

CONTRACT:

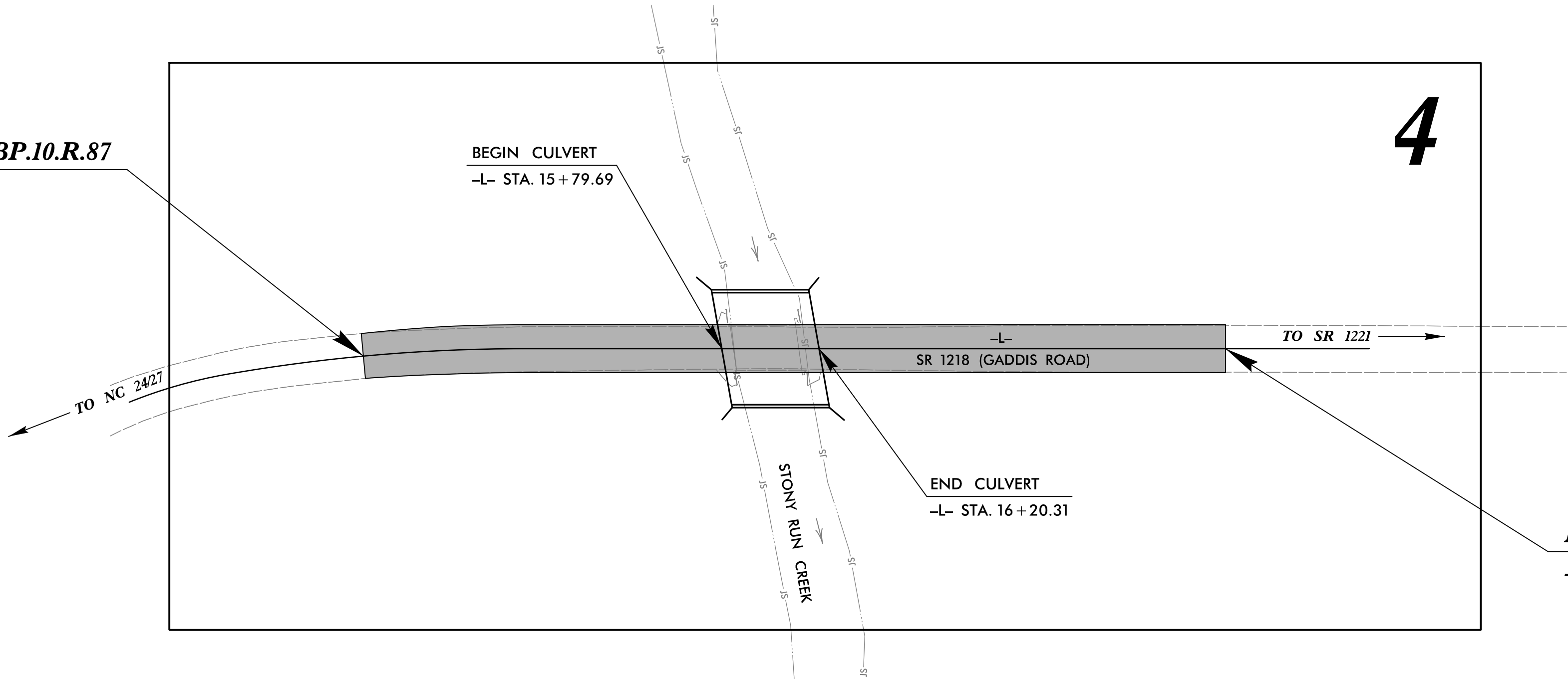
VICINITY MAP

●—●—● DETOUR

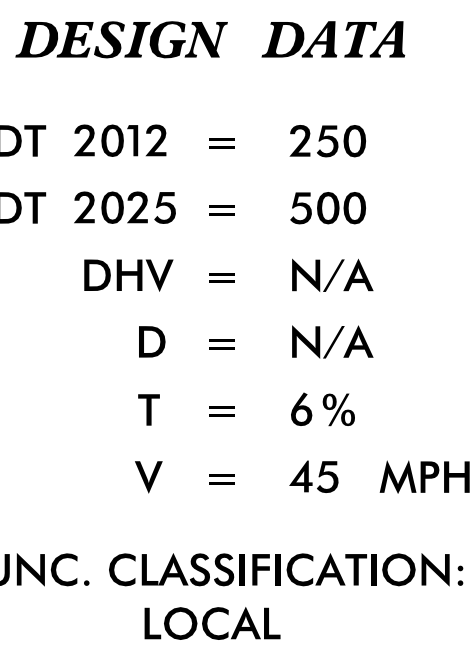
N.T.S.

**LOCATION: BRIDGE #156 OVER STONY RUN CREEK
ON SR 1218 (GADDIS RD)**

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



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LENGTH OF ROADWAY PROJECT WBS 17BP.10.R.87 = 0.060 MILES
 LENGTH OF STRUCTURE PROJECT WBS 17BP.10.R.87 = 0.008 MILES
 TOTAL LENGTH OF PROJECT WBS 17BP.10.R.87 = 0.068 MILES

NCDOT CONTACT: GARLAND HAYWOOD, PE
Division Bridge Manager



STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

RIGHT OF WAY DATE:
NOVEMBER 18, 2016

LETTING DATE:
SEPTEMBER 20, 2017

NIKKI T. HONEYCUTT, PE
PROJECT ENGINEER

MAAMOON K. ABDELAZIZ
PROJECT DESIGNER

DocuSigned by:

Edward J. Vance

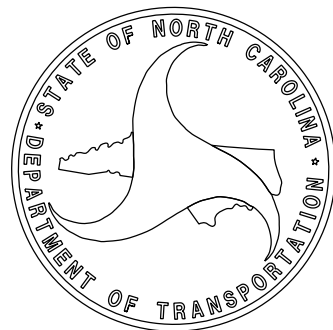
SIGNATURE

**ROADWAY
DESIGN
ENGINEER**

DocuSigned by

Nikki J. Hone

SIGNATURE



STV

100 Years

STV Engineers, Inc.

300 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.

17BP10.R.87

SHEET NO.

1A

ROADWAY DESIGN ENGINEER

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178

039234

ENGINEER

MARK T. HONE

01/21/2017

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INDEX OF SHEETS

GENERAL NOTES

STANDARD DRAWINGS

SHEET NUMBER	SHEET	GENERAL NOTES:	2012 SPECIFICATIONS EFFECTIVE: 01-01-2012	2012 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. January, 2012
1	TITLE SHEET				
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS				
1B	CONVENTIONAL SYMBOLS				
2C-1 THRU 2C-14	GUARDRAIL STANDARDS				
3	SUMMARIES AND TYPICAL SECTION SHEET				
4	PLAN AND PROFILE SHEET				
TMP-1	TRAFFIC MANAGEMENT PLANS				
EC-1 THRU EC-6	EROSION CONTROL PLANS				
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS				
X-1 THRU X-3	CROSS-SECTIONS				
C-1 THRU C-5	CULVERT PLANS				
		GRADE LINE: GRADING AND SURFACING:	THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.		The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:
		CLEARING:	CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.	STD.NO. TITLE	
		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.	DIVISION 2 - EARTHWORK 200.02 Method of Clearing - Method II 225.02 Guide for Grading Subgrade - Secondary and Local 225.04 Method of Obtaining Superelevation - Two Lane Pavement	
		SHOULDER CONSTRUCTION:	ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS 560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I	
		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.	DIVISION 8 - INCIDENTALS 876.02 Guide for Rip Rap at Pipe Outlets	
		RIGHT-OF-WAY MARKERS:	ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY THE DIVISION.	DIVISION 11 - WORK ZONE TRAFFIC CONTROL 1101.03 Temporary Road Closures 1110.01 Stationary Work Zone Signs - Mounting Height & Lateral Clearance 1145.01 Barricades - Type III	
				DIVISION 16 - EROSION CONTROL AND ROADSIDE DEVELOPMENT 1605.01 Temporary Silt Fence 1607.01 Gravel Construction Entrance 1630.04 Stilling Basin For Pumped Effluent 1630.06 Special Stilling Basin 1631.01 Matting Installation 1633.01 Temporary Rock Silt Check Type A	

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mobdelaziz

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	
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	

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY:

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

Proposed Permanent Easement with Iron Pin and Cap Marker	
--	--

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	
<i>VEGETATION:</i>	
Single Tree	
Single Shrub	
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	AATUR
End of Information	E.O.I.

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STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

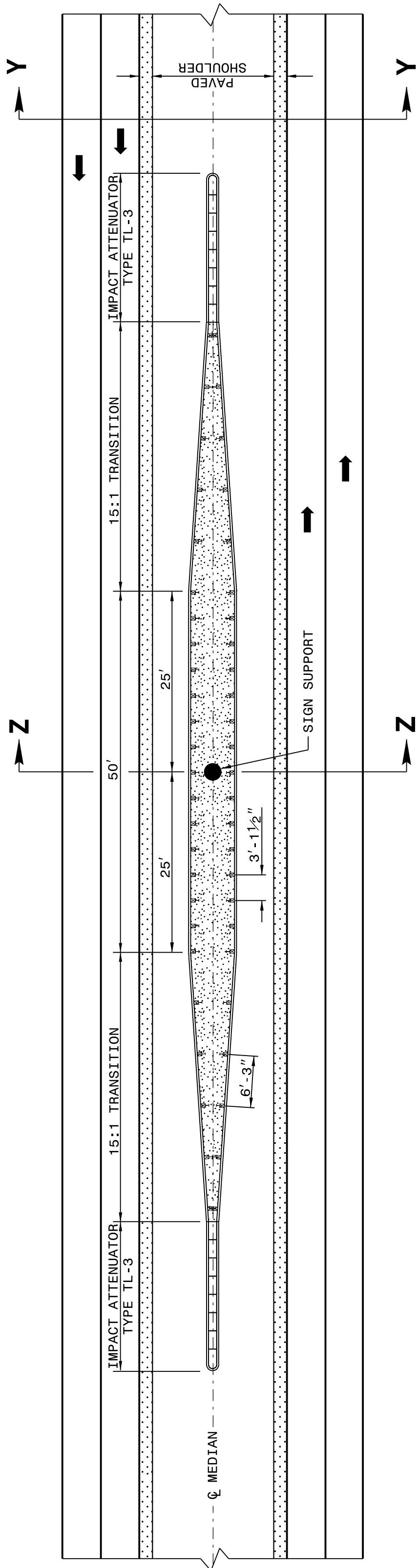
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

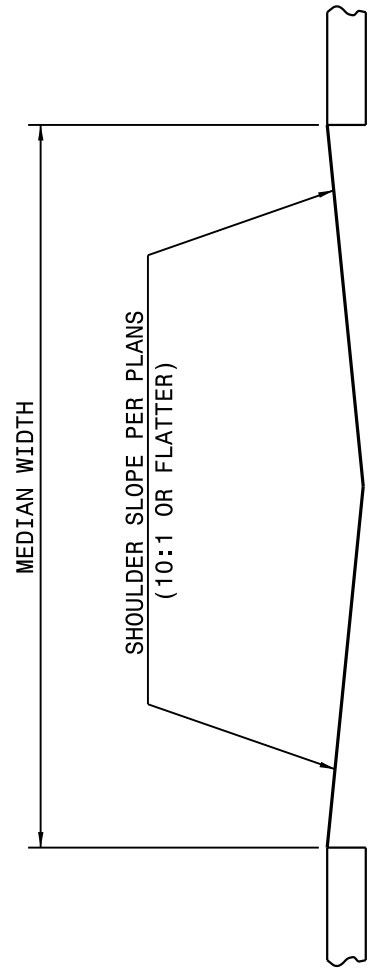
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

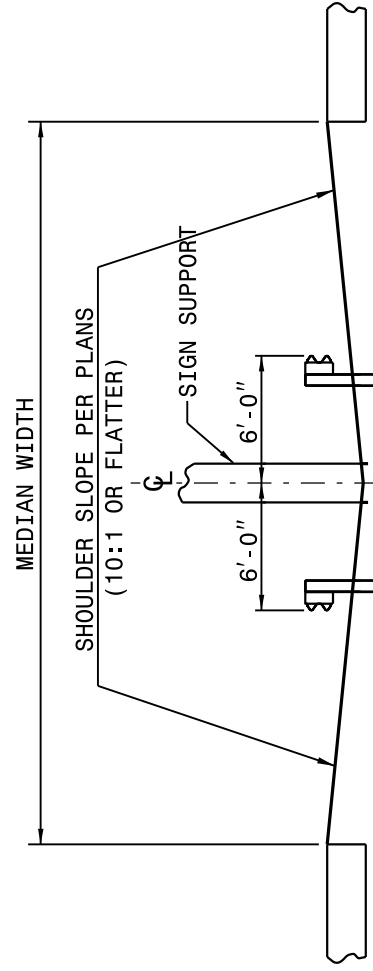
SHEET 2 OF 11
862D01



NOTE SPECIAL LAYER OF PAVEMENT
USE 3'-1 1/2" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STANDARD 862D01 SHEET 1 OF 12).



SECT. YY



SECT. ZZ

DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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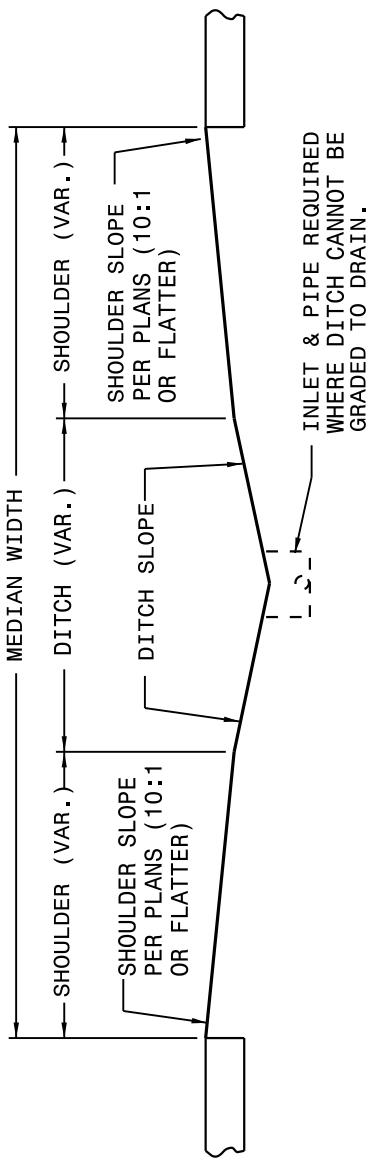
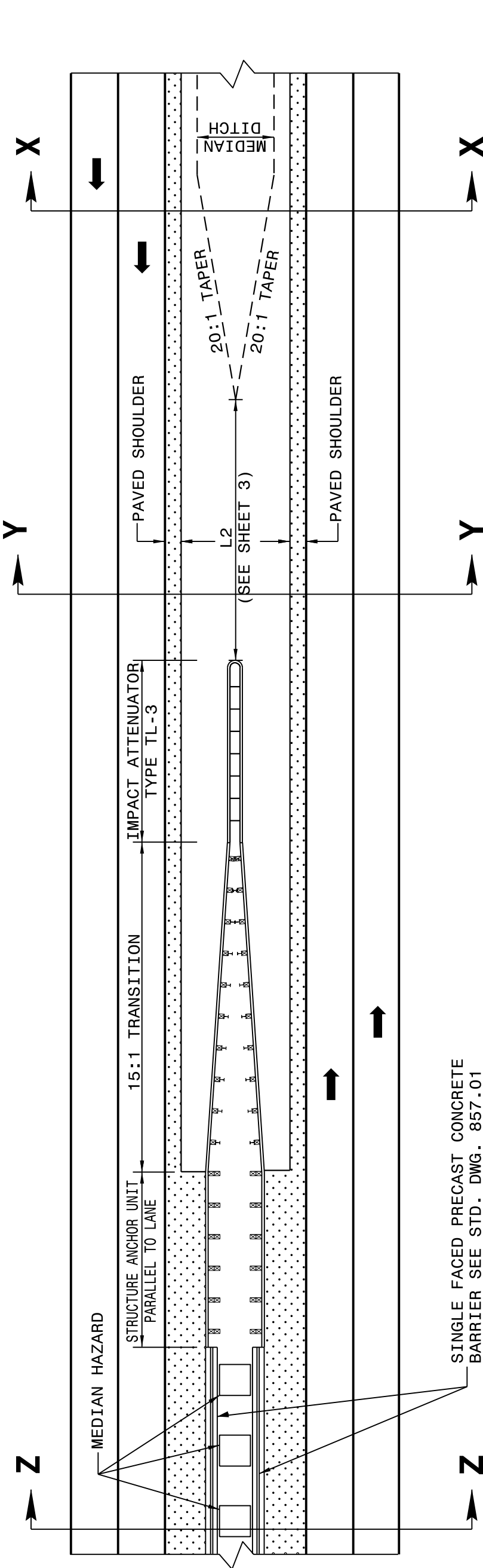
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

