

09/08/99

CONTRACT: C201257 TIP: PROJECT B-4093

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

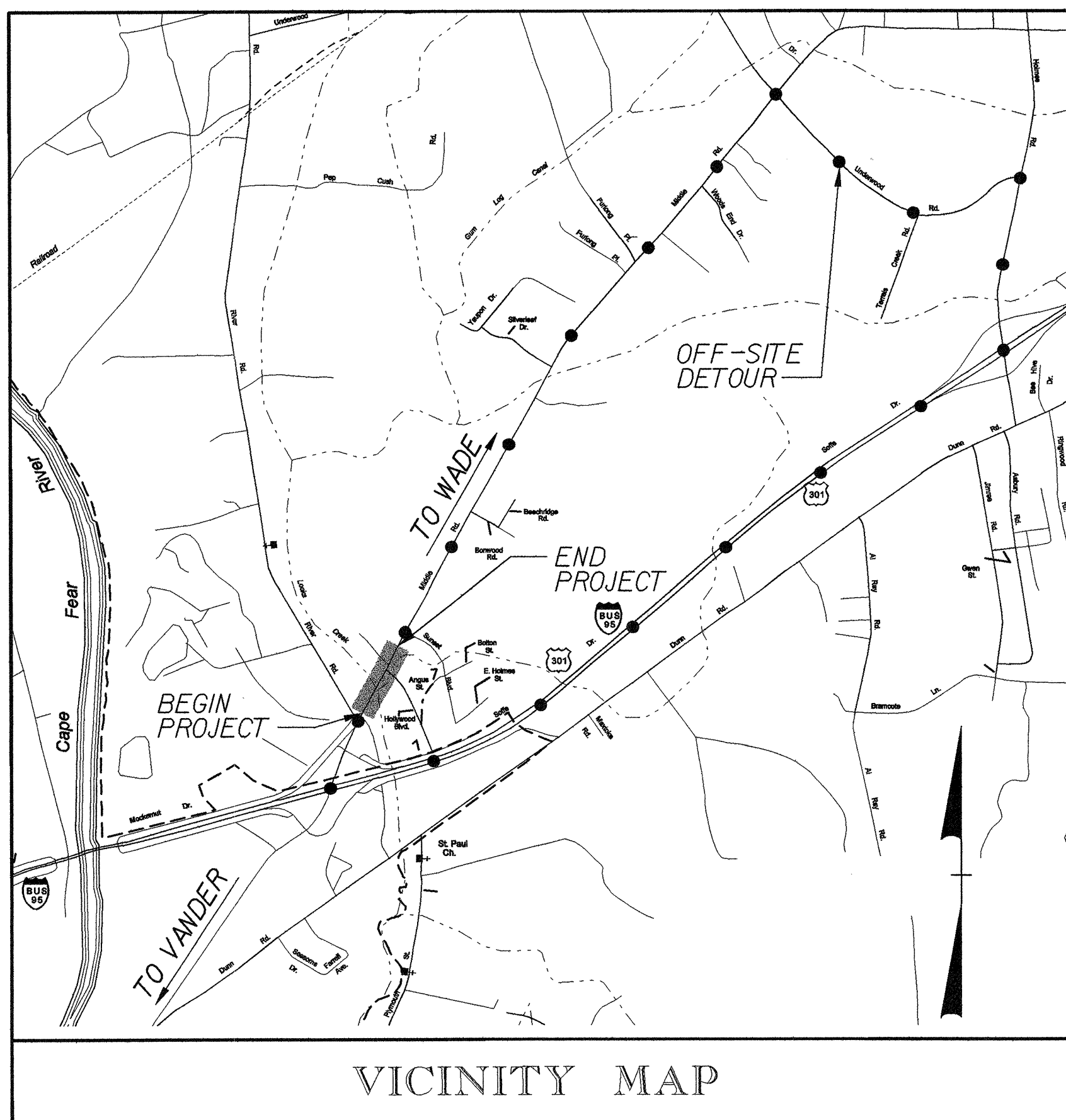
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

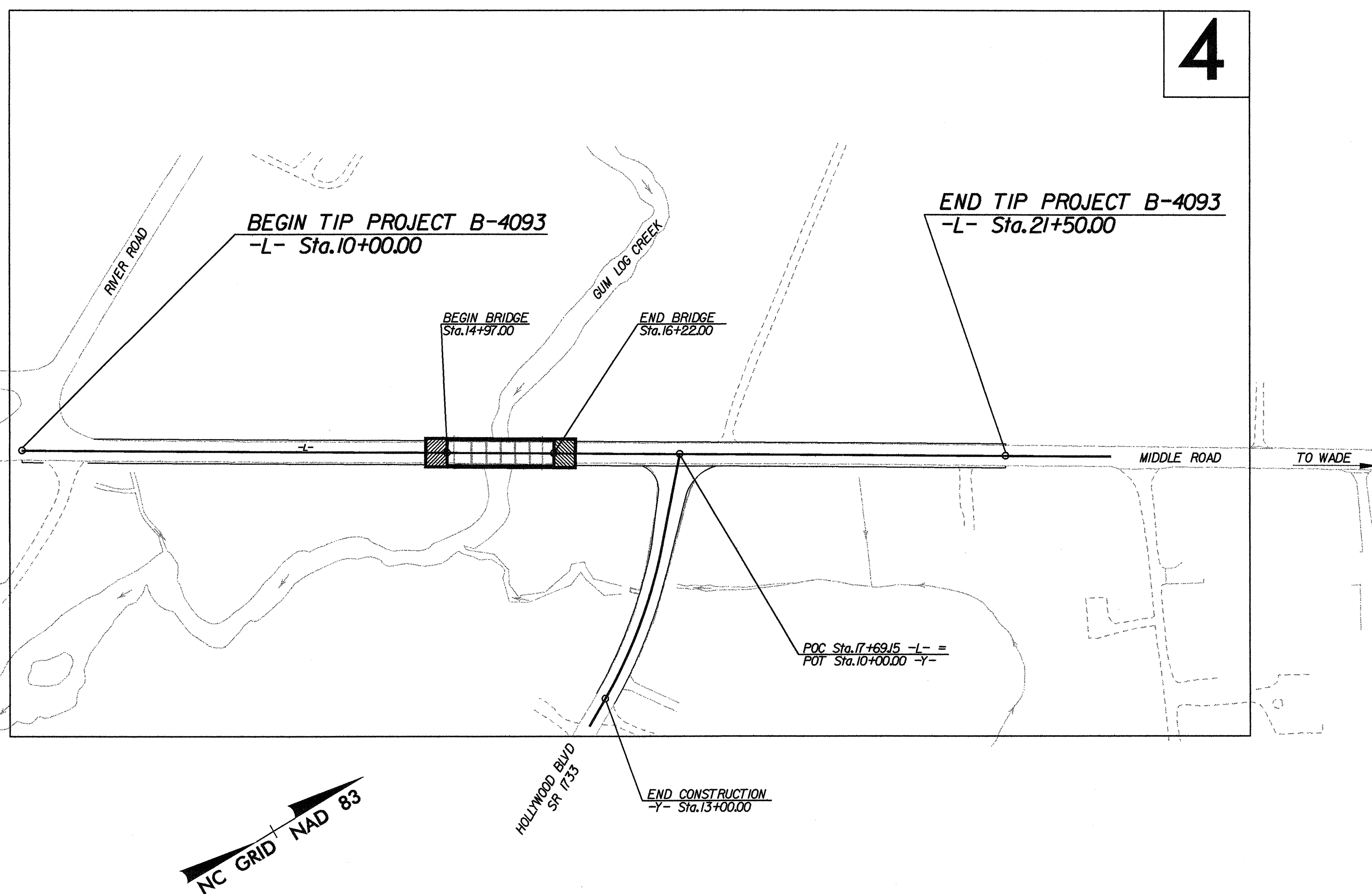
LOCATION: BRIDGE NO. 81 OVER GUM LOG CREEK ON SR 1728 (MIDDLE RD.)

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

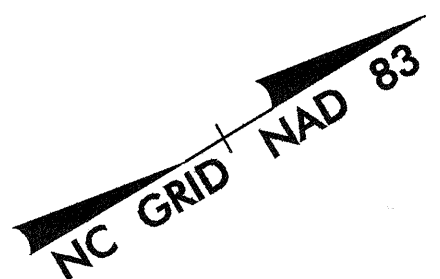
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4093	1	
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
33451.1.1	BRZ-1728(1)	P.E.	
33451.2.1	BRZ-1728(1)	R/W & UTILITIES	
33451.3.1	BRZ-1728(3)	CONST.	



VICINITY MAP

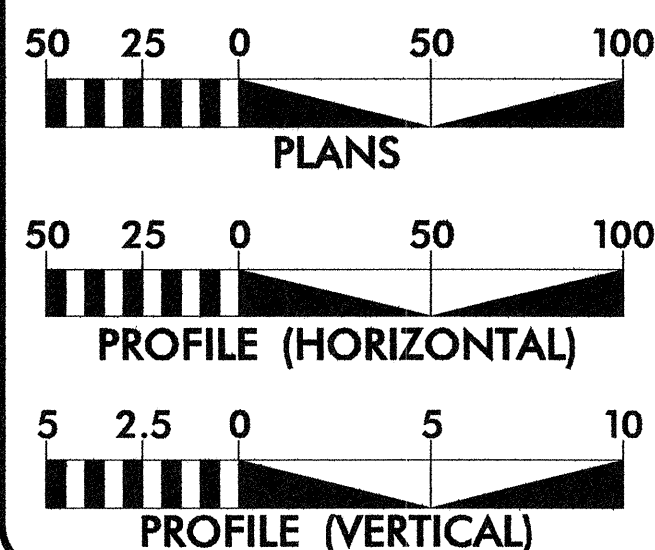


4



NCDOT CONTACT: B.D.TAYLOR, P.E. - PROJECT ENGINEER - ROADWAY DESIGN

GRAPHIC SCALES



DESIGN DATA

ADT 2005 = 3,250
 ADT 2025 = 5,400
 DHV = 10 %
 D = 60 %
 T = 4 % *
 V = 60 MPH
 * TTST 1% DUAL 3%
 FUNCTIONAL CLASS. = URBAN COLL.

PROJECT LENGTH

LENGTH OF ROADWAY
 TIP PROJECT B-4093 = 0.194 MILES

LENGTH OF STRUCTURE
 TIP PROJECT B-4093 = 0.024 MILES

TOTAL LENGTH OF
 TIP PROJECT B-4093 = 0.218 MILES

Prepared In the Office of:

WILBUR SMITH ASSOCIATES

P.O. BOX 2478 RALEIGH, NC 27602-2478 PHONE (919) 755-0583

2002 STANDARD SPECIFICATIONS

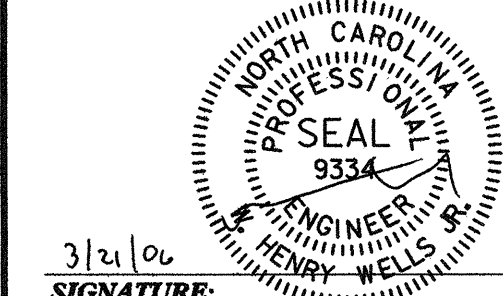
RIGHT OF WAY DATE:
SEPTEMBER 30, 2004

LETTING DATE:
AUGUST 15, 2006

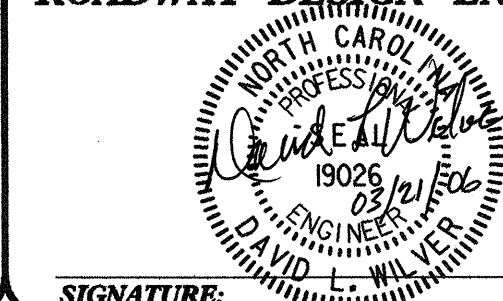
DAVID L. WILVER, P.E.
PROJECT ENGINEER

DAVID L. WILVER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER



3/21/06
SIGNATURE: ROADWAY DESIGN ENGINEER



SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

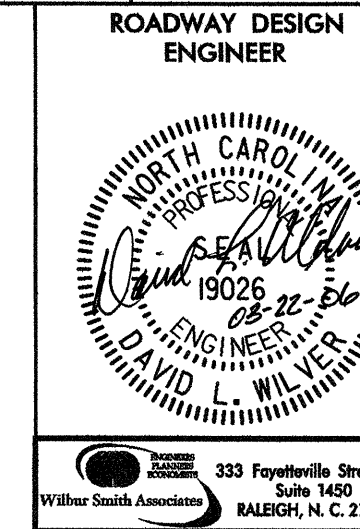
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR DATE

DATE: 3/21/06
FILE: c:\ncdot\1\roadway\proj\14093_rdy_tsh_01.dgn

5/28/99



INDEX OF SHEETS

SHEET NUMBERSHEET

1 TITLE SHEET

1-A INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS

1-B CONVENTIONAL SYMBOLS

1-C SURVEY CONTROL SHEET

2 PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS

2-A THRU 2-D REINFORCED BRIDGE APPROACH FILLS

2-E THRU 2-H GUARDRAIL INSTALLATION

2-I THRU 2-K STRUCTURE ANCHOR UNITS

3 SUMMARY OF QUANTITIES

3A SUMMARY OF DRAINAGE QUANTITIES

3B GUARDRAIL SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, EARTHWORK SUMMARY

4 PLAN AND PROFILE SHEET

TCP-1 THRU TCP-6 TRAFFIC CONTROL PLANS

EC-1 THRU EC-5 EROSION CONTROL PLANS

SIGN-1 THRU SIGN-3 SIGNING PLANS

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UO-1 UTILITIES BY OTHERS PLANS

X-1 THRU X-6 CROSS-SECTIONS

S-1 THRU S-25 STRUCTURE PLANS

GENERAL NOTES: 2002 SPECIFICATIONS
EFFECTIVE: 01-15-02
REVISED: 05-14-03

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

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

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE AREAS IN THE PLANS DESIGNATED SAFETY CLEARING. THE LIMITS ARE AS SHOWN AND THE CLEARING AND GRUBBING IS CONSIDERED A PART OF THE LUMP SUM ITEM FOR "CLEARING AND GRUBBING".

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 AND EARTH 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.

UNDERDRAINS:
UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 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.

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

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE
FAYETTEVILLE PWC (POWER DISTRIBUTION)
SPRINT - TELEPHONE

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

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

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 15, 2002 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
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
862.01	Guardrail Placement
876.02	Guide for Rip Rap at Pipe Outlets

EFF. 01-15-02
REV. 11-23-04

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

*S.U.E = SUBSURFACE UTILITY ENGINEER

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	---C---
Prop. Slope Stakes Fill	---F---
Prop. Woven Wire Fence	○-----○
Prop. Chain Link Fence	□-----□
Prop. Barbed Wire Fence	◇-----◇
Prop. Wheelchair Ramp	(WCR)
Curb Cut for Future Wheelchair Ramp	(CCFR)
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	⊕
Pavement Removal	XXXXXX

RIGHT OF WAY

Baseline Control Point	◆
Existing Right of Way Marker	△
Exist. Right of Way Line w/Marker	△-----
Prop. Right of Way Line with Proposed	-----
R/W Marker (Iron Pin & Cap)	▲
Prop. Right of Way Line with Proposed	-----
(Concrete or Granite) R/W Marker	⊙
Exist. Control of Access Line	⊙
Prop. Control of Access Line	⊙
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	-----RBB-----
Flow Arrow	→
Disappearing Stream	→
Spring	⊕
Swamp Marsh	⊕
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	-----CONC-----
Bridge Wing Wall, Head Wall and End Wall)CONC WW(

MINOR	
Head & End Wall	-----CONC HW-----
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	□ CB
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	•
Exist. Power Pole	•
Prop. Power Pole	○
Exist. Telephone Pole	•
Prop. Telephone Pole	○
Exist. Joint Use Pole	•
Prop. Joint Use Pole	○
Telephone Pedestal	⊕
U/G Telephone Cable Hand Hold	⊕
Cable TV Pedestal	⊕
U/G TV Cable Hand Hold	⊕
U/G Power Cable Hand Hold	⊕
Hydrant	⊕
Satellite Dish	⊕
Exist. Water Valve	⊕
Sewer Clean Out	⊕
Power Manhole	⊕
Telephone Booth	⊕
Cellular Telephone Tower	⊕
Water Manhole	⊕
Light Pole	⊕
H-Frame Pole	⊕
Power Line Tower	⊕
Pole with Base	⊕
Gas Valve	⊕
Gas Meter	⊕
Telephone Manhole	⊕
Power Transformer	⊕
Sanitary Sewer Manhole	⊕
Storm Sewer Manhole	⊕
Tank; Water, Gas, Oil	⊕
Water Tank With Legs	⊕
Traffic Signal Junction Box	⊕
Fiber Optic Splice Box	⊕
Television or Radio Tower	⊕
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	-----W-----
Designated Water Line (S.U.E.*)	-----W-----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----?UTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	⊕
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to UG Record	AATUR
End of Information	E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	⊕
Exist. Iron Pin	⊕
Property Corner	⊕
Property Monument	⊕
Property Number	⊕
Parcel Number	⊕
Fence Line	-----X-----
Existing Wetland Boundaries	-----WW & ISBW-----
High Quality Wetland Boundary	-----WLB-----
Medium Quality Wetland Boundaries	-----MQ WLB-----
Low Quality Wetland Boundaries	-----LQ WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	R/W
Guard Post	⊕ GP
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

VEGETATION

Single Tree	-----
Single Shrub	-----
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

RAILROADS

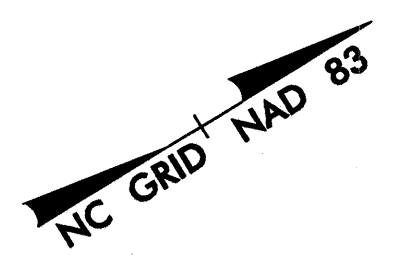
Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

5/28/99 DATE: 12/6/2005 PM 11:10:40 FILE: \\ncd\proj\4093\roadway\proj\4093_rdy_psh_01b.dgn

SURVEY CONTROL SHEET B-4093

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
4			478080.8730	2046897.6220	86.15	10+51.22	38.85 LT
3			478459.7090	2047126.0030	81.06	14+93.05	17.46 LT
2			478798.3460	2047308.9430	82.75	18+77.94	17.01 LT
1			479122.5280	2047483.9470	83.29	22+46.35	16.69 LT

