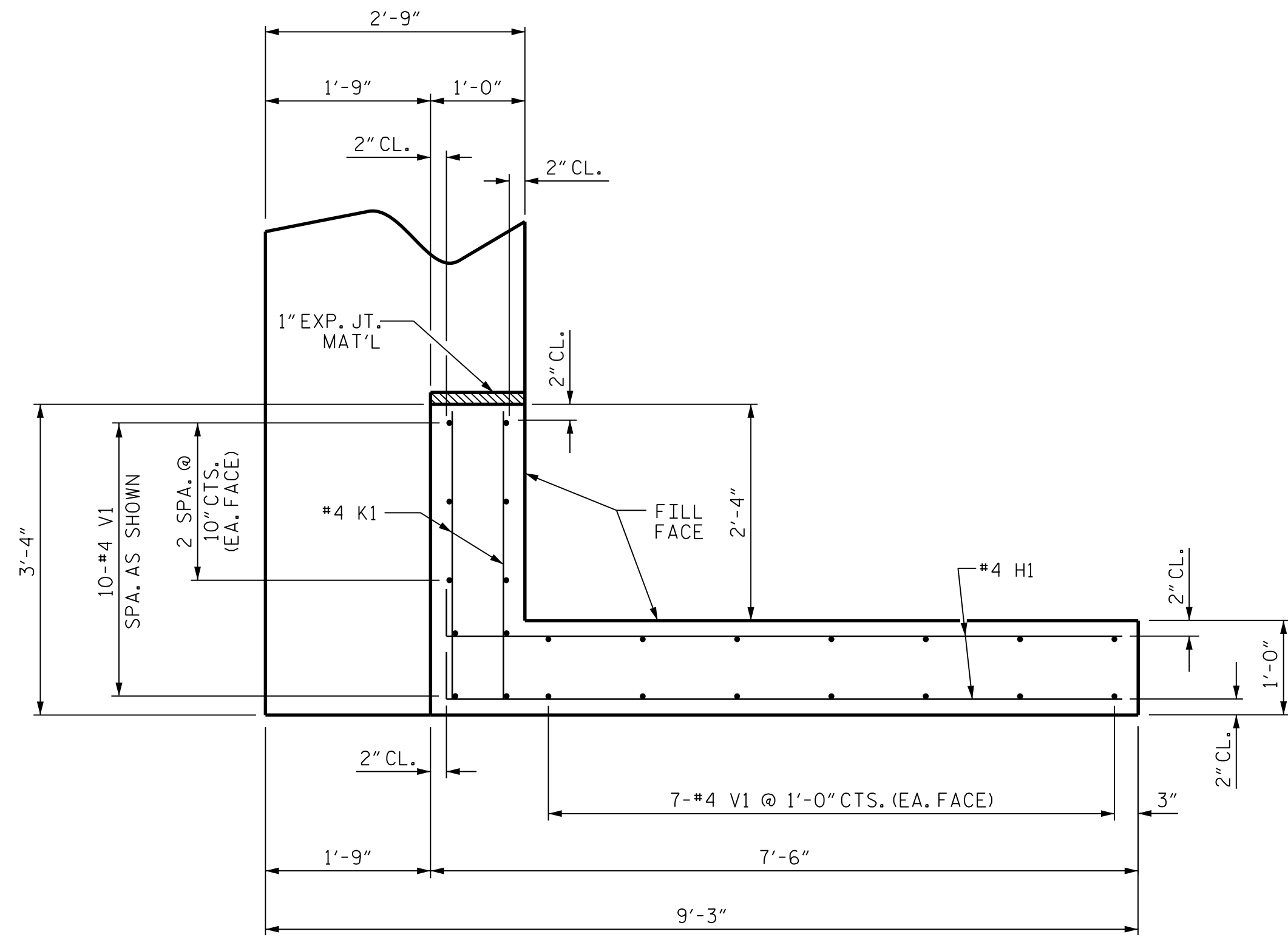
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CHECKED BY: THF DATE: 08/18
DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.

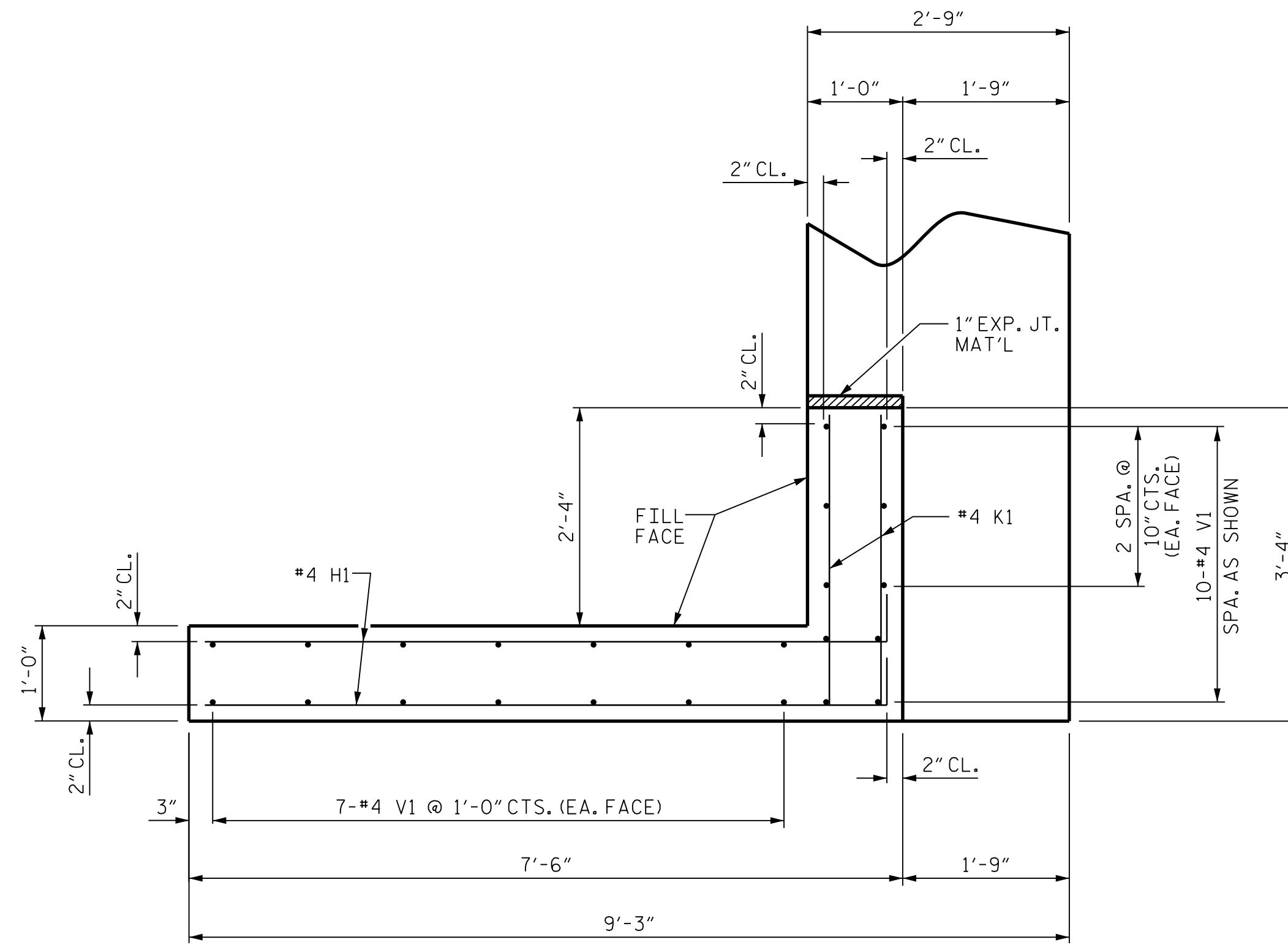
REVISIONS

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1			3		
2			4		

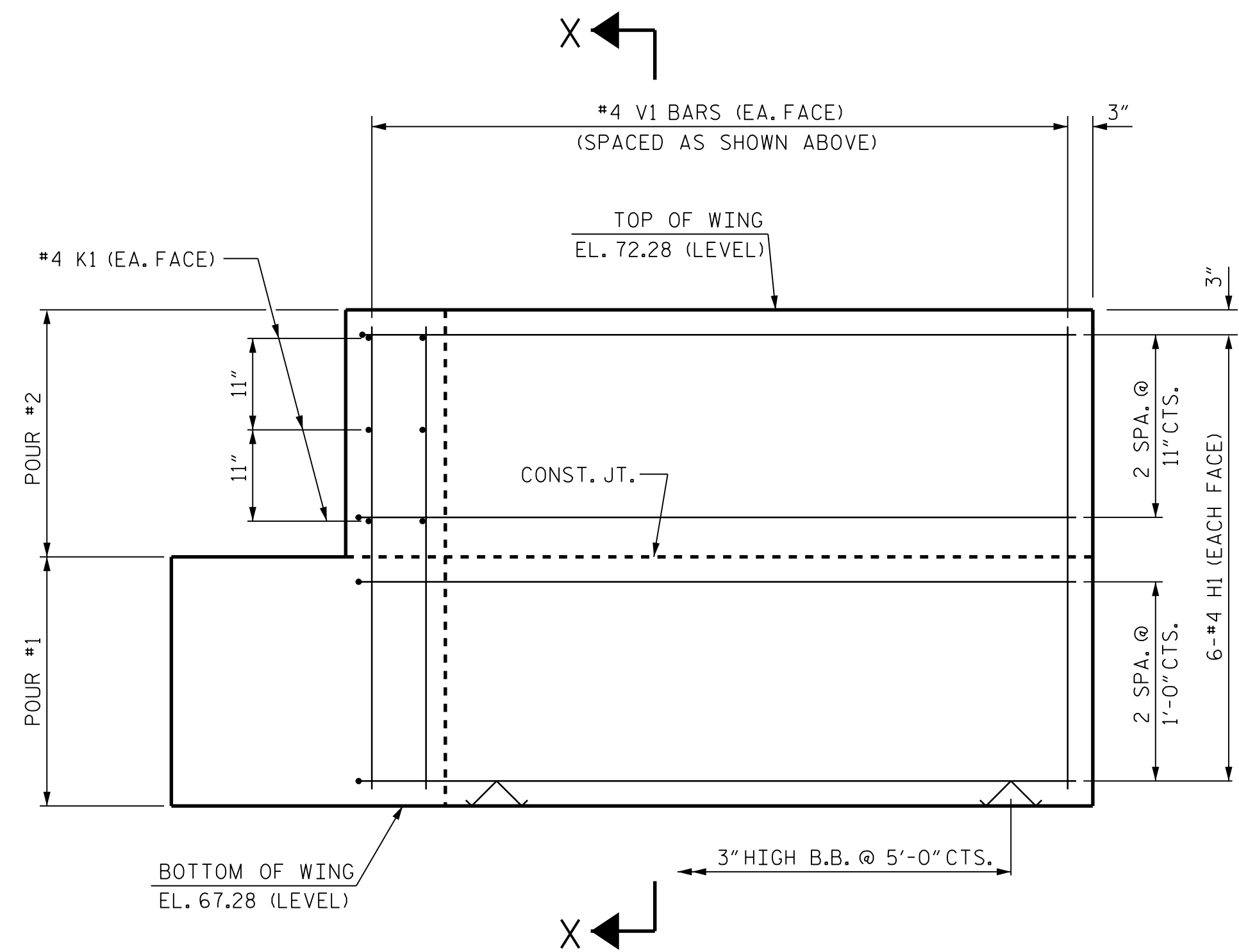
SHEET NO. S-12
TOTAL SHEETS 21



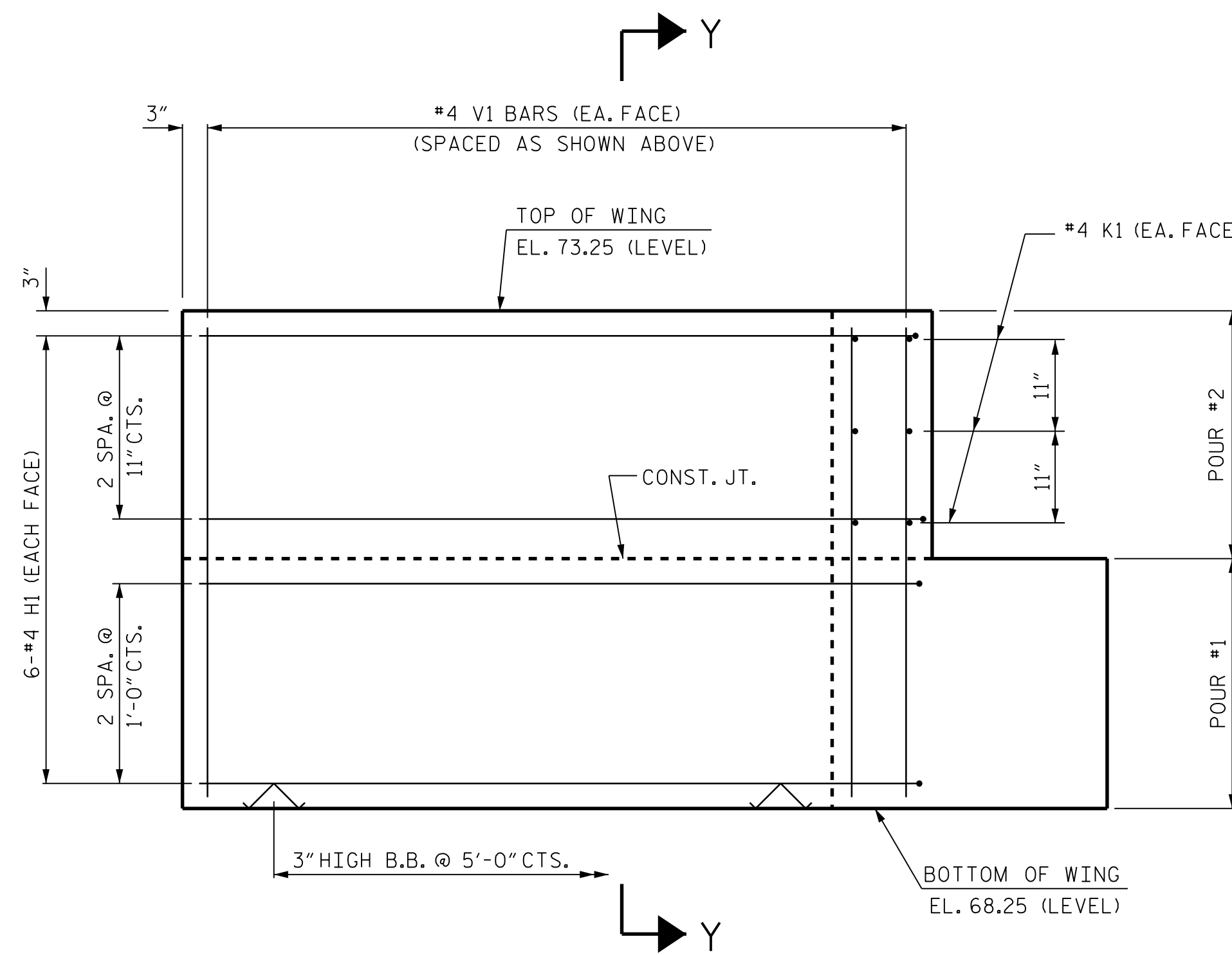
PLAN OF WING (W1)



PLAN OF WING (W2)

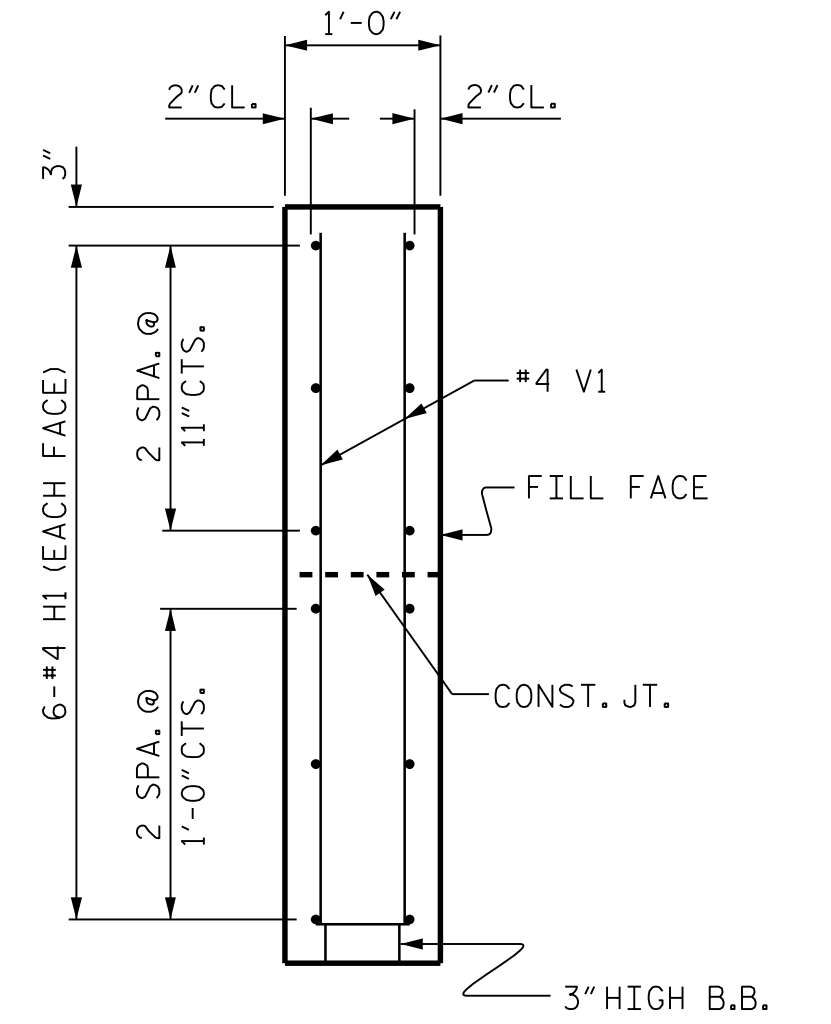


ELEVATION OF WING (W1)

