

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

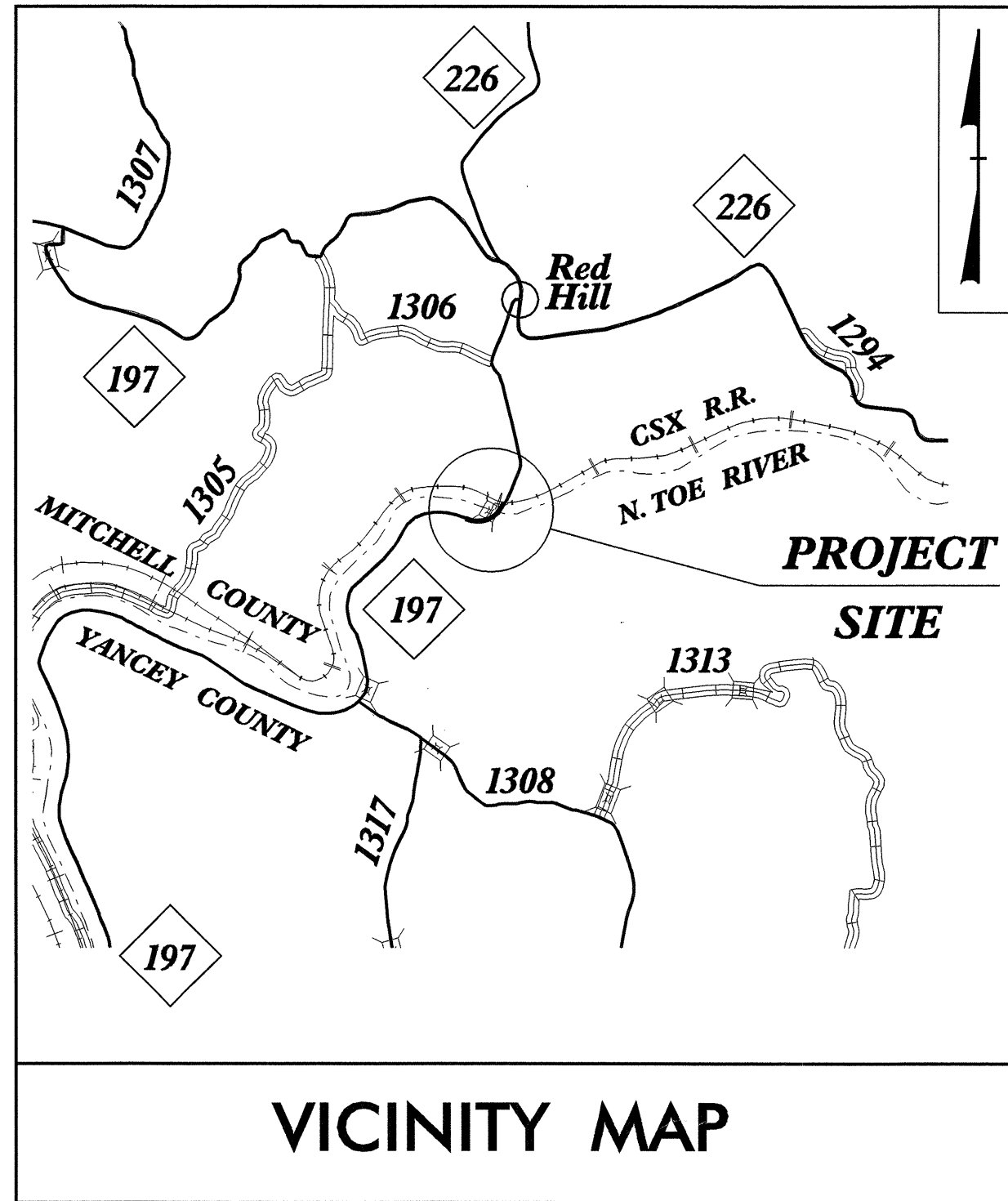
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-1443	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
32597.1.1	BRSTP-197(1)	PE	
32597.2.2	BRSTP-197(1)	ROW , UTIL.	
32597.3.2	BRSTP-197(1)	CONST.	

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

MITCHELL & YANCEY COUNTIES

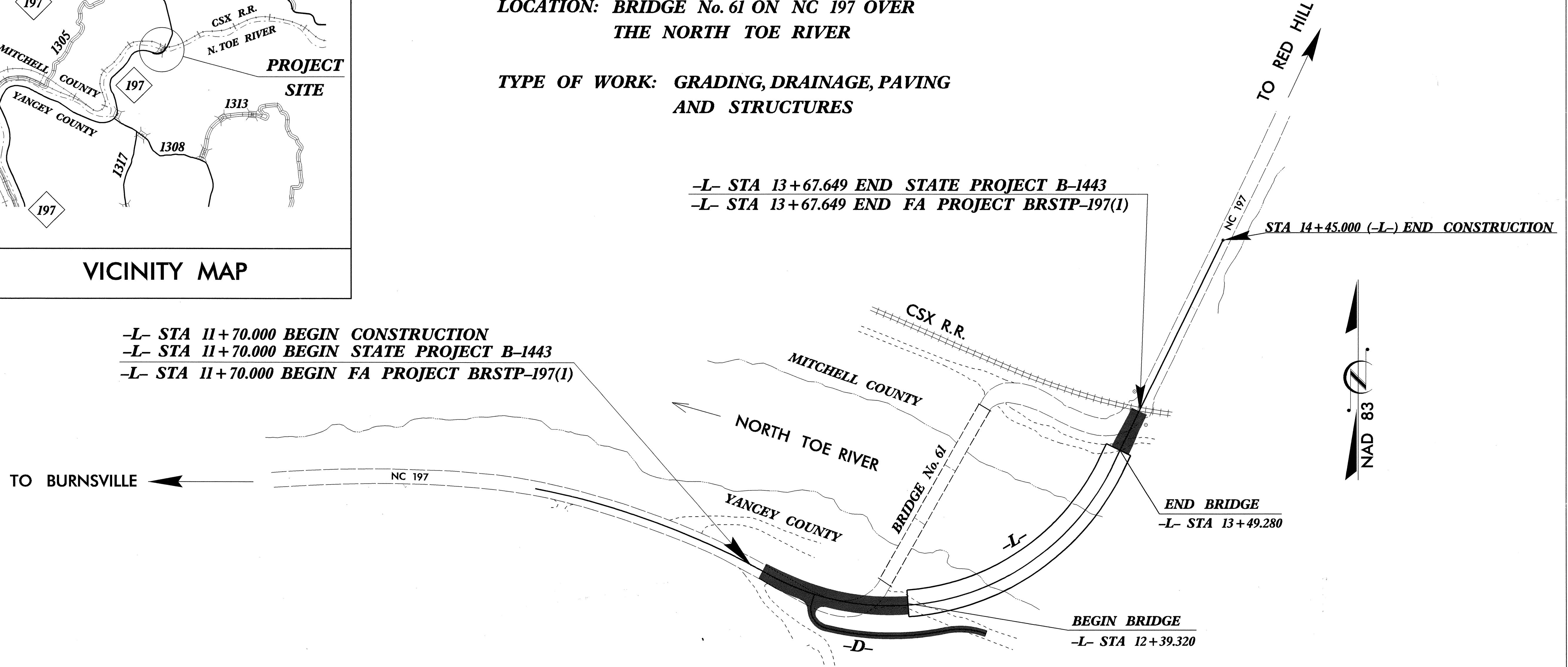
LOCATION: BRIDGE No. 61 ON NC 197 OVER THE NORTH TOE RIVER

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES



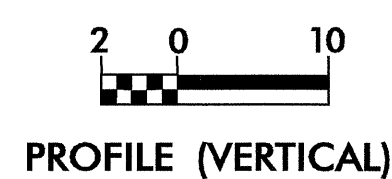
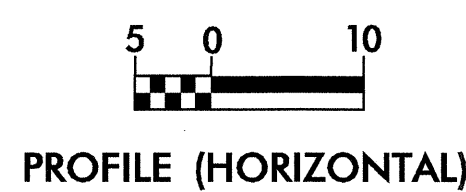
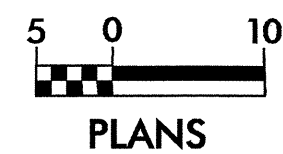
-L- STA 13+67.649 END STATE PROJECT B-1443
 -L- STA 13+67.649 END FA PROJECT BRSTP-197(1)

-L- STA 11+70.000 BEGIN CONSTRUCTION
 -L- STA 11+70.000 BEGIN STATE PROJECT B-1443
 -L- STA 11+70.000 BEGIN FA PROJECT BRSTP-197(1)



** DESIGN EXCEPTION FOR 'DESIGN SPEED' REQUIRED

GRAPHIC SCALES



DESIGN DATA

ADT 2005 = 1600
 ADT 2025 = 2800
 DHV = 9 %
 D = 55 %
 T = 8 % *
 V = 50 km/h
 (** REQUIRES DESIGN EXCEPTION)
 * TTST 2 % DUAL 6 %

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 8.1900401 = 0.088 KM
 LENGTH STRUCTURE STATE PROJECT 8.1900401 = 0.110 KM
 TOTAL LENGTH STATE PROJECT 8.1900401 = 0.198 KM

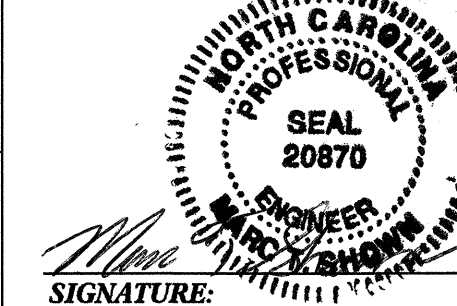
Prepared In the Office of:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **JIMMY GOODNIGHT, PE**
 PROJECT ENGINEER
 February 26, 2004

LETTING DATE: **MARK HUSSEY**
 PROJECT DESIGN ENGINEER
 FEBRUARY 20, 2007

HYDRAULICS ENGINEER



6-2-05
 P.E.
ROADWAY DESIGN
 SEAL 14493
 ENGINEER
 SIGNATURE: *James J. Goodnight, Jr.*
 DATE: 12-22-07

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

Out McMillan
 P.E.
 STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

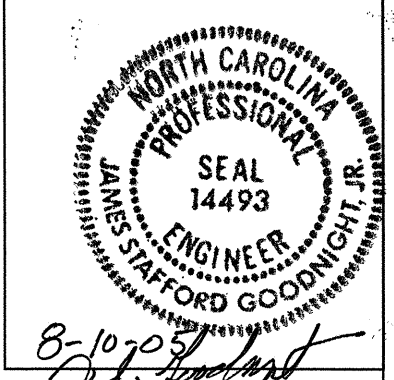
APPROVED
 DIVISION ADMINISTRATOR
 DATE

B-1443

CONTRACT: C201180



ROADWAY DESIGN ENGINEER



EFF. 01-15-02
REV. 04-07-04

SHEET NUMBER	INDEX OF SHEETS
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C & 1-D	SURVEY CONTROL DATA SHEET
1-E	CENTERLINE COORDINATE LIST
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2A	TYPICAL SECTION
2B	DETAILS OF GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
2-C THRU 2-F	DETAIL OF GUARDRAIL INSTALLATION
2-G THRU 2-I	DETAIL OF STRUCTURE ANCHOR UNITS
2-J THRU 2-M	DETAIL OF BRIDGE APPROACH FILLS
2-N	TEMPORARY SHORING
3A	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-9	TRAFFIC CONTROL PLANS
PM-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
RF-1	REFORSTATION PLAN
SIGN-1 THRU SIGN-5	SIGNING PLANS
UO-1	UTILITIES BY OTHERS
X-1	EARTHWORK VOLUME SUMMARY
X-2 THRU X- 8	CROSS-SECTIONS
S-1 THRU S- 39	STRUCTURE PLANS

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

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.

BERM DITCHES:
BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:
UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS IN PLANS USING 3' / 900 MM RADIUS OR RADIUS AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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.

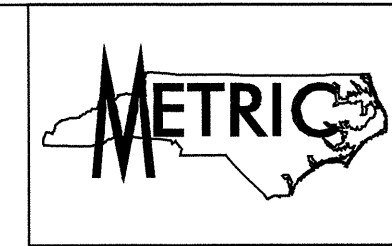
UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE FRENCH BROAD EMC- POWER DISTRIBUTION, VERIZON - TELEPHONE
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
240.01	GUIDE FOR BERM DITCH CONSTRUCTION
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.14	CONCRETE DROP INLET
840.16	BRICK DROP INLET
840.18	Concrete Median Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Median Drop Inlet Type 'B' - 300mm thru 900mm 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
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
850.11	Guide for Berm Drainage Outlet - 600mm and 800mm Pipe
862.01	Guardrail Placement
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap



*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	-----
Curb Cut For Future Wheelchair Ramp	----- WCFR ----- ----- CCFR -----
Exist. Guardrail	-----
Prop. Guardrail	-----
Exist. Cable Guiderail	-----
Prop. Cable Guiderail	-----
Equality Symbol	-----
Pavement Removal	-----

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	----- C -----
Prop. Control of Access Line	----- C -----
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	-----
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	----- □ -----
Cable TV Pedestal	----- □ -----
Hydrant	-----
Satellite Dish	-----
Exist. Water Valve	----- ⊗ -----
Sewer Clean Out	----- ⊕ -----
Power Manhole	----- ⊕ -----
Telephone Booth	----- □ -----
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 U/G Record	ATTUR
End of Information	E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	----- PL -----
Exist. Iron Pin	----- EIP -----
Property Corner	----- ⊕ -----
Property Monument	----- ECM -----
Property Number	----- 123 -----
Parcel Number	----- 6 -----
Fence Line	----- WW & ISBW -----
Existing Wetland Boundaries	----- 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	-----

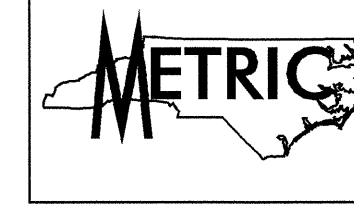
VEGETATION

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

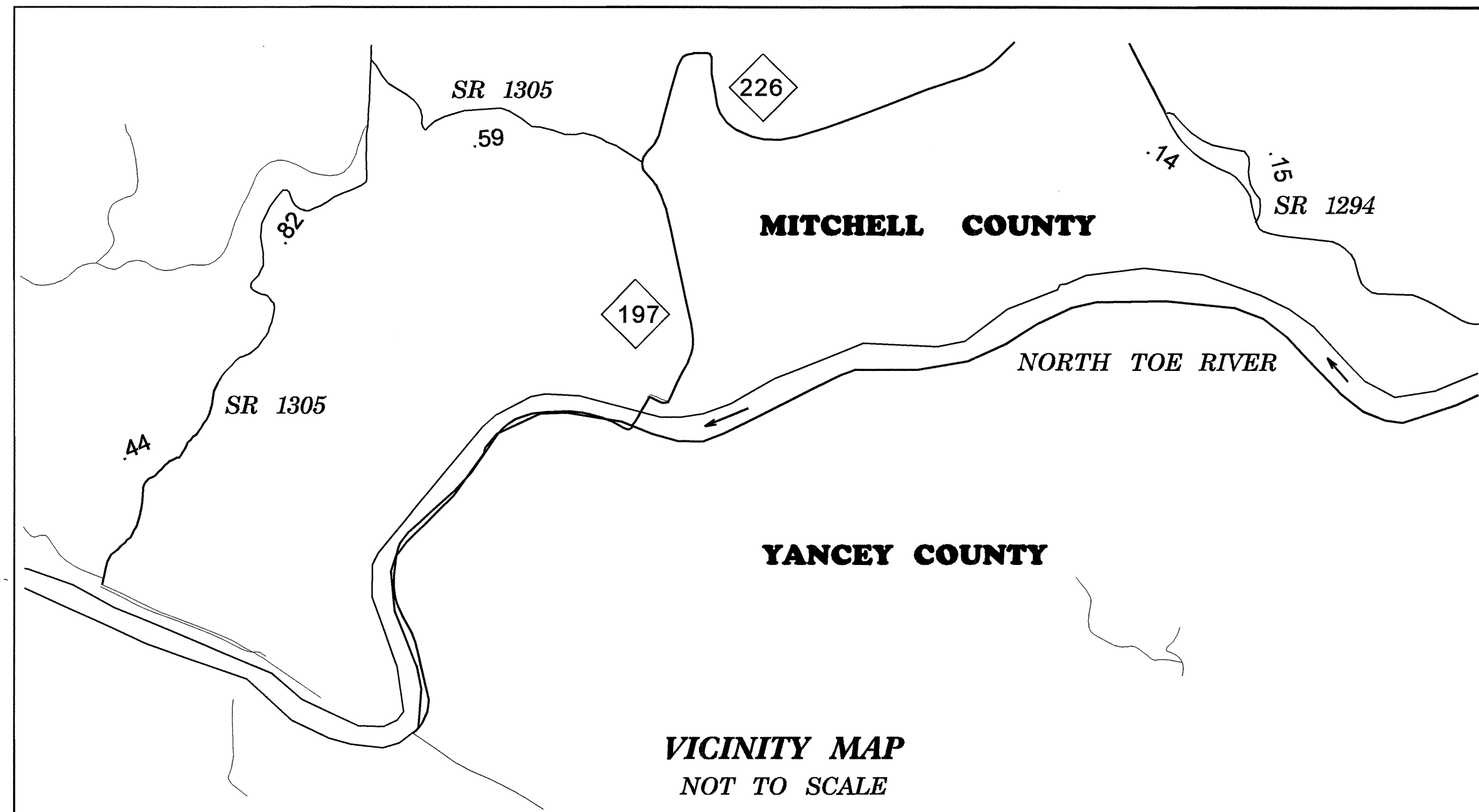
RAILROADS

Standard Gauge	-----
RR Signal Milepost	----- MILEPOST 35 -----
Switch	----- SWITCH -----

6/11/99
06-DEC-2004 15:01:45
JE:Johnson AT:R252626



SURVEY CONTROL SHEET



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-1443-01" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 255785.5918 (m) EASTING: 318,182.5459 (m) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999682815

THE N.C. LAMBERT GRID BEARING LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B1443-01" TO -L- STATION 10+79.047 IS
N 84° 48' 19.85" E 206.260 (m)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NGVD 29



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:

B1443 LS CONTROL_041222.TXT

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

▲ INDICATES NCGS GEODETIC CONTROL MONUMENTS USED FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

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

PROJECT CONTROL ESTABLISHED UTILIZING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM EXISTING NCGS AND NCDOT MONUMENTATION.

MITCHELL COUNTY

-L- STA 14+64.966 END STATE PROJECT 32597.1.1
 LOCALIZED PROJECT COORDINATES
 N = 255923.1832
 E = 318674.3840

NCDOT GPS STATION "B-1443-1"
 LOCALIZED PROJECT COORDINATES
 N = 255786.0960
 E = 318183.1730


-L- STA 10+79.047 BEGIN STATE PROJECT 32597.1.1
 LOCALIZED PROJECT COORDINATES
 N = 255804.3854
 E = 318387.9478

YANCEY COUNTY

NCDOT GPS STATION "B-1443-2"
 LOCALIZED PROJECT COORDINATES
 N = 255555.5549
 E = 317987.7940

NOTE:
 DRAWING NOT TO SCALE

SURVEY CONTROL SHEET

	PROJ. REFERENCE NO.	SHEET NO.
	B-1443	1 - D
	LOCATION & SURVEYS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B1443-01" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 255785.5918 (m) EASTING: 318,182.5459 (m) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999852815 THE N.C. LAMBERT GRID BEARING LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B1443-01" TO -L- STATION 10+79.047 IS **N 84° 46' 19.85" E** 206.260 (m) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
602	B1443-2		255555.5550	317987.7940	661.731	OUTSIDE PROJECT LIMITS	
601	B1443-1		255786.0960	318183.1730	663.185	OUTSIDE PROJECT LIMITS	
603			255814.1700	319309.1620	663.713	OUTSIDE PROJECT LIMITS	
604			255798.7310	319426.0320	667.734	OUTSIDE PROJECT LIMITS	
605			255762.5681	318533.7300	666.031	12+33.775	5.546 LT
606			255844.2600	318566.8660	665.813	13+46.991	62.216 LT
607			255840.9790	318643.2240	666.425	13+77.410	7.898 RT
608			255980.4160	318703.2650	666.210	OUTSIDE PROJECT LIMITS	
609			256129.6170	318682.5940	669.851	11+79.107	411.923 LT

BM DATA

 DUE TO TERRAIN, AND LENGTH OF BASELINE BEYOND DESIGN AREA, NO BENCHMARKS WERE SET, OTHER THAN THE REBAR AND CAPS ON THE BASELINE

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:
 B1443 LS CONTROL_041222.TXT

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



CENTERLINE COORDINATE LIST

Disclaimer: This coordinate list is provided for the convenience of interested contractors and is intended for use during the project bidding process only. Coordinates are localized to this particular project and any conversion to state grid coordinates or other formats will be the responsibility of the recipient. While every effort has been made to provide up-to-date, accurate information, NCDOT makes no express guarantee as to the validity or potential for revision of this information prior to project letting.

