

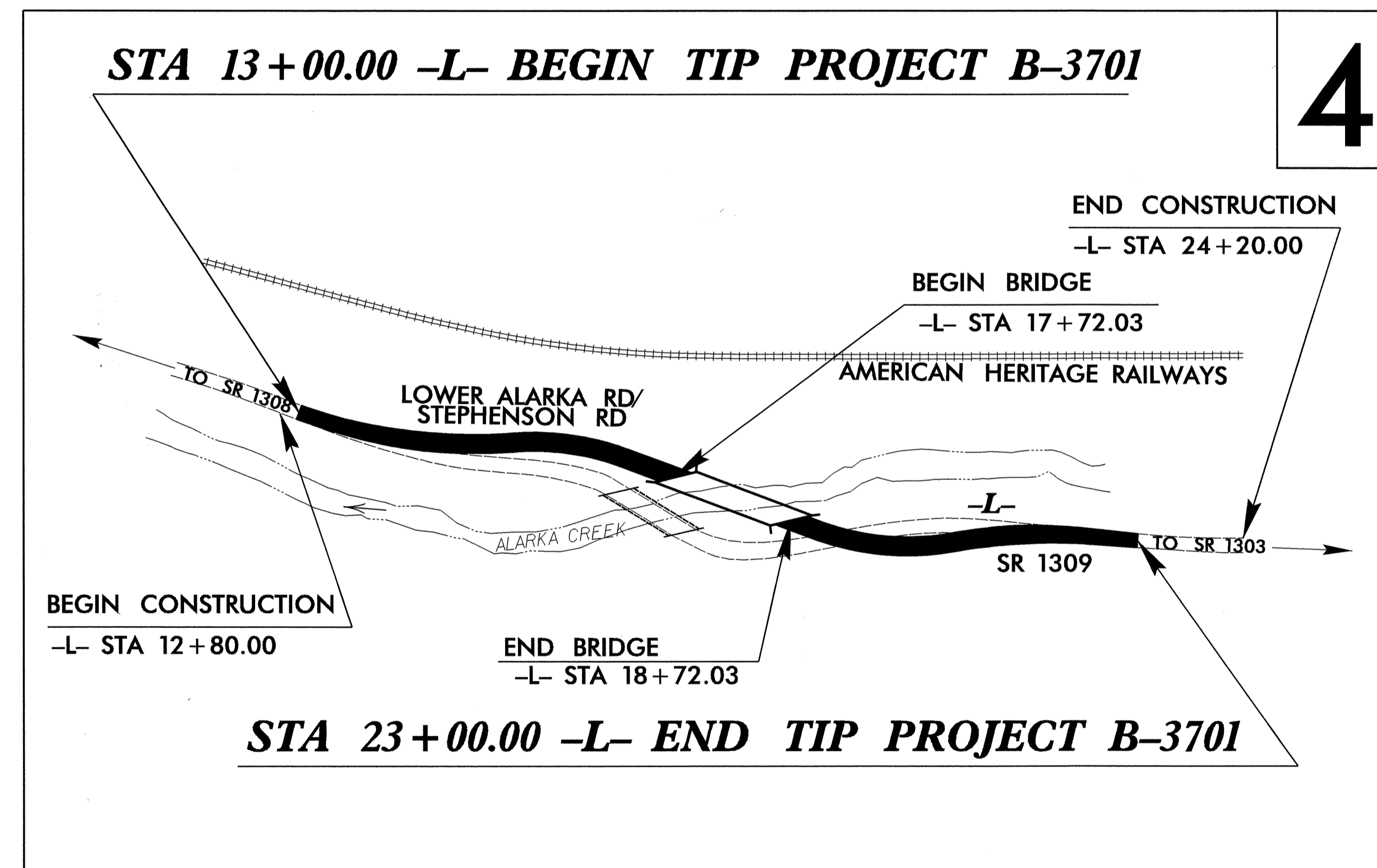
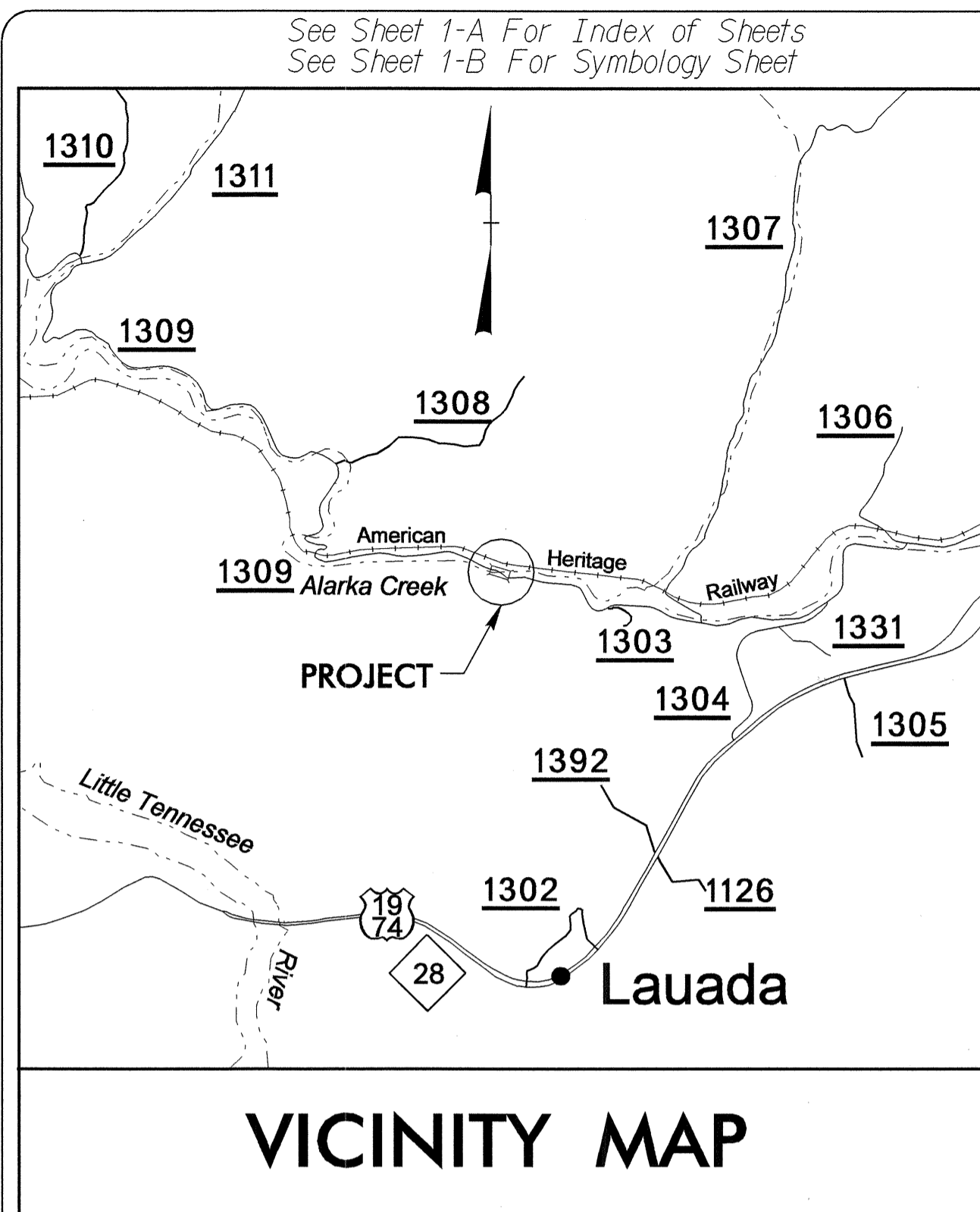
| | | | |
|-----------------|-----------------------------|-------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | B-3701 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 33241.1.1 | BRZ-1309(2) | PE | |
| 33241.2.1 | BRZ-1309(2) | RW, UTILI. | |
| 33241.3.1 | BRZ-1309(2) | CONST. | |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SWAIN COUNTY

**LOCATION: BRIDGE NO. 106 OVER ALARKA CREEK ON SR 1309
(LOWER ALARKA RD/STEPHENSON BRANCH RD)**

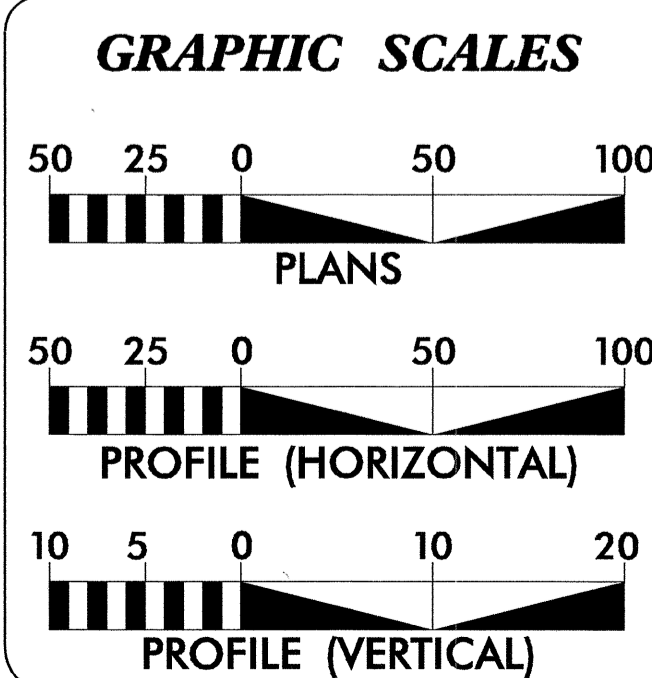
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, AND
RETAINING WALLS**



B-3701

CONTRACT: C201426

**DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED.



DESIGN DATA

| |
|-------------------------------------|
| ADT 2006 = 608 |
| ADT 2026 = 916 |
| DHV = 14 % |
| D = 65 % |
| T = 3 % * |
| V = 30 MPH** |
| * TTST 1 % DUAL 2 % |
| POSTED = 55 MPH (STAT.) |
| FUNC. CLASS = RURAL MINOR COLLECTOR |

PROJECT LENGTH

| | |
|--|---------------|
| LENGTH OF ROADWAY TIP PROJECT B-3701 | = 0.170 MILES |
| LENGTH OF STRUCTURE TIP PROJECT B-3701 | = 0.019 MILES |
| TOTAL LENGTH OF TIP PROJECT B-3701 | = 0.189 MILES |

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **BREND A MOORE, PE**
FEBRUARY 28, 2005
PROJECT ENGINEER

LETTING DATE: **REKHA PATEL, PE**
JUNE 20, 2006
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16800
PANDALL C. HENDERSON
3-21-06 P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16378
REKHA V. PATEL
3-21-06 P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

ant miller
STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

05/08/99
R:\FEB-2006\1453\B3701\rdj_tsh.dgn
B3701.dwg
1/23/06

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| | |
|---------------------------------|------------------|
| PROJECT REFERENCE NO. B-3701 | SHEET NO. 1-A |
| ROADWAY DESIGN ENGINEER | |
| | |

| SHEET NUMBER | SHEET |
|--------------------|---|
| 1 | TITLE SHEET |
| 1-A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1-B | CONVENTIONAL PLAN SHEET SYMBOLS |
| 1-C | SURVEY CONTROL SHEET |
| 2 | PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS, AND SHOULDER BERM GUTTER |
| 2-A THRU 2-D | DETAIL OF REINFORCED BRIDGE APPROACH FILLS |
| 2-E | DETAIL OF MODIFIED CONCRETE FLUME |
| 2-F THRU 2-I | DETAIL OF PRECAST REINFORCED CONCRETE BARRIER |
| 2-J THRU 2-M | DETAIL OF GUARDRAIL INSTALLATION |
| 2-N THRU 2-O | DETAIL OF STRUCTURE ANCHOR UNITS |
| 3 | SUMMARY OF QUANTITIES |
| 3-A THRU 3-B | SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY |
| 4 | PLAN SHEET |
| 5 | PROFILE SHEET |
| TCP-1 THRU TCP-6 | TRAFFIC CONTROL PLANS |
| EC-1 THRU EC-5 | EROSION CONTROL PLANS |
| RF-1 | REFORESTATION PLANS |
| SIGN-1 THRU SIGN-3 | SIGNING PLANS |
| UO-1 THRU UO-2 | UTILITIES BY OTHERS PLANS |
| X-1A | CROSS-SECTIONS SUMMARY SHEET |
| X-1 THRU X-27 | CROSS-SECTIONS |
| S-1 THRU S-26 | STRUCTURE PLANS |
| W-1 THRU W-4 | WALL 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.
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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING" OR "TEMPORARY SHORING-BARRIER SUPPORTED" DEPENDING UPON THE LOCATION OF THE SHORING.

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 Duke Energy
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

2002 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 |
| 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 6 - ASPHALT BASES AND PAVEMENTS | |
| 654.01 | Pavement Repairs |
| DIVISION 8 - INCIDENTALS | |
| 815.03 | Pipe Underdrain and Blind Drain |
| 816.04 | Markers for Drainage Structure and Concrete Pad |
| 820.04 | Drain Installation in Shoulder Berm Gutter |
| 838.05 | Concrete 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe |
| 838.15 | Brick 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.18 | Concrete Median Drop Inlet Type 'B' - 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 |
| 840.29 | 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 |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 850.01 | Concrete Paved Ditches |
| 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 |

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

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 | ○ EIP |
| Property Corner | ----- |
| Property Monument | □ ECM |
| Parcel/Sequence Number | (23) |
| Existing Fence Line | ----- |
| Proposed Woven Wire Fence | ----- |
| Proposed Chain Link Fence | ----- |
| Proposed Barbed Wire Fence | ----- |
| Existing Wetland Boundary | ----- WLB |
| Proposed Wetland Boundary | ----- WLB |
| Existing Endangered Animal Boundary | ----- EAB |
| Existing Endangered Plant Boundary | ----- EPB |

BUILDINGS AND OTHER CULTURE:

| | |
|-------------------------------|-----|
| Gas Pump Vent or U/G Tank Cap | ○ |
| Sign | ○ S |
| Well | ○ W |
| Small Mine | ✕ |
| Foundation | □ |
| Area Outline | □ |
| Cemetery | ↑ |
| Building | □ |
| School | □ |
| Church | □ |
| Dam | □ |

HYDROLOGY:

| | |
|------------------------------------|------------|
| Stream or Body of Water | ----- |
| Hydro, Pool or Reservoir | □ |
| Jurisdictional Stream | ----- JS |
| Buffer Zone 1 | ----- BZ 1 |
| Buffer Zone 2 | ----- BZ 2 |
| Flow Arrow | ← |
| Disappearing Stream | ----- |
| Spring | ○ |
| Swamp Marsh | ----- |
| Proposed Lateral, Tail, Head Ditch | ----- |
| False Sump | ----- |

RAILROADS:

| | |
|--------------------|---------------|
| Standard Gauge | ----- |
| RR Signal Milepost | ○ MILEPOST 35 |
| Switch | □ 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 | ○ R W |
| Proposed Right of Way Line with Concrete or Granite Marker | ○ R W |
| Existing Control of Access | ○ C A |
| Proposed Control of Access | ○ C A |
| Existing Easement Line | ----- E |
| Proposed Temporary Construction Easement | ----- E |
| Proposed Temporary Drainage Easement | ----- TDE |
| Proposed Permanent Drainage Easement | ----- PDE |
| Proposed Permanent Utility Easement | ----- PUE |

ROADS AND RELATED FEATURES:

| | |
|--------------------------------------|------------|
| Existing Edge of Pavement | ----- |
| Existing Curb | ----- |
| Proposed Slope Stakes Cut | ----- C |
| Proposed Slope Stakes Fill | ----- F |
| Proposed Wheel Chair Ramp | ----- WCR |
| Curb Cut for Future Wheel Chair Ramp | ----- CCFR |
| 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 | ----- Vineyard |

EXISTING STRUCTURES:

| | |
|--|---------------|
| MAJOR: | |
| Bridge, Tunnel or Box Culvert | ----- CONC |
| Bridge Wing Wall, Head Wall and End Wall | ----- CONC WW |
| MINOR: | |
| Head and End Wall | ----- CONC HW |
| Pipe Culvert | ----- |
| Footbridge | ----- |
| Drainage Box: Catch Basin, DI or JB | □ CB |
| Paved Ditch Gutter | ----- |
| Storm Sewer Manhole | ○ S |
| Storm Sewer | ----- S |

UTILITIES:

| | |
|-------------------------------------|---------|
| POWER: | |
| Existing Power Pole | ● |
| Proposed Power Pole | ○ |
| Existing Joint Use Pole | ● |
| Proposed Joint Use Pole | ○ |
| Power Manhole | ○ P |
| Power Line Tower | □ |
| Power Transformer | □ |
| U/G Power Cable Hand Hole | □ PH |
| H-Frame Pole | ● |
| Recorded U/G Power Line | ----- P |
| Designated U/G Power Line (S.U.E.*) | ----- P |

TELEPHONE:

| | |
|---|------------|
| Existing Telephone Pole | ● |
| Proposed Telephone Pole | ○ |
| Telephone Manhole | ○ T |
| Telephone Booth | □ |
| Telephone Pedestal | □ |
| Telephone Cell Tower | ○ |
| U/G Telephone Cable Hand Hole | □ PH |
| Recorded U/G Telephone Cable | ----- T |
| Designated U/G Telephone Cable (S.U.E.*) | ----- T |
| Recorded U/G Telephone Conduit | ----- TC |
| Designated U/G Telephone Conduit (S.U.E.*) | ----- TC |
| Recorded U/G Fiber Optics Cable | ----- T FO |
| Designated U/G Fiber Optics Cable (S.U.E.*) | ----- T FO |

WATER:

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

TV:

| | |
|--|-------------|
| TV Satellite Dish | ○ |
| TV Pedestal | □ |
| TV Tower | ○ |
| U/G TV Cable Hand Hole | □ PH |
| Recorded U/G TV Cable | ----- TV |
| Designated U/G TV Cable (S.U.E.*) | ----- TV |
| Recorded U/G Fiber Optic Cable | ----- TV FO |
| Designated U/G Fiber Optic Cable (S.U.E.*) | ----- TV FO |

GAS:

| | |
|-----------------------------------|---------------|
| Gas Valve | ○ |
| Gas Meter | ○ |
| Recorded U/G Gas Line | ----- G |
| Designated U/G Gas Line (S.U.E.*) | ----- G |
| Above Ground Gas Line | ----- A/G Gas |

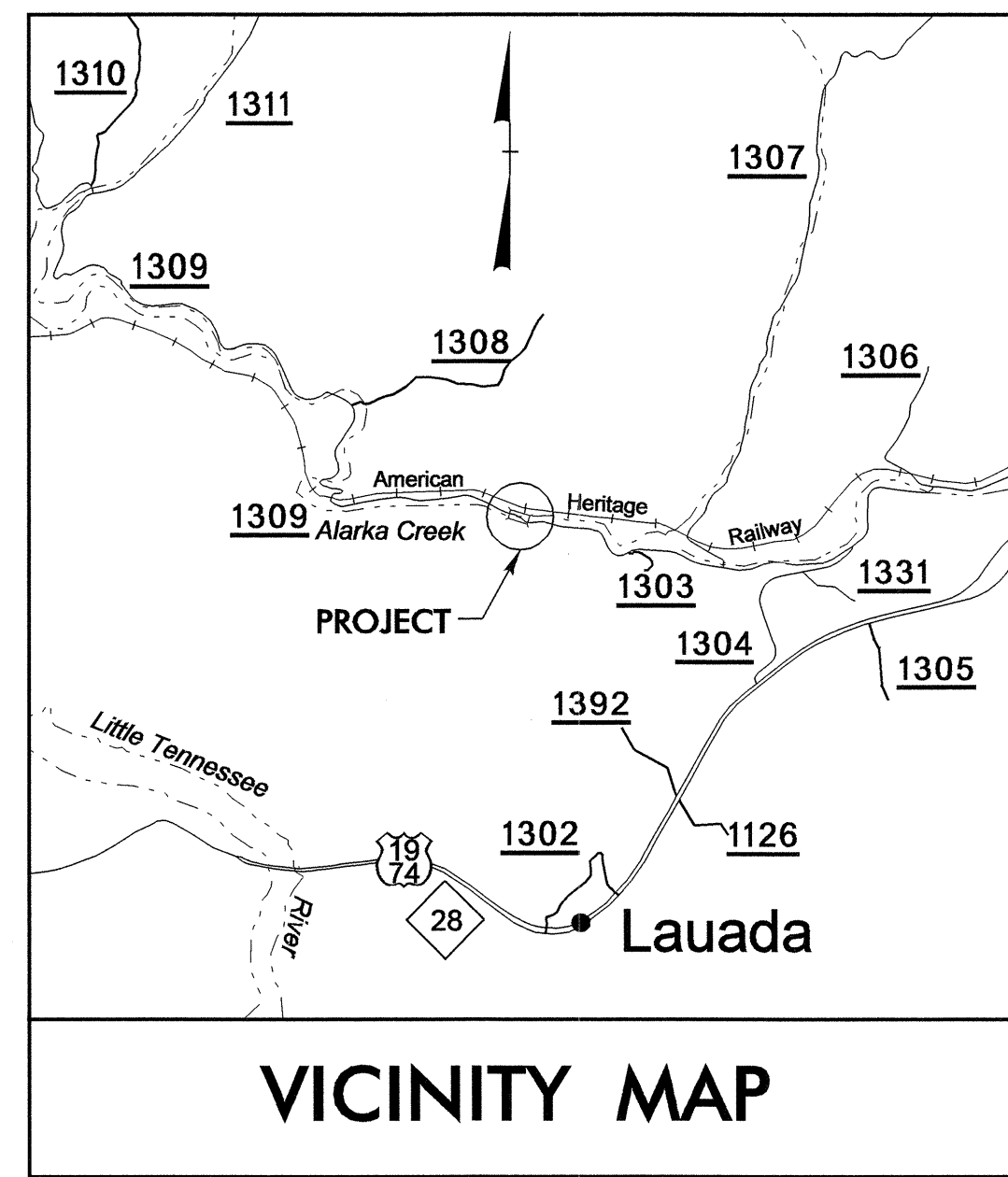
SANITARY SEWER:

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

MISCELLANEOUS:

| | |
|--|------------|
| Utility Pole | ● |
| Utility Pole with Base | □ |
| Utility Located Object | ○ |
| Utility Traffic Signal Box | □ |
| Utility Unknown U/G Line | ----- U/UL |
| 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. |

B-3701 SURVEY CONTROL SHEET



| BL POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|----------|-------|-------------|-------------|-----------|------------------------|----------|
| 1 | BL1 | 627593.4740 | 655718.2740 | 1778.32 | OUTSIDE PROJECT LIMITS | |
| 2 | BL2 | 627566.0950 | 656122.6050 | 1779.77 | OUTSIDE PROJECT LIMITS | |
| 3 | BL3 | 627374.0460 | 656480.6570 | 1783.90 | 13+57.24 | 14.58 RT |
| 4 | BL4 | 627285.1760 | 656808.6680 | 1788.60 | 17+02.27 | 20.06 RT |
| 5 | BL5 | 627209.5830 | 657037.5360 | 1793.03 | 19+41.02 | 19.49 LT |
| 6 | BL6 | 627154.0570 | 657375.1830 | 1804.98 | 22+90.37 | 11.84 LT |
| 7 | BL7 | 627100.5610 | 657852.3800 | 1806.43 | OUTSIDE PROJECT LIMITS | |

.....
 BM1 ELEVATION = 1787.42
 N 626847 E 658113
 L STATION 23+13
 S 67° 57' 50.3" E DIST 774.99
 8 INCH NAIL IN BASE OF 18 INCH RED OAK

.....
 BM3 ELEVATION = 1795.02
 N 627186 E 656757
 L STATION 17+03 132 RIGHT
 8 INCH NAIL IN BASE OF 10 INCH SYCAMORE

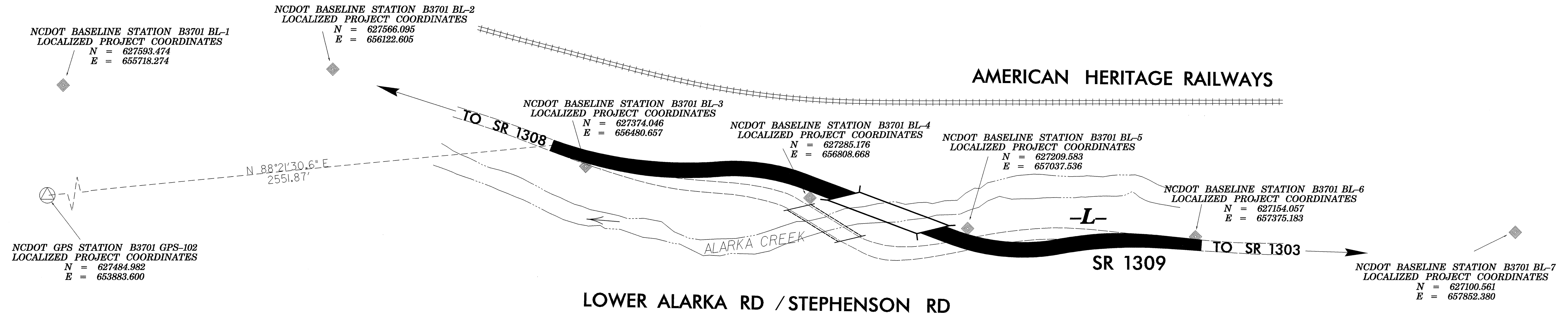
.....
 BM2 ELEVATION = 1799.84
 N 627503 E 656353
 L STATION 11+88 44 LEFT
 8 INCH NAIL IN ROOT OF 30 INCH WHITE PINE

.....
 BM4 ELEVATION = 1818.68
 N 627041 E 657834
 L STATION 23+13
 S 77° 36' 18.0" E DIST 449.61
 8 INCH NAIL IN BASE OF 18 INCH HEMLOCK



I. 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/
 FILE: B3701_LS_CONTROL_040806.TXT

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



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3701-102"
 WITH NAD 83 STATE PLANE GRID COORDINATES OF
 NORTHING: 627484.982(ft) EASTING: 653883.600(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99979521
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3701-102" TO -L- STATION 13+00.00 IS
 N 88° 21' 30.66" E 2,551.8706 FT
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NGVD 29

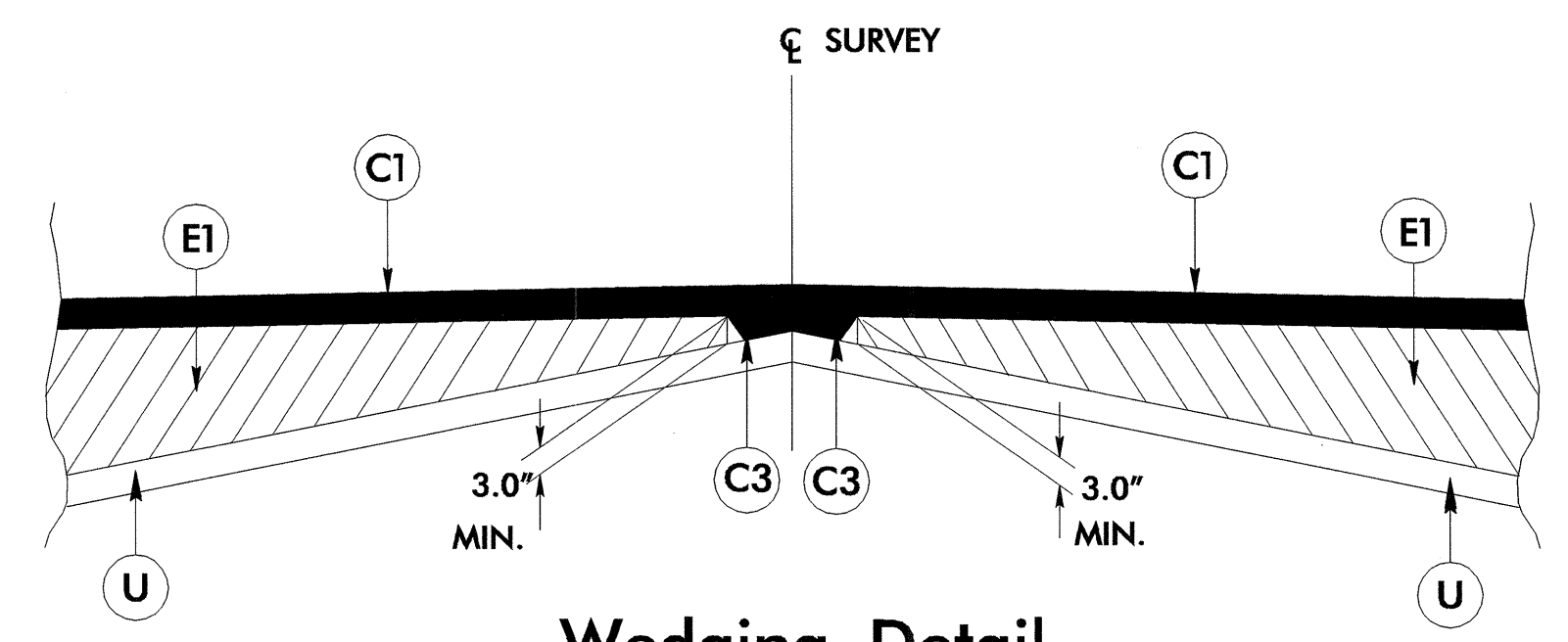
- ⊕ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 - ◆ INDICATES BASELINE CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED UTILIZING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.

