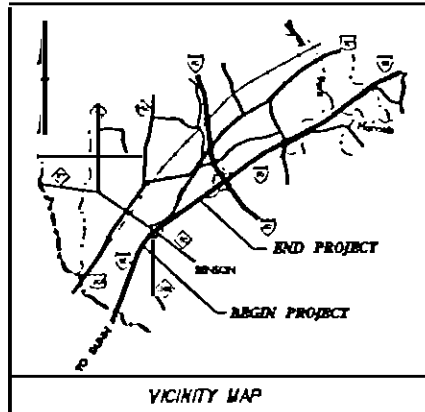


I-2812

PROJECT: 8.1311801

STRUCTURE



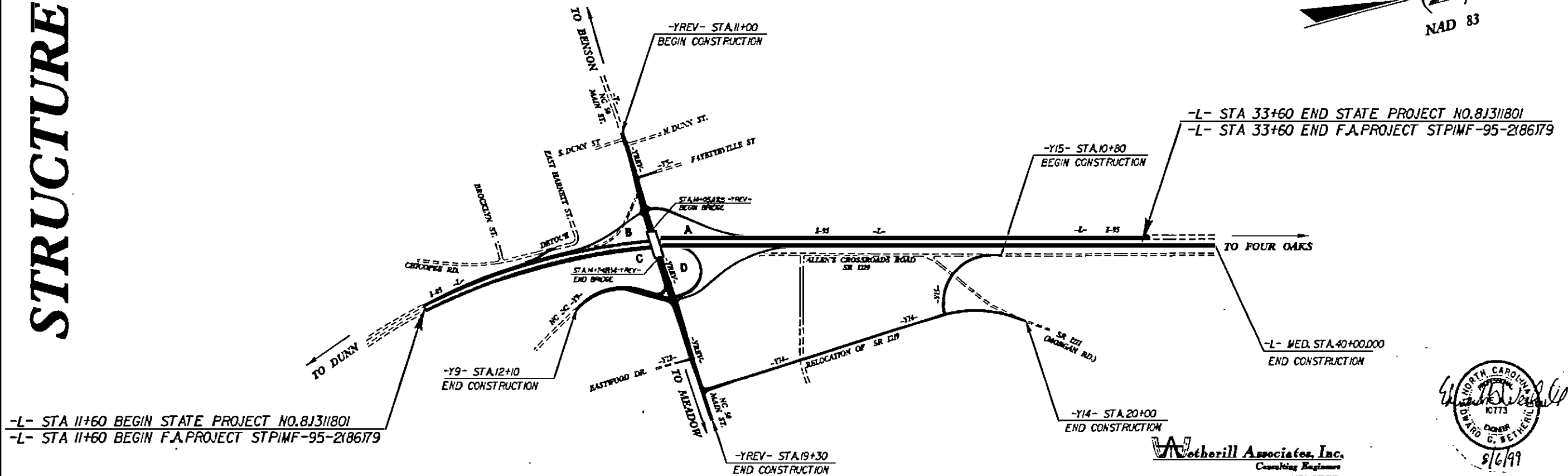
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
JOHNSTON COUNTY

LOCATION: I-95 AND NC 50 INTERCHANGE IN BENSON

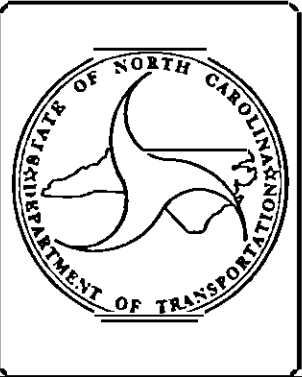
TYPE OF WORK: GRADING, WIDENING, PAVING, DRAINAGE, CURB & GUTTER, GUARDRAIL, TRAFFIC SIGNALS, LIGHTING, LONG LIFE PAVEMENT MARKINGS, RAISED PAVEMENT MARKERS AND STRUCTURE.



| | | | |
|-----------------|--------------------------|------------------------|--------------|
| STATE | STATE PROJECT NUMBER NO. | FILE NO. | TOTAL SHEETS |
| N.C. | I-2812 | | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 8 1311801 | STPIMF-95-2(86)79 | P.E., RW, UTIL. CONST. | |
| | | | |
| | | | |
| | | | |



Wetherill Associates, Inc.
 Consulting Engineers



DESIGN DATA

ADT 1995 = 40,100
 ADT 2020 = 71,000

DHV = 9 %
 D = 60 %
 T = 15 %*
 V = 110 km/h

* TTST 12% DUAL 3 %

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT STPIMF-95-2(86)79 = 2.200 Km
 TOTAL LENGTH STATE PROJECT 8.1311801 = 2.200 Km

Prepared for the Office of
DIVISION OF HIGHWAYS

1995 STANDARD SPECIFICATIONS

LETTING DATE:
 OCTOBER 19, 1999

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

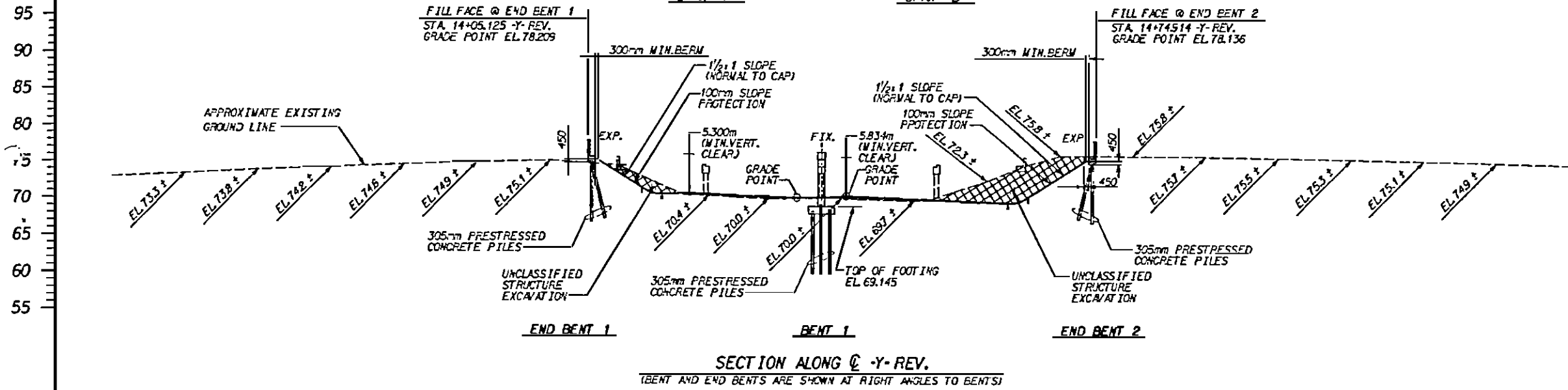
D. M. Barbour, Jr.
 STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

APPROVED: _____ DATE: _____

13+40 13+60 13+80 14+00 14+20 14+40 14+60 14+80

FEDERAL AID NO. STP INF-95-2(86)79

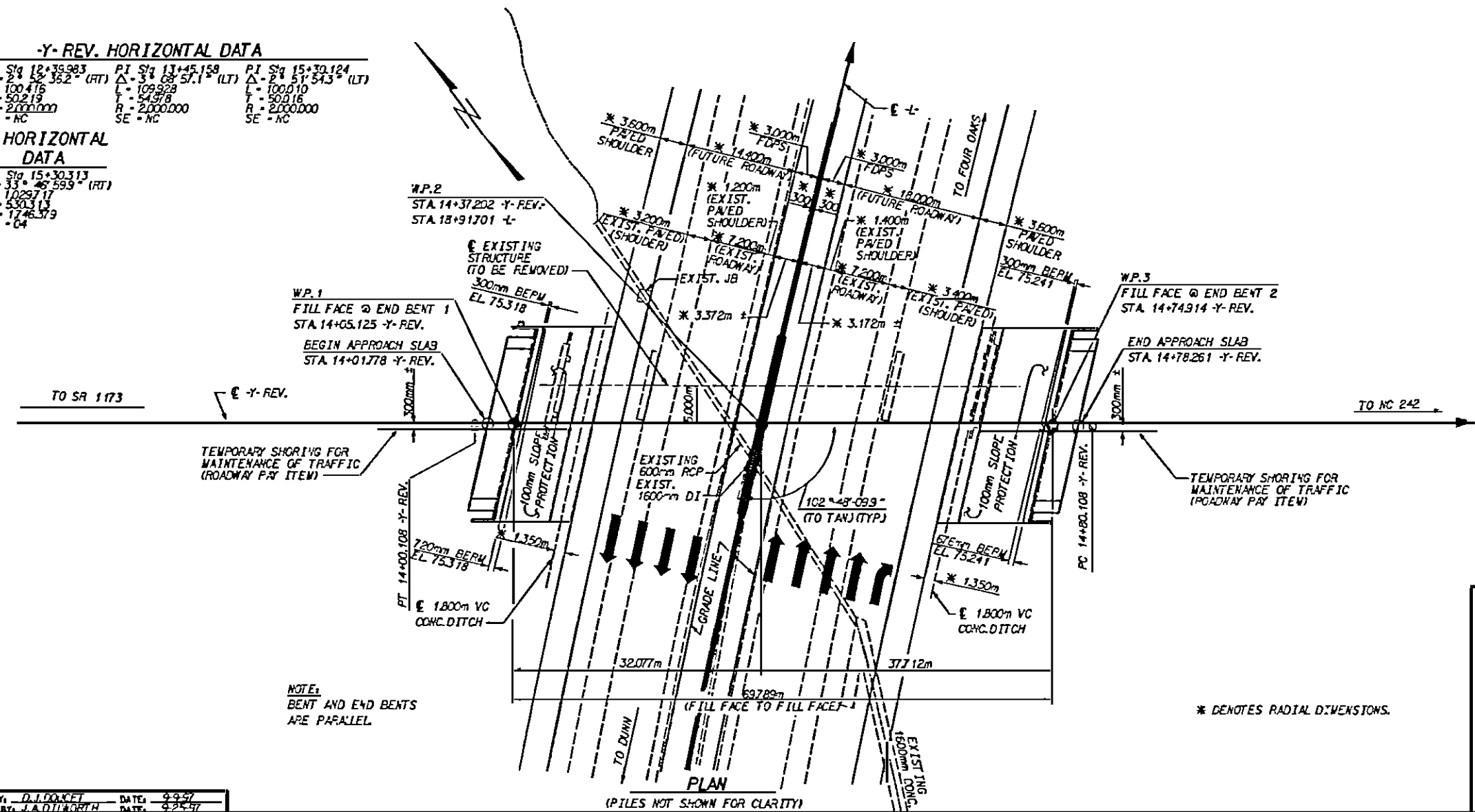


-Y- REV. HORIZONTAL DATA

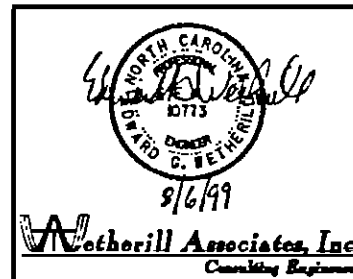
| | | |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| PI Sta 12+39.983 Δ = 2° 52' 35.2" (RT) L = 100.476 T = 50.219 R = 2000.000 SE = NC | PI Sta 13+45.158 Δ = 3° 08' 57.1" (LT) L = 109.928 T = 54.978 R = 2000.000 SE = NC | PI Sta 15+30.124 Δ = 2° 51' 54.3" (LT) L = 100.010 T = 50.016 R = 2000.000 SE = NC |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|

-L- HORIZONTAL DATA

| |
|----------------------------------------------------------------------------------------------------|
| PI Sta 15+30.313 Δ = 33° 46' 59.9" (RT) L = 102.977 T = 53.031 R = 1746.379 SE = C4 |
|----------------------------------------------------------------------------------------------------|



PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-
14+37202 -Y- REV.
 SHEET 1 OF 3. REPLACES BRIDGE NO. 51



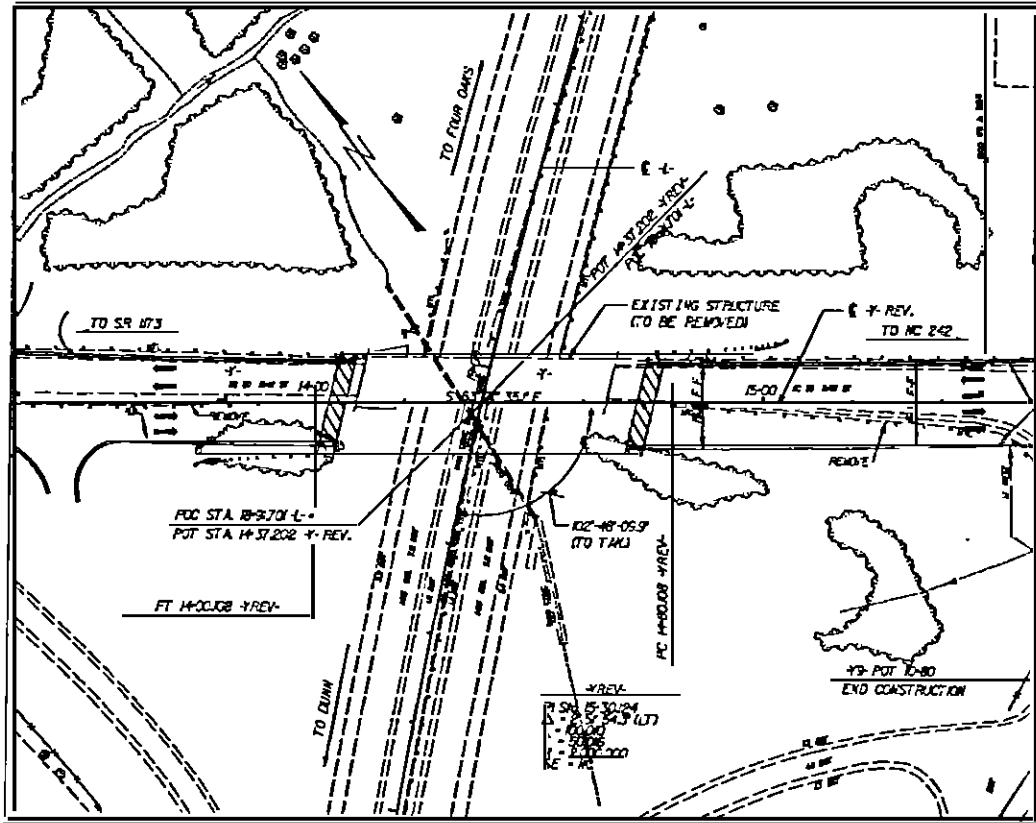
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER I-95 ON NC 50
 BETWEEN SR 1173 & NC 242

| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | 5-1 |

DRAWN BY: D.J. LOCKETT DATE: 9-9-97
 CHECKED BY: J.A. DILLON DATE: 9-23-97

Wetherill Associates, Inc.
 Consulting Engineers

BY #1 INC #2 BAR WITH CAP, STA. -BY-8+58913, ELEVATION 75.139.



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.
LOCATION SKETCH

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE IN METERS.
- ASSUMED LIVE LOAD - WS - 18 OR ALTERNATE LOADINGS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N5M.
- THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 345M AND PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR REINFORCED CONCRETE DECK SLAB, SEE SPECIAL PROVISIONS.
- FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.
- FOR CURING BRIDGE DECK SLABS, SEE THE SPECIAL PROVISIONS "REINFORCED CONCRETE DECK SLAB".
- PILES FOR END BENTS 1 AND 2 AND BENT 1 SHALL HAVE A MINIMUM BEARING CAPACITY OF 400 KN EACH.
- THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO MINIMUM DEPTH OF 510mm.
- AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 2 - 15.850m AND 2 - 12.192m SPANS WITH A 8.585m CLEAR ROADWAY WIDTH AND A REINFORCED CONCRETE DECK SLAB ON 5 LINES OF I-BEAMS SUPPORTED BY REINFORCED CONCRETE CAPS ON PILES AND LOCATED 5.0m LEFT OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 23.5m ± LEFT AND 16.5m ± RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES", FOR SEISMIC PERFORMANCE CATEGORY "A".

- FOR LIMIT OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 360000 KG OF REINFORCING STEEL, ONE 760mm SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 360000 KG OF REINFORCING STEEL, TWO 760mm SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.
- FOR FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC, SEE SPECIAL PROVISIONS.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+91.701 -L-".
- FOR METRIC STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
- FOR REINFORCING STEEL, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.
- STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.
- FOR PILE DRIVING ACCURACY, SEE SPECIAL PROVISIONS.
- FOR PROTECTION OF PAINTED STEEL, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORM WORK, SEE SPECIAL PROVISIONS.
- FOR GROOVING BRIDGE FLOORS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

| | REMOVAL OF EXISTING STRUCTURE | UNCLASSIFIED STRUCTURE EXCAVATION | FOUNDATION EXCAVATION | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS "A" CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | STRUCTURAL STEEL | 305mm PRESTRESSED CONCRETE PILES | 3 BAR METAL RAIL | 100mm SLOPE PROTECTION | POT BEARINGS | EVAZOTE JOINT SEALS | ELECTRICAL CONDUIT SYSTEM | |
|----------------|-------------------------------|-----------------------------------|-----------------------|-------------------------------|------------------------|--------------------|-----------------------|-------------------|---------------------------------|------------------|----------------------------------|------------------|------------------------|--------------|---------------------|---------------------------|----------|
| | LUMP SUM | CUBIC METER | LUMP SUM | SQ. METER | SQ. METER | CUBIC METER | LUMP SUM | Kg | Kg | APPROX. Kg | NO. | METER | METER | SQ. METERS | LUMP SUM | LUMP SUM | LUMP SUM |
| SUPERSTRUCTURE | LUMP SUM | | | 1590.1 | 1250.8 | | | | | 230859 | | 133.482 | | | | | |
| END BENT 1 | | 197 | | | | 44.3 | | 3756 | | | 19 | 37 | | | | | |
| BENT 1 | LUMP SUM | | LUMP SUM | | | 109.3 | | 15861 | 1504 | | 54 | 594 | 225 | | | | |
| END BENT 2 | | 1070 | | | | 44.3 | | 4022 | | | 18 | 230 | | 280 | | | |
| TOTAL | LUMP SUM | 1267 | LUMP SUM | 1590.1 | 1250.8 | 197.9 | LUMP SUM | 23639 | 1504 | 230859 | 91 | 1191 | 505 | | LUMP SUM | LUMP SUM | LUMP SUM |



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-
14+37202 -Y- REV.
 SHEET 3 OF 3.

Wetherill Associates, Inc.
Consulting Engineers

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

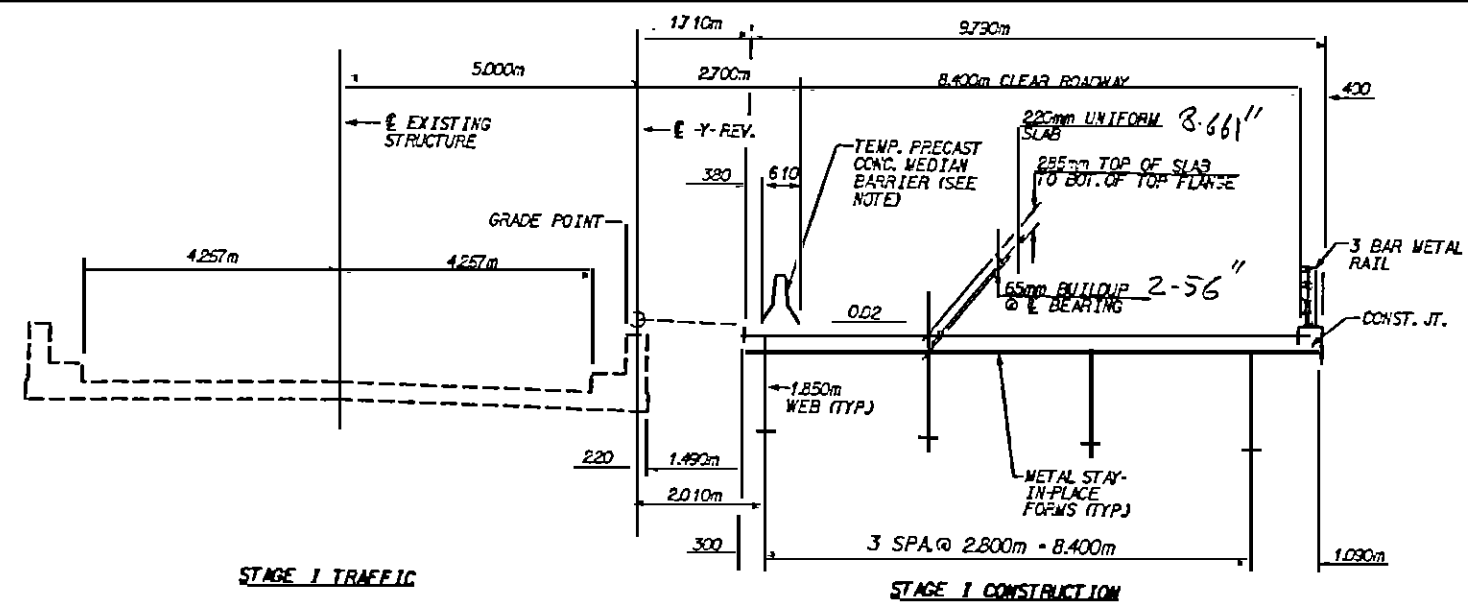
GENERAL DRAWING
FOR BRIDGE OVER I-95 ON NC 50
BETWEEN SR 1173 & NC 242

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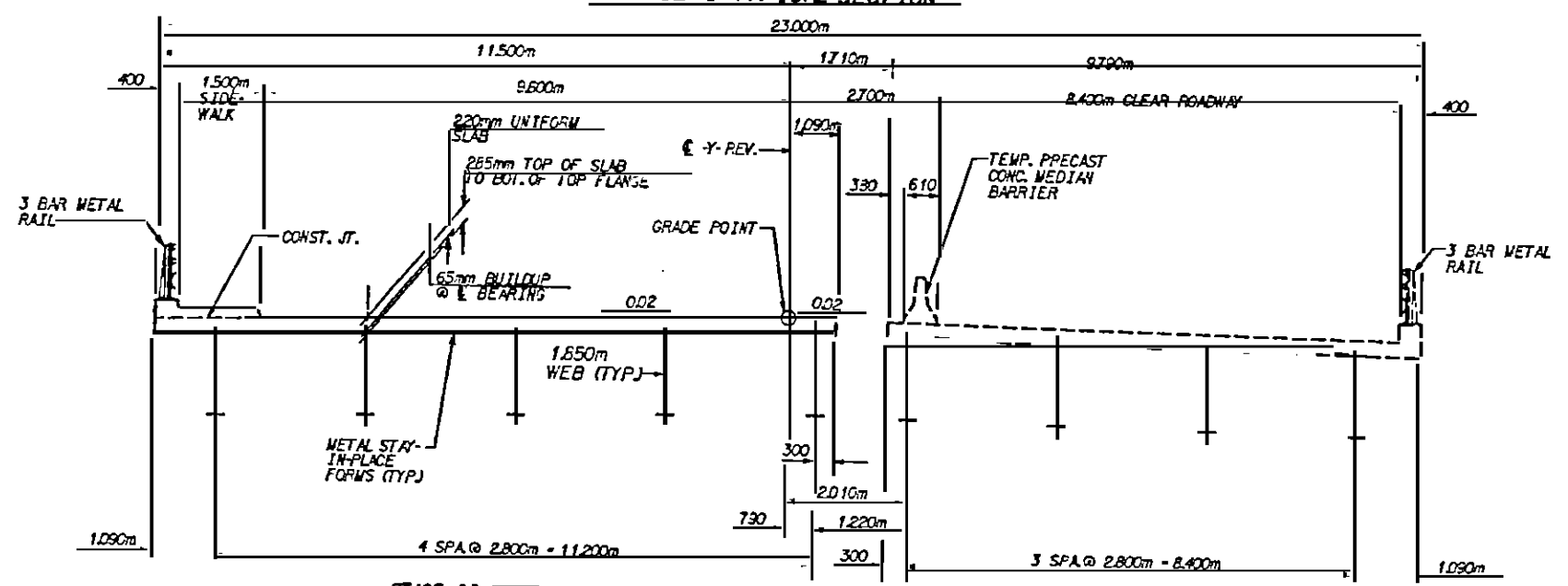
CAT2812-STR-GW/DWG/2/04 (250)

DRAWN BY: D. LOUDET DATE: 9-9-97
 CHECKED BY: P. G. WETTERILL DATE: 9-25-97

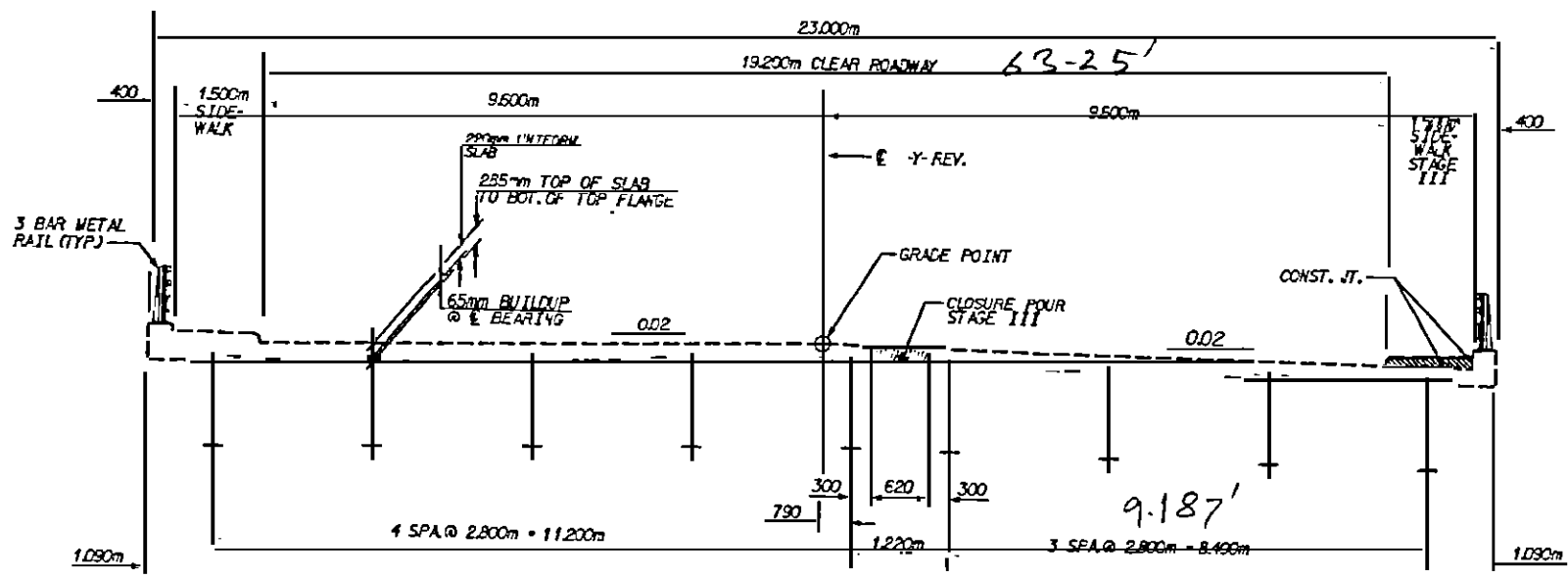
NOTE:
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS
OF THE ARCHED PORTABLE CONCRETE BARRIER.



STAGE I TRAFFIC
STAGE I TYPICAL SECTION
STAGE I CONSTRUCTION



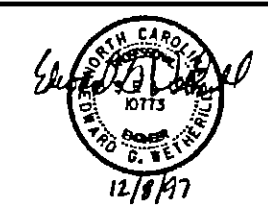
STAGE II CONSTRUCTION
STAGE II TYPICAL SECTION
STAGE II TRAFFIC



STAGE III TYPICAL SECTION



PROJECT NO. I-2812
JOHNSTON COUNTY
STATION: 18+91701 -L-



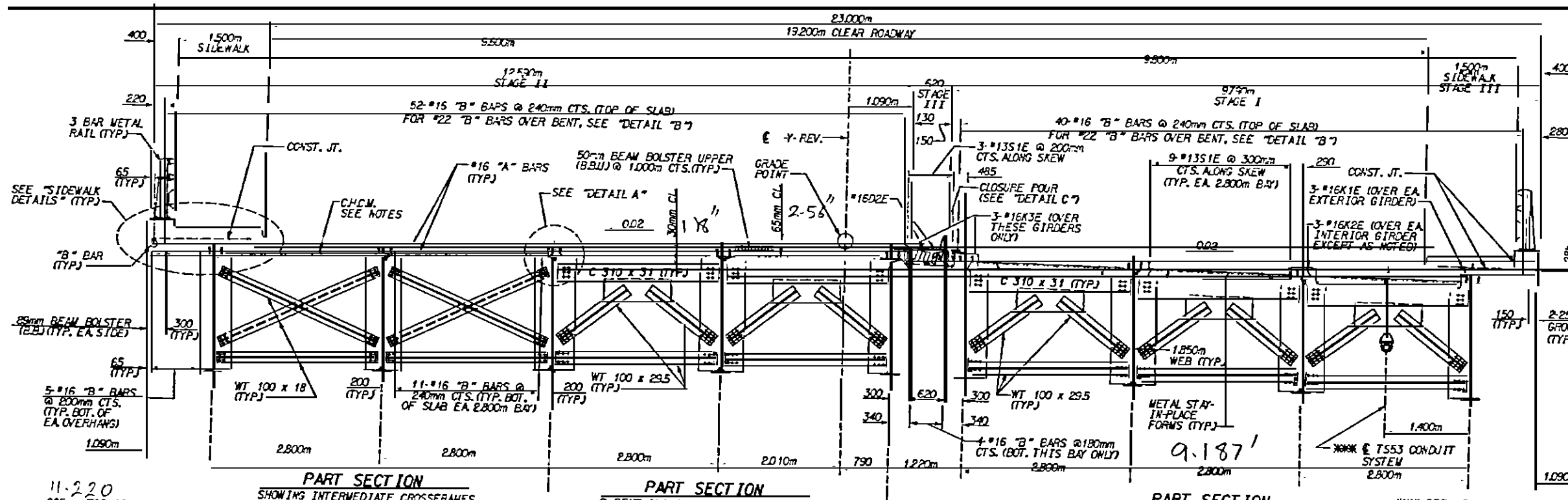
Wetherill Associates, Inc.
Consulting Engineers

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RAILROAD
SUPERSTRUCTURE
STAGED CONSTRUCTION
SEQUENCE

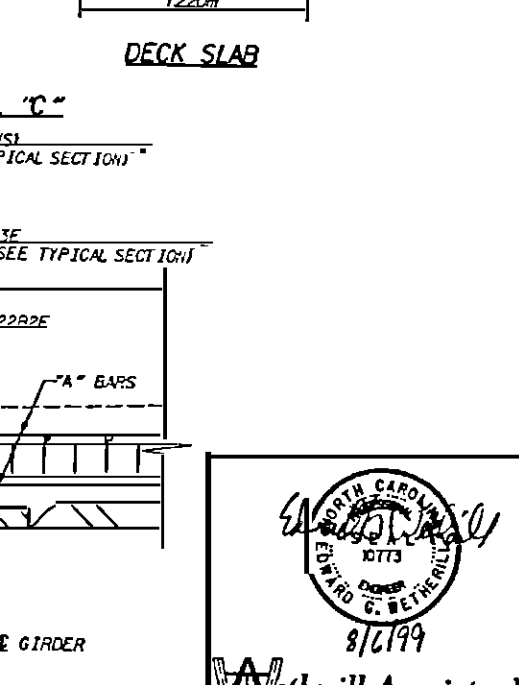
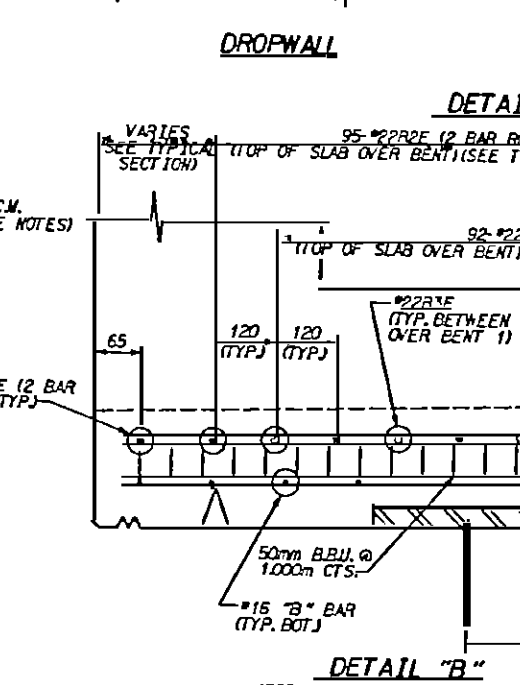
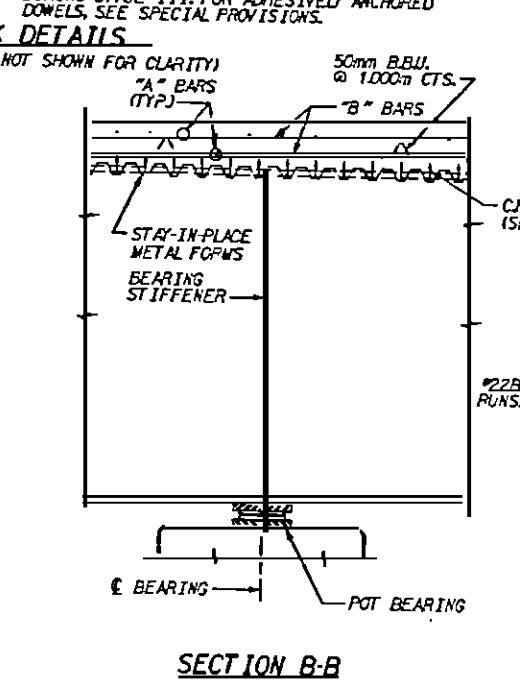
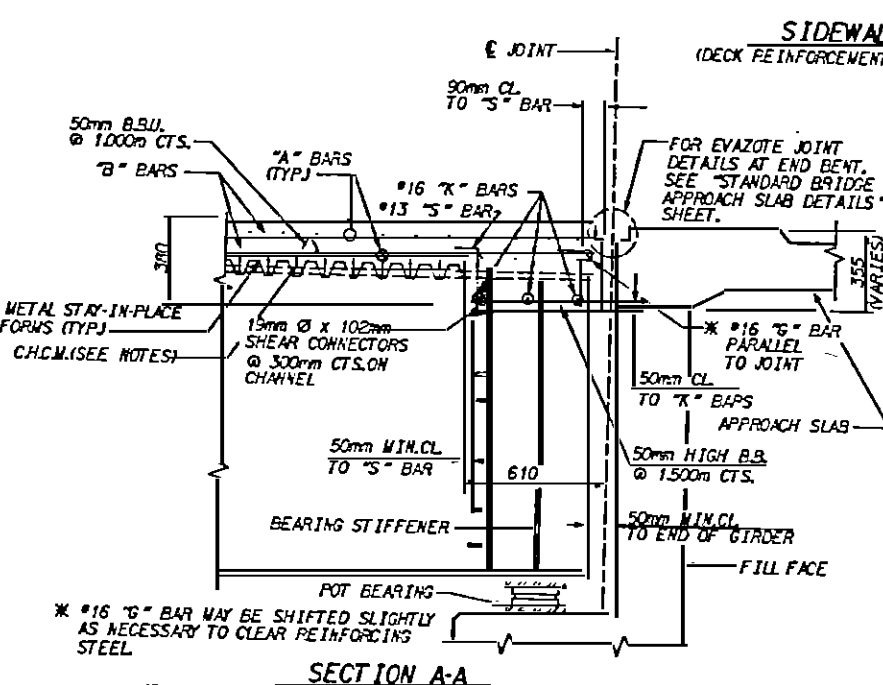
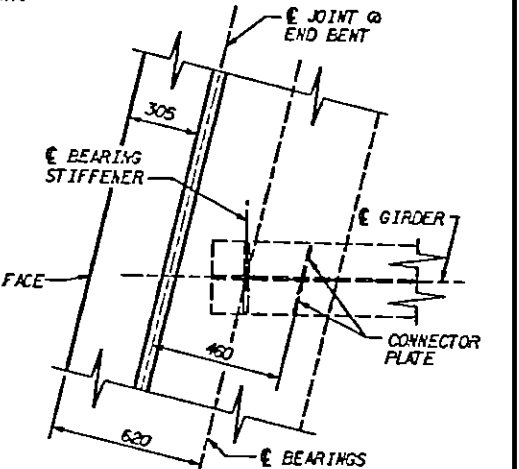
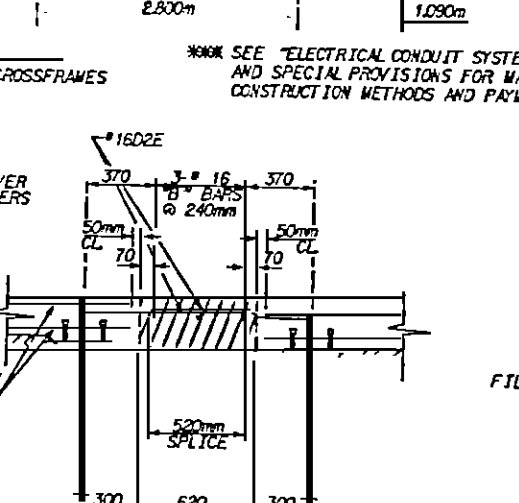
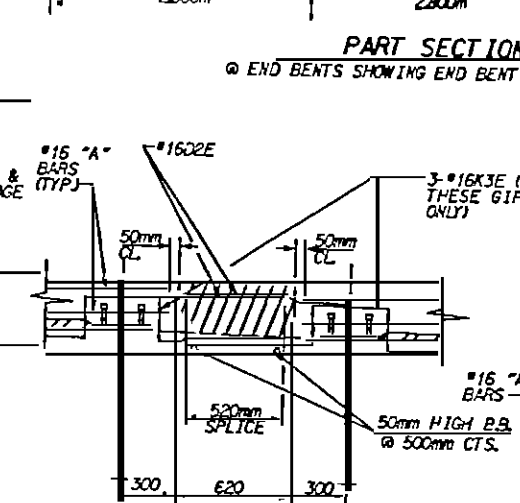
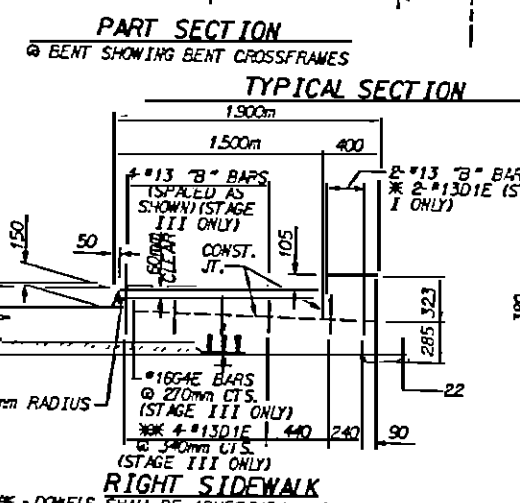
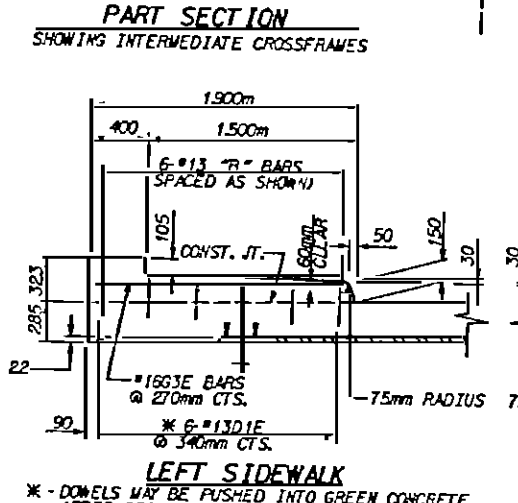
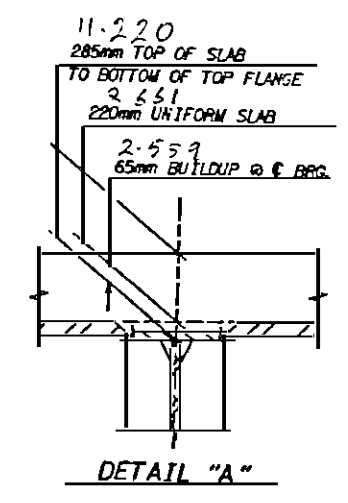
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|-----------|----|------|-----|----|------|--------------------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | TOTAL SHEETS 30 |
| 2 | | | 2 | | | |

DRAWN BY: D. L. DUNCAN DATE: 9-9-97
CHECKED BY: E. G. WETHERILL DATE: 11-11-97

11-2812STR STAGE DGN (1150)



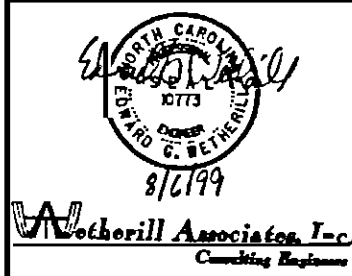
NOTES:
 PROVIDE CONTINUOUS HIGH CHAIR FOR METAL DECK (CH.C.M.) @ 1.2m CENTERS WITH LEG SPACING TO MATCH THE PITCH OF THE FORMS AND WITH A HEIGHT TO SUPPORT THE BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 30mm ABOVE THE TOP OF THE STAY-IN-PLACE FORM.
 PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 20.7 MPa BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 FALSEWORK AND FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHAPPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAILS SHEETS.
 STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
 THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENER OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.
 THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 13mm. SEE "SPECIAL PROVISIONS FOR POT BEARINGS".
 THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK OR PARAPET.
 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.



