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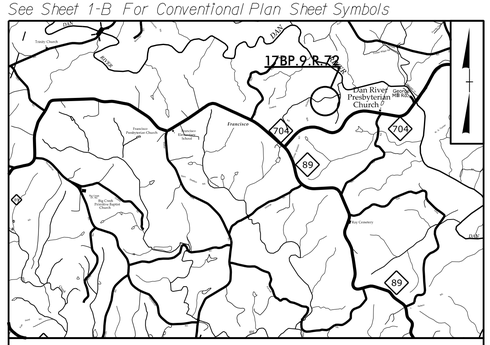
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09/08/99

TIP PROJECT: 17BP.9.R.72

CONTRACT: DI0233

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STOKES COUNTY

LOCATION: BRIDGE NO. 8 (84008) ON NC 704 OVER DAN RIVER

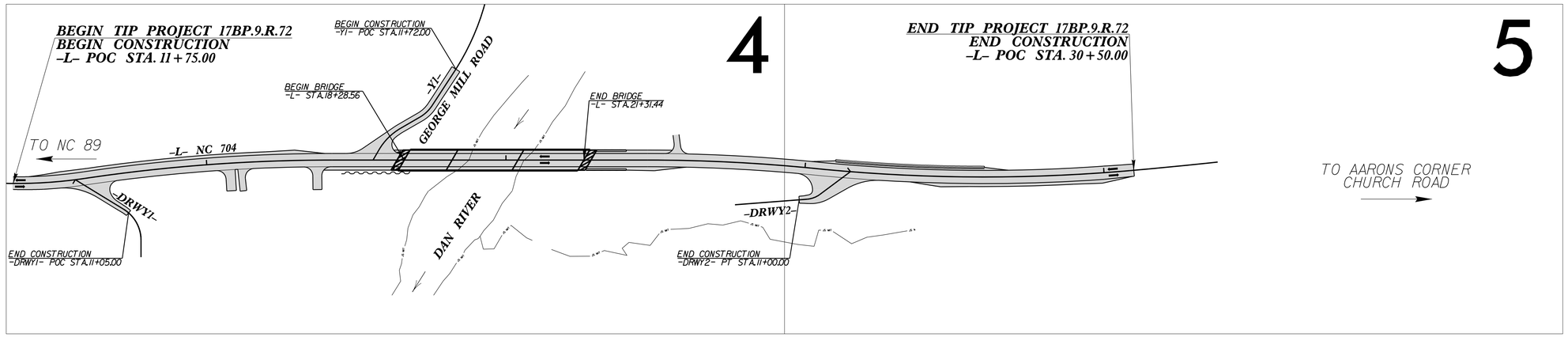
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.72	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.72	N/A	PE
17BP.9.R.72	N/A	R/W & UTIL
17BP.9.R.72	N/A	CONSTR.



NAD 83/
NA 2011



THIS IS NOT A CONTROL OF ACCESS PROJECT
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K VALUE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

ADT 2017 = 460

V = 60 MPH

FUNC CLASS = RURAL MAJOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.9.R.72 = .298 MI

LENGTH OF STRUCTURE TIP PROJECT 17BP.9.R.72 = 0.057 MI

TOTAL LENGTH OF PROJECT 17BP.9.R.72 = 0.355 MI

NCDOT CONTACT: DANIEL DAGENHART
NCDOT DIVISION 9 BRIDGE MANAGER

PREPARED IN THE OFFICE OF:
Stantec
STANTEC CONSULTING
801 Jones Franklin Road |Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866 | Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 12, 2021

LETTING DATE: JUNE 23, 2021

MIKE LINDGREN, PE
PROJECT ENGINEER

LEAH STARNES
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G Dalton 4/21/2021
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

DocuSigned by: Mike Lindgren 4/21/2021
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/20/2021
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	1A

ROADWAY DESIGN ENGINEER



4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
RW-01 THRU RW-05	SURVEY CONTROL & R/W CONTROL SHEETS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-3	SPECIAL DETAILS
2G-1 THRU 2G-3	TEMPORARY SHORING DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 7	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-07	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-1A THRU X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-42	CROSS-SECTIONS
S-1 THRU S-32	STRUCTURE PLANS

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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

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 POWER - SURRY-YADKIN EMC

COMMUNICATION - CENTURYLINK

COMMUNICATION - SPECTRUM

COMMUNICATION - CONTERRA

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

4/20/2021
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tsarnes

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	1B

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
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- 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 Easment 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 — HH
- 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:

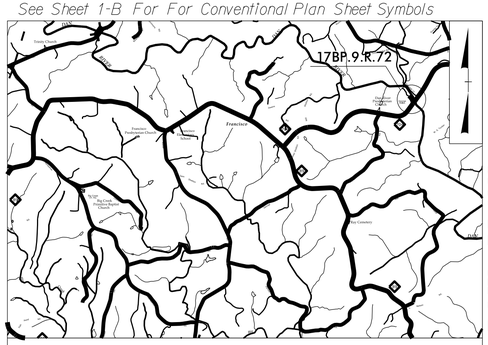
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

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09/08/99

TIP PROJECT: 17BP.9.R.72

See Sheet 1-B For For Conventional Plan Sheet Symbols



VICINITY MAP

ROW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

STOKES COUNTY

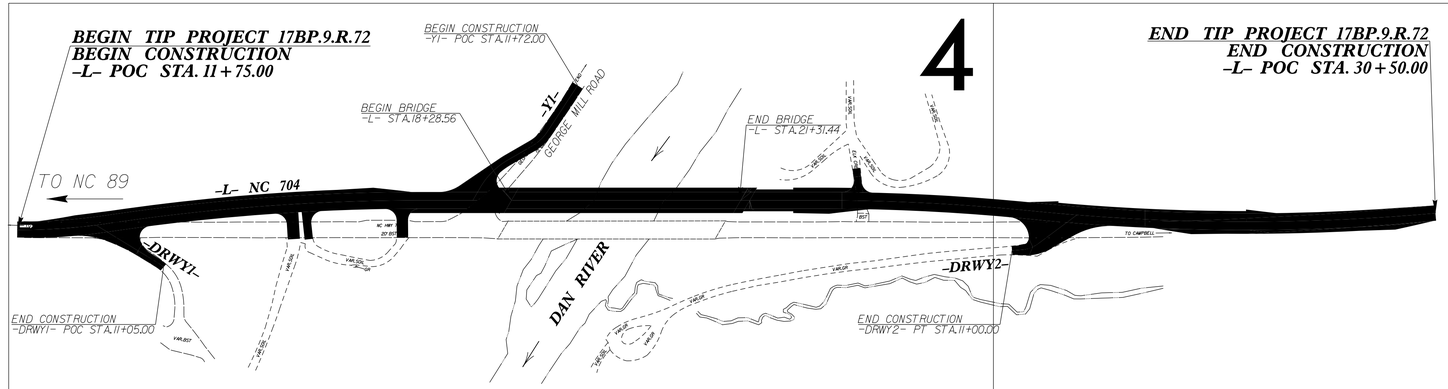
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.72	RW01	





BEGIN TIP PROJECT 17BP.9.R.72
BEGIN CONSTRUCTION
–L– POC STA. 11+75.00

4



END TIP PROJECT 17BP.9.R.72
END CONSTRUCTION
–L– POC STA. 30+50.00

5

TO AARONS CORNER CHURCH ROAD

THIS PROJECT IS NOT WITHIN ANY MUNICPAL BOUNDARIES
THIS IS NOT A CONTROL OF ACCESS PROJECT
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K VALUE
CLEARING ON THIS PROJECT SHALL BE IN ACCORDANCE WITH METHOD III.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE

50 25 0 50 100

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "840008-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 1008575.4369(ft) EASTING: 1616929.8829(ft) ELEVATION: 866.77(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000793148
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "840008-2" TO -L- STATION 10+00.00 IS S39°12'24"W 791.2027(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Offices of:

Stantec
801 JONES FRANKLIN ROAD, SUITE 300
RALEIGH, NC 27606
LICENSE NO.: F-0672
www.stantec.com

Allied Associates, P.A.
4720 KESTER MILL ROAD Phone (336) 765-2377
WINSTON-SALEM, N.C., 27103 FAX 760-8886
WWW.ALLIEDAPA.COM C-2198

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 12, 2021

LETTING DATE: JUNE 23, 2021

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3834 LAND SURVEYOR CLINTON B. OSBORNE

DocuSigned by:
Clinton Osborne
0A6F6B085F6449B...
4/21/2021

SIGNATURE: ***Date:***

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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

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PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	RW02D-1

Location and Surveys

Stantec
801 JONES FRANKLIN ROAD, SUITE 300
RALEIGH, NC 27606
LICENSE NO.: F-0672
www.stantec.com

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

Document ID: M.D. Lindgren
AAE4B0D4-E1492...

4/21/2021

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	1007962.3563	1616429.7490
PRC	12+94.46	1008190.3524	1616613.2897
PT	17+09.32	1008541.1664	1616834.0329
PC	22+36.68	1008965.5806	1617147.0398
PRC	25+18.05	1009183.2958	1617325.0947
PCC	30+43.19	1009603.2269	1617639.1542
PT	31+90.68	1009729.8823	1617714.7124

Y1

TYPE	STATION	NORTH	EAST
PC	10+00.00	1008940.3008	1616740.8838
PT	11+76.61	1008793.4869	1616836.4452
PC	12+44.53	1008729.8275	1616860.1347
PT	12+72.58	1008702.2440	1616863.5316
PC	13+09.88	1008665.1712	1616859.3924
PT	13+62.17	1008614.0545	1616867.1324
POT	13+81.37	1008596.4633	1616874.8145

DRWY1

TYPE	STATION	NORTH	EAST
POT	10+00.00	1008176.7623	1616605.9042
PC	10+94.95	1008212.6048	1616693.8285
PT	11+56.15	1008205.4236	1616751.9662
POT	11+84.88	1008188.4285	1616775.1349

DRWY2

TYPE	STATION	NORTH	EAST
POT	10+00.00	1009226.7687	1617363.6291
PC	10+64.00	1009162.7734	1617363.8203
PT	10+86.43	1009141.4810	1617357.7574
POT	12+07.54	1009038.7246	1617293.6488

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

REVISIONS

6/2/99

4/21/2021
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jlowder

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	RW03E-1

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NORTH CAROLINA PROFESSIONAL SEAL L-4269 LAND SURVEYOR REX COOPER

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+75.00	-30.38	1008107.7397	1616525.0709
L	12+94.46	-55.00	1008216.1309	1616564.7050
L	17+00.00	-55.00	1008566.1517	1616784.1394
L	21+93.00	-90.00	1008983.8491	1617048.6841
L	23+10.00	-56.00	1009058.4205	1617147.1395
L	25+50.00	-30.00	1009226.9849	1617323.9303
L	28+00.00	-40.00	1009425.2147	1617471.2982
L	29+55.00	-28.98	1009544.5973	1617567.7460

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	29+00.00	-60.00	1009516.8726	1617511.8566

I, F. Rex Cooper, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 5th day of November, 2019.

DocuSigned by:
Rex Cooper
61DD1950E8574DD...

Professional Land Surveyor L-4269

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.

$SHEET$ $DATE$ $TIME$ $USER$ DGN

6/2/99

REVISIONS

REVISIONS

I, F. Rex Cooper, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

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Witness my original signature, registration number and seal this 5th day of November, 2019.

DocuSigned by:
Rex Cooper
61DD1950E8574DD...

L-4269

Professional Land Surveyor

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	RW04

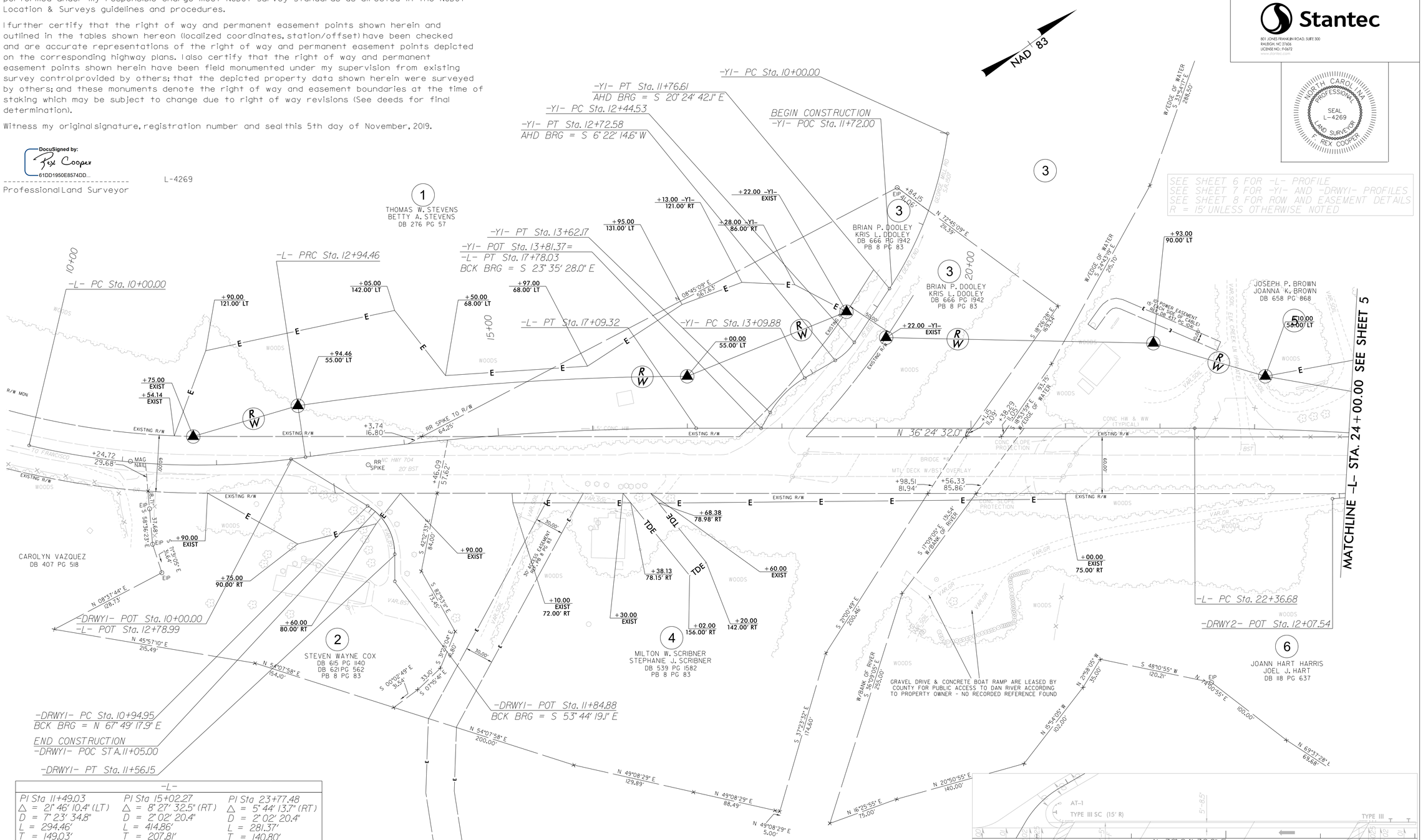
Location and Surveys

Stantec
801 JONES FRANKLIN ROAD, SUITE 300
RALEIGH, NC 27606
LICENSE NO.: F-0672

NORTH CAROLINA PROFESSIONAL SEAL L-4269 LAND SURVEYOR F. REX COOPER

NAD 83

SEE SHEET 6 FOR -L- PROFILE
SEE SHEET 7 FOR -Y1- AND -DRWY1- PROFILES
SEE SHEET 8 FOR ROW AND EASEMENT DETAILS
R = 15' UNLESS OTHERWISE NOTED



-L-		
PI Sta 11+49.03	PI Sta 15+02.27	PI Sta 23+77.48
△ = 21° 46' 10.4" (LT)	△ = 8° 27' 32.5" (RT)	△ = 5° 44' 13.7" (RT)
D = 7° 23' 34.8"	D = 2° 02' 20.4"	D = 2° 02' 20.4"
L = 294.46'	L = 414.86'	L = 281.37'
T = 149.03'	T = 207.81'	T = 140.80'
R = 775.00'	R = 2,810.00'	R = 2,810.00'
DS = 45 MPH	SE = SEE PLANS	SE = SEE PLANS

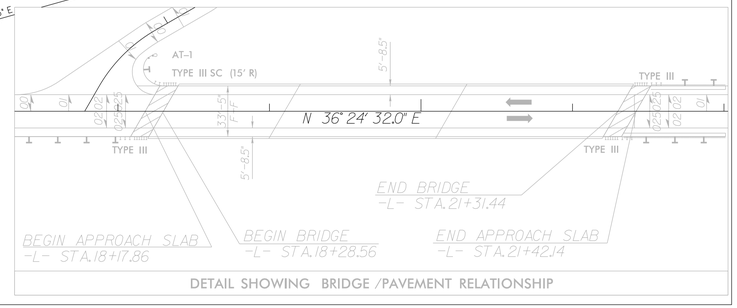
-Y1-		
PI Sta 10+89.77	PI Sta 12+58.81	PI Sta 13+36.64
△ = 25° 17' 49.0" (RT)	△ = 26° 46' 56.7" (RT)	△ = 29° 57' 42.6" (LT)
D = 14° 19' 26.2"	D = 95° 29' 34.7"	D = 57° 17' 44.8"
L = 176.61'	L = 28.05'	L = 52.29'
T = 89.77'	T = 14.28'	T = 26.76'
R = 400.00'	R = 60.00'	R = 100.00'

-DRWY1-
PI Sta 11+28.51
△ = 58° 26' 23.0" (RT)
D = 95° 29' 34.7"
L = 61.20'
T = 33.56'
R = 60.00'

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.



DETAIL SHOWING BRIDGE /PAVEMENT RELATIONSHIP

26-MAR-2020 08:21
U:\17001795\5\ur\en\Material\exports\191105\17BP9R72_ls_rw04_191105.dgn
Dbackovik

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	RW05

Location and Surveys

Stantec
801 JONES FRANKLIN ROAD, SUITE 300
RALEIGH, NC 27606
LICENSE NO.: F-0672
www.stantec.com

I, F. Rex Cooper, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

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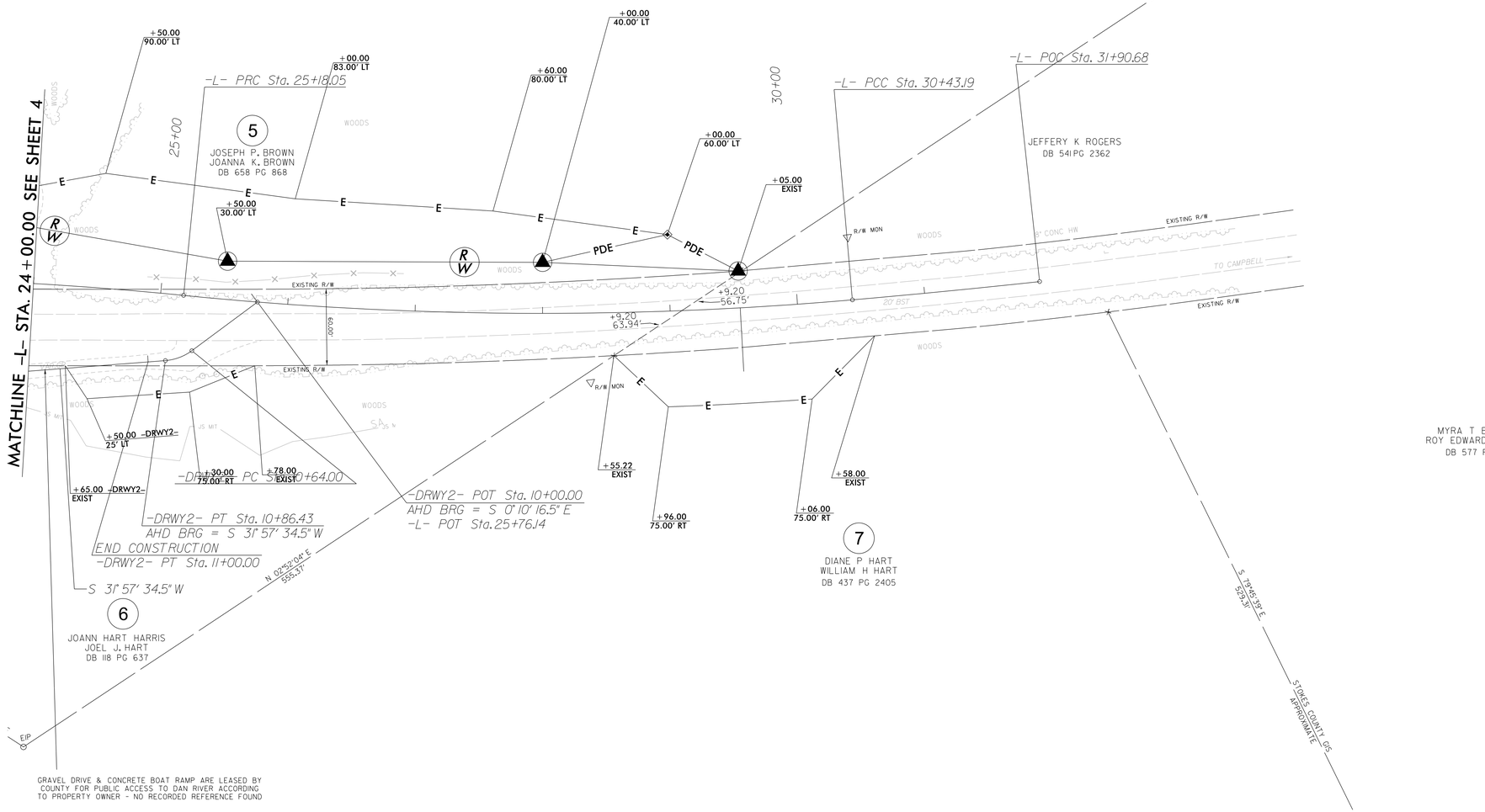
Witness my original signature, registration number and seal this 5th day of November, 2019.

DocuSigned by:
Rex Cooper
61DD1950E8574DD...

L-4269
Professional Land Surveyor

NORTH CAROLINA PROFESSIONAL SEAL L-4269 LAND SURVEYOR F. REX COOPER

NAD 83



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.

-L-		
PI Sta 23+77.48	PI Sta 27+81.39	PI Sta 31+16.94
△ = 5° 44' 13.7" (RT)	△ = 10° 42' 27.7" (LT)	△ = 1° 14' 20.5" (LT)
D = 2° 02' 20.4"	D = 2° 02' 20.4"	D = 0° 50' 24.4"
L = 281.37'	L = 525.14'	L = 147.48'
T = 140.80'	T = 263.34'	T = 73.74'
R = 2,810.00'	R = 2,810.00'	R = 6,820.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

-DRWY2-
PI Sta 10+75.51
△ = 32° 07' 51.0" (RT)
D = 143° 14' 22.0"
L = 22.43'
T = 11.52'
R = 40.00'

REVISIONS

6/2/99

26-MAR-2020 08:21
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ldeskonk at BUKONKIE_L

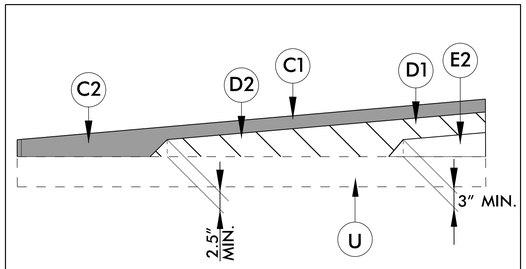
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6/2/99

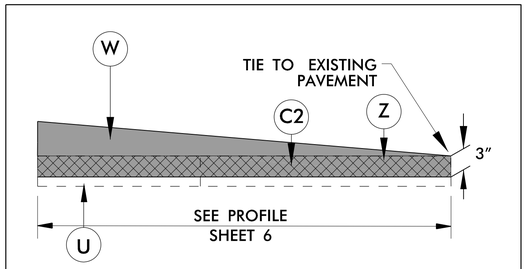
FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ OR GREATER THAN 2″.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ OR GREATER THAN 4″.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5 1/2″ IN DEPTH.
J1	PROP. 6″ AGGREGATE BASE COURSE
R1	PROP. EXPRESSWAY GUTTER.
R2	PROP. SHOULDER BERM & GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING. SEE DETAIL THIS SHEET
Z	MILLING 3″

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE PLANS FOR VARIABLE PAVED SHOULDER WIDTHS.

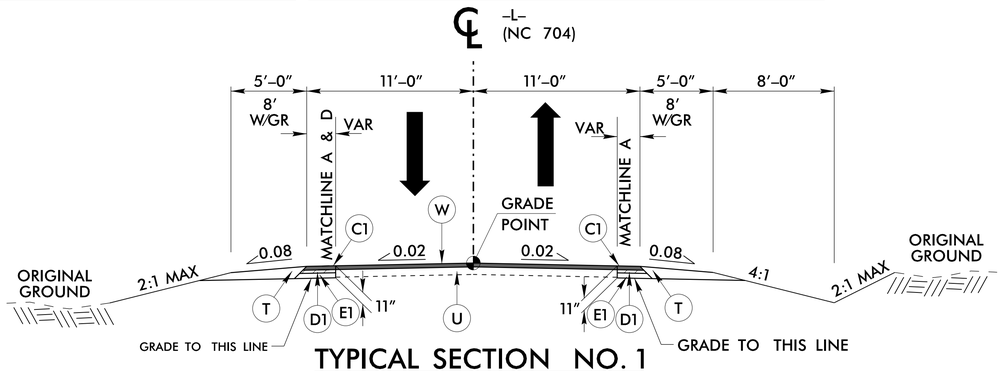


W: WEDGING DETAIL



MILLING DETAIL

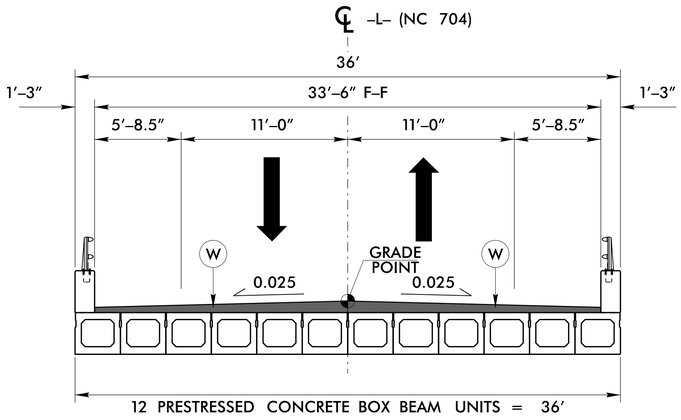
–L– STA. 11+75.00 TO STA. 13+20.00
–L– STA. 27+65.00 TO STA. 30+50.00



TYPICAL SECTION NO. 1

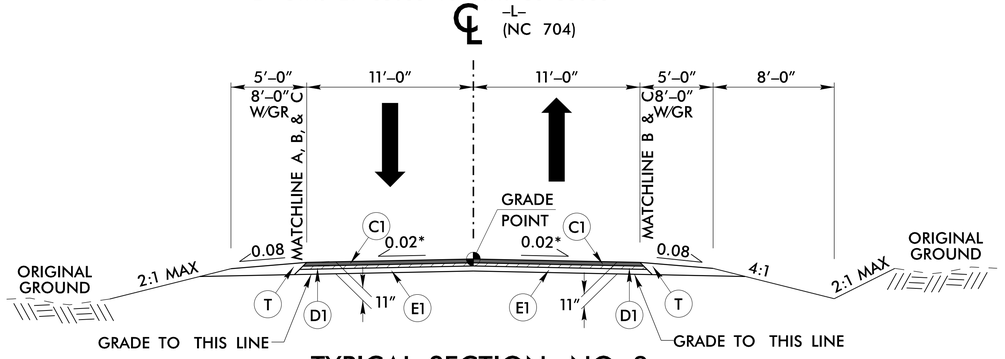
–L– STA. 11+75.00 TO STA. 13+06.00
–L– STA. 27+21.00 TO STA. 30+50.00

NOTE: SEE PARTIAL TYPICAL SECTION 1-A, SHEET 2A-2
SEE MILLING DETAIL FOR STATIONS:
-L- STA. 11+75.00 TO STA. 13+20.00
-L- STA. 27+65.00 TO STA. 30+50.00



TYPICAL SECTION NO. 2

–L– STA. 18+28.56 (BEGIN BRIDGE) TO STA. 21+31.44 (END BRIDGE)



TYPICAL SECTION NO. 3

–L– STA. 13+06.00 TO STA. 18+28.56 (BEGIN BRIDGE)
–L– STA. 21+31.44 (END BRIDGE) TO STA. 27+21.00

NOTE: SEE PARTIAL TYPICAL SECTION 1-A, SHEET 2A-2

*SUPER TRANSITIONS TO 0.025 NORMAL CROWN AT BRIDGE APPROACHES

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
17BP9R72	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D LINDBERG

4/21/2021

PAVEMENT DESIGN ENGINEER

PAVEMENT DESIGN PROVIDED BY NCDOT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

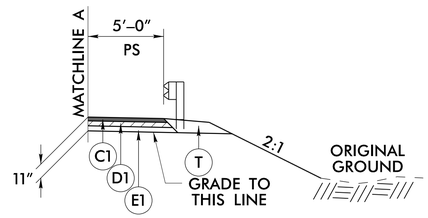
4/20/2021
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6/2/99

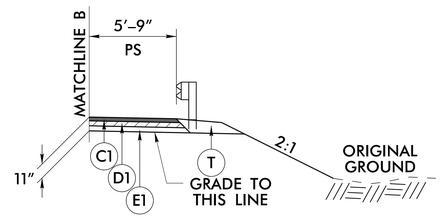
FINAL PAVEMENT DESIGN	
C1	PROP. APPROX. 3", TYPE S9.5C
C2	PROP. VAR. DEPTH, TYPE S9.5C
D1	PROP. APPROX. 4", I19.0C
D2	PROP. VAR. DEPTH, TYPE I19.0C
E1	PROP. APPROX. 4", TYPE B25.0C
E2	PROP. VAR. DEPTH, TYPE B25.0C
J1	PROP. APPROX. 6" ABC
R1	PROP. EXPRESSWAY GUTTER.
R2	PROP. SHOULDER BERM & GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS SHEET NO.2A-1)
Z	MILLING 3"

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE PLANS FOR VARIABLE PAVED SHOULDER WIDTHS



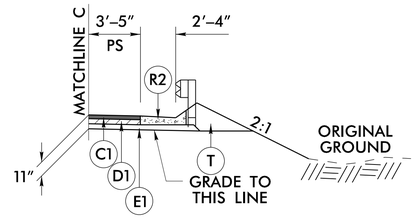
PARTIAL TYPICAL SECTION NO. 1A & 3A

USE PARTIAL TYPICAL SECTION IN CONJUNCTION
WITH TYPICAL SECTION NO. 1 & 3 AS FOLLOWS:
–L– STA. 12+49.14 TO STA. 16+49.71 LT (MIRRORED)
–L– STA. 27+25.00 TO STA. 29+98.47 RT



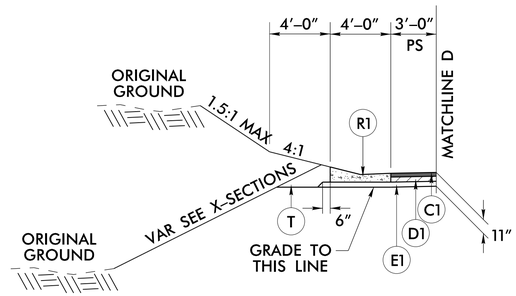
PARTIAL TYPICAL SECTION NO. 3B

USE PARTIAL TYPICAL SECTION IN CONJUNCTION
WITH TYPICAL SECTION NO. 3 AS FOLLOWS:
–L– STA. 17+03.33 TO STA. 18+20.33 RT
–L– STA. 18+16.81 TO STA. 18+39.67 LT (MIRRORED)
–L– STA. 22+01.00 TO STA. 22+72.24 LT (MIRRORED)
–L– STA. 22+01.00 TO STA. 22+51.00 RT



PARTIAL TYPICAL SECTION NO. 3C

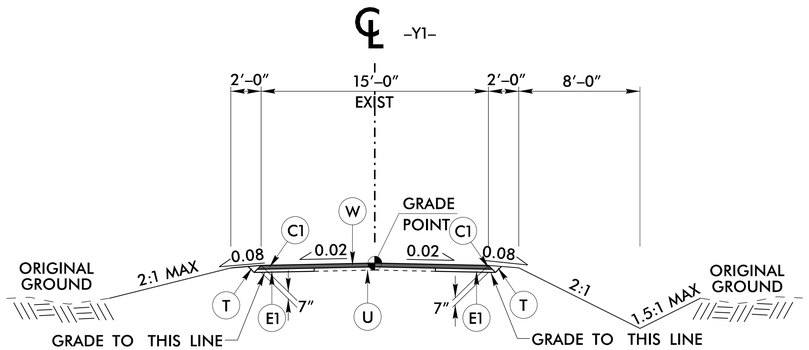
USE PARTIAL TYPICAL SECTION IN CONJUNCTION
WITH TYPICAL SECTION NO. 3 AS FOLLOWS:
–L– STA. 21+34.00 TO STA. 22+01.00 RT
–L– STA. 21+52.00 TO STA. 22+01.00 LT (MIRRORED)



PARTIAL TYPICAL SECTION NO. 1D & 3D

USE PARTIAL TYPICAL SECTION IN CONJUNCTION
WITH TYPICAL SECTION NO. 1 & 3 AS FOLLOWS:
–L– STA. 25+50.00 TO 28+00.00 STA. LT.

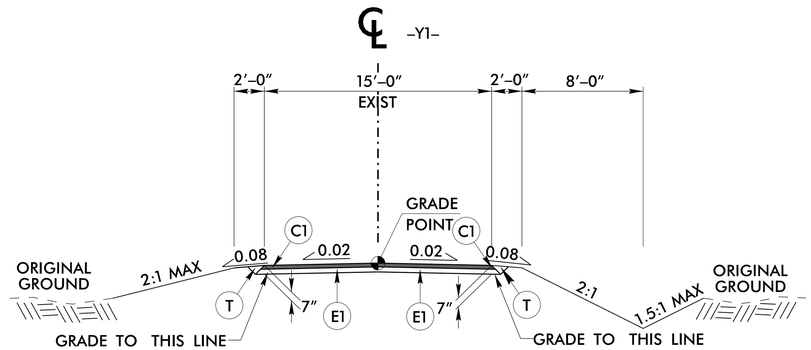
NOTE: 1.5:1 SLOPES TO BE USED WITH GEOTECH APPROVAL.
SEE XSC FOR LOCATIONS



TYPICAL SECTION NO. 4

–Y1– STA. 11+72.00 TO STA. 12+79.69

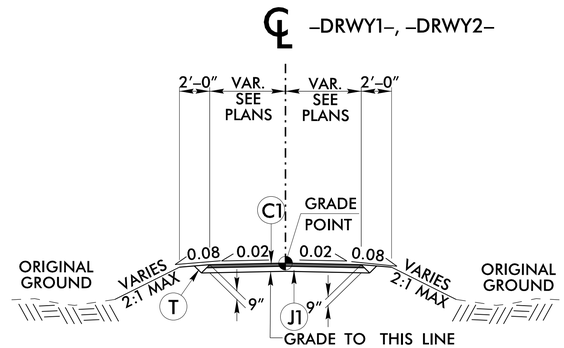
NOTE: 1.5:1 SLOPES TO BE USED WITH GEOTECH APPROVAL.
SEE XSC FOR LOCATIONS



TYPICAL SECTION NO. 5

–Y1– STA. 12+79.69 TO STA. 13+69.00

NOTE: 1.5:1 SLOPES TO BE USED WITH GEOTECH APPROVAL.
SEE XSC FOR LOCATIONS



TYPICAL SECTION NO. 6

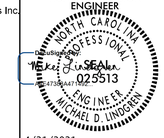
–DRWY1– STA. 10+17.00 TO STA. 11+05.00
–DRWY2– STA. 10+17.00 TO STA. 11+00.00

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
17BP9R72	2A-2

ROADWAY DESIGN ENGINEER



4/21/2021

PAVEMENT DESIGN ENGINEER

PAVEMENT DESIGN PROVIDED BY NCDOT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

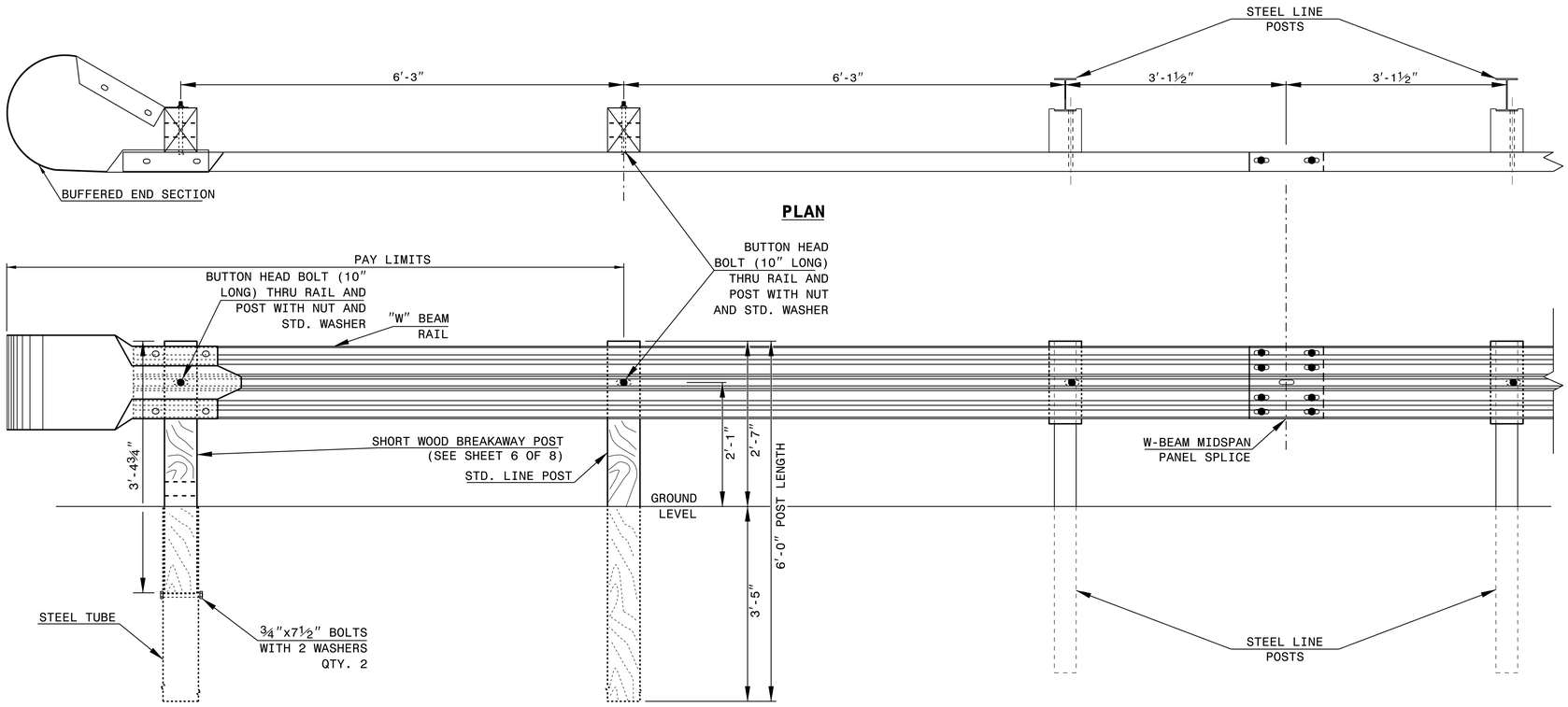
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Stantec

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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	2C-1

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

DocuSigned by: [signature] 873F3D17...

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER DAVID S. HOWERTON

4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

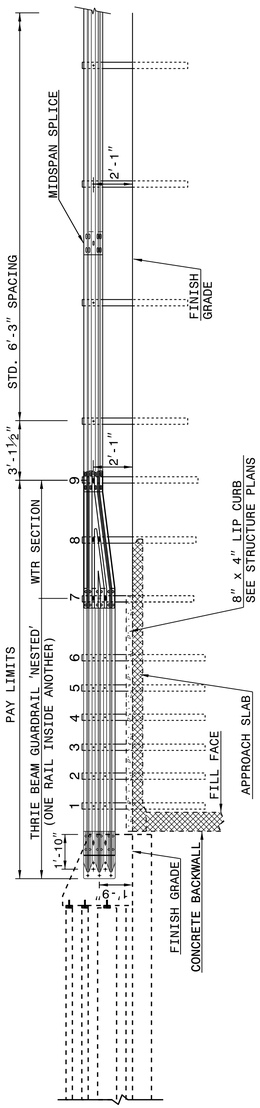
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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	2C-2

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

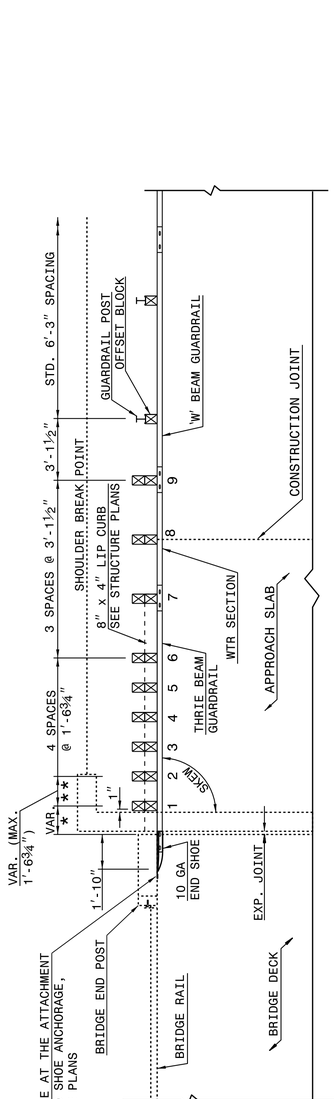
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



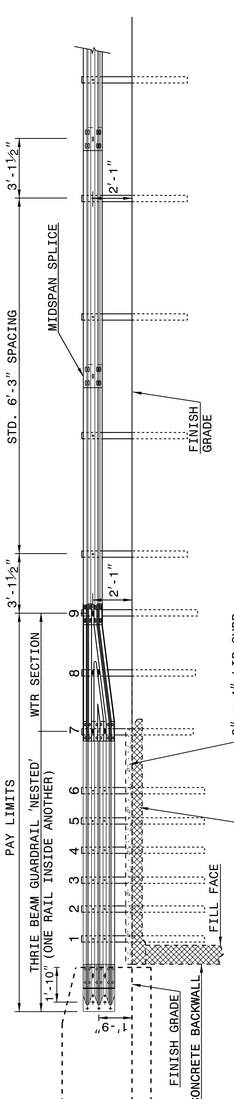
PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

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

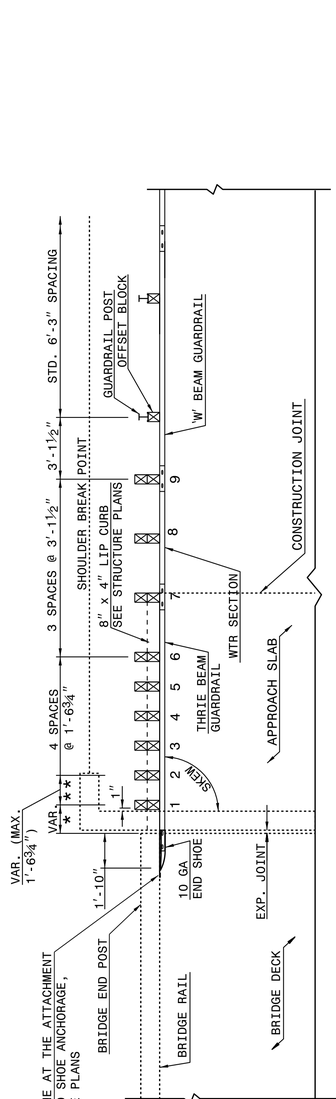
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

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4/21/2021
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER

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

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

14-DEC-2017 10:36
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn
jhowerton AT CSD-2425965

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	2C-3

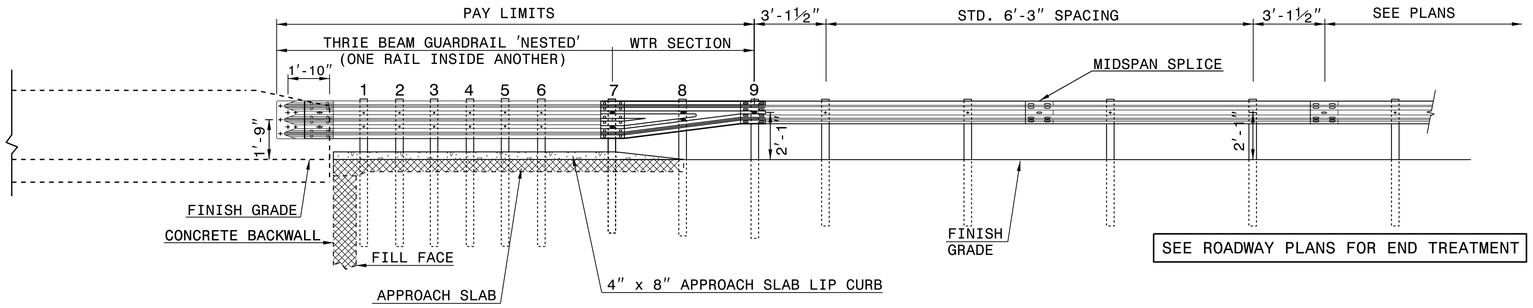
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

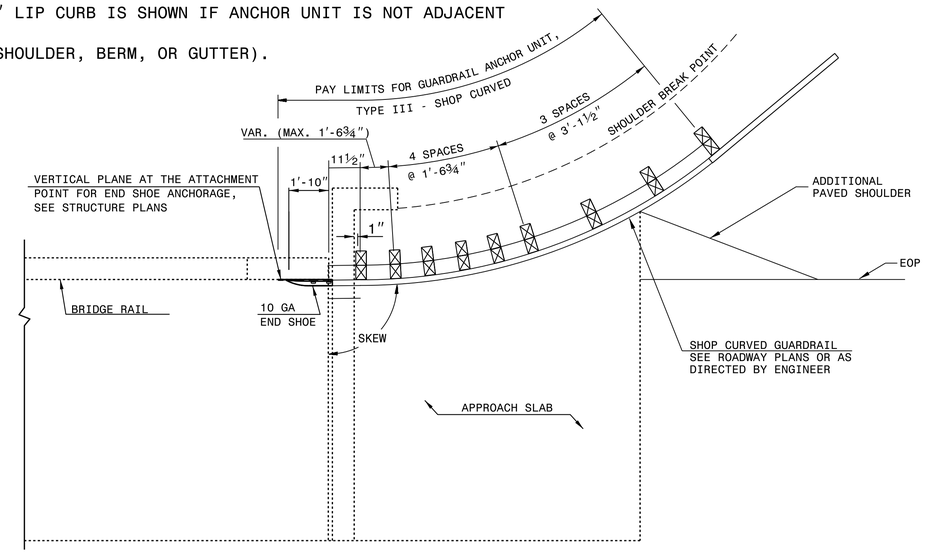
SHEET 1 OF 1

TYPE III SC



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED FOR ATTACHMENT TO RAIL ON BRIDGE

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

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NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S Howerton

4/21/2021

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: DATE:
FILE SPEC.: \jhowerton\guardrail\31inguardrail\typeiiisc.dgn

01-FEB-2018 09:09
S:\Contracts\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii_sc.dgn
jhowerton AT CSD-232595

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72 (SF-840008)	2G-1

GEOTECHNICAL ENGINEER

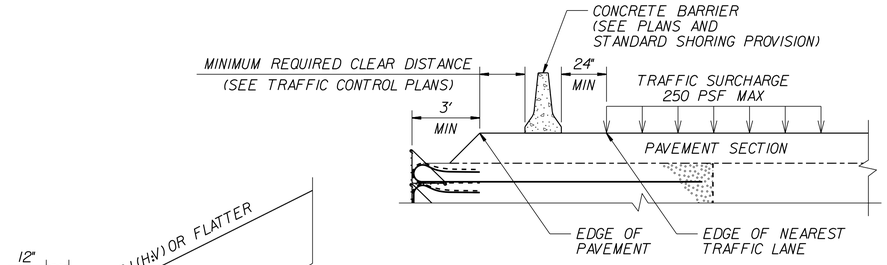
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. MIDDLETON

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SIGNATURE DATE

ENGINEER

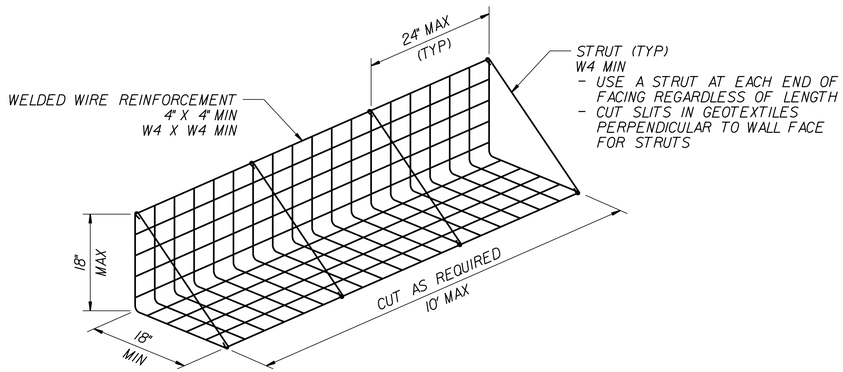
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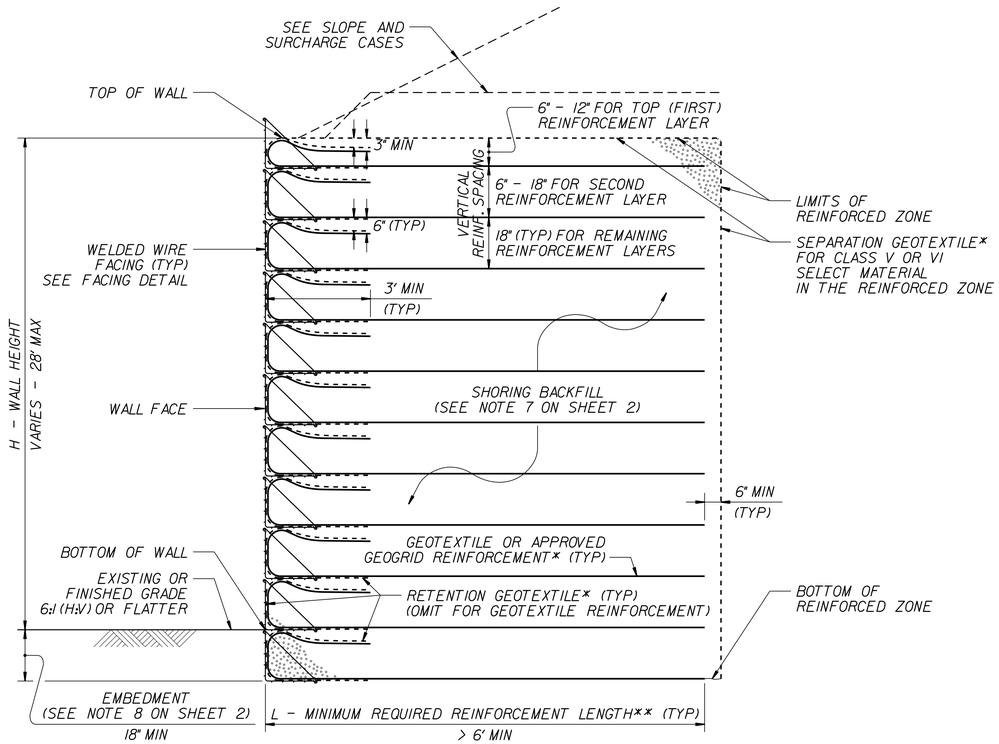


SURCHARGE CASE

SLOPE CASE

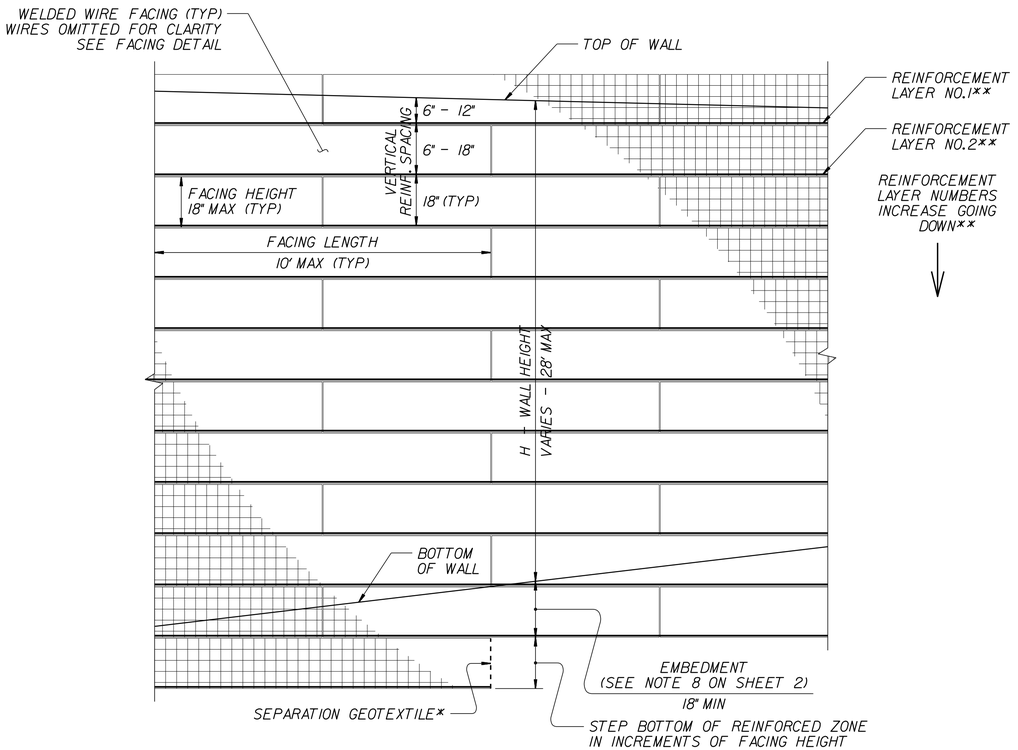


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72 (SF-840008)	2G-2

GEOTECHNICAL ENGINEER

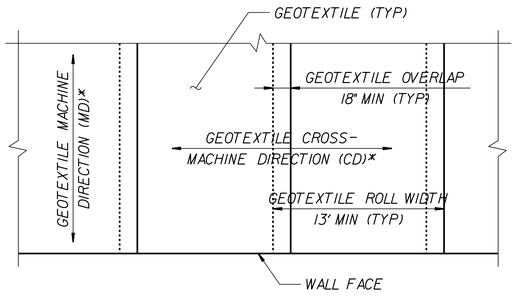
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. MIDDEN

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SIGNATURE DATE

ENGINEER

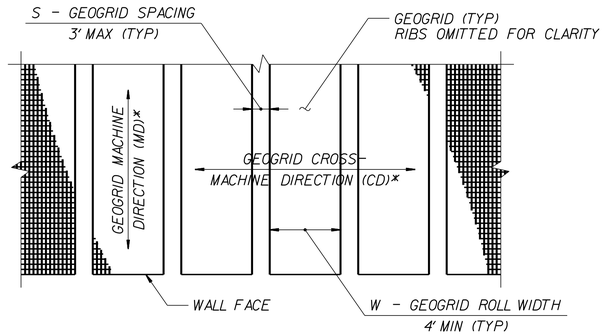
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GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

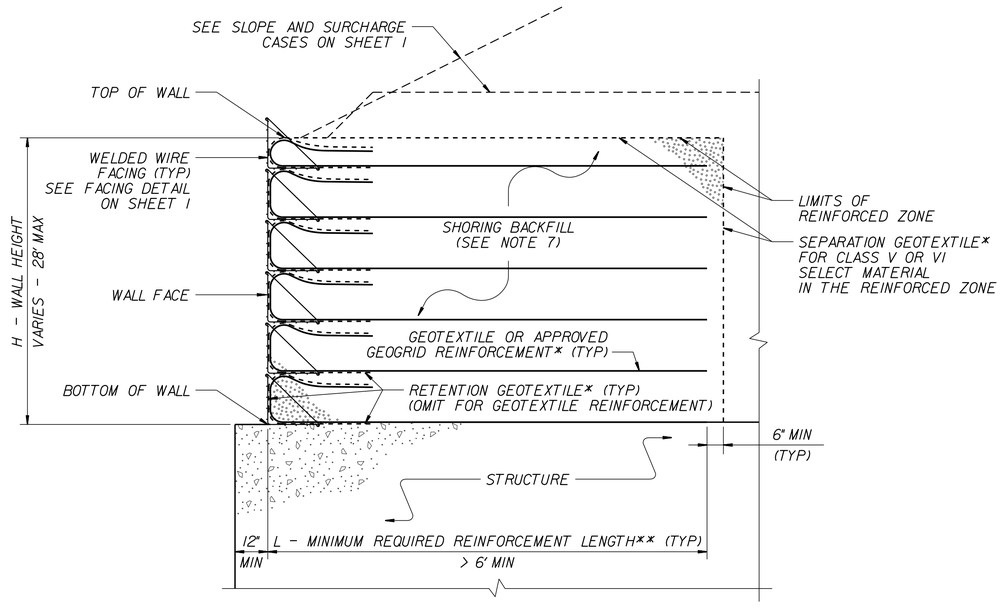


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72 (SF-840008)	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. MIDDEN

DocuSigned by: Scott A. Midden 3/2/2021 F760CAEB96FC4D3...

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

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5/28/99

COMPUTED BY: MBL DATE: 10 /22 /18
CHECKED BY: LS DATE: 02 /12 /19

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	3B-1

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	XI MOD	XI	GREU TL-3	M-350	XIII	CAT-1	VI MOD	TYPE III	AT-1	EA	G	NG				
-L-	12+49.14	16+49.14	LT	400'			15+00.00	13+50.00	5'-0"	8'-0"	50'	50'	1'	1'			2												
-L-	Y1 13+09.85	L 18+40.00	LT		50'		18+40.00		5'-9"	8'-9"			1'									1	1						
-L-	21+39.71	22+45.96	LT	106.25'				21+39.71	5'-9"	8'-9"												1							
-L-	22+45.96	22+70.59	LT		49'				5'-9"	8'-9"			1'										1						
-L-	17+05.00	17+26.58	RT		31.25'				5'-9"	8'-9"			1'										1						
-L-	17+26.58	18+20.33	RT	93.75'				18+20.00	5'-9"	8'-9"												1							
-L-	21+20.33	22+51.09	RT	131.25'			21+20.33		5'-9"	8'-9"	50'			1'			1					1							
-L-	27+25.00	30+00.00	RT	275'			27+25.00	30+00.00	5'-0"	8'-0"	50'	50'	1'	1'			2												
			SUBTOTAL	1,006.25'	130.25'												5					4	3						
	LESS ANCHOR DEDUCTIONS																												
	GREU-350 TL-3	5 @ 50'		-250'																									
	TYPE III	3 @ 18.75'		-56.25'																									
	TYPE III SHOP CURVED	1 @ 18.75'			-18.75																								
	AT-1	3 @ 6.25'			-18.75																								
			TOTAL	700'	92.75'																								
			SAY	700'	100'																								

ADDITIONAL GUARDRAIL POSTS = 5 EA

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
SUMMARY NO. 1					
-L- 11+75.00	18+17.00	5,488	7,370	1,882	-
-DRWY1- 10+17.40	11+05.00	4	147	143	-
-Y1- 11+72.00	13+68.00	3,485	178	-	3,307
SUBTOTAL SUMMARY NO. 1		8,977	7,695	2,025	3,307
SUMMARY NO. 2					
-L- 21+30.00	30+00.00	7,427	3,743	0	3,684
-DRWY2- 10+16.68	10+72.00	23	24	1	0
SUBTOTAL SUMMARY NO. 2		7,450	3,767	1	3,684
TOTAL:		16,427	11,462	2,026	6,991
WASTE IN LIEU OF BORROW				-2,026	-2,026
PROJECT TOTAL:		16,427	11,462		4,965
GRAND TOTALS:		16,427	11,462		4,965
SAY:		16,500			

SHOULDER BORROW = 540 CY
DDE = 1500 CY
UNDERCUT = 450 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.

