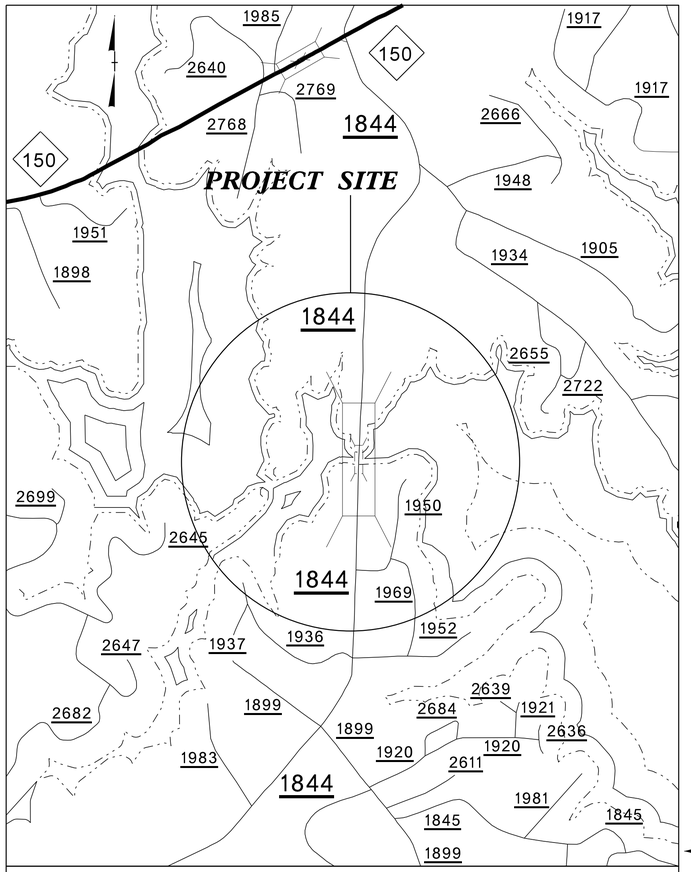
09/08/99

TIP PROJECT: HS–2012B

CONTRACT: DL00238

See Sheet 1A For Index of Sheets



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA COUNTY

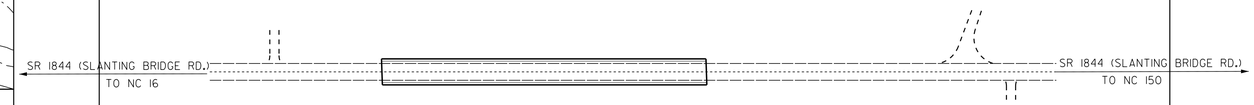
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS–2012B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49331.1.3	1844002	PE
49331.3.3	1844002	CONST

LOCATION: SR 1844 (SLANTING BRIDGE RD.) AT BRIDGE# 23.

TYPE OF WORK: APPROACH GUARDRAIL REPLACEMENT AT ALL FOUR CORNERS OF THE BRIDGE AND RETRO FIT GUARDRAIL ACROSS BRIDGE# 23.

2A



PROJECT LENGTH

LENGTH OF ROADWAY PROJECT TIP HS–2012A = 0.185 MILES

TOTAL LENGTH OF PROJECT TIP HS–2012A = 0.185 MILES

Prepared In the Office of:
DIVISION 12 DDC
1710 E. Marion St., Shelby NC, 28152

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: APRIL 27TH, 2021

MICHAEL L. POE, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30010 ENGINEER Michael L. Poe

DocuSigned by: Michael L. Poe 761E124BED8040A...
4/1/2021

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

01-APR-2021 14:04
S:\DDC\District 3\Catawba\HS-2012B_Slanting Bridge Rd\proj\HS-2012B_Rdy_tsh.dgn
$$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2012B	1A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30010 ENGINEER Michael L. Robinson

DocuSigned by: 4/1/2021

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
2 THRU 2A	ROADWAY GUARDRAIL DETAILS
S-1 THRU S-5	STRUCTURE GUARDRAIL DETAILS

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 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation

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

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON SHEET 2A SHALL BE VERIFIED/ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

01-APR-2021 09:28
C:\Projects\Catawba\HS-2012B_Slanting Bridge Rd\proj\HS-2012B_Rdy_psh_1A.dgn
$$$$USERNAME$$$$

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
HS-2012B	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 — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent 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
- H–Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

