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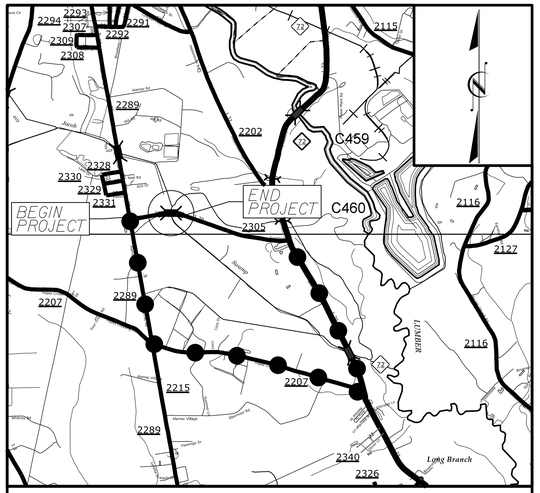
09/08/99

PROJECT: 17BP.6.R.105

CONTRACT: DF00238

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



VICINITY MAP

DETOUR ROUTE **N.T.S.**

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.105	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.6.R.105	N/A	PE
17BP.6.R.105	N/A	Row, Util.
17BP.6.R.105	N/A	Construction

LOCATION: REPLACE BRIDGE 770431 OVER JACOB SWAMP ON SR 2305 (KITE ROAD)

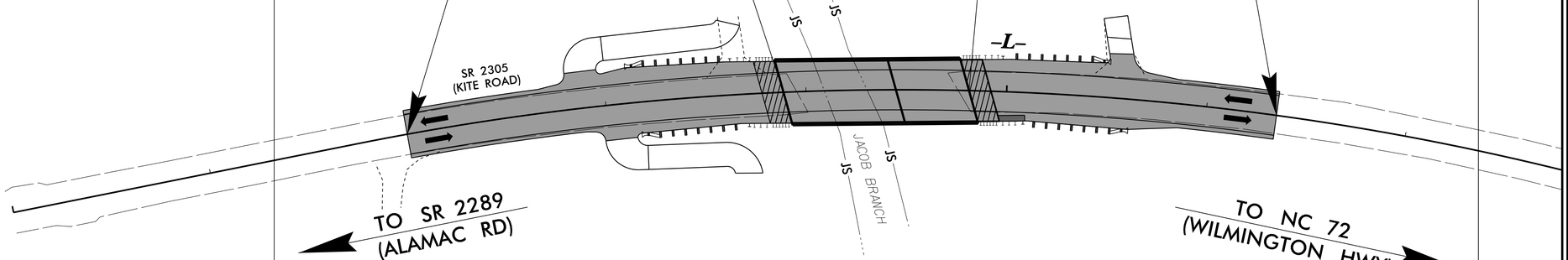
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NAD 83/ NA 2011

4

BEGIN PROJECT 17BP.6.R.105
-L- POC STA. 12+00.00

END PROJECT 17BP.6.R.105
-L- POC STA. 16+35.00



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2018 = 770 VPD
ADT 2040 = 1000 VPD
DHV = N/A
D = N/A
T = 7%
V = 55 MPH

FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.6.R.105	=	*0.064 MILES*
LENGTH BRIDGE PROJECT 17BP.6.R.105	=	*0.018 MILES*
TOTAL LENGTH PROJECT 17BP.6.R.105	=	*0.082 MILES*

Prepared in the Office of:

CDM Smith

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

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *JULY 30, 2018*

LETTING DATE: *DECEMBER 19, 2018*

DAVID J. CLODGO, PE
PROJECT ENGINEER

ADAM M. CONRAD, PE
PROJECT DESIGN ENGINEER

CHRISTY W. HUFF, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

11/26/2018 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18533 ANDREW T. NOTTINGHAM

DocuSigned by: Andrew T. Nottingham P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

11/26/2018 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 DAVID J. CLODGO

DocuSigned by: David J. Clodgo P.E.

SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	1-A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO

11/20/2018

DocuSigned by: David J. Clodgo DD481DE87C3C4FC...

CDM Smith

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

INDEX OF SHEETS

EFF. 01-16-2018
REV.

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
310.10	Driveway Pipe Construction
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	
840.29	Frames and Narrow 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
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY 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 TRANSMISSION
LUMBEE RIVER ELECTRIC MEMBERSHIP CORP. - POWER DISTRIBUTION
ROBESON COUNTY PUBLIC UTILITIES - WATER DISTRIBUTION
AT&T - TELECOMMUNICATION
SPIRIT - 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.

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.RJ05	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- 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 — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — 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 — P
- 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 — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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:

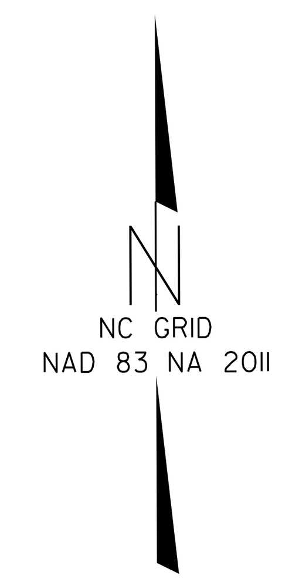
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	1C-1

Location and Surveys

REVISIONS

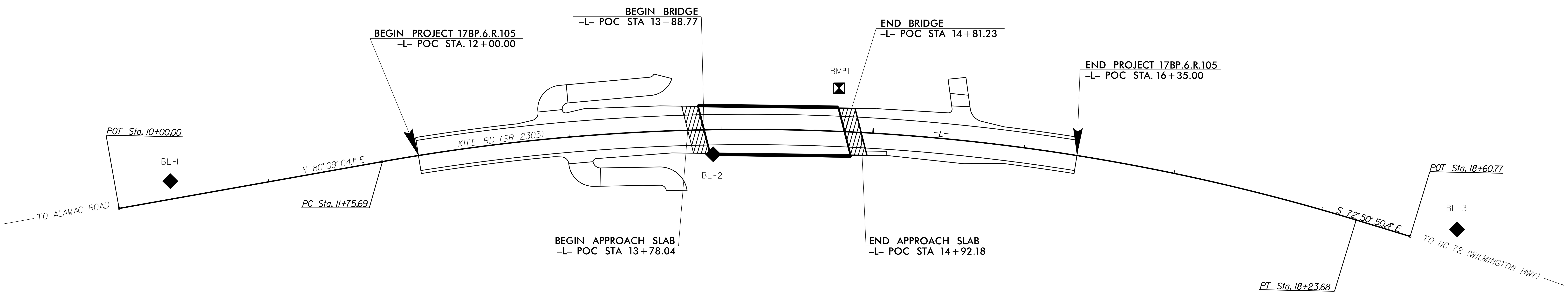
SURVEY CONTROL SHEET 770431



BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	302294.7250	1999862.5142	111.60
2	BL-2	302310.9675	2000219.7773	112.02
3	BL-3	302259.6987	2000708.9531	109.13

BM1 ELEVATION = 110.97
N 302354 E 2000303
L STATION 14+76.00 28 LEFT
RR SPIKE SET IN 10" OAK TREE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BL-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 302294.7250(ft) EASTING: 1999862.5142(ft)
ELEVATION: 111.60(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999940727
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-1" TO -L- STATION 10+00.00 IS
S62°12'59.15"W 38.1174'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. 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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	1D-1
Location and Surveys	

PROPOSED ALIGNMENT CONTROL SHEET 770431

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	302276.9572	1999828.7912
PC	11+75.69	302307.0091	2000001.8933
PT	18+23.68	302266.1166	2000642.5995
POT	18+60.77	302255.1784	2000678.0387

REVISIONS

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.

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET 770431

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	1E-1
Location and Surveys	

PROJECT SURVEYOR

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+60.00	-50.00	302376.2526	2000183.1600
L	15+15.00	-50.00	302373.2807	2000343.6838
L	13+75.00	30.00	302296.7851	2000200.8524
L	13+75.00	45.00	302281.7906	2000201.2565
L	13+60.00	-30.00	302356.2669	2000183.9168
L	15+15.00	45.00	302278.5469	2000336.5773
L	15+15.00	30.00	302293.5048	2000337.6994
L	15+15.00	-30.00	302353.3367	2000342.1877

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

SYSTIME
17BP.6.R.105.1s.1E-1.dgn

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	2A-1

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO 11/20/2018 DocuSigned by: David J. Clodgo DD481DE87C3C4FC...	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255	NC DEPARTMENT OF TRANSPORTATION PAVEMENT MANAGEMENT UNIT 1593 MAIL SERVICE CENTER RALEIGH, NC 27699-1593

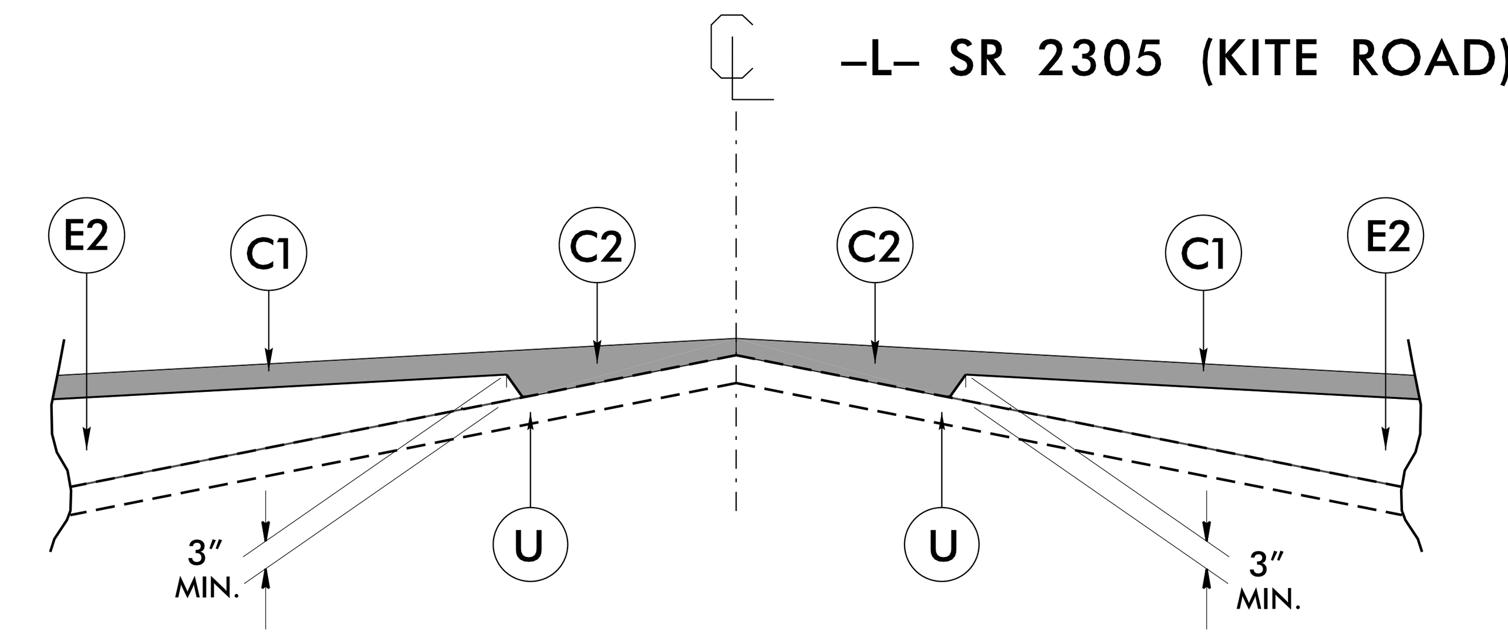
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

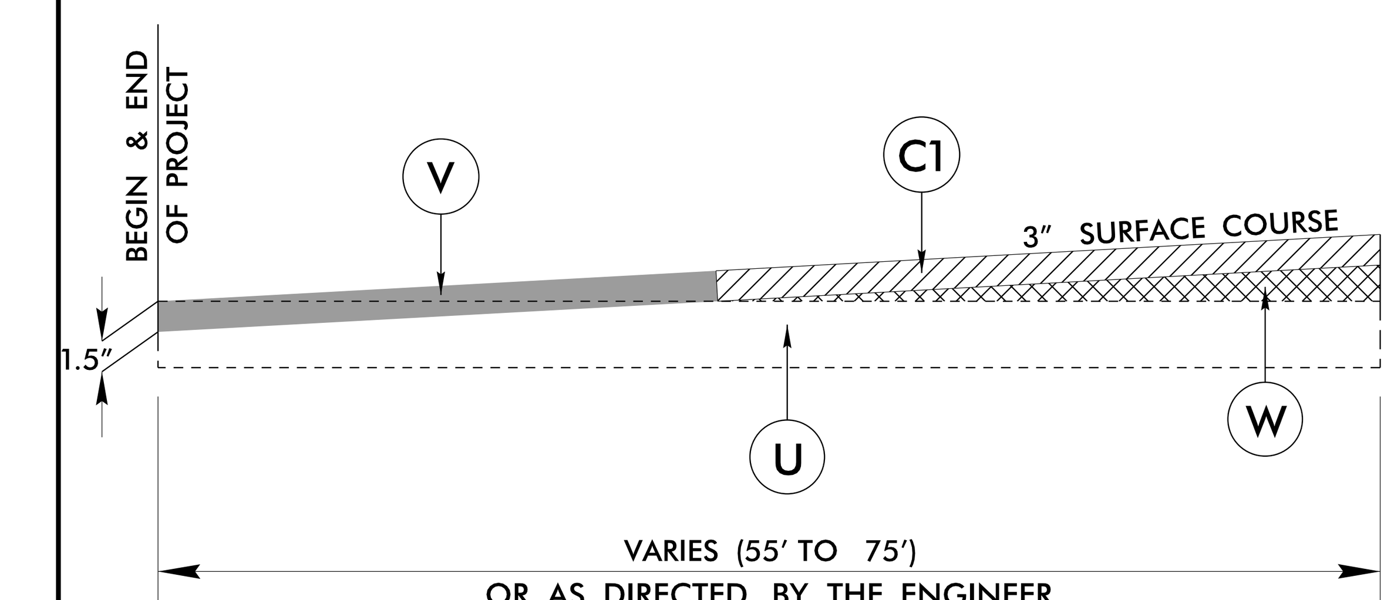
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)
Y	INCIDENTAL STONE

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

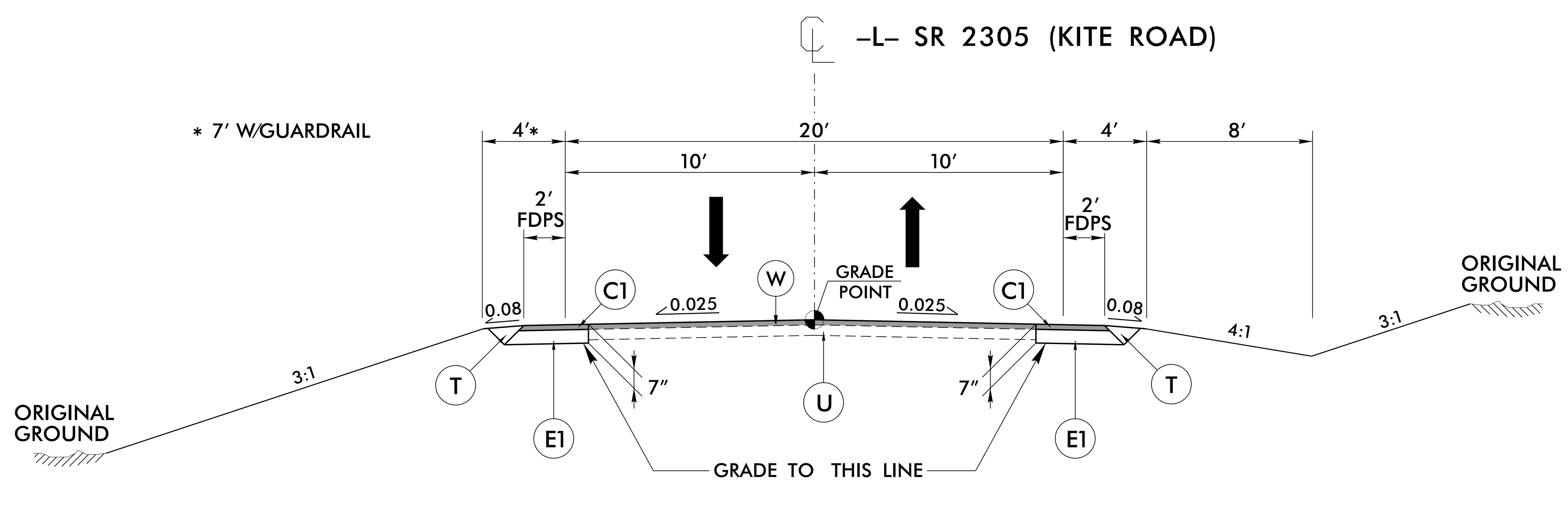


Detail Showing Method Of Wedging – W
–L–

MILLING DETAIL
INCIDENTAL MILLING AT BEGIN/END FOR TIE-INS



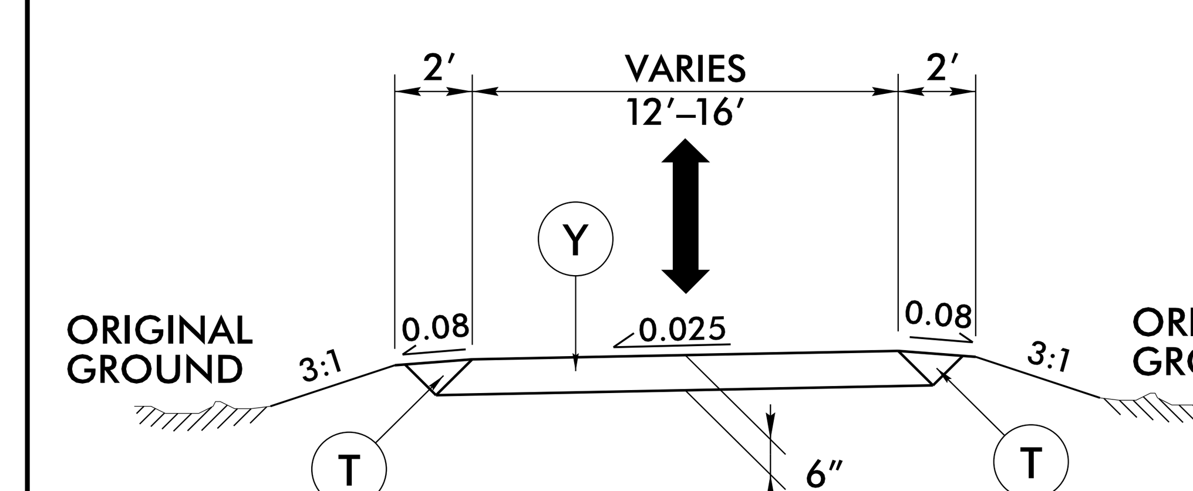
–L– STA. 12+00.00 AND STA. 12+75.00
–L– STA. 15+80.00 AND STA. 16+35.00



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 12+00.00 TO STA. 12+88.77
–L– STA. 15+81.23 TO STA. 16+35.00



DETAIL A

USE DETAIL A FOR DRIVEWAY CONSTRUCTION

SEE ROADWAY PLANS FOR LOCATIONS

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER

11/20/2018

DocuSigned by: David L. Clodfelter

SIGNATURE

PAVEMENT DESIGN ENGINEER

CDM Smith

CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3226
NC COA No. F-1255

NC DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT UNIT
1593 MAIL SERVICE CENTER
RALEIGH, NC 27699-1593

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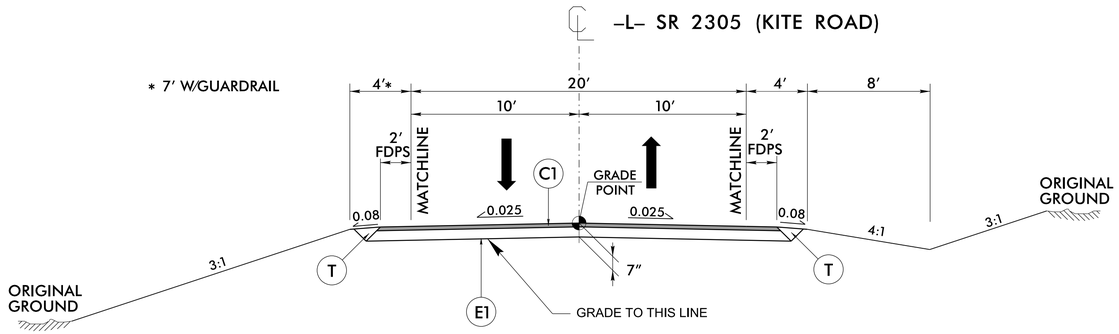
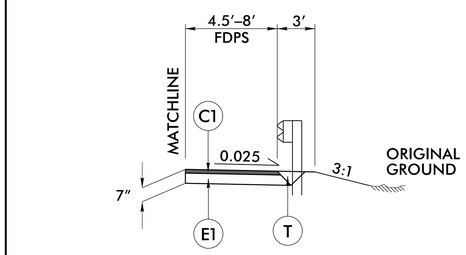


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 12+88.77 TO STA. 13+88.77 (BEGIN BRIDGE)
–L– STA. 14+81.23 (END BRIDGE) TO STA 15+81.23



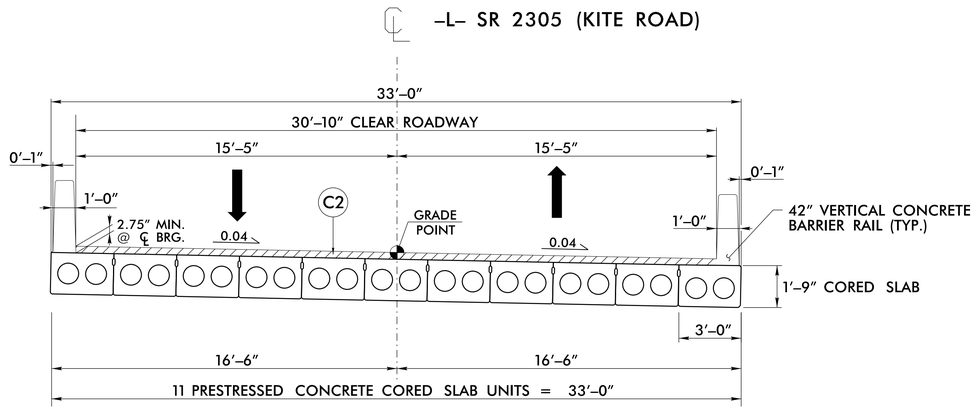
DETAIL B

USE DETAIL B IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 13+11.14 TO STA. 13+85.20 (LT)
–L– STA. 13+16.61 TO STA. 13+92.42 (RT)
–L– STA. 14+76.63 TO STA. 15+50.73 (LT)
–L– STA. 15+09.47 TO STA. 15+61.71 (RT)

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	3″ S9.5B
C2	VAR. S9.5B
E1	4″ B25.0C
E2	VAR. B25.0C
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING
Y	INCIDENTAL STONE

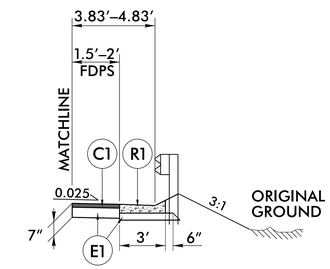
PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE



TYPICAL BRIDGE SECTION

USE TYPICAL BRIDGE SECTION

–L– STA. 13+88.77 (BEGIN BRIDGE) TO STA. 14+81.23 (END BRIDGE)



DETAIL C

USE DETAIL C IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 14+95.96 TO STA. 15+09.47 (RT)

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	2C-1

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

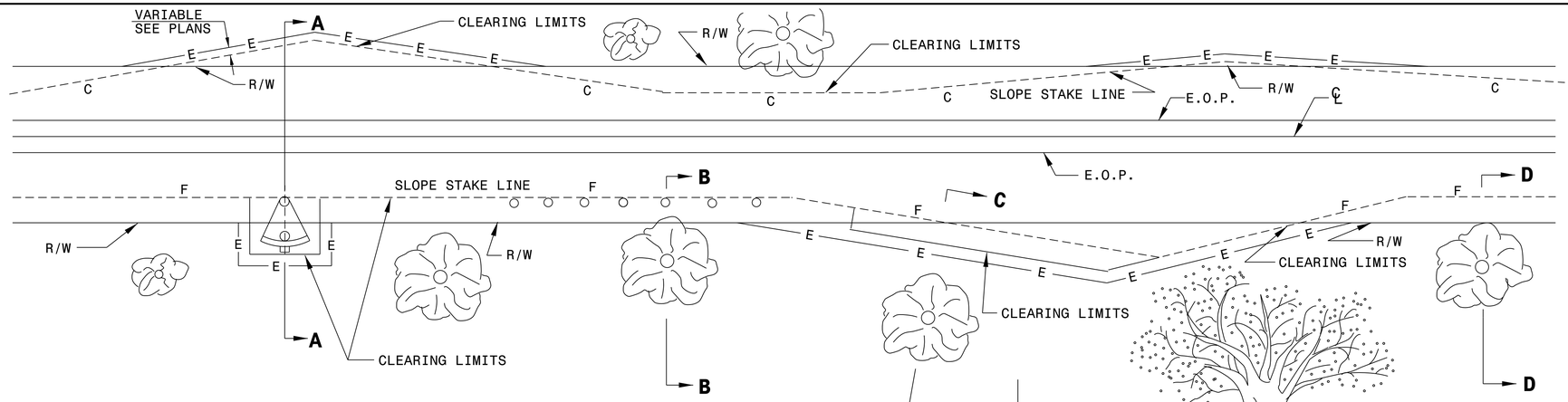
ENGLISH DETAIL DRAWING FOR

METHOD OF CLEARING

MODIFIED METHOD - II

SHEET 1 OF 1

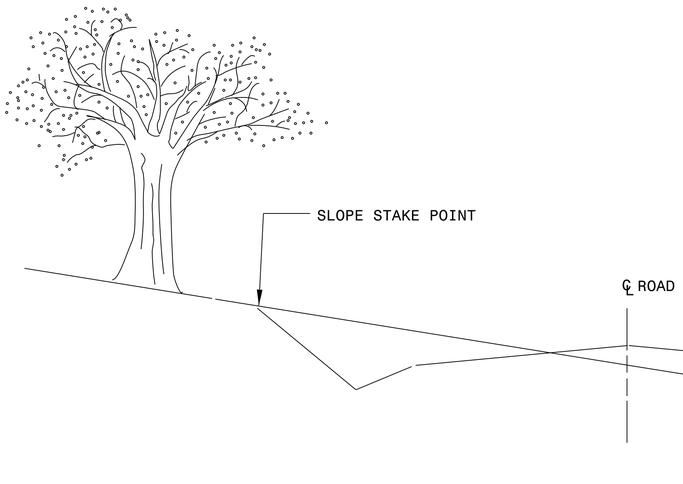
200d02



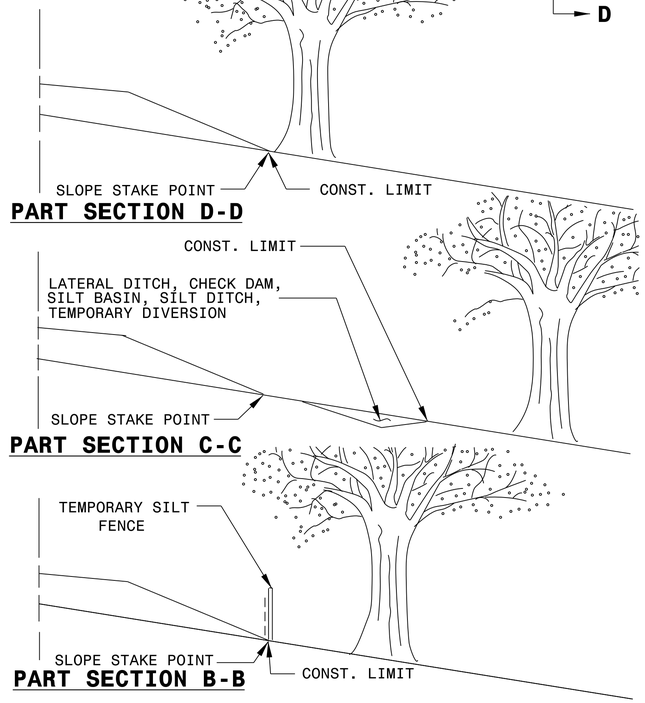
GENERAL NOTES:

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



SECTION A-A



PART SECTION D-D

PART SECTION C-C

PART SECTION B-B

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

11/20/2018

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton
873F3D17DCDC45F...

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

SEE TITLE BLOCK

ORIGINAL BY: rnbritt DATE: 05-02-11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/english/urban/u3615aconcreteflume.dgn

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	3B-1

COMPUTED BY: J. CROOK DATE: 02/20/2018
CHECKED BY: A. CONRAD DATE: 02/21/2018

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS		IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	III	EA	G	NG				
-L-	13+11.14	13+85.20	LT	75.00				13+85.20	5.55	8.55		50.00		1.00	1	1							
-L-	13+16.61	13+92.42	RT	75.00			13+92.42		5.54	8.54	50.00		1.00		1	1							
-L-	14+76.63	15+50.73	LT	75.00			14+76.63		5.28	8.28	50.00		1.00		1	1							
-L-	14+85.93	15+61.71	RT	75.00				14+85.93	5.26	8.26		50.00		1.00	1	1							
			SUBTOTALS	300.00											4	4							
			TYPE III, 4@18.75'	-75.00																			
			GREU TL-3, 4@50.00'	-200.00																			
			PROJECT TOTALS	25.00											4	4							
			SAY	25.00											4	4							
ADDITIONAL GUARDRAIL POSTS = 10 EA																							

SUMMARY OF EARTHWORK (CY)

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 12+00.00 - 13+88.77	76		49		27
-L- 14+81.23 - 16+35.00	35		100	65	
SUBTOTAL	111		149	65	27
TOTAL	111		149	65	27
WASTE IN LIEU OF BORROW				-27	
PROJECT TOTAL	111		149	38	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				2	
GRAND TOTAL	111		149	40	
SAY	125			50	

EST. DDE = 10 CY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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."