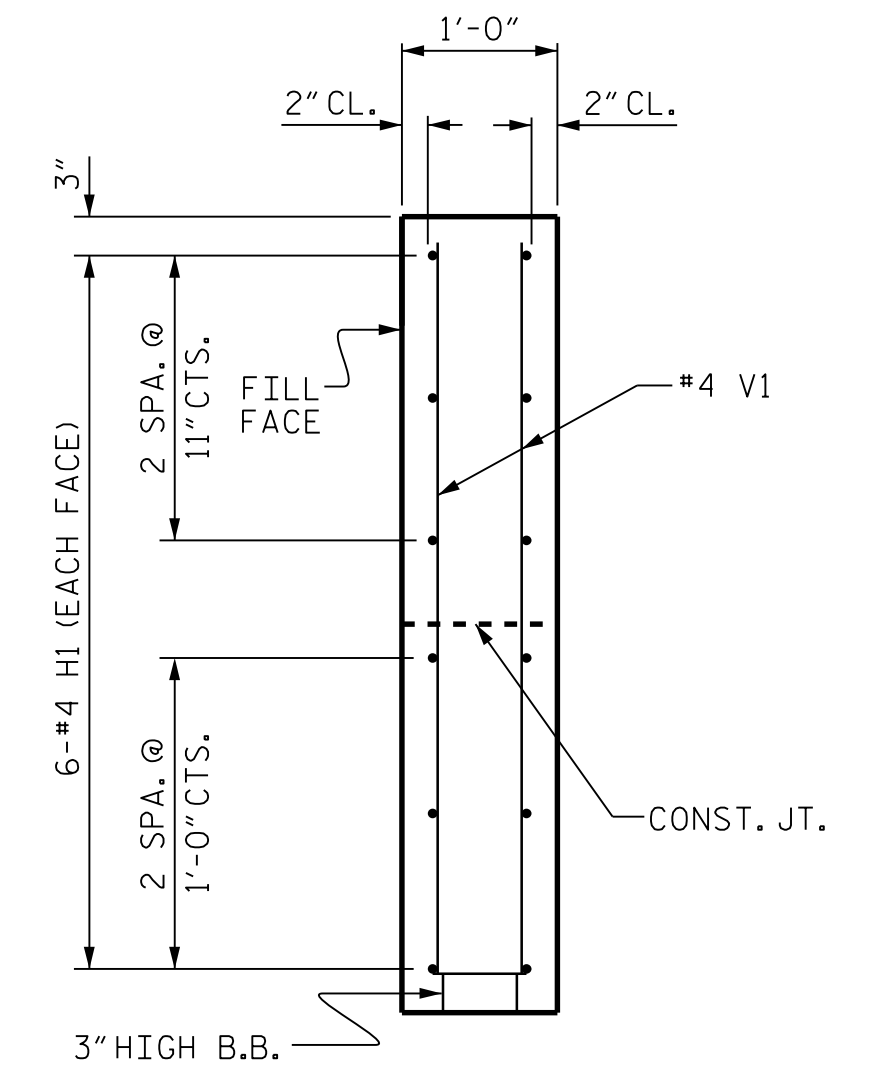


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.6.R.90
 BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

END BENT 1
 WING DETAILS

REVISIONS

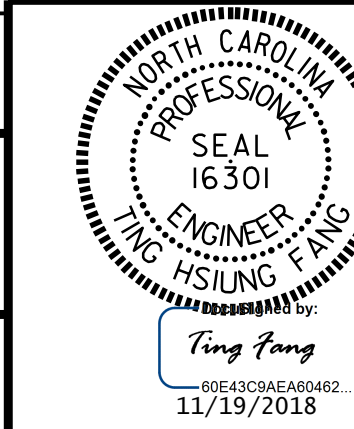
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1			3		
2			4		

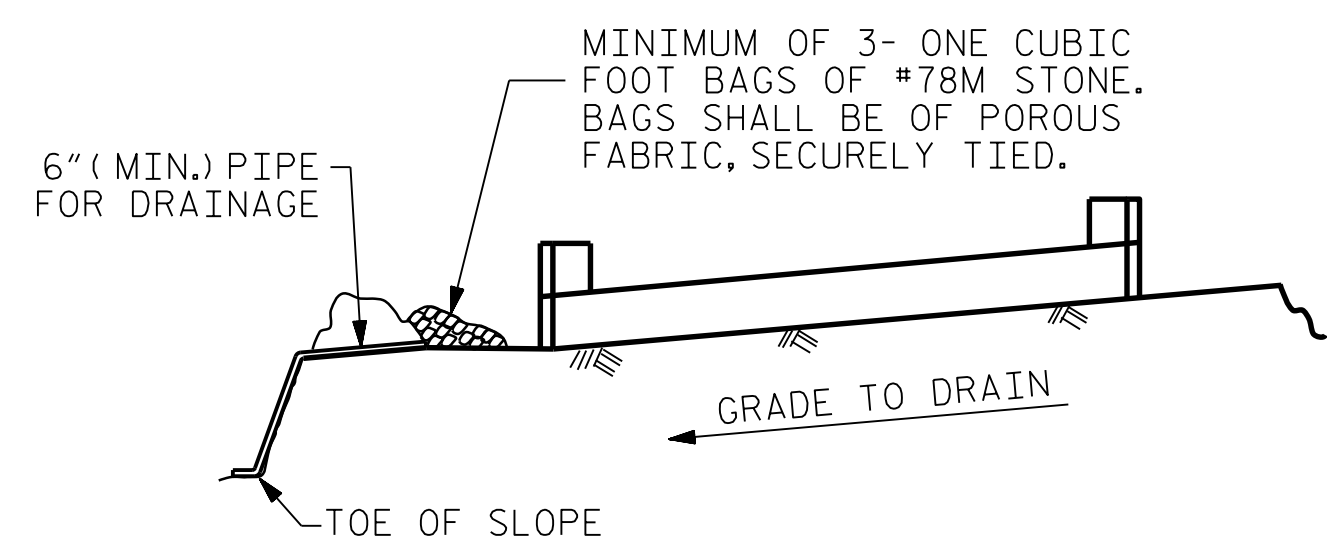
SHEET NO.
 S-13
 TOTAL SHEETS
 21

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DWG. No.
 DRAWN BY: VDK DATE: 08/18
 CHECKED BY: THF DATE: 08/18
 DESIGN ENGINEER: VDK DATE: 08/18



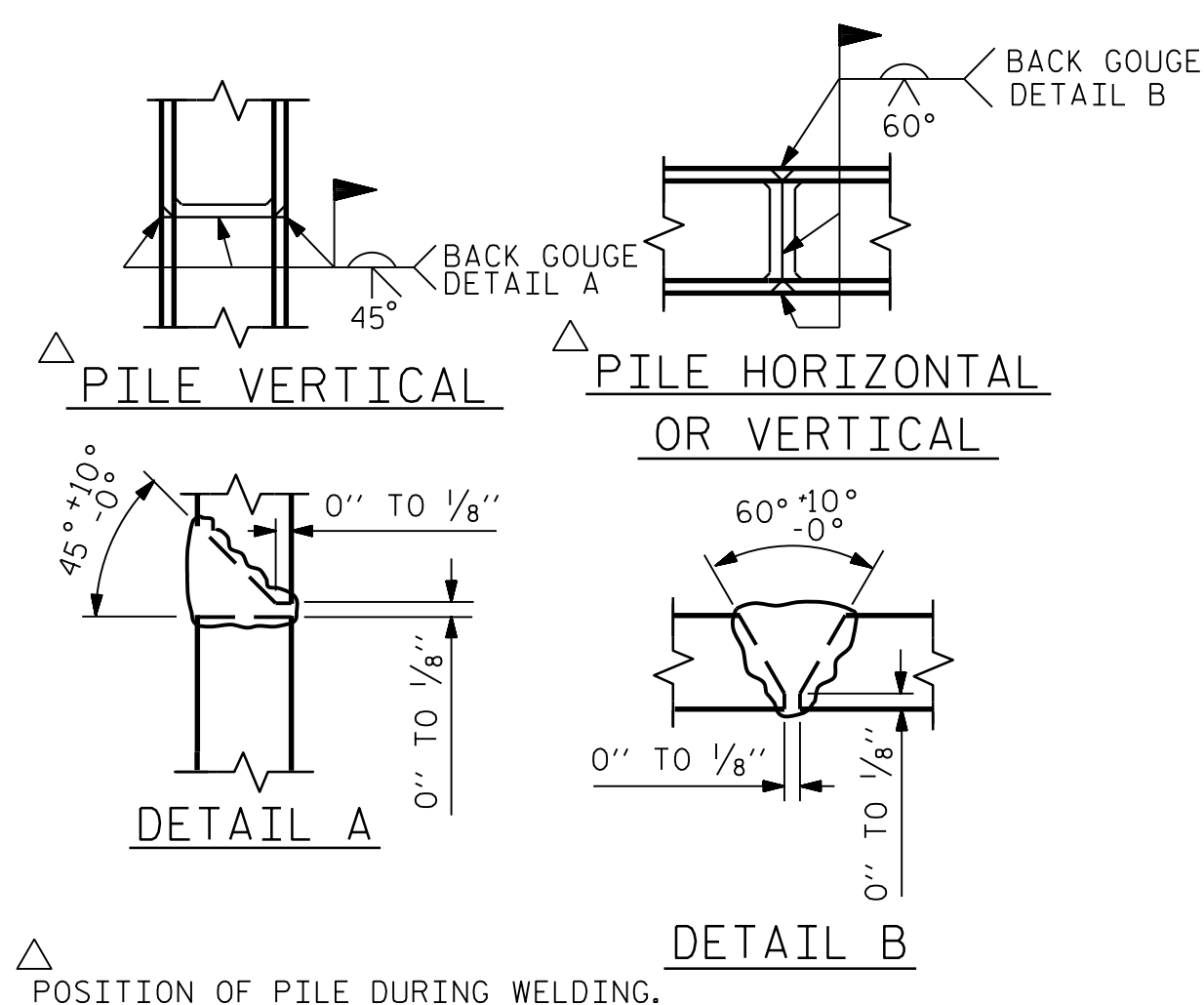


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

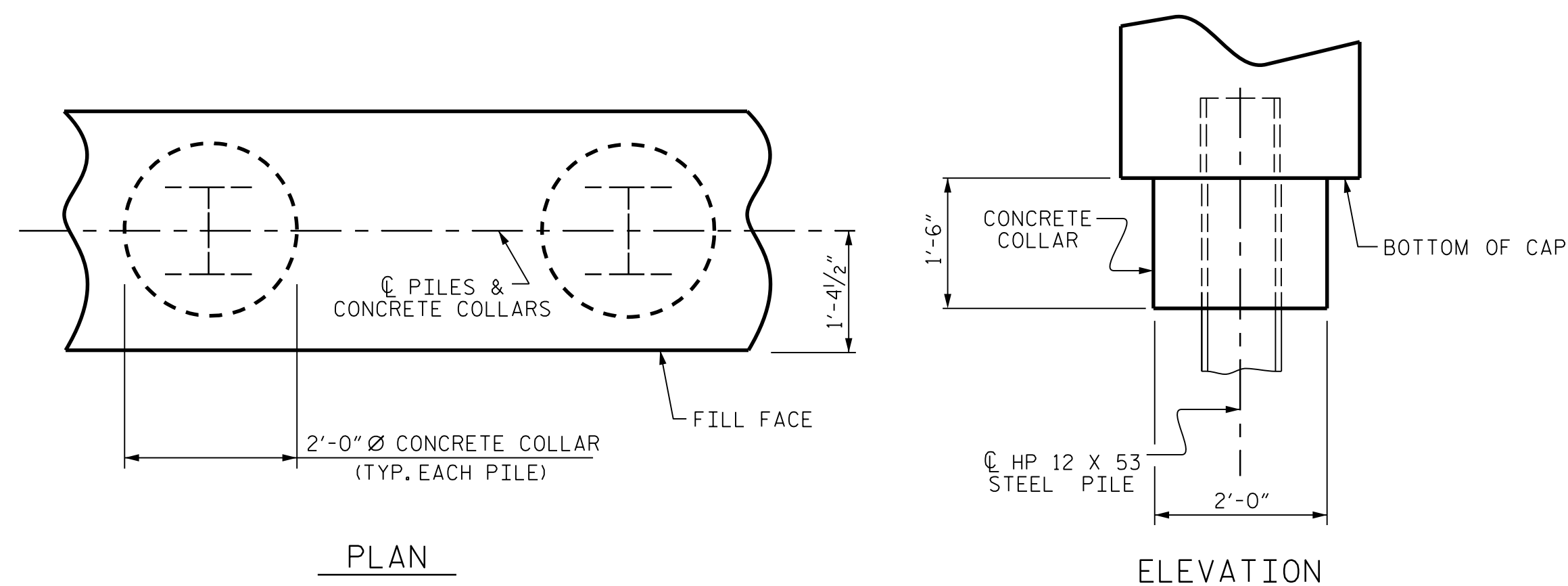
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



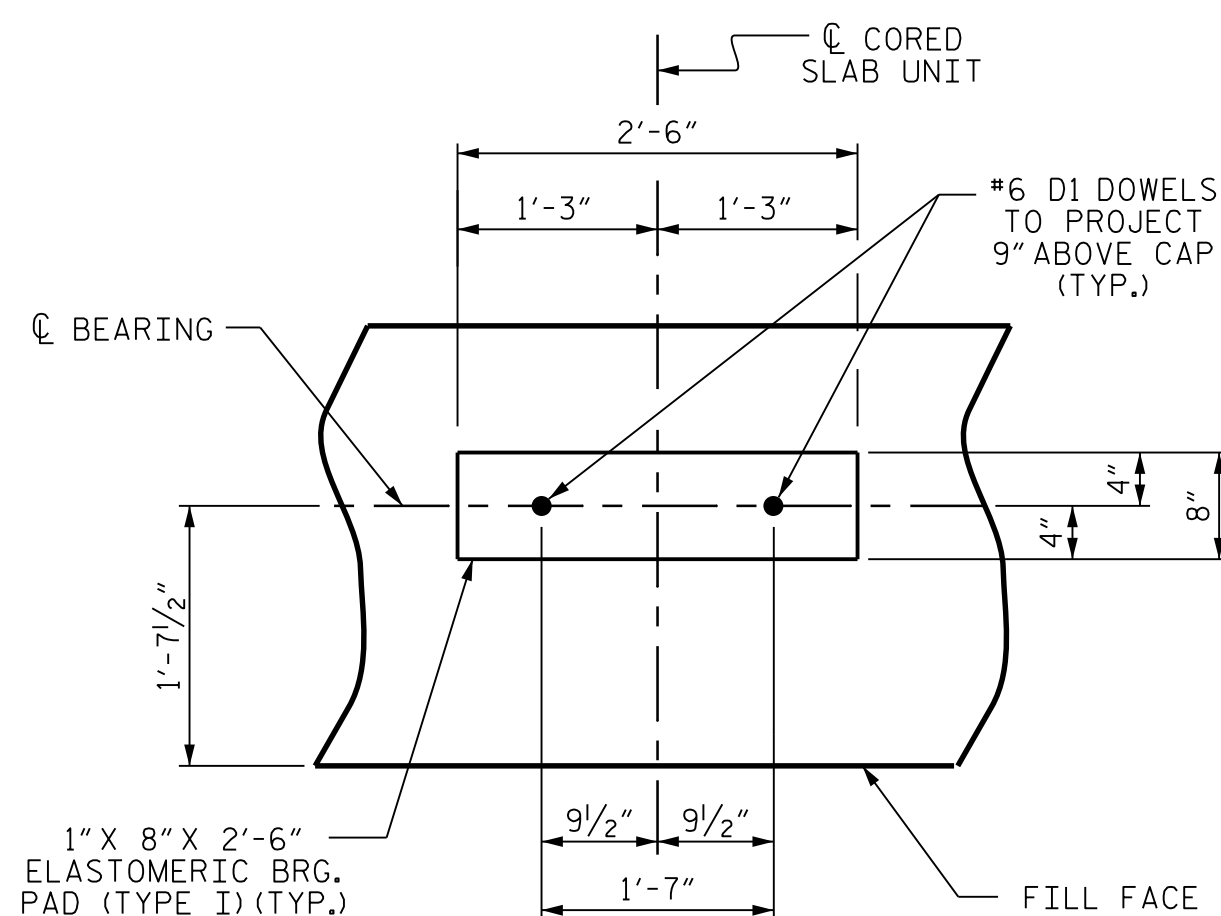
PILE SPLICE DETAILS

BAR TYPES					BILL OF MATERIAL				
					END BENT 1				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9		41'-0"	1115	D1	#6	STR	1'-6"	50
B2	#4	STR	20'-7"	220	H1	#4	2	7'-10"	126
B3	#4	STR	2'-5"	16	K1	#4	STR	2'-11"	23
					S1	#4	3	7'-5"	248
					S2	#4	4	3'-2"	106
					S3	#4	5	6'-6"	61
					V1	#4	STR	4'-8"	150
					REINFORCING STEEL 2115 LBS.				
					CLASS A CONCRETE BREAKDOWN:				
					POUR #1 CAP, LOWER PART OF WINGS & COLLARS 12.4 C.Y.				
					POUR #2 UPPER PART OF WINGS 1.8 C.Y.				
					TOTAL 14.2 C.Y.				
					HP 12 X 53 STEEL PILES				
					NO: 7 LIN. FT. = 350				
					PILE DRIVING EQUIP. SETUP FOR HP 12 X 53 STEEL PILES EA. 7				