Point #	Chain	Station	Northing(Y)	Easting(X)
1	L	10 + 80.00	255804.2018	318388.8830
2	L	11 + 20.00	255793.9699	318427.5244
3	L	11 + 60.00	255778.9267	318464.5588
4	L	12 + 00.00	255761.7283	318500.6037
5	L	12 + 40.00	255757.3950	318540.1005
6	L	12 + 80.00	255768.7844	318578.1671
7	L	13 + 20.00	255794.0986	318608.7934
8	L	13 + 60.00	255828.7711	318628.5118
9	L	14 + 00.00	255864.7492	318645.9925
10	L	14 + 40.00	255900.7272	318663.4733
11	L	14 + 64.97	255923.1832	318674.3840
12	L	14 + 64.97	255923.1832	318674.3840

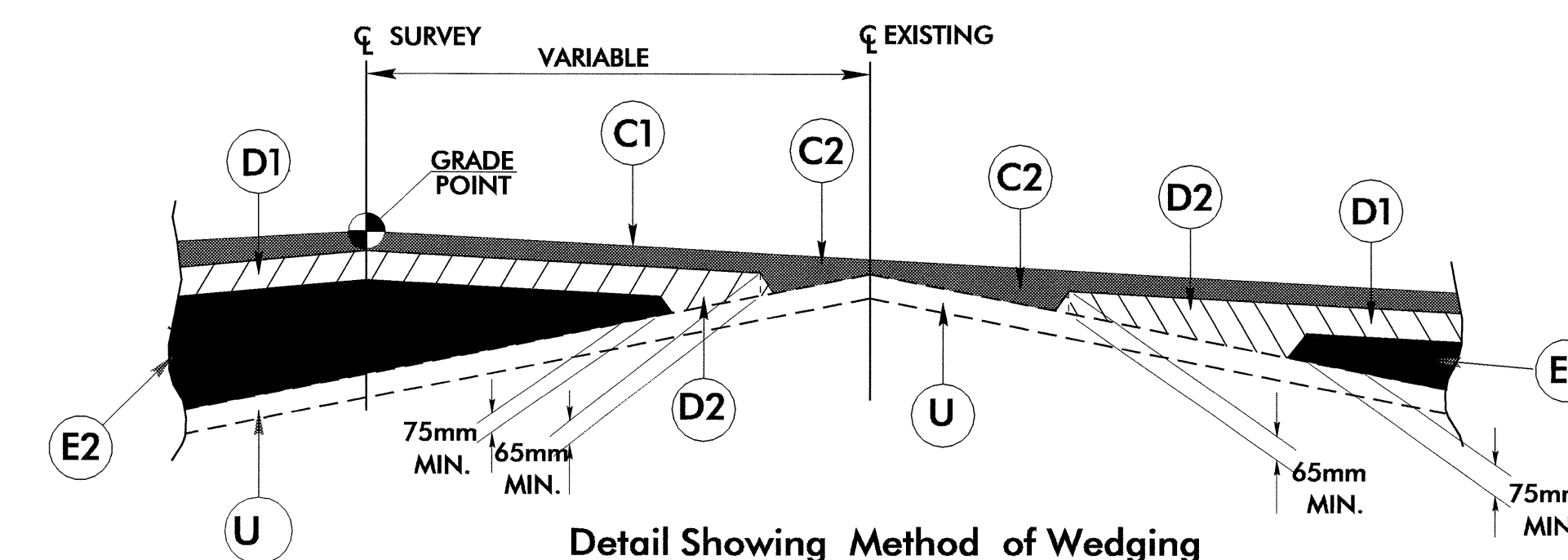
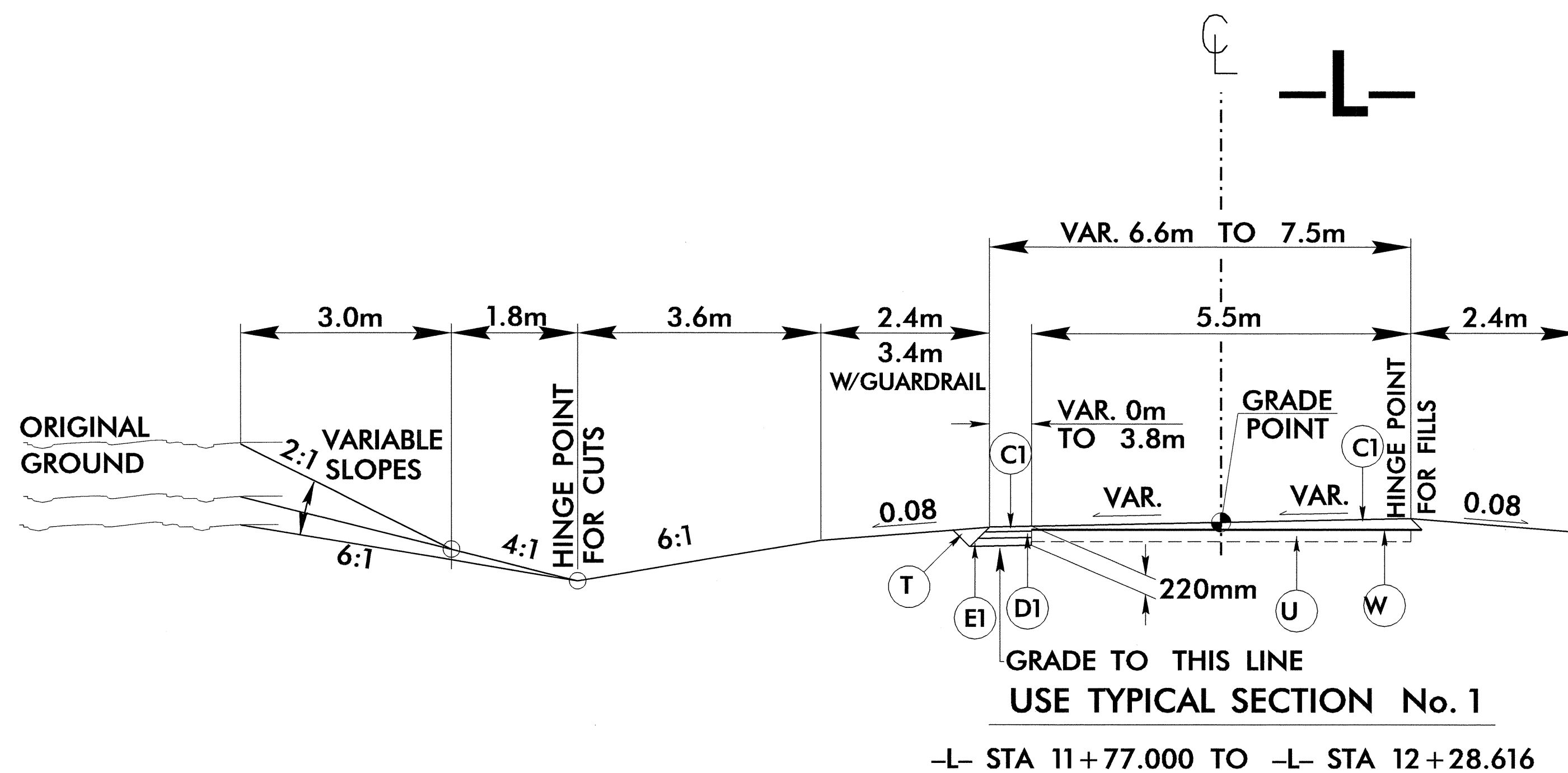


PROJECT REFERENCE NO. B-1443	SHEET NO. 2
ROADWAY DESIGN ENGINEER JAMES J. STAFFORD	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON

PAVEMENT SCHEDULE			
C1	PROP. APPROX. 50 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 120 kg PER SQ. METER.	E2	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
C2	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.4 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 50 mm IN DEPTH.	J	PROP. 150 mm AGGREGATE BASE COURSE.
D1	PROP. APPROX. 70 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 171.5 kg PER SQ. METER.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 65 mm IN DEPTH OR GREATER THAN 110 mm IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245.0 kg PER SQ. METER.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE STANDARD WEDGING DETAIL)

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

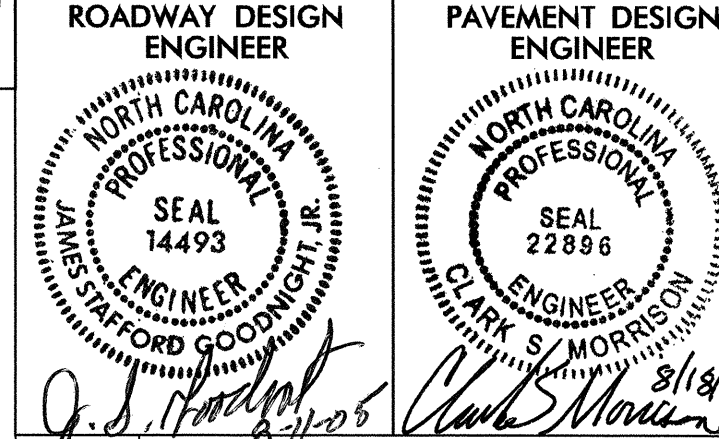
TYPICAL SECTION No. 1



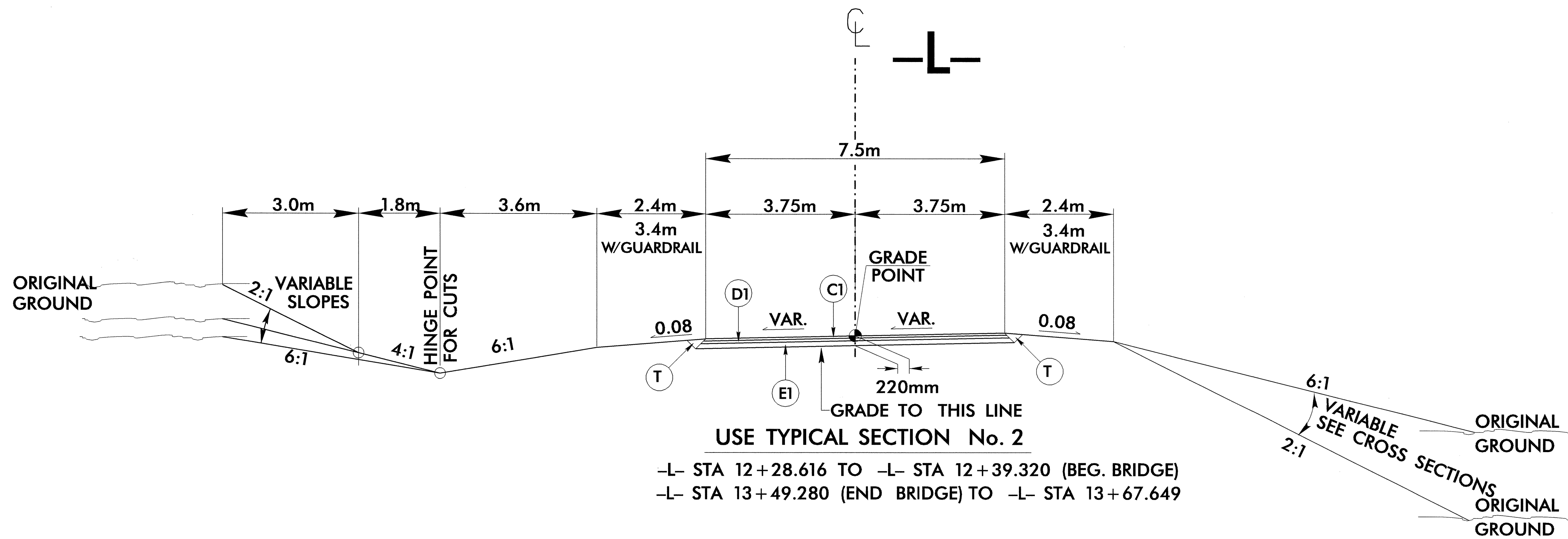


PROJECT REFERENCE NO. SHEET NO.

B-1443 2-A

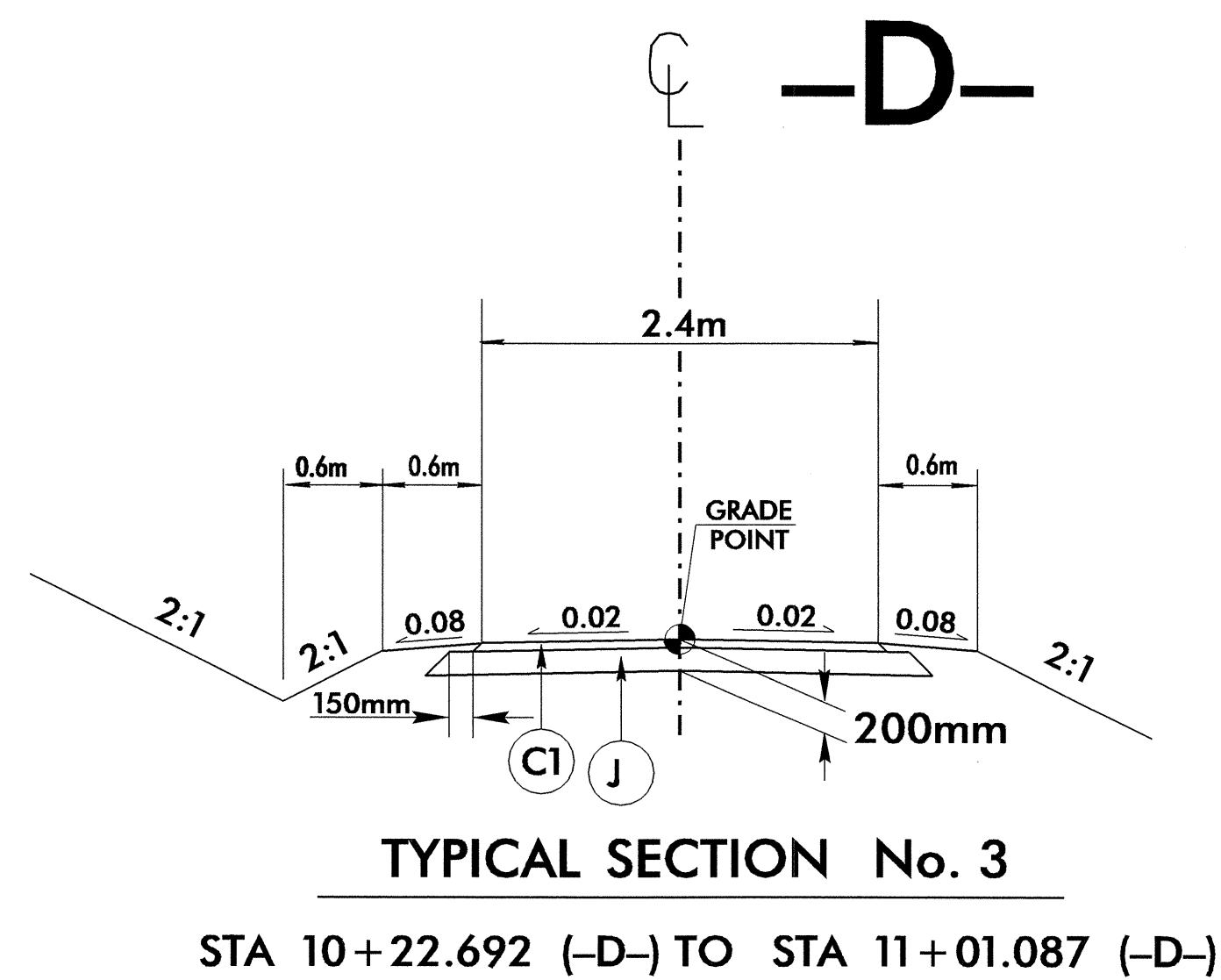


TYPICAL SECTION No. 2

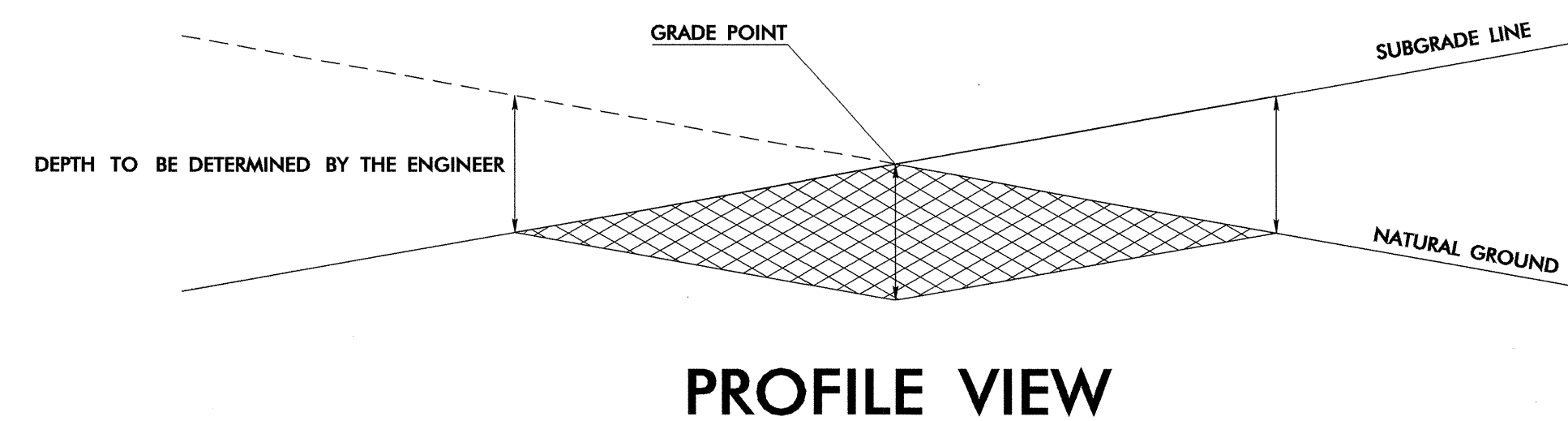


C1	50mm S9.5B
D1	70mm I19.0B
E1	100mm B25.0B
J	150mm ABC
T	EARTH MAT'L
U	EXIST. PAV'T
W	WEDGING

TYPICAL SECTION No. 3



DETAIL OF UNDERCUT AT GRADE POINT



6/16/09

10-AUG-2005 10:35 AM AT B:\223\1443.tup

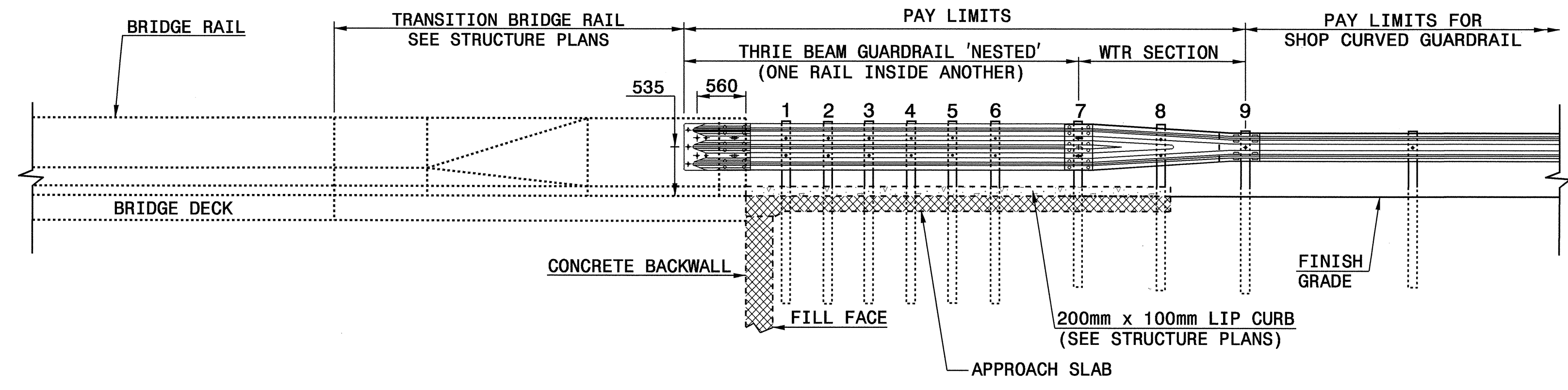


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

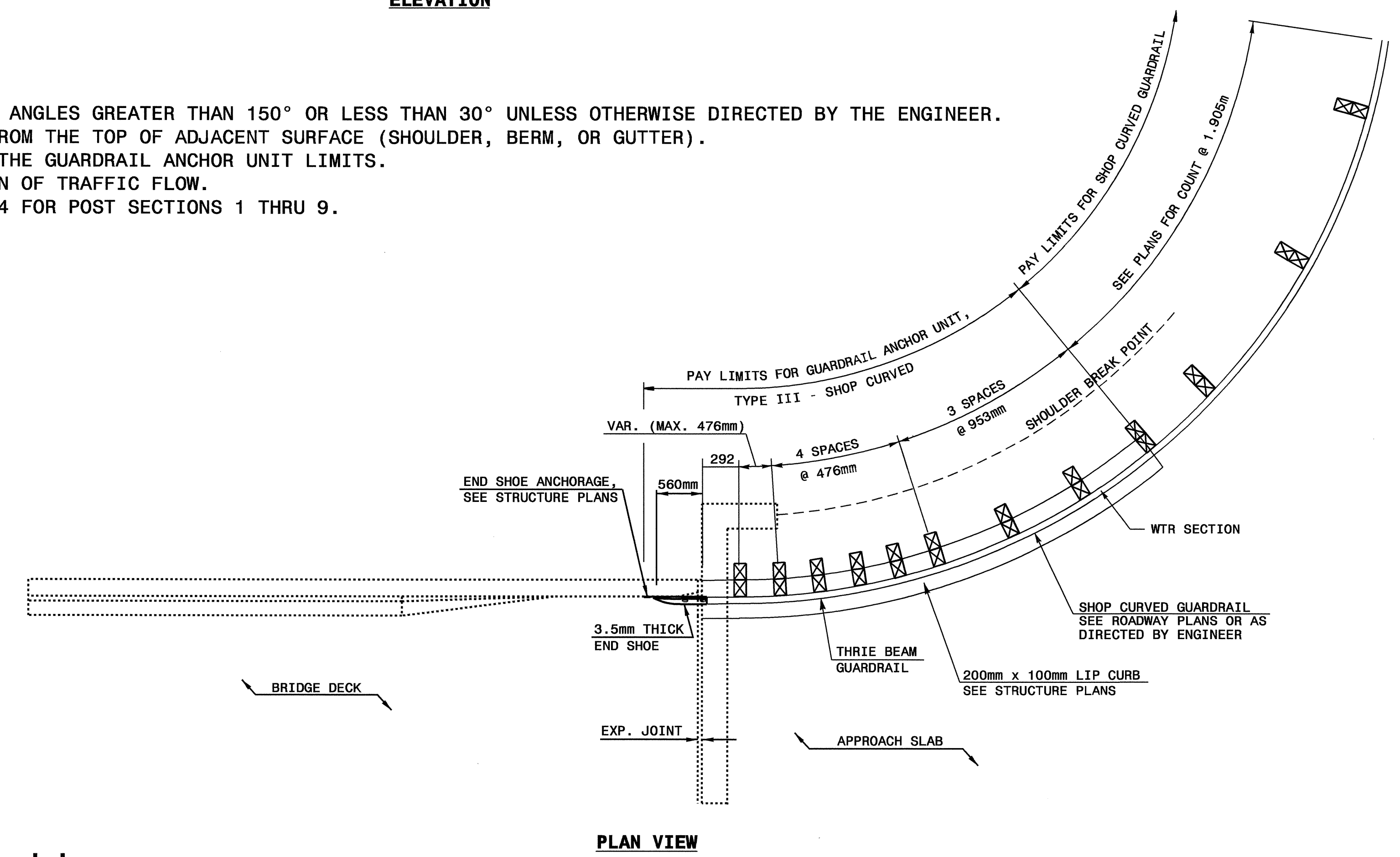
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT

METRIC DETAIL DRAWING FOR
TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT



NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

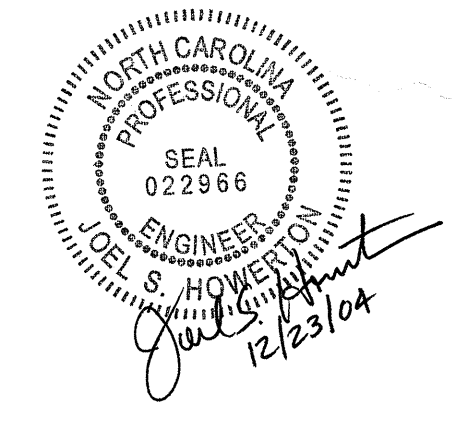
SHEET 1 OF 1
TYPE III SC

SHEET 1 OF 1
TYPE III SC

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: 11-17-04
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC: ward:\usr\details\stand\862stds\typeiii.sc.dgn



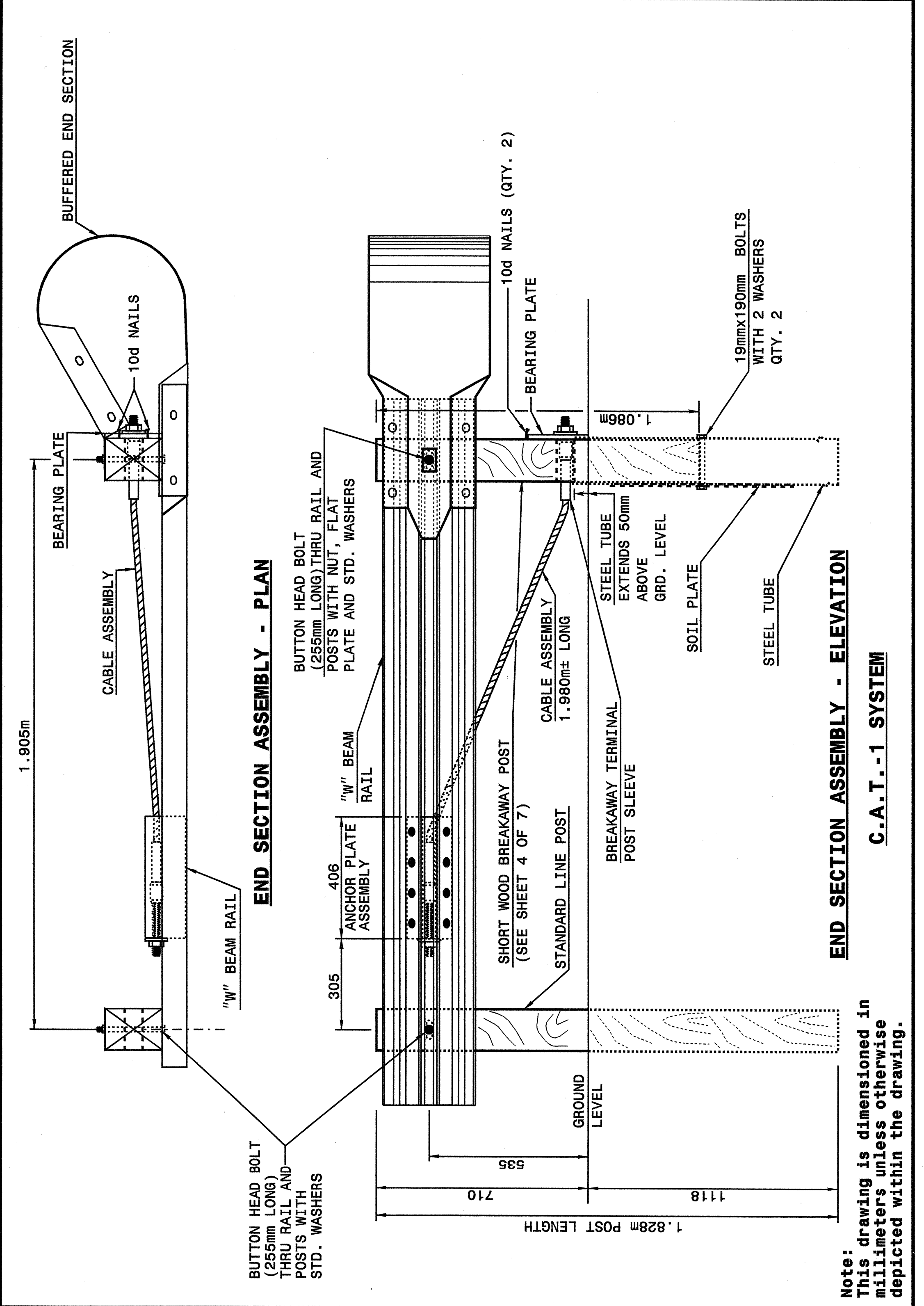
18-NOV-2004 11:42
M:\Special Details\ercward\usr\details\metric\862stds\type.iii.sc.dgn
ercward HT 05212260



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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 7
862D02



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

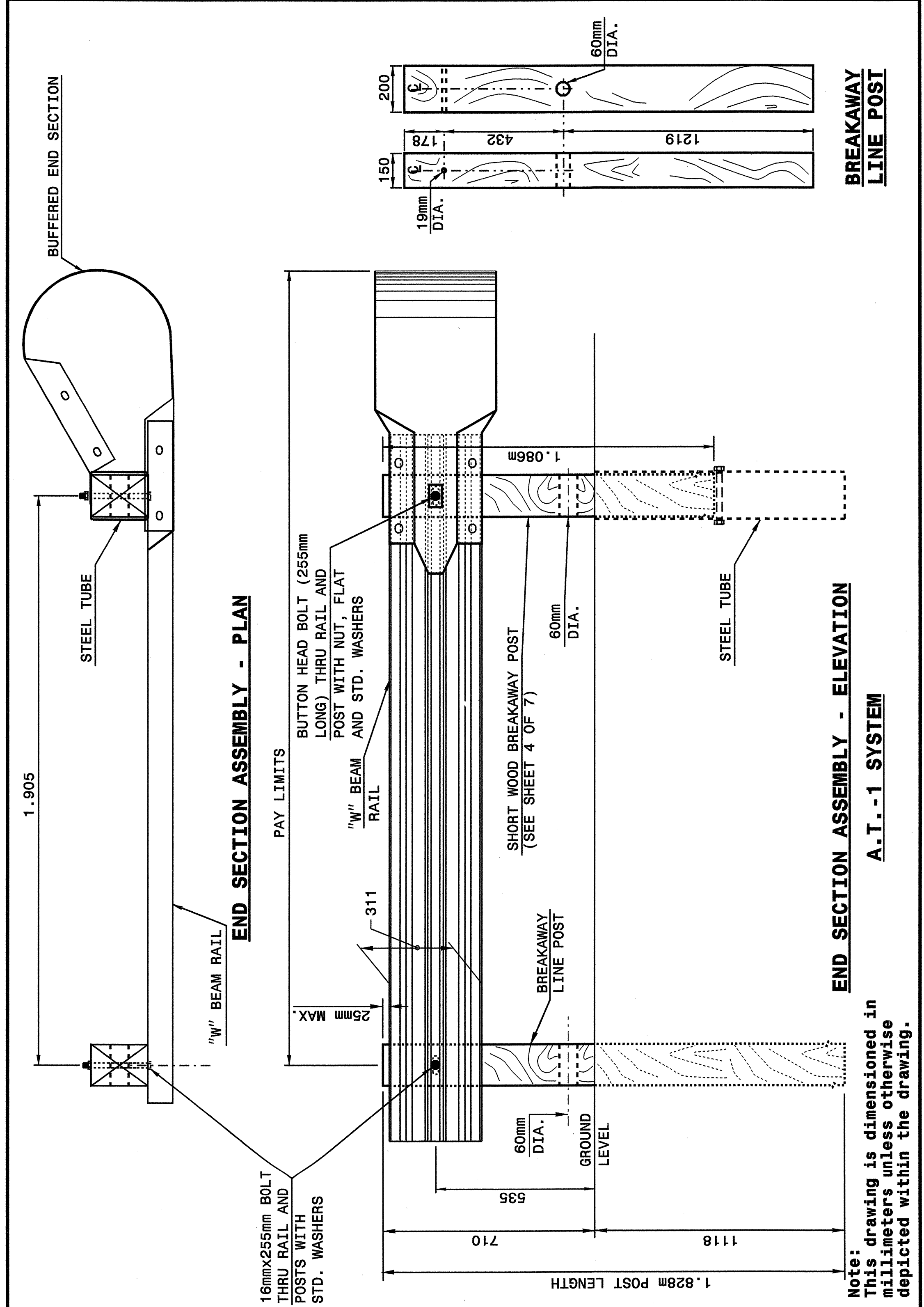
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 1 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 7
862D02



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

METRIC 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: 02-09-03
 MODIFIED BY: E.E. WARD DATE: 10/22/04
 CHECKED BY: [Signature] DATE: 11/29/06
 FILE SPEC.: /usr/stds/02todetail/metric/86202/86202m.dgn



21-0CT-2004 12:55
 M:\Special Details\Verward\stds\02\stds to Special Details\metric\86202\0862d02m.dgn
 erickard
 At 05212260



21-001-2004 12:55
 M:\Special Details\erichard\stds\02\stds to Special Details\metric\862d02\0862d02.mdn
 erichard
 At 10:52:22:60

**METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION**

SHEET 3 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02

ISOMETRIC VIEWS

PLAN

FRONT

ISOMETRIC VIEWS

FRONT

SIDE

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

NOTES:
 A - 16mm DIA. BUTTON HEAD SPLICE BOLT 32mm LONG WITH STD. WASHER UNDER NUT (8 REQ. PER SPLICE JOINT).
 B - 16mm DIA. BUTTON HEAD BOLT 190mm/228mm LONG WITH NUT FOR BOLTING 150mm/200mm ROUTED OFFSET BLOCK TO STEEL POSTS OR 16mm DIA. BUTTON HEAD BOLT 457mm LONG WITH STD. WASHER UNDER NUT FOR BOLTING TO WOOD POSTS (1 REQ. PER LOCATION)
 C - FIELD PUNCH HOLES INTO THE GUARDRAIL AS DIRECTED BY THE ENGINEER.

Note:
 This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

**METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION**

SHEET 4 OF 7
862D02

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02

ISOMETRIC VIEWS

FRONT

SOIL PLATE

ISOMETRIC VIEWS

FRONT

SOIL PLATE

SYSTEM PARTS

ROUTED WOOD OFFSET BLOCK

STEEL POST

STEEL TUBE

WOOD OFFSET BLOCK (FOR WOOD POSTS)

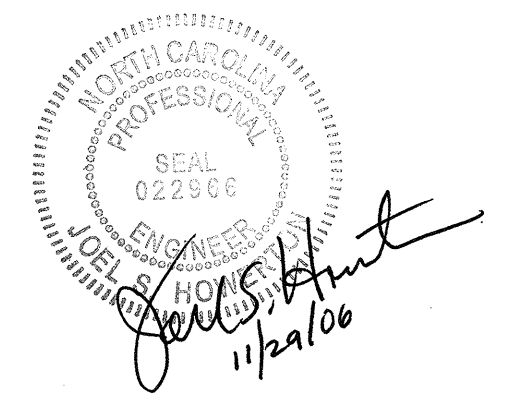
SHORT WOOD BREAKAWAY POST

STANDARD LINE POST

**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: 10/22/04
 FILE SPEC.: I:\sr\stds\02\detail\metric\862d02\862d02m.dgn

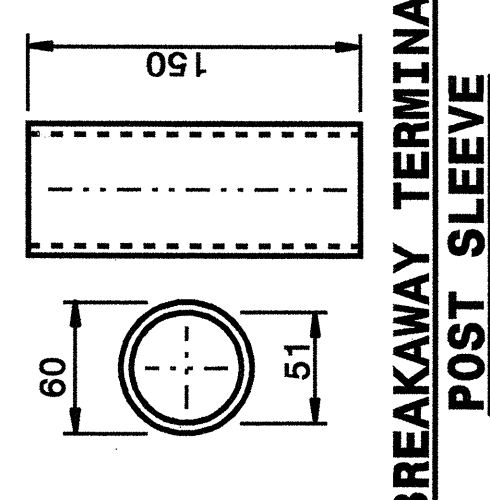




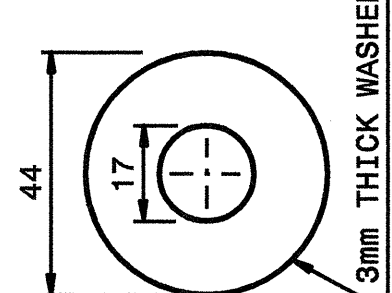
2:\CCT-2004\12156\series\stds\stds\02\stds to Spectral Details\metric\862202\0862d02m.dgn
 ericward
 10/22/06

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION
METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION

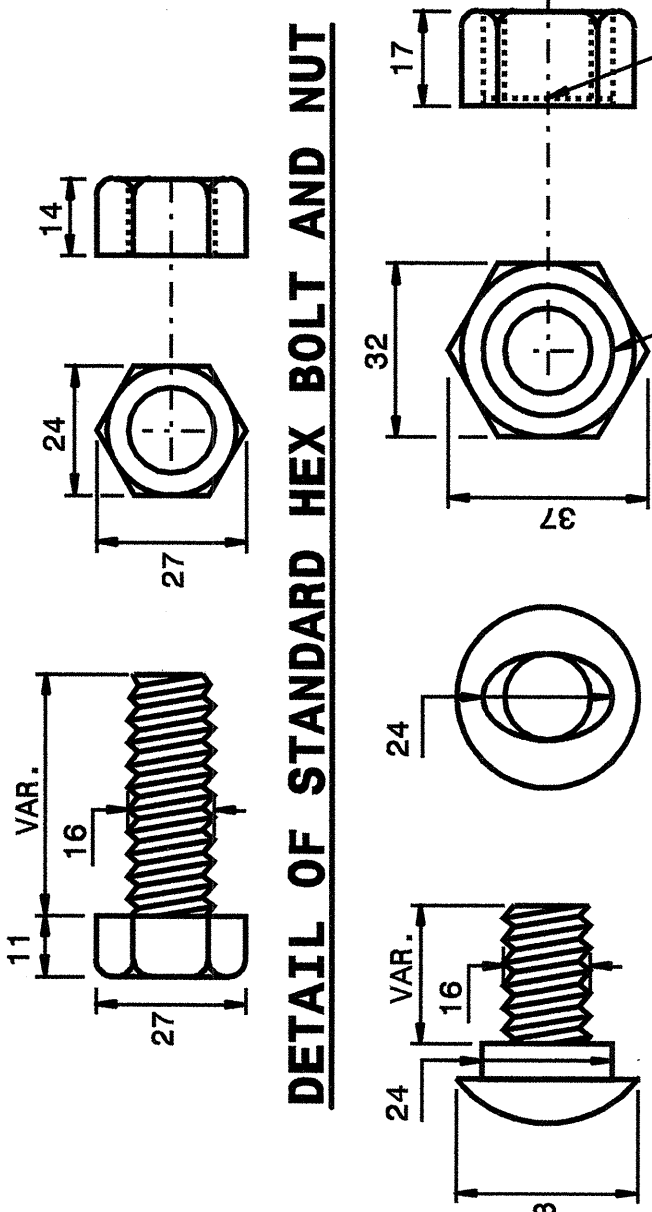
BREAKAWAY TERMINAL POST SLEEVE



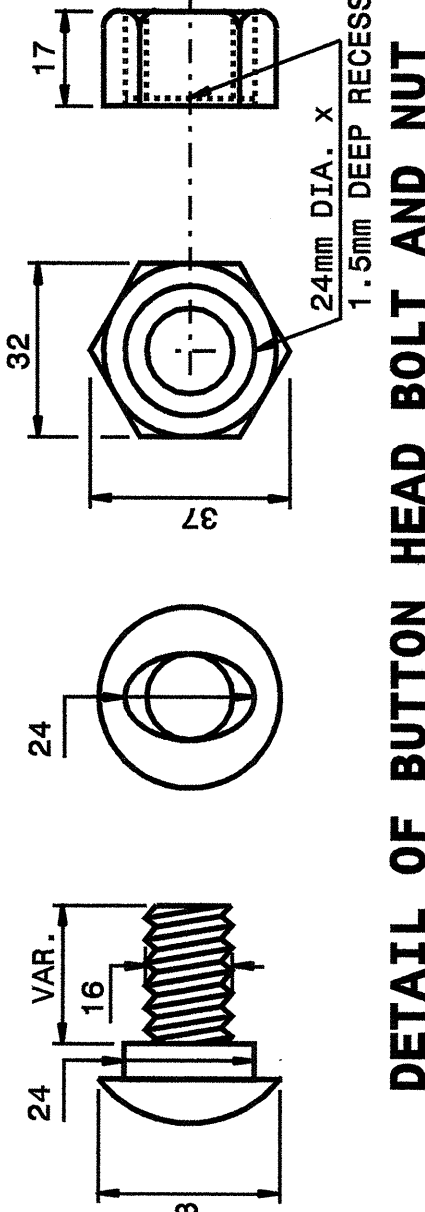
DETAIL OF STANDARD WASHER
STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