PLAN OF GIRDER AT END BENT NO. 1 (END BENT 2 SIMILAR)



PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701-L



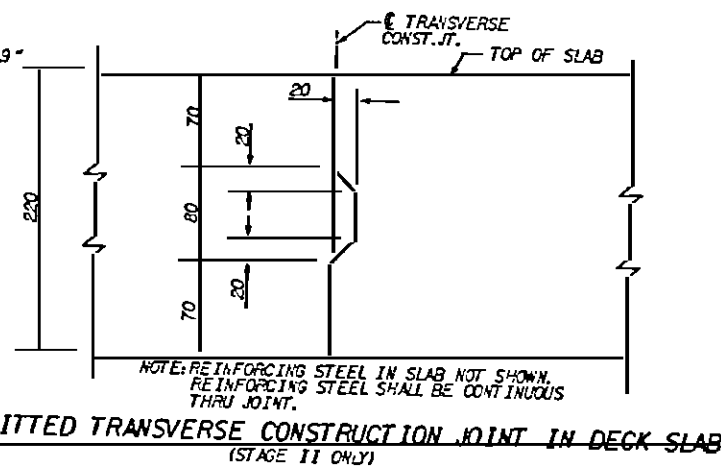
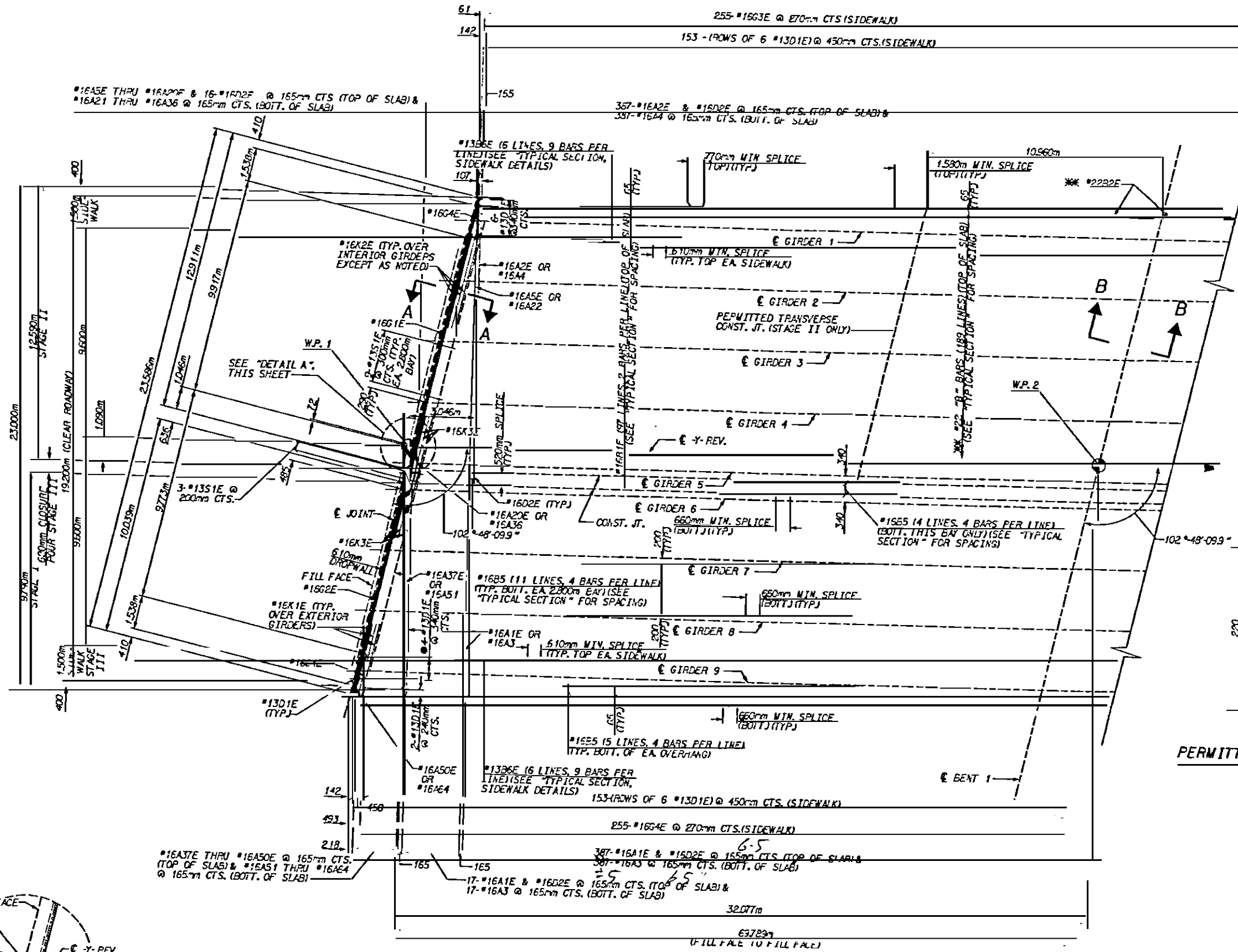
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 SUPERSTRUCTURE
 TYPICAL SECTION
 AND DETAILS
 STAGE I, II & III

| REVISIONS | | | | | SHEET NO. |
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| NO. | BY | DATE | NO. | BY | |
| 1 | | | 1 | | S-5 |
| 2 | | | 2 | | |

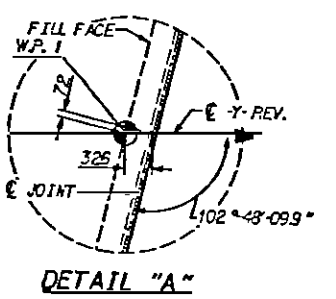
DRAWN BY: D. L. WETHERILL DATE: 9-9-97
 CHECKED BY: F. G. WETHERILL DATE: 11-11-97

I-2812(S1)PJ SECT 1.DG1 (25)

NOTE:
 #16 #16 BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-



** SEE "BENT TOP OF SLAB BAR LAYOUT", ON PLAN OF SPAN "B" SHEET.
 • THESE DOWELS ARE TO BE ADHESIVELY ANCHORED DURING STAGE III. FOR ADHESIVELY ANCHORED DOWEL, SEE SPECIAL PROVISIONS.

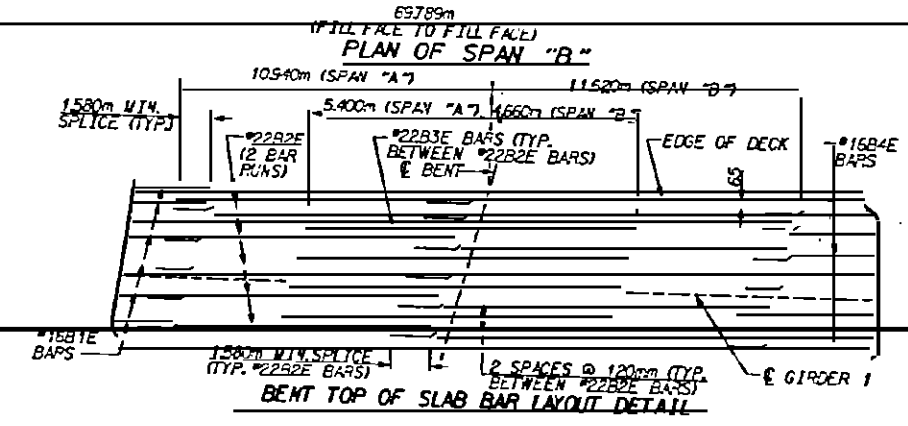
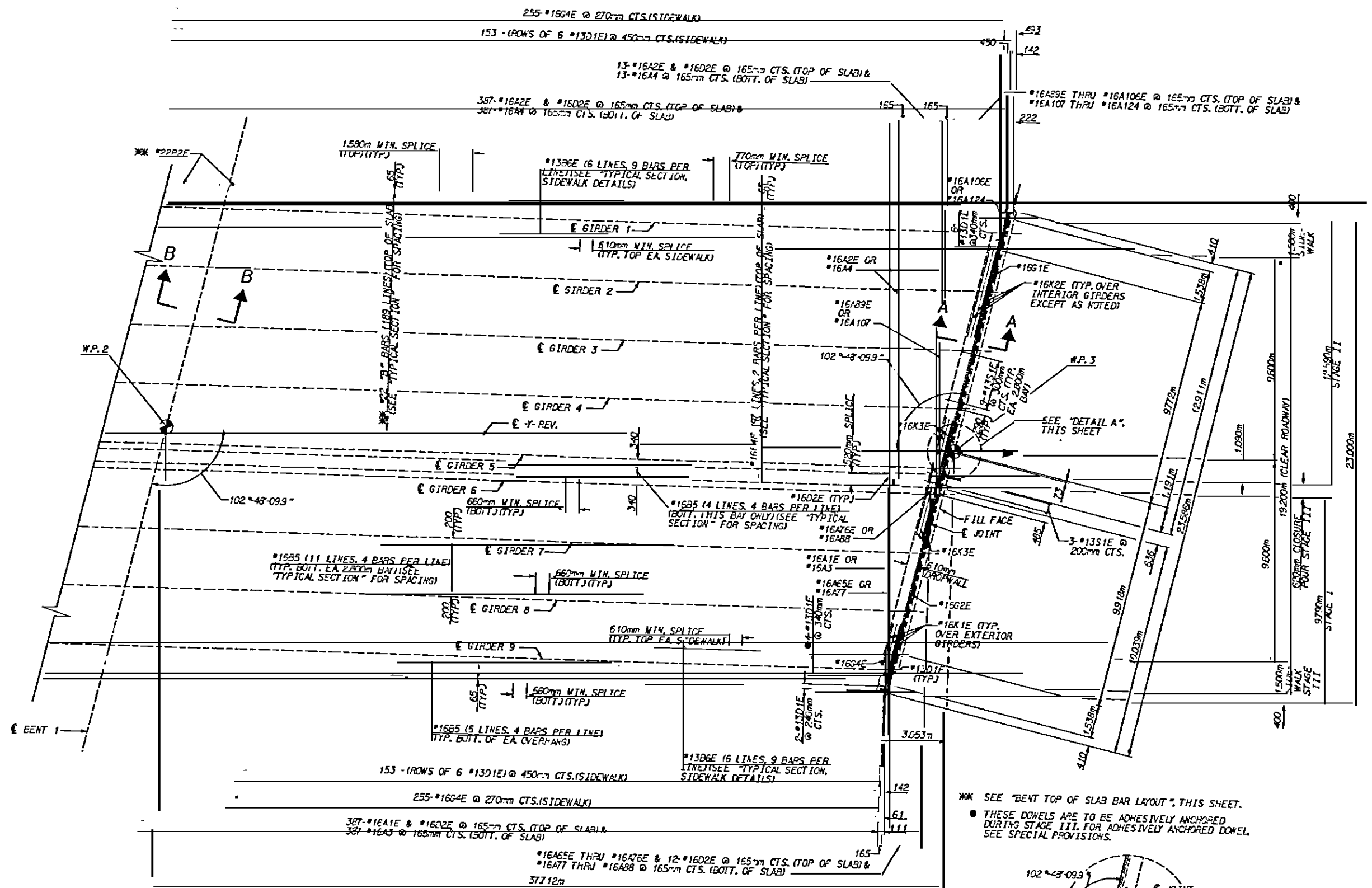
PLAN OF SPAN "A"

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RD00K
**SUPERSTRUCTURE
 PLAN OF SPAN "A"
 STAGE I, II & III**

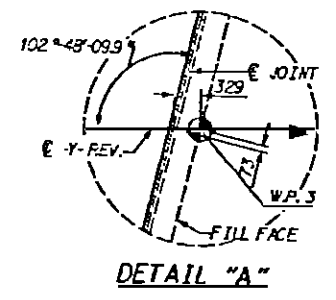
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| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | 8-6 |
| 2 | | | 2 | | | 30 |

DRAWN BY: J. J. [unclear] DATE: 9-97
 CHECKED BY: F. S. [unclear] DATE: 11-1-97

NOTE:
 *16 "C" BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STRIPUPS.



* SEE "BENT TOP OF SLAB BAR LAYOUT", THIS SHEET.
 • THESE DOWELS ARE TO BE ADHESIVELY ANCHORED DURING STAGE III. FOR ADHESIVELY ANCHORED DOWEL SEE SPECIAL PROVISIONS.



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701-L

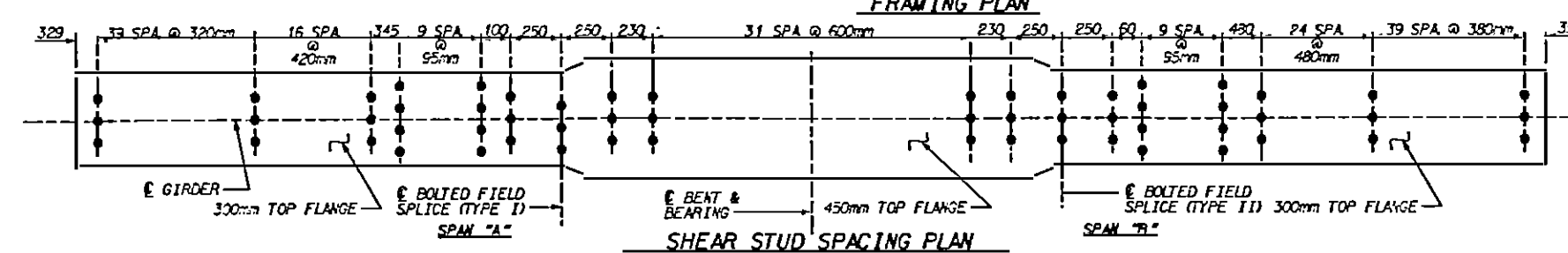
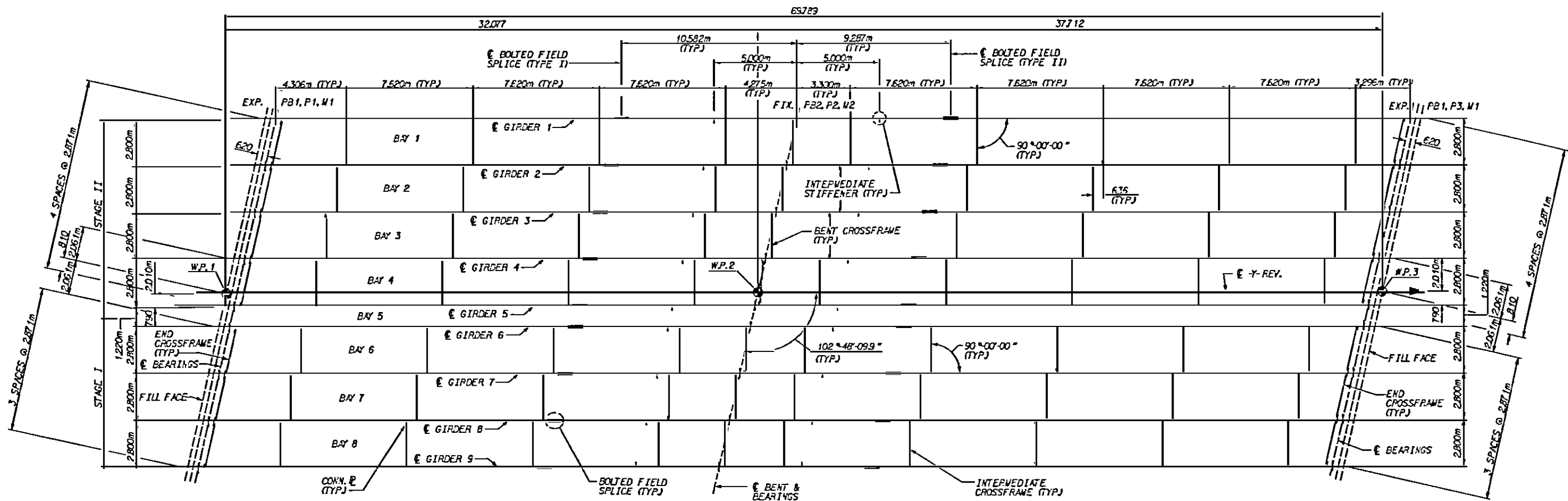
NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Wetherill Associates, Inc.
 Consulting Engineers
 8/1/99

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN "B"
 STAGE I, II & III

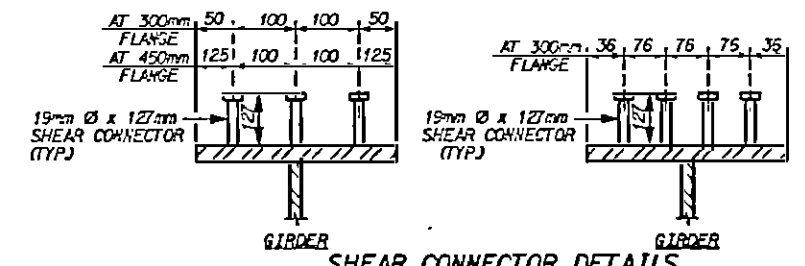
DRAWN BY: D. L. WILSON DATE: 9-9-97
 CHECKED BY: E. G. WETHERILL DATE: 11-11-97

| REVISIONS | | | | | |
|-----------|----|------|-----|----|------|
| NO. | BY | DATE | NO. | BY | DATE |
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| 2 | | | 2 | | |

SHEET
 6-7
 OF
 30 SHEETS



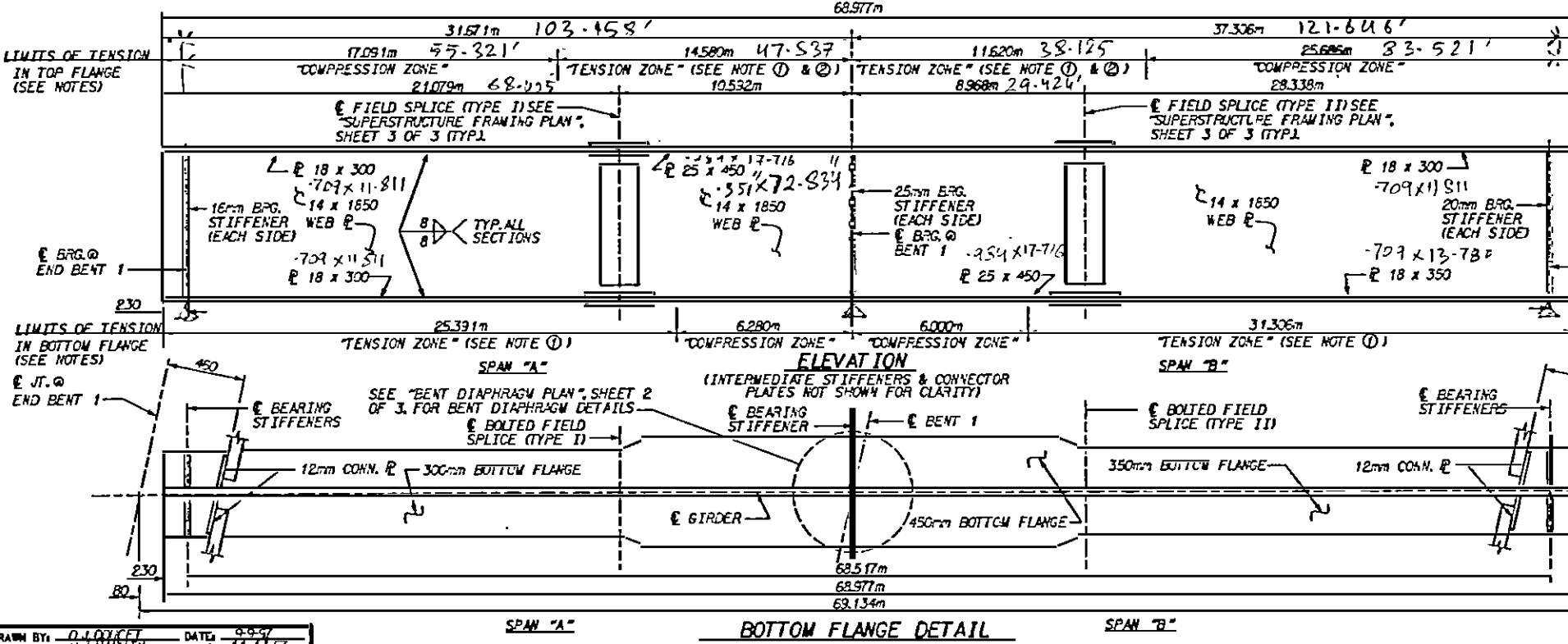
NOTES:
 PB1 AND PB2 DENOTES POT BEARINGS, P1 THRU P3 DENOTES SOLE PLATES AND M1 AND M2 DENOTES MASONRY PLATES. SEE "POT BEARING DETAILS" SHEETS.



NOTES:
 ① CHAPPY V-NOTCH TESTS WILL BE REQUIRED FOR TOP OR BOTTOM FLANGE PLATE WHICH FALLS WITHIN THESE LIMITS. ALSO, CHAPPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL WEB PLATES, WEB SPLICE AND FLANGE SPLICE PLATES. FOR CHAPPY V-NOTCH TESTS, SEE SPECIAL PROVISIONS.
 IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHAPPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE.
 ② NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-
 SHEET 1 OF 3



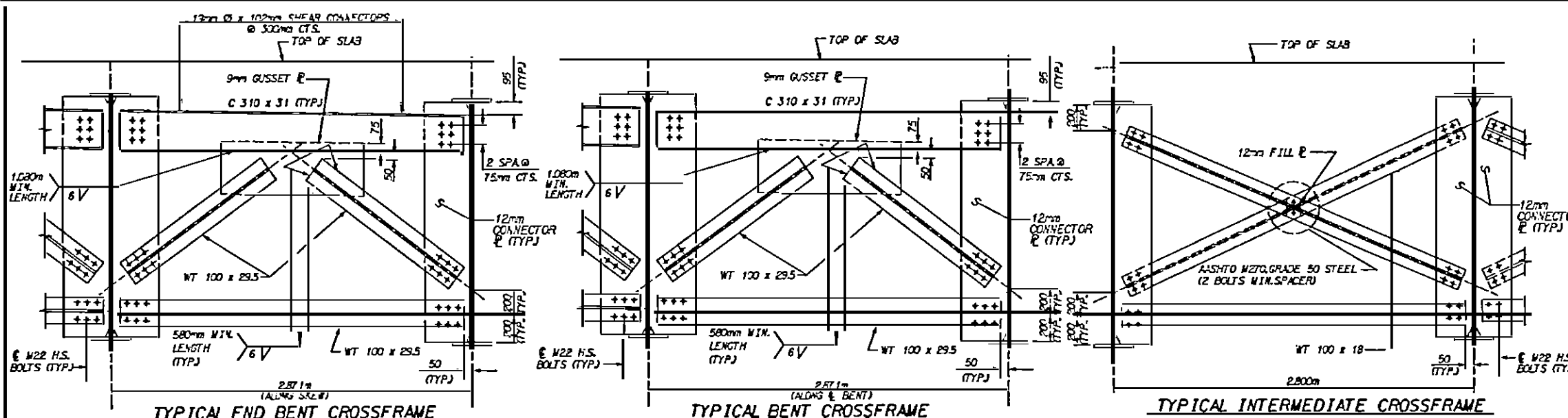
DRAWN BY: D. LOVACE DATE: 8-9-97
 CHECKED BY: H. L. WILSON DATE: 11-11-97

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALPH
 SUPERSTRUCTURE
 FRAMING PLAN AND
 GIRDER DETAILS FOR
 SPANS "A" & "B"
 STAGE I & II

8/1/99
 Wetherill Associates, Inc.
 Consulting Engineers

| REVISIONS | | | | | | SHEET NO. S-8 |
|-----------|----|------|-----|----|------|--------------------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | TOTAL SHEETS 30 |
| 2 | | | 2 | | | |

GN12812.STR.FRAMP.LANDEN (125)



STRUCTURAL STEEL NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 345W AND PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE W22 HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB, UNLESS OTHERWISE NOTED ON THE PLANS.

MAIN TENSION MEMBERS SHALL BE CVN IMPACT TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIAL PROVISIONS. FOR THE PURPOSE OF IMPACT TESTING, THE FOLLOWING PLATES SHALL BE CLASSIFIED AS MAIN TENSION MEMBERS.

- ALL FLANGE PLATES WHICH FALL WITHIN THE "TENSION ZONE", SEE FRAMING PLANS.
- ALL WEB PLATES
- ALL GIRDER SPLICE PLATES
- ALL CONNECTOR PLATES AT CROSSFRAMES
- ALL CROSSFRAME COMPONENTS.

FOR CHARPY V-NOTCH TESTS, SEE SPECIAL PROVISIONS.

CAMBERED GIRDER LENGTHS SHALL BE ADJUSTED AND BEARINGS ARE TO BE PLACED ON THE CAMBERED GIRDER SO AS TO BE ALIGNED WITH THE ANCHORS AFTER THE DEAD LOAD DEFLECTION HAS OCCURRED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

ALL CONNECTOR PLATES AT CROSSFRAMES SHALL BE PLACED IN PAIRS EXCEPT AT EXTERIOR GIRDERS WHERE THEY WILL BE PLACED ON THE INSIDE FACE ONLY.

ALL INTERMEDIATE STIFFENERS SHALL BE PLACED ON ONE SIDE ONLY. STIFFENERS ON EXTERIOR GIRDERS SHALL BE ON THE INSIDE FACE.

ENDS OF THE CONTINUOUS PLATE GIRDERS SHALL BE PLUMB.

INTERMEDIATE STIFFENERS AND INTERMEDIATE CROSSFRAME CONNECTOR PLATES SHALL BE PLACED NORMAL TO THE GIRDER FLANGES AND WEB.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 18 METERS AND WEB PIECE LENGTHS TO 14 METERS. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 4.5 METERS OF MAXIMUM DEAD LOAD DEFLECTION (NOT WITHIN 4.5 METERS OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 610mm MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 150mm MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICE.

SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED UP TO 25mm IF NECESSARY TO CLEAR FLANGE SPLICE WELDS.

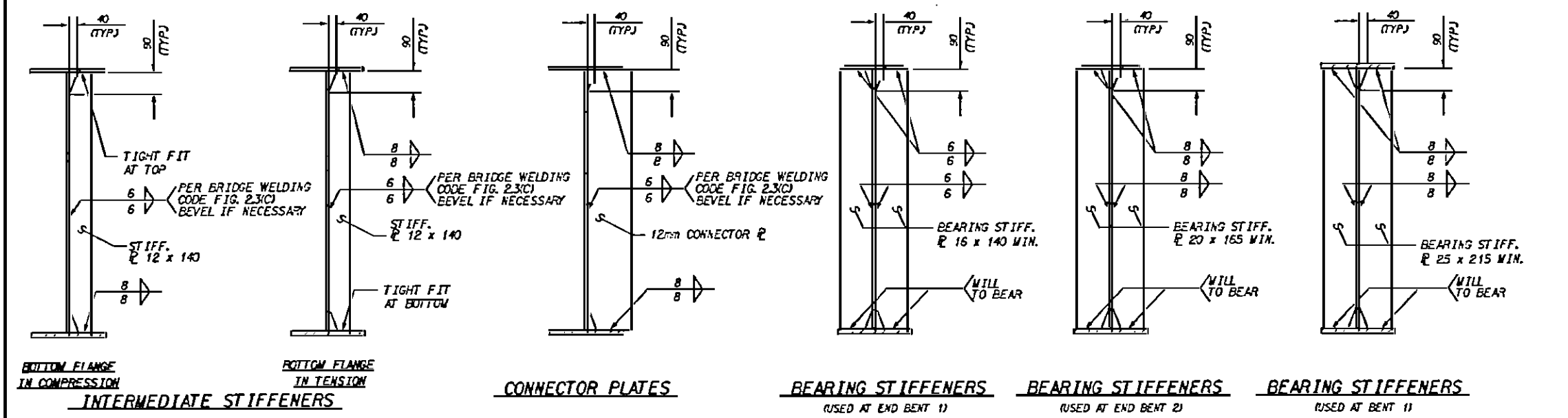
IN LIEU OF THE TURN OF THE NUT METHOD, TENSION ON A325W BOLTS MAY BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

FOR SURFACE PREPARATION OF UNPAINTED STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR RADIOGRAPHIC TESTING OF BUTT WELDS, SEE SPECIAL PROVISIONS.

FOR SHEAR STUDS, SEE SPECIAL PROVISIONS.

STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF EXTERIOR GIRDERS.



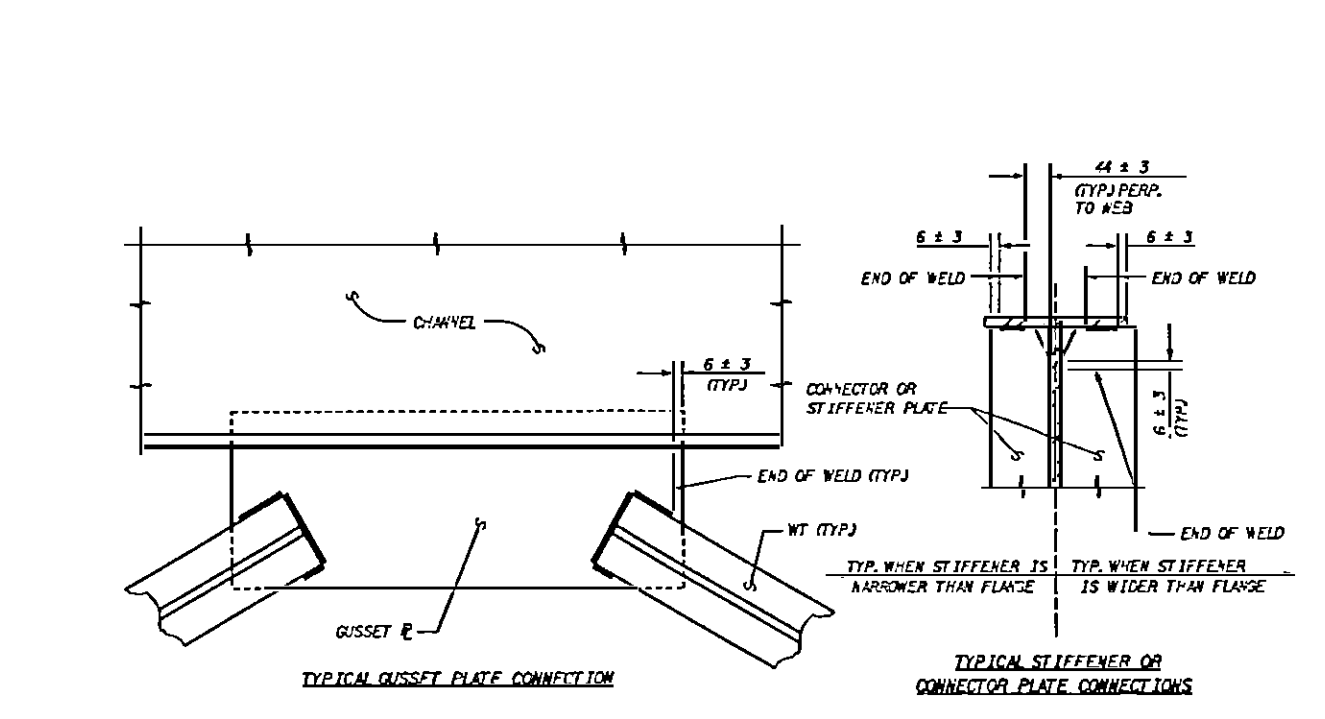
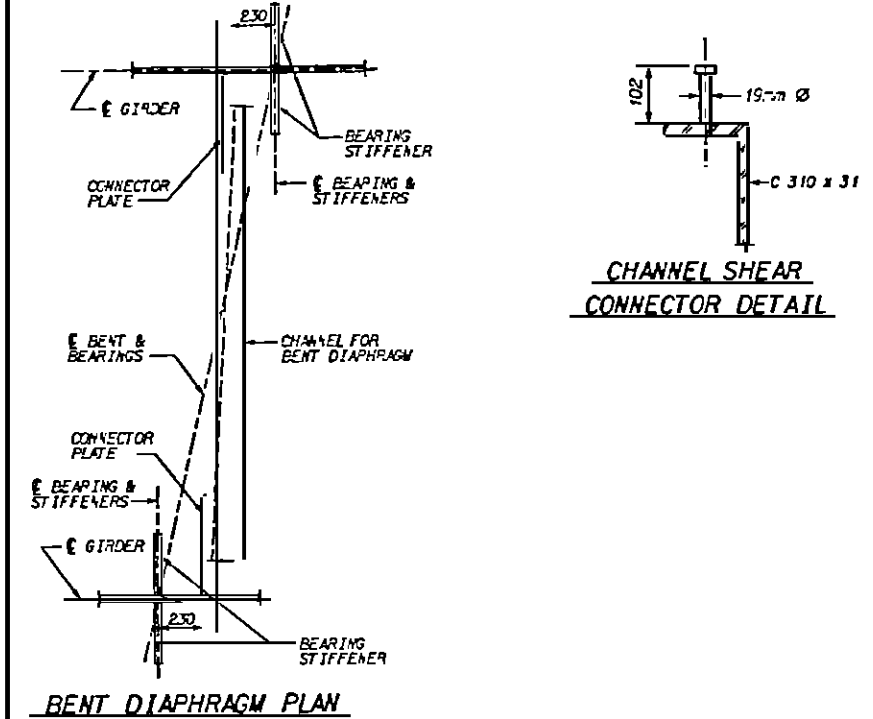
INTERMEDIATE STIFFENERS

CONNECTOR PLATES

BEARING STIFFENERS (USED AT END BENT 1)

BEARING STIFFENERS (USED AT END BENT 2)

BEARING STIFFENERS (USED AT BENT 1)



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-
 SHEET 2 OF 3.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Raleigh

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 Consulting Engineers

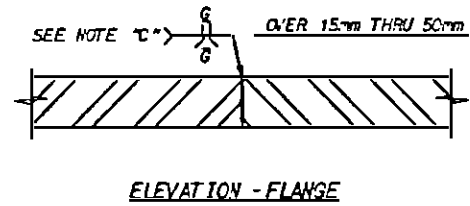
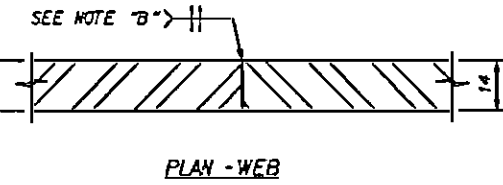
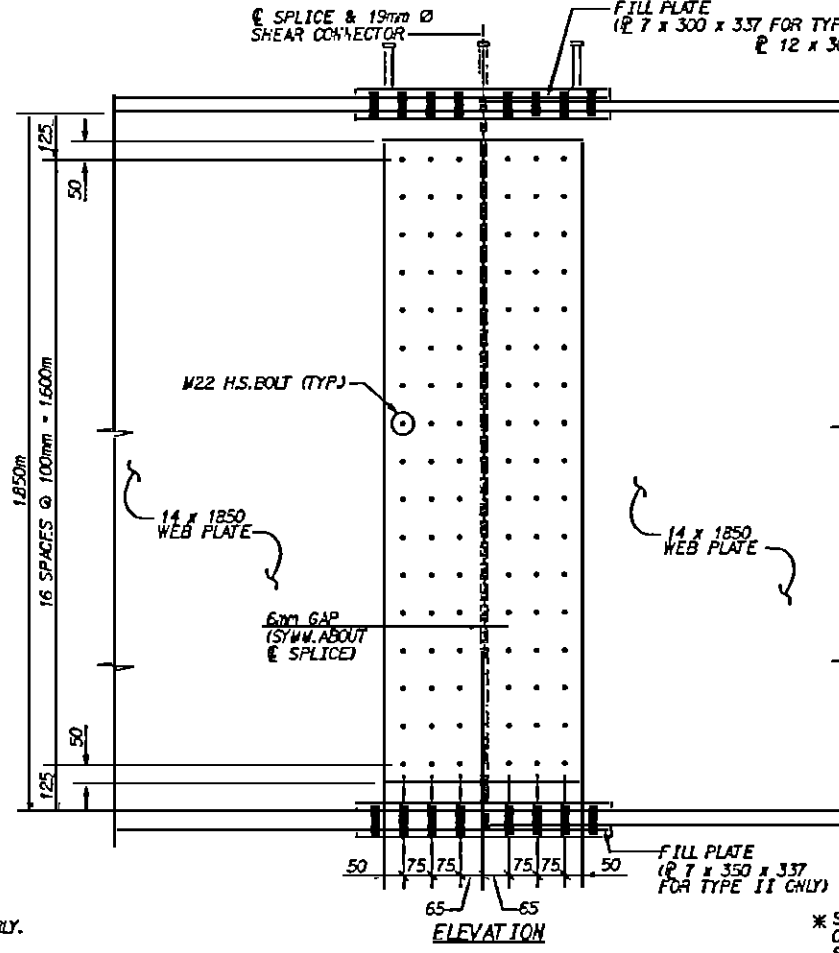
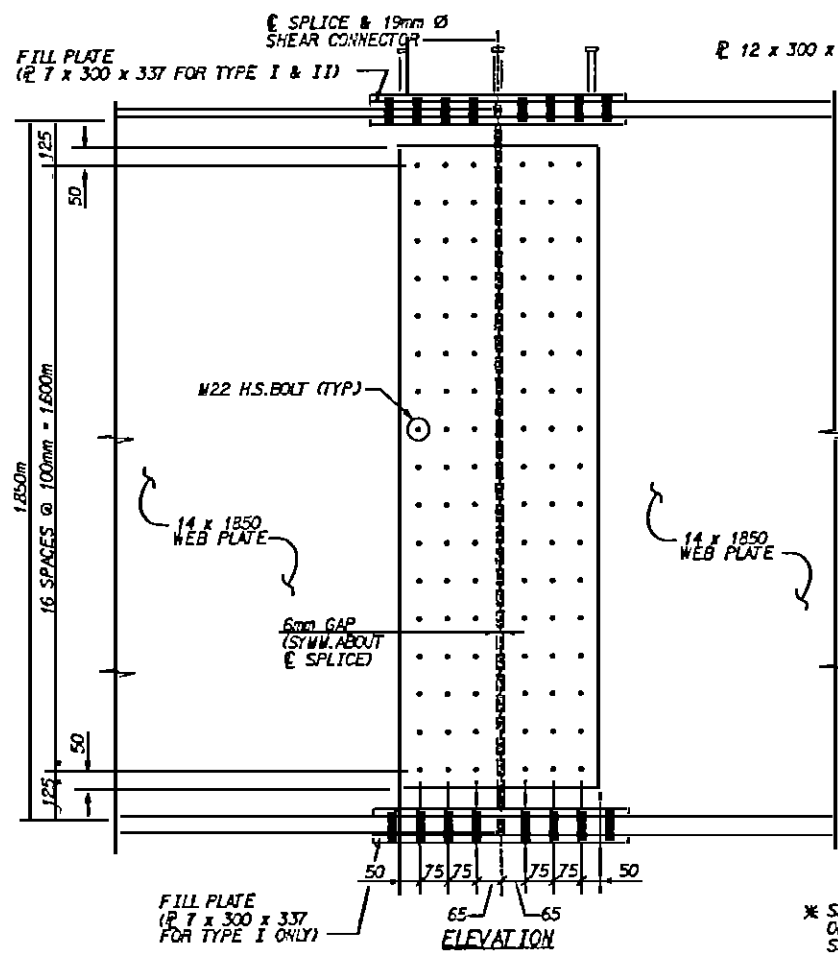
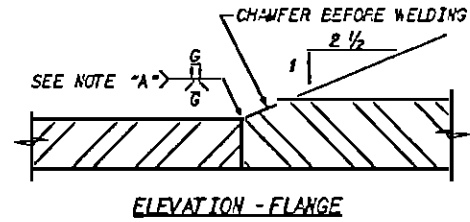
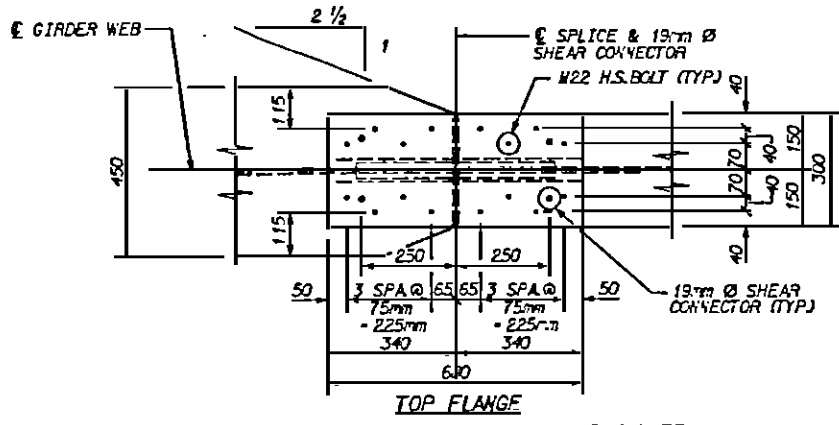
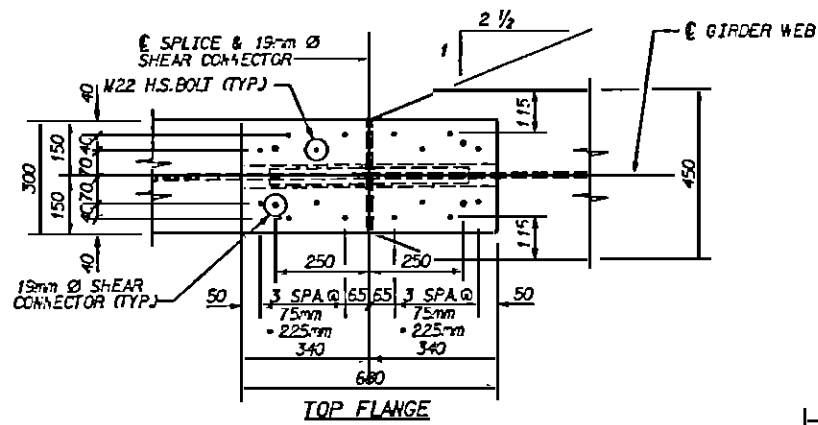
8/1/99