*****	*****
BM80 ELEVATION = 82.79	BM81 ELEVATION = 89.23
N 478891 E 2047418	N 477987 E 2047055
L STATION 20+11 36 RIGHT	L STATION 10+44 144 RIGHT
R/R SPIKE IN BASE OF 24' RIVER BIRCH	R/R SPIKE IN BASE OF 12" OAK TREE
*****	*****



REVISIONS

NCDOT GPS STATION B4093-1
LOCALIZED PROJECTS COORDINATES
N=477,203.646
E=2,046,117.167

-L- POT 10+00.00 =
-DETOUR- POT 10+00.00
LOCALIZED PROJECT COORDINATES
N=478,017.3588
E=2,046,907.5305

NCDOT GPS STATION B4093-2
LOCALIZED PROJECTS COORDINATES
N=477,675.478
E=2,046,714.853

BM #81
R/R SPIKE IN BASE OF
12" OAK TREE

NCDOT BASELINE STATION BL-4 (B-4093)
LOCALIZED PROJECTS COORDINATES
N=478,080.8730
E=2,046,897.6220

NCDOT BASELINE STATION BL-3 (B-4093)
LOCALIZED PROJECTS COORDINATES
N=478,459.7090
E=2,047,126.0030

-L- POT 17+69.15 =
-Y- POT 10+00.00
LOCALIZED PROJECT COORDINATES
N=478,694.5043
E=2,047,272.3199

NCDOT BASELINE STATION BL-2 (B-4093)
LOCALIZED PROJECTS COORDINATES
N=478,798.3460
E=2,047,308.9430

NCDOT BASELINE STATION BL-1 (B-4093)
LOCALIZED PROJECTS COORDINATES
N=479,122.5280
E=2,047,483.9470

-L- POT 22+73.22 =
-DETOUR- POT 22+80.63
LOCALIZED PROJECT COORDINATES
N=479,138.2760
E=2,047,511.3870

BM #80
R/R SPIKE IN BASE
OF 24" RIVER BIRCH

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "VANDER"

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 464925.950(ft) EASTING: 2069182.420(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998789

THE NC LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "VANDER" TO -L- STATION 10+00.00 IS
N 59°33'22.95" W, 25,837.10 (ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project)
FILE NAME: b4093_ls_control_041014.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT.
IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

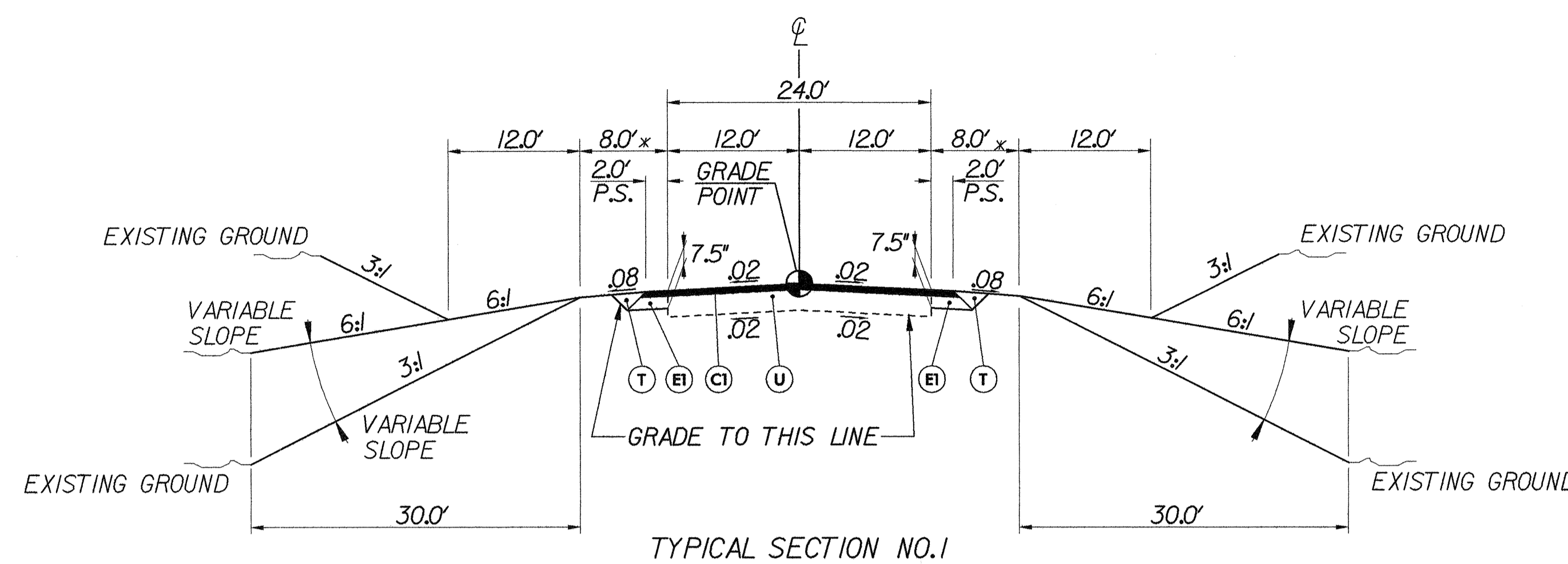
⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

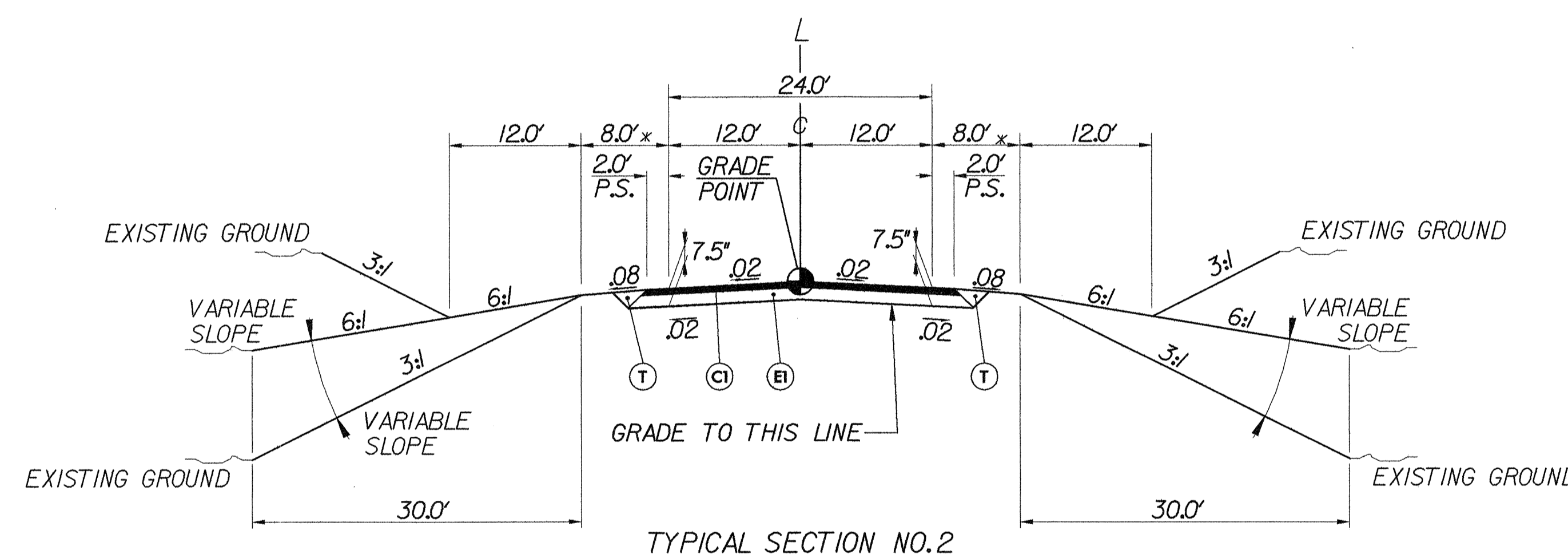
NOTE: DRAWING NOT TO SCALE

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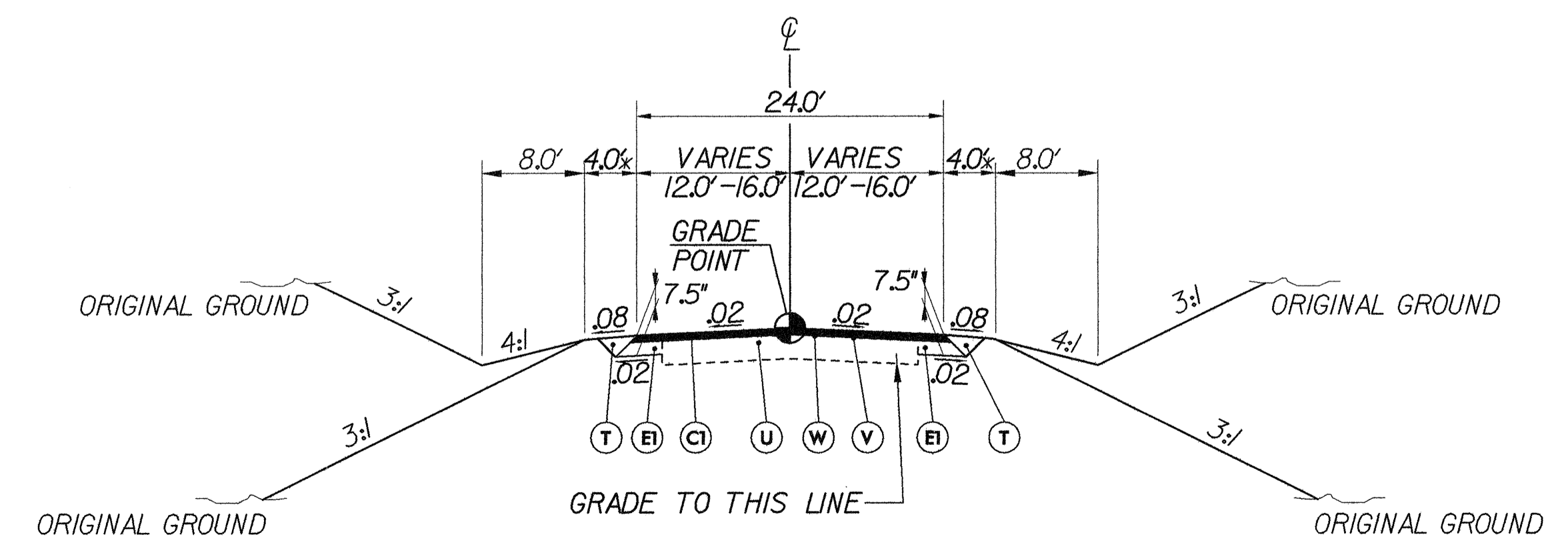
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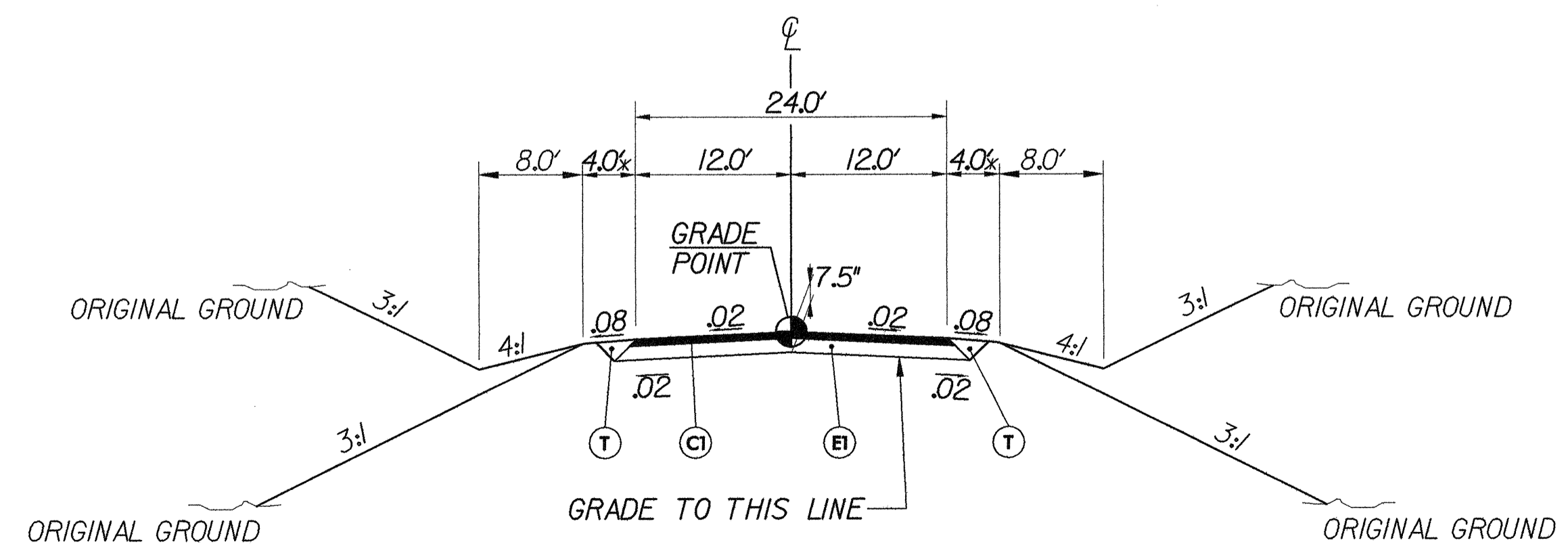
TYPICAL SECTION NO. 1
 USE ON: -L- Sta. 10+00.00 to Sta. 12+45.45
 -L- Sta. 18+65.31 to Sta. 21+50.00



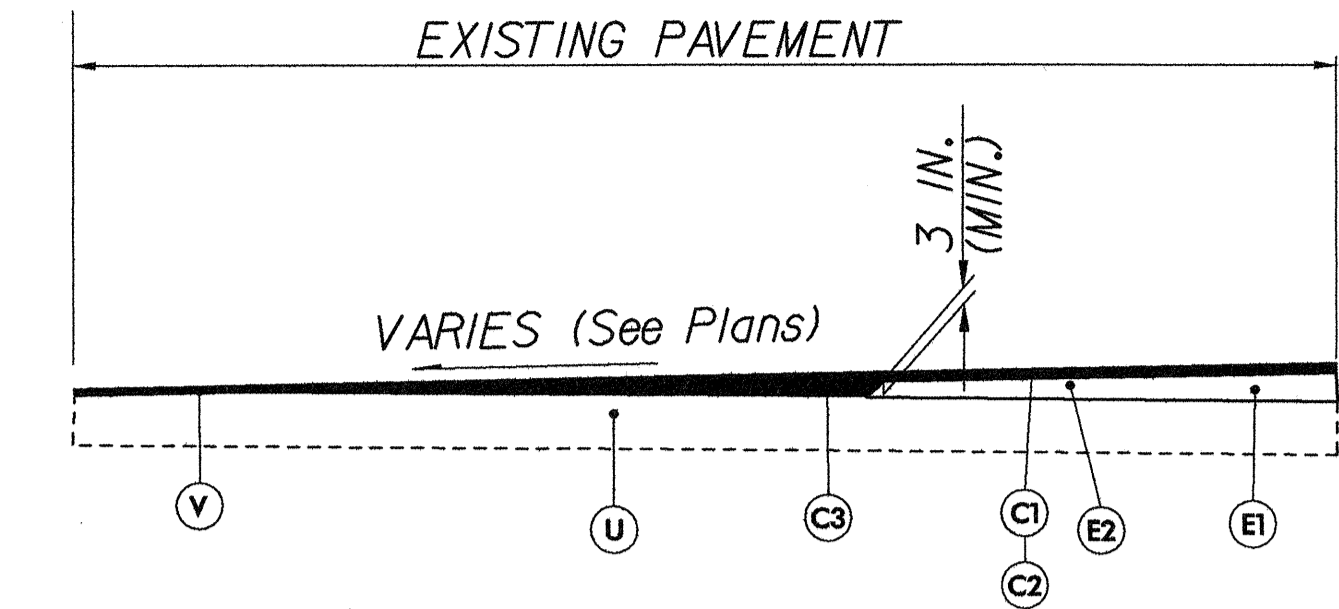
TYPICAL SECTION NO. 2
 USE ON: -L- Sta. 12+45.45 to Sta. 14+97.00 (BEGIN BRIDGE)
 -L- Sta. 16+22.00 (END BRIDGE) to Sta. 18+65.31



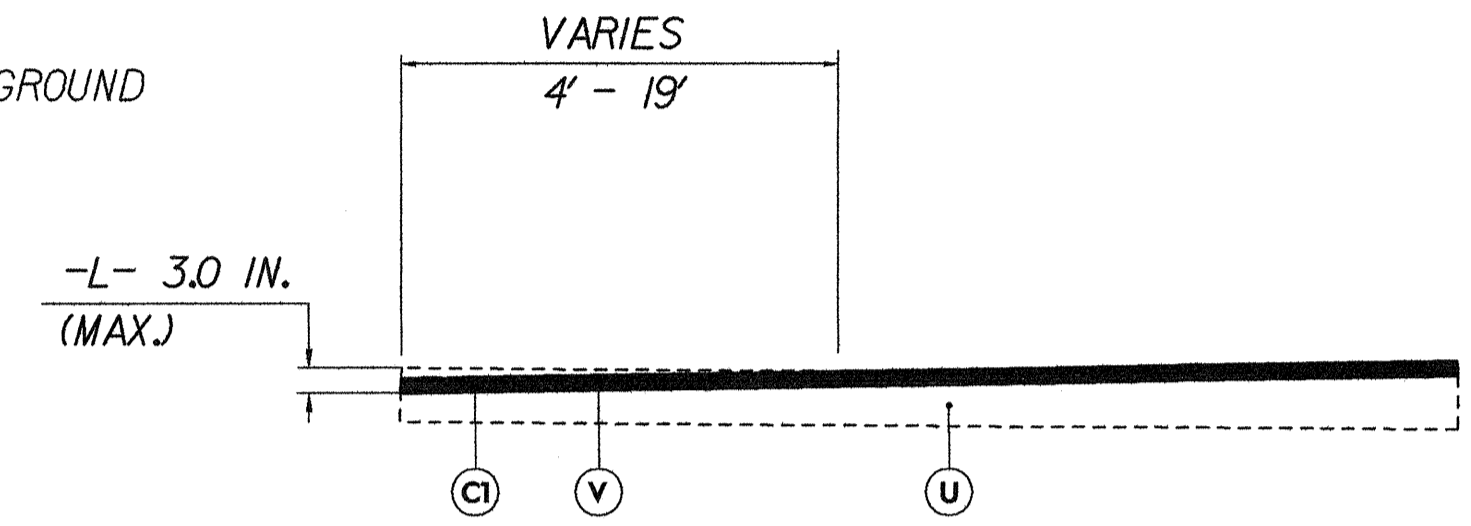
TYPICAL SECTION NO. 3
 USE ON: -Y- Sta. 10+14.25 to Sta. 12+60.00



