R-2111

PROJECT: 6.678006T 46.878

STATE	STATE PROJECT REFERENCE NO.	SHEET NO	TOTAL SHEETS
N.C.	6.678006T	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
8.1670102	F-117-1 (2)	P.E.
4.49006	OF-117-1(1)	R/W
6.678006T		CONST.

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

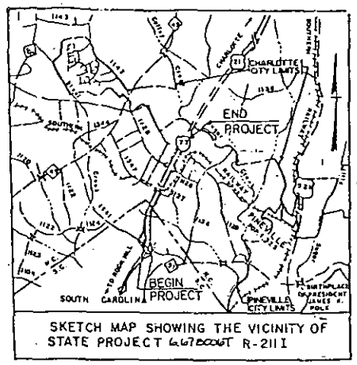
PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

~~YORK~~ ~~COUNTY~~ - ~~S.C.~~

MECKLENBURG COUNTY - N.C.

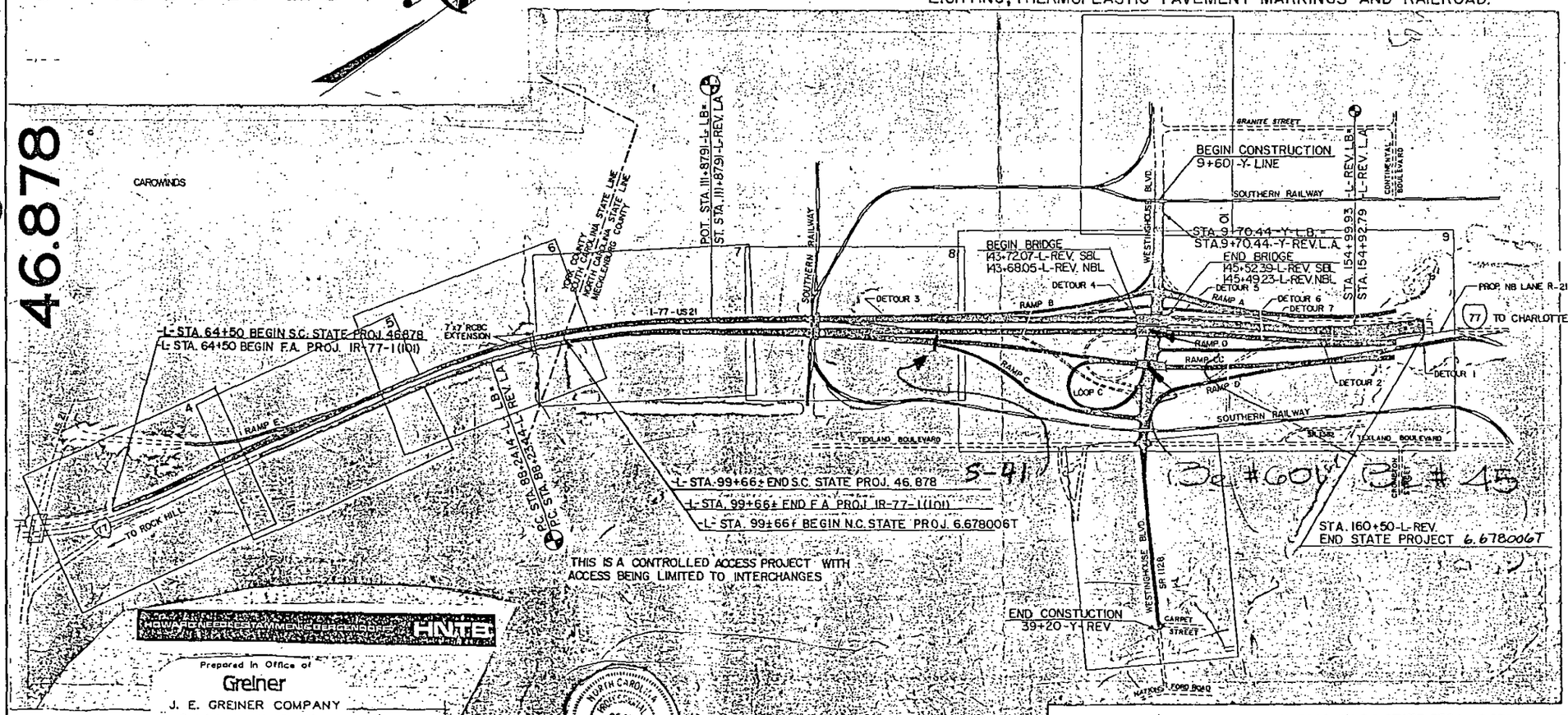
LOCATION: I-77 NORTH OF US21 INTERCHANGE IN SOUTH CAROLINA TO NORTH OF WESTINGHOUSE BOULEVARD IN NORTH CAROLINA.

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, STRUCTURES, CULVERT EXTENSION LIGHTING, THERMOPLASTIC PAVEMENT MARKINGS AND RAILROAD.



SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT 6.678006T R-2111

STRUCTURES



Prepared in Office of

Greiner

J. E. GREINER COMPANY

Raleigh, North Carolina

PLANS PREPARED BY:

Kimley-Horn

Kimley-Horn & Associates, Inc.
901 Jones Franklin Road
Raleigh, N.C. 27606

LETTING DATE: JULY 17, 1990

THIS WORK WAS PERFORMED UNDER THE RESPONSIBLE CHARGE OF

Bruce A. Moulds 8-05-88

BRUCE ANDREW MOULDS PE NO. 12620 DATE

NORTH CAROLINA PROFESSIONAL SEAL 12620 ENGINEER BRUCE ANDREW MOULDS

NORTH CAROLINA PROFESSIONAL SEAL 8276 ENGINEER WILLIAM L. BIGGER 5/9/90

NORTH CAROLINA PROFESSIONAL SEAL 9451 ENGINEER SHELDON HALL JR. 1/1/90

NORTH CAROLINA REGISTERED SEAL 23338 ENGINEER CECIL L. HARRON 5/9/90

1990 STANDARD SPECIFICATIONS

LENGTH OF ROADWAY S.C. STATE PROJ. 46.878 = 0.666 MI.
LENGTH OF ROADWAY F.A. PROJ. IR-77-1(101) = 0.666 MI.

LENGTH OF ROADWAY N.C. STATE PROJ. 6.678006T = 1.120 MI.
LENGTH OF STRUCTURE N.C. STATE PROJ. 6.678006T = 0.034 MI.

TOTAL LENGTH STATE PROJECTS 46.878 & 6.678006T = 1.820 MI.

NORTH CAROLINA PROFESSIONAL SEAL 3475 ENGINEER JOHN L. SMITH, JR.

John L. Smith, Jr. 6-8-90

CONVENTIONAL SYMBOLS

County Line	
City or Town Line	
Exist. Right of Way Line & Marker	(R/W)
Prop. Right of Way Line & Marker	(R/W)
Survey Line	
Property Line	
Exist. Fence	
Proposed Road	
Existing Road	
Railroad	
Control of Access Line	(C/A)
Slope Stake Line	
Bridge	
Culvert	
Woods	or
Telephone or Telegraph Pole	(EXISTING) (PROPOSED)
Tower Pole and Line	
Power Pole	(EXISTING) (PROPOSED)
Easement Line	E E E
Temporary Silt Fence	
Guard Rail	
Sanitary Sewer Line	SS SS
Water Line	
Gas Line	GAS
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Bridges	
Proposed Railroad	
Proposed Paved Shoulders	
Equality	

GRAPHIC SCALES

50 25 0 50 100 PLANS

50 25 0 50 100 PROFILE (HORIZONTAL)

10 5 0 10 20 PROFILE (VERTICAL)

DESIGN DATA

ADT	1985	= 35,325
ADT	2005	= 62,700
DHV		= 10%
D		= 60%
T		= 11 %
V		= 70 MPH

Pavement Removal

Wheel Chair Ramp ... WCR

Ditch Block

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

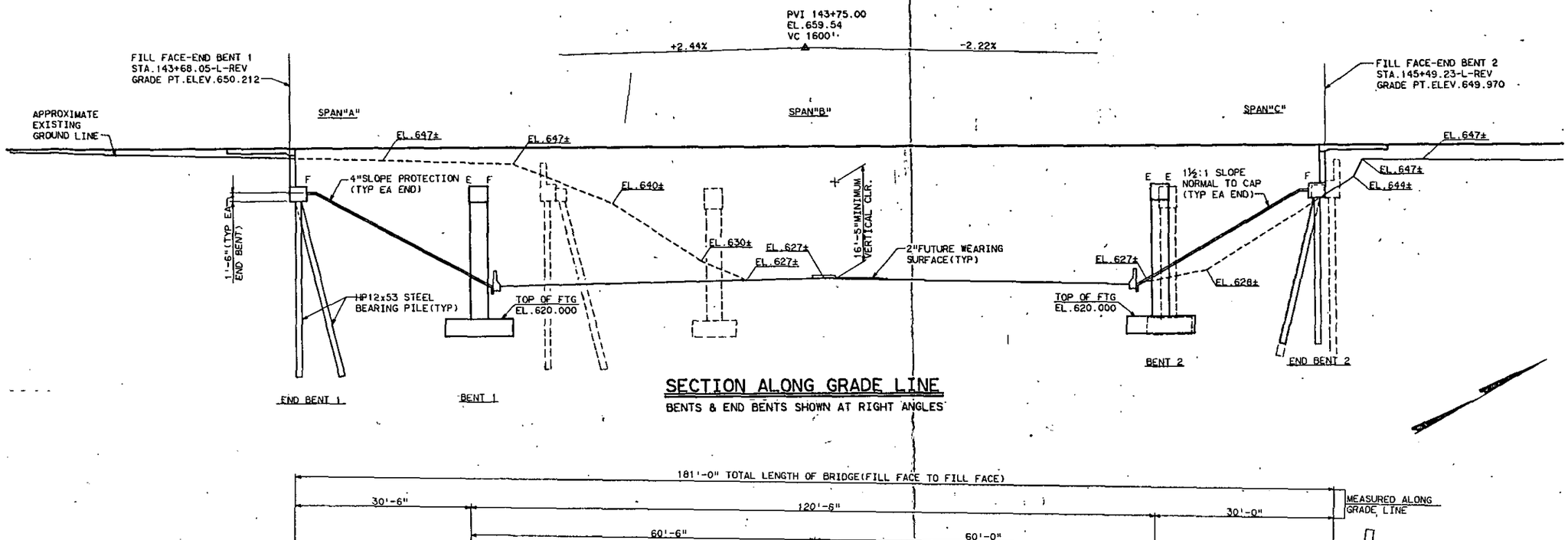
APPROVED: J. L. Smith P.E.
STATE HIGHWAY ENGINEER-DESIGN

P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

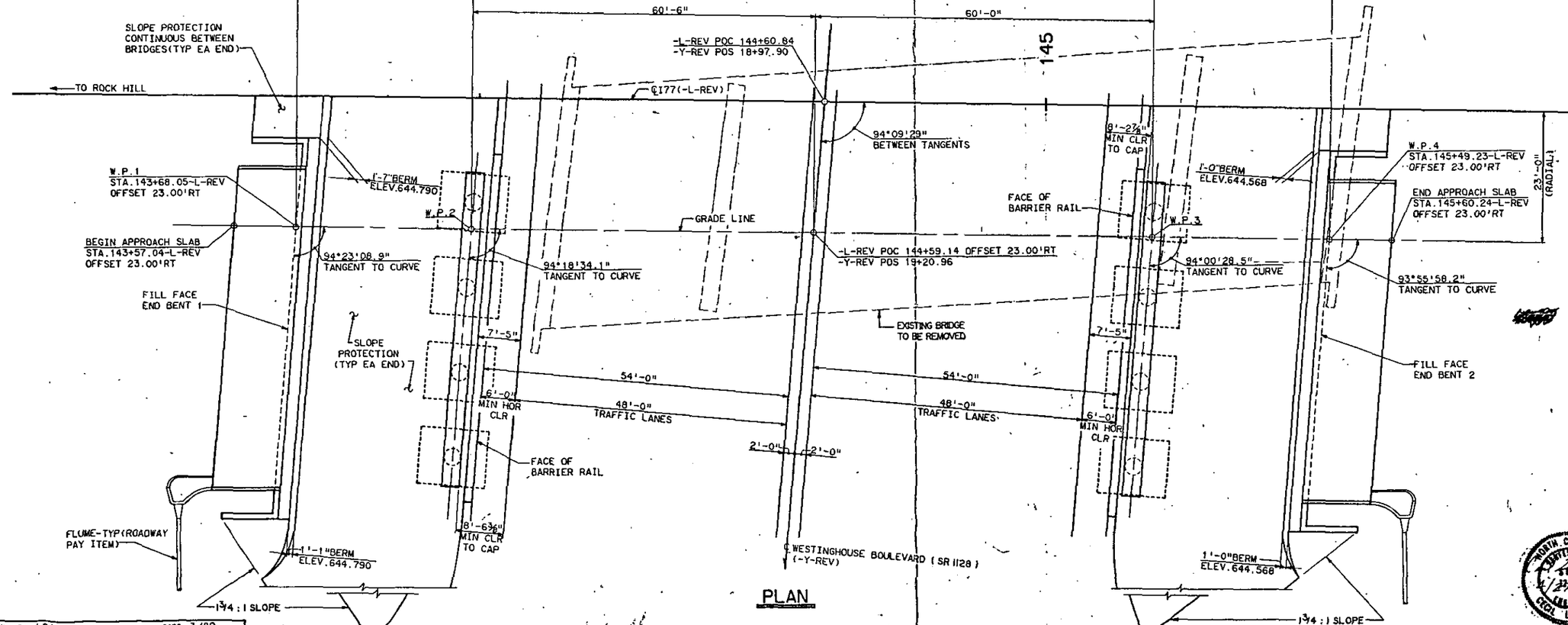
APPROVED: Ray C. Sheldon 6-19-90
FOR DIVISION ADMINISTRATOR DATE

F. A. PROJ. NO.



SECTION ALONG GRADE LINE

BENTS & END BENTS SHOWN AT RIGHT ANGLES



PLAN

-L-REV (HORIZONTAL CURVE DATA)

PI 140+74.77
△ = 2°56'00"RT.
D = 00°15'00"
T = 586.80'
L = 1173.33'
R = 22918.31'
Ts = 786.87'
SE = NONE

-Y-REV (HORIZONTAL CURVE DATA)

PI 14+98.83	PIS 18+93.18
△ = 6°33'39"RT.	Os = 1°00'00"RT.
D = 1°00'00"	Ls = 200.00'
T = 328.39'	U = 133.34'
L = 656.07'	V = 66.67'
R = 5729.58'	
Ts = 528.85'	
SE = NC	
PI 27+97.55	PIS 23+93.21
△ = 10°06'15"LT.	Os = 1°30'00"RT.
D = 1°30'00"	Ls = 200.00'
T = 337.68'	U = 133.34'
L = 673.60'	V = 66.67'
R = 3819.72'	
Ts = 538.76'	
SE = 0.02	

-Y-REV (VERTICAL CURVE DATA)

PVI 18+50.00
EL = 627.00'
VC = 200.00'
G1 = -0.918%
G2 = -0.227%

DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89

Kimley-Horn

Kimley-Horn & Associates, Inc.
901 Jones Franklin Road
Raleigh, N.C. 27606

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84
-Y-REV. 18+97.90

REPLACES BRIDGE No. 45

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING. 1

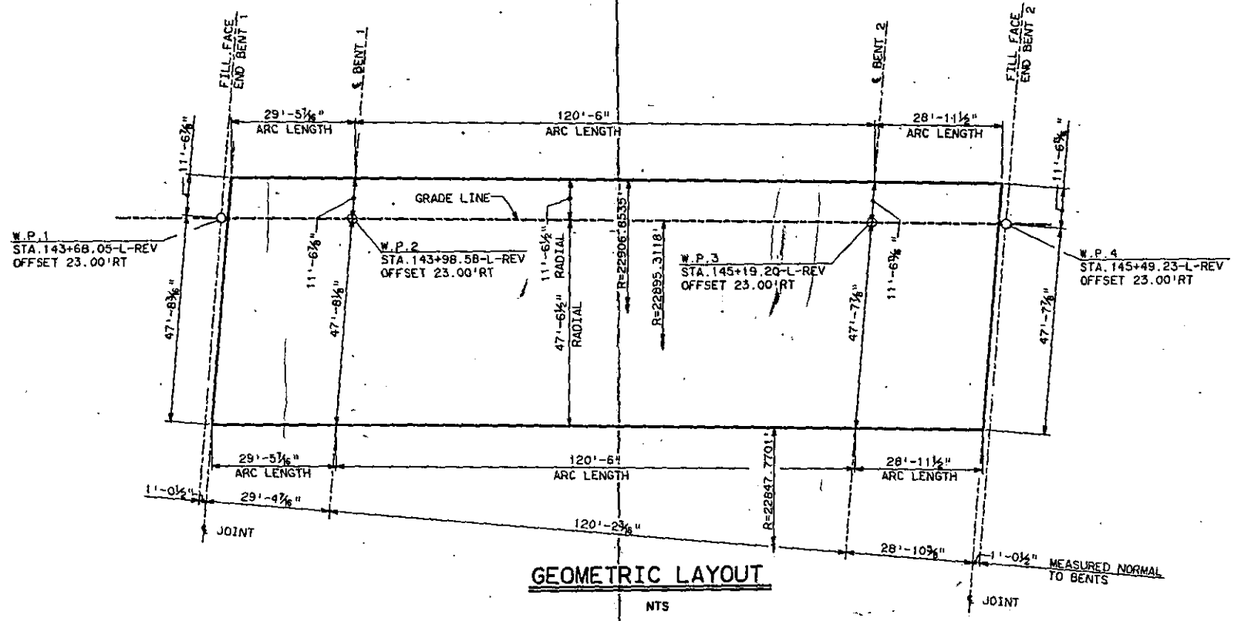
FOR BRIDGE ON I-77 NORTH
OVER WESTINGHOUSE BOULEVARD
BETWEEN ROCK HILL & STATESVILL

NORTH CAROLINA PROFESSIONAL SEAL 22182 ENGINEER CECIL L. HARRON

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-1
1			3			TOTAL SHEETS
2			4			13

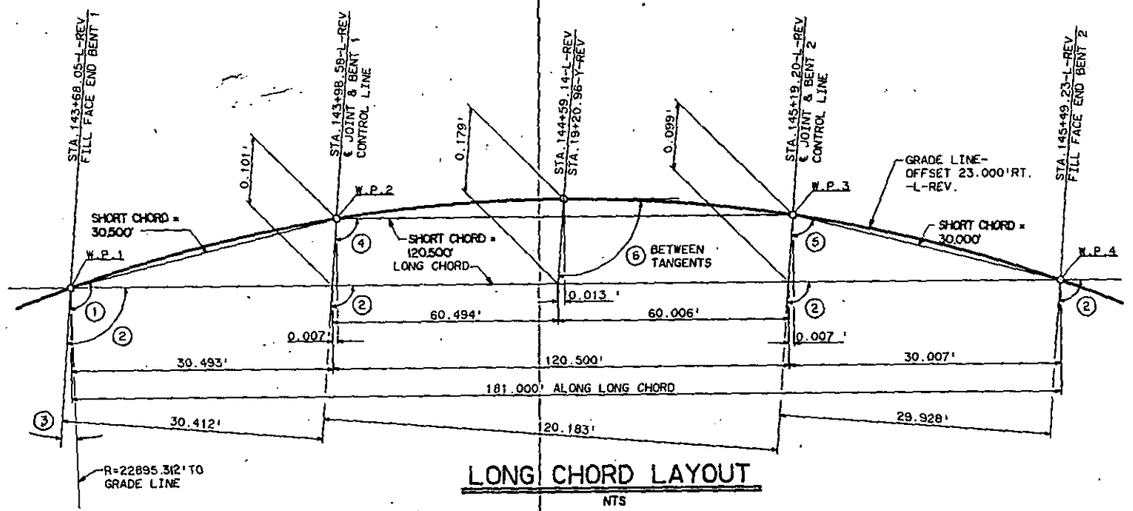
BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	CLASS "A" CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING	STRUCTURAL STEEL	HP12x53 STEEL PILE		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	BRIDGE APPROACH SLAB	ELASTOMERIC BEARING	PREFORMED COMPRESS. JOINT SEAL	EXPANSION JOINT SEAL	TFE EXPANSION BEARING ASSEMBLIES	GROOVING BRIDGE FLOORS
	LUMP SUM	CU.YD.	SQ.FT.	CU.YD.	LBS.	LBS.	APPROX.LBS.	NO.	LIN.FT.	LIN.FT.	SQ.YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.
SUPERSTRUCTURE			10,566				277,740			357.8			LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	13,008
END BENT 1				29.3	4,819			9	314		395	LUMP SUM					
BENT 1		339		95.1	22,955	1918											
BENT 2		303		94.8	22,842	1890											
END BENT 2				29.7	4,882			9	285		355	LUMP SUM					
TOTAL	LUMP SUM	642	10,566	248.9	55,498	3808	277,740	18	599	357.8	750	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	13,008



GEOMETRIC LAYOUT

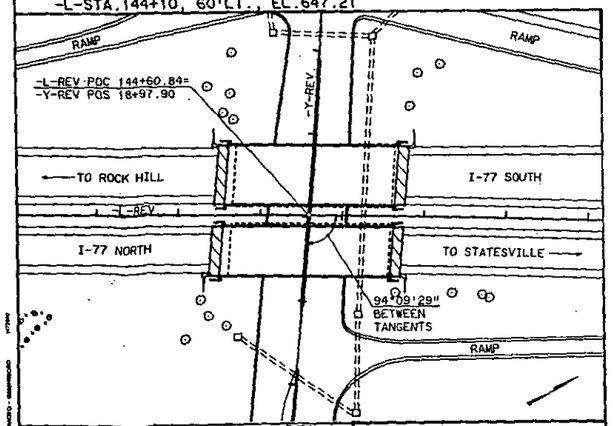
NTS



LONG CHORD LAYOUT

NTS

BM: "BRIDGE" BRASS DISK "BRIDGE 1968"
-L-STA.144+10, 60'LT., EL.647.21



DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89

LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HS 20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

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 PROVISION "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED ASTM A588 STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON PLANS.

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

FOUNDATION EXCAVATION TO BE MEASURED FROM THE GRADED ROADWAY TYPICAL SECTION.

PILES FOR END BENTS AND BENT SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS PER PILE.

COMPUTED FOUNDATION LOAD FOR BENTS 1-2 EQUALS 3.75 TONS PER SQ. FT.

WORK SHALL NOT BE STARTED ON END BENT 1 OR BENT 1 UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

FOR MAINTENANCE OF TRAFFIC, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPAN AT 31.5', 40.0', AND 31.5, CONCRETE SLAB DECK ON I-BEAMS; CLEAR ROADWAY WIDTH OF 40.0' WITH TWO 1.5' SAFETY WALKS, ON REINFORCED CONCRETE END BENTS ON STEEL PILE AND REINFORCED CONCRETE POST AND BEAM BENT SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SEE SPECIAL PROVISIONS.

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.

NOTE: ALL BENTS ARE PARALLEL

ANGLES	
1	94°-20'-51.5"
2	94°-09'-33.6"
3	04°-23'-08.8"
4	94°-09'-31.3"
5	93°-58'-13.4'
6	94°-17'-41.1"

PROJECT NO. G.078000T

MECKLENBURG COUNTY

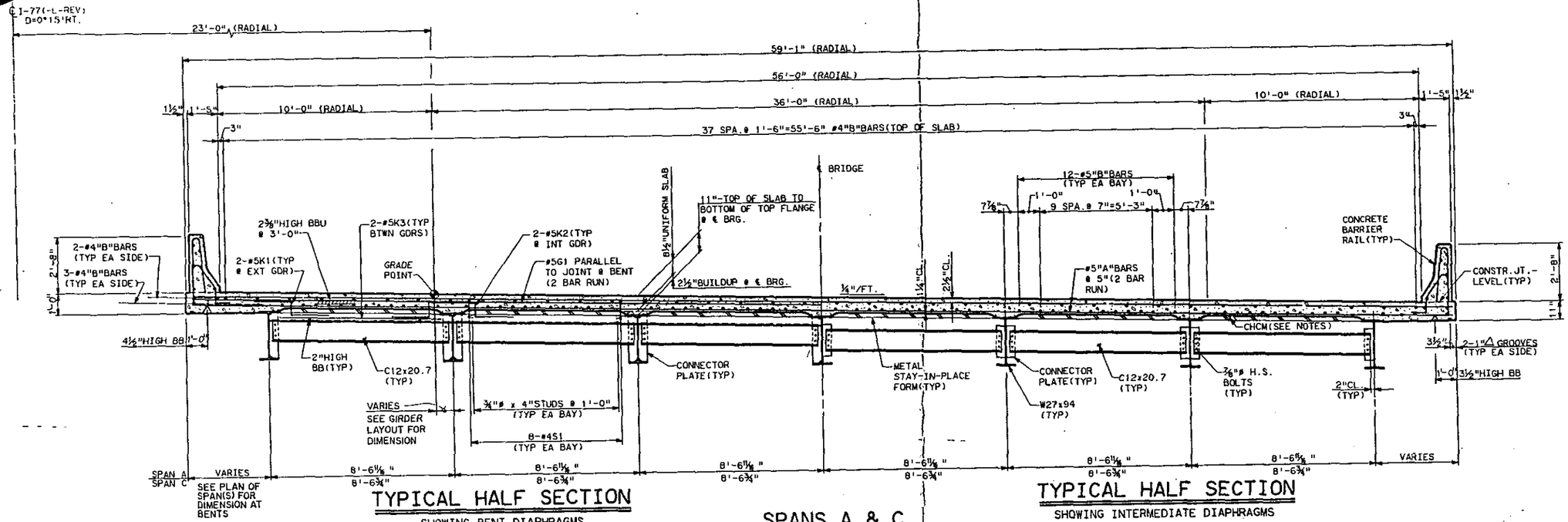
STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING 2

FOR BRIDGE ON I-77 NORTH
OVER WESTINGHOUSE BOULEVARD
BETWEEN ROCK HILL & STATESVILLE

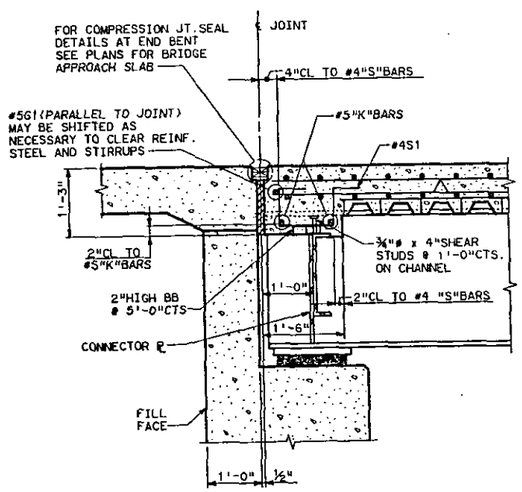
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-77
1			3			TOTAL SHEETS
2			4			130



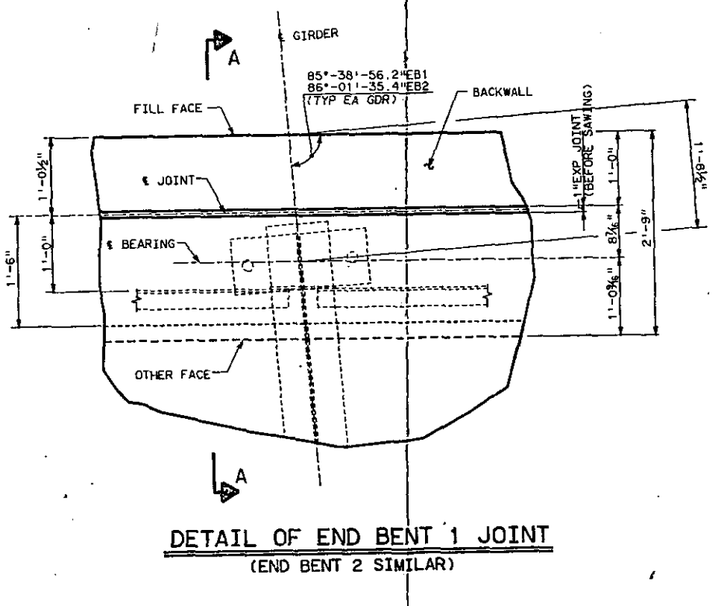
TYPICAL HALF SECTION
SHOWING BENT DIAPHRAGMS

SPANS A & C

TYPICAL HALF SECTION
SHOWING INTERMEDIATE DIAPHRAGMS



SECTION A-A
N.T.S.



DETAIL OF END BENT 1 JOINT
(END BENT 2 SIMILAR)

NOTES

STAY-IN-PLACE FORMS SHALL HAVE CLOSED TAPERED ENDS. FOR STAY-IN-PLACE FORMS SEE SPECIAL PROVISIONS.

PROVIDE CONTINUOUS HIGH CHAIR METAL DECK (CHCM) AT 4'-0" CTS. WITH LEG SPACING TO MATCH THE PITCH OF THE FORMS AND WITH A HEIGHT TO SUPPORT BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 ¼" ABOVE THE TOP OF THE STAY-IN-PLACE FORMS.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

PROJECT No. 6.678006T

MECKLENBURG COUNTY

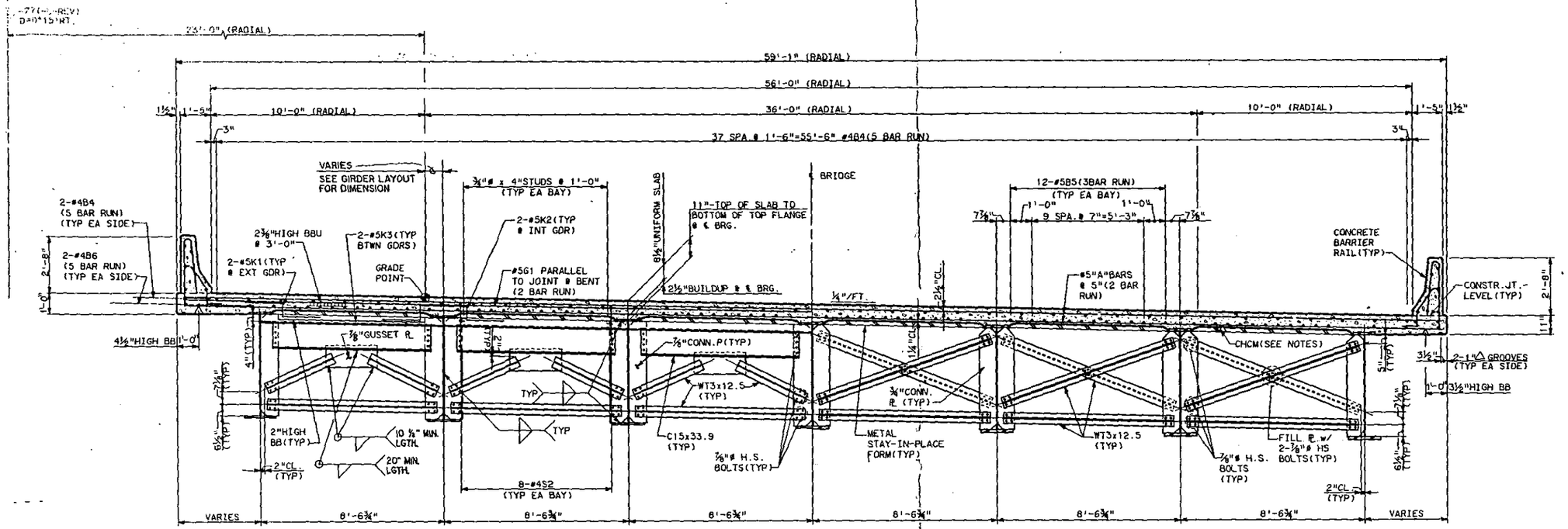
STATION -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATIO
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
SPANS A AND C

REVISIONS						SHE NO.
NO.	BY	DATE	NO.	BY	DATE	5-7
1			3			TOT SHEE
2			4			13

DRAWN BY	LSJ	DATE MAR '89
CHECKED BY	CLN	DATE MAR '89

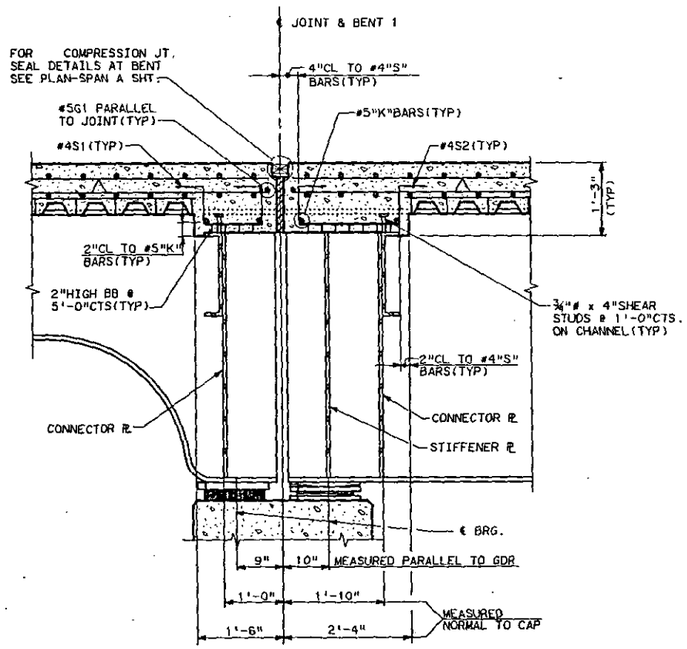


NOTE: FOR NOTES SEE TYPICAL SECTION SPAN A AND C SHEET.

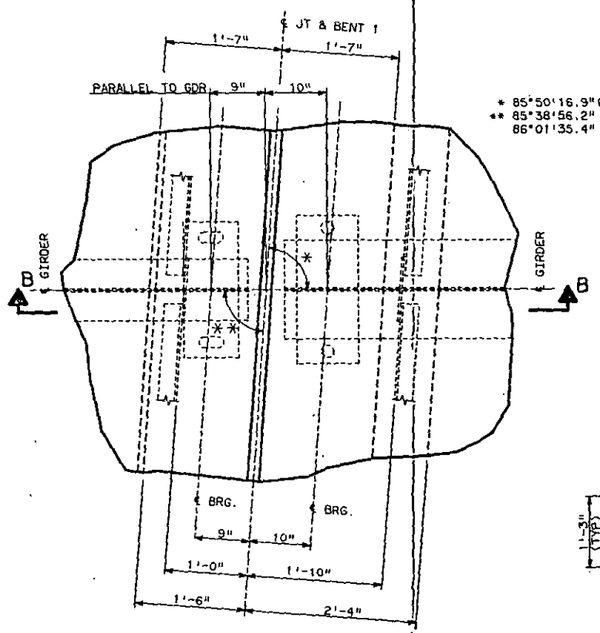
TYPICAL HALF SECTION
SHOWING BENT CROSSFRAMES

TYPICAL HALF SECTION
SHOWING INTERMEDIATE CROSSFRAMES

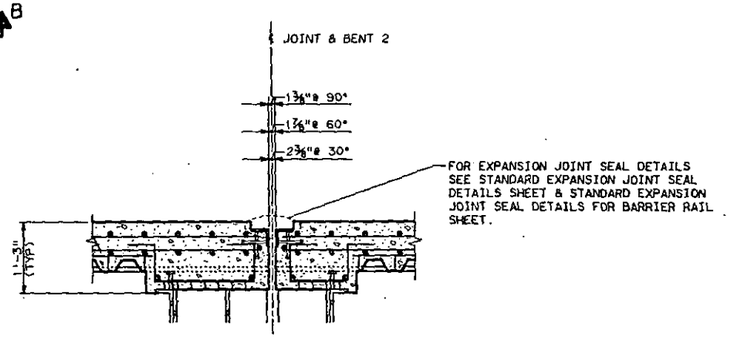
SPAN B



SECTION B-B



DETAIL OF BENT 1 JOINT
(BENT 2 SIMILAR)



BENT 2 JOINT DETAIL

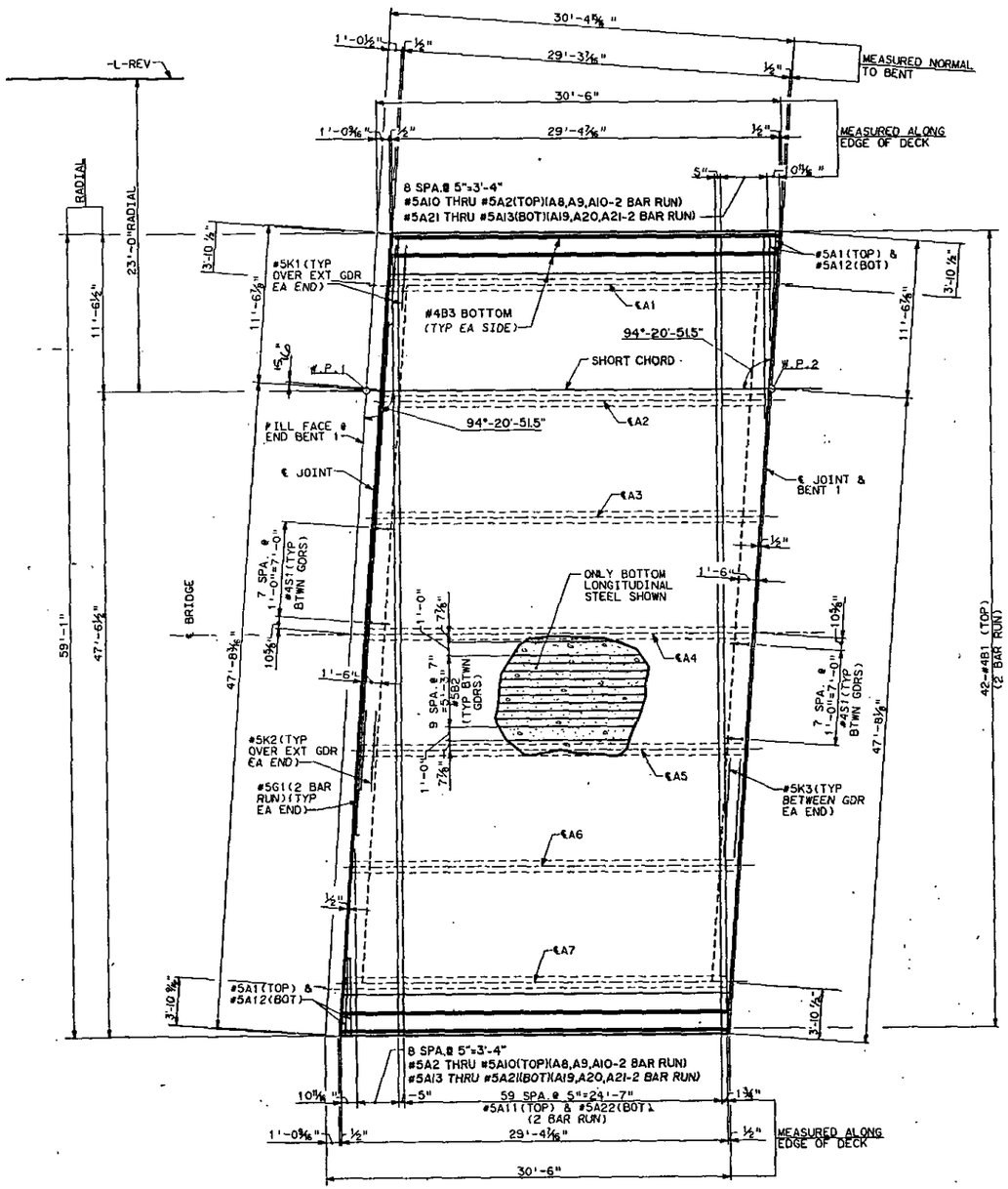
DRAWN BY LSJ DATE MAR '89
CHECKED BY CLN DATE MAR '89

PROJECT NO. G.G78006T
MECKLENBURG COUNTY
STATION -L-REV.144+60.84= -Y-REV.18+97.90

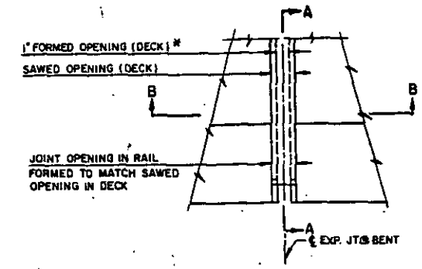
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
SPAN B

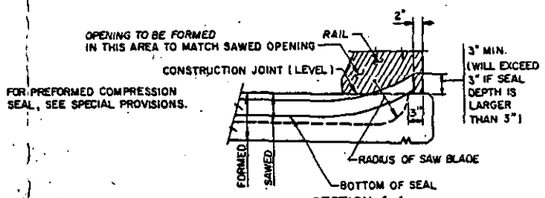
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-79
1			3			TOTAL SHEETS
2			4			130



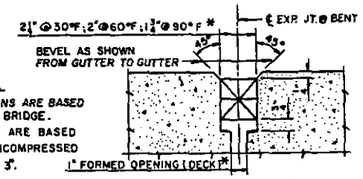
PLAN-SPAN A



PLAN



SECTION A-A



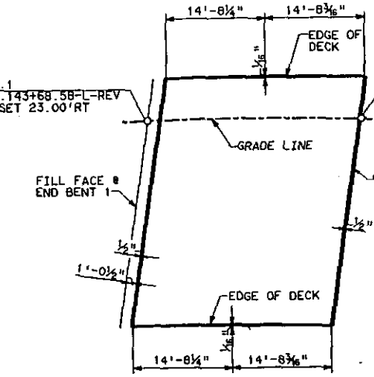
NOTE TO DETAILER

* THESE DIMENSIONS ARE BASED ON A THEORETICAL BRIDGE. OPENINGS SHOWN ARE BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

SECTION B-B

COMPRESSION JOINT SEAL DETAIL

N.T.S.



CURVE OFFSETS

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

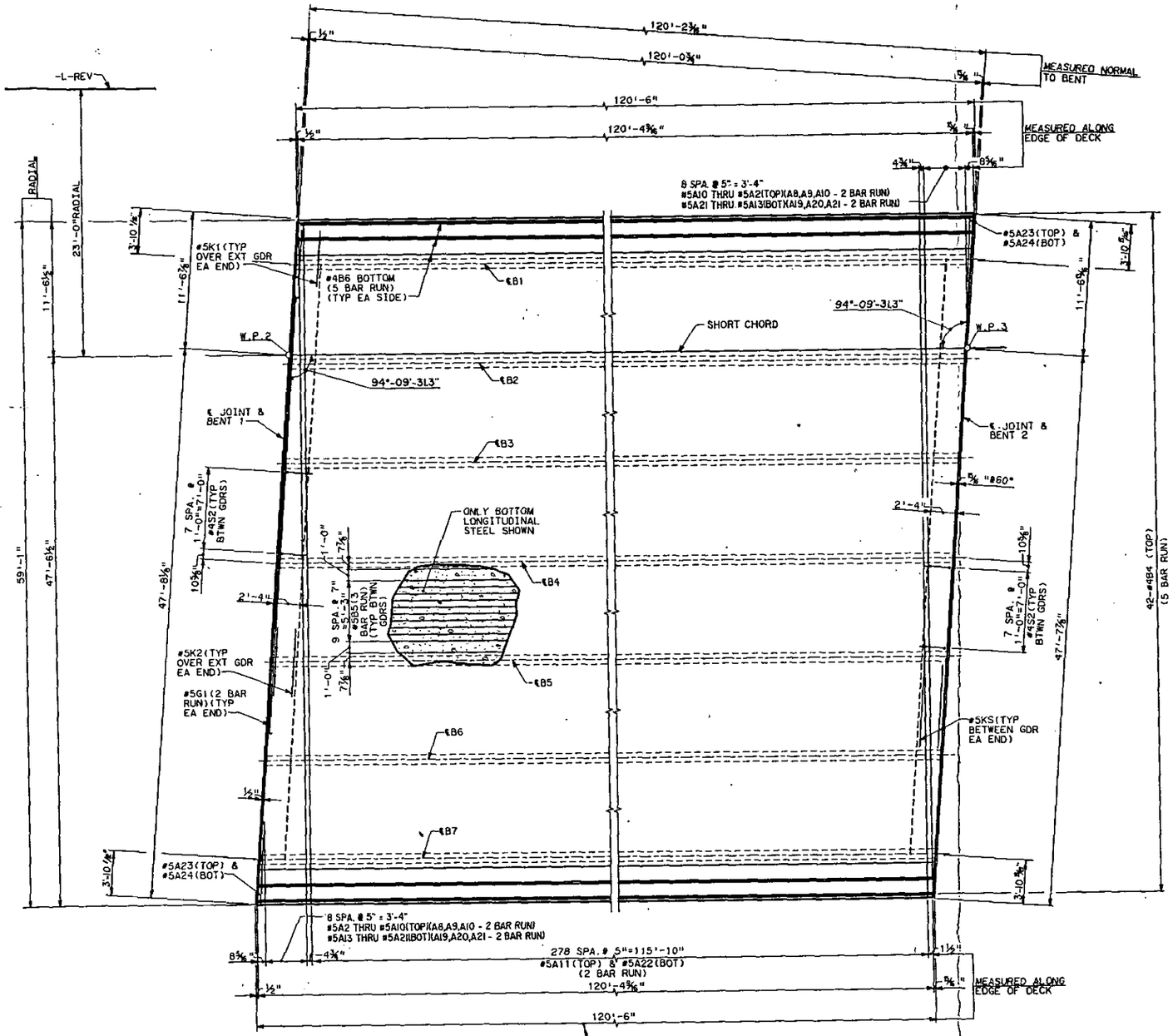
STATION -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

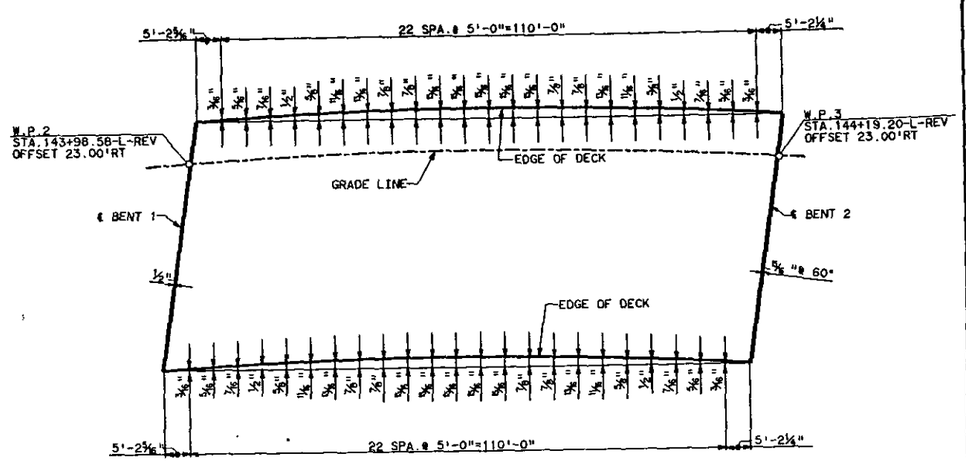
SUPERSTRUCTURE
PLAN-SPAN A

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-8C
1			3			TOTAL SHEETS
2			4			130

DRAWN BY LSJ DATE 3789
CHECKED BY CLN DATE 3789



PLAN-SPAN B



CURVE OFFSETS

PROJECT NO. 6.6780067

MECKLENBURG COUNTY

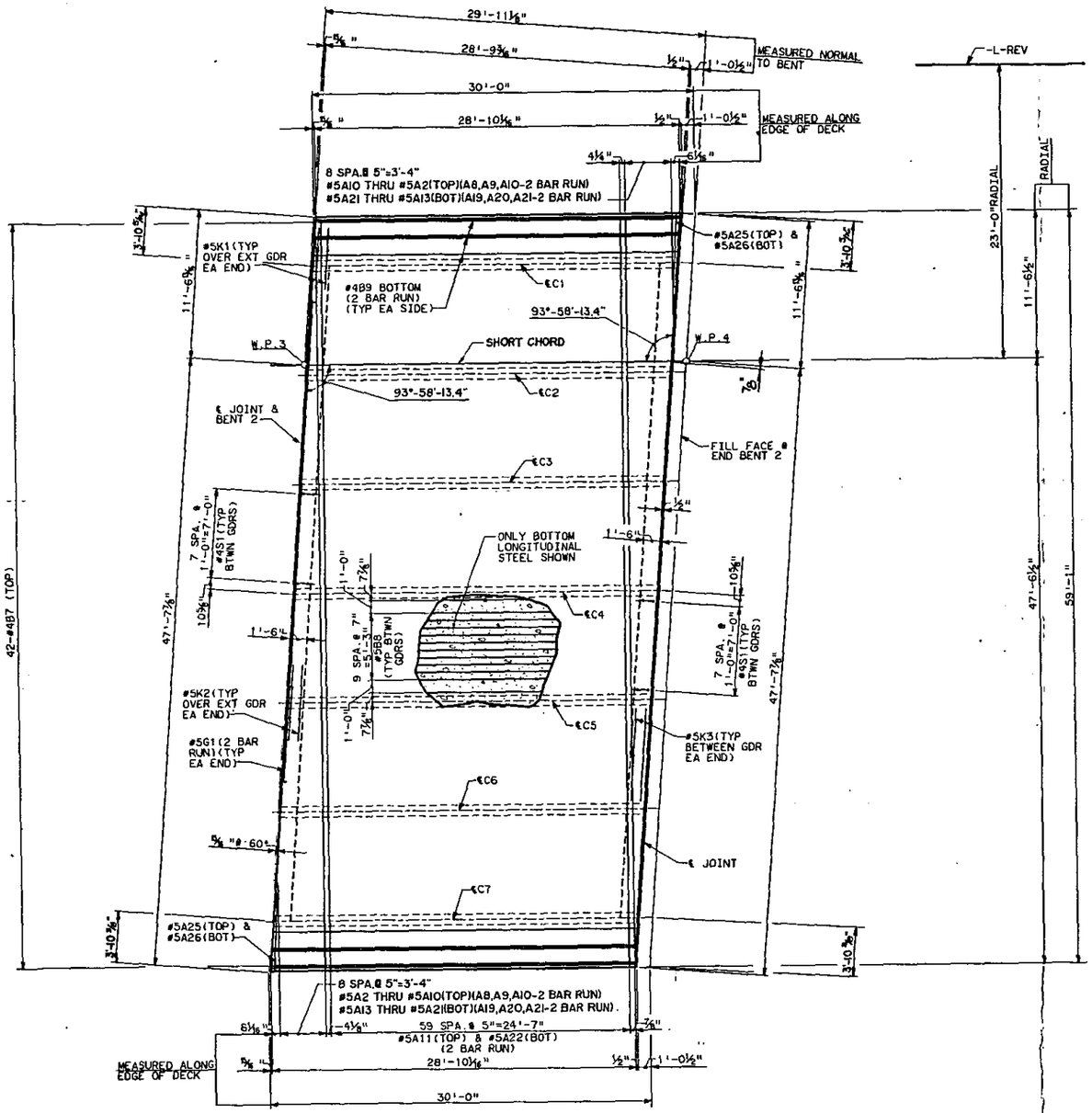
STATION L-REV.144+60.84=
-Y-REV.18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

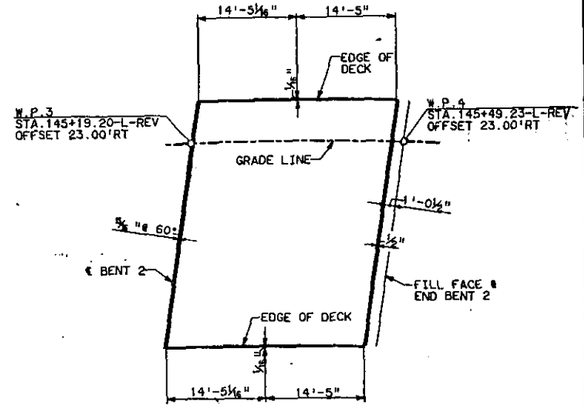
SUPERSTRUCTURE
PLAN-SPAN B

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-8
1			3			TOTAL SHEETS
2			4			130

DRAWN BY LSJ DATE 3789
CHECKED BY CLN DATE 3789



PLAN-SPAN C



CURVE OFFSETS

PROJECT NO. G-G78006T

MECKLENBURG COUNTY

STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN-SPAN C

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-82
1			3			TOTAL SHEETS
2			4			130

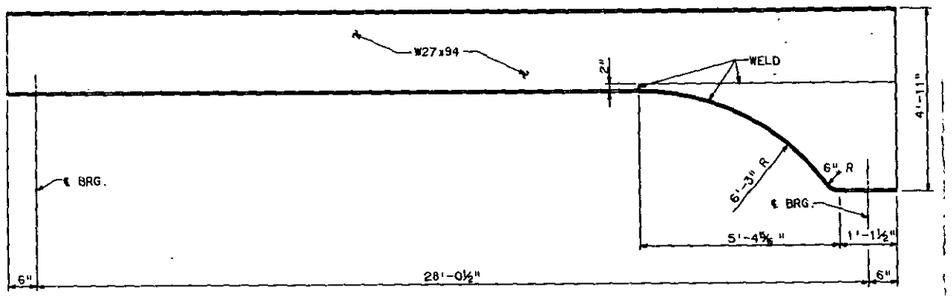
DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89

NOTE:

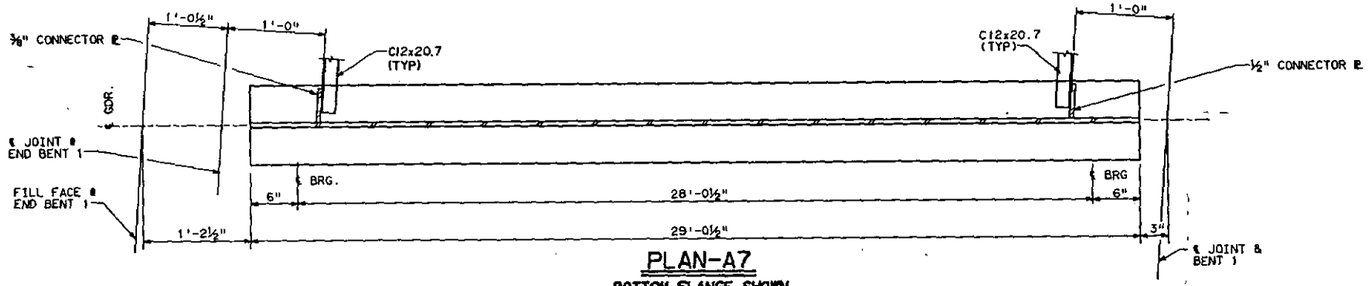
HAUNCH WEB & FLANGE THICKNESS & FLANGE WIDTH TO MATCH THE BEAM TO WHICH IT IS ATTACHED

RADIOGRAPHIC TESTING IS REQUIRED FOR ALL BUTT WELDS IN HAUNCH

OTHER HAUNCH MAKE-UP MAY BE SUBMITTED FOR APPROVAL



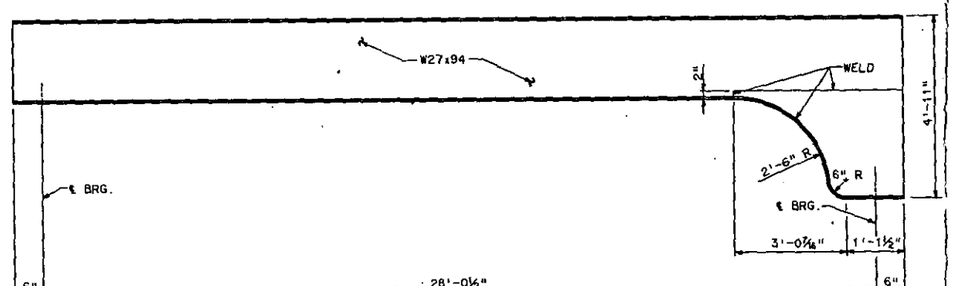
ELEVATION-A1 & A7



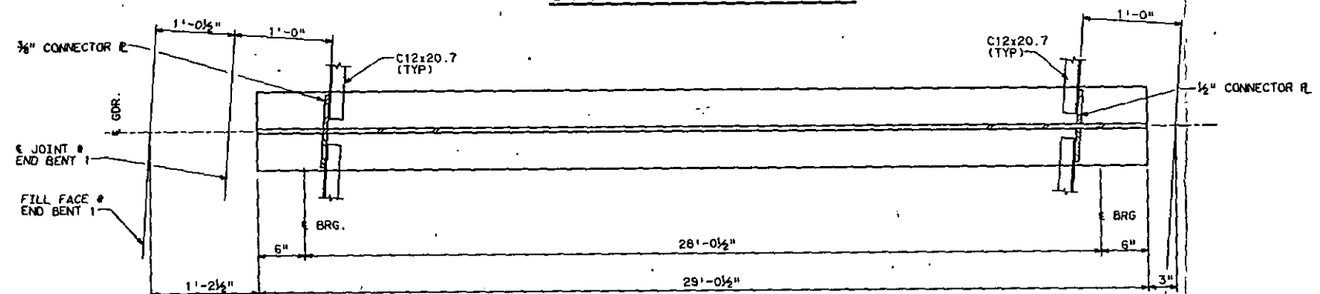
PLAN-A7

BOTTOM FLANGE SHOWN

END DIAPHRAGMS REQ'D. ON INTERIOR SIDE OF BEAM

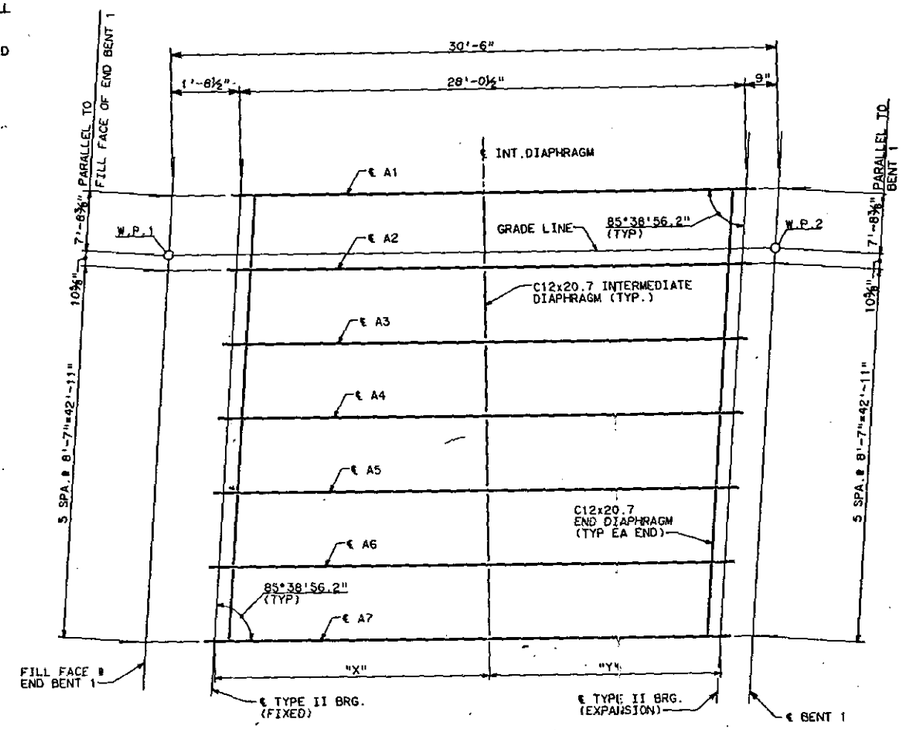


ELEVATION-A2 THRU A6



PLAN-A2 THRU A6

BOTTOM FLANGE SHOWN



BEAM LAYOUT-SPAN A

DEAD LOAD DEFLECTIONS AND BEAM CAMBER AT MID-POINT BETWEEN BEARINGS		
BEAM	A1 & A7	A2 - A6
DEFLECTION DUE TO WEIGHT OF STEEL	.001' ↓	.001' ↓
DEFLECTION DUE TO WEIGHT OF SLAB	.013' ↓	.013' ↓
DEFLECTION DUE TO RAIL AND F.W.S.	.004' ↓	.004' ↓
TOTAL DEAD LOAD DEFLECTION	.018' ↓	.018' ↓
VERTICAL CURVE ORDINATE	.003' ↑	.003' ↑
REQUIRED BEAM CAMBER	* NONE	* NONE

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) MIDPOINT BETWEEN ℄ BEARINGS EXCEPT "REQUIRED BEAM CAMBER" WHICH IS GIVEN IN INCHES\FRACTION FORM).

* TURN NATURAL MILL CAMBER UP.

FOR NOTES SEE GIRDER DETAIL SHEET

SPAN A INTERMEDIATE DIAPHRAGM SPACING		
GIRDER	"X"	"Y"
A1	12'-0⅝"	15'-11⅜"
A2	12'-8⅜"	15'-3⅜"
A3	13'-4⅛"	14'-8⅛"
A4	14'-0¼"	14'-0¼"
A5	14'-8⅛"	13'-4⅛"
A6	15'-3⅜"	12'-8⅜"
A7	15'-11⅝"	12'-0⅝"

PROJECT NO. 6.G780067

MECKLENBURG COUNTY

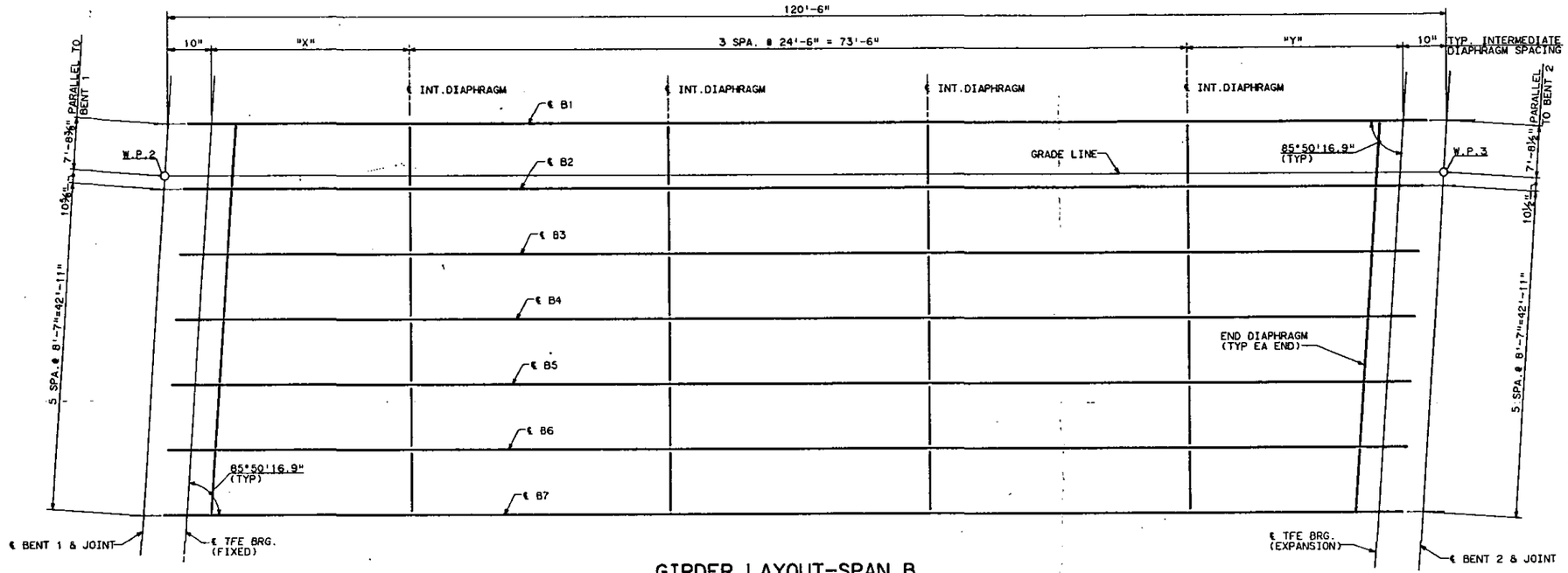
STATION -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEAM LAYOUT-SPAN A

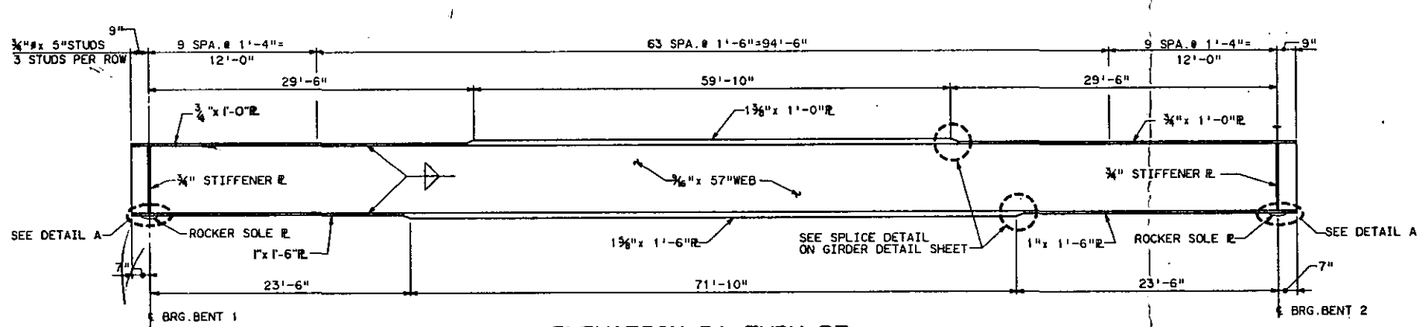
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-82
1			3			TOTAL SHEETS
2			4			130

DRAWN BY CSJ DATE 3/89
CHECKED BY CLN DATE 3/89

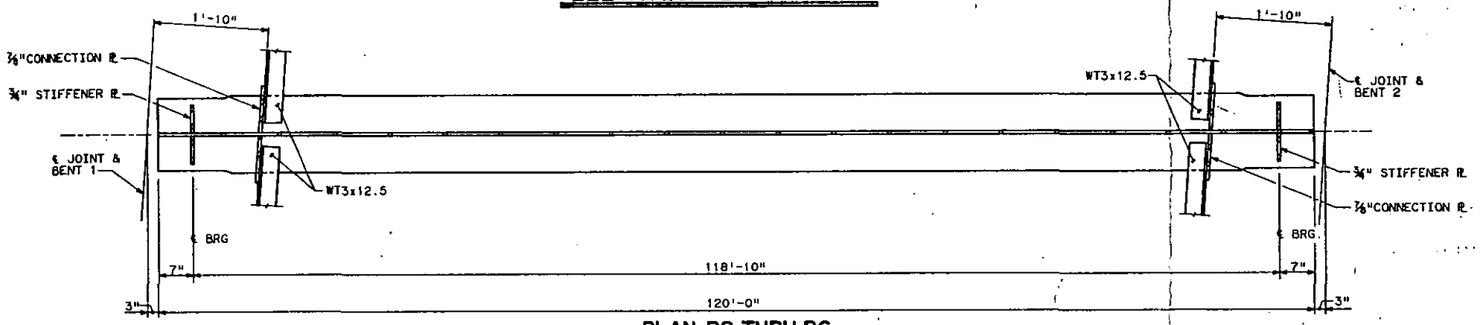


GIRDER LAYOUT-SPAN B

SPAN B INTERMEDIATE DIAPHRAGM SPACING		
GIRDER	"X"	"Y"
B1	20'-9 9/16"	24'-6 7/16"
B2	21'-5 1/16"	23'-10 5/16"
B3	22'-0 1/2"	23'-3 1/2"
B4	22'-8"	22'-8"
B5	23'-3 1/2"	22'-0 1/2"
B6	23'-10 5/16"	21'-5 1/16"
B7	24'-6 7/16"	20'-9 9/16"

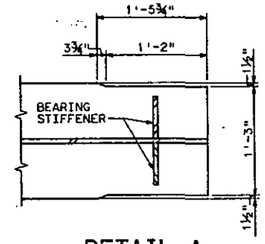


ELEVATION-B1 THRU B7



PLAN-B2 THRU B6

BOTTOM FLANGE SHOWN
(B1& B7 END DIAPH REQ'D.ON ONE SIDE ONLY,SEE LAYOUT)



DETAIL A

NOTE:
FOR NOTES AND DEAD LOAD DEFLECTIONS SEE GIRDER DETAILS SHEET.

PROJECT NO. 6.6780061

MECKLENBURG COUNTY

STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

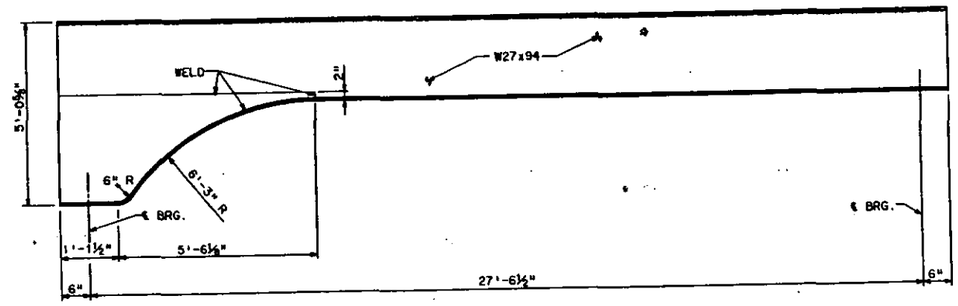
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT - SPAN B

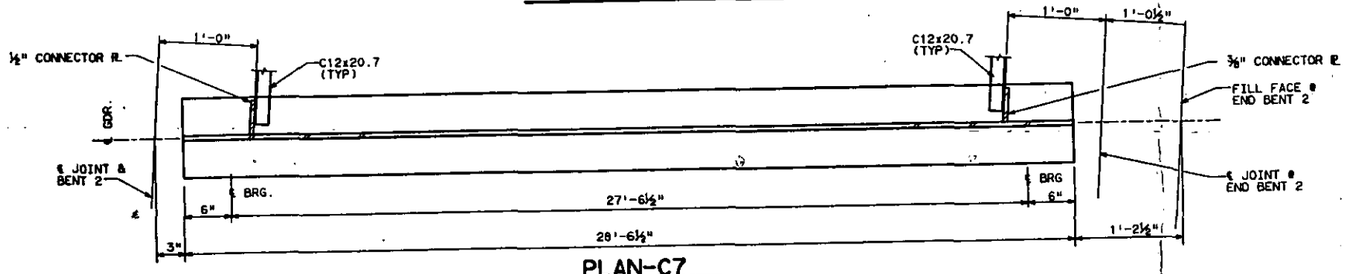
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-84
1			3			TOTAL SHEETS

DRAWN BY CSJ DATE 3/89
CHECKED BY CLN DATE 3/89

NOTE:
FOR HAUNCH NOTES SEE BEAM LAYOUT-SPAN A



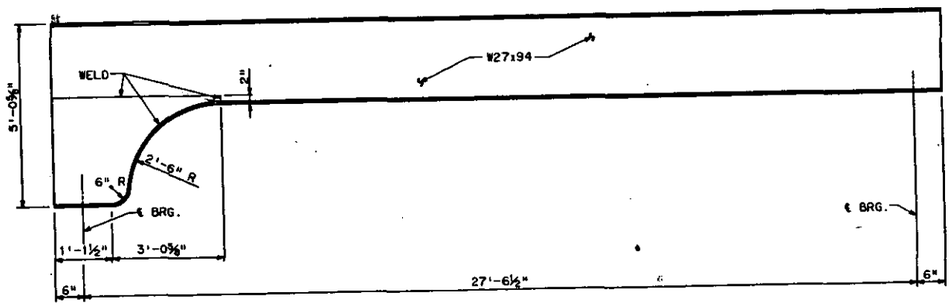
ELEVATION-C1 & C7



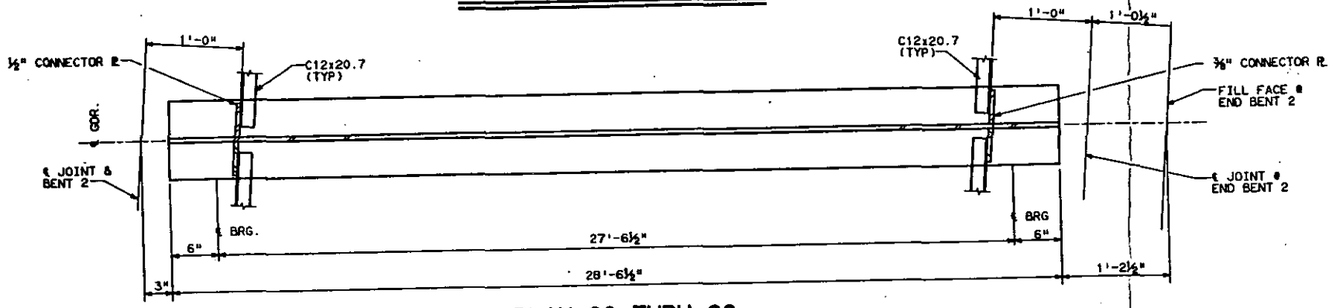
PLAN-C7

BOTTOM FLANGE SHOWN

END DIAPHRAGMS REQ'D. ON INTERIOR SIDE OF BEAM

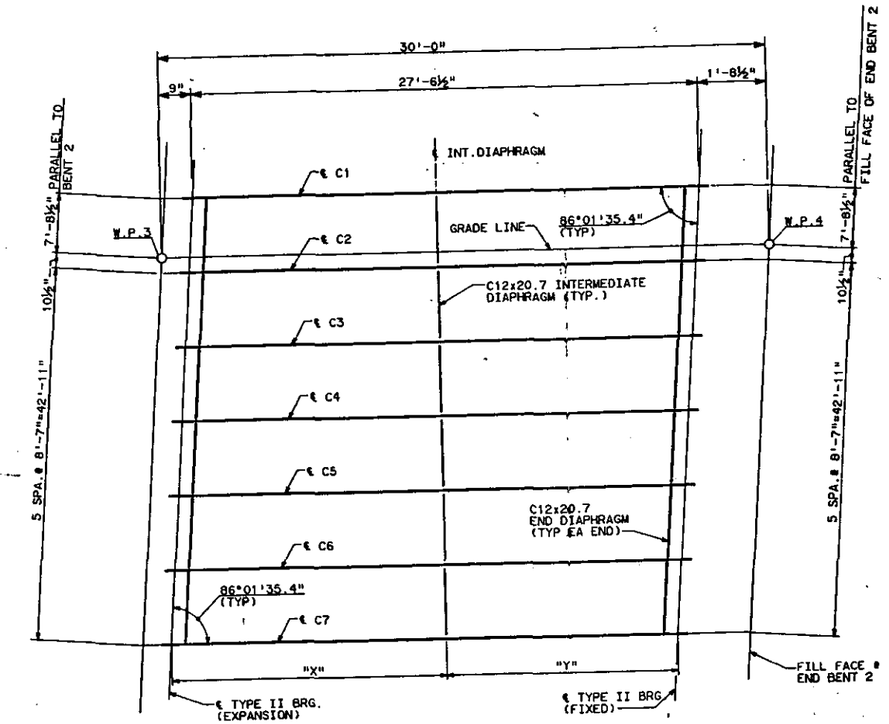


ELEVATION-C2 THRU C6



PLAN-C2 THRU C6

BOTTOM FLANGE SHOWN



BEAM LAYOUT-SPAN C

DEAD LOAD DEFLECTIONS AND BEAM CAMBER AT MID-POINT BETWEEN BEARINGS

BEAM	C1 & C7	C2 - C6
DEFLECTION DUE TO WEIGHT OF STEEL	.001'↓	.001'↓
DEFLECTION DUE TO WEIGHT OF SLAB	.013'↓	.013'↓
DEFLECTION DUE TO RAIL AND F.W.S.	.003'↓	.003'↓
TOTAL DEAD LOAD DEFLECTION	.017'↓	.017'↓
VERTICAL CURVE ORDINATE	.003'↑	.003'↑
REQUIRED BEAM CAMBER	* NONE	* NONE

NOTE : VALUES ARE GIVEN IN FEET (DECIMAL FORM) MIDPOINT BETWEEN ℄ BEARINGS EXCEPT "REQUIRED BEAM CAMBER" WHICH IS GIVEN IN INCHES(FRACTION FORM).

* TURN NATURAL MILL CAMBER UP.

FOR NOTES SEE GIRDER DETAIL SHEET

SPAN C INTERMEDIATE DIAPHRAGM SPACING

GIRDER	"X"	"Y"
C1	11'-11⅝"	15'-6⅝"
C2	12'-7"	14'-11½"
C3	13'-2⅛"	14'-4⅜"
C4	13'-9¼"	13'-9¼"
C5	14'-4⅜"	13'-2⅛"
C6	14'-11½"	12'-7"
C7	15'-6⅝"	11'-11⅝"

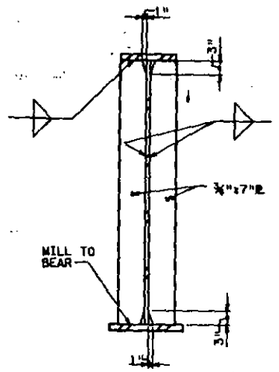
PROJECT NO. 6.C780061
MECKLENBURG COUNT
STATION ℄L-REV 144+60.
-Y-REV 18+97.9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTAT
RALEIGH

SUPERSTRUCTURE
BEAM LAYOUT-SPAN C

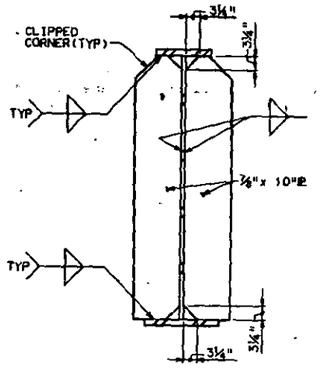
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89



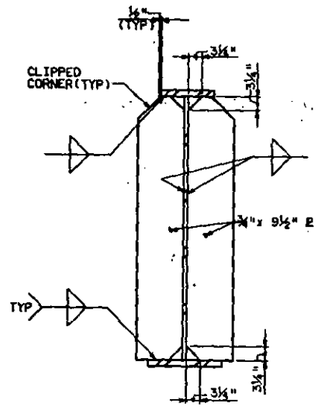
BEARING STIFFENER

SPAN B



CONNECTOR PLATE AT BENT CROSSFRAME

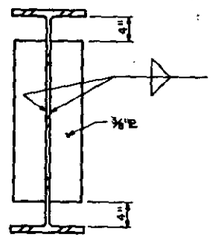
SPAN B



CONNECTOR PLATE AT INTERMEDIATE CROSSFRAME

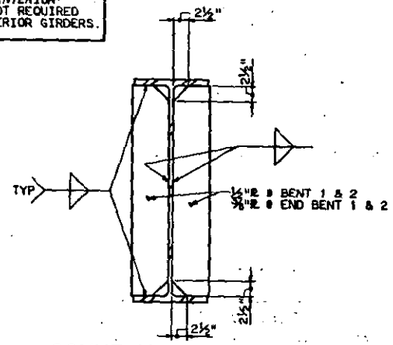
SPAN B

NOTE: STIFFENER & CONNECTOR PLATE DETAILS SHOWN AT INTERIOR GIRDERS. PLATES NOT REQUIRED ON OUTSIDE OF EXTERIOR GIRDERS.



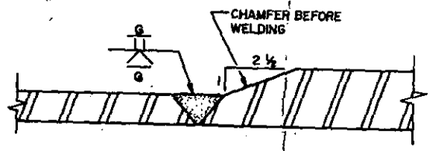
CONNECTOR PLATE AT INTERMEDIATE DIAPHRAGM

SPANS A & C



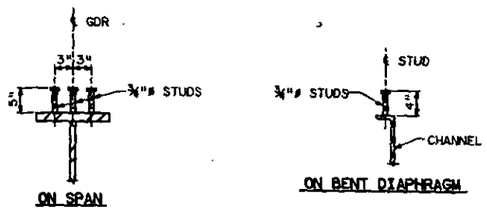
CONNECTOR PLATE AT BENT DIAPHRAGM

SPANS A & C

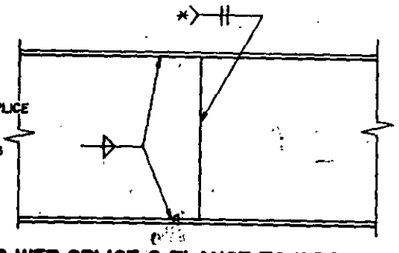


SHOP FLANGE SPLICE DETAIL (SECTION THRU FLANGE)

SPAN B



SHEAR CONNECTORS



* THE SHOP WEB SPLICE IS TO BE GROUND FOR OUTSIDE OF EXTERIOR GIRDERS ONLY.

SHOP WEB SPLICE & FLANGE TO WEB

SPAN B

DEAD LOAD DEFLECTIONS AND GIRDER CAMBER AT TENTH POINTS BETWEEN ℄ BEARINGS

SPAN B-GIRDER B1 & B7

GIRDER POINT	BRG	1	2	3	4	5	6	7	8	9	BRG
DEFLECTION DUE TO WEIGHT OF STEEL	.000'	.025'	.046'	.061'	.072'	.075'	.072'	.061'	.046'	.025'	.000'
DEFLECTION DUE TO WEIGHT OF SLAB	.000'	.009'	.203'	.270'	.313'	.327'	.313'	.270'	.203'	.009'	.000'
DEFLECTION DUE TO RAIL AND F.W.S.	.000'	.016'	.030'	.040'	.046'	.049'	.046'	.040'	.030'	.016'	.000'
TOTAL DEAD LOAD DEFLECTION	.000'	.150'	.279'	.371'	.431'	.451'	.431'	.371'	.279'	.150'	.000'
VERTICAL CURVE ORDINATE	.000'	.019'	.033'	.043'	.049'	.052'	.049'	.043'	.033'	.019'	.000'
REQUIRED GIRDER CAMBER	0"	2"	3⅜"	4⅝"	5⅛"	6⅛"	5⅛"	4⅝"	3⅜"	2"	0"

SPAN B-GIRDER B2-B6

GIRDER POINT	BRG	1	2	3	4	5	6	7	8	9	BRG
DEFLECTION DUE TO WEIGHT OF STEEL	.000'	.025'	.046'	.061'	.072'	.075'	.072'	.061'	.046'	.025'	.000'
DEFLECTION DUE TO WEIGHT OF SLAB	.000'	.108'	.200'	.267'	.309'	.323'	.309'	.267'	.200'	.108'	.000'
DEFLECTION DUE TO RAIL AND F.W.S.	.000'	.016'	.029'	.039'	.046'	.048'	.046'	.039'	.029'	.016'	.000'
TOTAL DEAD LOAD DEFLECTION	.000'	.149'	.275'	.367'	.427'	.446'	.427'	.367'	.275'	.149'	.000'
VERTICAL CURVE ORDINATE	.000'	.019'	.033'	.043'	.049'	.052'	.049'	.043'	.033'	.019'	.000'
REQUIRED GIRDER CAMBER	0"	2"	3⅜"	4⅝"	5⅛"	6"	5⅛"	4⅝"	3⅜"	2"	0"

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) @ TENTH POINTS BETWEEN ℄ BEARINGS EXCEPT "REQUIRED GIRDER CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).

STRUCTURAL STEEL NOTES

SPECIFICATIONS: DESIGNS.....A.A.S.H.T.O.(1983 WITH 1984 THRU 1987 INTERIM)

ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 P.S.I.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OF VERTICAL UNLESS OTHERWISE NOTED.

HIGH STRENGTH BOLTS SHALL BE ⅞"DIAMETER UNLESS OTHERWISE NOTED.

GIRDERS SHALL BE FABRICATED WITH CAMBER TO COMPENSATE FOR DEFLECTION CAUSED BY THE COMBINED WEIGHTS FOR THE STRUCTURAL STEEL AND THE SUPERIMPOSED DEAD LOADS, PLUS VERTICAL CURVE ORDINATE. SEE TABLE OF DEAD LOAD DEFLECTIONS AND GIRDER CAMBER.

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 OCCURED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

SHOP SPLICES ARE PERMITTED TO LIMIT MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES.

CHARPY V-NOTCH TEST WILL BE REQUIRED FOR WEB PLATES & BOTTOM FLANGE PLATES FOR ALL GIRDERS AND ALL ROLLED BEAMS. FOR CHARPY V-NOTCH TEST, SEE SPECIAL PROVISIONS.

ENDS OF BEAMS AND GIRDERS TO BE PLUMB AND STIFFENERS TO BE PARALLEL TO END OF BEAMS AND GIRDERS.

METAL STAY-IN-PLACE FORM SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST.

DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89

PROJECT NO. G.676006T

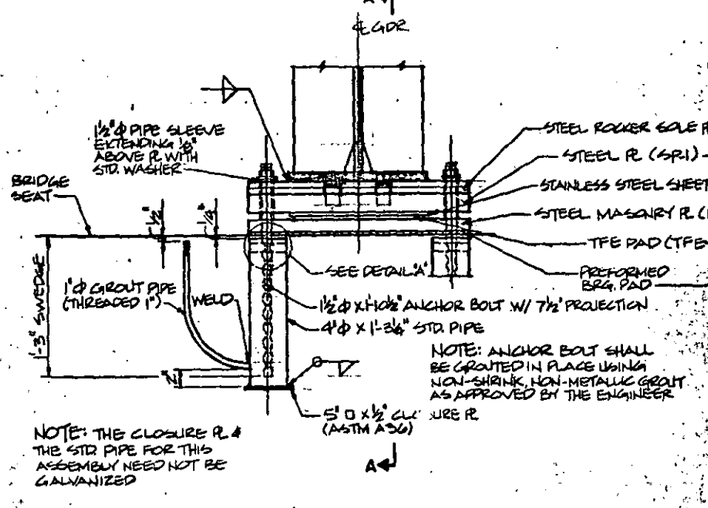
MECKLENBURG COUNTY

STATION -L-REV 144+60.8
-Y-REV 18+97.90

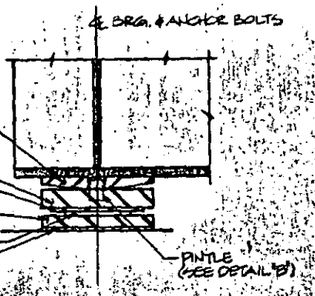
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-
1			3			TOTAL SHEETS
2			4			17

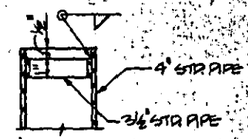


END VIEW

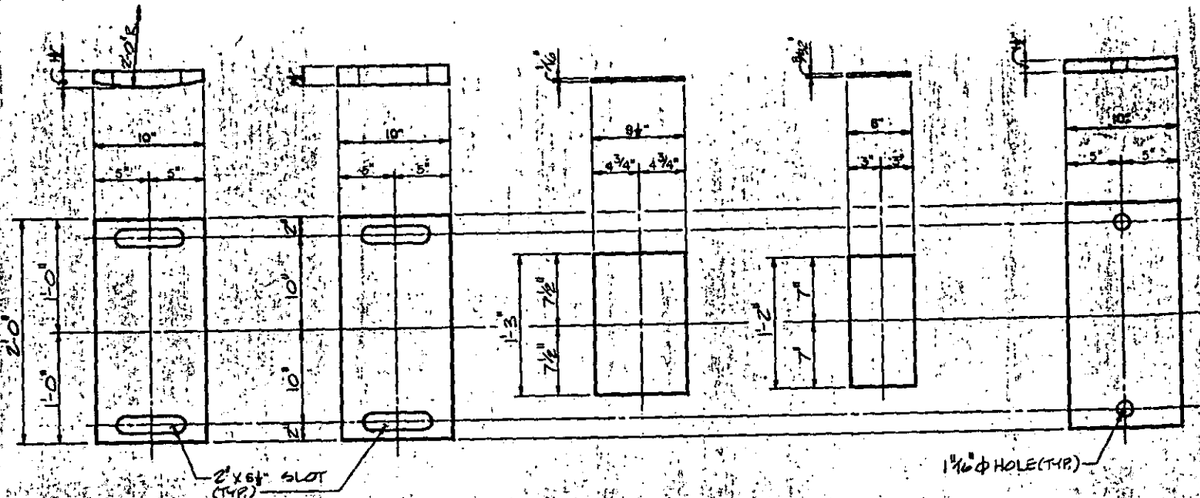


SECTION A-A

DETAIL B

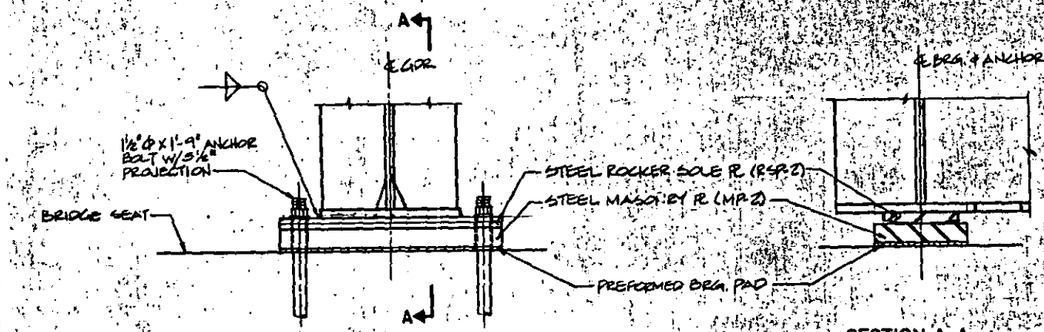


DETAIL A



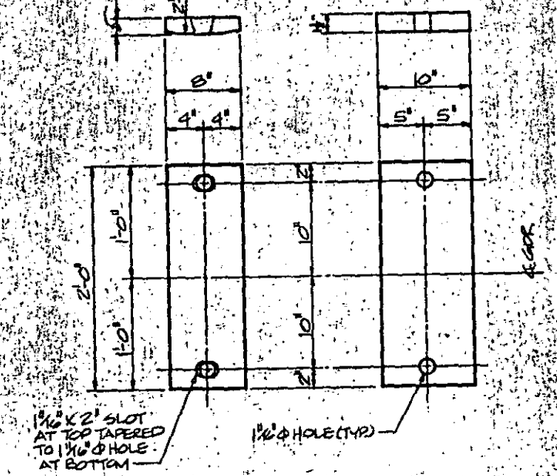
RSP-1 (7 REQ'D.) | SP-1 (7 REQ'D.) | SS-1 (7 REQ'D.) | TFE-1 (7 REQ'D.) | MP-1 (7 REQ'D.)

EXPANSION BEARING DETAILS



END VIEW

SECTION A-A



RSP-2 (7 REQ'D.) | MP-2 (7 REQ'D.)

FIXED BEARING DETAIL

NOTES

ALL BEARING PLATES SHALL BE ASTM A588 OR A572 GRADE 50. ALL BEARING PLATES SHALL BE GALVANIZED EXCEPT THE PLATES RECEIVING THE TFE PAD OR STAINLESS STEEL SHEET. THE PLATES RECEIVING THE TFE PAD OR STAINLESS STEEL SHEET SHALL BE COMMERCIALLY BLAST CLEANED AND EXCEPT FOR THE AREAS WITH SPECIAL FACING, SHALL BE PAINTED WITH TWO COATS OF ZINC RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

TFE EXPANSION BEARING ASSEMBLIES SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR THE ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

PROJECT NO. 6.678009
MECKLENBURG COUNTY

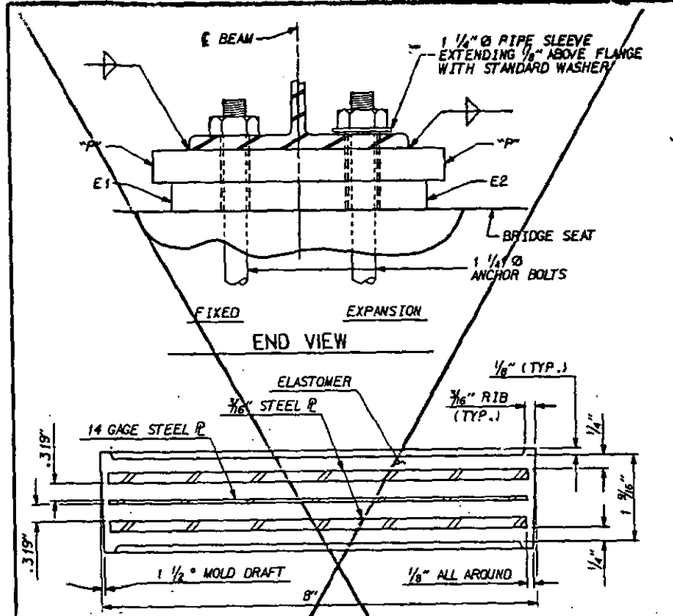
STATION -L- REV. 144+60
-Y- REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

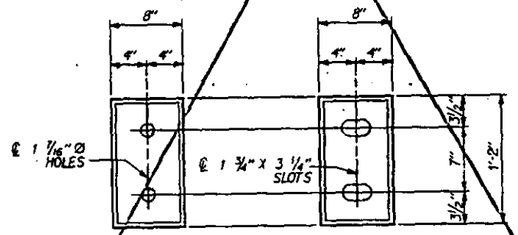
TFE
FIXED AND EXPANSION
BEARING DETAILS

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

DRAWN BY LSJ DATE 5/87
CHECKED BY CLH DATE 5/87



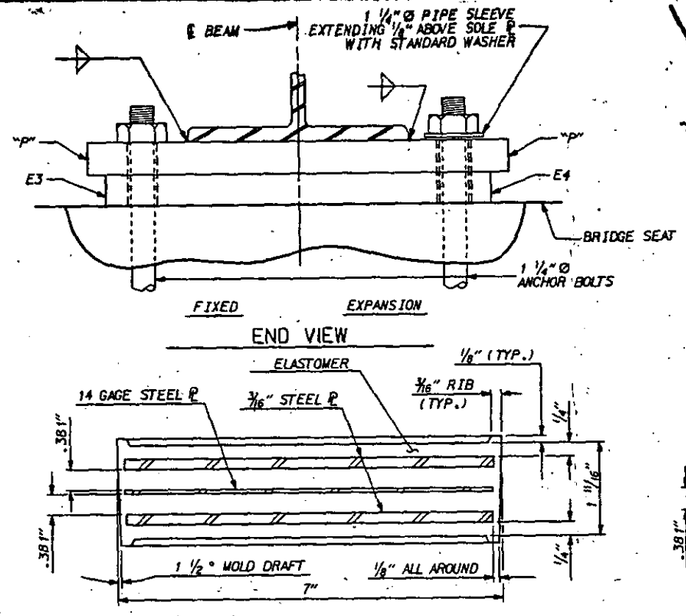
TYPICAL SECTION OF ELASTOMERIC BEARINGS



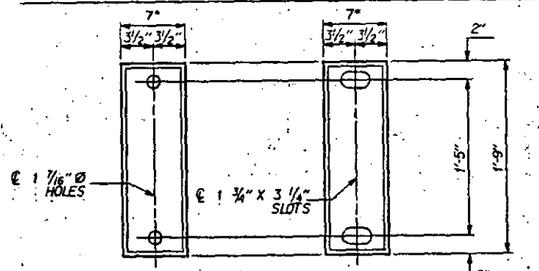
E1 (REQ'D) E2 (REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE I



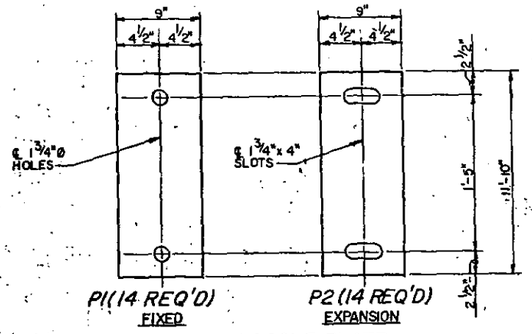
TYPICAL SECTION OF ELASTOMERIC BEARINGS



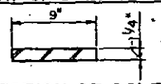
E3 (14 REQ'D) E4 (14 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

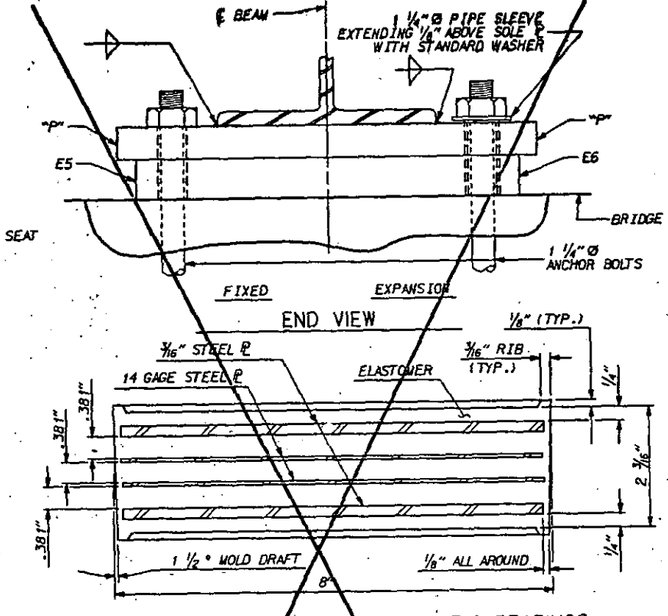
TYPE II



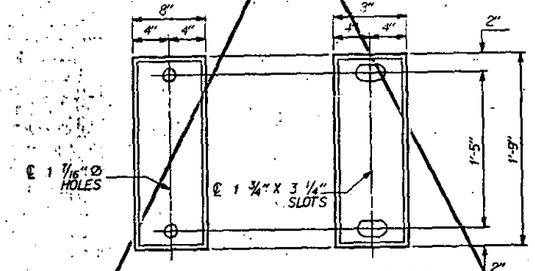
PLAN VIEW OF SOLE PLATE



TYPICAL SECTION OF SOLE PLATE



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E5 (REQ'D) E6 (REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE III

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 1 1/2"Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL, SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR UNPAINTED A.S.T.M. A-588 STRUCTURAL STEEL, SOLE PLATE SHALL BE A.S.T.M. A-588 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHITE LEAD AND TALLOW SHALL NOT BE APPLIED TO THE SURFACE OF THE SOLE PLATE IN CONTACT WITH THE ELASTOMERIC BEARING.

LOAD RATINGS

	MAX. D.L.+ L.L.	MAX. D.L.	MIN. D.L.	MAX. DEFL.
~~TYPE I~~	~~68.81 K~~	~~50.97 K~~	~~21.75 K~~	~~7.0 %~~
TYPE II	82.16 K	68.47 K	28.75 K	7.0 %
~~TYPE III~~	~~114.51 K~~	~~78.97 K~~	~~32.95 K~~	~~7.0 %~~
~~TYPE IV~~	~~142.17 K~~	~~88.86 K~~	~~37.51 K~~	~~7.0 %~~

PROJECT NO. G.678006T

MECKLENBURG COUNTY

STATION: -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

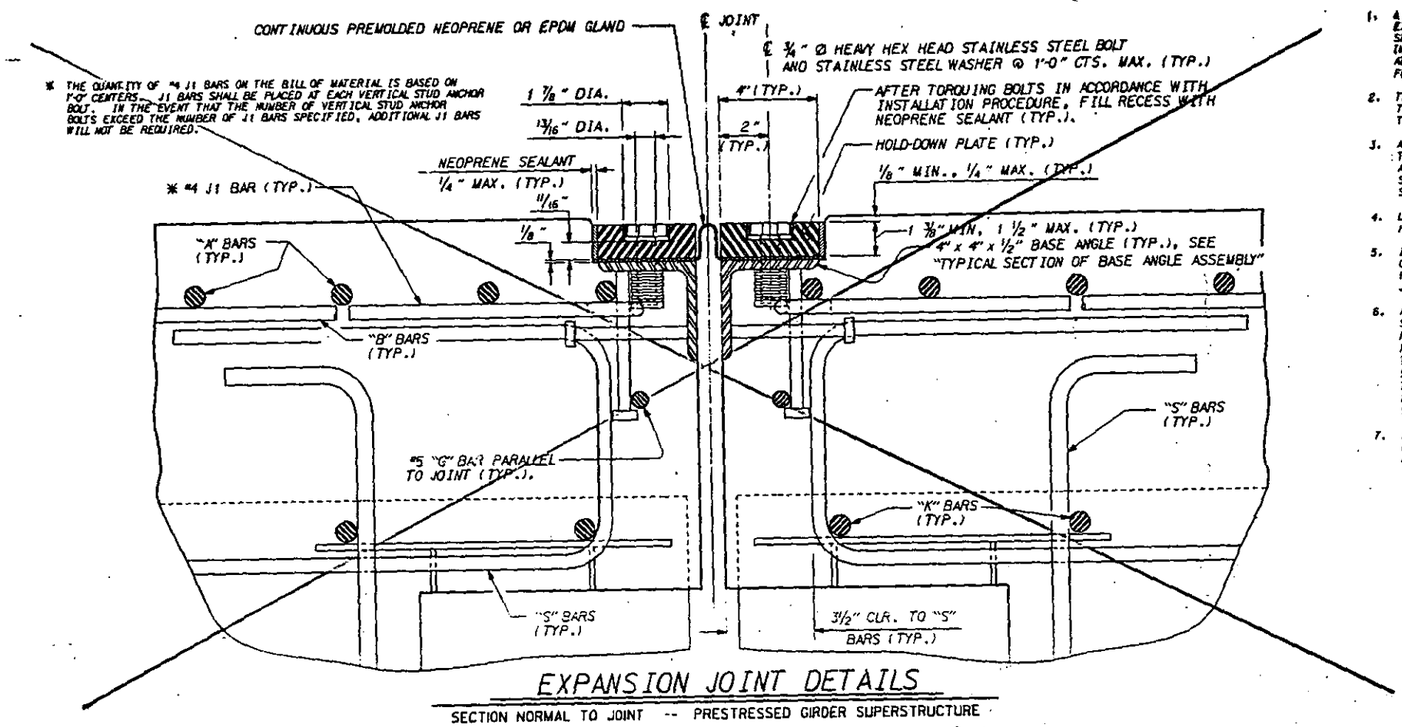
FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-88
1			3			TOTAL SHEETS
2			4			130

ASSEMBLED BY : LSJ	DATE : 3/89	SPECIAL
CHECKED BY : CLN	DATE : 3/89	
DRAWN BY : MIKE BRITT	DATE : NOV. 1987	STANDARD
CHECKED BY : RANDY BISSETTE	DATE : NOV. 1987	

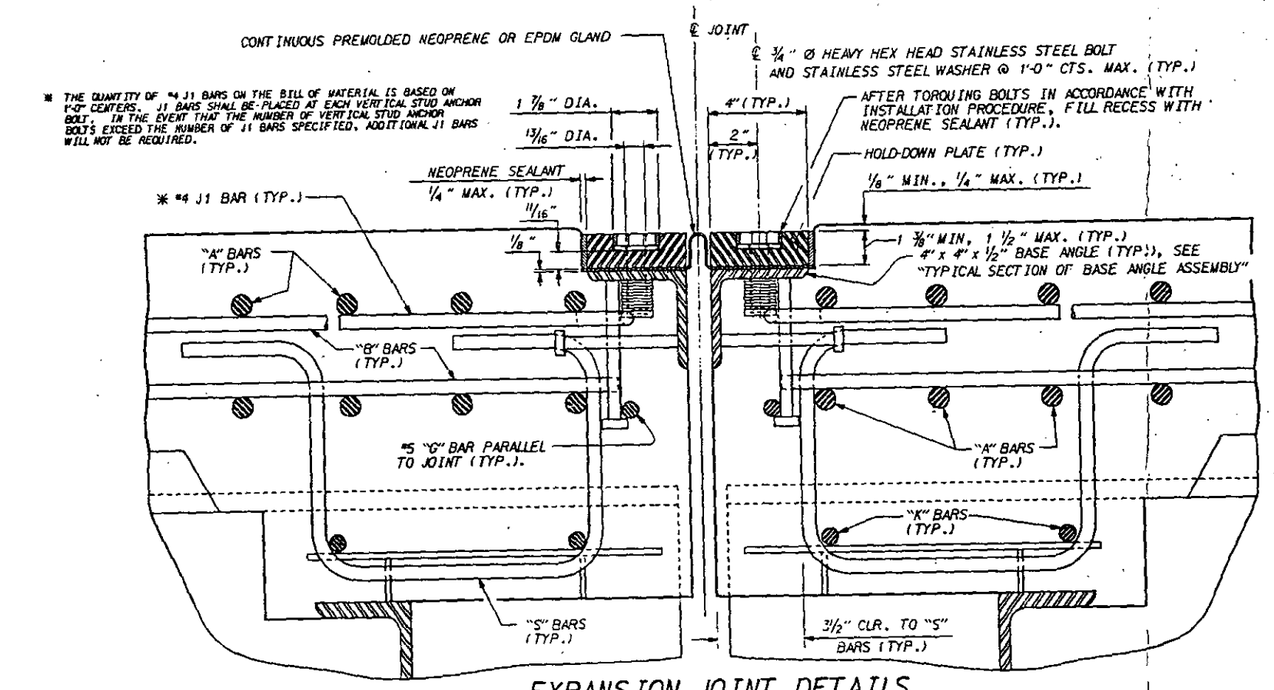
REDRAWN 2-29-88

SOLE PLATE DETAILS ("P")



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE



EXPANSION JOINT DETAILS

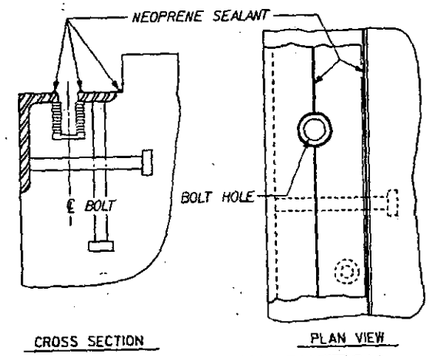
SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

ASSEMBLED BY : LSJ	DATE : 3/89	SPECIAL
CHECKED BY : CLN	DATE : 3/89	
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87	STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87	

CADD ZGH6203J1EXPJTSEAL.STD

REVISED BY A.R.B. CHECKED BY J.S.T. 6-1-1988
ADDED 2-29-88

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE ½" TO ¾" THICKER THAN THE HOLD DOWN PLATE AND 4 ⅛" TO 8 ⅛" WIDE IN ORDER FOR THE JOINT TO BE SET TO THE PROPER DEPTH. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED METHOD OF HOLDING THE BASE ANGLE ASSEMBLY IN PLACE WHILE THE CONCRETE IS CAST AROUND IT. THE TEMPLATE SHALL BE FLUSH WITH THE TOP OF DECK.
3. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
4. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
5. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
6. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT.-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT.-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT.-LBS. AFTER SEVEN (7) DAYS.
7. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.



INSTALLATION SKETCH

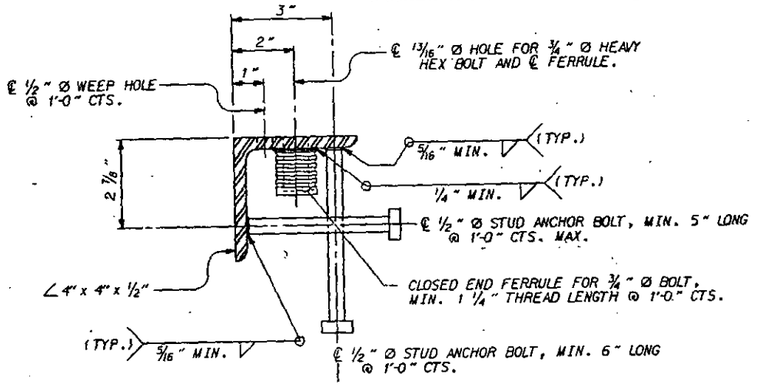
1. ARMORED JOINTS SHALL BE PROVIDED AT ALL LOCATIONS SHOWN ON THE PLANS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO TYPE 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A108, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT. GLAND SHALL BE EITHER ELASTIC POLYCHLOROPRENE (NEOPRENE) OR ETHYL PROPYLENE DIENE MONOMER (EPDM) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

	ASTM TEST	REQUIREMENTS
HARDNESS, DUROMETER-SHORE A	D2240	60±5, NEOPRENE (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
		75±5, EPDM AND NEOPRENE (UPWARD NON-CORRUGATED SHAPE)
		80±5, EPDM (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
TENSILE STRENGTH	D412	2000 PSI, MIN.
ELONGATION AT BREAK	D412	250% MIN.
THICKNESS OF UPTURNED PORTION OF GLAND	N/A	¼" (NON-CORRUGATED SHAPE)
		⅛" (CORRUGATED SHAPE)

5. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
6. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO PAINTING.
7. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIALLY BLAST CLEANED AND SHALL BE PAINTED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS. EACH COAT SHALL HAVE A MINIMUM THICKNESS OF 3 MILS. PAINTED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR DAMAGED GALVANIZING.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. BASE ANGLE ASSEMBLIES SHALL BE SHIPPED IN 25' MINIMUM LENGTH EXCEPT WHERE THE LENGTH OF JOINT IS LESS THAN 25' OR WHERE OTHERWISE DETAILED ON THE PLANS. FOR JOINTS REQUIRING BASE ANGLE ASSEMBLIES LONGER THAN 25', FIELD WELDING OF THE BASE ANGLE WILL BE PERMITTED. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. WHEN FIELD WELDING IS PROPOSED, THE CONTRACTOR SHALL SUBMIT PROPOSED WELDING DETAILS FOR APPROVAL. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF ⅛" AND A MAXIMUM OF ¼" BELOW THE TOP OF SLAB.
10. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
11. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
12. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.

MOVEMENT AND SETTING AT JOINT					
BENT NO.	* SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
2	94°-00'-285"	1 3/4"	2 3/8"	1 7/8"	1 3/8"

* TANGENT TO CURVE OF GRADE LINE & ℄ BENT



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. 6.667806T

MECKLENBURG COUNTY

STATION: -L-REV 144+60.84=
-Y-REV 18+97.90

SHEET 1 OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

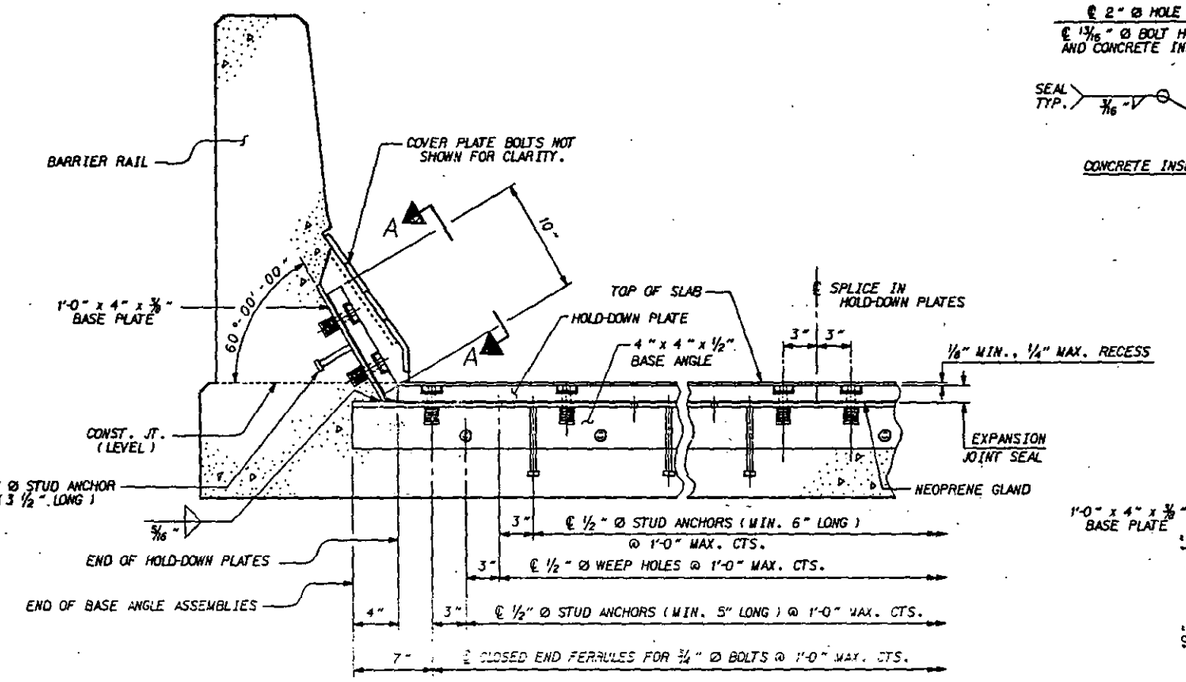
STANDARD

EXPANSION JOINT SEAL DETAILS

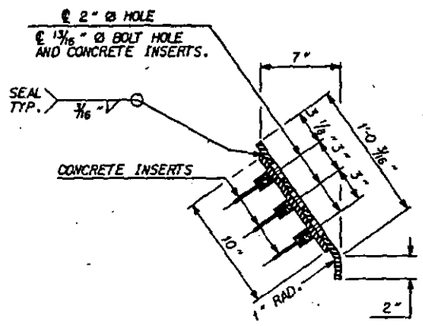
FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-89
1			3			TOTAL SHEETS
2			4			130

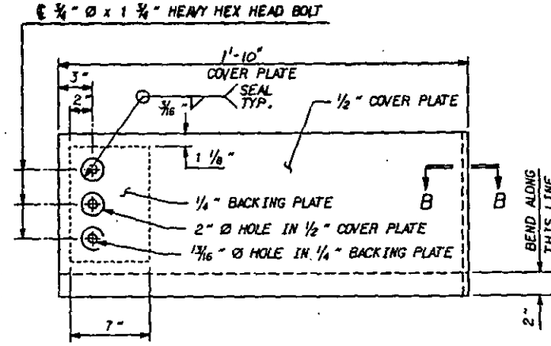
EJSI



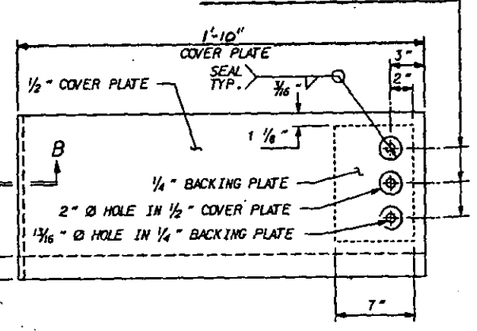
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

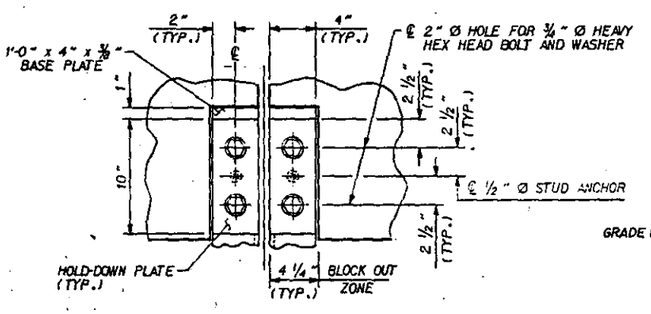


TYPE I - ELEVATION VIEW

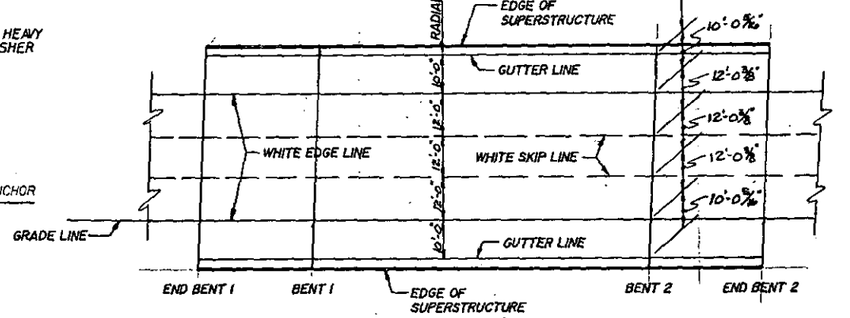


TYPE II - ELEVATION VIEW

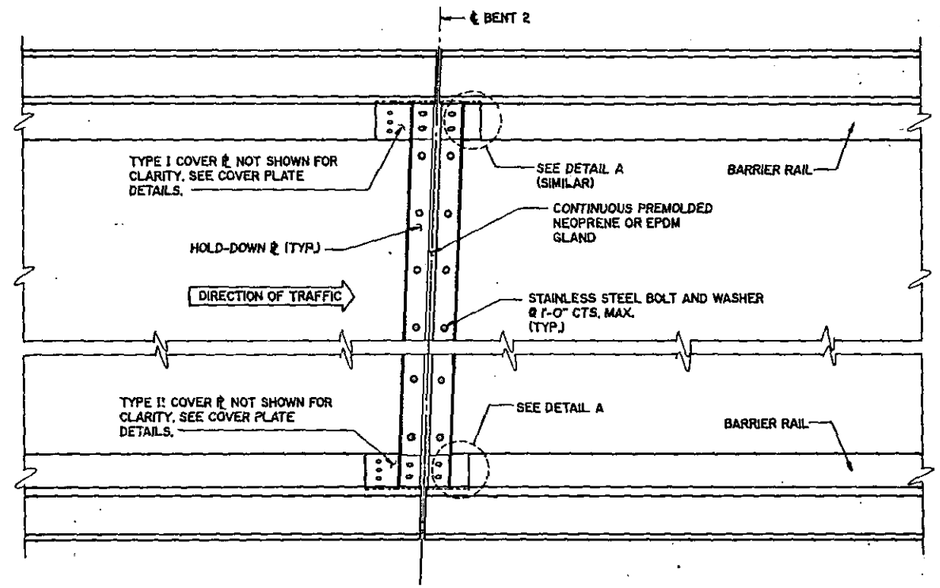
COVER PLATE DETAILS



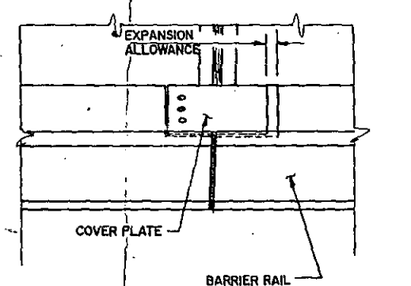
SECTION A - A



PAVEMENT MARKING ALIGNMENT



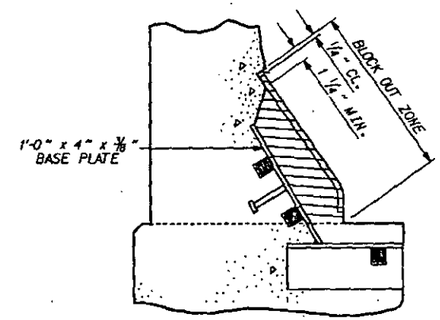
PLAN OF EXPANSION JOINT SEAL - BENT 2



* 2 3/16" @ 30°
1 7/8" @ 60°
1 5/8" @ 90°

NOTE : TYPE II COVER ℄ SHOWN, TYPE I SIMILAR.

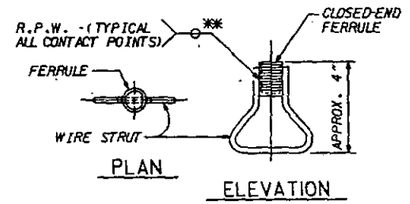
DETAIL A



BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.

SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. G.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

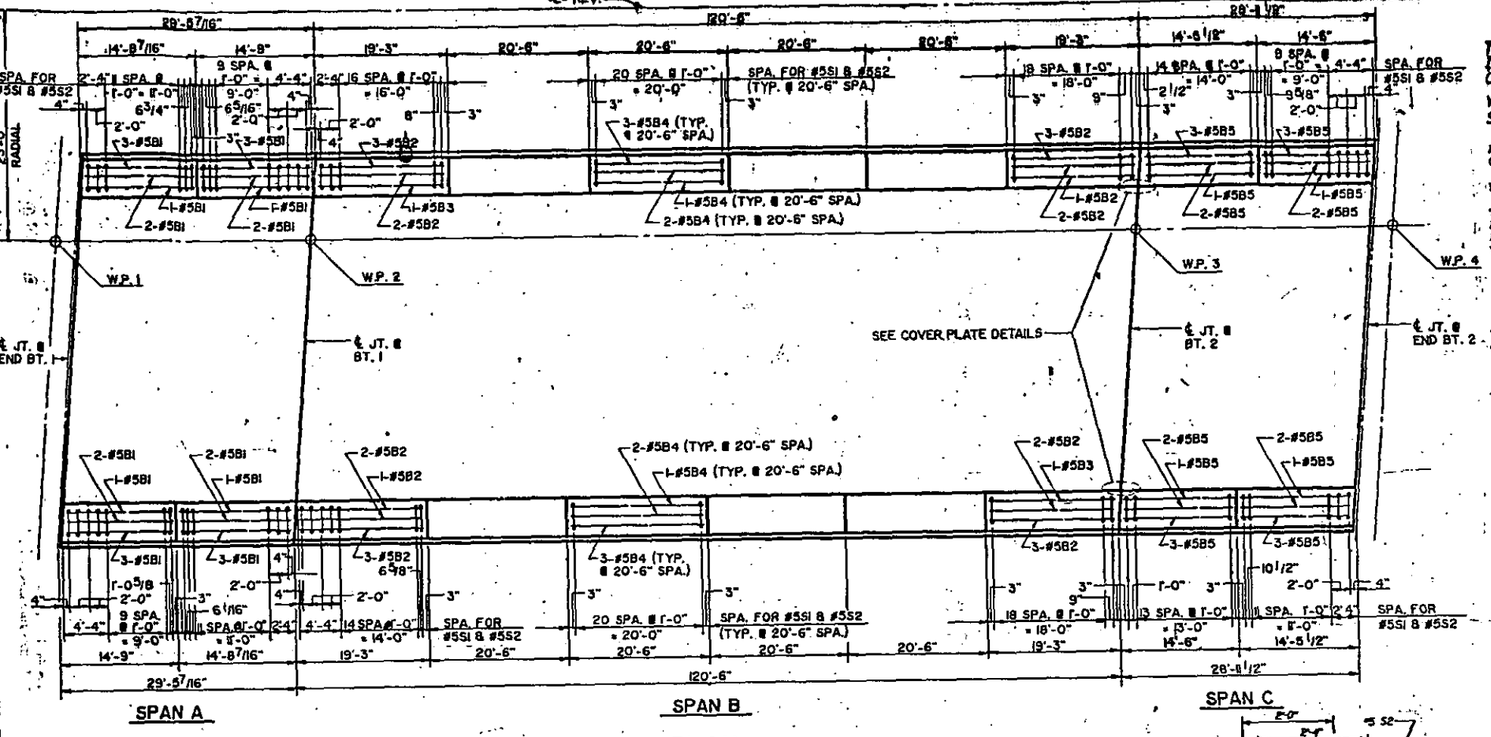
SHEET 2 OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

FEBRUARY 1988

ASSEMBLED BY :	BLF	DATE :	3-89	SPECIAL	REVISIONS		SHEET NO.
CHECKED BY :	CLN	DATE :	3-89		NO. BY: DATE: NO. BY: DATE:		5-90
DRAWN BY :	ROSS E. KUBENY CINDY B. KING	DATE :	9-18-87 10-2-87	STANDARD	1 3 2 4		TOTAL SHEETS 130



PLAN

NOTES

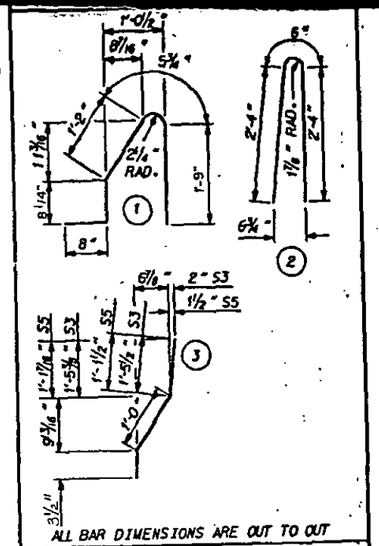
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #5B3 THRU #5B6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED BOLTS/DOWELS, SEE SPECIAL PROVISIONS. TESTING FOR ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



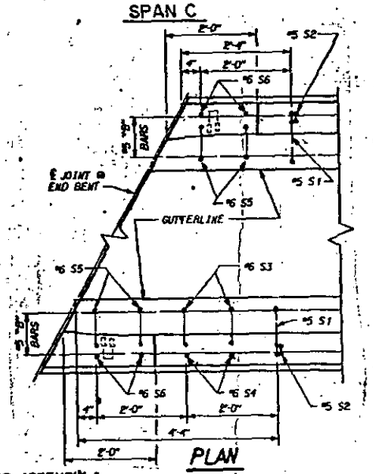
ALL BAR DIMENSIONS ARE OUT TO OUT

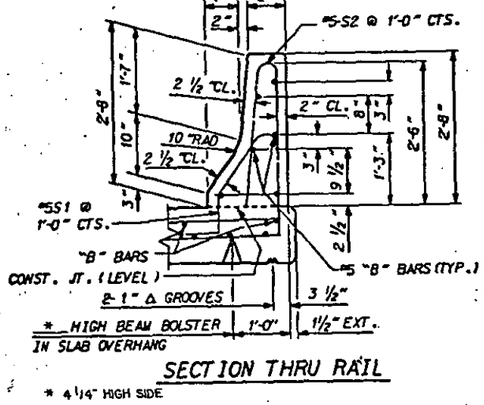
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	347	#5	1	4'-9"	1719
S2	347	#5	2	5'-2"	1870
S3	16	#5	3	2'-9"	66
S4	16	#5	STR.	2'-7"	62
S5	8	#5	3	2'-5"	29
S6	8	#5	STR.	2'-2"	26
B1	24	#5	STR.	14'-4"	359
B2	22	#5	STR.	18'-10"	432
B3	2	#5	STR.	18'-11"	39
B4	48	#5	STR.	20'-2"	1010
B5	24	#5	STR.	14'-1"	353

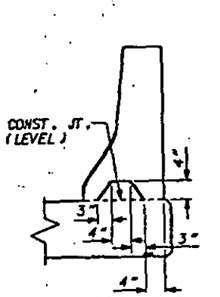
EPOXY COATED REINFORCING STEEL	5965 LBS.
CLASS A-A CONCRETE	32.8 CU. YDS.
CONCRETE BARRIER RAIL	357.82 LIN. FT.



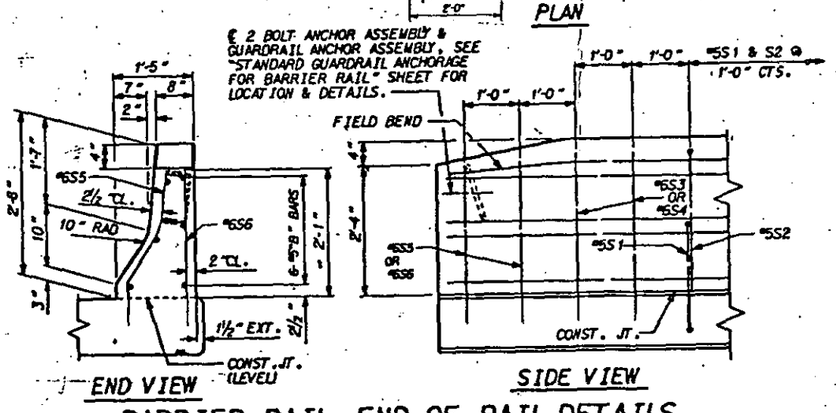


SECTION THRU RAIL

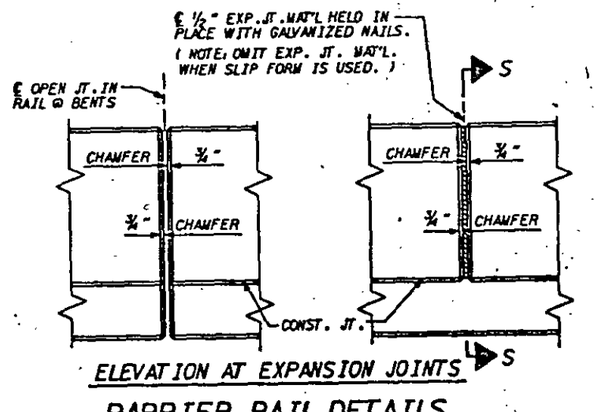
* 4 1/4" HIGH SIDE
3 1/2" LOW SIDE



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



BARRIER RAIL-END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. G.678006T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84
-Y- REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL

OCTOBER 1987

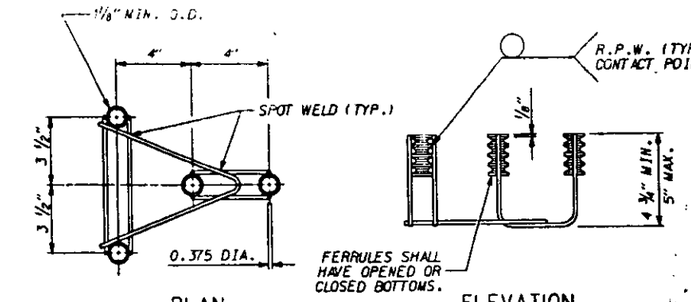
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

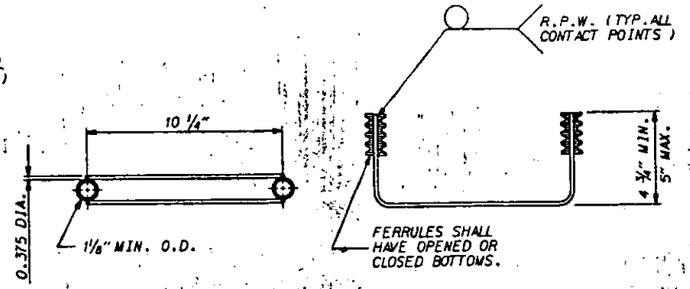
SHEET NO. S-91
TOTAL SHEETS 130

ASSEMBLED BY: MDM DATE: 3/89
CHECKED BY: CLN DATE: 3/89

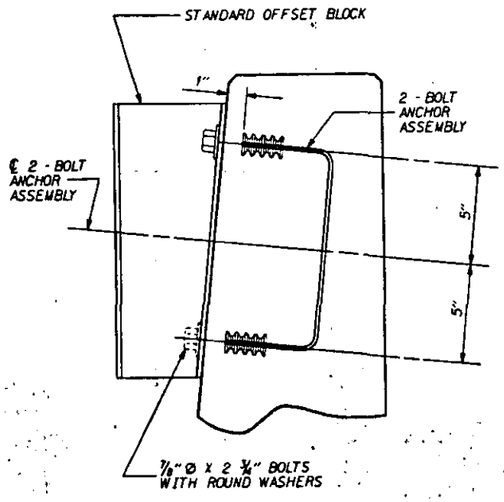
SPECIAL
STANDARD



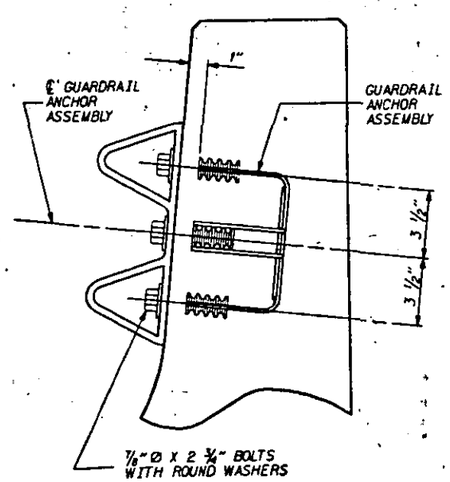
GUARDRAIL ANCHOR ASSEMBLY



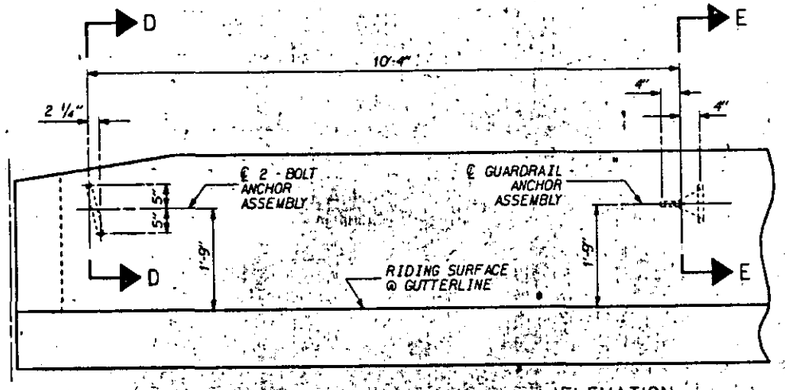
2 - BOLT ANCHOR ASSEMBLY

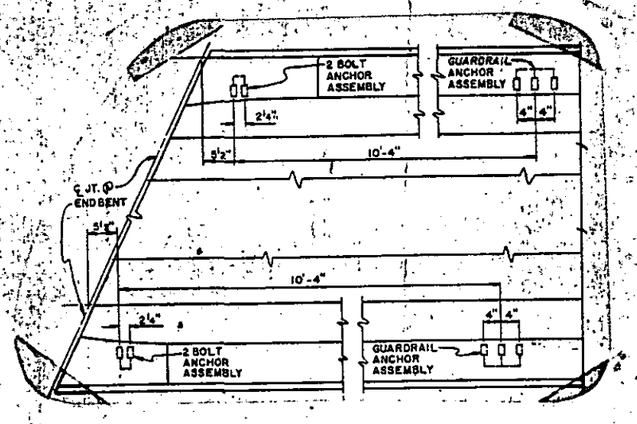


SECTION D-D



SECTION E-E





LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK

ASSEMBLED BY : MDM	DATE : 3/89	SPECIAL	
CHECKED BY : CLN	DATE : 3/89		
[illegible]	DATE : DEC. 1987	STANDARD	

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1½".

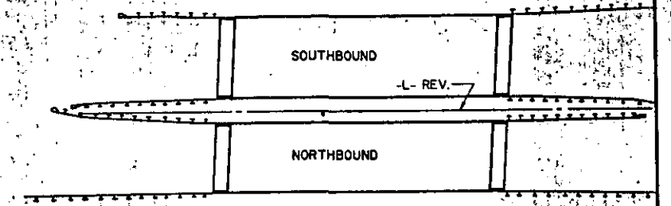
B. 4 - ⅞"Ø X 2 ¾" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2 - ⅞"Ø X 2 ¾" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞"Ø X 2 ¾" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



NOTE : PROVIDE GUARDRAIL CONNECTIONS AT 4 CORNERS SHOWN.

SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84 ±

-Y- REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-92
1			3			TOTAL SHEETS
2			4			130

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	4	5	STR.	6'- 1"	25
*A2	2	5	STR.	9'- 5"	20
*A3	2	5	STR.	14'-11"	31
*A4	2	5	STR.	20'- 5"	43
*A5	2	5	STR.	25'-11"	54
*A6	2	5	STR.	31'- 5"	66
*A7	2	5	STR.	36'-11"	77
*A8	4	5	STR.	21'-11"	91
*A9	4	5	STR.	24'- 8"	103
*A10	4	5	STR.	27'- 4"	114
*A11	120	5	STR.	30'- 1"	3,765
A12	4	5	STR.	6'- 1"	25
A13	2	5	STR.	9'- 5"	20
A14	2	5	STR.	14'-11"	31
A15	2	5	STR.	20'- 5"	43
A16	2	5	STR.	25'-11"	54
A17	2	5	STR.	31'- 5"	66
A18	2	5	STR.	36'-11"	77
A19	4	5	STR.	21'-11"	91
A20	4	5	STR.	24'- 8"	103
A21	4	5	STR.	27'- 4"	114
A22	120	5	STR.	30'- 1"	3,765
*A23	2	5	STR.	5'- 0"	10
A24	2	5	STR.	5'- 0"	10
*B1	42	4	STR.	29'- 0"	813
B2	72	5	STR.	29'- 0"	2,178
B3	6	4	STR.	29'- 0"	116
*G1	4	5	STR.	30'- 3"	126
*K1	8	5	1	5'- 5"	45
*K2	20	5	2	7'- 2"	150
K3	24	5	STR.	8'- 1"	202
*S1	96	4	3	3'- 5"	219
*Epoxy Coated Reinforcing					
Total Epoxy Coated Reinforcing				-LBS-	5,742
Total Reinforcing Steel				-LBS-	6,485

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A2	2	5	STR.	5'- 5"	20
*A3	2	5	STR.	8'- 2"	31
*A4	2	5	STR.	10'-11"	43
*A5	2	5	STR.	13'- 8"	54
*A6	2	5	STR.	16'- 5"	66
*A7	2	5	STR.	19'- 2"	77
*A8	4	5	STR.	21'-11"	91
*A9	4	5	STR.	24'- 8"	103
*A10	4	5	STR.	27'- 4"	114
*A11	558	5	STR.	30'- 1"	17,508
A13	2	5	STR.	5'- 5"	20
A14	2	5	STR.	8'- 2"	31
A15	2	5	STR.	10'-11"	43
A16	2	5	STR.	13'- 8"	54
A17	2	5	STR.	16'- 5"	66
A18	2	5	STR.	19'- 2"	77
A19	4	5	STR.	21'-11"	91
A20	4	5	STR.	24'- 8"	103
A21	4	5	STR.	27'- 4"	114
A22	558	5	STR.	30'- 1"	17,508
*A23	2	5	STR.	5'- 0"	10
A24	2	5	STR.	5'- 0"	10
*B4	210	4	STR.	25'- 0"	3,507
B5	216	5	STR.	41'- 0"	9,237
B6	30	4	STR.	25'- 0"	501
*G1	4	5	STR.	30'- 3"	126
*K1	8	5	1	5'- 5"	45
*K2	20	5	2	7'- 2"	150
K3	24	5	STR.	8'-1"	202
*S2	96	4	3	4'- 3"	272
*J1	59	4	4	1'- 5"	56
*Epoxy Coated Reinforcing					
Total Epoxy Coated Reinforcing				-LBS-	22,273
Total Reinforcing Steel				-LBS-	28,057

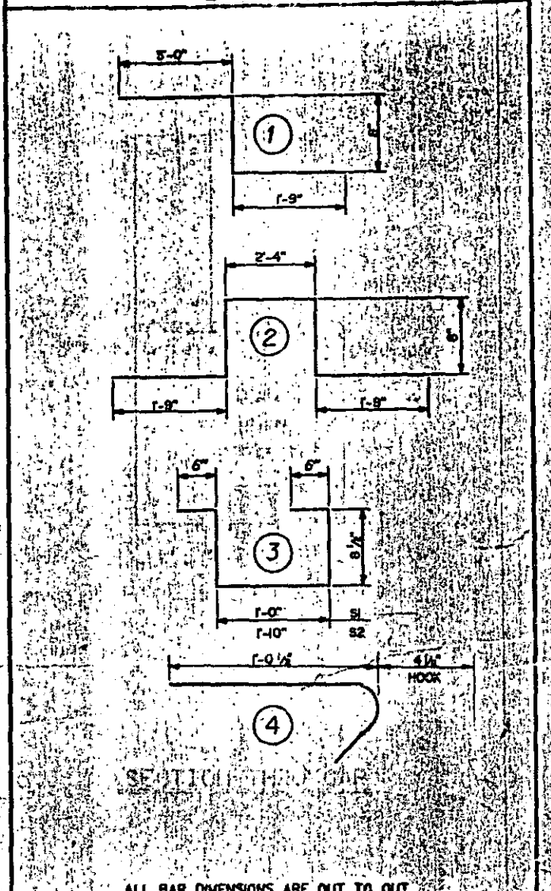
SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A2	2	5	STR.	5'- 5"	20
*A3	2	5	STR.	8'- 2"	31
*A4	2	5	STR.	10'-11"	43
*A5	2	5	STR.	13'- 8"	54
*A6	2	5	STR.	16'- 5"	66
*A7	2	5	STR.	19'- 2"	77
*A8	4	5	STR.	21'-11"	91
*A9	4	5	STR.	24'- 8"	103
*A10	4	5	STR.	27'- 4"	114
*A11	120	5	STR.	30'- 1"	3,765
A13	2	5	STR.	5'- 5"	20
A14	2	5	STR.	8'- 2"	31
A15	2	5	STR.	10'-11"	43
A16	2	5	STR.	13'- 8"	54
A17	2	5	STR.	16'- 5"	66
A18	2	5	STR.	19'- 2"	77
A19	4	5	STR.	21'-11"	91
A20	4	5	STR.	24'- 8"	103
A21	4	5	STR.	27'- 4"	114
A22	120	5	STR.	30'- 1"	3,765
*A25	2	5	STR.	4'- 0"	8
A26	2	5	STR.	4'- 0"	8
*B7	42	4	STR.	28'- 6"	800
B8	72	5	STR.	28'- 6"	2,140
B9	6	4	STR.	28'- 6"	114
*G1	4	5	STR.	30'- 3"	126
*K1	8	5	1	5'- 5"	45
*K2	20	5	2	7'- 2"	150
K3	24	5	STR.	8'- 1"	202
*S1	96	4	3	3'- 5"	219
*J1	59	4	4	1'- 5"	56
*Epoxy Coated Reinforcing					
Total Epoxy Coated Reinforcing				-LBS-	5,768
Total Reinforcing Steel				-LBS-	6,824

SPAN

SPAN

BAR TYPES



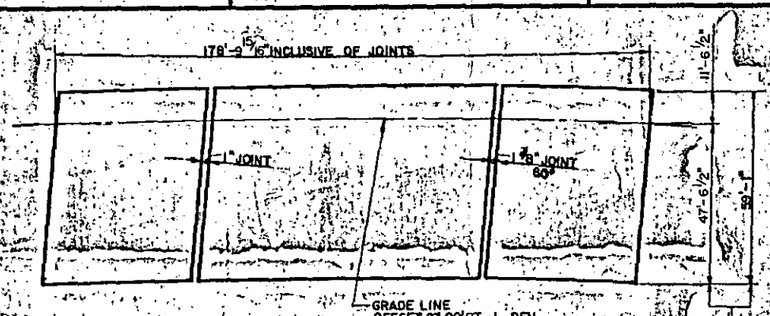
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS A-A CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN "A"	55.7	6,885	5,742
SPAN "B"	220.9	28,057	22,273
SPAN "C"	54.8	6,828	5,768
TOTALS**	331.4	41,770	33,783

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 10,566)

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84
-Y- REV. 18+97.90

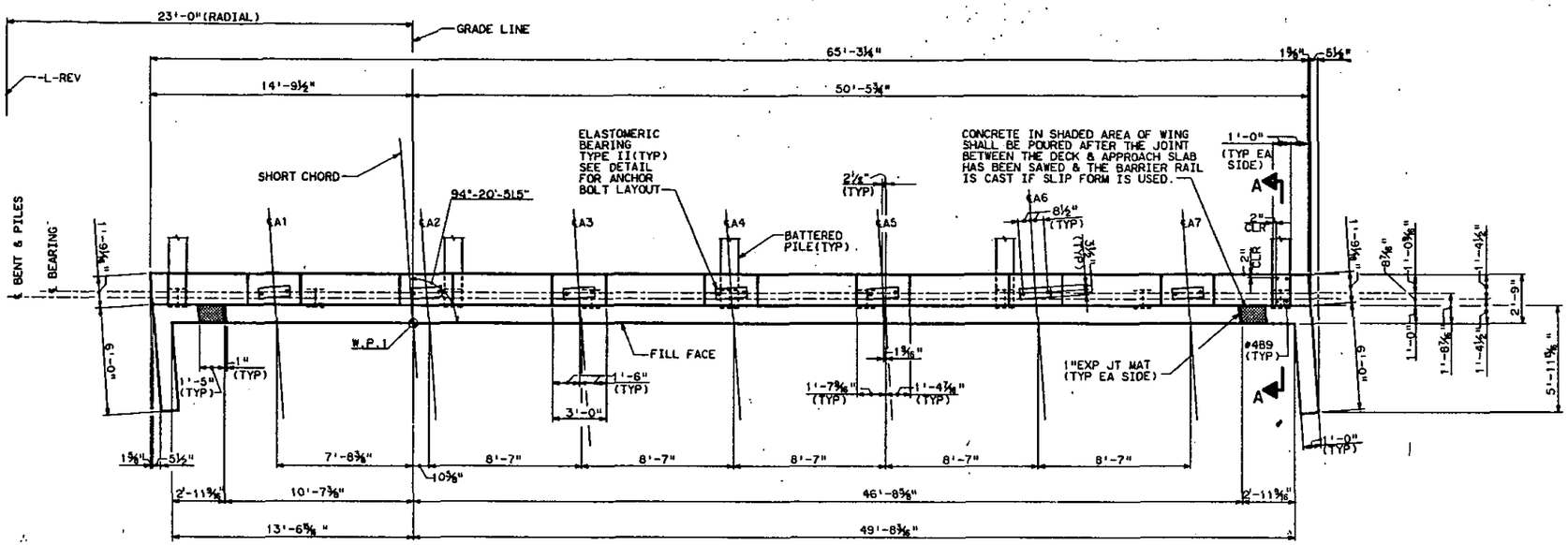
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL

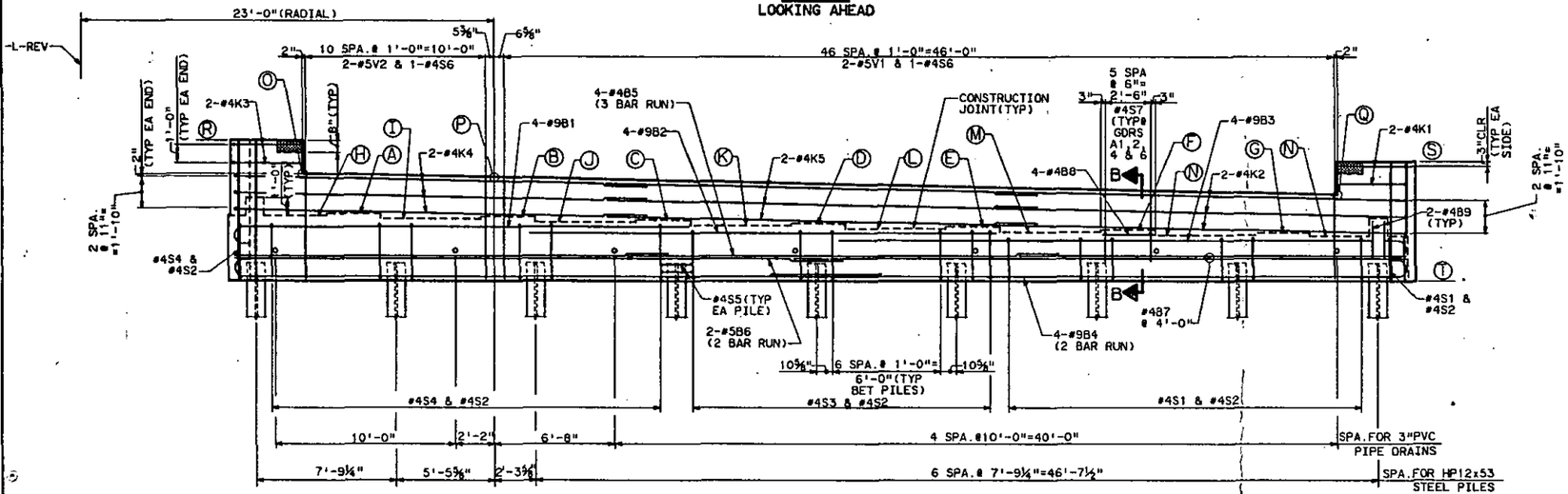
OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-93
1			3			TOTAL SHEETS
2			4			

ASSEMBLED BY: RLF/LSJ DATE MAR. '89
CHECKED BY: CLN DATE MAR. '89
COUNTY BY: M. BRITT DATE: 5/28/87



PLAN
LOOKING AHEAD



ELEVATION

ELEVATION TABLE			
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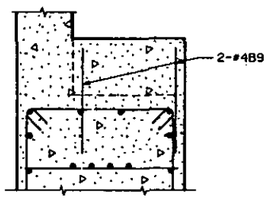
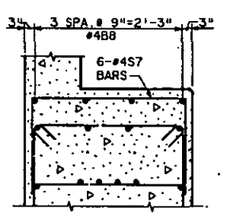
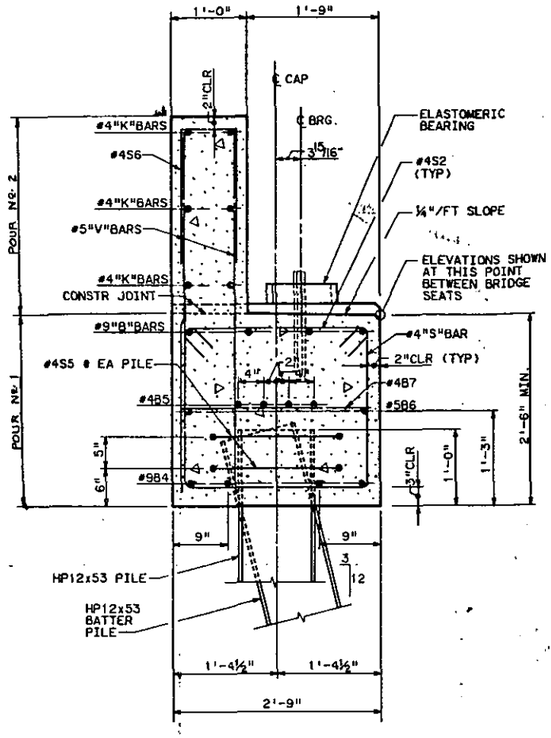
Ⓑ	646.853	Ⓛ	646.190
Ⓒ	646.673	Ⓜ	646.011
Ⓓ	646.494	Ⓝ	645.832
Ⓔ	646.315	Ⓞ	649.255
Ⓕ	646.136	Ⓟ	649.045
Ⓖ	645.957	Ⓠ	648.083
Ⓗ	646.907	Ⓡ	651.088
Ⓘ	646.728	Ⓢ	649.916
Ⓙ	646.548	Ⓣ	643.290



SECTION A-A



SECTION B-B

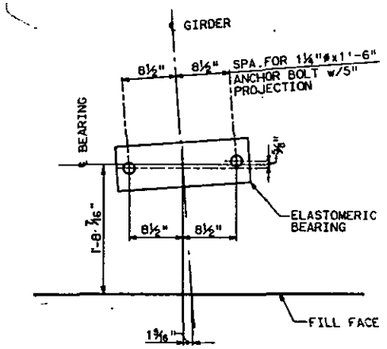


SECTION THRU CAP

NOTE:

FOR END BENT NOTES, PILE SPLICE DETAILS, AND PIPE DRAIN DETAILS SEE END BENT 1 DETAILS SHEET.

FOR TEMPORARY DRAINAGE AT END BENT SEE END BENT 2 DETAILS SHEET



ANCHOR BOLT LAYOUT DETAIL

PROJECT No. 6.678006I

MECKLENBURG COUNTY

STATION -L-REV 144+60.84= -Y-REV 18+97.90

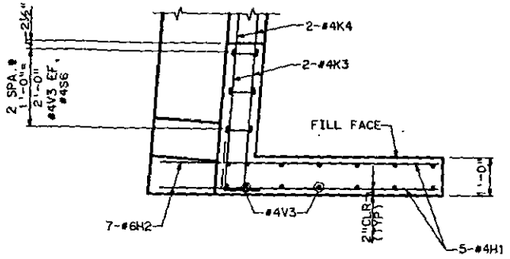
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

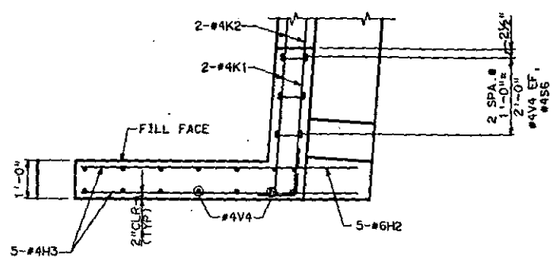
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

SHEET NO. 5-94
TOTAL SHEETS 130

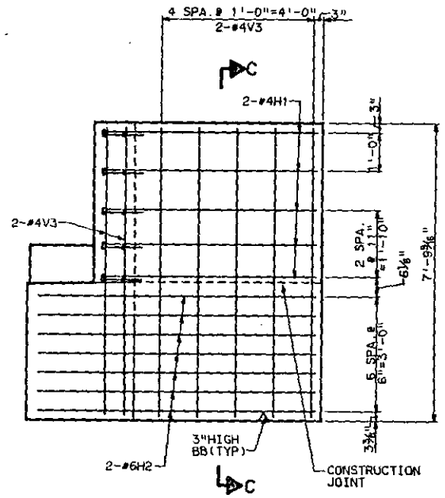
DRAWN BY LSJ DATE 3/89
CHECKED BY HDP DATE 3/89



PLAN

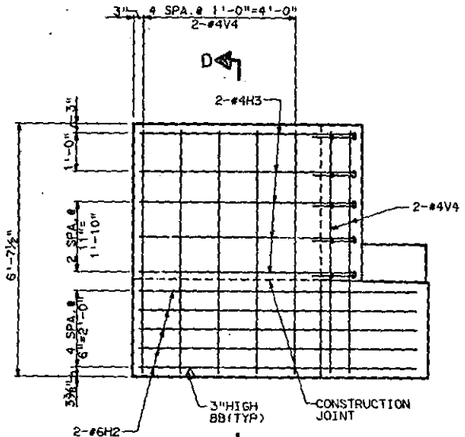


PLAN



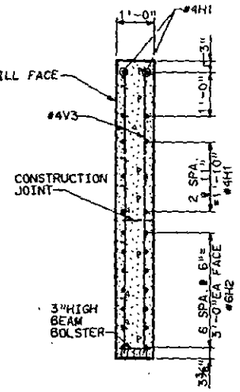
ELEVATION

LEFT WING

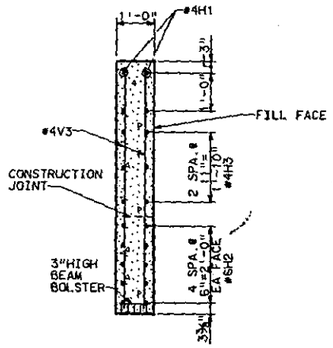


ELEVATION

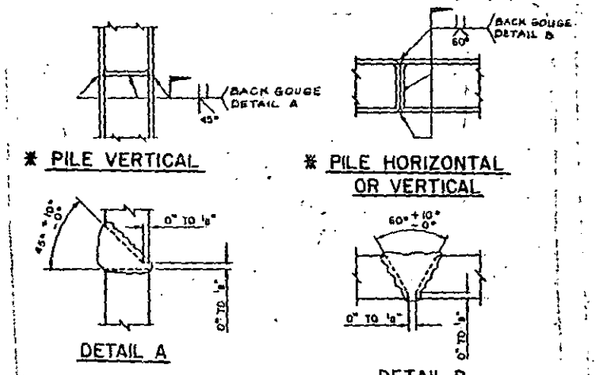
RIGHT WING



SECTION C-C

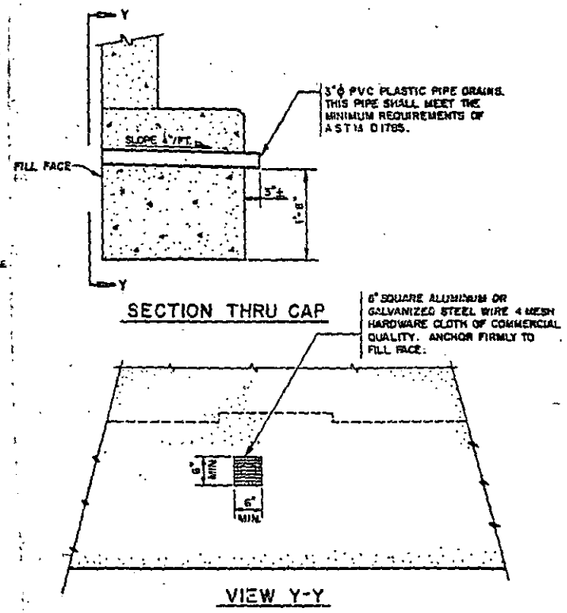


SECTION D-D



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



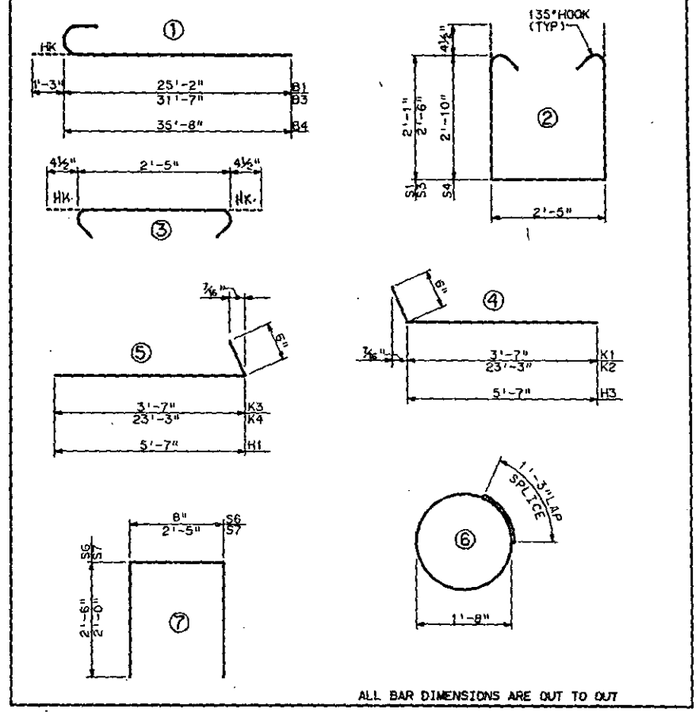
SECTION THRU CAP

VIEW Y-Y

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 BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	26'- 5"	359
B2	4	9	STR.	26'- 3"	357
B3	4	9	1	32'-10"	447
B4	8	9	1	36'-11"	1,004
B5	12	4	STR.	23'- 4"	187
B6	4	5	STR.	33'-10"	141
B7	16	4	STR.	2'- 5"	26
B8	16	4	STR.	2'- 8"	29
B9	8	4	STR.	2'- 0"	11
K1	4	4	4	4'- 1"	11
K2	6	4	4	23'- 9"	95
K3	4	4	5	4'- 1"	11
K4	6	4	5	23'- 9"	95
K5	6	4	STR.	23'- 4"	94
S1	20	4	2	7'- 4"	98
S2	38	4	3	3'- 2"	123
S3	16	4	2	8'- 2"	87
S4	22	4	2	8'-10"	130
S5	18	4	6	6'- 6"	78
S6	64	4	7	5'- 8"	242
S7	24	4	7	6'- 5"	103
V1	94	5	STR.	4'- 6"	441
V2	22	5	STR.	5'- 5"	124
V3	20	4	STR.	7'- 4"	98
V4	20	4	STR.	6'- 2"	82
H1	10	4	5	6'- 1"	41
H2	24	6	STR.	7'- 4"	264
H3	10	4	4	6'- 1"	41
Total Reinforcing				-LBS-	4,819
Class A Concrete					29.3CY
Pour NO. 1					21.5CY
Pour NO. 2					7.8CY
HP 12x53 Steel Piles					
			NO.	9	
			L.F.	314	

END BENT NOTES

REINFORCING STEEL SHALL HAVE 2"COVER UNLESS OTHERWISE NOTED.