SUPERSTRUCTURE FRAMING PLAN AND GIRDER DETAILS FOR SPANS "A" & "B" STAGE I & II

| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|------------------------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | S-9 TOTAL SHEETS 30 |
| 2 | | | 2 | | | |

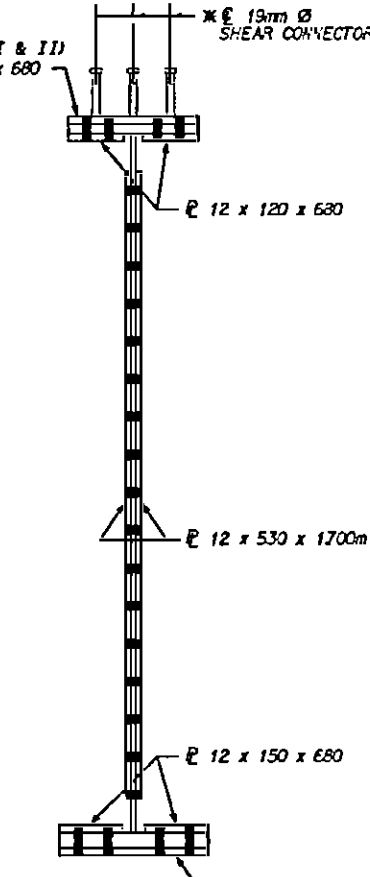
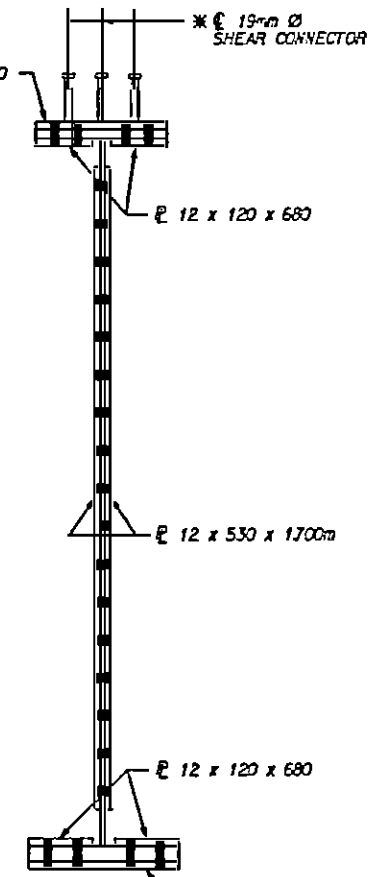
DRAWN BY: D. LOCKETT DATE: 9-9-97
 CHECKED BY: R.L. MERRILL DATE: 11-11-97

CA12812.STRN.STEEL.1.DGN (20)



- NOTES:
 A. SHOP FLANGE SPLICE - TYP. BOTH TOP AND BOTTOM FLANGES.
 B. PERMISSIBLE SHOP WEB SPLICE - GRIND SMOOTH AND FLUSH ON OUTSIDE FACE OF EXTERIOR GIRDERS.
 C. PERMISSIBLE FLANGE SPLICE - TYP. BOTH TOP AND BOTTOM FLANGES.

SHOP SPLICE DETAILS

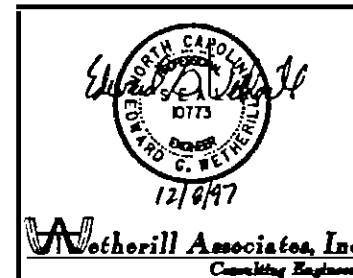


PROJECT NO. I-2812

JOHNSTON COUNTY

STATION: 18+91701 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALPH
**SUPERSTRUCTURE
 FRAMING PLAN AND
 GIRDER DETAILS FOR
 SPANS "A" & "B"**

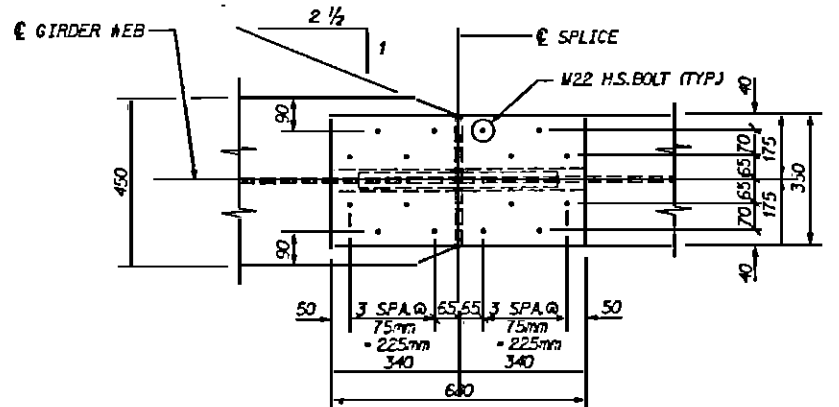
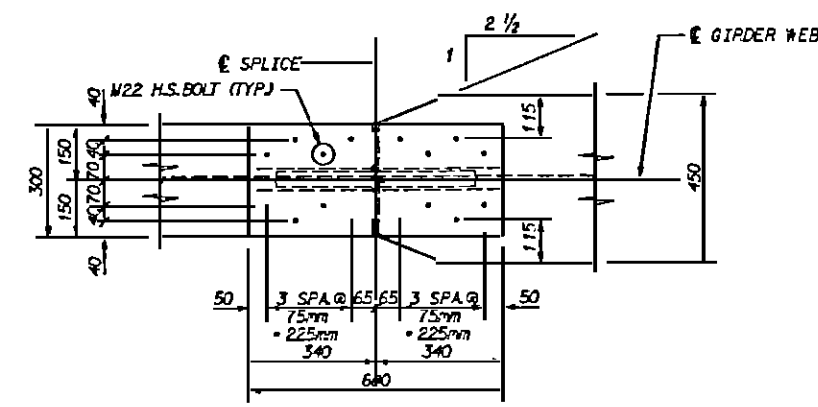
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|-----------|----|------|-----|----|------|--------------------|
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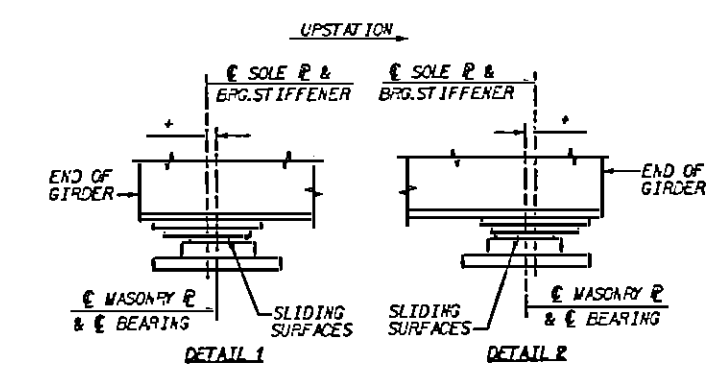
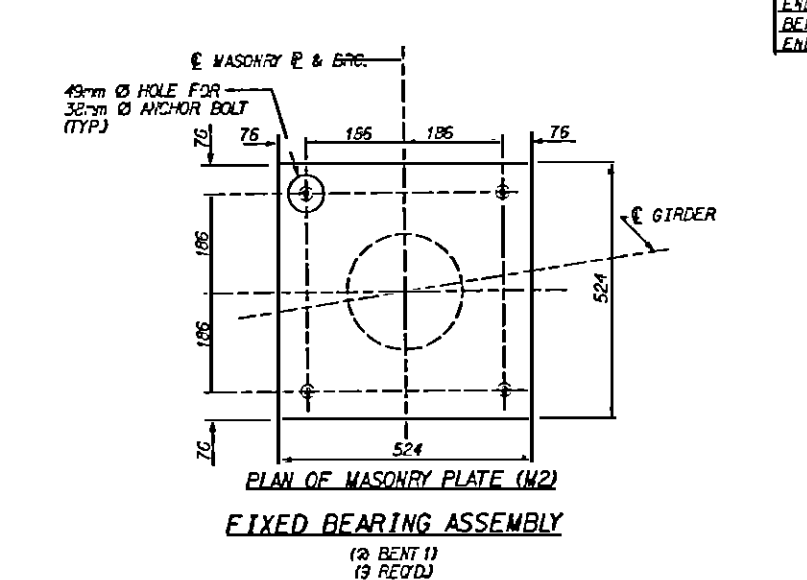
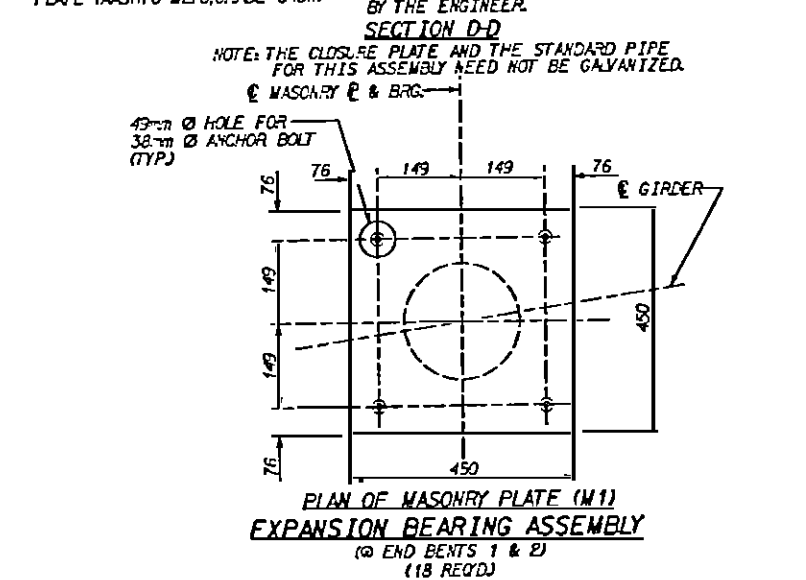
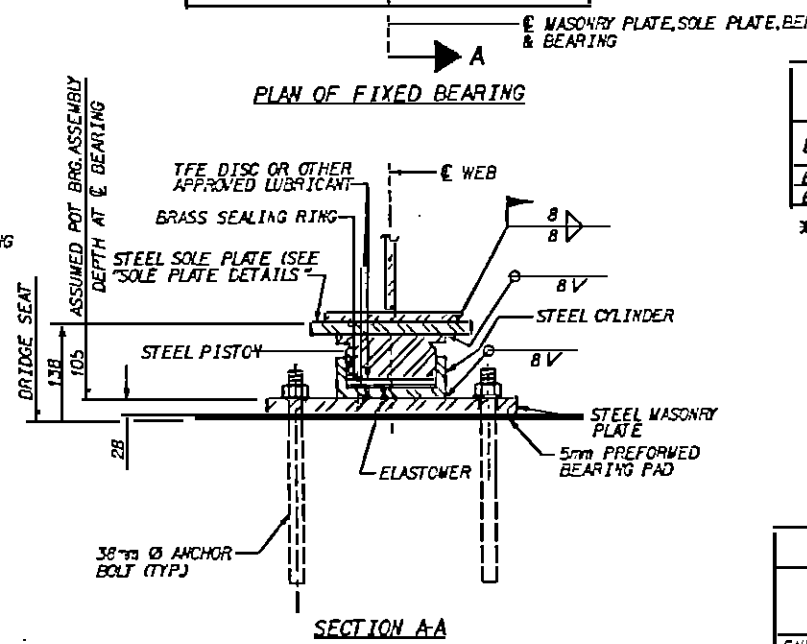
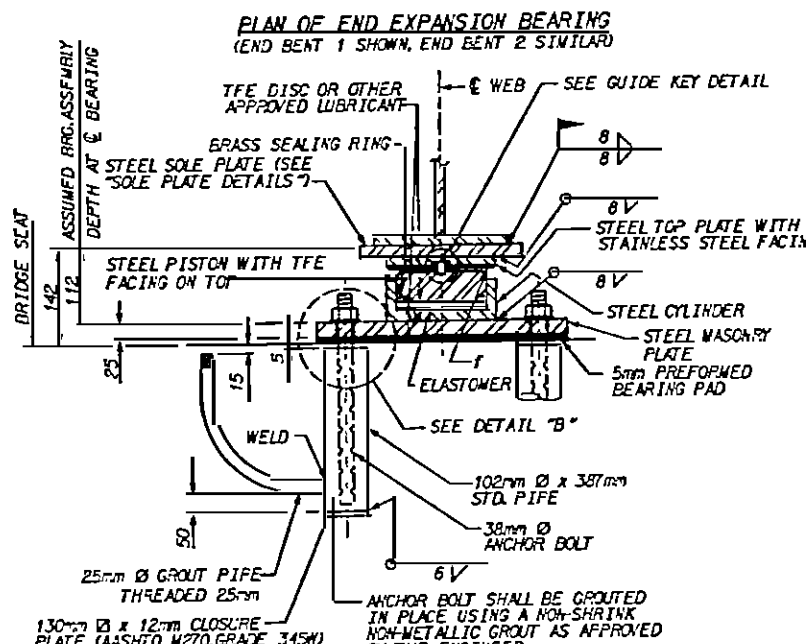
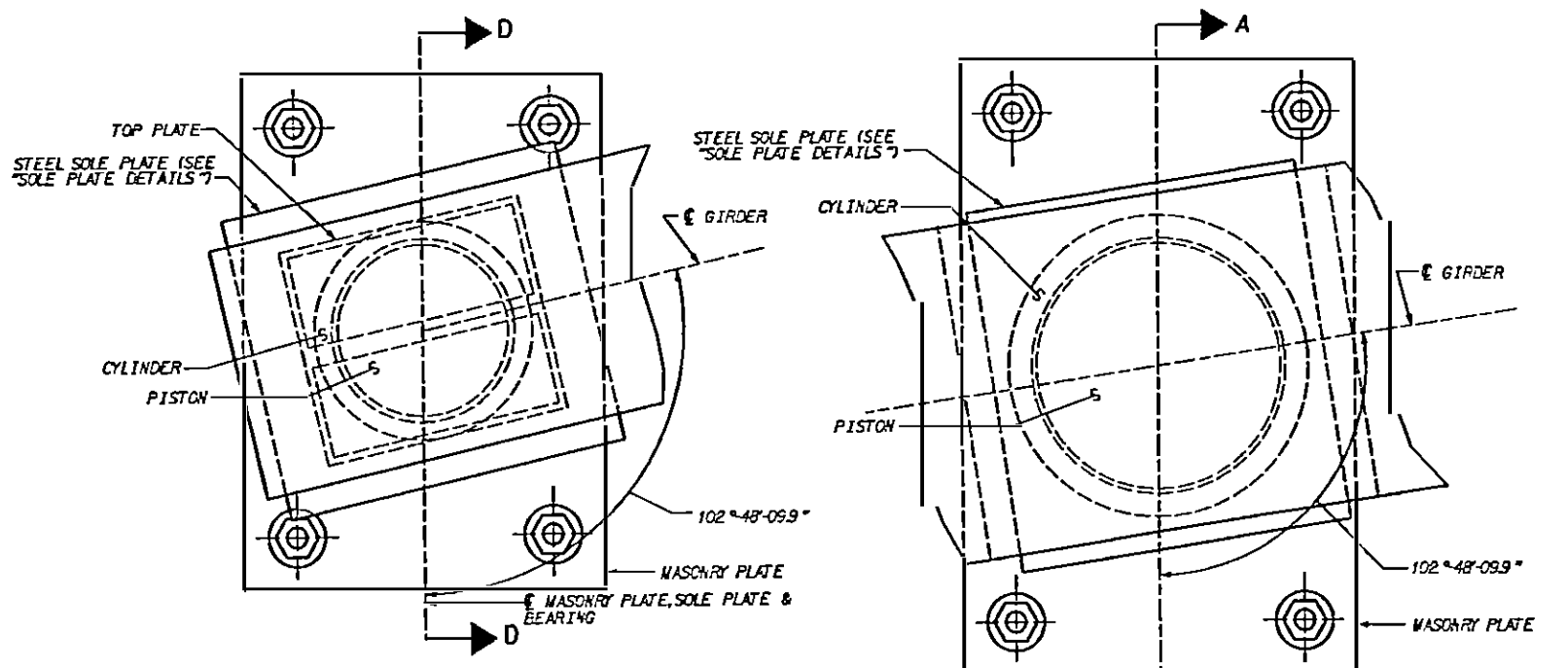
C:\2812\STRS\STEEL2.DGN (10)

DRAWN BY: D.J. DUFFY DATE: 9-2-97
 CHECKED BY: H.J. WARDEN DATE: 11-11-97

FIELD SPLICE DETAILS-TYPE I

FIELD SPLICE DETAILS-TYPE II





**-TABLE FOR PLATE SETTING DATA (mm)-
(EXPANSION POT BEARINGS)**

| BEARING LOCATION | SEE DETAIL NUMBER | TEMPERATURE @ TIME OF SETTING | | | % |
|------------------|-------------------|-------------------------------|-------|-------|----|
| | | 0° C | 16° C | 32° C | |
| END BENT 1 | 1 | -8 | 0 | +8 | +3 |
| END BENT 2 | 2 | -9 | 0 | +9 | +9 |

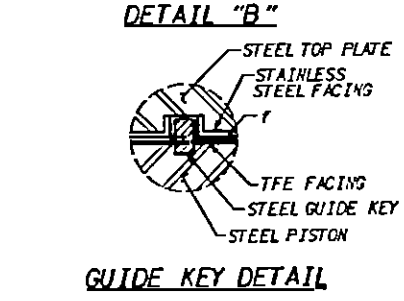
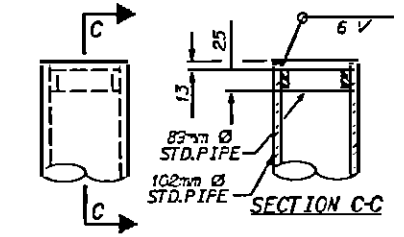
* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

-ANCHOR BOLT TABLE-

| BEARING LOCATION | NUMBER OF ANCHOR BOLTS | LENGTH (mm) | DIAMETER (mm) |
|------------------|------------------------|-------------|---------------|
| END BENT 1 | 35 | 480 | 38 |
| BENT 1 | 35 | 480 | 38 |
| END BENT 2 | 35 | 480 | 38 |

-TABLE FOR LOADS AND MOVEMENTS-

| BEARING LOCATION | BEARING TYPE | VERT. LOAD (KN) | | | LATERAL LOAD (KN) | TOTAL MOVEMENT (mm) |
|------------------|--------------|-----------------|------|-------|-------------------|---------------------|
| | | DL | LL+I | TOTAL | | |
| END BENT 1 | EXP. | 281 | 256 | 537 | 60 | 31 |
| BENT 1 | FIXED | 1175 | 424 | 1599 | 235 | 0 |
| END BENT 2 | EXP. | 377 | 260 | 637 | 60 | 37 |



NOTES
FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT IN SPANS "A" AND "B", NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURIED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 121°C. TEMPERATURE ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK OR FORMS ARE PLACED.

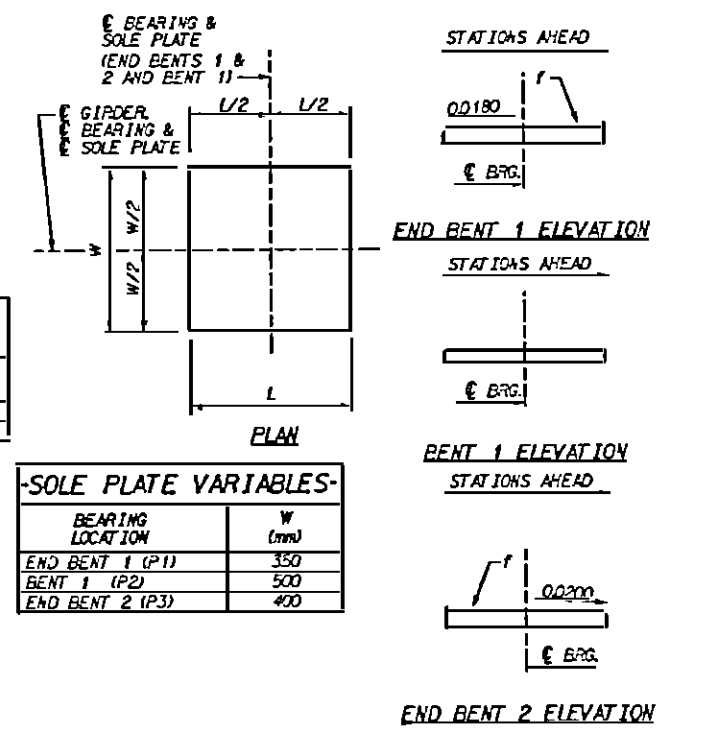
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR THERMAL SPRAYED COATINGS, METALLIZATION, SEE SPECIAL PROVISIONS.

FOR PROJECTION OF ANCHOR BOLTS, SEE BENT SHEETS.

AT THE CONTRACTOR'S OPTION, POT BEARING DETAILS OTHER THAN THOSE SHOWN MAY BE SUBMITTED FOR APPROVAL.



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 POT
 BEARING DETAILS**

Edward G. Wetherill
 KOTTS
 8/6/99
 Wetherill Associates, Inc.
 Consulting Engineers

REVISIONS

| NO. | BY | DATE | NO. | BY | DATE |
|-----|----|------|-----|----|------|
| 1 | | | 1 | | |
| 2 | | | 2 | | |

DESIGN: S-11
 TOTAL SHEETS: 30

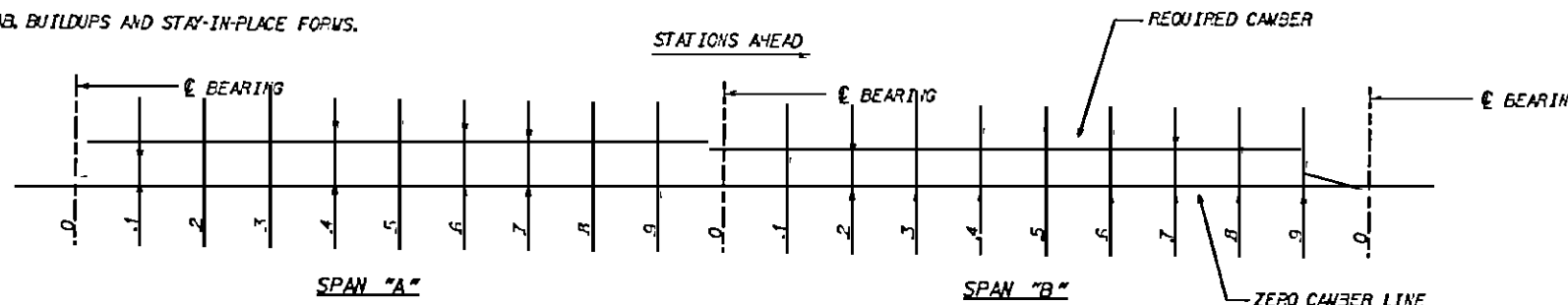
| DEAD LOAD DEFLECTION TABLE FOR GIRDERS 1 AND 9 | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| TENTH POINTS | SPAN "A" | | | | | | | | | | | SPAN "B" | | | | | | | | | | | |
| | 0 | .1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | |
| DEFLECTION DUE TO WEIGHT OF GIRDER (m) | 0 | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.004 | 0.006 | 0.008 | 0.009 | 0.010 | 0.009 | 0.007 | 0.004 | 0 | |
| DEFLECTION DUE TO WEIGHT OF SLAB (m)* | 0 | 0.006 | 0.011 | 0.013 | 0.014 | 0.012 | 0.009 | 0.005 | 0.001 | -0.001 | 0 | 0 | 0 | 0.007 | 0.017 | 0.028 | 0.039 | 0.045 | 0.045 | 0.042 | 0.034 | 0.017 | 0 |
| DEFLECTION DUE TO WEIGHT OF SIDEWALK AND 3 BAR METAL RAIL (m) | 0 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.003 | 0.004 | 0.006 | 0.006 | 0.006 | 0.006 | 0.004 | 0.002 | 0 |
| TOTAL DEAD LOAD DEFLECTION (m) | 0 | 0.008 | 0.015 | 0.018 | 0.019 | 0.017 | 0.013 | 0.007 | 0.001 | -0.001 | 0 | 0 | 0 | 0.009 | 0.024 | 0.038 | 0.053 | 0.060 | 0.062 | 0.067 | 0.064 | 0.062 | 0 |
| VERTICAL CURVE ORDINATE (m) | 0 | 0.025 | 0.044 | 0.058 | 0.066 | 0.068 | 0.066 | 0.058 | 0.044 | 0.025 | 0 | 0 | 0 | 0.034 | 0.061 | 0.080 | 0.091 | 0.095 | 0.091 | 0.080 | 0.061 | 0.034 | 0 |
| REQUIRED CAMBER (mm) | 0 | 33 | 59 | 76 | 85 | 85 | 79 | 65 | 45 | 24 | 0 | 0 | 43 | 85 | 118 | 144 | 155 | 153 | 137 | 103 | 57 | 0 | |

| DEAD LOAD DEFLECTION TABLE FOR GIRDERS 2, 3, 7 AND 8 | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| TENTH POINTS | SPAN "A" | | | | | | | | | | | SPAN "B" | | | | | | | | | | | |
| | 0 | .1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | |
| DEFLECTION DUE TO WEIGHT OF GIRDER (m) | 0 | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.004 | 0.006 | 0.008 | 0.009 | 0.010 | 0.009 | 0.007 | 0.004 | 0 | |
| DEFLECTION DUE TO WEIGHT OF SLAB (m)* | 0 | 0.007 | 0.012 | 0.014 | 0.015 | 0.013 | 0.009 | 0.005 | 0.001 | -0.001 | 0 | 0 | 0 | 0.008 | 0.018 | 0.031 | 0.042 | 0.049 | 0.049 | 0.045 | 0.034 | 0.018 | 0 |
| DEFLECTION DUE TO WEIGHT OF SIDEWALK AND 3 BAR METAL RAIL (m) | 0 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.003 | 0.004 | 0.005 | 0.006 | 0.006 | 0.006 | 0.004 | 0.002 | 0 |
| TOTAL DEAD LOAD DEFLECTION (m) | 0 | 0.009 | 0.016 | 0.019 | 0.020 | 0.018 | 0.013 | 0.007 | 0.001 | -0.001 | 0 | 0 | 0 | 0.010 | 0.025 | 0.041 | 0.055 | 0.061 | 0.065 | 0.065 | 0.064 | 0.062 | 0 |
| VERTICAL CURVE ORDINATE (m) | 0 | 0.025 | 0.044 | 0.058 | 0.066 | 0.068 | 0.066 | 0.058 | 0.044 | 0.025 | 0 | 0 | 0 | 0.034 | 0.061 | 0.080 | 0.091 | 0.095 | 0.091 | 0.080 | 0.061 | 0.034 | 0 |
| REQUIRED CAMBER (mm) | 0 | 34 | 60 | 77 | 86 | 86 | 79 | 65 | 45 | 24 | 0 | 0 | 44 | 86 | 121 | 146 | 159 | 156 | 133 | 106 | 59 | 0 | |

| DEAD LOAD DEFLECTION TABLE FOR GIRDER 4 | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| TENTH POINTS | SPAN "A" | | | | | | | | | | | SPAN "B" | | | | | | | | | | | |
| | 0 | .1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | |
| DEFLECTION DUE TO WEIGHT OF GIRDER (m) | 0 | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.004 | 0.006 | 0.008 | 0.009 | 0.010 | 0.009 | 0.007 | 0.004 | 0 | |
| DEFLECTION DUE TO WEIGHT OF SLAB (m)* | 0 | 0.007 | 0.012 | 0.014 | 0.015 | 0.013 | 0.009 | 0.005 | 0.001 | -0.001 | 0 | 0 | 0 | 0.008 | 0.018 | 0.031 | 0.042 | 0.049 | 0.049 | 0.045 | 0.034 | 0.018 | 0 |
| DEFLECTION DUE TO WEIGHT OF SIDEWALK AND 3 BAR METAL RAIL (m) | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0 |
| TOTAL DEAD LOAD DEFLECTION (m) | 0 | 0.008 | 0.014 | 0.017 | 0.018 | 0.016 | 0.011 | 0.006 | 0.001 | -0.001 | 0 | 0 | 0 | 0.009 | 0.022 | 0.037 | 0.050 | 0.058 | 0.063 | 0.064 | 0.064 | 0.062 | 0 |
| VERTICAL CURVE ORDINATE (m) | 0 | 0.025 | 0.044 | 0.058 | 0.066 | 0.068 | 0.066 | 0.058 | 0.044 | 0.025 | 0 | 0 | 0 | 0.034 | 0.061 | 0.080 | 0.091 | 0.095 | 0.091 | 0.080 | 0.061 | 0.034 | 0 |
| REQUIRED CAMBER (mm) | 0 | 33 | 58 | 75 | 84 | 84 | 77 | 64 | 45 | 24 | 0 | 0 | 43 | 83 | 117 | 141 | 153 | 150 | 134 | 102 | 55 | 0 | |

| DEAD LOAD DEFLECTION TABLE FOR GIRDERS 5 AND 6 | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| TENTH POINTS | SPAN "A" | | | | | | | | | | | SPAN "B" | | | | | | | | | | | |
| | 0 | .1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | |
| DEFLECTION DUE TO WEIGHT OF GIRDER (m) | 0 | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0 | 0 | 0 | 0.001 | 0.004 | 0.006 | 0.008 | 0.009 | 0.010 | 0.009 | 0.007 | 0.004 | 0 | |
| DEFLECTION DUE TO WEIGHT OF SLAB (m)* | 0 | 0.005 | 0.009 | 0.011 | 0.011 | 0.009 | 0.007 | 0.004 | 0.001 | -0.001 | 0 | 0 | 0 | 0.006 | 0.013 | 0.023 | 0.031 | 0.036 | 0.037 | 0.033 | 0.025 | 0.013 | 0 |
| DEFLECTION DUE TO WEIGHT OF SIDEWALK AND 3 BAR METAL RAIL (m) | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0 |
| TOTAL DEAD LOAD DEFLECTION (m) | 0 | 0.006 | 0.011 | 0.014 | 0.014 | 0.012 | 0.009 | 0.005 | 0.001 | -0.001 | 0 | 0 | 0 | 0.007 | 0.017 | 0.029 | 0.039 | 0.045 | 0.047 | 0.042 | 0.032 | 0.017 | 0 |
| VERTICAL CURVE ORDINATE (m) | 0 | 0.025 | 0.044 | 0.058 | 0.066 | 0.068 | 0.066 | 0.058 | 0.044 | 0.025 | 0 | 0 | 0 | 0.034 | 0.061 | 0.080 | 0.091 | 0.095 | 0.091 | 0.080 | 0.061 | 0.034 | 0 |
| REQUIRED CAMBER (mm) | 0 | 31 | 55 | 72 | 80 | 80 | 75 | 63 | 45 | 24 | 0 | 0 | 41 | 78 | 109 | 130 | 140 | 138 | 122 | 93 | 51 | 0 | |

NOTES:
 ALL DIMENSIONS ARE SHOWN IN METERS EXCEPT FINAL CAMBER IS SHOWN IN MILLIMETERS.
 VALUES ARE SHOWN AT TENTH POINTS BETWEEN BEARINGS.
 SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 * DENOTES INCLUSION OF SLAB, BUILDUPS AND STAY-IN-PLACE FORMS.



S-12 SCHEMATIC CAMBER ORDINATES



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 L-

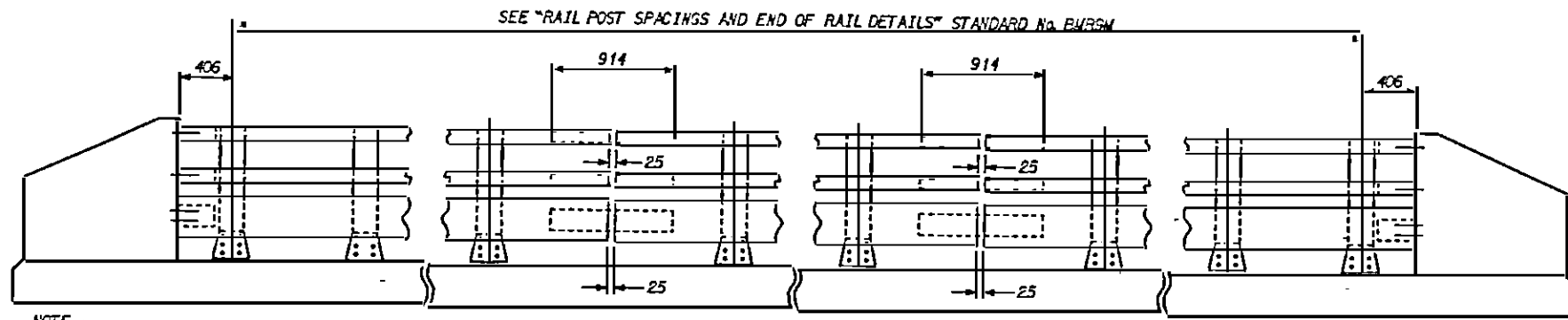
Wetherill Associates, Inc.
 Consulting Engineers

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Raleigh

**SUPERSTRUCTURE
 DEAD LOAD DEFLECTIONS
 FOR GIRDERS**

| REVISIONS | | | | | | SHEET NO. S-12 |
|-----------|----|------|-----|----|------|--------------------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 1 | | | TOTAL SHEETS 30 |
| 2 | | | 2 | | | |

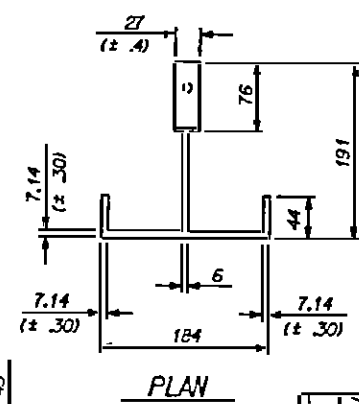
DRAWN BY: D. LOCKET DATE: 9-9-97
 CHECKED BY: J.A. O'DONNELL DATE: 9-2-97



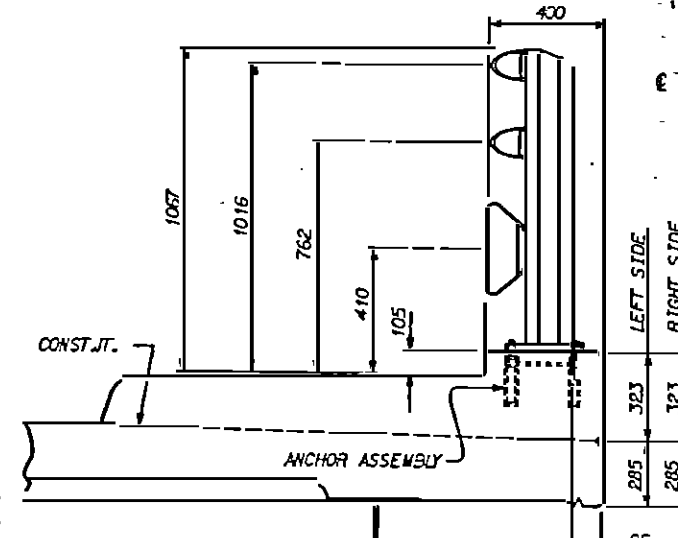
ELEVATION

NOTE 1
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE
"RAIL POST SPACINGS AND END OF RAIL DETAILS"
STD. No. BWR2M

| EXP. AT @ BENT | RAIL OPENING |
|-------------------|-----------------|
| BENT No. 1 | |
| BENT No. 2 | |
| BENT No. 3 | |



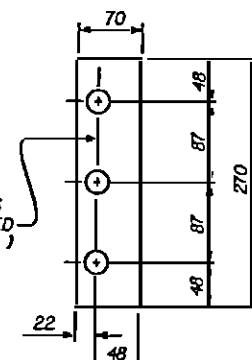
PLAN



SECTION THRU RAIL

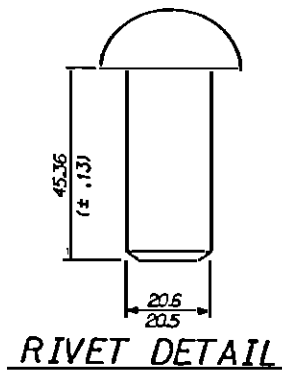
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL"
STD. No. BWR7M

REAR PLATE

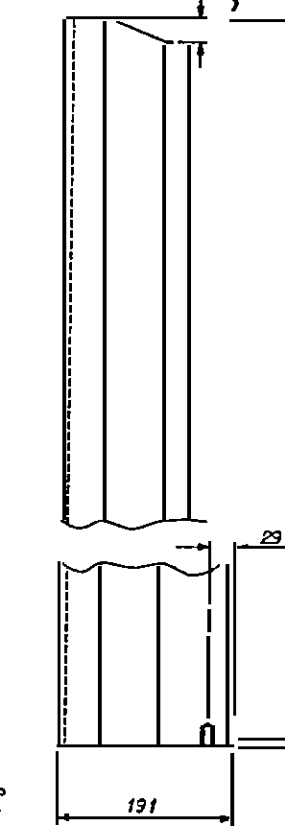


FRONT PLATE
SHIM DETAILS

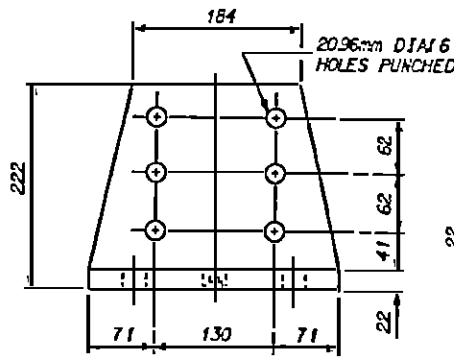
NOTE 1
SHIMS MAY BE CUT ALONG PERMITTED OUTLINE OR
SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



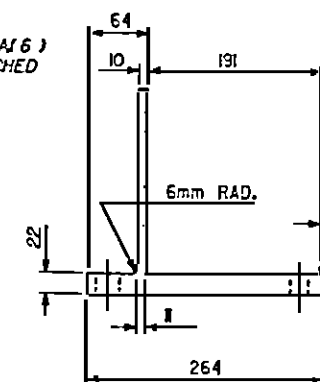
RIVET DETAIL



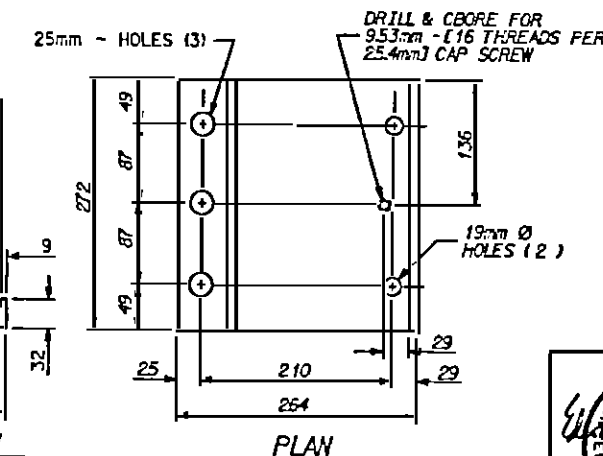
SIDE ELEVATION



FRONT ELEVATION



SIDE ELEVATION



PLAN

POST BASE DETAILS

20.96mm DIA (6) HOLES PUNCHED FOR RIVETS
8mm DIADRILL 25mm DEEP & 9.53mm - (16 THREADS PER 25.4mm) TAP 22mm DEEP FOR 9.53mm - (16 THREADS PER 25.4mm) TAP X 39mm STAINLESS STEEL CAP SCREW

FRONT ELEVATION
DETAILS OF POST

ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
CHECKED BY: H.L. MARVIN DATE: 11-11-97
DRAWN BY: JMB 1/88 REV. 5/6/97 EEM/RGR
CHECKED BY: CCH 1/88

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS. HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B-316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTT HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING. THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY. MATERIAL FOR SHIMS TO BE ASTM B-209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS: POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS; AASHTO M270 GRADE 250 GRADE STRUCTURAL STEEL - GALVANIZED TO ASTM A-123. RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A-502 FOR GRADE 1 RIVETS. THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-61. SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-570M FOR GRADE 230 OR A-611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123. RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A-245 GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.