TYPICAL SECTION NO. 4
 USE ON: -Y- Sta. 12+60.00 to Sta. 13+00.00

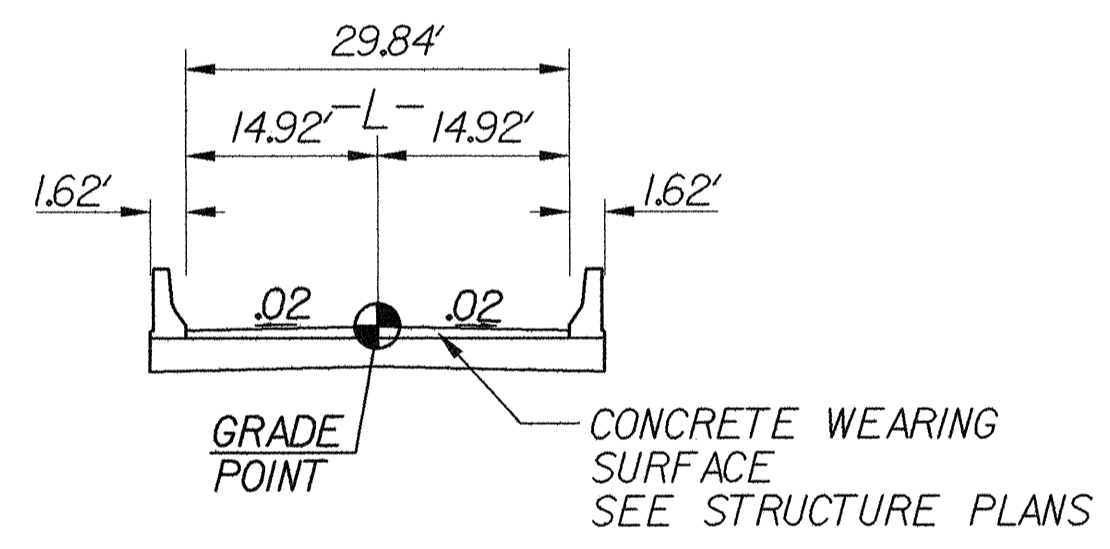


EXISTING PAVEMENT



WEDGING DETAIL

MILLING DETAIL B
 USE ON: -L- Sta. 10+00.00 TO Sta. 12+45.45
 -L- Sta. 18+65.31 TO Sta. 21+50.00



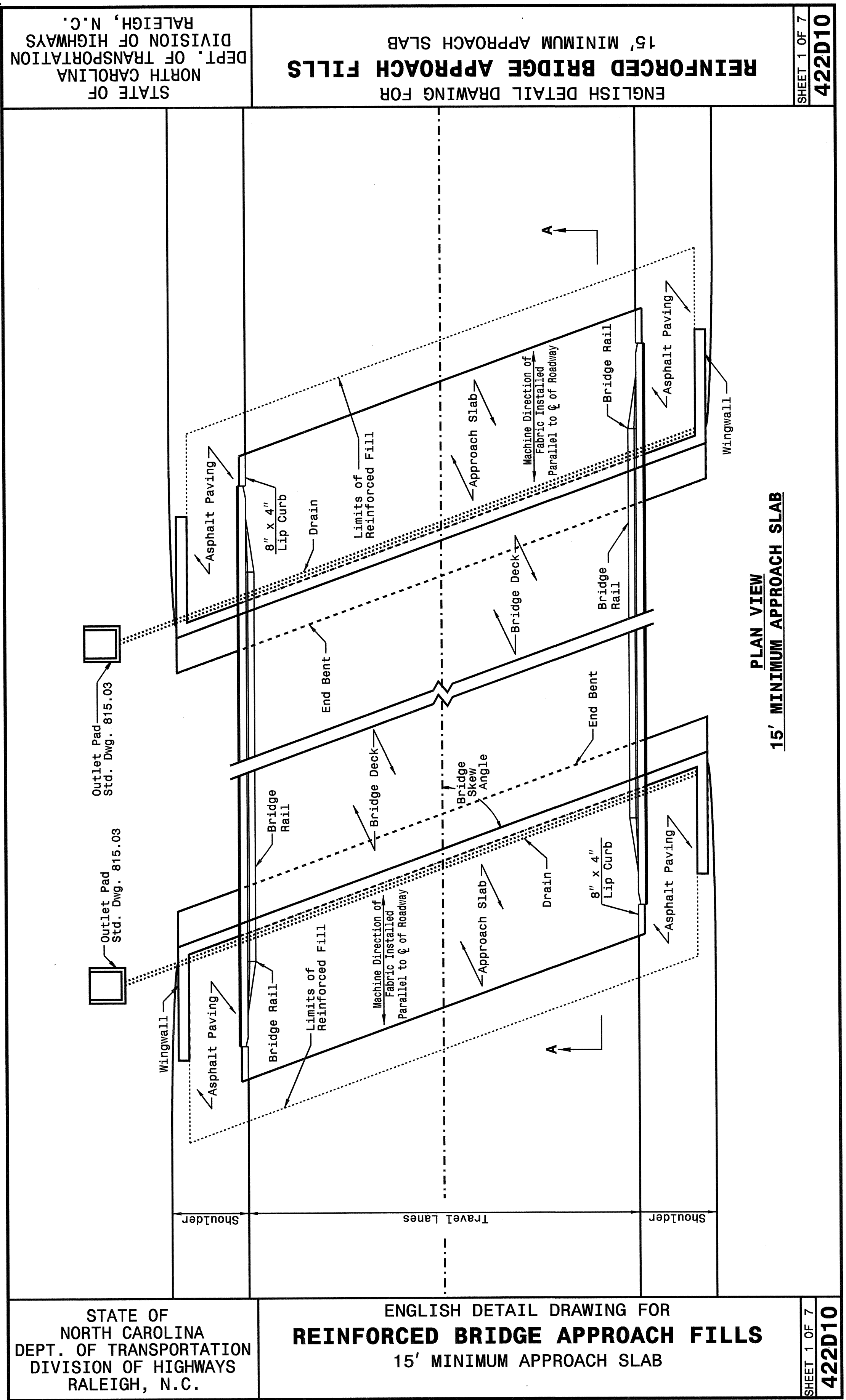
TYPICAL SECTION ON STRUCTURE
 USE ON: -L- Sta. 14+97.00 (BEGIN BRIDGE) to Sta. 16+22.00 (END BRIDGE)

NOTES:
 * TOTAL SHOULDER WIDTH TO BE INCREASED 3' WHERE GUARDRAIL IS USED.
 PAVEMENT EDGE SLOPES ARE 1H UNLESS OTHERWISE NOTED.

PAVEMENT SCHEDULE	
C1	PROPOSED APPROX. 3.0 IN. ASPHALT CONC. SURFACE COURSE, TYPE SF 9.5A, AT AN AVERAGE RATE OF 165 LBS/SY IN EACH OF TWO LAYERS.
C2	PROPOSED APPROX. 1.5 IN. ASPHALT CONC. SURFACE COURSE, TYPE SF 9.5A, AT AN AVERAGE RATE OF 165 LBS/SY.
C3	PROPOSED VAR. DEPTH. ASPHALT CONC. SURFACE COURSE, TYPE SF 9.5A, AT AN AVERAGE RATE OF 110 LBS PER SY PER 1 IN. DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.0 IN. NOR GREATER THAN 1.5 IN. IN DEPTH.
E1	PROPOSED APPROX. 4.5 IN. ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS/SY.
E2	PROPOSED VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SY PER 1 IN. DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0 IN. NOR GREATER THAN 5.5 IN. IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING
W	WEDGING

REVISIONS

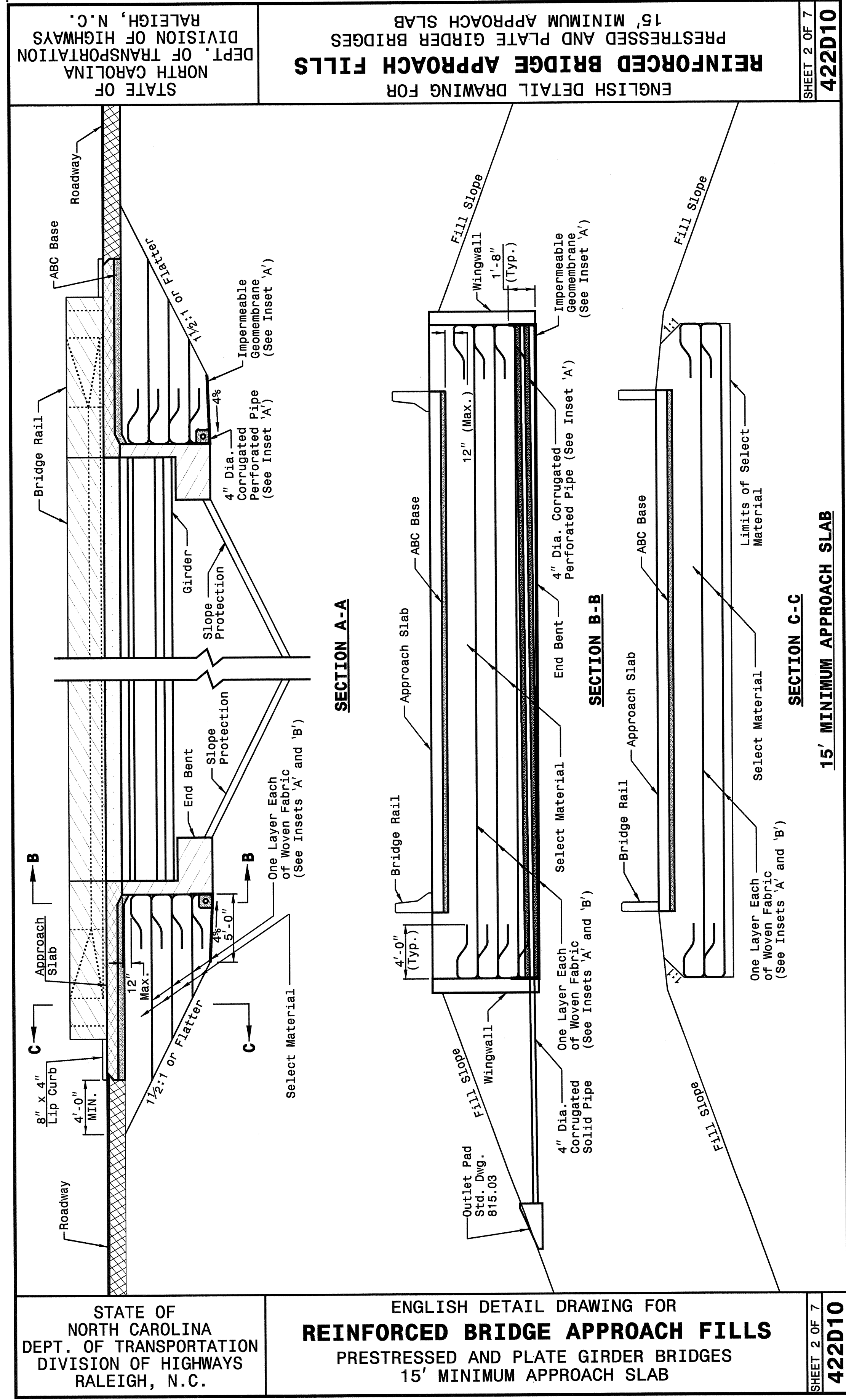
DATE: 6/12/06
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 8/17/99



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

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
15' MINIMUM APPROACH SLAB

SHEET 1 OF 7
422D10



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

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES
15' MINIMUM APPROACH SLAB

SHEET 2 OF 7
422D10

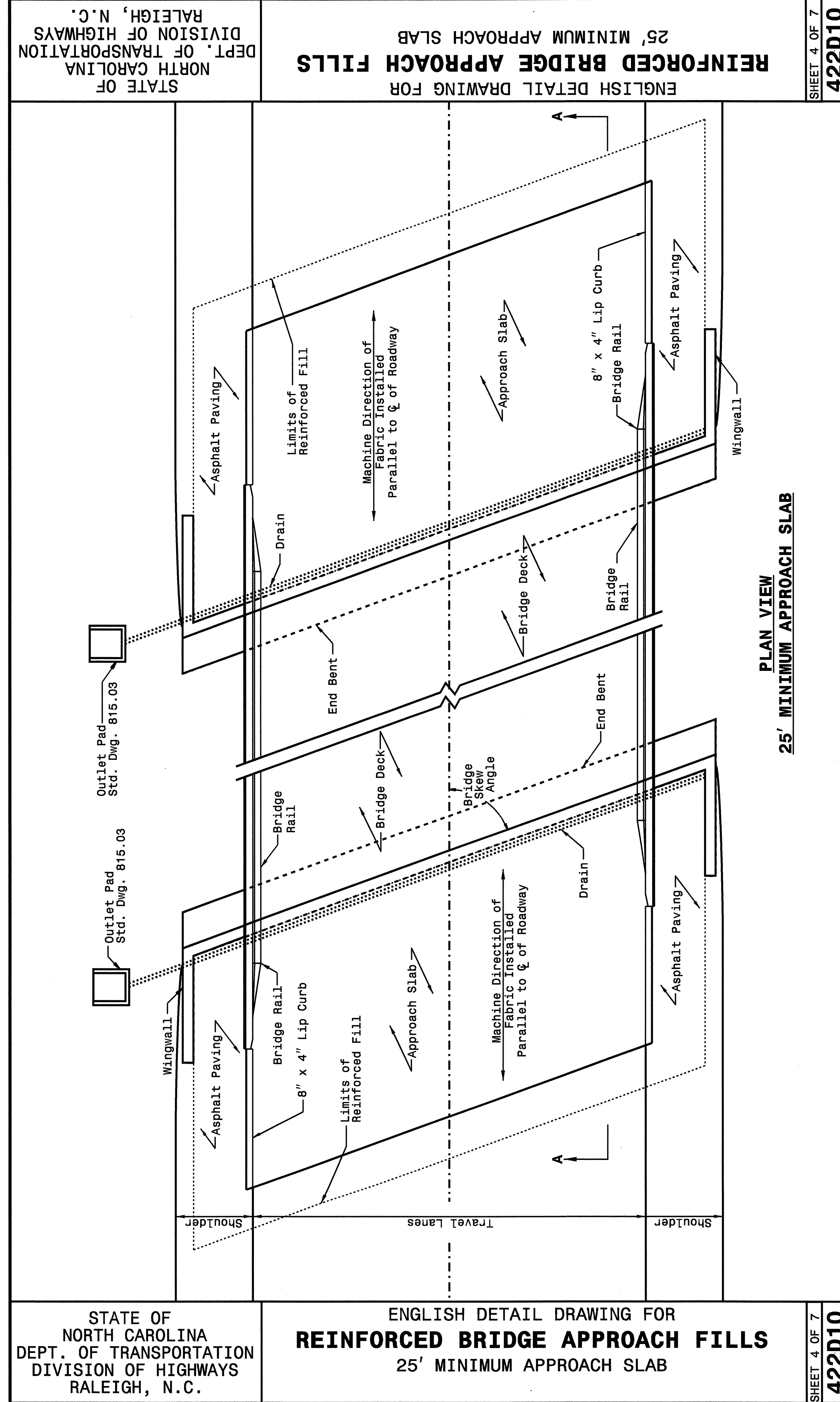
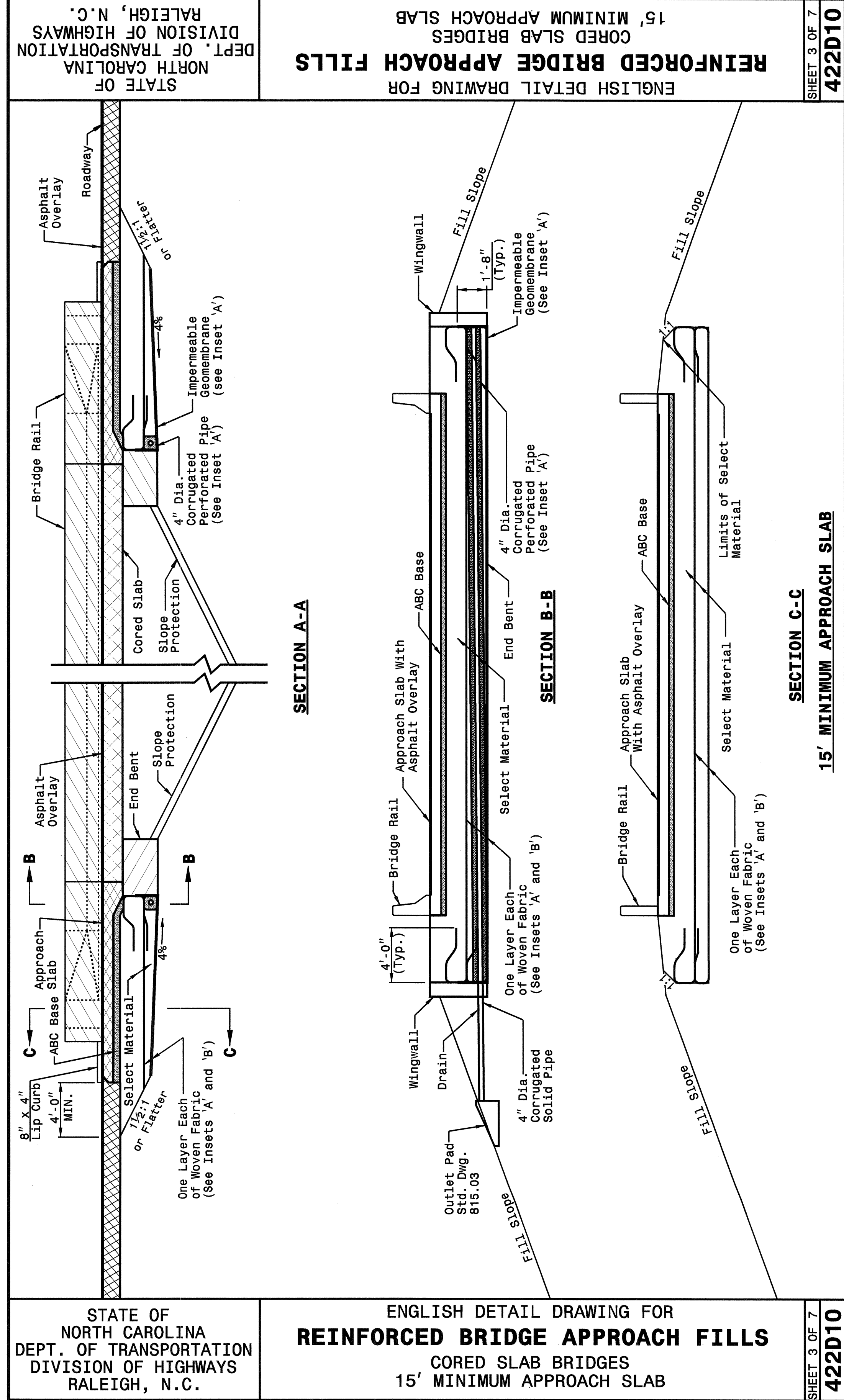
**PROJECT SERVICES UNIT
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Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