Approximate quantities only. Shoulder Borrow, Clearing and Grubbing, Fine Grading, and Removal of Existing Asphalt Pavement will be paid for at lump sum price for "Grading".

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT	21+52.00	22+01.00	49'
-L- RT	21+34.00	22+01.00	67'
		TOTAL:	116'
		SAY:	120'

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	13+33.00	18+25.00	RT	1200
-L-	20+97.00	27+90.00	RT	1423
			TOTAL:	2623
			SAY:	2,630

12/14/2020
L:\Roadway\Proj\17BP9R72_rdy_3B-1.dgn
mpuemba

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MEDWARDS

COMPUTED BY: MCE DATE: 06/24/2019

CHECKED BY: JGD DATE: 06/24/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
17BP.9.R.72	3D-1

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 | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12 | 15 | 18 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | R. C. PIPE CLASS III 12 | 15 | 18 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | ENDWALLS STD. 838.11 OR STD. 838.31 (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) A: 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | 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 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | ##" x ##" x ##" PERF. C.S.P. TEE RISER ##" THICK | ##" x ##" x ##" PERF. C.S.P. TEE RISER ##" THICK | ##" PIPE END SECTION | ##" PIPE END SECTION | ##" PIPE END SECTION | ##" PIPE END SECTION | ##" PIPE END SECTION | ##" DRAINAGE PIPE ELBOW | ##" DRAINAGE PIPE ELBOW | ##" DRAINAGE PIPE ELBOW | ##" R.C. ELBOW | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | 36" C.S. ELBOW | ##" C.S. ELBOW | ##" SLUICE GATE (##" SIZE SLUICE GATE) | MODIFIED CONC. FLUME | PREFORMED SCOUR HOLE (PER EACH) | ENERGY DISSIPATION BASIN | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | 15" DRAINAGE PIPE ELBOWS EACH | REMARKS |
|---|---|---

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COMPUTED BY: K. B. Miller, PG DATE: May 23, 2019
CHECKED BY: Shane C. Clark, PE DATE: May 23, 2019

(5-15-18)

PROJECT NO.	SHEET NO.
17BP.9.R.72(SF-840008)	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
CONTINGENCY				
		TOTAL SY/TONS:	0	0*

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	18	100	200	200		
			TOTAL CY/TONS/SY:		100	200**	200**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
							TOTAL SY:	0

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
					TOTAL SY:	0	0	0*	0**

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

SUMMARY OF PRE-SPLITTING OF ROCK

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
					TOTAL SY:	0

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
	TOTAL GAUGES (EACH):		

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS

SUMMARY OF BRIDGE WAITING PERIODS

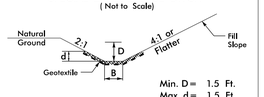
Bridge Description	End Bent/ Bent No.	MONTHS

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8/17/95

REVISIONS

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)

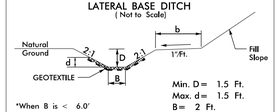


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 11+75 TO STA. 12+50 –L– LT
FROM STA. 24+00 TO STA. 25+00 –L– LT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)



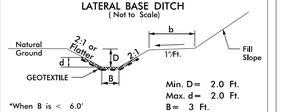
*When B is < 6.0'

Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+50 –L– LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



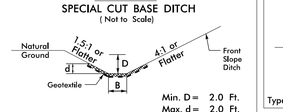
*When B is < 6.0'

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 13+50 TO STA. 16+50 –L– LT
FROM STA. 21+44 TO STA. 22+00 –L– LT
FROM STA. 12+50 TO STA. 13+00 –L– RT

DETAIL 4
SPECIAL CUT BASE DITCH
(Not to Scale)

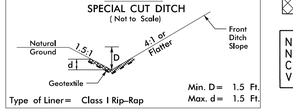


Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 16+50 TO STA. 17+59 –L– LT
FROM STA. 23+00 TO STA. 24+00 –L– LT

DETAIL 5
SPECIAL CUT DITCH
(Not to Scale)

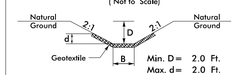


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+25 –Y1– RT

DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



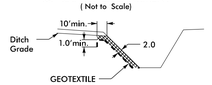
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

*When B is < 6.0'

Type of Liner= Class I Rip-Rap

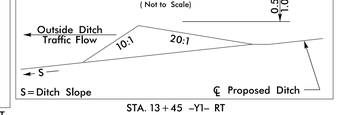
FROM STA. 18+93 TO STA. 19+43 –L– LT
FROM STA. 21+24 TO STA. 21+44 –L– LT

DETAIL 7
RIP RAP AT EMBANKMENT



FROM STA. 19+43 –L– TO STA. 19+50 –L– LT
FROM STA. 20+88 –L– TO STA. 21+24 –L– LT

DETAIL 8
FALSE SUMP
(Not to Scale)



STA. 13+45 –Y1– RT

PROPOSED REMOVAL OF EXISTING ASPHALT PAVEMENT

NOTE: THIS IS SURVEYOR'S BEST GUESS ON THIS PARCEL. NO FIELD DATA WAS OBTAINED IN THIS AREA. CALLS AROUND PROPERTY ARE APPROXIMATE AT BEST. VERY POOR LEGAL DESCRIPTION IN REFERENCED DEED.

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
4/21/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DAVIS
4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEET 6 FOR -L- PROFILE
SEE SHEET 7 FOR -Y1- AND -DRWY1- PROFILES
SEE SHEET RW FOR ROW AND EASEMENT DETAILS
SEE SHEETS S-1 THRU S-32 FOR STRUCTURES PLANS
R = 15' UNLESS OTHERWISE NOTED

BEGIN PROJECT 17BP.9.R.72
BEGIN CONSTRUCTION
BEGIN MILLING & RESURFACING
–L– POC STA. 11+75.00
MATCH EXISTING

10+00
–L– PC Sta. 10+00.00

–L– PRC Sta. 12+94.46

15+00
–L– PT Sta. 17+09.32

–Y1– PT Sta. 13+62.17
–Y1– POT Sta. 13+81.37=
–L– PT Sta. 17+78.03
BCK BRG = S 23° 35' 28.0" E

–Y1– PC Sta. 13+09.88

–Y1– PT Sta. 11+76.61
AHD BRG = S 20° 24' 42.1" E

–Y1– PC Sta. 12+44.53

–Y1– PT Sta. 12+72.58
AHD BRG = S 6° 22' 14.6" W

–Y1– PC Sta. 10+00.00

BEGIN CONSTRUCTION
–Y1– POC Sta. 11+72.00

20+00
–L– PC Sta. 22+36.68

–DRWY2– POT Sta. 12+07.54

–DRWY1– PC Sta. 10+94.95
BCK BRG = N 67° 49' 17.9" E

END CONSTRUCTION
–DRWY1– POC STA. 11+05.00

–DRWY1– PT Sta. 11+56.15

–DRWY1– POT Sta. 10+00.00
–L– POT Sta. 12+78.99

–DRWY1– POT Sta. 11+84.88
BCK BRG = S 53° 44' 19.1" E

NAD 83/ NA 2011

SPECIAL LATERAL 2' BASE DITCH w/CL I RIPRAP EST. 66 TON CL I RIPRAP EST. 121 SY GEOTEXTILE SEE DETAIL 1

LATERAL 2' BASE DITCH w/CL I RIPRAP EST. 98 TON CL I RIPRAP EST. 180 SY GEOTEXTILE SEE DETAIL 2

LATERAL 3' BASE DITCH w/CL I RIPRAP EST. 451 TON CL I RIPRAP EST. 790 SY GEOTEXTILE SEE DETAIL 3

SPECIAL CUT 3' BASE DITCH w/CL I RIPRAP EST. 169 TON CL I RIPRAP EST. 296 SY GEOTEXTILE SEE DETAIL 4

SPECIAL CUT 'V' DITCH w/CL I RIPRAP EST. 57 TON CL I RIPRAP EST. 108 SY GEOTEXTILE SEE DETAIL 5

LATERAL 3' BASE DITCH w/CL I RIPRAP EST. 62 TON CL I RIPRAP EST. 108 SY GEOTEXTILE SEE DETAIL 3

STANDARD 3' BASE DITCH w/CL I RIPRAP EST. 62 TON CL I RIPRAP EST. 108 SY GEOTEXTILE SEE DETAIL 6

STANDARD 3' BASE DITCH w/CL I RIPRAP EST. 24 TON CL I RIPRAP EST. 41 SY GEOTEXTILE SEE DETAIL 6

LATERAL 3' BASE DITCH w/CL I RIPRAP EST. 70 TON CL I RIPRAP EST. 121 SY GEOTEXTILE SEE DETAIL 3

SPECIAL CUT 3' BASE DITCH w/CL I RIPRAP EST. 139 TON CL I RIPRAP EST. 252 SY GEOTEXTILE SEE DETAIL 4

RIPRAP AT EMBANKMENT 64 TONS CL II RIPRAP 88 SY GEOTEXTILE SEE DETAIL 7

RIPRAP AT EMBANKMENT 13 TONS CL II RIPRAP 17 SY GEOTEXTILE SEE DETAIL 7

1 THOMAS W. STEVENS BETTY A. STEVENS DB 276 PG 57

2 STEVEN WAYNE COX DB 615 PG 1140 DB 621 PG 562 PB 8 PG 83

3 BRIAN P. DOOLEY KRIS L. DOOLEY DB 704 PG 1014 PB 8 PG 83

3 BRIAN P. DOOLEY KRIS L. DOOLEY DB 666 PG 1942 PB 8 PG 83

3 BRIAN P. DOOLEY KRIS L. DOOLEY DB 666 PG 1942 PB 8 PG 83

4 MILTON W. SCRIBNER STEPHANIE J. SCRIBNER DB 539 PG 1582 PB 8 PG 83

5 JOSEPH P. BROWN JOANNA K. BROWN DB 658 PG 868

6 COUNTY OF STOKES DB 118 PG 637

CAROLYN VAZQUEZ DB 407 PG 518

TIE TO EXISTING DITCH

REMOVE EXISTING BRIDGE (STRUCTURE PAY ITEM)

REMOVE –HW

HW FALSE SUMP

TEMPORARY SHORING SEE SHEETS TMP-1 THRU TMP-9

EXCAVATION LIMITS EXCAVATE 1.5:1 TO ELEVATION 840' (STRUCTURE PAY ITEM)

CLASS II RIP RAP TO TOP OF BERM (STRUCTURE PAY ITEM)

EXCAVATION LIMITS EXCAVATE 1.5:1 TO ELEVATION 843' (STRUCTURE PAY ITEM)

CLASS II RIP RAP TO TOP OF BERM (STRUCTURE PAY ITEM)

CONTRACTOR IS RESPONSABLE FOR ANY DAMAGE TO GRAVEL DRIVE

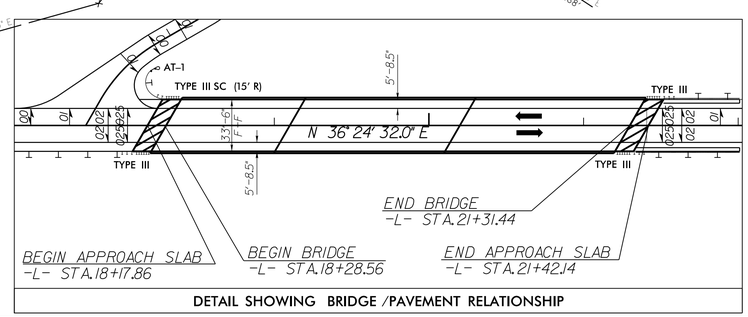
GRAVEL DRIVE & CONCRETE BOAT RAMP ARE LEASED BY COUNTY FOR PUBLIC ACCESS TO DAN RIVER ACCORDING TO PROPERTY OWNER - NO RECORDED REFERENCE FOUND

MATCHLINE –L– STA. 24+00.00 SEE SHEET 5

–L–		
PI Sta 11+49.03	PI Sta 15+02.27	PI Sta 23+77.48
△ = 21° 46' 10.4" (LT)	△ = 8° 27' 32.5" (RT)	△ = 5° 44' 13.7" (RT)
D = 7° 23' 34.8"	D = 2° 02' 20.4"	D = 2° 02' 20.4"
L = 294.46'	L = 414.86'	L = 281.37'
T = 149.03'	T = 207.81'	T = 140.80'
R = 775.00'	R = 2,810.00'	R = 2,810.00'
DS = 45 MPH	SE = SEE PLANS	SE = SEE PLANS

–Y1–		
PI Sta 10+89.77	PI Sta 12+58.81	PI Sta 13+36.64
△ = 25° 17' 49.0" (RT)	△ = 26° 46' 56.7" (RT)	△ = 29° 57' 42.6" (LT)
D = 14° 19' 26.2"	D = 95° 29' 34.7"	D = 57° 17' 44.8"
L = 176.61'	L = 28.05'	L = 52.29'
T = 89.77'	T = 14.28'	T = 26.76'
R = 400.00'	R = 60.00'	R = 100.00'

–DRWY1–
PI Sta 11+28.51
△ = 58° 26' 23.0" (RT)
D = 95° 29' 34.7"
L = 61.20'
T = 33.56'
R = 60.00'



DETAIL SHOWING BRIDGE /PAVEMENT RELATIONSHIP

4/20/2021
U:\Raleigh\Projects\17BP9R72_rdy_psh_04.dgn
17BP9R72

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PROPOSED REMOVAL OF EXISTING ASPHALT PAVEMENT

SUNGATE DESIGN GROUP, P.A.
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NC COA No. C-0890

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	5
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
4/21/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DAYTON
4/21/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEET 6 FOR -L- PROFILE
SEE SHEET 7 FOR -DRWY2- PROFILE
SEE SHEET RW FOR ROW AND EASEMENT DETAILS
SEE SHEETS S-1 THRU S-32 FOR STRUCTURES PLANS
R = 15' UNLESS OTHERWISE NOTED

NAD 83/ NA 2011

REVISIONS

8/17/99

MATCHLINE -L- STA. 24+00.00 SEE SHEET 4

SPECIAL CUT
2' BASE DITCH
w/CL I RIPRAP
EST. 131 TON CL I RIPRAP
EST. 241 SY GEOTEXTILE
SEE DETAIL 1

-L- PRC Sta. 25+18.05

5
JOSEPH P. BROWN
JOANNA K. BROWN
DB 658 PG 868

ENERGY UNITED

BEGIN EXP. GUTTER
-L- STA. 25+50.00

END EXP. GUTTER
-L- STA. 28+00.00

SPECIAL CUT
2' BASE DITCH
w/CL I RIPRAP
EST. 121 SY GEOTEXTILE
SEE DETAIL 9

-L- PCC Sta. 30+43.19

-L- POC Sta. 31+90.68

JEFFERY K ROGERS
DB 541 PG 2362

TO CAMPBELL

BL-5

BL-4

840008-I

MTL SIGN

WD BOLLARDS

CENTURY LINK
A IA3025538
NO UTILITIES ATTACHED

BM2

-DRWY2- PC Sta. 10+64.00

-DRWY2- PT Sta. 10+86.43
AHD BRG = S 31° 57' 34.5" W

END CONSTRUCTION
-DRWY2- PT Sta. 11+00.00

S 31° 57' 34.5" W

-DRWY2- POT Sta. 10+00.00
AHD BRG = S 0° 10' 16.5" E
-L- POT Sta. 25+76.14

6
COUNTY OF STOKES
DB 118 PG 637

7
DIANE P HART
WILLIAM H HART
DB 437 PG 2405

CONTRACTOR IS RESPONSABLE FOR ANY DAMAGE TO GRAVEL DRIVE

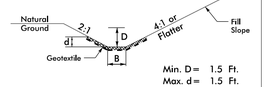
GRAVEL DRIVE & CONCRETE BOAT RAMP ARE LEASED BY COUNTY FOR PUBLIC ACCESS TO DAN RIVER ACCORDING TO PROPERTY OWNER - NO RECORDED REFERENCE FOUND

END PROJECT 17BP.9.R.72
END CONSTRUCTION
-L- POC STA. 30+50.00
MATCH EXISTING

MYRA T BULLINS
ROY EDWARD BULLINS
DB 577 PG 308

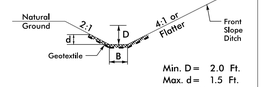
STOKES COUNTY GIS APPROXIMATE

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
Type of Liner = Class I Rip-Rap
FROM STA. 11+75 TO STA. 12+50 -L- LT
FROM STA. 24+00 TO STA. 25+00 -L- LT

DETAIL 9
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
Type of Liner = Class I Rip-Rap
FROM STA. 28+50 TO STA. 29+00 -L- LT

-L-		
PI Sta 23+77.48	PI Sta 27+81.39	PI Sta 31+16.94
Δ = 5° 44' 13.7" (RT)	Δ = 10° 42' 27.7" (LT)	Δ = 1° 14' 20.5" (LT)
D = 2° 02' 20.4"	D = 2° 02' 20.4"	D = 0° 50' 24.4"
L = 281.37'	L = 525.14'	L = 147.48'
T = 140.80'	T = 263.34'	T = 73.74'
R = 2,810.00'	R = 2,810.00'	R = 6,820.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

-DRWY2-
PI Sta 10+75.51
Δ = 32° 07' 51.0" (RT)
D = 143° 14' 22.0"
L = 22.43'
T = 11.52'
R = 40.00'

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BEGIN GRADE
-L- STA.11+75.00
ELEV.913.73

END EXISTING DITCH
BEGIN SPECIAL
LATERAL 2' BASE DITCH
PI = 11+75 -L- LT
EL = 912.3

(-)13.3%

END SPECIAL LATERAL
2' BASE DITCH
BEGIN LATERAL 2'
BASE DITCH
PI = 12+50 -L- LT
EL = 902.3

PI = 16+31.00
EL = 872.99'
K = 37*
VC = 300'
DS = 30 MPH

(-)10.47%

30" RCP-IV

(-)13.3%

145'
3" MILLING

BEGIN SPECIAL
LATERAL 2' BASE DITCH
PI = 12+50 -L- RT
EL = 896.0

END SPECIAL
LATERAL 2' BASE DITCH
PI = 13+00 -L- RT
ELEV = 895.8

END LATERAL 2' BASE DITCH
BEGIN LATERAL 3' BASE DITCH
PI = 13+50 -L- LT
EL = 889.0

(-)15.22%

(-)13.3%

PI = 13+70 -L- LT
EL = 886.3

(-)18.9342%

PROPOSED GRADE
PI = 16+00 -L- LT
EL = 874.3

END SPECIAL CUT
3' BASE DITCH
PI = 17+59 -L- LT
EL = 864.3

(-)10.8799%

(-)16.29%

END LATERAL
3' BASE DITCH
BEGIN LATERAL
3' BASE DITCH
PI = 14+50 -L- LT
EL = 882.1

EXISTING GROUND

END LATERAL
3' BASE DITCH
BEGIN SPECIAL CUT
3' BASE DITCH
PI = 16+50 -L- LT
EL = 871.2

*DESIGN EXCEPTION FOR K VALUE

BEGIN BRIDGE
-L- STA 18+28.56

-L-

PIPE HYDRAULIC DATA
30" RCP-IV Sta. 13+34

DRAINAGE AREA	= 6.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 16	CFS
DESIGN HW ELEVATION	= 898.0	FT
100 YEAR DISCHARGE	= 17	CFS
100 YEAR HW ELEVATION	= 898.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 63	CFS
OVERTOPPING ELEVATION	= 902.5	FT

BM #1 ELEVATION = 835.42'
-L- STATION 18+97.68 233.06' RIGHT
N 1008554 E 1617133
RAILROAD SPIKE SET IN 20" BIRCH TREE

CL II RIPRAP
1.5:1 NORMAL
1.73:1 SKEWED

EXCAVATE TO NG
ELEV. 840.0 AT CL
EST. 4640 CY

PROP 25 YR
WS ELEV. =844.8

PROP 100 YR
WS ELEV. =848.5

NWS ON 6-15-18
=832.2

PI = 21+50 -L- LT
EL = 846.5

END BRIDGE
-L- STA 21+31.44

SAG STA 21+87.6
ELEV. 868.2

(-)10.8799%

CL II RIPRAP
1.5:1 NORMAL
1.73:1 SKEWED

EXCAVATE TO NG
ELEV. 843.0 AT CL
EST. 1850 CY

(+)13.00%

(+)0.35%

3.5'
MIN.

END LATERAL
3' BASE DITCH
PI = 21+44 -L- LT
EL = 846.1

BEGIN LATERAL
3' BASE DITCH
PI = 22+00 -L- LT
EL = 848.0

285' 3" MILLING

(+)16.7065%

END GRADE
-L- STA.30+50.00
ELEV.917.63

PROPOSED GRADE

(+)0.4%

BEGIN SPECIAL CUT
2' BASE DITCH
STA 29+00 -L- LT
EL = 899.8

END SPECIAL CUT
2' BASE DITCH
STA 28+50 -L- LT
EL = 899.6

EXISTING GROUND

PI = 22+97.00
EL = 867.13'
K = 38
VC = 285'
DS = 30 MPH

(+)16.7065%

BEGIN SPECIAL CUT
2' BASE DITCH
STA 25+00 -L- LT
EL = 878.4

(+)5.85%

(+)5.85%

END SPECIAL CUT
3' BASE DITCH
PI = 23+00 -L- LT
EL = 866.7

END SPECIAL CUT
2' BASE DITCH
BEGIN SPECIAL CUT
3' BASE DITCH
PI = 24+00 -L- LT
EL = 872.6

END SPECIAL CUT
2' BASE DITCH
BEGIN SPECIAL CUT
3' BASE DITCH
PI = 24+00 -L- LT
EL = 872.6

BM2 ELEVATION = 875.92'
-L- STA 27+11.88 79.12' RIGHT
N 1009282 E 1617512
RAILROAD SPIKE SET IN 17" POPLAR TREE

*DESIGN EXCEPTION FOR K VALUE

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 13000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 844.8	FT
BASE DISCHARGE	= 19000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 848.5	FT
OVERTOPPING DISCHARGE	= 92657	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 868.2	FT
DATE OF SURVEY	6 / 15 / 18	
W.S. ELEVATION AT DATE OF SURVEY	= 832.2	FT

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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	6

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
DocuSigned by: 4/21/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
DocuSigned by: 4/21/2021

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SEE SHEETS 4 & 5 FOR PLANS
SEE SHEETS RW04 & RW05 FOR ROW AND EASEMENT DETAILS

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-Y1-

PI = 13+46.00
EL = 869.89'
K = 9
VC = 40'
DS = 15 MPH

PI = 12+12.00
EL = 853.88'
K = 19
VC = 80'
DS = 15 MPH

END GRADE
-Y1- STA.13+68.67=
-L- 17+84.38 OFF.11' LT
ELEV.871.44'

(+)1.9701%
(+)6.8312%
(+)11.9478%
(+)17.7250%

37.5' TIE IN' MILL SEE SHEET 2A-1

36" RCP-IV

BEGIN SPECIAL CUT 'V' DITCH
STA 13+25 -Y1- RT
EL = 865.0

END SPECIAL CUT 'V' DITCH
BEGIN EXISTING DITCH
STA 12+50 -Y1- RT
EL = 856.9

BEGIN GRADE
-Y1- STA.11+72.00
ELEV.850.79'

PIPE HYDRAULIC DATA
36" CSP Sta. 13+18

DRAINAGE AREA	= 17.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 43	CFS
DESIGN HW ELEVATION	= 867.9	FT
100 YEAR DISCHARGE	= 49	CFS
100 YEAR HW ELEVATION	= 868.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 74	CFS
OVERTOPPING ELEVATION	= 869.9	FT

-DRWY1-

PI = 10+85.00
EL = 904.60'
K = 3
VC = 40'
DS = 15 MPH

BEGIN GRADE
-DRWY1- STA.10+17.40=
-L- 12+92.37 OFF.11' RT
ELEV.903.25'

(+)1.9970%
(+)13.5000%

END GRADE
-DRWY1-
STA.11+05.00
ELEV.907.30'

-DRWY2-

PI = 10+38.00
EL = 883.68'
K = 13
VC = 40'
DS = 25 MPH

BEGIN GRADE
-DRWY2- STA.10+16.68=
-L- 25+63.63 OFF.11' LT
ELEV.885.2'

885.85

(-)13.8969%
(-)17.1295%
(-)10.1176%

END GRADE
-DRWY2- STA.10+72.00
ELEV.880.24'

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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	7

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
DocuSigned by: Michael D. Lindgren
4/21/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
DocuSigned by: Joshua G. Dalton
4/21/2021

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SEE SHEETS 4 & 5 FOR PLANS
SEE SHEETS RW04 & RW05 FOR ROW AND EASEMENT DETAILS

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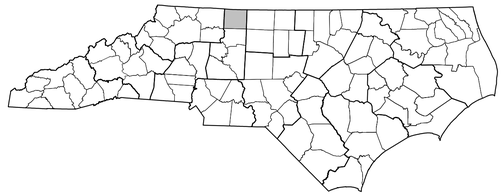
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

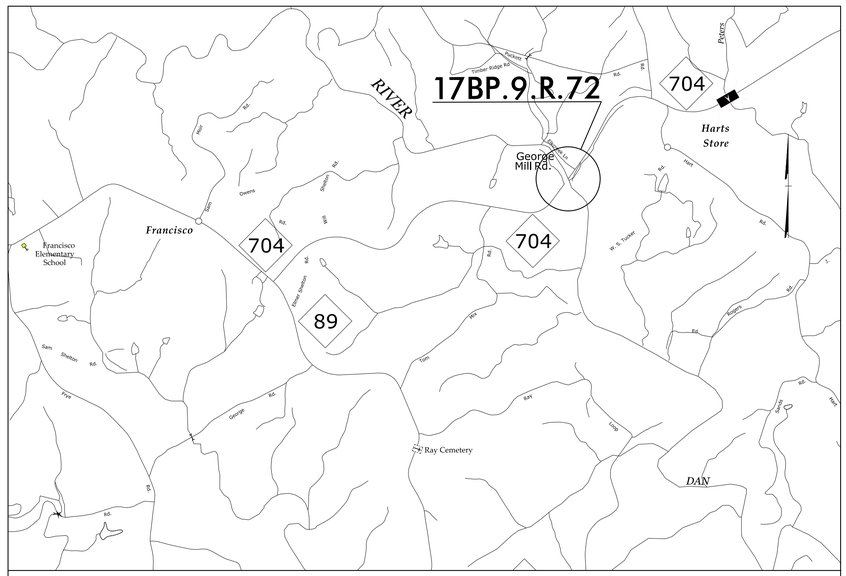
STOKES COUNTY

DIVISION 9



LOCATION: BRIDGE NO. 8 (84008) ON NC 704 OVER DAN RIVER

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	GENERAL NOTES
TMP-2	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
TMP-2A	TEMPORARY SHORING NOTES
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4,5	NC 704 -L- PHASE I, STEP 2
TMP-6,7	NC 704 -L- PHASE 1, STEP 3
TMP-8,9	NC 704 -L- PHASE II

SHEET NO.
TMP-1

TIP PROJECT: 17BP.9.R.72



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

PLANS PREPARED BY:

J. W. WOOLARD, P.E.
SENIOR TRANSPORTATION ENGINEER

S. L. PHILLIPS, E.I.
TRANSPORTATION DESIGNER

NCDOT CONTACTS:

DANIEL DAGENHART, PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

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

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4/21/2021

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD JR.

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PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.72	TMP-1A

ROADWAY STANDARD DRAWINGS

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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION

TEMPORARY PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	PAINT PAVEMENT MARKING LINES (4")
P1	WHITE EDGELINE
P5	2 FT. - 6 FT./SP WHITE MINISKIP
P13	YELLOW DOUBLE CENTER
	PAINT PAVEMENT MARKING LINES (24")
P61	WHITE STOPBAR

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- EXIST. PVMT.
- PROPOSED PVMT.
- NORTH ARROW
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- PREVIOUSLY STARTED / CONCURRENT CONSTRUCTION
- PAVEMENT REMOVAL
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT ASPHALT PAD
- TEMPORARY PAVEMENT BREAKDOWN LANE

PAVEMENT MARKINGS

- EXISTING LINES

TEMPORARY MARKINGS	PREVIOUSLY PLACED	
		WHITE EDGE LINE
		YELLOW EDGE LINE
		BROKEN LANE LINES
		MINISKIP LANE LINES
		DOUBLE YELLOW LINES
		GORELINE
		STOP BAR

PAVEMENT MARKING SYMBOLS

- EXISTING PAVEMENT MARKING SYMBOLS (HOLLOW)

TEMPORARY SYMBOLS	PREVIOUSLY PLACED	
		PAVEMENT MARKING SYMBOLS
ONLY	ONLY	PAVEMENT MARKING ALPHANUMERIC CHARACTERS

TRAFFIC CONTROL DEVICES

TEMPORARY DEVICES	PREVIOUSLY PLACED	
		BARRICADE (TYPE III)
		CONE
		DRUM
		FLASHING ARROW BOARD
		FLAGGER
		LAW ENFORCEMENT
		TRUCK MOUNTED ATTENUATOR (TMA)
		CHANGEABLE MESSAGE SIGN
		TEMPORARY CRASH CUSHION
		TEMPORARY CRASH CUSHION RESET
		PORTABLE CONCRETE BARRIER
		PORTABLE CONCRETE BARRIER (RESET)
		ANCHORED CONCRETE BARRIER
		ANCHORED CONCRETE BARRIER (RESET)

SIGNALS

- EXISTING
- PROPOSED
- TEMP TEMPORARY

TEMPORARY SIGNING

TEMPORARY SIGNS	PREVIOUSLY PLACED	
		PORTABLE SIGN
		STATIONARY SIGN
		STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

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NORTH CAROLINA PROFESSIONAL ENGINEER J. W. WOOLARD JR.

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

ROADWAY STANDARD DRAWINGS, AND LEGEND

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GENERAL NOTES

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.72	TMP-1B

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.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
-L- (NC 704)	7:00 A.M.-9:00 A.M. MONDAY THRU FRIDAY

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME
ALL ROADS

HOLIDAY

1) FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2) FOR NEW YEAR'S, BETWEEN THE HOURS OF 7:00 A.M. DECEMBER 31ST TO 7:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 7:00 P.M. THE FOLLOWING TUESDAY.

3) FOR EASTER, BETWEEN THE HOURS OF 7:00 A.M. THURSDAY AND 7:00 P.M. MONDAY.

4) FOR MEMORIAL DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.

5) FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 7:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE DAY AFTER INDEPENDENCE DAY. IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY; THEN BETWEEN THE HOURS OF 7:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6) FOR LABOR DAY, BETWEEN THE HOURS OF 7:00 A.M. FRIDAY AND 7:00 P.M. TUESDAY.

7) FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 7:00 A.M. TUESDAY TO 7:00 P.M. MONDAY.

8) FOR CHRISTMAS, BETWEEN THE HOURS OF 7:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 7:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

H) DO NOT INSTALL MORE THAN (X MILES) OF LANE CLOSURE ON (ROAD NAME) MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

I) DO NOT INSTALL MORE THAN (NUMBER) SIMULTANEOUS LANE CLOSURES IN ANY ONE DIRECTION ON (ROAD NAME).

OR

DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON (ROAD NAME).

J) PROVIDE A MINIMUM OF (LENGTH) BETWEEN LANE CLOSURES, MEASURED FROM THE END OF ONE CLOSURE TO THE FIRST SIGN OF THE NEXT LANE CLOSURE.

K) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

PAVEMENT EDGE DROP OFF REQUIREMENTS

L) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPEN TRAVEL LANE THAT HAS A DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

M) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FT IN ADVANCE AND A MINIMUM OF ONCE EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

O) 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.

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

Q) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

R) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE/RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

S) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS:

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45-50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

T) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

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

GENERAL NOTES

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PAVEMENT MARKINGS AND MARKERS

V) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	TEMPORARY RAISED
BRIDGES	COLD APPLIED PLASTIC TYPE IV	TEMPORARY RAISED

W) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

X) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

Y) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

Z) MAINTAIN VEHICULAR ACCESS TO ALL DRIVEWAYS DURING THE LIFE OF THE CONTRACT, UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER. USE INCIDENTAL STONE WHEN NECESSARY.

AA) ALL DIMENSIONS AND STATIONS IN THE TRANSPORTATION MANAGEMENT PLAN AND PHASING ARE APPROXIMATE (+/-); FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.

BB) COMPLETE ANY PROPOSED OR TEMPORARY WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE.

CC) ENSURE THE OVERSIZE/OVERWEIGHT PERMIT UNIT (919) 814-3700 HAS BEEN ADVISED OF THE ONGOING TRAFFIC OPERATIONS THROUGH THE DIVISION OFFICE.

DD) MAINTAIN EXISTING GUARDRAIL UNTIL PROPOSED FILL SLOPES ARE COMPLETED TO THE POINT THAT FIELD CONDITIONS NO LONGER MEET GUARDRAIL WARRANTS AS DIRECTED BY THE ENGINEER.

EE) MAINTAIN ALL EXISTING SIGNING ON PROJECT (WARNING, REGULATORY AND GUIDE SIGNS). WHERE CONSTRUCTION AFFECTS THE LOCATION OF A SIGN, RELOCATE AS NECESSARY, OR INSTALL REPLACEMENT SUCH THAT THE FUNCTION OF THE SIGN IS MAINTAINED AT ALL TIMES. DURING RELOCATION OF STOP SIGNS PROVIDE FLAGGERS WITH "FLAGGER AHEAD" (W20-7a) AND "BE PREPARED TO STOP" (W3-4) SIGNS AS NECESSARY TO MAINTAIN INTERSECTION TRAFFIC..

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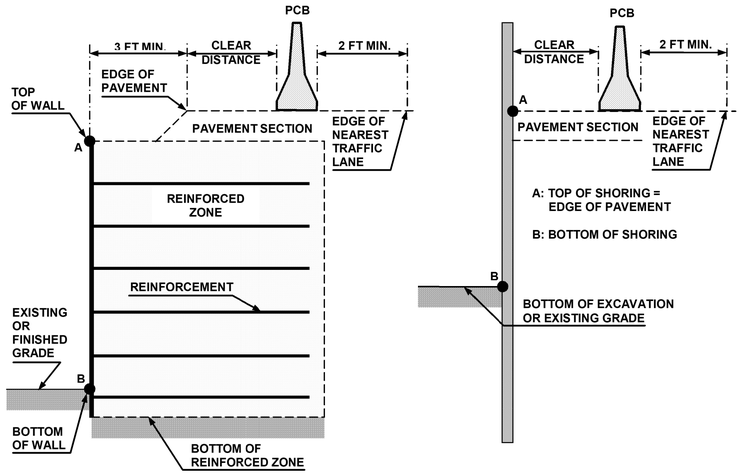
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NOTE: WALL OR SHORING HEIGHT = A - B

FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.

8- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.

9- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.

10- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

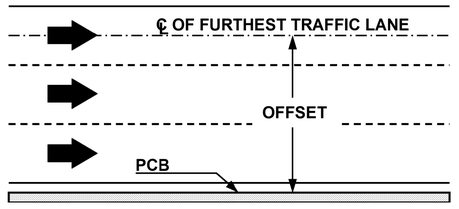


FIGURE B

DETAIL PROVIDED BY NCDOT

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PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

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TEMPORARY SHORING LOCATION NO. 01

SEE SHEET TMP-6

ESTIMATED QUANTITY = 345 SF

-L- STA. 17+25, 21.3′ RT TO -L- STA. 18+40, 21.3′ RT
LENGTH=115′ AVERAGE HEIGHT = 3.0 FT

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -L- STA. 17+25, 21.3′ RT, TO STATION -L- STA. 18+40, 21.3′ RT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT, (γ) = 120 PCF
- FRICTION ANGLE, (ϕ) = 30 DEGREES
- COHESION, (c) = 0 PSF
- GROUNDWATER ELEVATION = N/A FT

AT THE CONTRACTOR′S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -L- STA. 17+25, 21.3′ RT, TO STATION -L- STA. 18+40, 21.3′ RT. SEE GEOTECHNICAL STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

THE TEMPORARY SHORING NOTES SHOWN ON THIS SHEET WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEER. THE DOCUMENT WAS SUBMITTED TO STANTEC CONSULTING ON (AUGUST 20, 2020) AND SEALED BY A PROFESSIONAL ENGINEER, (MICHAEL H. STEPHENS, P.E.), LICENSE #028893.

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TEMPORARY SHORING NOTES

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PHASING

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PRIOR TO ANY WORK OPERATIONS,

PHASE I: (TMP-4,5,6,7)

STEP 1: INSTALL WORK ZONE ADVANCE WARNING SIGNS ON -L- (NC 704)AND -Y1- (GEORGE MILL RD.) PER ROADWAY STANDARD DRAWING 1101.01, SHEET 3 OF 3.

STEP 2: USING TEMPORARY LANE CLOSURES PER ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 14, AS NEEDED, PERFORM THE FOLLOWING:

CONSTRUCT -L- UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT FROM STA. 11+75±TO STA. 14+50±AND FROM STA. 25+00±TO STA. 30+43.±(TMP-4,5)

CONSTRUCT -L- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM STA. 14+50±TO STA. 17+56±. (TMP-4)

CONSTRUCT -Y1- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -Y1- STA. 11+72±TO STA. 13+20± CONSTRUCT 13 FEET OF -Y1- STARTING FROM THE RIGHT EDGE OF PAVEMENT UP TO BUT NOT INCLUDING THE FINAL LAYWER OF SURFACE COURSE FROM -Y1- STA. 13+20±TO STA. 13+81. (TMP-4)

NOTE:USE INCIDENTAL STONE TO MAINTAIN TRAFFIC AS NESSESARY TO MAINTAIN TRAFFIC ON -Y1-.

STEP 3: USING FLAGGERS AND RSD 1101.02, PLACE 4′ OF TEMPORARY PAVEMENT ON THE LEFT EDGE OF EXISTING PAVEMENT FROM -L-STA.16+50± TO -L-STA.18+23±(EXISTING BRIDGE). (TMP-6)

STEP 4: SHIFT -Y1- ON TO NEWLY CONSTRUCTED -Y1- AND ON TO -L- IN THE PATERN SHOWN ON TMP-6 USING FLAGGERS AND RSD 1101.02, PLACE PCB ON -L- AS SHOWN ON TMP-6. TIE THE PCB TO EXISTING BRIDGE RAIL IN A MATTER APROVED BY THE ENGINEER. CONSTRUCT -L- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COARSE. FROM STA. 17+65±TO STA. 25+00±INCLUDING PROPOSED STRUCTURE. INSTAL TEMPORARY SHORING AS SHOWN ON TMP-6.

WITH -Y1- SHIFTED TO THE RIGHT SIDE, CONSTRUCT LEFT SIDE OF -Y1- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AS SHOWN ON TMP-6.

PHASE II: (TMP-8,9)

STEP 1: USING FLAGGERS AND RSD 1101.02, PLACE TEMPORARY MARKINGS ON -L- AND -Y1- AS SHOWN ON TMP-8,9. SHIFT TRAFFIC ON TO PROPOSED -L-. (TMP-8,9)

STEP 2: USING FLAGGERS AND RSD 1101.02 AS NECCESSARY COMPLETE ALL DRIVEWAY TIE-INS AND REMAINING SLOPE CONSTRUCTION ON -L- AND -Y1. REMOVE EXISTING ROAD AND EXISTING STRUCTURE.(TMP-8,9)

STEP 3: USING FLAGGERS AND RSD 1101.02, PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS (SEE PAVEMENT MARKING PLAN) ON -L- AND -Y1-.

STEP 4: REMOVE ALL TRAFFIC CONTROL DEVICES AND OPEN THE PROJECT TO THE FINAL TRAFFIC PATTERN.

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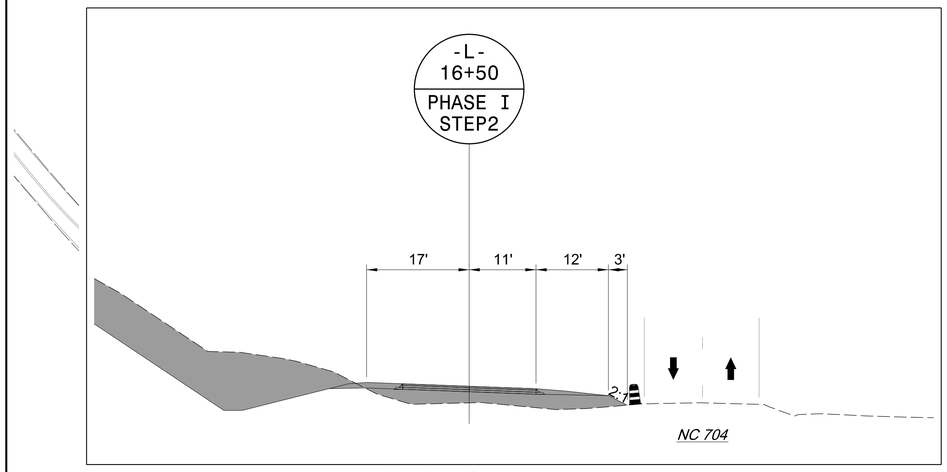
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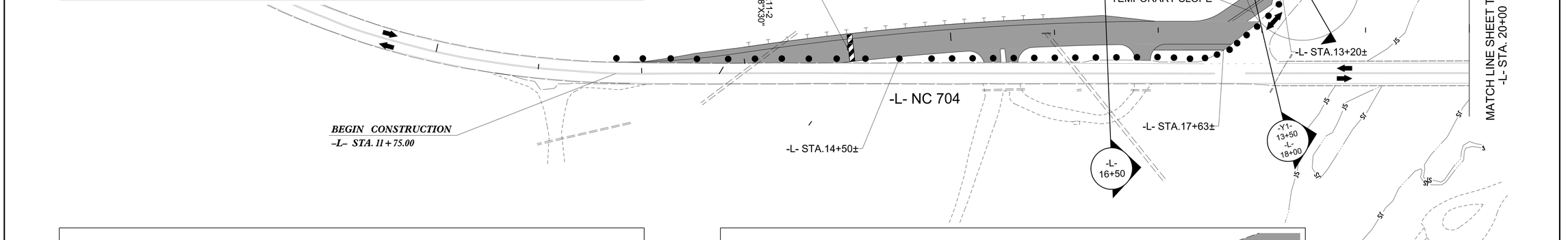
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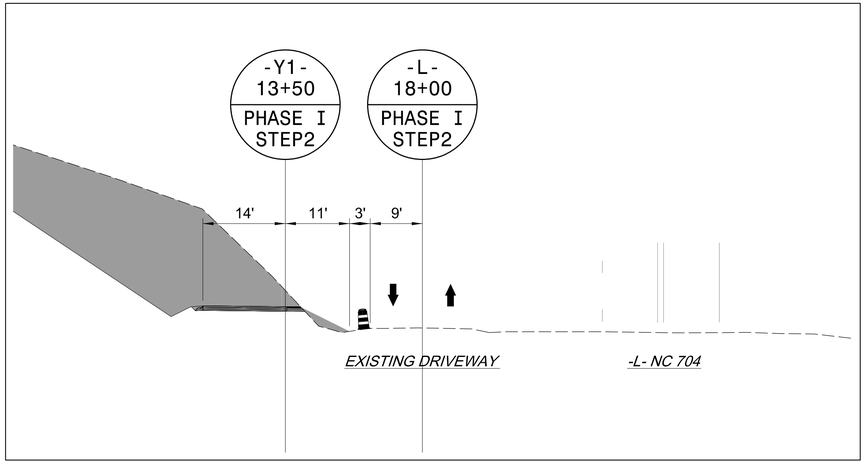
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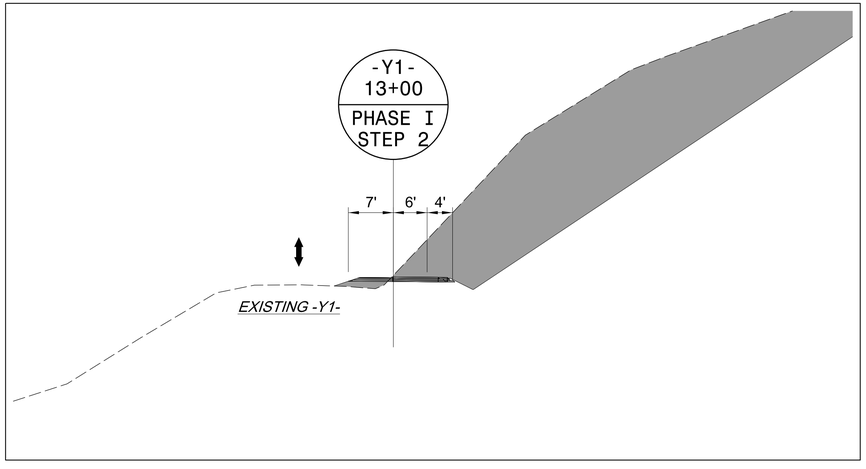
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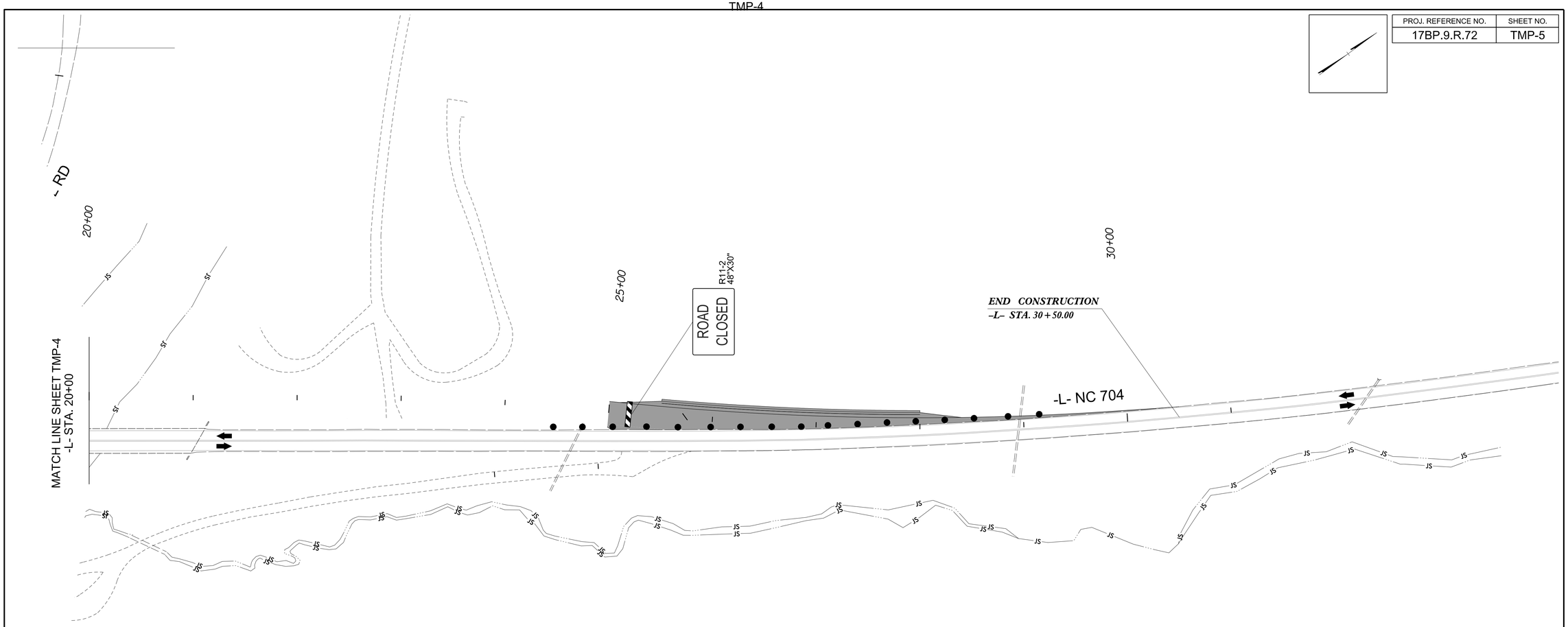
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STEP 2

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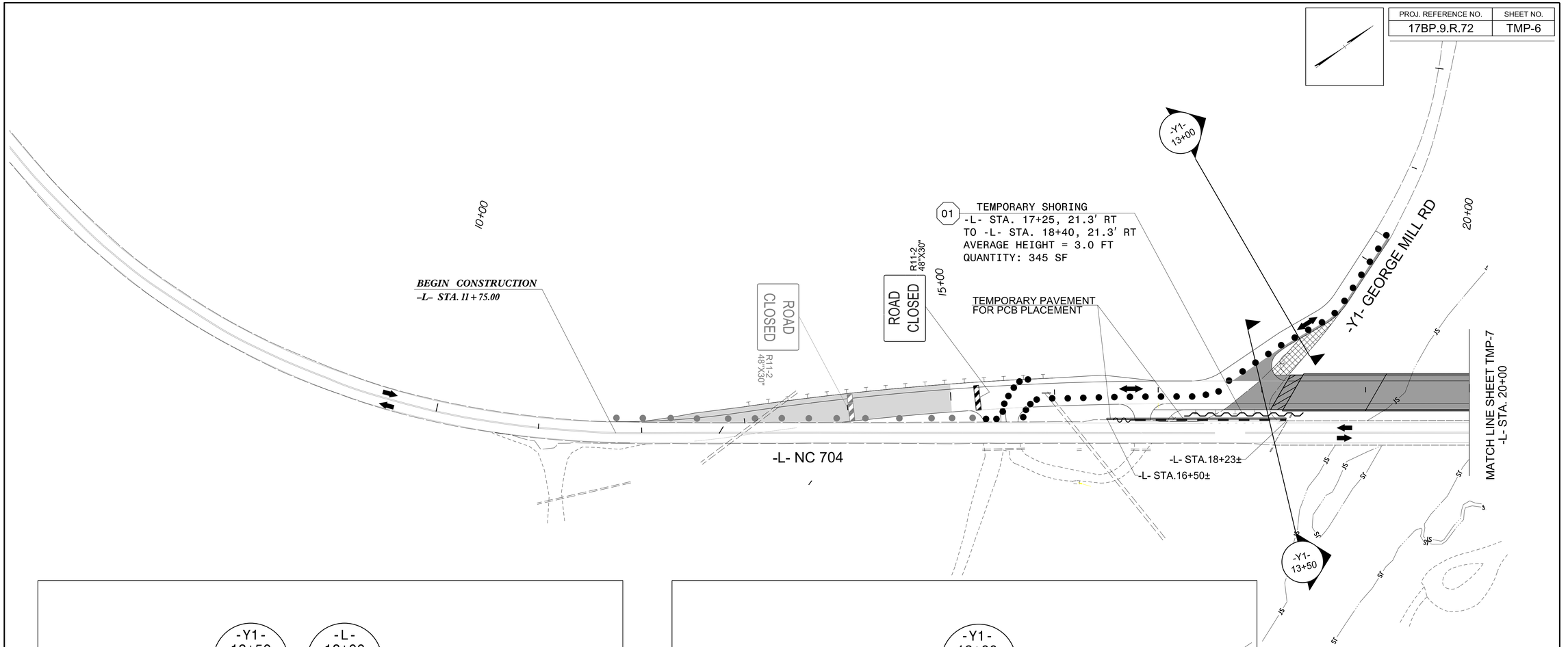
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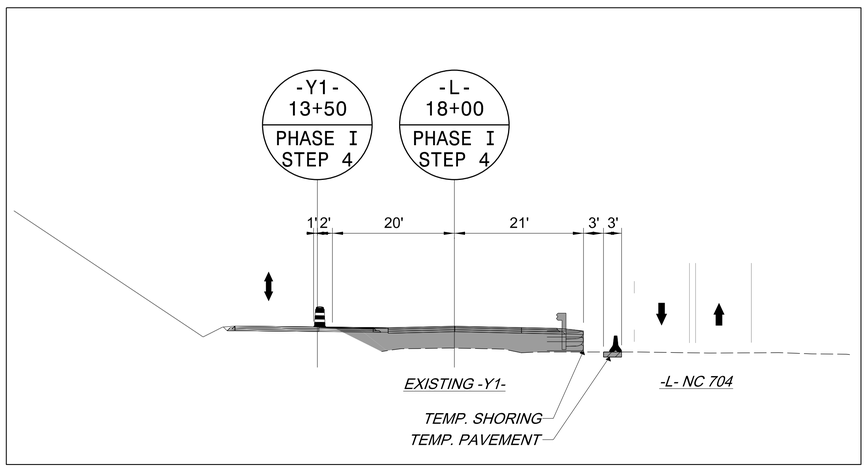
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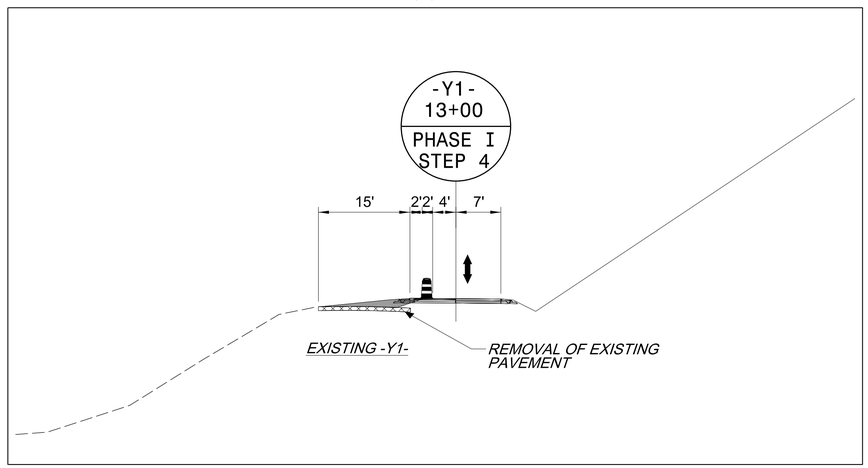
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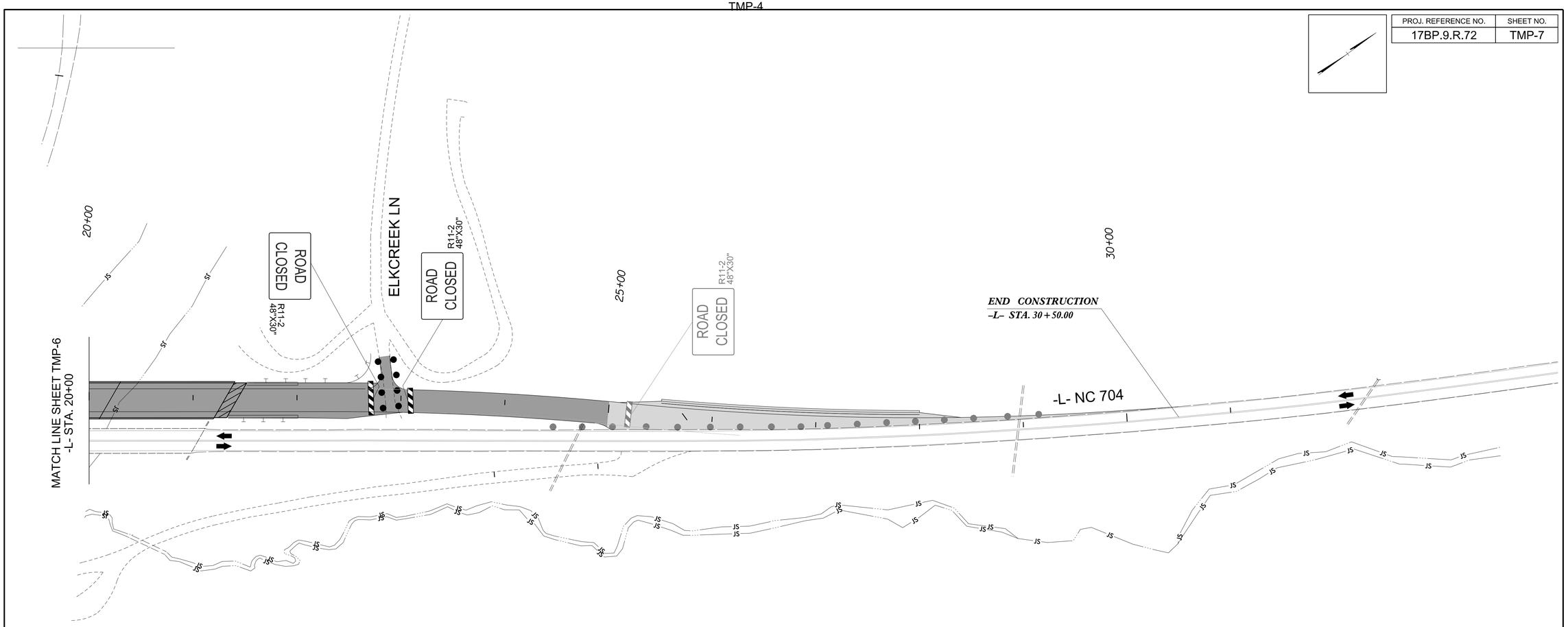
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17BP.9.R.72	TMP-7



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4/21/2021

NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD, JR.