SUMMARY OF SHOULDER BERM GUTTER (LF)

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	14+95.96	15+09.47	13.51
		TOTAL:	13.51
		SAY:	15

SUMMARY OF PAVEMENT REMOVAL (SY)

LINE	STATION - STATION	LOCATION	REMOVAL (SY)
-L-	STA. 12+88.77 TO STA. 13+95.35	CL	237
-L-	STA. 14+75.79 TO STA. 15+81.23	CL	229
GRAND TOTAL			466
SAY			470

GREG082016-PC

COMPUTED BY: ______________________ DATE: __________

CHECKED BY: ______________________ DATE: __________

PROJECT NO.	SHEET NO.
17BP.6.R.105	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, or, HDPE) 12	15	18	24	30	36	42		C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	
L 15+02	13	RT	0401		111.4																
			0401	0402		109.5	109.0			12											
L 14+76	35	RT	0403							32											
L 13+25	24	LT	0404																		
L 14+56	29	LT																			
SHEET TOTALS										44											
PROJECT TOTALS										44											

LINE & STATION	R. C. PIPE CLASS III 12	15	18	84		R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15		STRUCTURAL PLATE PIPE 60	66	72			15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	
L 15+02																									
L 14+76																									
L 13+25								140																	
L 14+56																									
SHEET TOTALS								140																	
PROJECT TOTALS								140																	

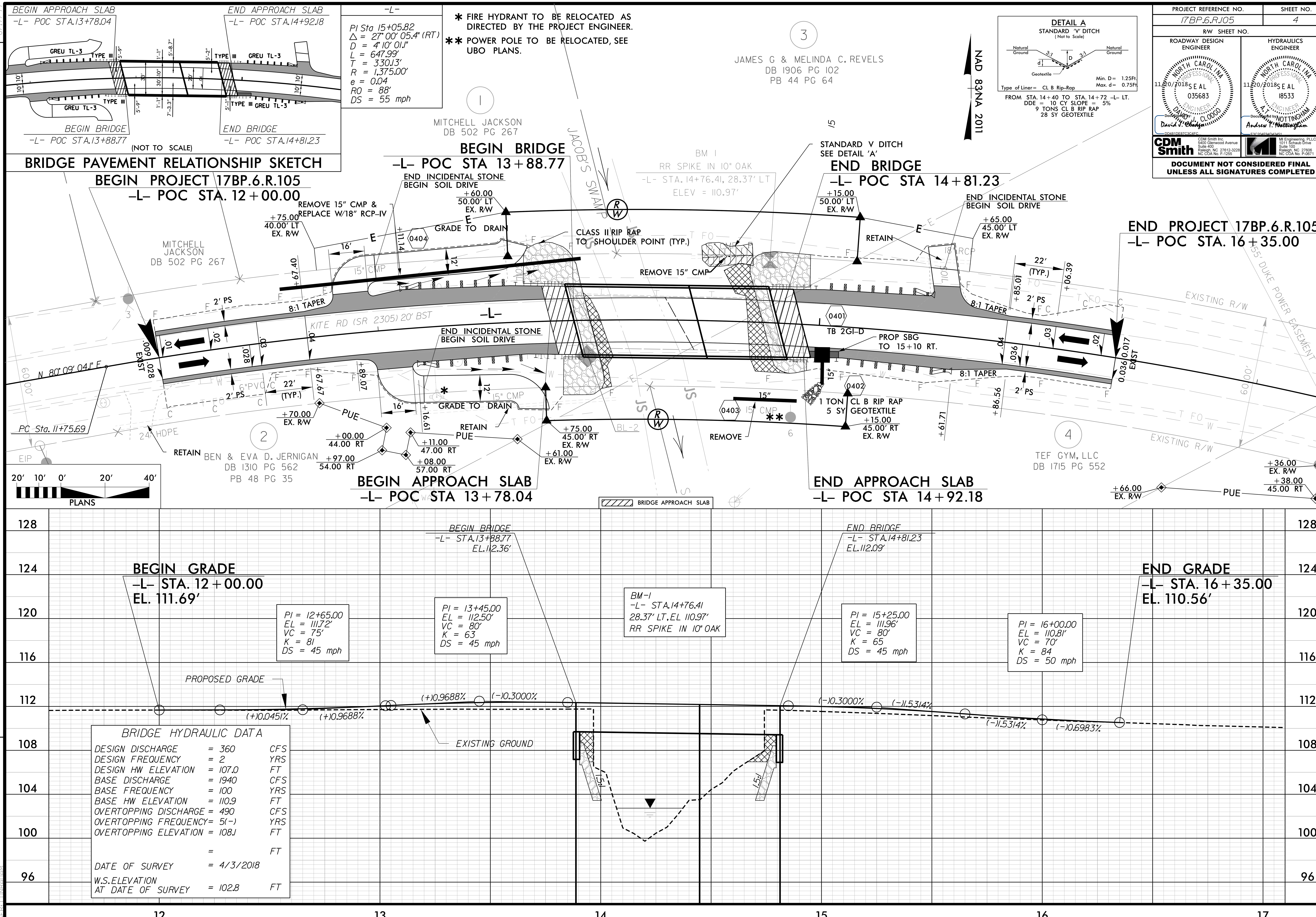
LINE & STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
L 15+02				1							
L 14+76											
L 13+25											
L 14+56											
SHEET TOTALS				1							
PROJECT TOTALS				1							

LINE & STATION	D.I. STD. 852.04 OR STD. 852.06 (CONCRETE TRANSITIONAL SECTION)	C.B. STD. 852.05 (CONCRETE TRANSITIONAL SECTION)	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	ENERGY DISSIPATION BASIN
L 15+02																	1						1	
L 14+76																								
L 13+25																								
L 14+56																								
SHEET TOTALS																	1						1	
PROJECT TOTALS																	1						1	

LINE & STATION		FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 15+02						
L 14+76					26	Remove 26LF 15" CMP
L 13+25					135	Remove 135LF 15" CMP
L 14+56					26	Remove 26LF 15" CMP
SHEET TOTALS					187	
PROJECT TOTALS					187	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT


BEGIN APPROACH SLAB
-L- POC STA.13+78.04
END APPROACH SLAB
-L- POC STA.14+92.18
GREU TL-3
TYPE III
BEGIN BRIDGE
-L- POC STA.13+88.77
END BRIDGE
-L- POC STA.14+81.23
(NOT TO SCALE)
BRIDGE PAVEMENT RELATIONSHIP SKETCH
-L-
PI Sta 15+05.82
Δ = 27° 00' 05.4" (RT)
D = 4° 10' 01.1"
L = 647.99'
T = 330.13'
R = 1,375.00'
e = 0.04
RO = 88'
DS = 55 mph
* FIRE HYDRANT TO BE RELOCATED AS DIRECTED BY THE PROJECT ENGINEER.
** POWER POLE TO BE RELOCATED, SEE UBO PLANS.
MITCHELL JACKSON
DB 502 PG 267
JAMES G & MELINDA C. REVELS
DB 1906 PG 102
PB 44 PG 64
NAD 83/NA 2011
DETAIL A
STANDARD 'V' DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D= 1.25Ft
Max. d= 0.75Ft
Type of Liner= CL B Rip-Rap
FROM STA. 14+40 TO STA. 14+72 -L- LT.
DDE = 10 CY SLOPE = 5%
9 TONS CL B RIP RAP
28 SY GEOTEXTILE
BEGIN BRIDGE
-L- POC STA 13+88.77
BM 1
RR SPIKE IN 10" OAK
-L- STA. 14+76.41, 28.37' LT
ELEV = 110.97'
STANDARD V DITCH
SEE DETAIL 'A'
END BRIDGE
-L- POC STA 14+81.23
BEGIN PROJECT 17BP.6.R.105
-L- POC STA. 12+00.00
END INCIDENTAL STONE
BEGIN SOIL DRIVE
+60.00
50.00' LT
EX. R/W
REMOVE 15" CMP & REPLACE W/18" RCP-IV
+75.00
40.00' LT
EX. R/W
GRADE TO DRAIN
CLASS II RIP RAP
TO SHOULDER POINT (TYP.)
+15.00
50.00' LT
EX. R/W
END INCIDENTAL STONE
BEGIN SOIL DRIVE
+65.00
45.00' LT
EX. R/W
RETAIN
END PROJECT 17BP.6.R.105
-L- POC STA. 16+35.00
JACOB'S SWAMP
REMOVE 15" CMP
22' (TYP.)
2' PS
8:1 TAPER
EXISTING R/W
DUKE POWER EASEMENT
KITE RD (SR 2305) 20' BST
TB 2GI-D
PROP SBG
TO 15+10 RT.
END INCIDENTAL STONE
BEGIN SOIL DRIVE
N 80° 09' 04.1" E
EXIST
PC Sta. 11+75.69
24" HDPE
6" PVC
RETAIN
BEN & EVA D. JERNIGAN
DB 1310 PG 562
PB 48 PG 35
PUE
+70.00
EX. R/W
+00.00
44.00' RT
+97.00
54.00' RT
+11.00
47.00' RT
+08.00
57.00' RT
GRADE TO DRAIN
15" CMP
RETAIN
+75.00
45.00' RT
EX. R/W
+61.00
EX. R/W
1 TON CL B RIP RAP
5 SY GEOTEXTILE
+15.00
45.00' RT
EX. R/W
REMOVE
TEF GYM, LLC
DB 1715 PG 552
+36.00
EX. R/W
+38.00
45.00' RT
+66.00
EX. R/W
PUE
20' 10' 0' 20' 40'
PLANS
BEGIN APPROACH SLAB
-L- POC STA 13+78.04
BRIDGE APPROACH SLAB
END APPROACH SLAB
-L- POC STA 14+92.18
BEGIN BRIDGE
-L- STA.13+88.77
EL.112.36'
END BRIDGE
-L- STA.14+81.23
EL.112.09'
BEGIN GRADE
-L- STA. 12+00.00
EL. 111.69'
END GRADE
-L- STA. 16+35.00
EL. 110.56'
PI = 12+65.00
EL = 111.72'
VC = 75'
K = 81
DS = 45 mph
PI = 13+45.00
EL = 112.50'
VC = 80'
K = 63
DS = 45 mph
BM-1
-L- STA.14+76.41
28.37' LT. EL 110.97'
RR SPIKE IN 10" OAK
PI = 15+25.00
EL = 111.96'
VC = 80'
K = 65
DS = 45 mph
PI = 16+00.00
EL = 110.81'
VC = 70'
K = 84
DS = 50 mph
PROPOSED GRADE
(+)0.0451%
(+)0.9688%
(-)0.3000%
(-)1.5314%
(-)0.6983%
EXISTING GROUND
1.5:1
128
124
120
116
112
108
104
100
96
12
13
14
15
16
17

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	360	CFS
DESIGN FREQUENCY	=	2	YRS
DESIGN HW ELEVATION	=	107.0	FT
BASE DISCHARGE	=	1940	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	110.9	FT
OVERTOPPING DISCHARGE	=	490	CFS
OVERTOPPING FREQUENCY	=	5(-)	YRS
OVERTOPPING ELEVATION	=	108.1	FT
	=		FT
DATE OF SURVEY	=	4/3/2018	
W.S.ELEVATION AT DATE OF SURVEY	=	102.8	FT

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 — David J. Clodgo — 11/20/2018

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18533 — Andrew Y. Nottingham — 11/20/2018

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

MI Engineering, PLLC, 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, NC COA No. P-0671

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REVISIONS

8/17/99

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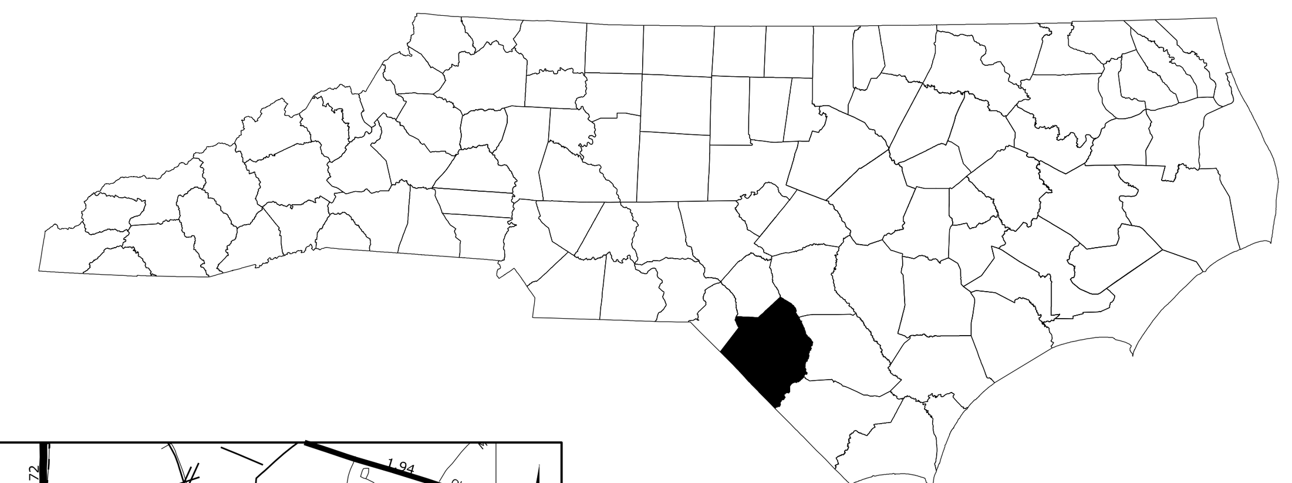
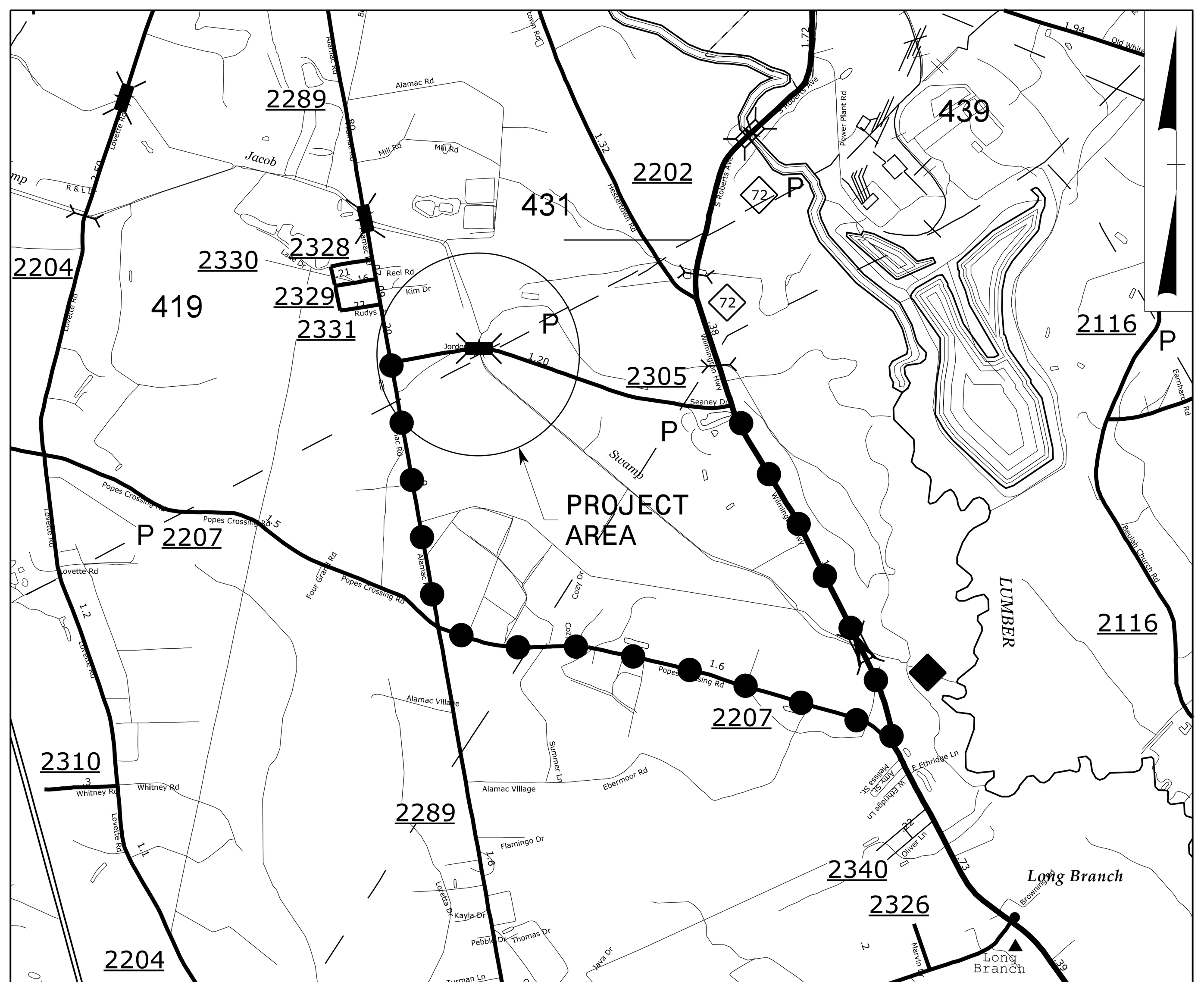
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROBESON COUNTY





VICINITY MAP

DETOUR ROUTE ●●●● N.T.S.

LOCATION: REPLACE BRIDGE 770431 OVER JACOB SWAMP ON SR 2305 (KITE ROAD)

INDEX OF SHEETS

SHEET NO. TMP-1

PROJECT: 17BP.6.R.105

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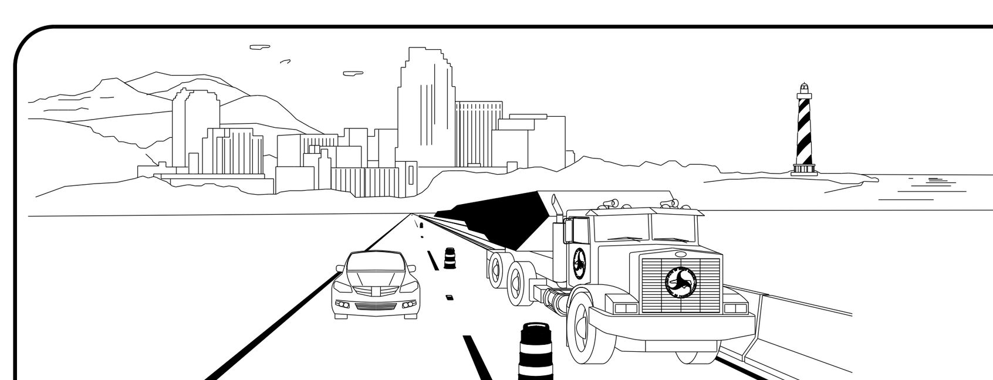


WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

ADAM CONRAD, P.E.
PROJECT ENGINEER

JONATHAN CROOK, E.I.
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

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

MATTHEW SPRINGER, P.E.
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — WORK ZONE TRAFFIC CONTROL

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

APPROVED:

DATE: 11/20/2018

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045167 ADAM M. CONRAD
DocuSigned by: Adam M. Conrad

8/29/2018
R:\ncdot\17BP.6.R.105 (Robeson 431)\VOID-all current files on PW\Traffic\TrafficControl\TCP\TRYING TO PRINT\17BP.6.R.105_TMP_TCP01.dgn
User:CROOKJC

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 (T E M P)

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

CDM Smith

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

APPROVED:

DATE: 11/20/2018

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER ADAM M. CONRAD

DocuSigned by: Adam M. Conrad

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.105	TMP-1B

MANAGEMENT STRATEGIES

1- CLOSE SR 2305 (KITE RD) 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 UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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

TRAFFIC PATTERN ALTERATIONS

A) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

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 2305 (KITE RD) FROM STA. 12+00+/- TO STA. 16+35+/- -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. 12+00+/- TO STA. 16+35+/-.

STEP 3: REMOVE TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO PROPOSED 2-LANE, 2-WAY TRAFFIC PATTERN.

LOCAL NOTES

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

CDM Smith

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

APPROVED:

DATE: 11/20/2018

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER ADAM M. CONRAD

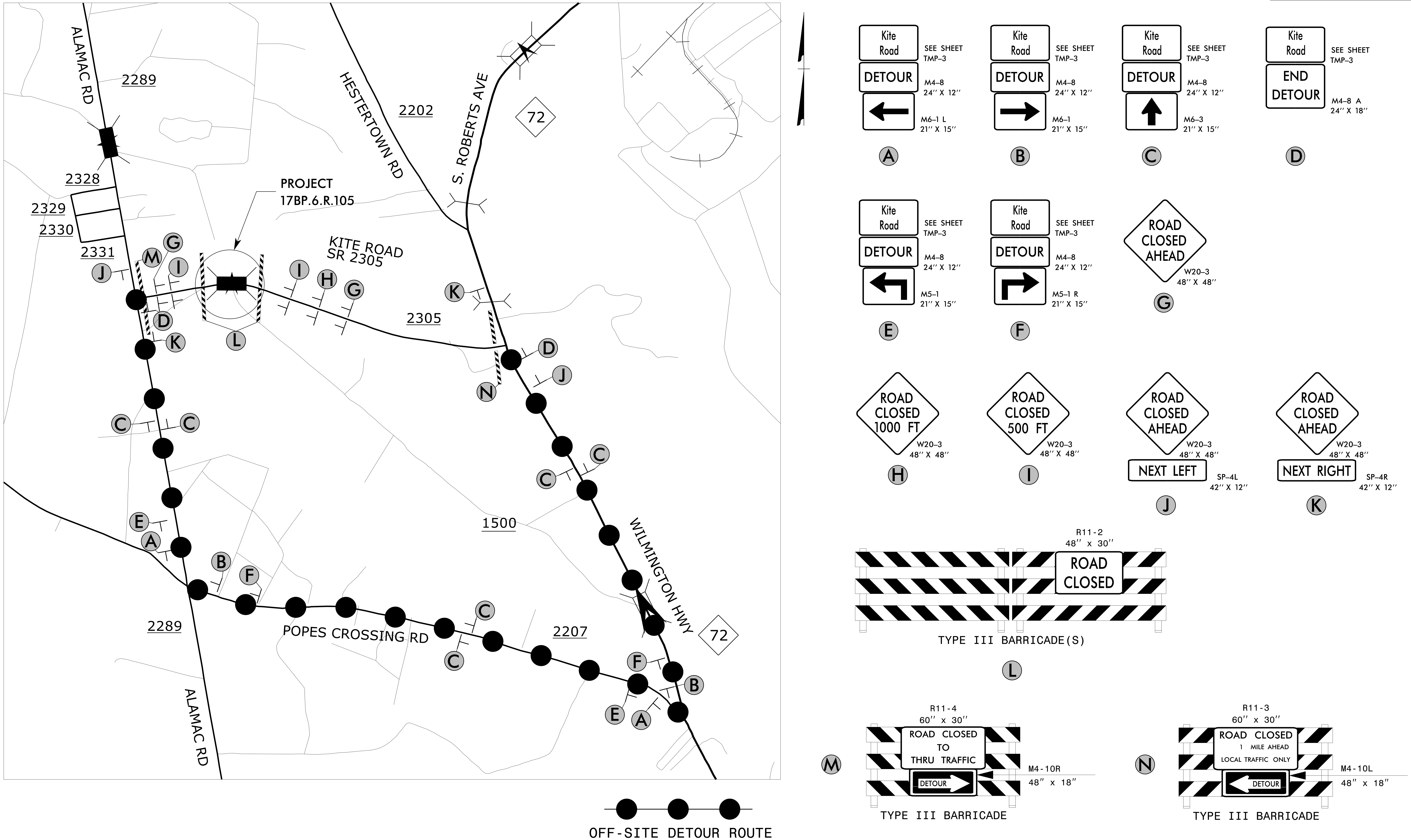
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

8/29/2018
R:\ncdot\17BP.6.R.105 (Robeson 431)\VOID-all current files on PW\Traffic\TrafficControl\TCP\TRYING TO PRINT\17BP.6.R.105_TMP_TC01B.dgn
User:CROOKJC

PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.105	TMP-2



CDM Smith

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

APPROVED:

DATE: 11/20/2018

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER ADAM M. CONRAD

DocuSigned by: Adam M. Conrad

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

OFF–SITE DETOUR

PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.105	TMP-3

SIGN NUMBER: name
TYPE: D
QUANTITY: 1

SIGN WIDTH: 2′-0″
HEIGHT: 1′-6″
TOTAL AREA: 3.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.38″
WIDTH: 0.63″
RADII: 1.5″

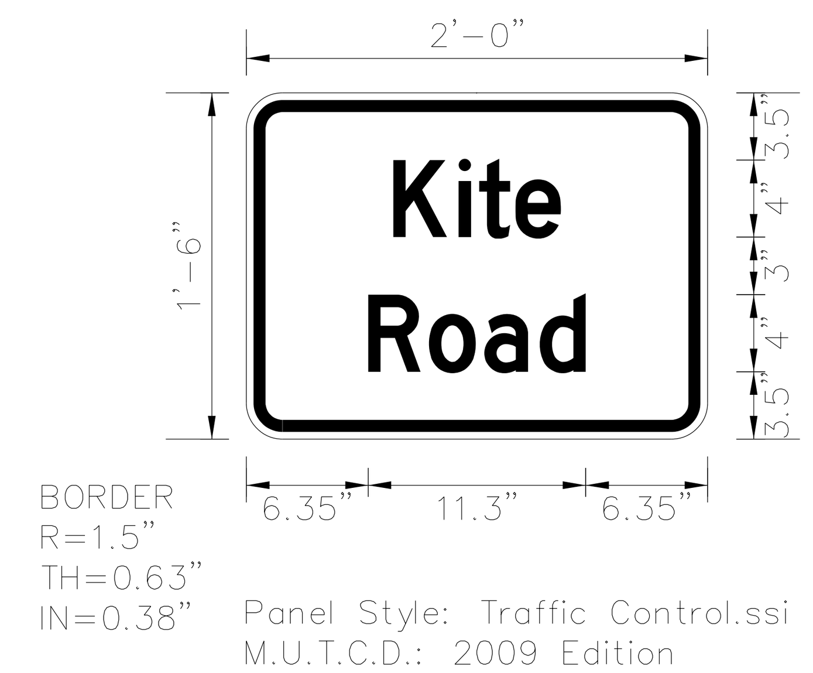
NO. Z BARS:
LENGTH:

BACKG COLOR: Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.063″ (1.6 mm) ALUMINUM

DESIGN BY: JCC
PROJECT ID: 17BP.6.R.105
CHECKED BY: AMC
LOCATION: ROBESON
Sep 07, 2018
DIV: 6



Spacing Factor is 1 unless specified otherwise

USE NOTES:

1. Legend and border(except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade B reflective sheeting.
3. Shields; A, B, and C type arrows shall be on 0.032″ (0.8mm) aluminum with Grade C reflective sheeting and demountable.
4. 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
	K	i	t	e	D 2000
	7.6	11	12.1	14	8.7
	R	o	a	d	D 2000
	6.3	9.5	12.4	15.3	11.3

FILENAME: 17BP.6.R.105_TMP_TC03

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED:
DATE: 11/20/2018
SEAL
DocuSigned by: Adam M. Conrad
NORTH CAROLINA PROFESSIONAL SEAL 043161 ENGINEER ADAM M. CONRAD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

SIGN DESIGN

09/07/18
pw:\\pw.cdmsmith.com:PW_PL\Documents\1\7240\22651\010 Transportation\04 Client Folder Structure\17BP.6.R.105\Traffic\TrafficControl\TCP\17BP.6.R.105_TMP_TC03.dgn
User:CONRADAM

PROJECT: 17BP.6.R.105

TIP NO.	SHEET NO.
17BP.6.R.105	PMP-1

APPROVED:
DATE: 11/20/2018

SEAL

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

ROBESON COUNTY

LOCATION: SR 2305 (KITE ROAD) OVER JACOB SWAMP

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:

STD. NO.	TITLE
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

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4810000000	1205	PAINT PAVEMENT MARKING LINES (4")	3,480	L.F.
4900000000	1251	PERMANENT RAISED PAVEMENT MARKERS	10	EA.

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:

ROAD NAME	MARKING	MARKER
KITE ROAD	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.