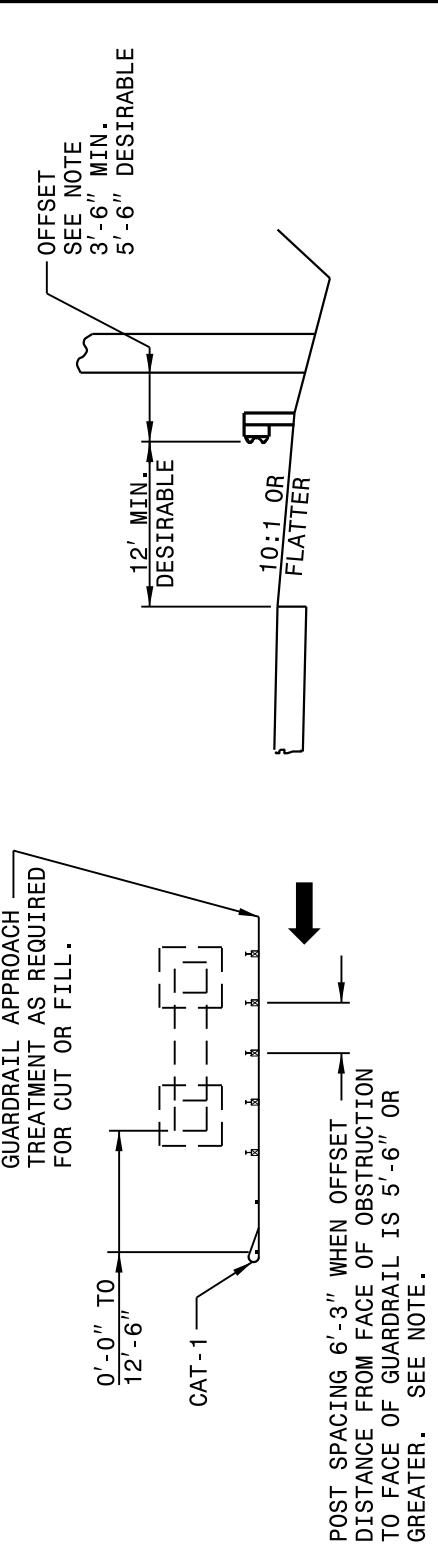
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

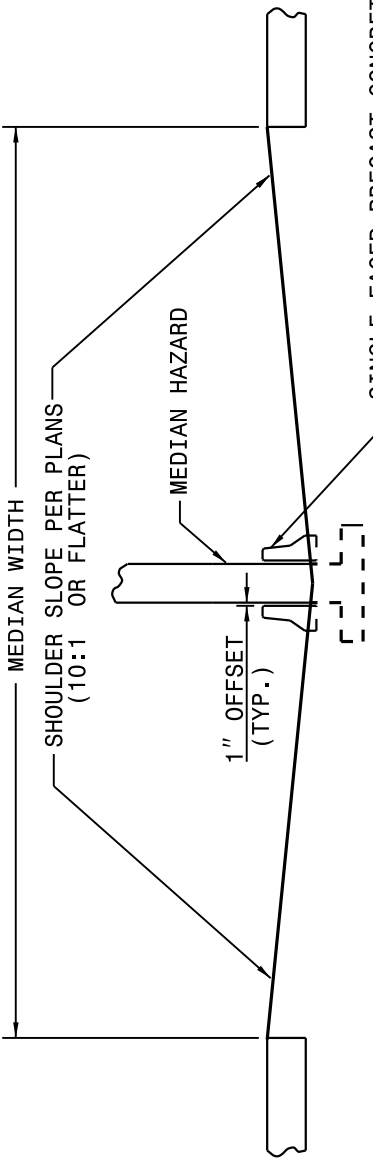
SHEET 1 OF 11
862D01



SECT. XX

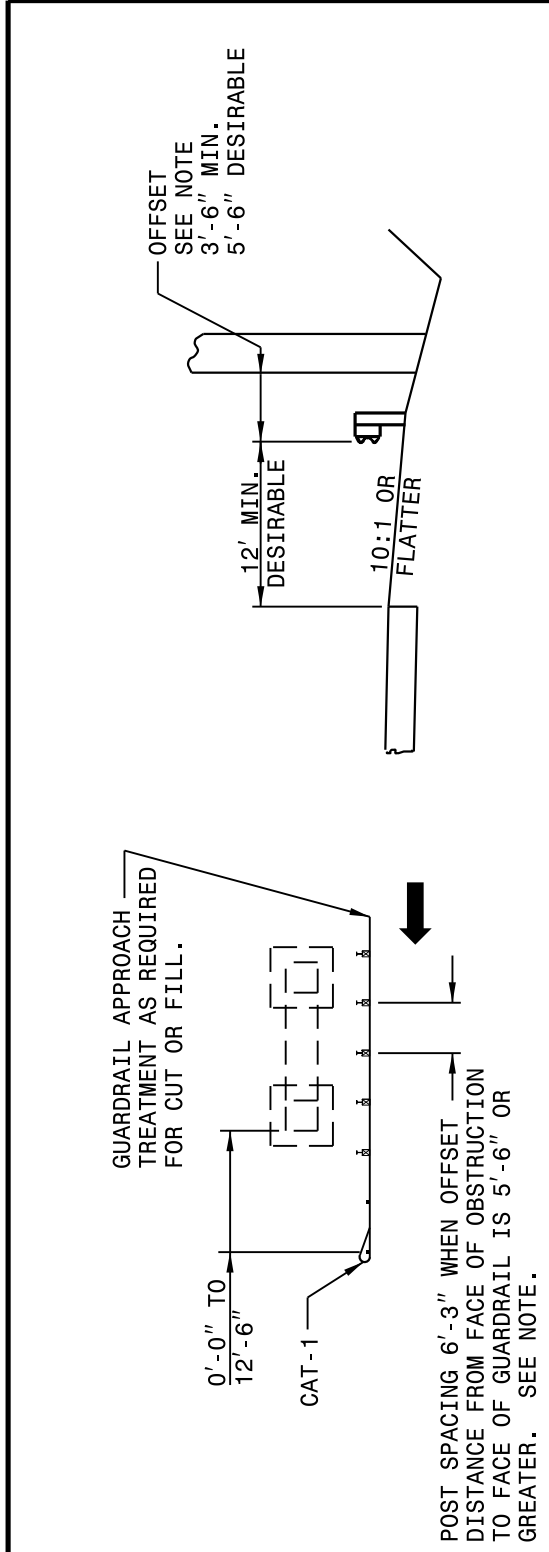


SECT. YY



SECT. ZZ

DETAIL OF MEDIAN TREATMENT AT UNDERPASS



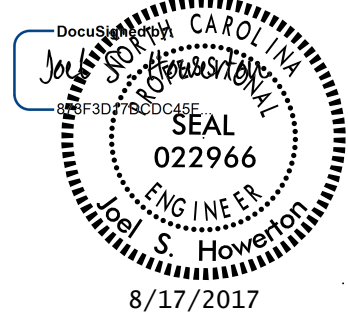
NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1 1/2" POST SPACING AT POINTS BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

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

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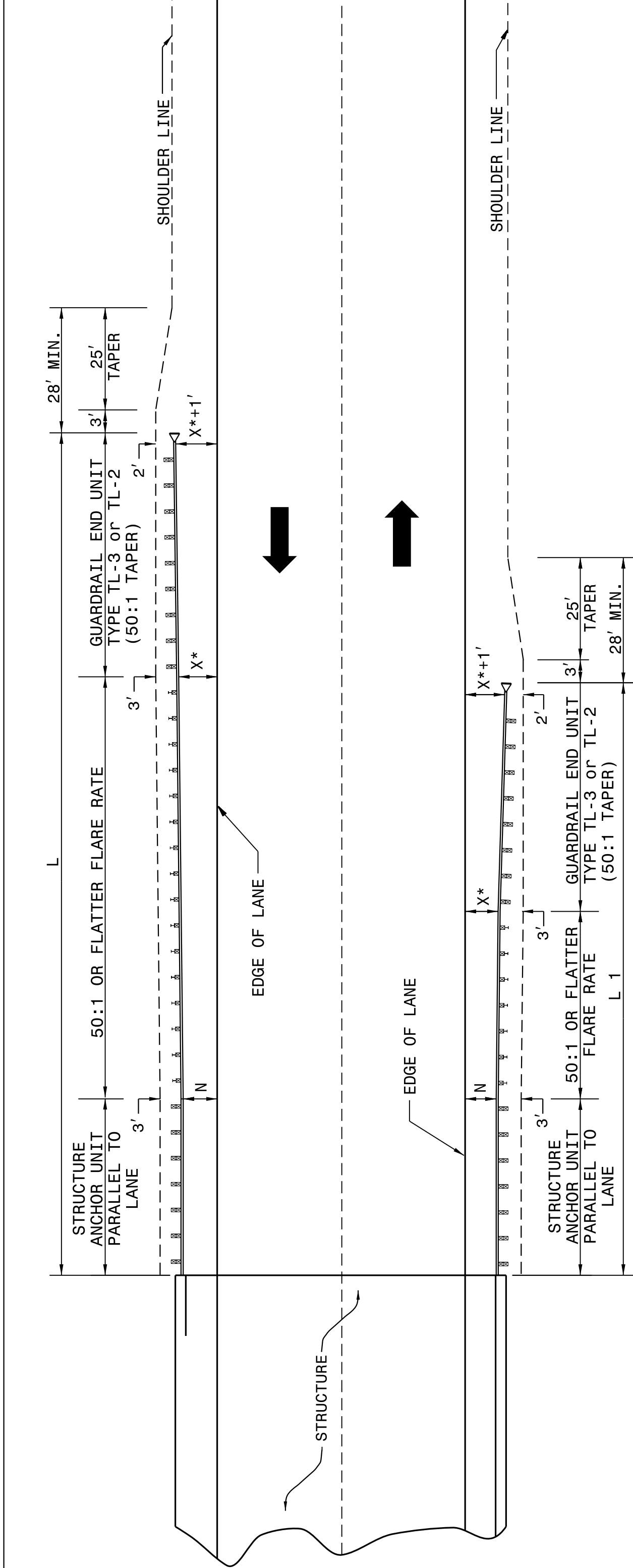
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 11
862D01



ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 11
862D01

* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED.
("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH
MANUAL, PART 1, 1-4B, F1).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS
PARALLEL TO LANE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

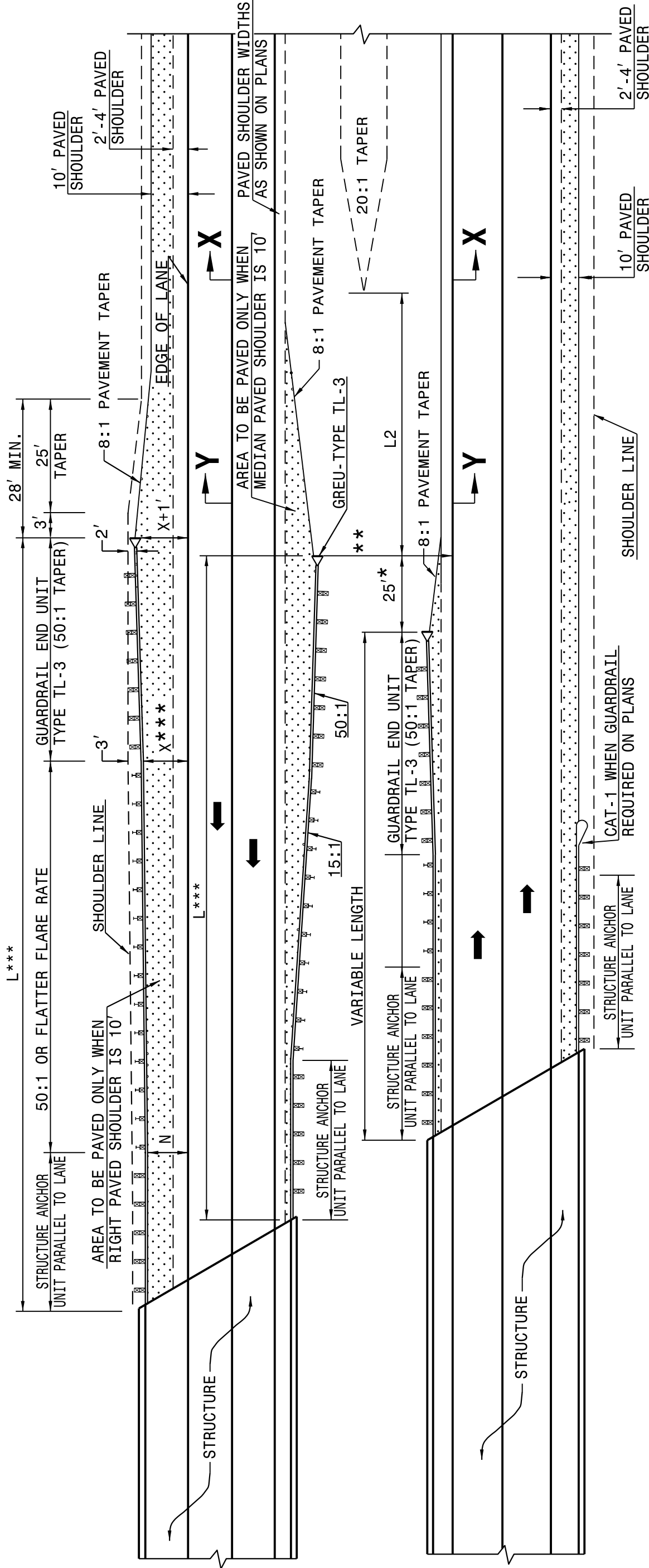
GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC							
DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)		"L1" TRAILING LENGTH (FT.)		DESIGN YEAR ADT		
	OVER 2000	1001- 2000	400- 1000	UNDER 400	OVER 2000	1001- 2000	400- 1000
70	362.5'	362.5'	350.0'	287.5'	187.5'	187.5'	175.0'
60	300.0'	287.5'	275.0'	225.0'	137.5'	137.5'	100.0'
50	212.5'	212.5'	200.0'	162.5'	87.5'	75.0'	75.0'
40	175.0'	150.0'	137.5'	112.5'	75.0'	75.0'	75.0'
X *	8'	6'	4'	4'	8'	6'	4'

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 3 OF 11
862D01



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 3 OF 11
862D01

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMMODATE THE 12'-6" IN
GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE
RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON
SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).
"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.
THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.
SEE SHEET 1 OF 12 FOR SECTIONS XX, YY
SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

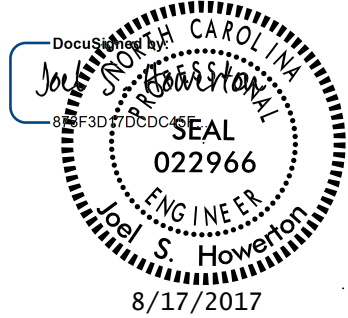
DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

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Office 919-707-6950 FAX 919-250-4119

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SHEET NO. 2C-2

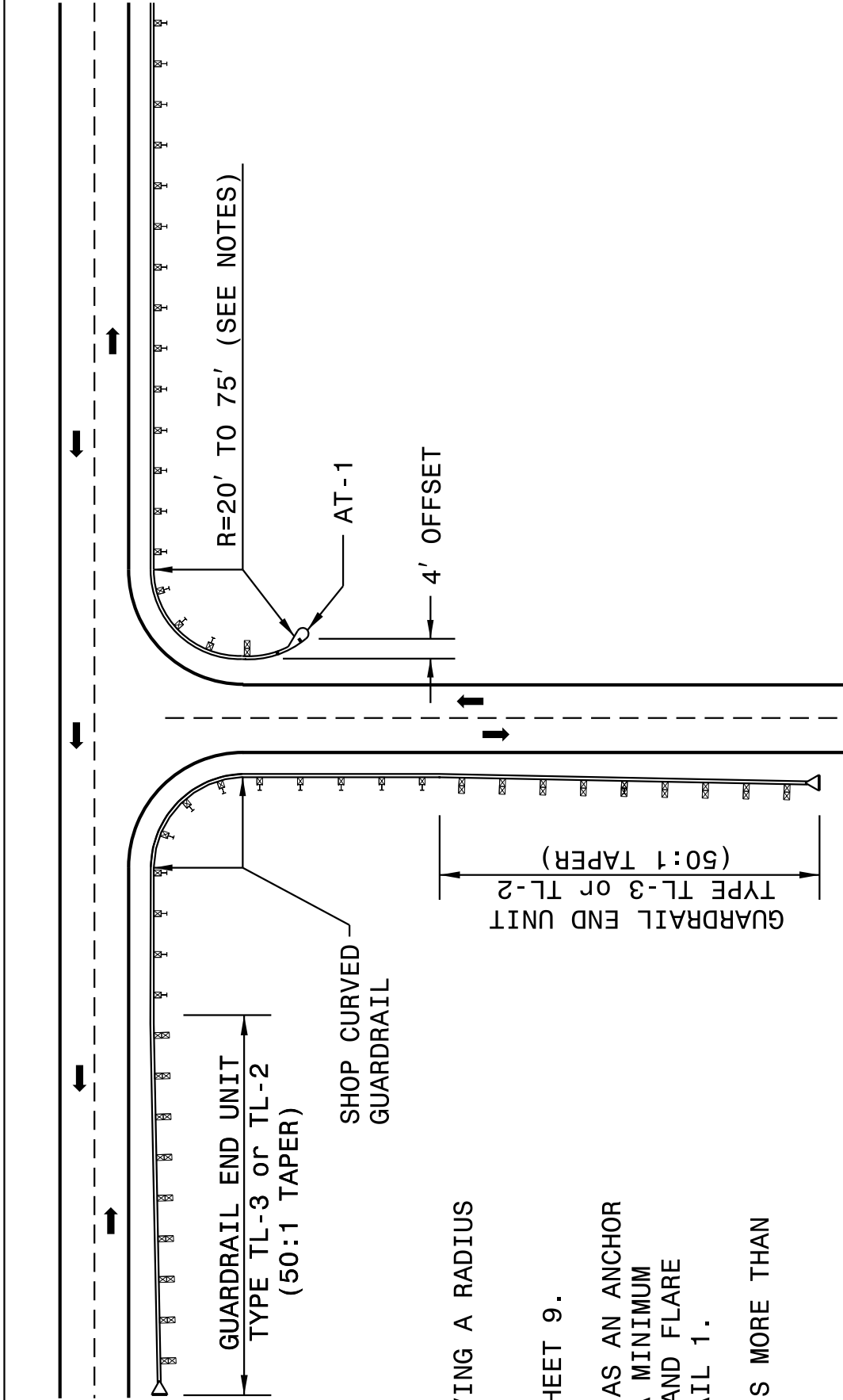
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 8 OF 11
862D01



