

CONTRACT: 201878 TIP PROJECT: R-4425

See Sheet I-A For Index of Sheets

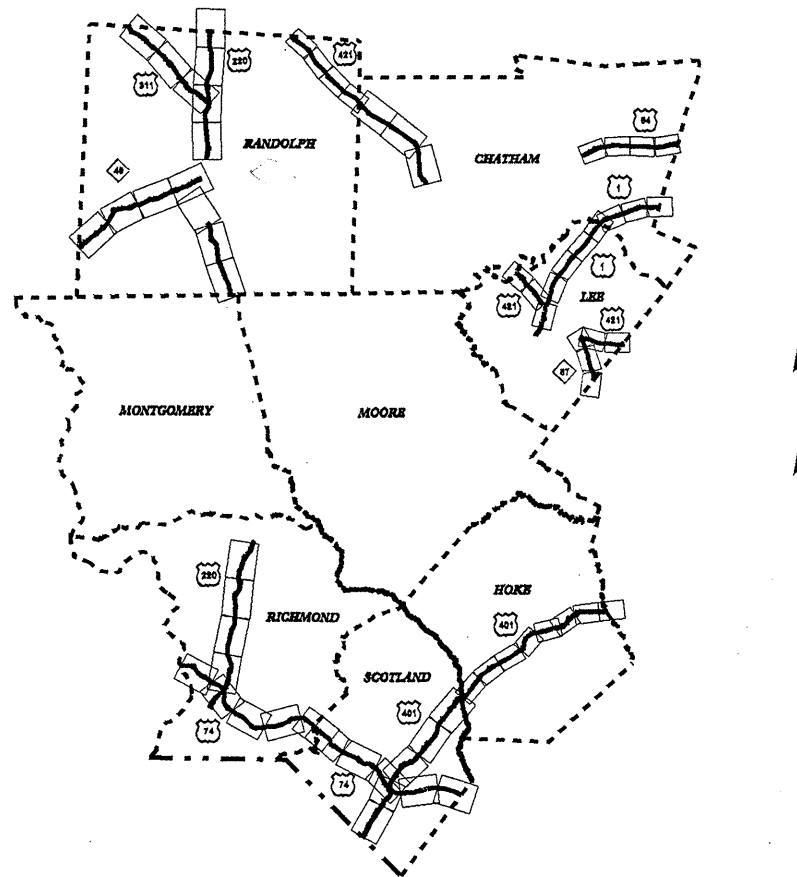
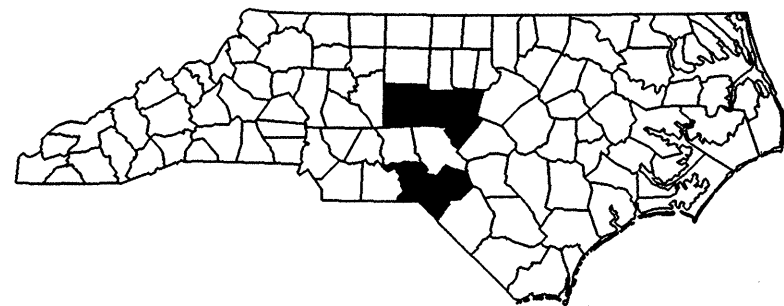
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHATHAM-HOKE-LEE-RANDOLPH-RICHMOND-SCOTLAND

LOCATION: US 1, US 64, US 74, US 220, US 311, US 401, US 421, NC 49 & NC 87

**TYPE OF WORK: NATIONAL HIGHWAY SYSTEM GUARDRAIL REHABILITATION-
UPGRADE SUB-STANDARD GUARDRAIL, END TREATMENTS.
AND BRIDGE ANCHOR UNITS**

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | R-4425 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 38913.1 | NHS-000S (433) | P.E. | |
| 38913.3 | NHS-000S (433) | CONST. | |
| | | | |
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| | | | |



- US 421, US 1 (LEE CO TO WAKE CO), US 84 (JORDAN LAKE TO WAKE CO.) - CHATHAM
- US 401 - HOKE
- US 421 (NORTH OF SANFORD TO CHATHAM CO.), US 1 (NC 42 TO CHATHAM CO.) NC 87 (SOUTH OF SANFORD TO HARNETT CO.) - LEE
- US 311, US 220 (MONTGOMERY CO. TO GUILFORD CO.) US 421 (CHATHAM CO. TO GUILFORD CO.) NC 49 (SR 1358 TO DAVIDSON CO.) - RANDOLPH
- US 74 (ANSON CO. TO SCOTLAND CO.) US 220 (US 74 TO NORTH OF ELLERBE) - RICHMOND
- US 74 (RICHMOND CO. TO ROBESON CO.) US 401 (SO. CAROLINA LINE TO HOKE CO.) - SCOTLAND

GRAPHIC SCALES

NTS

LETTING DATE: JULY, 15, 2008

DESIGN DATA

N/A

2006 STANDARDS SPECIFICATION

Prepared in the Office of:
**DIVISION OF HIGHWAYS
DIVISION 8 DESIGN & CONSTRUCT UNIT
902 N. SANDHILLS BLVD.
ABERDEEN NC 28315**

PLANS PREPARED BY:
PROJECT LENGTH
TOTAL LENGTH OF TIP PROJECT R-4425: 209.50 MILES

**DIVISION DESIGN &
CONSTRUCT ENGINEER**




Greg S. Davis
SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**



STATE HIGHWAY DESIGN ENGINEER

18-APR-2008 10:25:44-4425.tsh.dgn

| | |
|---|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-4425 | I-A |
| RW SHEET NO. | |
| DIVISION 8 DDC ENGINEER | |
|  | |
| 4-18-08 | |