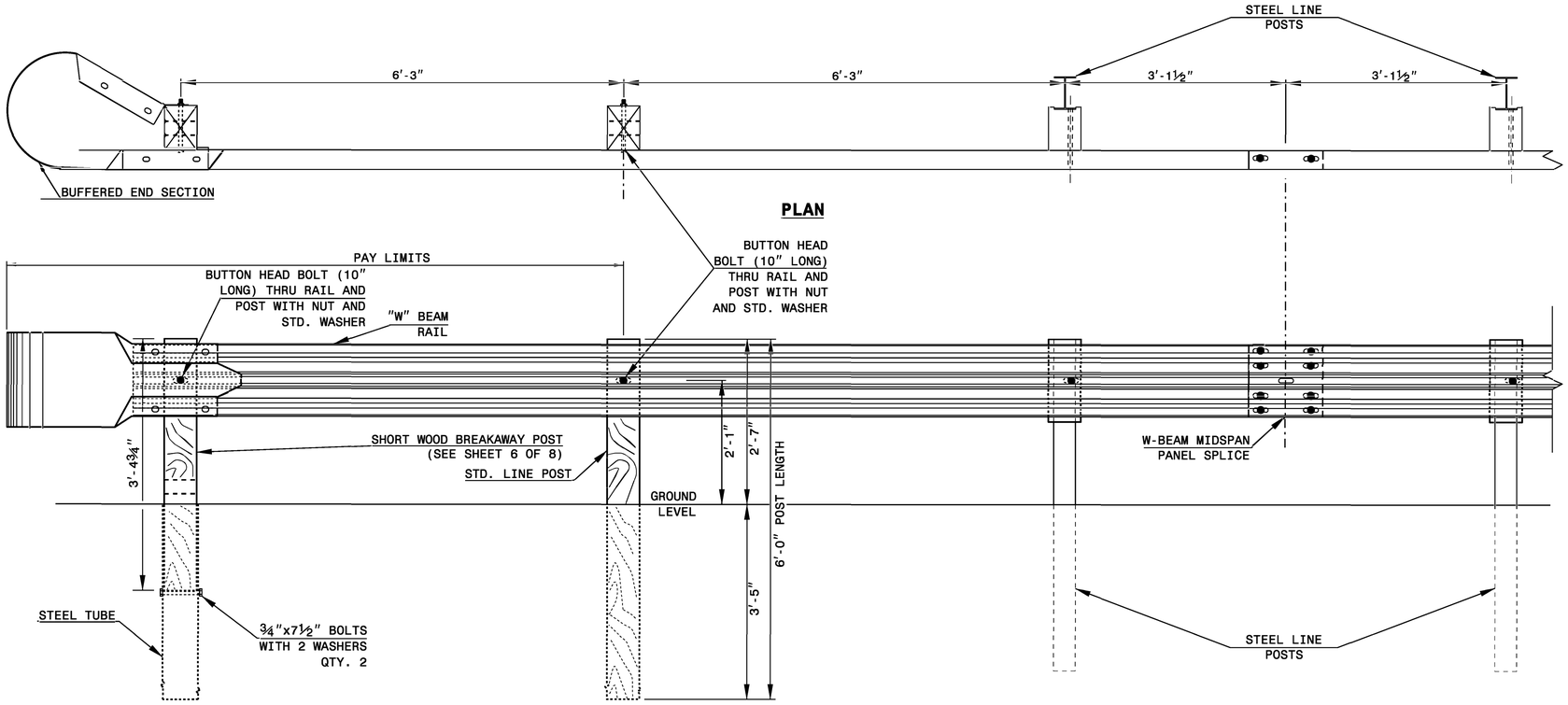
MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2012A	2

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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON

DocuSigned by:
[signature]
873F3D17DCDC45F...
4/1/2021

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.:_____

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
HS-2012B	2A

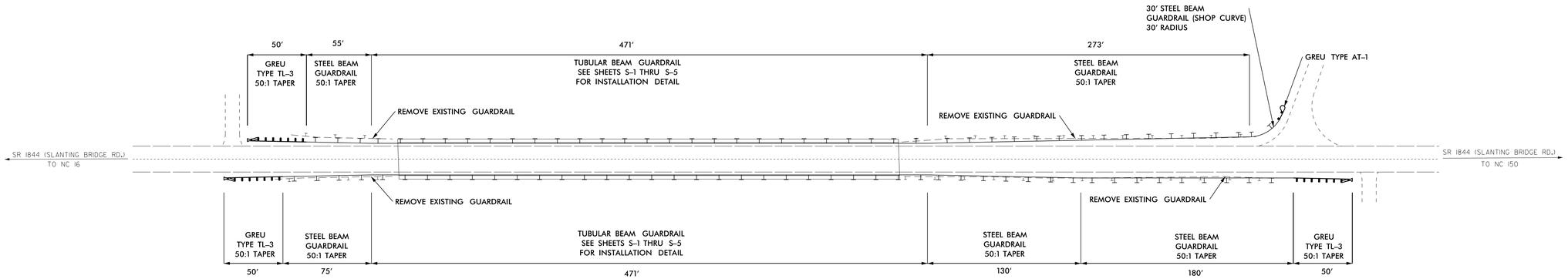
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30010 ENGINEER Michael L. Poe