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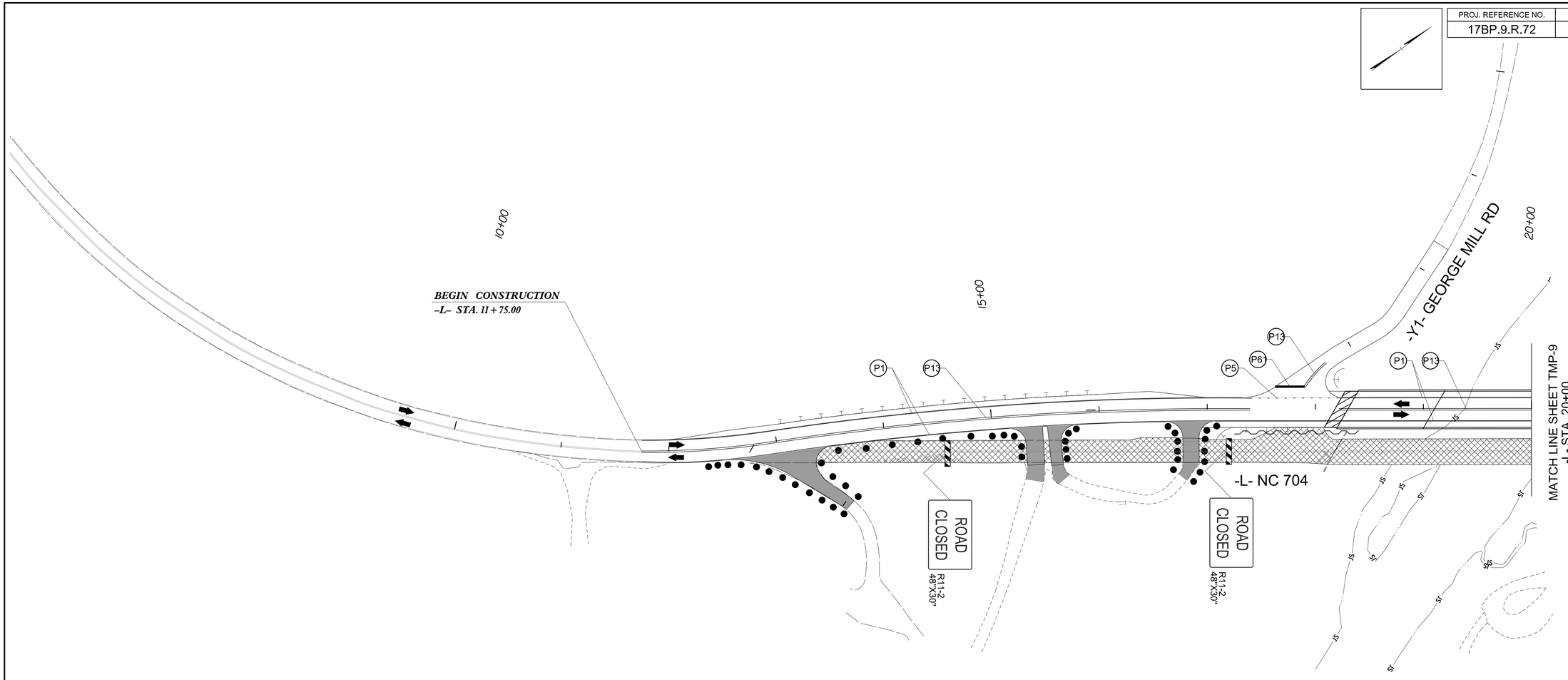
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

NC-704 -L-
PHASE I
STEP 4

4/20/2021
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PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.72	TMP-8



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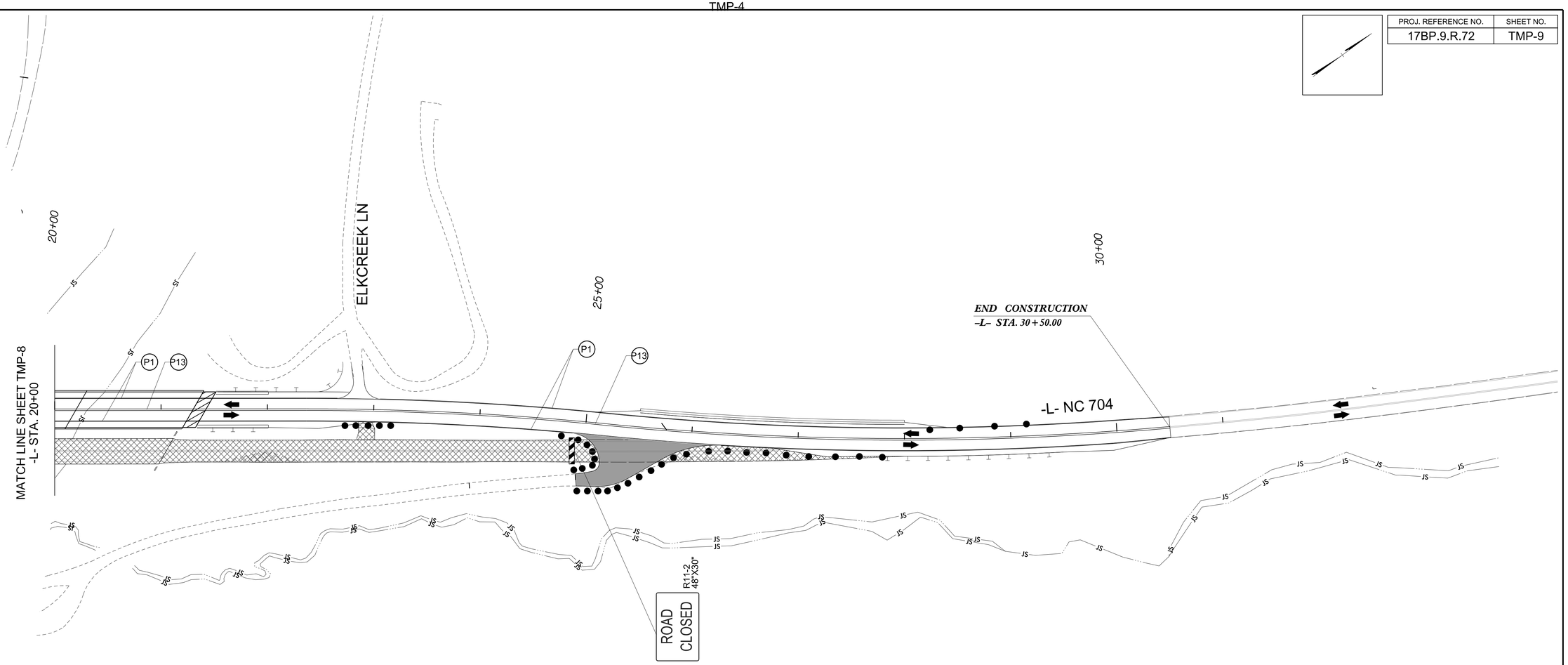
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NC-704 -L-
PHASE II

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PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.72	TMP-9



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NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J. W. WOOLARD JR.

4/21/2021

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

NC-273 -L-
PHASE II

4/20/2021
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T.I.P.: 17BP.9.R.72

CONTRACT NO.:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

STOKES COUNTY

LOCATION: BRIDGE NO. 8 (84008) ON NC 704

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

TIP NO.	SHEET NO.
17BP.9.R.72	PMP-1

APPROVED: _____

DATE: _____

SEAL



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ROADWAY STANDARD DRAWINGS

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 & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT & TEMPORARY
1261.01	GUARDRAIL & BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL & BARRIER DELINEATORS - TYPES & MOUNTING
1262.01	GUARDRAIL END DELINEATION

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION		PAY ITEM
T1	WHITE EDGELINE	(4", 90 MIL)	THERMOPLASTIC
T5	2 FT.-6 FT./SP WHITE MINISKIP	(4", 90 MIL)	THERMOPLASTIC
T13	YELLOW DOUBLE CENTER	(4", 90 MIL)	THERMOPLASTIC
MA	YELLOW & YELLOW, PERMANENT RAISED PAVEMENT MARKERS		
ME	YELLOW & YELLOW, SNOWPLOWABLE PAVEMENT MARKERS		

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
ALL ROADS	THERMOPLASTIC	SNOWPLOWABLE RAISED
BRIDGE DECKS	THERMOPLASTIC	PERMANENT RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

NCDOT CONTACT:	
DANIEL DAGENHART, PE	NCDOT DIVISION 9 BRIDGE MANAGER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · SIGNING AND DELINEATION UNIT

PLAN PREPARED BY:	
JAY WOOLARD, P.E.	SENIOR TRANSPORTATION ENGINEER
ANDREW N. GOOD	TRANSPORTATION DESIGNER

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INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2-3	PAVEMENT MARKING DETAIL

4/21/2021
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PAVEMENT MARKING LEGEND
(T1) WHITE EDGELINE (4")
(T5) 2 FT - 6 FT/SP WHITE MINISKIP (4")
(T13) YELLOW DOUBLE CENTER (4")

TIP NO.	SHEET NO.
17BP.9.R.72	PMP-2

APPROVED: _____

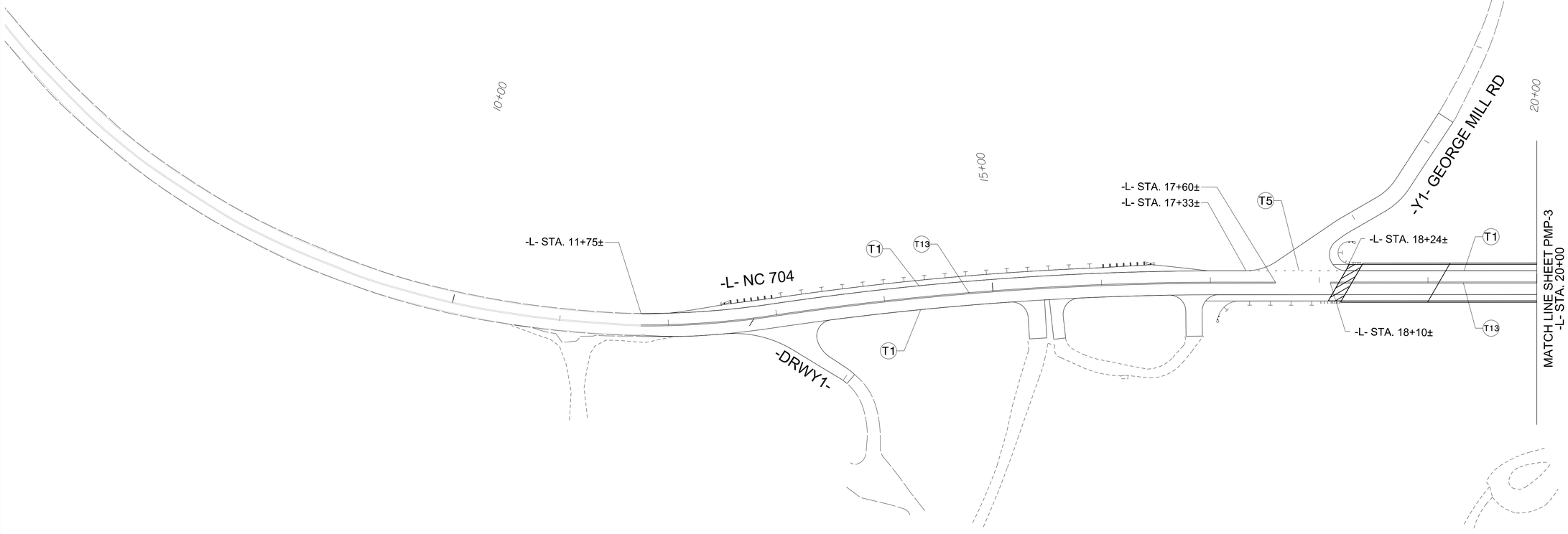
DATE: _____

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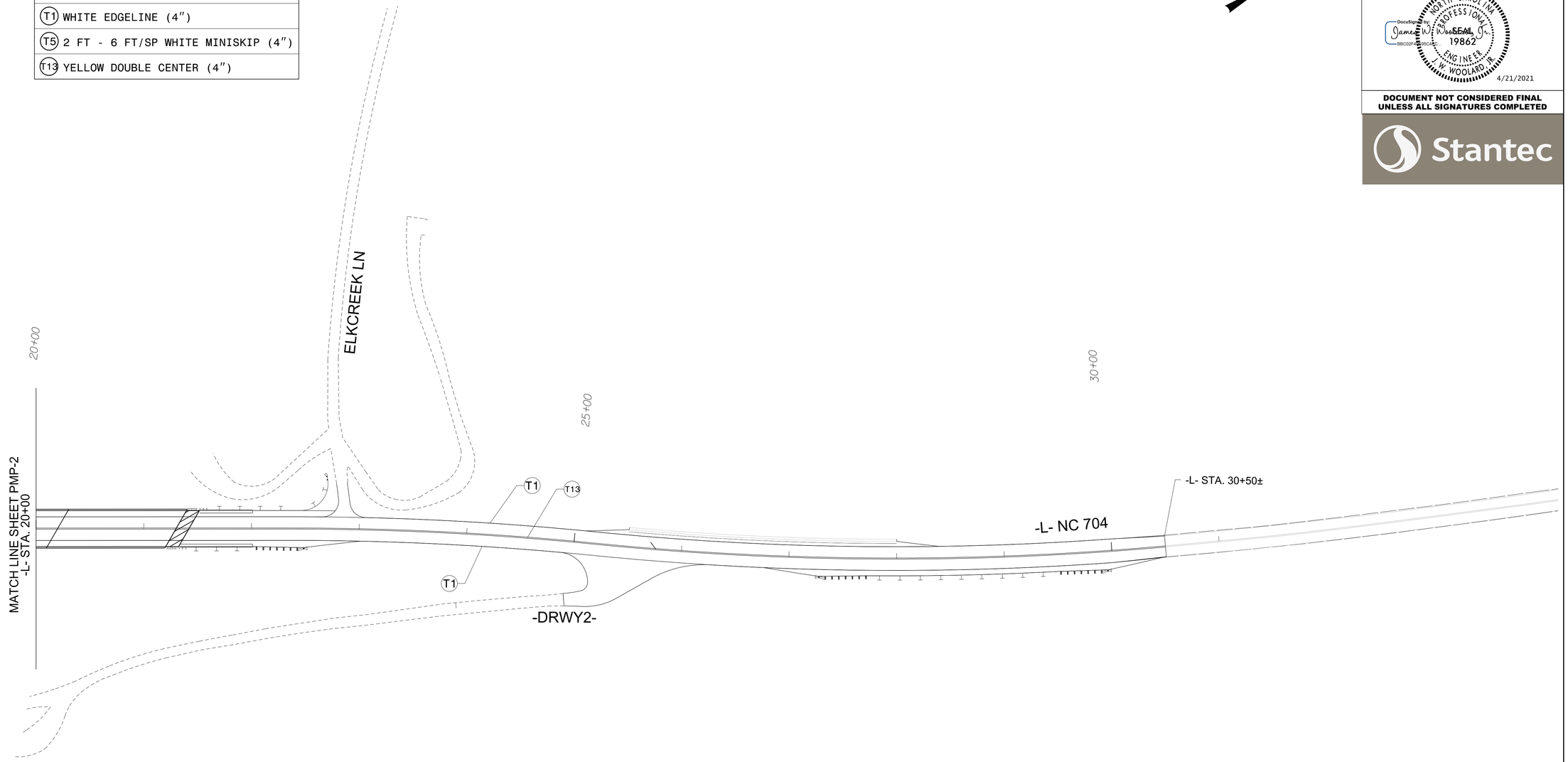


PAVEMENT MARKING DETAIL

4/21/2021
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PAVEMENT MARKING LEGEND	
T1	WHITE EDGELINE (4″)
T5	2 FT - 6 FT/SP WHITE MINISKIP (4″)
T13	YELLOW DOUBLE CENTER (4″)



TIP NO.	SHEET NO.
17BP.9.R.72	PMP-3

APPROVED: _____

DATE: _____

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NORTH CAROLINA PROFESSIONAL SEAL 19862 ENGINEER J.W. WOOLARD, JR.

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4/21/2021

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PAVEMENT MARKING DETAIL

4/21/2021
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.72	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.72		PE
17BP.9.R.72		R/W & UTIL
17BP.9.R.72		CONSTR.

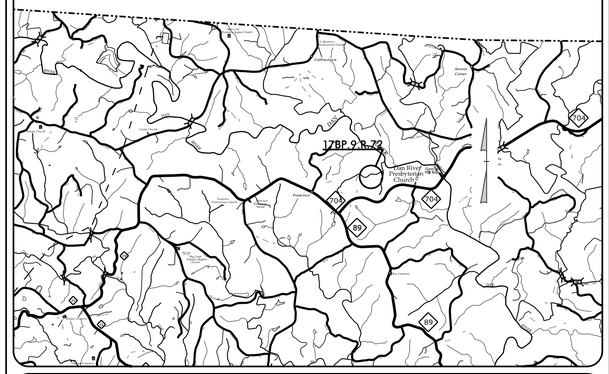
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

STOKES COUNTY

LOCATION: BRIDGE NO. 8 (84008) ON NC 704 OVER DAN RIVER

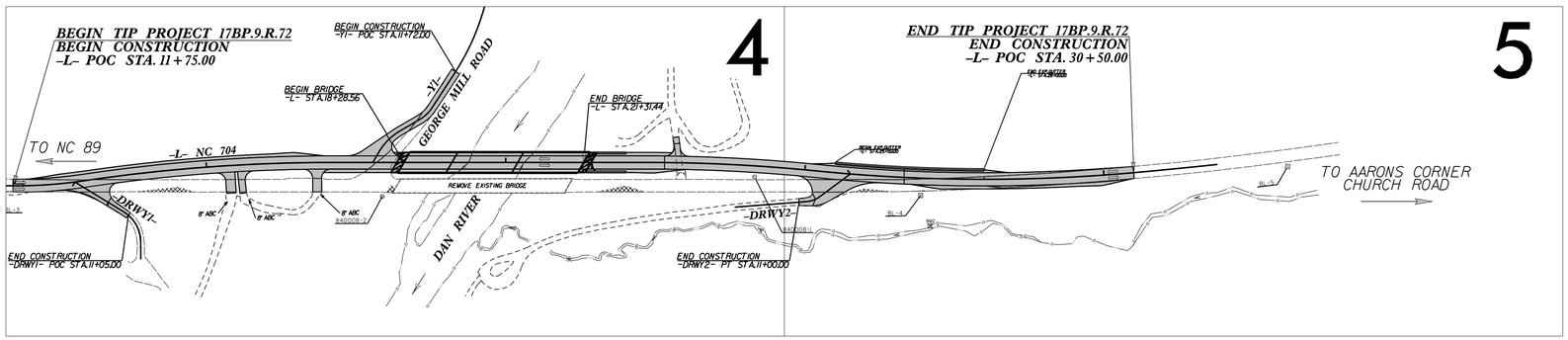
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



VICINITY MAP
NOT TO SCALE



NAD 83



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)	
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	SK
	Tiered Skimmer Basin	SK
	Infiltration Basin	

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

SUNGATE DESIGN GROUP, P.A.

905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

Designed by:

MATTHEW C. EDWARDS, EI 3992
NAME *LEVEL III CERTIFICATION NO.*

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.

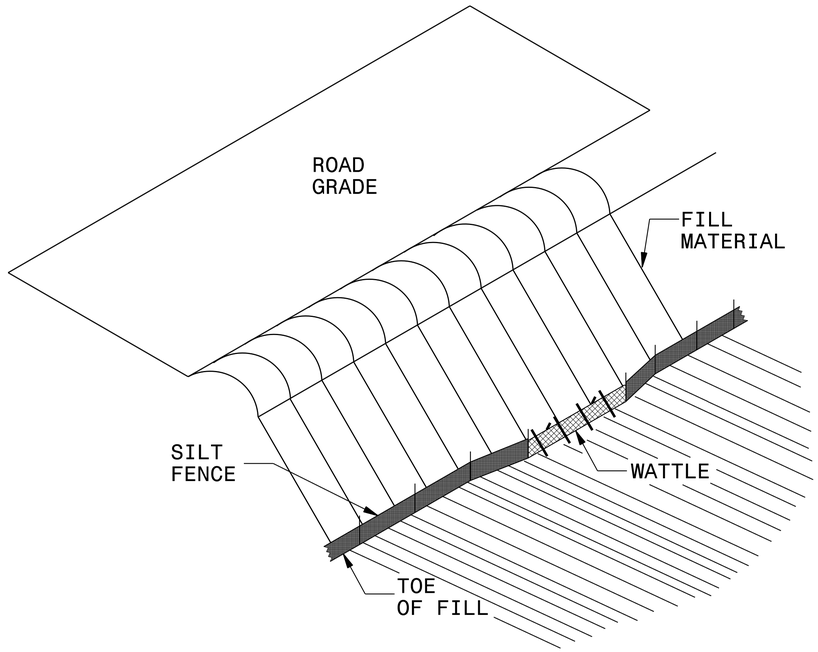
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type 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		

TIP PROJECT: 17BP.9.R.72

11/20/2019
17BP.9.R.72_EC_dsn_psh_01.dgn
MEdwards

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO.	SHEET NO.
I7BP.9.R.72	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) 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.

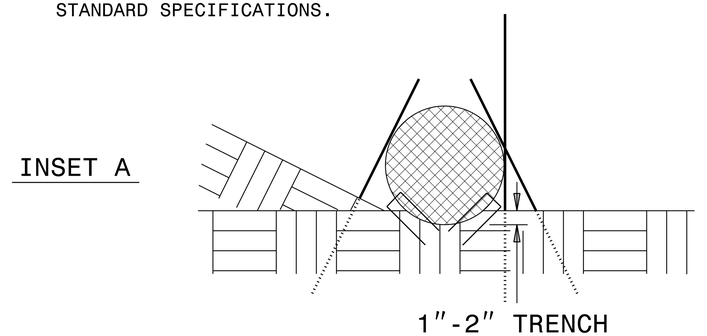
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

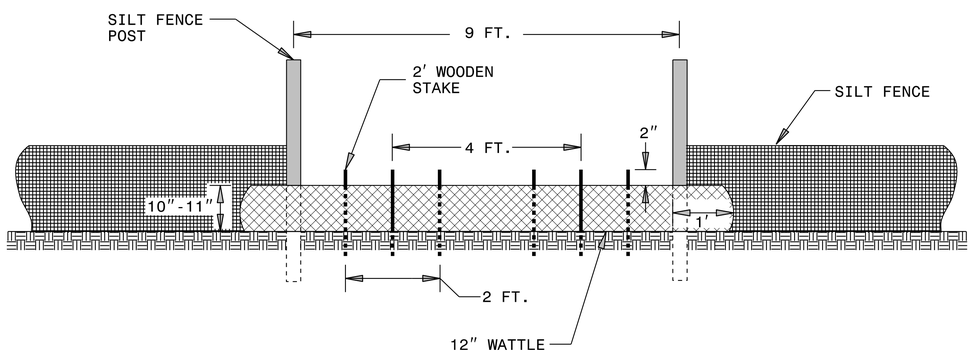
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

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

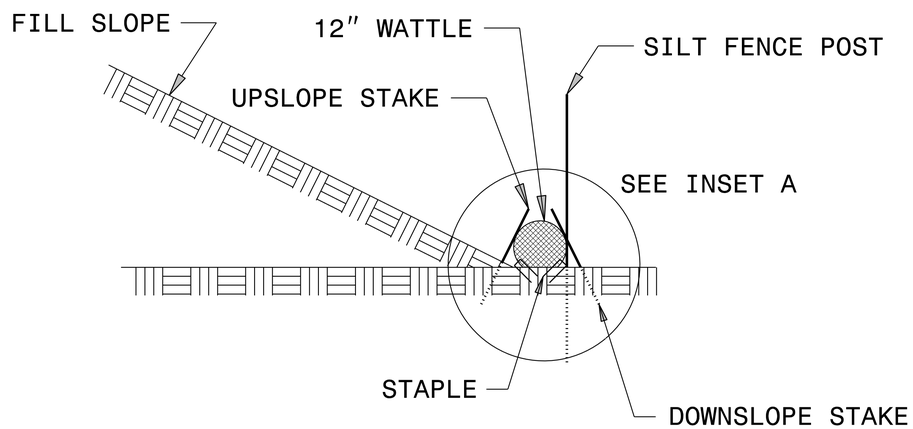
WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

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





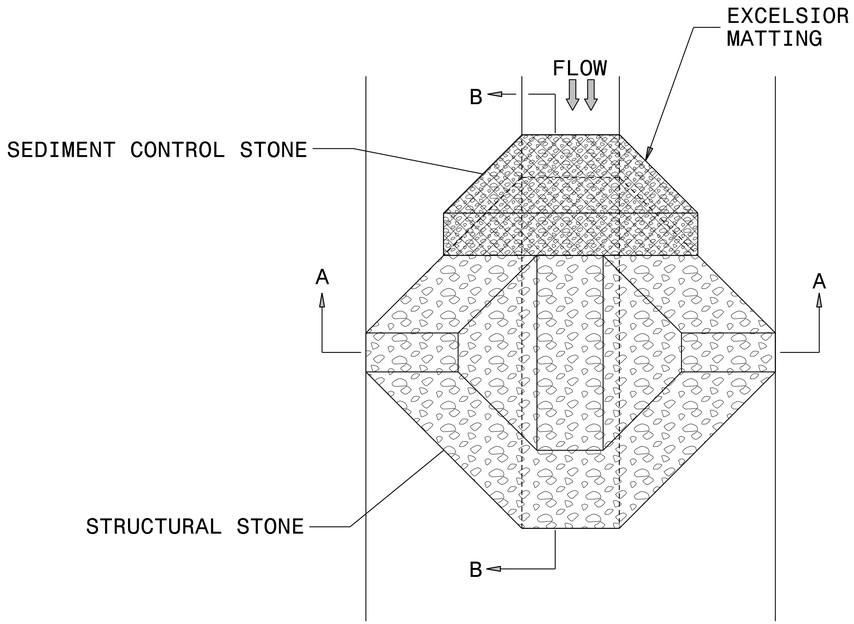
VIEW FROM SLOPE



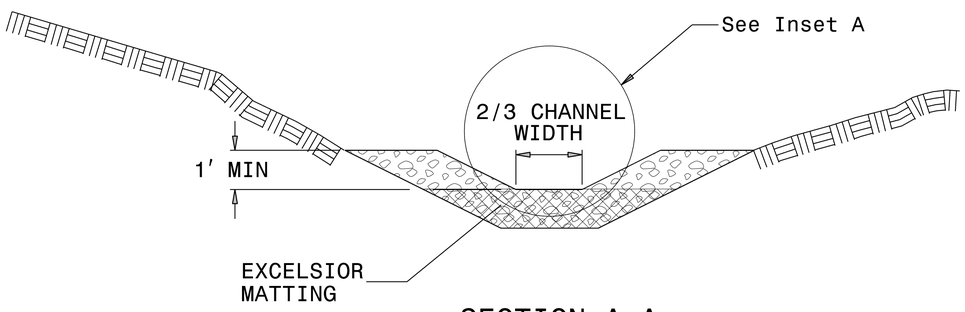
SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	EC-2A
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

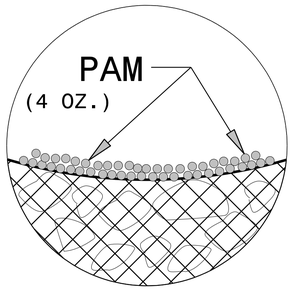
NOTES:

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

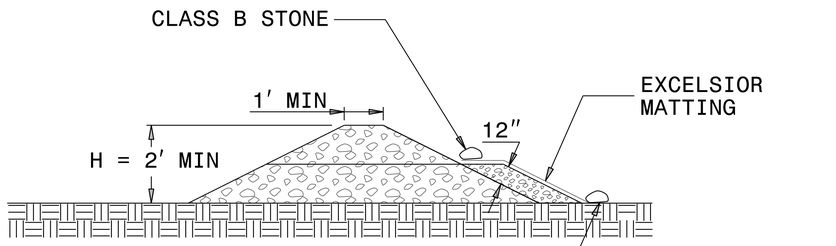
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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.9.R.72	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

PERMANENT SOIL REINFORCEMNT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	23+50	24+00	RT	70

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

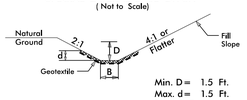
SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	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.9.R.72	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

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

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)

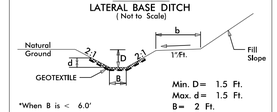


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 11+75 TO STA. 12+50 –L– LT
FROM STA. 24+00 TO STA. 25+00 –L– LT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)



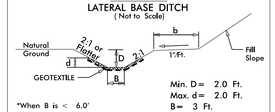
*When B is < 6.0'

Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+50 –L– LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



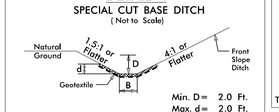
*When B is < 6.0'

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 13+50 TO STA. 16+50 –L– LT
FROM STA. 21+44 TO STA. 22+00 –L– LT
FROM STA. 12+50 TO STA. 13+00 –L– RT

DETAIL 4
SPECIAL CUT BASE DITCH
(Not to Scale)

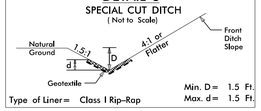


Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 16+50 TO STA. 17+59 –L– LT
FROM STA. 23+00 TO STA. 24+00 –L– LT

DETAIL 5
SPECIAL CUT DITCH
(Not to Scale)

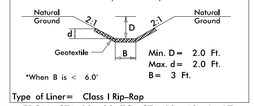


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+25 –Y1– RT

DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



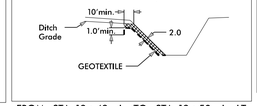
*When B is < 6.0'

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

Type of Liner= Class I Rip-Rap

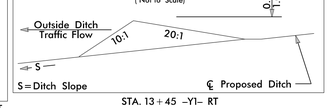
FROM STA. 18+93 TO STA. 19+43 –L– LT
FROM STA. 21+24 TO STA. 21+44 –L– LT

DETAIL 7
RIP RAP AT EMBANKMENT
(Not to Scale)



FROM STA. 19+43 –L– TO STA. 19+50 –L– LT
FROM STA. 20+88 –L– TO STA. 21+24 –L– LT

DETAIL 8
FALSE SUMP
(Not to Scale)



STA. 13+45 –Y1– RT

BEGIN PROJECT 17BP.9.R.72
BEGIN CONSTRUCTION
BEGIN MILLING & RESURFACING
–L– POC STA. 11+75.00
MATCH EXISTING

–L– PC Sta. 10+00.00
10+00
–L– PRC Sta. 12+94.46
–Y1– PC Sta. 12+44.53
–Y1– PT Sta. 12+72.58
AHD BRG = S 6° 22' 14.6" W
–Y1– PT Sta. 13+62.17
–Y1– POT Sta. 13+81.37=
–L– PT Sta. 17+78.03
BCK BRG = S 23° 35' 28.0" E
–L– PT Sta. 17+09.32
–Y1– PC Sta. 13+09.88
15+00
–Y1– PC Sta. 10+00.00
–Y1– PT Sta. 11+76.61
AHD BRG = S 20° 24' 42.1" E
BEGIN CONSTRUCTION
–Y1– POC Sta. 11+72.00
20+00
–L– PC Sta. 22+36.68
–DRWY2– POT Sta. 12+07.54
MATCHLINE –L– STA. 24+00.00 SEE SHEET 5

NAD 83/2011

SPECIAL LATERAL
2' BASE DITCH
w/CL I RIPRAP
EST. 66 TON CL I RIPRAP
EST. 121 SY GEOTEXTILE
SEE DETAIL 1

LATERAL
2' BASE DITCH
w/CL I RIPRAP
EST. 98 TON CL I RIPRAP
EST. 180 SY GEOTEXTILE
SEE DETAIL 2

LATERAL
3' BASE DITCH
w/CL I RIPRAP
EST. 451 TON CL I RIPRAP
EST. 790 SY GEOTEXTILE
SEE DETAIL 3

SPECIAL CUT
3' BASE DITCH
w/CL I RIPRAP
EST. 169 TON CL I RIPRAP
EST. 296 SY GEOTEXTILE
SEE DETAIL 4

SPECIAL CUT
'V' DITCH
w/CL I RIPRAP
EST. 57 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 5

STANDARD
3' BASE DITCH
w/CL I RIPRAP
EST. 62 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 6

RIPRAP AT EMBANKMENT
64 TONS CL II RIPRAP
88 SY GEOTEXTILE
SEE DETAIL 7

STANDARD
3' BASE DITCH
w/CL I RIPRAP
EST. 24 TON CL I RIPRAP
EST. 41 SY GEOTEXTILE
SEE DETAIL 6

LATERAL 3'
BASE DITCH
w/CL I RIPRAP
EST. 70 TON CL I RIPRAP
EST. 121 SY GEOTEXTILE
SEE DETAIL 3

SPECIAL CUT
3' BASE DITCH
w/CL I RIPRAP
EST. 139 TON CL I RIPRAP
EST. 252 SY GEOTEXTILE
SEE DETAIL 4

RIPRAP AT EMBANKMENT
13 TONS CL II RIPRAP
17 SY GEOTEXTILE
SEE DETAIL 7

LATERAL
3' BASE DITCH
w/CL I RIPRAP
EST. 62 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 3

–DRWY1– PC Sta. 10+94.95
BCK BRG = N 67° 49' 17.9" E
END CONSTRUCTION
–DRWY1– POC STA.11+05.00
–DRWY1– PT Sta. 11+56.15
–DRWY1– POT Sta. 10+00.00
–L– POT Sta. 12+78.99
–DRWY1– POT Sta. 11+84.88
BCK BRG = S 53° 44' 19.1" E

1 THOMAS W. STEVENS, BETTY A. STEVENS
2 STEVEN WAYNE COX
3 BRIAN P. DOOLEY, KRIS L. DOOLEY
4 MILTON W. SCRIBNER, STEPHANIE J. SCRIBNER
5 JOSEPH P. BROWN, JOANNA K. BROWN
6 COUNTY OF STOKES

CAROLYN VAZQUEZ

TS WORK PAD

FLOATING TURBIDITY CURTAIN

EXCAVATION LIMITS
EXCAVATE 1.5:1
TO ELEVATION 840

EXCAVATION LIMITS
EXCAVATE 1.5:1
TO ELEVATION 843

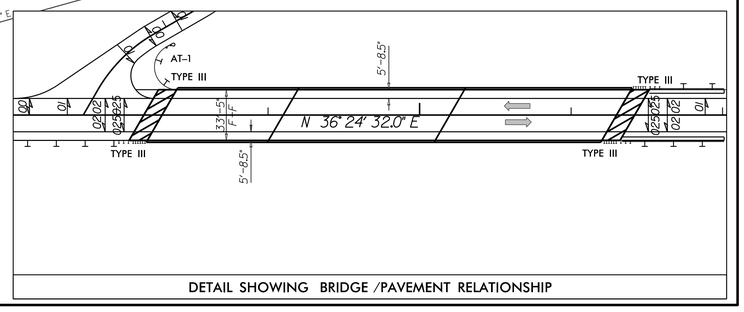
CLASS II RIP RAP
TO TOP OF BERM

REMOVE EXISTING BRIDGE (STRUCTURE #840008)

GRAVEL DRIVE & CONCRETE BOAT RAMP ARE LEASED BY COUNTY FOR PUBLIC ACCESS TO DAN RIVER ACCORDING TO PROPERTY OWNER - NO RECORDED REFERENCE FOUND

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

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS



DETAIL SHOWING BRIDGE /PAVEMENT RELATIONSHIP

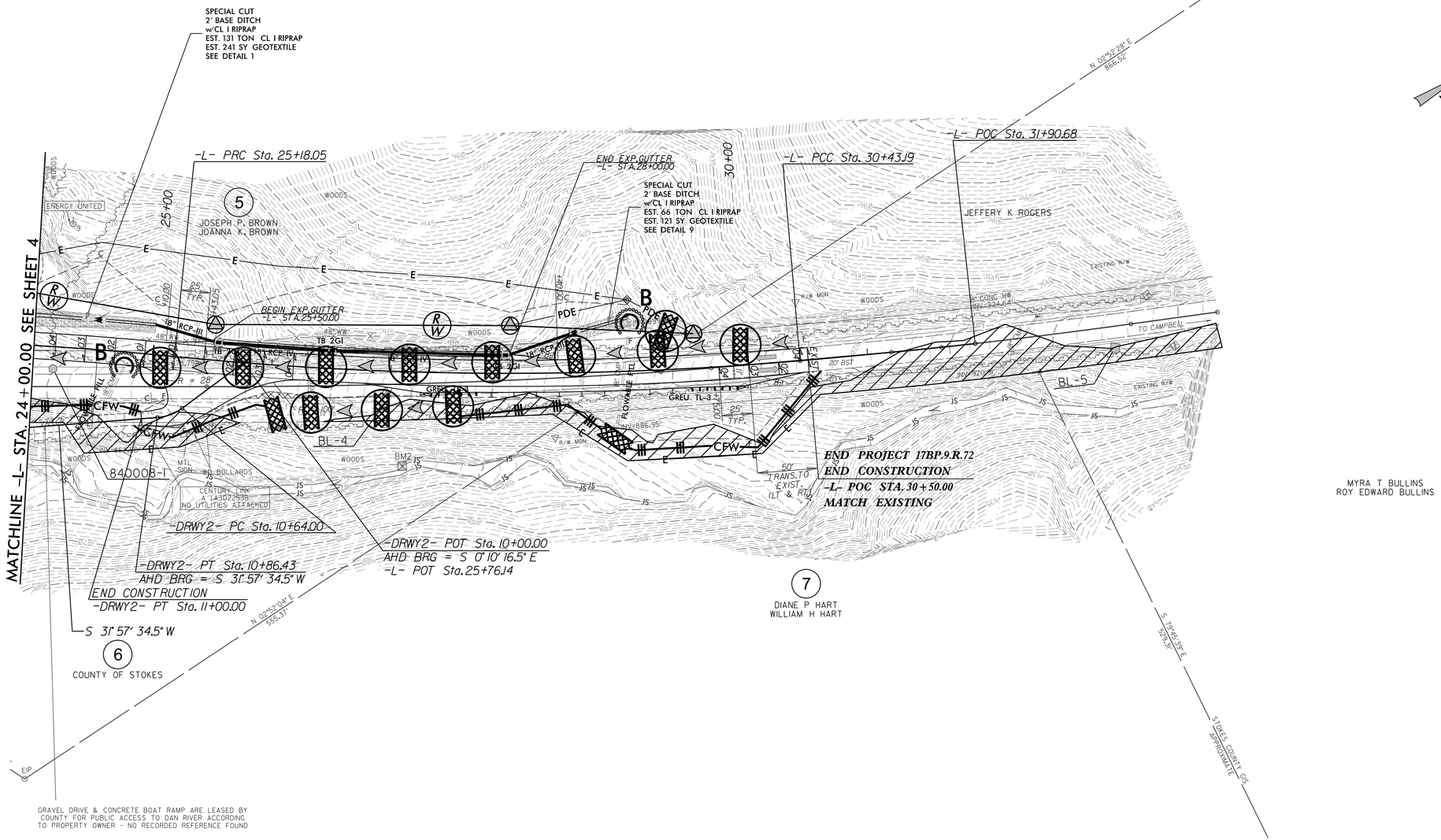
PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	EC-05/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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

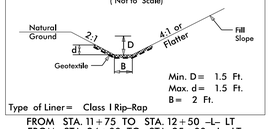
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 05

NAD 83/2011



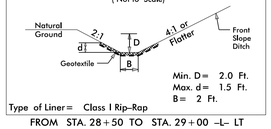
ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
Type of Liner = Class I Rip-Rap
FROM STA. 11+75 TO STA. 12+50 -L- LT
FROM STA. 24+00 TO STA. 25+00 -L- LT

DETAIL 9
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
Type of Liner = Class I Rip-Rap
FROM STA. 28+50 TO STA. 29+00 -L- LT

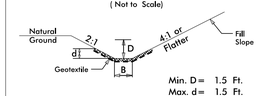
NOTE: R = 15' UNLESS OTHERWISE NOTED

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	EC-06/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADING EROSION CONTROL FOR CONSTRUCTION SHEET 04

For Slopes Excavated Greater Than 10 feet Install Matting for Erosion Control on Entire Slope as Work Allows.

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)

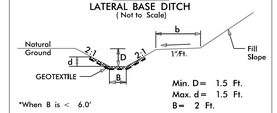


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 11+75 TO STA. 12+50 –L– LT
FROM STA. 24+00 TO STA. 25+00 –L– LT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)



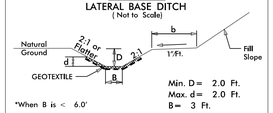
*When B is < 6.0'

Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+50 –L– LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



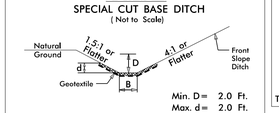
*When B is < 6.0'

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.
b= 5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 13+50 TO STA. 16+50 –L– LT
FROM STA. 21+44 TO STA. 22+00 –L– LT
FROM STA. 12+50 TO STA. 13+00 –L– RT

DETAIL 4
SPECIAL CUT BASE DITCH
(Not to Scale)

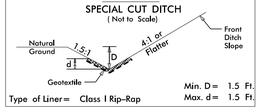


Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 16+50 TO STA. 17+59 –L– LT
FROM STA. 23+00 TO STA. 24+00 –L– LT

DETAIL 5
SPECIAL CUT DITCH
(Not to Scale)

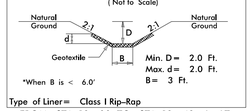


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 12+50 TO STA. 13+25 –Y1– RT

DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



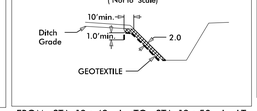
*When B is < 6.0'

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 3 Ft.

Type of Liner= Class I Rip-Rap

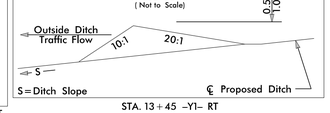
FROM STA. 18+93 TO STA. 19+43 –L– LT
FROM STA. 21+24 TO STA. 21+44 –L– LT

DETAIL 7
RIP RAP AT EMBANKMENT
(Not to Scale)



FROM STA. 19+43 –L– TO STA. 19+50 –L– LT
FROM STA. 20+88 –L– TO STA. 21+24 –L– LT

DETAIL 8
FALSE SUMP
(Not to Scale)



STA. 13+45 –Y1– RT

BEGIN PROJECT 17BP.9.R.72
BEGIN CONSTRUCTION
BEGIN MILLING & RESURFACING
–L– POC STA. 11+75.00
MATCH EXISTING

–L– PC Sta. 10+00.00

–L– PRC Sta. 12+94.46

–L– PT Sta. 17+09.32

–Y1– PT Sta. 13+62.17

–Y1– POT Sta. 13+81.37=

–L– PT Sta. 17+78.03

BCK BRG = S 23° 35' 28.0" E

–Y1– PC Sta. 13+09.88

–Y1– PC Sta. 10+00.00

–Y1– PT Sta. 11+76.61

AHD BRG = S 20° 24' 42.1" E

–Y1– PC Sta. 12+44.53

–Y1– PT Sta. 12+72.58

AHD BRG = S 6° 22' 14.6" W

BEGIN CONSTRUCTION
–Y1– POC Sta. 11+72.00

NAD 83/2011

SPECIAL LATERAL 2' BASE DITCH w/CL I RIPRAP
EST. 66 TON CL I RIPRAP
EST. 121 SY GEOTEXTILE
SEE DETAIL 1

LATERAL 2' BASE DITCH w/CL I RIPRAP
EST. 98 TON CL I RIPRAP
EST. 180 SY GEOTEXTILE
SEE DETAIL 2

LATERAL 3' BASE DITCH w/CL I RIPRAP
EST. 451 TON CL I RIPRAP
EST. 790 SY GEOTEXTILE
SEE DETAIL 3

SPECIAL CUT 3' BASE DITCH w/CL I RIPRAP
EST. 169 TON CL I RIPRAP
EST. 296 SY GEOTEXTILE
SEE DETAIL 4

SPECIAL CUT 'V' DITCH w/CL I RIPRAP
EST. 57 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 5

STANDARD 3' BASE DITCH w/CL I RIPRAP
EST. 62 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 6

RIPRAP AT EMBANKMENT
64 TONS CL II RIPRAP
88 SY GEOTEXTILE
SEE DETAIL 7

STANDARD 3' BASE DITCH w/CL I RIPRAP
EST. 24 TON CL I RIPRAP
EST. 41 SY GEOTEXTILE
SEE DETAIL 6

LATERAL 3' BASE DITCH w/CL I RIPRAP
EST. 70 TON CL I RIPRAP
EST. 121 SY GEOTEXTILE
SEE DETAIL 3

SPECIAL CUT 3' BASE DITCH w/CL I RIPRAP
EST. 139 TON CL I RIPRAP
EST. 252 SY GEOTEXTILE
SEE DETAIL 4

RIPRAP AT EMBANKMENT
13 TONS CL II RIPRAP
17 SY GEOTEXTILE
SEE DETAIL 7

LATERAL 3' BASE DITCH w/CL I RIPRAP
EST. 62 TON CL I RIPRAP
EST. 108 SY GEOTEXTILE
SEE DETAIL 3

–DRWY1– PC Sta. 10+94.95
BCK BRG = N 67° 49' 17.9" E

END CONSTRUCTION
–DRWY1– POC STA. 11+05.00

–DRWY1– PT Sta. 11+56.15

–DRWY1– POT Sta. 10+00.00
–L– POT Sta. 12+78.99

–DRWY1– POT Sta. 11+84.88
BCK BRG = S 53° 44' 19.1" E

–DRWY2– POT Sta. 12+07.54

–L– PC Sta. 22+36.68

MATCHLINE –L– STA. 24+00.00 SEE SHEET 5

1 THOMAS W. STEVENS, BETTY A. STEVENS
2 STEVEN WAYNE COX
3 BRIAN P. DOOLEY, KRIS L. DOOLEY
4 MILTON W. SCRIBNER, STEPHANIE J. SCRIBNER
5 JOSEPH P. BROWN, JOANNA K. BROWN
6 COUNTY OF STOKES

CAROLYN VAZQUEZ

TS WORK PAD

TS WORK PAD

FLOATING TURBIDITY CURTAIN

CLASS II RIP RAP TO TOP OF BERM

CLASS II RIP RAP TO TOP OF BERM

EXCAVATION LIMITS EXCAVATE 1.5:1 TO ELEVATION 840'

EXCAVATION LIMITS EXCAVATE 1.5:1 TO ELEVATION 843'

REMOVE EXISTING BRIDGE (STRUCTURE #840008-2)

840008-2

Place Matting for Erosion Control on Slope as Work Allows.
Sta. 13+00 to Sta. 14+50 –L– LT
Sta. 21+50 to Sta. 22+50 –L– LT
Sta. 12+50 to Sta. 12+75 –L– RT
Sta. 12+35 to Sta. 12+75 –Y1– LT

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

GRAVEL DRIVE & CONCRETE BOAT RAMP ARE LEASED BY COUNTY FOR PUBLIC ACCESS TO DAN RIVER ACCORDING TO PROPERTY OWNER - NO RECORDED REFERENCE FOUND

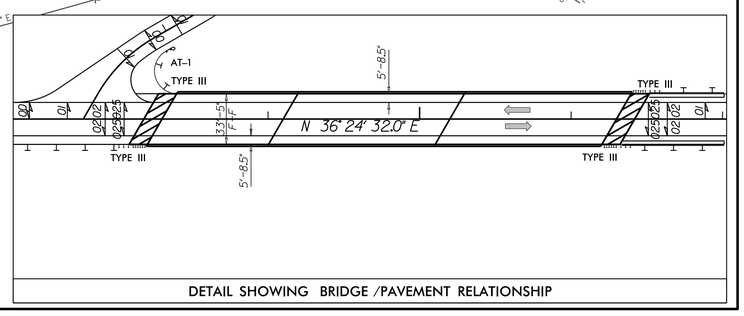
CENTURY LINK NO UTILITIES ATTACHED

ENERGY UNITED 9571 8 350 1/2 A

ENERGY UNITED 8 350 3

ENERGY UNITED 8 250 2 1/2

RIVER GAUGING STATION HEIGHT=16' +/- ABOVE GROUND SOLAR PANEL ATTACHED ON TOP



DETAIL SHOWING BRIDGE /PAVEMENT RELATIONSHIP

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	EC-07/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

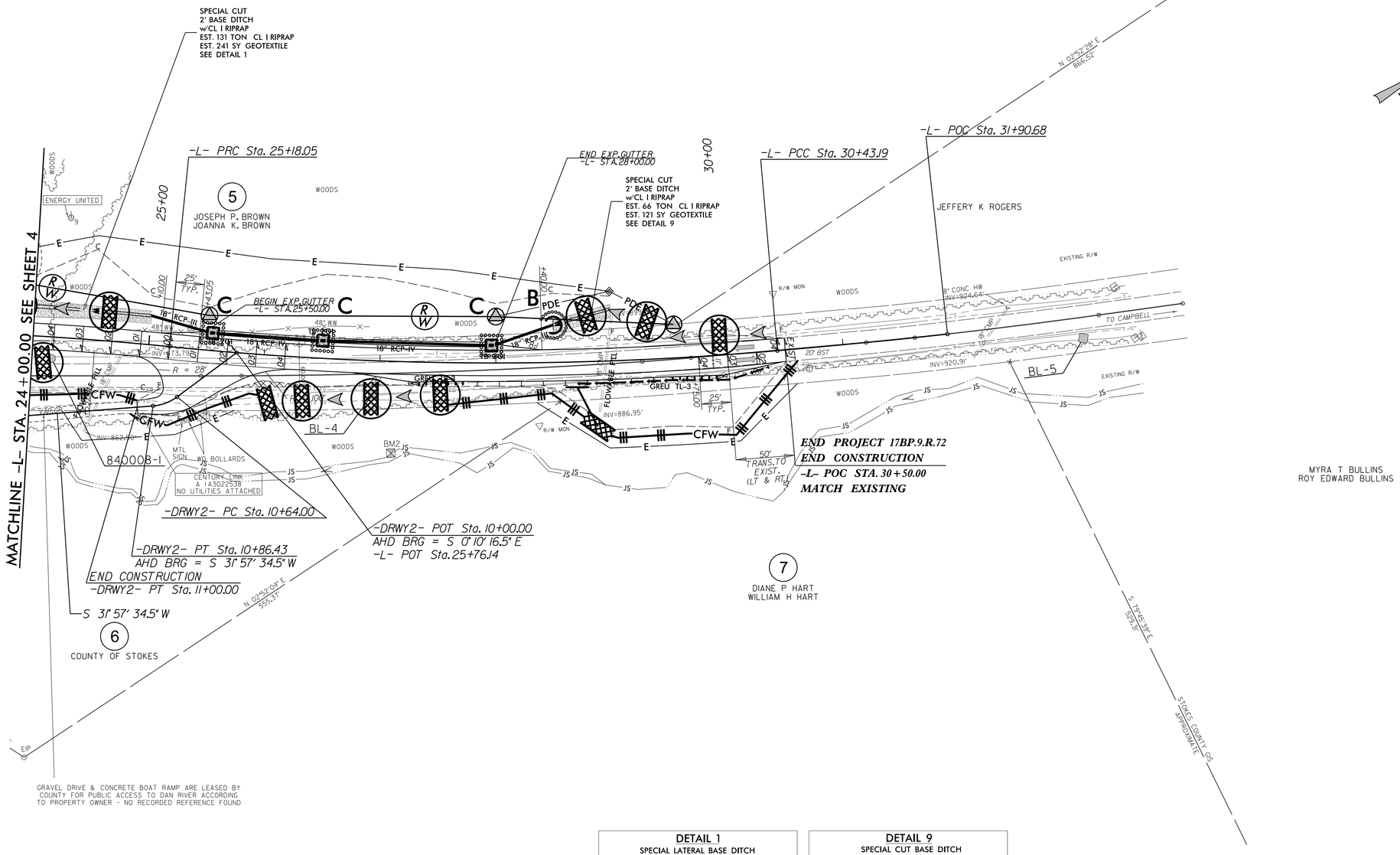
For Slopes Excavated Greater Than 10 feet Install Matting for Erosion Control on Entire Slope as Work Allows.

Place Matting for Erosion Control on Slope as Work Allows. Sta. 28+70 to Sta. 30+35 –L– RT

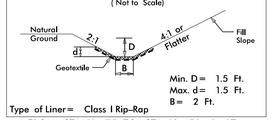
NOTE: UTILIZE SPECIAL STILLING BASIN(S) AS APPLICABLE.

FINAL GRADING EROSION CONTROL FOR CONSTRUCTION SHEET 05

NAD 83/2011



DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)

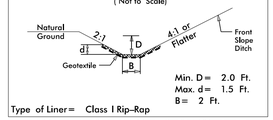


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = Class I Rip-Rap

FROM STA. 11+75 TO STA. 12+50 –L– LT
FROM STA. 24+00 TO STA. 25+00 –L– LT

DETAIL 9
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = Class I Rip-Rap

FROM STA. 28+50 TO STA. 29+00 –L– LT

NOTE: R = 15' UNLESS OTHERWISE NOTED

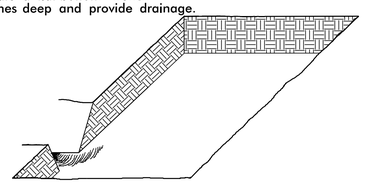
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.72	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

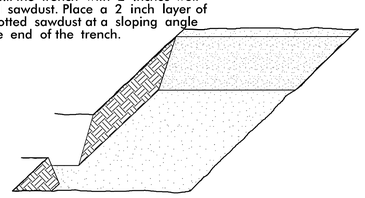
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

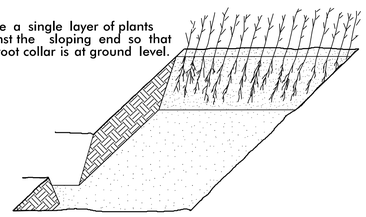
1. Locate a healing–in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



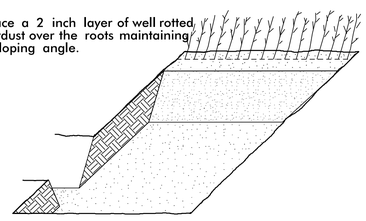
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

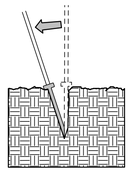


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

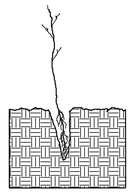


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

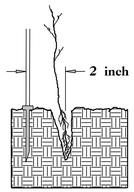
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



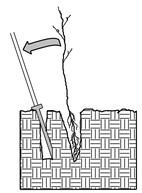
1. Insert planting bar as shown and pull handle toward planter.



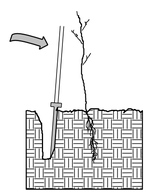
2. Remove planting bar and place seedling at correct depth.



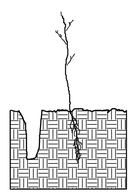
3. Insert planting bar 2 inches toward planter from seedling.