INDEX OF SHEETS

INDEX OF SHEETS

| SHEET NUMBER | SHEET |
|---------------------|---|
| 1 | TITLE SHEET |
| 1-A | INDEX OF SHEETS |
| 2 | GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR CHURCH RAIL |
| 2A | GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR POST & BEAM RAIL |
| 2B | DETAIL GUARDRAIL ANCHOR UNIT TYPE III MODIFIED ON BAR METAL BRIDGE RAIL |
| 2C | GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR POST & BEAM RAIL WITHOUT PARAPET |
| 3 | SUMMARY OF QUANTITIES |
| 3A | GUARDRAIL SUMMARY FOR TOTAL PROJECT |
| CHAT-1 THRU CHAT-3 | CHATHAM CO. GUARDRAIL SUMMARY |
| CHAT-4 THRU CHAT-13 | CHATHAM CO. MAP PLAN SHEETS |
| HOKE-1 | HOKE CO. GUARDRAIL SUMMARY |
| HOKE-2 THRU HOKE-6 | HOKE CO. MAP PLAN SHEETS |
| LEE-1 THRU LEE-2 | LEE CO. GUARDRAIL SUMMARY |
| LEE-3 THRU LEE-14 | LEE CO. MAP PLAN SHEETS |
| RAND-1 THRU RAND-5 | RANDOLPH CO. GUARDRAIL SUMMARY |
| RAND-6 THRU RAND-23 | RANDOLPH CO. MAP PLAN SHEETS |
| RICH-1 THRU RICH-3 | RICHMOND CO. GUARDRAIL SUMMARY |
| RICH-4 THRU RICH-12 | RICHMOND CO. MAP PLAN SHEETS |
| SCOT-1 THRU SCOT-4 | SCOTLAND CO. GUARDRAIL SUMMARY |
| SCOT-5 THRU SCOT-14 | SCOTLAND CO. MAP PLAN SHEETS |
| TCP-1 THRU TCP-10 | TRAFFIC CONTROL PLANS |

GENERAL NOTES

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.

USE STANDARD GUARDRAIL FLARE RATES UNLESS SPECIFIED OTHERWISE ON THE PLANS OR BY THE ENGINEER.

GUARDRAIL LOCATIONS ARE IDENTIFIED BY GUARDRAIL SITE NUMBERS. **(159)**

SEQUENTIAL NUMBERS MAY NOT BE INCLUDED ON THE SUMMARY DUE TO BEING UP TO STANDARD.

FIELD REFERENCE:

THE FIELD REFERENCE AS NOTED IN THE GUARDRAIL SUMMARIES OF THE VARIOUS COUNTIES REFERS TO PAINTED INVENTORY NUMBERS DURING INITIAL FIELD INVENTORY. THESE NUMBER MAY OR MAY NOT BE VISIBLE DURING CONSTRUCTION DUE TO WEATHER OR RESURFACING ACTIVITIES UNDER OTHER CONTRACTS.