NOTE: DRAWING NOT TO SCALE

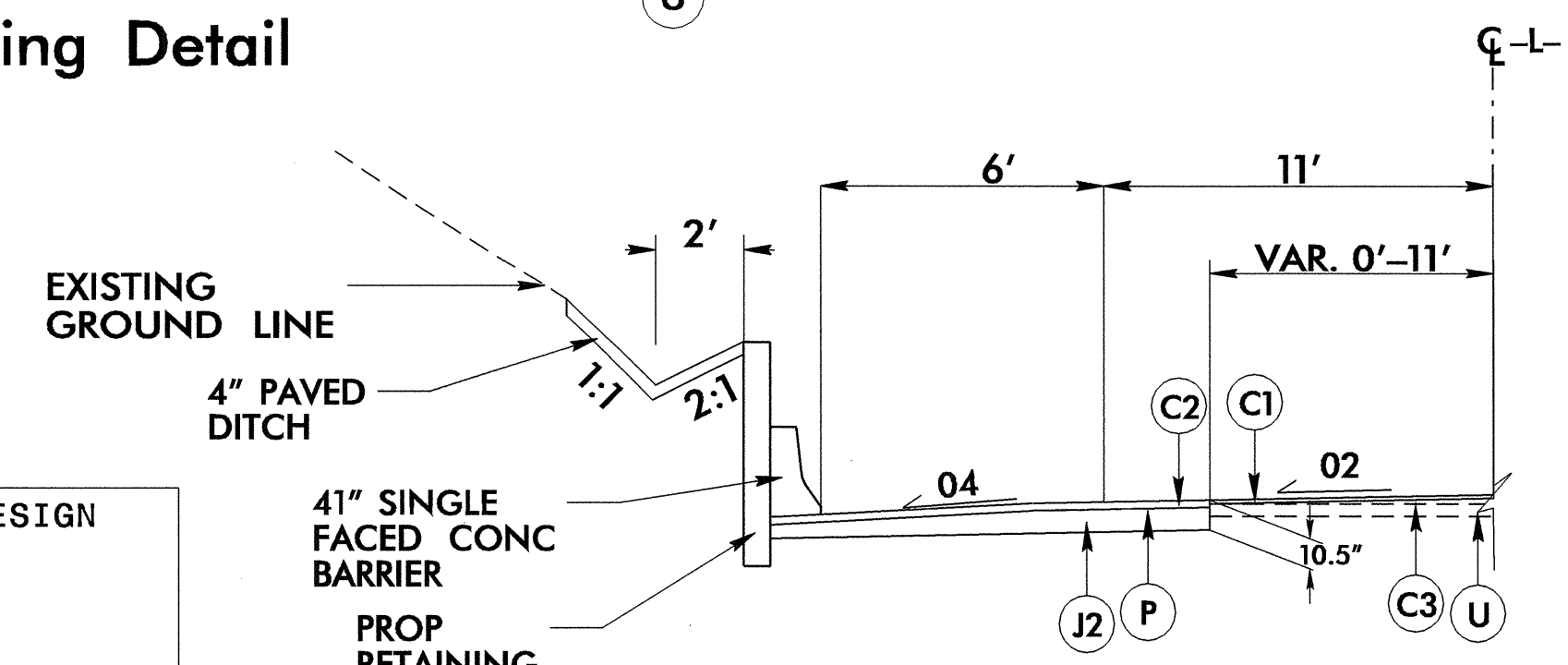
5/28/09
 20-MAR-2006 13:31
 RA:\pdpawm\1021303\1021303.dgn
 b3701_1021303

| PAVEMENT SCHEDULE (FINAL PAVEMENT SCHEDULE) | |
|--|--|
| C1 | PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. |
| C2 | PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | 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 TO EXCEED 1 1/2" IN DEPTH. |
| E1 | 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. |
| J1 | PROP. 6" AGGREGATE BASE COURSE. |
| J2 | PROP. 8" AGGREGATE BASE COURSE. |
| P | PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD. |
| R | SHOULDER BERM GUTTER. |
| T | EARTH MATERIAL. |
| U | EXISTING PAVEMENT. |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL) |

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



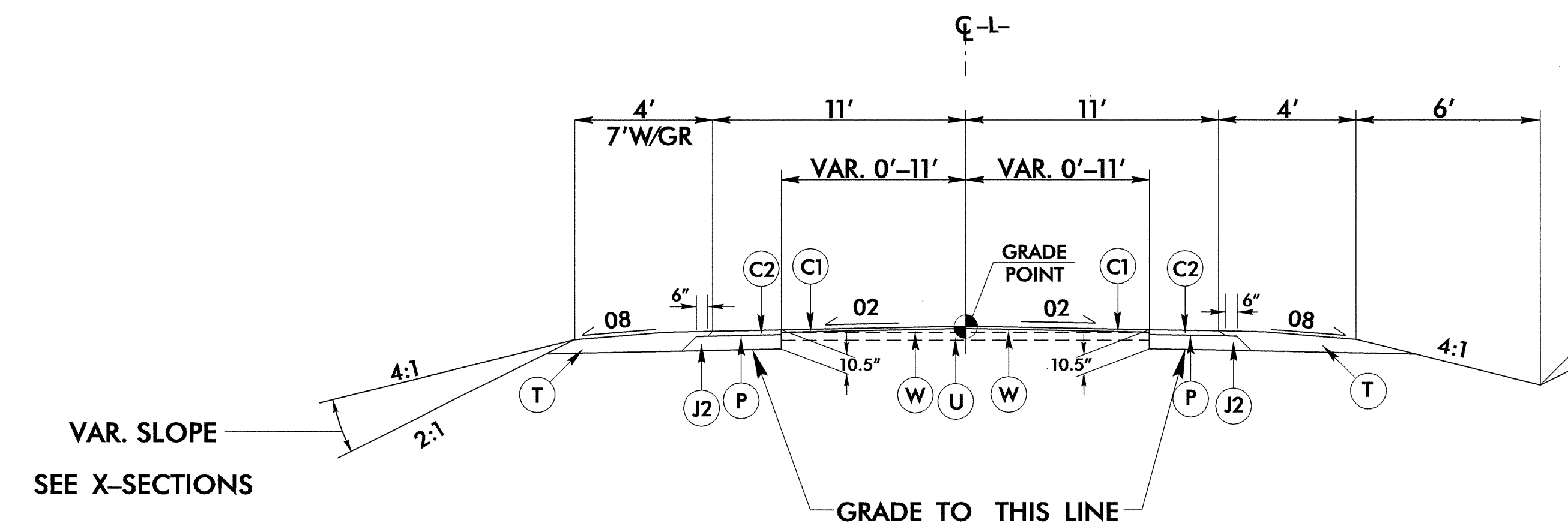
Wedging Detail



TYPICAL SECTION NO. 1A

USE TYPICAL SECTION NO. 1A IN CONJUNCTION WITH TYPICAL SECTION NO. 1
 -L- STA. 13+50 TO -L- STA. 17+00 LT

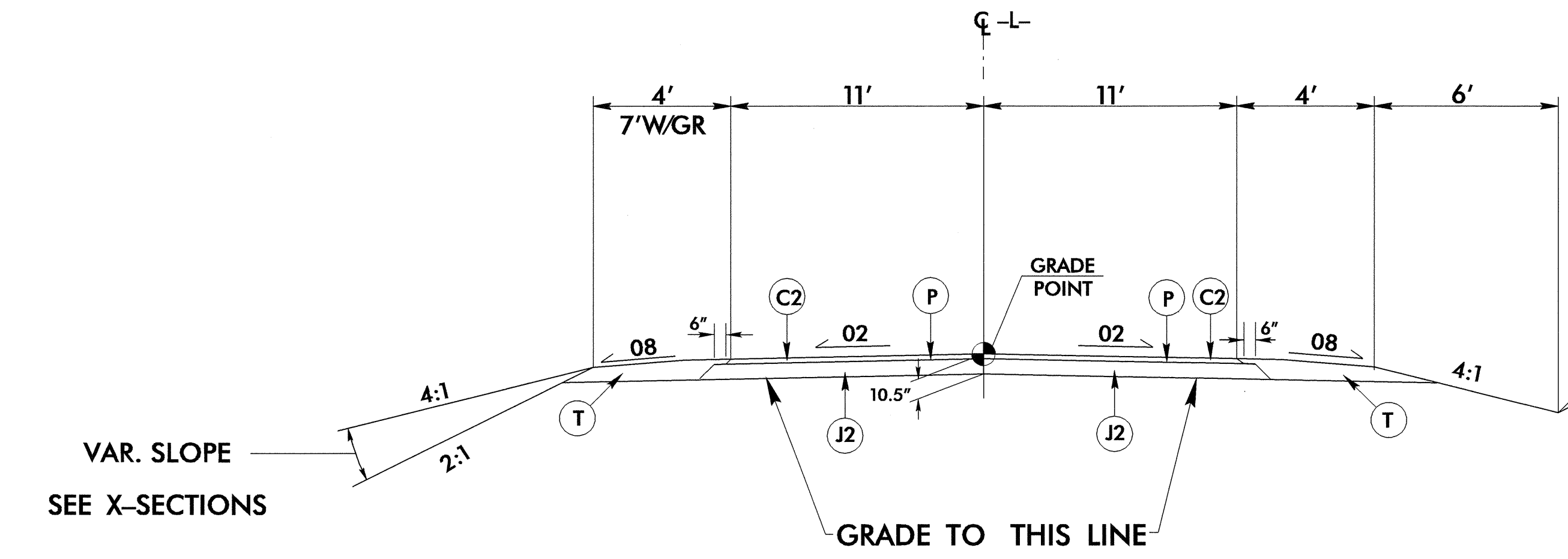
NOTE: TEMPORARY PAVEMENT DESIGN
 1.5" LAYER OF SF9.5A
 LAYER OF PRIME COAT
 6" LAYER OF ABC.
 FOR STATIONS AND LOCATION
 SEE SHEET TCP-3.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

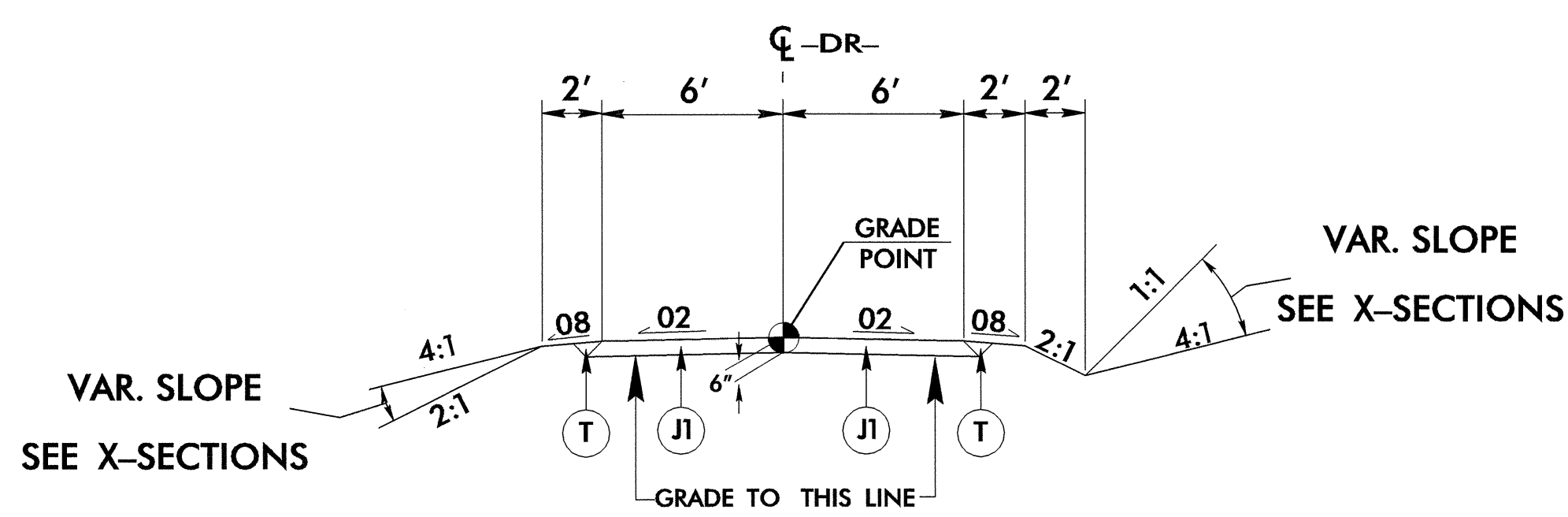
- L- STA. 13+00.00 TO -L- STA. 14+25.00
- L- STA. 19+20.00 TO -L- STA. 20+10.00
- L- STA. 21+50.00 TO -L- STA. 23+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

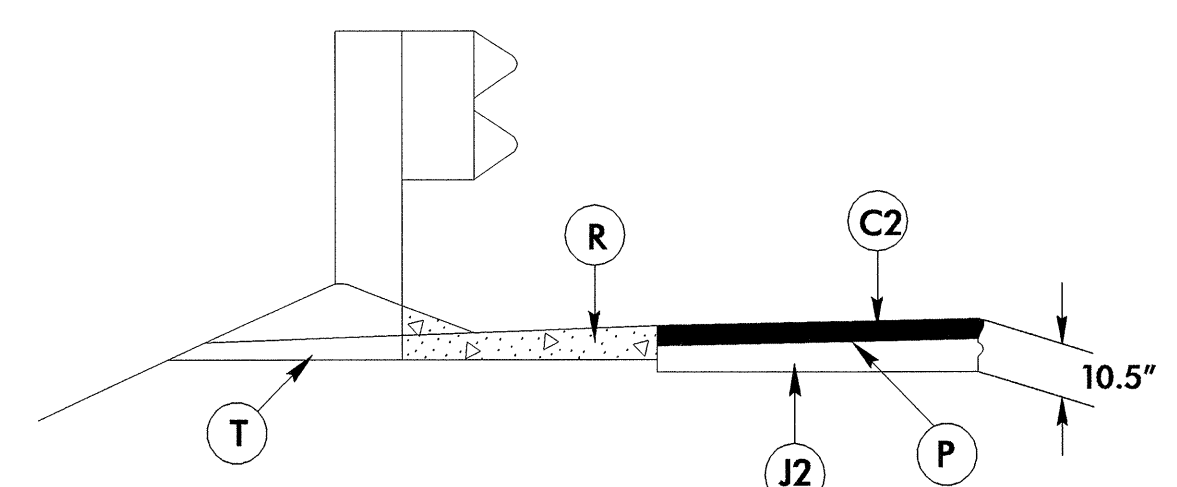
- L- STA. 14+25.00 TO -L- STA. 17+72.03 (BEGIN BRIDGE)
- L- STA. 18+72.03 (END BRIDGE) TO -L- STA. 19+20.00
- L- STA. 20+10.00 TO -L- STA. 21+50.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

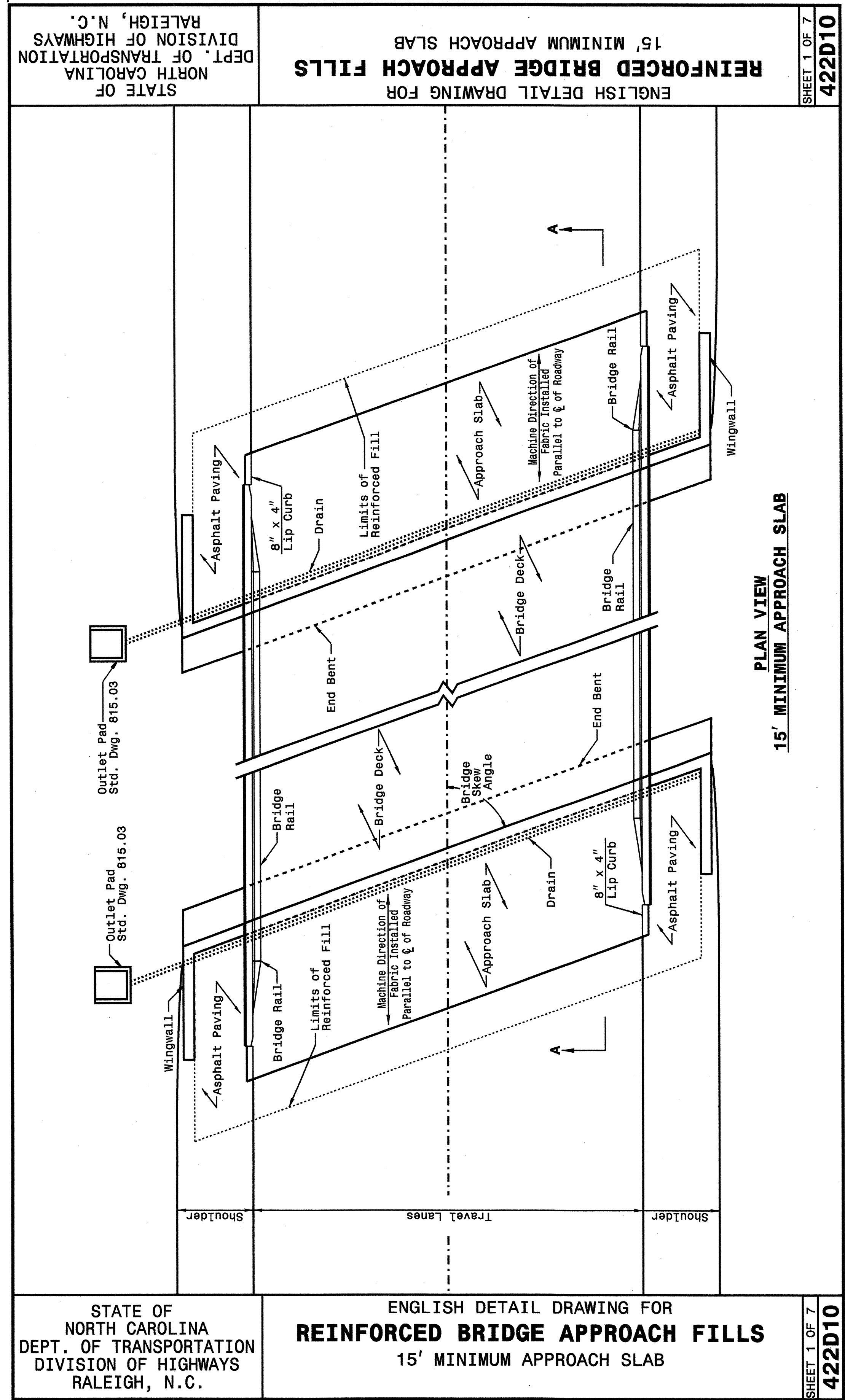
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SHOULDER BERM GUTTER DETAIL

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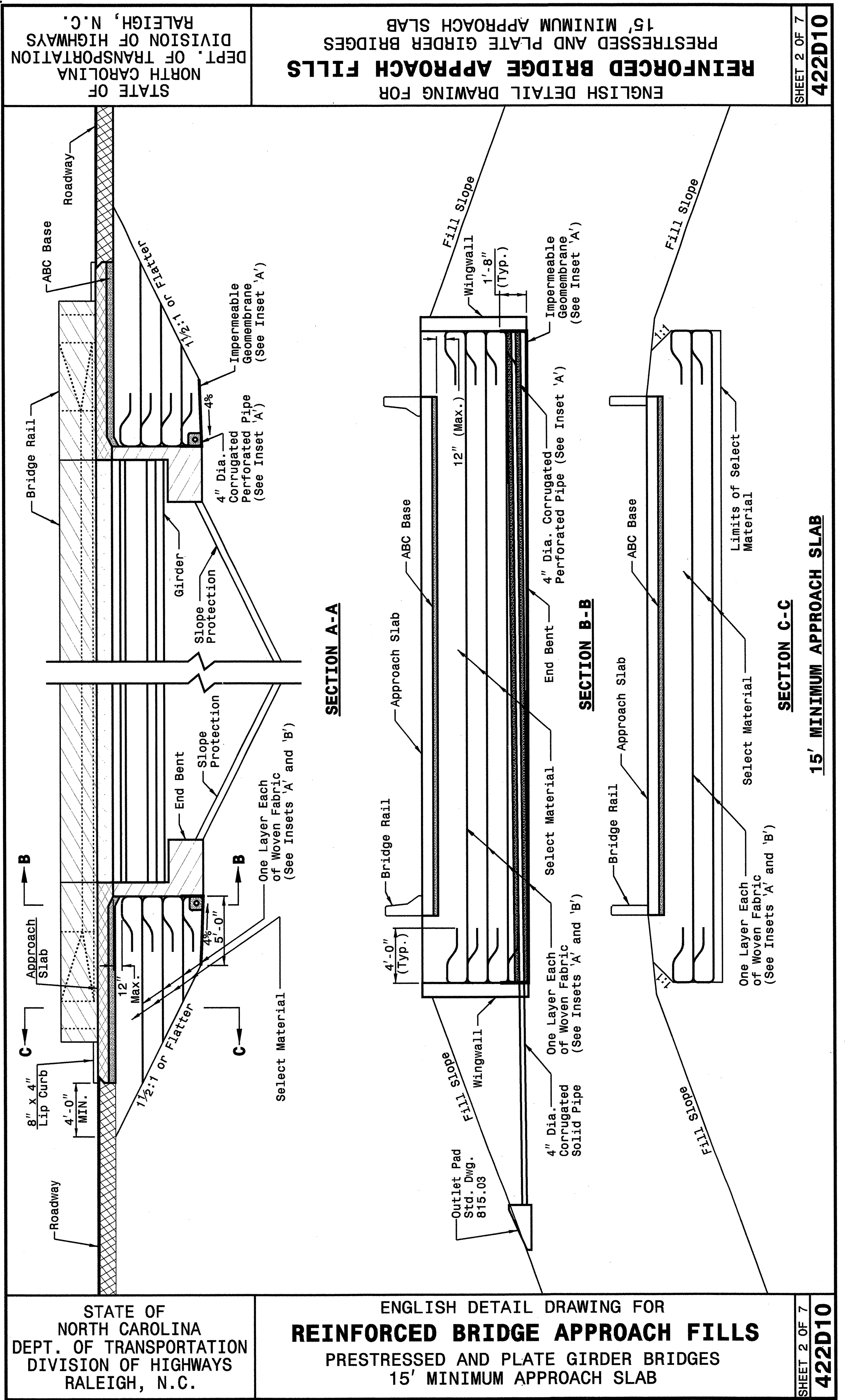
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- L- STA. 18+68.79 TO -L- STA. 18+86.05 (RT.)



STATE OF NORTH CAROLINA
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RALEIGH, N.C.