INDEX

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

PAVEMENT MARKING SCHEDULE

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

NAD 83/NA 2011

TIP NO.	SHEET NO.
17BP.6.RJ05	PMP-2

APPROVED: _____

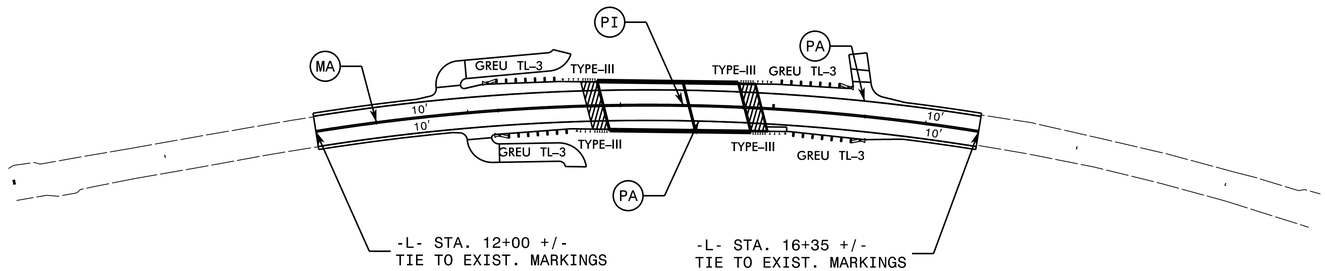
DATE: 11/20/2018

SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

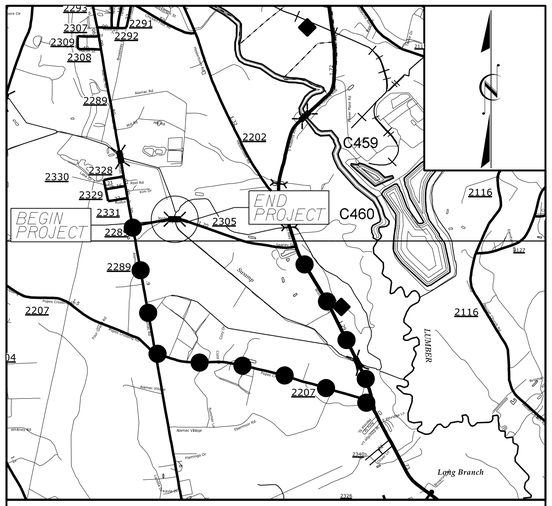
10



15

PAVEMENT MARKING DETAIL

PROJECT: 17BP.6.R.105



VICINITY MAP

DETOUR ROUTE **N.T.S.**

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROBESON COUNTY

LOCATION: REPLACE BRIDGE 770431 OVER JACOB SWAMP ON SR 2305 (KITE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.105	EC-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

NAD 83/ NA 2011

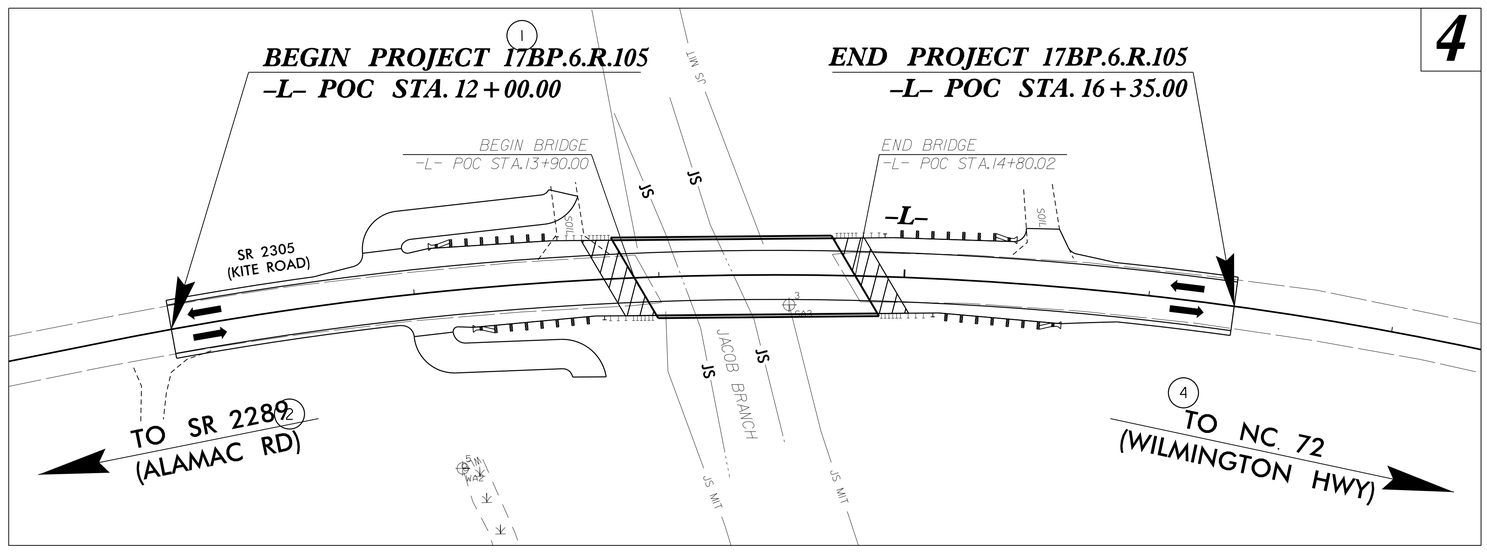
EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	

4

BEGIN PROJECT 17BP.6.R.105
–L– POC STA. 12+00.00

END PROJECT 17BP.6.R.105
–L– POC STA. 16+35.00



GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

MI ENGINEERING, PLLC
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606

Designed by:

KAREN HEFNER, PE ***3428***
NAME *LEVEL III CERTIFICATION NO.*

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

MARK STALEY, CPESC, CPSWQ

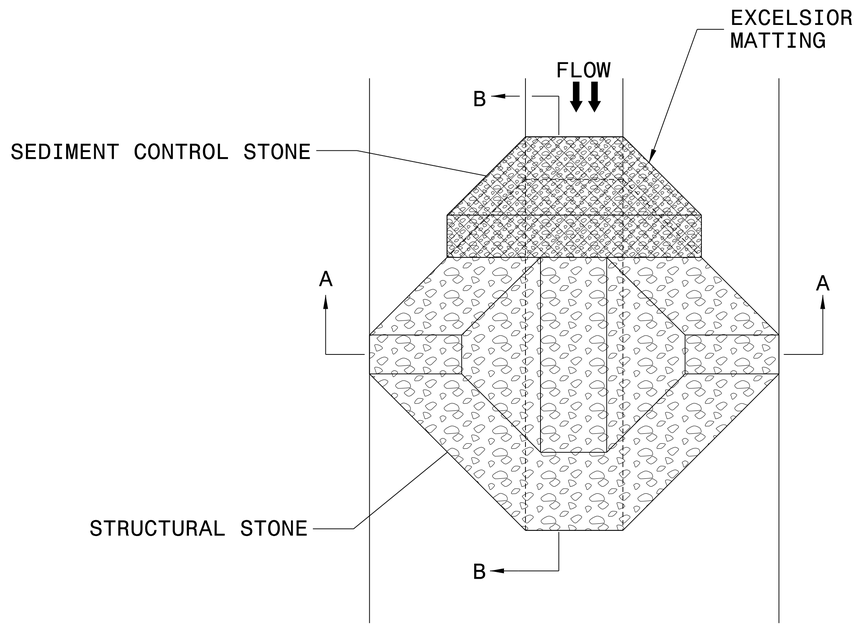
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

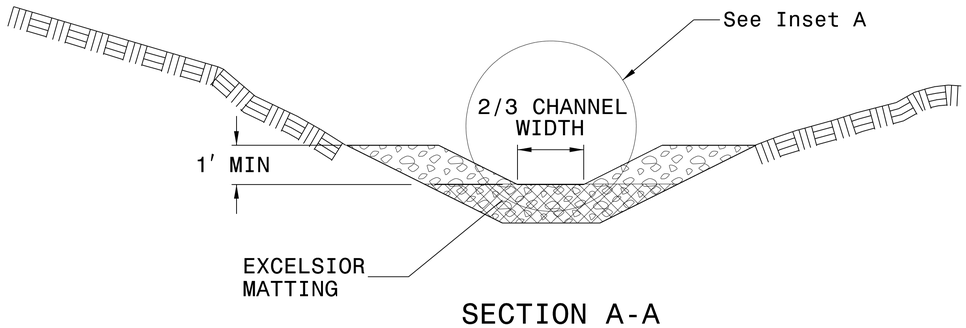
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.RJ05	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



SECTION A-A

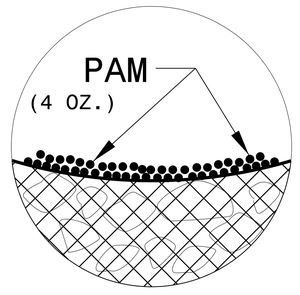
NOTES:

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

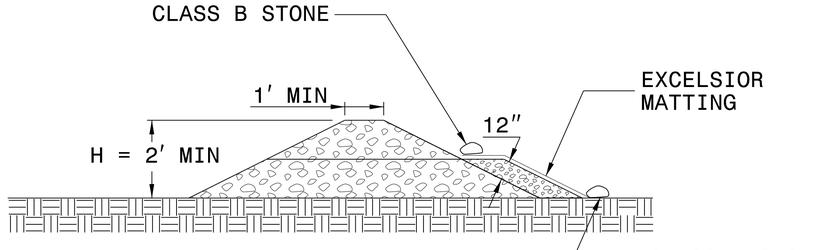
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

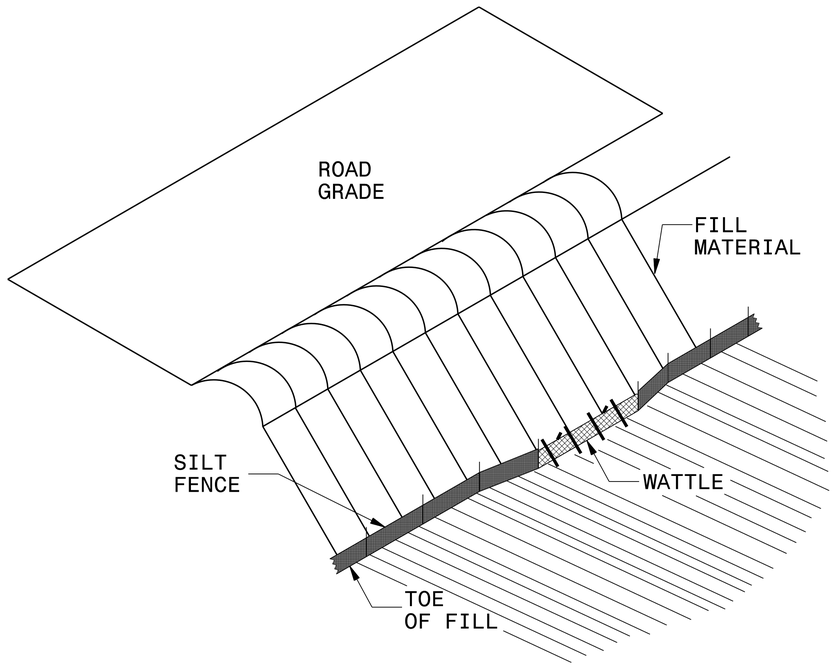


SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.RJ05	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.

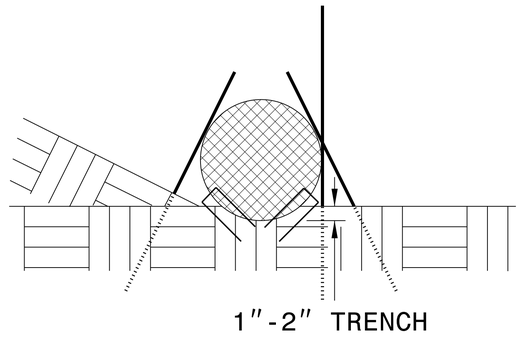
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

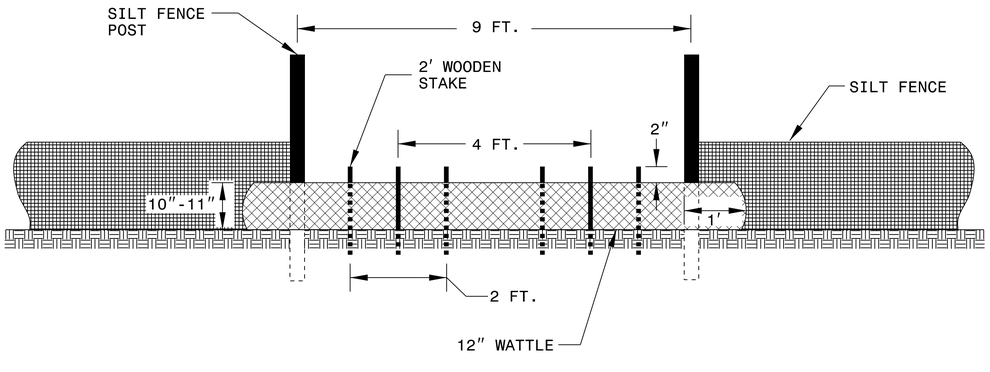
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

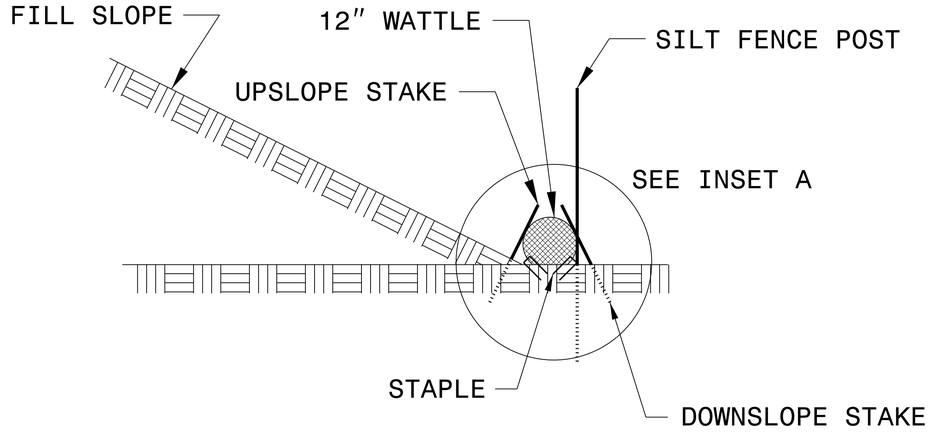
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

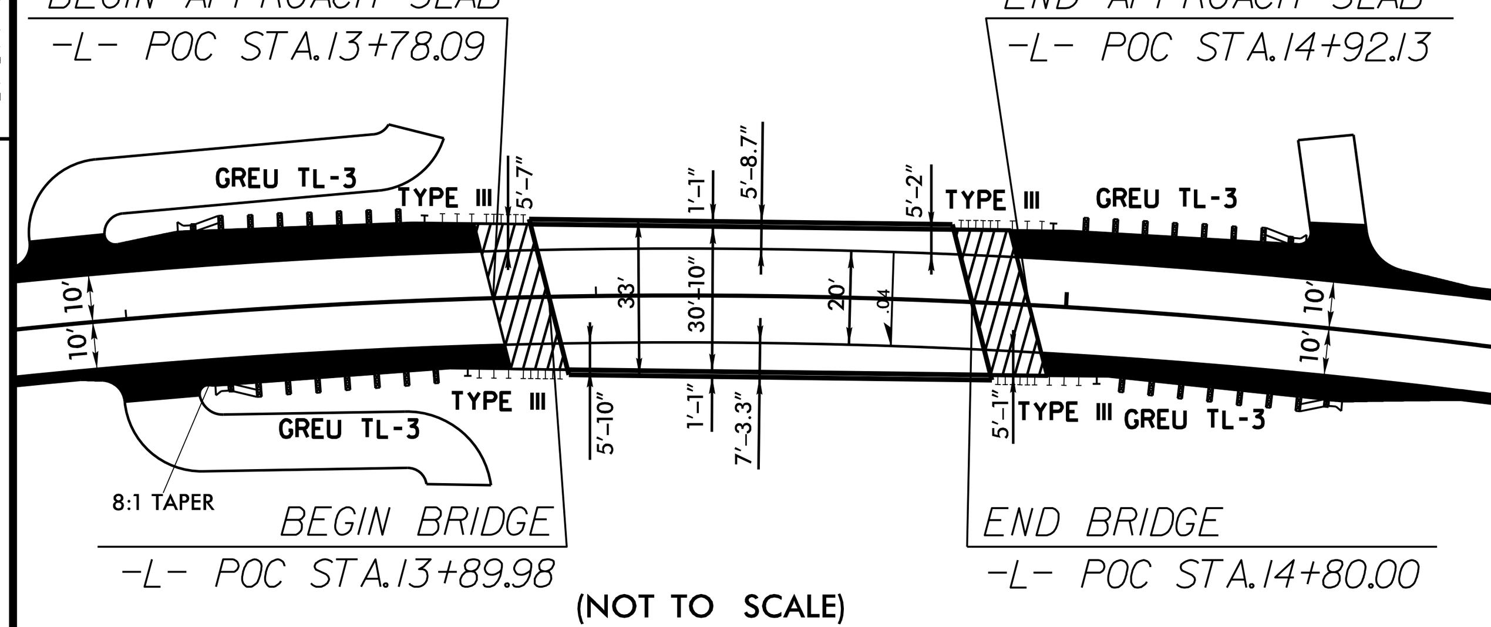
SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CDM Smith — CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3226, NC COA No. F-1255
MI Engineering, PLLC, 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, NC COA No. P-0671

NOTE: UTILIZE SPECIAL STILLING BASIN(S) WHERE APPLICABLE.



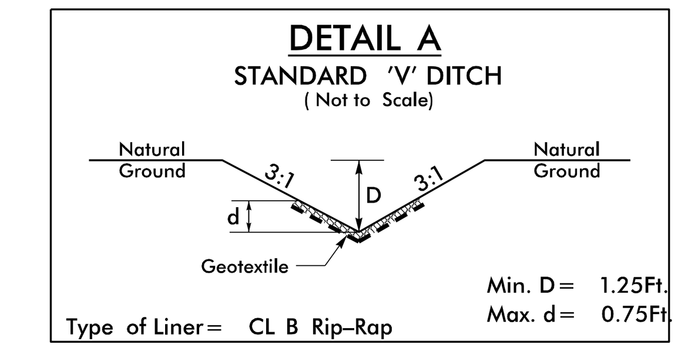
BRIDGE PAVEMENT RELATIONSHIP SKETCH

-L-
PI Sta 15+05.82
Δ = 27° 00' 05.4" (RT)
D = 4° 10' 01.1"
L = 647.99'
T = 330.13'
R = 1,375.00'
e = 0.04
RO = 88'
DS = 55 mph

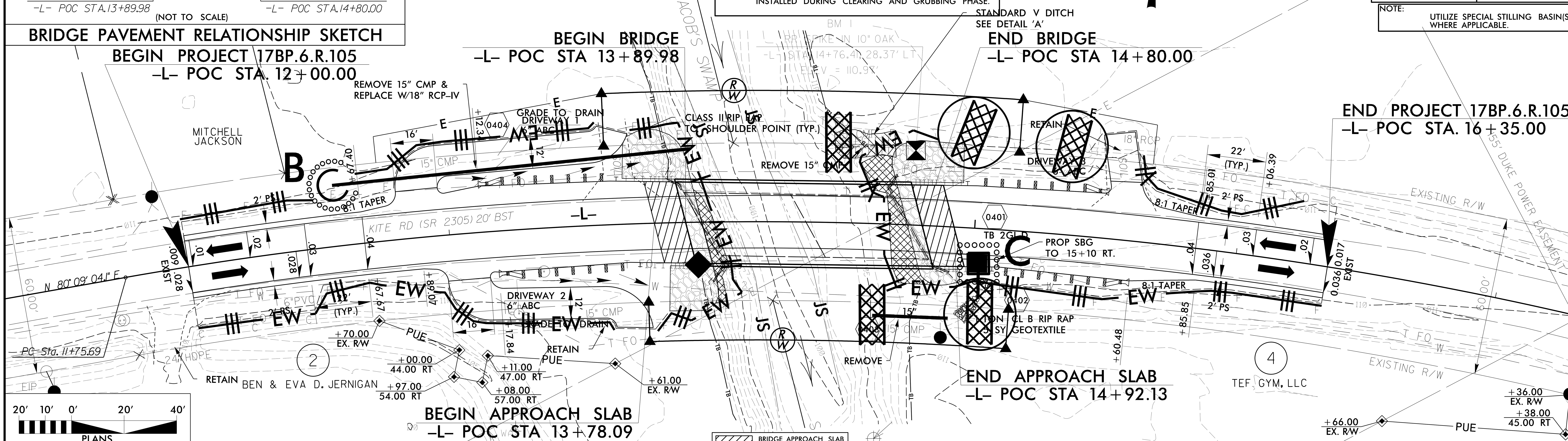
CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

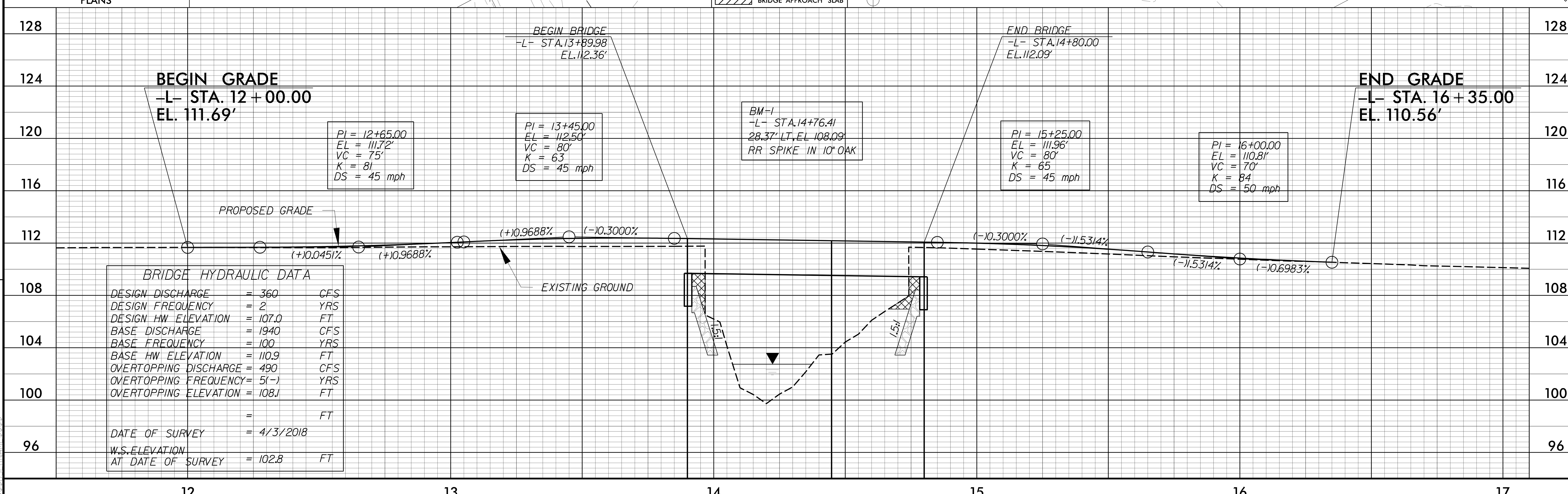
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

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



FROM STA. 14+40 TO STA. 14+72 -L- LT.
DDE = 10 CY SLOPE = 5%
9 TONS CL B RIP RAP
28 SY GEOTEXTILE





BRIDGE HYDRAULIC DATA

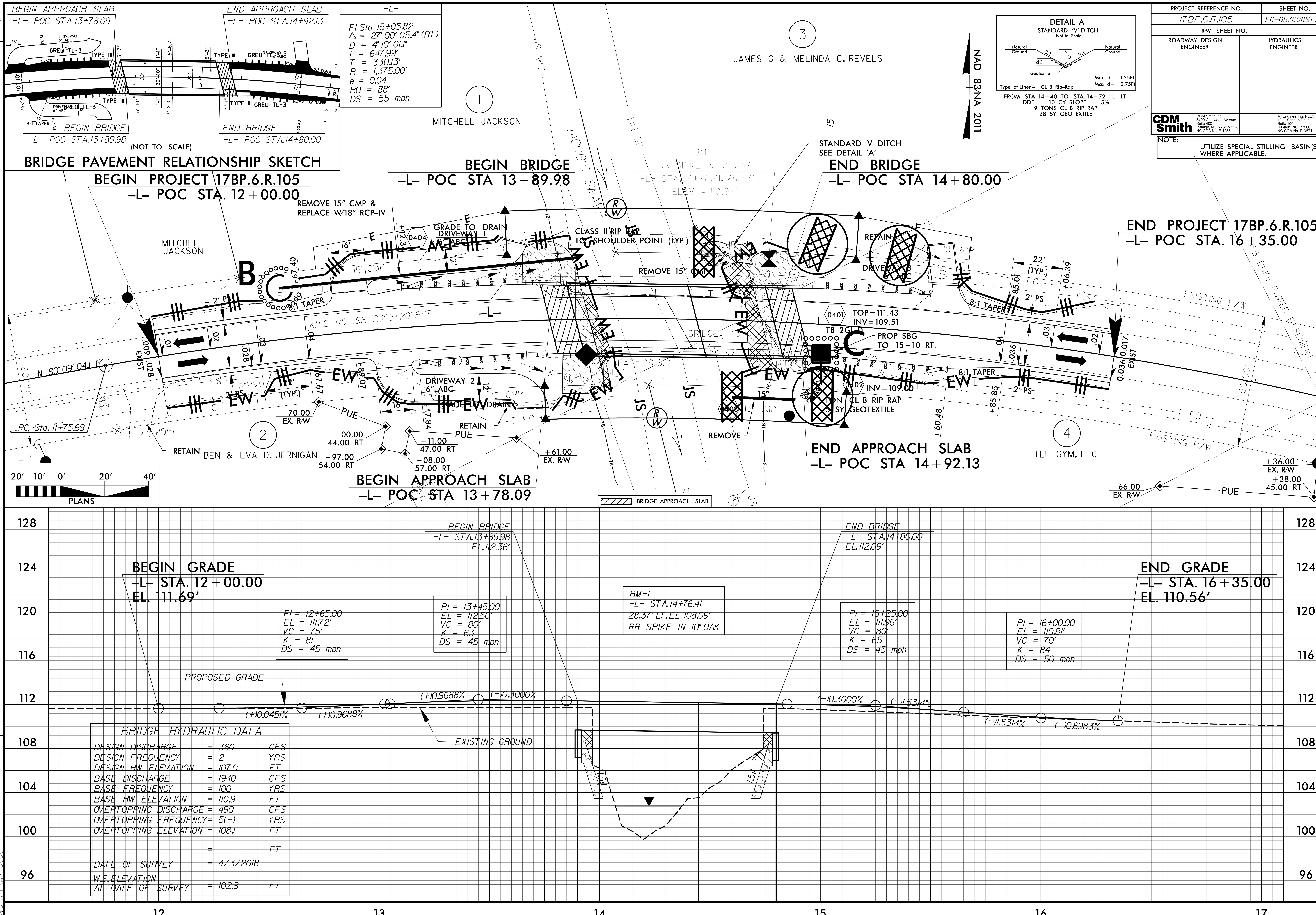
DESIGN DISCHARGE	=	360	CFS
DESIGN FREQUENCY	=	2	YRS
DESIGN HW ELEVATION	=	107.0	FT
BASE DISCHARGE	=	1940	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	110.9	FT
OVERTOPPING DISCHARGE	=	490	CFS
OVERTOPPING FREQUENCY	=	5(-)	YRS
OVERTOPPING ELEVATION	=	108.1	FT
	=		FT
DATE OF SURVEY	=	4/3/2018	
W.S. ELEVATION AT DATE OF SURVEY	=	102.8	FT

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CDM Smith — CDM Smith Inc., 5400 Glenwood Avenue, Suite 400, Raleigh, NC 27612-3226, NC COA No. F-1255

MI Engineering, PLLC, 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, NC COA No. P-0671

NOTE: UTILIZE SPECIAL STILLING BASIN(S) WHERE APPLICABLE.



BEGIN APPROACH SLAB
-L- POC STA.13+78.09
END APPROACH SLAB
-L- POC STA.14+92.13
BEGIN BRIDGE
-L- POC STA.13+89.98
END BRIDGE
-L- POC STA.14+80.00
(NOT TO SCALE)
BRIDGE PAVEMENT RELATIONSHIP SKETCH
-L-
PI Sta 15+05.82
Δ = 27° 00' 05.4" (RT)
D = 4° 10' 01.1"
L = 647.99'
T = 330.13'
R = 1,375.00'
e = 0.04
RO = 88'
DS = 55 mph
DETAIL A
STANDARD 'V' DITCH
(Not to Scale)
Type of Liner= CL B Rip-Rap
Min. D= 1.25Ft.
Max. d= 0.75Ft.
FROM STA. 14+40 TO STA. 14+72 -L- LT.
DDE = 10 CY SLOPE = 5%
9 TONS CL B RIP RAP
28 SY GEOTEXTILE
NAD 83/NA 2011
BEGIN PROJECT 17BP.6.R.105
-L- POC STA. 12+00.00
END PROJECT 17BP.6.R.105
-L- POC STA. 16+35.00
BEGIN BRIDGE
-L- POC STA 13+89.98
END BRIDGE
-L- POC STA 14+80.00
BEGIN APPROACH SLAB
-L- POC STA 13+78.09
END APPROACH SLAB
-L- POC STA 14+92.13
MITCHELL JACKSON
JAMES G & MELINDA C. REVELS
BEN & EVA D. JERNIGAN
TEF GYM, LLC
JACOB'S SWAMP
KITE RD (SR 2305) 20' BST
STANDARD V DITCH
SEE DETAIL 'A'
BM I
RR SPIKE IN 10" OAK
-L- STA. 14+76.41, 28.37' LT
ELEV = 110.97'
REMOVE 15" CMP & REPLACE W/18" RCP-IV
GRADE TO DRAIN
CLASS II RIP RAP TO SHOULDER POINT (TYP.)
REMOVE 15" CMP
TOP=111.43
INV=109.51
PROP SBG TO 15+10 RT.
INV=109.00
TON CL B RIP RAP
SY GEOTEXTILE
EXISTING R/W
55' DUKE POWER EASEMENT
PC Sta. 11+75.69
N 80° 09' 04.1" E
BRIDGE APPROACH SLAB
PLANS
BEGIN GRADE
-L- STA. 12+00.00
EL. 111.69'
END GRADE
-L- STA. 16+35.00
EL. 110.56'
BEGIN BRIDGE
-L- STA.13+89.98
EL.112.36'
END BRIDGE
-L- STA.14+80.00
EL.112.09'
PI = 12+65.00
EL = 111.72'
VC = 75'
K = 81
DS = 45 mph
PI = 13+45.00
EL = 112.50'
VC = 80'
K = 63
DS = 45 mph
BM-I
-L- STA.14+76.41
28.37' LT, EL 108.09'
RR SPIKE IN 10" OAK
PI = 15+25.00
EL = 111.96'
VC = 80'
K = 65
DS = 45 mph
PI = 16+00.00
EL = 110.81'
VC = 70'
K = 84
DS = 50 mph
PROPOSED GRADE
EXISTING GROUND
(+)0.0451%
(+)0.9688%
(-)0.3000%
(-)1.5314%
(-)0.6983%

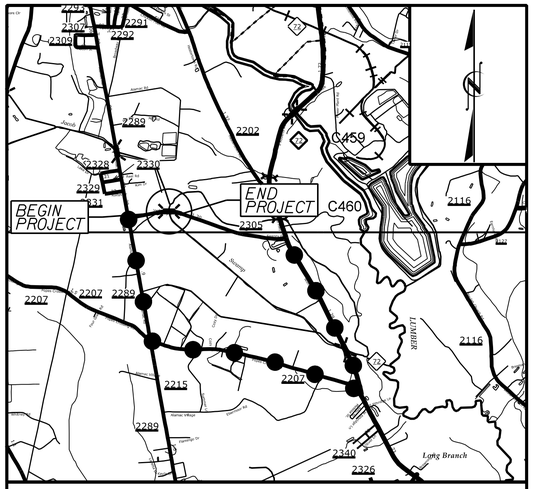
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	360	CFS
DESIGN FREQUENCY	=	2	YRS
DESIGN HW ELEVATION	=	107.0	FT
BASE DISCHARGE	=	1940	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	110.9	FT
OVERTOPPING DISCHARGE	=	490	CFS
OVERTOPPING FREQUENCY	=	5(-)	YRS
OVERTOPPING ELEVATION	=	108.1	FT
	=		FT
DATE OF SURVEY	=	4/3/2018	
W.S. ELEVATION AT DATE OF SURVEY	=	102.8	FT

REVISIONS

09/08/09

PROJECT: 17BP.6.R.105



VICINITY MAP

DETOUR ROUTE **N.T.S.**

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
ROBESON COUNTY

T.I.P. NO.	SHEET NO.
17BP.6.R.105	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.