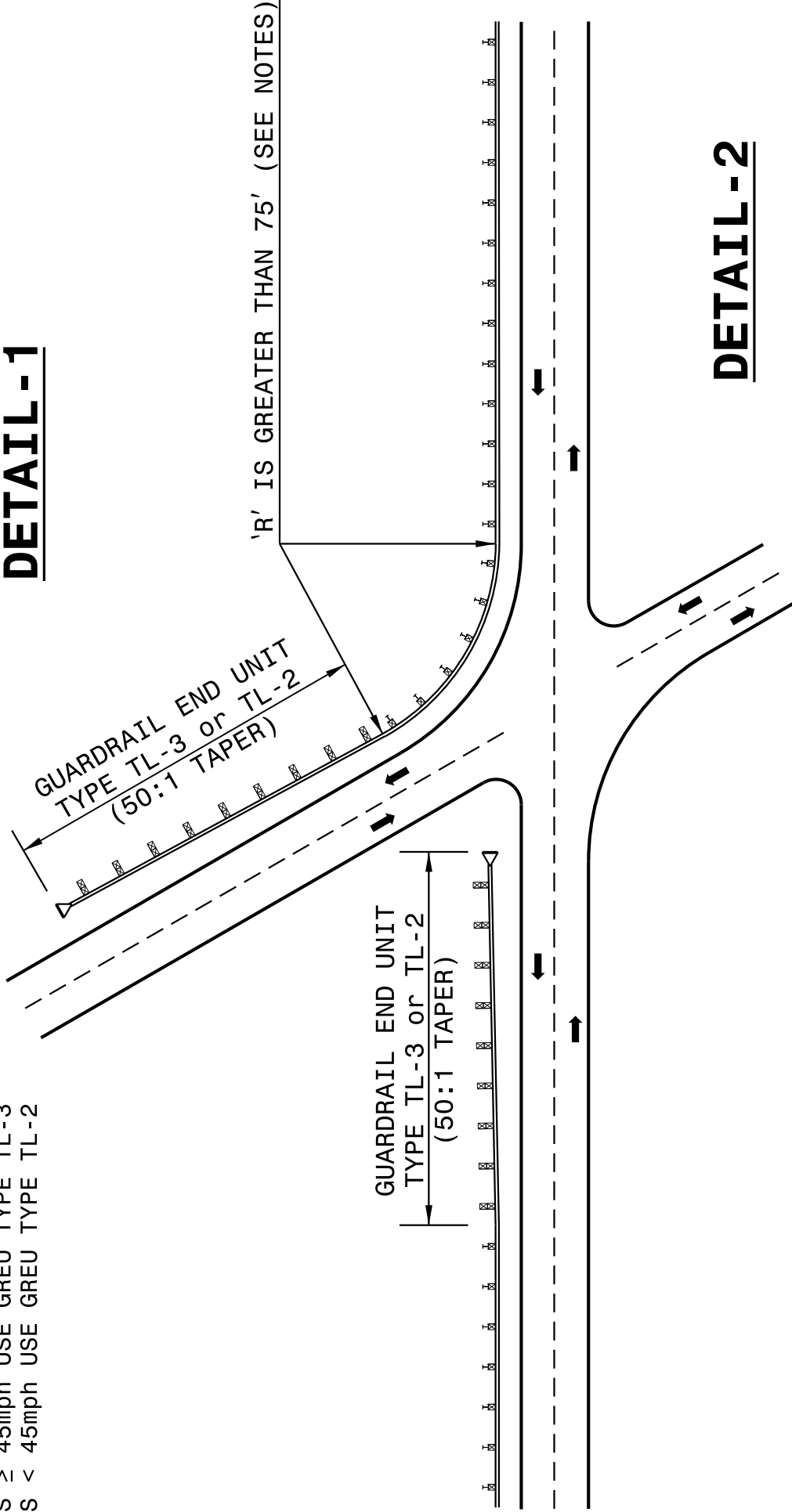
NOTES:

- SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150' OR LESS.
- WHEN RADIUS IS LESS THAN 20' REFER TO SHEET 9.
- WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20' TO 75', USE A MINIMUM LENGTH OF 50' OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.
- WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75', REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS $\geq$ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS $<$ 45mph USE GREU TYPE TL-2

DETAIL -1



DETAIL -2

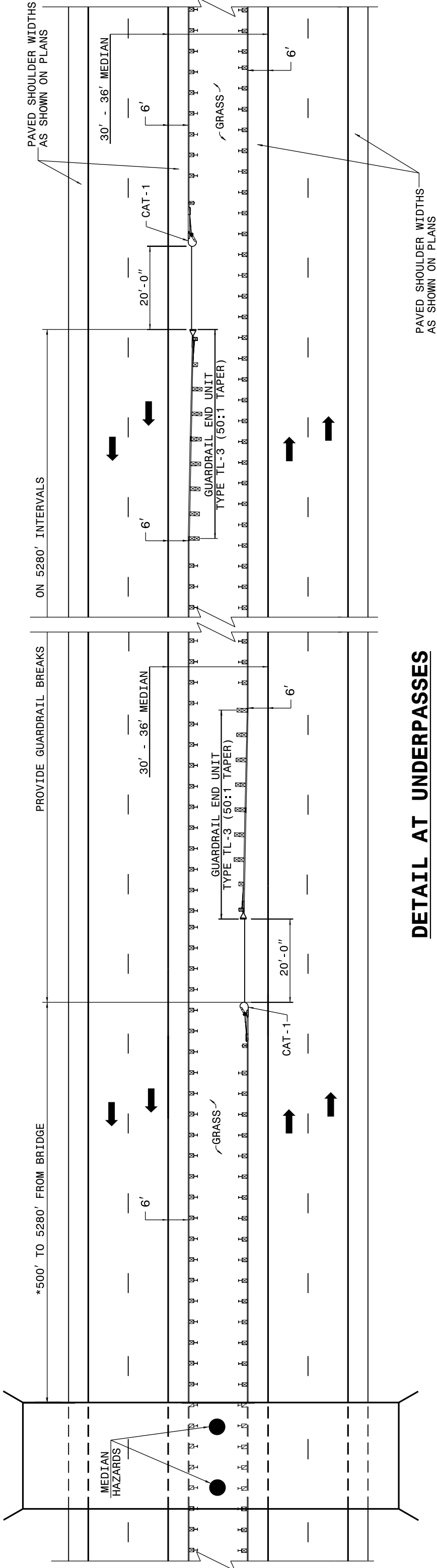
GUARDRAIL TREATMENT AT INTERSECTIONS

SHEET 8 OF 11
862D01

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

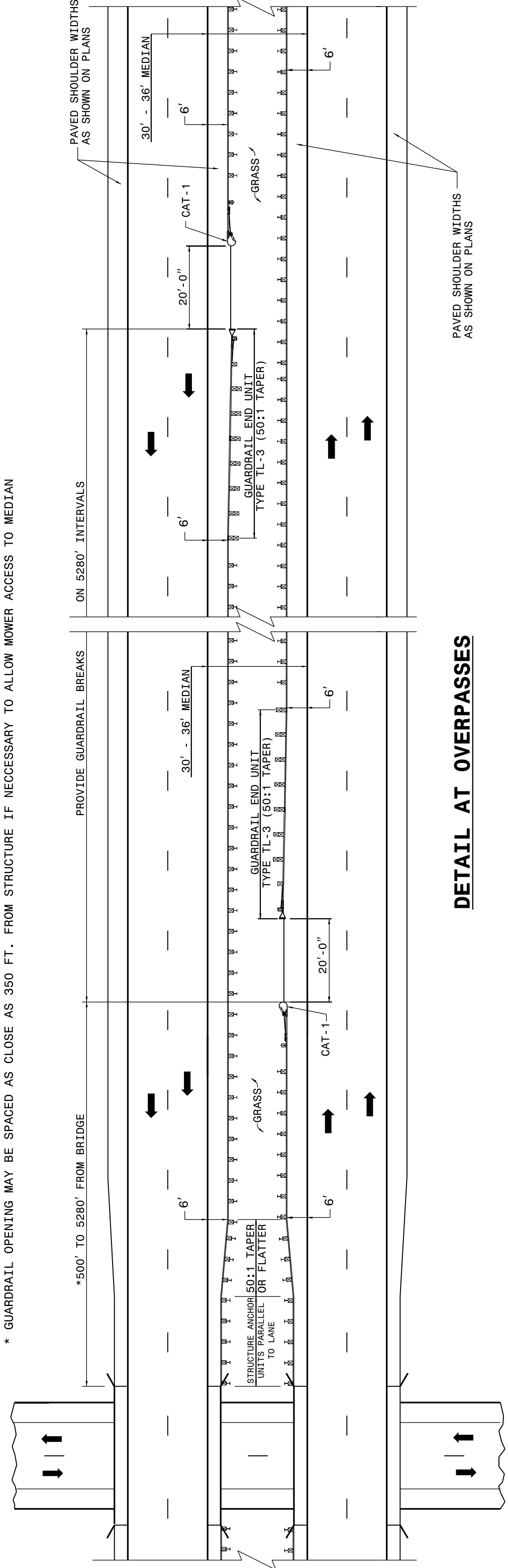
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 7 OF 11
862D01



DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECESSARY TO ALLOW MOWER ACCESS TO MEDIAN



DETAIL AT OVERPASSES

FOR POSTED SPEEDS $\geq$ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS $<$ 45mph USE GREU TYPE TL-2

GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

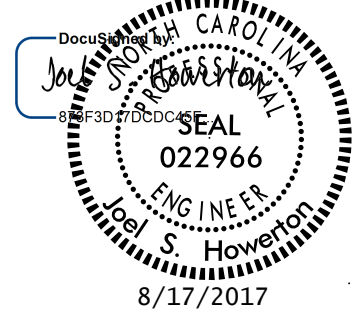
SHEET 7 OF 11
862D01

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

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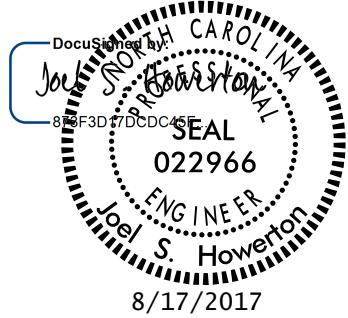
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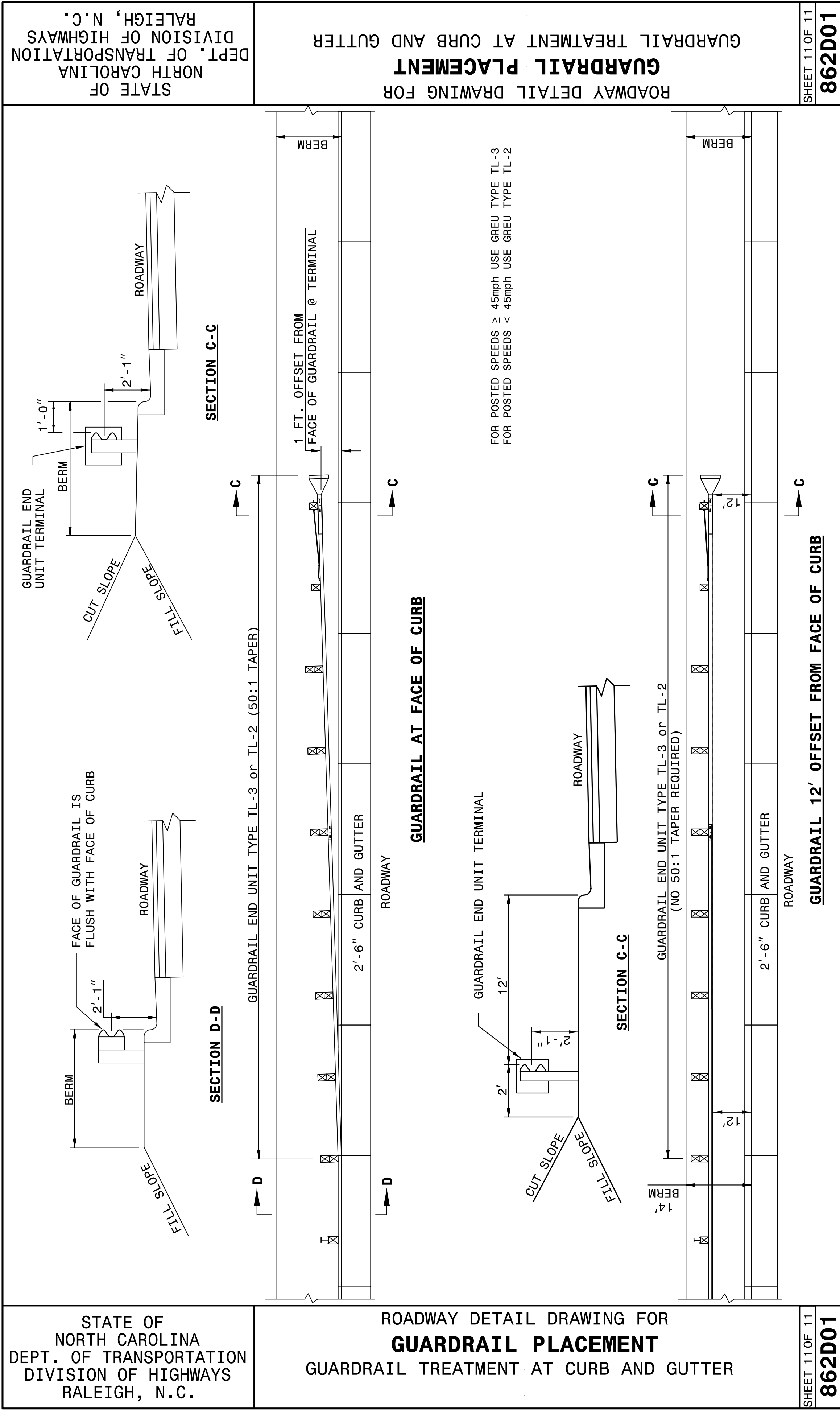
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR GUARDRAIL PLACEMENT	SHEET 10 OF 11 862D01		
Diagram of Flexible Paved Shoulder showing guardrail post hole, 10' paved shoulder, surface course, base course, and earth material. Diagram of Concrete Paved Shoulder showing guardrail post hole, 10' paved shoulder, CRS-2P emulsion, and earth material. NOTE: WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE. THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL. FLEXIBLE PAVED SHOULDER CONCRETE PAVED SHOULDER			ENGLISH DETAIL DRAWING FOR GUARDRAIL PLACEMENT	SHEET 10 OF 11 862D01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR GUARDRAIL PLACEMENT	SHEET 9 OF 11 862D01		
Diagram of Divided Highway showing guardrail end unit, driveway, and guardrail post hole. DETAIL - 3 DIVIDED HIGHWAY NOTE: USE DETAIL 3 & 4 WHENEVER 20' OR LARGER RADIUS CANNOT BE UTILIZED. MAINTAIN CLEAR SIGHT DISTANCE. FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3 FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2 DETAIL - 4 UNDIVIDED HIGHWAY			ROADWAY DETAIL DRAWING FOR GUARDRAIL PLACEMENT	SHEET 9 OF 11 862D01

