

09/08/99

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

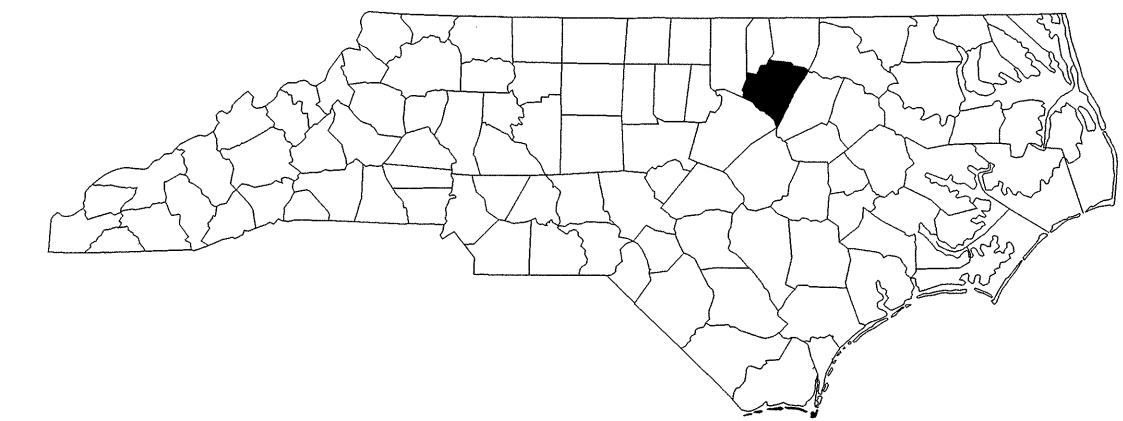
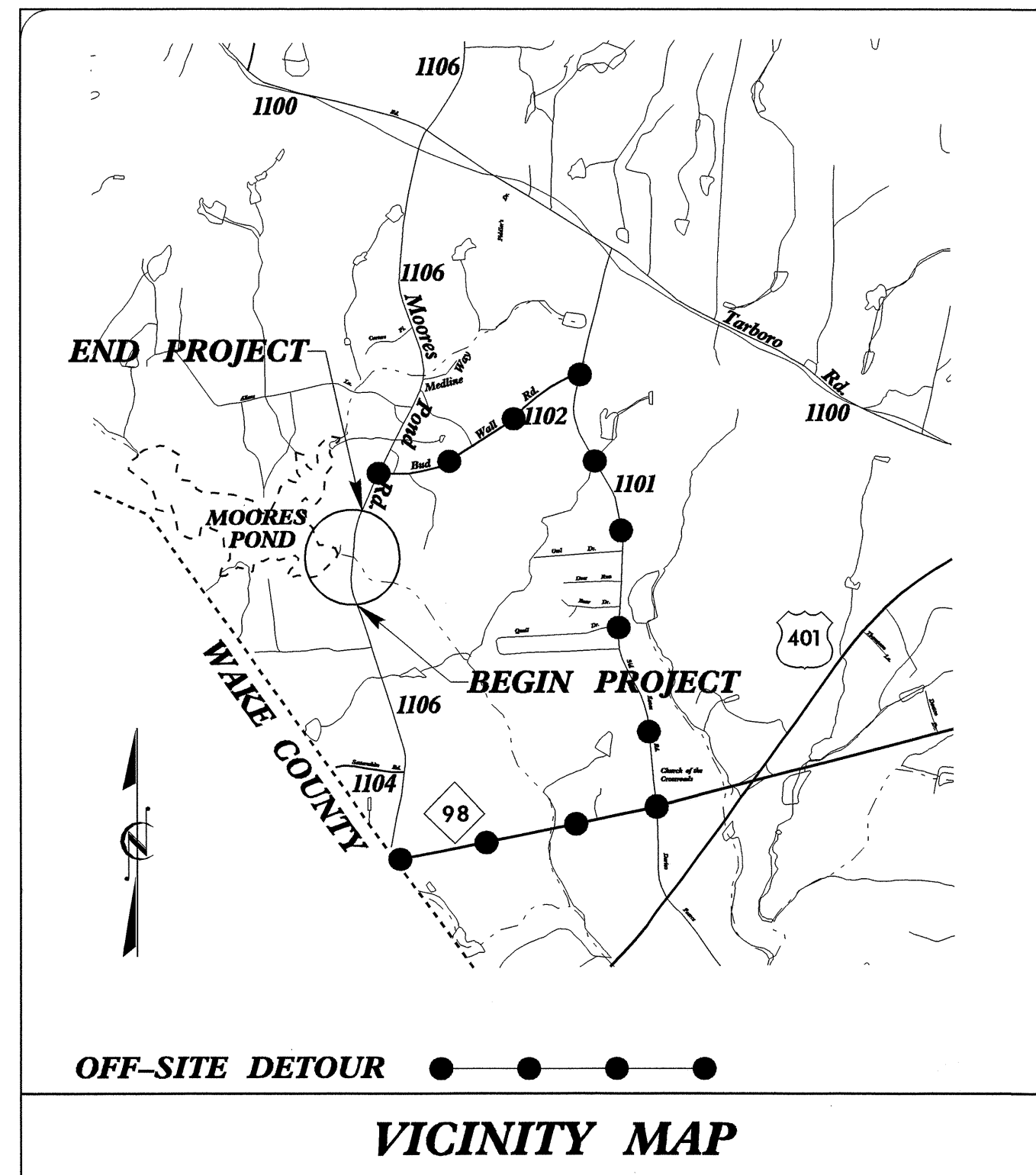
**FRANKLIN COUNTY**

LOCATION: BRIDGE NO. 15 OVER LITTLE RIVER AND  
APPROACHES ON SR 1106 (MOORES POND RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4113	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33468.1.1	BRZ-1106(3)	P.E.	
33468.2.1	BRZ-1106(3)	RW & UTIL.	
33468.3.1	BRZ-1106(3)	CONST.	

TIP: B-4113

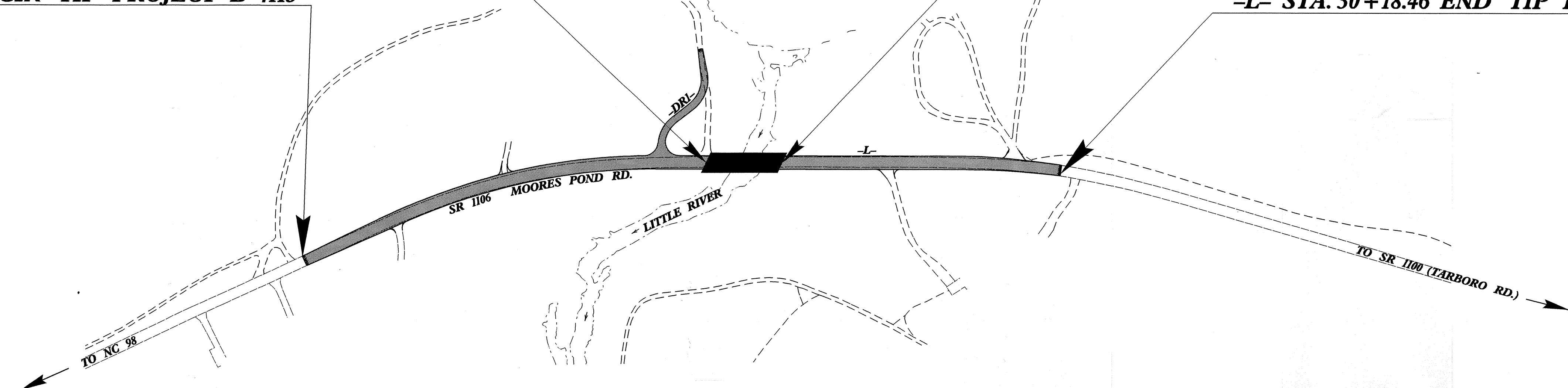


-L- STA. 16+50.00 BEGIN TIP PROJECT B-4113

BEGIN BRIDGE  
-L- STA. 23+90.00

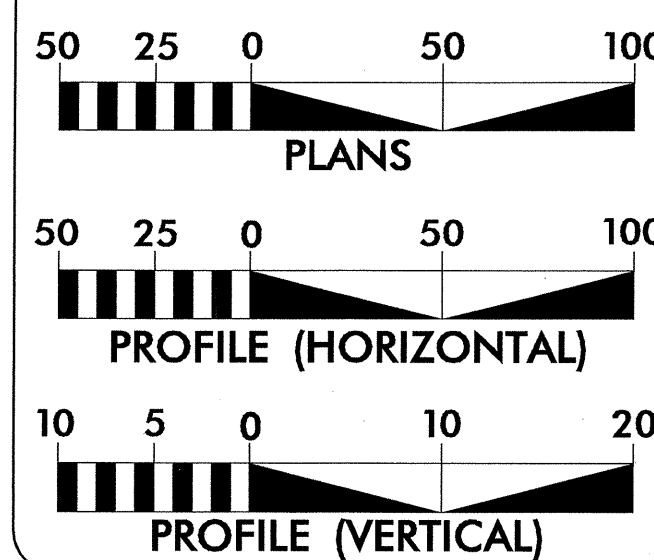
END BRIDGE  
-L- STA. 25+25.00

-L- STA. 30+18.46 END TIP PROJECT B-4113



\*\* DESIGN EXCEPTIONS FOR VERTICAL ALIGNMENT AND  
VERTICAL STOPPING SIGHT DISTANCE ARE REQUIRED.

GRAPHIC SCALES



DESIGN DATA

ADT 2005 = 1200  
ADT 2030 = 2200  
DHV = 13 %  
D = 60 %  
\* T = 3 %  
\*\* V = 60 MPH  
\* (TTST 1 % + DUAL 2 %)  
FUNC CLASS=RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4113 = 0.233 MILES  
LENGTH STRUCTURE TIP PROJECT B-4113 = 0.026 MILES  
TOTAL LENGTH OF TIP PROJECT B-4113 = 0.259 MILES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2002 STANDARD SPECIFICATIONS

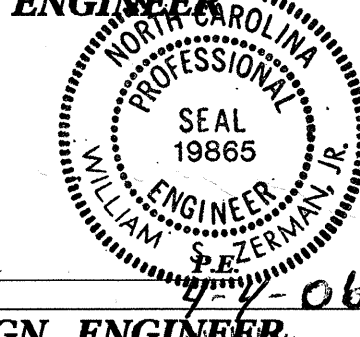
RIGHT OF WAY DATE:  
February 18, 2005

LETTING DATE:  
June 20, 2006

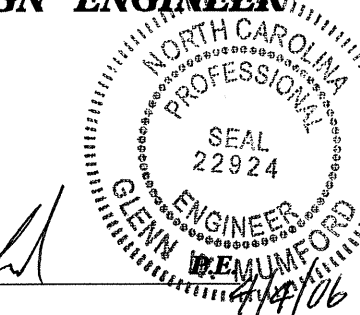
**GLENN W. MUMFORD, P.E.**  
PROJECT ENGINEER

**JEFFREY L. TEAGUE, E.I.**  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

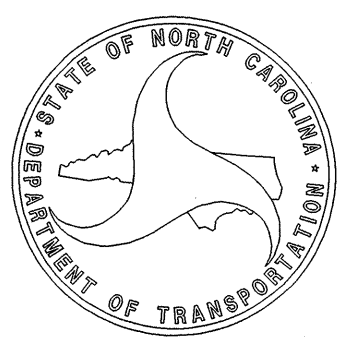


*W. Szezman*  
SIGNATURE  
ROADWAY DESIGN ENGINEER



*G. W. Mumford*  
SIGNATURE

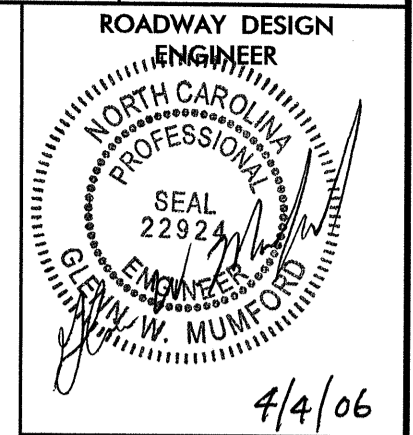
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA



*Jeffrey L. Teague*  
STATE HIGHWAY DESIGN ENGINEER

08-MAR-2006 10:30  
F:\ogdway\pco\14113\_rdy\_tsh.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

CONTRACT: C201444



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-A THROUGH 2-D	DETAILS OF REINFORCED BRIDGE APPROACH FILLS
2-E THROUGH 2-H	DETAILS OF GUARDRAIL INSTALLATION
2-I THROUGH 2-K	DETAILS OF STRUCTURE ANCHOR UNITS
2-L	DETAIL FOR CONCRETE BRIDGE APPROACH DROP INLET
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES AND GUARDRAIL SUMMARY
3-B	SUMMARY OF EARTHWORK AND REMOVAL OF EXISTING ASPHALT PAVEMENT
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THROUGH TCP-5	TRAFFIC CONTROL PLANS
EC-1 THROUGH EC-5	EROSION CONTROL PLANS
UO-1 THROUGH UO-2	UTILITIES BY OTHERS PLANS
X-A	CROSS-SECTION SUMMARY
X-1 THROUGH X-8	CROSS-SECTIONS
S-1 THROUGH S-22	STRUCTURE PLANS

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

**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 II.  
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.

**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 WAKE EMC AND SPRINT.  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

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

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
<b>DIVISION 2 - EARTHWORK</b>	
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
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
820.04	Drain Installation in Shoulder Berm Gutter
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Median Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Median Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete
840.27	Brick Median Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Median Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
862.01	Guardrail Placement
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### 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	---WLB---
Proposed Wetland Boundary	---WLB---
Existing High Quality Wetland Boundary	---HQ WLB---
Existing Endangered Animal Boundary	---EAB---
Existing Endangered Plant Boundary	---EPB---

### 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	-----
River Basin Buffer	---RBB---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Swamp Marsh	⊗
Proposed Lateral, Tail, Head Ditch	-----
False Sump	▽

### 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 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 Utility Easement	-----

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	Ⓜ
Curb Cut for Future Wheel Chair Ramp	Ⓜ
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊞

### VEGETATION:

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

### 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	●
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊙
Telephone Booth	⊞
Telephone Pedestal	⊞
Telephone Cell Tower	⊞
U/G Telephone Cable Hand Hole	⊞
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

### WATER:

Water Manhole	⊙
Water Meter	⊙
Water Valve	⊙
Water Hydrant	⊙
Recorded U/G Water Line	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	-----

### TV:

TV Satellite Dish	⊞
TV Pedestal	⊞
TV Tower	⊞
U/G TV Cable Hand Hole	⊞
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

### GAS:

Gas Valve	◇
Gas Meter	⊞
Recorded U/G Gas Line	-----
Designated U/G Gas Line (S.U.E.*)	-----
Above Ground Gas Line	-----

### SANITARY SEWER:

Sanitary Sewer Manhole	⊙
Sanitary Sewer Cleanout	⊙
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

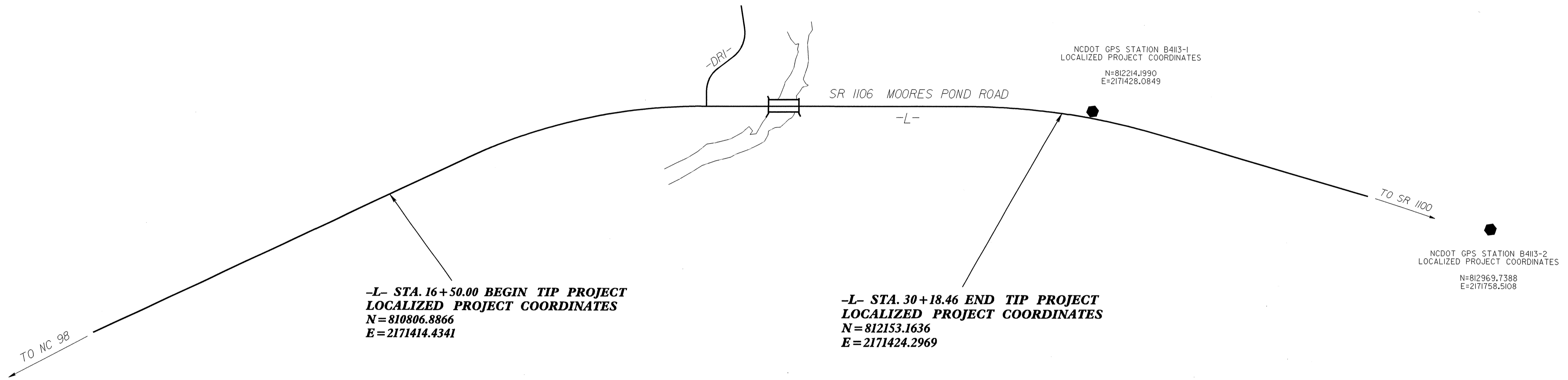
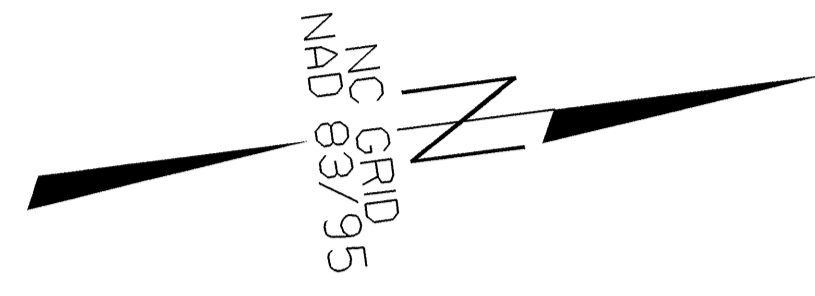
### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	⊞
Utility Located Object	○
Utility Traffic Signal Box	⊞
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	⊞
A/G Tank; Water, Gas, Oil	⊞
U/G Test Hole (S.U.E.*)	⊞
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

5/28/06/22 v

PROJECT REFERENCE NO.	SHEET NO.
B-4113	I-C
Location and Surveys	

# SURVEY CONTROL SHEET B-4113



**-L- STA. 16+50.00 BEGIN TIP PROJECT LOCALIZED PROJECT COORDINATES**  
**N = 810806.8866**  
**E = 2171414.4341**

**-L- STA. 30+18.46 END TIP PROJECT LOCALIZED PROJECT COORDINATES**  
**N = 812153.1636**  
**E = 2171424.2969**

NCDOT GPS STATION B4113-1  
 LOCALIZED PROJECT COORDINATES  
 N=812214.1990  
 E=2171428.0849

NCDOT GPS STATION B4113-2  
 LOCALIZED PROJECT COORDINATES  
 N=812969.7388  
 E=2171758.5108

**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4113-1"  
 WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 812214.1991(EFF) EASTING: 2171428.0849(EFF)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994073  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4113-1" TO -L- STATION 10+00.00 IS  
 S 5°10'47.08" E 2034.93  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3		810661.5800	2171445.2660	388.62	15+02.19	14.74 LT
4	BL-4		811020.2610	2171333.0450	371.25	18+77.35	14.07 LT
5	BL-5		811650.7100	2171331.5770	346.71	25+07.64	14.19 LT
1	B4113-1		812214.1991	2171428.0849	370.30	30+77.71	13.91 LT
2	B4113-2		812969.7389	2171758.5108	385.05		OUTSIDE PROJECT LIMITS

.....  
 100 ELEVATION = 343.51  
 N 811638 E 2171383  
 L STATION 25+02.38 RIGHT  
 R/R SPIKE IN 11" PINE  
 .....  
 101 ELEVATION = 383.74  
 N 810491 E 2171562  
 L STATION 13+05.44 RIGHT  
 R/R SPIKE IN 12" MAPLE  
 .....

**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)  
 THE FILES TO BE FOUND ARE AS FOLLOWS  
 B4113\_LS\_CONTROL\_040708.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.

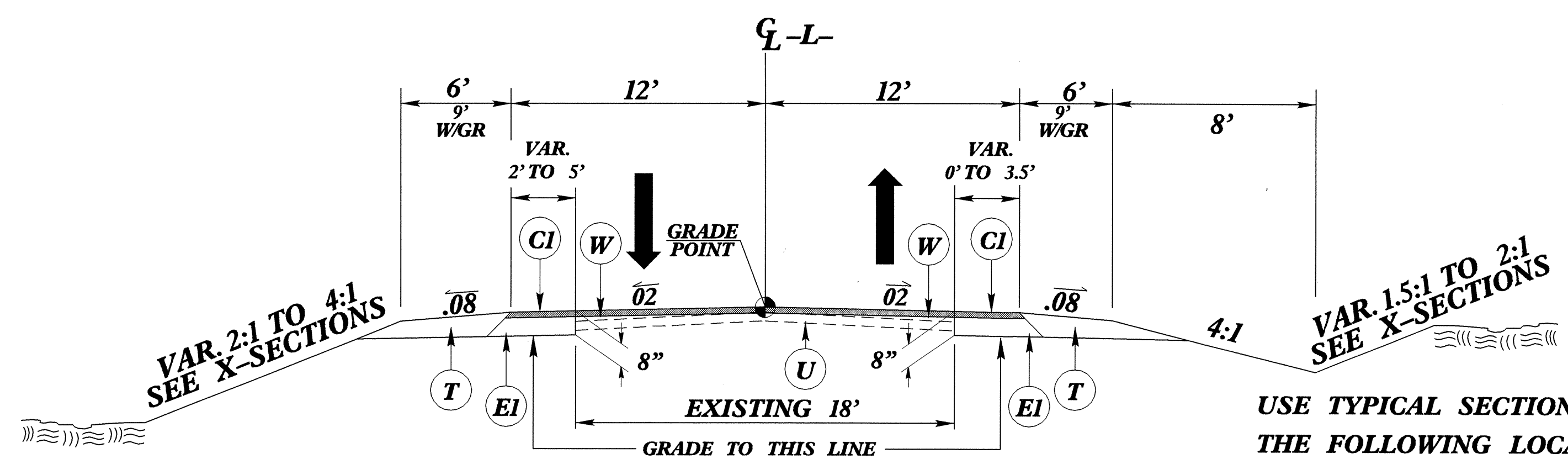
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NOTE: DRAWING NOT TO SCALE

08-MAR-2006 10:30  
 R:\Roadway\p\4113\1s\1c\_040708.dgn  
 kmw\gms

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1 1/2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS).