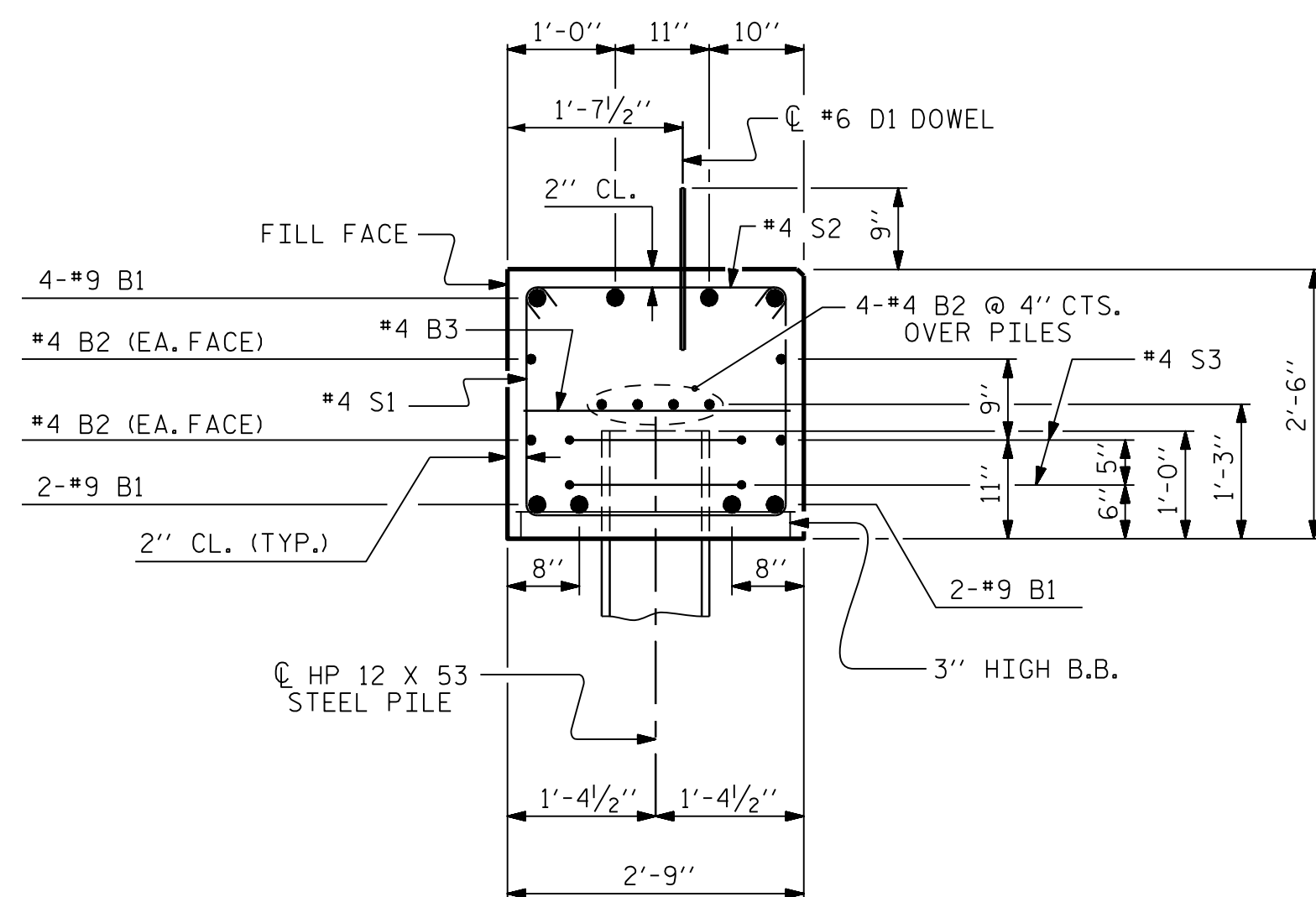


CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



SECTION A-A

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

PROJECT NO. 17BP.6.R.90
 BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1
 DETAILS

REVISIONS

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

SHEET NO.

S-14
 TOTAL SHEETS 21

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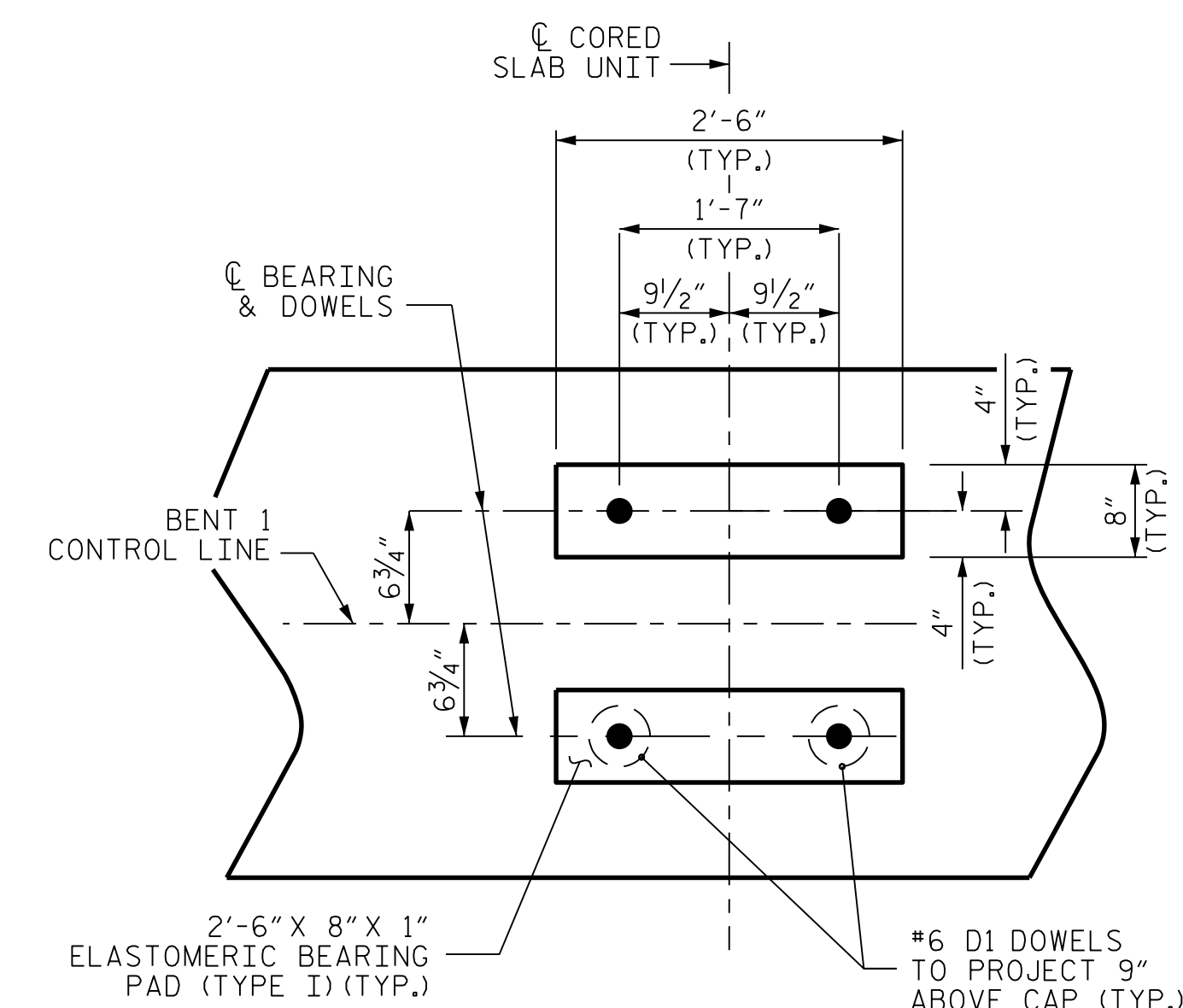
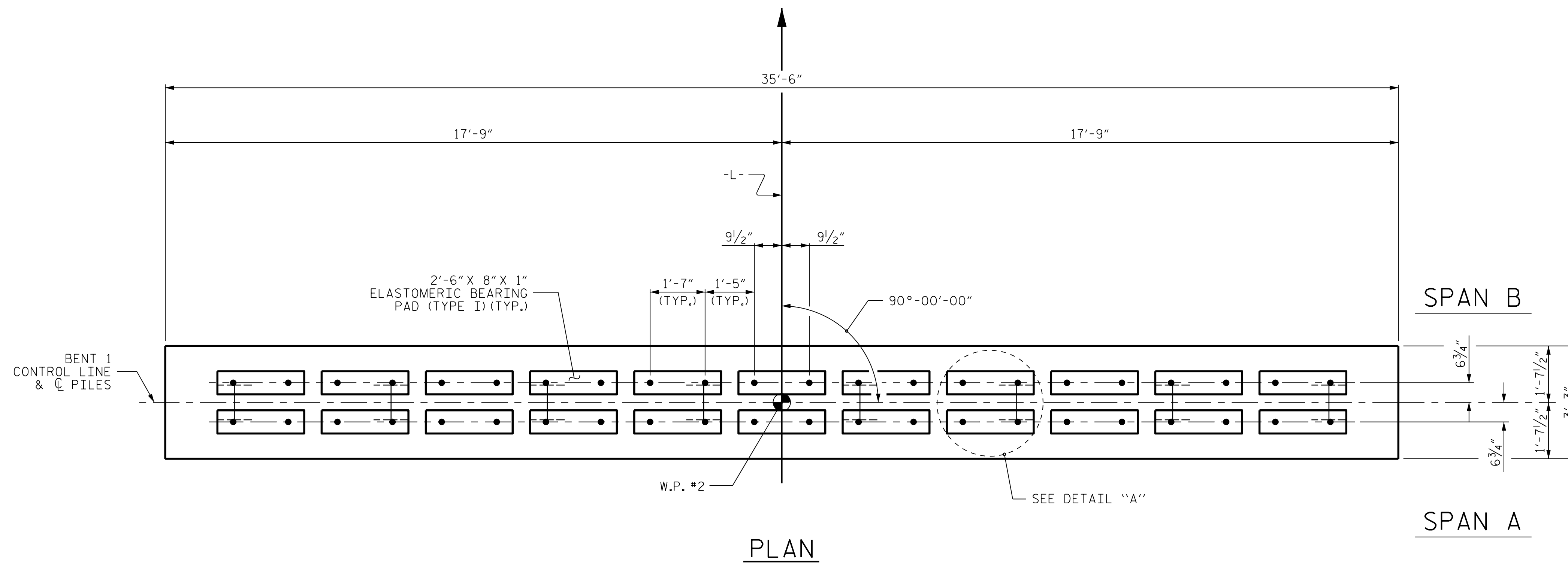
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 CHECKED BY: THF DATE: 08/18
 DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.

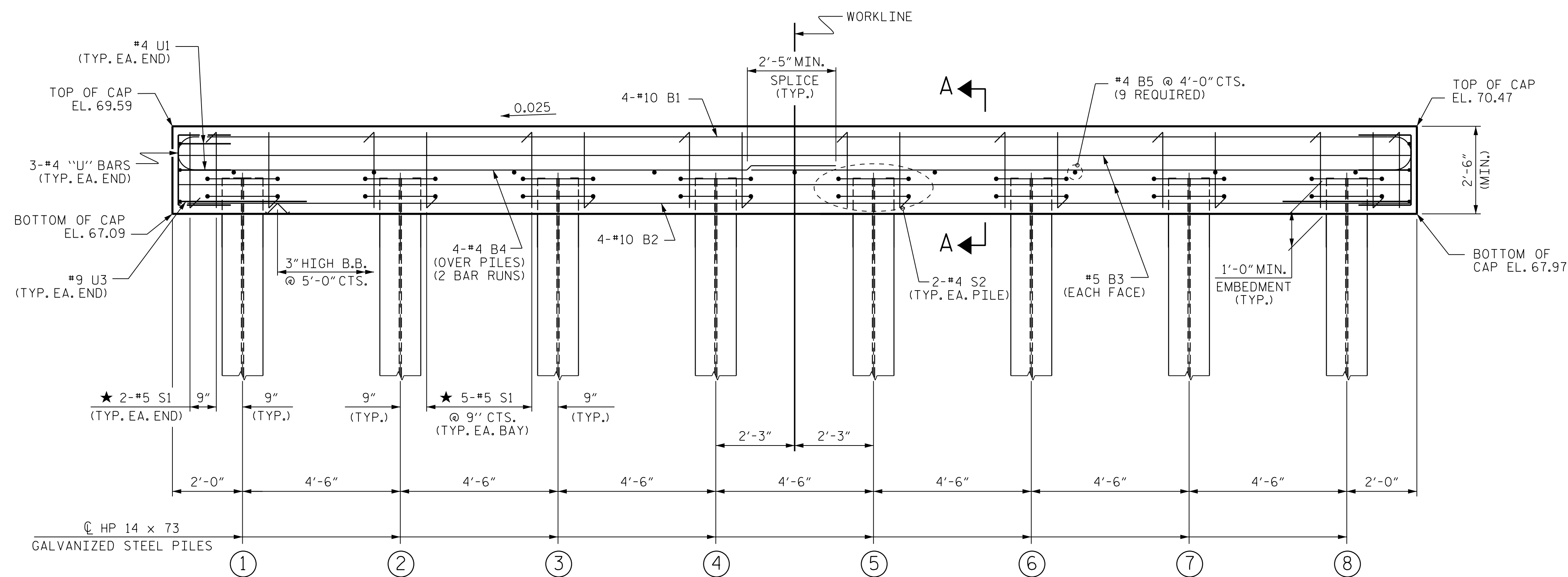
NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 16301
 TING FANG
 11/19/2018

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 33 FEET, GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"
(DIMENSIONS ARE TYPICAL EACH BEARING)



TOP OF PILE ELEVATIONS	
①	68.15
②	68.27
③	68.38
④	68.49
⑤	68.60
⑥	68.71
⑦	68.82
⑧	68.94

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

BENT 1

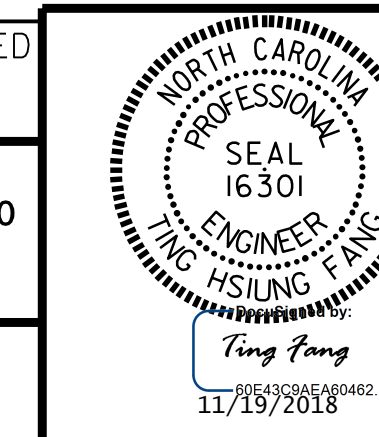
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			21

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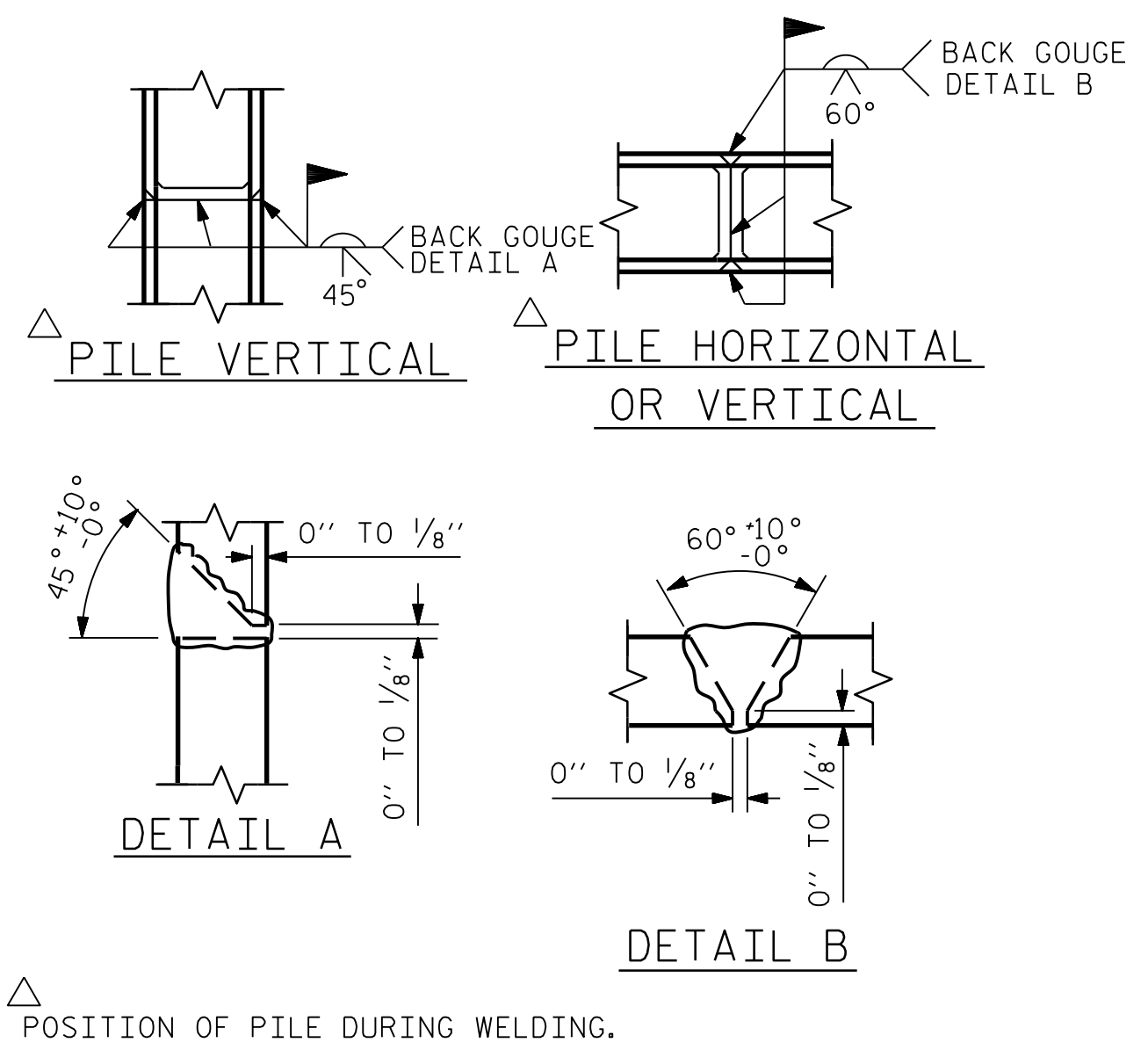
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 DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.