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



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

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



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



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

REFORESTATION

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

REFORESTATION

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

34%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in BR
33%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

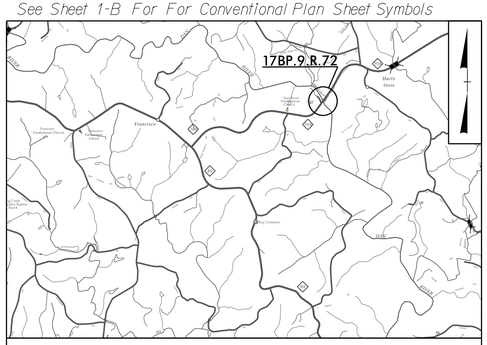
REFORESTATION DETAIL SHEET

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

09/08/09

TIP PROJECT: 17BP.9.R.72

See Sheet 1-B For For Conventional Plan Sheet Symbols



VICINITY MAP

25% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
STOKES COUNTY

LOCATION: BRIDGE NO. 8 (84008) ON NC 704 OVER DAN RIVER

TYPE OF WORK: UTILITY RELOCATION

T.I.P. NO.	SHEET NO.
17BP.9.R.72	UO–1

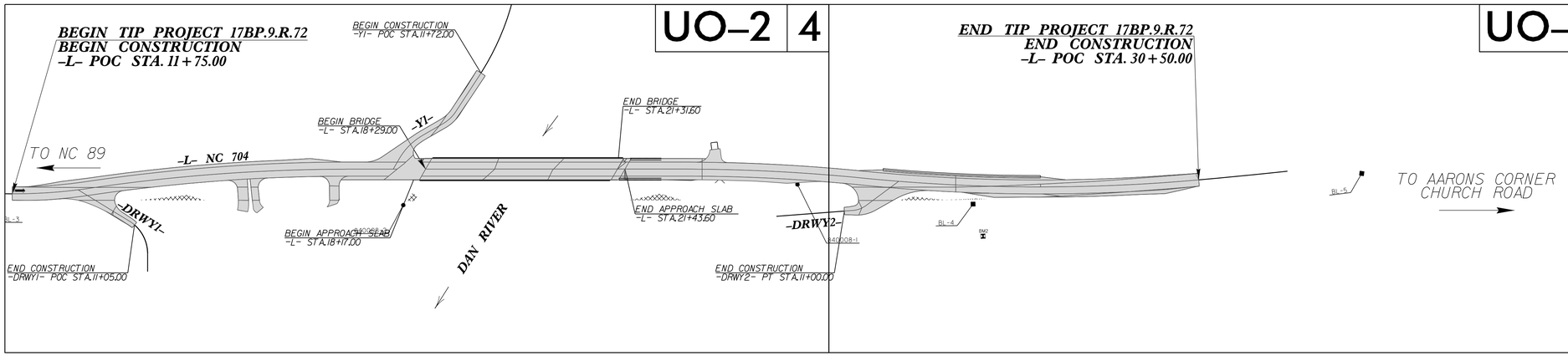
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



NAD 83'2011

UO–2 | 4

UO–3 | 5



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO–1	*TITLE SHEET*
UO–2 THRU UO–3	*UBO PLAN SHEETS*

UTILITY OWNERS WITH CONFLICTS

(A) POWER – SURRY-YADKIN EMC
(B) COMMUNICATION – CENTURYLINK
(C) COMMUNICATION – SPECTRUM
(D) COMMUNICATION – CONTERRA

PREPARED IN THE OFFICE OF:

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN – BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN – GIS/GPS – CONSTRUCTION OBSERVATION

John D. Schriner, PLS *PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
DIVISION 9
375 Silas Creek Parkway
Winston Salem, 27127

Matthew W. Jones, PE *Division Bridge Prog. Manager*
R. David Trantham *Division Utility Coordinator*

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	U0-2
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.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/2011

O/H POWER - SURRY-YADKIN EMC
O/H COMMUNICATION - CONTERRA
O/H COMMUNICATION - CENTURYLINK

EXISTING SURRY-YADKIN POLES TO REMAIN IN PLACE

-Y1- PC Sta. 10+00.00
-Y1- PT Sta. 11+76.61
AHD BRG = S 20° 24' 42.1" E
-Y1- PC Sta. 12+44.53
-Y1- PT Sta. 12+72.58
AHD BRG = S 6° 22' 14.6" W

BEGIN CONSTRUCTION
-Y1- POC Sta. 11+72.00

-Y1- PT Sta. 13+62.17
-Y1- POT Sta. 13+81.37=
-L- PT Sta. 17+78.03
BCK BRG = S 23° 35' 28.0" E

-L- PRC Sta. 12+94.46
-L- PT Sta. 17+09.32
-Y1- PC Sta. 13+09.88

-L- PC Sta. 10+00.00

10+00
15+00
20+00

1 THOMAS W. STEVENS, BETTY A. STEVENS, DB 276 PG 57
2 STEVEN WAYNE COX, DB 615 PG 1140, DB 621PG 562, PB 8 PG 83
3 BRIAN P. DOOLEY, KRIS L. DOOLEY, DB 666 PG 1942, PB 8 PG 83
4 MILTON W. SCRIBNER, STEPHANIE J. SCRIBNER, DB 539 PG 1582, PB 8 PG 83
5 JOSEPH P. BROWN, JOANNA K. BROWN, DB 658 PG 868
6 COUNTY OF STOKES, DB 118 PG 637

ABANDONED

REMOVE HW

GREU TL-3

FLOWABLE FILL

GRADE TO DRAIN

RETAIN

TDE

SEPTIC PUMP SWITCH

SERVICE LINE

RIVER GAUGING STATION HEIGHT=16' +/- ABOVE GROUND | SOLAR PANEL ATTACHED ON TOP

BRIDGE #8
MTL DECK W/BST OVERLAY

N 36° 24' 32.0" E

GRAVEL DRIVE & CONCRETE BOAT RAMP ARE LEASED BY COUNTY FOR PUBLIC ACCESS TO DAN RIVER ACCORDING TO PROPERTY OWNER - NO RECORDED REFERENCE FOUND

TIED TO EXISTING U/G COMMUNICATION (CENTURYLINK)

-DRWY1- POT Sta. 10+00.00
-L- POT Sta. 12+78.99

-DRWY1- PC Sta. 10+94.95
BCK BRG = N 67° 49' 17.9" E

END CONSTRUCTION
-DRWY1- POC STA.11+05.00

-DRWY1- PT Sta. 11+56.15

-DRWY1- POT Sta. 11+84.88
BCK BRG = S 53° 44' 19.1" E

-L- PC Sta. 22+36.68
-DRWY2- POT Sta. 12+07.54

U/G COMMUNICATION MUST BE 3' BELOW PROPOSED INVERT OF 895.80'

O/H POWER - SURRY-YADKIN EMC
O/H COMMUNICATION - CONTERRA
O/H COMMUNICATION - CENTURYLINK

O/H COMMUNICATION (CENTURYLINK)

O/H COMMUNICATION (CENTURYLINK)

EXISTING SURRY-YADKIN POLES TO REMAIN IN PLACE

MATCHLINE -L- STA. 24+00.00 SEE SHEET UO-3

5/14/99

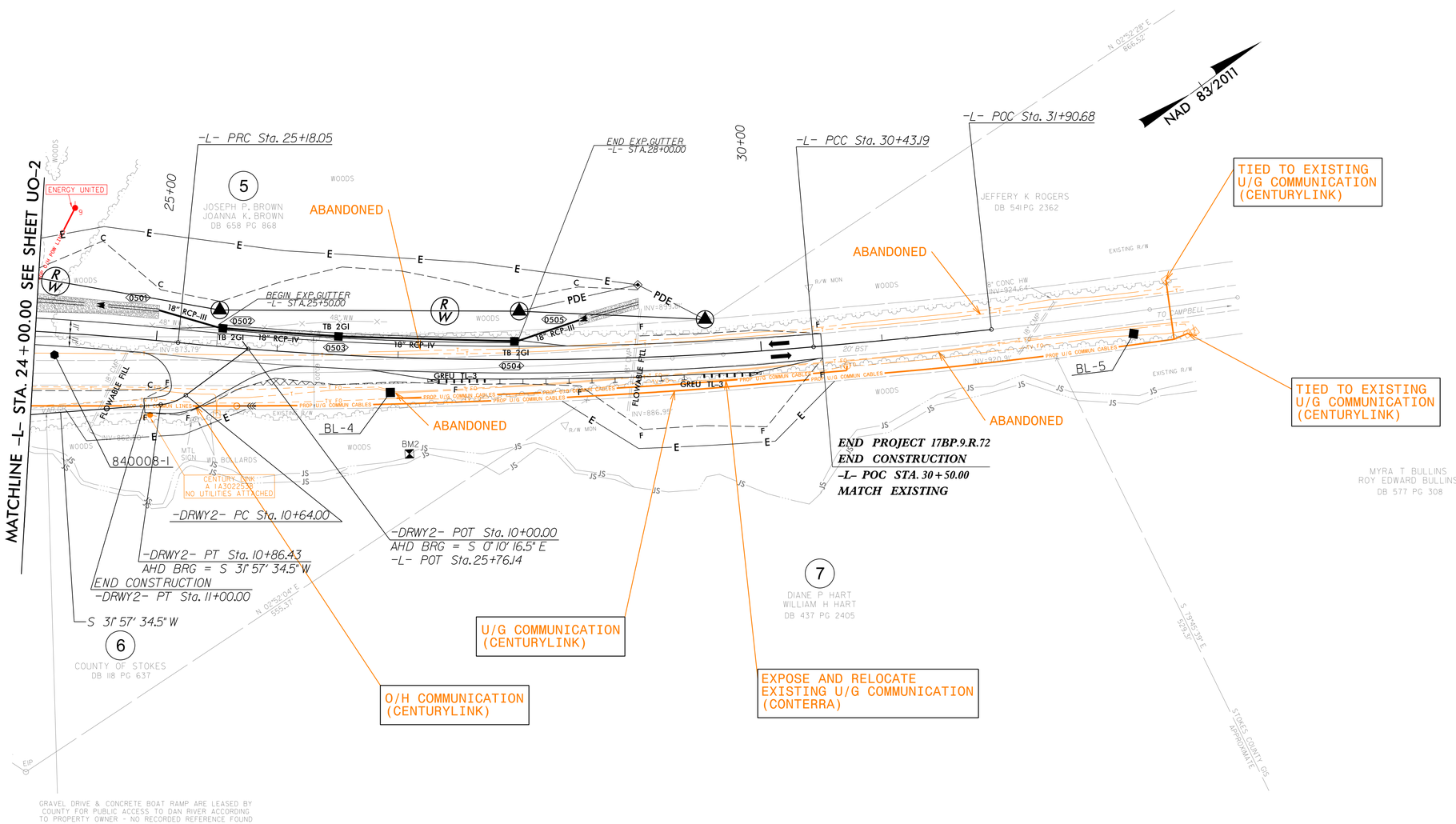
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PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	U0-3
THIS SHEET CORRESPONDS TO RDY-5	

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.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5/14/99
45:10 PM
8\Utilities\Engineering\UB0\Proj\17BP9R72_ut_rdy5_U03_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
17BP.9.R.72	X-A

CROSS SECTION INDEX

ROADWAY	STATION	TO	STATION	SHEET NO.
CROSS SECTION INDEX				X–A
CROSS SECTION SUMMARY				X–1A
–L– NC 704	11 + 75.00		31 + 00.00	X–1 – X–27
–Y1– GEORGE MILL RD	11 + 75.00		13 + 75.00	X–28 – X–36
–DRWY1–	10 + 00.00		10 + 75.00	X–37 – X–39
–DRWY2–	10 + 00.00		10 + 75.00	X–40 – X–42

PROJ. REFERENCE NO.	SHEET NO.
17BP.9.R.72	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+75.00000	0	0
12+00.00000	0	351
12+50.00000	39	711
13+00.00000	134	33
13+50.00000	388	56
14+00.00000	691	59
14+50.00000	931	48
15+00.00000	1111	42
15+39.00000	906	17
15+50.00000	251	0
15+59.00000	203	0
16+00.00000	804	13
16+50.00000	493	403
16+85.00000	93	1051
17+00.00000	28	822
17+50.00000	110	1753
18+00.00000	202	129
18+20.00000	25	0
21+30.00000	0	0
21+43.70000	485	0
21+50.00000	210	0
22+00.00000	1341	0
22+50.00000	518	31
22+90.00000	7	38
23+00.00000	3	14
23+50.00000	5	181
24+00.00000	0	401
24+50.00000	1	669
25+00.00000	11	519
25+50.00000	18	379
26+00.00000	17	765
26+50.00000	25	1130
27+00.00000	21	1087
27+50.00000	7	804
28+00.00000	2	570
28+50.00000	1	476
29+00.00000	97	297
29+50.00000	219	59
30+00.00000	267	7

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+72.00000	0	0
11+75.00000	0	0
12+00.00000	0	1
12+25.00000	2	1
12+50.00000	34	0
12+75.00000	36	184
13+00.00000	11	733
13+25.00000	16	1096
13+50.00000	35	912
13+68.00000	21	558

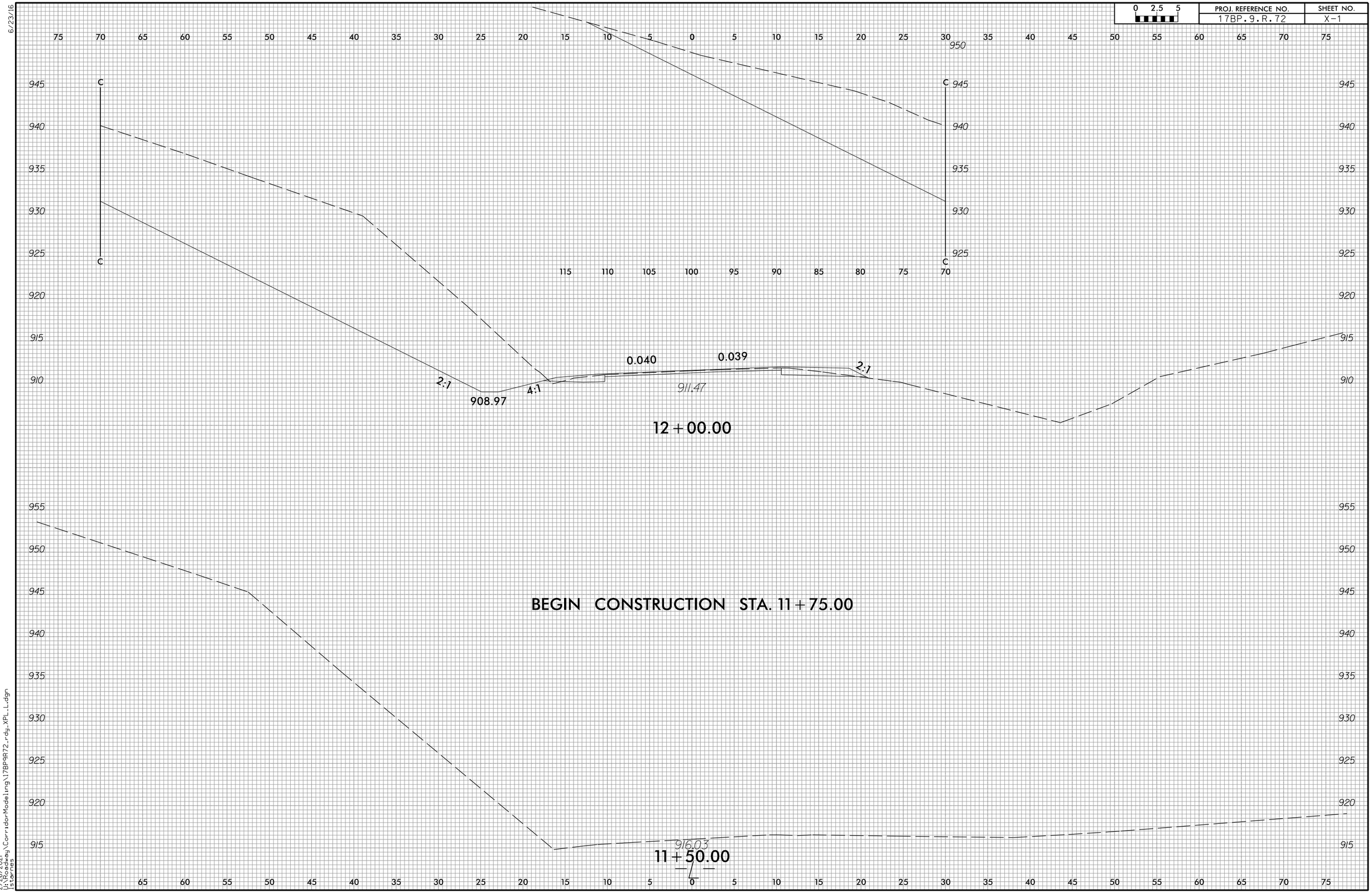
Station DRWY1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+17.40000	0	0
10+25.00000	0	1
10+50.00000	40	0
10+75.00000	63	0
11+00.00000	25	2
11+05.00000	0	1

Station DRWY2	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+16.68000	0	0
10+25.00000	6	0
10+50.00000	11	3
10+75.00000	4	10
11+00.00000	0	10

Approximate quantities only. Shoulder borrow, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

6/23/16

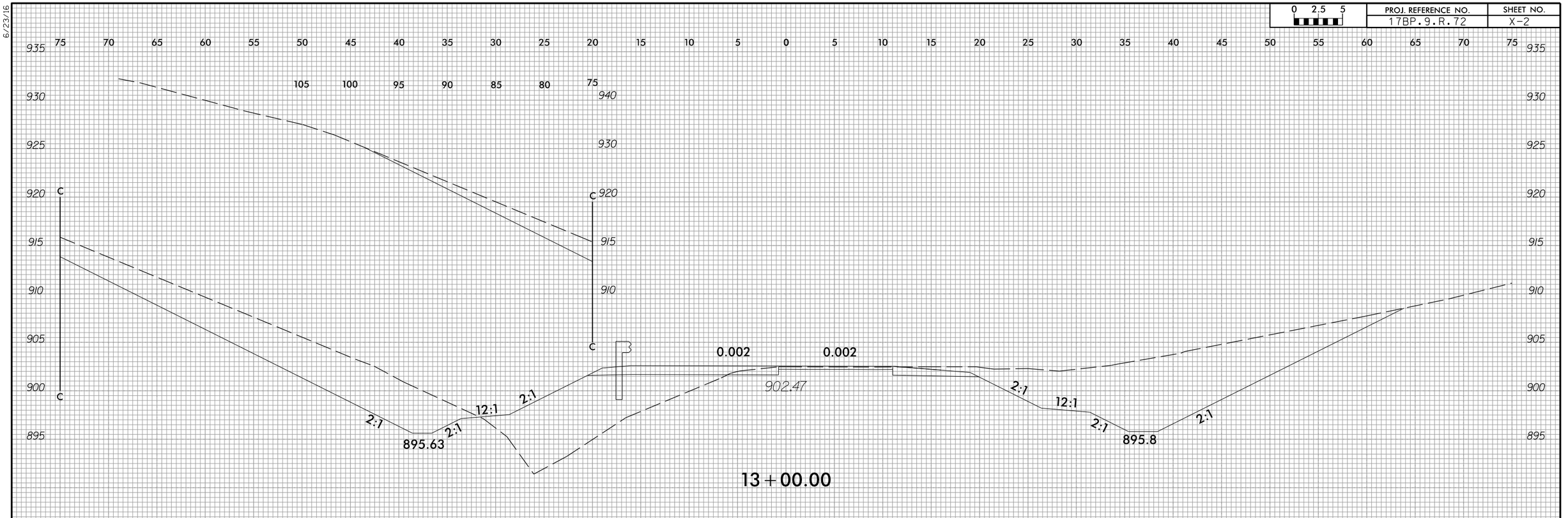
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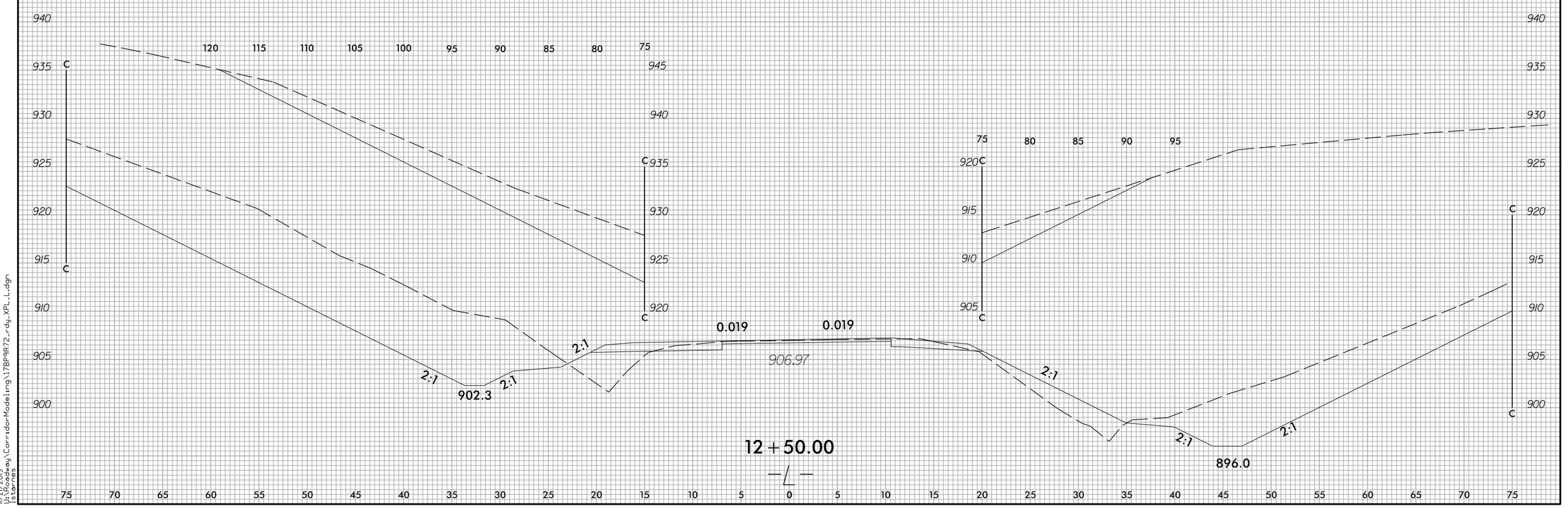


2/26/2021
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6/23/16

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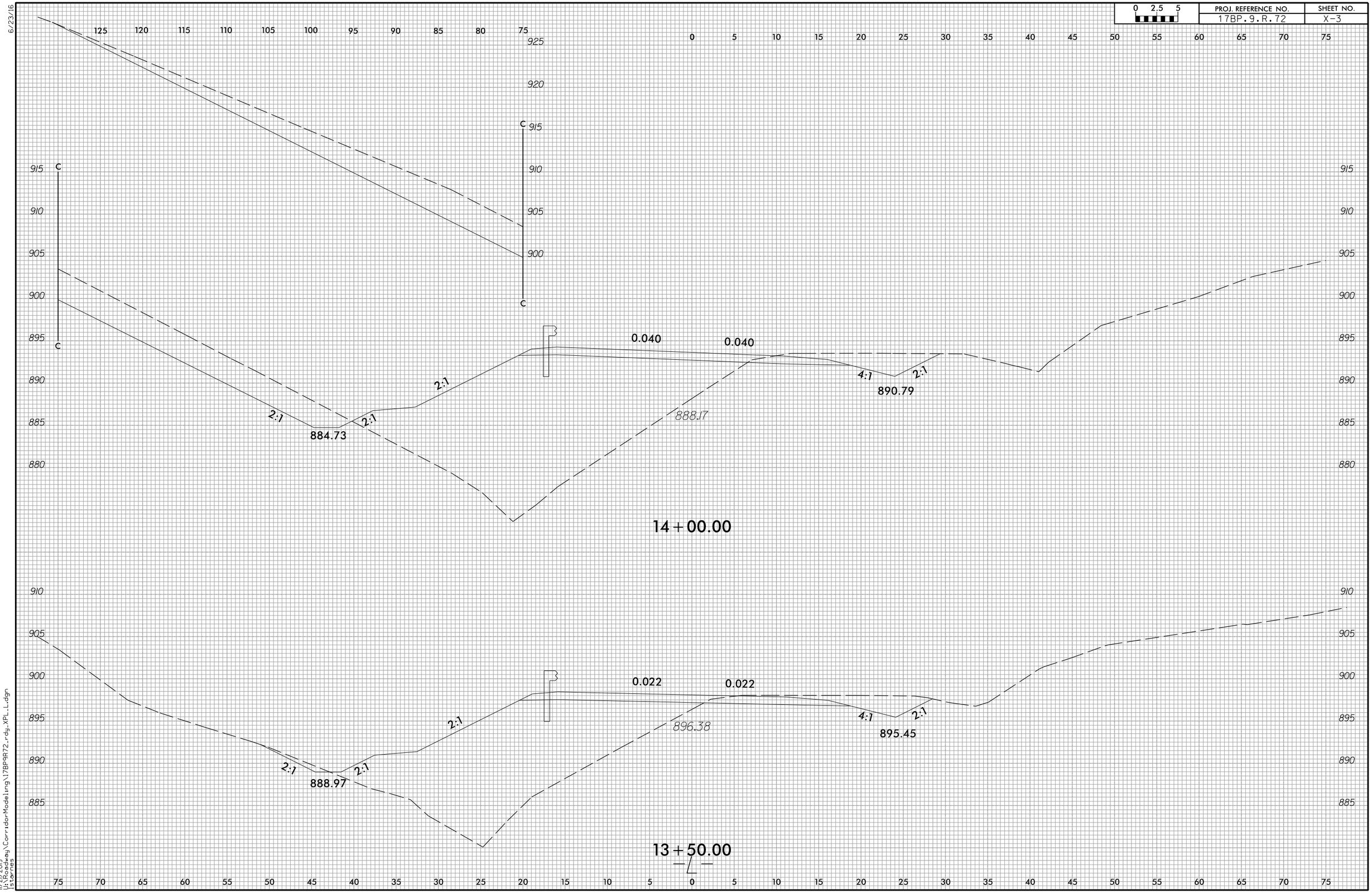




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6/23/16

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11/2/2018
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	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

910
905
900
895
890
885
880
875
870

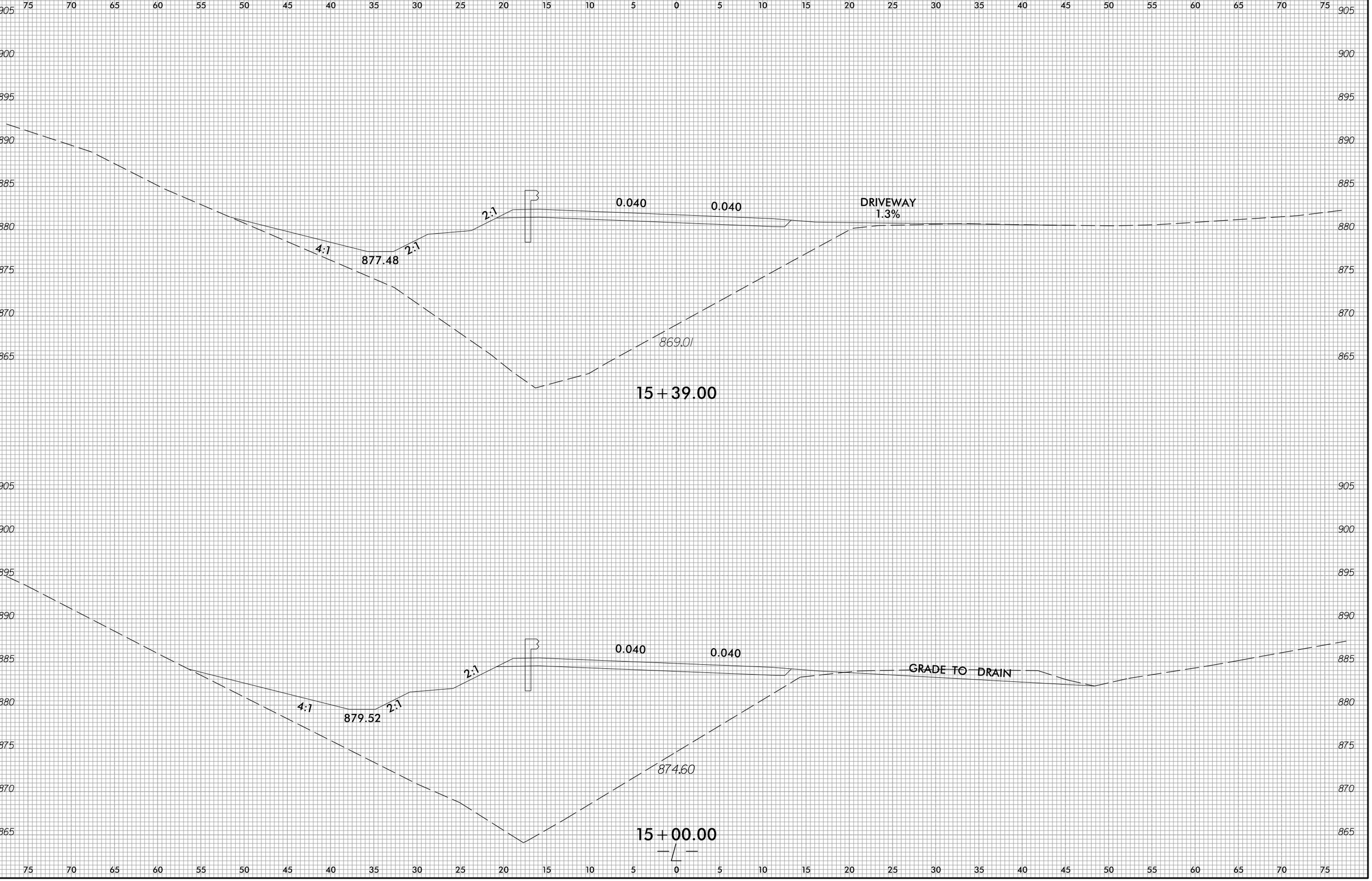
0.040
0.040
2:1
2:1
4:1
4:1
2:1
882.13
886.32
880.66

14+50.00

11/2/2019
U:\Scripts\CorridorModeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-5



11/2/2019
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-6

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

900 895 890 885 880 875 870 865 860

4:1 876.44 2:1 2:1 0.040 0.040 DRIVEWAY 2.5%

866.37

15+59.00

905 900 895 890 885 880 875 870 865

4:1 876.91 2:1 2:1 0.040 0.040 GRADE TO DRAIN 2%

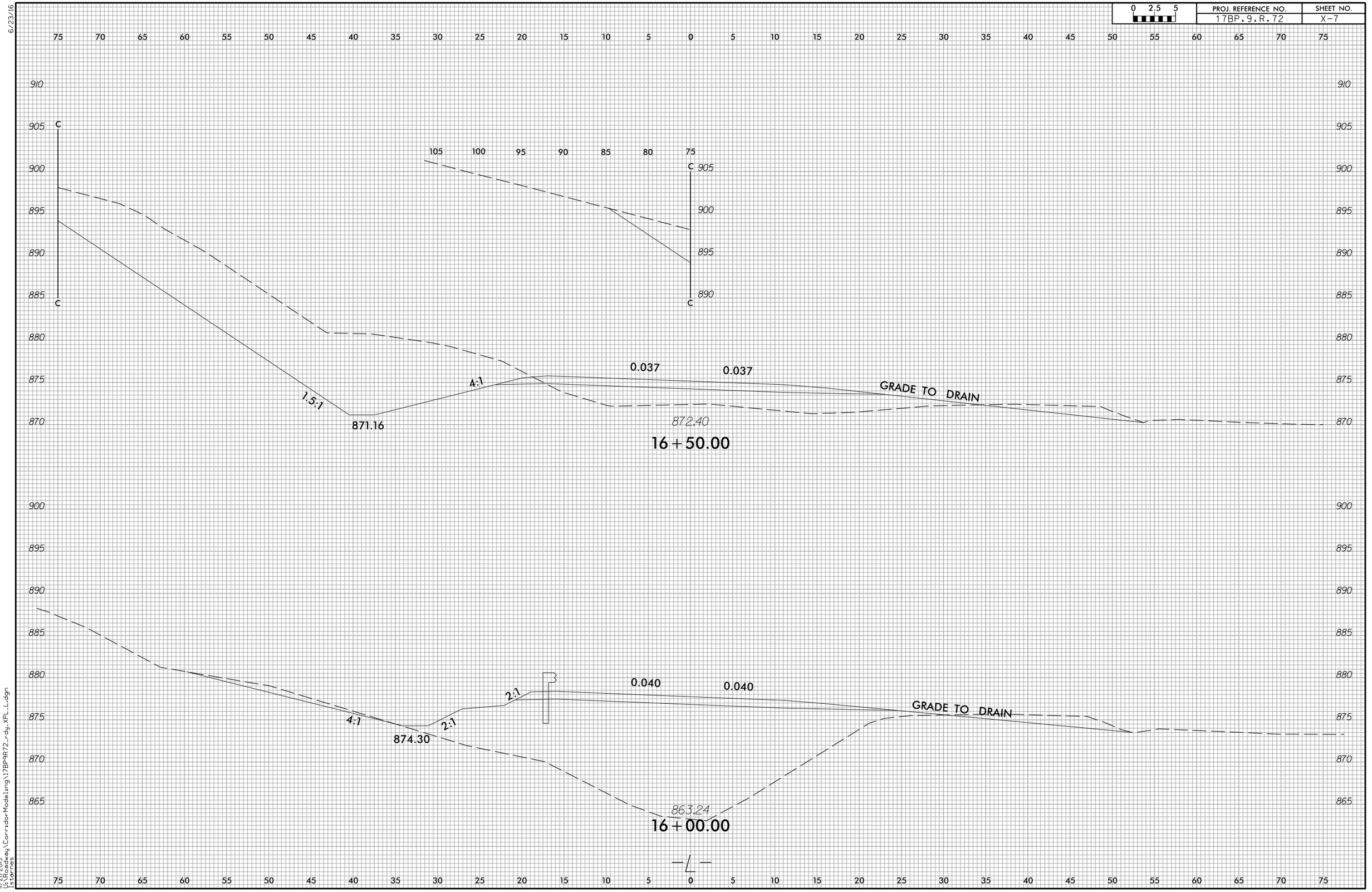
867.78

15+50.00

11/2/2019
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6/23/16

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11/2/2018
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-8

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

105 100 95 90 85 80 75

C

C905

900

895

890

885

880

875

870

865

860

855

878.38

0.023

0.023

4:1

4:1

1.5:1

868.95

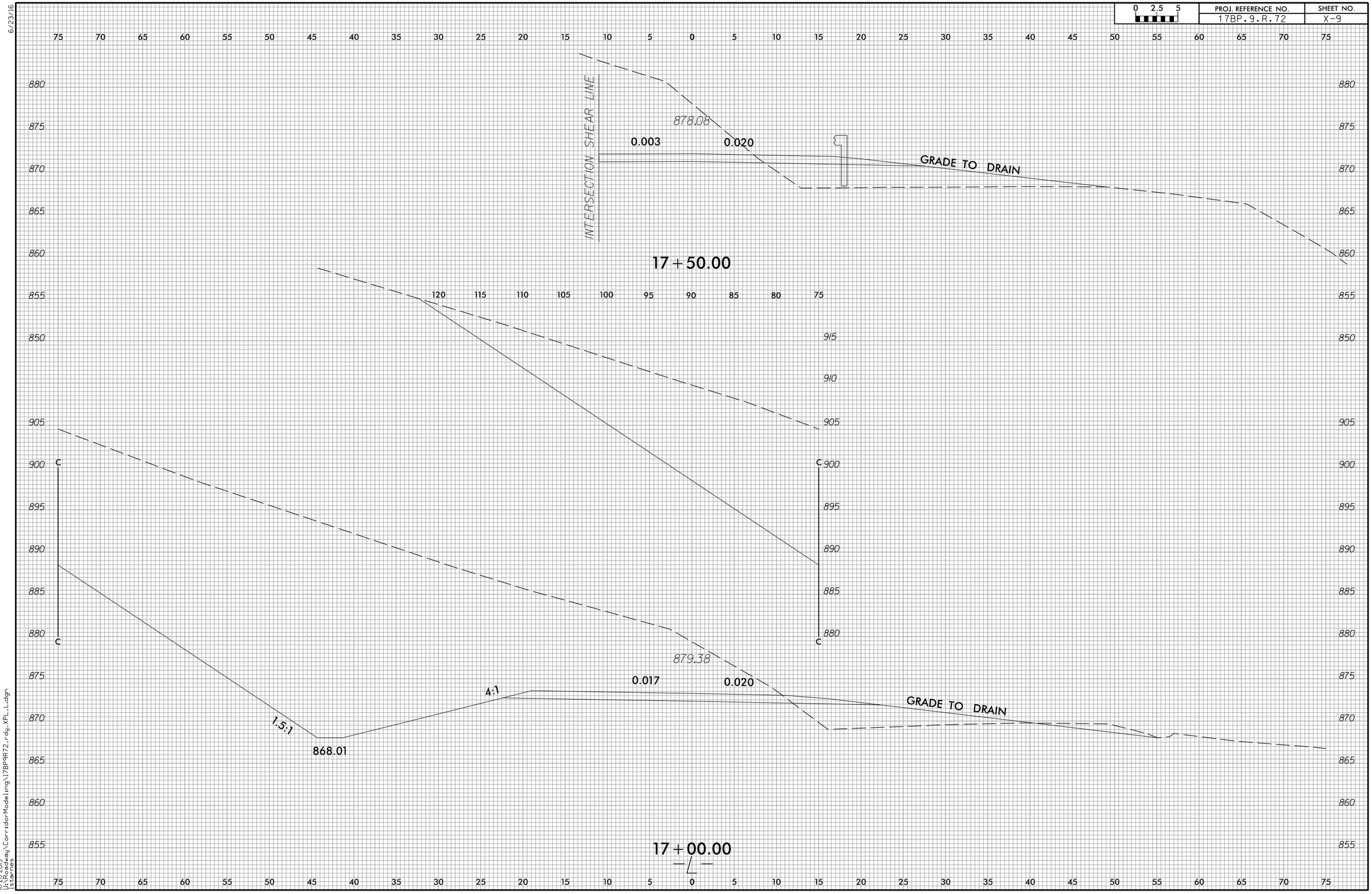
DRIVEWAY
8.4%

16+85.00

11/21/2019
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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-9



11/21/2019
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-10

BEGIN BRIDGE STA. 18+29.56

INTERSECTION SHEAR LINE

0.023

0.022

GRADE TO DRAIN

867.39

18+00.00

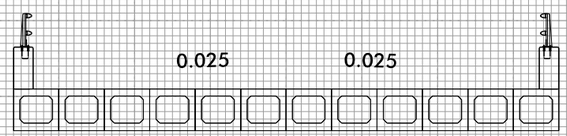
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6/23/16

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875 870 865 860 855 850 845 840 835 830



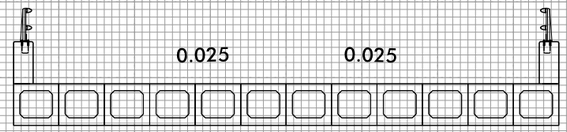
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18+50.00

11/21/2019
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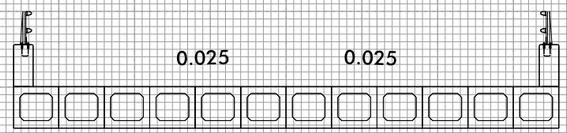
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-12



830.48

19+50.00



836.52

19+00.00

11/21/2019
U:\Highway\CorridorModeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

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830.40

20+00.00

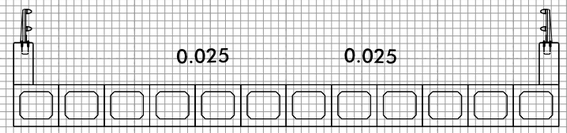
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11/21/2019
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jstarnes

6/23/16

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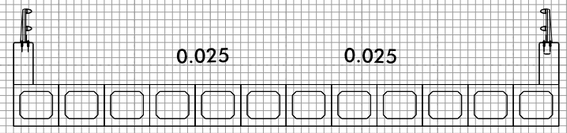
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



870 865 860 855 850 845 840 835 830

847.18

21+00.00



870 865 860 855 850 845 840 835

837.27

20+50.00

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

11/2/2018
U:\Highway Corridor Modeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-15

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

870 865 860 855 850 845

0.015 0.020 GRADE TO DRAIN

2:1 2:1 2:1

848.0

857.18

22+00.00

0.025 0.025 GRADE TO DRAIN

2:1 2:1 2:1

846.5

851.80

END BRIDGE STA. 21+31.44

21+50.00

840

11/21/2019
U:\Roadway\CorridorModeling\17BP9R72_rdg_XPLL.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-16

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

870
865
860
855
850

DRIVEWAY
4%

0.021

0.021

GRADE TO DRAIN 2%

868.73

22+90.00

2:1

0.005

0.02

GRADE TO DRAIN

868.23

22+50.00

11/21/2019
U:\Roadway\CorridorModeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-17

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

890 885 880 875 870 865 860 855 850

0.040 0.040

2:1 4:1

GRADE TO DRAIN

869.63

870.94

23+50.00

0.025 0.025

2:1 4:1

GRADE TO DRAIN

866.7

869.12

23+00.00

—℄—

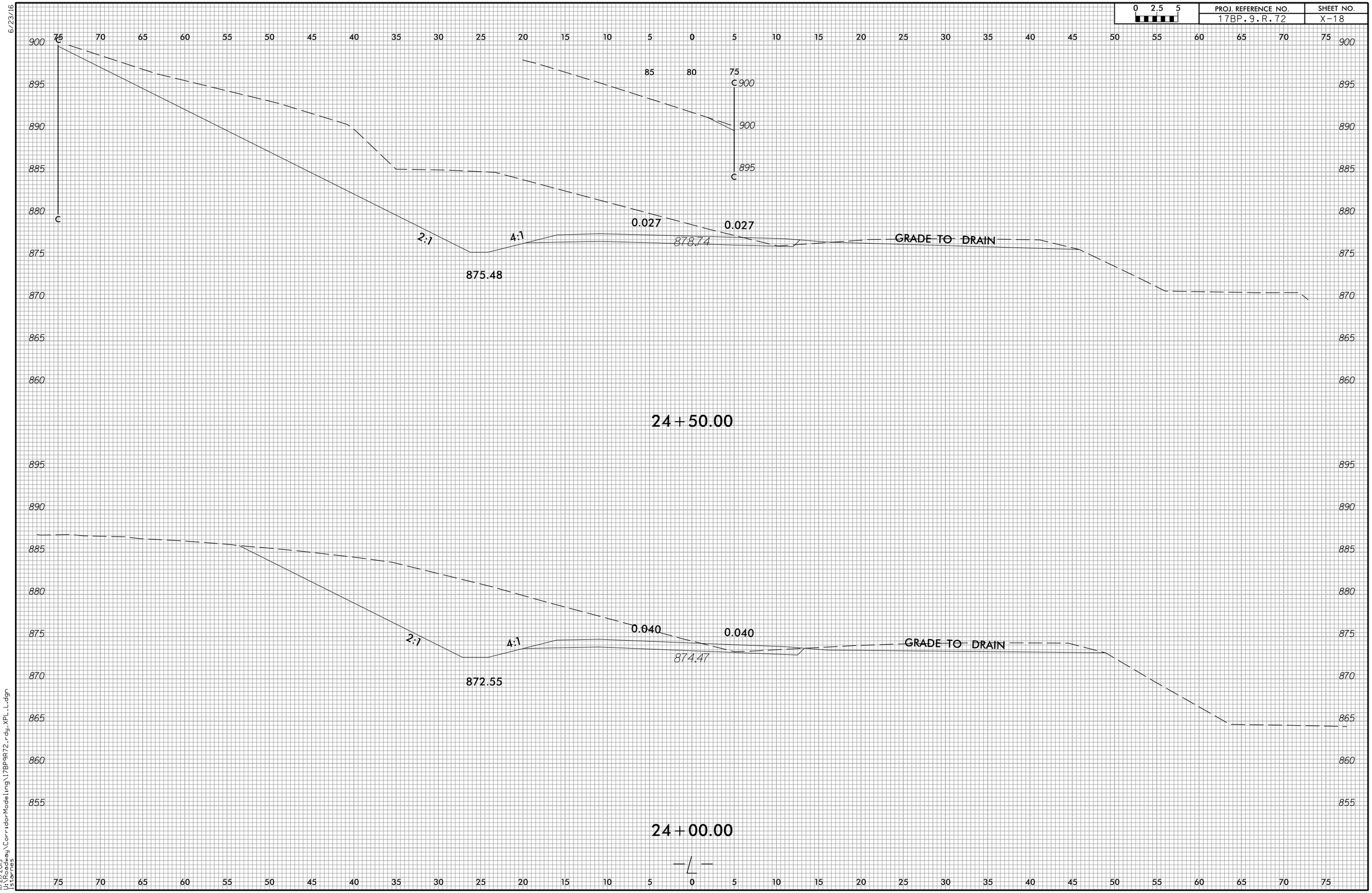
890 885 880 875 870 865 860 855 850

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

11/2/2019
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-18



11/2/2018
U:\Highway\CorridorModeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-19

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

900
895
890
885
880
875
870
865
860

0.007
0.007
GRADE TO DRAIN
2:1
4:1
878.4
881.58

25+00.00

—℄—

11/2/2019
I:\Projects\Highway Corridor Modeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-20

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

905
900
895
890
885
880
875
870
865

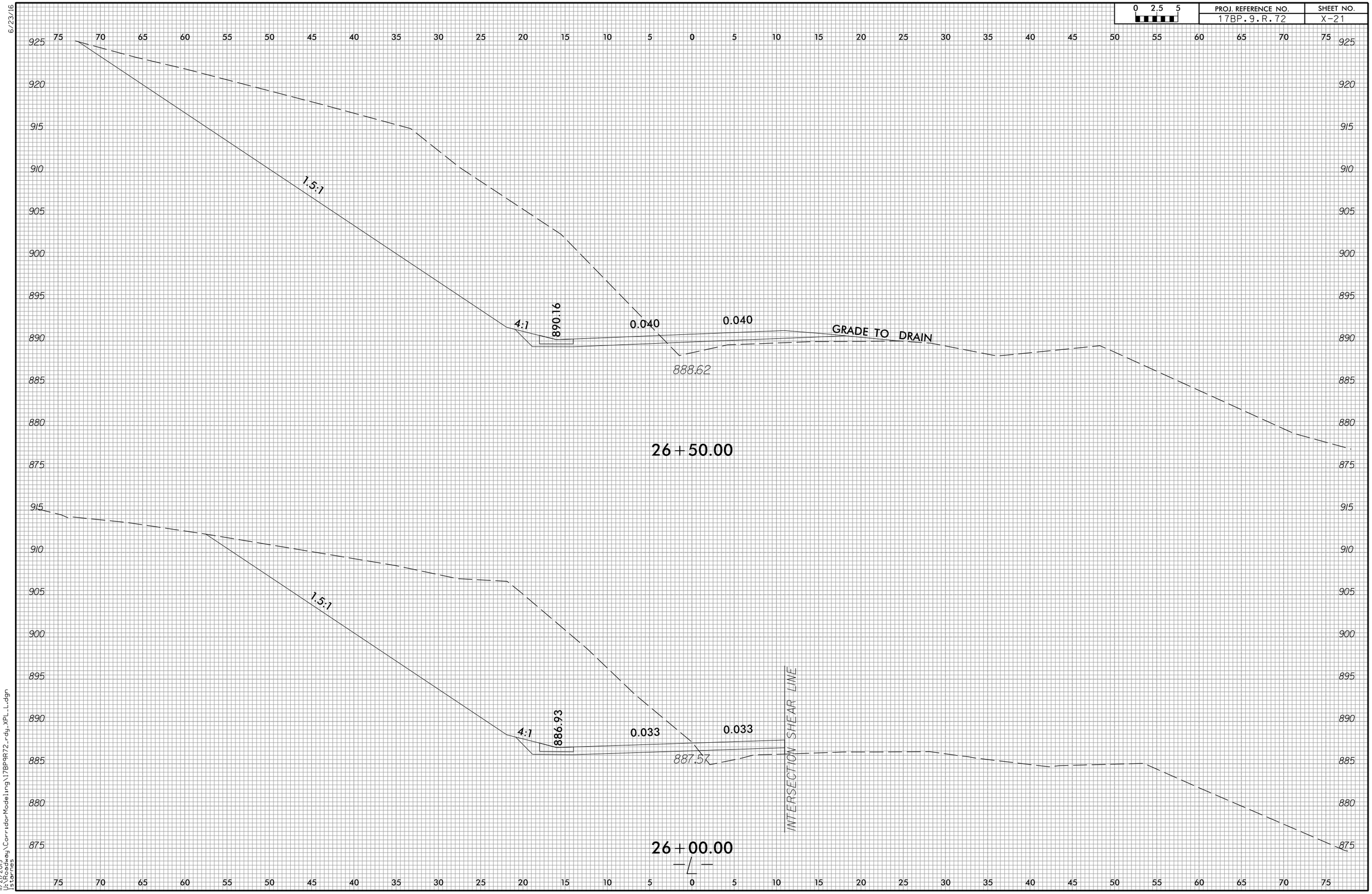
1.5:1
4:1
883.89
0.013
0.013
885.93
INTERSECTION SHEAR LINE

25+50.00

11/2/2018
L:\Highway Corridor Modeling\17BP9R72_rdy_XPL_L.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-21



11/21/2019
U:\Roadway\CorridorModeling\17BP9R72_rdy_XPLL.dgn
jstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-22

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

930
925
920
915
910
905
900
895
890
885
880
875

1.5:1

4:1

893.52

0.040

0.040

2:1

893.05

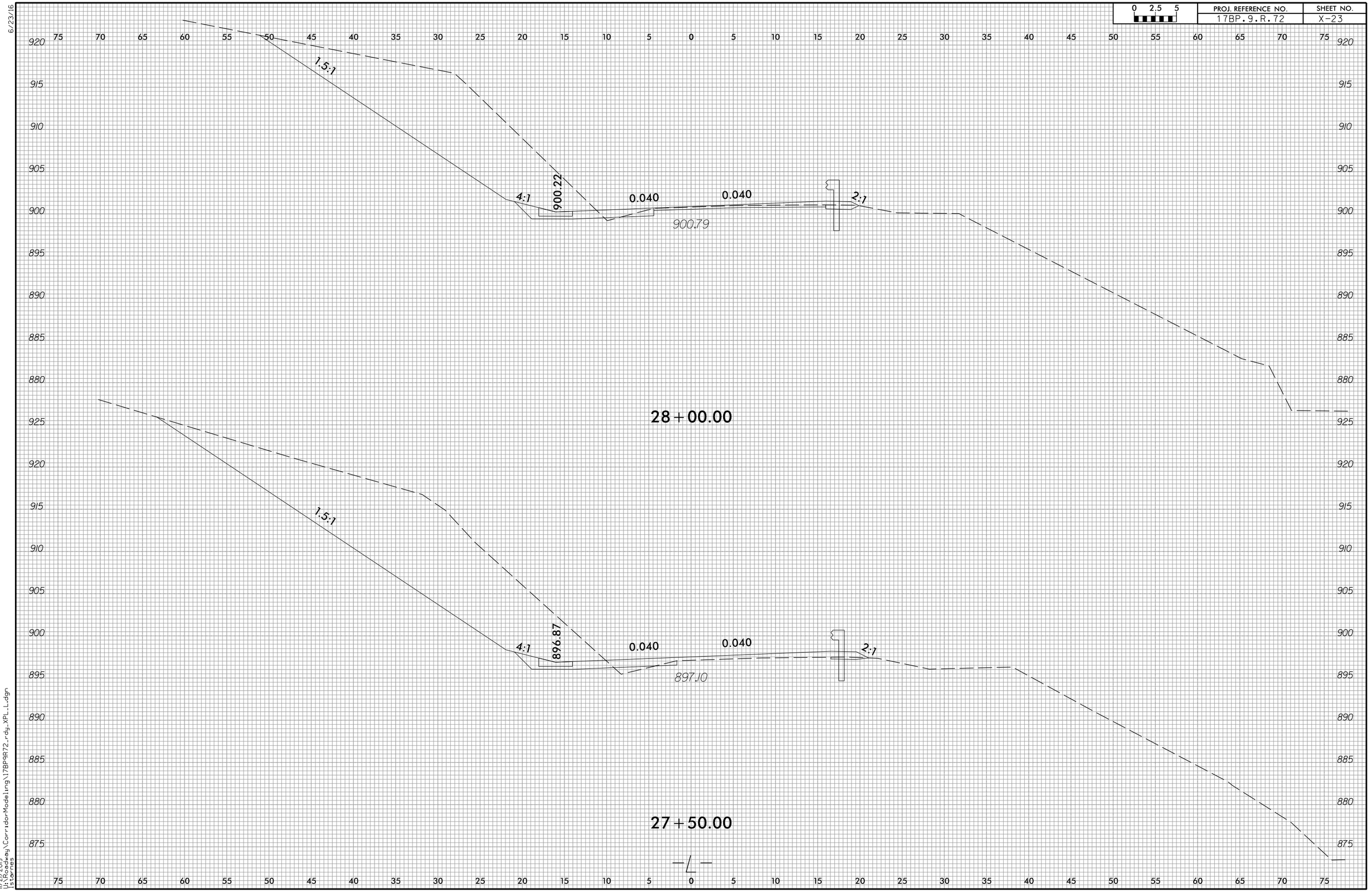
27+00.00

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11/21/2019
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lstarnes

6/23/16

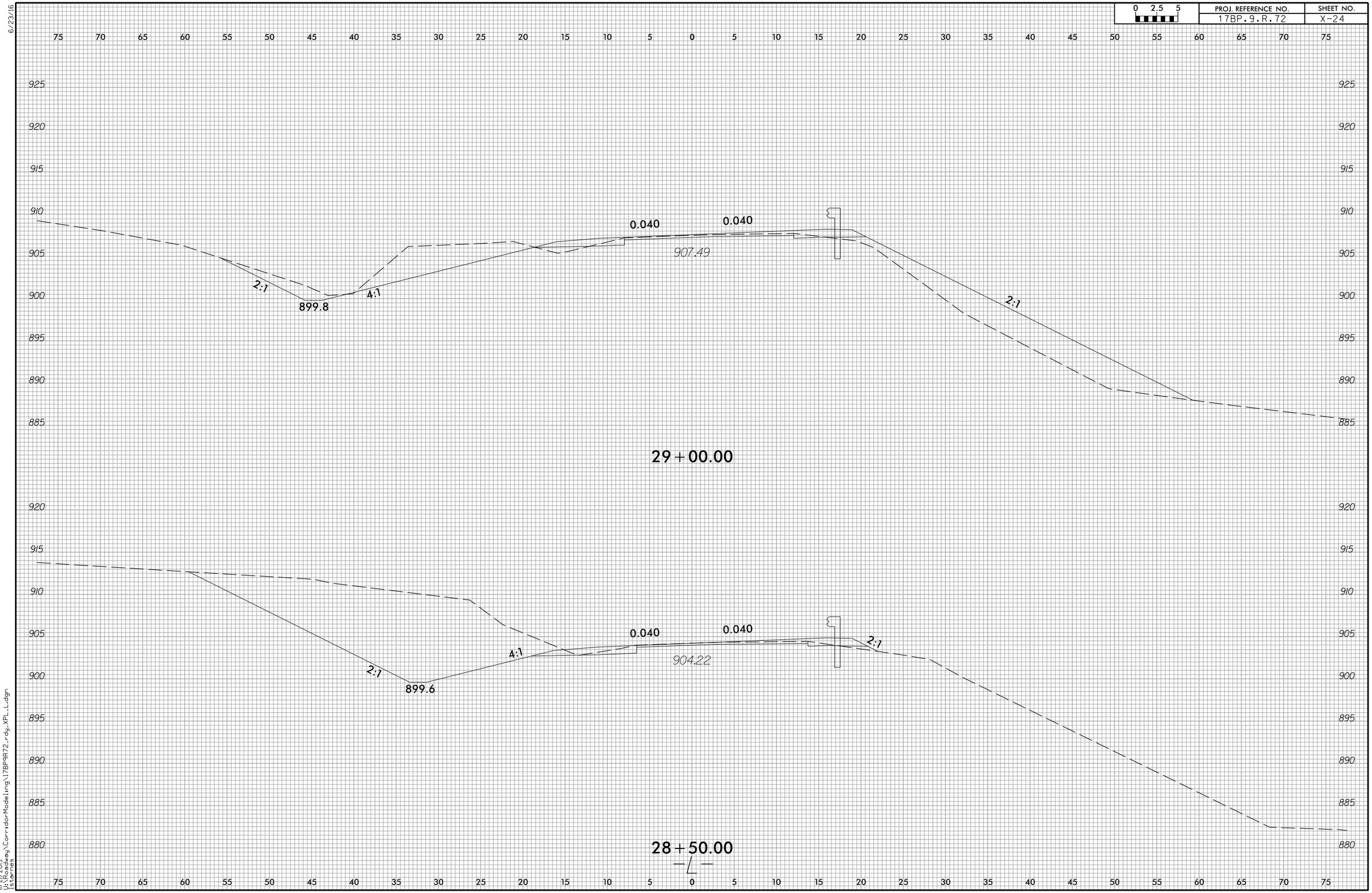
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	17BP.9.R.72	X-23



11/2/2019
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lstarnes

6/23/16

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	17BP.9.R.72	X-24



11/2/2009
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-25

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

925
920
915
910
905
900
895
890
885

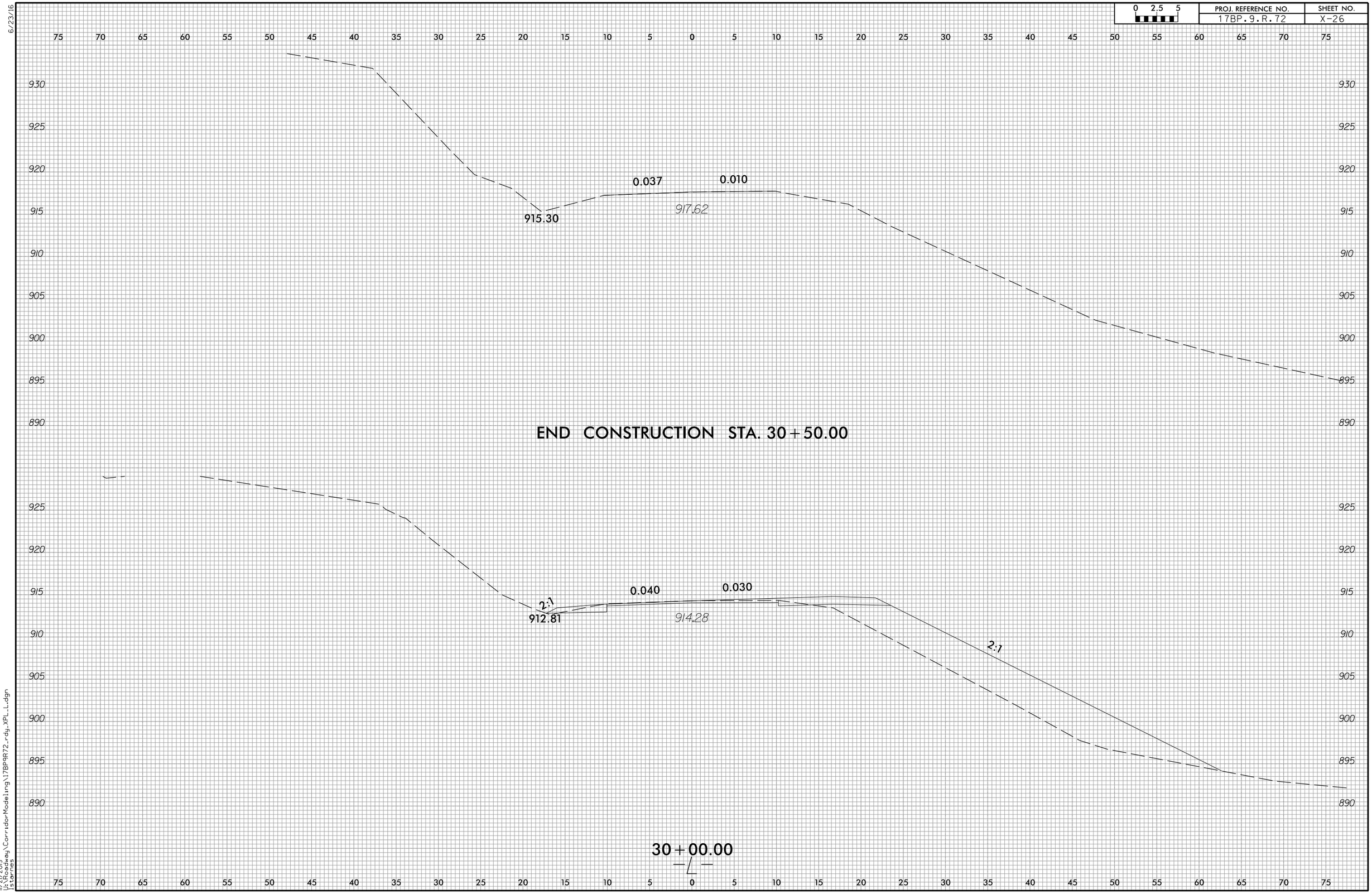
0.040
0.040
2:1
909.28
909.38
910.89
2:1

29+50.00

11/2/2018
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6/23/16

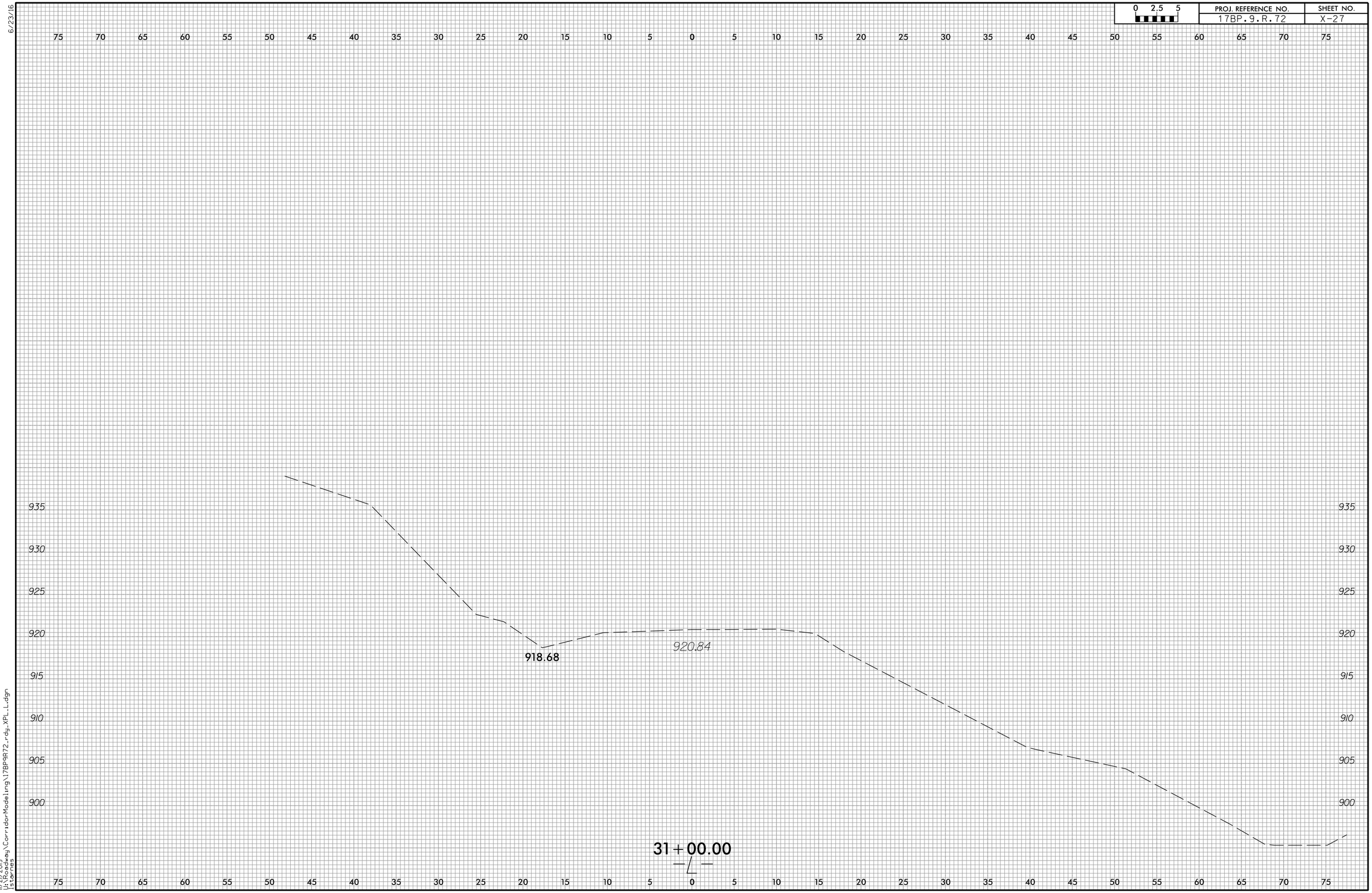
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6/23/16