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

SHEET 1 OF 7
422D10



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

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

SHEET 2 OF 7
422D10

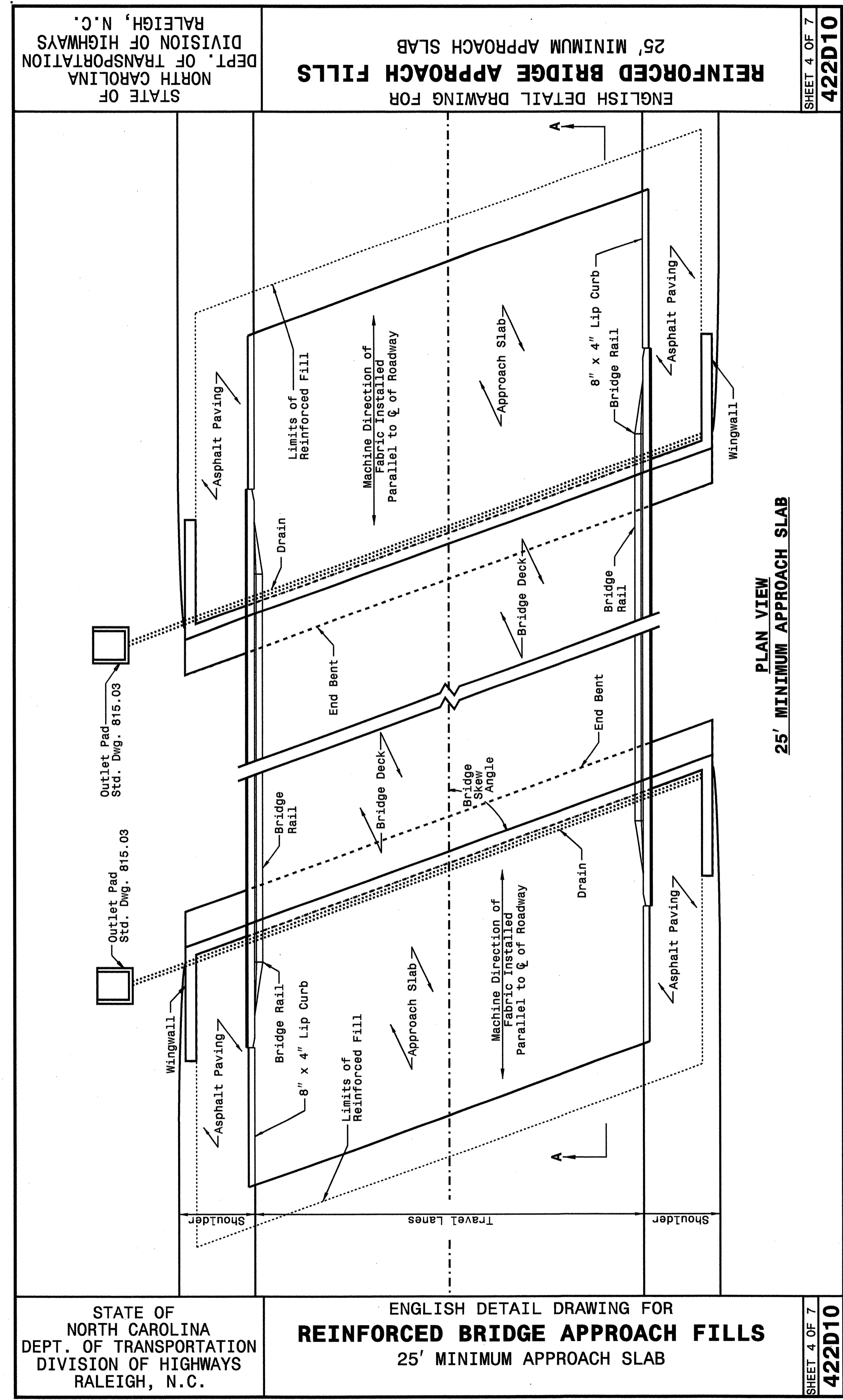
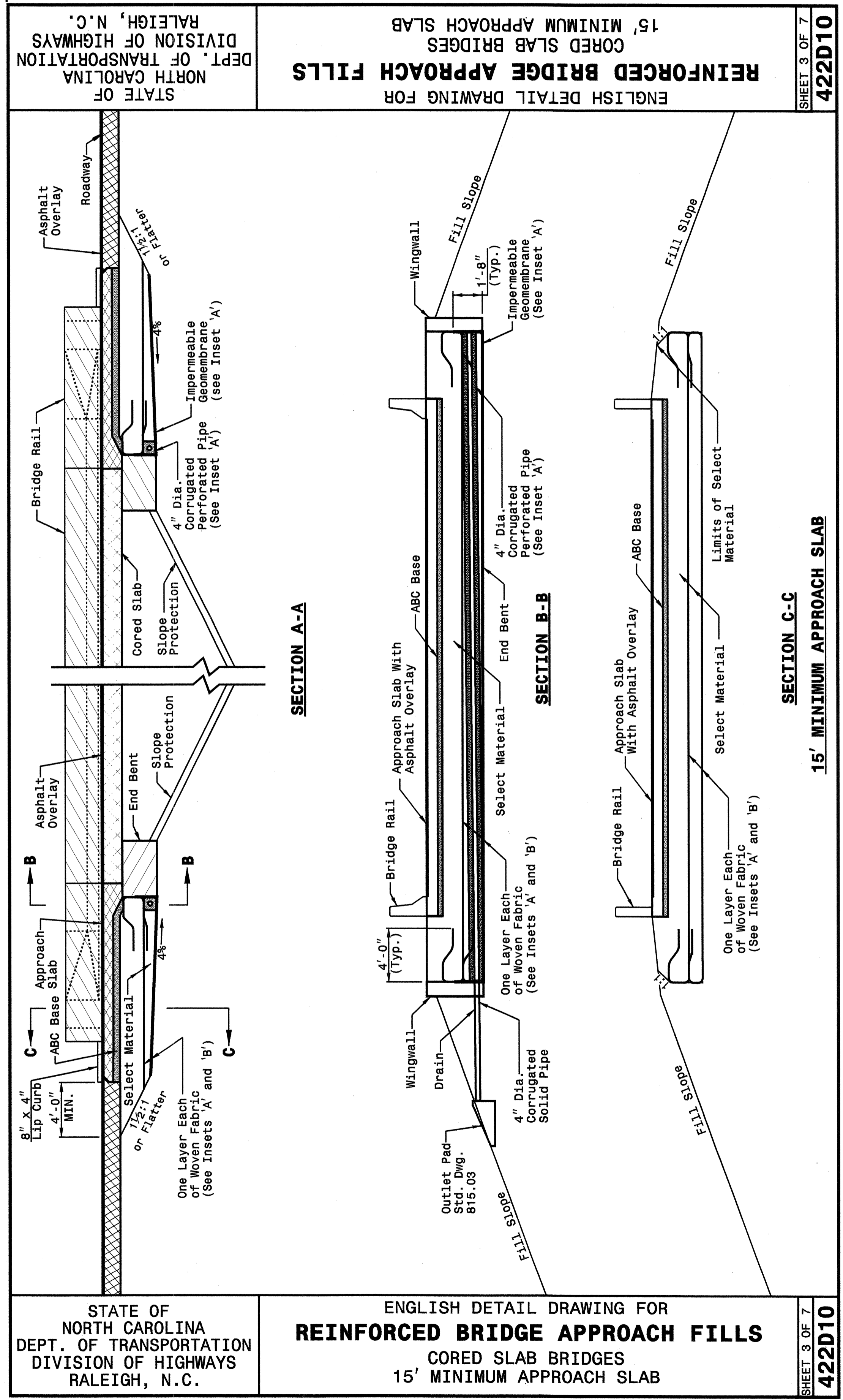
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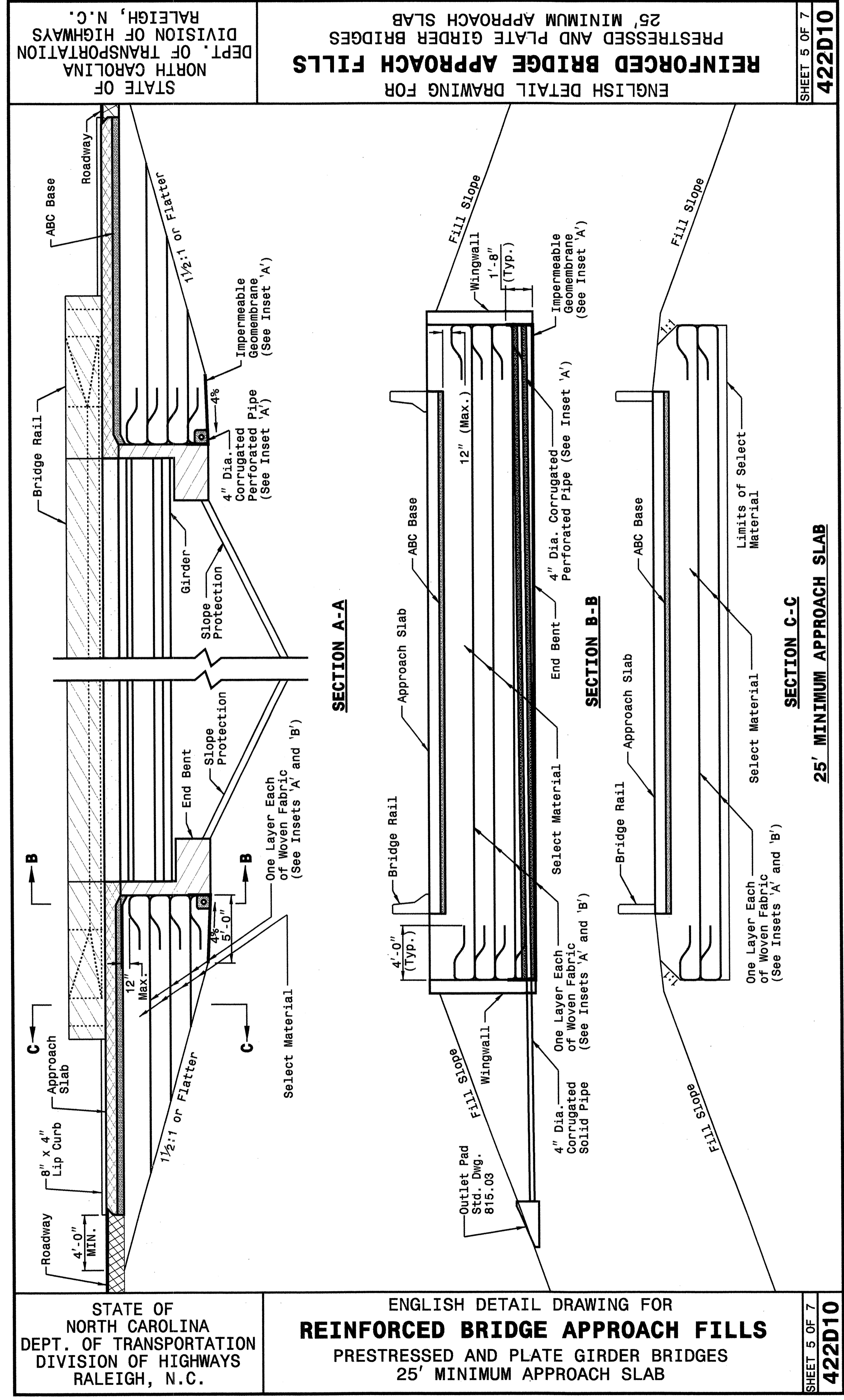
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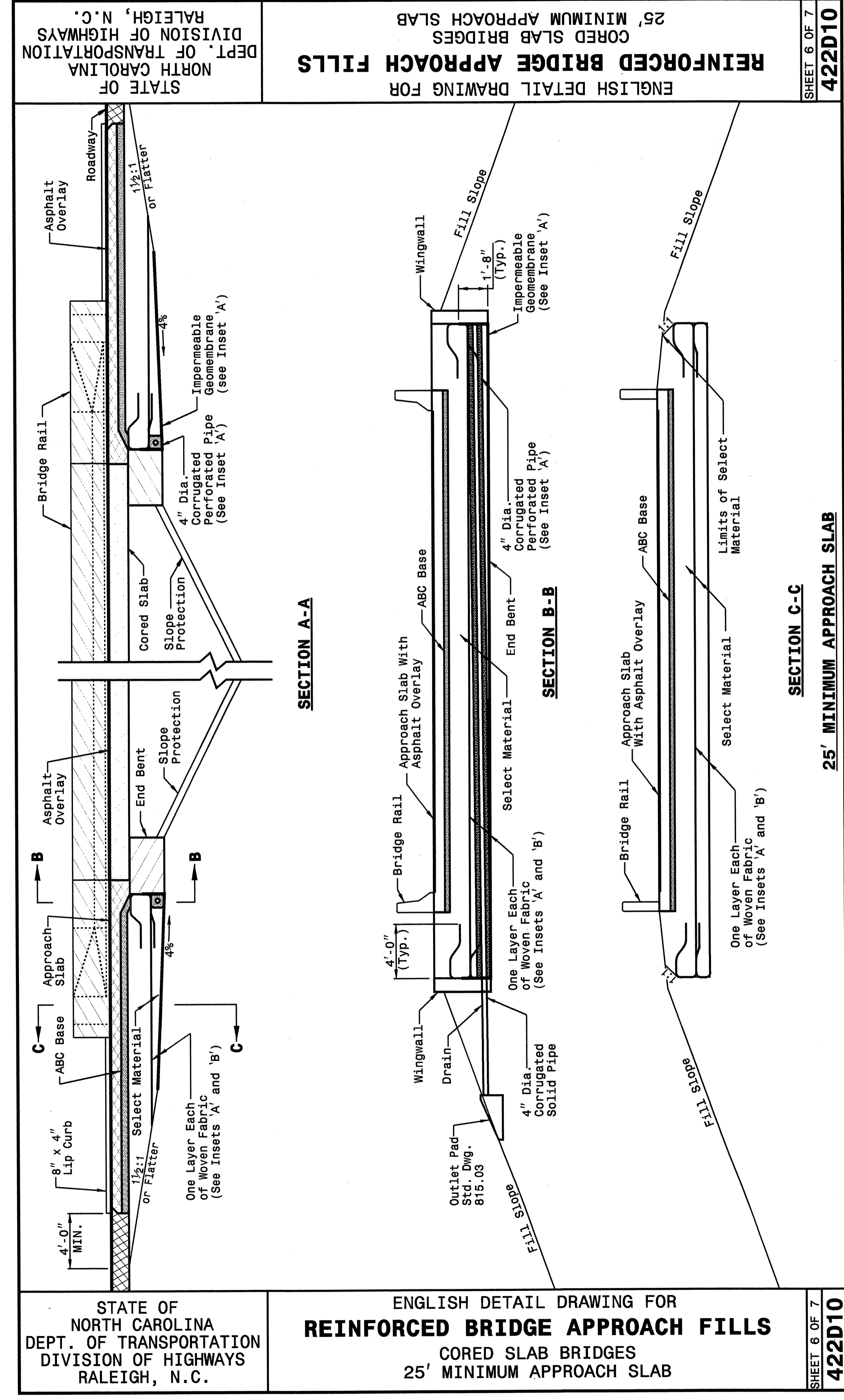
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STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

SHEET 5 OF 7
422D10

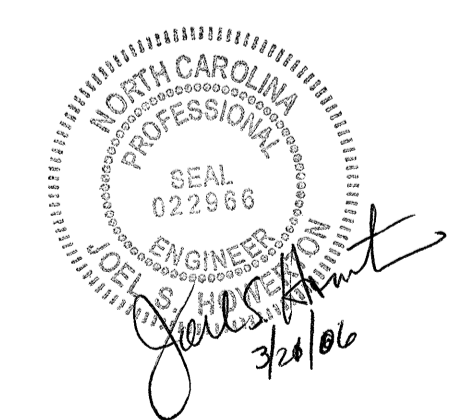


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RALEIGH, N.C.

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

SHEET 6 OF 7
422D10

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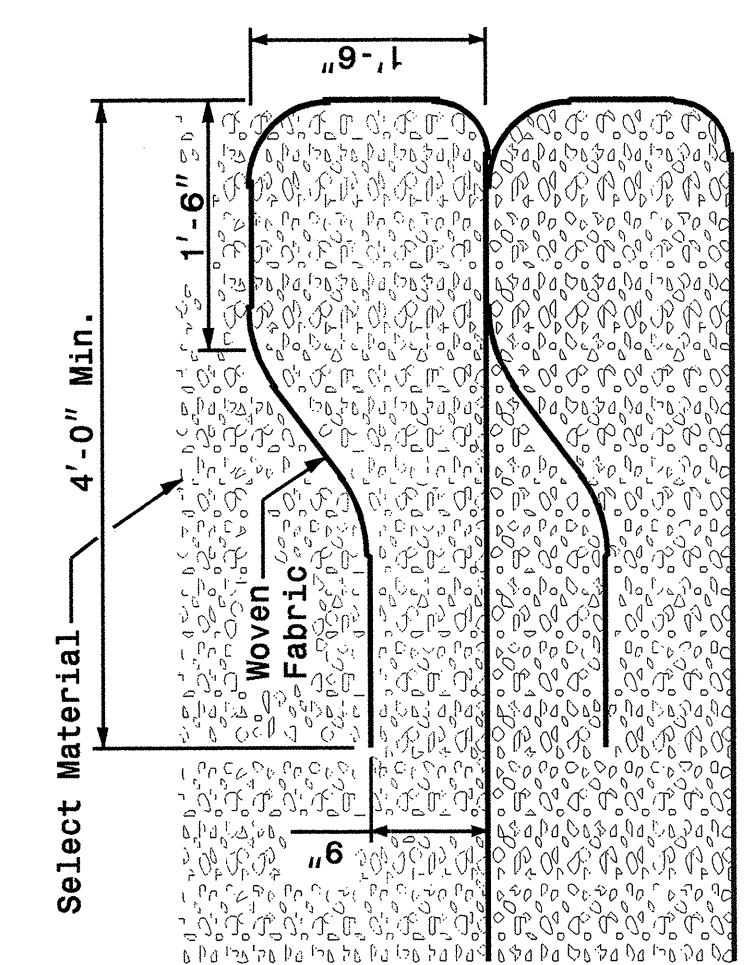
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
422D10

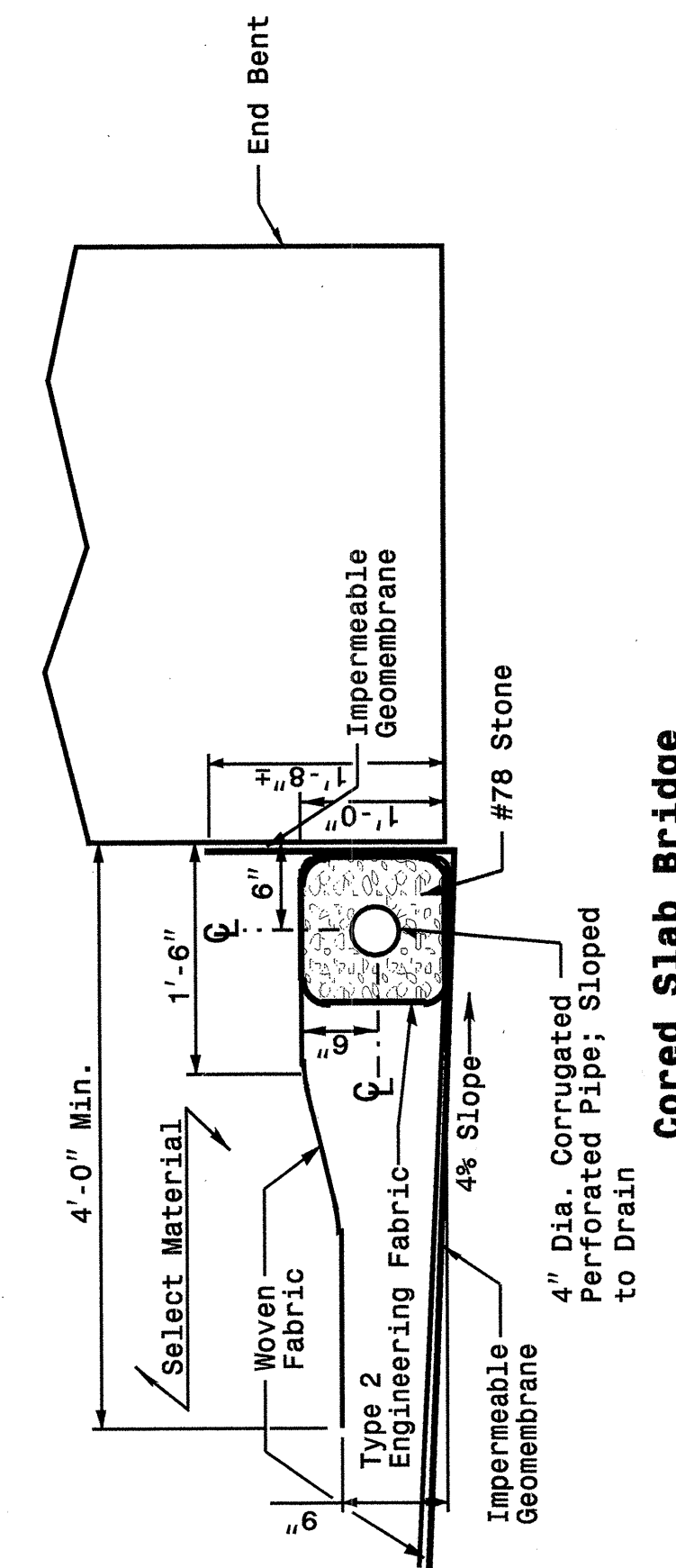


Typical Fabric Lift and Wrap
Showing Second and Above Lifts

Inset 'B'

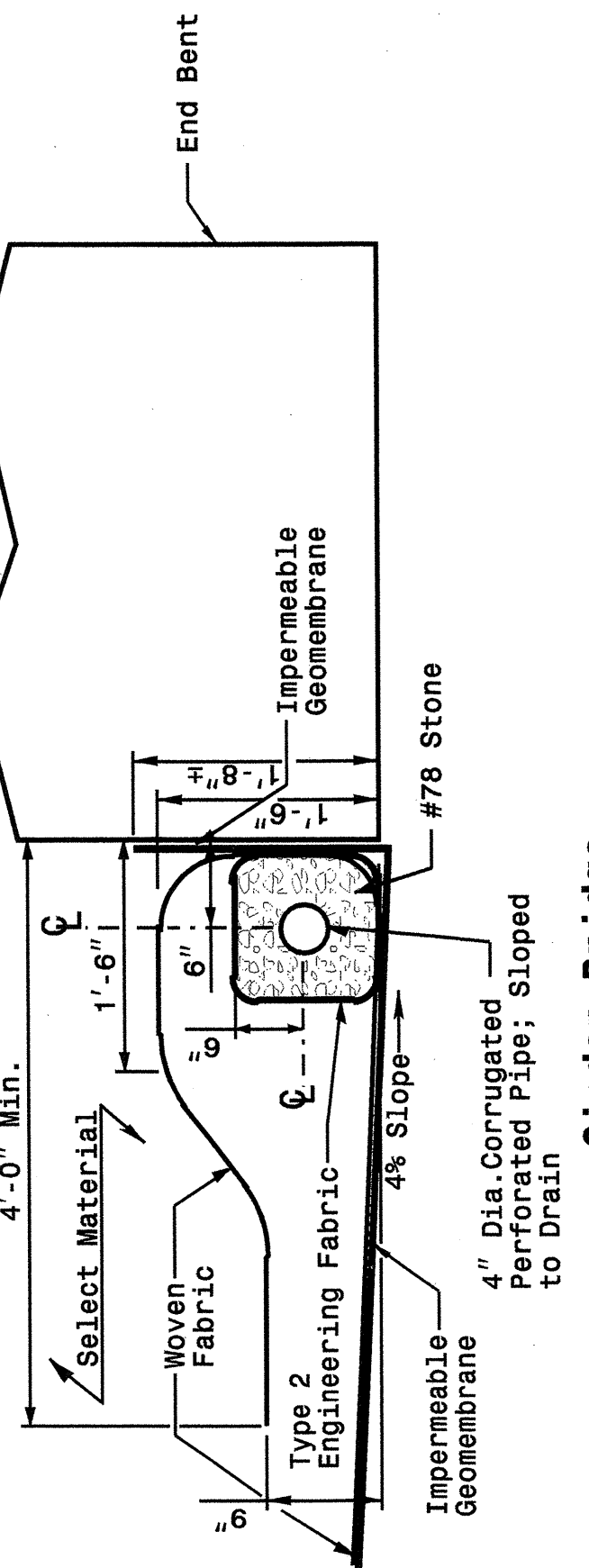
| Height of Backwall | Number of Fabric Layers |
|--------------------|-------------------------|
| 4'-6" - 5'-9" | 3 |
| 5'-10" - 7'-2" | 4 |
| 7'-3" - 8'-8" | 5 |
| 8'-9" - 10'-1" | 6 |
| 10'-2" - 11'-8" | 7 |

Note: Cored Slab Structures Require 2 Fabric Layers.



Cored Slab Bridge
Showing First Lift and Drains

Inset 'A'



Girder Bridge
Showing First Lift and Drains

Inset 'A'

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

STATE OF
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ENGLISH DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
422D10



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RALEIGH, N.C.