EPOXY PROTECTIVE COATING SHALL BE APPLIED TO COAT ALL EXPOSED SURFACE AREAS OF THE TOP OF CAP, INCLUDING BUILDUPS AND CHAMFERS. THE AREA UNDER THE ELASTOMERIC BEARING SHALL NOT BE COATED. SEE SPECIAL PROVISIONS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICAIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS EACH.

PROJECT NO. G.678006T

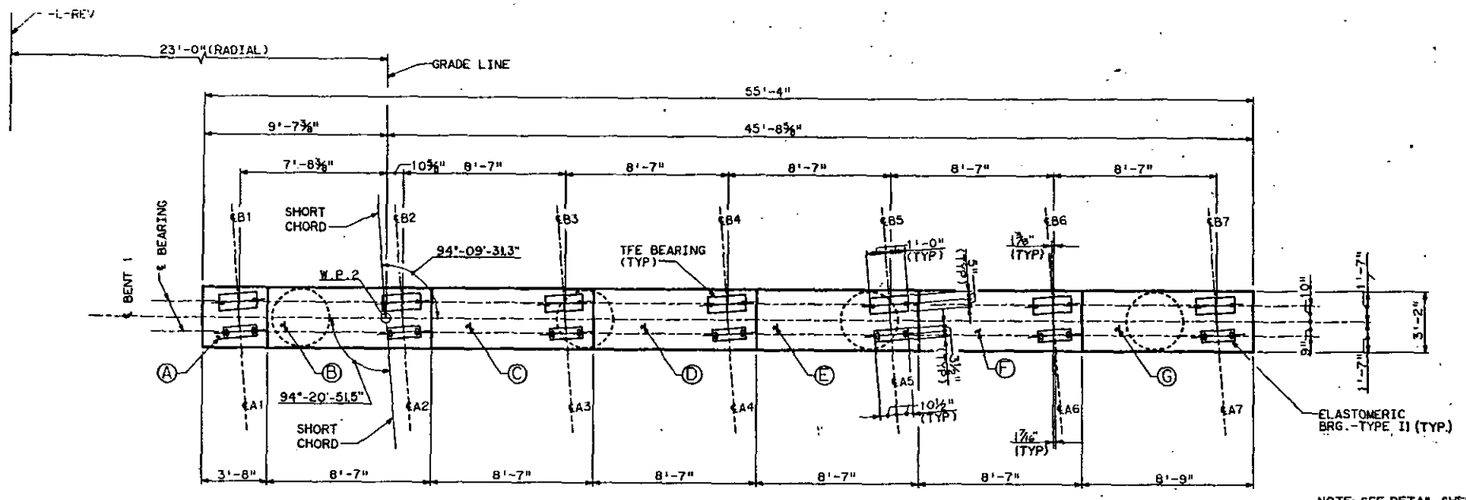
MECKLENBURG COUNTY

STATION -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-95
						TOTAL SHEETS



PLAN
LOOKING AHEAD

NOTE: SEE DETAIL SHEET FOR ANCHOR BOLT LAYOUT.

ELEVATION TABLE			
A	644.382	H	641.279
B	644.203	I	640.127
C	644.025	J	620.000
D	643.846	K	641.171
E	643.668	L	640.859
F	643.489	M	640.547
G	643.310	N	640.235

COLUMN HEIGHTS	
	BENT 1
A	21'-2 1/16"
B	20'-10 5/16"
C	20'-6 9/16"
D	20'-2 13/16"

BENT NOTES

REINFORCING STEEL IN THE CAP MAY BE SHIFTED SLIGHTLY AS REQUIRED TO CLEAR ANCHOR BOLTS.

REINFORCING STEEL SHALL HAVE 2"COVER AND FOOTING REINFORCEMENT SHALL HAVE 3"COVER UNLESS OTHERWISE NOTED.

THE TOP SURFACE OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

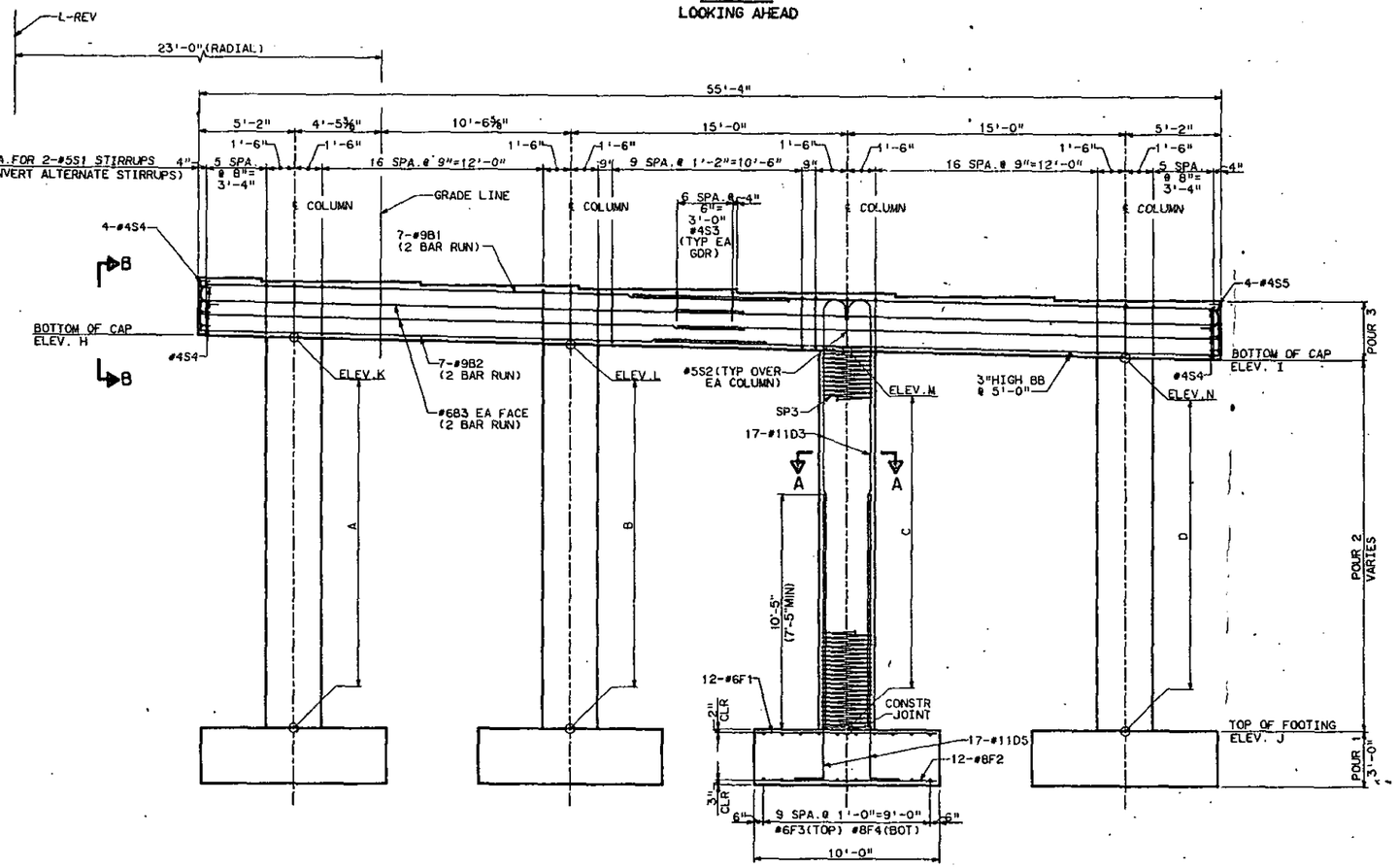
FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

COMPUTED FOUNDATION LOAD FOR SPREAD FOOTINGS EQUALS 3.75 TONS/SQ.FT

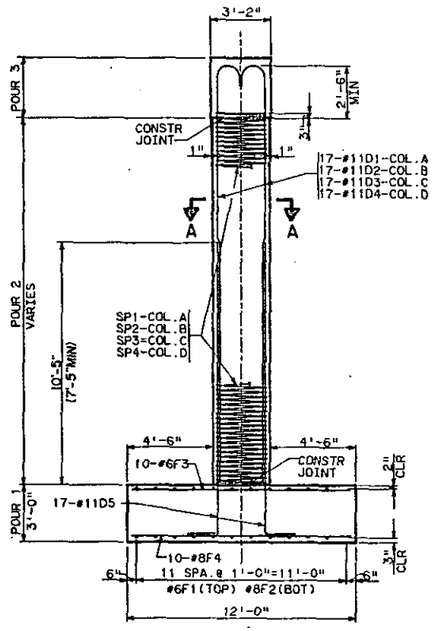
FOR BAR LIST AND QUANTITIES SEE DETAIL SHEET.

FOR PIPE INSERT SEE THE TFE BEARING DETAILS SHEET.

HOOKS ON "D"BARS MAY BE TURNED AS NECESSARY TO CLEAR REINFORCING STEEL IN CAP.



ELEVATION



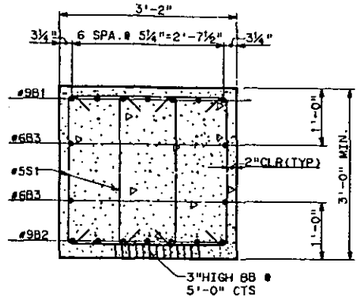
END ELEVATION

PROJECT NO. G.678006T
MECKLENBURG COUNTY
STATION -L-REV 144+60.84=
-Y-REV 18+97.90

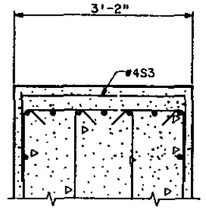
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

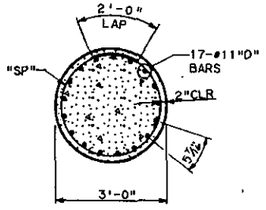
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-90



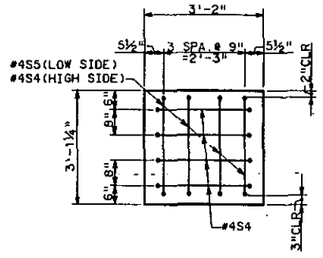
SECTION THRU CAP



SECTION THRU BEARING

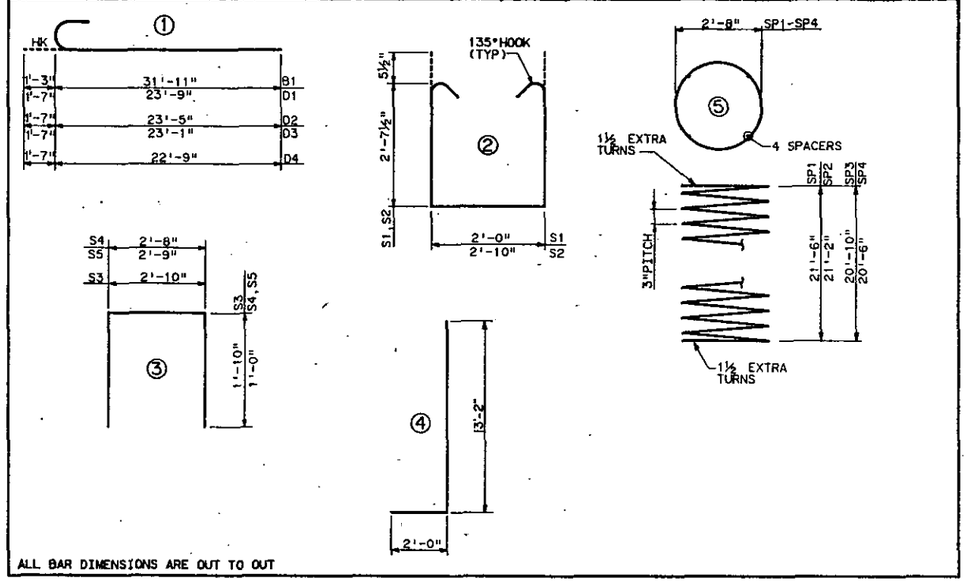


SECTION A-A



ELEVATION B-B

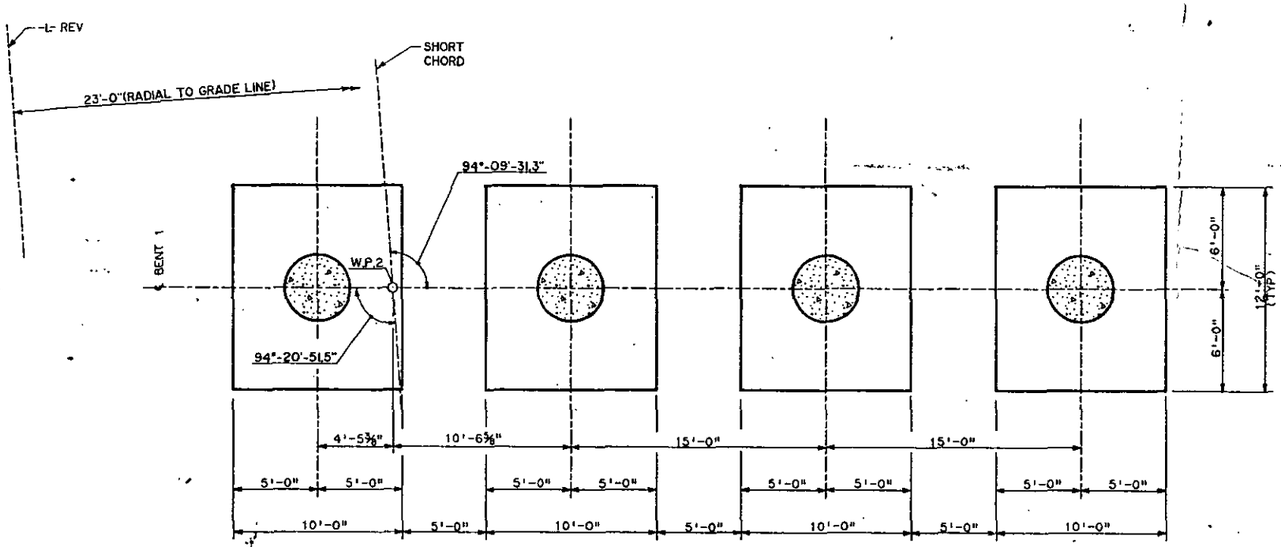
BAR TYPES



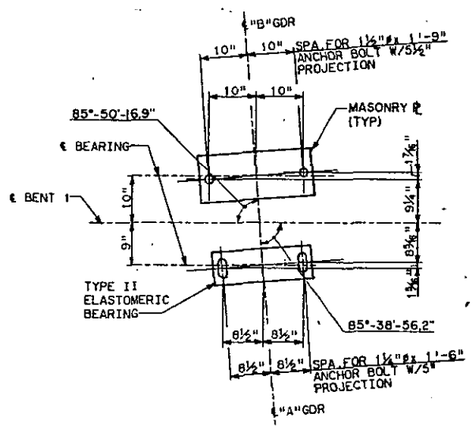
ALL BAR DIMENSIONS ARE OUT TO OUT

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
F1	48	6	STR.	9'-6"	685
F2	48	8	STR.	9'- 6"	1,218
F3	40	6	STR.	17'-6"	691
F4	40	8	STR.	11'- 6"	1,228
D1	17	11	1	25'- 4"	2,288
D2	17	11	1	25'- 0"	2,258
D3	17	11	1	24'- 8"	2,228
D4	17	11	1	24'- 4"	2,198
D5	68	11	4	15'-2"	5,479
B1	14	9	1	35'- 2"	1,579
B2	14	9	STR.	30'- 8"	1,460
B3	8	6	STR.	29'- 6"	354
S1	116	5	2	8'- 2"	988
S2	4	5	2	9'- 0"	38
S3	49	4	3	6'- 6"	213
S4	12	4	3	4'- 8"	37
S5	4	4	3	4'- 9"	13
SP1	1		5	734"- 4"	491
SP2	1		5	723"- 4"	483
SP3	1		5	712"- 4"	476
SP4	1		5	701"- 4"	468
Reinforcing Steel				-LBS-	22,955
Spiral Column					
Reinforcing Steel				-LBS-	1,918
Class A Concrete Breakdown					
	Pour # 1			-CY-	53.3
	Pour # 2			-CY-	21.7
	Pour # 3			-CY-	20.1
	Total			-CY-	95.1
Foundation Excavation				-CY-	339



PLAN OF FOOTINGS



ANCHOR BOLT LAYOUT
DETAIL-BENT 1

PROJECT No. G.678006T

MECKLENBURG COUNTY

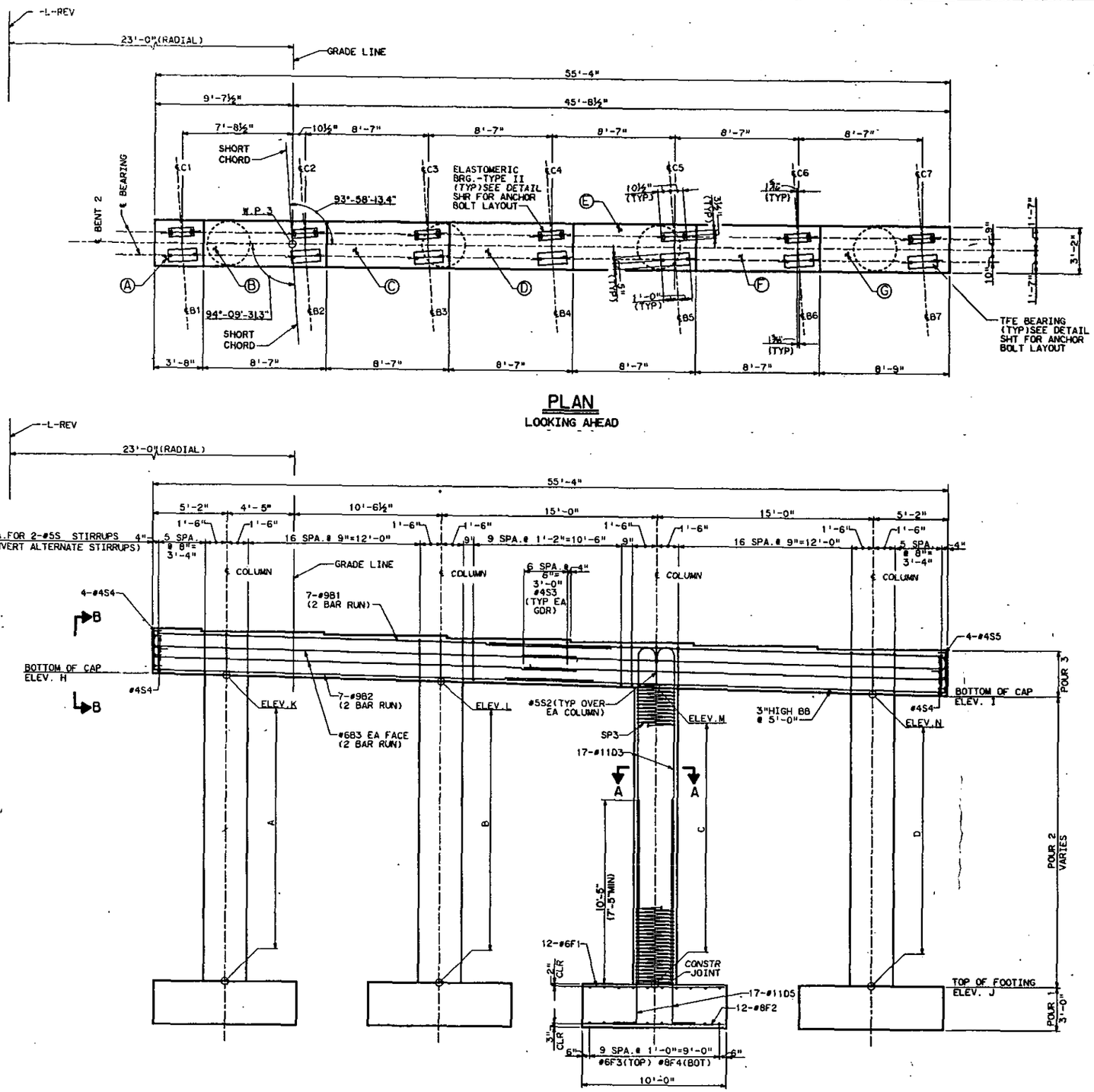
STATION -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 DETAILS

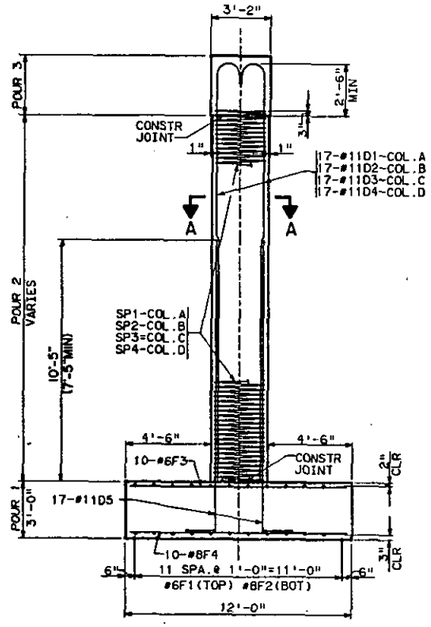
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-97
1			3			TOTAL
2			4			

DRAWN BY LSJ DATE 3/89



PLAN
LOOKING AHEAD

ELEVATION



END ELEVATION

NOTE:
FOR BENT NOTES SEE BENT 1 SHEET.

ELEVATION TABLE			
A	644.081	H	640.977
B	643.904	I	639.835
C	643.728	J	620.000
D	643.551	K	640.870
E	643.375	L	640.561
F	643.198	M	640.251
G	643.022	N	639.942

COLUMN HEIGHTS	
	BENT 2
A	20'-10⁷⁄₁₆"
B	20'-6¾"
C	20'-3"
D	19'-11⅜"

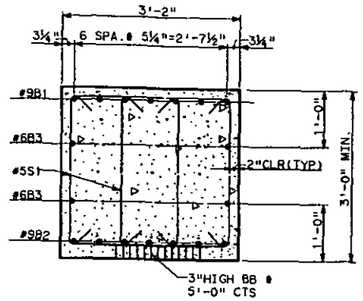
PROJECT NO. 6.678006T
MECKLENBURG COUNTY
STATION -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

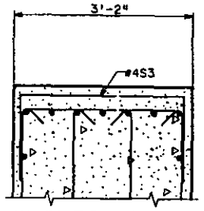
SUBSTRUCTURE
BENT 2

DRAWN BY	CSJ	DATE	3/89

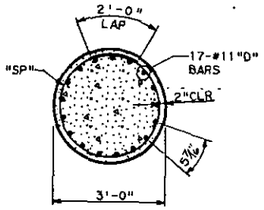
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-92



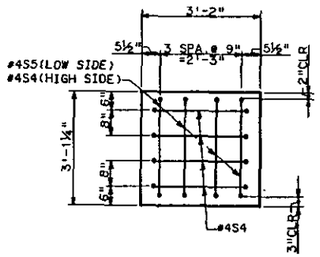
SECTION THRU CAP



SECTION THRU BEARING

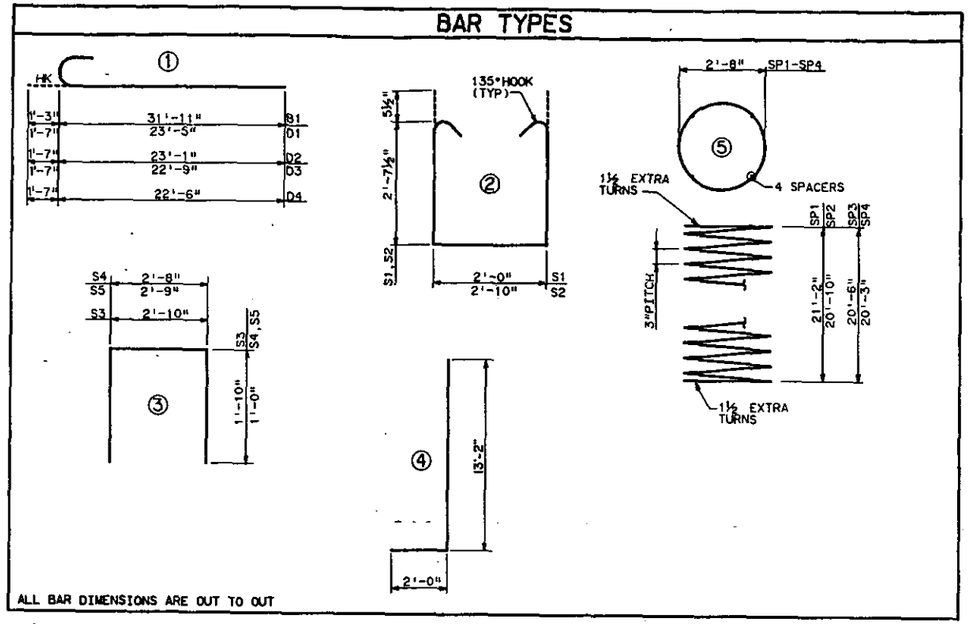


SECTION A-A



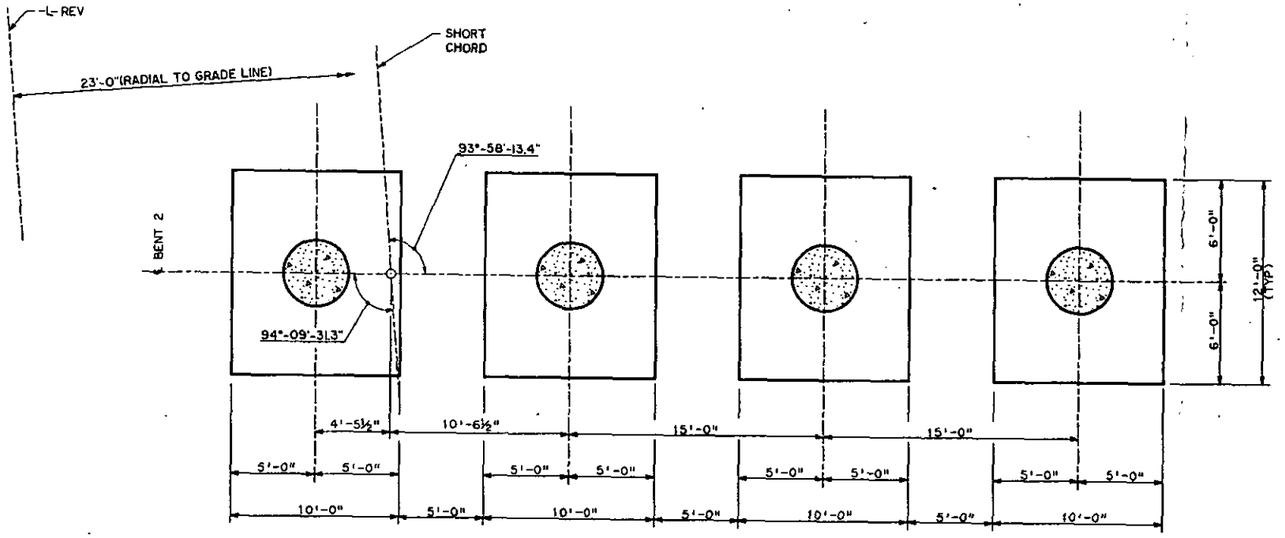
ELEVATION B-B

BAR TYPES

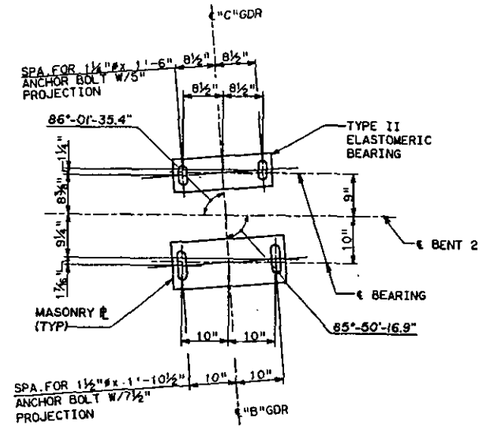


ALL BAR DIMENSIONS ARE OUT TO OUT

BENT 2.					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
F1	48	6	STR.	9'-6"	685
F2	48	8	STR.	9'-6"	1,218
F3	40	6	STR.	17'-6"	691
F4	40	8	STR.	11'-6"	1,228
D1	17	11	1	25'-0"	2,258
D2	17	11	1	24'-8"	2,228
D3	17	11	1	24'-4"	2,198
D4	17	11	1	24'-1"	2,175
D5	68	11	4	15'-2"	5,479
B1	14	9	1	33'-2"	1,579
B2	14	9	STR.	30'-8"	1,460
B3	8	6	STR.	29'-6"	354
S1	116	5	2	8'-2"	988
S2	4	5	2	9'-0"	38
S3	49	4	3	6'-6"	213
S4	12	4	3	4'-8"	37
S5	4	4	3	4'-9"	13
SP1	1		3	723'-4"	483
SP2	1		3	712'-4"	476
SP3	1		3	701'-4"	468
SP4	1		3	691'-1"	463
Reinforcing Steel				-LBS-	22,842
Spiral Column					
Reinforcing Steel				-LBS-	1,890
Class A Concrete Breakdown					
	Pour # 1			-CY-	53.3
	Pour # 2			-CY-	21.4
	Pour # 3			-CY-	20.1
	Total			-CY-	94.8
Foundation Excavation				-CY-	303



PLAN OF FOOTINGS



ANCHOR BOLT LAYOUT DETAIL-BENT 2

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

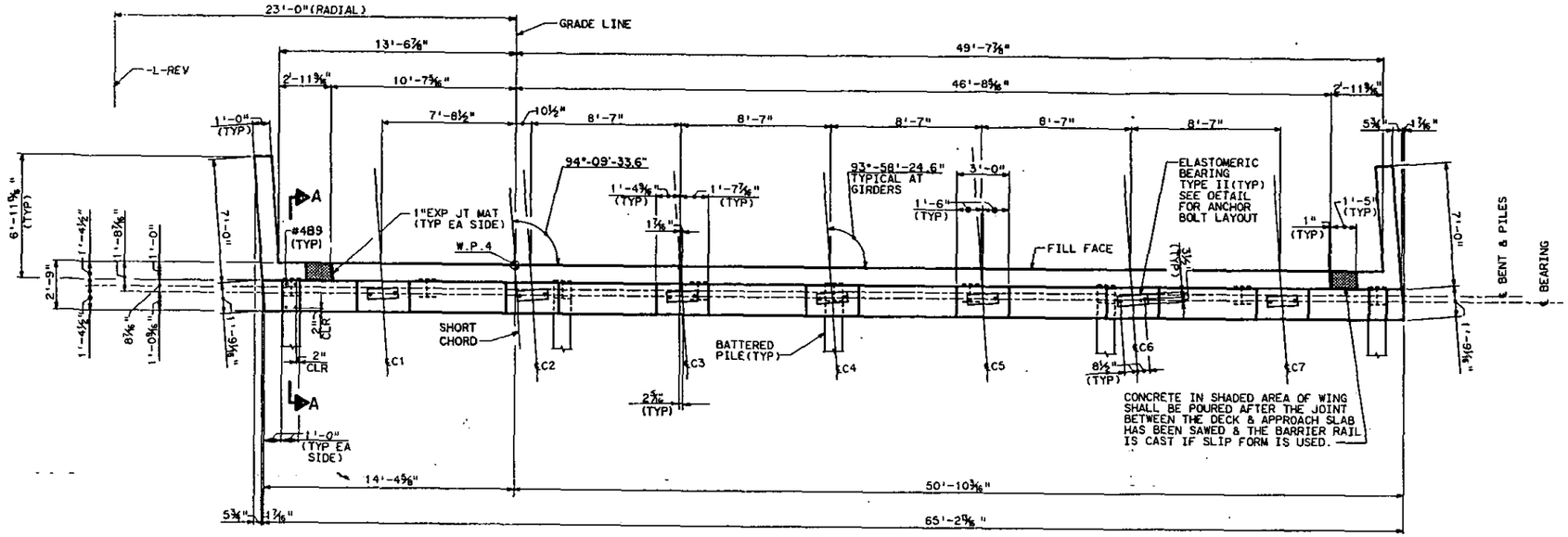
STATION -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

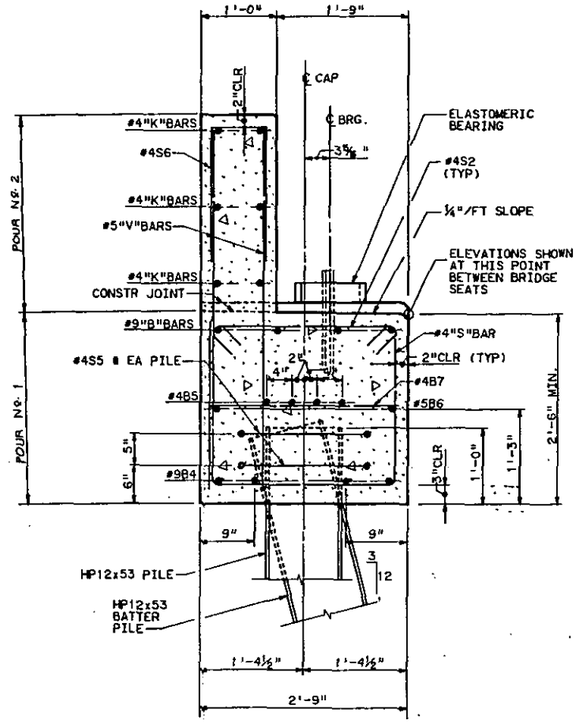
SUBSTRUCTURE
BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5.99
1			3			TOTAL

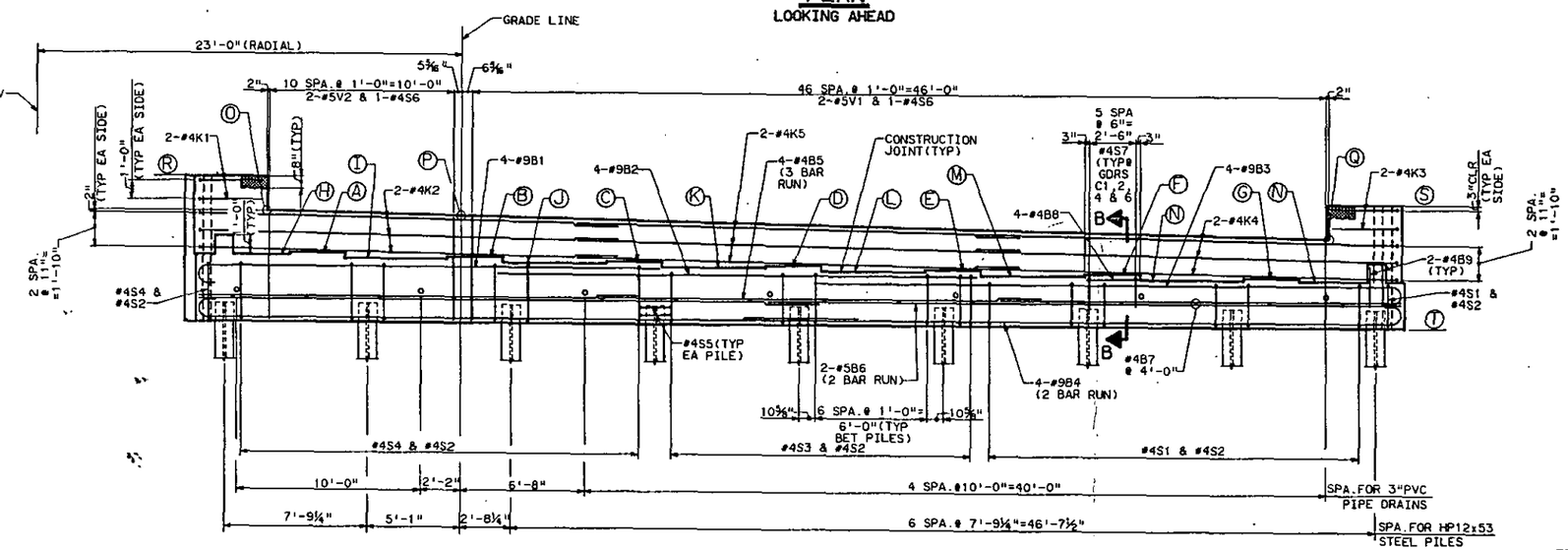
DRAWN BY LSJ DATE 3/89
CHECKED BY CLN DATE 3/89



PLAN
LOOKING AHEAD



SECTION THRU CAP



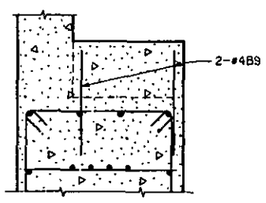
ELEVATION

NOTE:

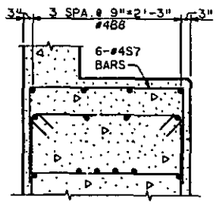
FOR END BENT NOTES, PILE SPLICE DETIALS, AND PIPE DRAIN DETAILS SEE END BENT 1 DETAILS SHEET.

FOR TEMPORARY DRAINAGE AT END BENT SEE END BENT 2 DETAILS SHEET

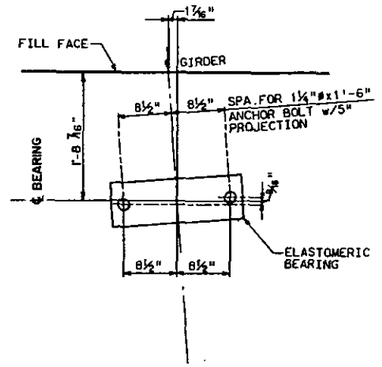
ELEVATION TABLE			
Ⓐ	646.792	Ⓚ	646.138
Ⓑ	646.616	Ⓛ	645.962
Ⓒ	646.440	Ⓜ	645.786
Ⓓ	646.263	Ⓝ	645.610
Ⓔ	646.087	Ⓞ	649.009
Ⓕ	645.911	Ⓟ	648.803
Ⓖ	645.735	Ⓠ	647.858
Ⓗ	646.667	Ⓡ	650.842
Ⓘ	646.491	Ⓢ	649.691
Ⓙ	646.315	Ⓣ	643.069



SECTION A-A



SECTION B-B



ANCHOR BOLT LAYOUT DETAIL

PROJECT No. 6.678006T

MECKLENBURG COUNTY

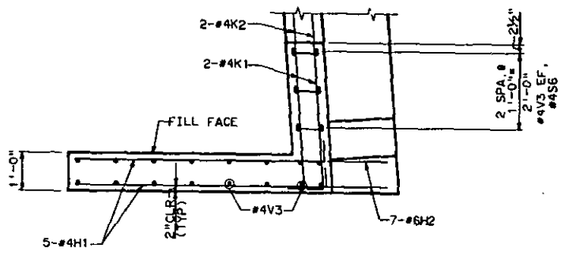
STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

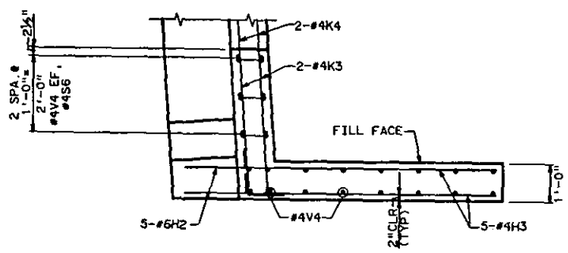
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-100

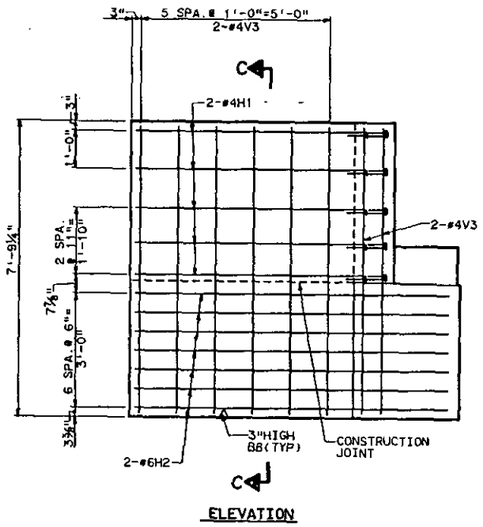
DRAWN BY LSJ DATE 3/85



PLAN

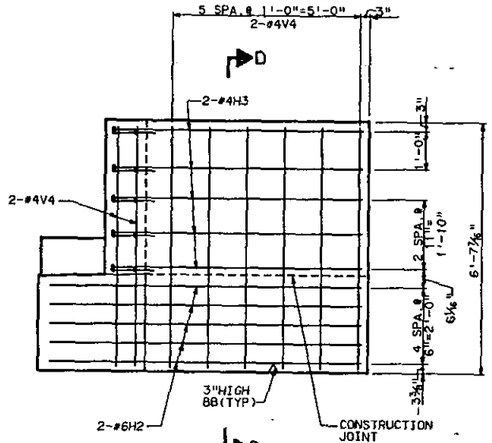


PLAN



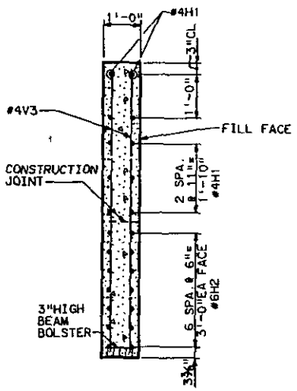
ELEVATION

LEFT WING

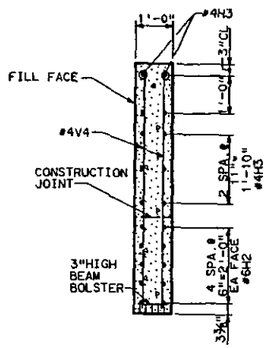


ELEVATION

RIGHT WING

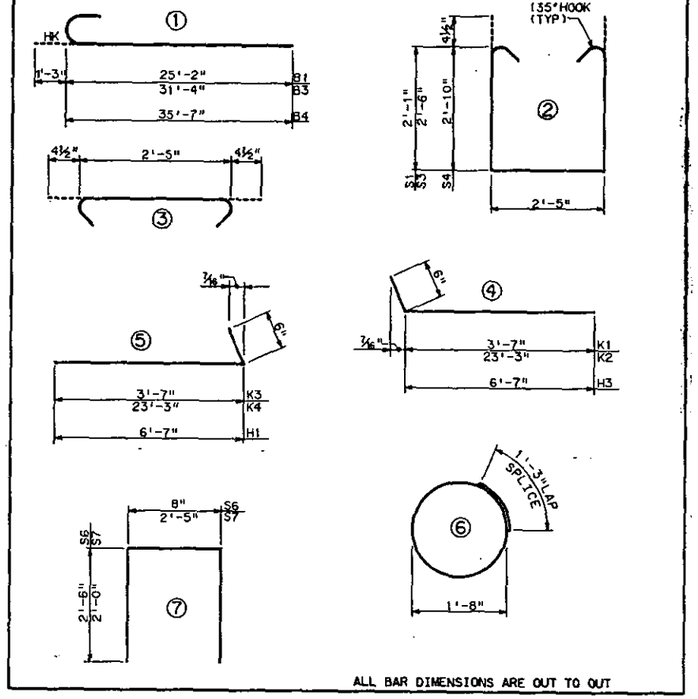


SECTION C-C



SECTION D-D

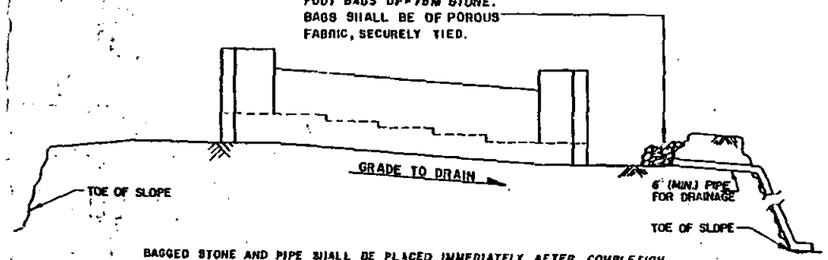
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	26'- 5"	359
B2	4	9	STR.	26'- 3"	357
B3	4	9	1	32'- 7"	443
B4	8	9	1	36'-10"	1,002
B5	12	4	STR.	23'- 3"	186
B6	4	5	STR.	34'- 0"	142
B7	16	4	STR.	2'- 3"	26
B8	16	4	STR.	2'- 8"	29
B9	8	4	STR.	2'- 0"	11
K1	4	4	4	4'- 1"	11
K2	6	4	4	23'- 9"	95
K3	4	4	5	4'- 1"	11
K4	6	4	5	23'- 9"	95
K5	6	4	STR.	23'- 3"	93
S1	20	4	2	7'- 4"	98
S2	58	4	3	3'- 2"	123
S3	16	4	2	8'- 2"	87
S4	22	4	2	8'-10"	130
S5	18	4	6	6'- 6"	78
S6	64	4	7	5'- 8"	242
S7	24	4	7	6'- 5"	103
V1	94	5	STR.	4'- 6"	441
V2	22	5	STR.	5'- 5"	124
V3	22	4	STR.	7'- 5"	109
V4	22	4	STR.	6'- 4"	93
H1	10	4	5	7'- 1"	47
H2	24	6	STR.	8'- 4"	300
H3	10	4	4	7'- 1"	47
Total Reinforcing				-LBS-	4,882
Class A Concrete					29.7 CY
Pour No. 1					21.7 CY
Pour No. 2					8.0 CY
HP 12 x 53 Steel Piles					
		NO.		9	
		L.F.		285	

MINIMUM OF 3-ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

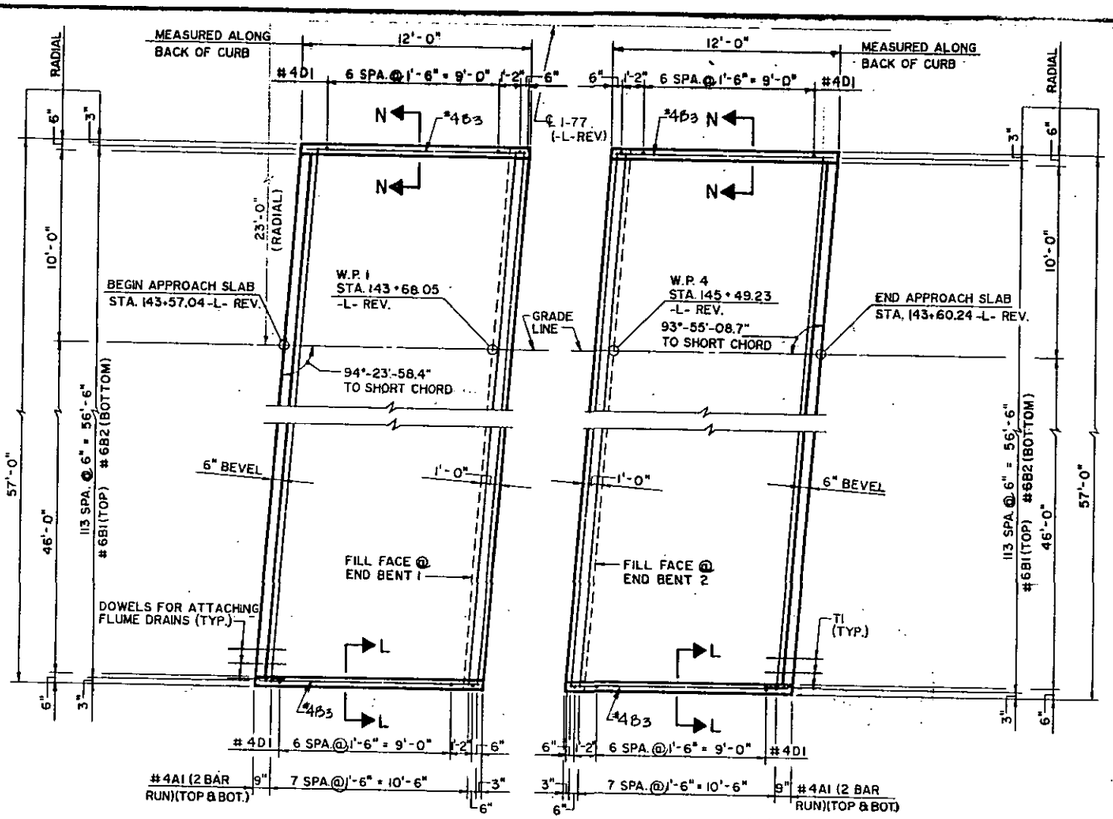
STATION -L-REV 144+60.84=
-Y-REV 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS

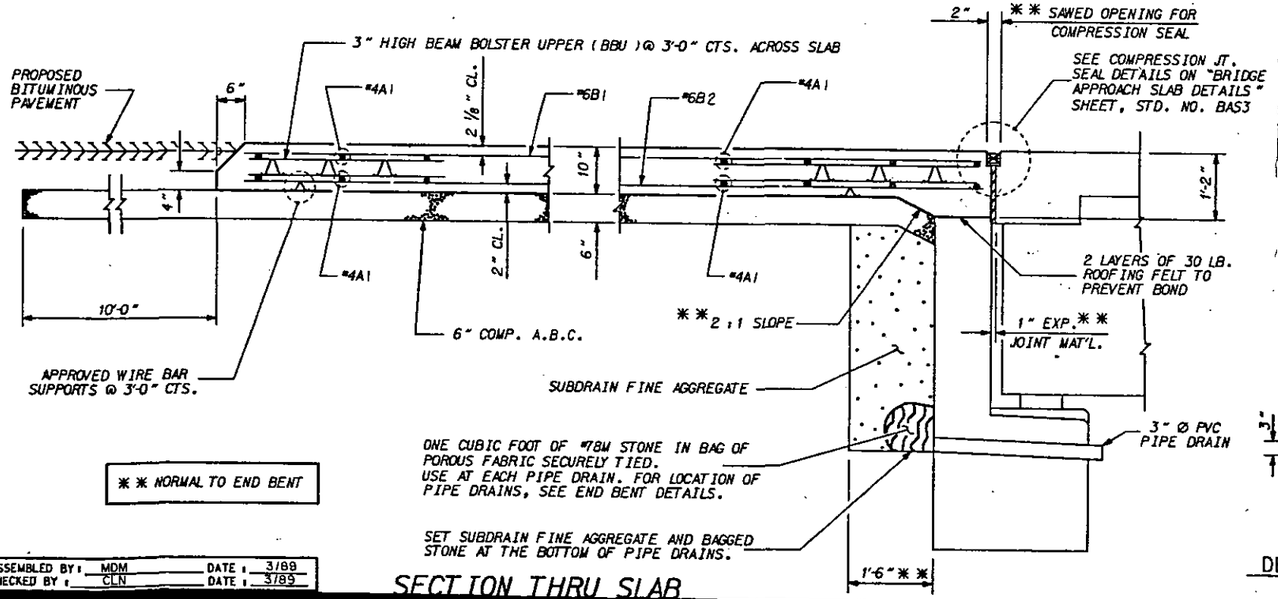
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-101

DRAWN BY LSJ DATE 3/89
CHECKED BY HDR 3/89



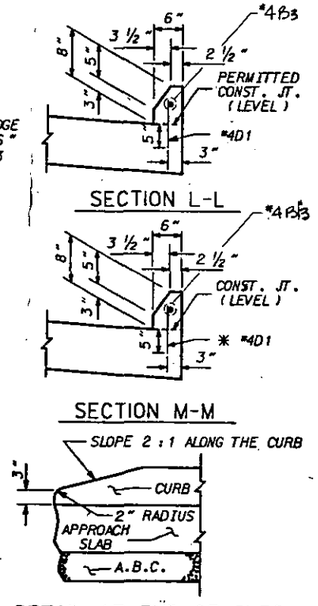
END BENT 1 END BENT 2

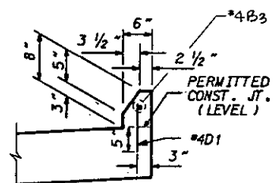
PLAN OF APPROACH SLABS

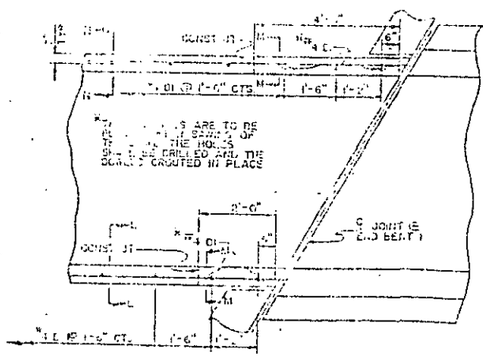


** NORMAL TO END BENT

SECTION THRU SLAB







NOTES

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

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

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

BILL OF MATERIAL

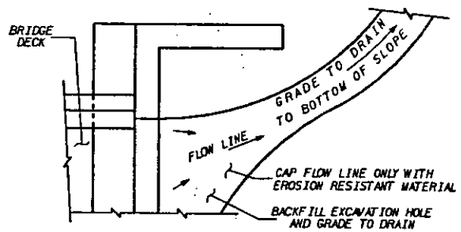
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	10	4	STR.	29'-0"	597
B1	84	6	STR.	11'-2"	1562
B2	84	6	STR.	11'-8"	1998
B3	2	4	STR.	11'-8"	16
D1	16	4	STR.	0'-10"	9
T1	6		STR.	1'-6"	54
TOTAL					4686

END BENT 1

CLASS AA CONCRETE	22.0 C.Y.
REINFORCING STEEL	4686 LBS

END BENT 2

CLASS AA CONCRETE	22.0 C.Y.
REINFORCING STEEL	4686 LBS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84=
-Y- REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

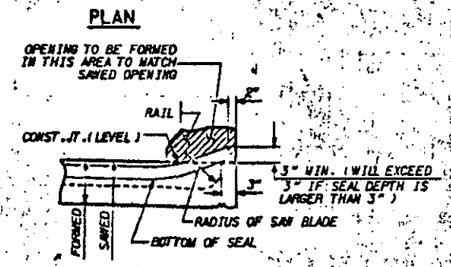
STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

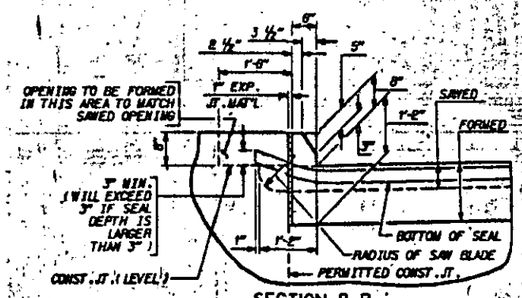
FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-102

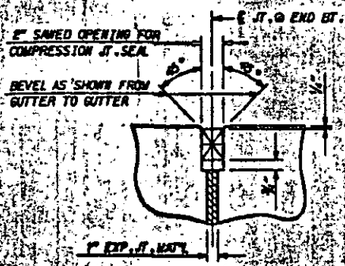
ASSEMBLED BY: MDM DATE: 3/89
CHECKED BY: CLN DATE: 3/89



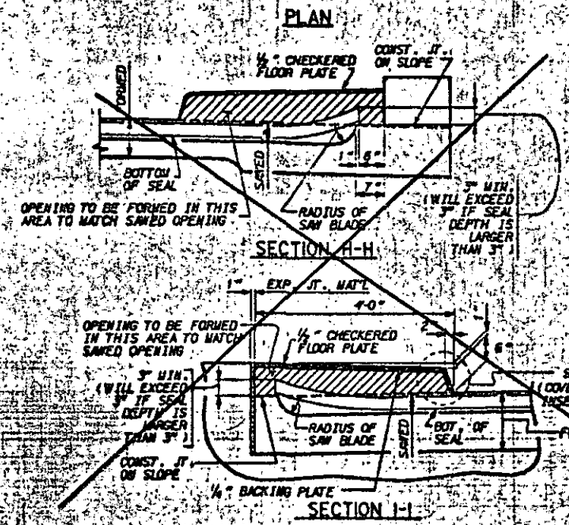
SECTION A-A

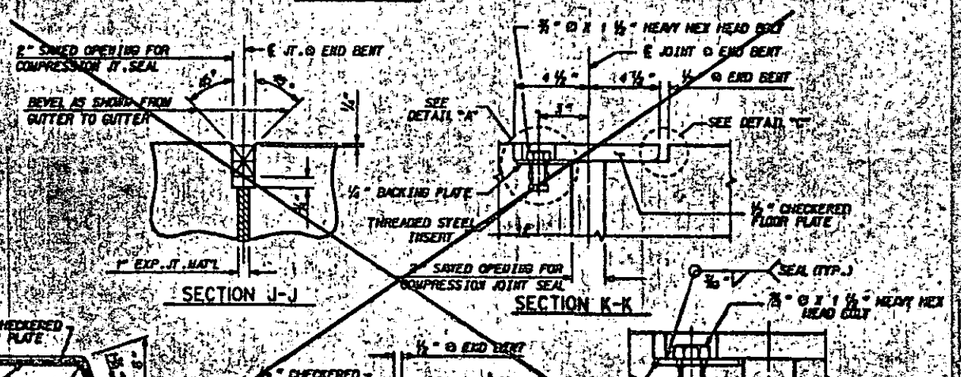


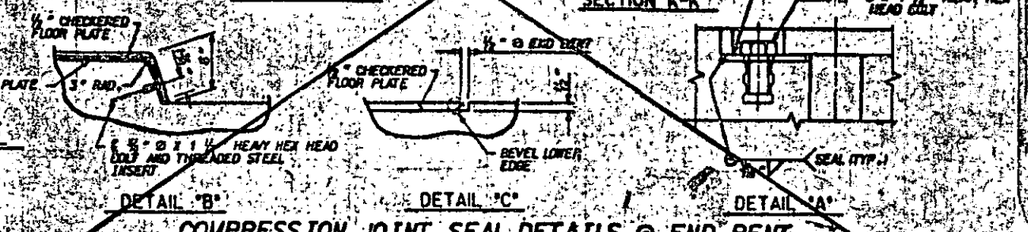
SECTION B-B



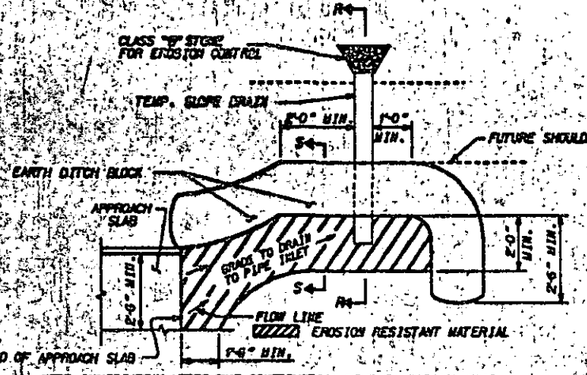
SECTION C-C





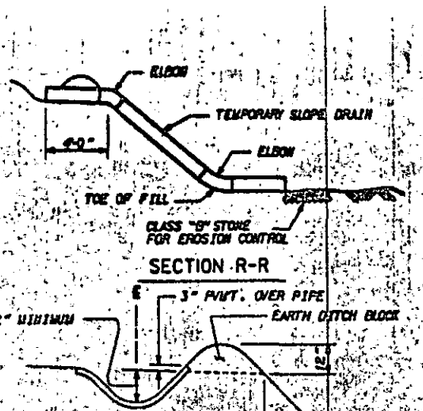


COMPRESSION JOINT SEAL DETAILS @ END BENT



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) BITUMINOUS PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

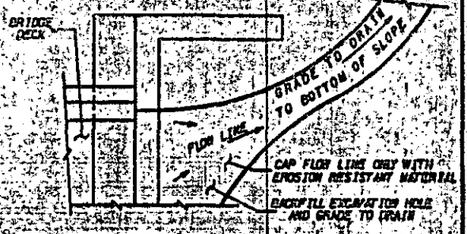
PLAN VIEW



SECTION R-R

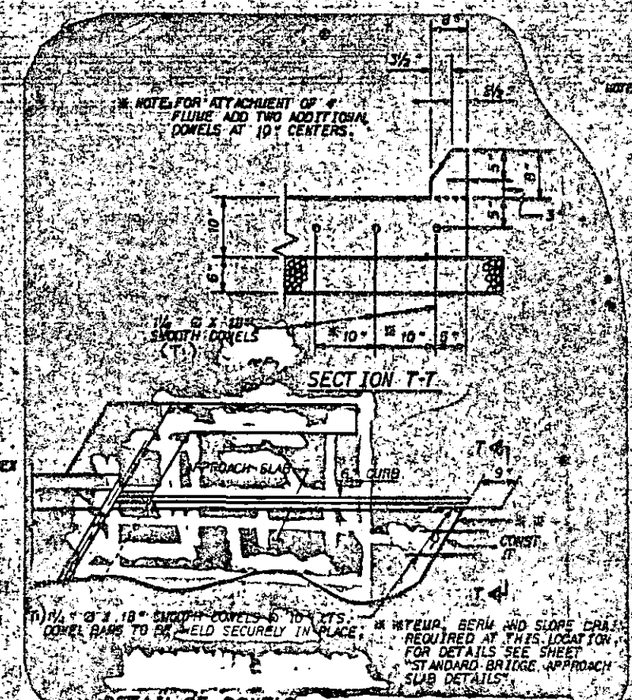
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



DETAIL OF DOWELS

PROJECT NO. 6.678008T

MECKLENBURG COUNTY

STATION: -L- REV. 144+60.84±
-Y- REV. 18+97.90

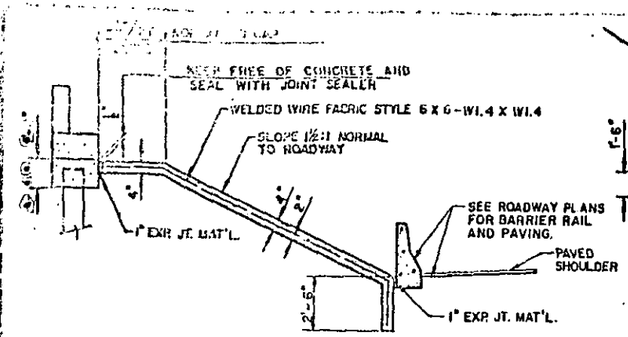
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

STANDARD BRIDGE APPROACH SLAB DETAILS

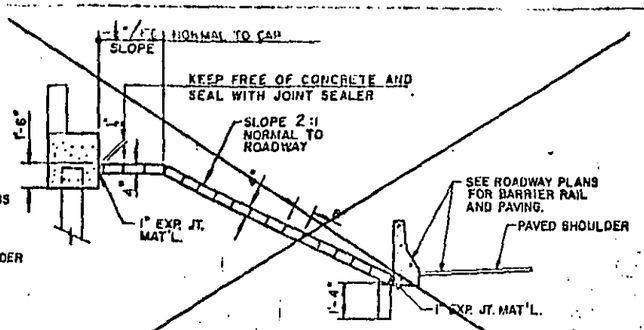
DECEMBER 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-103
1			3			TOTAL SHEETS
2			4			

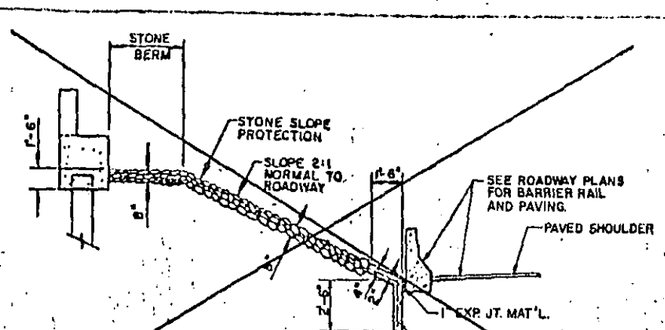
ASSEMBLED BY: RLF DATE: 2/89
CHECKED BY: CLN DATE: 2/89
SPECIAL



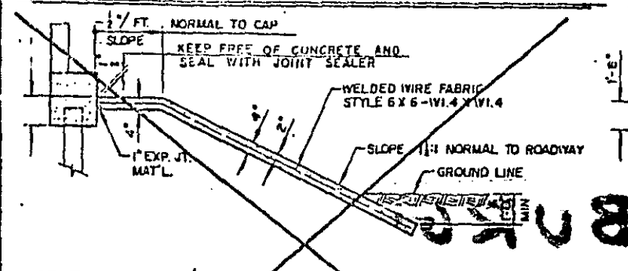
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



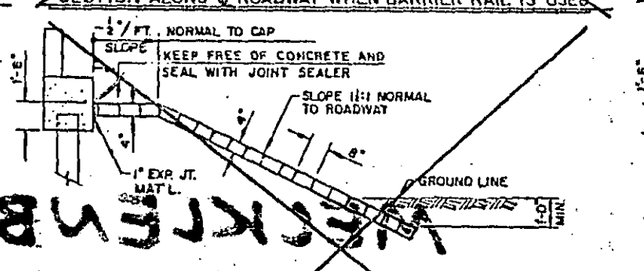
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



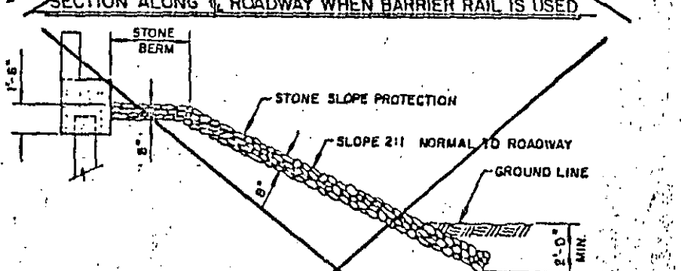
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



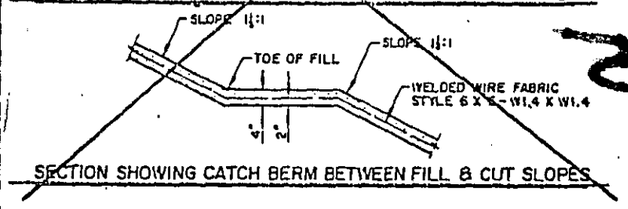
SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



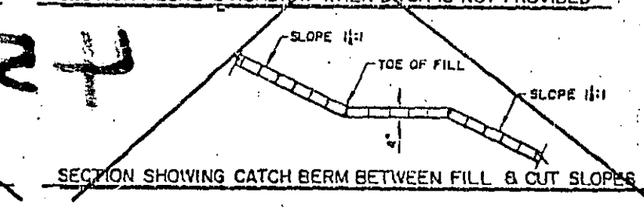
SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



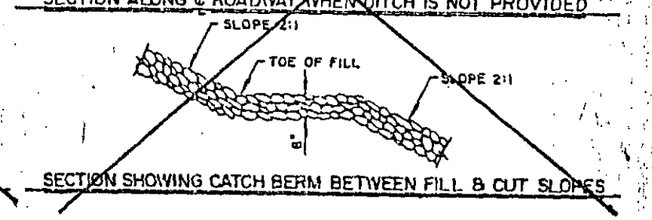
SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

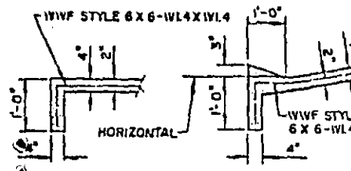


SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

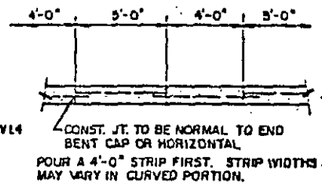


SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

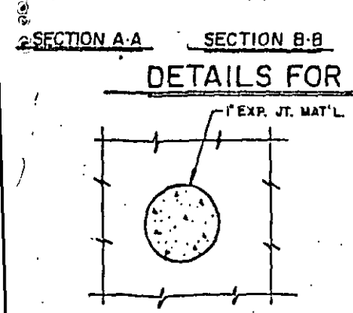
DETAILS FOR ALTERNATE "A"



SECTION A-A SECTION B-B

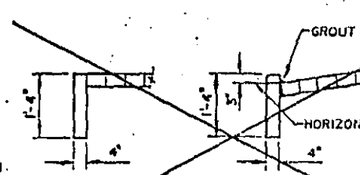


POURING DETAIL

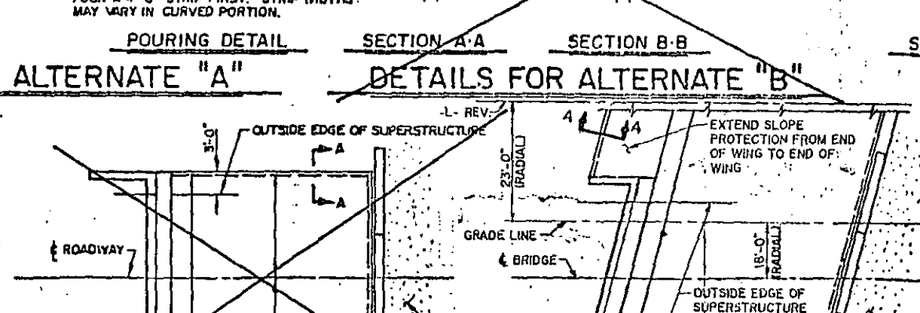


PLAN WHERE CONCRETE OR CONCRETE BLOCK SLOPE PROTECTION MUST BE PLACED

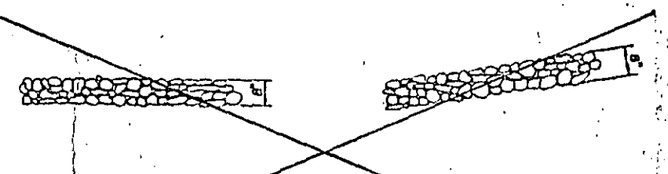
DETAILS FOR ALTERNATE "B"



SECTION A-A SECTION B-B

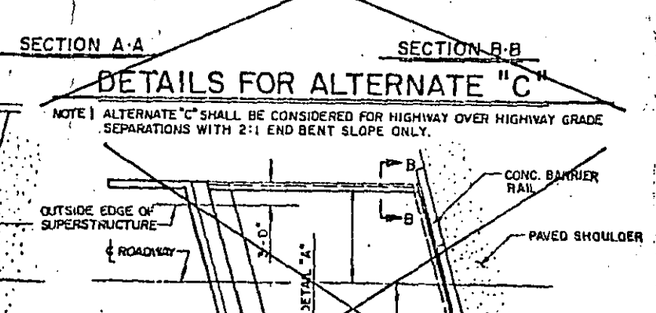


DETAILS FOR ALTERNATE "C"



SECTION A-A SECTION B-B

NOTE: ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.



GENERAL NOTES

4 INCH SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE. LIMITS OF THE PROTECTION SHALL BE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY PLACE EITHER TYPE. ALTERNATES "A", "B" OR "C", AS DESCRIBED BELOW. 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 670 OF THE STANDARD SPECIFICATIONS. THE SAME TYPE OF SLOPE PROTECTION SHALL BE USED UNDER BOTH ENDS OF ANY ONE BRIDGE. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF FOUR INCH 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. ALTERNATE "A" WELDED WIRE FABRIC REINFORCING SHALL BE STYLE 6 X 6-W1.4 X W1.4, 60 INCHES WIDE. ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST SIX INCHES. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE FOUR FT. AND FIVE FT. STRIPS AS SHOWN IN POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION.

ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF SOLID CONCRETE BLOCKS 4" X 8" X 16" LAID IN HORIZONTAL COURSES SUCH THAT THOSE IN SUCCESSIVE COURSES WILL BREAK JOINTS WITH UNITS IN THE PRECEDING ONE. BLOCKS SHALL BE LAID WITH THEIR LONG AXIS PARALLEL TO THE END BENT CAP WITH GROUTED JOINTS PREFERABLY ½" BUT NOT LESS THAN ¼" NOR MORE THAN 1¼" WIDE BETWEEN SUCCESSIVE COURSES AND ENDS OF BLOCKS. JOINTS SHALL BE GROUTED BY POURING A MIXTURE OF ONE PART PORTLAND CEMENT TO THREE PARTS SAND MIXED WITH SUFFICIENT WATER TO ENABLE THE MIXTURE TO BE POURED THROUGH A SPOUT. THE CONCRETE BLOCKS SHALL BE CAST TO ACCURATE DIMENSIONS, SHALL HAVE UNIFORM SURFACE COLOR AND TEXTURE AND SHALL BE MANUFACTURED OF MATERIALS TO PRODUCE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AT AGE OF 28 DAYS. NO BROKEN BLOCKS SHALL BE USED EXCEPT IN CONSTRUCTING A STRAIGHT LINE ALONG EACH SIDE OF THE PAVING DOWN THE SLOPE. CARE SHALL BE TAKEN TO BREAK THE BLOCKS SO AS TO GIVE A UNIFORM WORKMANLIKE JOINT AND SURFACE.

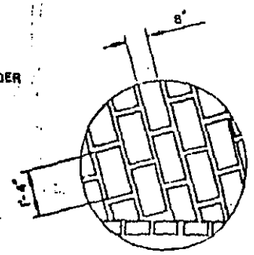
ALTERNATE "C"

ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.

ALTERNATE "C" 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. EIGHT INCHES 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 STYLE 6 X 6-W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION. FOR REQUIREMENTS ON SUBGRADING, STONE TYPE, STONE SIZING, AND HERTSIDE PROTECTION, SEE SPECIAL PROVISIONS FOR SLOPE PROTECTION.

	4 INCH SLOPE PROTECTION SQUARE YARDS		WELDED WIRE FABRIC, 60" WIDE APPROX. L.F.
	END BENT 1	END BENT 2	
BRIDGE ℄ STA. 144+60.84 -L-REV*	395	355	1500

*NOTE: QUANTITIES SHOWN EXTEND TO -L-REV FOR SLOPE PROTECTION



PROJECT No. 6.678006T

MECKLENBURG COUNTY

STATION: -L-REV 144+60.84
-Y-REV 18+97.90

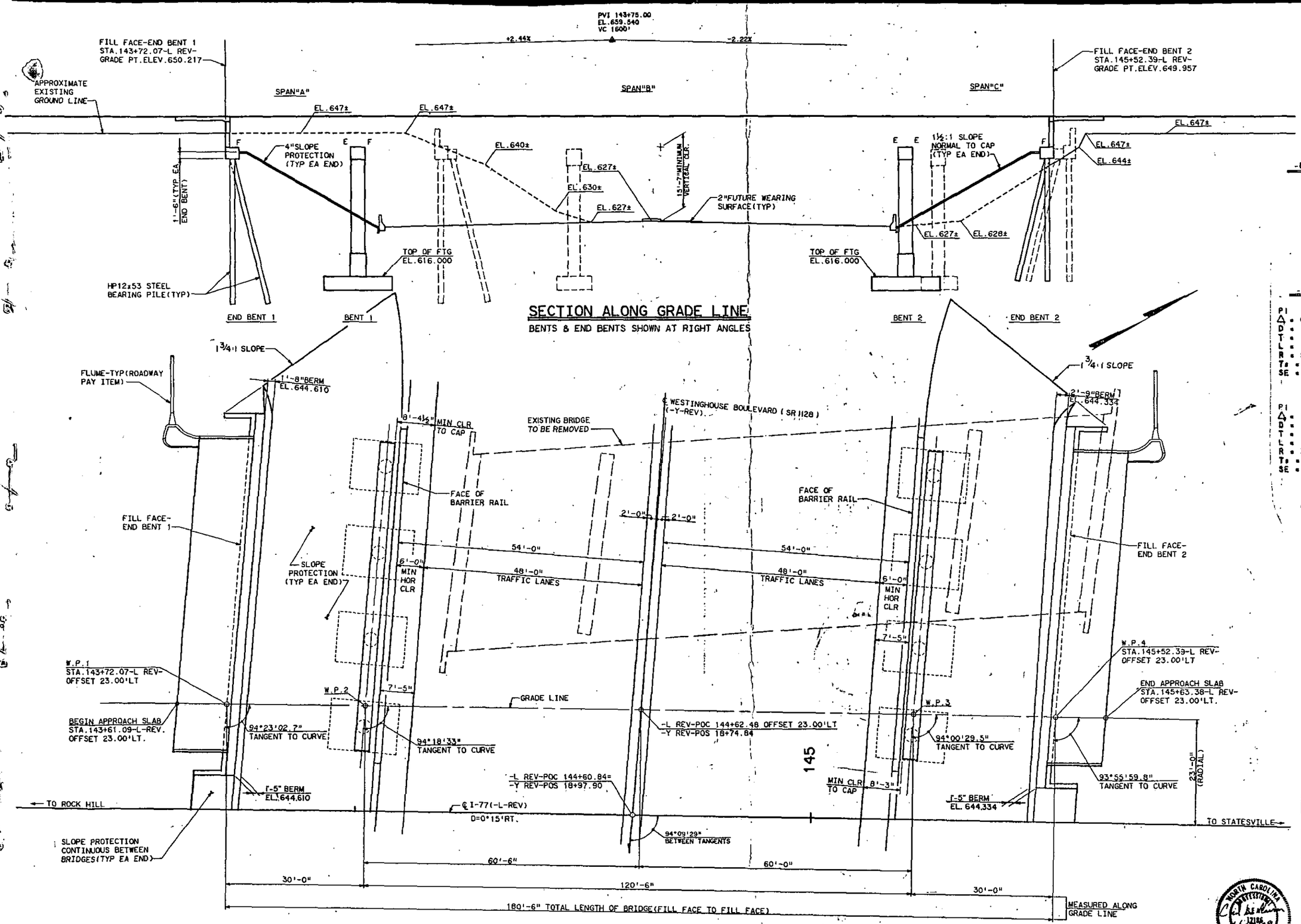
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SLOPE PROTECTION DETAILS

FEBRUARY

F. A. PROJ. NO.



PLAN

-L-REV (HORIZONTAL CURVE DATA)

PI = 140+74.77
Δ = 2°56'00"RT.
D = 00°15'00"
T = 586.80'
L = 1173.33'
R = 22918.31'
Ts = 786.87'
SE = NONE

-Y-REV (HORIZONTAL CURVE DATA)

PI = 14+98.83
Δ = 6°33'39"RT.
D = 1°00'00"
T = 328.39'
L = 656.07'
R = 5729.58'
Ts = 528.85'
SE = NC

PIS = 18+93.18
Os = 1°00'00"RT.
Ls = 200.00'
U = 133.34'
V = 66.67'

PI = 27+97.55
Δ = 10°06'15"LT.
D = 1°30'00"
T = 337.68'
L = 673.60'
R = 3819.72'
Ts = 536.76'
SE = 0.02

PIS = 23+93.21
Os = 1°30'00"RT.
Ls = 200.00'
U = 133.34'
V = 66.67'

-Y-REV (VERTICAL CURVE DATA)

PVI = 18+50.00
EL = 627.00'
VC = 200.00'
G1 = -0.918%
G2 = -0.227%

Kimley-Horn

Kimley-Horn & Associates, Inc.
901 Jones Franklin Road
Raleigh, N.C. 27606

BRIDGE NO. 46

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION -L-REV 144+60.84=
-Y-REV 18+97.90

REPLACING BRIDGE NO. 46

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING 1

FOR BRIDGE ON I-77 SOUTH
OVER WESTINGHOUSE BOULEVARD
BETWEEN ROCK HILL & STATESVILLE

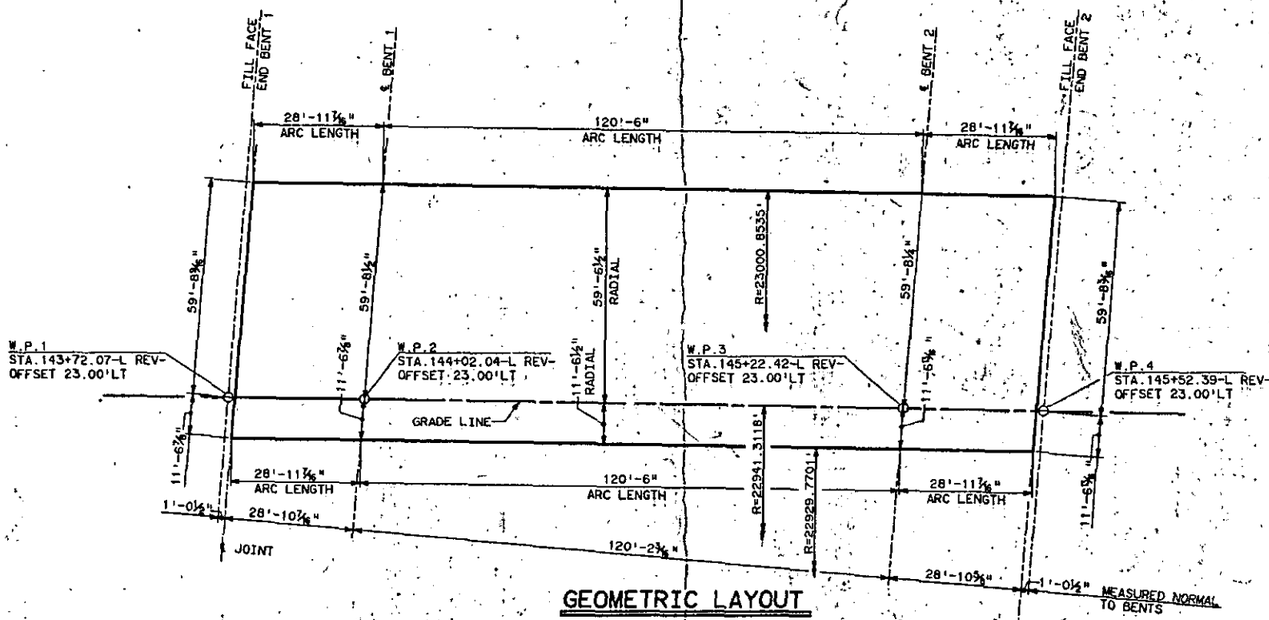
DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-47
1			3			TOTAL SHEETS
2			4			13

CECIL L. FRANKLIN 12186 NORTH CAROLINA REGISTERED 4/27/89

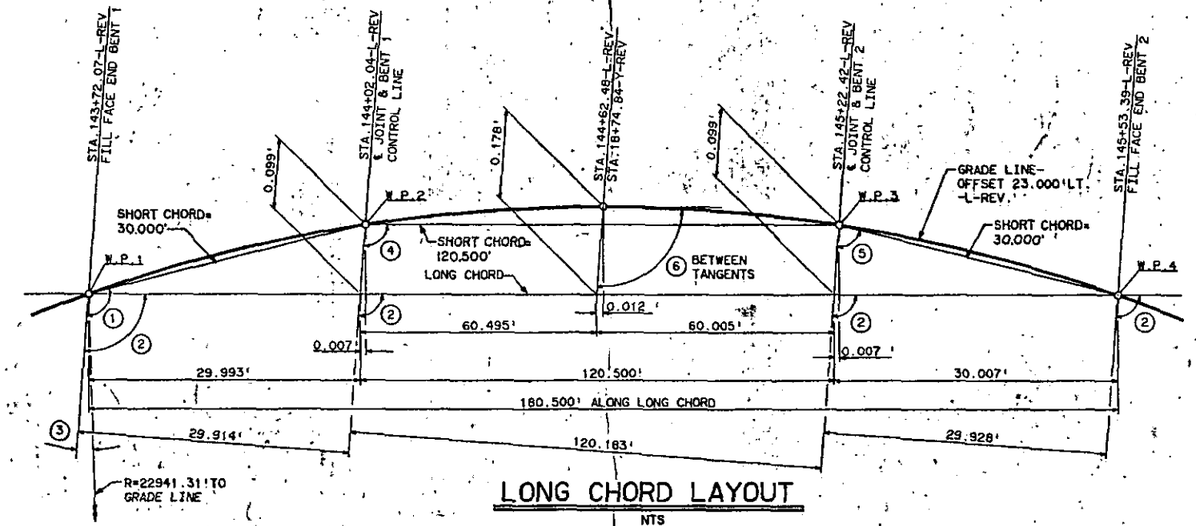
BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	CLASS "A" CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING	STRUCTURAL STEEL	HP12x53 STEEL PILE		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	BRIDGE APPROACH SLAB	ELASTOMERIC BEARING	PREFORMED COMPRESS. JOINT SEAL	EXPANSION JOINT SEAL	TFE EXPANSION BEARING ASSEMBLIES	GROOVING BRIDGE FLOORS
	LUMP SUM	CU. YD.	SQ. FT.	CU. YD.	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	Sq. Ft.
SUPERSTRUCTURE			12677				318,400			356.8			LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	12,975
END BENT 1				35.3	5,487			11	385		390	LUMP SUM					
BENT 1		600		137.9	31,622	2352											
BENT 2		525		137.6	31,504	2323											
END BENT 2				35.3	5,488			11	325		395	LUMP SUM					
TOTAL	LUMP SUM	1175	12677	346.1	74,101	4675	318,400	22	710	356.8	785	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	12,975



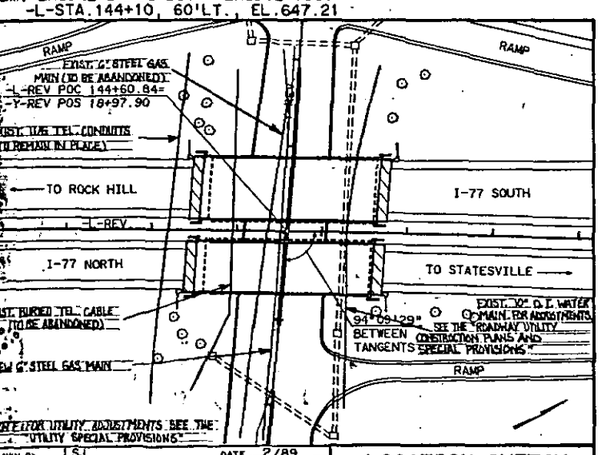
GEOMETRIC LAYOUT

NTS



LONG CHORD LAYOUT

NTS



DRAWN BY: LSJ DATE: 2/89
CHECKED BY: CLN DATE: 2/89

LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HS 20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

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 PROVISION *"REINFORCED CONCRETE DECK SLAB"*.

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED ASTM A588 STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON PLANS.

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

FOUNDATION EXCAVATION TO BE MEASURED FROM THE GRADED ROADWAY TYPICAL SECTION.

PILES FOR END BENTS AND BENT SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS PER PILE.

COMPUTED FOUNDATION LOAD FOR BENTS 1-2 EQUALS 3.75 TONS PER SQ. FT.

WORK SHALL NOT BE STARTED ON END BENT 1 OR BENT 1 UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

FOR MAINTENANCE OF TRAFFIC, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPAN AT 31.9', 80.0', AND 31.5, CONCRETE SLAB DECK ON I-BEAMS; CLEAR ROADWAY WIDTH OF 40.0' WITH TWO 1.5' SAFETY WALKS, ON REINFORCED CONCRETE END BENTS ON STEEL PILE AND REINFORCED CONCRETE POST AND BEAM BENT SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SEE SPECIAL PROVISIONS.

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.

NOTE: ALL BENTS ARE PARALLEL

ANGLES	
1	94°-20'-47.8"
2	94°-09'-31.2"
3	04°-23'-02.6"
4	94°-09'-31.2"
5	93°-58'-14.7"
6	93°-59'-32.9"

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

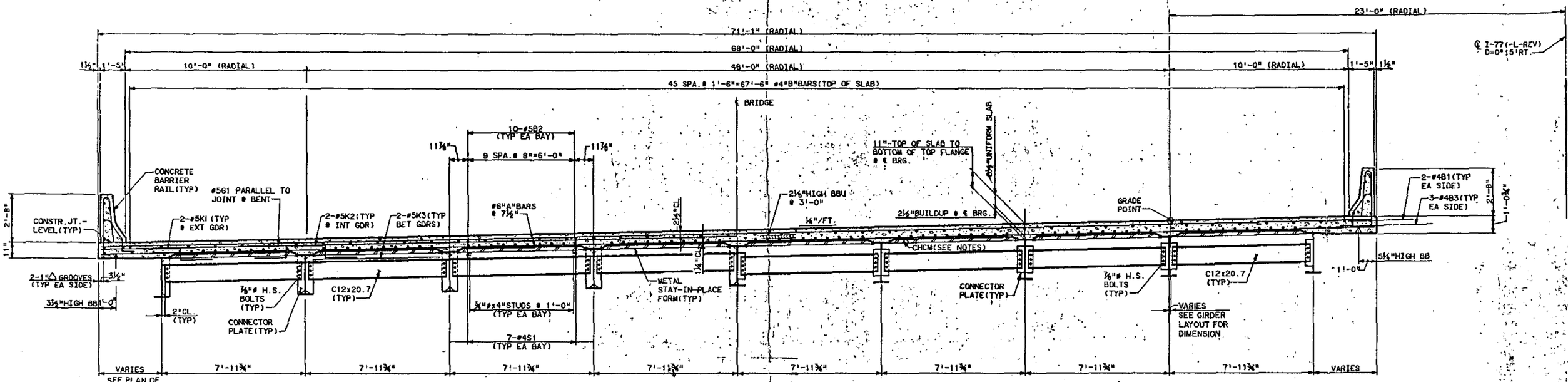
STATION -L-REV. 144+60.84= -Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING 2

FOR BRIDGE ON I-77 SOUTH OVER WESTINGHOUSE BOULEVARD BETWEEN ROCK HILL & STATESVILLE

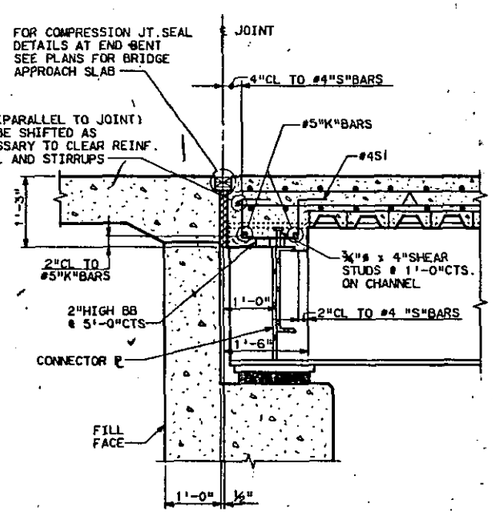
REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		S-4B
1			3			TOTAL SHEETS	130
2			4				



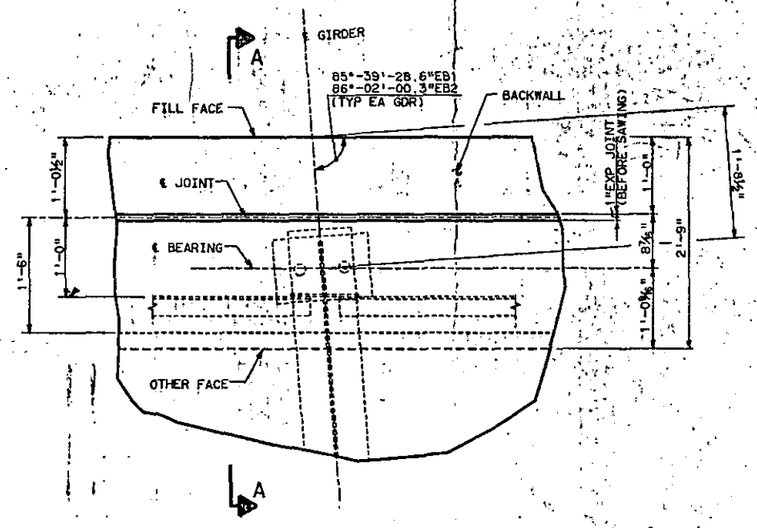
TYPICAL HALF SECTION
SHOWING BENT DIAPHRAGMS

SPANS A & C

TYPICAL HALF SECTION
SHOWING INTERMEDIATE DIAPHRAGMS



SECTION A-A
N.T.S.



DETAIL OF END BENT 1 JOINT
(END BENT 2 SIMILAR)

NOTES

STAY-IN-PLACE FORMS SHALL HAVE CLOSED TAPERED ENDS, FOR STAY-IN-PLACE FORMS SEE SPECIAL PROVISIONS.

PROVIDE CONTINUOUS HIGH CHAIR METAL DECK (CHCM) AT 4'-0"CTS. WITH LEG SPACING TO MATCH THE PITCH OF THE FORMS AND WITH A HEIGHT TO SUPPORT BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 ¼" ABOVE THE TOP OF THE STAY-IN-PLACE FORMS.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84
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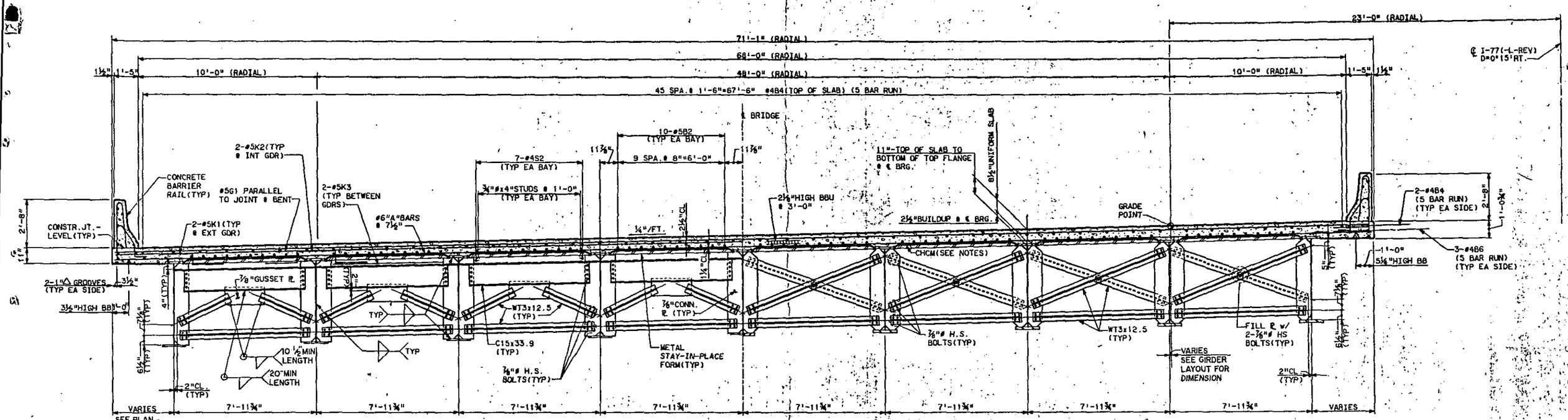
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION
SPANS A AND C

DRAWN BY	LSJ	DATE	2/89
CHECKED BY	CLN	DATE	2/89

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-29
1			3			TOTAL SHEETS
2			4			132

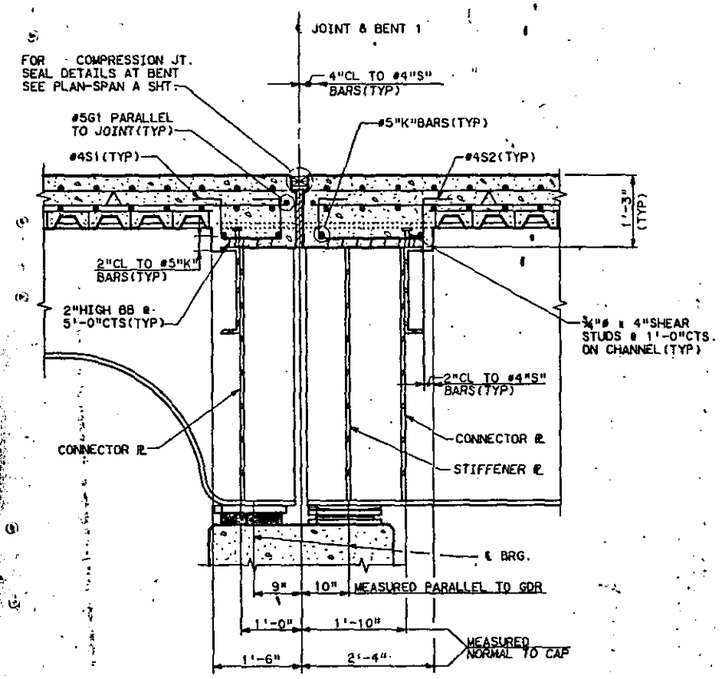


TYPICAL HALF SECTION
SHOWING BENT CROSSFRAMES

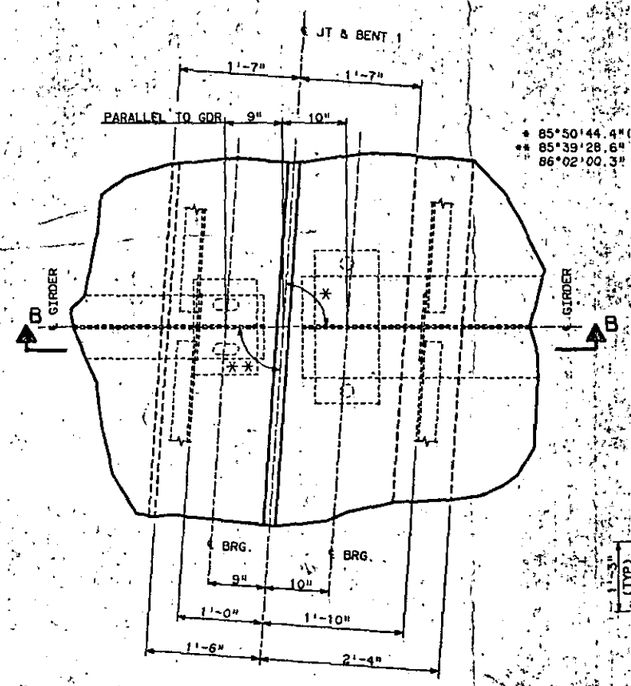
SPAN B

TYPICAL HALF SECTION
SHOWING INTERMEDIATE CROSSFRAMES

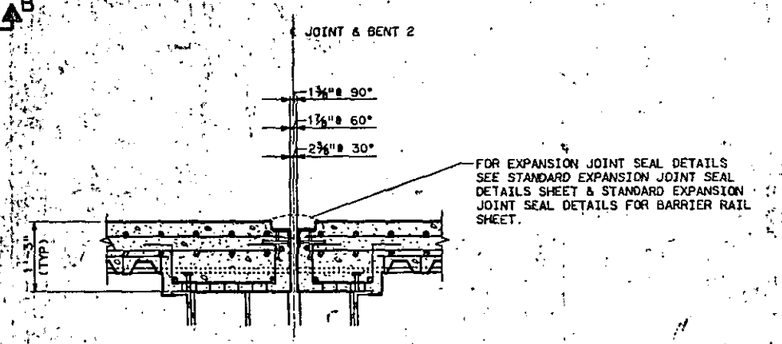
FOR NOTES SEE TYPICAL SECTION SPANS A AND C SHEET.



SECTION B-B



DETAIL OF BENT 1 JOINT
(BENT 2 SIMILAR)



BENT 2 JOINT DETAIL

PROJECT NO: 6.678006 T.

MECKLENBURG COUNTY

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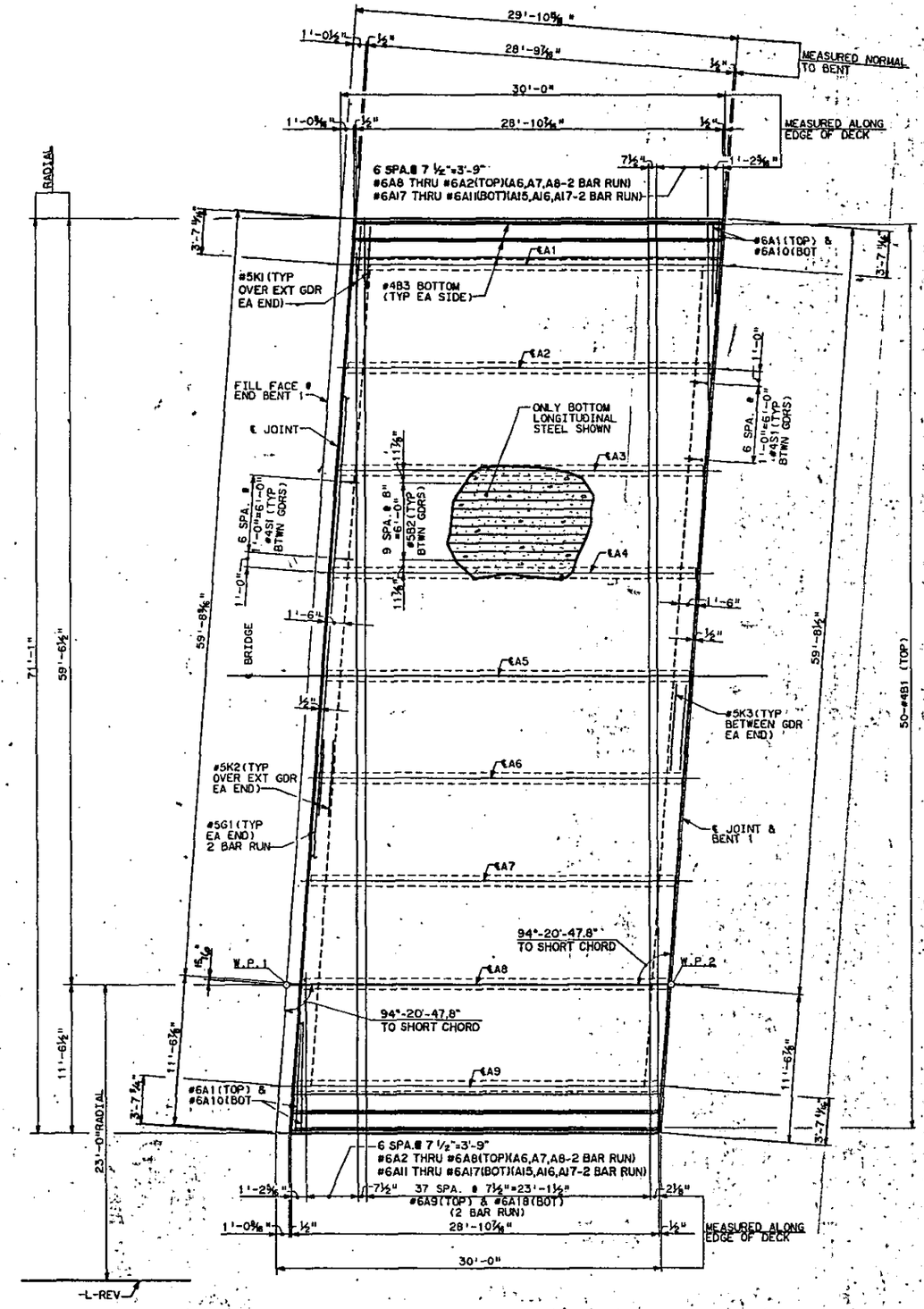
-Y-REV.18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

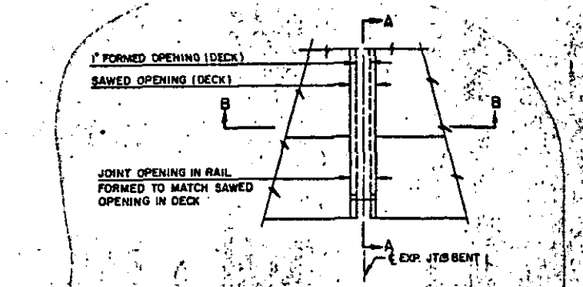
SUPERSTRUCTURE
TYPICAL SECTION
SPAN B

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-50
1			3			TOTAL SHEETS
2			4			130

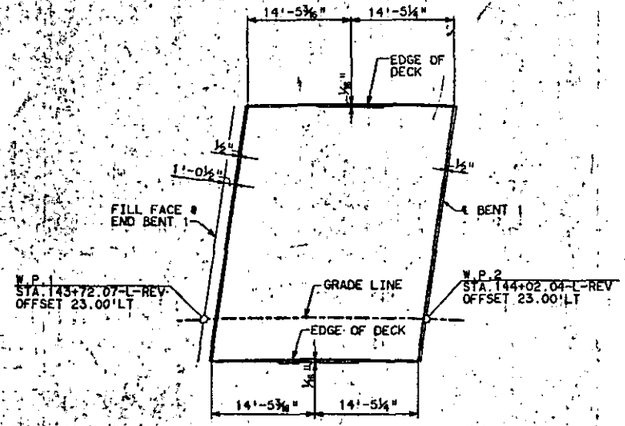
DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



PLAN-SPAN A



TYPICAL COMPRESSION JOINT SEAL DETAIL



CURVE OFFSETS

PROJECT NO. 6.C78006.T

MECKLENBURG COUNTY

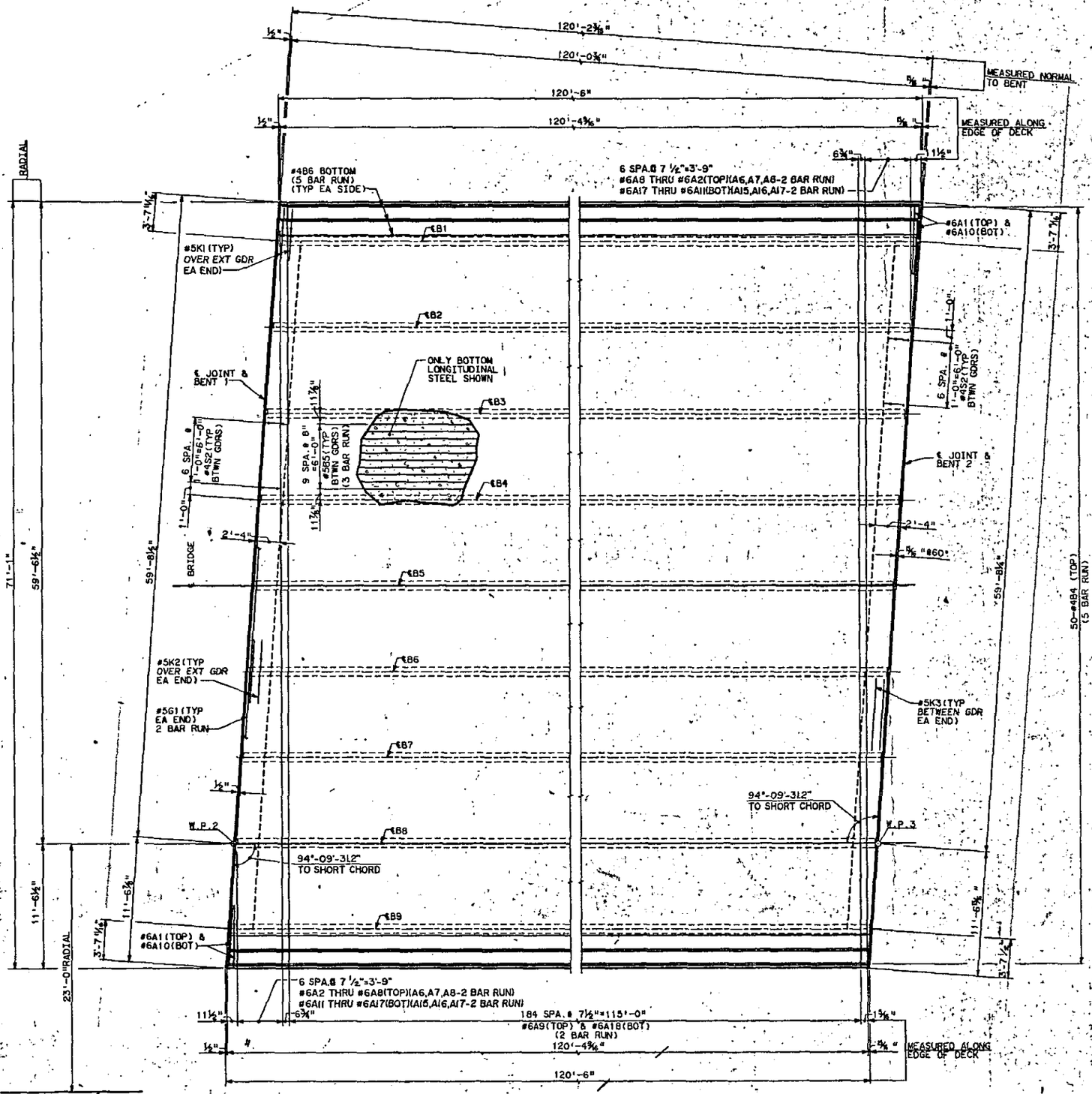
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

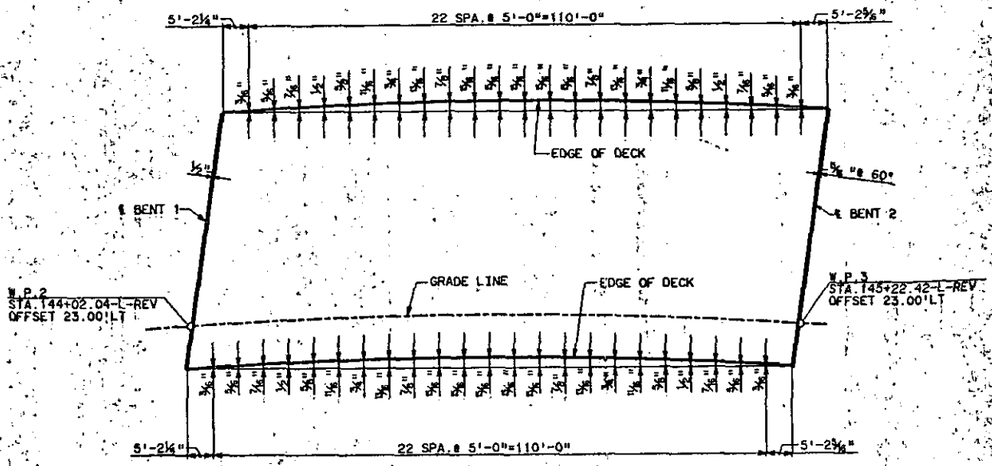
SUPERSTRUCTURE
PLAN-SPAN A

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-51
1			3			TOTAL SHEETS
2			4			136

DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



PLAN-SPAN B



CURVE OFFSETS

PROJECT NO. 6.6718006T

MECKLENBURG COUNTY

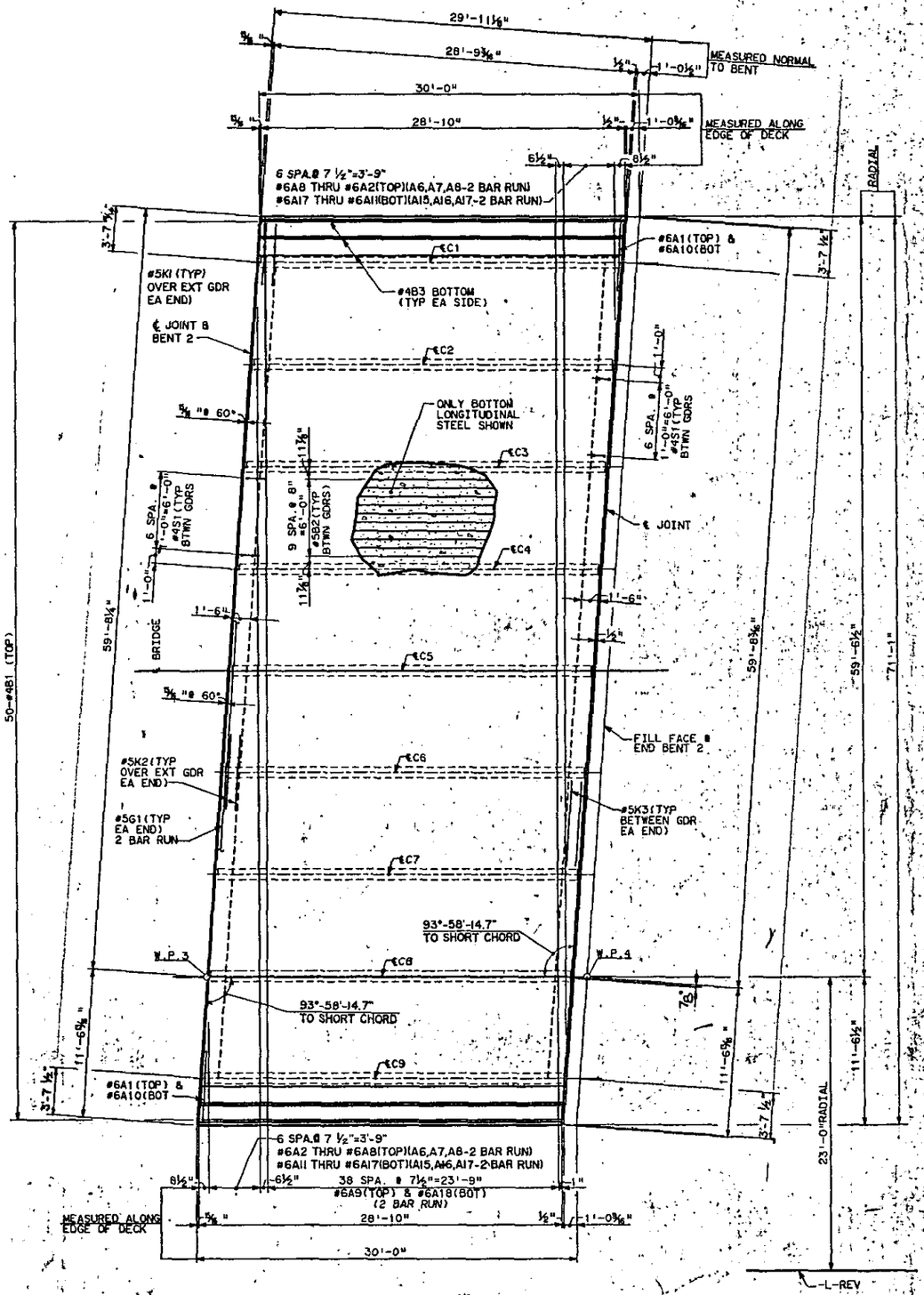
STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

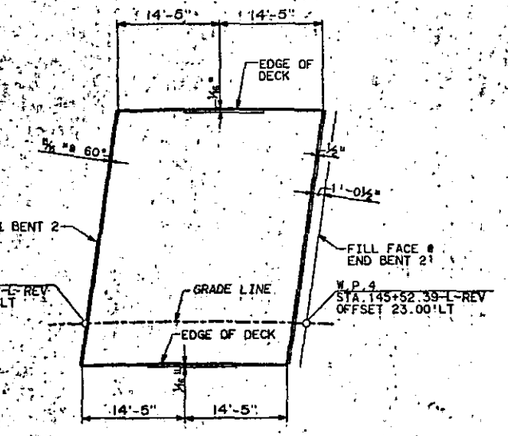
SUPERSTRUCTURE
PLAN-SPAN B

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-52
1			3			TOTAL SHEETS
2			4			130

DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



PLAN-SPAN C



CURVE OFFSETS

PROJECT NO. 6.678006T.

MECKLENBURG COUNTY

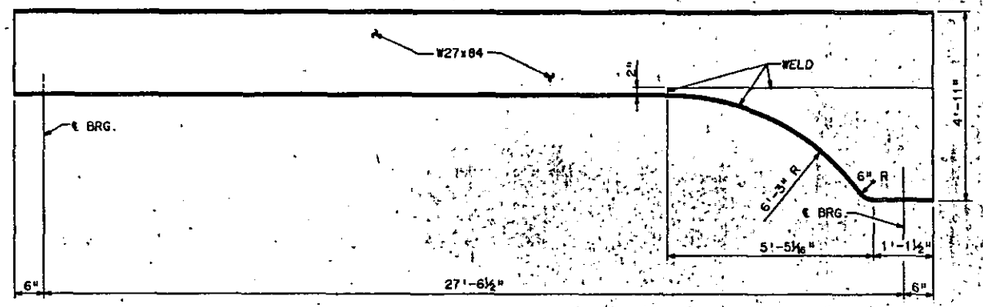
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

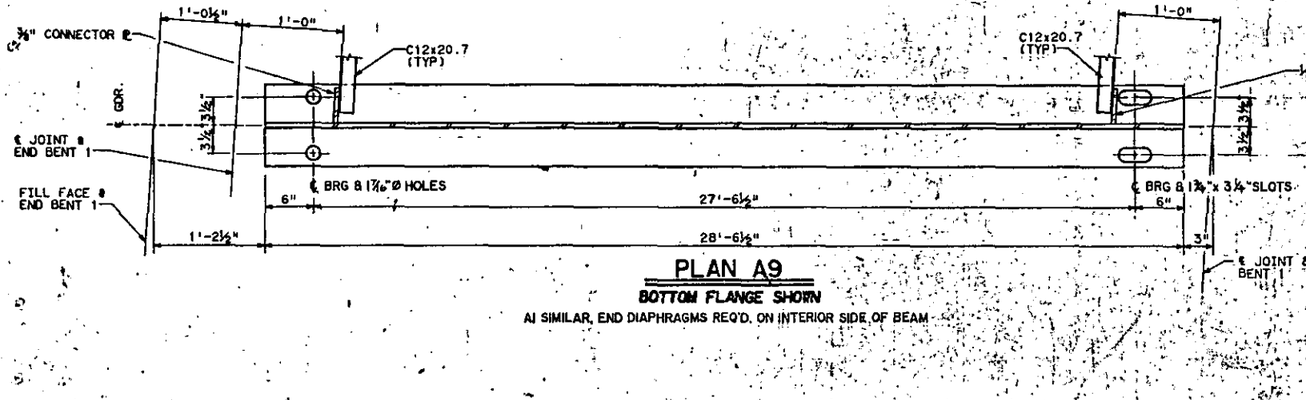
SUPERSTRUCTURE
PLAN-SPAN C

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-53
1			3			TOTAL SHEETS
2			4			130

DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



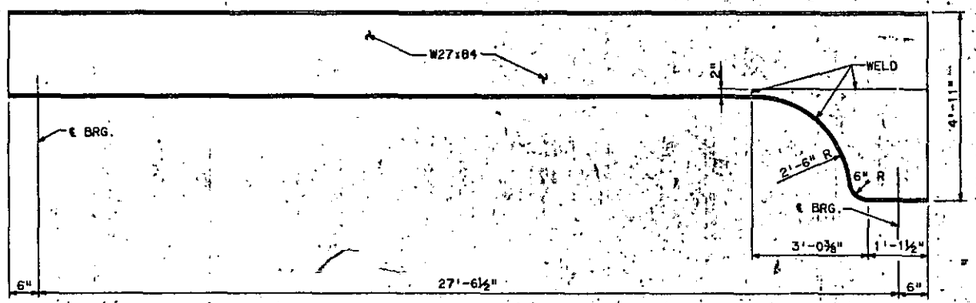
ELEVATION - A1 & A9



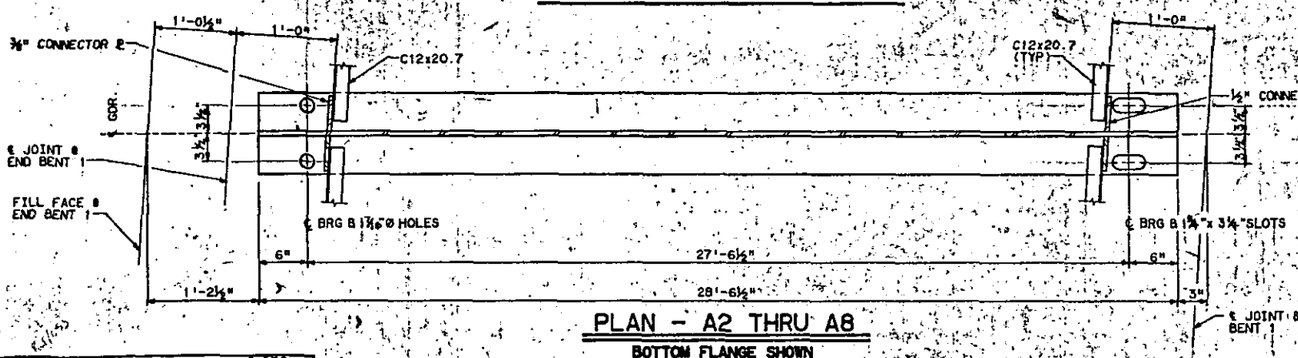
PLAN A9

BOTTOM FLANGE SHOWN

A1 SIMILAR, END DIAPHRAGMS REQ'D. ON INTERIOR SIDE OF BEAM



ELEVATION - A2 THRU A8



PLAN - A2 THRU A8

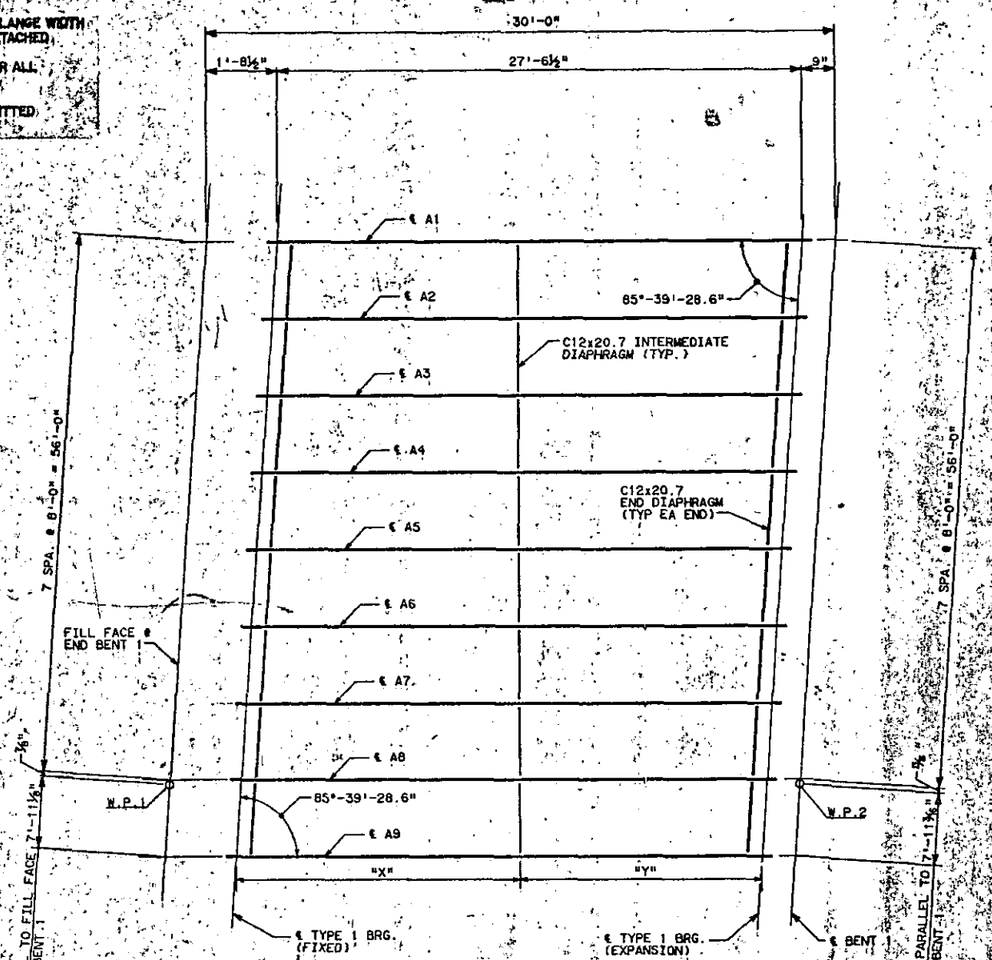
BOTTOM FLANGE SHOWN

NOTE:

HAUNCH WEB & FLANGE THICKNESS & FLANGE WIDTH TO MATCH THE BEAM TO WHICH IT IS ATTACHED.

RADIOGRAPHIC TESTING IS REQUIRED FOR ALL BUTT WELDS IN HAUNCH.

OTHER HAUNCH MAKE-UP MAY BE SUBMITTED FOR APPROVAL



BEAM LAYOUT-SPAN A

DEAD LOAD DEFLECTIONS AND BEAM CAMBER AT MID-POINT BETWEEN BEARINGS

BEAM	A1 & A9	A2 - A8
DEFLECTION DUE TO WEIGHT OF STEEL	.001'	.001'
DEFLECTION DUE TO WEIGHT OF SLAB	.014'	.014'
DEFLECTION DUE TO RAIL AND F.W.S.	.003'	.003'
TOTAL DEAD LOAD DEFLECTION	.018'	.018'
VERTICAL CURVE ORDINATE	.002'	.002'
REQUIRED BEAM CAMBER	*NONE	*NONE

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) MIDPOINT BETWEEN ℄ BEARINGS EXCEPT "REQUIRED BEAM CAMBER" WHICH IS GIVEN IN INCHES(FRACTION FORM).

* TURN NATURAL MILL CAMBER UP.

FOR NOTES SEE GIRDER DETAIL SHEET

SPAN A INTERMEDIATE DIAPHRAGM SPACING

GIRDER	"X"	"Y"
A1	11'-4⅜"	16'-2⅜"
A2	11'-11⅞"	15'-7⅛"
A3	12'-6⅛"	14'-11⅝"
A4	13'-2"	14'-4½"
A5	13'-9⅛"	13'-9⅛"
A6	14'-4½"	13'-2"
A7	14'-11⅝"	12'-6⅛"
A8	15'-7⅛"	11'-11⅞"
A9	16'-2⅜"	11'-4⅜"

PROJECT NO. 6.C78006T 1

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
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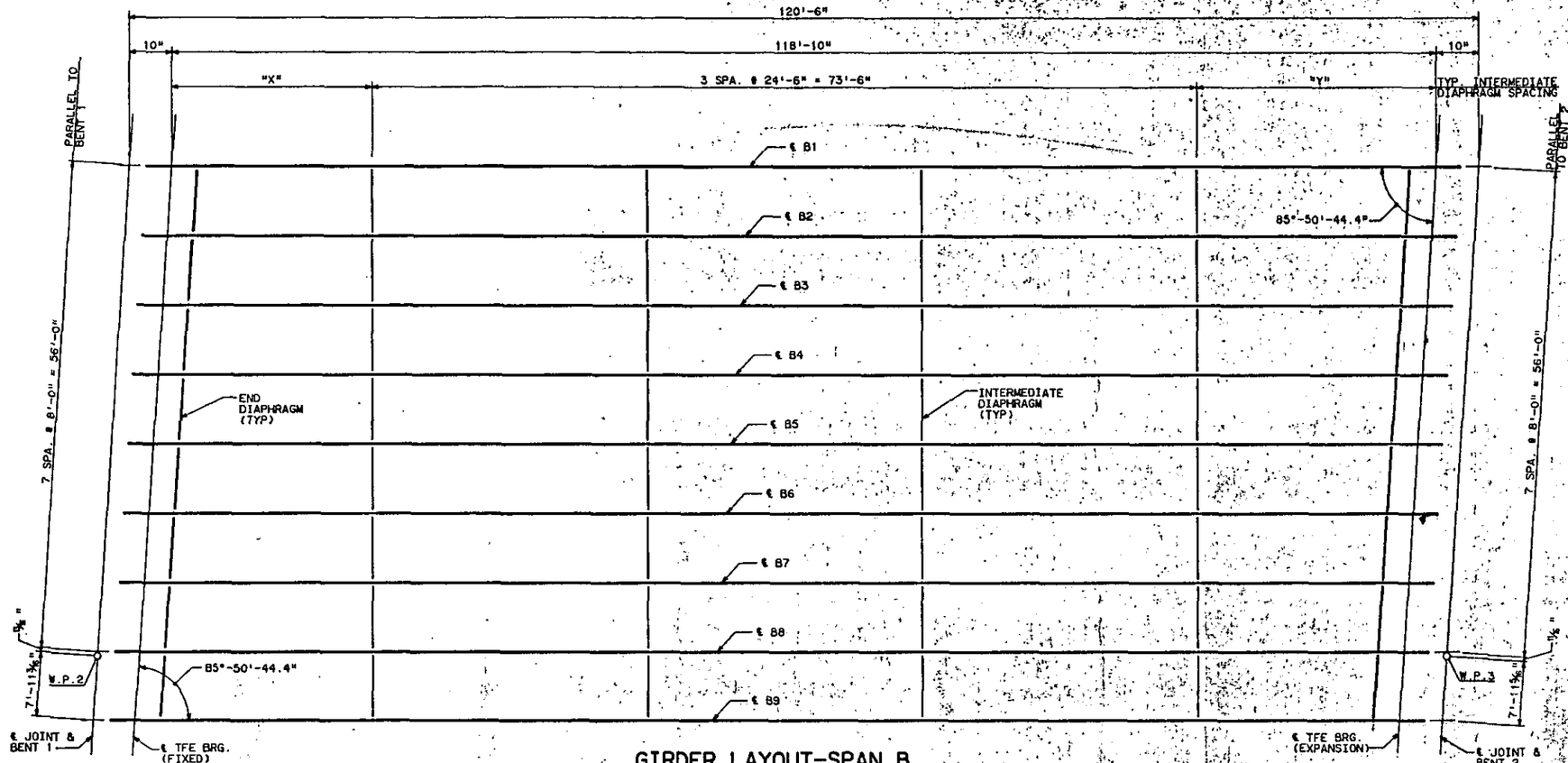
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEAM LAYOUT-SPAN A

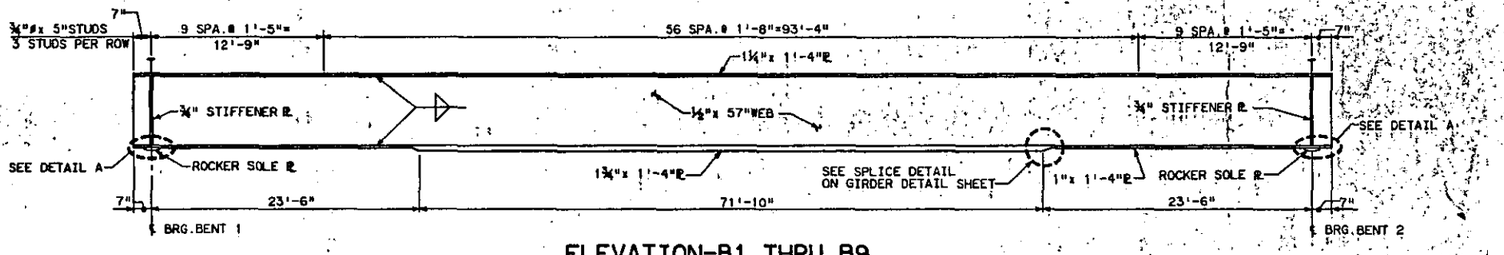
DRAWN BY RLF / LSJ DATE 2/89
CHECKED BY CLN DATE 2/89

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		S-54
1			3				TOTAL SHEETS
2			4				170

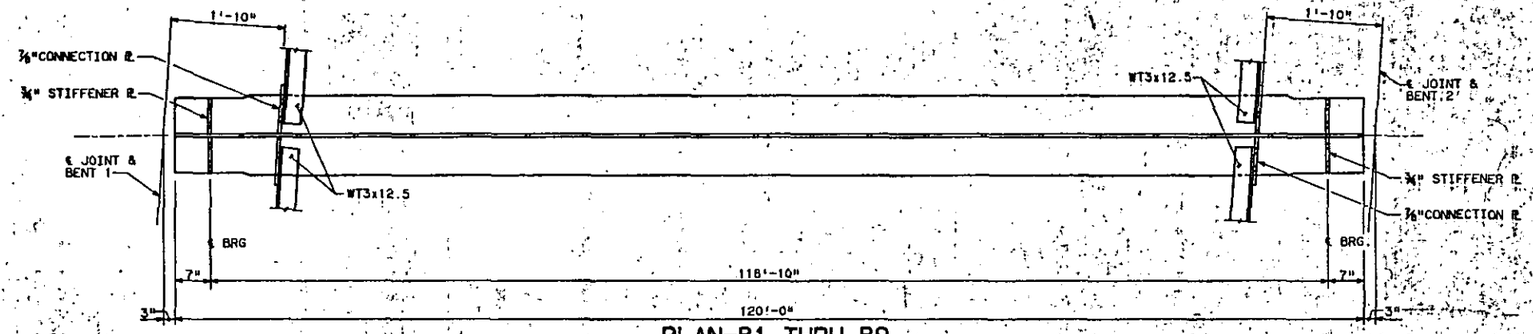


GIRDER LAYOUT-SPAN B

SPAN B INTERMEDIATE DIAPHRAGM SPACING		
GIRDER	"X"	"Y"
B1	20'-4⅜"	24'-11⅝"
B2	20'-11½"	24'-4⅞"
B3	21'-6⅛"	23'-9⅝"
B4	22'-1⅛"	23'-2⅝"
B5	22'-8"	22'-8"
B6	23'-2⅝"	22'-1⅛"
B7	23'-9⅝"	21'-6⅛"
B8	24'-4⅞"	20'-11½"
B9	24'-11⅝"	20'-4⅜"

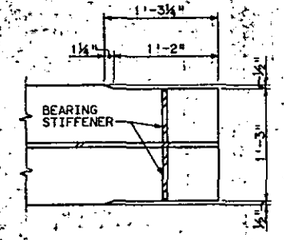


ELEVATION-B1 THRU B9



PLAN-B1 THRU B9

BOTTOM FLANGE SHOWN
(B1 & B9 END DIAPH REQ'D.ON ONE SIDE ONLY,SEE LAYOUT)



DETAIL A

FOR NOTES & GIRDER DEAD LOAD DEFLECTIONS AND GIRDER CAMBER, SEE GIRDER DETAIL SHEET.

PROJECT NO. 6.676006T
MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
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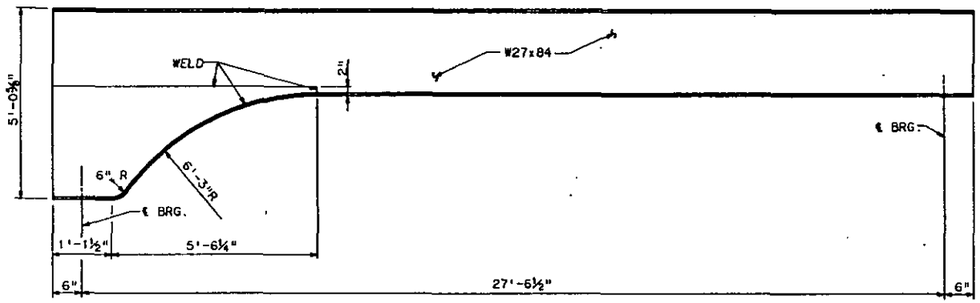
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT - SPAN B

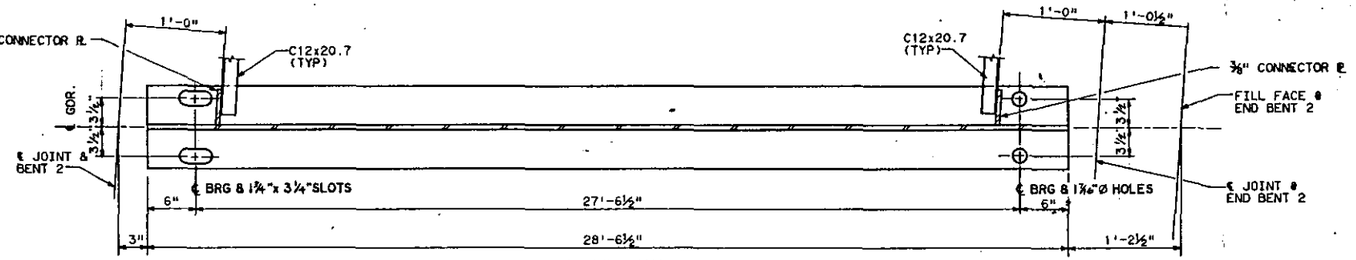
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-55
1			3			TOTAL SHEETS
2			4			120

DRAWN BY RLF / LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



ELEVATION - C1 & C9

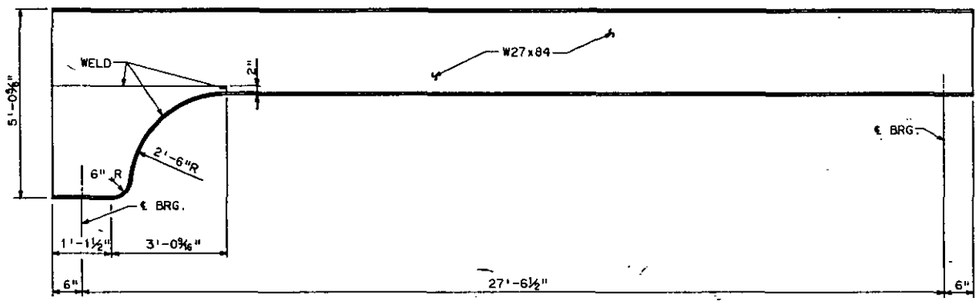
NOTE:
FOR HAUNCH NOTES SEE BEAM LAYOUT-SPAN A



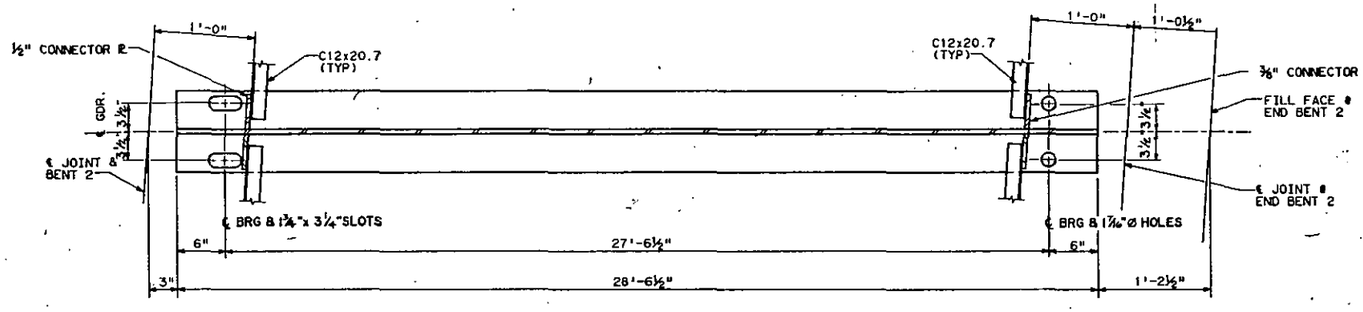
PLAN C9

BOTTOM FLANGE SHOWN

C1 SIMILAR, END DIAPHRAGMS REQ'D. ON INTERIOR SIDE OF BEAM

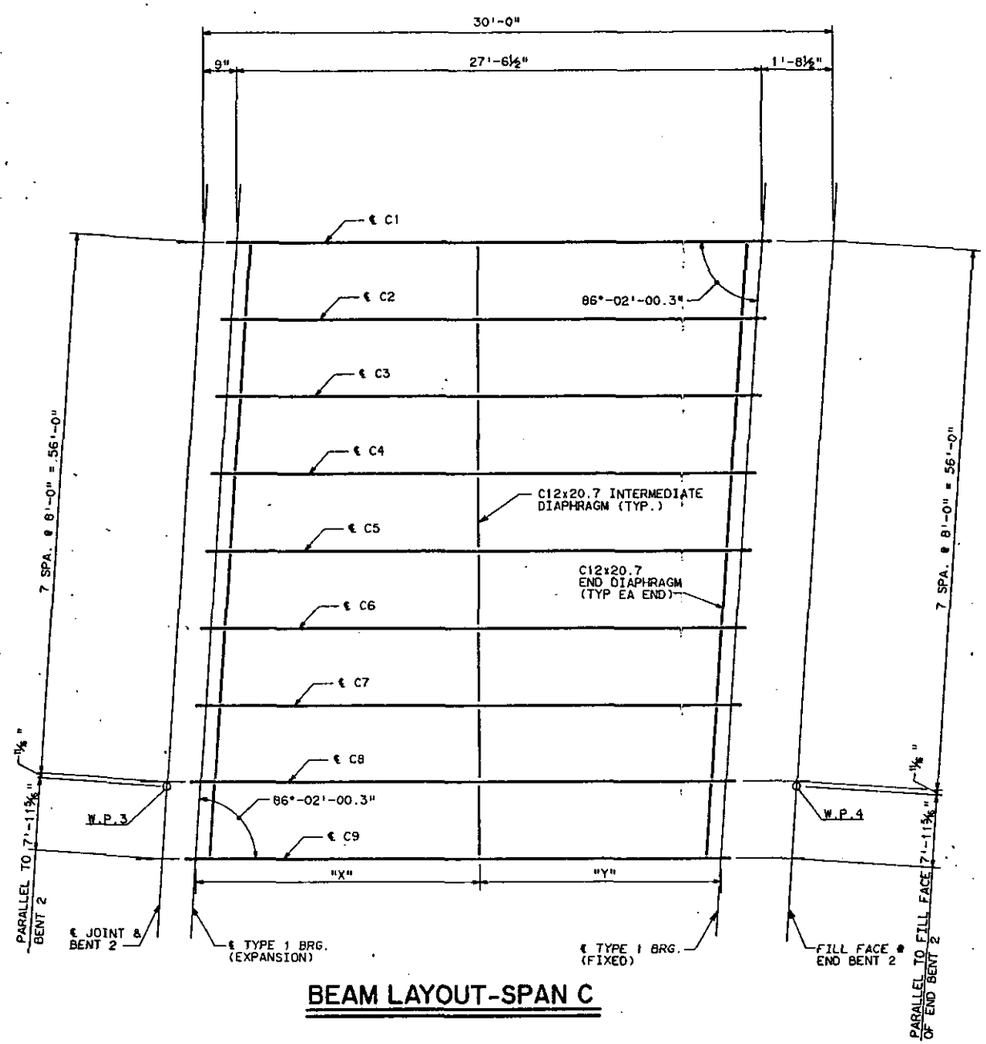


ELEVATION - C2 THRU C8



PLAN - C2 THRU C8

BOTTOM FLANGE SHOWN



BEAM LAYOUT-SPAN C

DEAD LOAD DEFLECTIONS AND BEAM CAMBER AT MID-POINT BETWEEN BEARINGS

BEAM	C1 & C9	C2 - C8
DEFLECTION DUE TO WEIGHT OF STEEL	.001'	.001'
DEFLECTION DUE TO WEIGHT OF SLAB	.014'	.014'
DEFLECTION DUE TO RAIL AND F.W.S.	.003'	.003'
TOTAL DEAD LOAD DEFLECTION	.018'	.018'
VERTICAL CURVE ORDINATE	.002'	.002'
REQUIRED BEAM CAMBER	* NONE	* NONE

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) MIDPOINT BETWEEN ℄ BEARINGS EXCEPT "REQUIRED BEAM CAMBER" WHICH IS GIVEN IN INCHES(FRACTION FORM).

* TURN NATURAL MILL CAMBER UP.

FOR NOTES SEE GIRDER DETAIL SHEET

SPAN C INTERMEDIATE DIAPHRAGM SPACING

GIRDER	"X"	"Y"
C1	11'-6⅛"	15'-11⅝"
C2	12'-11⅜"	15'-5⅛"
C3	12'-7⅝"	14'-10⅜"
C4	13'-2⅜"	14'-3⅞"
C5	13'-9¼"	13'-9¼"
C6	14'-3⅞"	13'-2⅜"
C7	14'-10⅜"	12'-7⅝"
C8	15'-5⅛"	12'-11⅜"
C9	15'-11⅝"	11'-6⅛"

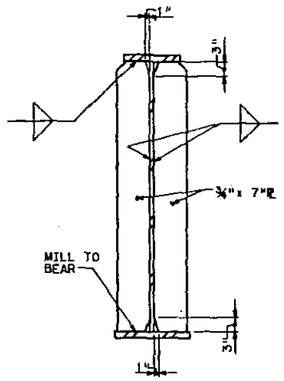
PROJECT No. 6.678006T
MECKLENBURG COUNTY
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEAM LAYOUT-SPAN C

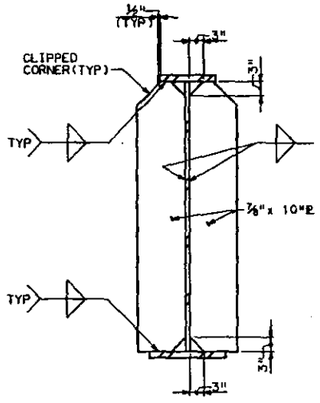
REVISIONS							SHEET NO. 5-3c
NO.	BY	DATE	NO.	BY	DATE		
1			3				TOTAL SHEETS 130
2			4				

DRAWN BY RLF / LSJ DATE 2 / 89
CHECKED BY CLN DATE 2 / 89



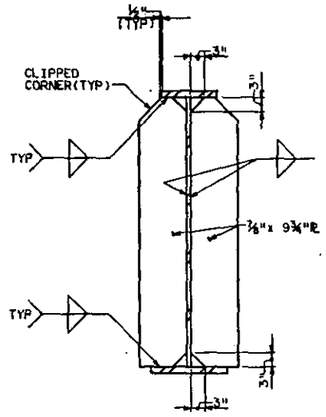
BEARING STIFFENER

SPAN B



CONNECTOR PLATE AT BENT CROSSFRAME

SPAN B



CONNECTOR PLATE AT INTERMEDIATE CROSSFRAME

SPAN B

NOTE: STIFFENER & CONNECTOR PLATE DETAILS SHOWN AT INTERIOR GIRDERS. PLATES NOT REQUIRED ON OUTSIDE OF EXTERIOR GIRDERS.

DEAD LOAD DEFLECTIONS AND GIRDER CAMBER AT TENTH POINTS BETWEEN ℄ BEARINGS

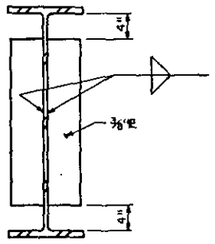
SPAN B-GIRDER B1 & B9

GIRDER POINT	BRG	1	2	3	4	5	6	7	8	9	BRG
DEFLECTION DUE TO WEIGHT OF STEEL	.000'	.024'	.044'	.060'	.070'	.073'	.070'	.060'	.044'	.024'	.000'
DEFLECTION DUE TO WEIGHT OF SLAB	.000'	.104'	.195'	.264'	.308'	.323'	.308'	.264'	.195'	.104'	.000'
DEFLECTION DUE TO RAIL AND F.W.S.	.000'	.016'	.030'	.040'	.047'	.049'	.047'	.040'	.030'	.016'	.000'
TOTAL DEAD LOAD DEFLECTION	.000'	.144'	.269'	.364	.425'	.445'	.425'	.364	.269'	.144'	.000'
VERTICAL CURVE ORDINATE	.000'	.019"	.033"	.044"	.050"	.051"	.050"	.044"	.033"	.019"	.000'
REQUIRED GIRDER CAMBER	0"	1⅝"	3⅜"	4⅞"	5⅛"	5⅛"	5⅛"	4⅞"	3⅜"	1⅝"	0"

SPAN B-GIRDER B2-B8

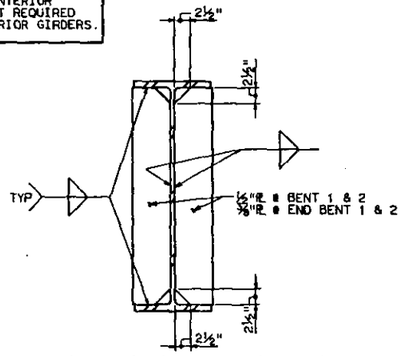
GIRDER POINT	BRG	1	2	3	4	5	6	7	8	9	BRG
DEFLECTION DUE TO WEIGHT OF STEEL	.000'	.024'	.044'	.060'	.070'	.073'	.070'	.060'	.044'	.024'	.000'
DEFLECTION DUE TO WEIGHT OF SLAB	.000'	.101'	.189'	.255'	.298'	.312'	.298'	.255'	.189'	.101'	.000'
DEFLECTION DUE TO RAIL AND F.W.S.	.000'	.009'	.016'	.022'	.026'	.027'	.026'	.022'	.016'	.009'	.000'
TOTAL DEAD LOAD DEFLECTION	.000'	.134'	.249'	.337'	.394'	.412'	.394'	.337'	.249'	.134'	.000'
VERTICAL CURVE ORDINATE	.000'	.019"	.033"	.044"	.050"	.051"	.050"	.044"	.033"	.019"	.000'
REQUIRED GIRDER CAMBER	0"	1⅝"	3⅜"	4⅝"	5⅛"	5⅛"	5⅛"	4⅝"	3⅜"	1⅝"	0"

NOTE : VALUES ARE GIVEN IN FEET (DECIMAL FORM) & TENTH POINTS BETWEEN ℄ BEARINGS EXCEPT "REQUIRED GIRDER CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).



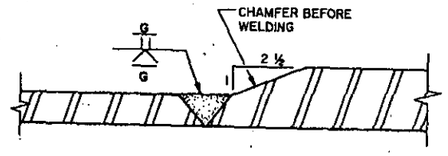
CONNECTOR PLATE AT INTERMEDIATE DIAPHRAGM

SPANS A & C



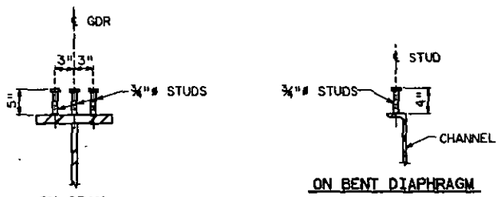
CONNECTOR PLATE AT BENT DIAPHRAGM

SPANS A & C

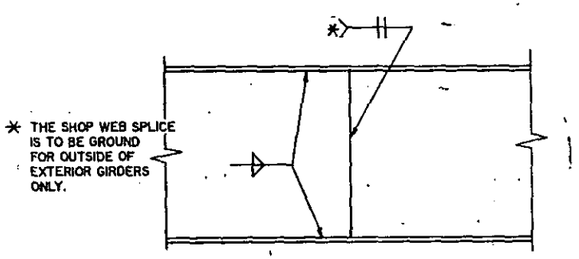


SHOP FLANGE SPLICE DETAIL (SECTION THRU FLANGE)

SPAN B



SHEAR CONNECTORS



SHOP WEB SPLICE & FLANGE TO WEB

SPAN B

STRUCTURAL STEEL NOTES

SPECIFICATIONS: DESIGNS.....A.A.S.H.T.O.(1983 WITH 1984 THRU 1987 INTERIM)

ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 P.S.I. ✓

ALL DIMENSIONS SHOWN ARE HORIZONTAL OF VERTICAL UNLESS OTHERWISE NOTED.

HIGH STRENGTH BOLTS SHALL BE ⅞"DIAMETER UNLESS OTHERWISE NOTED.

GIRDERS SHALL BE FABRICATED WITH CAMBER TO COMPENSATE FOR DEFLECTION CAUSED BY THE COMBINED WEIGHTS FOR THE STRUCTURAL STEEL AND THE SUPERIMPOSED DEAD LOADS, PLUS VERTICAL CURVE ORDINATE. SEE TABLE OF DEAD LOAD DEFLECTIONS AND GIRDER CAMBER.

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 OCCURED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

SHOP SPLICES ARE PERMITTED TO LIMIT MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES.

CHARPY V-NOTCH TEST WILL BE REQUIRED FOR WEB PLATES & BOTTOM FLANGE PLATES FOR ALL GIRDERS AND ALL ROLLED BEAMS. FOR CHARPY V-NOTCH TEST, SEE SPECIAL PROVISIONS.

ENDS OF BEAMS AND GIRDERS TO BE PLUMB AND STIFFENERS TO BE PARALLEL TO END OF BEAMS AND GIRDERS.

METAL STAY-IN-PLACE FORM SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST.

