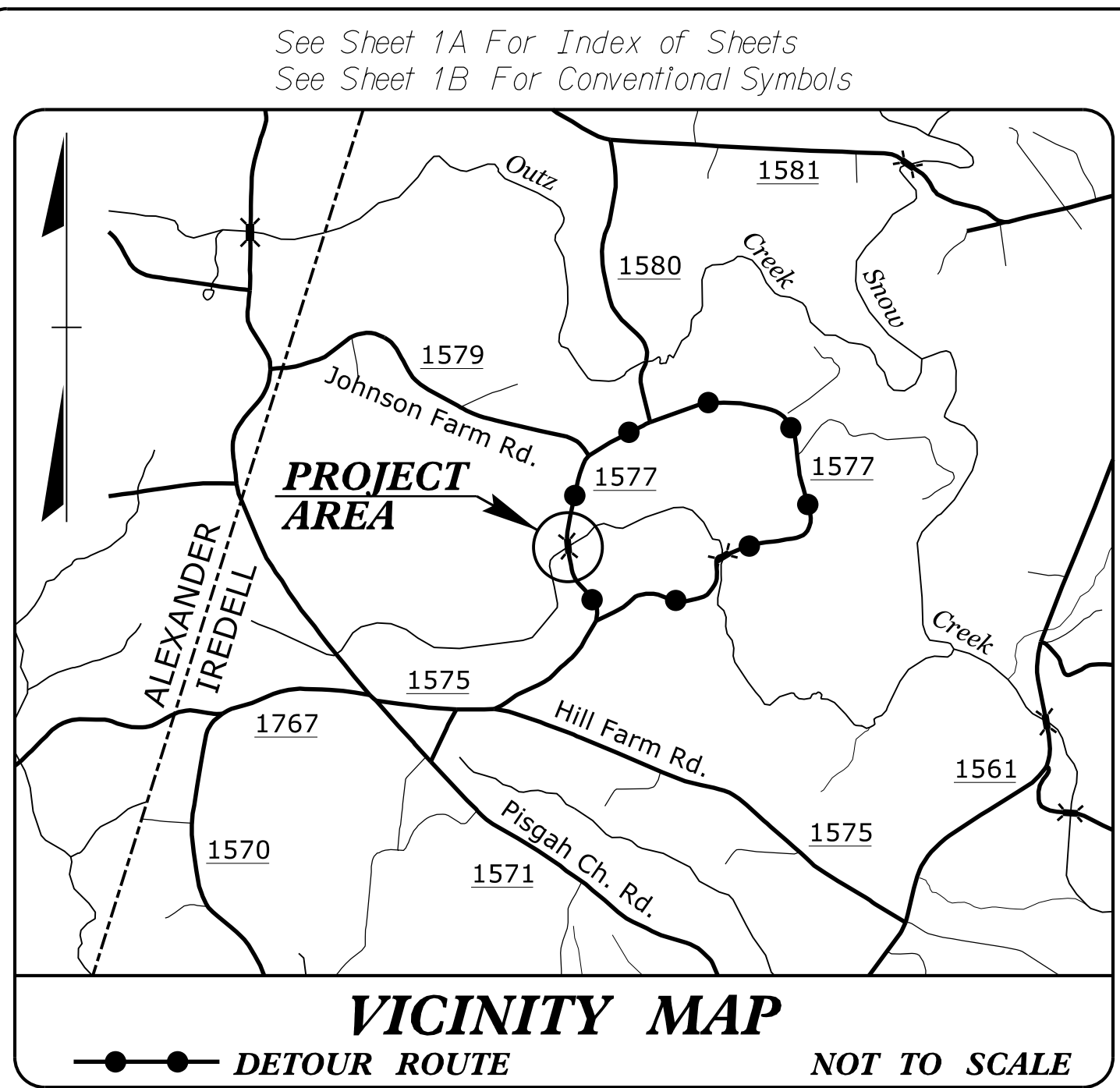


09_08/2019

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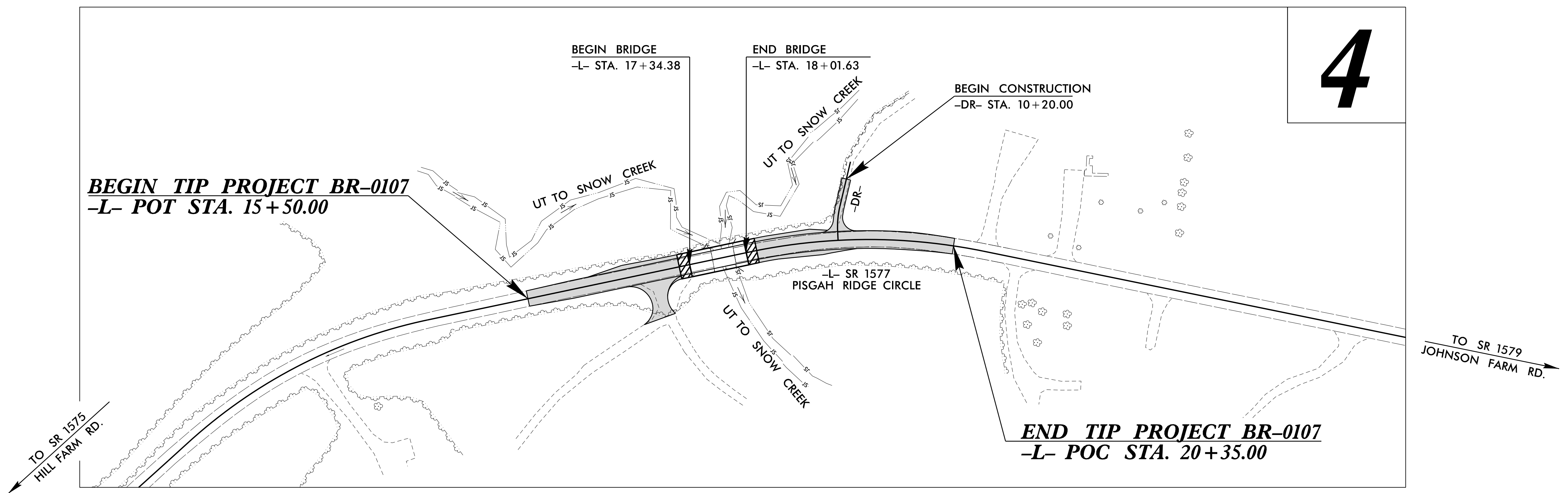
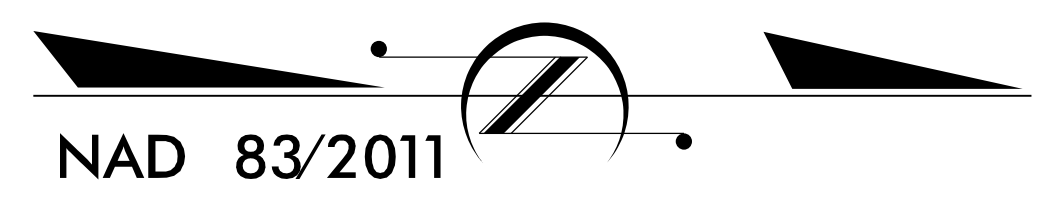
TIP PROJECT: BR-0107
CONTRACT: C204627



STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
IREDELL COUNTY

**LOCATION: REPLACE BRIDGE NO.131 ON SR 1577
 (PISGAH RIDGE CIRCLE) OVER UT TO SNOW CREEK**
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

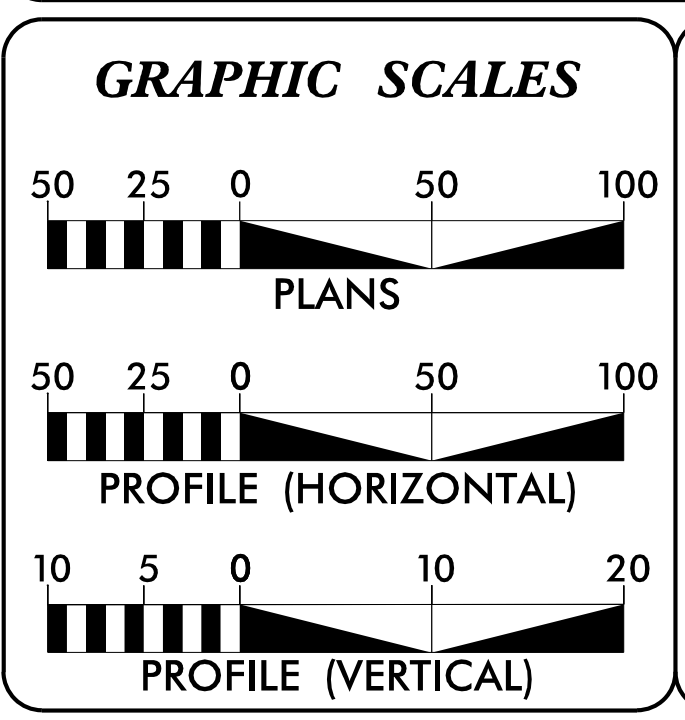
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0107	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49215.1.1		PE	
49215.2.1		RW & UTILITIES	
49215.3.1		CONSTRUCTION	



4

DESIGN EXCEPTION FOR MAX GRADE, SAG VERTICAL CURVE K VALUE AND NIGHTTIME STOPPING SIGHT DISTANCE.