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



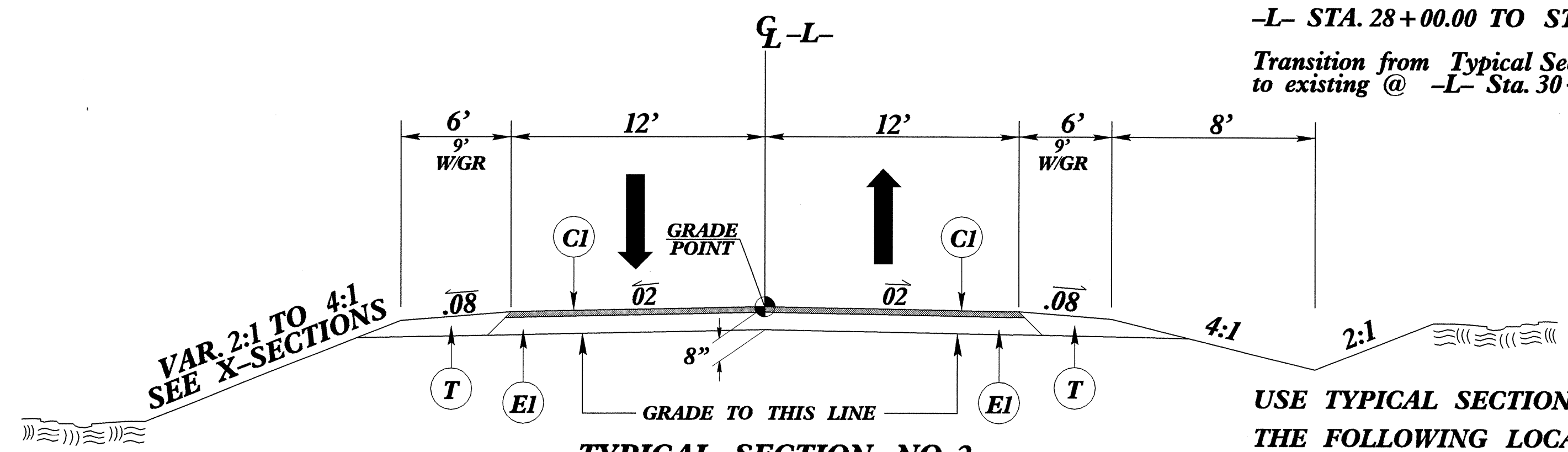
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS:

Transition from existing @ -L- Sta. 16+50.00 to Typical Section No. 1 @ -L- Sta. 18+00.00

-L- STA. 18+00.00 TO STA. 23+25.00  
-L- STA. 28+00.00 TO STA. 28+68.46

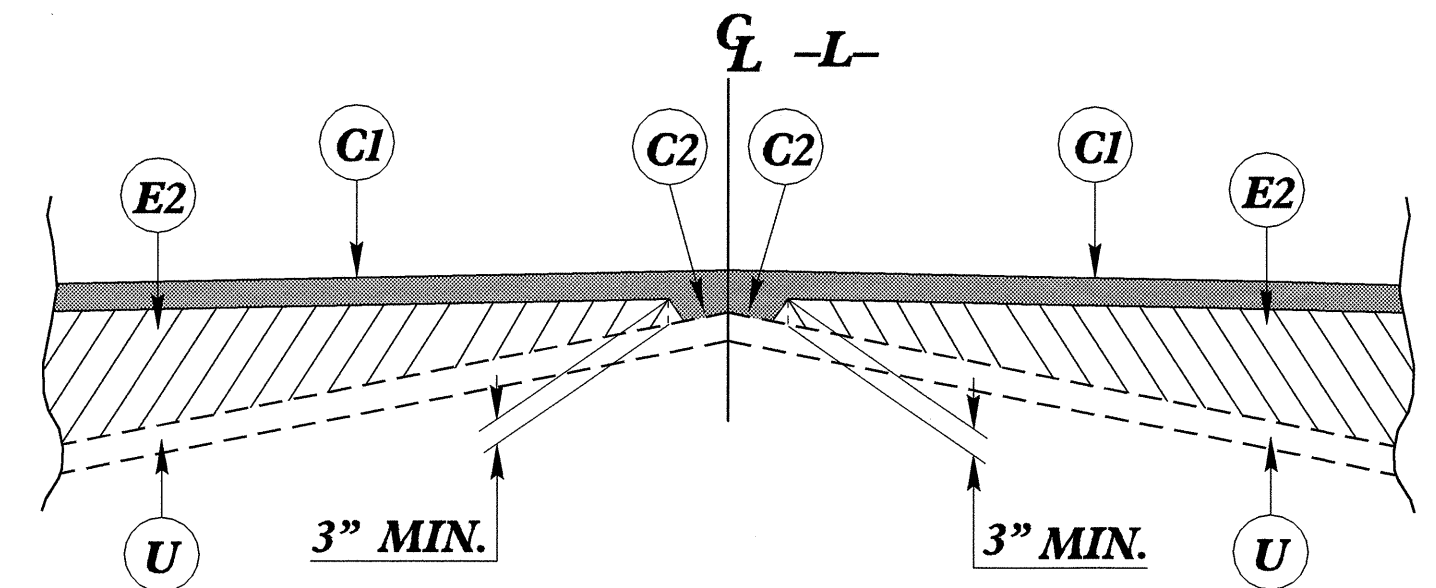
Transition from Typical Section No. 1 @ -L- Sta. 28+68.46 to existing @ -L- Sta. 30+18.46



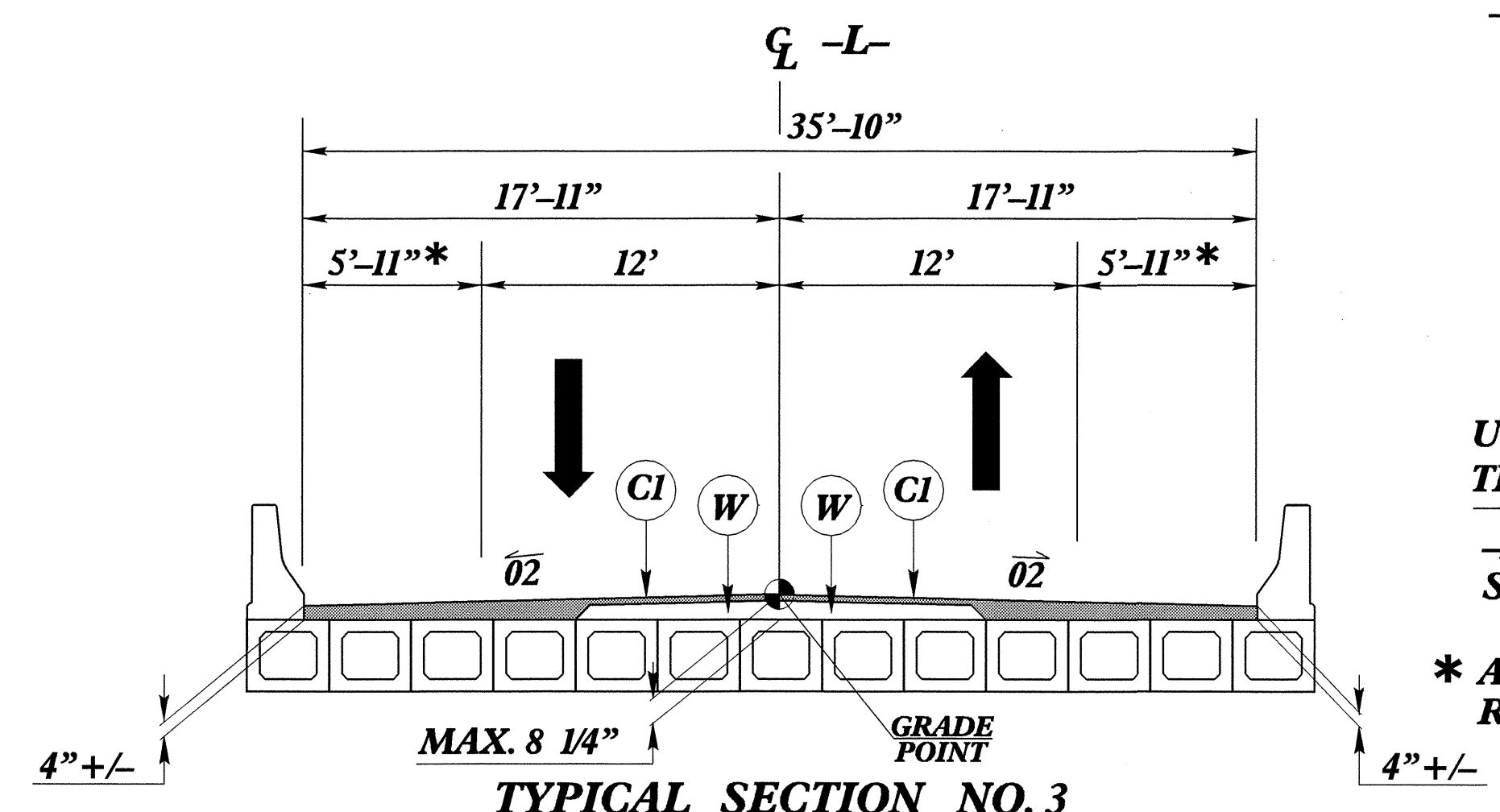
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AT THE FOLLOWING LOCATIONS:

-L- STA. 23+25.00 TO STA. 23+90.00 (BEGIN BRIDGE)  
-L- STA. 25+25.00 (END BRIDGE) TO STA. 28+00.00



DETAIL SHOWING METHOD OF WEDGING  
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

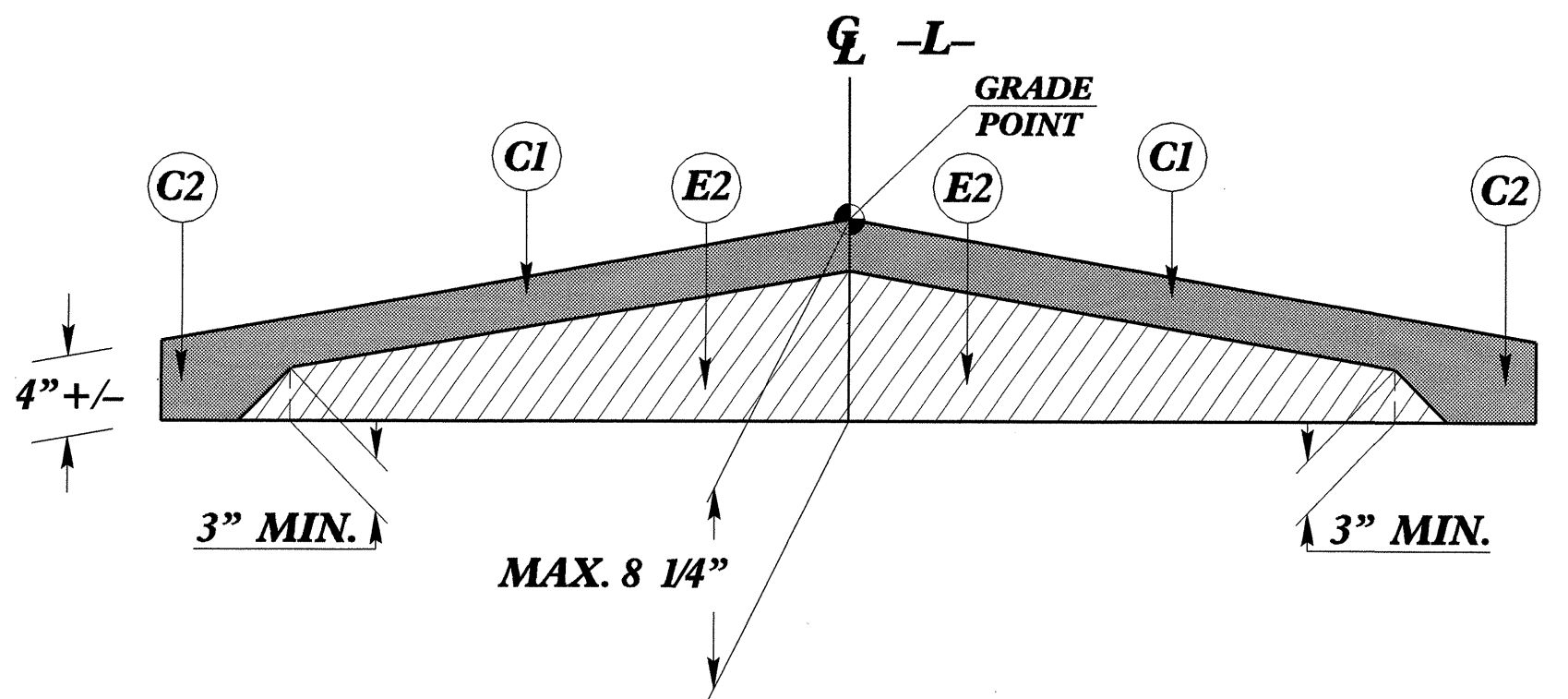


TYPICAL SECTION NO. 3  
BOX BEAM BRIDGE  
SEE STRUCTURE PLANS

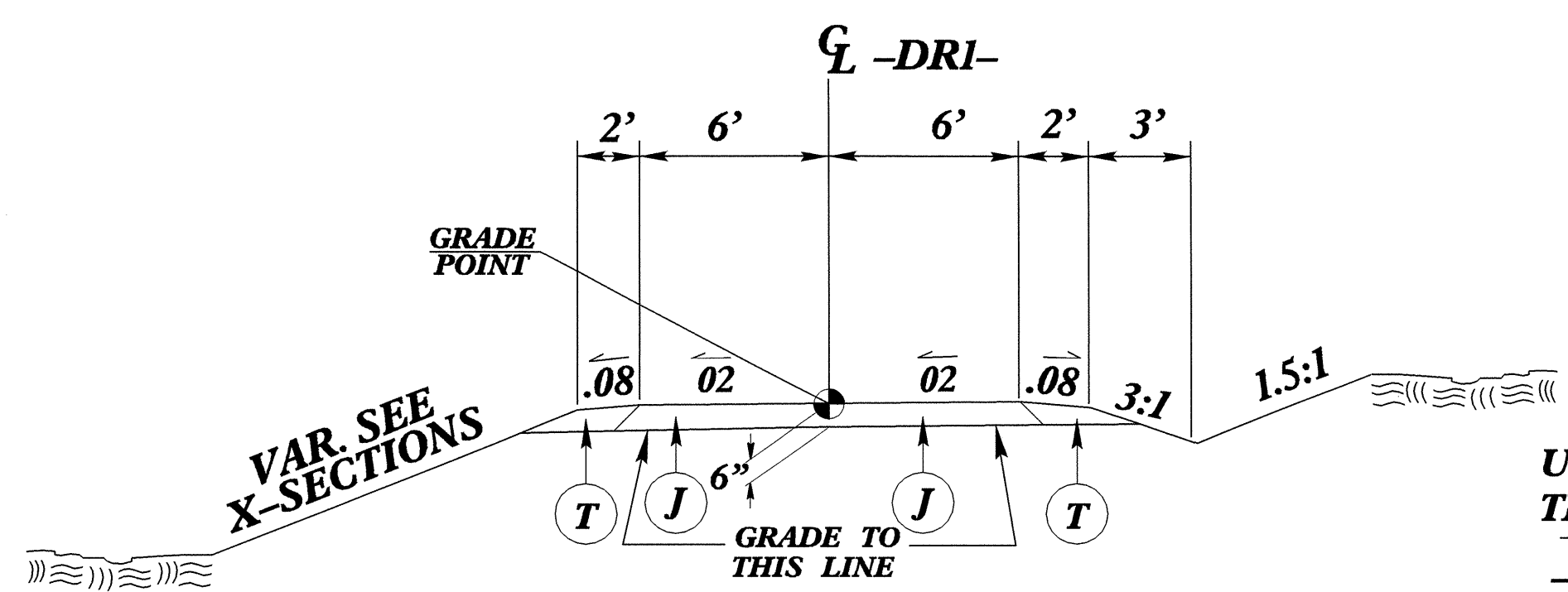
USE TYPICAL SECTION NO. 3 AT THE FOLLOWING LOCATION:

-L- STA. 23+90.00 (BEGIN BRIDGE) TO STA. 25+25.00 (END BRIDGE)

\* ADDITIONAL BRIDGE OFFSET WIDTH REQUIRED FOR HYDRAULIC DESIGN



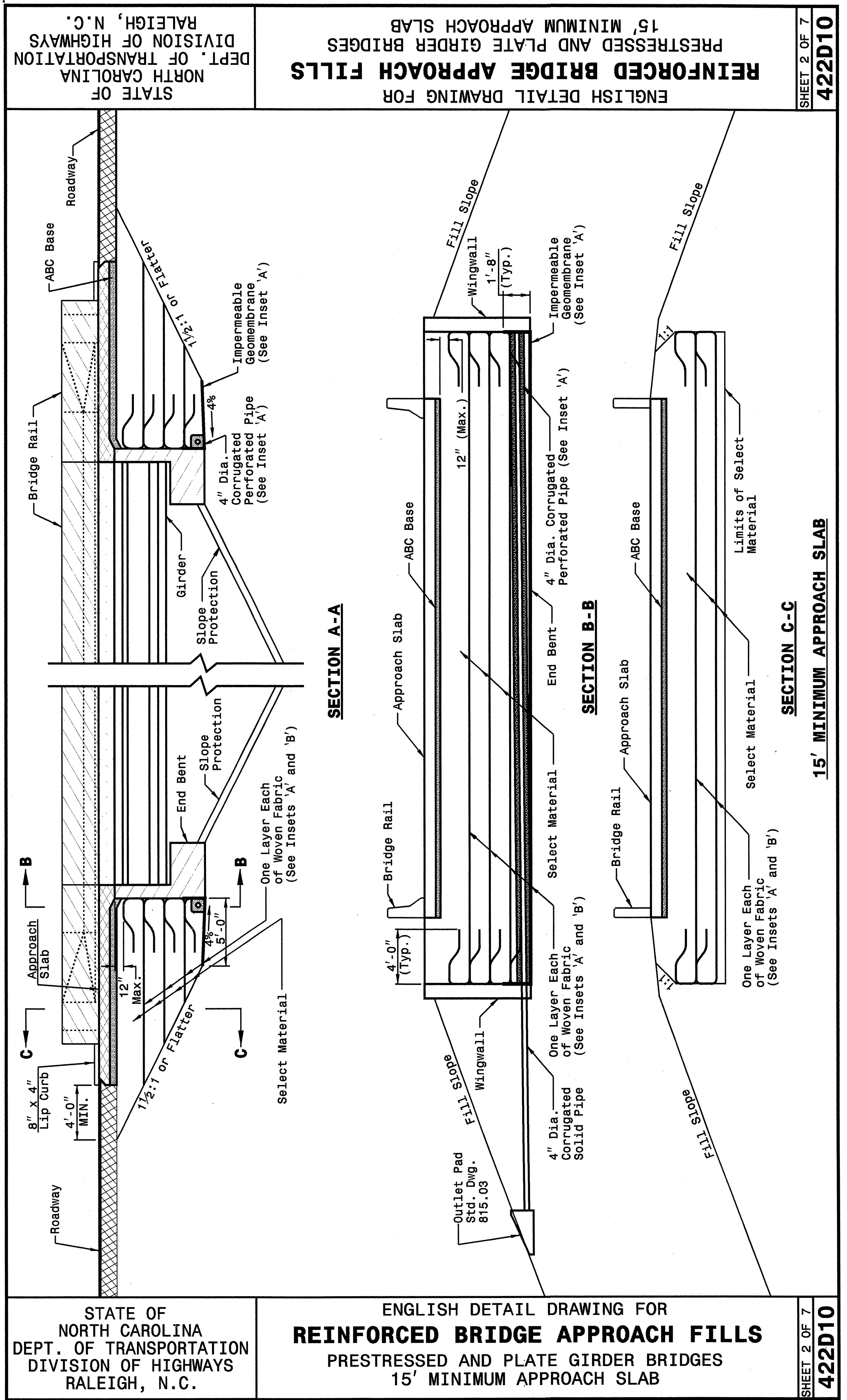
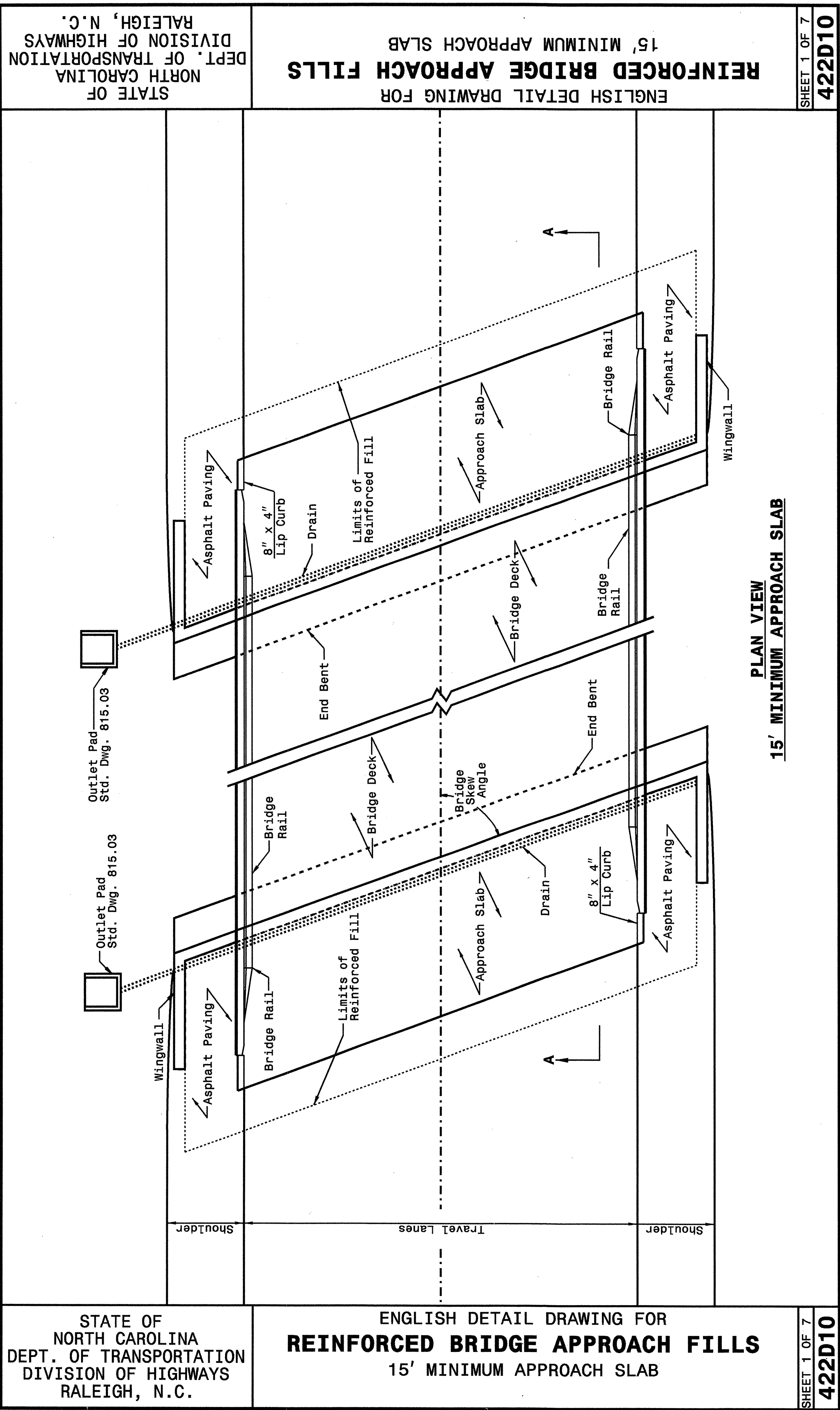
DETAIL SHOWING METHOD OF WEDGING ON BRIDGE  
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 AT THE FOLLOWING LOCATION:

-DRI- STA. 10+00.00 TO STA. 12+18.48



20-SEP-2005 08:31  
 S:\Contractors\Special Details\enr\stds\422D10\0422d10.dgn  
 422D10

James Hunt  
 4/5/06

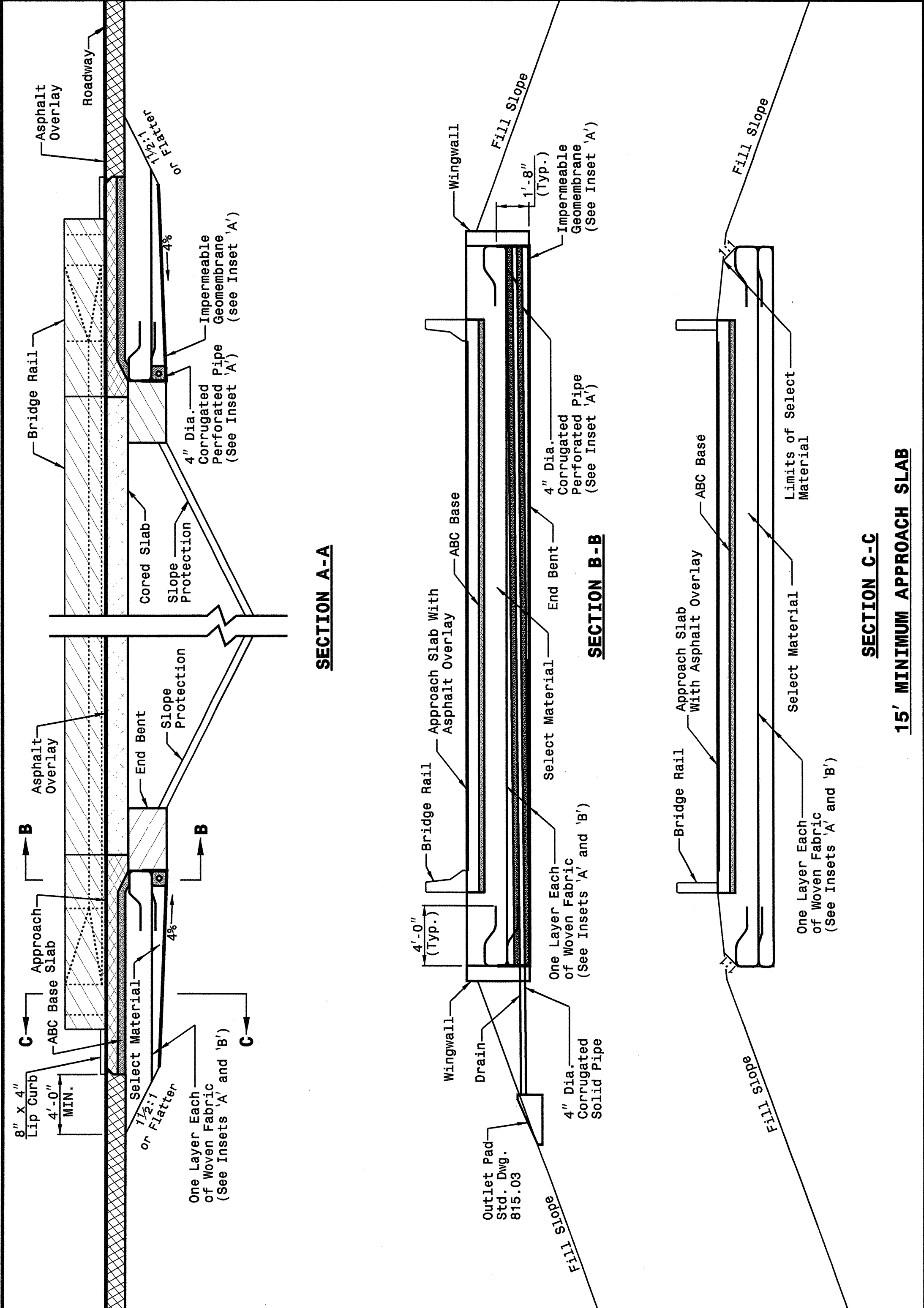
**PROJECT SERVICES UNIT**  
**STANDARDS AND SPECIAL DESIGN**  
 Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
 MODIFIED BY: F.E. WARD DATE: 09-12-05  
 CHECKED BY: *James Hunt* DATE: 4/20/06  
 FILE SPEC.: S:\02stdstodetails\enr\422d10

20-SEP-2005 10:36 S:\Contracts\02stds\stds\02stds\02stds\042210\0422d10.dgn ericward AT P52223

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

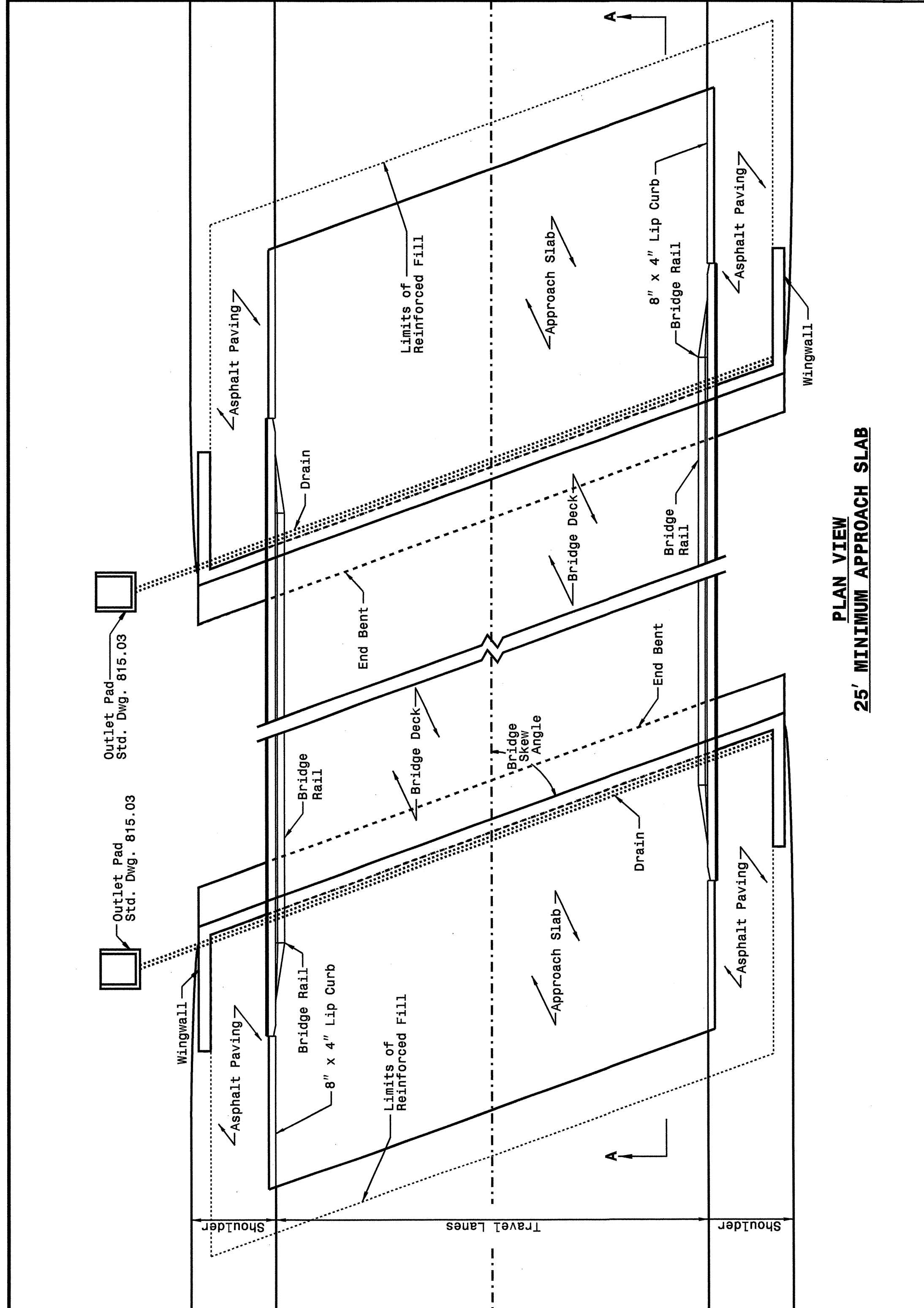


ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
CORED SLAB BRIDGES  
15' MINIMUM APPROACH SLAB  
SHEET 3 OF 7  
**422D10**

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

ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
CORED SLAB BRIDGES  
15' MINIMUM APPROACH SLAB  
SHEET 3 OF 7  
**422D10**

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



ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
25' MINIMUM APPROACH SLAB  
SHEET 4 OF 7  
**422D10**

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

ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
25' MINIMUM APPROACH SLAB  
SHEET 4 OF 7  
**422D10**



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

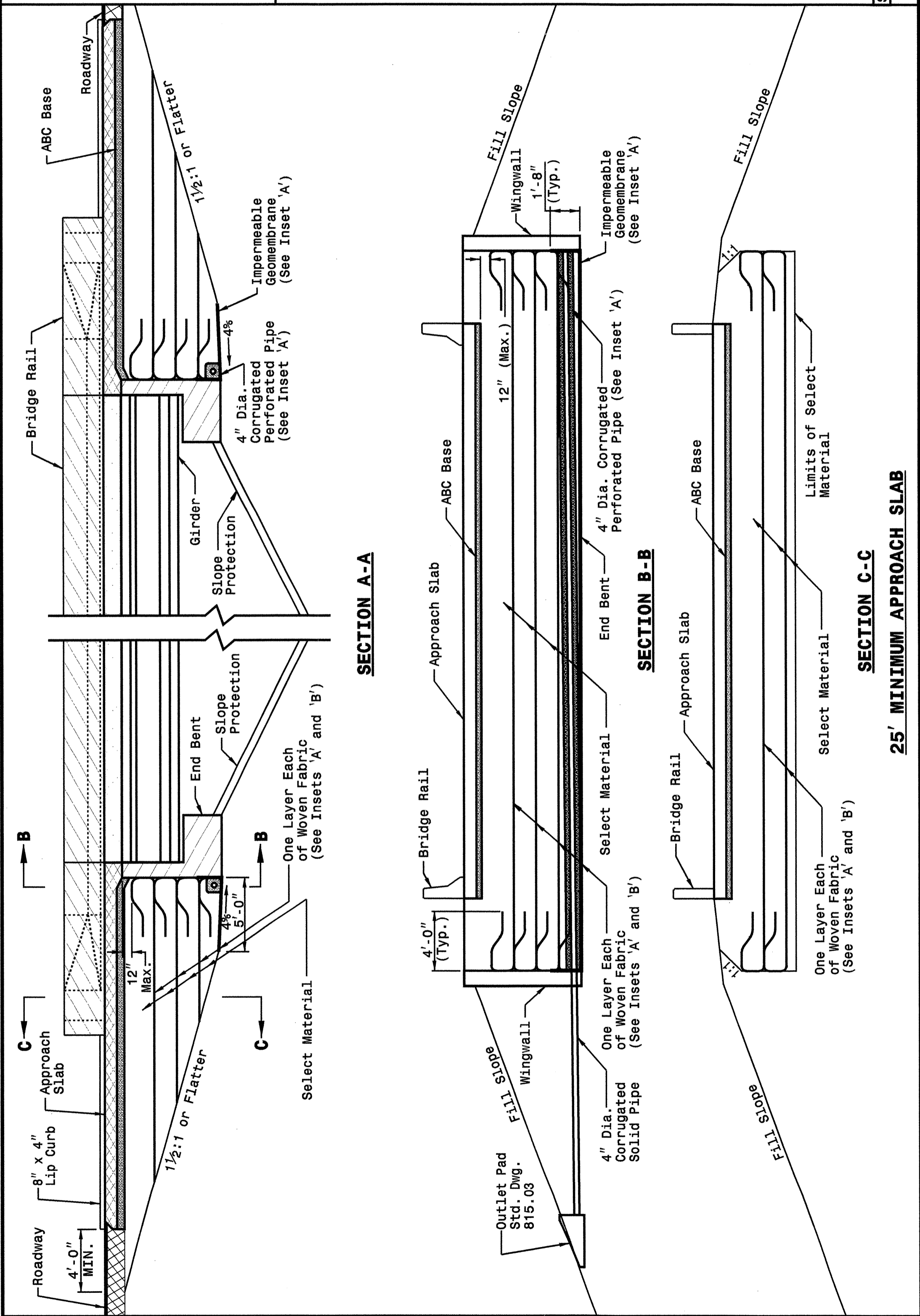
**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
MODIFIED BY: E.E. WARD DATE: 09-12-05  
CHECKED BY: Eric Ward DATE: 9/20/05  
FILE SPEC: 02stds\02stdsdetails/english\422d10.dgn

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

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

SHEET 5 OF 7  
**422D10**



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

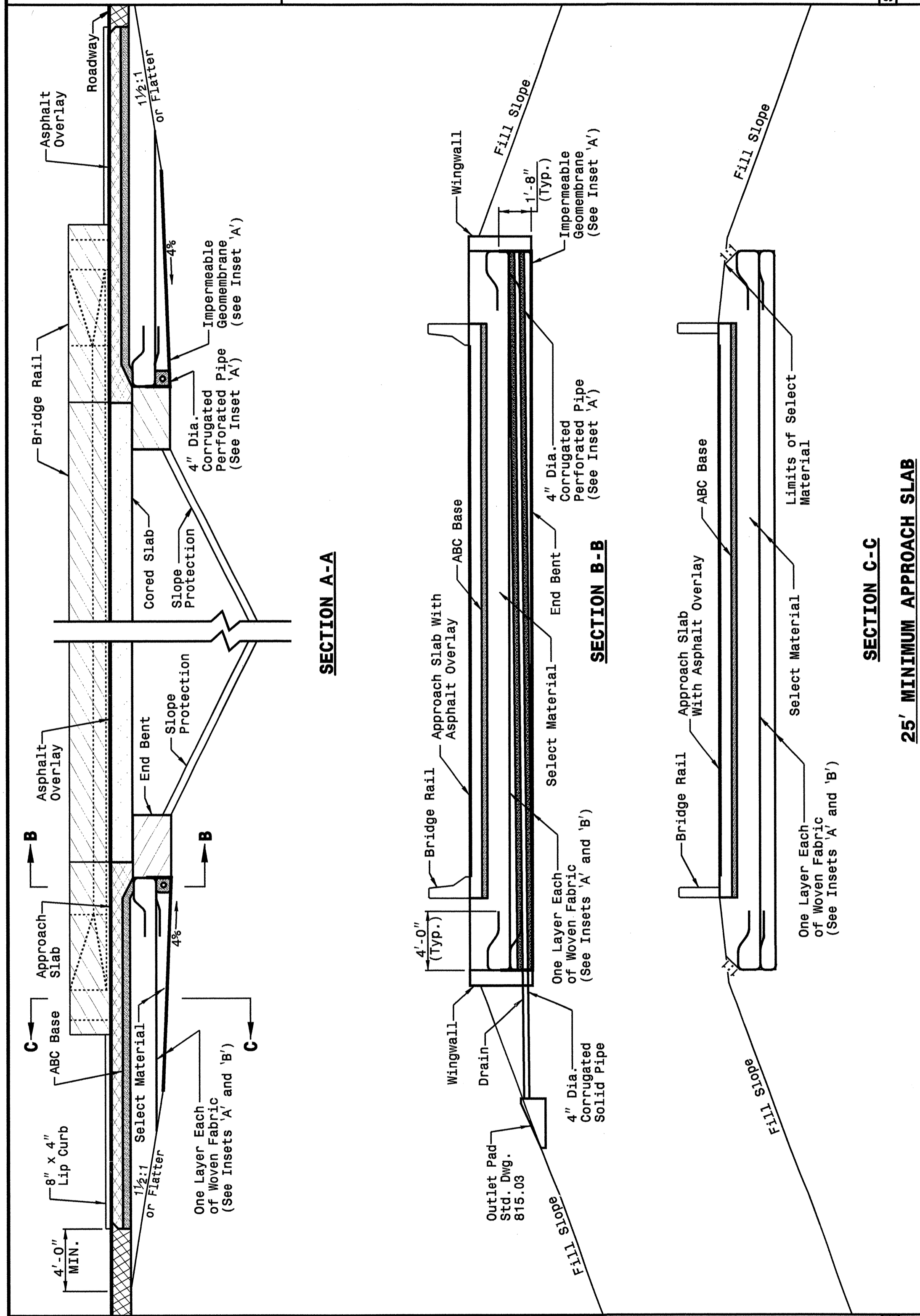
ENGLISH DETAIL DRAWING FOR  
REINFORCED BRIDGE APPROACH FILLS  
PRESTRESSED AND PLATE GIRDER BRIDGES  
25' MINIMUM APPROACH SLAB

SHEET 5 OF 7  
**422D10**

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

ENGLISH DETAIL DRAWING FOR  
CORED SLAB BRIDGES  
25' MINIMUM APPROACH SLAB

SHEET 6 OF 7  
**422D10**

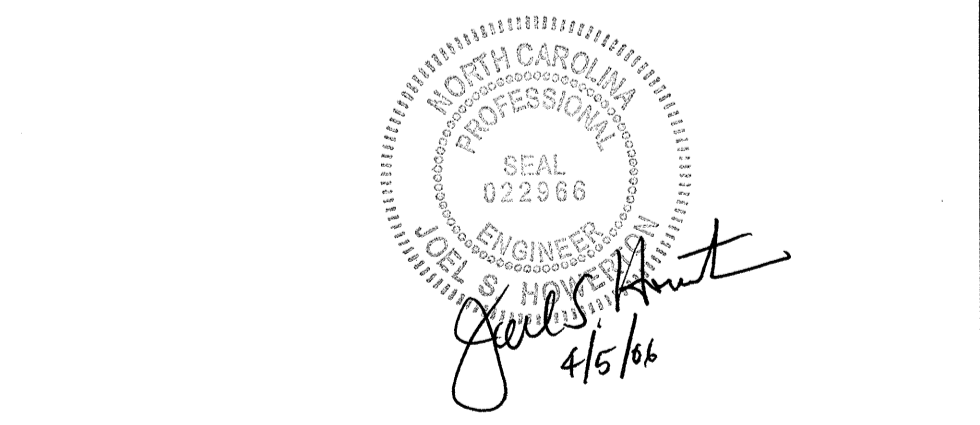


STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

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

SHEET 6 OF 7  
**422D10**

20-SEP-2005 08:49  
S:\Contracts\2005\stds\stds\02\stds to Special Details/english\422D10\0422d10.dgn  
ericward AT P5222593