GENERAL NOTES

- RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPliced AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPlice JUST BEYOND THE 3RD RAIL POST FROM EACH END, GENERALLY APPROXIMATELY 4257mm FROM THE END. PLACE OTHER JOINTS AS NEEDED.
- FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD No. BWR8M.
- CAP SCREWS SHALL BE ASTM F593 TYPE 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.
- METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.
- METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.
- CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.
- TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.
- SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.
- ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.
- MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 133.462 METERS



PROJECT NO. I-2812
JOHNSTON COUNTY
STATION: 18+91701 -L-

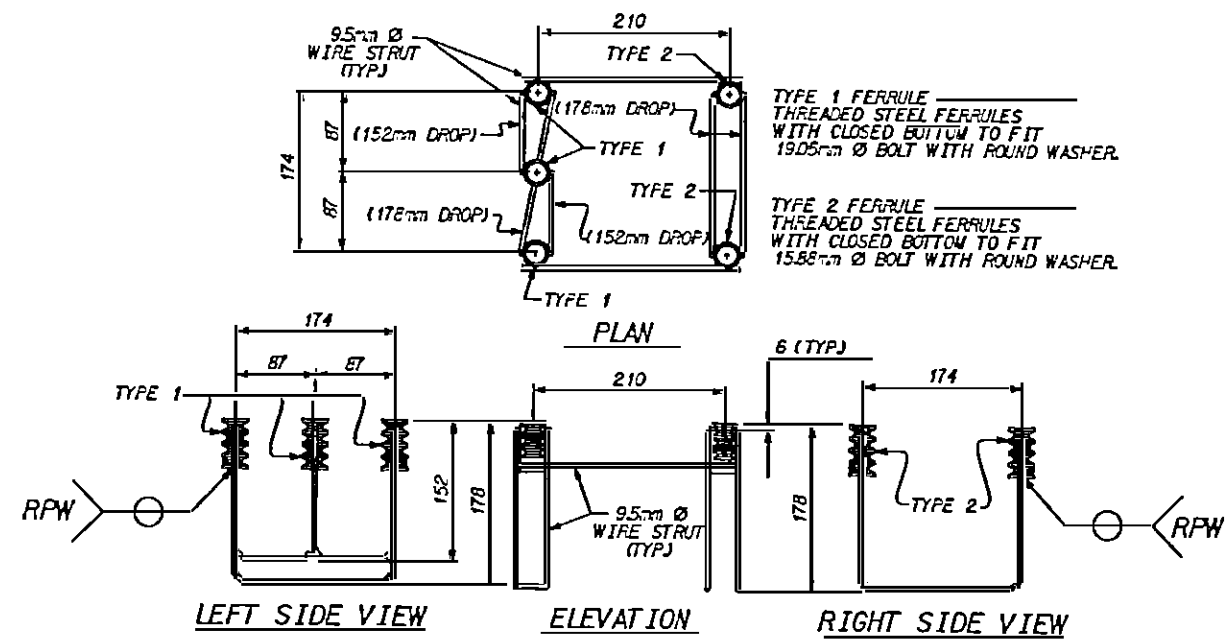
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
BALDWIN
STANDARD
3 BAR METAL RAIL

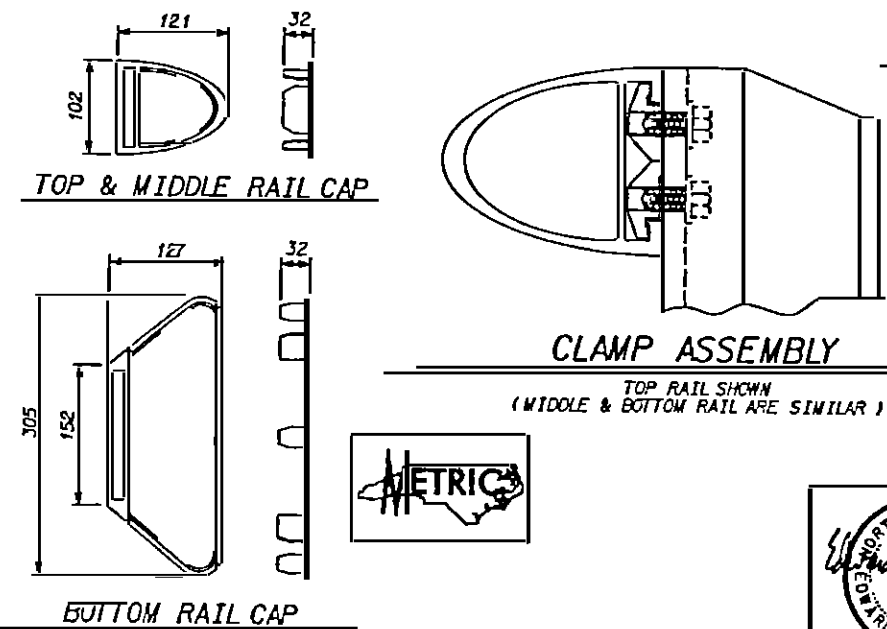
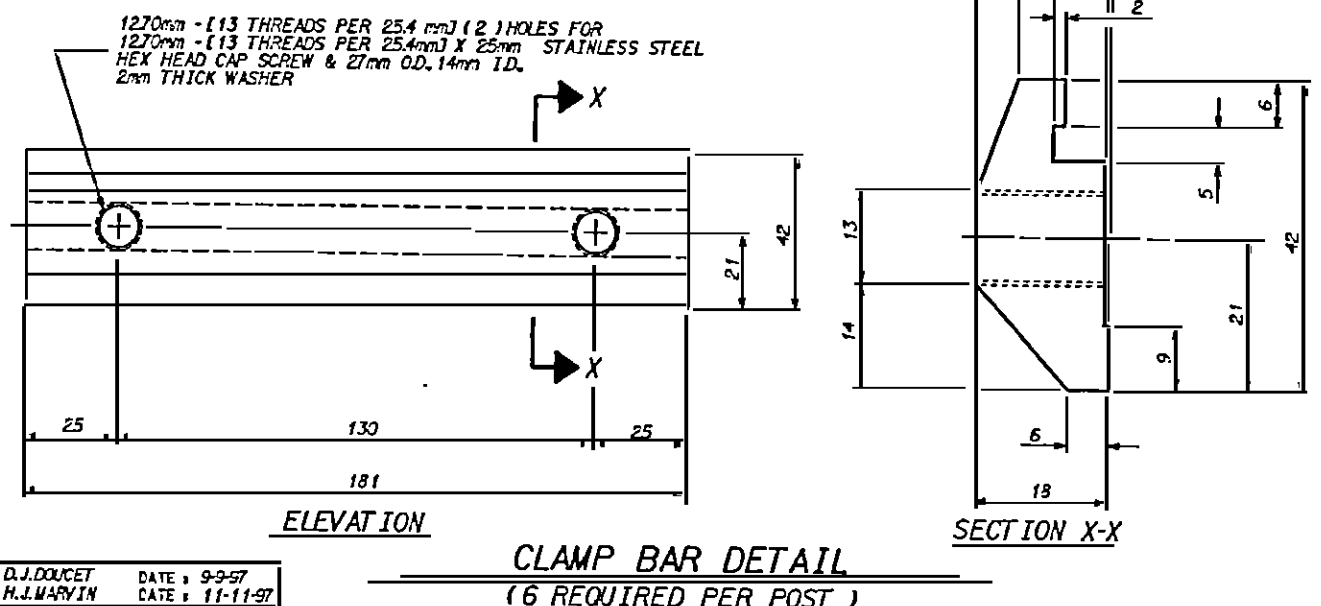
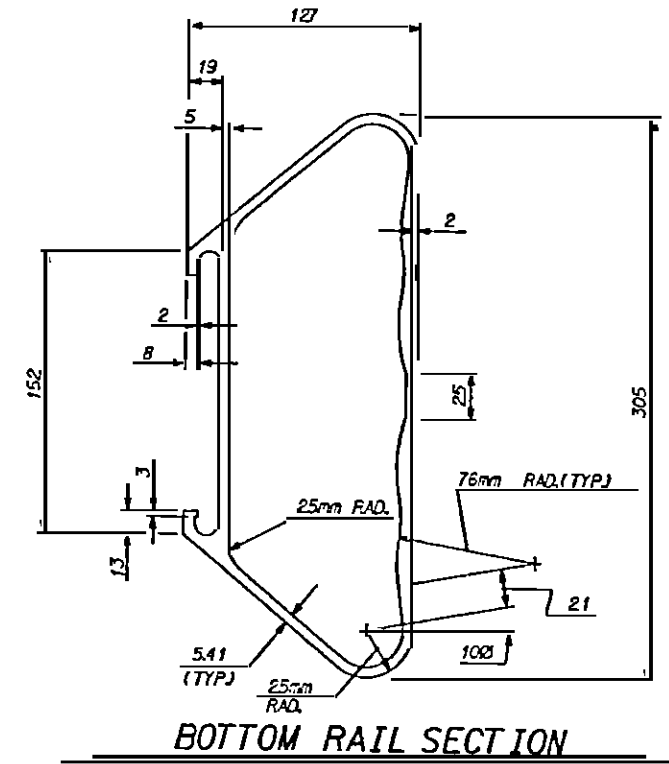
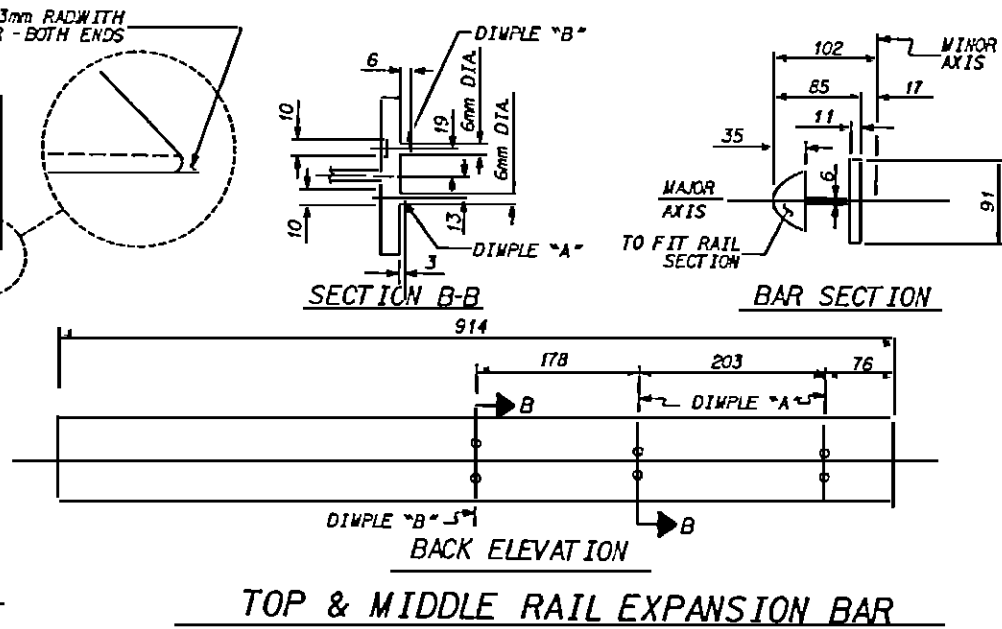
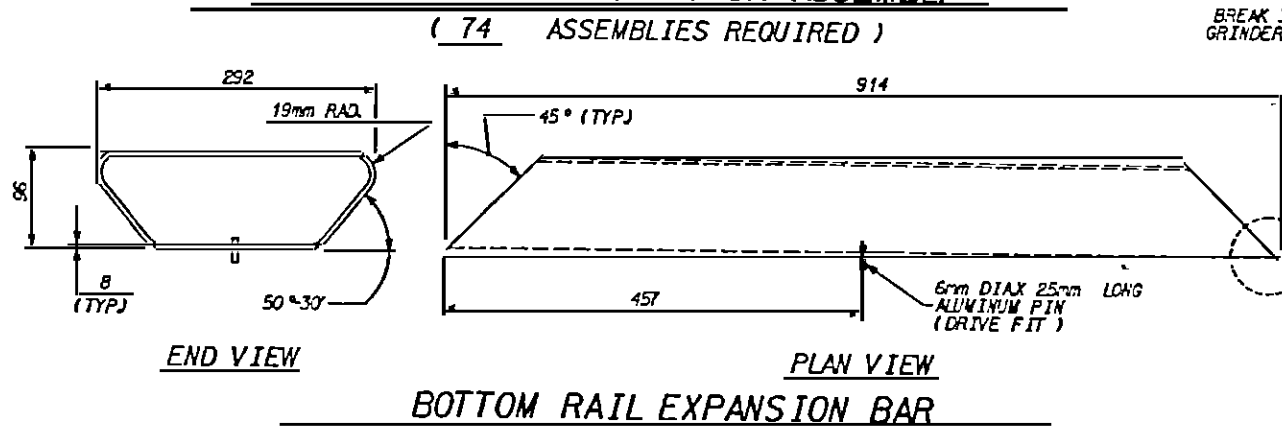
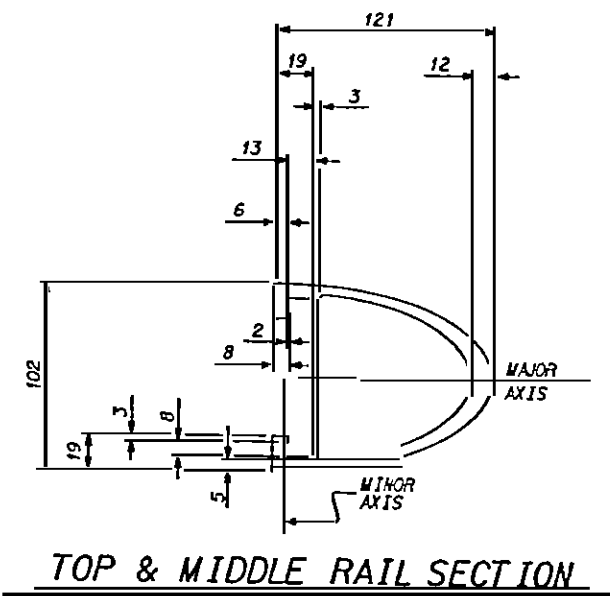


| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|--------------|
| NO. | BY | DATE | NO. | BY | DATE | S-13 |
| 1 | | | 1 | | | TOTAL SHEETS |
| | | | | | | 30 |

STD. No. BWR2M



- NOTES**
STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 51mm FOR 19.05mm FERRULES AND 45mm FOR 15.88mm FERRULES.
 - 3 - 19.05mm DIA X 64mm BOLTS WITH WASHERS BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 19.05mm DIA X 64mm GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - 2 - 15.88mm DIA X 57mm BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 15.88mm DIA X 57mm GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 689 MPa.
 - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF ASTM A-123.
 - THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR METERS OF METAL RAIL.
 - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGERTIGHT POSITION.



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-
 SHEET 2 OF 2

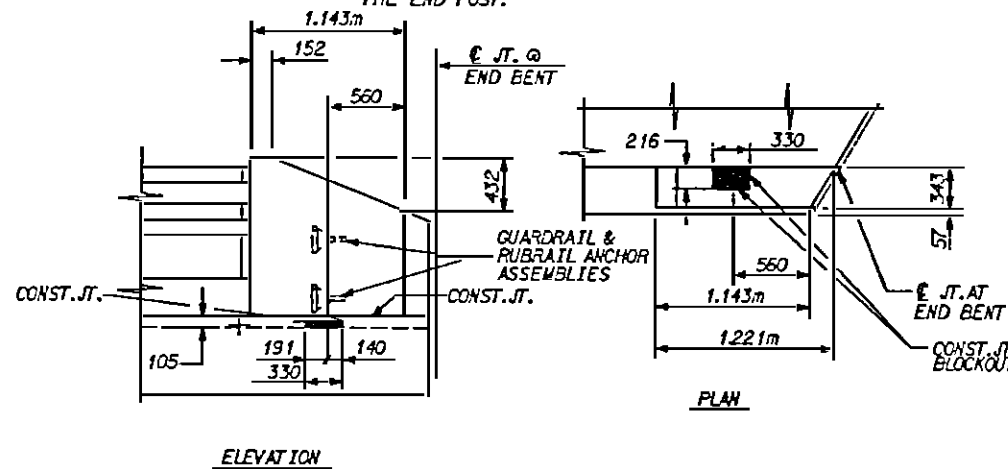
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD
3 BAR METAL RAIL

ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. MARVIN DATE: 11-11-97
 DRAWN BY: JMB 1/88 REV. 5/16/97 EDM/RGW
 CHECKED BY: GCH 1/88

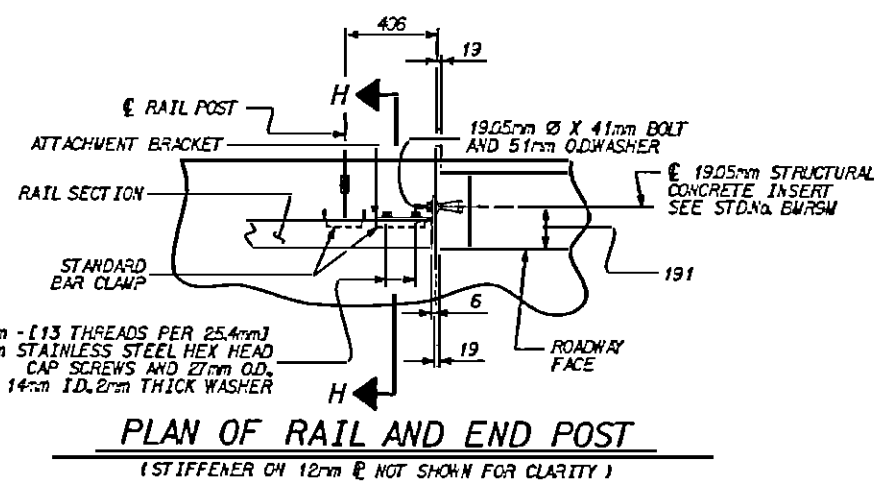


| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO. | BY | DATE | NO. | BY | DATE | 8-14 |
| 1 | | | 1 | | | 8-14 |
| 2 | | | 2 | | | 8-14 |

NOTE
THE CONCRETE IN THE SHADED AREA OF THE
SIDEWALK PARAPET SHALL BE POURED WITH
THE END POST.



BLOCKOUT DETAIL IN SIDEWALK PARAPET

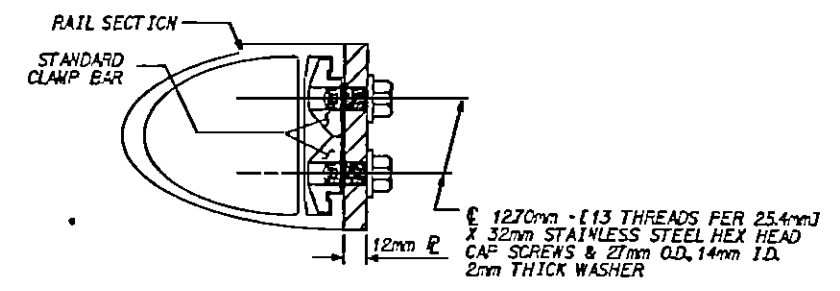


PLAN OF RAIL AND END POST
(STIFFENER ON 12mm R NOT SHOWN FOR CLARITY)

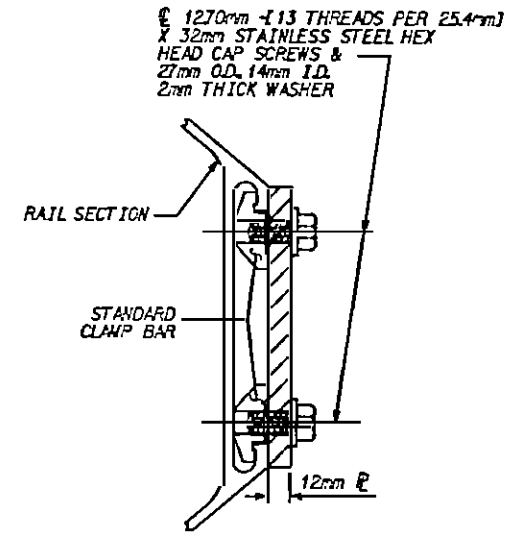
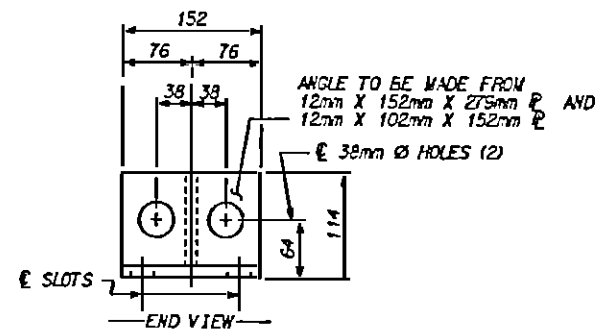
NOTES

METAL RAIL TO END POST CONNECTION

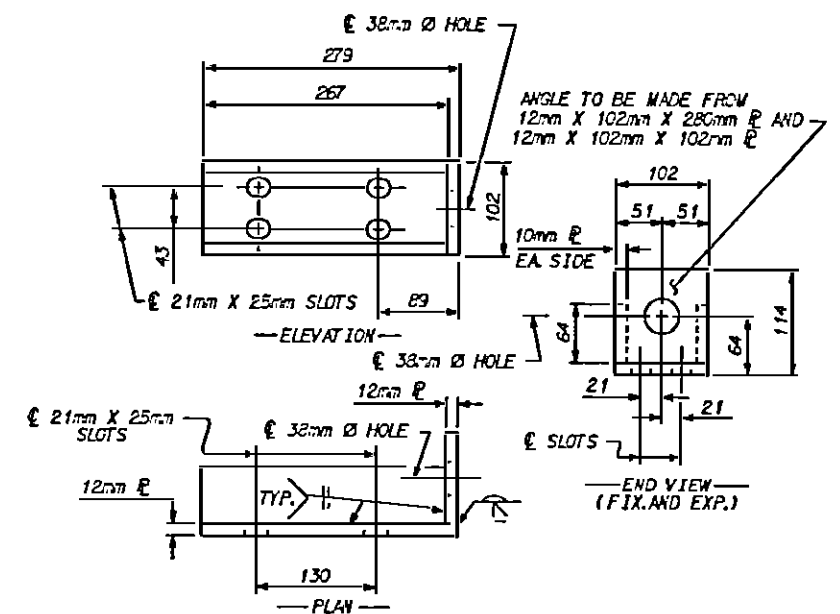
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 12mm PLATES SHALL CONFORM TO AASHTO M270 GRADE 250 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 19.05mm STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 21.4 KN THE FERRULES SHALL ENGAGE A 19.05mm DIA X 41mm BOLT WITH 51mm O.D. WASHER IN PLACE. THE 19.05mm DIA X 41mm BOLT SHALL HAVE N.C. THREADS.
 - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 TYPE 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 16° C. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
 - STANDARD CLAMP BARS (SEE METAL RAIL SHEET 1)
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR METERS OF 3 BAR METAL RAIL.
- THE 19.05mm STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 19.05mm STRUCTURAL CONCRETE INSERT ASSEMBLY AND THE 12mm PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR AT HIS OPTION MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST IF THE ADHESIVE BONDING SYSTEM IS USED. THE 19.05mm DIA X 41mm BOLT WITH WASHER SHALL BE REPLACED WITH A 19.05mm DIA X 165mm BOLT AND 51mm O.D. WASHER. ALL SPECIFICATIONS WHICH APPLY TO THE 19.05mm DIA X 41mm BOLT SHALL APPLY TO THE 19.05mm DIA X 165mm BOLT. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS". THE YIELD LOAD OF THE 19.05mm DIA BOLT IS 53.4 KN. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



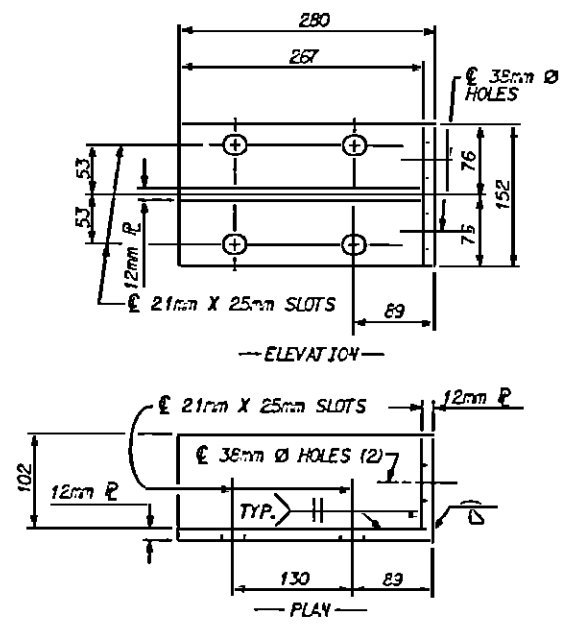
SECTION H-H
(FOR TOP & MIDDLE RAIL)



SECTION H-H
(FOR BOTTOM RAIL)



DETAILS FOR ATTACHMENT BRACKET
(TOP & MIDDLE RAIL ONLY)



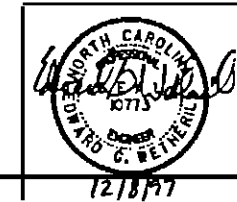
DETAILS FOR ATTACHMENT BRACKET
(BOTTOM RAIL ONLY)



PROJECT NO. 1-2812
JOHNSTON COUNTY
STATION: 18+91701 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RAILROAD
**STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS**
FOR THREE BAR METAL RAILS



| REVISIONS | | | | SHEET NO. | |
|-----------|----|------|-----|-----------|------|
| NO. | BY | DATE | NO. | BY | DATE |
| 1 | | | 1 | | 8-15 |
| 2 | | | 4 | | 30 |

ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
CHECKED BY: H.J. WARDEN DATE: 11-11-97
DRAWN BY: JMB 1/88 REV. 5/16/97 EEM/RDM
CHECKED BY: CCH 1/88

STD NO BRURSM

NOTES

GUARDRAIL ANCHOR ASSEMBLY AND RUBRAIL ANCHOR ASSEMBLY

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 6mm HOLD DOWN PLATE AND 4 - 22.23mm Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 250. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A563. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 22.23mm Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE GUARDRAIL IS TO BE ATTACHED TO THE END POST, AND THE RUBRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE RUBRAIL IS TO BE ATTACHED TO THE END POST. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND RUBRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

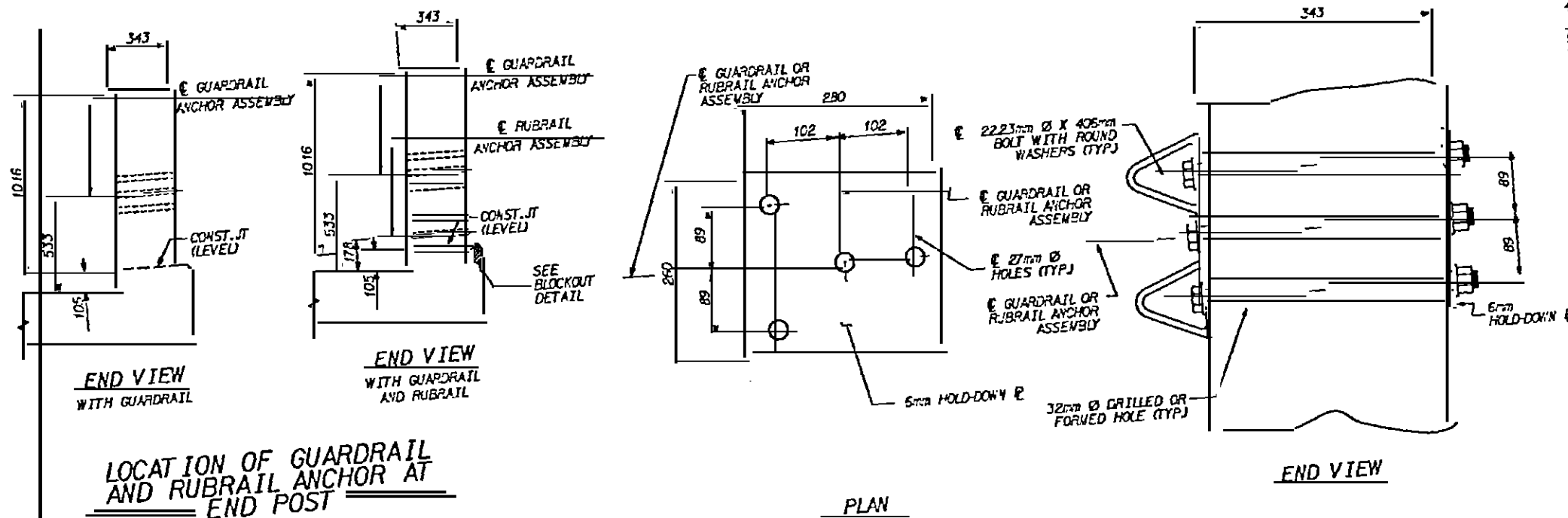
THE #22 "E" BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

NOTES

STRUCTURAL CONCRETE INSERT

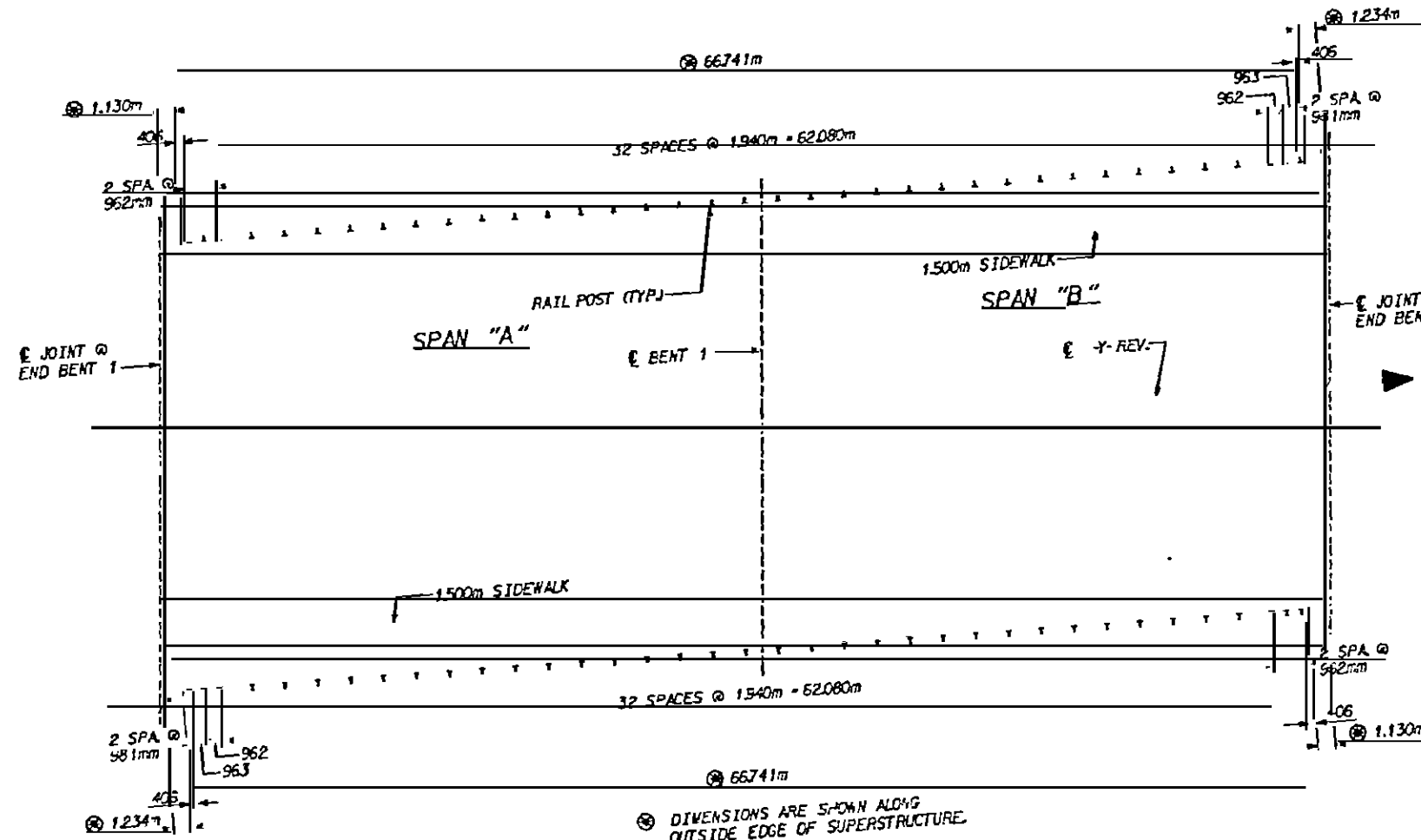
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 38mm.
- B. 1 - 19.05mm DIA X 41mm BOLT WITH WASHER, BOLT AND WASHER SHALL BE GALVANIZED. REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 19.05mm DIA X 41mm GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 689 MPa.