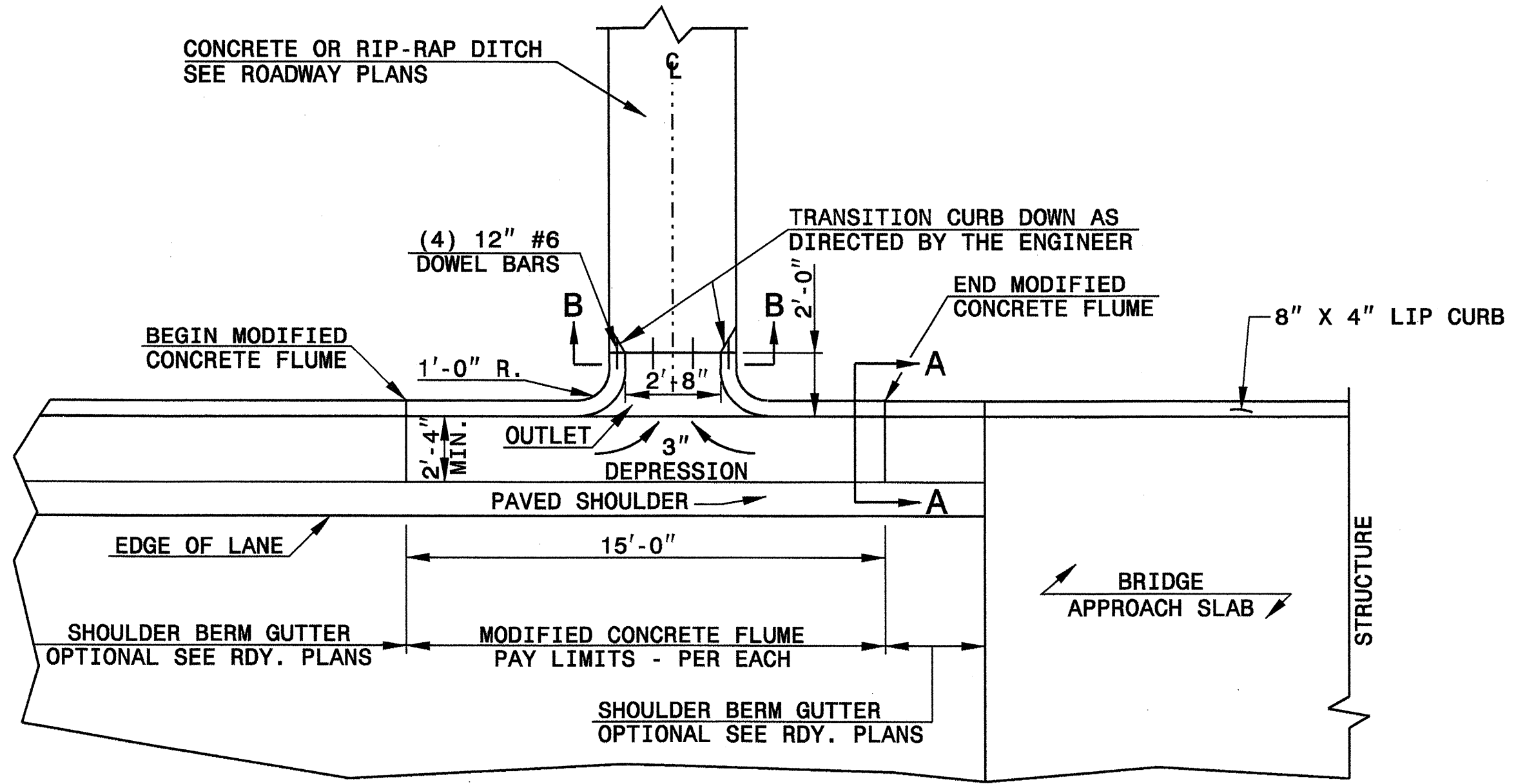
ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

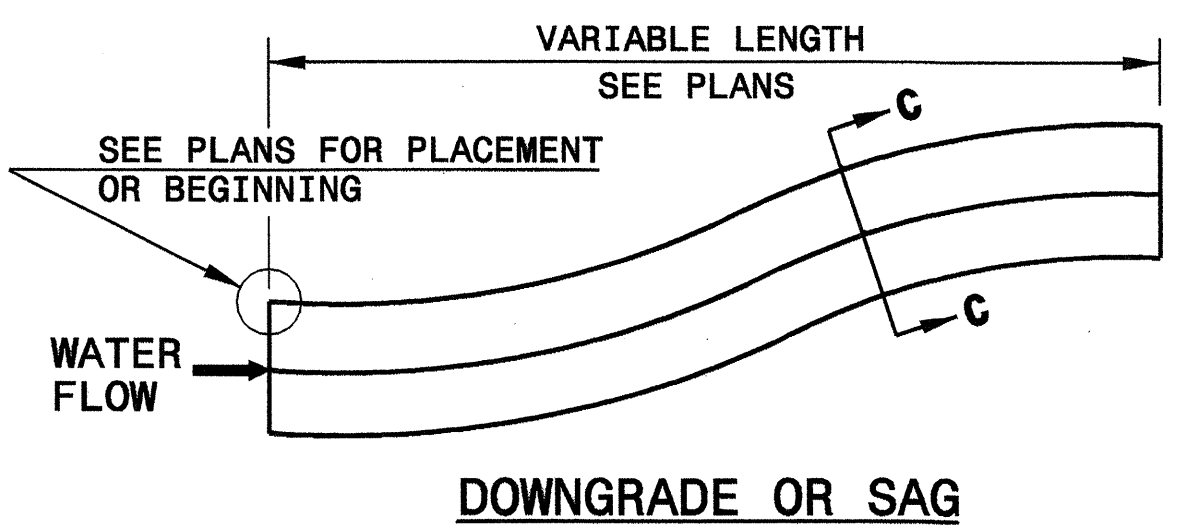
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ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

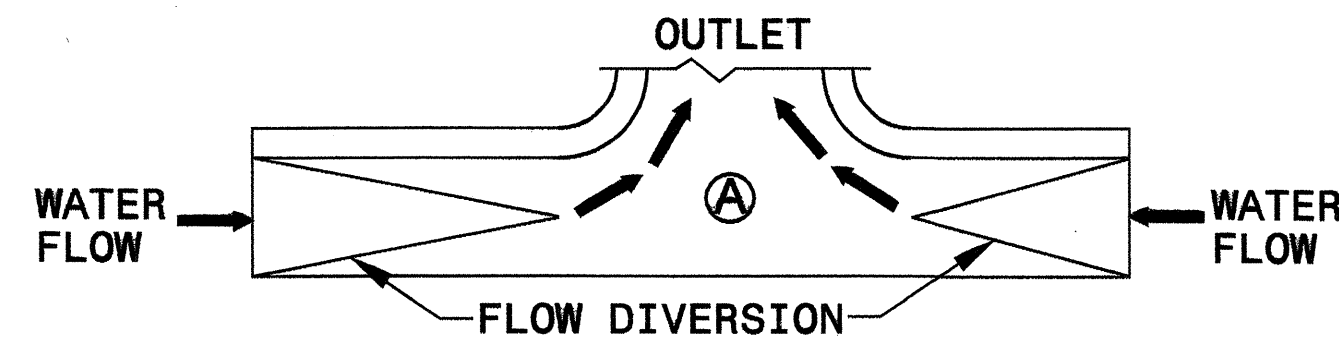
SHEET 1 OF 1
MODFLMDTCH



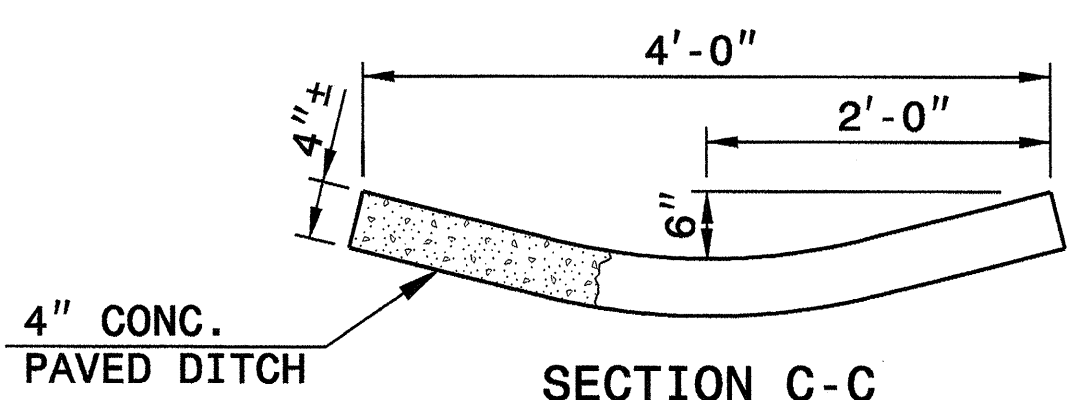
PLAN VIEW



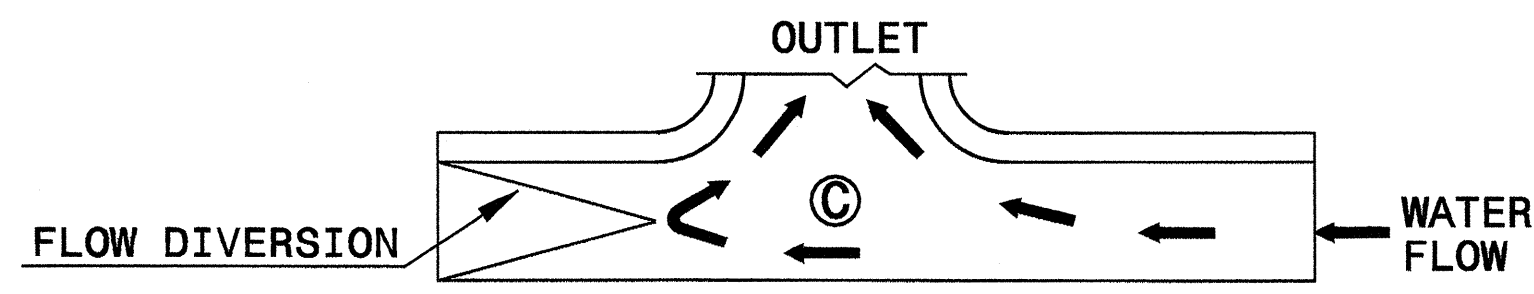
DOWNGRADE OR SAG



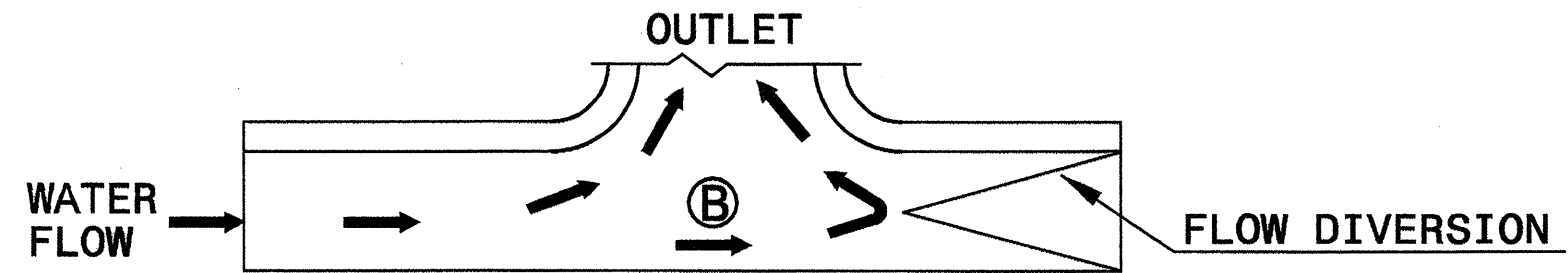
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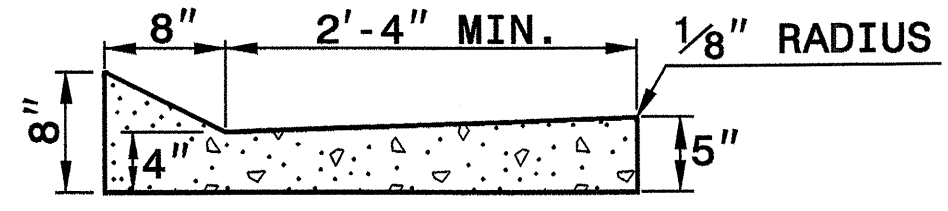
SECTION C-C



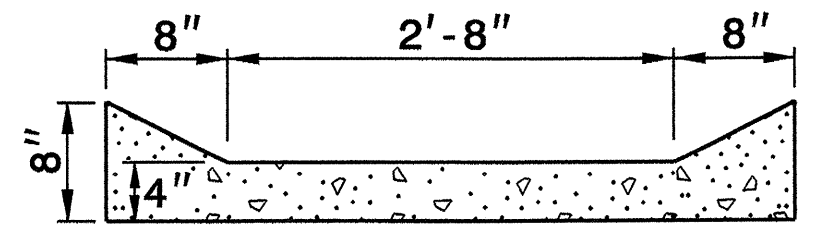
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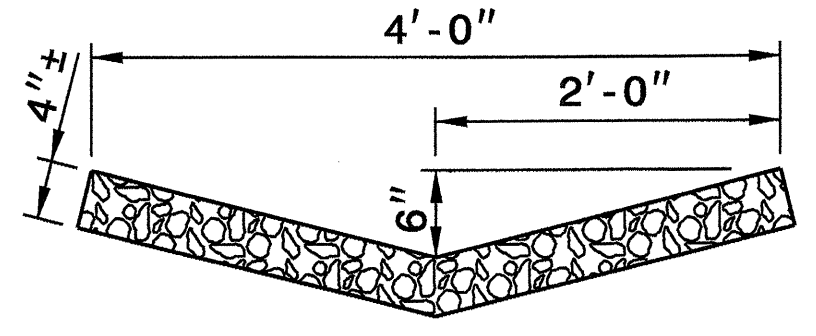
FLOW DIVERSION EXAMPLES



SECTION A-A



SECTION B-B



RIP-RAP LINED DITCH

- NOTES:
- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
 - CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
 - CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
 - CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
 - MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.



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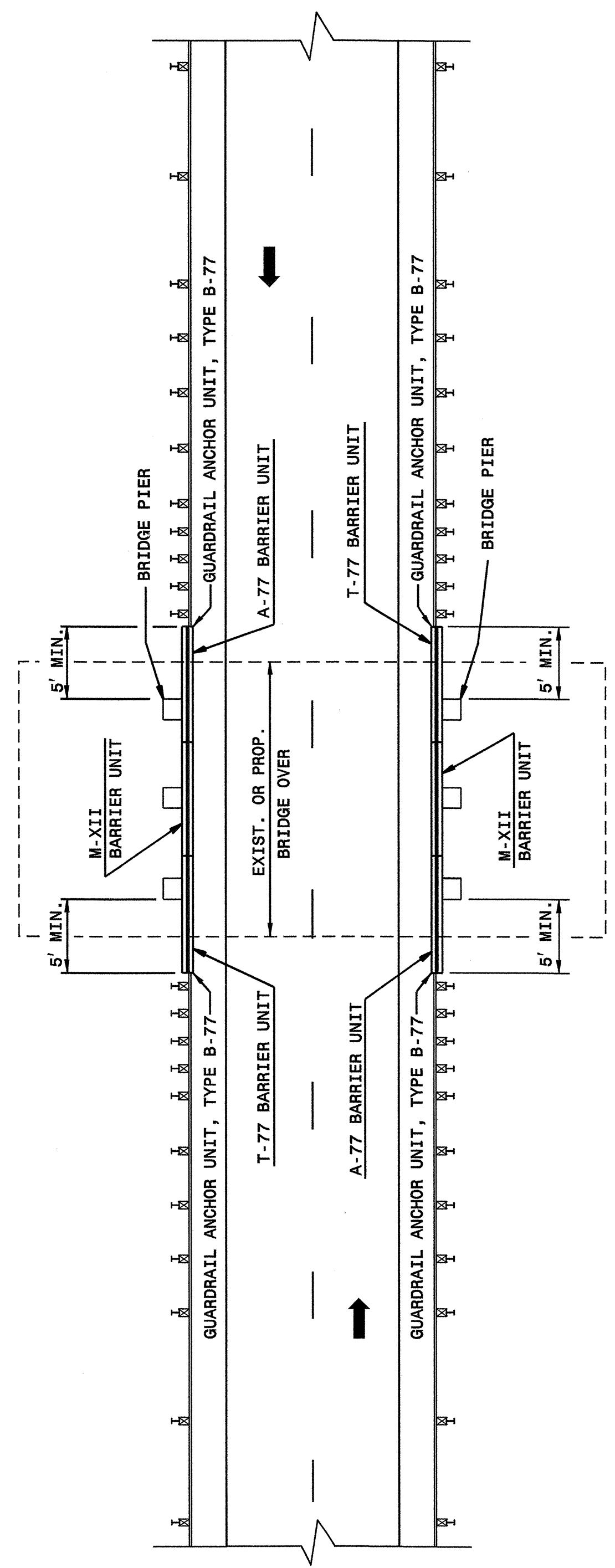
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ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED

SHEET 1 OF 8 857D01

NOTE:
 1) THIS DRAWING IS NOT INTENDED TO SHOW TYPICAL BARRIER AND GUARDRAIL INSTALLATION. IT DETAILS POSSIBLE BARRIER AND STRUCTURE ANCHOR COMBINATIONS FOR THIS TYPE FACILITY.
 2) USE TRAILING END GUARDRAIL IF WARRANTED



GUARDRAIL AND BARRIER AT UNDIVIDED HIGHWAY BRIDGE UNDERPASS

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

ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED

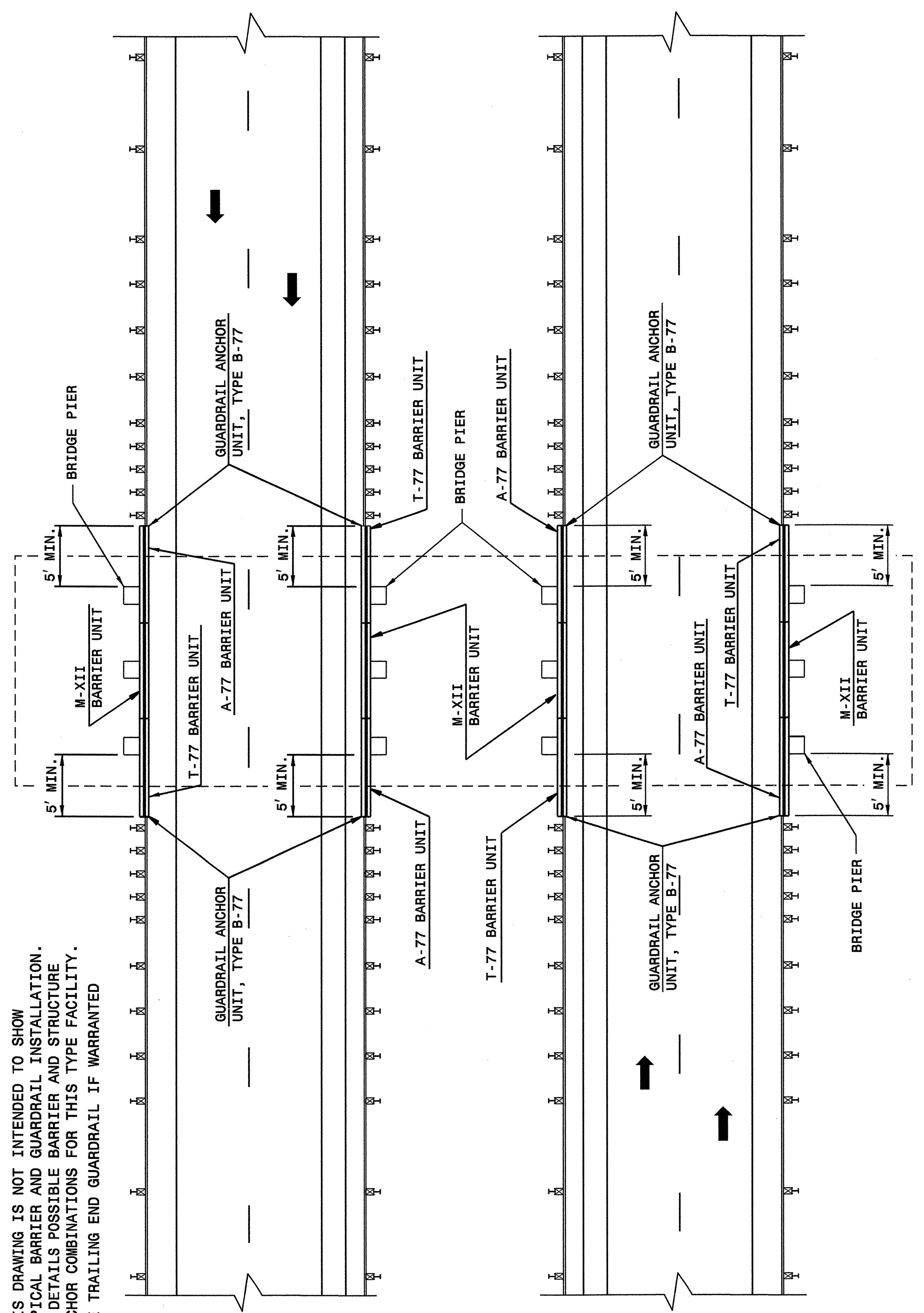
SHEET 1 OF 8 857D01

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

ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED

SHEET 2 OF 8 857D01

NOTE:
 1) THIS DRAWING IS NOT INTENDED TO SHOW TYPICAL BARRIER AND GUARDRAIL INSTALLATION. IT DETAILS POSSIBLE BARRIER AND STRUCTURE ANCHOR COMBINATIONS FOR THIS TYPE FACILITY.
 2) USE TRAILING END GUARDRAIL IF WARRANTED



GUARDRAIL AND BARRIER AT DIVIDED HIGHWAY BRIDGE UNDERPASS

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

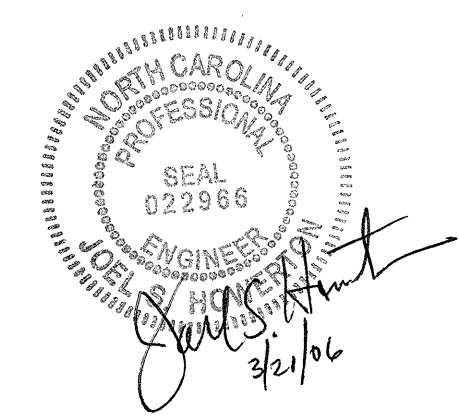
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SHEET 2 OF 8 857D01

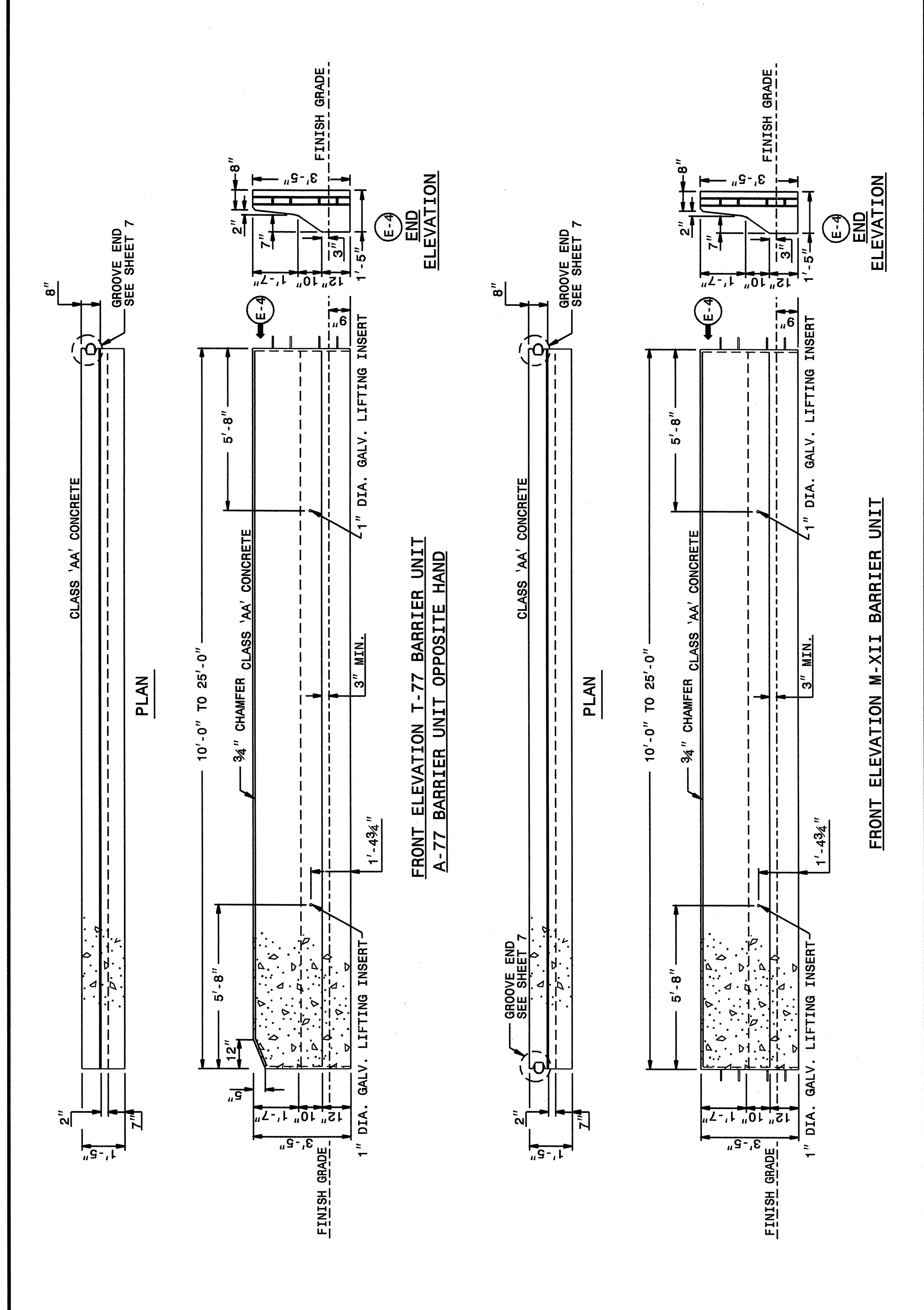
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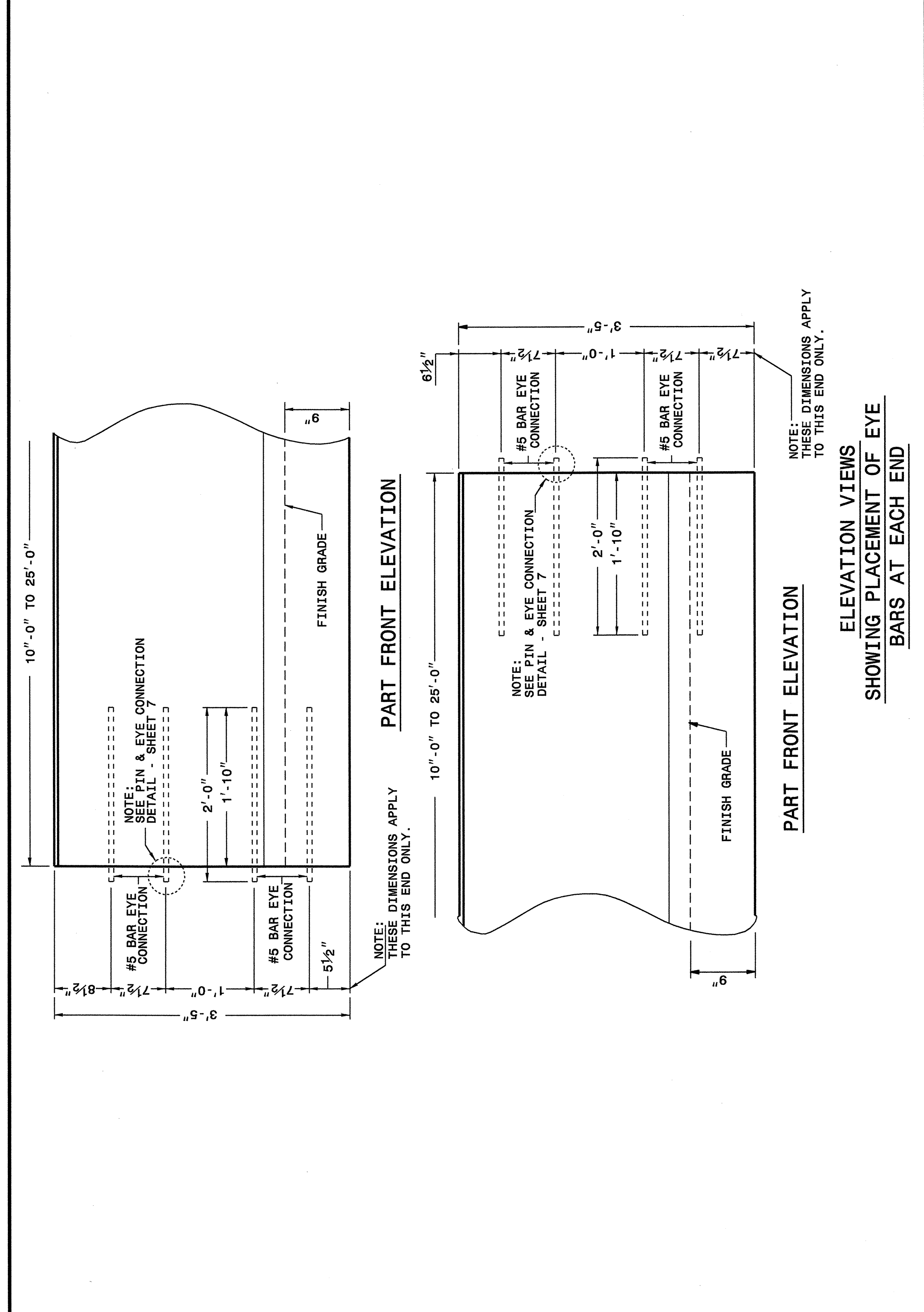