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

**SEE PLATE FOR TITLE**

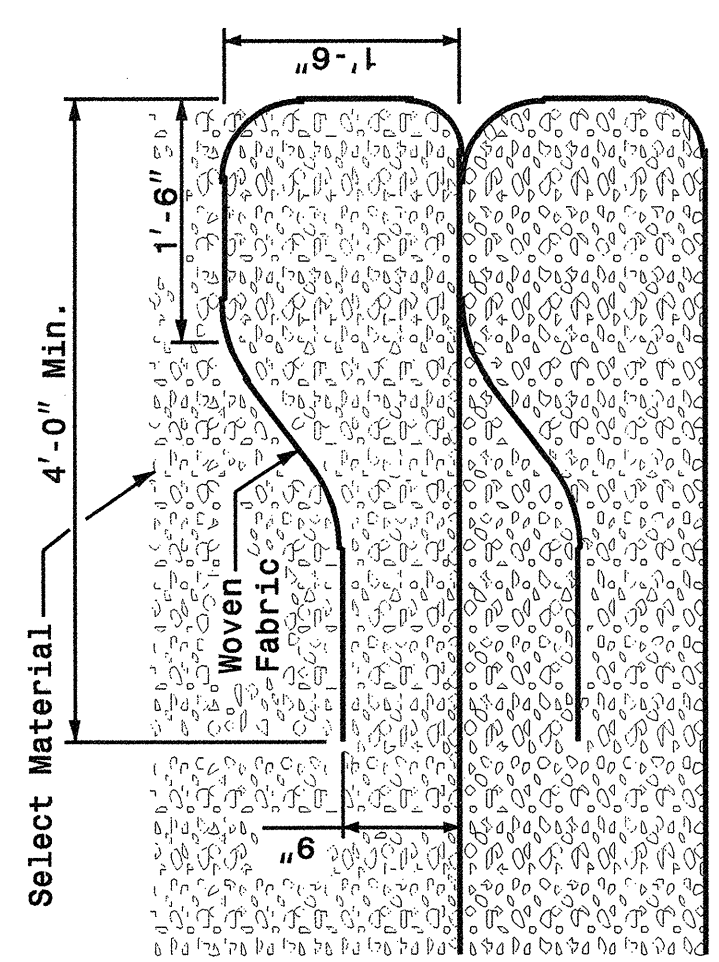
ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
 MODIFIED BY: E.E. WARD DATE: 09-12-05  
 CHECKED BY: *Paul S. Hunt* DATE: 9/20/05  
 FILE SPEC.: stds/02stdstodetails/english/422d10.dgn



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

ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
INSETS AND CHARTS

SHEET 7 OF 7  
**422D10**



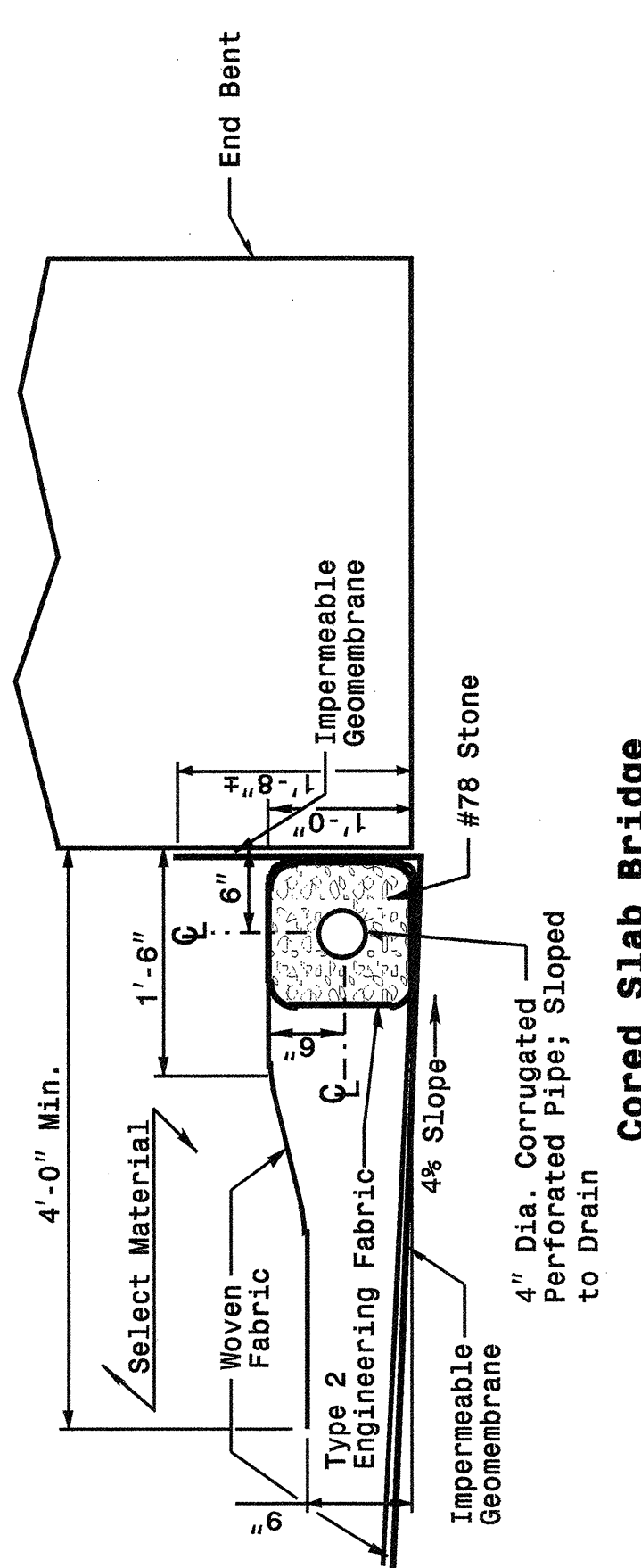
**Typical Fabric Lift and Wrap**  
Showing Second and Above Lifts

**Inset 'B'**

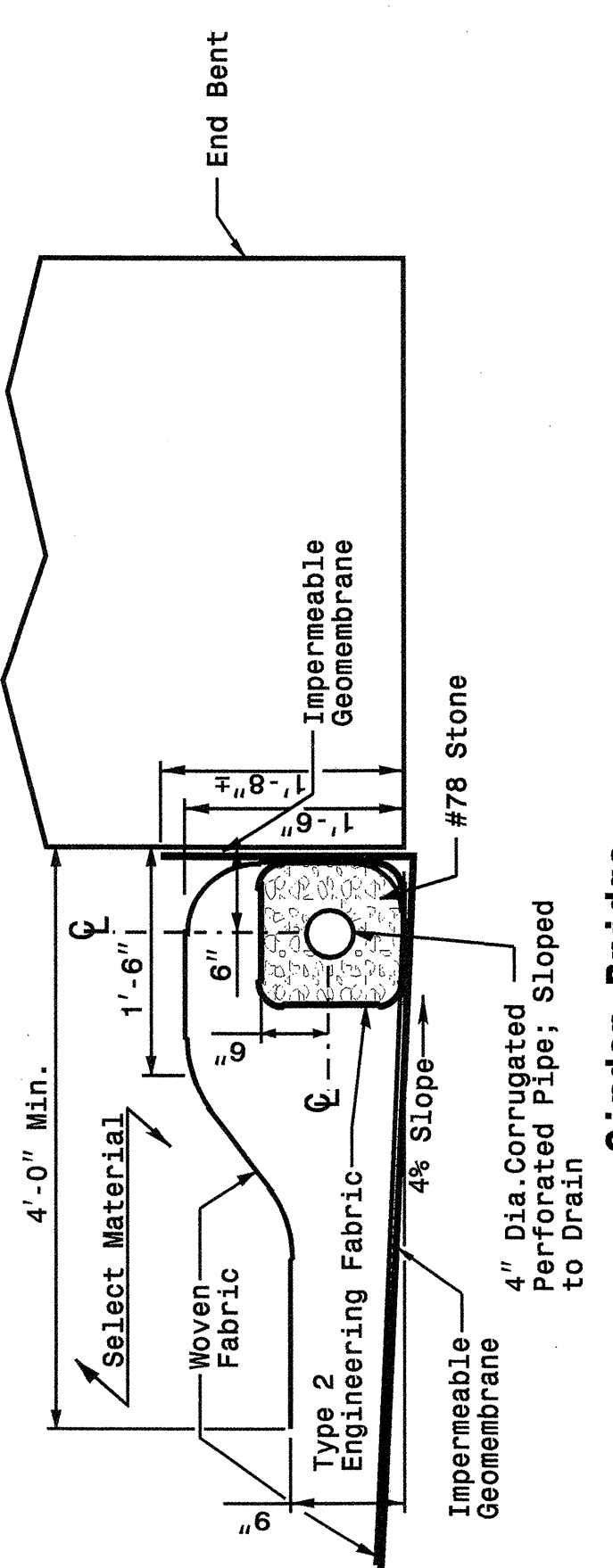
Height of Backwall	Number of Fabric Layers
4'-6" - 5'-9"	3
5'-10" - 7'-2"	4
7'-3" - 8'-8"	5
8'-9" - 10'-1"	6
10'-2" - 11'-8"	7

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°:  
(Roadway Width + 7'-0") / Sin (Bridge Skew Angle) = Dis. Between Wingwalls  
If Bridge Skew is Greater Than 90°:  
(Roadway Width + 7'-0") / Cos (Bridge Skew Angle - 90°) = Dis. Between Wingwalls



**Cored Slab Bridge**  
Showing First Lift and Drains



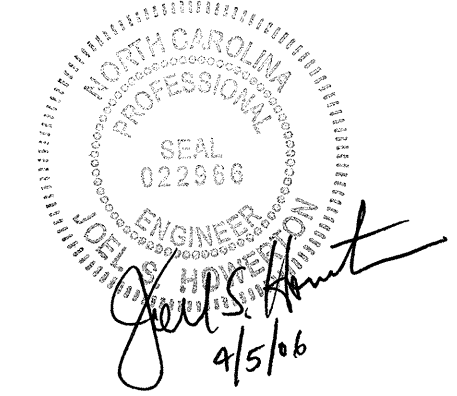
**Girder Bridge**  
Showing First Lift and Drains

**Inset 'A'**

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

ENGLISH DETAIL DRAWING FOR  
**REINFORCED BRIDGE APPROACH FILLS**  
INSETS AND CHARTS

SHEET 7 OF 7  
**422D10**



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

**SEE PLATE FOR TITLE**

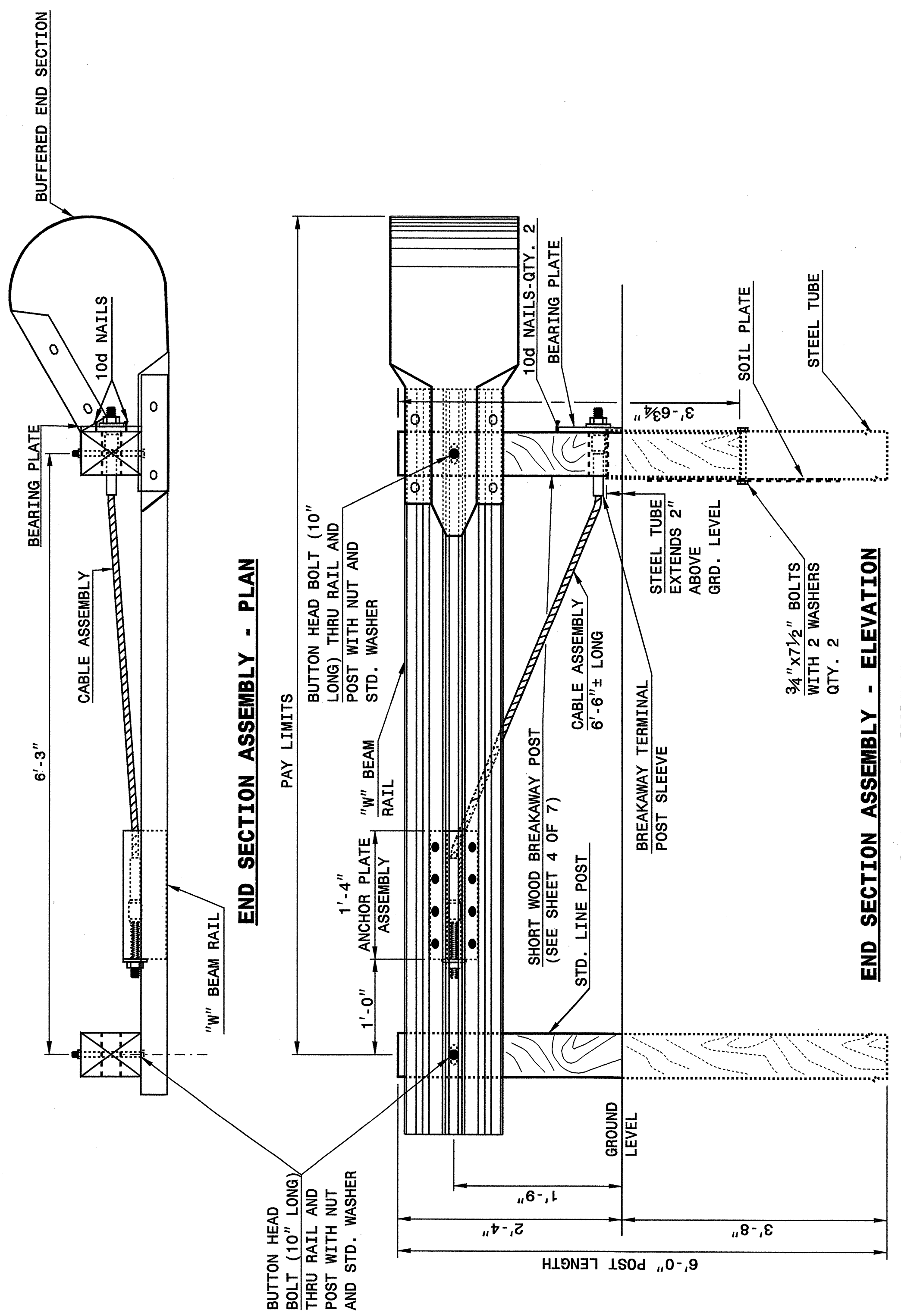
ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
MODIFIED BY: E.E. WARD DATE: 09-12-05  
CHECKED BY: *Joe S. Hunt* DATE: 9/20/05  
FILE SPEC.: s:\05\02stdstodetails/english\422d10.dgn

20-SEP-2005 08:49  
S:\Contracts\Contractors\Special Details\ward\stds\02\stds to Special Details/english\422d10\0422d10.dgn  
ward AT FSZ22243

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

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 1 OF 7  
862D02



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

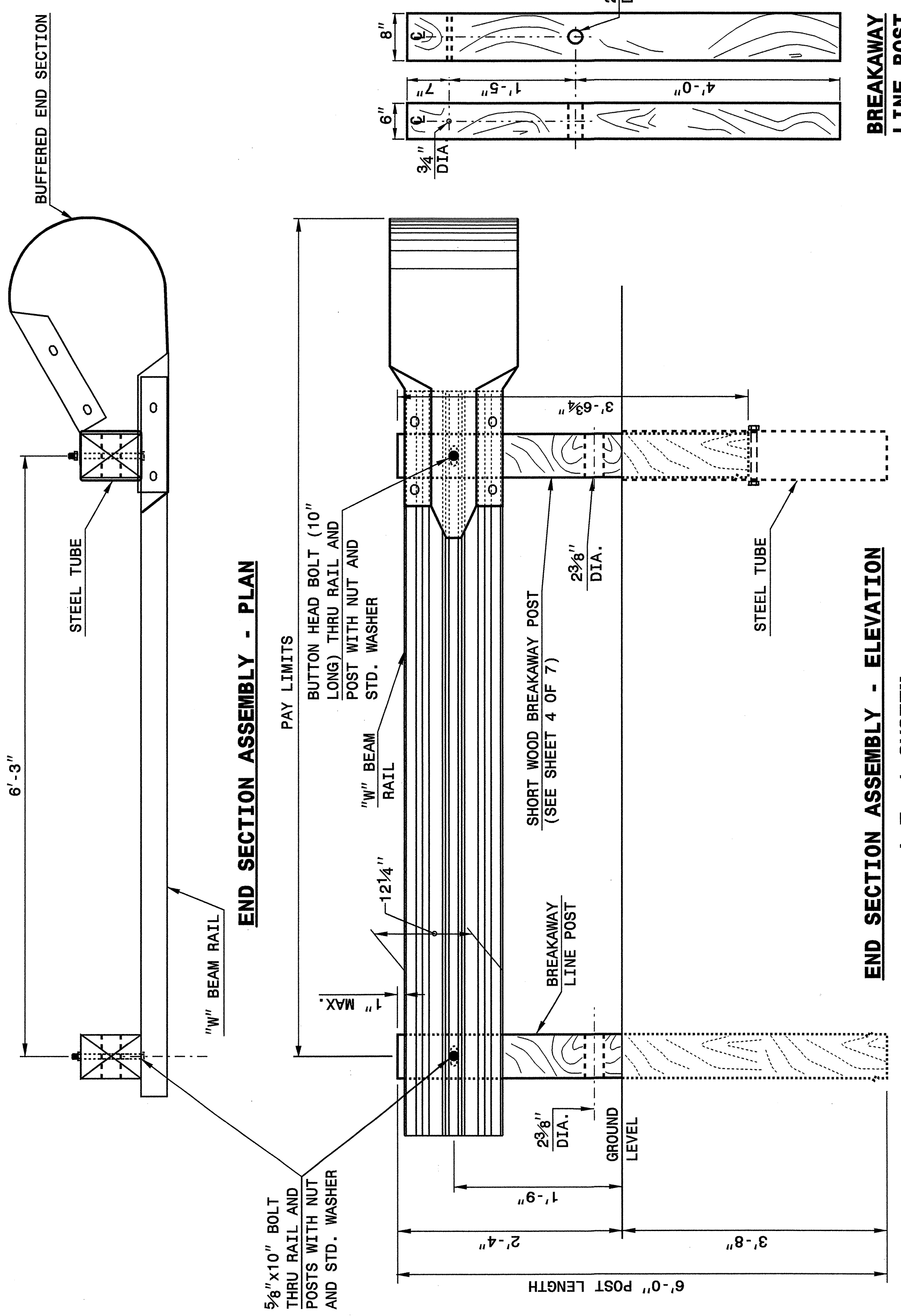
ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 1 OF 7  
862D02

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

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 2 OF 7  
862D02



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

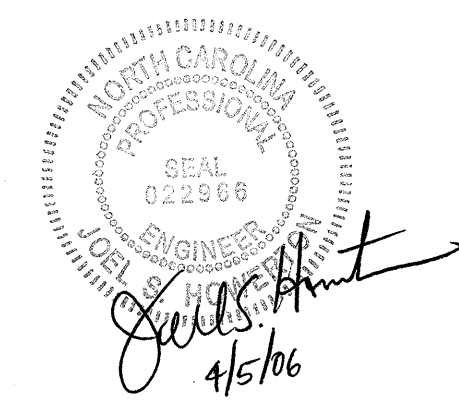
ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 2 OF 7  
862D02

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.862.02 DATE:  
MODIFIED BY: E.E. WARD DATE: 02-09-03  
CHECKED BY: DATE: 10/21/04  
FILE SPEC.: /usr/stds/02todetail/english/86202/862d02.dgn

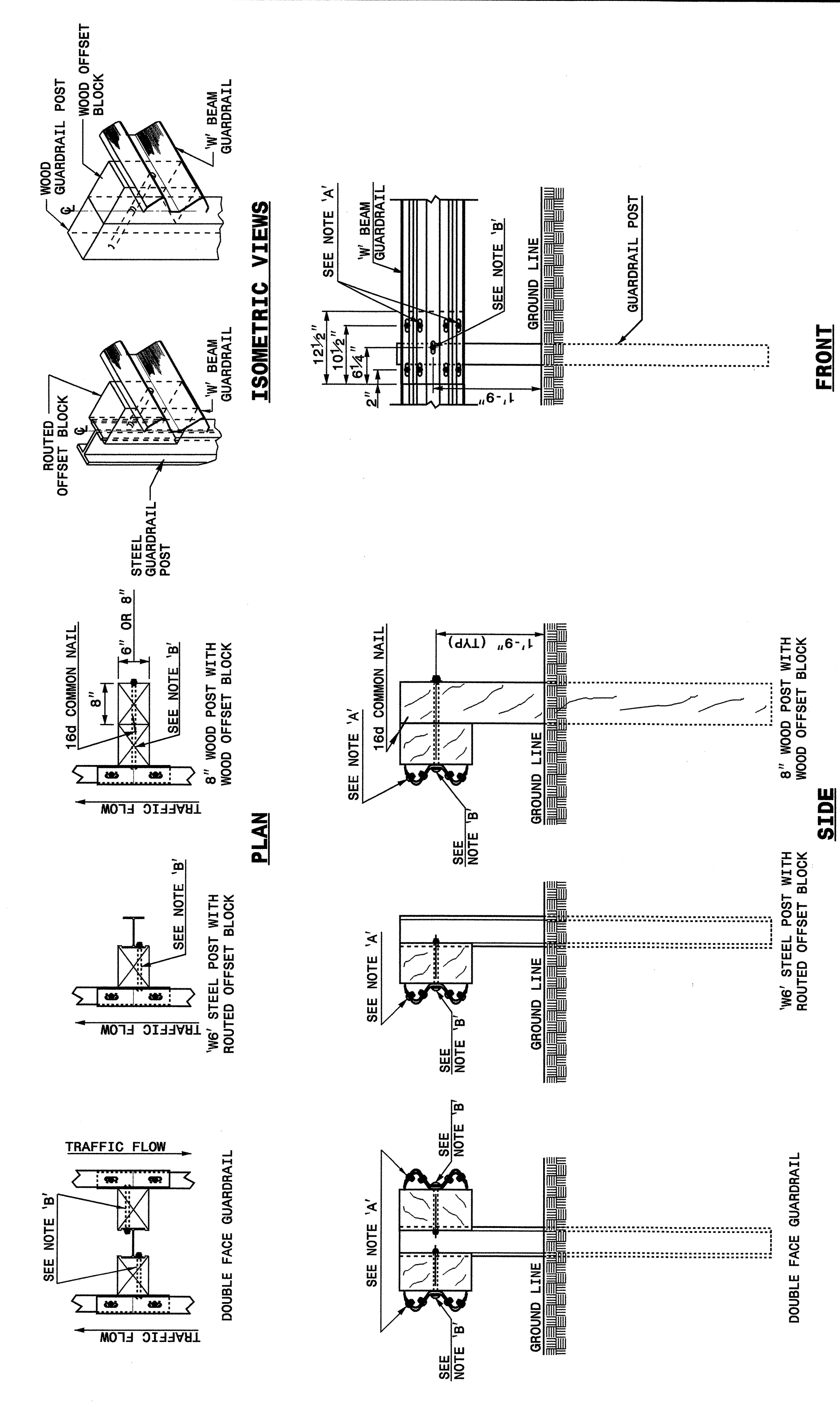


19-OCT-2004 11:38 AM C:\p01\Drawings\stds\02\stds\english\86202\0862d02.dgn

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

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SHEET 3 OF 7 862D02



**TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES**

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" / 9" LONG WITH NUT FOR BOLTING 6" / 8" ROUTED OFFSET BLOCK TO STEEL POSTS OR 5/8" 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.