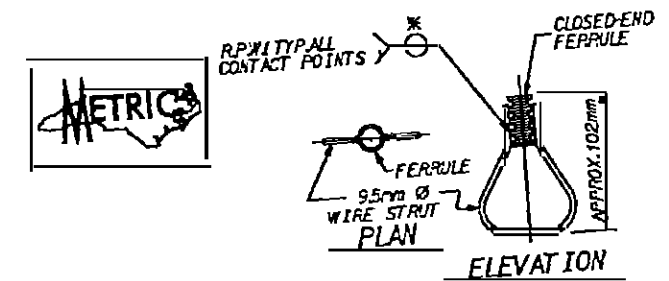


GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF GUARDRAIL AND RUBRAIL ANCHOR AT END POST

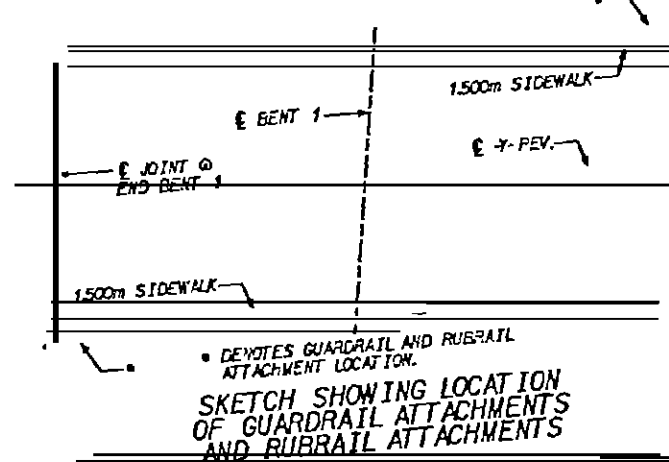


PLAN OF RAIL POST SPACING



STRUCTURAL CONCRETE INSERT

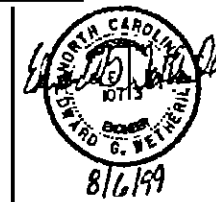
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



SKETCH SHOWING LOCATION OF GUARDRAIL ATTACHMENTS AND RUBRAIL ATTACHMENTS

PROJECT NO. I-2812
 COUNTY JOHNSTON
 STATION: 18+91701-Y-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS FOR THREE BAR METAL RAILS



| REVISIONS | | | | |
|-----------|----|------|-----|------|
| NO. | BY | DATE | NO. | DATE |
| 1 | | | 3 | |
| 2 | | | 4 | |

ASSEMBLED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 DRAWN BY: JMB 1/88 REV. 5/16/91 ENGINEER: _____
 CHECKED BY: GCH 1/88 REV. 7/17/98 RAV/LES

REINFORCING BAR SCHEDULE

SPANS "A" & "B"

| STAGE I | | | |
|---------|-----|-----|------------|
| A 1E | 404 | *16 | STR. 9680 |
| A 3 | 404 | *16 | STR. 9680 |
| A 37E | 1 | *16 | STR. 9680 |
| A 39E | 1 | *16 | STR. 9300 |
| A 40E | 1 | *16 | STR. 8560 |
| A 41E | 1 | *16 | STR. 7840 |
| A 42E | 1 | *16 | STR. 7120 |
| A 43E | 1 | *16 | STR. 6400 |
| A 44E | 1 | *16 | STR. 5680 |
| A 45E | 1 | *16 | STR. 4960 |
| A 46E | 1 | *16 | STR. 4240 |
| A 47E | 1 | *16 | STR. 3520 |
| A 48E | 1 | *16 | STR. 2800 |
| A 49E | 1 | *16 | STR. 2080 |
| A 50E | 1 | *16 | STR. 1360 |
| A 51 | 1 | *16 | STR. 9680 |
| A 52 | 1 | *16 | STR. 9300 |
| A 53 | 1 | *16 | STR. 8560 |
| A 54 | 1 | *16 | STR. 7840 |
| A 55 | 1 | *16 | STR. 7120 |
| A 56 | 1 | *16 | STR. 6400 |
| A 57 | 1 | *16 | STR. 5680 |
| A 58 | 1 | *16 | STR. 4960 |
| A 59 | 1 | *16 | STR. 4240 |
| A 60 | 1 | *16 | STR. 3520 |
| A 61 | 1 | *16 | STR. 2800 |
| A 62 | 1 | *16 | STR. 2080 |
| A 63 | 1 | *16 | STR. 1360 |
| A 64 | 1 | *16 | STR. 580 |
| A 65E | 1 | *16 | STR. 9160 |
| A 66E | 1 | *16 | STR. 8440 |
| A 67E | 1 | *16 | STR. 7720 |
| A 68E | 1 | *16 | STR. 7000 |
| A 69E | 1 | *16 | STR. 6280 |
| A 70E | 1 | *16 | STR. 5560 |
| A 71E | 1 | *16 | STR. 4840 |
| A 72E | 1 | *16 | STR. 4120 |
| A 73E | 1 | *16 | STR. 3400 |
| A 74E | 1 | *16 | STR. 2680 |
| A 75E | 1 | *16 | STR. 1960 |
| A 76E | 1 | *16 | STR. 1150 |
| A 77 | 1 | *16 | STR. 9160 |
| A 78 | 1 | *16 | STR. 8440 |
| A 79 | 1 | *16 | STR. 7720 |
| A 80 | 1 | *16 | STR. 7000 |
| A 81 | 1 | *16 | STR. 6280 |
| A 82 | 1 | *16 | STR. 5560 |
| A 83 | 1 | *16 | STR. 4840 |
| A 84 | 1 | *16 | STR. 4120 |
| A 85 | 1 | *16 | STR. 3400 |
| A 86 | 1 | *16 | STR. 2680 |
| A 87 | 1 | *16 | STR. 1960 |
| A 88 | 1 | *16 | STR. 1150 |
| B 1E | 80 | *16 | STR. 11560 |
| B 2E | 80 | *22 | STR. 12080 |
| B 3E | 39 | *22 | STR. 10140 |
| B 4E | 80 | *16 | STR. 11620 |
| B 5 | 152 | *16 | STR. 17760 |
| B 6E | 18 | *13 | STR. 8220 |
| D 1E | 310 | *13 | STR. 260 |
| E 1E | 4 | *22 | STR. 900 |
| E 2E | 4 | *22 | STR. 1080 |
| E 3E | 4 | *22 | STR. 1260 |
| E 4E | 4 | *22 | STR. 1440 |
| F 1E | 4 | *19 | STR. 800 |
| F 2E | 4 | *19 | STR. 1040 |
| F 3E | 2 | *19 | STR. 1080 |
| F 4E | 4 | *19 | STR. 1080 |
| F 5E | 2 | *19 | STR. 1100 |
| G 2E | 2 | *16 | STR. 10760 |
| K 1E | 6 | *16 | STR. 2340 |
| K 2E | 12 | *16 | STR. 4120 |
| K 3E | 6 | *16 | STR. 3300 |
| S 1E | 54 | *13 | STR. 1200 |

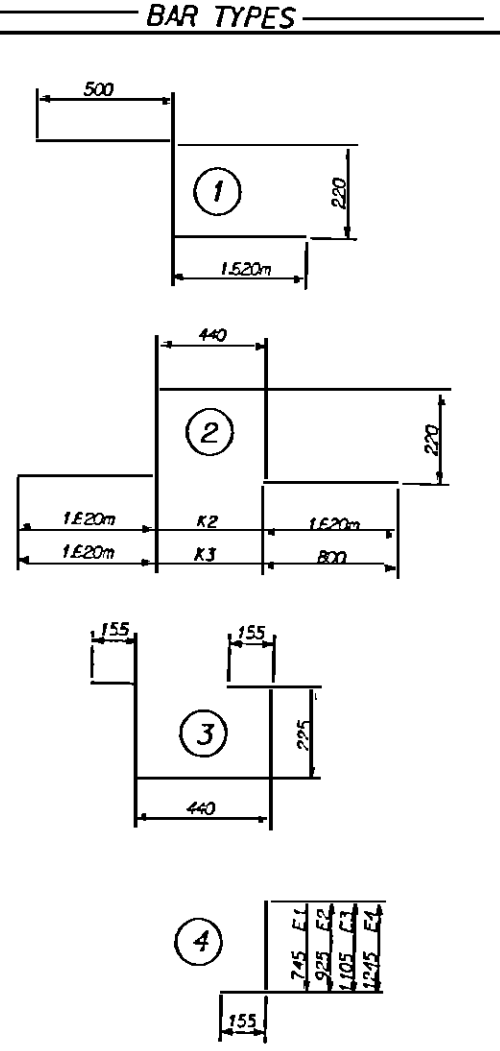
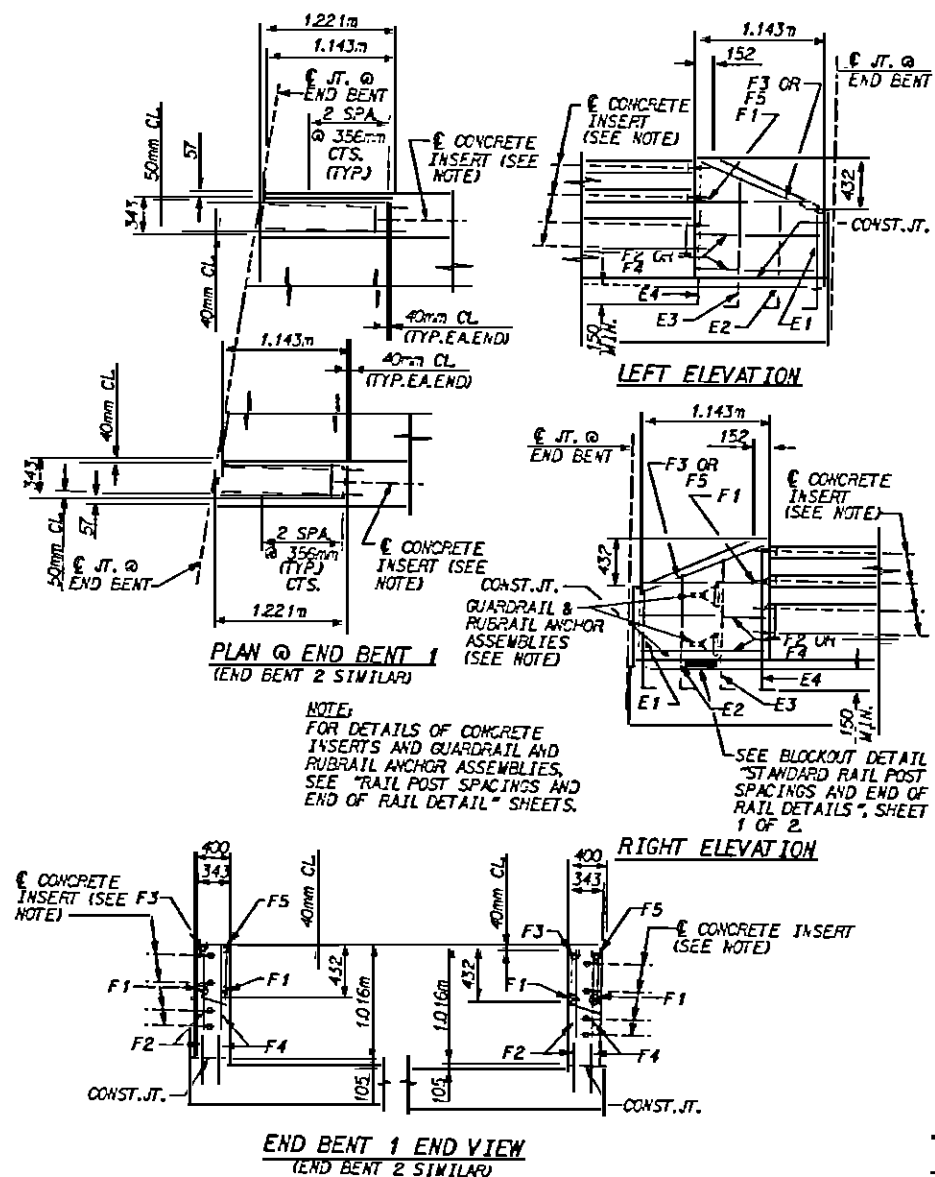
| STAGE II | | | |
|----------|-----|-----|------------|
| A 4 | 400 | *15 | STR. 12480 |
| A 5E | 1 | *15 | STR. 11960 |
| A 6E | 1 | *16 | STR. 11220 |
| A 7E | 1 | *16 | STR. 10500 |
| A 8E | 1 | *16 | STR. 9780 |
| A 9E | 1 | *16 | STR. 9060 |
| A 10E | 1 | *16 | STR. 8320 |
| A 11E | 1 | *16 | STR. 7600 |
| A 12E | 1 | *16 | STR. 6880 |
| A 13E | 1 | *16 | STR. 6140 |
| A 14E | 1 | *16 | STR. 5420 |
| A 15E | 1 | *16 | STR. 4700 |
| A 16E | 1 | *16 | STR. 3960 |
| A 17E | 1 | *16 | STR. 3240 |
| A 18E | 1 | *16 | STR. 2520 |
| A 19E | 1 | *16 | STR. 1780 |
| A 20E | 1 | *16 | STR. 1060 |
| A 21 | 1 | *16 | STR. 11960 |
| A 22 | 1 | *16 | STR. 11220 |
| A 23 | 1 | *16 | STR. 10500 |
| A 24 | 1 | *16 | STR. 9780 |
| A 25 | 1 | *16 | STR. 9060 |
| A 26 | 1 | *16 | STR. 8320 |
| A 27 | 1 | *16 | STR. 7600 |
| A 28 | 1 | *16 | STR. 6880 |
| A 29 | 1 | *16 | STR. 6140 |
| A 30 | 1 | *16 | STR. 5420 |
| A 31 | 1 | *16 | STR. 4700 |
| A 32 | 1 | *16 | STR. 3960 |
| A 33 | 1 | *16 | STR. 3240 |
| A 34 | 1 | *16 | STR. 2520 |
| A 35 | 1 | *16 | STR. 1780 |
| A 36 | 1 | *16 | STR. 1060 |
| A 89E | 1 | *16 | STR. 12480 |
| A 90E | 1 | *16 | STR. 12200 |
| A 91E | 1 | *16 | STR. 11480 |
| A 92E | 1 | *16 | STR. 10740 |
| A 93E | 1 | *16 | STR. 10020 |
| A 94E | 1 | *16 | STR. 9300 |
| A 95E | 1 | *16 | STR. 8580 |
| A 96E | 1 | *16 | STR. 7840 |
| A 97E | 1 | *16 | STR. 7120 |
| A 98E | 1 | *16 | STR. 6400 |
| A 99E | 1 | *16 | STR. 5680 |
| A 100E | 1 | *16 | STR. 4960 |
| A 101E | 1 | *16 | STR. 4240 |
| A 102E | 1 | *16 | STR. 3520 |
| A 103E | 1 | *16 | STR. 2800 |
| A 104E | 1 | *16 | STR. 2080 |
| A 105E | 1 | *16 | STR. 1360 |
| A 106E | 1 | *16 | STR. 580 |
| A 107 | 1 | *16 | STR. 12480 |
| A 108 | 1 | *16 | STR. 12200 |
| A 109 | 1 | *16 | STR. 11480 |
| A 110 | 1 | *16 | STR. 10740 |
| A 111 | 1 | *16 | STR. 10020 |
| A 112 | 1 | *16 | STR. 9300 |
| A 113 | 1 | *16 | STR. 8580 |
| A 114 | 1 | *16 | STR. 7840 |
| A 115 | 1 | *16 | STR. 7120 |
| A 116 | 1 | *16 | STR. 6400 |
| A 117 | 1 | *16 | STR. 5680 |
| A 118 | 1 | *16 | STR. 4960 |
| A 119 | 1 | *16 | STR. 4240 |
| A 120 | 1 | *16 | STR. 3520 |
| A 121 | 1 | *16 | STR. 2800 |
| A 122 | 1 | *16 | STR. 2080 |
| A 123 | 1 | *16 | STR. 1360 |
| A 124 | 1 | *16 | STR. 580 |
| B 1E | 104 | *16 | STR. 11560 |
| B 2E | 104 | *22 | STR. 12080 |
| B 3E | 51 | *22 | STR. 10140 |
| B 4E | 104 | *16 | STR. 11620 |
| B 5 | 196 | *16 | STR. 17760 |
| B 6E | 54 | *13 | STR. 8220 |
| D 1E | 930 | *13 | STR. 250 |
| E 1E | 4 | *22 | STR. 900 |
| E 2E | 4 | *22 | STR. 1080 |
| E 3E | 4 | *22 | STR. 1260 |
| E 4E | 4 | *22 | STR. 1440 |
| F 1E | 4 | *19 | STR. 800 |
| F 2E | 4 | *19 | STR. 1040 |
| F 3E | 2 | *19 | STR. 1080 |
| F 4E | 4 | *19 | STR. 1080 |
| F 5E | 2 | *19 | STR. 1100 |
| G 1E | 2 | *16 | STR. 12800 |
| G 3E | 153 | *16 | STR. 1740 |
| K 1E | 6 | *16 | STR. 2340 |
| K 2E | 18 | *16 | STR. 4120 |
| K 3E | 6 | *16 | STR. 3300 |
| S 1E | 72 | *13 | STR. 1200 |

GROOVING BRIDGE FLOORS

| | |
|----------------|---------------|
| APPROACH SLABS | 00 SQMETER |
| BRIDGE DECK | 12608 SQMETER |
| TOTAL | 12608 SQMETER |

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL | | APPROACH SLABS | | PARAPET AND BARRIER RAIL |
|----------|-----------------------------------------------------------------|----------|----------------|----------|--------------------------|
| | EPOXY COATED | UNCOATED | EPOXY COATED | UNCOATED | |
| #13 | 610 | 540 | 610 | 540 | 840 |
| #16 | 770 | 660 | 770 | 660 | 1050 |
| #19 | 920 | 790 | 1190 | 790 | 1330 |
| #22 | 1580 | 1060 | | | |
| #25 | 2080 | 1390 | | | |



SUPERSTRUCTURE BILL OF MATERIAL

| SPANS | CLASS AA CONCRETE (CU METER) | REINFORCING STEEL (Kg) | EPOXY COATED REINFORCING STEEL (Kg) |
|-----------|------------------------------|------------------------|-------------------------------------|
| "A" & "B" | | | |
| STAGE I | 1809 | 10469 | 13853 |
| STAGE II | 248.5 | 13500 | 18724 |
| STAGE III | 282 | 441 | 2300 |
| TOTALS | 4575 | 24410 | 34877 |

PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL

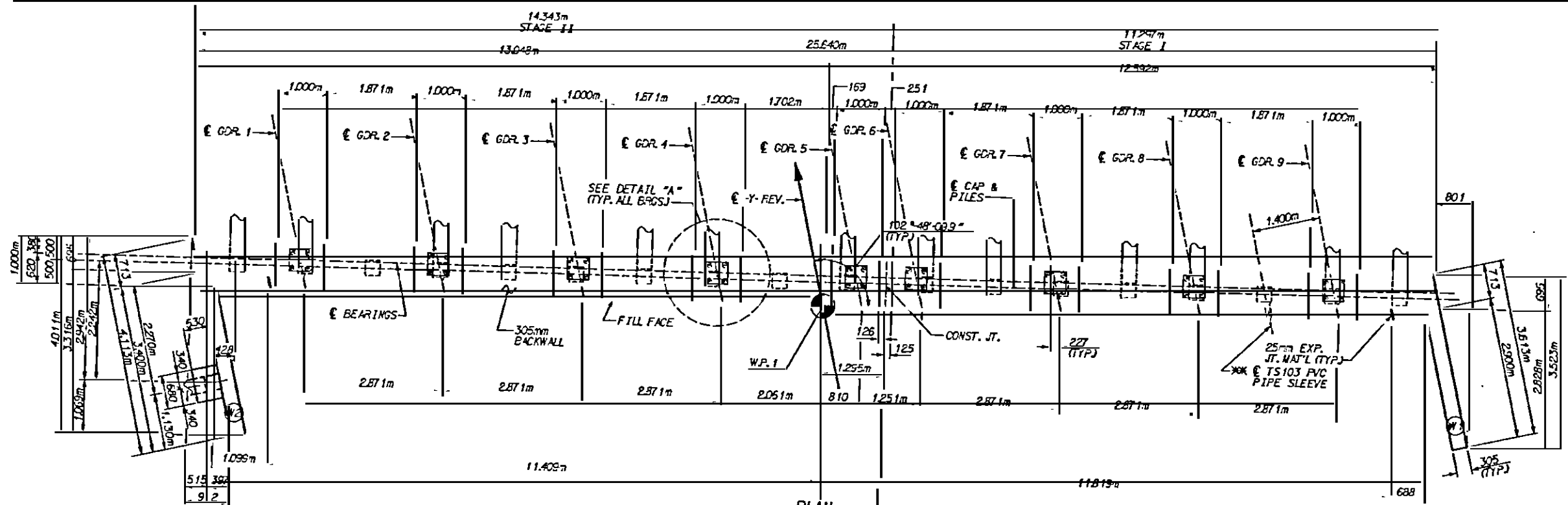
| REVISIONS | | | | SHEET NO. |
|-----------|----|------|--------|-----------|
| NO. | BY | DATE | REASON | |
| 1 | | | | 8-17 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |

ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. MARVIN DATE: 11-11-97
 DRAWN BY: JMS 5/87 REV. 5/16/97 EEW/RGW
 CHECKED BY: SJO 9/87

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. METER = 1590.1)

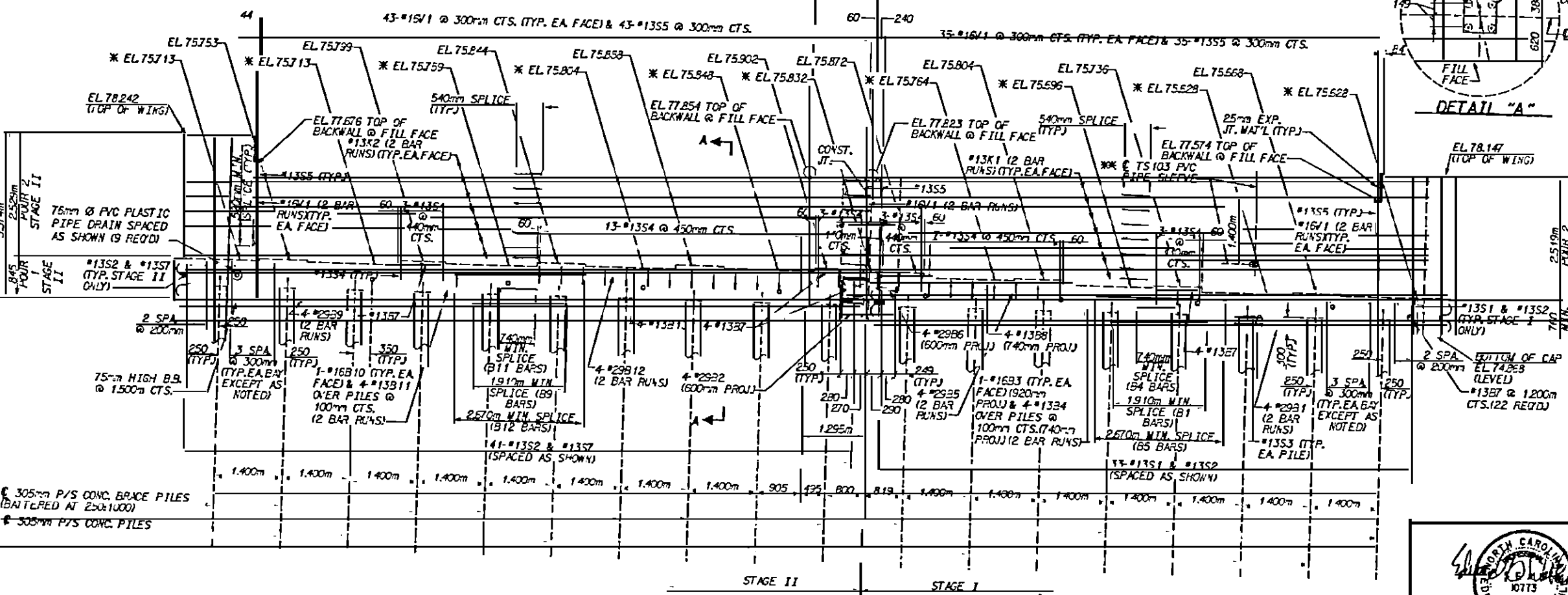
ENTERED IN PROJECTS/SPACEN (11/01)

STANDARD BILL 1511

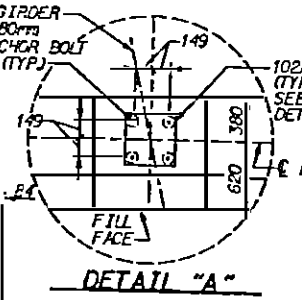


PLAN

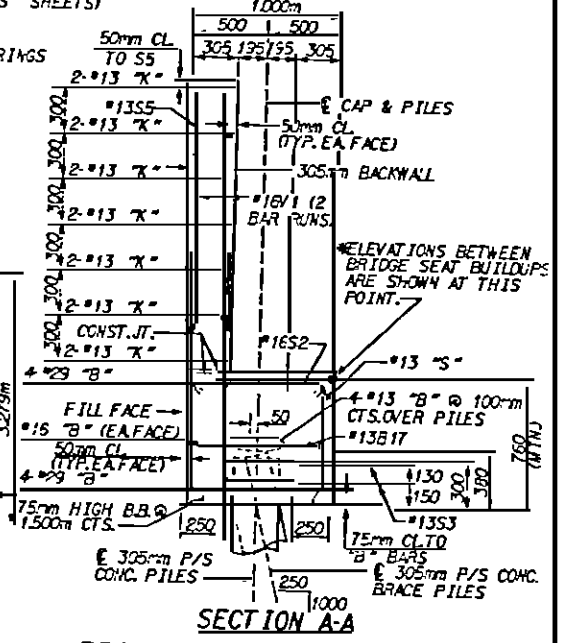
NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
 PIPE DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND ANCHOR BOLTS.
 FOR TEMPORARY DRAINAGE AT END BENTS, SEE END BENT 2 SHEET 2 OF 2.
 FOR PIPE DRAIN DETAILS AND BLOCKOUT DETAIL, SEE SHEET 2 OF 2.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
 FOR PIPE INSERT DETAILS, SEE "POT BEARING DETAILS" SHEETS.



ELEVATION
 (PILE IN WING WALL OMITTED FOR CLARITY)



DETAIL "A"



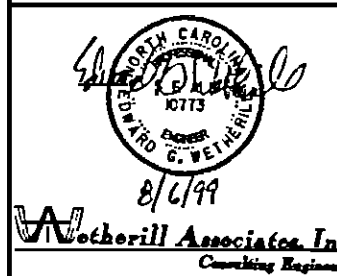
SECTION A-A

PROJECT NO. 1-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-

SHEET 1 OF 2

* FOR ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE "SECTION A-A", THIS SHEET.
 ** SEE "ELECTRICAL CONDUIT SYSTEM" DETAILS AND SPECIAL PROVISIONS FOR MATERIALS, CONSTRUCTION METHODS AND PAYMENT.

DRAWN BY: J. L. DODD
 CHECKED BY: J. L. DODD
 DATE: 9-9-97
 DATE: 11-11-97



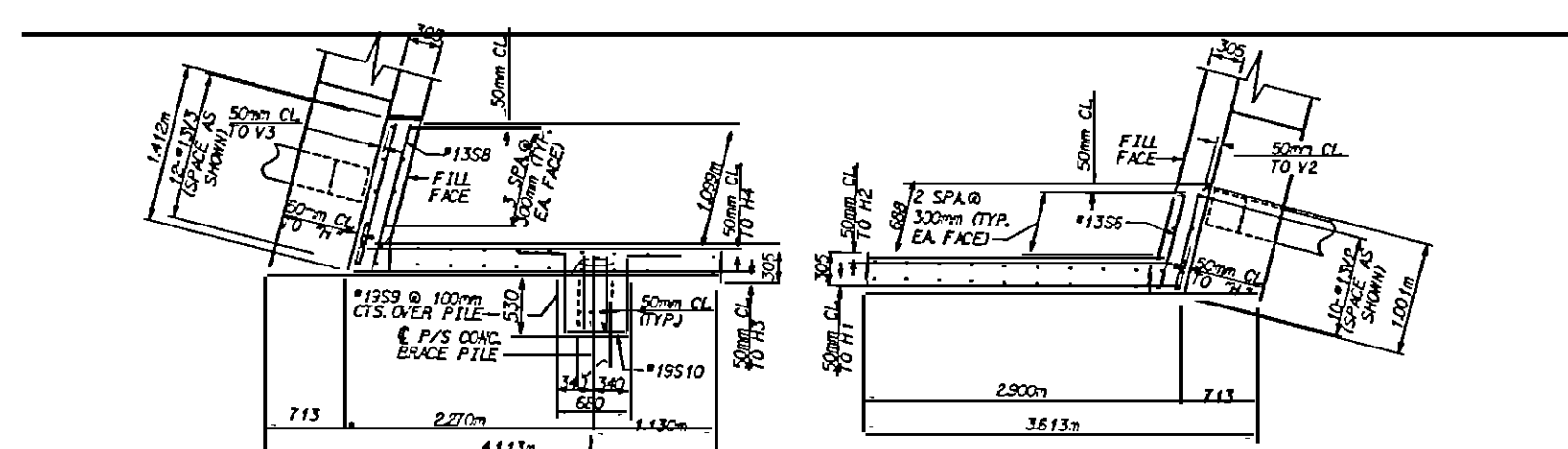
W. W. Wetherill Associates, Inc.
 Consulting Engineers

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1

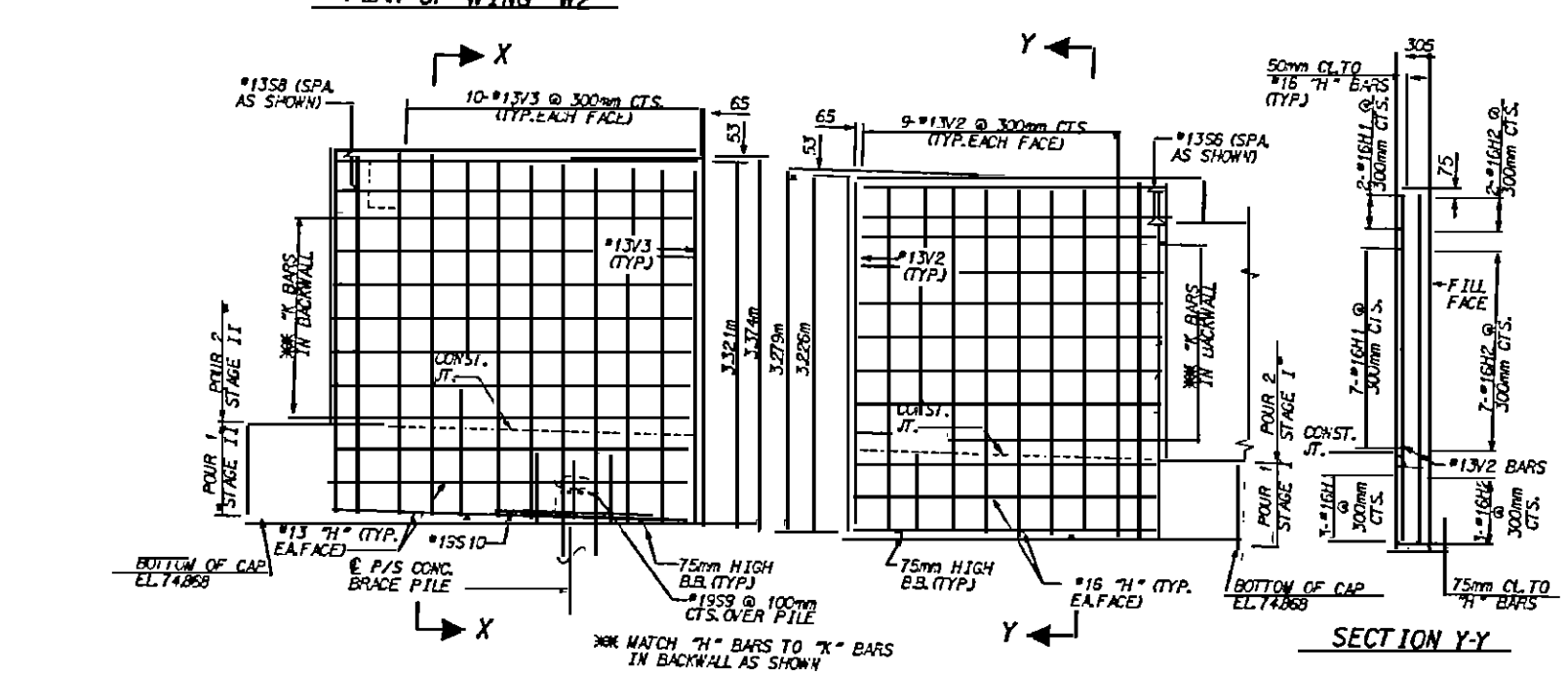
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| NO. | BY | DATE | NO. | BY | DATE | |
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| 2 | | | | | | 30 |

C:\12812\ST.PREF 1-1.DGN (50)



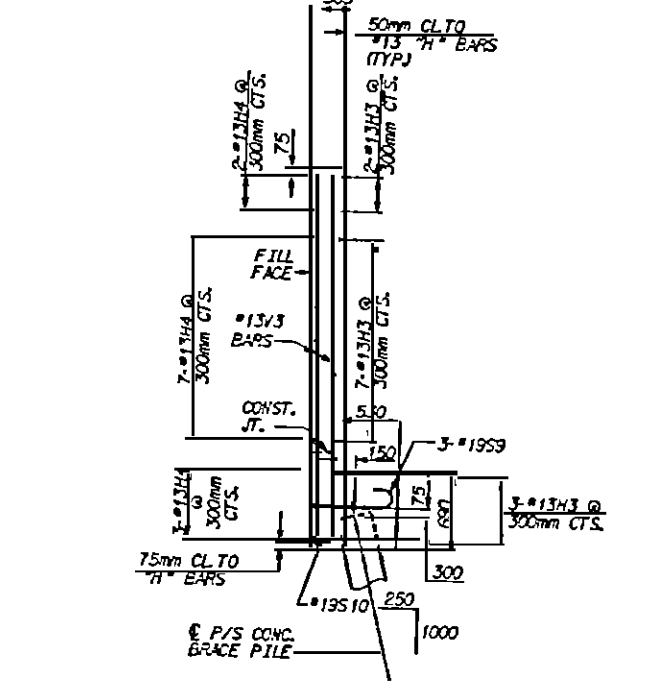
PLAN OF WING W2

PLAN OF WING W1

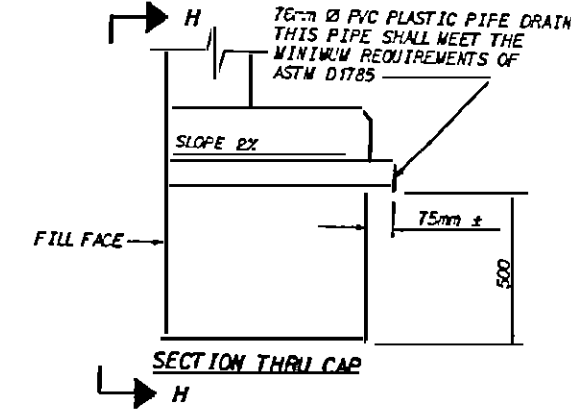


ELEVATION OF WING W2

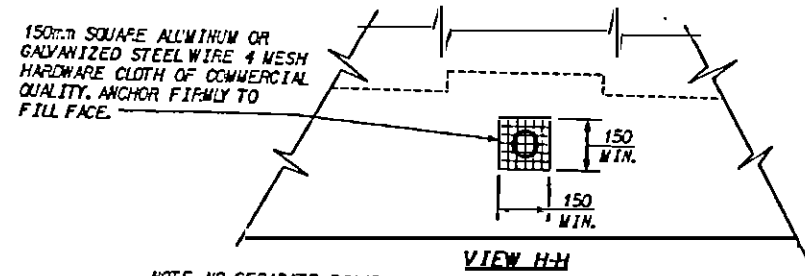
ELEVATION OF WING W1



SECTION X-X



SECTION THRU CAP



VIEW H-H

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

BAR TYPES
ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 1 STAGE I

| BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) |
|---------|------|------|-------------|-------------|
| B1 | #29 | 1 | 7060 | 285 |
| B2 | #29 | 2 | 1960 | 43 |
| B3 | #16 | STR. | 12640 | 39 |
| B4 | #13 | STR. | 6620 | 52 |
| B5 | #29 | 1 | 7440 | 301 |
| B6 | #29 | 2 | 1360 | 43 |
| B7 | #13 | STR. | 900 | 16 |
| B8 | #13 | STR. | 4820 | 19 |
| B9 | #29 | 1 | 3000 | 56 |
| B10 | #16 | STR. | 3040 | 57 |
| B11 | #13 | STR. | 6280 | 175 |
| B12 | #13 | STR. | 2420 | 79 |
| B13 | #13 | 4 | 1140 | 37 |
| B14 | #13 | 7 | 1980 | 31 |
| B15 | #13 | 8 | 1500 | 19 |
| B16 | #13 | 8 | 1400 | 49 |
| B17 | #13 | 9 | 2000 | 4 |
| B18 | #16 | STR. | 1720 | 374 |
| B19 | #13 | STR. | 3120 | 87 |

END BENT 1 STAGE II

| BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) |
|---------|------|------|-------------|-------------|
| B20 | #13 | STR. | 900 | 16 |
| B21 | #13 | STR. | 7420 | 59 |
| B22 | #29 | 1 | 8840 | 358 |
| B23 | #13 | STR. | 6680 | 27 |
| B24 | #13 | STR. | 3480 | 12 |
| B25 | #13 | STR. | 3440 | 11 |
| B26 | #13 | STR. | 7340 | 204 |
| B27 | #13 | STR. | 1140 | 46 |
| B28 | #13 | STR. | 1580 | 39 |
| B29 | #13 | STR. | 1400 | 60 |
| B30 | #13 | STR. | 2600 | 106 |
| B31 | #13 | STR. | 2800 | 6 |
| B32 | #13 | STR. | 1220 | 8 |
| B33 | #13 | STR. | 2860 | 6 |
| B34 | #16 | STR. | 1720 | 459 |
| B35 | #13 | STR. | 3200 | 102 |

TOTAL REINFORCING STEEL - 1761 Kg **TOTAL REINFORCING STEEL - 1995 Kg**

TOTAL CLASS "A" CONCRETE - 132 CU.METERS **TOTAL CLASS "A" CONCRETE - 25.1 CU.METERS**

CONCRETE BREAKDOWN
 * POUR 1 = 10.1 CU.METERS
 POUR 2 = 9.1 CU.METERS

CONCRETE BREAKDOWN
 * POUR 1 = 14.0 CU.METERS
 POUR 2 = 11.1 CU.METERS

305mm P/S CONCRETE PILES
 NO. = 8 LINEAR METERS = 129

305mm P/S CONCRETE PILES
 NO. = 11 LINEAR METERS = 178

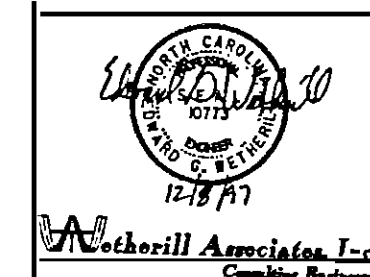
* CONCRETE DISPLACED BY PILES HAS BEEN DEDUCTED

TOTAL QUANTITIES FOR END BENT 1

| | REINFORCING STEEL (Kg) | CLASS "A" CONCRETE (CU. METERS) | 305mm P/S CONG. PILES (NO.) | 305mm P/S CONG. PILES (LINEAR METERS) |
|----------|------------------------|---------------------------------|-----------------------------|---------------------------------------|
| STAGE I | 1761 | 19.2 | 8 | 129 |
| STAGE II | 1995 | 25.1 | 11 | 178 |
| TOTAL | 3756 | 44.3 | 19 | 307 |



PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

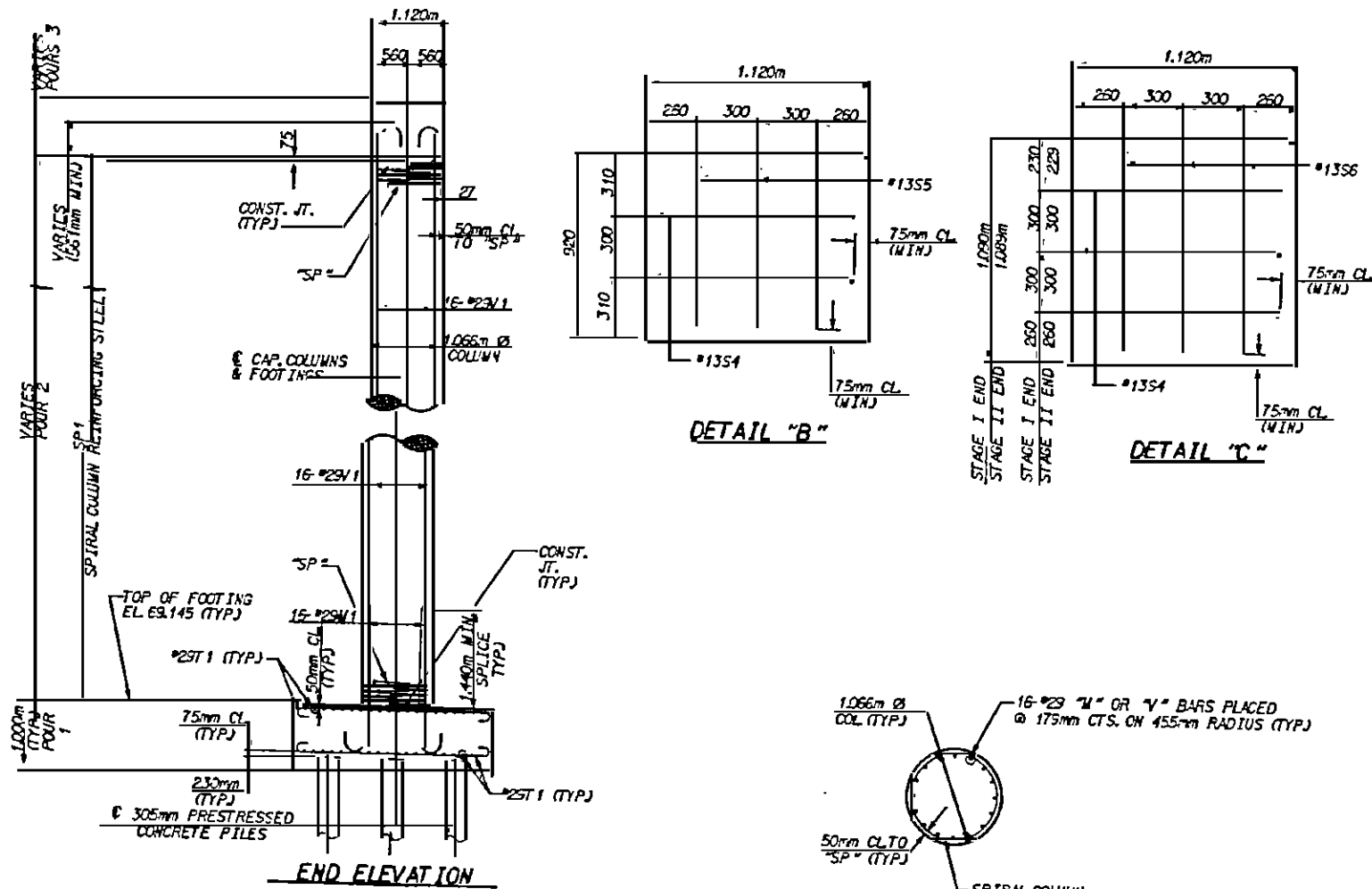
DRAWN BY: J.L. GIBSON DATE: 9-9-17
 CHECKED BY: J.L. GIBSON DATE: 11-1-17