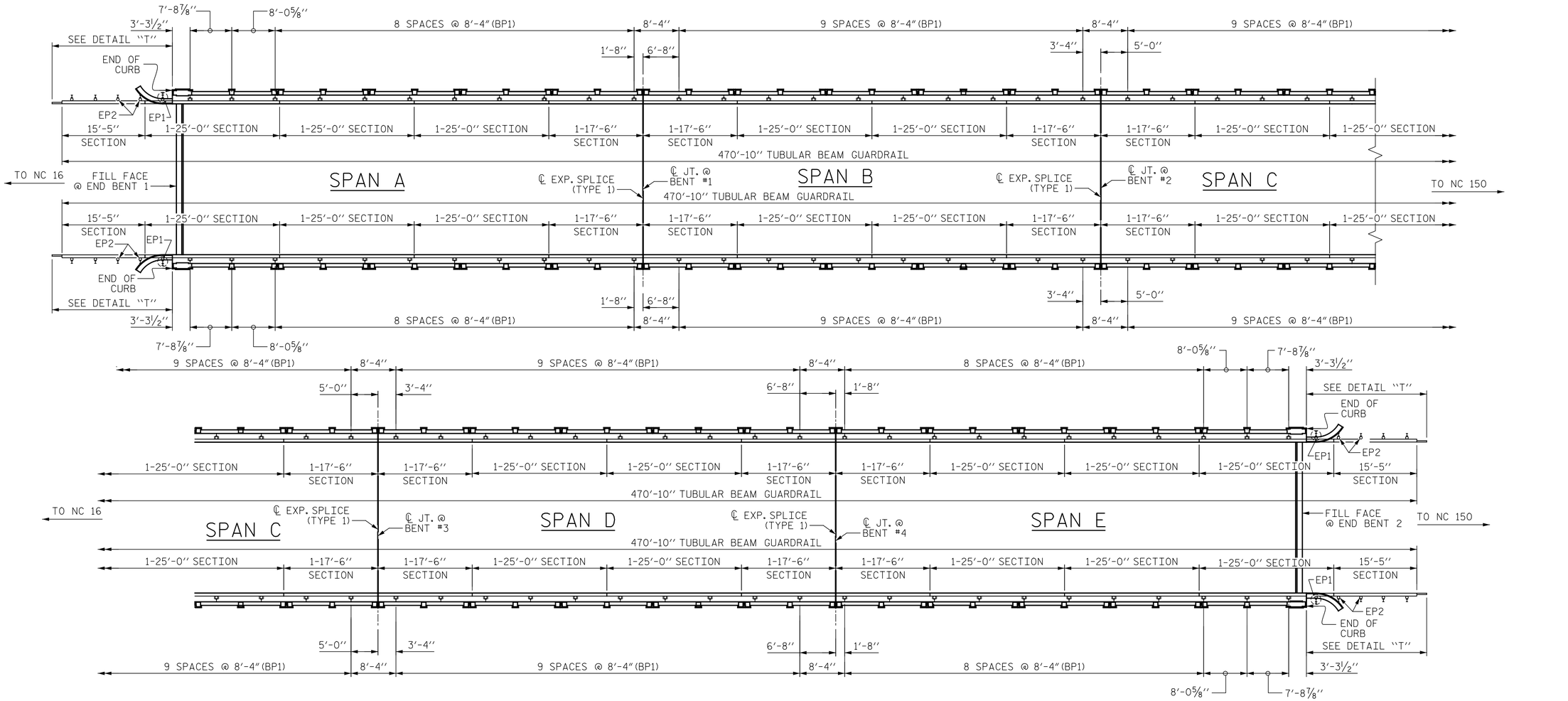
DocuSigned by: 761E124BED0B40A... 4/1/2021

GUARDRAIL PLACEMENT DETAIL



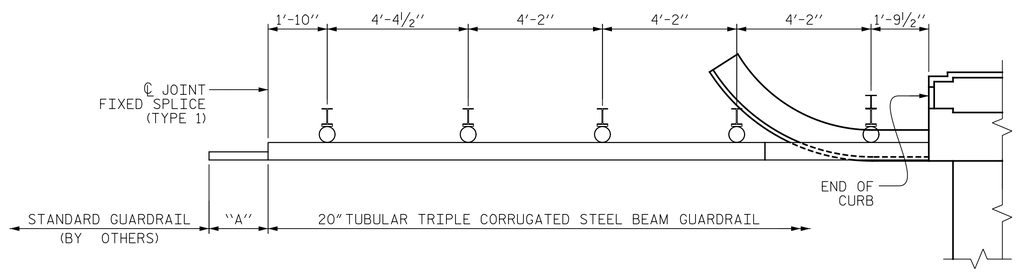
NOTES:
1) SEE PLANSHEET 2 FOR AT-1 DETAIL.
2) SEE PLANSHEET S-1 THRU S-5 FOR 20" TUBULAR GUARDRAIL DETAIL ACROSS BRIDGE.
3) SEE SECTION 862 OF THE STANDARD DRAWINGS FOR GUARDRAIL AND END UNIT INSTALLATION.
4) POTHOLE UTILITIES AS NEEDED FOR INSTALLATION OF GUARDRAIL AND END UNITS.

DETAIL NOT TO SCALE



LEGEND

----	USE	BP1
--------	USE	EP1
-----	USE	EP2
''A'' ----	USE	W-TR GUARDRAIL TRANSITIONAL SECTION
''B'' ----	USE	STANDARD GUARDRAIL



DETAIL ''T''