SHEET 3 OF 7 862D02

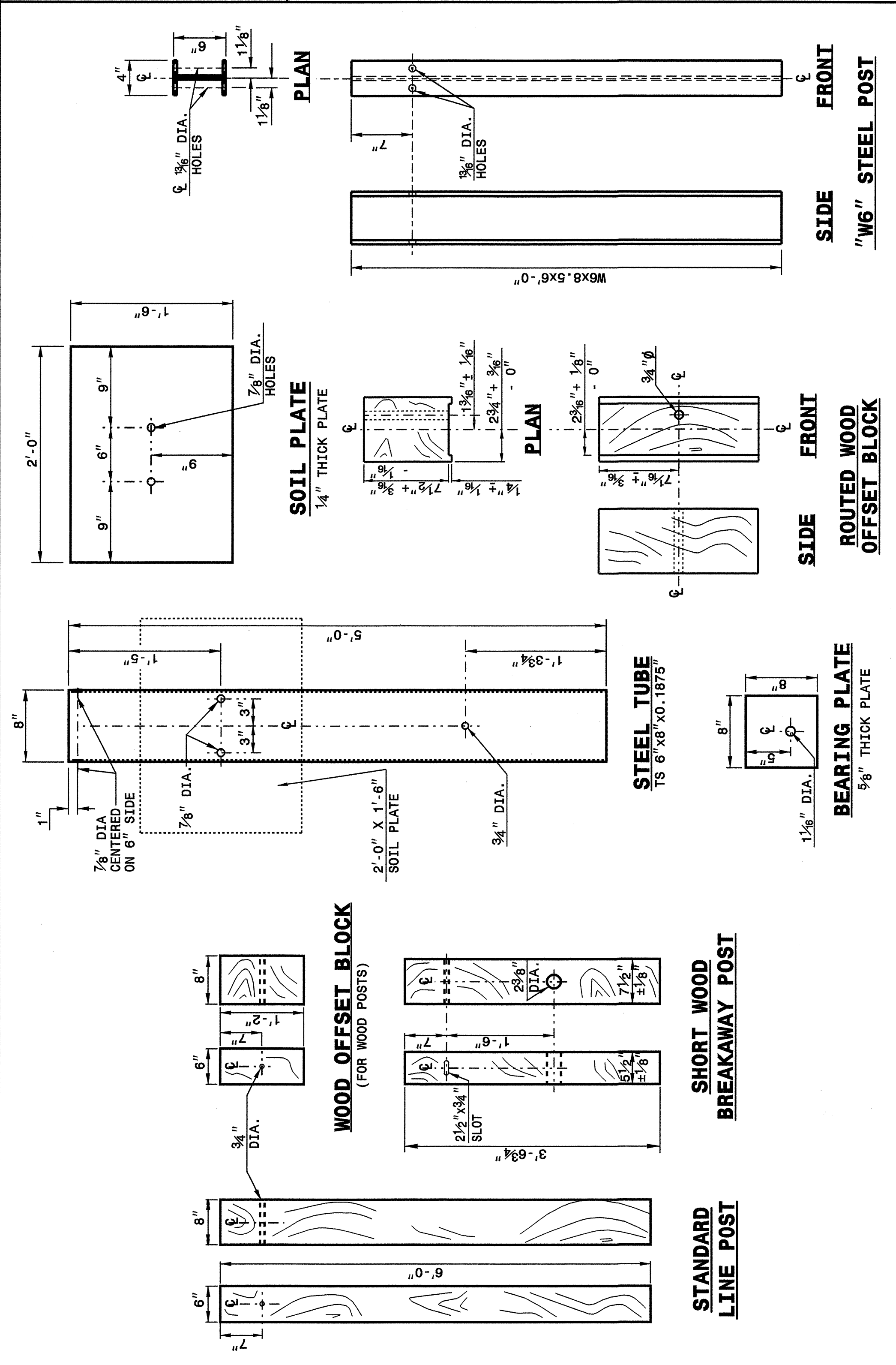
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

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

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SHEET 4 OF 7 862D02



SHEET 4 OF 7 862D02

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

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 862.02 DATE: 02-09-03  
 MODIFIED BY: F.E. WARD DATE: 10/2/04  
 CHECKED BY: DATE: 10/2/04  
 FILE SPEC.: /stds/02stdetail/eng1ish/86202/862d02.dgn

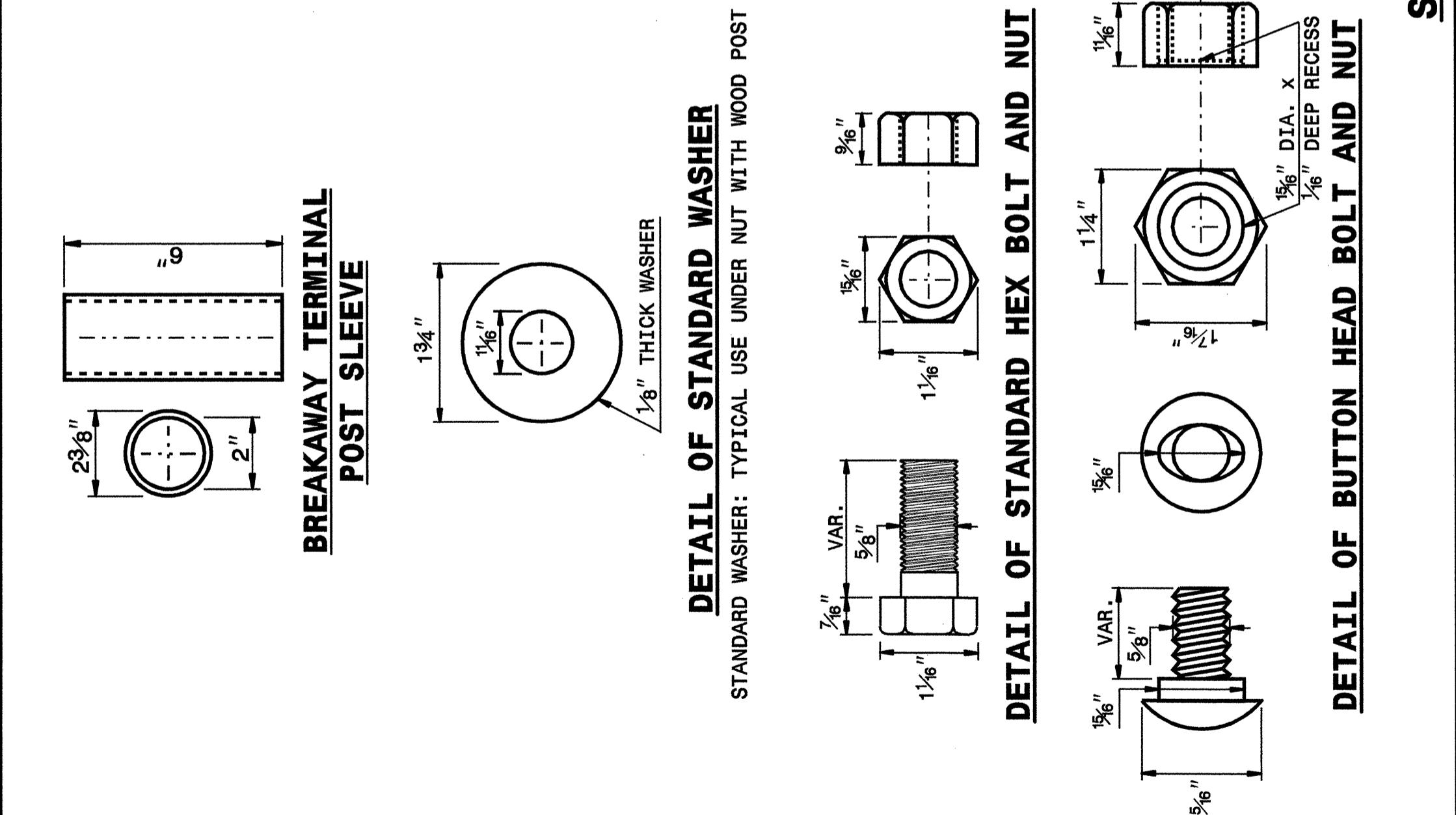
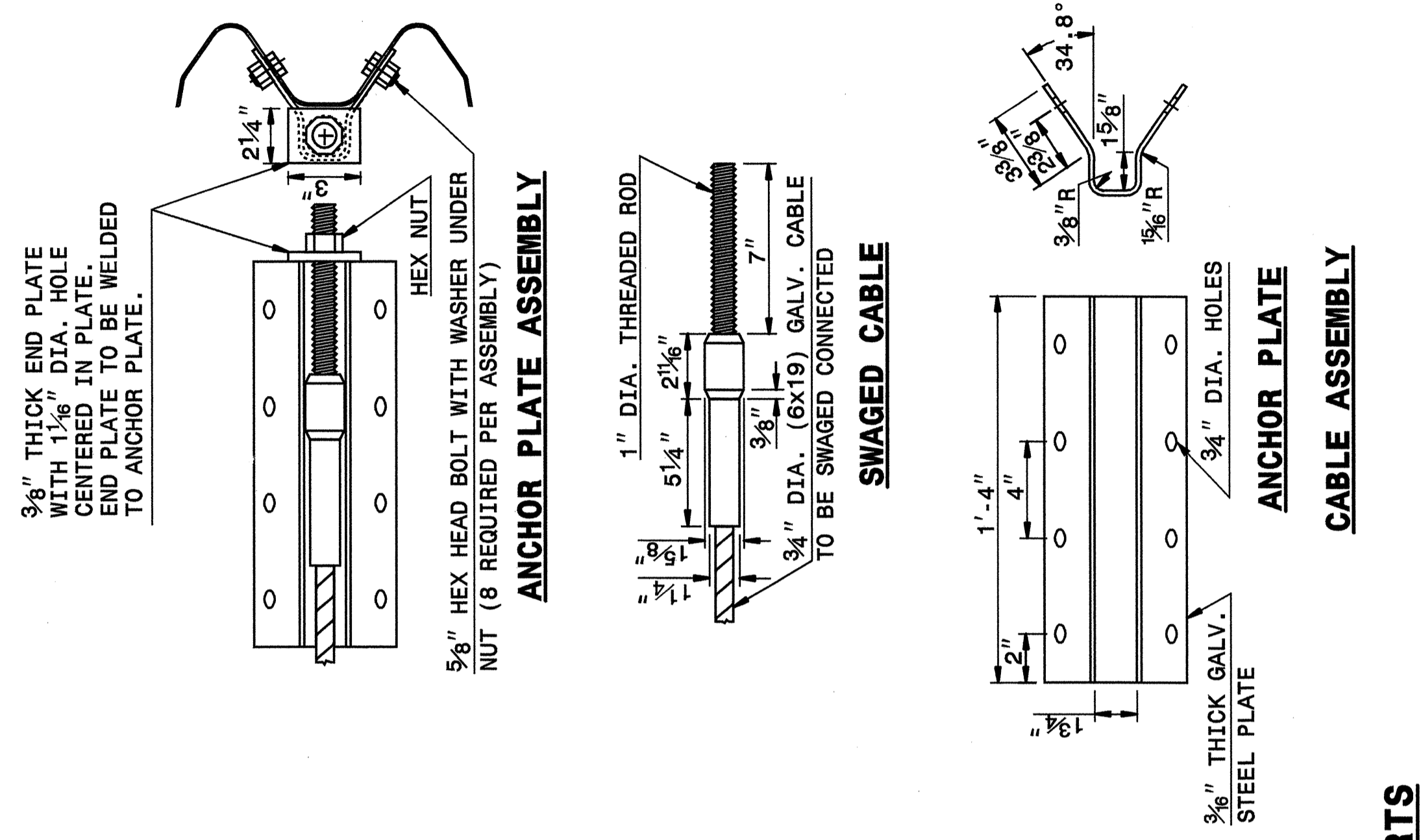


I:\9-00T-2004\1133\1\stds\eng\stds\02\stds to Special Details\english\86202\0862d02.dgn

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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 5 OF 7  
**862D02**



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

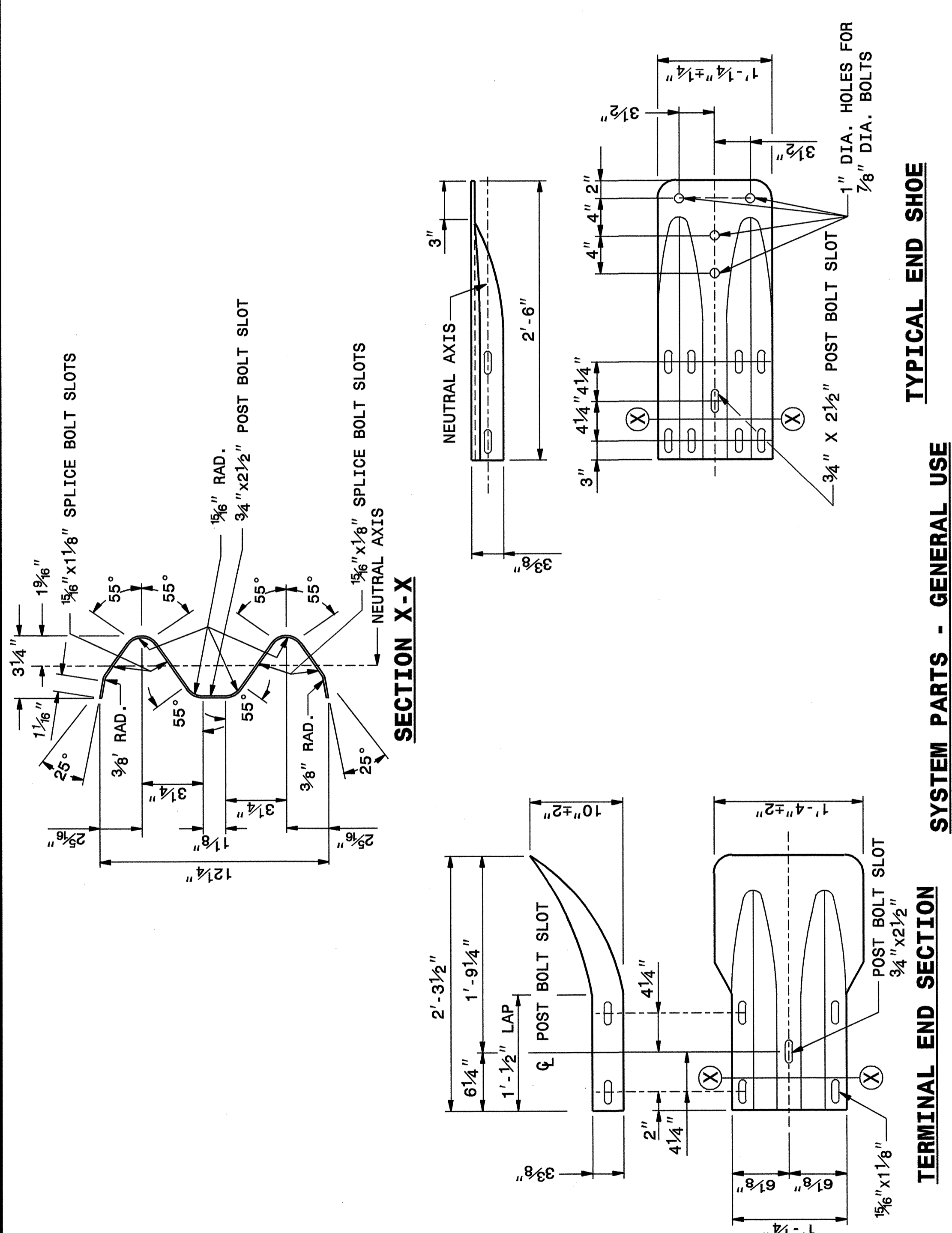
ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 5 OF 7  
**862D02**

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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 7  
**862D02**



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

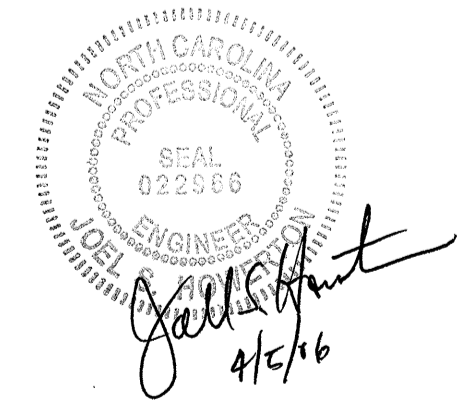
ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 7  
**862D02**

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STD.862.02 DATE:  
MODIFIED BY: E.E. WARD DATE: 02-09-03  
CHECKED BY: [Signature] DATE: 10/21/04  
FILE SPEC.: /usr/stds/02todetail/english/86202/862d02.dgn

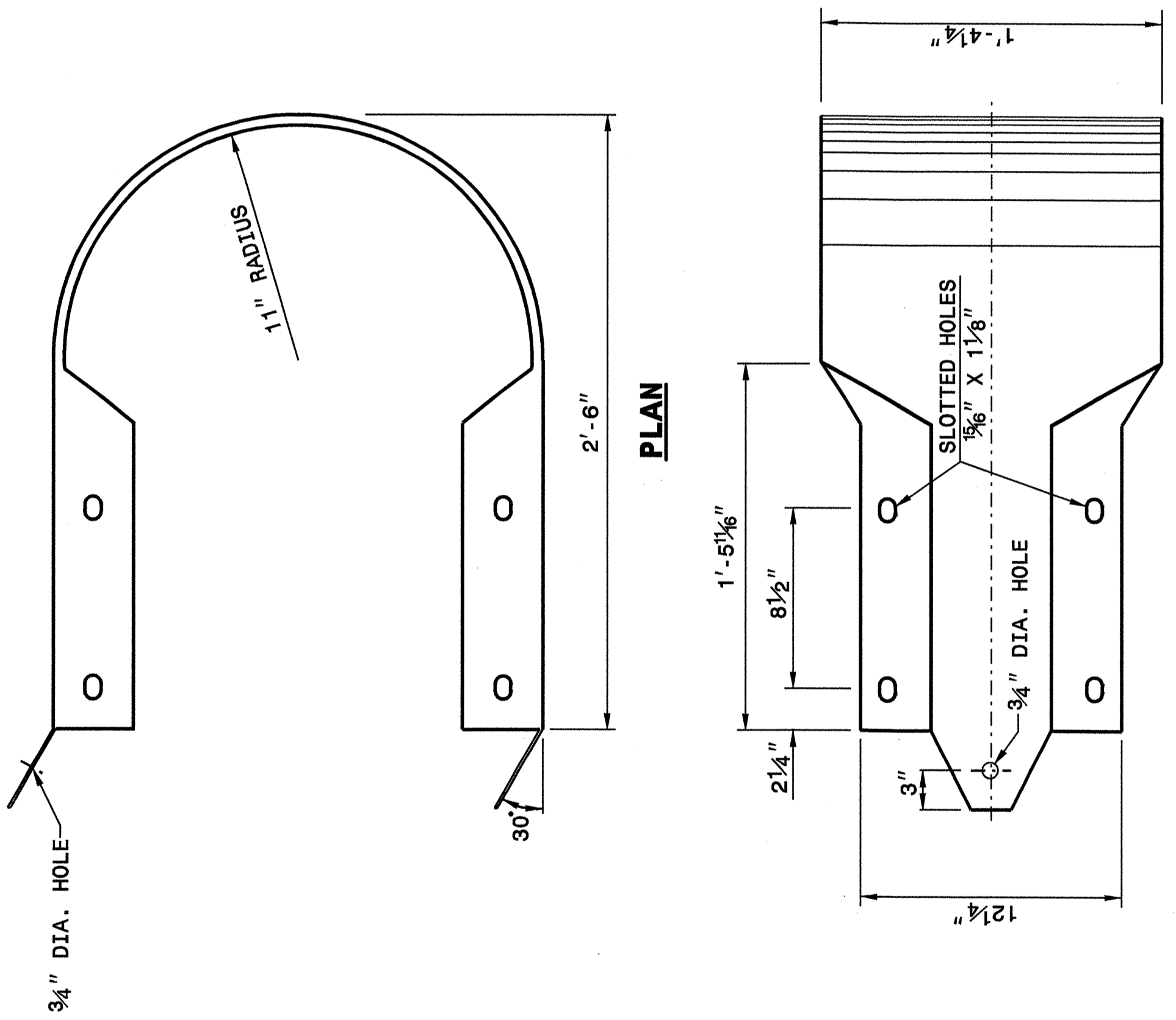


9-OCT-2004 11:39  
W:\Special Details\ward\stds\02\stds to Special Details\english\86202\0862d02.dgn  
Reviewed AT 05212260

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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 7 OF 7  
**862D02**