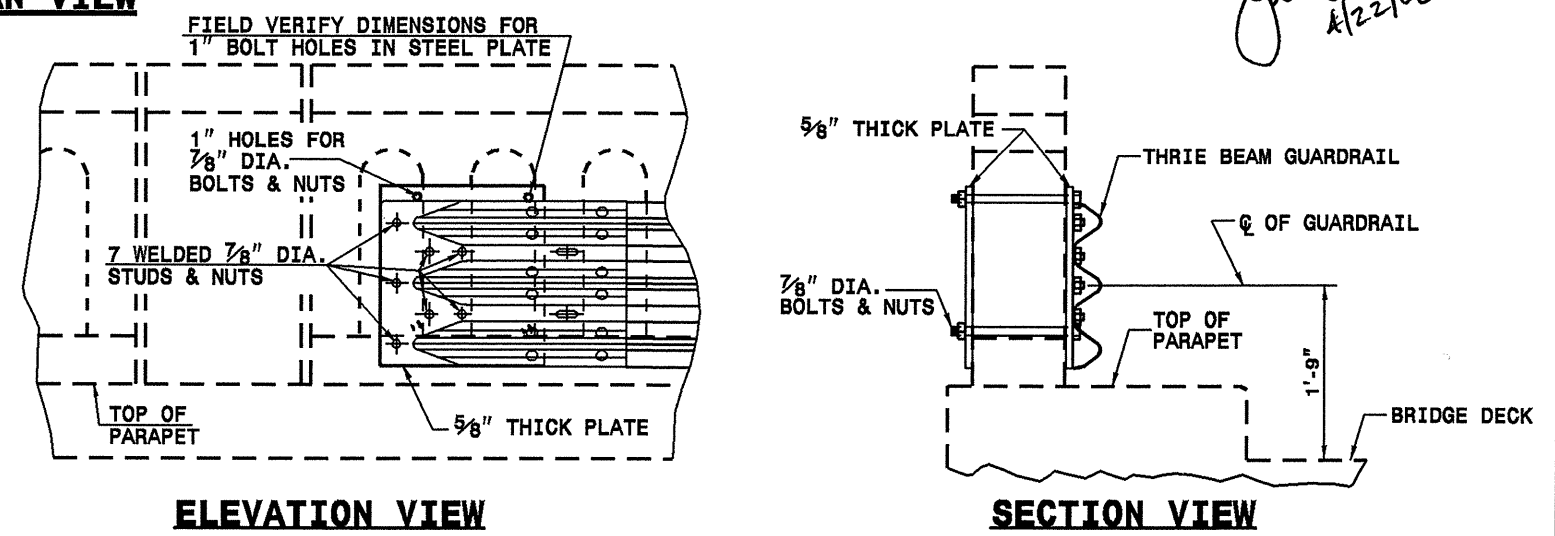
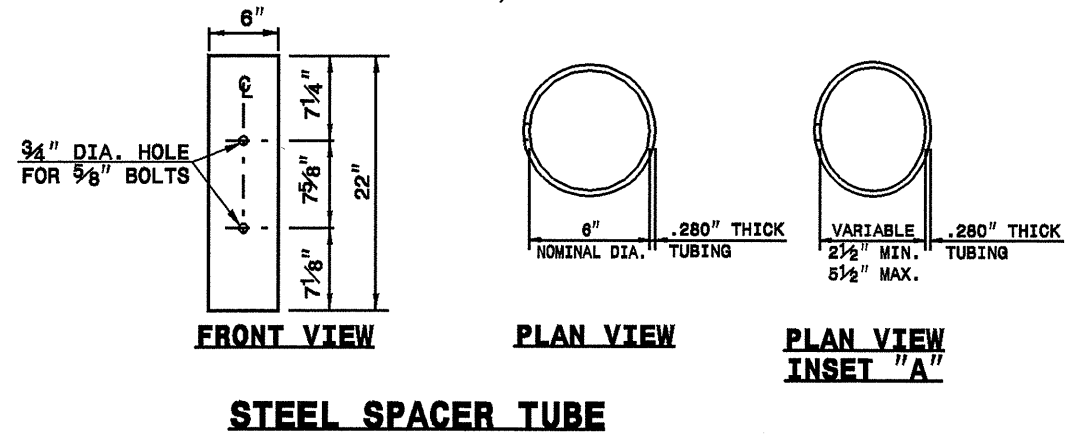
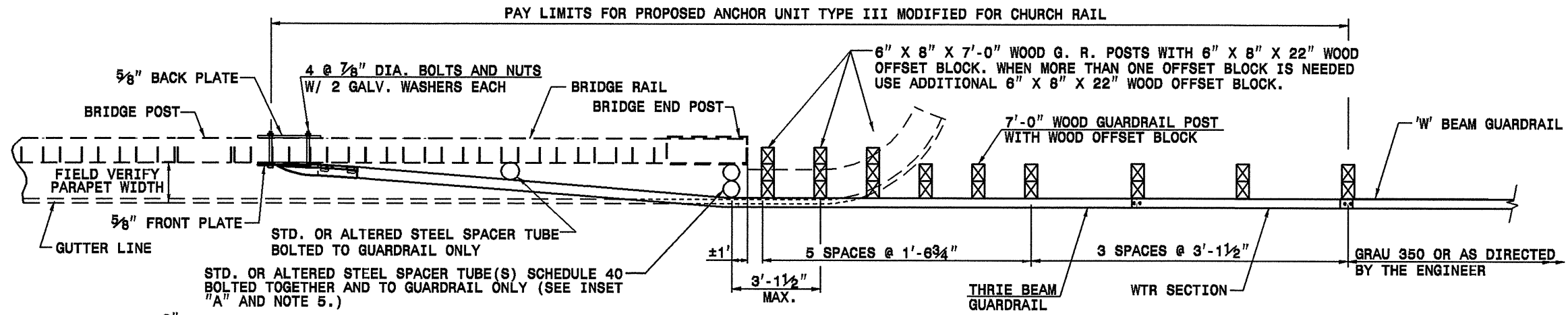
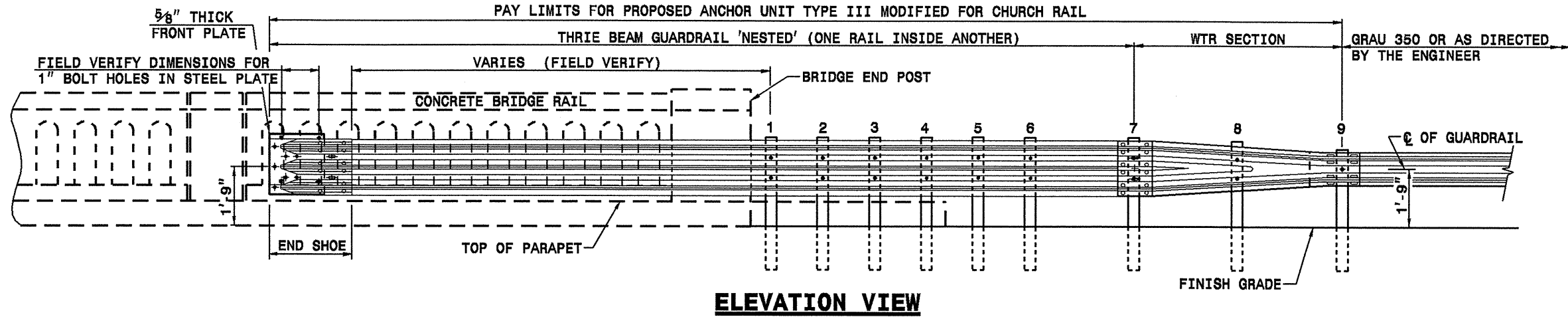
SHOULDER BORROW

SHOULDER BORROW SHALL BE USED AT LOCATIONS WHERE NEW GUARDRAIL OR NEW ANCHOR UNITS ARE INSTALLED OR AS DIRECTED BY THE ENGINEER. REFERENCE ROADWAY STANDARD DRAWING 862.01.

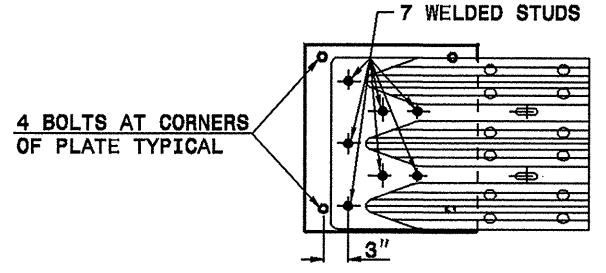
ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in the "Roadway Standard Drawings" highway Design Branch - N.C. Department of Transportation - Raleigh, N.C., dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