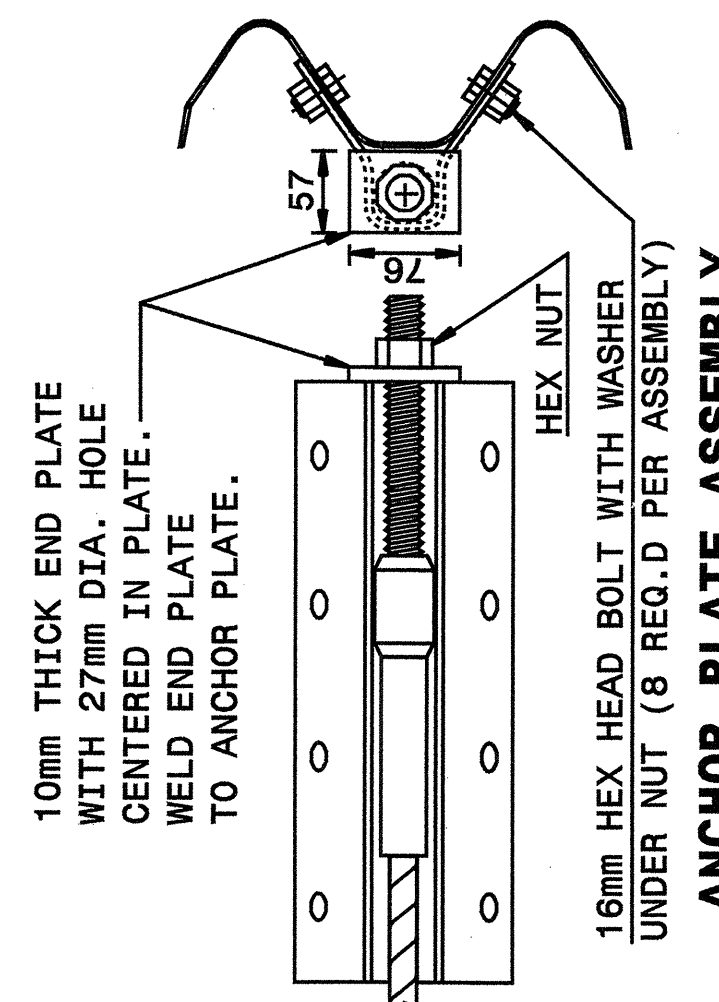
DETAIL OF STANDARD HEX BOLT AND NUT



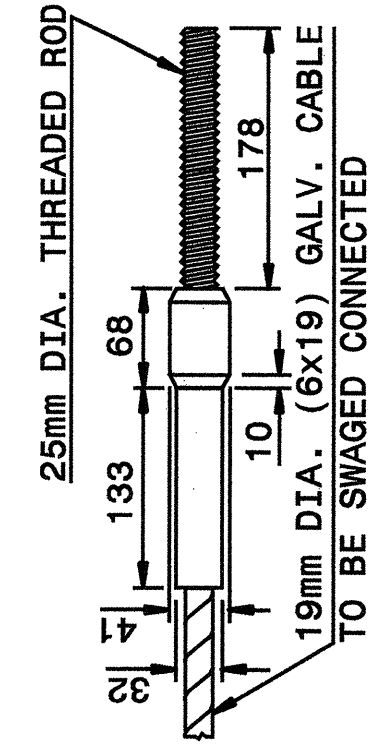
DETAIL OF BUTTON HEAD BOLT AND NUT



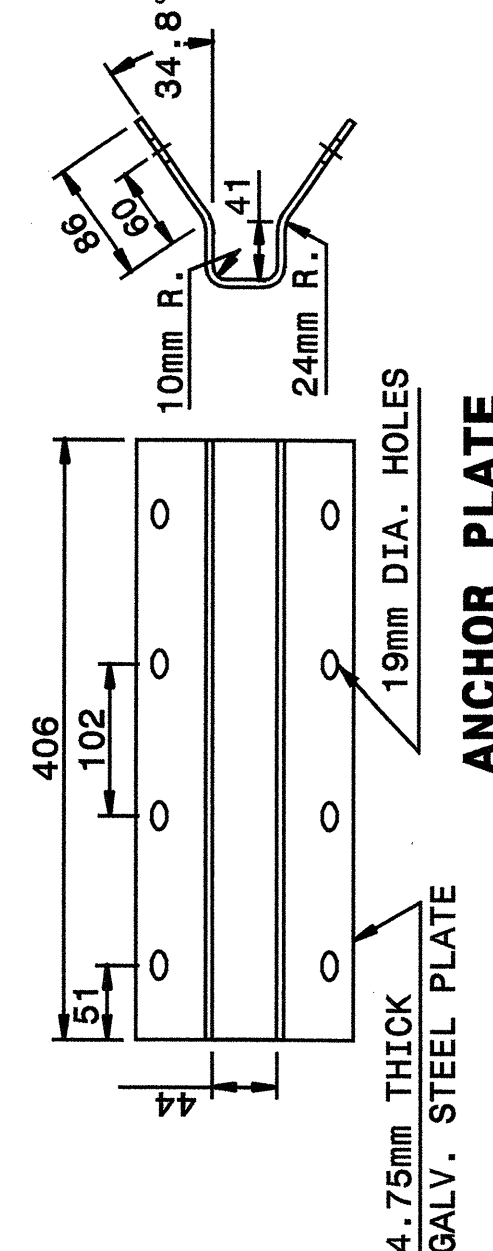
ANCHOR PLATE ASSEMBLY



SWAGED CABLE



ANCHOR PLATE



SYSTEM PARTS

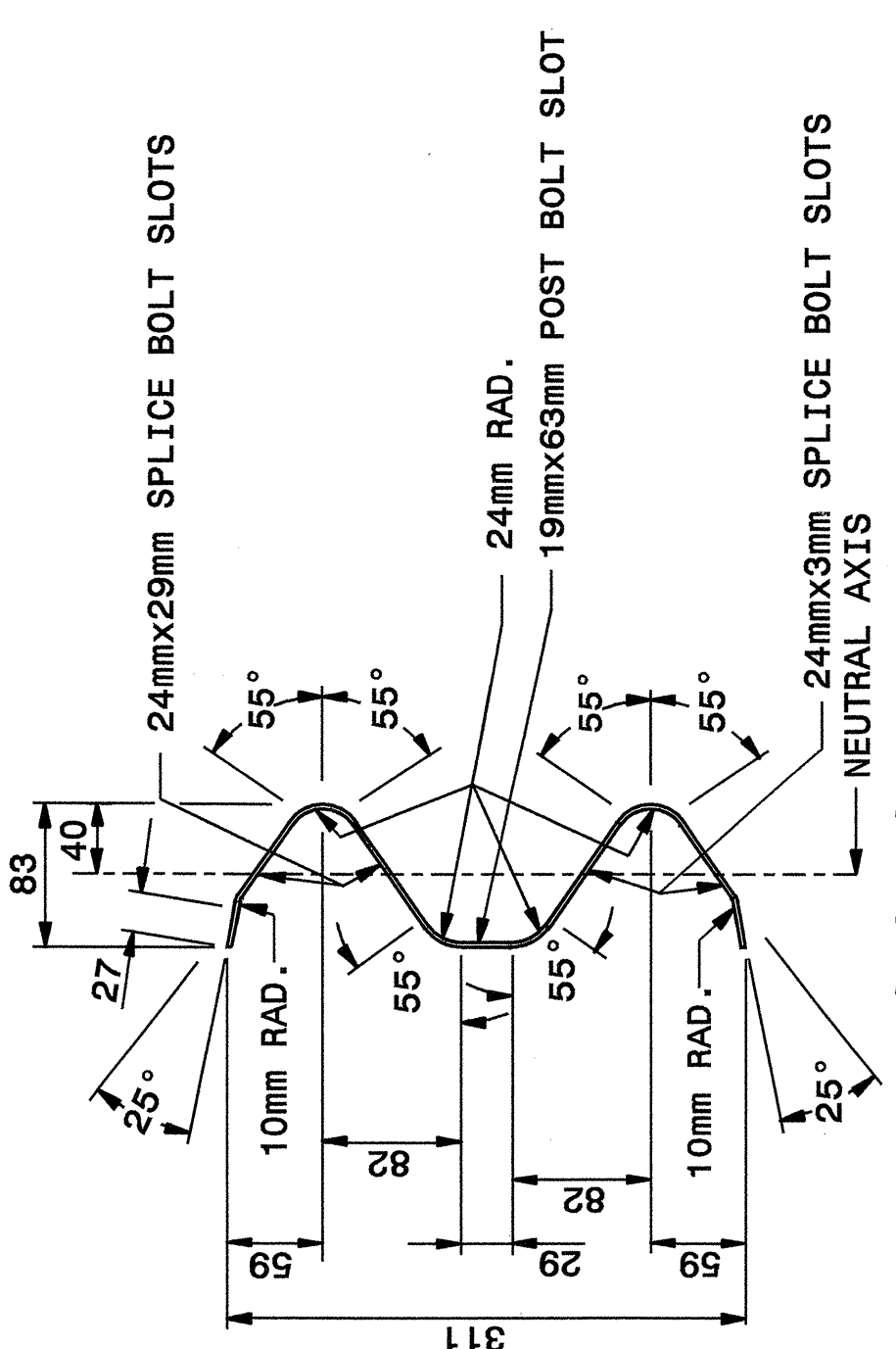
Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SHEET 5 OF 7
862D02

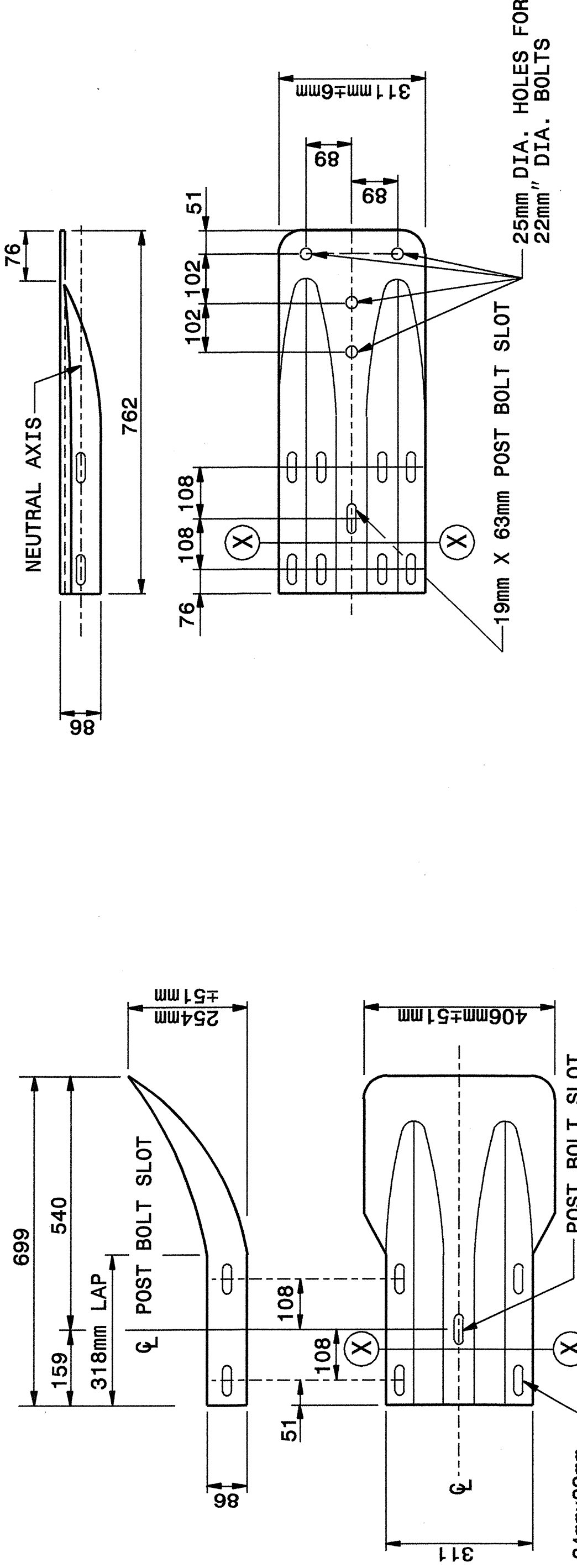
SHEET 5 OF 7
862D02

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION
METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SECTION X-X



TYPICAL END SHOE



SYSTEM PARTS - GENERAL USE

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

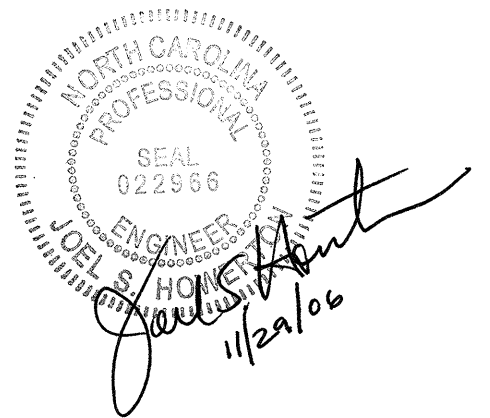
SHEET 6 OF 7
862D02

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: 02-09-03
 MODIFIED BY: E.E. WARD DATE: 10/22/06
 CHECKED BY: Eric Ward DATE: 10/22/06
 FILE SPEC.: J:\gr\stds\02\detail\metric\862202\862d02m.dgn

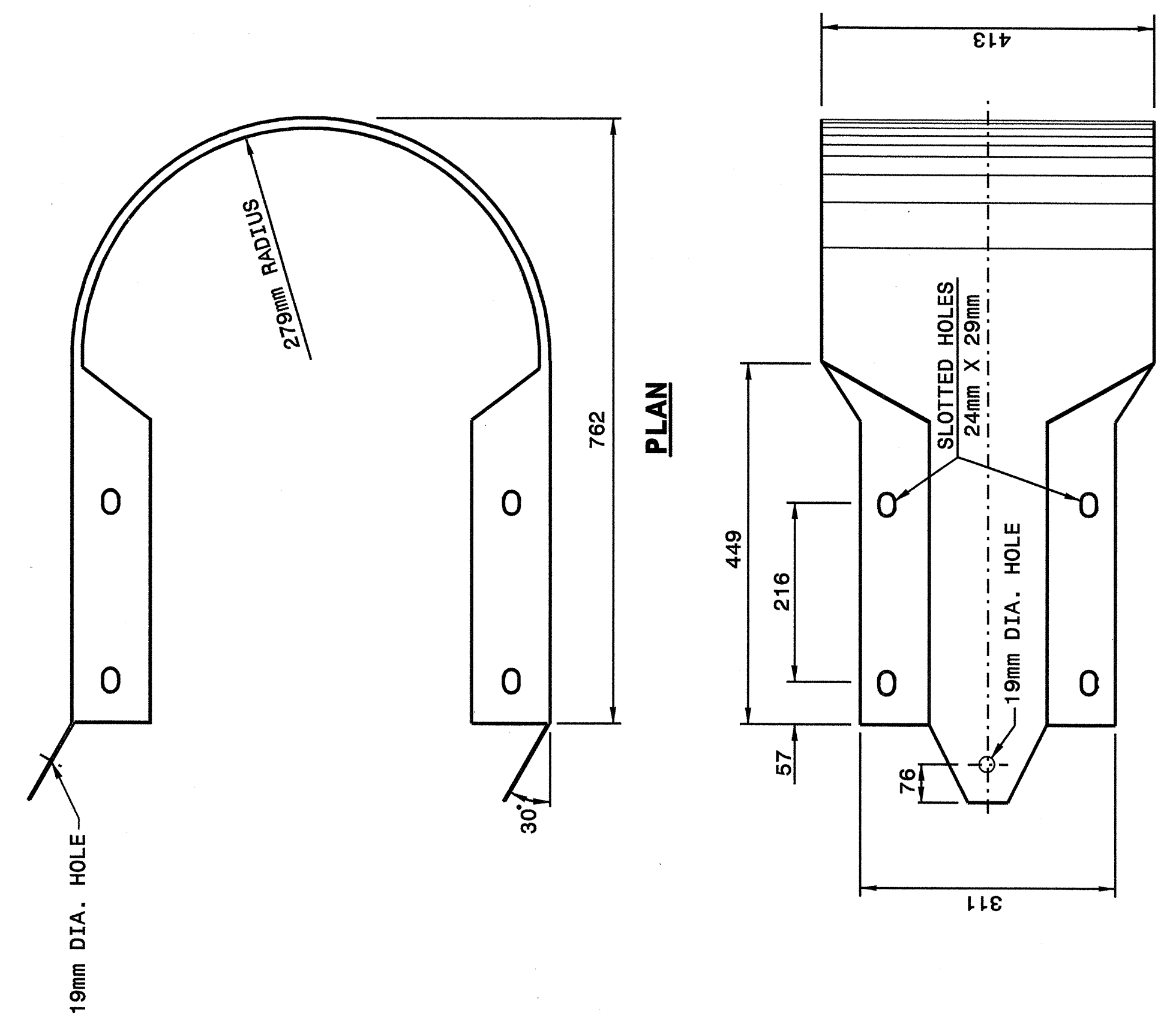




STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02



ELEVATION
BUFFERED END SECTION

Note:
This drawing is dimensioned in
millimeters unless otherwise
depicted within the drawing.

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

METRIC 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: *Joe S. Hunt* DATE: 10/22/04
 FILE SPEC.: J:\stds\02\detail\metric\86202\862002m.dgn



21-SEP-2005 14:25 S:\Contracts\10125518\Special Details\vertical\stds\02\stds to Special Details\metric\862d03\0862d03m.dgn

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

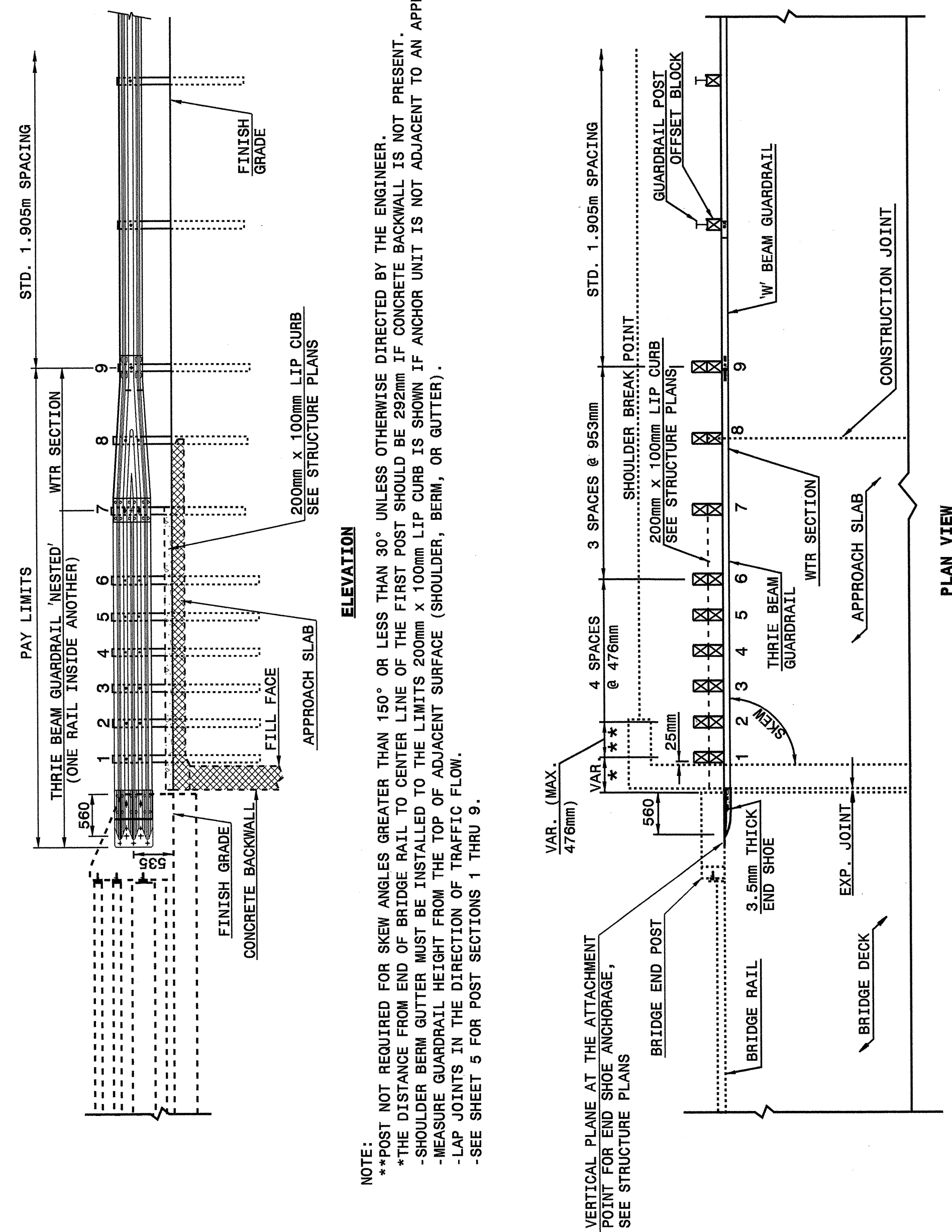
METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6
862D03

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6
862D03



Note: This drawing is dimensioned in GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB) millimeters unless otherwise depicted within the drawing.

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

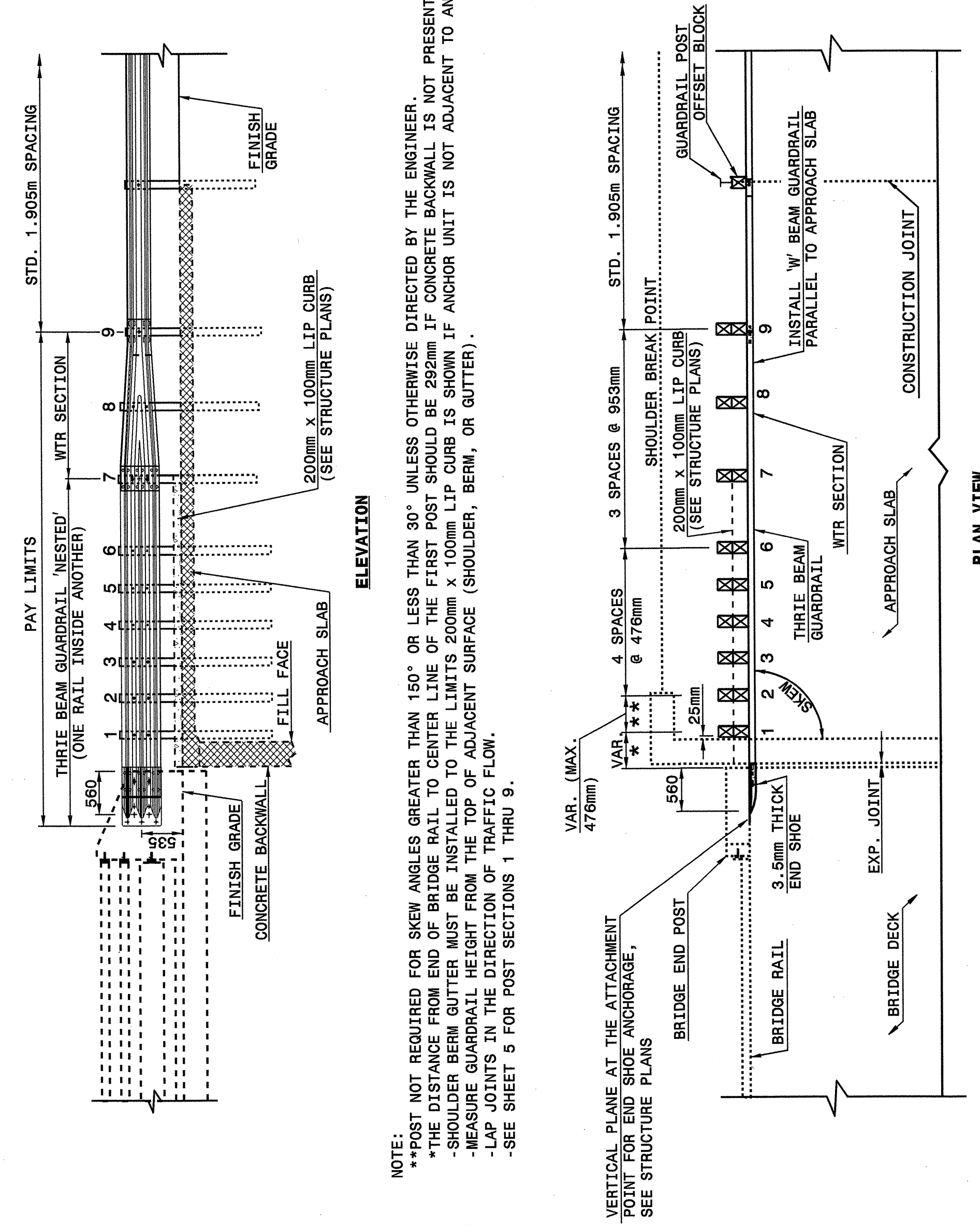
METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6
862D03

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6
862D03



Note: This drawing is dimensioned in GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (7.62m MINIMUM LENGTH APPROACH SLAB) millimeters unless otherwise depicted within the drawing.