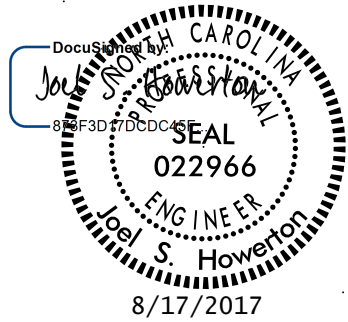
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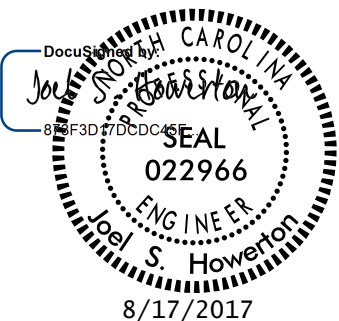
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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION SHEET 2 OF 8862D02
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION FLARED AND TANGENT ELEVATION VIEW ★ WHEN INSTALLING GUARDRAIL END UNITS THAT ARE 2'-1" MOUNTING HEIGHT TO EXISTING GUARDRAIL, REMOVE THE EXISTING GUARDRAIL TO TRANSITION FROM THE EXISTING HEIGHT TO THE PROPOSED 2'-1" HEIGHT. SEE 862.02, SHEET 4 OF 8 FOR TRANSITION DETAILS. FLARED AND TANGENT ELEVATION VIEW ★ APPROACH END UNITS SHEET 2 OF 8862D02 ROADWAY DETAIL DRAWING FOR GUARDRAIL INSTALLATION

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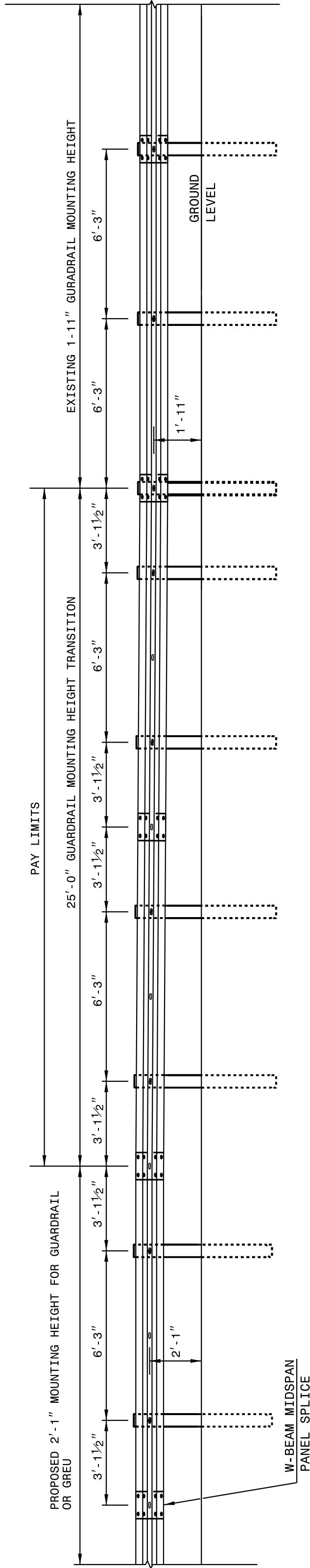
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1'-11", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL,
FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2'-1" GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM OR 1'-11" TO 2'-1" W-BEAM GUARDRAIL MOUNTING HEIGHT

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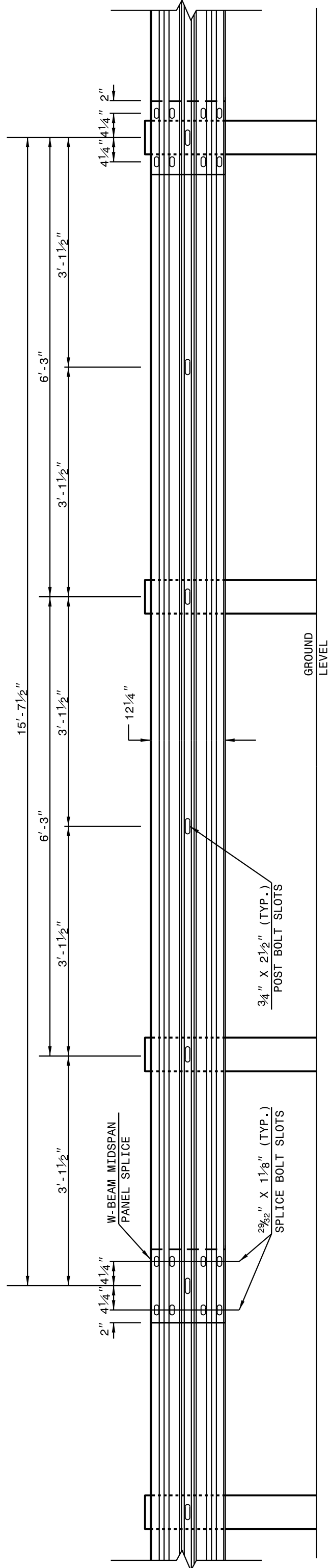
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02



15'-7 1/2" W-BEAM GUARDRAIL PANEL

NOTE: USE 5-SPACE 15'-7 1/2" W-BEAM GUARDRAIL PANEL
AT THE DOWNSTREAM END OF AN END UNIT OR EXISTING GUARDRAIL
THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

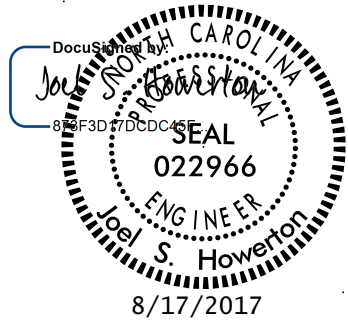
SHEET 3 OF 8
862D02

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD
LINE POST

3'-0",9"

6"

8"

7"

3/4" DIA.

6"

8"

1'-2"

7"

1'-8"

SHORT WOOD
BREAKAWAY POST

3'-8 3/4"

2 1/2" x 3/4" SLOT

1'-8"

7"

29/8" DIA.

5 1/2" ± 1/8"

7 1/2" ± 1/8"

± 1/8"

STEEL TUBE
TS 6"x8"x0.1875"

1'-3 3/4"

1'-5"

8"

1"

7/8" DIA.
CENTERED
ON 6" SIDE

3/4" DIA.

3"

3"

2'-0" X 1'-6" SOIL PLATE

5'-0"

ROUTED
OFFSET BLOCK

7 1/2" ± 3/16"

7 1/2" ± 3/16"

1/4" ± 1/16"

1/4" ± 1/16"

23/4" ± 3/16"

23/16" ± 1/8"

0"

3/4" DIA.

PLAN

1'-3/16" ± 1/16"

23/4" ± 3/16"

0"

"W6" STEEL POST

W6x8.5x6'-0"

7"

3/16" DIA.
HOLES

PLAN

1 1/8"

1 1/8"

4"

3/16" DIA.
HOLES

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 8
862D02

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 8
862D02

PLAN

TRAFFIC FLOW

SEE NOTE 'B'

"W6" STEEL POST WITH
ROUTED OFFSET BLOCK

ISOMETRIC VIEW

ROUTED
OFFSET BLOCK

STEEL
GUARDRAIL
POST

"W" BEAM
GUARDRAIL

PLAN

SEE NOTE 'A'

SEE NOTE 'B'

2'-1" (TYP)

GROUND LINE

"W6" STEEL POST WITH
ROUTED OFFSET BLOCK

SIDE

FRONT - MID SPAN SPLICE

12 1/2"

10 1/2"

6 1/4"

2"

SEE NOTE 'A'

"W" BEAM
GUARDRAIL

SEE NOTE 'B'

GROUND LINE

GUARDRAIL POST

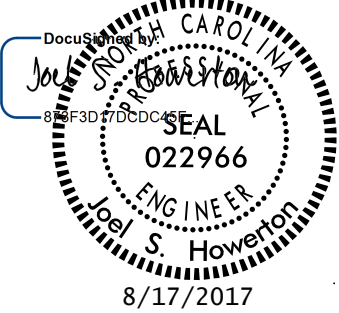
NOTES:
A - 5/8" DIA. BUTTON HEAD SPLICE BOLT 1 1/4" LONG (8 REQ. PER SPLICE JOINT).
B - 5/8" DIA. BUTTON HEAD BOLT 7 1/2"/8" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

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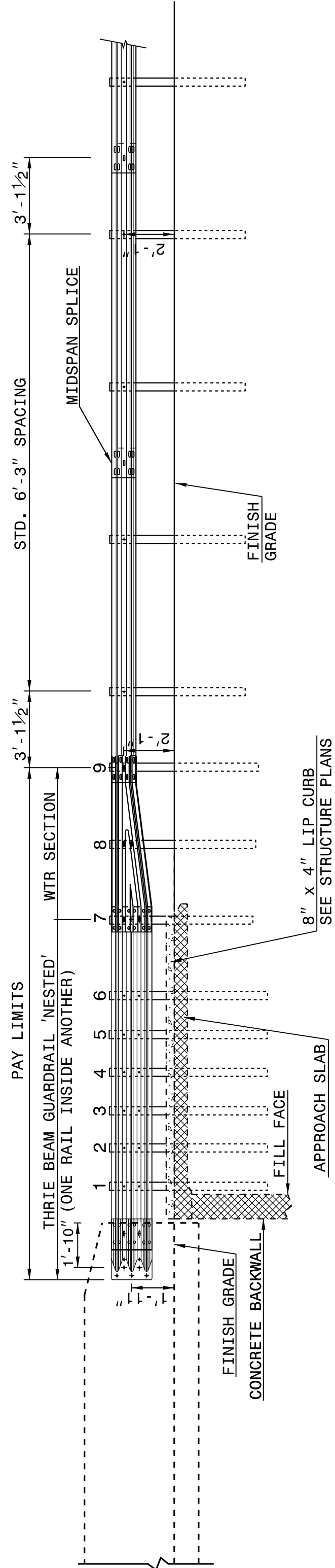
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RALEIGH, N.C.

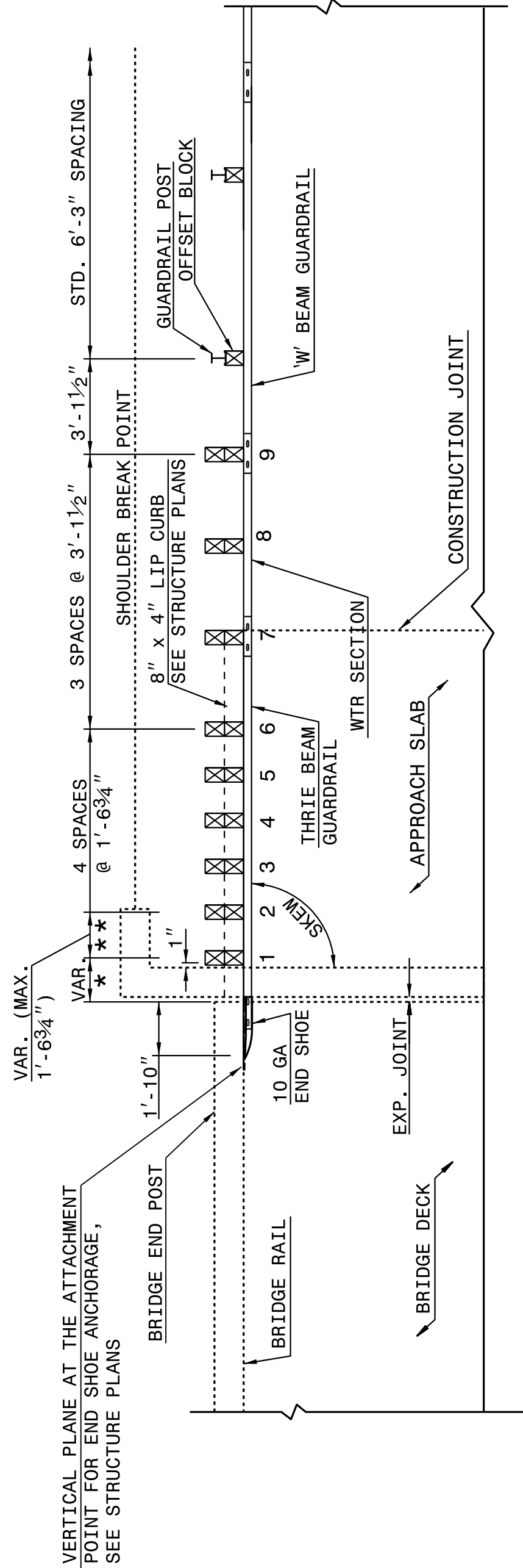
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

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 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

SHEET 2 OF 7
862D03

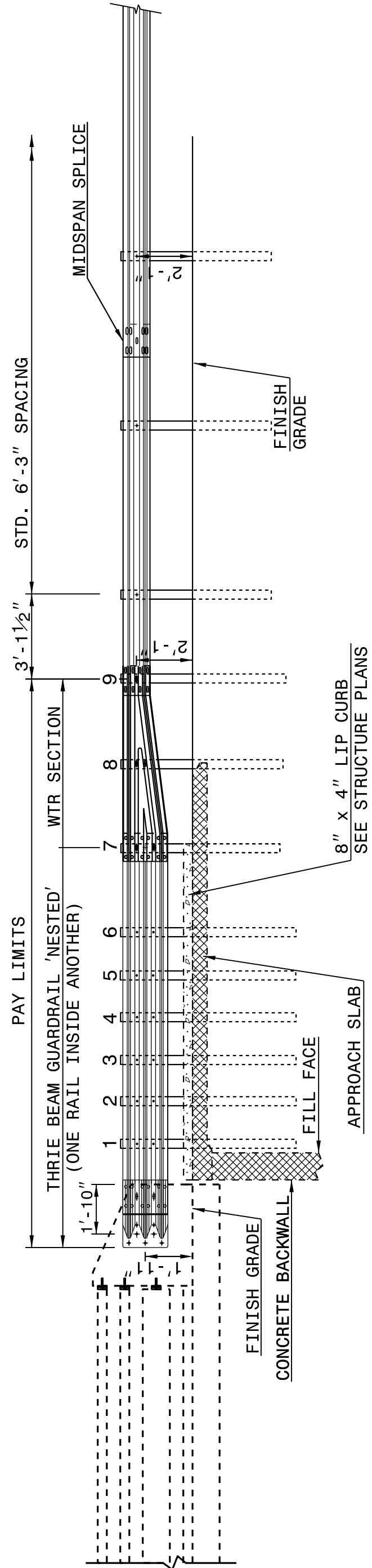
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STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

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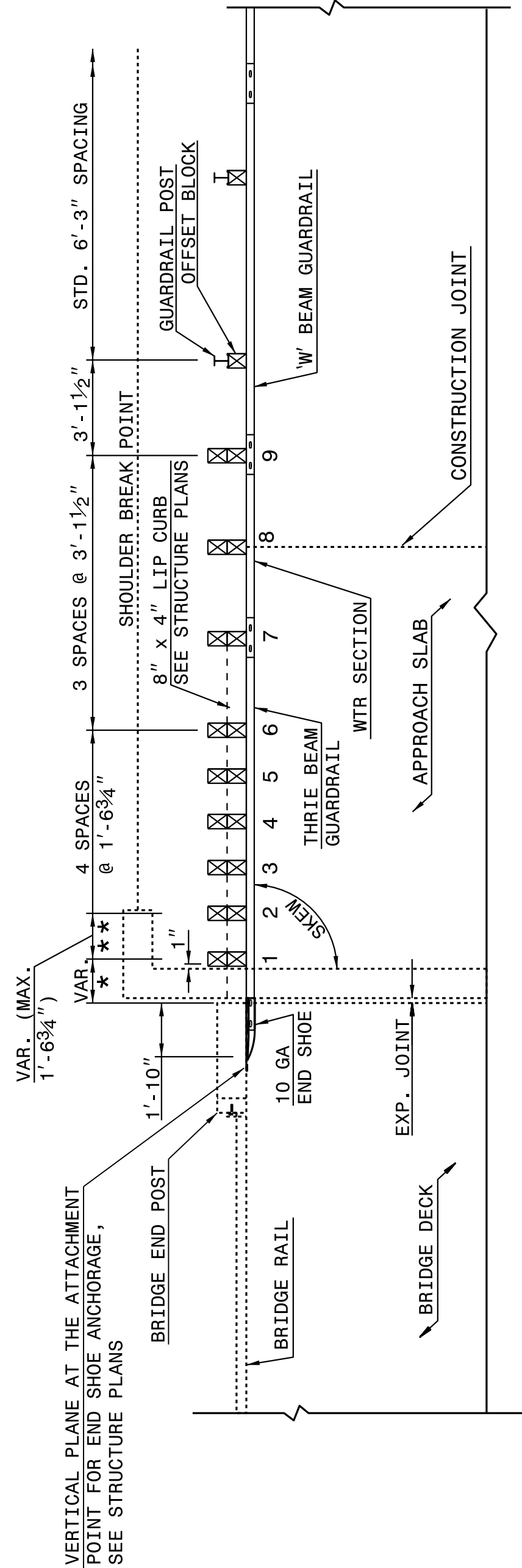
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

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*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 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

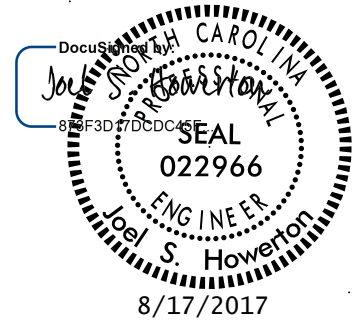
**GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE**

SHEET 1 OF 7
862D03

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

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RALEIGH, N.C.