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ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED
SHEET 3 OF 8 857D01



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ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED
SHEET 3 OF 8 857D01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED
SHEET 4 OF 8 857D01



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED
SHEET 4 OF 8 857D01

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| STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. | ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED | SHEET 5 OF 8 857D01 |
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| ENGLISH DETAIL DRAWING FOR PRECAST REINFORCED CONCRETE BARRIER 41" SINGLE FACED | | |
| SHEET 5 OF 8 857D01 | | |

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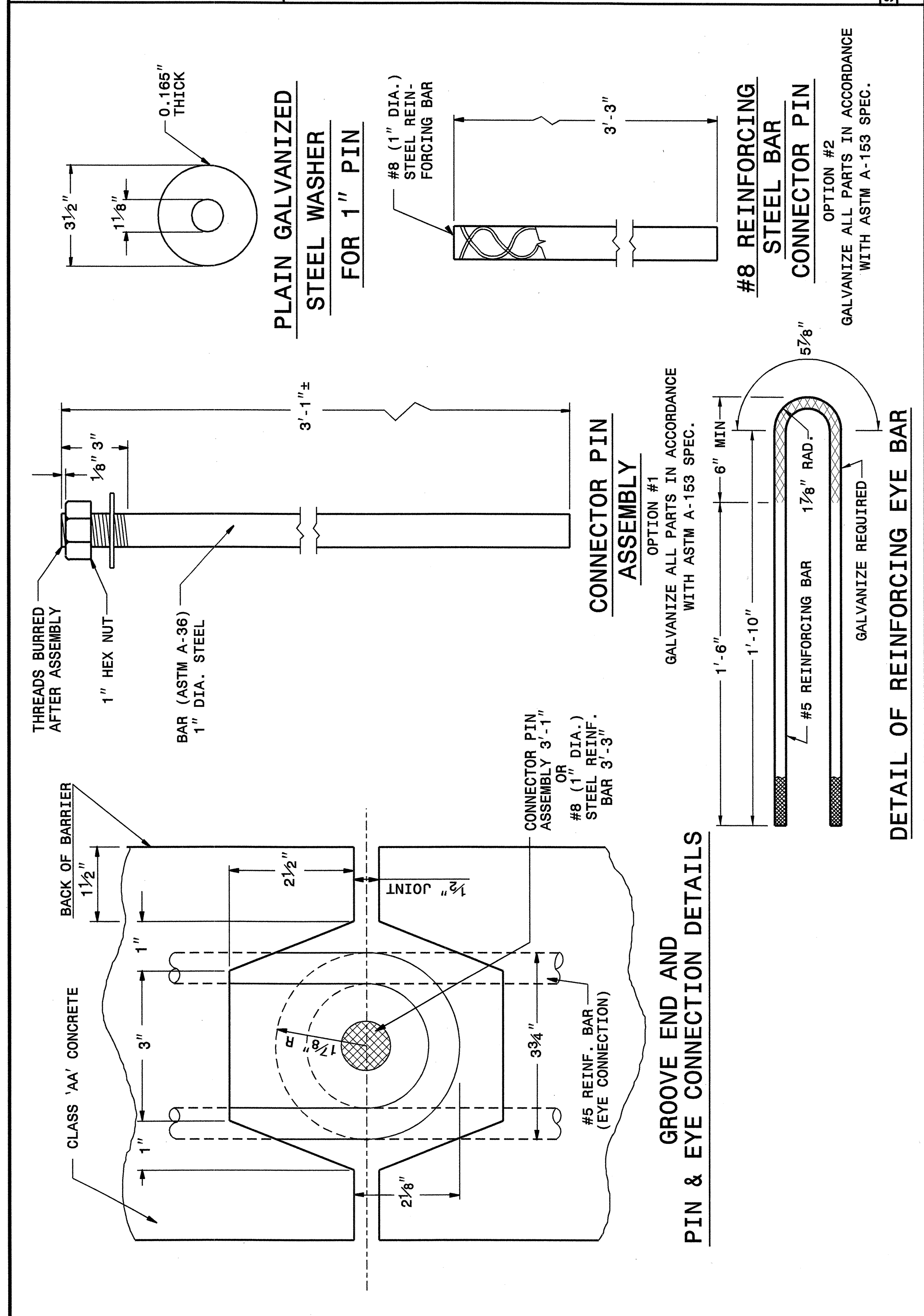
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ENGLISH DETAIL DRAWING FOR
PRECAST REINFORCED CONCRETE BARRIER
41" SINGLE FACED

SHEET 7 OF 8
857D01



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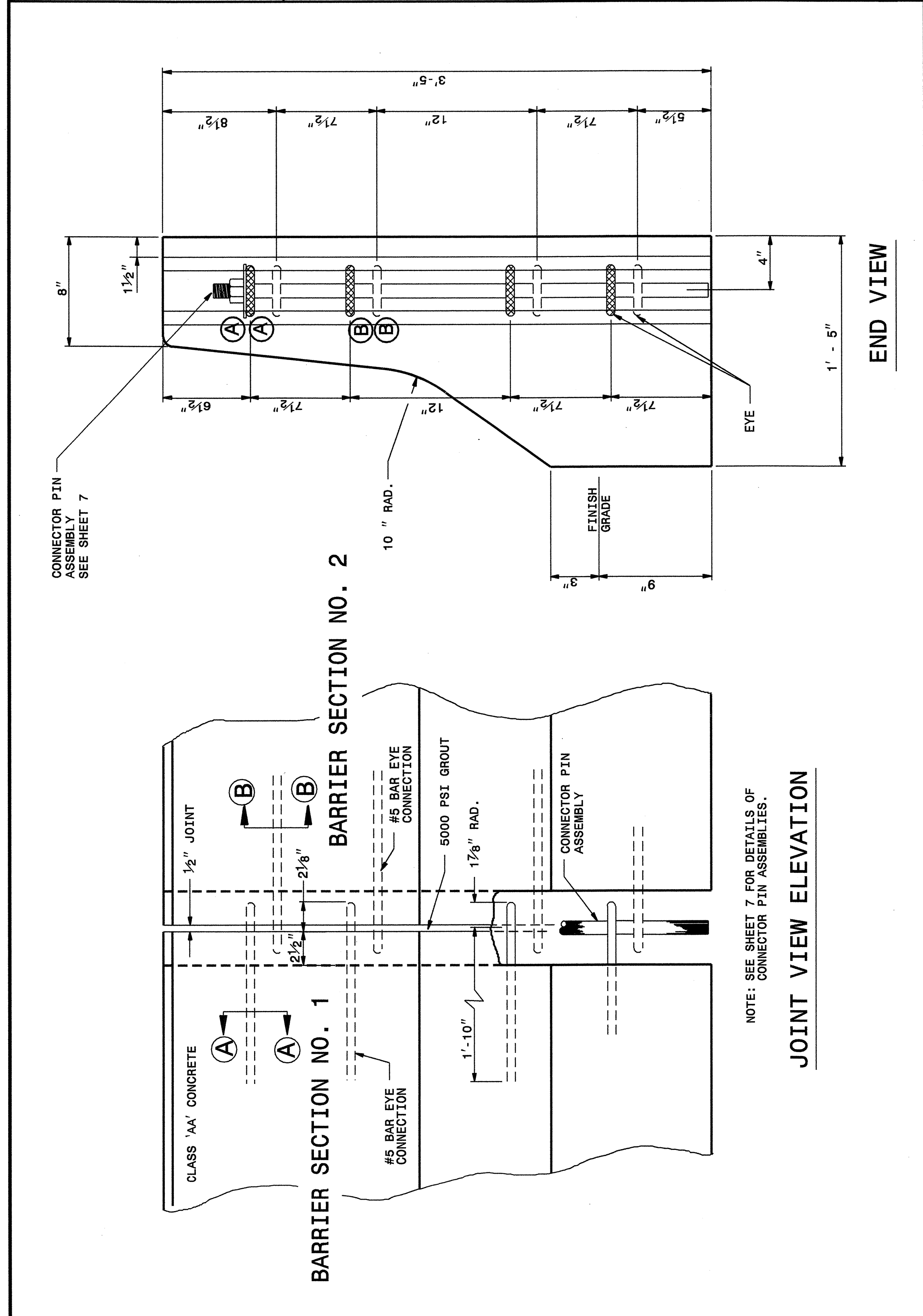
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41" SINGLE FACED

SHEET 7 OF 8
857D01

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ENGLISH DETAIL DRAWING FOR
PRECAST REINFORCED CONCRETE BARRIER
41" SINGLE FACED

SHEET 8 OF 8
857D01



STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
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41" SINGLE FACED

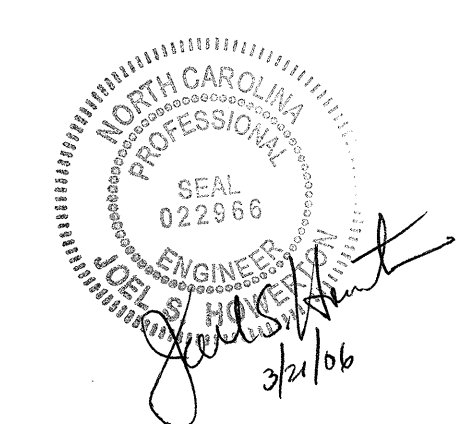
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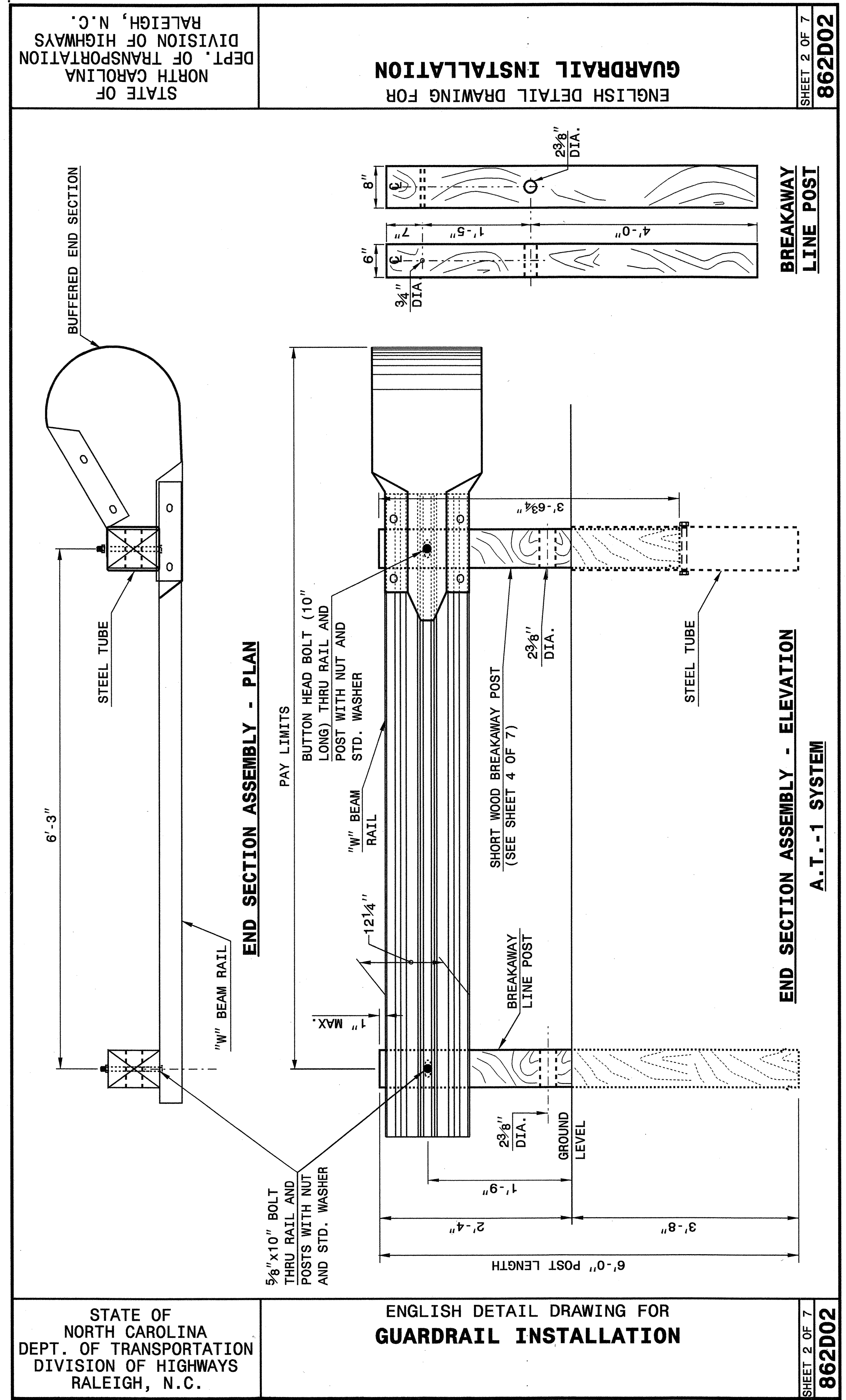
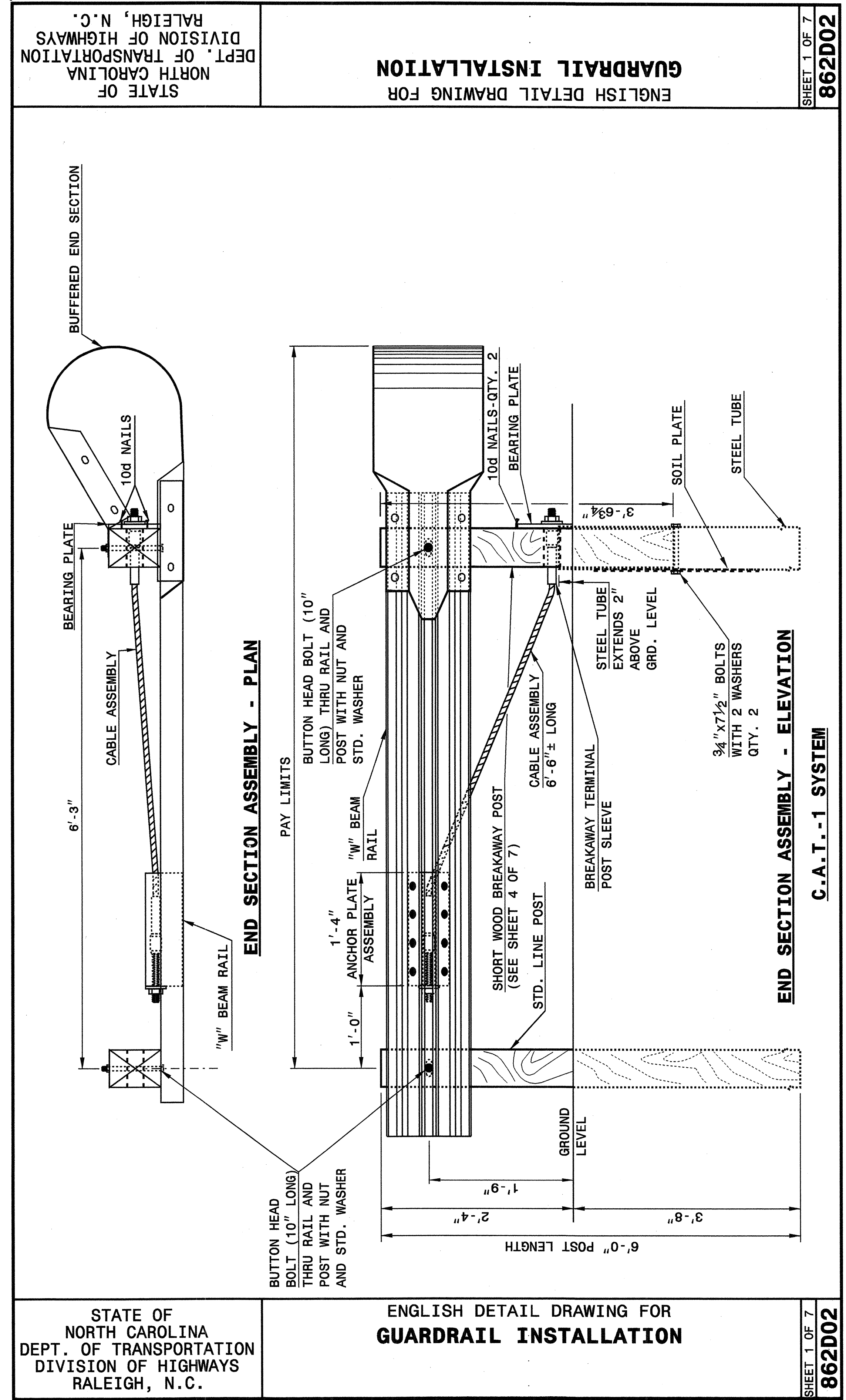
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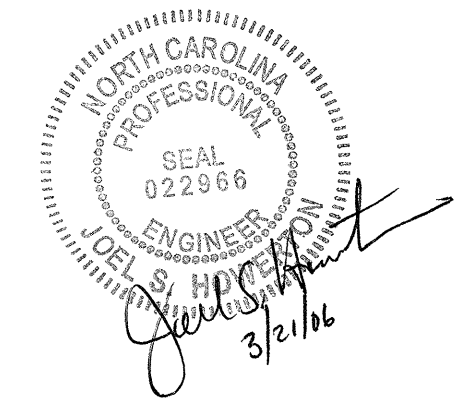




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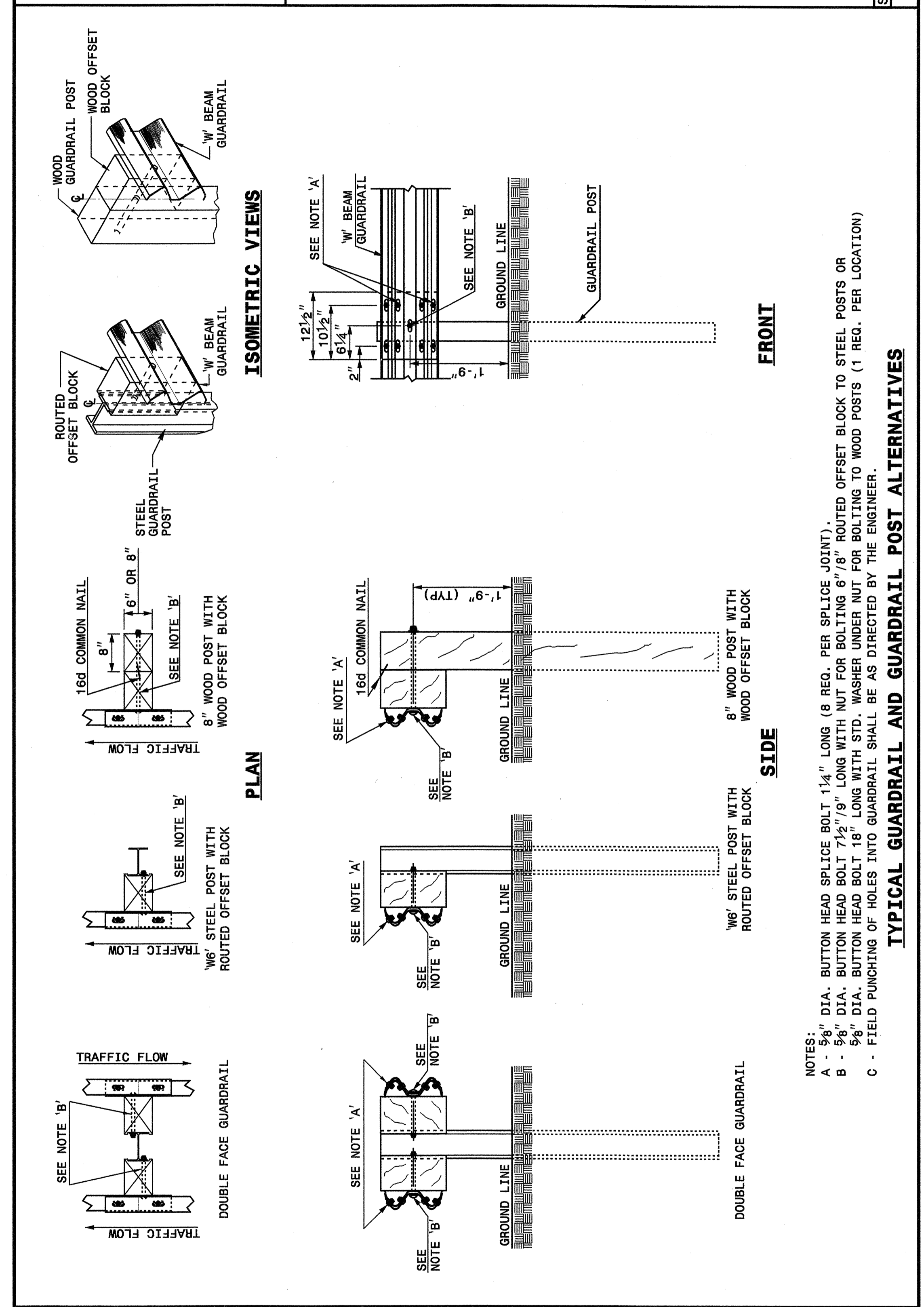


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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02



NOTES:

A - 3/8" DIA. BUTTON HEAD SPLICE BOLT 1 1/4" LONG (8 REQ. PER SPLICE JOINT).