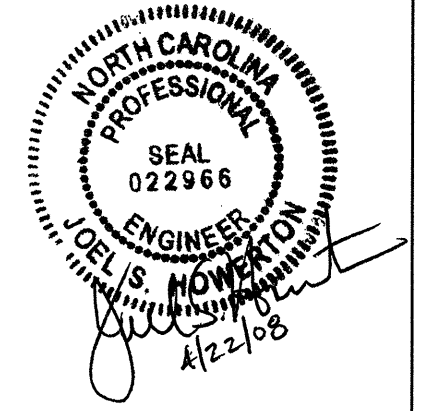
| STD. NO. | TITLE |
|----------|---|
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |
| 862.04 | Anchoring End of Guardrail - B-77 and B-83 Anchor Units |



GUARDRAIL ATTACHMENT TO BRIDGE POST

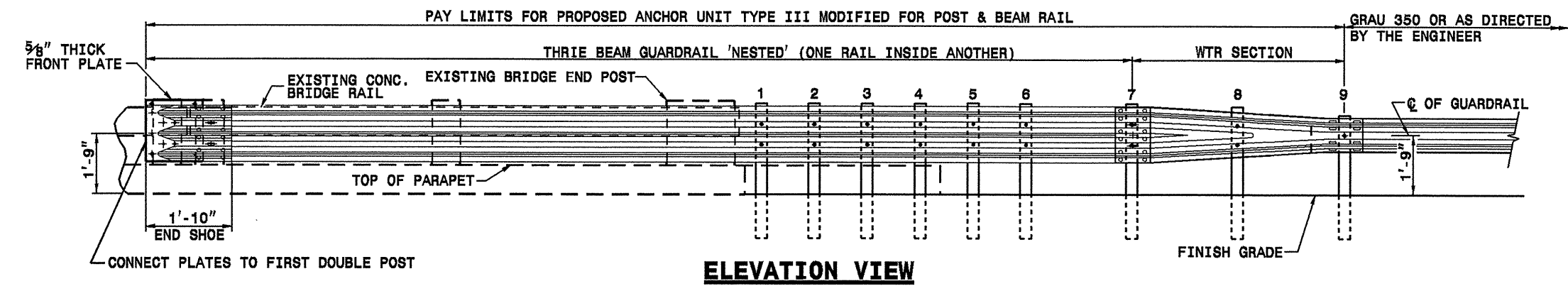


- GENERAL NOTES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
 2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
 3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1078 OF STAND. SPECS.
 4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
 5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST. SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
 6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
 7. ATTACH THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 8. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
 9. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 10. SEE 2002 ROADWAY STANDARD DRAWING 862.03 SHEET 4 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT.

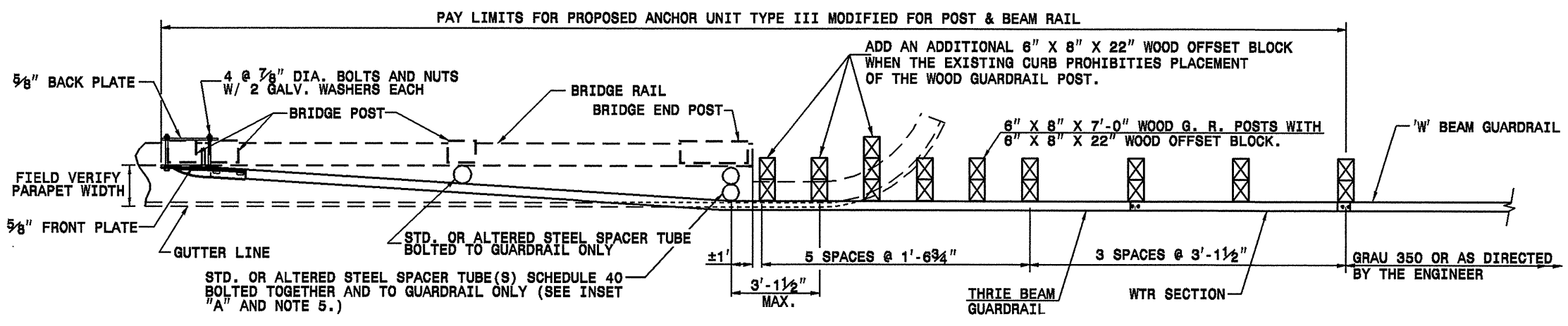


| | |
|--|-------------|
| PROJECT SERVICES UNIT STANDARDS AND SPECIAL DESIGN | |
| Office 919-250-4128 FAX 919-250-4119 | |
| GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR CHURCH RAIL | |
| ORIGINAL BY: C.O. CUEVAS | DATE: 12-00 |
| MODIFIED BY: E.E. WARD | DATE: 02-04 |
| CHECKED BY: | DATE: |
| FILE SPEC: .\user\details\stand\bp11.dgn | |