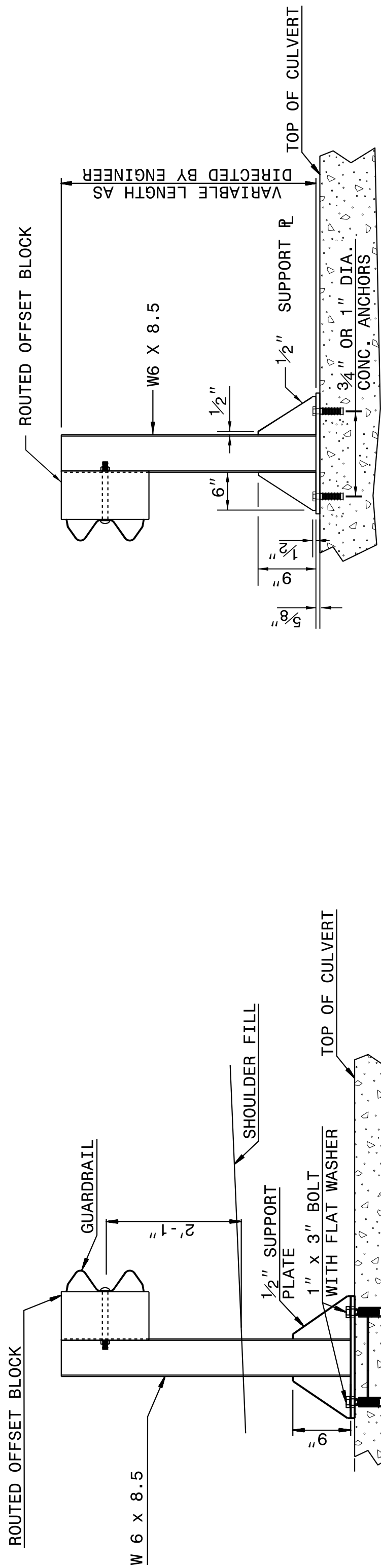
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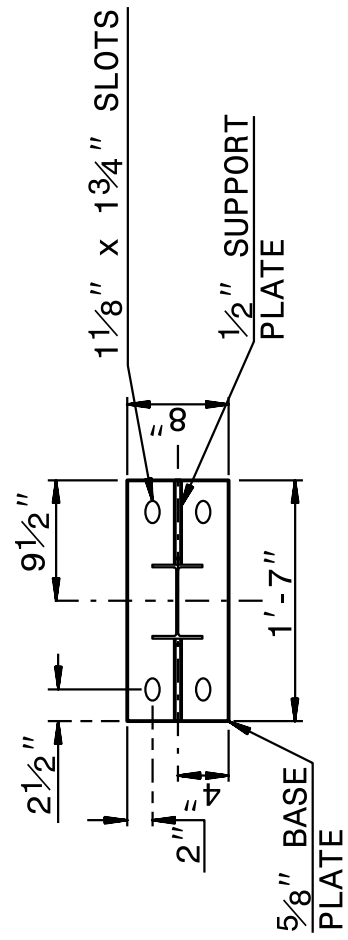
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ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03

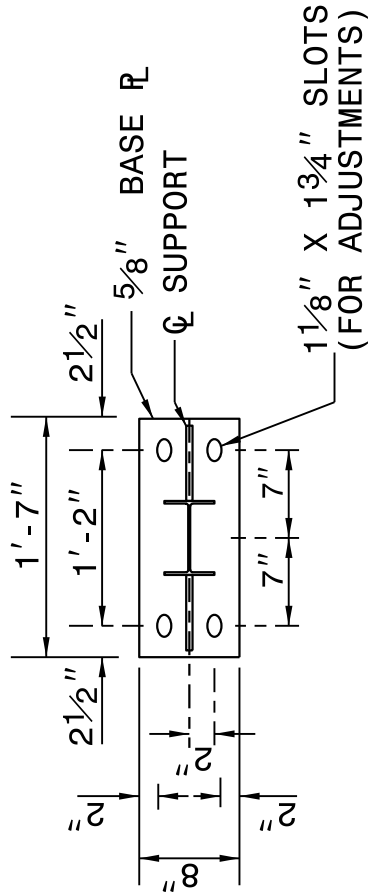


ELEVATION VIEW



PLAN VIEW

ELEVATION VIEW



PLAN VIEW

NOTES FOR:
-USE FULL LENGTH 1/4" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST.
-USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.

NEW STRUCTURES:

-ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:

-USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

-USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03

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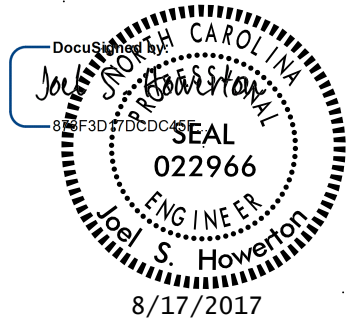
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17BP.10.R.87	2C-14

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mahdelaziz

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
OTHERS FOR MONUMENT "830156-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 558854.974 (ft) EASTING: 1599147.599 (ft)
ELEVATION: 547.762 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999850725
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GRID DISTANCE FROM
"BL-5" TO -L- STATION 14+30.00 IS
N 77° 55' 57.65" W 143.433 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM-1	N 558675	E 1598632	ELEV 530.00'
BL-5	N 558743.382	E 1598759.136	ELEV 525.28'

①
JERRY D. WILLIAMS,
AND WIFE
JUDITH G. WILLIAMS
DB 1592 PG 355

CLASS 'I' RIP RAP
EST. 31 TONS
GEOTEXTILE
EST. 68 S.Y.

+20.12

5.91' +22.81

68 68'

JERRY D. WILLIAMS,
AND WIFE
JUDITH G. WILLIAMS
DB 1592 PG 355

$PI Sta 14+34.64$
 $\Delta = 9^{\circ} 54' 10.5'' (RT)$
 $D = 7^{\circ} 57' 27.9''$
 $L = 124.44'$
 $T = 62.38'$
 $R = 720.00'$

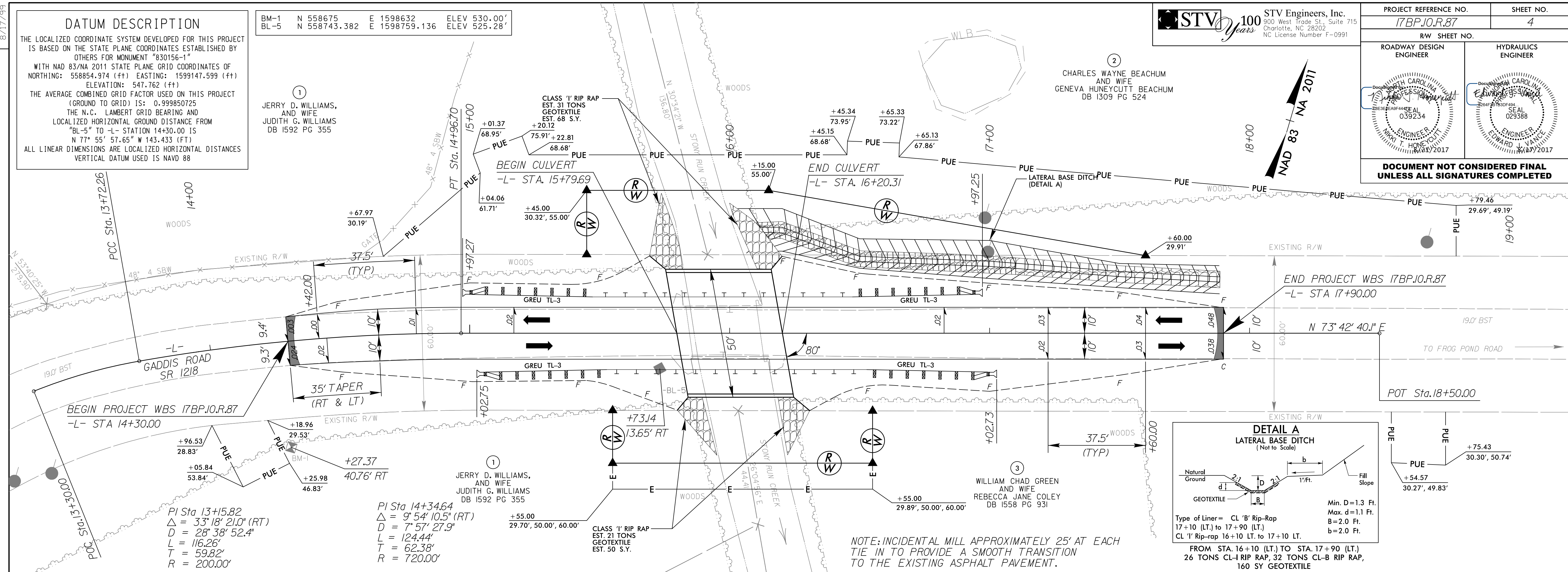
WILLIAM CHAD GREEN
AND WIFE
REBECCA JANE COLEY
DB 1558 PG 931

②
CHARLES WAYNE BEACHUM
AND WIFE
GENEVA HUNEYCUTT BEACHUM
DB 1309 PG 524



STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.		SHEET NO.	
17BP10.R.87		4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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BM-1
-L- 15+73.14, 13.65' RT
ELEV. 530.00
RR SPIKE IN BASE OF 24" OAK

BEGIN GRADE
STA. 14+30.00
EL = 530.63'

BEGIN CULVERT
-L- STA 15+79.69

END CULVERT
-L- STA 16+20.31

PI = 16+10.00
EL = 520.75'
VC = 360'
K = 27
DS = 25 MPH

PROPOSED GRADE

EXISTING GROUND

PROPOSED DITCH GRADE

EXIST (+17.5897 %)

PI = 17+90.00 LT
EI = 532.0

PI = 17+10.00 LT
EI = 523.0

PI = 16+10.00 LT
EI = 522.0

LOW POINT
STA 15+79.57
ELEV 526.53'

120 CY UNCLASSIFIED
STRUCTURE EXCAVATION
(TOTAL BOTH SIDES)

EXIST BRIDGE
TO BE REMOVED

40'x4' THREE
SIDED CULVERT

EXIST (-15.6914 %)

(-15.4889 %)

(+17.7222 %)

(+1.00 %)

(+11.25 %)

END GRADE
STA. 17+90.00
EL = 534.65'

NOTE:
THE DESIGN SPEED SHOWN FOR VERTICAL CURVES
ARE UP TO 20 MPH LESS THAN THE OVERALL
DESIGN SPEED PER THE SUB-REGIONAL TIER
DESIGN GUIDELINES.

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	2000	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	527.4	FT
BASE DISCHARGE	=	2900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	528.33	FT
OVERTOPPING DISCHARGE	=	1300	CFS
OVERTOPPING FREQUENCY	=	5+	YRS
OVERTOPPING ELEVATION	=	526.5	FT
DATE OF SURVEY	=	6/6/2016	
W.S. ELEVATION AT DATE OF SURVEY	=	526.5	FT

OFF-SITE DETOUR SIGNING AND ROAD CLOSURE SIGNING

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17BPJO.R.87

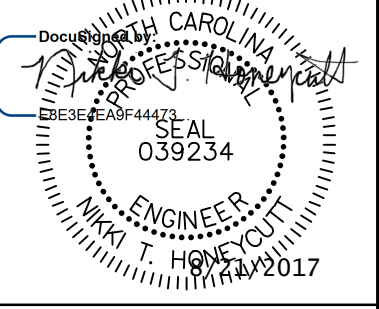
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TMP-1

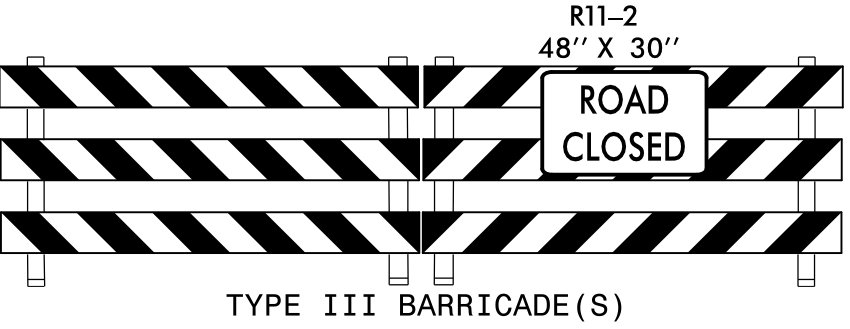
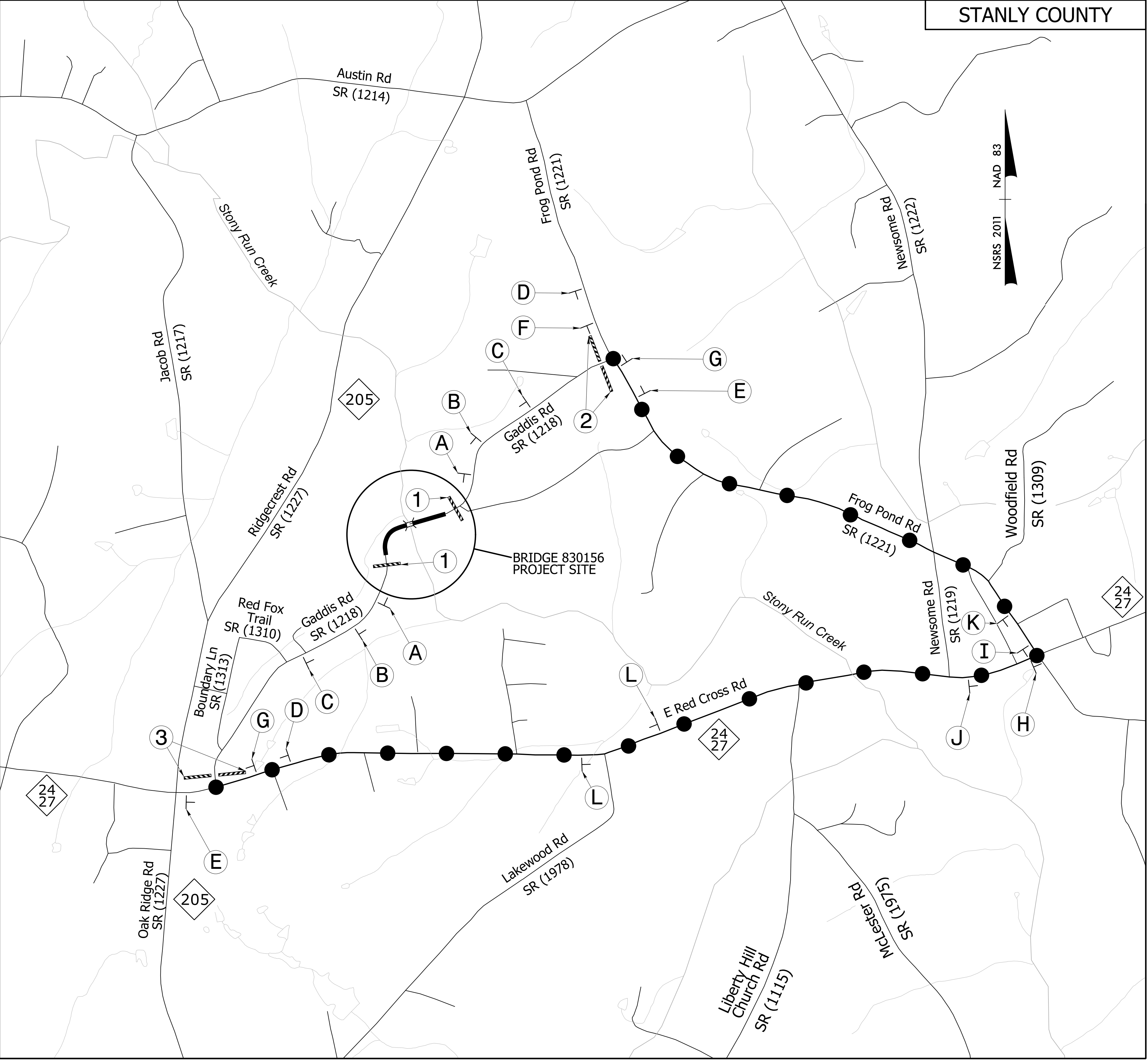
RW SHEET NO.