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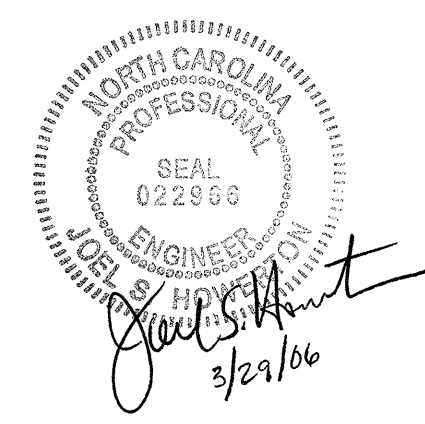


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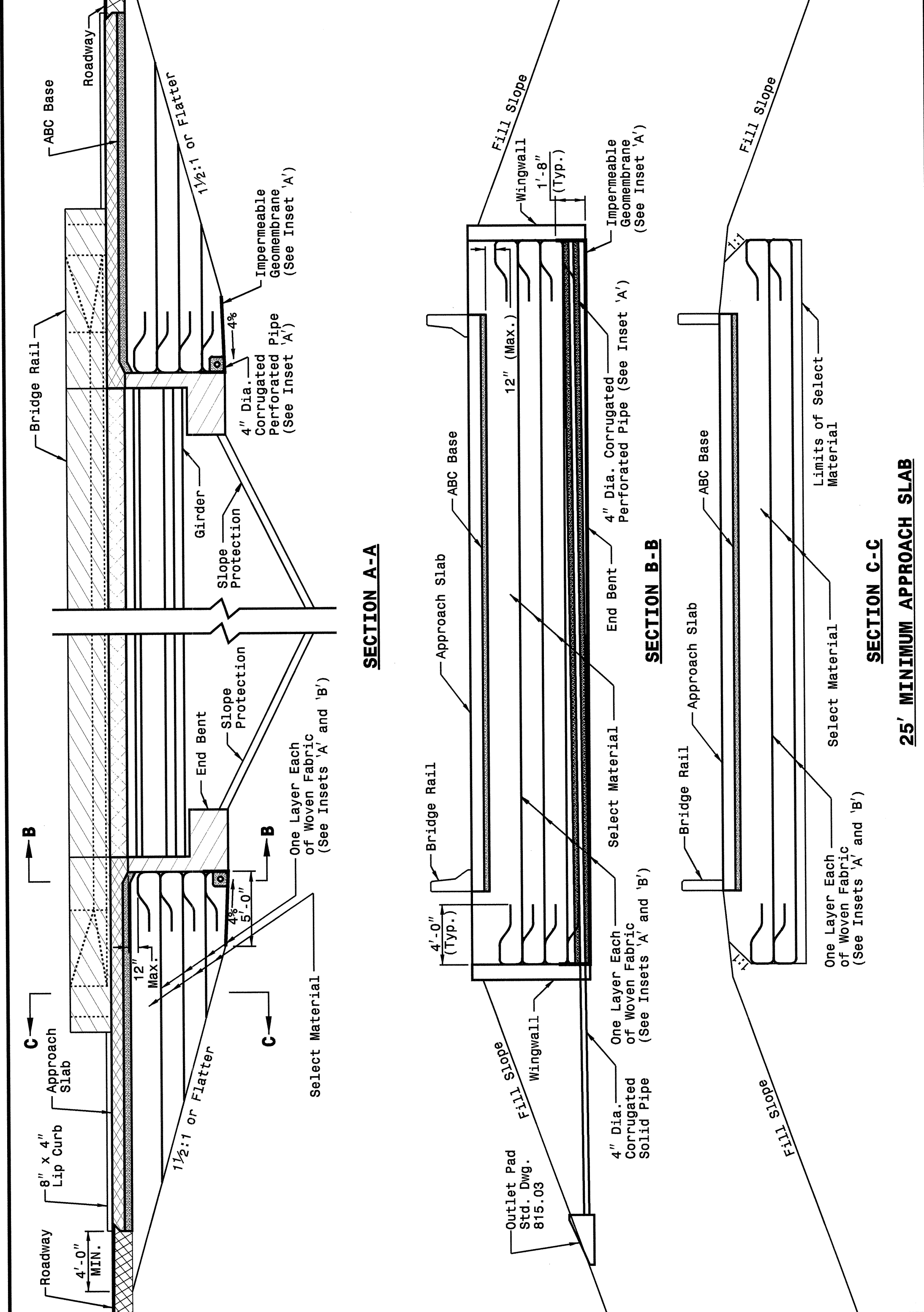
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES
25' MINIMUM APPROACH SLAB

SHEET 5 OF 7
422D10



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RALEIGH, N.C.

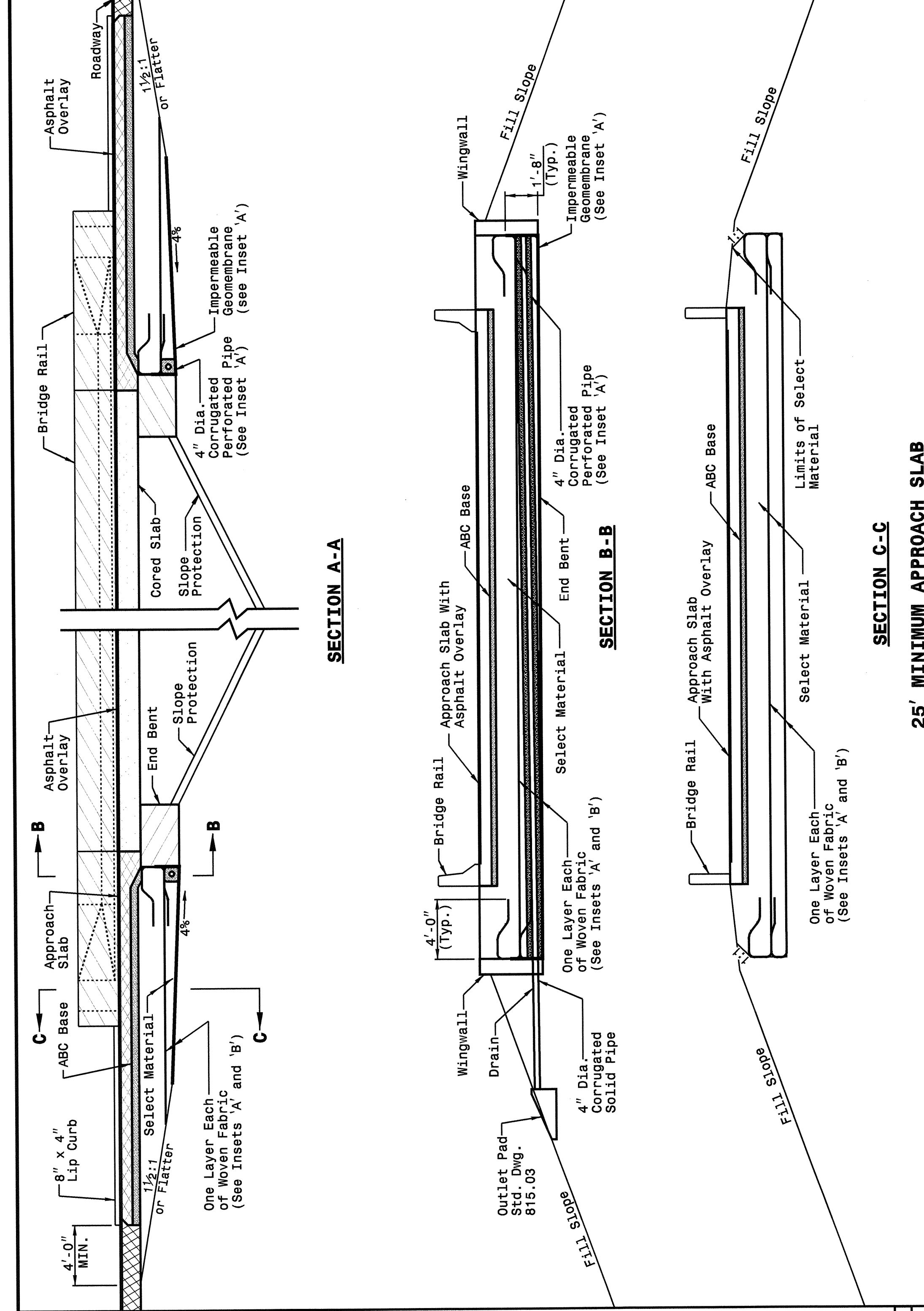
ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES
25' MINIMUM APPROACH SLAB

SHEET 5 OF 7
422D10

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ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES
25' MINIMUM APPROACH SLAB

SHEET 6 OF 7
422D10



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ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES
25' MINIMUM APPROACH SLAB

SHEET 6 OF 7
422D10

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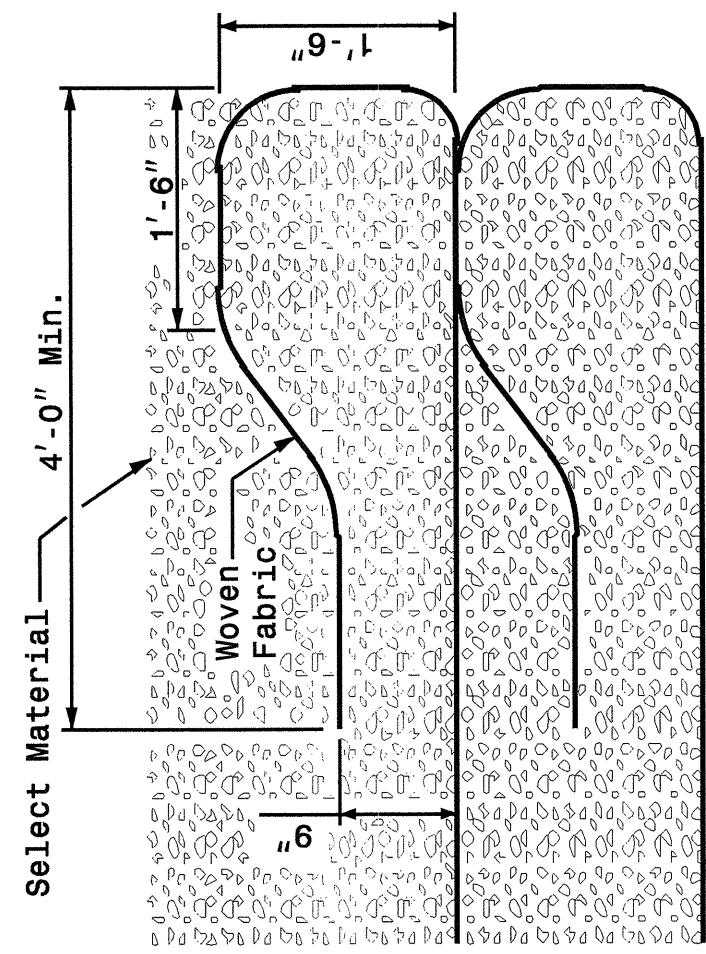


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ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
422D10



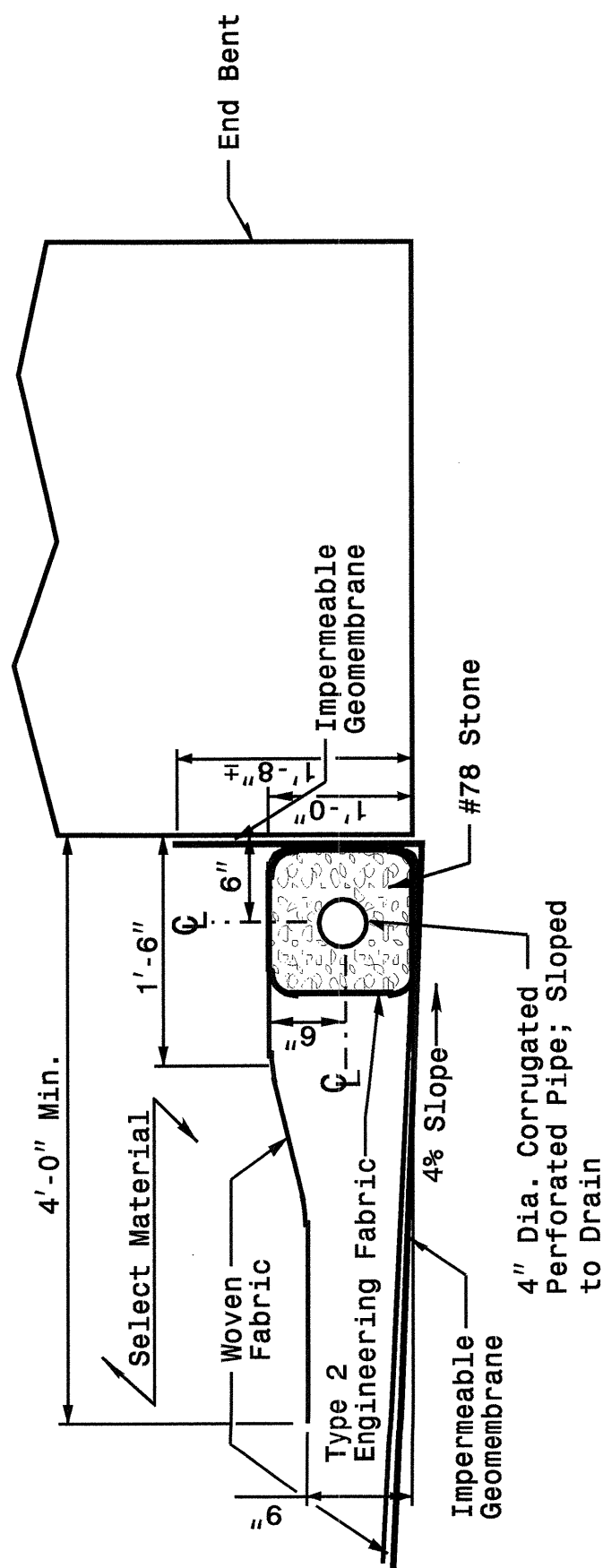
Typical Fabric Lift and Wrap
Showing Second and Above Lifts

Inset 'B'

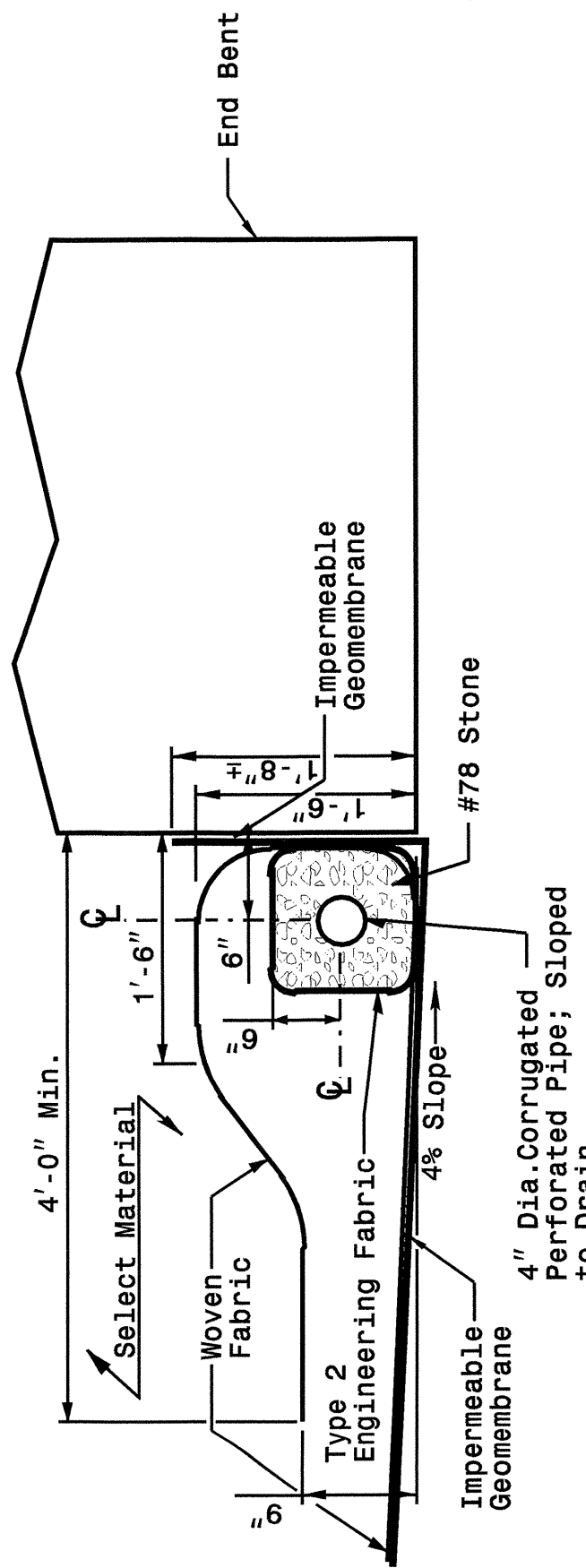
Height of Backwall	Number of Fabric Layers
4'-6" - 5'-9"	3
5'-10" - 7'-2"	4
7'-3" - 8'-8"	5
8'-9" - 10'-1"	6
10'-2" - 11'-8"	7

Note: Cored Slab Structures
Require 2 Fabric Layers.