DocuSigned by: John A. Yannaccone 7813617546784S6... 2/17/2021

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER JOHN A. YANNACCONE

PROJECT NO. HS-2012B

CATAWBA COUNTY

BRIDGE NO. 23

SHEET 1 OF 5

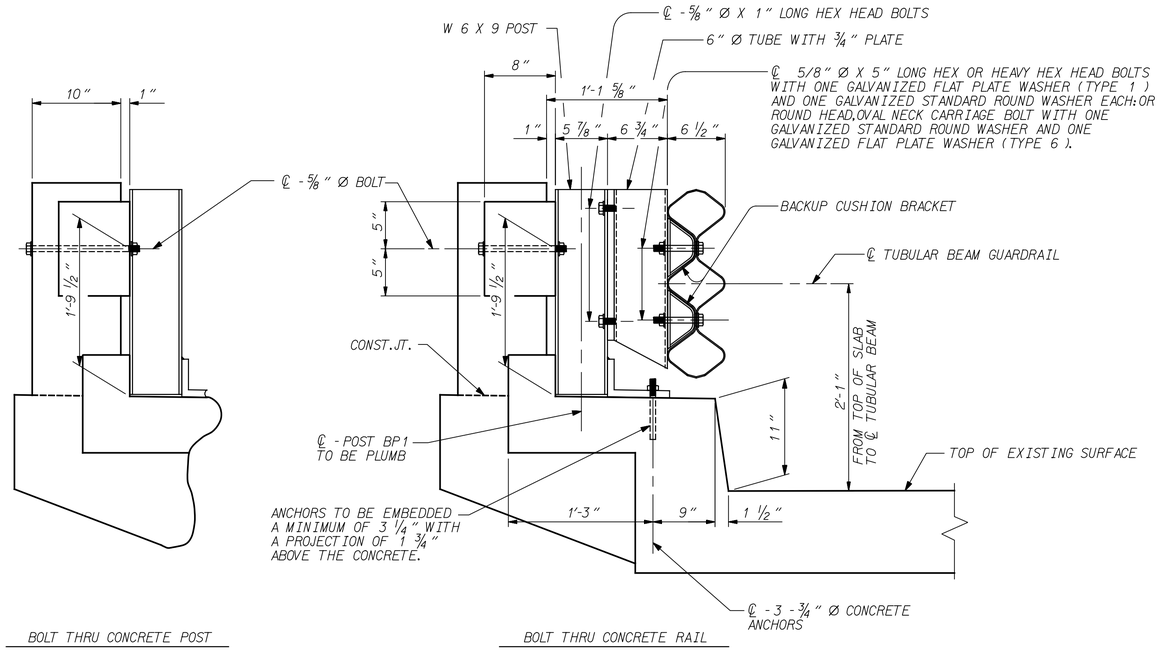
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL RETROFIT OF BRIDGE OVER LAKE NORMAN ON SR 1844 (SLANTING BRIDGE ROAD)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			5

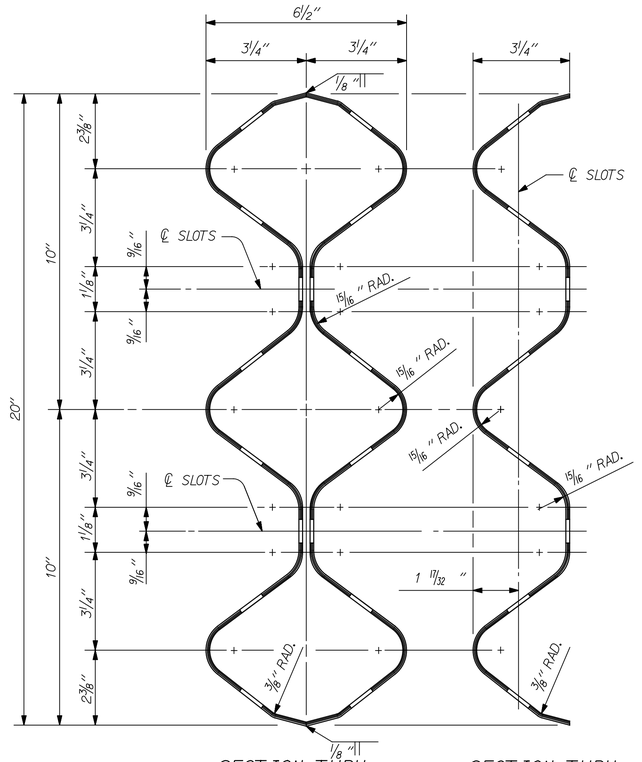
DRAWN BY : J. MYA DATE : 01/2021
CHECKED BY : J. YANNACCONE DATE : 01/2021

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270



RETROFIT EXISTING RAIL WITH TUBULAR BEAM GUARDRAIL
(WITHOUT WEARING SURFACE)

TOTAL BILL OF MATERIAL	
20 INCH TUBULAR STEEL BEAM GUARDRAIL	W-TR STEEL BEAM GUARDRAIL TRANSITION SECTIONS
LIN.FT.	EACH
941.7	4



SECTION THRU TUBULAR BEAM

SECTION THRU 20" TRIPLE CORRUGATED BEAM

GENERAL NOTES :