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

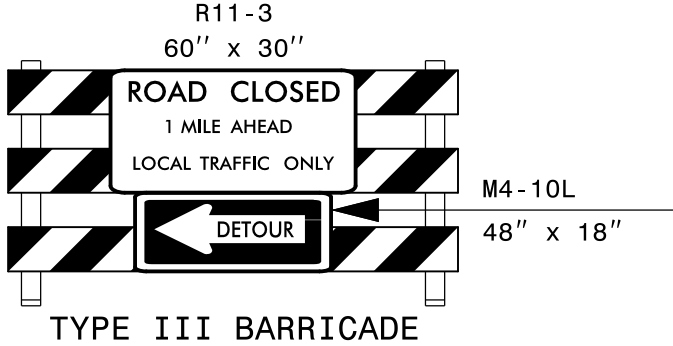
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ROADWAY DESIGN
ENGINEER

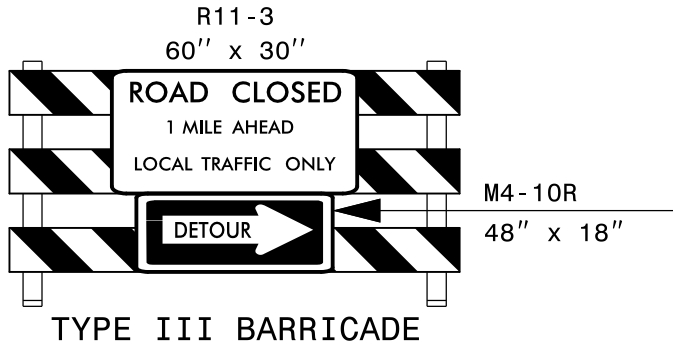




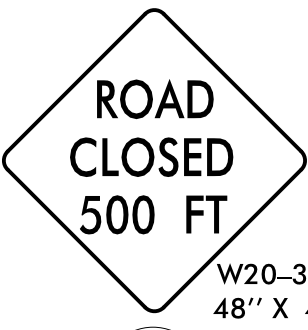
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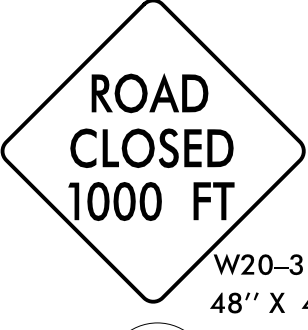
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3



A



B



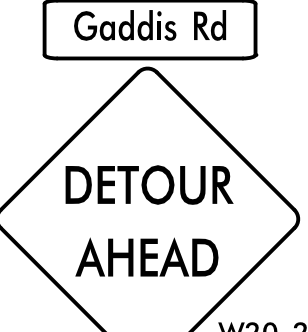
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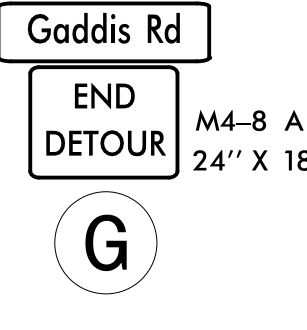
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E



F



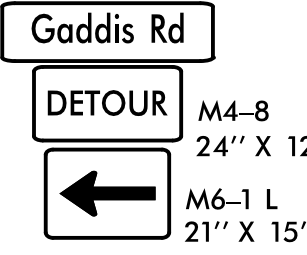
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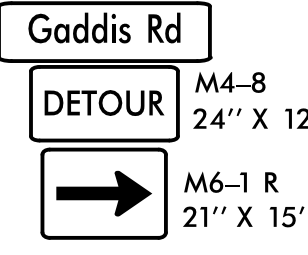
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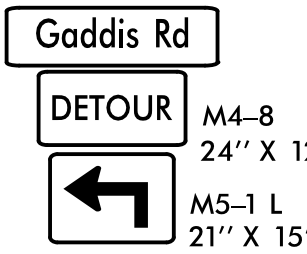
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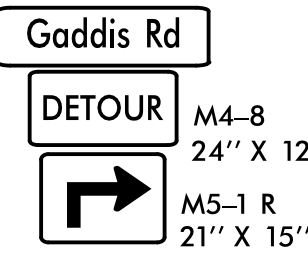
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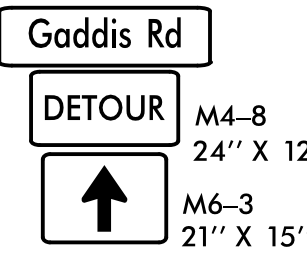
I



J



K



L

SEE ROADWAY STD DWG 1101.03, SHEET 1 OF 9 FOR ADVANCE WARNING AND BARRICADE PLACEMENT.

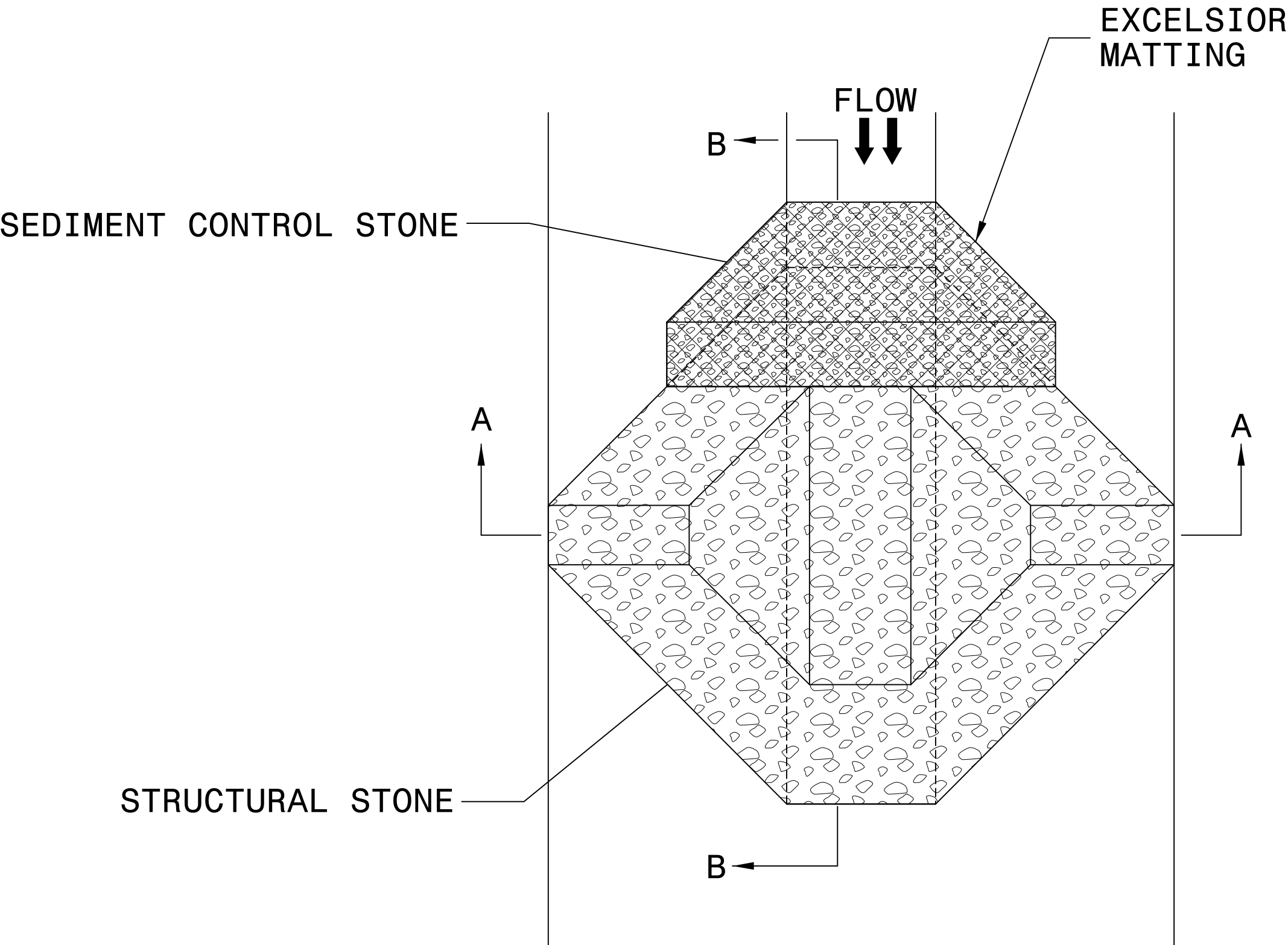


Scale: 1" = 800'

1632.01	Rock Inlet Sediment Trap	Type A
1632.02	Rock Inlet Sediment Trap	Type B
1632.03	Rock Inlet Sediment Trap	Type C
1633.01	Temporary Rock Silt Check	Type A
1633.02	Temporary Rock Silt Check	Type B
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
1640.01	Coir Fiber Baffle	
1645.01	Temporary Stream Crossing	

PROJECT REFERENCE NO.	SHEET NO.
17.BP.10.R.87	EC-2
R/W SHEET NO.	
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TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

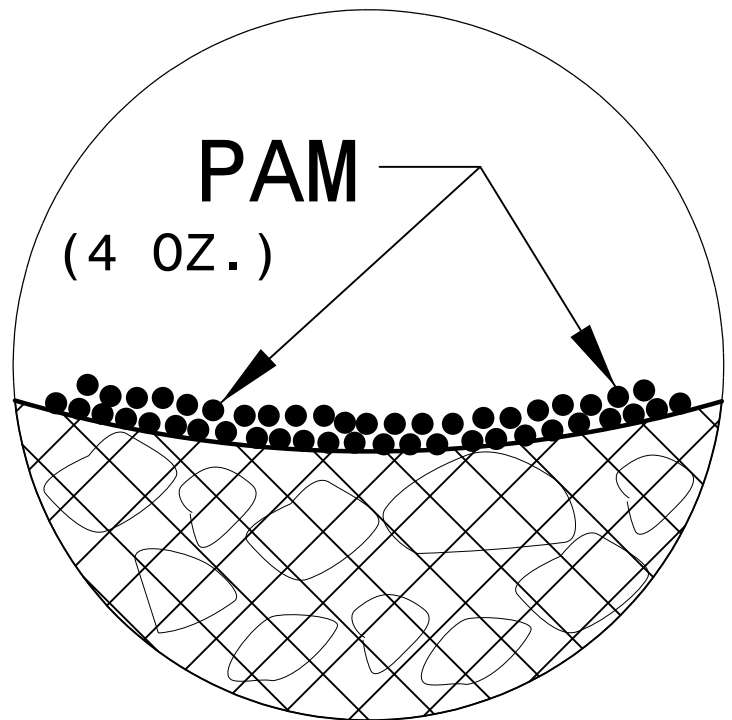
NOTES:

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

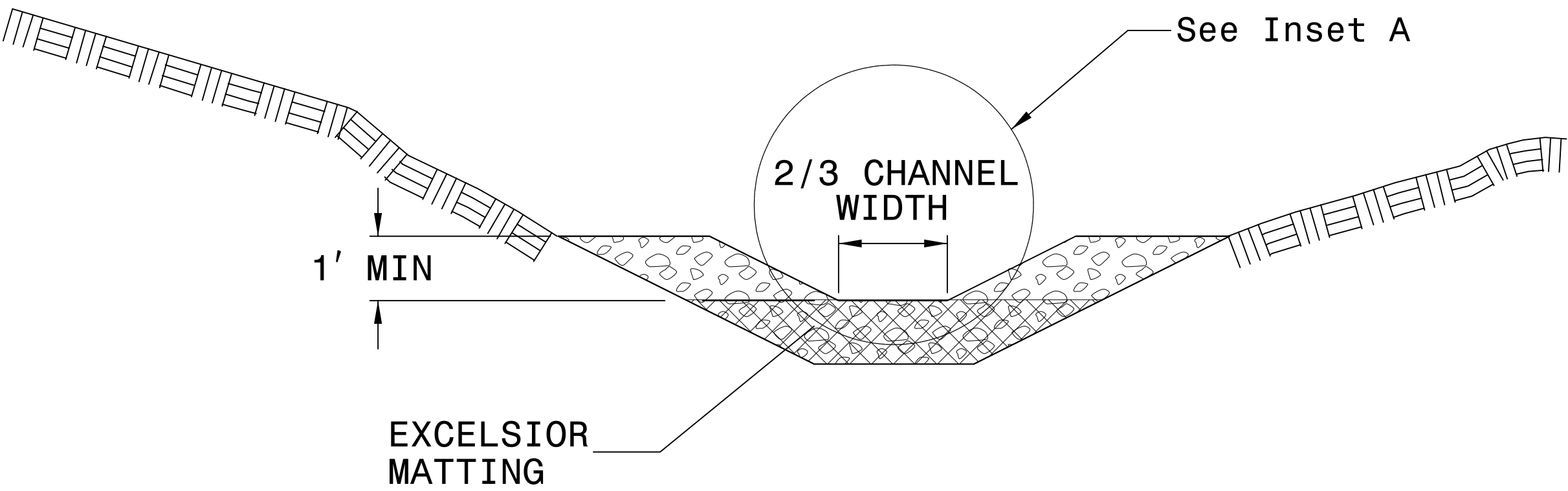
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

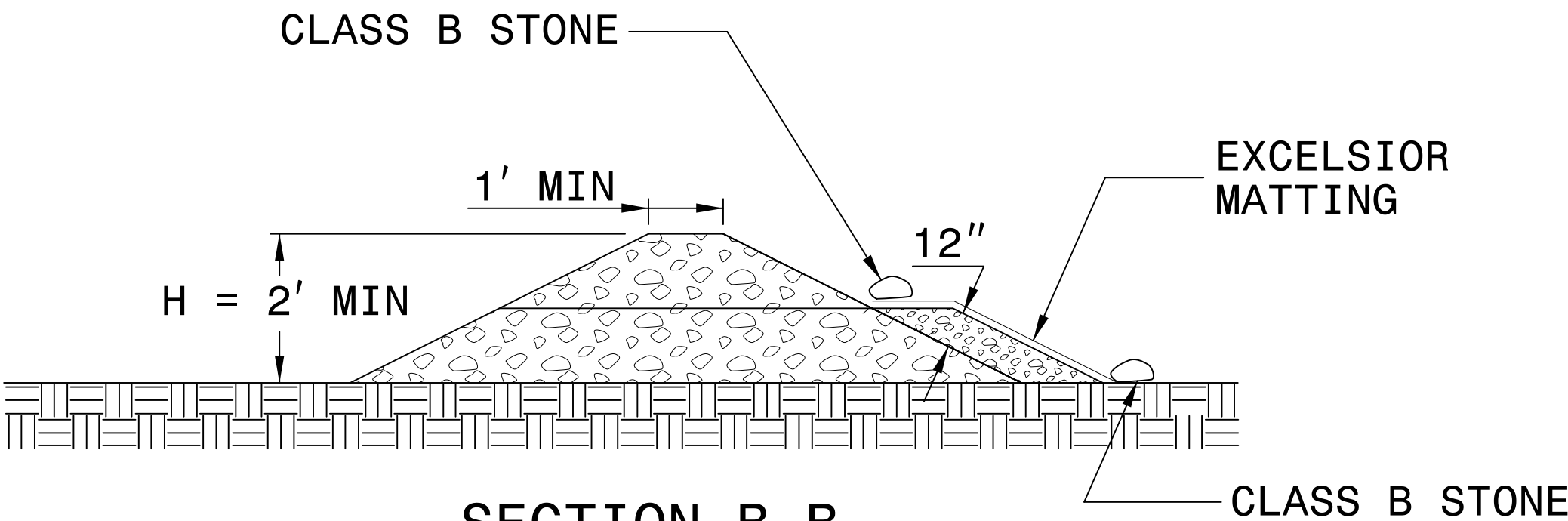
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
17BPJ0.R.87	EC-3
RW SHEET NO.	
STV 100 Years STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	14+30	15+80	LT	85
4	-L-	16+20	17+90	LT	95
4	-L-	16+20	17+90	RT	95
			SUBTOTAL		275
	MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER				725
				TOTAL	1000
				SAY	1000

PERMANENT SOIL REINFORCEMENT MATTING

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	GEO FOR DRAINAGE ESTIMATE (SY)

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
17BP10R87	EC-3A
RW SHEET NO.	
STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	

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.