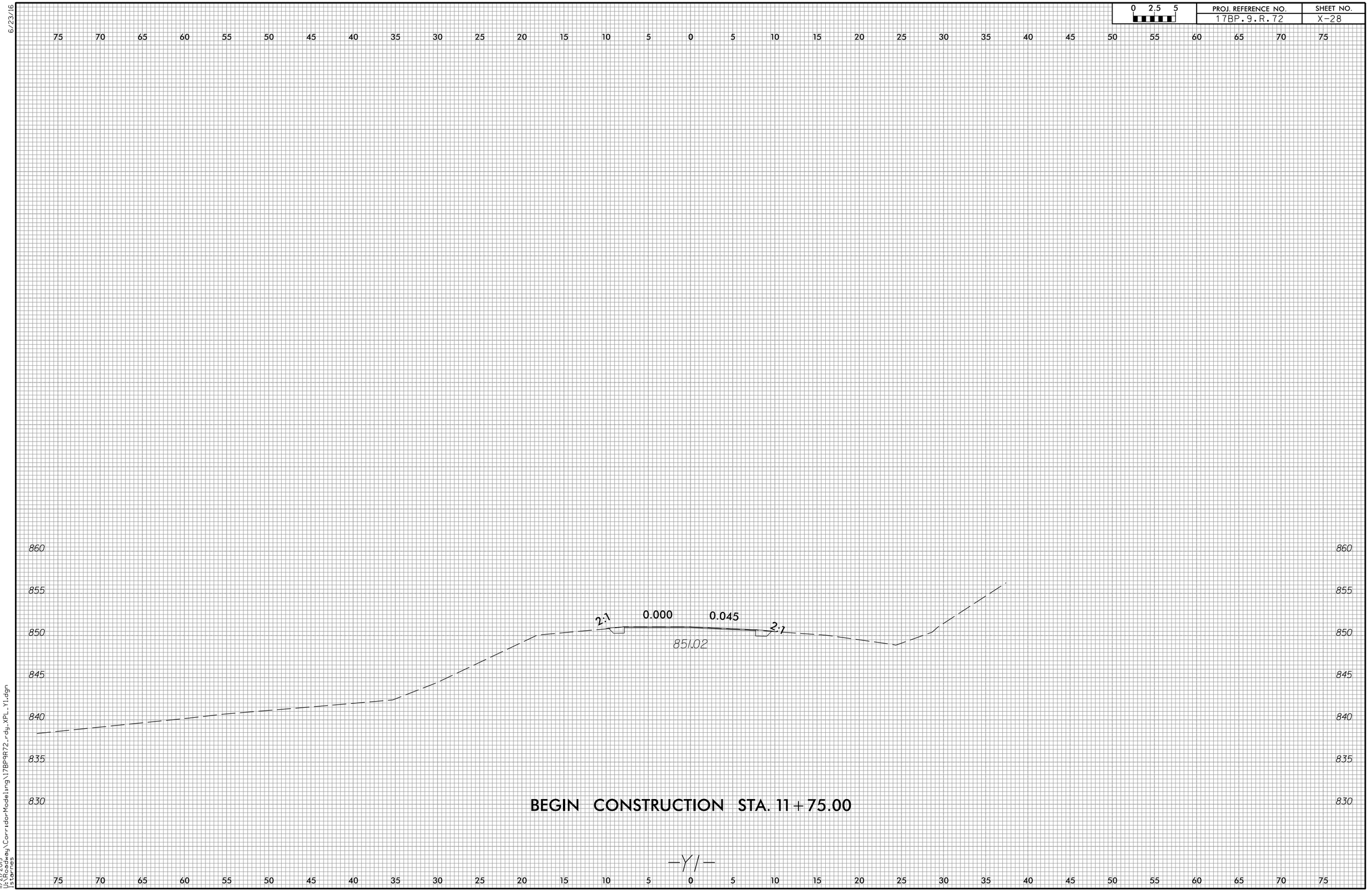
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	17BP.9.R.72	X-27



11/2/2019
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-28



11/2/2019
USACEDotMyCorridorModeling\17BP9R72_rdy_XPL_Y1.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-29

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

885 880 875 870 865 860 855 850 845 840 835 830

6:1 0.014 0.032 2:1

852.95

12+00.00

—Y1—

11/21/2019
U:\Roadway\CorridorModeling\17BP9R72_rdy_XPL_Y1.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-30

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 75

915 910 905 900 895 890 885 880 875 870 865 860 855 850 845 840 835 830

0.020 0.020

3:1 2:1

855.38

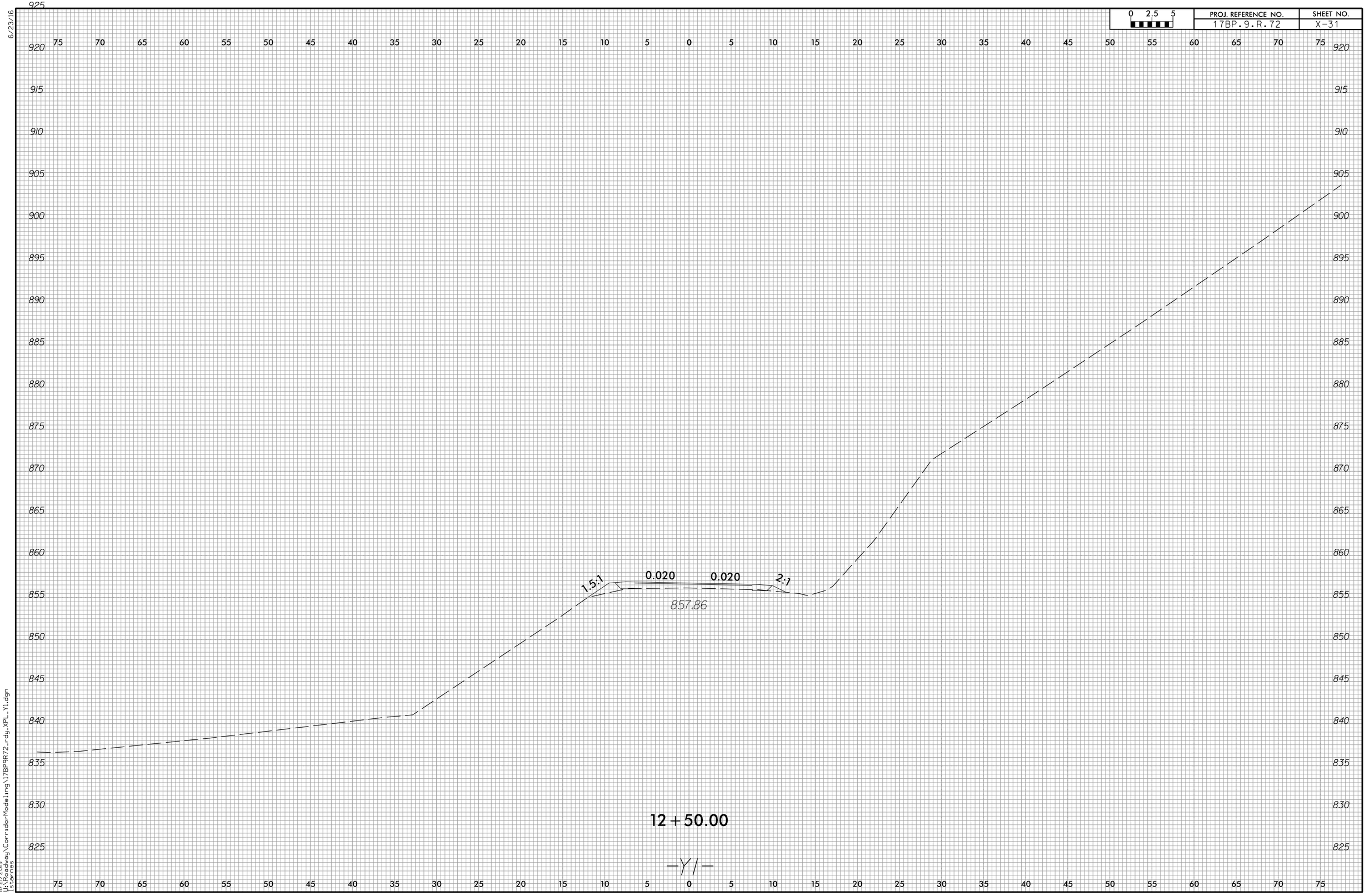
12+25.00

-Y1-

11/2/2009
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jstarnes

6/23/16

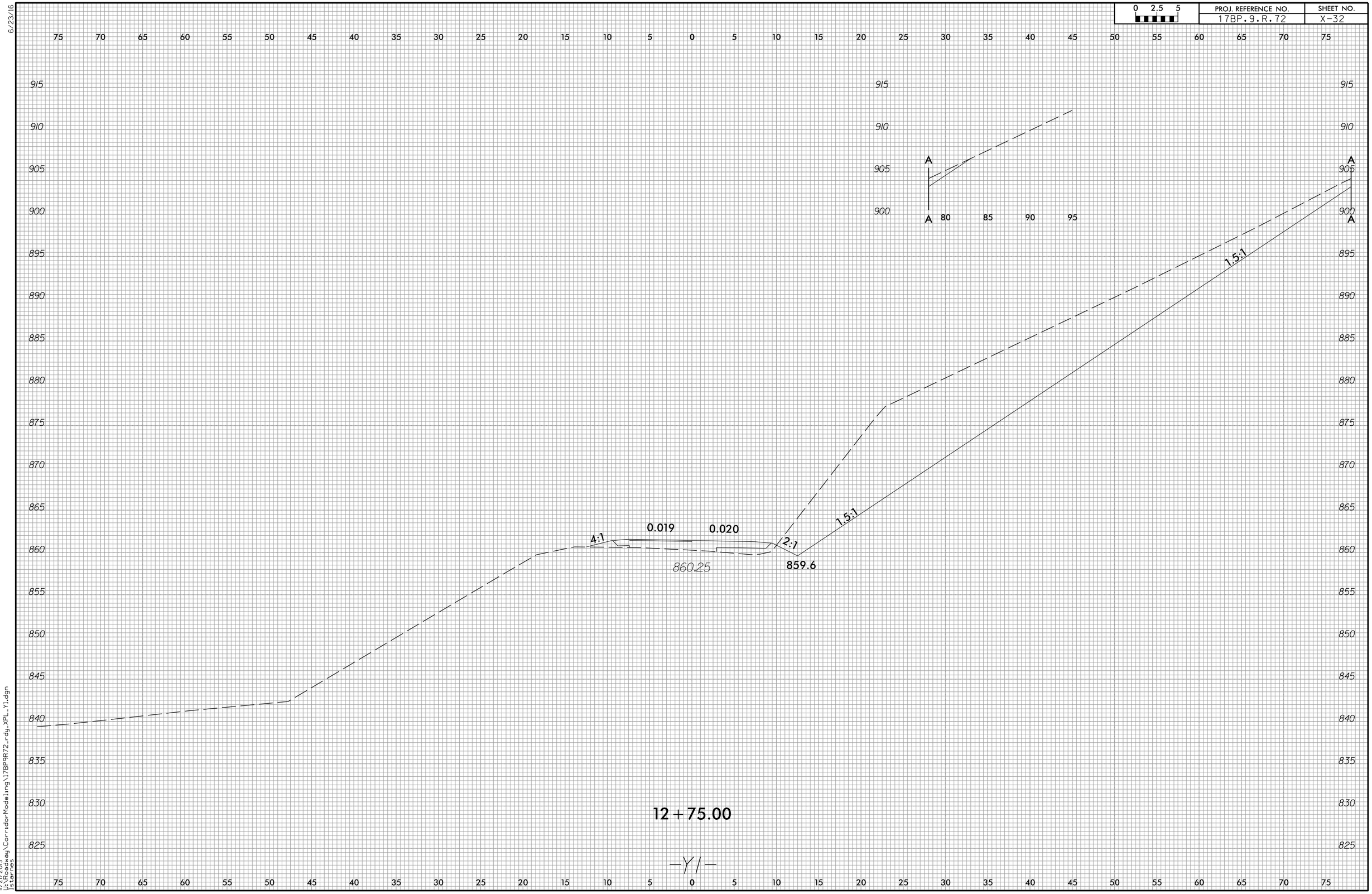
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	17BP.9.R.72	X-31



11/2/2018
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lstarnes

6/23/16

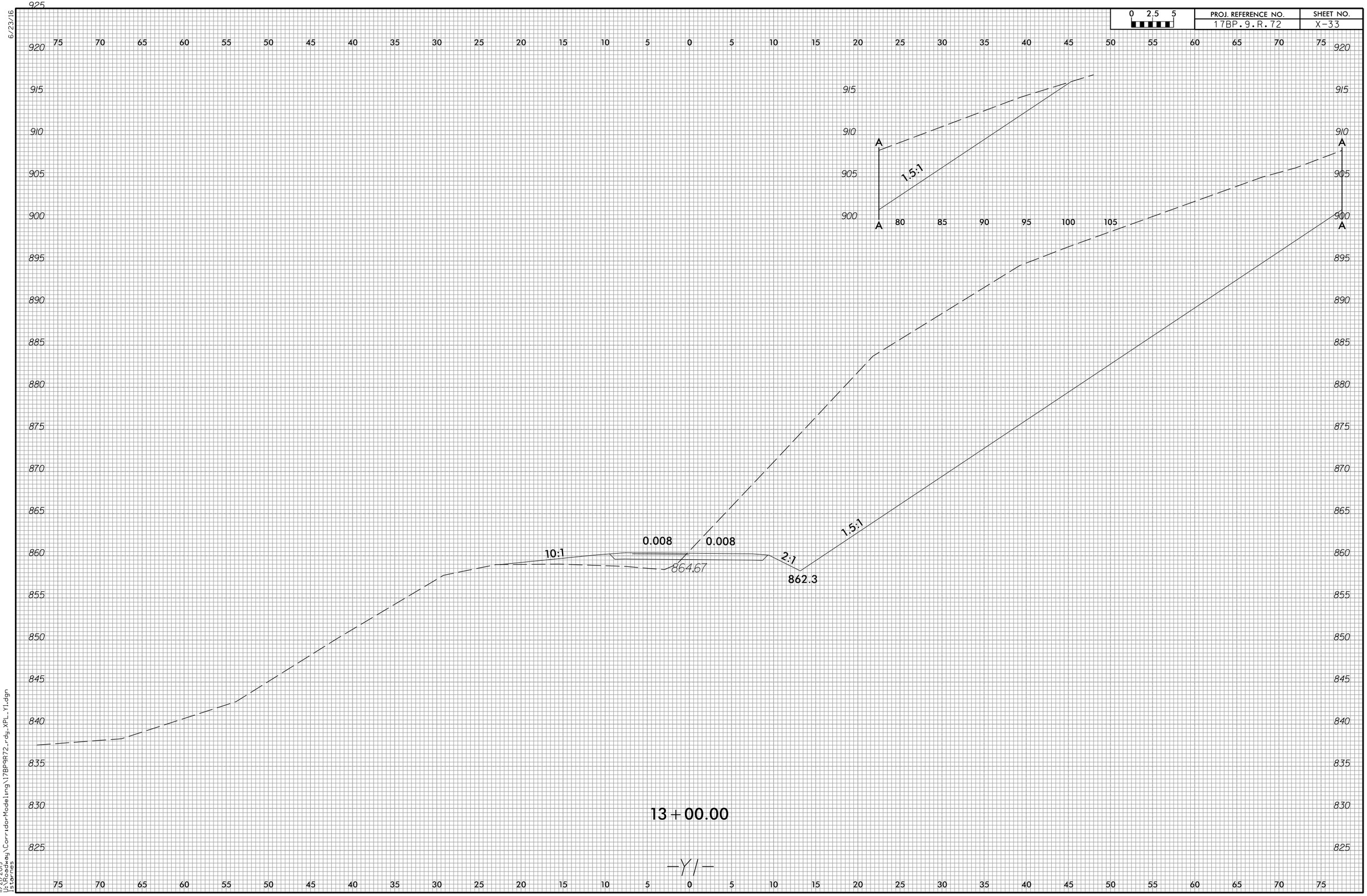
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	17BP.9.R.72	X-32



11/21/2019
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jstarnes

6/23/16

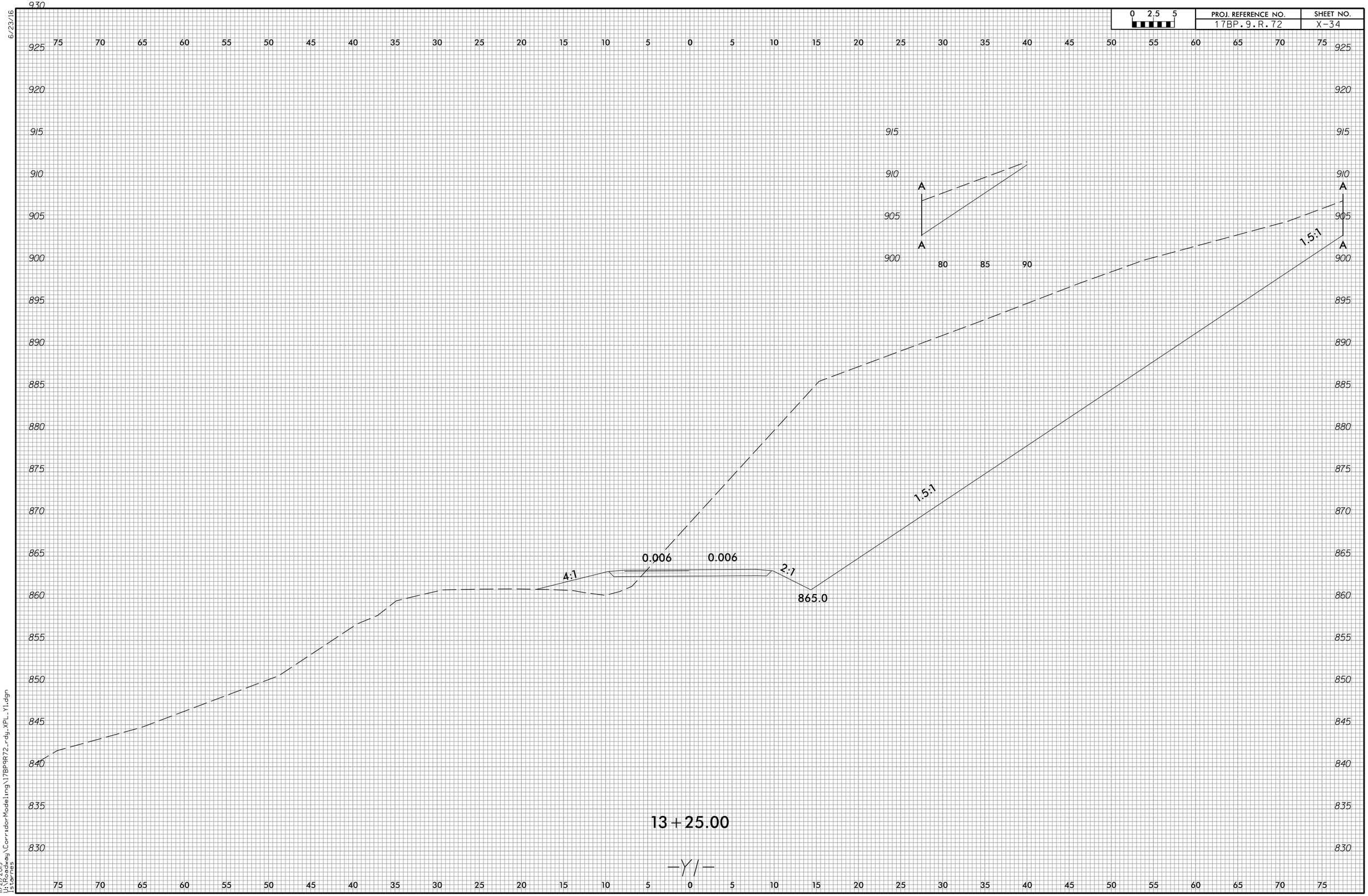
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	17BP.9.R.72	X-33



11/21/2019
\\KRDOT\Projects\Survey\CorridorModeling\17BP9R72_rdy_XPL_Y1.dgn
jstarnes

6/23/16

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	17BP.9.R.72	X-34

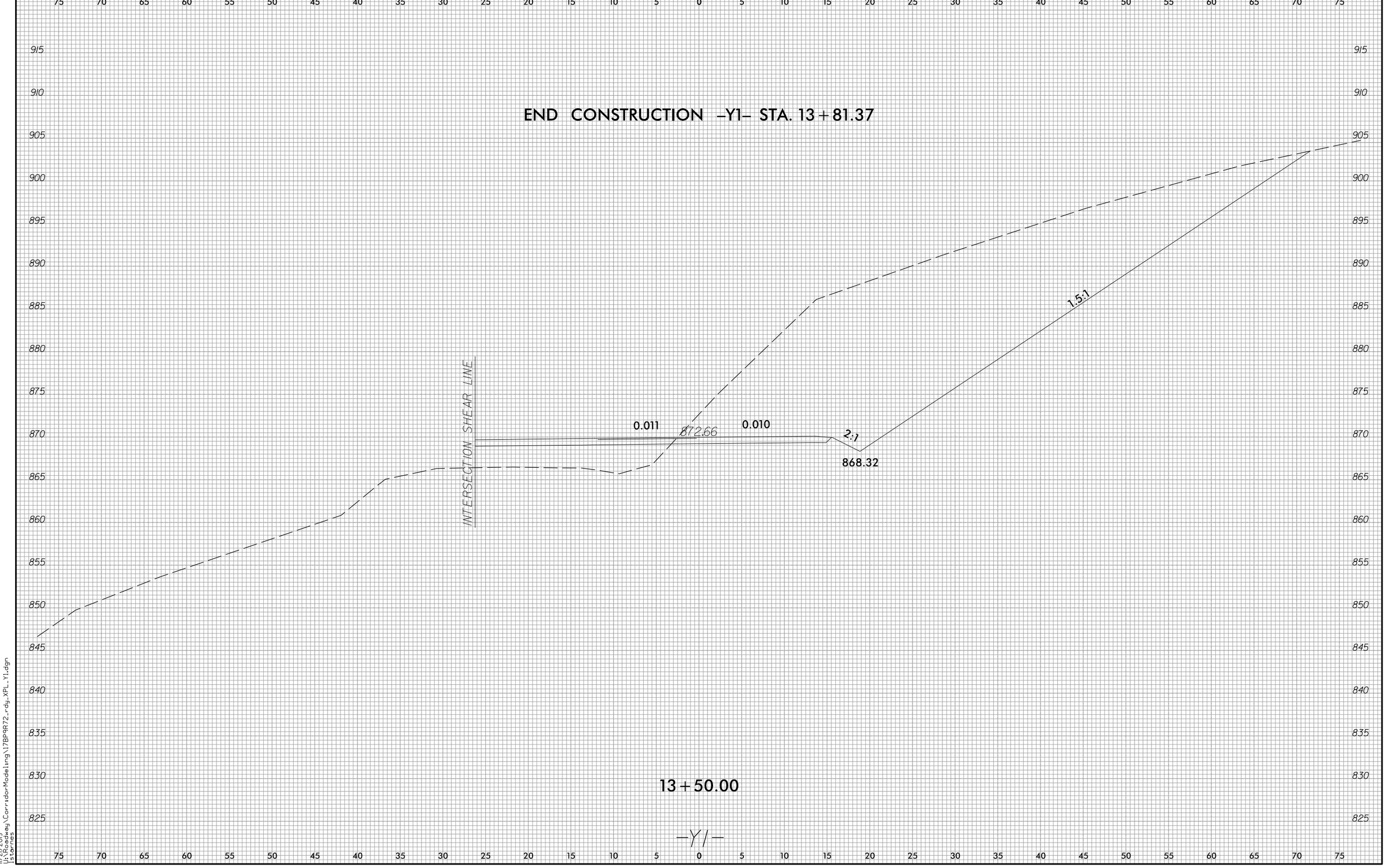


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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-35

END CONSTRUCTION –Y1– STA. 13+81.37



11/2/2018
\\KHOUeng\CorridorModeling\17BP9R72_rdy_XPL_Y1.dgn
lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-36

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

905
900
895
890
885
880
875
870
865
860
855
850
845
840
835
830
825

867.11

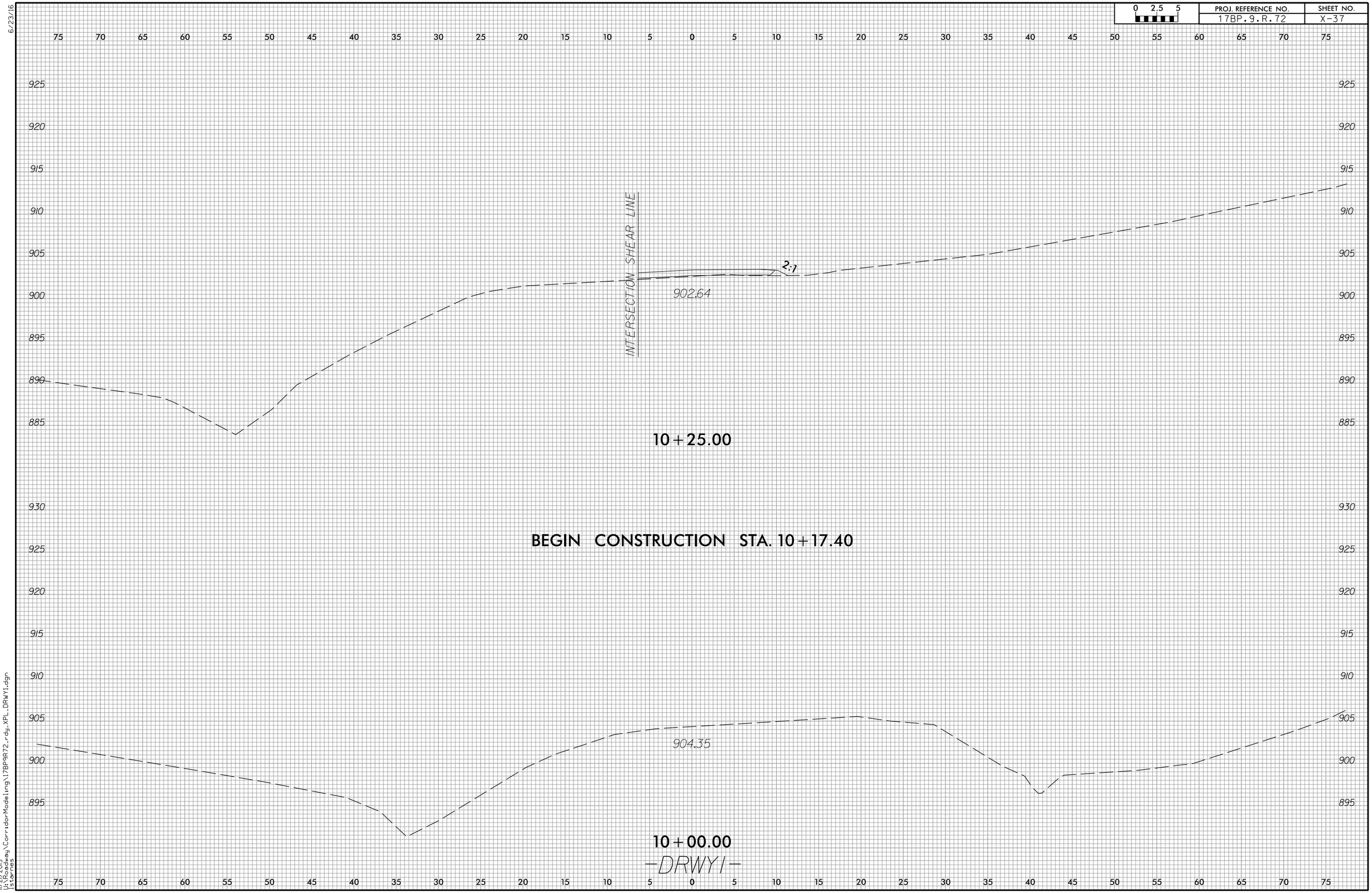
13+75.00

—Y1—

11/21/2019
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jstarnes

6/23/16

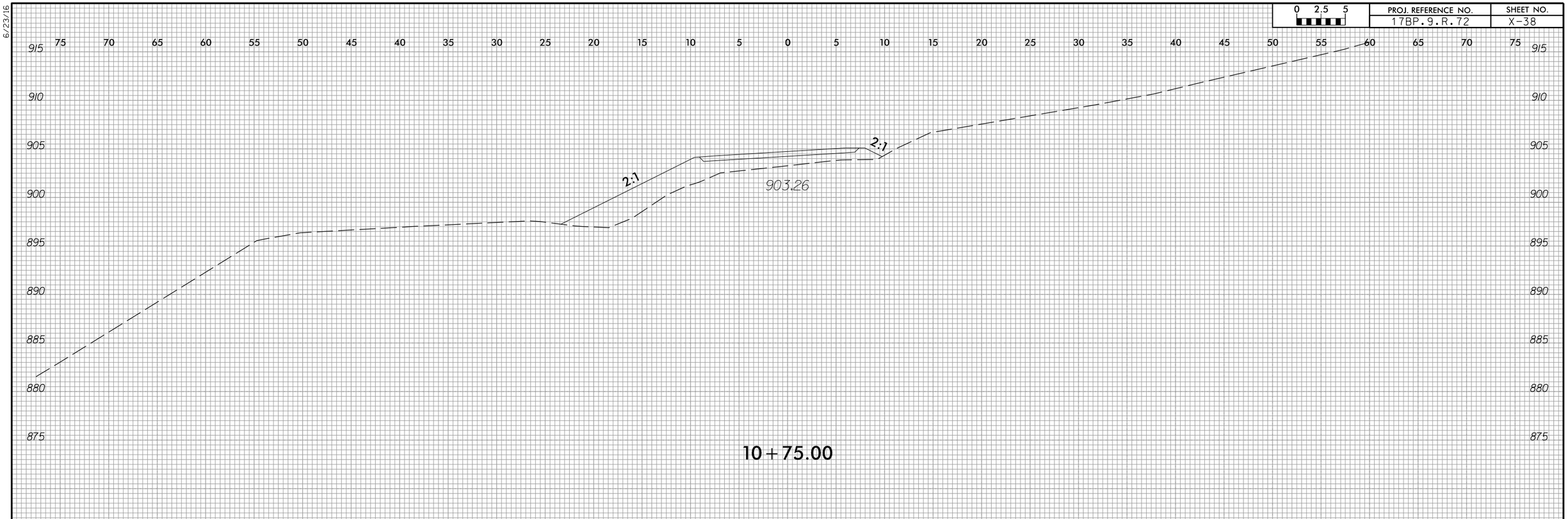
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	17BP.9.R.72	X-37



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lstarnes

6/23/16

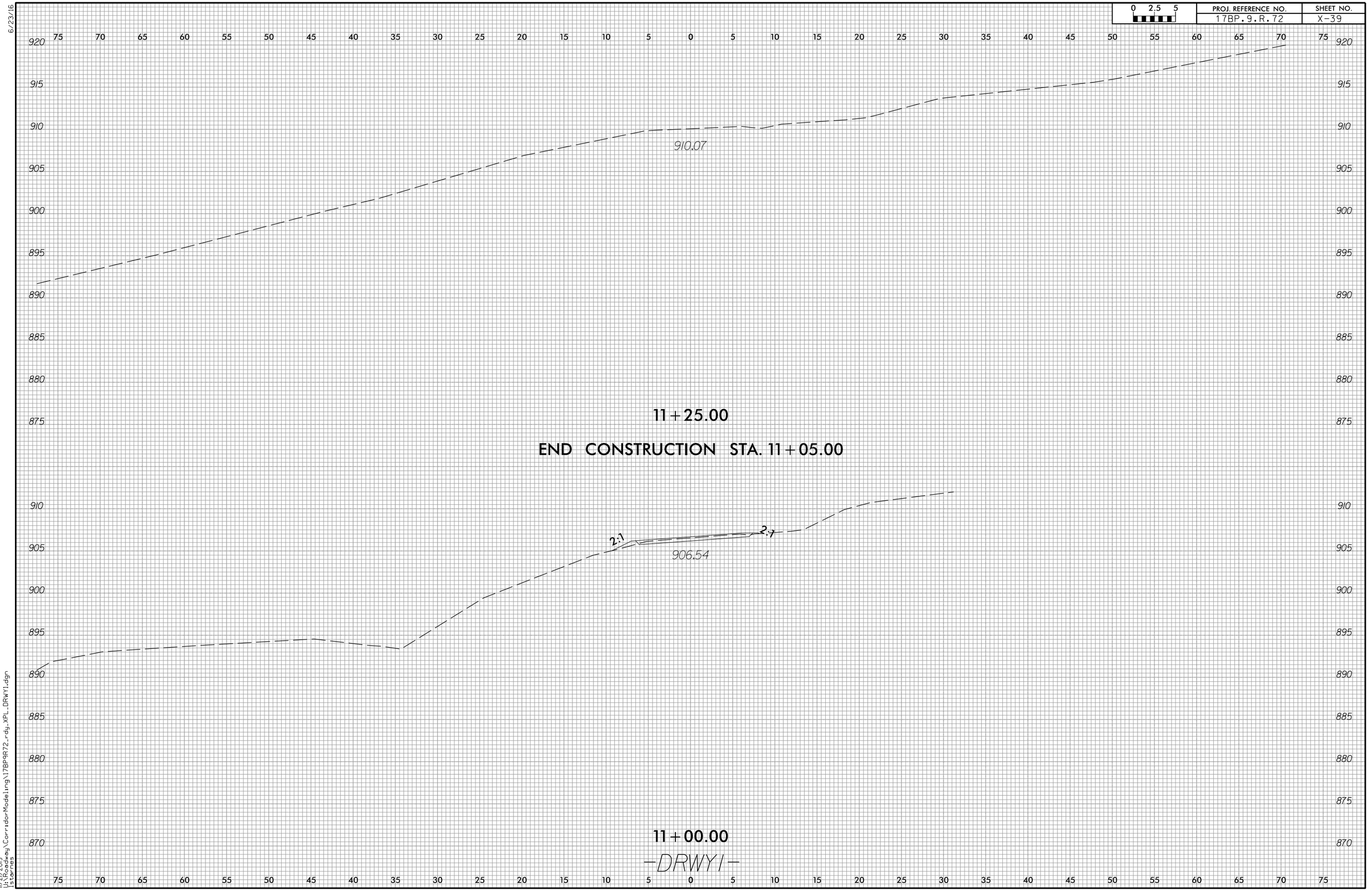
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	17BP.9.R.72	X-38



11/2/2018
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6/23/16

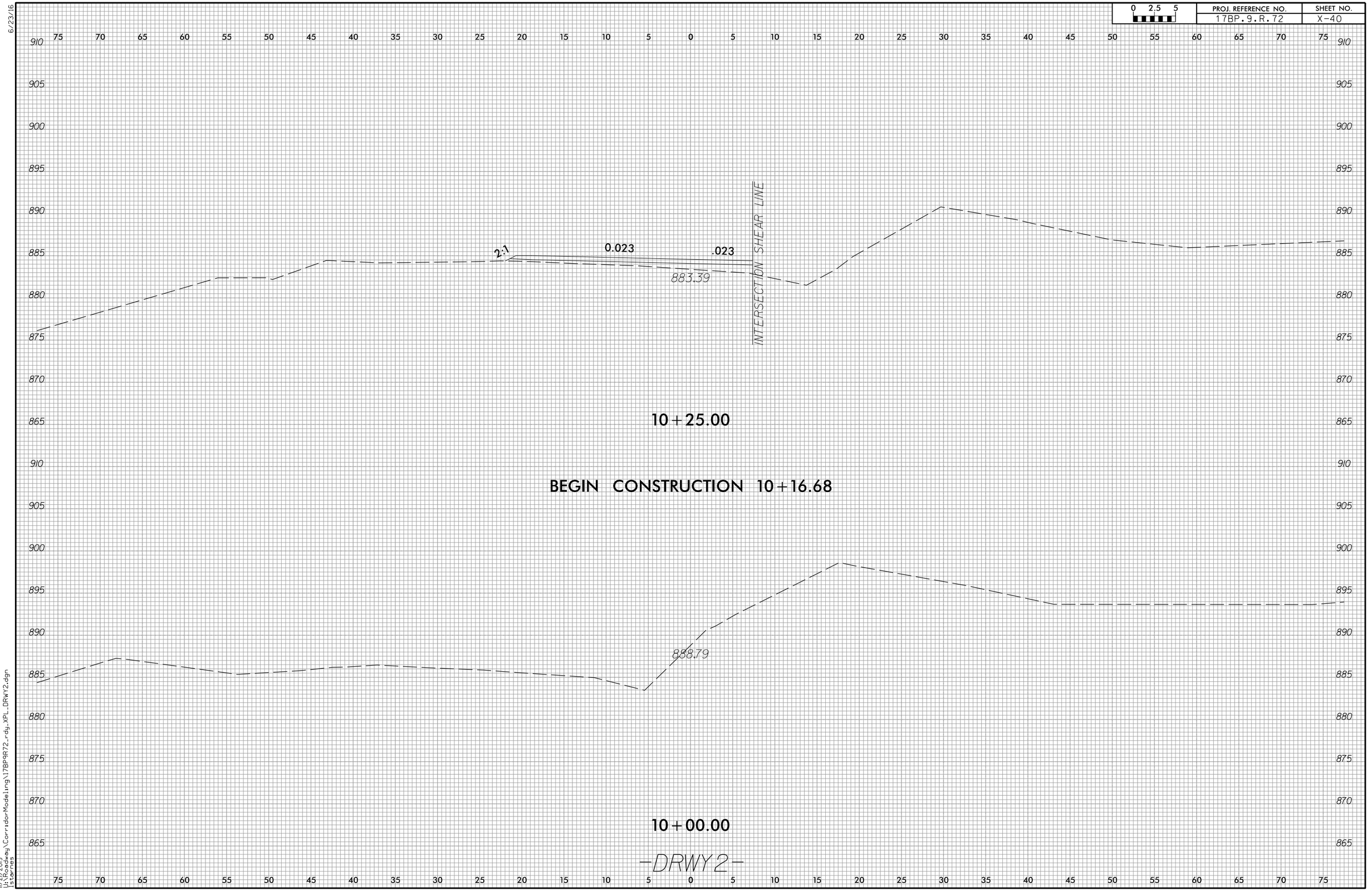
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	17BP.9.R.72	X-39



11/21/2019
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-40



11/2/2009
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lstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-41

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

905 900 895 890 885 880 875 870 865 860

0.02 0.02

879.92

10+75.00

905 900 895 890 885 880 875 870 865 860

2:1 0.014 0.014

882.27

INTERSECTION SHEAR LINE

10+50.00

-DRWY2-

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

11/21/2019
U:\Roadway\CorridorModeling\17BP9R72_rdg_XPL_DRWY2.dgn
jstarnes

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.9.R.72	X-42

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

905 900 895 890 885 880 875 870 865 860

873.50

11+25.00

0.02 0.02

876.90

END CONSTRUCTION STA. 11+00.00

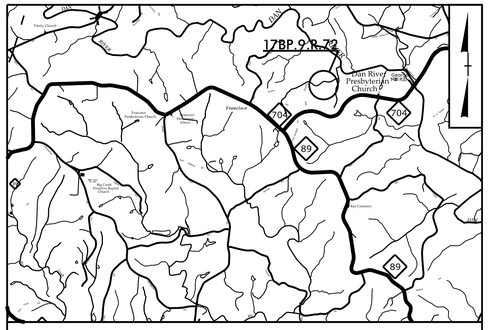
-DRWY2-

11/2/2019
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lstarnes

09/08/99

TIP PROJECT: 17BP.9.R.72

CONTRACT: DI00233



VICINITY MAP

STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STOKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.9.R.72		

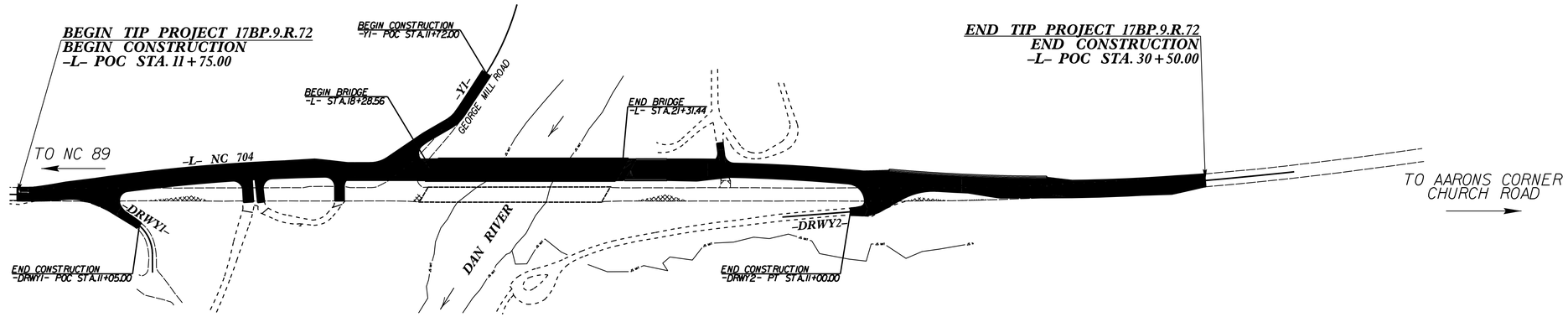
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.9.R.72		PE
17BP.9.R.72		R/W & UTIL
17BP.9.R.72		CONSTR.

LOCATION: BRIDGE NO. 8 (84008) ON NC 704 OVER DAN RIVER

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



NAD 83/2011



THIS PROJECT IS NOT WITHIN ANY MUNICPAL BOUNDARIES
THIS IS NOT A CONTROL OF ACCESS PROJECT
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K VALUE
CLEARING ON THIS PROJECT SHALL BE IN ACCORDANCE WITH METHOD III.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2017 = 460

V = 60 MPH

FUNC CLASS = RURAL MAJOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.9.R.72 = .298 MI

LENGTH OF STRUCTURE TIP PROJECT 17BP.9.R.72 = 0.057 MI

TOTAL LENGTH OF PROJECT 17BP.9.R.72 = 0.355 MI

NCDOT CONTACT: DANIEL DAGENHART, PE
NCDOT DIVISION 9 BRIDGE MANAGER

PREPARED IN THE OFFICE OF:
Stantec
STANTEC CONSULTING
301 Jones Franklin Road |Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866 | Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
500 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 2019

LETTING DATE: FEBRUARY 26, 2020

TOMMY DUDECK, P.E.
PROJECT ENGINEER

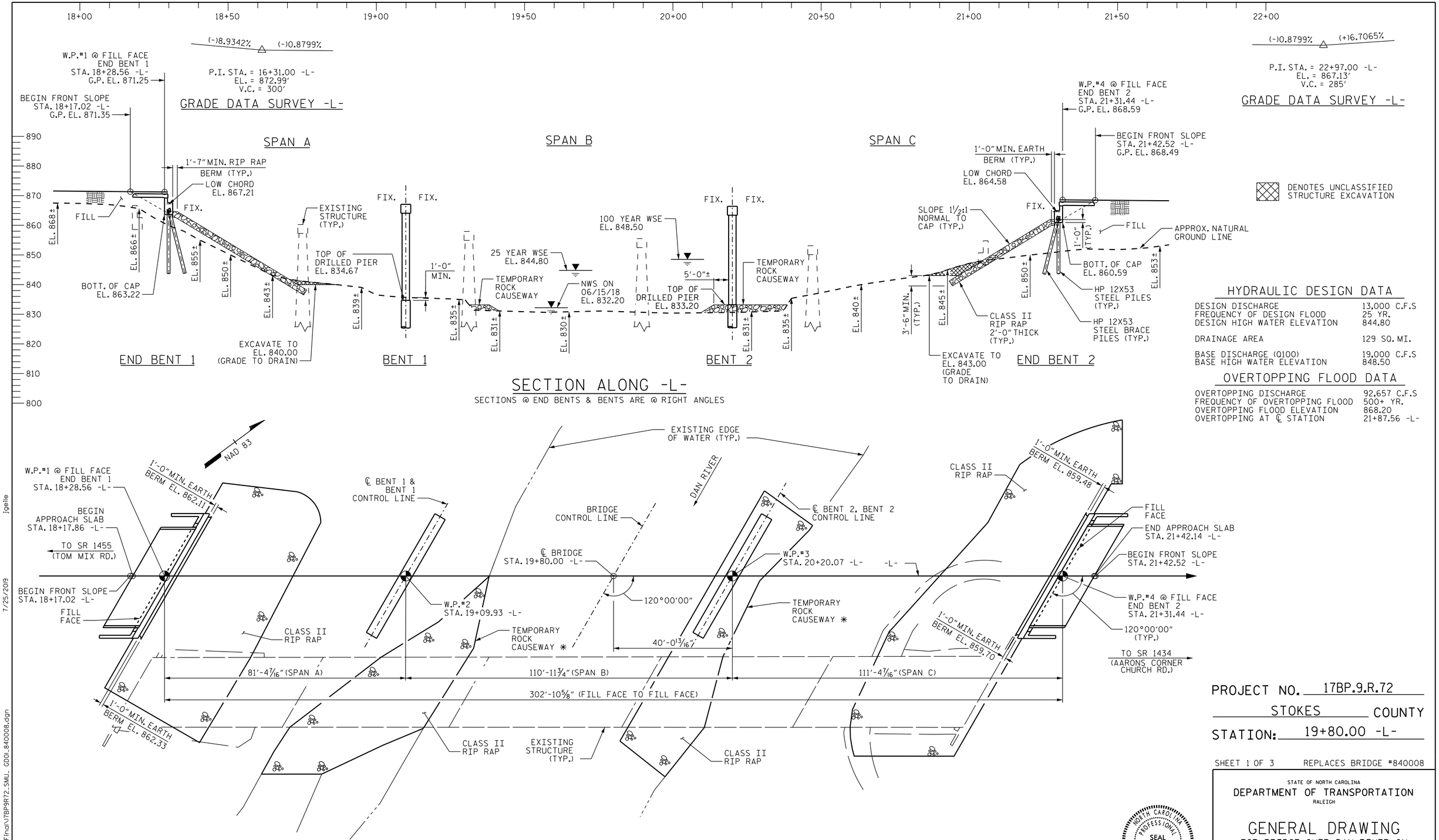
NICHOLAS D'AIUTO, P.E.
PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

7/25/2019 7:02:45 PM ndaiuto

U:\Structures\Drafting\Final\17BP9R72_SMU_TSH_840008.dgn

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SECTION ALONG -L-

SECTIONS @ END BENTS & BENTS ARE @ RIGHT ANGLES

HYDRAULIC DESIGN DATA

DESIGN DISCHARGE	13,000 C.F.S
FREQUENCY OF DESIGN FLOOD	25 YR.
DESIGN HIGH WATER ELEVATION	844.80
DRAINAGE AREA	129 SQ. MI.
BASE DISCHARGE (Q100)	19,000 C.F.S
BASE HIGH WATER ELEVATION	848.50

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	92,657 C.F.S
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD ELEVATION	868.20
OVERTOPPING AT ℄ STATION	21+87.56 -L-

PLAN ALONG -L-

(PILES NOT SHOWN FOR CLARITY)

* FOR INSTALLATION SEQUENCE OF TEMPORARY ROCK CAUSEWAYS, SEE PERMIT DRAWINGS.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #840008

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER DAN RIVER ON
NC 704 (WESLEY D. WEBSTER HWY)
BETWEEN SR 1455 (TOM MIX RD.) AND
SR 1434 (AARONS CORNER CHURCH RD.)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

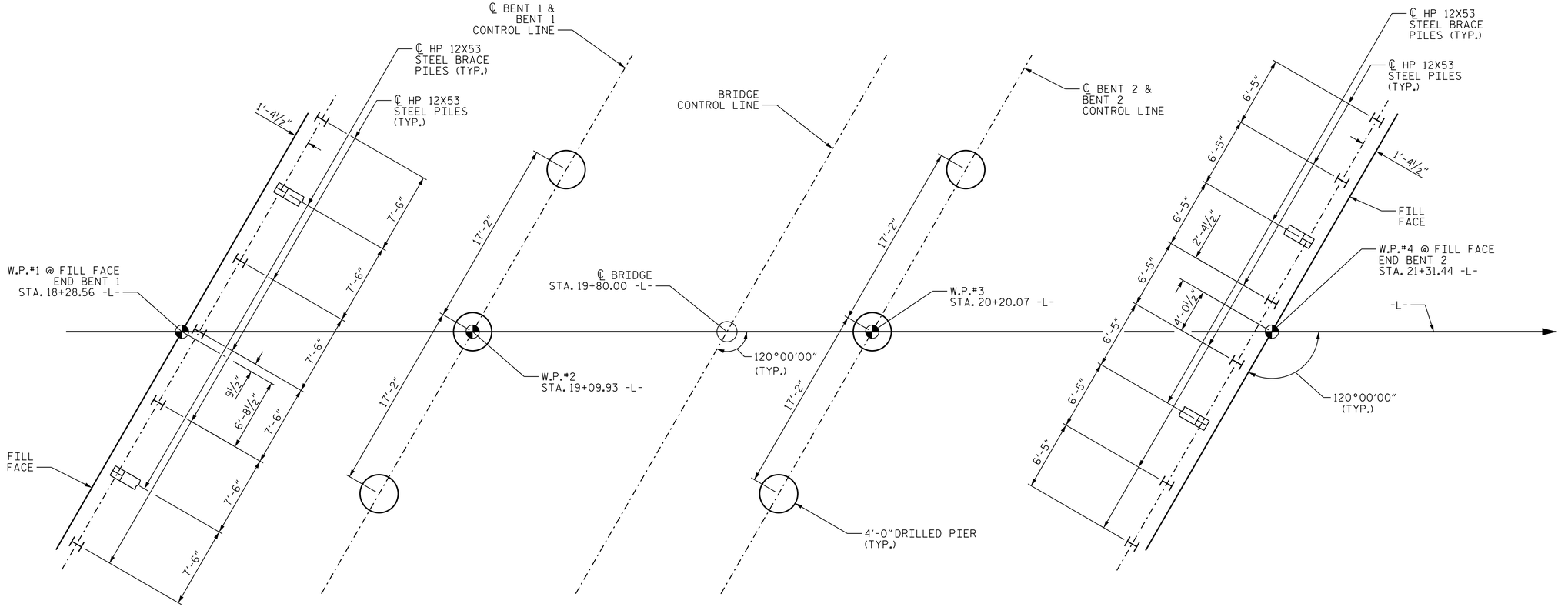
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			32

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License No. F-0672

DRAWN BY : J. E. HAGENBUSH DATE : 10/29/18
CHECKED BY : N. D'AIUTO DATE : 08/06/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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7/25/2019
jgelle

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END BENT 1 BENT 1 BENT 2 END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE
SHOWN TO CENTERLINE OF PILES AND DRILLED PIERS

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

STEEL PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 620 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 115 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIES AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 827 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 819.0 FT (LT) AND 815.0 FT (CT AND RT) WITH THE REQUIRED TIP RESISTANCE AND PENETRATION OF AT LEAST 8 FT (LT) ANND 12 FT (CT AND RT) INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 826 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 620 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 115 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIES AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 824.5 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 816.5 FT WITH THE REQUIRED TIP RESISTANCE AND PENETRATION OF AT LEAST 8 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS ELEVATION 824 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

STEEL PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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DRAWN BY : J. E. HAGENBUSH DATE : 10/29/18
CHECKED BY : N. D'AIUTO DATE : 08/06/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Nicholas D'Aiuto
7/25/2019

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PROJECT NO. 17BP.9.R.72
STOKES COUNTY
STATION: 19+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FOUNDATION LAYOUT

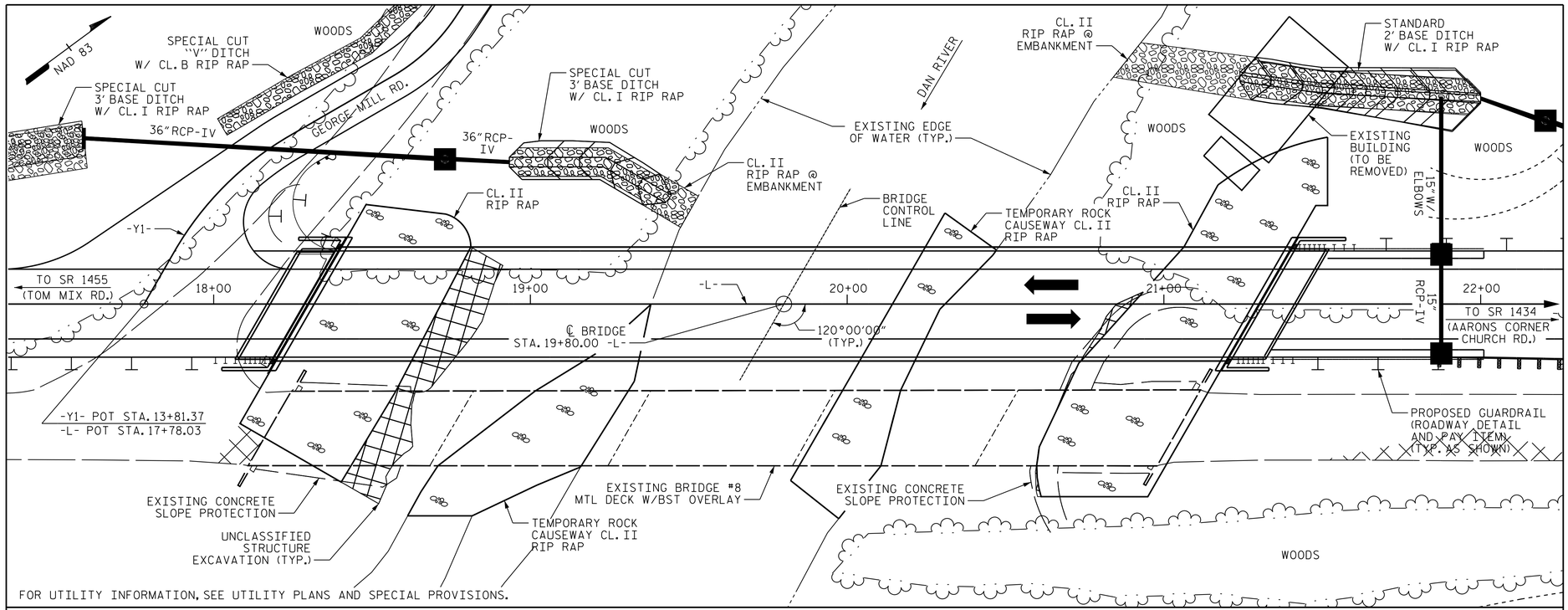
FOR BRIDGE OVER DAN RIVER ON
NC 704 (WESLEY D. WEBSTER HWY)
BETWEEN SR 1455 (TOM MIX RD.) AND
SR 1434 (AARONS CORNER CHURCH RD.)

REVISIONS						SHEET NO.
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BM#1: RAILROAD SPIKE SET IN 20"BIRCH TREE. STA. 18+97.68 -L-, 233.06' RT. EL. 835.42', N1008554 E1617133



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 5 SPANS (3 @ 57'-6" 1 @ 58'-3", 1 @ 56'-3") ON CONCRETE DECK ON REINFORCED CONC. DECK GIRDERS; CLEAR ROADWAY WIDTH OF 24'-0" ON CONCRETE CAP WITH CONCRETE PILES AT END BENTS AND CONCRETE CAP ON CONCRETE COLUMNS AT BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.