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2020 =	110
ADT 2040 =	220
V = 55 MPH	
FUNC CLASS =	LOCAL
SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY PROJECT BR-0107	=	0.079 MILES
LENGTH STRUCTURE PROJECT BR-0107	=	0.013 MILES
TOTAL LENGTH PROJECT BR-0107	=	0.092 MILES

Plans Prepared By:
 ms consultants, inc.
 5444 Wake Park Blvd.
 Suite 190
 Raleigh, NC 27607
 NC License Number: C-3239

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 JANUARY 27, 2020

LETTING DATE:
 JULY 20, 2021

Plans Prepared For:
 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 1000 BIRCH RIDGE DRIVE
 RALEIGH, NC 27610

DAVID STUTTS, PE
 NCDOT PROJECT ENGINEER

M. TRAVIS POTTS, PE
 PROJECT ENGINEER

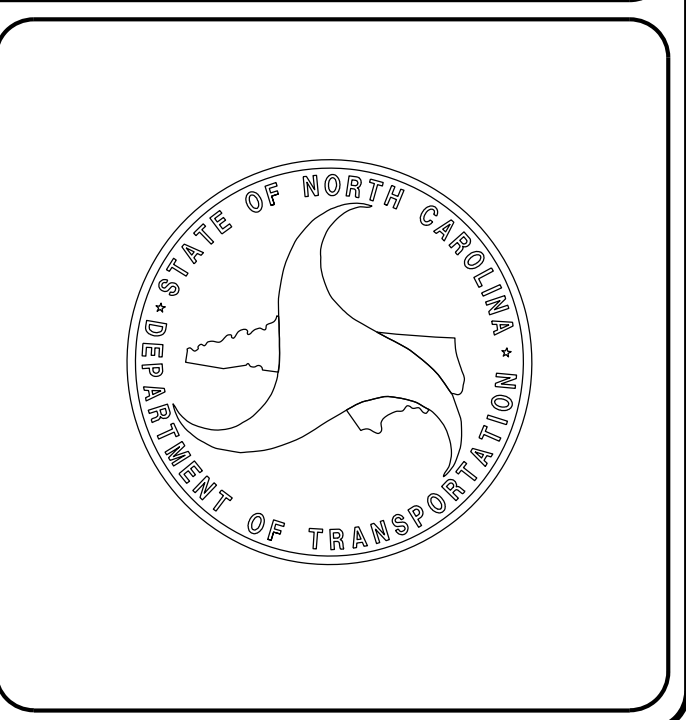
DAVE JANOSKO, PE
 PROJECT DESIGN ENGINEER

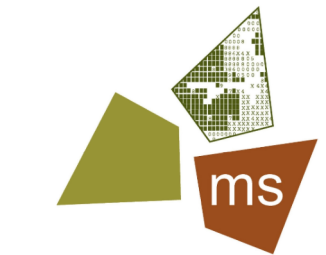
HYDRAULICS ENGINEER

DocuSigned by:
 Steven Boudar 4/28/2021
 D:\081518518AC7...
 SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
 M. Travis Potts 4/28/2021
 C:\81518518AC7...
 SIGNATURE: P.E.





ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

PROJECT REFERENCE NO. BR-0107 SHEET NO. 1A
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 041453 ENGINEER TRAVIS POITTS
1/28/2021
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
2A-1 PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 DETAIL FOR GUARDRAIL AT-1 END UNIT
2C-2 DETAIL FOR GUARDRAIL SYSTEM PARTS
2C-3 DETAIL FOR GUARDRAIL ANCHOR UNIT, TYPE III
2C-4 DETAIL FOR GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
3B-1 SUMMARIES OF EARTHWORK, PAVEMENT REMOVAL, SHOULDER BERM GUTTER, AND GUARDRAIL
3D-1 DRAINAGE SUMMARY
3G-1 GEOTECHNICAL SUMMARIES
4 PLAN AND PROFILE SHEET
RW01 THRU RW04 RIGHT-OF-WAY PLANS
TMP-1 THRU TMP-2 TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2 PAVEMENT MARKING PLANS
EC-1 THRU EC-5 EROSION CONTROL PLANS
UO-1 THRU UO-2 UTILITIES BY OTHERS PLANS
X-0 CROSS-SECTION SUMMARY SHEET
X-1 THRU X-4 CROSS-SECTIONS
S-1 THRU S-14 STRUCTURE PLANS

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.
END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.
UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE AT&T.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.
RIGHT-OF-WAY MARKERS:
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018 REV.
The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:
STD.NO. TITLE
DIVISION 2 - EARTHWORK
200.03 Method of Clearing - Method III
225.02 Guide for Grading Subgrade - Secondary and Local
225.04 Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS
300.01 Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES
422.02 Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01 Pavement Repairs
DIVISION 8 - INCIDENTALS
815.02 Subsurface Drain
840.00 Concrete Base Pad for Drainage Structures
840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24 Frames and Narrow Slot Sag Grates
840.25 Anchorage for Frames - Brick or Concrete or Precast
840.27 Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29 Frames and Narrow Slot Flat Grates
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
840.66 Drainage Structure Steps
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
862.01 Guardrail Placement
862.02 Guardrail Installation (Special Detail for Sheet 6 of 8)
862.03 Structure Anchor Units
876.01 Rip Rap in Channels
876.02 Guide for Rip Rap at Pipe Outlets

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
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	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easement Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite R/W Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage / Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	
Single Shrub	

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

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

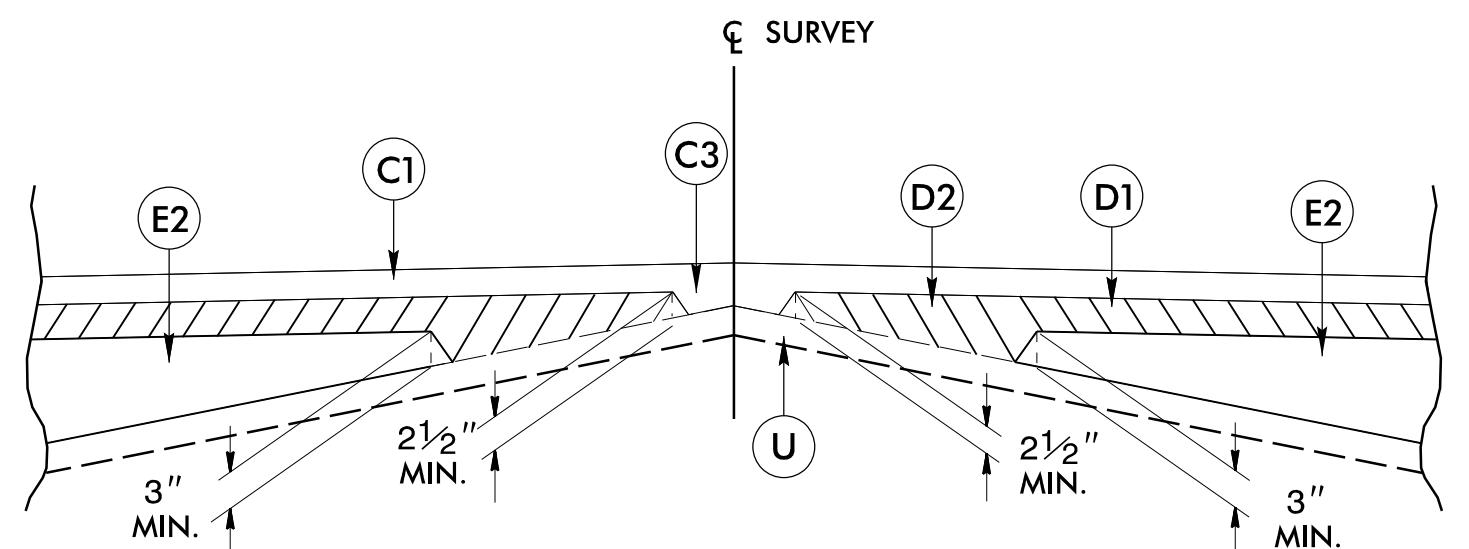
MISCELLANEOUS:

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

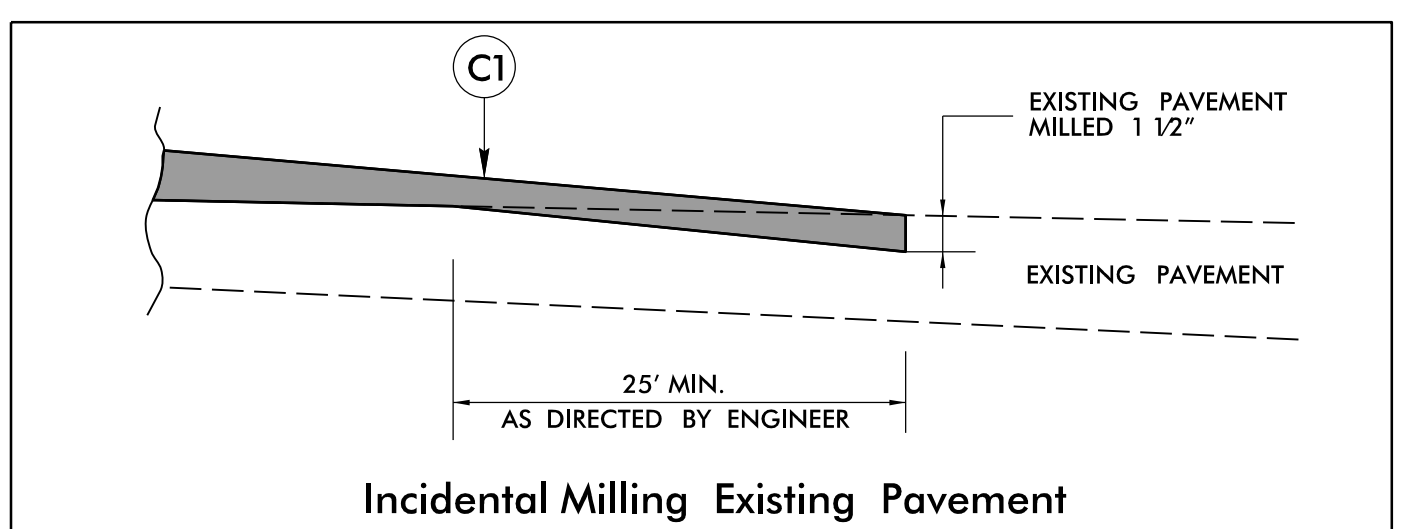
6/2/2019

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN: DECEMBER 6, 2019	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1 1/2" IN DEPTH
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" OR GREATER THAN 4" IN DEPTH
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 1/2" IN DEPTH
J	8" AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF 0.35 GAL/SY
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING)