LOCATION: REPLACE BRIDGE 770431 OVER JACOB SWAMP ON SR 2305 (KITE ROAD)

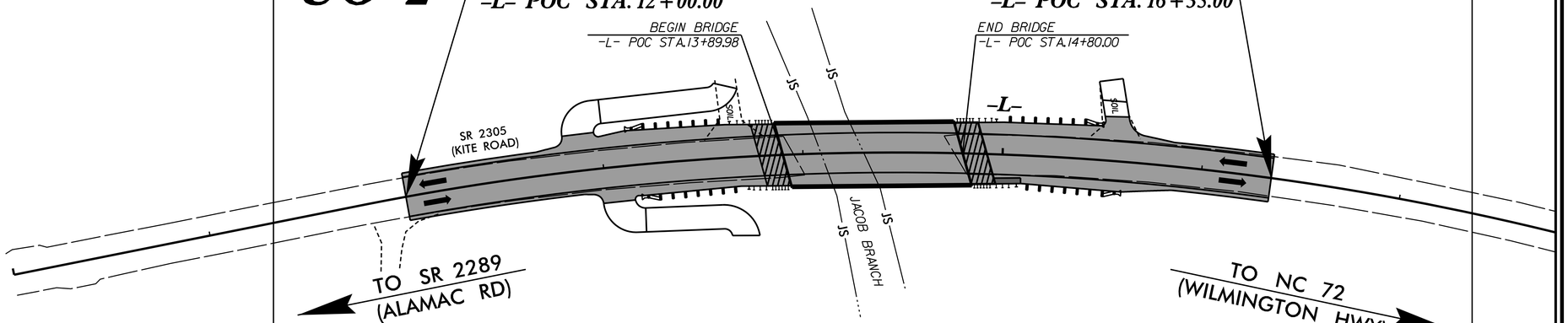
TYPE OF WORK: POWER (DISTRIBUTION) AND COMMUNICATIONS

NAD 83/NA 2011

UO–2

BEGIN PROJECT 17BP.6.R.105
–L– POC STA. 12+00.00

END PROJECT 17BP.6.R.105
–L– POC STA. 16+35.00



4

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2	*UBO PLAN SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) POWER (DISTRIBUTION) – LUMBEE RIVER EMC
(B) COMMUNICATIONS – AT&T
(C) COMMUNICATIONS – SPIRIT
(D) COMMUNICATIONS – SPECTRUM

PREPARED IN THE OFFICE OF:

SO-DEEP | SAM NC™

SO-DEEP I SAM NC, Inc.
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 6
DIV ADDRESS
558 GILLESPIE ST.
FAYETTEVILLE, NC 28301

Rick Handlin — *DIVISION CONTACT #1*
Randy Rogers — *DIVISION CONTACT #2*

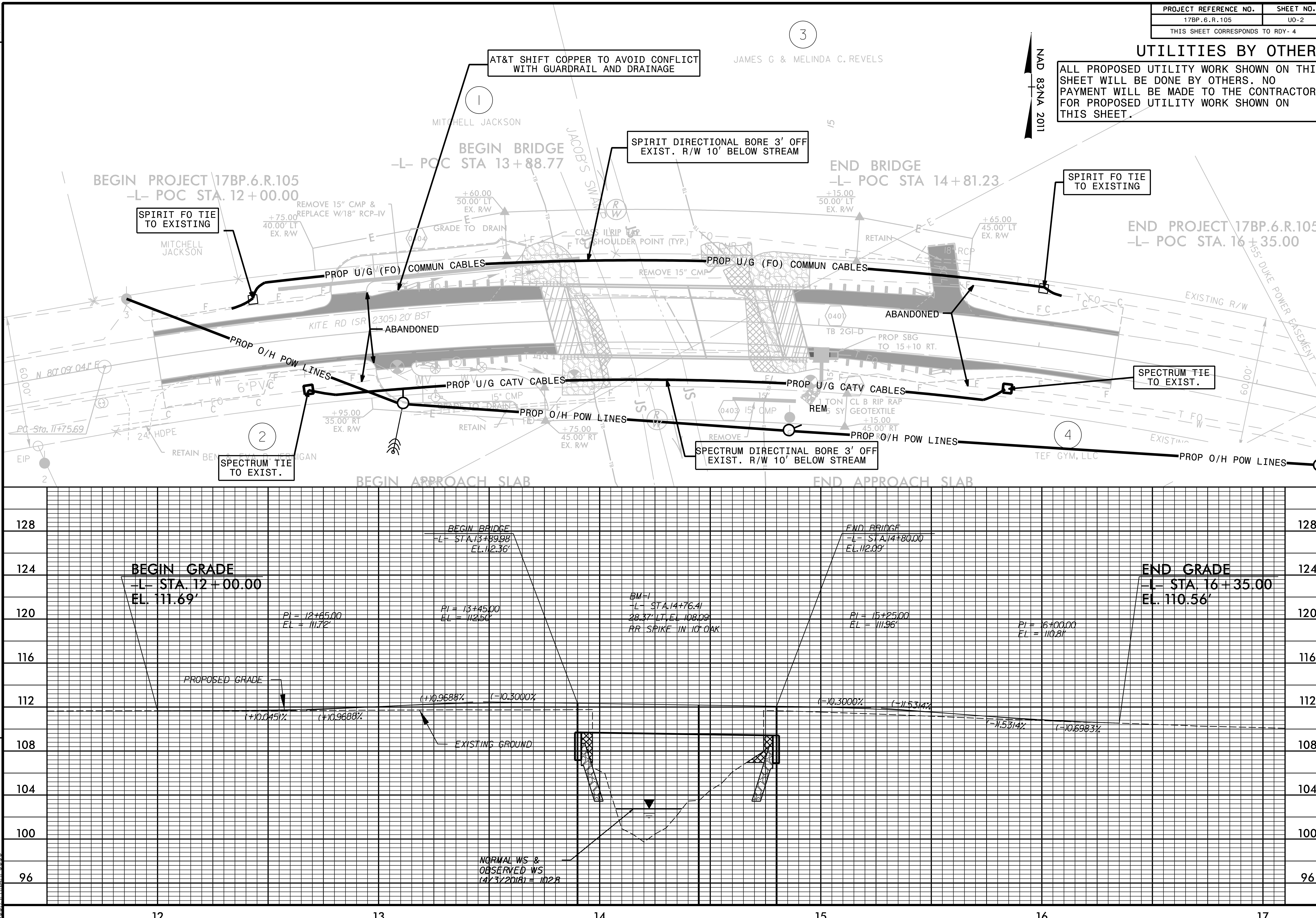
$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.105	UO-2

THIS SHEET CORRESPONDS TO RDY- 4

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.



NAD 83/NA 2011
AT&T SHIFT COPPER TO AVOID CONFLICT WITH GUARDRAIL AND DRAINAGE
SPIRIT DIRECTIONAL BORE 3' OFF EXIST. R/W 10' BELOW STREAM
SPIRIT FO TIE TO EXISTING
SPIRIT FO TIE TO EXISTING
SPECTRUM TIE TO EXIST.
SPECTRUM TIE TO EXIST.
SPECTRUM DIRECTIONAL BORE 3' OFF EXIST. R/W 10' BELOW STREAM
PROP U/G (FO) COMMUN CABLES
PROP U/G CATV CABLES
PROP O/H POW LINES
ABANDONED
JAMES G & MELINDA C. REVELS
MITCHELL JACKSON
TEF GYM, LLC
BEGIN PROJECT 17BP.6.R.105
-L- POC STA. 12+00.00
BEGIN BRIDGE
-L- POC STA 13+88.77
END BRIDGE
-L- POC STA 14+81.23
END PROJECT 17BP.6.R.105
-L- POC STA. 16+35.00
KITE RD (SR 2305) 20' BST
JACOB'S SWAMP
EXISTING R/W
155' DUKE POWER EASEMENT
BEGIN APPROACH SLAB
END APPROACH SLAB
BEGIN GRADE
-L- STA. 12+00.00
EL. 111.69'
END GRADE
-L- STA. 16+35.00
EL. 110.56'
BEGIN BRIDGE
-L- STA.13+89.98
EL.112.36'
END BRIDGE
-L- STA.14+80.00
EL.112.09'
BM-1
-L- STA.14+76.41
28.37' LT, EL 108.09
RR SPIKE IN 10" OAK
PI = 12+65.00
EL = 111.72'
PI = 13+45.00
EL = 112.50'
PI = 15+25.00
EL = 111.96'
PI = 16+00.00
EL = 110.81'
PROPOSED GRADE
EXISTING GROUND
NORMAL WS &
OBSERVED WS
(4/3/2018) = 102.8
128
124
120
116
112
108
104
100
96
12
13
14
15
16
17

CROSS SECTION SHEET INDEX

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."


PROJ. REFERENCE NO.
17BP.6.R.105
SHEET NO.
X-2
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."
13 + 88.77
BEGIN BRIDGE STA. 13 + 88.77
PROPOSED DRIVEWAY
111.76
13 + 50.00
111.74
13 + 00.00
111.67
12 + 50.00
VAR
111.69
12 + 00.00
BEGIN PROJECT STA. 12 + 00.00
EXIST
111.65
11 + 50.00

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.6.R.105	X-3

DRIVEWAY TIE

0.040 0.040

3:1

111.19

15+50.00

0.040 0.040

3:1

VAR

111.56

15+00.00

END BRIDGE STA. 14+81.23

0.040 0.040

3:1

111.69

14+81.23

0.040 0.040

106.0

104.49

14+50.00

0.040 0.040

107.64

14+00.00

-4-

_SYSTIME
17BP.6.R.105_Rdy_XPL_L.dgn
USER:CHOK_JT

6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.105	X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

115
110
105
115
110
105
115
110
105

EXIST EXIST

110.23

16+85.00

END PROJECT STA. 16+35.00

VAR 0.017 0.036 3:1

110.56

16+35.00

3:1 0.033 0.036 3:1

110.79

16+00.00

-4-

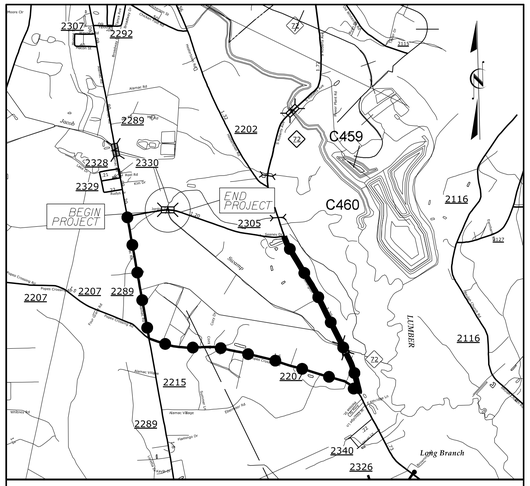
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

_SYSTIME
USER: CHOK
17BP.6.R.105_Rdy_XPL_L.dgn

PROJECT: 17BP.6.R.105

CONTRACT: DF00238

STRUCTURE



VICINITY MAP

OFF–SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

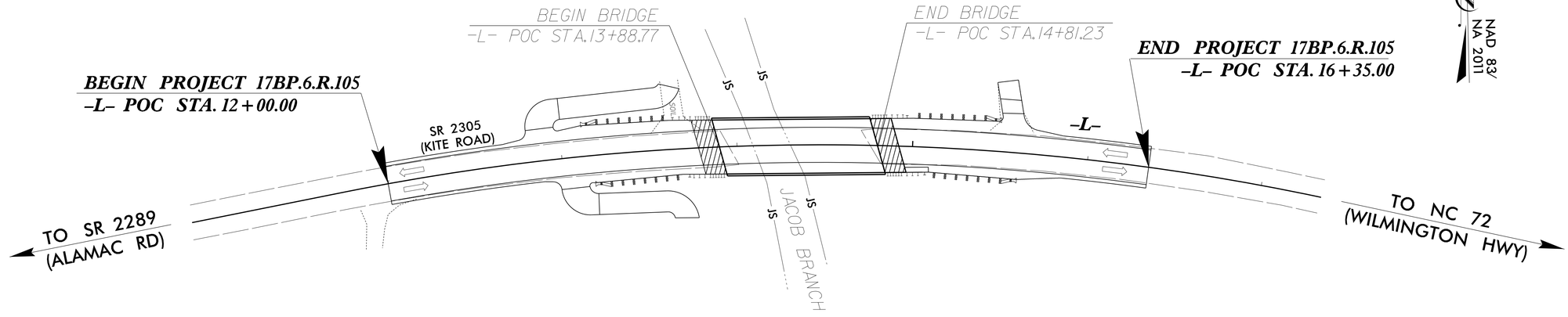
ROBESON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.105		19

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.6.R.105	N/A	P.E.
17BP.6.R.105	N/A	UTIL. & R/W
17BP.6.R.105	N/A	CONSTR.

LOCATION: REPLACE BRIDGE 431 OVER JACOB SWAMP ON SR 2305 (KITE ROAD)

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



DESIGN DATA

ADT 2018 = 770 VPD
ADT 2038 = 1000 VPD
DHV = N/A %
D = N/A %
T = 7 %
V = 55 MPH

FUNC CLASS = LOCAL
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.6.R.105 = 0.065 MILES

LENGTH STRUCTURE PROJECT 17BP.6.R.105 = 0.017 MILES

TOTAL LENGTH OF PROJECT 17BP.6.R.105 = 0.082 MILES

Prepared In the Office of:

CDM Smith

CDM Smith Inc.
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 : DECEMBER 19, 2018

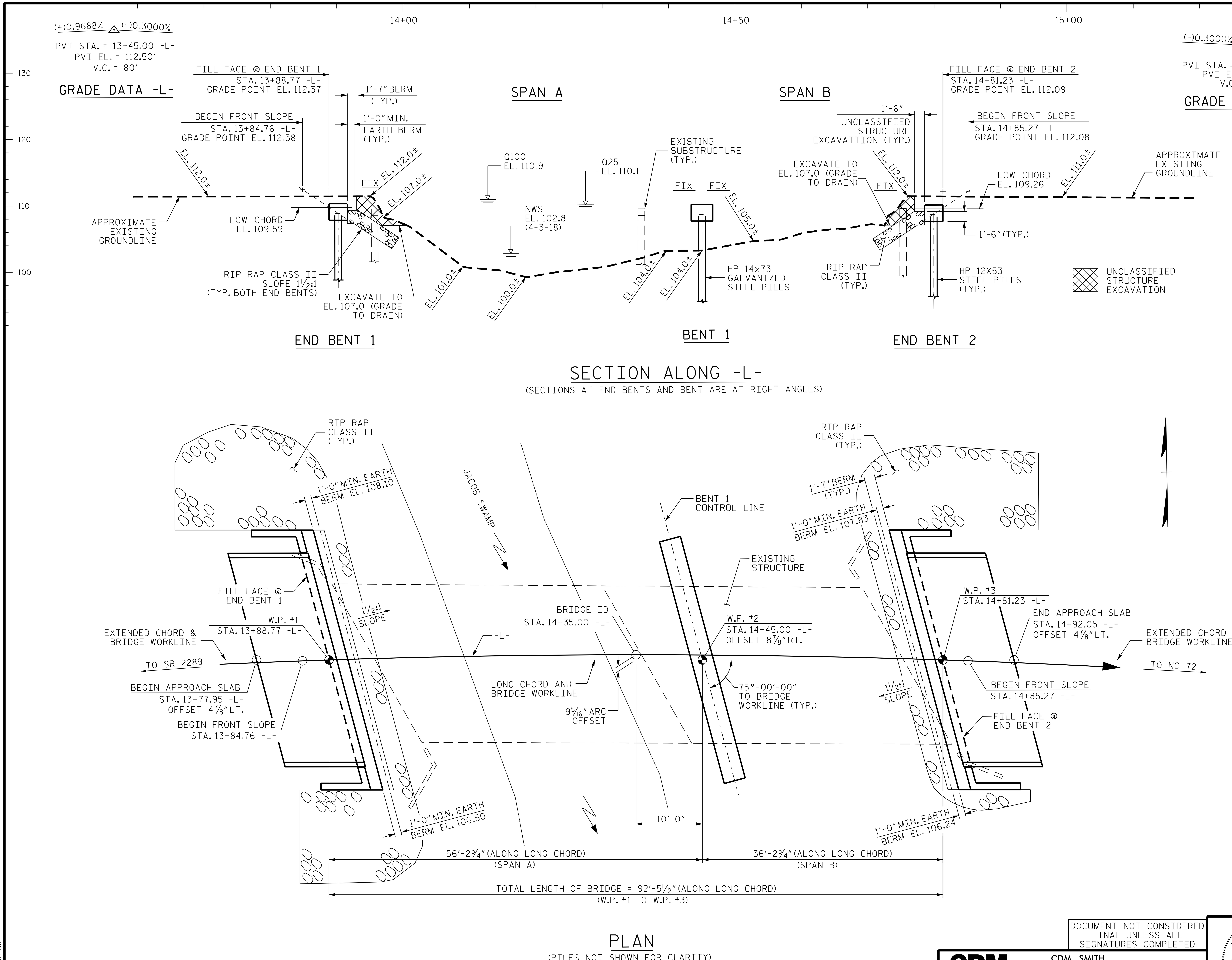
DAVID J. CLODGO, P.E.
PROJECT ENGINEER

TING HSIUNG FANG, P.E.
PROJECT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by:
Ting Fang
60E43C0AEA60462...

11/8/2018



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

HORIZONTAL CURVE DATA -L-

PI STA. = 15+05.82
Δ = 27°-00'-05.4" (RT.)
D = 4°-10'-01.1"
L = 647.99'
T = 330.13'
R = 1,375.00'

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
10/2/2018
DocuSigned by: Ting Fang
60E43C0AEA60462...

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 1 OF 3
REPLACES BRIDGE NO. 431

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER JACOB SWAMP ON SR 2305 BETWEEN SR 2289 & NC 72

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 : 07/18	DWG. No.
CHECKED BY : THF	DATE : 07/18	
DESIGN ENGINEER : VDK	DATE : 07/18	

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
DocuSigned by: Venkata D. T. Kollipara
10/2/2018

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-01
1			3				TOTAL SHEETS
2			4				19

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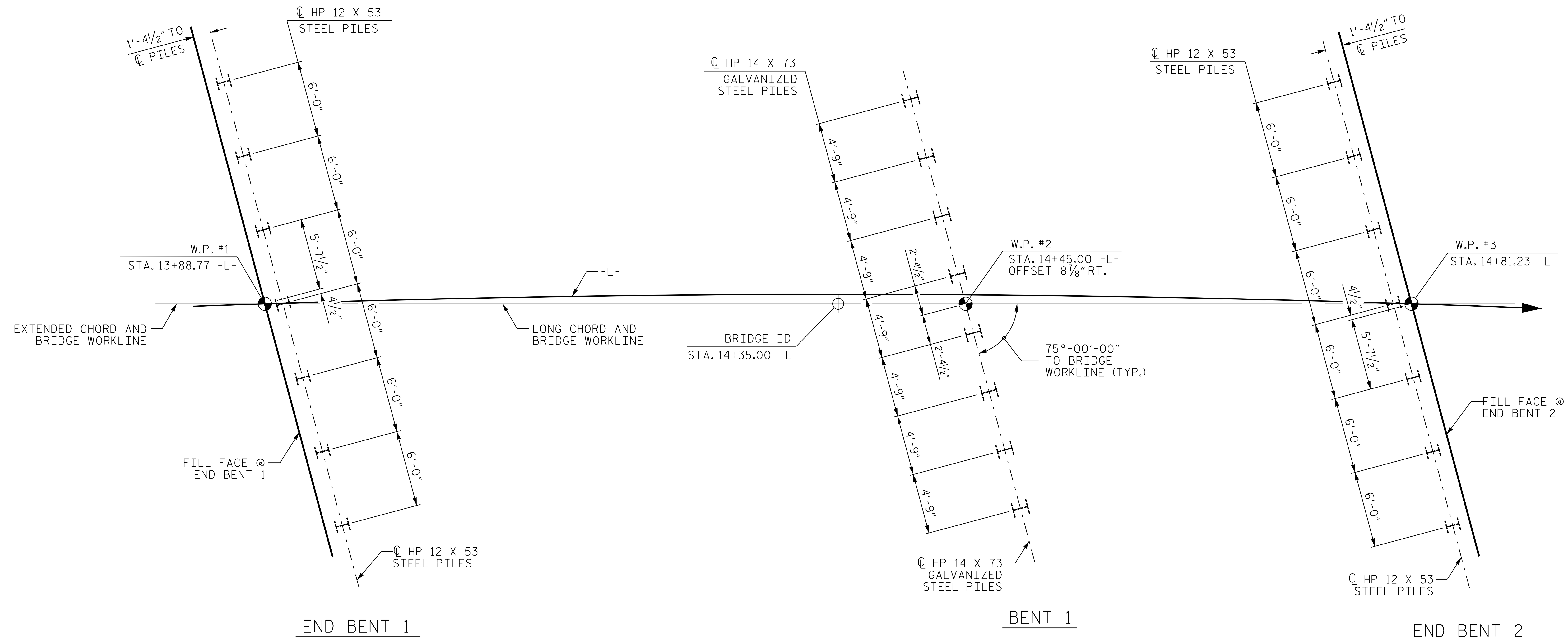


FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
ALL PILES ARE VERTICAL.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 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 125 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 95 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.

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER JACOB SWAMP ON SR 2305 BETWEEN SR 2289 & NC 72

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 : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
DocuSigned by: Venkata D. T. Kollipara
10/2/2018

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

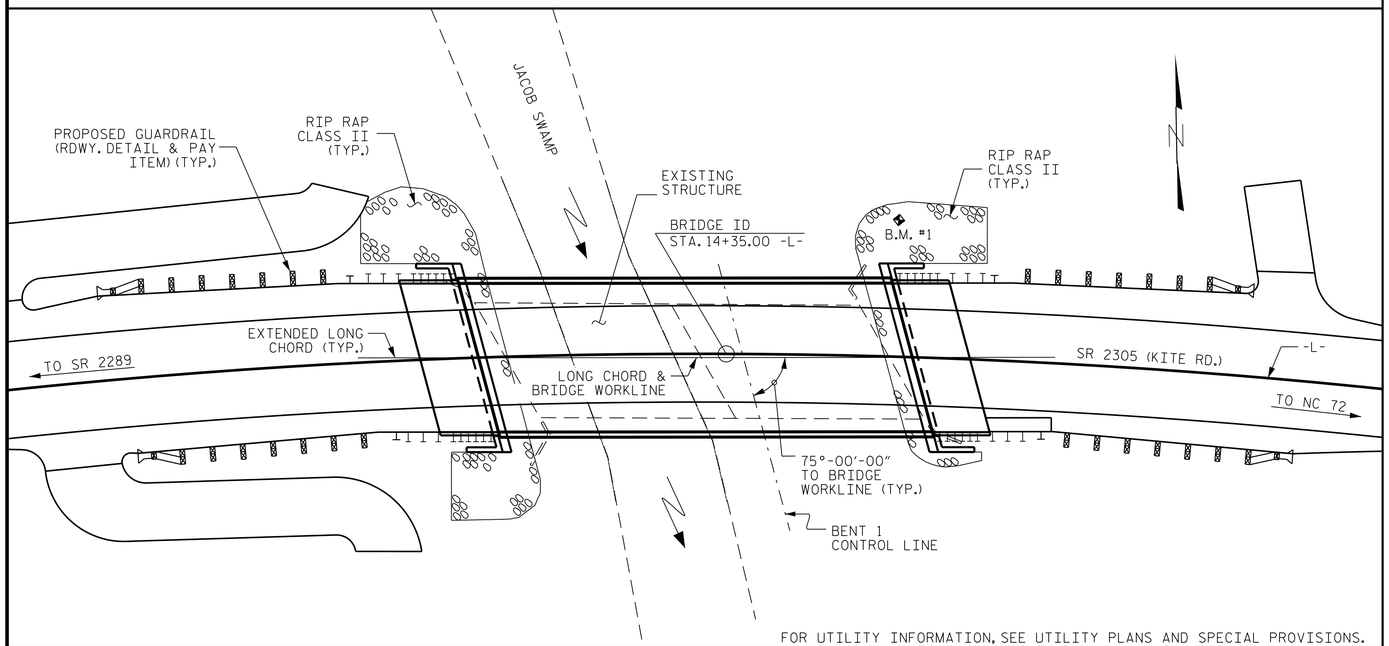
SHEET NO. S-02
TOTAL SHEETS 19

FILE: c:\pw_pl\kolliparav\d1883270\401_003_17BP6R105_SMU_GD02_002.dgn
DATE: 10/2/2018 10:58:30 AM

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	
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TON	SQ. YD.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE														180.26			LUMP SUM	22	990
END BENT 1				LUMP SUM	14.5		2,131	7		7	385.0				95	105			
BENT 1					11.3		2,127		8			8	480.0						
END BENT 2				LUMP SUM	14.5		2,131	7		7	350.0				70	75			
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	40.3	LUMP SUM	6,389	14	8	14	735.0	8	480.0	180.26	165	180	LUMP SUM	22	990

B.M. #: 1 RR SPIKE IN 10" OAK 28.37' LEFT OF STA. 14+76.41 -L-, EL. 110.97



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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".

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 14+35.00 -L-".

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 10 FT. LEFT SIDE, 30 FT. RIGHT SIDE, AT END BENTS 1 AND 27 FT. LEFT SIDE, 23 FT. RIGHT SIDE 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 2 SPANS: 1 @ 41'-0" AND 1 @ 40'-0" WITH CLEAR ROADWAY WIDTH OF 24'-0" AND STEEL PLANK FLOOR ON I-BEAMS, STD. BMD-10; SUBSTRUCTURE CONSISTING OF TIMBER CAPS ON TIMBER PILES AT END BENTS AND INTERIOR BENT EXCEPT RIGHT SIDE PILE AT INTERIOR BENT WHICH IS A CONCRETE ENCASED TIMBER PILE AND LOCATED AT THE SITE OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT.

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

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.

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

HYDRAULIC DATA

DESIGN DISCHARGE	= 360 CFS
FREQUENCY OF DESIGN FLOOD	= 2 YR.
DESIGN HIGH WATER ELEVATION	= 107.0 FT.
DRAINAGE AREA	= 15.5 SQ. MI.
BASE DISCHARGE (Q100)	= 1940 CFS
BASE HIGH WATER ELEVATION	= 110.9 FT.