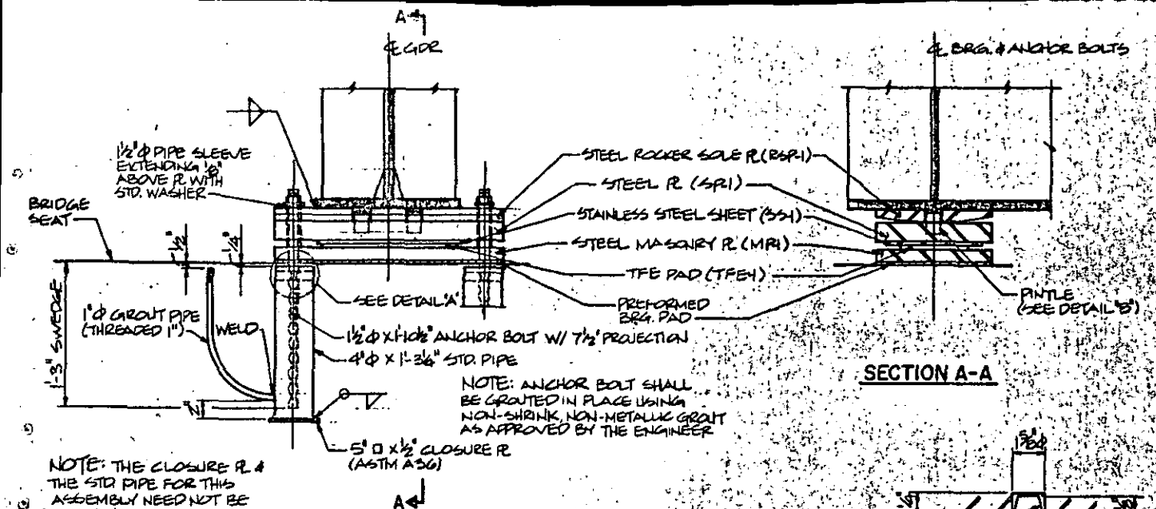
DRAWN BY LSJ DATE 2789
CHECKED BY CLN DATE 2789

PROJECT NO. G.G78000T
MECKLENBURG COUNTY
STATION L-REV. 144+60.84=
-Y-REV. 18+97.90

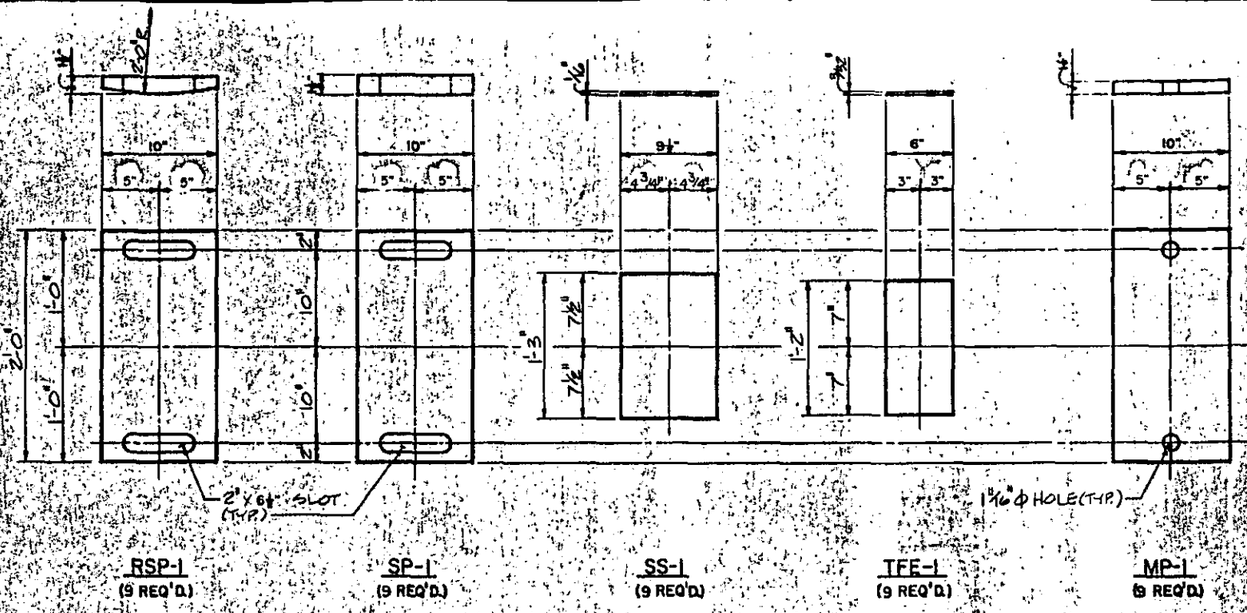
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

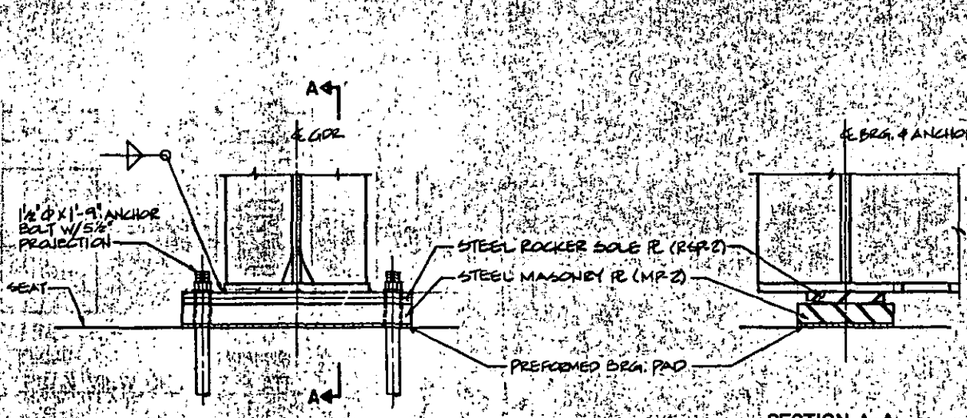
SUPERSTRUCTURE
GIRDER DETAILS

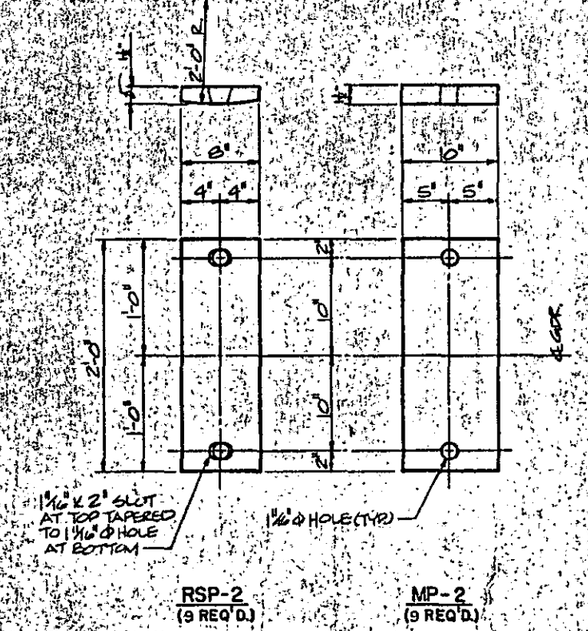
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-57
1			5			TOTAL SHEETS
2			6			130



EXPANSION BEARING DETAILS







FIXED BEARING DETAIL

NOTES

ALL BEARING PLATES SHALL BE ASTM A588 OR A572 GRADE 50. ALL BEARING PLATES SHALL BE GALVANIZED EXCEPT THE PLATES RECEIVING THE TFE PAD OR STAINLESS STEEL SHEET. THE PLATES RECEIVING THE TFE PAD OR STAINLESS STEEL SHEET SHALL BE COMMERCIALLY BLAST CLEANED AND EXCEPT FOR THE AREAS WITH SPECIAL FACING, SHALL BE PAINTED WITH TWO COATS OF ZINC RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

TFE EXPANSION BEARING ASSEMBLIES SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR THE ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

PROJECT NO. 26.6780001
MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

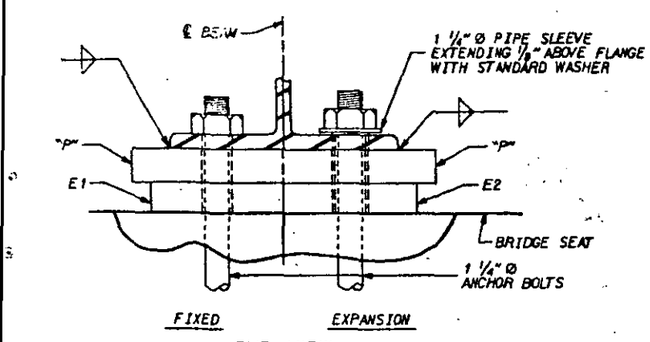
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TFE

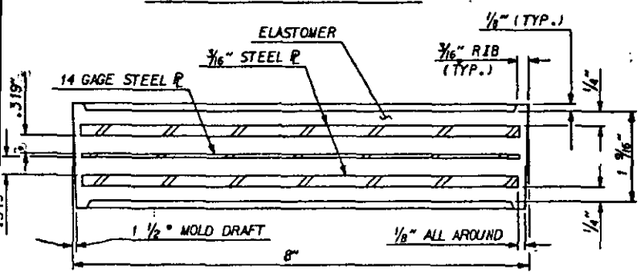
FIXED AND EXPANSION BEARING DETAILS

DRAWN BY	RLF	DATE	MARCH '89
CHECKED BY	CLN	DATE	MARCH '89

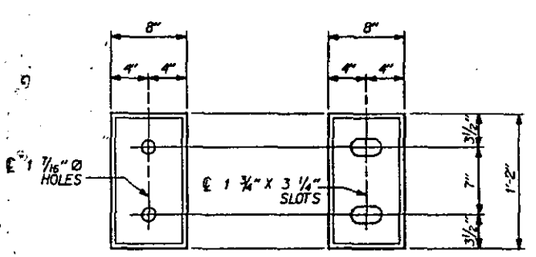
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-B
1			3			TOTAL SHEETS
2			4			12



END VIEW



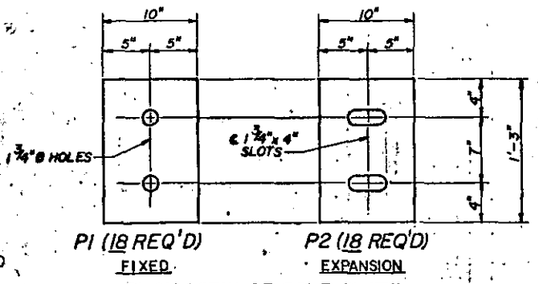
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (18 REQ'D) E2 (18 REQ'D)

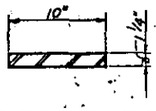
PLAN VIEW OF ELASTOMERIC BEARING

TYPE I

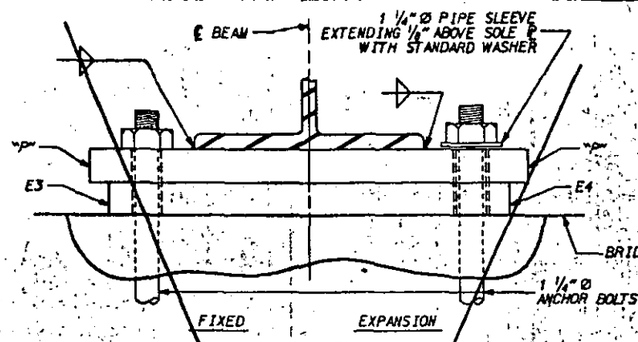


P1 (18 REQ'D) FIXED P2 (18 REQ'D) EXPANSION

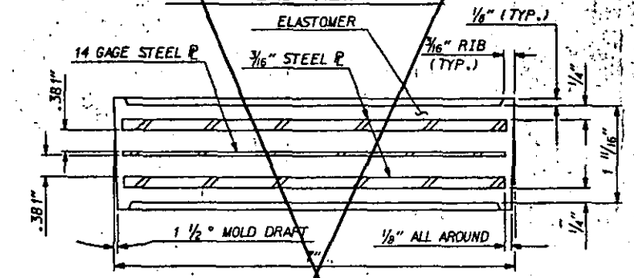
PLAN VIEW OF SOLE PLATE



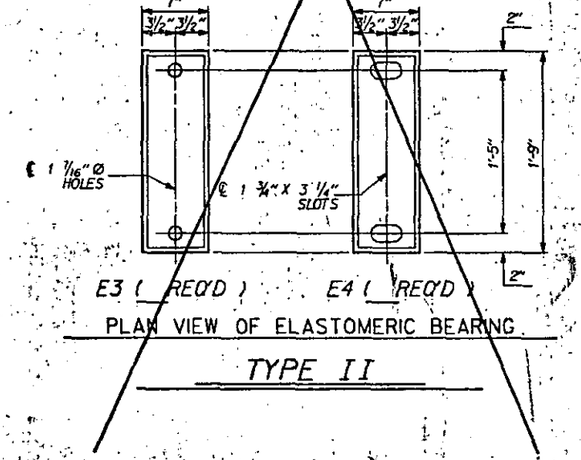
TYPICAL SECTION OF SOLE PLATE



END VIEW



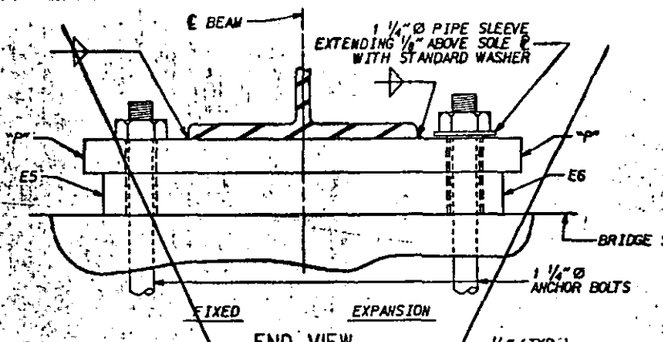
TYPICAL SECTION OF ELASTOMERIC BEARINGS



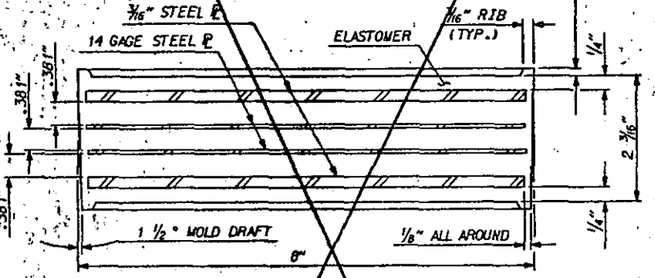
E3 (REQ'D) E4 (REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

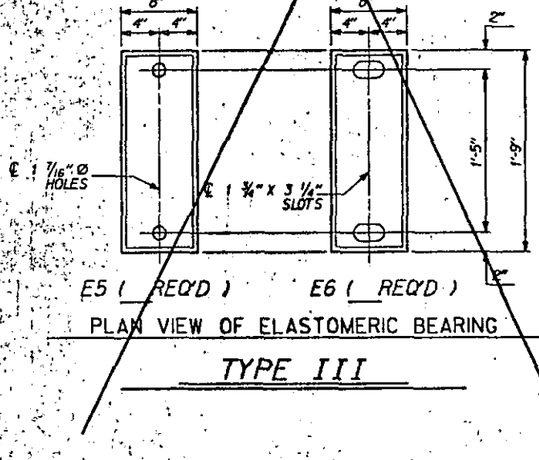
TYPE II



END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E5 (REQ'D) E6 (REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE III

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 1 1/4" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL, SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR UNPAINTED A.S.T.M. A-588 STRUCTURAL STEEL, SOLE PLATE SHALL BE A.S.T.M. A-588 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHITE LEAD AND TALLOW SHALL NOT BE APPLIED TO THE SURFACE OF THE SOLE PLATE IN CONTACT WITH THE ELASTOMERIC BEARING.

LOAD RATINGS

	MAX. D.L.+ L.L.	MAX. D.L.	MIN. D.L.	MAX. DEFL.
TYPE I	68.81 K	50.97 K	21.75 K	7.0 %
~~TYPE II~~	~~88.16 K~~	~~68.47 K~~	~~29.75 K~~	~~7.0 %~~
~~TYPE III~~	~~114.51 K~~	~~78.97 K~~	~~32.99 K~~	~~7.0 %~~
~~TYPE IV~~	~~142.17 K~~	~~88.86 K~~	~~37.51 K~~	~~7.0 %~~

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

ASSEMBLED BY : LSJ	DATE : 2/89	SPECIAL
CHECKED BY : CLN	DATE : 2/89	
DRAWN BY : MIKE BRITT	DATE : NOV. 1987	STANDARD
CHECKED BY : RANDY BISSETTE	DATE : NOV. 1987	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

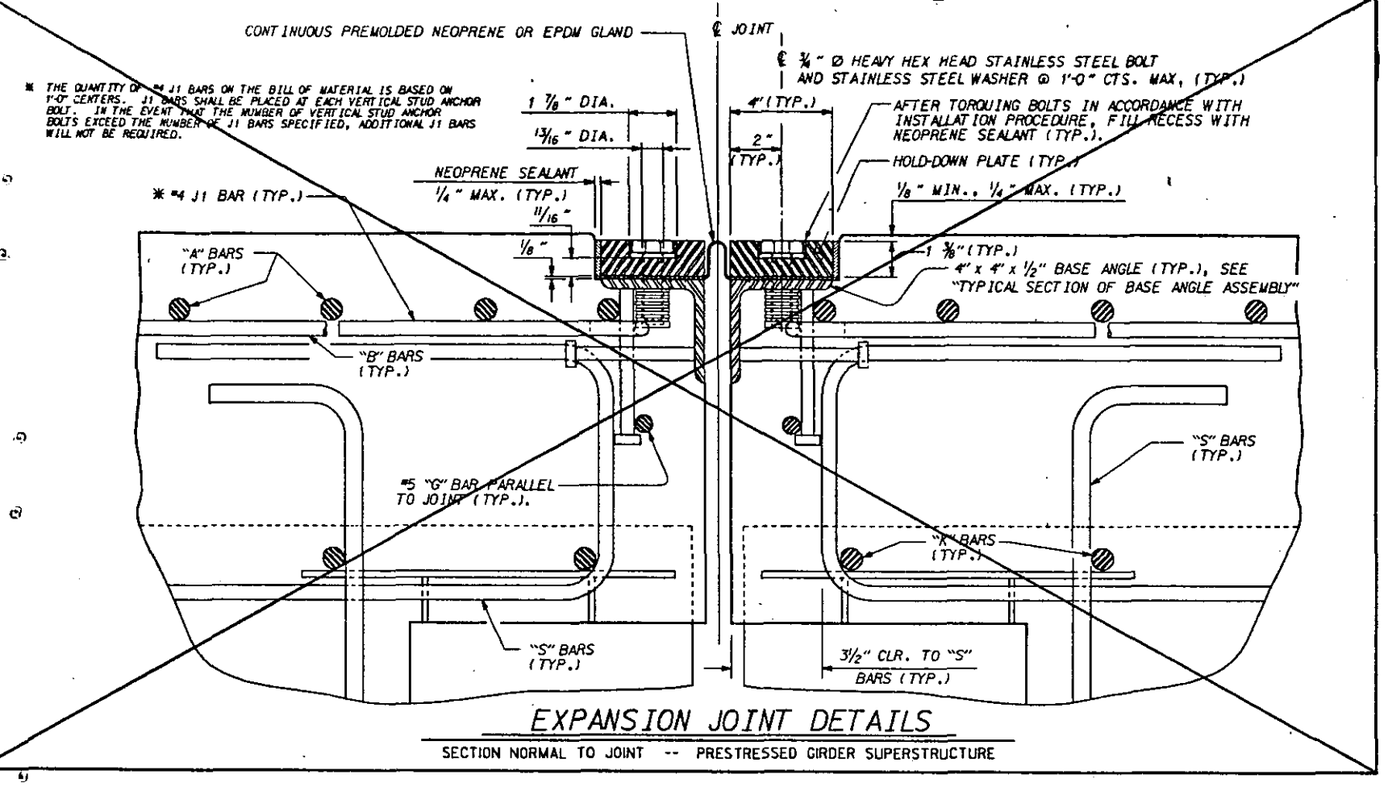
FEBRUARY 1988

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. 5-59

TOTAL SHEETS 130

~~SOLE PLATE DETAILS ("P")~~

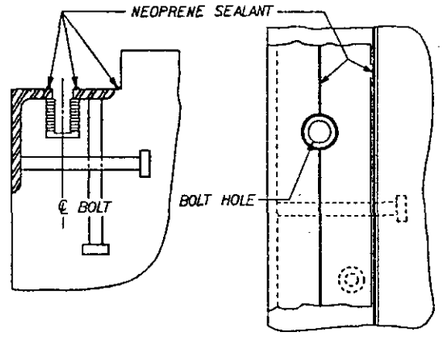


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1⅜" TO 1⅝" THICK BY 4⅛" TO 4¼" WIDE IN ORDER FOR THE JOINT TO BE SET TO THE PROPER DEPTH. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED METHOD OF HOLDING THE BASE ANGLE ASSEMBLY IN PLACE WHILE THE CONCRETE IS CAST AROUND IT. THE TEMPLATE SHALL BE FLUSH WITH THE TOP OF DECK.
3. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
4. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅜" IN DIAMETER WITH A HAND PUNCH.
5. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
6. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT.-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT.-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT.-LBS. AFTER SEVEN (7) DAYS.
7. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.



INSTALLATION SKETCH

GENERAL NOTES

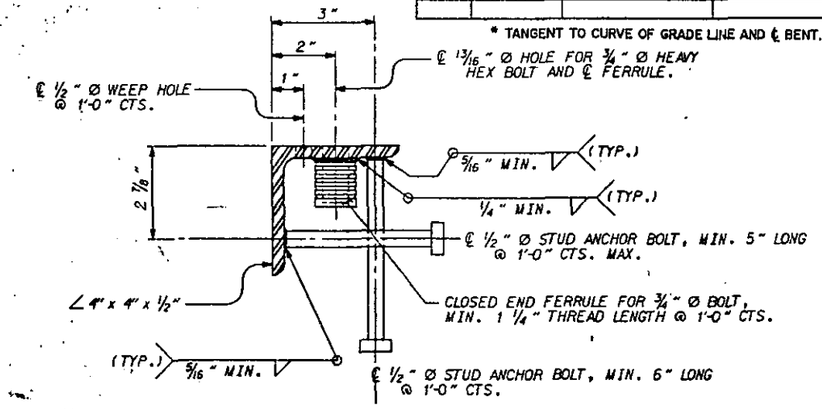
1. ARMORED JOINTS SHALL BE PROVIDED AT ALL LOCATIONS SHOWN ON THE PLANS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO TYPE 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A108, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT. GLAND SHALL BE EITHER ELASTIC POLYCHLOROPRENE (NEOPRENE) OR ETHYL PROPYLENE DIENE MONOMER (EPDM) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

	ASTM TEST	REQUIREMENTS
HARDNESS, DUROMETER-SHORE A	D2240	60±5, NEOPRENE (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED) 75±5, EPDM AND NEOPRENE (UPWARD NON-CORRUGATED SHAPE) 80±5, EPDM (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
TENSILE STRENGTH	D412	2000 PSI, MIN.
ELONGATION AT BREAK	D412	250% MIN.
THICKNESS OF UPTURNED PORTION OF GLAND	N/A	¼" (NON-CORRUGATED SHAPE) ⅛" (CORRUGATED SHAPE)

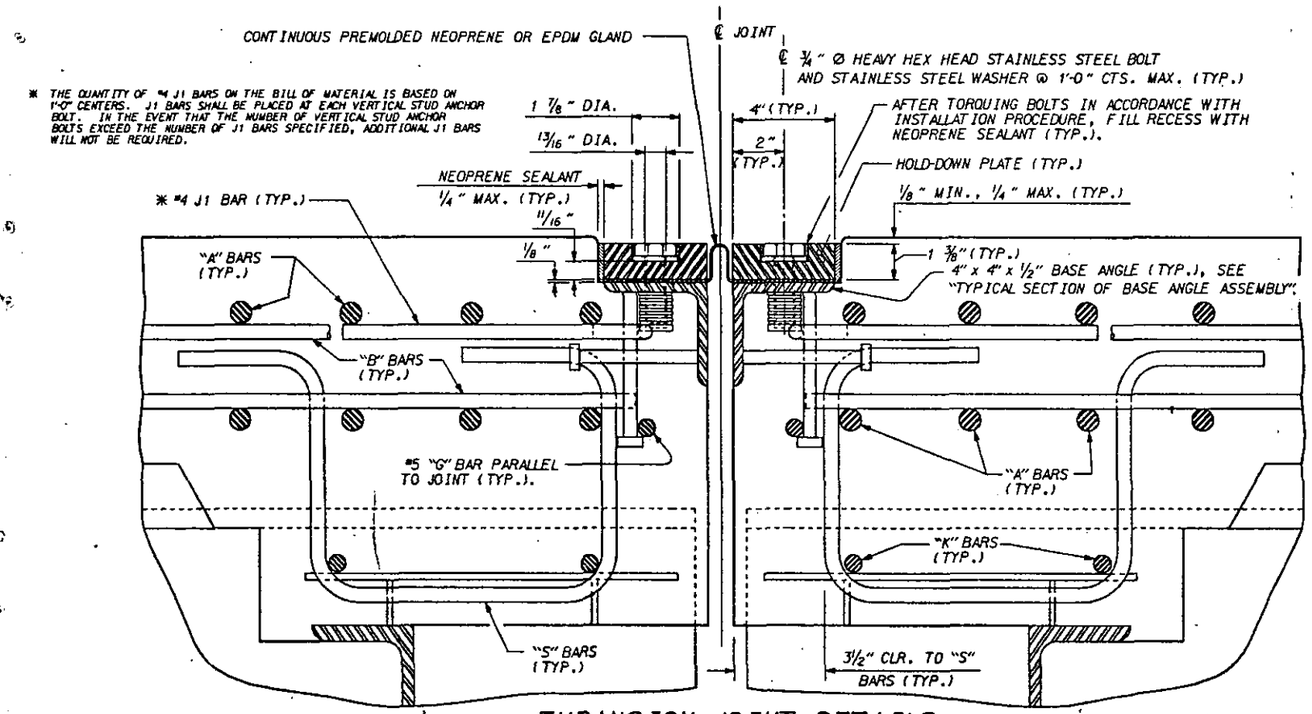
5. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
6. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO PAINTING.
7. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIALLY BLAST CLEANED AND SHALL BE PAINTED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS. EACH COAT SHALL HAVE A MINIMUM THICKNESS OF 3 MILS. PAINTED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR DAMAGED GALVANIZING.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. BASE ANGLE ASSEMBLIES SHALL BE SHIPPED IN 25' MINIMUM LENGTHS. FOR JOINTS REQUIRING BASE ANGLE ASSEMBLIES LONGER THAN 25', FIELD WELDING OF THE BASE ANGLE WILL BE PERMITTED. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. WHEN FIELD WELDING IS PROPOSED, THE CONTRACTOR SHALL SUBMIT PROPOSED WELDING DETAILS FOR APPROVAL. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF ⅛" AND A MAXIMUM OF ¼" BELOW THE TOP OF SLAB.
10. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
11. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
12. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.

MOVEMENT AND SETTING AT JOINT					
BENT NO.	* SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
2	94°-00'-29.5"	1¾"	2 3/8"	1 7/8"	1 5/8"

* TANGENT TO CURVE OF GRADE LINE AND ℄ BENT.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

ASSEMBLED BY : RLF	DATE : MARCH '89	SPECIAL	
CHECKED BY : CLN	DATE : MARCH '89		
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87	STANDARD	
CHECKED BY : CINDY R. KING	DATE : 10-2-87		

PROJECT NO. G.C.78006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

SHEET 1 OF

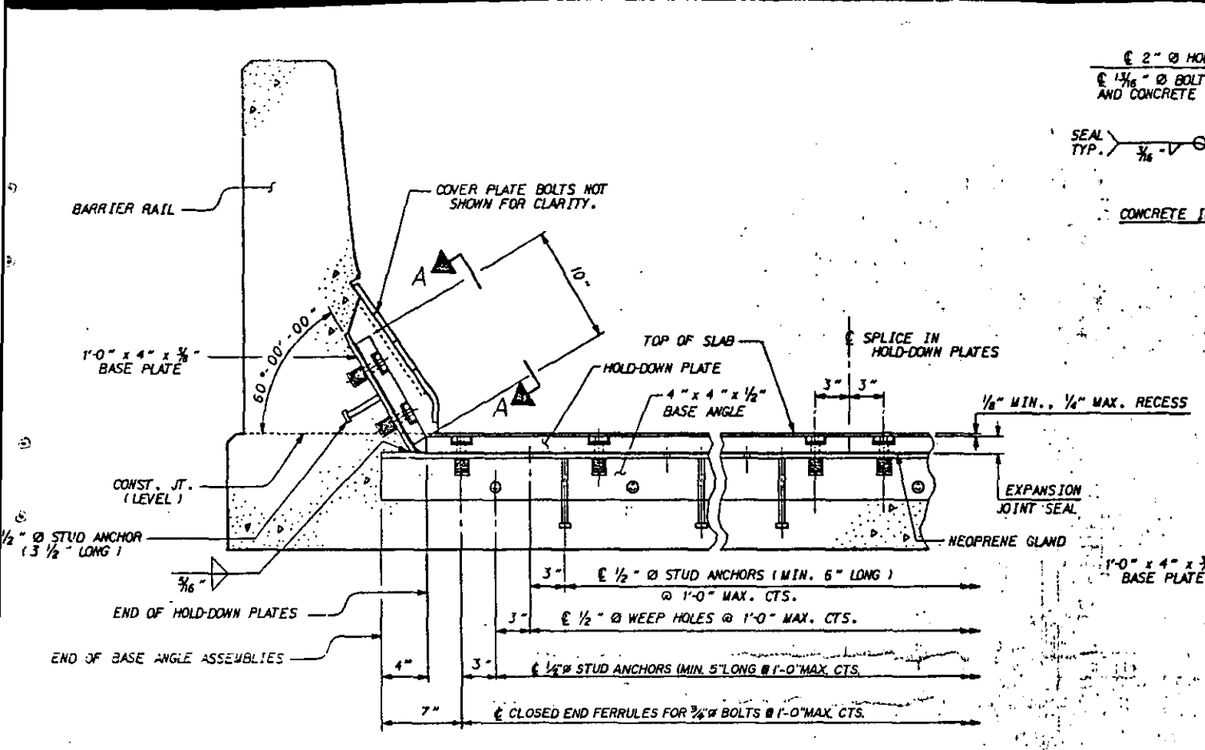
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

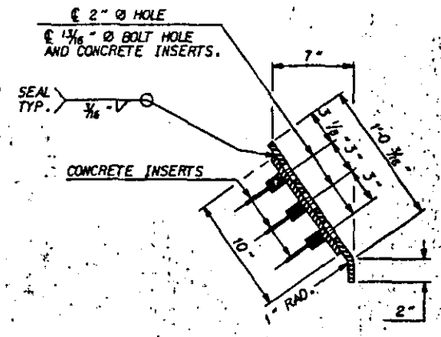
EXPANSION JOINT SEAL DETAILS

FEBRUARY 1988

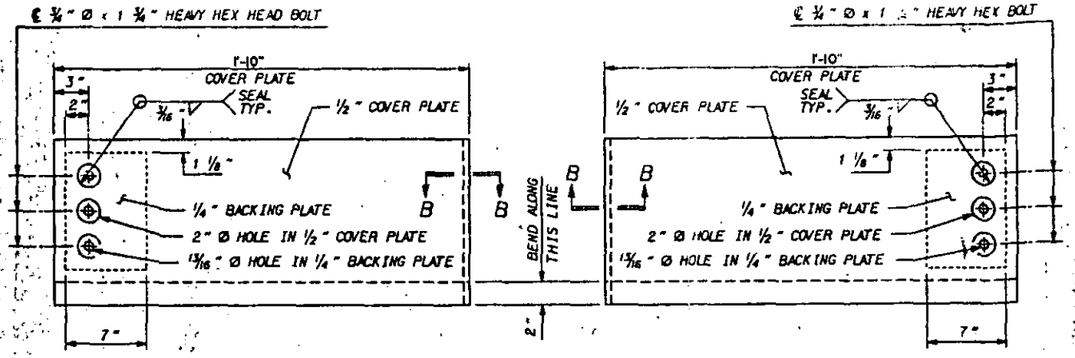
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-60
1			3			TOTAL SHEETS
2			4			130



SECTION THRU RAIL NORMAL TO JOINT



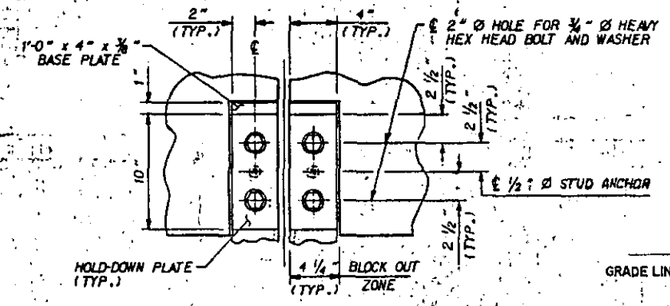
END VIEW



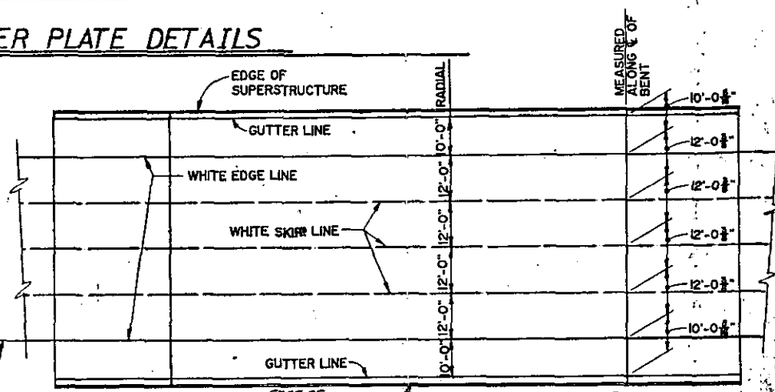
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

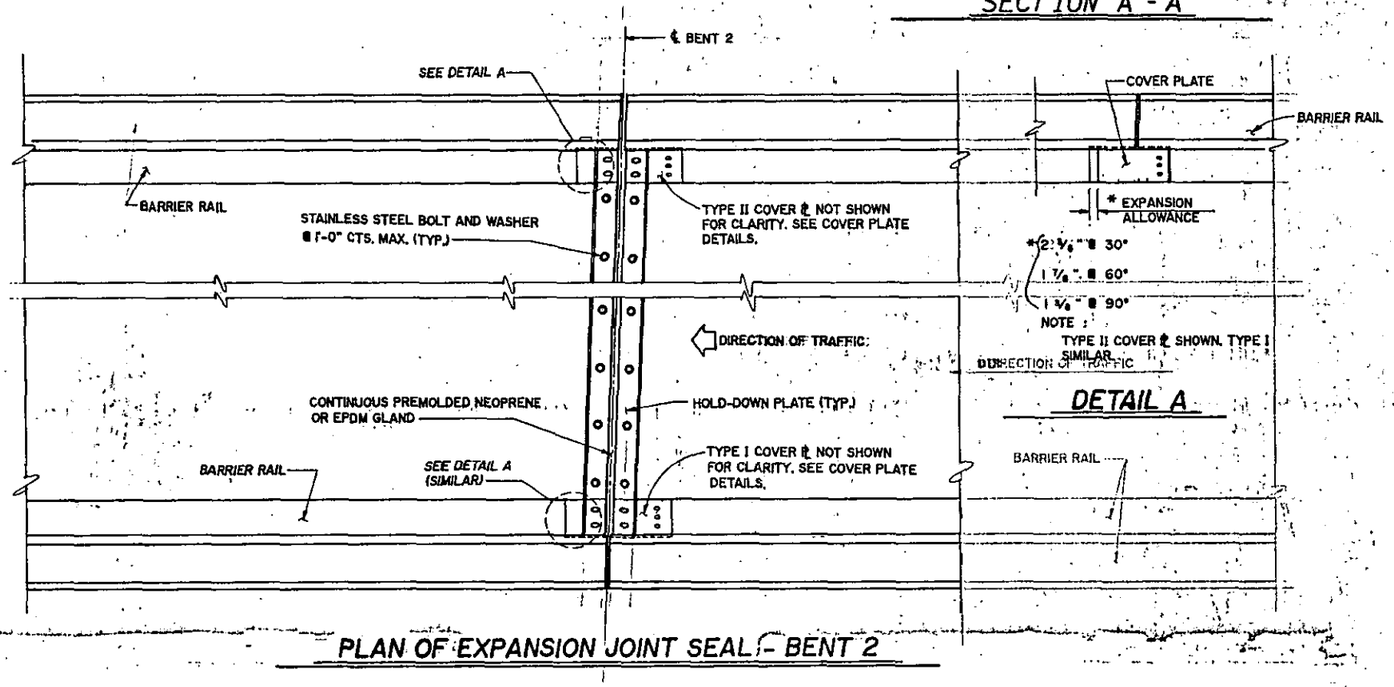
COVER PLATE DETAILS



SECTION A - A

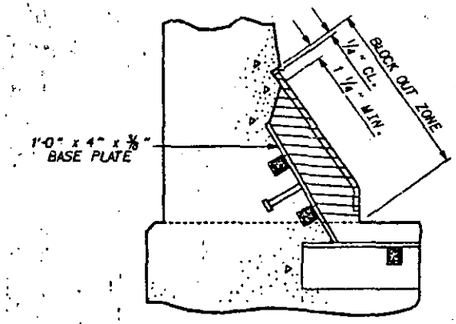


PAVEMENT MARKING ALIGNMENT



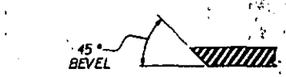
PLAN OF EXPANSION JOINT SEAL - BENT 2

DETAIL A

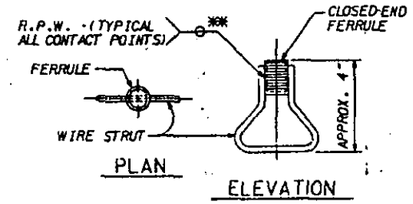


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

ASSEMBLED BY : RLF	DATE : MAR.'89			SPECIAL
CHECKED BY : CLN	DATE : MAR.'89			
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87			STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87			

PROJECT NO. 6.678006.T.

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

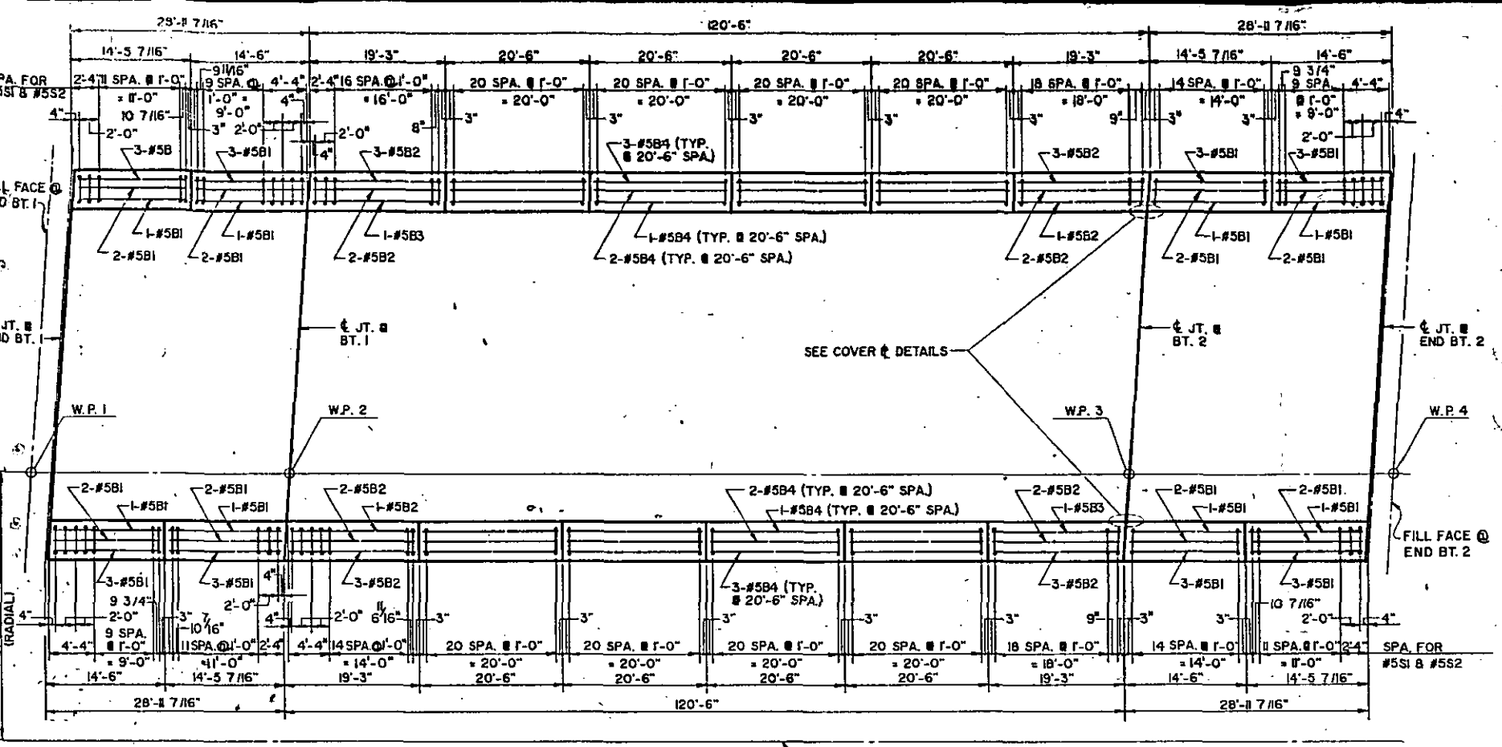
SHEET 2 OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS 130
2			4			



NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

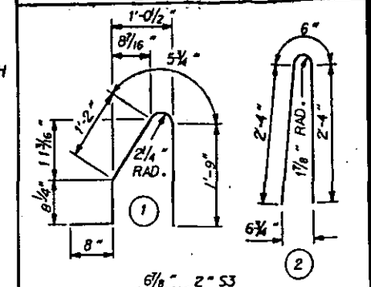
WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #S3 THRU #S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED BOLTS/DOWELS, SEE SPECIAL PROVISIONS. TESTING FOR ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BAR TYPES

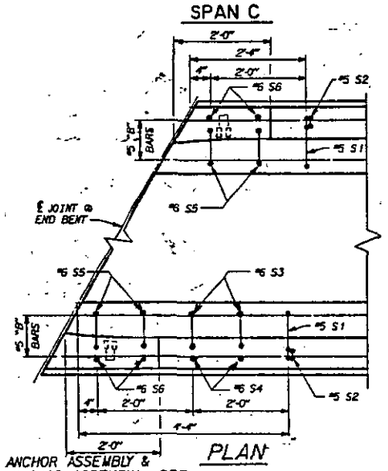


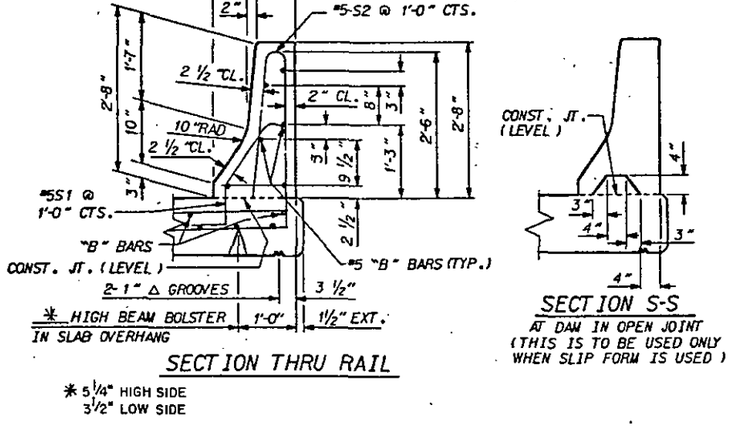
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	344	#5	1	4'-9"	1704
S2	344	#5	2	5'-2"	1854
S3	16	#6	3	2'-9"	66
S4	16	#6	STR.	2'-7"	62
S5	8	#6	3	2'-5"	29
S6	8	#6	STR.	2'-2"	26
B1	48	#5	STR.	14'-Γ	705
B2	22	#5	STR.	18'-10"	432
B3	2	#5	STR.	18'-11"	39
B4	48	#5	STR.	20'-2"	1010
EPOXY COATED REINFORCING STEEL				5927	LBS.
CLASS A-A CONCRETE				32.7	CU. YDS.
CONCRETE BARRIER RAIL				356.81	LIN. FT.



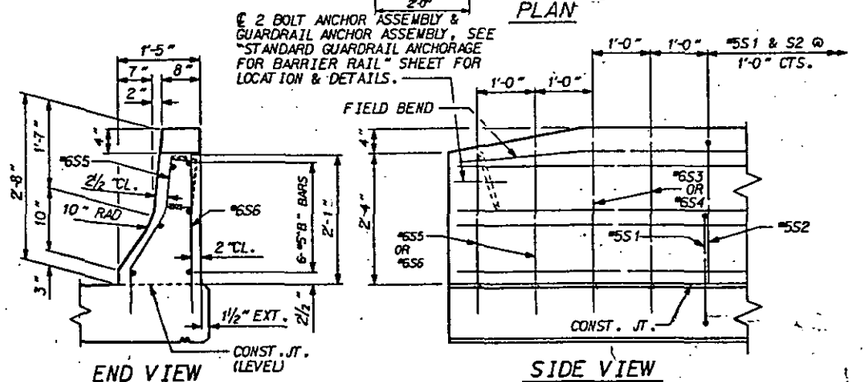


SECTION THRU RAIL

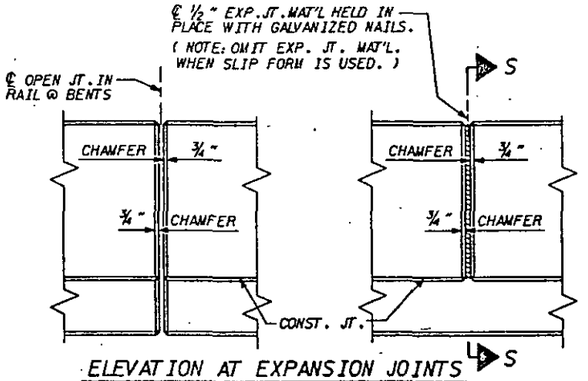
✱ 5¼" HIGH SIDE
3½" LOW SIDE

SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

℄ 2 BOLT ANCHOR ASSEMBLY & GUARDRAIL ANCHOR ASSEMBLY, SEE "STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET FOR LOCATION & DETAILS.



BARRIER RAIL-END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. G.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

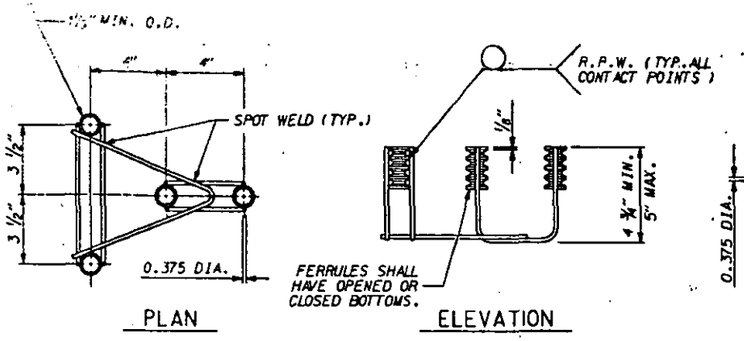
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

OCTOBER 1987

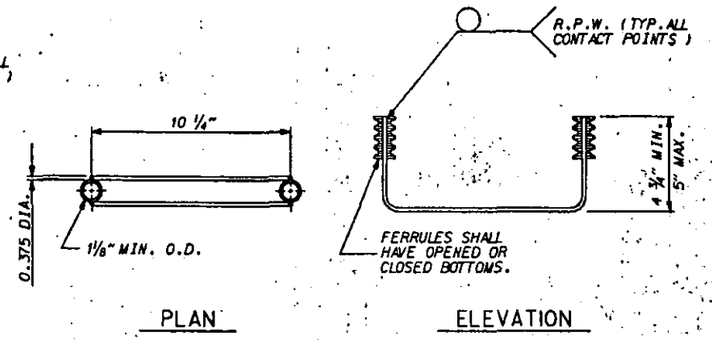
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			12.0

ASSEMBLED BY : MDM	DATE : 2/89		SPECIAL
CHECKED BY : CLN	DATE : 2/89		
DRAWN BY : R. BISSETTE	DATE : 5/28/87		STANDARD
S. L. DAVIS	DATE : 9/13/87		



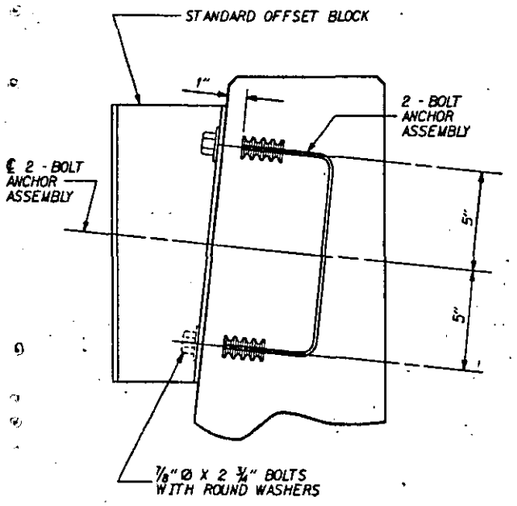
PLAN ELEVATION

GUARDRAIL ANCHOR ASSEMBLY

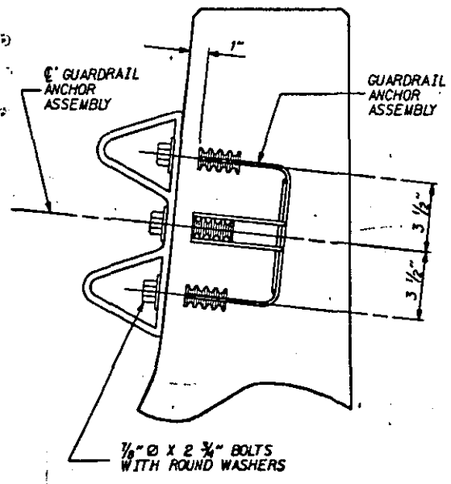


PLAN ELEVATION

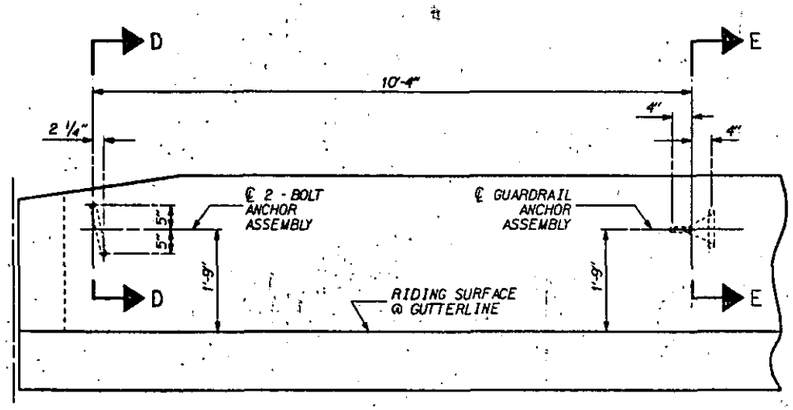
2 - BOLT ANCHOR ASSEMBLY



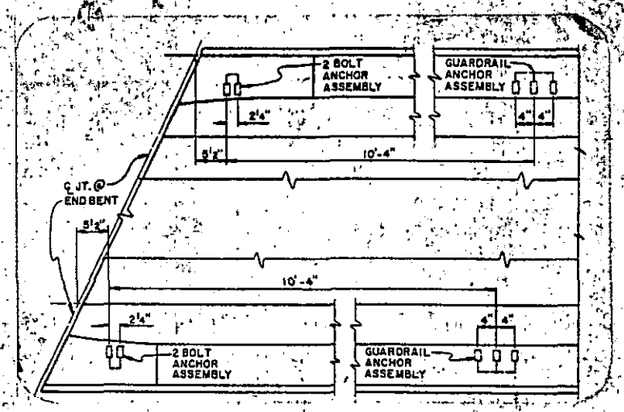
SECTION D-D



SECTION E-E



ELEVATION



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1½".

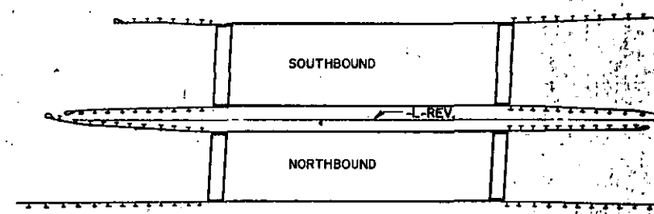
B. 4 - ⅞"Ø X 2 ¾" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2 - ⅞"Ø X 2 ¾" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞"Ø X 2 ¾" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



NOTE: PROVIDE GUARDRAIL CONNECTIONS AT 4 CORNERS SHOWN.

SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			12

ASSEMBLED BY : MDM	DATE : 2/89	SPECIAL
CHECKED BY : CLN	DATE : 2/89	
DRAWN BY : MIKE BRITT	DATE : DEC. 1987	STANDARD
CHECKED BY : RANDY BISSETTE	DATE : DEC. 1987	

REINFORCING BAR SCHEDULE

SPAN A

R	NO.	SIZE	TYPE	LENGTH	WEIGHT
	4	6	STR.	9'- 0"	54
	2	6	STR.	13'- 6"	41
	2	6	STR.	21'-10"	66
	2	6	STR.	30'- 0"	90
	2	6	STR.	38'- 2"	115
	4	6	STR.	24'- 2"	145
	4	6	STR.	28'- 3"	170
	4	6	STR.	32'- 4"	194
	76	6	STR.	36'- 4"	4148
	4	6	STR.	9'- 0"	54
	2	6	STR.	13'- 6"	41
	2	6	STR.	21'-10"	66
	2	6	STR.	30'- 0"	90
	2	6	STR.	38'- 2"	115
	4	6	STR.	24'- 2"	145
	4	6	STR.	28'- 3"	170
	4	6	STR.	32'- 4"	194
	76	6	STR.	36'- 4"	4148
	50	4	STR.	28'- 6"	952
	80	5	STR.	28'- 6"	2378
D	6	4	STR.	28'- 6"	114
	4	5	STR.	36'- 3"	151
	8	5		5'- 5"	45
	28	5		7'- 2"	209
	32	5	STR.	7'- 8"	256
	112	4		3'- 5"	256
	y Coated Reinforcing				
	Epoxy Coated Reinforcing			-LBS-	6636
	Reinforcing Steel			-LBS-	7771

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	4	6	STR.	9'- 0"	54
*A2	2	6	STR.	13'- 6"	41
*A3	2	6	STR.	21'-10"	66
*A4	2	6	STR.	30'- 0"	90
*A5	2	6	STR.	38'- 2"	115
*A6	4	6	STR.	24'- 2"	145
*A7	4	6	STR.	28'- 3"	170
*A8	4	6	STR.	32'- 4"	194
*A9	370	6	STR.	36'- 4"	20,192
A10	4	6	STR.	9'- 0"	54
A11	2	6	STR.	13'- 6"	41
A12	2	6	STR.	21'-10"	66
A13	2	6	STR.	30'- 0"	90
A14	2	6	STR.	38'- 2"	115
A15	4	6	STR.	24'- 2"	145
A16	4	6	STR.	28'- 3"	170
A17	4	6	STR.	32'- 4"	194
A18	370	6	STR.	36'- 4"	20,192
*B14	250	4	STR.	25'- 0"	4,175
B15	240	5	STR.	41'- 0"	10,263
B16	30	4	STR.	25'- 0"	501
*G1	4	5	STR.	36'- 3"	151
*K1	8	5	1	5'- 5"	45
*K2	28	5	2	7'- 2"	209
K3	32	5	STR.	7'- 8"	256
*S2	112	4	3	4'- 6"	318
*J1	71	4	4	1'- 6"	71
*Epoxy Coated Reinforcing					
Total Epoxy Coated Reinforcing				-LBS-	26,035
Total Reinforcing Steel				-LBS-	32,087

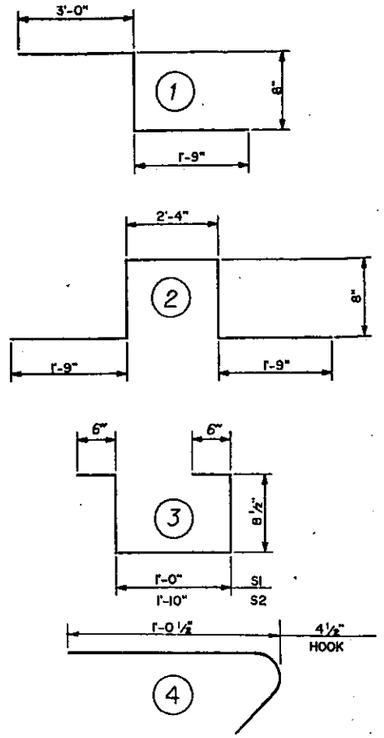
SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	2	6	STR.	9'- 0"	27
*A2	2	6	STR.	13'- 6"	41
*A3	2	6	STR.	21'-10"	66
*A4	2	6	STR.	30'- 0"	90
*A5	2	6	STR.	38'- 2"	115
*A6	4	6	STR.	24'- 2"	145
*A7	4	6	STR.	28'- 3"	170
*A8	4	6	STR.	32'- 4"	194
*A9	78	6	STR.	36'- 4"	4,257
A10	2	6	STR.	9'- 0"	27
A11	2	6	STR.	13'- 6"	41
A12	2	6	STR.	21'-10"	66
A13	2	6	STR.	30'- 0"	90
A14	2	6	STR.	38'- 2"	115
A15	4	6	STR.	24'- 2"	145
A16	4	6	STR.	28'- 3"	170
A17	4	6	STR.	32'- 4"	194
A18	78	6	STR.	36'- 4"	4,257
*B1	50	4	STR.	28'- 6"	952
B2	80	5	STR.	28'- 6"	2,378
B3	6	4	STR.	28'- 6"	114
*G1	4	5	STR.	36'- 3"	151
*K1	8	5	1	5'- 5"	45
*K2	28	5	2	7'- 2"	209
K3	32	5	STR.	7'- 8"	256
*S1	12	4	3	3'- 5"	256
*J1	71	4	4	1'- 6"	71
*Epoxy Coated Reinforcing					
Total Epoxy Coated Reinforcing				-LBS-	6,783
Total Reinforcing Steel				-LBS-	7,853

SPAN

SPAN

BAR TYPES



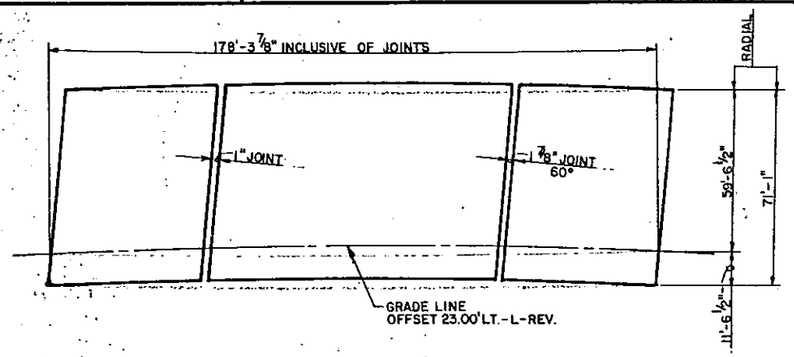
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPAN "A"	65.9	7,771	6,636
SPAN "B"	264.5	32,087	26,035
SPAN "C"	66.0	7,853	6,783
TOTALS**	369.4	47,711	39,454

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 12,677)

PROJECT NO. 6.6780001

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

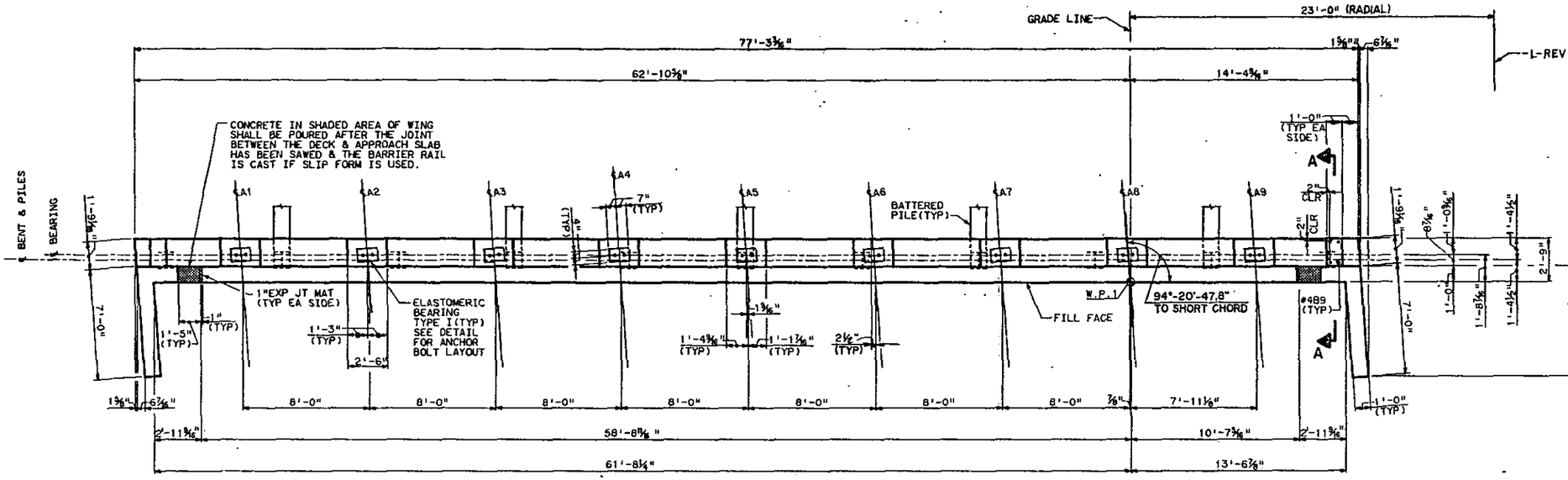
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL

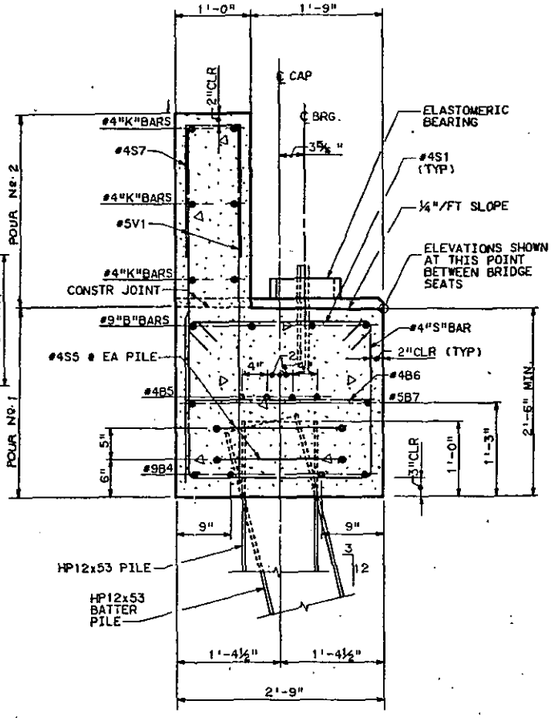
OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			130

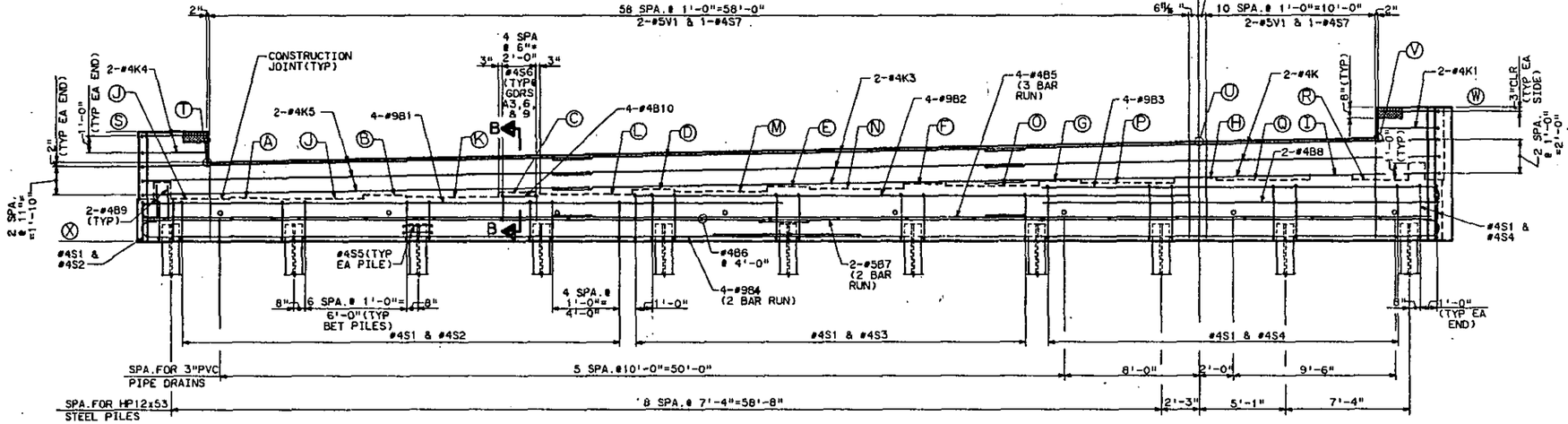
EMBLED BY : RLF/LSJ DATE MAR. '89
CKED BY : CLN DATE MAR. '89
WN BY : M. BRITT DATE : 5/28/87
ER BY : S.J. DAVIS DATE : 9/3/87



PLAN
LOOKING AHEAD



SECTION THRU CAP



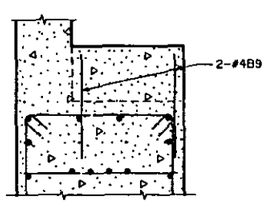
ELEVATION

NOTES :

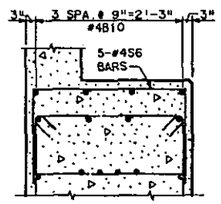
FOR PIPE DRAIN DETAILS & PILE SPLICE DETAILS SEE END BENT 1 DETAILS SHEET.

FOR TEMPORARY DRAINAGE AT END BENT SEE END BENT 2 DETAILS SHEET.

ELEVATION TABLE					
A	645.735	K	645.775	U	649.050
B	645.900	L	645.941	V	649.257
C	646.066	M	646.106	W	651.091
D	646.231	N	646.272	X	643.110
E	646.397	O	646.437		
F	646.562	P	646.603		
G	646.728	Q	646.768		
H	646.893	R	646.934		
I	647.059	S	649.680		
J	645.610	T	647.847		



SECTION A-A



SECTION B-B

END BENT NOTES

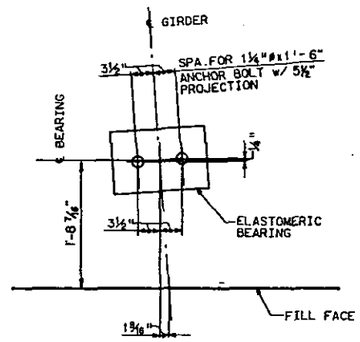
REINFORCING STEEL SHALL HAVE 2"COVERING UNLESS OTHERWISE NOTED.

EPOXY PROTECTIVE COATING SHALL BE APPLIED TO COAT ALL EXPOSED SURFACE AREAS OF THE TOP OF CAP, INCLUDING BUILDUPS AND CHAMFERS. THE AREA UNDER THE ELASTOMERIC BEARING SHALL NOT BE COATED, SEE SPECIAL PROVISIONS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS EACH.



ANCHOR BOLT LAYOUT DETAIL

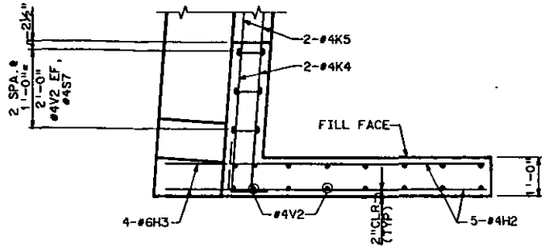
PROJECT NO. G.678006 T
MECKLENBURG COUNTY
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

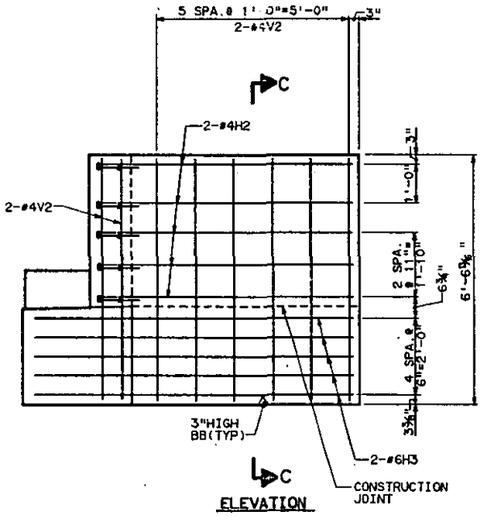
SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO. 5-65
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 130
2			4			

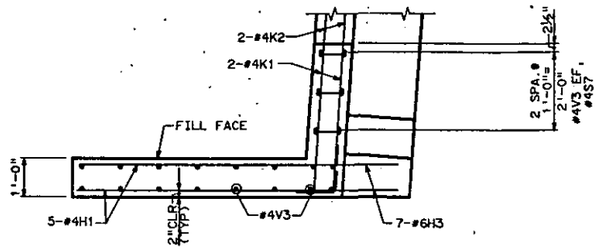
DRAWN BY LSJ DATE 2/89
CHECKED BY GRB DATE 2/89



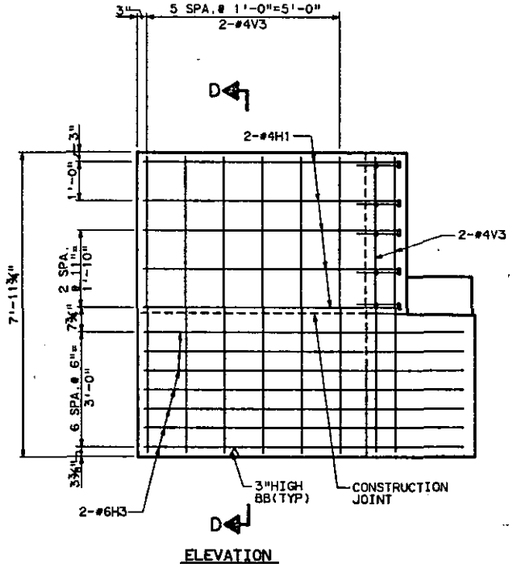
PLAN



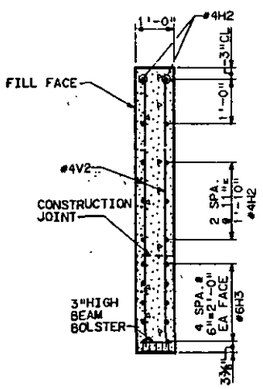
LEFT WING



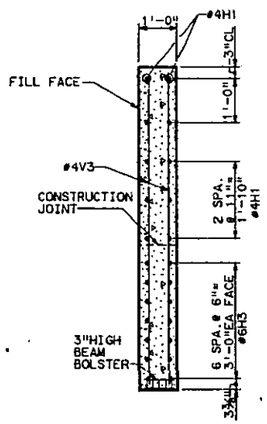
PLAN



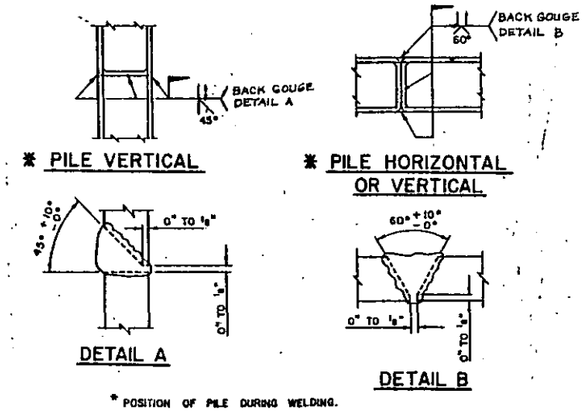
RIGHT WING



SECTION C-C



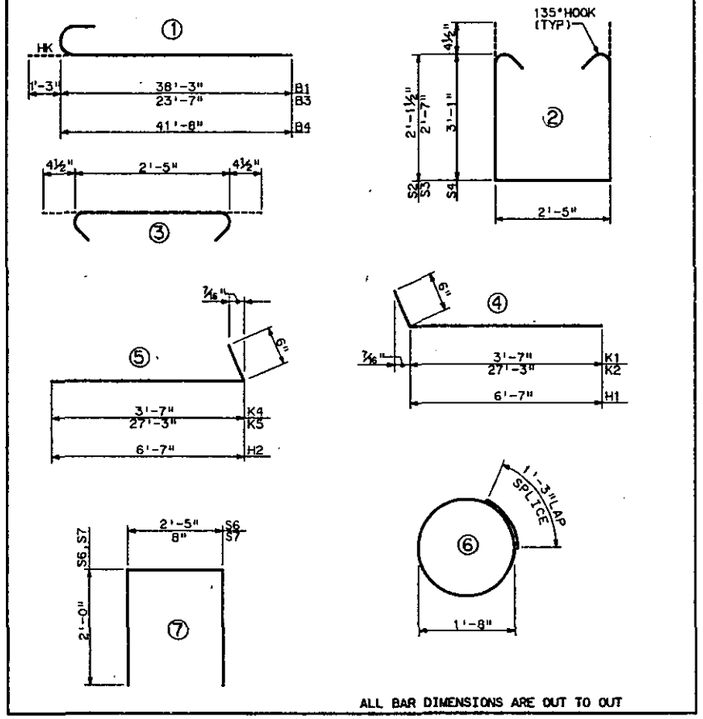
SECTION D-D



* POSITION OF PILE DURING WELDING.

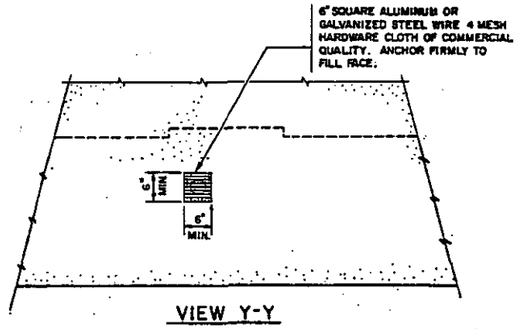
PILE SPLICE DETAILS

BAR TYPES



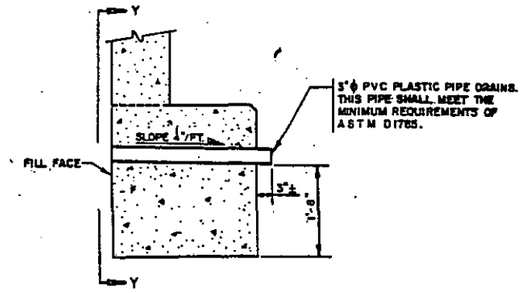
ALL BAR DIMENSIONS ARE OUT TO OUT

END BENT # 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	39'- 6"	537
B2	4	9	STR.	32'- 9"	445
B3	4	9	1	24'-10"	338
B4	8	9	1	42'-11"	1,167
B5	12	4	STR.	27'- 4"	219
B6	19	4	STR.	2'- 5"	31
B7	4	5	STR.	40'- 0"	167
B8	2	4	STR.	17'- 3"	23
B9	8	4	STR.	2'- 0"	11
B10	12	4	STR.	2'- 2"	17
K1	4	4	4	4'- 1"	11
K2	6	4	4	27'- 9"	111
K3	6	4	STR.	27'- 4"	110
K4	4	4	5	4'- 1"	11
K5	6	4	5	27'- 9"	111
S1	74	4	3	3'- 2"	157
S2	28	4	2	7'- 5"	139
S3	23	4	2	8'- 4"	128
S4	23	4	2	9'- 4"	143
S5	22	4	6	6'- 6"	96
S6	15	4	7	6'- 5"	64
S7	76	4	7	4'- 8"	237
V1	140	5	STR.	4'- 3"	621
V2	22	4	STR.	6'- 1"	89
V3	22	4	STR.	7'- 6"	110
H1	10	4	4	7'- 1"	47
H2	10	4	5	7'- 1"	47
H3	24	6	STR.	8'- 4"	300
Total Reinforcing Steel -LBS- 5,487					
Class A Concrete					35.1 CY
Pour NO. 1					26.3 CY
Pour NO. 2					8.8 CY
HP 12x53 Steel Piles					
		NO.		11	
		L.F.		305	



VIEW Y-Y

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 BID FOR THE SEVERAL PAY ITEMS.



SECTION THRU CAP

PIPE DRAIN DETAILS

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

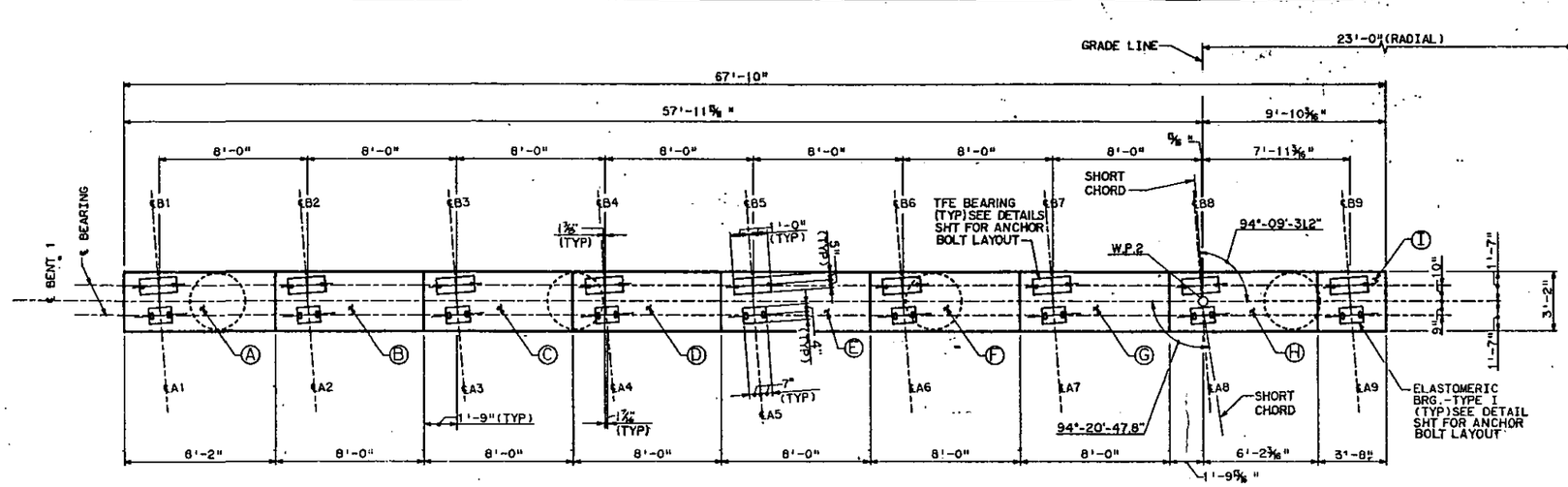
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

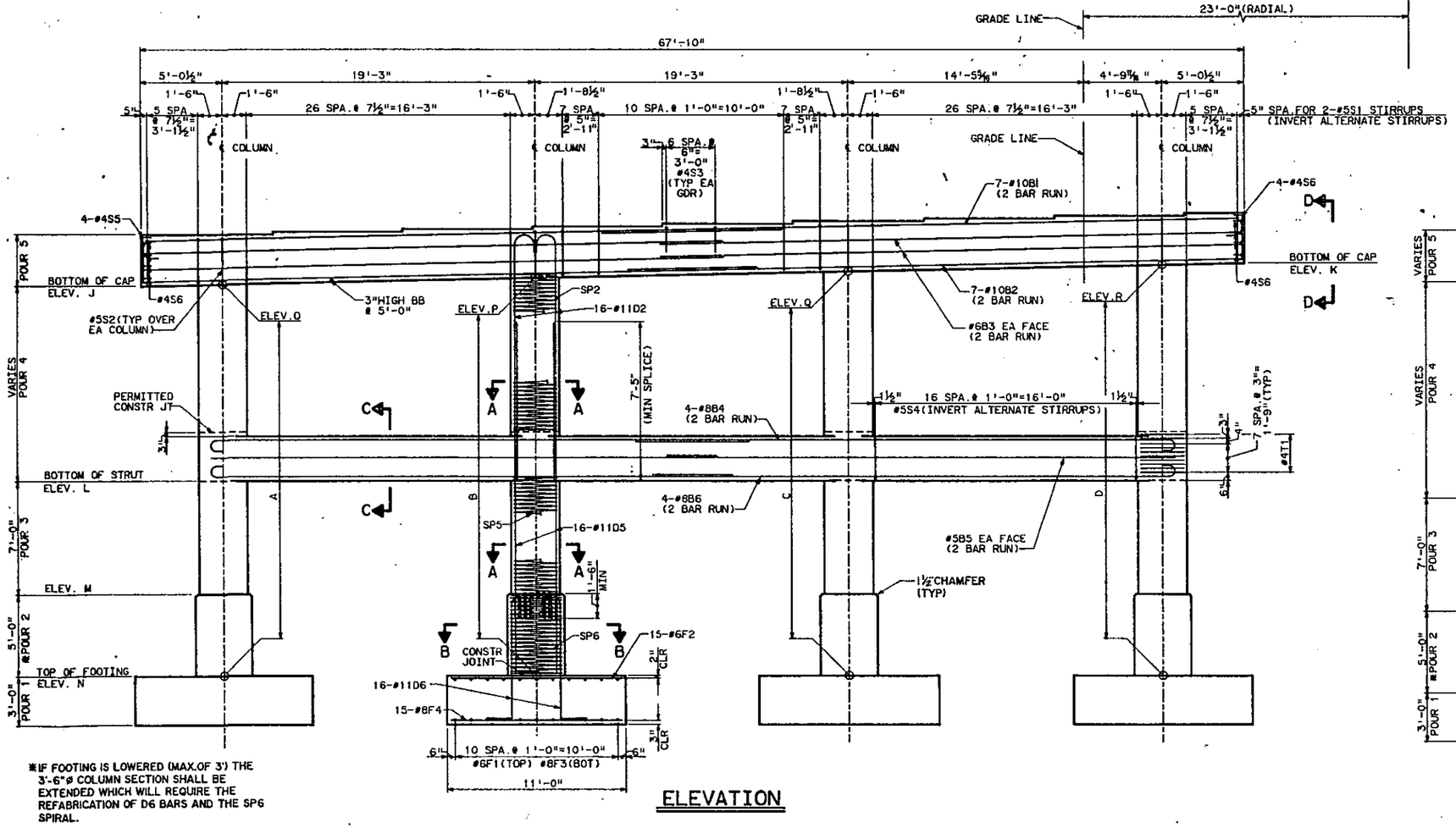
SUBSTRUCTURE
END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-6d
1			3			TOTAL SHEETS
2			4			13

DRAWN BY LSJ DATE 2/89
CHKD BY CLN DATE 2/89

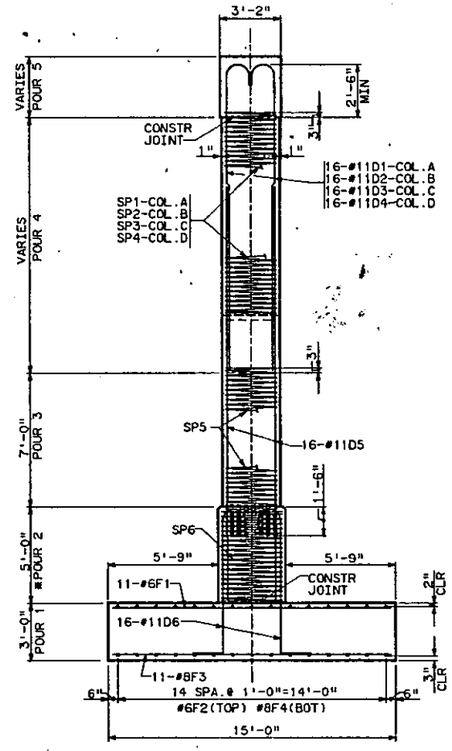


PLAN
LOOKING AHEAD



ELEVATION

*IF FOOTING IS LOWERED (MAX.OF 3') THE 3'-6"ø COLUMN SECTION SHALL BE EXTENDED WHICH WILL REQUIRE THE REFABRICATION OF D6 BARS AND THE SP6 SPIRAL.



END ELEVATION

ELEVATION TABLE			
A	643.060	K	641.298
B	643.226	L	628.000
C	643.392	M	621.000
D	643.558	N	616.000
E	643.724	O	639.994
F	643.890	P	640.394
G	644.056	Q	640.793
H	644.222	R	641.193
I	644.388		
J	639.889		

COLUMN HEIGHTS	
	BENT 1
A	23'-11⅝"
B	24'-4¾"
C	24'-9½"
D	25'-2⅜"

BENT NOTES

REINFORCING STEEL IN THE CAP MAY BE SHIFTED SLIGHTLY AS REQUIRED TO CLEAR ANCHOR BOLTS.

REINFORCING STEEL SHALL HAVE 2"COVER AND FOOTING REINFORCEMENT SHALL HAVE 3"COVER UNLESS OTHERWISE NOTED.

THE TOP SURFACE OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

COMPUTED FOUNDATION LOAD FOR SPREAD FOOTINGS EQUALS 3.75 TONS/SQ.FT

FOR BAR LIST AND QUANTITIES SEE DETAIL SHEET.

FOR PIPE INSERT SEE THE TFE BEARING DETAILS SHEET.

HOOKS ON "D"BARS MAY BE TURNED AS NECESSARY TO CLEAR REINFORCING STEEL IN CAP.

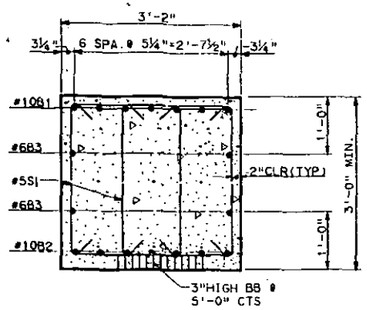
DRAWN BY LSJ DATE 2789
CHECKED BY CLN DATE 2789

PROJECT NO. 6.676006T
MECKLENBURG COUNTY
STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

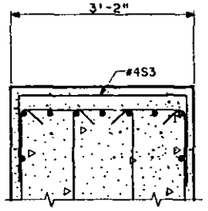
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

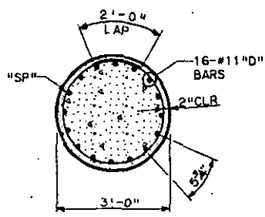
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	367
1			3			TOTAL SHEETS
2			4			458



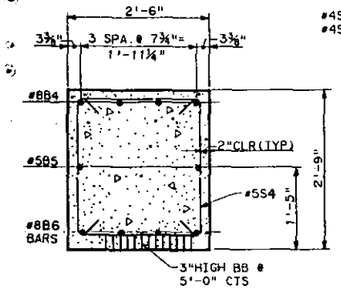
SECTION THRU CAP



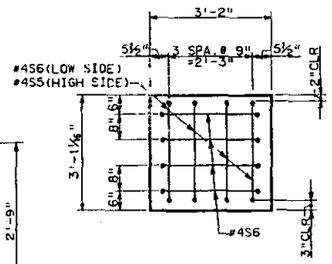
SECTION THRU BEARING



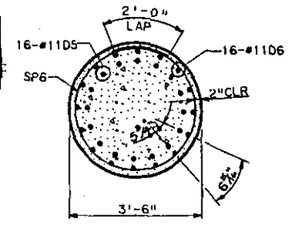
SECTION A-A



SECTION C-C

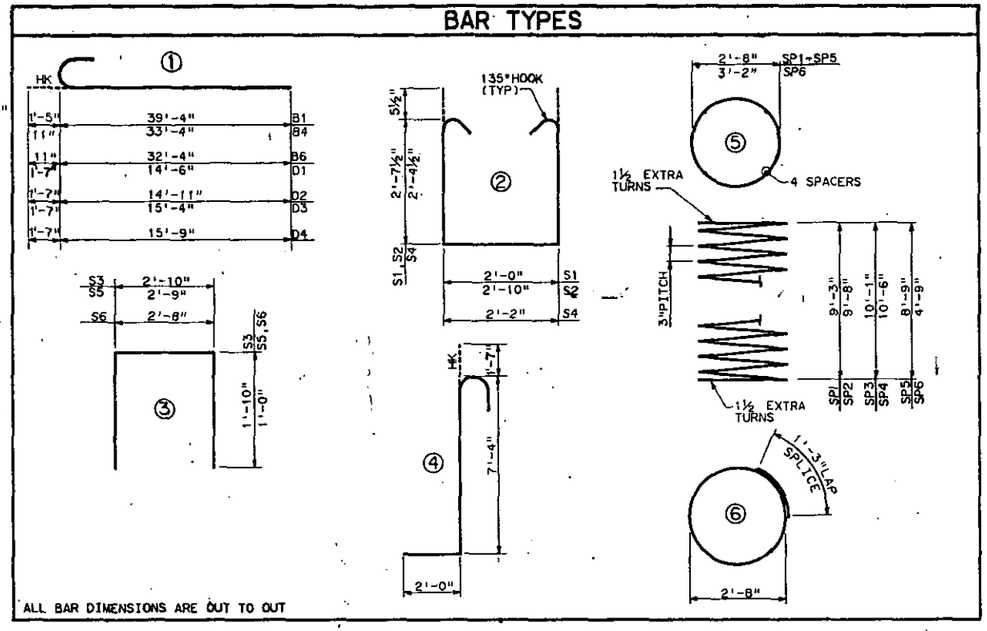


ELEVATION D-D



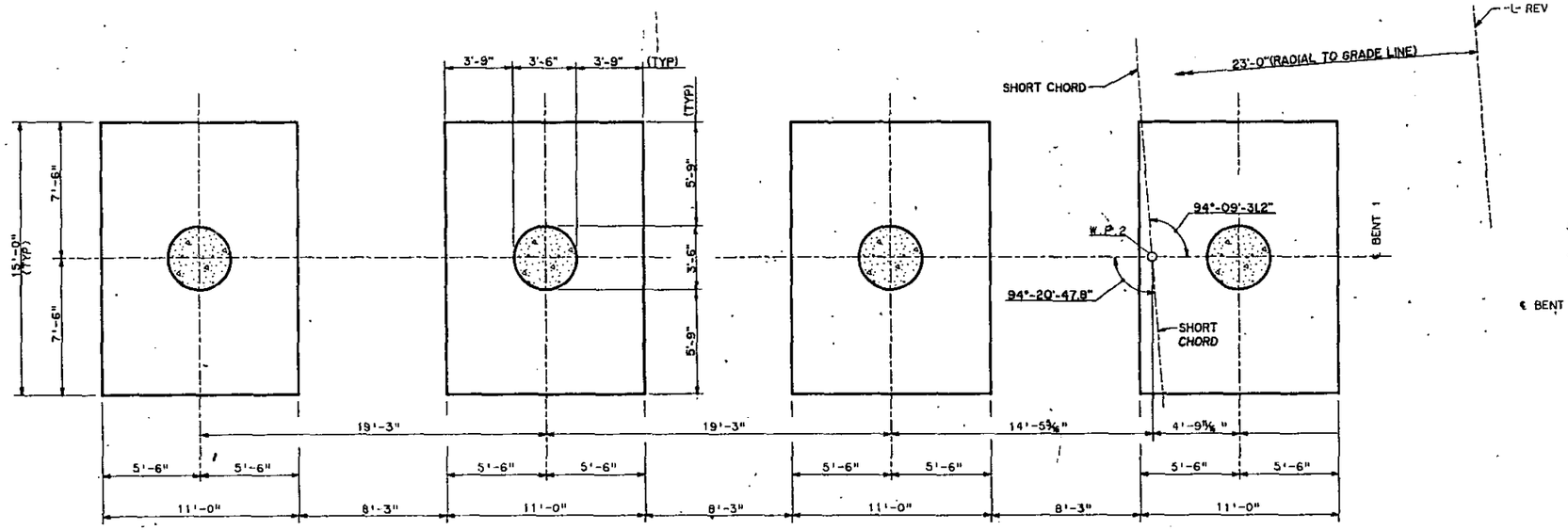
SECTION B-B

BAR TYPES

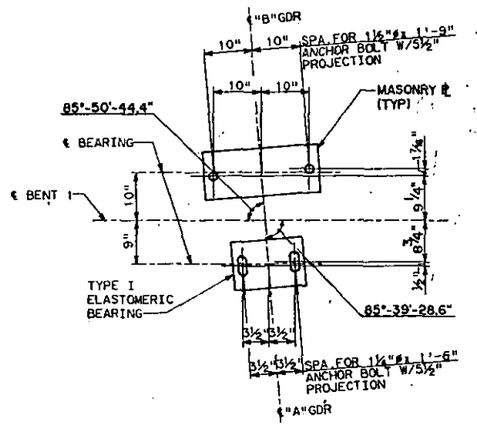


ALL BAR DIMENSIONS ARE OUT TO OUT

BENT # 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
F1	44	6	STR.	14'- 6"	958
F2	60	6	STR.	10'- 6"	946
F3	44	8	STR.	14'- 6"	1,703
F4	60	8	STR.	10'- 6"	1,682
D1	16	11	1	16'- 1"	1,367
D2	16	11	1	16'- 6"	1,403
D3	16	11	1	16'-11"	1,438
D4	16	11	1	17'- 4"	1,473
D5	64	11	STR.	22'- 5"	7,622
D6	64	11	4	10'-11"	3,712
B1	14	10	1	40'- 9"	2,455
B2	14	10	STR.	37'- 9"	2,274
B3	8	6	STR.	35'- 9"	430
B4	8	8	1	34'- 3"	732
B5	4	5	STR.	31' 2"	130
B6	8	8	1	33'- 3"	710
S1	182	5	2	8'- 2"	1,550
S2	4	5	2	9'- 0"	38
S3	673	4	3	6'- 6"	274
S4	51	5	2	7'-10"	417
S5	4	4	3	4'- 9"	13
S6	12	4	3	4'-8"	37
T1	40	4	6	9'- 8"	258
SP1	1	4	5	330'- 0"	220
SP2	1	4	5	343'-10"	230
SP3	1	4	5	357'- 7"	239
SP4	1	4	5	371'- 4"	248
SP5	4	4	5	313'- 7"	838
SP6	4	4	5	216'- 1"	577
Reinforcing Steel				-LBS-	31,622
Spiral Column Reinforced Steel				-LBS-	2,352
Class A Concrete Break Down					
Pour # 1				-C.Y.-	73.1
Pour # 2				-C.Y.-	7.1
Pour # 3				-C.Y.-	7.3
Pour # 4				-C.Y.-	25.6
Pour # 5				-C.Y.-	24.6
Total				-C.Y.-	137.9
Foundation Excavation				-C.Y.-	600



PLAN OF FOOTINGS



ANCHOR BOLT LAYOUT
DETAIL-BENT 1

PROJECT NO. G.G78006T

MECKLENBURG COUNTY

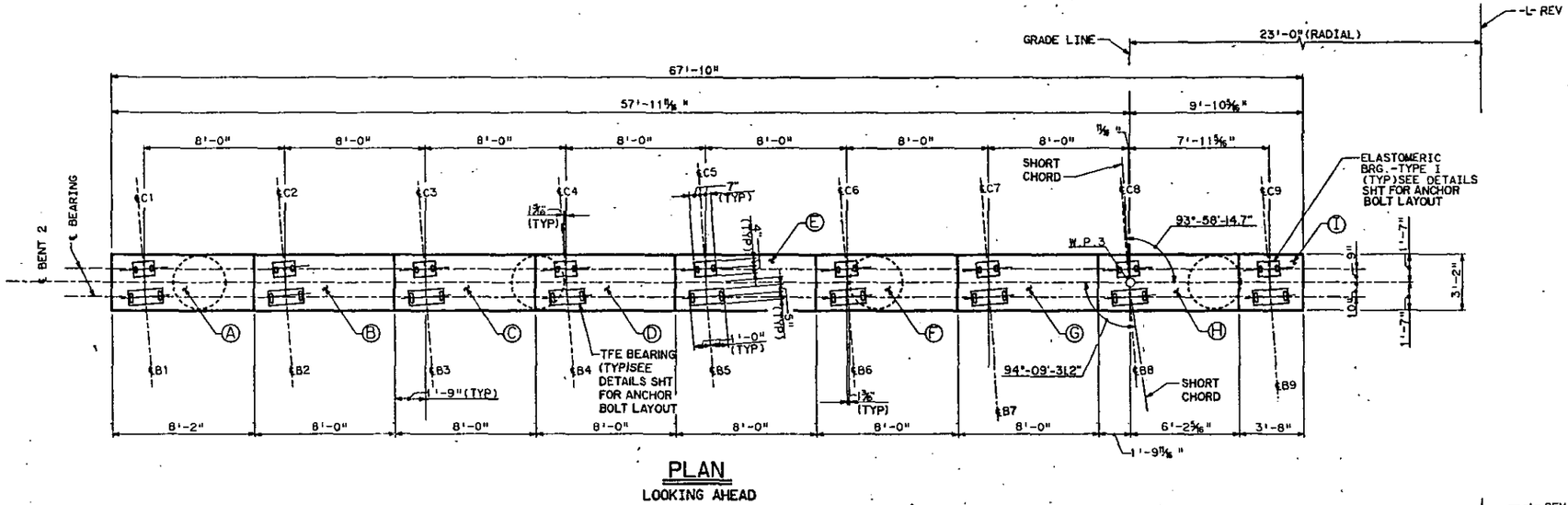
STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-28
1			3			TOTAL SHEETS
2			4			137

DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89

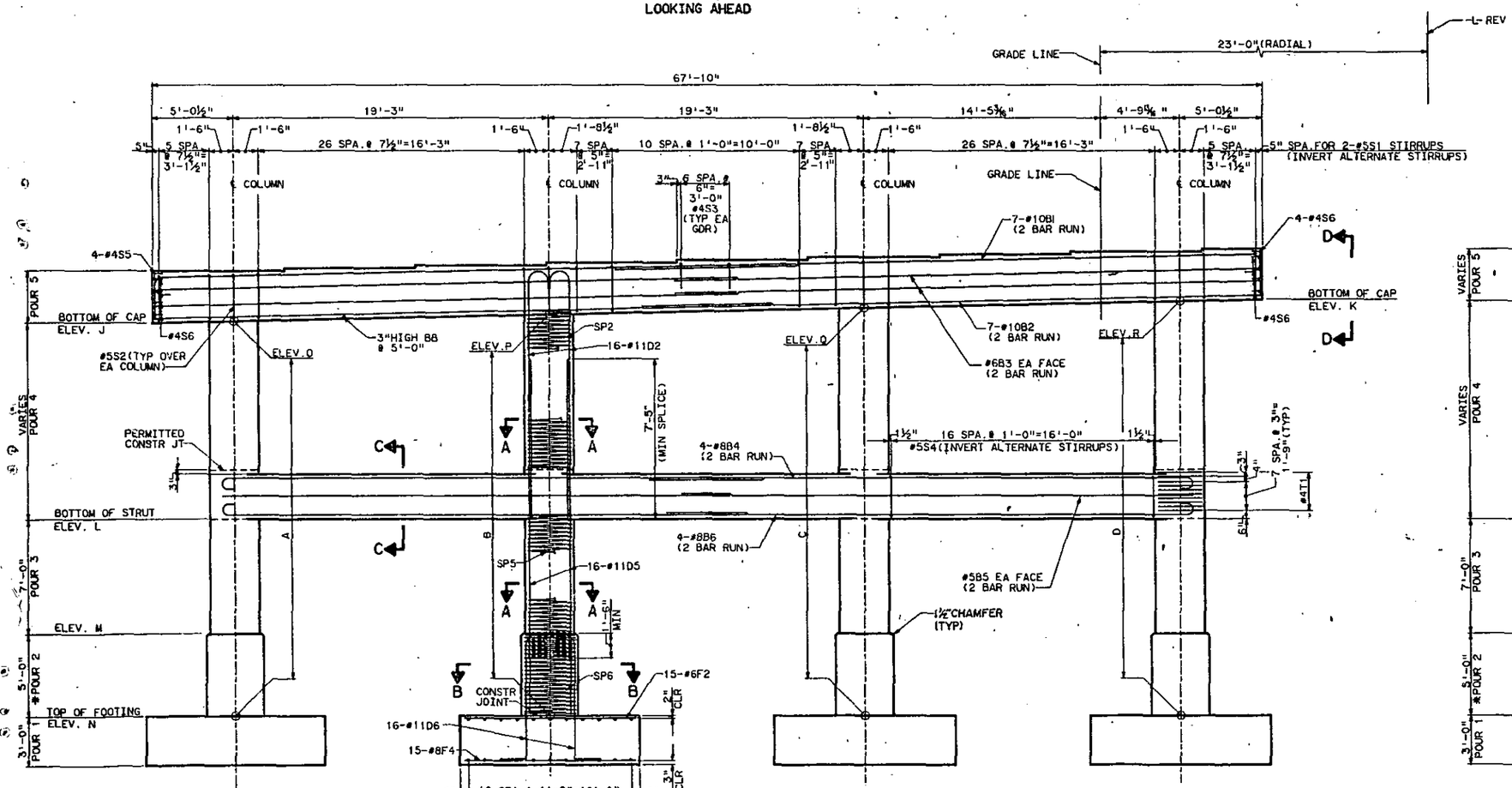


PLAN
LOOKING AHEAD

ELEVATION TABLE			
A	642.736	K	640.990
B	642.904	L	628.000
C	643.072	M	621.000
D	643.240	N	616.000
E	643.408	O	639.671
F	643.576	P	640.075
G	643.744	Q	640.480
H	643.912	R	640.684
I	644.080		
J	639.565		

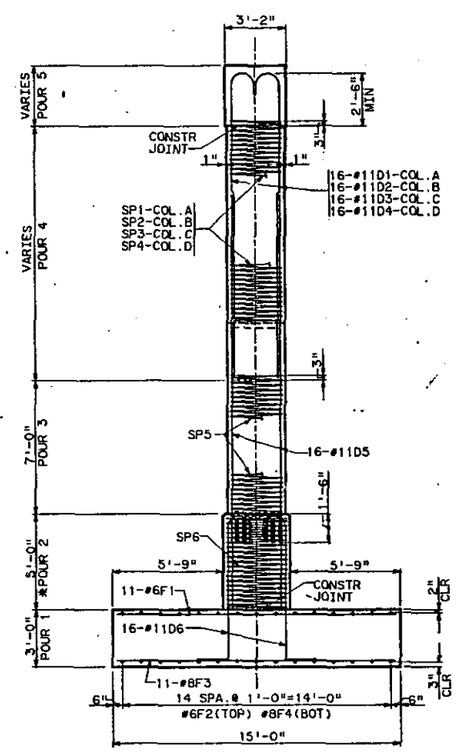
COLUMN HEIGHTS	
	BENT 2
A	23'-8⅛"
B	24'-0⅞"
C	24'-5¾"
D	24'-10⅝"

FOR NOTES SEE BENT 1 SHEET



ELEVATION

*IF FOOTING IS LOWERED (MAX.OF 3') THE 3'-6"ø COLUMN SECTION SHALL BE EXTENDED WHICH WILL REQUIRE THE REFABRICATION OF D6 BARS AND THE SP6 SPIRAL.



END ELEVATION

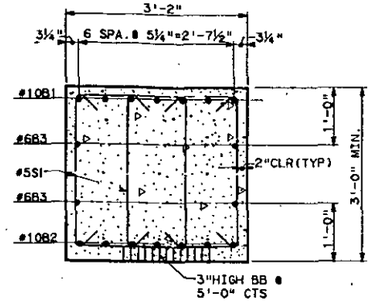
DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89

PROJECT NO. C.678006T
MECKLENBURG COUNTY
STATION -L-REV. 144+60.84=
-Y-REV. 18+97.90

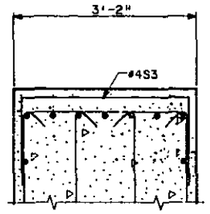
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2

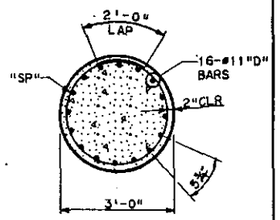
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-69
1			3			TOTAL SHEETS
2			4			130



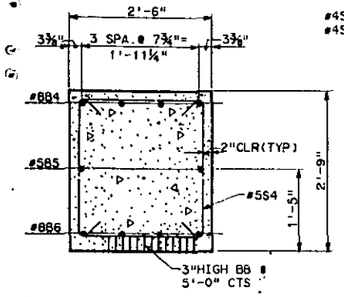
SECTION THRU CAP



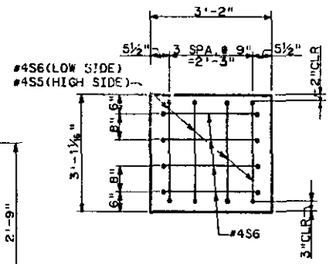
SECTION THRU BEARING



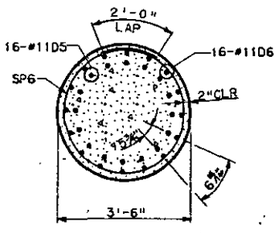
SECTION A-A



SECTION C-C

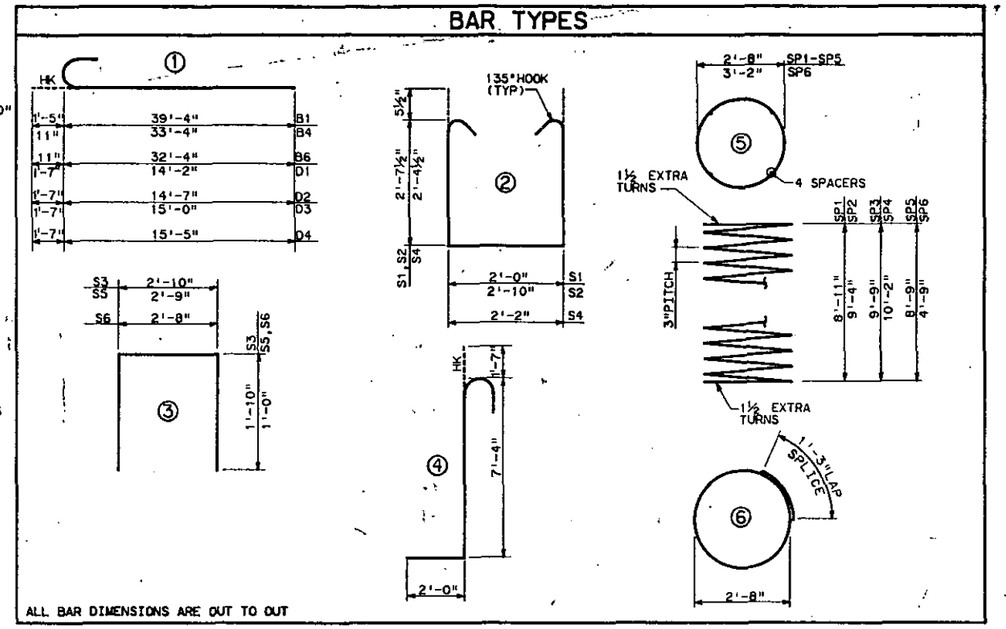


ELEVATION D-D



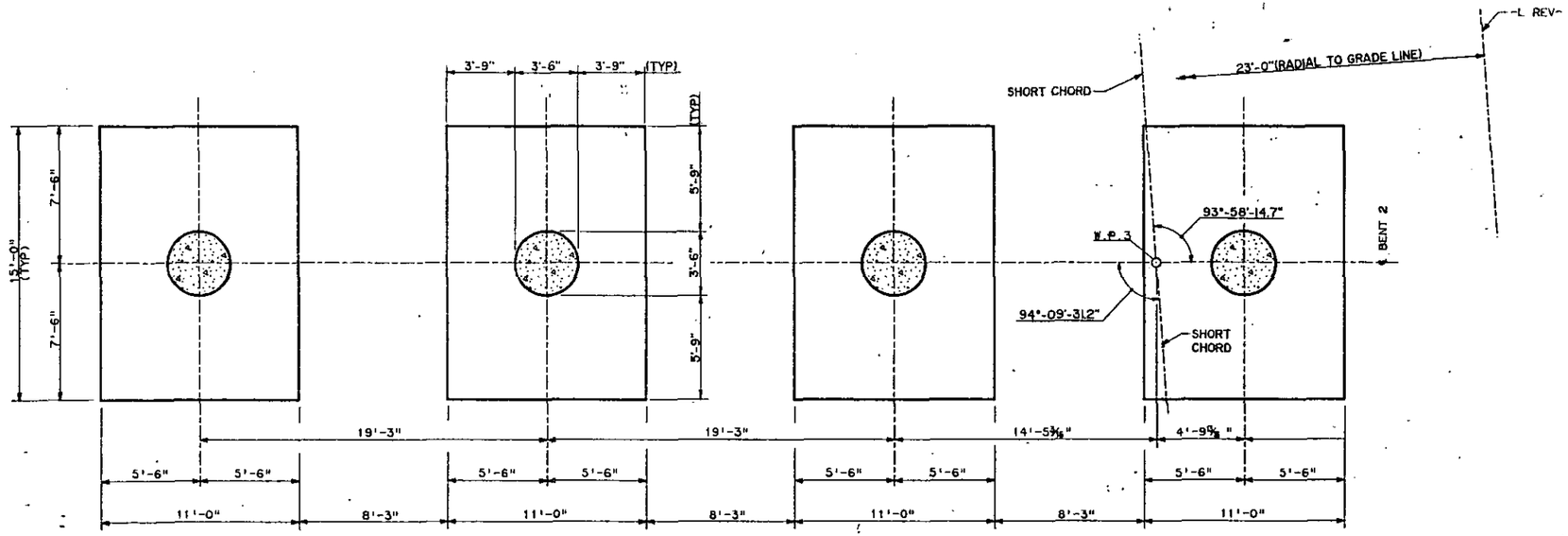
SECTION B-B

BAR TYPES

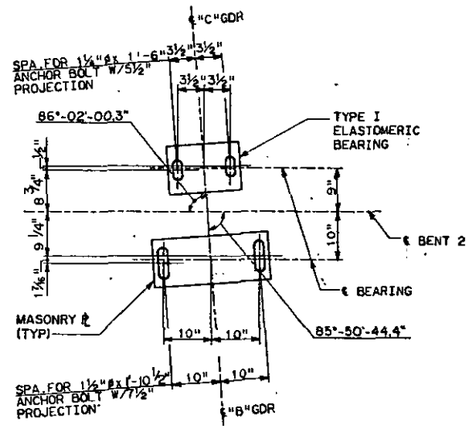


ALL BAR DIMENSIONS ARE OUT TO OUT

BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
F1	44	6	STR.	14'- 6"	958
F2	60	6	STR.	10'- 6"	946
F3	44	8	STR.	14'- 6"	1,703
F4	60	8	STR.	10'- 6"	1,682
D1	16	11	1	15'- 9"	1,339
D2	16	11	1	16'- 2"	1,374
D3	16	11	1	16'- 7"	1,410
D4	16	11	1	17'- 0"	1,445
D5	64	11	STR.	22'- 5"	7,622
D6	64	11	4	10'-11"	3,712
B1	14	10	1	40'- 9"	2,455
B2	14	10	STR.	37'- 9"	2,274
B3	8	6	STR.	35'- 9"	430
B4	8	8	1	34'- 3"	732
B5	4	5	STR.	31'- 2"	130
B6	8	8	1	33'- 3"	710
S1	182	5	2	8'- 2"	1,550
S2	4	5	2	9'- 0"	38
S3	63	4	3	6'- 6"	274
S4	51	5	2	7'-10"	417
S5	4	4	3	4'- 9"	13
S6	12	4	3	4'- 8"	37
T1	40	4	STR.	9'- 8"	258
SP1	1	4	5	319'- 0"	213
SP2	1	4	5	332'-10"	222
SP3	1	4	5	346'- 7"	232
SP4	1	4	5	360'- 4"	241
SP5	4	4	5	313'- 7"	838
SP6	4	4	5	216'- 1"	577
Reinforcing Steel				-LBS-	31,504
Spiral Column Reinforced Steel				-LBS-	2,323
Class A Concrete Break Down					
Pour # 1				-C.Y.-	73.3
Pour # 2				-C.Y.-	7.1
Pour # 3				-C.Y.-	7.3
Pour # 4				-C.Y.-	25.3
Pour # 5				-C.Y.-	24.6
Total				-C.Y.-	137.6
Foundation Excavation				-C.Y.-	525



PLAN OF FOOTINGS



ANCHOR BOLT LAYOUT DETAIL-BENT 2

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

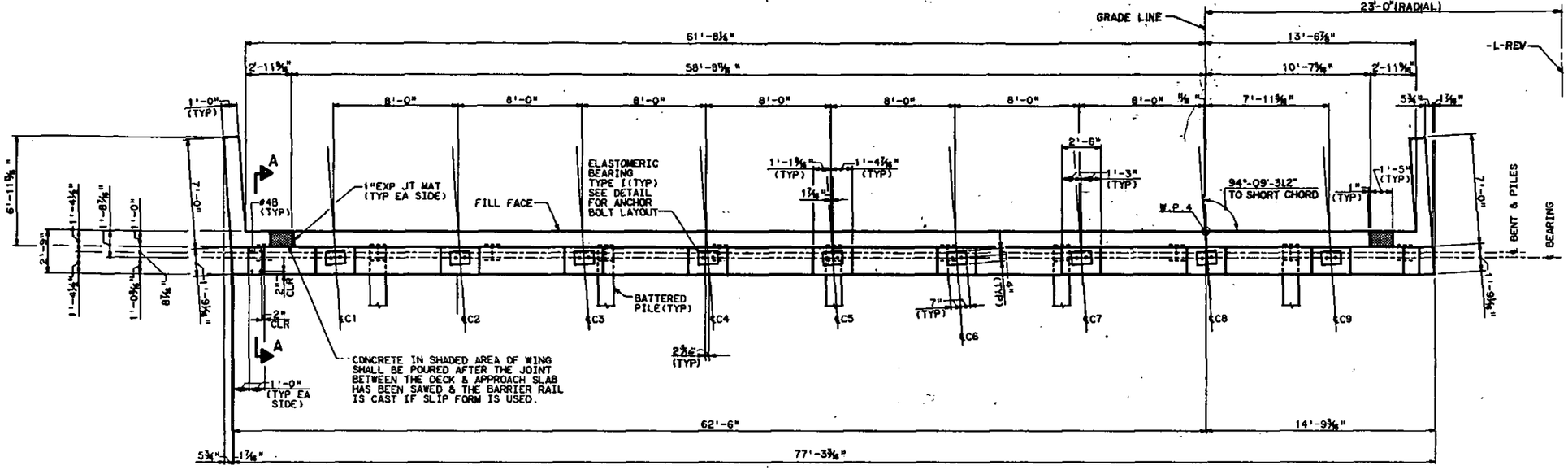
STATION -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

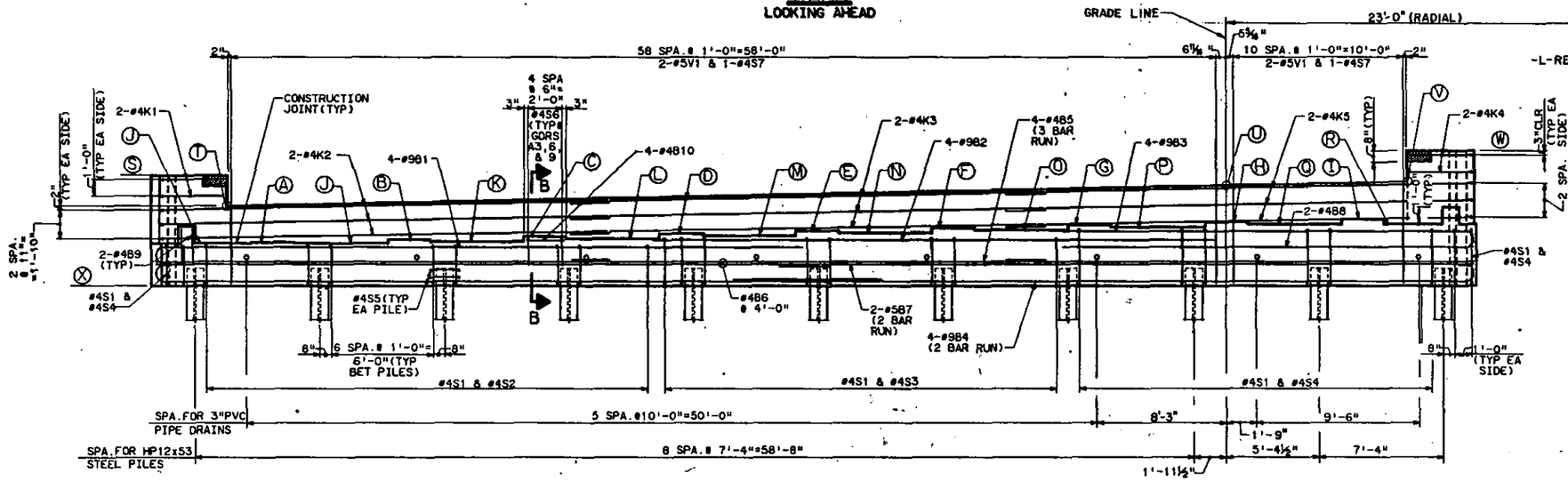
SUBSTRUCTURE
BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-70
1			3			TOTAL SHEETS
2			4			120

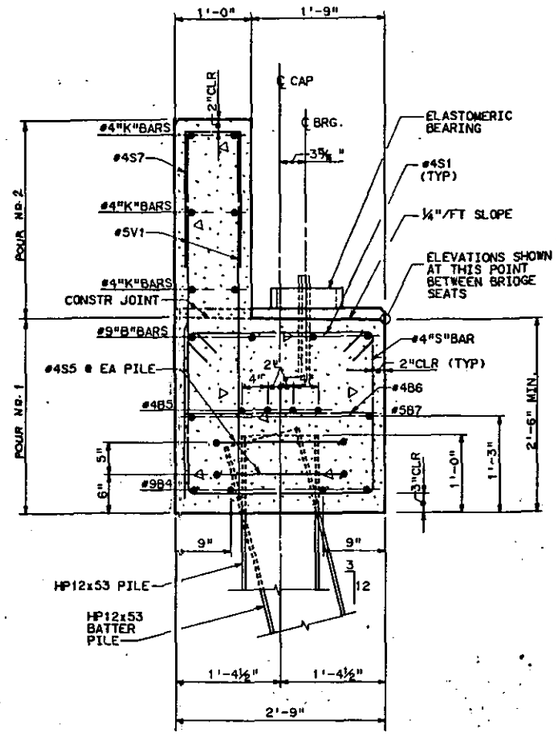
DRAWN BY LSJ DATE 2/89
CHECKED BY CLN DATE 2/89



PLAN
LOOKING AHEAD



ELEVATION



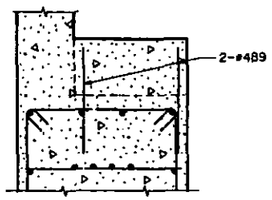
SECTION THRU CAP

NOTES :

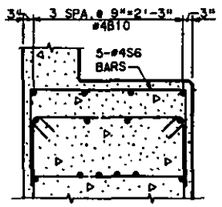
FOR END BENT NOTES SEE END BENT 1 SHEET.

FOR TEMPORARY DRAINAGE AT END BENT SEE END BENT 2 DETAILS SHEET.

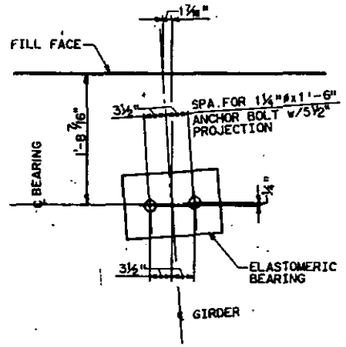
ELEVATION TABLE					
Ⓐ	645.459	Ⓚ	645.503	Ⓤ	648.790
Ⓑ	645.628	Ⓛ	645.671	Ⓥ	649.001
Ⓒ	645.796	Ⓜ	645.840	Ⓦ	650.835
Ⓓ	645.965	Ⓝ	646.008	Ⓧ	642.834
Ⓔ	646.133	Ⓞ	646.177		
Ⓕ	646.302	Ⓟ	646.345		
Ⓖ	646.470	Ⓠ	646.514		
Ⓗ	646.639	Ⓡ	646.682		
Ⓘ	646.807	Ⓢ	649.399		
Ⓙ	645.334	Ⓣ	647.565		



SECTION A-A



SECTION B-B



ANCHOR BOLT LAYOUT DETAIL

PROJECT No. G.678006T

MECKLENBURG COUNTY

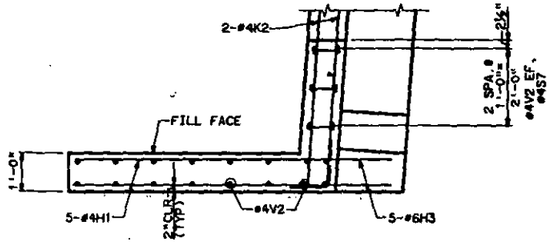
STATION : -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

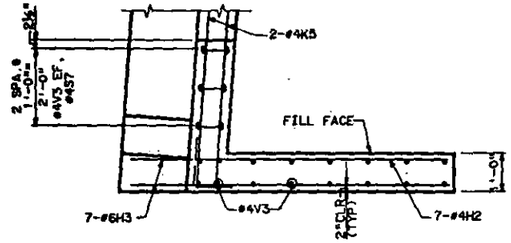
SUBSTRUCTURE
END BENT 2

DRAWN BY	LSJ	DATE	2/89
CHECKED BY	GRB	DATE	2/89

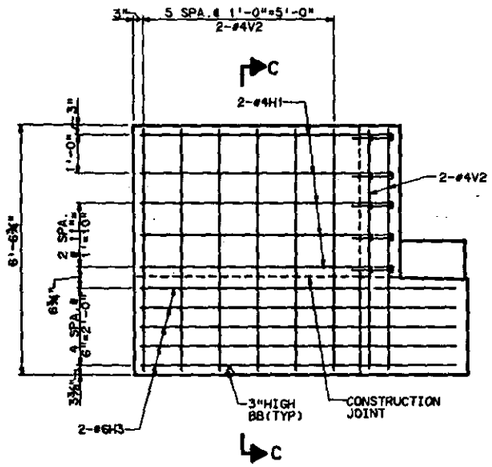
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-7
1			3			TOTAL SHEETS
2			4			130



PLAN

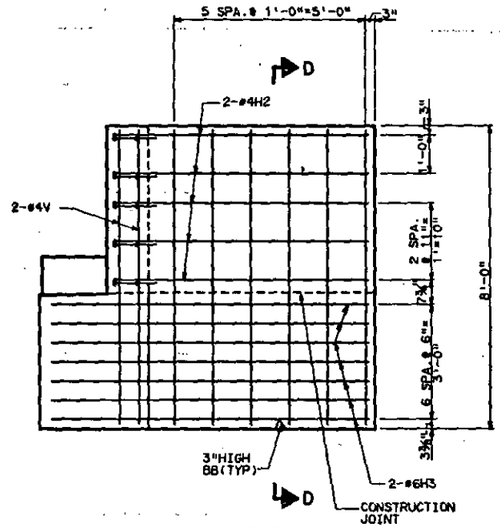


PLAN



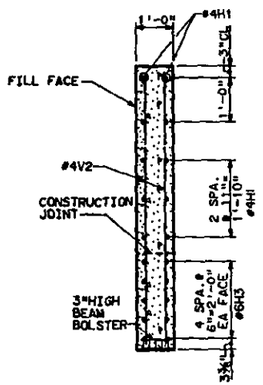
ELEVATION

LEFT WING

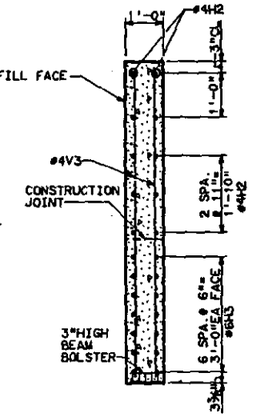


ELEVATION

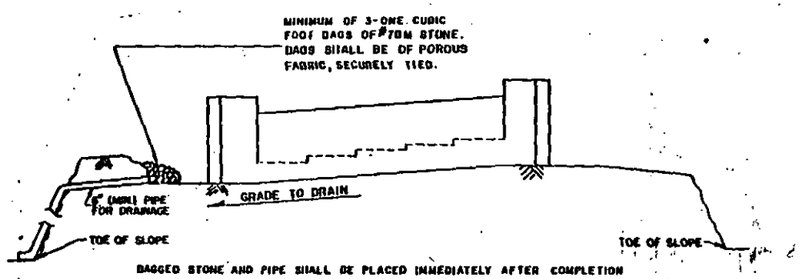
RIGHT WING



SECTION C-C



SECTION D-D



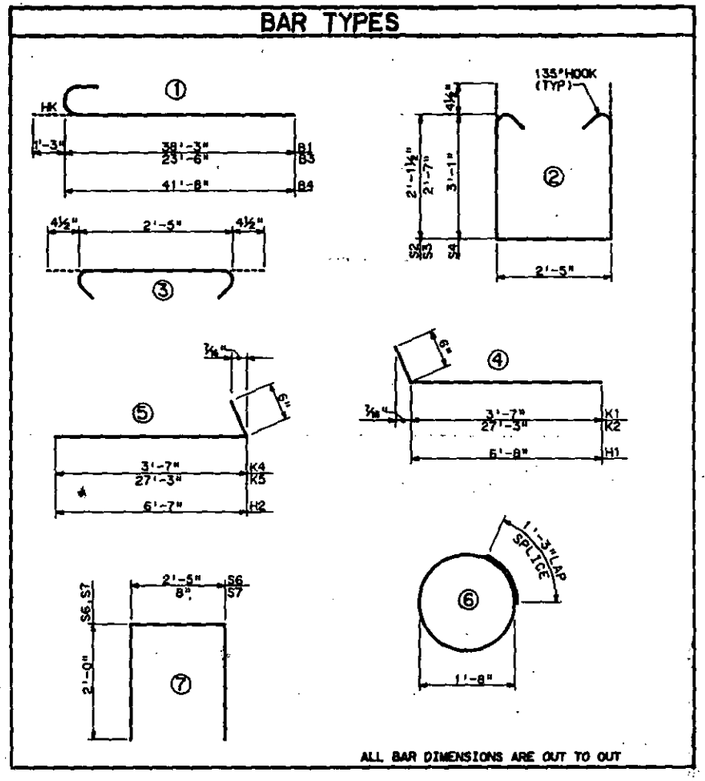
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

END BENT # 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	39'- 6"	337
B2	4	9	STR.	32'- 9"	445
B3	4	9	1	24'- 9"	337
B4	8	9	1	42'-11"	1,167
B5	12	4	STR.	27'- 4"	219
B6	19	4	STR.	2'- 5"	31
B7	4	5	STR.	40'- 0"	167
B8	2	4	STR.	17'- 3"	23
B9	8	4	STR.	2'- 0"	11
B10	12	4	STR.	2'- 2"	17
K1	4	4	4	4'- 1"	11
K2	6	4	4	27'- 9"	111
K3	6	4	STR.	27'- 4"	110
K4	4	4	5	4'- 1"	11
K5	6	4	5	27'- 9"	111
S1	74	4	3	3'- 2"	517
S2	28	4	2	7'- 5"	139
S3	23	4	2	8'- 4"	128
S4	23	4	2	9'- 4"	143
S5	22	4	6	6'- 6"	96
S6	15	4	7	6'- 5"	64
S7	76	4	7	4'- 8"	237
V1	140	5	STR.	4'- 3"	621
V2	22	4	STR.	6'- 1"	892
V3	22	4	STR.	7'- 7"	113
H1	10	4	4	7'- 2"	48
H2	10	4	5	7'- 1"	47
H3	24	6	STR.	8'- 4"	300

Total Reinforcing Steel -LBS-	6,488
Class A Concrete	35.3 CY
Pour NO. 1	26.3 CY
Pour NO. 2	9.0 CY
HP 12 x 53 Steel Piles	
NO.	11
L.F.	325

PROJECT NO. G.678006T

MECKLENBURG COUNTY

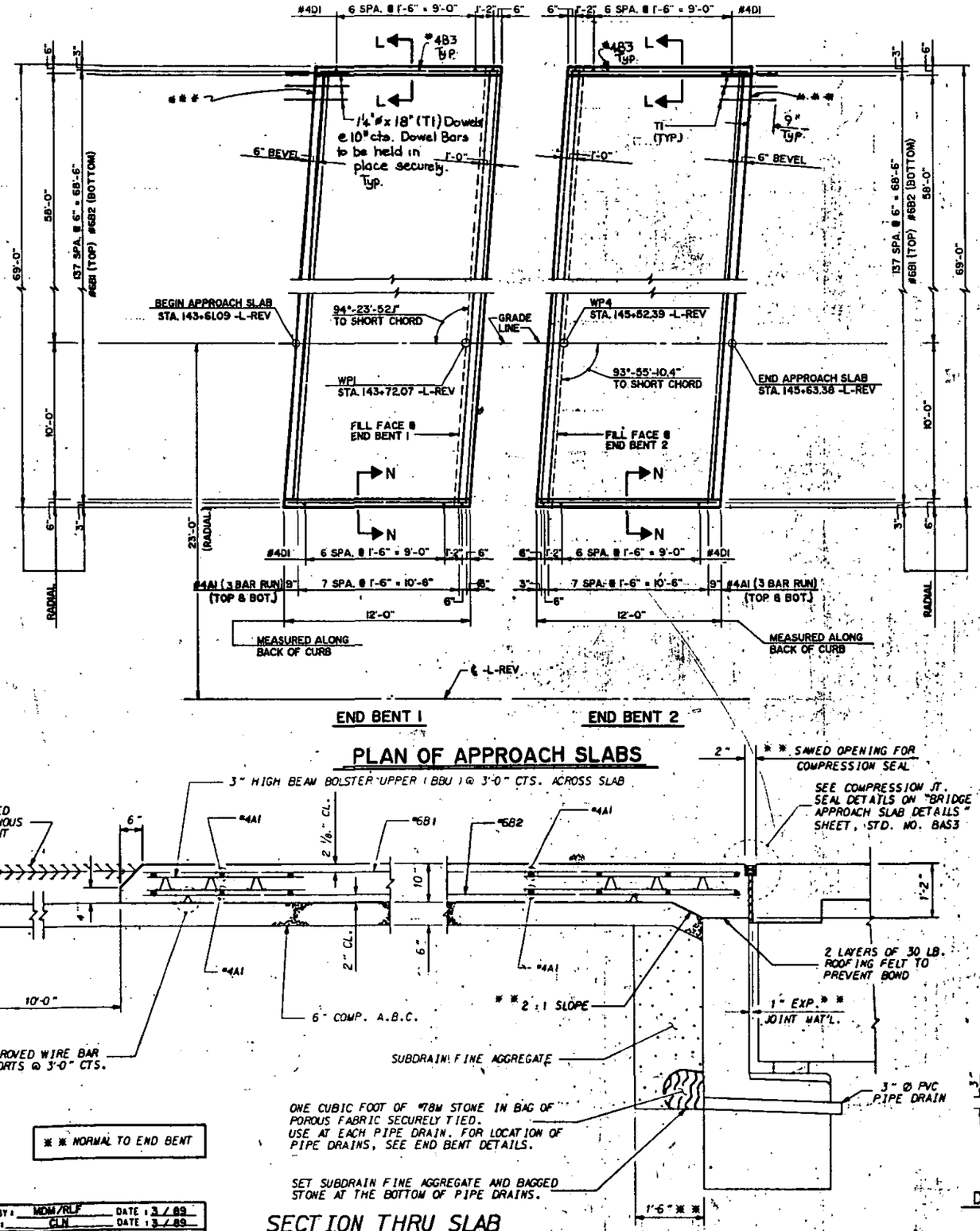
STATION: -L-REV. 144+60.84=
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-72
1			3			TOTAL SHEETS
2			4			134

DRAWN BY	LSJ	DATE	2/89
CHECKED BY	GRB	DATE	2/89



PLAN OF APPROACH SLABS

* * NORMAL TO END BENT

SECTION THRU SLAB

*** TEMP. BERM AND SLOPE DRAIN REQUIRED AT THIS LOCATION. FOR DETAILS SEE SHEET "STANDARD BRIDGE APPROACH SLAB DETAILS". THE APPROACH SLAB SHALL HAVE A VERTICAL FACE AT THE LOCATION OF THE PROPOSED FLUME.

NOTES

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

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

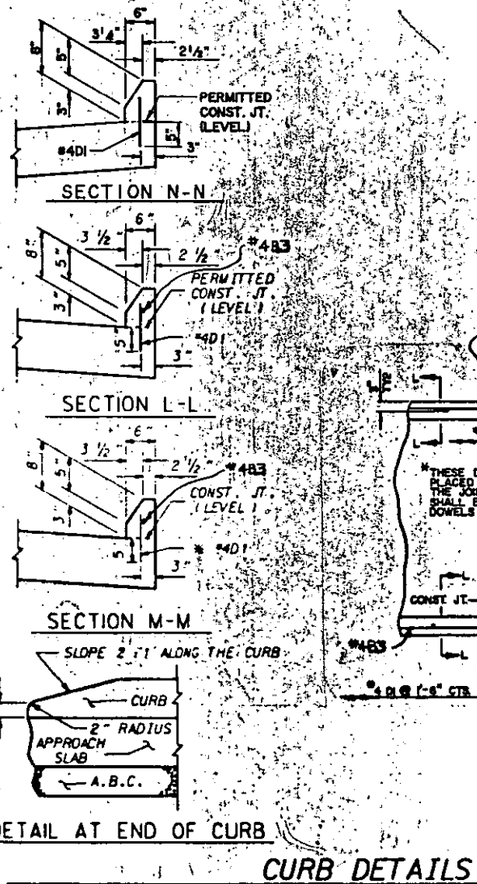
THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

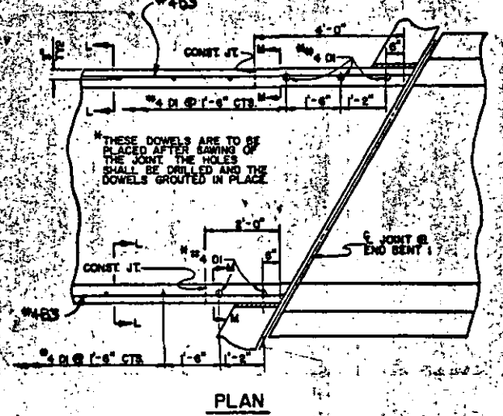
THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

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

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





CURB DETAILS

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	54	4	STR.	24'-0"	866
B1	138	6	STR.	11'-2"	2318
B2	138	6	STR.	11'-8"	2418
B3	2	4	Str	11'-2"	15
D1	16	4	STR.	0'-10"	9
T1	6		STR.	1'-6"	54
TOTAL					5677

END BENT 1		
CLASS AA CONCRETE	26.7	C.Y.
REINFORCING STEEL	5677	LBS.
END BENT 2		
CLASS AA CONCRETE	26.7	C.Y.
REINFORCING STEEL	5677	LBS.

PROJECT NO. 8.1670102

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

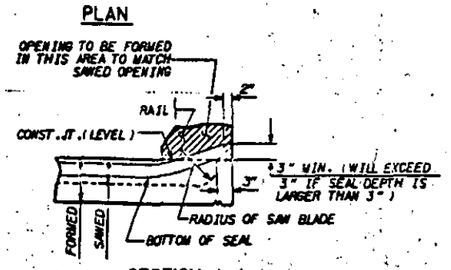
STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

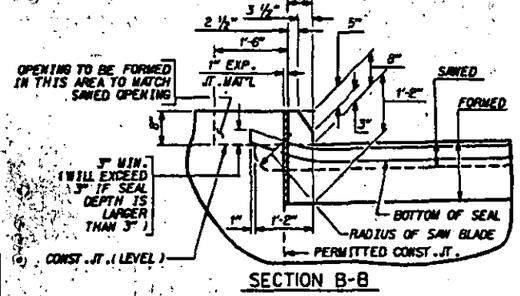
FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			120

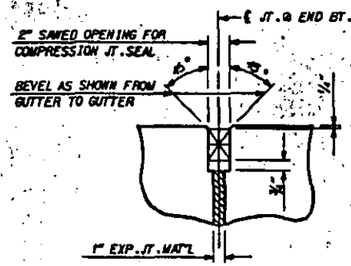
ASSEMBLED BY :	MDM/RLF	DATE : 3/89
CHECKED BY :	CLN	DATE : 3/89
T.D. DRAWN BY :	F. C. JONES	DATE : 6/10/87
DETAILED BY :	F. C. NIEN	DATE : 6/25/87



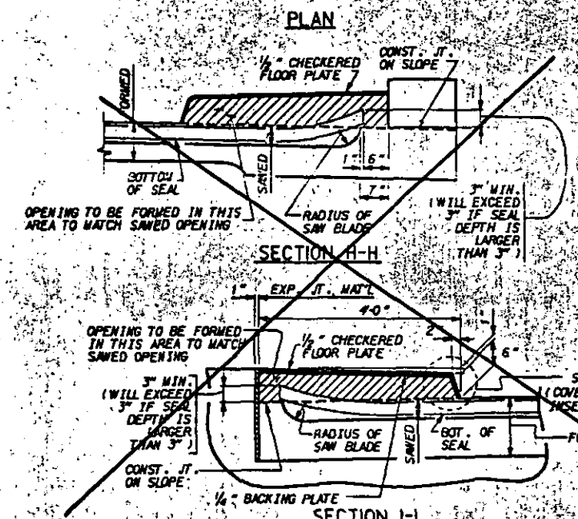
SECTION A-A

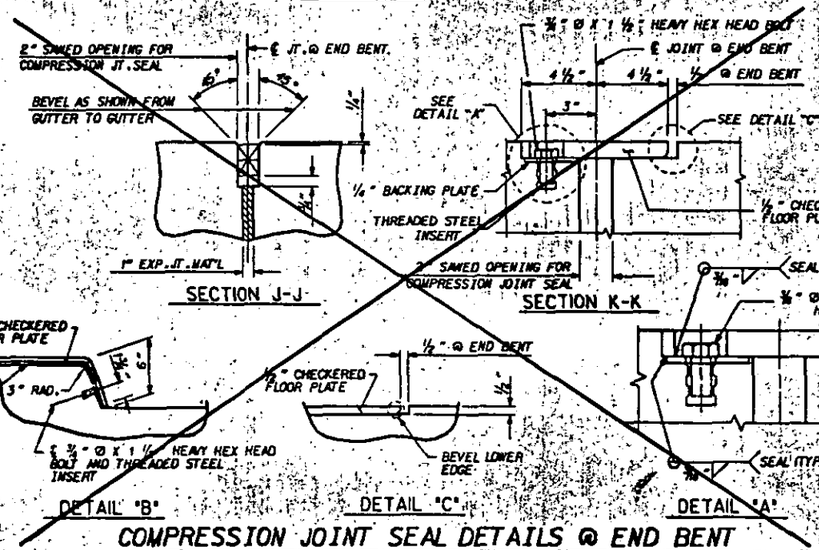


SECTION B-B

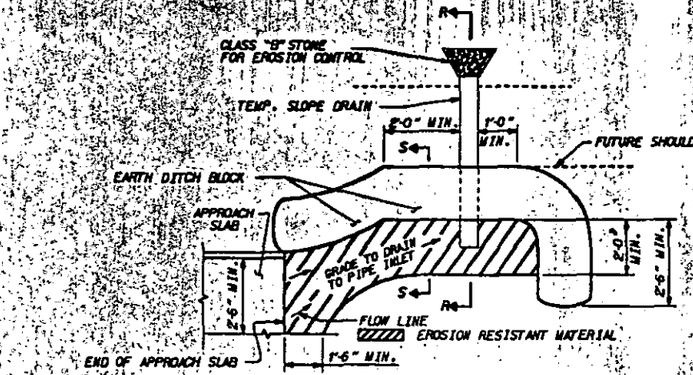


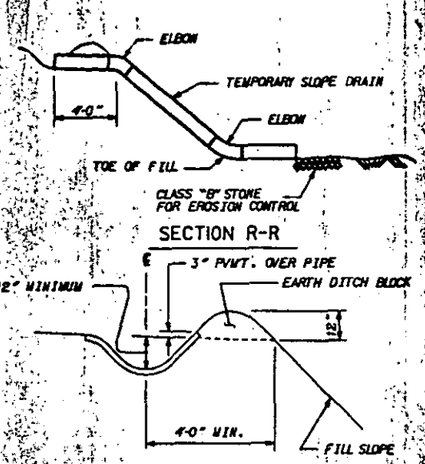
SECTION C-C



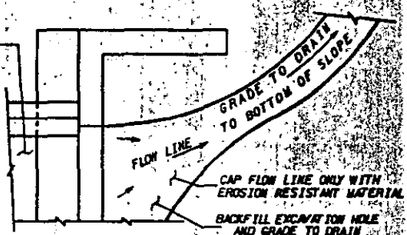


COMPRESSION JOINT SEAL DETAILS @ END BENT



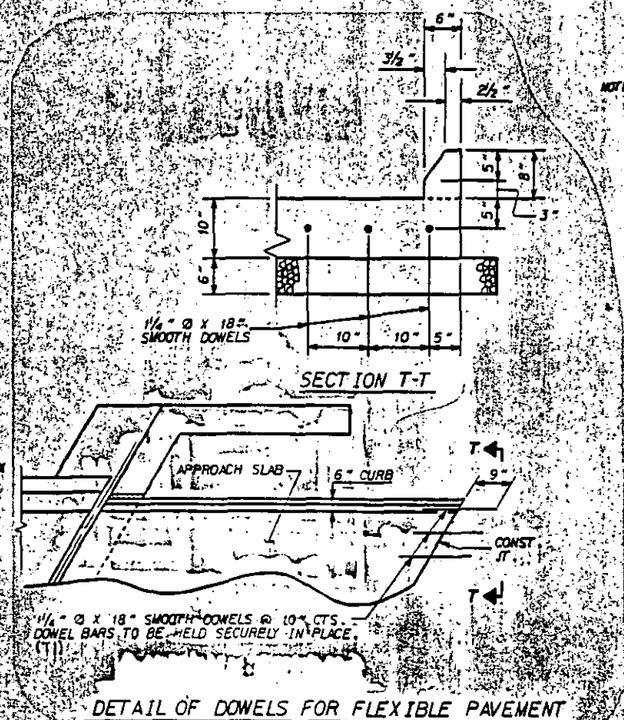


TEMPORARY BERM AND SLOPE DRAIN DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



DETAIL OF DOWELS FOR FLEXIBLE PAVEMENT

PROJECT NO. 8.1670102

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

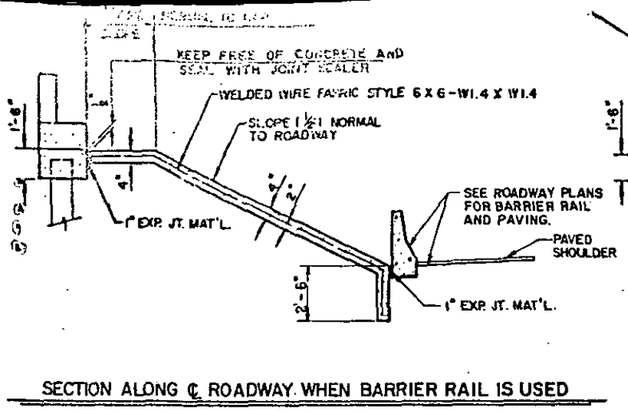
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB DETAILS

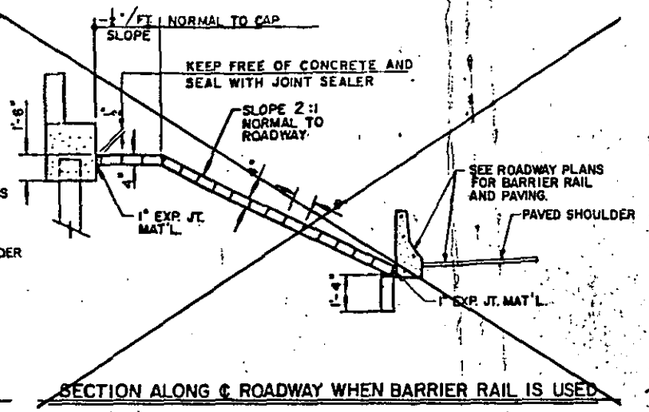
DECEMBER 1988

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			120

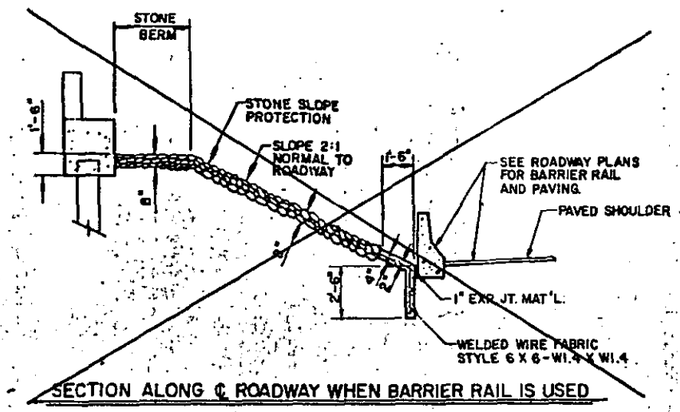
ASSEMBLED BY : RLF	DATE : 2/89	SPECIAL	
CHECKED BY : CLH	DATE : 2/89		
DRAWN BY : F.C. JONES	DATE : 11/28/88	STANDARD	
CHECKED BY : A.R. BISSETTE	DATE : 11/28/88		



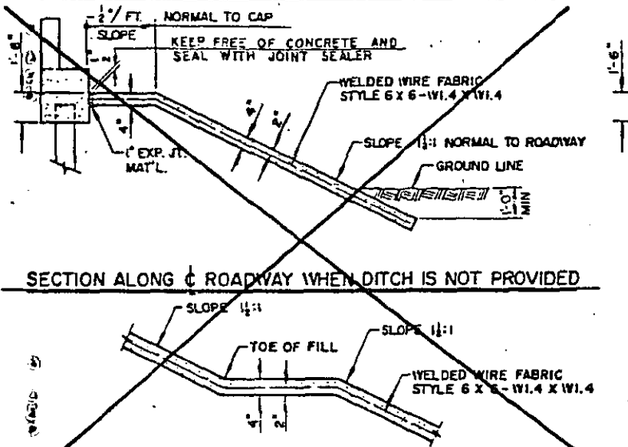
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



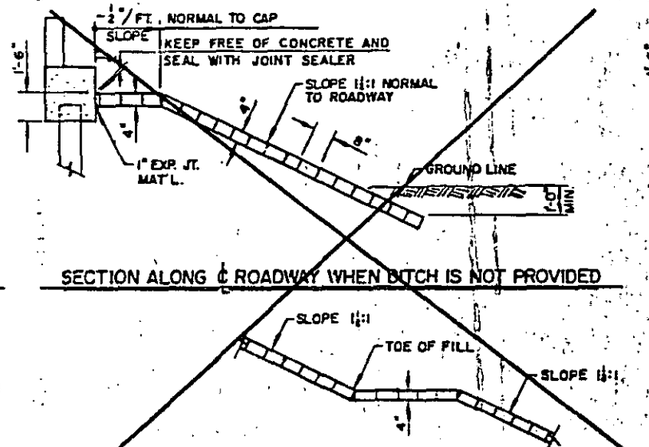
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



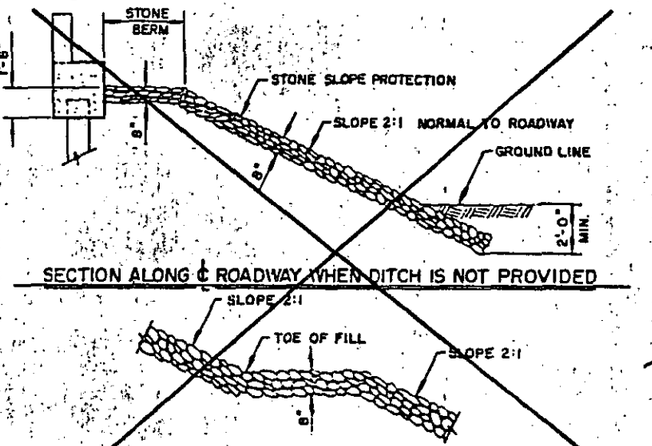
SECTION ALONG ℄ ROADWAY WHEN BARRIER RAIL IS USED



SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED

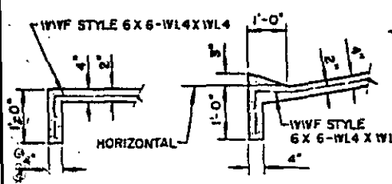


SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED

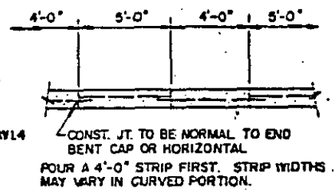
SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

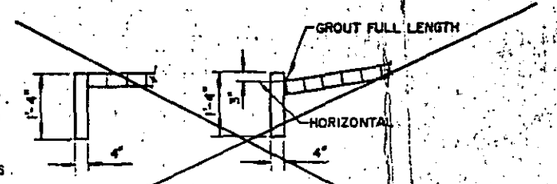
SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES



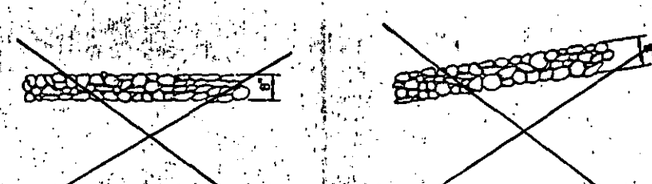
SECTION A-A SECTION B-B



POURING DETAIL

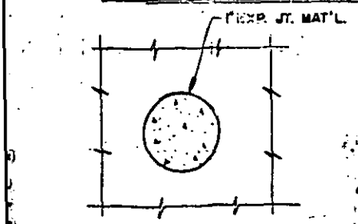


SECTION A-A SECTION B-B



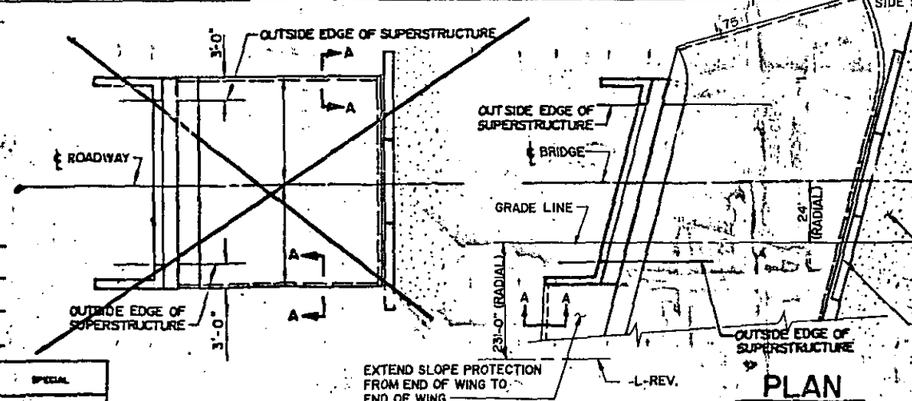
SECTION A-A SECTION B-B

DETAILS FOR ALTERNATE "A"



PLAN WHERE CONCRETE OR CONCRETE BLOCK SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN

DETAILS FOR ALTERNATE "B"

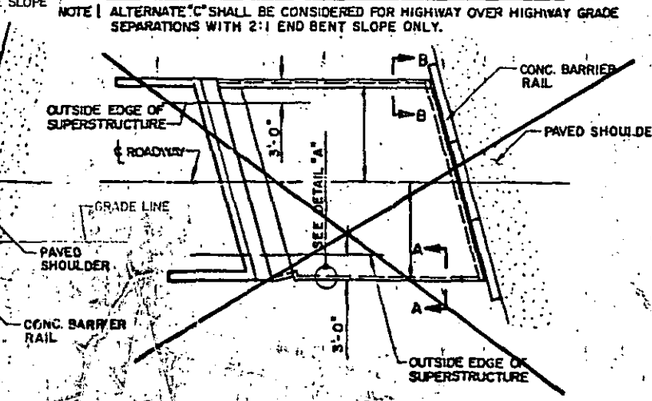


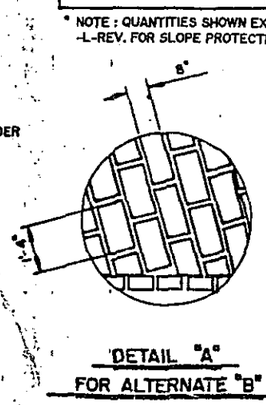
PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION

DETAILS FOR ALTERNATE "C"

NOTE | ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.





DETAIL "A" FOR ALTERNATE "B"

GENERAL NOTES

4 INCH SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE. LIMITS OF THE PROTECTION SHALL BE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY PLACE EITHER TYPE, ALTERNATES "A", "B" OR "C", AS DESCRIBED BELOW. 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 670 OF THE STANDARD SPECIFICATIONS. THE SAME TYPE OF SLOPE PROTECTION SHALL BE USED UNDER BOTH ENDS OF ANY ONE BRIDGE. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF FOUR INCH 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. ALTERNATE "A" WELDED WIRE FABRIC REINFORCING SHALL BE STYLE 6 X 6 - W1.4 X W1.4, 60 INCHES WIDE. ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST SIX INCHES. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE FOUR FT. AND FIVE FT. STRIPS AS SHOWN IN POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION.

ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF SOLID CONCRETE BLOCKS 4" X 8" X 16" LAID IN HORIZONTAL COURSES SUCH THAT THOSE IN SUCCESSIVE COURSES WILL BREAK JOINTS WITH UNITS IN THE PRECEDING ONE. BLOCKS SHALL BE LAID WITH THEIR LONG AXIS PARALLEL TO THE END BENT CAP WITH GROUTED JOINTS PREFERABLY ½" BUT NOT LESS THAN ¼" NOR MORE THAN 1¼" WIDE BETWEEN SUCCESSIVE COURSES AND ENDS OF BLOCKS. JOINTS SHALL BE GROUTED BY POURING A MIXTURE OF ONE PART PORTLAND CEMENT TO THREE PARTS SAND MIXED WITH SUFFICIENT WATER TO ENABLE THE MIXTURE TO BE POURED THROUGH A SPOUT. THE CONCRETE BLOCKS SHALL BE CAST TO ACCURATE DIMENSIONS, SHALL HAVE UNIFORM SURFACE COLOR AND TEXTURE AND SHALL BE MANUFACTURED OF MATERIALS TO PRODUCE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AT AGE OF 28 DAYS. NO BROKEN BLOCKS SHALL BE USED EXCEPT IN CONSTRUCTING A STRAIGHT LINE ALONG EACH SIDE OF THE PAVING DOWN THE SLOPE. CARE SHALL BE TAKEN TO BREAK THE BLOCKS SO AS TO GIVE A UNIFORM WORKMANLIKE JOINT AND SURFACE.

ALTERNATE "C"

ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.

ALTERNATE "C" 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. EIGHT INCHES 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 STYLE 6 X 6 - W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION. FOR REQUIREMENTS ON SUBGRADING, STONE TYPE, STONE SIZING, AND HERBICIDE PROTECTION, SEE SPECIAL PROVISIONS FOR SLOPE PROTECTION.

	4 INCH SLOPE PROTECTION SQUARE YARDS		WELDED WIRE FABRIC, 60" WIDE APPROX. L.F.
	END BENT 1	END BENT 2	
BRIDGE # STA. 144+60.84 -L-REV.	390	395	1870

* NOTE : QUANTITIES SHOWN EXTEND TO -L-REV. FOR SLOPE PROTECTION.

PROJECT NO. 6.678006T

MECKLENBURG COUNTY

STATION: -L-REV. 144+60.84
-Y-REV. 18+97.90

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SLOPE PROTECTION DETAILS

FEBRUARY 1979

REVISIONS						STANDARD NO.
NO.	BY	DATE	NO.	BY	DATE	S-75
1			3			
2			4			SHEET NO. 130

DESIGNED BY	RLF	DATE	MAR. '89
CHECKED BY	CLN	DATE	MAR. '89
DRAWN BY	G.C. MITCHINER JR.	DATE	DEC. 1979
APPROVED BY	Research & Application	DATE	FEB. 21, 79

SPECIAL

STANDARD

FILL FACE @ END BENT 1
STA. 194+16.27 -L- REV. I-77
WORK LINE EL. 575.114

BEGIN FRONT SLOPE
STA. 194+08.38 -L- REV. I-77
EL. 575.047 (ON WORK LINE)

WORK LINE PROFILE @ 23' RT OF -L- REV. I-77
P.V.T. STA. 186+50.00 -L- REV. I-77 △ +0.8447%
EL. 568.641

FILL FACE @ END BENT 2
STA. 195+96.27 -L- REV. I-77
WORK LINE EL. 576.634

BEGIN FRONT SLOPE
STA. 196+04.85 -L- REV. I-77
EL. 576.707 (ON WORK LINE)

FEDERAL AID PROJECT NO. IR-77-1(100)2

FOR GENERAL NOTES SEE DRAWING 2.

580 / 570 / 560 / 550

1'-8" BERM
EXP
SPAN A
FIX
SPAN B
EXP
SPAN C
1'-8" BERM
EXP

EL. 573.0±
567.0±
1'-6"
APPROXIMATE EXISTING GROUNDLINE 23' RIGHT OF -L- REV. I-77
HP 12 X 53 STEEL PILES
1'-0¾" EARTH BERM
END BENT 1
1½:1 SLOPE NORM. TO CAP
EXCAVATION (ROADWAY PAY ITEM)
EL. 561.0±
EL. 560.0±
CHANNEL BERM
EL. 553.0±
SIDES OF CHANNEL ARE RIP RAPPED (SEE ROADWAY PLANS)
HIGH WATER EL. 568± YEAR-AFTER 1970
WATER SURFACE EL. 552.6
DATE OF SURVEY 11/9/86
EL. 552.0±
TOP OF FTG. EL. 549.174
HP 12 X 53 STEEL PILES
BENT 1
TOP OF FTG. EL. VAR.ES
EL. 560.0±
1½:1 SLOPE NORMAL TO CAP
CHANNEL BERM
36" SS
EL. 560.0±
54" SS
CHANNEL EXCAVATION (ROADWAY PAY ITEM)
BENT 2
HP 12 X 53 STEEL PILES
1'-6"
HP 12 X 53 STEEL PILES
1'-0¾" EARTH BERM
END BENT 2

PGL. NBL. & -L- REV. I-77
P.V.T. STA. 186+50 -L- REV. I-77 △ +0.8447%
EL. 569.120
PROFILE GRADE OF -L- REV. I-77

HYDROGRAPHIC DATA

DESIGN DISCHARGE	= 10,000 cfs
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGHWATER ELEVATION	= 568.46
DRAINAGE AREA	= 54.9 SQ. MI.
BASIC DISCHARGE (Q 100)	= 11,000 cfs
BASIC HIGHWATER ELEVATION	= 569.01

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 13,000 cfs
FREQUENCY OF OVERTOPPING FLOOD	= 400± YRS
OVERTOPPING FLOOD ELEV.	= 571.65

SECTION ALONG WORK LINE
(BENTS ON SECTION @ RIGHT ANGLES TO BENTS)

1'-8" BERM EL. 570.268
RIP RAP TO EL. 569.5
-L- REV. I-77 & P.G.L. N.B.L.
23'-0"
WP#1 FILL FACE @ END BENT 1 STA. 194+16.27 -L- REV. I-77
BEGIN APPROACH SLAB STA. 194+05.37 -L- REV
BEGIN FRONT SLOPE STA. 194+08.38 -L- REV. I-77
WP#2 STA. 194+74.27 -L- REV. I-77
TOP OF CHANNEL BANK
25'-0 1/4"
WORKLINE I-77 N.B.
CHANNEL BERM
SUGAR CREEK
STA. 195+10.02 -L- REV. I-77 = 19+38.27 OF CHANNEL CHANGE
WP#3 STA. 195+38.27 -L- REV. I-77
STA. 194+99.29 -L- REV. I-77 = STA. 19+63.65 OF CHANNEL CHANGE
TOP OF CHANNEL BANK
CHANNEL BERM
1'-8" BERM EL. 571.696
RIP RAP TO EL. 569.5
WP#4 FILL FACE @ END BENT 2 STA. 195+96.27 -L- REV. I-77
END APPROACH SLAB STA. 196+07.17 -L- REV. I-77
BEGIN FRONT SLOPE STA. 196+04.85 -L- REV. I-77
TO CHARLOTTE
115'-00"-00" (TYP.)
PLAIN RIP RAP CLASS II
EXISTING STRUCTURE (SLAB, END & INT. BENTS) TO BE REMOVED

75'-0"
TO FT. MILL, S.C.
STA. 2+21.08 RAMP "D" FILL FACE END BENT 1
SC RAMP "D" STA. 2+00
BEGIN APPROACH SLAB STA. 2+10.62 RAMP "D"
-L- I-77
PLAIN RIP RAP CLASS II
BASE OF CHANNEL
℄ CHANNEL CHANGE
C.S. RAMP "D" STA. 3+80.41
36" SAN. SEWER
54" SAN. SEWER
STA. 3+89.91 RAMP "D" FILL FACE END BENT 2
END APPROACH SLAB STA. 3+99.94 RAMP "D"
-L- I-77
EXISTING STRUCTURE (SLAB, END & INT. BENTS) TO BE REMOVED

RIP RAP TO ELEV 569.5
1'-8" BERM EL. 567.265
EXIST CONC. APRON TO BE REMOVED & REPLACED WITH PLAIN RIP RAP CLASS II SLOPE PROTECTION.
STA. 193+65
RIP RAP TO EL. 569.5

CURVE DATA RAMP "D"

P.I. = 2+92.19
△ = 19°-01'-14"
Dc = 5°-00'-00"
θs = 5°-00'-00"
Ls = 200.00'
Ts = 292.19'
Lc = 180.41'
R = 1145.92'
U = 133.39'
V = 66.72'
e = .08'
DS = 60 MPH

56'-0" | 64'-0" | 58'-0"
180'-0" TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE)

PLAN

GRADE DATA RAMP "D"

+0.85% △ +0.30% △ -1.81%

PVT STA. 0+00	PVI STA. 1+50	PVI STA. 4+50
EL. 572.325	EL. 573.600	EL. 574.500
	VC = 200'	VC = 250'

DRAWN BY EOB DATE 8-87
CHECKED BY SW DATE 12-88

PREPARED BY HDR Henningson, Durham & Richardson

DWG. NO. 1

NORTH CAROLINA PROFESSIONAL SEAL 15497 ENGINEER STEVEN S. WILSON
Steven S. Wilson
19 April '89

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29
SHEET 1 OF 2 REPLACING BRIDGES NO. 70

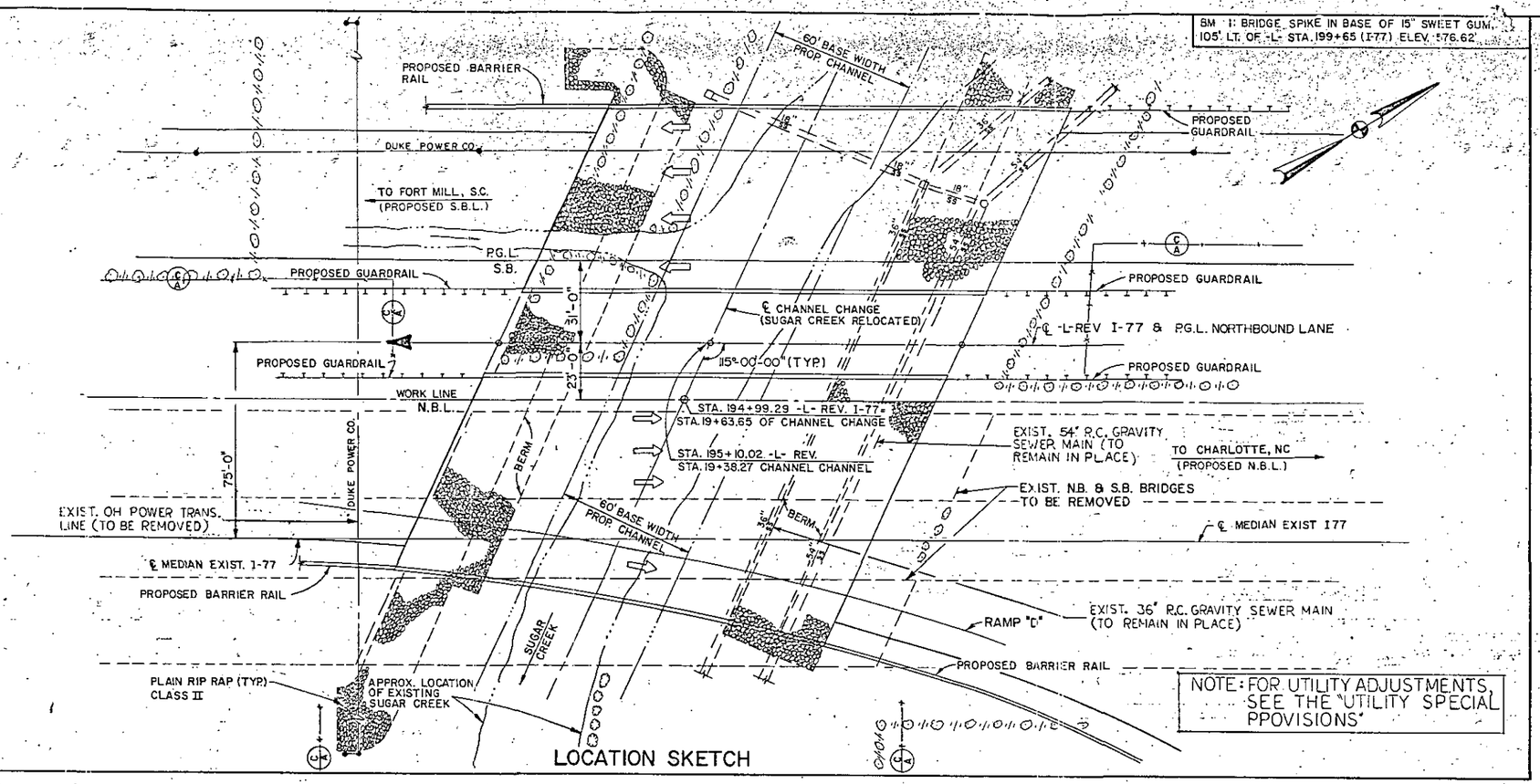
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING FOR BRIDGE OVER SUGAR CREEK ON I-77 BETWEEN SR1128 & SR1138

DEC. NORTHBOUND LANE 1988

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		
1			3				TOTAL SHEETS
2			4				115

R-2117B

70 Mecklenburg



GENERAL NOTES

ASSUMED LIVE LOAD = HS20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA & GENERAL NOTES, SEE SHEET S-N.