1. THE 20" TRIPLE TUBULAR CORRUGATED BEAM RAIL SECTION SHALL BE FABRICATED BY WELDING TWO (2) 20" TRIPLE CORRUGATED BEAM RAIL ELEMENTS AS SHOWN AND THE GUARDRAIL SHALL CONFORM TO THE NCDOT STANDARD SPECIFICATIONS EXCEPT AS NOTED AND SHOWN ON THE PLANS.
2. 20' TRIPLE TUBULAR CORRUGATED BEAM RAIL SHALL BE 10 GAGE.
3. POSTS, BASE ANGLES AND/OR BASE PLATES, 6" DIA. TUBES, AND OFFSET BLOCKS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-36. SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-570 GRADE 33 OR A-611 GRADE C.
4. POSTS, BASE ANGLES AND/OR BASE PLATES, TUBES, BLOCKS AND SHIMS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.
5. POSTS ARE TO BE PLUMB. SHIMS MAY BE USED BENEATH THE ROADWAY EDGE OF THE BASE ANGLES AND/OR BASE PLATES AS NECESSARY FOR POST ALIGNMENT. PROVIDE ONE 1/8 " AND TWO 1/16 " STEEL SHIMS FOR 25 % OF THE POSTS ON THE BRIDGE.
6. ''BP'' POST HEIGHT TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR.
7. PROPOSED RAIL POST MAY BE SHIFTED SLIGHTLY TO CLEAR REINFORCING STEEL. STANDARD SLOTS MAY BE USED IN THE RAIL TO ALLOW ADJUSTMENT.
8. HOLES SHALL BE DRILLED HORIZONTAL OR VERTICAL USING A ROTARY DRILL OR A ROTARY IMPACT DRILL. IMPACT TOOLS WILL NOT BE PERMITTED. CARBIDE TIPPED BITS SHALL BE USED UNLESS REINFORCING STEEL IS ENCOUNTERED. AN APPROPRIATE BIT FOR DRILLING THROUGH REINFORCING STEEL SHALL BE USED WHEN NECESSARY. THE CONTRACTOR SHALL BE PREPARED TO DRILL THROUGH REINFORCING STEEL AT TIMES.
9. POST SPACINGS AS SHOWN ON THE PLANS SHALL BE CHECKED BEFORE HOLES ARE DRILLED IN THE 20" TRIPLE TUBULAR CORRUGATED BEAM RAIL. STANDARD SLOTS WILL BE ALLOWED. FIELD PUNCHING OF THE HOLES OR SLOTS WILL NOT BE PERMITTED.
10. A SEALANT WILL BE REQUIRED IN THE AREA OF THE ANCHOR BOLTS AND WILL BE PLACED IN THE FOLLOWING MANNER:
    A. BEFORE THE BASE PLATE HAS BEEN SET IN PLACE, IF THE GROUT DOES NOT COMPLETELY FILL THE ANCHOR HOLE, SEAL THE AREA AROUND EACH CONCRETE ANCHOR BOLT TO KEEP MOISTURE FROM ENTERING THE HOLE.
    B. AFTER THE BASE PLATE HAS BEEN SET IN PLACE AND BEFORE THE WASHERS AND NUTS HAVE BEEN PLACED ON THE BOLT, SEAL THE HOLE REMAINING AROUND THE ANCHOR BOLT.

    THE SEALANT SHALL BE A ONE-COMPONENT POLYSULFIDE GUN GRADE MEETING FEDERAL SPECIFICATION TT-S-230. SEALANT SHALL BE GRAY IN COLOR AND APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION. THE FOLLOWING SEALANTS MEET THE ABOVE REQUIREMENTS:
    'SONOLASTIC ONE PART", MANUFACTURED BY SONNEBORN-DESOTO CO., DES PLAINES, ILLINOIS, 60018.
    'THOROSPAN ONE COMPONENT', MANUFACTURED BY STANDARD DRY WALL PRODUCTS, INC., MIAMI, FLORIDA, 33166.
    'HORNFLEX ONE COMPONENT', MANUFACTURED BY W. R. GRACE AND CO., CAMBRIDGE, MASSACHUSETTS, 02140.
11. ALL CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
12. VERTICAL SLOTS IN THE 6" TUBE ALLOW FOR SOME VERTICAL ADJUSTMENT OF RAIL HEIGHT IN ORDER TO OBTAIN THE CENTERLINE OF RAIL HEIGHT OF 1'-10" ABOVE RIDING SURFACE.
13. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES." ELECTROSLAG WELDING WILL NOT BE PERMITTED.
14. LAP BEAM RAIL JOINTS IN DIRECTION OF TRAFFIC.
15. THE EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO FABRICATION OF THE RAIL SYSTEM, THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

CONCRETE ANCHOR NOTES :

1. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.
   A) THE 3/4" DIAMETER ANCHOR BOLTS SHALL BE TESTED USING LEVEL 2 FIELD TESTING AS SHOWN IN THE STANDARD SPECIFICATIONS. THE YIELD LOAD OF THE 3/4" DIAMETER ANCHOR IS 10 KIPS.
   B) THE SUCCESSFULLY TESTED ANCHOR MAY BE USED IN THE FINAL RAIL ASSEMBLY, IF APPROPRIATELY LOCATED. IF NOT SO LOCATED, OR IF THE ANCHOR FAILS THE TEST, THE TEST AREA SHALL BE REPAIRED AS DAMAGED CONCRETE, SEE 'GENERAL NOTES'.
2. EMBEDMENT SHOWN ON THE PLANS IS A MINIMUM, BUT THE MANUFACTURER'S RECOMMENDATIONS SHALL BE FOLLOWED.
3. THE 3/4" DIAMETER CONCRETE ANCHOR SHALL CONSIST OF A STUD, THREADED ON ONE END, WITH NUT AND WASHERS. THE ANCHOR SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS OF ASTM A-153.
4. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL ANCHORS MAY BE USED AS AN ALTERNATE FOR THE GALVANIZED CONCRETE ANCHORS. THEY SHALL MEET OR EXCEED THE MECHANICAL REQUIREMENTS FOR THE GALVANIZED ANCHORS. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
5. EXPANSION ANCHORS WILL NOT BE PERMITTED.
6. FOR ANCHOR BOLTS, SEE STANDARD SPECIFICATIONS.

NOTES :

TUBULAR BEAM POSTS ARE TO BE MOUNTED AGAINST THE EXISTING CONCRETE RAIL.
HOLES FOR THE 5/8" DIAMETER BOLTS, THRU THE EXISTING CONCRETE RAIL OR POST, SHALL BE 3/4" DIAMETER.

3/4" AND 5/8" DIAMETER BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-307 AND SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS OF ASTM A-153.