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

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

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

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 COST 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 19+80.00 -L-.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+80.00 -L-.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENENCE & REMOVAL OF TEMPORARY ACCESS AT STA. 19+80.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 19+80.00 -L-	ASBESTOS ASSESSMENT	4'-0" DIA. DRILLED PIERS IN SOIL	4'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" DIA DRILLED PIER	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 19+80.00 -L-	REINFORCING STEEL	SPIRAL REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES		STEEL PILE POINTS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	LUMP SUM	CU.YDS.	LUMP SUM	LBS.	LBS.	EA.	NO.	LIN.FT.	EA.
SUPERSTRUCTURE																
END BENT 1									33.7		5,195		7	7	220	7
BENT 1				18.4	38.0	24.4	1		87.1		12,983	3,647				
BENT 2				21.3	29.0	26.1	1		85.3		12,846	3,563				
END BENT 2									33.9		5,240		8	8	200	8
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	39.7	67.0	50.5	2	LUMP SUM	240.0	LUMP SUM	36,264	7,210	15	15	420	15

TOTAL BILL OF MATERIAL CONT'D

TWO BAR METAL RAIL	1'-2" X 2'-6" (NOM.) CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	NO.	LIN.FT.
583.72	600.57			LUMP SUM	36	3,600.00
		405.0	450.0			
		180.0	200.0			
		175.0	195.0			
		555.0	615.0			
583.72	600.57	1,315.0	1,460.0	LUMP SUM	36	3,600.00

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER DAN RIVER ON NC 704 (WESLEY D. WEBSTER HWY) BETWEEN SR 1455 (TOM MIX RD.) AND SR 1434 (AARONS CORNER CHURCH RD.)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Electronically signed by: Nicholas D'Aiuto 7/25/2019

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1			3			TOTAL SHEETS
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DRAWN BY : J. E. HAGENBUSH DATE : 10/30/18
CHECKED BY : N. D'AIUTO DATE : 08/03/18

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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

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⟩	1.87	--	1.75	0.197	3.67	A	I	39.13	0.610	**1.87**	A	EL	**7.13**	0.80	0.197	3.93	A	I	39.13	
		HL-93(Opr)	N/A	--	2.47	--	1.35	0.197	4.75	A	I	39.13	0.610	2.47	A	EL	7.13	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	2.43	87.480	1.75	0.197	4.88	A	I	39.13	0.610	**2.43**	A	EL	**7.13**	0.80	0.197	4.62	A	I	39.13	
		HS-20(Opr)	36.000	--	3.20	115.200	1.35	0.197	6.33	A	I	39.13	0.610	3.20	A	EL	7.13	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	7.66	103.410	1.40	0.197	14.04	A	I	39.13	0.610	7.66	A	EL	7.13	0.80	0.197	12.99	A	I	39.13	
		SNGARBS2	20.000	--	5.36	107.200	1.40	0.197	10.34	A	I	39.13	0.610	5.36	A	EL	7.13	0.80	0.197	9.57	A	I	39.13	
		SNAGRIS2	22.000	--	4.96	109.120	1.40	0.197	9.74	A	I	39.13	0.610	4.96	A	EL	7.13	0.80	0.197	9.01	A	I	39.13	
		SNCOTTS3	27.250	--	3.73	101.643	1.40	0.197	6.96	A	I	39.13	0.610	3.73	A	EL	7.13	0.80	0.197	6.45	A	I	39.13	
		SNAGGRS4	34.925	--	3.04	106.172	1.40	0.197	5.78	A	I	39.13	0.610	3.04	A	EL	7.13	0.80	0.197	5.35	A	I	39.13	
		SNS5A	35.550	--	3.08	109.494	1.40	0.197	5.66	A	I	39.13	0.610	3.08	A	EL	7.13	0.80	0.197	5.24	A	I	39.13	
		SNS6A	39.950	--	2.78	111.061	1.40	0.197	5.18	A	I	39.13	0.610	2.78	A	EL	7.13	0.80	0.197	4.79	A	I	39.13	
		SNS7B	42.000	--	2.72	114.240	1.40	0.197	4.93	A	I	39.13	0.610	2.72	A	EL	7.13	0.80	0.197	4.56	A	I	39.13	
	TTST	TNAGRIT3	33.000	--	3.35	110.550	1.40	0.197	6.31	A	I	39.13	0.610	3.35	A	EL	7.13	0.80	0.197	5.84	A	I	39.13	
		TNT4A	33.075	--	3.27	108.155	1.40	0.197	6.33	A	I	39.13	0.610	3.27	A	EL	7.13	0.80	0.197	5.86	A	I	39.13	
		TNT6A	41.600	--	2.89	120.224	1.40	0.197	5.16	A	I	39.13	0.610	2.89	A	EL	7.13	0.80	0.197	4.77	A	I	39.13	
		TNT7A	42.000	--	2.83	118.860	1.40	0.197	5.18	A	I	39.13	0.610	2.83	A	EL	7.13	0.80	0.197	4.79	A	I	39.13	
		TNT7B	42.000	--	2.66	111.720	1.40	0.197	5.33	A	I	39.13	0.610	2.66	A	EL	7.13	0.80	0.197	4.93	A	I	39.13	
		TNAGRIT4	43.000	--	2.57	110.510	1.40	0.197	5.09	A	I	39.13	0.610	2.57	A	EL	7.13	0.80	0.197	4.71	A	I	39.13	
		TNAGT5A	45.000	--	2.55	114.750	1.40	0.197	4.80	A	I	39.13	0.610	2.55	A	EL	7.13	0.80	0.197	4.45	A	I	39.13	
		TNAGT5B	45.000	⟨3⟩	2.44	109.800	1.40	0.197	4.75	A	I	39.13	0.610	**2.44**	A	EL	**7.13**	0.80	0.197	4.40	A	I	39.13	

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.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

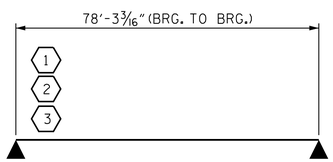
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

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DRAWN BY : J. B. GEILE DATE : 11/20/18
CHECKED BY : N. D'AIUTO DATE : 4/4/19

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

DocuSigned by: Nicholas D'Aiuto 7/25/2019

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PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 80' BOX BEAM UNIT 120° SKEW

(NON-INTERSTATE TRAFFIC)

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

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)	1.51	--	1.75	0.185	**1.51**	B, C	I	**54.13**	0.619	1.53	B, C	EL	98.13	0.80	0.185	1.83	B, C	I	54.13	
		HL-93(Opr)	N/A	--	1.95	--	1.35	0.185	1.95	B, C	I	54.13	0.619	2.04	B, C	EL	98.13	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	2.04	73.440	1.75	0.185	2.15	B, C	I	54.13	0.619	2.18	B, C	EL	98.13	0.80	0.185	**2.04**	B, C	I	**54.13**	
		HS-20(Opr)	36.000	--	2.79	100.440	1.35	0.185	2.79	B, C	I	54.13	0.619	2.88	B, C	EL	98.13	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.46	87.210	1.40	0.185	6.46	B, C	I	54.13	0.619	7.56	B, C	EL	98.13	0.80	0.185	6.48	B, C	I	54.13	
		SNGARBS2	20.000	--	4.64	92.800	1.40	0.185	4.64	B, C	I	54.13	0.619	5.23	B, C	EL	98.13	0.80	0.185	4.66	B, C	I	54.13	
		SNAGRIS2	22.000	--	4.33	95.260	1.40	0.185	4.33	B, C	I	54.13	0.619	4.80	B, C	EL	98.13	0.80	0.185	4.34	B, C	I	54.13	
		SNCOTTS3	27.250	--	3.21	87.473	1.40	0.185	3.21	B, C	I	54.13	0.619	3.61	B, C	EL	98.13	0.80	0.185	3.22	B, C	I	54.13	
		SNAGGRS4	34.925	--	2.62	90.718	1.40	0.185	2.62	B, C	I	54.13	0.619	2.77	B, C	EL	98.13	0.80	0.185	2.63	B, C	I	54.13	
		SNS5A	35.550	--	2.56	91.008	1.40	0.185	2.56	B, C	I	54.13	0.619	2.71	B, C	EL	98.13	0.80	0.185	2.57	B, C	I	54.13	
		SNS6A	39.950	--	2.32	92.684	1.40	0.185	2.32	B, C	I	54.13	0.619	2.49	B, C	EL	98.13	0.80	0.185	2.33	B, C	I	54.13	
		SNS7B	42.000	--	2.21	92.820	1.40	0.185	2.21	B, C	I	54.13	0.619	2.38	B, C	EL	98.13	0.80	0.185	2.22	B, C	I	54.13	
	TTST	TNAGRIT3	33.000	--	2.83	93.390	1.40	0.185	2.83	B, C	I	54.13	0.619	2.98	B, C	EL	98.13	0.80	0.185	2.84	B, C	I	54.13	
		TNT4A	33.075	--	2.83	93.602	1.40	0.185	2.83	B, C	I	54.13	0.619	3.11	B, C	EL	98.13	0.80	0.185	2.84	B, C	I	54.13	
		TNT6A	41.600	--	2.29	95.264	1.40	0.185	2.29	B, C	I	54.13	0.619	2.46	B, C	EL	98.13	0.80	0.185	2.30	B, C	I	54.13	
		TNT7A	42.000	--	2.29	96.180	1.40	0.185	2.29	B, C	I	54.13	0.619	2.42	B, C	EL	98.13	0.80	0.185	2.30	B, C	I	54.13	
		TNT7B	42.000	--	2.31	97.020	1.40	0.185	2.34	B, C	I	54.13	0.619	2.31	B, C	EL	98.13	0.80	0.185	2.34	B, C	I	54.13	
		TNAGRIT4	43.000	--	2.25	96.750	1.40	0.185	2.25	B, C	I	54.13	0.619	2.33	B, C	EL	98.13	0.80	0.185	2.25	B, C	I	54.13	
		TNAGT5A	45.000	--	2.13	95.850	1.40	0.185	2.13	B, C	I	54.13	0.619	2.22	B, C	EL	98.13	0.80	0.185	2.14	B, C	I	54.13	
		TNAGT5B	45.000	(3)	2.11	94.950	1.40	0.185	**2.11**	B, C	I	**54.13**	0.619	2.24	B, C	EL	98.13	0.80	0.185	2.12	B, C	I	54.13	

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.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

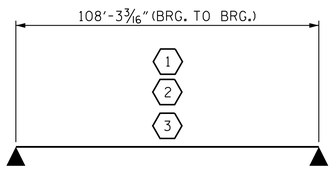
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

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DRAWN BY : J. B. GEILE DATE : 11/20/18
CHECKED BY : N. D'AIUTO DATE : 4/4/19

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

DocuSigned by: Nicholas D'Aiuto 7/25/2019

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PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 2

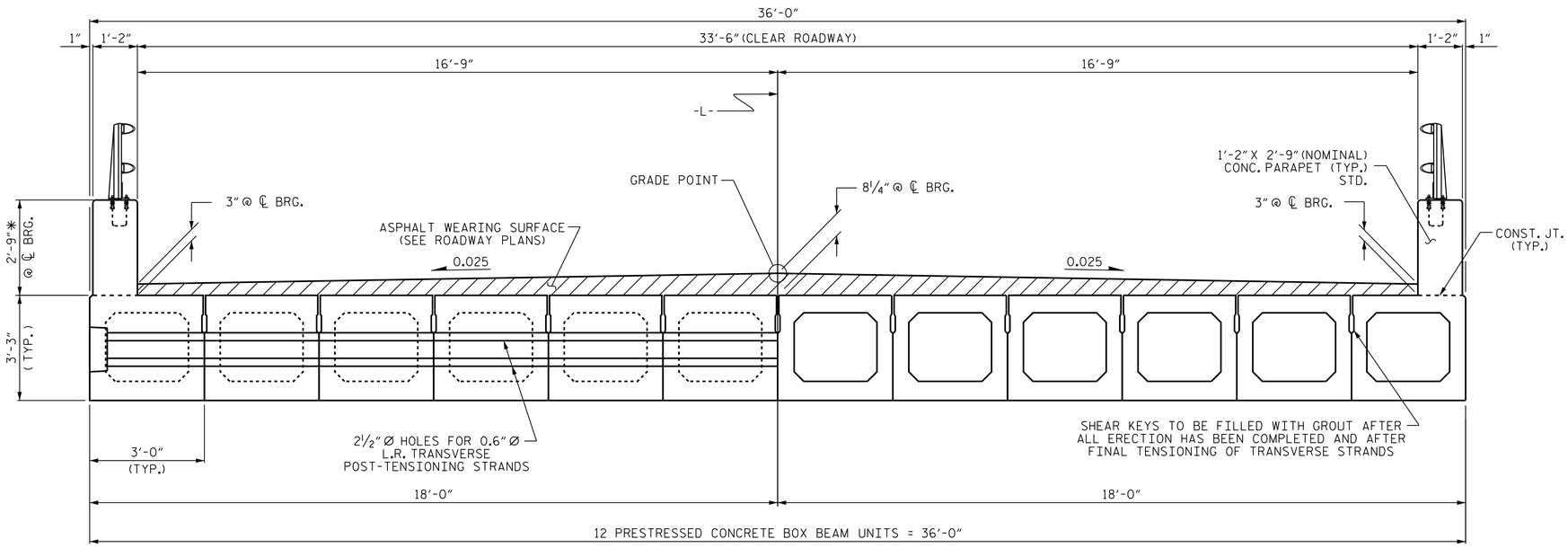
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 110' BOX BEAM UNIT 120° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			32

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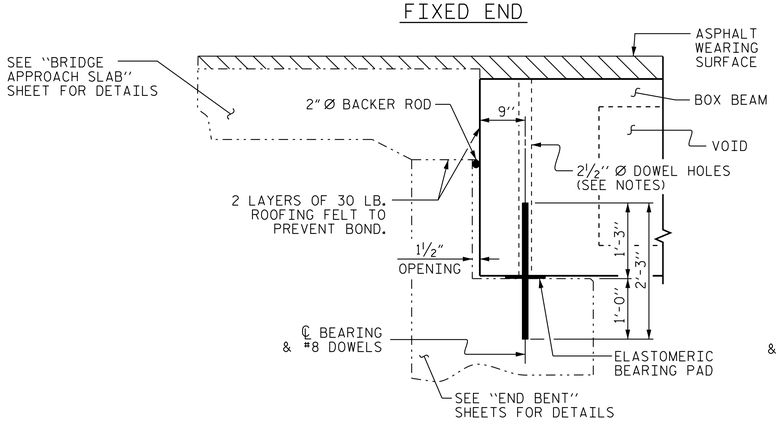


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

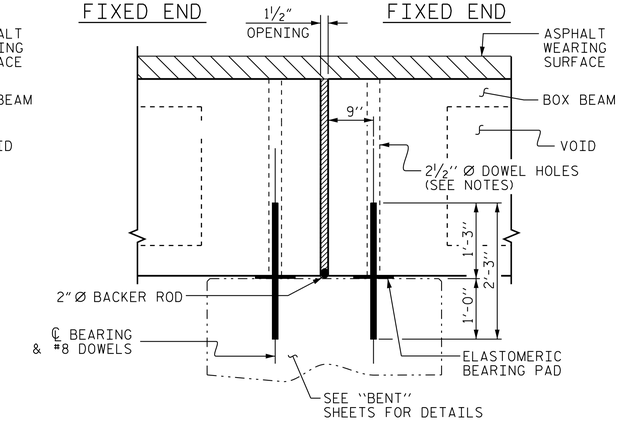
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

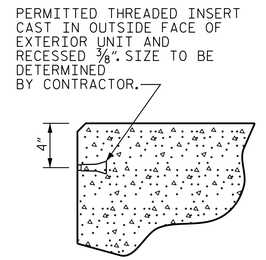
*THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE CONCRETE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "SECTION THRU CONCRETE PARAPET" DETAIL.



SECTION AT END BENT



SECTION AT BENTS 1 & 2



THREADED INSERT DETAIL

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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM 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.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN CONCRETE PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL 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.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

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.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

DocuSigned by: Nicholas D'Aiuto 7/25/2019

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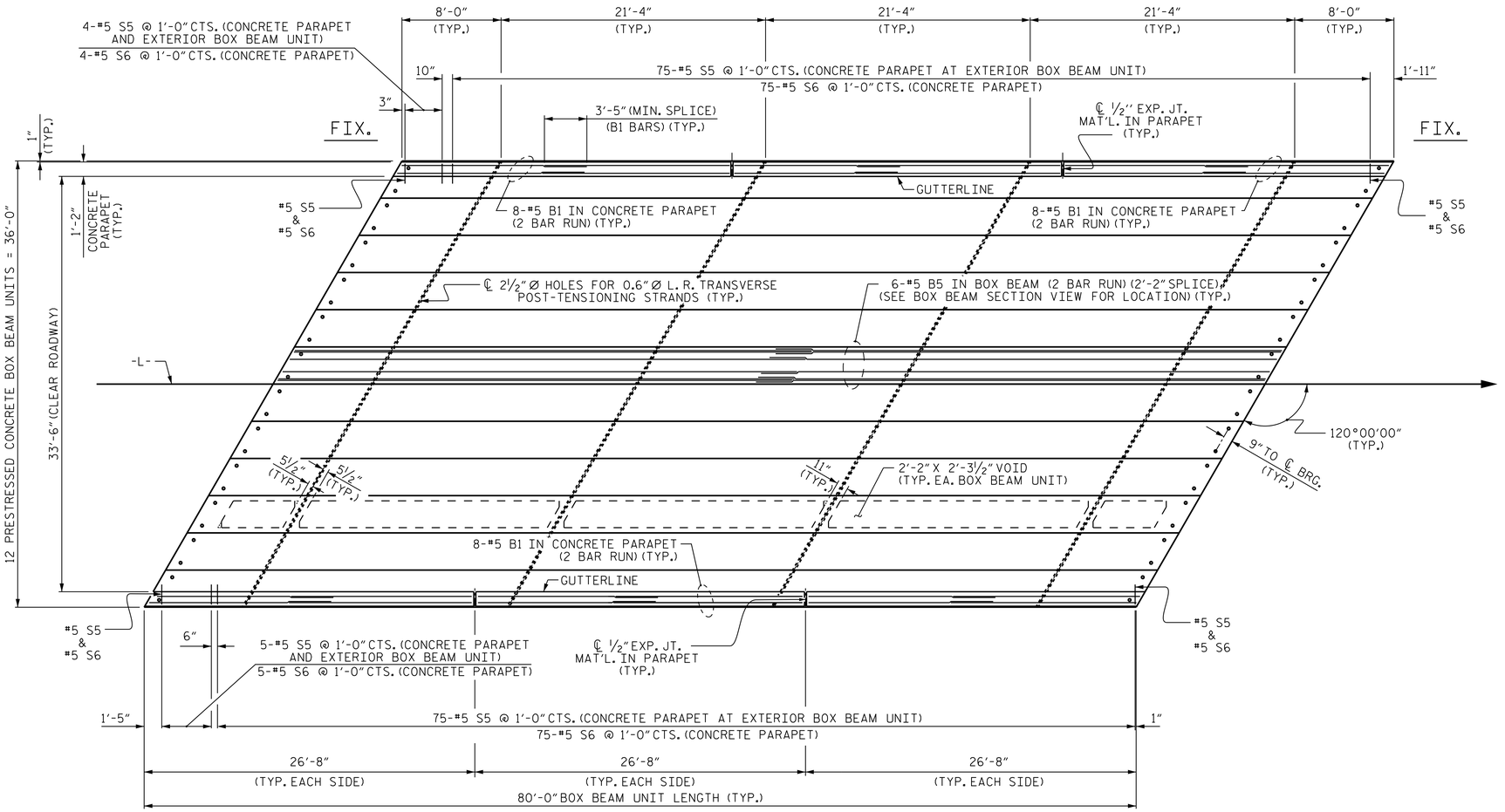
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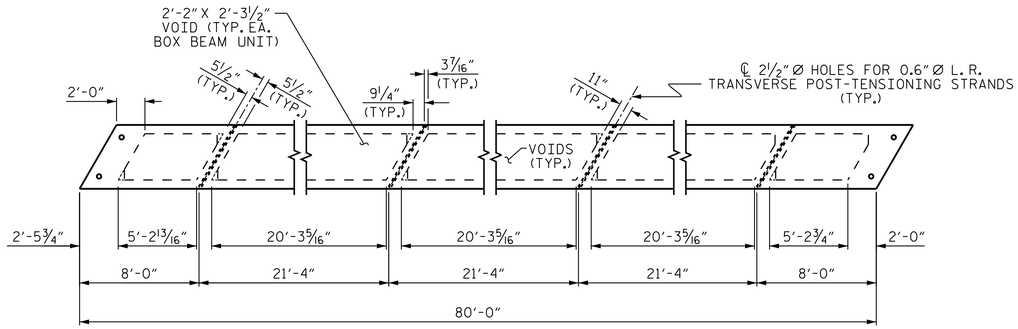
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CHECKED BY : N. D'AIUTO DATE : 11/21/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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PLAN OF UNIT - SPAN A



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 80' UNIT 33'-6" CLEAR ROADWAY 120° SKEW (SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

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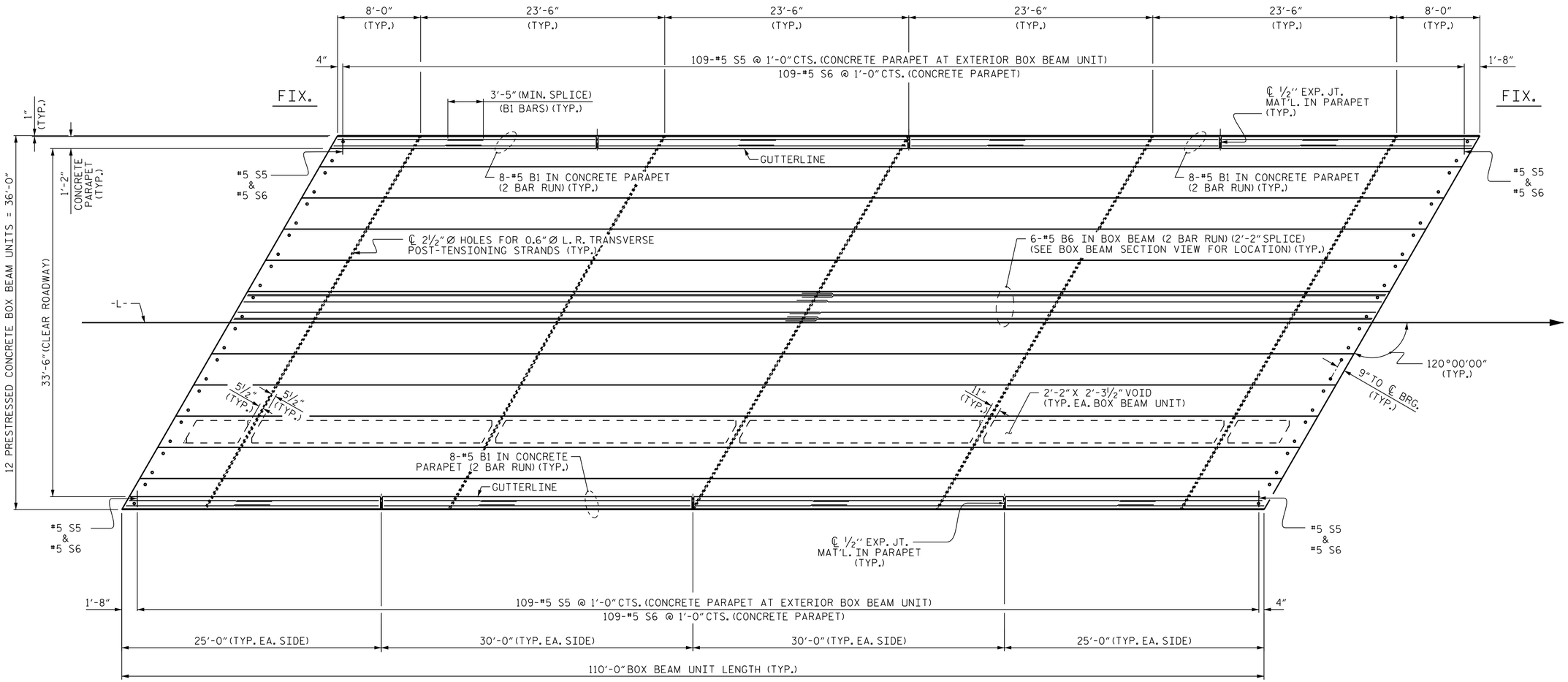
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ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/01/18
CHECKED BY : N. D'AIUTO DATE : 11/21/18

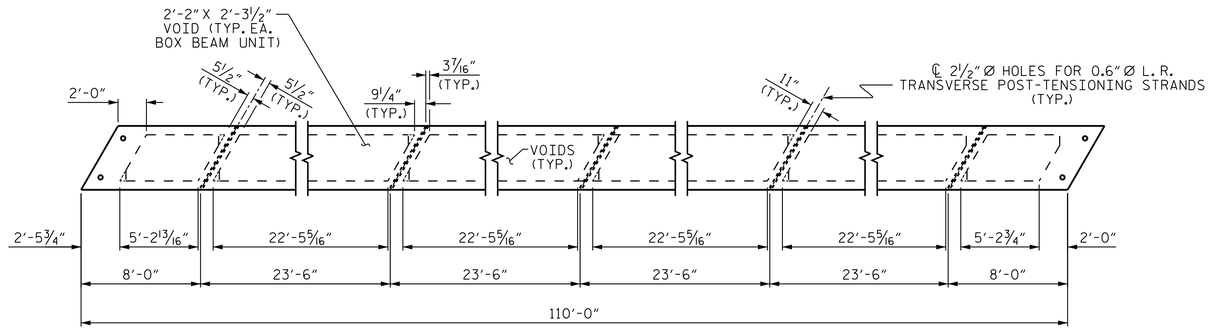
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PLAN OF UNIT - SPAN B



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 110' UNIT 33'-6" CLEAR ROADWAY 120° SKEW

(SPAN B)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto 7/25/2019

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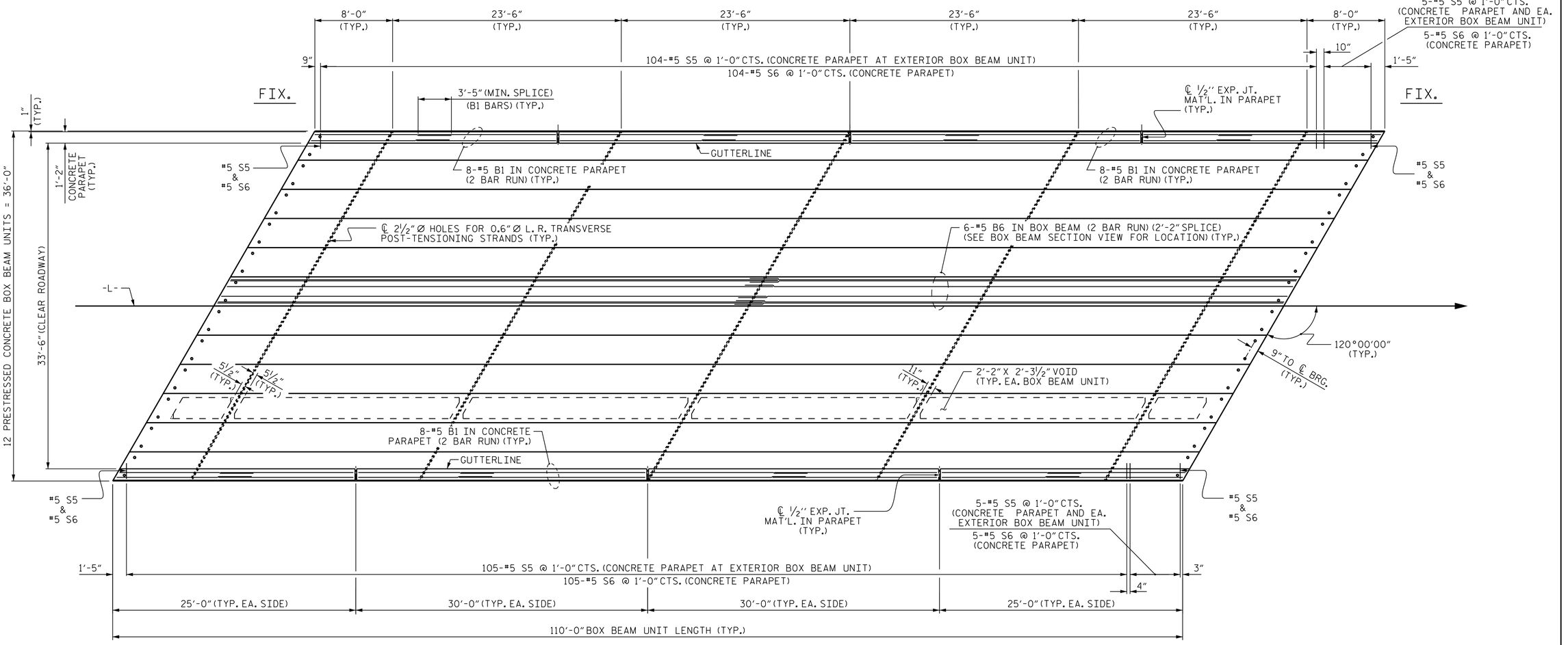
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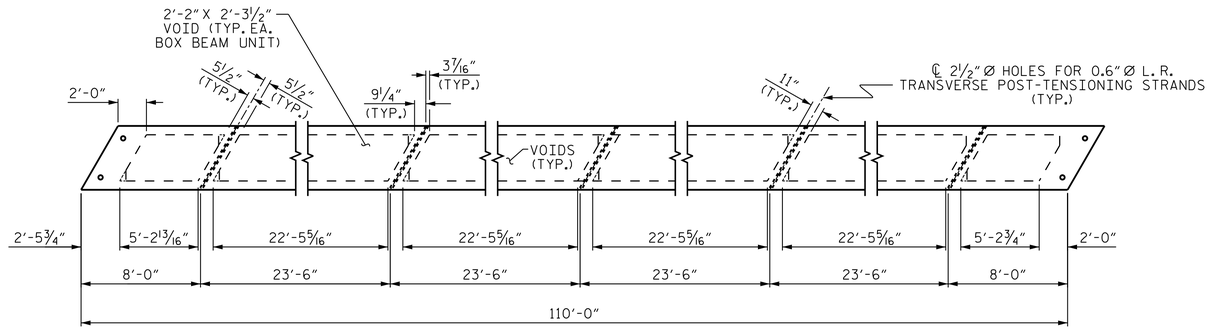
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CHECKED BY : N. D'AIUTO	DATE : 11/21/18		

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PLAN OF UNIT - SPAN C



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 110' UNIT 33'-6" CLEAR ROADWAY 120° SKEW

(SPAN C)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

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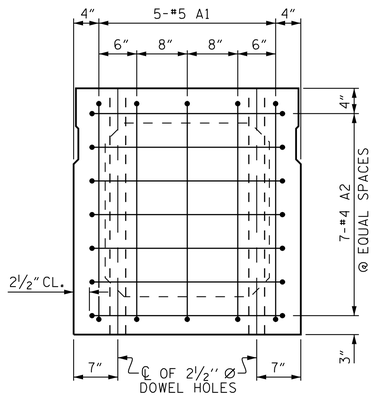
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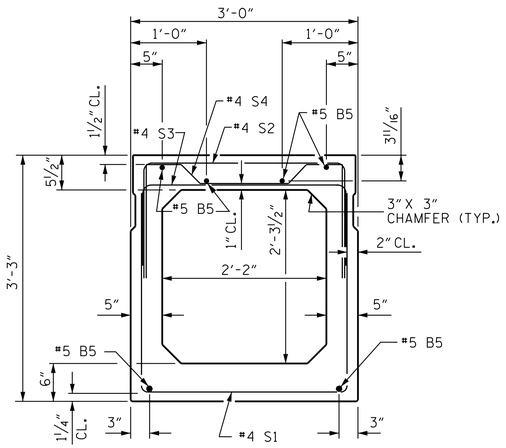
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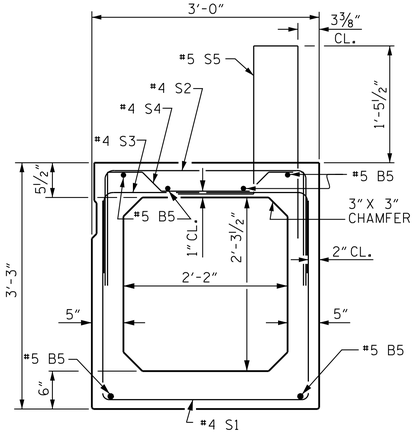
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

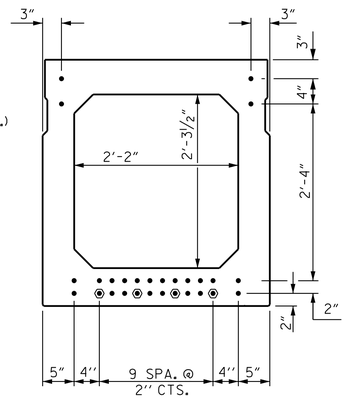
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

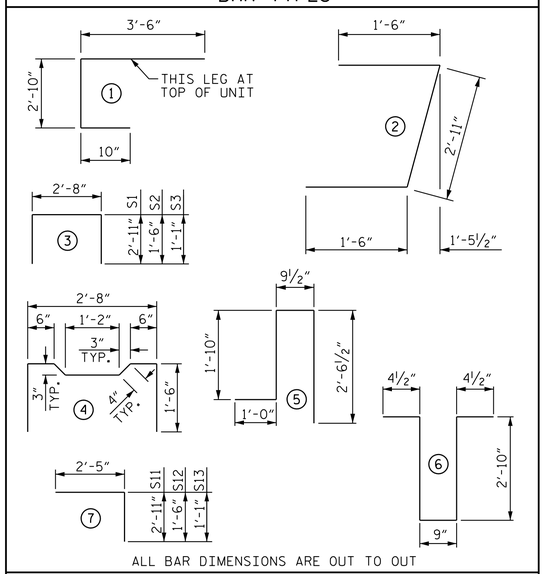
(28 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⬣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

BAR TYPES



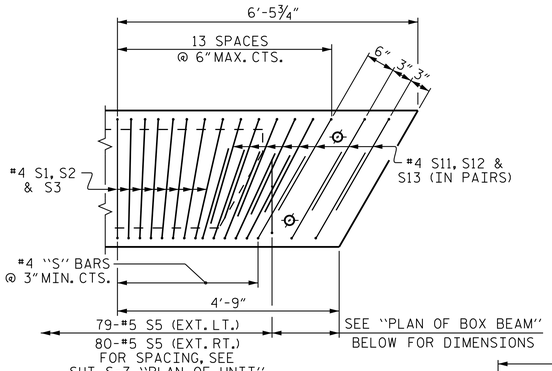
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	38	#4	2	5'-11"	151	5'-11"	151
B5	12	#5	STR	40'-11"	513	40'-11"	513
K1	12	#4	6	7'-2"	58	7'-2"	58
K2	8	#4	STR	2'-10"	16	2'-10"	16
S1	62	#4	3	8'-6"	353	8'-6"	353
S2	62	#4	3	5'-8"	235	5'-8"	235
S3	107	#4	3	4'-10"	346	4'-10"	346
S4	45	#4	4	5'-10"	176	5'-10"	176
S11	32	#4	7	5'-4"	114	5'-4"	114
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
EXT. LT. ✱ S5	79	#5	5	6'-2"	509	--	--
EXT. RT. ✱ S5	80	#5	5	6'-2"	515	--	--
REINFORCING STEEL					2196 LBS.		2196 LBS.
✱ EPOXY COATED REINF. STEEL (EXT. LT.)					509 LBS.		
✱ EPOXY COATED REINF. STEEL (EXT. RT.)					515 LBS.		
7500 P.S.I. CONCRETE					15.9 CU. YDS.	15.8	CU. YDS.
0.6" Ø L.R. STRANDS					No. 28	No.	28

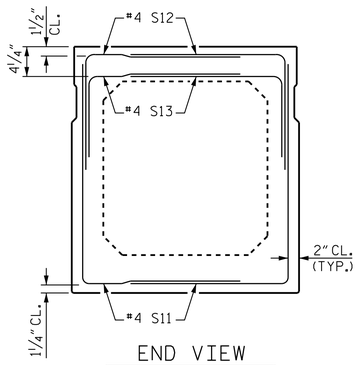
GRADE 270 STRANDS

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



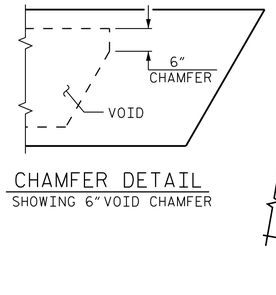
DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



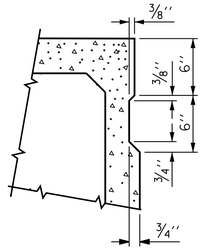
END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)



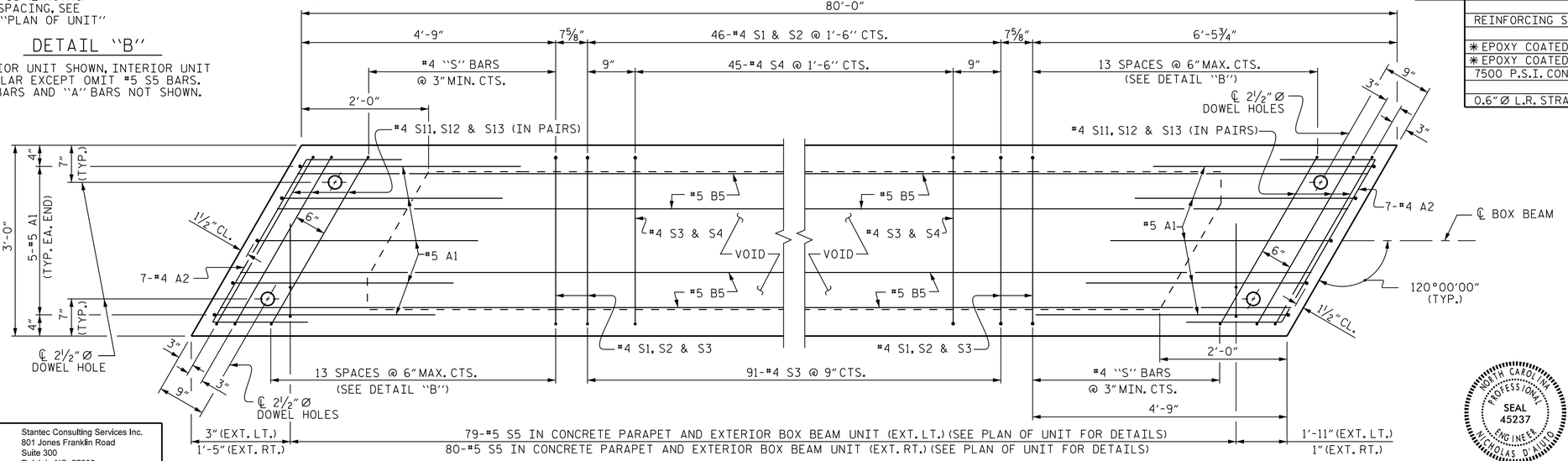
CHAMFER DETAIL

SHOWING 6" VOID CHAMFER



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/06/18
CHECKED BY : N. D'AIUTO DATE : 11/21/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

PROJECT NO. 17BP.9.R.72
STOKES COUNTY
STATION: 19+80.00 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT (SPAN A)

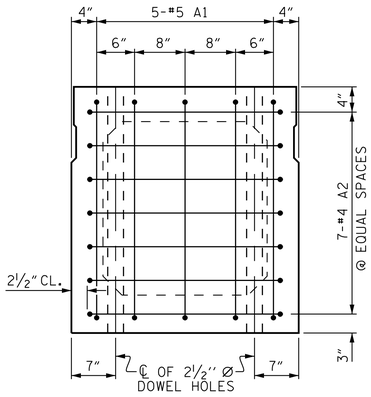
NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Nicholas D'Aiuto
7/25/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
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2			4			32

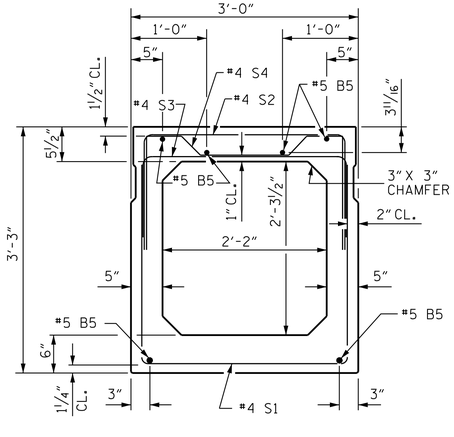
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7/25/2019
Jgelle

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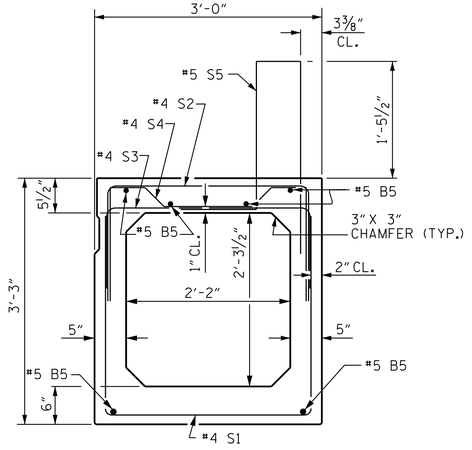
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

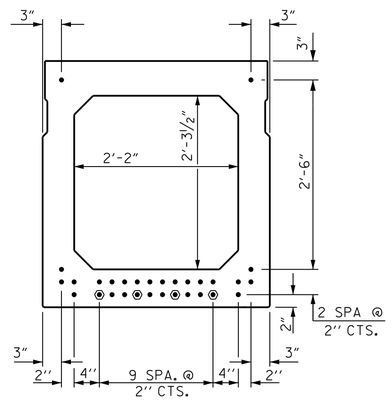
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

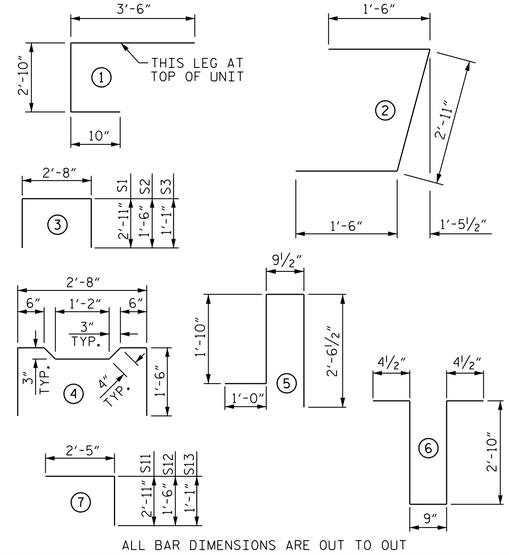
(30 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⬢ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

BAR TYPES



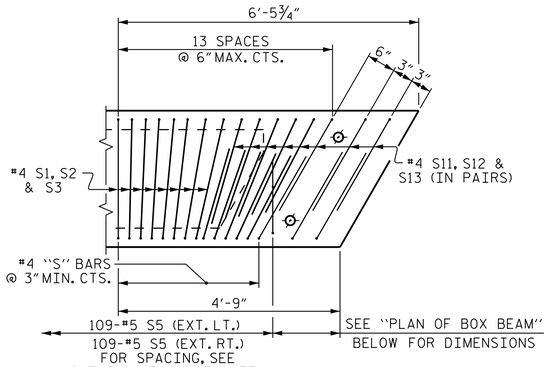
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-11"	174	5'-11"	174
B5	12	#5	STR	55'-11"	700	55'-11"	700
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-10"	19	2'-10"	19
S1	82	#4	3	8'-6"	466	8'-6"	466
S2	82	#4	3	5'-8"	311	5'-8"	311
S3	147	#4	3	4'-10"	475	4'-10"	475
S4	65	#4	4	5'-10"	254	5'-10"	254
S11	32	#4	7	5'-4"	114	5'-4"	114
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
EXT. LT. ✱ S5	109	#5	5	6'-2"	702	--	--
EXT. RT. ✱ S5	109	#5	5	6'-2"	702	--	--
REINFORCING STEEL					2819 LBS.		2819 LBS.
✱ EPOXY COATED REINF. STEEL					1404 LBS.		
7500 P.S.I. CONCRETE				21.5	CU. YDS.	21.4	CU. YDS.
0.6" Ø L.R. STRANDS				No. 30		No. 30	

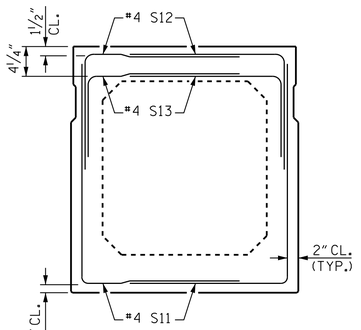
GRADE 270 STRANDS

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



DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



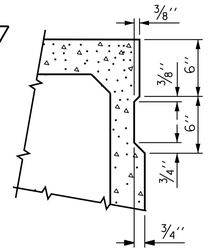
END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)



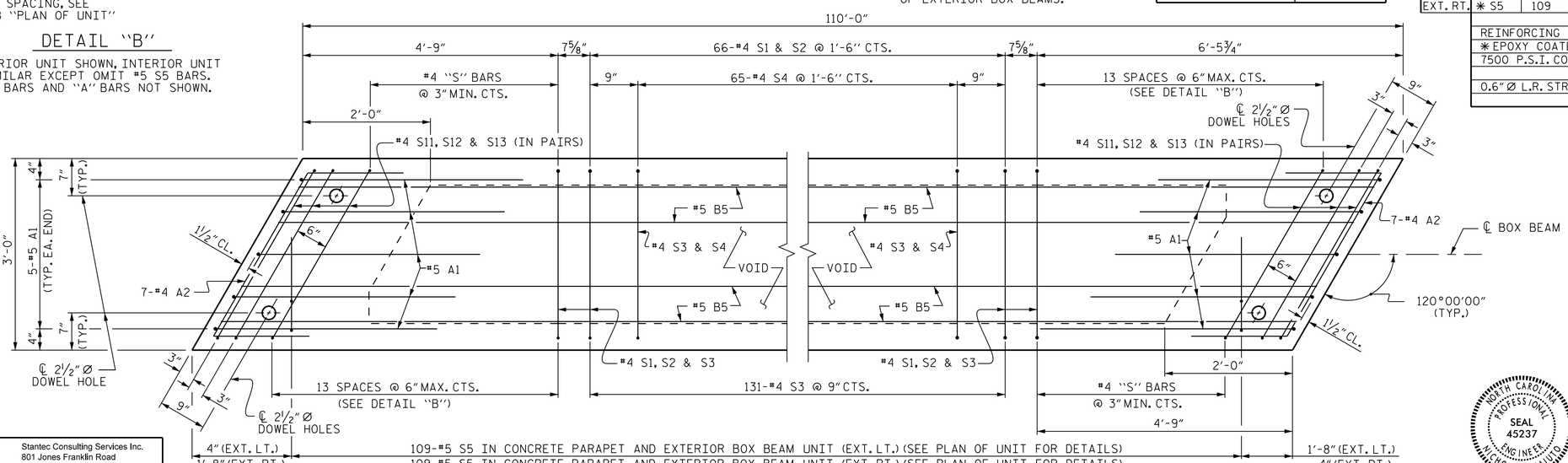
CHAMFER DETAIL

SHOWING 6" VOID CHAMFER



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT (SPAN B)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

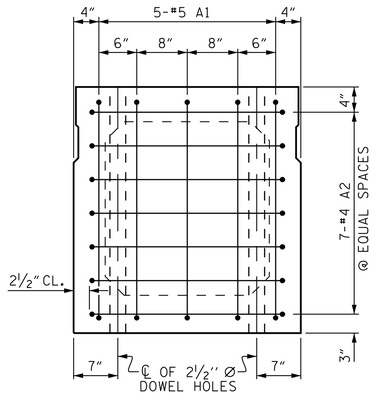
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1			3			TOTAL SHEETS
2			4			32

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ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/06/18
CHECKED BY : N.D'AIUTO DATE : 11/26/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

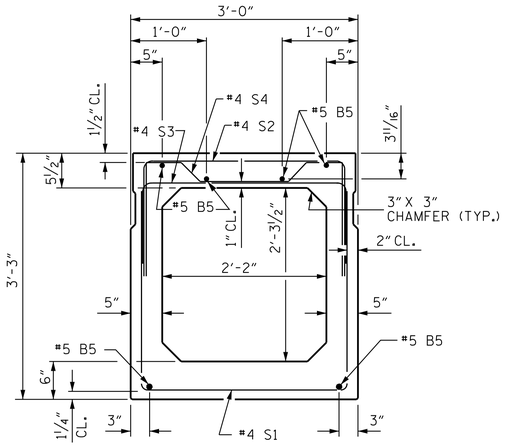
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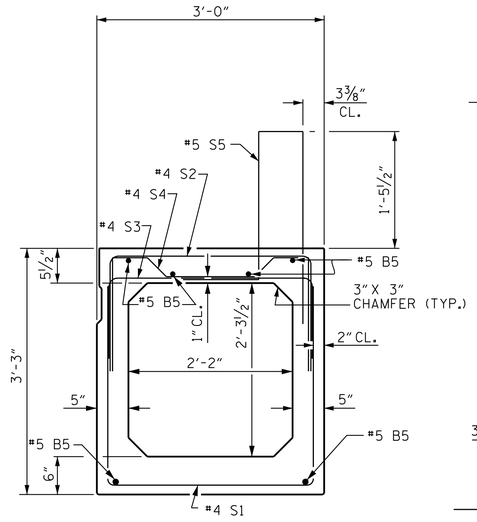
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

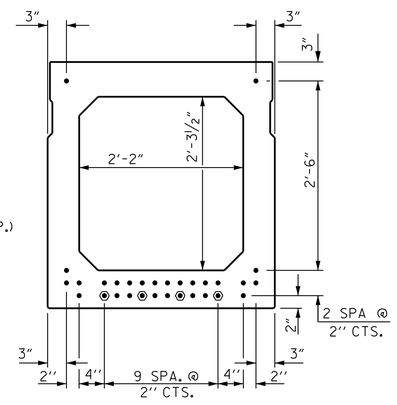
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

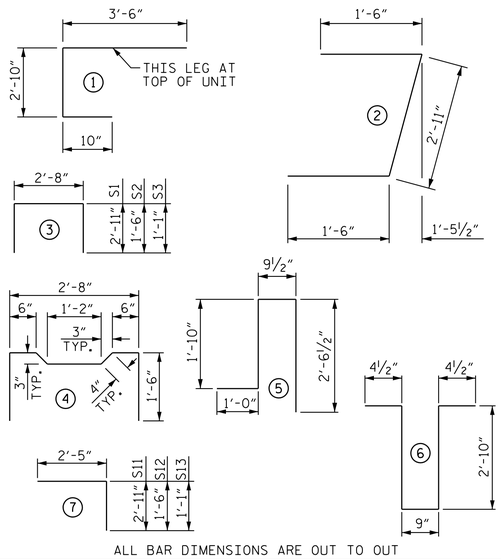
(28 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⬢ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

BAR TYPES



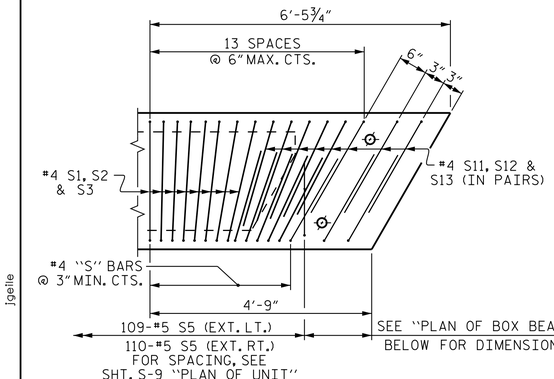
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
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S2	82	#4	3	5'-8"	311	5'-8"	311
S3	147	#4	3	4'-10"	475	4'-10"	475
S4	65	#4	4	5'-10"	254	5'-10"	254
S11	32	#4	7	5'-4"	114	5'-4"	114
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
EXT. LT. ✳ S5	109	#5	5	6'-2"	702	--	--
EXT. RT. ✳ S5	110	#5	5	6'-2"	708	--	--
REINFORCING STEEL					2819 LBS.		2819 LBS.
✳ EPOXY COATED REINF. STEEL (EXT. LT.)					702 LBS.		
✳ EPOXY COATED REINF. STEEL (EXT. RT.)					708 LBS.		
7500 P.S.I. CONCRETE					21.5 CU. YDS.		21.4 CU. YDS.
0.6" Ø L.R. STRANDS					No. 30		No. 30

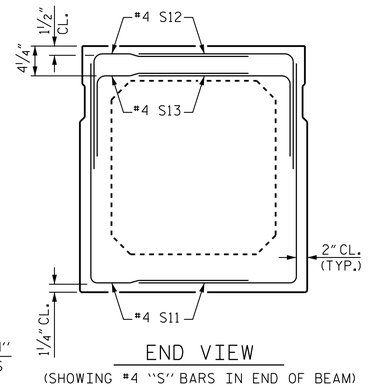
GRADE 270 STRANDS

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



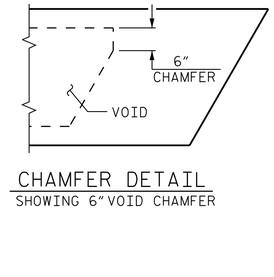
DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



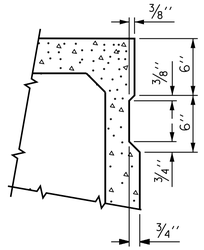
END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)



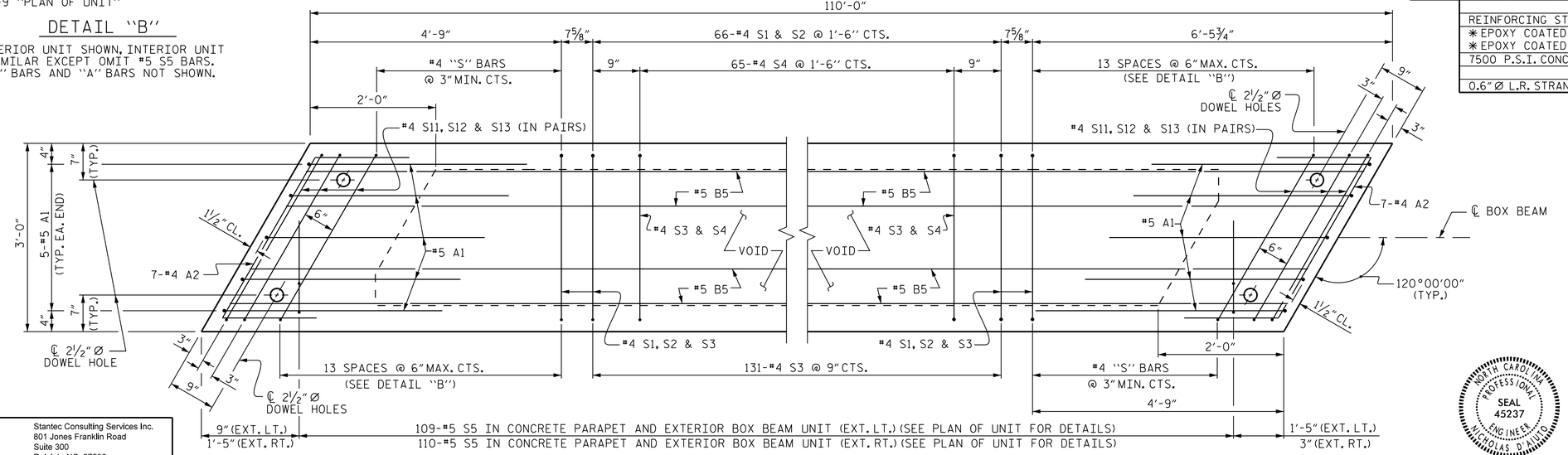
CHAMFER DETAIL

SHOWING 6" VOID CHAMFER



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT (SPAN C)

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Digitally signed by: Nicholas D'Aiuto
7/25/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

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

SHEET NO. S-12

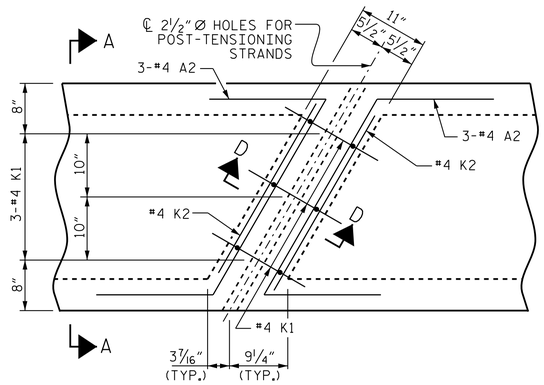
TOTAL SHEETS 32

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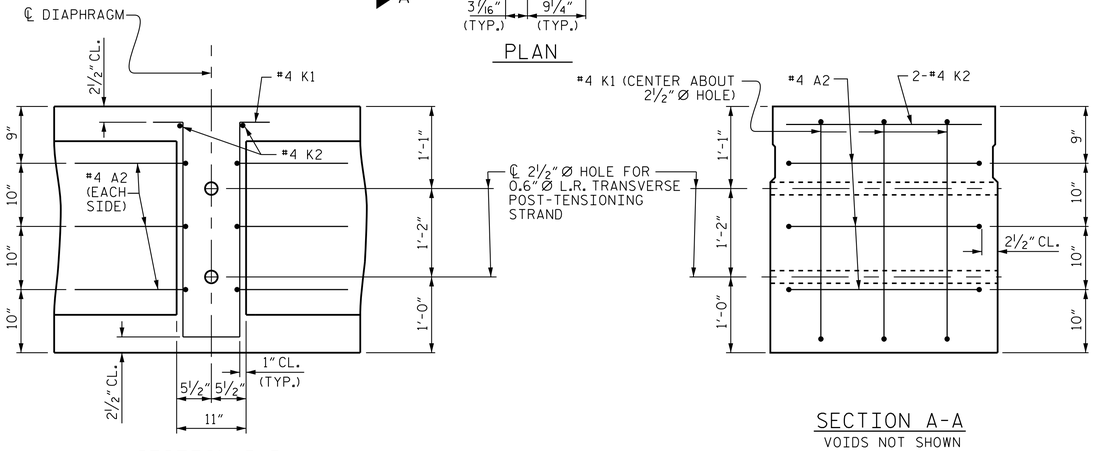
ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/06/18
CHECKED BY : N. D'AIUTO DATE : 11/26/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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Jgelle
7/25/2019

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PLAN

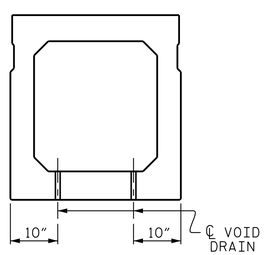


SECTION D-D

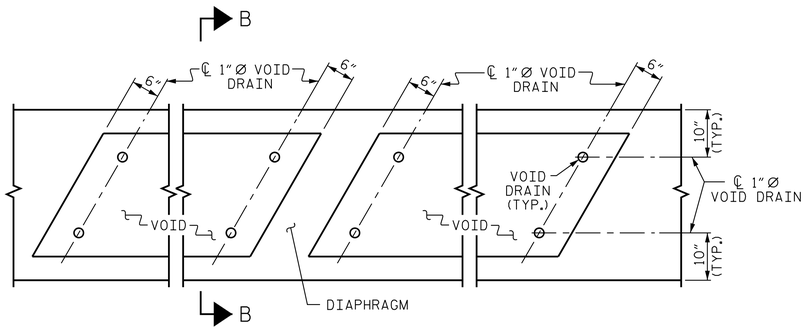
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



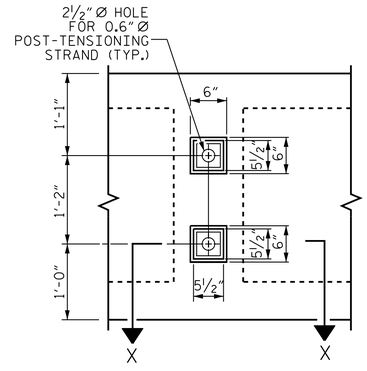
SECTION B-B



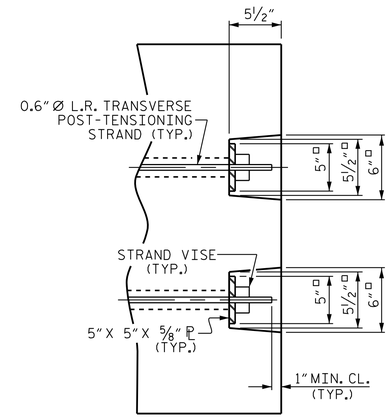
PART PLAN

VOID DRAIN DETAILS

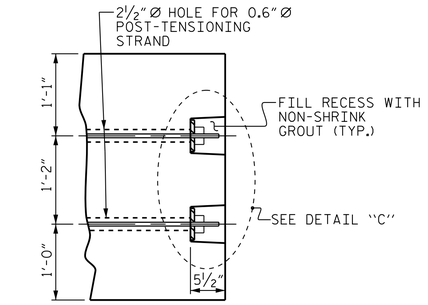
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



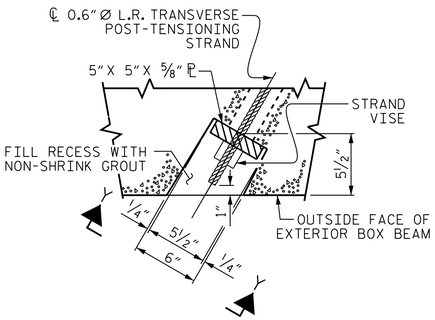
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

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

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
80' BOX BEAM UNIT (NC & SE)	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 5/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	5/16" ↓
FINAL CAMBER	1 5/16" ↑

** INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
110' BOX BEAM UNIT (NC & SE)	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 7/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1 3/16" ↓
FINAL CAMBER	11/16" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 17BP.9.R.72
STOKES COUNTY
STATION: 19+80.00 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/06/18
CHECKED BY : N.D'AIUTO DATE : 11/26/18

DRAWN BY : DGE II/II
CHECKED BY : TMG II/II

REV. 8/14 MAA/TMG

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Docusigned by: Nicholas D'Aiuto 7/25/2019

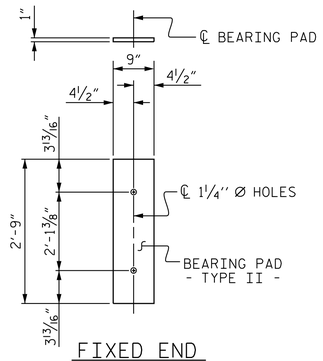
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REVISIONS						SHEET NO.
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STD.NO.39PCBB7_120S

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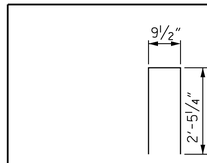


FIXED END
(TYPE II - 72 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

39" BOX BEAM UNITS REQUIRED				
SPAN	80' UNIT	NUMBER	LENGTH	TOTAL LENGTH
A	EXTERIOR C.S.	2	80'-0"	160'-0"
	INTERIOR C.S.	10	80'-0"	800'-0"
	TOTAL	12		960'-0"
SPAN	110' UNIT	NUMBER	LENGTH	TOTAL LENGTH
B & C	EXTERIOR C.S.	4	110'-0"	440'-0"
	INTERIOR C.S.	20	110'-0"	2200'-0"
	TOTAL	24		2640'-0"



① BAR TYPE
BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR CONCRETE PARAPET						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A -80' UNIT					
✳ B1	96	96	#5	STR	16'-6"	1653
✳ S6	159	159	#5	1	5'-8"	940
✳EPOXY COATED REINFORCING STEEL				LBS.		2593
CLASS AA CONCRETE				CU.YDS.		18.8
TOTAL CONCRETE PARAPET				LIN. FT.		160.00

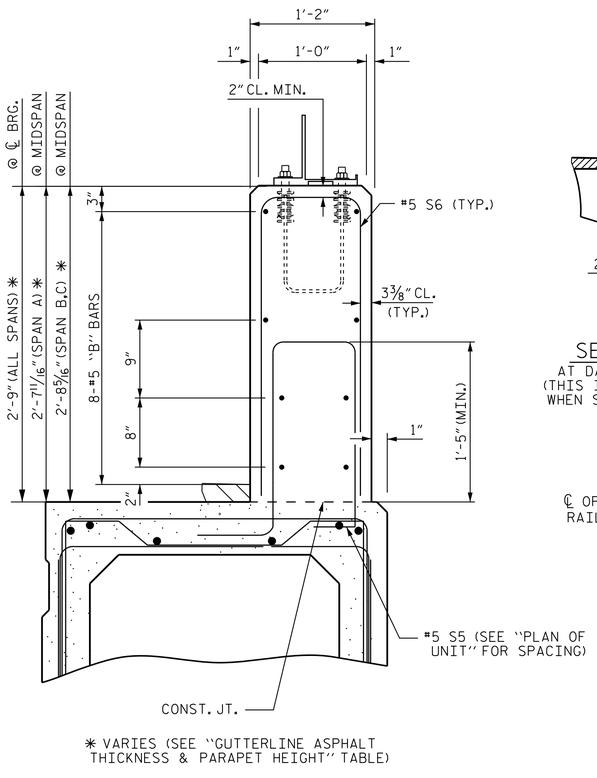
NOTE: QUANTITIES SHOWN ARE FOR SPAN A. SEE CONCRETE PARAPET AND END POST DETAILS FOR END POST CONCRETE AND REINFORCING STEEL.