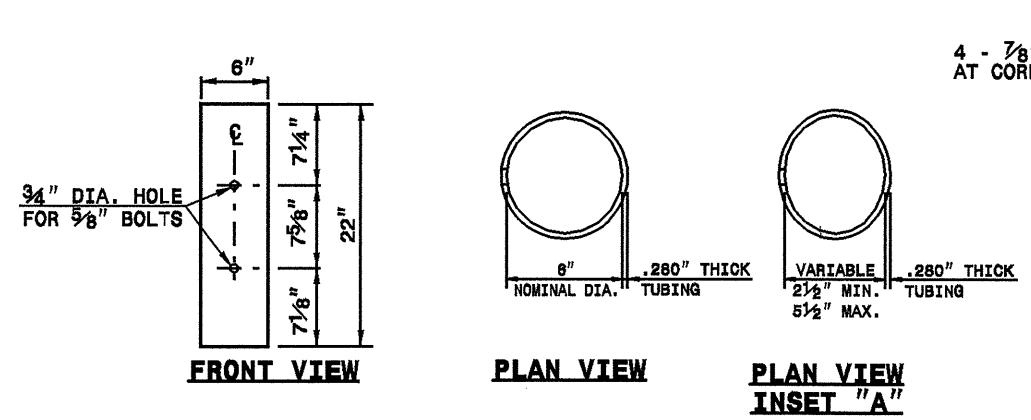
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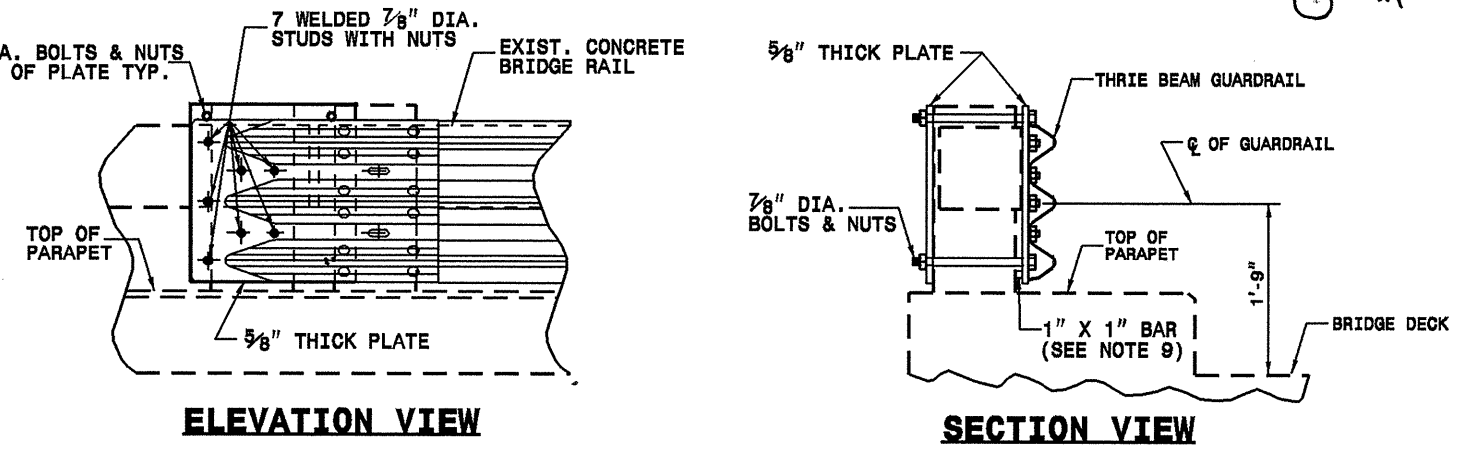
ELEVATION VIEW



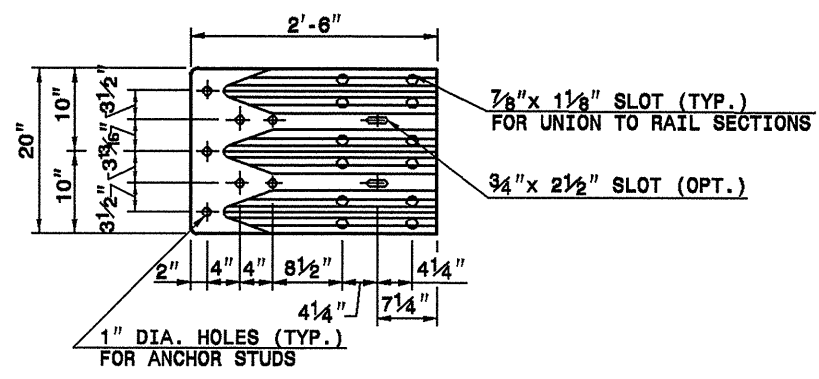
PLAN VIEW



STEEL SPACER TUBE

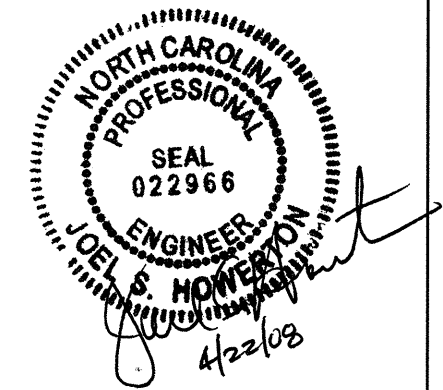


GUARDRAIL ATTACHMENT TO BRIDGE POST



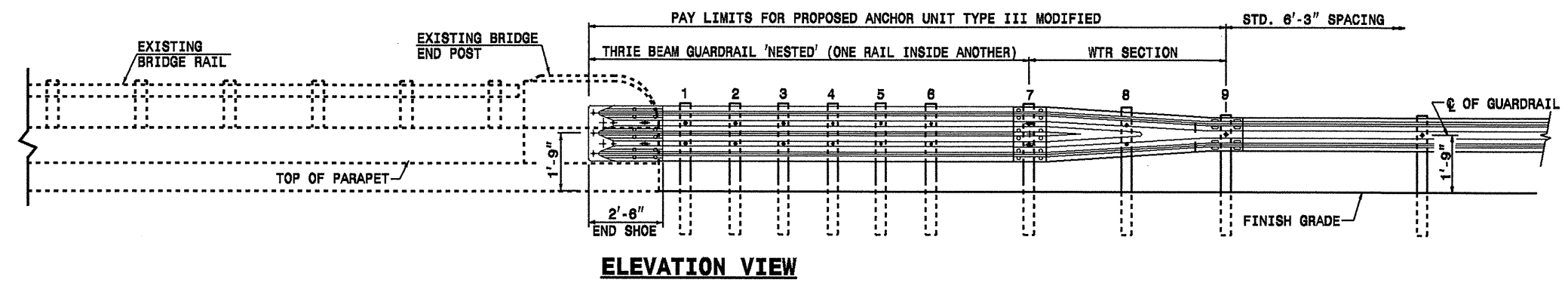
END SHOE

- GENERAL NOTES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
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 5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
 6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
 7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
 8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
 10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
 11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 12. SEE ROADWAY STARDARD DRAWING 862.03 SHEET 4 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT

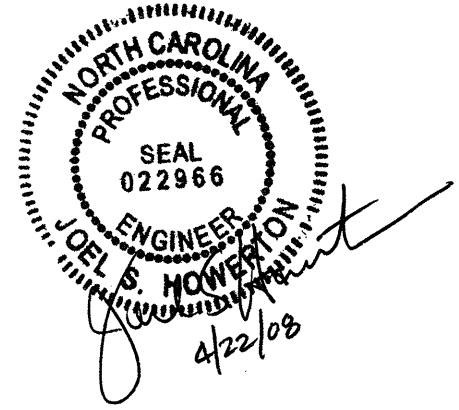
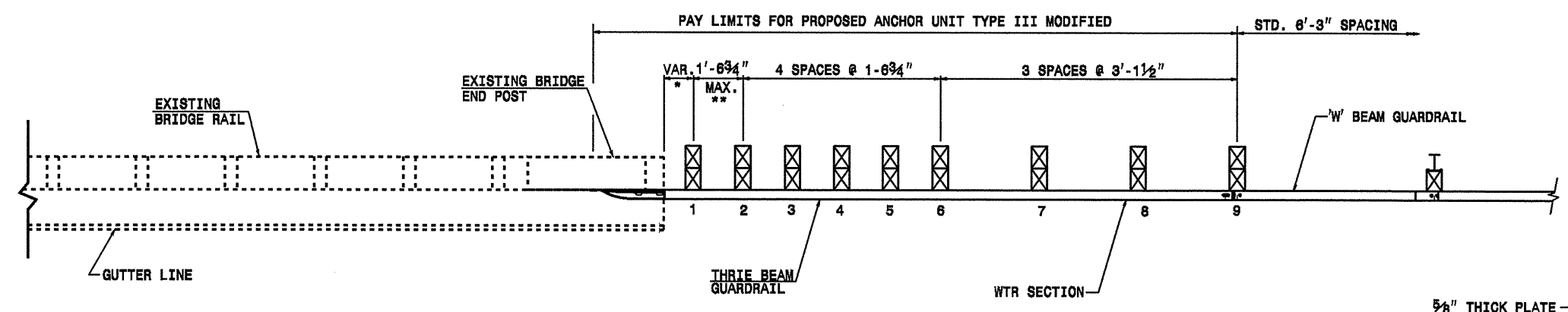


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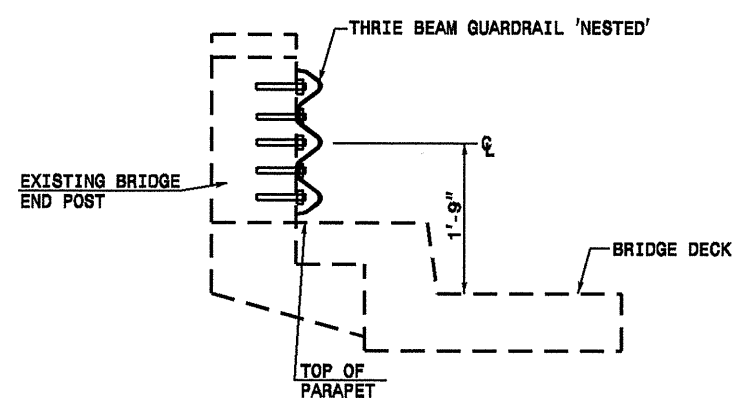
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|--|-------------|
| PROJECT SERVICES UNIT STANDARDS AND SPECIAL DESIGN Office 919-250-4128 FAX 919-250-4119 | |
| GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR POST & BEAM RAIL | |
| ORIGINAL BY: E.E. WARD | DATE: 01-03 |
| MODIFIED BY: E.E. WARD | DATE: 02-04 |
| CHECKED BY: | DATE: |
| FILE SPEC: .user\details\stand\bol11 original.dgn | |



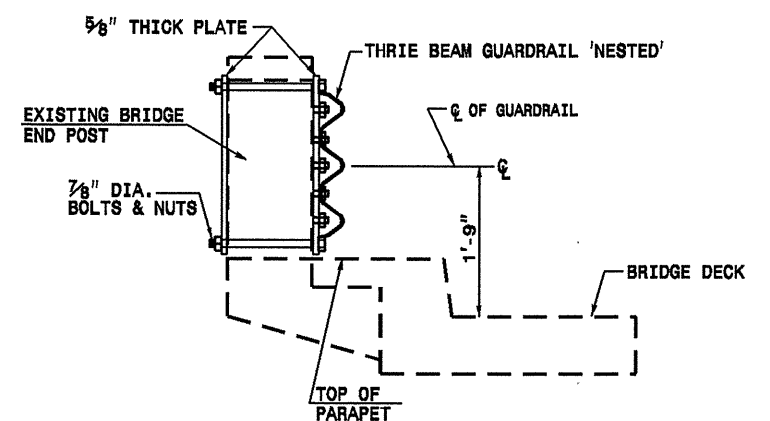
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.