B - 3/8" DIA. BUTTON HEAD BOLT 7 1/2" LONG WITH NUT FOR BOLTING 6" / 8" ROUTED OFFSET BLOCK TO STEEL POSTS OR 3/8" 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.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

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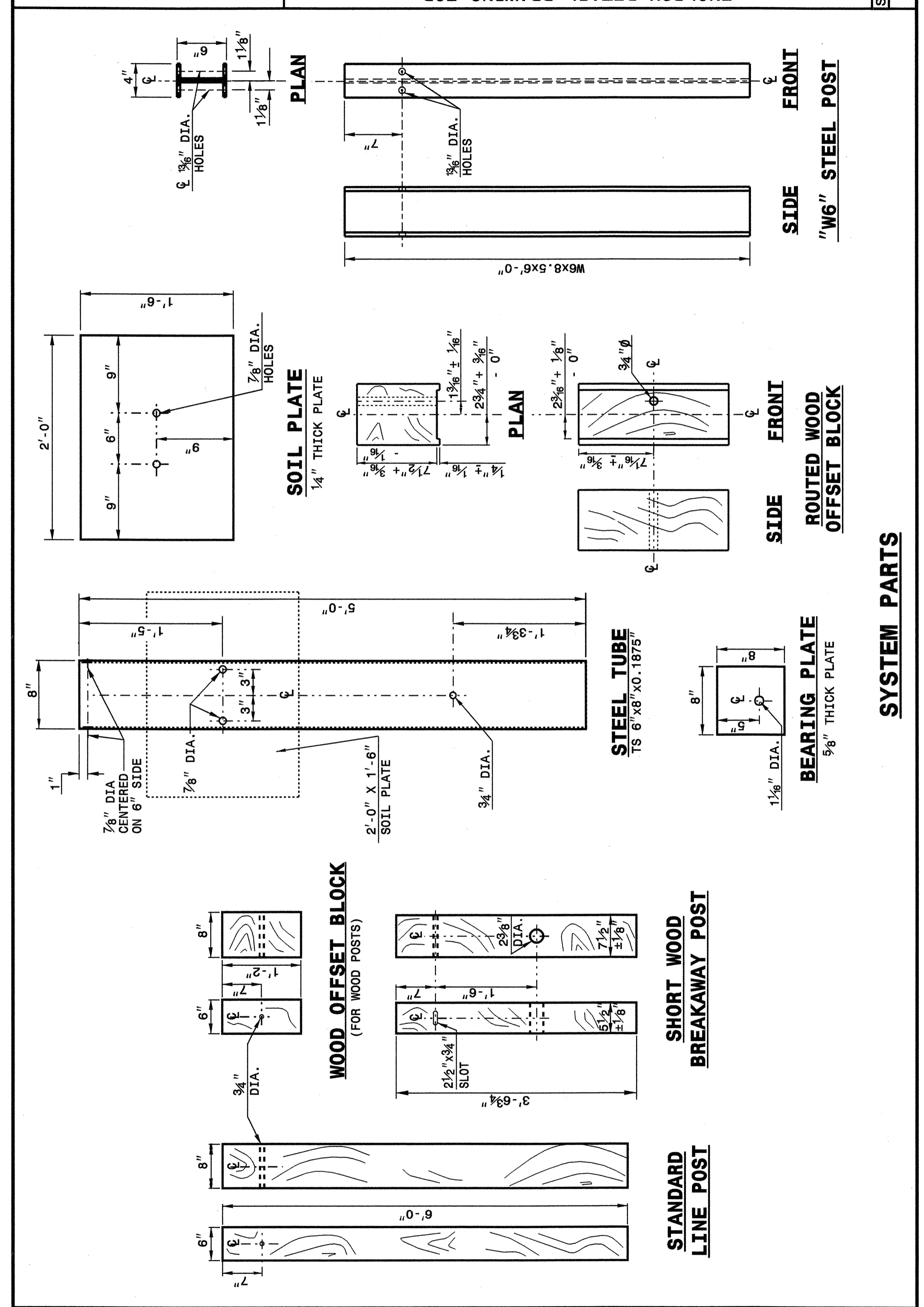
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02

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ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02



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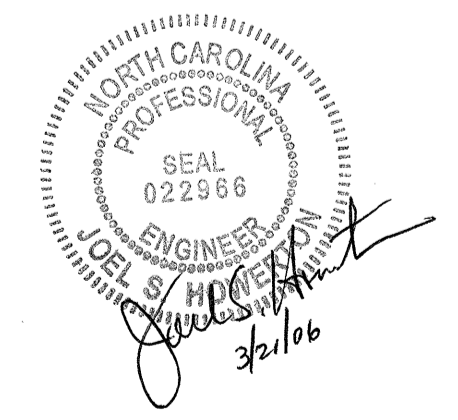
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02

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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/02stdetail/english/86202/862d02.dgn



ENGLISH 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

CABLE ASSEMBLY

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

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SHEET 5 OF 7
862D02

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SECTION X-X

TERMINAL END SECTION

TYPICAL END SHOE

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

ENGLISH DETAIL DRAWING FOR GUARDRAIL INSTALLATION

SHEET 6 OF 7
862D02

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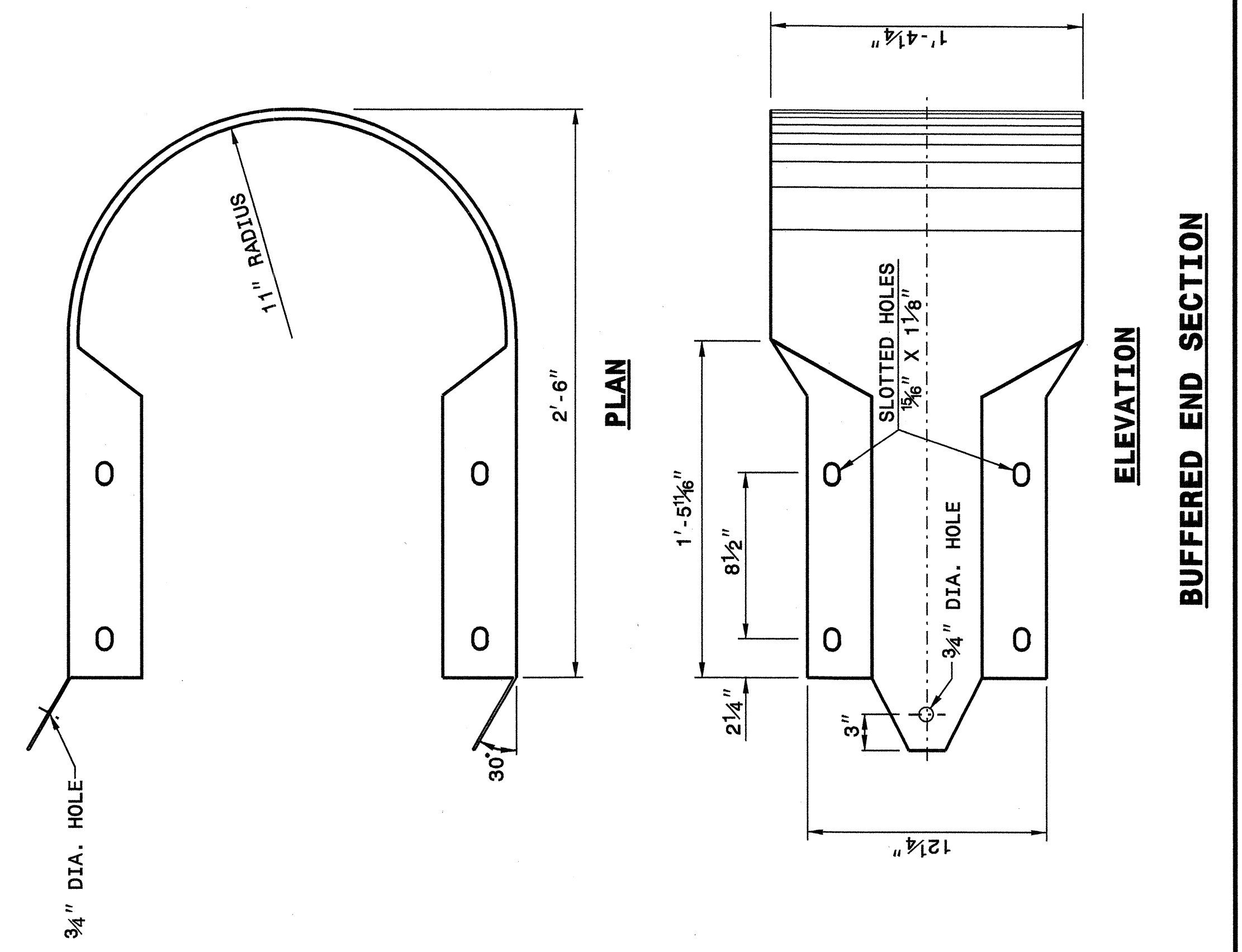
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ORIGINAL BY: 2002 STD.862.02 DATE:
MODIFIED BY: F.E. WARD DATE: 02-09-03
CHECKED BY: *F.E. Ward* DATE: 10/21/04
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02



STATE OF NORTH CAROLINA
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RALEIGH, N.C.

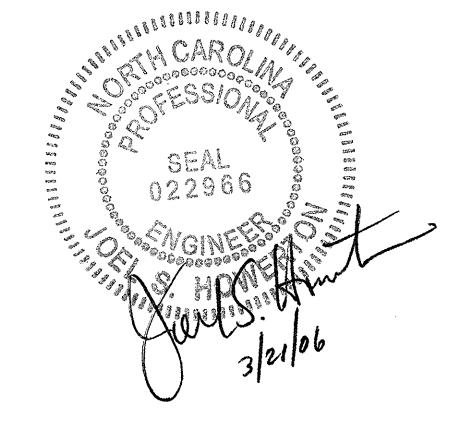
ENGLISH DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02

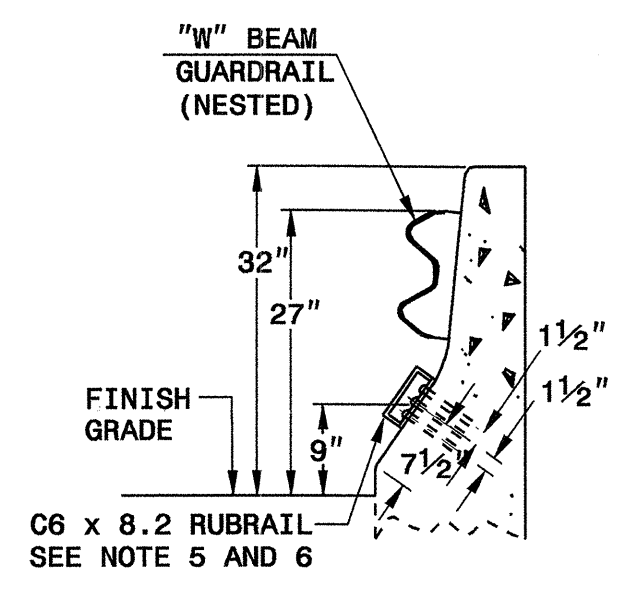
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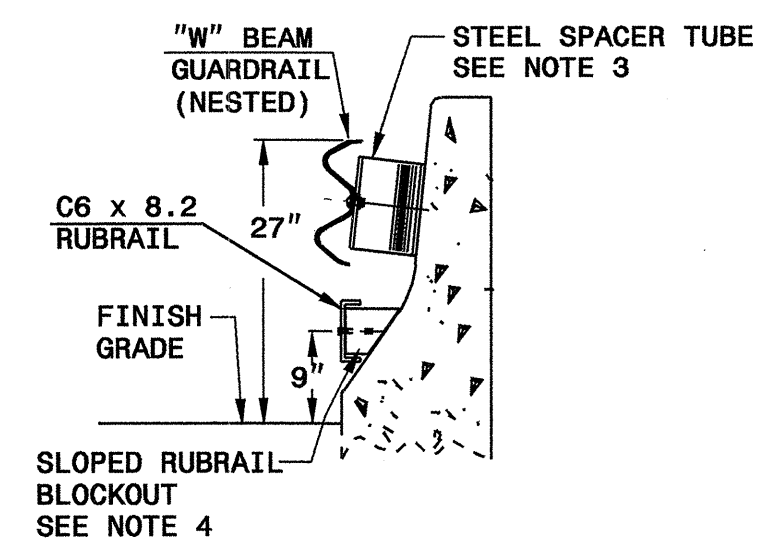
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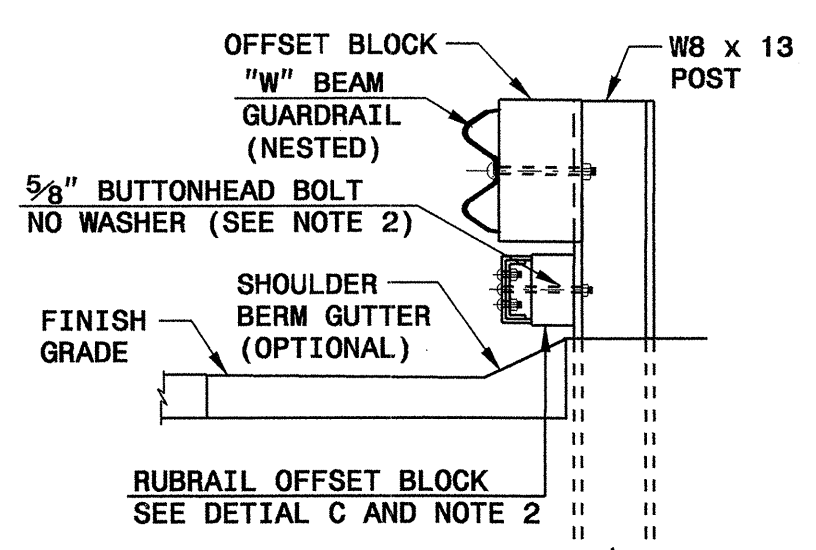
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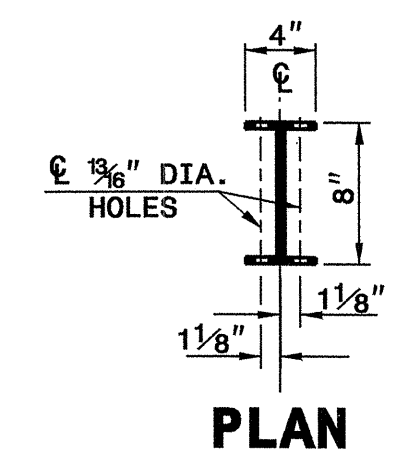
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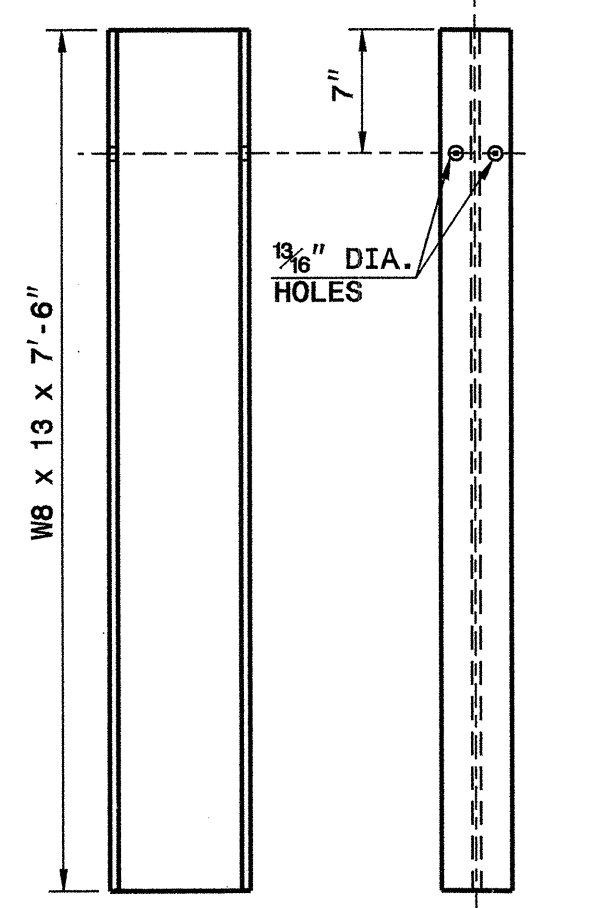
SECTION B-B



SECTION C-C

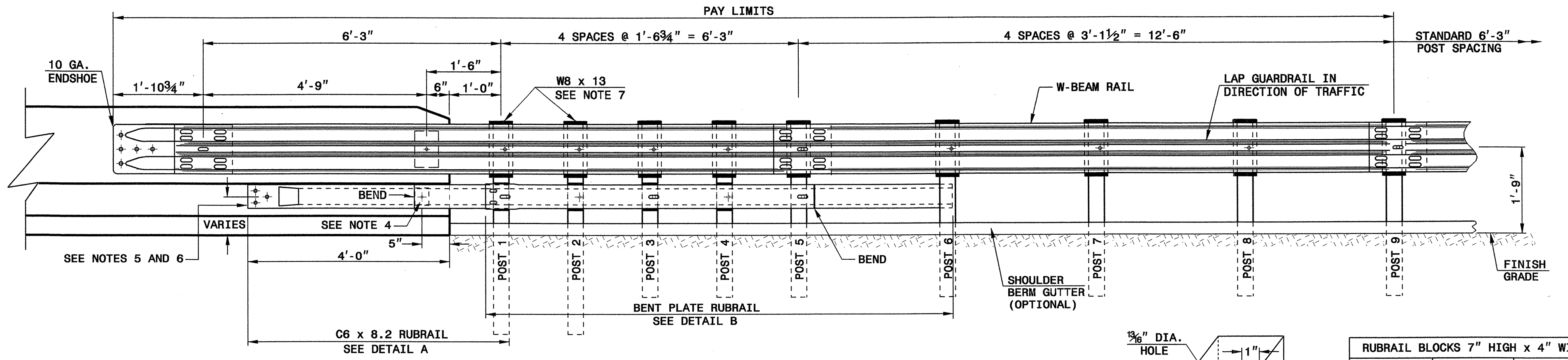


PLAN

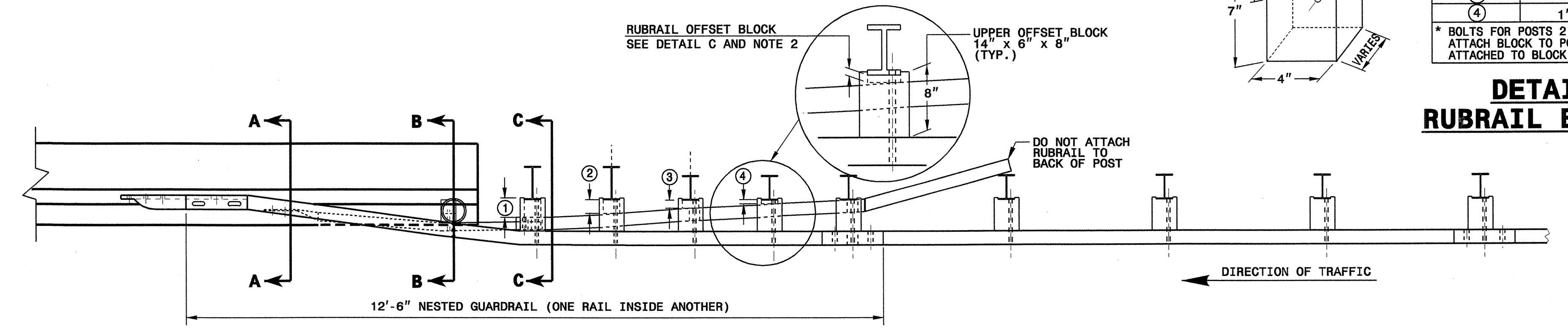


SIDE FRONT

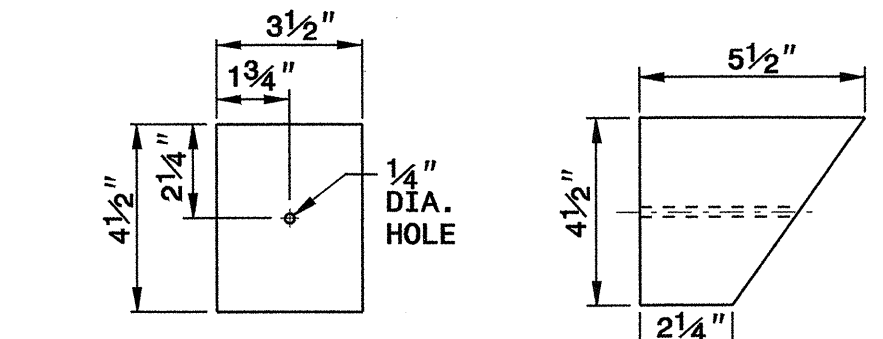
DETAIL F
"W8 X 13 X 7'-6" STEEL POST



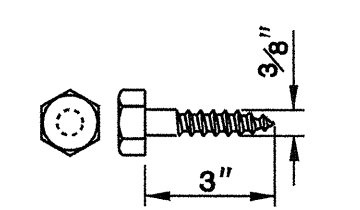
ELEVATION



PLAN

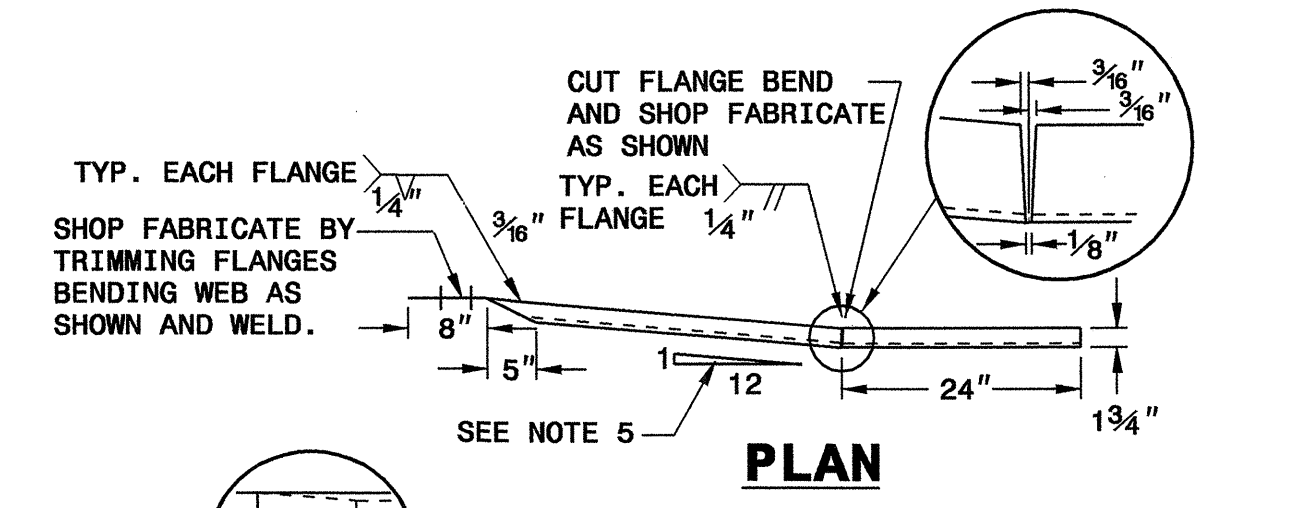


FRONT SIDE
DETAIL D
SLOPED RUBRAIL BLOCKOUT

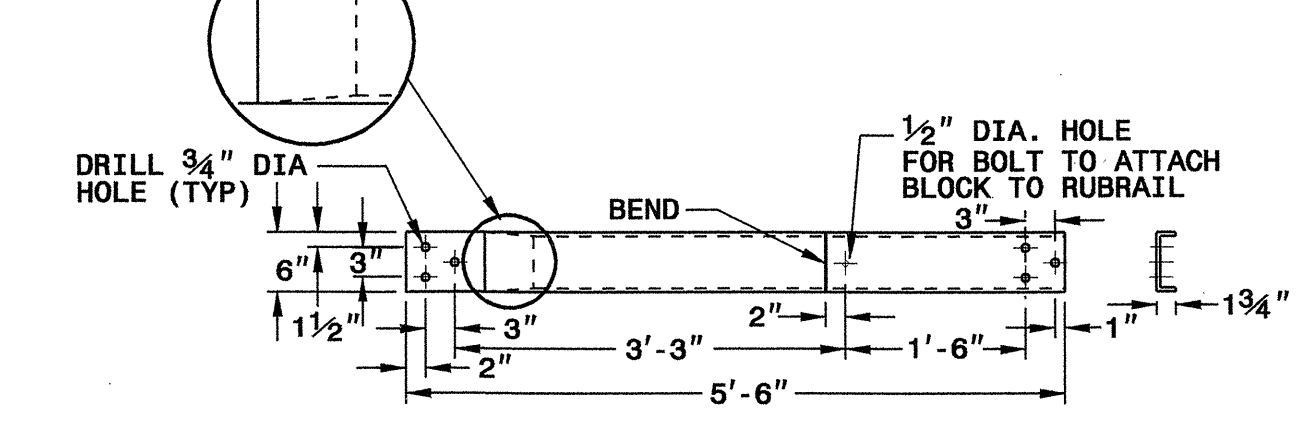


DETAIL E
LAG BOLT

- GENERAL NOTES:**
- POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
 - RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 5/8" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A 5/8" x 4 1/2" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
 - STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH 5/8" x 1 1/4" LONG BUTTONHEAD BOLT AND RECTANGULAR PIPE WASHER.
 - SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE 3/8" x 3" LAG BOLT WITH FLAT WASHER.
 - SHOP FABRICATE THE C6x8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE JERSEY SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
 - ANCHORAGE:
 - AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, RUBRAIL SHALL BE ANCHORED USING THREE 5/8" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS.
 - AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, THE W-BEAM END SHOE SHALL BE ANCHORED USING A 4 BOLT HOLD-DOWN PLATE AS SHOWN ON DETAIL 857D01 SHEET 6. A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (857D01). THE W-BEAM END SHOE SHALL BE INSTALLED BEHIND THE NESTED W-BEAM ELEMENTS.
 - AT NEW BRIDGE RAIL, THE W-BEAM END SHOE AND RUBRAIL SHALL BE ANCHORED AS DETAILED ON THE STRUCTURE PLANS.
 - POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

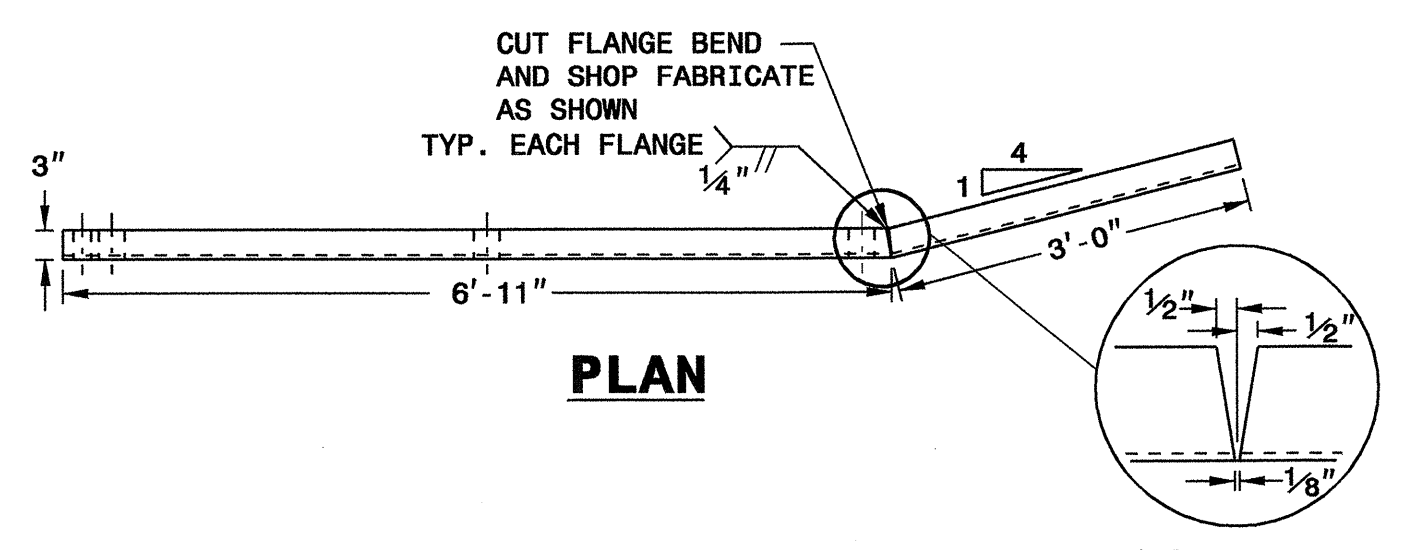


PLAN

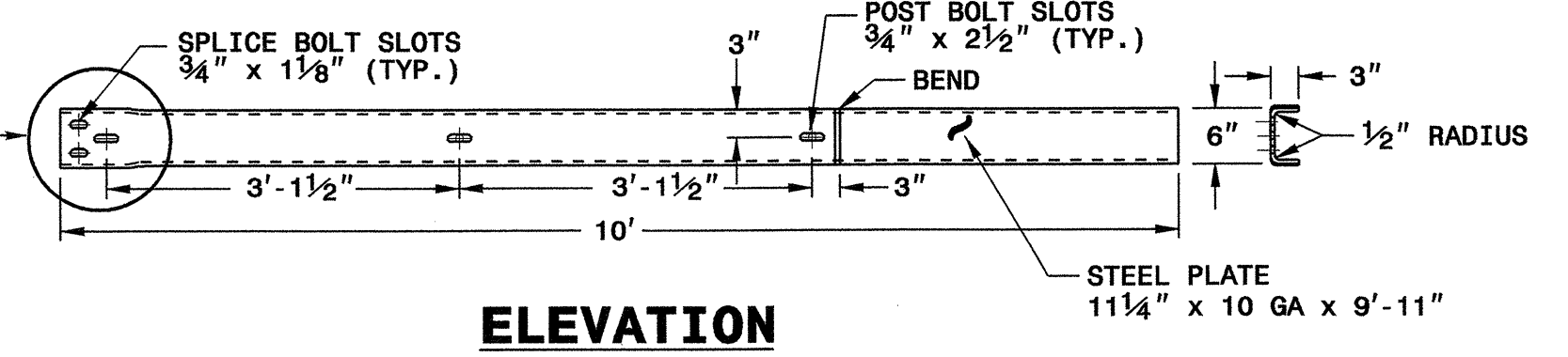


ELEVATION

DETAIL A
C6 x 8.2 RUBRAIL

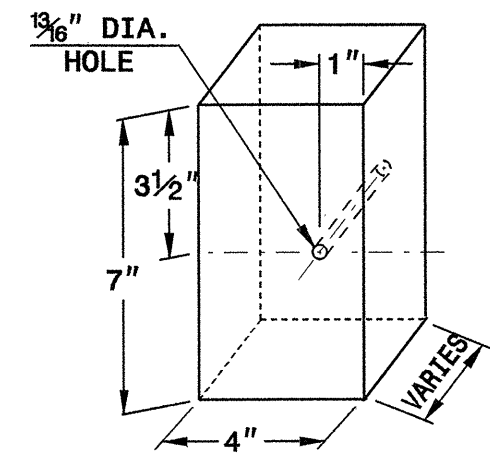


PLAN



ELEVATION

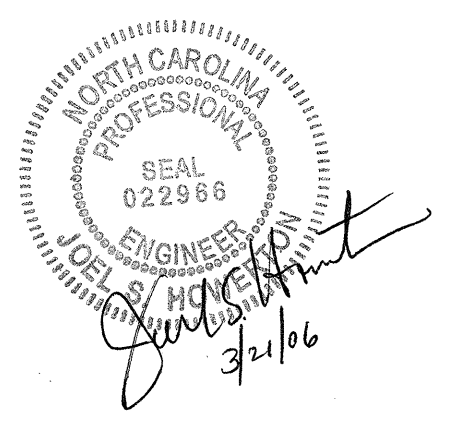
DETAIL B
BENT PLATE RUBRAIL



| POST | THICKNESS | BOLT LENGTH |
|------|-----------|-------------|
| ① | 4 1/4" | 9" |
| ② | 3 1/4" | 5" * |
| ③ | 2" | 6" |
| ④ | 1" | 3" * |

* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.