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



Detail Showing Method of Wedging

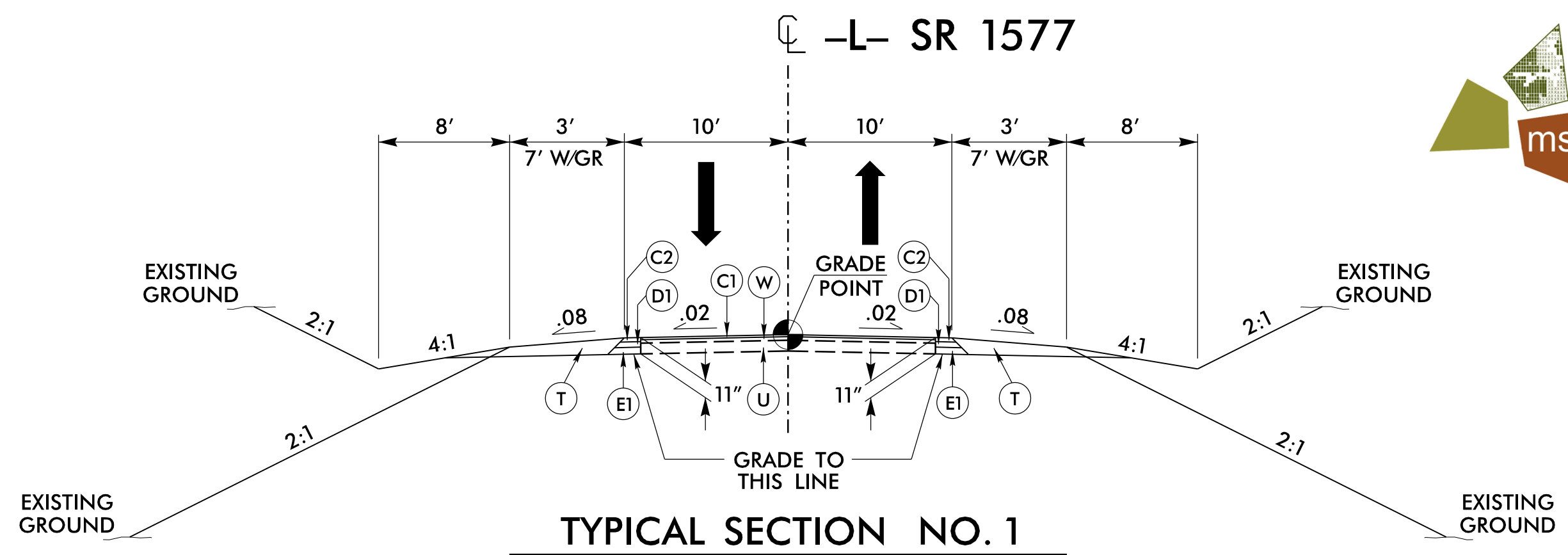


Incidental Milling Existing Pavement

ms consultants, inc.
5444 Wake Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

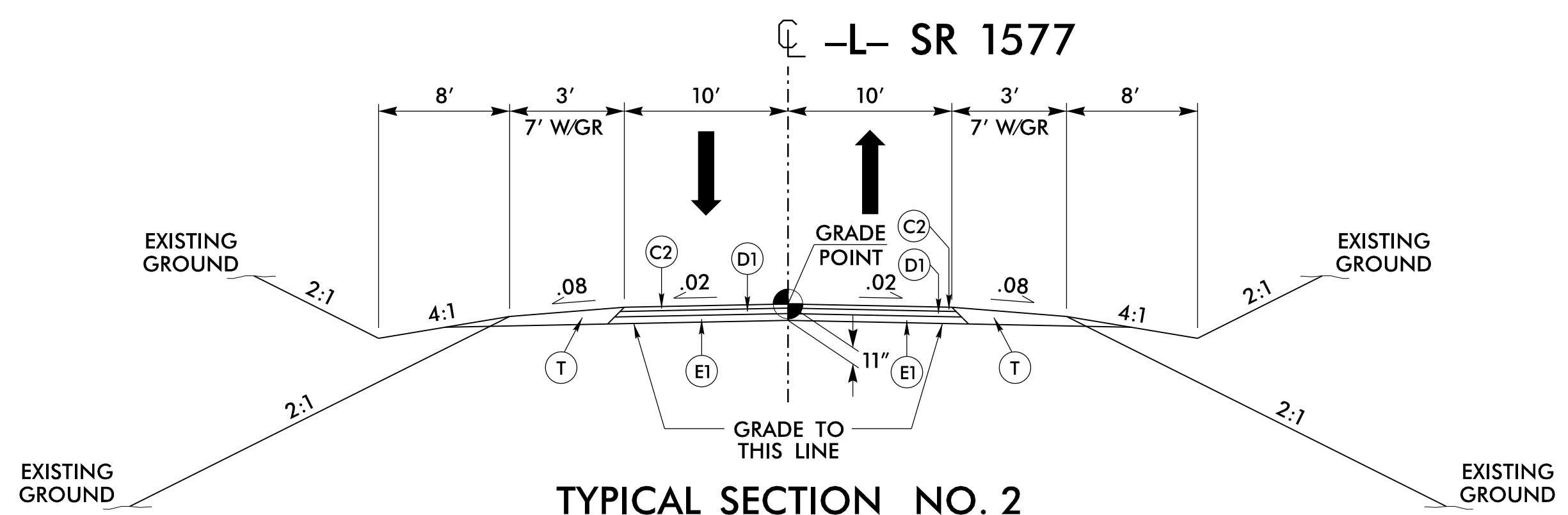
PROJECT REFERENCE NO. BR-0107	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER SEAL 041453 M. Travis Potts	PAVEMENT DESIGN ENGINEER SEAL 022896 Clark S. Morrison
DocuSigned by: M. Travis Potts 4/28/2021	DocuSigned by: Clark S. Morrison 4/28/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