PLAN VIEW



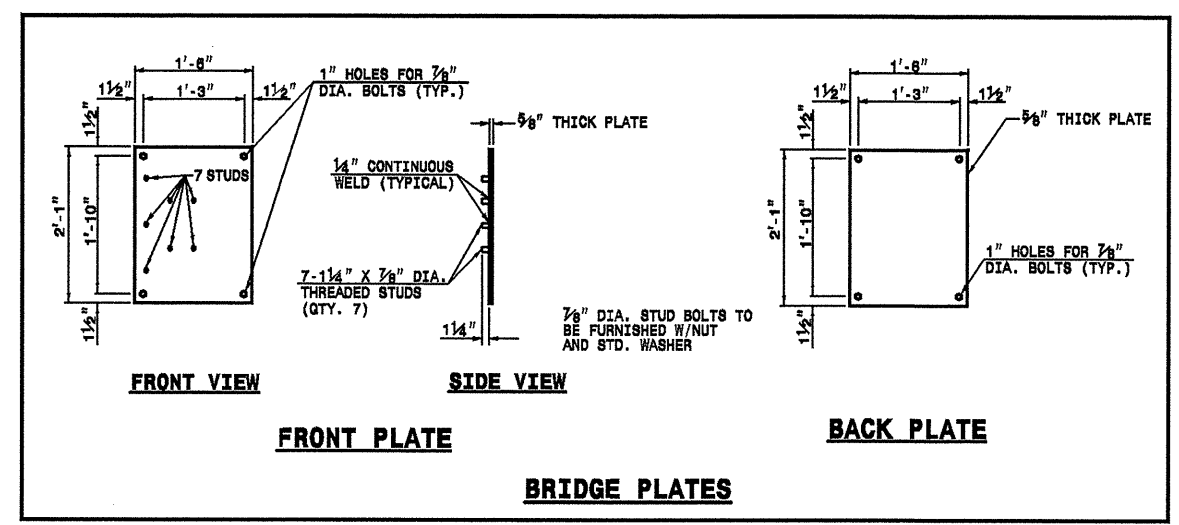
OPTION 1 SECTION VIEW
CHEMICAL BONDING



OPTION 2 SECTION VIEW
BRIDGE PLATES

- GENERAL NOTES:**
1. SEE ROADWAY STANDARD 862.03 SHEET 4 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT
 2. USE THIS DETAIL ON TRAILING END GUARDRAIL WITH BAR METAL RAIL BRIDGE.
 3. MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 4. USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 5. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 6. REFER TO STANDARD SPECIFICATION SECTION 862 FOR GUARDRAIL.

- NOTES FOR ANCHORING END OF GUARDRAIL WITH BRIDGE PLATES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
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 4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
 5. ATTACH THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 6. ALL WORK AND MATERIALS USED SHALL MEET THE APPROVAL OF THE ENGINEER.

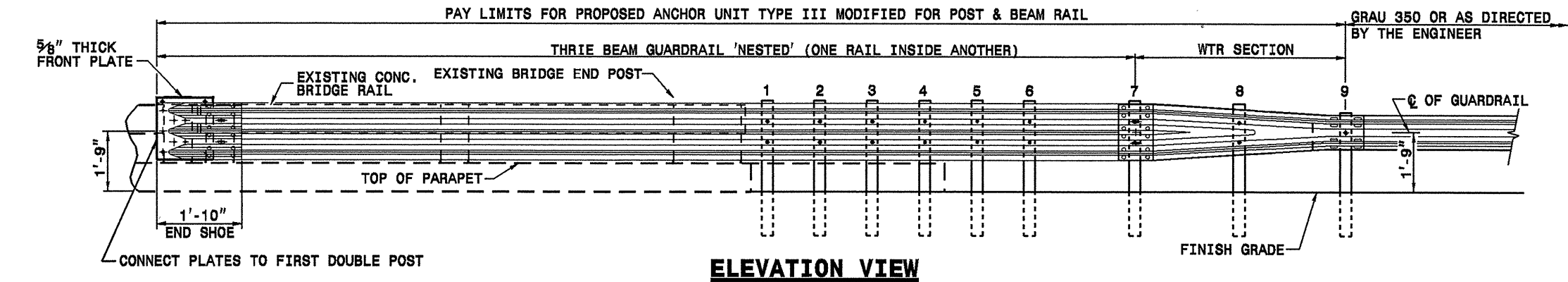


**PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
 Office 919-250-4128 FAX 919-250-4119

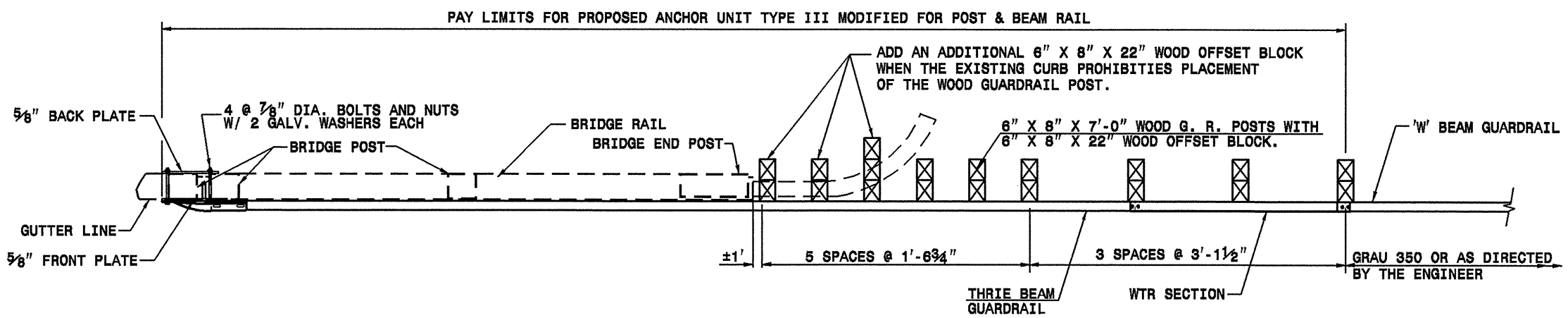
**DETAIL OF GUARDRAIL
ANCHOR UNIT TYPE III MODIFIED ON
BAR METAL BRIDGE RAIL**

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 MODIFIED BY: E.E. WARD DATE: 2-05-04
 CHECKED BY: DATE:
 FILE SPEC.: \\user\deta11s\stand\bp iii original.dgn