DESIGN MAINTAINS EXISTING LEVEL OF SERVICE

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 490 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 5(-) YRS.
OVERTOPPING FLOOD ELEVATION	= 108.1 FT. *

* AT EXISTING SAG PT. APPROX. 2000 FT EAST OF BRIDGE

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER JACOB SWAMP ON SR 2305 BETWEEN SR 2289 & NC 72

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 : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA

Venkata D. T. Kollipara
10/27/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			19

FILE: c:\pw_pll\kollipara\d1883370\401_005_17BP6R105_SMU_GD03_003.dgn
DATE: 10/5/2018 10:58:41 AM

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)	1.065	--	1.75	0.27	1.25	55′	EL	26.982	0.616	1.12	55′	EL	5.396	0.80	0.27	**1.07**	55′	EL	**26.982**	
		HL-93(Opr)	N/A	--	1.452	--	1.35	0.27	1.61	55′	EL	26.982	0.616	1.45	55′	EL	5.396	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	1.335	48.043	1.75	0.27	1.56	55′	EL	26.982	0.616	1.34	55′	EL	5.396	0.80	0.27	**1.33**	55′	EL	**26.982**	
		HS-20(Opr)	36.000	--	1.734	62.425	1.35	0.27	2.02	55′	EL	26.982	0.616	1.73	55′	EL	5.396	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.802	37.83	1.4	0.27	4.09	55′	EL	26.982	0.616	3.81	55′	EL	5.396	0.80	0.27	2.80	55′	EL	26.982	
		SNGARBS2	20.000	--	2.175	43.506	1.4	0.27	3.18	55′	EL	26.982	0.616	2.76	55′	EL	5.396	0.80	0.27	2.18	55′	EL	26.982	
		SNAGRIS2	22.000	--	2.099	46.173	1.4	0.27	3.07	55′	EL	26.982	0.616	2.58	55′	EL	5.396	0.80	0.27	2.10	55′	EL	26.982	
		SNCOTTS3	27.250	--	1.397	38.065	1.4	0.27	2.04	55′	EL	26.982	0.616	1.91	55′	EL	5.396	0.80	0.27	1.40	55′	EL	26.982	
		SNAGGRS4	34.925	--	1.2	41.922	1.4	0.27	1.75	55′	EL	26.982	0.616	1.62	55′	EL	5.396	0.80	0.27	1.20	55′	EL	26.982	
		SNS5A	35.550	--	1.172	41.648	1.4	0.27	1.71	55′	EL	26.982	0.616	1.66	55′	EL	5.396	0.80	0.27	1.17	55′	EL	26.982	
		SNS6A	39.950	--	1.089	43.514	1.4	0.27	1.59	55′	EL	26.982	0.616	1.53	55′	EL	5.396	0.80	0.27	1.09	55′	EL	26.982	
		SNS7B	42.000	--	1.038	43.587	1.4	0.27	1.52	55′	EL	26.982	0.616	1.53	55′	EL	5.396	0.80	0.27	1.04	55′	EL	26.982	
	TTST	TNAGRIT3	33.000	--	1.333	43.973	1.4	0.27	1.95	55′	EL	26.982	0.616	1.81	55′	EL	5.396	0.80	0.27	1.33	55′	EL	26.982	
		TNT4A	33.075	--	1.342	44.4	1.4	0.27	1.96	55′	EL	26.982	0.616	1.75	55′	EL	5.396	0.80	0.27	1.34	55′	EL	26.982	
		TNT6A	41.600	--	1.112	46.252	1.4	0.27	1.62	55′	EL	26.982	0.616	1.67	55′	EL	5.396	0.80	0.27	1.11	55′	EL	26.982	
		TNT7A	42.000	--	1.125	47.255	1.4	0.27	1.64	55′	EL	26.982	0.616	1.56	55′	EL	5.396	0.80	0.27	1.13	55′	EL	26.982	
		TNT7B	42.000	--	1.174	49.318	1.4	0.27	1.72	55′	EL	26.982	0.616	1.47	55′	EL	5.396	0.80	0.27	1.17	55′	EL	26.982	
		TNAGRIT4	43.000	--	1.111	47.786	1.4	0.27	1.62	55′	EL	26.982	0.616	1.42	55′	EL	5.396	0.80	0.27	1.11	55′	EL	26.982	
		TNAGT5A	45.000	--	1.041	46.851	1.4	0.27	1.52	55′	EL	26.982	0.616	1.44	55′	EL	5.396	0.80	0.27	1.04	55′	EL	26.982	
		TNAGT5B	45.000	(3)	1.023	46.02	1.4	0.27	1.49	55′	EL	26.982	0.616	1.35	55′	EL	5.396	0.80	0.27	**1.02**	55′	EL	**26.982**	

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:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

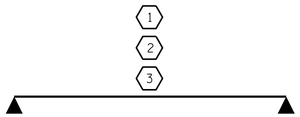
(2) DESIGN LOAD RATING (HS-20)

(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.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

SHEET 1 OF 2

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 : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA

DocuSigned by: Venkata D. T. Kollipara
10/2/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 55′ CORED SLAB UNIT

75°SKEW, SPAN A

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			19

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STD. NO. 21LRFR1_75&105S_55L

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)	1.06	--	1.75	0.275	1.38	35'	EL	16.982	0.623	1.2	35'	EL	1.698	0.80	0.275	**1.06**	35'	EL	**16.982**	
		HL-93(Opr)	N/A	--	1.549	--	1.35	0.275	1.79	35'	EL	16.982	0.623	1.55	35'	EL	1.698	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	1.377	49.573	1.75	0.275	1.82	35'	EL	13.586	0.623	**1.38**	35'	EL	**1.698**	0.80	0.275	1.41	35'	EL	16.982	
		HS-20(Opr)	36.000	--	1.785	64.262	1.35	0.275	2.36	35'	EL	13.586	0.623	1.79	35'	EL	1.698	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.424	32.72	1.4	0.275	3.95	35'	EL	16.982	0.623	3.55	35'	EL	1.698	0.80	0.275	2.42	35'	EL	16.982	
		SNGARBS2	20.000	--	2.082	41.635	1.4	0.275	3.34	35'	EL	13.586	0.623	2.68	35'	EL	1.698	0.80	0.275	2.08	35'	EL	13.586	
		SNAGRIS2	22.000	--	2.076	45.668	1.4	0.275	3.31	35'	EL	13.586	0.623	2.56	35'	EL	1.698	0.80	0.275	2.08	35'	EL	13.586	
		SNCOTTS3	27.250	--	1.213	33.066	1.4	0.275	1.98	35'	EL	16.982	0.623	1.79	35'	EL	1.698	0.80	0.275	1.21	35'	EL	16.982	
		SNAGGRS4	34.925	--	1.123	39.207	1.4	0.275	1.83	35'	EL	16.982	0.623	1.6	35'	EL	1.698	0.80	0.275	1.12	35'	EL	16.982	
		SNS5A	35.550	--	1.09	38.739	1.4	0.275	1.77	35'	EL	16.982	0.623	1.69	35'	EL	1.698	0.80	0.275	1.09	35'	EL	16.982	
		SNS6A	39.950	--	1.052	42.014	1.4	0.275	1.71	35'	EL	16.982	0.623	1.58	35'	EL	1.698	0.80	0.275	1.05	35'	EL	16.982	
		SNS7B	42.000	(3)	1.004	42.153	1.4	0.275	1.63	35'	EL	16.982	0.623	1.62	35'	EL	1.698	0.80	0.275	**1.00**	35'	EL	**16.982**	
	TTST	TNAGRIT3	33.000	--	1.299	42.872	1.4	0.275	2.11	35'	EL	16.982	0.623	1.85	35'	EL	1.698	0.80	0.275	1.30	35'	EL	16.982	
		TNT4A	33.075	--	1.298	42.933	1.4	0.275	2.11	35'	EL	16.982	0.623	1.75	35'	EL	1.698	0.80	0.275	1.30	35'	EL	16.982	
		TNT6A	41.600	--	1.137	47.314	1.4	0.275	1.85	35'	EL	16.982	0.623	1.71	35'	EL	1.698	0.80	0.275	1.14	35'	EL	16.982	
		TNT7A	42.000	--	1.175	49.358	1.4	0.275	1.92	35'	EL	16.982	0.623	1.59	35'	EL	1.698	0.80	0.275	1.18	35'	EL	16.982	
		TNT7B	42.000	--	1.156	48.536	1.4	0.275	1.88	35'	EL	16.982	0.623	1.54	35'	EL	1.698	0.80	0.275	1.16	35'	EL	16.982	
		TNAGRIT4	43.000	--	1.17	50.308	1.4	0.275	1.89	35'	EL	13.586	0.623	1.48	35'	EL	1.698	0.80	0.275	1.17	35'	EL	16.982	
		TNAGT5A	45.000	--	1.079	48.572	1.4	0.275	1.76	35'	EL	16.982	0.623	1.56	35'	EL	1.698	0.80	0.275	1.08	35'	EL	16.982	
		TNAGT5B	45.000	--	1.041	46.853	1.4	0.275	1.69	35'	EL	16.982	0.623	1.4	35'	EL	1.698	0.80	0.275	1.04	35'	EL	16.982	

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:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

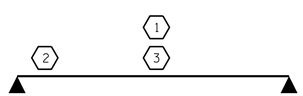
(2) DESIGN LOAD RATING (HS-20)

(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 B

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 35' CORED SLAB UNIT

75°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

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DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Digitally signed by: Venkata D. T., kollipara
10/2/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			19

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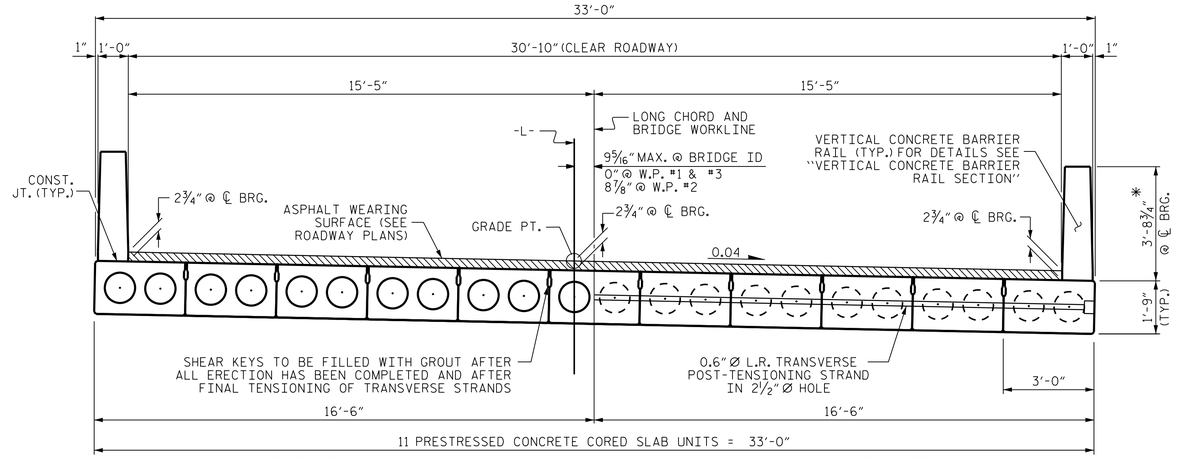
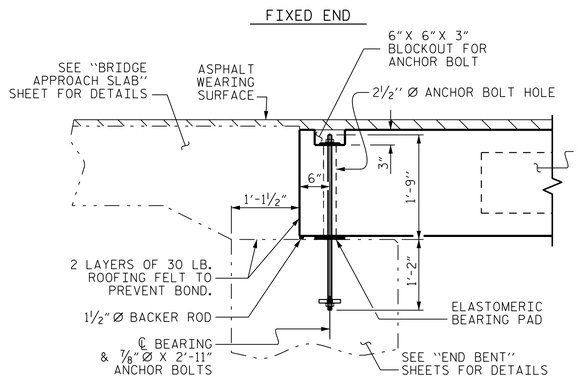


HALF SECTION THROUGH VOIDS

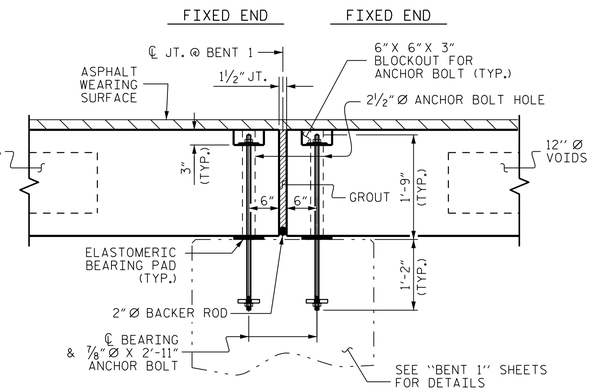
HALF SECTION AT INTERMEDIATE DIAPHRAGMS

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



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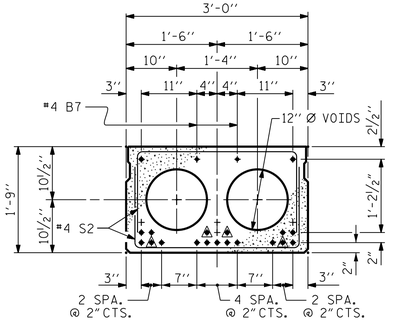
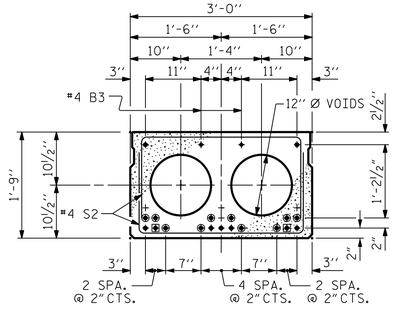


INTERIOR SLAB SECTION SPAN A (55' UNIT)

(19 STRANDS REQUIRED)



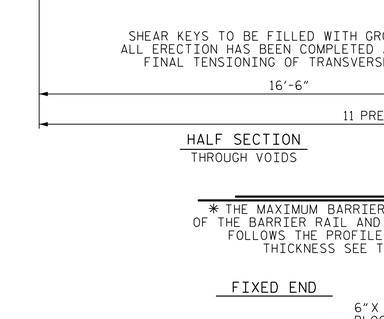
INTERIOR SLAB SECTION SPAN B (35' UNIT)

(9 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

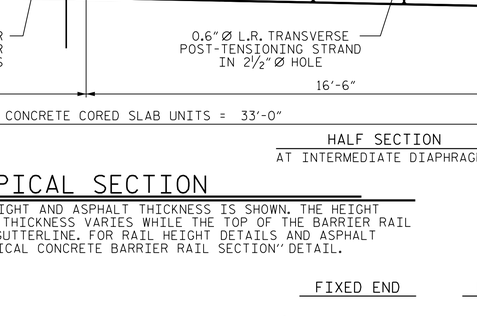
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED 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



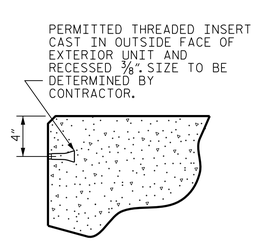
EXT. SLAB SECTION

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

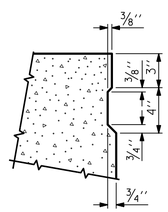


END ELEVATION

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

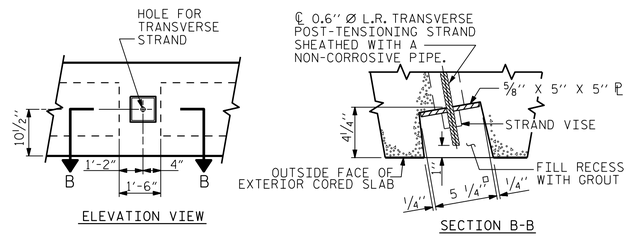


THREADED INSERT DETAIL



SHEAR KEY DETAIL

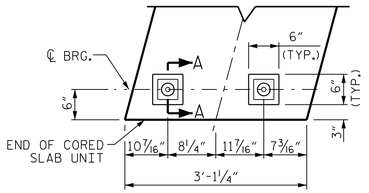
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



ELEVATION VIEW

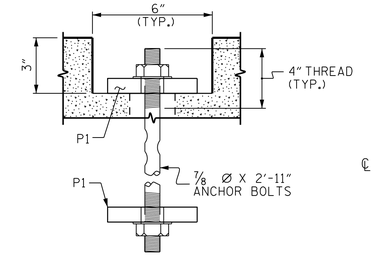
SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



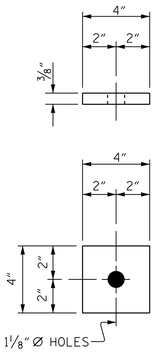
TYPICAL PLAN

FIXED END



SECTION A-A

(FIXED)



P1
(FIXED)
P1 (176 REQ'D.)

PLATE DETAILS

BLOCKOUT DETAIL FOR ANCHOR BOLTS

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW SPANS A & B

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DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D. T. KOLLIPARA
Venkata D. T., kollipara
9EA4A616C55B455...
10/2/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
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2			4			19

STD. NO. 21" PCS2_33_75S

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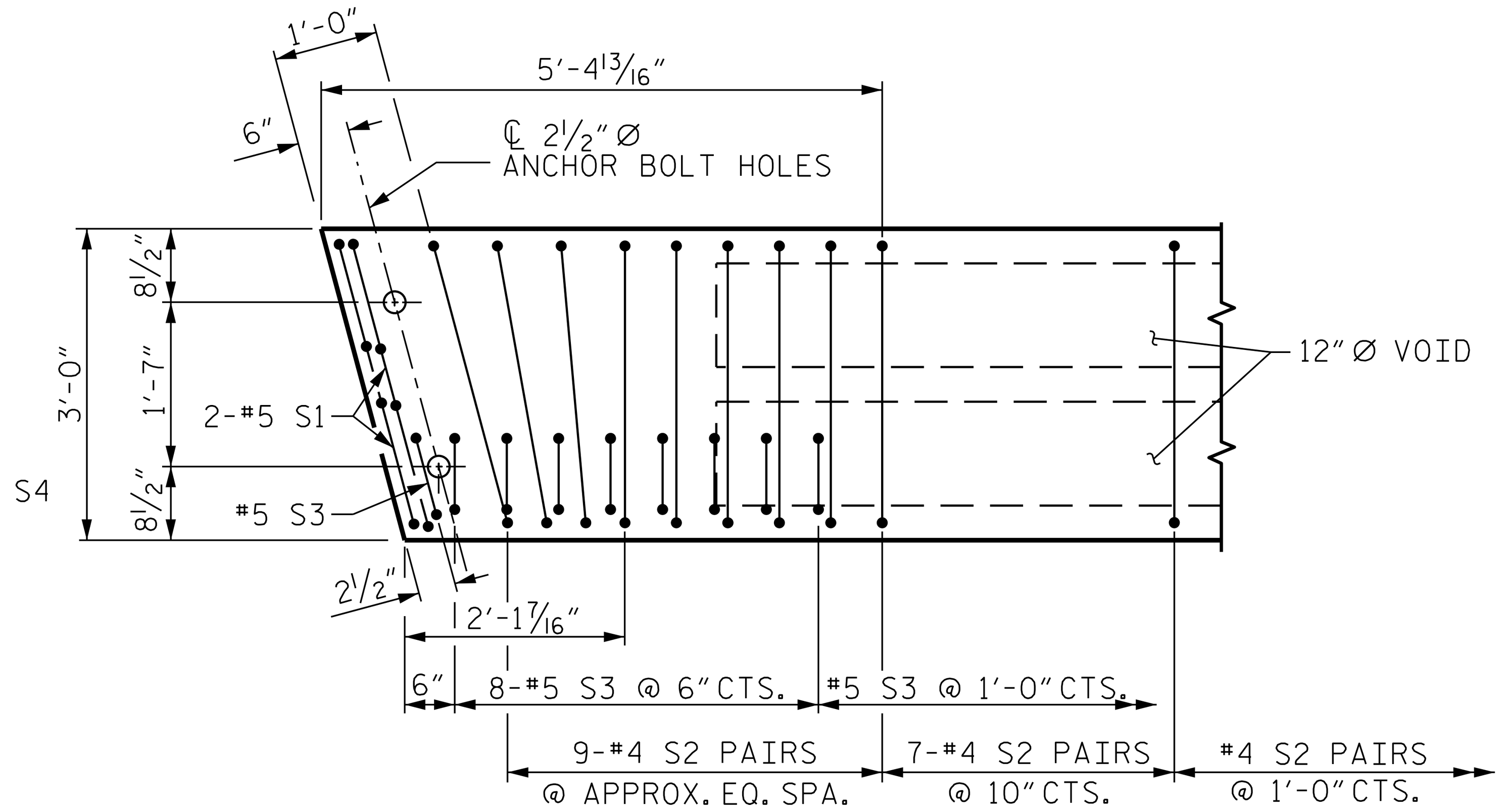
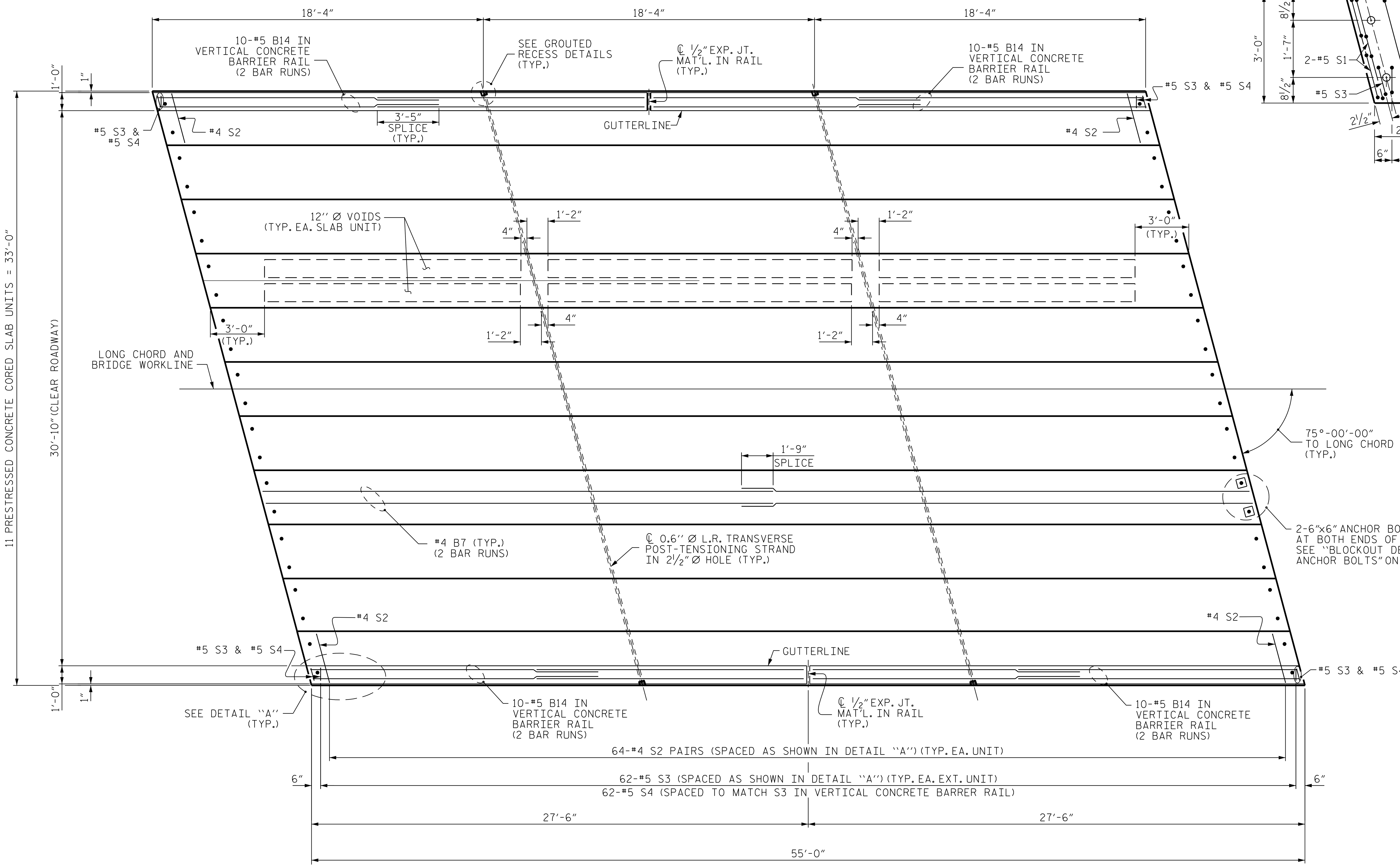


DETAIL "A"

(SIMILAR 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.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT
30'-10" CLEAR ROADWAY
75° SKEW

SPAN A

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Venkata D. T. Kollipara
10/2/2018

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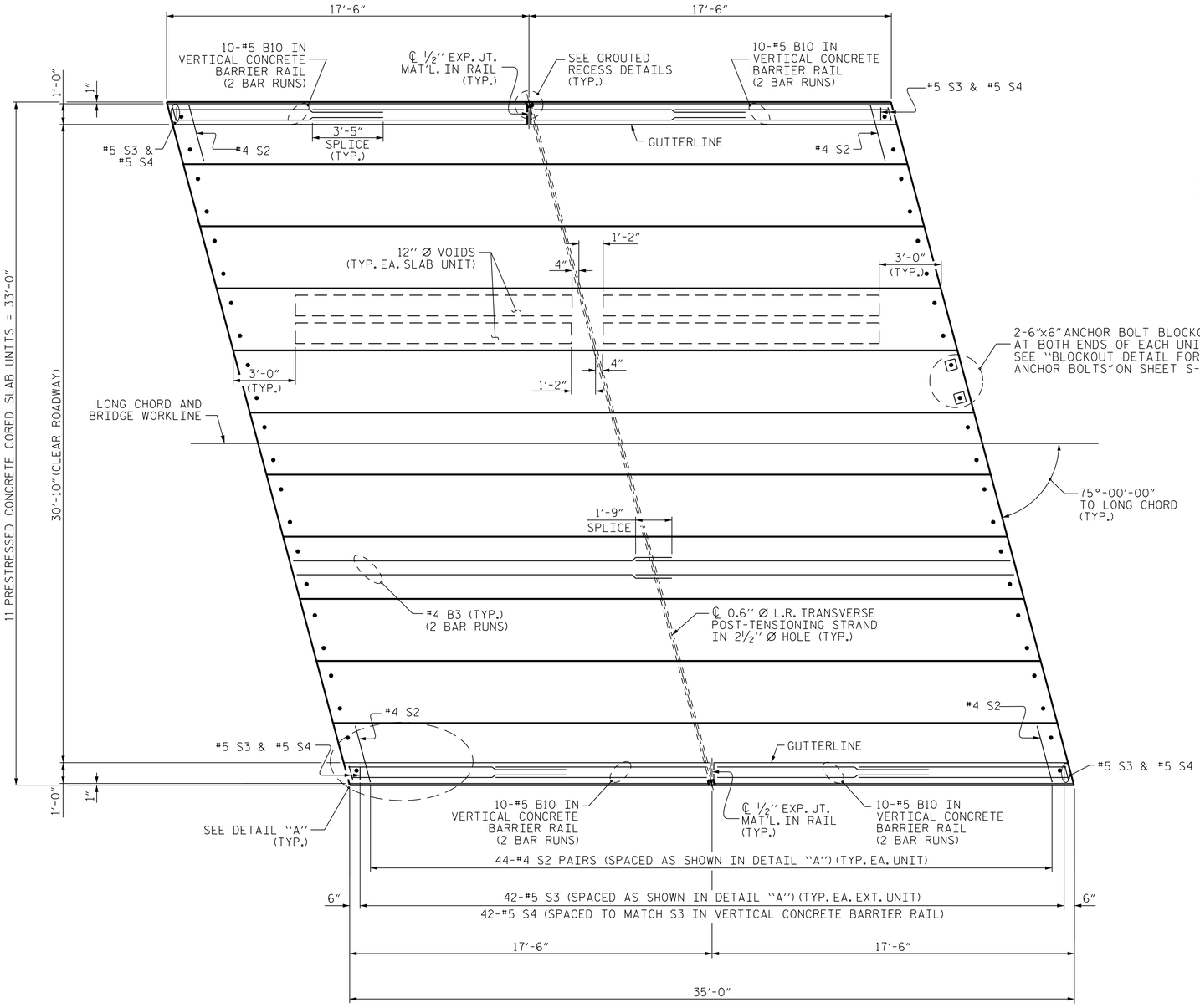
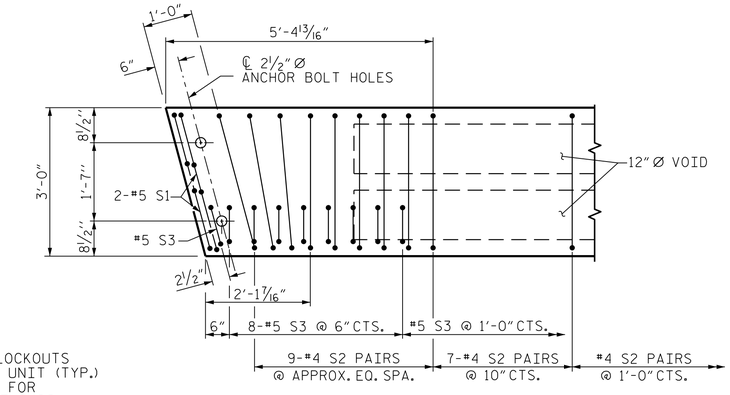


PLAN OF SPAN B



DETAIL "A"

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

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 35' UNIT 30'-10" CLEAR ROADWAY 75° SKEW SPAN B

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DESIGN ENGINEER : VDK DATE : 07/18

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NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Electronically signed by: Venkata D. T. Kollipara
10/27/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			19

STD. NO. 21"PCS_33_75S_35L

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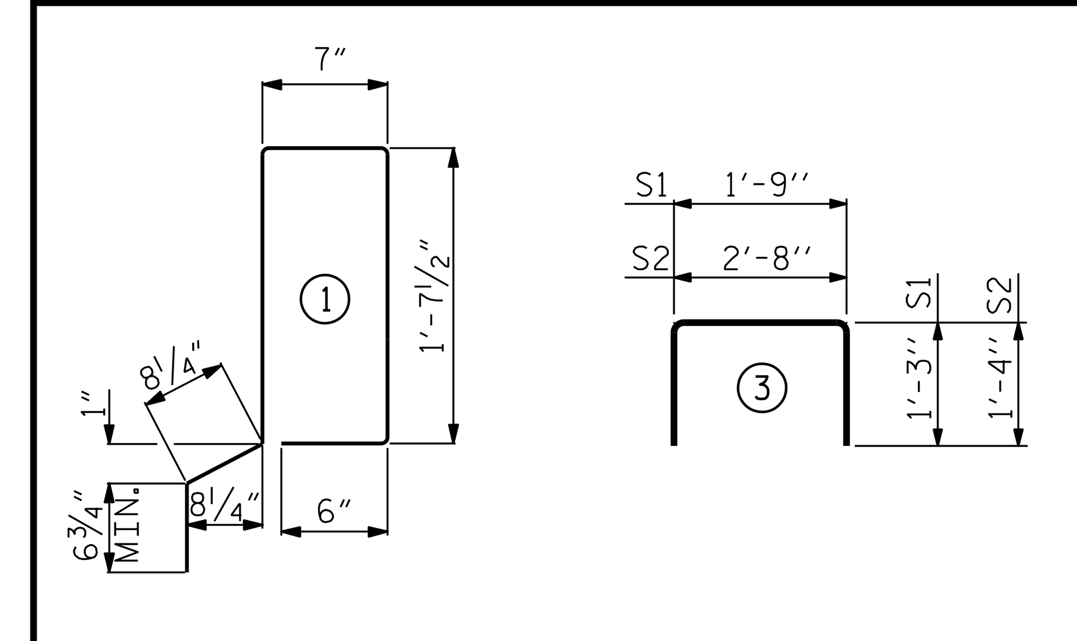
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

CONCRETE RELEASE STRENGTH

UNIT	PSI
SPAN A (55′ UNITS)	4900
SPAN B (35′ UNITS)	4000

DEAD LOAD DEFLECTION AND CAMBER

ALL UNITS, 0.6″ Ø L.R. STRAND	SPAN A 55′ - 21″CS UNIT	SPAN B 35′ - 21″CS UNIT
CAMBER (SLAB ALONE IN PLACE)	1½″ ↑	¼″ ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	⅜″ ↓	⅛″ ↓
FINAL CAMBER	1⅛″ ↑	⅛″ ↑

** INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE CORED SLAB UNIT

SPAN A (55′ - 21″ CORED SLAB UNIT)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28′-3″	75	28′-3″	75
S1	8	#5	3	4′-3″	35	4′-3″	35
S2	128	#4	3	5′-4″	456	5′-4″	456
* S3	64	#5	1	5′-7″	373		
REINFORCING STEEL			LBS.		566		566
* EPOXY COATED REINFORCING STEEL			LBS.		373		
6500 P.S.I. CONCRETE			CU. YDS.		7.9		7.9
0.6″ Ø L.R. STRANDS			No.		19		19

SPAN B (35′ - 21″ CORED SLAB UNIT)

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18′-3″	49	18′-3″	49
S1	8	#5	3	4′-3″	35	4′-3″	35
S2	88	#4	3	5′-4″	314	5′-4″	314
* S3	44	#5	1	5′-7″	256		
REINFORCING STEEL			LBS.		398		398
* EPOXY COATED REINFORCING STEEL			LBS.		256		
5000 P.S.I. CONCRETE			CU. YDS.		5.2		5.2
0.6″ Ø L.R. STRANDS			No.		9		9

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

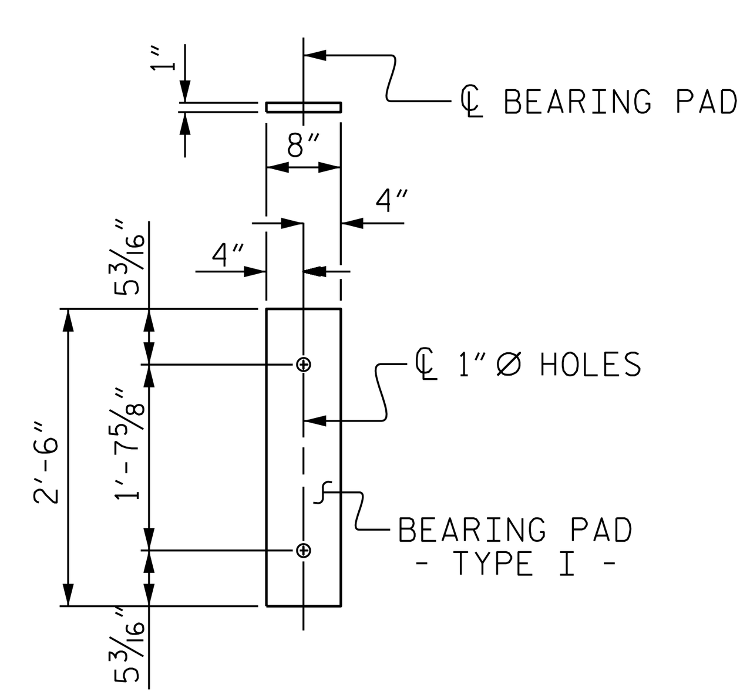
CORED SLABS REQUIRED

SPAN A (55′ UNITS)

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	55′-0″	110′-0″
INTERIOR C.S.	9	55′-0″	495′-0″
TOTAL			605′-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″



FIXED END
(TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

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 2½″ Ø ANCHOR BOLT 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, ½″ 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.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES. SHOP INSPECTION IS REQUIRED.

NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

ANCHOR BOLTS, NUTS, WASHERS AND PLATES "P1" SHALL BE GALVANIZED IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES SHALL BE INCLUDED IN THE PRESTRESSED CONCRETE CORED SLAB UNITS PAY ITEM.

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3′-0″ X 1′-9″
PRESTRESSED CONCRETE
CORED SLAB UNIT
75° SKEW
SPANS A & B

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DWG. No.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047117 VENKATA D.T. KOLIPARA
Venkata D. T. Kolipara
10/2/2018

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SHEET NO. S-09
TOTAL SHEETS 19

STD. NO. 21″BOM INFO_33_75S

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BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

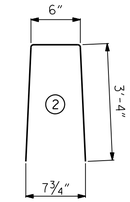
SPAN A (55′ UNIT)

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B14	80	80	#5	STR	15′-5″	1286
✳ S4	128	128	#5	2	7′-2″	957
✳EPOXY COATED REINFORCING STEEL					LBS.	2243
CLASS AA CONCRETE					CU.YDS.	14.1
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	110.13

SPAN B (35′ UNIT)

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B10	80	80	#5	STR	10′-5″	869
✳ S4	88	88	#5	2	7′-2″	658
✳EPOXY COATED REINFORCING STEEL					LBS.	1527
CLASS AA CONCRETE					CU.YDS.	9.0
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	70.13

BAR TYPE

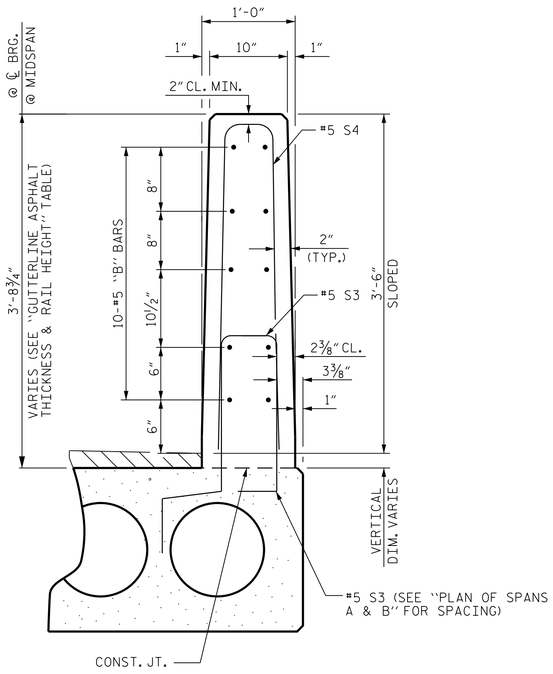


ALL BAR DIMENSIONS ARE OUT TO OUT

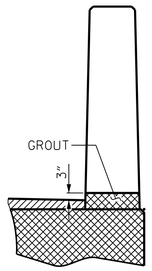
TOTAL VERTICAL CONCRETE BARRIER RAIL FOR ENTIRE BRIDGE: 180.26 LN.FT.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

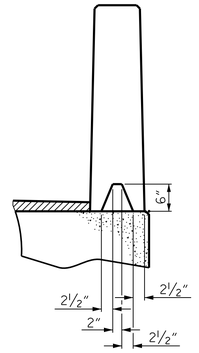
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
SPAN A (55′ UNITS)	1⅝″	3′-7⅝″
SPAN B (35′ UNITS)	2⅝″	3′-8⅝″



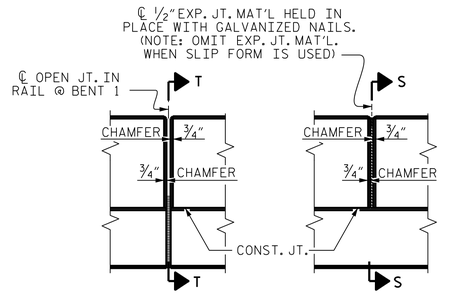
VERTICAL CONCRETE BARRIER RAIL SECTION



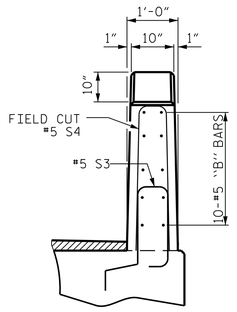
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



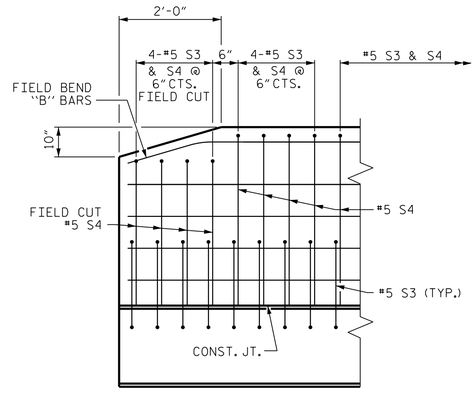
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3′-0″ X 1′-9″ PRESTRESSED CONCRETE CORED SLAB UNIT 75°SKEW SPANS A & B

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NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Digitally signed by Venkata D. T. Kollipara
10/22/2018

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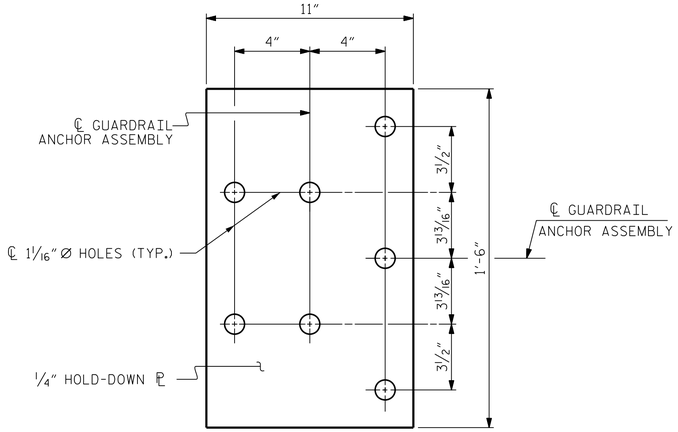
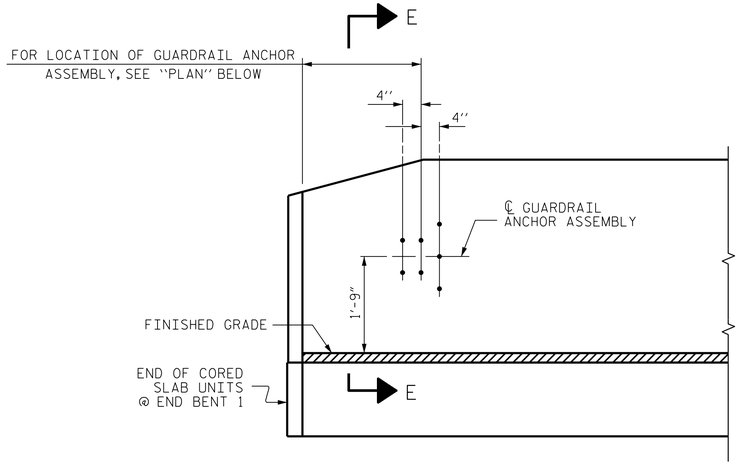
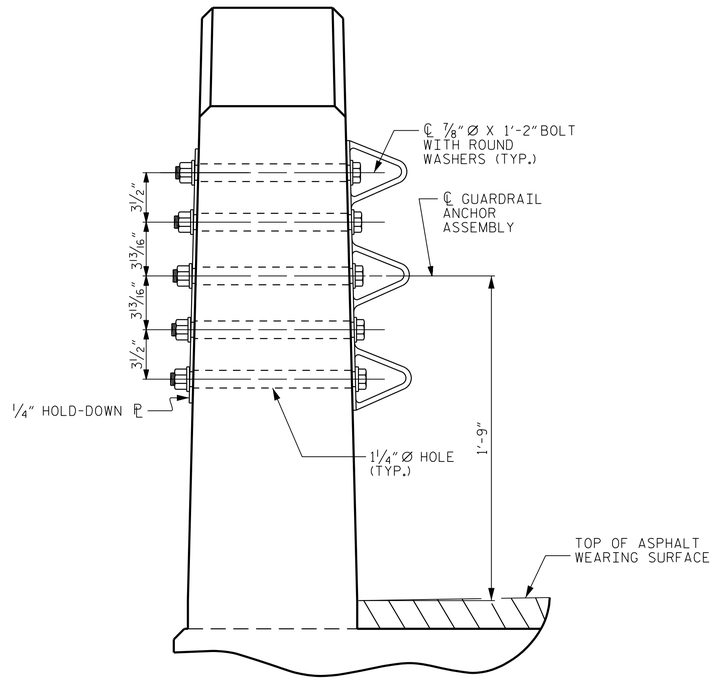
STD. NO. 21"PCS3_33_75S



PLAN



ELEVATION



SECTION E-E

PLAN

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

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Digitally signed by: Venkata D. T. Kollipara
10/2/2018

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:	S-11
1			3			TOTAL SHEETS
2			4			19

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DATE: 10/22/2018 10:59:41 AM

STD. NO. GRA3

NOTES

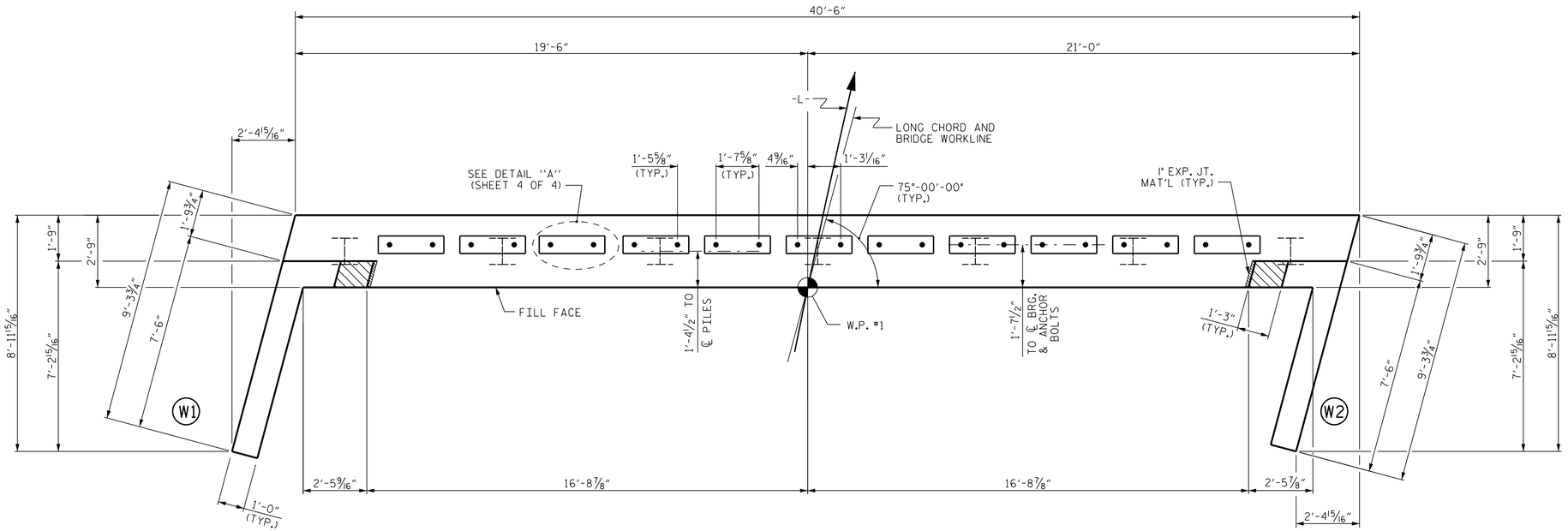
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

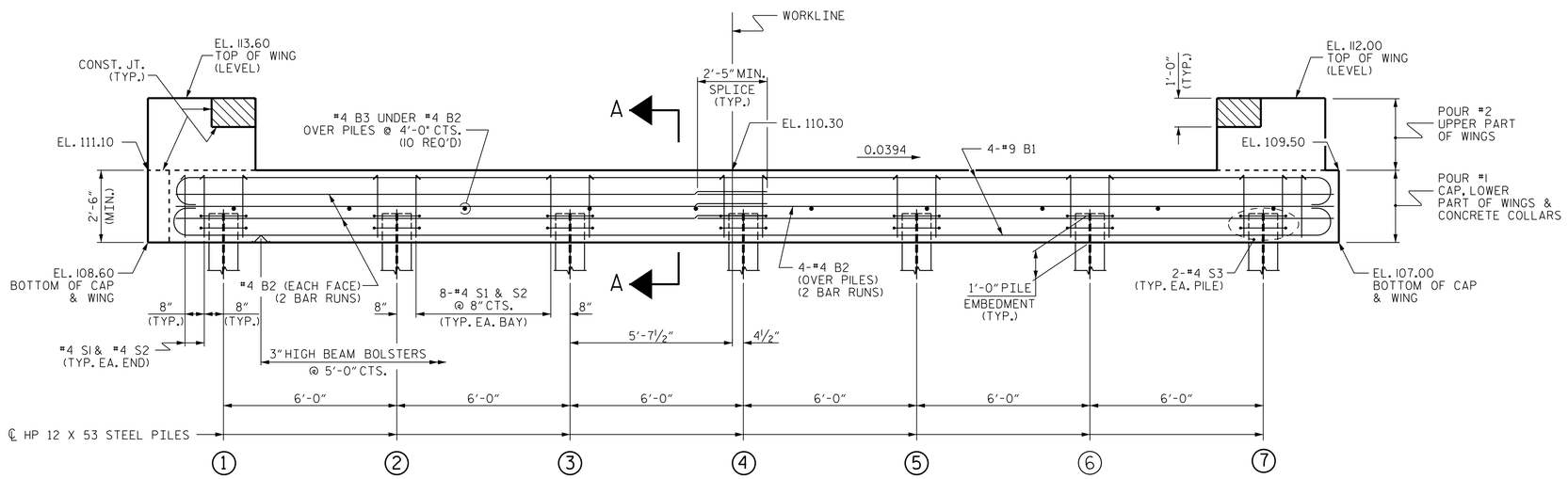
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR ANCHOR BOLTS DETAILS, SEE SHEET S-06.



PLAN



ELEVATION

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

TOP OF PILE ELEVATIONS	
1	109.49
2	109.26
3	109.02
4	108.78
5	108.55
6	108.31
7	108.07

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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 : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Venkata D. T. Kollipara
10/2/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			19

STD. NO. EB_33_75S

FILE: c:\pw_pjl\kollipara\d1188370\d01_023_17BP6R105_SMU_E1_012.dgn
DATE: 10/2/2018 10:59:48 AM

NOTES

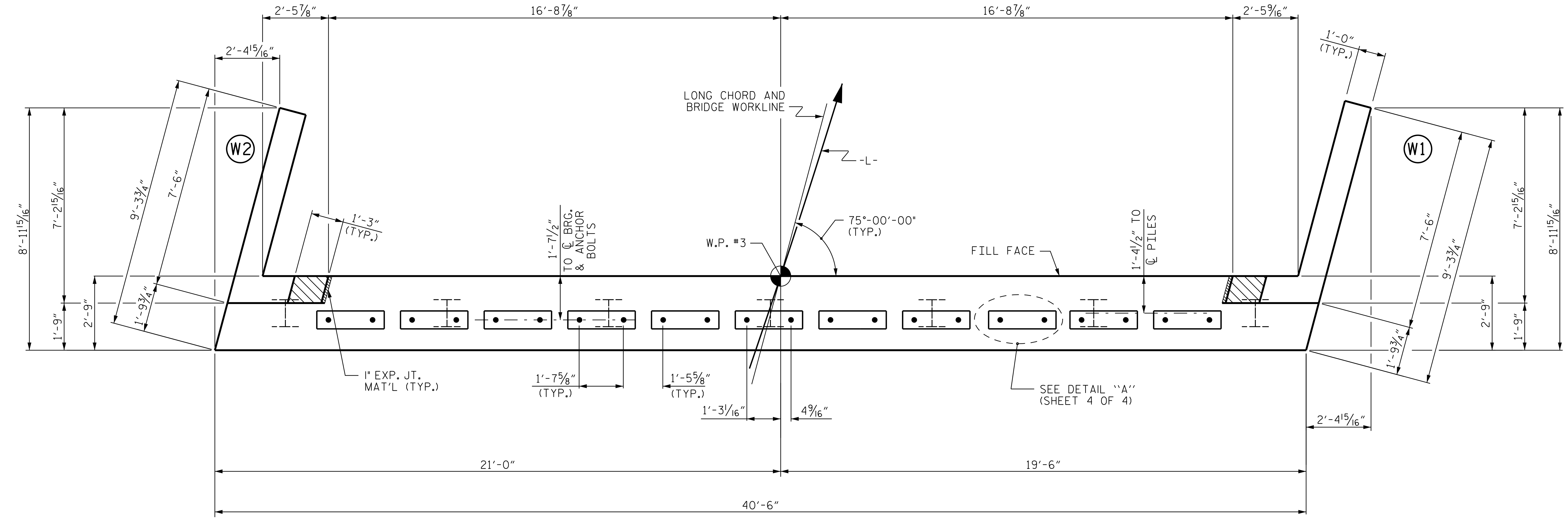
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

FOR ANCHOR BOLTS DETAILS, SEE SHEET S-06.



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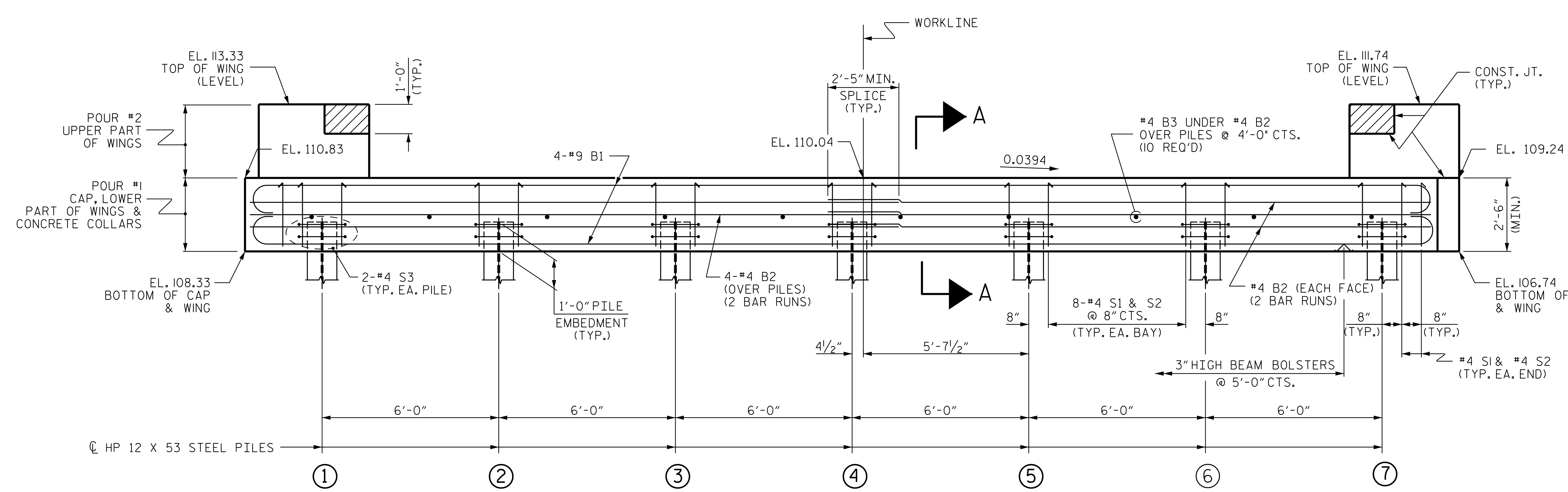

ELEVATION

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

TOP OF PILE ELEVATIONS	
①	109.22
②	108.99
③	108.75
④	108.51
⑤	108.27
⑥	108.04
⑦	107.80

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 2 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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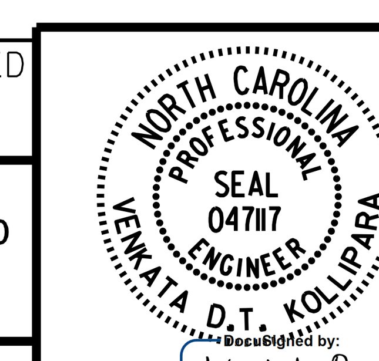
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.



Venkata D. T. Kollipara
10/2/2018

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

SHEET NO. S-13
TOTAL SHEETS 19

STD. NO. EB_33_75S

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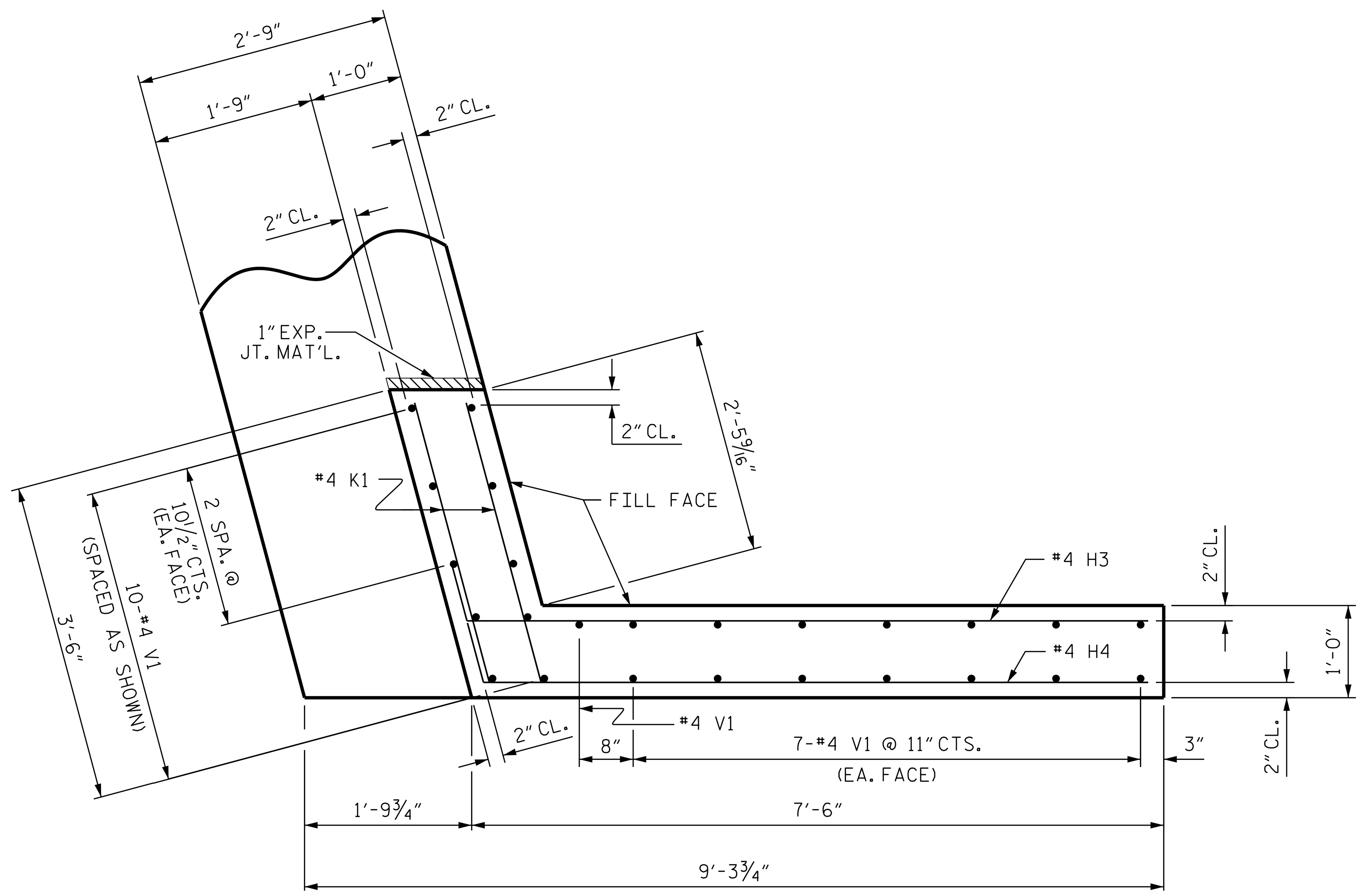
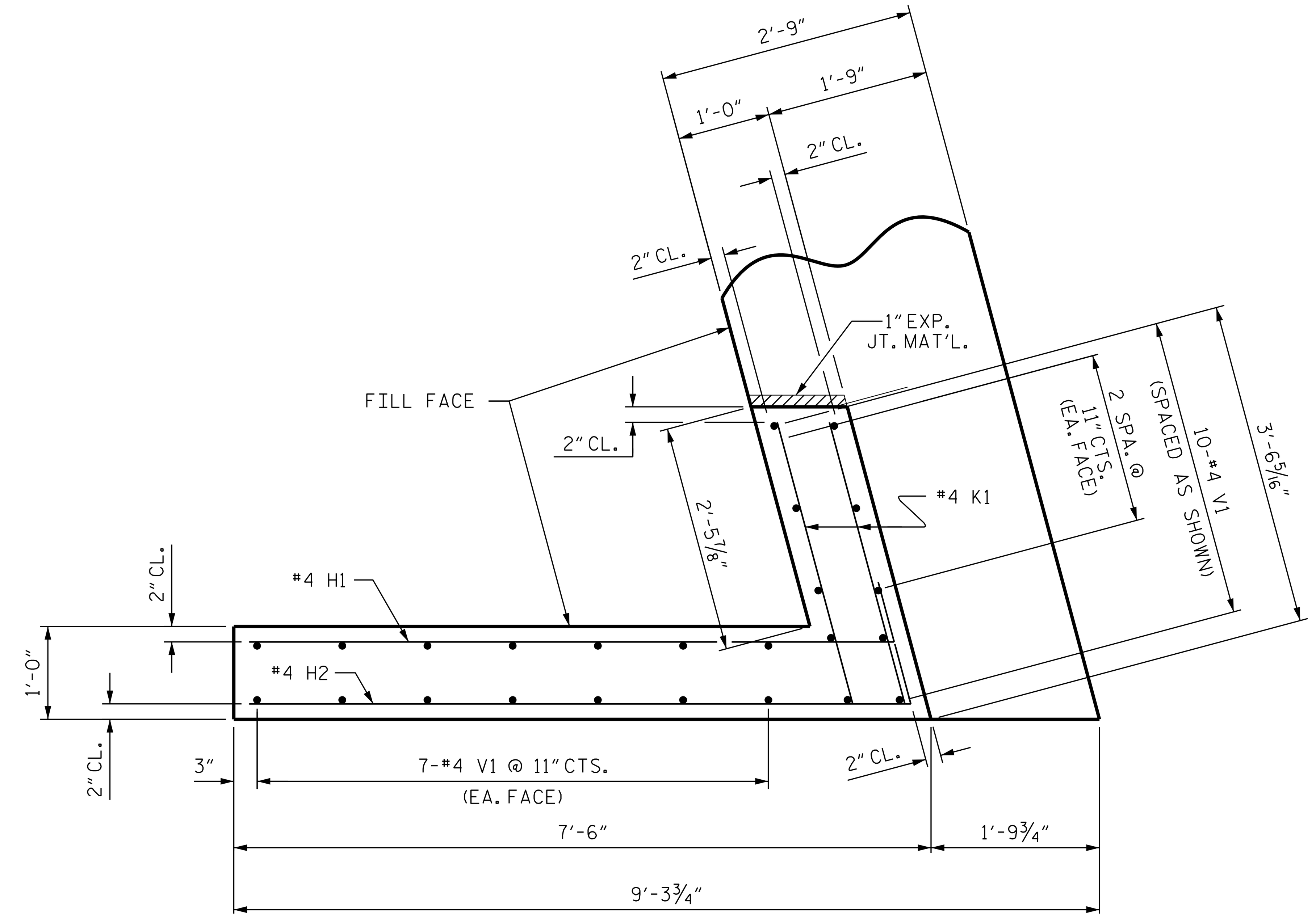
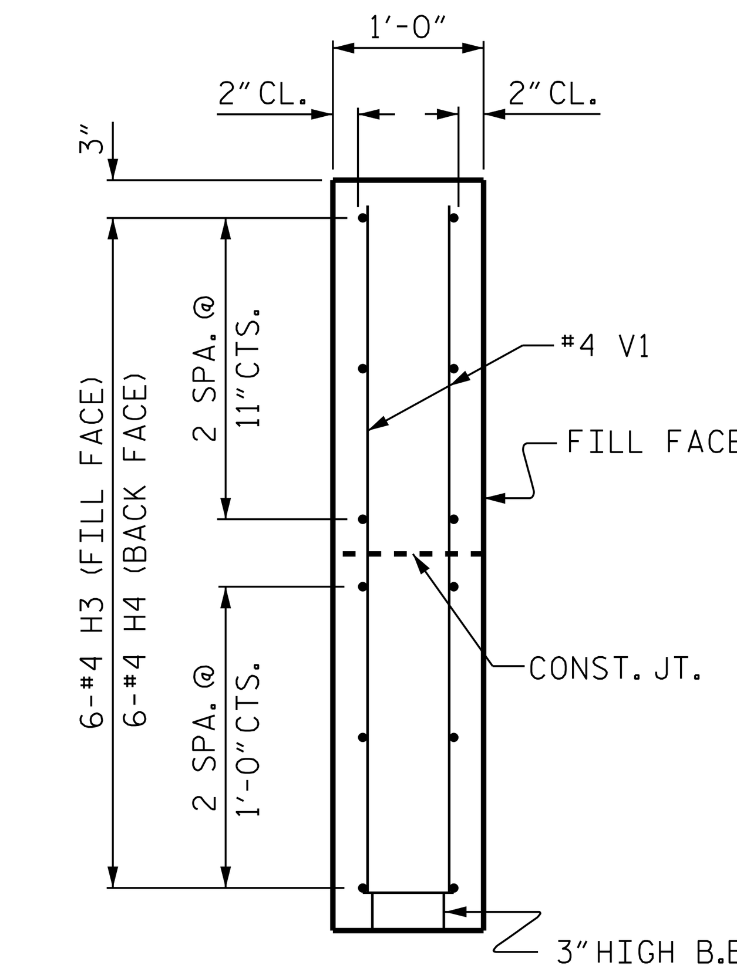