DocuSigned by: John A. Yannaccone 781361754678406...
2/17/2021

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER JOHN A. YANNACCONE

PROJECT NO. HS-2012B
CATAWBA COUNTY
BRIDGE NO. 23

SHEET 2 OF 5

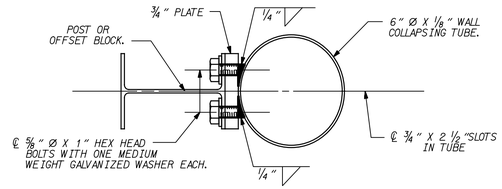
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

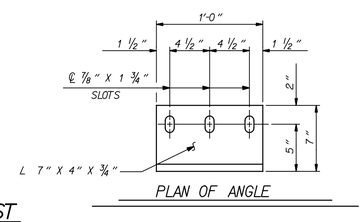
DETAILS FOR RETROFIT OF EXISTING BRIDGE RAIL WITH TUBULAR BEAM GUARDRAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			5

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : J. MYA DATE : 01/2021
CHECKED BY : J. YANNACCONE DATE : 01/2021



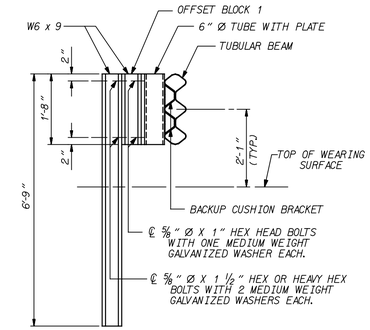


PLAN OF ANGLE

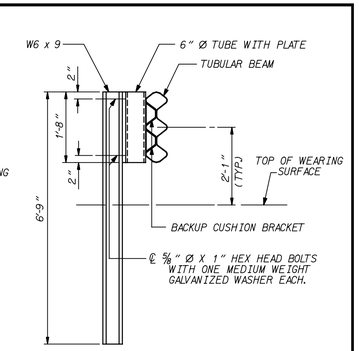
NOTE A : HEIGHT OF POST BP1 (DIMENSION A) SHALL BE DETERMINED IN THE FIELD SO THAT THE ℄ OF THE TUBULAR BEAM IS 2'-1" ABOVE TOP OF SLAB OR TOP OF WEARING SURFACE.

NOTE B : SLOT TO BE DRILLED ON SIDE OF WEB FACING "ONCOMING TRAFFIC".

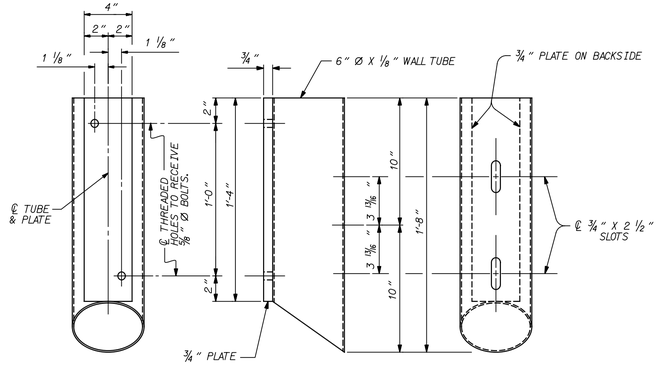
DETAIL SHOWING CONNECTION OF 6" Ø TUBE TO POST OR OFFSET BLOCK



POST "EP1"

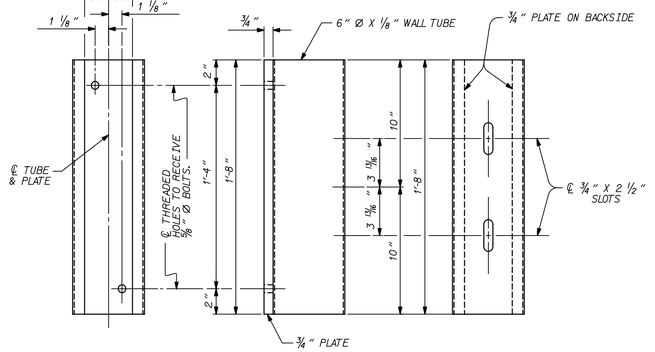


POST "EP2"



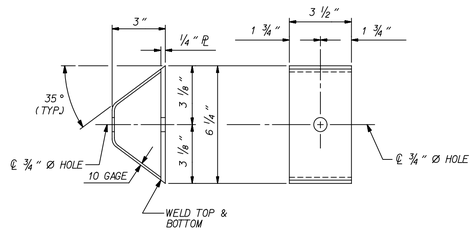
6" Ø TUBE DETAILS

USE WITH POST "BP1", "BP2" AND "BP3"

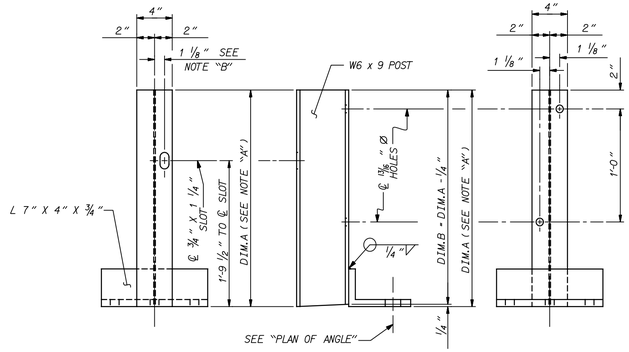


6" Ø TUBE DETAILS

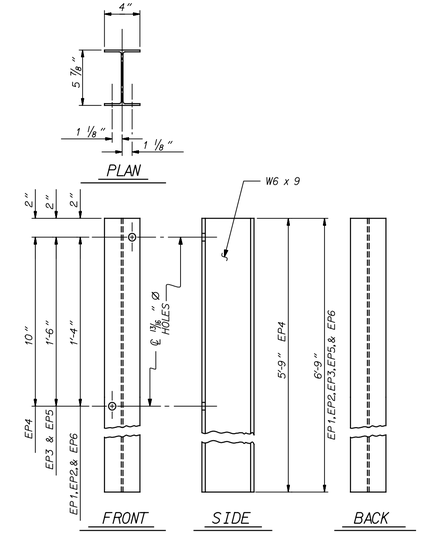
USE WITH POST "EP1 & EP2"