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective August 3, 2011 issued by the North Carolina Department of Environment and Natural Resources Division of Water Quality. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity. Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

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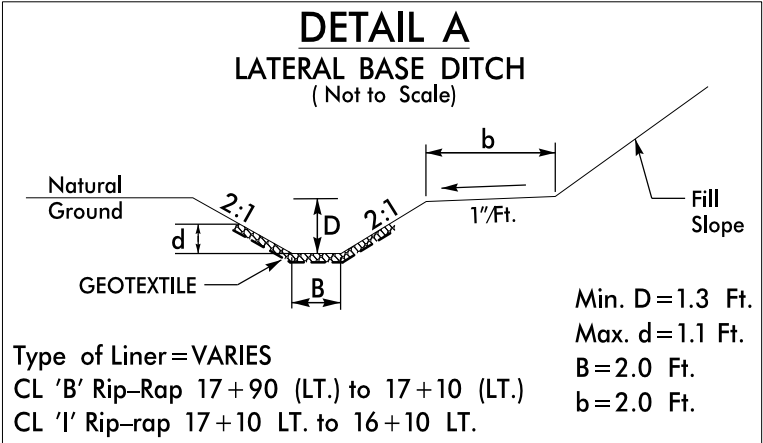
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RW SHEET NO.	
STV 100 Years STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	

BRIDGE #830156

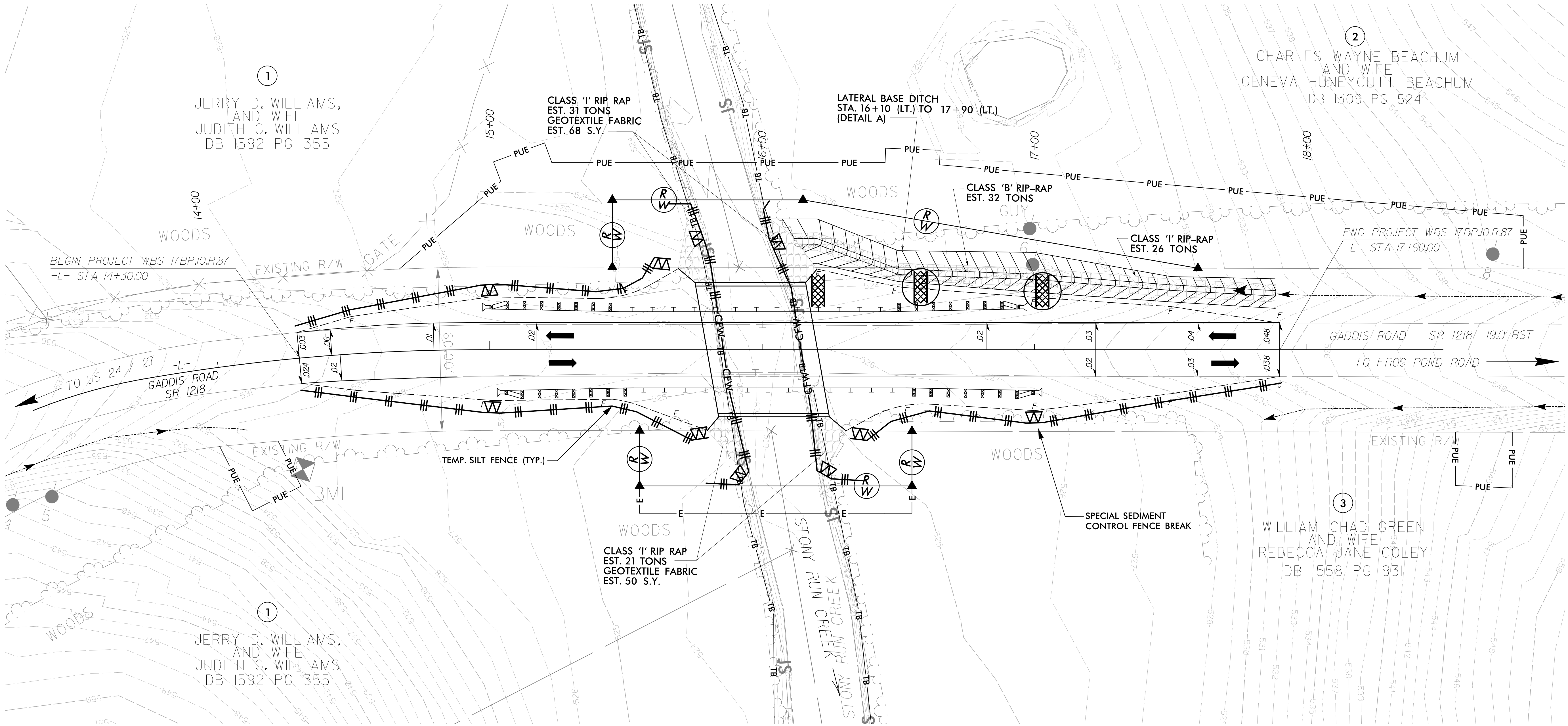
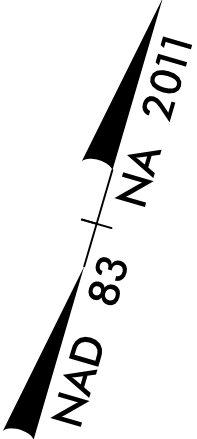
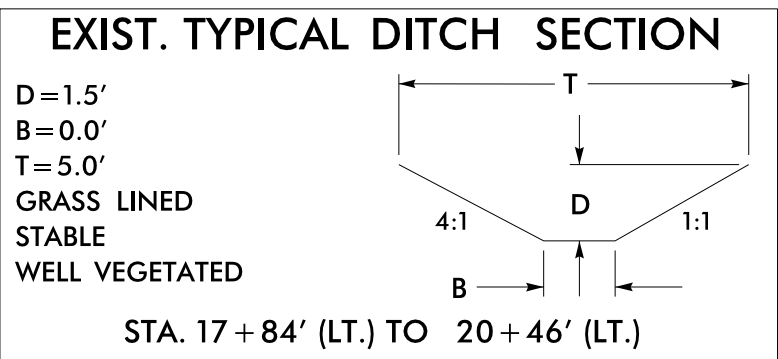
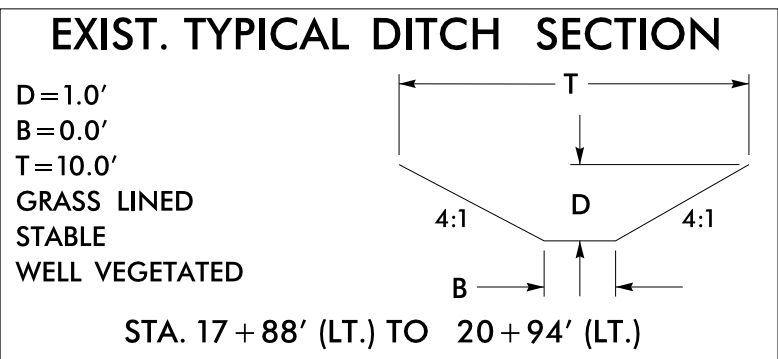
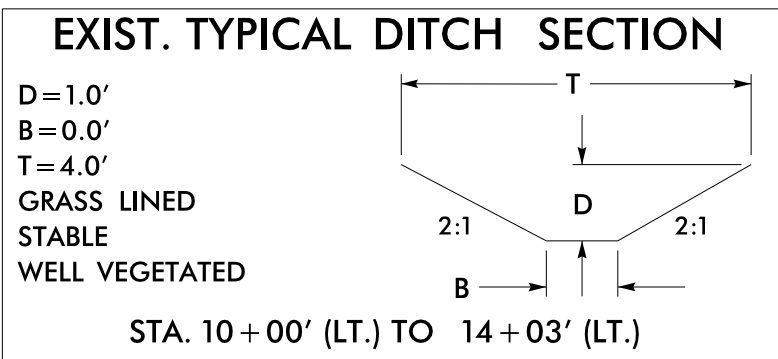
SCALE: 1"=20'

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

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



FROM STA. 17+90 (LT.) TO STA. 16+10 (LT.)



NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL
REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY
NEED TO BE INSTALLED AS DIRECTED BY THE
ENGINEER.

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING
BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

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

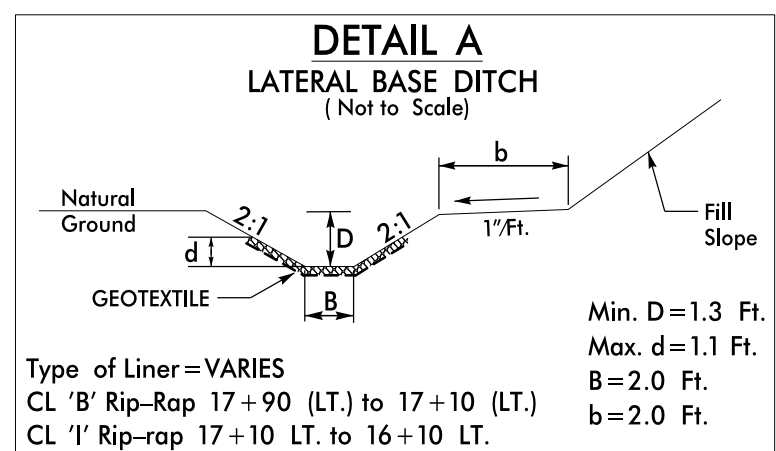
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8/16/2017

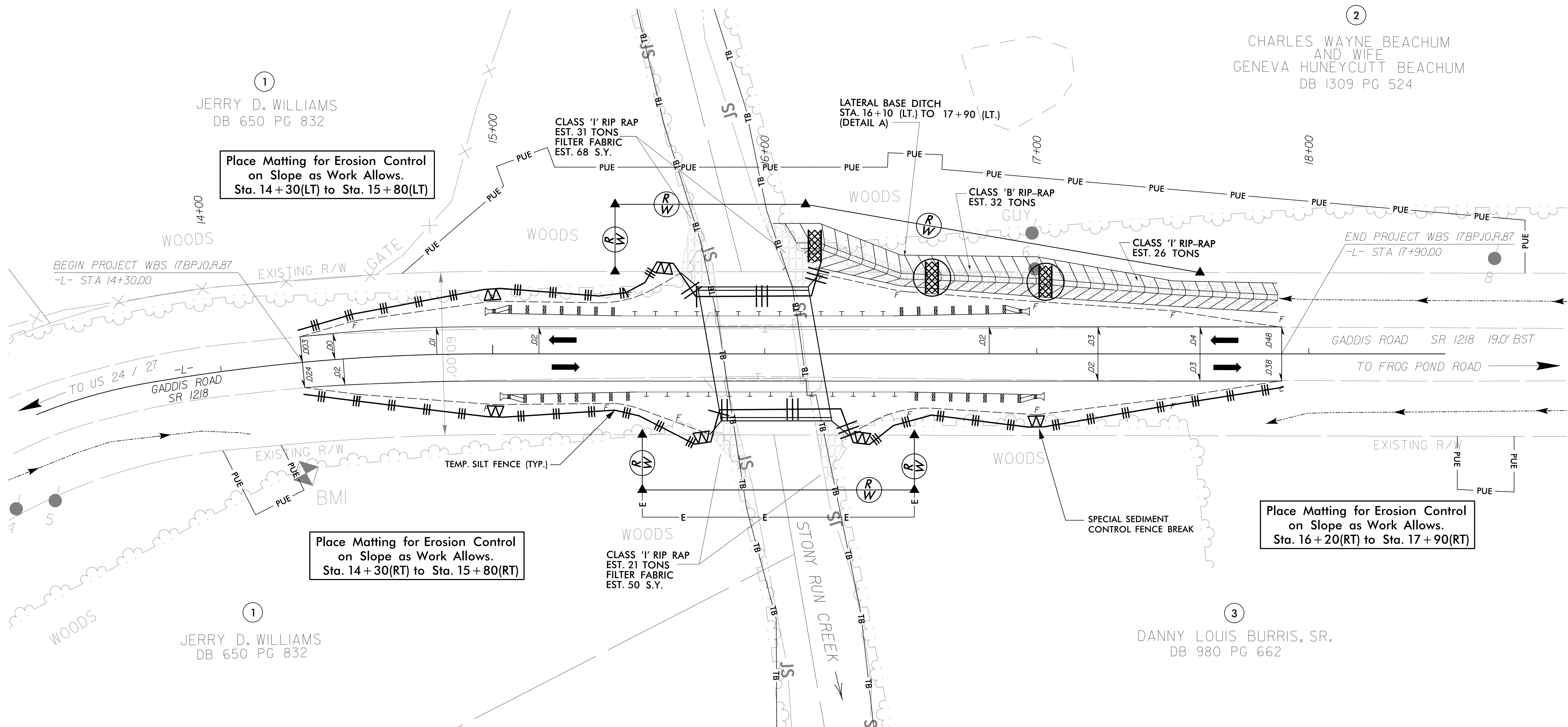
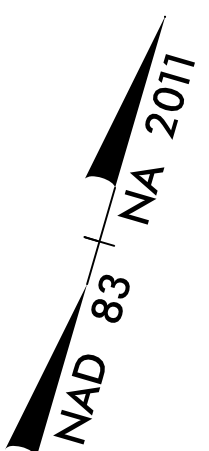
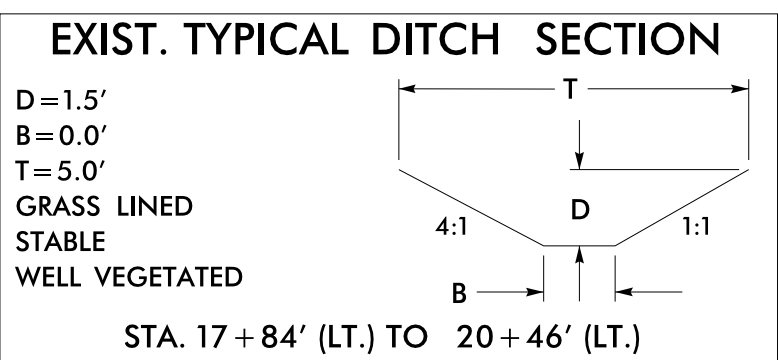
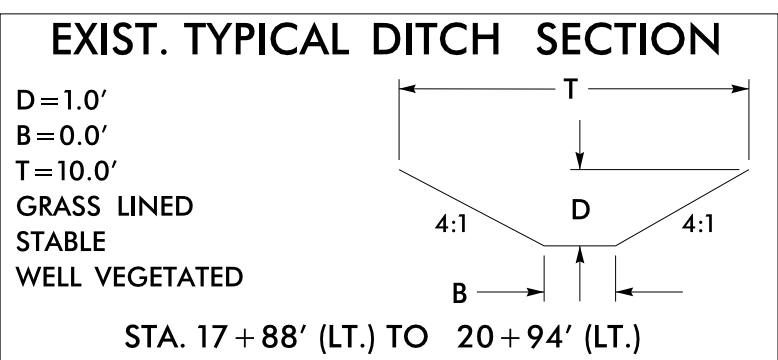
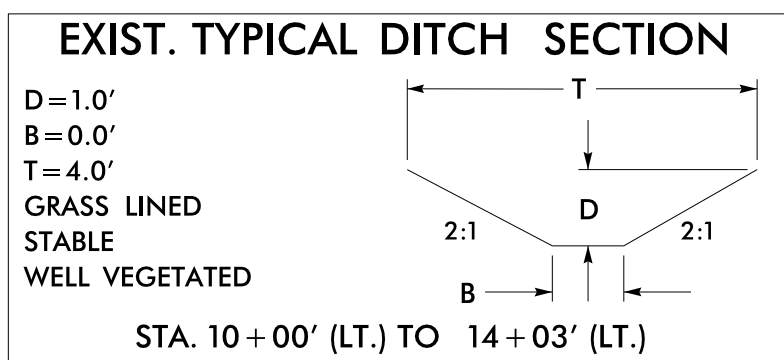
SCALE: 1"=20'



FINAL EROSION CONTROL FOR
CONSTRUCTION SHEET 4



FROM STA. 17+90 (LT.) TO STA. 16+10 (LT.)



NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL
REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY
NEED TO BE INSTALLED AS DIRECTED BY THE
ENGINEER.