BILL OF MATERIAL FOR CONCRETE PARAPET						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN B & C - 110' UNIT					
✳ B1	256	256	#5	STR	16'-6"	4406
✳ S6	437	437	#5	1	5'-8"	2583
✳EPOXY COATED REINFORCING STEEL				LBS.		6989
CLASS AA CONCRETE				CU.YDS.		51.9
TOTAL CONCRETE PARAPET				LIN. FT.		440.00

NOTE: QUANTITIES SHOWN ARE FOR SPANS B & C. SEE CONCRETE PARAPET AND END POST DETAILS FOR END POST CONCRETE AND REINFORCING STEEL.

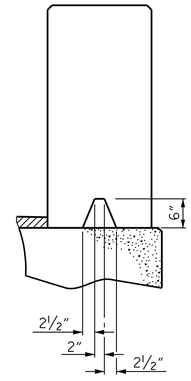
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
33'-6" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
80' UNITS	1 11/16"	2'-7 11/16"
110' UNITS	2 5/16"	2-8 5/16"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
80' UNITS	5500
110' UNITS	5500

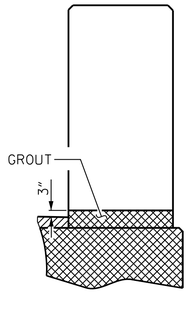


✳ VARIES (SEE "GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT" TABLE)

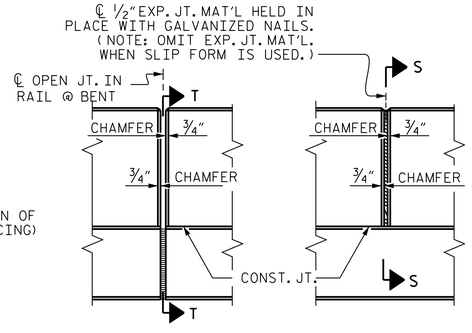
SECTION THRU CONC. PARAPET



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



SECTION T-T



ELEVATION AT EXPANSION JOINTS

CONCRETE PARAPET SECTION

PROJECT NO. 17.BP.9.R.72
STOKES COUNTY
STATION: 19+80.00 -L-
SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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7/25/2019

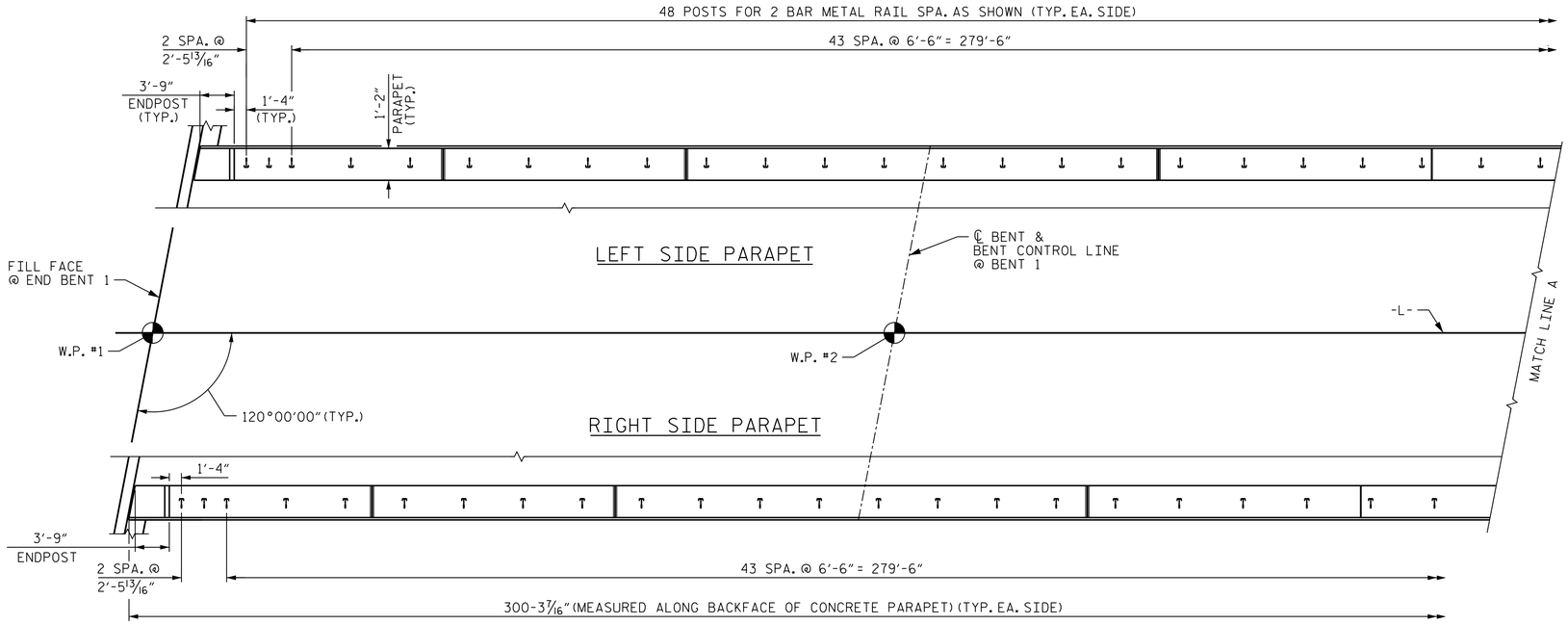
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ASSEMBLED BY : J.E. HAGENBUSH DATE : 11/14/18
CHECKED BY : N. D'AIUTO DATE : 11/26/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

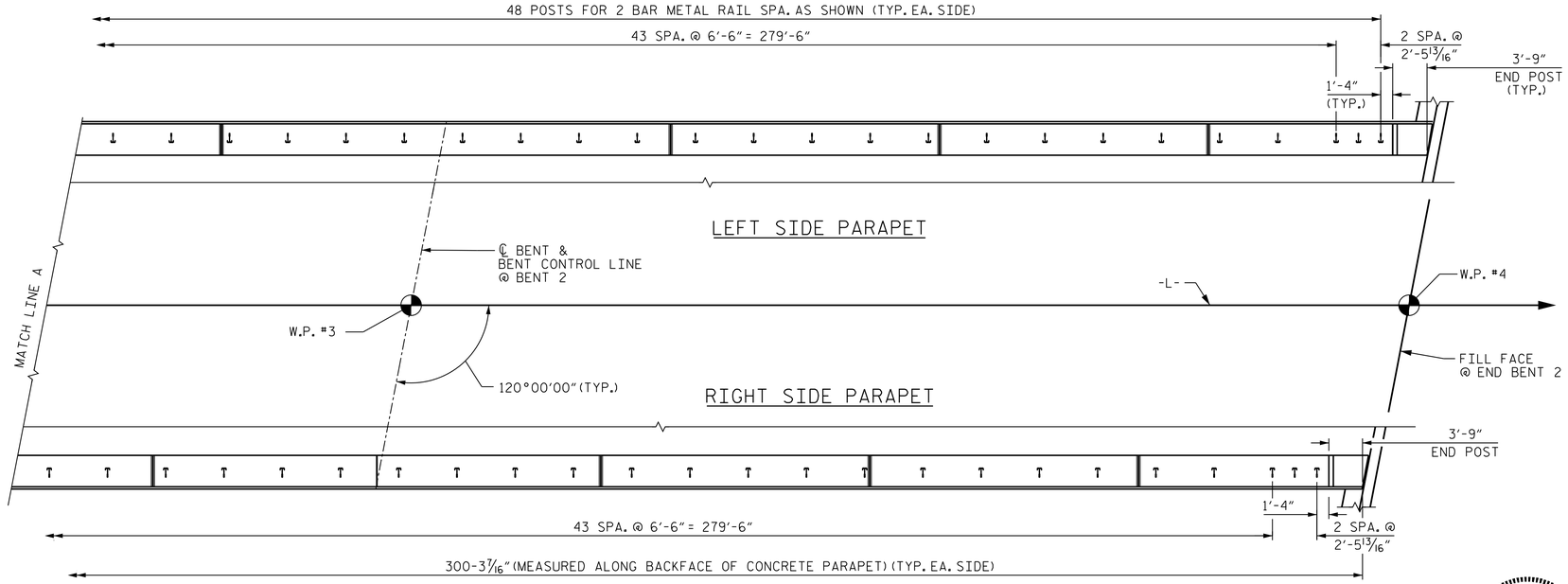
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PLAN OF RAIL POST SPACINGS

(FOR CONCRETE PARAPET JOINT SPACING, SEE "PLAN OF UNIT" FOR DETAILS)



PLAN OF RAIL POST SPACINGS

(FOR CONCRETE PARAPET JOINT SPACING, SEE "PLAN OF UNIT" FOR DETAILS)

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

RAIL POST SPACING FOR 2 BAR METAL RAIL

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1			3			TOTAL SHEETS
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NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

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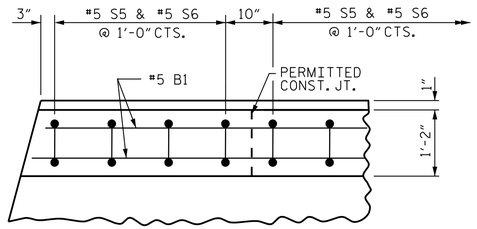
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DRAWN BY : J. B. GEILE DATE : 11/20/18
CHECKED BY : N.D'AIUTO DATE : 11/26/18

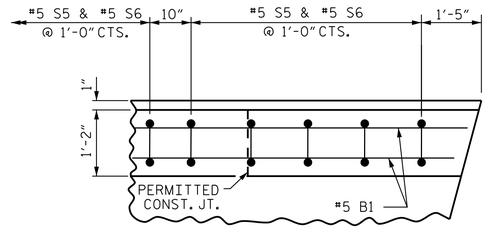
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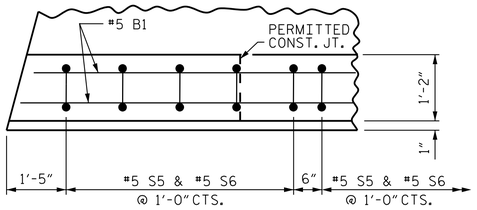
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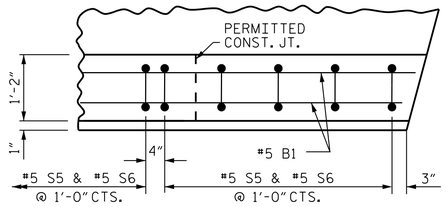
END BENT 1 LEFT PARAPET



END BENT 2 LEFT PARAPET

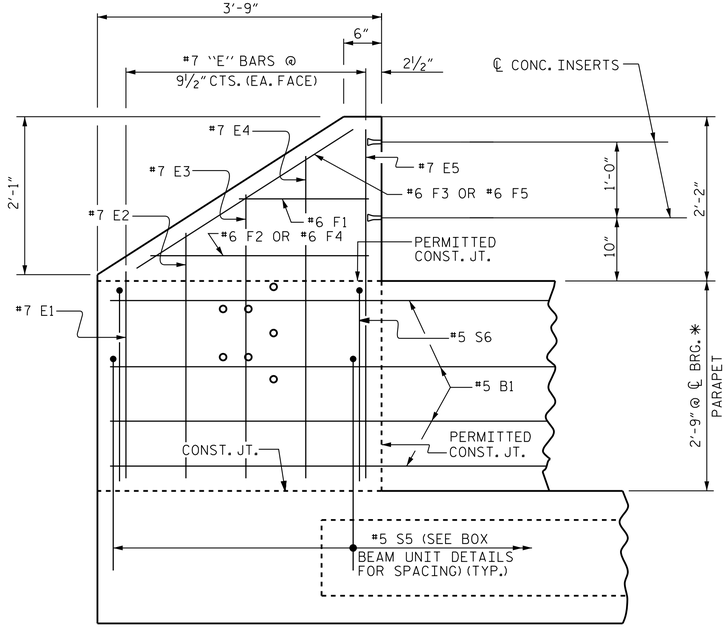


END BENT 1 RIGHT PARAPET

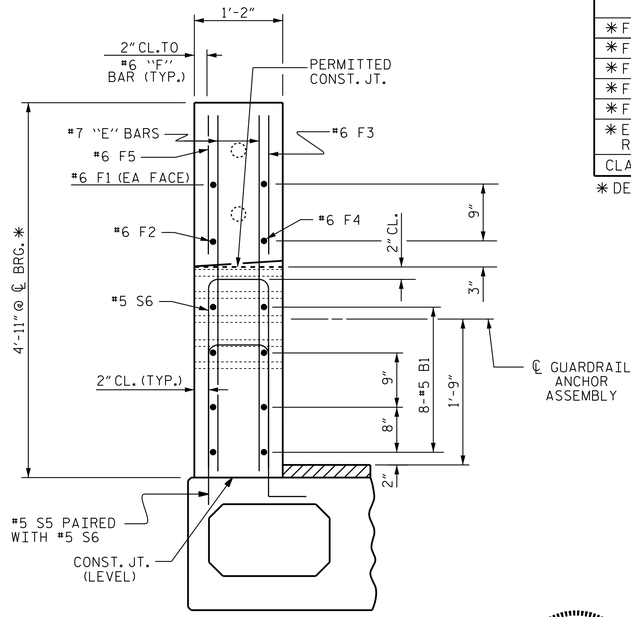


END BENT 2 RIGHT PARAPET

PLAN OF PARAPETS



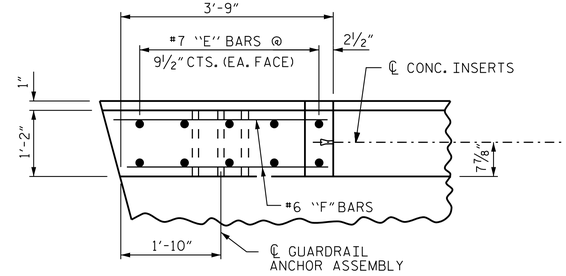
ELEVATION



END VIEW

END POST DETAILS

✳ VARIES (SEE "GUTTERLINE ASPHALT THICKNESS" AND PARAPET TABLE)



TYPICAL END POST PLAN

NOTES

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

#5 S5 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR BOX BEAM UNITS.

THE ½" EXPANSION JOINT IN THE PARAPET MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE #5 S5 & #S6 BARS.

BILL OF MATERIAL

FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	8	#7	STR	3'-0"	50
✳E2	8	#7	STR	3'-5"	56
✳E3	8	#7	STR	3'-10"	63
✳E4	8	#7	STR	4'-3"	70
✳E5	8	#7	STR	4'-7"	75
✳F1	8	#6	STR	2'-2"	27
✳F2	4	#6	STR	3'-5"	21
✳F3	4	#6	STR	3'-6"	22
✳F4	4	#6	STR	3'-7"	22
✳F5	4	#6	STR	3'-11"	24
✳EPOXY COATED REINFORCING STEEL				LBS.	430
CLASS AA CONCRETE				C.Y.	0.9

✳DENOTES EPOXY COATED REINFORCING

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PARAPET & END POST DETAILS

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ASSEMBLED BY : J. B. GEILE DATE : 11/16/18
CHECKED BY : N. D'AIUTO DATE : 11/26/18

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

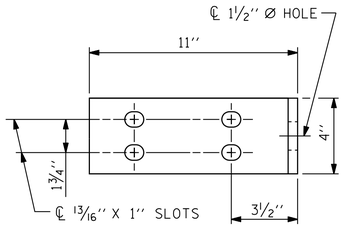
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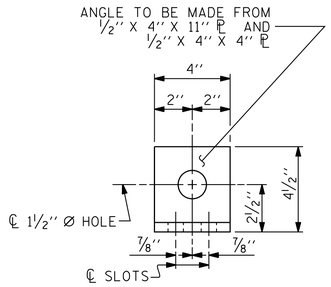
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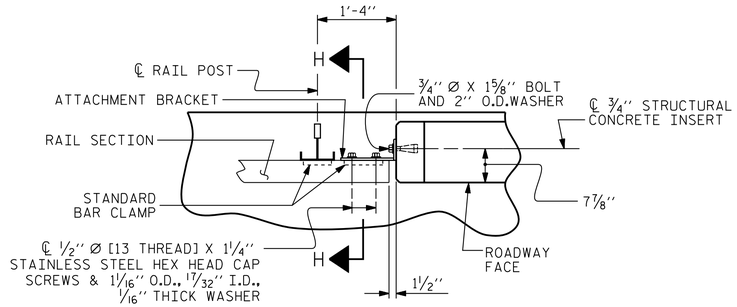
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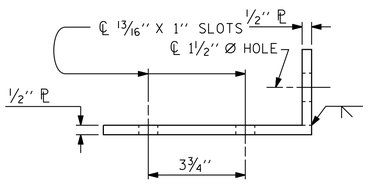
ELEVATION



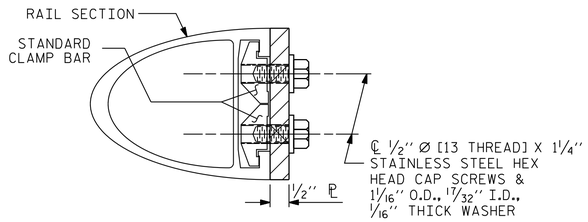
END VIEW



PLAN - RAIL AND END POST



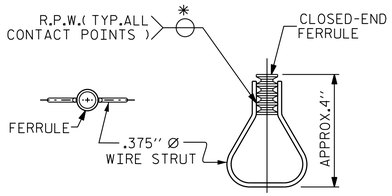
TOP VIEW



SECTION H-H

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

✳ EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½''.

B. 1 - ¾'' Ø X 1⅝'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 1⅝'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾''Ø X 1⅝'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE ¾''Ø X 1⅝'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

E. ½'' Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾'' Ø X 1⅝'' BOLT WITH WASHER SHALL BE REPLACED WITH A ¾''Ø X 6½'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾'' Ø X 1⅝'' BOLT SHALL APPLY TO THE ¾''Ø X 6 ½'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

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ASSEMBLED BY : J. B. GEILE	DATE : 11/16/18
CHECKED BY : N. D'AIUTO	DATE : 11/26/18
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Electronically signed by: Nicholas D'Aiuto
7/25/2019
DocuSigned by: 5F2D0E749A9C...

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DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

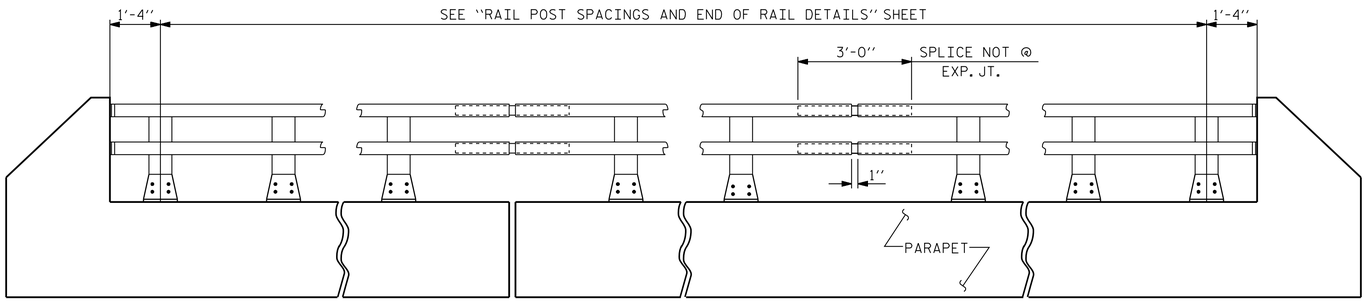
END OF RAIL DETAILS TWO BAR METAL RAILS

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STD. NO. BMR2

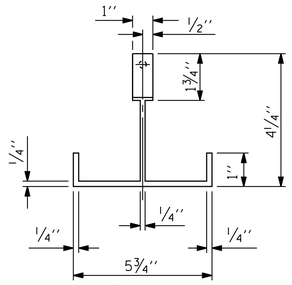
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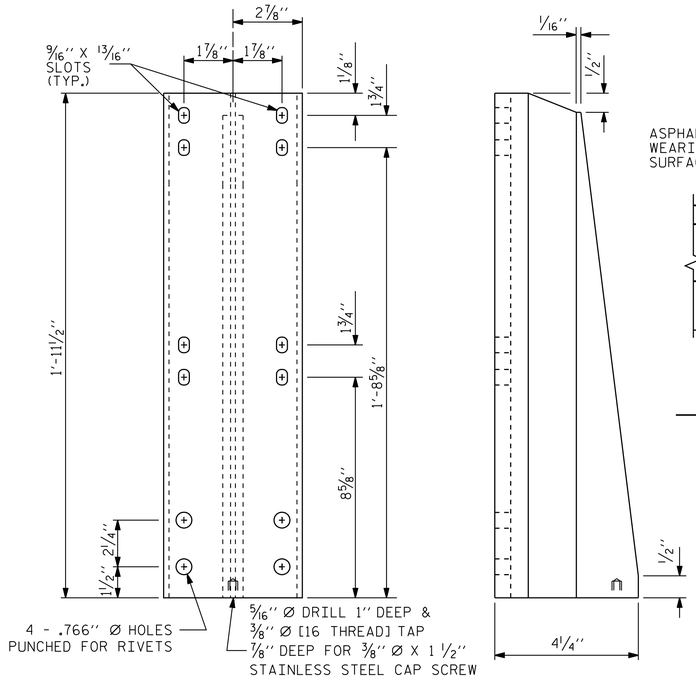


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



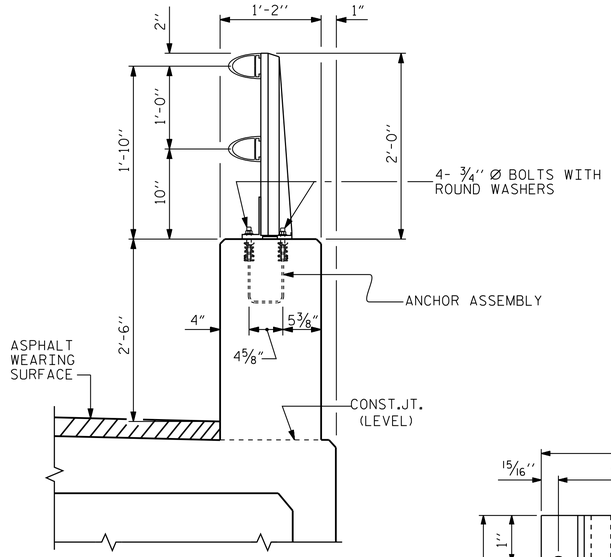
PLAN



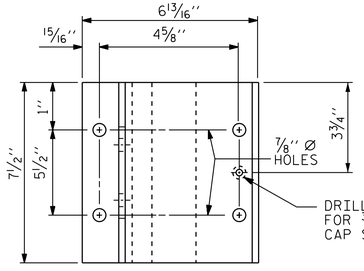
FRONT ELEVATION

SIDE ELEVATION

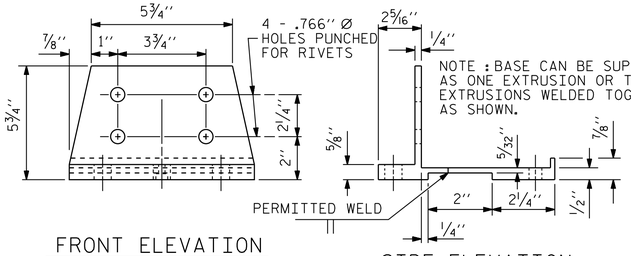
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



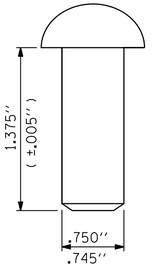
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

PAY LENGTH = 583.72 LIN. FT.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

STD. NO. BMR3

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Docusigned by: Nicholas D'Aiuto 7/25/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			32

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ASSEMBLED BY : J. B. GEILE DATE : 11/20/18
CHECKED BY : N.D'AIUTO DATE : 11/26/18

DRAWN BY : EEM 6/94
CHECKED BY : RGW 6/94

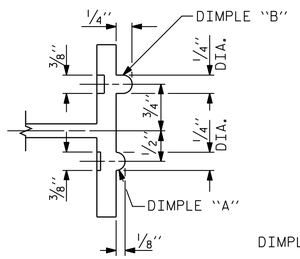
REV. 10/1/11 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

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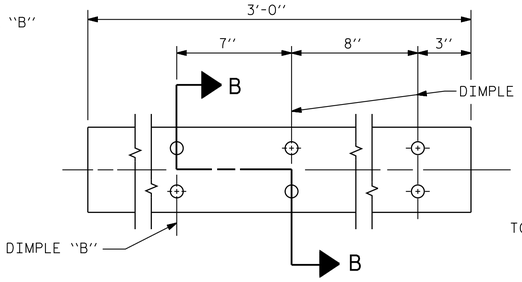
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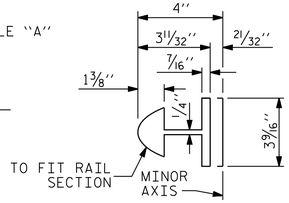
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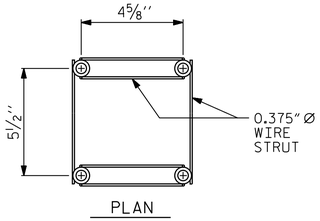
SECTION B - B



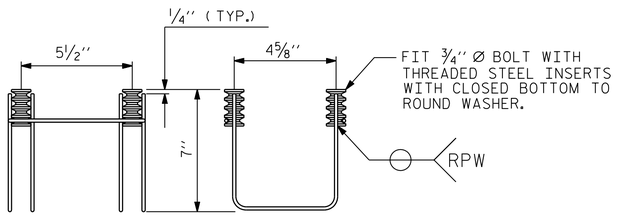


BAR SECTION

EXPANSION BAR DETAILS



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(96 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS 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.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

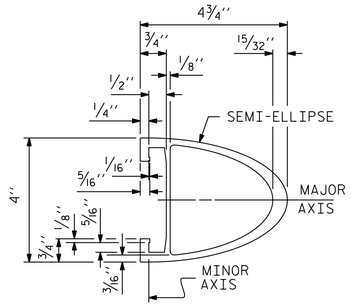
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

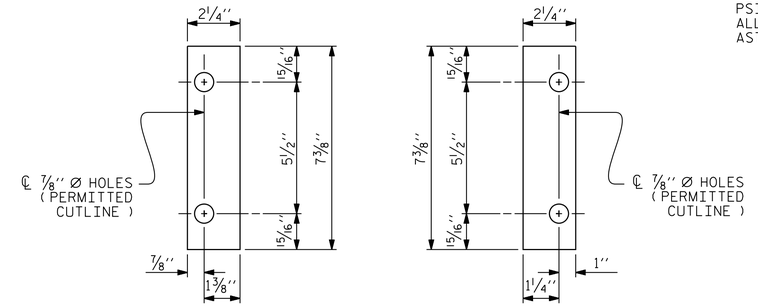
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4'' Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



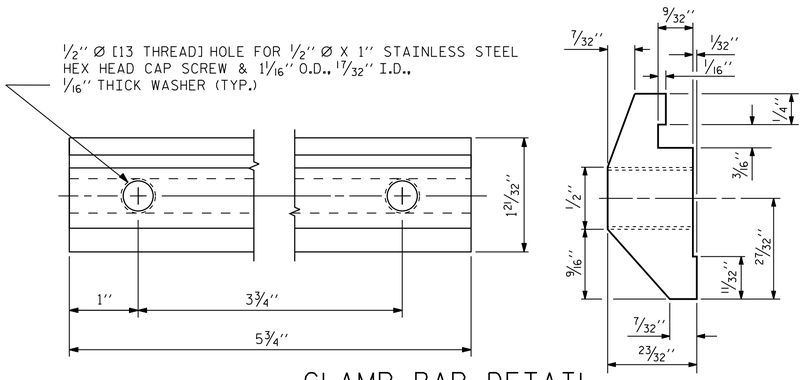
RAIL SECTION



FRONT PLATE REAR PLATE

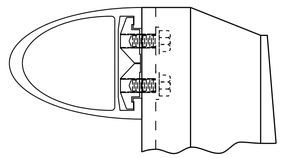
SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

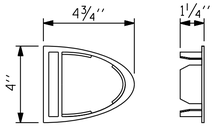


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

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ASSEMBLED BY : J. B. GEILE DATE : 11/20/18
CHECKED BY : N.D'AIUTO DATE : 11/28/18

DRAWN BY : EEM 6/94
CHECKED BY : RGW 6/94

REV. 5/1/06R KMM/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

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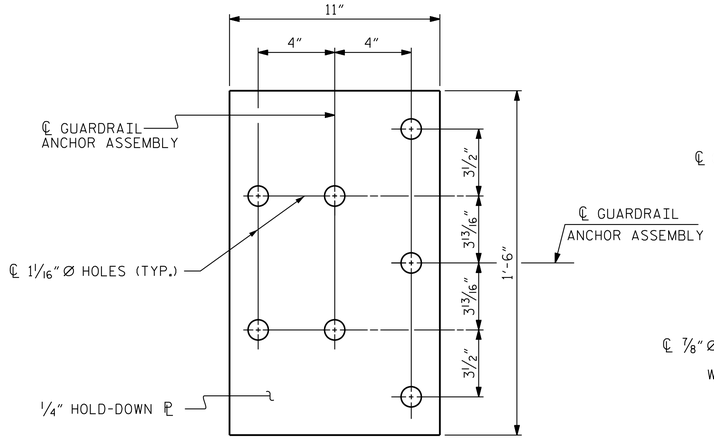
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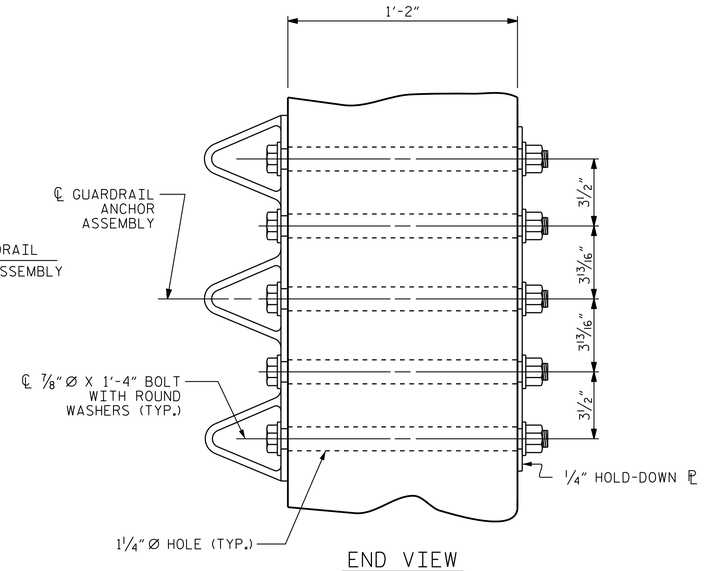
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PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

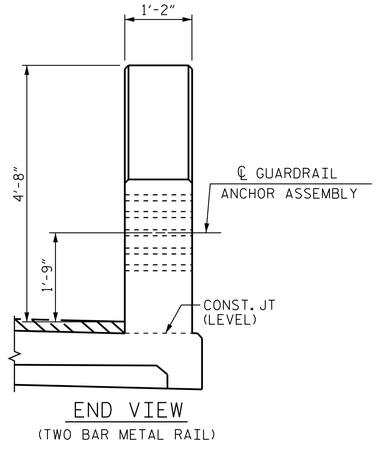
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

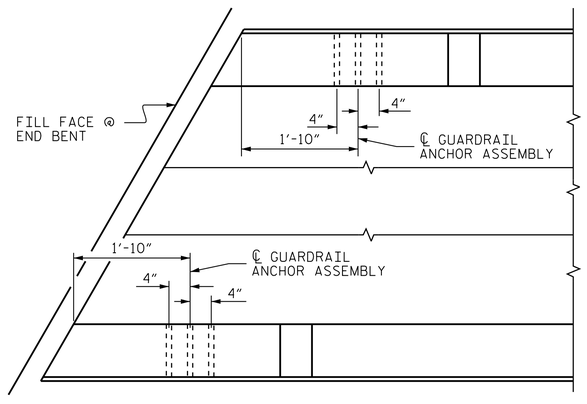
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

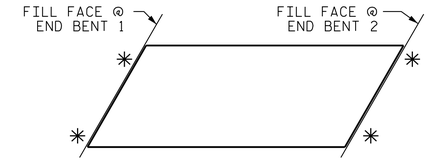
THE 1 1/4″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



END VIEW
(TWO BAR METAL RAIL)



PLAN



SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

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ASSEMBLED BY : J.B.GEILE	DATE : 11/12/18
CHECKED BY : N.D'AIUTO	DATE : 11/28/18
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Digitally signed by: Nicholas D'Aiuto
DocuSigned by: 7/25/2019

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DEPARTMENT OF TRANSPORTATION
RALEIGH

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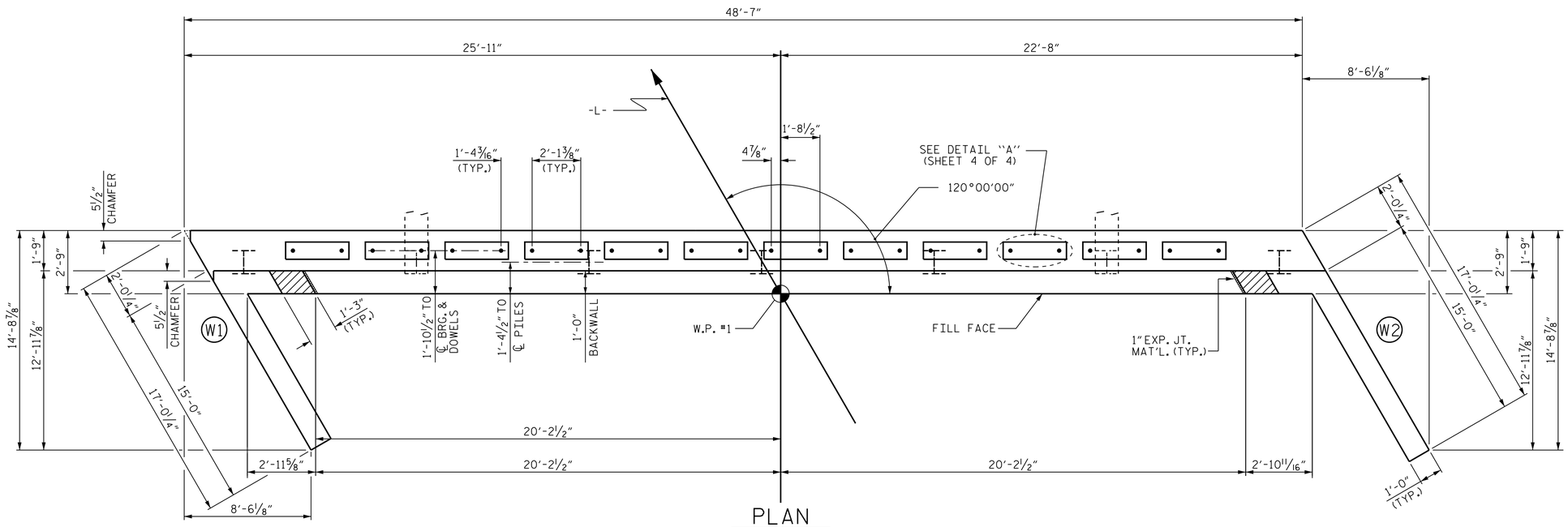
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

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1			3			TOTAL SHEETS
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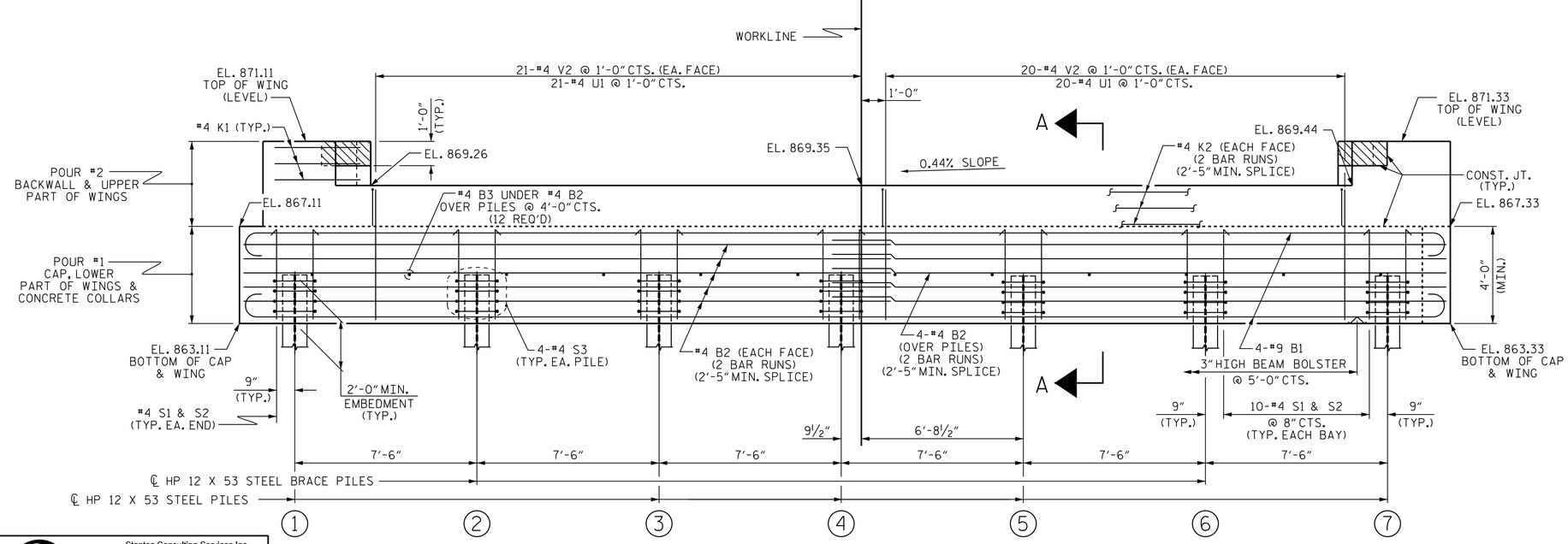
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PLAN



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.

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

GROUT THE SHEAR KEYS BETWEEN THE LEVEL AND SLOPED BOX BEAM UNITS. (I.E. SHEAR KEYS AT BREAK POINTS IN THE CAP) PRIOR TO TENSIONING THE TRANSVERSE STRANDS.

TOP OF PILE ELEVATIONS	
①	865.16
②	865.19
③	865.23
④	865.26
⑤	865.29
⑥	865.33
⑦	865.36

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

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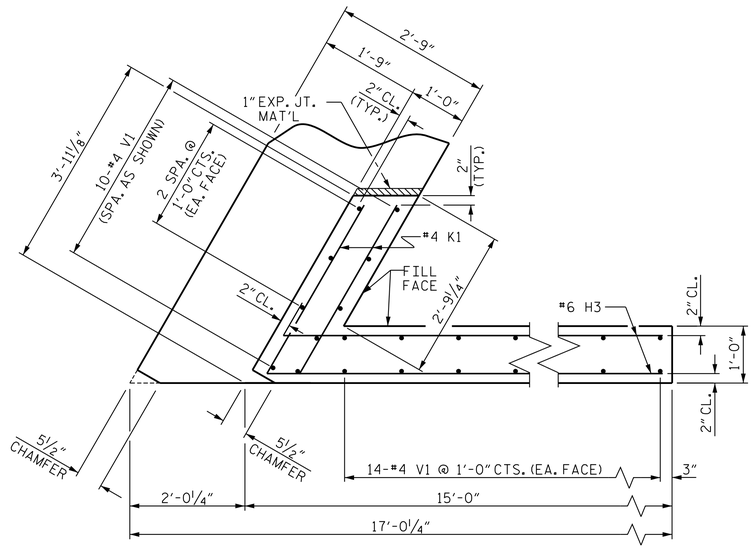
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ASSEMBLED BY : J. B. GEILE	DATE : 11/12/18	
CHECKED BY : N.D'AIUTO	DATE : 11/27/18	
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG	DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19
CHECKED BY : AAC 12/11		

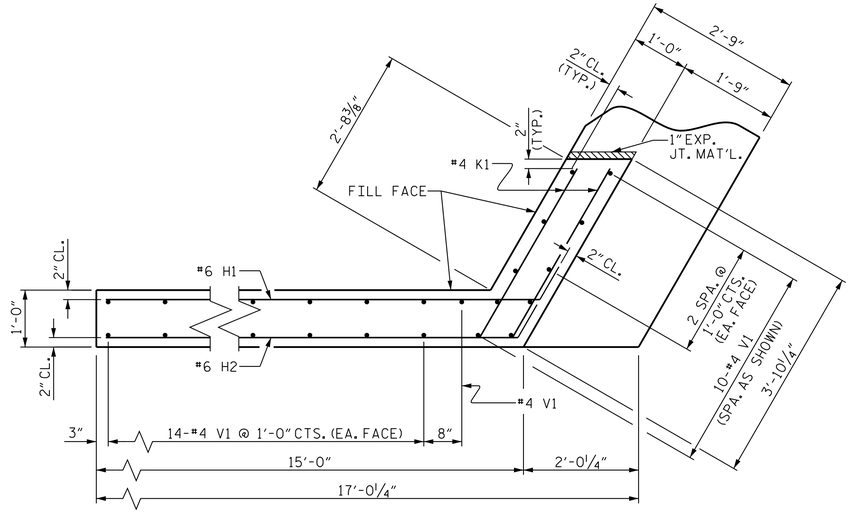
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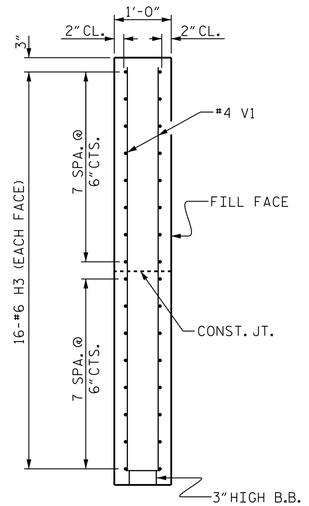
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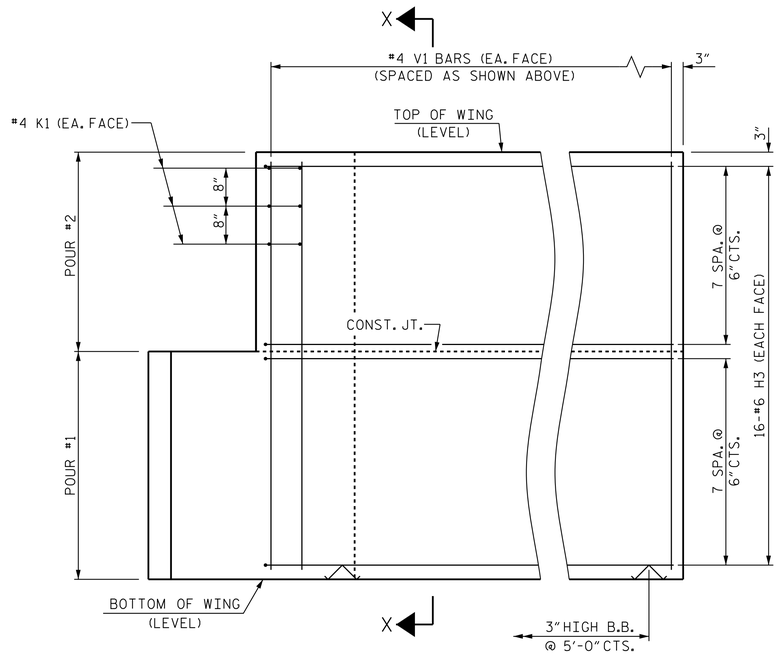
PLAN OF WING (W1)



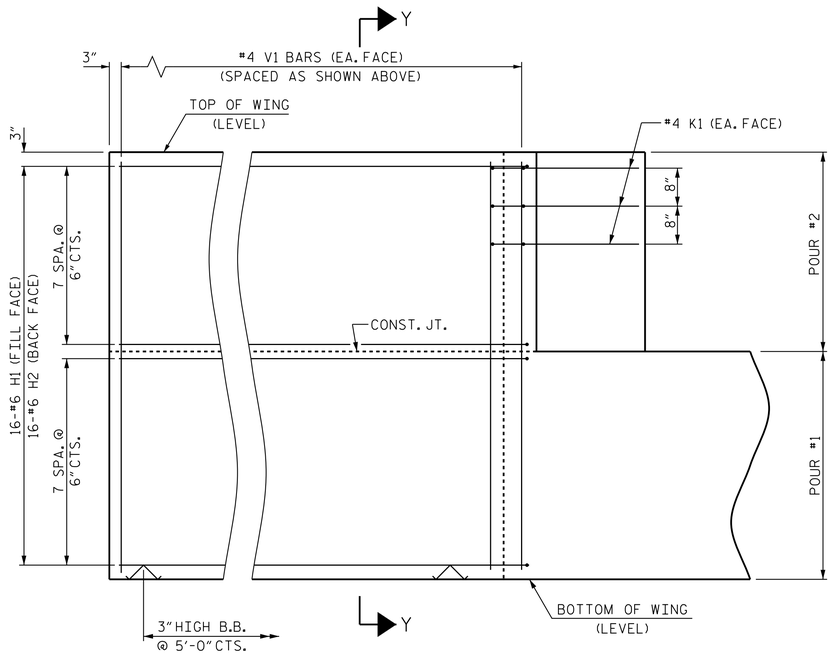
PLAN OF WING (W2)



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

SECTION Y-Y

WING DETAILS

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD SUBSTRUCTURE
END BENT WING DETAILS

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J. B. GEILE DATE : 11/12/18
CHECKED BY : N.D'AIUTO DATE : 11/27/18

DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11

REV. 4/15 MAA/TMG

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Electronically signed by: Nicholas D'Aiuto
7/25/2019

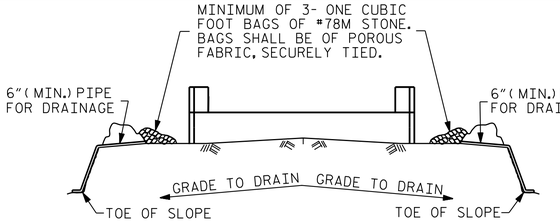
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STD. NO. EB_36_120S4_33BB

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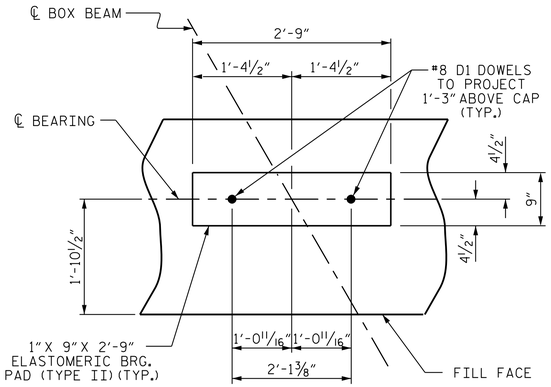


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

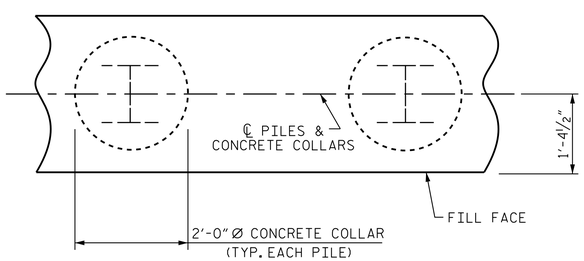
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

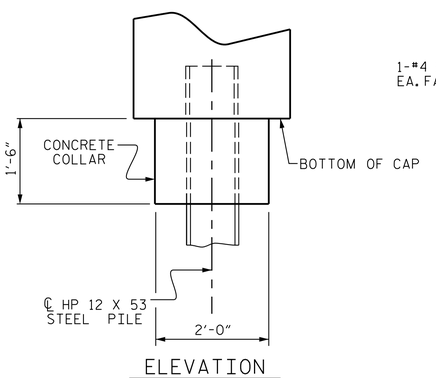


DETAIL "A"

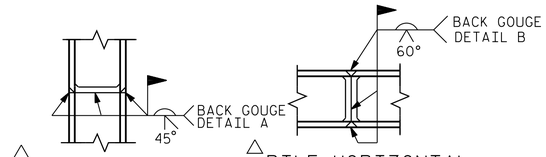
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



PLAN

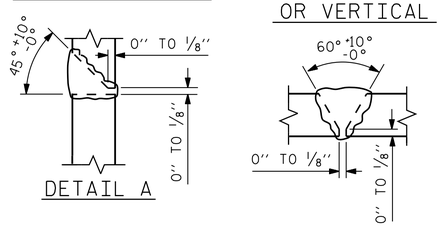


ELEVATION



△ PILE VERTICAL

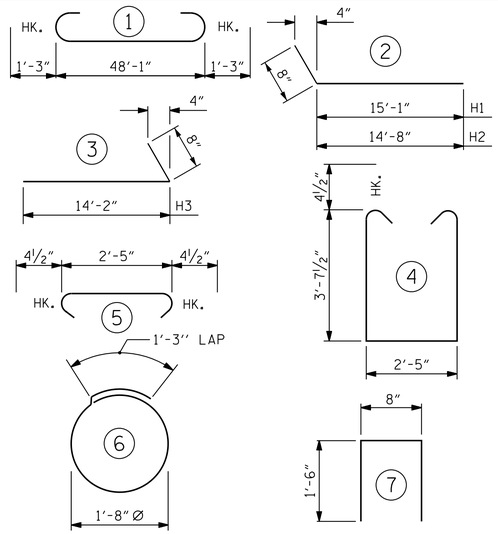
△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 1
HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 220.0

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	STEEL PILE POINTS NO: 7

BILL OF MATERIAL

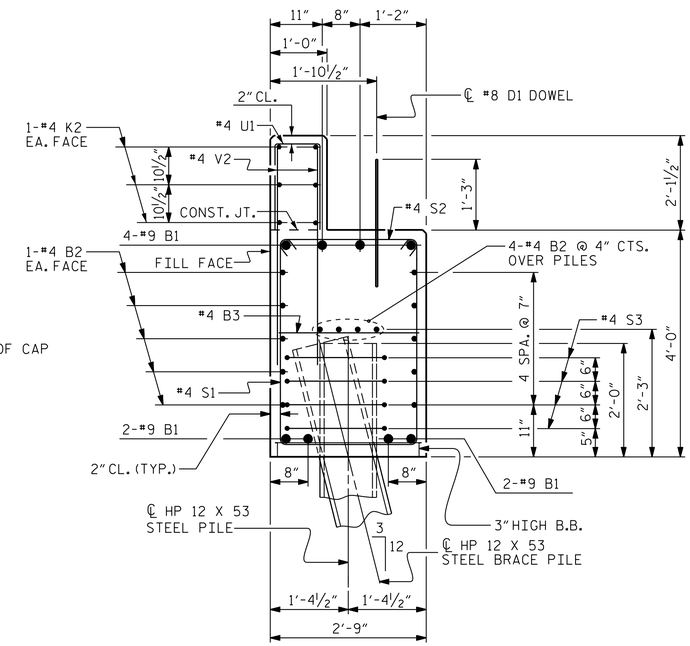
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'-7"	1376
B2	28	#4	STR	25'-4"	474
B3	12	#4	STR	2'-5"	19
D1	24	#8	STR	2'-3"	144
H1	16	#6	2	15'-9"	379
H2	16	#6	2	15'-4"	368
H3	32	#6	3	14'-10"	713
K1	12	#4	STR	3'-3"	26
K2	12	#4	STR	25'-4"	203
S1	62	#4	4	10'-5"	431
S2	62	#4	5	3'-2"	131
S3	28	#4	6	6'-6"	122
U1	41	#4	7	3'-8"	100
V1	77	#4	STR	7'-8"	394
V2	82	#4	STR	5'-9"	315

REINFORCING STEEL (FOR ONE END BENT) 5195 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	25.2 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	8.5 C.Y.
TOTAL CLASS A CONCRETE		33.7 C.Y.



SECTION A-A

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

CORROSION PROTECTION FOR STEEL PILES DETAIL

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Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J. B. GEILE	DATE : 11/12/18	
CHECKED BY : N. D'AIUTO	DATE : 11/27/18	
DRAWN BY : WJH 12/11	REV. 4/17 MAA/THC	DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19
CHECKED BY : AAC 12/11		

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Nicholas D'Aiuto 7/25/2019

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PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 3 OF 3

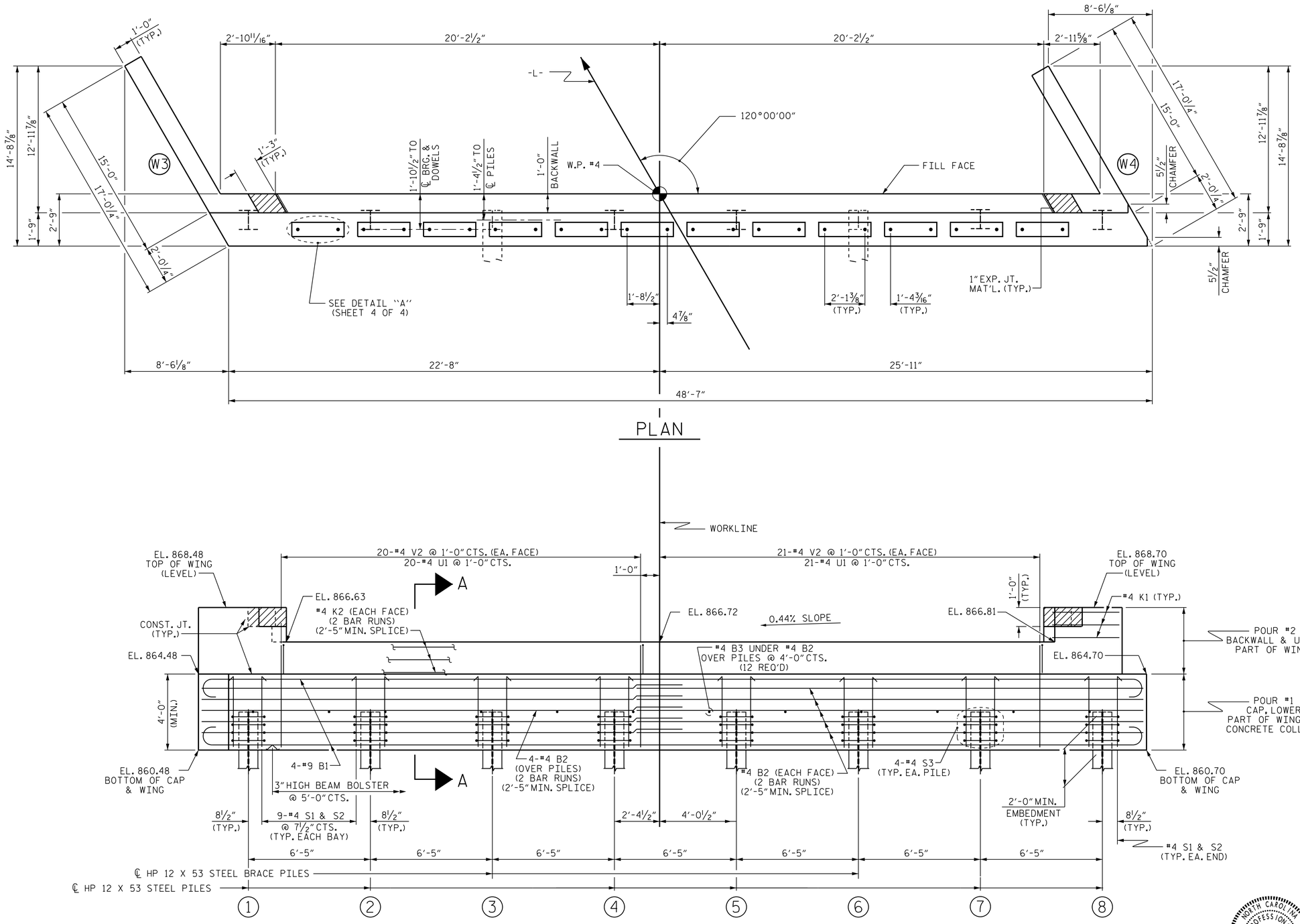
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD SUBSTRUCTURE
END BENT 1 DETAILS

REVISIONS						SHEET NO.
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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.

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

GROUT THE SHEAR KEYS BETWEEN THE LEVEL AND SLOPED BOX BEAM UNITS. (I.E. SHEAR KEYS AT BREAK POINTS IN THE CAP) PRIOR TO TENSIONING THE TRANSVERSE STRANDS.