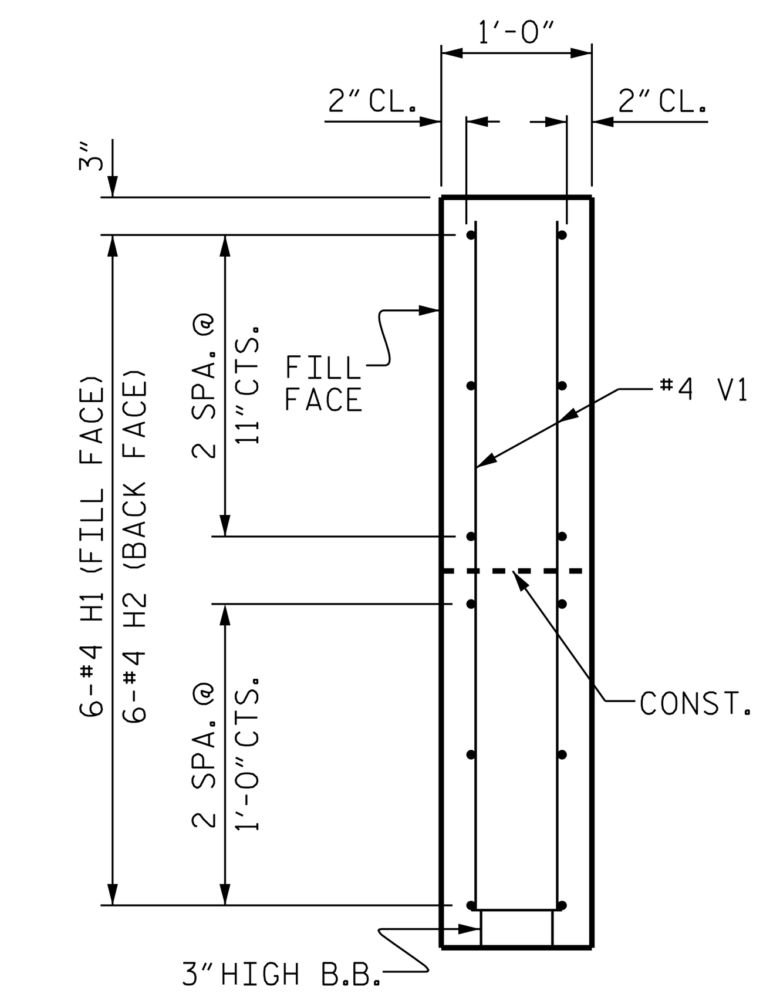
PLAN OF WING (W1)



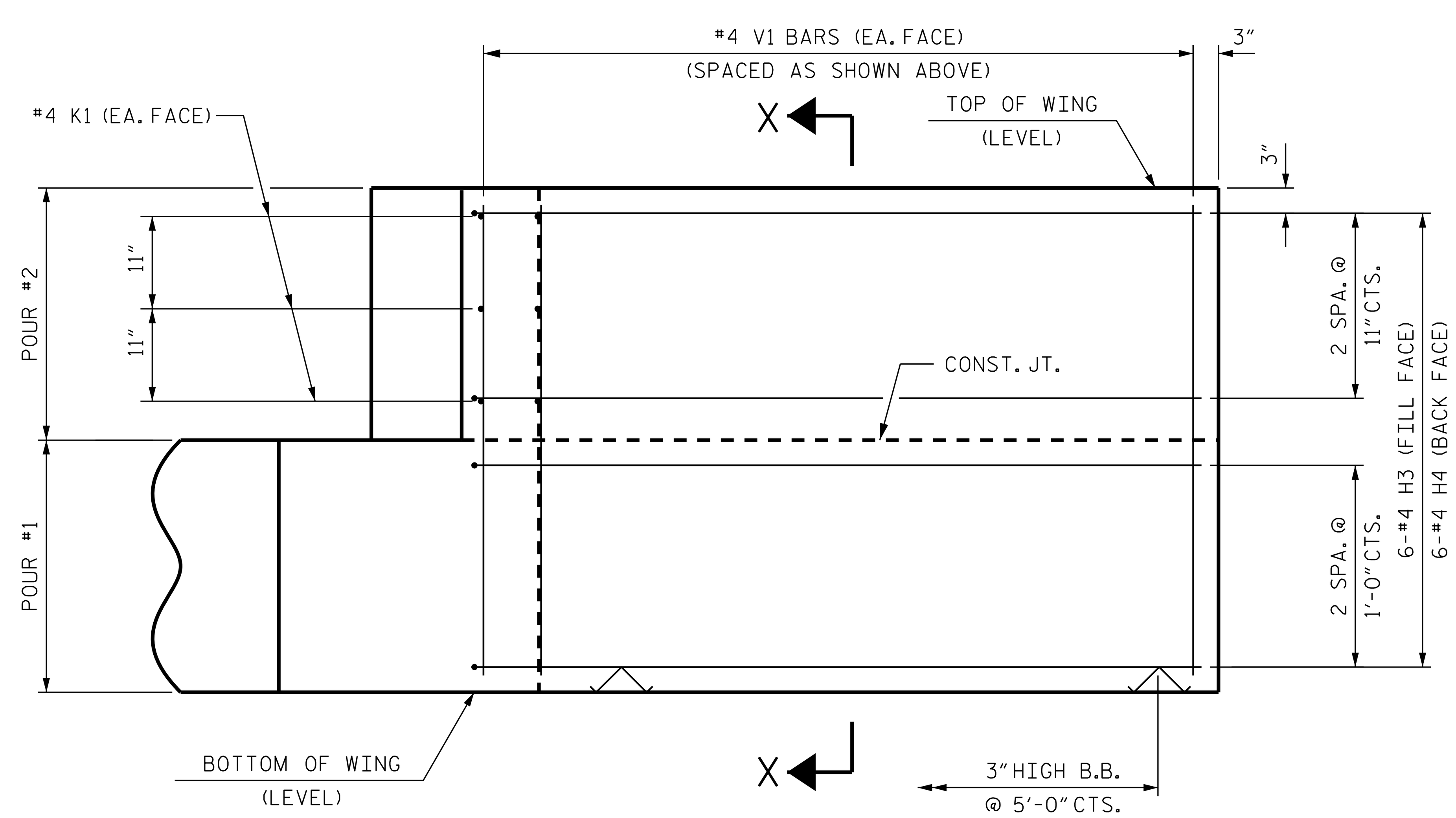
PLAN OF WING (W2)



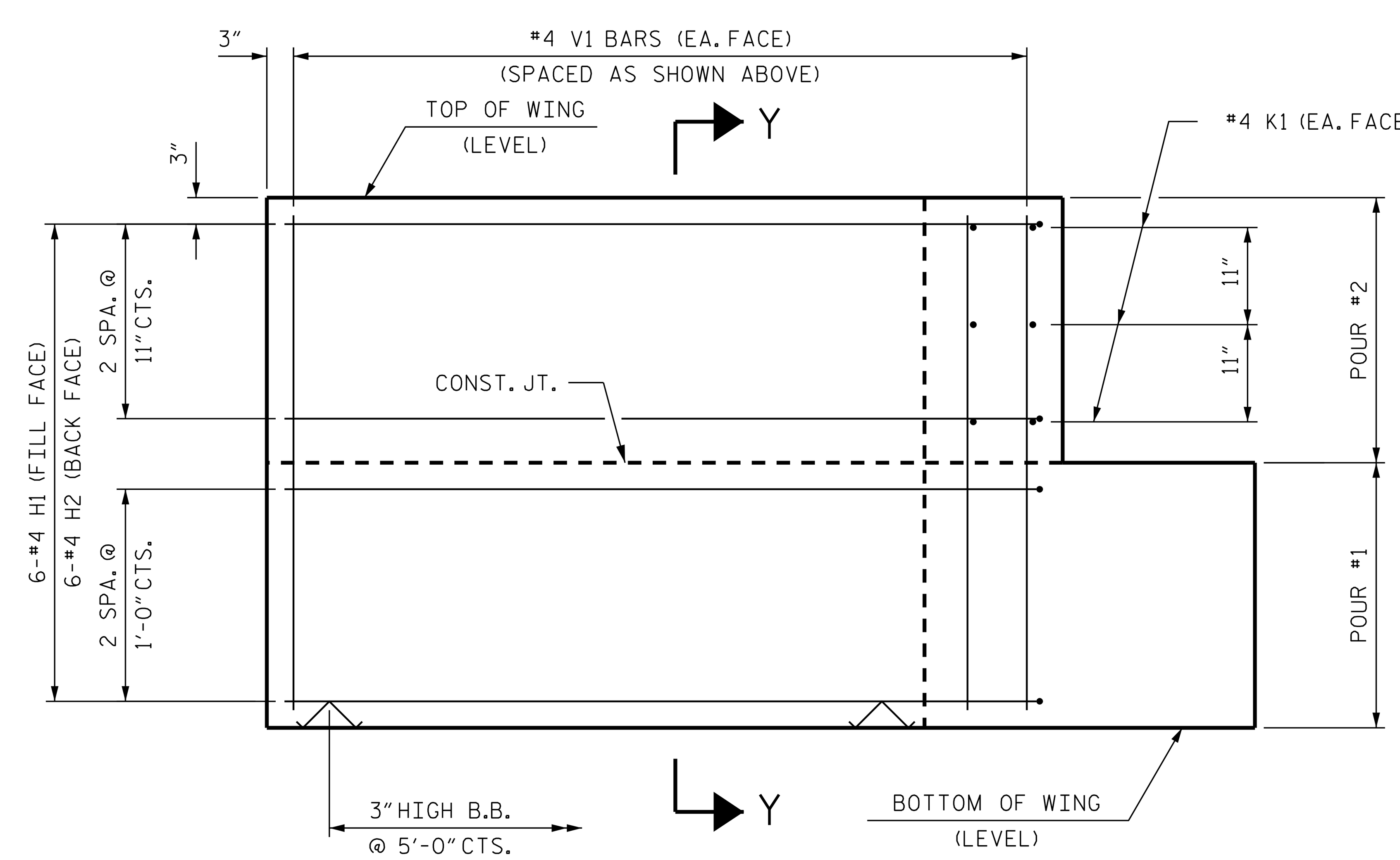
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2
WING DETAILS

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5400 Glenwood Avenue, Suite 400
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NC COA No. F-1255

DRAWN BY : VDK DATE : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D. T. KOLLIPARA
Venkata D. T. Kollipara
10/2/2018

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

SHEET NO. S-14
TOTAL SHEETS 19

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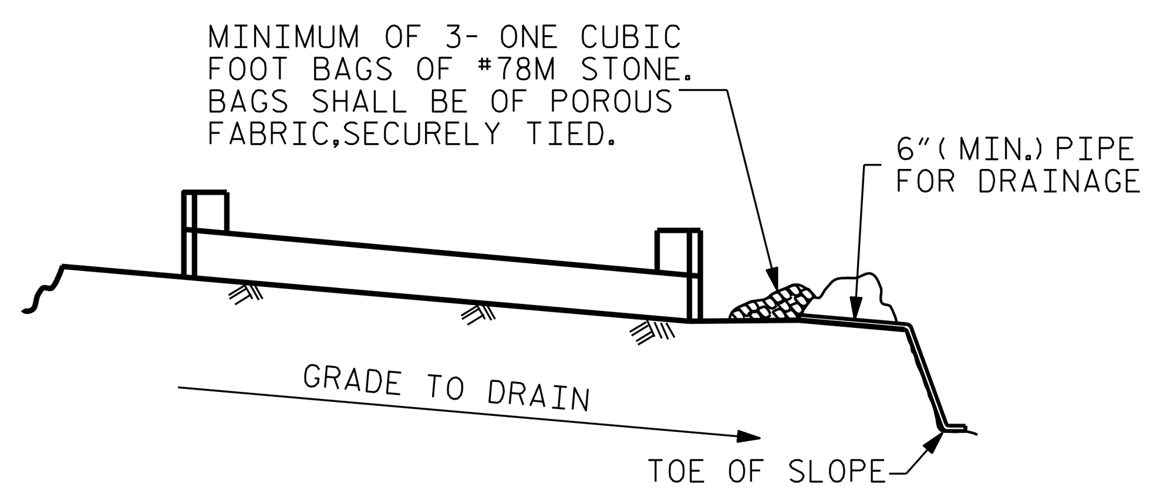
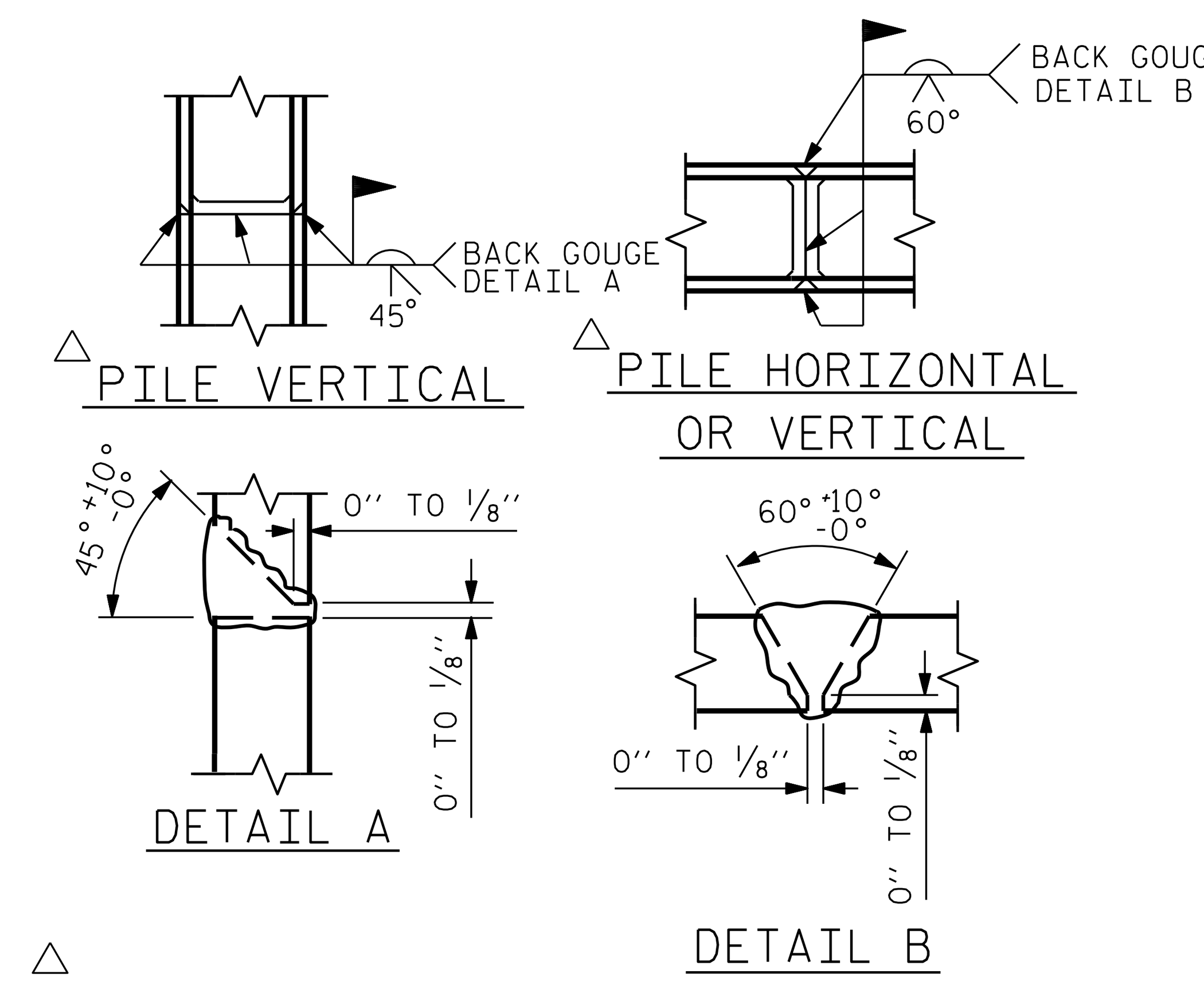


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

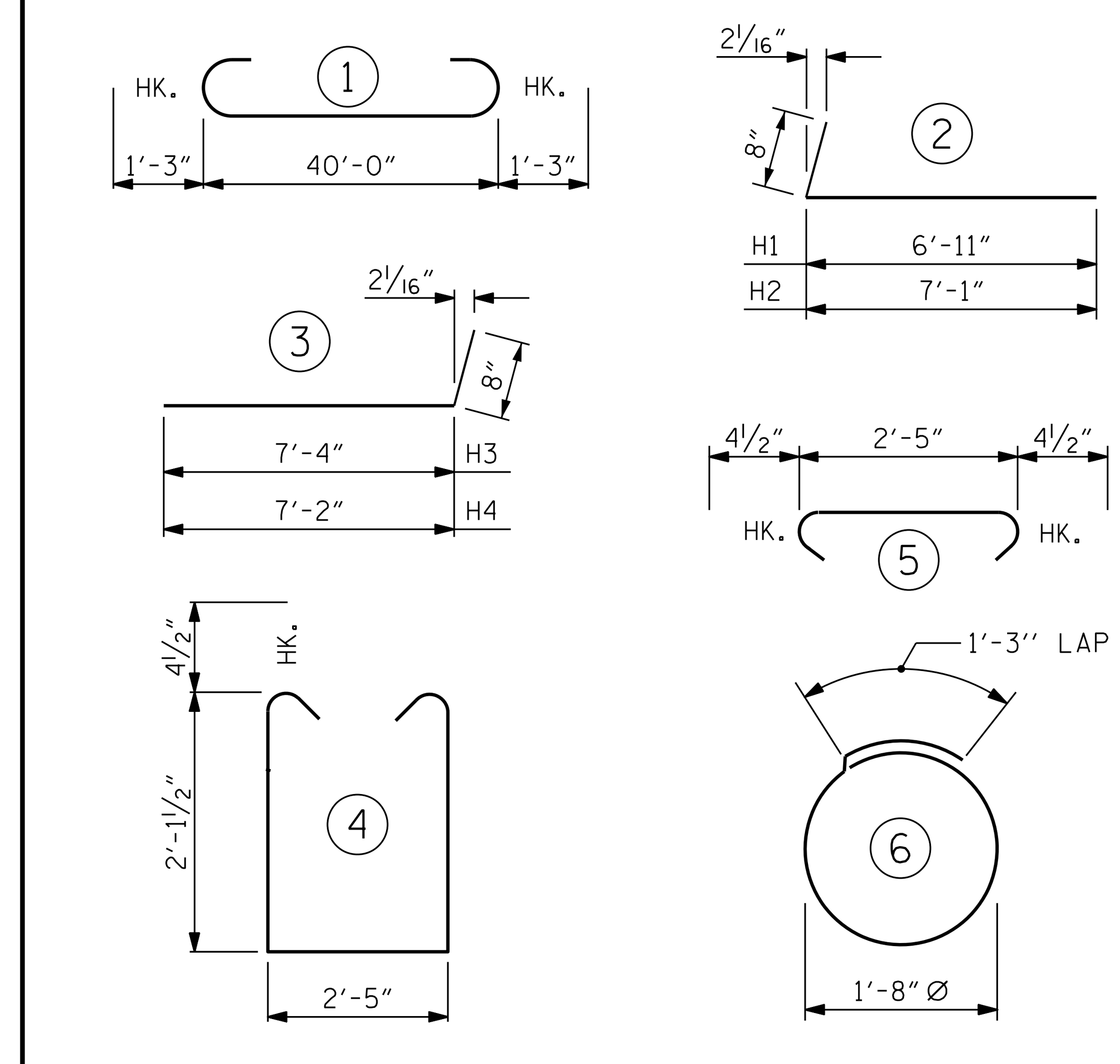
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 1	END BENT 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 385	NO: 7 LIN. FT.= 350
PILE DRIVING EQUIP. SETUP FOR HP 12 X 53 STEEL PILES EA. 7	PILE DRIVING EQUIP. SETUP FOR HP 12 X 53 STEEL PILES EA. 7

BILL OF MATERIAL
FOR ONE END BENT
(2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	42'-6"	1156
B2	16	#4	STR	21'-4"	228
B3	10	#4	STR	2'-5"	16
H1	6	#4	2	7'-7"	30
H2	6	#4	2	7'-9"	31
H3	6	#4	3	8'-0"	32
H4	6	#4	3	7'-10"	31
K1	12	#4	STR	3'-1"	25
S1	52	#4	4	7'-5"	258
S2	52	#4	5	3'-2"	110
S3	14	#4	6	6'-6"	61
V1	49	#4	STR	4'-8"	153

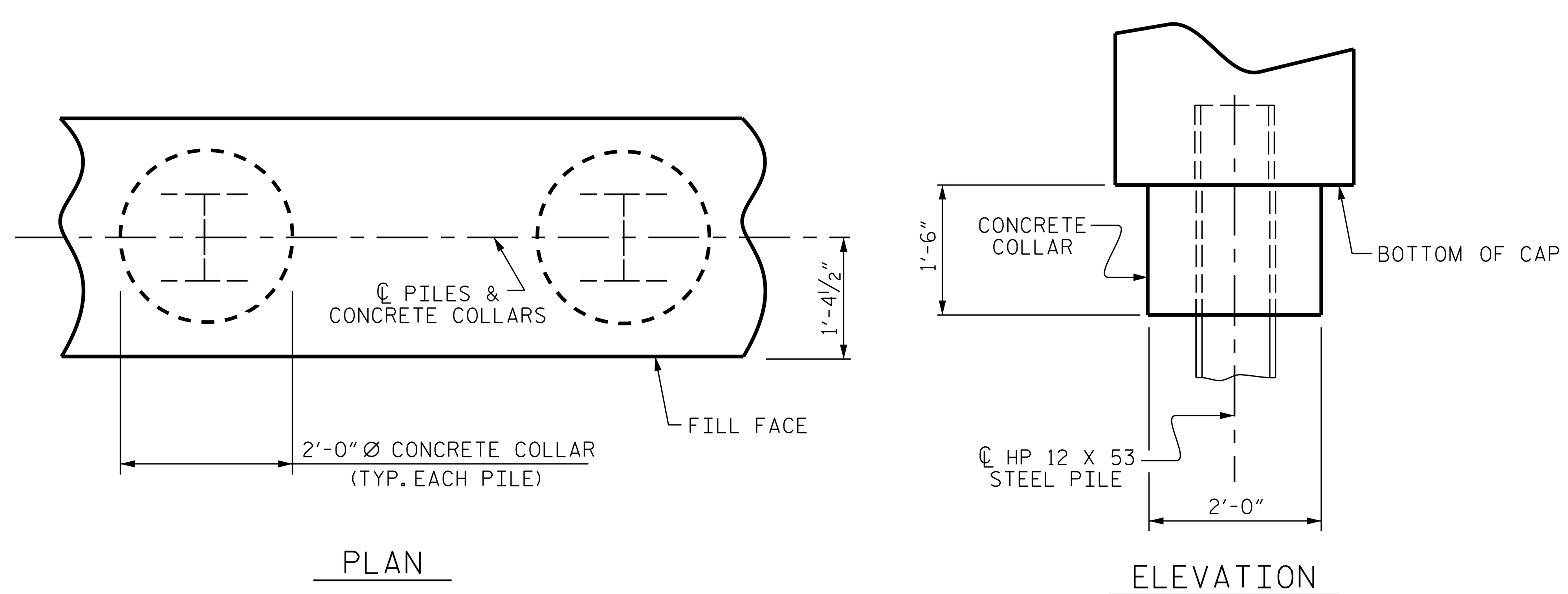
REINFORCING STEEL 2131 LBS.

CLASS A CONCRETE BREAKDOWN

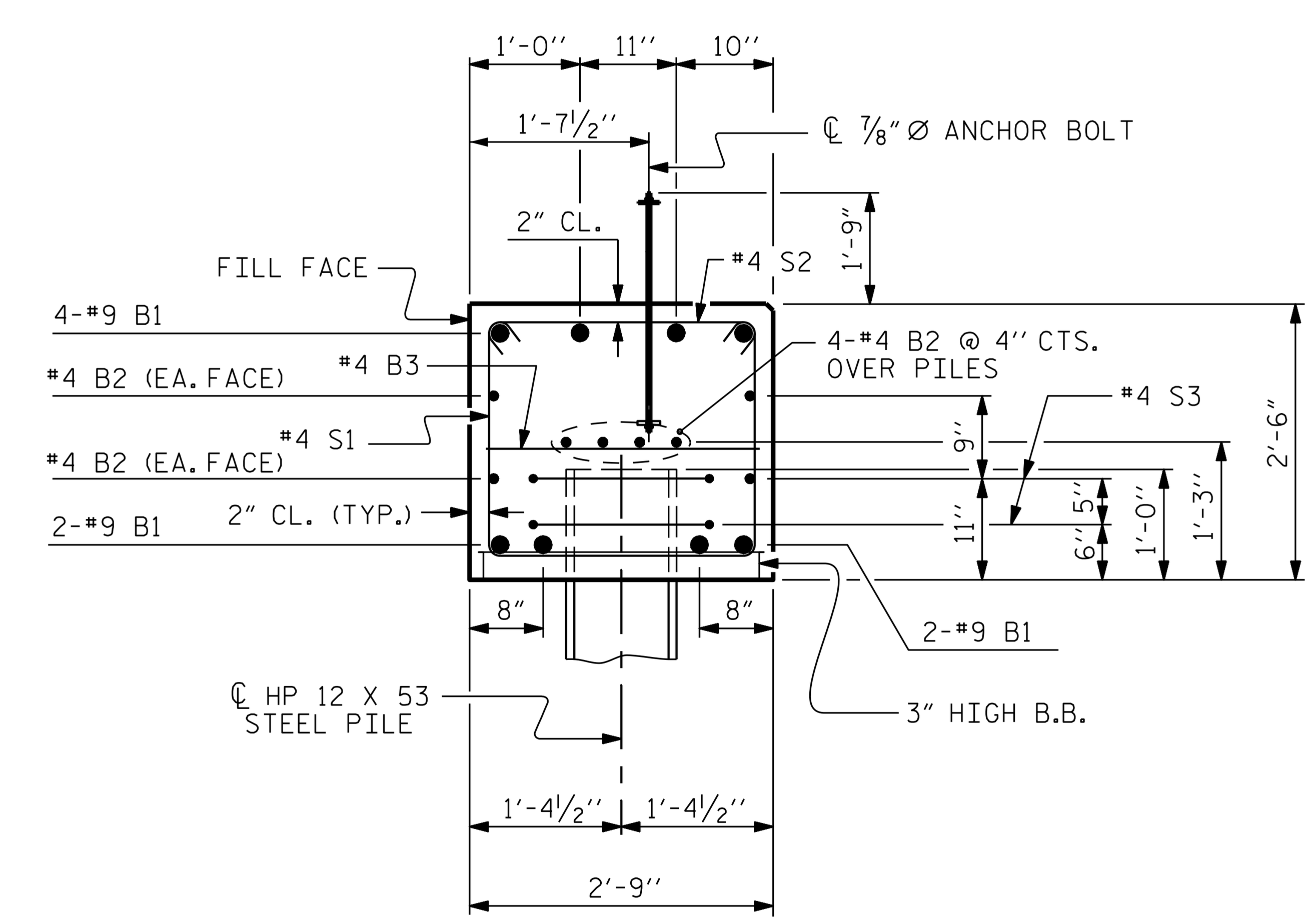
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	12.7 C.Y.
POUR #2	UPPER PART OF WINGS	1.8 C.Y.
TOTAL CLASS A CONCRETE		14.5 C.Y.