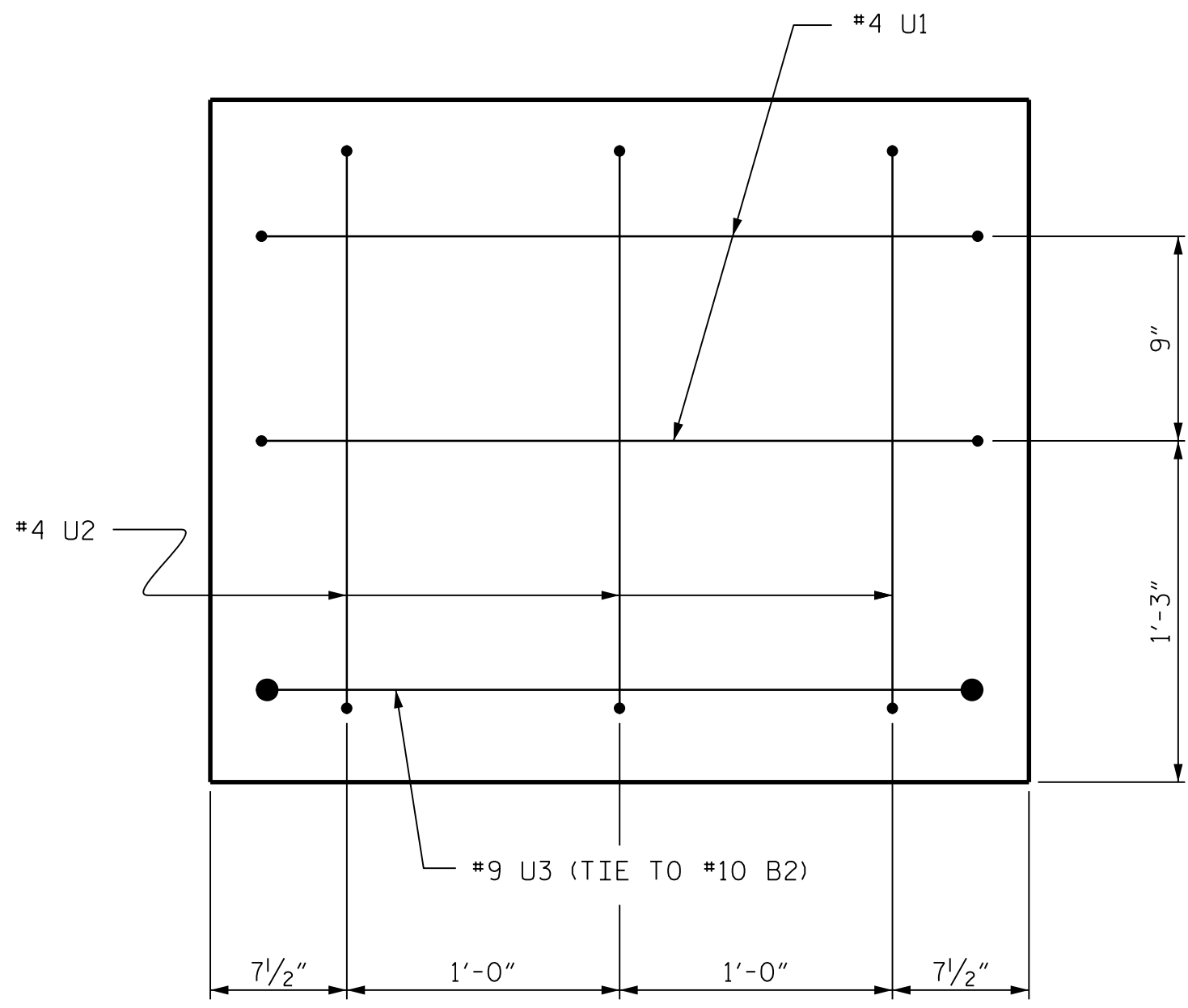
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ELEVATION
 FOR SECTION A-A, SEE SHEET 2 OF 2

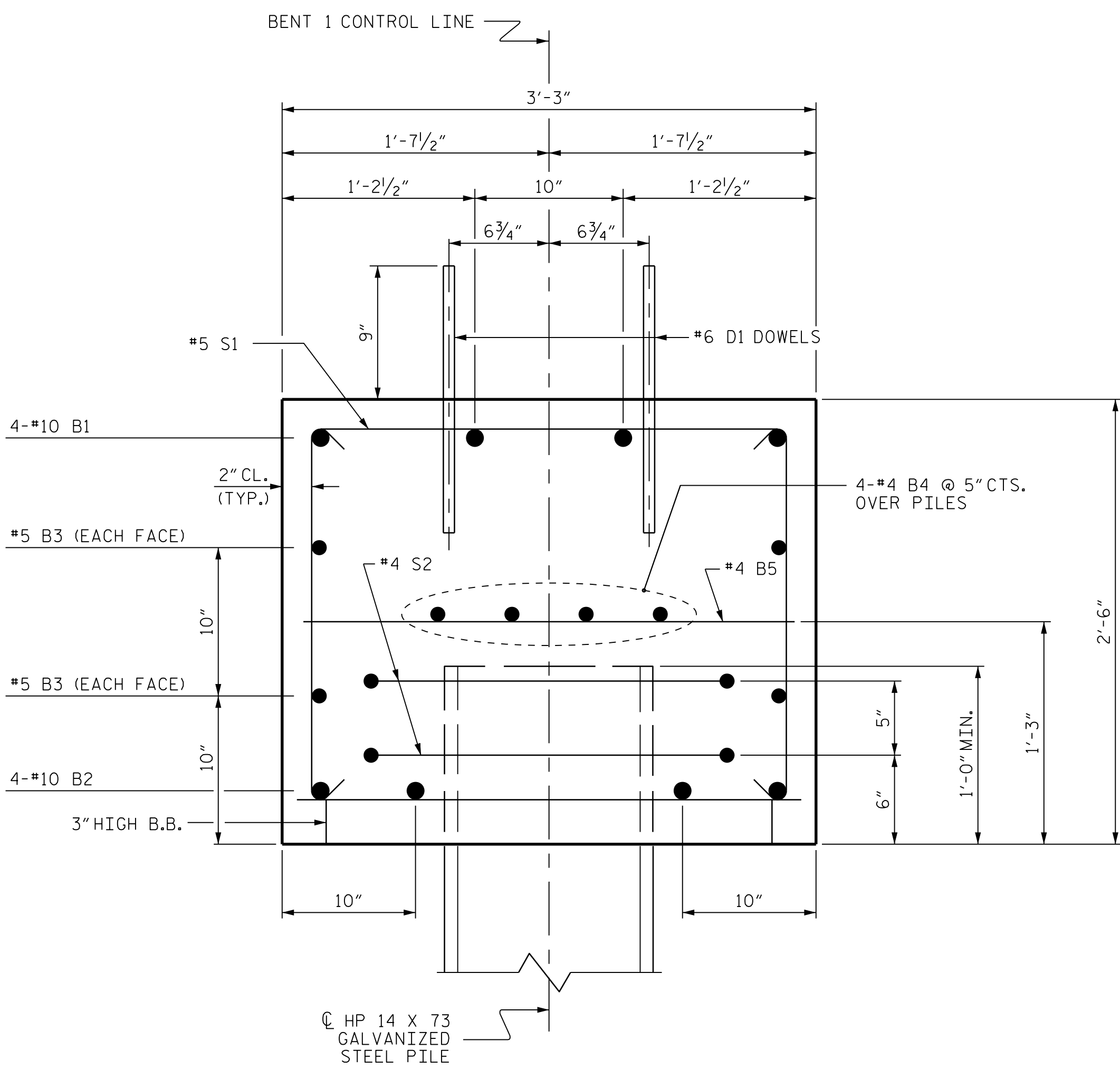


PILE SPLICE DETAILS

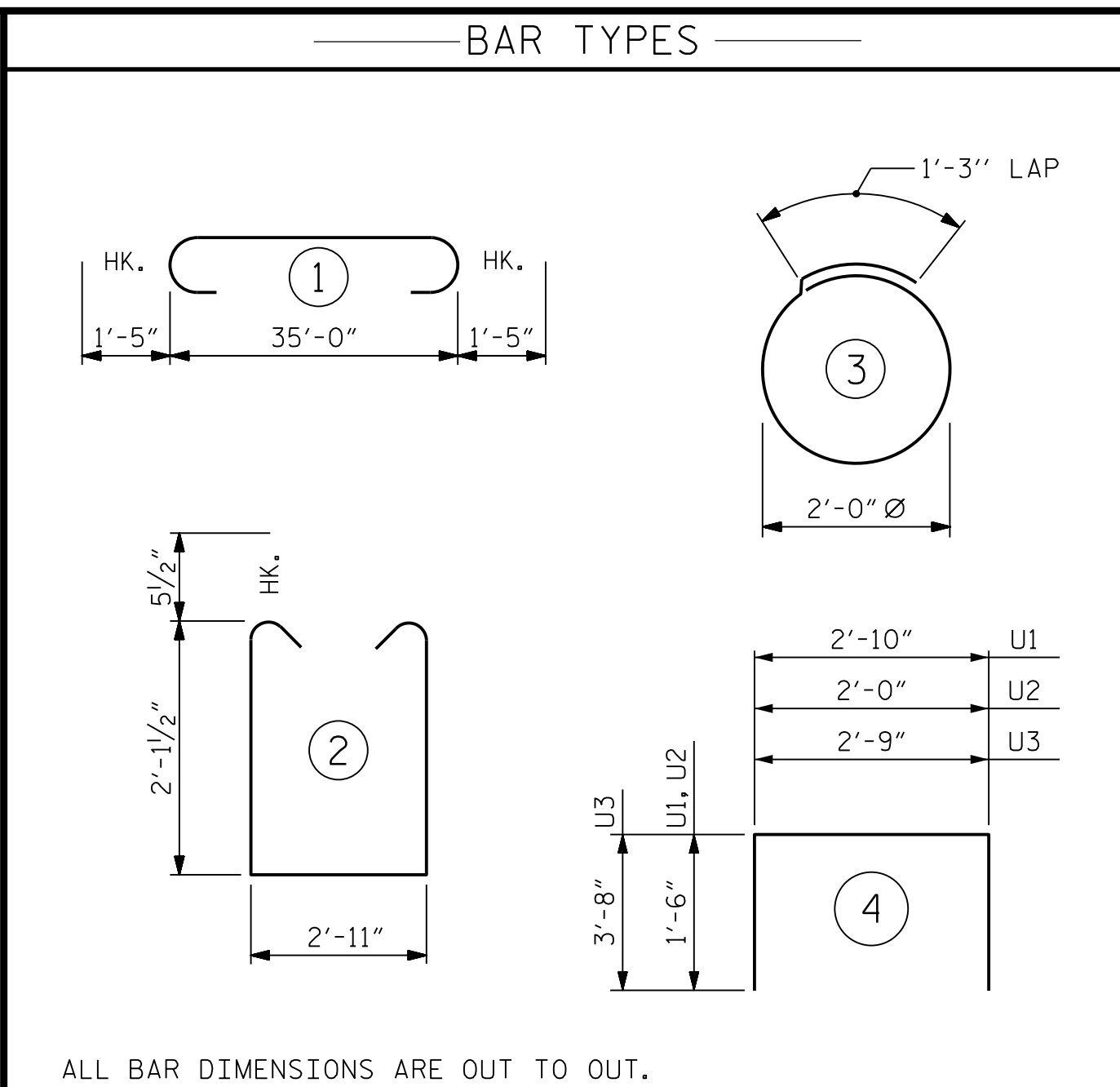
△ POSITION OF PILE DURING WELDING.



END OF CAP VIEW
(TYPICAL BOTH ENDS)



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	9	#4	STR	2'-11"	18
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
REINFORCING STEEL					2136 LBS
TOTAL CLASS A CONCRETE					10.7 C.Y.
HP 14 X 73 GALVANIZED STEEL PILES					
No. 8					LIN. FT. 520
PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 GALVANIZED STEEL PILES					EA. 8

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
BENT 1

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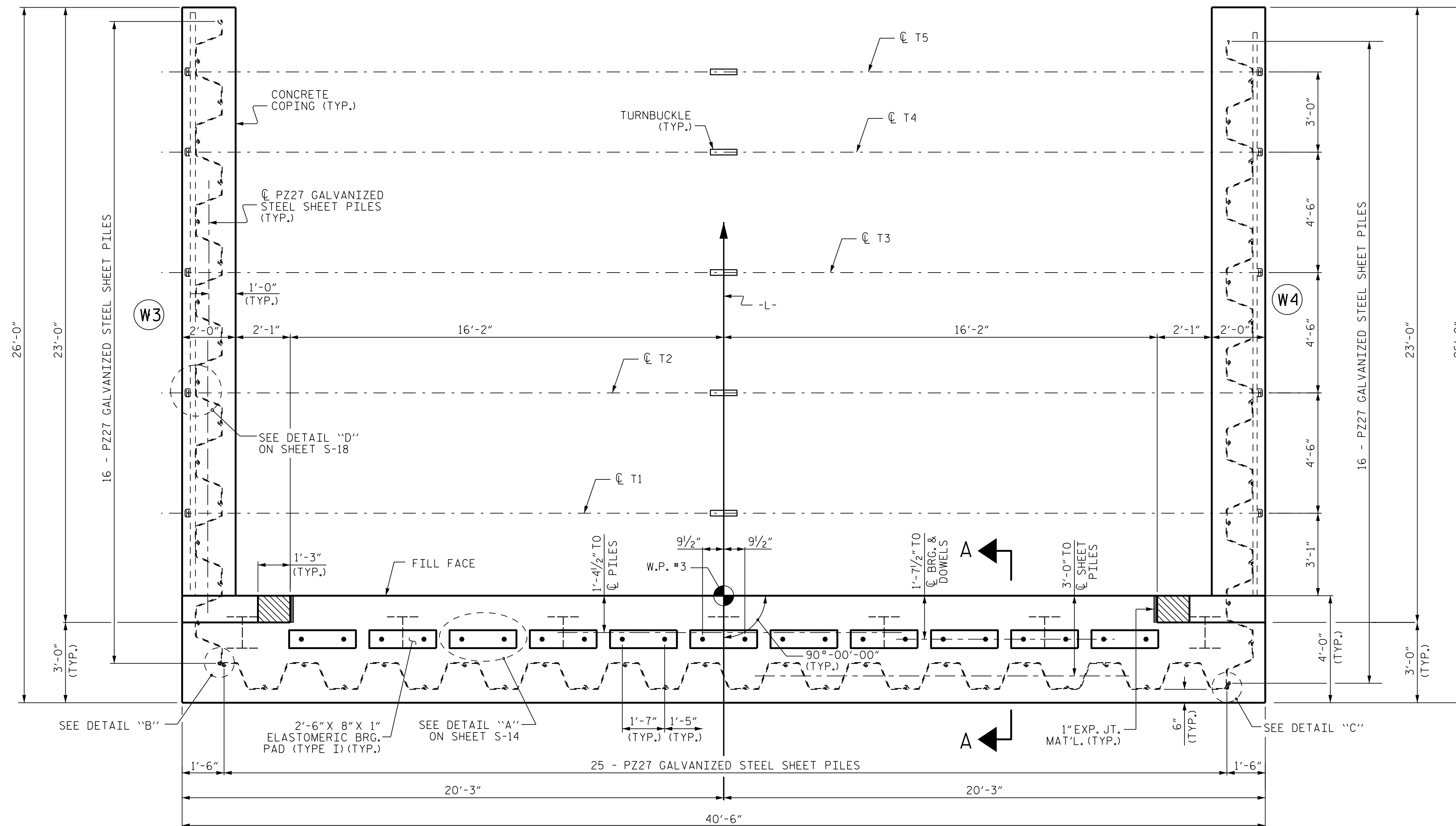
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 CDM SMITH
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 Raleigh, NC 27612-3228
 NC COA No. F-1255



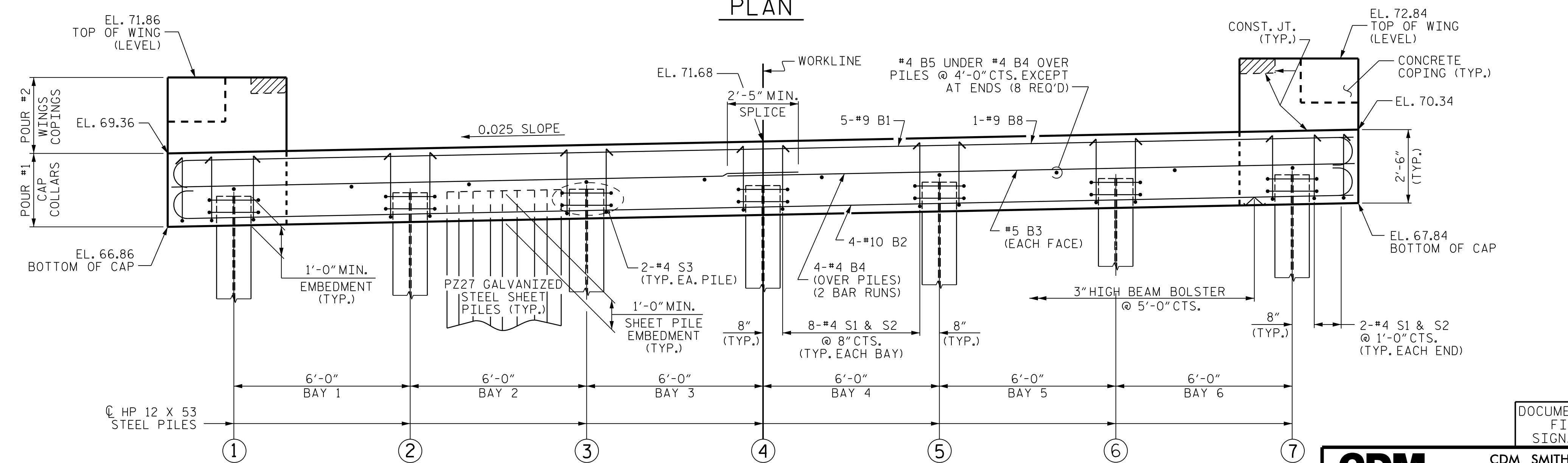
DRAWN BY : VDK	DATE : 08/18	DWG. No.
CHECKED BY : THF	DATE : 08/18	
DESIGN ENGINEER : VDK	DATE : 08/18	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
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2			4			21

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PLAN

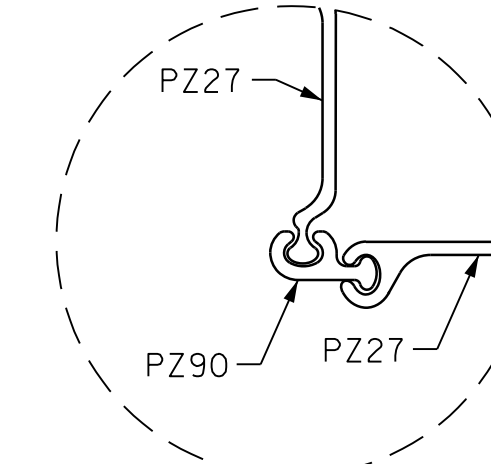


ELEVATION

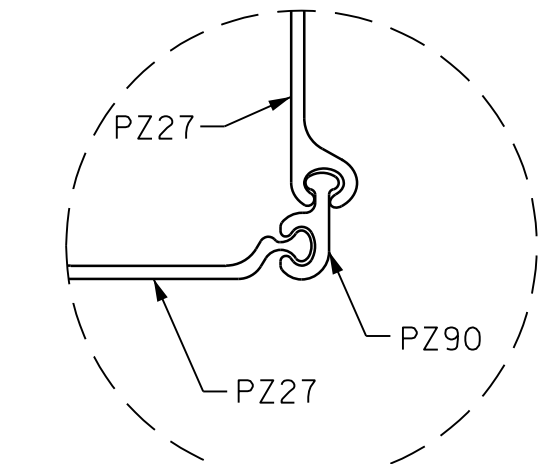
FOR SECTION A-A, SEE SHEET 3 OF 3.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL" ON SHEET S-14.