PILES FOR END BENTS 1 & 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

PILES FOR BENTS 1 & 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

FOR CURING BRIDGE DECK SLAB, SEE THE SPECIAL PROVISION, "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL SHALL BE GRADE 60.

ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED A.S.T.M. A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON THE PLANS.

NO WORK IS TO BE DONE ON END BENTS UNTIL 3 MONTHS AFTER THE APPROACH FILL IS COMPLETED.

FOR REINFORCED CONCRETE DECK SLAB, SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.

THE 2 Exist. STRUCTURES, EACH CONSISTING OF 4 SPANS (49'-50'-50'-49'), PRESTRESSED CONCRETE GIRDERS, 28' CLEAR ROADWAY WIDTH AND A 7 3/4" DEPTH CONCRETE FLOOR ON END BENTS AND BENTS, REINFORCED POST & BEAM WHICH ARE LOCATED IN THE APPROXIMATE AREA OF THE PROPOSED STRUCTURES, SHALL BE REMOVED. THE EXISTING BRIDGES ARE PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGES DETERIORATE DURING CONSTRUCTION OF THE PROPOSED S.B.L. BRIDGE, A LOAD LIMIT SHOULD BE POSTED AND SHOULD BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

RIP RAP THAT WAS REMOVED AT BENT 2 DUE TO EXCAVATION SHALL BE REPLACED IMMEDIATELY AFTER BACKFILLING FOR FOOTING EXCAVATION. PAYMENT FOR THE REMOVAL AND REPLACEMENT OF THIS RIP RAP SHALL BE INCLUDED IN THE LUMP SUM PAYMENT FOR FOUNDATION EXCAVATION.

– TOTAL BILL OF MATERIALS –

	REMOVAL OF ~~2 EXISTING~~ STRUCTURES	FOUNDATION EXCAVATION ~~238~~	REINFORCED CONCRETE DECK SLAB	CLASS "A" CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 x 53 STEEL PILES		CONCRETE BARRIER RAIL	BRIDGE APPROACH SLAB	POT BEARINGS	~~ELAIN~~ RIP-RAP CLASS II	PREFORMED COMPRESSION JOINT SEAL
	LUMP SUM	LUMP SUM	SQ. FT.	CU. YDS.	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	TONS	LUMP SUM
SUPERSTRUCTURE			15,713				301,628			367.02		LUMP SUM		
END BENT #1				41.2	6,918			12	252				475	
BENT #1		LUMP SUM		93.9	~~15,978~~	2,094		30	480					
BENT #2		LUMP SUM		~~109.6~~	17,720	2,573		36	~~864~~					
END BENT #2				55.8	9,490			15	720				675	
TOTAL	LUMP SUM	LUMP SUM	15,713	300.5	50,106	4667	301,628	93	2,316	367.02	LUMP SUM	LUMP SUM	1150	LUMP SUM

I hereby certify that this structure was built according to plans except as noted hereon.

Resident Engineer

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER SUGAR CREEK ON I-77 BETWEEN SR1128 & SR1138
NORTHBOUND LANE
DEC. 1988

DWG NO. 2

REVISIONS

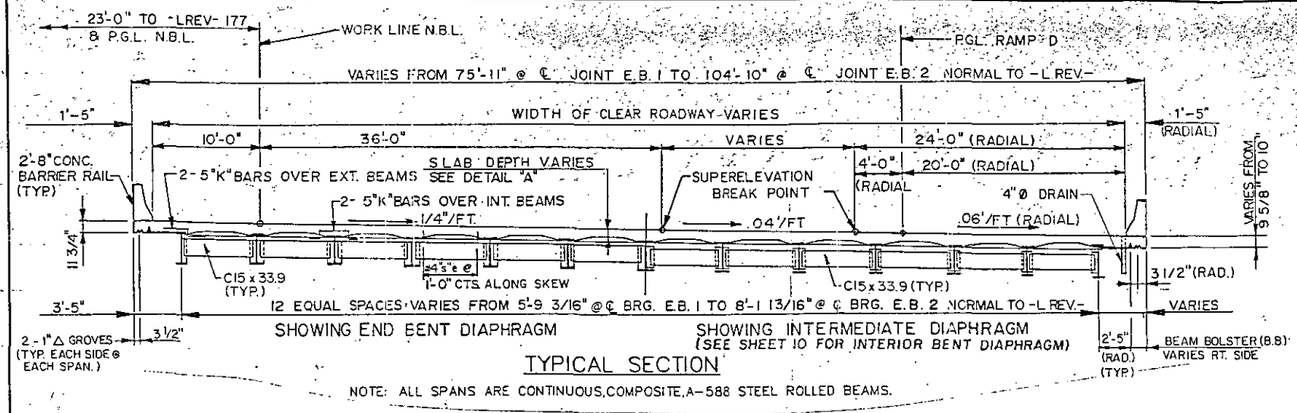
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-2
TOTAL SHEETS 115

PREPARED BY
HDR
Henningson, Durham & Richardson

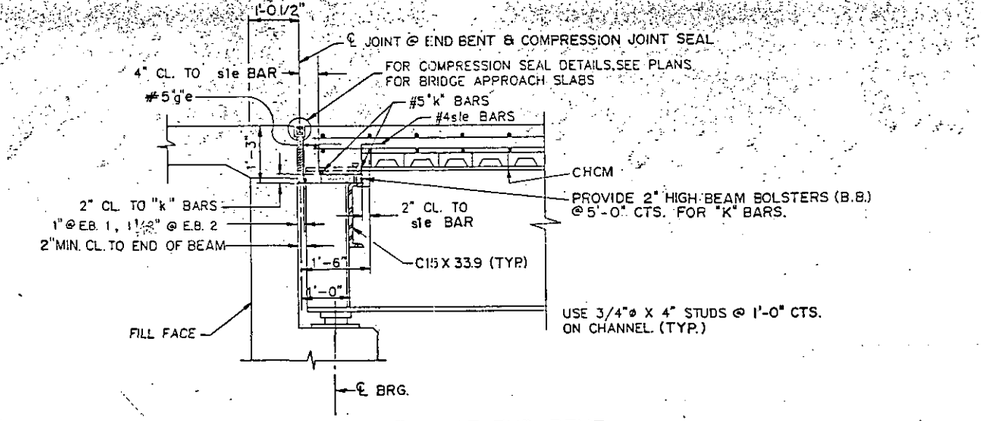
DRAWN BY JKS DATE Dec 88
CHECKED BY JSW DATE Dec 88

274

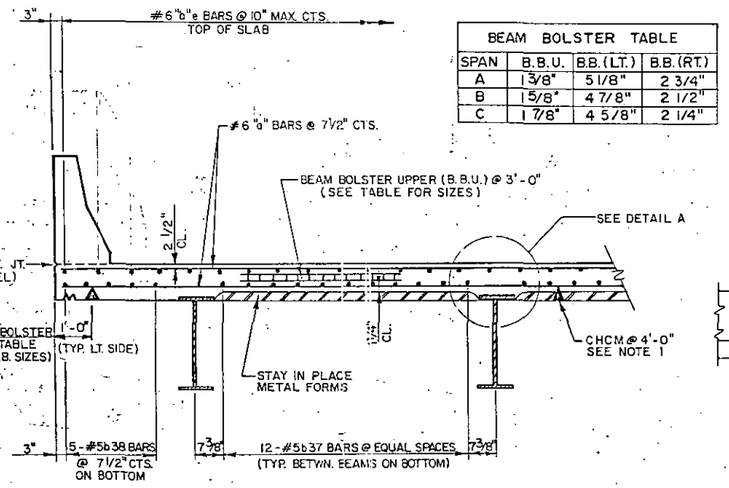


TYPICAL SECTION

NOTE: ALL SPANS ARE CONTINUOUS, COMPOSITE, A-588 STEEL ROLLED BEAMS.

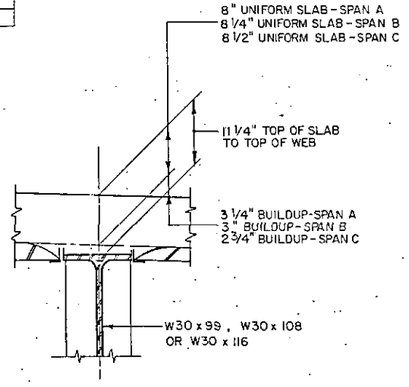


END OF BEAM DETAIL AT END BENT

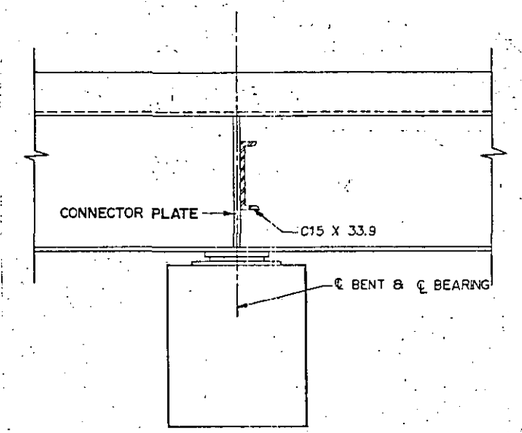


BEAM BOLSTER TABLE			
SPAN	B.B.U.	B.B. (LT.)	B.B. (RT.)
A	1 3/8"	5 1/8"	2 3/4"
B	1 5/8"	4 7/8"	2 1/2"
C	1 7/8"	4 5/8"	2 1/4"

TYPICAL SLAB REINFORCEMENT

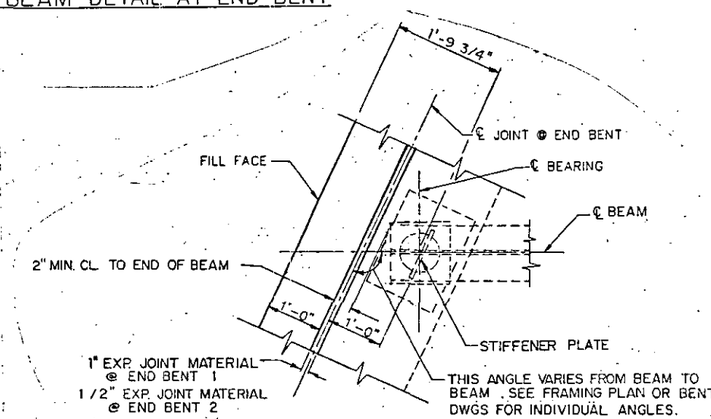


DETAIL A

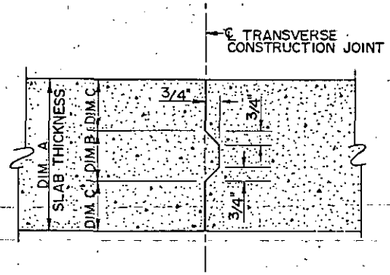


SECTION THRU BENT DIAPHRAGM

* DIMENSIONS MEASURED ALONG ℄ BEAM.



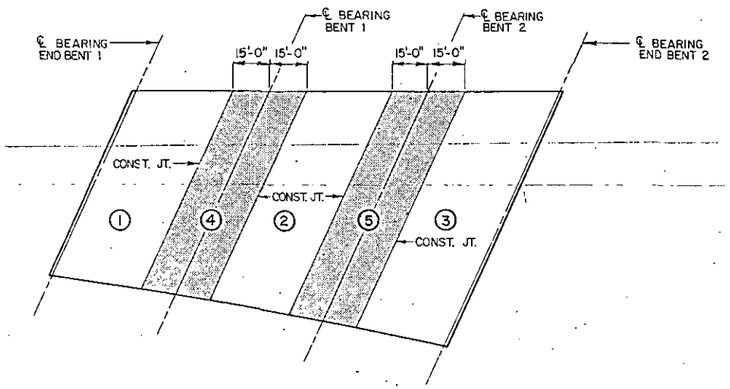
PLAN OF BEAM AT END BENT



SPAN	DIM. A	DIM. B	DIM. C
A	8"	2 5/8"	2 11/16"
B	8 1/4"	2 3/4"	2 3/4"
C	8 1/2"	2 7/8"	2 13/16"

NOTE:
REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB



DECK POURING SCHEDULE

NOTES:

1. PROVIDE CONTINUOUS HIGH CHAIR FOR METAL DECK (CHCM) 4'-0" CTS. WITH LEG SPACING TO MATCH THE PITCH OF THE FORM AND WITH A HEIGHT TO SUPPORT THE BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 1/4" ABOVE THE TOP OF THE STAY IN PLACE FORM.
2. BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
3. REQUIRED SEQUENCE OF POURS IS 1, 2, 3, 4, 5
4. PREVIOUS CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
5. FOR BARS INDICATED AND NO BAR MARKS SHOWN, SEE SLAB REINFORCING PLAN.
6. FOR EPOXY-COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.
7. METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR BEAM FLANGES REQUIRING CHARPY "V" NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION & DETAILS

DEC. NORTHBOUND LANE 1988

DRAWN BY: STEPHEN E. WHEELER DATE: 12/88
CHECKED BY: W.B. DATE: 12/88

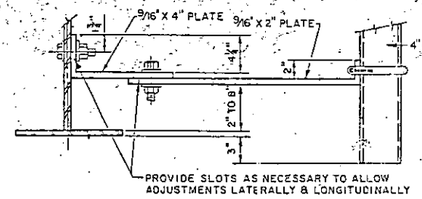
PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 3

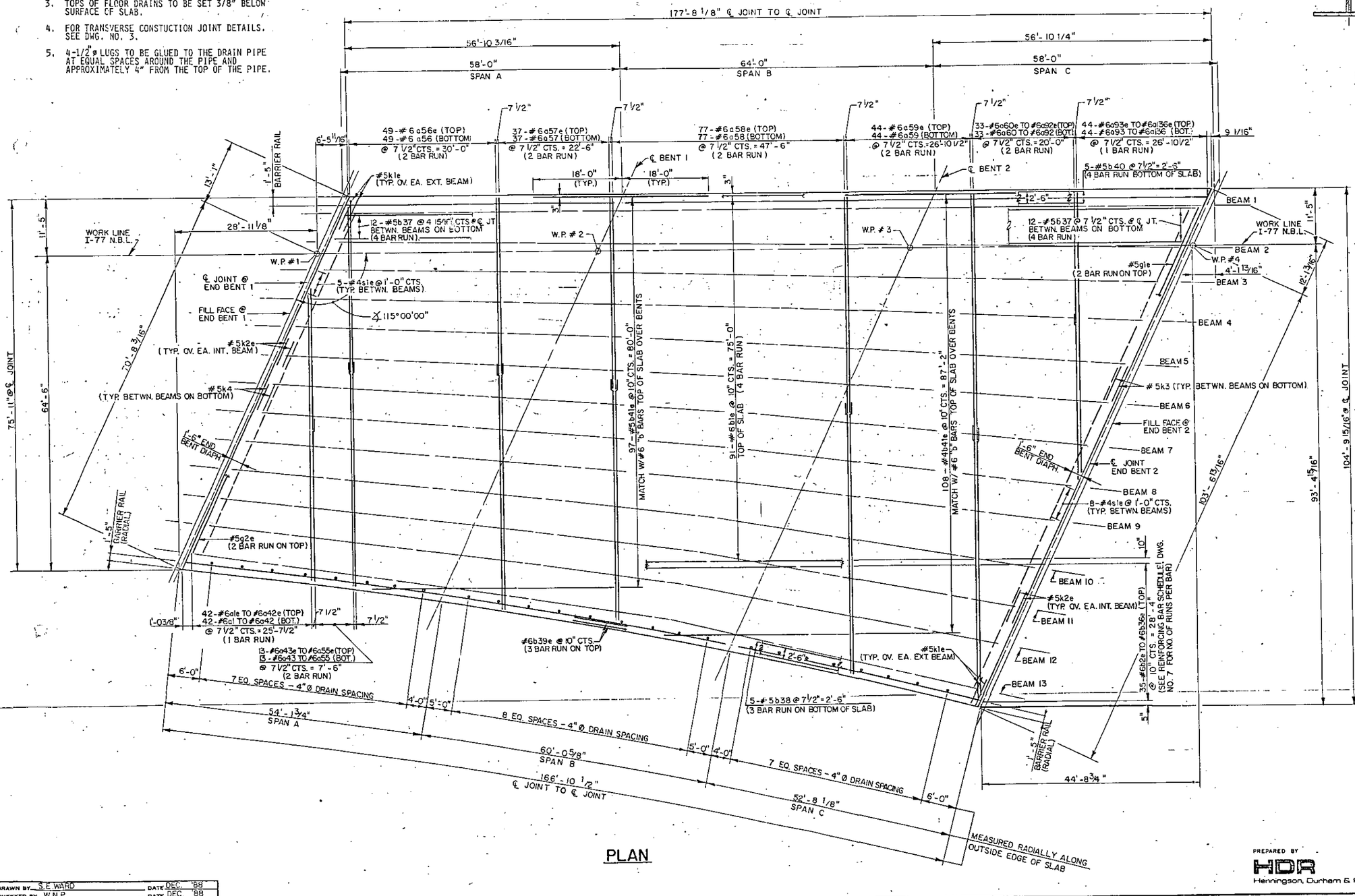
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-3
1	S.E.W.	1/31/89	3			TOTAL SHEETS
2			4			115

NOTES

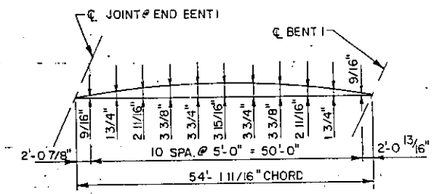
1. FOR DECK POURING SCHEDULE & NOTES, SEE DWG. NO. 3.
2. COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
3. TOPS OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
4. FOR TRANSVERSE CONSTUCTION JOINT DETAILS, SEE DWG. NO. 3.
5. 4-1/2"ø LUGS TO BE GLUED TO THE DRAIN PIPE AT EQUAL SPACES AROUND THE PIPE AND APPROXIMATELY 4" FROM THE TOP OF THE PIPE.



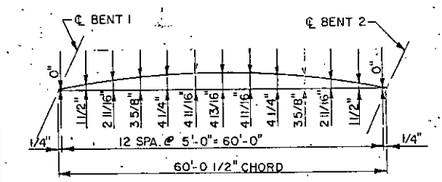
DRAIN CONNECTOR DETAIL



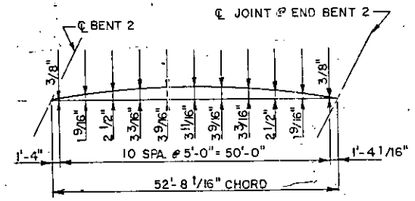
PLAN



SPAN A EDGE OF CURVE OFFSETS



SPAN B EDGE OF CURVE OFFSETS



SPAN C EDGE OF CURVE OFFSETS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE SLAB REINFORCEMENT PLAN

DEC. NORTHBOUND LANE 1988

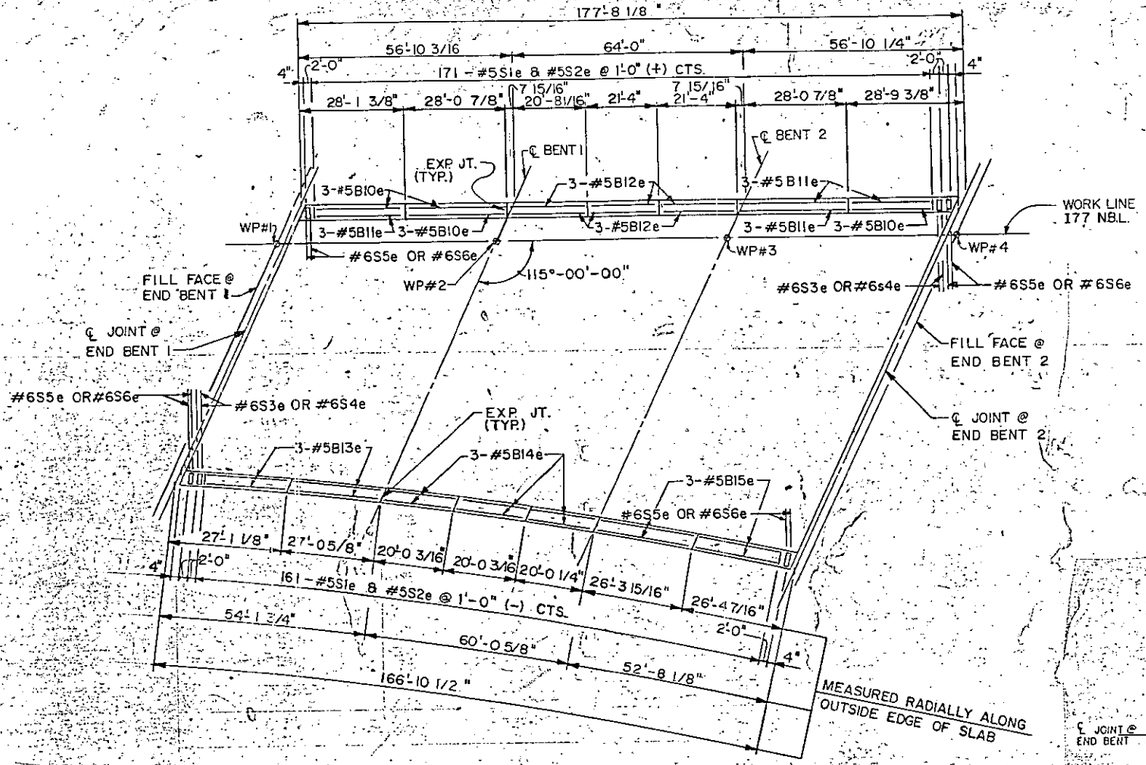
DWG. NO. 4

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		S4
1			3				TOTAL SHEETS
2			4				115

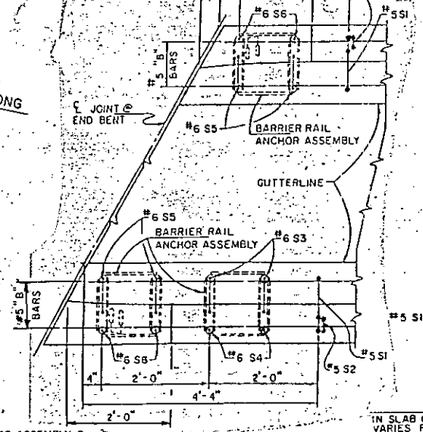
PREPARED BY
HDR
Henningson, Durham & Richardson

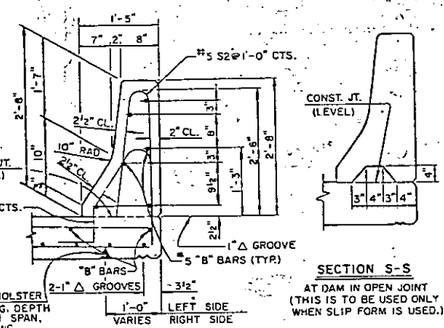
DRAWN BY S.E. WARD DATE DEC. '88
CHECKED BY W.N.P DATE DEC. '88

276



PLAN



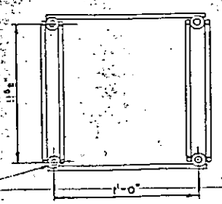


BEAM BOLSTER IN SLAB OVERHANG. DEPTH VARIES FOR EACH SPAN, EACH SIDE. SEE DWG. NO. 3

SECTION THRU RAIL

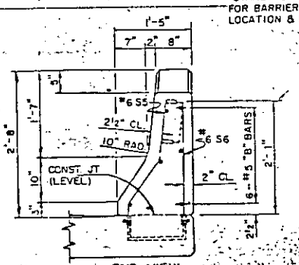
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED.)

THREADED STEEL INSERTS WITH OPEN OR CLOSED BOTTOM TO FIT THREADED REINFORCING BAR

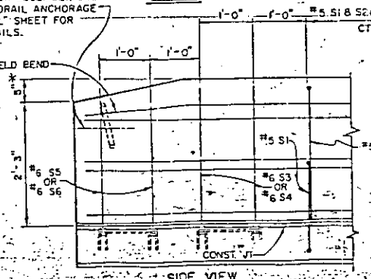


BARRIER RAIL ANCHOR ASSEMBLY — 6 ANCHOR ASSEMBLIES REQUIRED

℄ 2 BOLT ANCHOR ASSEMBLY & GUARDRAIL ANCHOR ASSEMBLY, SEE "STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET FOR LOCATION & DETAILS.

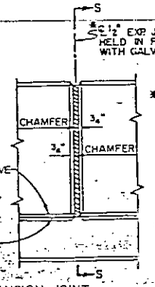


BARRIER RAIL — END OF RAIL DETAILS



PLAN

* BARRIER RAIL ON RT. SIDE OF BRIDGE IS TO EXTEND ONTO APPROACH SLAB. THE 5" DROPOFF DOES NOT APPLY TO THESE AREAS.



*NOTE
OMIT EXP JT MAT'L WHEN SLIP FORM IS USED.

ELEVATION AT EXPANSION JOINT

BARRIER RAIL DETAILS

NOTES

FOR CONCRETE BARRIER RAIL, SEE SPECIAL PROVISIONS.

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

THE 1" Δ GROOVE AT THE CONSTRUCTION JOINT MAY BE OMITTED.

A 1-1/2" EXTENSION OF THE CONCRETE SLAB BEYOND THE OUTSIDE FACE OF THE BARRIER RAIL WILL BE REQUIRED IF THE CONTRACTOR ELECTS TO SLIP FORM THE BARRIER RAILS. NO ADDITIONAL REINFORCING STEEL IS REQUIRED AND THE PAYMENT FOR THE REINFORCED CONCRETE DECK SLAB WILL BE FOR THE QUANTITY SHOWN ON THE PLANS.

FERRULES SHALL BE PLUGGED DURING CASTING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

THE BARRIER RAIL ANCHOR ASSEMBLY FERRULES SHALL HAVE THREADS COMPATIBLE TO THE THREADED REINFORCING BARS. THE FERRULES SHALL HAVE A MINIMUM LENGTH EQUAL TO THE LENGTH OF THE THREADS ON THE REINFORCING BARS.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

THE THREADED REINFORCING BARS ARE TO BE TIGHTENED BY HAND.

THE WIRE GAGE AND FERRULES SHALL BE OF SUFFICIENT STRENGTH TO ENSURE LOAD ANCHORING CAPACITY AS SPECIFIED IN THE AASHTO SPECIFICATIONS. A MANUFACTURER'S CERTIFICATION OF LOAD ANCHORING CAPACITY SHALL BE FURNISHED WITH EACH SHIPMENT OF BARRIER RAIL ANCHOR ASSEMBLIES.

THE THREADED REINFORCING BARS SHALL BE GRADE 60. THE BAR SHALL BE MANUFACTURED WITH A MALE THREADED END WITH A MINIMUM TENSILE STRESS AREA OF 0.334 SQUARE INCHES. THE BARRIER RAIL ANCHOR ASSEMBLY AND THREADED REINFORCING BARS SHALL BE SUPPLIED AS A UNIT.

THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE ASSEMBLED IN THE SHOP. REINFORCING BAR THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

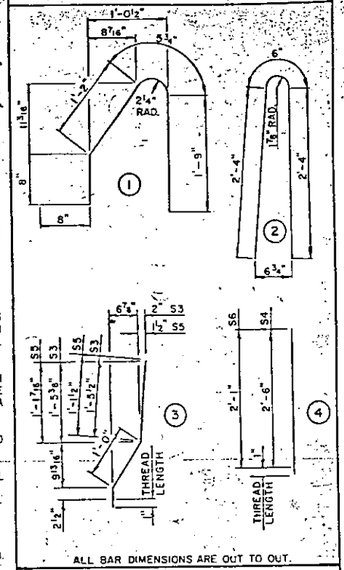
ALL REINFORCING STEEL IN BARRIER RAIL SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

JOINTS IN BARRIER RAIL ON LEFT SIDE SHALL BE PERPENDICULAR TO PGL I-77 N.B.

JOINTS IN BARRIER RAIL ON RIGHT SIDE SHALL BE PARALLEL WITH SKEW.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1e	354	#5	1	4'-9"	1754
S2e	354	#5	2	5'-2"	1908
S3e	4	#6	3	2'-9"	17
S4e	4	#6	4	2'-7"	16
S5e	8	#6	3	2'-5"	29
S6e	8	#6	4	2'-2"	26
B10e	12	#5	STR.	27'-8"	346
B11e	12	#5	STR.	28'-4"	355
B12e	18	#5	STR.	21'-0"	394
B13e	12	#5	STR	26'-8"	334
B14e	18	#5	STR.	19'-8"	369
B15e	12	#5	STR.	26'-0"	325
B16e	6	#5	STR.	11'-2"	70
B17e	6	#5	STR.	10'-8"	67
REINFORCING STEEL *					6,010 LBS.
CLASS A-A CONCRETE *					33.7 CU. YDS.
CONCRETE BARRIER RAIL *					367.02 LIN. FT.

* INCLUDES BARRIER RAIL ON APPROACH SLAB, SEE DWG. NO. 28

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

MARCH NORTHBOUND LANE 1984

DWG. NO. 5

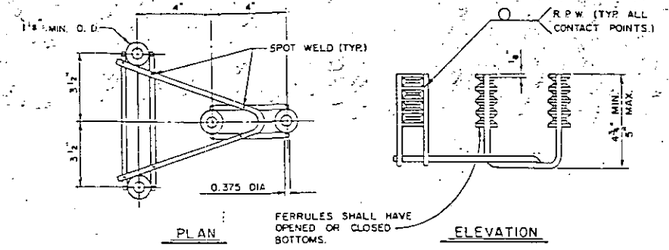
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-5
1			3			TOTAL SHEETS
2			4			115

STD. NO. CBRI

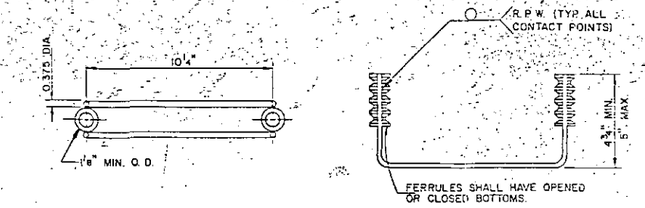
ASSEMBLED BY SW	DATE 12-'83	SPECIAL	
CHECKED BY WNP	DATE 12/'83		
DRAWN BY E. R. LUMWICK, JR	DATE JANUARY 3, 1984	STANDARD	
CHECKED BY R. R. HUTCHERSON	DATE JANUARY 3, 1984		

REVISED 3-12-87 BY JST
REVISED 5-31-85 BY RNH
ADDED 3-31-84 BY WS

277



GUARDRAIL ANCHOR ASSEMBLY



2-BOLT ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1 1/2".

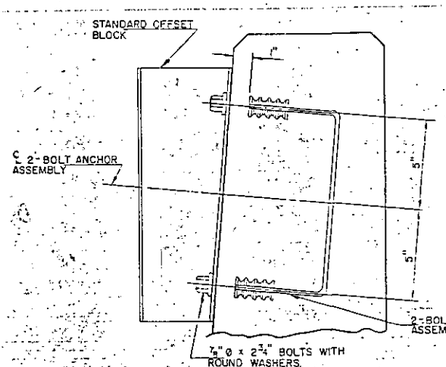
B. 4 - 7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2-7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" DIA. X 2 3/4" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

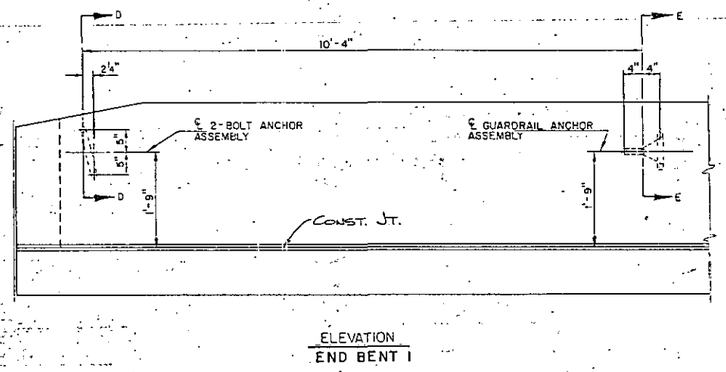
THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

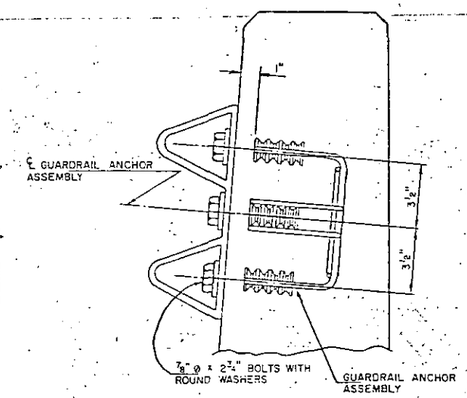
THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



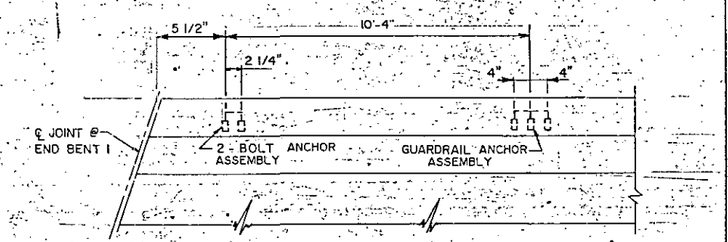
SECTION D-D



ELEVATION
END BENT 1

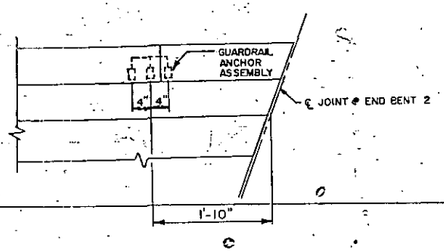


SECTION E-E



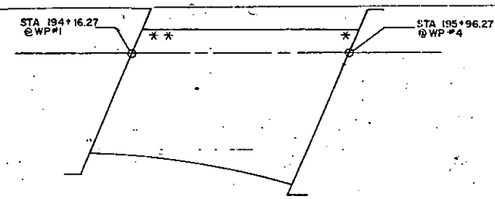
PLAN

** LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSETS BLOCKS
END BENT 1



PLAN

* LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK
END BENT 2



SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL
MARCH NORTHBOUND LANE 1984

ASSEMBLED BY	JCC	DATE	10-88	
CHECKED BY	SSW	DATE	11-88	SPECIAL
DRAWN BY	E. R. LURWICK, JR	DATE	JANUARY 3, 1984	
CHECKED BY	R. N. HUTCHERSON	DATE	JANUARY 3, 1984	STANDARD

DWG. NO. 6	REVISIONS						SHEET NO.
	NO.	BY	DATE	NO.	BY	DATE	S-6 278
	1			3			TOTAL SHEETS
	2			4			115

STD. NO. GRAI

REDRAWN 3-1-84

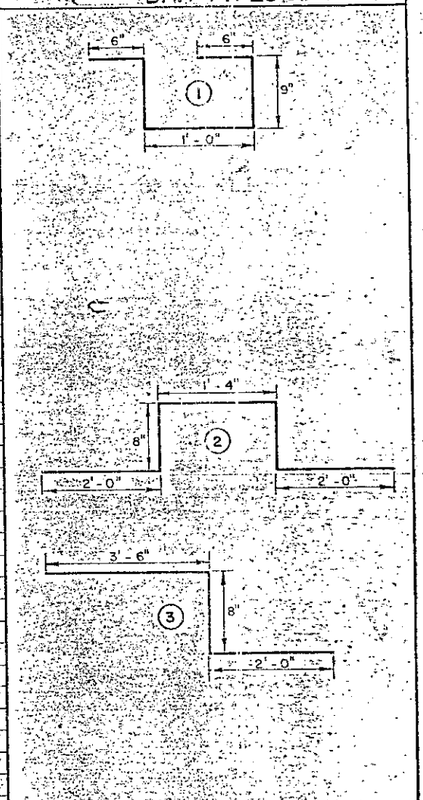
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
a1	1	#6	STR.	1'-9"	3
a2	1	#6	STR.	3'-2"	5
a3	1	#6	STR.	4'-7"	7
a4	1	#6	STR.	6'-0"	9
a5	1	#6	STR.	7'-5"	11
a6	1	#6	STR.	8'-9"	13
a7	1	#6	STR.	10'-2"	15
a8	1	#6	STR.	11'-7"	17
a9	1	#6	STR.	13'-0"	19
a10	1	#6	STR.	14'-5"	22
a11	1	#6	STR.	15'-10"	24
a12	1	#6	STR.	17'-3"	26
a13	1	#6	STR.	18'-8"	28
a14	1	#6	STR.	20'-1"	30
a15	1	#6	STR.	21'-5"	32
a16	1	#6	STR.	22'-10"	34
a17	1	#6	STR.	24'-3"	36
a18	1	#6	STR.	25'-8"	38
a19	1	#6	STR.	27'-1"	41
a20	1	#6	STR.	28'-6"	43
a21	1	#6	STR.	29'-11"	45
a22	1	#6	STR.	31'-4"	47
a23	1	#6	STR.	32'-9"	49
a24	1	#6	STR.	34'-2"	51
a25	1	#6	STR.	35'-7"	53
a26	1	#6	STR.	37'-0"	55
a27	1	#6	STR.	44'-0"	66
a28	1	#6	STR.	45'-5"	68
a29	1	#6	STR.	44'-6"	67
a30	1	#6	STR.	42'-8"	64
a31	1	#6	STR.	44'-0"	66
a32	1	#6	STR.	45'-5"	68
a33	1	#6	STR.	46'-10"	70
a34	1	#6	STR.	48'-3"	72
a35	1	#6	STR.	49'-8"	74
a36	1	#6	STR.	51'-8"	77
a37	1	#6	STR.	52'-6"	79
a38	1	#6	STR.	53'-11"	81
a39	1	#6	STR.	55'-4"	83
a40	1	#6	STR.	56'-9"	85
a41	1	#6	STR.	58'-2"	87
a42	1	#6	STR.	59'-7"	89
a43	2	#6	STR.	31'-10"	95
a44	2	#6	STR.	32'-6"	97
a45	2	#6	STR.	33'-3"	99
a46	2	#6	STR.	33'-1"	96
a47	2	#6	STR.	34'-8"	104
a48	2	#6	STR.	35'-4"	106
a49	2	#6	STR.	36'-1"	108
a50	2	#6	STR.	36'-9"	110
a51	2	#6	STR.	37'-6"	112
a52	2	#6	STR.	38'-2"	114
a53	2	#6	STR.	38'-11"	116
a54	2	#6	STR.	39'-8"	119
a55	2	#6	STR.	40'-4"	121
a56	98	#6	STR.	43'-5"	6,366
a57	74	#6	STR.	45'-5"	5,028
a58	154	#6	STR.	50'-4"	11,595
a59	88	#6	STR.	53'-7"	7,054
a60	2	#6	STR.	52'-11"	158
a61	2	#6	STR.	52'-3"	156
a62	2	#6	STR.	51'-7"	154
a63	2	#6	STR.	50'-11"	152
a64	2	#6	STR.	50'-3"	150
a65	2	#6	STR.	49'-7"	148
a66	2	#6	STR.	48'-11"	146
a67	2	#6	STR.	48'-2"	144
a68	2	#6	STR.	47'-6"	142
a69	2	#6	STR.	46'-10"	140
a70	2	#6	STR.	46'-2"	138
a71	2	#6	STR.	45'-6"	136
a72	2	#6	STR.	44'-10"	134
a73	2	#6	STR.	44'-2"	132
a74	2	#6	STR.	43'-6"	130
a75	2	#6	STR.	42'-10"	128
a76	2	#6	STR.	42'-2"	126
a77	2	#6	STR.	41'-6"	124
a78	2	#6	STR.	40'-10"	122
a79	2	#6	STR.	40'-2"	120
a80	2	#6	STR.	39'-6"	118
a81	2	#6	STR.	38'-10"	116
a82	2	#6	STR.	38'-2"	114
a83	2	#6	STR.	37'-6"	112
a84	2	#6	STR.	36'-10"	110
a85	2	#6	STR.	36'-2"	108
a86	2	#6	STR.	35'-6"	106
a87	2	#6	STR.	34'-10"	104
a88	2	#6	STR.	34'-2"	102
a89	2	#6	STR.	33'-6	100
a90	2	#6	STR.	32'-10"	98
a91	2	#6	STR.	32'-1"	96
a92	2	#6	STR.	31'-5"	94
a93	1	#6	STR.	56'-9"	88
a94	1	#6	STR.	57'-4"	86
a95	1	#6	STR.	56'-0"	84
a96	1	#6	STR.	54'-8"	82
a97	1	#6	STR.	53'-4"	80
a98	1	#6	STR.	52'-0"	78
a99	1	#6	STR.	50'-8"	76
a100	1	#6	STR.	49'-4"	74
a101	1	#6	STR.	48'-0"	72
a102	1	#6	STR.	46'-8"	70
a103	1	#6	STR.	45'-4"	68
a104	1	#6	STR.	44'-0"	66
a105	1	#6	STR.	42'-8"	64
a106	1	#6	STR.	41'-3"	62
a107	1	#6	STR.	39'-11"	60
a108	1	#6	STR.	38'-7"	58
a109	1	#6	STR.	37'-3"	56
a110	1	#6	STR.	35'-11"	54
a111	1	#6	STR.	34'-7"	52
a112	1	#6	STR.	33'-3"	50
a113	1	#6	STR.	31'-11"	48
a114	1	#6	STR.	30'-7"	46
a115	1	#6	STR.	29'-3"	44
a116	1	#6	STR.	27'-11"	42
a117	1	#6	STR.	26'-7"	40
a118	1	#6	STR.	25'-2"	38
a119	1	#6	STR.	23'-10"	36
a120	1	#6	STR.	22'-6"	34
a121	1	#6	STR.	21'-2"	32
a122	1	#6	STR.	19'-10"	30
a123	1	#6	STR.	18'-6"	28
a124	1	#6	STR.	17'-2"	26
a125	1	#6	STR.	15'-10"	24
a126	1	#6	STR.	14'-6"	22
a127	1	#6	STR.	13'-2"	20
a128	1	#6	STR.	11'-10"	18
a129	1	#6	STR.	10'-5"	16
a130	1	#6	STR.	9'-1"	14
a131	1	#6	STR.	7'-9"	12
a132	1	#6	STR.	6'-5"	10
a133	1	#6	STR.	5'-1"	8
a134	1	#6	STR.	3'-9"	6
a135	1	#6	STR.	2'-5"	4
a136	1	#6	STR.	1'-1"	2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
a46e	2	#6	STR.	33'-11"	101
a47e	2	#6	STR.	34'-8"	104
a48e	2	#6	STR.	35'-4"	106
a49e	2	#6	STR.	36'-1"	108
a50e	2	#6	STR.	36'-9"	110
a51e	2	#6	STR.	37'-6"	112
a52e	2	#6	STR.	38'-2"	114
a53e	2	#6	STR.	38'-11"	116
a54e	2	#6	STR.	39'-8"	119
a55e	2	#6	STR.	40'-4"	121
a56e	98	#6	STR.	43'-5"	6,366
a57e	74	#6	STR.	45'-5"	5,028
a58e	154	#6	STR.	50'-4"	11,595
a59e	88	#6	STR.	53'-7"	7,054
a60e	2	#6	STR.	52'-11"	158
a61e	2	#6	STR.	52'-3"	156
a62e	2	#6	STR.	51'-7"	154
a63e	2	#6	STR.	50'-11"	152
a64e	2	#6	STR.	50'-3"	150
a65e	2	#6	STR.	49'-7"	148
a66e	2	#6	STR.	48'-11"	146
a67e	2	#6	STR.	48'-2"	144
a68e	2	#6	STR.	47'-6"	142
a69e	2	#6	STR.	46'-10"	140
a70e	2	#6	STR.	46'-2"	138
a71e	2	#6	STR.	45'-6"	136
a72e	2	#6	STR.	44'-10"	134
a73e	2	#6	STR.	44'-2"	132
a74e	2	#6	STR.	43'-6"	130
a75e	2	#6	STR.	42'-10"	128
a76e	2	#6	STR.	42'-2"	126
a77e	2	#6	STR.	41'-6"	124
a78e	2	#6	STR.	40'-10"	122
a79e	2	#6	STR.	40'-2"	120
a80e	2	#6	STR.	39'-6"	118
a81e	2	#6	STR.	38'-10"	116
a82e	2	#6	STR.	38'-2"	114
a83e	2	#6	STR.	37'-6"	112
a84e	2	#6	STR.	36'-10"	110
a85e	2	#6	STR.	36'-2"	108
a86e	2	#6	STR.	35'-6"	106
a87e	2	#6	STR.	34'-10"	104
a88e	2	#6	STR.	34'-2"	102
a89e	2	#6	STR.	33'-6"	100
a90e	2	#6	STR.	32'-10"	98
a91e	2	#6	STR.	32'-1"	96
a92e	2	#6	STR.	31'-5"	94
a93e	1	#6	STR.	56'-9"	88
a94e	1	#6	STR.	57'-4"	86
a95e	1	#6	STR.	56'-0"	84
a96e	1	#6	STR.	54'-8"	82
a97e	1	#6	STR.	53'-4"	80
a98e	1	#6	STR.	52'-0"	78
a99e	1	#6	STR.	50'-8"	76
a100e	1	#6	STR.	49'-4"	74
a101e	1	#6	STR.	48'-0"	72
a102e	1	#6	STR.	46'-8"	70
a103e	1	#6	STR.	45'-4"	68
a104e	1	#6	STR.	44'-0"	66
a105e	1	#6	STR.	42'-8"	64
a106e	1	#6	STR.	41'-3"	62
a107e	1	#6	STR.	39'-11"	60
a108e	1	#6	STR.	38'-7"	58
a109e	1	#6	STR.	37'-3"	56
a110e	1	#6	STR.	35'-11"	54
a111e	1	#6	STR.	34'-7"	52
a112e	1	#6	STR.	33'-3"	50
a113e	1	#6	STR.	31'-11"	48
a114e	1	#6	STR.	30'-7"	46
a115e	1	#6	STR.	29'-3"	44
a116e	1	#6	STR.	27'-11"	42
a117e	1	#6	STR.	26'-7"	40
a118e	1	#6	STR.	25'-2"	38
a119e	1	#6	STR.	23'-10"	36
a120e	1	#6	STR.	22'-6"	34
a121e	1	#6	STR.	21'-2"	32
a122e	1	#6	STR.	19'-10"	30
a123e	1	#6	STR.	18'-6"	28
a124e	1	#6	STR.	17'-2"	26
a125e	1	#6	STR.	15'-10"	24
a126e	1	#6	STR.	14'-6"	22
a127e	1	#6	STR.	13'-2"	20
a128e	1	#6	STR.	11'-10"	18
a129e	1	#6	STR.	10'-5"	16
a130e	1	#6	STR.	9'-1"	14
a131e	1	#6	STR.	7'-9"	12
g1e	2	#5	STR.	53'-4"	111
g2e	2	#5	STR.	38'-11"	81
s1e	156	#4	STR.	3'-6"	365

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
b1e	364	#6	STR.	46'-3"	25,185
b2e	1	#6	STR.	0'-11"	1
b3e	1	#6	STR.	4'-8"	7
b4e	1	#6	STR.	8'-5"	13
b5e	1	#6	STR.	12'-3"	18
b6e	1	#6	STR.	16'-1"	24
b7e	1	#6	STR.	20'-0"	30
b8e	1	#6	STR.	23'-11"	36
b9e	1	#6	STR.	27'-11"	42
b10e	1	#6	STR.	32'-0"	48
b11e	1	#6	STR.	36'-1"	54
b12e	1	#6	STR.	40'-4"	60
b13e	1	#6	STR.	44'-6"	67
b14e	1	#6	STR.	48'-10"	73
b15e	1	#6	STR.	53'-3"	80
b16e	1	#6	STR.	57'-8"	86
b17e	2	#6	STR.	32'-5"	97
b18e	2	#6	STR.	34'-9"	104
b19e	2	#6	STR.	37'-1"	111
b20e	2	#6	STR.	39'-6"	118
b21e	2	#6	STR.	41'-11"	125
b22e	2	#6	STR.	44'-5"	133
b23e	2	#6	STR.	47'-0"	141
b24e	2	#6	STR.	49'-7"	148
b25e	2	#6	STR.	52'-4"	157
b26e	2	#6	STR.	55'-1"	165
b27e	2	#6	STR.	57'-11"	173
b28e	3	#6	STR.	61'-5"	186
b29e	3	#6	STR.	43'-5"	195
b30e	3	#6	STR.	45'-6"	204
b31e	3	#6	STR.	47'-8"	214
b32e	3	#6	STR.	49'-11"	224
b33e	3	#6	STR.	52'-3"	234
b34e	3	#6	STR.	54'-9"	246
b35e	3	#6	STR.	57'-4"	257
b36e	4	#6	STR.	45'-9"	274
b37	576	#5	STR.	45'-11"	27,587
b38	15	#5	STR.	56'-11"	890
b39e	6	#6	STR.	56'-11"	512
b40	20	#5	STR.	45'-11"	958
b41e	205	#5	STR.	36'-0"	7,697
k1e	8	#5	STR.	6'-2"	51
k2e	44	#5	STR.	6'-8"	306
k3	24	#5	STR.	8'-6"	213
k4	24	#5	STR.	5'-11"	148

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIALS

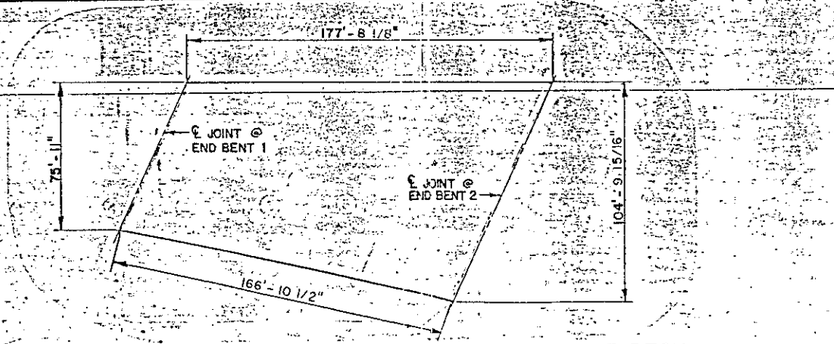
CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINF. STEEL	
469.3 cy	69,307 lbs.	7964 lbs.	
469.3 cy	69,307 lbs.	7964 lbs.	TOTALS

NOTE: QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION 194+99.29

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

BAR	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-9"	2'-5"
#5	2'-2"	3'-0"
#6	2'-7"	3'-7"
#8	4'-0"	4'-10"



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK (SQ. FT = 15,713)

DRAWN BY STEPHEN E. WARD DATE 10/88
CHECKED BY S.S.W. DATE 12/88

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL

DEC. NORTHBOUND LANE 1988

DWG. NO. 7

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 57 279
TOTAL SHEETS 115

PREPARED BY
HDR
Henningson, Durham & Richardson

SOUTHERN PHOTO-DESIGNS HDR43

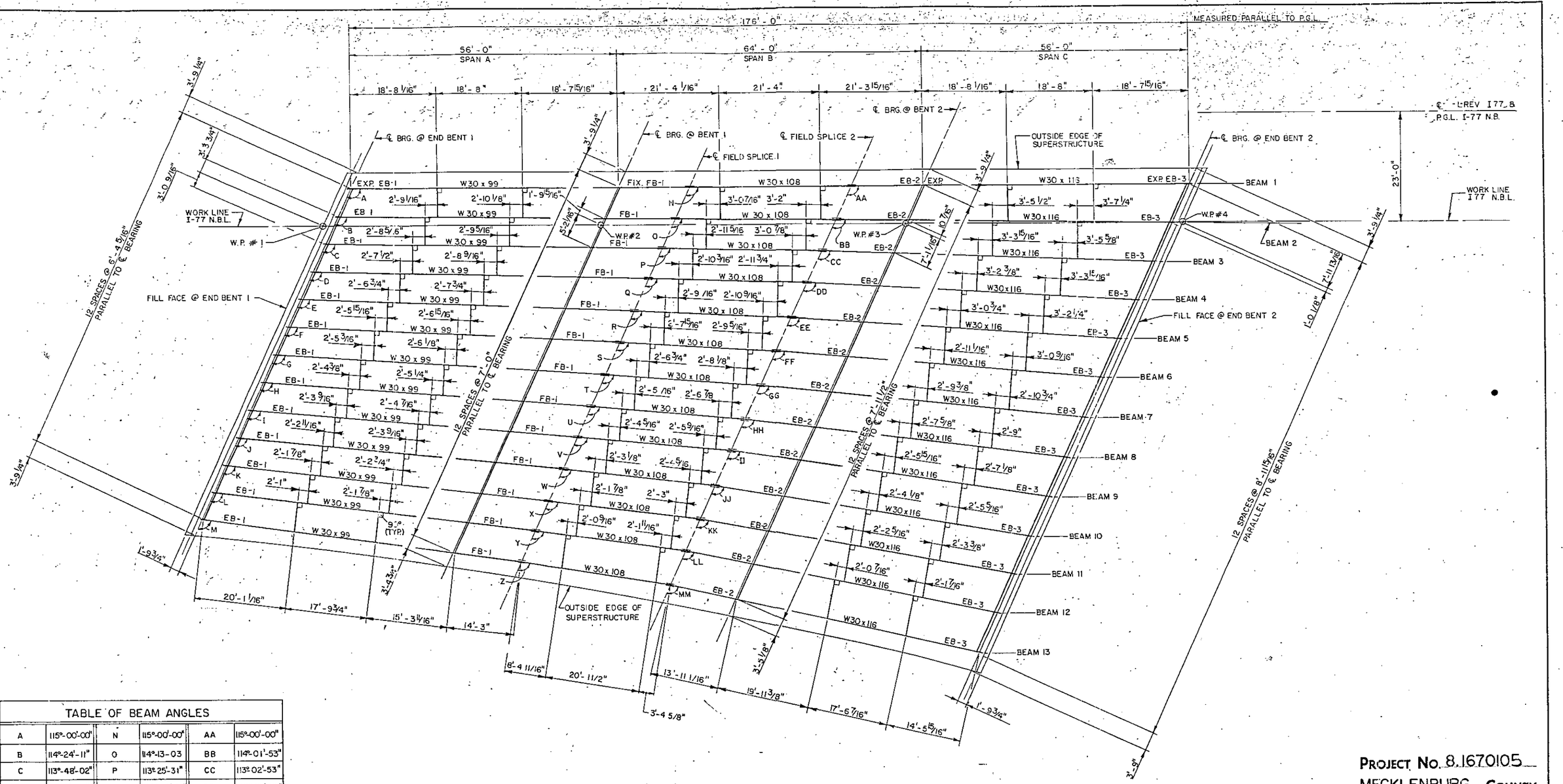


TABLE OF BEAM ANGLES					
A	115°-00'-00"	N	115°-00'-00"	AA	115°-00'-00"
B	114°-24'-11"	O	114°-13'-03"	BB	114°-01'-53"
C	113°-48'-02"	P	113°-25'-31"	CC	113°-02'-53"
D	113°-11'-32"	Q	112°-37'-25"	DD	112°-03'-00"
E	112°-34'-42"	R	111°-48'-44"	EE	111°-02'-16"
F	111°-57'-33"	S	110°-59'-30"	FF	110°-00'-42"
G	111°-20'-04"	T	110°-09'-43"	GG	108°-58'-19"
H	110°-42'-15"	U	109°-19'-24"	HH	107°-55'-08"
I	110°-04'-07"	Y	108°-28'-34"	II	106°-51'-12"
J	109°-25'-41"	W	107°-37'-13"	JJ	105°-46'-33"
K	108°-46'-57"	X	106°-45'-23"	KK	104°-41'-11"
L	108°-07'-54"	Y	105°-53'-04"	LL	103°-35'-10"
M	107°-28'-34"	Z	105°-00'-18"	MM	102°-28'-33"

FRAMING PLAN

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

DEC. NORTHBOUND LANE 1988

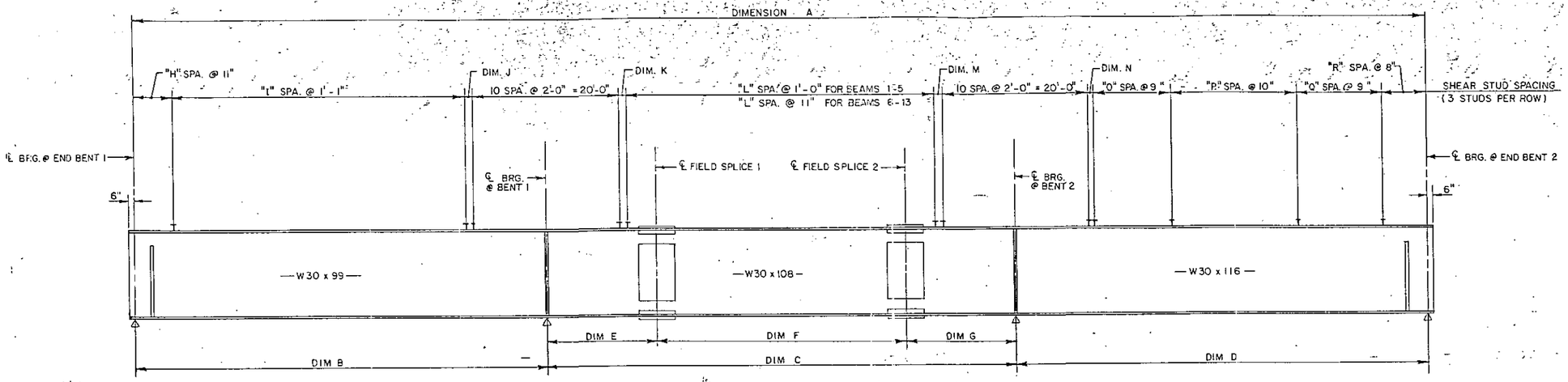
DRAWN BY S.E.W. DATE 11/30/88
CHECKED BY S.S.W. DATE 12-88

PREPARED BY
HDR
Henningson, Durham & Richardson

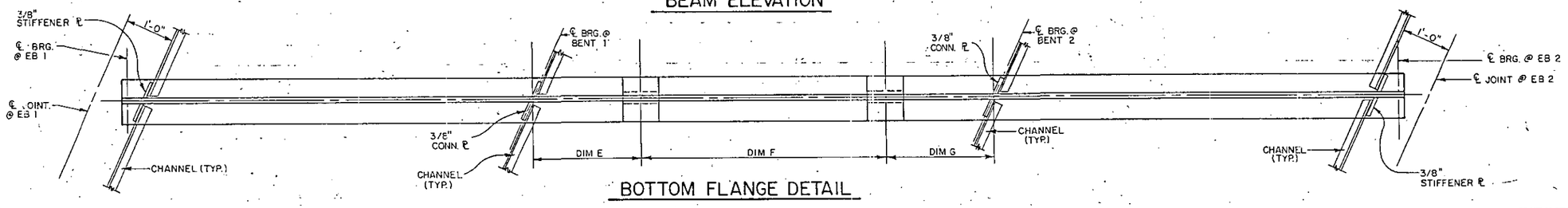
DWG. NO. 8

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	58
1	S.E.W.	1/31/89	3			TOTAL SHEETS
2			4			115

280



BEAM ELEVATION



BOTTOM FLANGE DETAIL

TABLE OF BEAM DIMENSIONS

	DIM A	DIM B	DIM C	DIM D	DIM E	DIM F	DIM G	H	I	DIM J	DIM K	L	DIM M.	DIM N	O	P	Q	R
BEAM 1	176'-0"	56'-0"	64'-0"	56'-0"	15'-0"	34'-0"	15'-0"	6	37	0'-5"	1'-0"	42	1'-0"	9"	15	20	15	8
BEAM 2	174'-0 13/16"	55'-8 13/16"	63'-7 3/16"	55'-6 13/16"	14'-11 1/8"	33'-9 7/16"	14'-10 5/8"	6	36	1'-2 13/16"	9 5/8"	42	9 9/16"	1'-0 13/16"	15	20	15	8
BEAM 3	173'-10 1/8"	55'-5 5/8"	63'-2 5/8"	55'-1 7/8"	14'-10 5/16"	33'-7"	14'-9 5/16"	6	36	11 5/8"	7 5/16"	42	7 1/4"	7 7/8"	15	20	15	8
BEAM 4	172'-9 3/4"	55'-2 9/16"	62'-10 1/16"	54'-9 1/8"	14'-9 1/2"	33'-4 9/16"	14'-8"	6	36	8 9/16"	11 1/16"	41	11"	1'-0 1/8"	14	20	15	8
BEAM 5	171'-9 7/8"	54'-11 9/16"	62'-5 13/16"	54'-4 1/2"	14'-8 11/16"	33'-2 5/16"	14'-6 13/16"	6	36	5 5/8"	8 7/8"	41	8 7/8"	7 9/16"	14	20	15	8
BEAM 6	170'-10 7/16"	54'-8 11/16"	62'-1 9/16"	54'-0 3/16"	14'-7 7/8	33'-0 1/16"	14'-5 5/8"	6	35	1'-3 11/16"	10 13/16"	44	10 3/4"	1'-0 13/16"	14	20	14	8
BEAM 7	169'-11 7/16"	54'-5 7/8"	61'-9 9/16"	53'-8"	14-7 1/8"	32'-9 15/16"	14'-4 1/2"	6	35	1'-0 7/8"	8 3/4"	44	8 13/16"	8"	14	20	14	8
BEAM 8	169'-0 7/8"	54'-3 1/16"	61'-5 11/16"	53'-4 1/8"	14'-6 3/8"	32'-7 7/8"	14'-3 7/16"	6	35	10 1/16"	1'-0 3/8"	43	1'-0 5/16"	4 1/16"	14	20	14	8
BEAM 9	168'-2 15/16"	54'-0 7/16"	61'-2"	53'-0 3/8"	14'-5 11/16"	32'-5 7/8"	14'-2 7/16"	6	35	7 7/16"	10 1/2"	43	10 1/2"	10 3/8"	14	19	14	8
BEAM 10	167'-5 3/16"	53'-9 13/16"	60'-10 1/2"	52'-8 7/8"	14'-5"	32'-4"	14'-1 1/2"	6	35	4 13/16"	8 3/4"	43	8 3/4"	6 7/8"	14	19	14	8
BEAM 11	166'-8 1/16"	53'-7 5/16"	60'-7 1/8"	52'-5 5/8"	14'-4 5/16"	32'-2 3/16"	14'-0 5/8"	6	34	1'-3 5/16"	1'-0 9/16"	42	1'-0 9/16"	1'-0 5/8"	13	19	14	8
BEAM 12	165'-11 3/16"	53'-4 7/8"	60'-3 15/16"	52'-2 9/16"	14'-3 11/16"	32'-0 7/16"	13'-11 3/16"	6	34	1'-0 7/8"	10 15/16"	42	11"	9 9/16"	13	19	14	8
BEAM 13	165'-3 3/16"	53'-2 1/2"	60'-0 15/16"	51'-11 3/4"	14'-3 1/16"	31'-10 13/16"	13'-11 1/16"	6	34	10 1/2"	9 7/16"	42	9 1/2"	6 3/4"	13	19	14	8

NOTE:
W30X99 AND W30X116 SHALL HAVE ENDS THAT ARE NORMAL TO ℄ BEAM. THE W30 X 108 (LOCATED BETWEEN FIELD SPLICE #1 & FIELD SPLICE #2) SHALL BE FABRICATED TO FIT SKEW CONDITIONS AND PROVIDE A 1/4" UNIFORM GAP BETWEEN BEAM FACES AT FIELD SPLICES.

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEAM DETAILS

DEC. NORTHBOUND LANE 1988

DWG. NO. 9

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

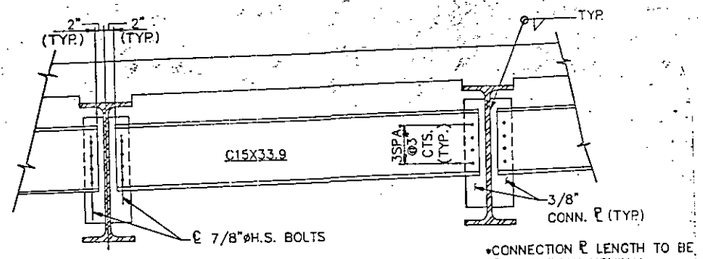
SHEET NO. 57

TOTAL SHEETS 115

281

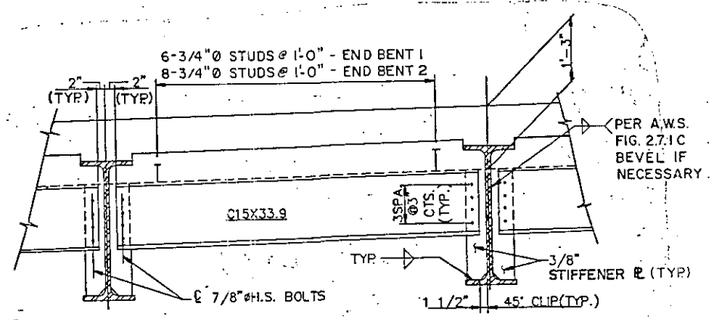
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.E.WARD DATE 11-30-88
CHECKED BY S.S.W. DATE DEC. 88

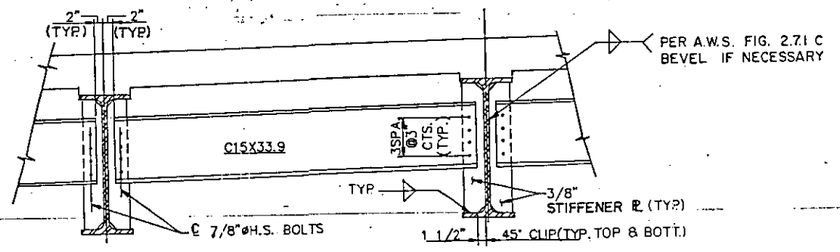


*CONNECTION ℄ LENGTH TO BE 8" LESS THAN NOMINAL BEAM DEPTH

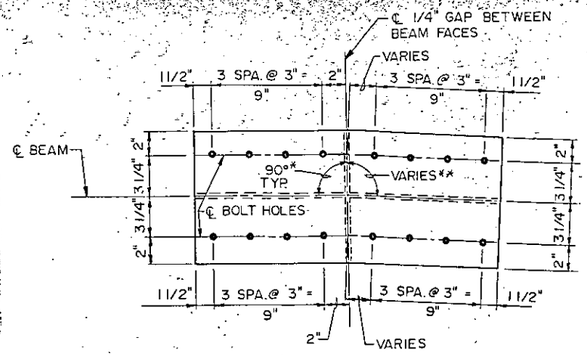
TYPICAL INTERMEDIATE DIAPHRAGM FOR ROLLED BEAMS



TYPICAL END BENT DIAPHRAGM FOR ROLLED BEAMS



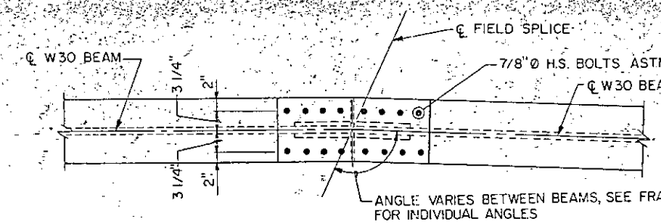
TYPICAL BENT DIAPHRAGM FOR ROLLED BEAMS



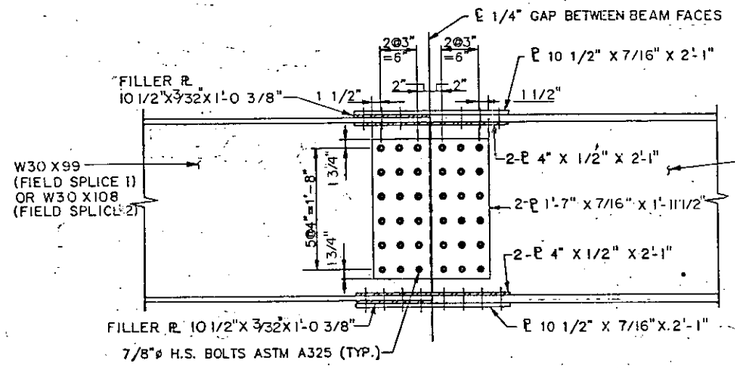
FLANGE ℄ LAYOUT

FOR FIELD SPLICE #1 & FIELD SPLICE #2 TOP & BOTT. TYPICAL

* FOR W30 X 99 & W30 X 116
** FOR W30 X 108



PLAN - TOP & BOTTOM

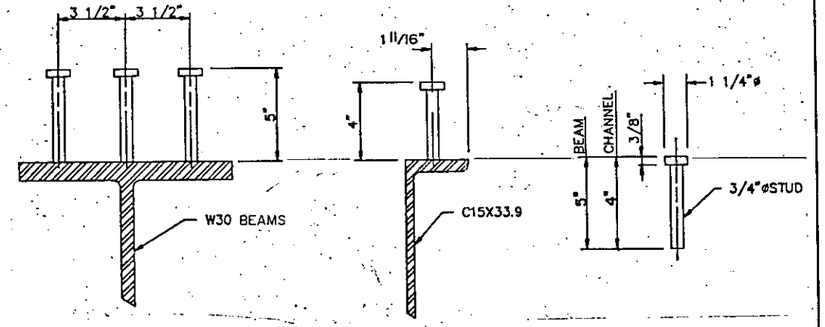


NOTE: ALL DIMENSIONS AND PLATE LENGTHS MEASURED ALONG ℄ BEAM. ENDS OF FLANGE SPLICE PLATES SHALL BE FABRICATED NORMAL TO ℄ BEAM.

ELEVATION - FIELD SPLICE 1 & 2

NOTES

1. AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND THEN, GIVEN AN ADDITIONAL 1/4 TURN, THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
2. ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
3. CAMBERED BEAM LENGTHS SHALL BE ADJUSTED AND BEARINGS ARE TO BE PLACED ON THE CAMBERED BEAM SO AS TO BE ALIGNED WITH THE ANCHORS AFTER THE DEAD LOAD DEFLECTION HAS OCCURRED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.
4. ALL STRUCTURAL STEEL SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL FIELD CONNECTIONS ARE TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
6. STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF THE EXTERIOR BEAM. END STIFFENERS SHALL BE PLUMB.
7. A CHARPY V-NOTCH TEST IS REQUIRED ON ALL BEAM SECTIONS, WEB SPLICE & FLANGE SPLICE PLATES AS SHOWN ON THE PLANS, SEE SPECIAL PROVISIONS
8. STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETED BEFORE FALSE WORK OR FORMS ARE PLACED ON THE UNIT.
9. HIGH STRENGTH BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM A325, TYPE 3.



STUD DETAILS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
FIELD SPLICE DETAILS & MISC. STEEL DETAILS

DEC. NORTHBOUND LANE 1988

DWG. NO. 10

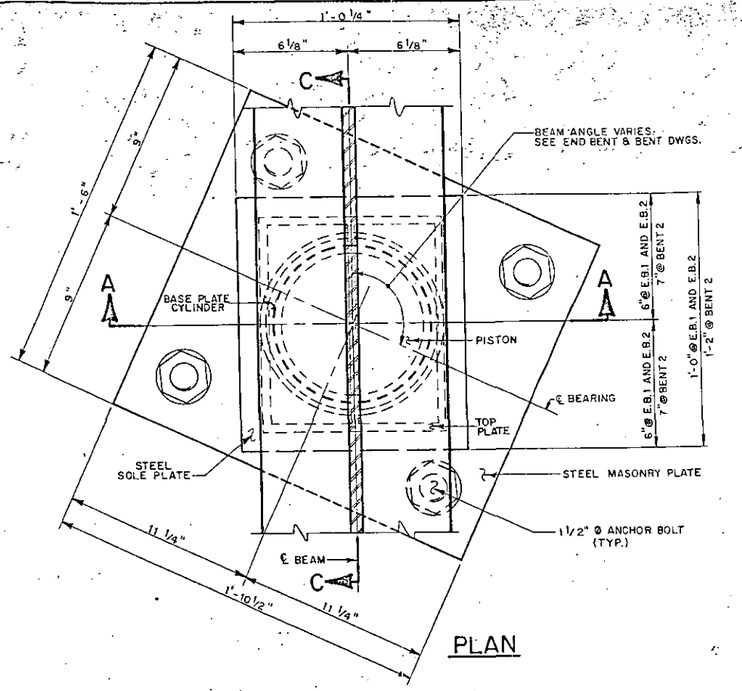
REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	S.E.W.	1/31/89	3		
2			4		

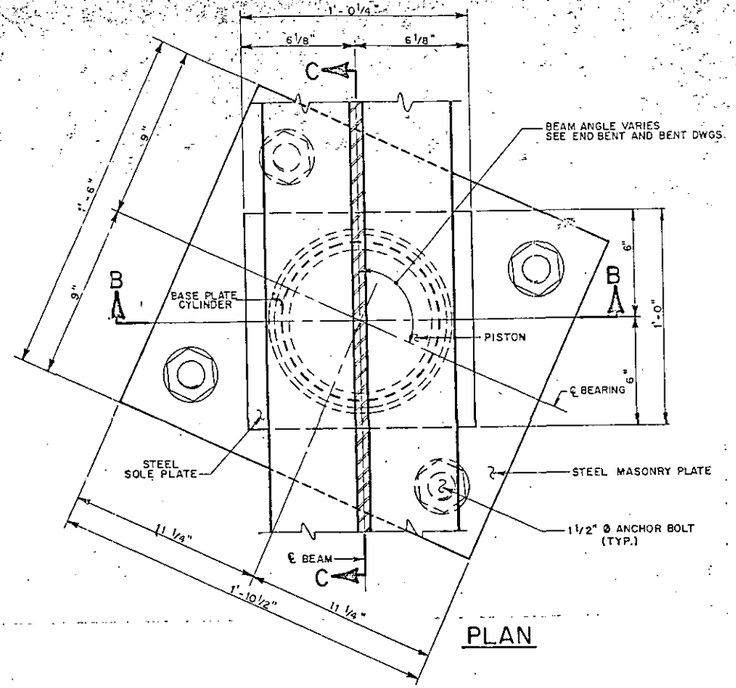
SHEET NO. S-10 282
TOTAL SHEETS 115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.E.W. DATE DEC. 88
CHECKED BY S.S.W. DATE DEC 88



PLAN

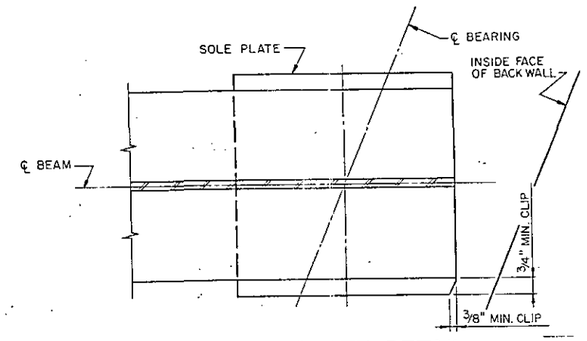


PLAN

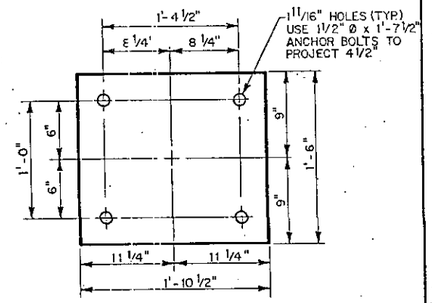
NOTES:
FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. PLANS FOR ANY ADJUSTMENTS SHALL BE APPROVED BEFORE ANY WORK IS BEGUN ON THE BENT.

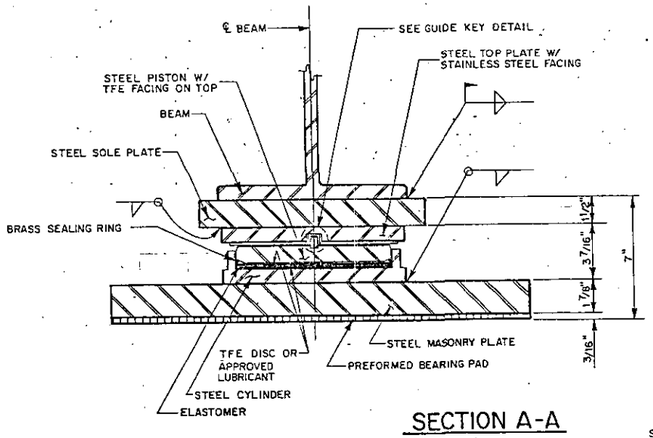
AT ALL POINTS OF SUPPORT IN SPANS A,B & C, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.



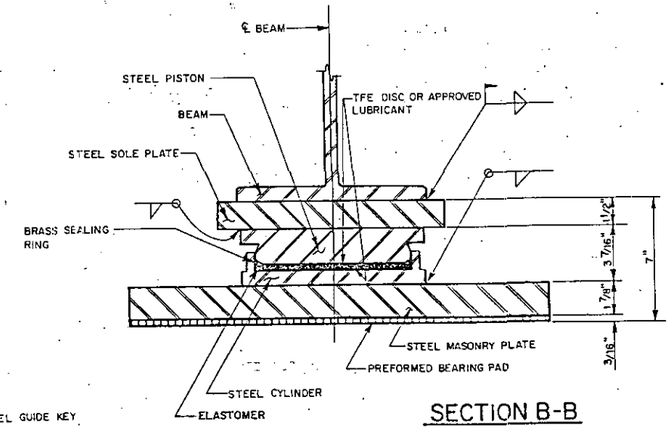
SOLE PLATE DETAIL AT END BENT



TYPICAL MASONRY PLATE

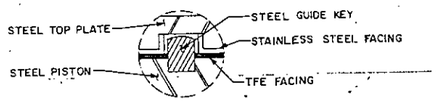


SECTION A-A



SECTION B-B

EXPANSION BEARINGS
(END BENT 1, BENT 2, END BENT 2)

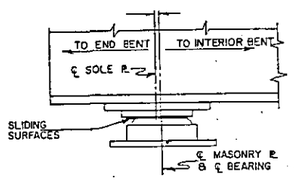


GUIDE KEY DETAIL

FIXED - BEARINGS
(BENT 1)

TABLE FOR PLATE SETTING DATA (EXPANSION POT BEARINGS)				
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	*
END BENT 1	-3/16"	0	+3/16"	0
BENT 2	-3/16"	0	+3/16"	0
END BENT 2	-3/8"	0	+3/8"	0

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



TEMPERATURE SETTING DETAIL

TABLE FOR LOADS AND MOVEMENTS					
BEARING	LOCATION	LOAD IN KIPS			TOTAL MOVEMENT, IN.
		DEAD	LIVE	TOTAL	
EB-1	END BENT 1	24.5	50.1	74.6	5/8"
FB-1	BENT 1	75.7	63.2	138.9	0
EB-2	BENT 2	78.9	75.1	154.0	3/4"
EB-3	END BENT 2	27.9	68.0	95.9	1 3/8"

DRAWN BY S. E. WARD DATE 12-89
CHECKED BY S. S. W. DATE 12-89

PREPARED BY
HDR
Henningson, Durham & Richardson

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
POT BEARING DETAILS

DEC. NORTHBOUND LANE 1988

DWG. NO. 11

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	S.E.W.	2-15-89	3			TOTAL SHEETS
2			4			115

28

.003	.005	.007	.008	.008	.007	.005	.003	.001		.000	.002	.003	.004	.005	.004	.003	.002	.000		.001	.003	.005	.006	.007	.007	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.026	.048	.062	.069	.069	.062	.046	.027	.011		.002	.013	.025	.035	.040	.039	.030	.015	.005		.007	.019	.034	.046	.053	.054	.049	.037	.020	DEFLECTION DUE TO WEIGHT OF SLAB
.003	.006	.008	.009	.009	.008	.006	.003	.001		.001	.004	.006	.008	.008	.008	.006	.004	.001		.001	.003	.006	.007	.008	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.032	.059	.077	.086	.086	.077	.057	.033	.013		.003	.019	.034	.047	.053	.051	.039	.021	.006		.009	.025	.045	.059	.068	.069	.063	.047	.026	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPER ELEVATION ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	REQUIRED CAMBER
3/8"	11/16"	15/16"	1 1/16"	1 1/16"	15/16"	11/16"	3/8"	1/8"		1/16"	1/4"	7/16"	9/16"	5/8"	5/8"	7/16"	1/4"	1/16"		1/8"	5/16"	9/16"	11/16"	13/16"	13/16"	3/4"	9/16"	5/16"	

SPAN A — SPAN B — SPAN C

℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 2 — ℄ BRG. @ END BENT NO. 2

BEAM NO. 1

.003	.005	.007	.008	.008	.007	.005	.003	.001		.000	.002	.003	.004	.004	.004	.003	.002	.000		.001	.003	.005	.006	.007	.007	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.022	.039	.053	.058	.057	.050	.036	.023	.009		.001	.012	.023	.033	.037	.033	.026	.014	.005		.007	.020	.033	.044	.052	.053	.049	.036	.020	DEFLECTION DUE TO WEIGHT OF SLAB
.003	.006	.008	.009	.008	.007	.006	.004	.001		.001	.004	.006	.007	.008	.007	.006	.004	.001		.001	.003	.005	.007	.008	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.028	.050	.068	.075	.073	.064	.047	.030	.011		.002	.018	.032	.044	.049	.044	.035	.020	.006		.009	.026	.043	.057	.067	.068	.063	.046	.026	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.001	.001	.001	.001	.001	.001	.001	.001		.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPER ELEVATION ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
5/16"	5/8"	13/16"	7/8"	7/8"	3/4"	9/16"	3/8"	1/8"		0"	1/4"	3/8"	5/16"	5/8"	9/16"	7/16"	1/4"	1/16"		1/8"	5/16"	1/2"	11/16"	13/16"	13/16"	3/4"	9/16"	5/16"	REQUIRED CAMBER

SPAN A — SPAN B — SPAN C

℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 2 — ℄ BRG. @ END BENT NO. 2

BEAM NO. 2 & 3

.003	.005	.007	.007	.007	.006	.005	.003	.001		.000	.002	.003	.004	.004	.004	.003	.001	.000		.001	.003	.004	.006	.007	.007	.006	.005	.002	DEFLECTION DUE TO WEIGHT OF STEEL
.021	.037	.050	.055	.054	.047	.035	.022	.009		.002	.011	.022	.030	.035	.031	.025	.013	.004		.007	.018	.030	.041	.047	.049	.044	.033	.019	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.003	.004	.004	.004	.003	.002	.002	.001		.001	.002	.003	.004	.004	.004	.003	.002	.001		.001	.002	.003	.004	.004	.004	.004	.003	.002	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.026	.045	.061	.066	.065	.056	.042	.027	.011		.003	.015	.028	.038	.043	.039	.031	.016	.005		.009	.023	.037	.051	.058	.060	.054	.041	.023	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000		.002	.004	.004	.004	.004	.004	.004	.004	.002		.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPER ELEVATION ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
5/16"	9/16"	3/4"	13/16"	3/4"	11/16"	1/2"	5/16"	1/8"		1/16"	1/4"	3/8"	1/2"	9/16"	1/2"	7/16"	1/4"	1/16"		1/8"	1/4"	7/16"	5/8"	11/16"	3/4"	5/8"	1/2"	1/4"	REQUIRED CAMBER

SPAN A — SPAN B — SPAN C

℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 1 — ℄ BRG. @ END BENT NO. 2 — ℄ BRG. @ END BENT NO. 2

BEAM NO. 4,5 & 6

SCHEMATIC CAMBER ORDINATES

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRGS. EXCEPT BEAM CAMBER WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CAMBER DIAGRAM

DEC. NORTHBOUND LANE 1988

DWG. NO. 12

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 5-12

TOTAL SHEETS 115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.E. WARD, J.K.S. DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88

284

.003	.005	.007	.007	.007	.006	.005	.003	.001	.000	.002	.003	.004	.004	.004	.003	.001	.000	.001	.003	.004	.006	.007	.007	.006	.005	.002	DEFLECTION DUE TO WEIGHT OF STEEL
.021	.037	.050	.055	.054	.047	.035	.022	.009	.002	.011	.022	.030	.035	.031	.025	.013	.004	.007	.018	.030	.041	.047	.049	.044	.033	.019	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.003	.004	.004	.004	.003	.002	.002	.001	.001	.002	.003	.004	.004	.004	.003	.002	.001	.001	.002	.003	.004	.004	.004	.004	.003	.002	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.026	.045	.061	.066	.065	.056	.042	.027	.011	.003	.015	.028	.038	.043	.039	.031	.016	.005	.009	.023	.037	.051	.058	.060	.054	.041	.023	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.005	.006	.006	.006	.006	.006	.003	.000	.009	.011	.010	.008	.007	.006	.004	.003	.001	SUPERELEVATION ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
5/16"	9/16"	3/4"	13/16"	3/4"	11/16"	1/2"	5/16"	1/8"	1/16"	1/4"	7/16"	1/2"	9/16"	9/16"	7/16"	1/4"	1/8"	3/16"	7/16"	9/16"	11/16"	3/4"	13/16"	11/16"	1/2"	1/4"	REQUIRED CAMBER

SPAN A — SPAN B — SPAN C

℄ BEARING END BENT NO. 1 — ℄ BEARING BENT NO. 1 — ℄ BEARING BENT NO. 2 — ℄ BEARING END BENT NO. 2

BEAM NO. 7

NOTE: VALUES ARE IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRGS. EXCEPT BEAM CAMBER WHICH IS GIVEN IN INCHES (FRACTION FORM). SLOPE OF ZERO CAMBER BASE LINE VARIES FROM BEAM 10.

.003	.005	.006	.007	.007	.006	.004	.003	.001	.000	.001	.003	.004	.004	.004	.003	.001	.000	.001	.002	.004	.005	.006	.006	.006	.004	.002	DEFLECTION DUE TO WEIGHT OF STEEL
.020	.036	.047	.053	.052	.045	.033	.020	.008	.002	.014	.021	.030	.034	.030	.024	.012	.004	.007	.016	.027	.037	.045	.045	.042	.032	.017	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.002	.003	.004	.004	.003	.003	.002	.001	.001	.002	.003	.003	.003	.003	.002	.002	.001	.001	.002	.002	.003	.004	.004	.003	.002	.001	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.025	.043	.056	.064	.063	.054	.040	.025	.010	.003	.017	.027	.037	.041	.037	.029	.015	.005	.009	.020	.033	.045	.055	.055	.051	.038	.020	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000	.006	.012	.014	.014	.014	.014	.014	.012	.006	.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPERELEVATION ORDINATE
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
5/16"	1/2"	11/16"	3/4"	3/4"	5/8"	1/2"	5/16"	1/8"	1/8"	3/8"	1/2"	5/8"	11/16"	5/8"	1/2"	5/16"	1/8"	1/8"	1/4"	3/8"	9/16"	11/16"	11/16"	5/8"	7/16"	1/4"	REQUIRED CAMBER

SPAN A — SPAN B — SPAN C

℄ BEARING END BENT NO. 1 — ℄ BEARING BENT NO. 1 — ℄ BEARING BENT NO. 2 — ℄ BEARING END BENT NO. 2

BEAM NO. 8 & 9

.003	.005	.006	.007	.007	.006	.004	.003	.001	.000	.001	.003	.004	.004	.004	.003	.001	.000	.001	.002	.004	.005	.006	.006	.006	.004	.002	DEFLECTION DUE TO WEIGHT OF STEEL
.020	.036	.047	.053	.052	.045	.033	.020	.008	.002	.014	.021	.030	.034	.030	.024	.012	.004	.007	.016	.027	.037	.045	.045	.042	.032	.017	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.002	.003	.004	.004	.003	.003	.002	.001	.001	.002	.003	.003	.003	.003	.002	.002	.001	.001	.002	.002	.003	.004	.004	.003	.002	.001	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.025	.043	.056	.064	.063	.054	.040	.025	.010	.003	.017	.027	.037	.041	.037	.029	.015	.005	.009	.020	.033	.045	.055	.055	.051	.038	.020	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000	.017	.035	.049	.059	.072	.087	.029	.023	.012	.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPERELEVATION ORDINATE
-.004	-.008	-.009	-.013	-.014	-.014	-.013	-.010	-.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	VERTICAL CURVE ORDINATE
1/4"	7/16"	9/16"	5/8"	9/16"	1/2"	5/16"	3/16"	1/16"	1/4"	5/8"	15/16"	1 1/8"	1 3/8"	1 1/2"	11/16"	7/16"	3/16"	1/8"	1/4"	3/8"	9/16"	11/16"	11/16"	5/8"	7/16"	1/4"	REQUIRED CAMBER

SPAN A — SPAN B — SPAN C

℄ BEARING END BENT NO. 1 — ℄ BEARING BENT NO. 1 — ℄ BEARING BENT NO. 2 — ℄ BEARING END BENT NO. 2

BEAM NO. 10

SCHEMATIC CAMBER ORDINATES

PREPARED BY HDR Henningson, Durham & Richardson

DRAWN BY: K.D.H. DATE: MARCH 89
CHECKED BY: S.S.W. DATE: MARCH 89

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CAMBER DIAGRAM

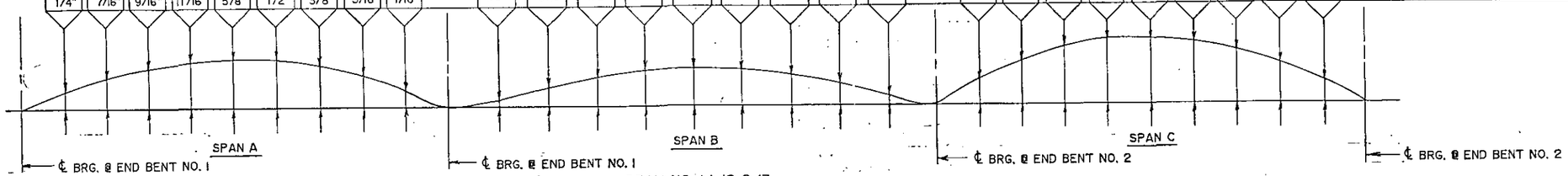
DEC. NORTHBOUND LANE 1988

DWG. NO. 13

REVISIONS						SHEET NO. 6-13
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS 115
1			3			
2			4			

SOUTHERN PHOTO-LITHO CORP.

.003	.005	.006	.007	.007	.006	.004	.003	.001	.000	.001	.003	.003	.004	.004	.003	.001	.000	.001	.002	.004	.005	.006	.006	.005	.004	.002	DEFLECTION DUE TO WEIGHT OF STEEL
.020	.034	.046	.052	.050	.045	.034	.021	.008	.002	.010	.020	.028	.032	.029	.023	.013	.004	.006	.017	.028	.036	.042	.044	.040	.030	.016	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.005	.007	.007	.007	.006	.005	.003	.001	.001	.003	.005	.006	.006	.006	.005	.003	.001	.001	.002	.004	.006	.006	.006	.006	.004	.002	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.025	.044	.059	.066	.064	.057	.043	.027	.010	.003	.014	.028	.037	.042	.039	.031	.017	.005	.008	.021	.036	.047	.054	.056	.051	.038	.020	TOTAL DEAD LOAD DEFLECTION
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	SUPER ELEVATION ORDINATE
-.004	-.007	-.010	-.011	-.012	-.013	-.011	-.009	-.005	.006	.014	.015	.012	.011	.013	.016	.016	.009	.004	.007	.010	.011	.011	.011	.010	.007	.004	VERTICAL CURVE ORDINATE
1/4"	7/16"	9/16"	11/16"	5/8"	1/2"	3/8"	3/16"	1/16"	1/8"	5/16"	1/2"	9/16"	5/8"	5/8"	9/16"	3/8"	3/16"	1/8"	5/16"	9/16"	11/16"	3/4"	13/16"	3/4"	9/16"	5/16"	REQUIRED CAMBER



BEAM NO. 11, 12 & 13

SCHEMATIC CAMBER ORDINATES

NOTE: VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRGS. EXCEPT BEAM CAMBER WHICH IS GIVEN IN INCHES (FRACTION FORM). SLOPE OF ZERO CAMBER BASE LINE VARIES.

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CAMBER DIAGRAM

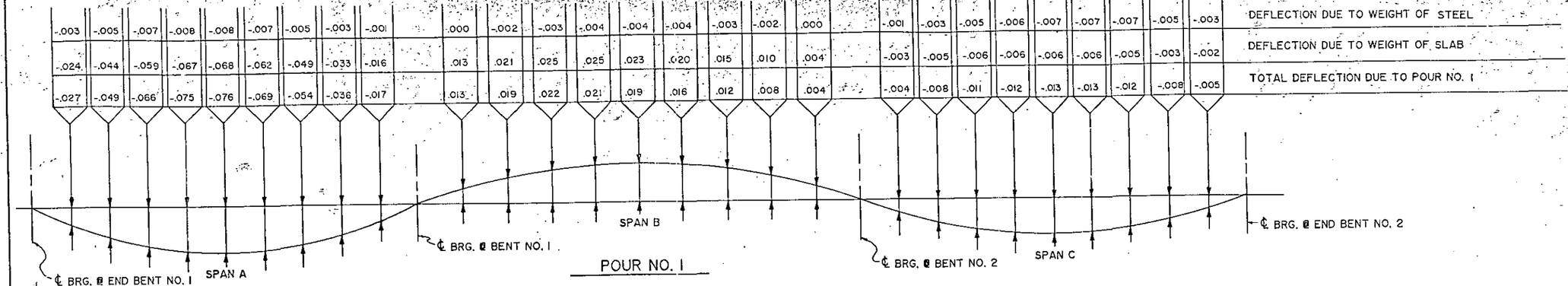
DEC. NORTHBOUND LANE 1988

DWG. NO. 14

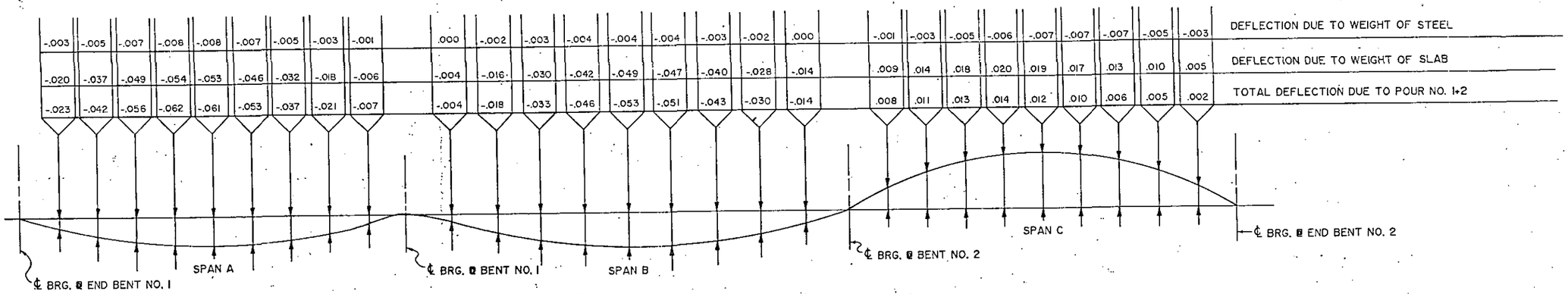
PREPARED BY
HDR
Henningson, Durham & Richardson

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. ~~S-14~~ 286
1			3			TOTAL SHEETS 115
2			4			

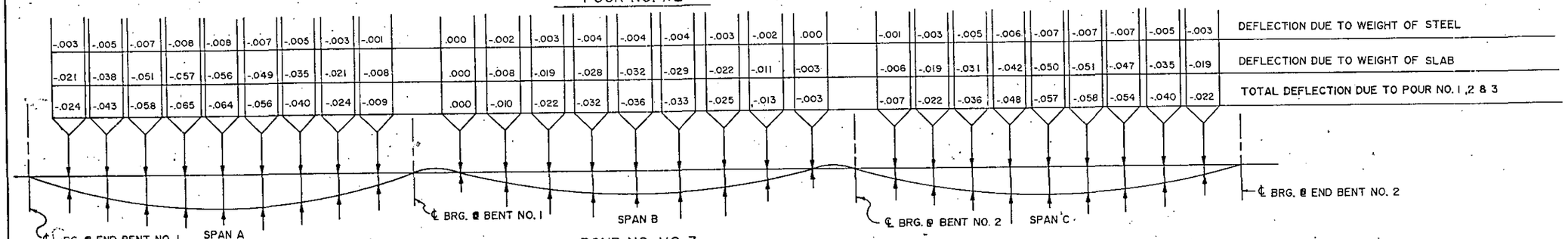
DRAWN BY J.K.S. DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88



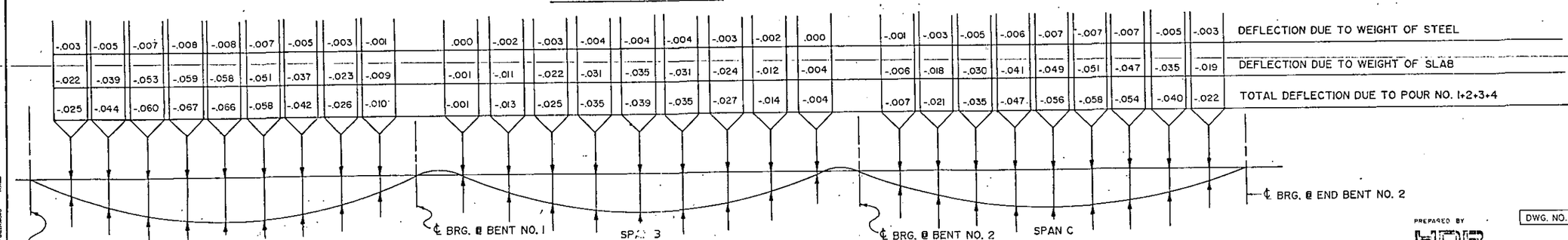
POUR NO. 1



POUR NO. 1+2



POUR NO. 1+2+3



POUR NO. 1+2+3+4

NOTES:

ALL DEFLECTIONS FOR INTERIOR BEAM.
NEGATIVE DEFLECTION INDIATES DOWNWARD MOVEMENT.

ALL VALVES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BEARINGS.

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE POUR DEFLECTION DIAGRAM FOR BEAMS 2,3 & 4

DEC. NORTHBOUND LANE 1988

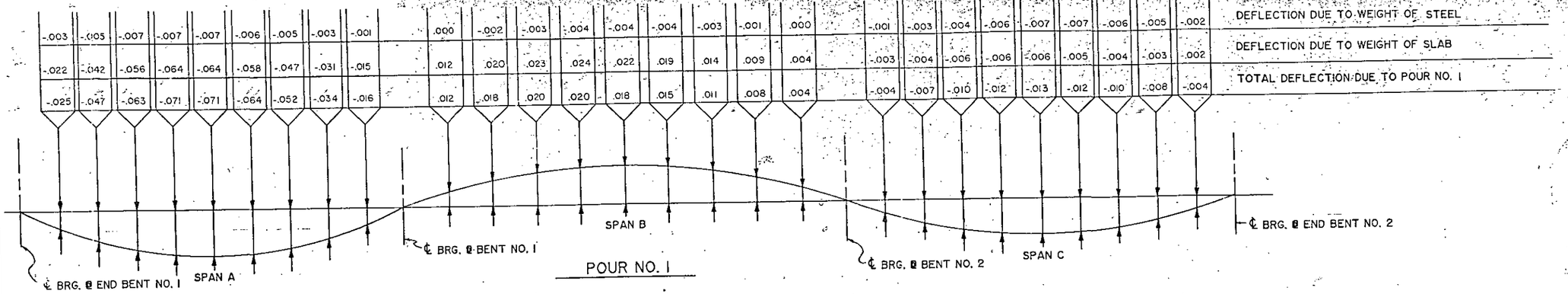
DRAWN BY JKS DATE 9-20-88
CHECKED BY SSW DATE 9-20-88

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 15

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-15
1			3			TOTAL SHEETS
2			4			115

287

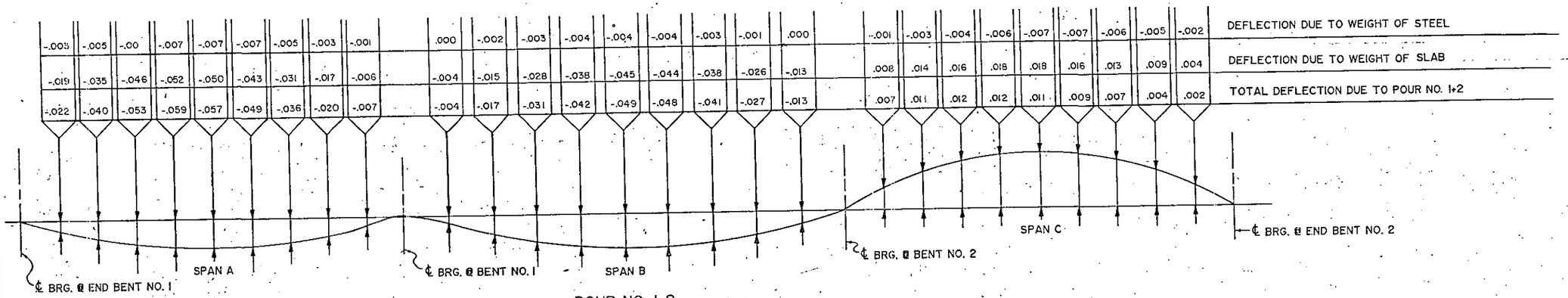


POUR NO. 1

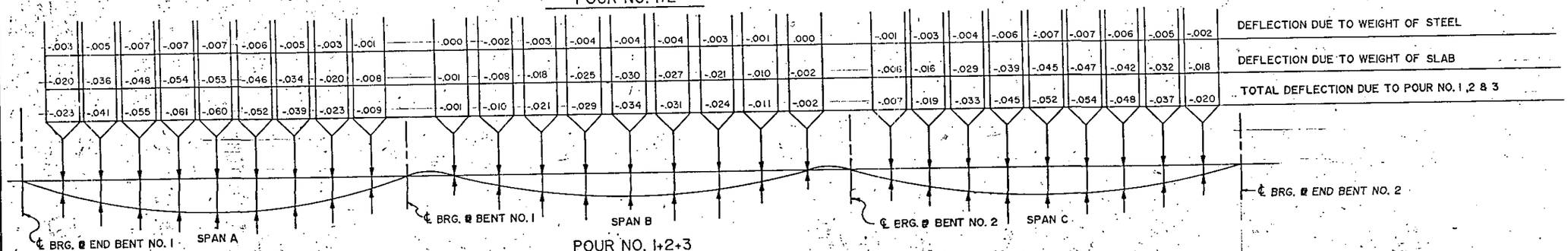
NOTES:

ALL DEFLECTIONS FOR INTERIOR BEAM.
NEGATIVE DEFLECTION INDIATES DOWNWARD MOVEMENT.

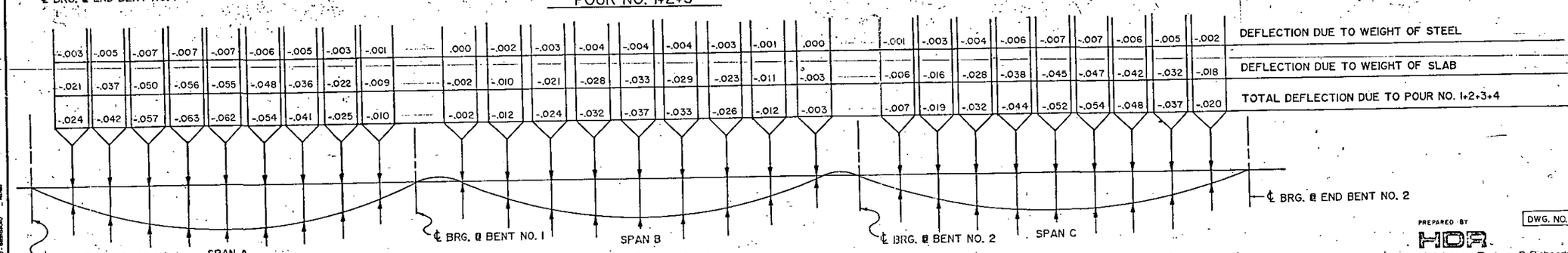
ALL VALVES ARE GIVEN IN FEET (DECIMAL FORM)
AT TENTH POINTS BETWEEN CL BEARINGS.



POUR NO. 1+2



POUR NO. 1+2+3



POUR NO. 1+2+3+4

Project No. 8.1670105
MECKLENBURG County
Station: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
POUR DEFLECTION DIAGRAM
FOR BEAMS 5,6 & 7
DEC. NORTHBOUND LANE 1988

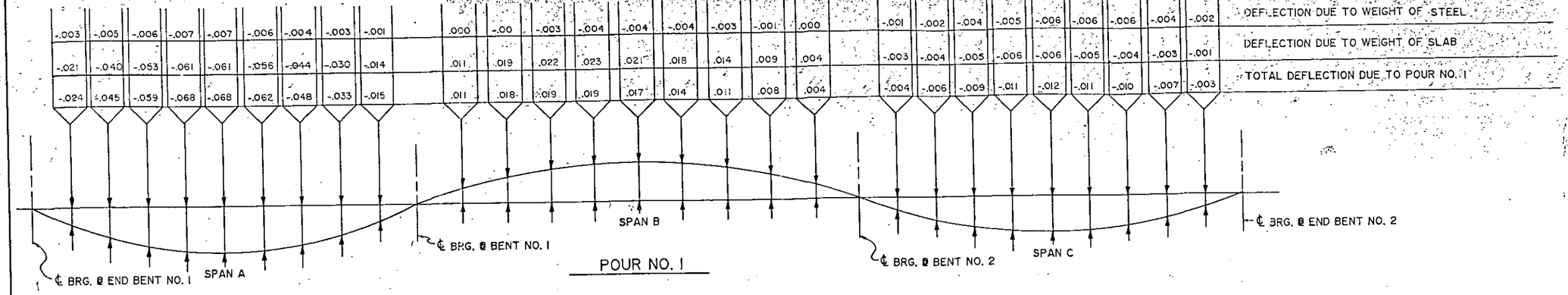
DRAWN BY: JKS DATE: 9-20-88
CHECKED BY: SW DATE: 9-20-88

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 16

REVISIONS						SHEET NO.	TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	5-16	115
1			3				
2			4				

28

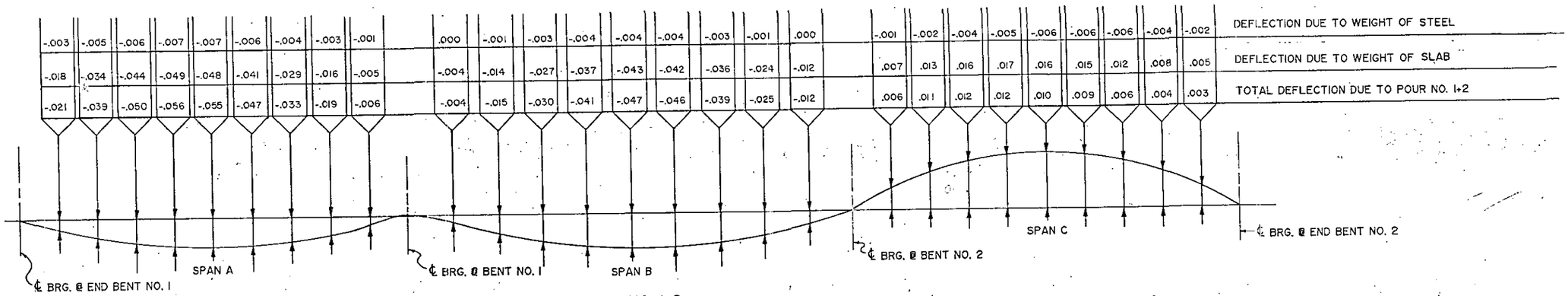


POUR NO. 1

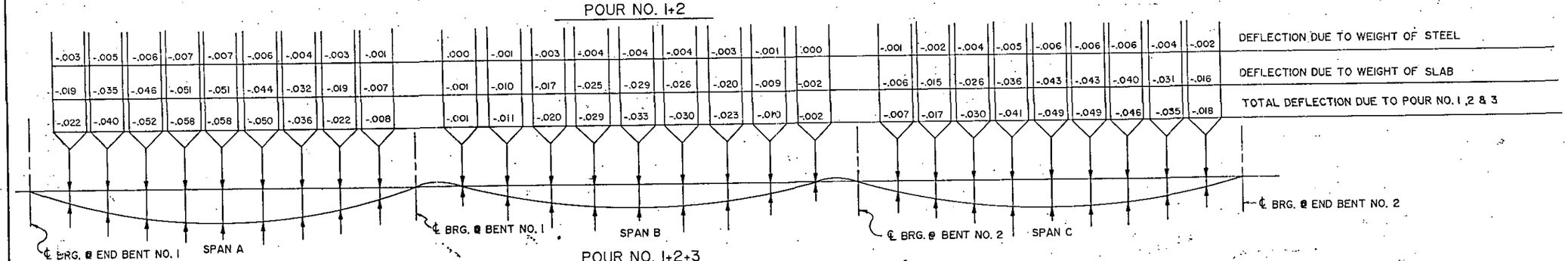
NOTES:

ALL DEFLECTIONS FOR INTERIOR BEAM.
NEGATIVE DEFLECTION INDIATES DOWNWARD MOVEMENT.

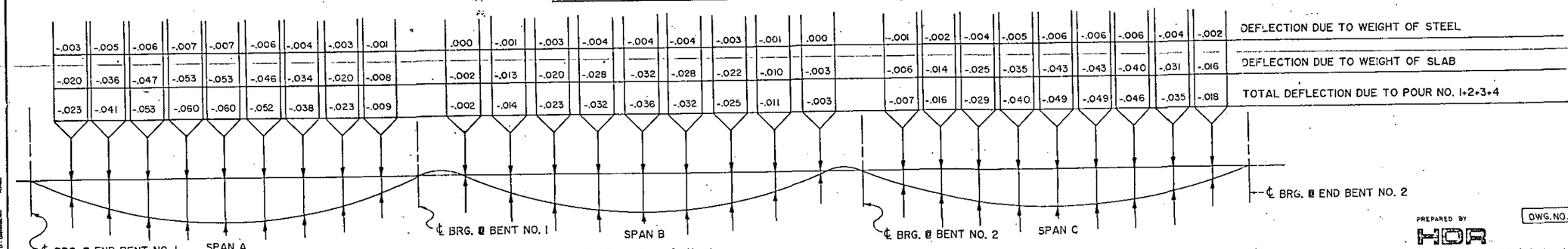
ALL VALVES ARE GIVEN IN FEET (DECIMAL FORM)
AT TENTH POINTS BETWEEN CL BEARINGS.



POUR NO. 1+2



POUR NO. 1+2+3



POUR NO. 1+2+3+4

DRAWN BY JKS DATE 9-20-88
CHECKED BY SW DATE 9-20-88

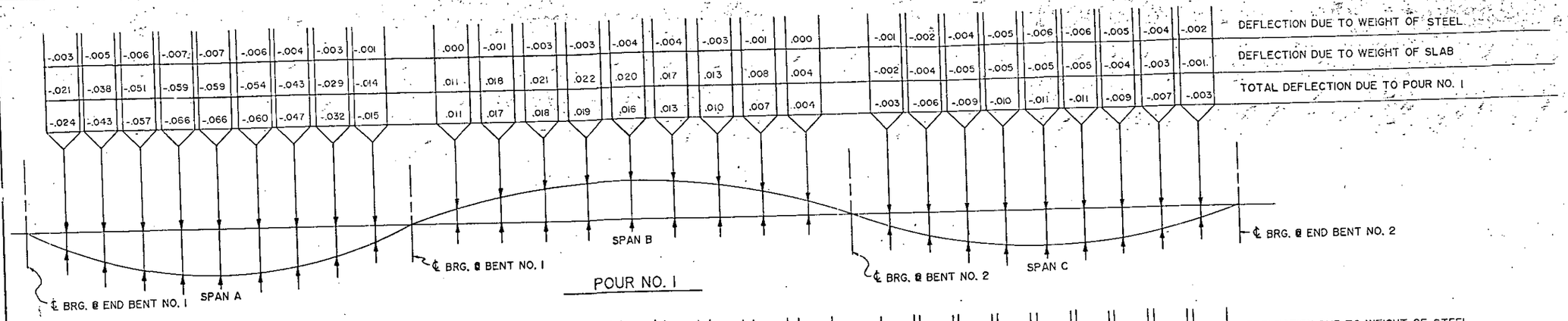
PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
POUR DEFLECTION DIAGRAM
FOR BEAMS 8,9 & 10
DEC. NORTHBOUND LANE 1988

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 17

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-17
1			3			TOTAL SHEETS
2			4			115

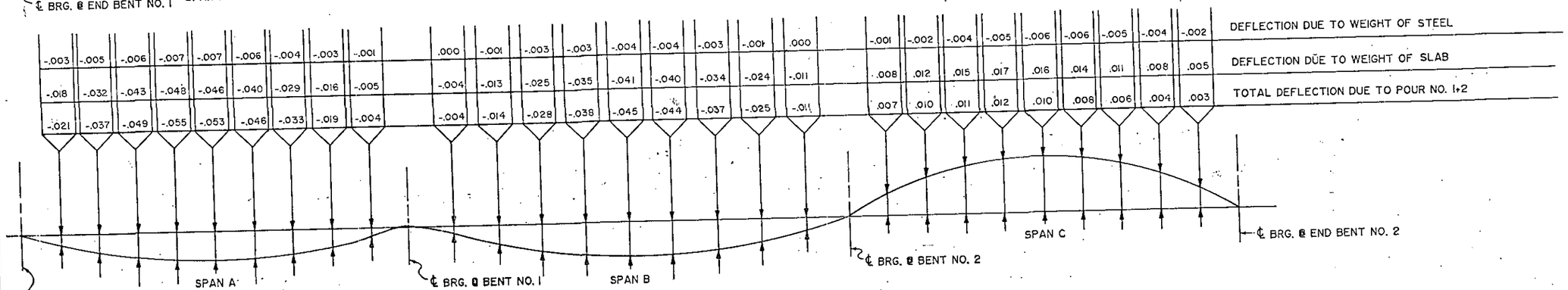


POUR NO. 1

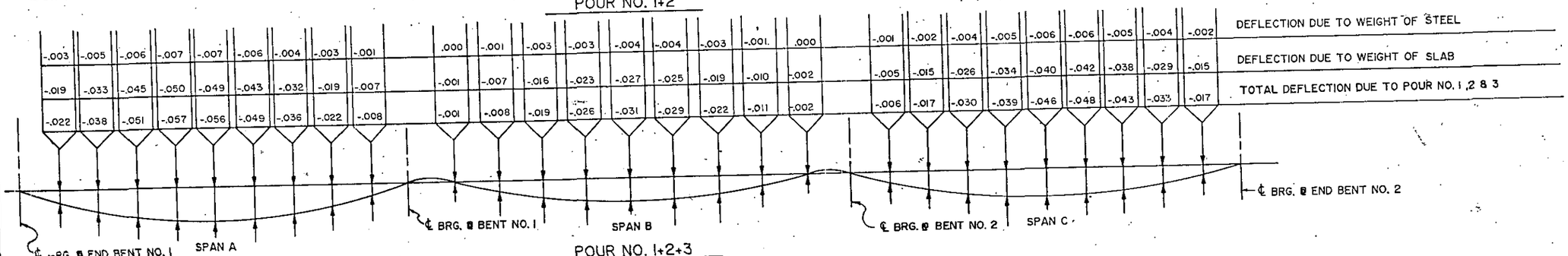
NOTES:

ALL DEFLECTIONS FOR INTERIOR BEAM.
NEGATIVE DEFLECTION INDIATES DOWNWARD MOVEMENT.

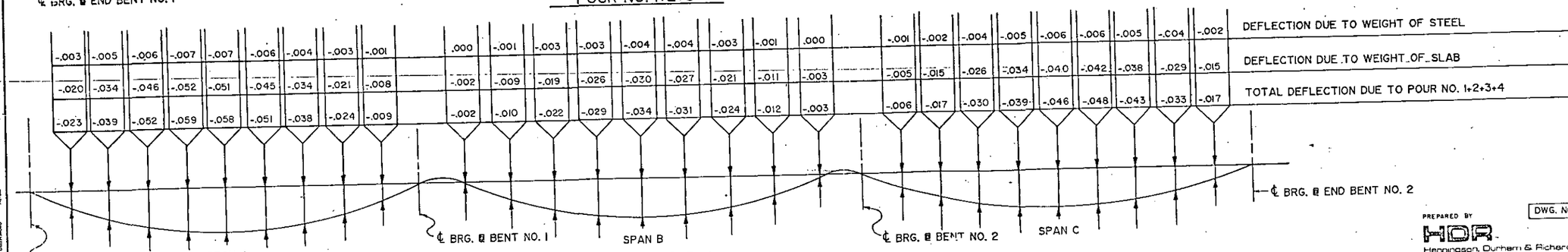
ALL VALVES ARE GIVEN IN FEET (DECIMAL FORM).
AT TENTH POINTS BETWEEN CL BEARINGS.



POUR NO. 1+2



POUR NO. 1+2+3



POUR NO. 1+2+3+4

Project No. 8.1670105
MECKLENBURG County
Station: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
POUR DEFLECTION DIAGRAM
FOR BEAMS 11 & 12
DEC. NORTHBOUND LANE 1988

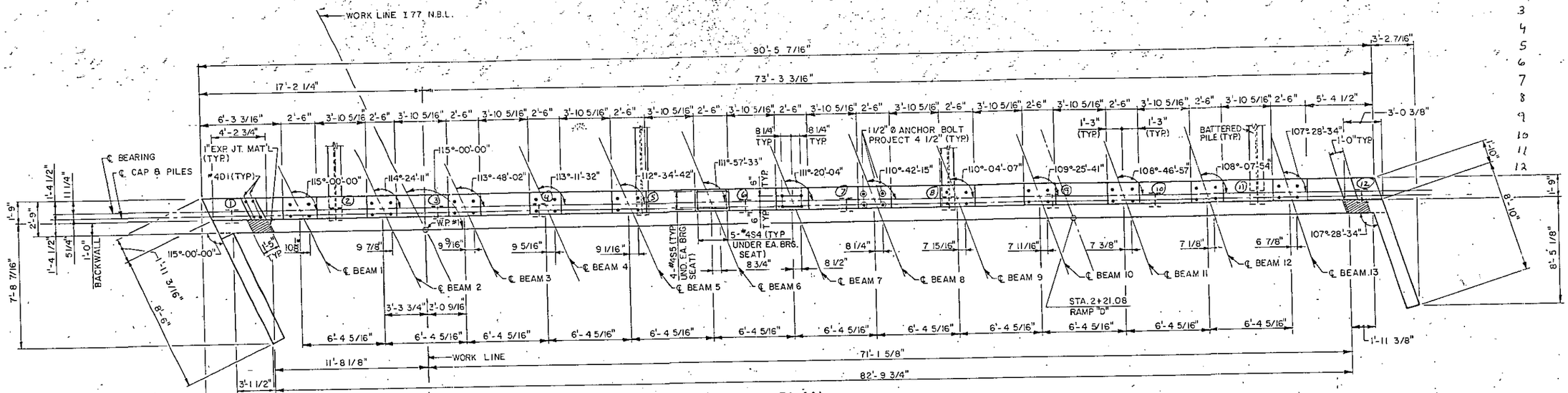
DWG. NO. 18

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-10
1			3			TOTAL SHEETS
2			4			115

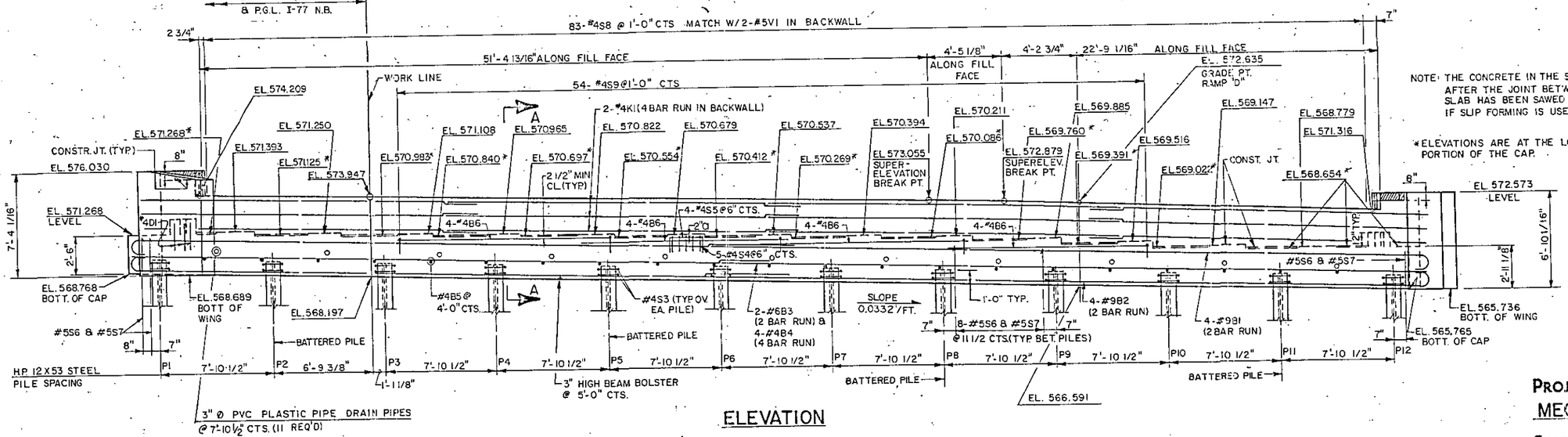
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY JKS DATE 9-20-88
CHECKED BY SW DATE 9-20-88

EQUIVEN PHOTO - DESIGNED



PLAN



ELEVATION

PILE #	LENGTH
1	30.3
2	29.9
3	27.0
4	23.7
5	24.2
6	24.1
7	23.4
8	23.9
9	24.1
10	21.0
11	22.7
12	35.5

NOTE: THE CONCRETE IN THE SHADED AREA SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL CAST IF SLIP FORMING IS USED.

*ELEVATIONS ARE AT THE LOW SIDE OF THE SLOPED PORTION OF THE CAP.

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
P1	569.684
P2**	569.423
P3	569.161
P4	568.900
P5**	568.638
P6	568.377
P7	568.115
P8**	567.854
P9	567.592
P10	567.331
P11**	567.070
P12	566.808

** DENOTES BATTERED PILES 3:12

NOTES

1. THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4"/FT.
2. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
3. COAT ALL SURFACE AREAS OF THE TOP OF CAP INCLUDING CHAMFERS. THE BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENT ARE APPROVED BY THE ENGINEER.
5. FOR POT BEARING DETAILS, SEE DWG. NO. 11.
6. 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.
7. PILES SHALL BE DRIVEN TO MINIMUM BEARING CAPACITY OF 50 TONS EACH.
8. FOR PILE SPLICE DETAILS, SEE DWG. NO. 27.
9. FOR TEMPORARY DRAINAGE DETAILS, SEE DWG. NO. 27.
10. ELEVATIONS SHOWN FOR THE TOP OF BACKWALL ARE GIVEN AT THE FILL FACE SIDE.
11. PIPE DRAINS MAY BE SHIFTED SLIGHTLY IF NECESSARY TO CLEAR ANCHOR BOLTS AND REINFORCING STEEL.
12. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
13. FOR PIPE DRAIN DETAILS SEE STANDARD BAS-2, DWG. NO. 28.

DRAWN BY S.E.WARD DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 19

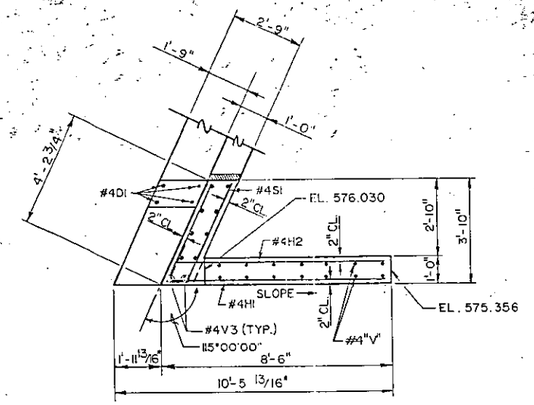
PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT NO. 1
DEC. NORTHBOUND LANE 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-19
1			3			TOTAL SHEETS
2			4			115

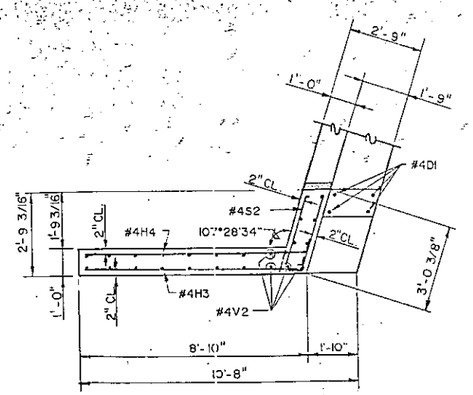
SOUTHERN PIPE & CULVERT CO. M3143



PLAN

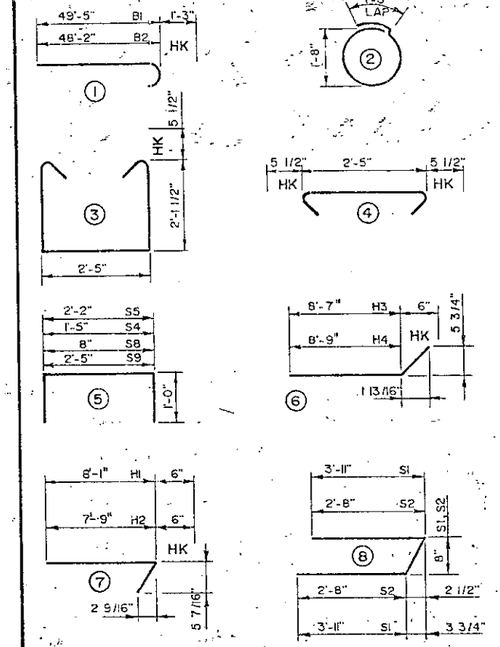
END BENT 1 - LEFT WINGWALL

NOTE:
N.F. DENOTES NEAR FACE
F.F. DENOTES FAR FACE
E.F. DENOTES EACH FACE



PLAN

END BENT 1 - RIGHT WINGWALL



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

Bar	Size	No.	Type	Length	Weight
B1	#9	8	1	50'-8"	1379
B2	#9	8	1	49'-5"	1344
B3	#6	4	Str.	47'-0"	282
B4	#4	16	Str.	24'-4"	260
B5	#4	23	Str.	2'-5"	37
B6	#4	16	Str.	15'-3"	163
D1	#4	8	Str.	2'-0"	11
H1	#4	8	7	8'-7"	46
H2	#4	8	7	8'-3"	44
H3	#4	8	6	9'-3"	49
H4	#4	8	6	9'-3"	49
K1	#4	24	Str.	24'-4"	390
S1	#4	5	6	8'-7"	29
S2	#4	5	8	6'-0"	20
S3	#4	24	2	6'-6"	104
S4	#4	65	5	3'-5"	148
S5	#4	52	5	4'-5"	145
S6	#5	91	3	7'-7"	720
S7	#5	91	4	3'-4"	316
S8	#4	83	5	2'-8"	148
S9	#4	54	5	4'-5"	159
V1	#5	166	Str.	6'-0"	866
V2	#4	24	Str.	6'-5"	103
V3	#4	10	Str.	6'-11"	46
V4	#4	2	Str.	6'-9"	9
V5	#4	2	Str.	6'-8"	9
V6	#4	2	Str.	6'-7"	9
V7	#4	2	Str.	6'-6"	9
V8	#4	2	Str.	6'-5"	9
V9	#4	2	Str.	6'-3"	8
V10	#4	2	Str.	6'-2"	8

REINFORCING STEEL-- LBS. = 6918

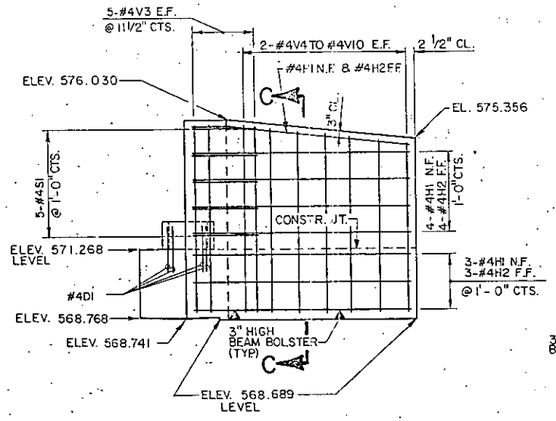
CLASS A CONCRETE-- CU. YDS. = 41.2

HP 12 X 53 STEEL PILES

NO. = 12

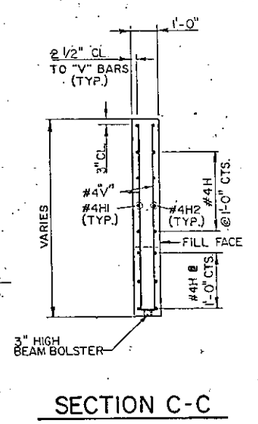
LIN. FT. = 252

SPLICE LENGTHS	
BAR	SPLICE
B1	8'-9"
B2	6'-3"
B3	3'-10"
B4	2'-5"
K1	2'-5"

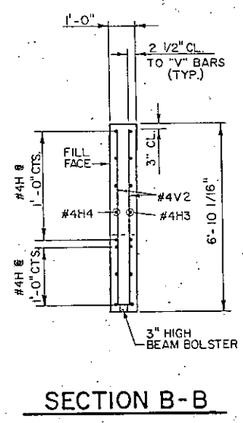


ELEVATION

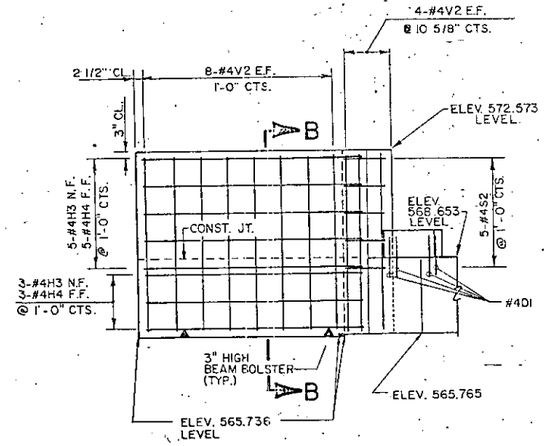
END BENT 1 - LEFT WINGWALL



SECTION C-C

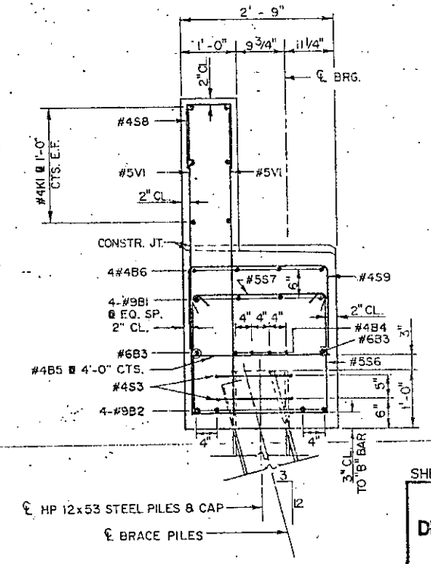


SECTION B-B



ELEVATION

END BENT 1 - RIGHT WINGWALL



SECTION A-A

PROJECT No. 8.1670105

MECKLENBURG COUNTY

STATION: 194+99.29

SHEET 2 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

DEC. NORTHBOUND LANE 1988

DWG. NO. 20

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-28 292
1			3			TOTAL SHEETS
2			4			115

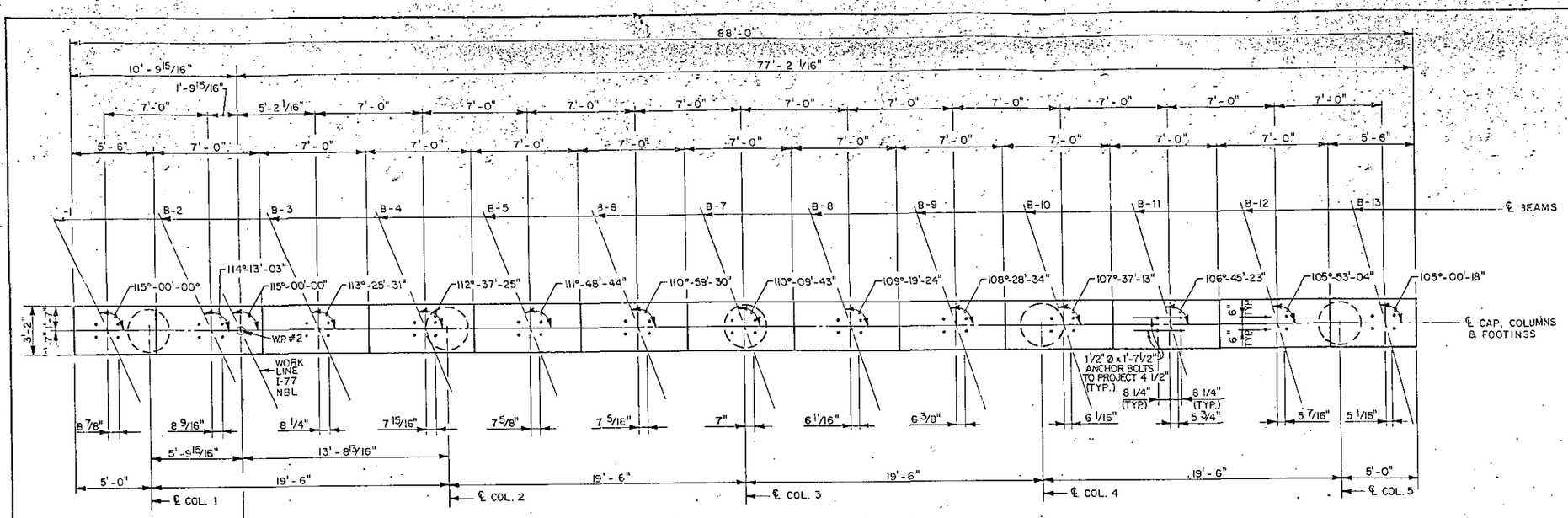
PREPARED BY

HDR

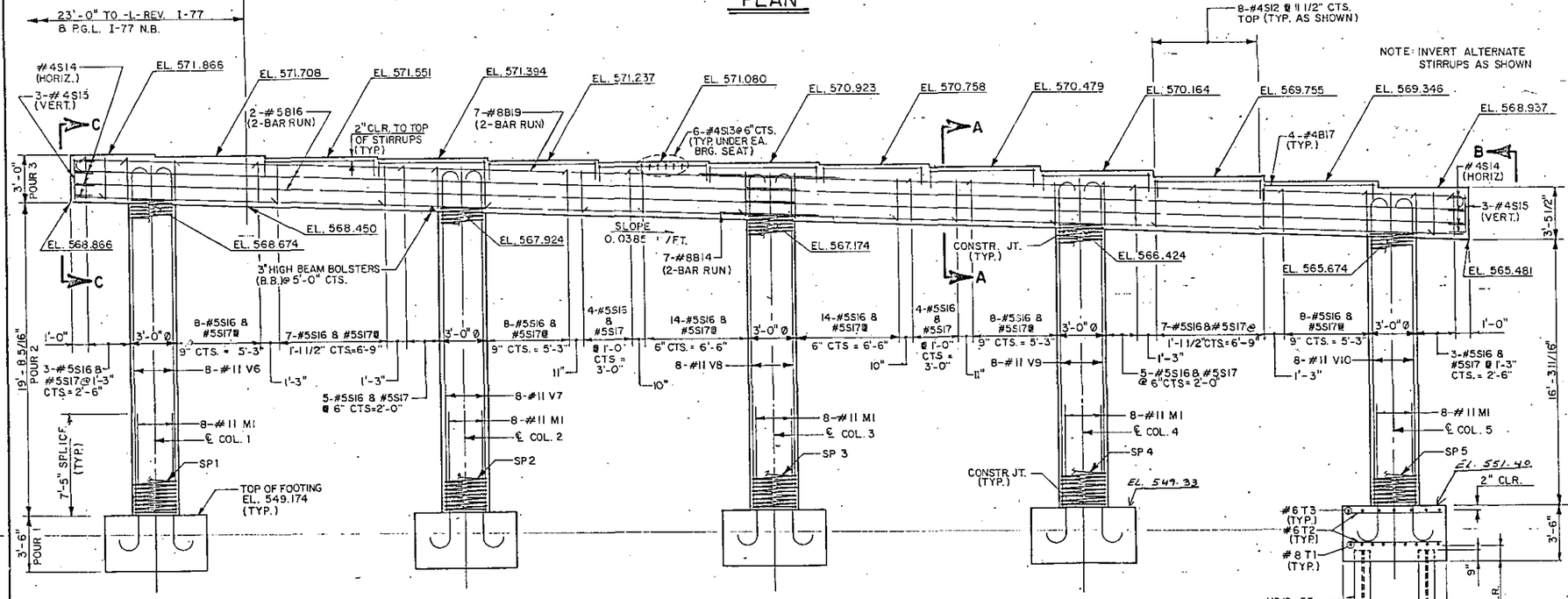
Henningson, Durham & Richardson

DRAWN BY S.E. WARD DATE DEC. '88

CHECKED BY S.S.W. DATE DEC. '88



PLAN



ELEVATION
(ALL FOOTINGS TYPICAL)

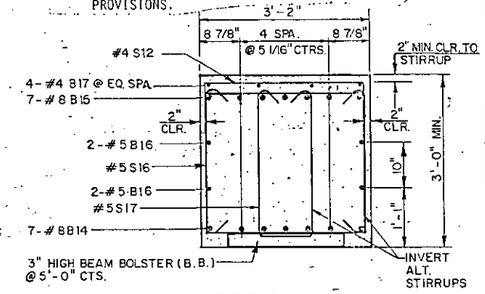
NOTE:

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

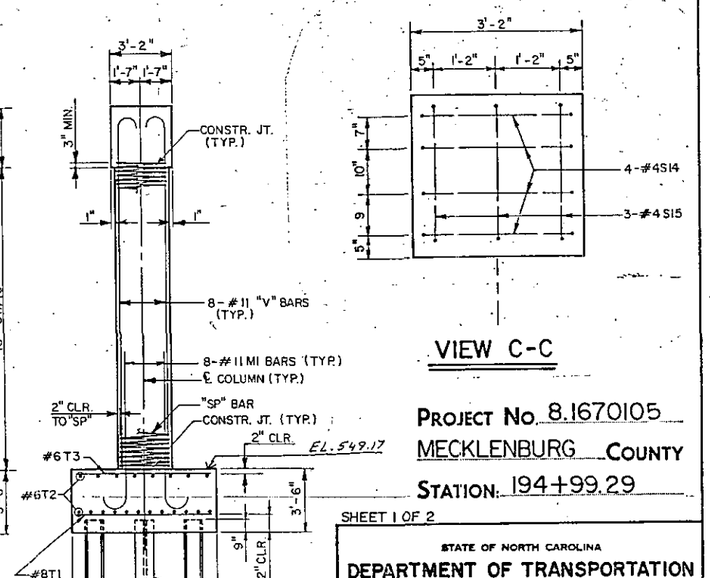
DRAWN BY S.E. WARD, J. BROWN DATE DEC. '88
CHECKED BY S.S.W. DATE DEC. '88

NOTES:

1) HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING OF REINFORCING STEEL.
2) STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3) THE TOP SURFACE OF THE BENT SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
4) FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
5) FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
6) FOR POT BEARING DETAILS, SEE DWG. NO. 11.
7) STIRRUPS ARE TO BE ALTERNATELY INVERTED AS SHOWN.
8) FOR PILE SPLICE DETAILS, SEE DWG. NO. 27.
9) ALL PILES SHALL BE DRIVEN TO A MININUM BEARING CAPACITY OF 50 TONS EACH.
10) FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.



SECTION A-A



VIEW B-B

VIEW C-C

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT NO. 1

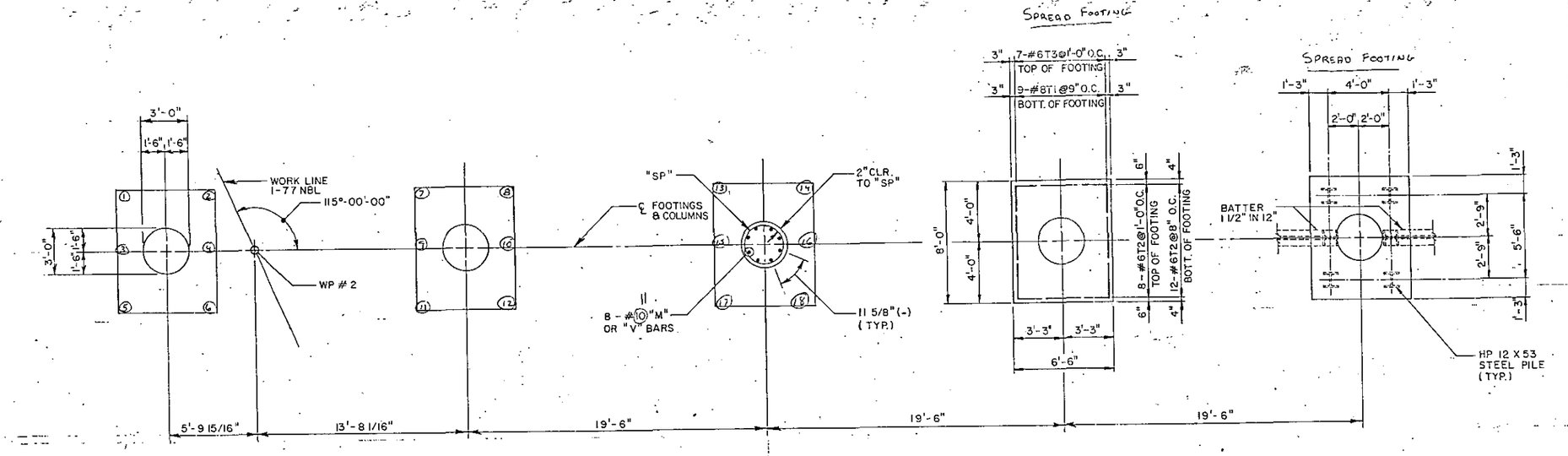
DEC. NORTHBOUND LANE 1988

DWG. NO. 21

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-21
1			3			TOTAL SHEETS 115
2			4			

PREPARED BY
HDR
Henningson, Durham & Richardson

293

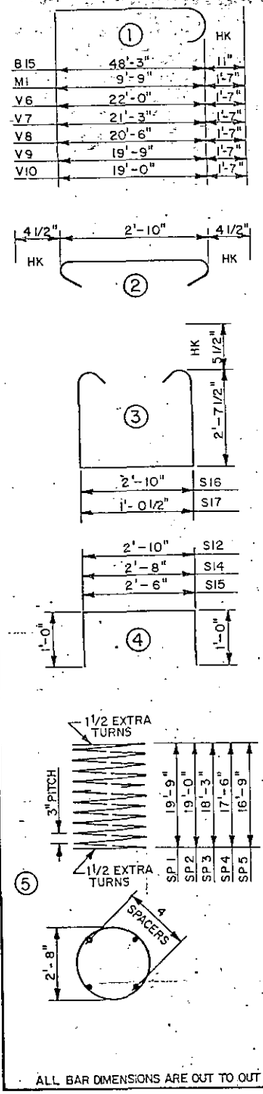


PLAN OF FOOTINGS

(DETAILS SHOWN ARE TYPICAL FOR EACH FOOTING)

Pile #	Length
1	9.9 ✓
2	10.3 ✓
3	8.6 ✓
4	11.73 ✓
5	12.8 ✓
6	12.5 ✓
7	12.5 ✓
8	12.8 ✓
9	12.8 ✓
10	11.89 ✓
11	11.8 ✓
12	12.6 ✓
13	12.0 ✓
14	11.3 ✓
15	10.5 ✓
16	11.4 ✓
17	11.7 ✓
18	~~15.0~~ 10.9

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS	
BAR	SPLICE
B14	4'-11"
B15	6'-11"
B16	3'-0"

BILL OF MATERIAL

BENT NO. 1

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B14	16	#8	STR.	46'-4"	1975
B15	16	#8	1	48'-3"	2061
B16	8	#5	STR.	45'-3"	378
B17	40	#4	STR.	7'-0"	187
M1	40	#11	1	11'-4"	2409
S12	80	#4	4	4'-10"	253
S13	78	#4	2	3'-7"	187
S14	8	#4	4	4'-8"	25
S15	6	#4	4	4'-6"	18
S16	98	#5	3	9'-0"	920
S17	98	#5	3	7'-5"	741
SP1	1		5	676'-6"	452
SP2	1		5	651'-9"	435
SP3	1		5	627'-0"	419
SP4	1		5	602'-3"	402
SP5	1		5	577'-6"	386
T1	45	#8	STR.	7'-6"	901
T2	100	#6	STR.	5'-6"	826
T3	35	#6	STR.	7'-6"	394
V6	8	#11	1	23'-7"	1002
V7	8	#11	1	22'-10"	971
V8	8	#11	1	22'-1"	939
V9	8	#11	1	21'-4"	907
V10	8	#11	1	20'-7"	875

SPIRAL COL. REINF. STEEL LBS. = 2,094
REINFORCING STEEL LBS. = 15,973
CLASS "A" CONCRETE C.Y. = 93.9

DIVISION OF CONCRETE	
POUR NO.	CUBIC YARDS
1	33.7
2	23.6
3	36.6
TOTAL =	93.9

HP 12 x 53 STEEL PILES
NO. = 30 LIN. FT. = 480'

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 1

DEC. NORTHBOUND LANE 1988

DWG. NO. 22

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-32
1			3			TOTAL SHEETS
2			4			11.5

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY R. SATT, S.E. WARD DATE 12-15-88
CHECKED BY S.S.W. DATE DEC. 88

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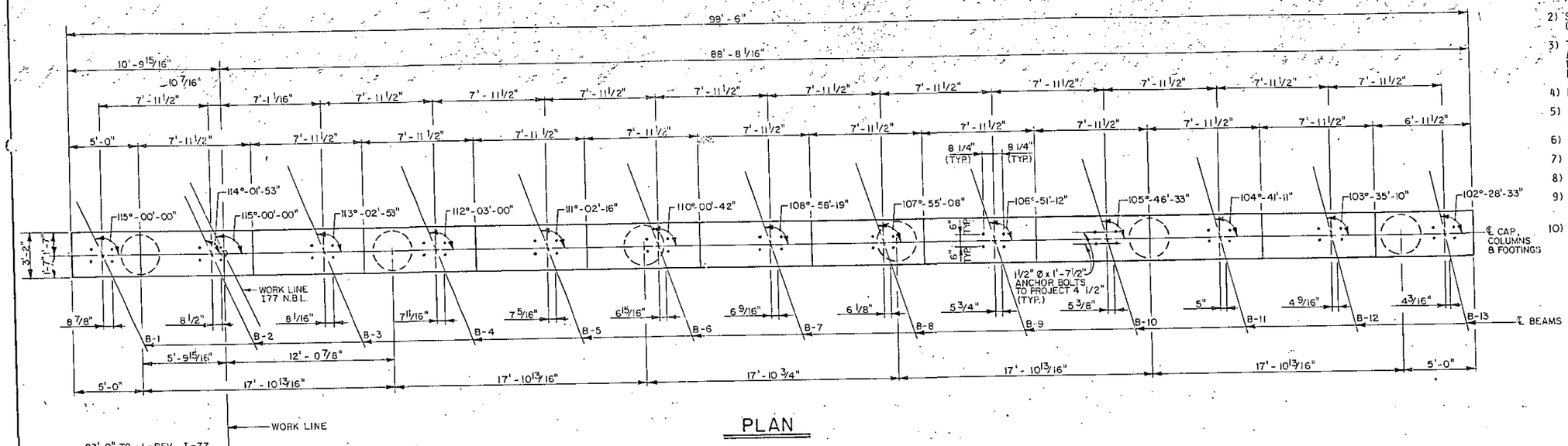
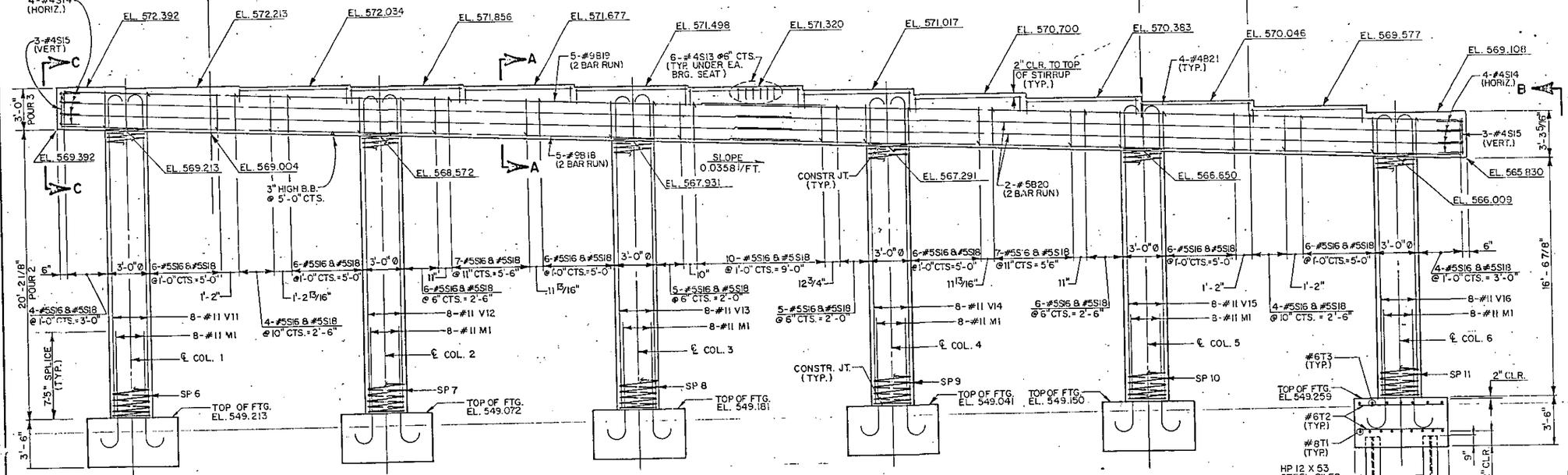
NOTES:

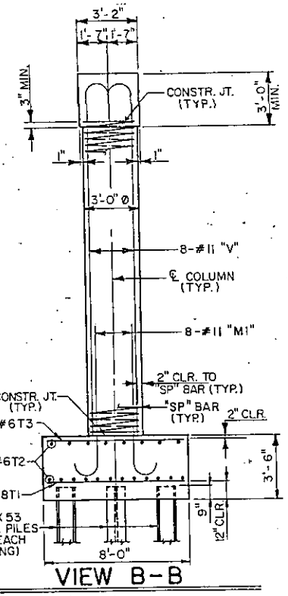
1) HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING OF REINFORCING STEEL.
2) STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3) THE TOP SURFACE OF THE BENT SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
4) FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
5) FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
6) FOR POT BEARING DETAILS, SEE DWG. NO. 11
7) STIRRUPS ARE TO BE ALTERNATELY INVERTED AS SHOWN.
8) FOR PILE SPLICE DETAILS, SEE DWG. NO. 27
9) ALL PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
10) FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.