REVISIONS

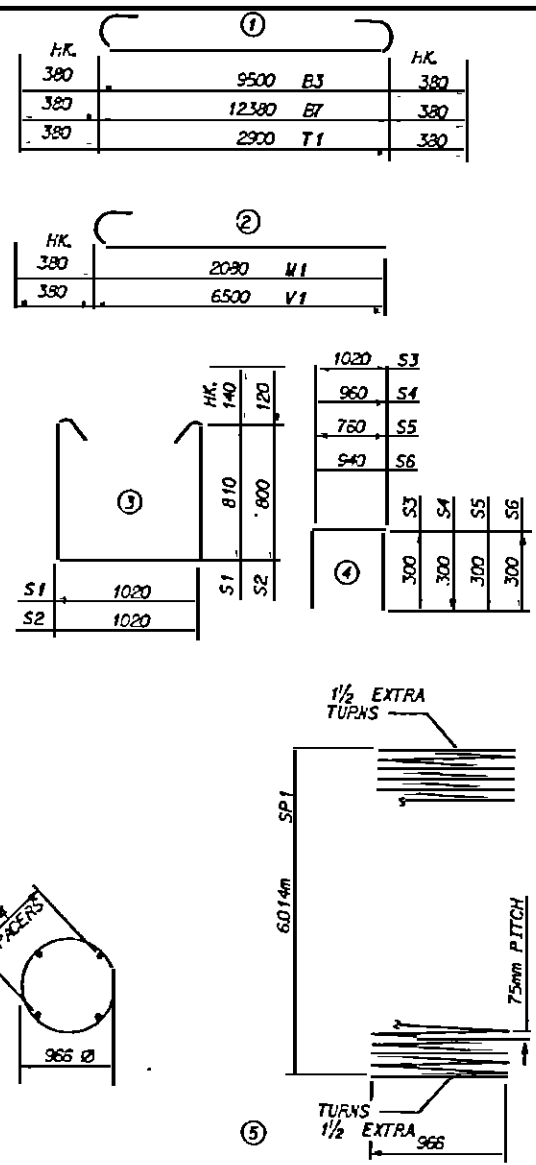
| NO. | BY | DATE | NO. | BY | DATE |
|-----|----|------|-----|----|------|
| 1 | | | 1 | | |
| 2 | | | 2 | | |

SHEET NO. 5-19

CN12812 STREET I-27/4 (33.33)

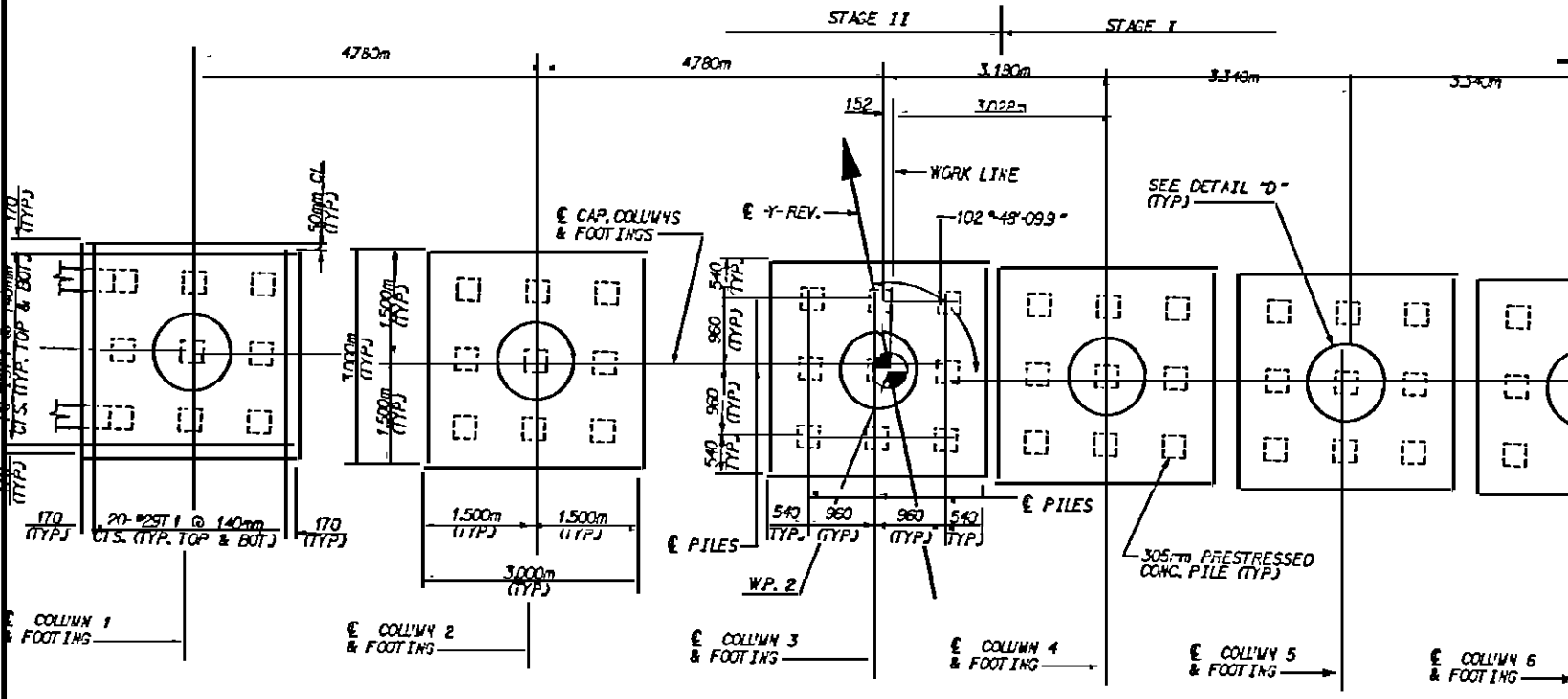


BAR TYPES
ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

| BENT 1 STAGE I | | | | | BENT 1 STAGE II | | | | |
|-------------------------------------------------------|------|----------|-------------|-------------|-------------------------------------------------------|------|----------|-------------|-------------|
| BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) | BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) |
| B1 | 6 | #29 STR. | 9500 | 228 | E5 | 6 | #29 STR. | 12380 | 376 |
| B2 | 4 | #16 STR. | 9500 | 59 | B6 | 4 | #16 STR. | 12380 | 77 |
| B3 | 8 | #29 | 10250 | 415 | E7 | 8 | #29 | 13140 | 532 |
| B4 | 8 | #13 STR. | 3760 | 30 | B8 | 8 | #13 STR. | 6620 | 53 |
| M1 | 48 | #29 | 2460 | 557 | M1 | 48 | #29 | 2460 | 557 |
| S1 | 24 | #16 | 2520 | 109 | S2 | 84 | #13 | 2860 | 233 |
| S2 | 36 | #13 | 2860 | 102 | S3 | 43 | #13 | 1620 | 69 |
| S3 | 32 | #13 | 1620 | 52 | S4 | 5 | #13 | 1560 | 8 |
| S4 | 5 | #13 | 1560 | 8 | S5 | 3 | #13 | 1360 | 4 |
| S5 | 3 | #13 | 1360 | 4 | S6 | 3 | #13 | 1540 | 5 |
| S6 | 3 | #13 | 1540 | 5 | | | | | |
| T1 | 240 | #29 | 3660 | 445 | T1 | 240 | #29 | 3660 | 445 |
| V1 | 48 | #29 | 6880 | 1671 | V1 | 48 | #29 | 6880 | 1671 |
| TOTAL REINFORCING STEEL = 7785 Kg | | | | | TOTAL REINFORCING STEEL = 8076 Kg | | | | |
| SPT | 3 | 5 | 252100 | 752 | SPT | 3 | 5 | 252100 | 752 |
| TOTAL SPIRAL COLUMN REINFORCING STEEL = 752 Kg | | | | | TOTAL SPIRAL COLUMN REINFORCING STEEL = 752 Kg | | | | |
| TOTAL CLASS "A" CONCRETE = 529 CU. METERS | | | | | TOTAL CLASS "A" CONCRETE = 564 CU. METERS | | | | |
| CONCRETE BREAKDOWN | | | | | CONCRETE BREAKDOWN | | | | |
| FOOTINGS * POUR 1 = 26.4 CU. METERS | | | | | FOOTINGS * POUR 1 = 26.4 CU. METERS | | | | |
| COLUMNS POUR 2 = 15.9 CU. METERS | | | | | COLUMNS POUR 2 = 15.9 CU. METERS | | | | |
| CAP POUR 3 = 10.6 CU. METERS | | | | | CAP POUR 3 = 14.1 CU. METERS | | | | |
| 305mm P/S CONCRETE PILES NO. = 27 LINEAR METERS = 257 | | | | | 305mm P/S CONCRETE PILES NO. = 27 LINEAR METERS = 257 | | | | |
| * CONCRETE DISPLACED BY PILES HAS BEEN DEDUCTED. | | | | | | | | | |

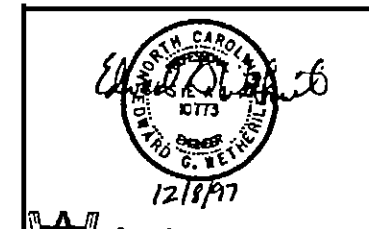


TOTAL QUANTITIES FOR BENT 1

| | REINFORCING STEEL (Kg) | CLASS "A" CONCRETE (CU. METERS) | SPIRAL COL. REIN. STEEL (Kg) | 305mm P/S CONG. PILES (NO.) | 305mm P/S CONG. PILES (LINEAR METERS) |
|----------|------------------------|---------------------------------|------------------------------|-----------------------------|---------------------------------------|
| STAGE I | 7785 | 529 | 752 | 27 | 257 |
| STAGE II | 8076 | 564 | 752 | 27 | 257 |
| TOTAL | 15861 | 1093 | 1504 | 54 | 514 |



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

DESIGNED BY: J. J. HARRIS DATE: 9-9-97
 CHECKED BY: J. J. HARRIS DATE: 11-11-97

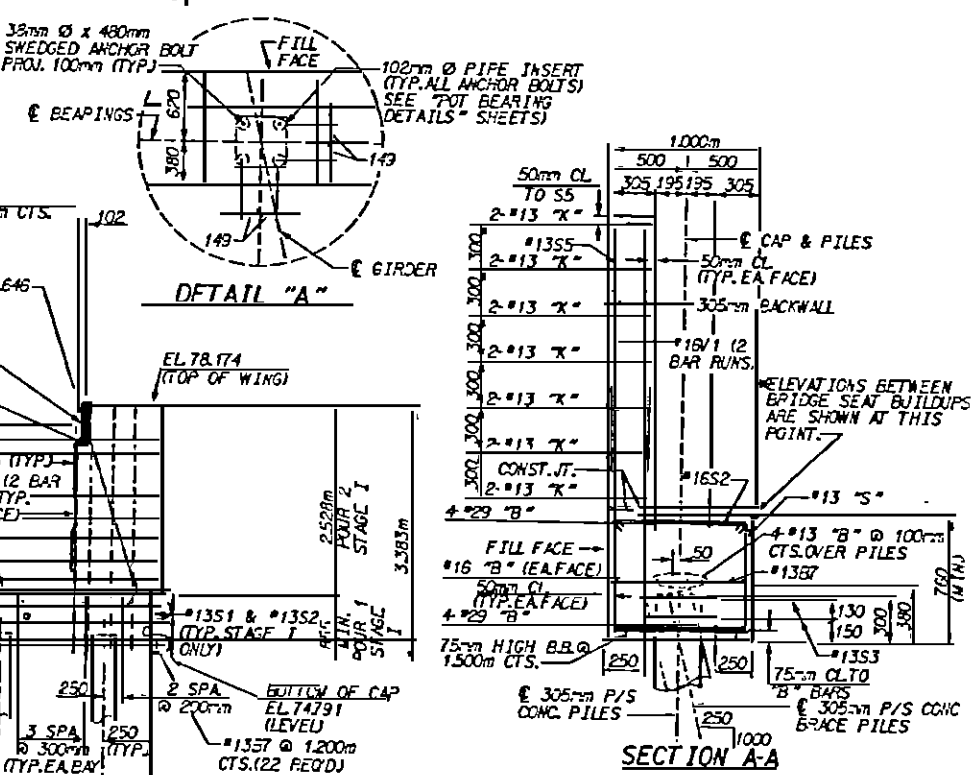
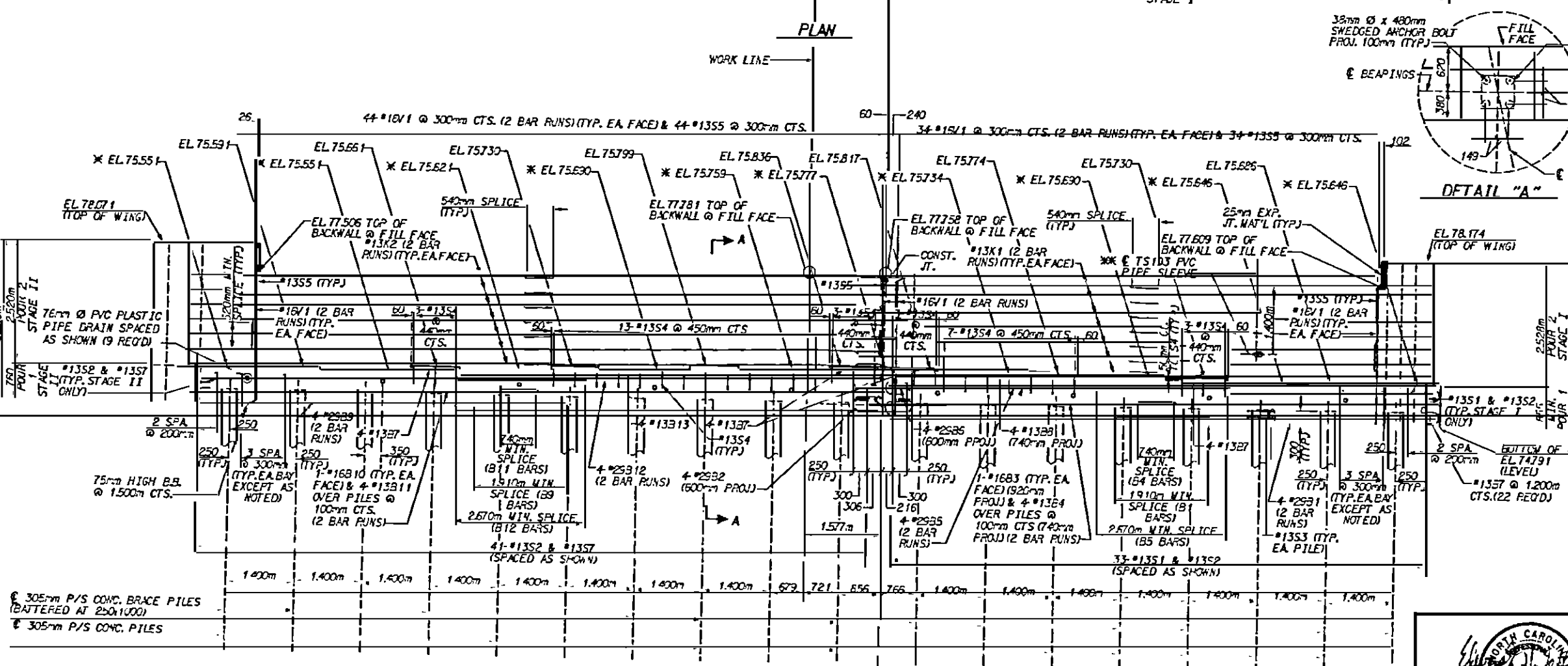
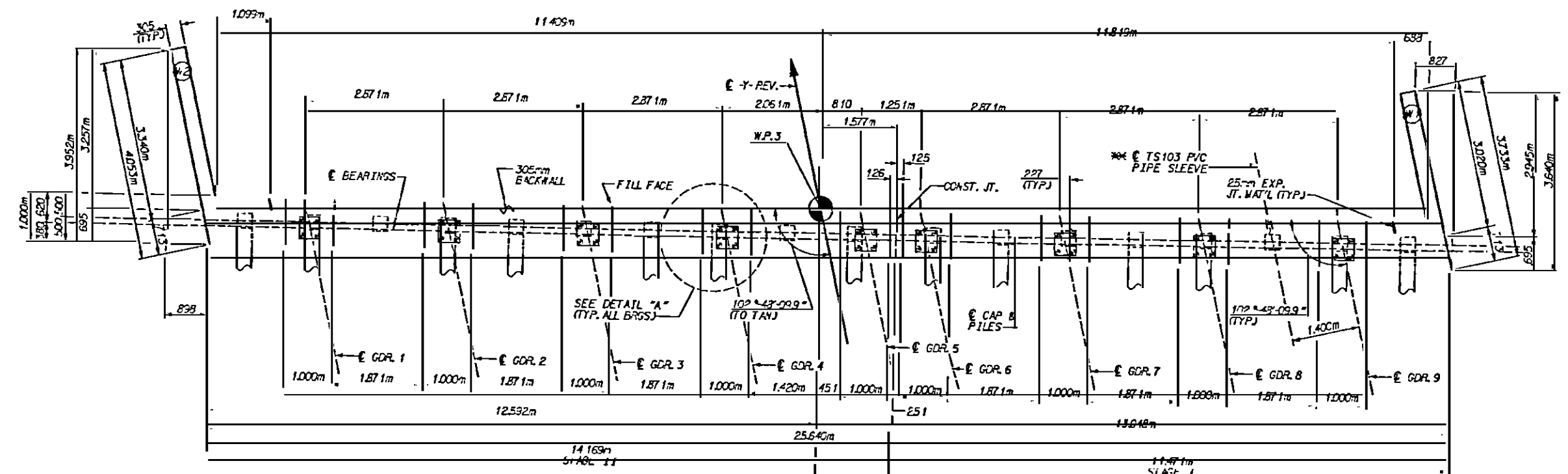
FOOTING PLAN
 NOTE: REINFORCING STEEL IS TYPICAL FOR ALL FOOTINGS.

REVISIONS

| NO. | BY | DATE | NO. | BY | DATE |
|-----|----|------|-----|----|------|
| 1 | | | 1 | | |
| 2 | | | 2 | | |

SHEET NO. S-21
 TOTAL SHEETS 30

NOTES:
STIRRIPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
FOR EPOXY PROTECTIVE COATINGS, SEE SPECIAL PROVISIONS.
PIPE DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND ANCHOR BOLTS.
FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 2 OF 2.
FOR PIPE DRAIN DETAILS AND BLOCKOUT DETAIL, SEE END BENT 1, SHEET 2 OF 2.
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%
FOR PIPE INSERT DETAILS, SEE "POT BEARING DETAILS" SHEETS.



SECTION A-A
PROJECT NO. I-2812
JOHNSTON COUNTY
STATION: 18+91701 -L-

Professional Engineer Seal for NORTH CAROLINA, License No. 00773, dated 8/6/99. The seal is for the firm Nothorill Associates, Inc., Consulting Engineers.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

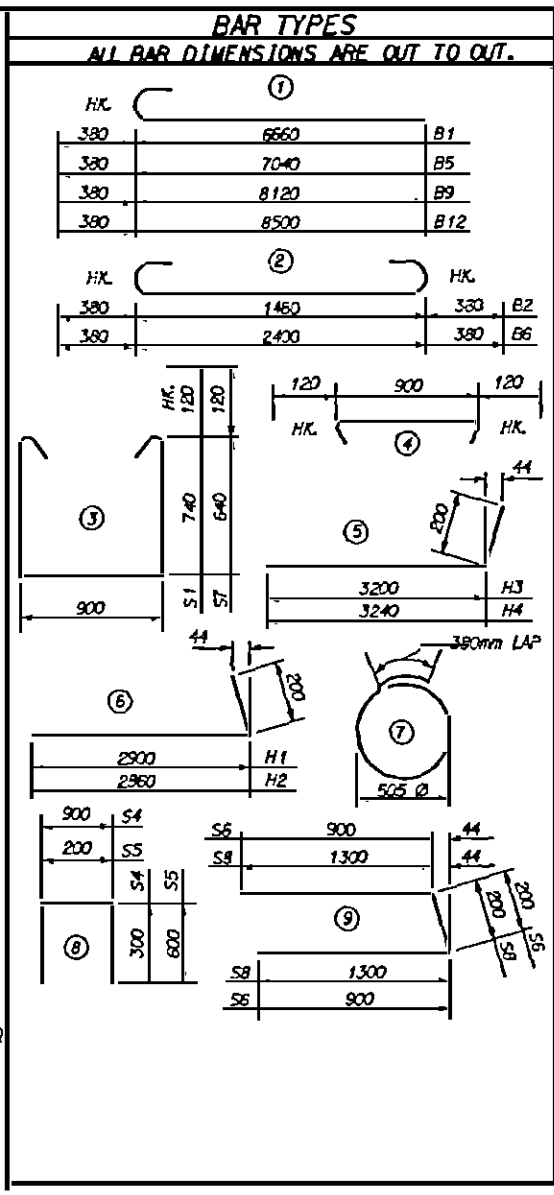
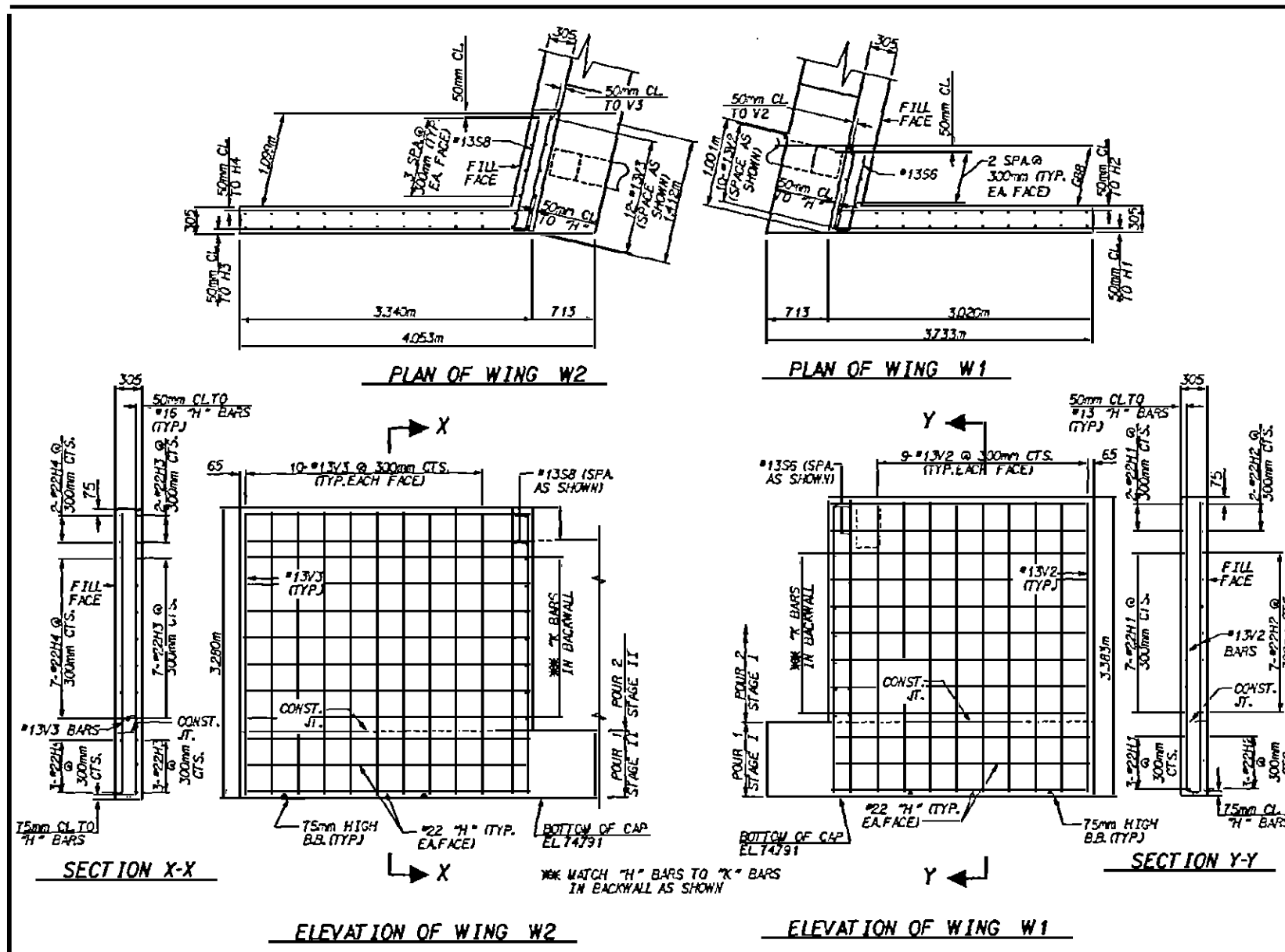
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| 2 | | | 2 | | |

TOTAL SHEETS 30

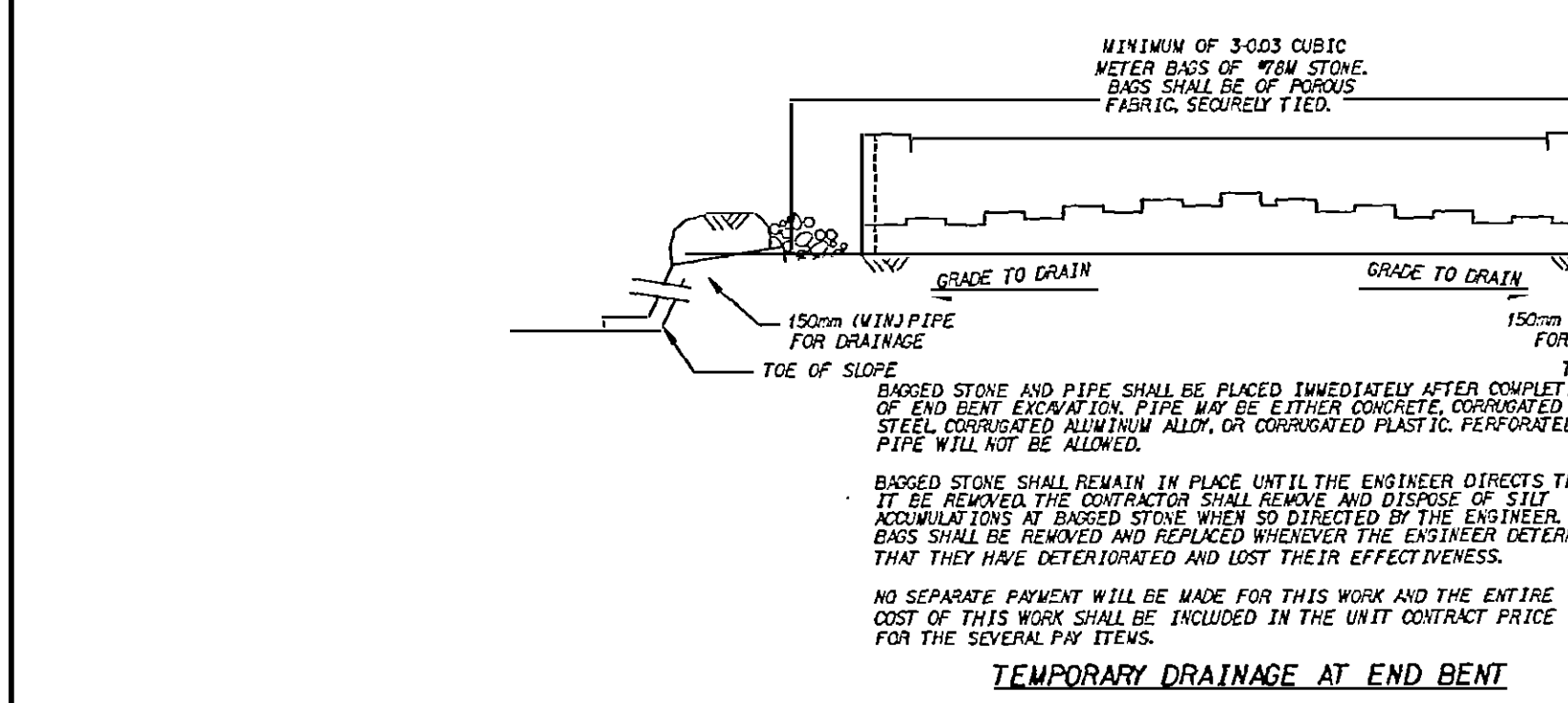
DRAWN BY: J. L. DICKET
CHECKED BY: J. A. DICKET

* FOR ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE "SECTION A-A", THIS SHEET.
** SEE "ELECTRICAL CONDUIT SYSTEM" DETAILS AND SPECIAL PROVISIONS FOR MATERIALS, CONSTRUCTION METHODS AND PAYMENT.

C:\12812\STREPT2-1.DWG (50)



| END BENT 2 STAGE I | | | | | END BENT 2 STAGE II | | | | | | |
|--------------------------------------------|------|------|-------------|-------------|--------------------------------------------|------|------|-------------|-------------|-------|-----|
| BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) | BAR NO. | SIZE | TYPE | LENGTH (mm) | WEIGHT (Kg) | | |
| B1 | 8 | #29 | 1 | 7040 | 295 | B7 | 20 | #13 | STR. | 900 | 18 |
| B2 | 4 | #29 | 2 | 1960 | 40 | B9 | 8 | #29 | 1 | 8500 | 344 |
| B3 | 2 | #16 | STR. | 12360 | 38 | B10 | 2 | #16 | STR. | 14100 | 44 |
| B4 | 8 | #13 | STR. | 6460 | 51 | B11 | 8 | #13 | STR. | 7440 | 59 |
| B5 | 8 | #29 | 1 | 7420 | 300 | B12 | 8 | #29 | 1 | 8880 | 359 |
| B6 | 4 | #29 | 2 | 1360 | 40 | B13 | 4 | #13 | STR. | 6680 | 27 |
| B7 | 18 | #13 | STR. | 900 | 16 | | | | | | |
| B8 | 4 | #13 | STR. | 4700 | 19 | H3 | 12 | #22 | 5 | 3400 | 124 |
| | | | | | | H4 | 12 | #22 | 5 | 3440 | 126 |
| H1 | 12 | #22 | 6 | 3100 | 113 | | | | | | |
| H2 | 12 | #22 | 6 | 3060 | 112 | K2 | 28 | #13 | STR. | 7440 | 207 |
| K1 | 28 | #13 | STR. | 6180 | 172 | S2 | 41 | #13 | 4 | 1140 | 46 |
| | | | | | | S3 | 20 | #13 | 7 | 1980 | 39 |
| S1 | 33 | #13 | 3 | 2520 | 86 | S4 | 19 | #13 | 8 | 1500 | 28 |
| S2 | 33 | #13 | 4 | 1140 | 37 | S5 | 44 | #13 | 8 | 1400 | 61 |
| S3 | 16 | #13 | 7 | 1980 | 51 | S7 | 41 | #13 | 3 | 2420 | 99 |
| S4 | 13 | #13 | 8 | 1500 | 19 | S8 | 2 | #13 | 9 | 2800 | 6 |
| S5 | 34 | #13 | 8 | 1400 | 47 | | | | | | |
| S6 | 2 | #13 | 9 | 2000 | 4 | V1 | 176 | #16 | STR. | 1720 | 470 |
| | | | | | | V3 | 32 | #13 | STR. | 3160 | 101 |
| V1 | 136 | #16 | STR. | 1720 | 363 | | | | | | |
| V2 | 28 | #13 | STR. | 3250 | 91 | | | | | | |
| TOTAL REINFORCING STEEL = 1864 Kg | | | | | TOTAL REINFORCING STEEL = 2158 Kg | | | | | | |
| TOTAL CLASS "A" CONCRETE = 20.0 CU. METERS | | | | | TOTAL CLASS "A" CONCRETE = 24.3 CU. METERS | | | | | | |
| CONCRETE BREAKDOWN | | | | | CONCRETE BREAKDOWN | | | | | | |
| * POUR 1 = 11.0 CU. METERS | | | | | * POUR 1 = 13.1 CU. METERS | | | | | | |
| POUR 2 = 9.0 CU. METERS | | | | | POUR 2 = 11.2 CU. METERS | | | | | | |
| 305mm P/S CONCRETE PILES | | | | | 305mm P/S CONCRETE PILES | | | | | | |
| NO. = 8 LINEAR METERS = 129 | | | | | NO. = 10 LINEAR METERS = 161 | | | | | | |



| TOTAL QUANTITIES FOR END BENT 2 | | | |
|---------------------------------|-------------------|--------------------|-----------------------|
| | REINFORCING STEEL | CLASS "A" CONCRETE | 305mm P/S CONC. PILES |
| | Kg | CU. METERS | NO. LINEAR METERS |
| STAGE I | 1864 | 20.0 | 8 129 |
| STAGE II | 2158 | 24.3 | 10 161 |
| TOTAL | 4022 | 44.3 | 18 290 |



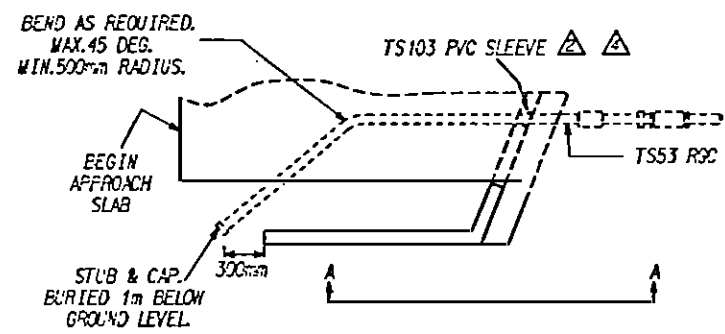
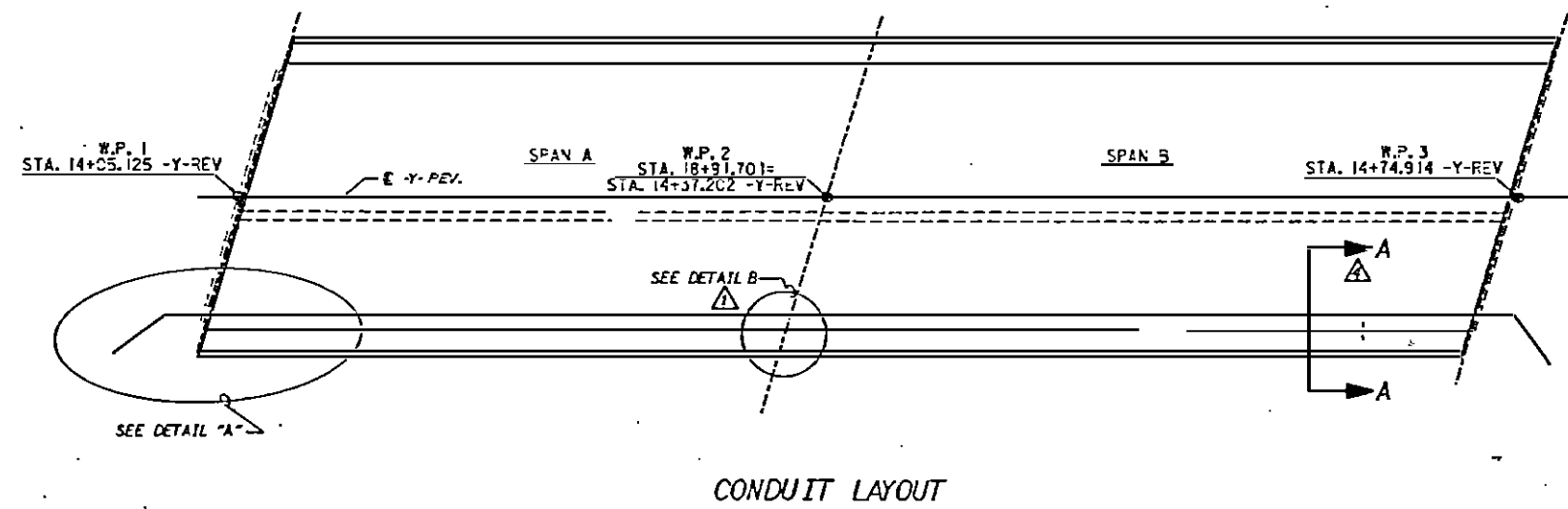
PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L

Wetherill Associates, Inc.
 Consulting Engineers
 12/8/97

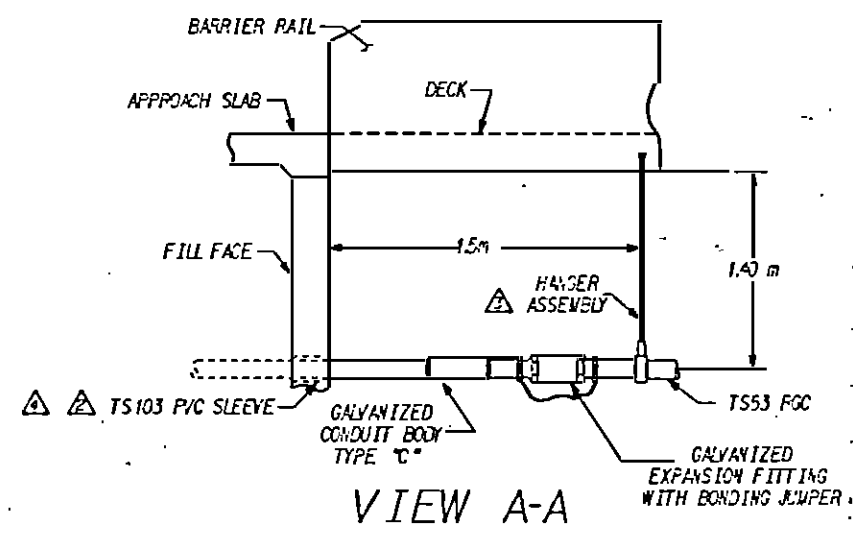
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Raleigh

**SUBSTRUCTURE
 END BENT 2**

| REVISIONS | | | | | |
|-----------|----|------|-----|----|------|
| NO. | BY | DATE | NO. | BY | DATE |
| 1 | | | 1 | | |



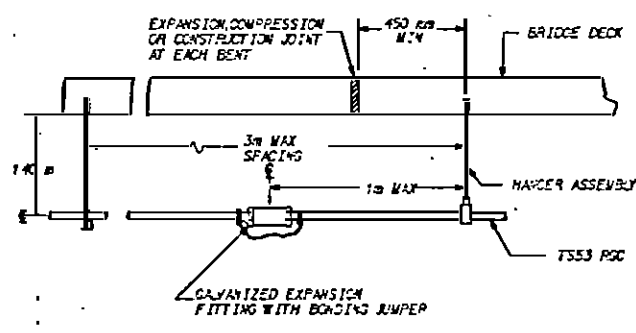
TERMINATION OF CONDUIT AT WING WALL (SIMILAR AT EACH END BENT)



NOTES

- △ PROVIDE EXPANSION FITTINGS FOR EACH CONDUIT AT ALL LOCATIONS WHERE CONDUIT CROSSES AN EXPANSION, COMPRESSION OR CONSTRUCTION JOINT. SEE DETAIL B (SHEET 2 OF 2).
- △ SEE DETAIL C ON SHEET 2 OF 2 FOR SLEEVE INSTALLATION.
- △ SEE DETAIL D ON SHEET 2 OF 2 FOR HANGER ASSEMBLY INSTALLATION.
- △ INSTALL SLEEVE PARALLEL TO GIRDERS.

SEE PROJECT SPECIAL PROVISIONS TITLED "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS CONSTRUCTION METHODS AND PAYMENT.