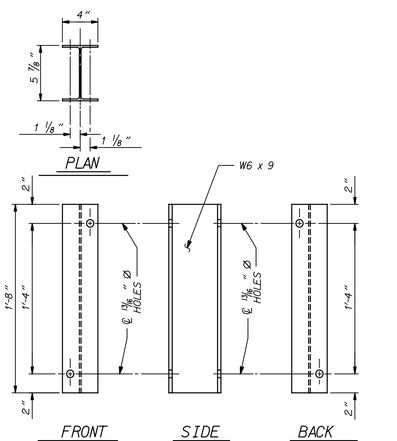
BACKUP CUSHION BRACKET



BP1 POST DETAILS



DETAIL OF POST EP1,EP2,EP3,EP4,EP5,& EP6



DETAILS OF OFFSET BLOCK 1

USE WITH POST "EP1"

QUANTITY OF RAIL POSTS *	
TYPE	NUMBER
BP-1	104
EP-1	4
EP-2	16

* RAIL POSTS,STEEL TUBES AND PLATES,MISCELLANEOUS HARDWARE AND ALL OTHER MATERIALS ARE INCLUDED IN THE UNIT PRICE BID FOR "20 INCH TUBULAR TRIPLE CORRUGATED STEEL BEAM GUARDRAIL" AND "W-TR STEEL BEAM GUARDRAIL TRANSITION SECTIONS".

PROJECT NO. HS-2012B

CATAWBA COUNTY

BRIDGE NO. 23

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DETAILS FOR RETROFIT OF EXISTING BRIDGE RAIL WITH TUBULAR BEAM GUARDRAIL

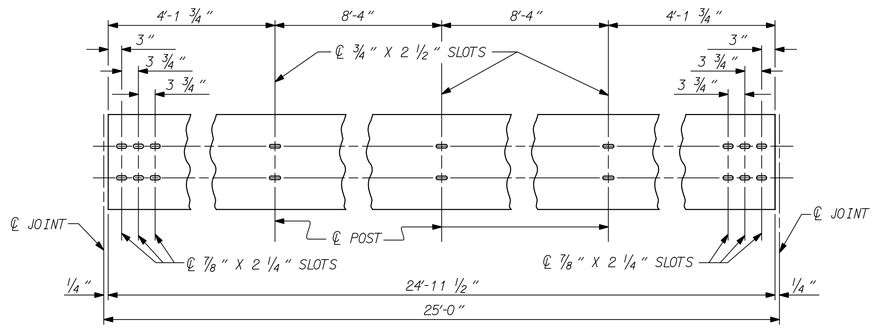
DocuSigned by: John A. Yannaccone 7813617546784S6... 2/17/2021

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER J. A. YANNACCONE

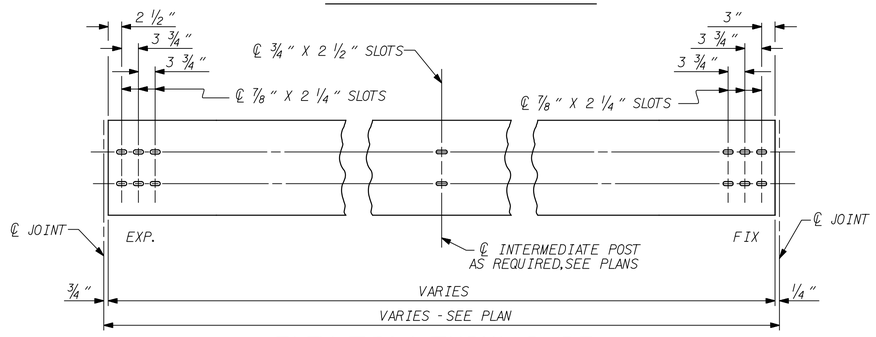
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			5

DRAWN BY : J. MYA DATE : 01/2021
CHECKED BY : J. YANNACCONE DATE : 01/2021

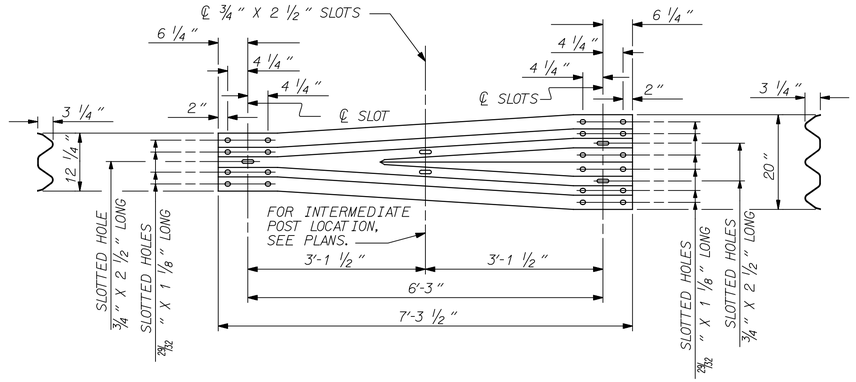
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270