PLAN



ELEVATION
(ALL FOOTINGS TYPICAL)



VIEW B-B

NOTE:
BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

DRAWN BY S.E. WARD DATE DEC. '88
CHECKED BY S.S.W. DATE DEC. '88

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

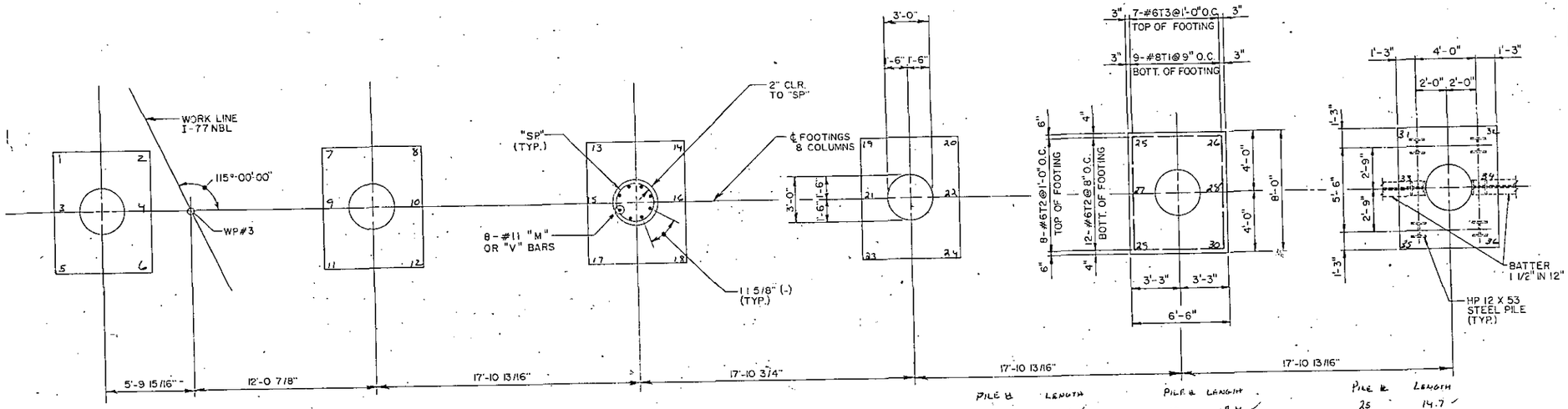
SUBSTRUCTURE BENT NO. 2

DEC. NORTHBOUND LANE 1988

DWG. NO. 23

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.	5-23
1			3			TOTAL SHEETS	115
2			4				

PREPARED BY
HDR
Henningson, Durham & Richardson



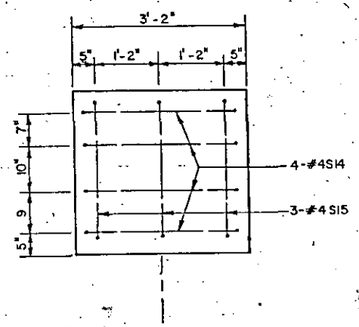
PILE #	LENGTH
1	21.8
2	19.1
3	20.2
4	20.9
5	20.8
6	14.9
7	15.9
8	16.0
9	19.0
10	19.0
11	16.9
12	16.7

PILE #	LENGTH
13	19.4
14	22.3
15	18.5
16	19.0
17	19.4
18	19.5
19	15.0
20	16.0
21	17.9
22	14.7
23	17.0
24	21.2

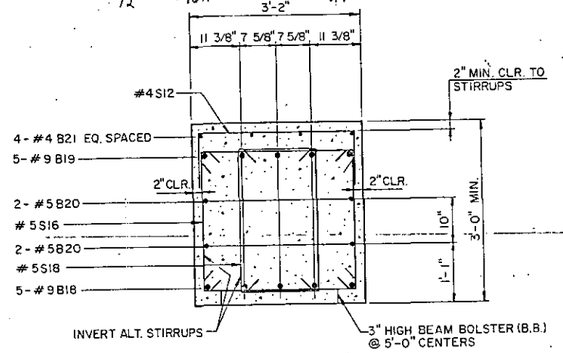
PILE #	LENGTH
25	14.7
26	14.0
27	11.2
28	14.5
29	16.6
30	13.6
31	12.3
32	14.6
33	12.1
34	14.5
35	12.7
36	12.0

PLAN OF FOOTINGS

DETAILS SHOWN FOR EACH FOOTING ARE TYPICAL

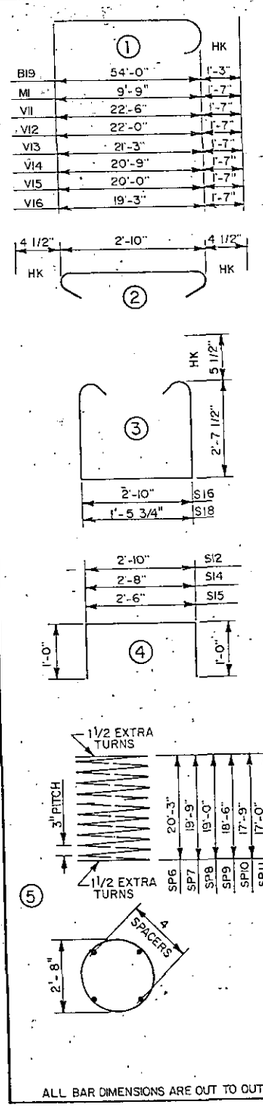


VIEW C-C



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B18	10	# 9	STR.	52'-9"	1,794
B19	10	# 9	1	55'-3"	1,879
B20	8	# 5	STR.	51'-1"	426
B21	40	# 4	STR.	7'-8"	212
M1	48	# 11	1	11'-4"	2,890
S12	90	# 4	4	4'-10"	291
S13	78	# 4	2	3'-7"	187
S14	8	# 4	4	4'-8"	25
S15	6	# 4	4	4'-6"	18
S16	98	# 5	3	9'-0"	920
S18	98	# 5	3	7'-8"	784
SP6	1		5	693'-0"	463
SP7	1		5	676'-6"	452
SP8	1		5	651'-9"	435
SP9	1		5	635'-3"	424
SP10	1		5	610'-6"	408
SP11	1		5	585'-9"	391
V11	8	# 11	1	24'-1"	1,024
V12	8	# 11	1	23'-7"	1,002
V13	8	# 11	1	22'-10"	971
V14	8	# 11	1	22'-4"	949
V15	8	# 11	1	21'-7"	917
V16	8	# 11	1	20'-10"	886
T1	54	# 8	STR.	7'-6"	1,081
T2	120	# 6	STR.	5'-6"	991
T3	42	# 6	STR.	7'-6"	473

SPIRAL COL. REINF. STEEL LBS.= 2,573
REINFORCING STEEL LBS.= 17,720
CLASS "A" CONCRETE C.Y. = 109.6

DIVISION OF CONCRETE

POUR NO.	CUBIC YARDS
1	40.4
2	29.0
3	40.2
TOTAL :	109.6

HP 12x53 STEEL PILES
NO.: 36 LIN. FT.= 864

SPLICE LENGTHS	
BAR	SPLICE
B18	6'-3"
B19	8'-9"
B20	3'-0"

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 2

DEC. NORTHBOUND LANE 1988

DWG. NO. 24

REVISIONS

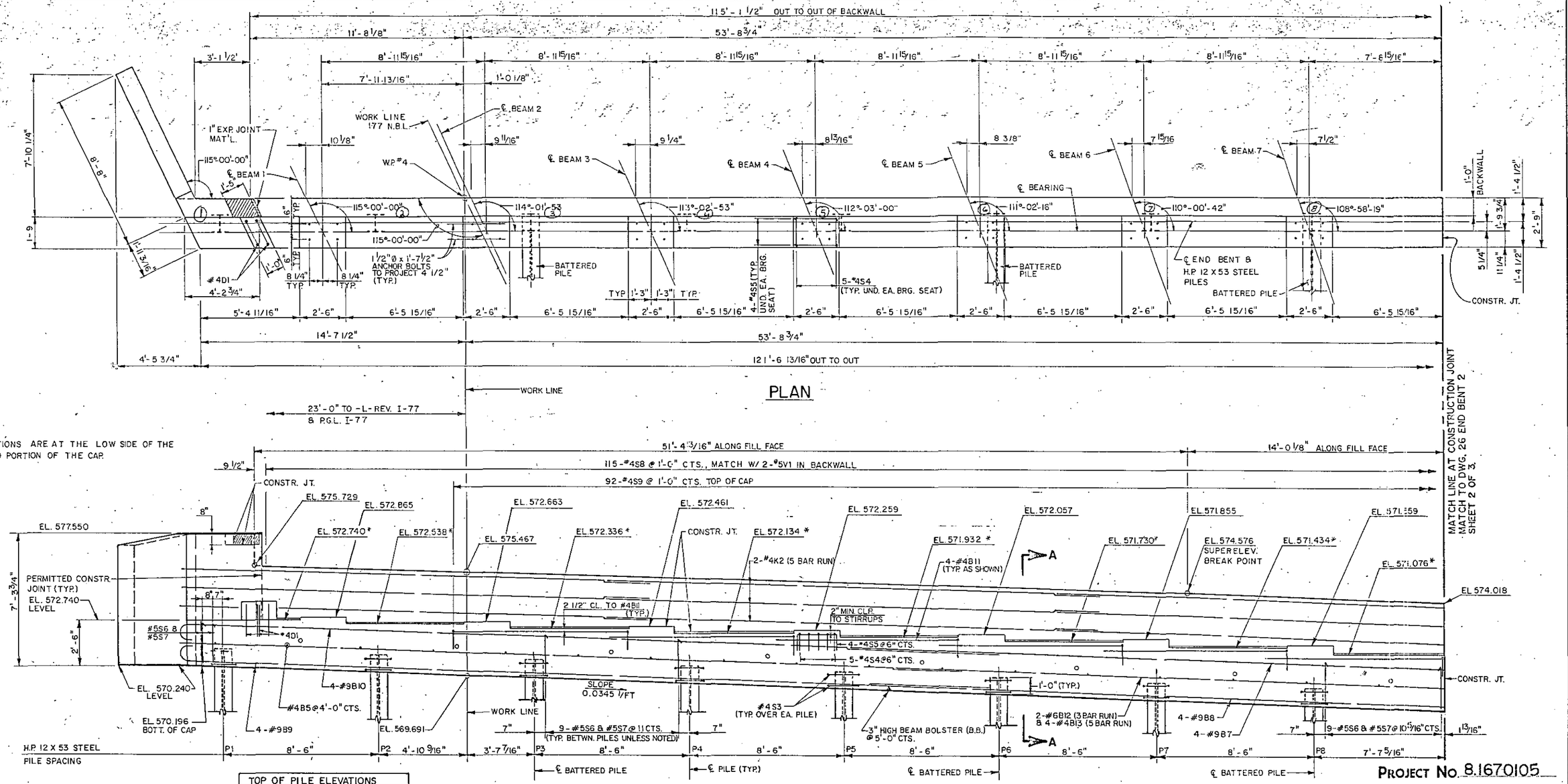
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 5-24 296
TOTAL SHEETS 115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.F. WARD, R. SATTERFIELD DATE DEC. '88
CHECKED BY S.S.W. DATE DEC. '88

SOUTHERN PHOTO - DENMARK



TOP OF PILE ELEVATIONS		LENGTH
PILE	ELEVATION	
P1	571.153	51.5
P2	570.860	39.8
P3**	570.567	37.7
P4	570.274	49.3
P5	569.981	48.1
P6**	569.688	47.4
P7	569.395	41.3
P8**	569.102	43.8
P9	568.809	42.3
P10**	568.517	41.7
P11	568.224	39.3
P12	567.931	37.2
P13**	567.638	37.1
P14	567.345	35.8
P15	567.052	35.4
** DENOTES BATTERED PILE 3:12		

DRAWN BY S.E.WARD DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 25

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-25
1			3			TOTAL SHEETS
2			4			115

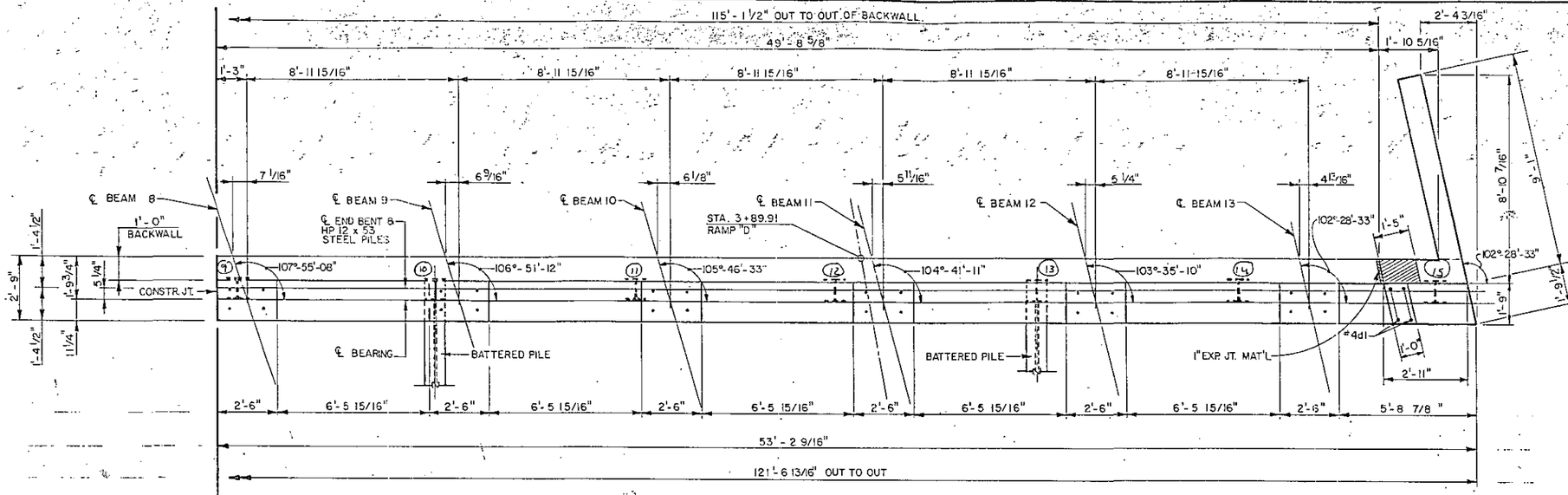
297

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29
SHEET 1 OF 3

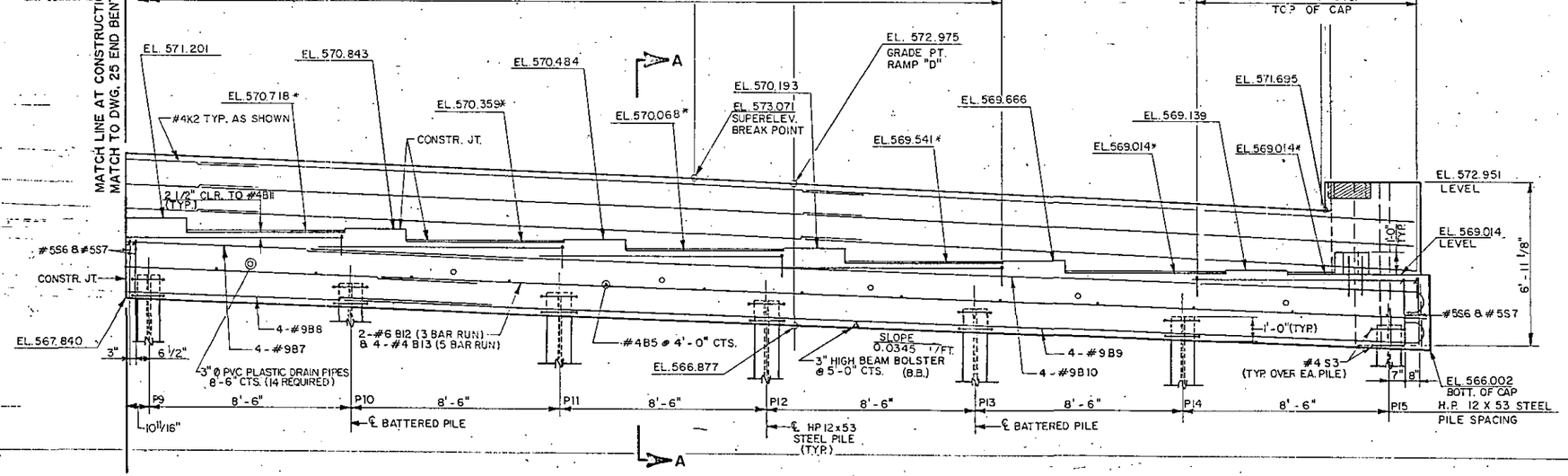
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT NO. 2

DEC. NORTHBOUND LANE 1988



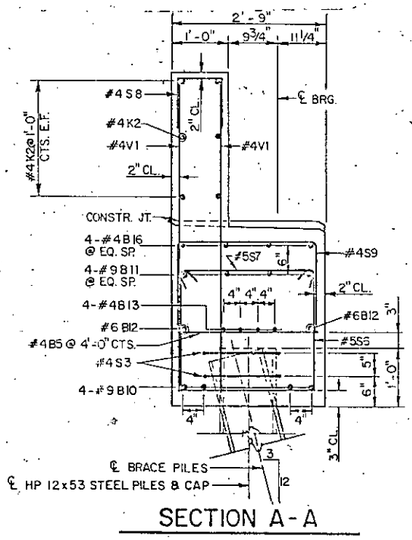
PLAN



ELEVATION

NOTES:

1. THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4"/FT.
2. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
3. COAT ALL SURFACE AREAS OF THE TOP OF CAP INCLUDING CHAMFERS. THE BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
5. FOR POT BEARING DETAILS, SEE DWG. NO. 11.
6. 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.
7. PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
8. ELEVATIONS SHOWN FOR THE TOP OF BACKWALL ARE GIVEN AT THE FILL FACE SIDE.
9. PIPE DRAINS MAY BE SHIFTED SLIGHTLY IF NECESSARY TO CLEAR ANCHOR BOLTS AND REINFORCING STEEL.
10. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
11. FOR PIPE DRAIN DETAILS SEE STANDARD BAS-2, DWG. NO. 28.



SECTION A-A

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT NO. 2

DEC. NORTHBOUND LANE 1988

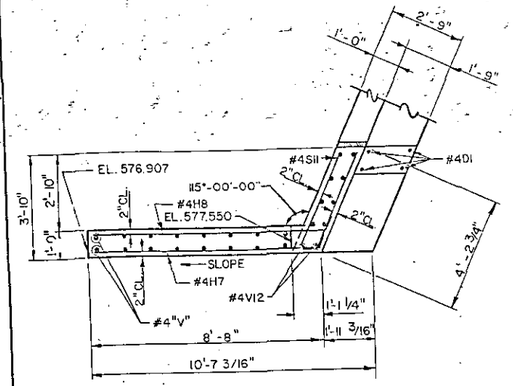
DWG. NO. 26

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			11.5

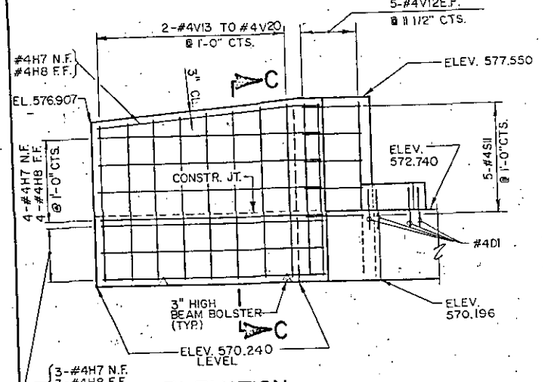
PREPARED BY
HDR
Hennington, Durham & Richardson

DRAWN BY S.E. WARD DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88

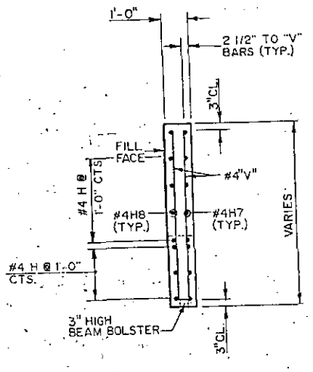
298



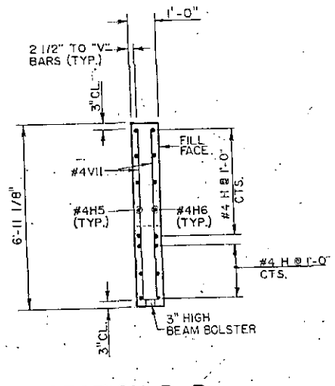
PLAN
END BENT 2 - LEFT WINGWALL



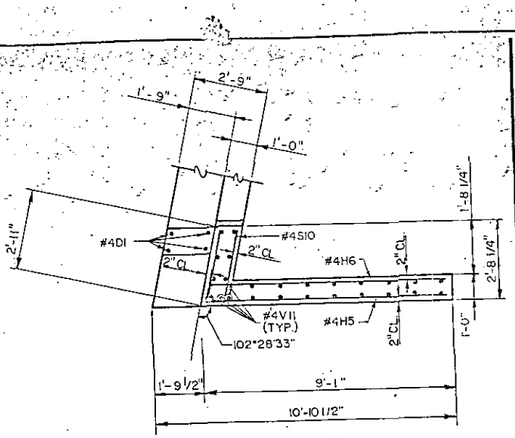
ELEVATION
END BENT 2 - LEFT WINGWALL



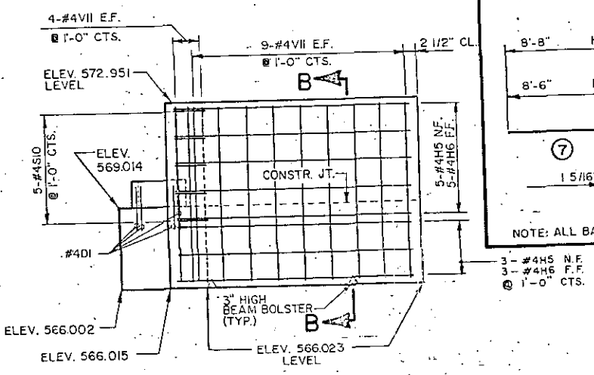
SECTION C-C



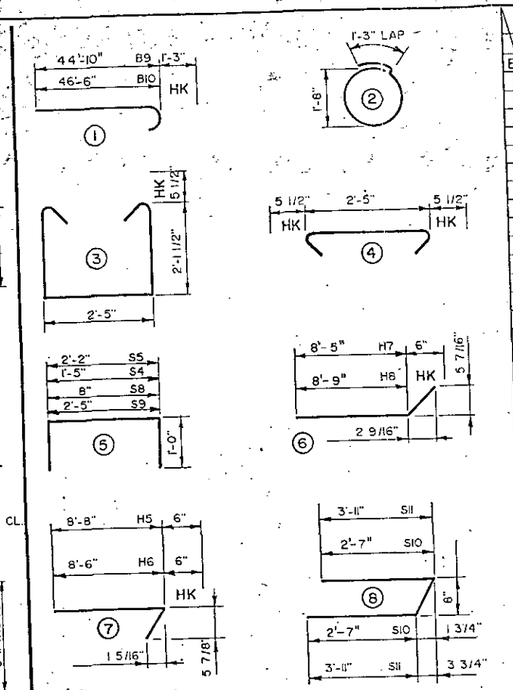
SECTION B-B



PLAN
END BENT 2 - RIGHT WINGWALL



ELEVATION
END BENT 2 - RIGHT WINGWALL



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT 2

Bar	Size	No.	Type	Length	Weight
B6	#4	31	Str.	2'-5"	50
B7	#9	4	Str.	46'-6"	652
B8	#9	4	Str.	44'-10"	610
B9	#9	8	1	46'-1"	1253
B10	#9	8	1	47'-9"	1299
B11	#4	44	Str.	10'-0"	294
B12	#5	16	Str.	43'-3"	390
B13	#4	20	Str.	26'-4"	352
D1	#4	8	Str.	2'-0"	11
H5	#4	8	7	9'-2"	49
H6	#4	8	7	9'-0"	48
H7	#4	8	6	8'-11"	48
H8	#4	8	6	9'-3"	49
K2	#4	30	Str.	26'-4"	528
S3	#4	30	2	6'-6"	130
S4	#4	65	5	3'-5"	148
S5	#4	52	5	4'-2"	145
S6	#5	132	8	7'-7"	1044
S7	#5	132	4	3'-4"	459
S8	#4	115	5	2'-8"	205
S9	#4	92	5	4'-5"	271
S10	#4	5	8	5'-10"	19
S11	#4	5	8	8'-7"	29
V1	#5	230	Str.	5'-0"	1199
V11	#4	26	Str.	6'-6"	113
V12	#4	10	Str.	6'-11"	46
V13	#4	2	Str.	6'-2"	8
V14	#4	2	Str.	6'-3"	8
V15	#4	2	Str.	6'-4"	8
V16	#4	2	Str.	6'-5"	9
V17	#4	2	Str.	6'-6"	9
V18	#4	2	Str.	6'-7"	9
V19	#4	2	Str.	6'-8"	9
V20	#4	2	Str.	6'-9"	9

REINFORCING STEEL ___ LBS. = 9490

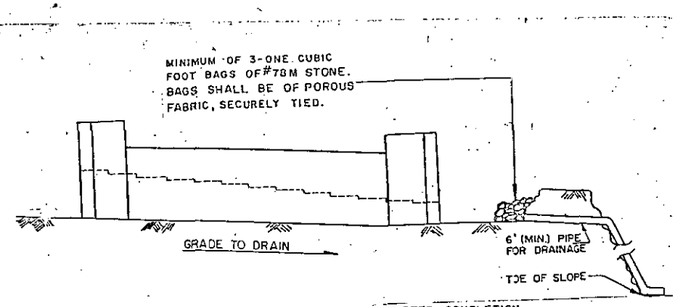
CLASS A CONCRETE ___ CU. YDS. = 55.8

HP 12 x 53 STEEL PILES

NO. = 15

L.IN. F.T. = 720

SPLICE LENGTHS	
BAR	SPLICE
B8,B9	6'-3"
B10,B7	8'-9"
B12	3'-10"
B13,K2	2'-5"

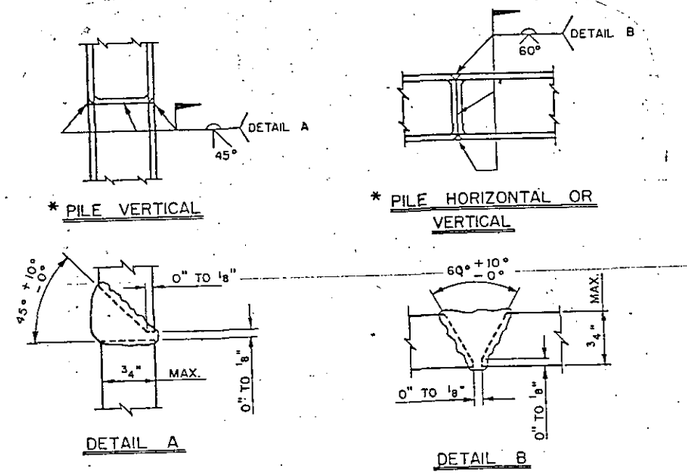


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS

DEC. NORTHBOUND LANE 1988

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

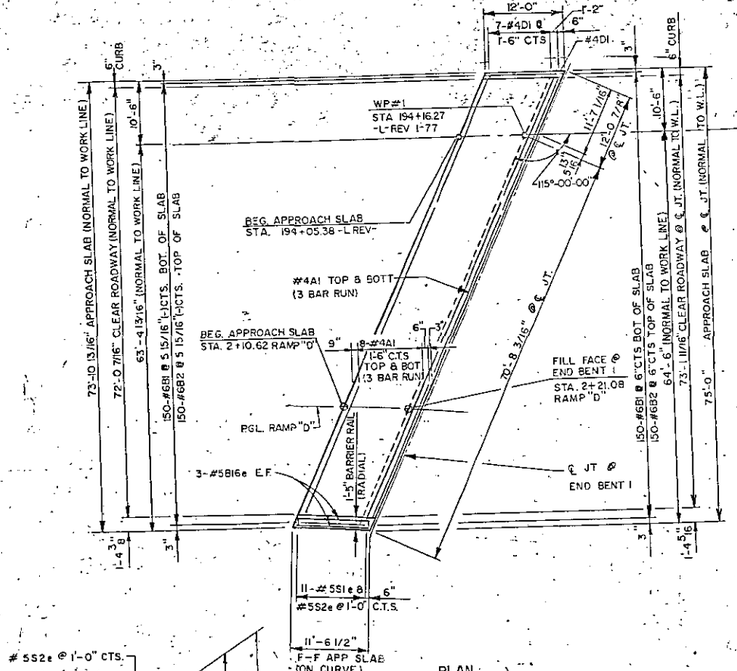
SHEET NO. 3 of 3
TOTAL SHEETS 115

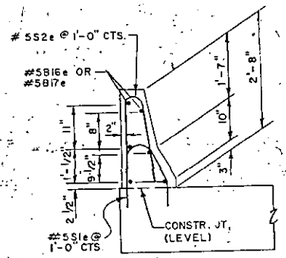
DWG. NO. 27

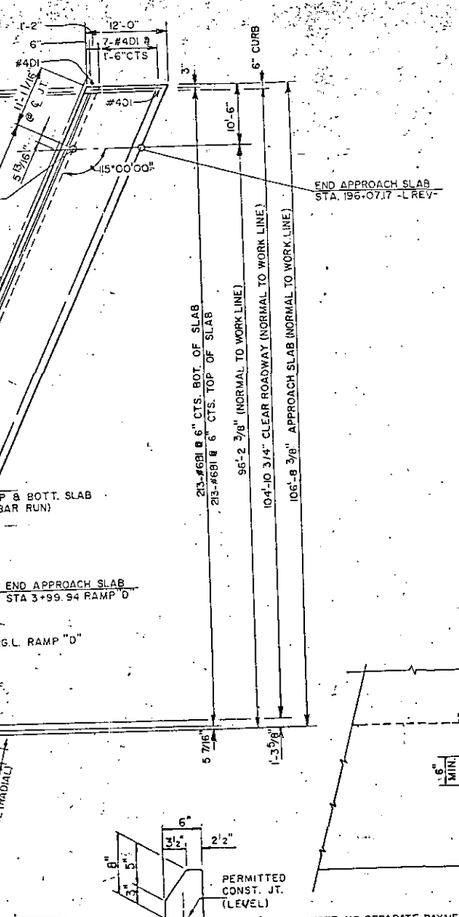
PREPARED BY
HDR
Henningson, Durham & Richardson

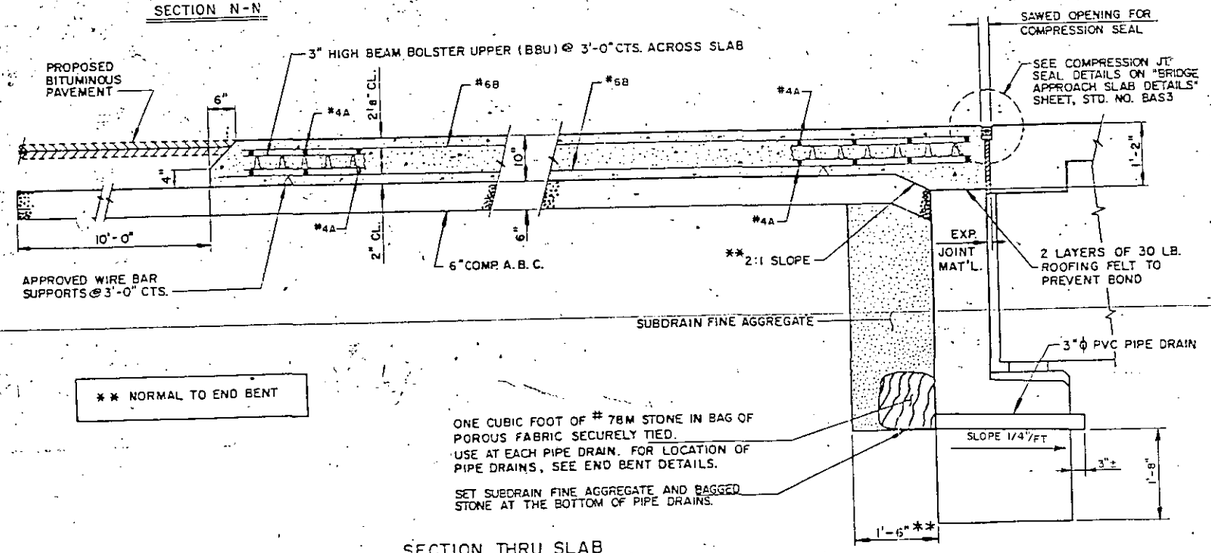
DRAWN BY S.E. WARD DATE DEC. 88
CHECKED BY S.S.W. DATE DEC. 88

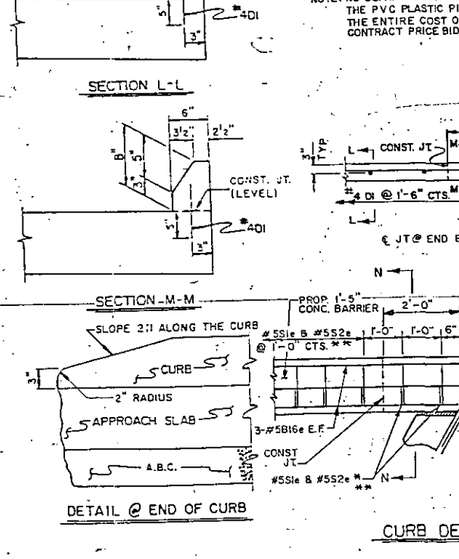
SOUTHERN PHOTO - GUILFORD

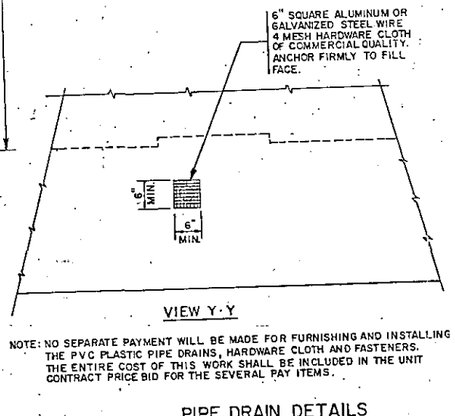






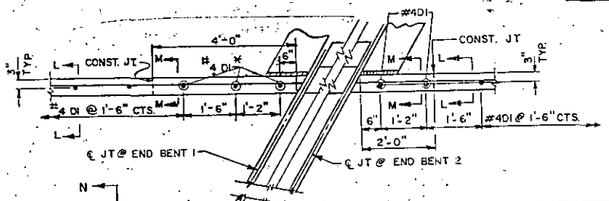






NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS



NOTES

FOR BRIDGE APPROACH SLABS, SEE SPECIAL PROVISIONS.

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWINGS.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 13'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB. IF SPECIAL DRAINAGE IS USED, THE 6" COMP. A.B.C. SHALL ALSO EXTEND UNDER THE CONCRETE FLUME AND 1'-0" OUTSIDE OF EACH EDGE OF CURB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

NO DIRECT PAYMENT WILL BE MADE FOR THE TEMPORARY DRAINAGE AS SUCH WORK WILL BE CONSIDERED INCIDENTAL TO OTHER WORK BEING PAID FOR BY THE VARIOUS ITEMS IN THE CONTRACT.

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

APPROACH SLABS FOR END BENT 1 AND END BENT 2 HAVE A CURVE OFFSET OF 3/16" AT THE MIDPOINT OF THE CHORD CONNECTING THE ℄ JOINT @ END BENT AND END APPROACH SLAB.

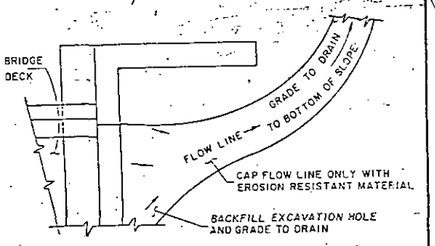
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
	END BENT 1				
A-1	54	#4	STR	28'-3"	1019
B-1	150	#6	STR	11'-8"	2629
B-2	150	#6	STR	11'-2"	2516
D-1	8	#4	STR	1'-0"	5
	END BENT 2				
A-2	90	#4	STR	24'-5"	1468
B-1	213	#6	STR	11'-8"	3732
B-2	213	#6	STR	11'-2"	3573
D-1	8	#4	STR	1'-0"	5

REINF. STEEL END BENT 1 = 6169 LBS.
REINF. STEEL END BENT 2 = 8778 LBS.

CLASS "AA" CONCRETE
END BENT 1 = 29.0CY
END BENT 2 = 41.0CY

*QUANTITIES FOR BARRIER RAIL NOT INCLUDED, SEE DWG. 5



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAILS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

JULY NORTHBOUND LANE 1978

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-28
1			3			TOTAL SHEETS 115
2			4			

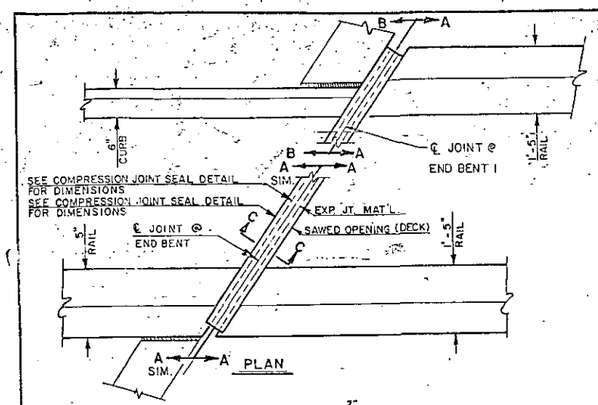
DWG. NO. 28

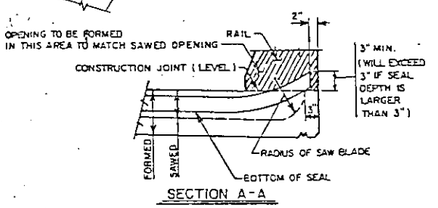
STD. NO. BAS2

STD DRAWN BY: AGP DATE: 2-71 CHECKED BY: J.K.K.
DRAWN BY JCC / JKS DATE 10-88
CHECKED BY SSW DATE 12-88

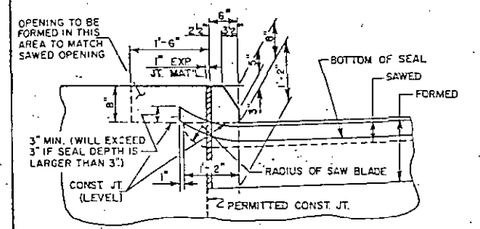
REVISED 8-28-79 BY: RDU. CHECKED BY: CCM
REVISED 4-1-79 BY: CC M CHECKED BY: R.D.U.
REVISED 7-31-78 BY: R.E.K. CHECKED BY: R.D.U.
REVISED 3-1-84 BY: ERL CHECKED BY: RNR
REVISED 2-2-82 BY: ERL CHECKED BY: RGF
REVISED 9-1-81 BY: ERL CHECKED BY: RGF

300



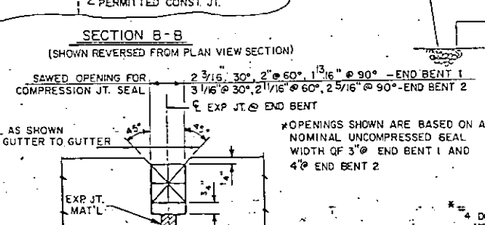


SECTION A-A



SECTION B-B

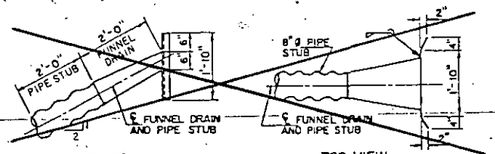
(SHOWN REVERSED FROM PLAN VIEW SECTION)



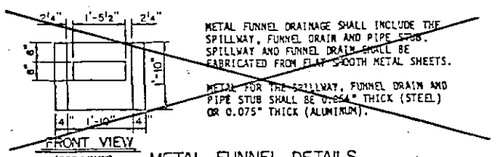
*OPENINGS SHOWN ARE BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3" @ END BENT 1 AND 4" @ END BENT 2

SECTION C-C

COMPRESSION JOINT SEAL DETAILS
@ END BENT



SIDE VIEW TOP VIEW



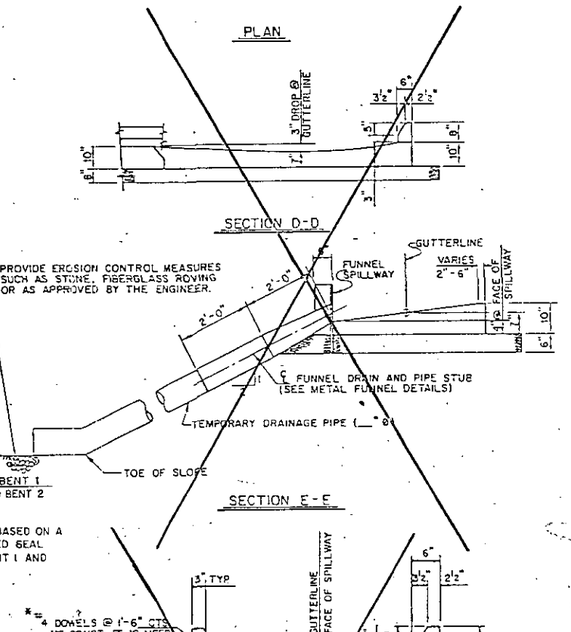
FRONT VIEW (SPILLWAY)

METAL FUNNEL DRAINAGE SHALL INCLUDE THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB. SPILLWAY AND FUNNEL DRAIN SHALL BE FABRICATED FROM FLAT SMOOTH METAL SHEETS.

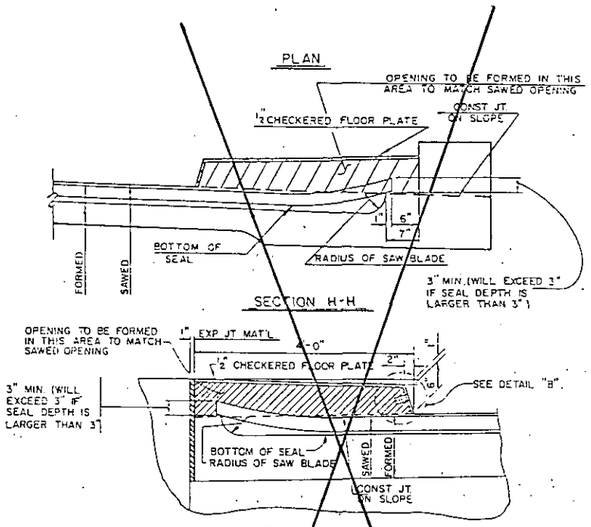
METAL FOR THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB SHALL BE 0.064" THICK (STEEL) OR 0.075" THICK (ALUMINUM).

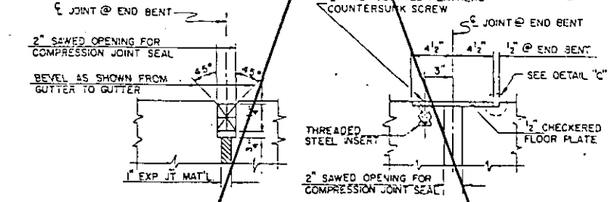
METAL FUNNEL DETAILS

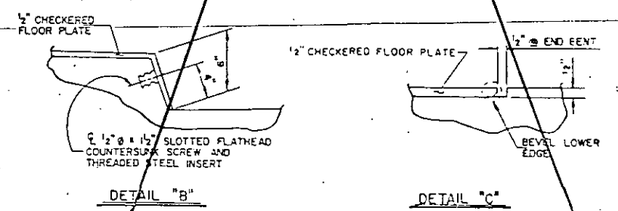
ASSEMBLED BY SEW	DATE 12-88	SPECIAL
CHECKED BY SSW	DATE 12-88	
DRAWN BY E. R. LUTHER, JR.	DATE JANUARY 3, 1984	STANDARD
CHECKED BY R. R. HUTCHERSON	DATE JANUARY 3, 1984	



SPECIAL DRAINAGE DETAILS

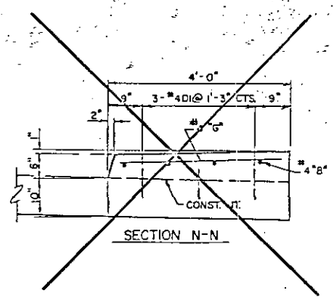






COMPRESSION JOINT SEAL DETAILS
@ END BENT

SIDEWALK DETAILS



SECTION N-N

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS

MARCH NORTHBOUND LANE 1984

DWG NO. 29

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-29
1			3			TOTAL SHEETS
2			4			115

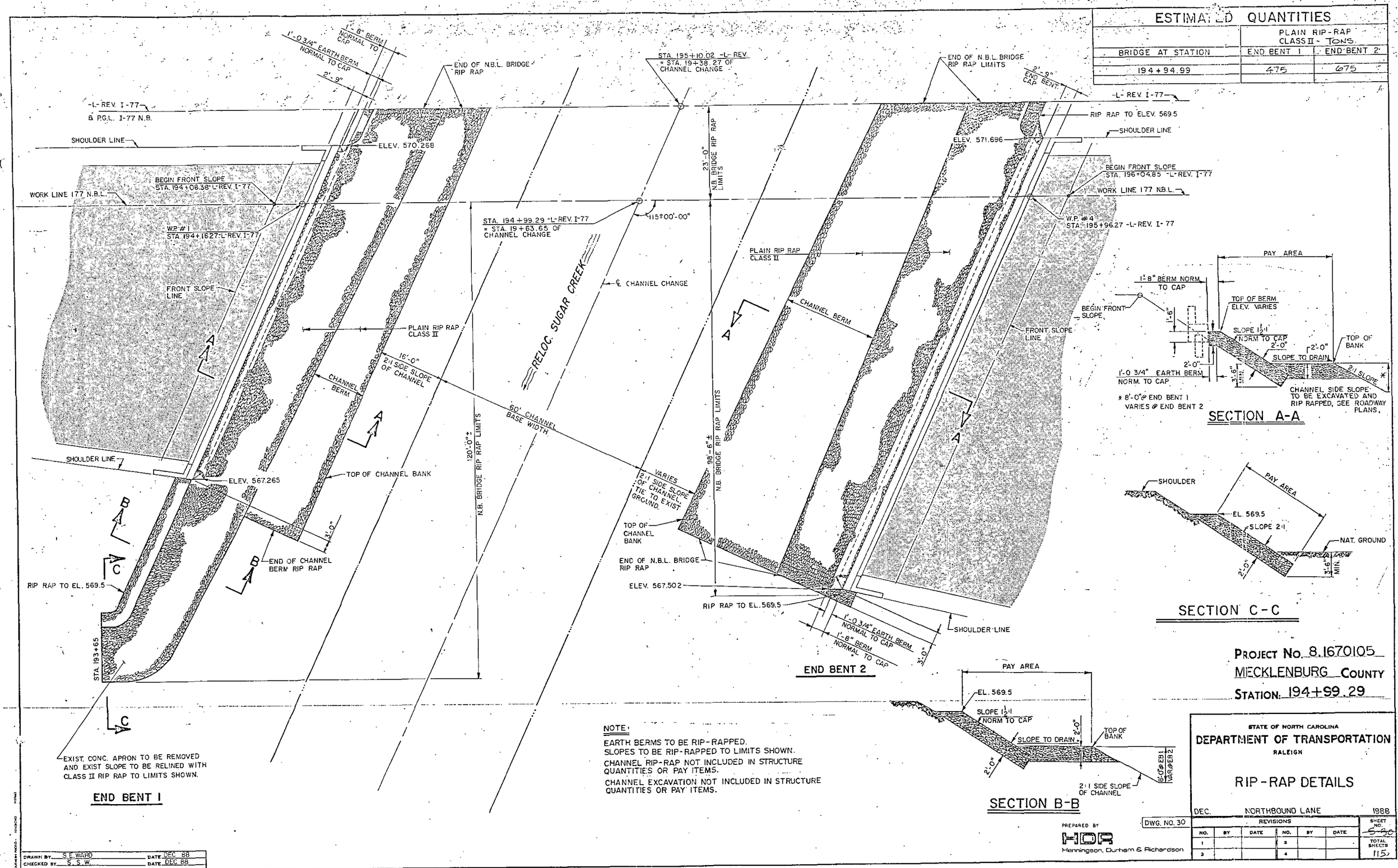
STD. NO. BAS3

301

REVISED 5-31-85 BY SJD
ADDED 3-1-84 BY RNH

ESTIMATED QUANTITIES

BRIDGE AT STATION	PLAIN RIP-RAP CLASS II - TONS	
	END BENT 1	END BENT 2
194+94.99	475	675



NOTE:

EARTH BERMS TO BE RIP-RAPPED.
SLOPES TO BE RIP-RAPPED TO LIMITS SHOWN.
CHANNEL RIP-RAP NOT INCLUDED IN STRUCTURE QUANTITIES OR PAY ITEMS.
CHANNEL EXCAVATION NOT INCLUDED IN STRUCTURE QUANTITIES OR PAY ITEMS.

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 194+99.29

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP-RAP DETAILS

DEC. NORTHBOUND LANE 1988

DWG. NO. 30

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	30
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.E. WARD DATE DEC 88
CHECKED BY S. S. W. DATE DEC 88

FEDERAL AID PROJECT # IR-77-1(106)2

FOR GENERAL NOTES SEE DRAWING 2.

FILL FACE @ END BENT 1
STA. 194+41.46 -L- REV. 1-77
GRADE POINT EL. 575.314

BEGIN FRONT SLOPE
STA. 194+32.83 -L- REV. 1-77
EL. 575.241

+0.8447%
PVT STA. 191+4744 SBL I-77 PGL
EL. 572.830

FILL FACE @ END BENT 2
STA. 196+21.46 -L- REV. 1-77
GRADE POINT EL. 576.834

BEGIN FRONT SLOPE
STA. 196+30.80 -L- REV. 1-77
EL. 576.913

EXP. SPAN A FIX SPAN B EXP. SPAN C EXP.

1'-8" BERM
1'-6"
1 1/2:1 SLOPE NORMAL TO CAP
EL. 557.0±
HP 12 x 53 STEEL PILES
EL. 559.0±
1'-0 3/4" EARTH BERM
CHANNEL BERM
EL. 560.0±
EL. 559.0±
EL. 561.0±
EL. 552.0±
HIGH WATER EL.-568+ YEAR-AFTER 1970 WATER SURFACE EL.-552.6 DATE OF SURVEY-11-9-86
EL. 552.0±
TOP OF FTG. EL. 549.096
TOP OF FTG. EL. 549.387
CHANNEL BERM
EL. 560.0±
1 1/2:1 SLOPE NORMAL TO CAP
36"S.S.
54"S.S.
EL. 561.0±
CHANNEL EXCAVATION (ROADWAY PAY ITEM)
1'-8" BERM
1'-6"
HP 12 X 53 STEEL PILES
EL. 561.0±
1'-0 3/4" EARTH BERM

APPROXIMATE EXISTING GROUNDLINE 31' LEFT OF -L- REV. 1-77.

END BENT 1

SIDES OF CHANNEL TO BE RIP RAPPED (ROADWAY PAY ITEM)

HP 12x53 STEEL PILES

BENT 1

HP 12x53 STEEL PILES

BENT 2

END BENT 2

HYDROGRAPHIC DATA

DESIGN DISCHARGE	= 10,000 cfs
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGHWATER ELEVATION	= 568.46
DRAINAGE AREA --	= 54.9 SQ. MI.
BASIC DISCHARGE (Q100)	= 11,000 cfs
BASIC HIGHWATER ELEVATION	= 569.01

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 13,000 cfs
FREQUENCY OF OVERTOPPING FLOOD	= 400± YRS.
OVERTOPPING FLOOD ELEV.	= 571.65

SECTION ALONG PROFILE GRADE LINE
(BENTS ON SECTION @ RIGHT ANGLES TO BENTS)

CHANNEL BERM
TOP OF CHANNEL BANK
BASE OF CHANNEL
EL. 569.50
1'-8" BERM EL. 570.790
PLAIN RIP-RAP CLASS II
PROPOSED RELOCATED SEWER LINES

STA. 194+50
TOP OF CHANNEL BANK
BASE OF CHANNEL
1'-8" BERM EL. 569.303
EL. 569.50
JCT. BOX
18" SAN. SEWER
RELOC. SUGAR CREEK
PLAIN RIP-RAP CLASS II
CHANNEL BERM
℄ CHANNEL CHANGE
36" SAN. SEWER
54" SAN. SEWER
JCT. BOX
JCT. BOX
54" SAN. SEWER
BEGIN FRONT SLOPE STA. 194+32.83 -L- REV. 1-77
BEGIN FRONT SLOPE STA. 196+30.80 -L- REV. 1-77
WP #2 STA. 194+99.46
WP #3 STA. 195+63.46
END APPROACH SLAB STA. 196+32.36 -L- REV. 1-77
BEGIN APPROACH SLAB STA. 194+30.56 -L- REV. 1-77
PROFILE GRADE LINE I-77 SOUTHBOUND
FT. MILL, SC
CHARLOTTE, NC
STA. 195+24.48 -L- REV.
STA. 19+04.06 CHANNEL CHANGE
115°00'00" (TYP)
WP #1 FILL FACE @ END BENT 1 STA. 194+41.46 -L- REV. 1-77
W.P. #4 FILL FACE @ END BENT 2 STA. 196+21.46 -L- REV. 1-77
1'-8" BERM EL. 569.303
1'-8" BERM EL. 570.790
31'-0"
EL. 569.50
58'-0"
64'-0"
58'-0"
EL. 569.50
25'-0 1/4"
180'-0" TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE)
℄ -L- REV. 1-77
STA. 195+10.02 -L- REV. I-77
STA. 19+38.27 CHANNEL CHANGE

PLAN

DRAWN BY EDB DATE 8/87
CHECKED BY JEJ DATE 8/87

SOUTH CAROLINA PROFESSIONAL ENGINEER SEAL 15417 STEVEN S. WILSON

Steven S. Wilson
19 APRIL '89

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER SUGAR CREEK ON I-77 BETWEEN SR1128 & SR1138

DEC. SOUTHBOUND LANE 1988

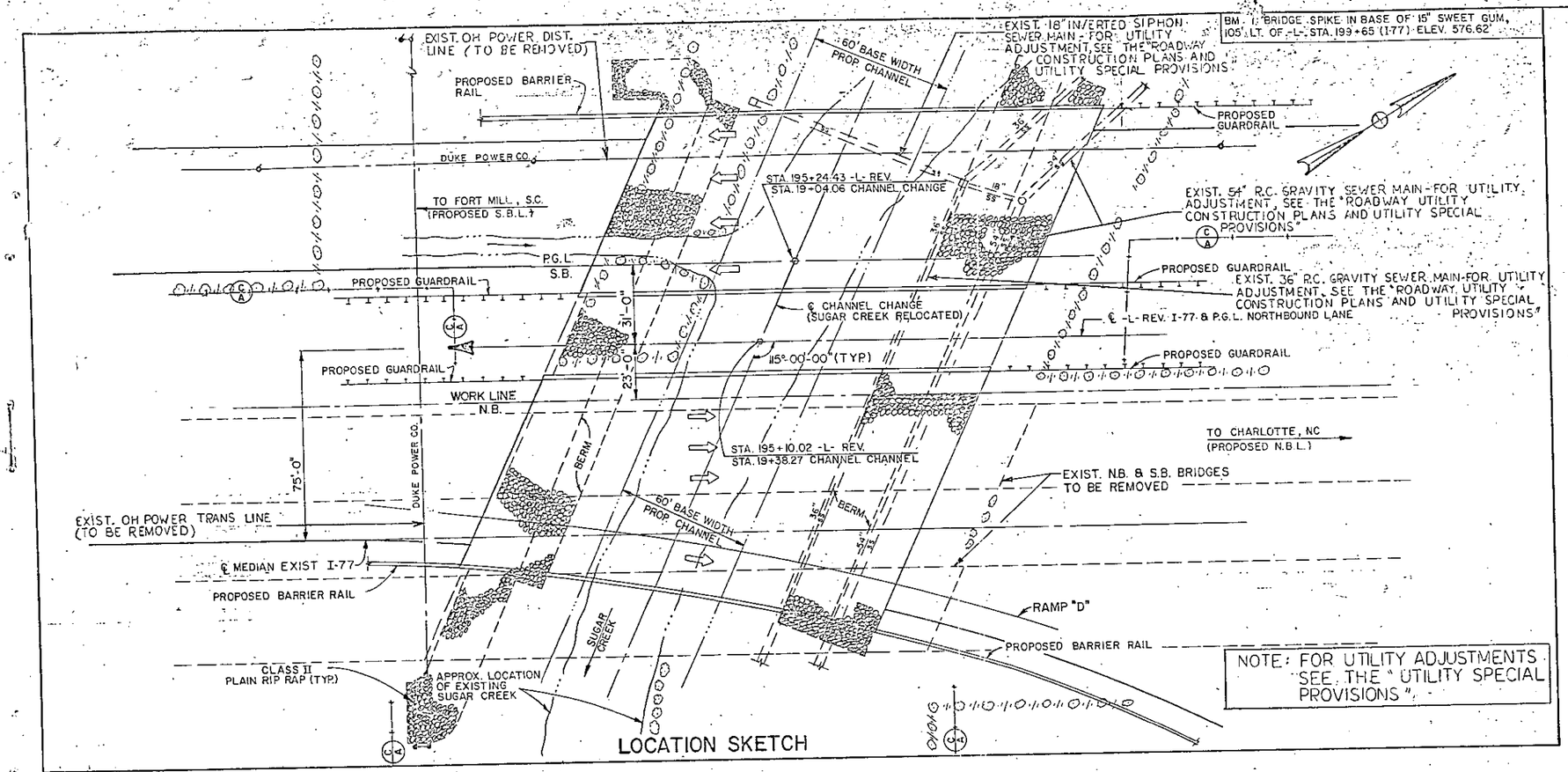
DWG. NO. 1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-31
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

R-2112C

#75
Mecklenburg



LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HS20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA & GENERAL NOTES, SEE SHEET S-N.

PILES FOR END BENTS 1 & 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

PILES FOR BENTS 1 & 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

FOR CURING BRIDGE DECK SLAB, SEE THE SPECIAL PROVISION, "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR FABRICATED METAL STAY-IN-PLACE FORMS, SEE SPECIAL PROVISIONS.

ALL STRUCTURAL STEEL FOR THIS STRUCTRUE SHALL BE UNPAINTED A.S.T.M. A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON THE PLANS.

NO WORK IS TO BE DONE ON END BENTS UNTIL 3 MONTHS AFTER THE APPROACH FILL IS COMPLETED.

FOR REINFORCED CONCRETE DECK SLAB, SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.

RIP RAP THAT WAS REMOVED AT BENT 2 DUE TO EXCAVATION SHALL BE REPLACED IMMEDIATELY AFTER BACKFILLING FOR FOOTING EXCAVATION. PAYMENT FOR THE REMOVAL AND REPLACEMENT OF THIS RIP RAP SHALL BE INCLUDED IN THE LUMP SUM PAYMENT FOR FOUNDATION EXCAVATION.

– TOTAL BILL OF MATERIALS –

	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	CLASS "A" CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 x 53 STEEL PILES		CONCRETE BARRIER RAIL	BRIDGE APPROACH SLAB	POT BEARINGS	PLAIN RIP-RAP CLASS II	PREFORMED COMPRESSION JOINT SEAL
	LUMP SUM	SQ. FT.	CU. YDS.	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	TONS	LUMP SUM
SUPERSTRUCTURE		12,941				239,693			367.22				
END BENT #1			41.4	6,686			13	390		LUMP SUM		520	
BENT #1	LUMP SUM		86.8	14,286	2,232		30	480					
BENT #2	LUMP SUM		87.2	14,339	2,260		30	660					
END BENT #2			41.8	6,714			13	533		LUMP SUM		700	
TOTAL	LUMP SUM	12,941	257.2	42,025	4492	239,693	86	2063	367.22	LUMP SUM	LUMP SUM	1220	LUMP SUM

I hereby certify that this structure was built according to plans except as noted hereon.

Resident Engineer

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER SUGAR CREEK ON I-77 BETWEEN SR1128 & SR1138

SOUTHBOUND LANE

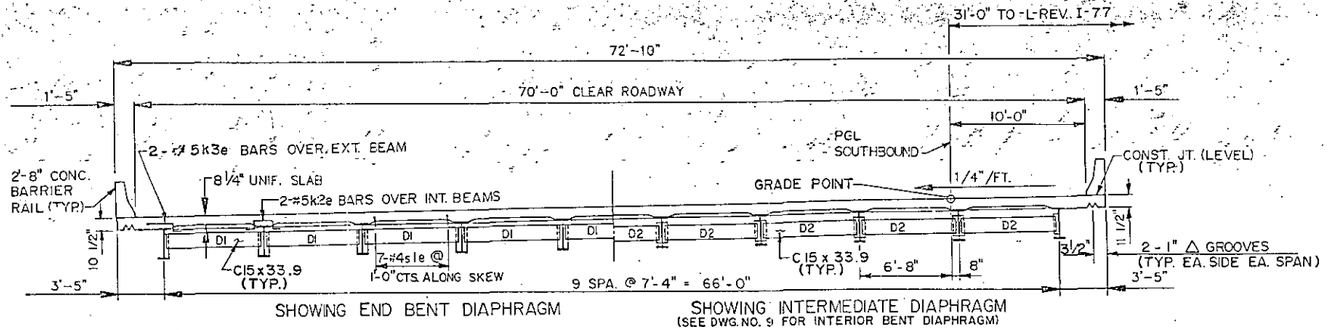
DES. 1988

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S-2	
1			3			TOTAL SHEETS	
2			4			115	

DWG NO. 2

PREPARED BY
HDR
Henningson, Durham & Richardson

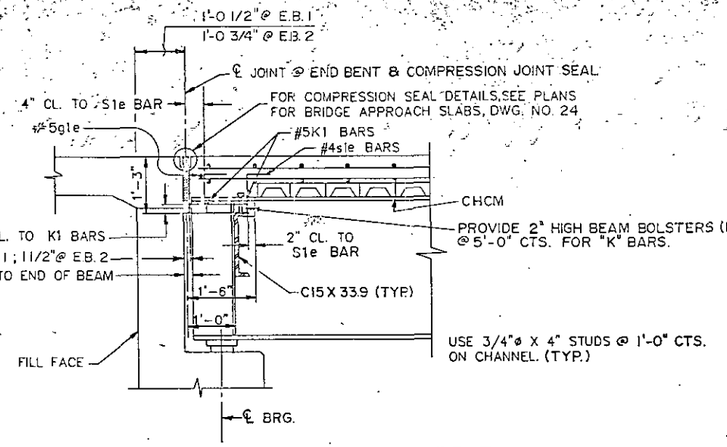
DRAWN BY: J.K.S. DATE: DEC. 88
CHECKED BY: S.S.W. DATE: DEC. 88



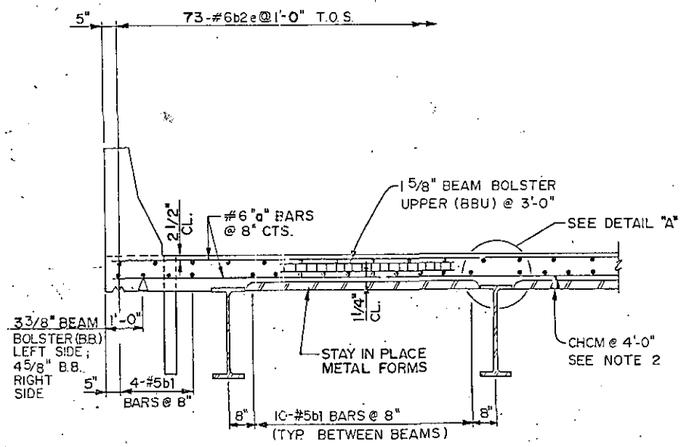
SHOWING END BENT DIAPHRAGM SHOWING INTERMEDIATE DIAPHRAGM
(SEE DWG. NO. 9 FOR INTERIOR BENT DIAPHRAGM)

TYPICAL SECTION

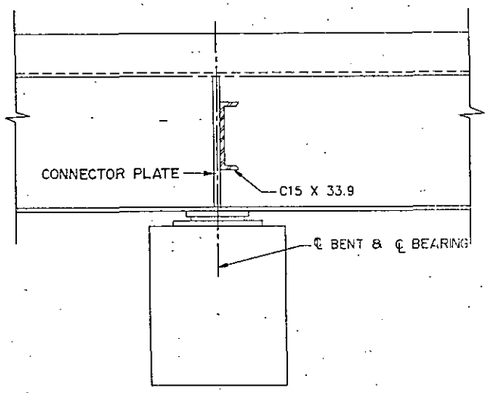
NOTE: ALL SPANS ARE CONTINUOUS, COMPOSITE, A-588 STEEL ROLLED BEAMS.



END OF BEAM DETAIL AT END BENT

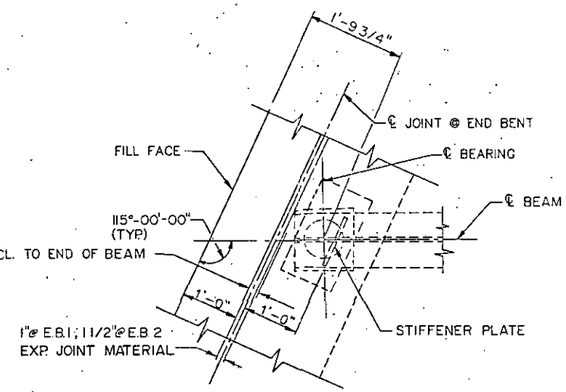


TYPICAL SLAB REINFORCEMENT

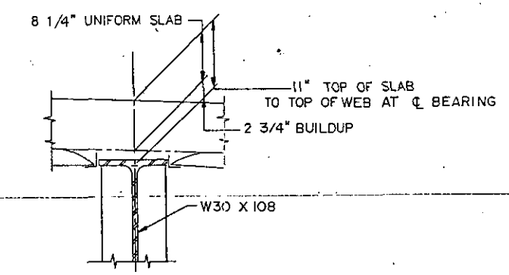


SECTION THRU BENT DIAPHRAGM

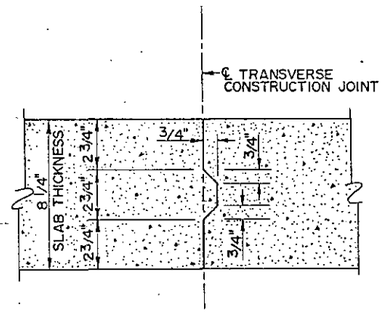
* DIMENSIONS MEASURED ALONG ℄ BEAM



PLAN OF BEAM AT END BENT JOINT



DETAIL "A"



NOTE:
REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

NOTES:

1.) BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

2) PROVIDE CONTINUOUS HIGH CHAIR FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH LEG SPACING TO MATCH PITCH OF THE FORM AND WITH A HEIGHT TO SUPPORT THE BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 1/4" ABOVE THE TOP OF THE STAY-IN-PLACE FORM.

3) FOR BARS INDICATED AND NO BARMARKS SHOWN, SEE SLAB REINFORCING PLAN.

4) FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION & DETAILS

DEC. SOUTHBOUND LANE 1988

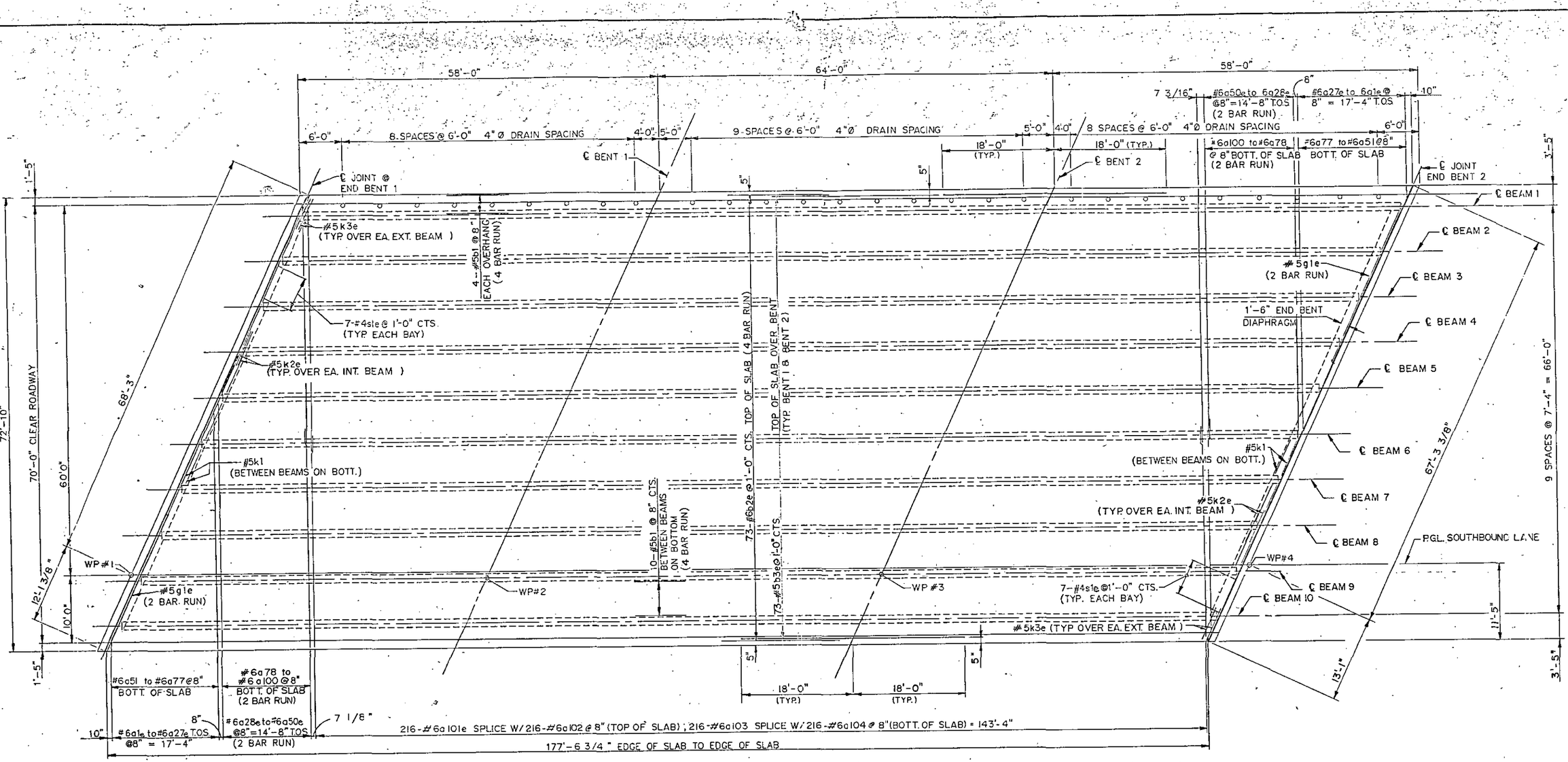
DWG. NO. 3

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		
1			3				TOTAL SHEETS
2			4				115

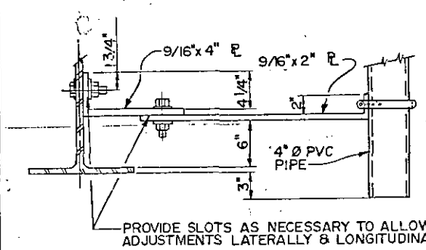
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY: E.D.P. S.E. WARD DATE: DEC. 88
CHECKED BY: W.N.P. DATE: 11-8-88

SOUTHERN PROJ.: GUILFORD NO.343



DECK PLAN

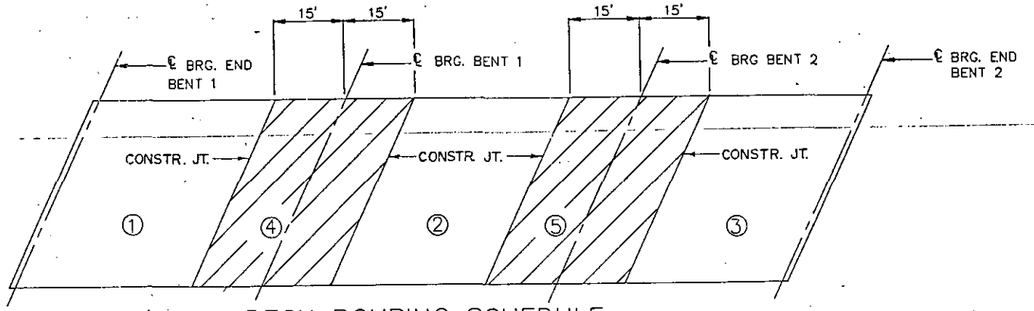


PROVIDE SLOTS AS NECESSARY TO ALLOW ADJUSTMENTS LATERALLY & LONGITUDINALLY.

DRAIN CONNECTOR DETAIL

NOTES:

1) REQUIRED SEQUENCE OF POURS IS 1,2,3,4,5
2.)PREVIOUS CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
3.) COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
4.) METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR BEAM FLANGES REQUIRING CHARPY "V" NOTCH TEST. SEE STRUCTURAL DETAIL SHEETS.
5.) TOPS OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
6) FOR TRANSVERSE CONSTRUCTION JOINT DETAILS, SEE DWG. NO. 3
7) 4-1/2" LUGS TO BE GLUED TO THE DRAIN PIPE AT EQUAL SPACES AROUND THE PIPE AND APPROXIMATELY 4" FROM THE TOP OF THE PIPE.



DECK POURING SCHEDULE

DRAWN BY E.D.B., S.E.WARD DATE DEC. 88
CHECKED BY W.N.P. DATE 11-8-88

PREPARED BY
HDR
Henningson, Durham & Richardson

DWG. NO. 4

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

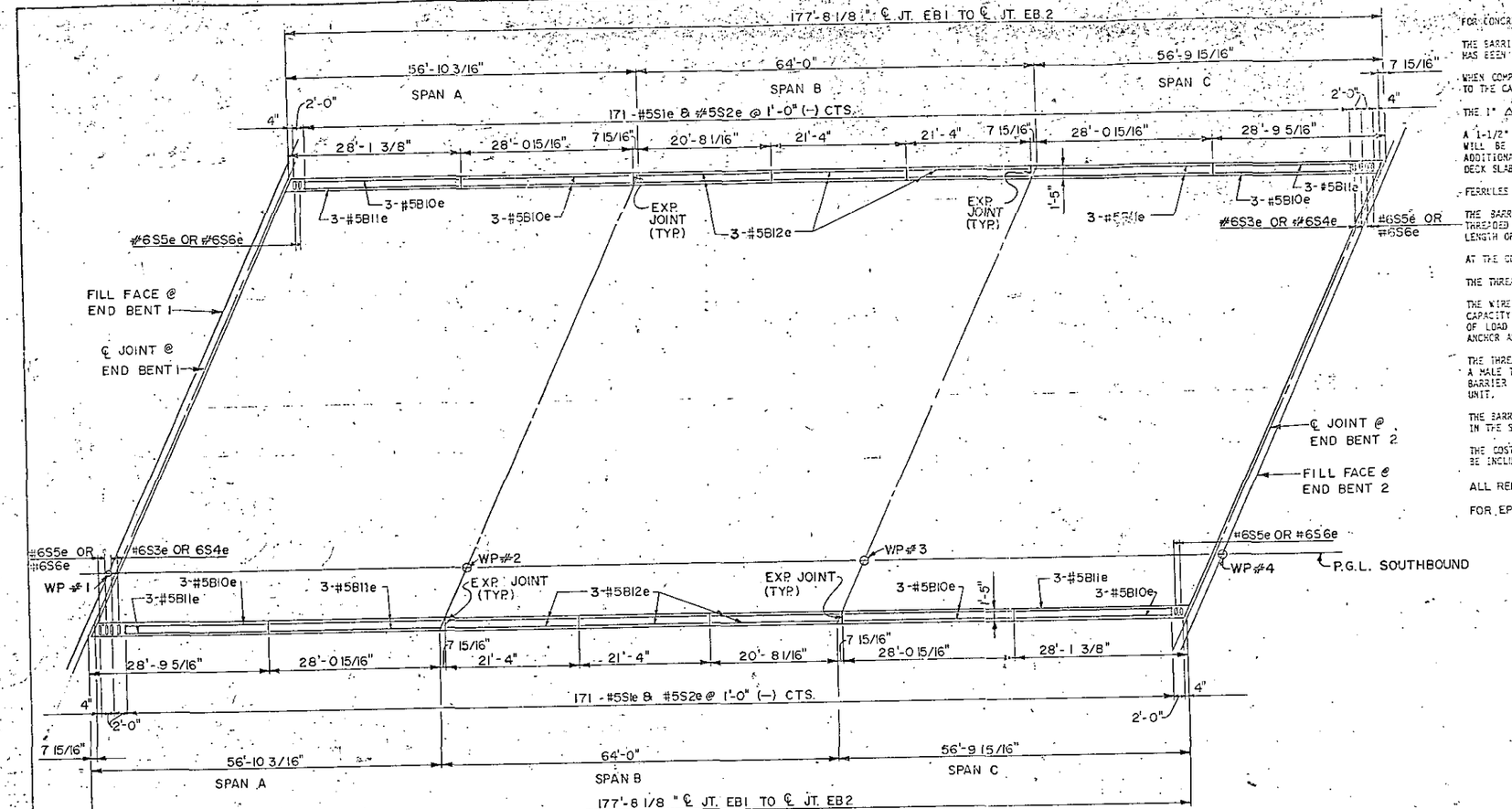
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

SLAB REINFORCEMENT PLAN

DEC. SOUTHBOUND LANE 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			115

306



NOTES

FOR CONCRETE BARRIER RAIL, SEE SPECIAL PROVISIONS.

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

THE 1" Δ GROOVE AT THE CONSTRUCTION JOINT MAY BE OMITTED.

A 1-1/2" EXTENSION OF THE CONCRETE SLAB BEYOND THE OUTSIDE FACE OF THE BARRIER RAIL WILL BE PERMITTED IF THE CONTRACTOR ELECTS TO SLIP FORM THE BARRIER RAILS. NO ADDITIONAL REINFORCING STEEL IS REQUIRED AND THE PAYMENT FOR THE REINFORCED CONCRETE DECK SLAB WILL BE FOR THE QUANTITY SHOWN ON THE PLANS.

FERRULES SHALL BE PLUGGED DURING CASTING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

THE BARRIER RAIL ANCHOR ASSEMBLY FERRULES SHALL HAVE THREADS COMPATIBLE TO THE THREADED REINFORCING BARS. THE FERRULES SHALL HAVE A MINIMUM LENGTH EQUAL TO THE LENGTH OF THE THREADS ON THE REINFORCING BARS.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

THE THREADED REINFORCING BARS ARE TO BE TIGHTENED BY HAND.

THE WIRE GAGE AND FERRULES SHALL BE OF SUFFICIENT STRENGTH TO ENSURE LOAD ANCHORING CAPACITY AS SPECIFIED IN THE AASHTO SPECIFICATIONS. A MANUFACTURER'S CERTIFICATION OF LOAD ANCHORING CAPACITY SHALL BE FURNISHED WITH EACH SHIPMENT OF BARRIER RAIL ANCHOR ASSEMBLIES.

THE THREADED REINFORCING BARS SHALL BE GRADE 60. THE BAR SHALL BE MANUFACTURED WITH A MALE THREADED END WITH A MINIMUM TENSILE STRESS AREA OF 0.334 SQUARE INCHES. THE BARRIER RAIL ANCHOR ASSEMBLY AND THREADED REINFORCING BARS SHALL BE SUPPLIED AS A UNIT.

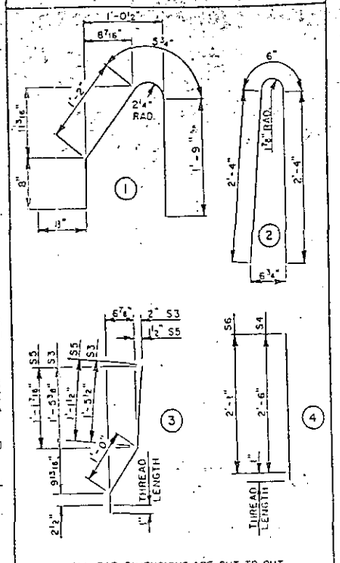
THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE ASSEMBLED IN THE SHOP. REINFORCING BAR THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

BAR TYPES



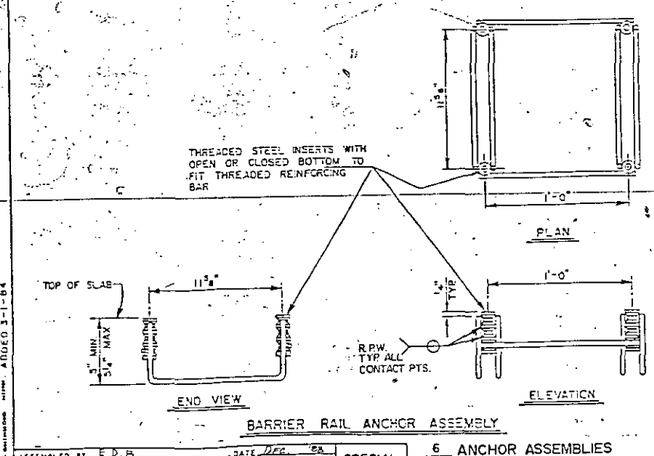
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

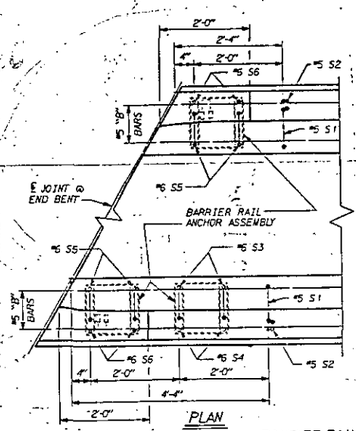
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
S1e	364	#5	1	4'-9"	1754
S2e	354	#5	2	5'-2"	1908
S3e	4	#5	3	2'-0"	17
S4e	4	#5	4	2'-7"	16
S5e	8	#5	3	2'-5"	29
S6e	8	#5	4	3'-2"	26
B10e	24	5	STR.	27'-8"	693
B11e	24	5	STR.	29'-4"	709
B12e	36	5	STR.	21'-0"	789
B13e	6	5	STR.	11'-8"	73
REINFORCING STEEL (EPOXY COATED)					6013 LBS.*
CLASS A-A CONCRETE					337 CU. YDS.*
CONCRETE BARRIER RAIL					367.22 LIN. FT.*

*INCLUDES BARRIER RAIL ON APPROACH SLAB. SEE DWG. NO. 23 FOR APPROACH SLAB DETAILS



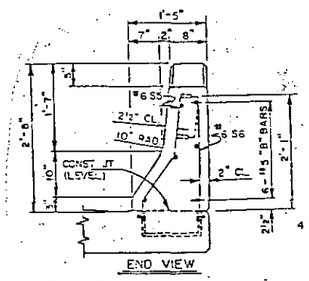
BARRIER RAIL ANCHOR ASSEMBLY

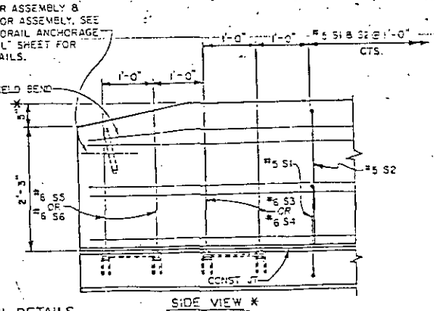
6 ANCHOR ASSEMBLIES REQUIRED



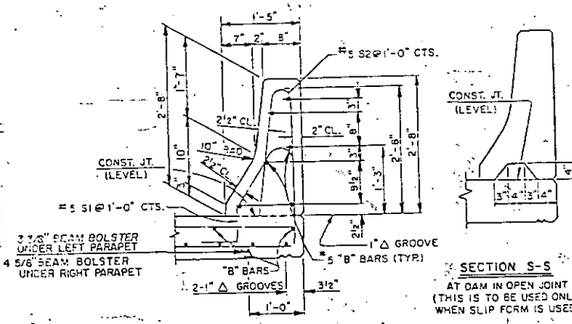
℄ 2 BOLT ANCHOR ASSEMBLY & GUARDRAIL ANCHOR ASSEMBLY, SEE "STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET FOR LOCATION & DETAILS.

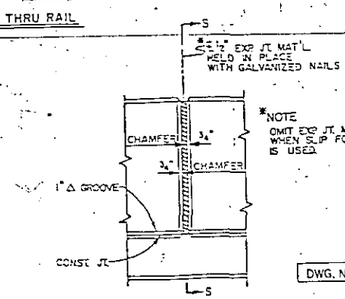
BARRIER RAIL - END OF RAIL DETAILS





*BARRIER RAIL @ END BENT 1, LEFT SIDE IS TO EXTEND ONTO APPROACH SLAB. THE 5" DROP OFF DOES NOT APPLY HERE.





ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. 8.1670105

MECKLENBURG COUNTY

STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

MARCH 1984 — SOUTHBOUND LANE

DWG. NO. 5

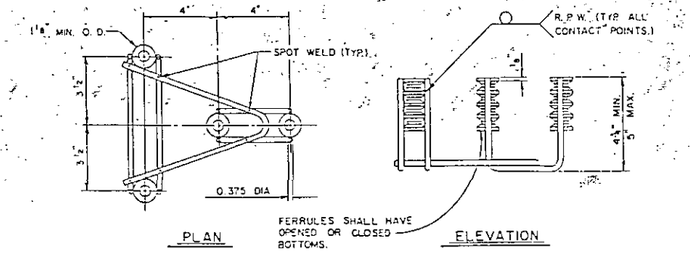
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-35
1			3			TOTAL SHEETS
2			4			115

STD. NO. CRRI

ASSEMBLED BY E.D.B.	DATE DEC. '83	SPECIAL
CHECKED BY S.H.	DATE 12-15-83	
DRAWN BY E.R. LUDWICK JR.	DATE JANUARY 3, 1984	STANDARD
CHECKED BY R.N. HUTCHERSON	DATE JANUARY 3, 1984	

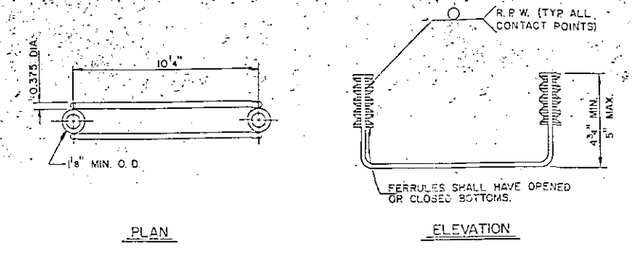
REVISED 5-31-85 BY:TGS
ADDED 3-1-84 BY:RNH

307



PLAN ELEVATION

GUARDRAIL ANCHOR ASSEMBLY



PLAN ELEVATION

2-BOLT ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1 1/2".

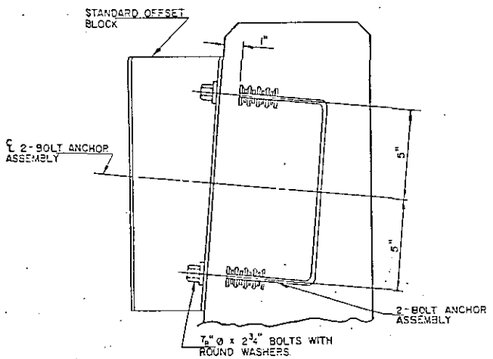
B. 4 - 7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2-7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" DIA. X 2 3/4" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

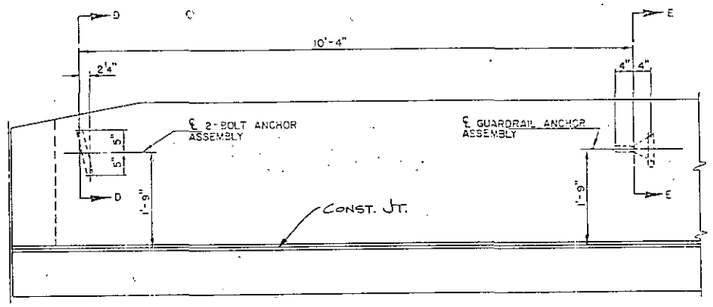
THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

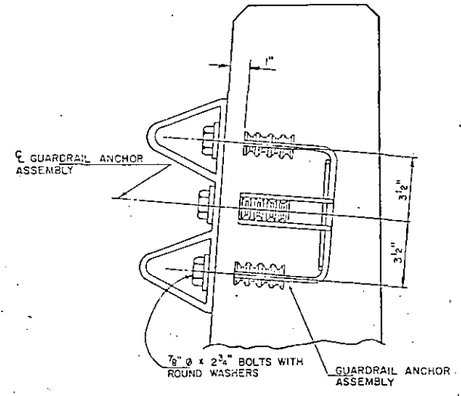
THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



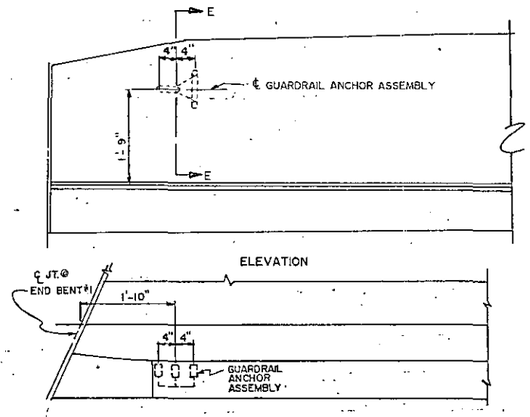
SECTION D-D



ELEVATION
END BENT 2

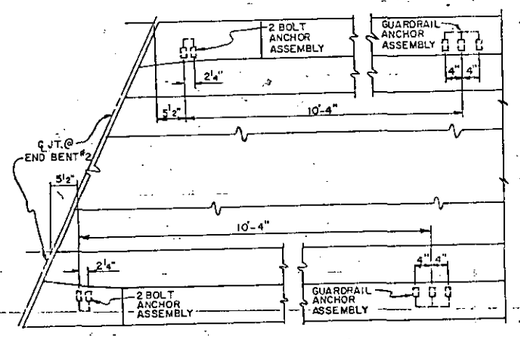


SECTION E-E



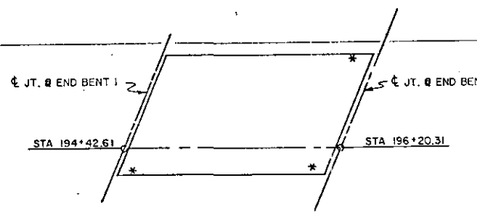
PLAN

LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSETS BLOCKS
END BENT 1



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK
END BENT 2



SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

MARCH SOUTHBOUND LANE 1984

DWG. NO. 6

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-26
TOTAL SHEETS 115

STD. NO. GRAI

ASSEMBLED BY E.D.B.	DATE Dec. 88	SPECIAL
CHECKED BY E.W.	DATE 12-15-88	
DRAWN BY E. R. LURWICK, JR	DATE JANUARY 3, 1984	STANDARD
CHECKED BY R. N. HUTCHERSON	DATE JANUARY 3, 1984	

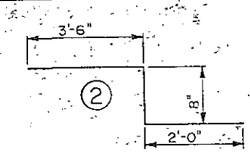
REDRAWN 3-1-94

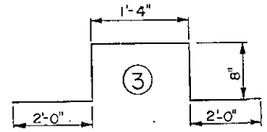
308

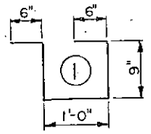
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
a1e	2	#6	STR.	1'-2"	4
a2e	2	#6	STR.	2'-7"	8
a3e	2	#6	STR.	4'-0"	12
a4e	2	#6	STR.	5'-6"	17
a5e	2	#6	STR.	6'-11"	21
a6e	2	#6	STR.	8'-4"	25
a7e	2	#6	STR.	9'-9"	29
a8e	2	#6	STR.	11'-2"	34
a9e	2	#6	STR.	12'-7"	38
a10e	2	#6	STR.	14'-0"	42
a11e	2	#6	STR.	15'-6"	47
a12e	2	#6	STR.	16'-11"	51
a13e	2	#6	STR.	18'-4"	55
a14e	2	#6	STR.	19'-9"	59
a15e	2	#6	STR.	21'-2"	64
a16e	2	#6	STR.	22'-7"	68
a17e	2	#6	STR.	24'-1"	72
a18e	2	#6	STR.	25'-6"	77
a19e	2	#6	STR.	26'-11"	81
a20e	2	#6	STR.	28'-4"	85
a21e	2	#6	STR.	29'-9"	89
a22e	2	#6	STR.	31'-2"	94
a23e	2	#6	STR.	32'-8"	98
a24e	2	#6	STR.	34'-1"	102
a25e	2	#6	STR.	35'-6"	107
a26e	2	#6	STR.	36'-11"	111
a27e	2	#6	STR.	38'-4"	115
a28e	4	#6	STR.	21'-3"	128
a29e	4	#6	STR.	21'-11"	132
a30e	4	#6	STR.	22'-8"	136
a31e	4	#6	STR.	23'-4"	140
a32e	4	#6	STR.	24'-1"	145
a33e	4	#6	STR.	24'-9"	149
a34e	4	#6	STR.	25'-6"	153
a35e	4	#6	STR.	26'-3"	158
a36e	4	#6	STR.	26'-11"	162
a37e	4	#6	STR.	27'-8"	166
a38e	4	#6	STR.	28'-4"	170
a39e	4	#6	STR.	29'-1"	175
a40e	4	#6	STR.	29'-9"	179
a41e	4	#6	STR.	30'-6"	183
a42e	4	#6	STR.	31'-3"	188
a43e	4	#6	STR.	31'-11"	192
a44e	4	#6	STR.	32'-8"	196
a45e	4	#6	STR.	33'-4"	200
a46e	4	#6	STR.	34'-1"	205
a47e	4	#6	STR.	34'-10"	209
a48e	4	#6	STR.	35'-6"	213
a49e	4	#6	STR.	36'-3"	218
a50e	4	#6	STR.	36'-11"	222
a51	2	#6	STR.	1'-2"	4
a52	2	#6	STR.	2'-7"	8
a53	2	#6	STR.	4'-0"	12
a54	2	#6	STR.	5'-6"	17
a55	2	#6	STR.	6'-11"	21
a56	2	#6	STR.	8'-4"	25
a57	2	#6	STR.	9'-9"	29
a58	2	#6	STR.	11'-2"	34
a59	2	#6	STR.	12'-7"	38
a60	2	#6	STR.	14'-0"	42
a61	2	#6	STR.	15'-6"	47
a62	2	#6	STR.	16'-11"	51
a63	2	#6	STR.	18'-4"	55
a64	2	#6	STR.	19'-9"	59
a65	2	#6	STR.	21'-2"	64
a66	2	#6	STR.	22'-7"	68
a67	2	#6	STR.	24'-1"	72
a68	2	#6	STR.	25'-6"	77
a69	2	#6	STR.	26'-11"	81
a70	2	#6	STR.	28'-4"	85
a71	2	#6	STR.	29'-9"	89
a72	2	#6	STR.	31'-2"	94
a73	2	#6	STR.	32'-8"	98
a74	2	#6	STR.	34'-1"	102
a75	2	#6	STR.	35'-6"	107
a76	2	#6	STR.	36'-11"	111
a77	2	#6	STR.	38'-4"	115
a78	4	#6	STR.	21'-3"	128
a79	4	#6	STR.	21'-11"	132
a80	4	#6	STR.	22'-8"	136
a81	4	#6	STR.	23'-4"	140
a82	4	#6	STR.	24'-1"	145
a83	4	#6	STR.	24'-9"	149
a84	4	#6	STR.	25'-6"	153
a85	4	#6	STR.	26'-3"	158
a86	4	#6	STR.	26'-11"	162
a87	4	#6	STR.	27'-8"	166
a88	4	#6	STR.	28'-4"	170
a89	4	#6	STR.	29'-1"	175
a90	4	#6	STR.	29'-9"	179
a91	4	#6	STR.	30'-6"	183
a92	4	#6	STR.	31'-3"	188
a93	4	#6	STR.	31'-11"	192
a94	4	#6	STR.	32'-8"	196
a95	4	#6	STR.	33'-4"	200
a96	4	#6	STR.	34'-7"	205
a97	4	#6	STR.	34'-10"	209
a98	4	#6	STR.	35'-6"	213
a99	4	#6	STR.	36'-3"	218
a100	4	#6	STR.	36'-11"	222
a101e	216	#6	STR.	33'-11"	11,004
a102e	216	#6	STR.	41'-3"	13,383
a103	216	#6	STR.	33'-11"	11,004
a104	216	#6	STR.	41'-3"	13,383
b1	392	#5	STR.	46'-0"	18,807
b2e	292	#6	STR.	46'-4"	20,321
b3e	146	#5	STR.	36'-0"	5,482
g1e	4	#5	STR.	41'-1"	171
k1	36	#5	STR.	7'-8"	288
k2e	32	#5	3	6'-8"	223
k3e	8	#5	2	6'-2"	51
s1e	126	#4	1	3'-6"	295

BAR TYPES







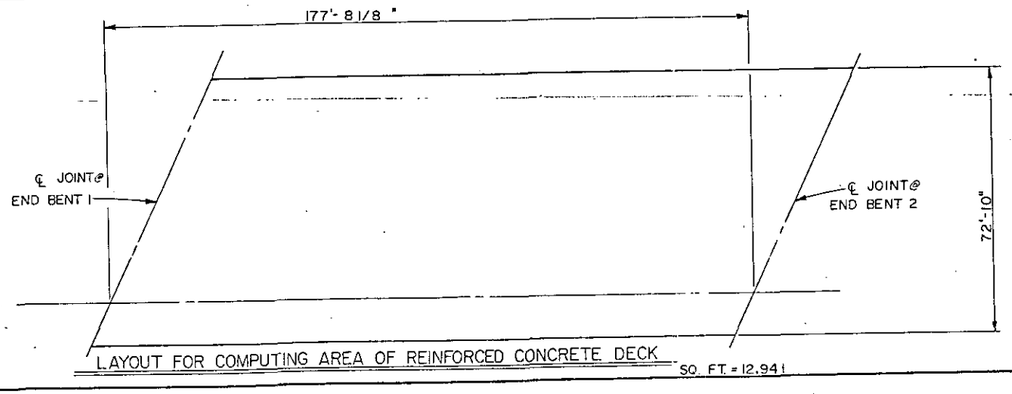
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINF. STEEL	
	384.0	49,106	56,554	
TOTALS	384.0	49,106	56,554	

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-9"	2'-5"
#5	2'-2"	3'-0"
#6	2'-7"	3'-7"
#8	4'-0"	4'-10"



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SQ. FT. = 12,941

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SUPERSTRUCTURE BILL OF MATERIAL

DEC. SOUTHBOUND LANE 1988

DWG. NO. 7

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-27
TOTAL SHEETS 115

304

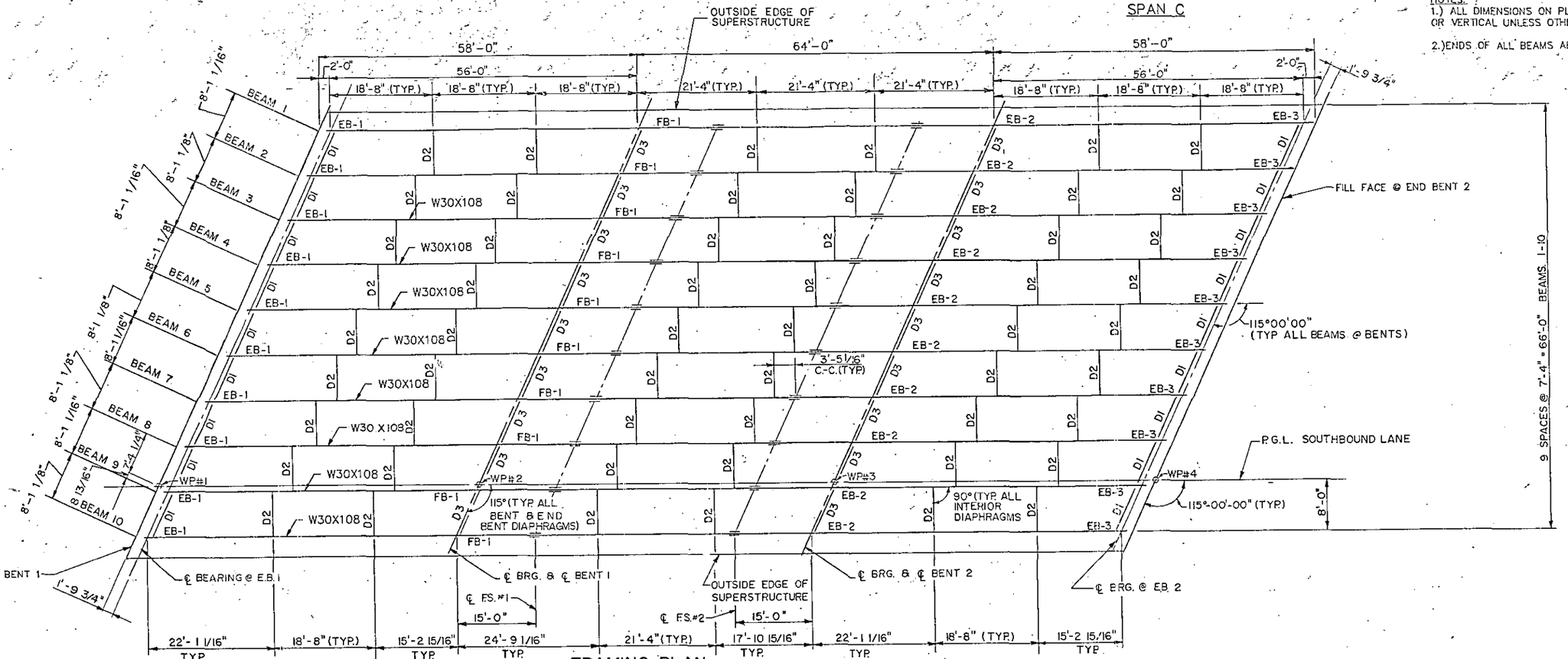
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY E.O.B. DATE NOV. 88
CHECKED BY W.N.P. DATE 11-9-88

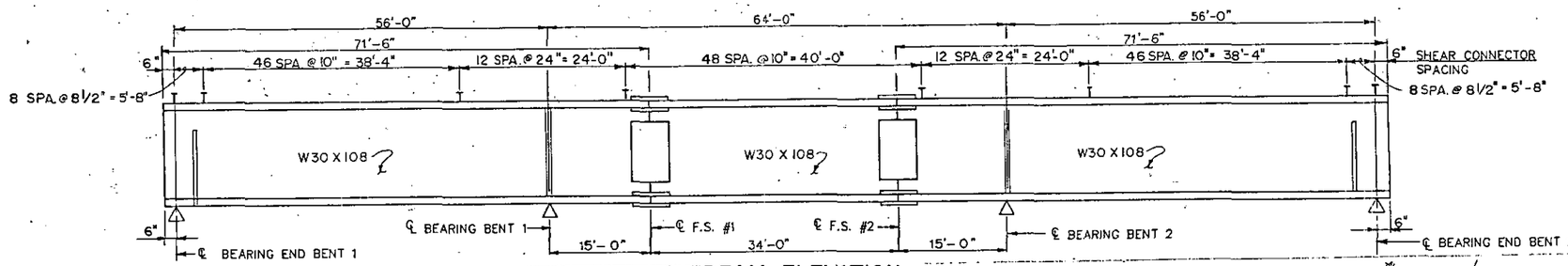
SOUTHERN PHOTO - BLUEPRINTING NOMA

SPAN C

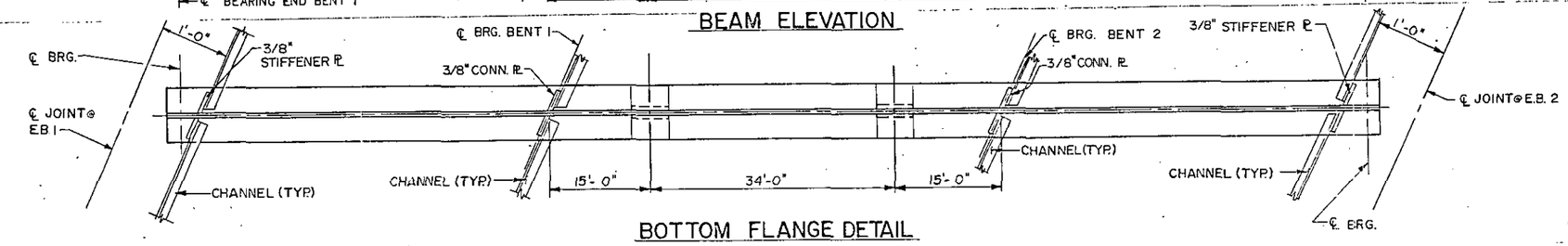
NOTES:
1.) ALL DIMENSIONS ON PLANS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.
2.) ENDS OF ALL BEAMS ARE TO BE PLUMB



FRAMING PLAN



BEAM ELEVATION



BOTTOM FLANGE DETAIL

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN & BEAM ELEVATION

DEC SOUTHBOUND LANE 1988

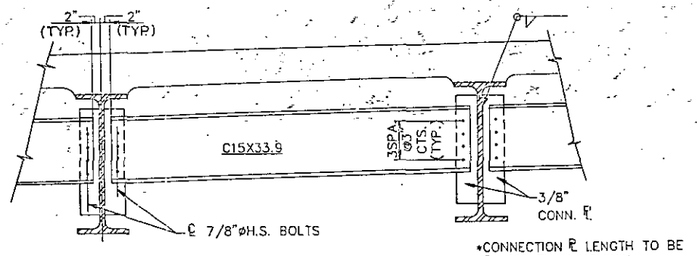
DWG. NO. 8

REVISIONS						SHEET NO.
No.	BY	DATE	No.	BY	DATE	S-310
1			3			TOTAL SHEETS
2			4			115

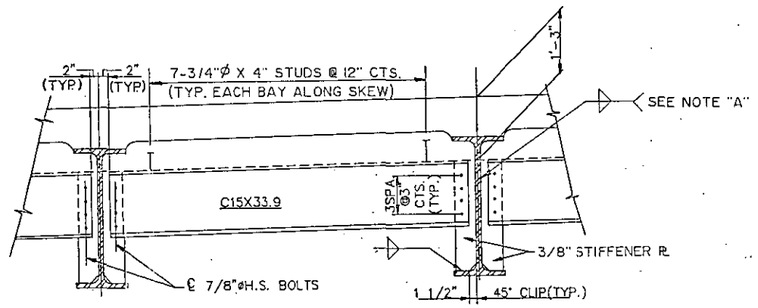
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY E.D.B. DATE DEC '88
CHECKED BY W.N.P. DATE DEC. 15 '88

S-310

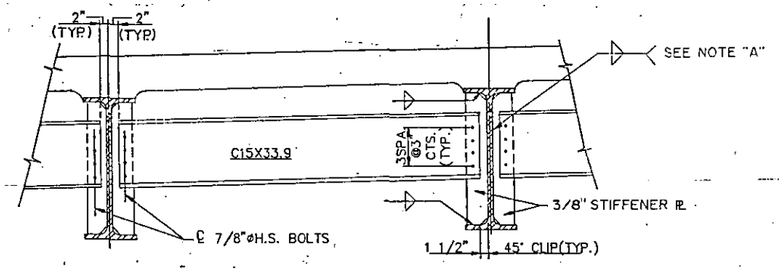


TYPICAL INTERMEDIATE DIAPHRAGM D2 FOR ROLLED BEAMS



TYPICAL END BENT DIAPHRAGM D1 FOR ROLLED BEAMS

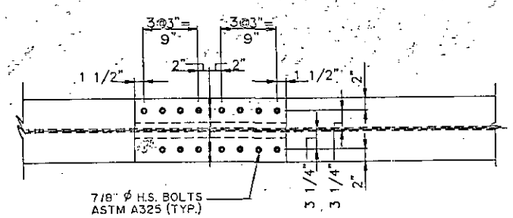
NOTE "A"
PER A.W.S. FIG. 2.7.IC;
BEVEL IF NECESSARY.



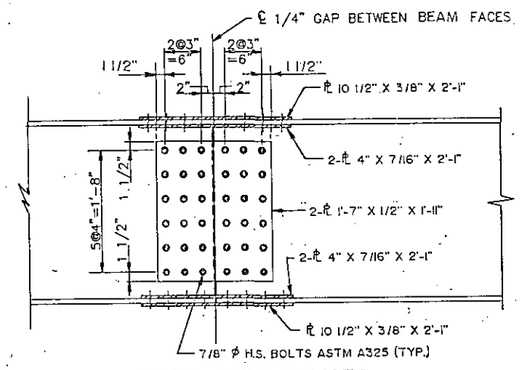
TYPICAL INTERIOR BENT DIAPHRAGM D3 FOR ROLLED BEAMS

NOTES

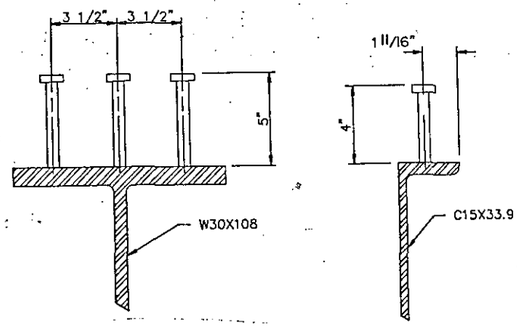
1. AT FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND THEN, GIVEN AN ADDITIONAL 1/4 TURN, THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
2. ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
3. CAMBERED BEAM LENGTHS SHALL BE ADJUSTED AND BEARINGS ARE TO BE PLACED ON THE CAMBERED BEAM SO AS TO BE ALIGNED WITH THE ANCHORS AFTER THE DEAD LOAD DEFLECTION HAS OCCURRED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.
4. ALL STRUCTURAL STEEL SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI, UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL FIELD CONNECTIONS ARE TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
6. STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF THE EXTERIOR BEAM, END STIFFENERS SHALL BE PLUMB.
7. A CHARPY V-NOTCH TEST IS REQUIRED ON ALL BEAM SECTIONS, WEB SPLICE & FLANGE SPLICE PLATES AS SHOWN ON THE PLANS. SEE SPECIAL PROVISIONS.
8. STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETED BEFORE FALSE WORK OR FORMS ARE PLACED ON THE UNIT.
9. HIGH STRENGTH BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM A325, TYPE 3.



PLAN—TOP & BOTTOM



ELEVATION--FIELD SPLICES #1 & 2



STUD DETAILS

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

SPLICE & MISC. STEEL DETAILS
DEC. SOUTHBOUND LANE 1988

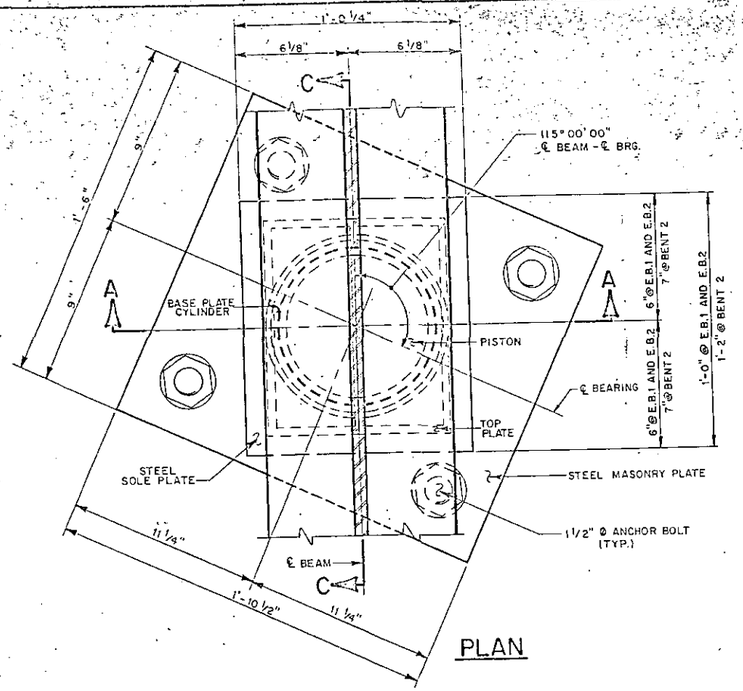
DWG. NO. 9

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	6 39
1			3			TOTAL SHEETS
2			4			115

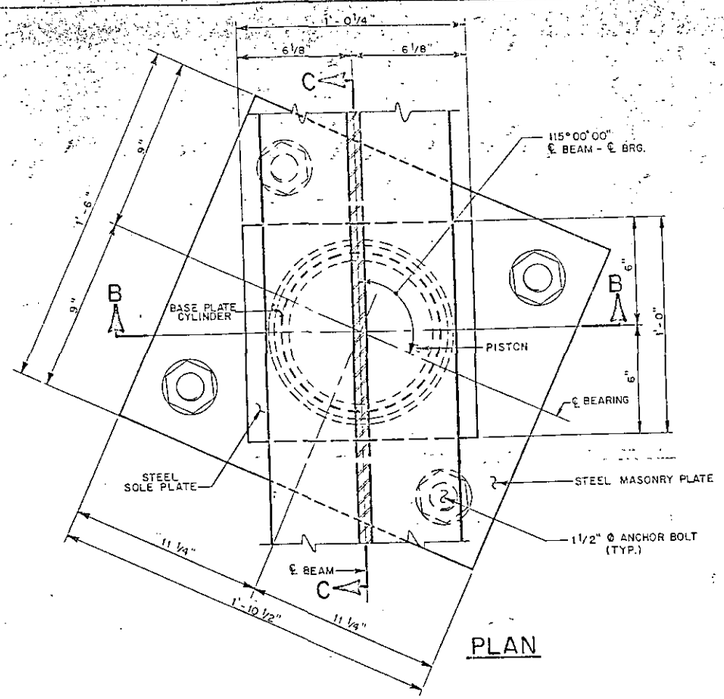
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY E.D.S. DATE NOV. 88
CHECKED BY W.N.P. DATE 11-8-88

3.11



PLAN



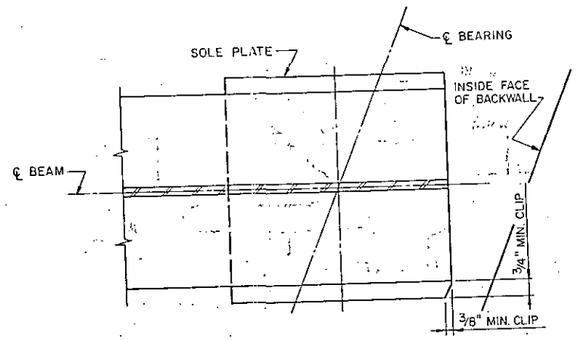
PLAN

NOTES:

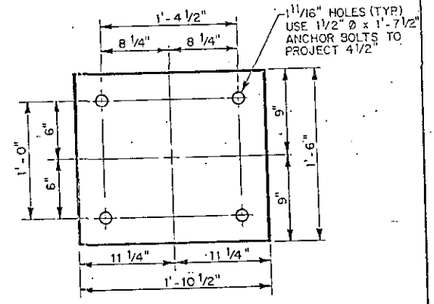
FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. PLANS FOR ANY ADJUSTMENTS SHALL BE APPROVED BEFORE ANY WORK IS BEGUN ON THE BENT.

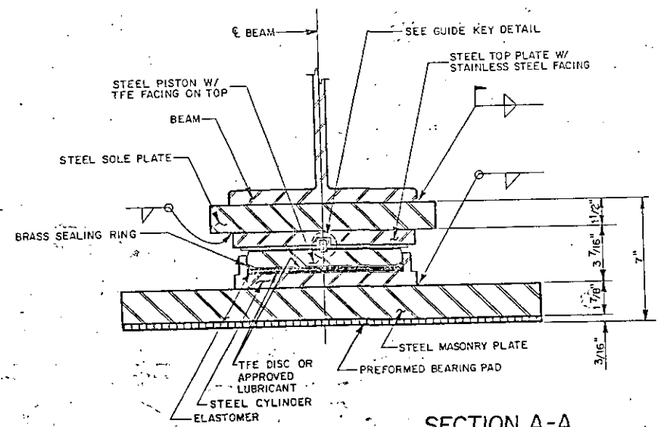
AT ALL POINTS OF SUPPORT IN SPANS A,B B C, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.



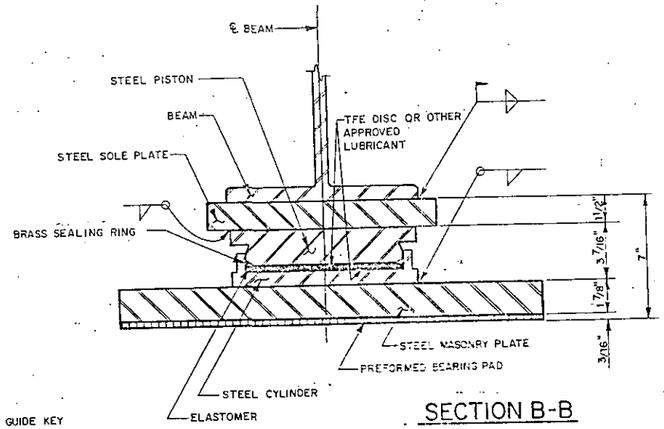
SOLE PLATE DETAIL AT END BENT



TYPICAL MASONRY PLATE



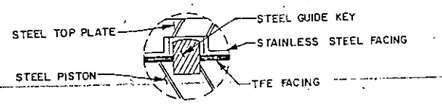
SECTION A-A



SECTION B-B

EXPANSION BEARINGS
(END BENT 1, BENT 2, END BENT 2)

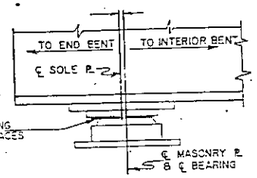
FIXED BEARINGS
(BENT 1)



GUIDE KEY DETAIL

TABLE FOR PLATE SETTING DATA (EXPANSION POT BEARINGS)				
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	*
END BENT 1	-3/16"	0	+3/16"	0
BENT 2	-3/16"	0	+3/16"	0
END BENT 2	-3/8"	0	+3/8"	0

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



TEMPERATURE SETTING DETAIL

TABLE FOR LOADS AND MOVEMENTS					
BEARING	LOCATION	LOAD IN KIPS			TOTAL MOVEMENT, IN
		DEAD	LIVE	TOTAL	
EB-1	END BENT 1	28.5	59.6	88.1	5/8"
FB-1	BENT 1	86.2	68.8	155.0	0
EB-2	BENT 2	86.2	68.8	155.0	3/4"
EB-3	END BENT 2	28.5	59.6	88.1	1 3/8"

DRAWN BY S.E. WARD DATE 12-89
CHECKED BY S.S.W. DATE 12-89

PREPARED BY
Hennington, Durham & Richardson

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

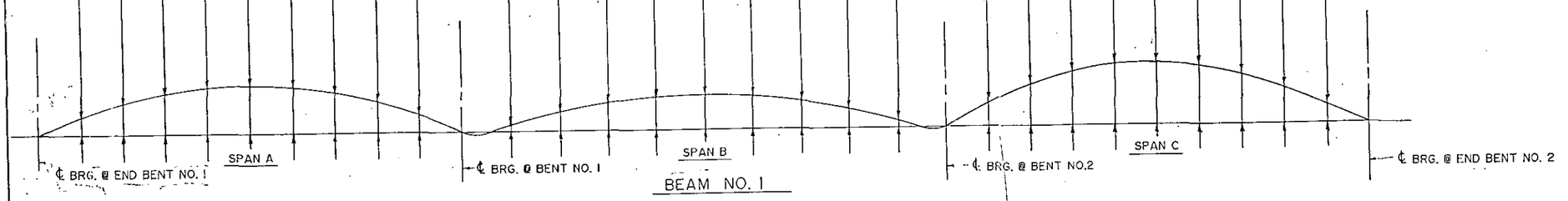
SUPERSTRUCTURE
POT BEARING DETAILS

DEC. SOUTHBOUND LANE 1988

DWG. NO. 10

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-40
1	S.E.W.	2-15-89	3			TOTAL SHEETS
2			4			115

.003	.005	.007	.007	.007	.006	.005	.003	.001		.001	.002	.003	.004	.005	.004	.003	.001	.001		.001	.003	.004	.006	.007	.007	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.024	.044	.059	.066	.065	.057	.043	.024	.010		.003	.015	.025	.035	.040	.038	.030	.016	.006		.008	.022	.037	.048	.057	.058	.052	.038	.021	DEFLECTION DUE TO WEIGHT OF SLAB
.003	.005	.007	.008	.008	.007	.005	.003	.001		.001	.003	.005	.007	.007	.007	.005	.003	.001		.001	.003	.005	.007	.008	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.030	.054	.073	.081	.080	.070	.053	.030	.012		.005	.020	.033	.046	.052	.049	.038	.020	.008		.010	.028	.046	.057	.072	.073	.066	.048	.027	TOTAL DEAD LOAD DEFLECTION
3/8"	5/8"	7/8"	1"	15/16"	13/16"	5/8"	3/8"	1/8"		1/16"	1/4"	3/8"	9/16"	5/8"	9/16"	7/16"	1/4"	1/8"		1/8"	5/16"	9/16"	3/4"	7/8"	7/8"	13/16"	9/16"	5/16"	REQUIRED CAMBER

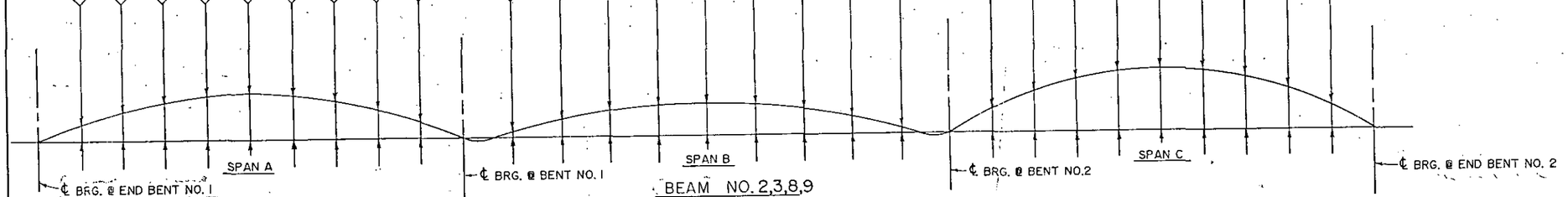


BEAM NO. 1

NOTE

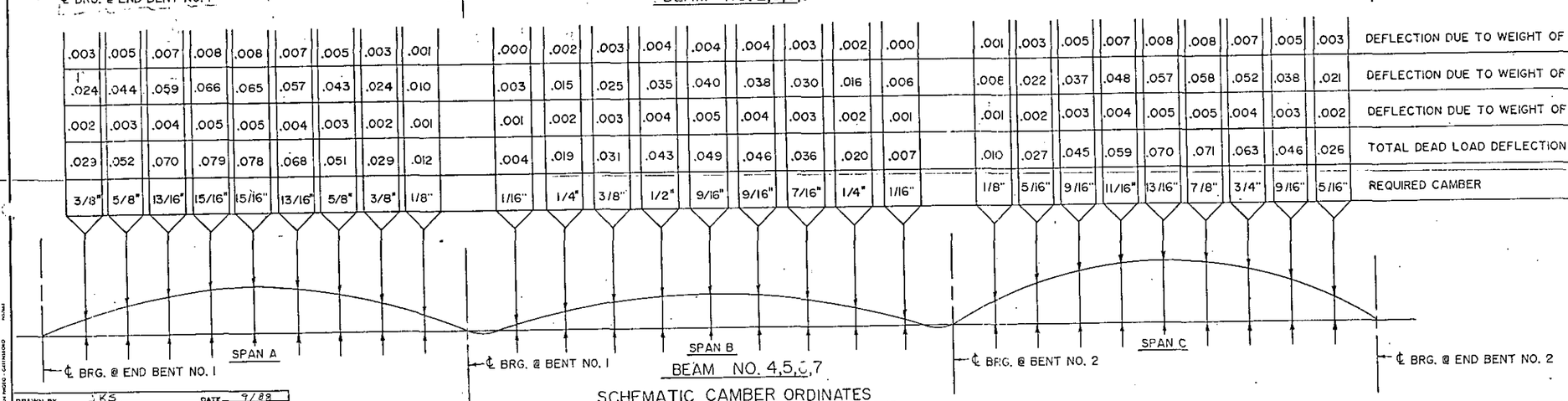
VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRGS. EXCEPT "BEAM CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).

.003	.005	.007	.008	.008	.007	.005	.003	.001		.000	.002	.003	.004	.004	.004	.003	.001	.000		.001	.003	.005	.007	.008	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.024	.044	.059	.066	.065	.057	.043	.024	.010		.003	.015	.025	.035	.040	.038	.030	.016	.006		.008	.022	.037	.048	.057	.058	.052	.038	.021	DEFLECTION DUE TO WEIGHT OF SLAB
.003	.006	.008	.009	.009	.008	.006	.003	.001		.001	.004	.006	.008	.008	.008	.006	.004	.001		.001	.003	.006	.008	.009	.009	.008	.006	.003	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.030	.055	.074	.083	.082	.072	.054	.030	.012		.004	.021	.034	.047	.052	.050	.039	.022	.007		.010	.028	.048	.063	.074	.075	.067	.049	.028	TOTAL DEAD LOAD DEFLECTION
3/8"	11/16"	7/8"	1"	1"	7/8"	5/8"	3/8"	1/8"		1/16"	1/4"	7/16"	9/16"	5/8"	5/8"	7/16"	1/4"	1/16"		1/8"	5/16"	9/16"	3/4"	7/8"	7/8"	13/16"	9/16"	5/16"	REQUIRED CAMBER



BEAM NO. 2,3,8,9

.003	.005	.007	.008	.008	.007	.005	.003	.001		.000	.002	.003	.004	.004	.004	.003	.002	.000		.001	.003	.005	.007	.008	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.024	.044	.059	.066	.065	.057	.043	.024	.010		.003	.015	.025	.035	.040	.038	.030	.016	.006		.008	.022	.037	.048	.057	.058	.052	.038	.021	DEFLECTION DUE TO WEIGHT OF SLAB
.002	.003	.004	.005	.005	.004	.003	.002	.001		.001	.002	.003	.004	.005	.004	.003	.002	.001		.001	.002	.003	.004	.005	.005	.004	.003	.002	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.023	.052	.070	.079	.078	.068	.051	.029	.012		.004	.019	.031	.043	.049	.046	.036	.020	.007		.010	.027	.045	.059	.070	.071	.063	.046	.026	TOTAL DEAD LOAD DEFLECTION
3/8"	5/8"	13/16"	15/16"	15/16"	13/16"	5/8"	3/8"	1/8"		1/16"	1/4"	3/8"	1/2"	9/16"	9/16"	7/16"	1/4"	1/16"		1/8"	5/16"	9/16"	11/16"	13/16"	7/8"	3/4"	9/16"	5/16"	REQUIRED CAMBER



BEAM NO. 4,5,6,7

SCHEMATIC CAMBER ORDINATES

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CAMBER DIAGRAM & DEAD LOAD DEFLECTIONS FOR SPANS A, B & C

DEC. SOUTHBOUND LANE 1988

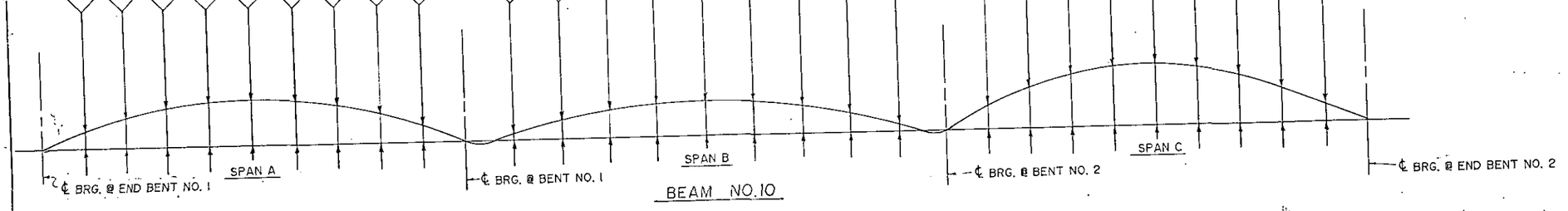
DWG. NO. 11

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-41
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY JKS DATE 9/88
CHECKED BY SW DATE 9/88

.003	.005	.006	.007	.007	.006	.005	.003	.001		.001	.002	.003	.004	.004	.004	.003	.001	.001		.001	.003	.004	.006	.007	.007	.006	.005	.003	DEFLECTION DUE TO WEIGHT OF STEEL
.025	.045	.061	.068	.067	.058	.044	.025	.010		.003	.015	.026	.036	.041	.039	.031	.016	.006		.008	.023	.038	.049	.058	.059	.053	.039	.022	DEFLECTION DUE TO WEIGHT OF SLAB
.003	.005	.007	.008	.008	.007	.005	.003	.001		.001	.003	.006	.007	.008	.007	.006	.003	.001		.001	.003	.005	.007	.007	.008	.007	.005	.003	DEFLECTION DUE TO WEIGHT OF RAIL & FUTURE W.S.
.031	.055	.074	.083	.082	.071	.054	.031	.012		.005	.020	.035	.047	.053	.050	.040	.020	.008		.010	.029	.047	.062	.072	.074	.066	.049	.028	TOTAL DEAD LOAD DEFLECTION
3/8"	11/16"	7/8"	1"	1"	7/8"	5/8"	3/8"	1/8"		1/16"	1/4"	7/16"	9/16"	5/8"	5/8"	1/2"	1/4"	1/8"		1/8"	3/8"	9/16"	3/4"	7/8"	7/8"	13/16"	9/16"	5/16"	REQUIRED CAMBER



BEAM NO. 10

SCHEMATIC CAMBER ORDINATES

NOTE

VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRGS. EXCEPT "BEAM CAMBER" WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CAMBER DIAGRAM & DEAD LOAD DEFLECTIONS FOR SPANS A, B & C
SOUTHBOUND LANE

DEC. 1988

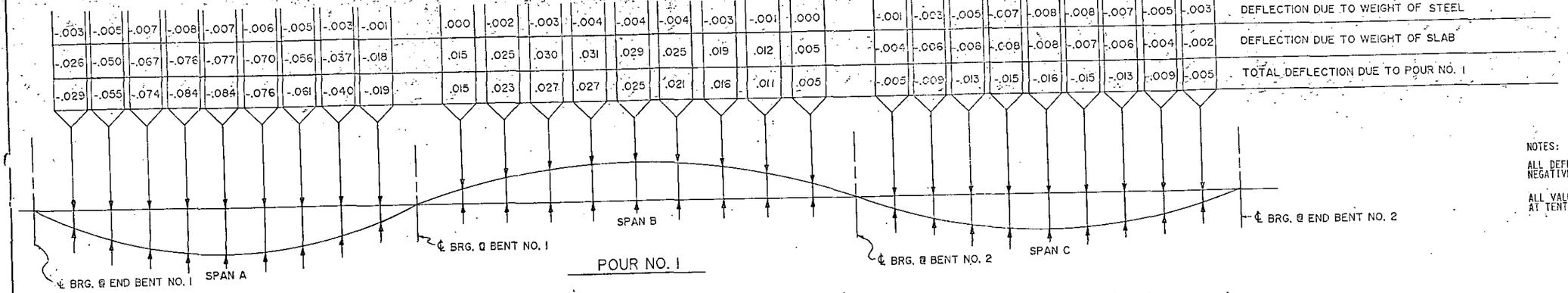
DWG. NO. 12

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-42
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY JKS DATE 9/88
CHECKED BY SW DATE 9/88

SOUTHERN PHOTO REPRODUCTION 1-1-83

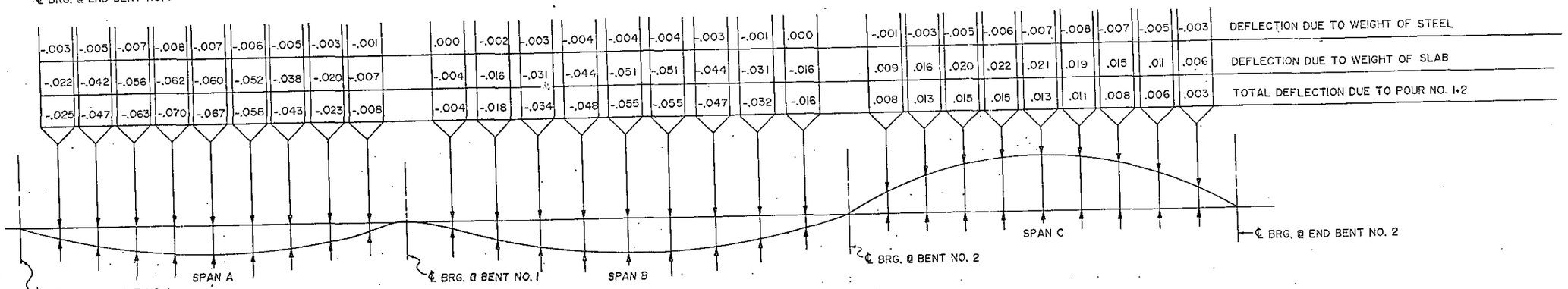


POUR NO. 1

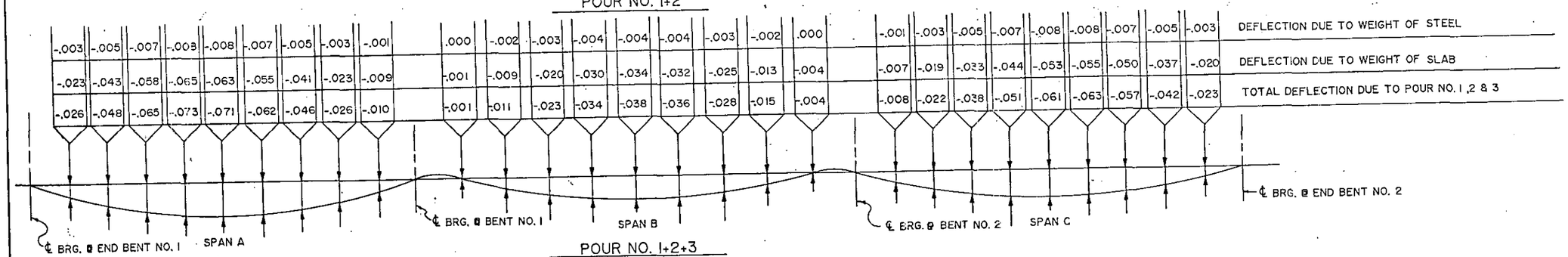
NOTES:

ALL DEFLECTIONS FOR INTERIOR BEAM.
NEGATIVE DEFLECTION INDICATES DOWNWARD MOVEMENT.

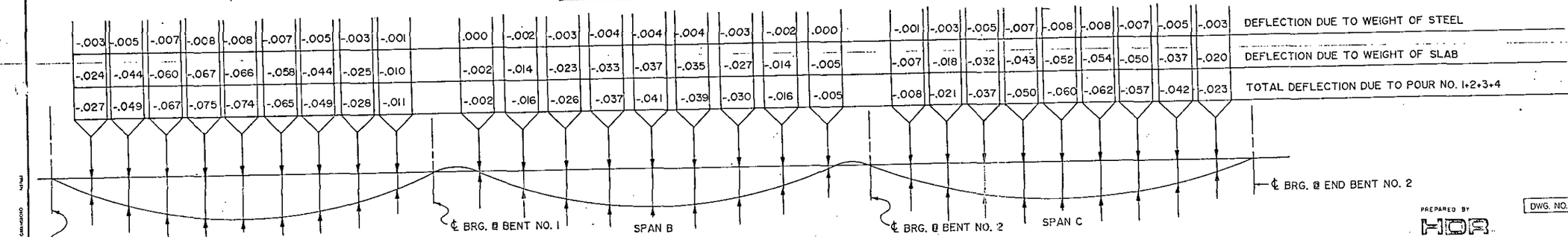
ALL VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BEARINGS.



POUR NO. 1+2



POUR NO. 1+2+3



POUR NO. 1+2+3+4

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE POUR DEFLECTION DIAGRAM FOR SPANS A, B & C

DEC SOUTHBOUND LANE 1988

DWG. NO. 13

REVISIONS							SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE			
1			3				TOTAL SHEETS	
2			4				115	

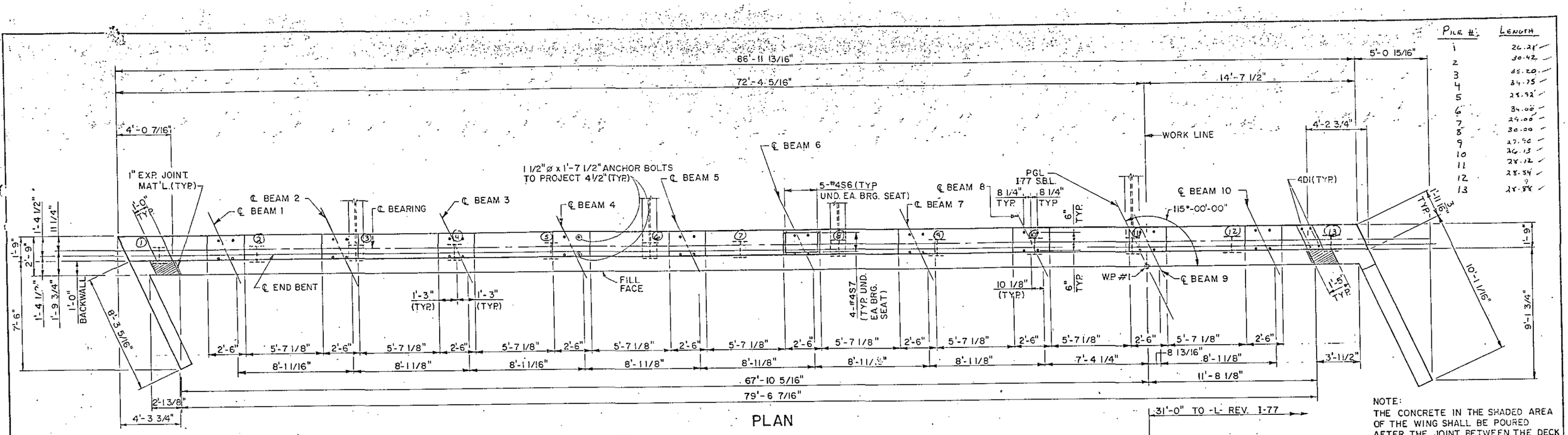
PREPARED BY
HDR
Hennington, Durham & Richardson

DRAWN BY JKS DATE 9-20-88
CHECKED BY SW DATE 9-20-88

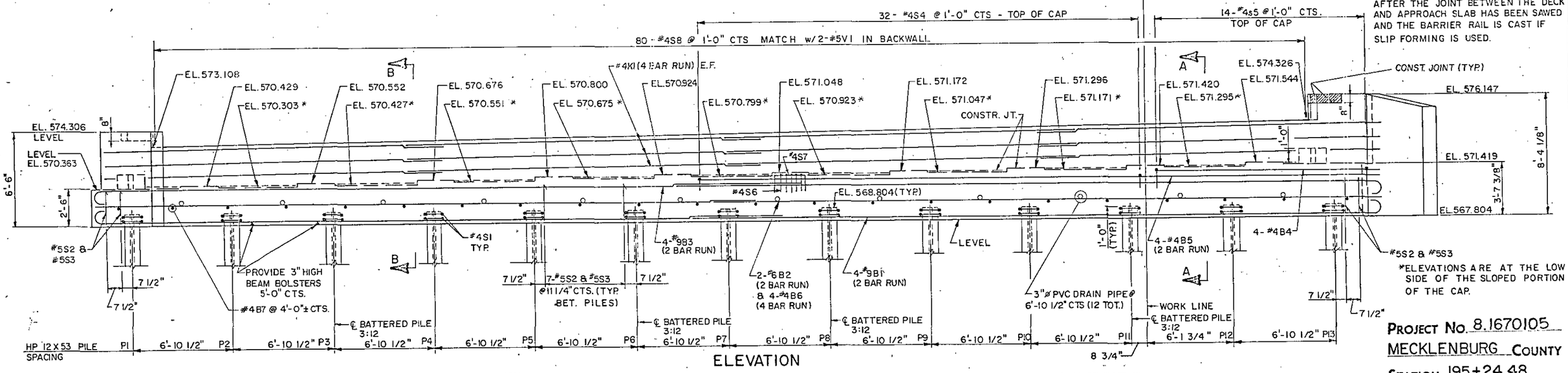
SOUTHERN HDR-CARLISLE

3/5

PILE #	LENGTH
1	26.21
2	30.42
3	85.20
4	84.75
5	28.92
6	34.00
7	29.00
8	30.00
9	27.56
10	26.13
11	28.12
12	28.54
13	27.88



PLAN

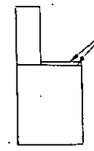


ELEVATION

*ELEVATIONS ARE AT THE LOW SIDE OF THE SLOPED PORTION OF THE CAP.

NOTE:
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

NOTE:
MINIMUM SPLICE LENGTHS ARE AS FOLLOWS:
#9B1 = 6'-3"
#6B2 = 3'-10"
#9B3 = 8'-9"
#4B6 = 2'-5"
#4K1 = 2'-5"



NOTES:
1) THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4"/FT.
2) FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
3) COAT ALL SURFACE AREAS OF THE TOP OF CAP INCLUDING CHAMFERS. DO NOT COAT THE AREAS BENEATH THE POT BEARINGS. THE BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4) BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
5) FOR POT BEARING DETAILS, SEE DRAWING NO. 10
6) 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.
7) PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
8) FOR SECTION A-A, B-B & WINGWALL DETAILS, SEE DRAWING NO. 15
9) FOR END BENT BILL OF MATERIAL, SEE DRAWING NO. 18
10) ELEVATIONS SHOWN FOR THE TOP OF BACKWALL ARE GIVEN AT THE FILL FACE SIDE.
11) PIPE DRAINS MAY BE SHIFTED SLIGHTLY IF NECESSARY TO CLEAR ANCHOR BOLTS AND REINFORCING STEEL.
12) STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS
13) FOR PIPE DRAIN DETAILS SEE STANDARD BAS_2, DRAWING NO. 23
14) FOR PILE SPLICE DETAILS, SEE DRAWING NO. 18
15) FOR TEMPORARY DRAINAGE DETAILS, SEE DRAWING NO. 18

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1
DEC. SOUTHBOUND LANE 1988

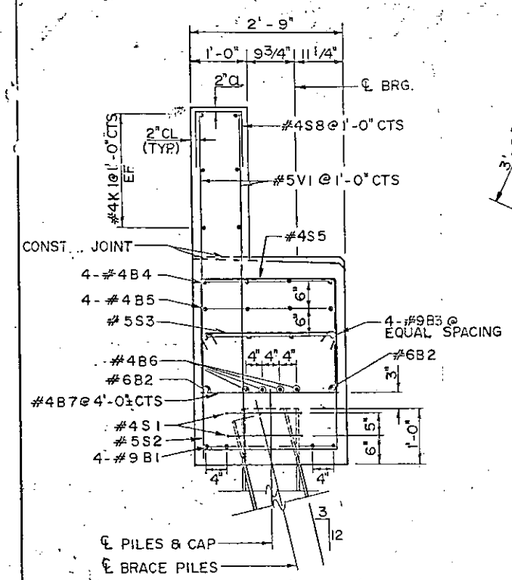
DRAWN BY S.E.W. DATE 10-88
CHECKED BY S.S.W. DATE 12-88

PREPARED BY HDR Henningson, Durham & Richardson

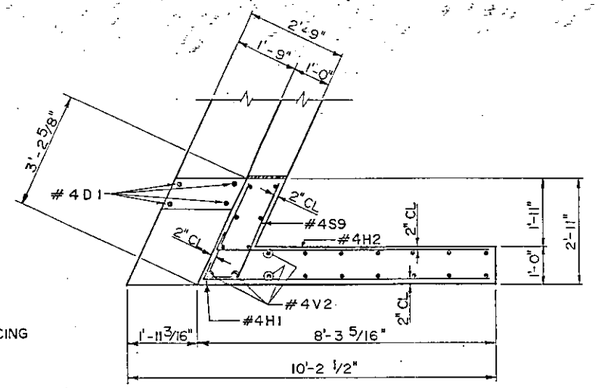
DWG. NO. 14

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-44
1			3			TOTAL SHEETS
2			4			115

316

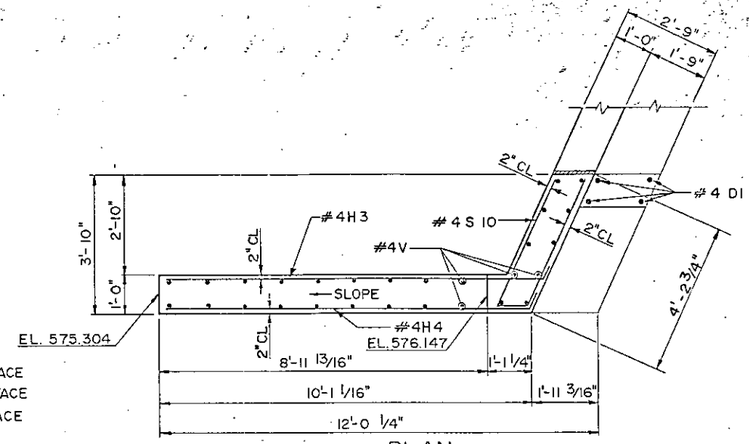


SECTION A-A

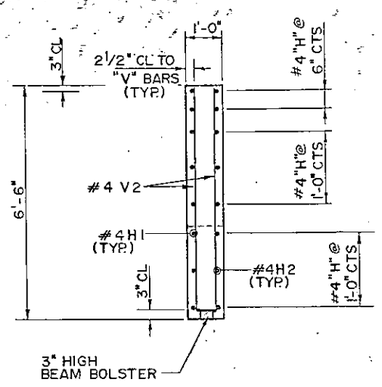


PLAN
END BENT 1 WINGWALL - LEFT

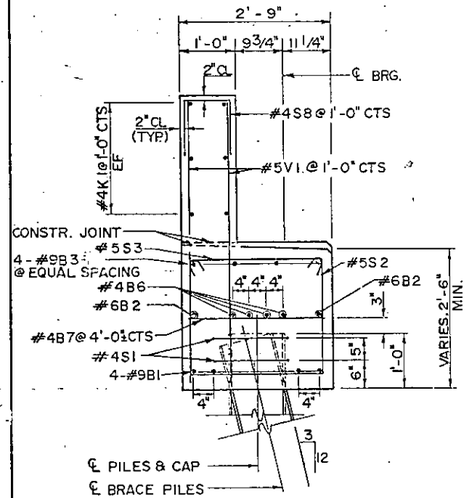
NOTE
E.F. DENOTES EACH FACE
N.F. DENOTES NEAR FACE
F.F. DENOTES FAR FACE



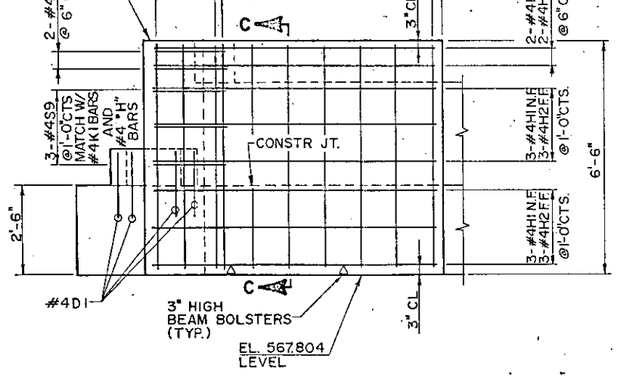
PLAN
END BENT 1 WINGWALL - RIGHT



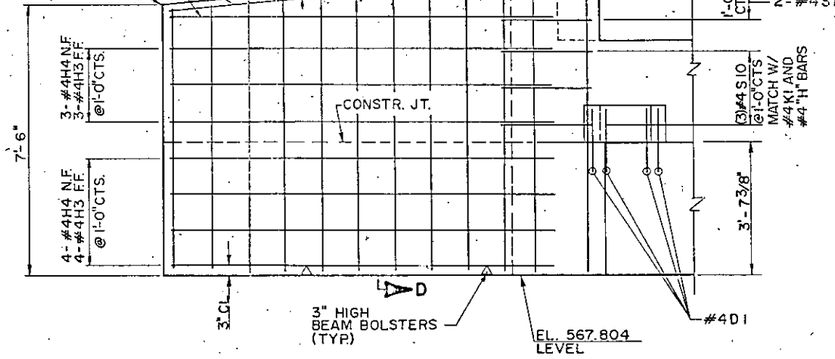
SECTION C-C



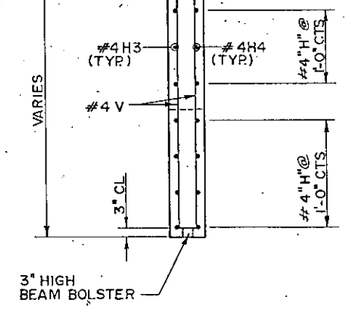
SECTION B-B



ELEVATION
END BENT 1 WINGWALL - LEFT



ELEVATION
END BENT 1 WINGWALL - RIGHT



SECTION D-D

PROJECT No. 8.1670105
MECKLENBERG COUNTY
STATION: 195+24.48

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

DEC. SOUTHBOUND LANE 1988

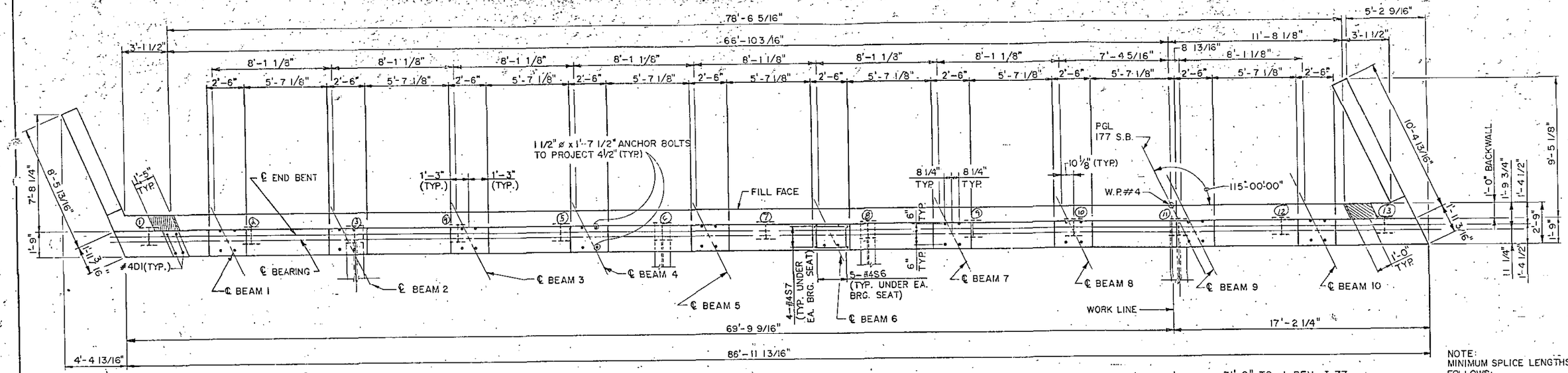
DWG. NO. 15

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-45
1			3			TOTAL SHEETS
2			4			115

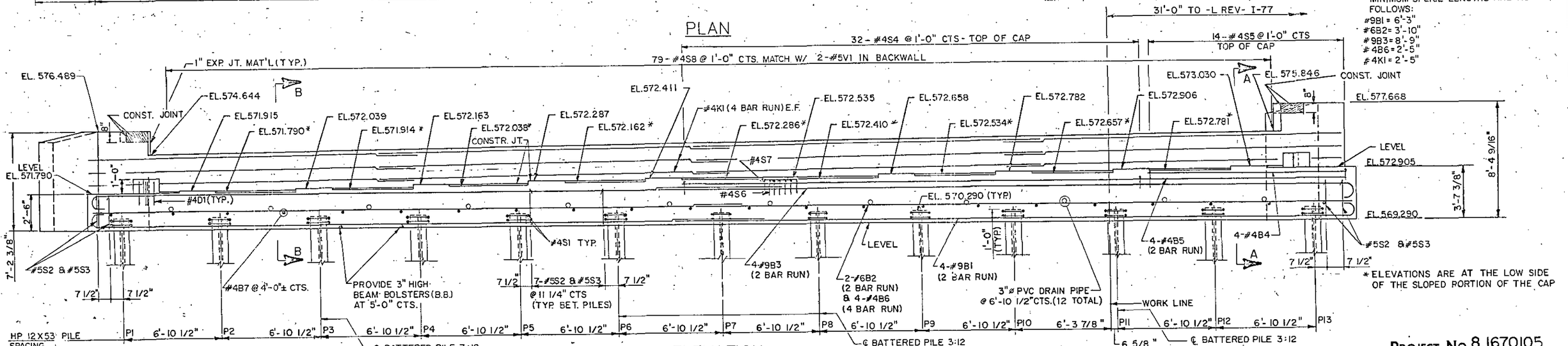
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY STEPHEN E. WARD DATE 9/13/88
CHECKED BY S.W. DATE 12-11-88

317



PLAN



ELEVATION

NOTE
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB. HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

Pile #	Length	Pile #	Length
1	37.3	11	39.9
2	35.1	12	39.9
3	39.4	13	49.8
4	35.8		
5	38.5		
6	40.0		
7	37.9		
8	35.0		
9	36.0		
10	41.2		

NOTES:

1) THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4"/FT.
2) FOR EPOXY COATING, SEE SPECIAL PROVISIONS.
3) COAT ALL SURFACE AREAS OF THE TOP OF CAP INCLUDING CHAMFERS. DO NOT COAT THE AREAS BENEATH THE POT BEARINGS. THE BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4) BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
5) FOR POT BEARING DETAILS, SEE DRAWING NO. 10
6) 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.
7) PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
8) FOR SECTION A-A, B-B & WINGWALL DETAILS, SEE DRAWING NO. 17.
9) FOR END BENT BILL OF MATERIAL, SEE DRAWING NO. 18
10) ELEVATIONS SHOWN FOR THE TOP OF BACKWALL ARE GIVEN AT THE FILL FACE SIDE.
11) PIPE DRAINS MAY BE SHIFTED SLIGHTLY IF NECESSARY TO CLEAR ANCHOR BOLTS AND REINFORCING STEEL.
12) STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS
13) FOR PIPE DRAIN DETAILS SEE STANDARD BAS_2, DRAWING NO. 23
14) FOR PILE SPLICE DETAILS, SEE DRAWING NO. 18
15) FOR TEMPORARY DRAINAGE DETAILS, SEE DRAWING NO. 18

NOTE:
MINIMUM SPLICE LENGTHS ARE AS FOLLOWS:
#9B1 = 6'-3"
#6B2 = 3'-10"
#9B3 = 8'-9"
#4B6 = 2'-5"
#4K1 = 2'-5"

*ELEVATIONS ARE AT THE LOW SIDE OF THE SLOPED PORTION OF THE CAP

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
DEC. SOUTHBOUND LANE 1988

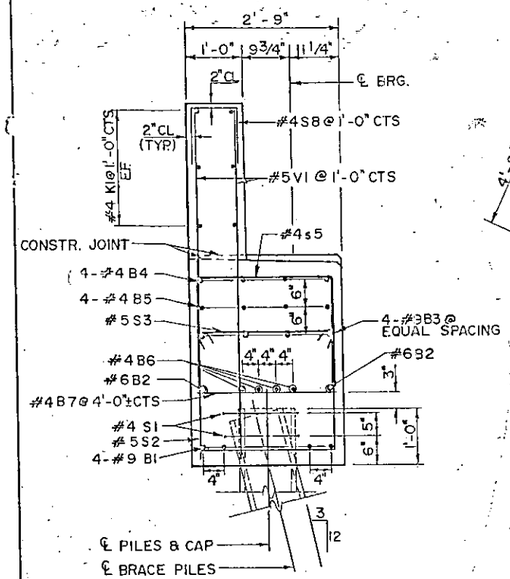
DWG. NO. 16

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		5-46
1			3				TOTAL SHEETS
2			4				115

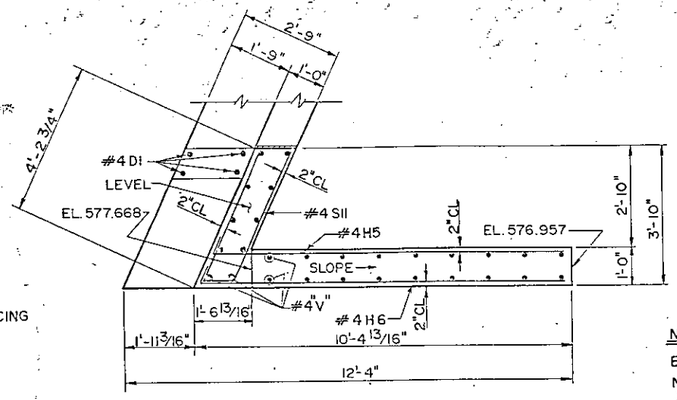
PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY EDR DATE Dec. 88
CHECKED BY S.W. DATE Dec. 16 '88

318

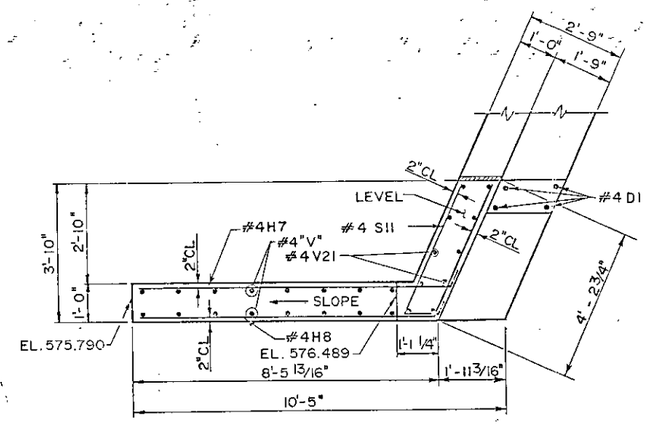


SECTION A-A

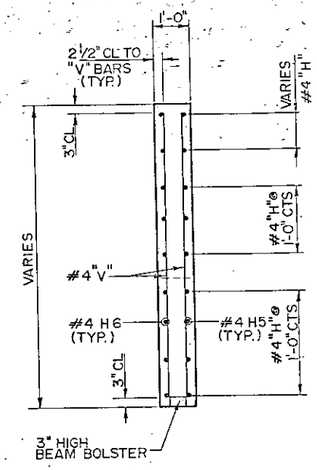


PLAN
END BENT 2 WINGWALL-RIGHT

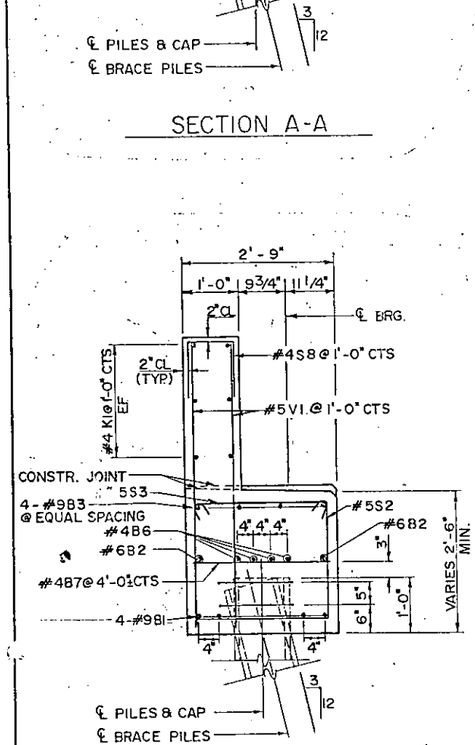
NOTE
E.F. DENOTES EACH FACE
N.F. DENOTES NEAR FACE
F.F. DENOTES FAR FACE



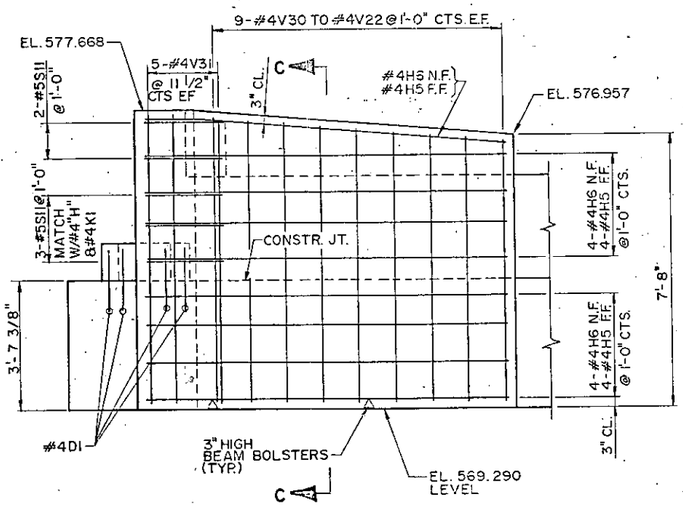
PLAN
END BENT 2 WINGWALL-LEFT



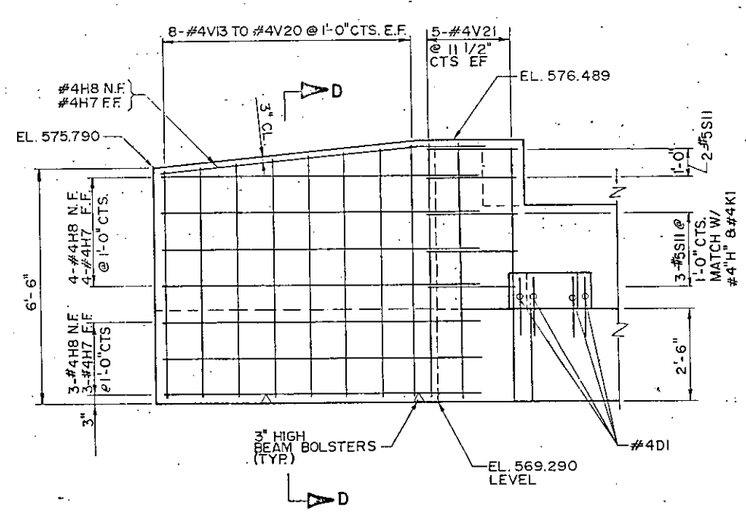
SECTION C-C



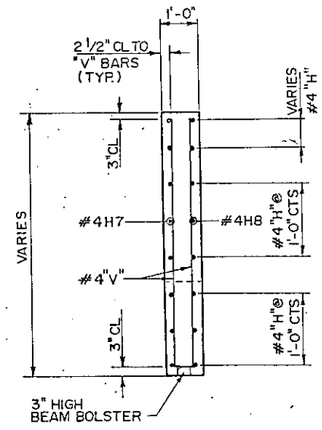
SECTION B-B



ELEVATION
END BENT 2 WINGWALL - RIGHT



ELEVATION
END BENT 2 WINGWALL - LEFT



SECTION D-D

PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS

DEC. SOUTHBOUND LANE 1988

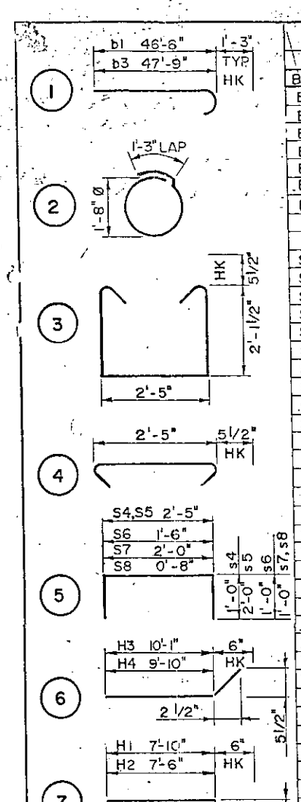
DWG NO. 17

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-47
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY SEW DATE 12-16-88
CHECKED BY SSW DATE 12-16-88

SOUTHERN PHOTO-GRAPHICS 747643



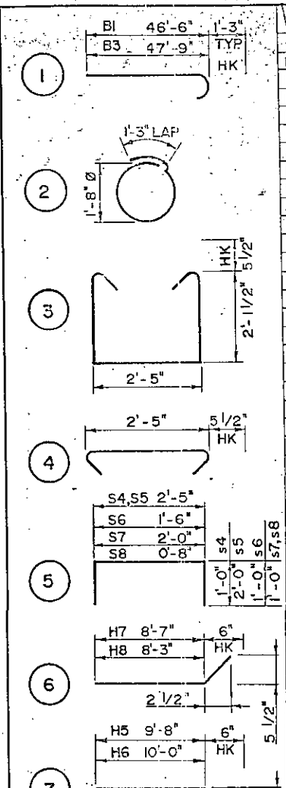
BILL OF MATERIAL
END BENT 1

Bar	Size	No.	Type	Length	Weight
B1	#9	8	1	47'-9"	1299
B2	#6	4	STR	45'-5"	272
B3	#9	8	1	49'-0"	1333
B4	#4	4	STR	14'-2"	38
B5	#4	8	STR	25'-2"	135
B6	#4	16	STR	23'-6"	251
B7	#4	22	STR	2'-5"	36
S1	#4	26	2	6'-6"	113
S2	#5	88	3	7'-7"	696
S3	#5	88	4	3'-4"	306
S4	#4	32	5	4'-5"	94
S5	#4	14	5	6'-5"	60
S6	#4	50	5	3'-6"	117
S7	#4	40	5	4'-0"	107
S8	#4	80	5	2'-8"	143
S9	#4	5	8	6'-5"	21
S10	#4	5	8	6'-5"	28
V1	#5	160	STR	4'-10"	807
V2	#4	22	STR	6'-0"	88
V3	#4	2	STR	7'-0"	9
V4	#4	2	STR	7'-1"	9
V5	#4	2	STR	7'-3"	10
V6	#4	2	STR	7'-4"	10
V7	#4	2	STR	7'-5"	10
V8	#4	2	STR	7'-6"	10
V9	#4	2	STR	7'-7"	10
V10	#4	2	STR	7'-8"	10
V11	#4	2	STR	7'-9"	10
V12	#4	10	STR	7'-10"	52
D1	#4	8	STR	2'-0"	11
H1	#4	8	7	8'-4"	45
H2	#4	8	7	8'-0"	43
H3	#4	9	6	10'-7"	64
H4	#4	9	6	10'-4"	62
K1	#4	24	STR	23'-6"	377

REINF. STEEL LBS. = 6686

CLASS A CONC. Cu.Yds. = 41.4

HP 12 x 53 STEEL PILES:
NO. = 13
LIN. FT. = 390



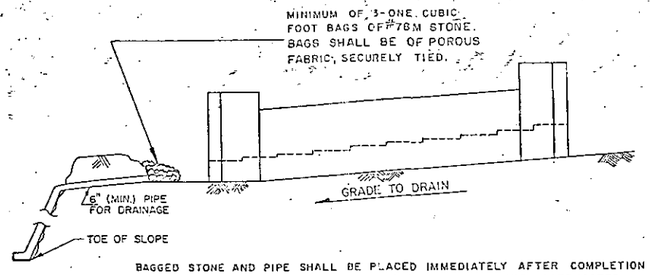
BILL OF MATERIAL
END BENT 2

Bar	Size	No.	Type	Length	Weight
B1	#9	8	1	47'-9"	1299
B2	#6	4	STR	45'-3"	272
B3	#9	8	1	49'-0"	1333
B4	#4	4	STR	14'-2"	38
B5	#4	8	STR	25'-2"	135
B6	#4	16	STR	23'-6"	251
B7	#4	22	STR	2'-5"	36
S1	#4	26	2	6'-6"	113
S2	#5	88	3	7'-7"	696
S3	#5	88	4	3'-4"	306
S4	#4	32	5	4'-5"	94
S5	#4	14	5	6'-5"	60
S6	#4	50	5	3'-6"	117
S7	#4	40	5	4'-0"	107
S8	#4	79	5	2'-8"	141
S11	#4	10	8	8'-5"	56
V1	#5	158	STR	4'-10"	796
V13	#4	2	STR	6'-0"	8
V14	#4	2	STR	6'-1"	8
V15	#4	2	STR	6'-3"	8
V16	#4	2	STR	6'-4"	8
V17	#4	2	STR	6'-5"	9
V18	#4	2	STR	6'-6"	9
V19	#4	2	STR	6'-7"	9
V20	#4	2	STR	6'-8"	9
V21	#4	10	STR	6'-9"	45
V22	#4	2	STR	7'-2"	10
V23	#4	2	STR	7'-3"	10
V24	#4	2	STR	7'-4"	10
V25	#4	2	STR	7'-5"	10
V26	#4	2	STR	7'-6"	10
V27	#4	2	STR	7'-7"	10
V28	#4	2	STR	7'-8"	10
V29	#4	2	STR	7'-9"	10
V30	#4	2	STR	7'-10"	10
V31	#4	10	STR	7'-11"	53
D1	#4	8	STR	2'-0"	11
H5	#4	9	7	10'-2"	61
H6	#4	9	7	10'-6"	63
H7	#4	8	6	9'-1"	49
H8	#4	8	6	8'-9"	47
K1	#4	24	STR	23'-6"	377

REINF. STEEL LBS. = 6714

CLASS A CONC. Cu.Yds. = 41.3

HP 12 x 53 STEEL PILES:
NO. = 13
LIN. FT. = 538

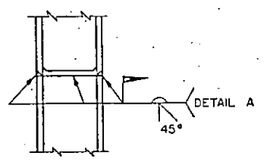


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

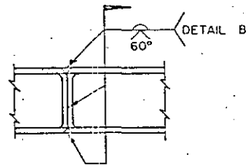
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

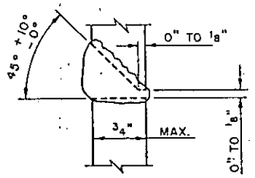
TEMPORARY DRAINAGE AT END BENT



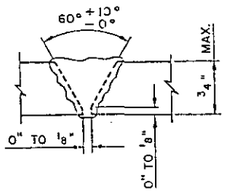
* PILE VERTICAL



* PILE HORIZONTAL OR VERTICAL



DETAIL A



DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1 & 2
BILL OF MATERIAL
DEC. SOUTHBOUND LANE 1988

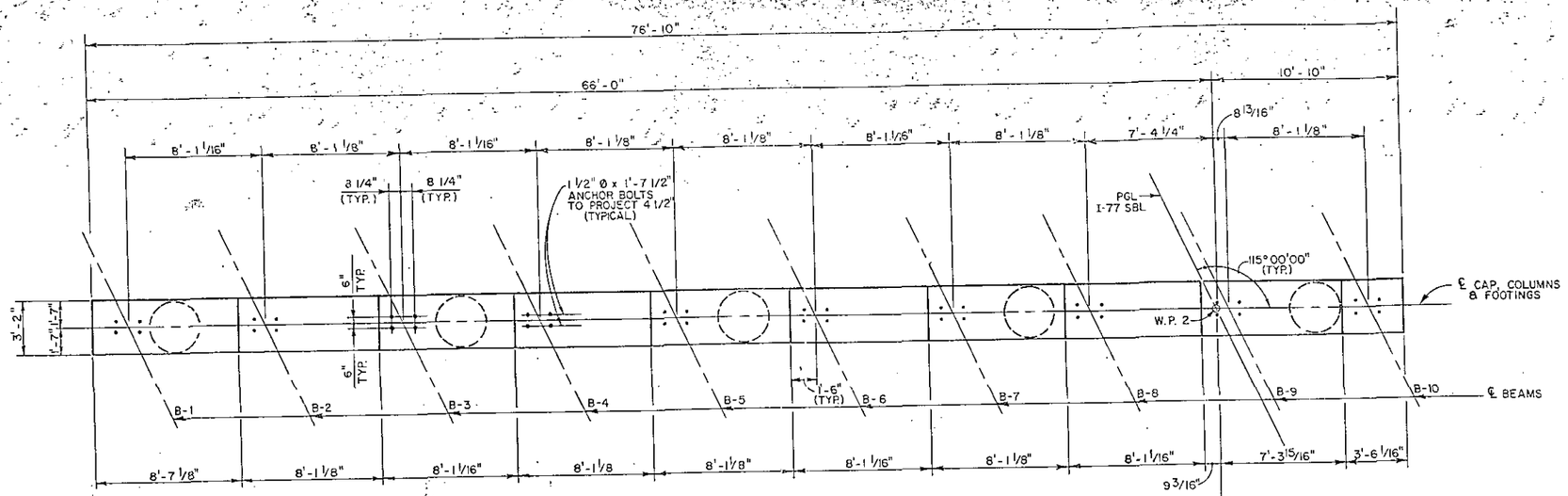
DWG NO. 18

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	~~317~~ 320
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY STEPHEN E. WARD DATE 9/19/88
CHECKED BY SSW DATE 12-15-88

SOUTHERN PHOTO - DUPLICATORS RALEIGH



PLAN

NOTE:

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

NOTE:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING OF REINFORCING STEEL.