DETAIL C
RUBRAIL BLOCKOUT



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GUARDRAIL ANCHOR UNIT
TYPE B-77

ORIGINAL BY: CONNDOT DATE: 10-01-00
 MODIFIED BY: E.E. WARD DATE: 04-07-04
 CHECKED BY: [Signature] DATE: 10/25/04
 FILE SPEC.: [Signature]

22-OCT-2004 14:43 [Path] Approved: B-77 Comm: Dot.dgn

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RALEIGH, N.C.

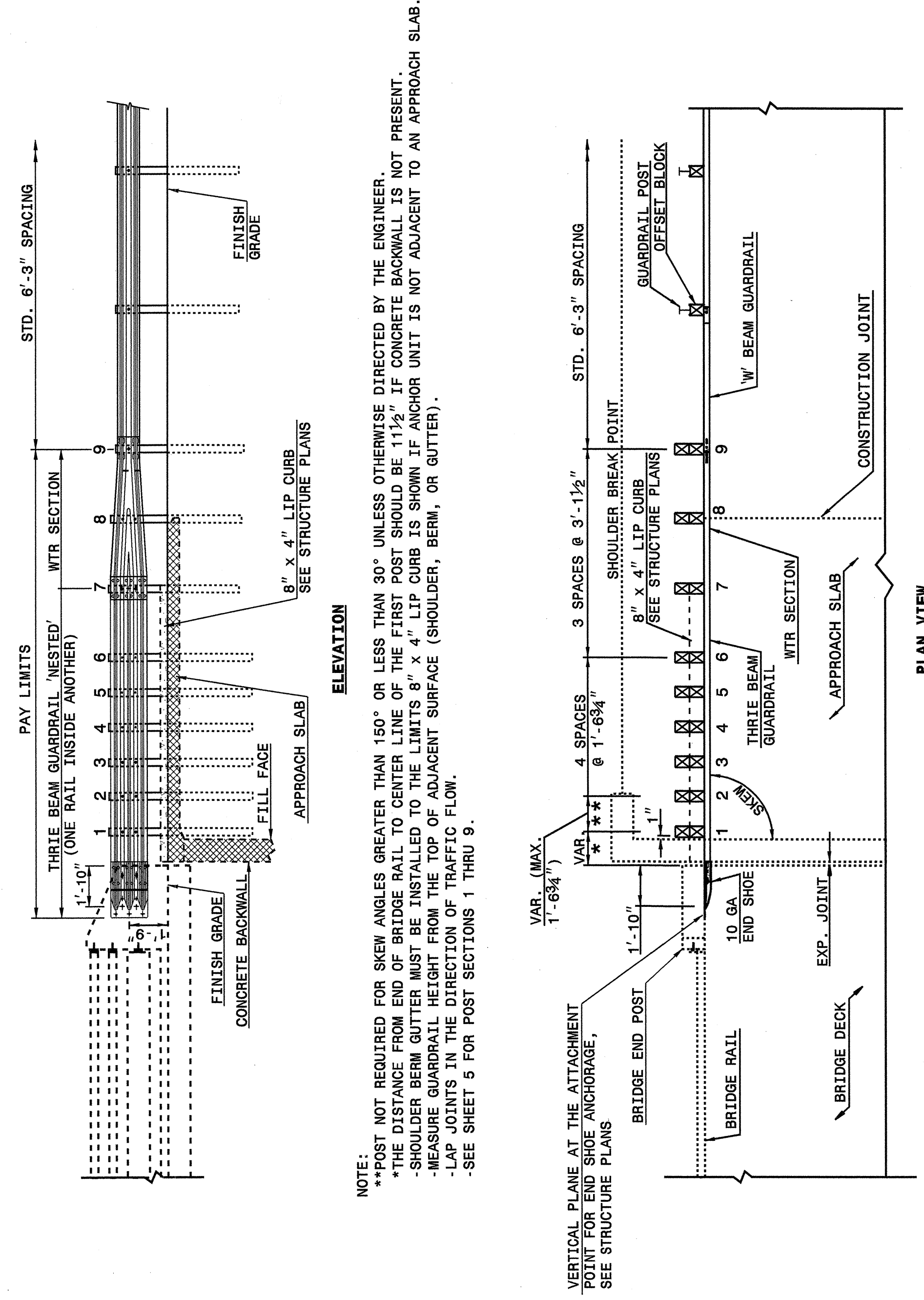
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6
862D03

STATE OF
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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



NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2". IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" X 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -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 BRIDGE (15' MINIMUM LENGTH APPROACH SLAB)**

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RALEIGH, N.C.

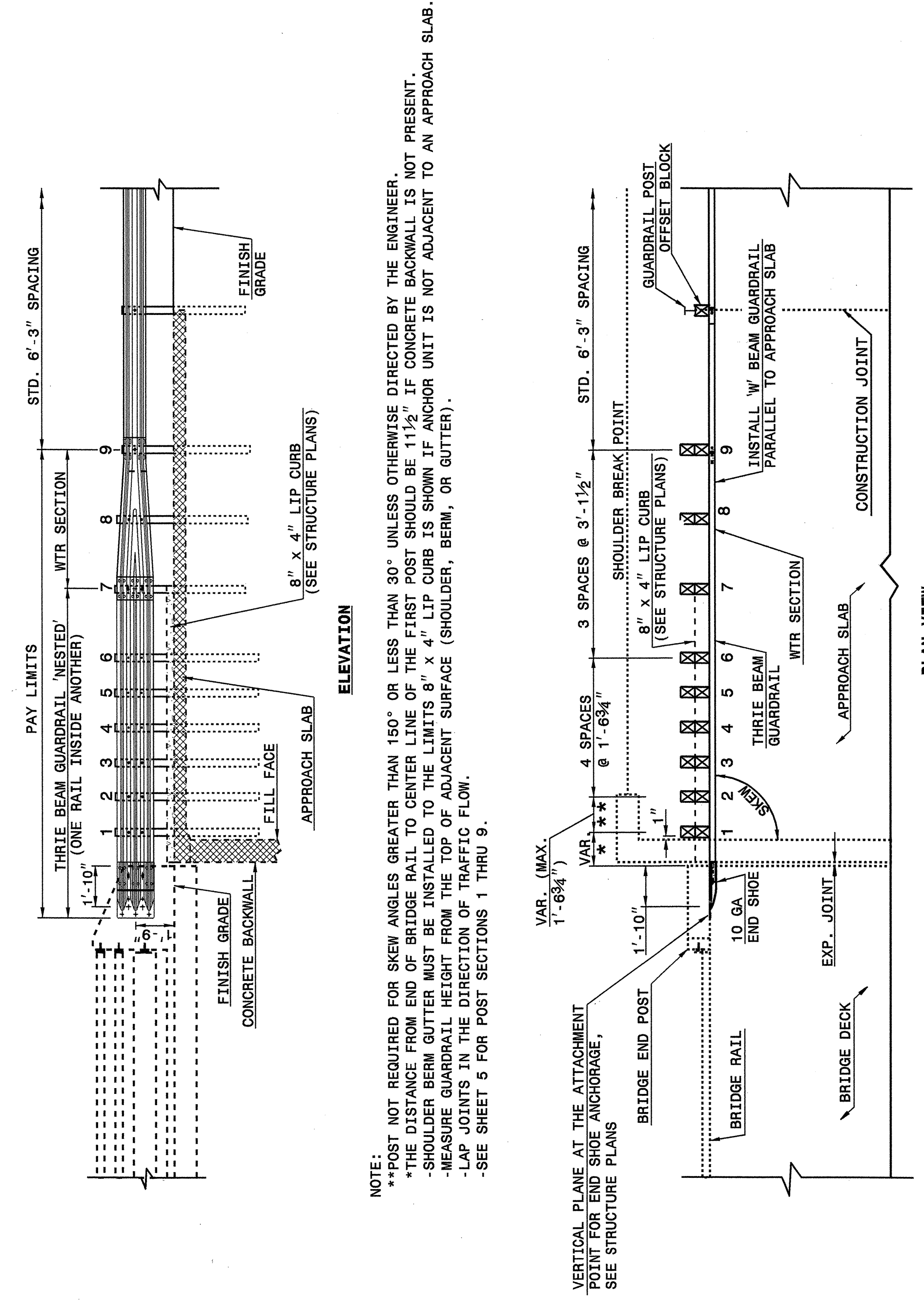
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE (25' MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6
862D03

STATE OF
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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



NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2". IF CONCRETE BACKWALL IS NOT PRESENT.
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 -SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

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



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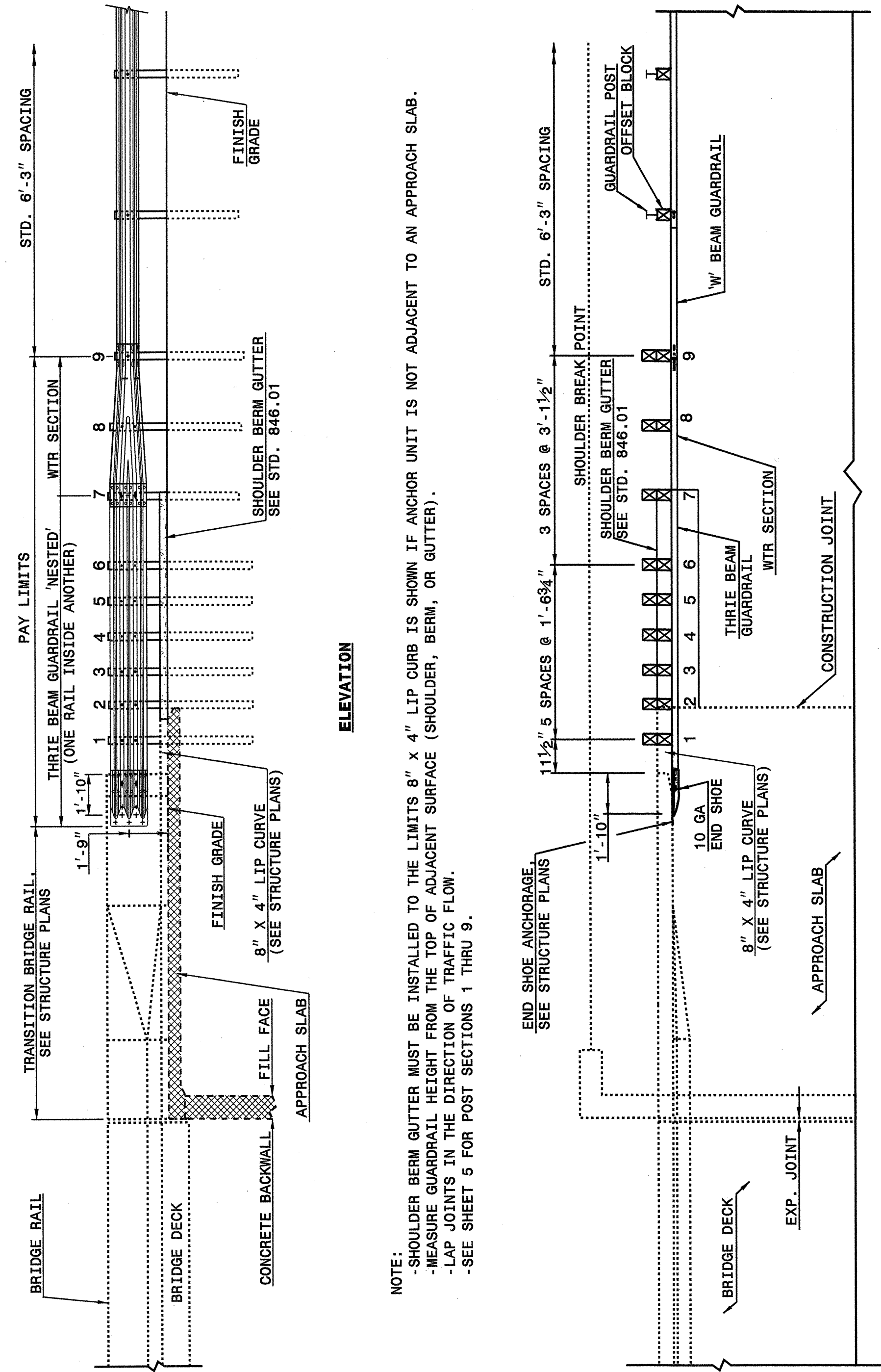
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 CHECKED BY: *Joel S. Ward* DATE: 3/2/06
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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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



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.

ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS 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.

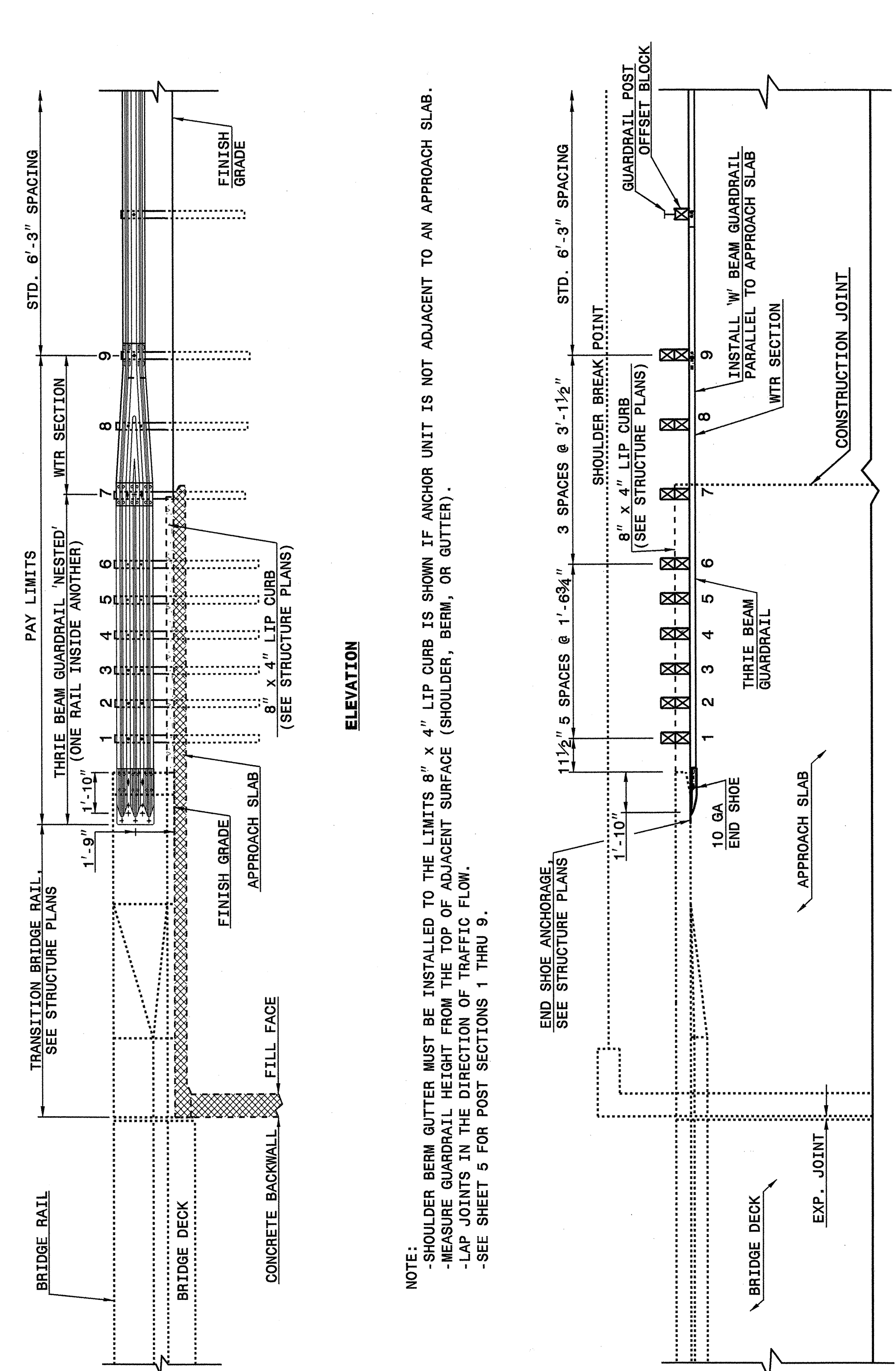
ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (15' MINIMUM LENGTH APPROACH SLAB)

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



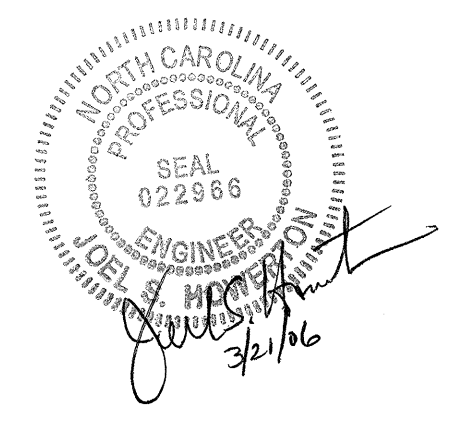
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ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (25' MINIMUM LENGTH APPROACH SLAB)

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



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 CHECKED BY: Eric Ward DATE: 9/21/05
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ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

SHEET 5 OF 6
862D03

**THRIE BEAM
OFFSET BLOCK**

**SECTION OF 'W'
BEAM POST 9**

**THRIE BEAM
LINE POST**

**SECTION OF WTR
BEAM POST 8**

**SECTION OF THRIE
BEAM POST 7**

**SECTION OF THRIE BEAM
POSTS 1 THRU 6**

**THRIE-BEAM
SECTION**

**WTR SECTION
ELEVATION VIEW**

END SHOE

**NOTE: THE MID POST AND OFFSET BLOCK OF
THE WTR SECTION WILL REQUIRE
SPECIAL BOLT HOLE DRILLING IN
THE THRIE BEAM OFFSET BLOCK
AND LINE POST.**

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SHEET 5 OF 6
862D03

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

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SHEET 6 OF 6
862D03

ELEVATION VIEW

PLAN VIEW

ELEVATION VIEW

PLAN VIEW

NOTES FOR:

- GUARDRAIL POST ANCHORED TO STRUCTURE.
- USE FULL LENGTH 1/4" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST OR STEEL TUBE.
- USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.
- USE WOOD POSTS WHICH FIT SNUGLY IN THE STEEL TUBE WITH A MAXIMUM OF 1/8" CLEARANCE BETWEEN TUBE WALL AND POST.

NEW STRUCTURES:

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

EXISTING STRUCTURES:

- GUARDRAIL ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED ON THE OTHER END.
- USE CONCRETE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A 3/4" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.
- USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE 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.

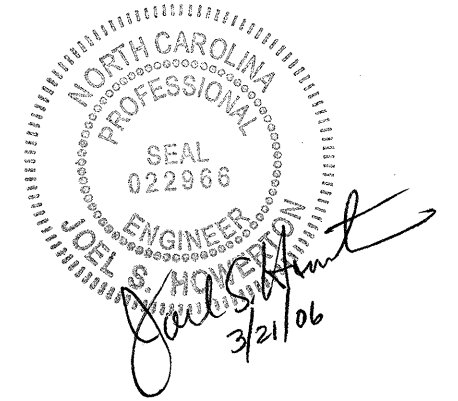
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SHEET 6 OF 6
862D03

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 CHECKED BY: *Paul S. Hunt* DATE: 7/5/05
 FILE SPEC: s:\05\02stdstodetails\enclish\862d03.dgn



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201426

| ItemNumber | Sec # | Quantity | Unit | Description | ItemNumber | Sec # | Quantity | Unit | Description | ItemNumber | Sec # | Quantity | Unit | Description | ItemNumber | Sec # | Quantity | Unit | Description |
|-------------|-------|----------|------|---|-------------|-------|----------|------|---|-------------|-------|----------|------|---|-------------|-------|----------|------|---|
| 000100000-N | 800 | Lump Sum | | MOBILIZATION | 202200000-E | 815 | 112 | CY | SUBDRAIN EXCAVATION | 402500000-E | 901 | 5 | SF | CONTRACTOR FURNISHED, TYPE *** SIGN (E) | 603000000-E | 1630 | 1,545 | CY | SILT EXCAVATION |
| 000400000-N | 801 | Lump Sum | | CONSTRUCTION SURVEYING | 203300000-E | 815 | 84 | CY | SUBDRAIN FINE AGGREGATE | 603600000-E | 1631 | 910 | SY | MATting FOR EROSION CONTROL | 603800000-E | SP | 55 | SY | PERMANENT SOIL REINFORCEMENT MAT |
| 002200000-E | 225 | 16,700 | CY | UNCLASSIFIED EXCAVATION | 204400000-E | 815 | 500 | LF | 6" PERFORATED SUBDRAIN PIPE | 407200000-E | 903 | 13 | LF | SUPPORTS, 3-LB STEEL U-CHANNEL | 604200000-E | 1632 | 260 | LF | 1/4" HARDWARE CLOTH |
| 002900000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ***** (18+22.03) | 205500000-E | 815 | 15 | EA | 6" SUBDRAIN PIPE WYES, TEES, & ELBOWS | 410200000-N | 904 | 1 | EA | SIGN ERECTION, TYPE E | 607000000-N | SP | 20 | EA | SPECIAL STILLING BASINS |
| 005000000-E | 226 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUBBING | 206600000-N | 815 | 2 | EA | CONCRETE PAD FOR SUBDRAIN PIPE OUTLET | 415500000-N | 907 | 3 | EA | DISPOSAL OF SIGN SYSTEM, U-CHANNEL | 608400000-E | 1660 | 4 | ACR | SEEDING & MULCHING |
| 005700000-E | 226 | 500 | CY | UNDERCUT EXCAVATION | 207700000-E | 815 | 12 | LF | 6" OUTLET PIPE (SUBDRAINS) | 441200000-E | SP | 72 | SF | WORK ZONE SIGNS (STATIONARY) | 608700000-E | 1660 | 2 | ACR | MOWING |
| 006300000-N | SP | Lump Sum | | GRADING | 220900000-E | 838 | 1 | CY | ENDWALLS | 441210000-E | SP | 160 | SF | WORK ZONE SIGNS (PORTABLE) | 609000000-E | 1661 | 50 | LB | SEED FOR REPAIR SEEDING |
| 008000000-E | SP | 500 | TON | CLASS IV SUBGRADE STABILIZATION | 227500000-E | SP | 4 | CY | FLOWABLE FILL | 441220000-E | SP | 40 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) | 609300000-E | 1661 | 0.25 | TON | FERTILIZER FOR REPAIR SEEDING |
| 019500000-E | 265 | 500 | CY | SELECT GRANULAR MATERIAL | 228600000-N | 840 | 7 | EA | MASONRY DRAINAGE STRUCTURES | 443000000-N | 1130 | 40 | EA | DRUMS | 609600000-E | 1662 | 75 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| 019600000-E | 270 | 500 | SY | FABRIC FOR SOIL STABILIZATION | 236600000-N | 840 | 3 | EA | FRAME WITH TWO GRATES, STD 840.24 | 443500000-N | 1135 | 40 | EA | CONES | 610800000-E | 1665 | 3 | TON | FERTILIZER TOPDRESSING |
| 020600000-E | SP | 1,200 | SF | TEMPORARY SHORING - BARRIER SUPPORTED | 236700000-N | 840 | 4 | EA | FRAME WITH TWO GRATES, STD 840.29 | 444610000-E | SP | 48 | LF | BARRICADES (TYPE III) | 611400000-N | SP | 2 | HR | SPECIALIZED HAND MOWING |
| 031800000-E | 300 | 39 | TON | FOUNDATION CONDITIONING MATERIAL, MINOR STRS | 255600000-E | 846 | 370 | LF | SHOULDER BERM GUTTER | 445500000-N | 1150 | 280 | MD | FLAGGER | 612300000-E | 1670 | 0.1 | ACR | REFORESTATION |
| 034400000-E | 310 | 44 | LF | 18" SIDE DRAIN PIPE | 257000000-N | SP | 2 | EA | MODIFIED CONCRETE FLUME | 446500000-N | 1160 | 4 | EA | TEMPORARY CRASH CUSHIONS | 613200000-N | SP | 8 | EA | GENERIC EROSION CONTROL ITEM RESPONSE FOR EROSION CONTROL |
| 037200000-E | 310 | 48 | LF | 18" RC PIPE CULVERTS, CLASS III | 261900000-E | 850 | 195 | SY | 4" CONCRETE PAVED DITCH | 448500000-E | 1170 | 320 | LF | PORTABLE CONCRETE BARRIER | | | | | |
| 070800000-E | 310 | 24 | LF | 15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK | 272400000-E | 857 | 350 | LF | PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED | 449000000-E | 1170 | 90 | LF | PORTABLE CONCRETE BARRIER (ANCHORED) | | | | | |
| 080600000-E | 310 | 2 | EA | 15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK | 303000000-E | 862 | 537.5 | LF | STEEL BM GUARDRAIL | 465000000-N | 1251 | 20 | EA | TEMPORARY RAISED PAVEMENT MARKERS | | | | | |
| 099500000-E | 340 | 40 | LF | PIPE REMOVAL | 304500000-E | 862 | 62.5 | LF | STEEL BM GUARDRAIL, SHOP CURVED | 481000000-E | 1205 | 21,600 | LF | PAINT PAVEMENT MARKING LINES (4") | | | | | |
| 112100000-E | 520 | 1,200 | TON | AGGREGATE BASE COURSE | 315000000-N | 862 | 5 | EA | ADDITIONAL GUARDRAIL POSTS | 485000000-E | 1205 | 2,492 | LF | REMOVAL OF PAVEMENT MARKING LINES (4") | | | | | |
| 122000000-E | 545 | 500 | TON | INCIDENTAL STONE BASE | 319500000-N | 862 | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE AT-1 | 600000000-E | 1605 | 560 | LF | TEMPORARY SILT FENCE | | | | | |
| 127500000-E | 600 | 560 | GAL | PRIME COAT | 321500000-N | 862 | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE III | 600600000-E | 1610 | 285 | TON | STONE FOR EROSION CONTROL, CLASS A | | | | | |
| 148900000-E | 610 | 60 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B | 327000000-N | SP | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 | 600900000-E | 1610 | 285 | TON | STONE FOR EROSION CONTROL, CLASS B | | | | | |
| 152500000-E | SP | 400 | TON | ASPHALT CONC SURFACE COURSE, TYPE SF9.5A | 331700000-N | 862 | 2 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 | 601200000-E | 1610 | 780 | TON | SEDIMENT CONTROL STONE | | | | | |
| 156000000-E | 620 | 29 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 | 364900000-E | 876 | 140 | TON | PLAIN RIP RAP, CLASS B | 601500000-E | 1615 | 3 | ACR | TEMPORARY MULCHING | | | | | |
| 169300000-E | 654 | 120 | TON | ASPHALT PLANT MIX, PAVEMENT REPAIR | 365600000-E | 876 | 1,360 | SY | FILTER FABRIC FOR DRAINAGE | 601800000-E | 1620 | 100 | LB | SEED FOR TEMPORARY SEEDING | | | | | |
| | | | | | 365900000-N | SP | 2 | EA | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON | 602100000-E | 1620 | 0.5 | TON | FERTILIZER FOR TEMPORARY SEEDING | | | | | |
| | | | | | | | | | | 602900000-E | SP | 450 | LF | SAFETY FENCE | | | | | |