BARRIER RAIL NOT SHOWN

PROJECT NO. _____

COUNTY _____

STATION _____

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

| REVISIONS | | | | |
|-----------|----|------|-----|------|
| NO. | BY | DATE | NO. | DATE |
| 1 | | | 3 | |
| 2 | | | 4 | |

U-AM 01: _____ DATE: 7/20/00

CHECKED BY: _____ DATE: _____

PROJECT NO. I-2812

JOHNSTON COUNTY

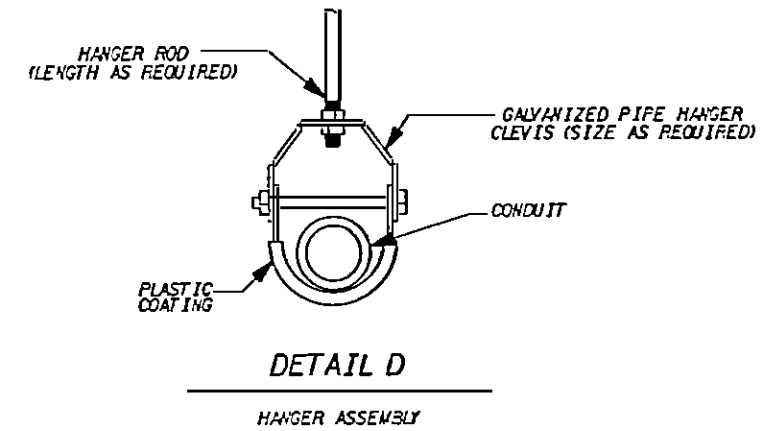
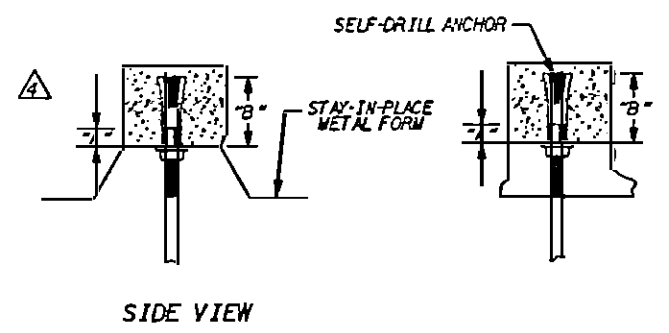
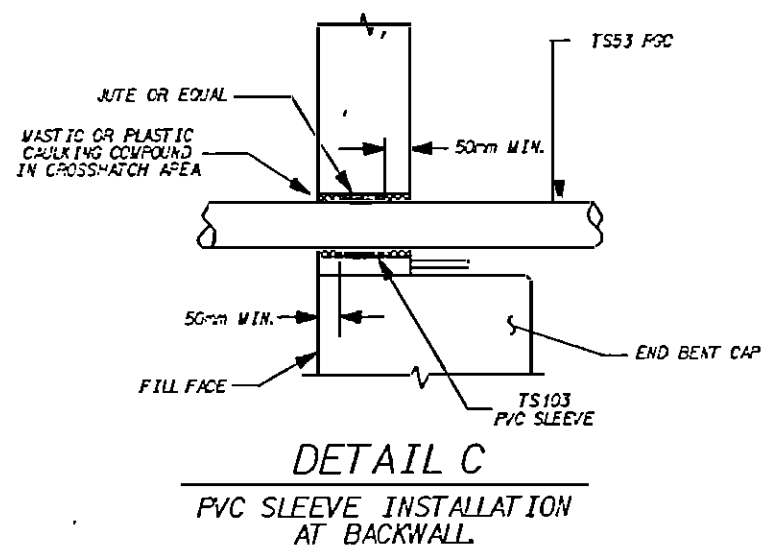
STATION: 18+91701 -L-
14+37.202 -Y-REV

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**ELECTRICAL
CONDUIT
SYSTEM**

| REVISIONS | | | | | SHEET NO. |
|-----------|----|------|-----|------|--------------|
| NO. | BY | DATE | NO. | DATE | S-24 |
| 1 | | | 3 | | TOTAL SHEETS |
| 2 | | | 4 | | 30 |



ESTIMATED BILL OF MATERIALS

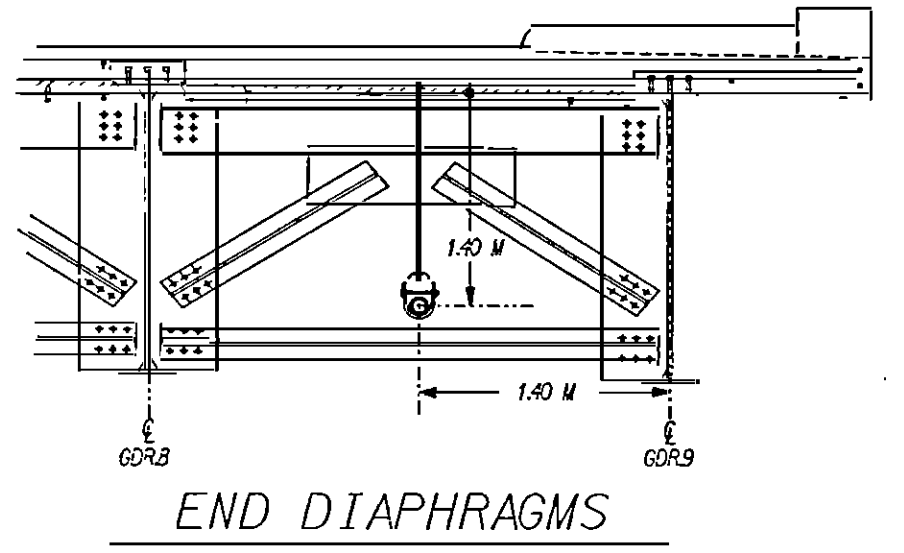
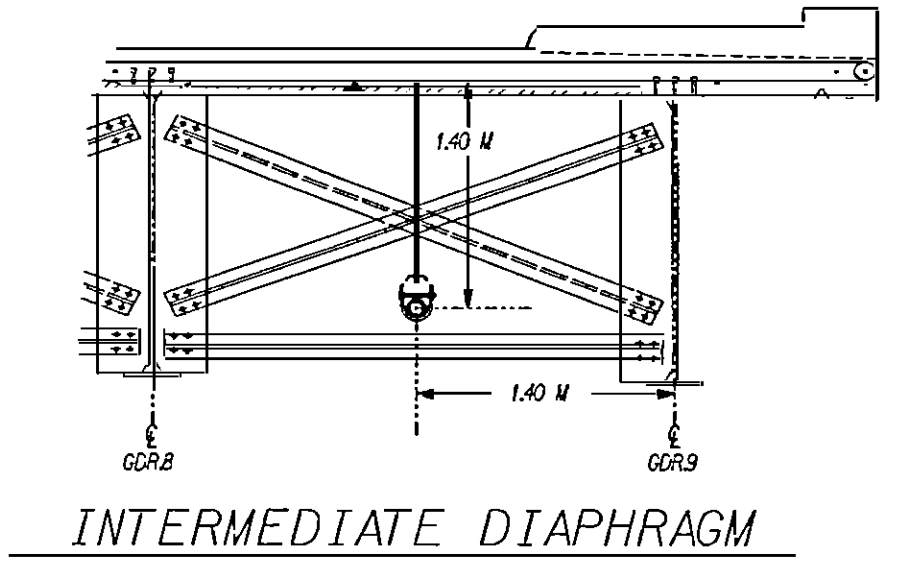
| QTY | UNIT | ITEMS |
|-----|------|------------------------------------------------|
| 75 | M | TS53 RIGID GALVANIZED CONDUIT (RGC) |
| 75 | M | POLYETHYLENE PULL LINE |
| 2 | EA | END CAPS |
| 2 | EA | TYPE "C" GALVANIZED CONDUIT BODIES |
| 25 | EA | GALV. HANGER ASSEMBLIES W/ GALV. STEEL RODS |
| 4 | EA | GALVANIZED EXPANSION FITTING W/ BONDING JUMPER |
| 25 | M | SELF DRILL ANCHORS |
| 2 | EA | TS103 PVC SLEEVE |
| 1 | LOT | JUTE |
| 1 | LOT | MASTIC |

SELF - DRILL ANCHORS

| SIZE | | "A" MIN. | | * "B" TYP. | | PULLOUT FORCE | |
|--------|-----|----------|-------|------------|---------|---------------|-------|
| mm | In. | mm | In. | mm | In. | Kg. | Lbs. |
| 6.350 | 1/4 | 9.525 | 3/8 | 27.781 | 1 1/32 | 1233 | 2713 |
| 9.525 | 3/8 | 14.288 | 9/16 | 38.894 | 1 17/32 | 1909 | 4200 |
| 12.700 | 1/2 | 20.639 | 13/16 | 51.594 | 2 1/32 | 3341 | 7350 |
| 15.875 | 5/8 | 23.813 | 15/16 | 62.706 | 2 15/32 | 4659 | 10250 |

* PER APPROVED MANUFACTURER'S SPECIFICATIONS

TS53 RGC HANGER ASSEMBLY



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91.01 -L-
14+37.202 -Y-REV

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 BUREAU

**ELECTRICAL
 CONDUIT
 SYSTEM**

SEE PROJECT SPECIAL PROVISIONS TITLED "ELECTRICAL CONDUIT SYSTEM" FOR MATERIALS CONSTRUCTION METHODS AND PAYMENT.

| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|-----------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 3 | | | 8-25 |
| 2 | | | 4 | | | 30 |

NOTES

CONCRETE DESIGN DATA : $f'_c = 34.5 \text{ MPa}$; $f_c = 13.8 \text{ MPa}$

IMPACT IN HANDLING - 50%

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE PILE SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 24.1 MPa .

IN DRIVING PILES, A METHOD APPROVED BY THE ENGINEER SHALL BE USED, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILLED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS TO BE INDICATED WITH A BLACK MARK 50-mm WIDE.

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO ASTM A-416 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

THE CONTRACTOR MAY USE EITHER OF THE FOLLOWING STRAND CONFIGURATIONS:

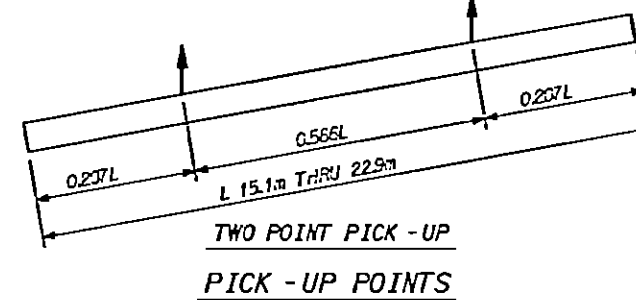
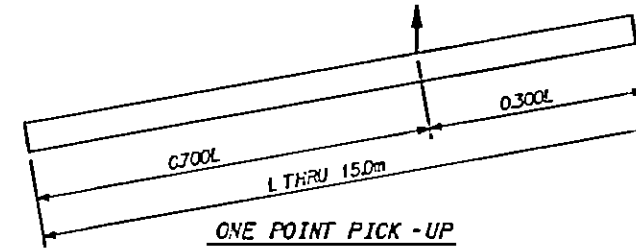
| SIZE | GRADE | NUMBER OF STRANDS | AREA mm^2 | ULTIMATE STRENGTH KN | APPLIED PRESTRESS FORCE KN |
|------|-------|-------------------|--------------------|----------------------|----------------------------|
| 1270 | 270 | 4 | 9971 | 1837 PER STRAND | 137.8 PER STRAND |
| 1270 | 270 | 5 | 9971 | 1837 PER STRAND | 137.8 PER STRAND |

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED THE LAST STRAND MAY BE BURNED SINGLY, ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

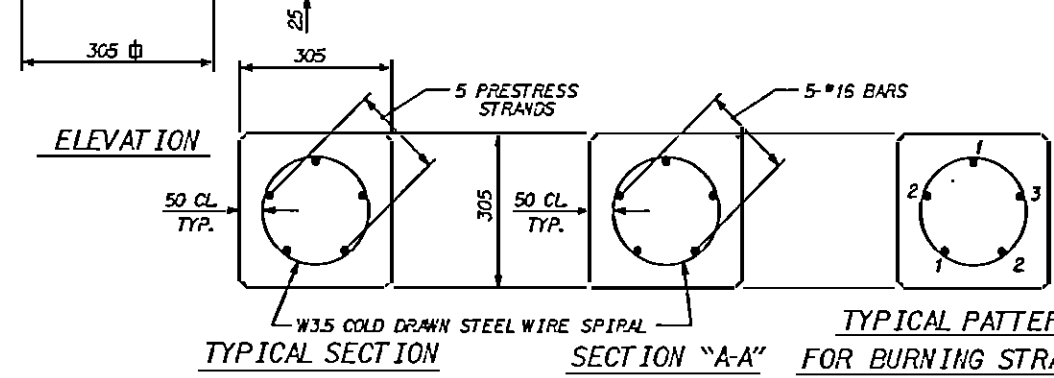
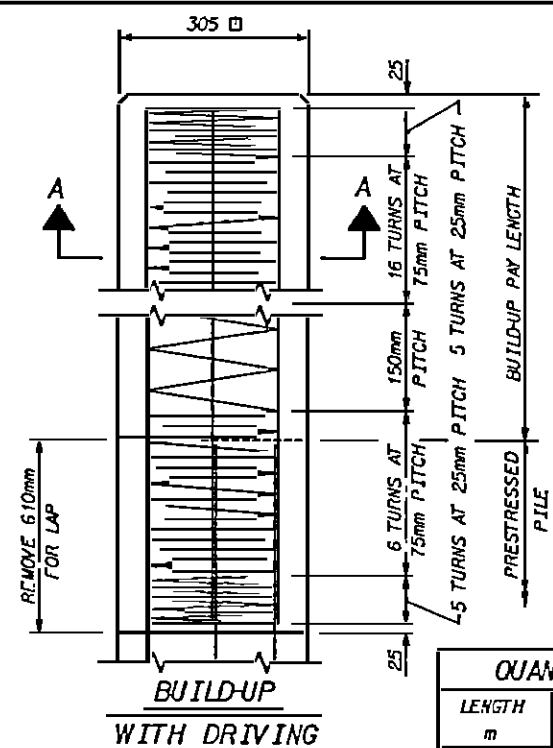
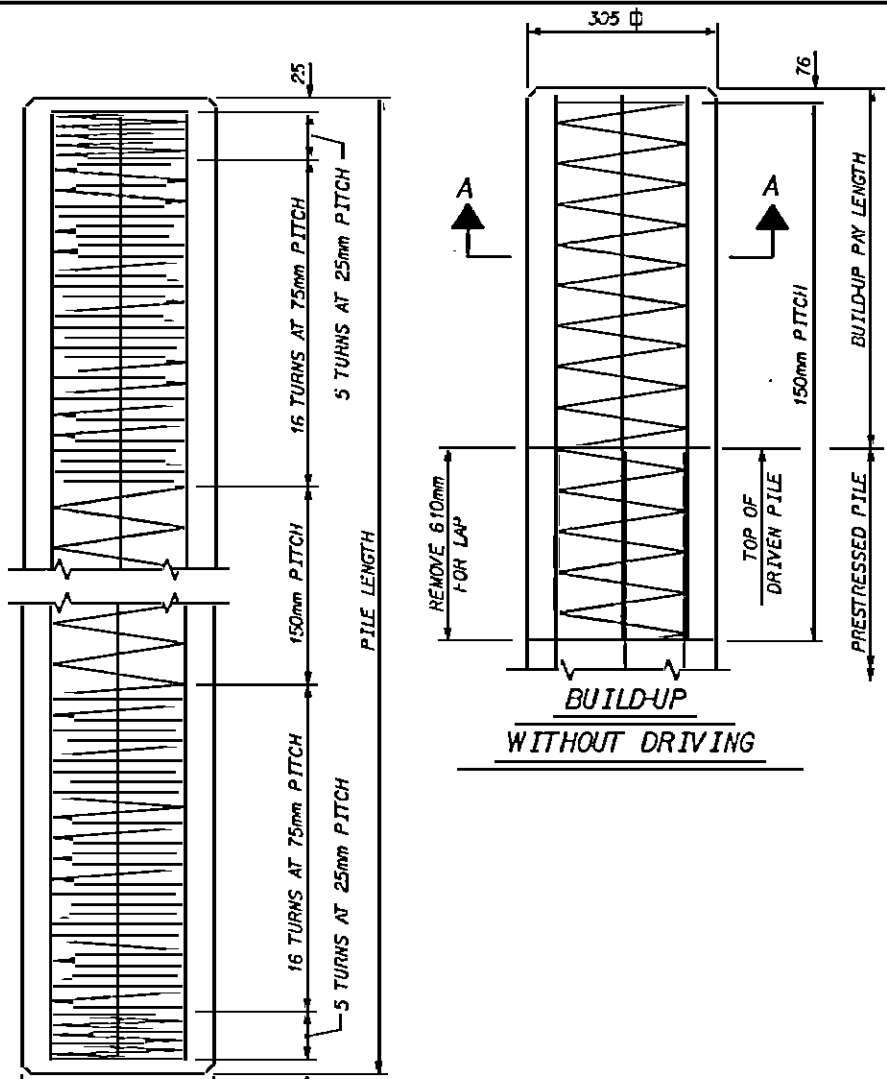
BUILDUPS SHALL BE CLASS A CONCRETE WITH 20% ADDITIONAL CEMENT. NO DRIVING OF THE BUILT-UP PILE WILL BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 20.7 MPa AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

ALL CORNERS TO BE CHAMFERED 19mm.

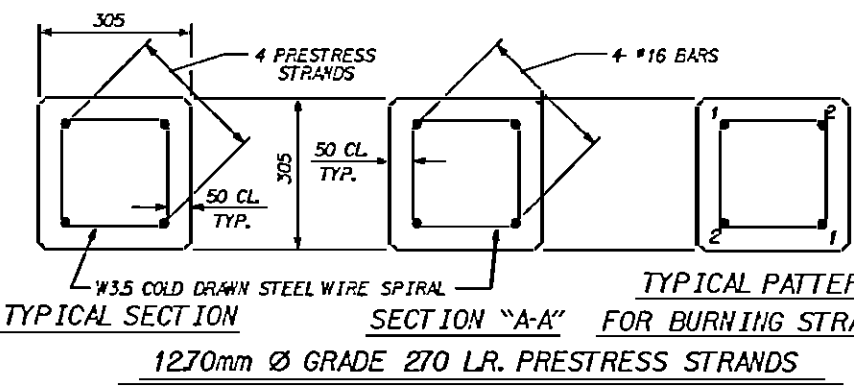


QUANTITIES FOR ONE 305mm PRESTRESSED PILE

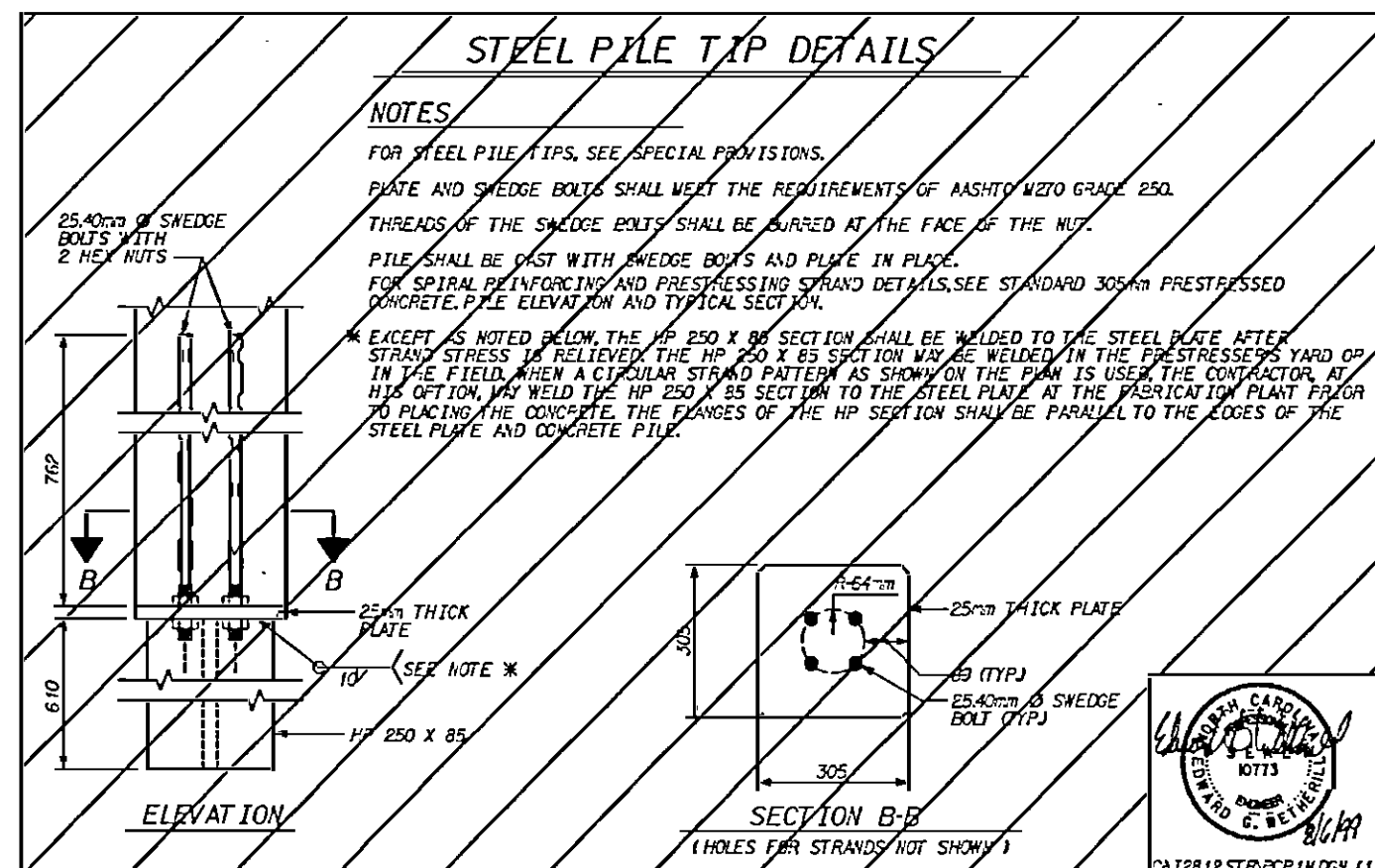
| LENGTH m | CONCRETE m^3 | PILE WT. Kg | ONE PICK-UP POINT | | TWO PICK-UP POINT | |
|-------------|--------------------------|----------------|-------------------|----------|-------------------|----------|
| | | | 0.300L m | 0.700L m | 0.207L m | 0.566L m |
| 7.5 | 0.70 | 1690 | 2.25 | 5.25 | | |
| 9.0 | 0.84 | 2020 | 2.70 | 6.30 | | |
| 10.5 | 0.98 | 2350 | 3.15 | 7.35 | | |
| 12.0 | 1.12 | 2690 | 3.60 | 8.40 | | |
| 13.5 | 1.26 | 3030 | 4.05 | 9.45 | | |
| 15.0 | 1.40 | 3360 | 4.50 | 10.50 | | |
| 16.5 | 1.53 | 3680 | | | 3.42 | 9.57 |
| 18.0 | 1.67 | 4010 | | | 3.73 | 10.55 |
| 19.5 | 1.81 | 4350 | | | 4.04 | 11.43 |
| 21.0 | 1.95 | 4690 | | | 4.35 | 12.31 |
| 22.5 | 2.09 | 5020 | | | 4.66 | 13.19 |



1270mm Ø GRADE 270 LR. PRESTRESS STRANDS



1270mm Ø GRADE 270 LR. PRESTRESS STRANDS

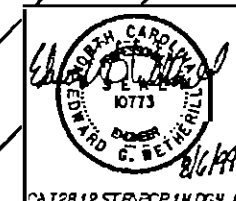


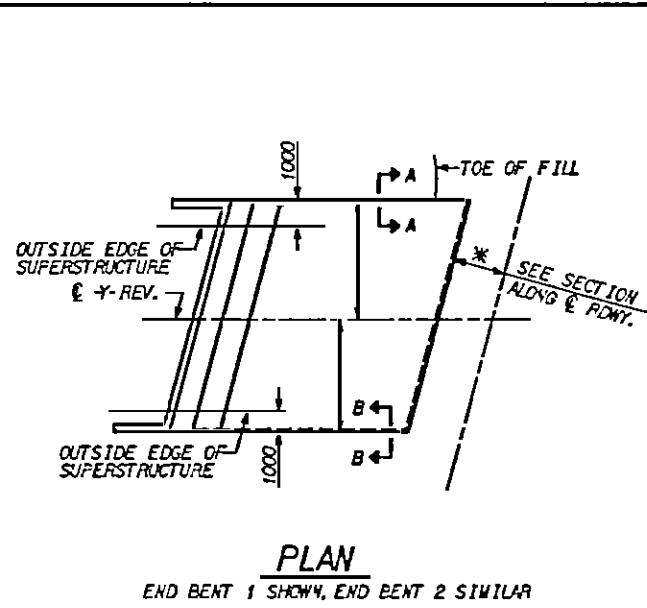
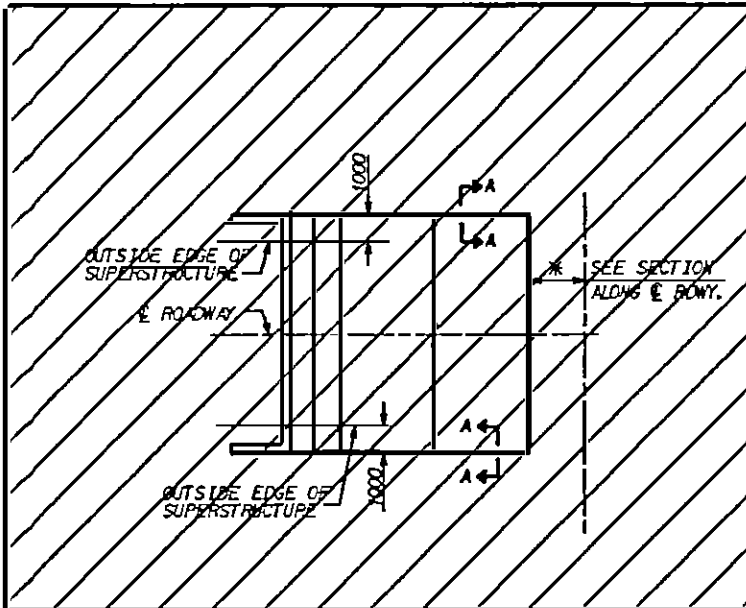
ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. VAN VLIET DATE: 11-11-97
 DRAWN BY: FCJ 7/88 REV. 5/16/97 ENL/ROM
 CHECKED BY: CTR 3/89 REV. 7/17/98 RWR/ALES

PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**STANDARD
 305mm PRESTRESSED
 CONCRETE PILE**

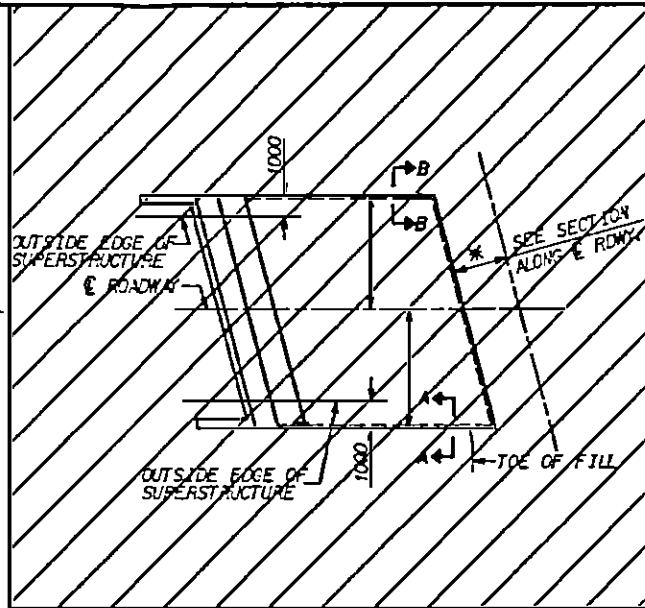
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|-----------|----|------|-----|----|------|-------------------|
| NO. | BY | DATE | NO. | BY | DATE | |
| 1 | | | 3 | | | LOCAL SETS 30 |
| 2 | | | 4 | | | |





PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR



GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR AT HIS OPTION MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL UNPOPULATED AREAS STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER VISUAL INSPECTION INDICATES A NEED FOR IT. METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE AS PRESCRIBED IN SECTION 422 OF THE STANDARD SPECIFICATIONS FOR BERM WIDTH. SEE GENERAL DRAWING.

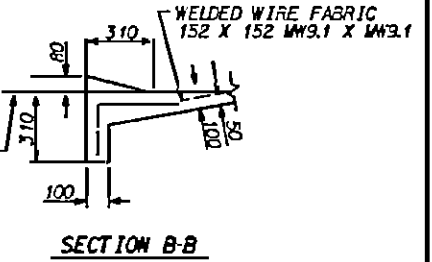
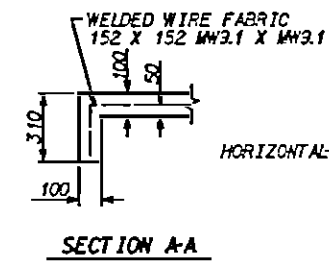
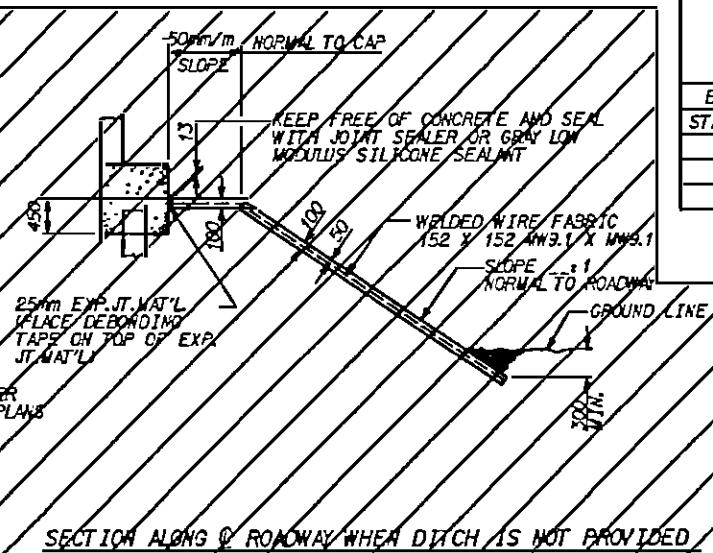
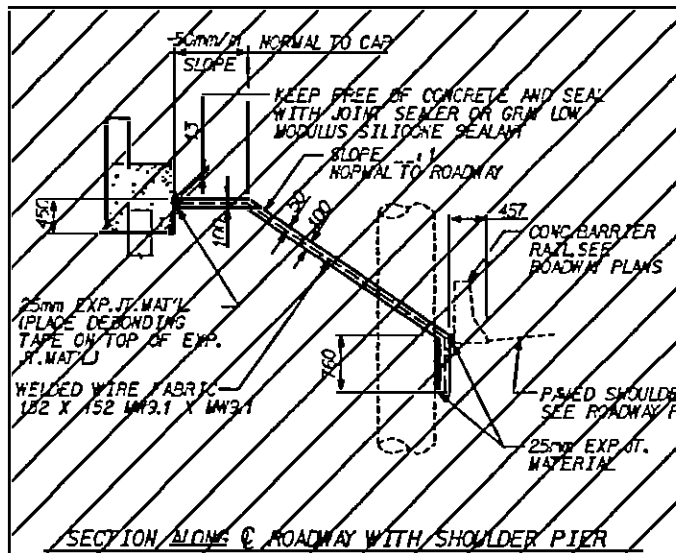
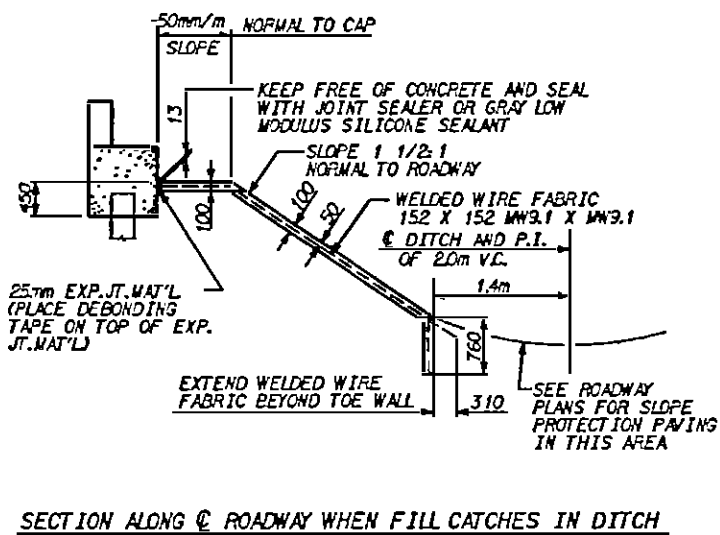
ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF 100mm POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 152 X 152 MW9.1 X MW9.1 152mm WIDE ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST 150mm. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE 1220mm AND 1520mm STRIPS AS SHOWN IN THE POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE METER FOR SLOPE PROTECTION.

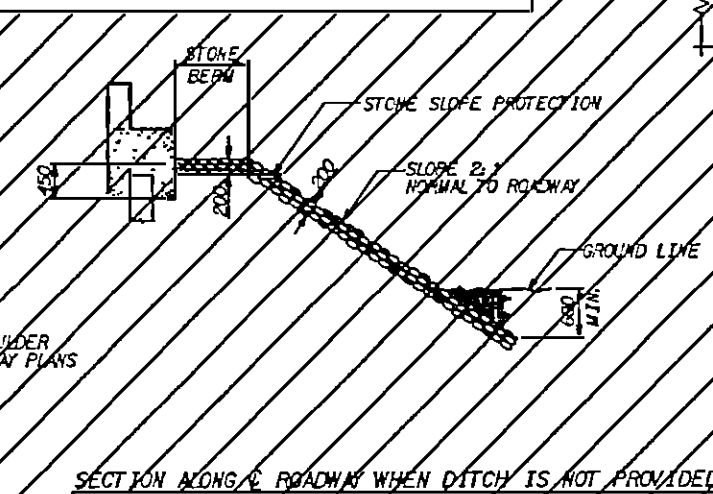
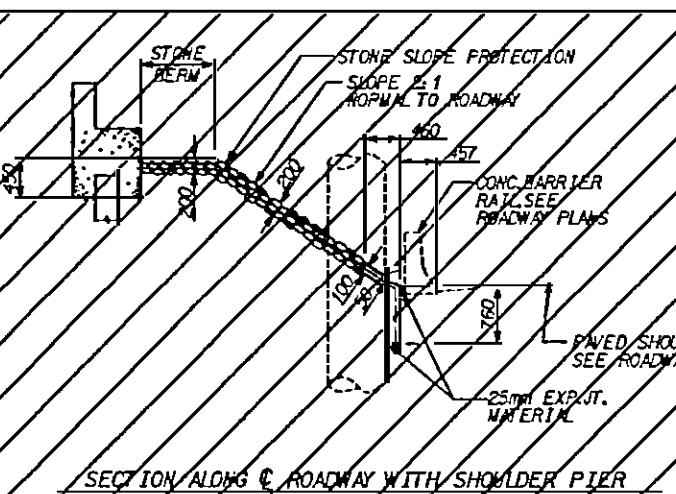
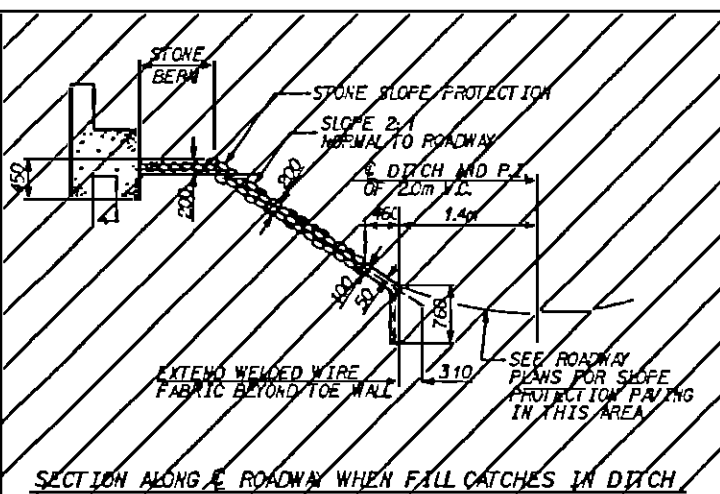
ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF A COMBINATION CONCRETE SLAB AND STONE SLOPE PROTECTION. THE CONCRETE PORTIONS SHALL CONSIST OF PAVED STRIPS ALONG THE DITCH AS SHOWN IN THE DETAILS. 200mm OF STONE SHALL BE PLACED OVER THE REMAINING AREA SHOWN ON THE PLANS TO BE COVERED WITH SLOPE PROTECTION. CONCRETE SHALL BE CLASS "B". THE COST OF THE CONCRETE, STONE AND WELDED WIRE FABRIC 152 X 152 MW9.1 X MW9.1 SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE METER FOR SLOPE PROTECTION. SUBGRADING, STONE TYPE, STONE SIZE, AND HERBICIDE PROTECTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE HERBICIDE TYPE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO APPLICATION.