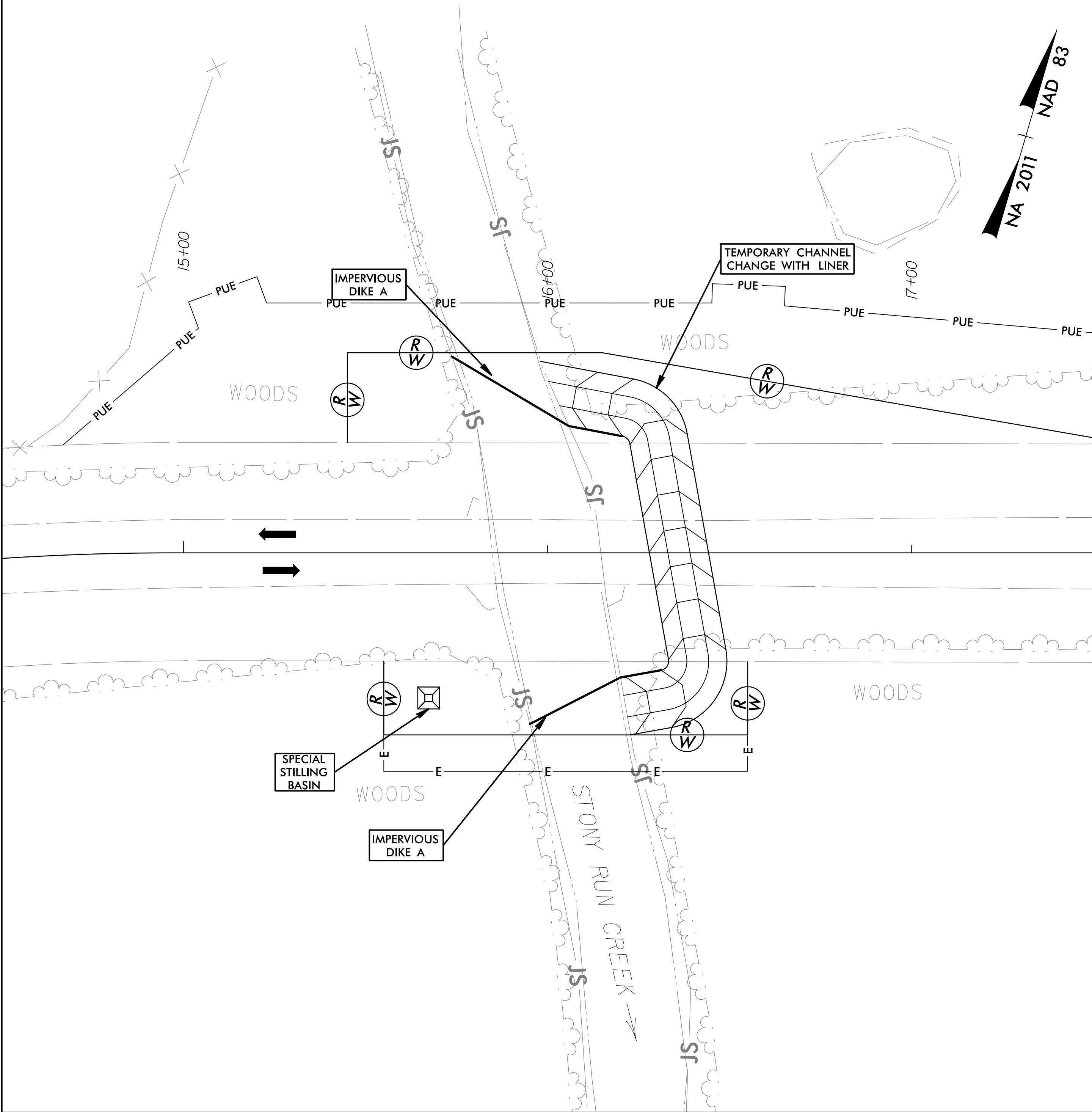
NOTE: UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

PROJECT REFERENCE NO.	SHEET NO.
17BPJO.R.87	EC-6/CONST.4
RW SHEET NO.	
STV 100 Years STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	

CULVERT CONSTRUCTION SEQUENCE STA. 16 + 00 –L–

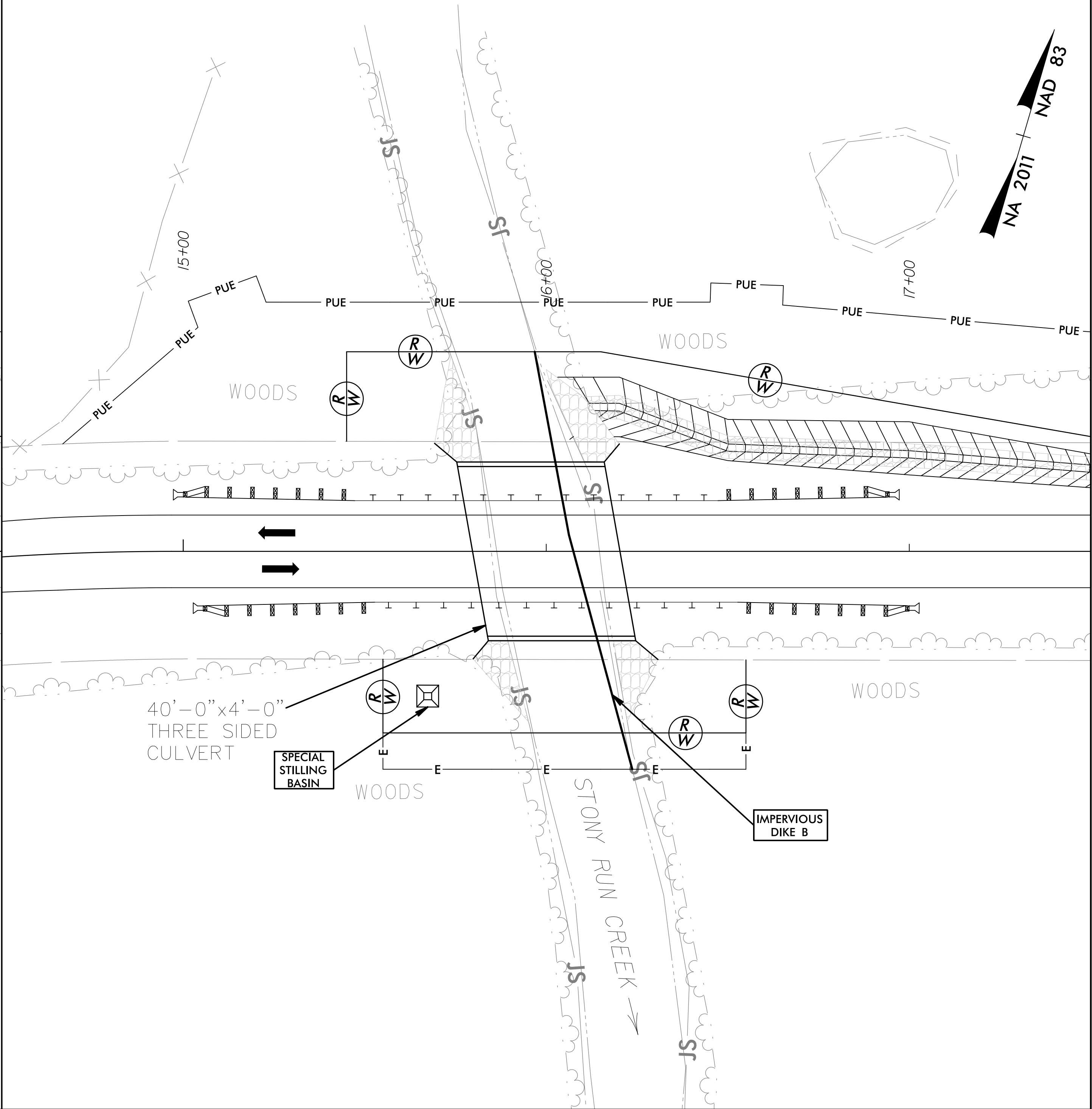
PHASE I

1. UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
2. CONSTRUCT IMPERVIOUS DIKES (A) AND TEMP. CHANNEL CHANGE WITH LINER (6 FT BASE, 4 FT DEEP, 2:1 SIDE SLOPE).
3. EXCAVATE AND CONSTRUCT FOOTINGS.
4. CONSTRUCT PROPOSED 40’-0”x4’-0” THREE SIDED CULVERT.
5. CONSTRUCT THE WESTERN WING WALLS FOR THE PROPOSED CULVERT, AND ANY NECESSARY CHANNEL AND FLOODPLAIN IMPROVEMENTS.



PHASE II

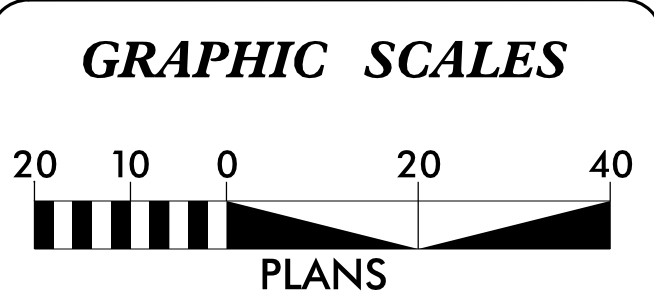
6. REMOVE IMPERVIOUS DIKES (A) ALLOWING NORMAL FLOW THROUGH CULVERT, CONSTRUCT IMPERVIOUS DIKE (B)
7. REMOVE TEMPORARY CHANNEL CHANGE, CONSTRUCT THE EASTERN WING WALLS FOR THE PROPOSED CULVERT, AND ANY NECESSARY CHANNEL AND FLOODPLAIN IMPROVEMENTS.
8. COMPLETE DRAINAGE, INCLUDING INLET/OUTLET IMPROVEMENTS.
9. REMOVE IMPERVIOUS DIKE (B) AND ANY REMAINING SPECIAL STILLING BASIN(S), AND COMPLETE ROADWAY.



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8/16/2017

CONTRACT:



UTILITIES BY OTHERS PLANS

(1) POWER – UNION POWER COOPERATIVE

NC License Number: F-1088

**UTILITIES PROJECT DESIGNER**

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK
SHOWN ON THIS SHEET WILL
BE DONE BY OTHERS



V&M
Vaughn & Melton
Consulting Engineers

Asheville,
North Carolina
828-253-2796

Tri-Cities,
Tennessee
423-467-8401

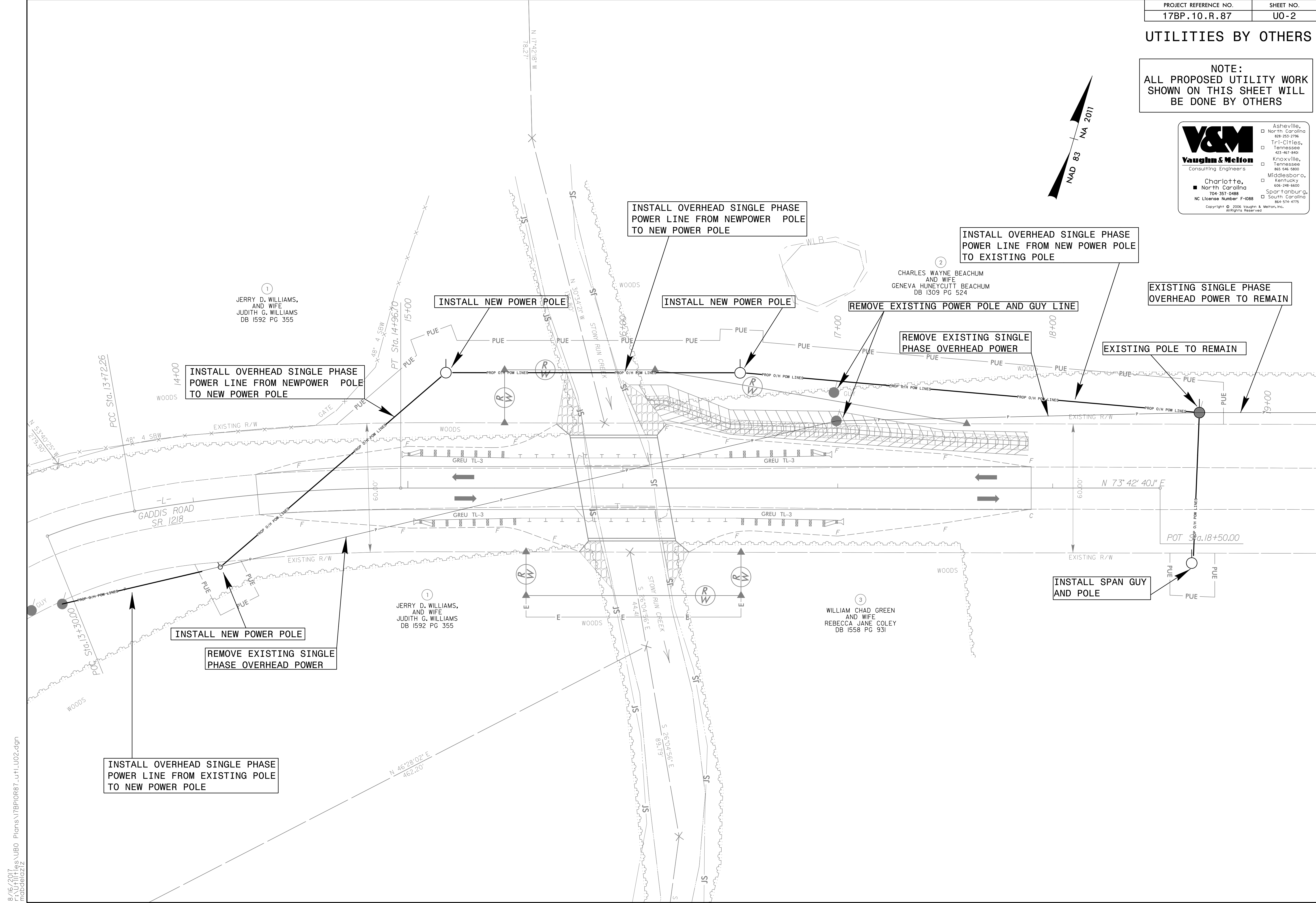
Knoxville,
Tennessee
865-546-5800

Middlesboro,
Kentucky
606-248-6600

Spartanburg,
South Carolina
864-514-4115

Charlotte,
North Carolina
704-351-0488
NC License Number F-1088

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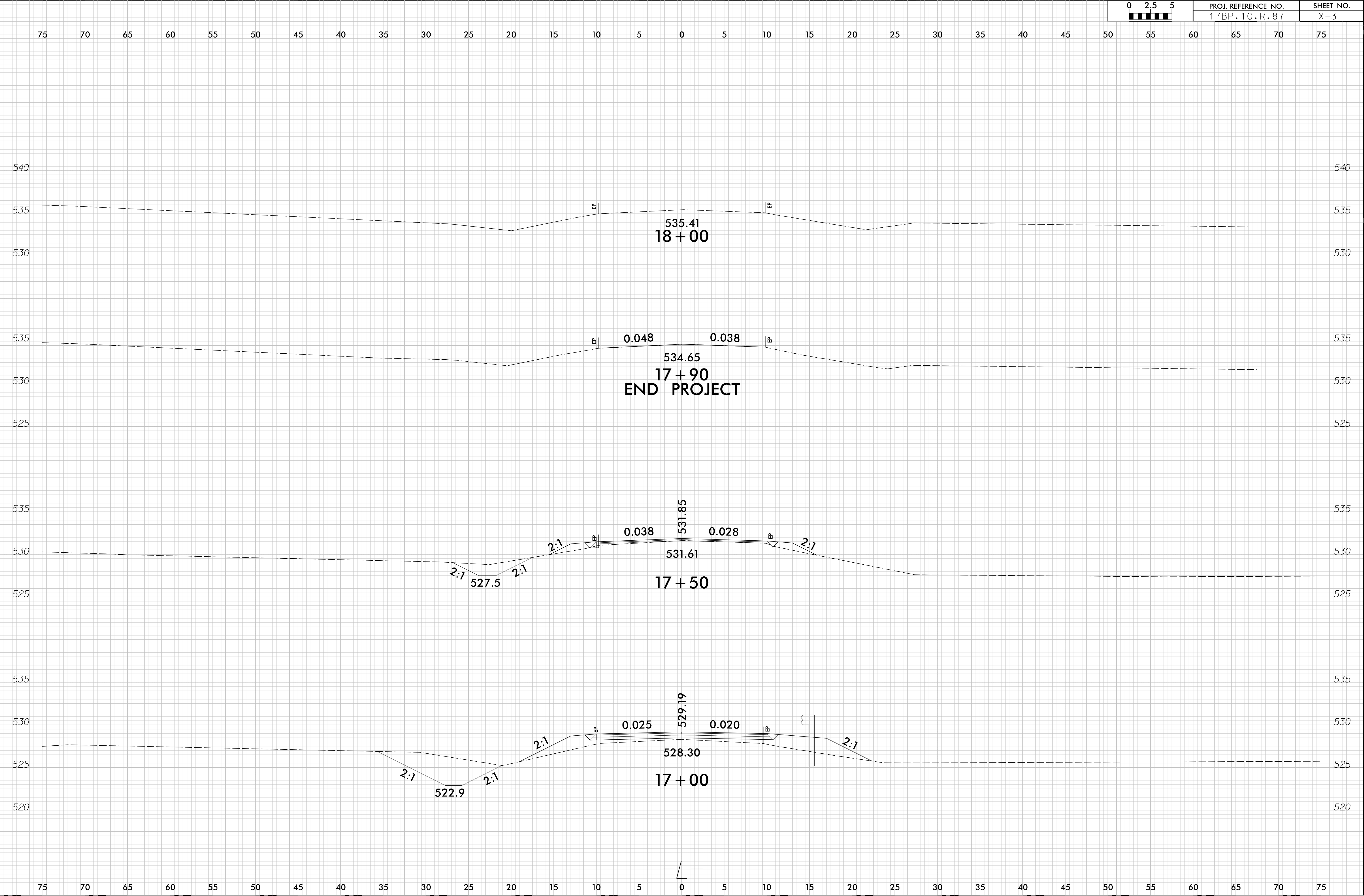






8/23/99

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	17BP.10.R.87	X-3



8/16/2017
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