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: *David Ward* DATE: 9/21/05
 FILE SPEC.: stds\02stdstodetails\metric\862d03.dgn

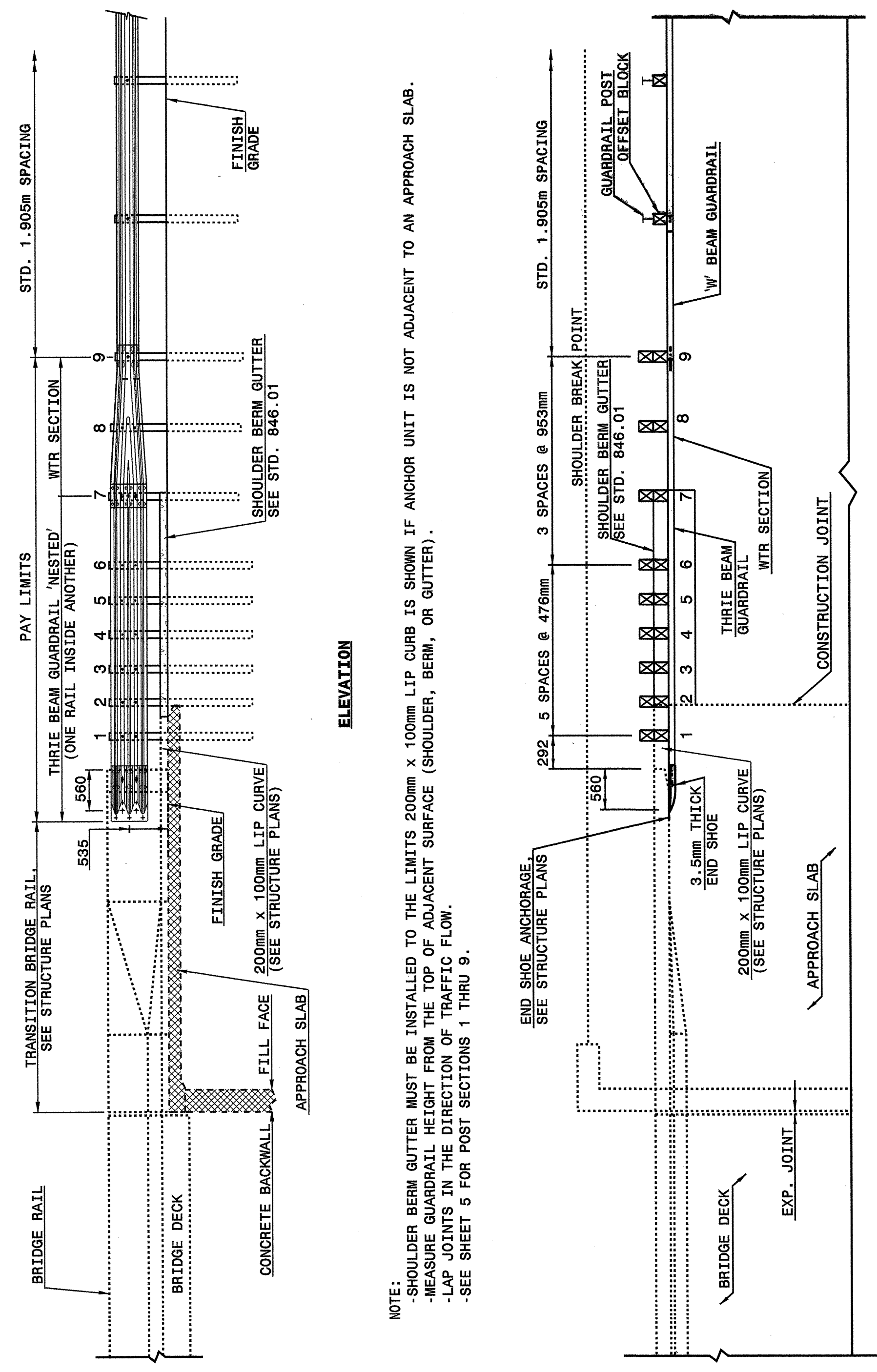
PROFESSIONAL ENGINEER
 SEAL 022866
J. Ward
 11/29/06



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

METRIC DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6 862D03



NOTE:
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 200mm x 100mm 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.

Note:
 This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

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

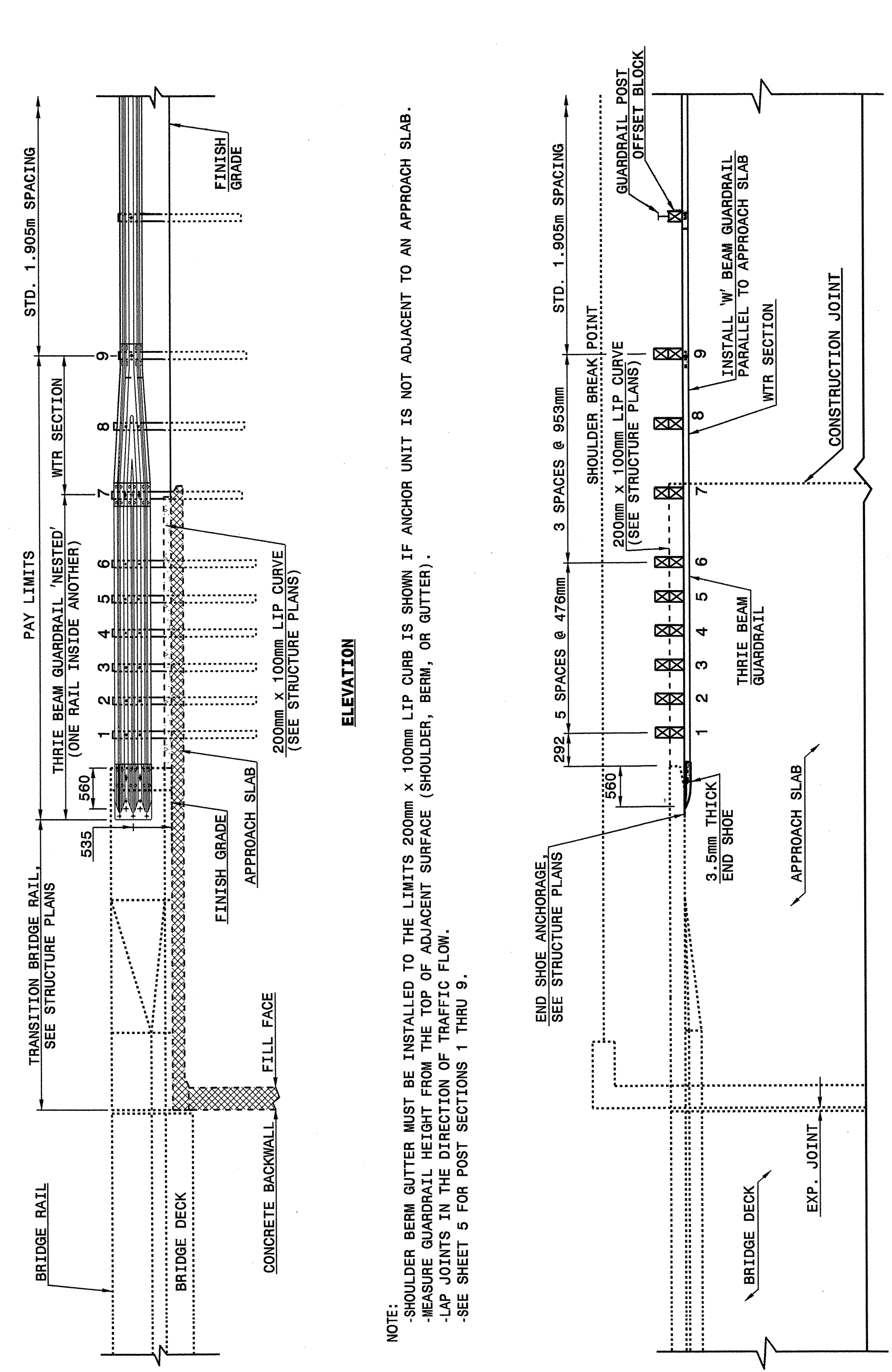
METRIC DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6 862D03

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

METRIC DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6 862D03



NOTE:
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 200mm x 100mm 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.

Note:
 This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

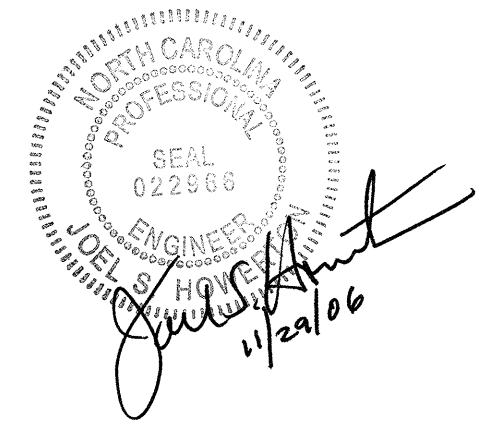
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

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

METRIC DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6 862D03

21-SEP-2005 14:26 S:\Contractors\02stds\Special Details\metric\stds\02stds to Special Details\metric\862D03\0862d03.mxdgn Ericward - R1 P522253



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: 9/21/05
 FILE SPEC.: stps\02stdstodetails\metric\862d03.dgn



16-SEP-2005 09:23 S:\Contracts\Construction\Special Details\metric\stds\02_Std to Special Details\metric\862d03\0862d03.mxd
 ericward AT P:222293

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

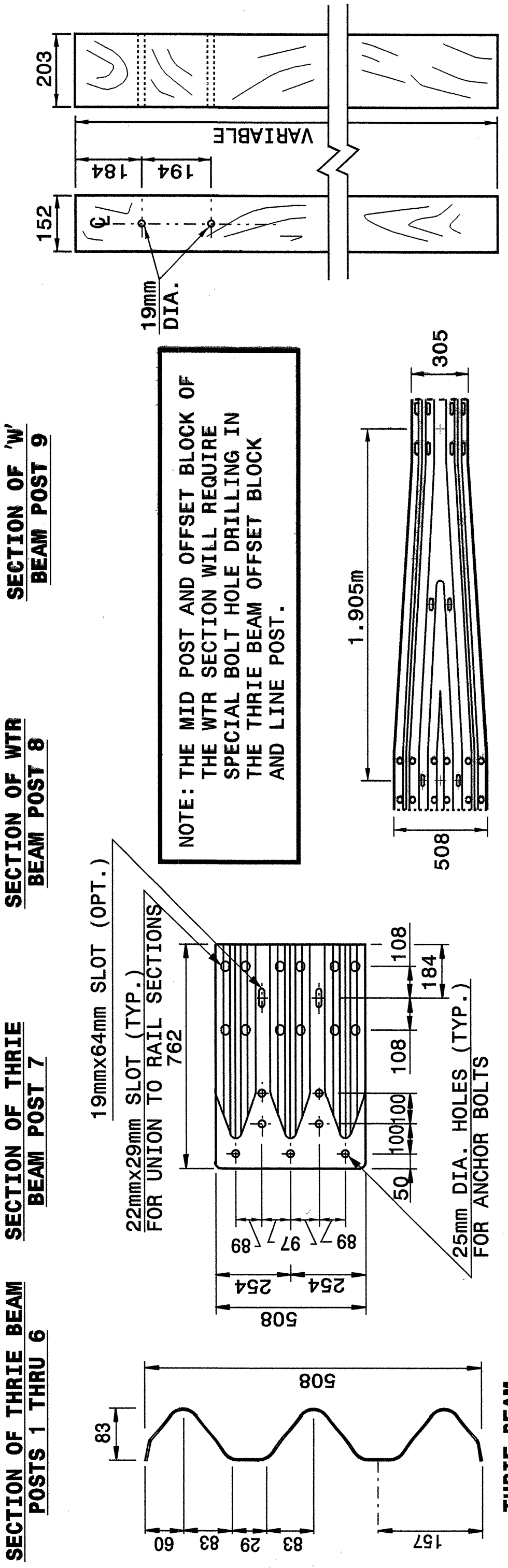
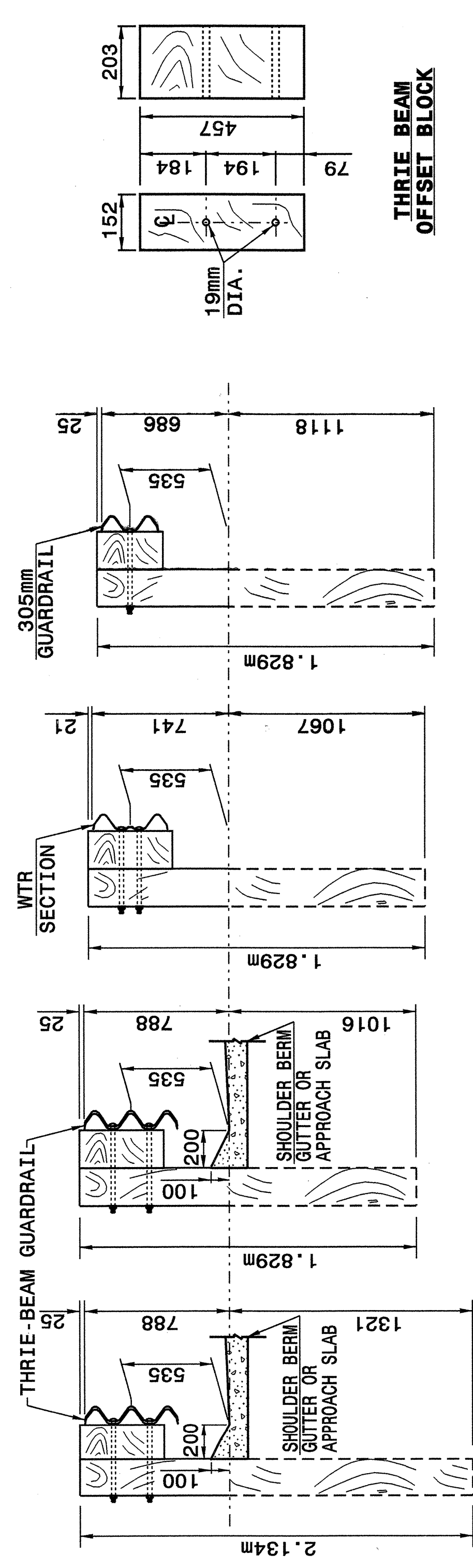
METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 5 OF 6
862D03

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

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

SHEET 5 OF 6
862D03



Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

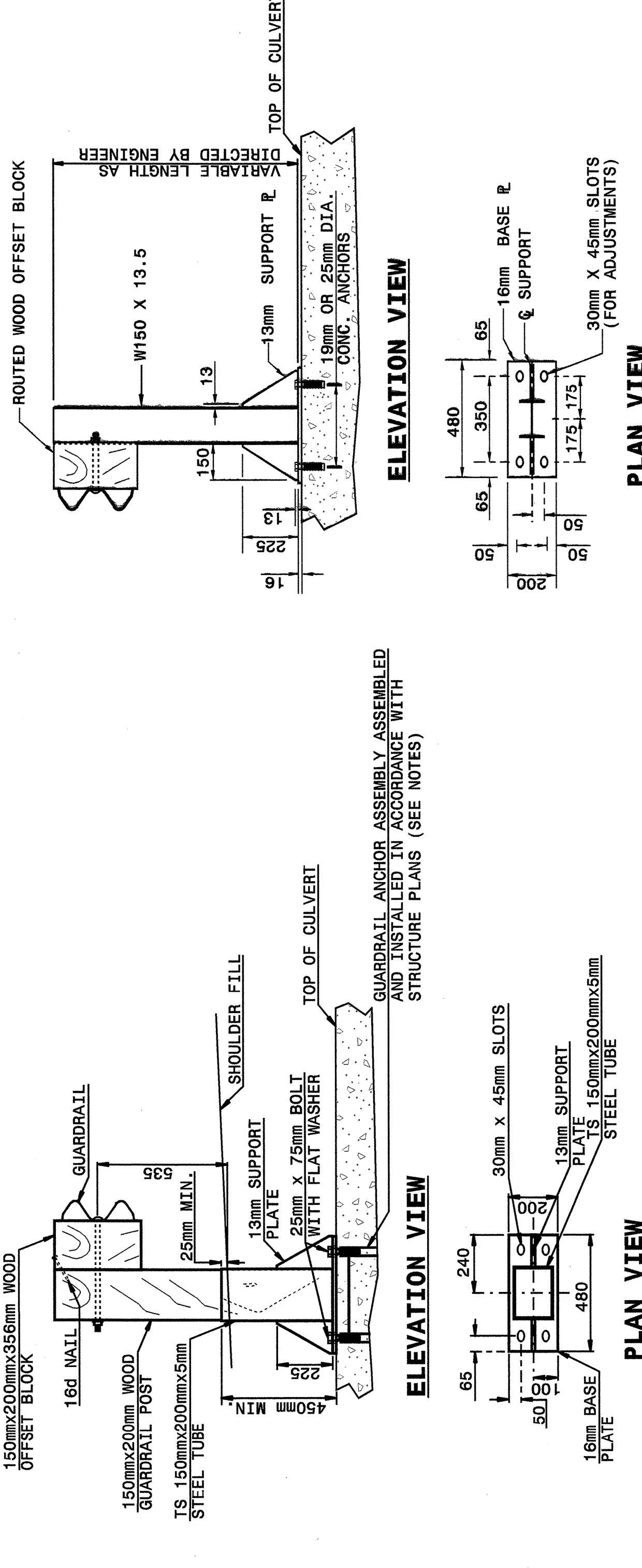
METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
 GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 6 OF 6
862D03

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

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

SHEET 6 OF 6
862D03



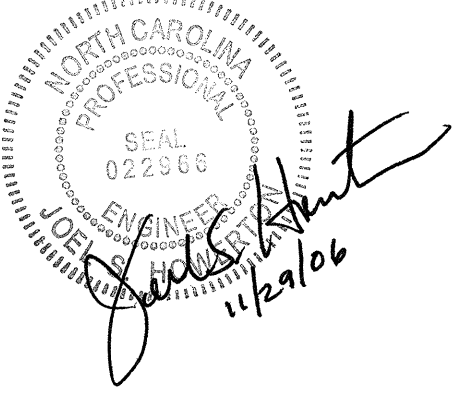
NOTES FOR:
 - GUARDRAIL POST ANCHORED TO STRUCTURE:
 - USE FULL LENGTH 6mm BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST OR STEEL TUBE.
 - USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.
 - USE WOOD POSTS WHICH FIT SNUGLY IN THE STEEL TUBE WITH A MAXIMUM OF 3mm CLEARANCE BETWEEN TUBE WALL AND POST.
 - ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.
EXISTING STRUCTURES:
 - USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 1300kg. FOR A 19mm OR 25mm DIAMETER BOLT, CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 24MPa 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.

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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: 9/19/05
 FILE SPEC.: S:\02stdstodetail\metric\862d03.dgn