7/8"Ø ANCHOR BOLTS	EA. 22
EMBEDDED WASHERS, NUTS & PLATES	EA. 22

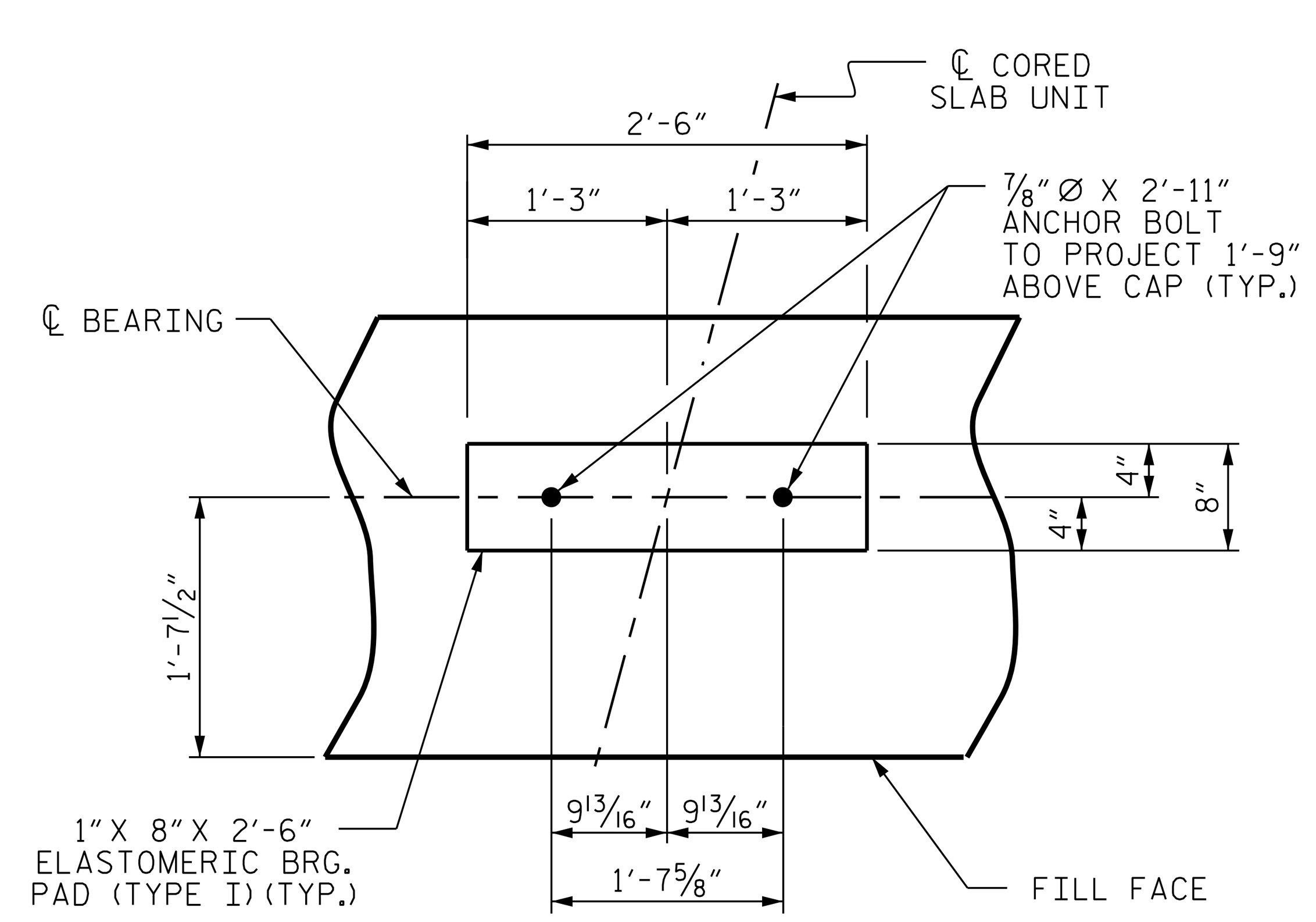
FOR PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES, SEE NOTE ON SHEET S-09.



CORROSION PROTECTION FOR STEEL PILES DETAIL
(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.") FOR 7/8"Ø ANCHOR BOLTS DETAILS, SEE SHEET S-06.



DETAIL "A"
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

PROJECT NO. 17BP.6.R.105
ROBESON COUNTY
STATION: 14+35.00 -L- POC

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2 DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC COA No. F-1255

DRAWN BY :	VDK	DATE :	07/18
CHECKED BY :	THF	DATE :	07/18
DESIGN ENGINEER :	VDK	DATE :	07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLIPARA
Signed by: Venkata D. T. Kolipara
10/2/2018

REVISIONS

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

SHEET NO. S-15
TOTAL SHEETS 19

FILE: c:\pw_pf\kolipara\d1883770\401_029_17BP6R105_SMU_E4_015.dgn
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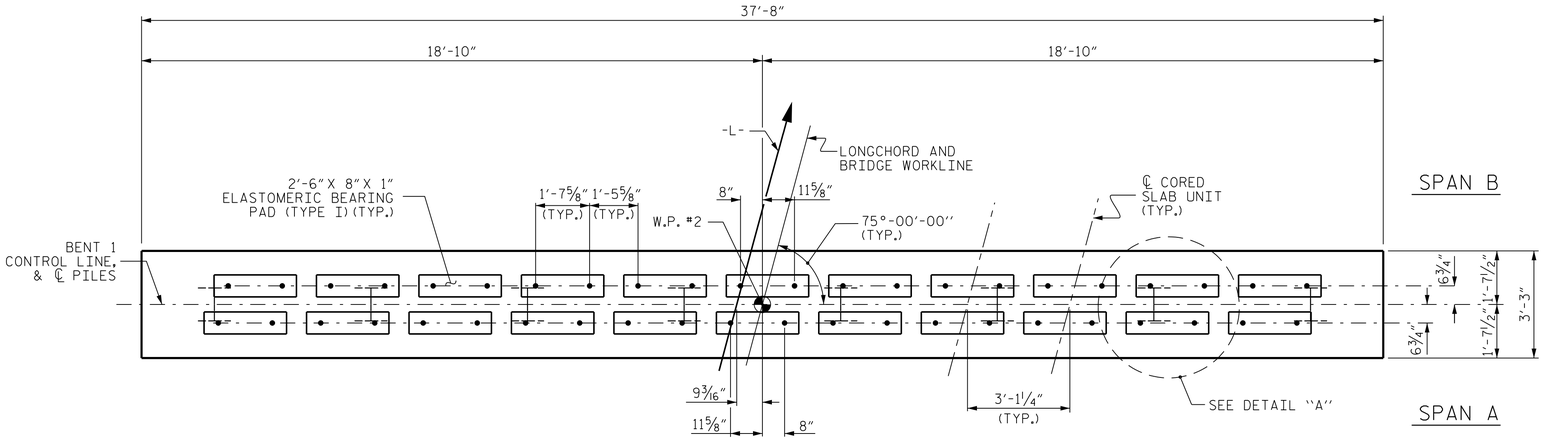
STD. NO. EB_33_75S



PLAN

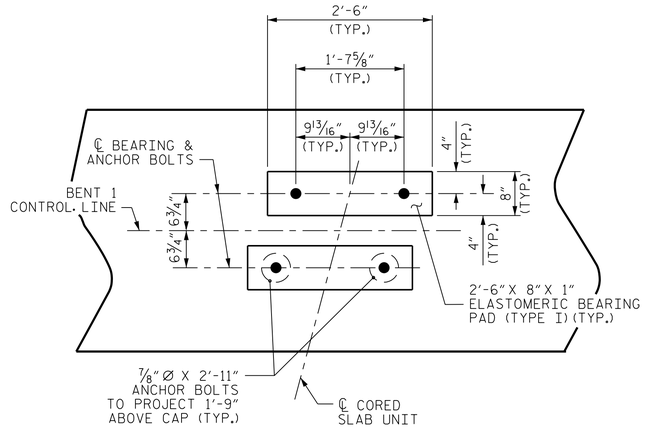
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

★ INVERT ALTERNATE STIRRUPS.

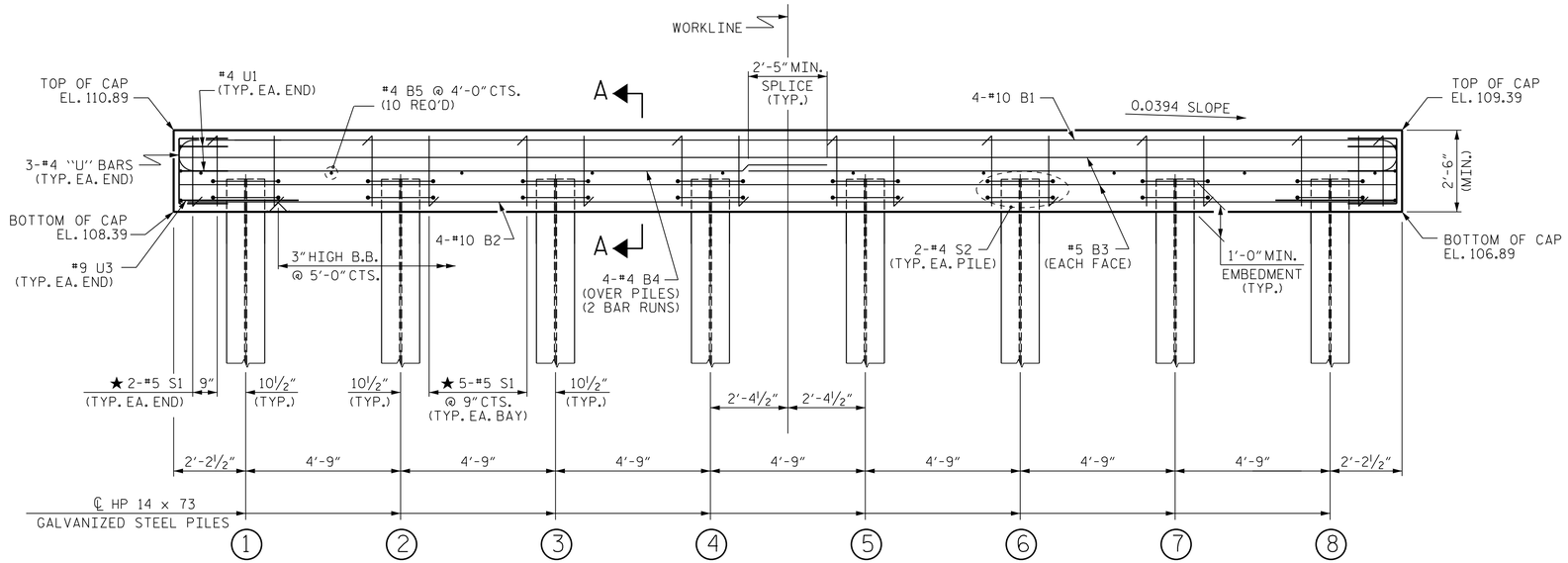
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR ANCHOR BOLTS DETAILS, SEE SHEET S-06.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2

TOP OF PILE ELEVATIONS	
1	109.28
2	109.09
3	108.91
4	108.72
5	108.53
6	108.34
7	108.16
8	107.97

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BENT 1

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

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DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Digitally signed by: Venkata D. T. Kollipara
10/2/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			19

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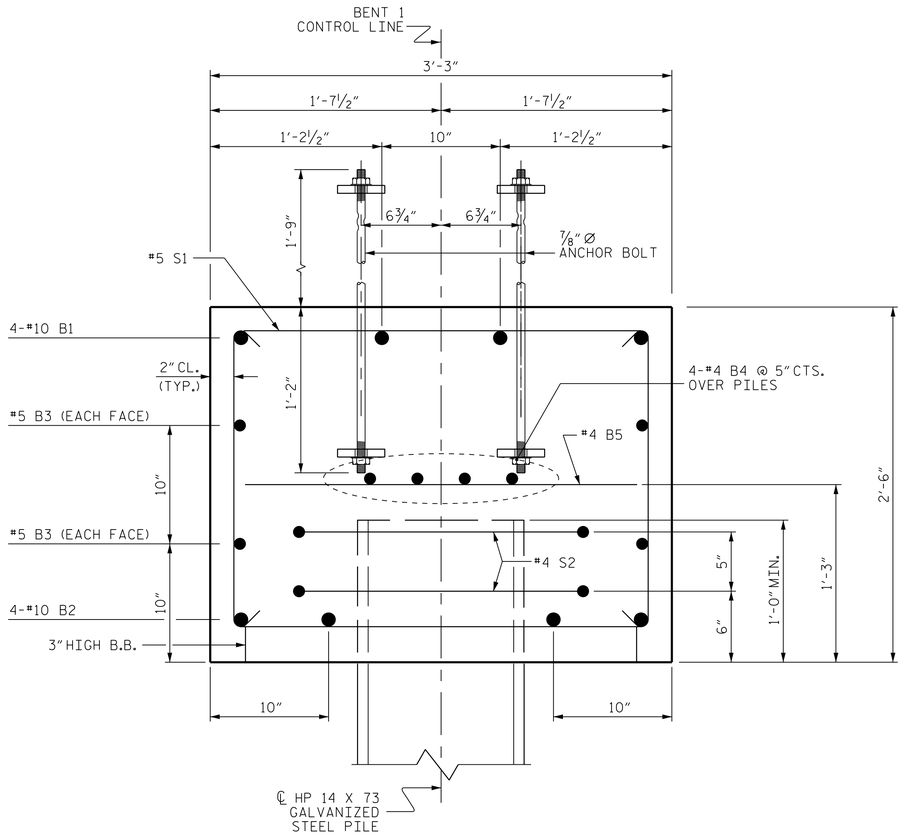
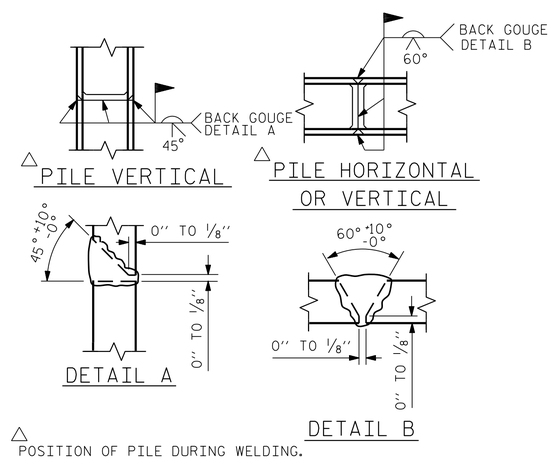
DATE: 10/2/2018 11:00:18 AM

STD. NO. 14"HP_BT_33_75S_<60'



SECTION A-A

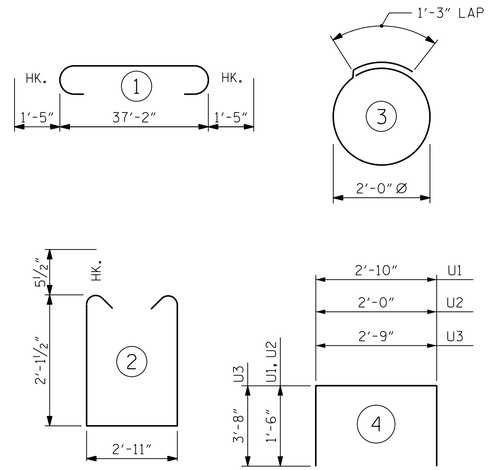
FOR ⅞" Ø ANCHOR BOLTS DETAILS, SEE SHEET S-06.



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	40'-0"	688
B2	4	#10	STR	37'-4"	643
B3	4	#5	STR	37'-4"	156
B4	8	#4	STR	19'-11"	106
B5	10	#4	STR	2'-11"	19
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 2127 LBS

TOTAL CLASS A CONCRETE 11.3 C.Y.

HP 14 X 73 GALVANIZED STEEL PILES

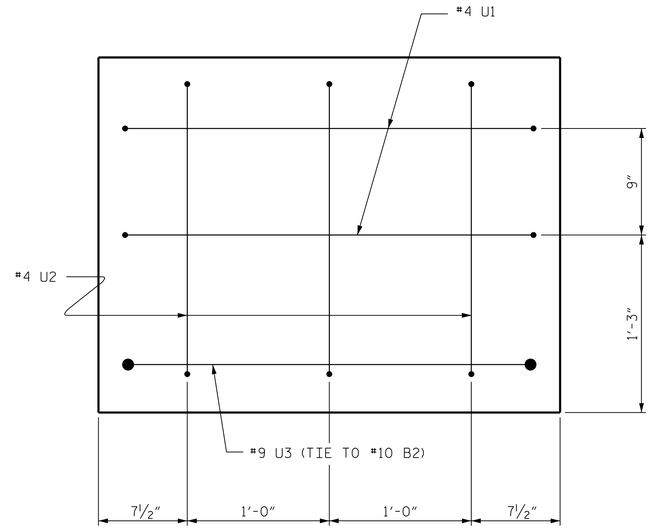
No. 8 LIN. FT. 480

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES EA. 8

⅞" Ø ANCHOR BOLTS EA. 44

EMBEDDED WASHERS, NUTS & PLATES EA. 44

FOR PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES, SEE NOTE ON SHEET S-09.



END OF CAP VIEW

(TYPICAL BOTH ENDS)

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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

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DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA
Digitally signed by: Venkata D. T. Kollipara
DocuSigned by: 10/27/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			19

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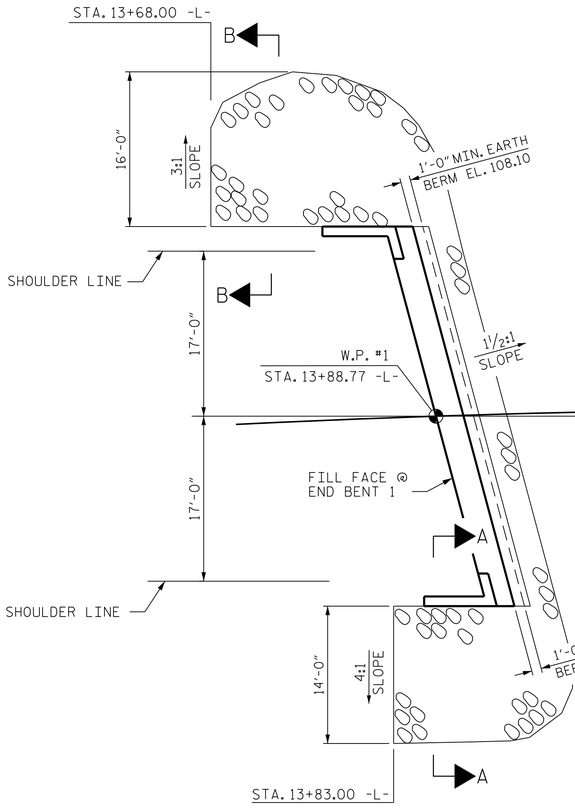
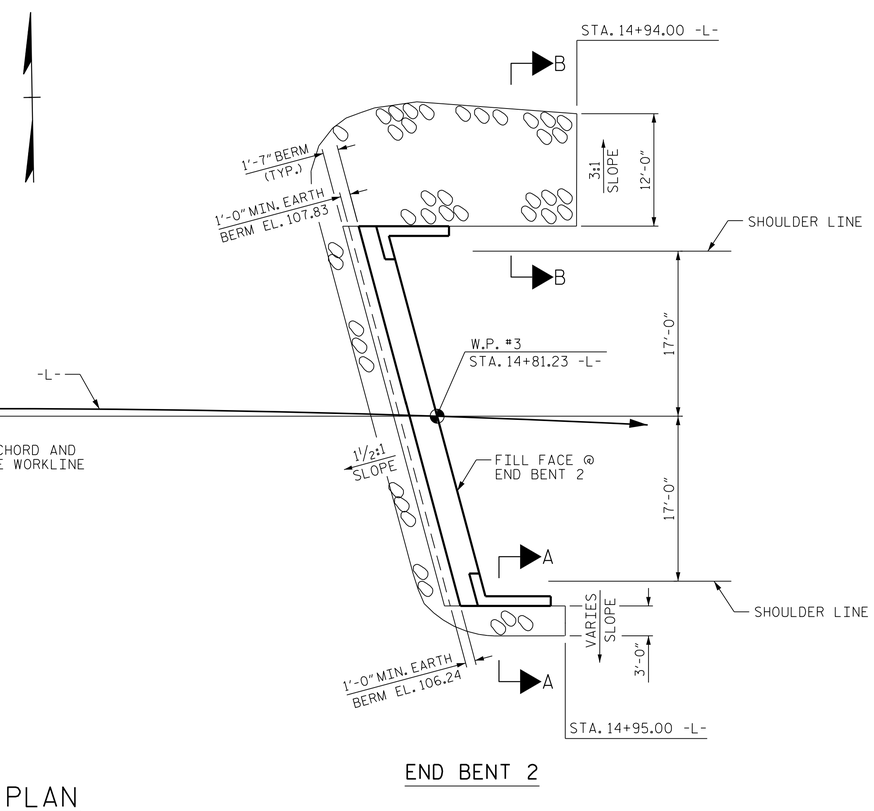
DATE: 10/22/2018 11:00:25 AM

STD. NO. 14"HP_BT_33_75&105S_<60'

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+35.00 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	95	105
END BENT 2	70	75
TOTAL	165	180

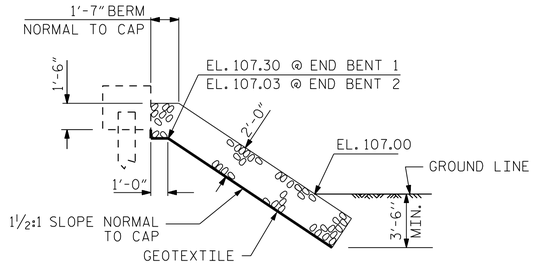


END BENT 1



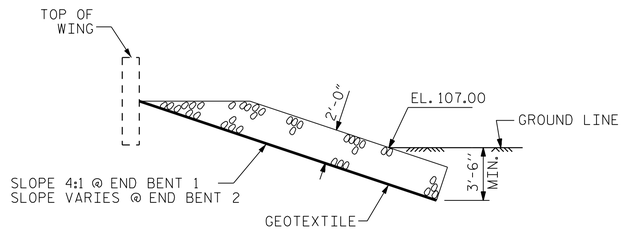
PLAN

END BENT 2

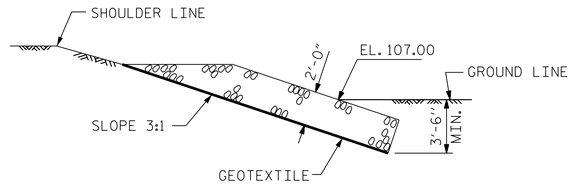


℄ SECTION

BERM RIP RAPPED



SECTION A-A



SECTION B-B

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
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5400 Glenwood Avenue, Suite 400
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Digitally signed by: Venkata D. T. Kollipara
10/29/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			19

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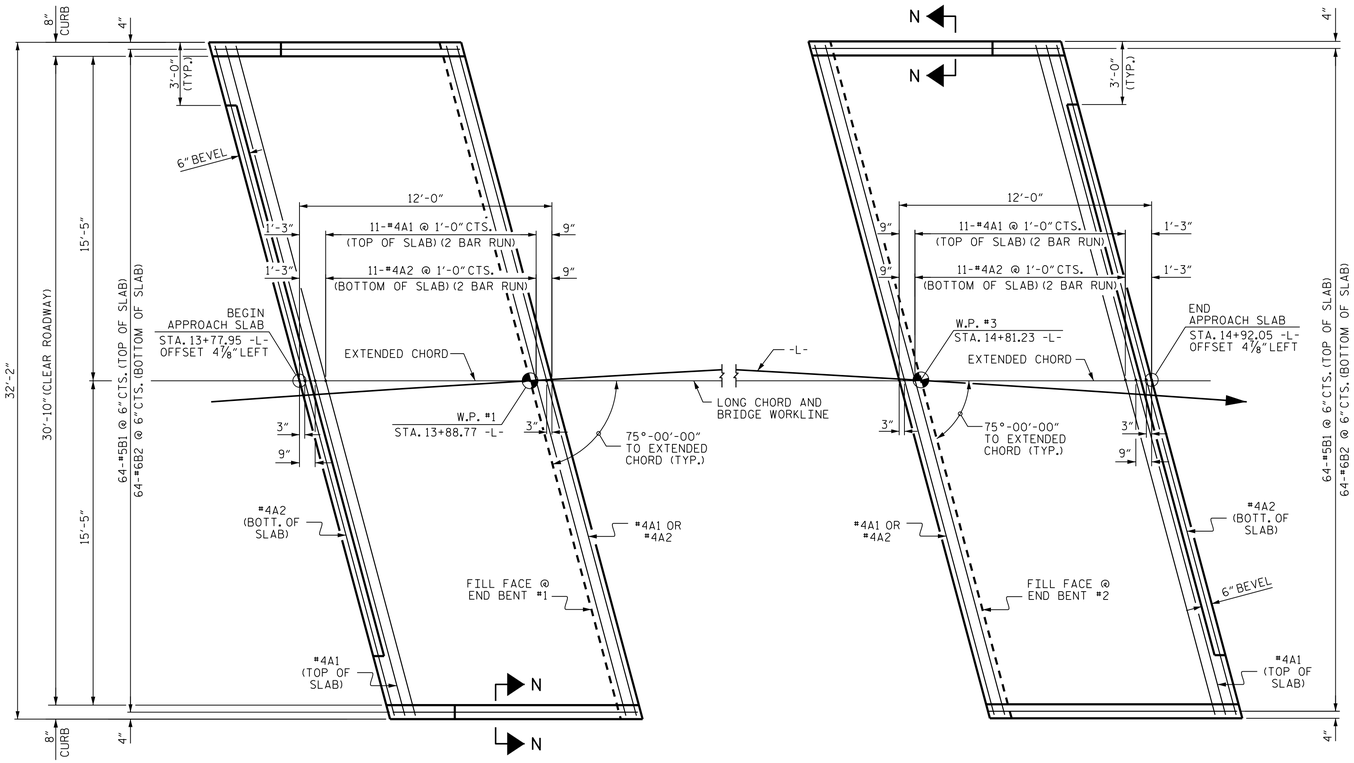
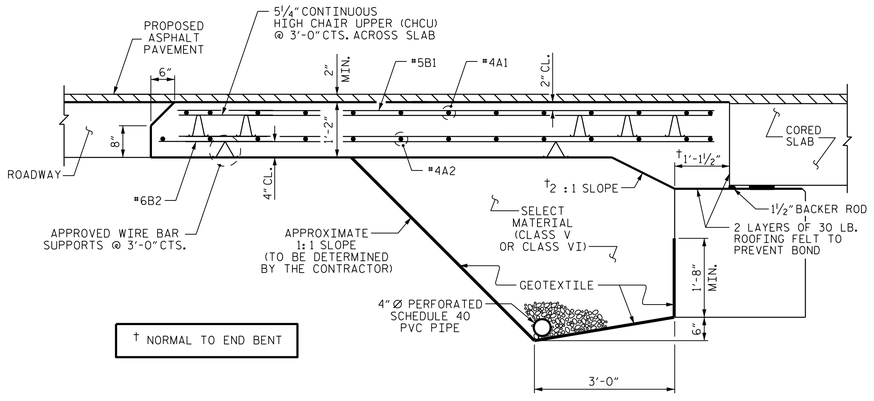


AT END BENT 1

AT END BENT 2

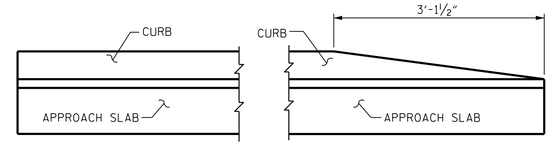
PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



END OF CURB WITH SHOULDER BERM GUTTER

AT RIGHT SIDE OF END BENT 2 ONLY

END OF CURB WITHOUT SHOULDER BERM GUTTER

SECTION N-N

CURB DETAILS

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.

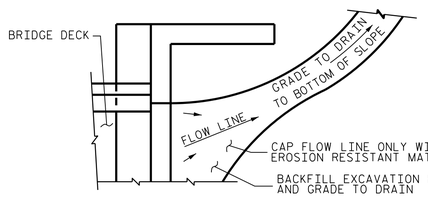
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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.

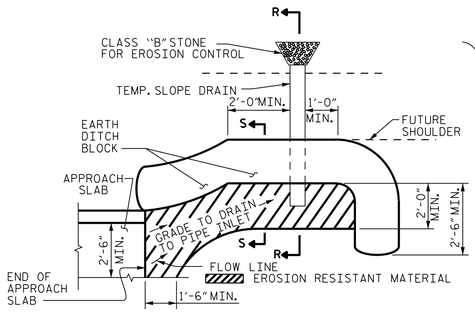
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



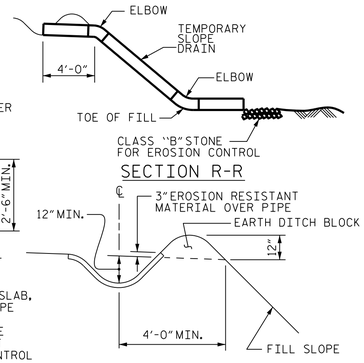
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

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.

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	17'-6"	304
A2	26	#4	STR	17'-5"	302
✱ B1	64	#5	STR	11'-1"	740
B2	64	#6	STR	11'-7"	1113
REINFORCING STEEL				LBS.	1415
✱ EPOXY COATED REINFORCING STEEL				LBS.	1044
CLASS AA CONCRETE				C.Y.	18.4

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	17'-6"	304
A2	26	#4	STR	17'-5"	302
✱ B1	64	#5	STR	11'-1"	740
B2	64	#6	STR	11'-7"	1113
REINFORCING STEEL				LBS.	1415
✱ EPOXY COATED REINFORCING STEEL				LBS.	1044
CLASS AA CONCRETE				C.Y.	18.4

SPLICE LENGTHS

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

PROJECT NO. 17BP.6.R.105

ROBESON COUNTY

STATION: 14+35.00 -L- POC

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 : 07/18
CHECKED BY : THF DATE : 07/18
DESIGN ENGINEER : VDK DATE : 07/18

DWG. No.

NORTH CAROLINA PROFESSIONAL SEAL 047117 ENGINEER VENKATA D.T. KOLLIPARA

Digitally signed by Venkata D. T. Kollipara
10/2/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
75°SKEW

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

STD. NO. BAS_33_75S

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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. FINS 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

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

Invalid expression
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USER: FANGTH