**ELEVATION**  
**BUFFERED END SECTION**

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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 7 OF 7  
**862D02**



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

**SEE PLATE FOR TITLE**

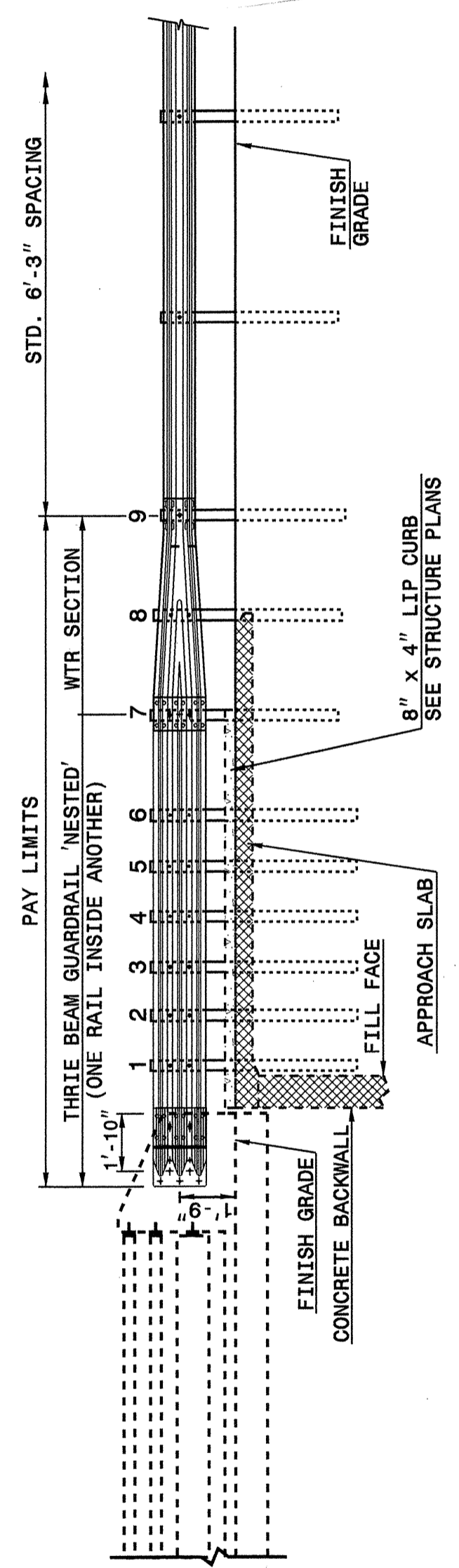
ORIGINAL BY: 2002 STD. 862.02 DATE: \_\_\_\_\_  
 MODIFIED BY: E.E. WARD DATE: 02-09-03  
 CHECKED BY: *Joel E. Ward* DATE: 10/21/04  
 FILE SPEC.: /usr/stds/02todetail/english/86202/862d02.dgn

19-OCT-2004 11:39  
 M:\Special Details\stds\02\stds to Special Details\english\86202\0862d02.dgn  
 erward

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

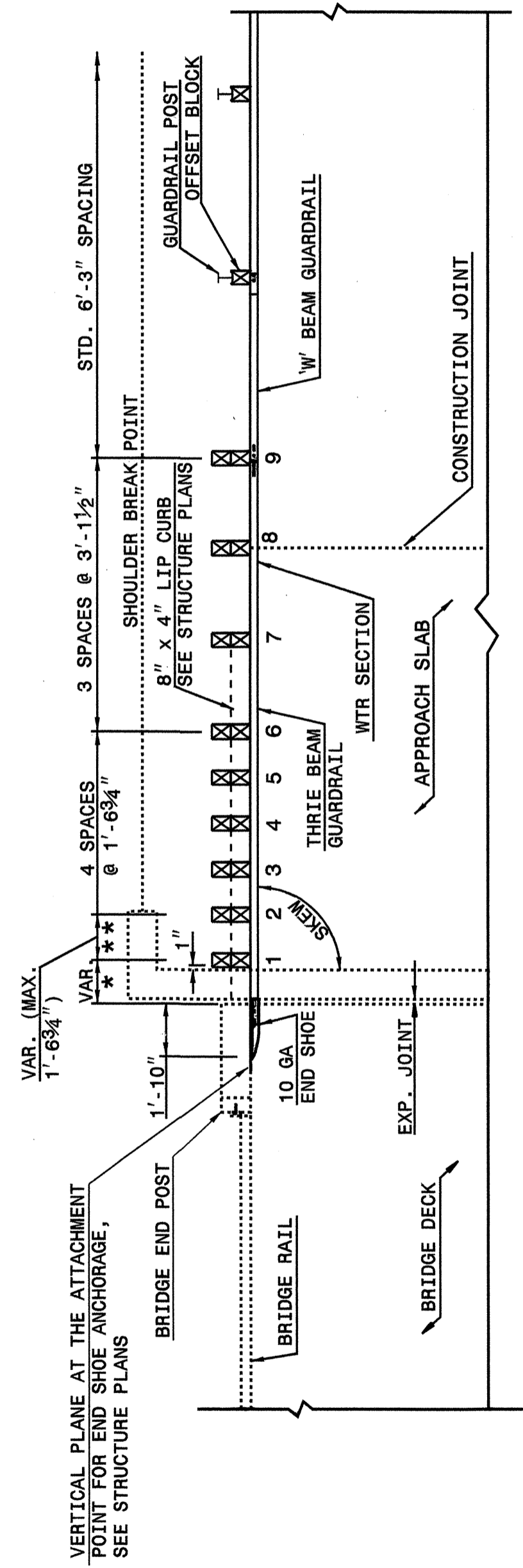
ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6  
**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 (15' MINIMUM LENGTH APPROACH SLAB)**

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

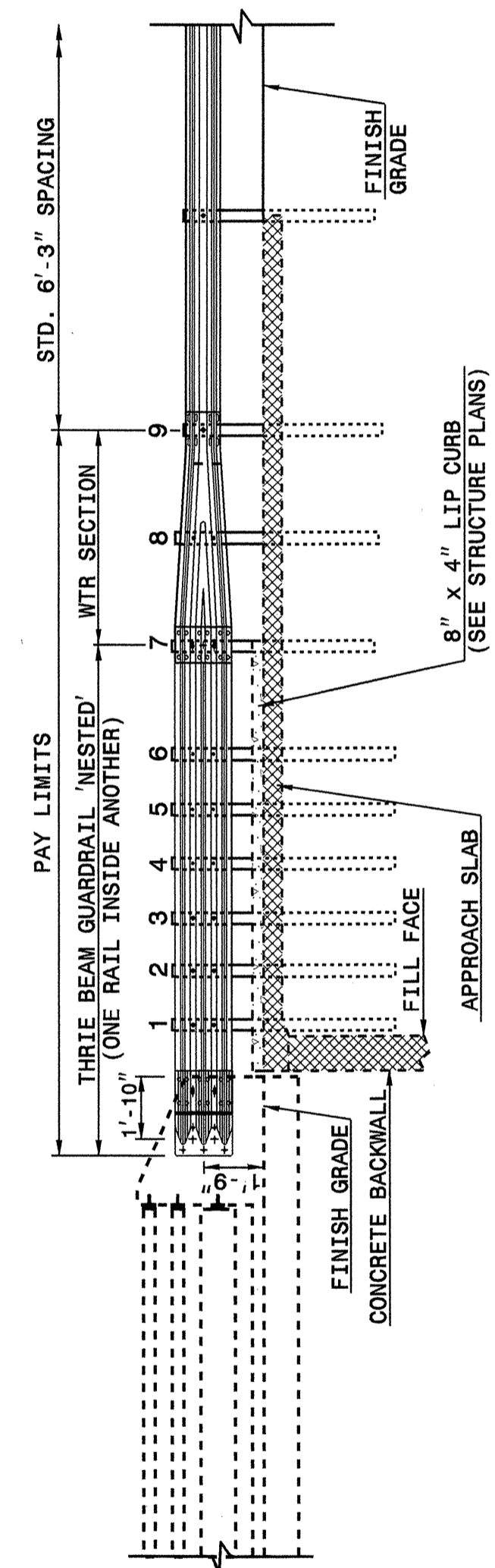
ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6  
**862D03**

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

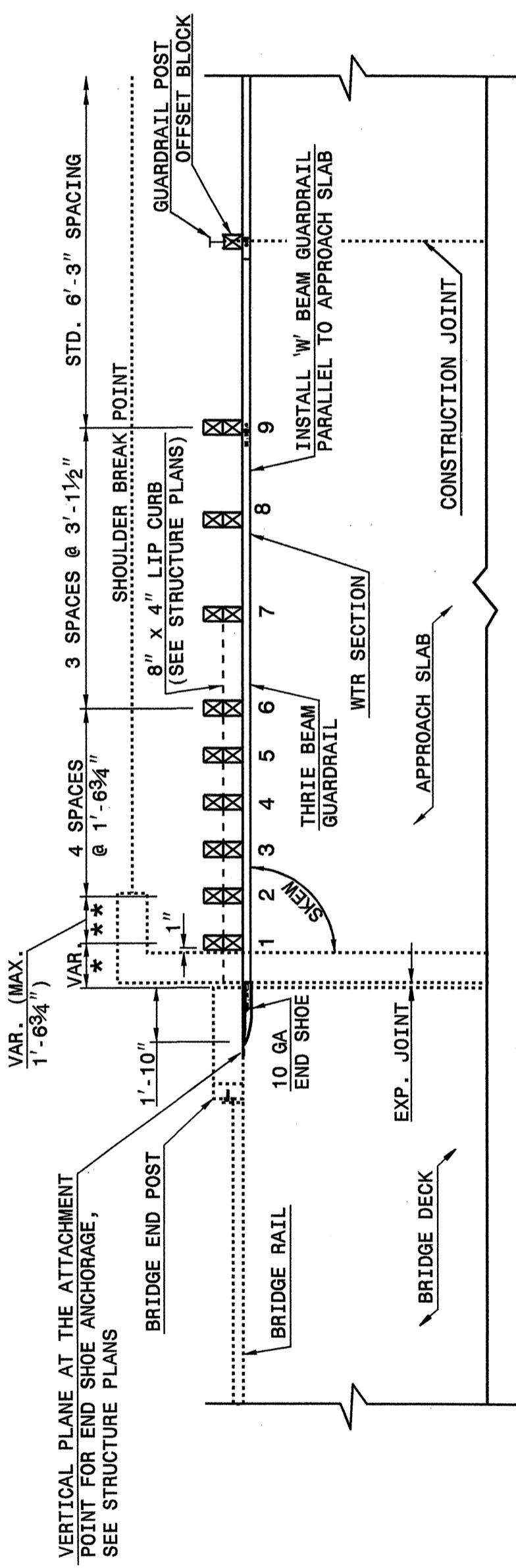
ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6  
**862D03**



**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 (25' MINIMUM LENGTH APPROACH SLAB)**

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

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**

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

**SEE PLATE FOR TITLE**

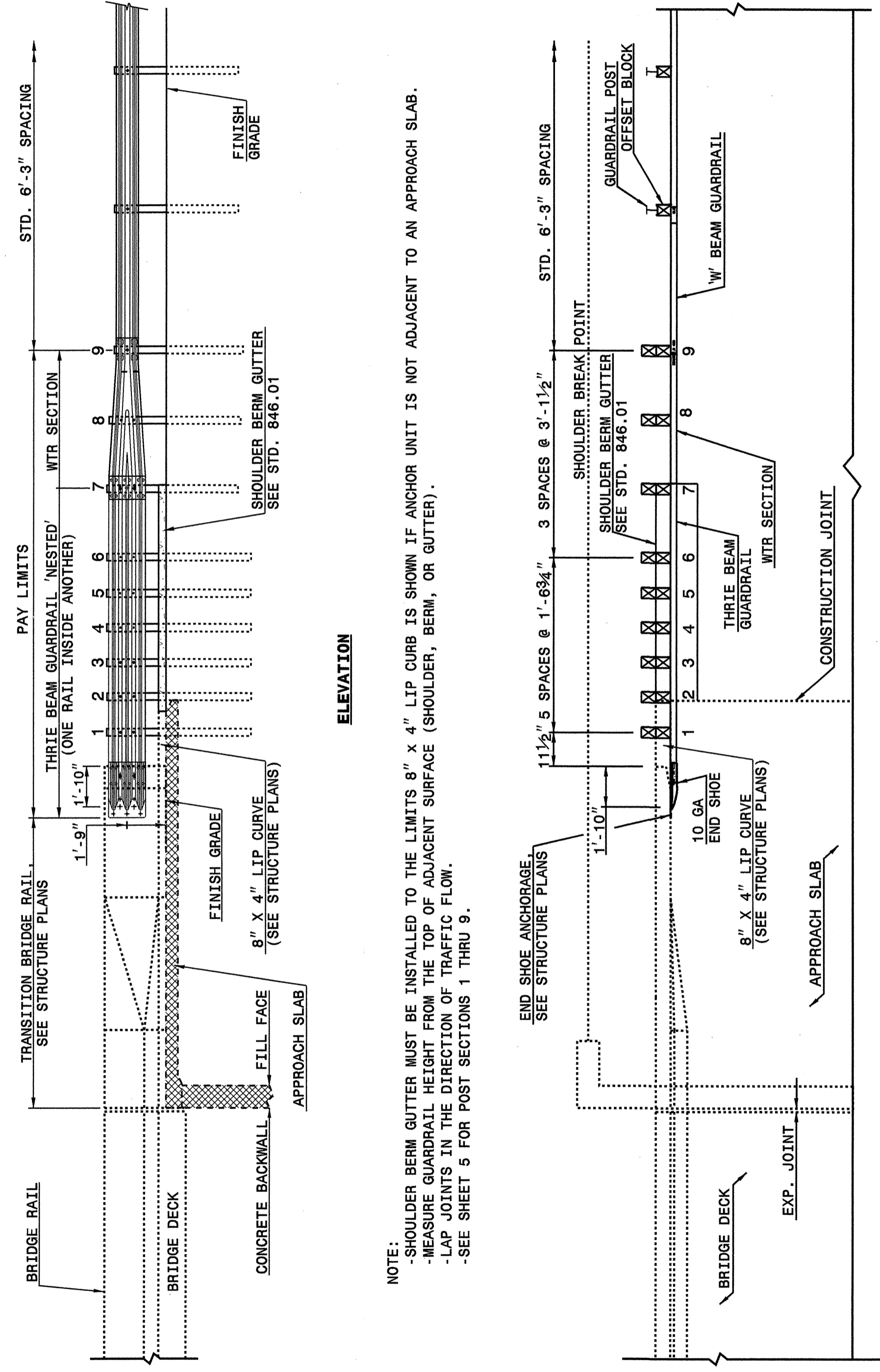
ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
 MODIFIED BY: E.E. WARD DATE: 09-14-05  
 CHECKED BY: *Joel S. Hunt* DATE: 7/21/05  
 FILE SPEC.: stds/02stdstodetails/english/862d03.dgn



21-SEP-2005 09:34 s:\Contractors\862D03\stds\02stds\Special Details\vericard\stds\02stds\Special Details\english\862D03\0862d03.dgn

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

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.

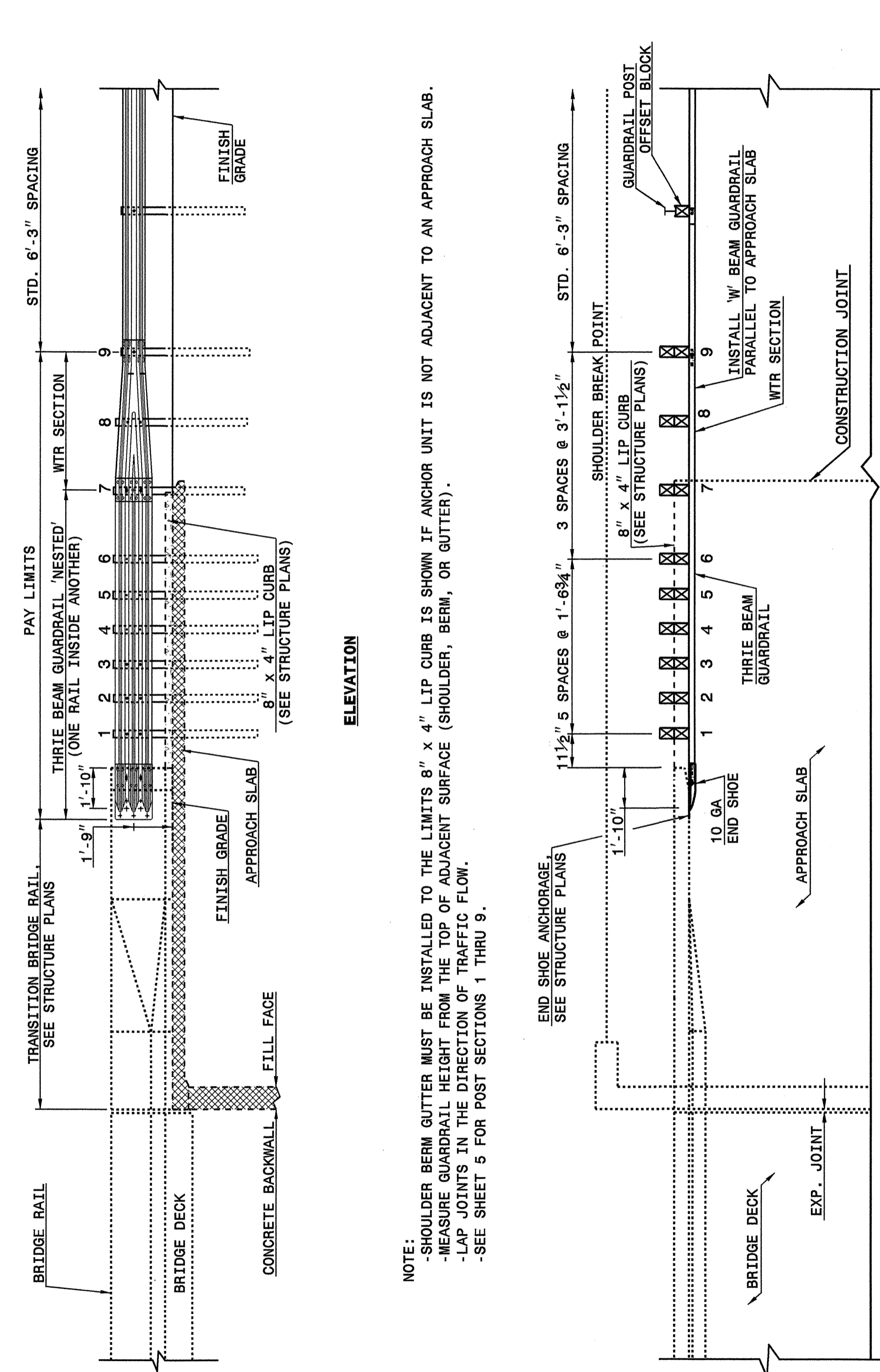
**GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON APPROACH SLAB (15' MINIMUM LENGTH APPROACH SLAB)**

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

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**

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

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)**

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

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**



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

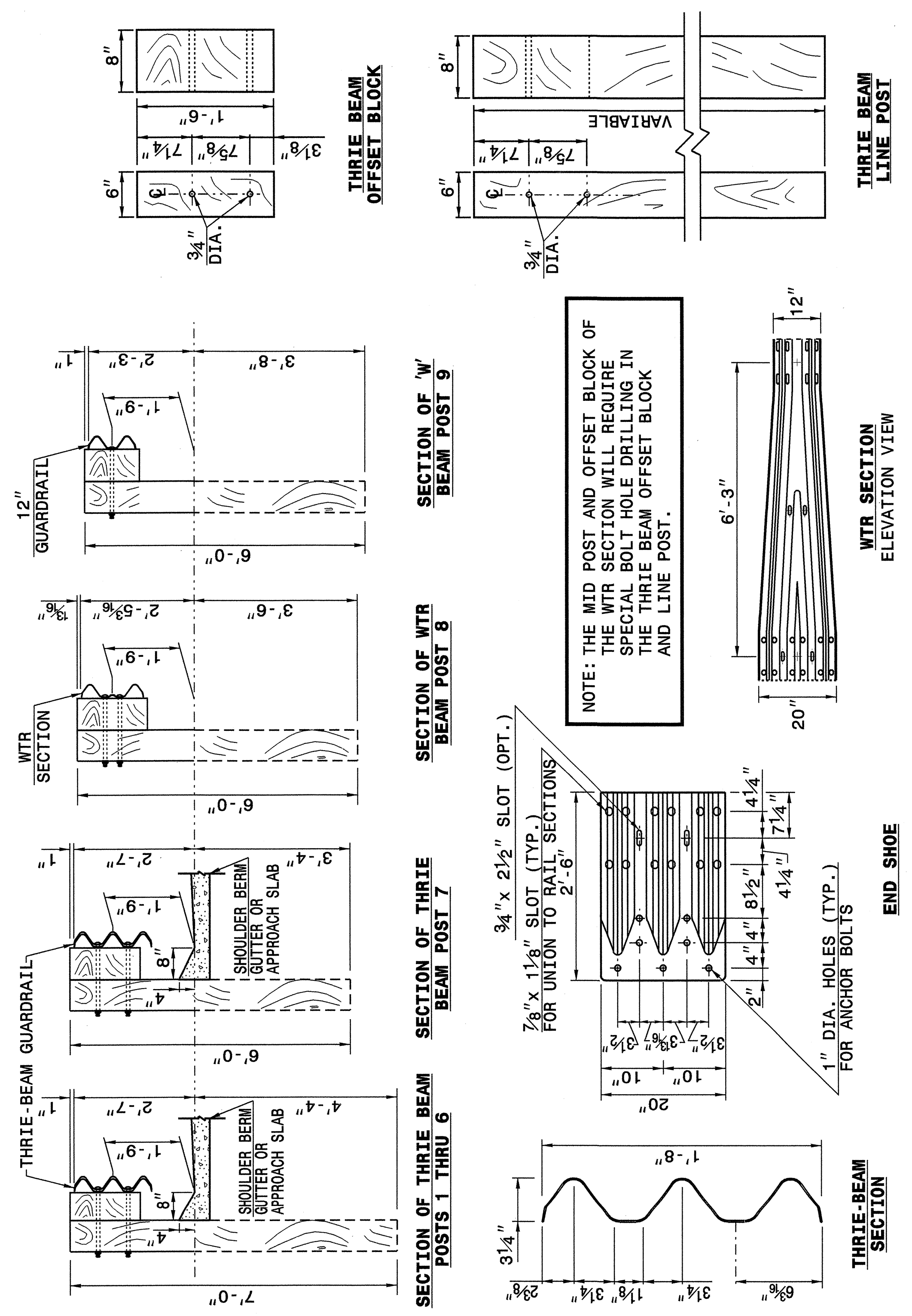
**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02  
MODIFIED BY: E.E. WARD DATE: 09-14-05  
CHECKED BY: *Joe S. Hunt* DATE: 9/2/05  
FILE SPEC.: stds/02stdstodetails/english/862d03.dgn