TOP OF PILE ELEVATIONS	
①	862.54
②	862.57
③	862.59
④	862.62
⑤	862.65
⑥	862.68
⑦	862.71
⑧	862.74

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Docusigned by: Nicholas D'Aiuto 7/25/2019

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REVISIONS					
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SHEET NO. S-24

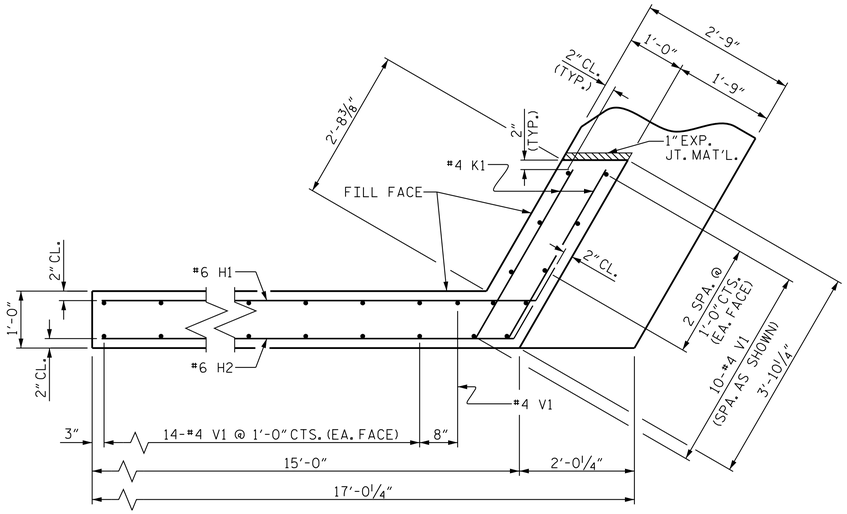
TOTAL SHEETS 32

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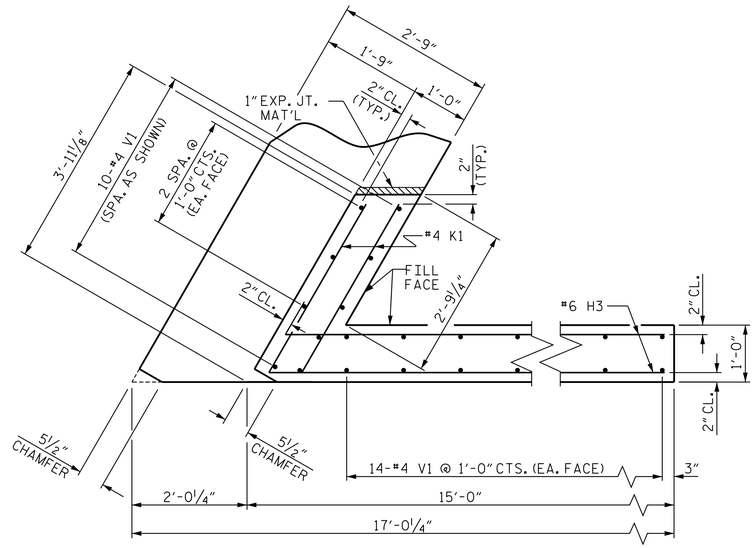
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CHECKED BY : N.D'AIUTO DATE : 11/27/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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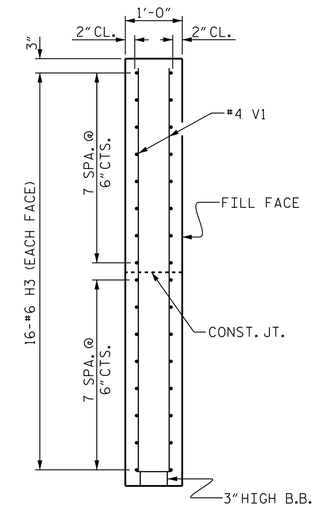
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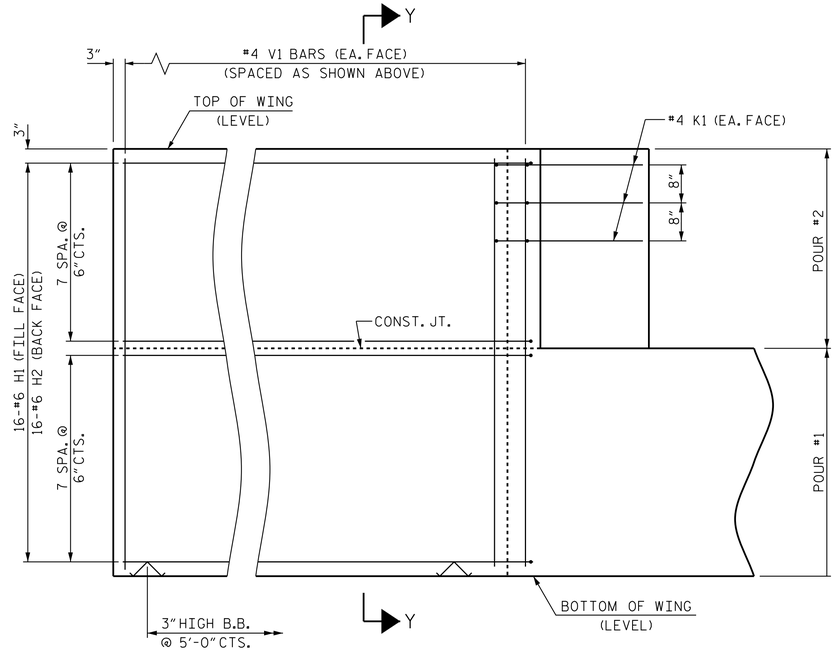
PLAN OF WING (W3)



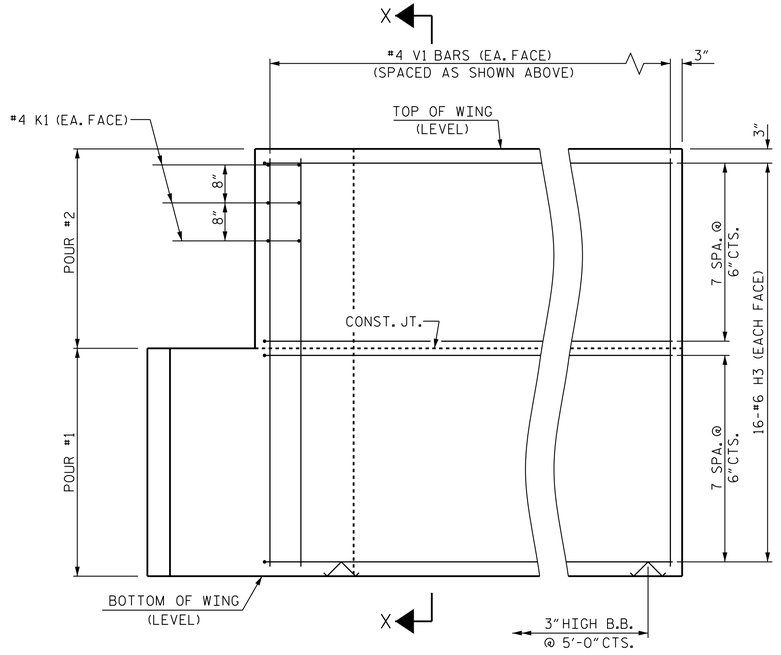
PLAN OF WING (W4)



SECTION X-X



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

SECTION Y-Y

WING DETAILS

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 3

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DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Digitally signed by: Nicholas D'Aiuto
DocuSigned by: 7/25/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

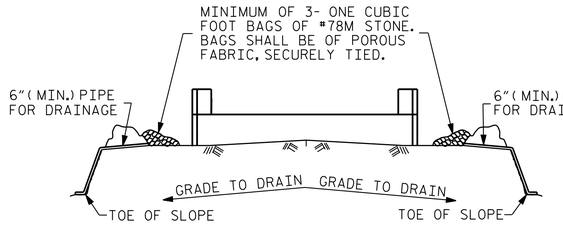
SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
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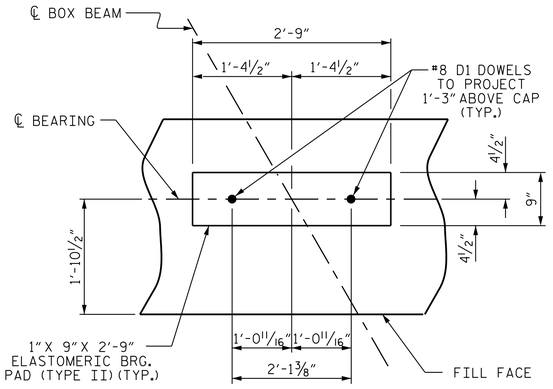


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

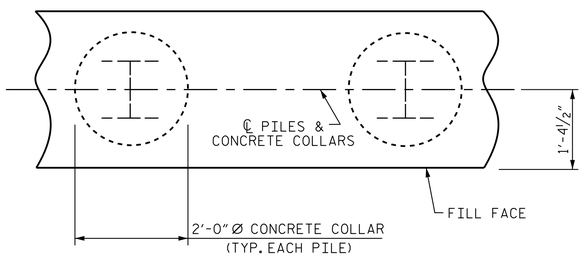
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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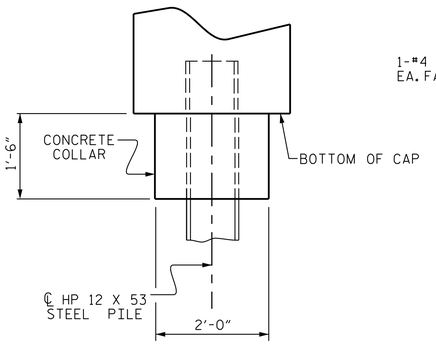
TEMPORARY DRAINAGE AT END BENT



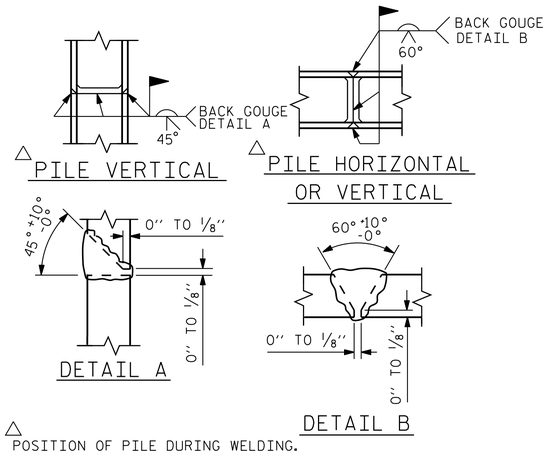
DETAIL "A"



PLAN



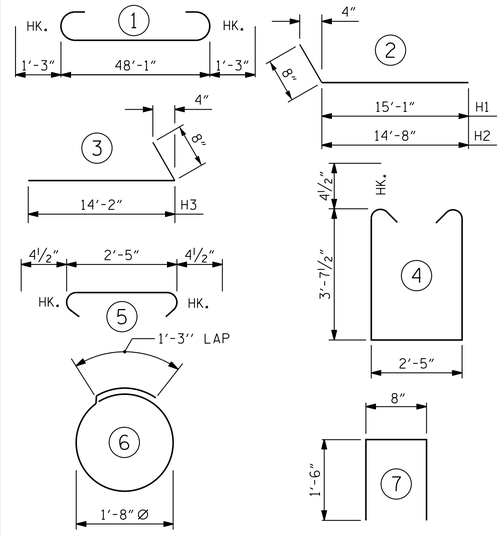
ELEVATION



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 2
HP 12 X 53 STEEL PILES
NO: 8 LIN. FT.= 200.0

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 8	STEEL PILE POINTS NO: 8

BILL OF MATERIAL

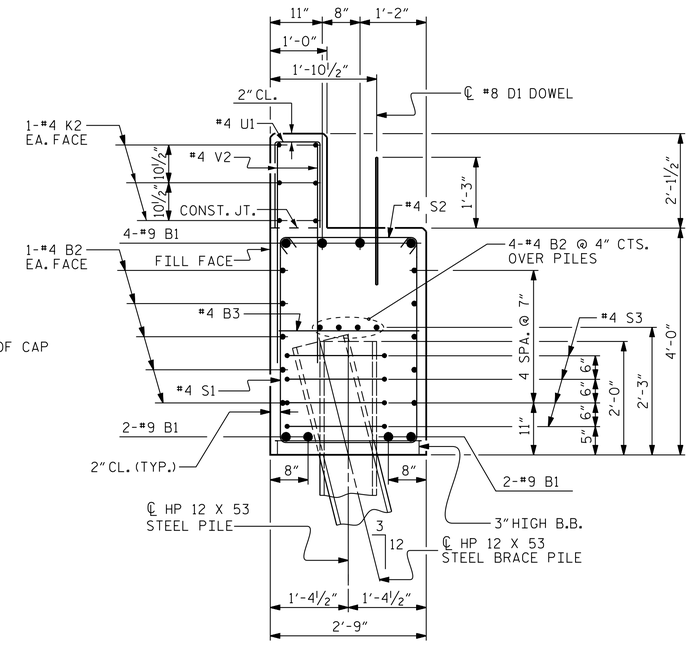
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'-7"	1376
B2	28	#4	STR	25'-4"	474
B3	12	#4	STR	2'-5"	19
D1	24	#8	STR	2'-3"	144
H1	16	#6	2	15'-9"	379
H2	16	#6	2	15'-4"	368
H3	32	#6	3	14'-10"	713
K1	12	#4	STR	3'-3"	26
K2	12	#4	STR	25'-4"	203
S1	65	#4	4	10'-5"	452
S2	65	#4	5	3'-2"	138
S3	32	#4	6	6'-6"	139
U1	41	#4	7	3'-8"	100
V1	77	#4	STR	7'-8"	394
V2	82	#4	STR	5'-9"	315

REINFORCING STEEL (FOR ONE END BENT) 5240 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	25.4 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	8.5 C.Y.
TOTAL CLASS A CONCRETE		33.9 C.Y.



SECTION A-A

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

CORROSION PROTECTION FOR STEEL PILES DETAIL

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Suite 300
Raleigh, NC 27606
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Fax. (919) 851-7024
www.stantec.com
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DRAWN BY : J. B. GEILE DATE : 11/13/18
CHECKED BY : N. D'AIUTO DATE : 11/27/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Digitally signed by: Nicholas D'Aiuto
DN: cn=Nicholas D'Aiuto, o=Stantec, ou=Bridges, email=nicholas.daiuto@stantec.com, c=US
Date: 2019.07.25 14:04:49 -04'00'
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SHEET NO. S-26
TOTAL SHEETS 32

PROJECT NO. 17BP.9.R.72
STOKES COUNTY
STATION: 19+80.00 -L-

SHEET 3 OF 3

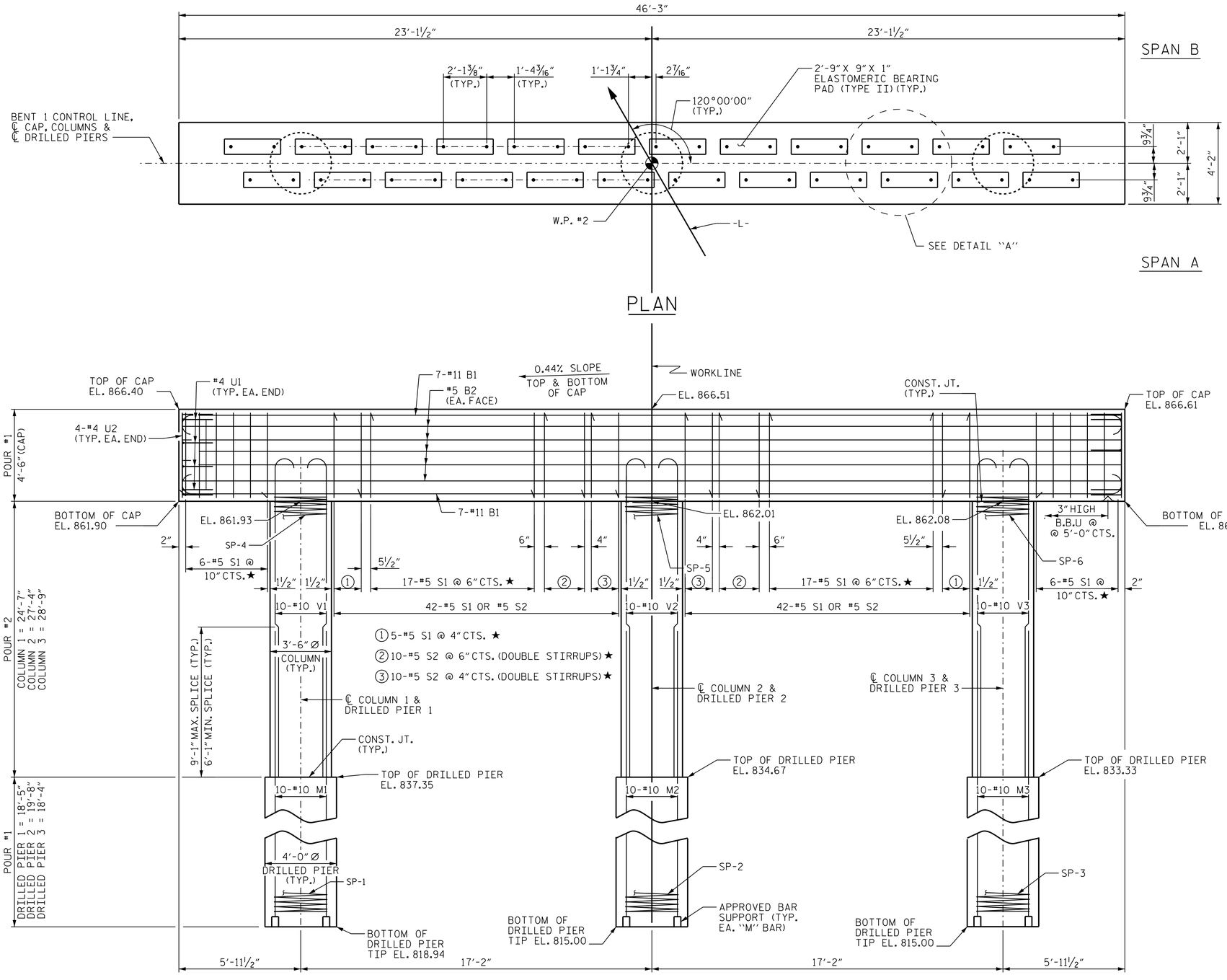
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

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ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES

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

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

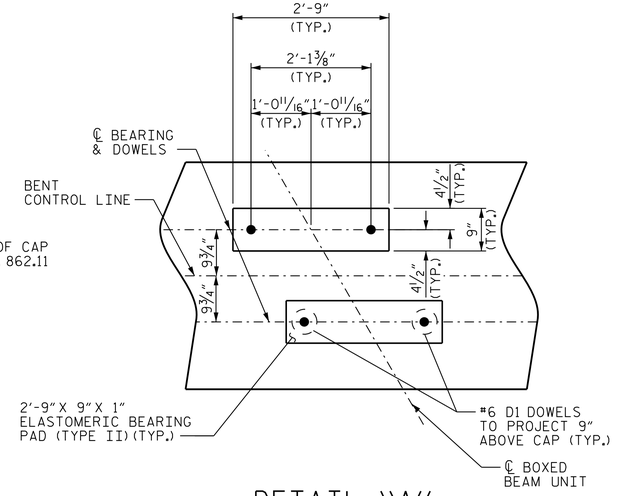
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Digitally signed by: Nicholas D'Aiuto
7/25/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			32

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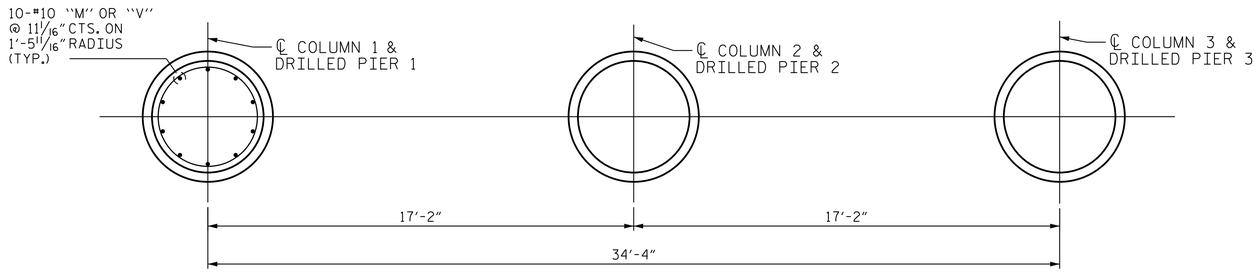
Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
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Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

DRAWN BY : J. B. GEILE DATE : 06/19/18
CHECKED BY : N.D'AIUTO DATE : 11/27/18

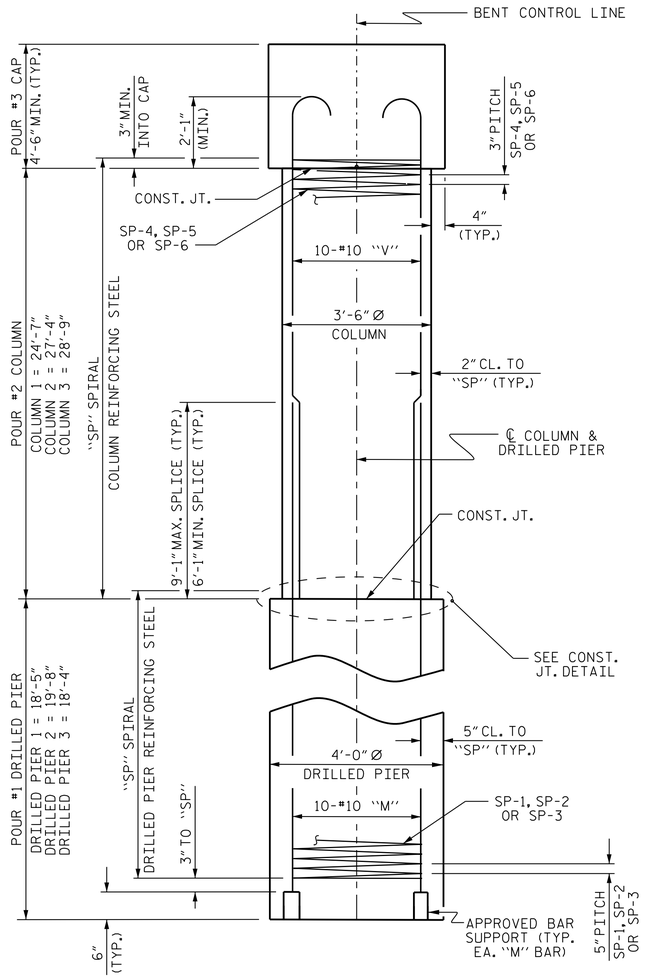
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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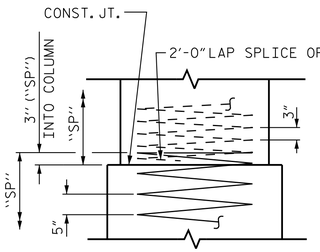
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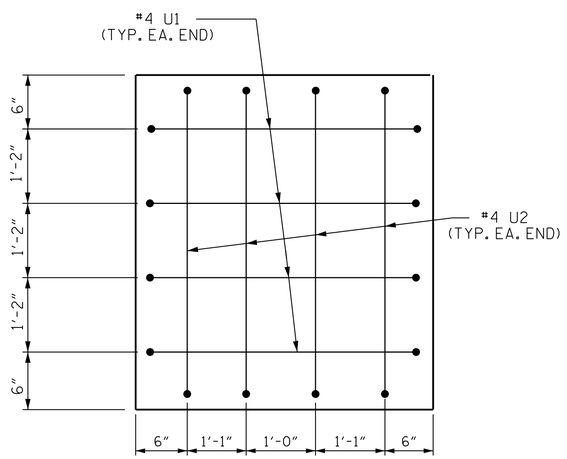
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



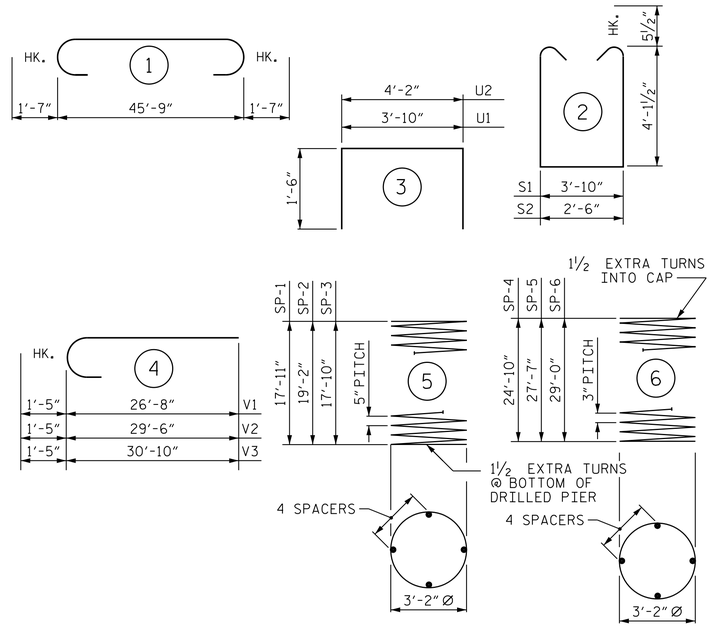
CONSTRUCTION JOINT DETAIL



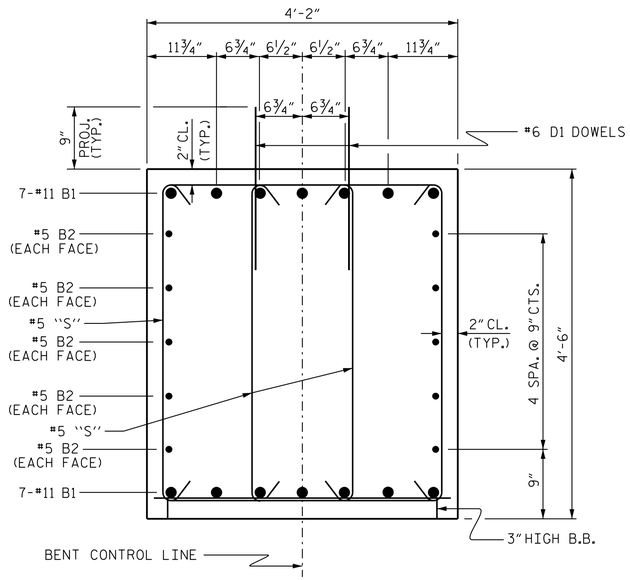
END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#11	1	48'-11"	3639
B2	10	#5	STR	45'-11"	479
D1	24	#6	STR	2'-3"	81
M1	10	#10	STR	27'-0"	1162
M2	10	#10	STR	28'-3"	1216
M3	10	#10	STR	26'-11"	1158
S1	56	#5	2	13'-0"	759
S2	40	#5	2	11'-8"	487
U1	8	#4	3	6'-10"	37
U2	8	#4	3	7'-2"	39
V1	10	#10	4	28'-1"	1208
V2	10	#10	4	30'-11"	1330
V3	10	#10	4	32'-3"	1388
REINFORCING STEEL					12983 LBS.
SP-1	1	*	5	450'-7"	470
SP-2	1	*	5	482'-5"	503
SP-3	1	*	5	450'-7"	470
SP-4	1	**	6	1011'-7"	676
SP-5	1	**	6	1119'-7"	748
SP-6	1	**	6	1168'-8"	781
SPIRAL COLUMN REINFORCING STEEL					3647 LBS.

* THE "SP" SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE "SP" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	28.7 C.Y.
POUR #3 (CAP)	32.1 C.Y.
TOTAL CLASS A CONCRETE	60.8 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	26.3 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	38.0 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	18.4 LIN. FT.
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	24.4 LIN. FT.
CSL TUBES	243.6 LIN. FT.
CSL TESTING	1 EA.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

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DRAWN BY : J. B. GEILE DATE : 11/08/18
CHECKED BY : N.D'AIUTO DATE : 11/27/18

DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

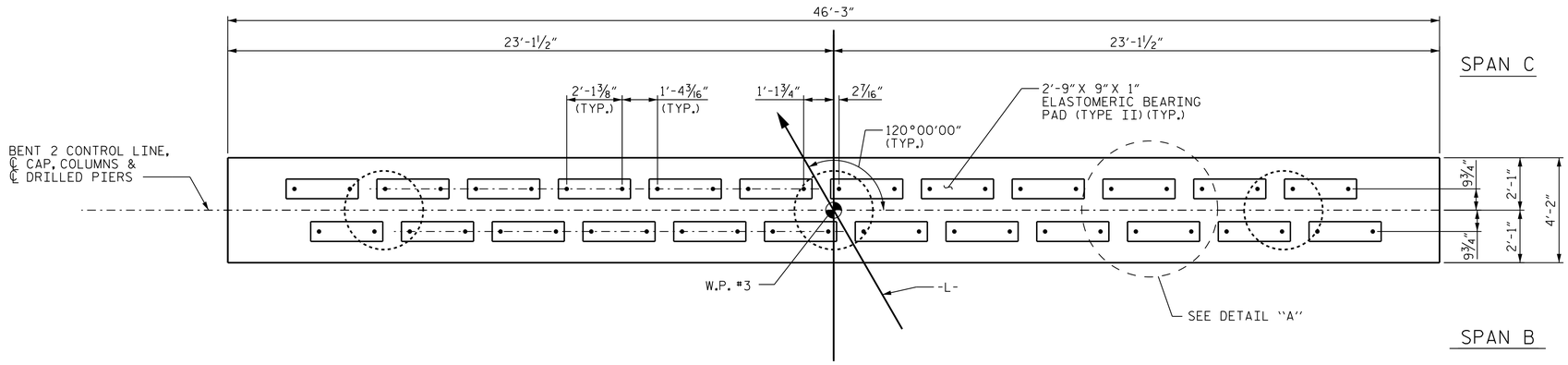
NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Digitally signed by: Nicholas D'Aiuto
DN: cn=Nicholas D'Aiuto, o=Stantec, ou=Bridges, email=nicholas.daiuto@stantec.com, c=US
7/25/2019

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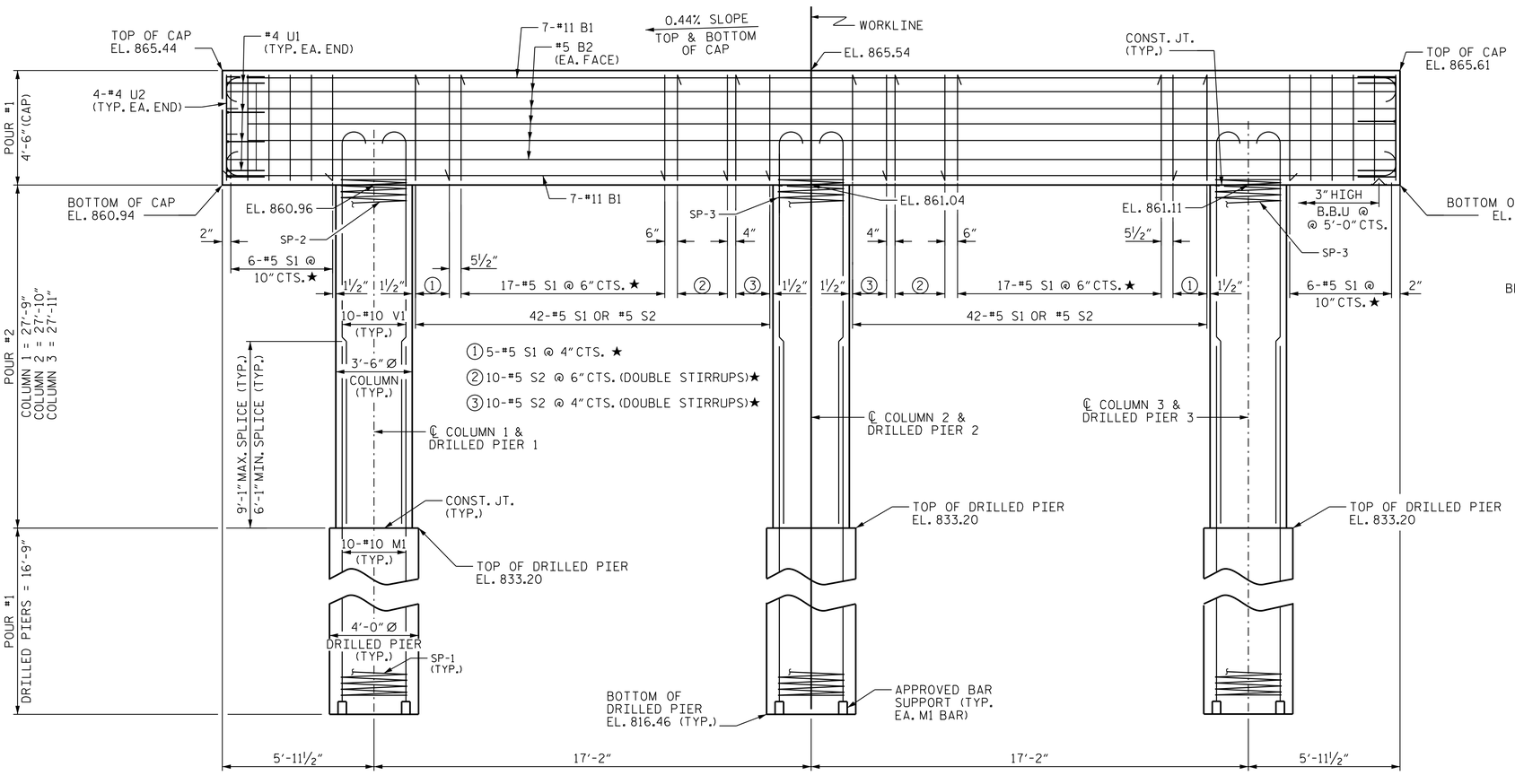
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PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES

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

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

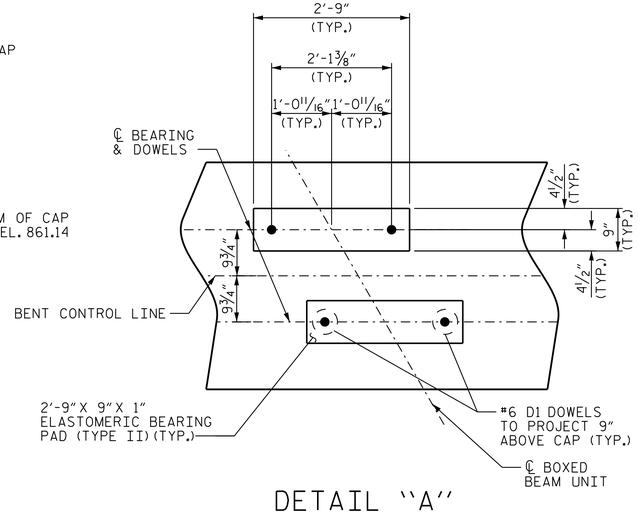
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DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Digitally signed by: Nicholas D'Aiuto
7/25/2019

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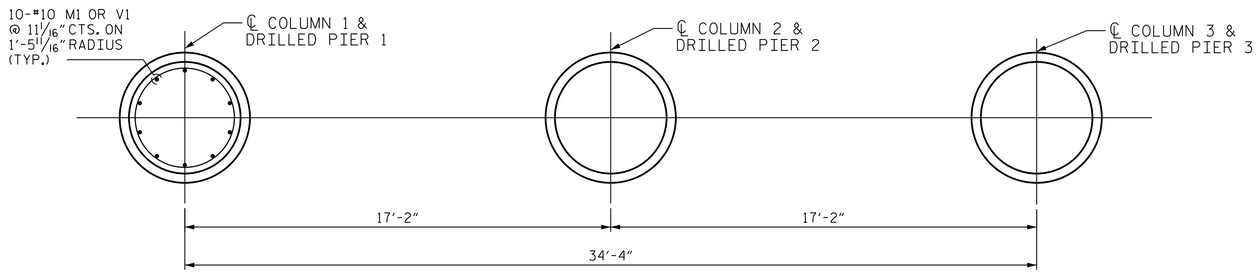
REVISIONS						SHEET NO.
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2			4			32

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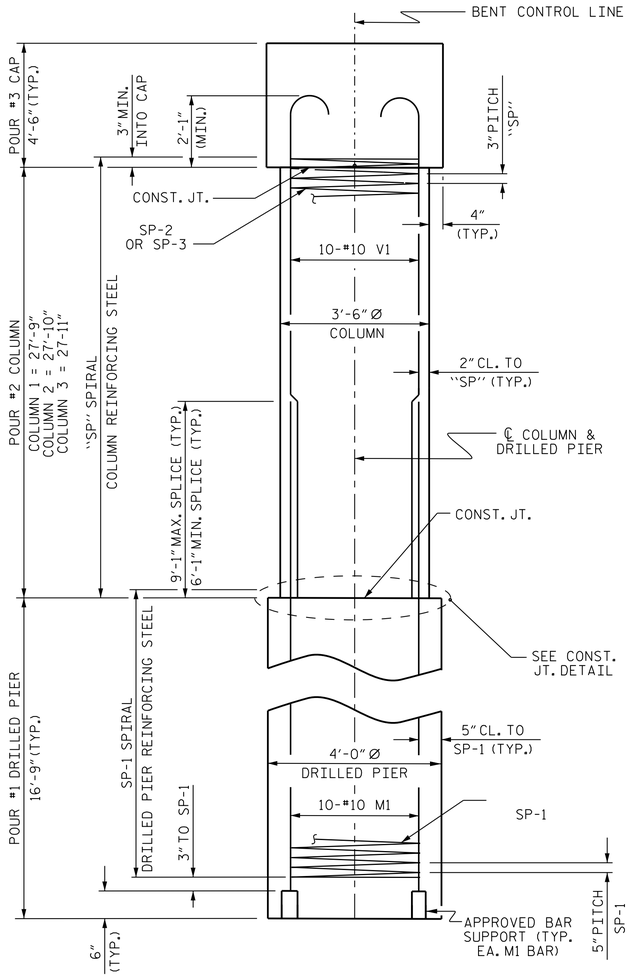
DRAWN BY : J. B. GEILE DATE : 11/09/18
CHECKED BY : N.D'AIUTO DATE : 11/27/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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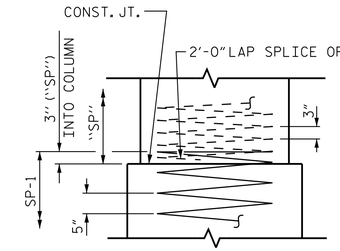
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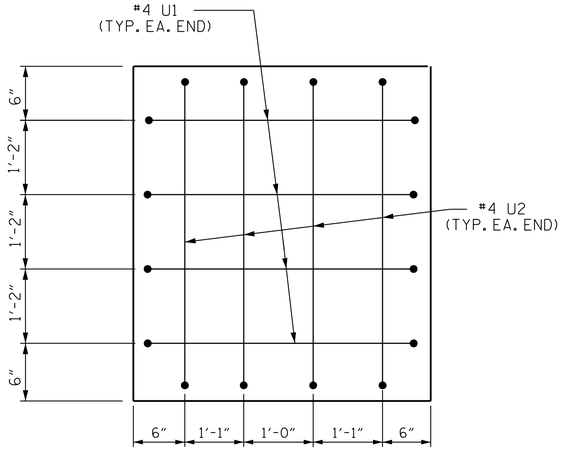
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



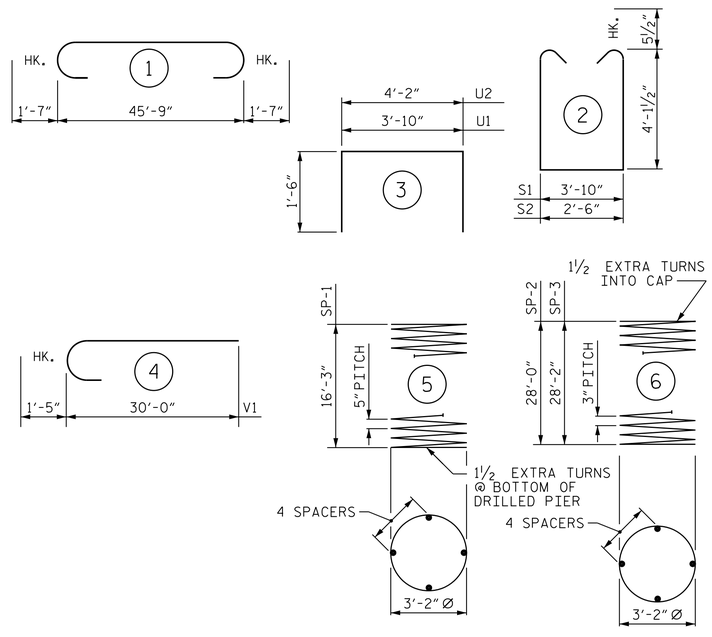
CONSTRUCTION JOINT DETAIL



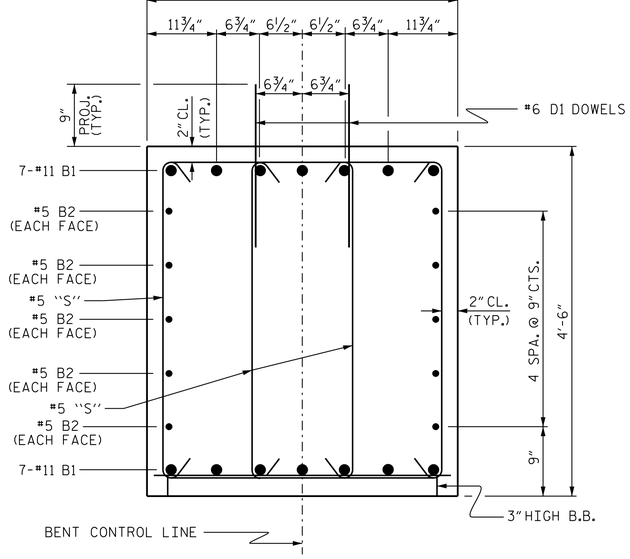
END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#11	1	48'-11"	3639
B2	10	#5	STR	45'-11"	479
D1	24	#6	STR	2'-3"	81
M1	30	#10	STR	25'-4"	3270
S1	56	#5	2	13'-0"	759
S2	40	#5	2	11'-8"	487
U1	8	#4	3	6'-10"	36
U2	8	#4	3	7'-2"	39
V1	30	#10	4	31'-5"	4056
REINFORCING STEEL					12846 LBS.
SP-1	3	✳	5	411'-4"	1287
SP-2	1	✳✳	6	1129'-5"	754
SP-3	2	✳✳	6	1139'-3"	1522
SPIRAL COLUMN REINFORCING STEEL					3563 LBS.

✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

✳✳ THE "SP" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	29.8 C.Y.
POUR #3 (CAP)	32.1 C.Y.
TOTAL CLASS A CONCRETE	61.9 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	23.4 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	29.0 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	21.3 LIN. FT.
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	26.1 LIN. FT.
CSL TUBES	219.0 LIN. FT.
CSL TESTING	1 EA.

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 2

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DRAWN BY : J. B. GEILE DATE : 11/09/18
CHECKED BY : N.D'AIUTO DATE : 05/29/19
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO

Nicholas D'Aiuto
7/25/2019

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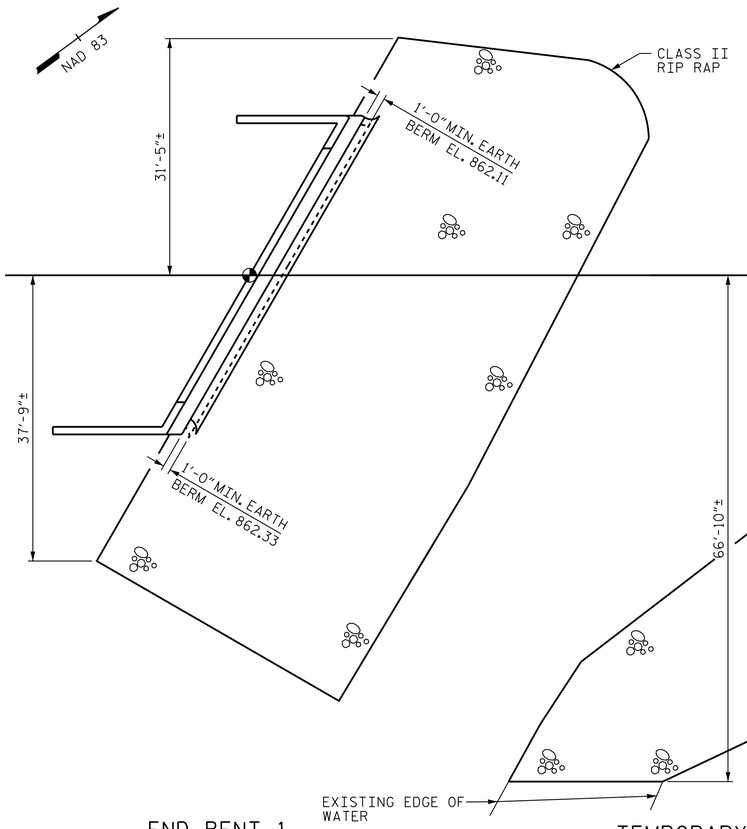
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NOTES:

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

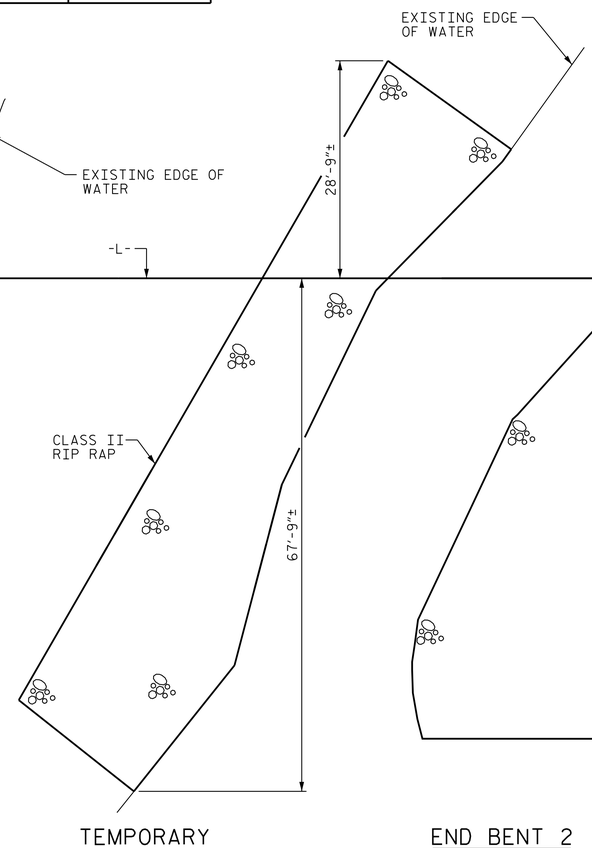
ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+80.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	405.0	450.0
TEMPORARY ROCK CAUSEWAY ✳	180.0	200.0
TEMPORARY ROCK CAUSEWAY ✳✳	175.0	195.0
END BENT 2	555.0	615.0
TOTAL	1,315.0	1,460.0

✳ NEAR BENT 1, ✳✳ NEAR BENT 2

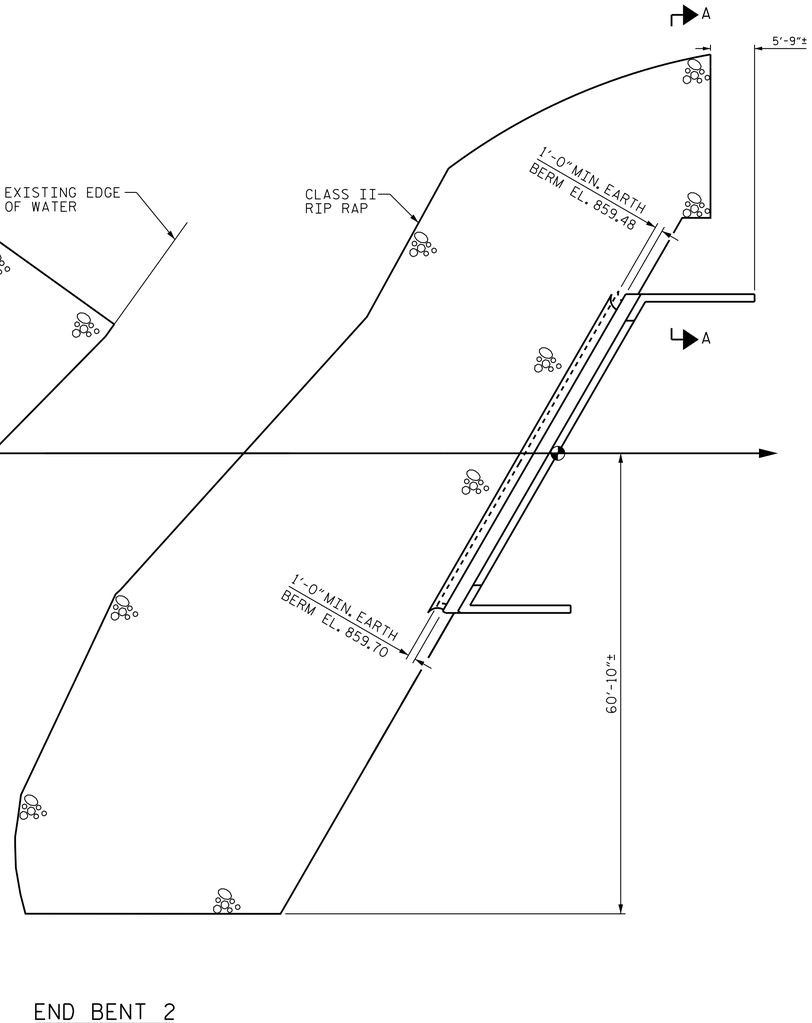


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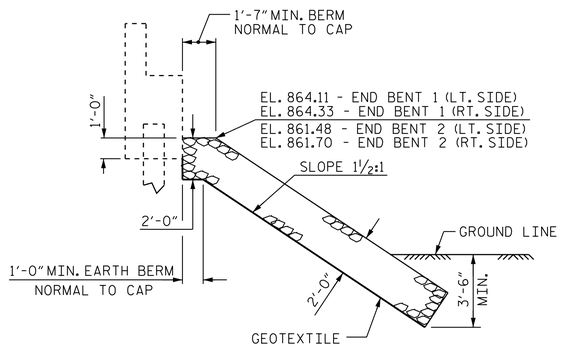
TEMPORARY ROCK CAUSEWAY
NEAR BENT 1



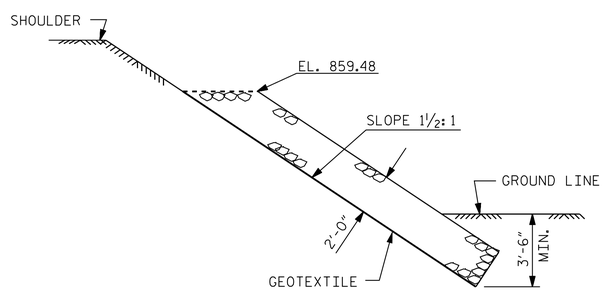
TEMPORARY ROCK CAUSEWAY
NEAR BENT 2



END BENT 2



SECTION THRU
BERM RIP RAPPED



SECTION A-A

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

RIP RAP

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Digitally signed by: Nicholas D'Aiuto
7/25/2019

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1			3		
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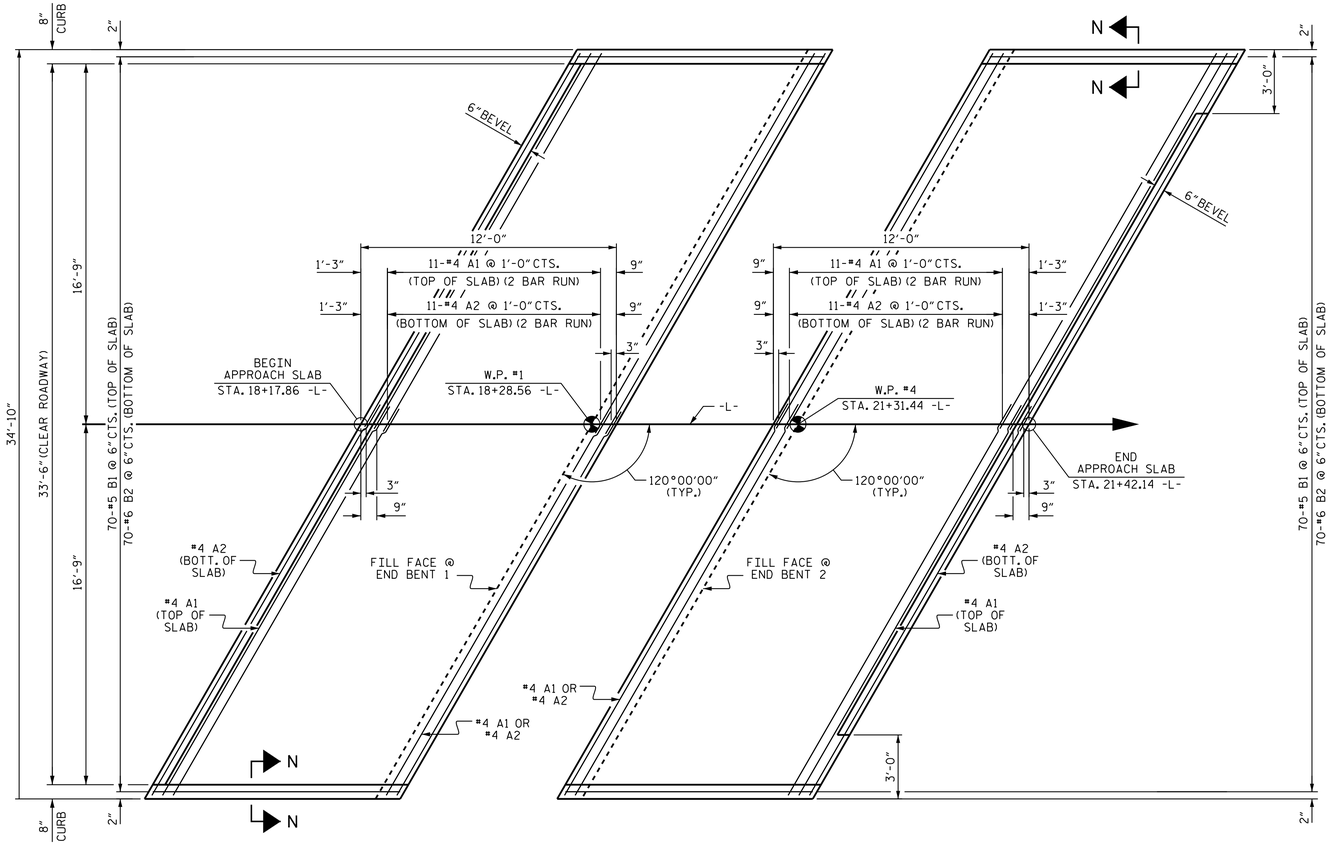
SHEET NO. S-31
TOTAL SHEETS 32

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DRAWN BY : J.B. GIELE DATE : 11/27/18
CHECKED BY : N. D'AIUTO DATE : 11/27/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

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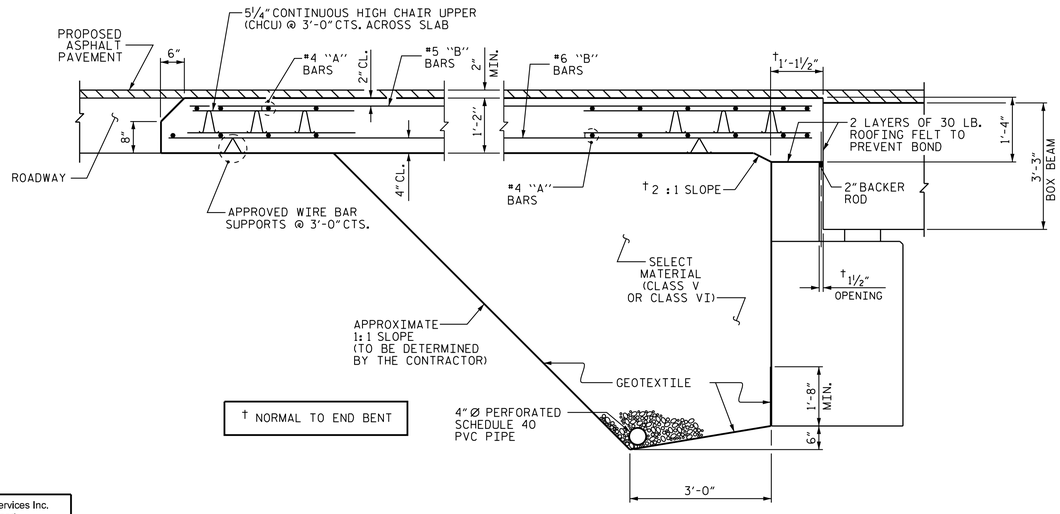
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PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES

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

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

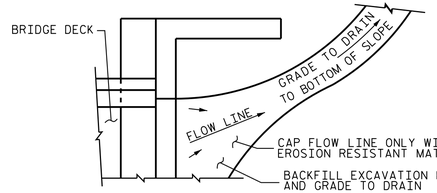
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

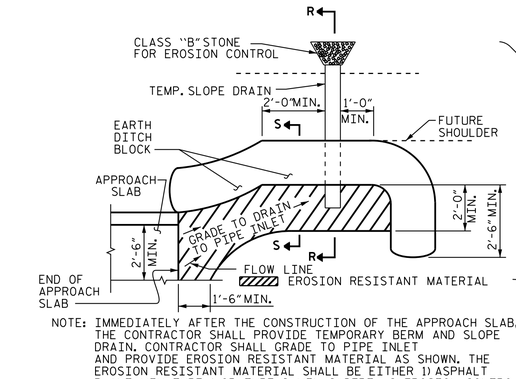
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



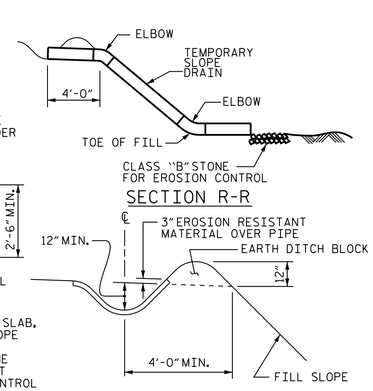
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

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

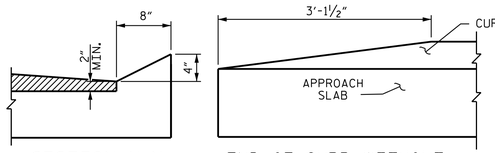


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	21'-0"	365
A2	26	#4	STR	20'-10"	362
✱ B1	70	#5	STR	11'-0"	803
B2	70	#6	STR	11'-7"	1218
REINFORCING STEEL				LBS.	1,580
✱ EPOXY COATED REINFORCING STEEL				LBS.	1,168
CLASS AA CONCRETE				C.Y.	18.6

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	21'-0"	365
A2	26	#4	STR	20'-10"	362
✱ B1	70	#5	STR	11'-0"	803
B2	70	#6	STR	11'-7"	1218
REINFORCING STEEL				LBS.	1,580
✱ EPOXY COATED REINFORCING STEEL				LBS.	1,168
CLASS AA CONCRETE				C.Y.	18.6

PROJECT NO. 17BP.9.R.72

STOKES COUNTY

STATION: 19+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)

120° SKEW

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

NORTH CAROLINA PROFESSIONAL SEAL 45237 ENGINEER NICHOLAS D'AIUTO
Docusigned by: Nicholas D'Aiuto 7/25/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			32

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License No. F-0672

ASSEMBLED BY : J. B. GEILE DATE : 06/19/18
CHECKED BY : N. D'AIUTO DATE : 11/27/18
DESIGN ENGINEER OF RECORD: N. D'AIUTO DATE : 07/25/19

U:\Structures\Drafting\Final\17BP9R72_SMU_ASOL_840008.dgn 7/25/2019 jgeile

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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" 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

STD. NO. SN

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM REV. 12-17 MAA (/) THC