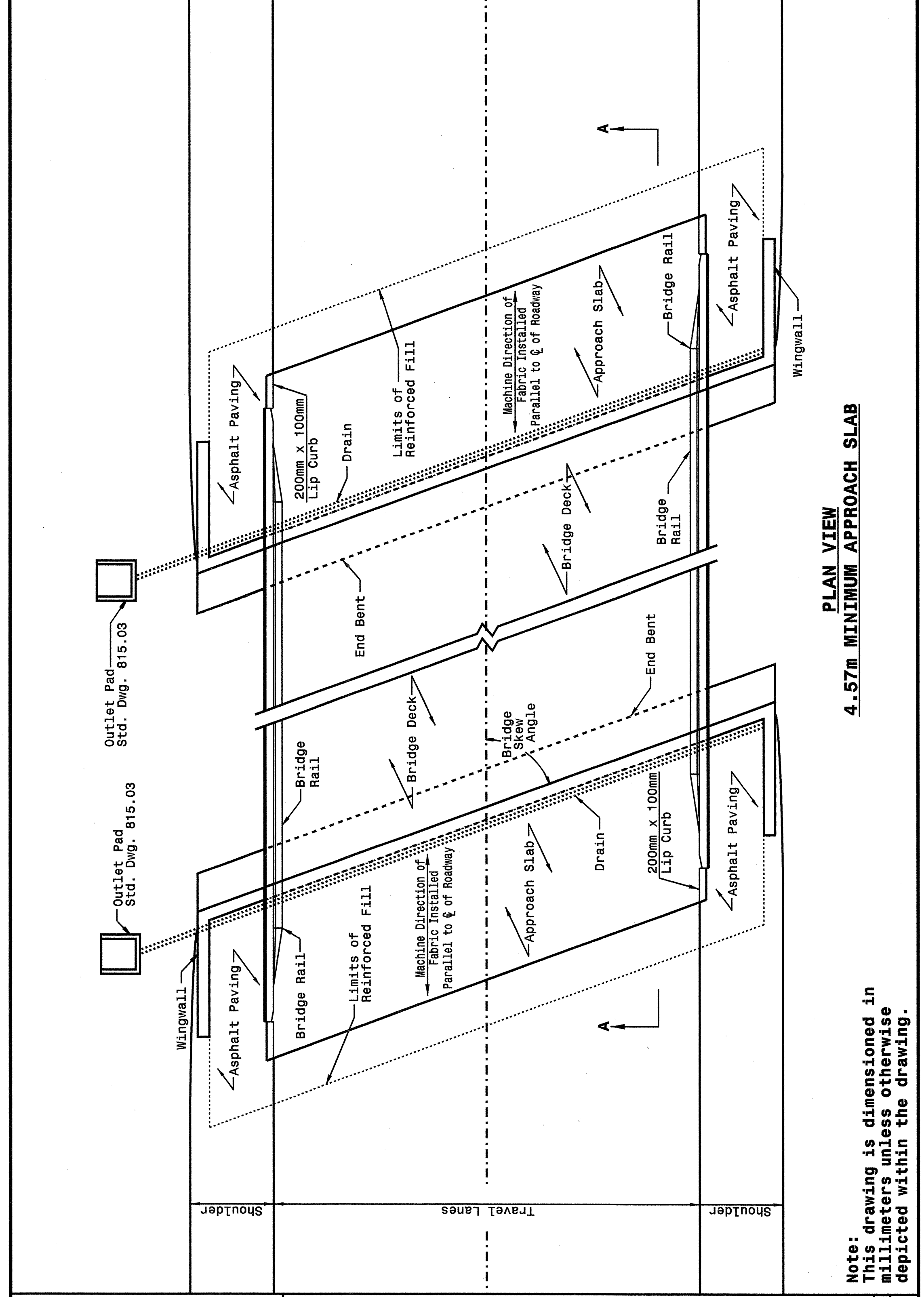




STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 1 OF 7
422D10



Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

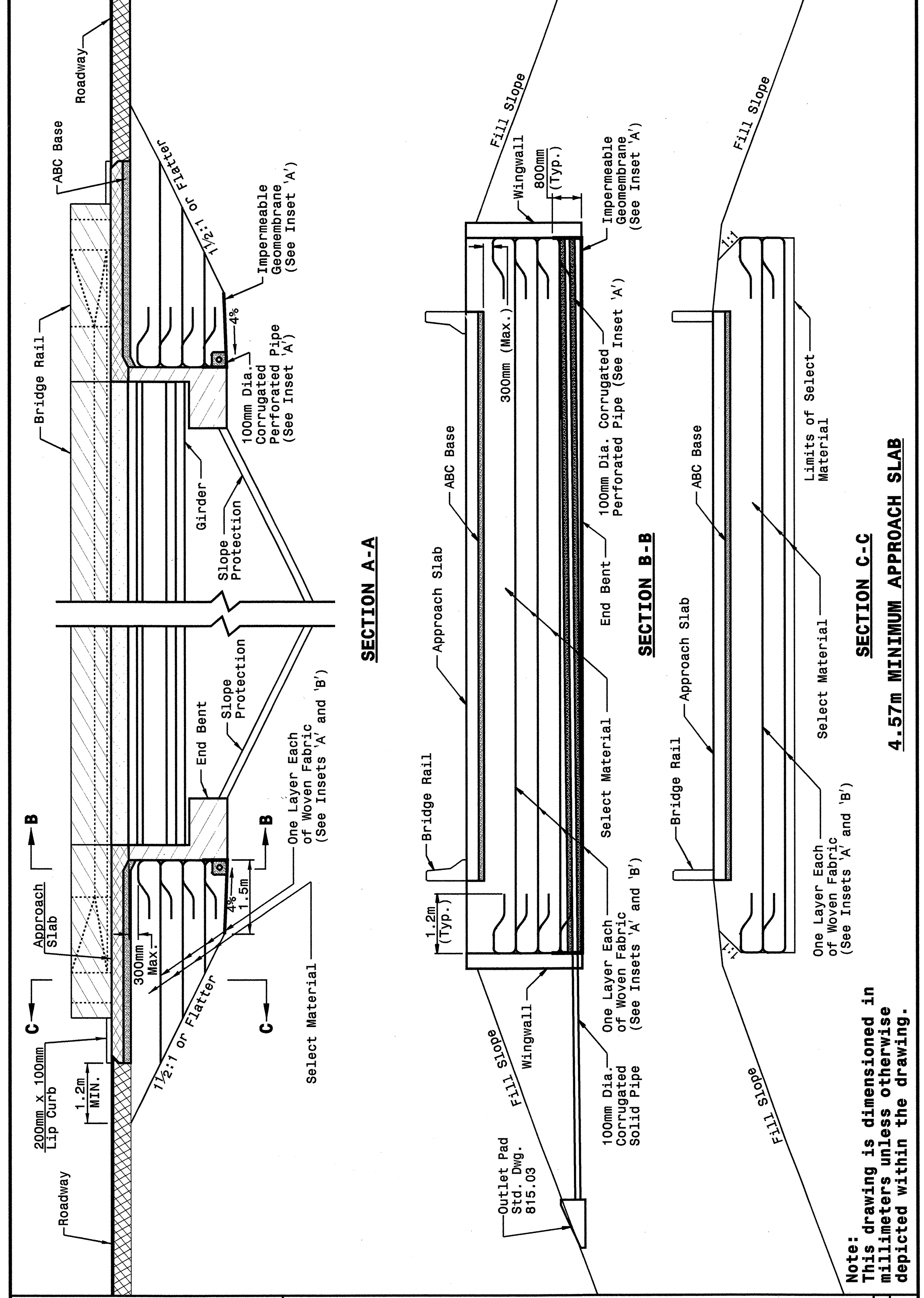
METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 1 OF 7
422D10

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

METRIC DETAIL DRAWING FOR
PRESTRESSED AND PLATE GIRDER BRIDGES
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 2 OF 7
422D10



Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

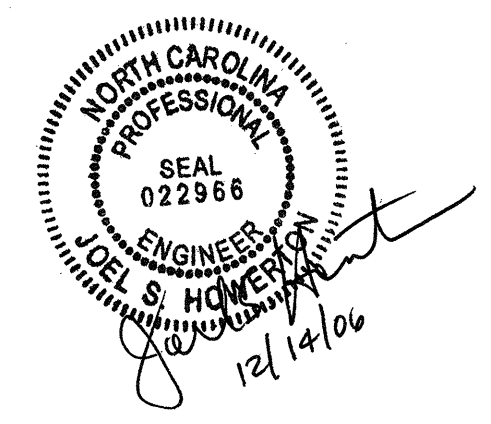
METRIC DETAIL DRAWING FOR
PRESTRESSED AND PLATE GIRDER BRIDGES
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 2 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: 09-28-05
CHECKED BY: J. S. HENDERSON DATE: 9/21/05
FILE SPEC.: stds/02stdstodetails/metric/422d10.dgn



29-SEP-2005 09:58
Std:\contracts\02stds\stds\Special Details\metric\422d10\0422d10m.dgn
forward AT P5222270

29-SEP-2005 09:58
S:\contracts\10411\specs\Special_Details\metric\stds\42210\0422d10m.dgn
-erward AT P52Z29J

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

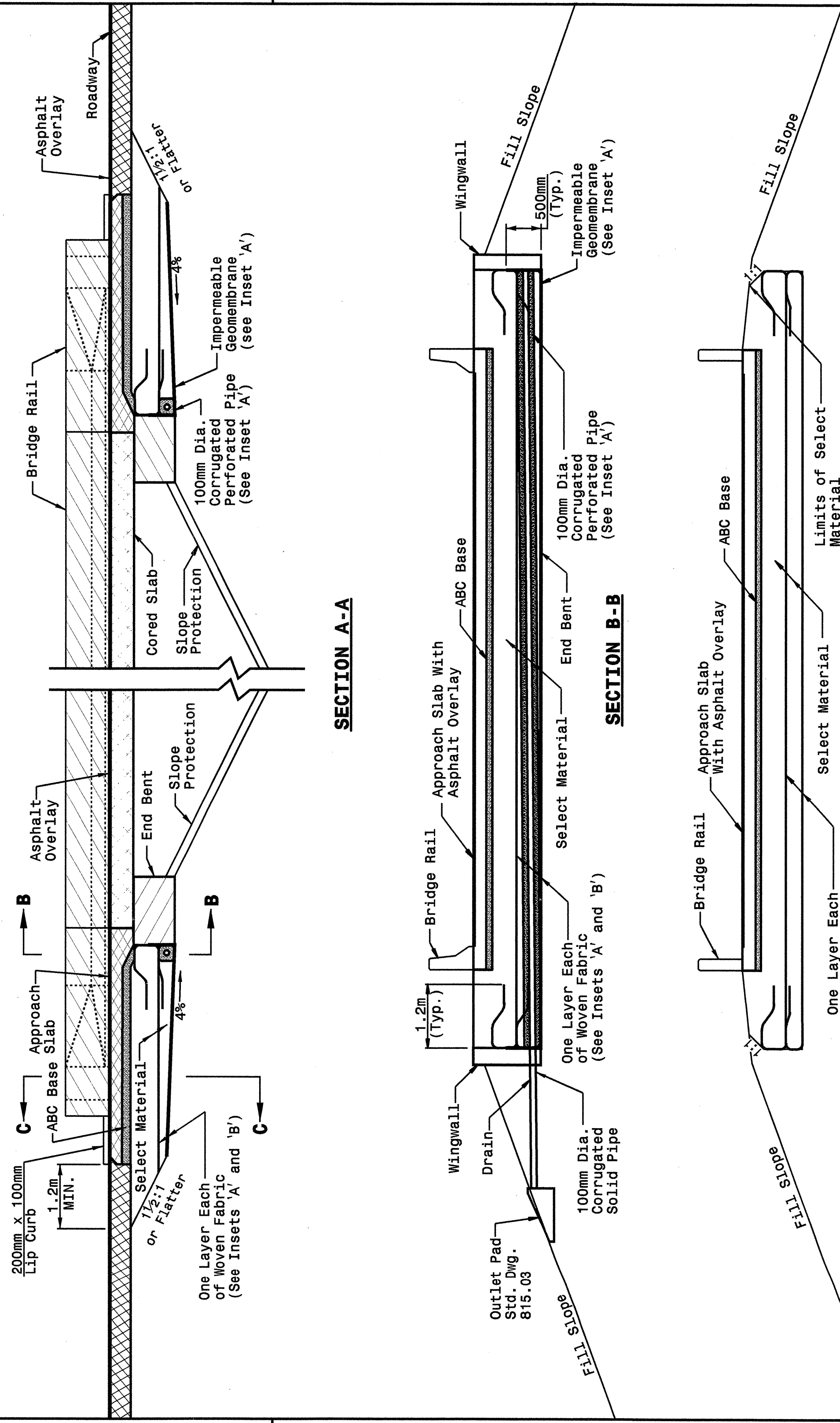
METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES
4.57m MINIMUM APPROACH SLAB

SHEET 3 OF 7
422D10

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
CORED SLAB BRIDGES
4.57m MINIMUM APPROACH SLAB

SHEET 3 OF 7
422D10



Note:
This drawing is dimensioned in
millimeters unless otherwise
depicted within the drawing.

SECTION C-C
4.57m MINIMUM APPROACH SLAB

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

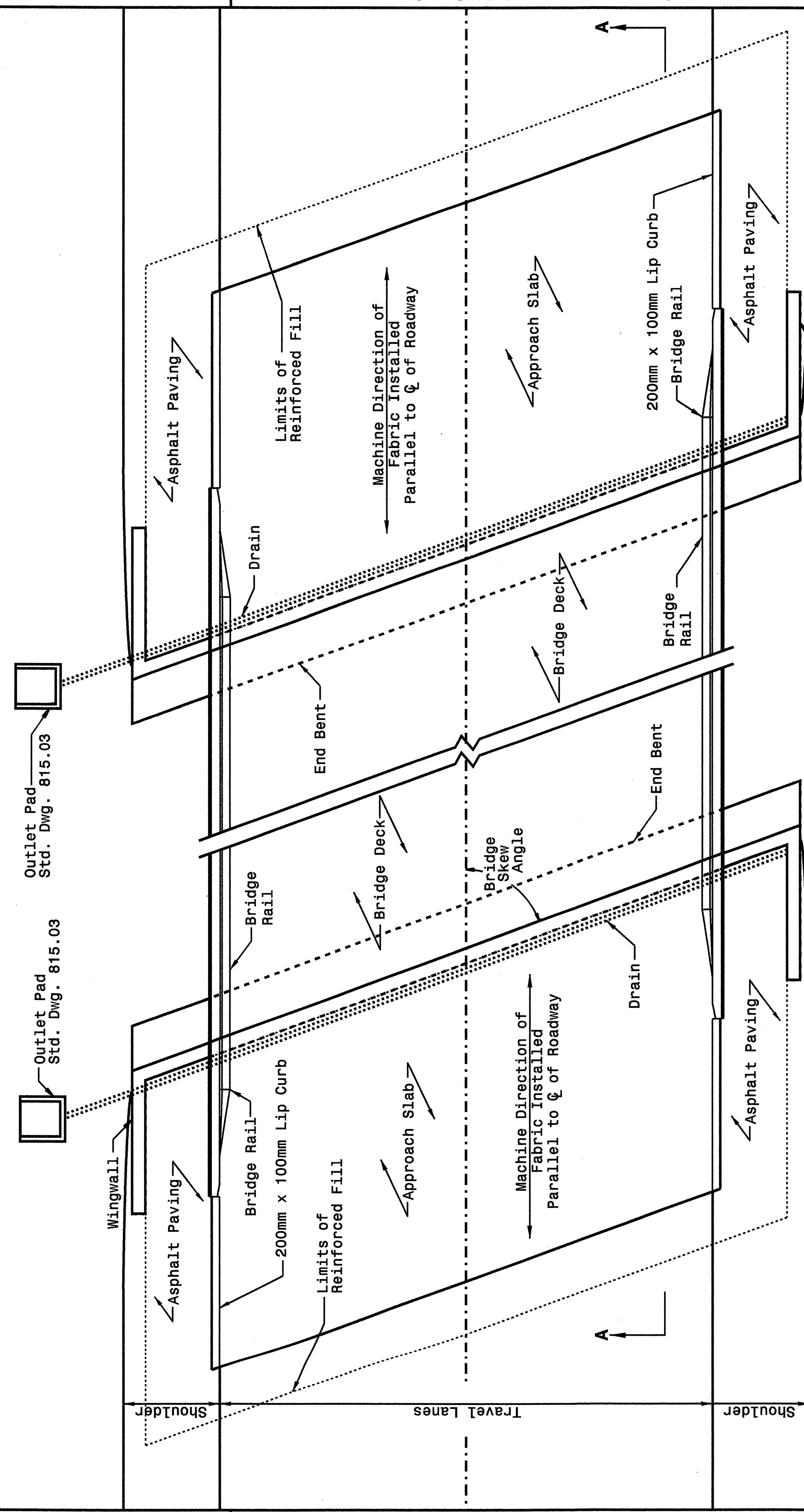
METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
7.62m MINIMUM APPROACH SLAB

SHEET 4 OF 7
422D10

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
7.62m MINIMUM APPROACH SLAB

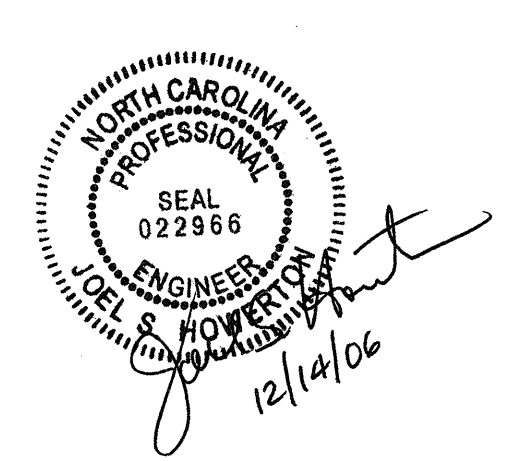
SHEET 4 OF 7
422D10



Note:
This drawing is dimensioned in
millimeters unless otherwise
depicted within the drawing.

PLAN VIEW
7.62m MINIMUM APPROACH SLAB

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: 09-28-05
CHECKED BY:	[Signature] DATE: 1/29/05
FILE SPEC.: stds/02stdstodetails/metric/422d10.dgn	



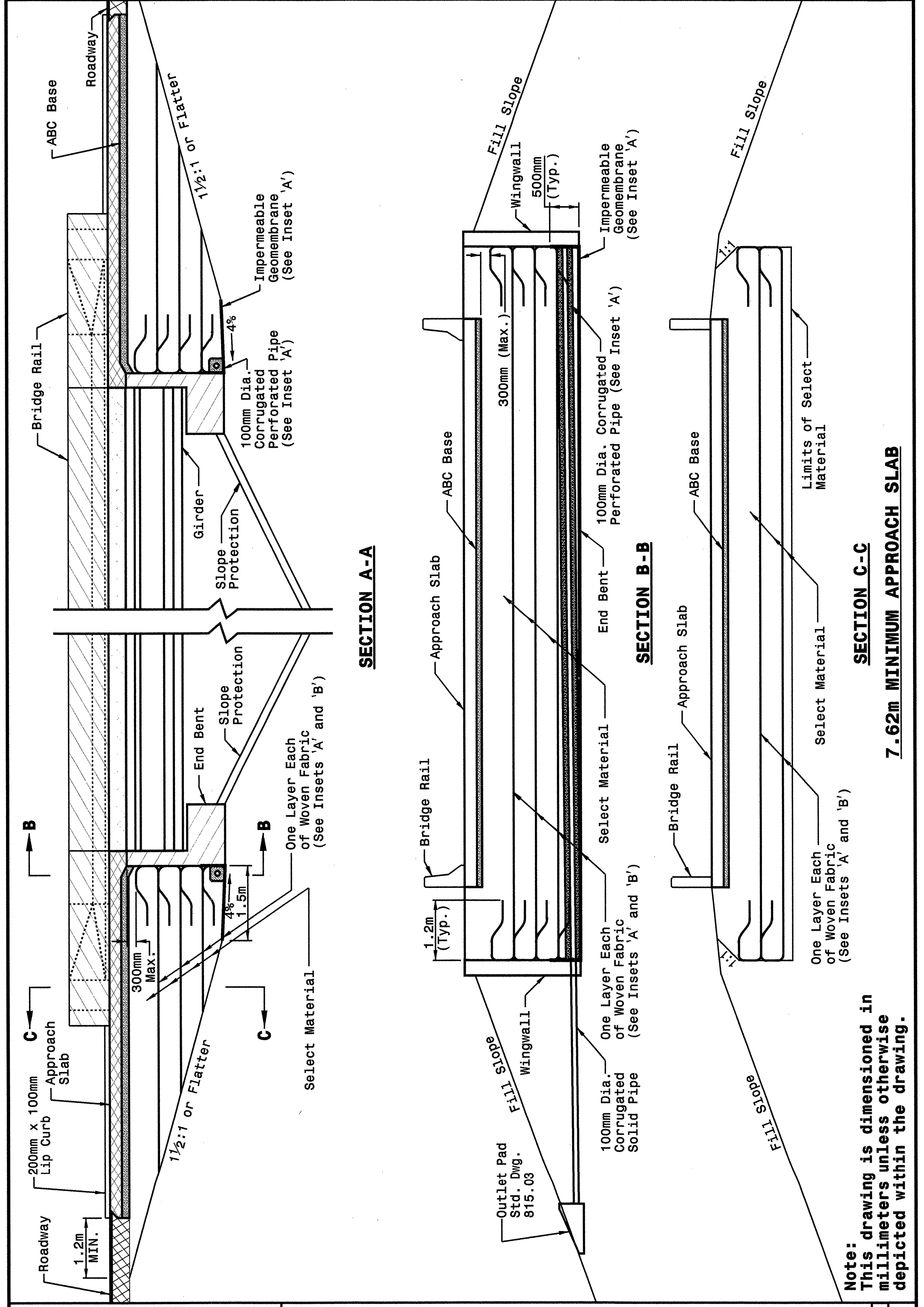


22-SEP-2005 10:47:30
 S:\Projects\422D10\Special Details\viewer\dstds\02\Std to Special Details\metric\422D10\422d10m.dgn
 Reviewer: A1 P5272253

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
 PRESTRESSED AND PLATE GIRDER BRIDGES
 7.62m MINIMUM APPROACH SLAB

SHEET 5 OF 7
422D10



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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
 PRESTRESSED AND PLATE GIRDER BRIDGES
 7.62m MINIMUM APPROACH SLAB

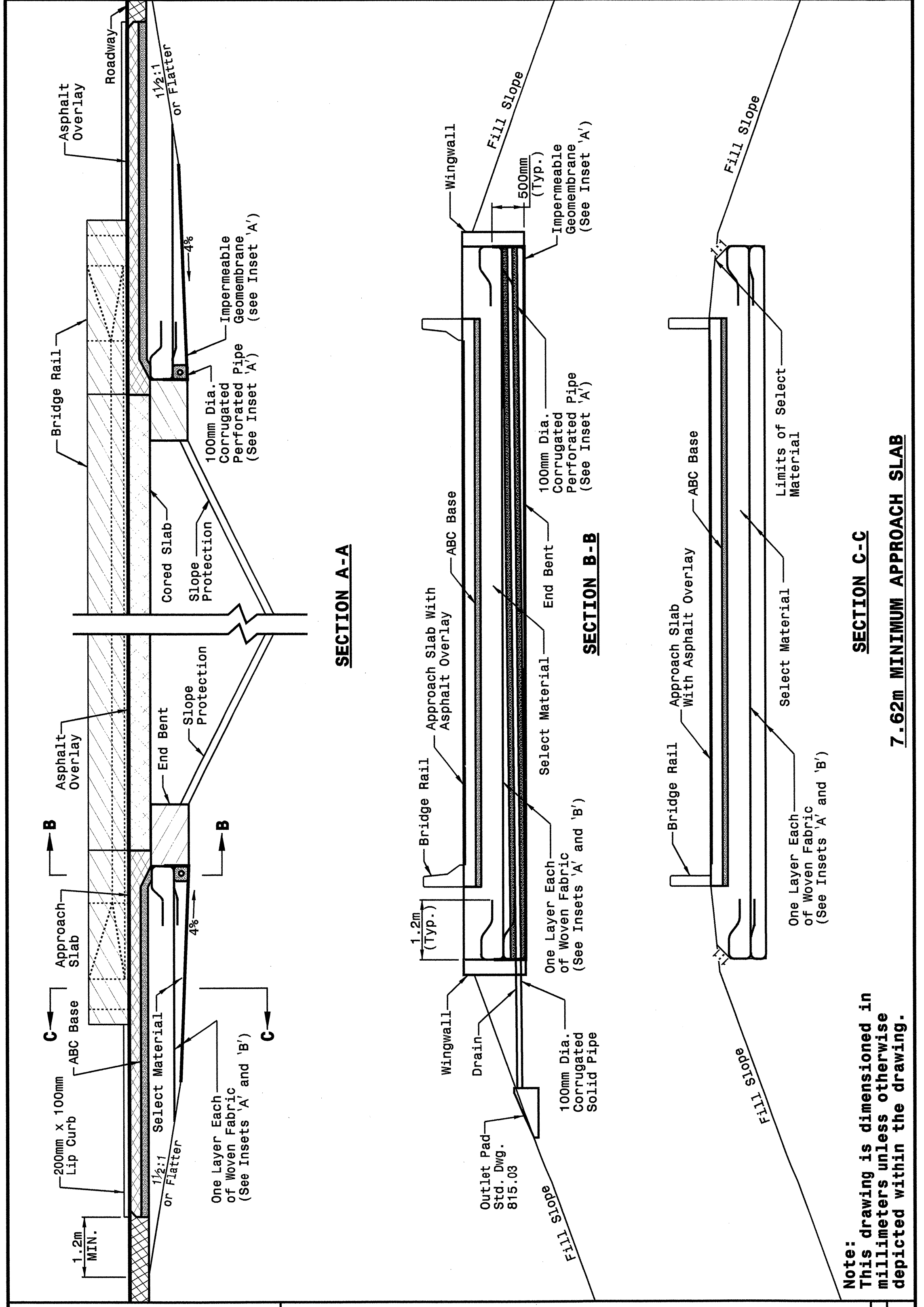
SHEET 5 OF 7
422D10

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
 CORED SLAB BRIDGES
 7.62m MINIMUM APPROACH SLAB

SHEET 6 OF 7
422D10

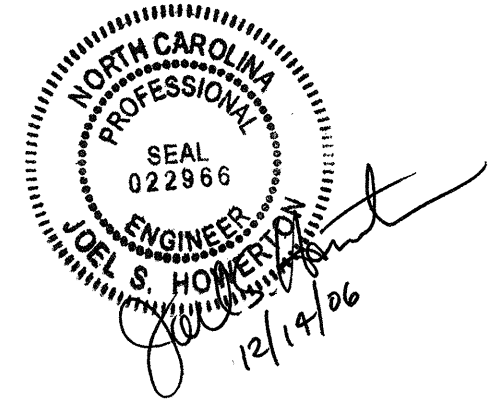


STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
 CORED SLAB BRIDGES
 7.62m MINIMUM APPROACH SLAB

SHEET 6 OF 7
422D10

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.