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 3 OF 3.
- FOR TIE ROD ANCHOR SYSTEM AND CONCRETE COPING DETAILS, SEE SHEET 2 OF 3.
- FOR 18" STEEL SHEET PILE SYSTEM, SEE SPECIAL PROVISIONS.
- GALVANIZE THE FULL LENGTH OF PZ27 AND PZ90 STEEL SHEET PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
- THE CONSTRUCTION SEQUENCE FOR THE 18" STEEL SHEET PILE SYSTEM SHALL BE AS FOLLOWS, UNLESS DIRECTED BY THE ENGINEER:
 - INSTALL ALL SHEET PILES TO THE REQUIRED TIP ELEVATIONS AS SHOWN ON THE PLANS.
 - END BENT PILES SHALL BE DRIVEN BEFORE PLACING BACKFILL.
 - CONSTRUCT THE CAST-IN-PLACE CONCRETE COPING.
 - THE CONCRETE COPING SHALL HAVE A SMOOTH FINISH. CONCRETE COPING IS REQUIRED ALONG THE ENTIRE LENGTH OF STEEL SHEET PILE WINGS.



DETAIL "B"



DETAIL "C"

TOP OF PILE ELEVATIONS	
①	67.93
②	68.07
③	68.21
④	68.36
⑤	68.50
⑥	68.65
⑦	68.79

PROJECT NO. 17BP.6.R.90
 BLADEN COUNTY
 STATION: 15+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2

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

SHEET NO. S-17
 TOTAL SHEETS 21

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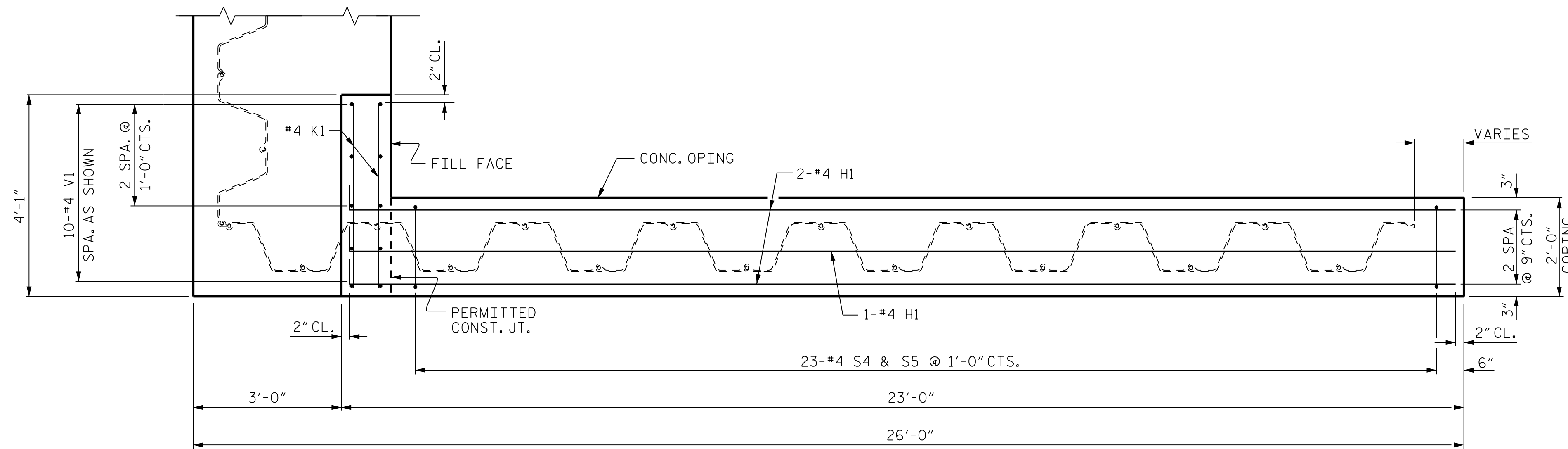
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 NC COA No. F-1255

DRAWN BY: VDK DATE: 08/18
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 DESIGN ENGINEER: VDK DATE: 08/18

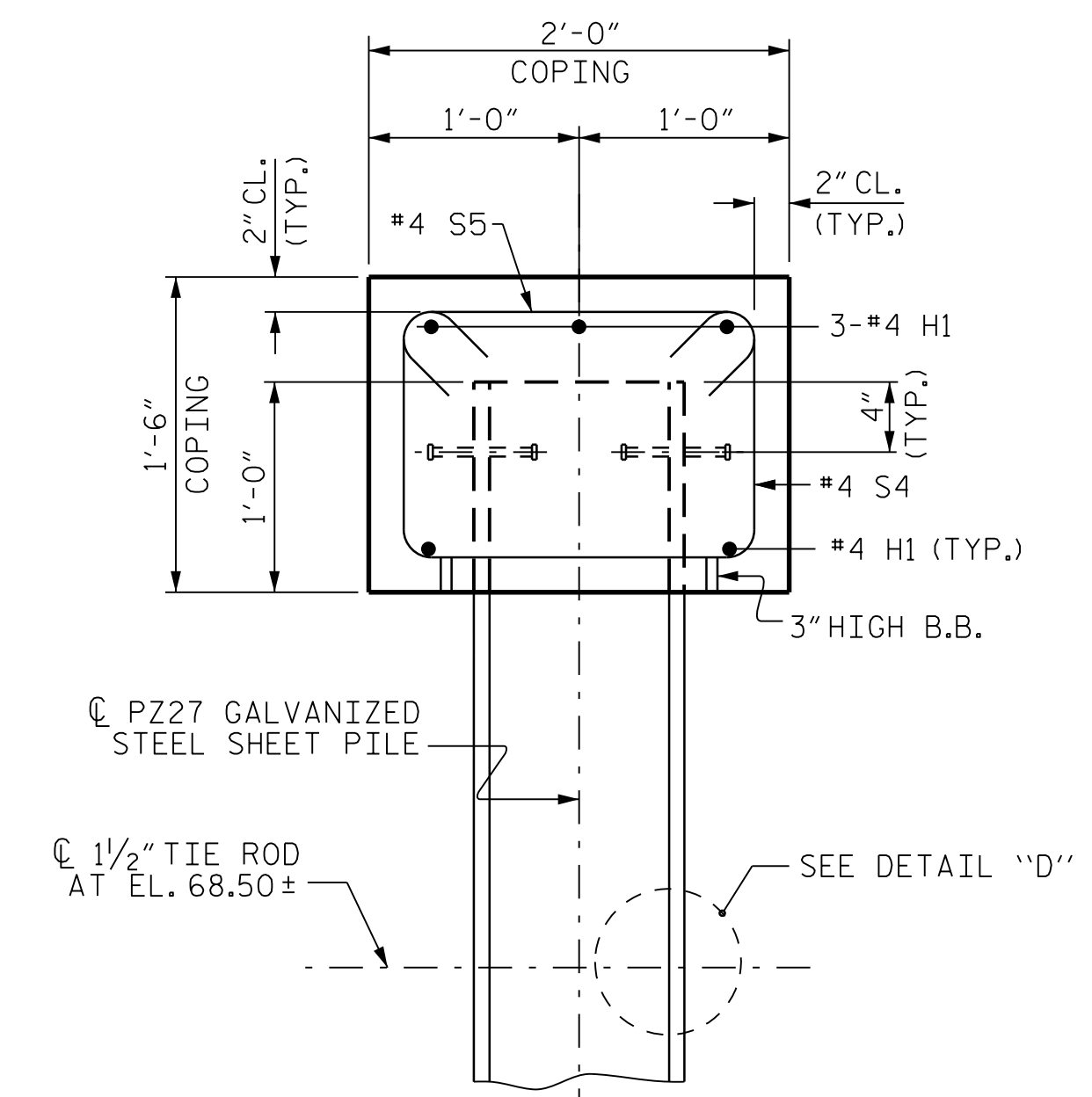
DWG. No.

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 16301
 TUNG FANG
 11/19/2018

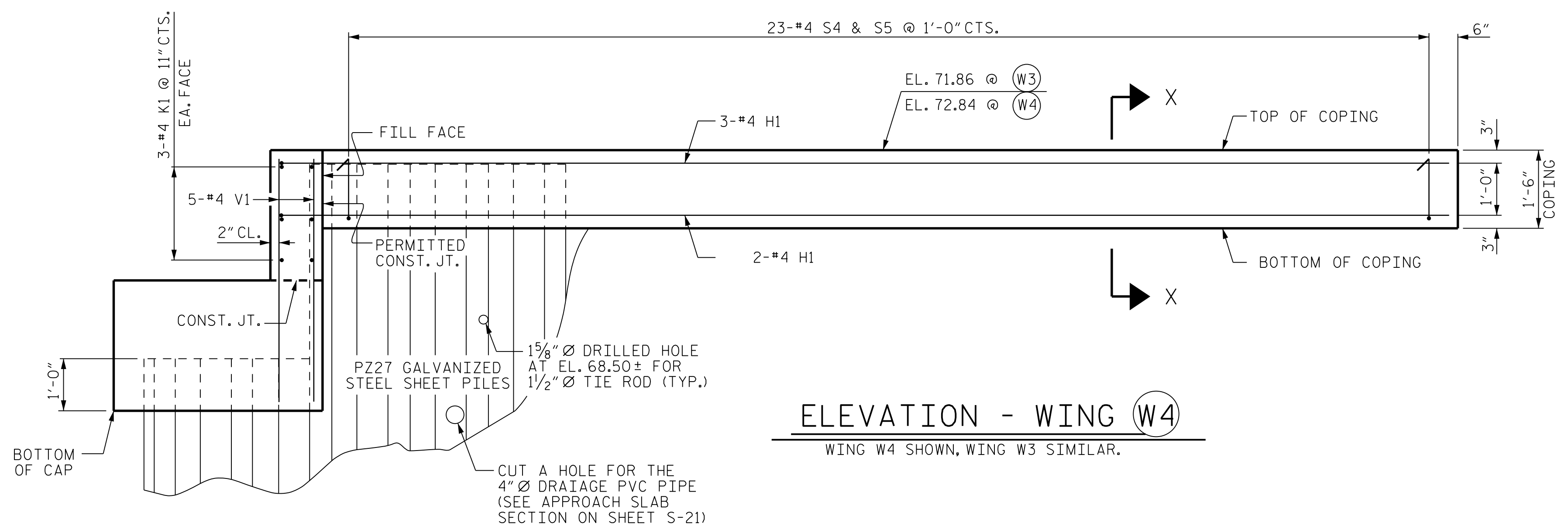
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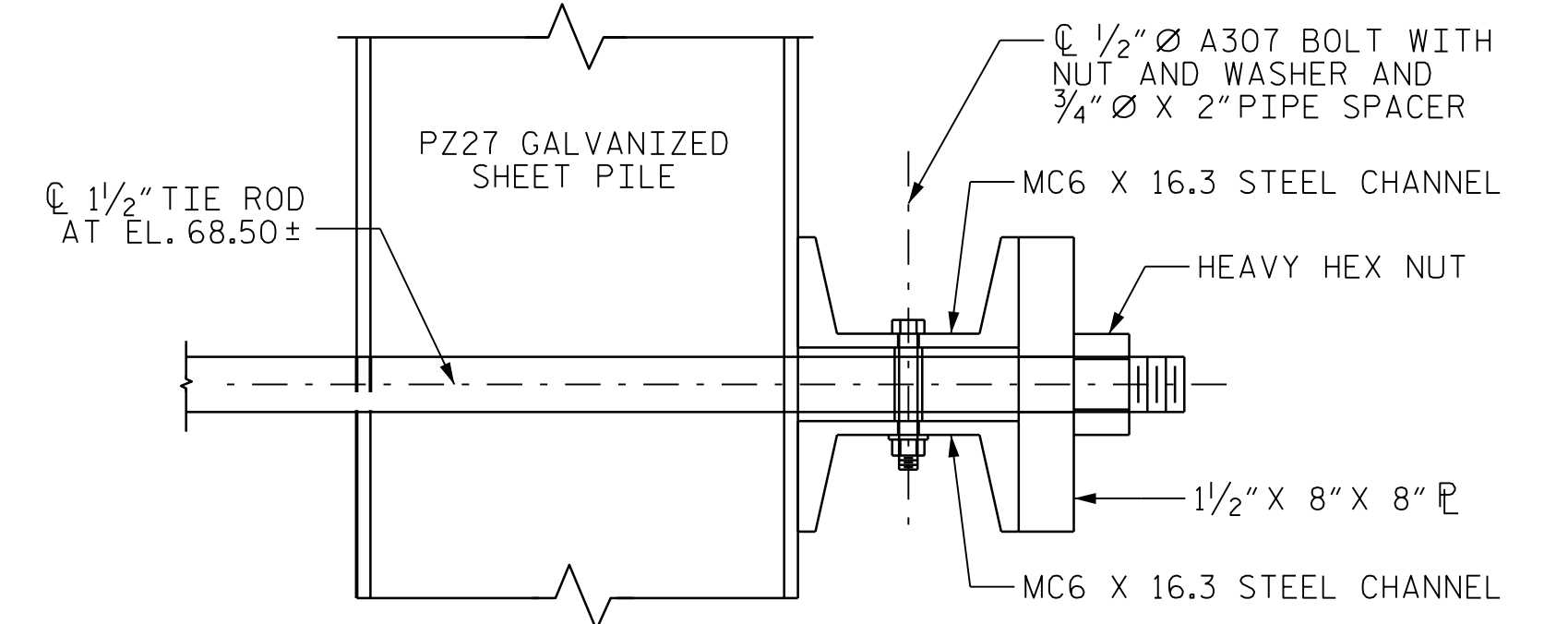
PLAN - WING (W4)
WING W4 SHOWN, WING W3 SIMILAR.



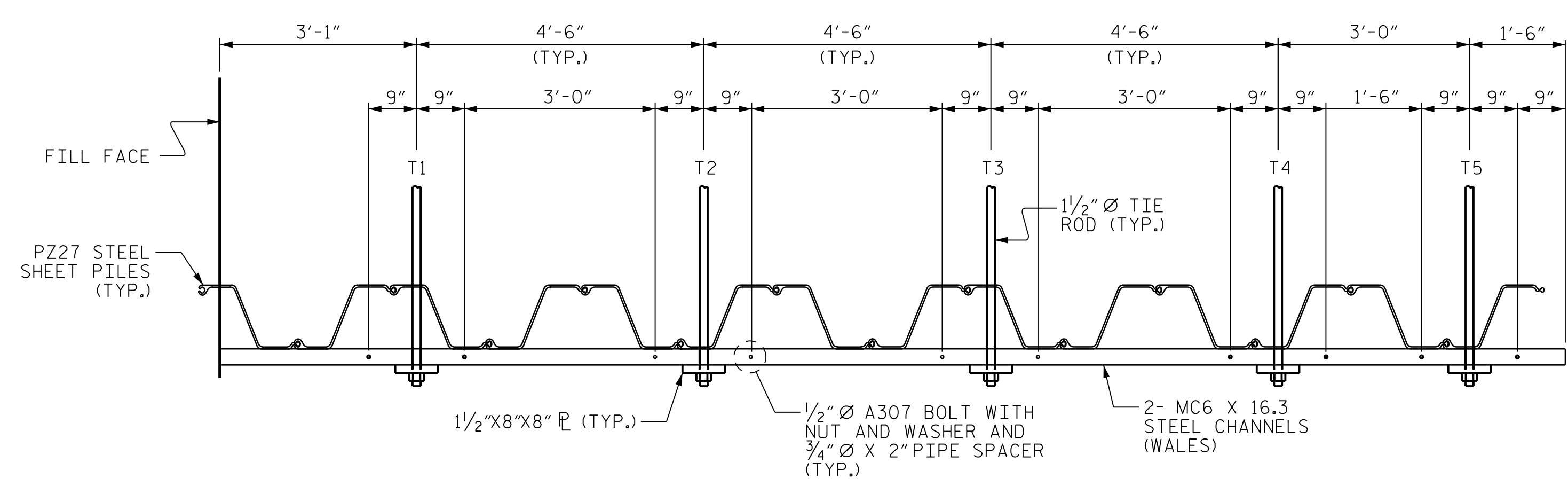
SECTION X-X
SHOWING ANCHOR STUDS AND ANCHORAGE SYSTEM
BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S4 BARS.