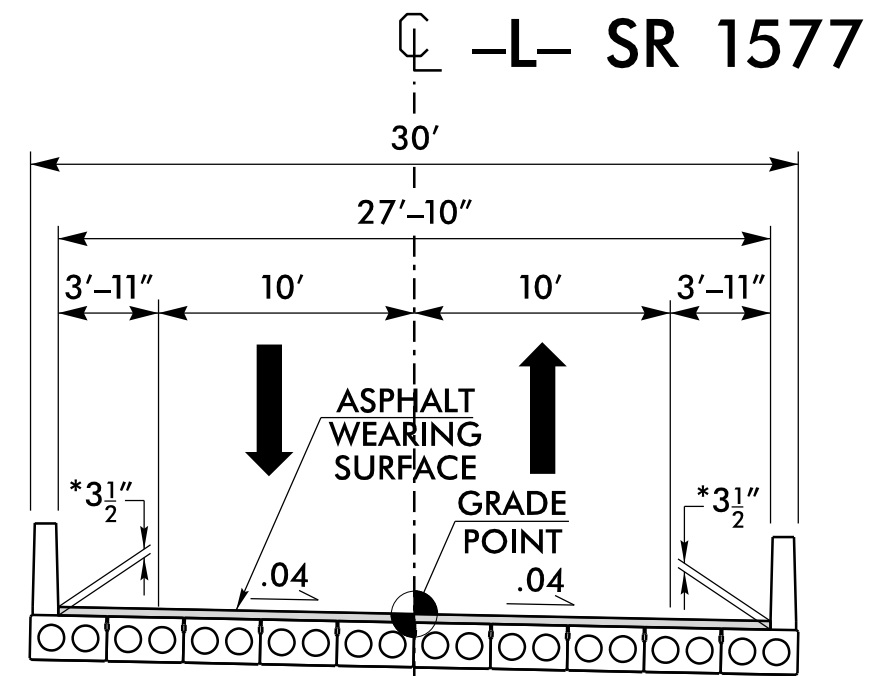
TYPICAL SECTION NO. 1

-L- STA. 15 + 50.00 TO -L- STA. 16 + 85.00
-L- STA. 18 + 50.00 TO -L- STA. 20 + 35.00



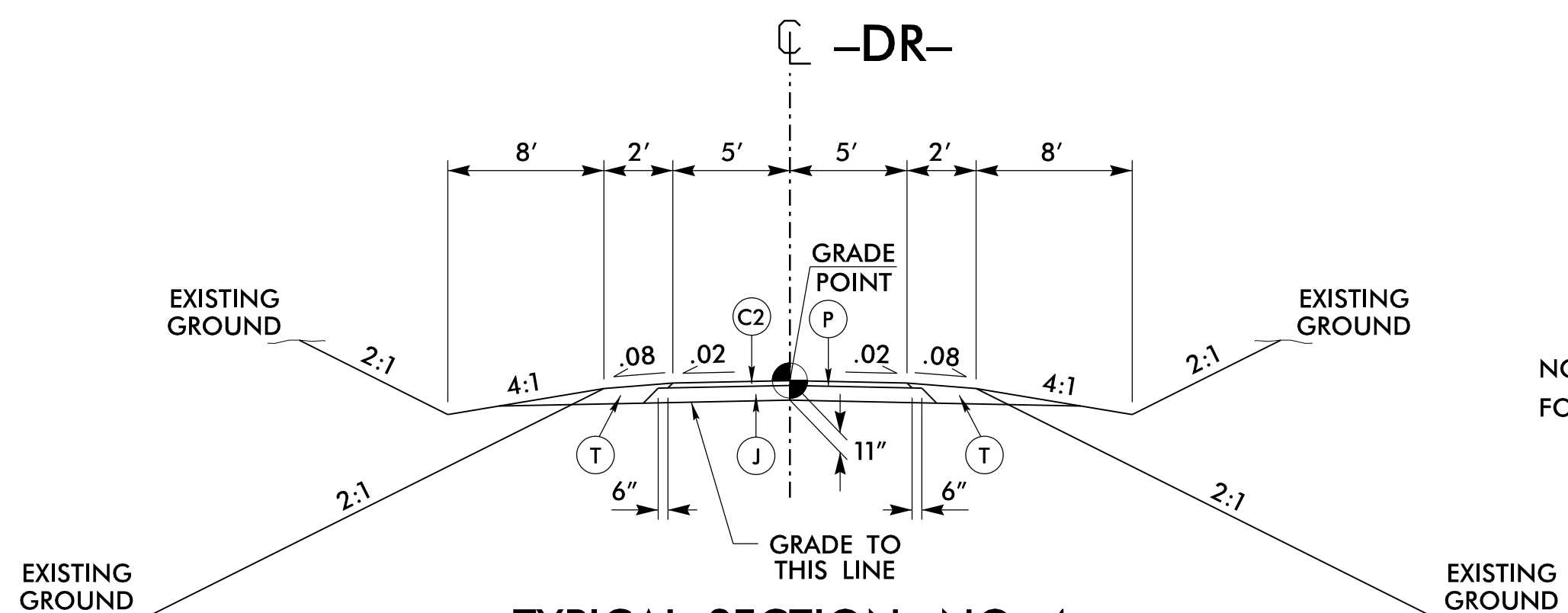
TYPICAL SECTION NO. 2

-L- STA. 16 + 85.00 TO -L- STA. 17 + 34.38 (BEGIN BRIDGE)
-L- STA. 18 + 01.63 (END BRIDGE) TO -L- STA. 18 + 50.00



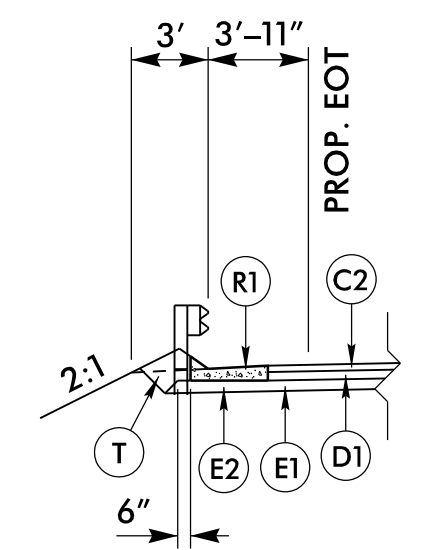
TYPICAL SECTION NO. 3

-L- STA. 17 + 34.38 (BEGIN BRIDGE) TO -L- STA. 18 + 01.63 (END BRIDGE)
*DEPTH AT BEARING, SEE STRUCTURE PLANS FOR MORE INFORMATION



TYPICAL SECTION NO. 4

-DR- STA. 10 + 20.00 TO -DR- STA. 10 + 80.00
DRIVEWAY TURNOUT AT STA. -L- 17 + 00 RT (SEE NOTE 1)



SHOULDER BERM GUTTER DETAIL

-L- STA. 17 + 18.50 TO -L- STA. 17 + 23.50 LT & RT
-L- STA. 18 + 12.50 TO -L- STA. 18 + 17.50 LT
-L- STA. 18 + 12.50 TO -L- STA. 18 + 35.50 RT

NOTE 1:
FOR DRIVEWAY TURNOUT AT STA. -L- 17 + 00 RT
USE TYPICAL SECTION NO. 4 UP TO R/W LINE
PAVE WITH 8" ABC FROM R/W LINE TO END OF CONSTRUCTION
PAVE TO EOP LIMITS AS SHOWN ON PLAN SHEET 4

07-APR-2021 13:06
 K:\D01560\06-03-BR-0107-03-BR-0107-131-OVER UT SNOW CREEK\Roadway\Pro\BR-0107_r.dwg_tup.dgn
 USER:NAME

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

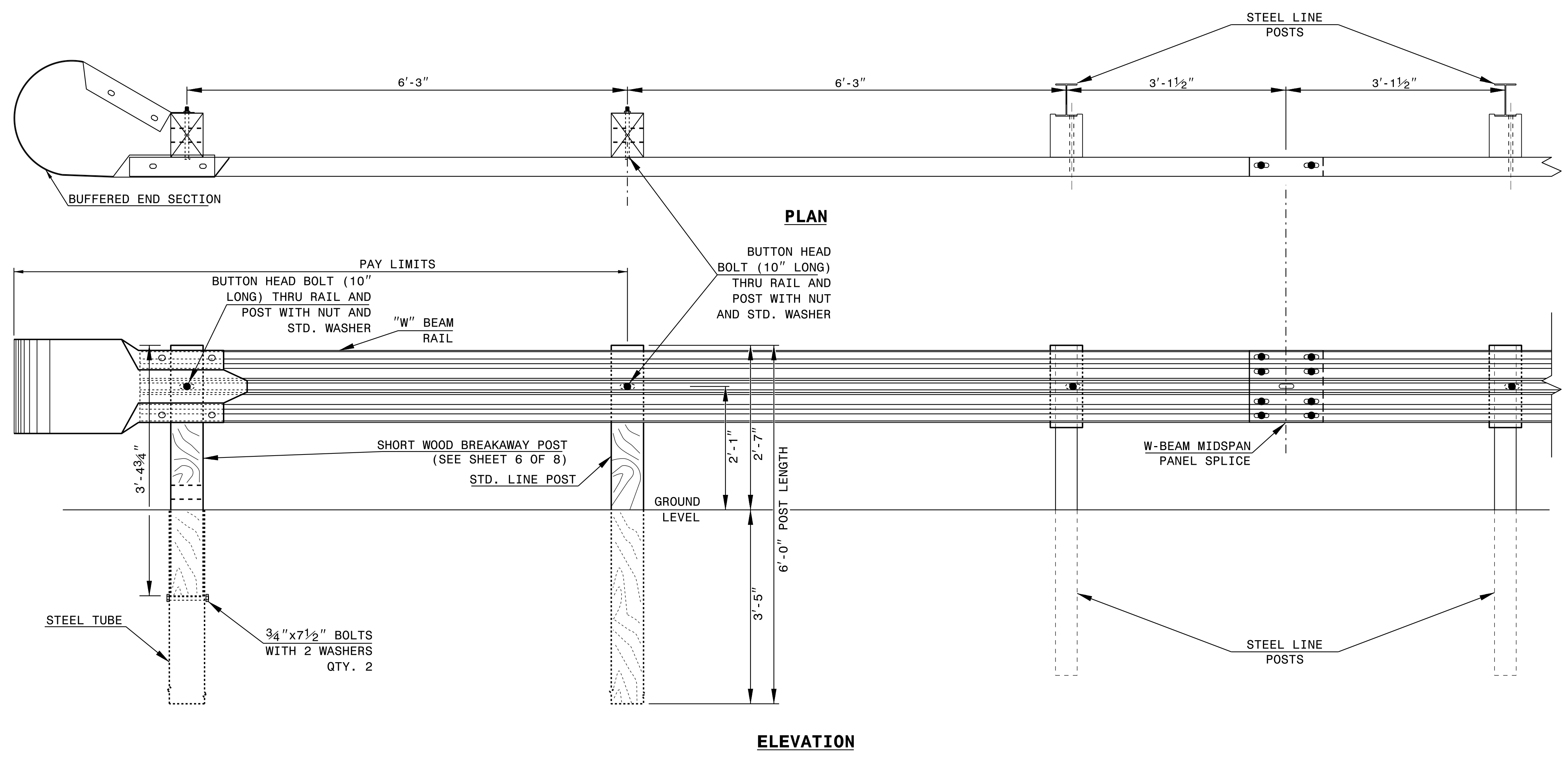
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

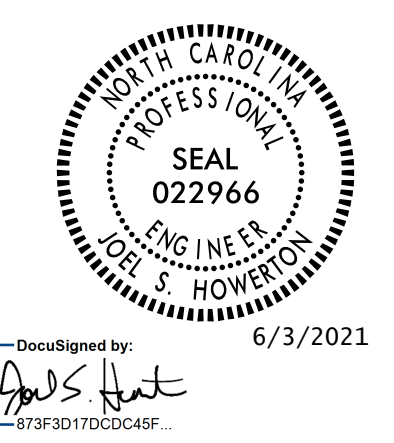
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM



DocuSigned by:
Joel S. Howerton
6/3/2021

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.: _____

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

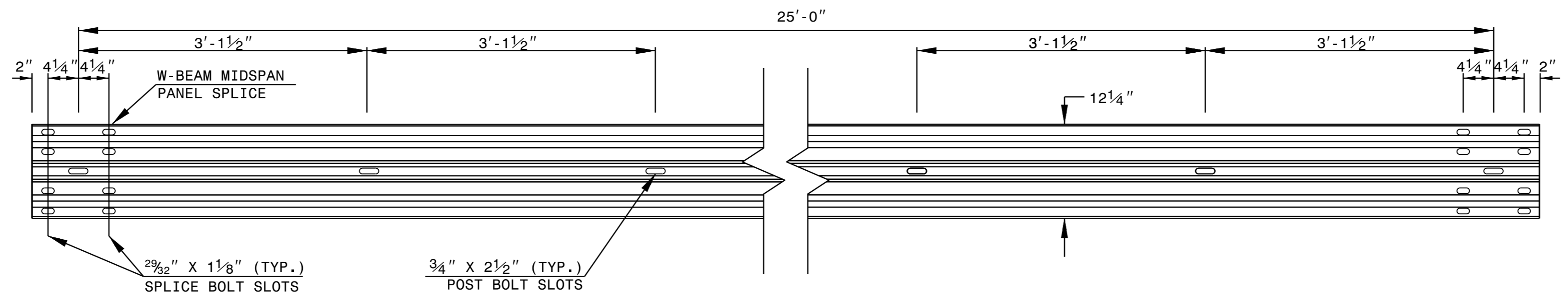
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