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

SEE PLATE FOR TITLE

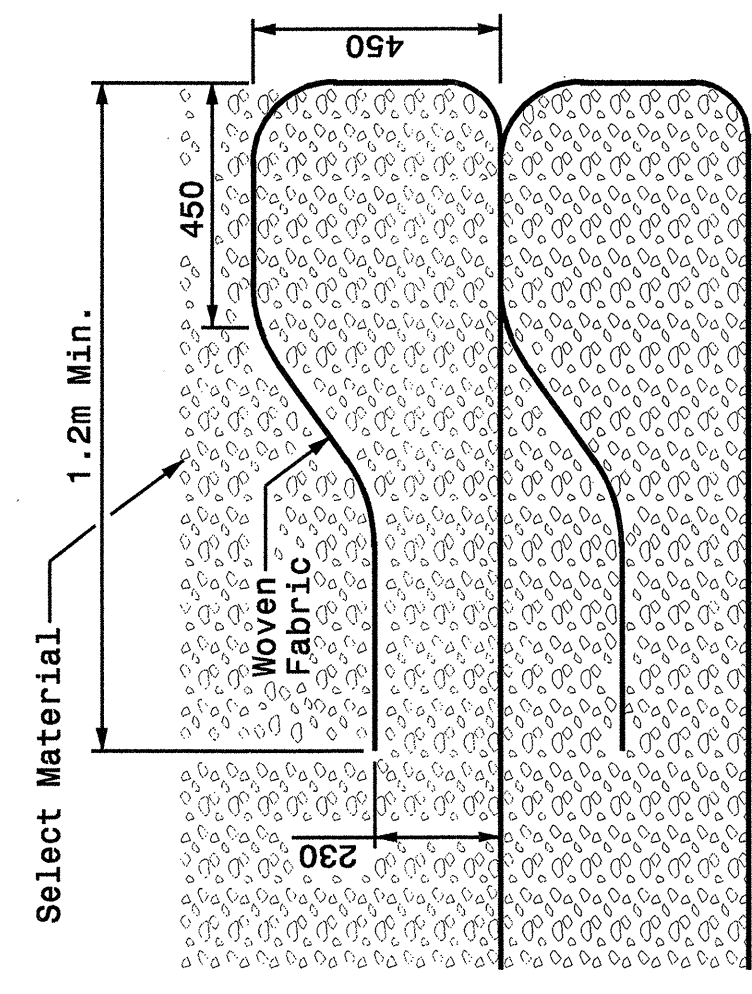
ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
 MODIFIED BY: E.E. WARD DATE: 09-12-05
 CHECKED BY: [Signature] DATE: 4/23/05
 FILE SPEC.: s:\02stdstodetails\metric\422d10.dgn



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

METRIC 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

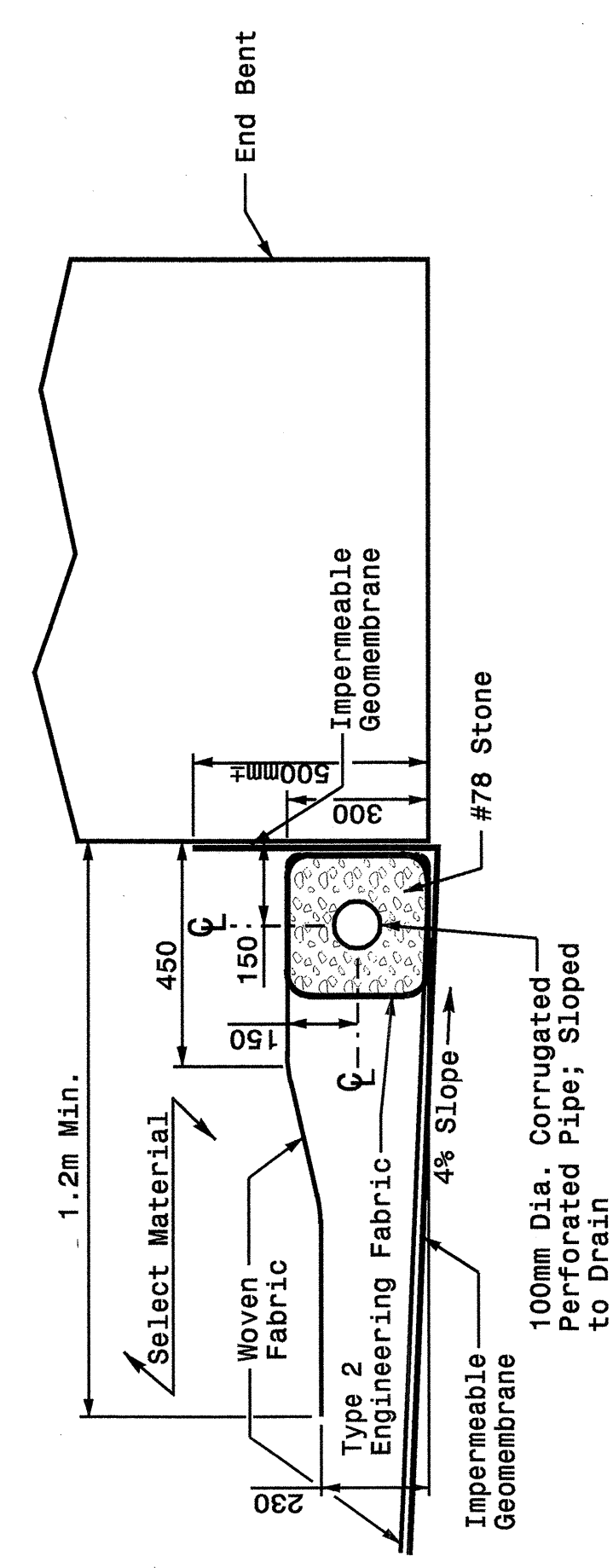
Inset 'B'

Height of Backwall	Number of Fabric Layers
1400-1750	3
1760-2200	4
2210-2650	5
2660-3100	6
3110-3550	7

Note: Cored Slab Structures
Require 2 Fabric Layers.

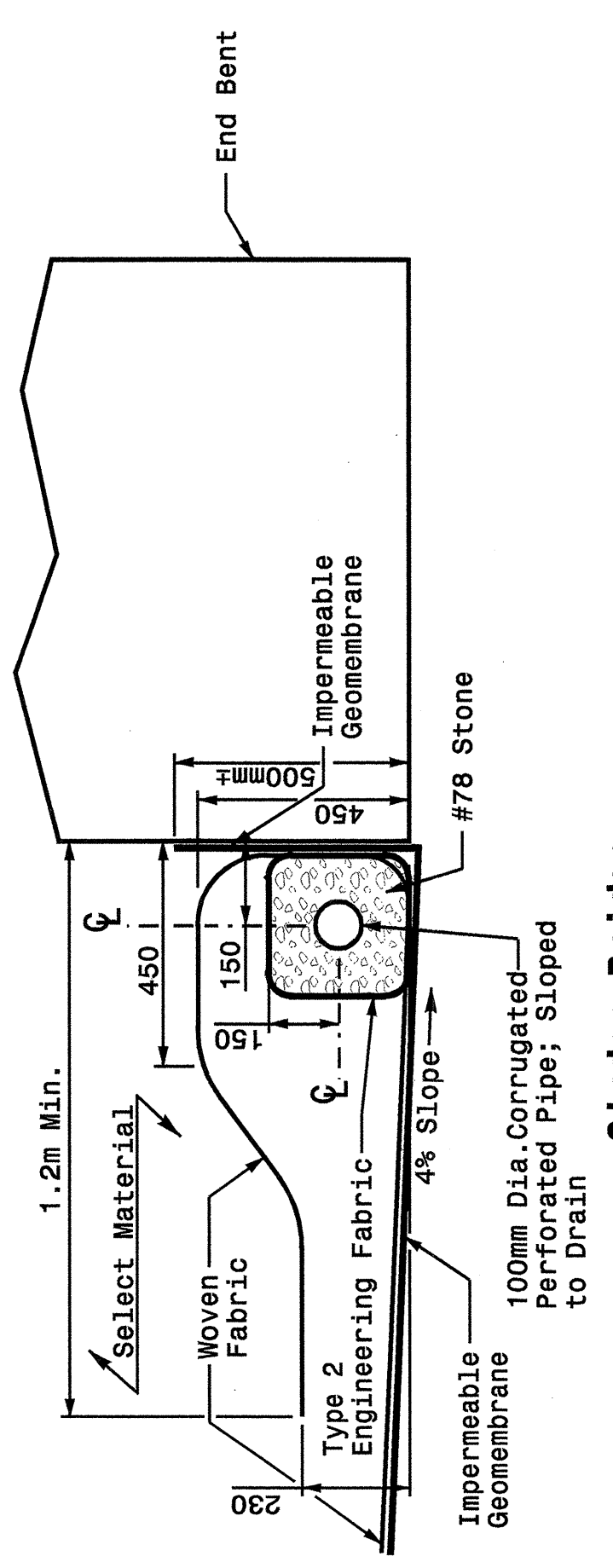
Length of Bridge End Bent Inside Wingwalls
If Bridge Skew is Less Than or Equal to 90°:
$$\frac{\text{Roadway Width} + 2140\text{mm}}{\sin(\text{Bridge Skew Angle})} = \text{Dis. Between Wingwalls}$$

If Bridge Skew is Greater Than 90°:
$$\frac{\text{Roadway Width} + 2140\text{mm}}{\cos(\text{Bridge Skew Angle} - 90^\circ)} = \text{Dis. Between Wingwalls}$$



Cored Slab Bridge
Showing First Lift and Drains

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.



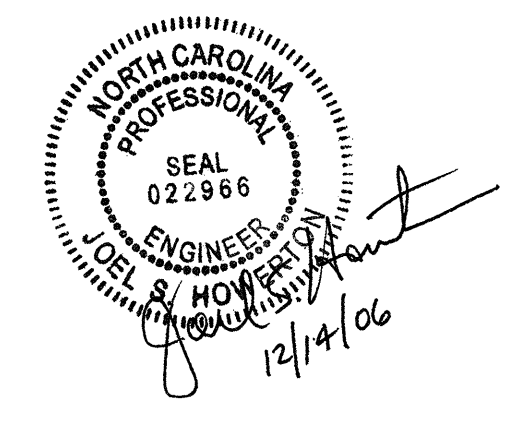
Girder Bridge
Showing First Lift and Drains

Inset 'A'

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

METRIC 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: A.E. WARD DATE: 09-12-05
CHECKED BY: *Joel S. Hovatter* DATE: 1/23/06
FILE SPEC.: s:\02stdstodetails/metric/422d10.dgn

25-SEP-2005 11:55 AM
S:\contract\422d10\02stdstodetails\02stds to Special Details\metric\422d10\0422d10m.dgn
forward AT 12:22:23



NOTES

FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE SPECIAL PROVISIONS.

SELECT THE APPROPRIATE STANDARD SHORING DESIGN FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC IN LIEU OF SUBMITTING CONTRACTOR SHORING DESIGN. USE STANDARD SHORING DESIGN ONLY WHEN ALL OF THE FOLLOWING CRITERIA ARE MET:

- MAXIMUM HEIGHT OF SHORING EXCAVATION IS 3.3m
- GROUNDWATER TABLE IS NOT ABOVE BOTTOM OF THE EXCAVATION
- BACKFILL SLOPE IS 2:1 OR FLATTER
- TRAFFIC SURCHARGE EQUAL TO 11.0 kPa
- SOLDIER PILE SPACING OF 1.8m
- TIMBER LAGGING SHALL HAVE A MINIMUM THICKNESS OF 76mm

SUBMIT "STANDARD SHORING SELECTION" FORM TO ENGINEER PRIOR TO CONSTRUCTION OF SHORING.

DO NOT USE THE STANDARD SHORING DESIGNS WHEN VERY SOFT SOIL OR MUCK IS PRESENT WITHIN THE SHORING EMBEDMENT ZONE.

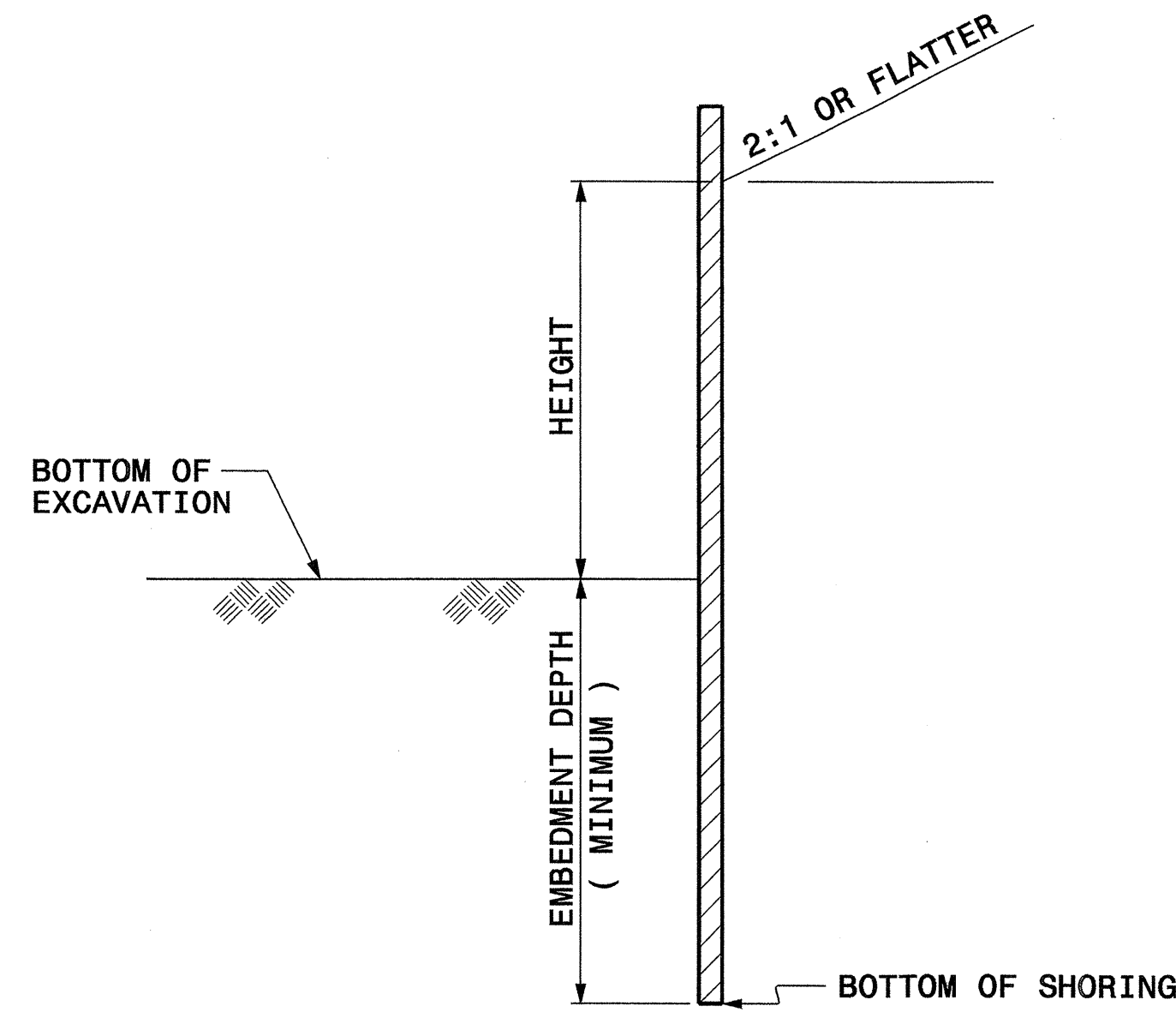
CONTRACTOR MUST VERIFY LOCATION OF GROUNDWATER TABLE PRIOR TO CONSTRUCTION OF SHORING.

THE CONTRACTOR HAS THE OPTION OF USING SOLDIER PILES SET IN DRILLED HOLES WITH A SHORTENED LENGTH EQUAL TO 75% OF THE EMBEDMENT DEPTHS SHOWN IN THE TABLE. FOR DRILLING REQUIREMENTS, SEE TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC SPECIAL PROVISION.

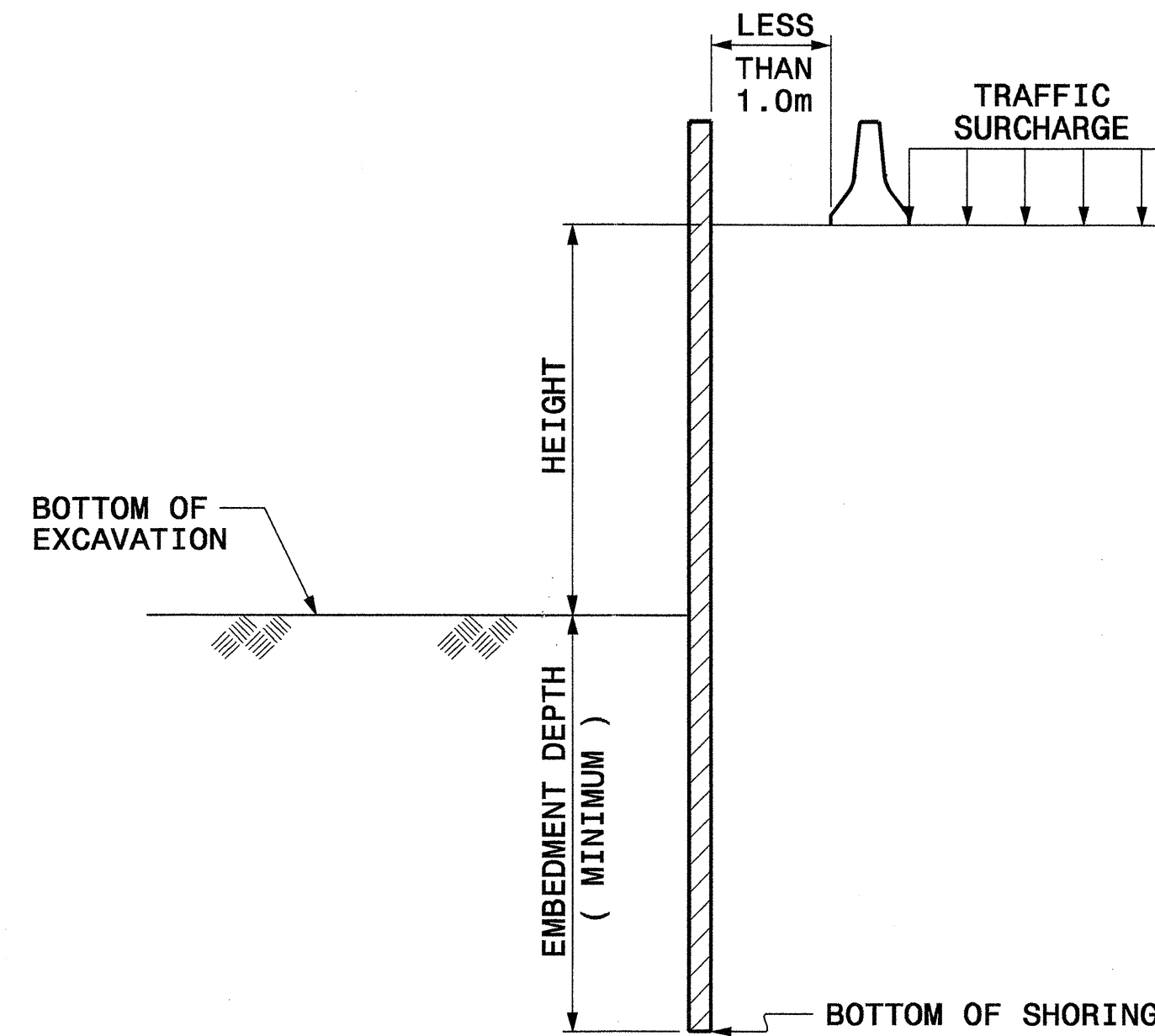
IF DESIGN EMBEDMENT DEPTH IS NOT ACHIEVED, THEN NOTIFY THE ENGINEER IMMEDIATELY.