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

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

SHEET 5 OF 6  
**862D03**



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

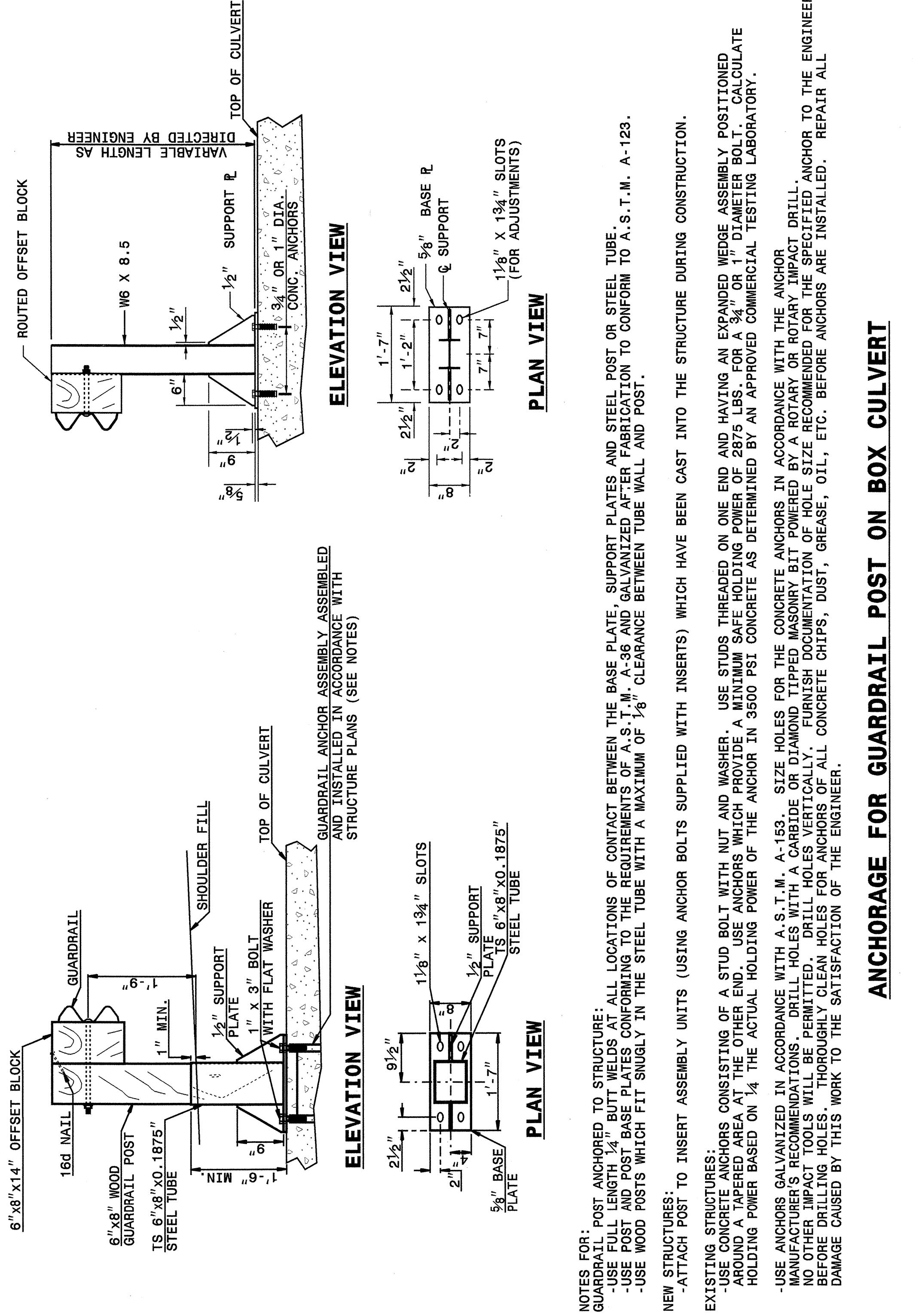
ENGLISH DETAIL DRAWING FOR  
STRUCTURE ANCHOR UNITS  
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 5 OF 6  
**862D03**

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

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

SHEET 6 OF 6  
**862D03**



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

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

SHEET 6 OF 6  
**862D03**

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: *Joel S. Hunt* DATE: 1/15/06  
FILE SPEC.: #05/02stdstodetails/english/862d03.dgn



15-SEP-2005 10:05  
S:\Contrac\ts\101\enr\0513\Special Details\enrward\stds\02\Std to Special Details/english\862d03\0862d03.dgn  
enrward AT 1522222



**GENERAL NOTES:**

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER.  
USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

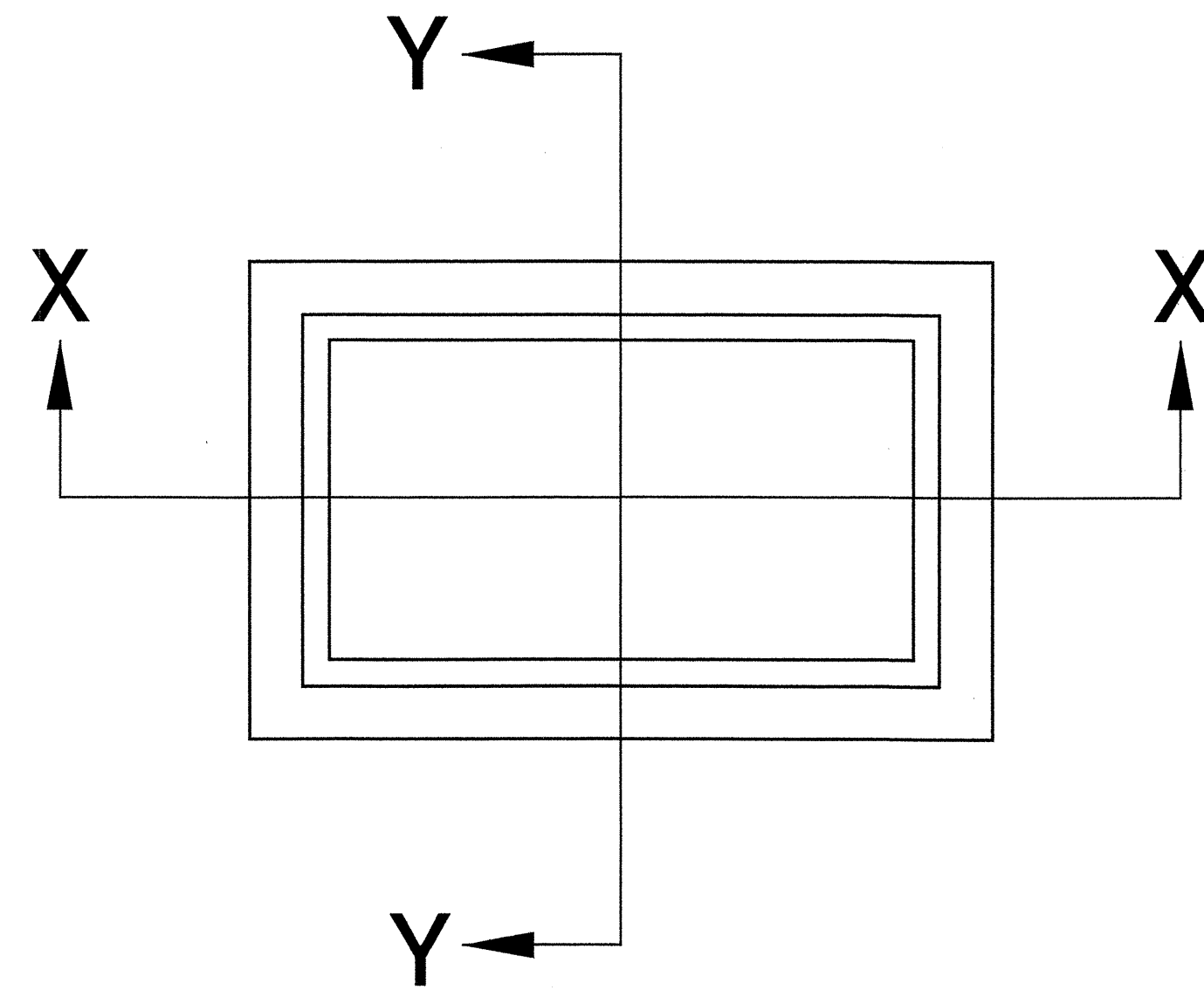
#4 BAR DOWELS "B" AT 12" CENTERS.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

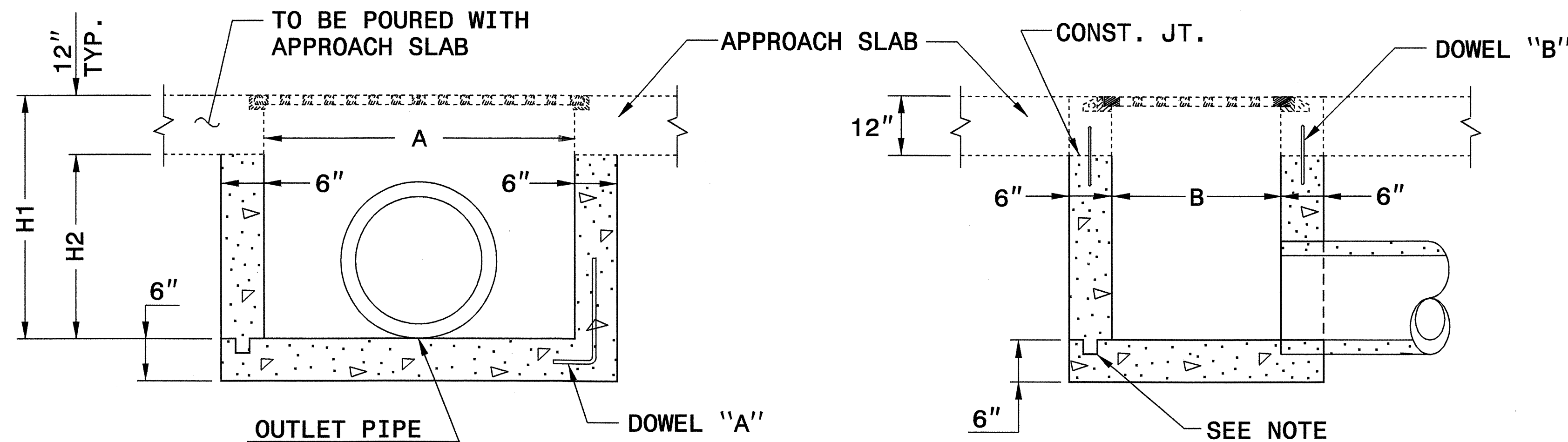
FOR LOCATIONS OF DROP INLET, SEE BRIDGE APPROACH SLABS IN THE STRUCTURE PLANS.

CONSTRUCT WITH PIPE CROWNS MATCHING.

DRAWING NOT TO SCALE.

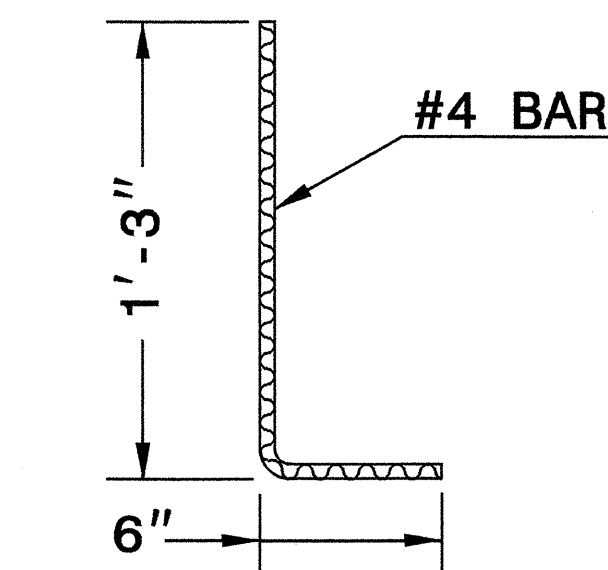


**PLAN**

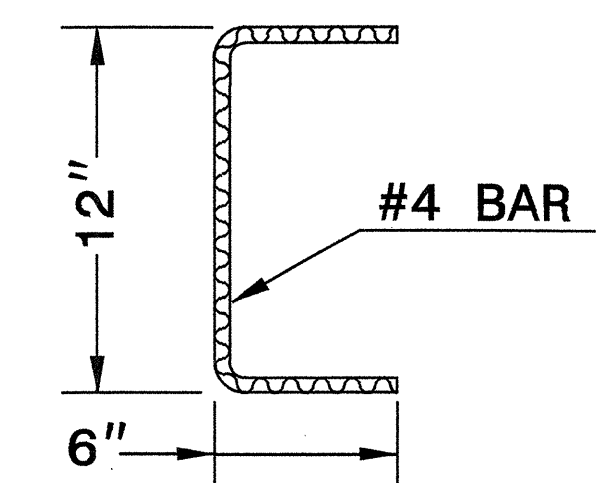


**SECTION X-X**

**SECTION Y-Y**



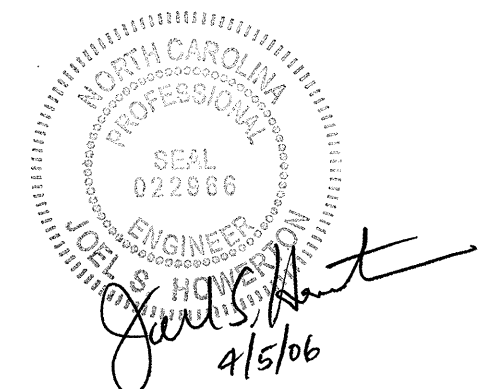
**DOWEL "A"**



**DOWEL "B"**

**MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE DROP INLET**

PIPE D	SPAN A	WIDTH B	HEIGHT H1	HEIGHT H2	CUBIC YARDS OF CONCRETE IN BOX				DEDUCTIONS FOR ONE PIPE	
					BOTTOM SLAB	H PER FT. HT.	H MIN. TOTAL	TOTAL	C.S.	R.C.
12"	3'-8"	2'-0"	2'-6"	1'-6"	0.259	0.247	0.597	0.856	0.020	0.032
15"	3'-8"	2'-0"	2'-9"	1'-9"	0.259	0.247	0.659	0.918	0.023	0.036
18"	3'-8"	2'-0"	3'-0"	2'-0"	0.259	0.247	0.720	0.979	0.033	0.049
24"	3'-8"	2'-0"	3'-6"	2'-6"	0.259	0.247	0.865	1.124	0.059	0.085



**PROJECT SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119  
**DETAIL FOR CONCRETE  
BRIDGE APPROACH  
DROP INLET**

ORIGINAL BY: T. Spell DATE: 04-07-04  
MODIFIED BY: DATE:  
CHECKED BY: DATE: 10/21/04  
FILE SPEC.: st09/02stdstodetails/english/840d13.dgn

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201444

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (24+57.50)
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
005700000-E	226	400	CY	UNDERCUT EXCAVATION
008000000-E	SP	100	TON	CLASS IV SUBGRADE STABILIZATION
013400000-E	240	187	CY	DRAINAGE DITCH EXCAVATION
019500000-E	265	200	CY	SELECT GRANULAR MATERIAL
019600000-E	270	200	SY	FABRIC FOR SOIL STABILIZATION
031800000-E	300	87	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
036600000-E	310	336	LF	15" RC PIPE CULVERTS, CLASS III
037200000-E	310	32	LF	18" RC PIPE CULVERTS, CLASS III
070800000-E	310	68	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
080600000-E	310	2	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
099500000-E	340	81	LF	PIPE REMOVAL
112100000-E	520	113	TON	AGGREGATE BASE COURSE
122000000-E	545	75	TON	INCIDENTAL STONE BASE
148900000-E	610	930	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
152500000-E	SP	750	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
156000000-E	620	89	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
200000000-N	806	13	EA	RIGHT OF WAY MARKERS
202200000-E	815	112	CY	SUBDRAIN EXCAVATION
203300000-E	815	84	CY	SUBDRAIN FINE AGGREGATE

ItemNumber	Sec #	Quantity	Unit	Description
204400000-E	815	500	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	15	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
225300000-E	840	1	CY	PIPE COLLARS
228600000-N	840	8	EA	MASONRY DRAINAGE STRUCTURES
236600000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.24
236700000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.29
255600000-E	846	340	LF	SHOULDER BERM GUTTER
303000000-E	862	625	LF	STEEL BM GUARDRAIL
304500000-E	862	50	LF	STEEL BM GUARDRAIL, SHOP CURVED
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
319500000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
321500000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
327000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
363500000-E	876	9	TON	PLAIN RIP RAP, CLASS II
364900000-E	876	109	TON	PLAIN RIP RAP, CLASS B
365600000-E	876	922	SY	FILTER FABRIC FOR DRAINAGE
441200000-E	SP	267	SF	WORK ZONE SIGNS (STATIONARY)
441200000-E	SP	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
442500000-N	1125	2	EA	WARNING FLAG SETS
444610000-E	SP	64	LF	BARRICADES (TYPE III)
468500000-E	1205	2,850	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
468600000-E	1205	2,850	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)

ItemNumber	Sec #	Quantity	Unit	Description
490000000-N	1252	18	EA	PERMANENT RAISED PAVEMENT MARKERS
600000000-E	1605	950	LF	TEMPORARY SILT FENCE
600600000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	330	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	260	TON	SEDIMENT CONTROL STONE
601500000-E	1615	3	ACR	TEMPORARY MULCHING
601800000-E	1620	150	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEEDING
602900000-E	SP	400	LF	SAFETY FENCE
603000000-E	1630	1,570	CY	SILT EXCAVATION
603600000-E	1631	1,050	SY	MATTING FOR EROSION CONTROL
603800000-E	SP	2,600	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	160	LF	1/4" HARDWARE CLOTH
607000000-N	SP	6	EA	SPECIAL STILLING BASINS
608400000-E	1660	3	ACR	SEEDING & MULCHING
608700000-E	1660	2	ACR	MOWING
609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
609600000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
610800000-E	1665	2.25	TON	FERTILIZER TOPDRESSING
611400000-N	SP	2	HR	SPECIALIZED HAND MOWING
613200000-N	SP	8	EA	GENERIC EROSION CONTROL ITEM RESPONSE FOR EROSION CONTROL

***** BEGIN SCHEDULE AA *****				
***** (3 ALTERNATES) *****				
037800000-E AA1	310	380	LF	24" RC PIPE CULVERTS, CLASS III
*** OR ***				
098600000-E AA2	SP	380	LF	GENERIC PIPE ITEM 24" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 0.064" THICK
*** OR ***				
098600000-E AA3	SP	380	LF	GENERIC PIPE ITEM 24" HDPE PIPE CULVERTS
***** END SCHEDULE AA *****				

5/28/99

06-OCT-2005 10:44  
r:\roadway\p01\c4113\_rdy\_sum.dgn  
\$\$\$\$\$ USER:VHE \$\$\$\$



**\* SUMMARY OF EARTHWORK  
 IN CUBIC YARDS**

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- STA. 16+50.00 TO 23+90.00 (BEGIN BRIDGE)	889	0	1,043	154	0
END BENT 1	0	0	20	20	0
END BENT 2	0	0	19	19	0
-L- STA. 25+25.00 (END BRIDGE) TO 30+18.46	543	0	526	0	17
SUBTOTAL	1,432	0	1,608	193	17
-DRI- STA. 10+00.00 TO 12+18.48	20	0	287	267	0
SUBTOTAL	20	0	287	267	0
TOTAL	1,452	0	1,895	460	17
LOSS DUE TO CLEARING & GRUBBING	-300			300	
ESTIMATED SHOULDER MATERIAL			942	942	
WASTE IN LIEU OF BORROW				-17	-17
UNCLASSIFIED STRUCTURE EXCAVATION IN LIEU OF BORROW (QUANTITY IS FROM STRUCTURE PLANS)				-522	
PROJECT TOTALS	1,152	0	2,837	1,163	0
ESTIMATED 5% TO REPLACE TOPSOIL ON BORROW PIT				58	
GRAND TOTALS	1,152	0	2,837	1,221	0
SAY	1,200			1,300	