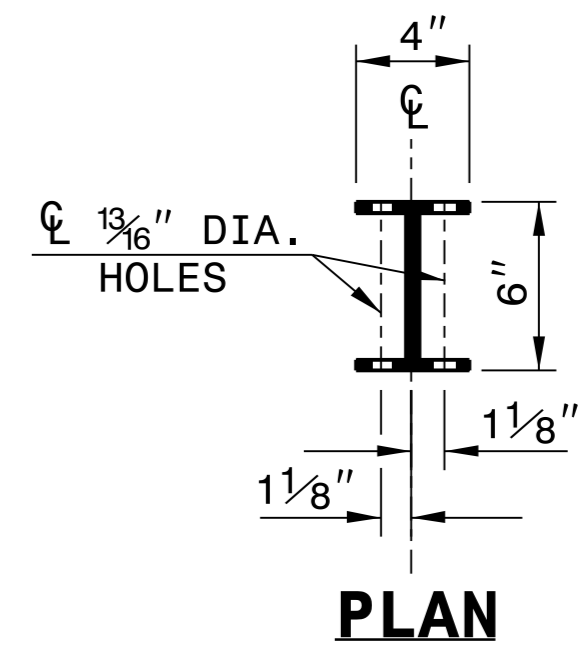
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

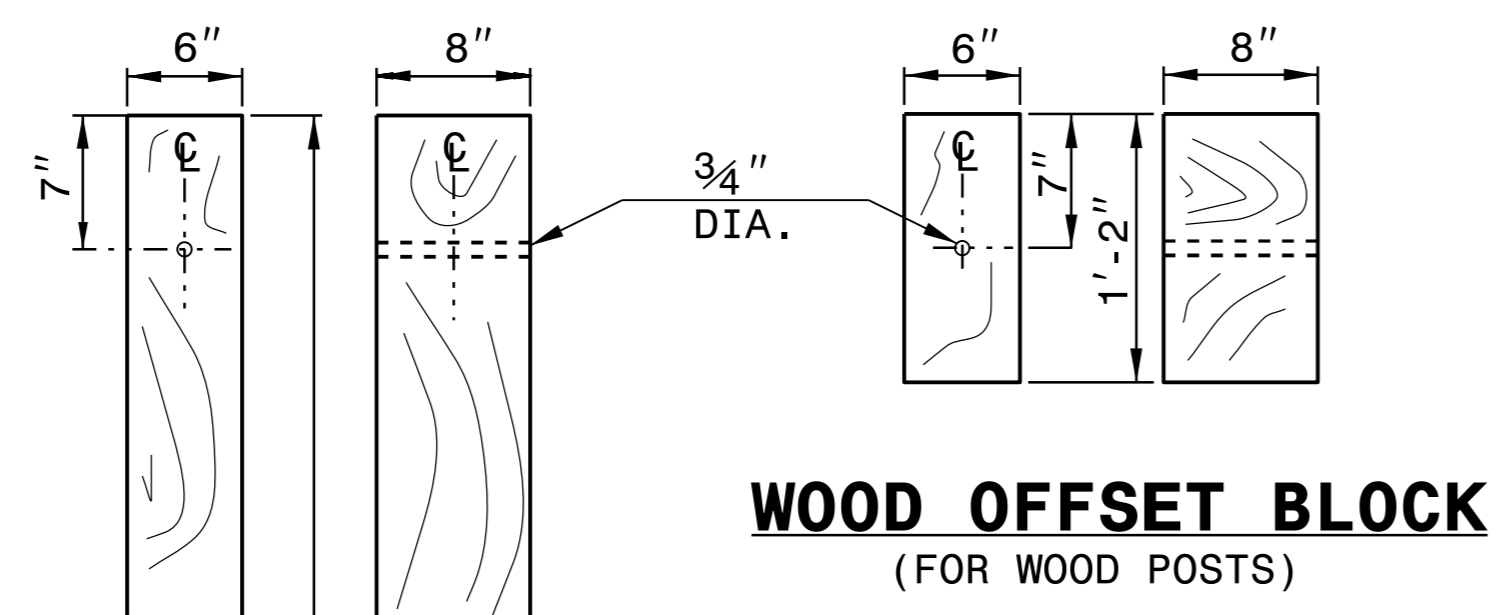
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862D02