Length of Bridge End Bent Inside Wingwalls
If Bridge Skew is Less Than or Equal to 90°:
 $\frac{(\text{Roadway Width} + 7'-0")}{\sin(\text{Bridge Skew Angle})} = \text{Dis. Between Wingwalls}$
If Bridge Skew is Greater Than 90°:
 $\frac{(\text{Roadway Width} + 7'-0")}{\cos(\text{Bridge Skew Angle} - 90^\circ)} = \text{Dis. Between Wingwalls}$



Cored Slab Bridge
Showing First Lift and Drains



Girder Bridge
Showing First Lift and Drains

Inset 'A'

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REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
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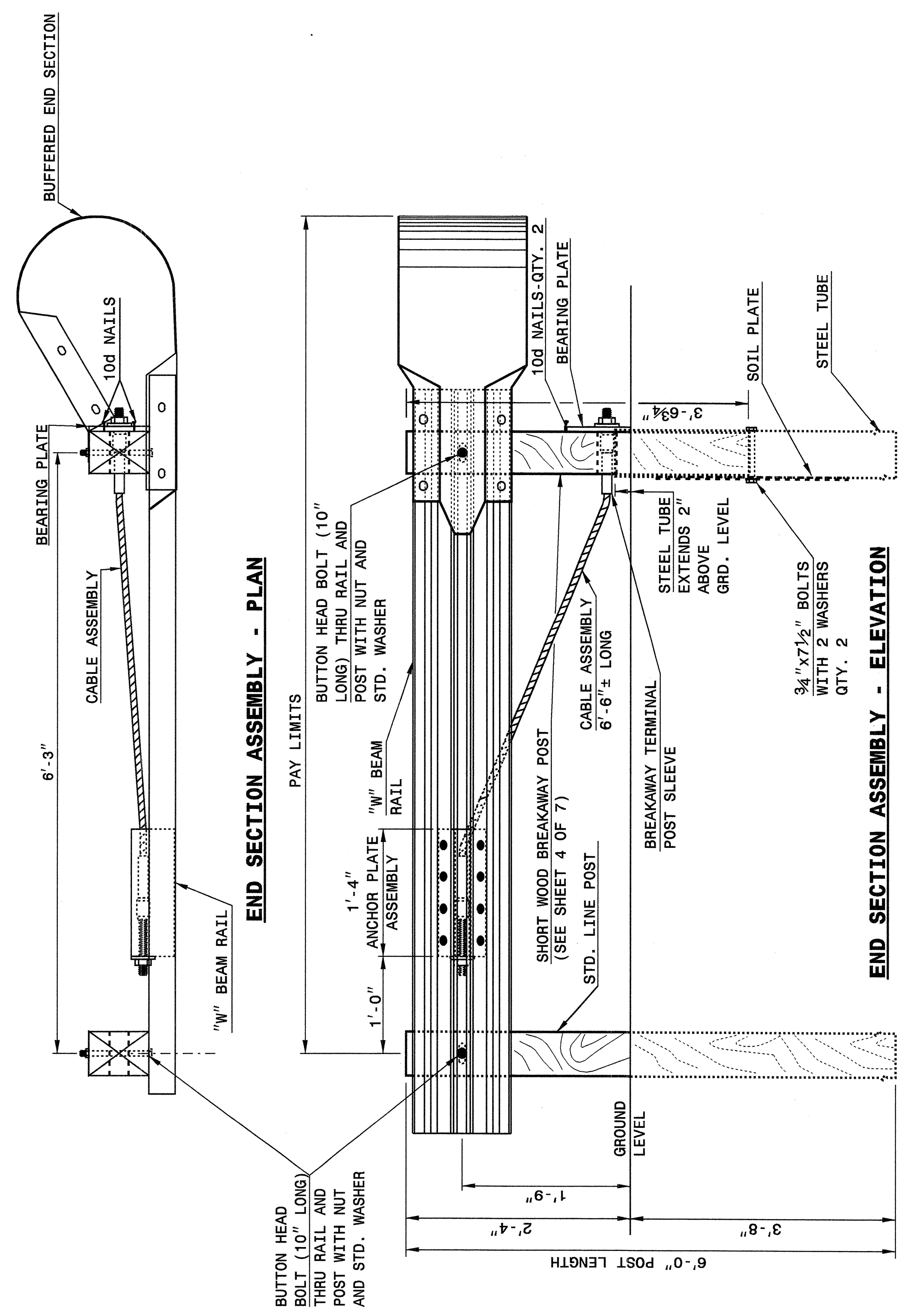
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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 7
862D02



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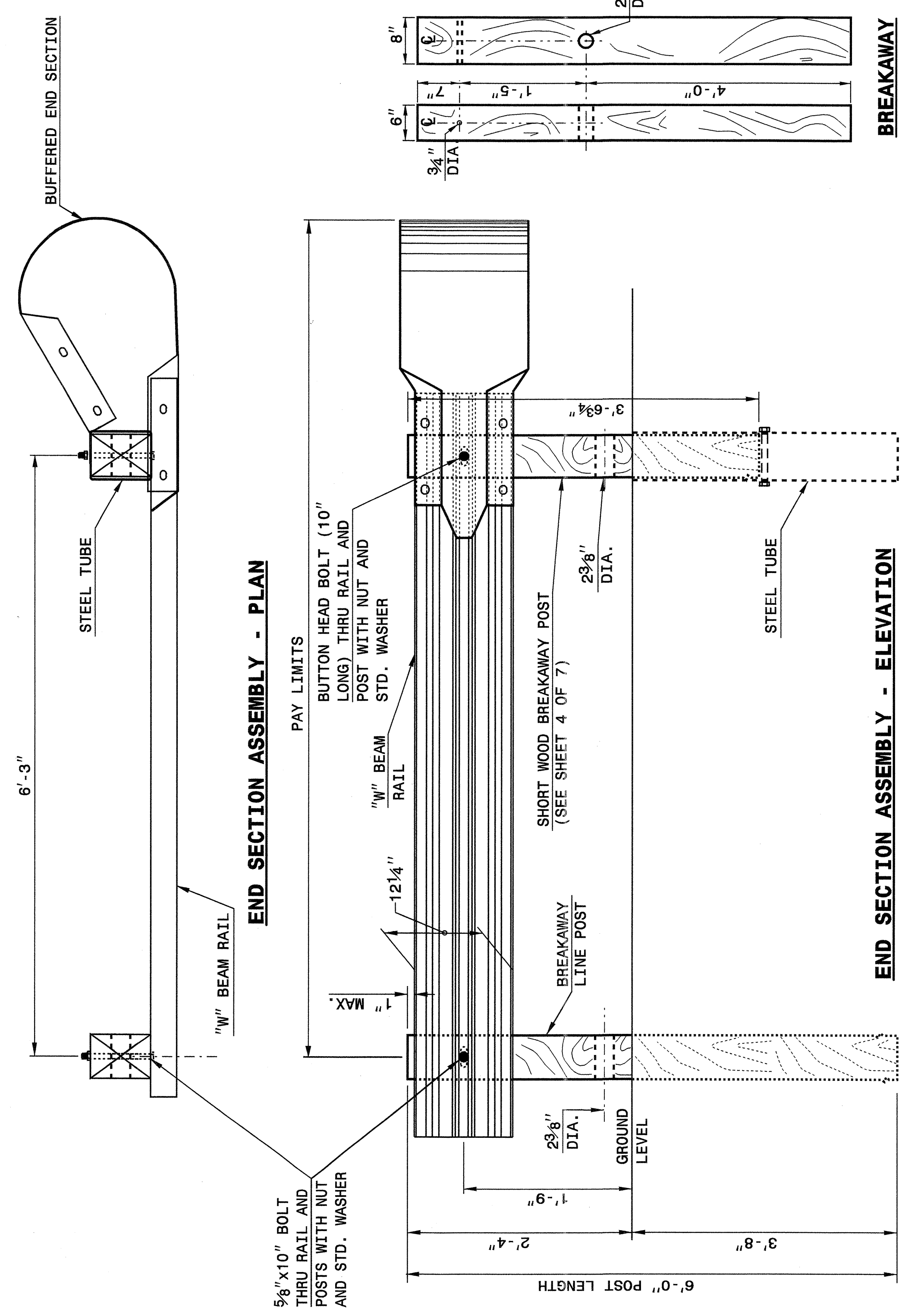
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 7
862D02

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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 7
862D02



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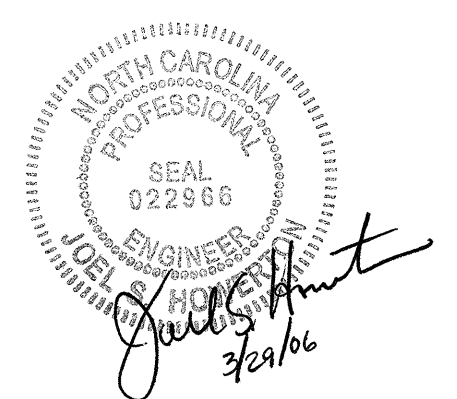
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 7
862D02

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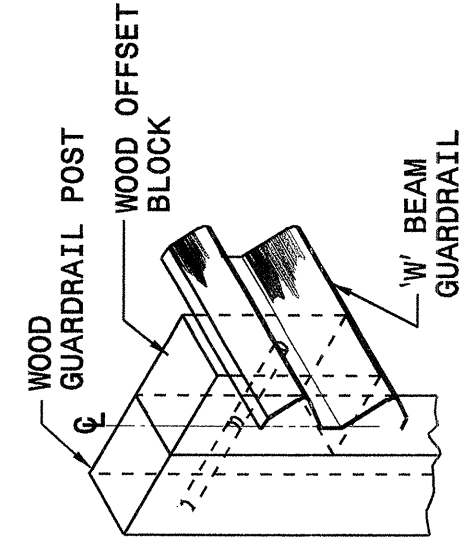
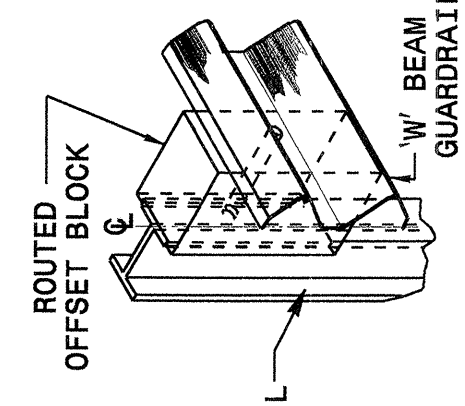
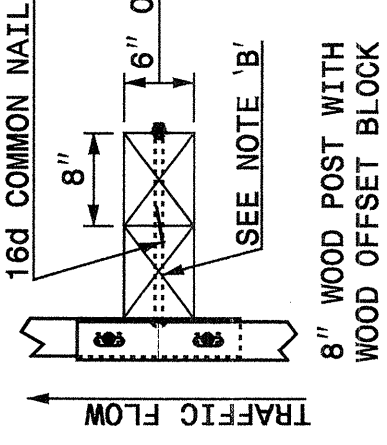
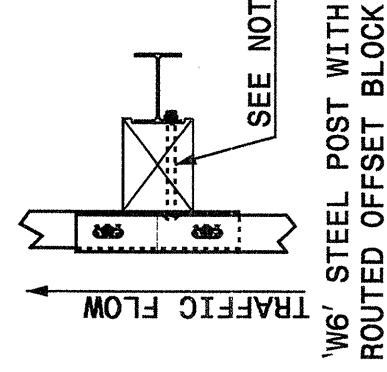
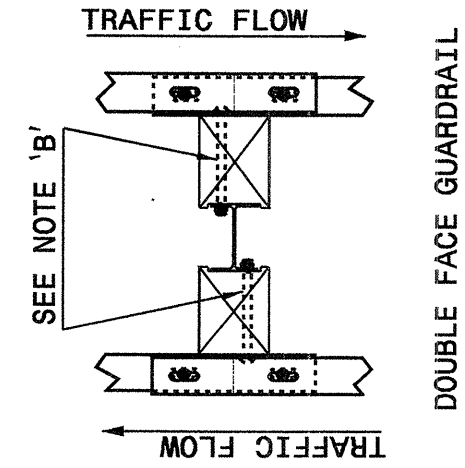
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DIVISION OF HIGHWAYS
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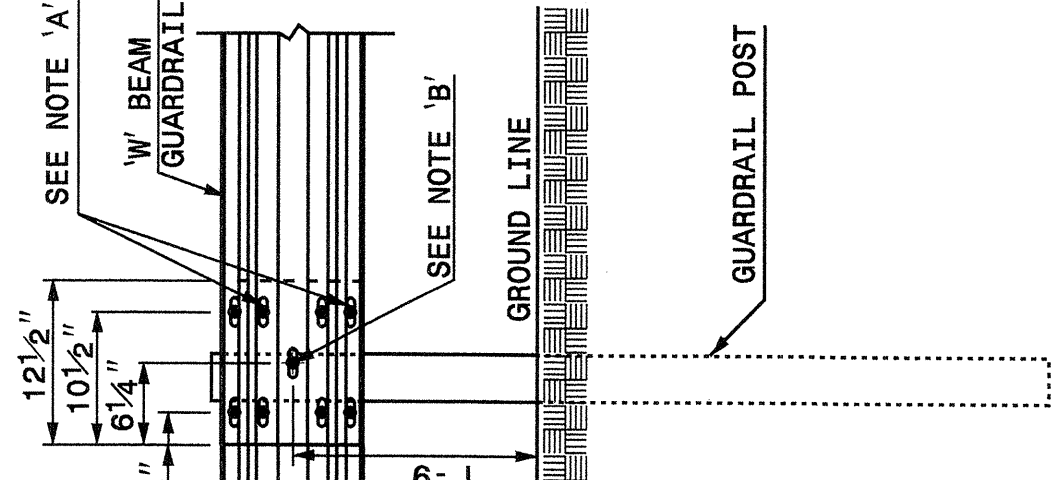
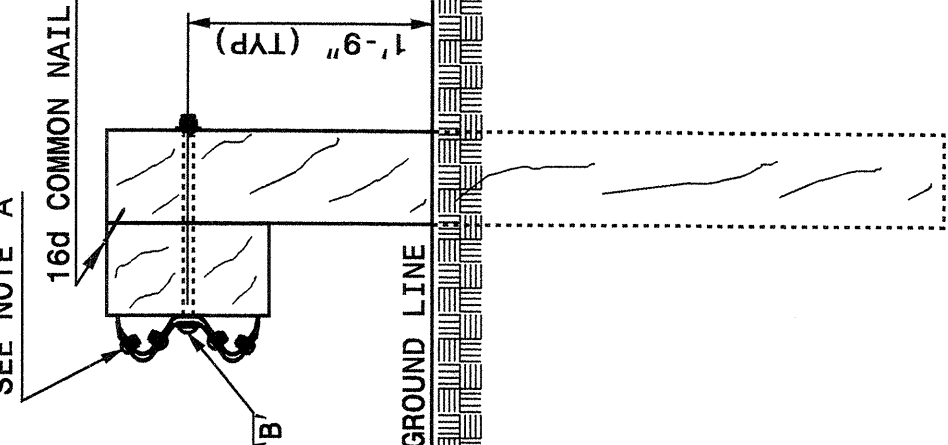
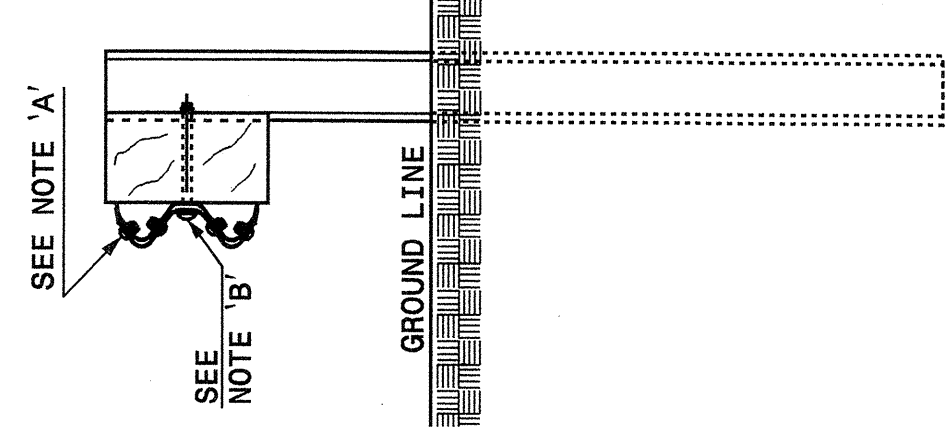
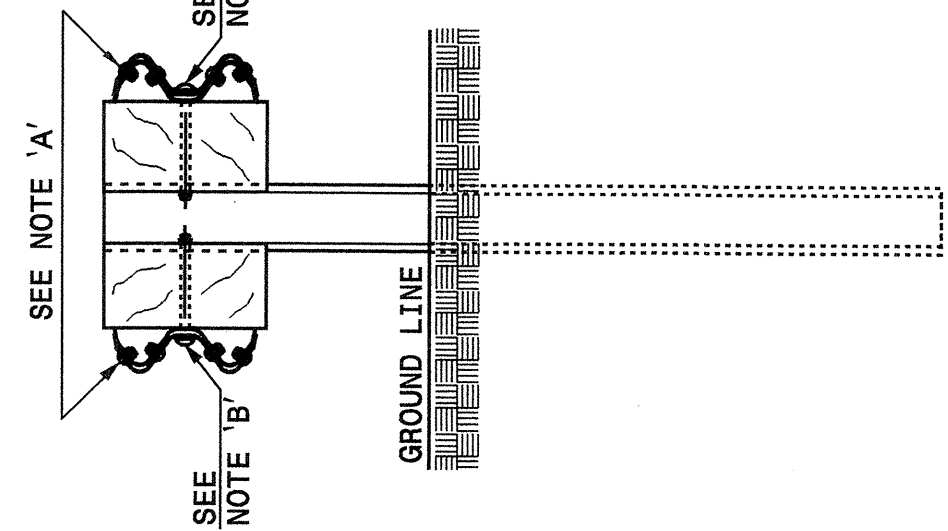
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02



PLAN

ISOMETRIC VIEWS



FRONT

SIDE

FRONT

- NOTES:
- A - 3/4" DIA. BUTTON HEAD SPICE BOLT 1 1/4" LONG (8 REQ. PER SPICE JOINT).
 - B - 3/8" DIA. BUTTON HEAD BOLT 7 1/2" / 9" LONG WITH NUT FOR BOLTING 6" / 8" ROUTED OFFSET BLOCK TO STEEL POSTS OR 3/4" DIA. BUTTON HEAD BOLT 18" LONG WITH STD. WASHER UNDER NUT FOR BOLTING TO WOOD POSTS (1 REQ. PER LOCATION)
 - C - FIELD PUNCHING OF HOLES INTO GUARDRAIL SHALL BE AS DIRECTED BY THE ENGINEER.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