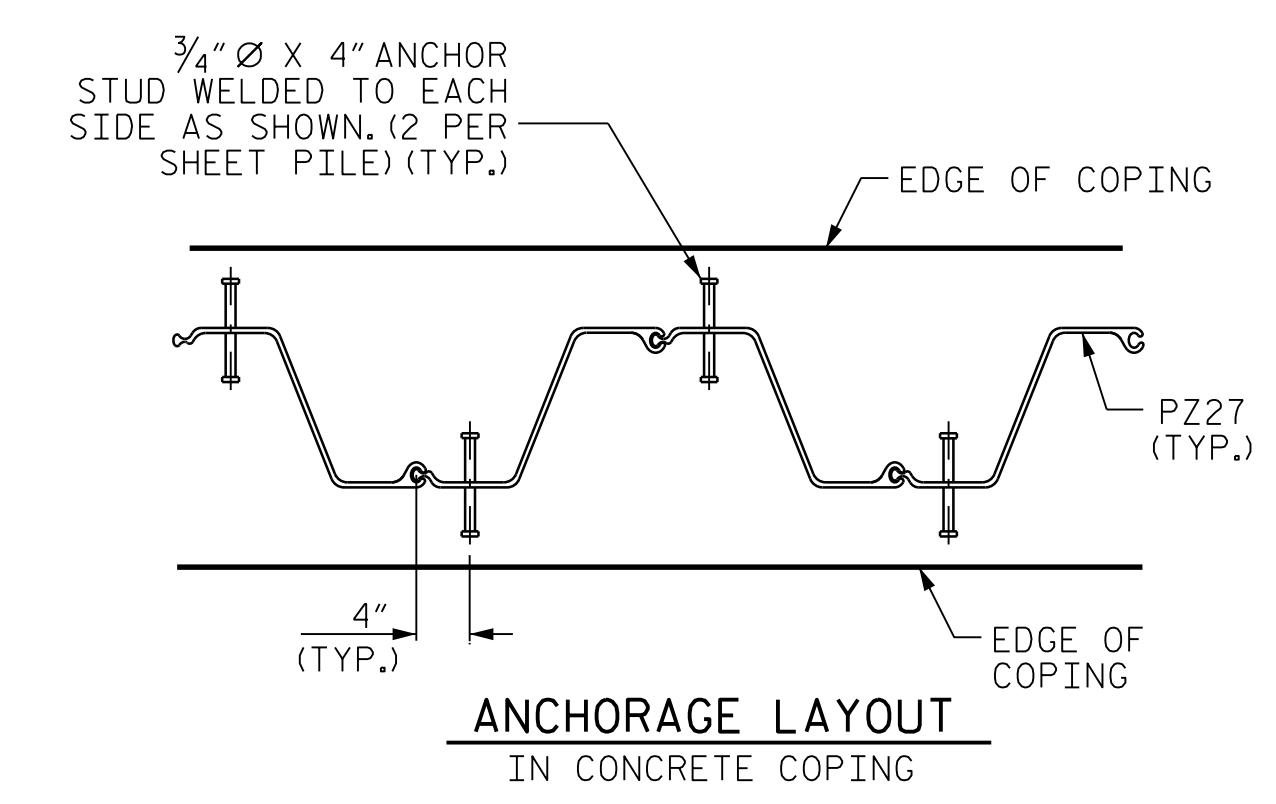
ELEVATION - WING (W4)
WING W4 SHOWN, WING W3 SIMILAR.



DETAIL "D"



TIE ROD ANCHOR SYSTEM - (W4)



ANCHORAGE LAYOUT
IN CONCRETE COPING

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
18" STEEL SHEET PILE
SYSTEM DETAILS

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

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NC COA No. F-1255

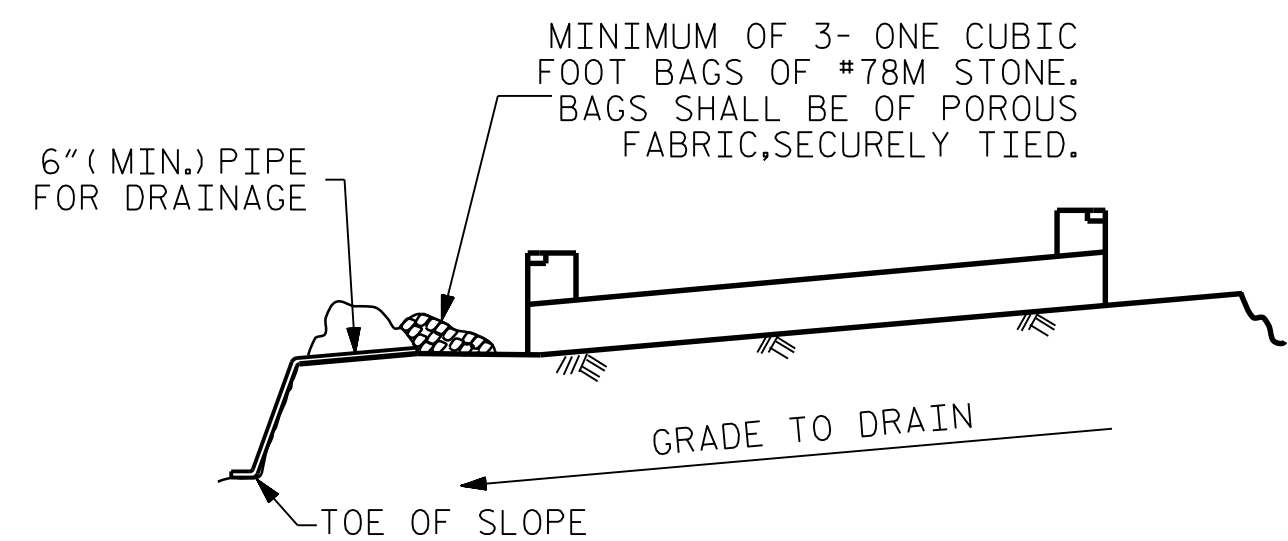
DRAWN BY: VDK DATE: 08/18
CHECKED BY: THF DATE: 08/18
DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
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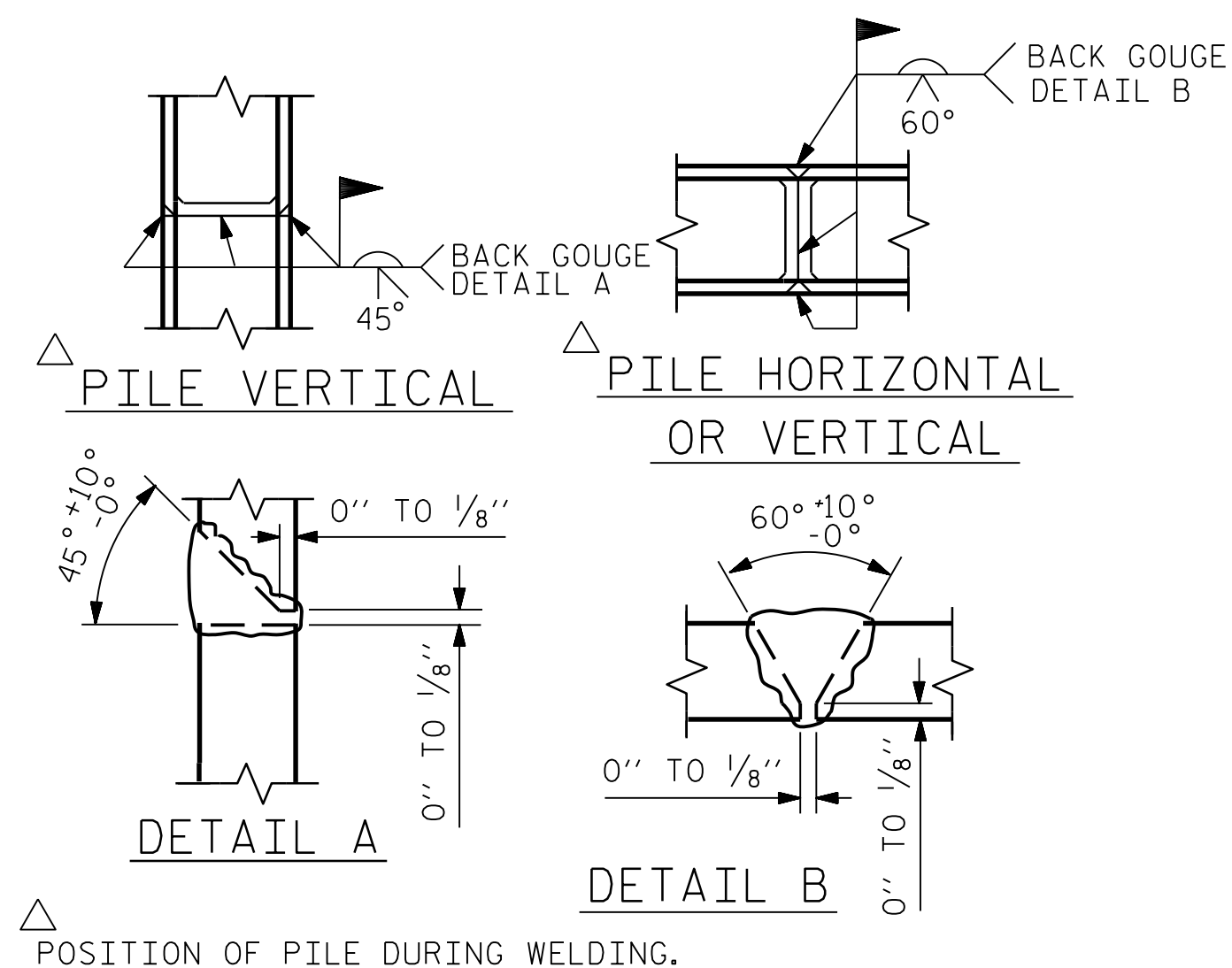


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

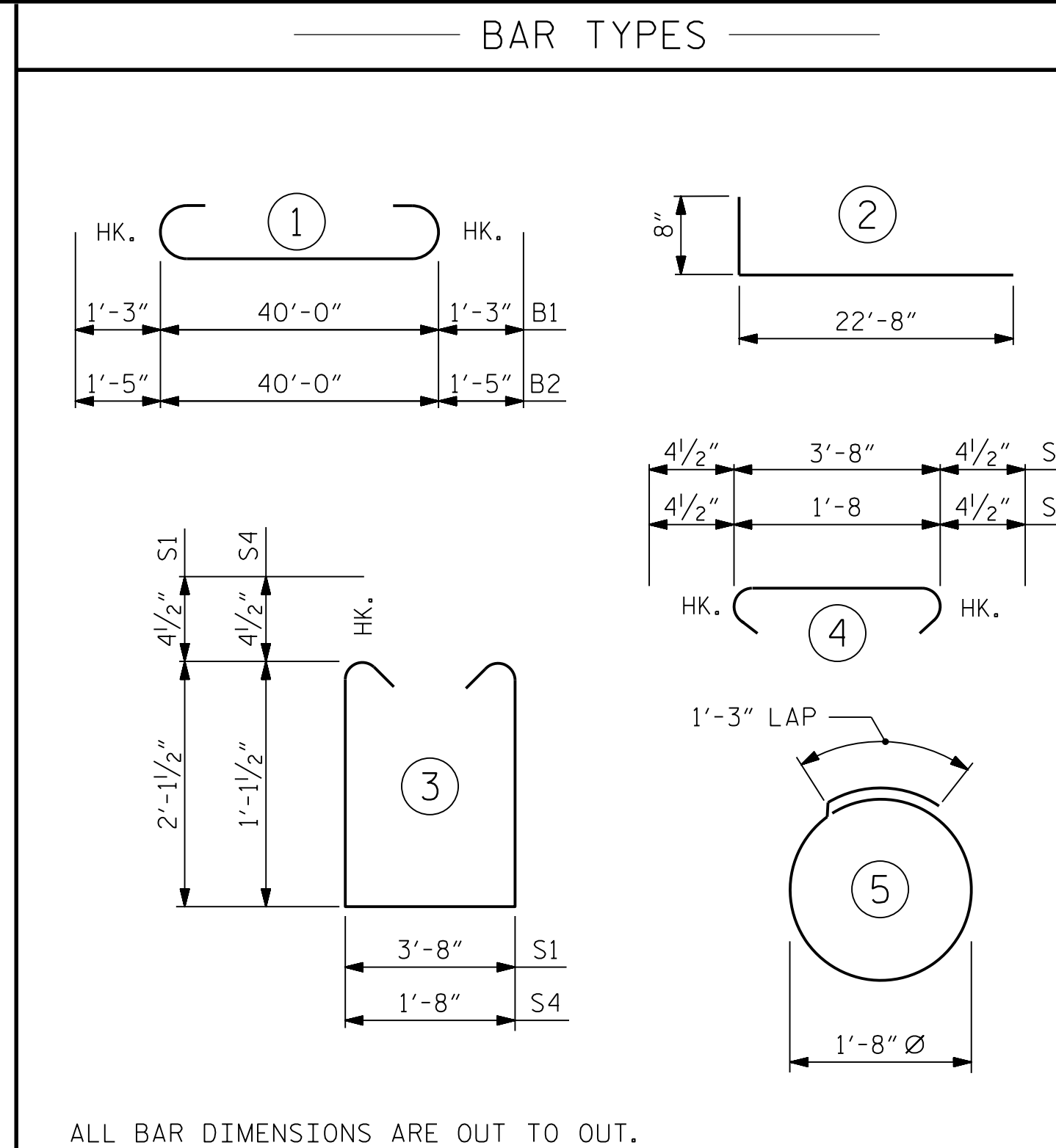
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

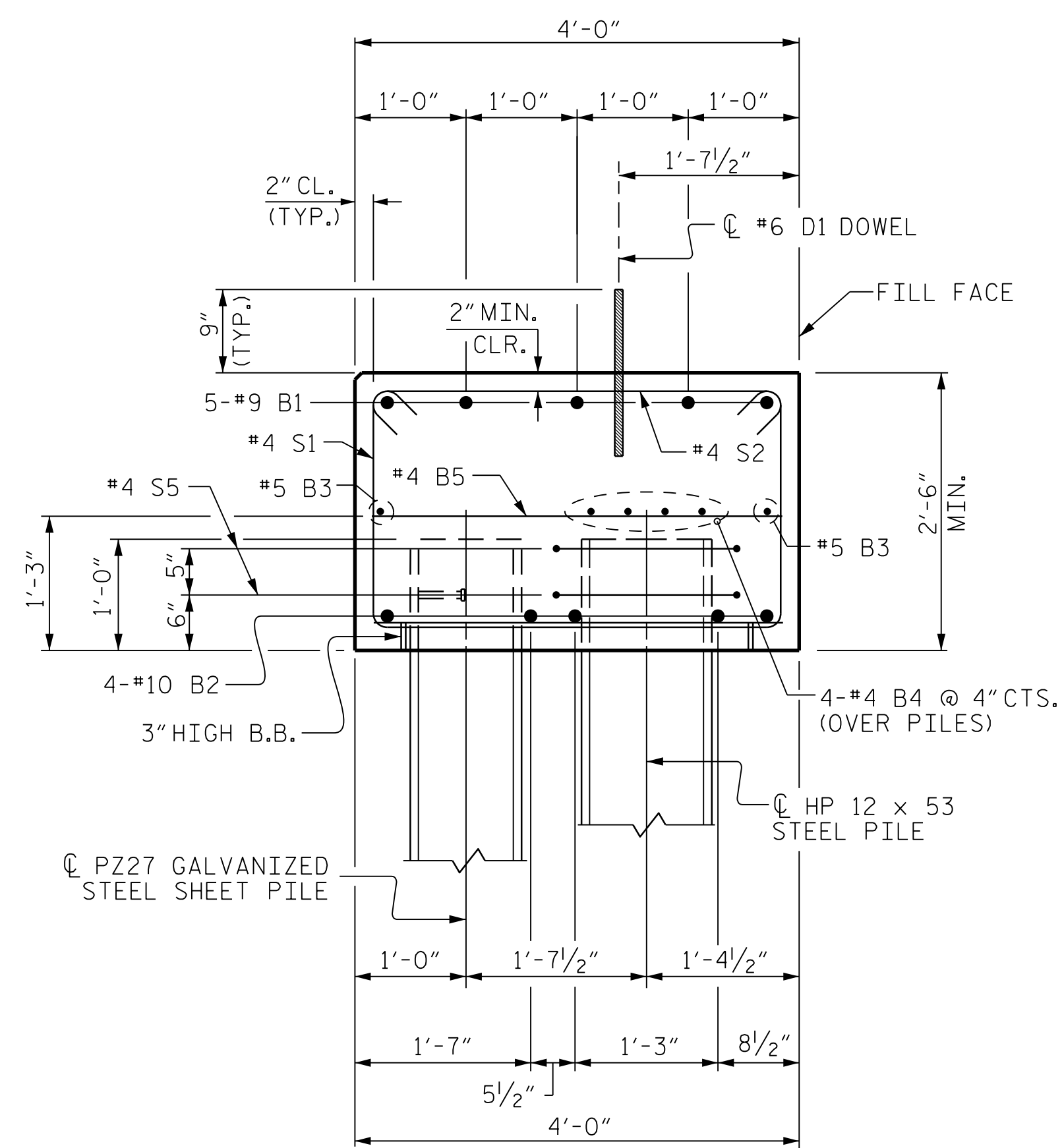
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	42'-6"	723
B2	4	#10	1	42'-10"	737
B3	2	#5	STR	40'-2"	84
B4	8	#4	STR	21'-4"	114
B5	8	#4	STR	3'-8"	20
D1	22	#6	STR	1'-6"	50
H1	10	#4	2	23'-4"	156
K1	12	#4	STR	3'-9"	30
S1	52	#4	3	8'-8"	301
S2	52	#4	4	4'-5"	153
S3	14	#4	5	6'-6"	61
S4	46	#4	3	4'-8"	143
S5	46	#4	4	2'-5"	74
V1	20	#4	STR	4'-8"	62

REINFORCING STEEL 2,708 LBS.

CLASS A CONCRETE BREAKDOWN		
POUR #1	CAP & COLLARS	16.4 C.Y.
POUR #2	WINGS & COPINGS	5.7 C.Y.
TOTAL		24.2 C.Y.