THE TOP SURFACE AREAS OF THE BENT SHALL BE CURVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

FOR POT BEARING DETAILS SEE DRAWING NO: 10

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

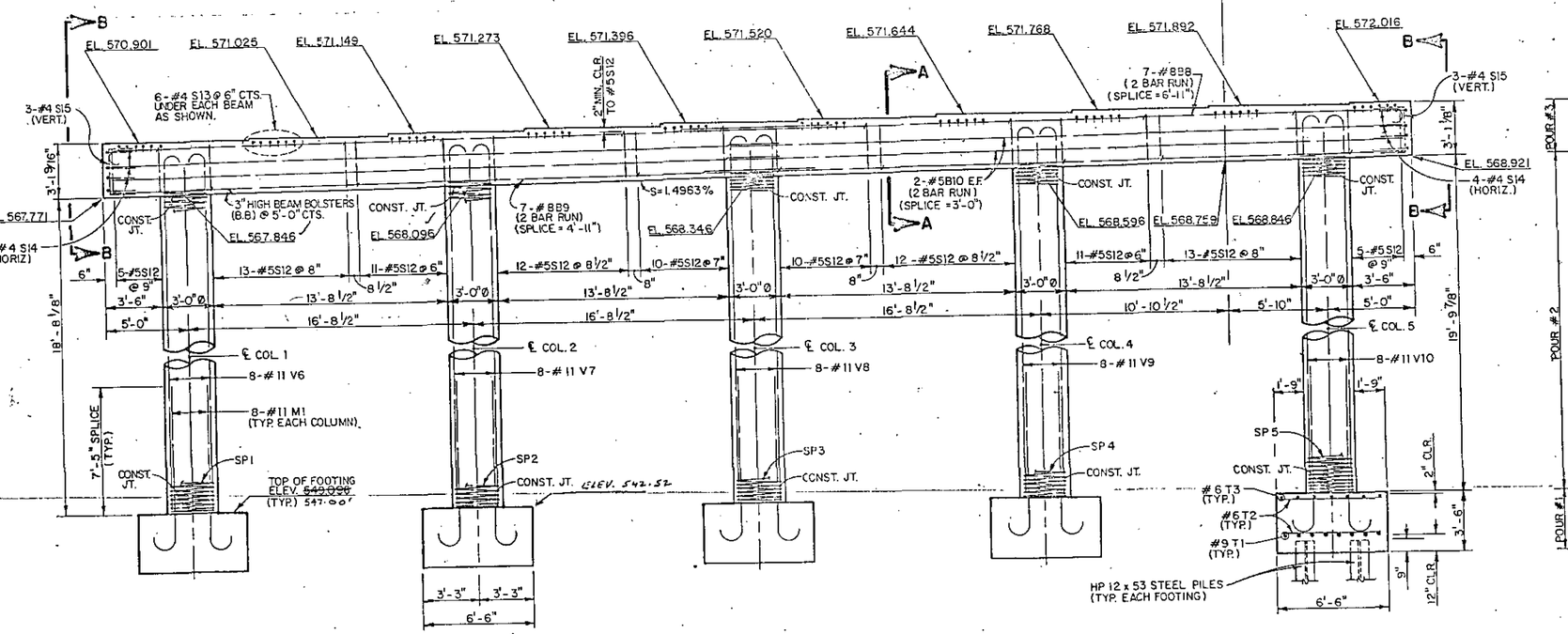
FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

STIRRUPS ARE TO BE ALTERNATELY INVERTED AS SHOWN.

PILES TO BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS.

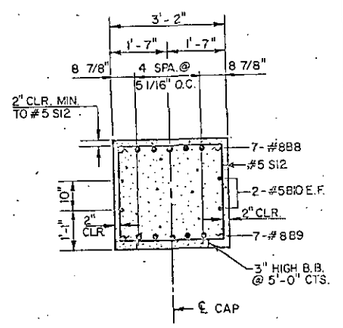
FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR PILE SPLICE DETAILS, SEE DRAWING NO. 18

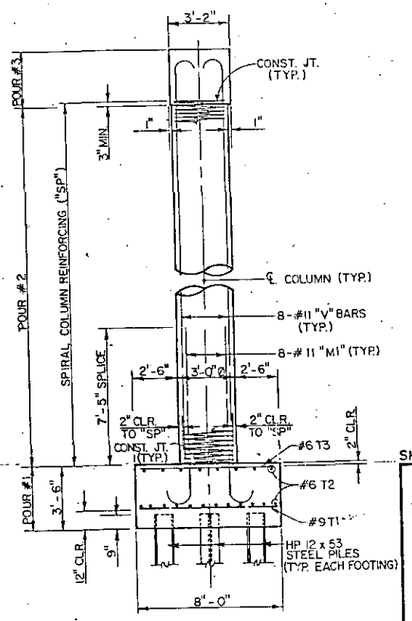


ELEVATION

(ALL FOOTINGS TYPICAL)



SECTION A-A



PREPARED BY

Henningson, Durham & Richardson

PROJECT NO. 8.1670105

MECKLENBURG COUNTY

STATION: 195+24.48

SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUBSTRUCTURE BENT NO. 1

DEC. SOUTHBOUND LANE 1988

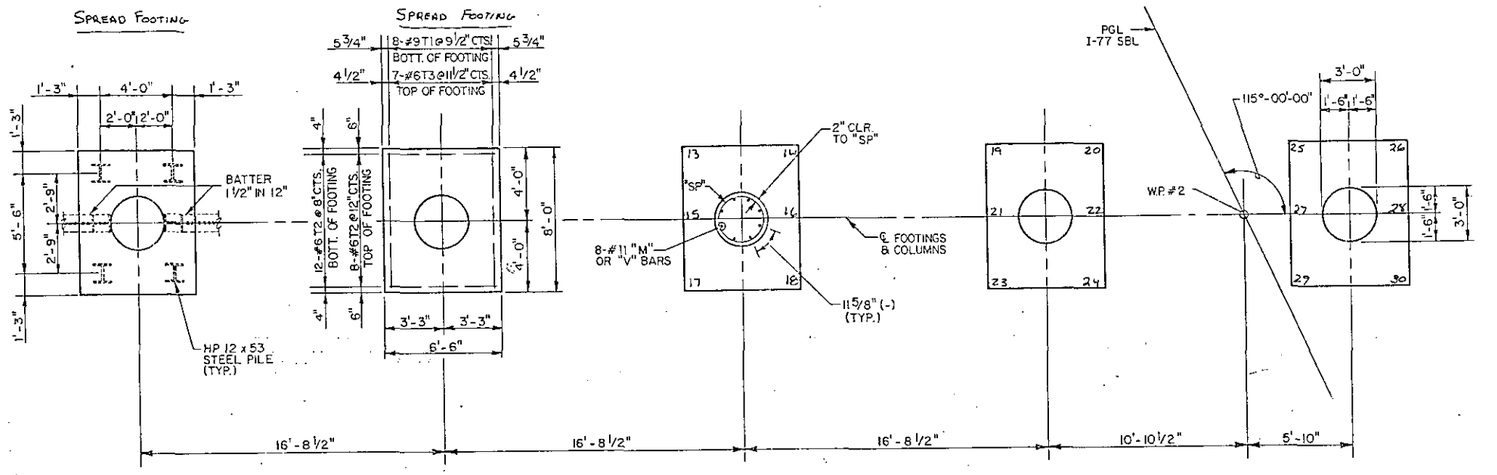
DWG. NO. 19

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-44
1			3			TOTAL SHEETS
2			4			115

DRAWN BY S. E. WARD DATE DEC. '88

CHECKED BY W. LAMB DATE DEC. '88

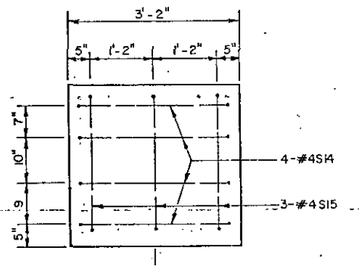
321



PLAN OF FOOTINGS

(DETAILS SHOWN ARE TYPICAL FOR EACH FOOTING)

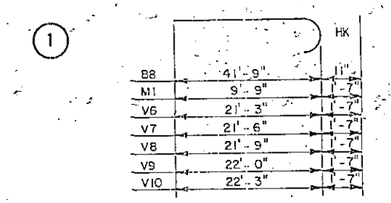
PILE #	LENGTH
1-12	Deleted (Changed To Spread Footings)
13	14.5 ✓
14	15.9 ✓
15	13.3 ✓
16	16.5 ✓
17	14.7 ✓
18	15.8 ✓
19	19.17
20	18.17
21	18.67
22	18.67
23	18.67
24	18.67
25	17.0 ✓
26	16.75 ✓
27	16.25 ✓
28	16.32
29	17.25
30	16.25



VIEW B-B

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



BILL OF MATERIAL

BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B8	14	#8	1	42'-8"	1595
B9	14	#8	STR.	40'-9"	1523
B10	8	#5	STR.	39'-9"	332
M1	40	#11	1	11'-4"	2409
S12	102	#5	3	9'-0"	957
S13	60	#4	2	3'-7"	141
S14	8	#4	4	5'-8"	30
S15	8	#4	4	5'-6"	22
T1	40	#9	STR.	7'-6"	1020
T2	100	#6	STR.	6'-0"	901
T3	35	#6	STR.	7'-6"	394
V6	8	#11	1	22'-10"	971
V7	8	#11	1	23'-1"	981
V8	8	#11	1	23'-4"	992
V9	8	#11	1	23'-7"	1002
V10	8	#11	1	23'-10"	1013
TOTAL					14,286
SP1	1		5	651'-10"	435
SP2	1		5	660'-1"	441
SP3	1		5	668'-4"	446
SP4	1		5	676'-7"	452
SP5	1		5	684'-10"	455

SPIRAL COL. REINF. STEEL LBS. =	2232
REINFORCING STEEL LBS. =	14,286
CLASS "A" CONCRETE C. Y. =	86.8

DIVISION OF CONCRETE	
POUR NO.	CUBIC YARDS
1	33.8
2	25.2
3	27.8
TOTAL	86.8

HP 12 x 53 STEEL PILES	
NO. 30	LIN. FT. = 480

PROJECT NO. 8.1670105

MECKLENBURG COUNTY

STATION: 195+24.48

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT NO. 1

DEC. SOUTHBOUND LANE 1988

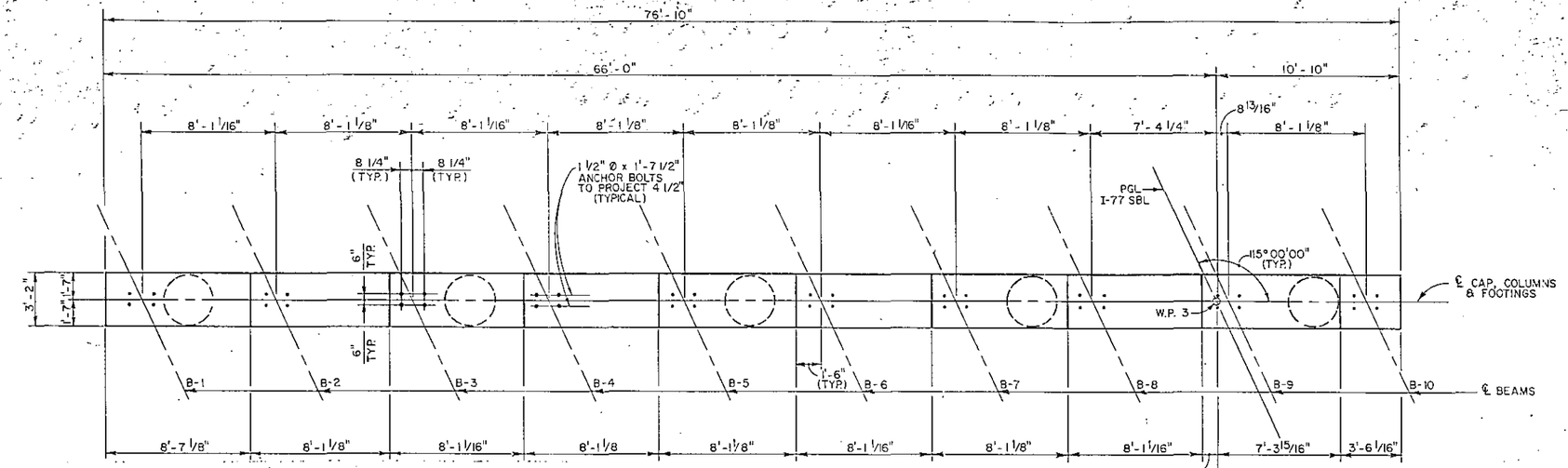
DWG. NO. 20

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-~~50~~ 322
1			3			TOTAL SHEETS
2			4			115

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S. E. WARD DATE DEC. '88
CHECKED BY W. LAMB DATE DEC. '88

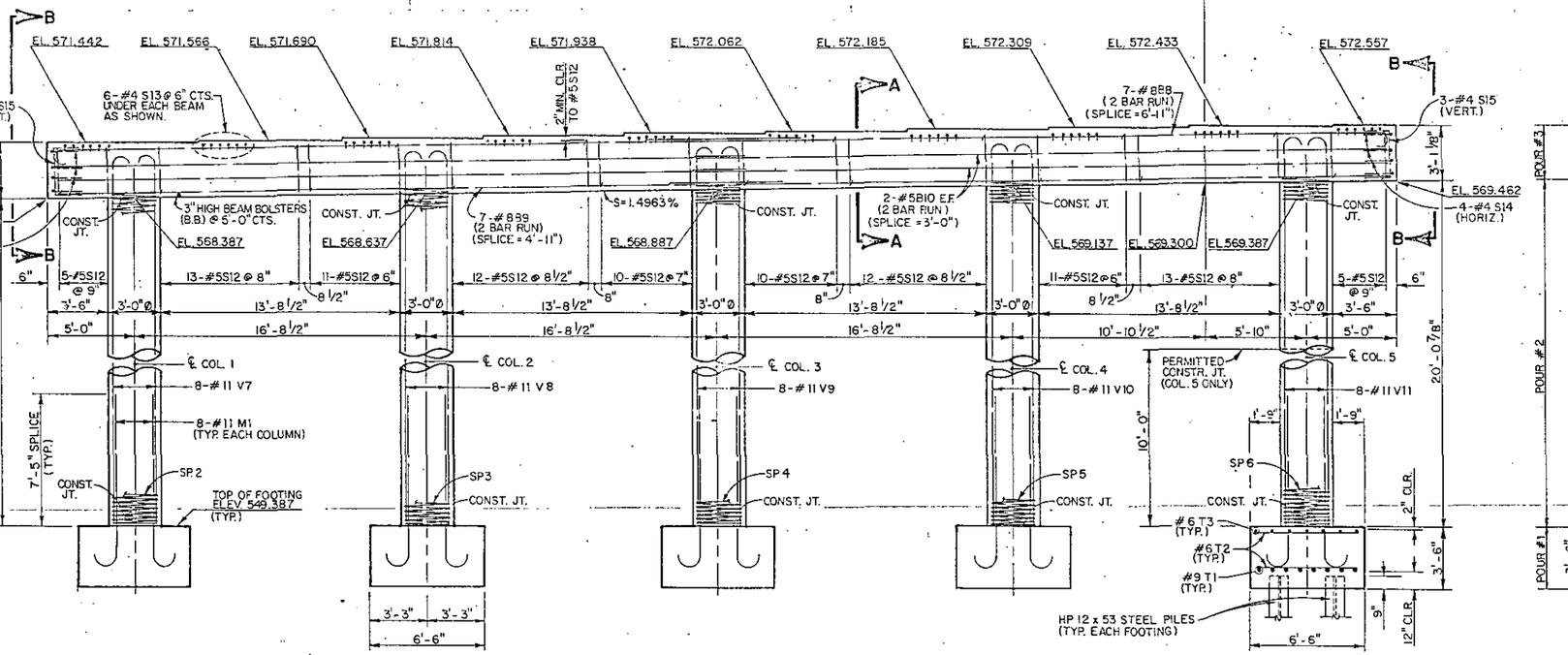
SOUTHERN PHOTO-LITHOGRAPHED M1963



NOTE:

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

PLAN



ELEVATION

(ALL FOOTINGS TYPICAL)

NOTE:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING OF REINFORCING STEEL.

THE TOP SURFACE AREAS OF THE BENT SHALL BE CURVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

FOR POT BEARING DETAILS SEE DRAWING NO. 10.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

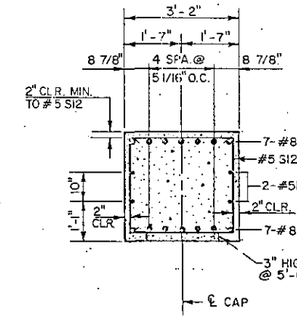
FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

STIRRUPS ARE TO BE ALTERNATELY INVERTED AS SHOWN.

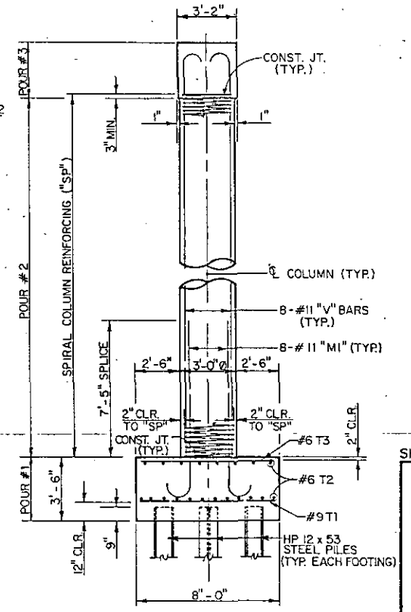
PILES TO BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS.

FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR PILE SPLICE DETAILS, SEE DRAWING NO. 10.



SECTION A-A



PROJECT No. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT NO. 2

DEC. SOUTHBOUND LANE 1988

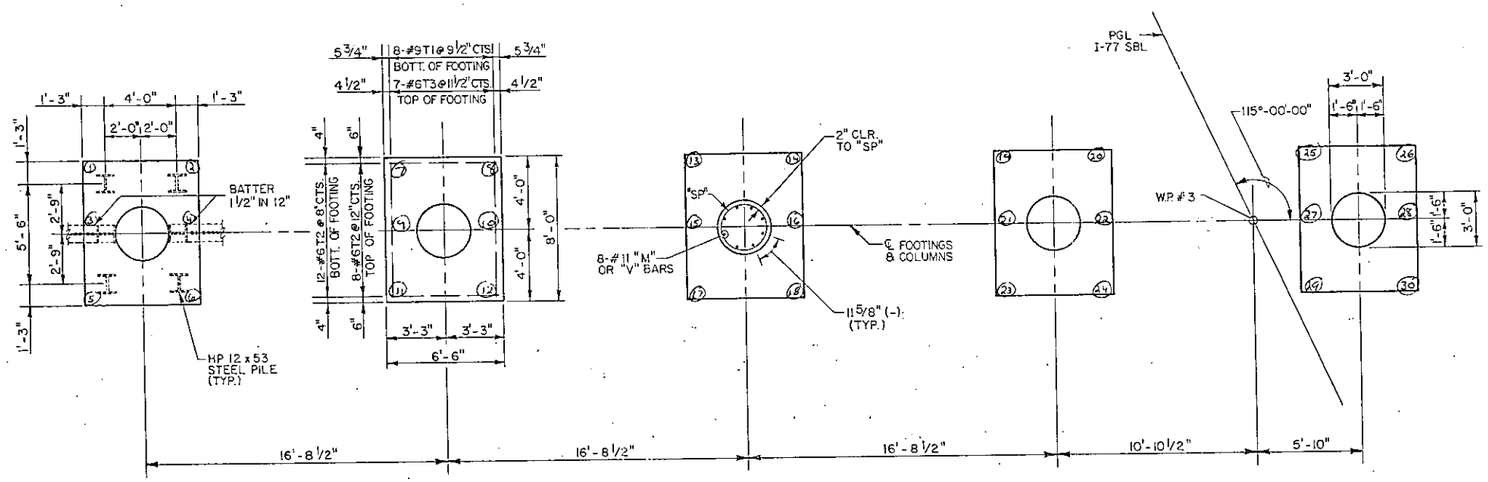
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	~~S-5~~ 323
1			3			TOTAL SHEETS
2			4			115

DWG. NO. 21

PREPARED BY
HDR
Henningson, Durham & Richardson

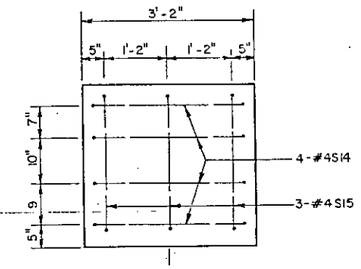
DRAWN BY S. E. WARD DATE DEC. '88
CHECKED BY W. LAMB DATE DEC. '88

SOUTHERN VIDEO GRAPHICS 11/1/82



PLAN OF FOOTINGS

(DETAILS SHOWN ARE TYPICAL FOR EACH FOOTING)

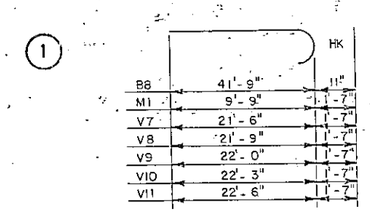


VIEW B-B

PILE #	LENGTH
1	6.7
2	7.9
3	12.7
4	7.8
5	6.5
6	5.8
7	7.7
8	10.0
9	7.6
10	11.7
11	8.7
12	10.8
13	17.9
14	20.4
15	18.0
16	21.8
17	17.3
18	18.2
19	15.6
20	15.5
21	19.2
22	16.4
23	19.4
24	19.8
25	16.0
26	16.4
27	14.5
28	13.0
29	14.4
30	19.4

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



BILL OF MATERIAL

BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B8	14	# 8	1	42'-8"	1595
B9	14	# 8	STR.	40'-9"	1523
B10	8	# 5	STR.	39'-9"	332
M1	40	#11	1	11'-4"	2409
S12	102	# 5	3	9'-0"	957
S13	50	# 4	2	3'-7"	144
S14	8	# 4	4	5'-8"	30
S15	6	# 4	4	5'-6"	22
T1	40	# 9	STR.	7'-6"	1020
T2	100	# 6	STR.	6'-0"	901
T3	35	# 6	STR.	7'-6"	394
V7	8	#11	1	23'-1"	981
V8	8	#11	1	23'-4"	992
V9	8	#11	1	23'-7"	1002
V10	8	#11	1	23'-10"	1013
V11	8	#11	1	24'-1"	1024
TOTAL					14,339
SP 2	1		5	660'-1"	441
SP 3	1		5	668'-4"	446
SP 4	1		5	676'-7"	452
SP 5	1		5	684'-10"	456
SP 6	1		5	693'-1"	463

SPIRAL COL. REINF. STEEL LBS. =	2260
REINFORCING STEEL LBS. =	14,339
CLASS "A" CONCRETE C. Y. =	87.2

DIVISION OF CONCRETE

POUR NO.	CUBIC YARDS
1	33.8
2	25.6
3	27.8
TOTAL	87.2

HP 12 x 53 STEEL PILES
NO. 30 LIN. FT. = 660

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT NO. 2

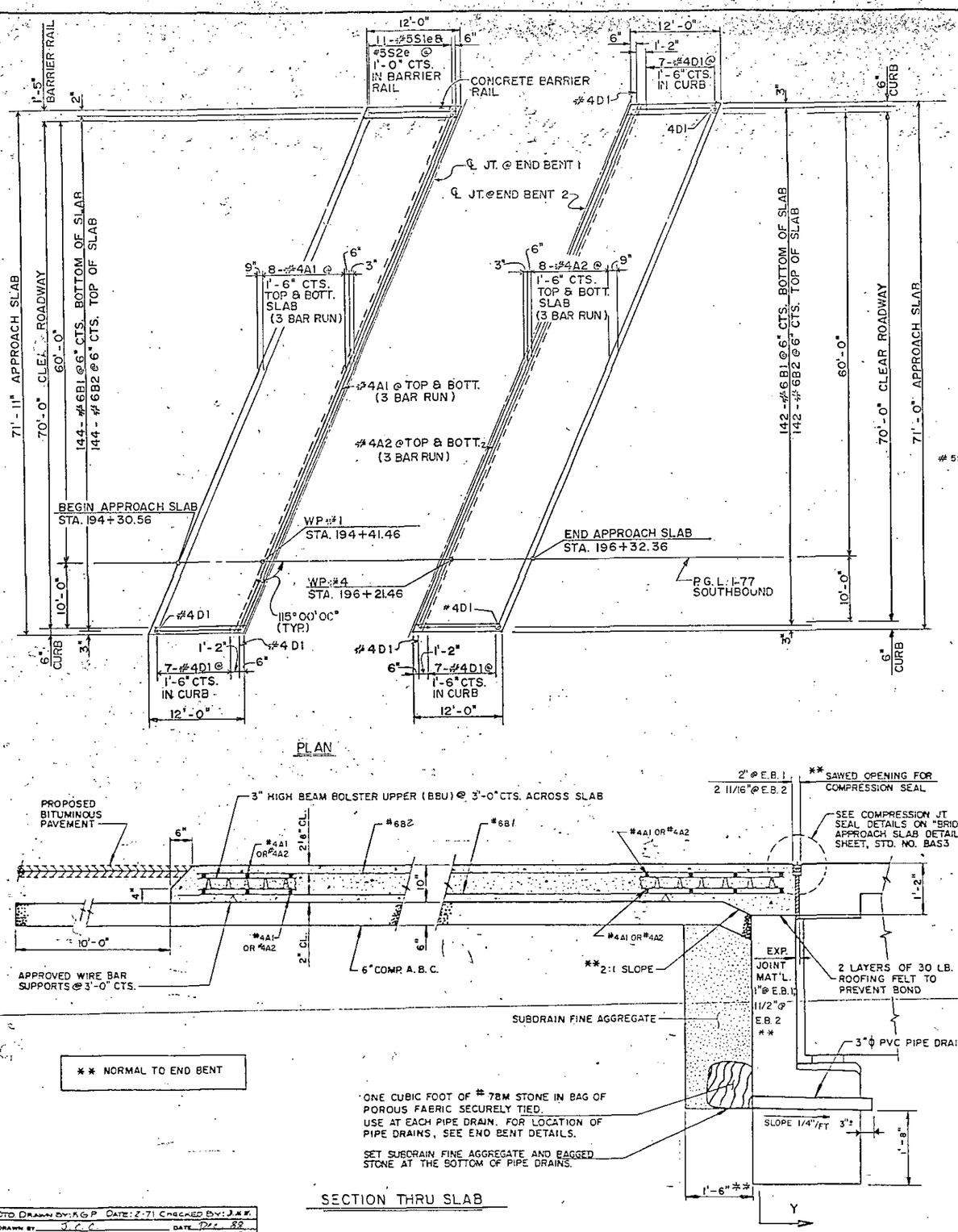
DEC. SOUTHBOUND LANE 1988

DWG. NO. 22

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	~~S-32~~ 324
1			3			TOTAL SHEETS 115
2			4			

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY S.E. WARD DATE DEC. '88
CHECKED BY W. LAMB DATE DEC. '88



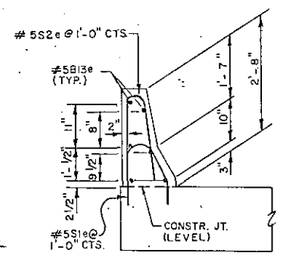
PLAN

** NORMAL TO END BENT

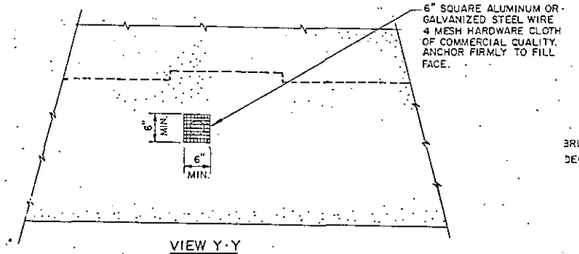
ONE CUBIC FOOT OF # 78M STONE IN BAG OF POROUS FABRIC SECURELY TIED. USE AT EACH PIPE DRAIN. FOR LOCATION OF PIPE DRAINS, SEE END BENT DETAILS.

SET SUBDRAIN FINE AGGREGATE AND BAGGED STONE AT THE BOTTOM OF PIPE DRAINS.

SECTION THRU SLAB



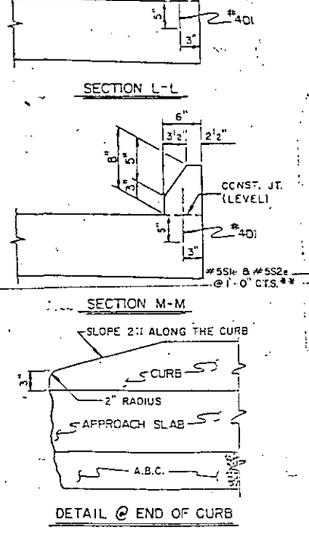
SECTION N-N



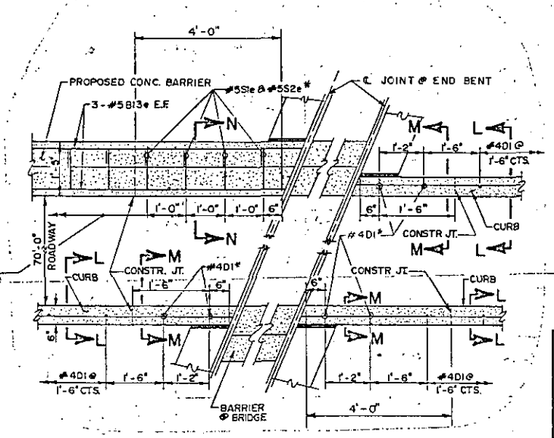
VIEW Y-Y

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 BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS



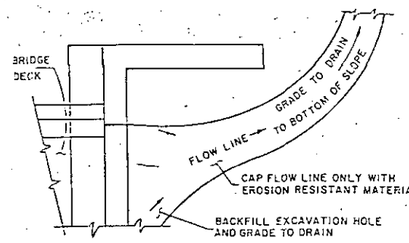
DETAIL @ END OF CURB



*BARS OR DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT. HOLES SHALL BE DRILLED AND BARS GROUTED INTO PLACE. THE HOOK FOR #5S1e SHALL BE REMOVED.

**SEE STANDARD CONC. BARRIER RAIL FOR BAR TYPES AND DIMENSIONS.

CURB DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAILS

NOTES

FOR BRIDGE APPROACH SLABS, SEE SPECIAL PROVISIONS.

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB. IF SPECIAL DRAINAGE IS USED, THE 6" COMP. A.B.C. SHALL ALSO EXTEND UNDER THE CONCRETE FILLING AND 1'-0" OUTSIDE OF EACH EDGE OF CURB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

NO DIRECT PAYMENT WILL BE MADE FOR THE TEMPORARY DRAINAGE AS SUCH WORK WILL BE CONSIDERED INCIDENTAL TO OTHER WORK BEING PAID FOR BY THE VARIOUS ITEMS IN THE CONTRACT.

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

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
END BENT 1					
A1	54	#4	STR	27'-5"	989
B1	144	#6	STR	11'-8"	2523
B2	144	#6	STR	11'-2"	2415
D1	8	#4	STR	1'-0"	5
END BENT 2					
A2	54	#4	STR	22'-1"	977
B1	142	#6	STR	11'-8"	2488
B2	142	#6	STR	11'-2"	2382
D1	16	#4	STR	1'-0"	11

REINF. STEEL END BENT 1 *5932 LBS
REINF. STEEL END BENT 2 *5858 LBS

CLASS "AA" CONCRETE
END BENT 1 Cu. Yds. * 27.9*
END BENT 2 Cu. Yds. * 27.6

*DOES NOT INCLUDE QUANTITY OF BARRIER RAIL SEE STANDARD CONC BARRIER RAIL, DWG. NO. 5

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

JULY SOUTHBOUND LANE 1978

REVISIONS

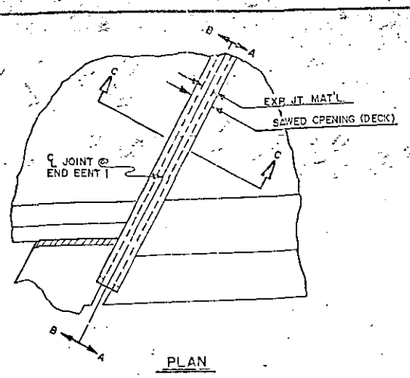
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 325
TOTAL SHEETS 115

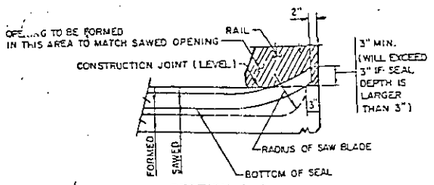
STD. NO. BAS2

STD. DRAWN BY: KGP DATE: 2-71 CHECKED BY: J.M.W.
DRAWN BY: J.C.C. DATE: Dec. 88
CHECKED BY: S.W. DATE: 12-16-88

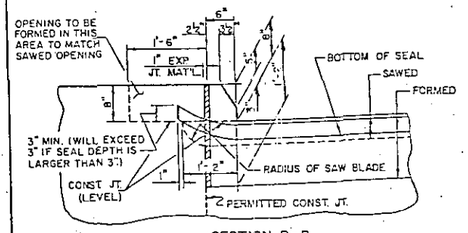
REVISED 8-28-79 BY: RDU CHECKED BY: CLM
REVISED 4-1-79 BY: CC M CHECKED BY: R.D.U.
REVISED 7-31-78 BY: R.E.K. CHECKED BY: R.D.U.
REVISED 7-11-85 BY: TGS CHECKED BY: JST
REVISED 5-1-84 BY: ERL CHECKED BY: RAH
REVISED 2-2-82 BY: ERL CHECKED BY: RGF
REVISED 9-1-81 BY: ERL CHECKED BY:



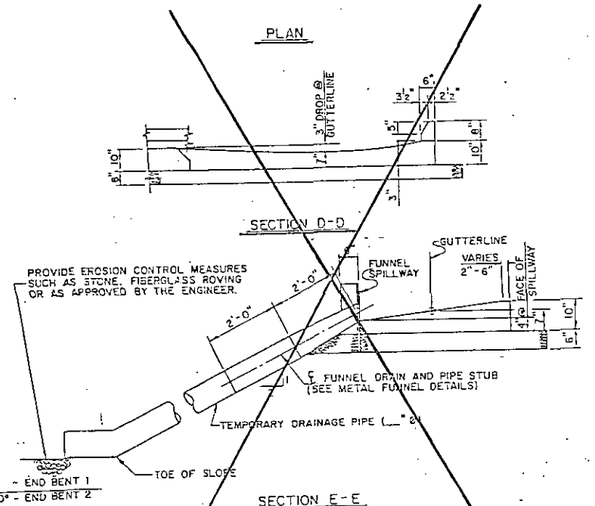
PLAN

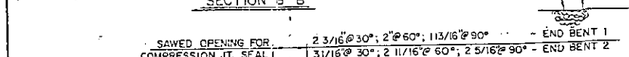


SECTION A-A



SECTION B-B

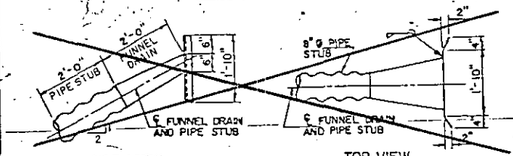


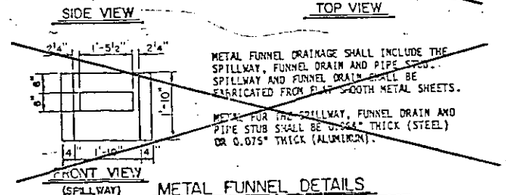


SECTION C-C

* OPENINGS SHOWN ARE BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3" @ END BENT 1, AND 4" @ END BENT 2

COMPRESSION JOINT SEAL DETAILS @ END BENT



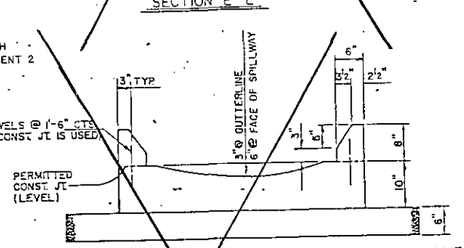


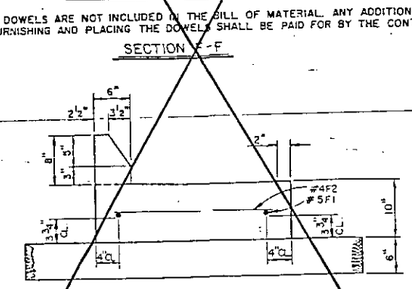
METAL FUNNEL DRAINAGE SHALL INCLUDE THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB. SPILLWAY AND FUNNEL DRAIN SHALL BE FABRICATED FROM FLAT SMOOTH METAL SHEETS.

METAL FOR THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB SHALL BE 0.044" THICK (STEEL) OR 0.075" THICK (ALUMINUM).

METAL FUNNEL DETAILS

* THESE DOWELS ARE NOT INCLUDED IN THE BILL OF MATERIAL. ANY ADDITIONAL COST FOR FURNISHING AND PLACING THE DOWELS SHALL BE PAID FOR BY THE CONTRACTOR.

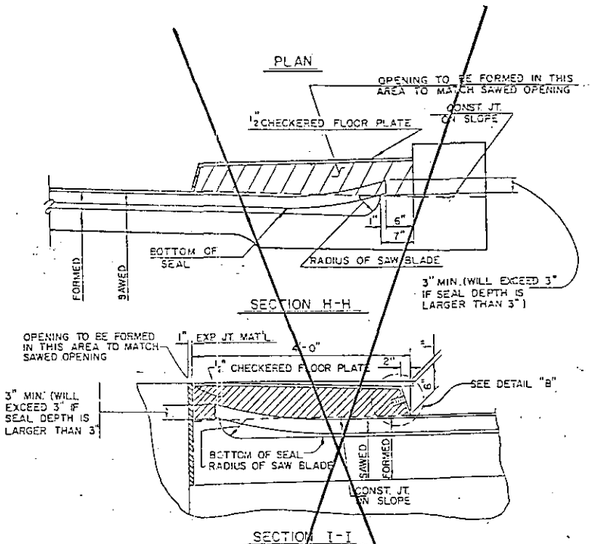




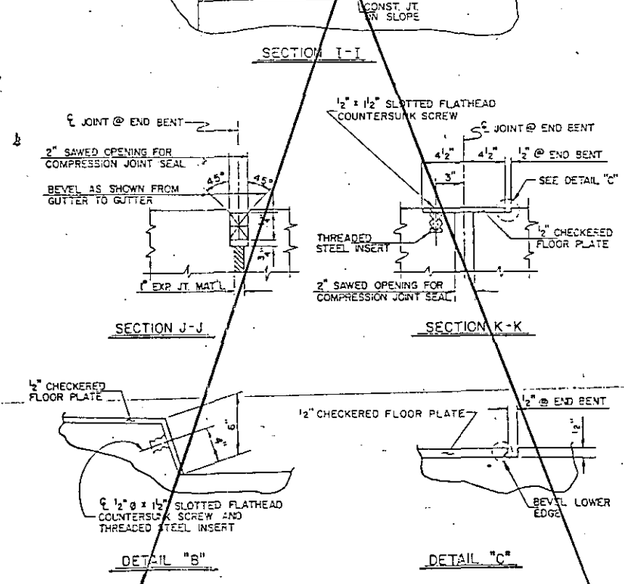
REINFORCING BAR CLEARANCES ARE SHOWN. (SEE PLAN VIEW FOR BAR SPACING)

SECTION G-G

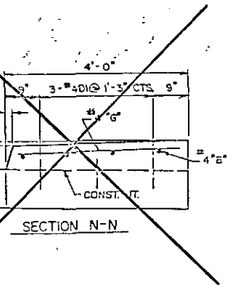
SPECIAL DRAINAGE DETAILS



SECTION I-I



COMPRESSION JOINT SEAL DETAILS @ END BENT



SECTION N-N

SIDEWALK DETAILS

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+24.48

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS

MARCH SOUTHBOUND LANE 1984

DWG NO. 24

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			115
2			4			

STD. NO. BAS3

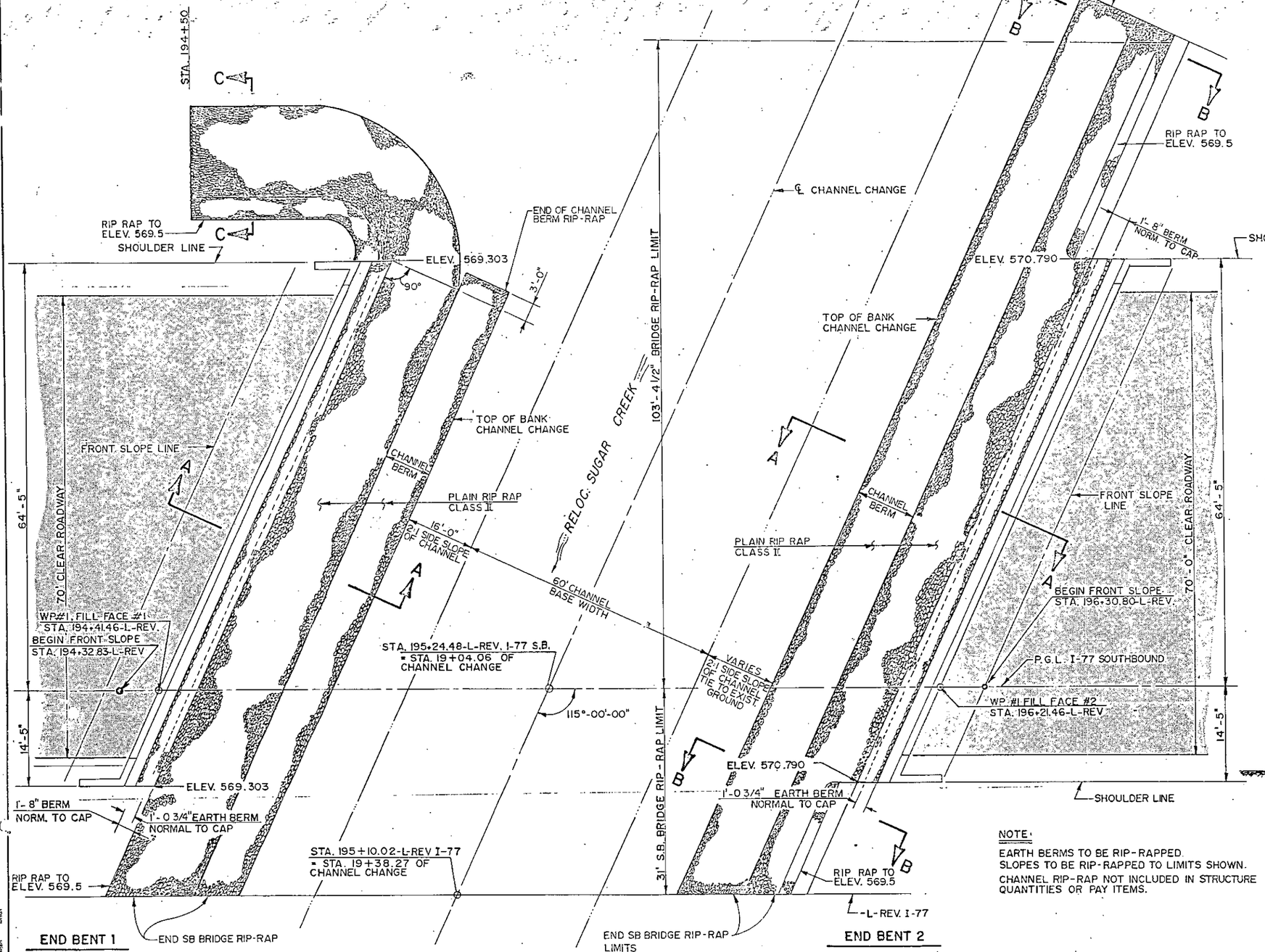
326

ASSEMBLED BY: EDB	DATE: 12-15-88	SPECIAL
CHECKED BY: SSW	DATE: 12-15-88	
DRAWN BY: E. R. LENTZ, JR.	DATE: JANUARY 3, 1984	STANDARD
CHECKED BY: R. R. PATTERSON	DATE: JANUARY 3, 1984	

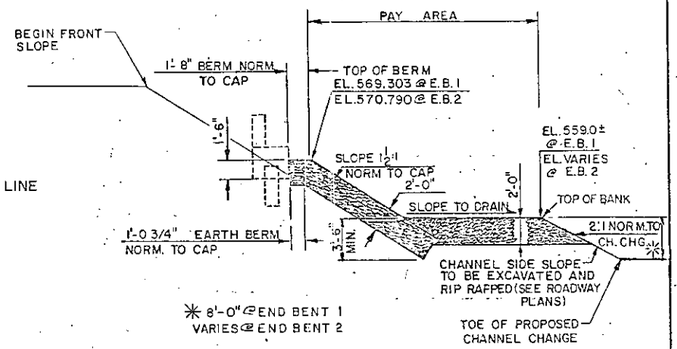
REVISED 5-31-85 BY SJD
ADDED 3-1-84

ESTIMATED QUANTITIES

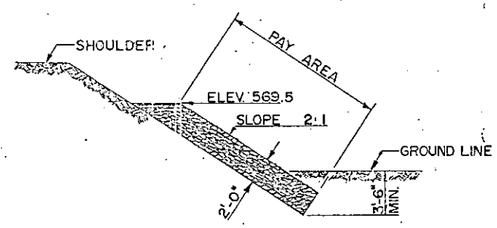
BRIDGE AT STATION	PLAIN RIP-RAP CLASS II TONS	
	END BENT 1	END BENT 2
195+24.48	520	700



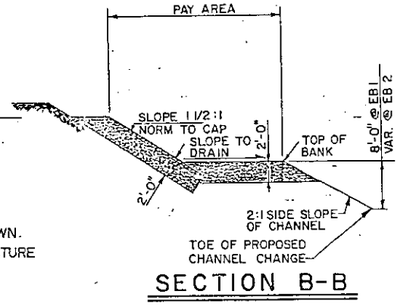
NOTE:
EARTH BERMS TO BE RIP-RAPPED.
SLOPES TO BE RIP-RAPPED TO LIMITS SHOWN.
CHANNEL RIP-RAP NOT INCLUDED IN STRUCTURE QUANTITIES OR PAY ITEMS.



SECTION A-A



SECTION C-C



SECTION B-B

PROJECT NO. 8.1670105
MECKLENBURG COUNTY
STATION: 195+2448

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP-RAP DETAILS

DES. SOUTHBOUND LANE 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-55
1			3			TOTAL SHEETS 115
2			4			

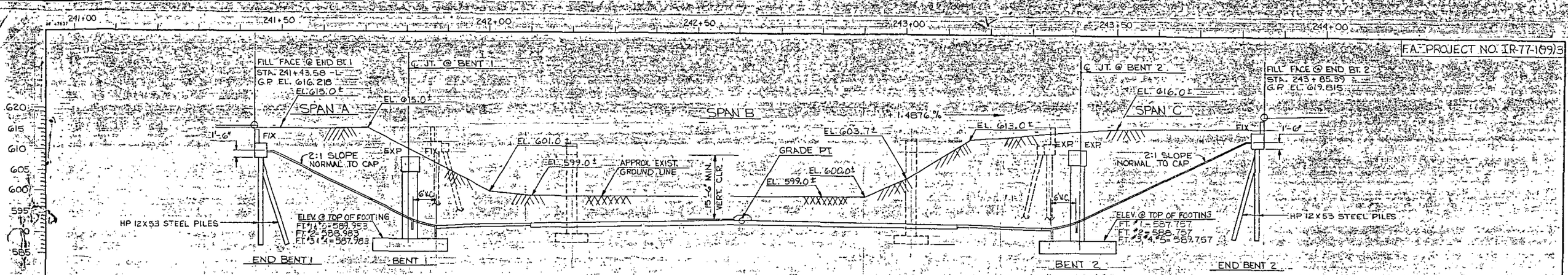
DWG. NO. 25

PREPARED BY
HDR
Henningson, Durham & Richardson

DRAWN BY STEPHEN E. WARD DATE 9/23/88
CHECKED BY S.S.W. DATE 12/88

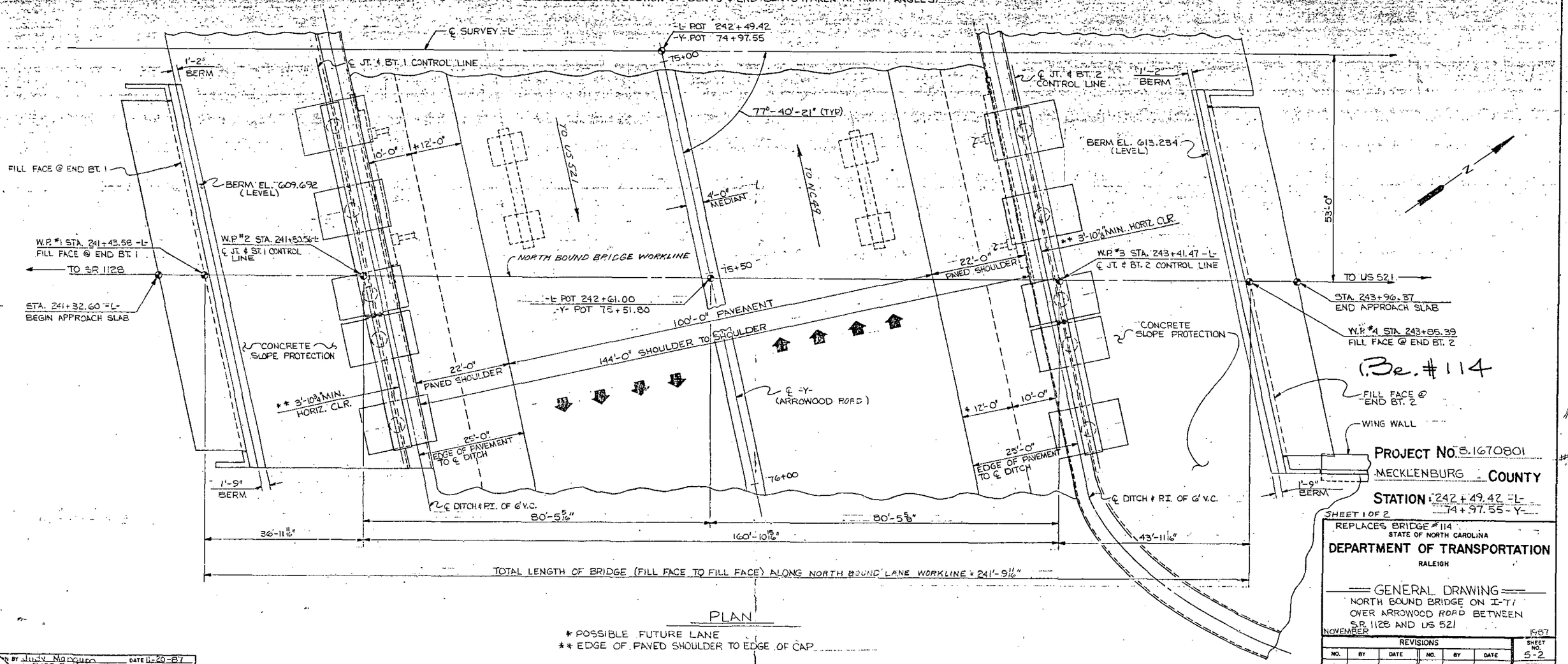
327

F.A. PROJECT NO. IR-77-1(99)3



SECTION ALONG NORTH BOUND BRIDGE WORKLINE

(SECTION OF BENTS & END BENTS TAKEN AT RIGHT ANGLES)



PLAN

* POSSIBLE FUTURE LANE
** EDGE OF PAVED SHOULDER TO EDGE OF CAP

PROJECT NO. B-1670801
MECKLENBURG COUNTY
STATION 242+49.42 -L-
74+97.55 -Y-
SHEET 1 OF 2

REPLACES BRIDGE #114
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

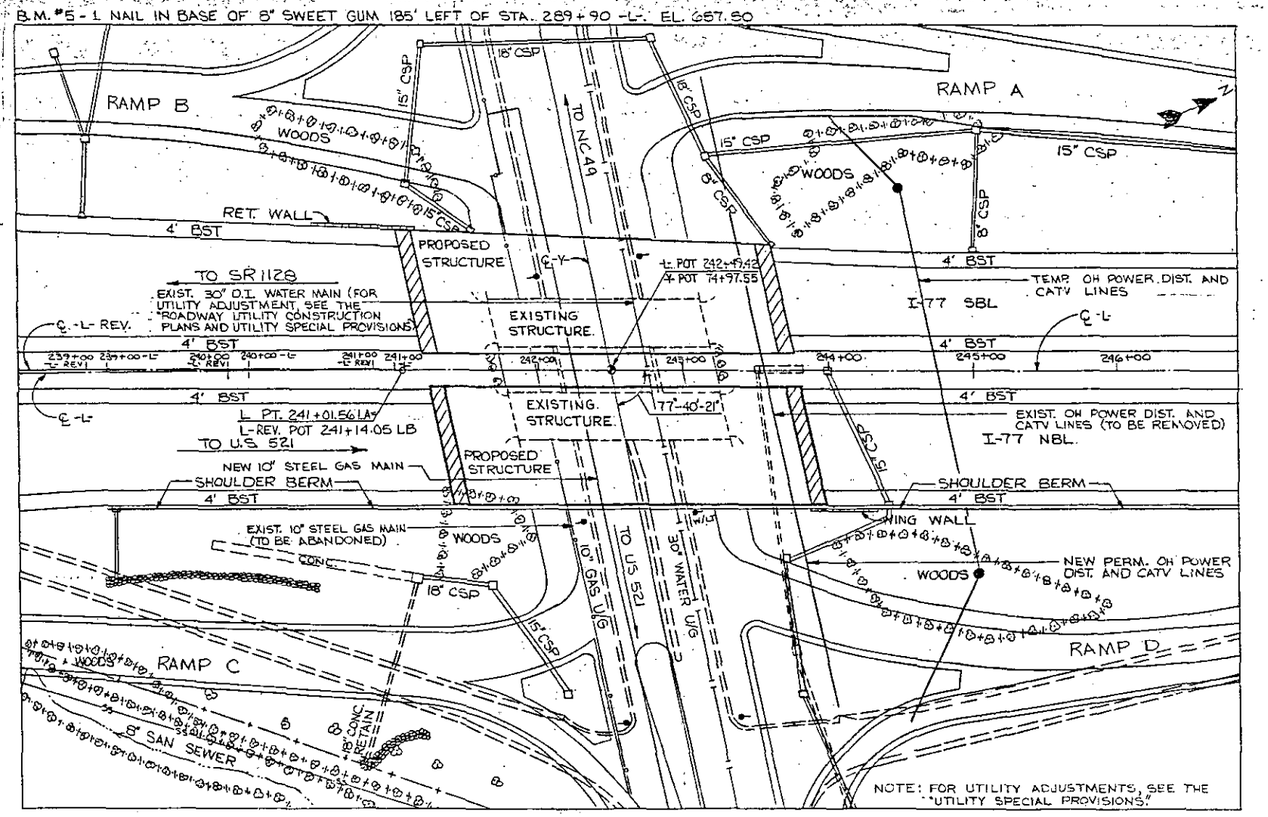
GENERAL DRAWING
NORTH BOUND BRIDGE ON I-77
OVER ARROWOOD ROAD BETWEEN
SR 1128 AND US 521
NOVEMBER 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-2
1			3			TOTAL SHEETS
2			4			82

DRAWN BY JUDY McDONALD DATE 11-20-87
CHECKED BY ROSS E. HIBENY DATE 12-13-88

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 242+49.42 -L-	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	CLASS A CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	BRIDGE APPROACH SLABS	POT BEARINGS	ELASTOMERIC BEARINGS	4" SLOPE PROTECTION	EXPANSION JOINT SEAL	PREFORMED COMPRESSION JOINT SEAL	SELECT BACKFILL MATERIAL CLASS I	
	LUMP SUM	CU. YDS.	SQ. FT.	CU. YDS.	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	SQ. YDS.	LUMP SUM	LUMP SUM	TONS	
SUPERSTRUCTURE	LUMP SUM		19,913				702,200			479.3	LUMP SUM	LUMP SUM	LUMP SUM		LUMP SUM	LUMP SUM		
END BENT NO. 1				44.9	7,042			15	375					448				
BENT NO. 1		375		175.0	23,636	2,165												
BENT NO. 2		375		150.8	23,740	2,441												
END BENT NO. 2		55		63.4	8,916			23	845					961			22	
TOTAL	LUMP SUM	805	19,913	434.1	63,334	4,606	702,200	38	1,220	479.3	LUMP SUM	LUMP SUM	LUMP SUM	1,409	LUMP SUM	LUMP SUM	22	



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.

ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI 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 PROVISION "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

COMPUTED FOUNDATION LOAD FOR BENT NO. 1 EQUALS 3 TONS PER SQ. FT. AND BENT NO. 2 EQUALS 4 TONS PER SQ. FT.

FOUNDATION EXCAVATION TO BE MEASURED FROM THE GRADED ROADWAY TYPICAL SECTION.

PILES FOR E.B.T. NO. 1&2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

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.

AFTER SERVING AS A TEMPORARY CROSSING, THE EXISTING STRUCTURE CONSISTING OF THREE SPANS OF REINFORCED CONCRETE DECK ON STEEL I-BEAMS (TWO @ 34'-0" AND ONE @ 81'-0") PROVIDING 23 FEET OF CLEAR ROADWAY AND SITTING ON REINFORCED CONCRETE CAPS ON STEEL PILES AT THE END BENTS AND REINFORCED CONCRETE POST AND BEAM INTERIOR BENTS AND LOCATED AT THE SAME SITE AS 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. SEE SPECIAL PROVISIONS.

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242 + 49.42 -L-
74 + 97.55 -Y-

SHEET 2 OF 2

REPLACES BRIDGE NO. 114
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

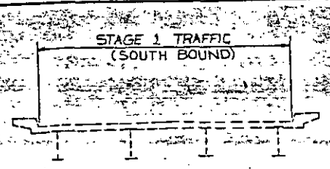
GENERAL DRAWING

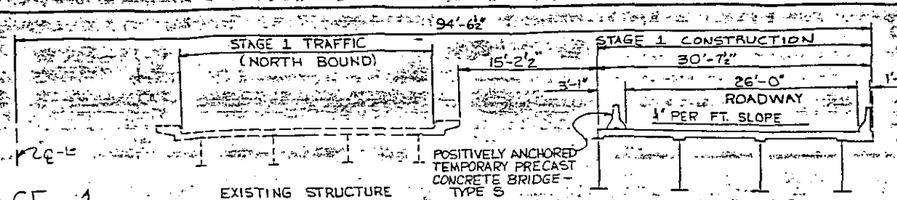
NORTH BOUND BRIDGE ON I-77 OVER ARROWOOD ROAD BETWEEN S.R. 1128 AND US 521

JULY 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-3
1			3			TOTAL SHEETS
2			4			82

DRAWN BY Judy E. Mangum DATE 7-28-88
CHECKED BY Ross E. Kubeny DATE 12-13-88

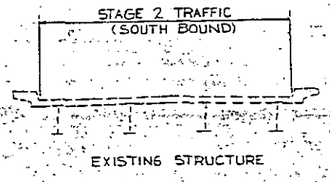


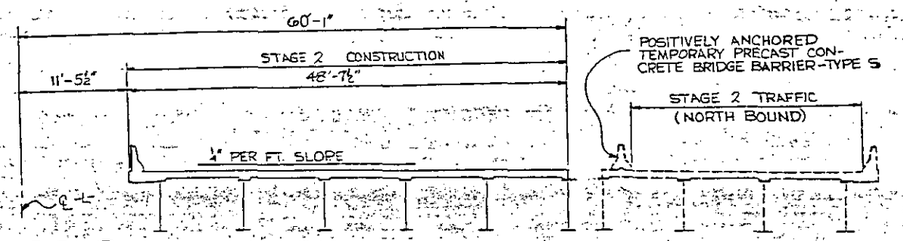


STAGE 1

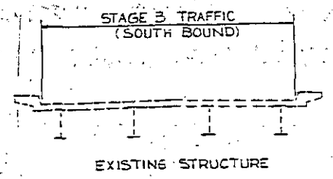
NOTE

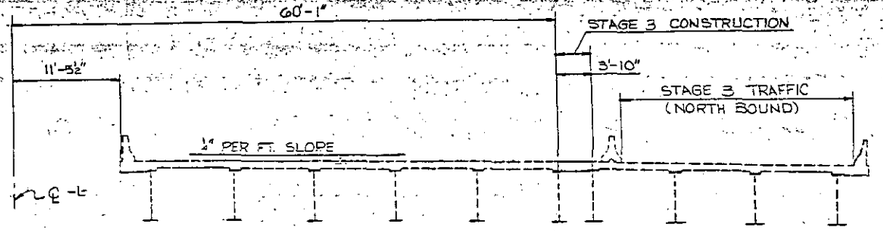
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE POSITIVELY ANCHORED TEMPORARY PRECAST CONCRETE BRIDGE BARRIER-TYPE S AND THE STANDARD PRECAST TEMPORARY CONCRETE MEDIAN BARRIER.



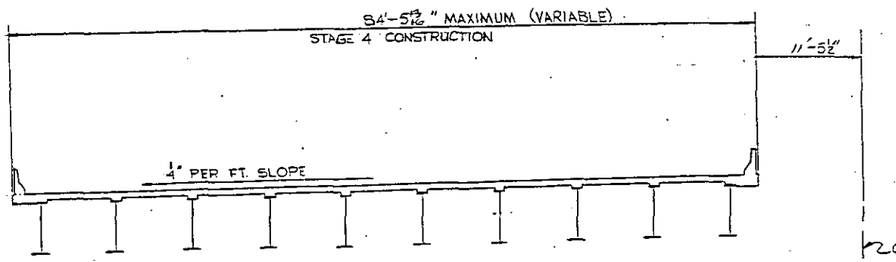


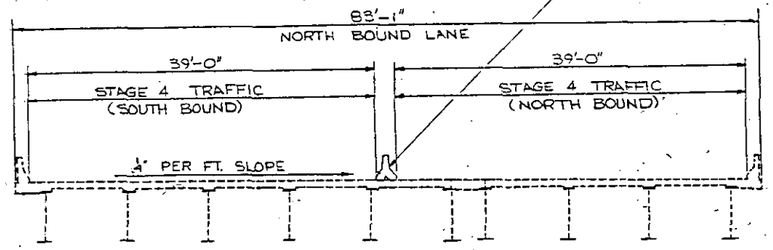
STAGE 2



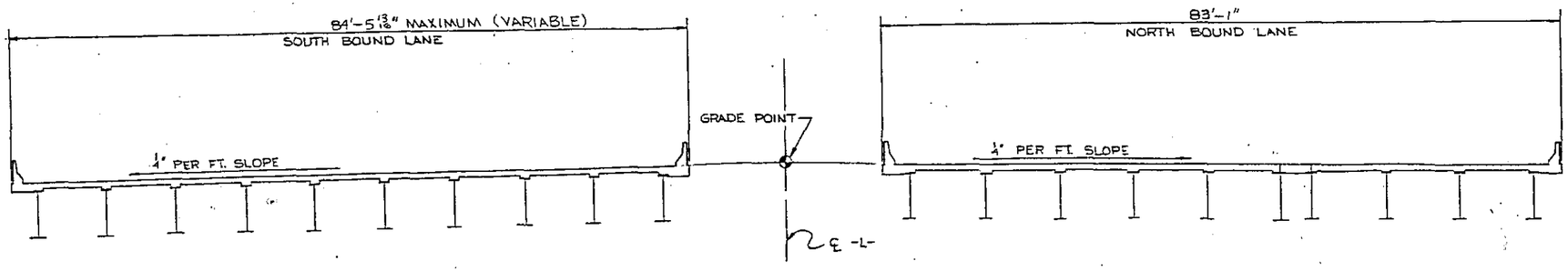


STAGE 3





STAGE 4



FINAL

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

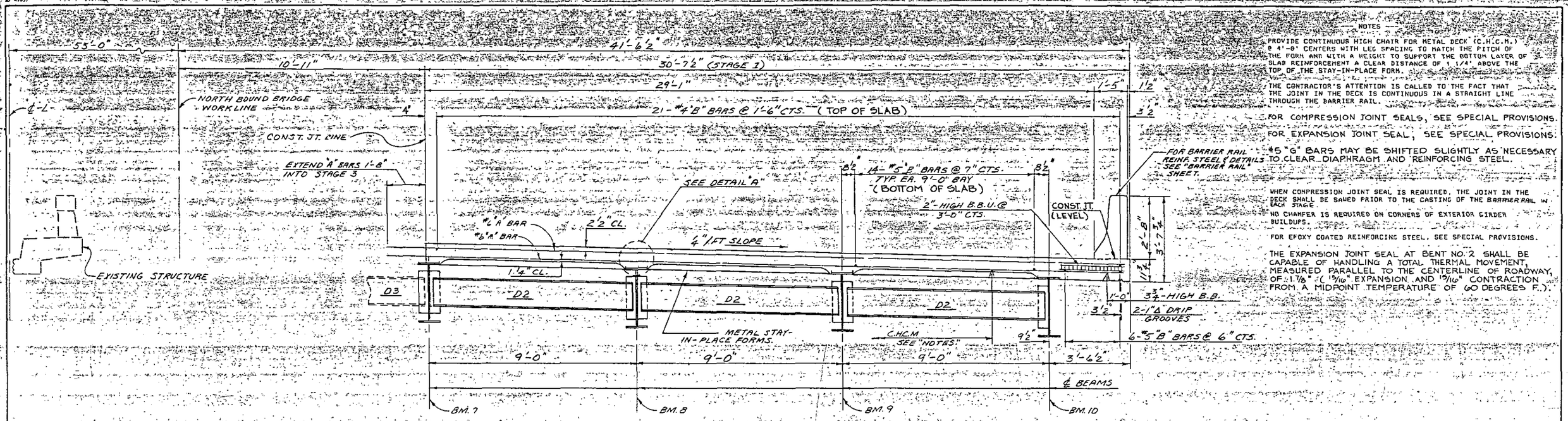
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION STAGING

OCTOBER 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-4
1			3			TOTAL SHEETS
2			4			82

DRAWN BY Judy E. Mangum DATE 10-26-88
CHECKED BY G.A. Thompson DATE 11-15-88



NOTES

PROVIDE CONTINUOUS HIGH CHAIR FOR METAL DECK (C.H.C.M.) @ 4'-0" CENTERS WITH LEG SPACING TO MATCH THE PITCH OF THE FORM AND WITH A HEIGHT TO SUPPORT THE BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 1/4" ABOVE THE TOP OF THE STAY-IN-PLACE FORM.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE JOINT IN THE DECK IS CONTINUOUS IN A STRAIGHT LINE THROUGH THE BARRIER RAIL.

FOR COMPRESSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINT SEAL, SEE SPECIAL PROVISIONS.

#5 "G" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL IN EACH STAGE.

NO CHAMFER IS REQUIRED ON CORNERS OF EXTERIOR GIRDER BUILDUPS.

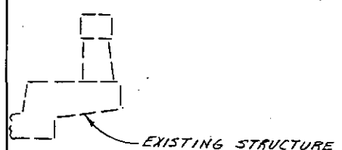
FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

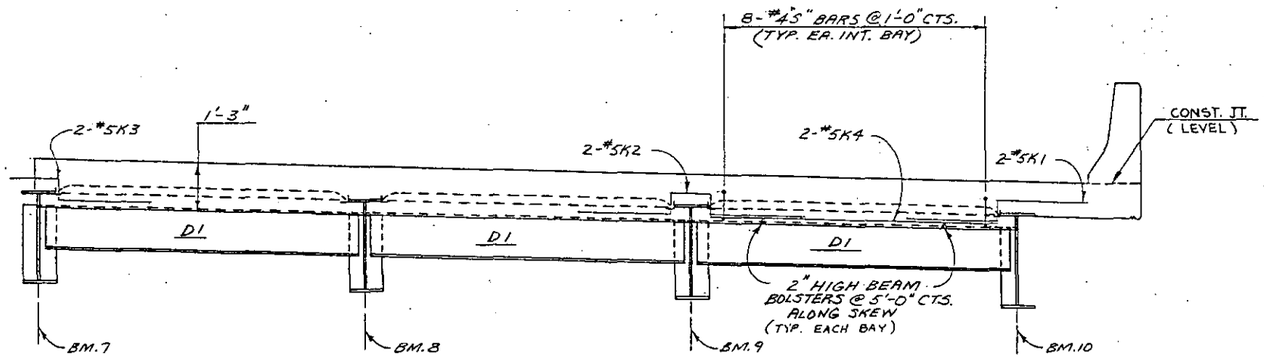
THE EXPANSION JOINT SEAL AT BENT NO. 2 SHALL BE CAPABLE OF HANDLING A TOTAL THERMAL MOVEMENT, MEASURED PARALLEL TO THE CENTERLINE OF ROADWAY, OF 1 7/8" (± 15/16" EXPANSION AND 15/16" CONTRACTION FROM A MIDPOINT TEMPERATURE OF 60 DEGREES F.).

TYPICAL SECTION - SPANS A&C

SHOWING INTERMEDIATE DIAPHRAGMS FOR SPANS A&C

FOR INTERMEDIATE DIAPHRAGMS SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAIL SHEET FOR LOCATION OF DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

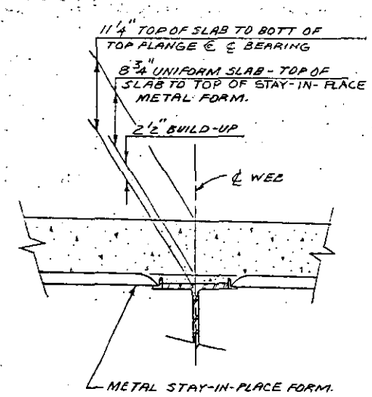




TYPICAL SECTION @ END BENTS

SHOWING END BENT DIAPHRAGMS FOR SPANS A&C

FOR BENT DIAPHRAGMS SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAILS SHEET. FOR LOCATION OF DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.



DETAIL "A"

DRAWN BY RORY MARTIN DATE 10-23-87
CHECKED BY KOSS E. KUBENY DATE 11-9-88

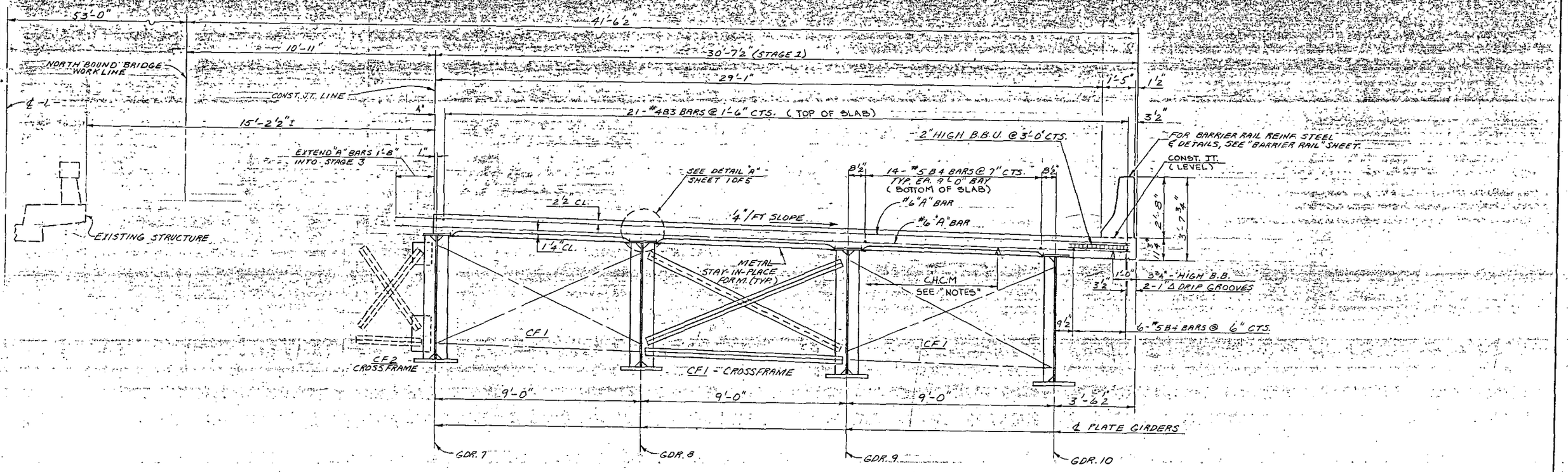
PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42-L-
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTIONS (STAGE 1)

SEPT. (N.B.L.) 1987

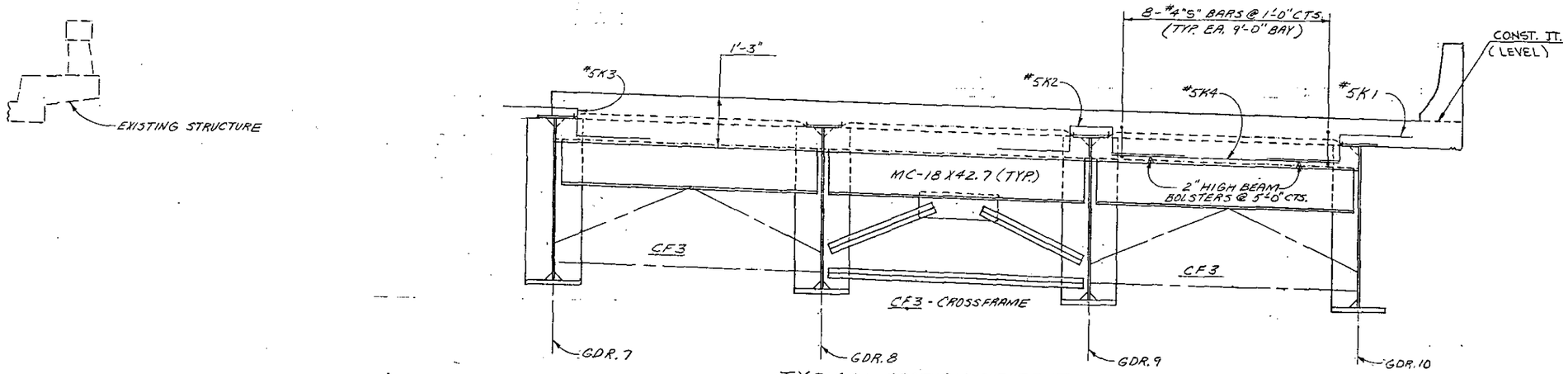
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-5
1			3			TOTAL SHEETS
2			4			82



TYPICAL SECTION - SPAN "B"

SHOWING INTERMEDIATE CROSSFRAMING FOR SPAN B

FOR INTERMEDIATE CROSSFRAMES SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAILS SHEET. FOR LOCATION OF CROSSFRAMES SEE "FRAMING PLAN" SHEET.



TYPICAL SECTION AT BENTS

SHOWING BENT CROSSFRAMING FOR SPANS A, B & C

FOR BENT CROSSFRAMES SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAIL SHEET. FOR LOCATION OF CROSSFRAMES, SEE "FRAMING PLAN" SHEET.

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 5

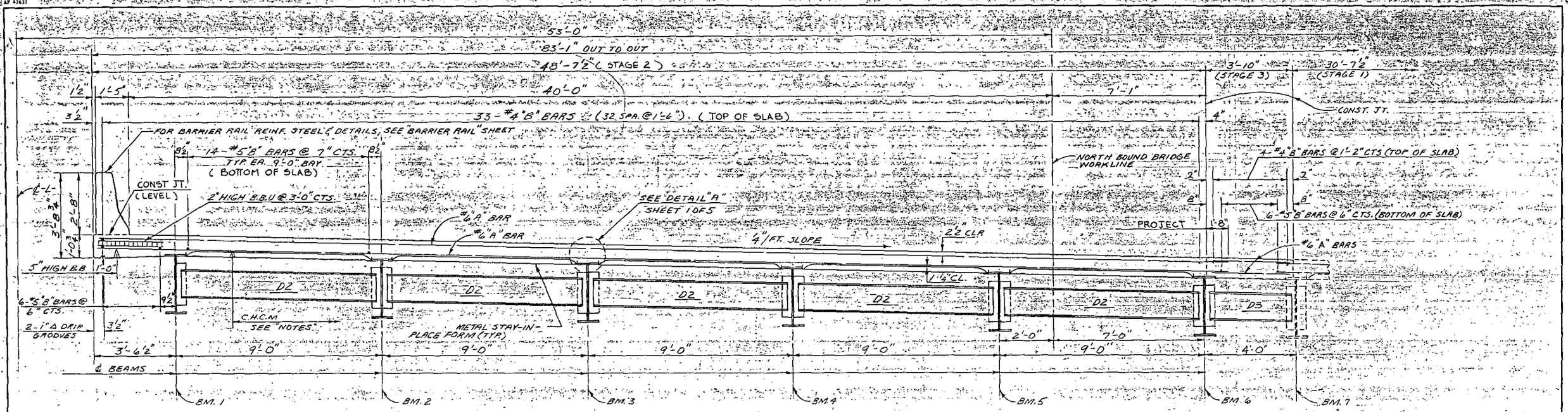
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTIONS (STAGE 1)

SEPT. (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-6
1			3			TOTAL SHEETS
2			4			82

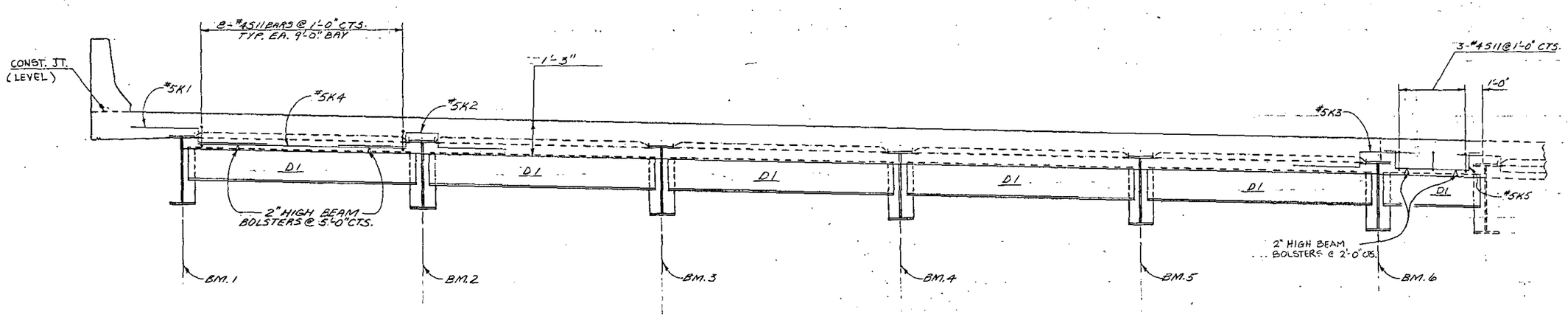
DRAWN BY RORY MARTIN DATE 9-23-87
CHECKED BY ROSS E. KIBENY DATE 11-7-88



TYPICAL SECTION - SPANS A & C

SHOWING INTERMEDIATE DIAPHRAGMS FOR SPANS A & C

FOR INTERMEDIATE DIAPHRAGMS SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAIL SHEET. FOR LOCATION OF DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.



TYPICAL SECTION @ END BENTS

SHOWING END BENT DIAPHRAGMS FOR SPANS A & C

FOR BENT DIAPHRAGM LOCATIONS AND TYPES, SEE "FRAMING PLAN" SHEET.

FOR BENT DIAPHRAGMS SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAILS SHEET.

DRAWN BY RORY MARTIN DATE 10-6-87
CHECKED BY ROSS E. KUSSEMY DATE 11-7-88

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

SHEET 3 OF 5

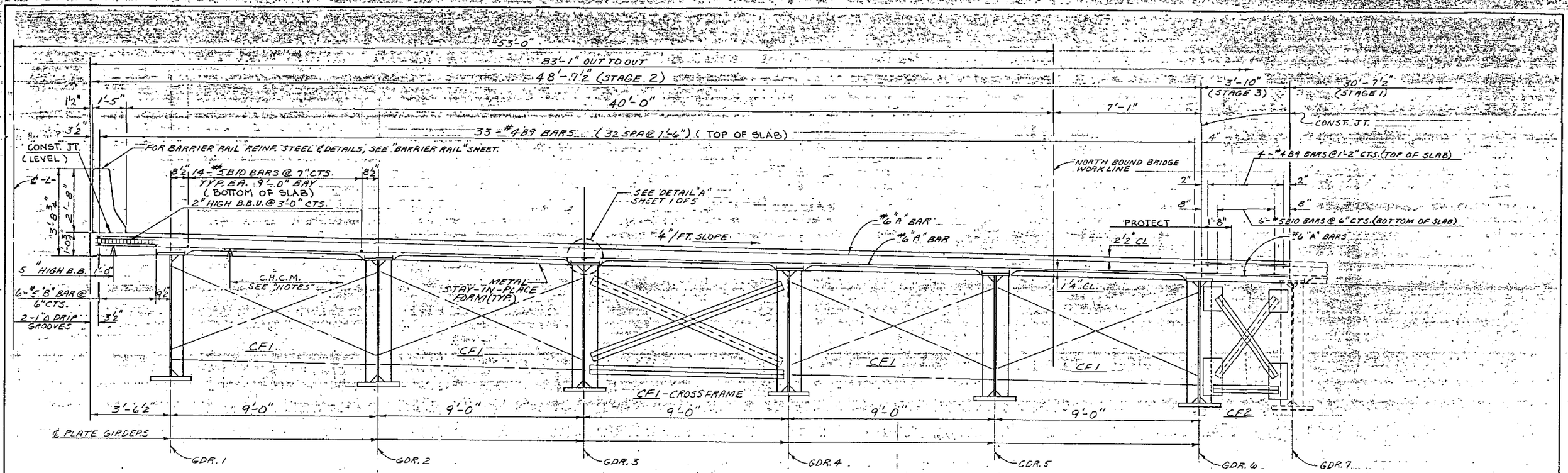
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTIONS

(STAGE 2 & STAGE 3 SPANS A & C)

OCT. (N.B.L.) 1987

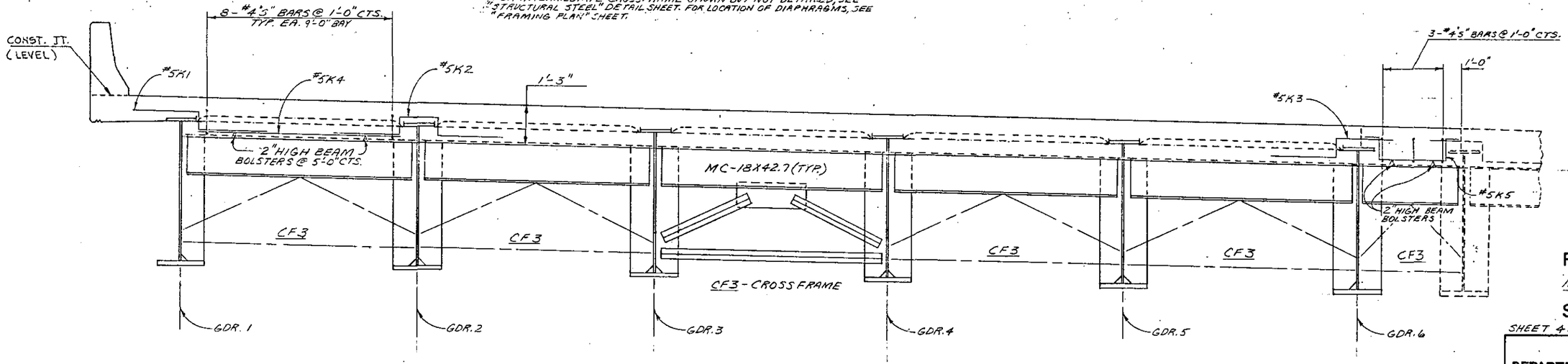
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-7
1			3			TOTAL SHEETS
2			4			82



TYPICAL SECTION-SPAN B

SHOWING INTERMEDIATE CROSSFRAMING FOR SPAN B

FOR INTERMEDIATE CROSSFRAME SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAIL SHEET. FOR LOCATION OF DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.



TYPICAL SECTION @ BENTS

SHOWING BENT CROSSFRAMING FOR SPANS A, B & C

FOR BENT CROSSFRAMING SHOWN BUT NOT DETAILED, SEE "STRUCTURAL STEEL" DETAIL SHEET. FOR LOCATION OF DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42-L-

SHEET 4 OF 5

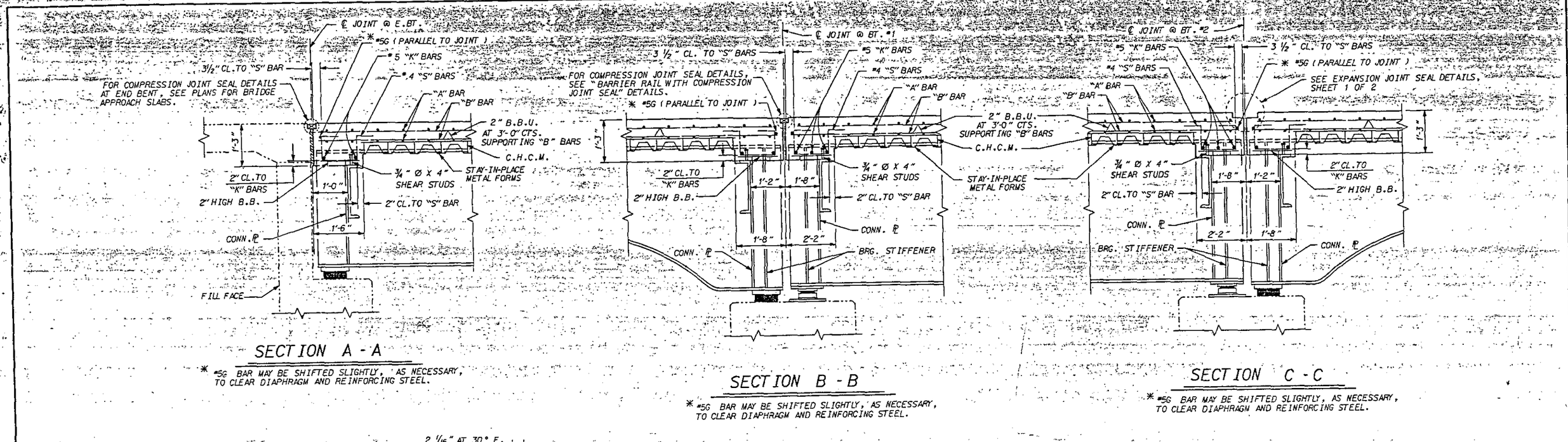
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS
(STAGE 2 & STAGE 3)

SEPT (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-8
1			3			TOTAL SHEETS
2			4			82

DRAWN BY RORY MARTIN DATE 9-28-87
CHECKED BY ROSS E. KUBENY DATE 11-7-88



BARRIER RAIL WITH COMPRESSION JOINT SEAL @ BT. #1

(FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS)

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

DECEMBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9-21-88
CHECKED BY: G.A. Thompson DATE: 9-21-88

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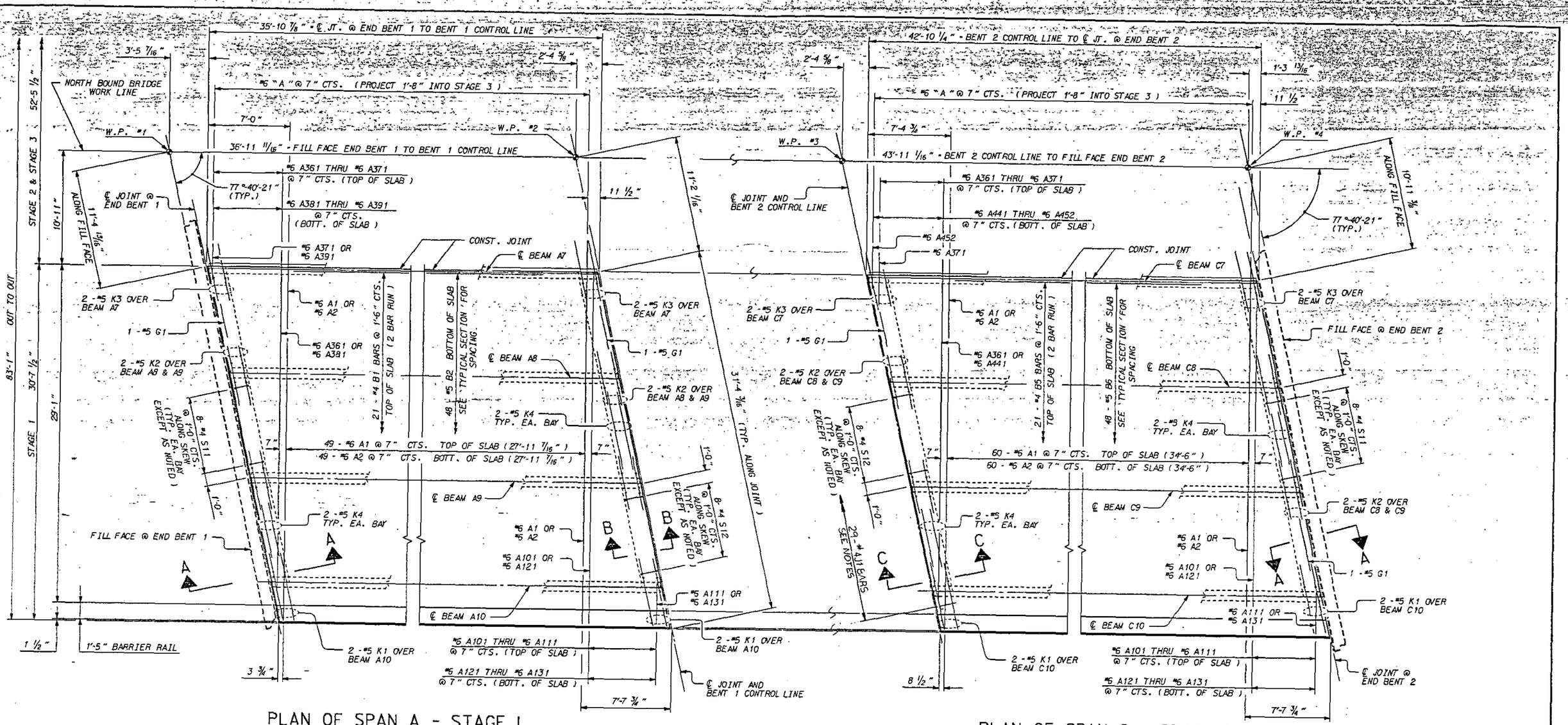
RKUBENY



PLAN OF SPAN A - STAGE I

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION A-A AND SECTION B-B.

PLAN OF SPAN C - STAGE I

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION A-A AND SECTION C-C.
SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR PLACEMENT OF #4J1 BARS.

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A - STAGE 1
PLAN OF SPAN C - STAGE 1

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-10
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 11/29/88
CHECKED BY : G. A. Thompson DATE : 3-21-89

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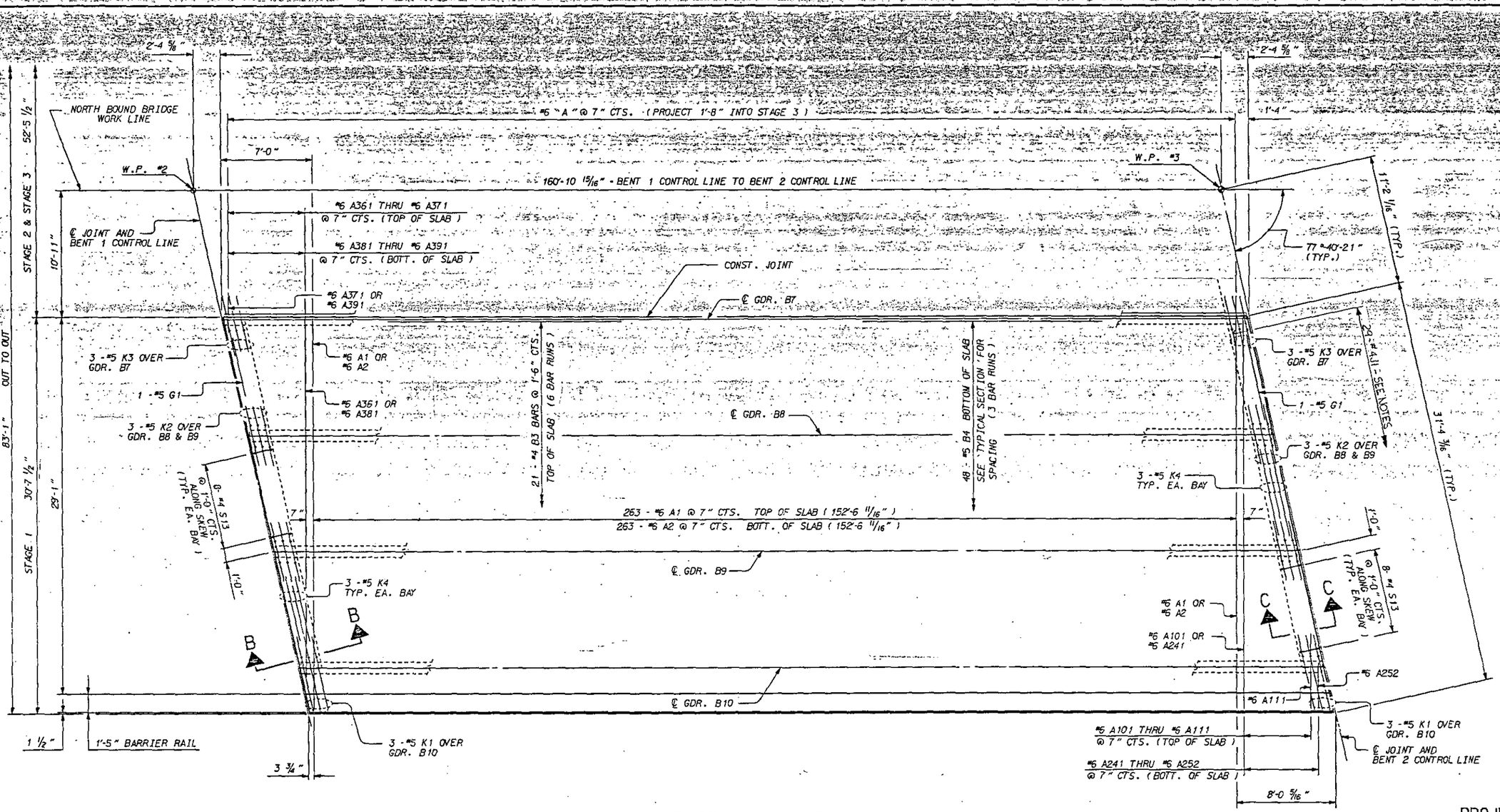


PLAN OF SPAN B - STAGE 1

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION A-A AND SECTION C-C.
SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR PLACEMENT OF #4J1 BARS.

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

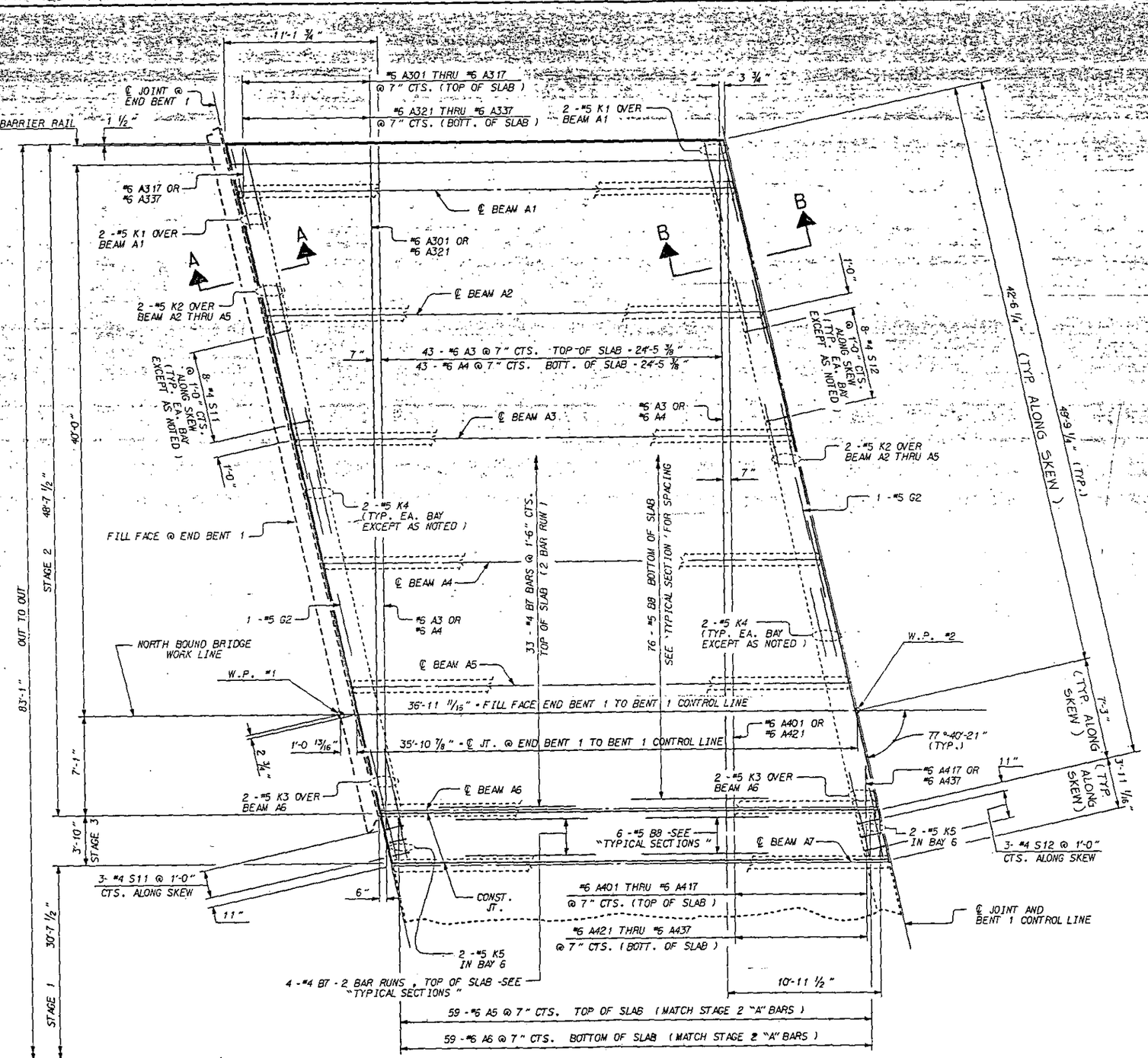
PLAN OF SPAN B - STAGE 1

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 11/29/88
CHECKED BY : G. A. Thompson DATE : 3-21-89

28-INR-1989 (5-17)
20-1287.3221 (46201 SPA.DGN)
RKUBENY



PLAN OF SPAN A - STAGE 2 & STAGE 3

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS. SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION A-A AND SECTION B-B.

DRAWN BY : ROSS E. KUBENY DATE : 11/29/88
CHECKED BY : G.A. Thompson DATE : 3-22-89

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

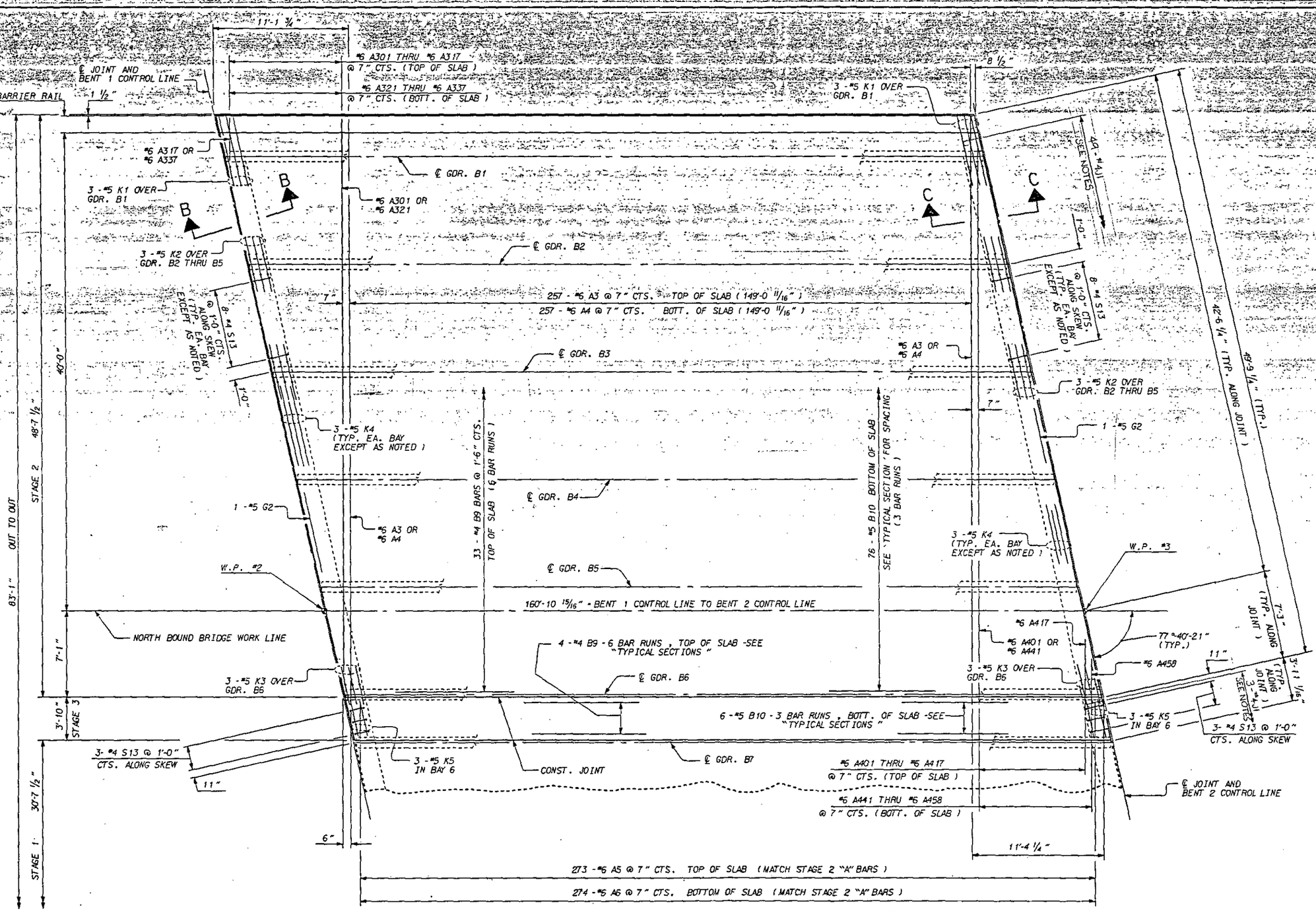
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A - STAGE 2 AND STAGE 3

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-12
1			3			TOTAL SHEETS
2			4			82



PLAN OF SPAN B - STAGE 2 & STAGE 3

NOTE: SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION B-B AND SECTION C-C.

NOTE: SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR PLACEMENT OF #4J1 BARS.

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B - STAGE 2 AND STAGE 3

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 11/29/88
CHECKED BY: G.A. Thompson DATE: 3-21-89

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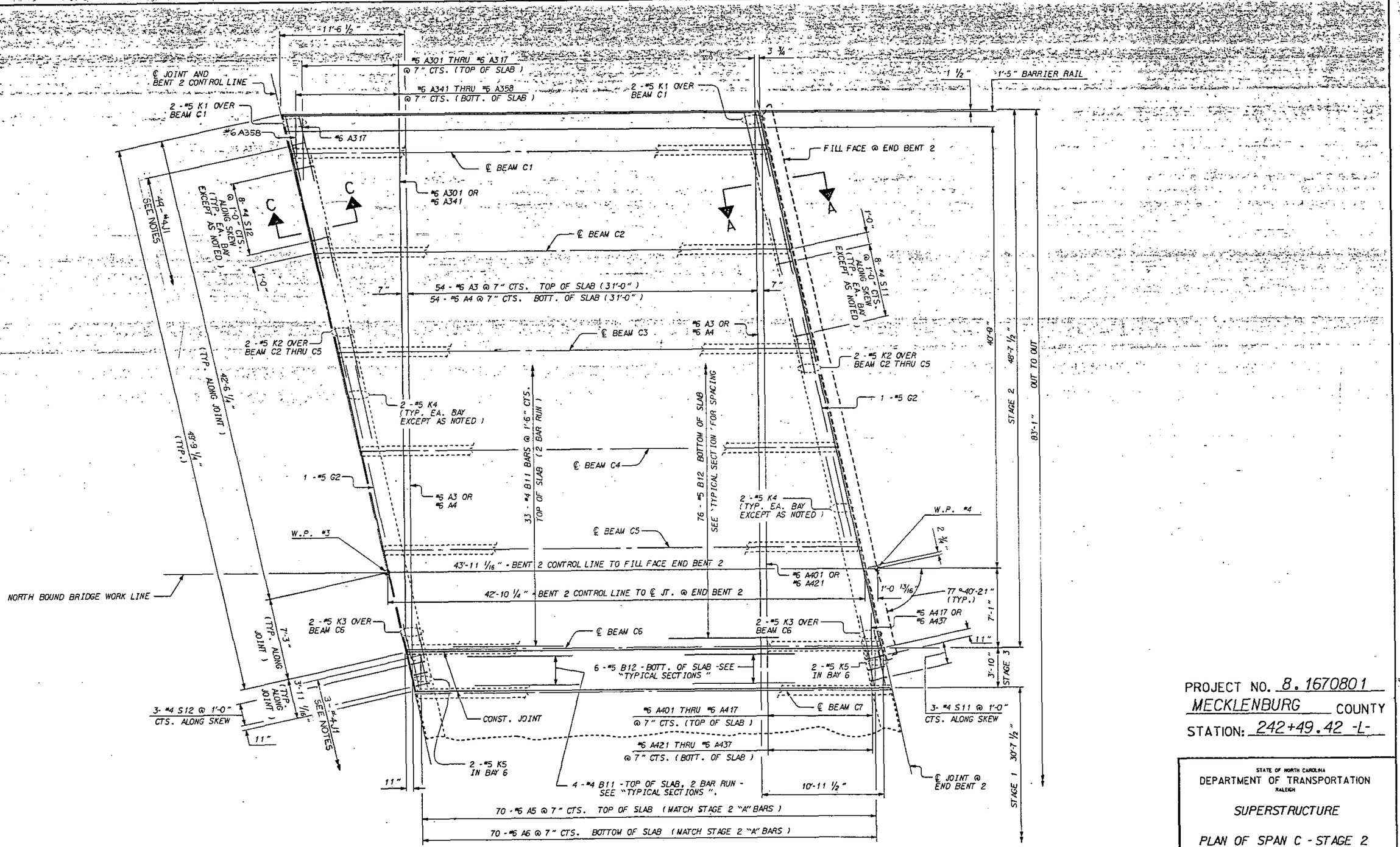

PLAN OF SPAN C - STAGE 2 & STAGE 3

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
SEE SUPERSTRUCTURE "TYPICAL SECTIONS" SHEET FOR SECTION A-A AND SECTION C-C.

NOTE: SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR THE PLACEMENT OF #4J1 BARS

DRAWN BY : ROSS E. KUBENY DATE : 11/29/88
CHECKED BY : G.A. Thompson DATE : 3-21-89

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C - STAGE 2 AND STAGE 3

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
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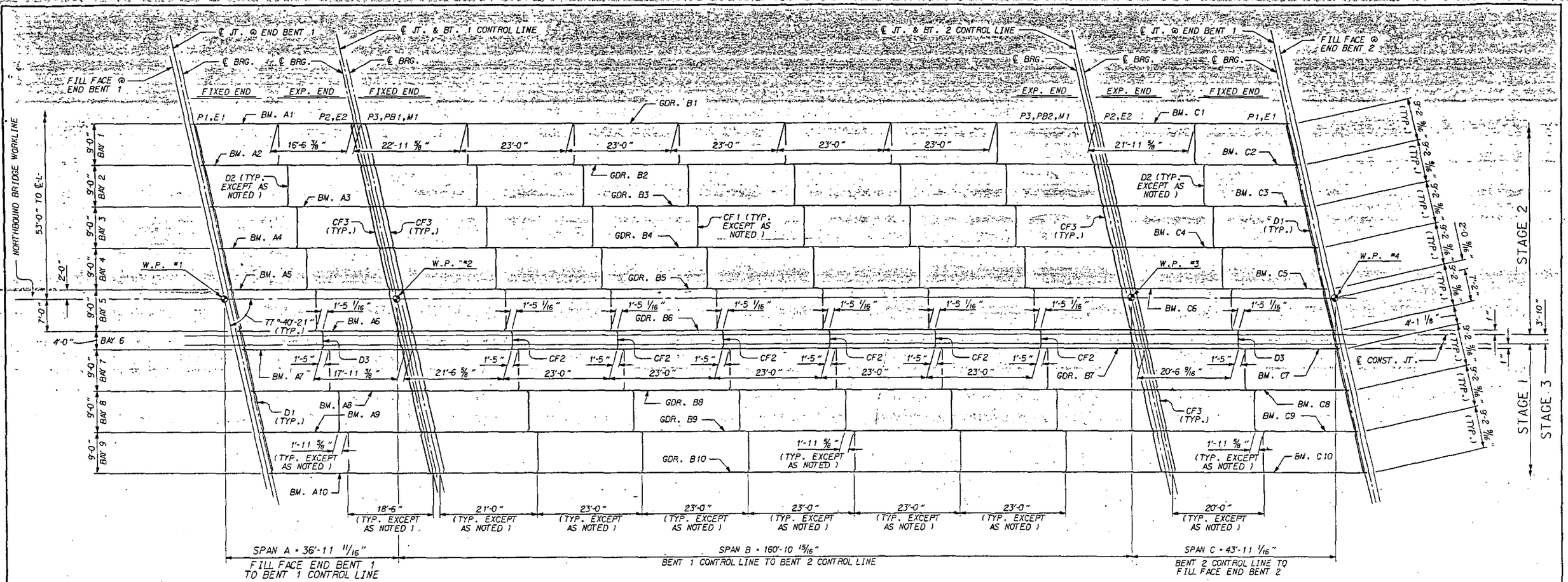
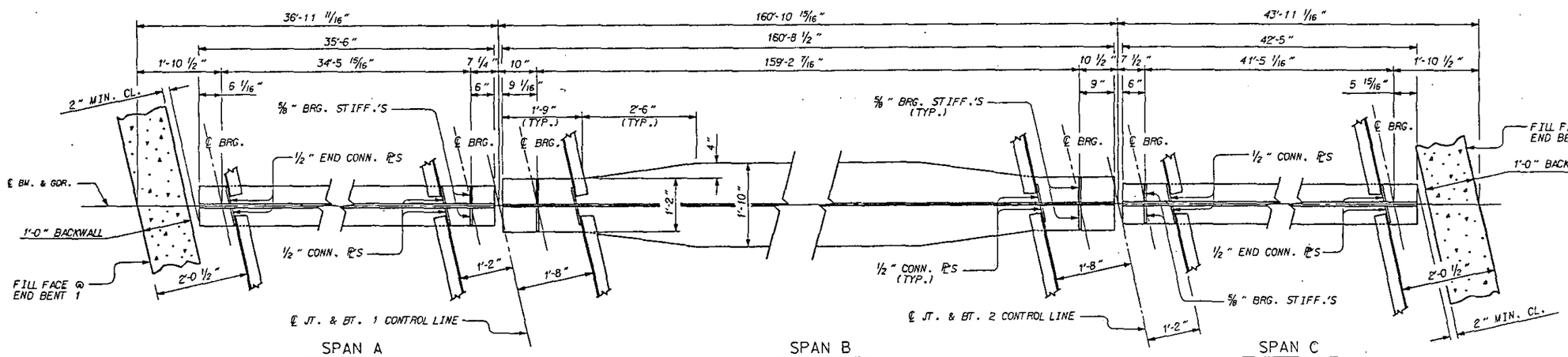


FRAMING PLAN - SPAN A, B & C - STAGE 1 & 2



BOTTOM FLANGE DETAILS

OMIT ALL CONNECTOR PLATES ON OUTSIDE FACE OF EXTERIOR BEAMS AND GIRDERS.

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
FRAMING PLAN & BOTTOM FLANGE DETAILS

NOVEMBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
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CHECKED BY: G. A. Thompson DATE: 2-21-89

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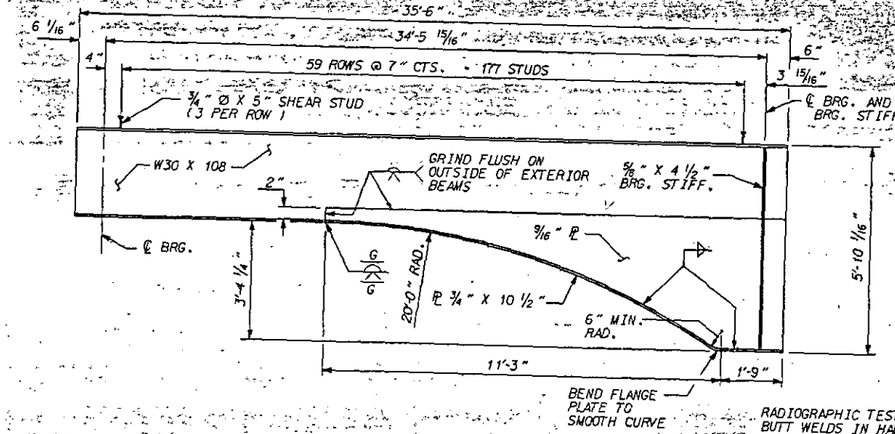
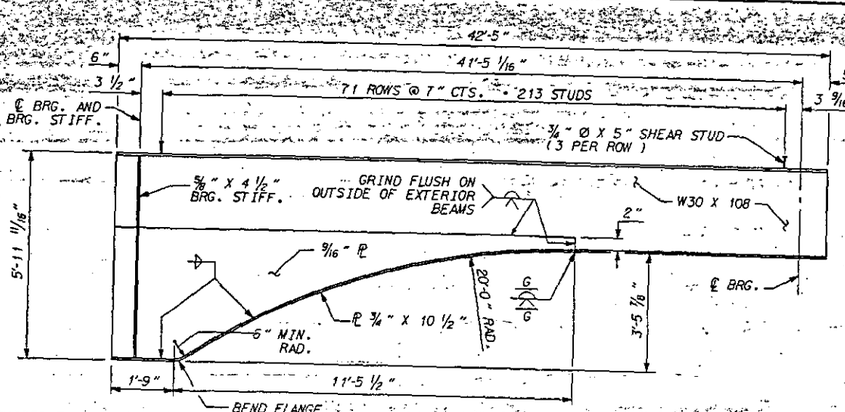


BEAM ELEVATION
SPAN A - BM.A1 & A10

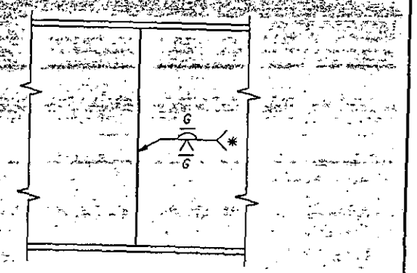


BEAM ELEVATION
SPAN C - BM.C1 & C10

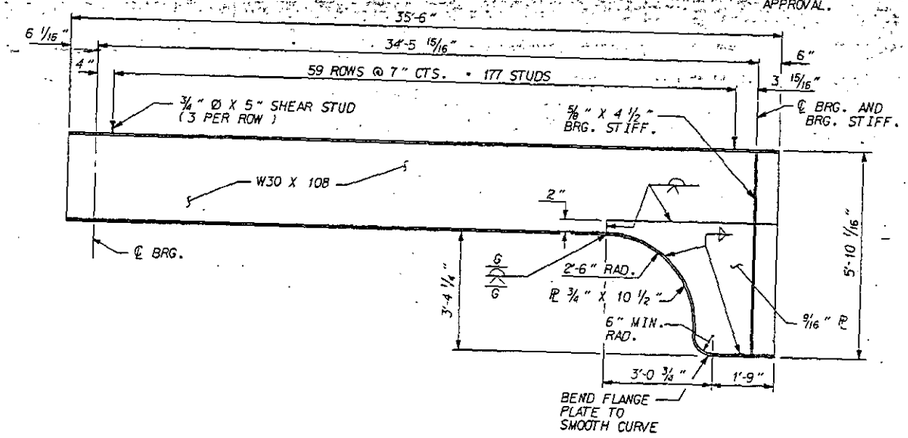
RADIOGRAPHIC TESTING IS REQUIRED FOR ALL BUTT WELDS IN HAUNCHES.

HAUNCH WEB AND FLANGE THICKNESS AND FLANGE WIDTH SHALL MATCH THE BEAM TO WHICH IT IS ATTACHED.

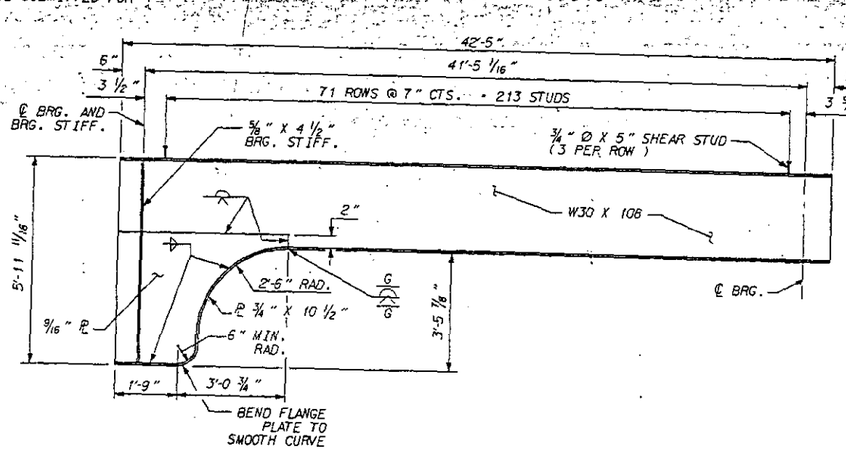
OTHER HAUNCH MAKE-UP MAY BE SUBMITTED FOR APPROVAL.



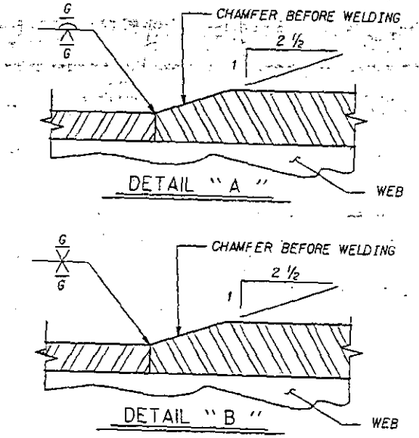
PERMISSIBLE SHOP WEB SPLICE
* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS, (SEE NOTES).



BEAM ELEVATION
SPAN A - BM.A2 THRU A9

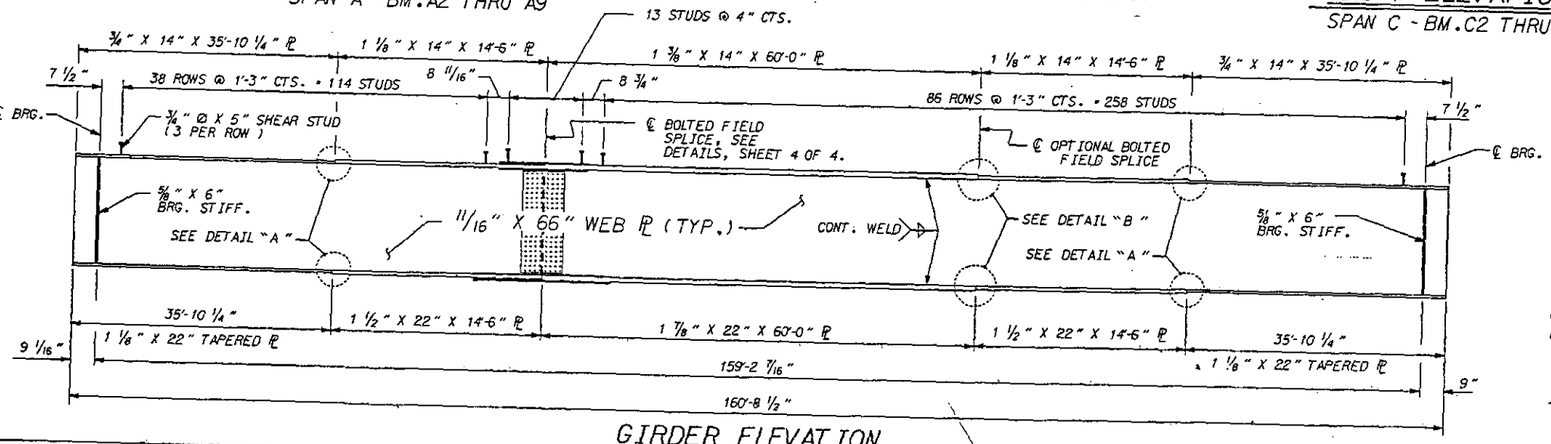


BEAM ELEVATION
SPAN C - BM.C2 THRU C9

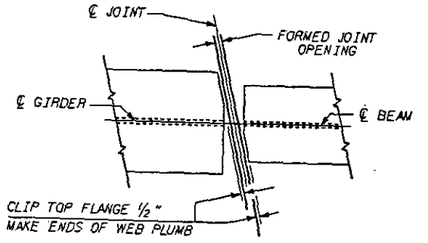


FLANGE SPLICE DETAIL
TYPICAL FOR BOTH TOP AND BOTTOM FLANGES.

NOTE : ENDS OF ALL BEAM AND GIRDER WEBS ARE PLUMB.



GIRDER ELEVATION
SPAN B - GDR.B1 THRU GDR.B10



TOP FLANGE AT JOINTS

DRAWN BY : ROSS E. KUBENY DATE : 12-01-87
CHECKED BY : G. A. Thompson DATE : 2-01-89

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 2 OF 4

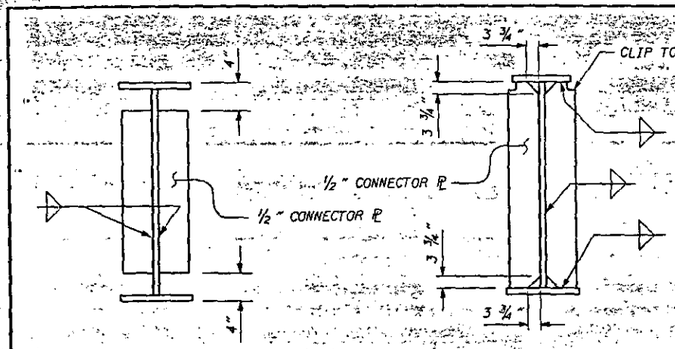
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

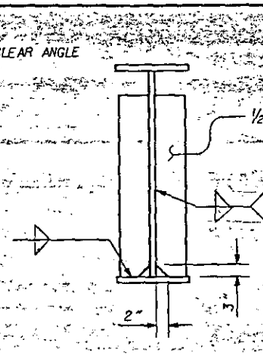
DECEMBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			82



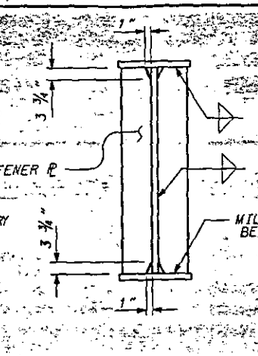
INTERMEDIATE CONNECTOR PLATE

OMIT INTERMEDIATE CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS & GIRDERS.



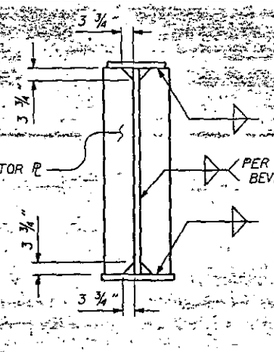
END CONNECTOR

TYPICAL FOR SPANS A & C @ E. BT. END OF BEAMS. OMIT END CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS .



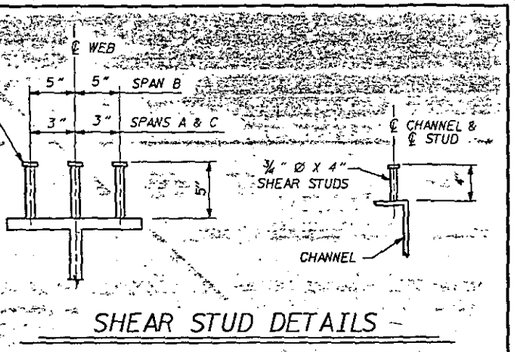
BEARING STIFFENER

TYPICAL FOR SPAN A, B & C @ BT. 1 AND BT. 2.

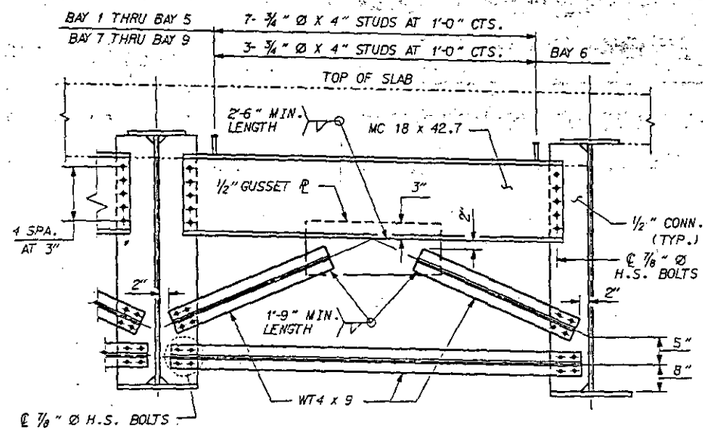


BENT CONNECTOR PLATE

TYPICAL FOR SPAN A, B & C @ BT. 1 AND BT. 2. OMIT BENT CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS & GIRDERS .

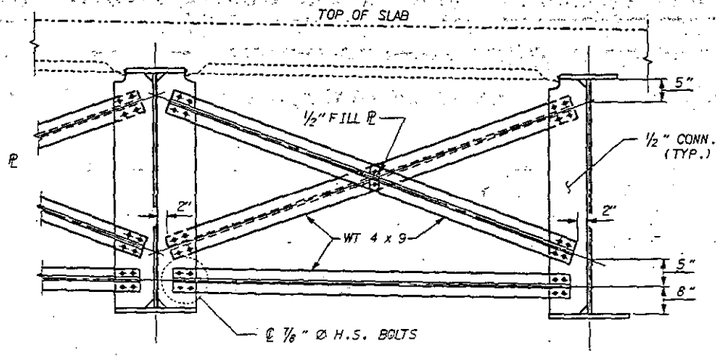


SHEAR STUD DETAILS



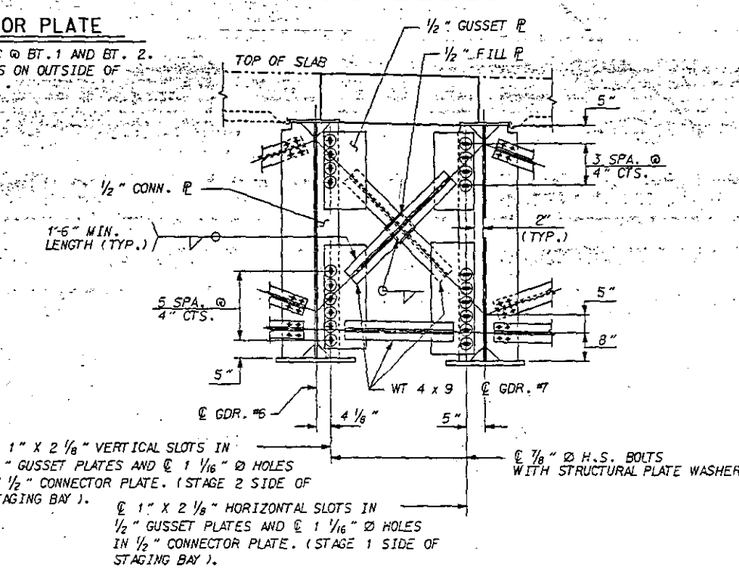
TYPICAL BENT CROSSFRAME (CF3)

FOR SPANS A, B & C @ INTERIOR BENTS.



TYPICAL INTERMEDIATE CROSSFRAME (CF1)

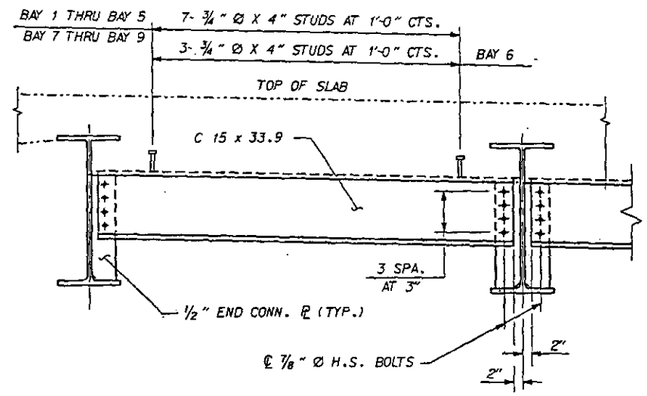
FOR SPAN B



TYPICAL INTERMEDIATE CROSSFRAME (CF2)

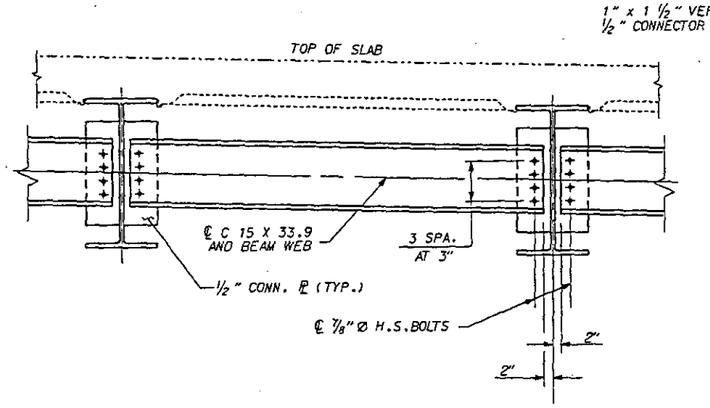
SHOWING STAGING BAY FOR SPAN B.

SPAN B INTERMEDIATE CROSSFRAMES SHALL BE INSTALLED AFTER THE POURING OF STAGE 1 AND STAGE 2. NOTE: NUTS ON BOLTS FOR CONNECTING CROSSFRAME TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL STAGE 3 OF SLAB HAS BEEN POURED.



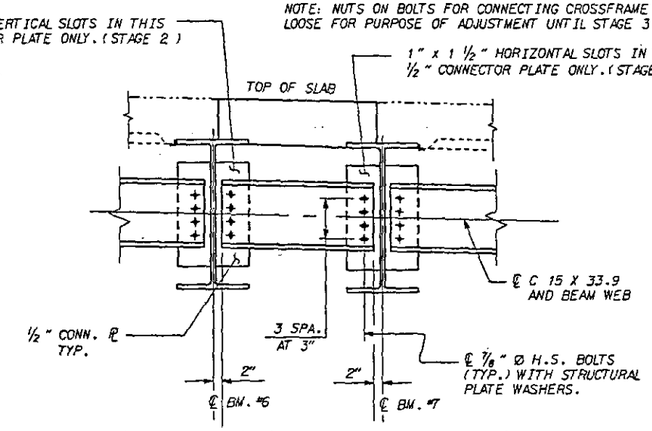
TYPICAL BENT DIAPHRAGM (D1)

FOR SPANS A & C @ END BENTS.



TYPICAL INTERMEDIATE DIAPHRAGM (D2)

FOR SPANS A & C.



TYPICAL INTERMEDIATE DIAPHRAGM (D3)

SHOWING STAGING BAY FOR SPANS A & C.

NOTE: NUTS ON BOLTS FOR CONNECTING CHANNEL TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL STAGE 3 OF SLAB HAS BEEN POURED.

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

DECEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 11-29-88
CHECKED BY : G.A. Thompson DATE : 3-21-89

28-MAR-1989 15:02
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ROUBENY

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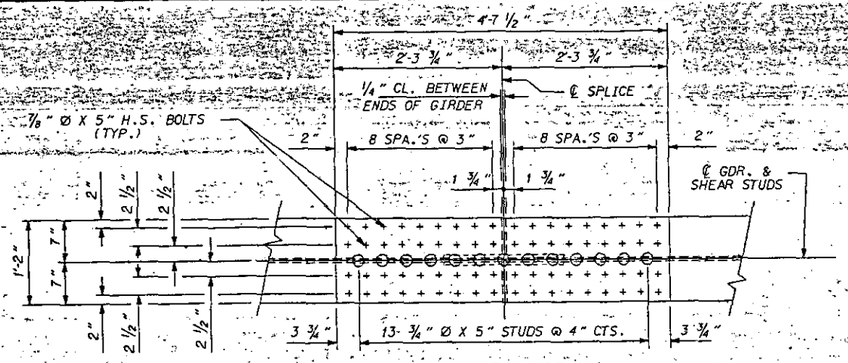
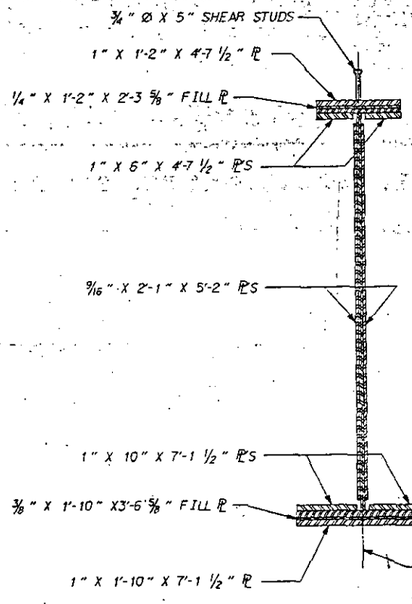
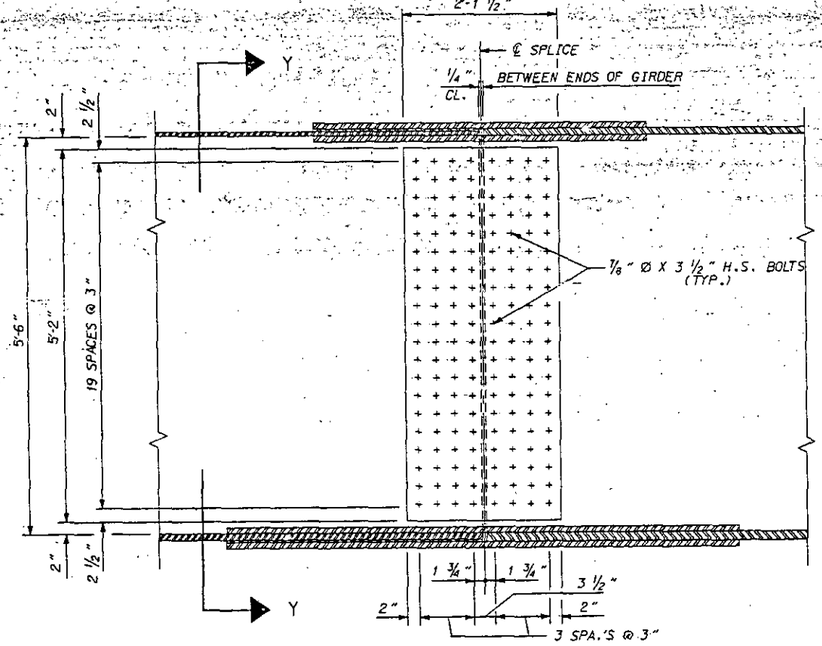


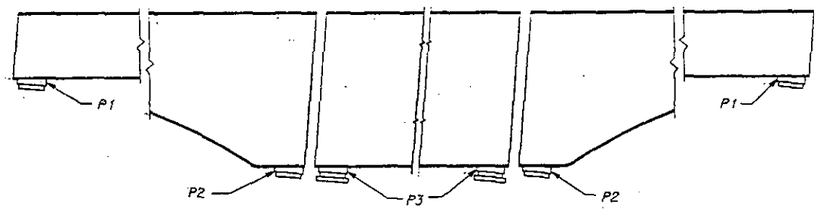
TOP FLANGE



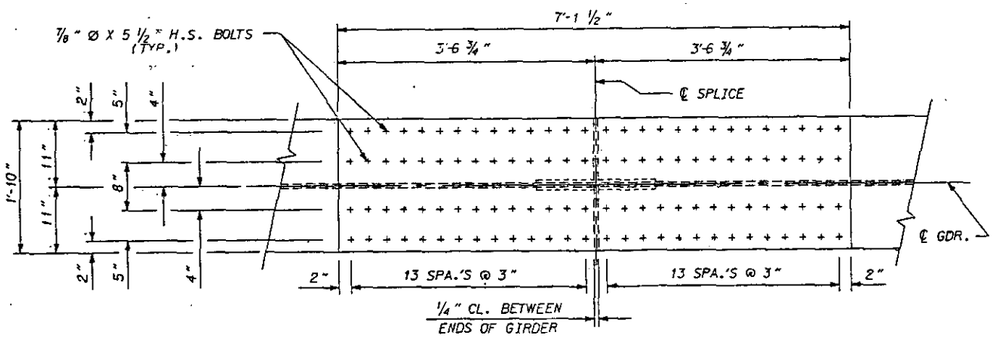
SECTION Y-Y



WEB



ALIGNMENT OF SOLE PLATES



FIELD SPLICE DETAILS

BOTTOM FLANGE

NOTES

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SPLICES.

THE ATMOSPHERIC CORROSION RESISTANCE AND COLORING CHARACTERISTICS OF A.S.T.M. A-588 STEEL ARE REQUIRED FOR THE HIGH STRENGTH BOLTS, NUTS, WASHERS, AND THE WELD FILLER METAL FOR THIS STRUCTURE.

ALL STRUCTURAL STEEL SHALL BE UNPAINTED A.S.T.M. A-588 (MINIMUM YIELD STRENGTH OF 50,000 PSI) WITH THE EXCEPTION OF BEARING ASSEMBLIES. SEE SPECIAL PROVISIONS.

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

A CHARPY V-NOTCH TEST IS REQUIRED FOR I-BEAM SECTIONS AND HAUNCHS. SEE SPECIAL PROVISIONS. (SPAN A & C)

A CHARPY V-NOTCH TEST IS REQUIRED FOR ALL WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES, FILLER PLATES, AND WEB SPLICE PLATES FOR ALL GIRDERS. SEE SPECIAL PROVISIONS. (SPAN B)

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

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF GIRDER AND SHALL BE PLUMB.

SOLE PLATES SHALL BE A.S.T.M. A-588 STEEL AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AN OPTIONAL BOLTED FIELD SPLICE WILL BE PERMITTED IN THE GIRDERS IN SPAN B. IF THE OPTIONAL FIELD SPLICE IS USED, IT SHALL BE MADE ENTIRELY AT THE CONTRACTOR'S EXPENSE AND NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE FOR THE ADDITIONAL MATERIALS REQUIRED. THE LOCATION OF OPTIONAL FIELD SPLICE IS SHOWN ON PLANS. THE DETAILS AND SPLICE MATERIAL SHALL BE IDENTICAL TO THE BOLTED FIELD SPLICE IN SPAN B.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
NOTES &
FIELD SPLICE DETAILS

DECEMBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-18
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 12-10-87
CHECKED BY : E. C. Powell DATE : 12-14-88

8-NOV-1988 10:29
ZCU:[207,221]4620MLD.DGN;1
C.RKUBENY

DEAD LOAD DEFLECTION TABLE FOR BEAMS

	SPAN "A"				SPAN "C"		
	A7	A8,A9	A10		C7	C8,C9	C10
DEFLECTION DUE TO WEIGHT OF BEAM	.003	.003	.003		.005	.005	.005
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 1	.013	.024	.021		.027	.049	.044
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 3	.004	.000	.000		.009	.000	.000
* DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.001	.002	.002		.003	.005	.005
TOTAL DEAD LOAD DEFLECTION	.021	.029	.026		.044	.059	.054
REQUIRED BEAM CAMBER	1/4	3/8	5/16		1/2	11/16	5/8

NOTE : SPAN "A & C" VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT MIDPOINT BETWEEN ℄ BRG., EXCEPT BEAM "CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

* VALUES DO NOT SHOW DEFLECTION DUE TO WEIGHT OF TEMPORARY BARRIER RAIL.

DEAD LOAD DEFLECTION TABLE FOR BEAMS

	SPAN "A"				SPAN "C"			
	A1	A2,A3	A4,A5	A6	C1	C2,C3	C4,C5	C6
DEFLECTION DUE TO WEIGHT OF BEAM	.003	.002	.002	.003	.005	.006	.006	.005
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 2	.021	.024	.024	.013	.044	.049	.049	.027
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 3	.000	.000	.000	.004	.000	.000	.000	.009
* DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.002	.003	.002	.001	.005	.005	.003	.003
TOTAL DEAD LOAD DEFLECTION	.026	.029	.028	.021	.054	.060	.058	.044
REQUIRED BEAM CAMBER	5/16	3/8	3/8	1/4	5/8	3/4	11/16	1/2

NOTE : SPAN "A & C" VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT MIDPOINT BETWEEN ℄ BRG., EXCEPT BEAM "CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

* VALUES DO NOT SHOW DEFLECTION DUE TO WEIGHT OF TEMPORARY BARRIER RAIL.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN "B"																																								
	B1											B2 & B3											B4 & B5											B6										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	.000	.068	.126	.169	.195	.204	.195	.169	.126	.068	.000	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000	.000	.078	.129	.173	.200	.209	.200	.173	.129	.078	.000
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 2	.000	.191	.355	.475	.548	.574	.548	.475	.355	.191	.000	.000	.213	.396	.530	.612	.641	.612	.530	.396	.213	.000	.000	.213	.396	.530	.612	.641	.612	.530	.396	.213	.000	.000	.117	.218	.292	.337	.352	.337	.292	.218	.117	.000
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.039	.072	.097	.112	.118	.112	.097	.072	.039	.000
* DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.029	.053	.072	.084	.088	.084	.072	.053	.029	.000	.000	.033	.062	.084	.097	.102	.097	.084	.062	.033	.000	.000	.020	.037	.050	.057	.060	.057	.050	.037	.020	.000	.000	.017	.032	.043	.050	.052	.050	.043	.032	.017	.000
TOTAL DEAD LOAD DEFLECTION	.000	.288	.534	.716	.827	.866	.827	.716	.534	.288	.000	.000	.316	.587	.787	.909	.952	.909	.787	.587	.316	.000	.000	.303	.562	.753	.869	.910	.869	.753	.562	.303	.000	.000	.243	.451	.625	.699	.731	.699	.605	.451	.243	.000
REQUIRED CAMBER	0	3 7/16	6 7/16	8 9/16	9 15/16	10 3/8	9 15/16	8 9/16	6 7/16	3 7/16	0	0	3 13/16	7 1/16	9 7/16	10 15/16	11 7/16	10 15/16	9 7/16	7 1/16	3 13/16	0	0	3 5/8	6 3/4	9 1/16	10 7/16	10 15/16	10 7/16	9 1/16	6 3/4	3 5/8	0	0	2 15/16	5 7/16	7 1/4	8 3/8	8 3/4	8 3/8	7 1/4	5 7/16	2 15/16	0

NOTE : SPAN "B" VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRG., EXCEPT GIRDER "CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

* VALUES DO NOT SHOW DEFLECTION DUE TO WEIGHT OF TEMPORARY BARRIER RAIL.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN "B"																																								
	B7											B8 & B9											B10																					
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000	.000	.068	.126	.169	.195	.204	.195	.169	.126	.068	.000											
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 1	.000	.117	.218	.292	.337	.352	.337	.292	.218	.117	.000	.000	.213	.396	.530	.612	.641	.612	.530	.396	.213	.000	.000	.191	.355	.475	.548	.574	.548	.475	.355	.191	.000											
DEFLECTION DUE TO WEIGHT OF SLAB - STAGE 3	.000	.039	.072	.097	.112	.118	.112	.097	.072	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000											
* DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.017	.032	.043	.050	.052	.050	.043	.032	.017	.000	.000	.029	.053	.072	.084	.088	.084	.072	.053	.029	.000	.000	.029	.053	.072	.084	.088	.084	.072	.053	.029	.000											
TOTAL DEAD LOAD DEFLECTION	.000	.243	.451	.605	.699	.731	.699	.605	.451	.243	.000	.000	.312	.578	.775	.896	.938	.896	.775	.578	.312	.000	.000	.288	.534	.716	.827	.866	.827	.716	.534	.288	.000											
REQUIRED CAMBER	0	2 15/16	5 7/16	7 1/4	8 3/8	8 3/4	8 3/8	7 1/4	5 7/16	2 15/16	0	0	3 3/4	6 15/16	9 5/16	10 3/4	11 1/4	10 3/4	9 5/16	6 15/16	3 3/4	0	0	3 7/16	6 7/16	8 9/16	9 15/16	10 3/8	9 15/16	8 9/16	6 7/16	3 7/16	0											

NOTE : SPAN "B" VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRG., EXCEPT GIRDER "CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

* VALUES DO NOT SHOW DEFLECTION DUE TO WEIGHT OF TEMPORARY BARRIER RAIL.

DRAWN BY : ROSS E. KUBENY DATE : 11-7-88
CHECKED BY : E.C. POWELL DATE : 11-8-88

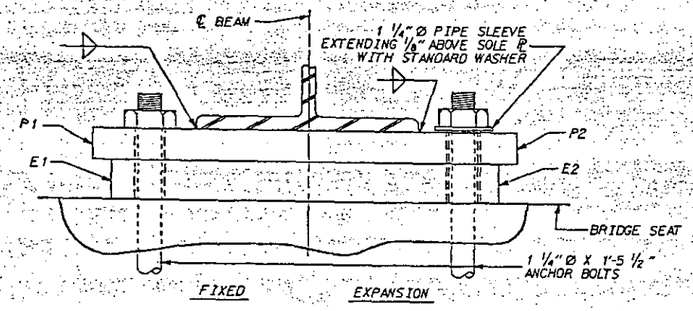
PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

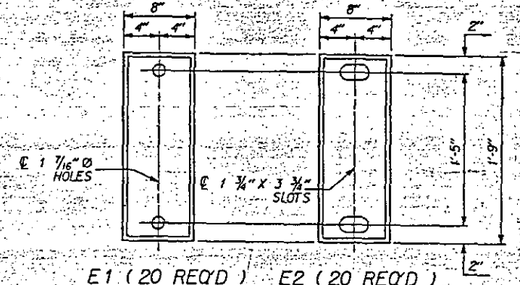
DEAD LOAD DEFLECTION TABLES FOR STAGE 1, STAGE 2 & STAGE 3

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			82



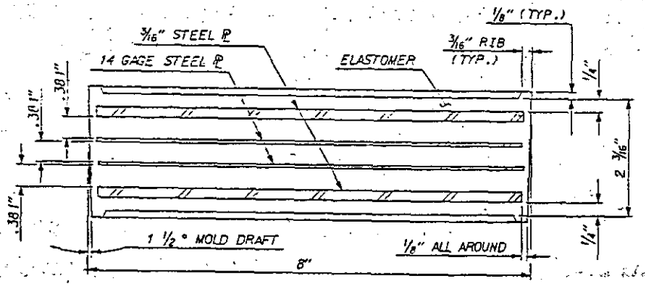
END VIEW



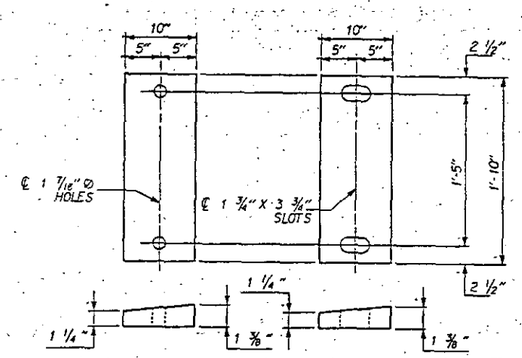
E1 (20 REQ'D) E2 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARINGS

TYPE III



TYPICAL SECTION OF ELASTOMERIC BEARINGS



P1 (20 REQ'D) P2 (20 REQ'D)

SOLE PLATE DETAILS ("P")

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 1 1/4" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1783.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

SOLE PLATE SHALL BE A.S.T.M. A-588 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHITE LEAD AND TALLOW SHALL NOT BE APPLIED TO THE SURFACE OF THE SOLE PLATE IN CONTACT WITH THE ELASTOMERIC BEARING.

FOR ALIGNMENT OF SOLE PLATES, SEE " STRUCTURAL STEEL NOTES & FIELD SPLICE DETAILS " SHEET.