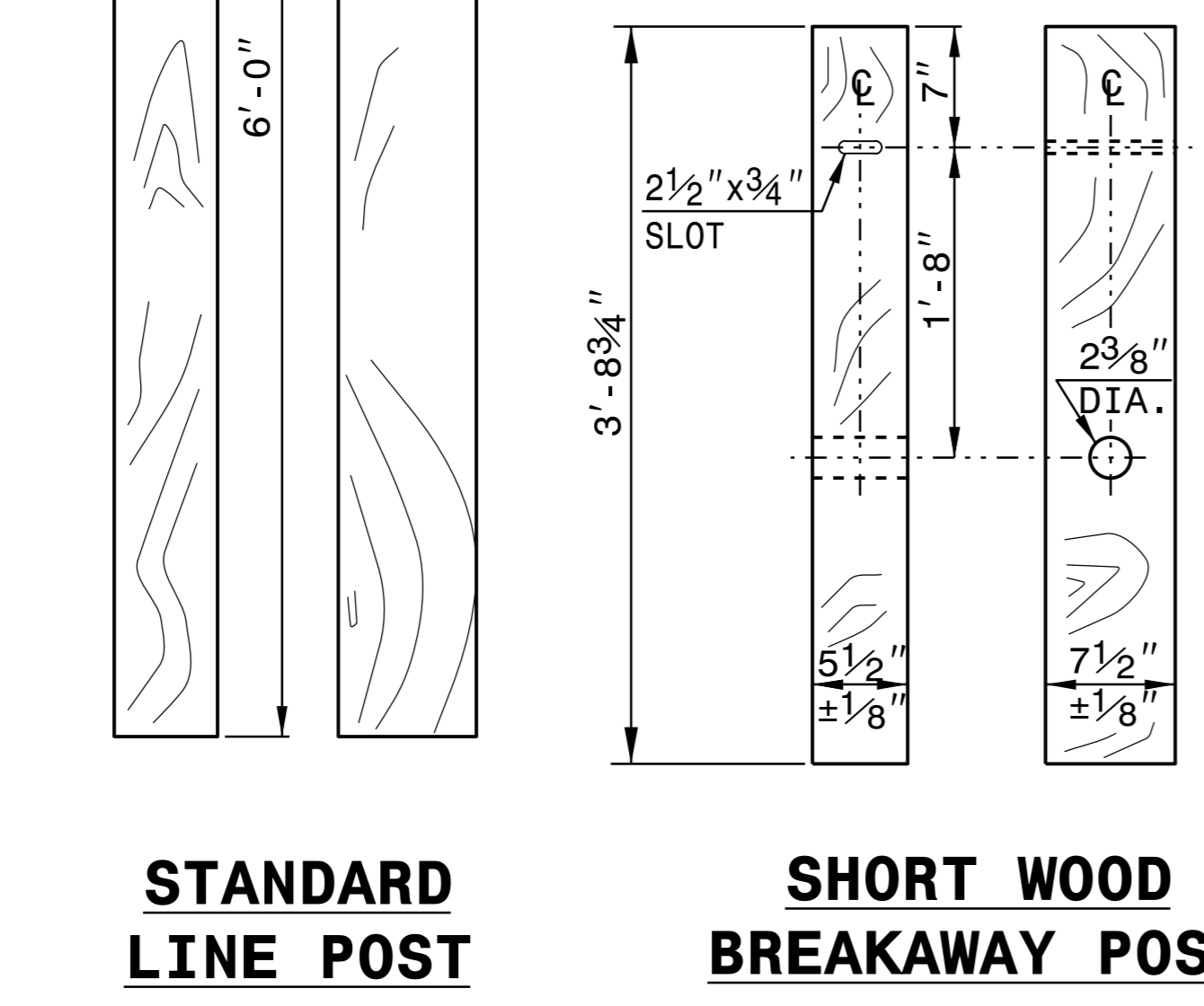
STANDARD W-BEAM GUARDRAIL



PLAN

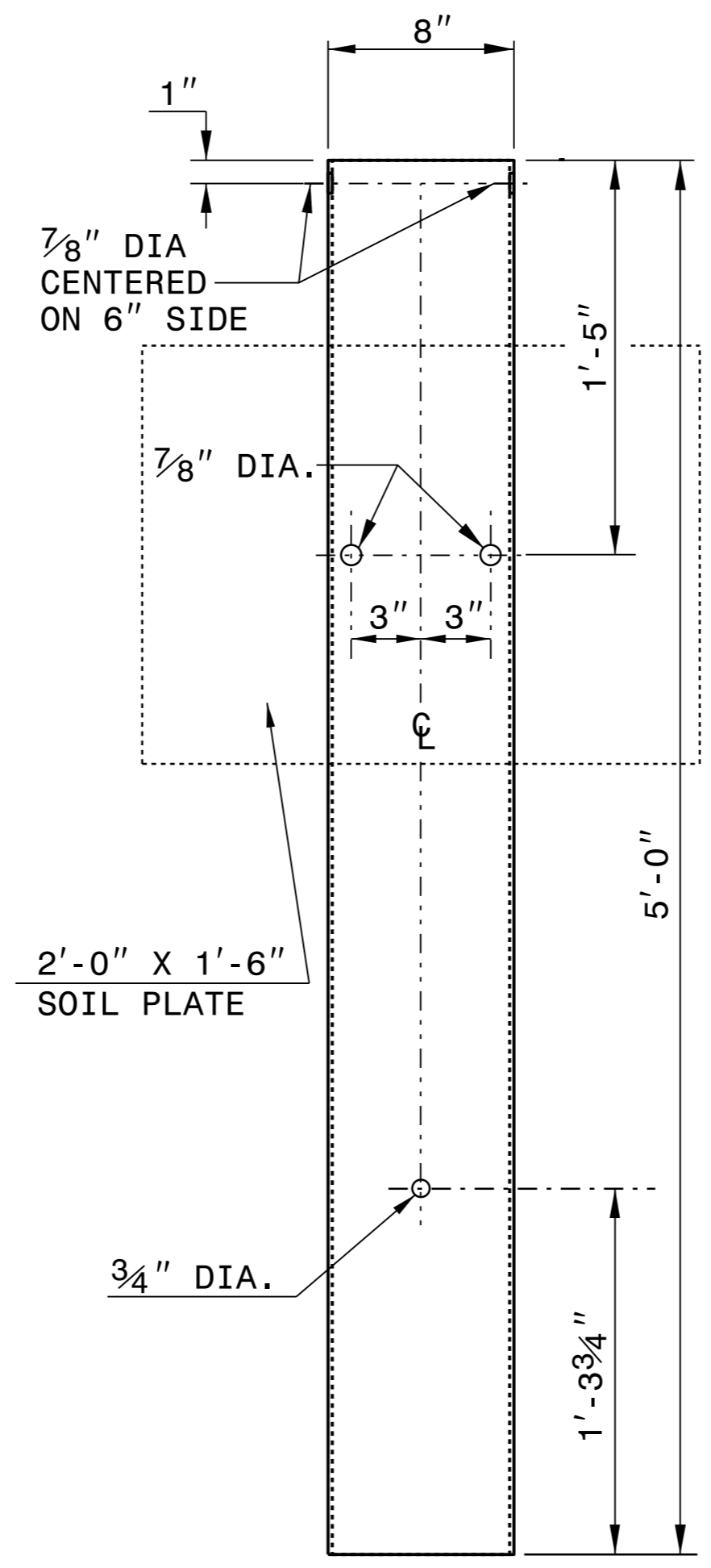


**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

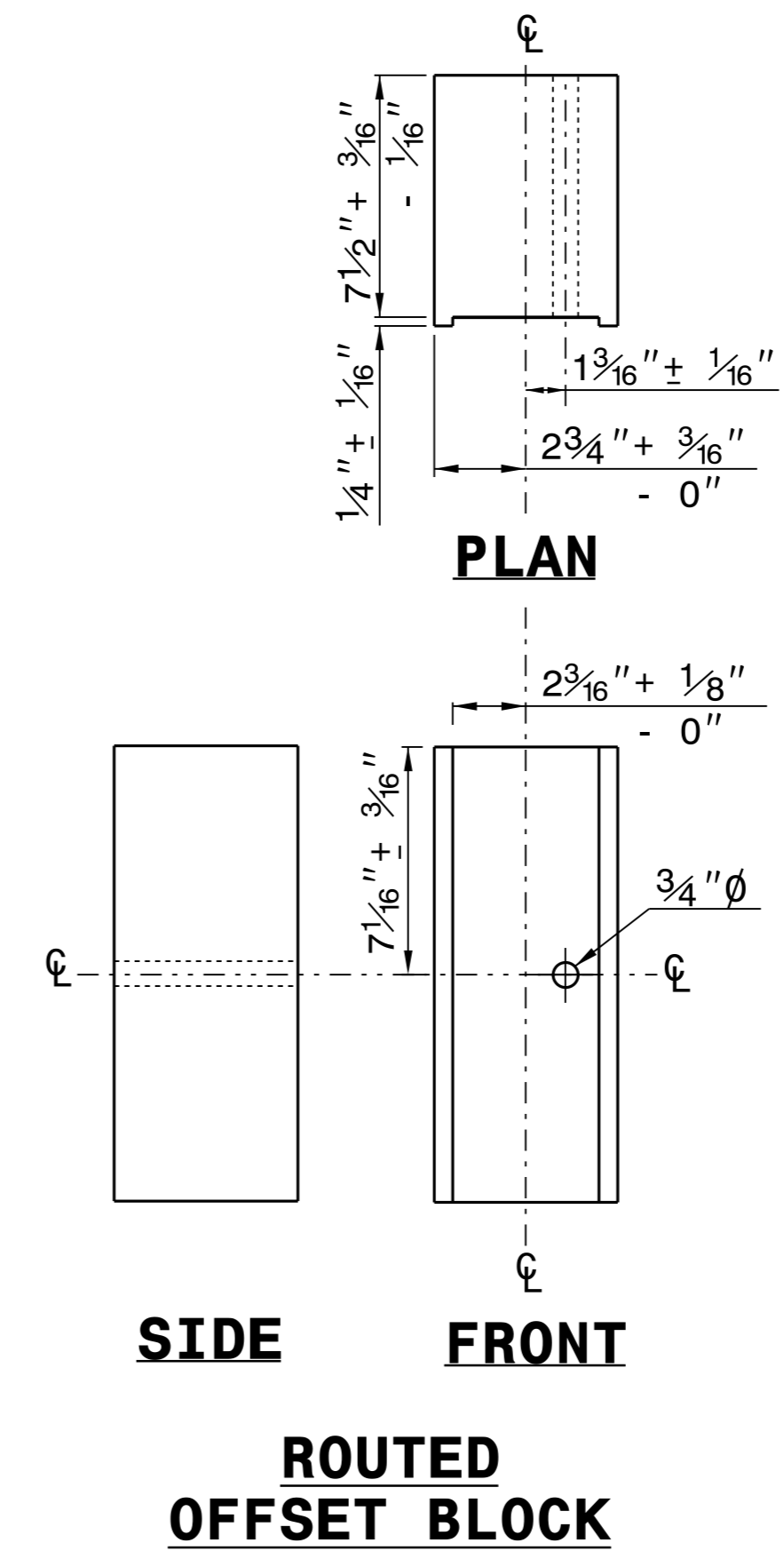


STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



**STEEL TUBE
TS 6"x8"x0.1875"**

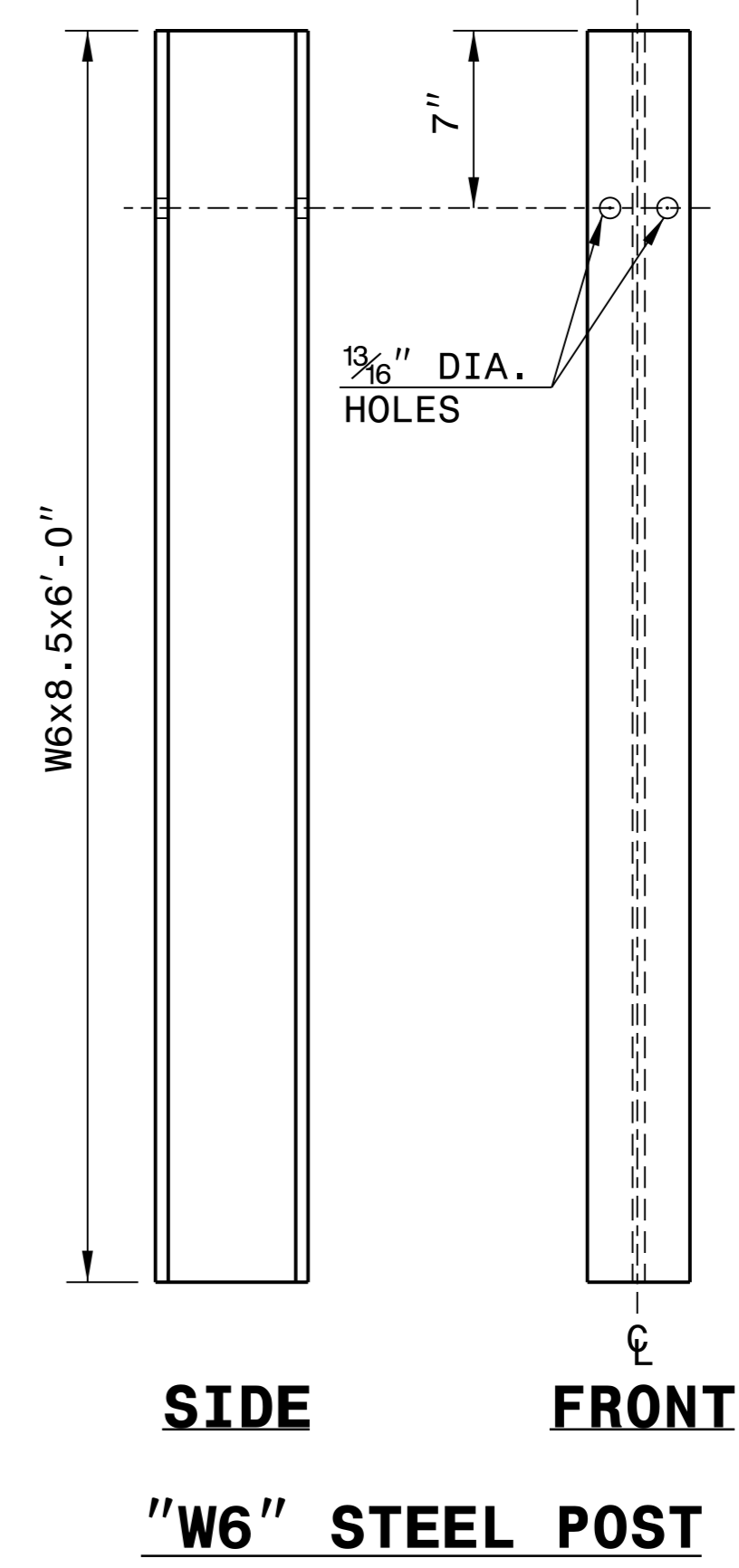


PLAN

SIDE

FRONT

ROUTED OFFSET BLOCK

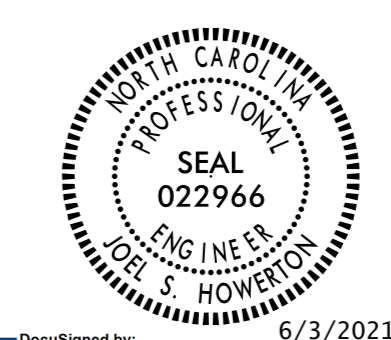


SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS



DocuSigned by:
J. Howerton
6/3/2021

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

SEE TITLE BLOCK

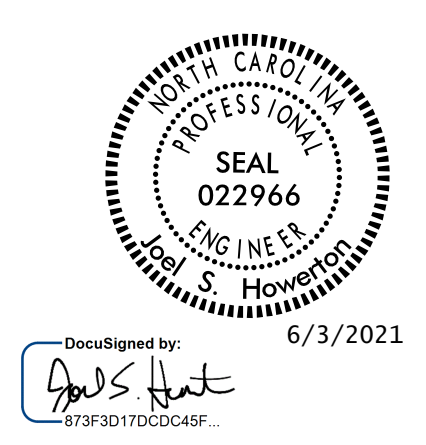
ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

I4-DEC-2017 10:36 S:\Contracts\Projects\Special Details\Standard Drawings\Division 8\0862d0301.dgn Jhowerton AT:CSU-292595

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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **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. </div> </div>		
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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **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. </div> </div>		
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER		

CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119	
SEE TITLE BLOCK	
ORIGINAL BY: J HOWERTON MODIFIED BY: CHECKED BY: FILE SPEC.:	DATE: 06-22-12 DATE: DATE: DATE:



DocuSigned by:
J. Howerton
 6/3/2021

DOCUMENT NOT CONSIDERED FINAL
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STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

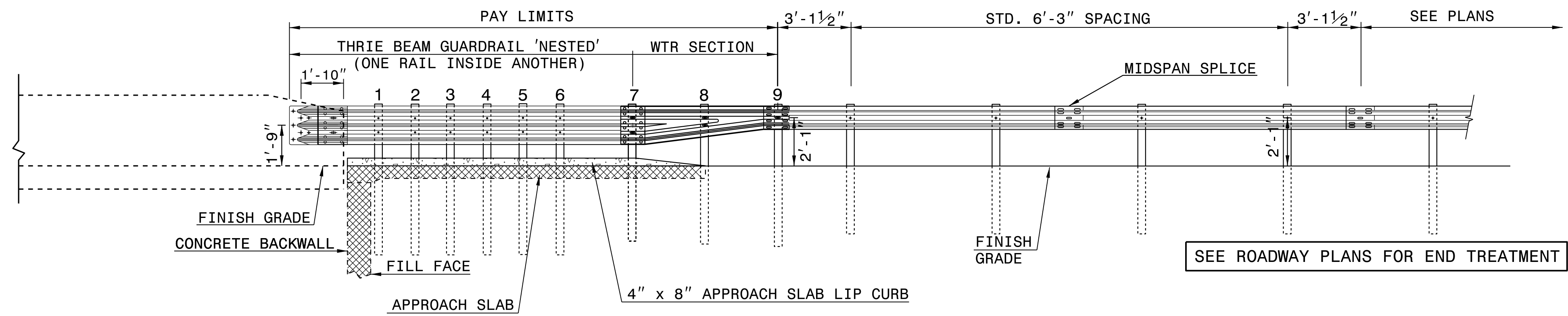
ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC

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

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

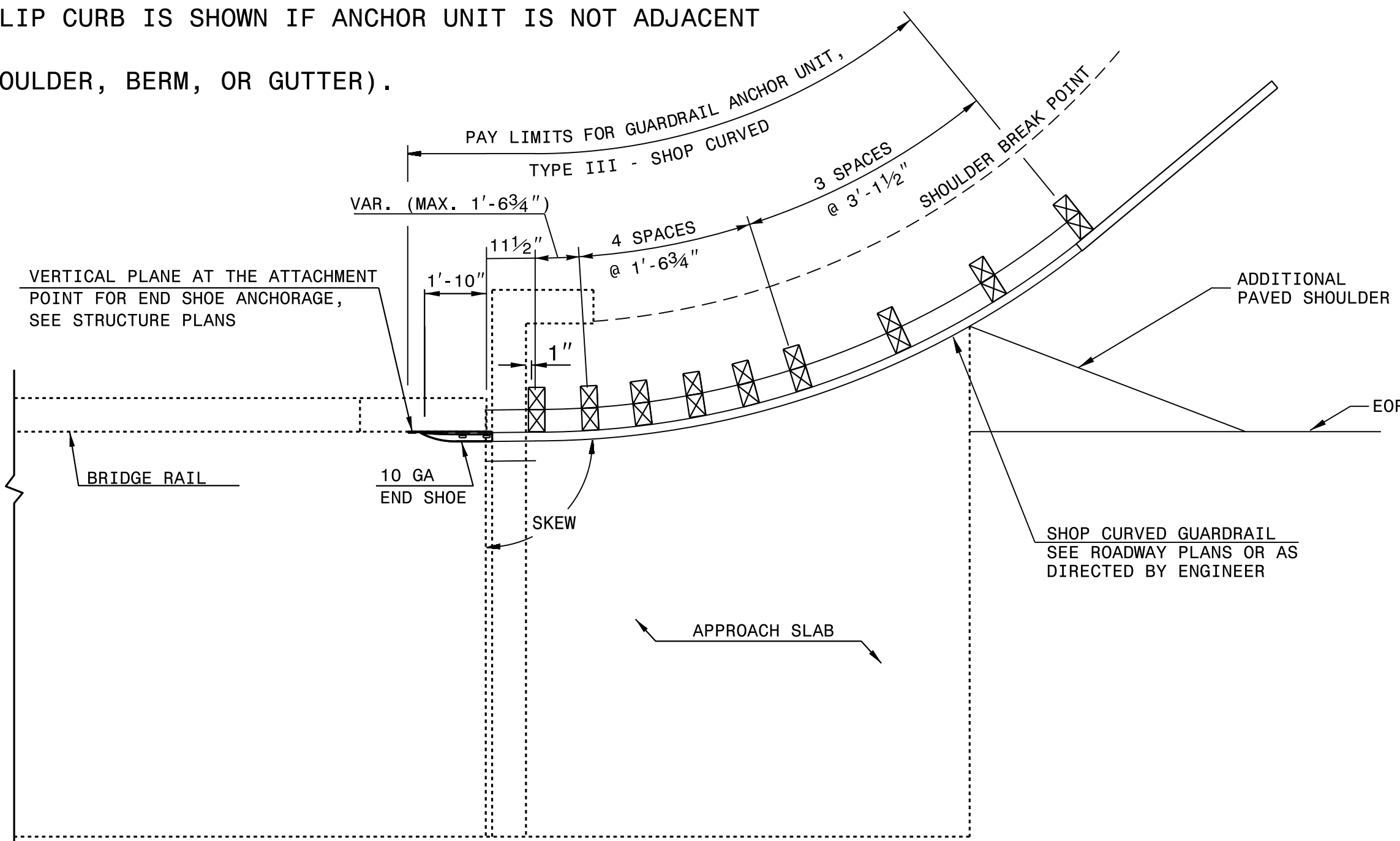
SHEET 1 OF 1
TYPE III SC



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 11 1/2" 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**

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**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\typeiiiisc.dgn



DocuSigned by:
E.E. Ward
6/3/2021

01-FEB-2018 09:49 S:\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii_sc.dgn jhowerton AT CSD-292595

5/14/99

12/06/07

COMPUTED BY: NKB DATE: MAY 29, 2020
 CHECKED BY: MTP DATE: JUNE 2, 2020

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. BR-0107
 SHEET NO. 3B-1