HP 14 X 73 STEEL PILES
NO: 7 LIN. FT. 315
PILE DRIVING EQUIP. SETUP FOR HP 12 X 53 STEEL PILES EA. 7

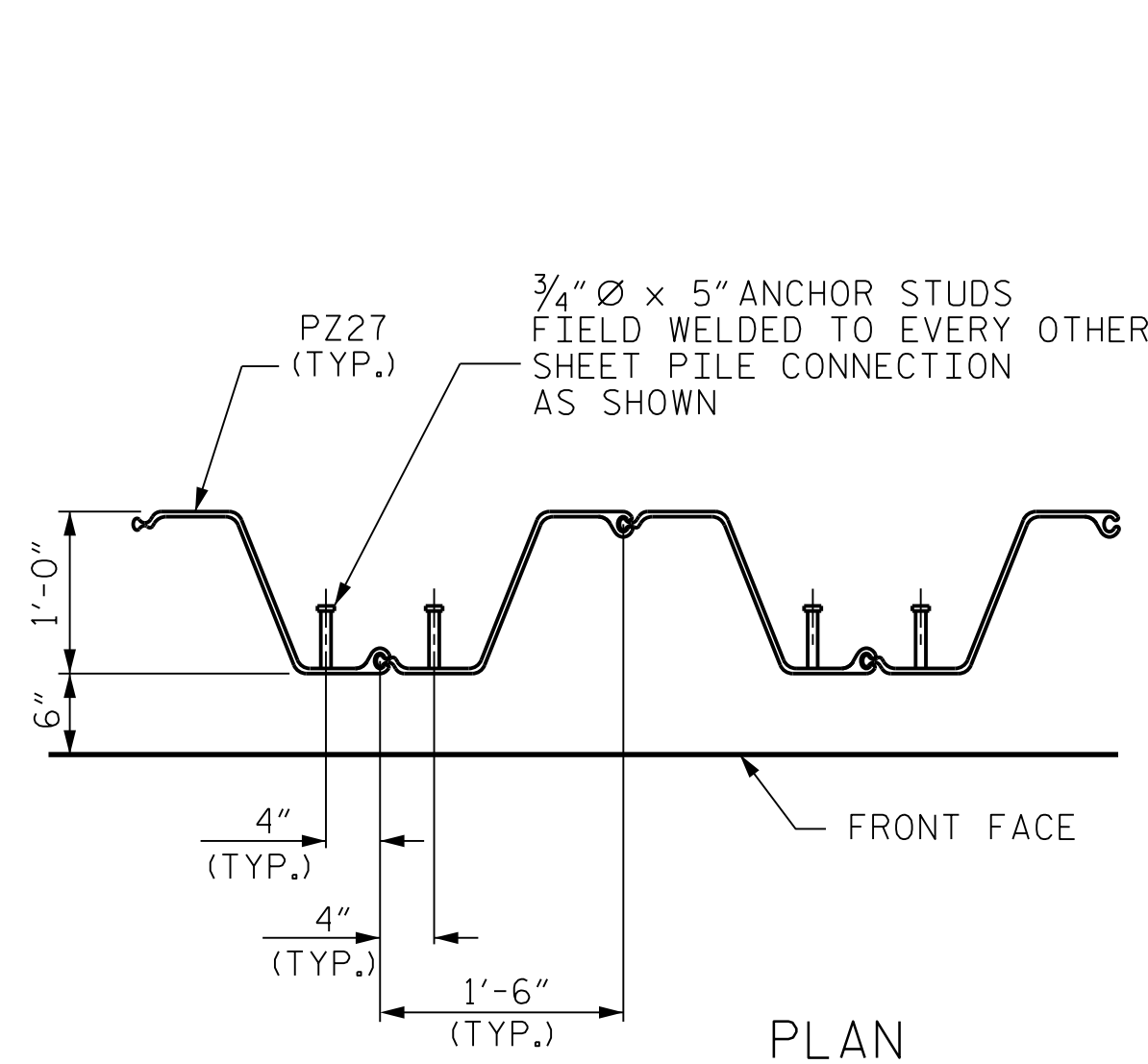
18" STEEL SHEET PILE SYSTEM:
PZ27 - NO: 57 SQ. FT. = 2,950
PZ90 - NO: 2 SQ. FT. = 50
TOTAL NO: 59 SQ. FT. = 3,000



SECTION A-A

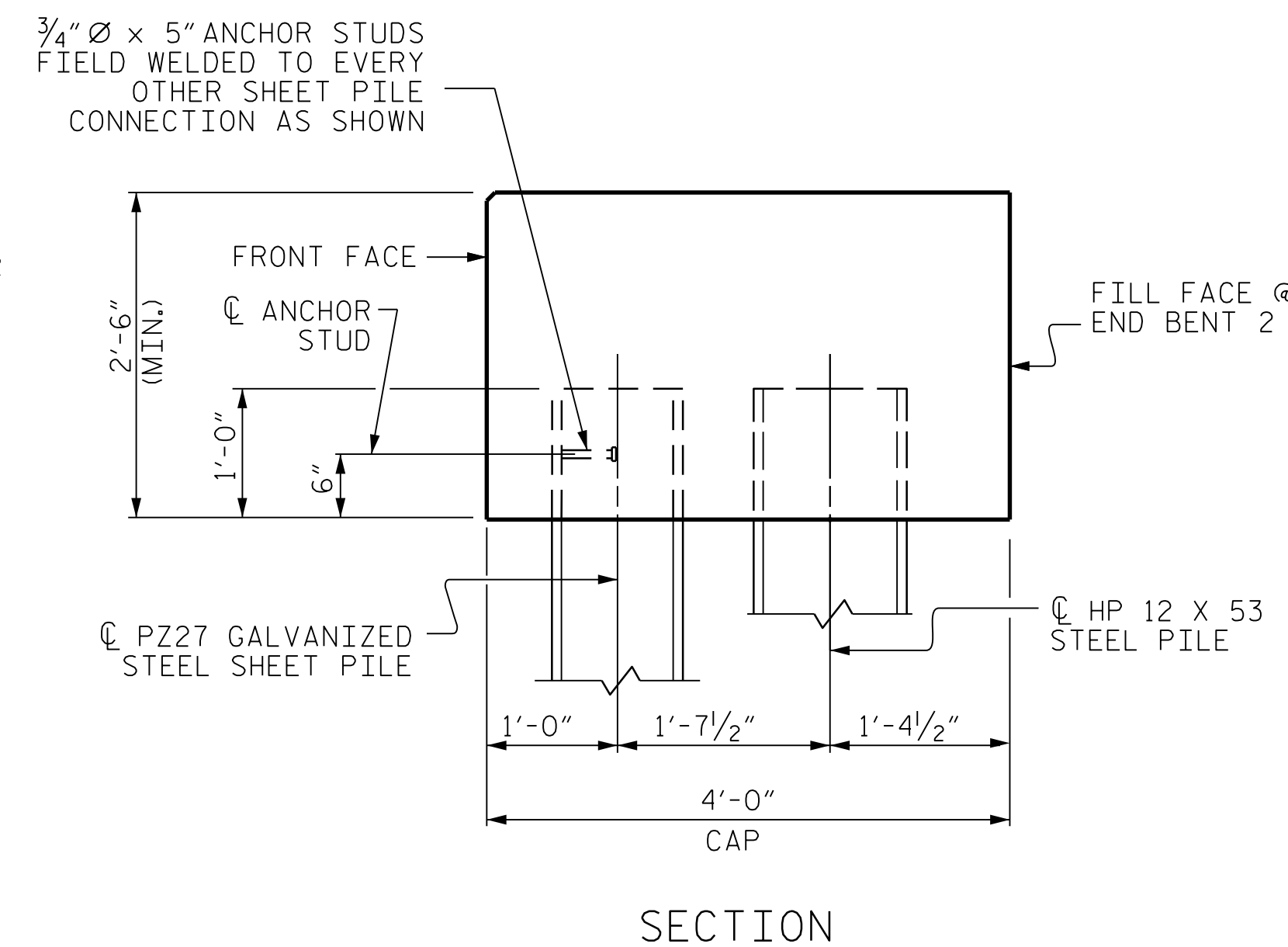
BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S1 BARS

CONCRETE COLLARS NOT SHOWN FOR CLARITY, FOR CONCRETE COLLAR DETAILS SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL" ON SHEET S-14.



SHEET PILE ANCHOR STUD DETAILS

IN END BENT CAP



SECTION

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

END BENT 2 DETAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-19
2			4			TOTAL SHEETS 21

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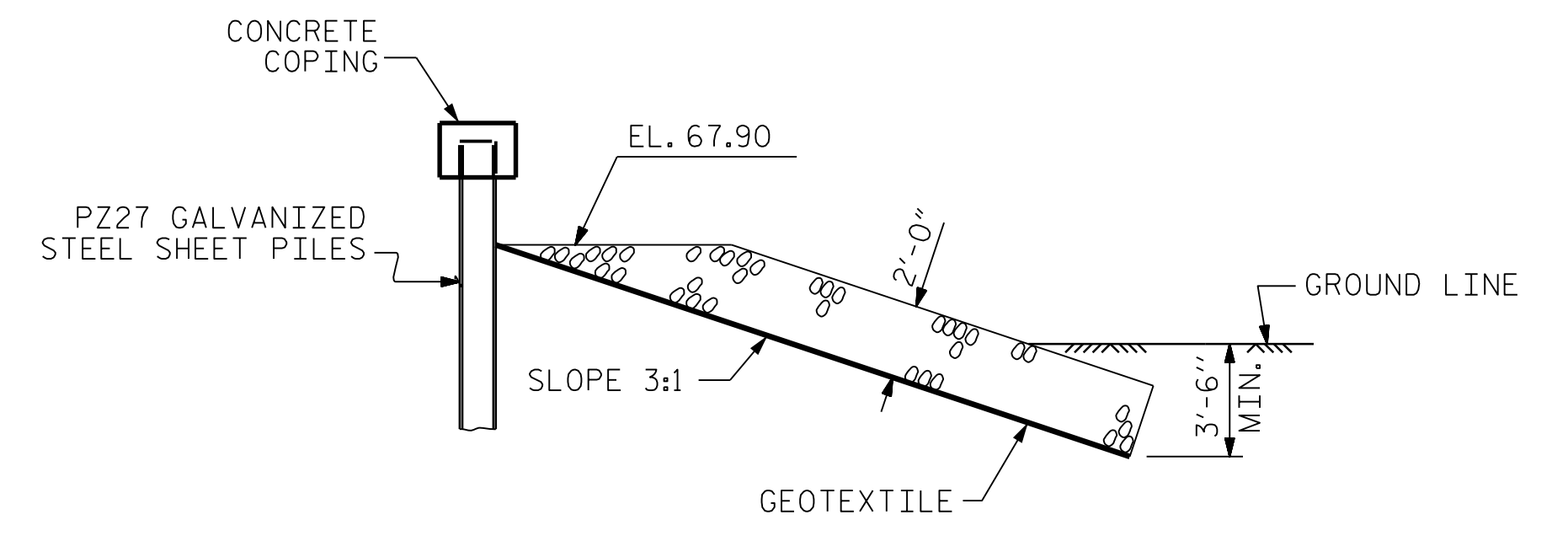
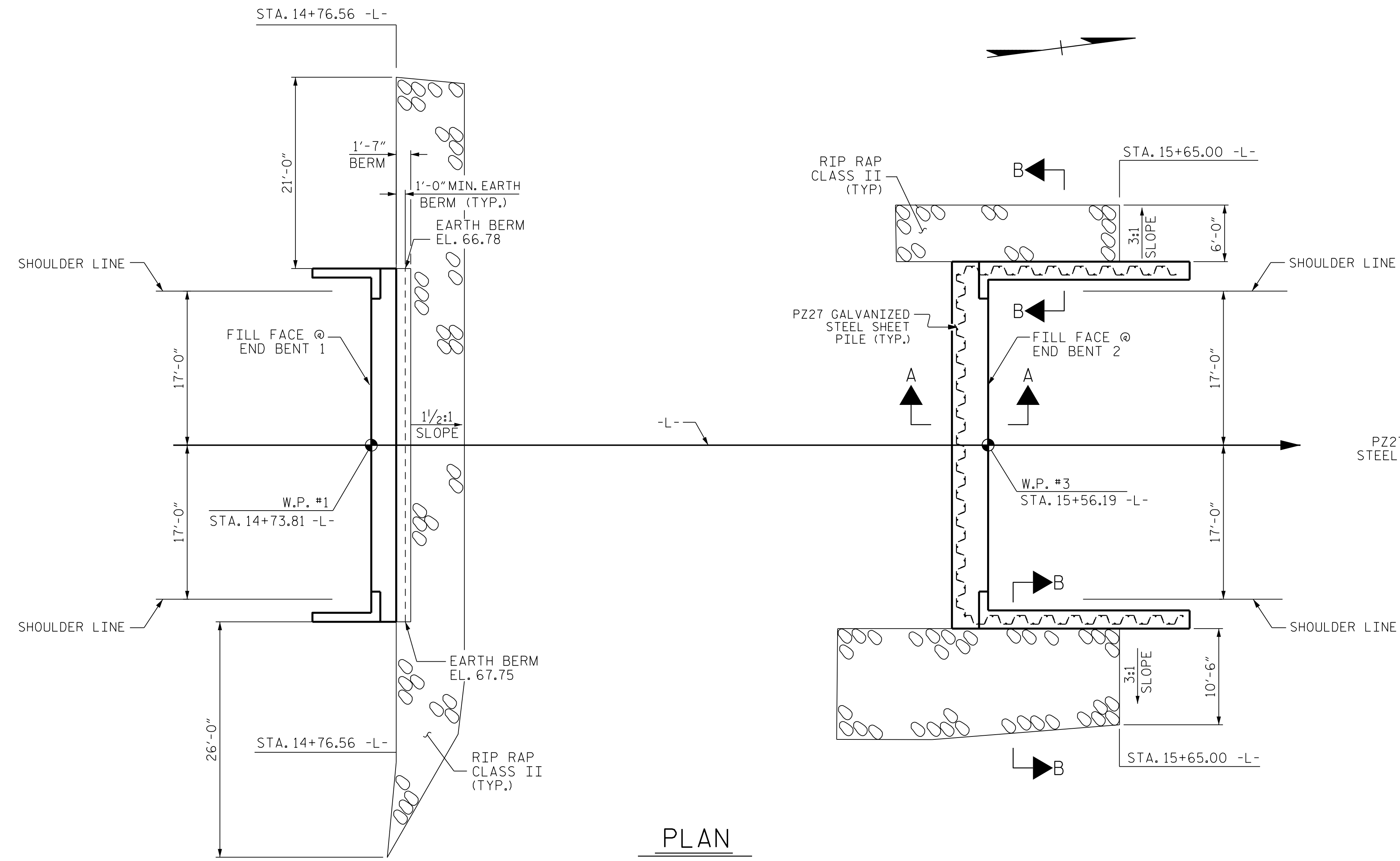
CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255



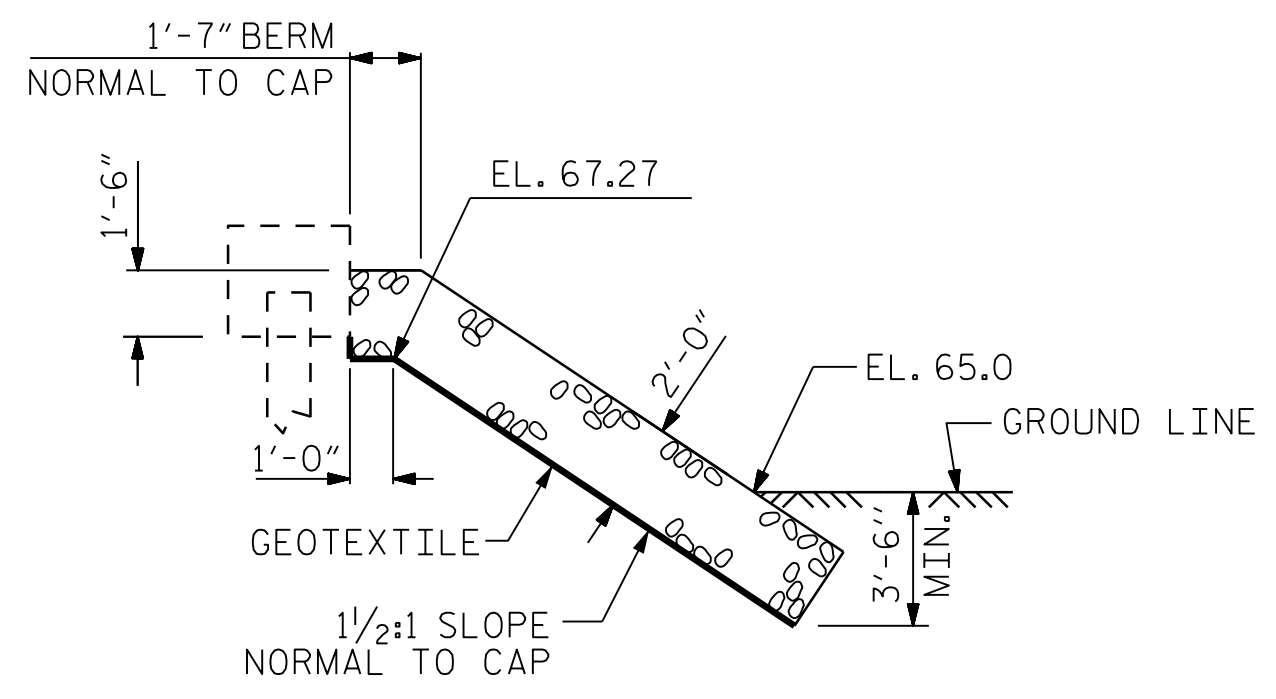
DRAWN BY: VDK DATE: 08/18
CHECKED BY: THF DATE: 08/18
DESIGN ENGINEER: VDK DATE: 08/18
DWG. No.