| ***** BEGIN SCHEDULE AA ***** | | | | |
|-------------------------------|-----|-----|----|---|
| ***** (2 ALTERNATES) ***** | | | | |
| 036600000-E | 310 | 252 | LF | 15" RC PIPE CULVERTS, CLASS III |
| AA1 | | | | |
| *** OR *** | | | | |
| 036600000-E | 310 | 232 | LF | 15" RC PIPE CULVERTS, CLASS III |
| AA2 | | | | |
| 098600000-E | SP | 20 | LF | GENERIC PIPE ITEM 15" HDPE PIPE CULVERTS |
| AA2 | | | | |
| *** OR *** | | | | |
| 036600000-E | 310 | 232 | LF | 15" RC PIPE CULVERTS, CLASS III |
| AA3 | | | | |
| 098600000-E | SP | 20 | LF | GENERIC PIPE ITEM 15" ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, 0.064" THICK |
| AA3 | | | | |
| ***** END SCHEDULE AA ***** | | | | |

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STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

| LOCATION | UNCLASSIFIED EXCAVATION | EMBT + % | BORROW | WASTE |
|-----------------------------------|-------------------------|------------|--------|--------------|
| -L- 13+00 TO 17+72.03 | 4299 | 238 | | 4061 |
| -L- 18+72.03 TO 23+00 | 5230 | 411 | | 4819 |
| -DR- 10+11 TO 13+02.12 | 8562 | 12 | | 8550 |
| TOTAL | 18091 | 662 | | 17429 |
| LOSS DUE TO CLEARING AND GRUBBING | -1450 | | | -1450 |
| ADJUSTMENT FOR ROCK SWELL | | | | 2131 |
| GRAND TOTAL | 16641 | 662 | | 18110 |
| SAY | 16700 | | | 18200 |

SUMMARY OF PAVEMENT REMOVAL
 IN SQUARE YARDS

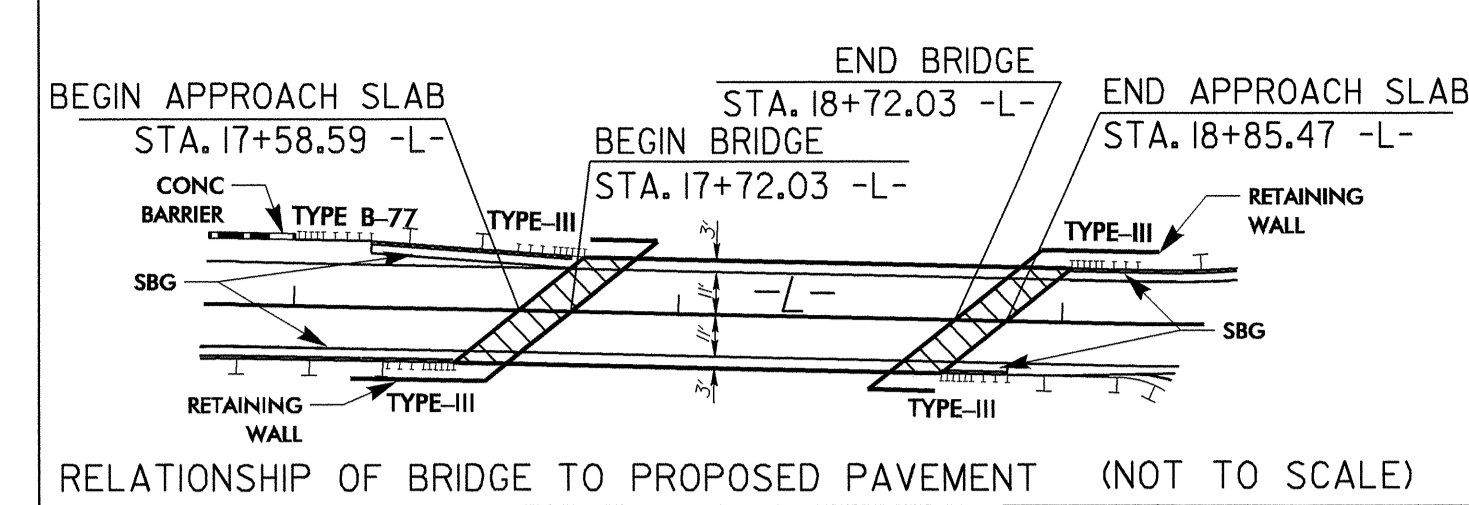
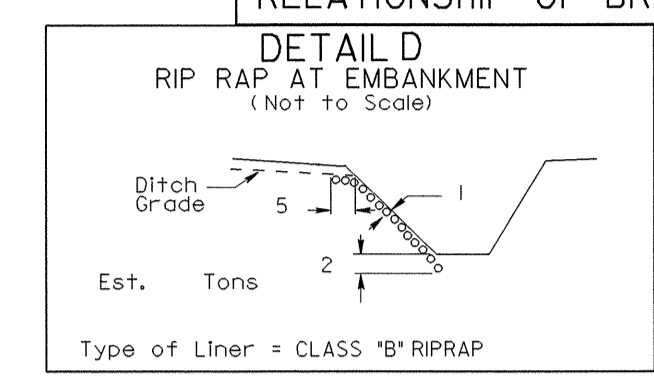
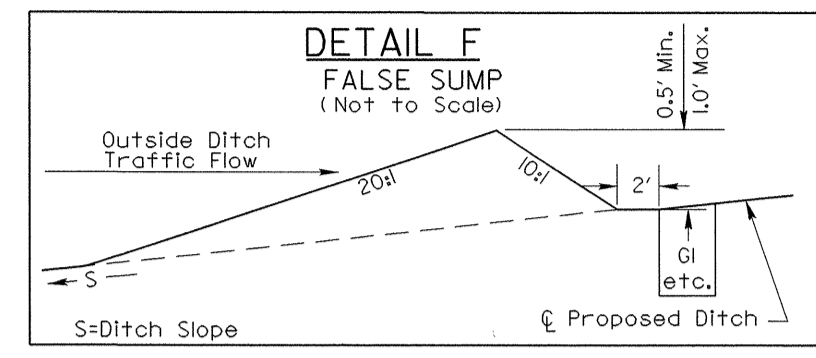
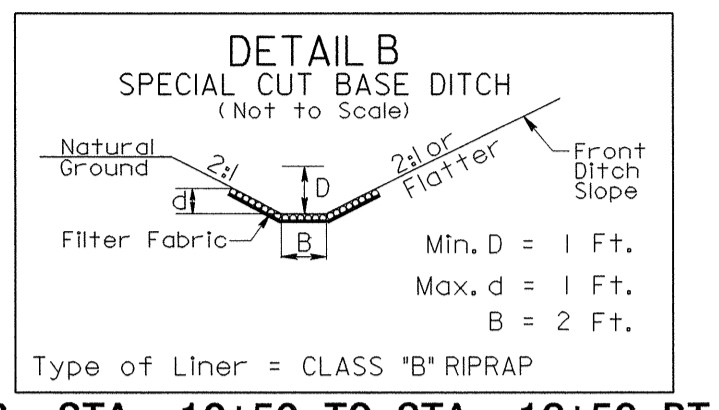
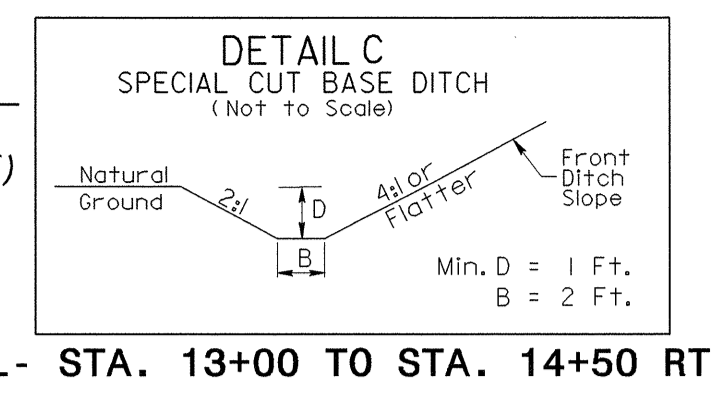
| LINE | BEGIN STATION | END STATION | LOCATION | ASPHALT PAVEMENT REMOVAL |
|------|----------------|-------------|--------------|--------------------------|
| -L- | 13+00 | 17+03 | RT | 509 |
| -L- | 17+67 | 19+50 | RT | 336 |
| -L- | 19+57 | 22+00 | LT | 281 |
| -L- | TEMP. PAVEMENT | | LT /RT | 270 |
| | | | TOTAL | 1396 |
| | | | SAY | 1400 |

UNDERCUT EXCAVATION = 500 C.Y.
 -L- & -DRIVE- PAVEMENT STRUCTURE VOLUME = 600 CY

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

| | | | | | |
|---|--|--|--|---|--|
| PI Sta 11+69.82 $\Delta = 4' 40'' 23.9''$ (RT) $D = 2' 12'' 13.3''$ $L = 212.07'$ $T = 106.09'$ $R = 2,600.00'$ $Se = 0.04$ Run off= see plans $**V = 60$ MPH | PI Sta 14+31.08 $\Delta = 24' 56'' 39.8''$ (LT) $D = 9' 57'' 52.1''$ $L = 250.33'$ $T = 127.18'$ $R = 575.00'$ $Se = 0.04$ Run off= see plans $**V = 40$ MPH | PI Sta 16+21.03 $\Delta = 25' 06'' 13.4''$ (RT) $D = 19' 05'' 54.9''$ $L = 131.44'$ $T = 66.79'$ $R = 300.00'$ $Se = 0.04$ Run off= see plans $**V = 30$ MPH | PI Sta 20+08.14 $\Delta = 31' 00'' 00.0''$ (LT) $D = 19' 05'' 54.9''$ $L = 162.32'$ $T = 83.20'$ $R = 300.00'$ $Se = 0.04$ Run off= see plans $**V = 30$ MPH | PI Sta 21+64.30 $\Delta = 15' 15'' 42.7''$ (RT) $D = 9' 57'' 52.1''$ $L = 153.16'$ $T = 77.04'$ $R = 575.00'$ $Se = 0.04$ Run off= see plans $**V = 40$ MPH | PI Sta 24+06.99 $\Delta = 8' 14'' 30.6''$ (LT) $D = 4' 35'' 01.2''$ $L = 179.81'$ $T = 90.06'$ $R = 1,250.00'$ $Se = 0.04$ Run off= see plans $**V = 40$ MPH |
|---|--|--|--|---|--|

**DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED (30 MPH)



BRIDGE APPROACH SLABS

PROJECT REFERENCE NO. B-3701 SHEET NO. 4

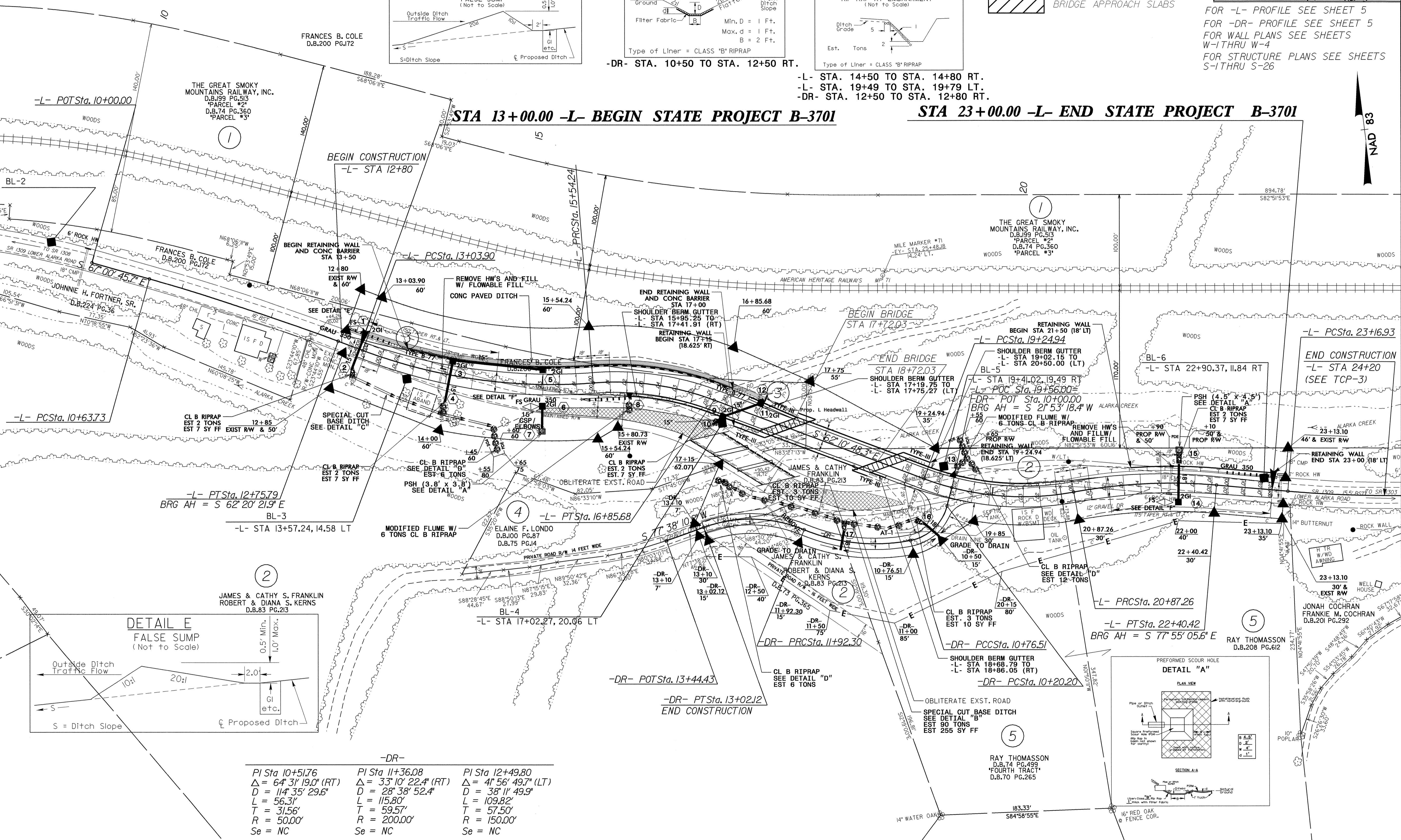
RW SHEET NO.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER, REKHA V. PATEL, SEAL 16378

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER, RANDALL C. HEINECK, SEAL 16800

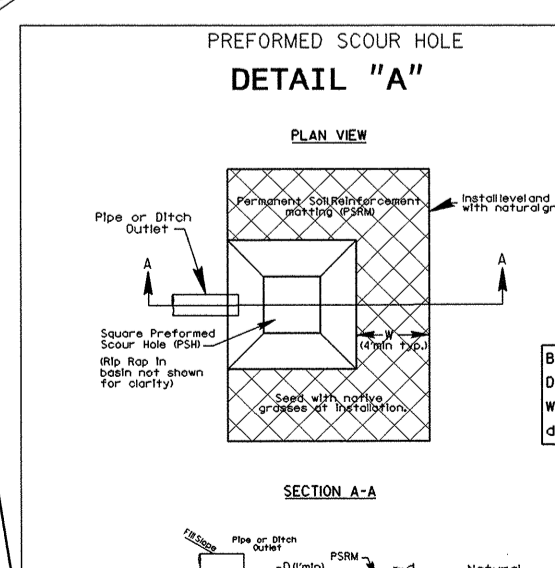
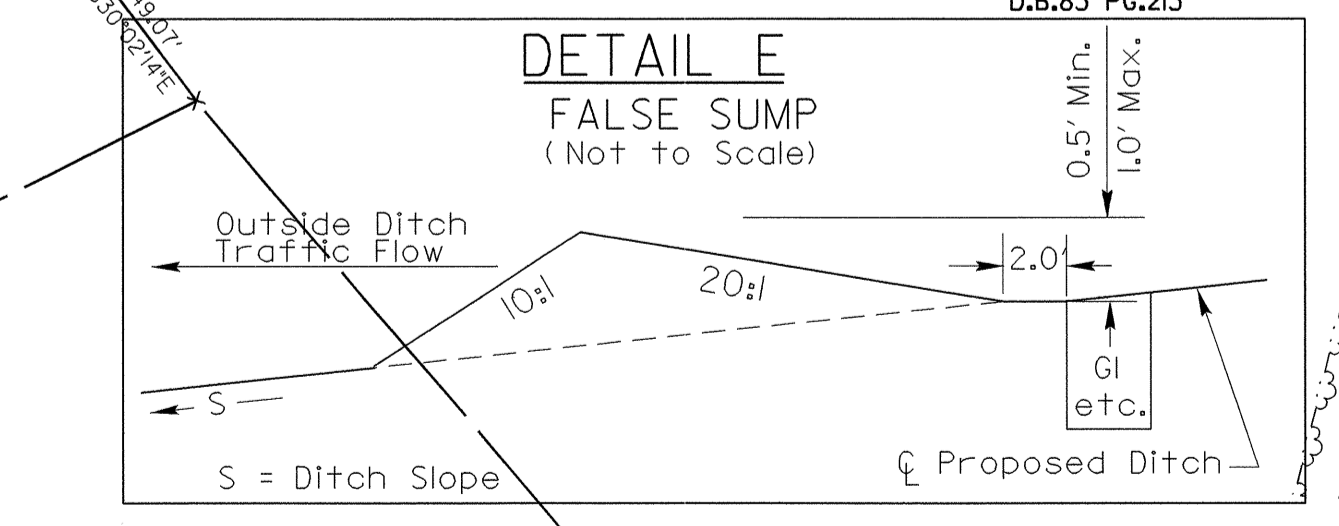
Scale: 5/15/06

FOR -L- PROFILE SEE SHEET 5
 FOR -DR- PROFILE SEE SHEET 5
 FOR WALL PLANS SEE SHEETS W-1 THRU W-4
 FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-26



STA 13+00.00 -L- BEGIN STATE PROJECT B-3701

STA 23+00.00 -L- END STATE PROJECT B-3701



| | | |
|---|--|--|
| PI Sta 10+51.76 $\Delta = 64' 31'' 19.0''$ (RT) $D = 114' 35'' 29.6''$ $L = 56.31'$ $T = 31.56'$ $R = 50.00'$ $Se = NC$ | PI Sta 11+36.08 $\Delta = 33' 10'' 22.4''$ (RT) $D = 28' 38'' 52.4''$ $L = 115.80'$ $T = 59.57'$ $R = 200.00'$ $Se = NC$ | PI Sta 12+49.80 $\Delta = 41' 56'' 49.7''$ (LT) $D = 38' 11'' 49.9''$ $L = 109.82'$ $T = 57.50'$ $R = 150.00'$ $Se = NC$ |
|---|--|--|

NAD 83

5/28/99

****DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED (30 MPH)**

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE = 4500 CFS
 DESIGN FREQUENCY = 25 YRS
 DESIGN HW ELEVATION = 1788.73 FT
 BASE DISCHARGE = 6400 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 1792.35 FT
 OVERTOPPING DISCHARGE = 6200 CFS
 OVERTOPPING FREQUENCY = 50+ YRS
 OVERTOPPING ELEVATION = 1789.30 FT

-L-

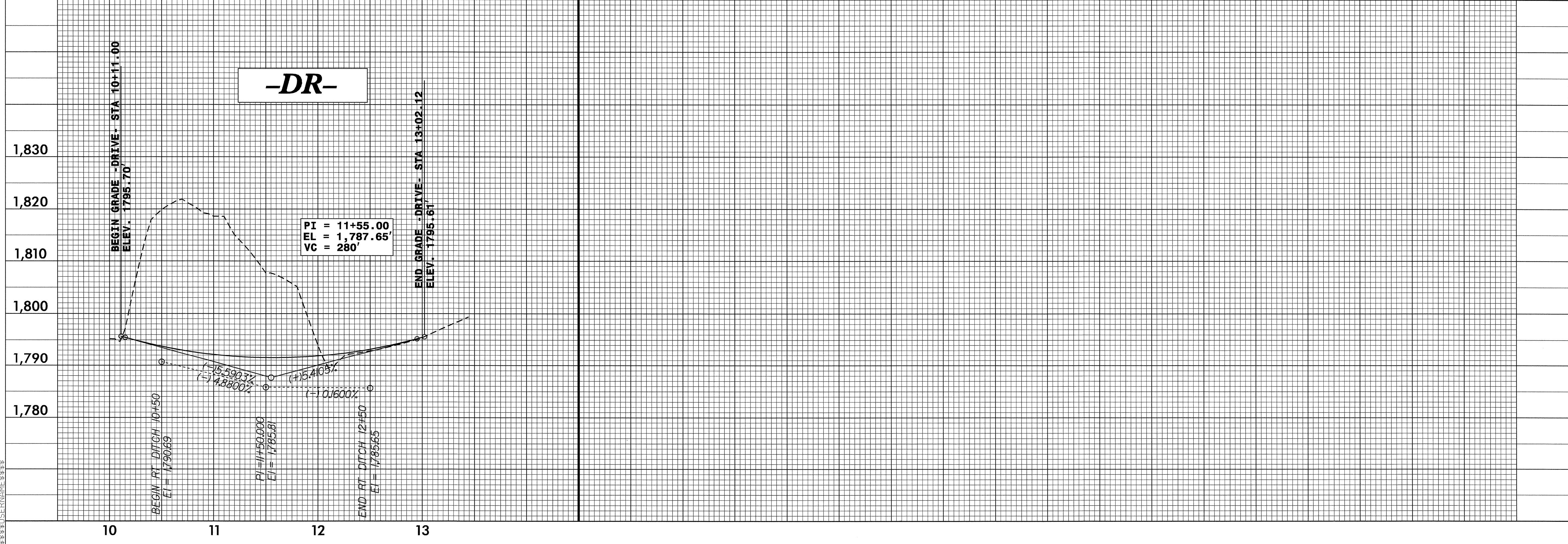
BM#3 ELEV. 1795.02'
 -L- STA. 17+02.89 OFF 132.25' RT
 8 INCH NAIL IN BASE OF 10 INCH SYCAMORE.
 +/- 84 FEET FROM THE SOUTH EP OF BRIDGE
 OVER ALARKA CREEK. +/- 12 FEET NORTH OF
 THE CENTERLINE OF A 10 FOOT GRAVEL ROAD
 (TWIN COVES ROAD). +/- 25 FEET SOUTH SW
 FROM A 3 FOOT HIGH METAL GATE.

RT DITCH GRADE

| | |
|--|---|
| PROJECT REFERENCE NO. B-3701 | SHEET NO. 5 |
| ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 16378 MEKHU V. PATEL 3-21-06 | HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 16800 DANALL C. HEISLER R C King 3-21-06 |



-DR-



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