**SUMMARY OF EARTHWORK
 VOLUME IN CUBIC YARDS**

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 15+50.00	-L- 17+34.38	48	29		19
(BEGIN BRIDGE)					
SUBTOTALS:		48	29		19
-L- 18+01.63	-L- 20+35.00	46	33		13
(END BRIDGE)					
-DR- 10+20.00	-DR- 10+80.00		23	23	
SUBTOTALS:		46	56	23	13
TOTALS:		94	85	23	32
MATERIAL FOR SHOULDER CONSTRUCTION			80	80	
WASTE IN LIEU OF BORROW				-13	-13
PROJECT TOTALS:		94	165	90	19
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				5	
GRAND TOTALS:		94	165	95	19
SAY:		100		100	

EST. UNDERCUT = 450 CY
 EST. SELECT GRANULAR MATERIAL = 400 CY

Earthwork quantities are calculated by ms consultants. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
-L-	16+85	17+62	CL	149
-L-	17+87	18+50	CL	121
TOTAL:				270
SAY:				280

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT	17+18.50	17+23.50	5
-L- RT	17+18.50	17+23.50	5
-L- LT	18+12.50	18+17.50	5
-L- RT	18+12.50	18+35.50	23
TOTAL:			38
SAY:			40

GUARDRAIL SUMMARY

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS				IMPACT ATTENUATOR TYPE 350			REMOVE EXISTING GUARDRAIL	REMOVE AND RESET EXISTING GUARDRAIL	REMARKS			
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	TYPE III	TYPE III SHOP CURVED	AT-1	EA	G	NG						
-L-	16+61	17+34	LT	81.25				17+34	4	7		50		1	1	1	1										
-L-	17+04	17+34	RT		62.50			17+34	4	7							1	1								SHOP CURVE RADIUS = 20'	
-L-	18+02	18+74	LT	81.25				18+02	4	7	50		1		1	1											
-L-	18+02	18+87	RT		87.50			18+02	4	7		50		1	1												
SUBTOTAL				250.00	62.50																						
ANCHOR DEDUCTIONS																											
GREU TL-3 3 @ 50					-150.00																						
TYPE III 3 @ 18.75					-56.25																						
TYPE III SC 1 @ 18.75					-18.75																						
AT-1 1 @ 6.25					-6.25																						
PROJECT TOTAL				43.75	37.50																						
SAY				50.00	50.00																						
EXTRA GUARDRAIL POSTS = 5 EA																											

Z:\NOV-2000\1626\1626.dwg
 N:\00\1626\1626.dwg
 BR-0107 NCDOT IREDELL 131 OVER UT SNOW CREEK Roadway\Proc\BR-0107_rdy_sum.dwg

COMPUTED BY: C R Lavender DATE: 10/19/2019
 CHECKED BY: S C Clark DATE: 10/19/2019

(12-17-19)

PROJECT NO.
BR-0107

SHEET NO.
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 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(1)	12"	100	200	300		
TOTAL CY/TONS/SY:					100	200**	300**	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.