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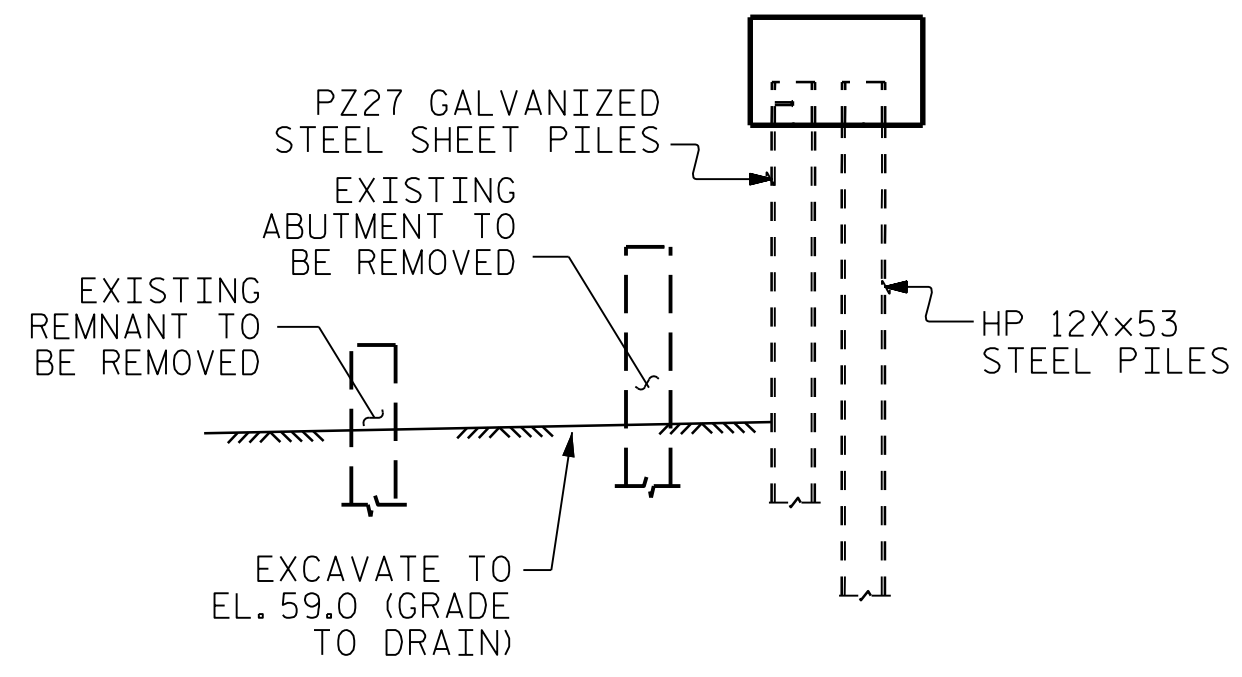
ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+15.00 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	95	105
END BENT 2	35	40
TOTAL	130	145



SECTION B-B



SECTION @ END BENT 1
BERM RIP RAPPED



SECTION A-A

PROJECT NO. 17BP.6.R.90
BLADEN COUNTY
STATION: 15+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			21

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CDM SMITH
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Raleigh, NC 27612-3228
NC COA No. F-1255

DRAWN BY: VDK DATE: 08/18
CHECKED BY: THF DATE: 08/18
DESIGN ENGINEER: VDK DATE: 08/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 16301
ENGINEER
TING FANG
11/19/2018

FILE: c:\pwworking\17209288\101_039_17BP.6.R.90_S&U_RL_020.dwg
DATE: 11/12/08 8:17:33 PM

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.

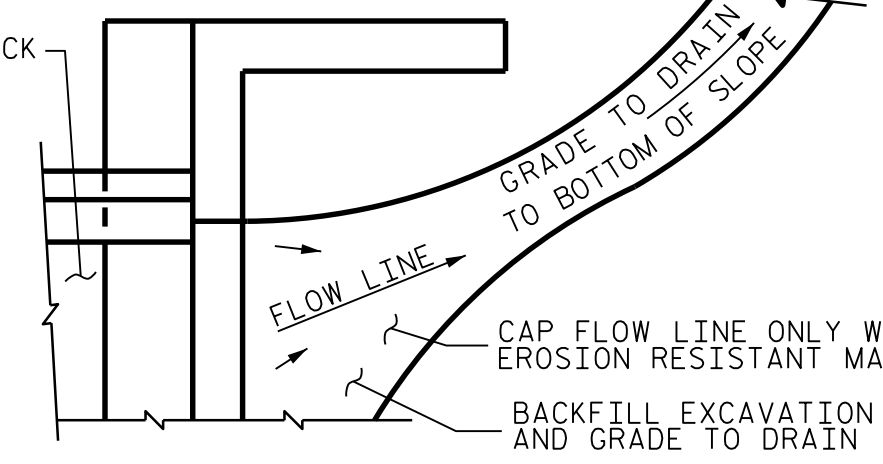
FOR THE 4"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
*B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL			LBS.		1412
*EPOXY COATED REINFORCING STEEL			LBS.		1039
CLASS AA CONCRETE		C. Y.		18.4	

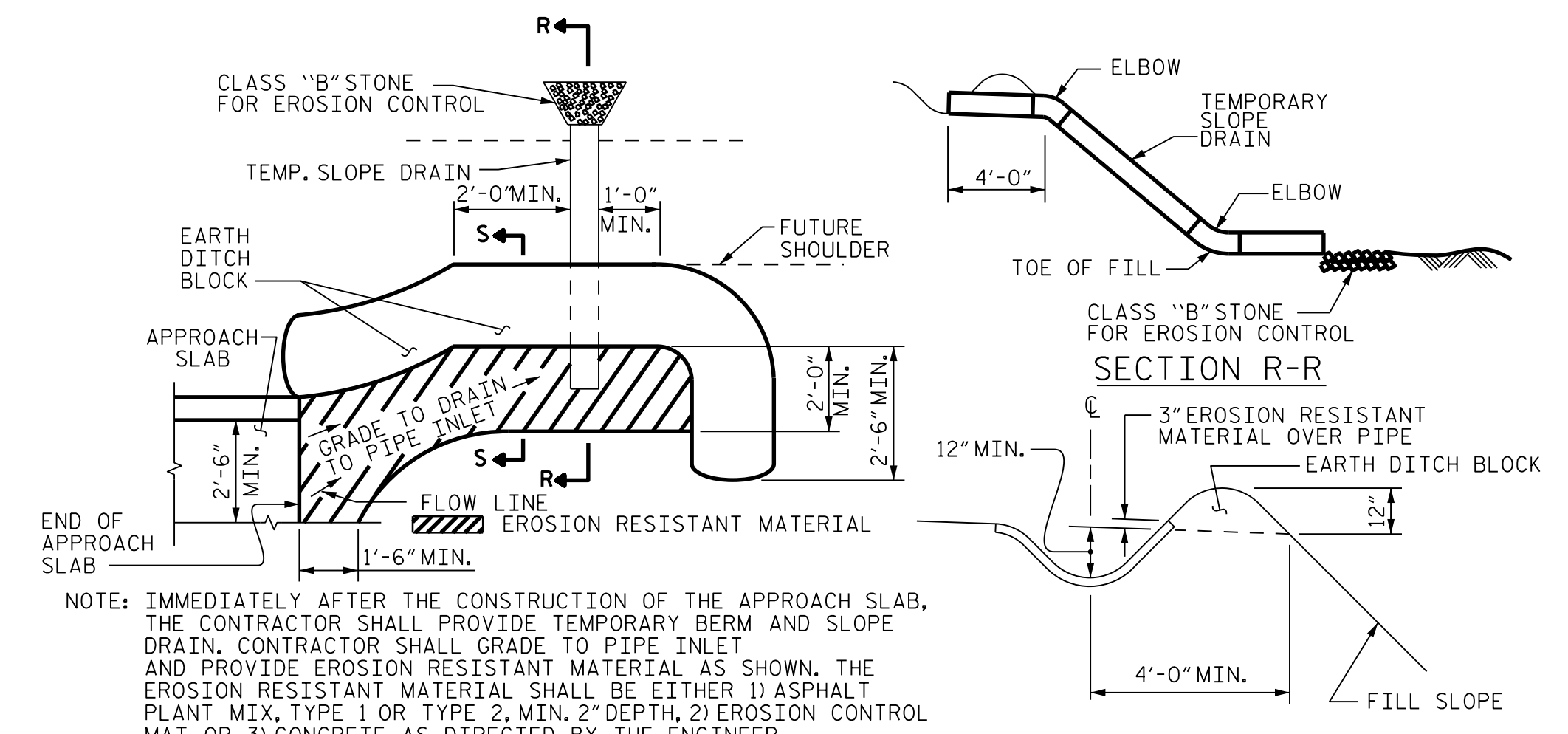
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
*B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL			LBS.		1412
*EPOXY COATED REINFORCING STEEL			LBS.		1039
CLASS AA CONCRETE		C. Y.		18.4	



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.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

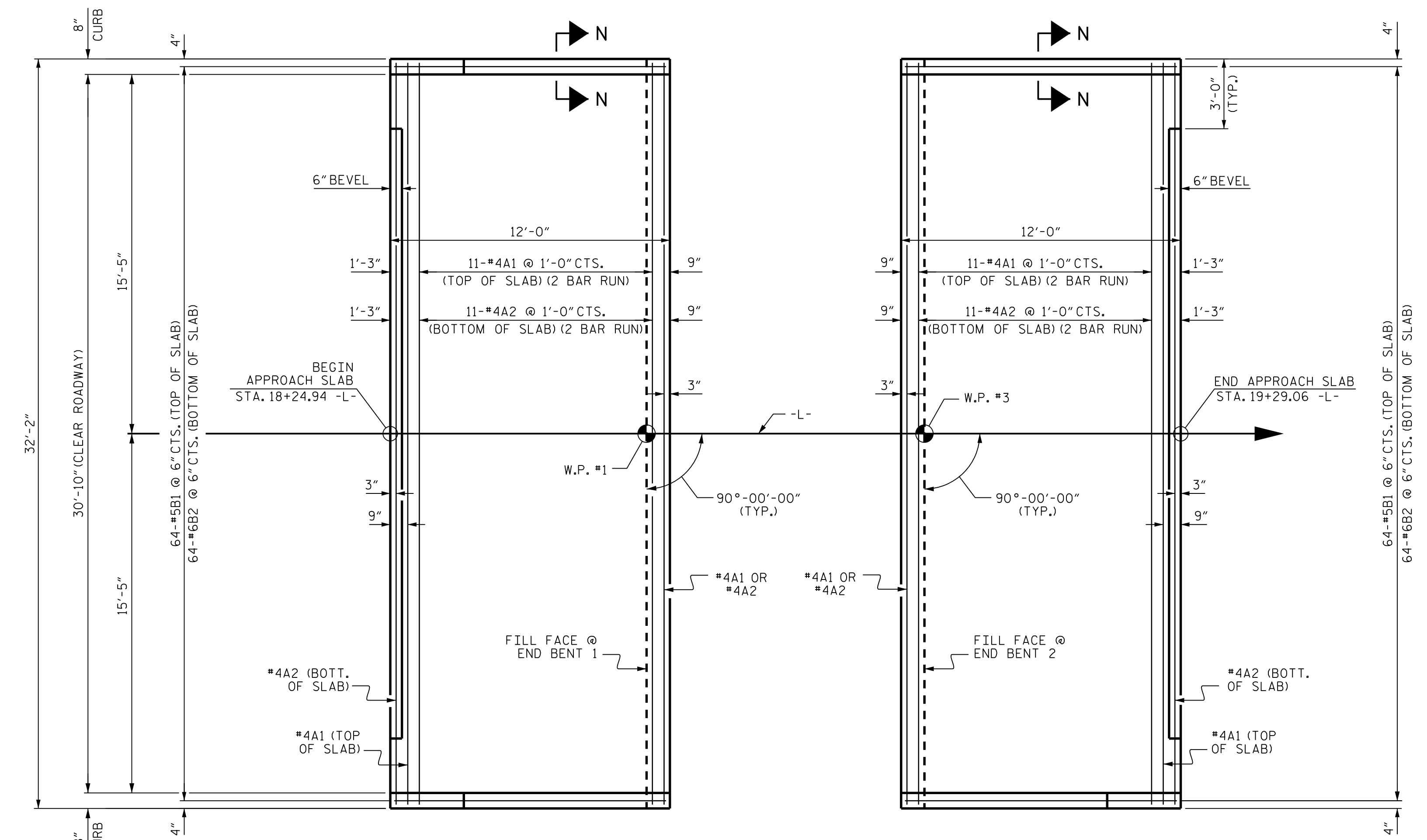
TEMPORARY DRAINAGE DETAIL



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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

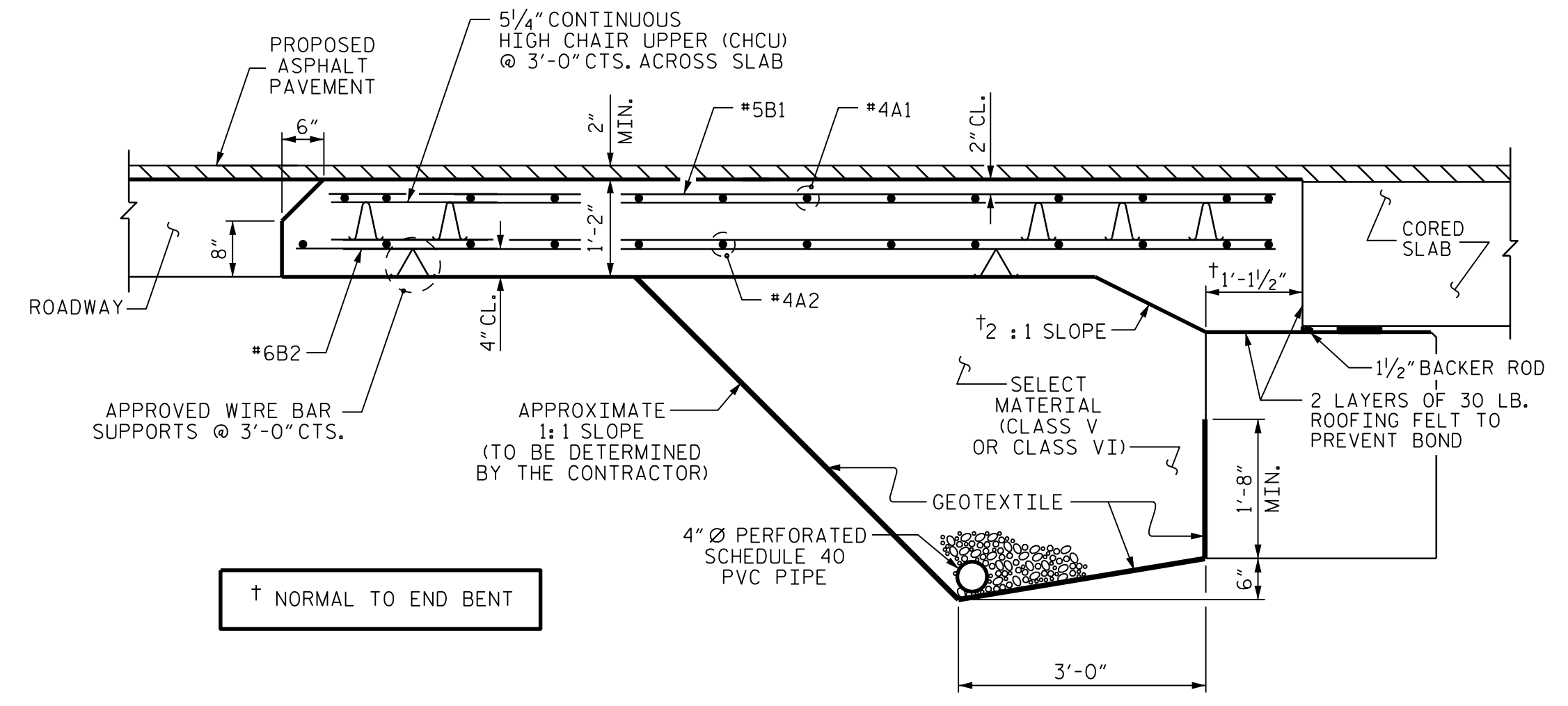
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



AT END BENT 1 AT END BENT 2

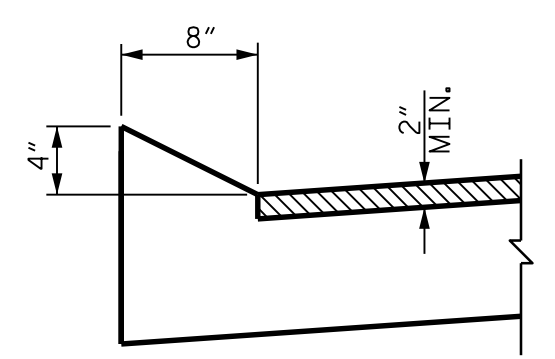
PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

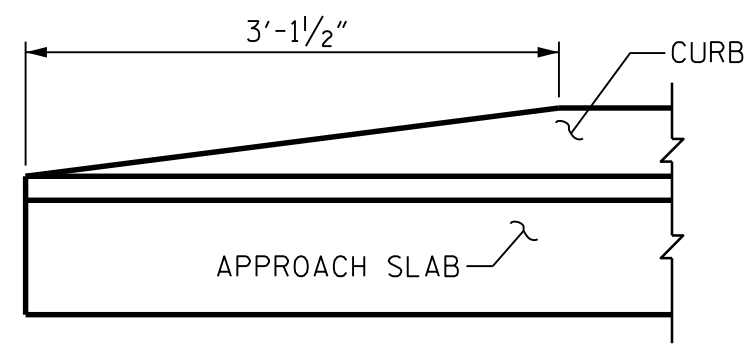


SECTION THRU SLAB

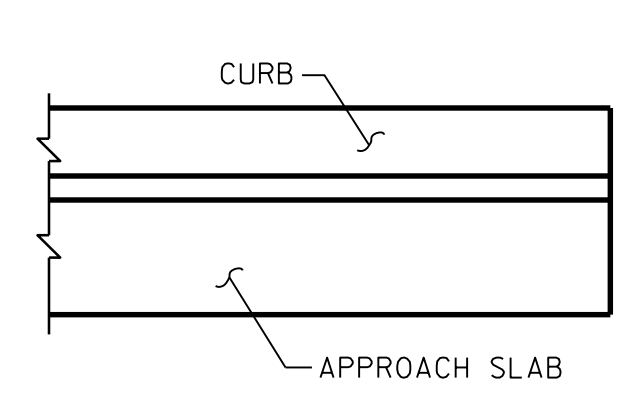
(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER AT END BENT 1 (SEE ROADWAY PLANS)



END OF CURB WITH SHOULDER BERM GUTTER AT END BENT 2 (SEE ROADWAY PLANS)

CURB DETAILS

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DWG. No.



PROJECT NO. **17BP.6.R.90**
BLADEN COUNTY
 STATION: **15+15.00 -L-**

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

REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S-21
2			TOTAL SHEETS 21

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990