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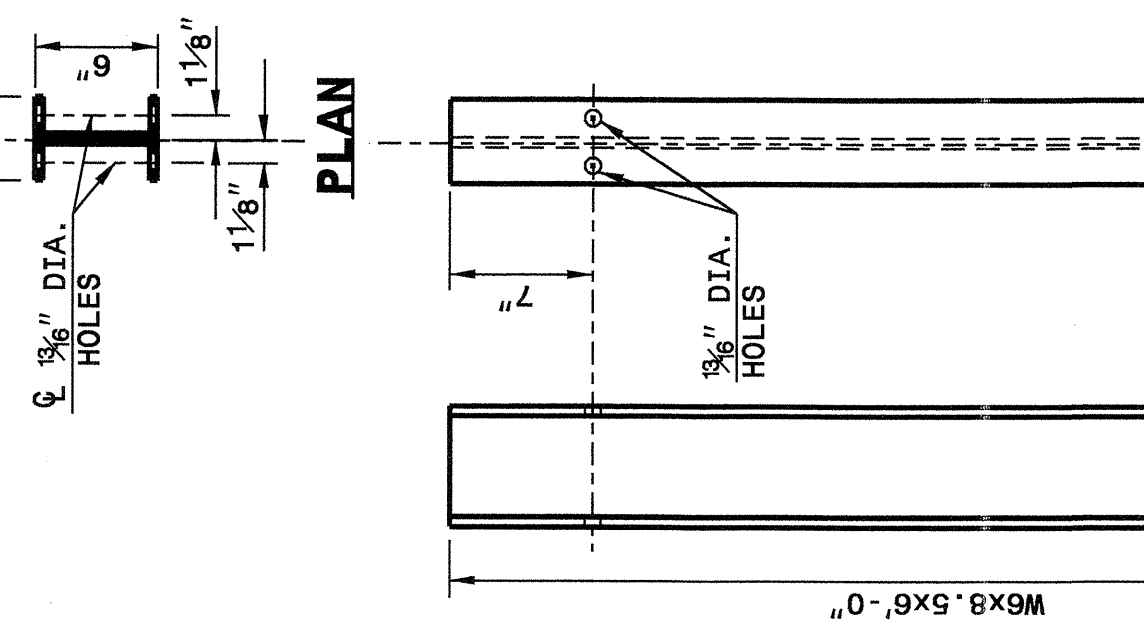
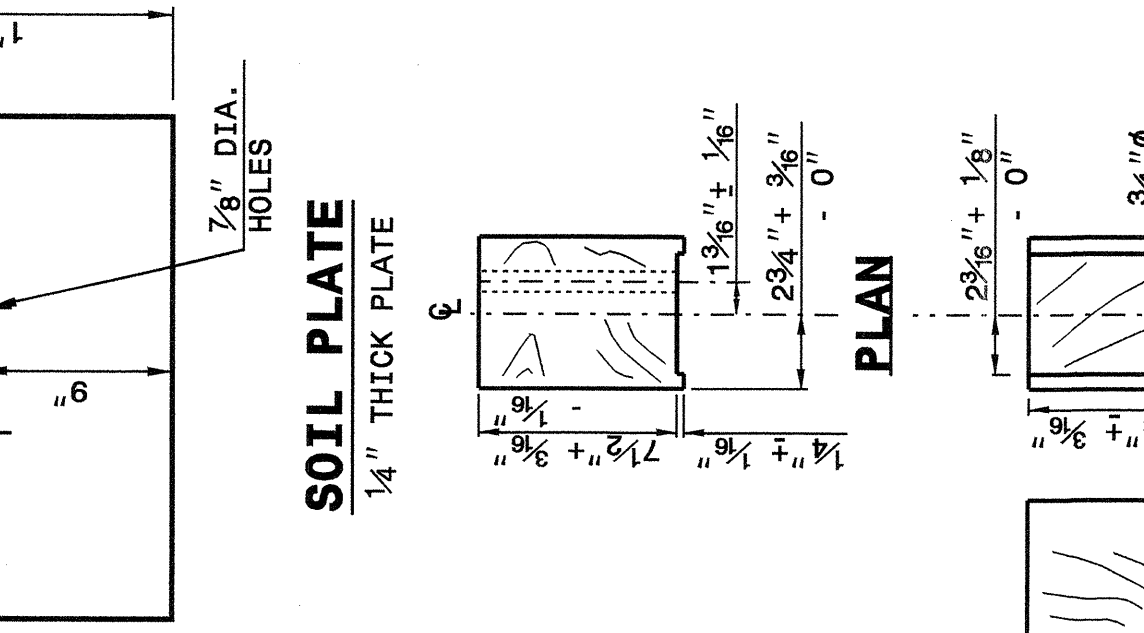
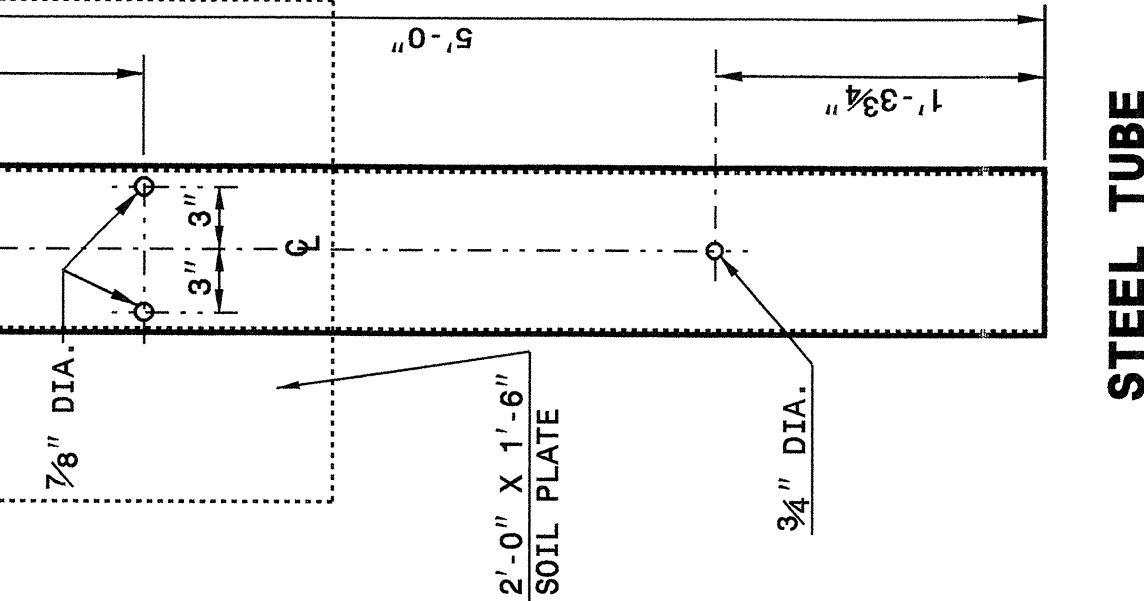
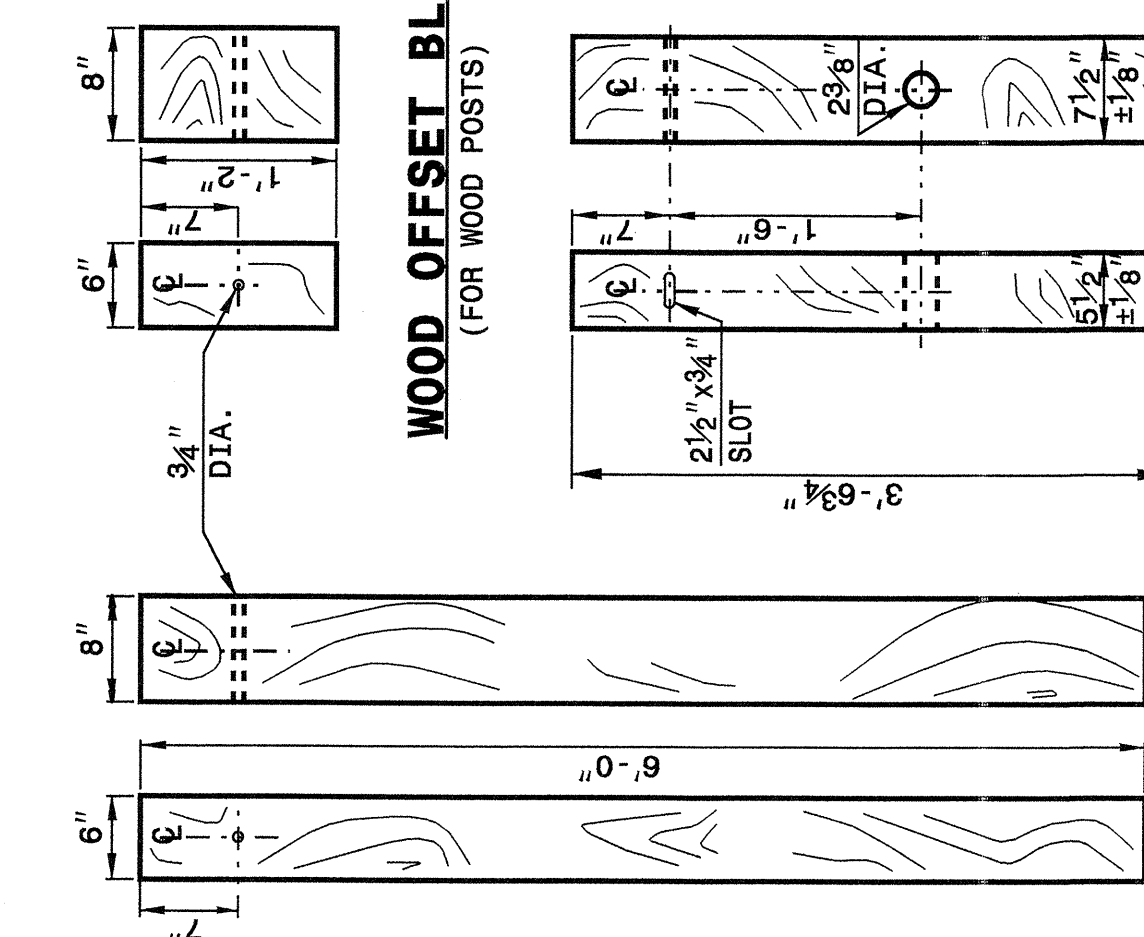
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02

STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

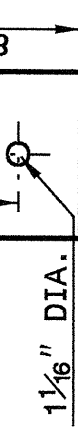
SHEET 4 OF 7
862D02



STANDARD LINE POST

SHORT WOOD BREAKAWAY POST

BEARING PLATE
5/8" THICK PLATE



ROUTED WOOD OFFSET BLOCK

W6" STEEL POST

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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02

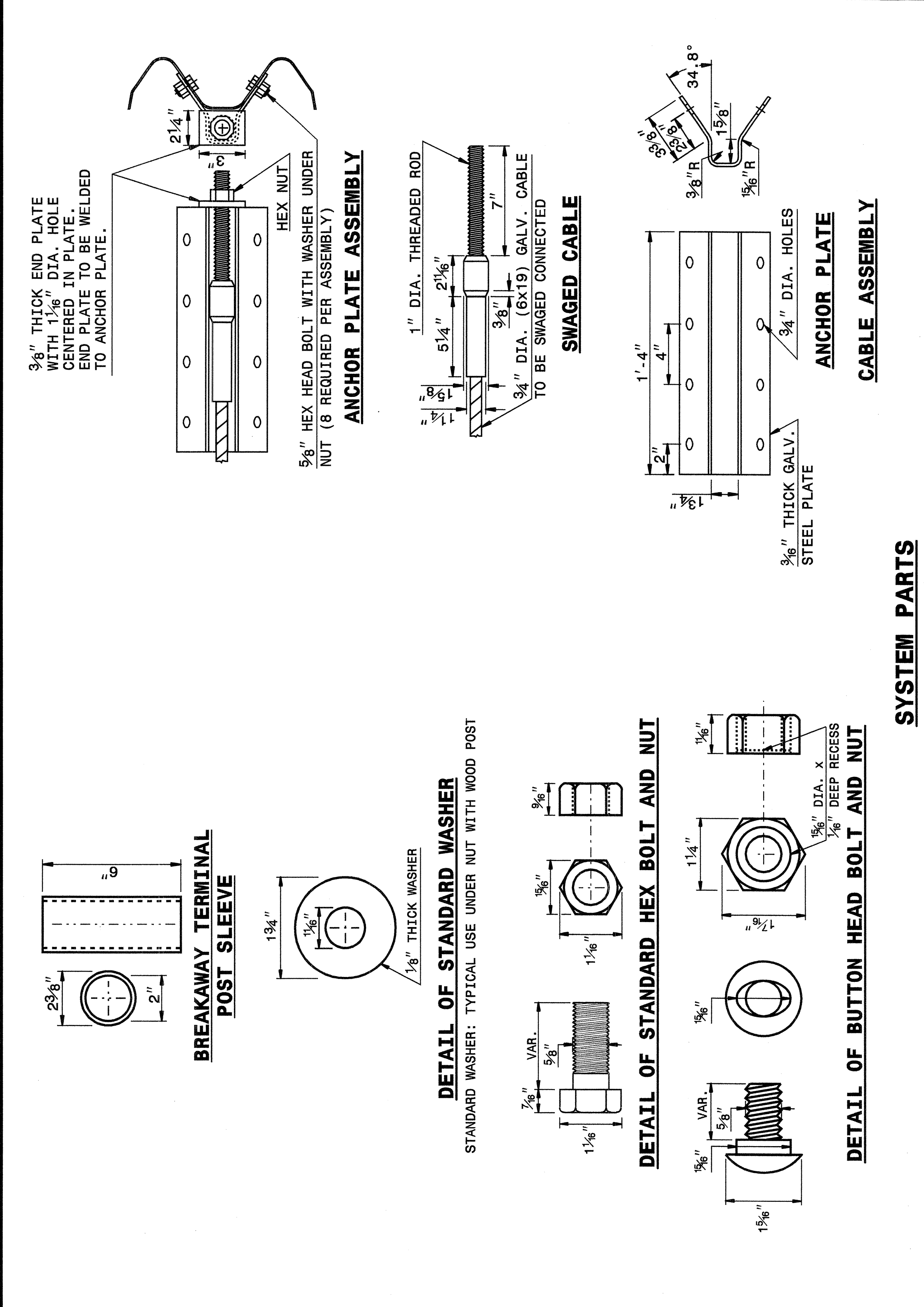
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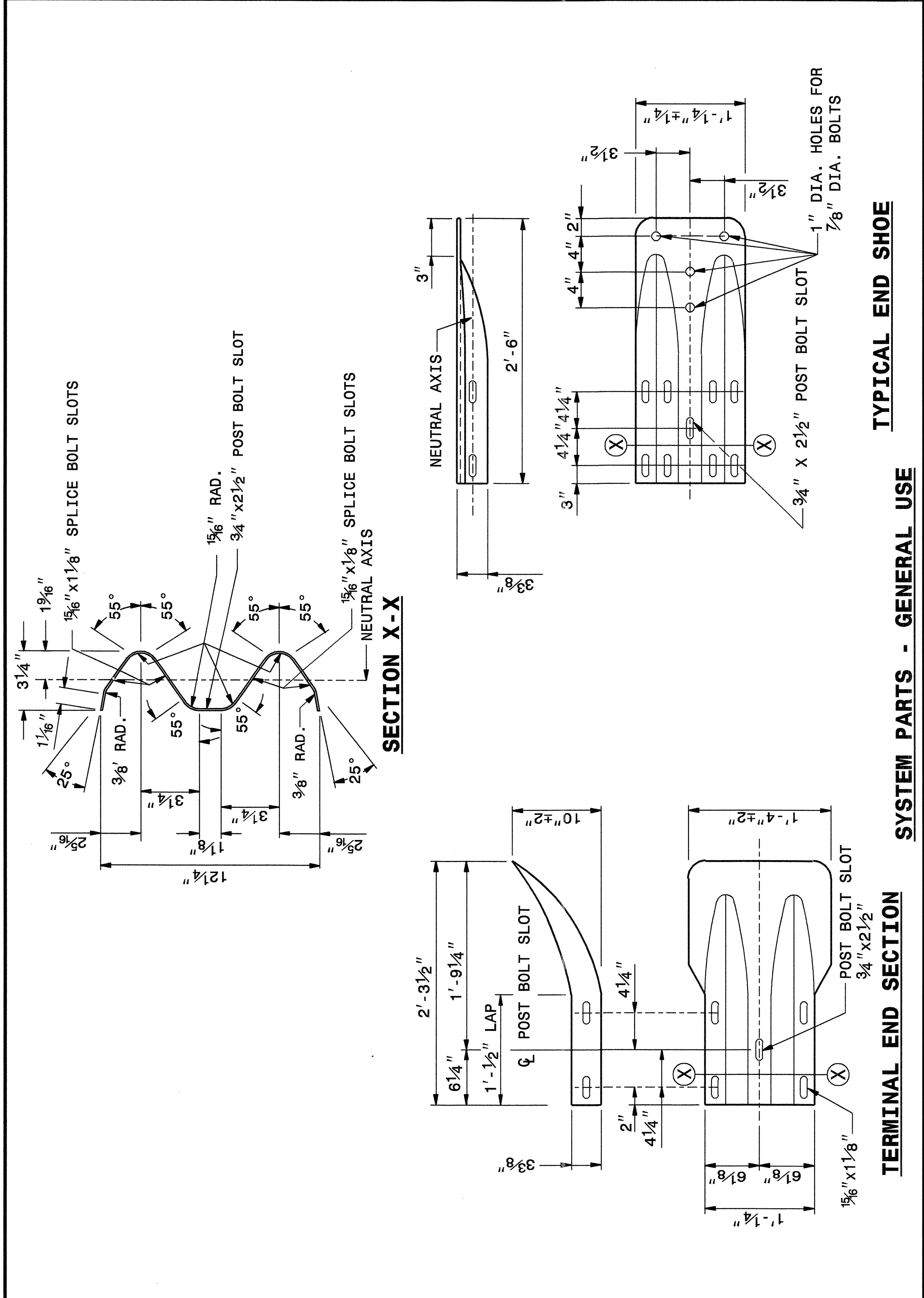