ELEVATION TUBULAR BEAM STANDARD RAIL



ELEVATION TUBULAR BEAM EXPANSION RAIL FOR TYPE 1 SPLICE



W-TR GUARDRAIL TRANSITIONAL SECTION

PROJECT NO. HS-2012B

CATAWBA COUNTY

BRIDGE NO. 23

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DETAILS FOR RETROFIT OF EXISTING BRIDGE RAIL WITH TUBULAR BEAM GUARDRAIL

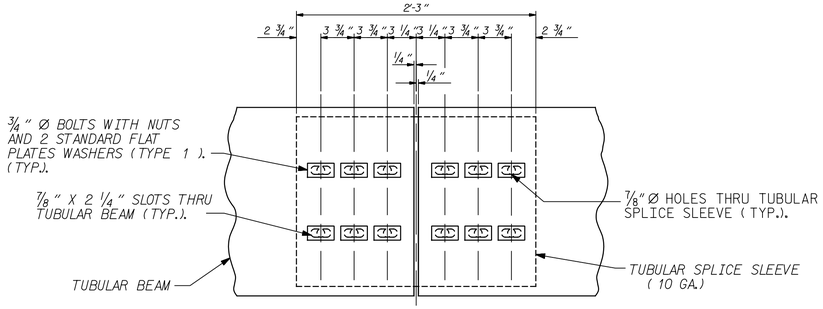
DocuSigned by: John R. Yannaccone
781361754678478...
2/17/2021

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER JOHN R. YANNACCONE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			5

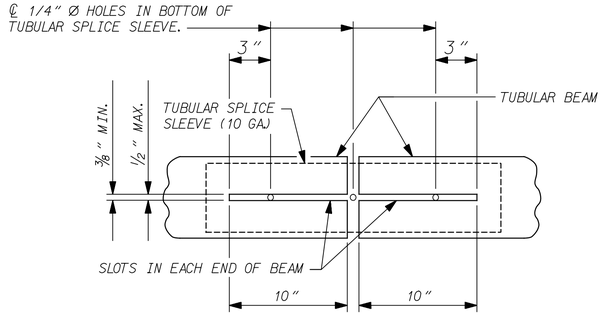
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : J. MYA DATE : 01/2021
CHECKED BY : J. YANNACCONE DATE : 01/2021

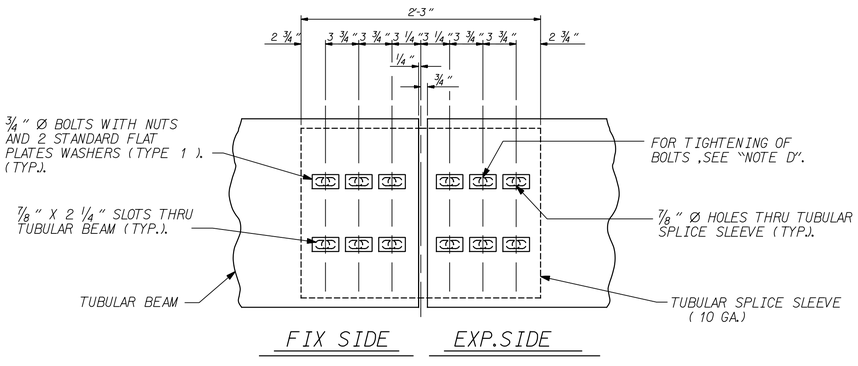


FIXED SPLICE BETWEEN POST (TYPE 1)

TUBULAR BEAM SPLICE

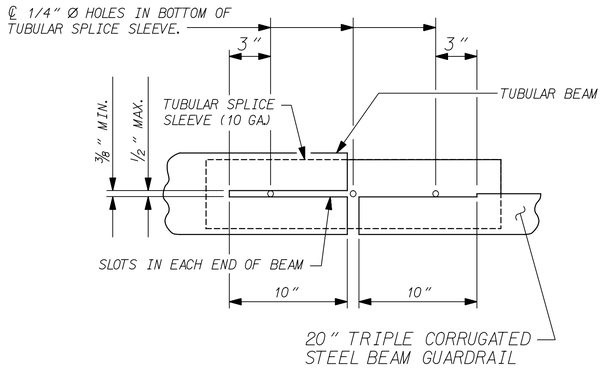


BOTTOM VIEW OF TUBULAR BEAM SPLICE



EXPANSION SPLICE BETWEEN POST (TYPE 1)

TUBULAR BEAM SPLICE



BOTTOM VIEW OF TUBULAR AND 20" TRIPLE CORRUGATED STEEL BEAM SPLICE

DocuSigned by:
John A. Yannaccone
781361754678456...
2/17/2021

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER JOHN A. YANNACCONE

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
2610 Wycliff Road
Suite 102
Raleigh NC 27607-3073
(919) 420-7660
NC Lic. No. F-0270

DRAWN BY : J. MYA DATE : 01/2021
CHECKED BY : J. YANNACCONE DATE : 01/2021

PROJECT NO. HS-2012B
CATAWBA COUNTY
BRIDGE NO. 23
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DETAILS FOR RETROFIT OF EXISTING BRIDGE RAIL WITH TUBULAR BEAM GUARDRAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			5