LOAD RATINGS

	MAX. D.L.+ L.L.	MAX. D.L.	MIN. D.L.	MAX. DEFL.
TYPE III	114.51 K.	78.37 K	32.95 K	7.0 %

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

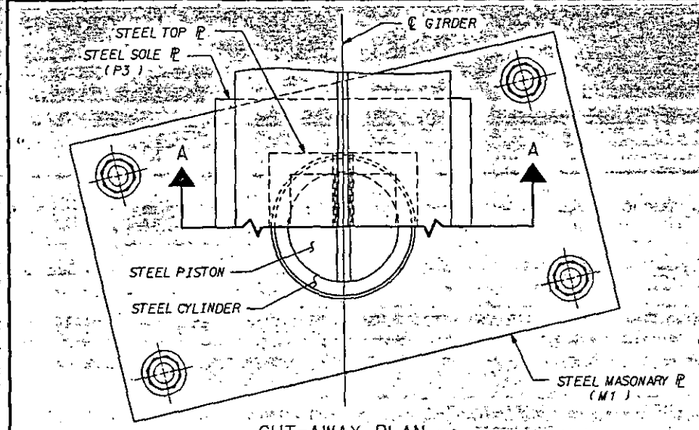
JAN. (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			82

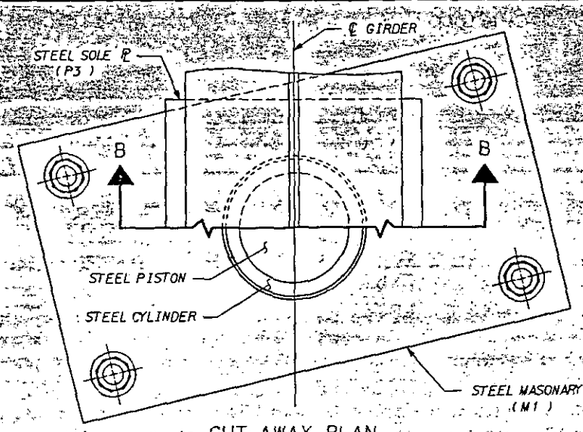
ASSEMBLED BY: ROSS E. KUBENY DATE: 1-27-88		SPECIAL
CHECKED BY: E.C. Powell DATE: 9-88		
DRAWN BY: MIKE BRITT DATE: NOV. 1987		STANDARD
CHECKED BY: E.C. Powell DATE: 9-88		

*CADD [205.1111452218RG.DGN

PRINTED 9-30-88



CUT-AWAY PLAN



CUT-AWAY PLAN

TABLE FOR LOADS AND MOVEMENTS					
BEARING	LOCATION	LOAD IN KIPS			TOTAL MOVEMENT (INCH)
		DEAD	LIVE	TOTAL	
PB1	BENT 1	146	67	213	—
PB2	BENT 2	146	67	213	1 ½"

TABLE FOR PLATE SETTING DATA (EXPANSION POT BEARINGS)				
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	
BENT 2	-⅜"	0	⅜"	

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

BRIDGE SEAT ELEVATIONS ARE BASED ON THE ASSUMED POT BEARING DEPTHS AS SHOWN. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. PLANS FOR ANY ADJUSTMENTS SHALL BE APPROVED BEFORE ANY WORK IS BEGUN ON THE BENTS.

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

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 OCCURED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

AFTER ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, PIPE SHALL BE GROUTED IN PLACE USING NON-SHRINK, NON-METALLIC GROUT AS APPROVED BY THE ENGINEER.

BEARINGS ARE TO BE PROTECTED AND KEPT CLEAN DURING CONSTRUCTION. BEARINGS ARE NOT TO BE DISASSEMBLED DURING INSTALLATION, EXCEPT AT THE MANUFACTURER'S DIRECTION.

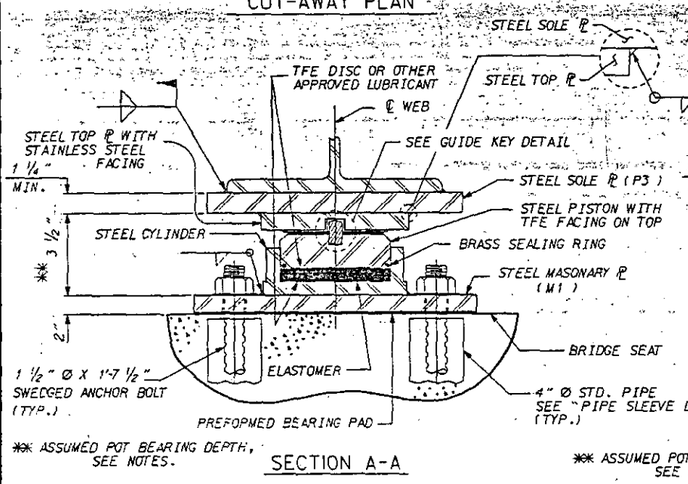
THE CLOSURE PLATE AND THE STANDARD PIPE FOR THE PIPE SLEEVE ASSEMBLY NEED NOT BE GALVANIZED.

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

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

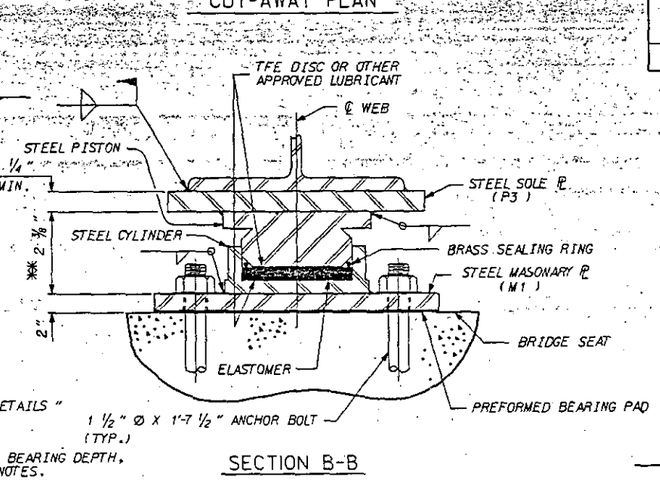
FOR ALIGNMENT OF SOLE PLATES, SEE '' STRUCTURAL STEEL NOTES & FIELD SPLICE DETAILS '' SHEET.

THE POT BEARING SHALL BE CAPABLE OF HANDLING A TOTAL THERMAL MOVEMENT MEASURED PARALLEL TO THE CENTERLINE OF THE ROADWAY OF 1 1/2'' (3/4'' EXP. AND 3/4'' CONTRACTION)



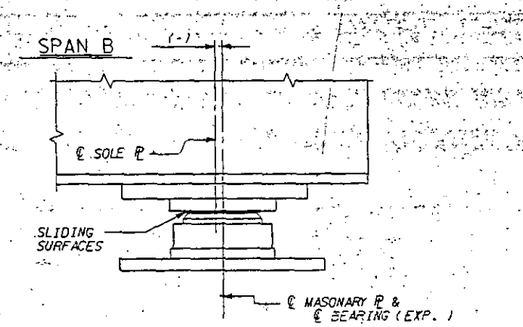
** ASSUMED POT BEARING DEPTH, SEE NOTES.

SECTION A-A

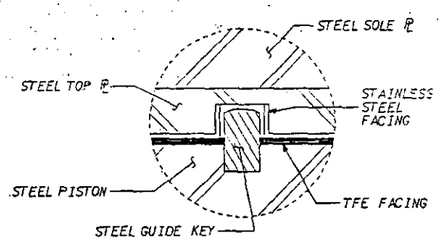


** ASSUMED POT BEARING DEPTH, SEE NOTES.

SECTION B-B



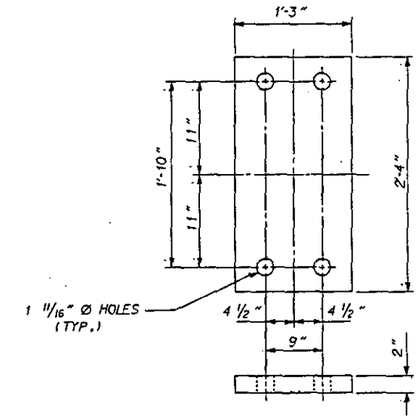
TEMPERATURE SETTING DETAIL



GUIDE KEY DETAIL

EXPANSION POT BEARING DETAILS

PB2 (10 REQUIRED)

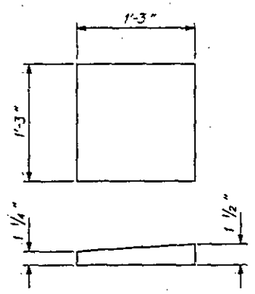


MASONRY PLATE DETAILS

M1 (20 REQUIRED)

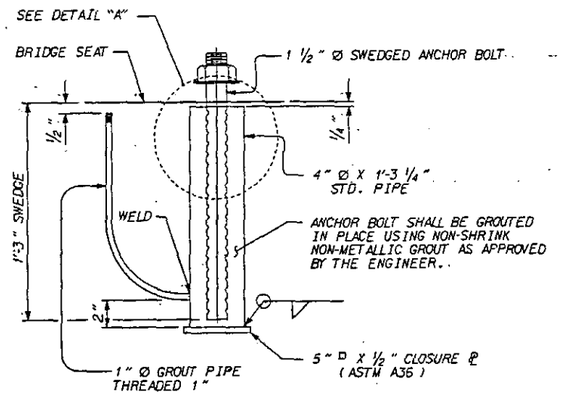
FIXED POT BEARING DETAILS

PB1 (10 REQUIRED)

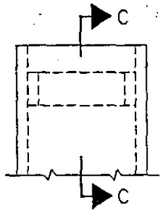


SOLE PLATE DETAILS

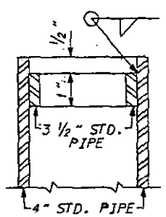
P3 (20 REQUIRED)



PIPE SLEEVE DETAILS



DETAIL " A "



SECTION C-C

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POT BEARING DETAILS

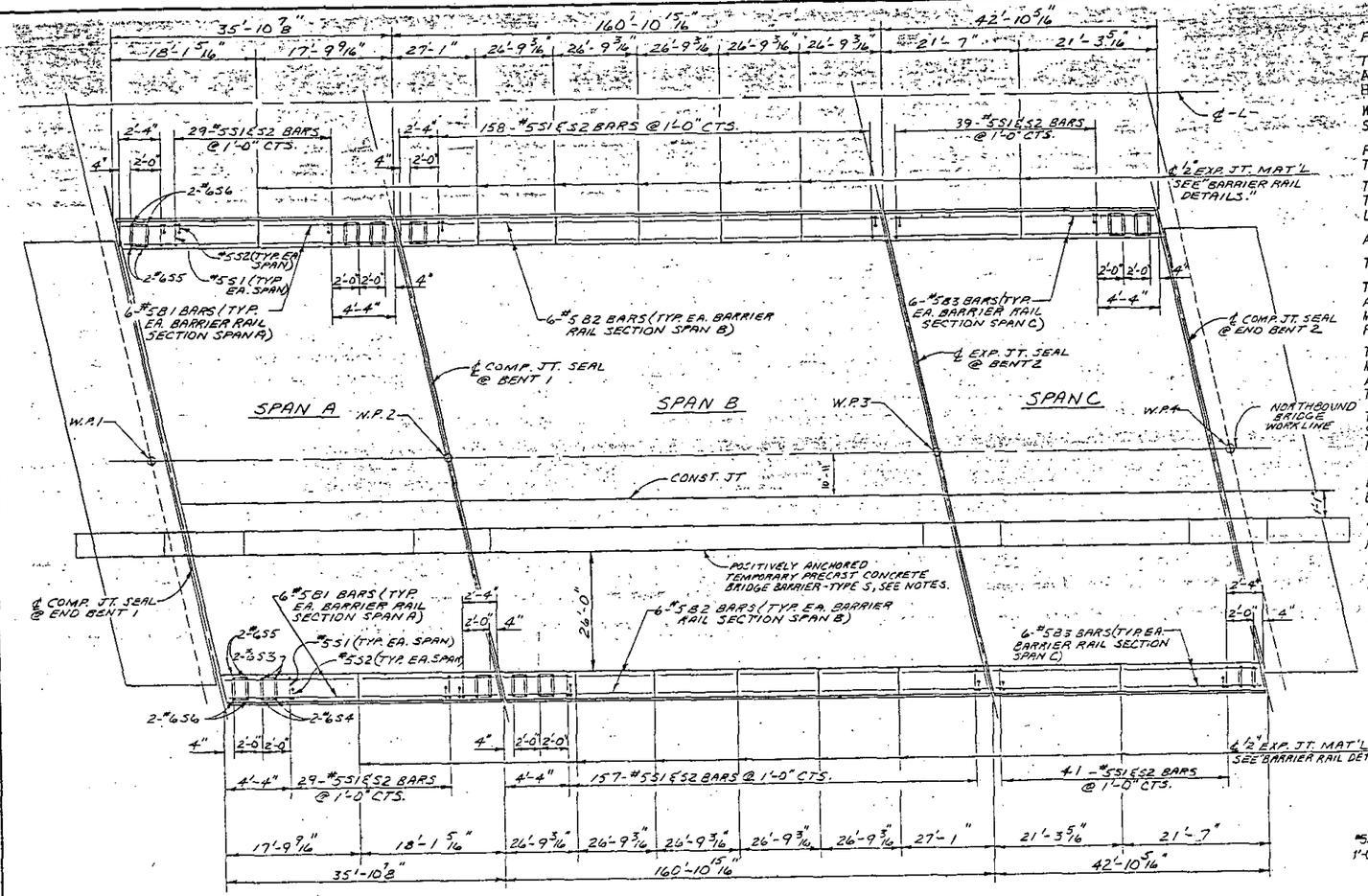
JAN. (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-21
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 1-27-88
CHECKED BY : E.C. POWELL DATE : 9-88

CADD [201,22]14620|BRG.DGN

PRINTED 9-30-88



PLAN

NOTE: SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE POSITIVELY ANCHORED TEMPORARY PRECAST CONCRETE BRIDGE BARRIER - TYPE S.

NOTES

FOR CONCRETE BARRIER RAIL, SEE SPECIAL PROVISIONS.

THE BARRIER RAIL IN EACH STAGE OF EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN OF THAT STAGE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

FERRULES SHALL BE PLUGGED DURING CASTING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

THE BARRIER RAIL ANCHOR ASSEMBLY FERRULES SHALL HAVE THREADS COMPATIBLE TO THE THREADED REINFORCING BARS. THE FERRULES SHALL HAVE A MINIMUM LENGTH EQUAL TO THE LENGTH OF THE THREADS ON THE REINFORCING BARS.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

THE THREADED REINFORCING BARS ARE TO BE TIGHTENED BY HAND.

THE WIRE GAGE AND FERRULES SHALL BE OF SUFFICIENT STRENGTH TO ENSURE LOAD ANCHORING CAPACITY AS SPECIFIED IN THE AASHTO SPECIFICATIONS. A MANUFACTURER'S CERTIFICATION OF LOAD ANCHORING CAPACITY SHALL BE FURNISHED WITH EACH SHIPMENT OF BARRIER RAIL ANCHOR ASSEMBLIES.

THE THREADED REINFORCING BARS SHALL BE GRADE 60. THE BAR SHALL BE MANUFACTURED WITH A MALE THREADED END WITH A MINIMUM TENSILE STRESS AREA OF 0.334 SQUARE INCHES. THE BARRIER RAIL ANCHOR ASSEMBLY AND THREADED REINFORCING BARS SHALL BE SUPPLIED AS A UNIT.

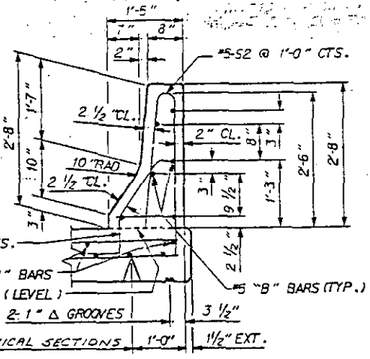
THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE ASSEMBLED IN THE SHOP. REINFORCING BAR THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE BARRIER RAIL ANCHOR WITH THREADED REINFORCING BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

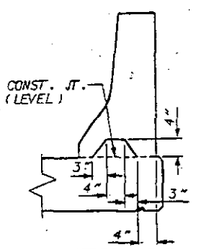
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #5 "S" BARS AT THE EXPANSION JOINT IN THE RAIL MAY BE SHIFTED SLIGHTLY TO MAINTAIN 3" MIN. CONCRETE COVER.



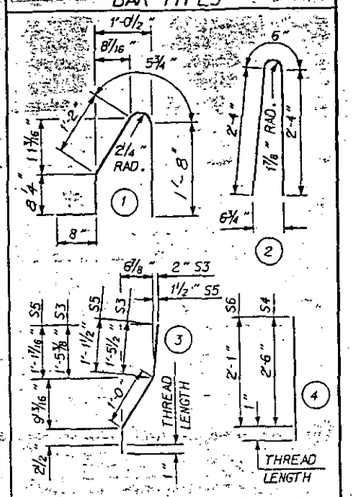
SECTION THRU RAIL



SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

BAR TYPES



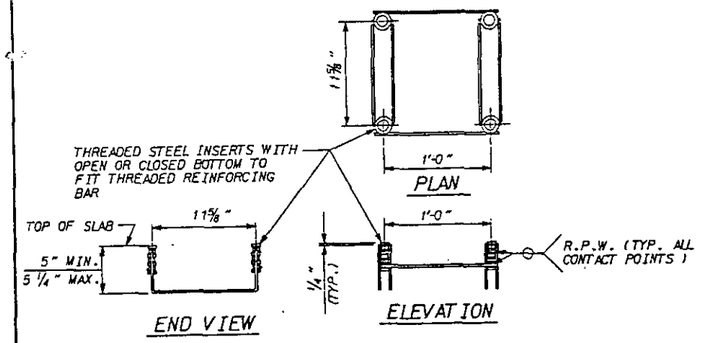
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	455	#5	1	4'-8"	2,215
S2	455	#5	2	5'-2"	2,452
S3	16	#5	3	2'-9"	66
S4	16	#5	4	2'-7"	62
S5	8	#5	3	2'-5"	29
S6	8	#5	4	2'-2"	26
B1	24	#5	STR.	17'-5"	436
B2	72	#5	STR.	26'-4"	1,978
B3	24	#5	STR.	20'-11"	524

EPOXY COATED REINFORCING STEEL	7,788 LBS.
CLASS A-A CONCRETE	44.0 CU. YDS.
CONCRETE BARRIER RAIL	479.3 LIN. FT.



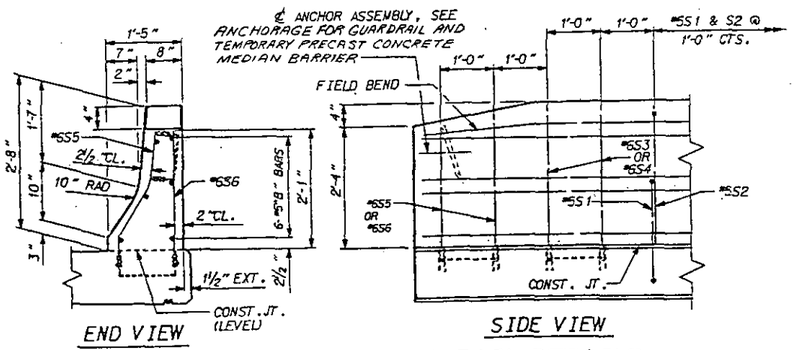
BARRIER RAIL ANCHOR ASSEMBLY

12 ANCHOR ASSEMBLIES REQUIRED

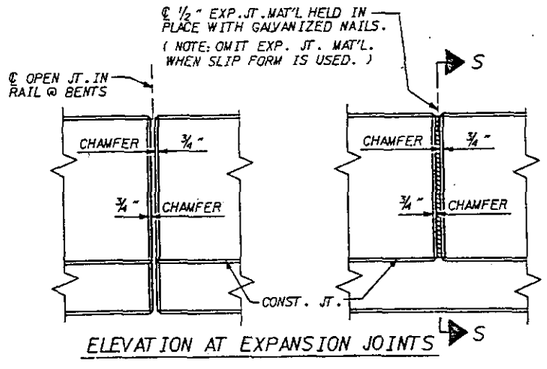
ASSEMBLED BY : RORY MARTIN DATE : 11-10-87		SPECIAL
CHECKED BY : ELLIS POWELL DATE : 11-22-88		
DRAWN BY : R. BISSETTE DATE : 5/28/87		STANDARD
CHECKED BY : S.J. DAVIS DATE : 9/3/87		

REDRAWN 10-2-87

CADD



BARRIER RAIL-END OF RAIL DETAILS



BARRIER RAIL DETAILS

PROJECT NO. 8.1670801

MECKLENBURG COUNTY #1

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

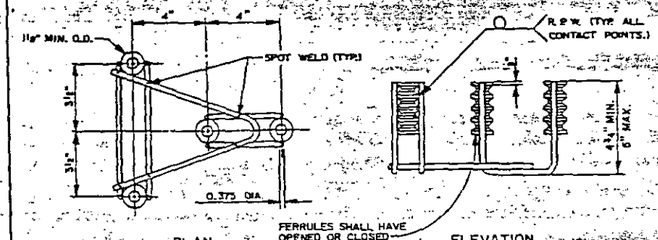
CONCRETE BARRIER RAIL AND TEMPORARY PRECAST CONCRETE BRIDGE BARRIER NBL

OCTOBER 1987

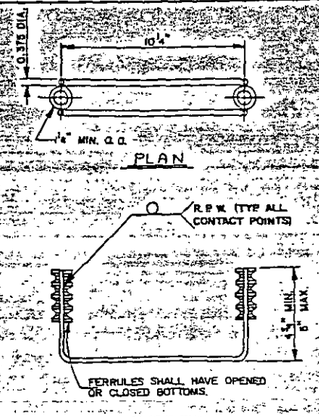
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			82

STD. NO. CBRI

AV 47637



GUARDRAIL ANCHOR ASSEMBLY



2-BOLT ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1 1/2".

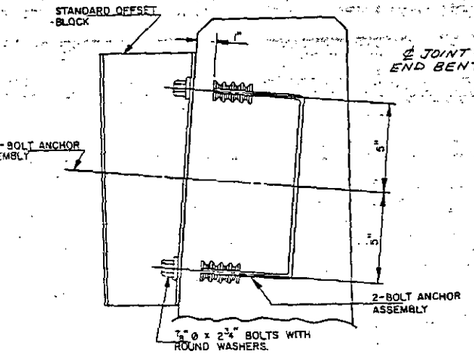
B. 4 - 7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2-7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" DIA. X 2 3/4" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

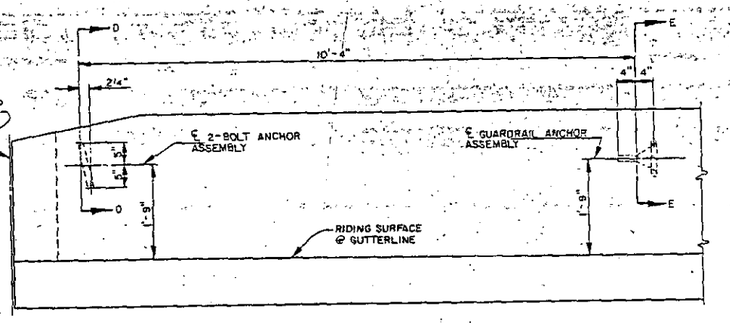
THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

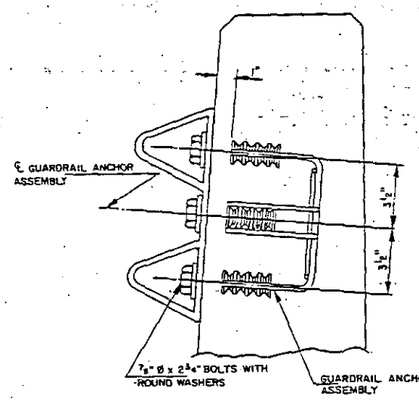
THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



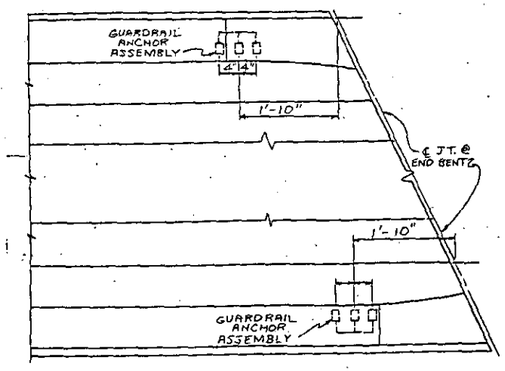
SECTION D-D



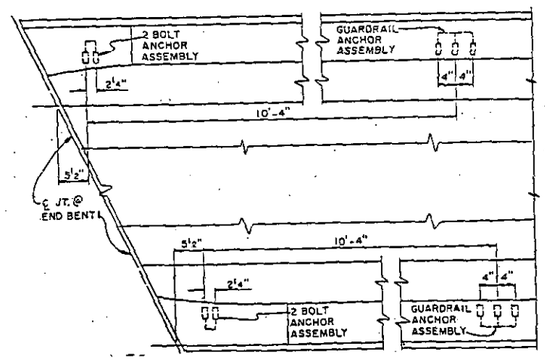
ELEVATION



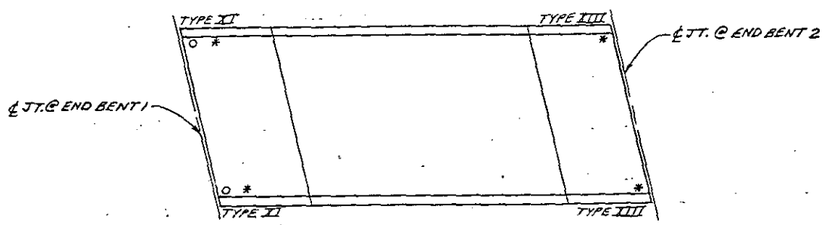
SECTION E-E



BARRIER RAIL - LOCATION OF ANCHOR ASSEMBLY
(TYPE XIII)



PLAN
LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK
(TYPE XI)



O — DENOTES 2 BOLT ANCHOR ASSEMBLY.
* — DENOTES GUARDRAIL ANCHOR ASSEMBLY.

SKETCH SHOWING POINTS OF ATTACHMENTS

DRAWN BY MORT MARTIN DATE 1-20-88
CHECKED BY ELLIS POWELL DATE 11-21-88

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.92-L-

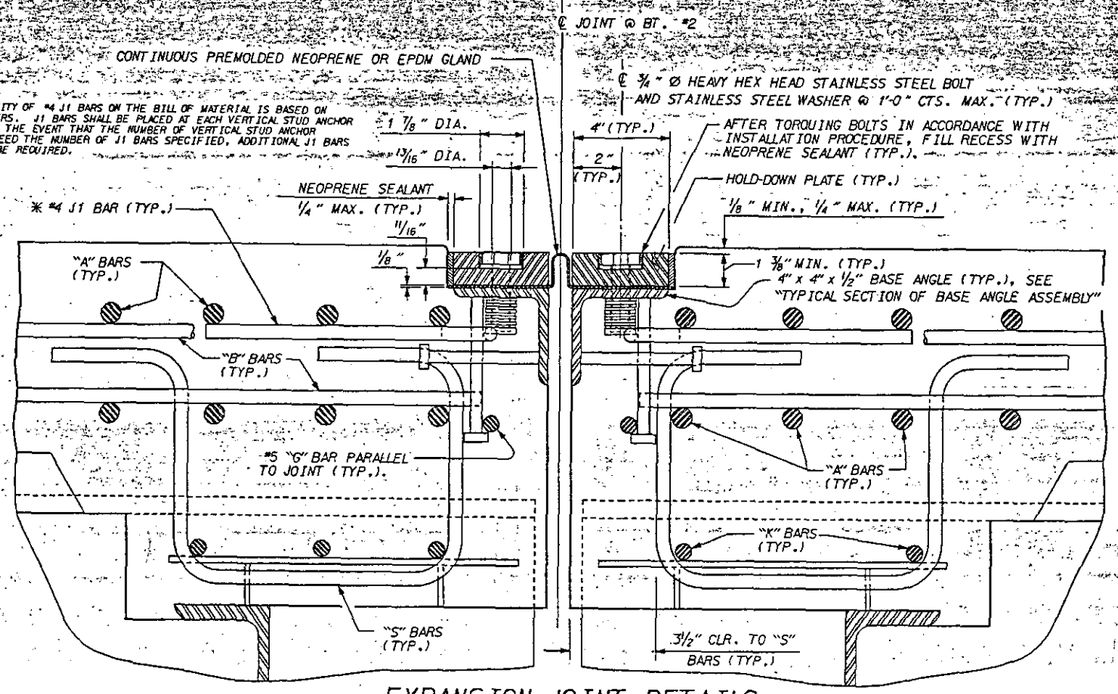
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ANCHORAGE FOR GUARDRAIL AND TEMPORARY PRECAST CONCRETE BRIDGE BARRIER. (N.B.L.)

JAN. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-23
1			3			TOTAL SHEETS
2			4			82

N.B.

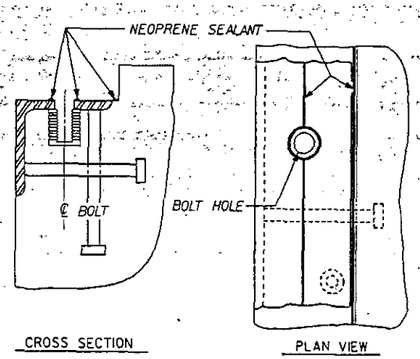


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1¾" TO 1¾" THICK BY 4 1/4" TO 4 1/2" WIDE IN ORDER FOR THE JOINT TO BE SET TO THE PROPER DEPTH. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED METHOD OF HOLDING THE BASE ANGLE ASSEMBLY IN PLACE WHILE THE CONCRETE IS CAST AROUND IT. THE TEMPLATE SHALL BE FLUSH WITH THE TOP OF DECK.
3. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
4. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅛" IN DIAMETER WITH A HAND PUNCH.
5. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
6. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT.-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT.-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT.-LBS. AFTER SEVEN (7) DAYS.
7. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.



CROSS SECTION PLAN VIEW

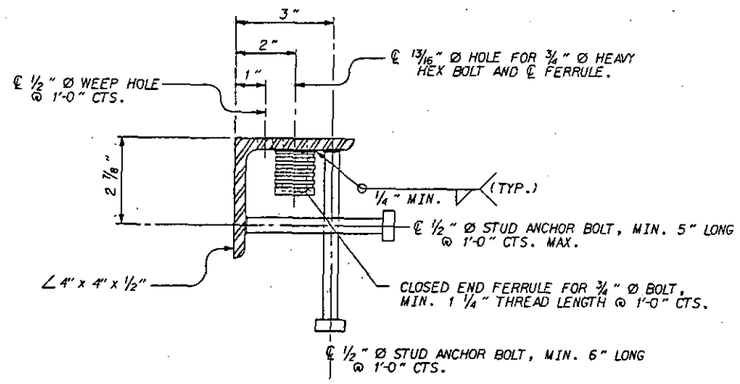
INSTALLATION SKETCH

GENERAL NOTES

1. ARMORED JOINTS SHALL BE PROVIDED AT ALL LOCATIONS SHOWN ON THE PLANS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO TYPE 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A108, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT. GLAND SHALL BE EITHER ELASTIC POLYCHLOROPRENE (NEOPRENE) OR ETHYL PROPYLENE DIENE MONOMER (EPDM) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

	ASTM TEST	REQUIREMENTS
HARDNESS, DUROMETER-SHORE A	D2240	60±5, NEOPRENE (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED) 75±5, EPDM AND NEOPRENE (UPWARD NON-CORRUGATED SHAPE) 80±5, EPDM (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
TENSILE STRENGTH	D412	2000 PSI, MIN
ELONGATION AT BREAK	D412	250% MIN
THICKNESS OF UPTURNED PORTION OF GLAND	N/A	¼" (NON-CORRUGATED SHAPE) ⅛" (CORRUGATED SHAPE)

5. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
6. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO PAINTING.
7. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIALLY BLAST CLEANED AND SHALL BE PAINTED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS. EACH COAT SHALL HAVE A MINIMUM THICKNESS OF 3 MILS. PAINTED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR DAMAGED GALVANIZING.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. BASE ANGLE ASSEMBLIES SHALL BE SHIPPED IN 25' MINIMUM LENGTHS. FOR JOINTS REQUIRING BASE ANGLE ASSEMBLIES LONGER THAN 25', FIELD WELDING OF THE BASE ANGLE WILL BE PERMITTED. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. WHEN FIELD WELDING IS PROPOSED, THE CONTRACTOR SHALL SUBMIT PROPOSED WELDING DETAILS FOR APPROVAL. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF ⅛" AND A MAXIMUM OF ¼" BELOW THE TOP OF SLAB.
10. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
11. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
12. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ ROWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
2	77°-40'-21"	1 7/8"	2 3/8"	1 15/16"	1 ½"

ASSEMBLED BY : ROSS E. KUBENY	DATE : 9-15-88		SPECIAL
CHECKED BY : E.C. Powell	DATE : 9-88		
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87		STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87		

CADD [207,223]46202EJS.DGN

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS

FEBRUARY (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-24
1			3			TOTAL SHEETS
2			4			82

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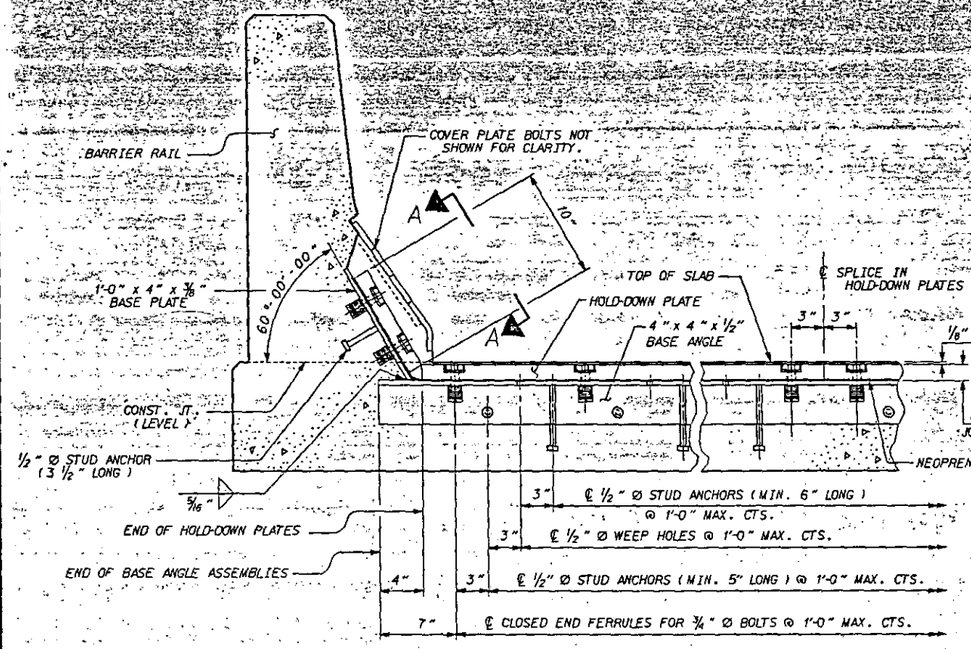
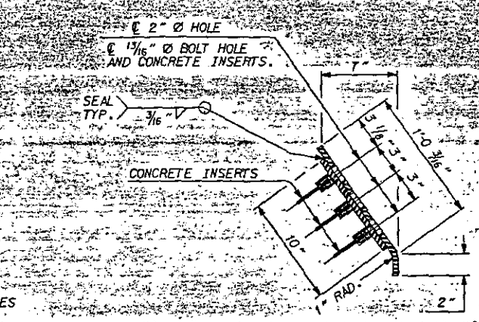
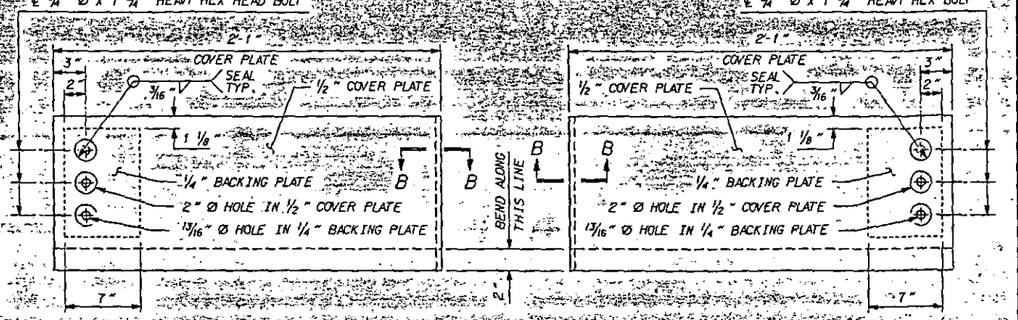


SECTION THRU RAIL NORMAL TO JOINT



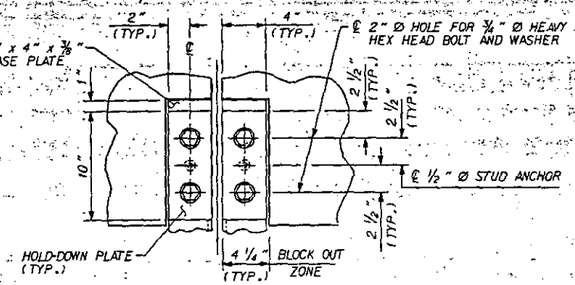
END VIEW



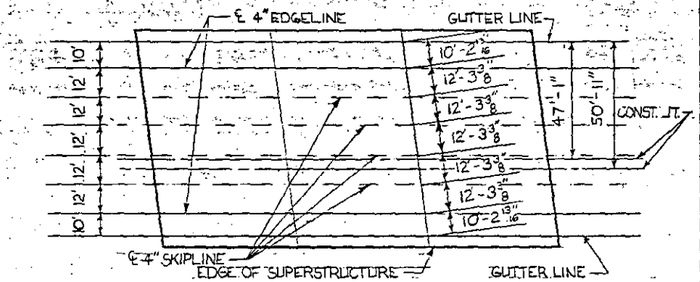
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

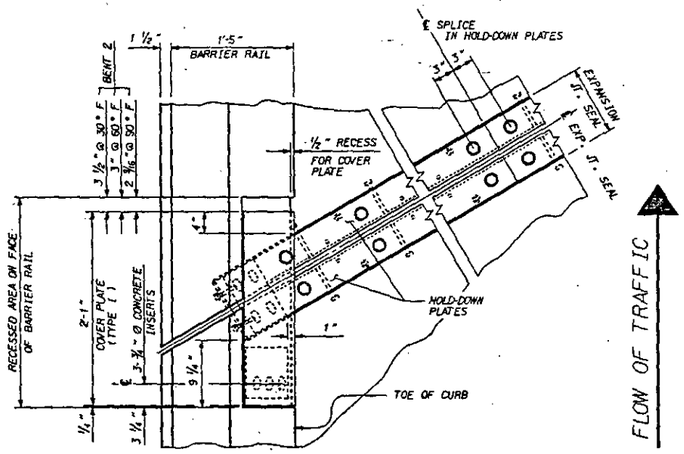
COVER PLATE DETAILS



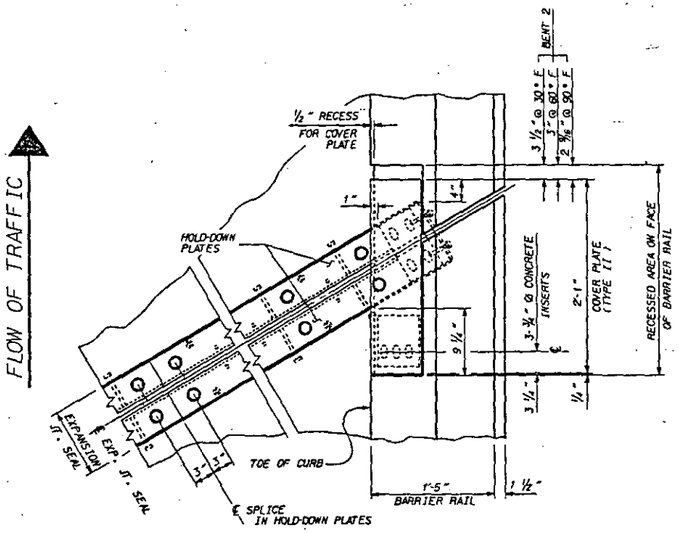
SECTION A - A



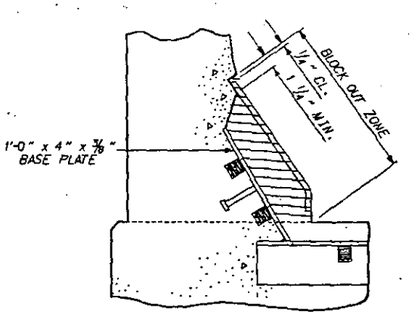
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

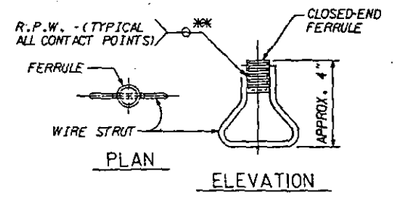


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



CONCRETE INSERT

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

SECTION B - B

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

FEBRUARY (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-25
1			3			TOTAL SHEETS
2			4			82

ASSEMBLED BY : ROSS E. KUBENY DATE : 9-26-88 CHECKED BY : G.A. THOMPSON DATE : 3-21-89	SPECIAL
DRAWN BY : ROSS E. KUBENY DATE : 9-18-87 CHECKED BY : CINDY R. KING DATE : 10-2-87	STANDARD

PRINTED 9-30-88

CADD [20T,22]1462O1EJS.DGN

EJS2

29-NOV-1988 11:18
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KRUBENY

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	49	6	STR.	32'-1"	2361
A2	49	6	STR.	32'-1"	2361
*A101	1	6	STR.	30'-8"	46
*A102	1	6	STR.	28'-0"	42
*A103	1	6	STR.	25'-4"	38
*A104	1	6	STR.	22'-8"	34
*A105	1	6	STR.	19'-11"	30
*A106	1	6	STR.	17'-3"	26
*A107	1	6	STR.	14'-7"	22
*A108	1	6	STR.	11'-11"	18
*A109	1	6	STR.	9'-3"	14
*A110	1	6	STR.	6'-7"	10
*A111	1	6	STR.	3'-11"	6
A121	1	6	STR.	30'-8"	46
A122	1	6	STR.	28'-0"	42
A123	1	6	STR.	25'-4"	38
A124	1	6	STR.	22'-8"	34
A125	1	6	STR.	19'-11"	30
A126	1	6	STR.	17'-3"	26
A127	1	6	STR.	14'-7"	22
A128	1	6	STR.	11'-11"	18
A129	1	6	STR.	9'-3"	14
A130	1	6	STR.	6'-7"	10
A131	1	6	STR.	3'-11"	6
*A361	1	6	STR.	29'-7"	44
*A362	1	6	STR.	26'-11"	40
*A363	1	6	STR.	24'-3"	36
*A364	1	6	STR.	21'-7"	32
*A365	1	6	STR.	18'-10"	28
*A366	1	6	STR.	16'-2"	24
*A367	1	6	STR.	13'-6"	20
*A368	1	6	STR.	10'-10"	16
*A369	1	6	STR.	8'-2"	12
*A370	1	6	STR.	5'-6"	8
*A371	1	6	STR.	2'-10"	4

REINFORCING STEEL LBS. 4684

*EPOXY COATED REINFORCING STEEL LBS. 3799

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A381	1	6	STR.	29'-7"	44
A382	1	6	STR.	26'-11"	40
A383	1	6	STR.	24'-3"	36
A384	1	6	STR.	21'-7"	32
A385	1	6	STR.	18'-10"	28
A386	1	6	STR.	16'-2"	24
A387	1	6	STR.	13'-6"	20
A388	1	6	STR.	10'-10"	16
A389	1	6	STR.	8'-2"	12
A390	1	6	STR.	5'-6"	8
A391	1	6	STR.	2'-10"	4
*B1	42	4	STR.	18'-4"	514
B2	48	5	STR.	35'-5"	1773
*G1	2	5	STR.	30'-11"	64
*K1	4	5	1	6'-2"	26
*K2	8	5	2	5'-7"	47
*K3	4	5	1	4'-1"	17
*K4	12	5	STR.	8'-10"	111
*S11	24	4	4	3'-4"	53
*S12	24	4	4	3'-6"	56

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	263	6	STR.	32'-1"	12674
A2	263	6	STR.	32'-1"	12674
*A101	1	6	STR.	30'-8"	46
*A102	1	6	STR.	28'-0"	42
*A103	1	6	STR.	25'-4"	38
*A104	1	6	STR.	22'-8"	34
*A105	1	6	STR.	19'-11"	30
*A106	1	6	STR.	17'-3"	26
*A107	1	6	STR.	14'-7"	22
*A108	1	6	STR.	11'-11"	18
*A109	1	6	STR.	9'-3"	14
*A110	1	6	STR.	6'-7"	10
*A111	1	6	STR.	3'-11"	6
A241	1	6	STR.	32'-5"	49
A242	1	6	STR.	29'-9"	45
A243	1	6	STR.	27'-1"	41
A244	1	6	STR.	24'-5"	37
A245	1	6	STR.	21'-9"	33
A246	1	6	STR.	19'-1"	29
A247	1	6	STR.	16'-5"	25
A248	1	6	STR.	13'-9"	21
A249	1	6	STR.	11'-1"	17
A250	1	6	STR.	8'-5"	13
A251	1	6	STR.	5'-9"	9
A252	1	6	STR.	3'-0"	5
*A361	1	6	STR.	29'-7"	44
*A362	1	6	STR.	26'-11"	40
*A363	1	6	STR.	24'-3"	36
*A364	1	6	STR.	21'-7"	32
*A365	1	6	STR.	18'-10"	28
*A366	1	6	STR.	16'-2"	24
*A367	1	6	STR.	13'-6"	20
*A368	1	6	STR.	10'-10"	16
*A369	1	6	STR.	8'-2"	12
*A370	1	6	STR.	5'-6"	8
*A371	1	6	STR.	2'-10"	4

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A381	1	6	STR.	29'-7"	44
A382	1	6	STR.	26'-11"	40
A383	1	6	STR.	24'-3"	36
A384	1	6	STR.	21'-7"	32
A385	1	6	STR.	18'-10"	28
A386	1	6	STR.	16'-2"	24
A387	1	6	STR.	13'-6"	20
A388	1	6	STR.	10'-10"	16
A389	1	6	STR.	8'-2"	12
A390	1	6	STR.	5'-6"	8
A391	1	6	STR.	2'-10"	4
*B3	126	4	STR.	27'-9"	2336
B4	144	5	STR.	54'-6"	8185
*G1	2	5	STR.	30'-11"	64
*J1	29	4	3	1'-5"	27
*K1	6	5	1	6'-2"	39
*K2	12	5	2	5'-7"	70
*K3	6	5	1	4'-1"	26
*K4	18	5	STR.	8'-10"	166
*S13	48	4	4	4'-0"	128

REINFORCING STEEL LBS. 21447

*EPOXY COATED REINFORCING STEEL LBS. 16080

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	60	6	STR.	32'-1"	2891
A2	60	6	STR.	32'-1"	2891
*A101	1	6	STR.	30'-8"	46
*A102	1	6	STR.	28'-0"	42
*A103	1	6	STR.	25'-4"	38
*A104	1	6	STR.	22'-8"	34
*A105	1	6	STR.	19'-11"	30
*A106	1	6	STR.	17'-3"	26
*A107	1	6	STR.	14'-7"	22
*A108	1	6	STR.	11'-11"	18
*A109	1	6	STR.	9'-3"	14
*A110	1	6	STR.	6'-7"	10
*A111	1	6	STR.	3'-11"	6
A121	1	6	STR.	30'-8"	46
A122	1	6	STR.	28'-0"	42
A123	1	6	STR.	25'-4"	38
A124	1	6	STR.	22'-8"	34
A125	1	6	STR.	19'-11"	30
A126	1	6	STR.	17'-3"	26
A127	1	6	STR.	14'-7"	22
A128	1	6	STR.	11'-11"	18
A129	1	6	STR.	9'-3"	14
A130	1	6	STR.	6'-7"	10
A131	1	6	STR.	3'-11"	6
*A361	1	6	STR.	29'-7"	44
*A362	1	6	STR.	26'-11"	40
*A363	1	6	STR.	24'-3"	36
*A364	1	6	STR.	21'-7"	32
*A365	1	6	STR.	18'-10"	28
*A366	1	6	STR.	16'-2"	24
*A367	1	6	STR.	13'-6"	20
*A368	1	6	STR.	10'-10"	16
*A369	1	6	STR.	8'-2"	12
*A370	1	6	STR.	5'-6"	8
*A371	1	6	STR.	2'-10"	4

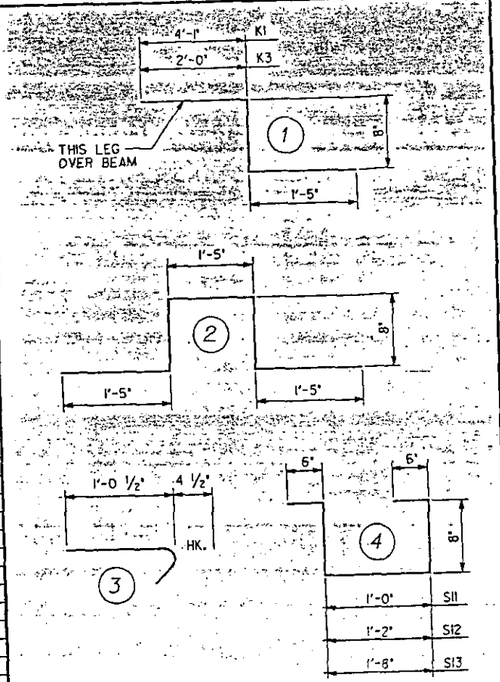
REINFORCING STEEL LBS. 5601

*EPOXY COATED REINFORCING STEEL LBS. 4452

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A441	1	6	STR.	31'-4"	47
A442	1	6	STR.	28'-8"	43
A443	1	6	STR.	26'-0"	39
A444	1	6	STR.	23'-4"	35
A445	1	6	STR.	20'-8"	31
A446	1	6	STR.	18'-0"	27
A447	1	6	STR.	15'-4"	23
A448	1	6	STR.	12'-8"	19
A449	1	6	STR.	10'-0"	15
A450	1	6	STR.	7'-4"	11
A451	1	6	STR.	4'-8"	7
A452	1	6	STR.	1'-11"	3
*B5	42	4	STR.	21'-9"	610
B6	48	5	STR.	42'-5"	2124
*G1	2	5	STR.	30'-11"	64
*J1	29	4	3	1'-5"	27
*K1	4	5	1	6'-2"	26
*K2	8	5	2	5'-7"	47
*K3	4	5	1	4'-1"	17
*K4	12	5	STR.	8'-10"	111
*S11	24	4	4	3'-4"	53
*S12	24	4	4	3'-6"	56

BAR TYPES



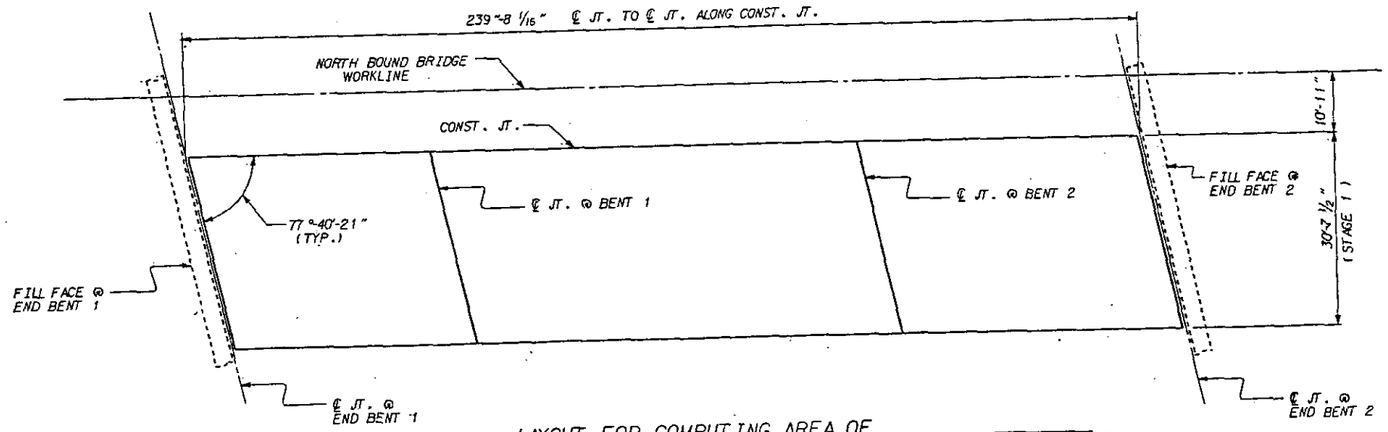
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

STAGE 1	CLASS A-A CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN "A"	35.2	4684	3799
SPAN "B"	153.5	21447	16080
SPAN "C"	41.8	5601	4452
TOTALS **	230.5	31732	24331

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB IN STAGE 1

(SQ. FT. = 7340)

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

— STAGE 1 —

BILL OF MATERIAL

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-26
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 11-29-88
CHECKED BY : E.C. Powell DATE : 11-29-88

CADD [207,2234620]BOM.DGN

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	43	6	STR.	50'-1"	3235
A4	43	6	STR.	50'-1"	3235
*A301	1	6	STR.	46'-8"	70
*A302	1	6	STR.	44'-0"	66
*A303	1	6	STR.	41'-4"	62
*A304	1	6	STR.	38'-8"	58
*A305	1	6	STR.	35'-11"	54
*A306	1	6	STR.	33'-3"	50
*A307	1	6	STR.	30'-7"	46
*A308	1	6	STR.	27'-11"	42
*A309	1	6	STR.	25'-3"	38
*A310	1	6	STR.	22'-7"	34
*A311	1	6	STR.	19'-11"	30
*A312	1	6	STR.	17'-3"	26
*A313	1	6	STR.	14'-7"	22
*A314	1	6	STR.	11'-11"	18
*A315	1	6	STR.	9'-3"	14
*A316	1	6	STR.	6'-7"	10
*A317	1	6	STR.	3'-11"	6
A321	1	6	STR.	46'-8"	70
A322	1	6	STR.	44'-0"	66
A323	1	6	STR.	41'-4"	62
A324	1	6	STR.	38'-8"	58
A325	1	6	STR.	35'-11"	54
A326	1	6	STR.	33'-3"	50
A327	1	6	STR.	30'-7"	46
A328	1	6	STR.	27'-11"	42
A329	1	6	STR.	25'-3"	38
A330	1	6	STR.	22'-7"	34
A331	1	6	STR.	19'-11"	30
A332	1	6	STR.	17'-3"	26
A333	1	6	STR.	14'-7"	22
A334	1	6	STR.	11'-11"	18
A335	1	6	STR.	9'-3"	14
A336	1	6	STR.	6'-7"	10
A337	1	6	STR.	3'-11"	6
*A401	1	6	STR.	47'-7"	71
*A402	1	6	STR.	44'-11"	67
*A403	1	6	STR.	42'-3"	63
*A404	1	6	STR.	39'-7"	59
*A405	1	6	STR.	36'-10"	55
*A406	1	6	STR.	34'-2"	51
*A407	1	6	STR.	31'-6"	47
*A408	1	6	STR.	28'-10"	43
*A409	1	6	STR.	26'-2"	39

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A410	1	6	STR.	23'-6"	35
*A411	1	6	STR.	20'-10"	31
*A412	1	6	STR.	18'-2"	27
*A413	1	6	STR.	15'-6"	23
*A414	1	6	STR.	12'-10"	19
*A415	1	6	STR.	10'-2"	15
*A416	1	6	STR.	7'-6"	11
*A417	1	6	STR.	4'-10"	7
A421	1	6	STR.	47'-7"	71
A422	1	6	STR.	44'-11"	67
A423	1	6	STR.	42'-3"	63
A424	1	6	STR.	39'-7"	59
A425	1	6	STR.	36'-10"	55
A426	1	6	STR.	34'-2"	51
A427	1	6	STR.	31'-6"	47
A428	1	6	STR.	28'-10"	43
A429	1	6	STR.	26'-2"	39
A430	1	6	STR.	23'-6"	35
A431	1	6	STR.	20'-10"	31
A432	1	6	STR.	18'-2"	27
A433	1	6	STR.	15'-6"	23
A434	1	6	STR.	12'-10"	19
A435	1	6	STR.	10'-2"	15
A436	1	6	STR.	7'-6"	11
A437	1	6	STR.	4'-10"	7
*B7	66	4	STR.	18'-4"	808
B8	76	5	STR.	35'-5"	2807
*G2	2	5	STR.	49'-4"	103
*K1	4	5	1	6'-2"	26
*K2	16	5	2	5'-7"	93
*K3	4	5	1	4'-1"	17
*K4	20	5	STR.	8'-10"	184
*S11	40	4	4	3'-4"	89
*S12	40	4	4	3'-6"	94

REINFORCING STEEL LBS. 7351

*EPOXY COATED REINFORCING STEEL LBS. 5958

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	257	6	STR.	50'-1"	19333
A4	257	6	STR.	50'-1"	19333
*A301	1	6	STR.	46'-8"	70
*A302	1	6	STR.	44'-0"	66
*A303	1	6	STR.	41'-4"	62
*A304	1	6	STR.	38'-8"	58
*A305	1	6	STR.	35'-11"	54
*A306	1	6	STR.	33'-3"	50
*A307	1	6	STR.	30'-7"	46
*A308	1	6	STR.	27'-11"	42
*A309	1	6	STR.	25'-3"	38
*A310	1	6	STR.	22'-7"	34
*A311	1	6	STR.	19'-11"	30
*A312	1	6	STR.	17'-3"	26
*A313	1	6	STR.	14'-7"	22
*A314	1	6	STR.	11'-11"	18
*A315	1	6	STR.	9'-3"	14
*A316	1	6	STR.	6'-7"	10
*A317	1	6	STR.	3'-11"	6
A321	1	6	STR.	46'-8"	70
A322	1	6	STR.	44'-0"	66
A323	1	6	STR.	41'-4"	62
A324	1	6	STR.	38'-8"	58
A325	1	6	STR.	35'-11"	54
A326	1	6	STR.	33'-3"	50
A327	1	6	STR.	30'-7"	46
A328	1	6	STR.	27'-11"	42
A329	1	6	STR.	25'-3"	38
A330	1	6	STR.	22'-7"	34
A331	1	6	STR.	19'-11"	30
A332	1	6	STR.	17'-3"	26
A333	1	6	STR.	14'-7"	22
A334	1	6	STR.	11'-11"	18
A335	1	6	STR.	9'-3"	14
A336	1	6	STR.	6'-7"	10
A337	1	6	STR.	3'-11"	6
*A401	1	6	STR.	47'-7"	71
*A402	1	6	STR.	44'-11"	67
*A403	1	6	STR.	42'-3"	63
*A404	1	6	STR.	39'-7"	59
*A405	1	6	STR.	36'-10"	55
*A406	1	6	STR.	34'-2"	51
*A407	1	6	STR.	31'-6"	47
*A408	1	6	STR.	28'-10"	43
*A409	1	6	STR.	26'-2"	39

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A410	1	6	STR.	23'-6"	35
*A411	1	6	STR.	20'-10"	31
*A412	1	6	STR.	18'-2"	27
*A413	1	6	STR.	15'-6"	23
*A414	1	6	STR.	12'-10"	19
*A415	1	6	STR.	10'-2"	15
*A416	1	6	STR.	7'-6"	11
*A417	1	6	STR.	4'-10"	7
A441	1	6	STR.	49'-4"	74
A442	1	6	STR.	46'-8"	70
A443	1	6	STR.	44'-0"	66
A444	1	6	STR.	41'-4"	62
A445	1	6	STR.	38'-8"	58
A446	1	6	STR.	36'-0"	54
A447	1	6	STR.	33'-4"	50
A448	1	6	STR.	30'-8"	46
A449	1	6	STR.	28'-0"	42
A450	1	6	STR.	25'-4"	38
A451	1	6	STR.	22'-8"	34
A452	1	6	STR.	19'-11"	30
A453	1	6	STR.	17'-3"	26
A454	1	6	STR.	14'-7"	22
A455	1	6	STR.	11'-11"	18
A456	1	6	STR.	9'-3"	14
A457	1	6	STR.	6'-7"	10
A458	1	6	STR.	3'-11"	6
*B9	198	4	STR.	27'-9"	3670
B10	228	5	STR.	54'-6"	12960
*G2	2	5	STR.	49'-4"	103
*J1	49	4	3	1'-5"	46
*K1	6	5	1	6'-2"	39
*K2	24	5	2	5'-7"	140
*K3	6	5	1	4'-1"	26
*K4	30	5	STR.	8'-10"	276
*S13	80	4	4	4'-0"	214

REINFORCING STEEL LBS. 33659

*EPOXY COATED REINFORCING STEEL LBS. 25156

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	54	6	STR.	50'-1"	4062
A4	54	6	STR.	50'-1"	4062
*A301	1	6	STR.	46'-8"	70
*A302	1	6	STR.	44'-0"	66
*A303	1	6	STR.	41'-4"	62
*A304	1	6	STR.	38'-8"	58
*A305	1	6	STR.	35'-11"	54
*A306	1	6	STR.	33'-3"	50
*A307	1	6	STR.	30'-7"	46
*A308	1	6	STR.	27'-11"	42
*A309	1	6	STR.	25'-3"	38
*A310	1	6	STR.	22'-7"	34
*A311	1	6	STR.	19'-11"	30
*A312	1	6	STR.	17'-3"	26
*A313	1	6	STR.	14'-7"	22
*A314	1	6	STR.	11'-11"	18
*A315	1	6	STR.	9'-3"	14
*A316	1	6	STR.	6'-7"	10
*A317	1	6	STR.	3'-11"	6
A421	1	6	STR.	47'-7"	71
A422	1	6	STR.	44'-11"	67
A423	1	6	STR.	42'-3"	63
A424	1	6	STR.	39'-7"	59
A425	1	6	STR.	36'-10"	55
A426	1	6	STR.	34'-2"	51
A427	1	6	STR.	31'-6"	47
A428	1	6	STR.	28'-10"	43
A429	1	6	STR.	26'-2"	39
A430	1	6	STR.	23'-6"	35
A431	1	6	STR.	20'-10"	31
A432	1	6	STR.	18'-2"	27
A433	1	6	STR.	15'-6"	23
A434	1	6	STR.	12'-10"	19
A435	1	6	STR.	10'-2"	15
A436	1	6	STR.	7'-6"	11
A437	1	6	STR.	4'-10"	7
*A401	1	6	STR.	47'-7"	71
*A402	1	6	STR.	44'-11"	67
*A403	1	6	STR.	42'-3"	63
*A404	1	6	STR.	39'-7"	59
*A405	1	6	STR.	36'-10"	55
*A406	1	6	STR.	34'-2"	51
*A407	1	6	STR.	31'-6"	47
*A408	1	6	STR.	28'-10"	43
*A409	1	6	STR.	26'-2"	39

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A410	1	6	STR.	23'-6"	35
*A411	1	6	STR.	20'-10"	31
*A412	1	6	STR.	18'-2"	27
*A413	1	6	STR.	15'-6"	23
*A414	1	6	STR.	12'-10"	19
*A415	1	6	STR.	10'-2"	15
*A416	1	6	STR.	7'-6"	11
*A417	1	6	STR.	4'-10"	7
A341	1	6	STR.	48'-5"	73
A342	1	6	STR.	45'-9"	69
A343	1	6	STR.	43'-1"	65
A344	1	6	STR.	40'-5"	61
A345	1	6	STR.	37'-9"	57
A346	1	6	STR.	35'-1"	53
A347	1	6	STR.	32'-5"	49
A348	1	6	STR.	29'-9"	45
A349	1	6	STR.	27'-1"	41
A350	1	6	STR.	24'-5"	37
A351	1	6	STR.	21'-9"	33
A352	1	6	STR.	19'-0"	29
A353	1	6	STR.	16'-4"	25
A354	1	6	STR.	13'-8"	21
A355	1	6	STR.	11'-0"	17
A356	1	6	STR.	8'-4"	13
A357	1	6	STR.	5'-8"	9
A358	1	6	STR.	3'-0"	5
*B11	66	4	STR.	21'-9"	959
B12	76	5	STR.	42'-5"	3362
*G2	2	5	STR.	49'-4"	103
*J1	49	4	3	1'-5"	46
*K1	4	5	1	6'-2"	26
*K2	16	5	2	5'-7"	93
*K3	4	5	1	4'-1"	17
*K4	20	5	STR.	8'-10"	184
*S11	40	4	4	3'-4"	89
*S12	40	4	4	3'-6"	94

REINFORCING STEEL LBS. 8789

*EPOXY COATED REINFORCING STEEL LBS. 6982

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

STAGE 2	CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	56.0	7351	5958
SPAN "B"	243.8	33659	25156
SPAN "C"	66.4	8789	6982
TOTALS **	366.2	49799	38096

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB IN STAGE 2
(SQ. FT. = 11654)

DRAWN BY: ROSS E. KUBENY DATE: 8-29-88
CHECKED BY: E.C. Powell DATE: 11-29-88

CADD [207,22]46201BOM.DGN

29-NOV-1988 12:48 ZG1:[207,22]L46201BOM.DGN RMTSSETTE

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
— STAGE 2 —
BILL OF MATERIAL

NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			82

28-MAR-1989 10:15
Z01:C207.2211-5201 BOM.DGN
RKUBENY

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A5	59	6	STR.	3'-8"	325
A6	59	6	STR.	3'-8"	325
*B7	8	4	STR.	18'-4"	98
B8	6	5	STR.	35'-5"	222
*K5	4	5	2	4'-8"	19
*S11	3	4	4	3'-4"	7
*S12	3	4	4	3'-6"	7

REINFORCING STEEL LBS. 547

*EPOXY COATED REINFORCING STEEL LBS. 456

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A5	273	6	STR.	3'-8"	1504
A6	274	6	STR.	3'-8"	1509
*B9	24	4	STR.	27'-9"	445
B10	18	5	STR.	54'-6"	1023
*J1	3	4	3	1'-5"	3
*K5	6	5	2	4'-8"	29
*S13	6	4	4	4'-0"	16

REINFORCING STEEL LBS. 2527

*EPOXY COATED REINFORCING STEEL LBS. 2002

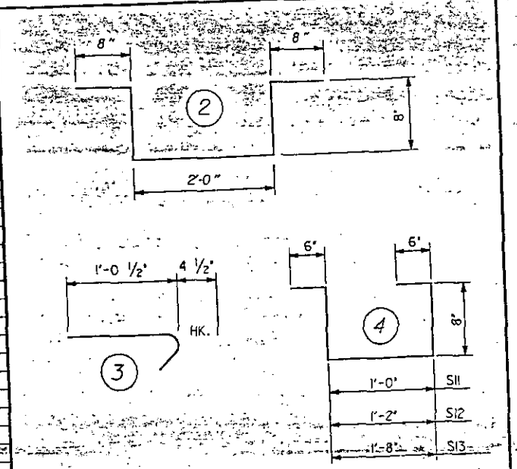
SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A5	70	6	STR.	3'-8"	386
A6	70	6	STR.	3'-8"	386
*B11	8	4	STR.	21'-9"	116
B12	6	5	STR.	42'-5"	265
*J1	3	4	3	1'-5"	3
*K5	4	5	2	4'-8"	19
*S11	3	4	4	3'-4"	7
*S12	3	4	4	3'-6"	7

REINFORCING STEEL LBS. 651

*EPOXY COATED REINFORCING STEEL LBS. 538

BAR TYPES

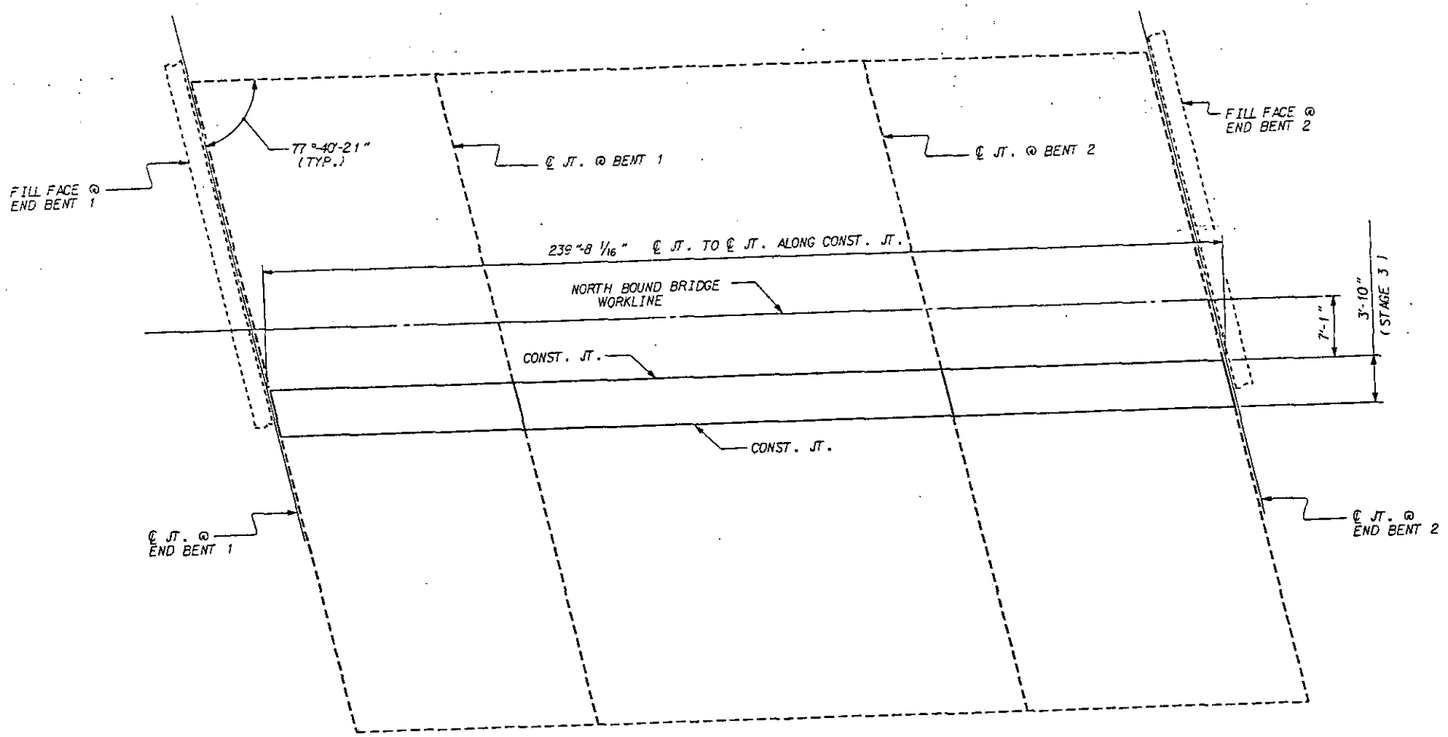


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

STAGE 3	CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	4.8	547	456
SPAN "B"	21.1	2527	2002
SPAN "C"	5.8	651	538
TOTALS **	31.7	3725	2996

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB IN STAGE 3

(SQ. FT. = 919)

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

BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"

TOTAL SUPERSTRUCTURE BILL OF MATERIAL

TOTAL	CLASS A-A CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
STAGE 1	230.5	31732	24331
STAGE 2	366.2	49799	38096
STAGE 3	31.7	3725	2996
TOTALS **	628.4	85256	65423

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

— STAGE 3 —

BILL OF MATERIAL

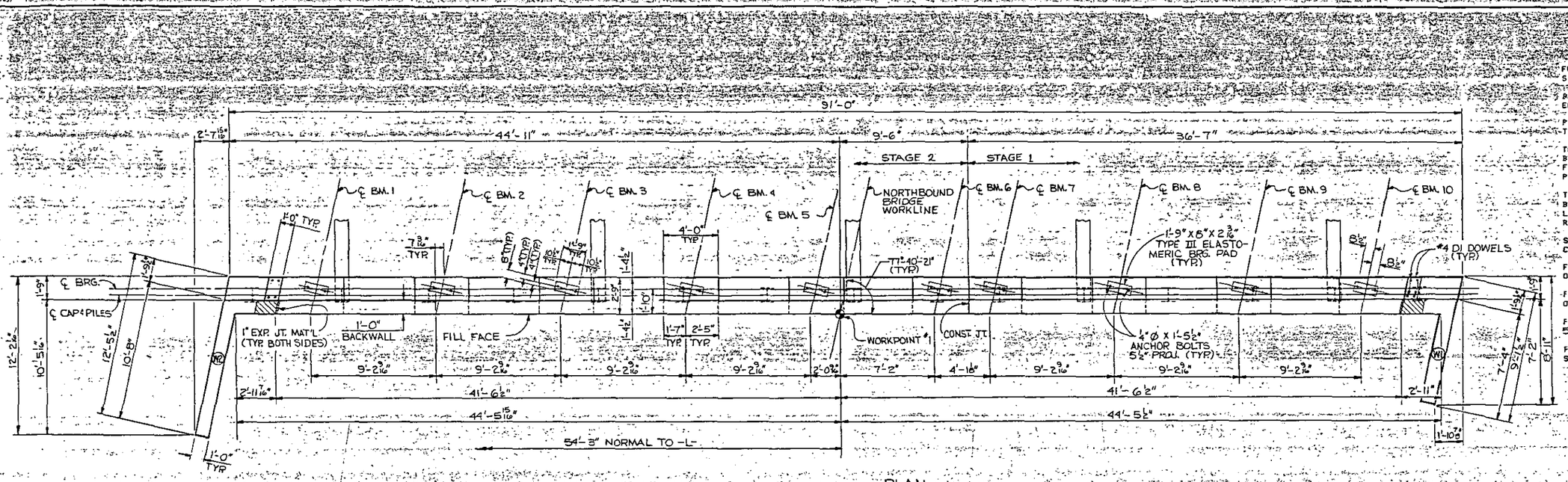
NOVEMBER (N.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 8-29-88

CHECKED BY : G A Thompson DATE : 9-22-88

CADRUM.DGN



PLAN

NOTES

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

PIPE DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND ANCHOR BOLTS.

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 1/4" PER FOOT.

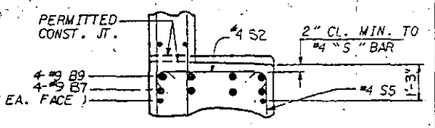
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR PIPE DRAIN DETAILS, SEE END BENT 2, SHEET 2 OF 5.

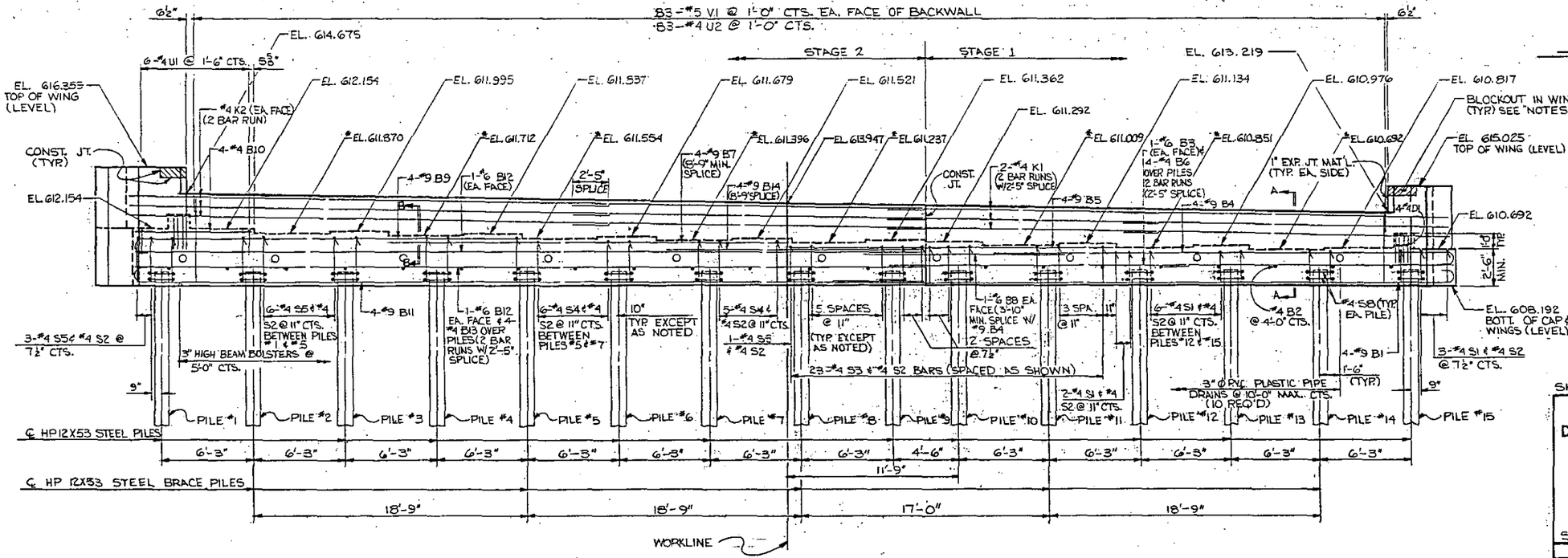
FOR PILE SPLICE DETAILS, SEE END BENT 2, SHEET 2 OF 5.

FOR BLOCKOUT DETAILS, SEE END BENT 2, SHEET 2 OF 5.

FOR TEMPORARY DRAINAGE DETAILS AT END BENT 1, SEE END BENT 2, SHEET 2 OF 5.



SECTION B-B



ELEVATION

* FOR LOCATION OF ELEVATIONS, SEE "SECTION A-A"

PROJECT No. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

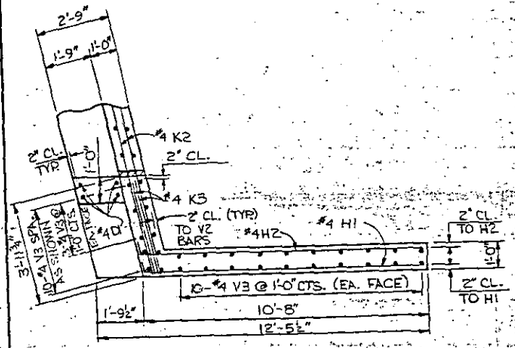
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

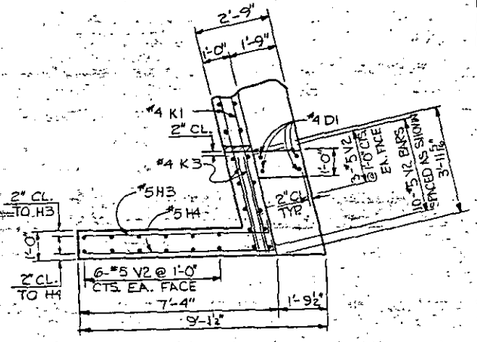
SUBSTRUCTURE
END BENT No. 1
STAGE 1 & 2
SEPTEMBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-29
1			3			TOTAL SHEETS
2			4			82

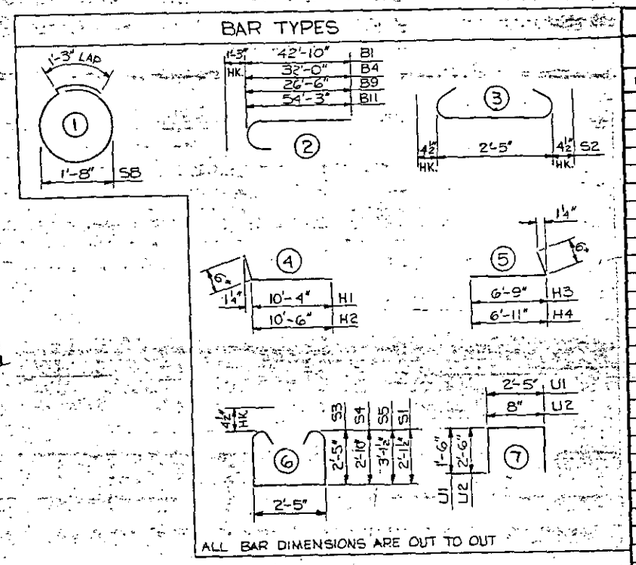
DRAWN BY Judy Mangum DATE 9-25-87
CHECKED BY E.G. ALLEN DATE 10-18-88



PLAN OF LEFT WING -W2-
(STAGE 2)



PLAN OF RIGHT WING -W1-
(STAGE 1)



BILL OF MATERIAL
STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	2	44'-1"	600
B2	8	4	STR	2'-5"	13
B3	2	6	STR	40'-5"	121
B4	4	9	2	33'-3"	452
B5	4	9	STR	22'-0"	299
B6	8	4	STR	25'-6"	136
B8	2	6	STR	12'-4"	37
D1	4	4	STR	2'-0"	5
H3	7	5	5	7'-3"	53
H4	7	5	5	7'-5"	54
K1	12	4	STR	20'-9"	166
K3	4	4	STR	3'-7"	10
S1	23	4	6	7'-5"	114
S2	36	4	3	3'-2"	76
S3	13	4	6	8'-0"	69
S8	12	4	1	6'-6"	52
U2	32	4	7	5'-8"	121
V1	64	5	STR	4'-8"	312
V2	22	5	STR	6'-6"	149

REINFORCING STEEL LBS. 2,936

HP 12X53 STEEL PILES
NO. 6 LIN. FT. 150

CLASS 'A' CONCRETE C.Y. 16.0

BILL OF MATERIAL
STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	13	4	STR	2'-5"	21
B7	4	9	STR	27'-9"	377
B9	4	9	2	27'-9"	377
B10	4	4	STR	8'-0"	21
B11	4	9	2	55'-6"	755
B12	4	6	STR	54'-1"	325
B13	8	4	STR	28'-3"	151
B14	4	9	STR	17'-8"	240
D1	4	4	STR	2'-0"	5
H1	8	5	4	10'-10"	58
H2	8	5	4	11'-0"	59
K2	12	4	STR	28'-3"	226
K3	4	4	STR	3'-7"	10
S2	54	4	3	3'-2"	114
S3	10	4	6	8'-0"	53
S4	17	4	6	8'-10"	100
S5	27	4	6	9'-5"	170
S8	18	4	1	6'-6"	78
U1	6	4	7	5'-5"	22
U2	51	4	7	5'-8"	193
V1	102	5	STR	5'-8"	603
V3	30	5	STR	7'-10"	245

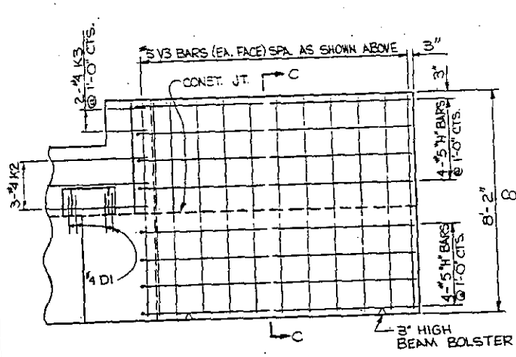
REINFORCING STEEL LBS. 4,203

HP 12X53 STEEL PILES
NO. 9 LIN. FT. 225

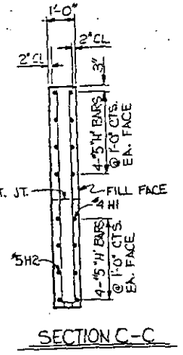
CLASS 'A' CONCRETE C.Y. 28.9

TOTAL BILL OF MATERIAL

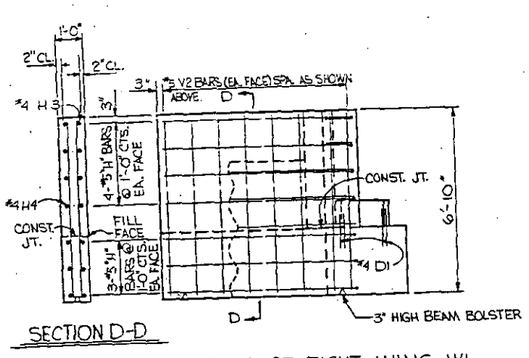
REINFORCING STEEL	LBS.	7,042
CLASS 'A' CONCRETE	C.Y.	44.9
HP 12X53 STEEL PILES NO. 15	LIN. FT.	375



ELEVATION OF LEFT WING-W2
(STAGE 2)

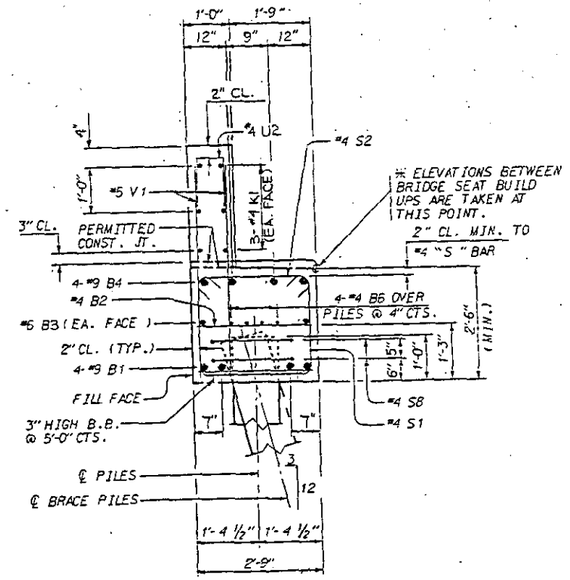


SECTION C-C



SECTION D-D

ELEVATION OF RIGHT WING-W1
(STAGE 1)



SECTION A-A

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

SHEET 2 OF 2

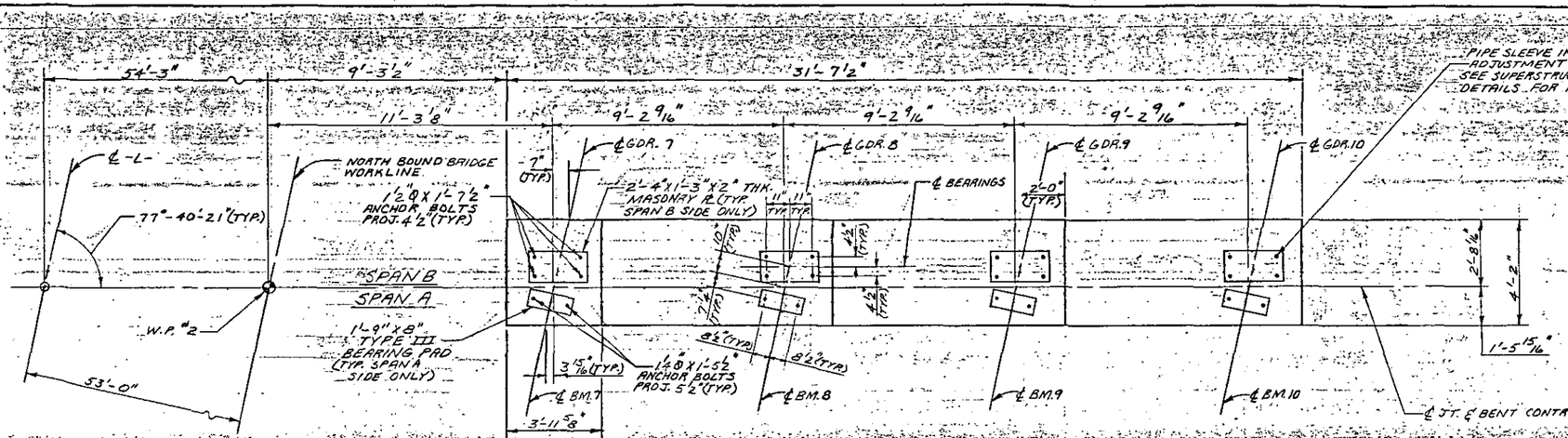
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1
STAGE 1 & 2
OCTOBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-30
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: Judy Manaum DATE 10-9-87
CHECKED BY: E.G. ALDEN DATE 10-16-87

AP 47637



NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

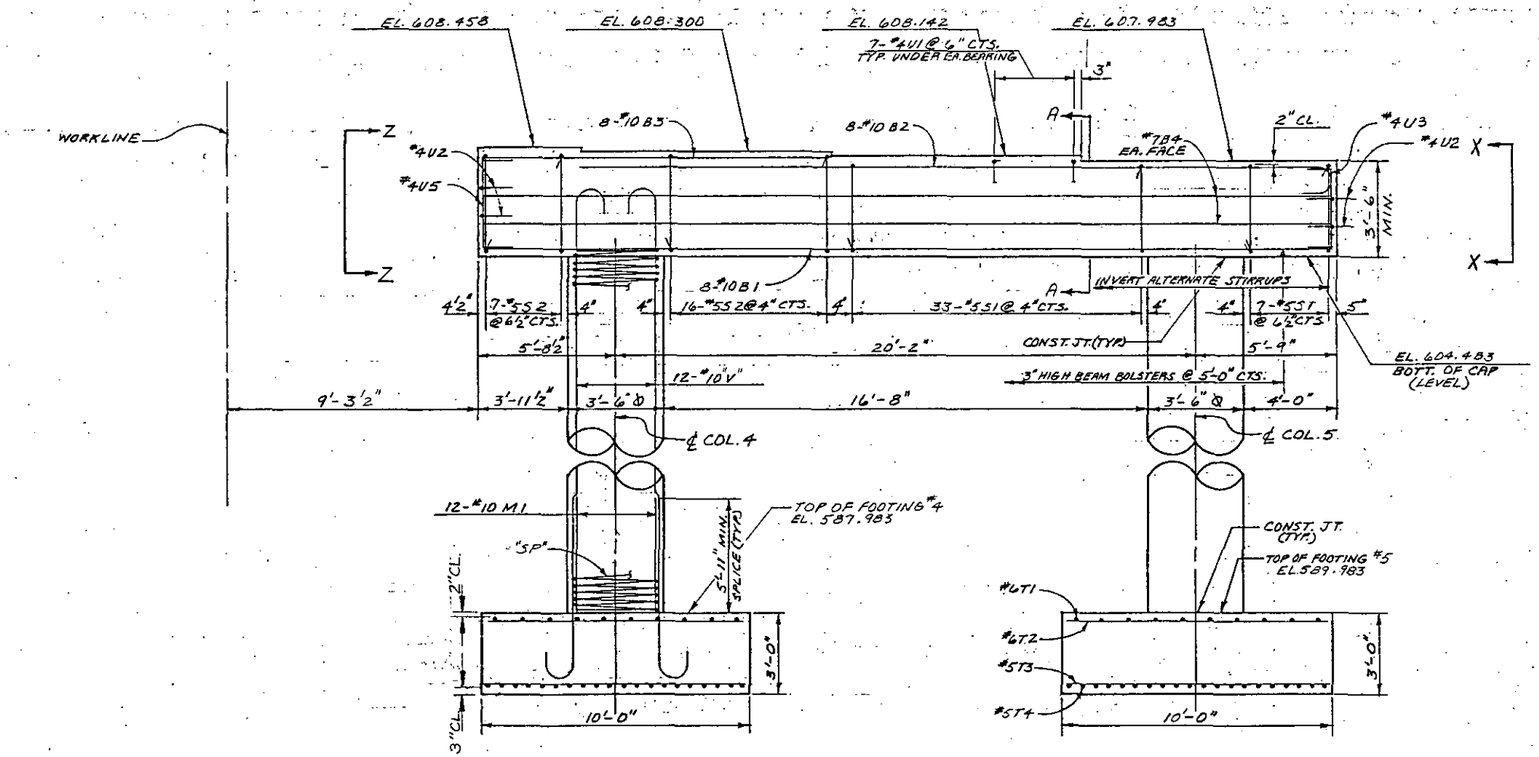
FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

THE TOP SURFACE AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.

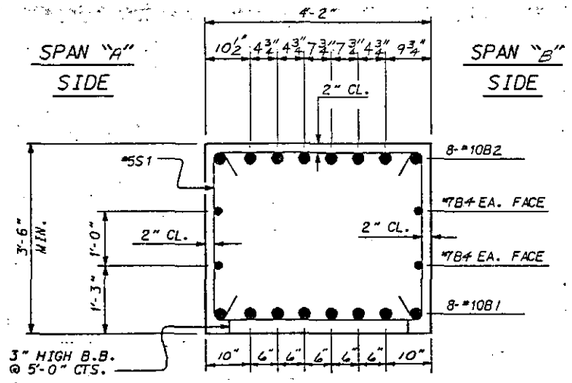
BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

PLAN OF CAP



ELEVATION

FOR COLUMN REINF. STEEL, SEE CHART "B" STEEL IS THE SAME FOR FOOTINGS #4 & #5.



SECTION A-A

CHART "B"	
COLUMN 4	COLUMN 5
V2	V1
SP-2	SP-1

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42-L-

SHEET 10F3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
STAGE 1
(N.B.L.)

NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-31
1			3			TOTAL SHEETS
2			4			82

DRAWN BY RORY MARTIN DATE 10-11-88
CHECKED BY ROSS E. KUBENY DATE 11-21-88

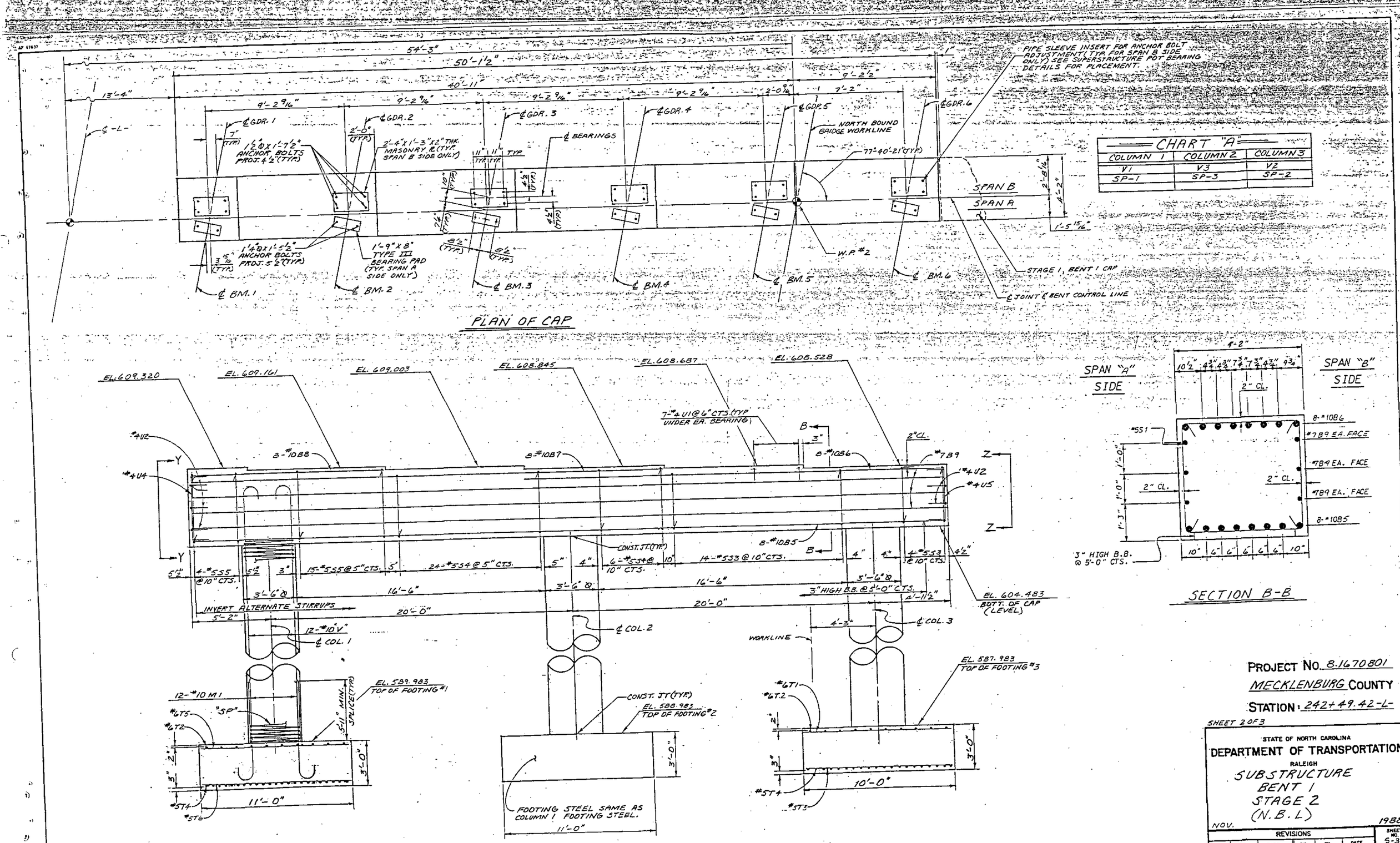


CHART "A"		
COLUMN 1	COLUMN 2	COLUMN 3
V1	V3	V2
SP-1	SP-3	SP-2

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42-L-

SHEET 2 OF 3

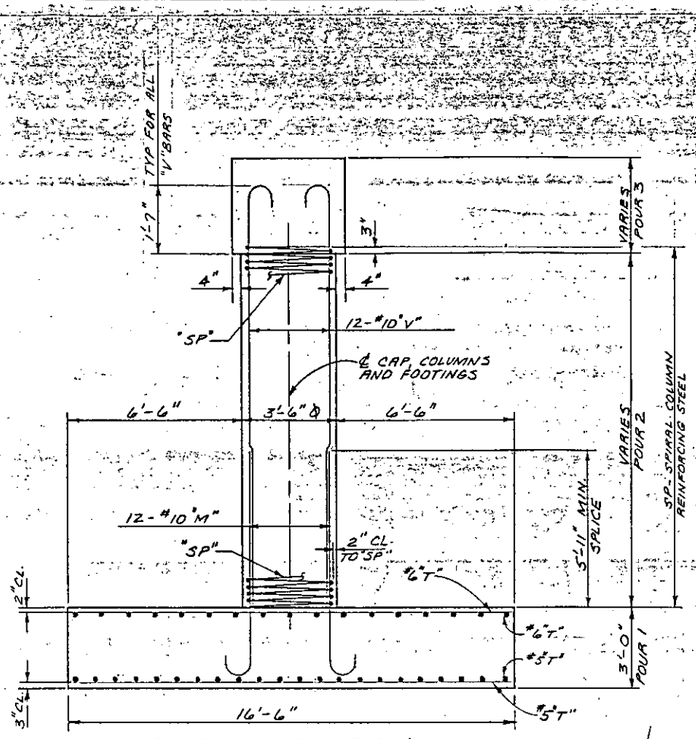
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
STAGE 2
(N.B.L)

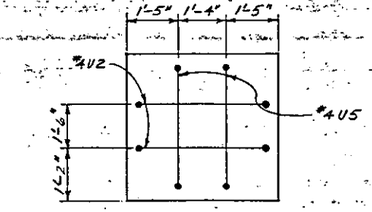
NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-32
1			3			TOTAL SHEETS
2			4			82

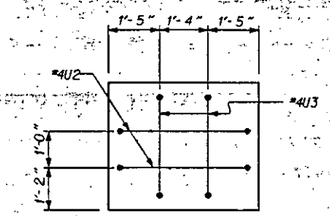
DRAWN BY RORY MARTIN DATE 10-11-88
CHECKED BY ROSS E. KUBENY DATE 11-21-88



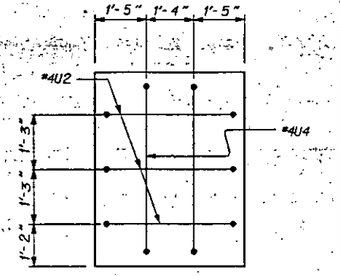
END ELEVATION



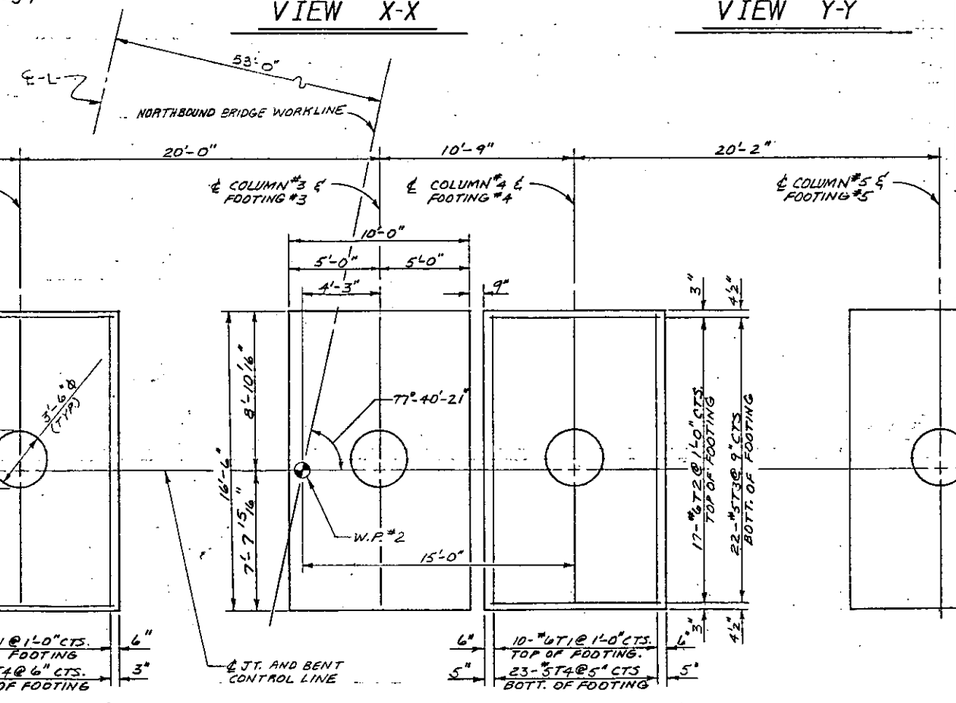
VIEW Z-Z



VIEW X-X



VIEW Y-Y



PLAN OF FOOTING

ALL FOOTING DIMENSIONS AND BAR TYPES ARE IDENTICAL FOR FOOTINGS #1 & #2.
ALL FOOTING DIMENSIONS AND BAR TYPES ARE IDENTICAL FOR FOOTINGS #3, #4 & #5.

DRAWN BY: RORY MARTIN DATE: 10-6-88
CHECKED BY: ROSS E. KWENY DATE: 11-21-88

BILL OF MATERIAL
BENT 1 (STAGE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	STR.	31'-3"	1,076
B2	8	10	1	32'-8"	1,125
B3	8	10	1	14'-3"	491
B4	4	7	STR.	31'-3"	256
M1	24	10	1	13'-0"	1,343
S1	40	5	2	11'-0"	459
S2	23	5	2	11'-7"	278
T1	20	6	STR.	16'-2"	486
T2	34	6	STR.	9'-8"	494
T3	44	5	STR.	9'-8"	444
T4	46	5	STR.	16'-2"	776
U1	28	4	3	6'-4"	118
U2	4	4	3	5'-8"	15
U3	2	4	3	5'-0"	7
U5	2	4	3	5'-3"	7
V1	12	10	1	17'-6"	904
V2	12	10	1	19'-6"	1,007
SP-1	1		4	608'-11"	407
SP-2	1		4	687'-6"	459

REINFORCING STEEL LBS. 9,286
SPIRAL COLUMN REINFORCING STEEL LBS. 866

CLASS "A" CONCRETE BREAKDOWN
POUR #1 (FOOTINGS) C.Y. 36.7
POUR #2 (COLUMNS) C.Y. 11.0
POUR #3 (CAP) C.Y. 18.0
CLASS "A" CONCRETE TOTAL CY. 65.7
FOUNDATION EXCAVATION C.Y. 150

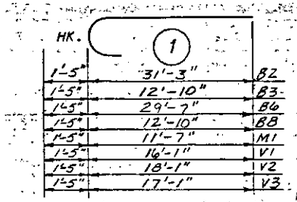
BILL OF MATERIAL
BENT 1 (STAGE 2)

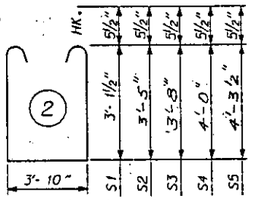
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	8	10	STR.	49'-9"	1,713
B6	8	10	1	31'-0"	1,067
B7	8	10	STR.	31'-3"	1,076
B8	8	10	1	14'-3"	491
B9	6	7	STR.	49'-9"	610
M1	36	10	1	13'-0"	2,014
S3	18	5	2	12'-1"	227
S4	30	5	2	12'-9"	399
S5	19	5	2	13'-4"	264
T1	32	6	STR.	16'-2"	777
T2	17	6	STR.	9'-8"	247
T3	22	5	STR.	9'-8"	222
T4	67	5	STR.	16'-2"	1,130
T5	34	6	STR.	10'-8"	545
T6	44	5	STR.	10'-8"	490
U1	42	4	3	6'-4"	178
U2	5	4	3	5'-8"	19
U4	2	4	3	5'-11"	8
U5	2	4	3	5'-3"	7
V1	12	10	1	17'-6"	904
V2	12	10	1	19'-6"	1,007
V3	12	10	1	18'-6"	955
SP-1	1		4	608'-11"	407
SP-2	1		4	687'-6"	459
SP-3	1		4	648'-2"	433

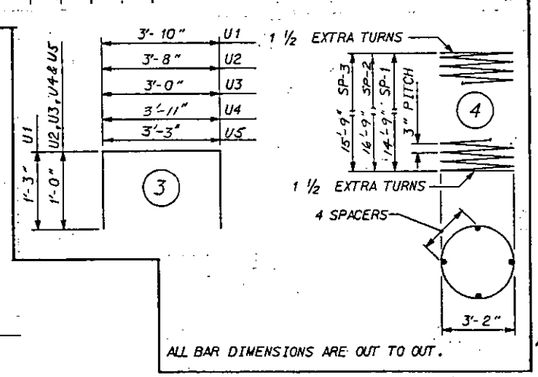
REINFORCING STEEL LBS. 14,350
SPIRAL COLUMN REINFORCING STEEL LBS. 1,299

CLASS "A" CONCRETE BREAKDOWN
POUR #1 (FOOTINGS) C.Y. 58.7
POUR #2 (COLUMNS) C.Y. 16.6
POUR #3 (CAP) C.Y. 34.0
CLASS "A" CONCRETE TOTAL C.Y. 109.3
FOUNDATION EXCAVATION CY. 225

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

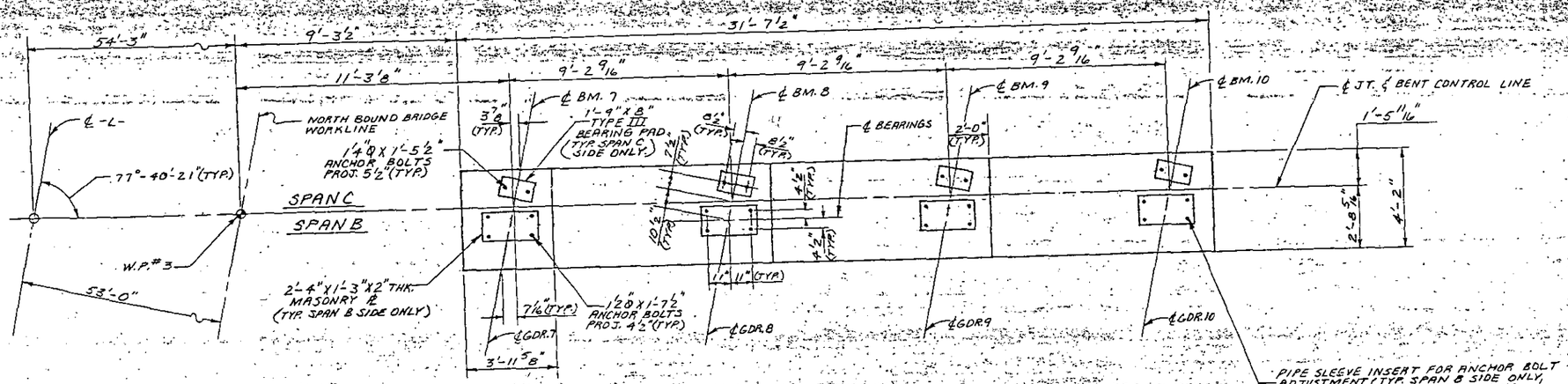
PROJECT NO. 8.1670801
MECKLENBURG COUNTY #1
STATION: 242+49.42-L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 1 (N.B.L.)

NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-33
1			3			TOTAL SHEETS
2			4			82



NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

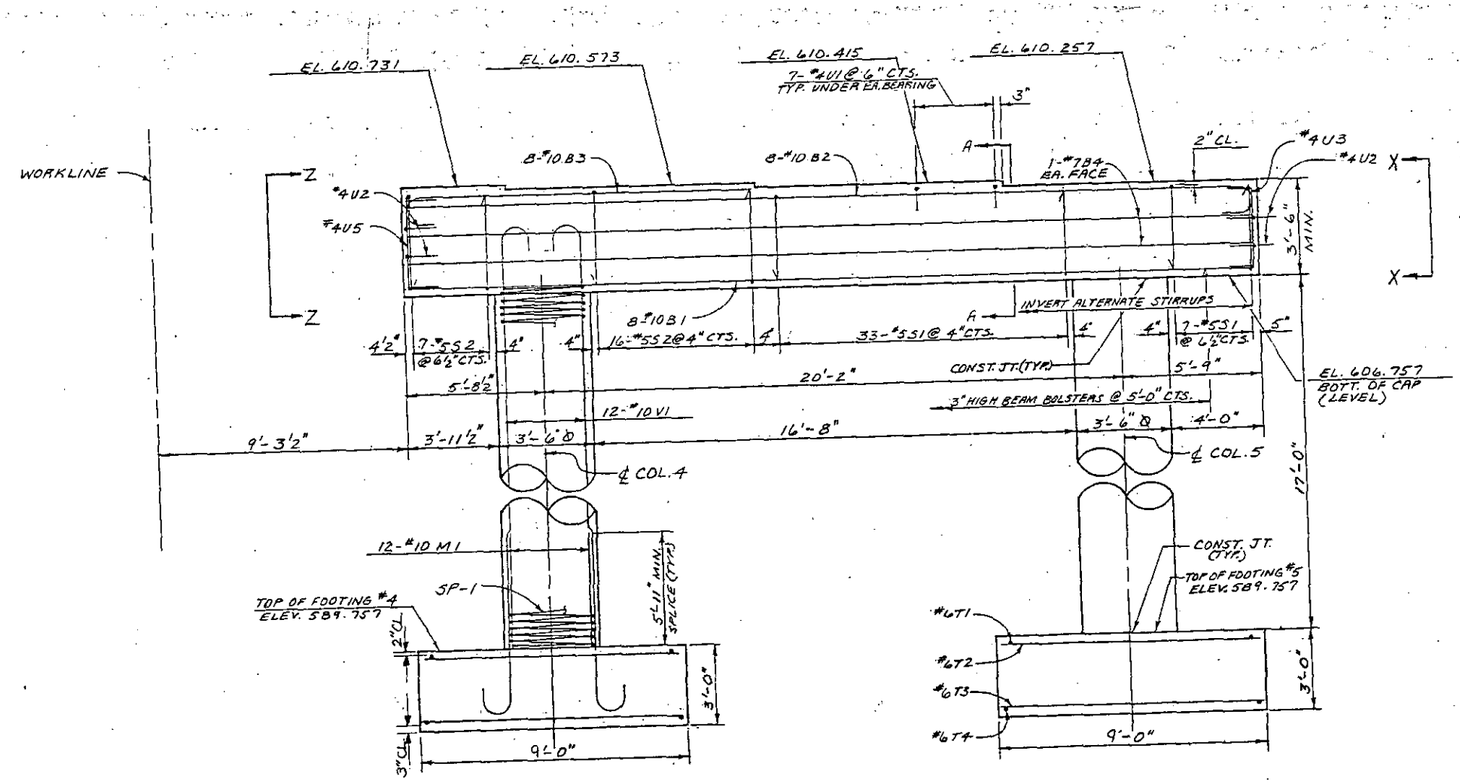
FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

THE TOP SURFACE AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.

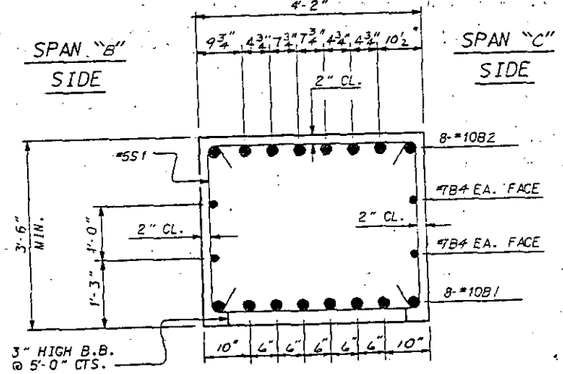
PLAN OF CAP



ELEVATION

STEEL IS THE SAME FOR COLUMN 4 & 5 AND FOOTING 4 & 5.

SPAN "B" SIDE



SPAN "C" SIDE

SECTION A-A

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION: 2424+49.42-L-

SHEET 10F3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 1
(N.B.L.)

NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-34
1			3			TOTAL SHEETS
2			4			82

DRAWN BY RORY MARTIN DATE 10-11-88
CHECKED BY ROSS E. KUBENY DATE 11-21-88

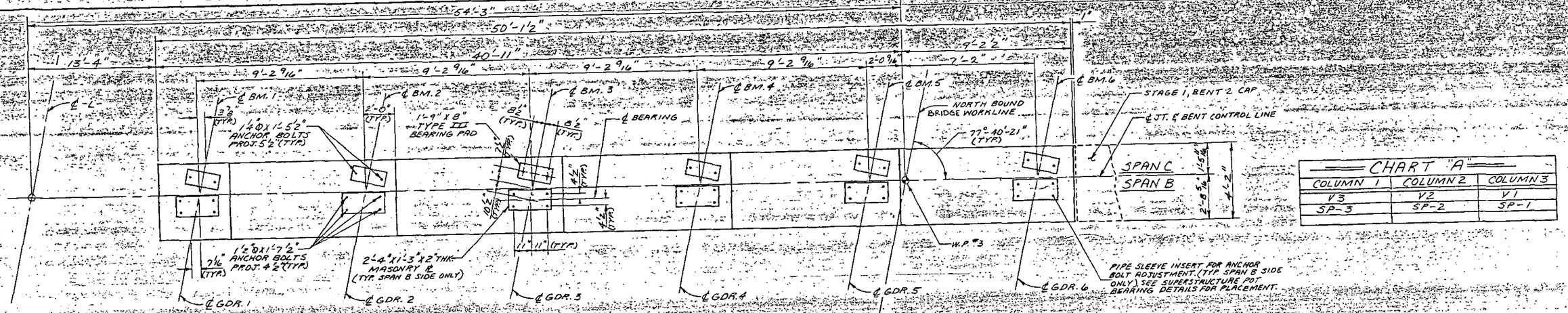
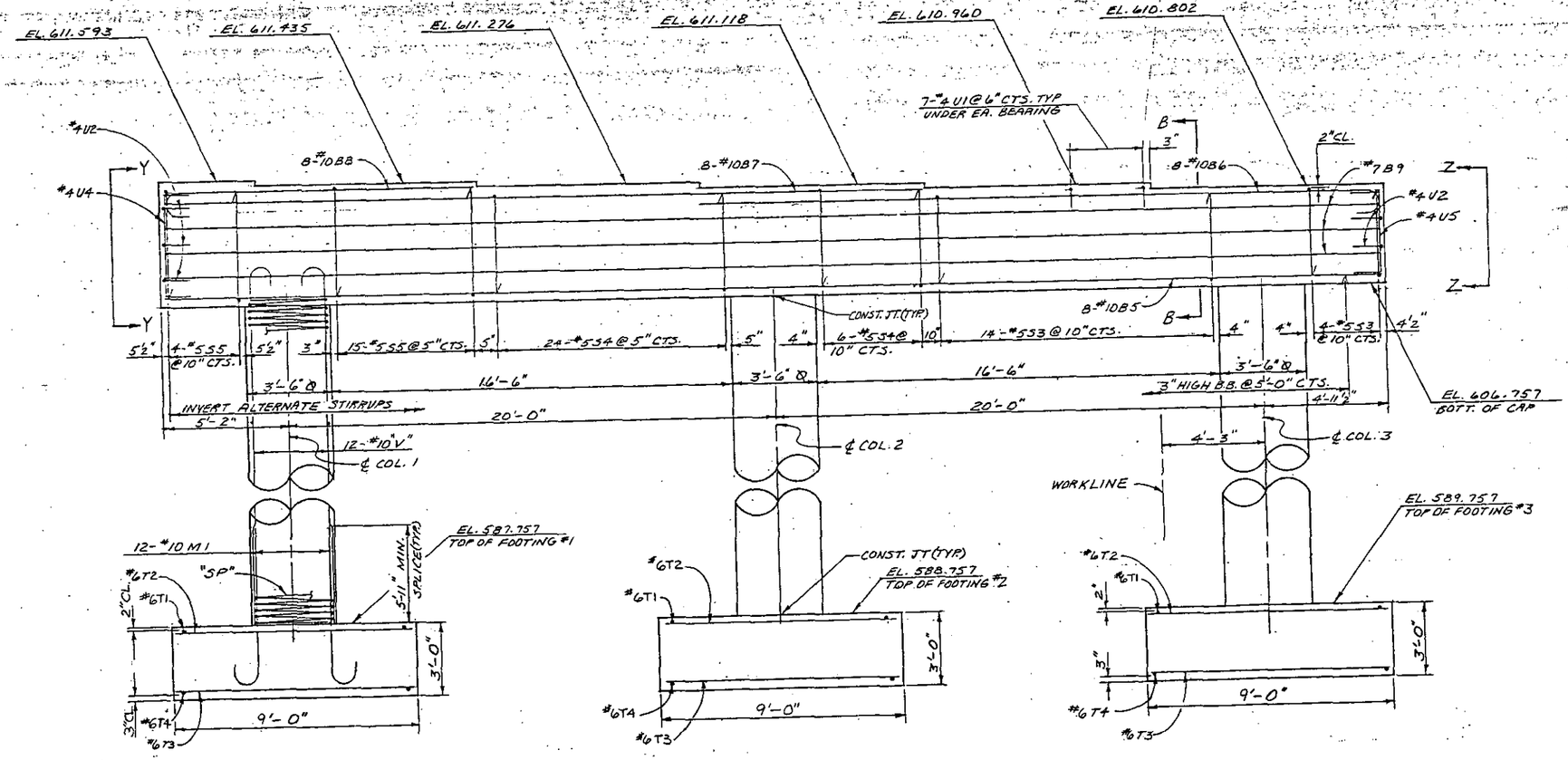


CHART "A"

COLUMN 1	COLUMN 2	COLUMN 3
V3	V2	V1
SP-3	SP-2	SP-1

PLAN OF CAP

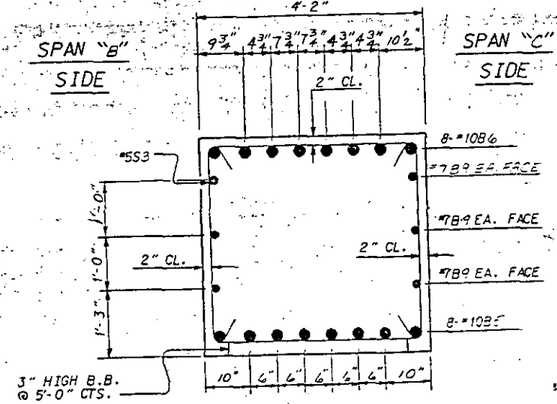


ELEVATION

FOR COLUMN REINF. STEEL, SEE CHART "A"

SPAN "B" SIDE

SPAN "C" SIDE



SECTION B-B

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42-L-

SHEET 2 OF 3

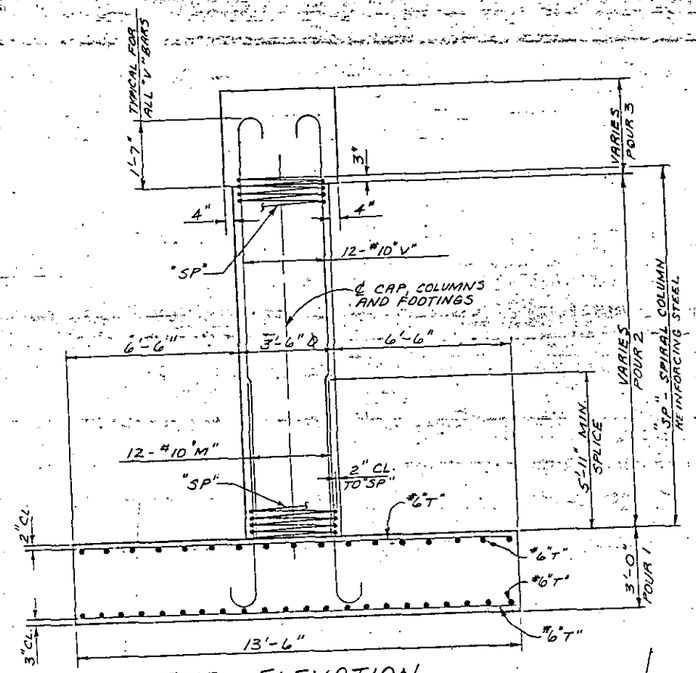
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
STAGE 2
(N.B.L)

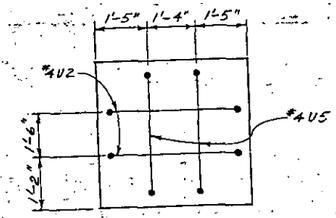
NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-35
1			3			TOTAL SHEETS
2			4			82

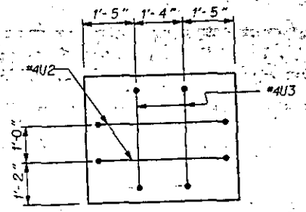
DRAWN BY RORY MARTIN DATE 10-11-88
CHECKED BY ROSS E. KUBENY DATE 11-22-88



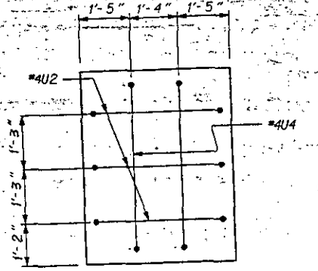
END ELEVATION



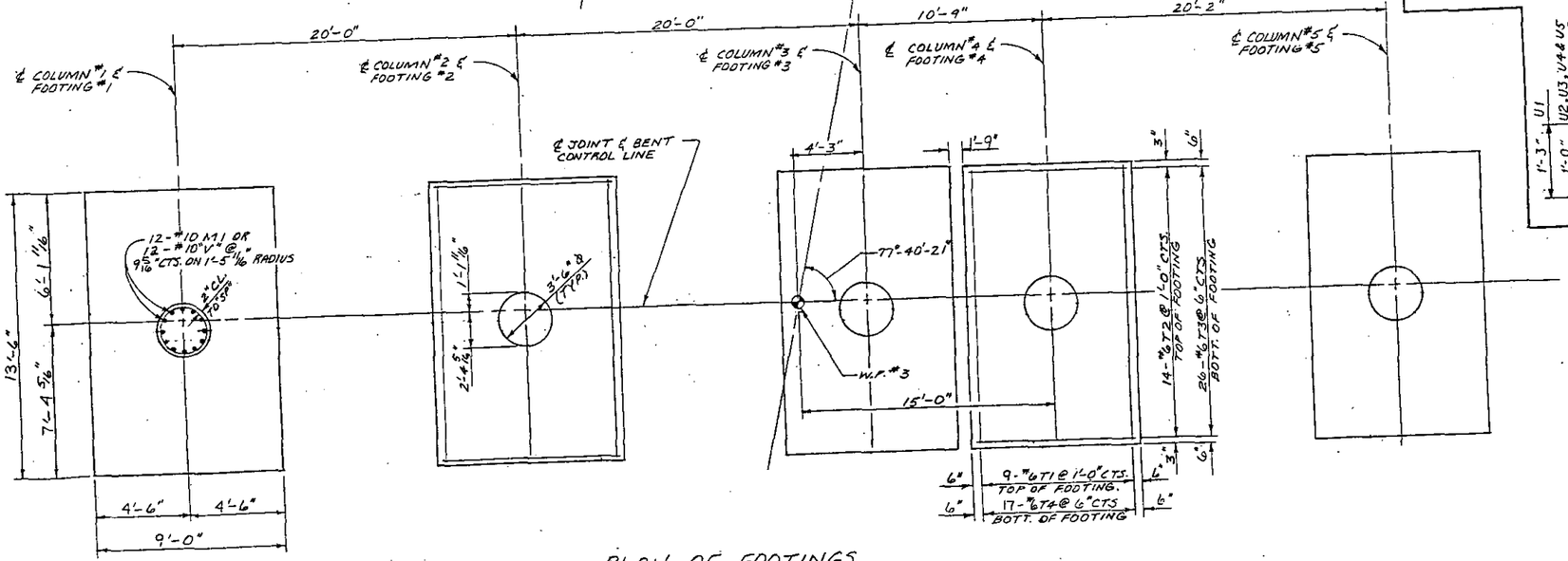
VIEW Z-Z



VIEW X-X



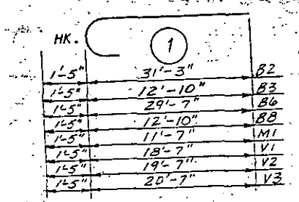
VIEW Y-Y

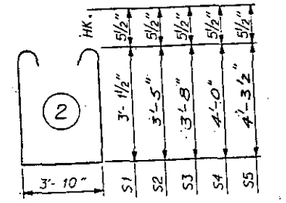


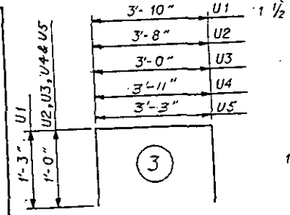
PLAN OF FOOTINGS

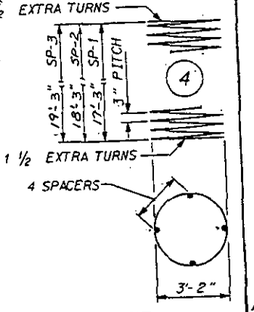
ALL FOOTING DIMENSIONS AND BAR TYPES ARE TYPICAL.

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT 2 (STAGE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	STR.	31'-3"	1,076
B2	8	10	1	32'-8"	1,125
B3	8	10	1	14'-3"	491
B4	4	7	STR.	31'-3"	256
M1	24	10	1	13'-0"	1,343
S1	40	5	2	11'-0"	459
S2	23	5	2	11'-7"	278
T1	18	6	STR.	13'-2"	356
T2	28	6	STR.	8'-8"	364
T3	52	6	STR.	8'-8"	677
T4	39	6	STR.	13'-2"	672
U1	28	4	3	6'-4"	118
U2	4	4	3	5'-8"	15
U3	2	4	3	5'-0"	7
U5	2	4	3	5'-3"	7
V1	24	10	1	20'-0"	2,065
SP-1	2		4	707'-2"	945

REINFORCING STEEL LBS. 9309

SPIRAL COLUMN REINFORCING STEEL LBS. 945

CLASS "A" CONCRETE BREAKDOWN
POUR #1 (FOOTINGS) C.Y. 27.0
POUR #2 (COLUMNS) C.Y. 12.1
POUR #3 (CAP) C.Y. 18.0

CLASS "A" CONCRETE TOTAL C.Y. 57.1

FOUNDATION EXCAVATION C.Y. 140

BILL OF MATERIAL
BENT 2 (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	8	10	STR.	49'-9"	1,713
B6	8	10	1	31'-0"	1,067
B7	8	10	STR.	31'-3"	1,076
B8	8	10	1	14'-3"	491
B9	6	7	STR.	49'-9"	610
M1	36	10	1	13'-0"	2,014
S3	18	5	2	12'-1"	227
S4	30	5	2	12'-9"	399
S5	19	5	2	13'-4"	264
T1	27	6	STR.	13'-2"	534
T2	42	6	STR.	8'-8"	547
T3	78	6	STR.	8'-8"	1,015
T4	51	6	STR.	13'-2"	1,009
U1	42	4	3	6'-4"	178
U2	5	4	3	5'-8"	19
U4	2	4	3	5'-11"	8
U5	2	4	3	5'-3"	7
V1	12	10	1	20'-0"	1,033
V2	12	10	1	21'-0"	1,084
V3	12	10	1	22'-0"	1,136
SP-1	1		4	707'-2"	472
SP-2	1		4	746'-5"	499
SP-3	1		4	785'-8"	525

REINFORCING STEEL LBS. 14,431

SPIRAL COLUMN REINFORCING STEEL LBS. 1,496

CLASS "A" CONCRETE BREAKDOWN
POUR #1 (FOOTINGS) C.Y. 40.5
POUR #2 (COLUMNS) C.Y. 19.2
POUR #3 (CAP) C.Y. 34.0

CLASS "A" CONCRETE TOTAL C.Y. 93.7

FOUNDATION EXCAVATION CY. 235

PROJECT No. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 3 OF 3

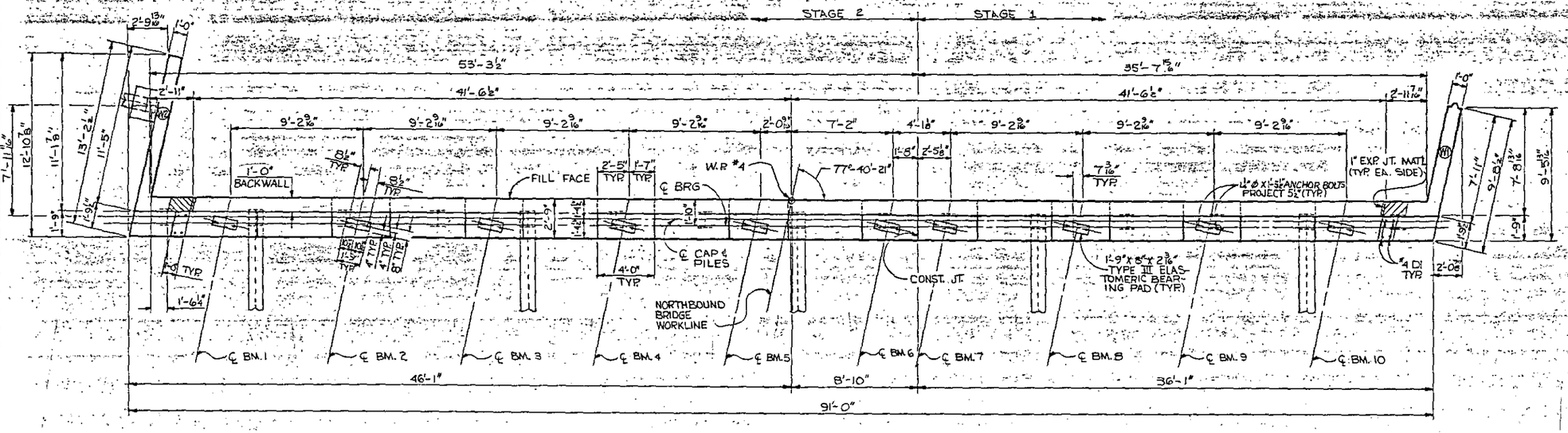
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 2 (N.B.L.)

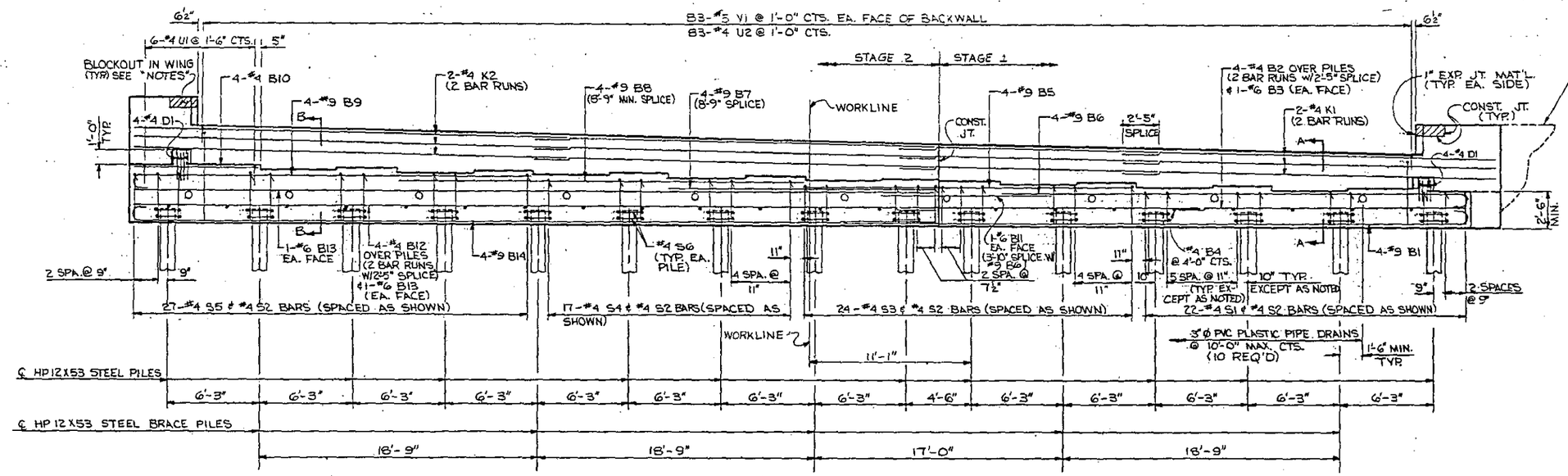
NOV. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-36
1			3			TOTAL SHEETS
2			4			82

DRAWN BY RORY MARTIN DATE 10-6-88
CHECKED BY ROSS E. KUBENY DATE 11-22-88



PLAN



ELEVATION

FOR ELEVATIONS SEE SHEET 2 OF 8

—— 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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS 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 1/4" PER FOOT.

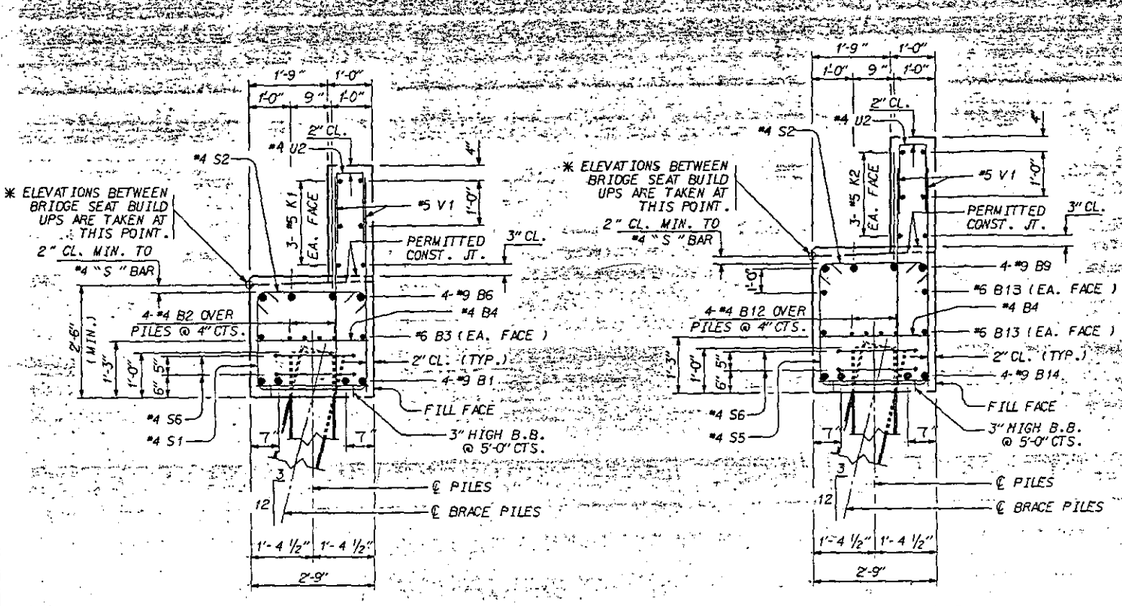
FOR BLOCKOUT DETAILS, SEE SHEET 2 OF 5.

DRAWN BY Judy Nanqum DATE 10-24-87
CHECKED BY E.G. ALLEN DATE 10-26-87

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242 + 49.42 -L-
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 2
STAGE 1 & 2
OCTOBER (N.B.L.) 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-37
1			3			TOTAL SHEETS
2			4			82

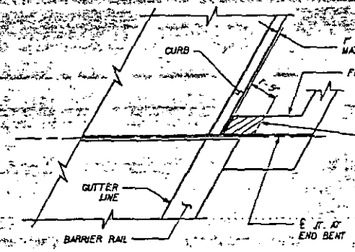


SECTION A-A

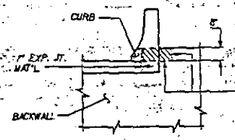
STAGE 1

SECTION B-B

STAGE 2



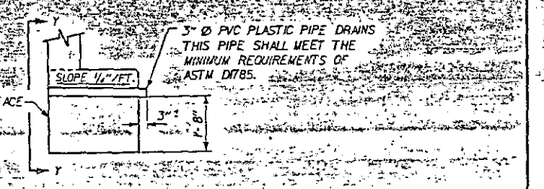
PLAN



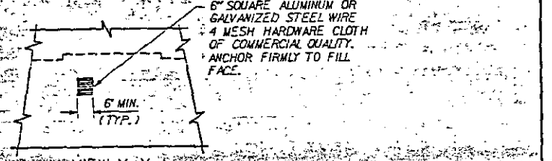
ELEVATION

BLOCKOUT IN WING WALL FOR FITTING COMPRESSION JOINT SEAL

NOTE: THE CONCRETE IN THE CROSS-HATCHED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



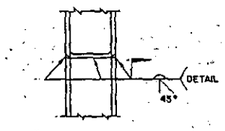
SECTION THRU CAP



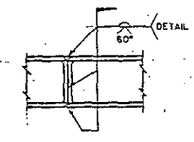
VIEW Y-Y

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 BID FOR THE SEVERAL PAY ITEMS.

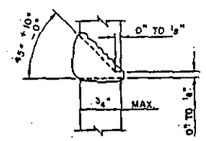
PIPE DRAIN DETAILS



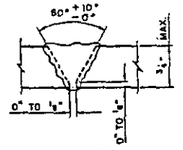
* PILE VERTICAL



* PILE HORIZONTAL OR VERTICAL



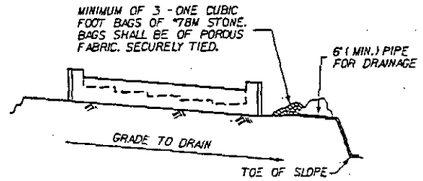
DETAIL A



DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

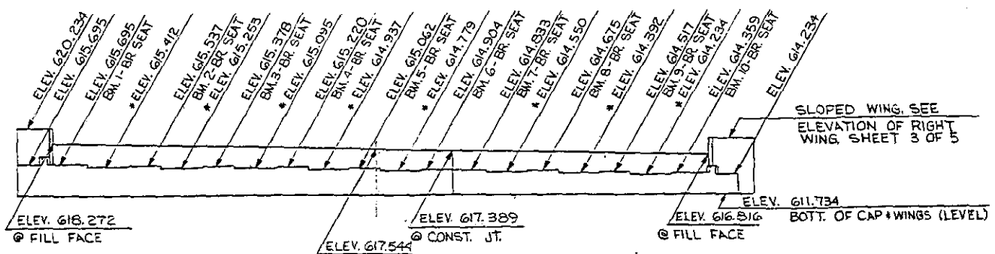


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



CAP ELEVATION DETAIL

* FOR LOCATION OF ELEVATION, SEE "SECTION A-A"

DRAWN BY Judy Mahaffey DATE 10-29-87
CHECKED BY E. G. Allen DATE 10-30-87

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

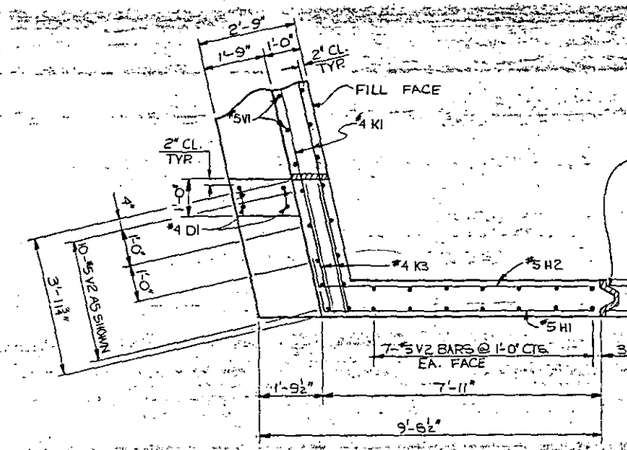
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

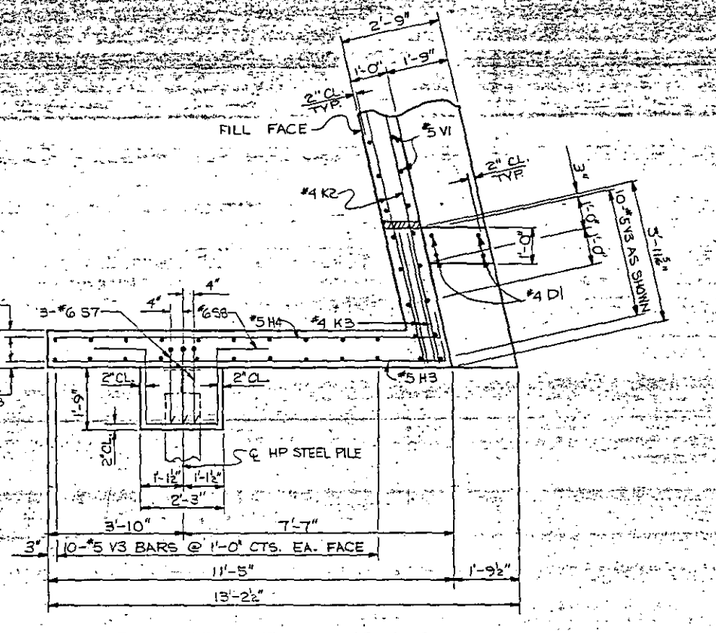
SUBSTRUCTURE
END BENT No. 2
(N.B.L.)

OCTOBER 1987

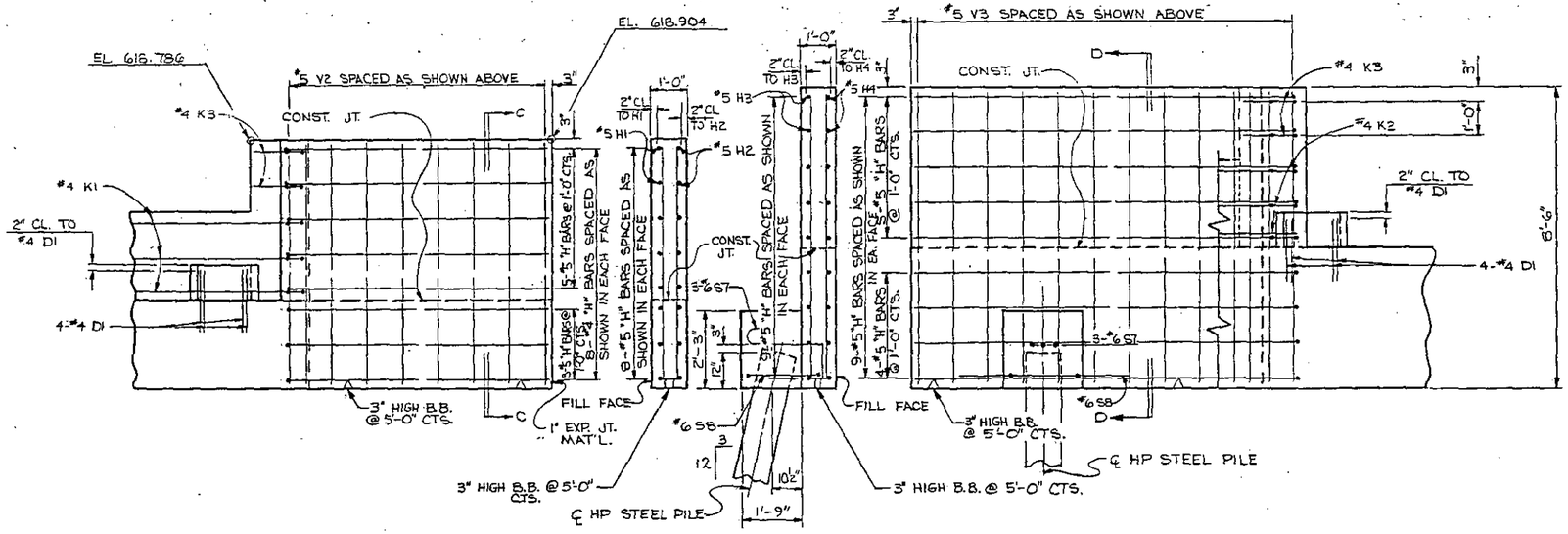
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-38
1			3			TOTAL SHEETS
2			4			82



PLAN OF RIGHT WING-W1
STAGE 1



PLAN OF LEFT WING-W2
STAGE 2



ELEVATION OF RIGHT WING-W1
STAGE 1

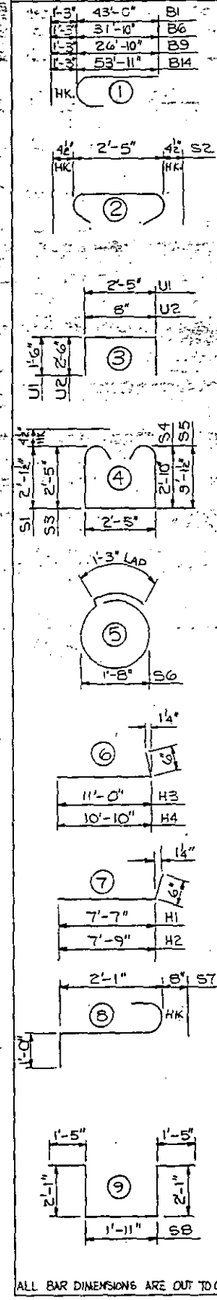
SECTION C-C

SECTION D-D

ELEVATION OF LEFT WING-W2
STAGE 2

DRAWN BY: JUAN MANOLLO DATE: 11-13-87
CHECKED BY: E.G. ALLEN DATE: 10-31-88

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL — STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	44'-3"	602
B2	8	4	STR	20'-7"	110
B3	2	6	STR	40'-2"	121
B4	8	4	STR	2'-5"	13
B5	4	9	STR	22'-0"	299
B6	4	9	1	33'-1"	450
B11	2	6	STR	12'-2"	37
D1	4	4	STR	2'-0"	5
H1	8	5	7	8'-1"	67
H2	8	5	7	8'-3"	69
K1	12	4	STR	20'-7"	165
K3	4	4	STR	3'-7"	10
S1	22	4	4	7'-5"	109
S2	36	4	2	3'-2"	76
S3	14	4	4	8'-0"	75
S6	12	4	5	6'-6"	52
U2	33	4	3	5'-8"	125
V1	66	5	STR	4'-6"	321
V2	24	5	STR	6'-8"	167

REINFORCING STEEL LBS. 2,873

HP 12X53 STEEL PILES NO. 6 LIN. FT. 210

CLASS "A" CONCRETE C.Y. 15.8

BILL OF MATERIAL — STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	13	4	STR	2'-5"	21
B7	4	9	STR	17'-10"	243
B8	4	9	STR	28'-4"	585
B9	4	9	1	28'-1"	382
B10	4	4	STR	7'-10"	21
B12	4	4	STR	28'-6"	76
B13	4	6	STR	54'-3"	326
B14	4	9	1	55'-2"	750
D1	4	4	STR	2'-0"	5
H3	9	5	6	11'-6"	108
H4	9	5	6	11'-4"	106
K2	12	4	STR	28'-3"	226
K3	4	4	STR	3'-7"	10
S2	54	4	2	3'-2"	114
S3	10	4	4	8'-0"	53
S4	17	4	4	8'-10"	100
S5	27	4	4	9'-5"	170
S6	18	4	5	6'-6"	78
S7	3	6	8	3'-9"	17
S8	1	6	9	8'-11"	13
U1	6	4	3	5'-5"	22
U2	50	4	3	5'-8"	189
V1	100	5	STR	4'-8"	487
V3	30	5	STR	8'-2"	256

REINFORCING STEEL LBS. 4,158

HP 12X53 STEEL PILES NO. 9 LIN. FT. 315

CLASS "A" CONCRETE C.Y. 28.5

FOR TOTAL BILL OF MATERIAL, SEE SHEET 5 OF 5

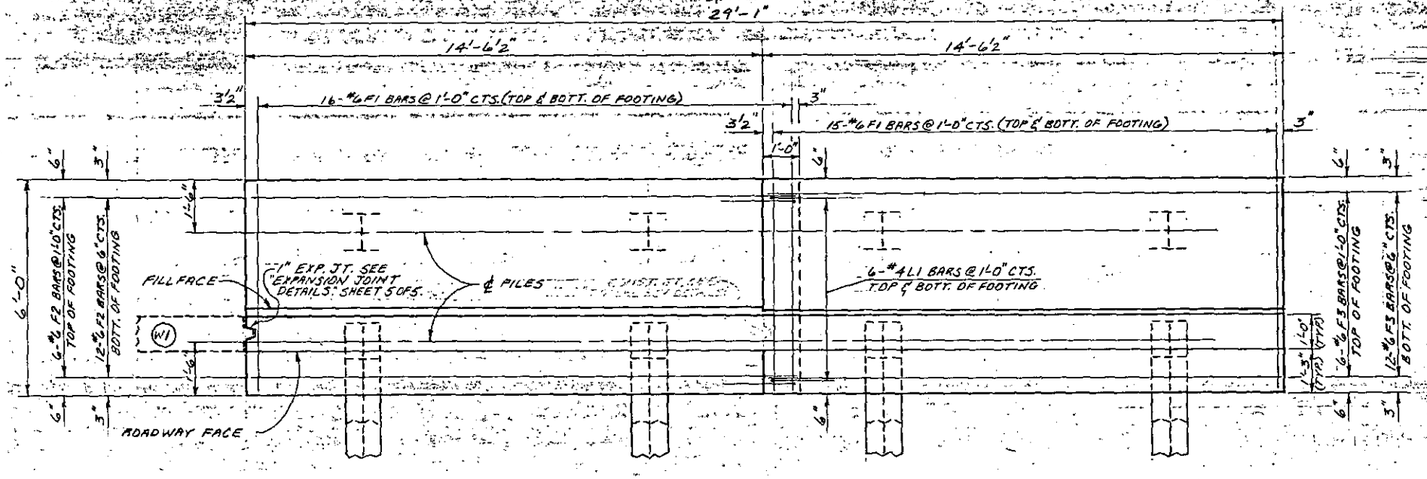
PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
(N.B.L.)

NOVEMBER 1987

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-39
1			3			TOTAL SHEETS
2			4			82



PLAN

NOTES

DESIGN SPECIFICATIONS - AASHTO (1984)

DESIGN DATA: $h = 9$; $f'_c = 3000$ psi; $f_s = 24{,}000$ psi; WEIGHT OF SOIL = 120 pcf; ANGLE OF INTERNAL FRICTION = 33°

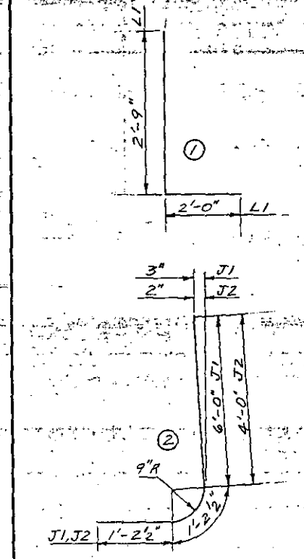
BACKFILL: THE WALL SHALL BE BACKFILLED USING CLASS I SELECT BACKFILL MATERIAL.

FOUNDATION DATA: PILES TO BE DRIVEN TO A MINIMUM OF 45 TONS PER PILE.

DRAINAGE: PIPE DRAINS SHALL BE PROVIDED AT 10'-0" CTS.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET 3-N.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

RETWING WALL (#2)

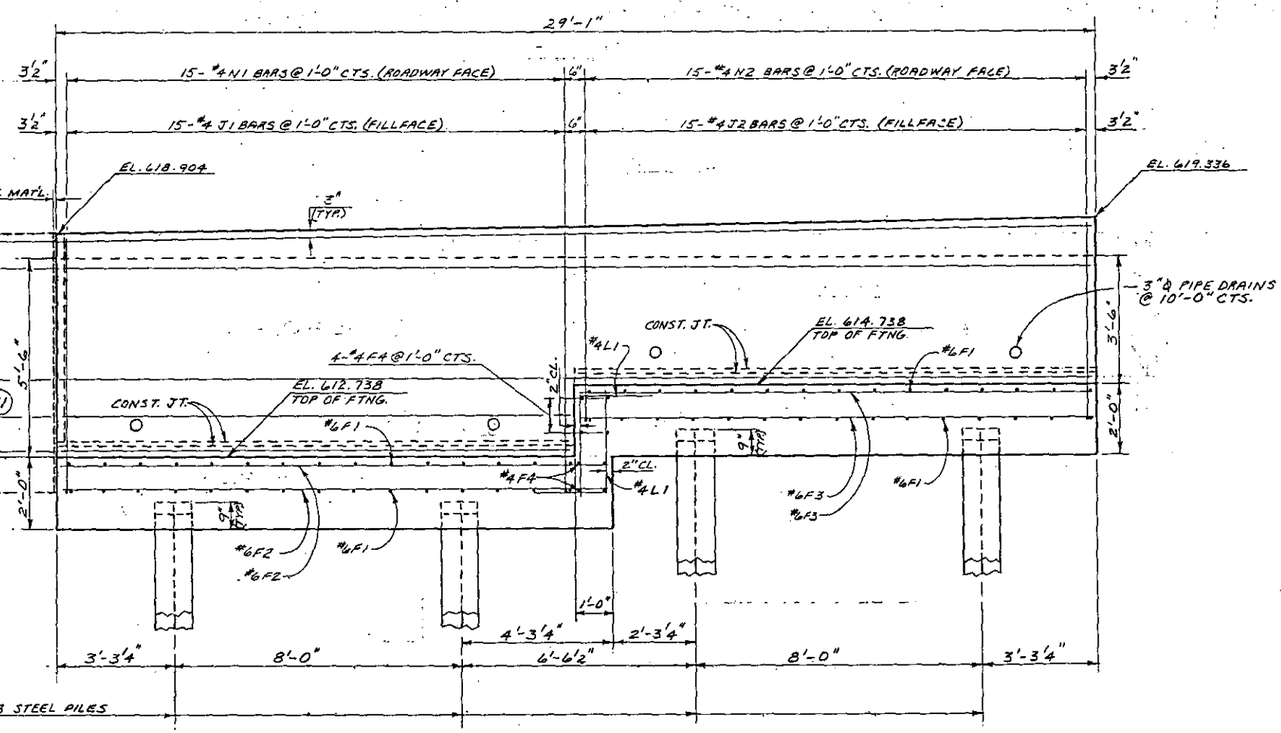
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
F1	62	#6	STR.	5'-8"	528
F2	18	#6	STR.	15'-2"	410
F3	18	#6	STR.	14'-2"	383
F4	6	#4	STR.	5'-8"	23
G1	4	#4	STR.	15'-2"	41
G2	10	#4	STR.	28'-9"	192
J1	15	#4	2	8'-5"	84
J2	15	#4	2	6'-5"	64
L1	12	#4	1	4'-9"	38
N1	15	#4	STR.	7'-0"	70
N2	15	#4	STR.	5'-2"	52

REINFORCING STEEL LBS. 1,885

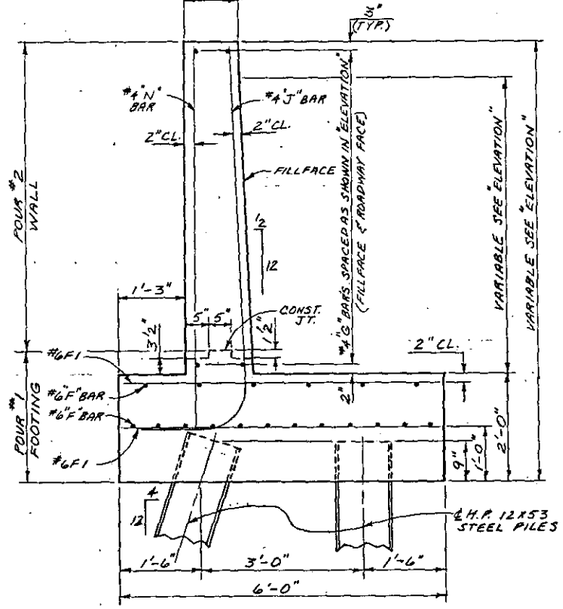
H.P 12/53 STEEL PILES
NO. 8 LIN.FT. 320

CLASS "A" CONCRETE BREAKDOWN

POUR #1 FOOTING	C.Y. 13.7
POUR #2 WALL	C.Y. 5.4
TOTAL C.Y.	19.1
FOUNDATION EXCAVATION	C.Y. 55



ELEVATION



TYPICAL SECTION

PROJECT NO. 8.1670801 #1

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING WALL
END BENT 2
(N.B.L.)

OCT. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-40
1			3			TOTAL SHEETS
2			4			82

DRAWN BY PCMY MARTIN DATE 10-21-88
CHECKED BY E.G. ALLEN DATE 11-16-88

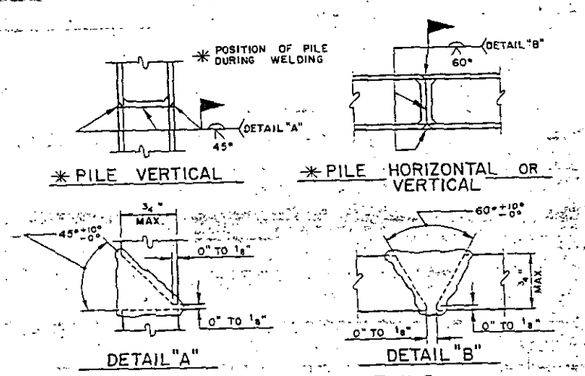
SOUTHERN PUBLISHING CO., GASTONIA, N.C.