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ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION
SHEET 5 OF 7 862D02



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION
SHEET 5 OF 7 862D02

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ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION
SHEET 6 OF 7 862D02

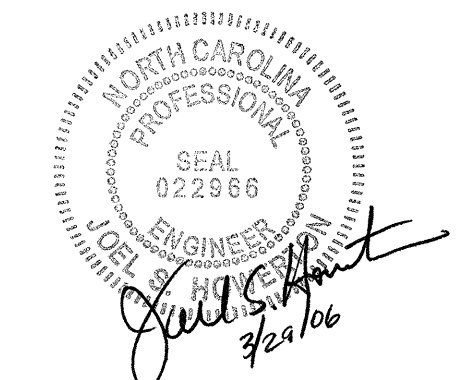


STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION
SHEET 6 OF 7 862D02

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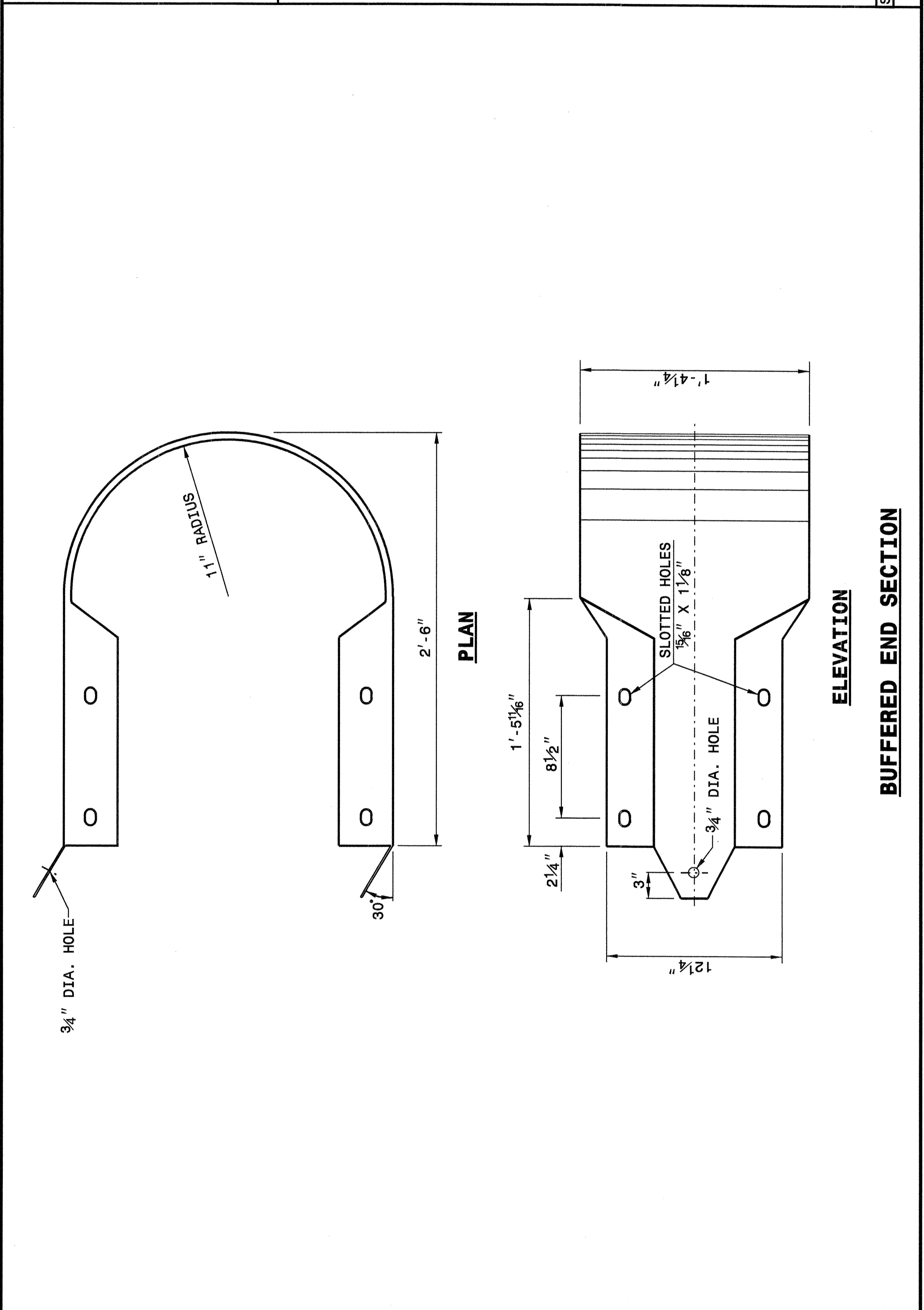


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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02



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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02



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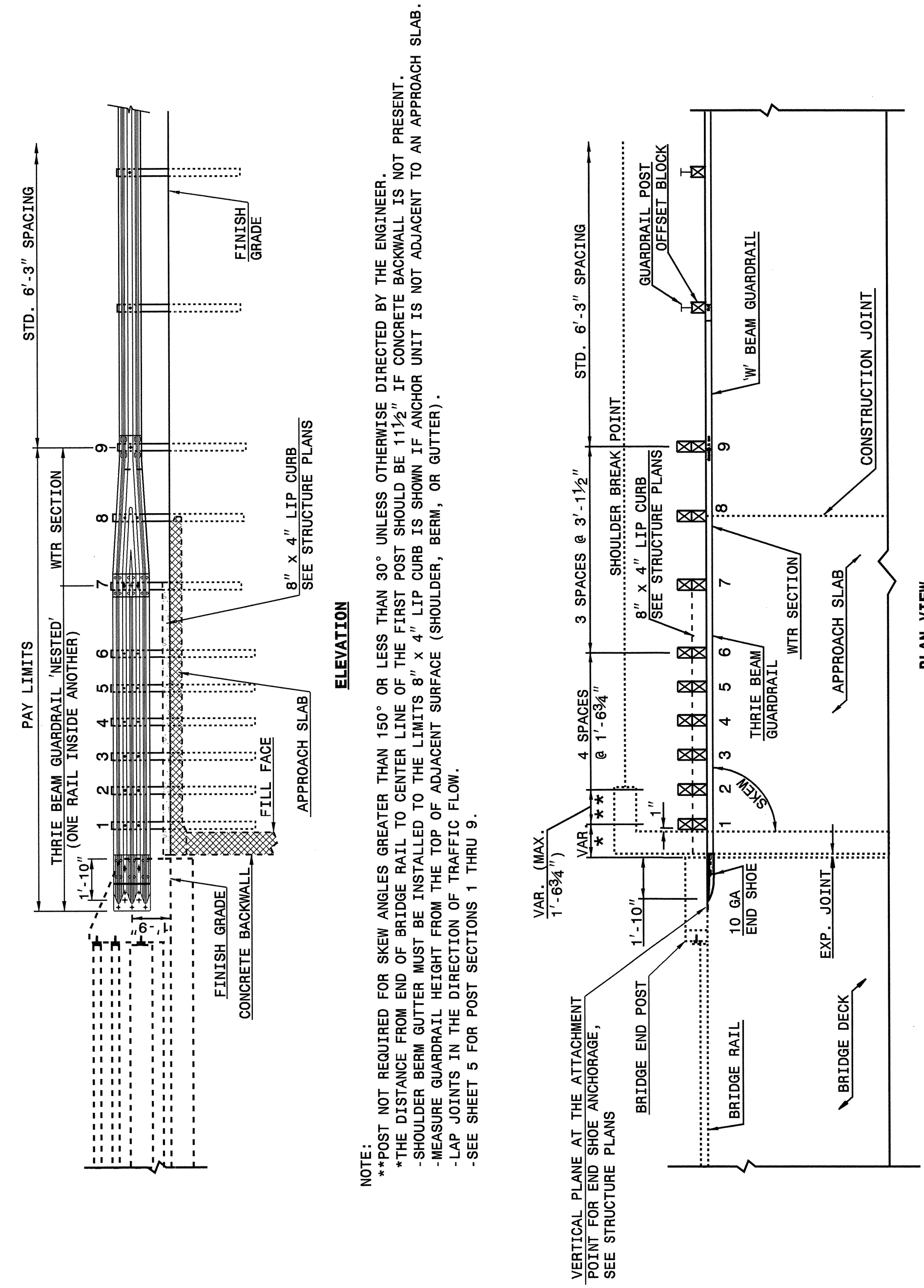
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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6
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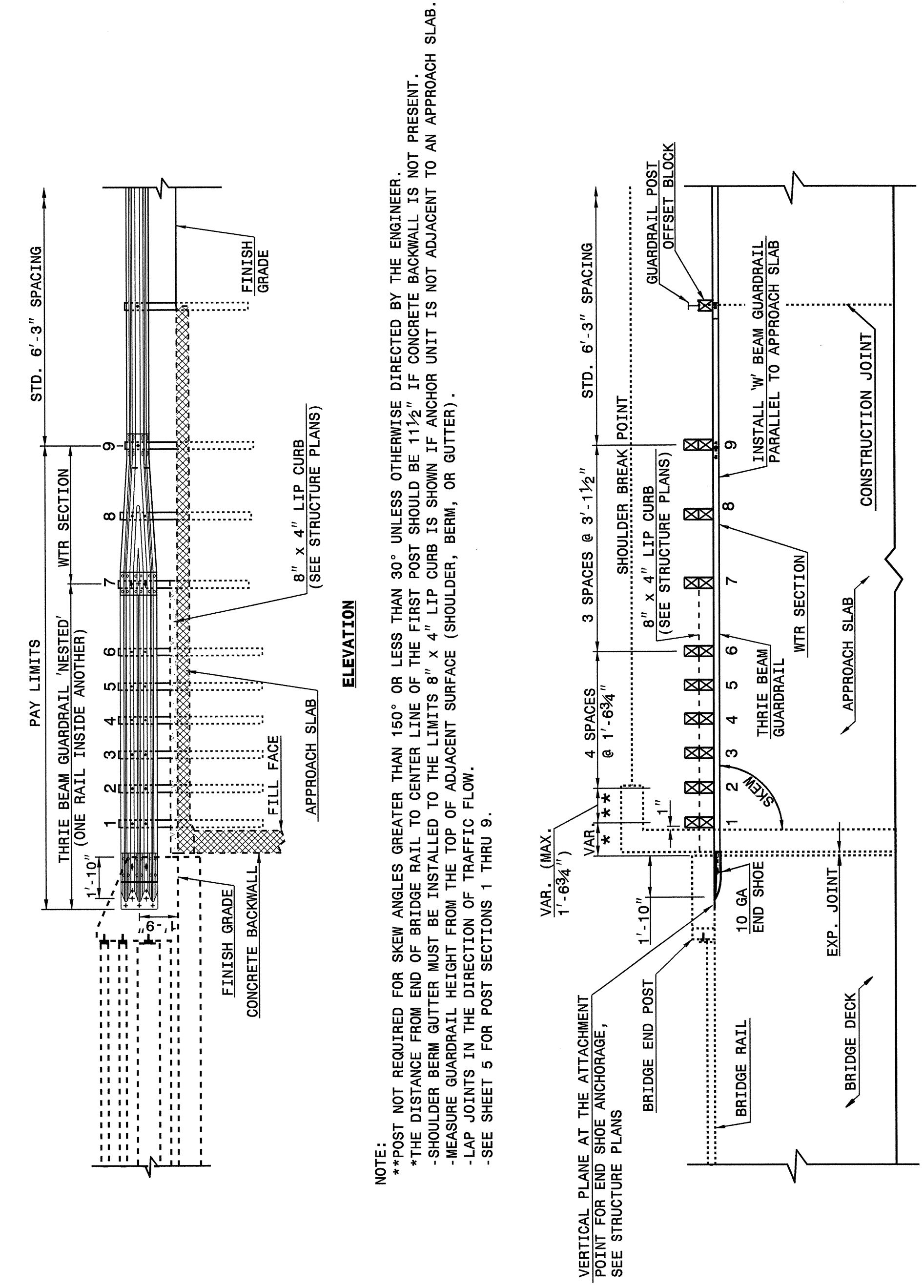
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STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6
862D03

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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6
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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6
862D03

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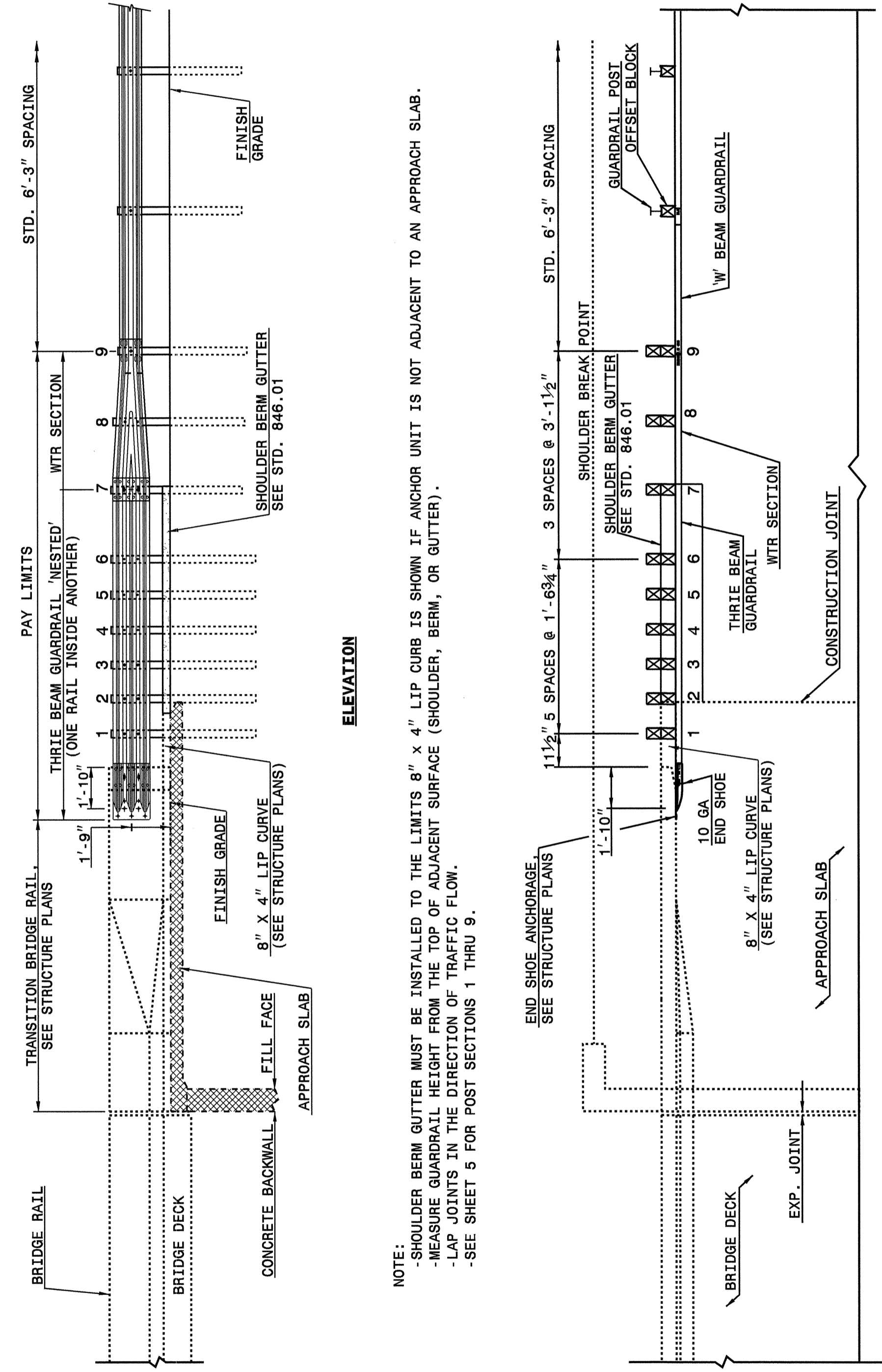
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GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6
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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6
862D03



ELEVATION

PLAN VIEW

NOTE:
 -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.

**GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (15' MINIMUM LENGTH APPROACH SLAB)**

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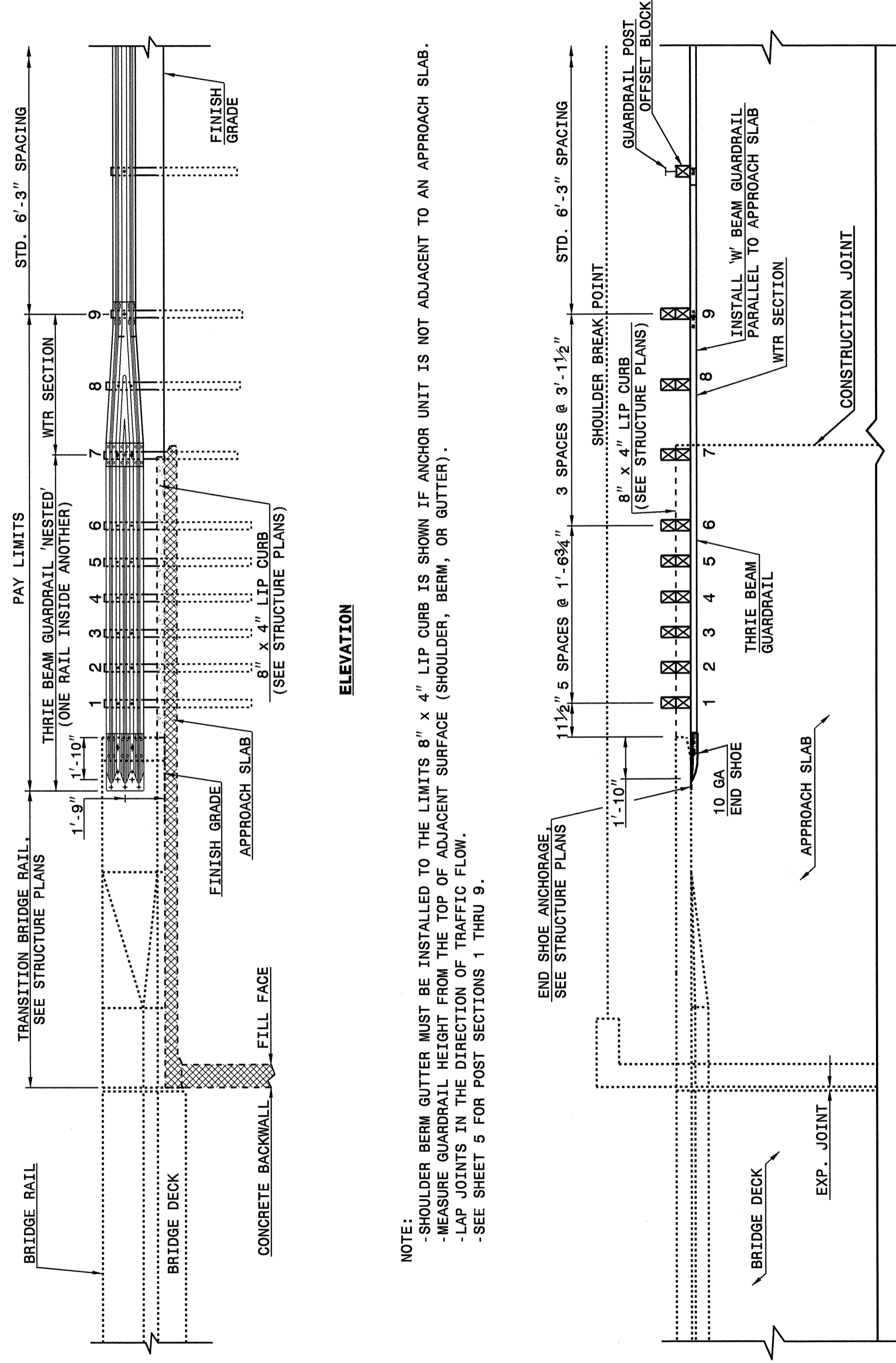
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STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6
862D03

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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6
862D03



ELEVATION

PLAN VIEW

NOTE:
 -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.

**GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (25' MINIMUM LENGTH APPROACH SLAB)**

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ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

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SHEET 5 OF 6
862D03

SECTION OF THRIE BEAM POSTS 1 THRU 6

SECTION OF THRIE BEAM POST 7

SECTION OF WTR BEAM POST 8

SECTION OF 'W' BEAM POST 9

THRIE-BEAM SECTION

WTR SECTION ELEVATION VIEW

END SHOE

THRIE BEAM LINE POST

THRIE BEAM OFFSET BLOCK

THRIE BEAM OFFSET BLOCK

THRIE BEAM LINE POST

ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

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ENGLISH DETAIL DRAWING FOR ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

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SHEET 6 OF 6
862D03

ELEVATION VIEW

ELEVATION VIEW

PLAN VIEW

PLAN VIEW

NOTES FOR:

- GUARDRAIL POST ANCHORED TO STRUCTURE:
- USE FULL LENGTH 1/2" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST OR STEEL TUBE.
- 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.
- USE WOOD POSTS WHICH FIT SNUGLY IN THE STEEL TUBE WITH A MAXIMUM OF 1/8" CLEARANCE BETWEEN TUBE WALL AND POST.

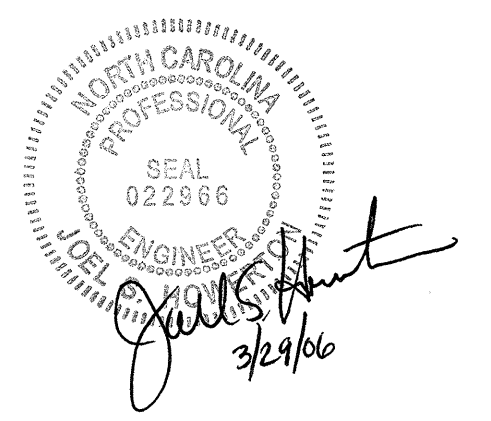
NEW STRUCTURES:

- ATTACH POSTS 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.

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
 MODIFIED BY: E.E. WARD DATE: 09-14-05
 CHECKED BY: *[Signature]* DATE: 3/11/06
 FILE SPEC.: stds/02stdstodetails/english/862d03.dgn



DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201257

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION	207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)	481000000-E	1205	11,623	LF	PAINT PAVEMENT MARKING LINES (4")
000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	225300000-E	840	0.9	CY	PIPE COLLARS	483500000-E	1205	32	LF	PAINT PAVEMENT MARKING LINES (24")
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (15+59.50)	226400000-E	840	0.09	CY	PIPE PLUGS	490000000-N	1252	20	EA	PERMANENT RAISED PAVEMENT MARKERS
004300000-N	226	Lump Sum		GRADING	228600000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES	530000000-E	1505	22	TON	FOUNDATION CONDITIONING MATERIAL, UTILITIES CLASS ***** (VI)
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING	235500000-N	840	2	EA	FRAME WITH GRATE, STD #40.29	530600000-E	SP	22	TON	BEDDING MATERIAL, UTILITIES CLASS ***** (VI)
005700000-E	226	100	CY	UNDERCUT EXCAVATION	303000000-E	862	487.5	LF	STEEL BM GUARDRAIL	537800000-E	1510	204	LF	12" DI WATER PIPE, PC 350
019500000-E	265	100	CY	SELECT GRANULAR MATERIAL	304500000-E	862	62.5	LF	STEEL BM GUARDRAIL, SHOP CURVED	542300000-E	1510	38	LF	*** PE WATER PIPE, SDR *****, *****WP (3/4", SDR 7, 200#)
019600000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION	315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	548000000-E	1510	1,510	LB	DUCTILE IRON WATER PIPE FITTINGS, 250# MIN WP
031800000-E	300	15	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	319500000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	564800000-N	1510	2	EA	RELOCATE EXISTING WATER METER
034500000-E	310	40	LF	24" SIDE DRAIN PIPE	321500000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	580400000-E	1530	204	LF	FILL OR REMOVE ABANDONED 12" PIPE, ***** (PVC WATER)
036600000-E	310	32	LF	15" RC PIPE CULVERTS, CLASS III	327000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	600000000-E	1605	1,100	LF	TEMPORARY SILT FENCE
037200000-E	310	24	LF	18" RC PIPE CULVERTS, CLASS III	364900000-E	876	3	TON	PLAIN RIP RAP, CLASS B	600600000-E	1610	75	TON	STONE FOR EROSION CONTROL, CLASS A
070800000-E	310	20	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	365600000-E	876	245	SY	FILTER FABRIC FOR DRAINAGE	600900000-E	1610	115	TON	STONE FOR EROSION CONTROL, CLASS B
080600000-E	310	2	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK	402500000-E	901	31.25	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	601200000-E	1610	45	TON	SEDIMENT CONTROL STONE
122000000-E	545	100	TON	INCIDENTAL STONE BASE	402500000-E	901	7.188	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (F)	601500000-E	1615	1.5	ACR	TEMPORARY MULCHING
133000000-E	607	1,200	SY	INCIDENTAL MILLING	407200000-E	903	71	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
148900000-E	610	680	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	410200000-N	904	3	EA	SIGN ERECTION, TYPE E	602100000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
152500000-E	SP	700	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	410800000-N	904	1	EA	SIGN ERECTION, TYPE F	602400000-E	1622	50	LF	TEMPORARY SLOPE DRAINS
156000000-E	620	76	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	415500000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	602700000-N	1622	2	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
202200000-E	815	56	CY	SUBDRAIN EXCAVATION	441200000-E	SP	431	SF	WORK ZONE SIGNS (STATIONARY)	602900000-E	SP	200	LF	SAFETY FENCE
203300000-E	815	42	CY	SUBDRAIN FINE AGGREGATE	441220000-E	SP	57	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	603000000-E	1630	100	CY	SILT EXCAVATION
204400000-E	815	250	LF	6" PERFORATED SUBDRAIN PIPE	442500000-N	1125	6	EA	WARNING FLAG SETS	603600000-E	1631	1,100	SY	MATting FOR EROSION CONTROL
205500000-E	815	9	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS	443000000-N	1130	20	EA	DRUMS	604200000-E	1632	60	LF	1/4" HARDWARE CLOTH
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	444610000-E	SP	48	LF	BARRICADES (TYPE III)	608400000-E	1660	1.5	ACR	SEEDING & MULCHING
					445500000-N	1150	50	MD	FLAGGER	608700000-E	1660	1	ACR	MOWING
										609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
										609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
										609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
										610800000-E	1665	1	TON	FERTILIZER TOPDRESSING
										611400000-N	SP	2.5	HR	SPECIALIZED HAND MOWING
										613200000-N	SP	8	EA	GENERIC EROSION CONTROL ITEM RESPONSE FOR EROSION CONTROL

8/17/99

DATE: 12/6/05
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STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

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

STATION	LOCATION (L.T., RT., OR C.Y.)	STRUCTURE NO.	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)						BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)						16" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS		QUANTITIES FOR DRAINAGE STRUCTURES	TOTAL L.F. FOR PAY QUANTITY SHALL BE 'A' + (1.3 X 'COLB')	FRAME, GRATES, AND HOOD STD. 840.03	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS								
							12"	15"	18"	24"	30"	36"	12"	15"	18"	24"	30"	36"				42"	48"									R.C.P.	C.S.P.	PER EACH (O THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE	E	F	G
L 11+30	RT	1																																				0.45	
L 11+34	RT	1	2	EX	79.91					16																											0.045		
L 19+84	LT	3																																			0.045		
L 11+13	LT	5	6																																		0.45		
L 11+13	LT	5	6		80.85	EX				8																													
L 14+70	RT	7	8		81.70																																		
L 14+70	LT	8	9		78.95	78.86				32																													
L 14+70	LT	8	9		81.70																																		
L 14+70	LT	8	9		78.86	75.00																																	
L 18+49	LT	10			80.45	80.32																																	
TOTAL																																							
SAY																																							

ABBREVIATIONS

C.B. CATCH BASIN
 N.D.I. NARROW DROP INLET
 D.I. DROP INLET
 M.D.I. MEDIAN DROP INLET
 M.D.I.(N.S.) MEDIAN DROP INLET (NARROW SLOT)

J.B. JUNCTION BOX
 M.H. MANHOLE
 T.B.D.I. TRAFFIC BEARING DROP INLET
 T.B.J.B. TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: T. H. B. DATE: 8-04
 CHECKED BY: D. L. W. DATE: 8-04

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. B-4093
 SHEET NO. 3B

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR TYPE 350			SINGLE FACED CONCRETE BARRIERS	REMARKS							
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	CAT-1	AT-1	B-77	TYPE III	EA	G	NG										
-L-	11+84.50	14+84.50	RT	300					8.0	11.0	231.25		4.62																			
-L-	13+47.00	14+84.50	LT	137.50					8.0	11.0			68.75		1.38																	
-L-	16+34.50	17+22.00	RT	87.5					8.0	11.0			31.25		0.62																	
-L-	16+34.50	18+20.50	LT	162.5	25				8.0	11.0	156.25		3.12																			
-L-	18+44.50	19+34.50	LT	87.5	37.5				8.0	11.0																						
SUBTOTAL				775	62.5																											
	LESS ANCHOR	DEDUCTIONS																														
	TYPE III	4 @ 18.75'	=	-75.00'																												
	GRAU 350	4 @ 50'	=	-200.00'																												
	AT-1	2 @ 6.25'	=	-12.50'																												
TOTAL				487.5'	62.5'																											
			SAY	487.5'	62.5'																											
				5 ADDITIONAL GUARDRAIL POST																												

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBANKMENT + %	BORROW	WASTE
SUMMARY #1					
-L- 10+00.00 TO -L- 14+97.00	746		149	112	
SUBTOTAL: SUMMARY #1	746		149	112	
SUMMARY #2					
-L- 16+22.00 TO -L- 21+50.00	728		246	210	
-Y- 10+00.00 TO -Y- 13+00.00	22		104	103	
SUBTOTAL: SUMMARY #2	750		350	313	
TOTAL	1,496		499	425	
EST. TO REPLACE TOPSOIL ON BORROW PITS				21	
GRAND TOTAL	1,496		499	446	
SAY	1,550			475	
EST. UNDERCUT = 100 CY					

EXISTING ASPHALT PAVEMENT REMOVAL SUMMARY

LINE	STATION TO STATION	LOCATION	SQUARE YARDS
-L-	Sta. 12+45.45 TO Sta. 15+05.09	LT & RT	692
-L-	Sta. 16+08.61 TO Sta. 18+65.31	LT & RT	685
-Y-	Sta. 12+60.00 TO Sta. 13+00.00	LT & RT	107
		TOTAL	1,484
		SAY	1,500 SY

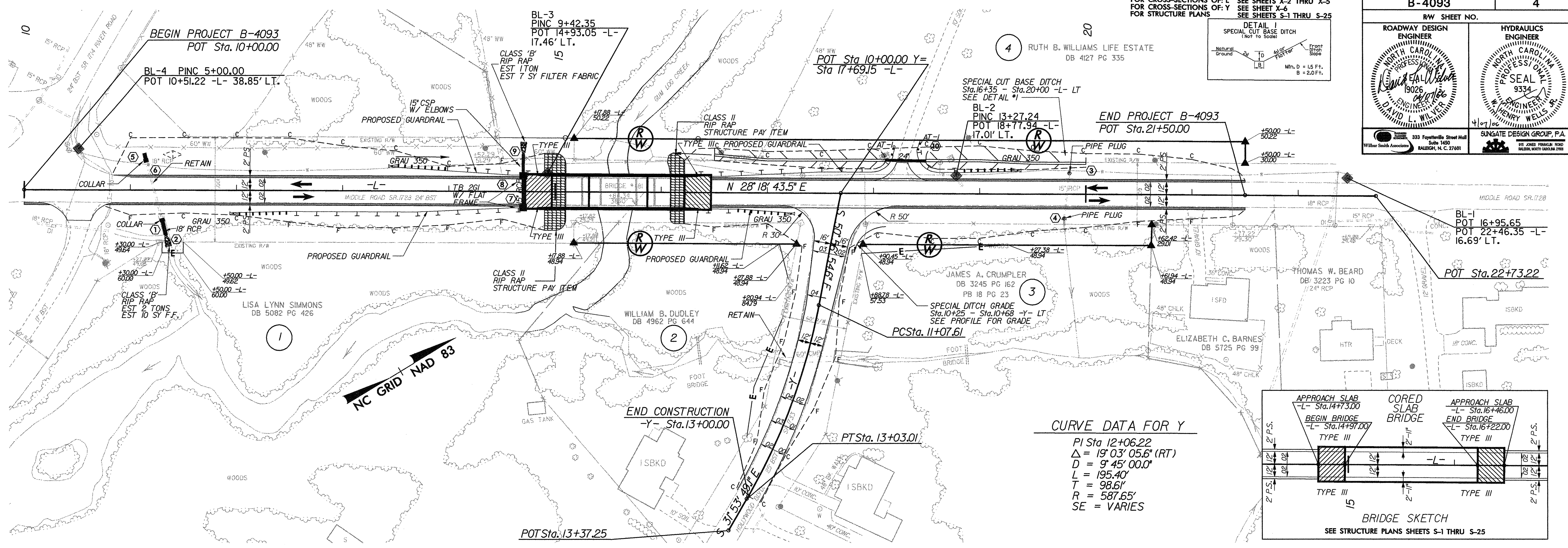
NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

6/16/99
 DATE: 4/20/06
 PL: [unclear]
 ROADWAY PROJ: B-4093_RDY_SUM_03B.dgn

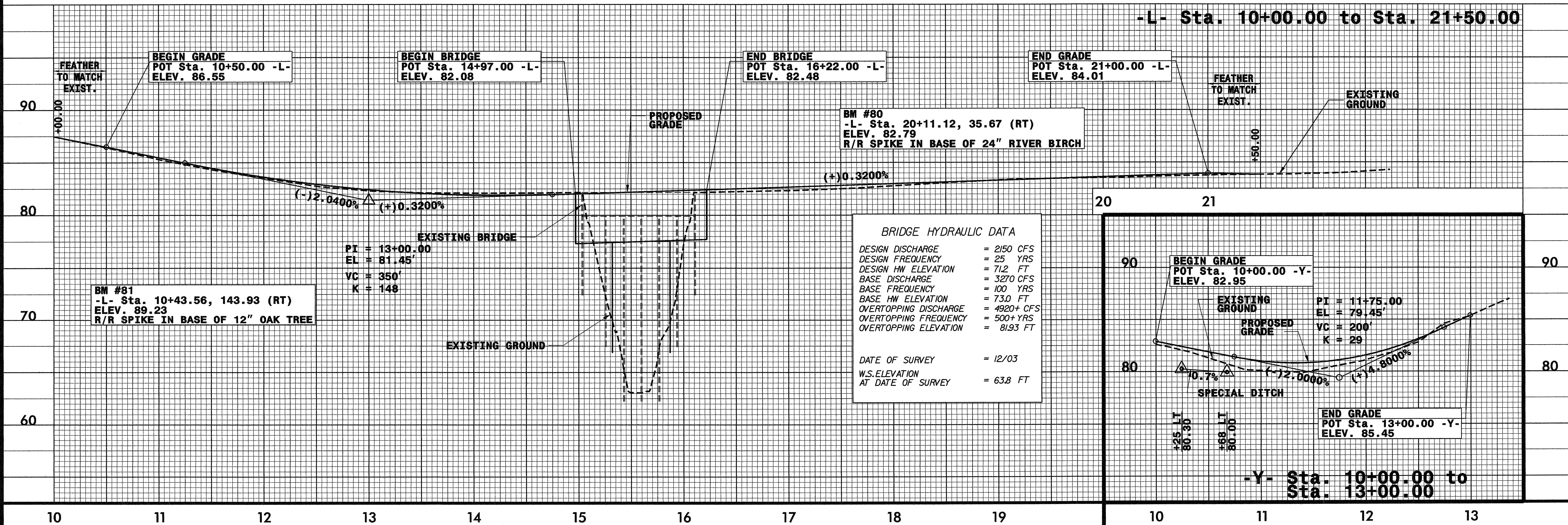
8/17/99

NOTES
FOR CROSS-SECTIONS OF: L SEE SHEETS X-2 THRU X-5
FOR CROSS-SECTIONS OF: Y SEE SHEET X-6
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-25

PROJECT REFERENCE NO. B-4093		SHEET NO. 4
RW SHEET NO.		
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 	
SUNGATE DESIGN GROUP, P.A. 333 Fayetteville Street, Suite 1400 Raleigh, N.C. 27601		



REVISIONS
11/30/04 R/W REVISION: ADDED PROPERTY TIES FROM LOCATION AND SURVEYS



DATE: 4/6/2006 AM
FILE: (ncdot)\b-4093\roadway\proj\4093_rdy_psh_04.dgn