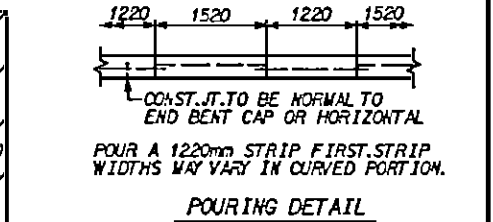
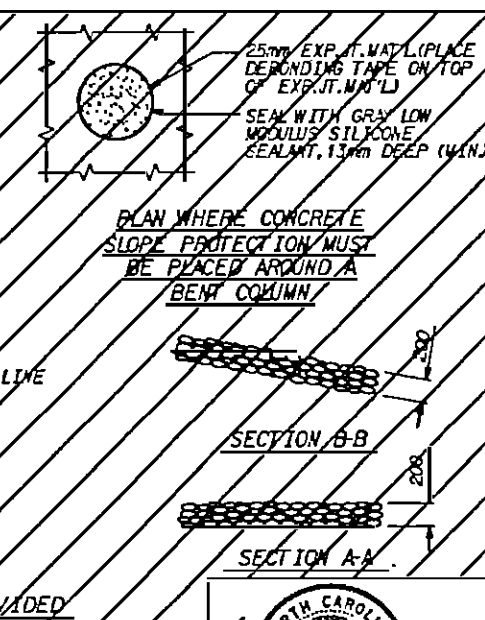
| BRIDGE AT | 100mm SLOPE PROTECTION SQUARE METERS | | WELDED WIRE FABRIC 152mm WIDE APPROX. METERS |
|------------------------|--------------------------------------|------------|----------------------------------------------|
| | END BENT 1 | END BENT 2 | |
| STA. 14+37.202 -Y-REV. | | | |
| STAGE I | 97 | 121 | 159 |
| STAGE II | 128 | 159 | 209 |
| TOTAL | 225 | 280 | 368 |



DETAILS FOR ALTERNATE "A"



DETAILS FOR ALTERNATE "B"

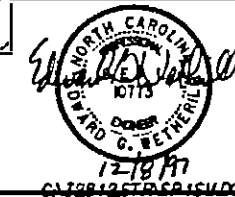


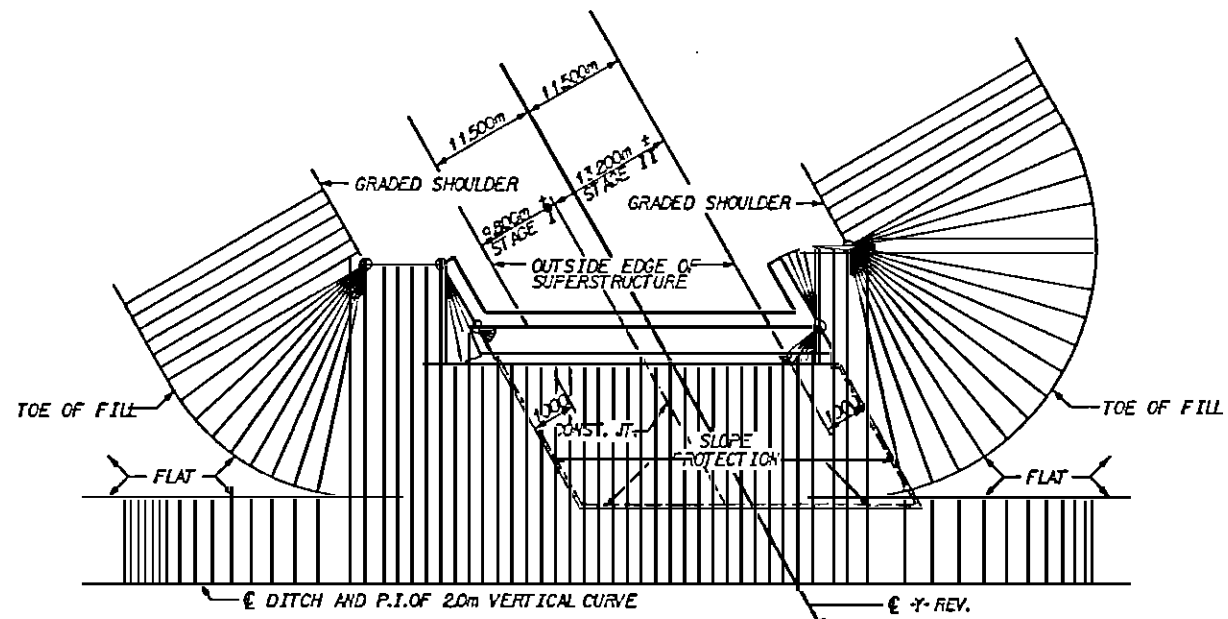
PROJECT NO. **I-2812**
JOHNSTON COUNTY
 STATION: **18+91701 -L-**
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 STANDARD
 SLOPE PROTECTION
 DETAILS

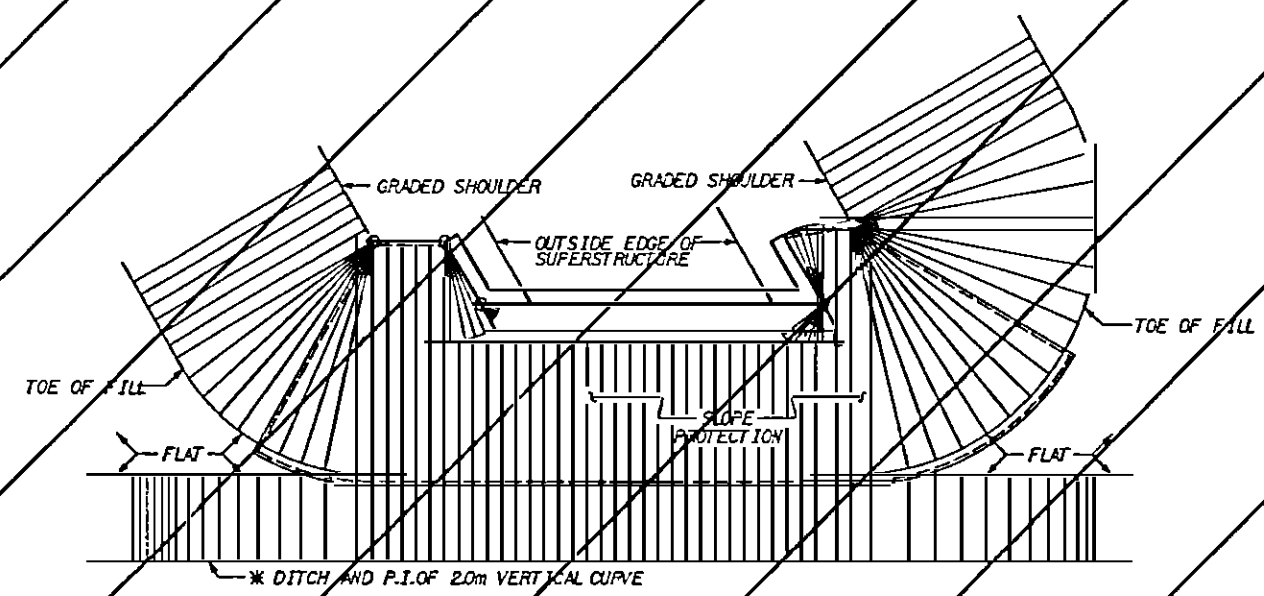
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| 2 | | | 3 | | | 12/8/97 |
| 3 | | | 4 | | | 12/8/97 |

ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. WATKIN DATE: 11-11-97
 DRAWN BY: ELR 5/92 REV. 5/16/97 EEM/PCW
 CHECKED BY: BPP 6/92

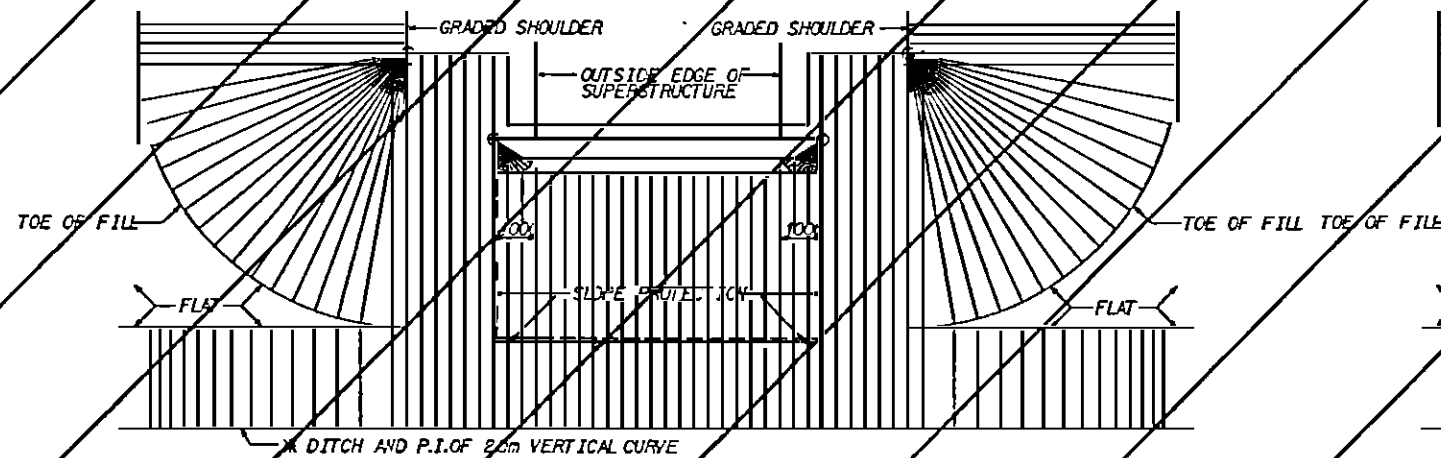




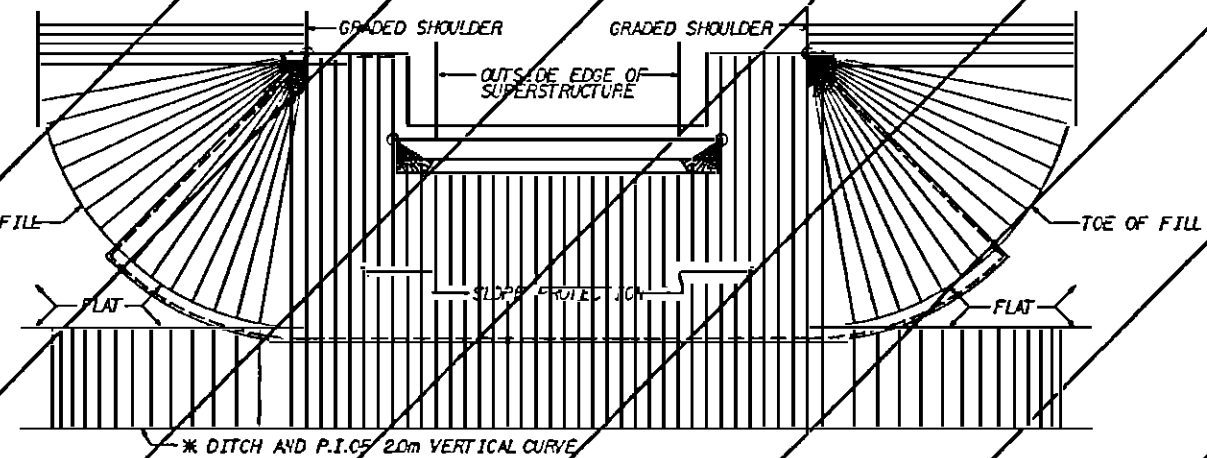
PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED
(1 1/5:1 SLOPE)



PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED
(1 1/2:1 SLOPE)



PLAN - END BENT WITH SWEEP BACK WINGS - 90°
(2:1 SLOPE)



PLAN - END BENT WITH SWEEP BACK WINGS - 90°
(1 1/2:1 SLOPE)



PROJECT NO. I-2812
JOHNSTON COUNTY
 STATION: 18+91701 -L-

SHEET 2 OF 2

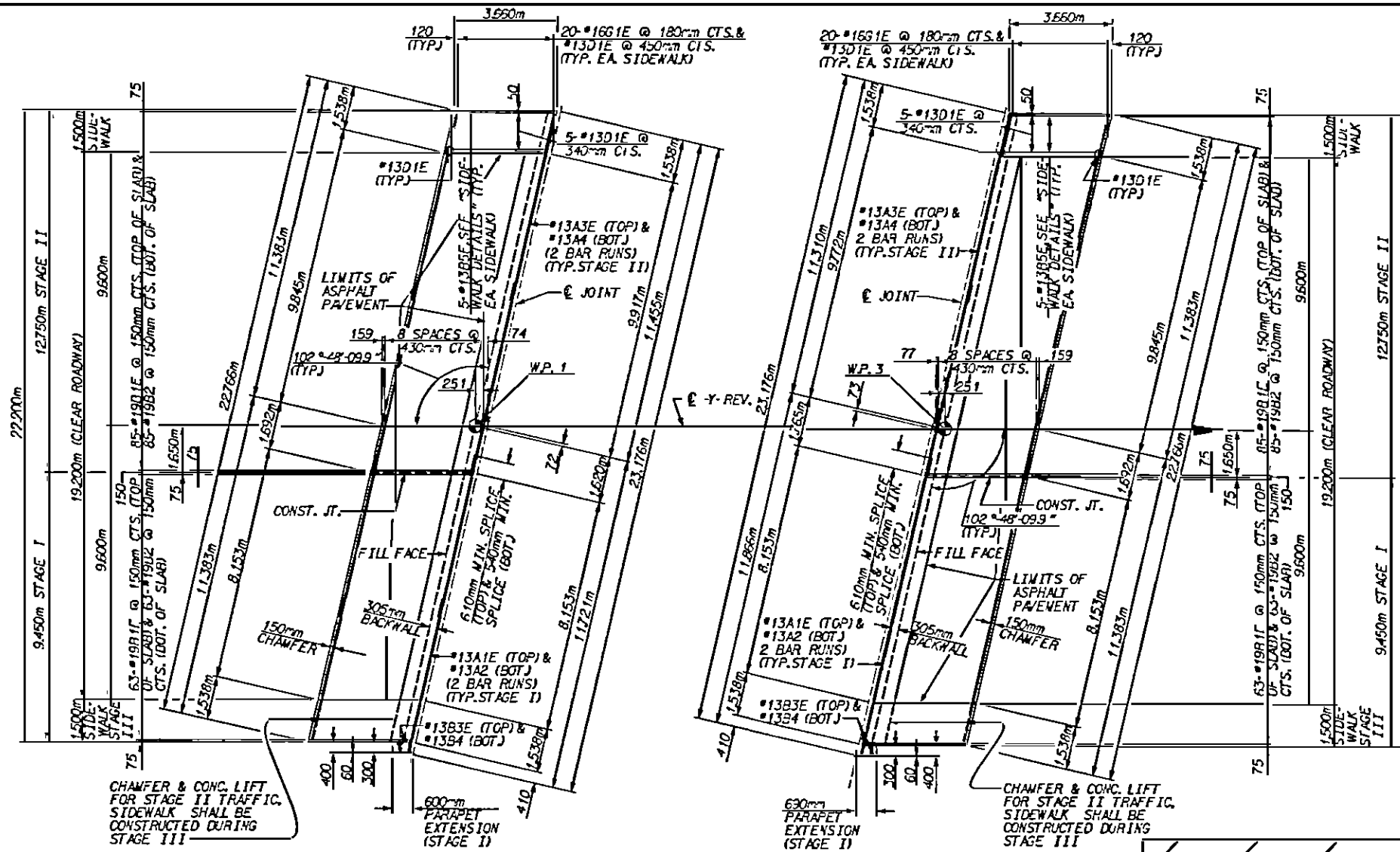
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 SLOPE PROTECTION
 DETAILS

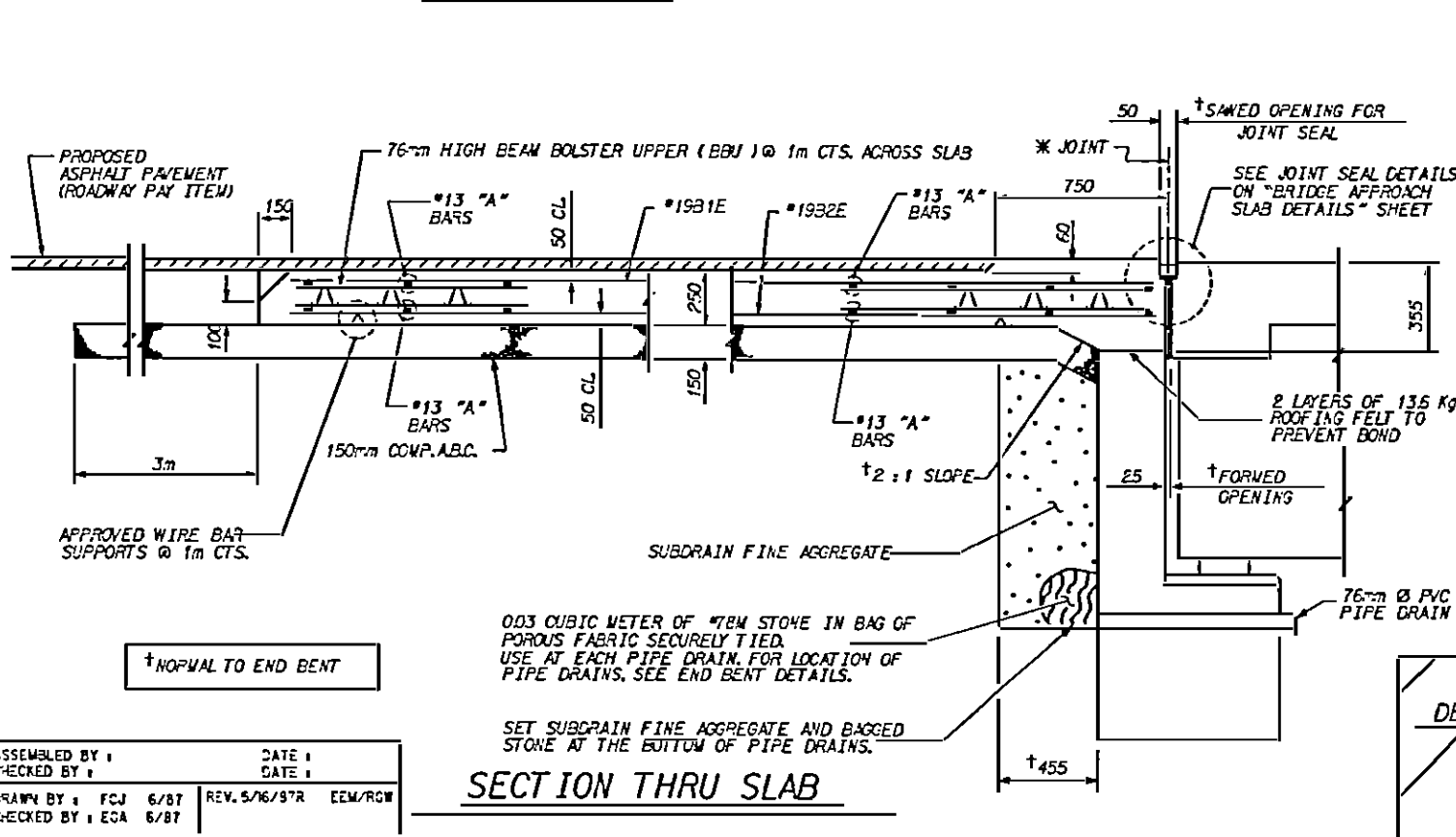


ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. MARVIN DATE: 11-11-97
 DRAWN BY: W.M. 10/88 REV. 5/16/97 EEM/FGW
 CHECKED BY: FGJ 10/88

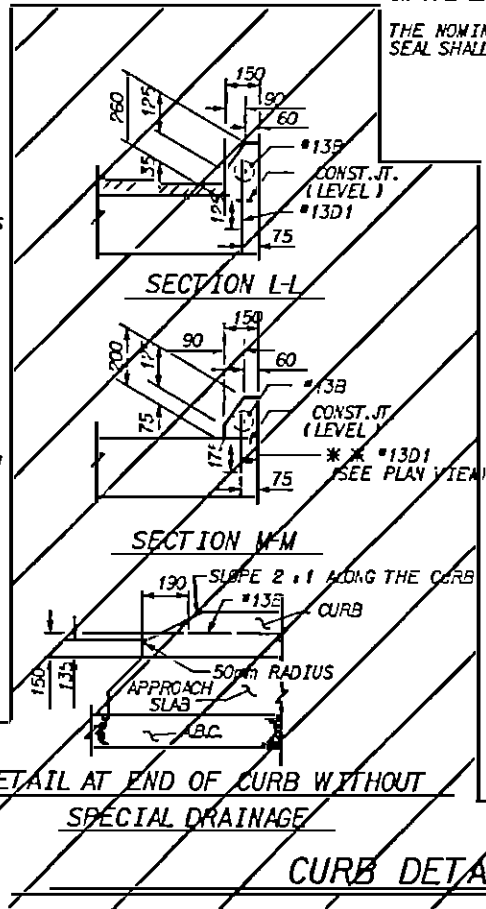
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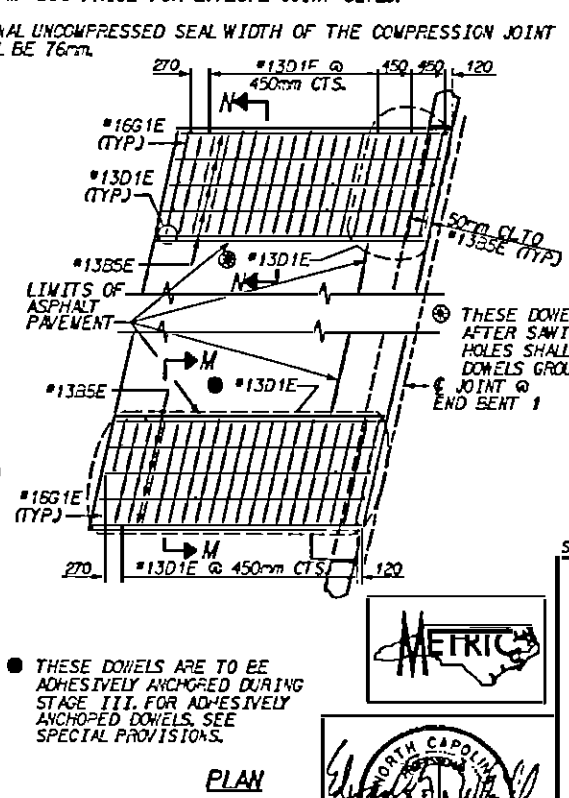
PLAN @ END BENT 1



SECTION THRU SLAB



DETAIL AT END OF CURB WITHOUT SPECIAL DRAINAGE



PLAN

NOTES

SUBDRAIN FINE AGGREGATE IS TO BE CONTINUOUS ALONG FILL FACE OF BACKFILL AND END BENT FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

TEMPORARY GRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE.

THE AREAS BETWEEN THE WINGWALLS AND THE APPROACH SLABS SHALL BE PAVED, SEE ROADWAY PLANS.

THE 150mm COMP. ABC SHALL EXTEND 3m BEYOND THE END OF THE APPROACH SLAB AND 300mm OUTSIDE OF EACH EDGE OF THE SLAB.

THE CONTRACTOR MAY, AT HIS OPTION, USE 100mm TYPE H9 ASPHALT CONCRETE BASE COURSE IN LIEU OF 150mm COMP. ABC. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 3m BEYOND THE END OF THE APPROACH SLAB AND 300mm OUTSIDE BOTH EDGES OF THE SLAB.

THE CONTRACTOR MAY, AT HIS OPTION, USE 125mm CLASS 'A' CONCRETE BASE IN LIEU OF 150mm COMP. ABC. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 3m BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 136 Kg ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE SLAB HAS BEEN SCREEDED AND FLOAT FINISHED EXCEPT AS NOTED ON THE PLANS.

THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE CONCRETE CURB AND THE BARRIER RAIL.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR SKEWS BETWEEN 70° AND 110°, THE CONTRACTOR MAY, AT HIS OPTION, USE A COMPRESSION JOINT SEAL IN LIEU OF THE EVAZOTE JOINT SEAL. SEE SPECIAL PROVISION FOR OPTIONAL PREFORMED COMPRESSION JOINT SEALS.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

PAYMENT FOR EVAZOTE JOINT SEALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 71mm.

WITH OPTIONAL COMPRESSION JOINT SEAL

PAYMENT FOR OPTIONAL COMPRESSION JOINT SEALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE COMPRESSION JOINT SEAL SHALL BE 76mm.

THESE DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED IN PLACE.

THESE DOWELS ARE TO BE ADHESIVELY ANCHORED DURING STAGE III. FOR ADHESIVELY ANCHORED DOWELS, SEE SPECIAL PROVISIONS.

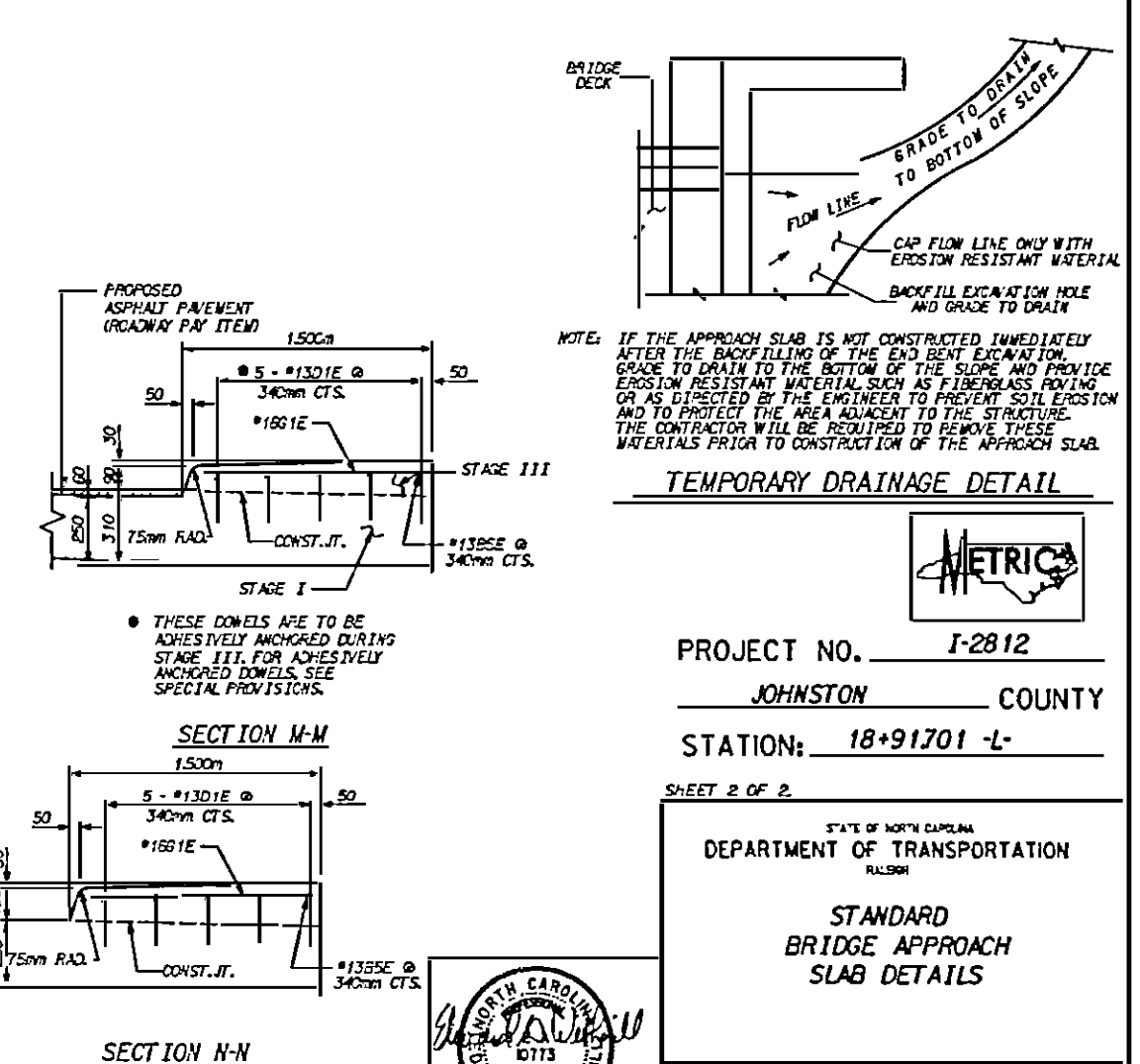
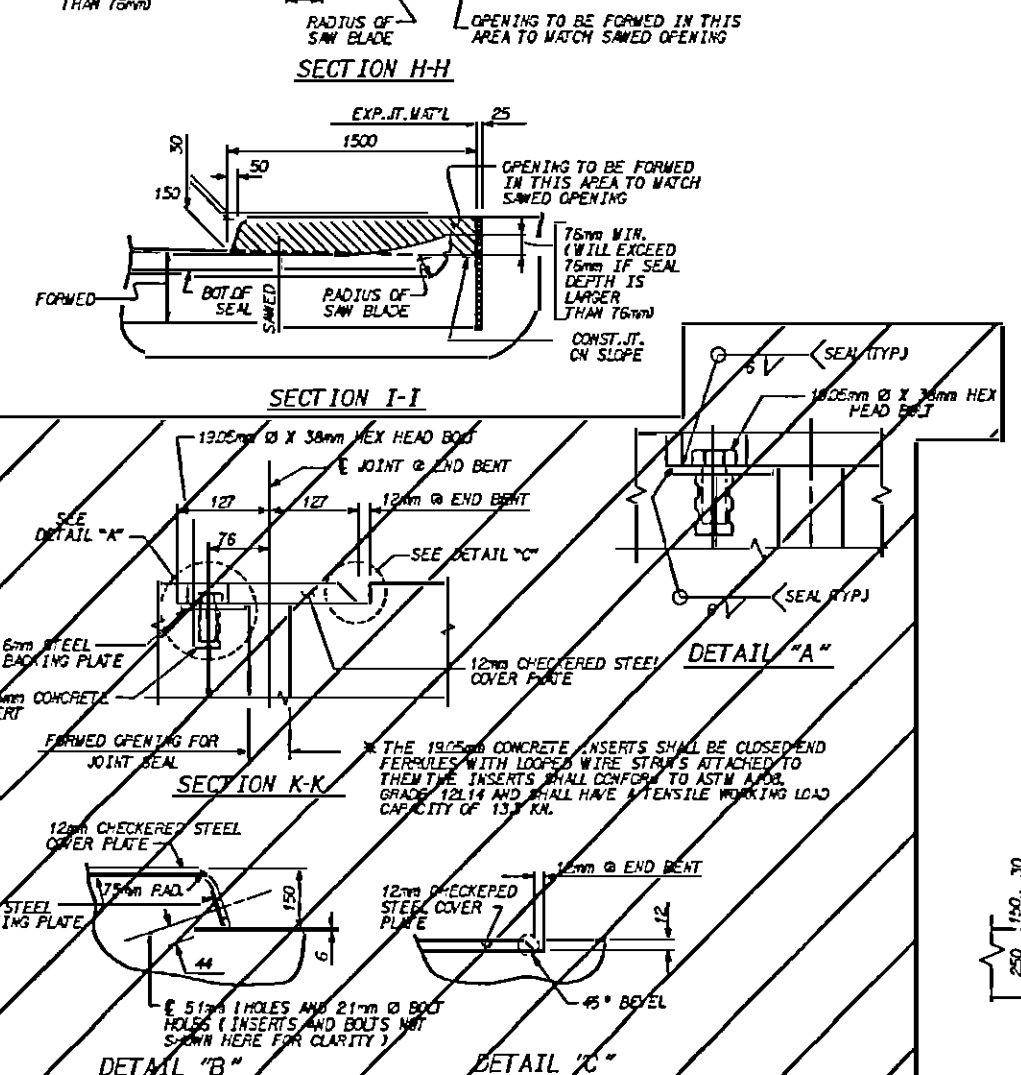
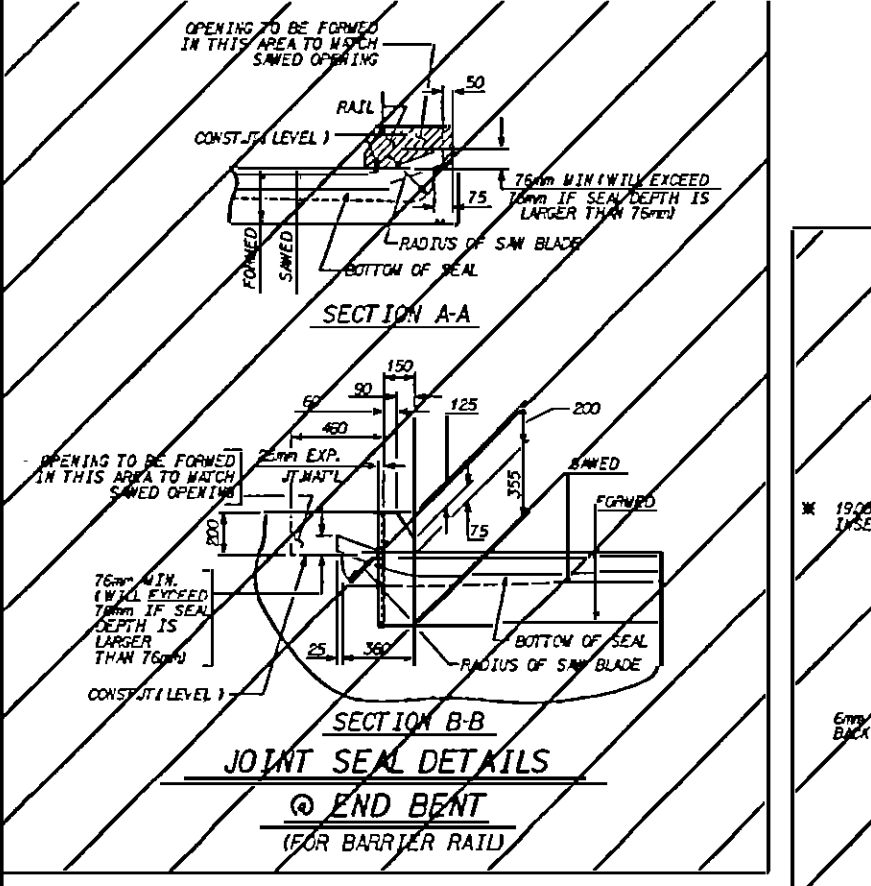
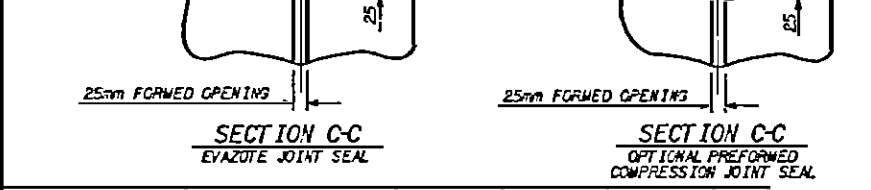
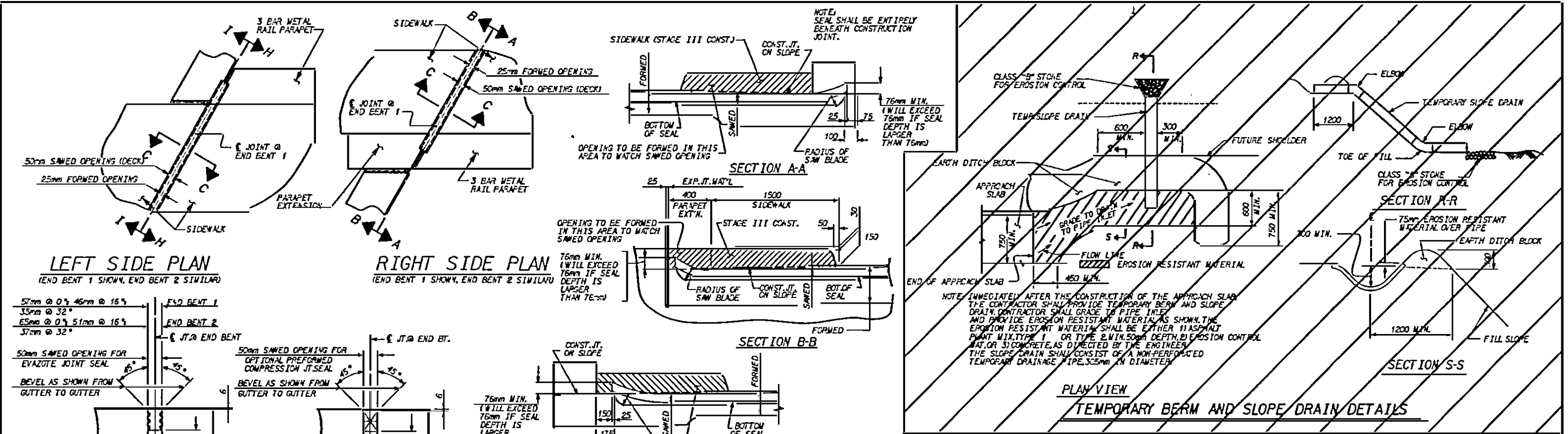
| BILL OF MATERIAL | | | | | |
|---------------------------|------|------|--------|--------|-----------------|
| AT END BENT 1 STAGE I | | | | | |
| BAR NO. | SIZE | TYPE | LENGTH | WEIGHT | |
| A1E | 18 | #13 | STR. | 5640 | 101 |
| A2 | 18 | #13 | STR. | 5580 | 100 |
| B1E | 63 | #19 | STR. | 3420 | 482 |
| B2 | 63 | #19 | STR. | 3560 | 501 |
| B3E | 2 | #13 | STR. | 500 | 1 |
| B4 | 2 | #13 | STR. | 500 | 1 |
| REINFORCING STEEL | | | | - | 602 Kg |
| EPOXY COATED REINF. STEEL | | | | - | 584 Kg |
| CLASS "AA" CONCRETE | | | | - | 9.2 CU. METERS |
| AT END BENT 1 STAGE II | | | | | |
| A3E | 18 | #13 | STR. | 7140 | 128 |
| A4 | 18 | #13 | STR. | 7060 | 126 |
| B1E | 63 | #19 | STR. | 3420 | 482 |
| B2 | 63 | #19 | STR. | 3560 | 501 |
| B5E | 5 | #13 | STR. | 3560 | 74 |
| D1E | 45 | #13 | STR. | 260 | 12 |
| G1E | 20 | #16 | STR. | 1420 | 44 |
| REINFORCING STEEL | | | | - | 802 Kg |
| EPOXY COATED REINF. STEEL | | | | - | 927 Kg |
| CLASS "AA" CONCRETE | | | | - | 13.1 CU. METERS |
| AT END BENT 1 STAGE III | | | | | |
| B5E | 5 | #13 | STR. | 3560 | 74 |
| D1E | 45 | #13 | STR. | 260 | 12 |
| G1E | 20 | #16 | STR. | 1420 | 44 |
| EPOXY COATED REINF. STEEL | | | | - | 130 Kg |
| CLASS "AA" CONCRETE | | | | - | 0.9 CU. METERS |
| AT END BENT 2 STAGE I | | | | | |
| A1E | 18 | #13 | STR. | 5640 | 101 |
| A2 | 18 | #13 | STR. | 5580 | 100 |
| B1E | 63 | #19 | STR. | 3420 | 482 |
| B2 | 63 | #19 | STR. | 3560 | 501 |
| B3E | 2 | #13 | STR. | 500 | 1 |
| B4 | 2 | #13 | STR. | 500 | 1 |
| REINFORCING STEEL | | | | - | 602 Kg |
| EPOXY COATED REINF. STEEL | | | | - | 584 Kg |
| CLASS "AA" CONCRETE | | | | - | 9.2 CU. METERS |
| AT END BENT 2 STAGE II | | | | | |
| A3E | 18 | #13 | STR. | 7140 | 128 |
| A4 | 18 | #13 | STR. | 7060 | 126 |
| B1E | 63 | #19 | STR. | 3420 | 482 |
| B2 | 63 | #19 | STR. | 3560 | 501 |
| B5E | 5 | #13 | STR. | 3560 | 74 |
| D1E | 45 | #13 | STR. | 260 | 12 |
| G1E | 20 | #16 | STR. | 1420 | 44 |
| REINFORCING STEEL | | | | - | 802 Kg |
| EPOXY COATED REINF. STEEL | | | | - | 927 Kg |
| CLASS "AA" CONCRETE | | | | - | 13.1 CU. METERS |
| AT END BENT 2 STAGE III | | | | | |
| B5E | 5 | #13 | STR. | 3560 | 74 |
| D1E | 45 | #13 | STR. | 260 | 12 |
| G1E | 20 | #16 | STR. | 1420 | 44 |
| EPOXY COATED REINF. STEEL | | | | - | 130 Kg |
| CLASS "AA" CONCRETE | | | | - | 0.9 CU. METERS |

PROJECT NO. I-2812
 JOHNSTON COUNTY
 STATION: 18+91701 -L

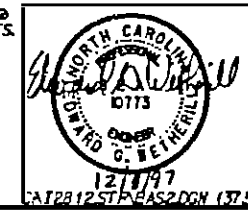
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALPH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

| | |
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| ASSEMBLED BY : | DATE : |
| CHECKED BY : | DATE : |
| DRAWN BY : FCJ 6/87 | REV. 5/16/97R EEM/RGW |
| CHECKED BY : ESA 6/87 | |

| REVISIONS | | | | SHEET NO. | |
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ASSEMBLED BY: D.J. DOUCET DATE: 9-9-97
 CHECKED BY: H.J. MARVIN DATE: 11-11-97
 DRAWN BY: F.G. 11/98 REV. 5/26/97 EDL/908
 CHECKED BY: APB 11/98



PROJECT NO. **I-2812**
 COUNTY **JOHNSTON**
 STATION: **18+91701-L**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALPH

STANDARD BRIDGE APPROACH SLAB DETAILS

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12/19/97
 CATP812-STD-RAS-200N (37.5)

5-30
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STANDARD NOTES

DESIGN DATA:

| | | |
|------------------------------------------|-------|------------------------|
| SPECIFICATIONS | ----- | A.A.S.H.T.O. (CURRENT) |
| LIVE LOAD | ----- | SEE PLANS |
| IMPACT ALLOWANCE | ----- | SEE A.A.S.H.T.O. |
| STRESS IN EXTREME FIBER OF | | |
| STRUCTURAL STEEL - AASHTO M270 GRADE 250 | -- | 140 MPa |
| - AASHTO M270 GRADE 345W | -- | 190 MPa |
| - AASHTO M270 GRADE 345 | -- | 190 MPa |
| REINFORCING STEEL IN TENSION | | |
| GRADE 420 | -- | 165 MPa |
| CONCRETE IN COMPRESSION | ----- | 8.3 MPa |
| CONCRETE IN SHEAR | ----- | SEE A.A.S.H.T.O. |
| STRUCTURAL TIMBER - TREATED OR | | |
| UNTREATED - EXTREME FIBER STRESS | ----- | 12 MPa |
| COMPRESSION PERPENDICULAR TO GRAIN | | |
| OF TIMBER | ----- | 2.6 MPa |
| EQUIVALENT FLUID PRESSURE OF EARTH | ----- | 480 kg/m ³ |
| | | (MINIMUM) |

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 1995 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 19mm WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 38mm RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 6mm FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 6mm RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 300mm INTO THE OLD CONCRETE AND GROTTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
FIVE SETS OF DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 22.23mm Ø SHEAR STUDS FOR THE 19.05mm Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 22.23mm Ø STUDS ALONG THE BEAM AS SHOWN FOR 19.05mm Ø STUDS BASED ON THE RATIO OF 3 - 22.23mm Ø STUDS FOR 4 - 19.05mm Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 610mm.
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 8mm IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 50mm OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.
PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-1.1.
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 2mm OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

METRIC

JANUARY, 1990