8.17.17.99

-L-	-DR-
PI Sta 12+86.01 $\Delta = 30^\circ 16' 53.0''$ (RT) $D = 9^\circ 57' 52.1''$ $L = 303.89'$ $T = 155.59'$ $R = 575.00'$	PI Sta 19+38.74 $\Delta = 23^\circ 28' 16.0''$ (RT) $D = 8^\circ 54' 38.5''$ $L = 263.40'$ $T = 133.58'$ $R = 643.00'$ $SE = 0.06$ $RO = 114'$ $DS = 45$ MPH
PI Sta 10+65.88 $\Delta = 16^\circ 17' 45.7''$ (LT) $D = 57^\circ 17' 44.8''$ $L = 28.44'$ $T = 14.32'$ $R = 100.00'$	

NAD 83/2011

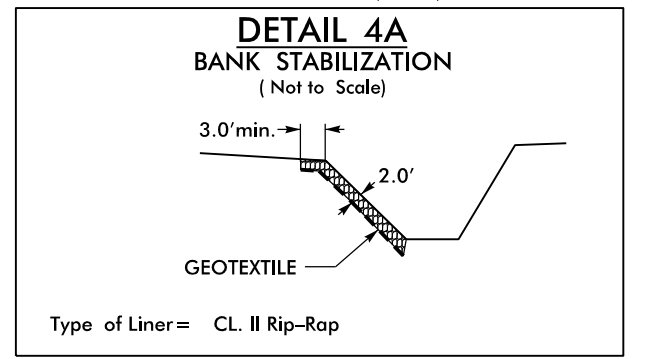
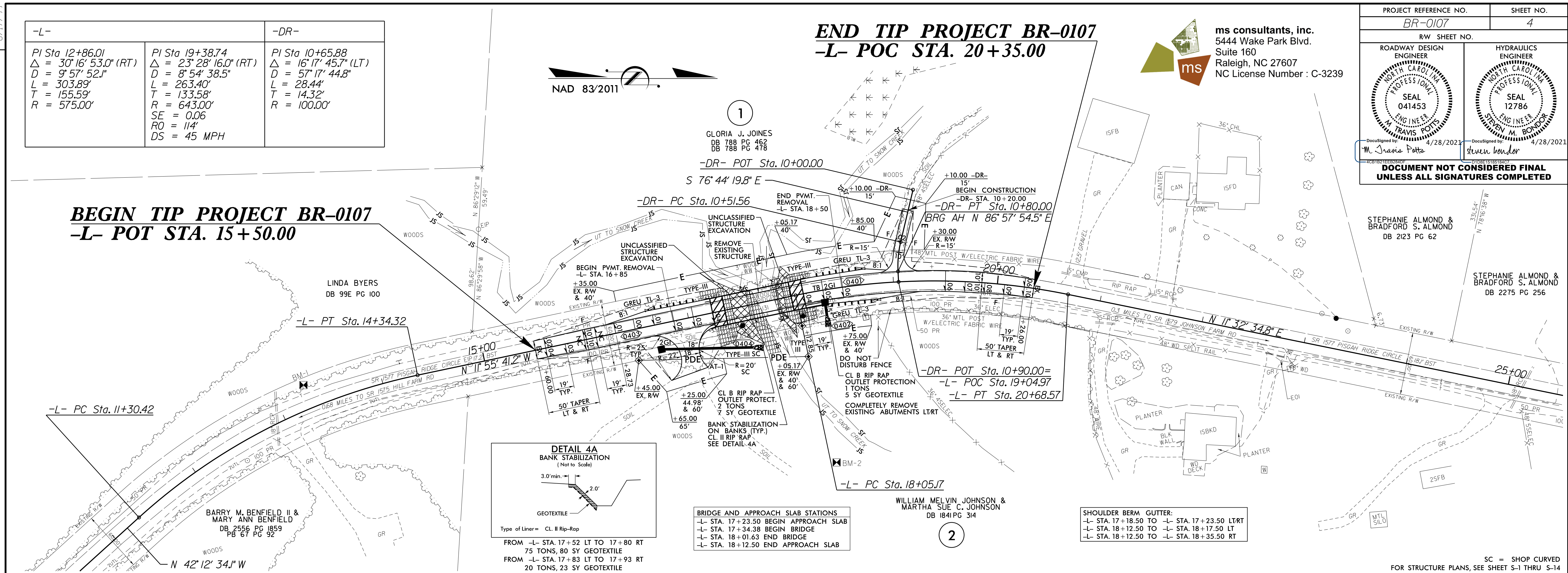
END TIP PROJECT BR-0107 -L- POC STA. 20+35.00

ms consultants, inc.
 5444 Wake Park Blvd.
 Suite 160
 Raleigh, NC 27607
 NC License Number : C-3239

PROJECT REFERENCE NO. BR-0107	SHEET NO. 4
ROADWAY DESIGN ENGINEER SEAL 041453 M. Travis Potts	HYDRAULICS ENGINEER SEAL 12786 Steven M. Bondok
4/28/2021	4/28/2021

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

BEGIN TIP PROJECT BR-0107 -L- POT STA. 15+50.00

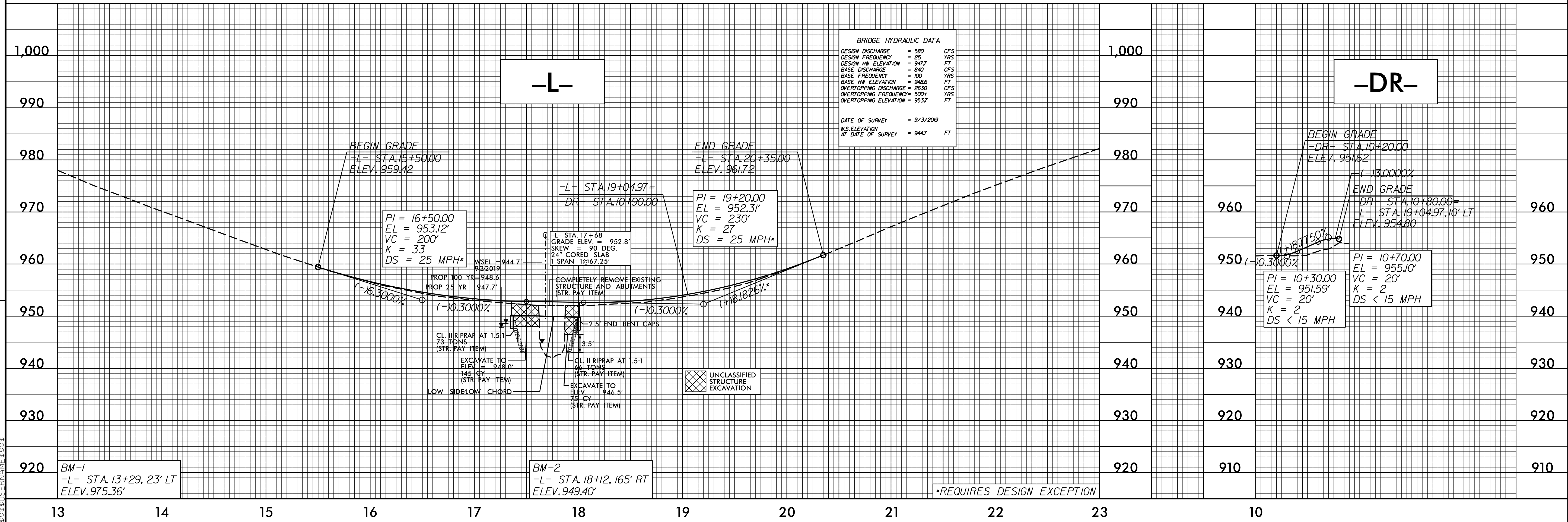


BRIDGE AND APPROACH SLAB STATIONS

-L- STA. 17+23.50 BEGIN APPROACH SLAB
-L- STA. 17+34.38 BEGIN BRIDGE
-L- STA. 18+01.63 END BRIDGE
-L- STA. 18+12.50 END APPROACH SLAB

SHOULDER BERM GUTTER:

-L- STA. 17+18.50 TO -L- STA. 17+23.50 LT/RT
-L- STA. 18+12.50 TO -L- STA. 18+17.50 LT
-L- STA. 18+12.50 TO -L- STA. 18+35.00 RT



REVISIONS

24-MAR-2021(16:51) K:\D:\6561\2021-03-BR-0107_NCDOT_IREDELL_131-DIVER_UT_SNOW_CREEK\Roadway\Proc\BR-0107_r.dwg_psh.dgn

SC = SHOP CURVED
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-14