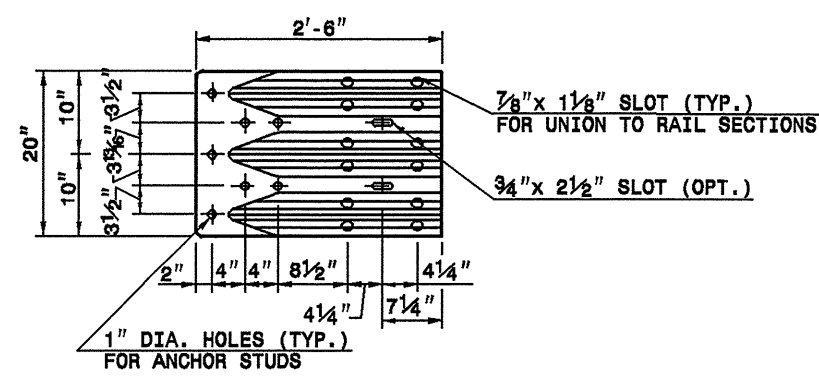
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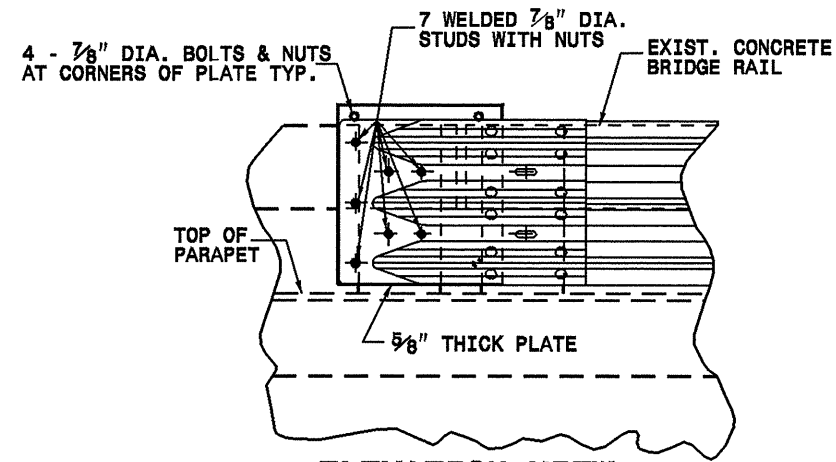
ELEVATION VIEW



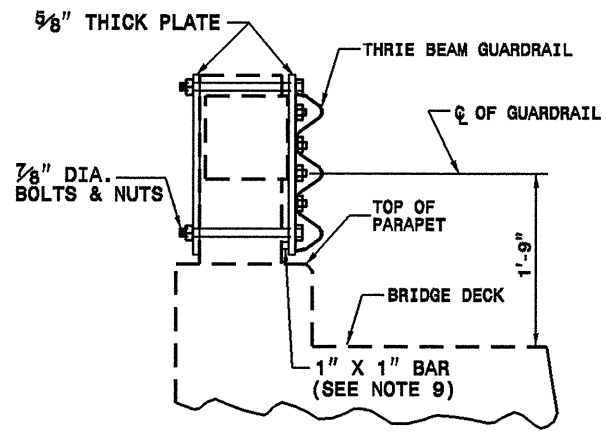
PLAN VIEW



END SHOE



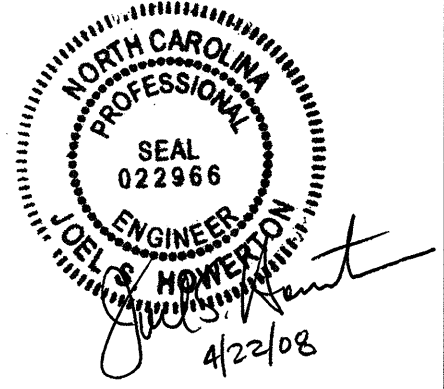
ELEVATION VIEW



SECTION VIEW

GUARDRAIL ATTACHMENT TO BRIDGE POST

- GENERAL NOTES:**
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 10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
 11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 12. SEE ROADWAY STARDARD DRAWING 862.03 SHEET 4 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



| | |
|---|------------------|
| PROJECT SERVICES UNIT STANDARDS AND SPECIAL DESIGN | |
| Office 919-250-4128 | FAX 919-250-4119 |
| GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR POST & BEAM RAIL WITHOUT PARAPET | |
| ORIGINAL BY: C.O. GUEVAS | DATE: 12-00 |
| MODIFIED BY: E.E. WARD | DATE: 02-04 |
| CHECKED BY: | DATE: |
| FILE SPEC.: \\usr\details\stand\pp11.dgn | |

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SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
 ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201878

| ItemNumber | Sec # | Quantity | Unit | Description |
|--------------|-------|----------|------|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 1231000000-E | 560 | 3,900 | CY | SHOULDER BORROW |
| 3000000000-N | SP | 3 | EA | IMPACT ATTENUATOR UNIT, TYPE 350 |
| 3030000000-E | 862 | 47,950 | LF | STEEL BM GUARDRAIL |
| 3045000000-E | 862 | 1,065 | LF | STEEL BM GUARDRAIL, SHOP CURVED |
| 3150000000-N | 862 | 30 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3180000000-N | 862 | 40 | EA | GUARDRAIL ANCHOR UNITS, TYPE ***** (III MOD) |
| 3195000000-N | 862 | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE AT-1 |
| 3210000000-N | 862 | 211 | EA | GUARDRAIL ANCHOR UNITS, TYPE CAT-1 |
| 3270000000-N | SP | 498 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 |
| 3285000000-N | SP | 72 | EA | GUARDRAIL ANCHOR UNITS, TYPE M-350 |
| 3317000000-N | 862 | 146 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 |
| 3319000000-N | 862 | 83 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-83 |
| 3360000000-E | 863 | 50,619.5 | LF | REMOVE EXISTING GUARDRAIL |
| 3435000000-N | SP | 80 | EA | GENERIC GUARDRAIL ITEM REPLACE EXISTING GUARDRAIL OFFSET BLOCKS |
| 4589000000-N | SP | Lump Sum | | GENERIC TRAFFIC CONTROL ITEM TRAFFIC CONTROL |
| 6084000000-E | 1660 | 5 | ACR | SEEDING & MULCHING |