EST. UNDERCUT = 400 CY  
 EST. DRAINAGE DITCH EXCAVATION = 187 CY

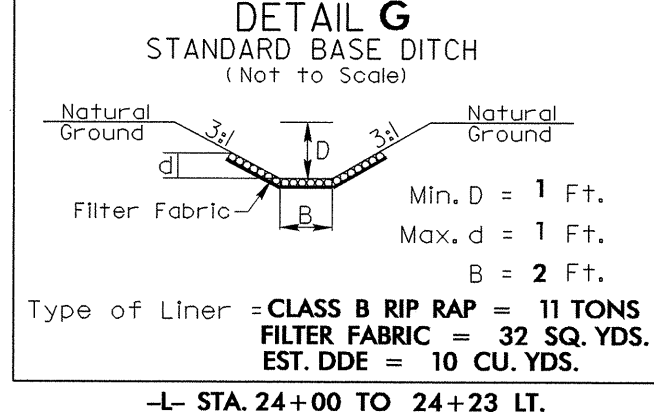
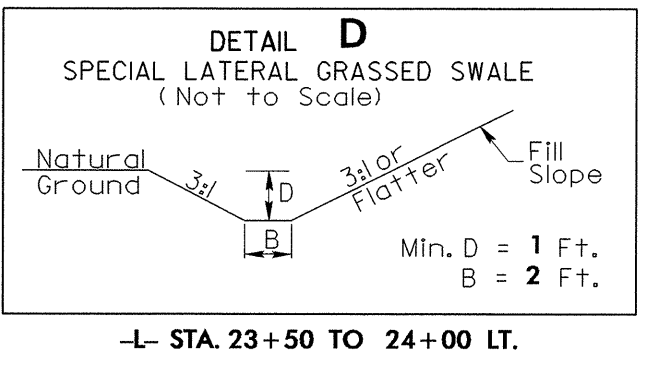
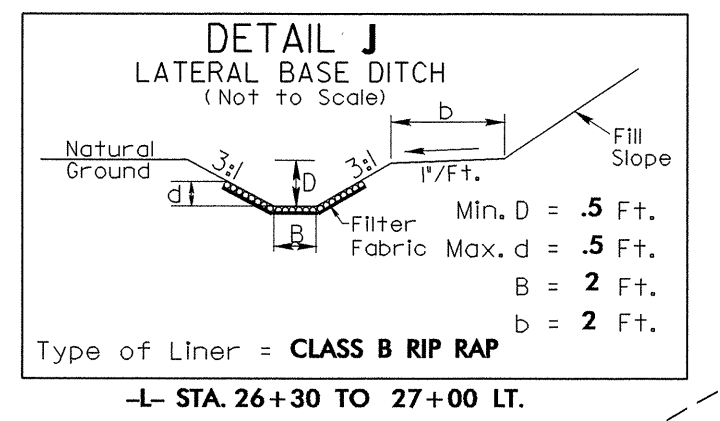
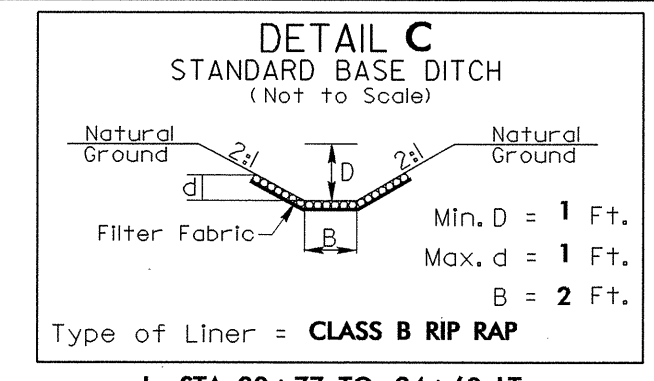
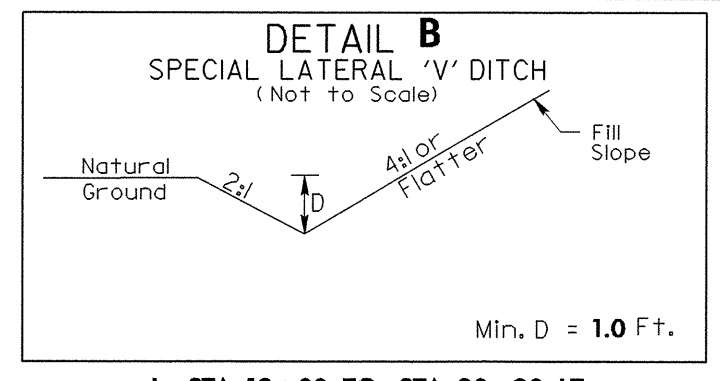
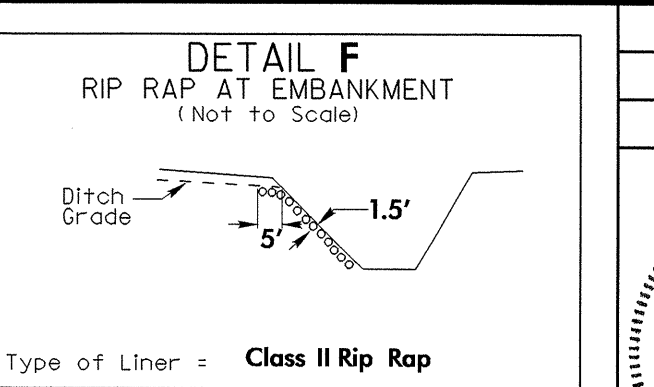
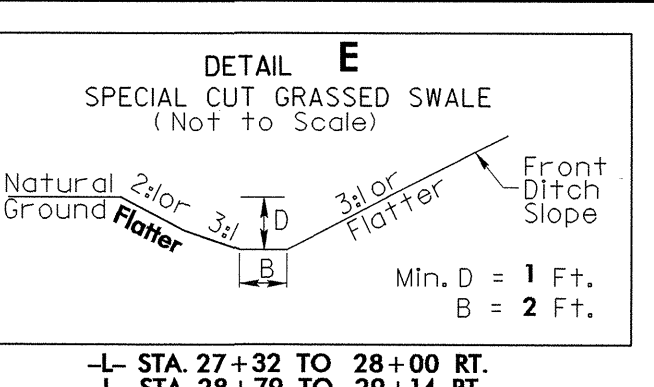
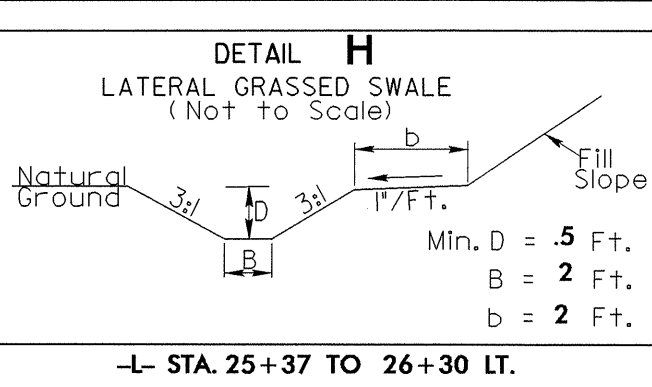
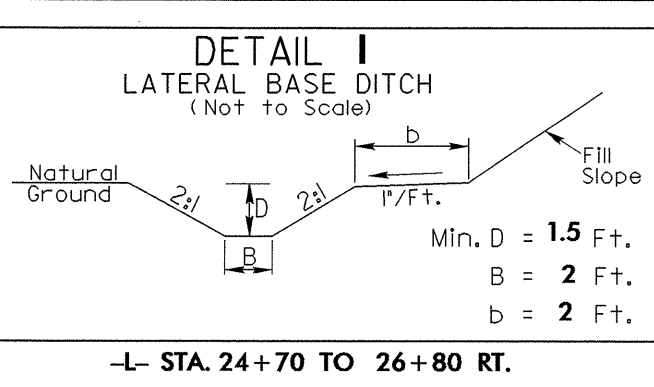
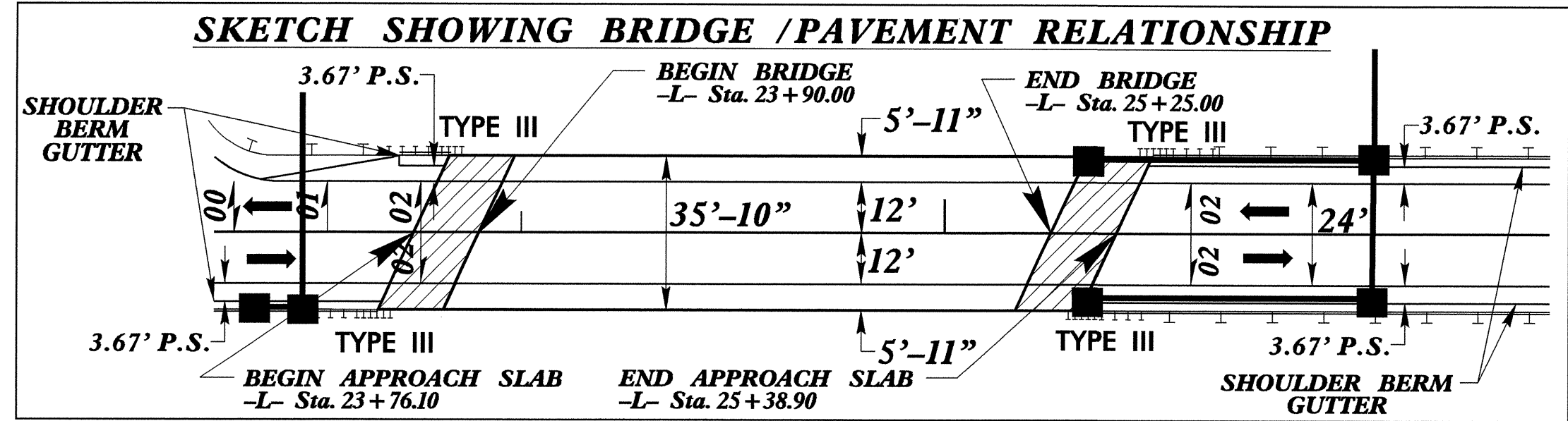
**\* ASPHALT PAVEMENT  
 REMOVAL AND BREAKING SUMMARY  
 IN SQUARE YARDS**

LINE	STATION TO STATION	LOCATION	REMOVAL	BREAK-UP
-L-	23+25.00 TO 24+35.00	EXISTING ROADBED	244	
-L-	24+95.00 TO 28+00.00	EXISTING ROADBED	634	
	TOTAL		878	
	SAY		900	

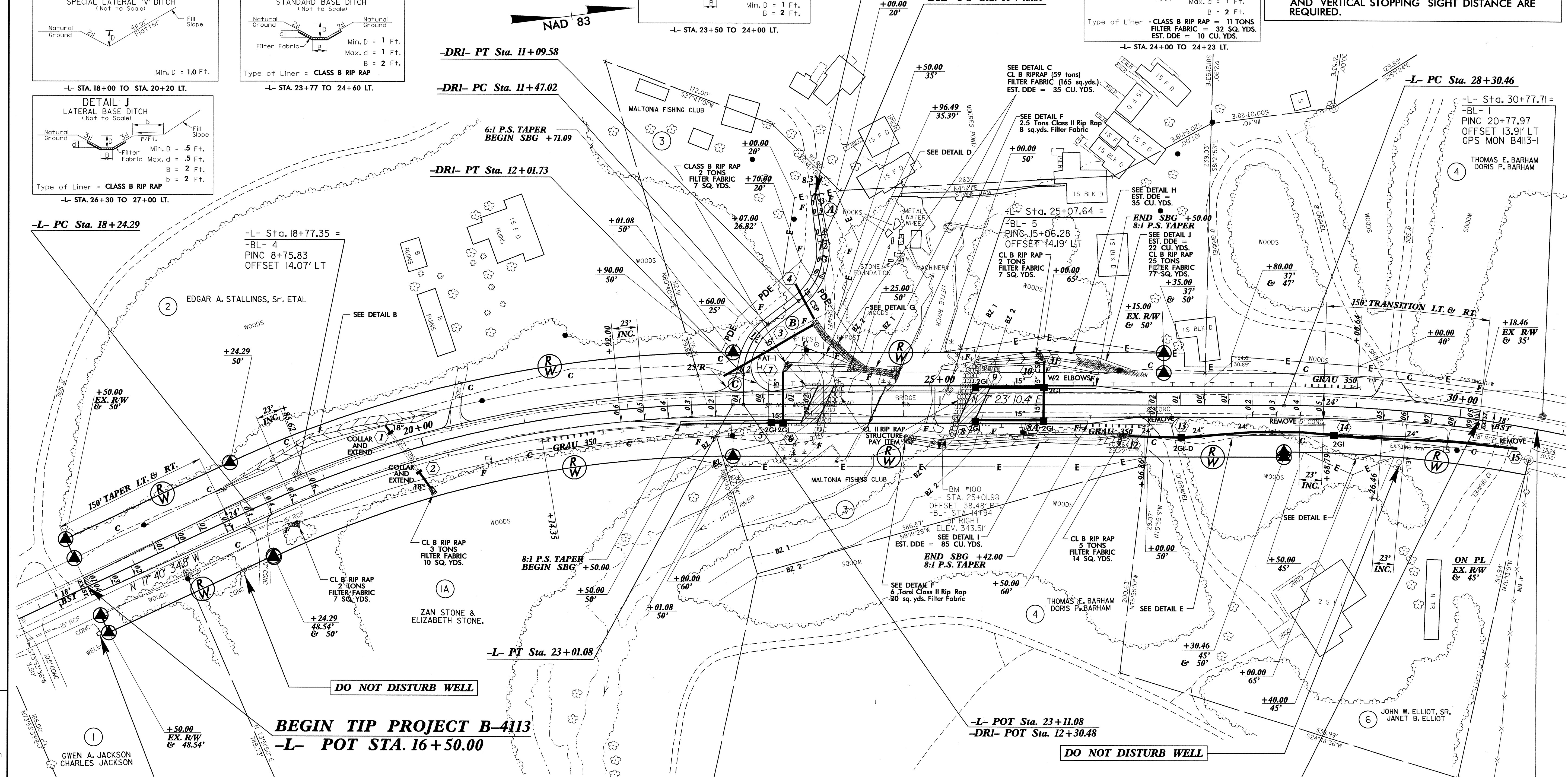
**\* APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".**

6/21/08

14-MAR-2006 10:33  
 F:\oadway\RT\RD0327dy-sum.dgn



**\* DESIGN EXCEPTIONS FOR VERTICAL ALIGNMENT AND VERTICAL STOPPING SIGHT DISTANCE ARE REQUIRED.**



-L-	
PI Sta 20+66.56	PI Sta 30+2112
$\Delta = 25^{\circ} 03' 45.2''$ (RT)	$N 23^{\circ} 34' 54.1'' E$ (Ahead)
$D = 5' 15' 23.4''$	$PT Sta 32+09.23$
$L = 476.79'$	$\Delta = 16^{\circ} 11' 43.7''$ (RT)
$T = 242.27'$	$D = 4' 16' 32.9''$
$R = 1,090.00'$	$L = 378.77'$
$SE = 0.06$	$T = 190.66'$
$RUNOFF = 138'$	$R = 1,340.00'$
(SEE PLANS)	$SE = 0.05$
	$RUNOFF = 115'$
	(SEE PLANS)

-DRI-	
PI Sta 10+81.01	PI Sta 11+76.44
$\Delta = 6^{\circ} 06' 36.1''$ (RT)	$\Delta = 52^{\circ} 14' 37.5''$ (LT)
$D = 95' 29' 34.7''$	$D = 95' 29' 34.7''$
$L = 63.99'$	$L = 54.71'$
$T = 35.42'$	$T = 29.42'$
$R = 60.00'$	$R = 60.00'$
$SE = NC$	$SE = NC$
(A) $N 88^{\circ} 31' 11.5'' E$	(C) $S 82^{\circ} 36' 49.9'' E$
(B) $S 30^{\circ} 22' 12.4'' E$	

**END TIP PROJECT B-4113**  
 -L- POC STA. 30+18.46

**END CONSTRUCTION**  
 -L- POT STA. 30+75.00

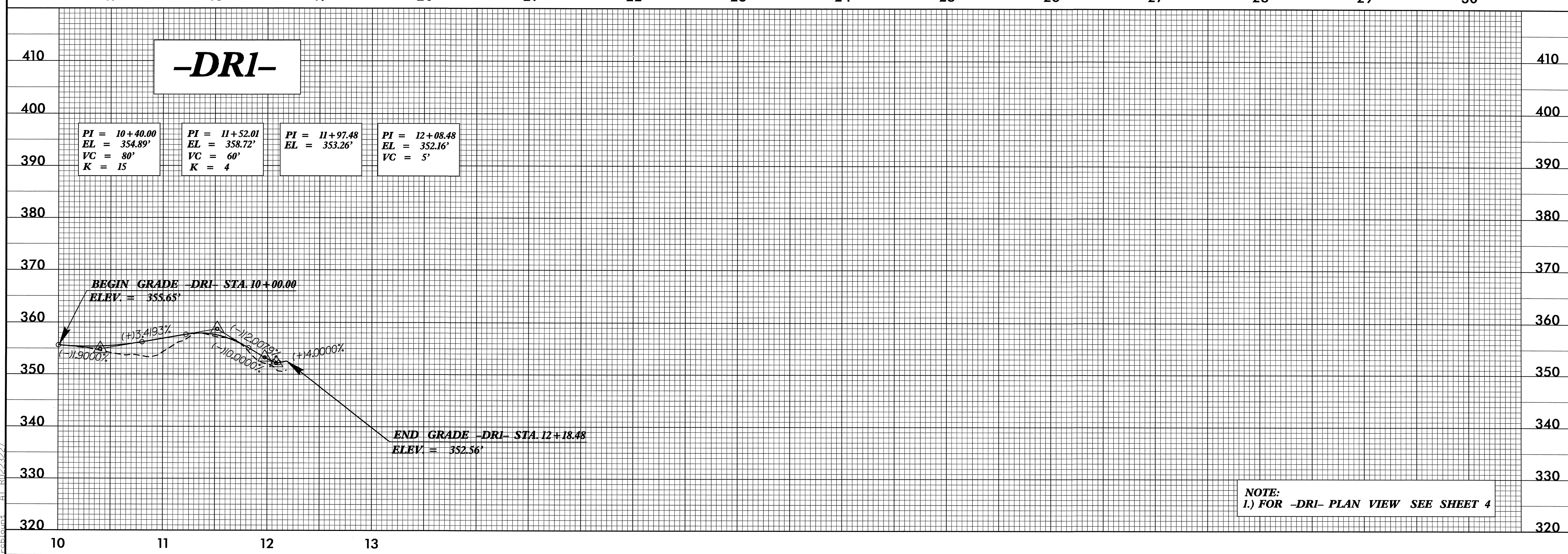
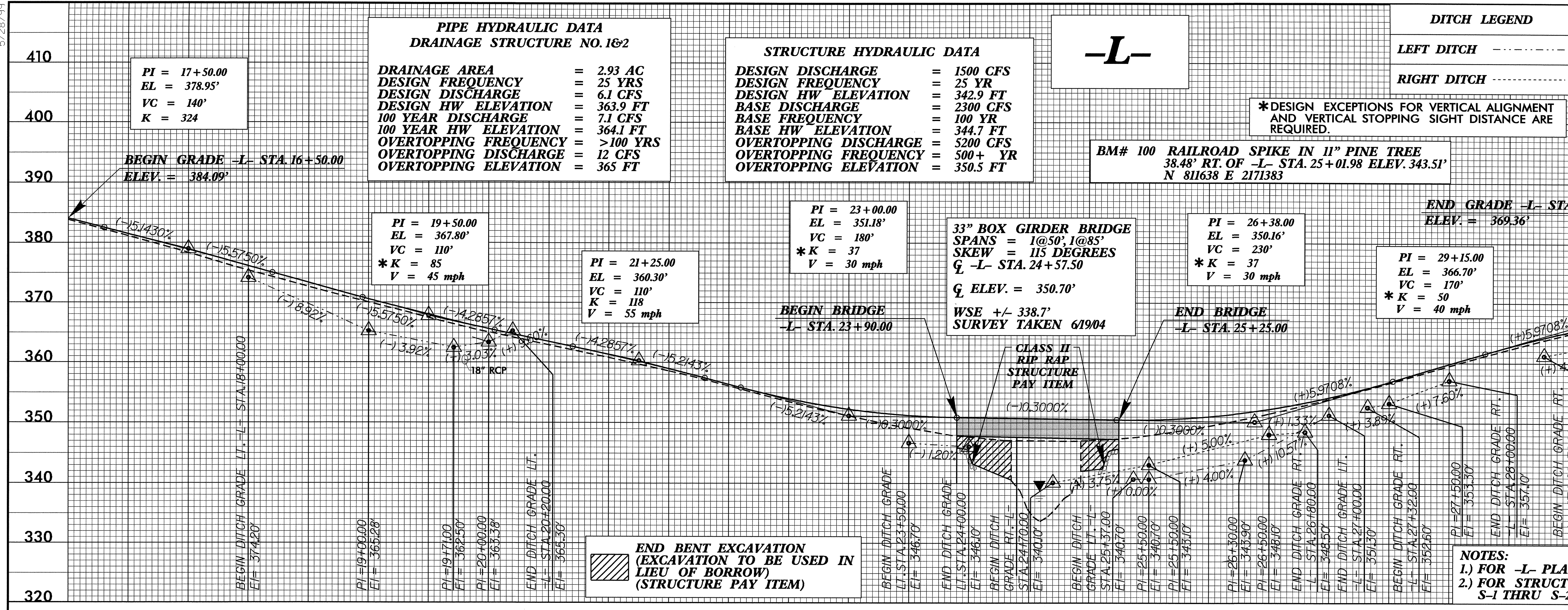
**NOTES:**  
 1.) FOR -L- AND -DRI- PROFILES SEE SHEET 5  
 2.) ALL DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE  
 3.) FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-22

REVISIONS

06-MAR-2006 10:23 4113\_rdy\_psh4.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4113	5
4/4/06	4-4-06



14-MAR-2006 10:33 AM  
F:\Roadway\B-4113\_rdy\_pf1.dgn  
William W. Mumford