GROUNDWATER TABLE CONDITIONS

- 1) WHEN WATER TABLE IS ABOVE THE BOTTOM OF EXCAVATION, SUBMIT CONTRACTOR SHORING DESIGN TO THE ENGINEER FOR APPROVAL.
- 2) WHEN WATER TABLE IS BELOW THE BOTTOM OF EXCAVATION AND ABOVE THE BOTTOM OF SHORING, USE "WATER TABLE" CASE.
- 3) WHEN WATER TABLE IS BELOW BOTTOM OF SHORING, USE "NO WATER TABLE" CASE.



TEMPORARY SHORING
(SLOPING OR LEVEL WITH TRAFFIC SURCHARGE, NO BARRIER IMPACT)



TEMPORARY SHORING - BARRIER SUPPORTED
(LEVEL WITH TRAFFIC SURCHARGE, WITH BARRIER IMPACT)

CASE	HEIGHT (m)	TEMPORARY SHORING					TEMPORARY SHORING - BARRIER SUPPORTED				
		CANTILEVER SHEETING		DRIVEN SOLDIER PILE			CANTILEVER SHEETING		DRIVEN SOLDIER PILE		
		MINIMUM EMBEDMENT DEPTH (m)	MINIMUM SECTION MODULUS (cm ³ / m OF WALL)	MINIMUM EMBEDMENT DEPTH (m)			MINIMUM EMBEDMENT DEPTH (m)	MINIMUM SECTION MODULUS (cm ³ / m OF WALL)	MINIMUM EMBEDMENT DEPTH (m)		
			HP 250x62	HP 310x79	HP 360x108			HP 250x62	HP 310x79	HP 360x108	
"NO WATER TABLE"	< 1.8	2.3	160	2.4	2.4	2.4	3.4	540	2.9	2.9	2.9
	2.1	2.6	240	2.9	2.9	2.9	3.7	650	3.2	3.2	3.2
	2.4	3.0	350	3.2	3.2	3.2	3.8	750	3.5	3.5	3.5
	2.7	3.4	510	--	3.7	3.7	4.1	890	--	3.8	3.8
	3.0	3.8	700	--	--	4.2	4.3	1050	--	4.2	4.2
	3.3	4.1	920	--	--	4.5	4.6	1210	--	--	4.5
"WATER TABLE"	< 1.8	3.5	240	3.5	3.5	3.5	4.9	650	4.0	4.0	4.0
	2.1	4.0	380	4.0	4.0	4.0	5.2	780	4.5	4.5	4.5
	2.4	4.6	540	--	4.6	4.6	5.5	920	--	4.7	4.7
	2.7	5.2	750	--	5.2	5.2	5.8	1080	--	5.2	5.2
	3.0	5.6	1050	--	--	5.7	6.1	1270	--	--	5.7
	3.3	6.3	1400	--	--	--	6.4	1510	--	--	6.1

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

STANDARD TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

ORIGINAL BY: SOILS & FOUNDATIONS DATE: 10-2001
MODIFIED BY: *[Signature]* DATE: *[Date]*
CHECKED BY: *[Signature]* DATE: *[Date]*
FILE SPEC.: ericward\usr\det\std\stand\shoring_detail.dgn

30-OCT-2001 16:02
ericward

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GUARDRAIL SUMMARY

ASPHALT PAVEMENT
 REMOVAL SUMMARY
 IN SQUARE METERS

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		ANCHORS				SINGLE FACED CONCRETE BARRIERS	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	AT-1			III SHOP CURVED
-L-	12+05.40	12+35.66	RT.	31.86			12+39.32	12+39.32	1.0	1.0			1	1	1			SHORTENED DUE TO -DRIVE-	
-L-	13+50.00	13+58.00	RT.		7.62		13+50.00		1.0	1.0									
-L-	12+08.99	12+35.66	LT.	26.67			12+39.32	12+39.32	2.4	2.4			1	1	1				
-L-	13+50.00	13+58.00	LT.		7.62		13+50.00		2.4	2.4									
PROJECT TOTALS				58.53	15.24								2	2	2	2			
ANCHOR DEDUCTIONS:																			
GRAU-350				2 @ 15.24m =	-30.48														
TYPE III				2 @ 5.715m =	-11.43														
SHOP CURVED				2 @ 5.715m =	-11.43														
AT-1				2 @ 1.905m =	-3.81														
GRAND TOTAL				16.62	0.00														
SAY				22.86	0.00														
ADDITIONAL GUARDRAIL POSTS =				5 ea.															
TEMPORARY GUARDRAIL (SEE TRAFFIC CONTROL PLANS FOR LOCATIONS)																			
-L-	13+47.00	13+59.00	LT.	36.195			13+47.00												
ANCHOR DEDUCTIONS:																			
GRAU-350				1 @ 15.24m =															
AT-1				1 @ 1.905m =															
TOTALS				19.05															

LOCATION	* ASPHALT REMOVAL
-L- 11+87.00 TO 12+20.65	51.32
-L- 12+22.19 TO 12+31.13	22.27
-L- 13+40.79 TO 13+49.65	240.95
TOTALS	314.54
SAY	320.00
* ALL CADD MEASURED	

Note: Approximate quantities only. 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".

DRAINAGE SUMMARY

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)

SUMMARY OF EARTHWORK

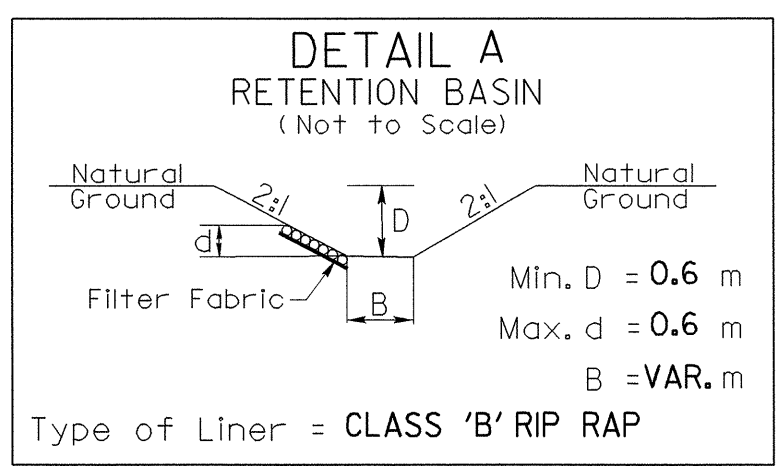
IN CUBIC METERS

STATION	LOCATION (L, RT, OR CL)	STRUCTURE NO.	TOP ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)												ENDWALLS	QUANTITIES STRUCTURES	REMARKS								
						BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)						CORRUGATED STEEL PIPE TYPE B (TEMPORARY - SEE TRAFFIC CONTROL PLANS FOR LOCATIONS)									375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	R.C.P.	C.S.P.			
						300	375	450	600	750	900	1050	1200	300	400	450	600									800	900	1000
12+21	LT	2	665.57														1.63									2@600		
12+30	LT	3	666.15														1.63									2@600		
12+21	RT	4	666.14														1.63									2@600		
10+51	-D-	5	666.12														1.63									2@600		
12+15				665.05	674.50												2.01									2@600		
12+21																	2.01									2@600		
TOTALS																	2.77									2@600		

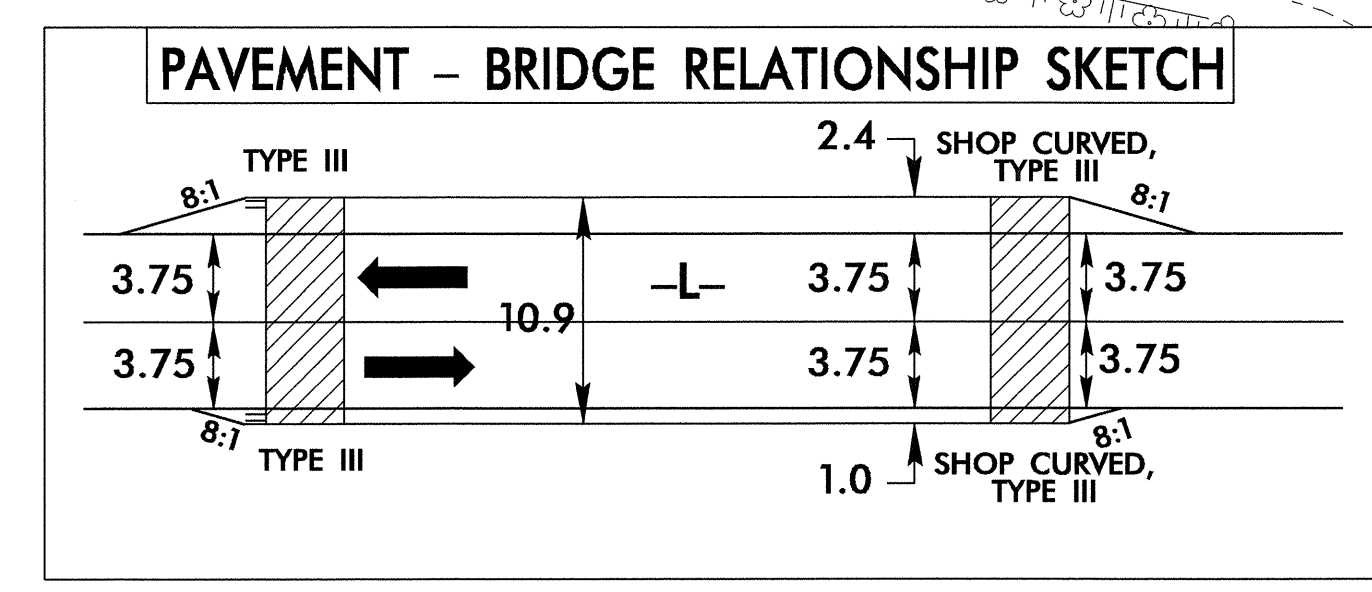
LOCATION	UNCL. EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 11+70.00 TO 12+46.00	269		413	144	
DRIVE (-L- 12+00.00 TO 12+64.49)	3472		4		3468
SUBTOTALS	3741		417	144	3468
-L- 13+44.00 TO 13+67.64	50		284	234	
SUBTOTALS	50		284	234	
TOTALS	3791		701	378	3468
LOSS DUE TO CLEAR. & GRUB. -10					
USE WASTE IN LIEU OF BORROW -378 - 378					
PROJECT TOTALS	3781		701	0	3090
SAY	3800				
EST DDE = 70 CM					
GEOTECH RECS OF OCTOBER, 2004:					
EST FABRIC FOR SOIL STABILIZATION		500 SM			
EST GRADE POINT UNDERCUT		100 CM			
EST UNDERDRAINS		300 M			
EST SELECT GRANULAR MATERIAL		500 CM			
EST SUBGRADE STABILIZATION MATERIAL CLASS IV		500 TONS			

CONST. REV.
R/W REV.

PROJECT REFERENCE NO. B-1443	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14493 DAVID J. RUDISILL	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14493 DAVID J. RUDISILL



NOTE: KEEP THE SIDE OF THE BASIN WITH THE RIP RAP AT A CONSTANT ELEVATION TO PROMOTE SHEET FLOW WHEN OVERFLOWING. EST. DDE = 70 CM

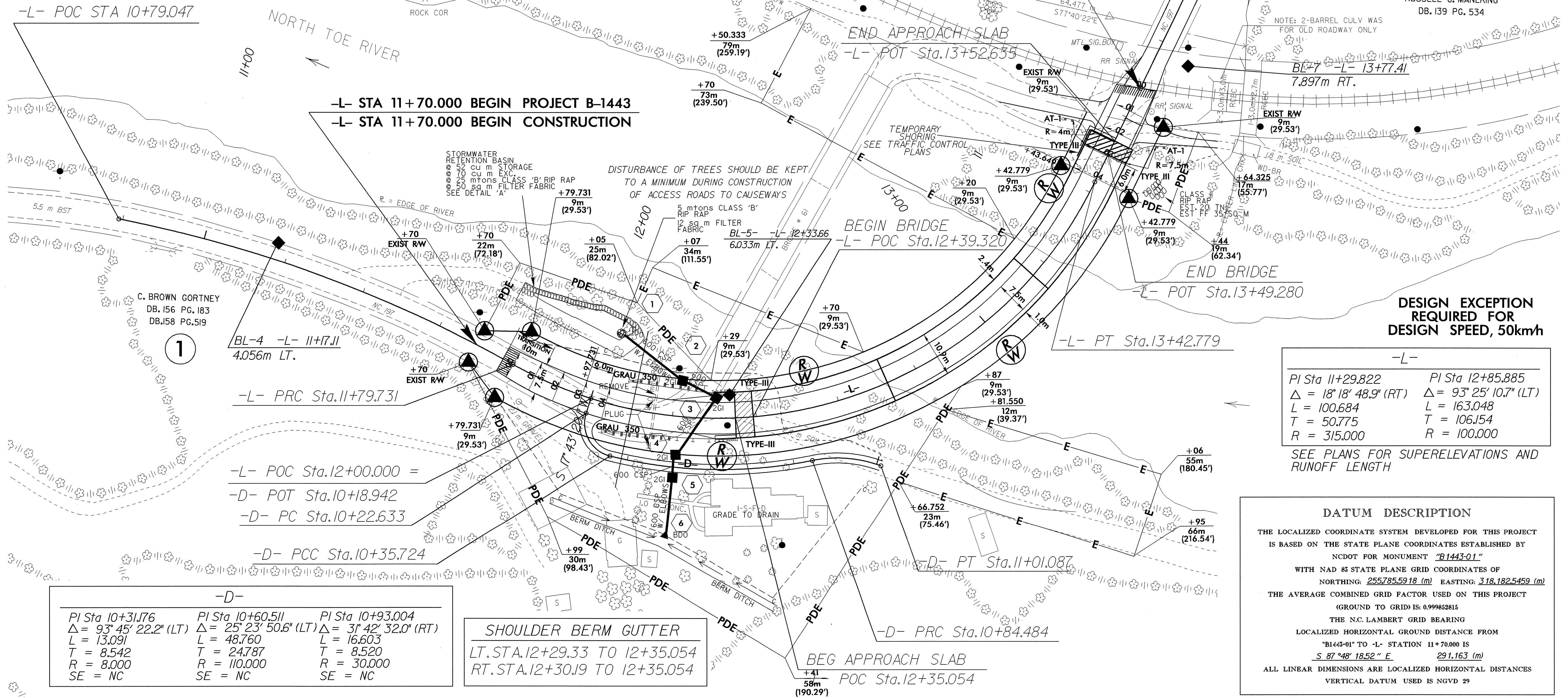


-L- POC STA 10+79.047

-L- STA 11+70.000 BEGIN PROJECT B-1443
-L- STA 11+70.000 BEGIN CONSTRUCTION

-L- STA 14+45.000 END CONSTRUCTION

-L- STA 13+67.649 END PROJECT B-1443



REVISIONS

02-AUG-2005 1483
13:43:00
13:43:00

METRIC

5 0 10

CONST. REV.
R /W REV.

PROJECT REFERENCE NO. **B-1443** SHEET NO. **5**

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 14493

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 20870

12-22-05
6-2-05

**DESIGN EXCEPTION REQUIRED
FOR DESIGN SPEED, 50 km/h**

**BEGIN GRADE -L- STA 11+77.000
ELEV. = 667.887**

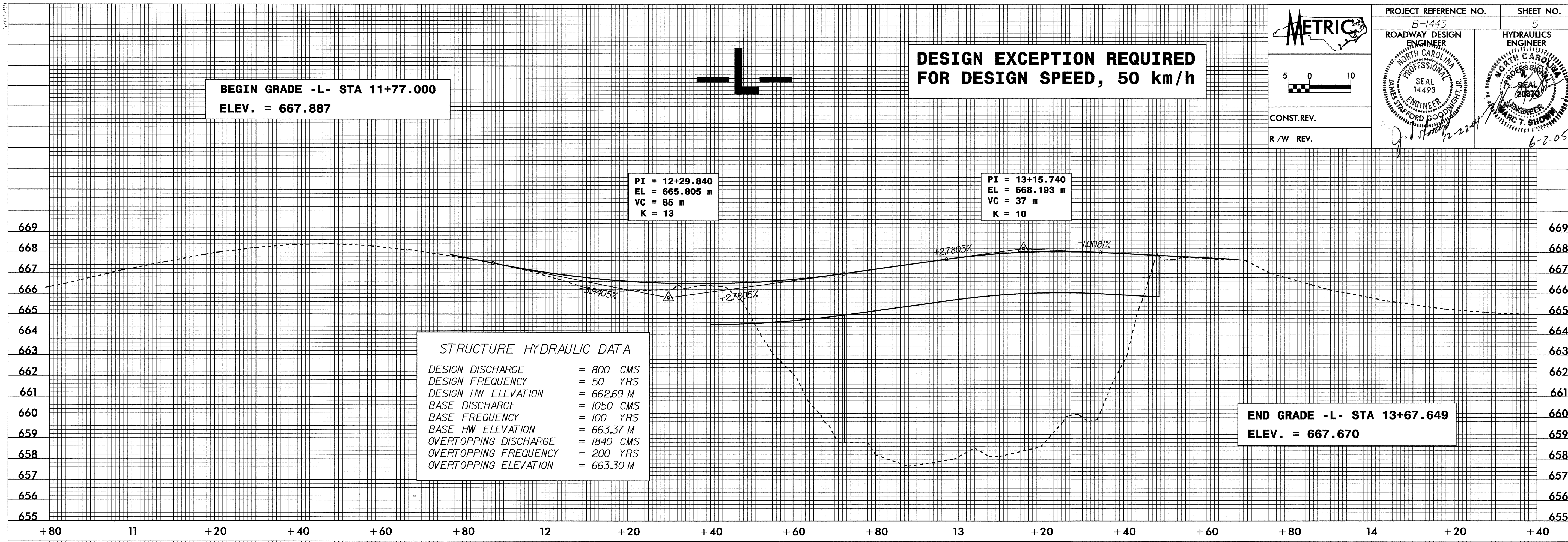
PI = 12+29.840
EL = 665.805 m
VC = 85 m
K = 13

PI = 13+15.740
EL = 668.193 m
VC = 37 m
K = 10

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 800 CMS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 662.69 M
BASE DISCHARGE	= 1050 CMS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 663.37 M
OVERTOPPING DISCHARGE	= 1840 CMS
OVERTOPPING FREQUENCY	= 200 YRS
OVERTOPPING ELEVATION	= 663.30 M

**END GRADE -L- STA 13+67.649
ELEV. = 667.670**



-D-

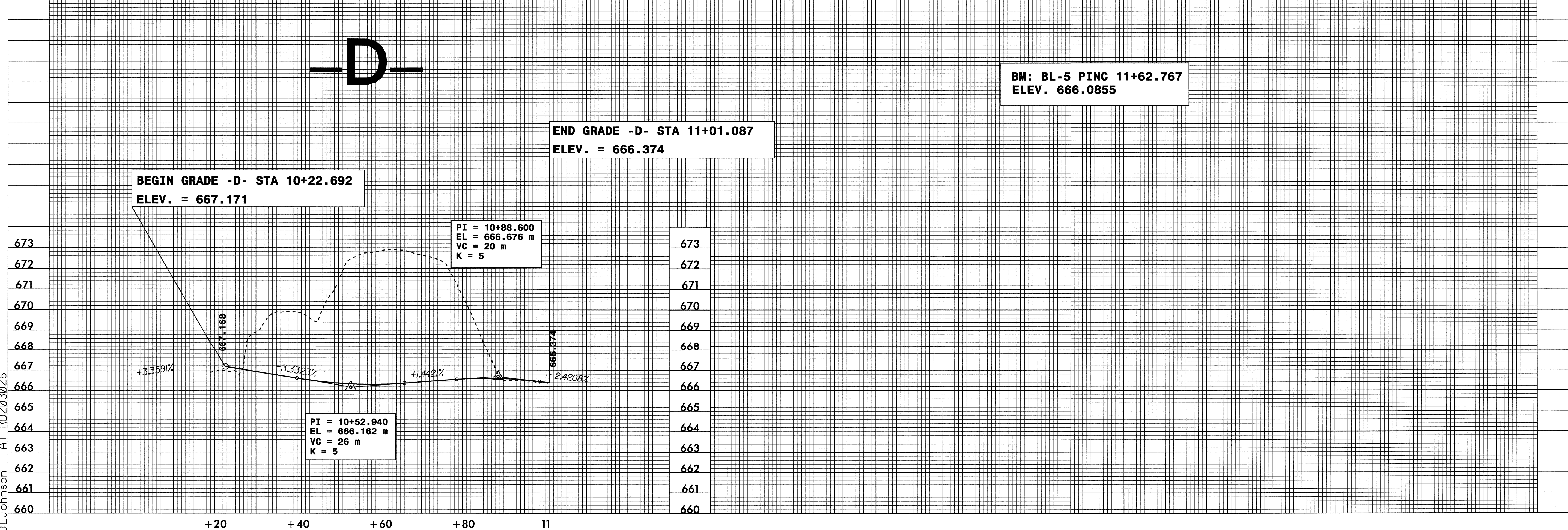
**BM: BL-5 PINC 11+62.767
ELEV. 666.0855**

**END GRADE -D- STA 11+01.087
ELEV. = 666.374**

**BEGIN GRADE -D- STA 10+22.692
ELEV. = 667.171**

PI = 10+88.600
EL = 666.676 m
VC = 20 m
K = 5

PI = 10+52.940
EL = 666.162 m
VC = 26 m
K = 5



06-DEC-2004 14:56
R:\proj\bl1443\pl1
JEJohnson AT RD203026