AF 67637

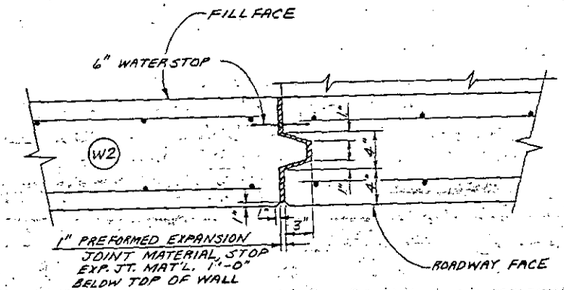
TOTAL BILL OF MATERIAL
(END BENT 2)

REINFORCING STEEL	8,916 LBS.
H.P. 12X53 STEEL PILES	845 LIN. FT.
CLASS "A" CONCRETE	63.4 CU. YDS.
FOUNDATION EXCAVATION	55 CU. YDS.
SELECT BACKFILL MATERIAL - CLASS I	22 TONS

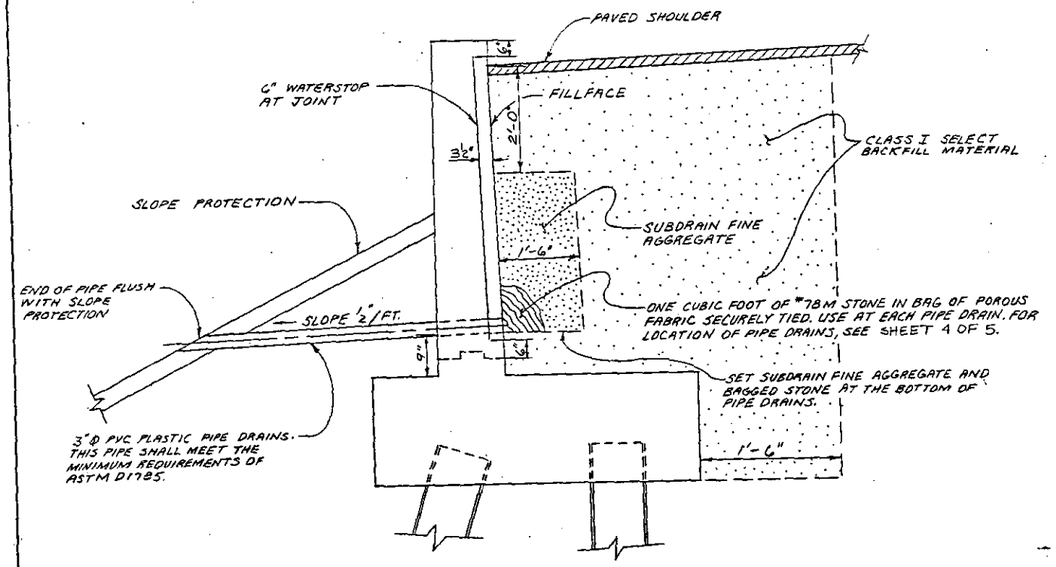
QUANTITIES FOR WING WALL ARE INCLUDED.



PILE SPLICE DETAILS

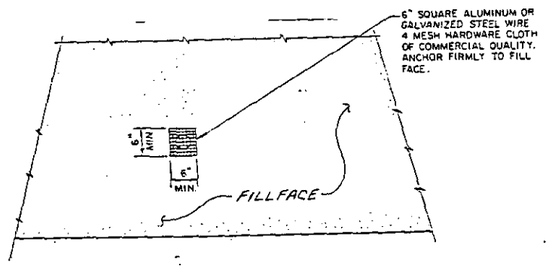


EXPANSION JOINT DETAILS



DRAINAGE DETAILS

NOTE: SUBDRAIN FINE AGGREGATE IS TO BE CONTINUOUS ALONG FILL FACE OF WING WALL. NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND PLACING FINE AGGREGATE AND STONE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.



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 BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

DRAWN BY ADAY MARTIN DATE 10-28-88
CHECKED BY E.G. ALLEN DATE 11-14-88

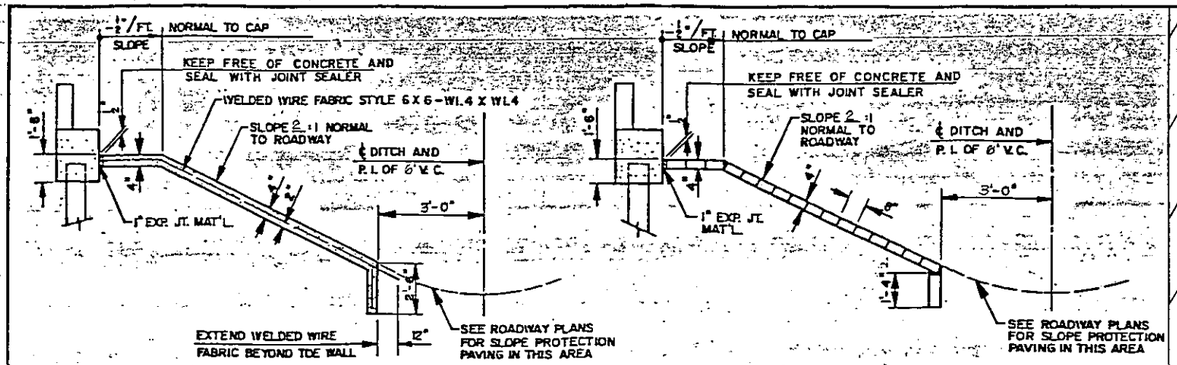
PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
-RALEIGH

WING WALL
END BENT 2
(N.B. L)

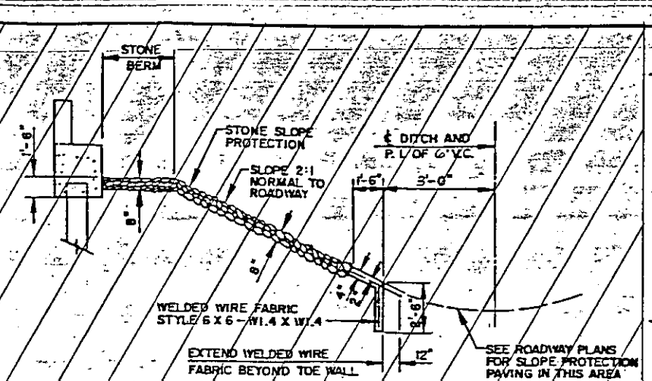
OCT. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-41
1			3			TOTAL SHEETS
2			4			82

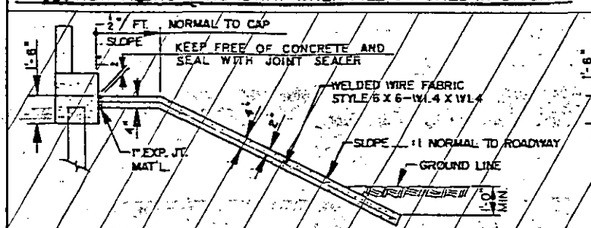


SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH

SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



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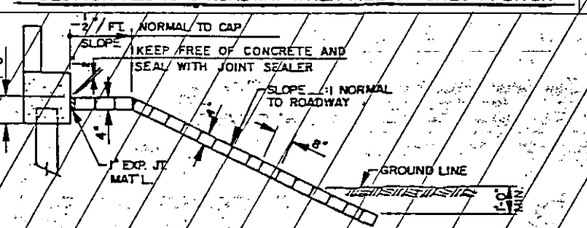

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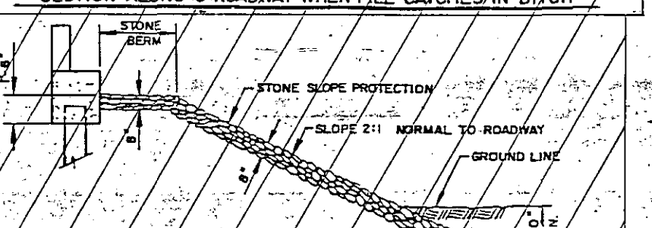

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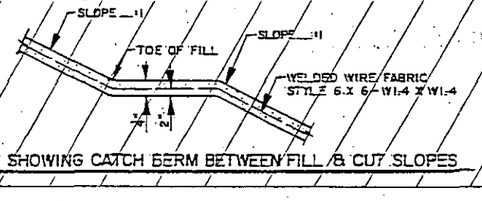
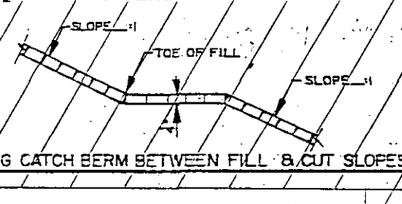
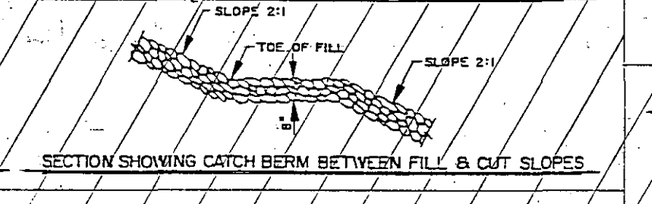


SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES



SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES



SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

GENERAL NOTES

4 INCH SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE. LIMITS OF THE PROTECTION SHALL BE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY PLACE EITHER TYPE, ALTERNATES "A", "B" OR "C", AS DESCRIBED BELOW. 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 870 OF THE STANDARD SPECIFICATIONS. THE SAME TYPE OF SLOPE PROTECTION SHALL BE USED UNDER BOTH ENDS OF ANY ONE BRIDGE. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF FOUR INCH 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. ALTERNATE "A" WELDED WIRE FABRIC REINFORCING SHALL BE STYLE 6 X 6 - W1.4 X W1.4, 60 INCHES WIDE. ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST SIX INCHES. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE FOUR FT. AND FIVE FT. STRIPS AS SHOWN IN POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION.

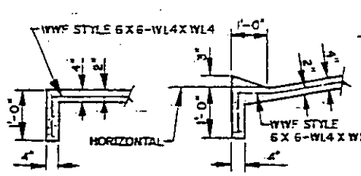
ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF SOLID CONCRETE BLOCKS 4" X 8" X 16" LAID IN HORIZONTAL COURSES SUCH THAT THOSE IN SUCCESSIVE COURSES WILL BREAK JOINTS WITH UNITS IN THE PRECEDING ONE. BLOCKS SHALL BE LAID WITH THEIR LONG AXIS PARALLEL TO THE END BENT CAP WITH GROUTED JOINTS PREFERABLY $\frac{3}{4}$" BUT NOT LESS THAN $\frac{1}{2}$" NOR MORE THAN $1\frac{1}{4}$" WIDE BETWEEN SUCCESSIVE COURSES AND ENDS OF BLOCKS. JOINTS SHALL BE GROUTED BY POURING A MIXTURE OF ONE PART PORTLAND CEMENT TO THREE PARTS SAND MIXED WITH SUFFICIENT WATER TO ENABLE THE MIXTURE TO BE POURED THROUGH A SPOUT. THE CONCRETE BLOCKS SHALL BE CAST TO ACCURATE DIMENSIONS, SHALL HAVE UNIFORM SURFACE COLOR AND TEXTURE AND SHALL BE MANUFACTURED OF MATERIALS TO PRODUCE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AT AGE OF 28 DAYS. NO BROKEN BLOCKS SHALL BE USED EXCEPT IN CONSTRUCTING A STRAIGHT LINE ALONG EACH SIDE OF THE PAVING DOWN THE SLOPE. CARE SHALL BE TAKEN TO BREAK THE BLOCKS SO AS TO GIVE A UNIFORM WORKMANLIKE JOINT AND SURFACE.

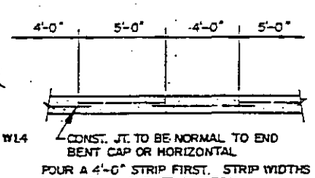
ALTERNATE "C"

ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.

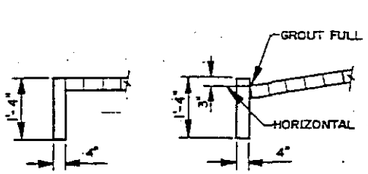
ALTERNATE "C" SHALL CONSIST OF A COMBINATION CONCRETE SLAB AND STONE SLOPE PROTECTION. THE CONCRETE PORTIONS SHALL CONSIST OF PAVED STRIPS ALONG THE DITCH AS SHOWN IN THE DETAILS. EIGHT INCHES OF STONE SHALL BE PLACED OVER THE REMAINING AREA SHOWN ON THE PLANS TO BE COVERED WITH SLOPE PROTECTION. CONCRETE SHALL BE CLASS B. THE COST OF THE CONCRETE, STONE AND WELDED WIRE FABRIC STYLE 6 X 6 - W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR 4 INCH SLOPE PROTECTION. FOR REQUIREMENTS ON SUBGRADING, STONE TYPE, STONE SIZING, AND HERBICIDE PROTECTION, SEE SPECIAL PROVISIONS FOR SLOPE PROTECTION.



SECTION A-A SECTION B-B



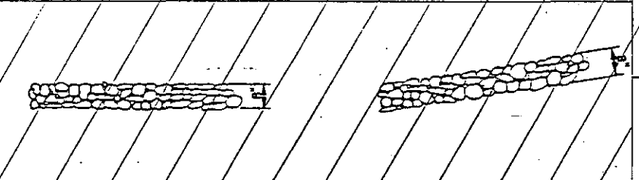
POURING DETAIL



SECTION A-A SECTION B-B

DETAILS FOR ALTERNATE "A"

DETAILS FOR ALTERNATE "B"

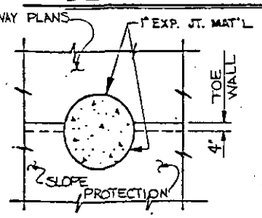


SECTION A-A SECTION B-B

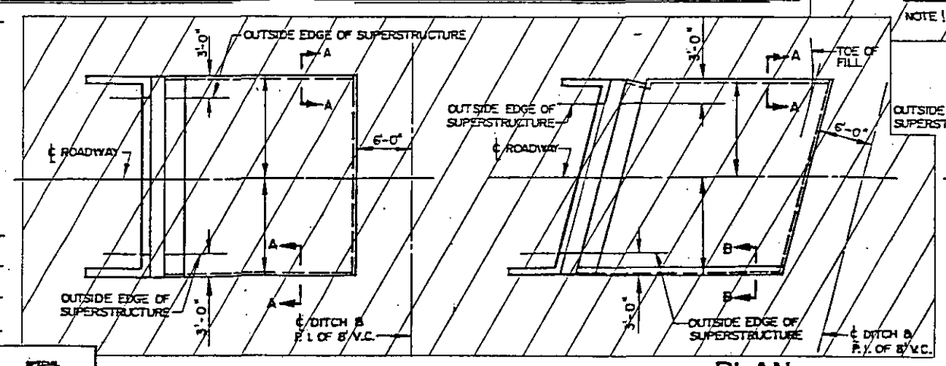
DETAILS FOR ALTERNATE "C"

NOTE! ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.

	4 INCH SLOPE PROTECTION SQUARE YARDS		WELDED WIRE FABRIC, 60" WIDE APPROX. L.F.
	END BENT 1	END BENT 2	
BRIDGE @ STA. 242+49.42 -L-			
STAGE 1	162	569	1462
STAGE 2	286	392	1356
STAGE 4	441	510	1902

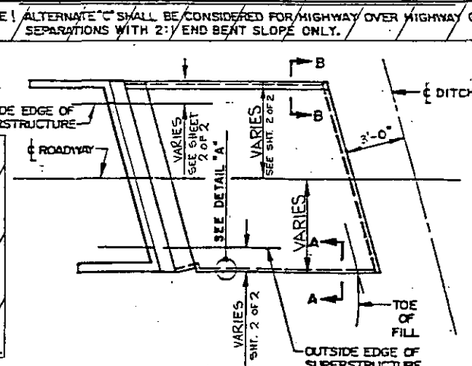


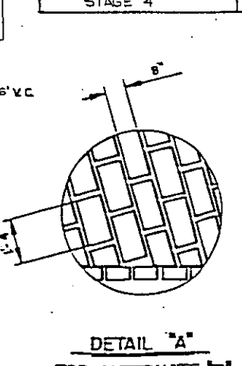
PLAN WHERE CONCRETE OR CONCRETE BLOCK SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION





DETAIL "A" FOR ALTERNATE "B"

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION 242+49.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD SLOPE PROTECTION DETAILS

FOR NORTH AND SOUTH BOUND BRIDGES

FEBRUARY 1979

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		5-42
1			3			TOTAL SHEETS	
2			4				82

STD. NO. SPI

DRAWN BY: Judy Nanaum DATE: 1-6-78 SPECIAL

CHECKED BY: ROBERT KUBNY DATE: 11-20-78

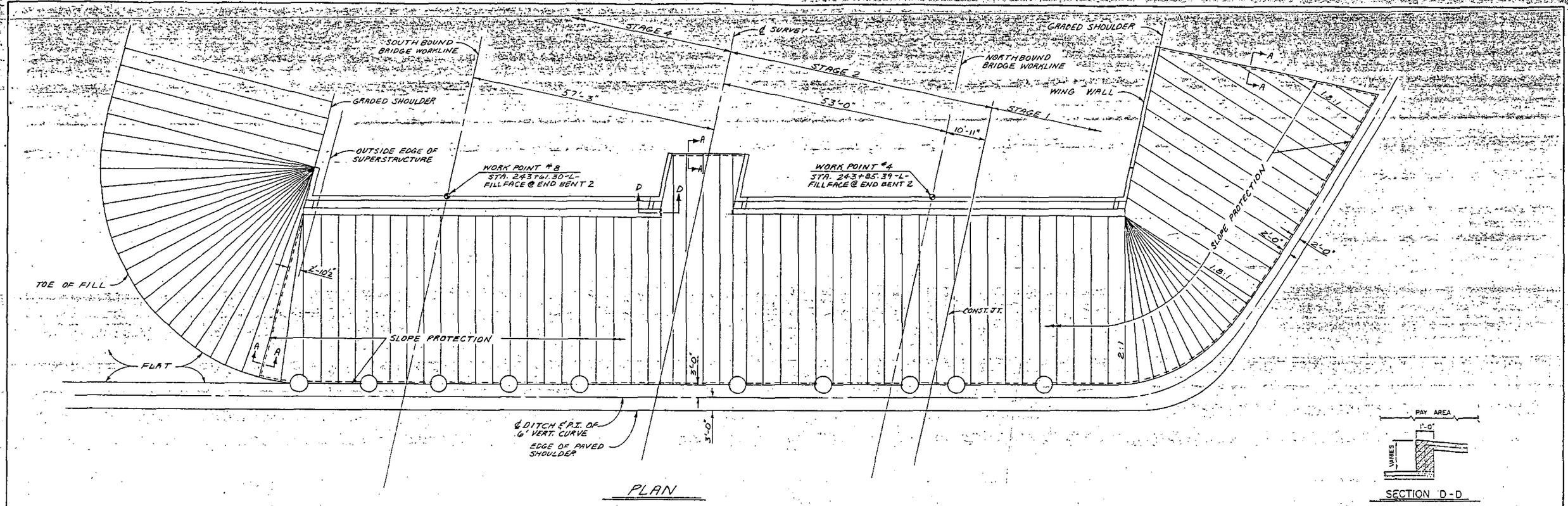
SUBMITTED BY: C.C. MITCHILER DATE: FEB. 1979

APPROVED BY: Kenneth H. Eckerson DATE: Feb. 21, 79 STANDARD

REVISED 3-12-87 BY: TGS / BY: JST
REVISED 7-11-84 BY: TGS / BY: JST
REVISED 3-1-84 BY: JWB / BY: RDU
REVISED 6-18-82 BY: ERL / BY: RGF

REVISED 5-25-82 BY: R.D.U. / BY: R.D.U.
REVISED 2/9/82 BY: E.R.L. / BY: R.D.U.
REDRAWN AND ADOPTED APRIL 1, 1979

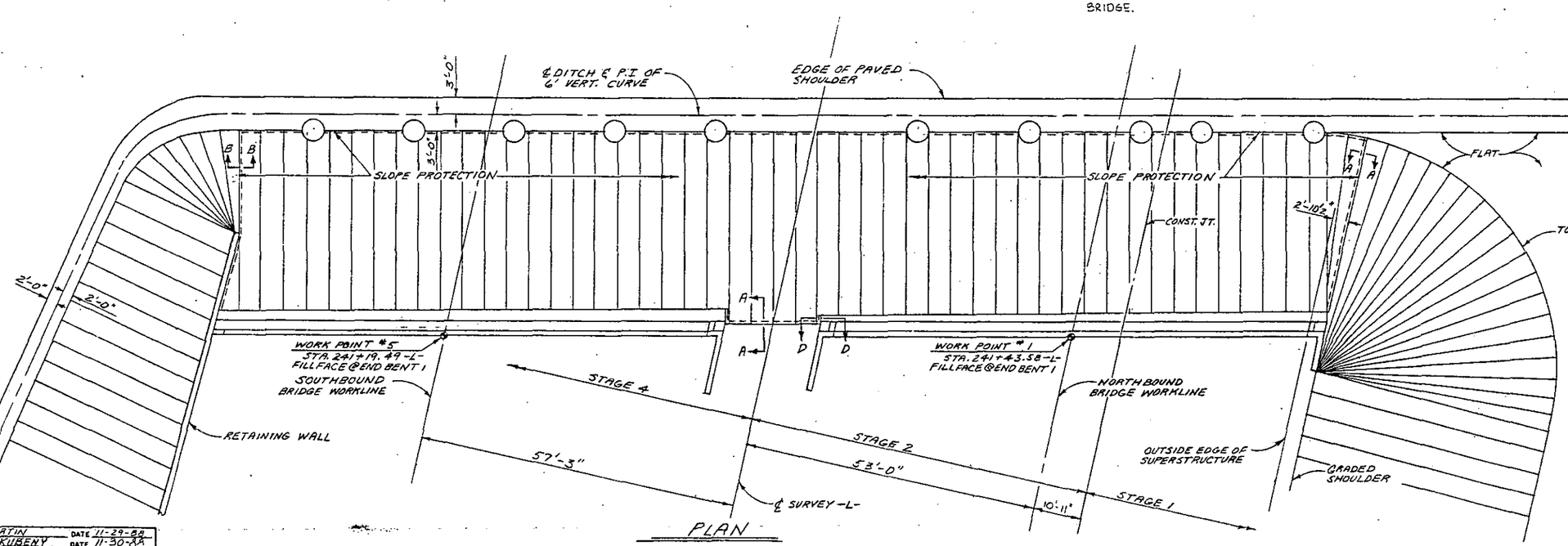
AF 67637



PLAN

SECTION D-D

NOTE: FOR BERM WIDTH DIMENSIONS AND ELEVATIONS, SEE "GENERAL DRAWINGS".
STAGE 3 IS THE CLOSURE POUR IN THE NORTH BOUND BRIDGE.



PLAN

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42-L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

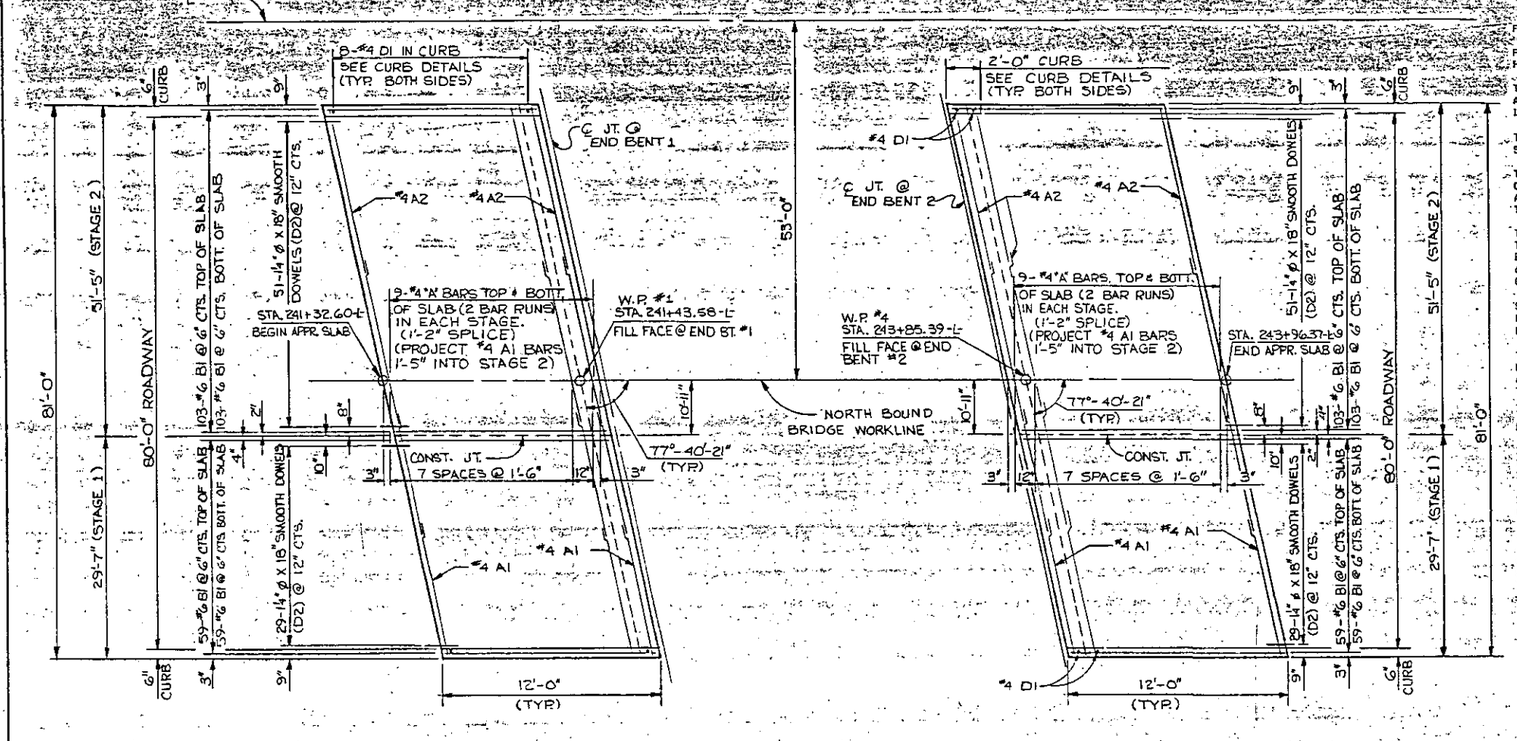
SLOPE PROTECTION DETAILS

FOR NORTH AND SOUTH BOUND BRIDGES

NOV 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-43
1			3			TOTAL SHEETS
2			4			82

DRAWN BY ROXY MARTIN DATE 11-29-88
CHECKED BY ROSS E KIBENY DATE 11-30-88



NOTES

FOR BRIDGE APPROACH SLABS, SEE SPECIAL PROVISIONS.

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID." SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB. IF SPECIAL DRAINAGE IS USED, THE 6" COMP. A.B.C. SHALL ALSO EXTEND UNDER THE CONCRETE FLUME AND 1'-0" OUTSIDE OF EACH EDGE OF CURB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

NO DIRECT PAYMENT WILL BE MADE FOR THE TEMPORARY DRAINAGE AS SUCH WORK WILL BE CONSIDERED INCIDENTAL TO OTHER WORK BEING PAID FOR BY THE VARIOUS ITEMS IN THE CONTRACT.

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

BILL OF MATERIAL

STAGE 1-APPROACH SLAB @ EBT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	36	4	STR	16'-5"	395
B1	118	6	STR	11'-7"	2053
D1	2	4	STR	0'-10"	1
D2	29	14"ϕ	STR	1'-6"	181
REINFORCING STEEL				LBS.	2630
CLASS "AA" CONCRETE				C.Y.	11.5

STAGE 2-APPROACH SLAB @ EBT. #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2	36	4	STR	26'-9"	643
B1	206	6	STR	11'-7"	3584
D1	2	4	STR	0'-10"	1
D2	51	14"ϕ	STR	1'-6"	319
REINFORCING STEEL				LBS.	4547
CLASS "AA" CONCRETE				C.Y.	19.9

TOTAL BILL OF MATERIAL FOR APPROACH SLAB @ EBT. #2

REINFORCING STEEL	LBS.	7,177
CLASS "AA" CONCRETE	C.Y.	31.4

BILL OF MATERIAL

STAGE 1-APPROACH SLAB @ EBT #1

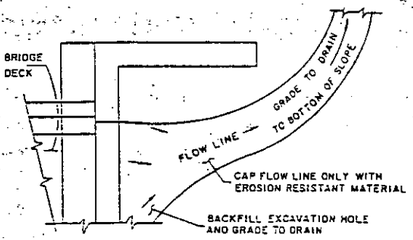
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	36	4	STR	16'-5"	395
B1	118	6	STR	11'-7"	2053
D1	8	4	STR	0'-10"	4
D2	29	14"ϕ	STR	1'-6"	181
REINFORCING STEEL				LBS.	2,633
CLASS "AA" CONCRETE				C.Y.	11.6

STAGE 2-APPROACH SLAB @ EBT. #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2	36	4	STR	26'-9"	643
B1	206	6	STR	11'-7"	3584
D1	8	4	STR	0'-10"	4
D2	51	14"ϕ	STR	1'-6"	819
REINFORCING STEEL				LBS.	4550
CLASS "AA" CONCRETE				C.Y.	20.0

TOTAL BILL OF MATERIAL FOR APPROACH SLAB @ EBT. #1

REINFORCING STEEL	LBS.	7183
CLASS "AA" CONCRETE	C.Y.	31.6

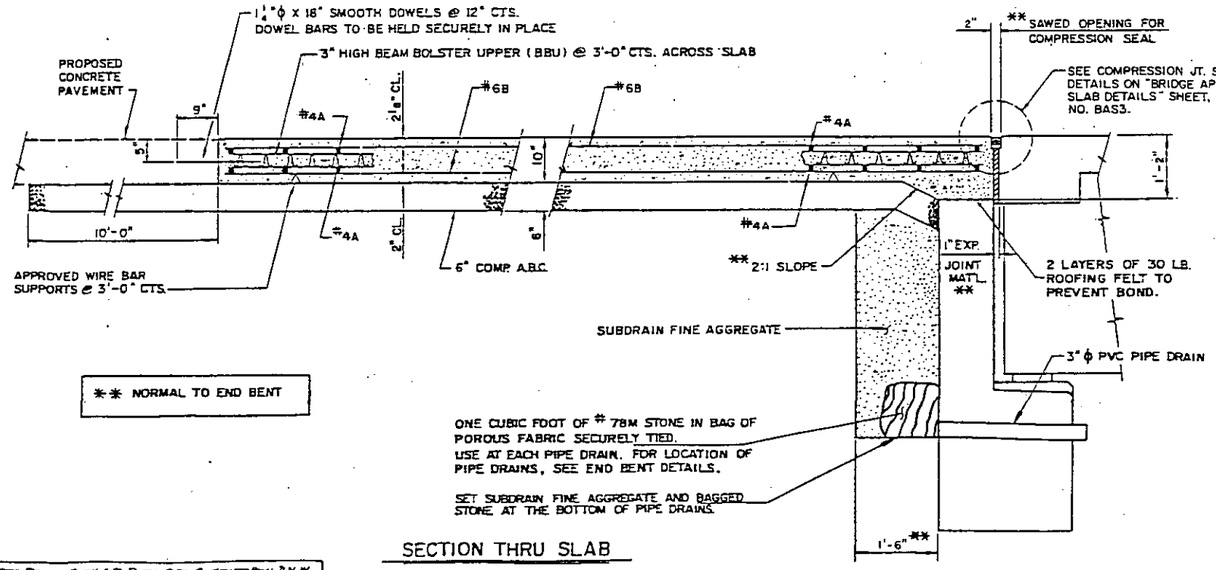


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

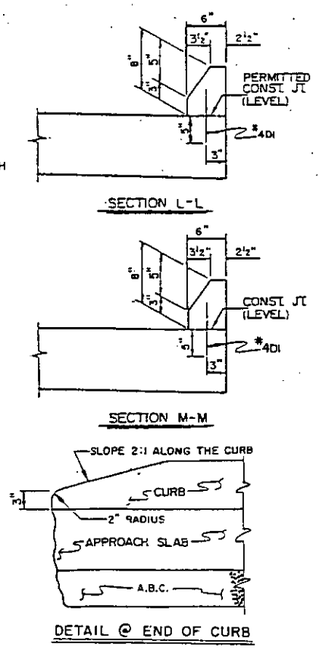
TEMPORARY DRAINAGE DETAILS

PLAN OF APPROACH SLAB @ END BENT #1

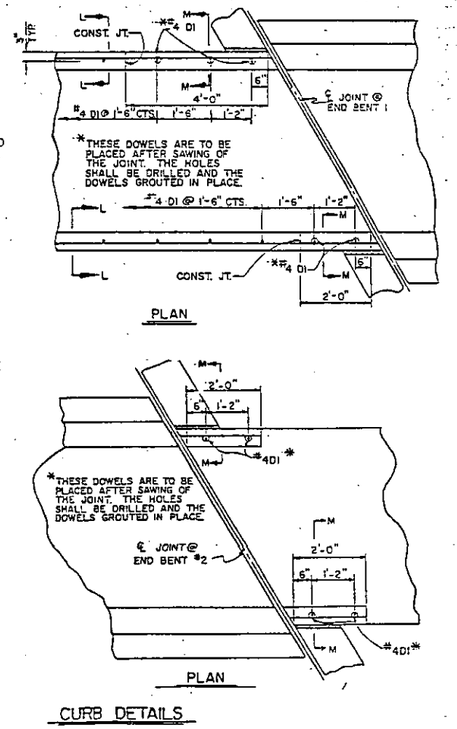
PLAN OF APPROACH SLAB @ END BENT #2



SECTION THRU SLAB



DETAIL @ END OF CURB



CURB DETAILS

PROJECT No. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR RIGID PAVEMENT

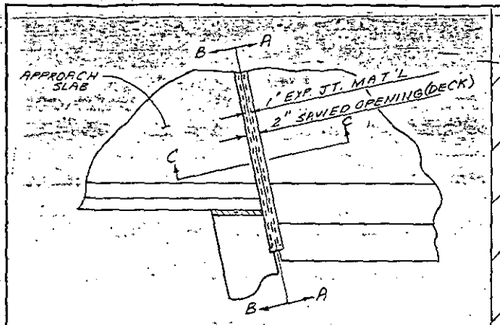
JULY (N.B.L.) 1978

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-44
1			3			TOTAL SHEETS
2			4			82

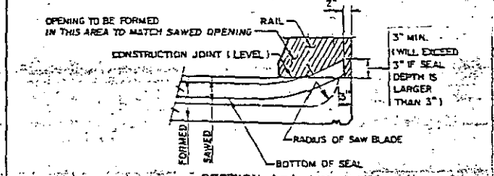
STD. NO. BAS1

STD. DRAWN BY: K.B.P. DATE: 2-71 CHECKED BY: J.N.W.
DRAWN BY: JOHN MARCUM DATE: 12-21-87
CHECKED BY: ROSS E. KUBENY DATE: 11-7-88

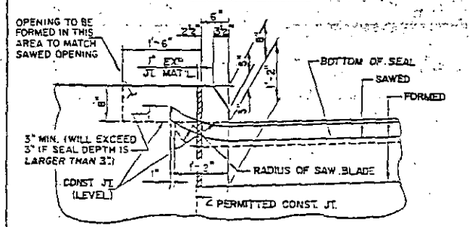
REVISED 10-28-79 BY: R.D.U. CHECKED BY: CCM
REVISED 4-1-79 BY: CCM CHECKED BY: R.D.U.
REVISED 7-31-78 BY: R.E.K. CHECKED BY: R.D.U.
REVISED 6-1-84 BY: TDS CHECKED BY: JST
REVISED 3-2-84 BY: E.R.L. CHECKED BY: R.N.H.
REVISED 9-82 BY: E.R.L. CHECKED BY: A.G.F.



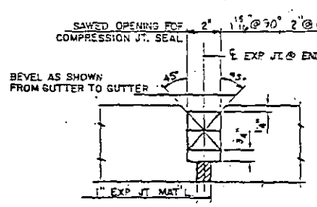
PLAN



SECTION A-A

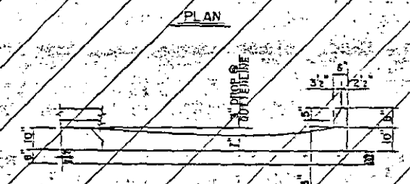


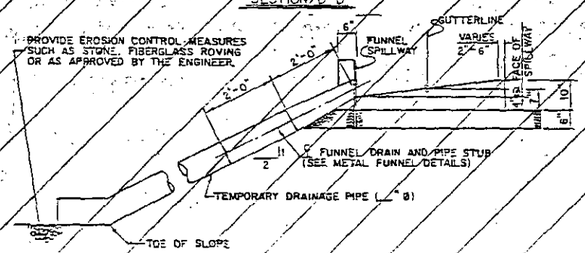
SECTION B-B



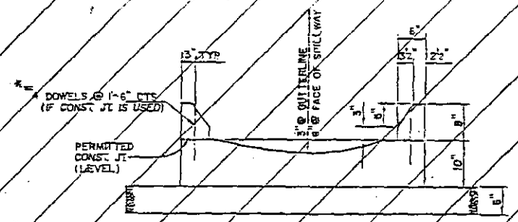
SECTION C-C

COMPRESSION JOINT SEAL DETAILS
@ END BENT



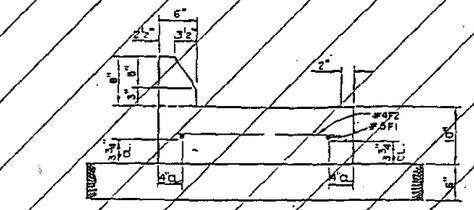


SECTION E-E



* THESE DOWELS ARE NOT INCLUDED IN THE BILL OF MATERIAL. ANY ADDITIONAL COST FOR FURNISHING AND PLACING THE DOWELS SHALL BE PAID FOR BY THE CONTRACTOR.

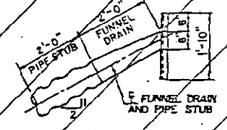
SECTION F-F



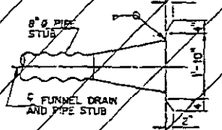
REINFORCING BAR CLEARANCES ARE SHOWN (SEE PLAN VIEW FOR BAR SPACINGS)

SECTION G-G

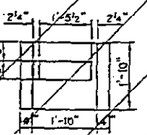
SPECIAL DRAINAGE DETAILS



SIDE VIEW



TOP VIEW



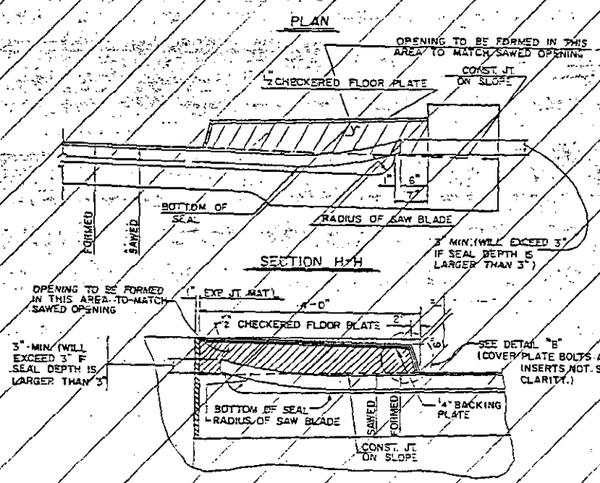
FRONT VIEW (SPILLWAY)

METAL FUNNEL DRAINAGE SHALL INCLUDE THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB. SPILLWAY AND FUNNEL DRAIN SHALL BE FABRICATED FROM FLAT SMOOTH METAL SHEETS.

METAL FOR THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB SHALL BE 0.064" THICK (STEEL) OR 0.072" THICK (ALUMINUM).

METAL FUNNEL DETAILS

ASSEMBLED BY: Judy Mangum	DATE: 5-9-85	SPECIAL
CHECKED BY: E. G. ALLEN	DATE: 5-14-85	
DRAWN BY: E. R. LUMPKIN, JR.	DATE: JANUARY 3, 1984	STANDARD
CHECKED BY: R. R. HUTCHERSON	DATE: JANUARY 3, 1984	

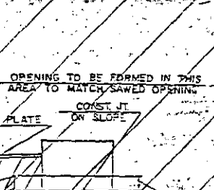


SECTION I-I

SECTION J-J

SECTION K-K

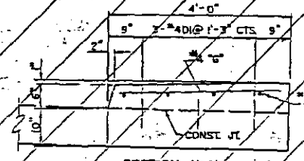
DETAIL "B"



DETAIL "C"

DETAIL "A"

COMPRESSION JOINT SEAL DETAILS
@ END BENT



SECTION N-N

PLAN

SIDEWALK DETAILS

PROJECT NO. 8.1670801 #1
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 2 OF 2

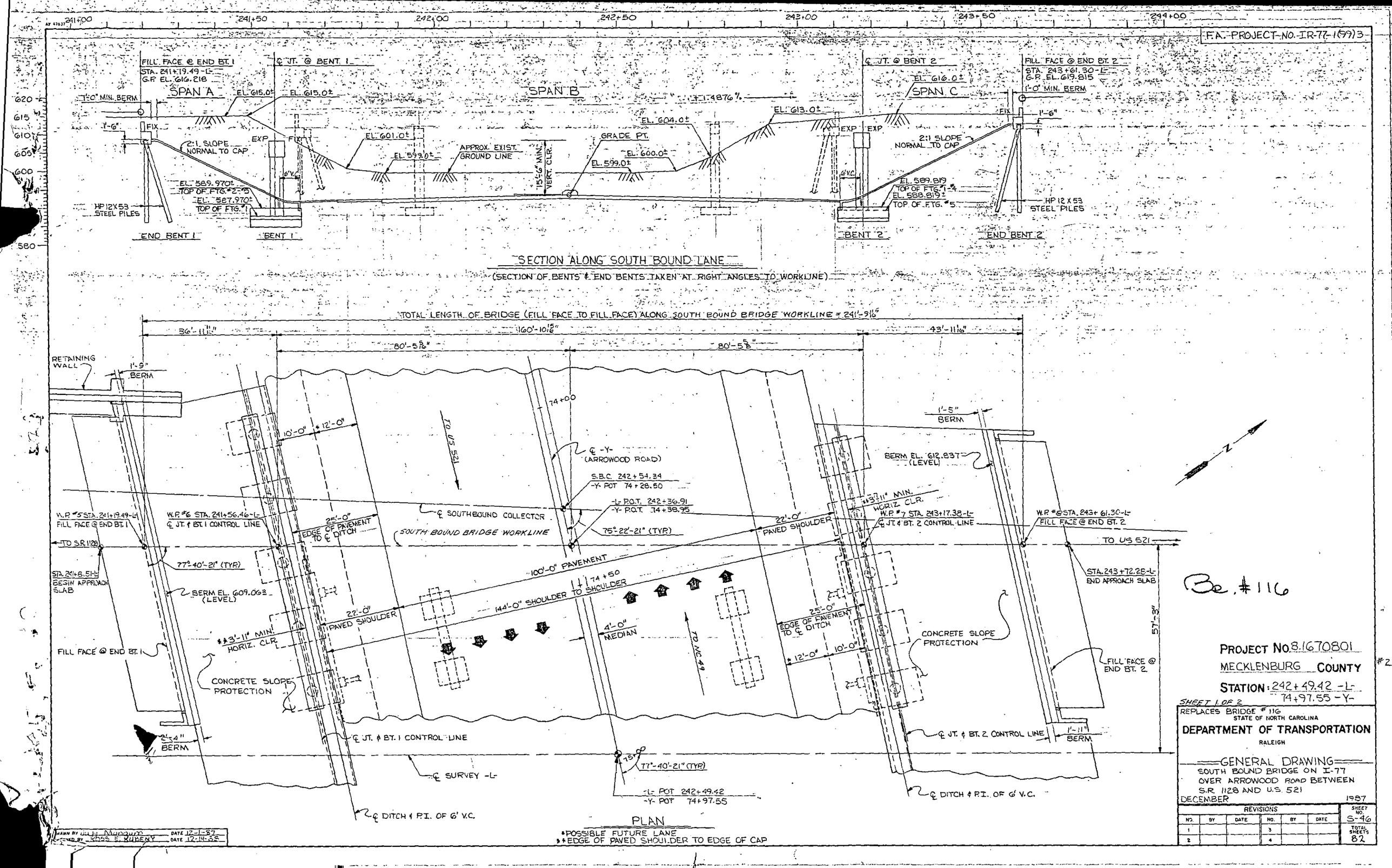
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
(NBL)

MARCH 1984

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-45
1			3			TOTAL SHEETS
2			4			82

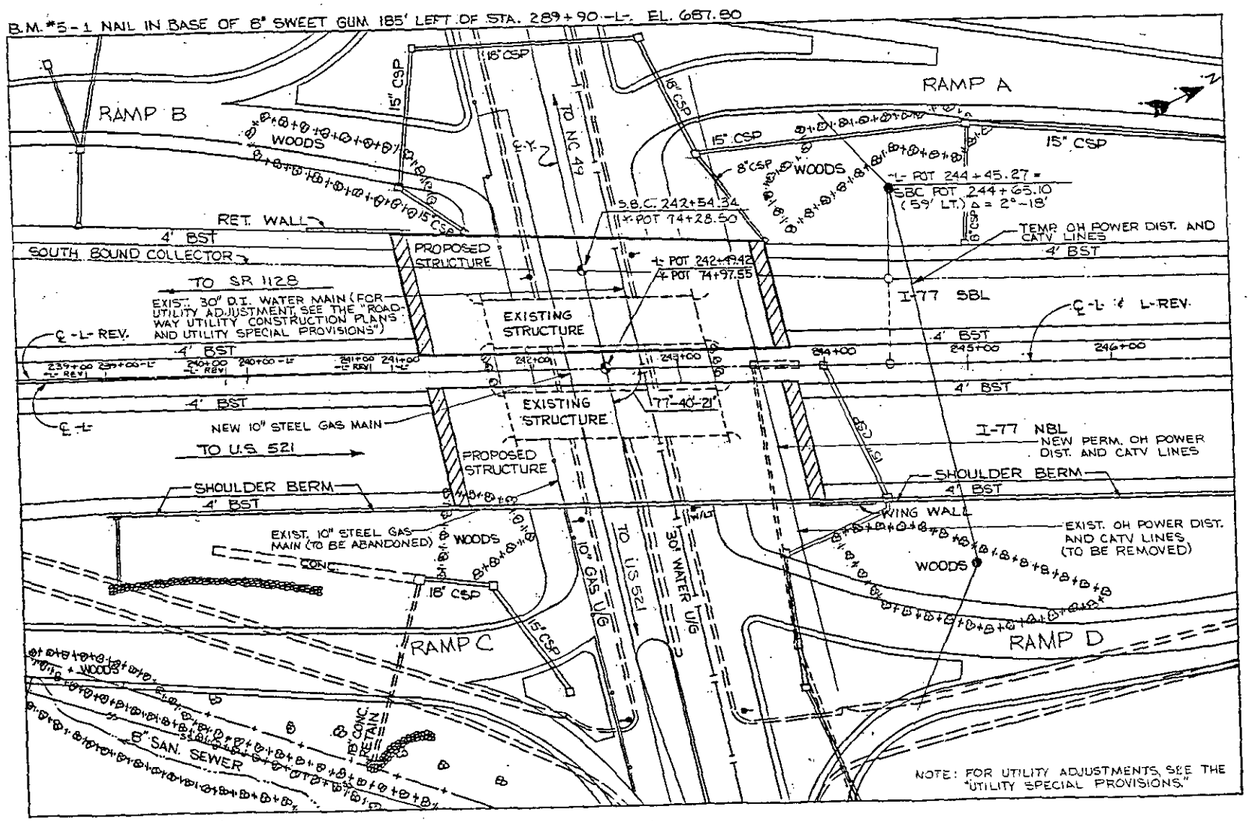
REVISED 5-31-85 BY:SJD
ADDED 3-1-84 BY:RNH

STD. NO. BAS3


F.A. PROJECT NO. IR-77-1(99)3
241+00
241+50
242+00
242+50
243+00
243+50
244+00
620
615
610
605
600
580
FILL FACE @ END BT. 1
STA. 241+19.49-L
G.P. EL. 616.218
℄ JT. @ BENT 1
SPAN A
SPAN B
SPAN C
℄ JT. @ BENT 2
FILL FACE @ END BT. 2
STA. 243+61.30-L
G.P. EL. 619.815
1'-0" MIN. BERM
EL. 615.0±
EL. 615.0±
EL. 616.0±
+1.4876%
EL. 613.0±
EL. 604.0±
EL. 601.0±
EL. 599.0±
APPROX. EXIST. GROUND LINE
GRADE PT.
EL. 600.0±
EL. 599.0±
15'-6" MIN. VERT. CLR.
2:1 SLOPE NORMAL TO CAP
EL. 589.970±
TOP OF FTG. #2-5
EL. 587.970±
TOP OF FTG. #1
HP 12X53 STEEL PILES
EL. 589.819
TOP OF FTG. #1-4
EL. 588.819±
TOP OF FTG. #5
END BENT 1
BENT 1
BENT 2
END BENT 2
SECTION ALONG SOUTH BOUND LANE
(SECTION OF BENTS & END BENTS TAKEN AT RIGHT ANGLES TO WORKLINE)
TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE) ALONG SOUTH BOUND BRIDGE WORKLINE = 241'-9 1/16"
36'-11 11/16"
160'-10 15/16"
43'-11 1/16"
80'-5 5/16"
80'-5 5/8"
RETAINING WALL
1'-9" BERM
1'-5" BERM
10'-0"
*12'-0"
74+00
TO US 521
℄ -Y- (ARROWOOD ROAD)
S.B.C. 242+54.34
-Y- POT 74+28.50
-L- P.O.T. 242+36.91
-Y- P.O.T. 74+38.95
75°-22'-21" (TYP.)
BERM EL. 612.837 (LEVEL)
**3'-11" MIN. HORIZ. CLR.
W.P. #5 STA. 241+19.49-L
FILL FACE @ END BT. 1
W.P. #6 STA. 241+56.46-L
℄ JT. & BT. 1 CONTROL LINE
25'-0" EDGE OF PAVEMENT TO ℄ DITCH
℄ SOUTHBOUND COLLECTOR
SOUTH BOUND BRIDGE WORKLINE
22'-0" PAVED SHOULDER
W.P. #7 STA. 243+17.38-L
℄ JT. & BT. 2 CONTROL LINE
W.P. #8 STA. 243+61.30-L
FILL FACE @ END BT. 2
TO S.R. 1128
TO US 521
77°-40'-21" (TYP.)
STA. 241+8.51-L
BEGIN APPROACH SLAB
100'-0" PAVEMENT
74+50
144'-0" SHOULDER TO SHOULDER
STA. 243+72.28-L
END APPROACH SLAB
BERM EL. 609.063 (LEVEL)
22'-0" PAVED SHOULDER
**3'-11" MIN. HORIZ. CLR.
4'-0" MEDIAN
TO NC 49
25'-0" EDGE OF PAVEMENT TO ℄ DITCH
*12'-0"
10'-0"
CONCRETE SLOPE PROTECTION
57'-3"
FILL FACE @ END BT. 1
FILL FACE @ END BT. 2
CONCRETE SLOPE PROTECTION
2'-4" BERM
℄ JT. & BT. 1 CONTROL LINE
℄ JT. & BT. 2 CONTROL LINE
1'-11" BERM
75+00
77°-40'-21" (TYP.)
℄ SURVEY -L-
-L- POT 242+49.42
-Y- POT 74+97.55
℄ DITCH & P.I. OF 6' V.C.
℄ DITCH & P.I. OF 6' V.C.
PLAN
*POSSIBLE FUTURE LANE
**EDGE OF PAVED SHOULDER TO EDGE OF CAP
N
Be. #116
PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
74+97.55 -Y-
SHEET 1 OF 2
REPLACES BRIDGE #116
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
SOUTH BOUND BRIDGE ON I-77
OVER ARROWOOD ROAD BETWEEN
S.R. 1128 AND U.S. 521
DECEMBER 1987
REVISIONS
NO. BY DATE NO. BY DATE
1 2 3 4
SHEET NO. S-46
TOTAL SHEETS 82
DRAWN BY DATE 12-1-87
CHECKED BY ROSS E. RUBENY DATE 12-14-88

TOTAL BILL OF MATERIAL

	RENOVAL OF EXISTING STRUCTURE AT STATION 242+49.42 -L-	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	CLASS A CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	BRIDGE APPROACH SLABS	POT BEARINGS	ELASTOMERIC BEARINGS	4" SLOPE PROTECTION	EXPANSION JOINT SEAL	PREFORMED COMPRESSION JOINT SEAL	
	LUMP SUM	CU. YDS.	SQ. FT.	CU. YDS.	LBS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	SQ. YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE	LUMP SUM		19,085				710,900			481.7	LUMP SUM	LUMP SUM	LUMP SUM		LUMP SUM	LUMP SUM	
END BENT NO. 1				45.6	7,079			14	350		LUMP SUM			441			
BENT NO. 1		290		148.8	22,665	2,010											
BENT NO. 2		280		147.2	22,050	2,322											
END BENT NO. 2				35.5	6,639			14	280		LUMP SUM			510			
TOTAL	LUMP SUM	570	19,085	377.1	58,433	4,332	710,900	28	630	481.7	LUMP SUM	LUMP SUM	LUMP SUM	951	LUMP SUM	LUMP SUM	



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20-44 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.

THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.

ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED ASTM A588 STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI 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 PROVISION "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL SHALL BE GRADE 60.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR PROTECTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

COMPUTED FOUNDATION LOAD FOR BENT NO.1&2 EQUALS 4 TONS PER SQ. FT.

FOUNDATION EXCAVATION TO BE MEASURED FROM THE GRADED ROADWAY TYPICAL SECTION.

PILES FOR END BENTS NO.1&2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

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.

AFTER SERVING AS A TEMPORARY CROSSING, THE EXISTING STRUCTURE CONSISTING OF THREE SPANS OF REINFORCED CONCRETE DECK ON STEEL I-BEAMS (TWO @ 34'-0" AND ONE @ 81'-0") PROVIDING 28 FEET OF CLEAR ROADWAY AND SITTING ON REINFORCED CONCRETE CAPS ON STEEL PILES AT THE END BENTS AND REINFORCED CONCRETE POST AND BEAM INTERIOR BENTS AND LOCATED AT THE SAME SITE AS 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. SEE SPECIAL PROVISIONS.

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-
74+97.55 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

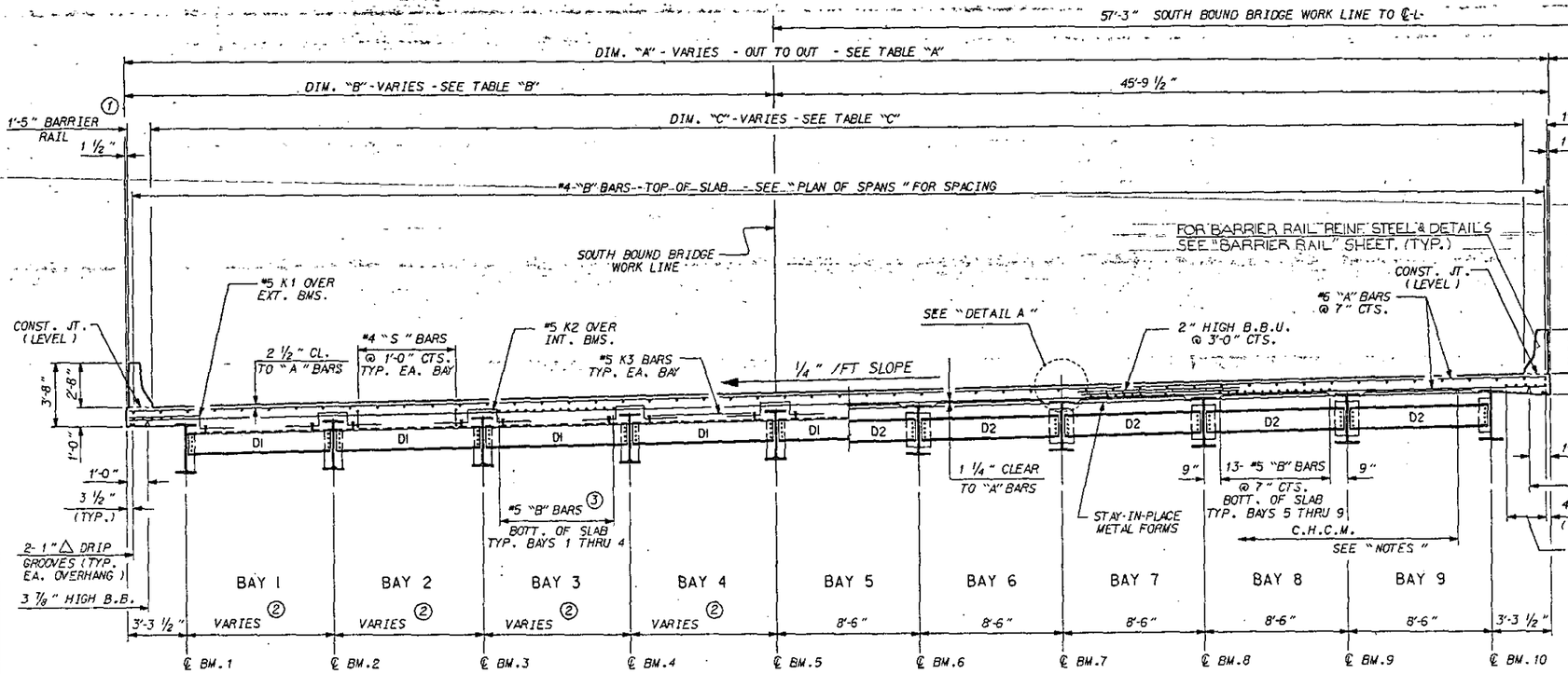
GENERAL DRAWING

SOUTH BOUND BRIDGE ON I-77 OVER ARROWOOD ROAD BETWEEN S.R. 1126 AND US 521

JULY 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-47
1			3			TOTAL SHEETS
2			4			82

28-MAR-1989 16:38
$220 LEGACY 2211 46208STS.DGN
ROUBENK



TYPICAL HALF SECTION

BENT DIAPHRAGM (D1) SHOWN IS FOR SPAN "A" NEAR SIDE AND SPAN "C" FAR SIDE.

TYPICAL HALF SECTION

SHOWING INTERMEDIATE DIAPHRAGMS (D2)

NOTES

PROVIDE CONTINUOUS HIGH CHAIR FOR METAL DECK (C.H.C.M.) @ 4'-0" CENTERS WITH LEG SPACING TO MATCH THE PITCH OF THE FORM AND WITH A HEIGHT TO SUPPORT THE BOTTOM LAYER OF SLAB REINFORCEMENT A CLEAR DISTANCE OF 1 1/4" ABOVE THE TOP OF THE STAY-IN-PLACE FORM.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE JOINT IN THE DECK IS CONTINUOUS IN A STRAIGHT LINE THROUGH THE BARRIER RAIL.

BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR EXPANSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE EXPANSION JOINT SEAL AT BENT #2 SHALL BE CAPABLE OF HANDLING A TOTAL THERMAL MOVEMENT, MEASURED PARALLEL TO THE CENTERLINE OF ROADWAY, OF 1-7/16" (-15/16" EXPANSION AND 15/16" CONTRACTION FROM A MIDPOINT TEMPERATURE OF 60 DEGREES F).

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

NO CHAMFER IS REQUIRED ON CORNERS OF EXTERIOR GIRDER BUILDUPS.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

PREVIOUSLY CAST CONCRETE IN SPAN "B" SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THAT SPAN.

ALL FALSEWORK FOR SPAN "B" SLAB SHALL REMAIN IN PLACE UNTIL THE ENTIRE SPAN IS CAST AND CURED.

STRUCTURAL STEEL ERECTION IN SPAN "B" SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE SLAB.

NO TRANSVERSE CONSTRUCTION JOINT WILL BE PERMITTED IN SPAN "A" AND "C".

TYPICAL SECTION - SPAN A & SPAN C

(1) NORMAL TO ℄ EXTERIOR BEAM

(2) SEE "FRAMING PLAN DETAILS"

(3) SEE "PLAN OF SPAN" FOR SPACING

FOR BENT DIAPHRAGMS AND INTERMEDIATE DIAPHRAGMS SHOWN BUT NOT DETAILED SEE "STRUCTURAL STEEL" DETAIL SHEET 6 OF 6.

FOR BENT DIAPHRAGM AND INTERMEDIATE DIAPHRAGM LOCATIONS AND TYPES, SEE "FRAMING PLAN DETAILS" SHEET.

FOR BARS SHOWN BUT NO BAR MARKS, SEE "PLAN OF SPAN".

TABLE "A"	
℄ JOINT @ END BENT #1	- 84'-5 13/16"
℄ JOINT @ BENT #1	- 83'-0 3/8"
℄ JOINT @ BENT #2	- 76'-6 1/8"
℄ JOINT @ END BENT #2	- 74'-9 1/4"

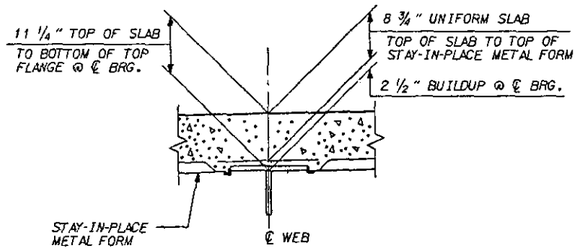
ALL DIMENSIONS TAKEN NORMAL TO WORK LINE

TABLE "B"	
℄ JOINT @ END BENT #1	- 38'-8 5/16"
℄ JOINT @ BENT #1	- 37'-2 7/8"
℄ JOINT @ BENT #2	- 30'-8 5/8"
℄ JOINT @ END BENT #2	- 29'-11 3/4"

ALL DIMENSIONS TAKEN NORMAL TO WORK LINE

TABLE "C"	
℄ JOINT @ END BENT #1	- 81'-4 5/8"
℄ JOINT @ BENT #1	- 79'-11 3/16"
℄ JOINT @ BENT #2	- 73'-4 15/16"
℄ JOINT @ END BENT #2	- 71'-8 1/16"

ALL DIMENSIONS TAKEN NORMAL TO WORK LINE



DETAIL "A"

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9-20-88
CHECKED BY: G.A. THOMPSON DATE: 5-23-89

12-DEC-1988 15:02
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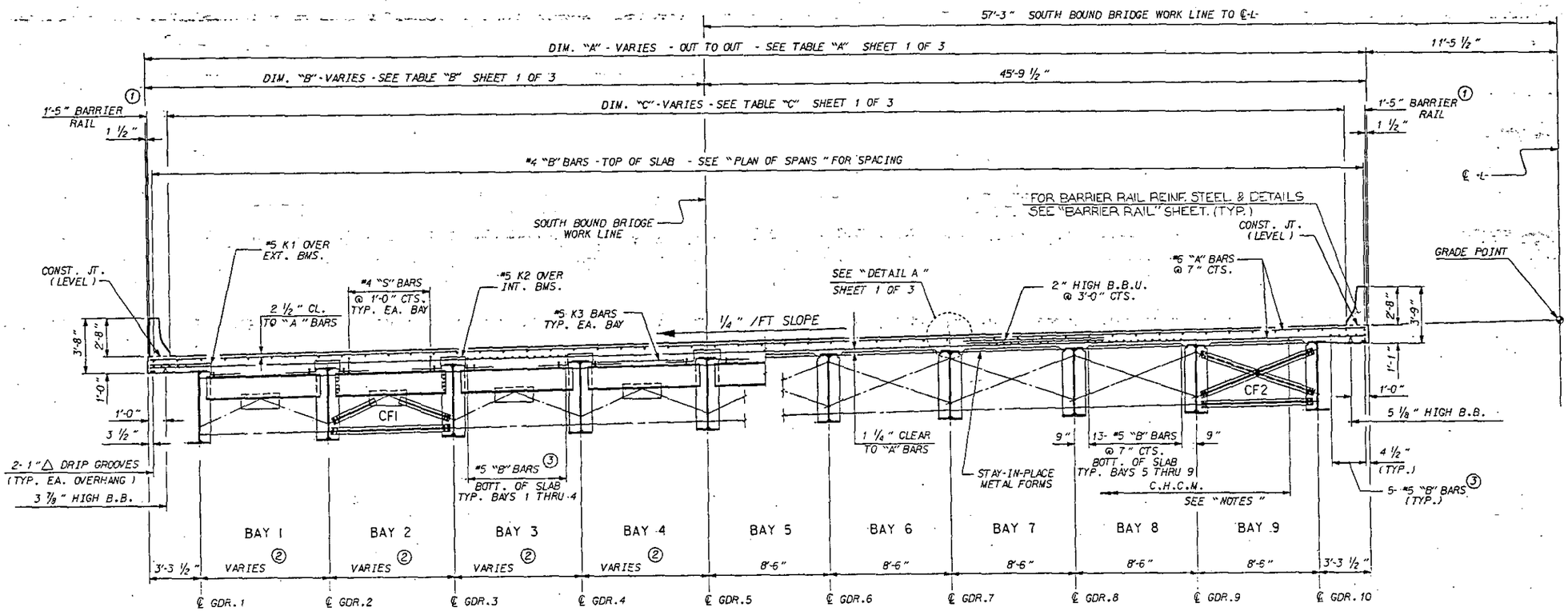
RKUBENY



TYPICAL HALF SECTION

BENT CROSSFRAME (CF1) SHOWN IS FOR SPAN "A" FAR SIDE, SPAN "B" NEAR AND FAR SIDE, AND SPAN "C" NEAR SIDE.

TYPICAL HALF SECTION

SHOWING INTERMEDIATE CROSSFRAME (CF2)

① NORMAL TO ℄ EXTERIOR GIRDER

② SEE "FRAMING PLAN DETAILS"

③ SEE "PLAN OF SPAN" FOR SPACING

TYPICAL SECTION - SPAN B

FOR BENT CROSSFRAMES AND INTERMEDIATE CROSSFRAMES SHOWN BUT NOT DETAILED SEE "STRUCTURAL STEEL" DETAIL SHEET 6 OF 6.

FOR BENT CROSSFRAME AND INTERMEDIATE CROSSFRAME LOCATIONS AND TYPES, SEE "FRAMING PLAN DETAILS" SHEET.

FOR BARS SHOWN BUT NO BAR MARKS, SEE "PLAN OF SPAN".

PROJECT NO. B-1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

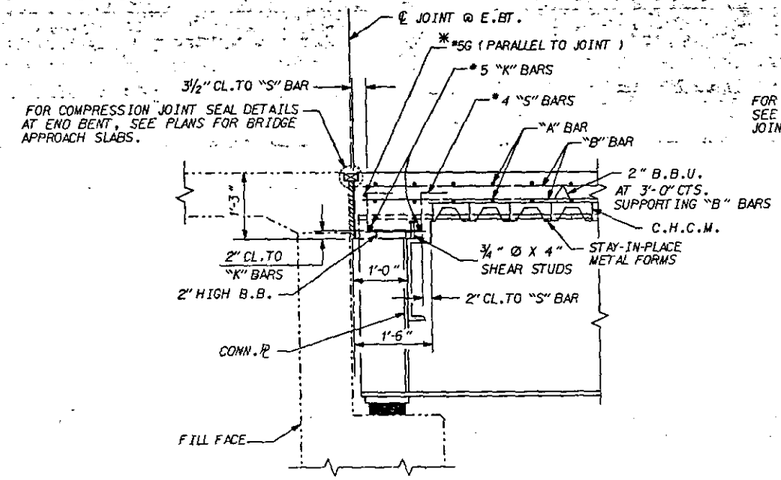
SUPERSTRUCTURE

TYPICAL SECTIONS

JULY (S.B.L.) 1988

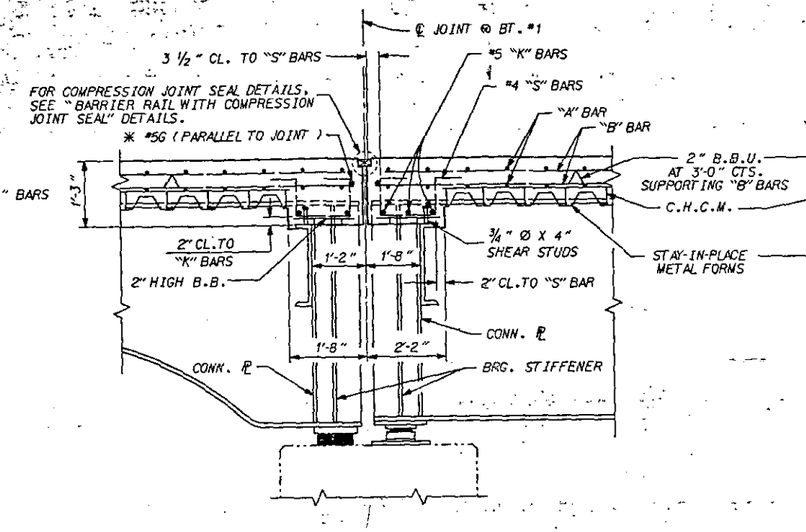
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9-20-88
CHECKED BY : E.C. Powell DATE : 12-5-88



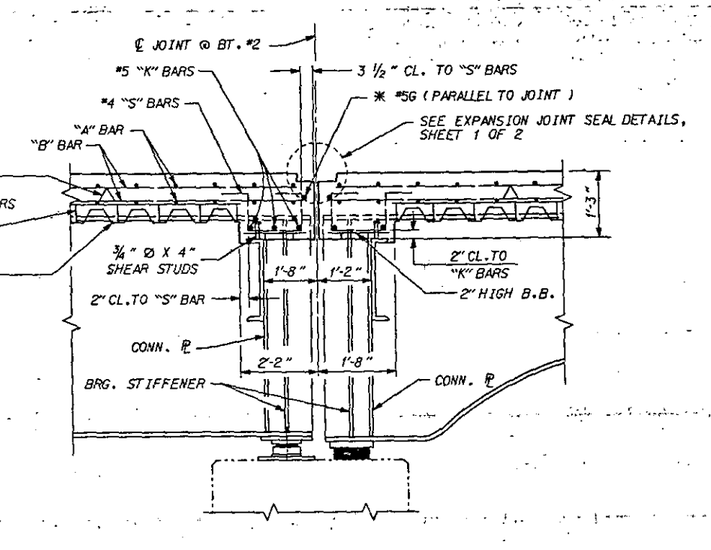
SECTION A - A

* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



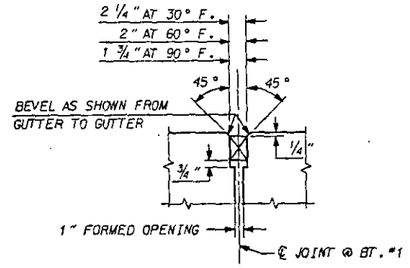
SECTION B - B

* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

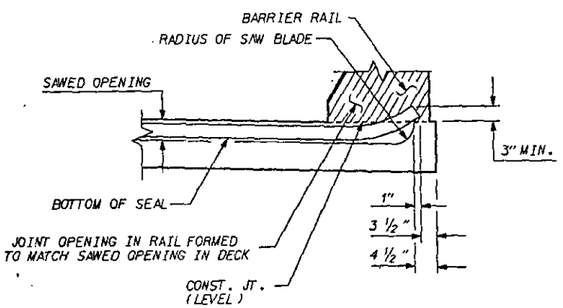


SECTION C - C

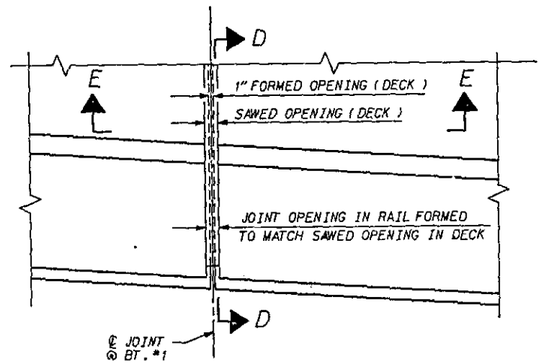
* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



SECTION E-E



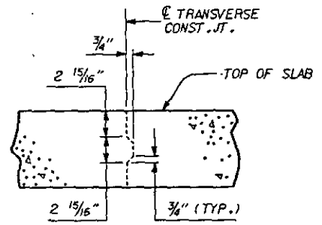
SECTION D-D



PLAN

BARRIER RAIL WITH COMPRESSION JOINT SEAL @ BT. #1

(FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS)



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: SLAB REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9-21-88
CHECKED BY: G.A. THOMPSON DATE: 3-[illegible]-88

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15-DEC-1988 12:41
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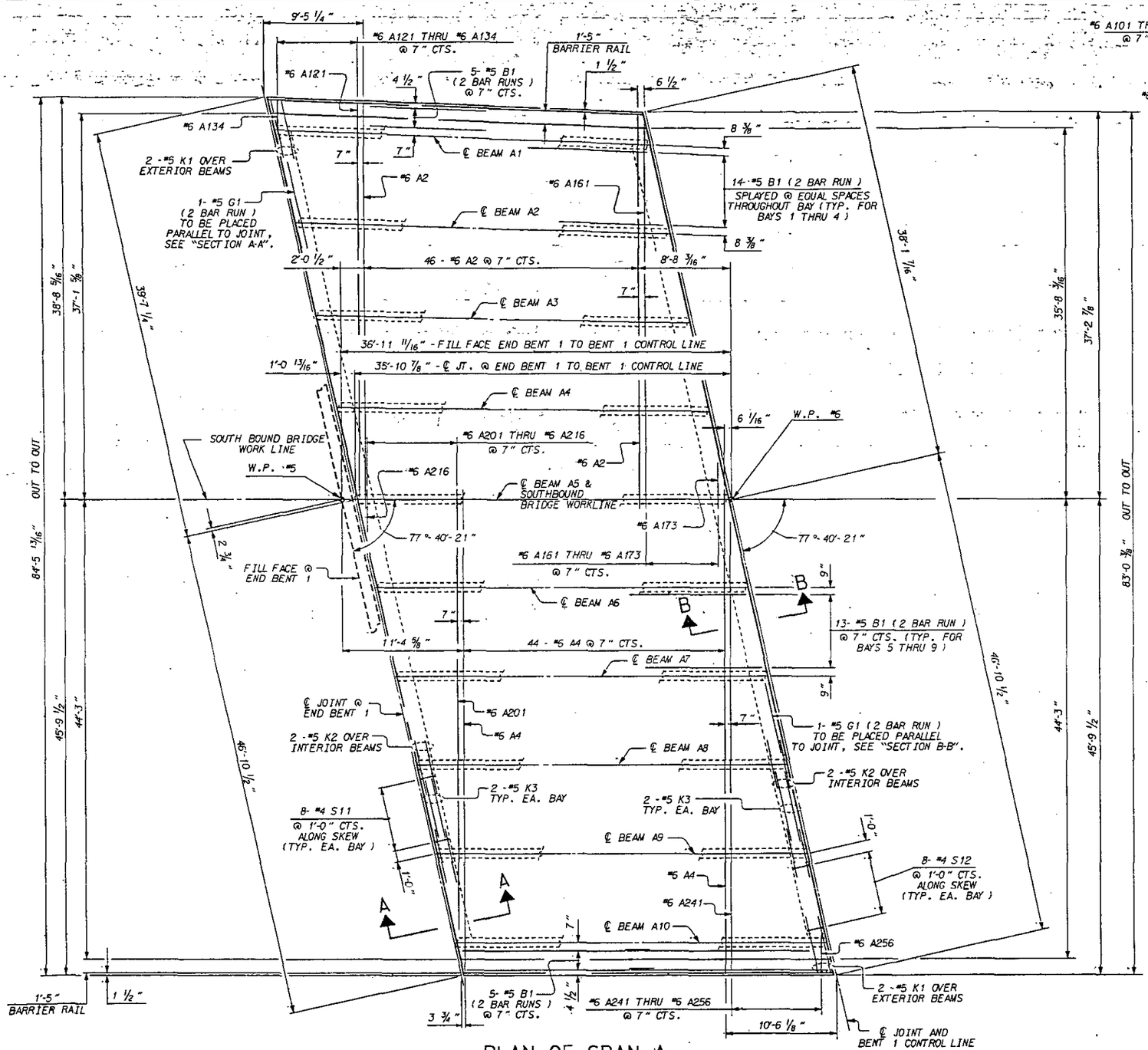


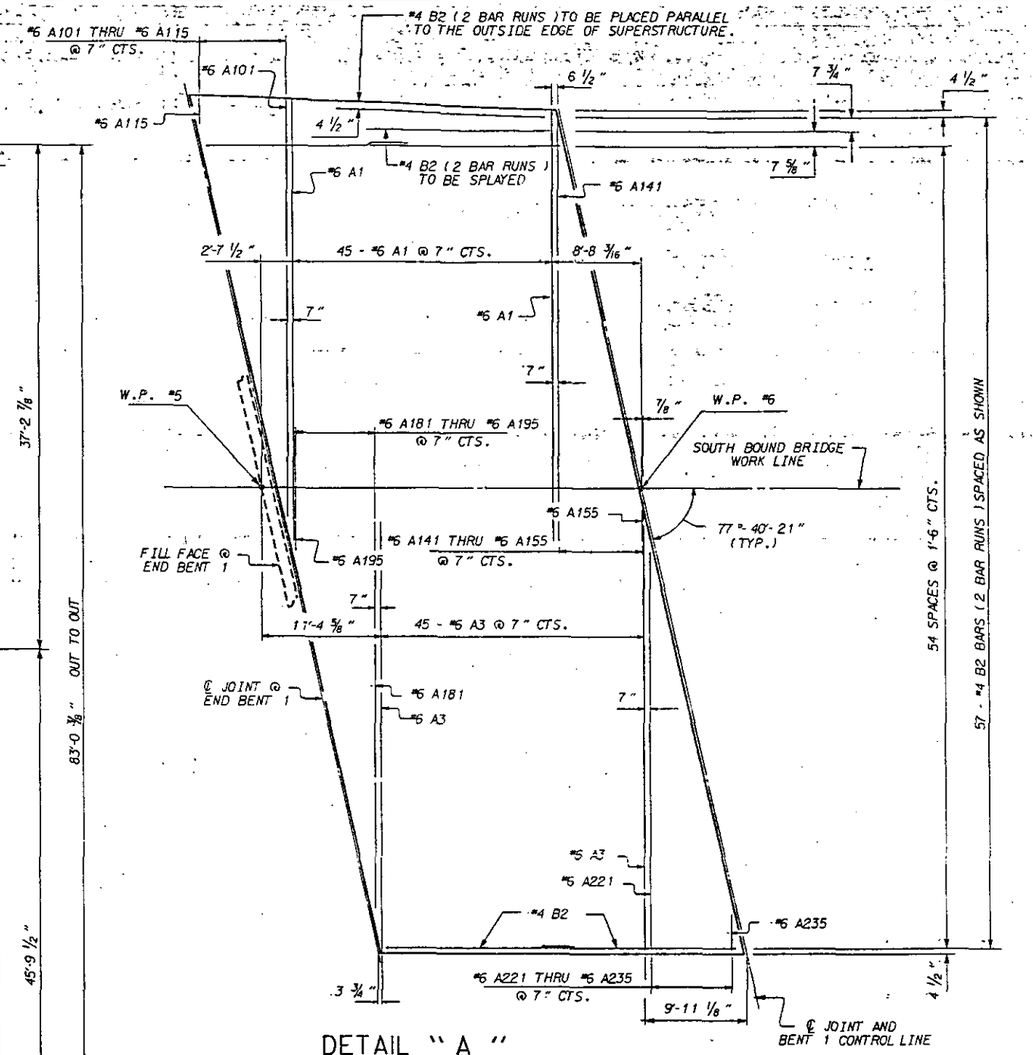
PLAN OF SPAN A

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.

ALL "A" & "B" BARS SHOWN ARE IN THE BOTTOM MAT OF STEEL.

FOR #6 "A" & #4 "B" BARS IN TOP MAT OF STEEL, SEE DETAIL "A".

FOR SECTION "A-A" AND "B-B", SEE SUPERSTRUCTURE "TYPICAL SECTION DETAIL" SHEET 3 OF 3.



DETAIL "A"

ALL "A" & "B" BARS SHOWN ARE IN THE TOP MAT OF STEEL.

FOR #6 "A" & #5 "B" BARS IN BOTTOM MAT OF STEEL, SEE "PLAN OF SPAN A".

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

JUNE (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9/21/88
CHECKED BY : E.C. Powell DATE : 12-15-88

15-DEC-1988 12:42
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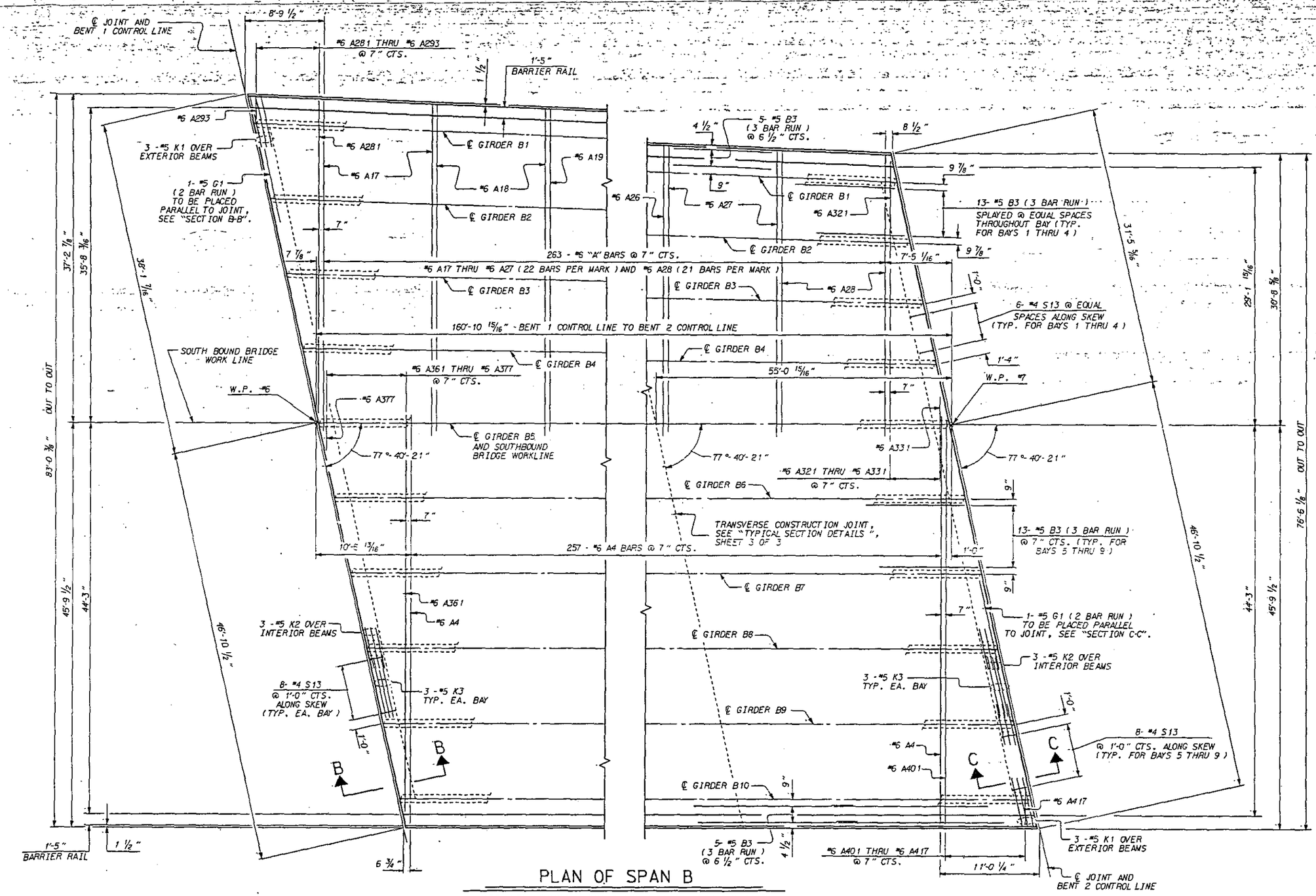
KUBENY



PLAN OF SPAN B

NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.
ALL "A" & "B" BARS SHOWN ARE IN THE BOTTOM MAT OF STEEL.
FOR #6 "A" & #4 "B" BARS IN TOP MAT OF STEEL, SEE DETAIL "B", SHEET 2 OF 2.
FOR SECTION "B-B" & "C-C", SEE SUPERSTRUCTURE "TYPICAL SECTION DETAILS" SHEET 3 OF 3.

DRAWN BY : ROSS E. KUBENY DATE : 9/15/88
CHECKED BY : E. C. Powell DATE : 12-15-88

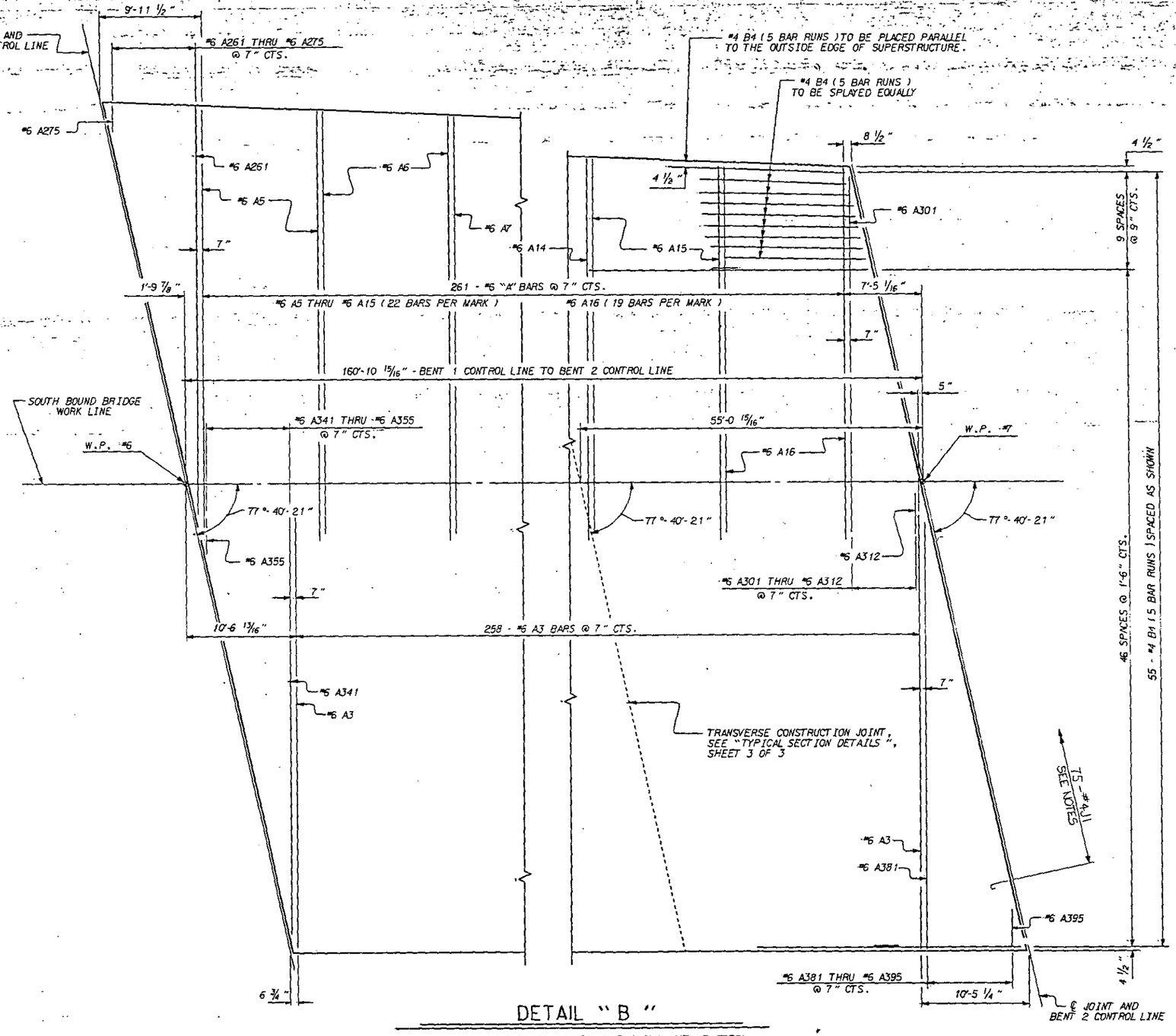
PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B

JUNE (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			82



DETAIL "B"

ALL "A" & "B" BARS SHOWN ARE IN THE TOP MAT OF STEEL.

FOR #6 "A" & #5 "B" BARS IN BOTTOM MAT OF STEEL, SEE "PLAN OF SPAN B - SHEET 1 OF 2".

SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR PLACEMENT OF #4J1 BARS.

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B
DETAIL "B"

JUNE (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9/15/88
CHECKED BY: E.C. Powell DATE: 12-15-88

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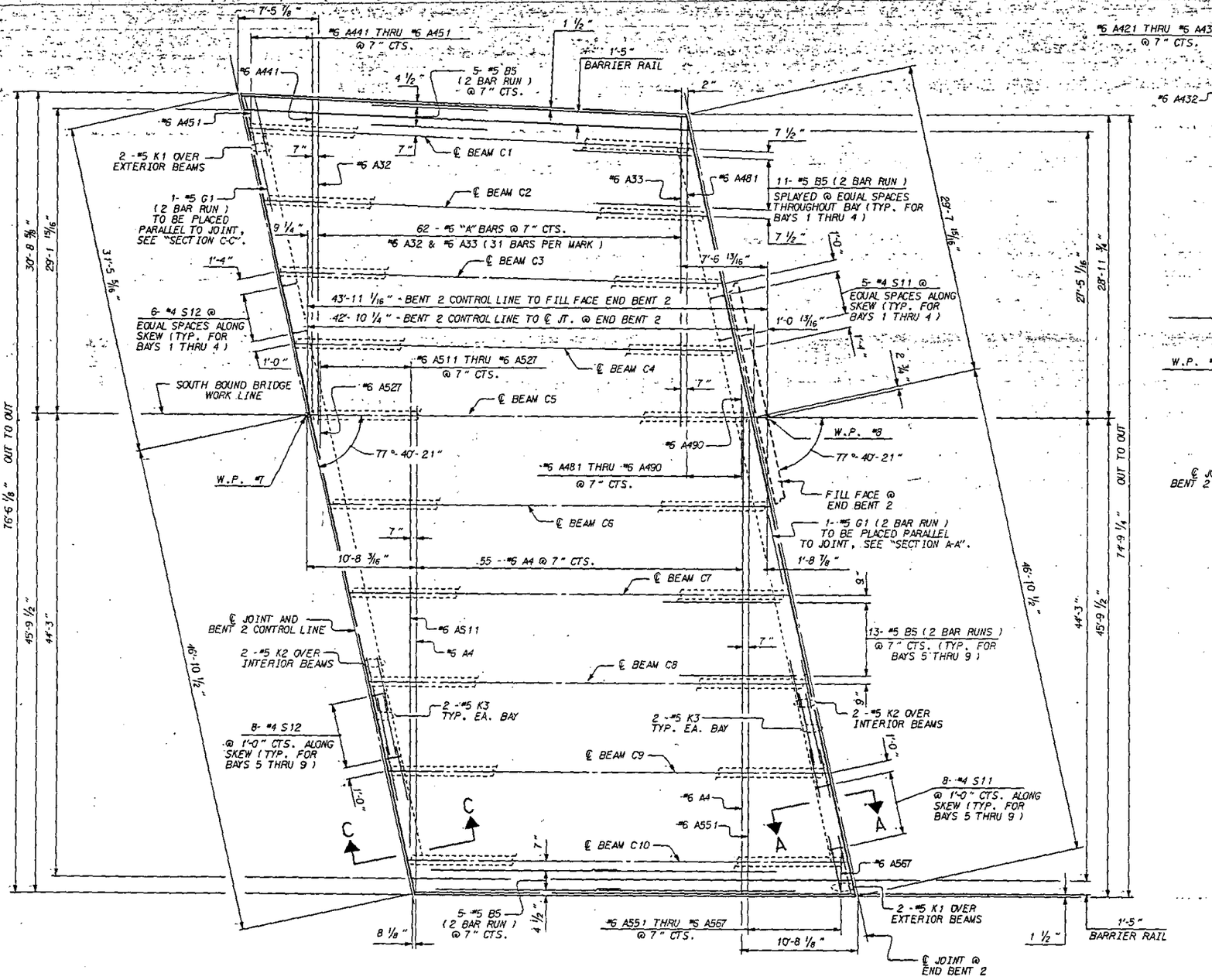


PLAN OF SPAN C

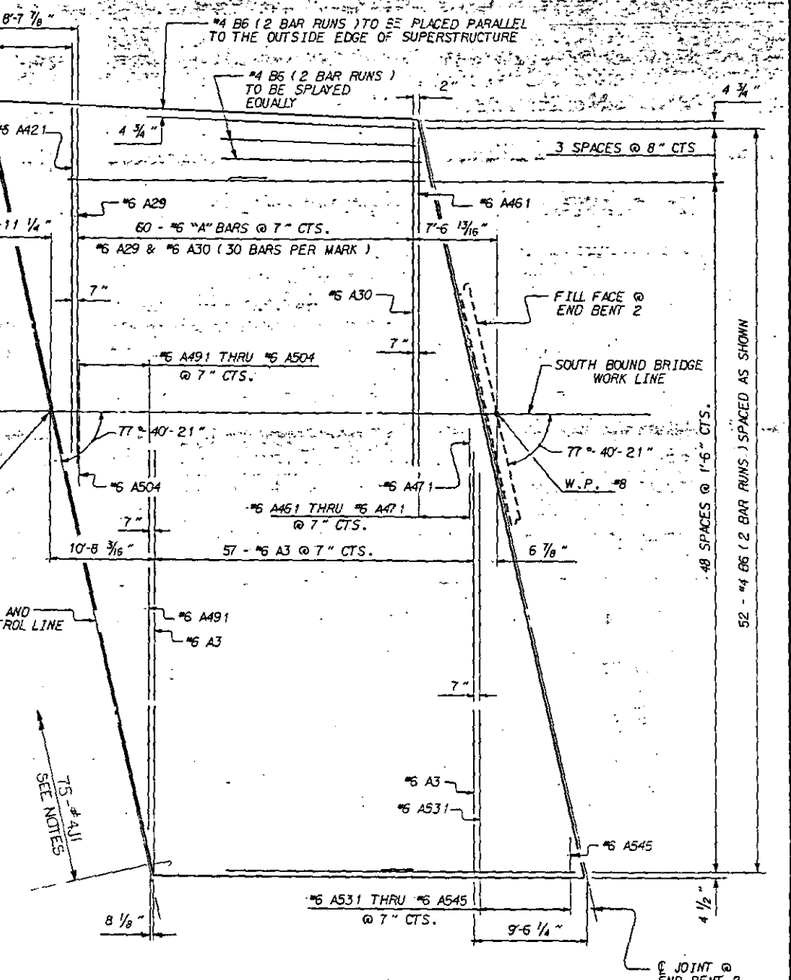
NOTE : SEE "CONCRETE BARRIER RAIL" SHEET FOR PLACEMENT OF BARRIER RAIL ANCHOR ASSEMBLIES AND #5 S1 BARS.

ALL "A" & "B" BARS SHOWN ARE IN THE BOTTOM MAT OF STEEL.

FOR #6 "A" & #4 "B" BARS IN TOP MAT OF STEEL, SEE DETAIL "C".

FOR SECTION "A-A" & "C-C", SEE SUPERSTRUCTURE "TYPICAL SECTION DETAILS" SHEET 3 OF 3.

NOTE: SEE SECTION NORMAL TO JOINT ON THE "STANDARD EXPANSION JOINT SEAL DETAILS" SHEET FOR PLACEMENT OF #4J1 BARS.



DETAIL "C"

ALL "A" & "B" BARS SHOWN ARE IN THE TOP MAT OF STEEL.

FOR #6 "A" & #5 "B" BARS IN BOTTOM MAT OF STEEL, SEE "PLAN OF SPAN C".

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

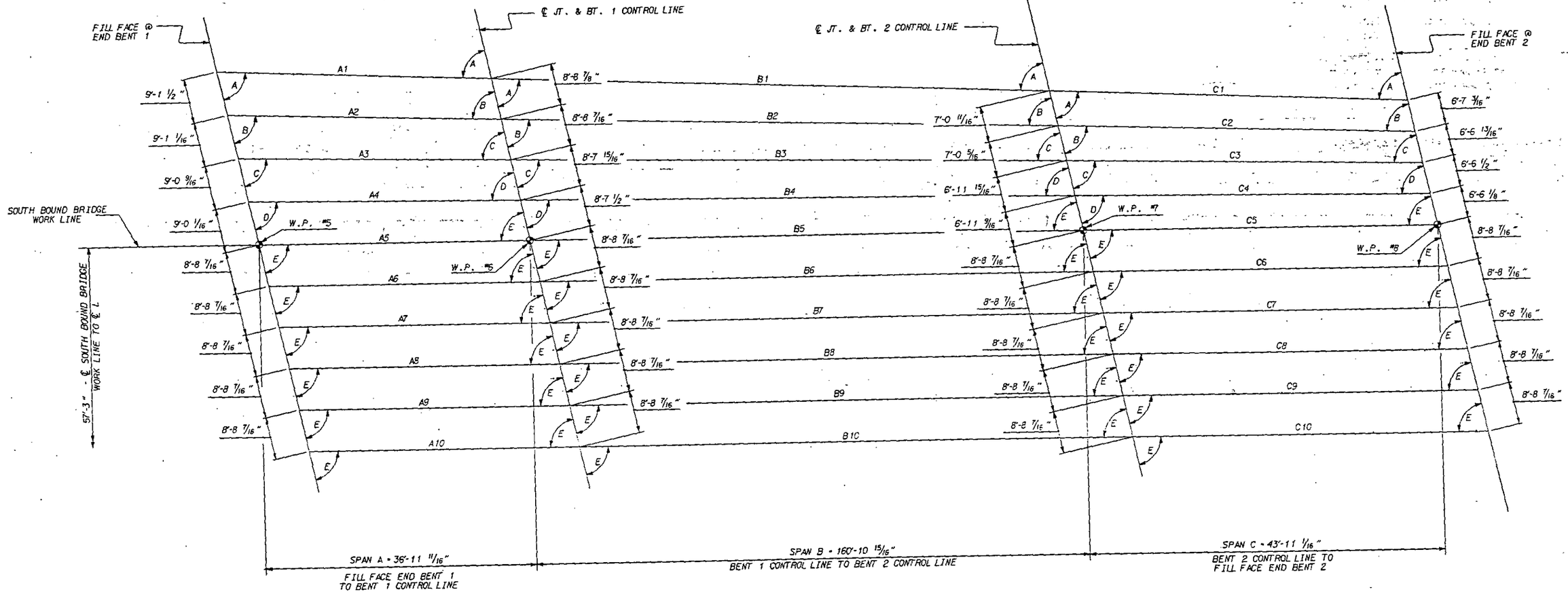
SUPERSTRUCTURE

PLAN OF SPAN C

JUNE (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9/21/88
CHECKED BY : E.C. Powell DATE : 12-15-88



CONTROL PLAN - SPAN A, B & C

ALL END BENTS AND BENTS ARE PARALLEL.

TABLE OF ANGLES		
CODE	ANGLE	
A	75°-22'-12"	75.37°
B	75°-56'-43"	75.945°
C	76°-31'-15"	76.521°
D	77°-05'-48"	77.097°
E	77°-40'-21"	77.673°

PROJECT NO. 8.1670801 *2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

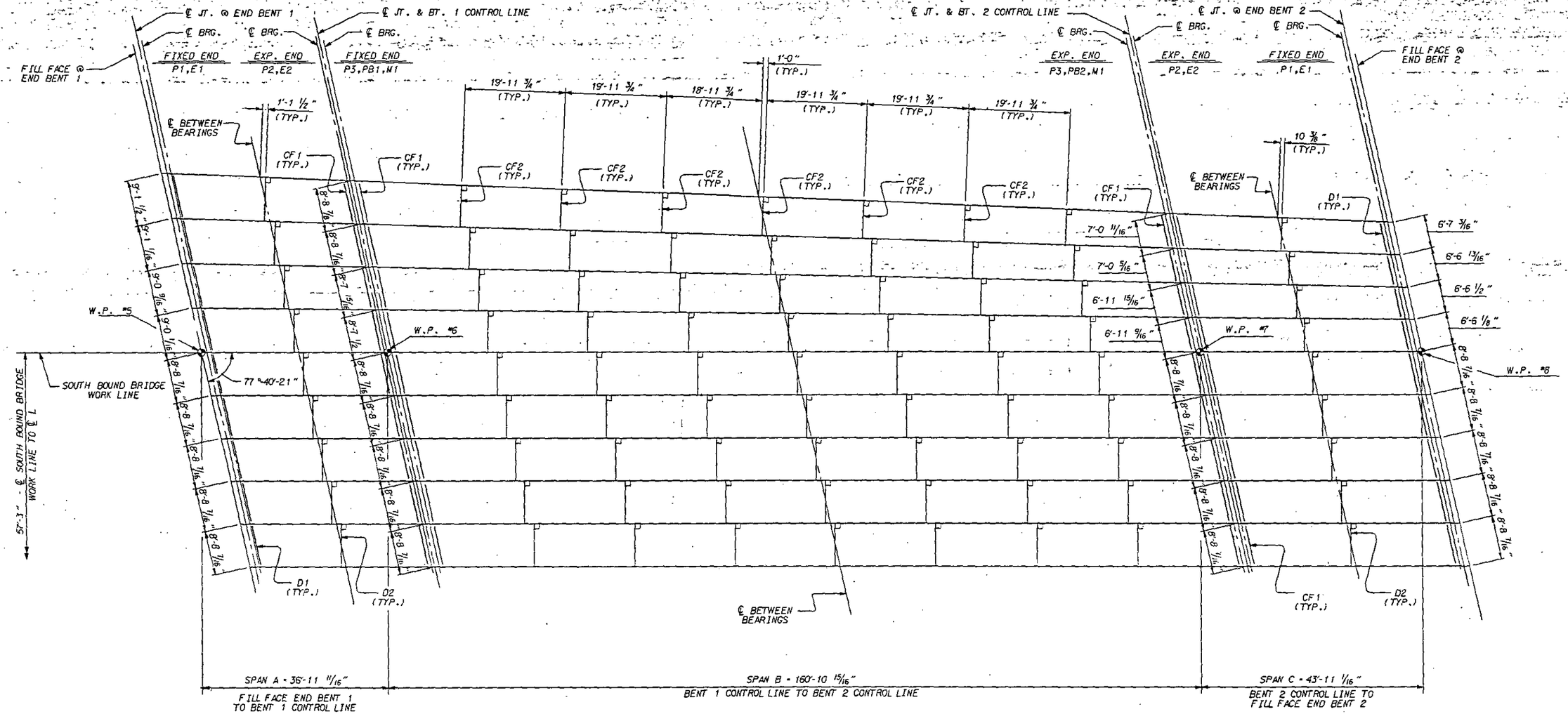
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

CONTROL PLAN

AUGUST (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			82

ROSS E. KUBENY DATE: 9-21-88



FRAMING PLAN - SPAN A, B & C

SEE "CONTROL PLAN" FOR BEAM AND GIRDER ANGLES.
ALL END BENTS AND BENTS ARE PARALLEL.

PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
FRAMING PLAN DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9-21-88
CHECKED BY : E.C. Powell DATE : 12-15-88

14-DEC-1988 16:18
ZC1:[207,22]146282SSD.DGN
EALDEN

TABLE "D" - SPAN "A" - DIMENSIONS

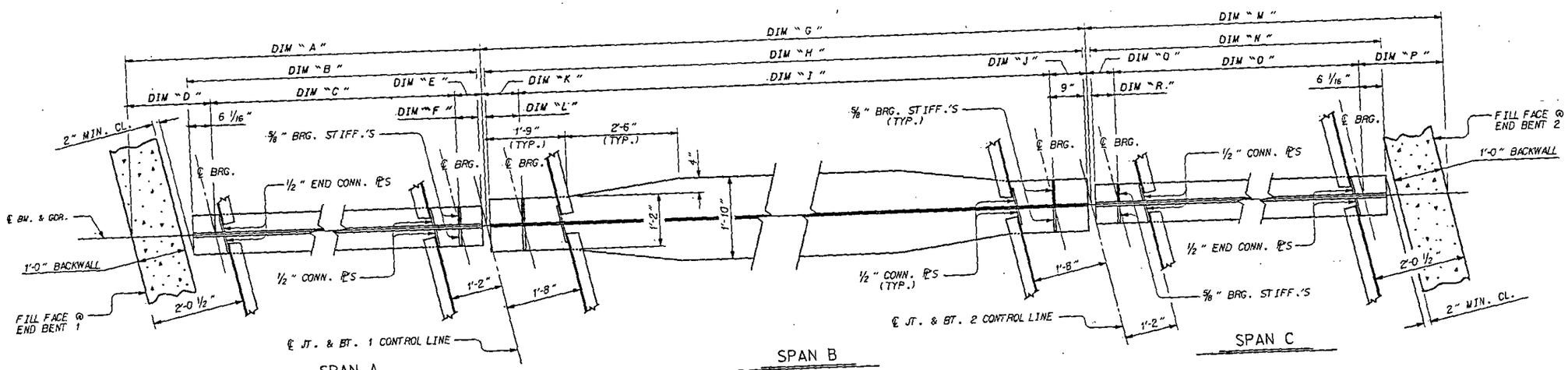
BEAM	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	DIM "S"
A1	37'-4"	35'-10"	34'-9 15/16"	1'-10 3/4"	7 5/16"	6"	7 15/16"
A2	37'-2 7/8"	35'-9"	34'-8 7/8"	1'-10 11/16"	7 5/16"	6 1/16"	6 7/8"
A3	37'-1 3/4"	35'-8"	34'-7 7/8"	1'-10 9/16"	7 5/16"	6 1/16"	5 7/8"
A4	37'-0 11/16"	35'-7"	34'-6 7/8"	1'-10 9/16"	7 1/4"	6 1/16"	4 7/8"
A5	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"
A6	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"
A7	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"
A8	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"
A9	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"
A10	36'-11 11/16"	35'-6"	34'-5 15/16"	1'-10 1/2"	7 1/4"	6"	4"

TABLE "E" - SPAN "B" - DIMENSIONS

GIRDER	DIM "G"	DIM "H"	DIM "I"	DIM "J"	DIM "K"	DIM "L"	DIM "T"	DIM "U"
B1	162'-5 5/8"	162'-3"	160'-8 7/8"	10 9/16"	10 1/8"	9 1/16"	1'-4 3/4"	36'-7 1/2"
B2	162'-0 5/8"	161'-10"	160'-4"	10 9/16"	10 1/16"	9"	1'-2 1/4"	36'-5"
B3	161'-7 7/8"	161'-5 1/4"	159'-11 1/4"	10 9/16"	10 1/16"	9"	11 7/8"	36'-2 5/8"
B4	161'-3 1/4"	161'-0 3/4"	159'-6 3/4"	10 1/2"	10"	9"	9 5/8"	36'-0 3/8"
B5	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"
B6	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"
B7	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"
B8	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"
B9	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"
B10	160'-10 15/16"	160'-8 1/2"	159'-2 7/16"	10 1/2"	10"	9 1/16"	7 1/2"	35'-10 1/4"

TABLE "F" - SPAN "C" - DIMENSIONS

BEAM	DIM "M"	DIM "N"	DIM "O"	DIM "P"	DIM "Q"	DIM "R"	DIM "V"
C1	44'-4 3/16"	42'-10"	41'-9 7/8"	1'-10 3/4"	7 9/16"	6 1/16"	8 5/16"
C2	44'-2 13/16"	42'-8 3/4"	41'-8 5/8"	1'-10 5/8"	7 9/16"	6 1/16"	7 1/16"
C3	44'-1 1/2"	42'-8 1/2"	41'-7 3/8"	1'-10 9/16"	7 9/16"	6 1/16"	5 13/16"
C4	44'-0 1/4"	42'-6 1/4"	41'-6 3/16"	1'-10 9/16"	7 1/2"	6"	4 5/8"
C5	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"
C6	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"
C7	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"
C8	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"
C9	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"
C10	43'-11 1/16"	42'-5"	41'-5 1/16"	1'-10 1/2"	7 1/2"	5 7/8"	3 1/2"



BOTTOM FLANGE DETAILS

OMIT CONNECTOR PLATES ON OUTSIDE FACE OF EXTERIOR BEAMS AND GIRDERS.

DRAWN BY : ROSS E. KUBENY DATE : 9-15-88
E.C. POWELL DATE : 9-86

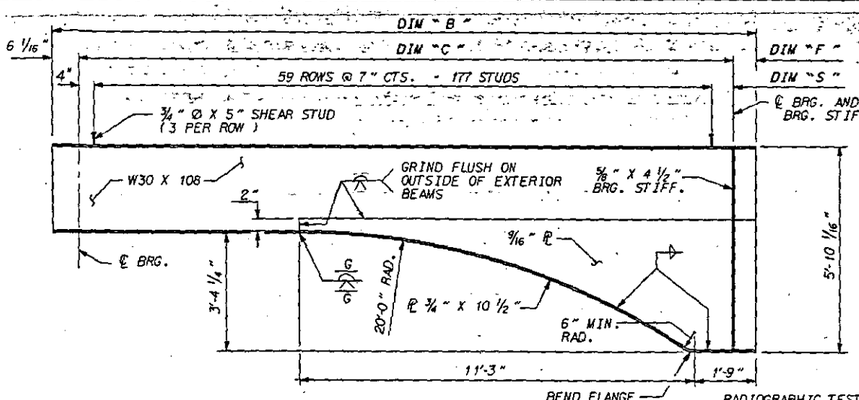
PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

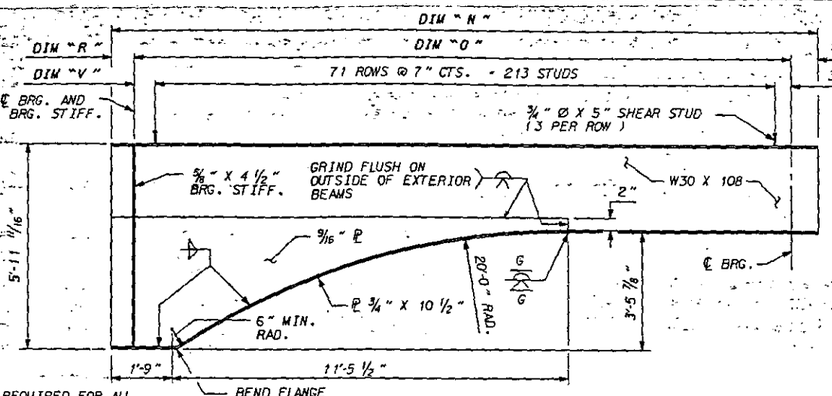
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
BOTTOM FLANGE DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			82



BEAM ELEVATION
SPAN A - BM.A1 & A10

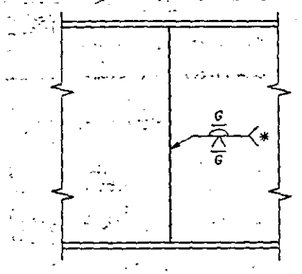


BEAM ELEVATION
SPAN C - BM.C1 & C10

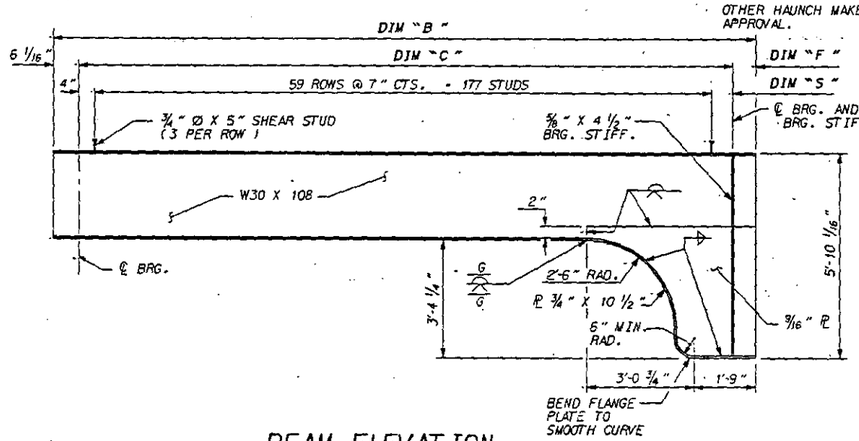
RADIOGRAPHIC TESTING IS REQUIRED FOR ALL BUTT WELDS IN HAUNCHES.

HAUNCH WEB AND FLANGE THICKNESS AND FLANGE WIDTH SHALL MATCH THE BEAM TO WHICH IT IS ATTACHED.

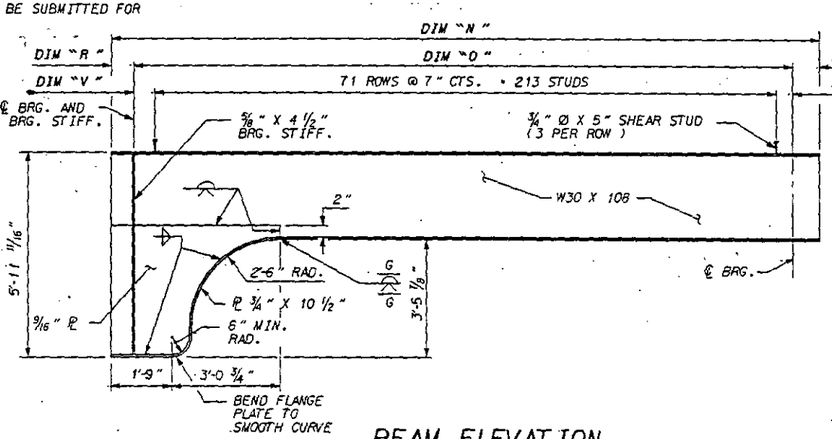
OTHER HAUNCH MAKE-UP MAY BE SUBMITTED FOR APPROVAL.



PERMISSIBLE SHOP WEB SPLICE
* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS.

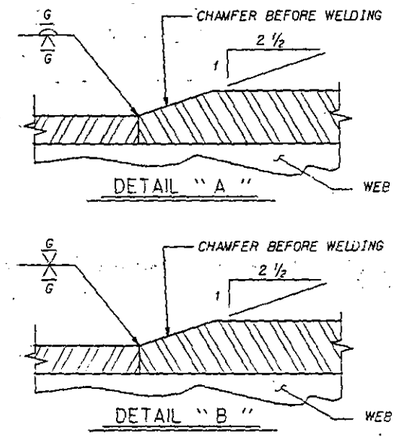


BEAM ELEVATION
SPAN A - BM.A2 THRU A9



BEAM ELEVATION
SPAN C - BM.C2 THRU C9

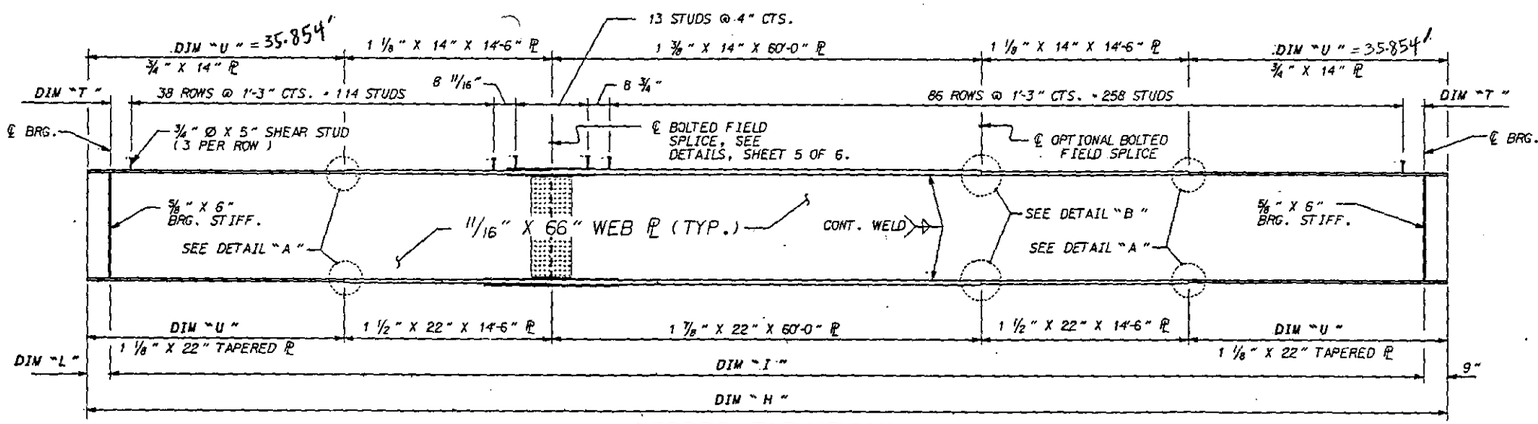
NOTE : ENDS OF ALL BEAM AND GIRDER WEBS ARE PLUMB.
FOR DIMENSIONS SHOWN BUT NOT DETAILED, SEE TABLE "D", "E", "F" SHEET 3 OF 6.



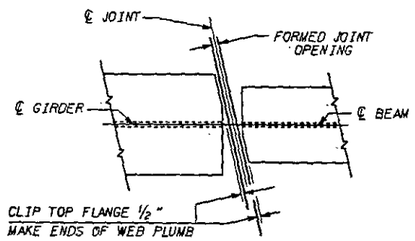
DETAIL "A"

DETAIL "B"

FLANGE SPLICE DETAIL
TYPICAL FOR BOTH TOP AND BOTTOM FLANGES.



GIRDER ELEVATION
SPAN B - GDR.B1 THRU GDR.B10



TOP FLANGE AT JOINTS

PROJECT NO. 8.1670801 *2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			82

ROSS E. KUBENY DATE: 9-15-88

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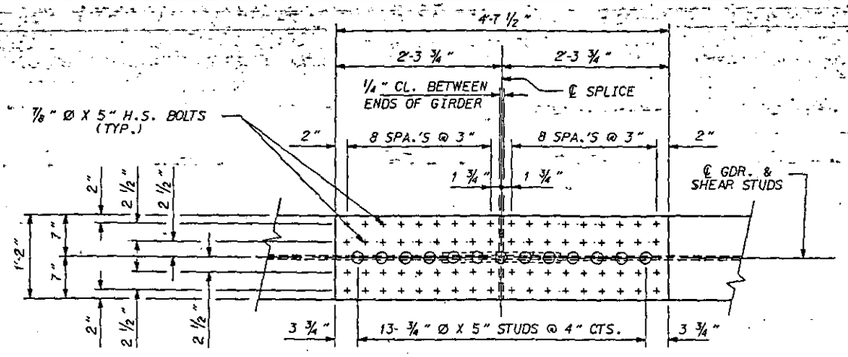
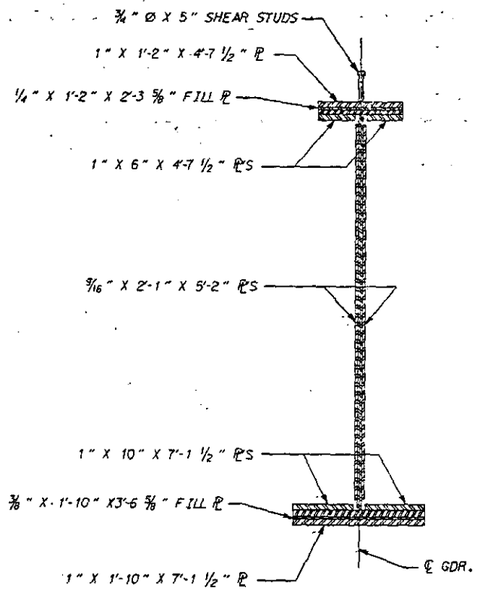
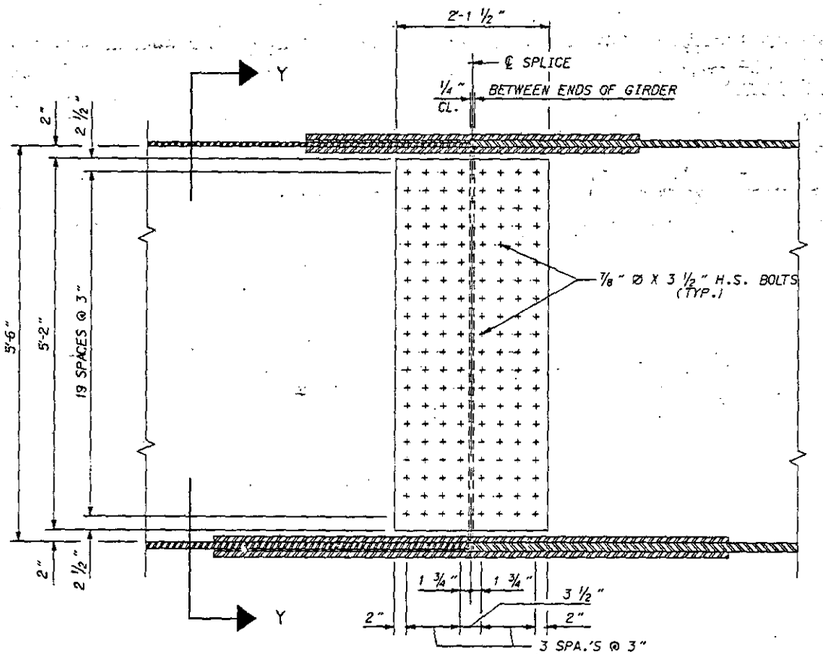
DGN: C:\07.221\46282SSD.DGN
RKBENT



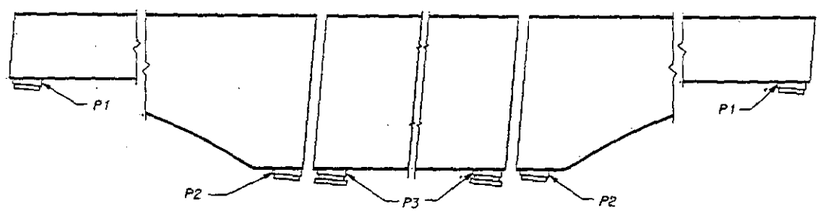
TOP FLANGE



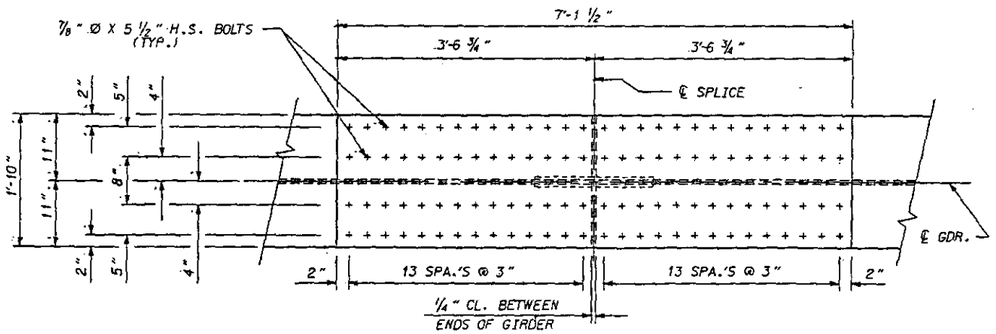
SECTION Y-Y



WEB



ALIGNMENT OF SOLE PLATES



FIELD SPLICE DETAILS

BOTTOM FLANGE

NOTES

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SPLICES.

THE ATMOSPHERIC CORROSION RESISTANCE AND COLORING CHARACTERISTICS OF A.S.T.M. A-588 STEEL ARE REQUIRED FOR THE HIGH STRENGTH BOLTS, NUTS, WASHERS, AND THE WELD FILLER METAL FOR THIS STRUCTURE.

ALL STRUCTURAL STEEL SHALL BE UNPAINTED A.S.T.M. A-588 (MINIMUM YIELD STRENGTH OF 50,000 PSI) WITH THE EXCEPTION OF BEARING ASSEMBLIES. SEE SPECIAL PROVISIONS.

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

A CHARPY V-NOTCH TEST IS REQUIRED FOR I-BEAM SECTIONS AND HAUNCHS, SEE SPECIAL PROVISIONS. (SPAN A & C)

A CHARPY V-NOTCH TEST IS REQUIRED FOR ALL WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES, FILLER PLATES, AND WEB SPLICE PLATES FOR ALL GIRDERS. SEE SPECIAL PROVISIONS. (SPAN B)

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

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF GIRDER AND SHALL BE PLUMB.

AN OPTIONAL BOLTED FIELD SPLICE WILL BE PERMITTED IN THE GIRDERS IN SPAN B. IF THE OPTIONAL FIELD SPLICE IS USED, IT SHALL BE MADE ENTIRELY AT THE CONTRACTOR'S EXPENSE AND NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE FOR THE ADDITIONAL MATERIALS REQUIRED. THE LOCATION OF OPTIONAL FIELD SPLICE IS SHOWN ON PLANS. THE DETAILS AND SPLICE MATERIAL SHALL BE IDENTICAL TO THE BOLTED FIELD SPLICE IN SPAN B.

SOLE PLATES SHALL BE A.S.T.M. A-588 STEEL AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

DRAWN BY : ROSS E. KUBENY DATE : 9-15-88
CHECKED BY : E.C. Powell DATE : 12-15-88

PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 5 OF 6

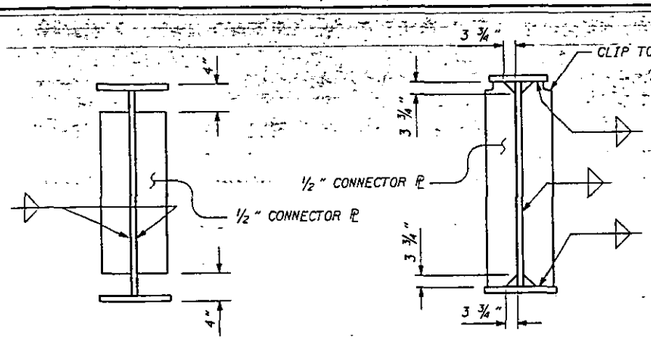
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL NOTES
&
FIELD SPLICE DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			82

20-MAR-1989 16:26
ZDILLE29, 22314620255D.DGN
RUDKENY

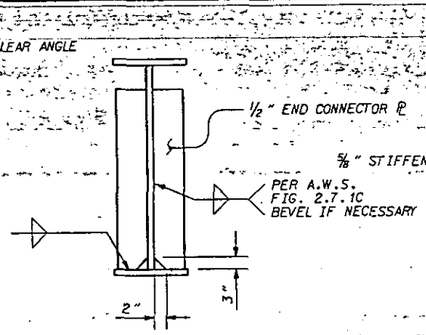


SPAN A & C

SPAN B

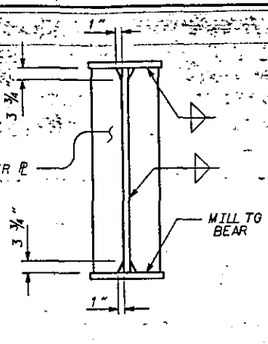
INTERMEDIATE CONNECTOR PLATE

OMIT INTERMEDIATE CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS & GIRDERS .



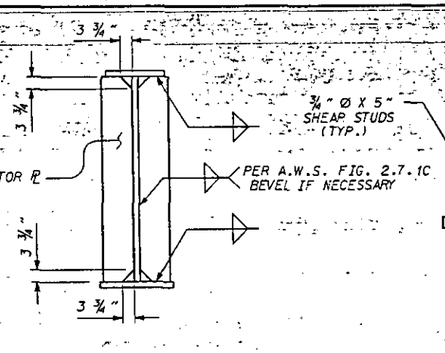
END CONNECTOR

TYPICAL FOR SPANS A & C @ E. BT. END OF BEAMS. OMIT END CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS .



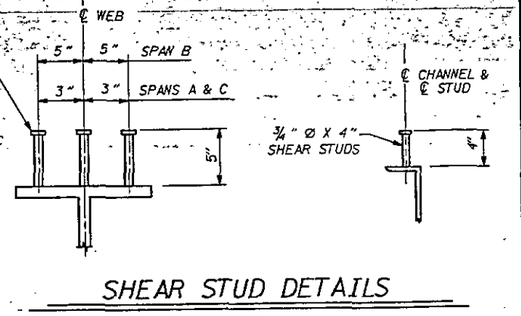
BEARING STIFFENER

TYPICAL FOR SPAN A, B & C @ BT. 1 AND BT. 2.

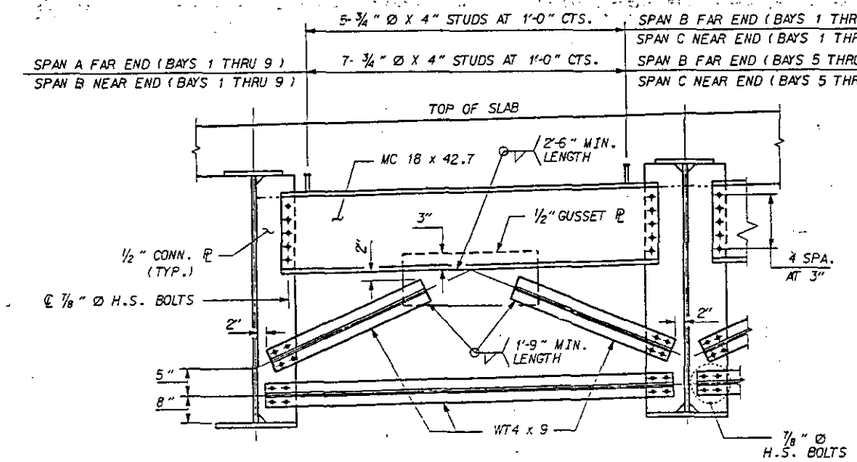


BENT CONNECTOR PLATE

TYPICAL FOR SPAN A, B & C @ BT.1 AND BT. 2. OMIT BENT CONNECTOR PLATES ON OUTSIDE OF EXTERIOR BEAMS & GIRDERS .

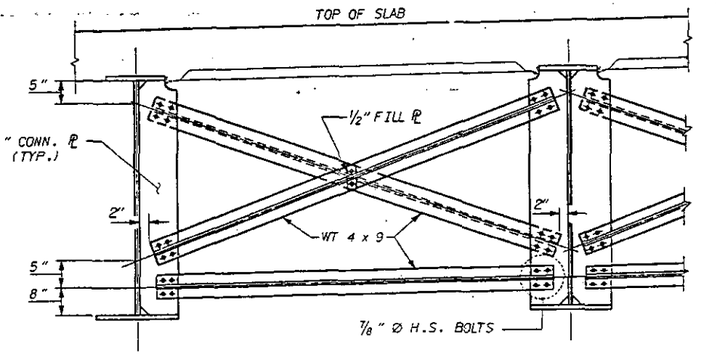


SHEAR STUD DETAILS



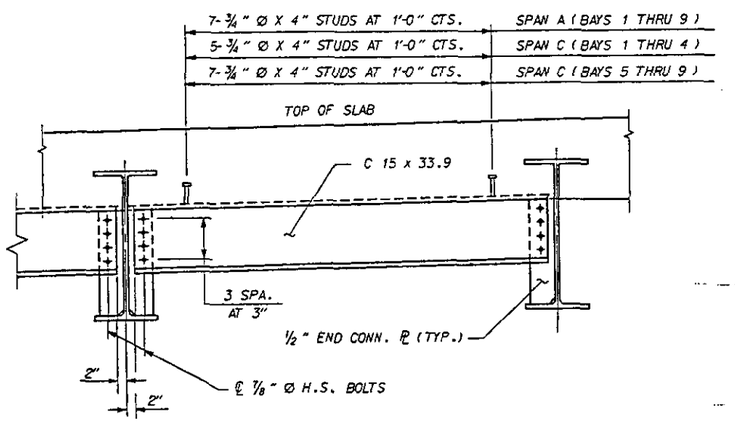
TYPICAL BENT CROSSFRAME (CF1)

FOR SPANS A, B & C @ INTERIOR BENTS.



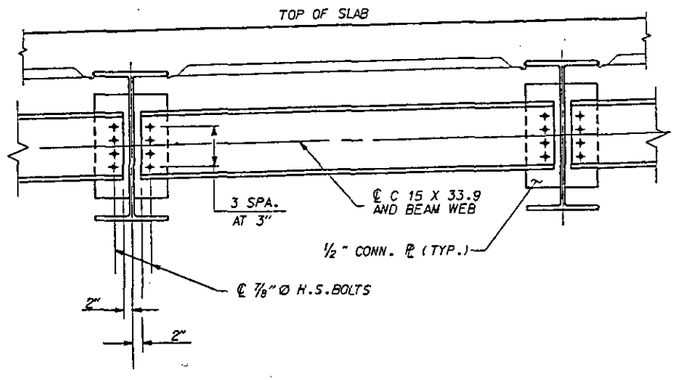
TYPICAL INTERMEDIATE CROSSFRAME (CF2)

FOR SPAN B



TYPICAL BENT DIAPHRAGM (D1)

FOR SPANS A & C @ END BENTS.



TYPICAL INTERMEDIATE DIAPHRAGM (D2)

FOR SPANS A & C.

DRAWN BY : ROSS E. KUBENY DATE : 9-15-88
CHECKED BY : G.A THOMPSON DATE : 3-23-89

PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5 - 60
1			3			TOTAL SHEETS
2			4			82

G-DEC-1988
ZGI:E287,22)146:
RKUBENY

DEAD LOAD DEFLECTION TABLE FOR BEAMS

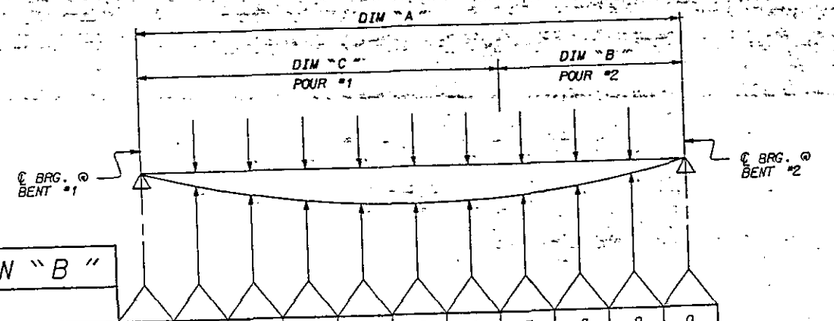
	SPAN "A"									
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
DEFLECTION DUE TO WEIGHT OF BEAM	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
DEFLECTION DUE TO WEIGHT OF SLAB	.021	.024	.023	.023	.023	.023	.023	.023	.023	.021
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.002	.003	.003	.001	.001	.001	.001	.002	.002	.002
TOTAL DEAD LOAD DEFLECTION	.026	.030	.029	.027	.027	.027	.027	.028	.028	.026
REQUIRED BEAM CAMBER	*	*	*	*	*	*	*	*	*	*

DEAD LOAD DEFLECTION TABLE FOR BEAMS

	SPAN "C"									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
DEFLECTION DUE TO WEIGHT OF BEAM	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005
DEFLECTION DUE TO WEIGHT OF SLAB	.039	.038	.037	.037	.042	.047	.047	.047	.047	.044
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.004	.005	.005	.003	.003	.003	.003	.005	.005	.004
TOTAL DEAD LOAD DEFLECTION	.048	.048	.047	.045	.050	.055	.055	.057	.057	.053
REQUIRED BEAM CAMBER	*	*	*	*	*	*	*	*	*	*

NOTE : SPAN "A & C" VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT MIDPOINT BETWEEN ℄ BRG'S.

* NO SHOP CAMBER REQUIRED. TURN NATURAL MILL CAMBER UP.



POUR DEFLECTIONS - SPAN "B"

	GIRDER	DIMENSIONS			0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
		DIM "A"	DIM "B"	DIM "C"											
DUE TO POUR #1	G1	160'-8 7/8"	54'-8 11/16"	106'-0 3/16"	.000	.138	.254	.336	.382	.392	.366	.308	.224	.118	.000
	G2	160'-4"	54'-7 1/16"	105'-8 15/16"	.000	.146	.269	.355	.404	.414	.387	.326	.237	.125	.000
	G3	159'-11 1/4"	54'-5 7/16"	105'-5 13/16"	.000	.145	.267	.353	.401	.411	.384	.324	.236	.124	.000
	G4	159'-6 3/4"	54'-3 15/16"	105'-2 13/16"	.000	.144	.265	.351	.398	.409	.382	.322	.234	.124	.000
	G5	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.151	.278	.367	.417	.428	.400	.337	.245	.129	.000
	G6 THRU G9	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.159	.292	.387	.439	.451	.421	.355	.259	.136	.000
	G10	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.138	.254	.335	.381	.391	.366	.308	.224	.118	.000
DUE TO POUR #1 AND POUR #2	G1	160'-8 7/8"	54'-8 11/16"	106'-0 3/16"	.000	.162	.300	.401	.463	.484	.465	.407	.307	.166	.000
	G2	160'-4"	54'-7 1/16"	105'-8 15/16"	.000	.170	.316	.422	.487	.510	.489	.429	.323	.175	.000
	G3	159'-11 1/4"	54'-5 7/16"	105'-5 13/16"	.000	.169	.313	.418	.483	.505	.485	.425	.320	.173	.000
	G4	159'-6 3/4"	54'-3 15/16"	105'-2 13/16"	.000	.167	.310	.415	.479	.501	.481	.421	.318	.172	.000
	G5	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.175	.324	.433	.500	.523	.502	.440	.332	.179	.000
	G6 THRU G9	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.184	.341	.456	.526	.550	.528	.463	.349	.189	.000
	G10	159'-2 7/16"	54'-2 7/16"	105'-0"	.000	.160	.297	.397	.458	.479	.460	.403	.304	.164	.000

NOTES : DEFLECTIONS ARE SHOWN AT ONE-TENTH POINTS BETWEEN BEARINGS AND ARE GIVEN IN FEET (DECIMAL FORM).

THE DEFLECTIONS IN THE TABLE ABOVE SHOW THE AMOUNT OF DOWNWARD MOVEMENT OF EACH GIRDER DUE ONLY TO THE WEIGHT OF SLAB CONCRETE PER POUR, NOT TO THE WEIGHT OF GIRDER, BARRIER RAIL, OR FUTURE WEARING SURFACE.

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

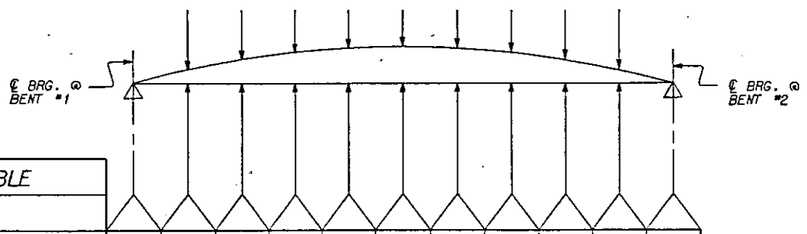
SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES AND POUR DEFLECTIONS

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			82

ROSS E. KUBENY DATE: 9-15-88



DEAD LOAD DEFLECTION TABLE
SPAN "B"

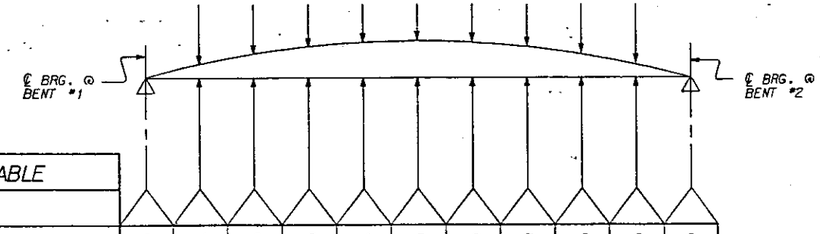
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 1	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.131	.175	.202	.212	.202	.175	.131	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.162	.300	.401	.463	.484	.465	.407	.307	.166	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.028	.053	.071	.083	.087	.083	.071	.053	.028	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.260	.484	.647	.748	.783	.750	.653	.491	.264	.000
	REQUIRED CAMBER	0	3 1/8"	5 13/16"	7 3/4"	9"	9 3/8"	9"	7 13/16"	5 7/8"	3 3/16"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 2	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.072	.133	.178	.206	.215	.206	.178	.133	.072	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.170	.316	.422	.487	.510	.489	.429	.323	.175	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.032	.060	.081	.094	.099	.094	.081	.060	.032	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.274	.509	.681	.787	.824	.789	.688	.516	.279	.000
	REQUIRED CAMBER	0	3 5/16"	6 1/8"	8 3/16"	9 7/16"	9 7/8"	9 7/15"	8 1/4"	6 3/16"	3 3/8"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 3	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.071	.132	.177	.204	.213	.204	.177	.132	.071	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.169	.313	.418	.483	.505	.485	.425	.320	.173	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.032	.060	.080	.093	.098	.093	.080	.060	.032	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.272	.505	.675	.780	.816	.782	.682	.512	.276	.000
	REQUIRED CAMBER	0	3 1/4"	6 1/16"	8 1/8"	9 3/8"	9 13/16"	9 3/8"	8 3/16"	6 1/8"	3 5/16"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 4	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.131	.175	.202	.211	.202	.175	.131	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.167	.310	.415	.479	.501	.481	.421	.318	.172	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.018	.033	.044	.051	.054	.051	.044	.033	.018	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.255	.474	.634	.732	.766	.734	.640	.482	.260	.000
	REQUIRED CAMBER	0	3 1/16"	5 11/16"	7 5/8"	8 13/16"	9 3/16"	8 13/16"	7 11/16"	5 13/16"	3 1/8"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 5	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.175	.324	.433	.500	.523	.502	.440	.332	.179	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.018	.034	.045	.052	.055	.052	.045	.034	.018	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.263	.487	.651	.752	.787	.754	.658	.495	.267	.000
	REQUIRED CAMBER	0	3 1/8"	5 7/8"	7 13/16"	9"	9 7/16"	9 1/16"	7 7/8"	5 15/16"	3 3/16"	0



DEAD LOAD DEFLECTION TABLE
SPAN "B"

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 6 & GIRDER 7	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.184	.341	.456	.526	.550	.528	.463	.349	.189	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.019	.035	.047	.054	.057	.054	.047	.035	.019	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.273	.505	.676	.760	.816	.782	.683	.513	.278	.000
	REQUIRED CAMBER	0	3 1/4"	6 1/16"	8 1/8"	9 3/8"	9 13/16"	9 3/8"	8 3/16"	6 1/8"	3 5/16"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 8 & GIRDER 9	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.184	.341	.456	.526	.550	.528	.463	.349	.189	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.032	.060	.081	.094	.098	.094	.081	.060	.032	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.286	.530	.710	.820	.857	.822	.717	.538	.291	.000
	REQUIRED CAMBER	0	3 7/16"	6 3/8"	8 1/2"	9 13/16"	10 5/16"	9 7/8"	8 5/8"	6 7/16"	3 1/2"	0

	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
GIRDER 10	DEFLECTION DUE TO WEIGHT OF GIRDER	.000	.070	.129	.173	.200	.209	.200	.173	.129	.070	.000
	DEFLECTION DUE TO WEIGHT OF SLAB	.000	.160	.297	.397	.458	.479	.460	.403	.304	.164	.000
	DEFLECTION DUE TO WEIGHT OF BARRIER RAIL AND FUTURE WEARING SURFACE	.000	.028	.052	.070	.081	.085	.081	.070	.052	.028	.000
	TOTAL DEAD LOAD DEFLECTION	.000	.258	.478	.640	.739	.773	.741	.646	.485	.262	.000
	REQUIRED CAMBER	0	3 1/8"	5 3/4"	7 11/16"	8 7/8"	9 1/4"	8 7/8"	7 3/4"	5 13/16"	3 1/8"	0

NOTE : DEFLECTION VALUES ARE GIVEN IN FEET (DECIMAL FORM) AT TENTH POINTS BETWEEN ℄ BRG., EXCEPT GIRDER "CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. 8.1670801 *2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

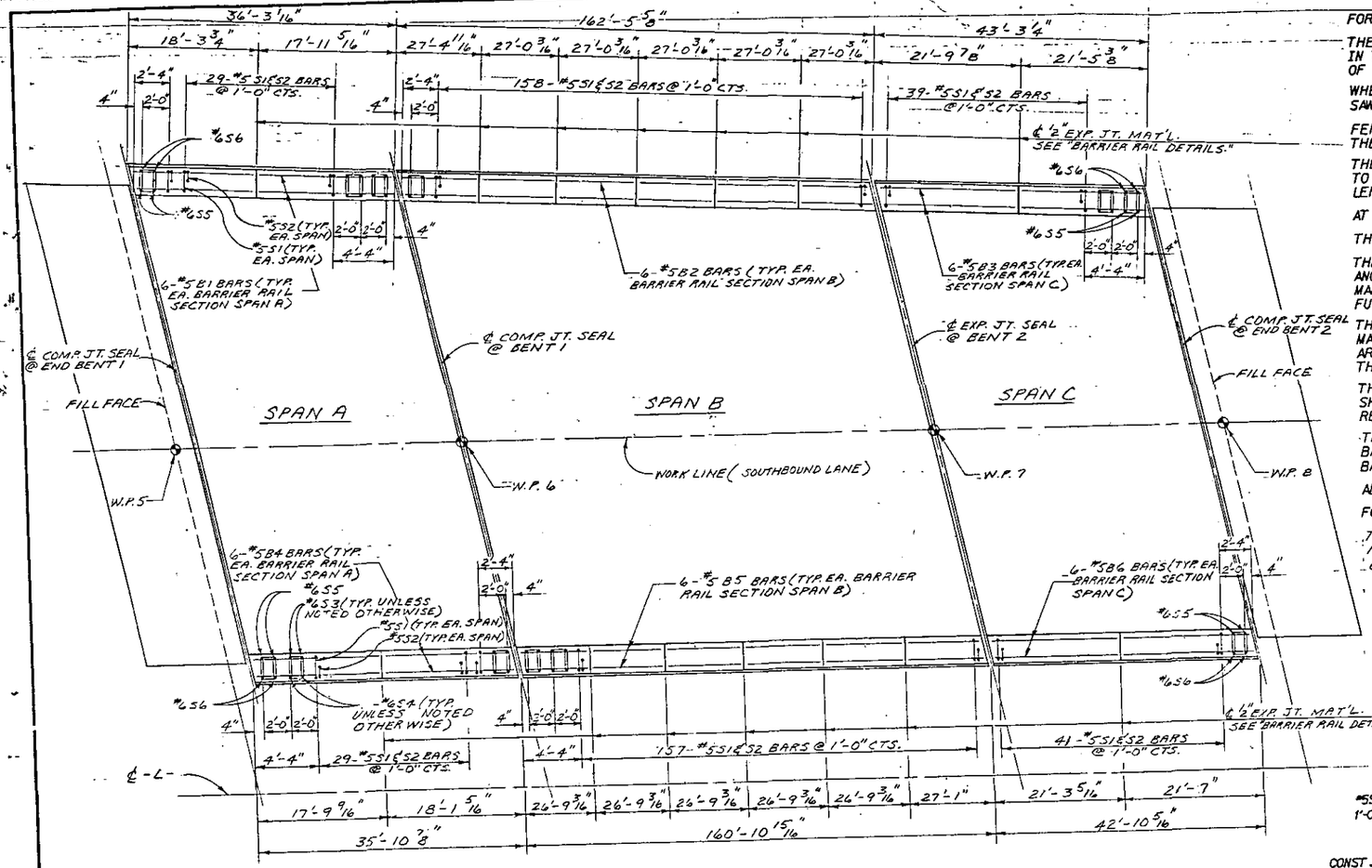
SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9-15-88
CHECKED BY: E.C. POWELL DATE: 9-98



PLAN

NOTES

FOR CONCRETE BARRIER RAIL, SEE SPECIAL PROVISIONS.

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

FERRULES SHALL BE PLUGGED DURING CASTING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

THE BARRIER RAIL ANCHOR ASSEMBLY FERRULES SHALL HAVE THREADS COMPATIBLE TO THE THREADED REINFORCING BARS. THE FERRULES SHALL HAVE A MINIMUM LENGTH EQUAL TO THE LENGTH OF THE THREADS ON THE REINFORCING BARS.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

THE THREADED REINFORCING BARS ARE TO BE TIGHTENED BY HAND.

THE WIRE GAGE AND FERRULES SHALL BE OF SUFFICIENT STRENGTH TO ENSURE LOAD ANCHORING CAPACITY AS SPECIFIED IN THE AASHTO SPECIFICATIONS. A MANUFACTURER'S CERTIFICATION OF LOAD ANCHORING CAPACITY SHALL BE FURNISHED WITH EACH SHIPMENT OF BARRIER RAIL ANCHOR ASSEMBLIES.

THE THREADED REINFORCING BARS SHALL BE GRADE 60. THE BAR SHALL BE MANUFACTURED WITH A MALE THREADED END WITH A MINIMUM TENSILE STRESS AREA OF 0.334 SQUARE INCHES. THE BARRIER RAIL ANCHOR ASSEMBLY AND THREADED REINFORCING BARS SHALL BE SUPPLIED AS A UNIT.

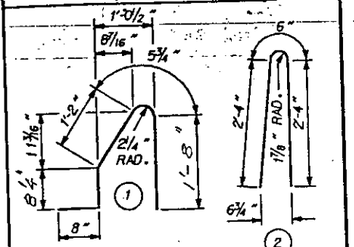
THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE ASSEMBLED IN THE SHOP. REINFORCING BAR THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE BARRIER RAIL ANCHOR WITH THREADED REINFORCING BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #5S BARS AT THE EXPANSION JOINT IN THE RAIL MAY BE SHIFTED SLIGHTLY TO MAINTAIN 3" MIN. CONCRETE COVER.



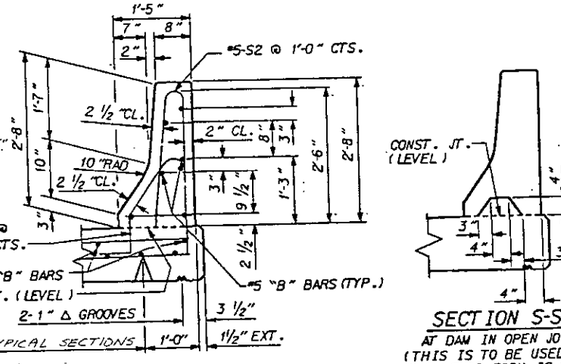
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

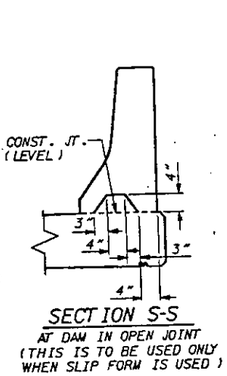
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	456	#5	1	4'-8"	2,220
S2	456	#5	2	5'-2"	2,457
S3	16	#5	3	2'-9"	66
S4	16	#5	4	2'-7"	62
S5	8	#5	3	2'-5"	29
S6	8	#5	4	2'-2"	26
B1	12	#5	STR.	17'-7"	220
B2	36	#5	STR.	26'-8"	1,001
B3	12	#5	STR.	21'-1"	264
B4	12	#5	STR.	17'-5"	213
B5	36	#5	STR.	24'-5"	992
B6	12	#5	STR.	20'-11"	262

EPOXY COATED REINFORCING STEEL	7,817	LBS.
CLASS A-A CONCRETE	44.2	CU. YDS.
CONCRETE BARRIER RAIL	481.7	LIN. FT.

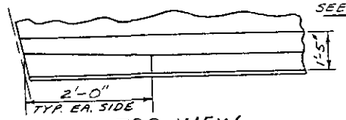


SECTION THRU RAIL

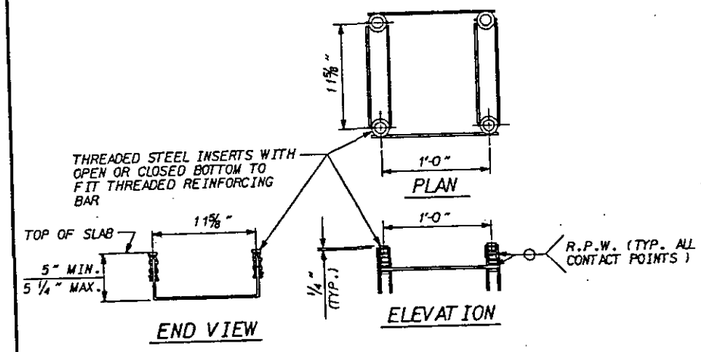


SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

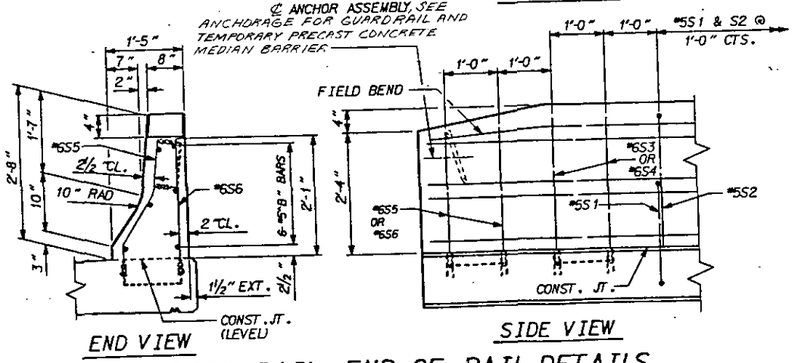


TOP VIEW

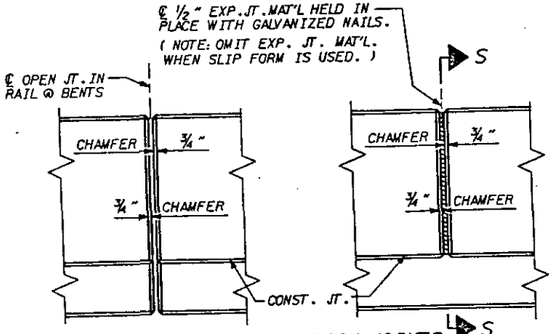


BARRIER RAIL ANCHOR ASSEMBLY

12 ANCHOR ASSEMBLIES REQUIRED



BARRIER RAIL-END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42-L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL (S.B.L.)

OCTOBER 1987

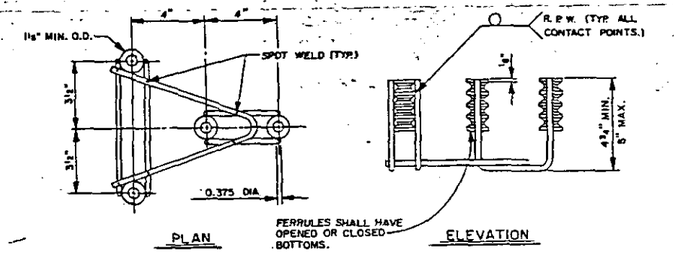
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			82

STD. NO. CBRI

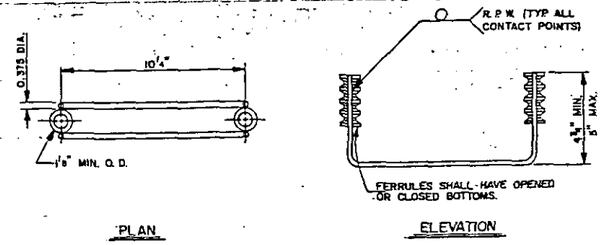
ASSEMBLED BY :	RUNY MARTIN	DATE : 2-3-88	SPECIAL
CHECKED BY :	E.C. ALLEN	DATE : 2-10-88	
DRAWN BY :	R. BISSETTE	DATE : 5/28/87	STANDARD
CHECKED BY :	S.J. DAVIS	DATE : 9/3/87	

REDRAWN 10-2-87

CADD



GUARDRAIL ANCHOR ASSEMBLY



2-BOLT ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1 1/2".

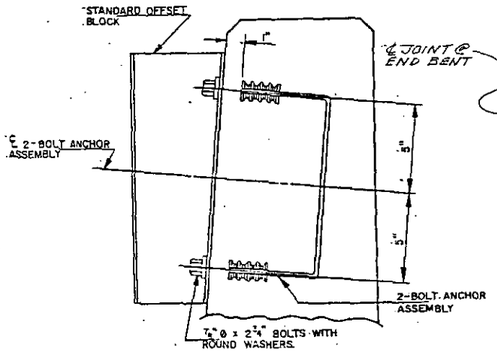
B. 4 - 7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2-7/8" DIA. X 2 3/4" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" DIA. X 2 3/4" 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.)

C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

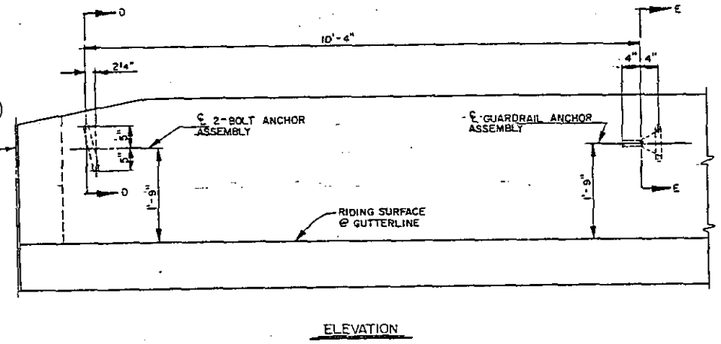
THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

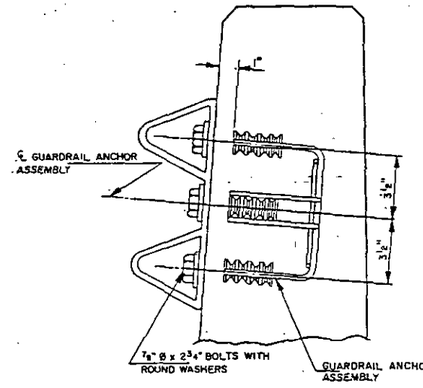
THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.



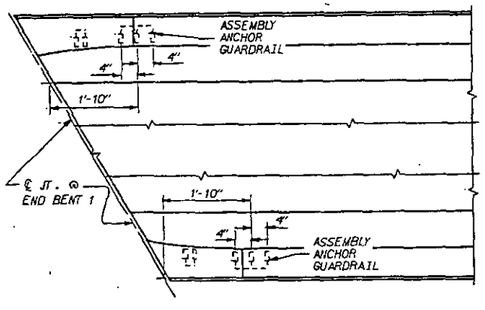
SECTION D-D



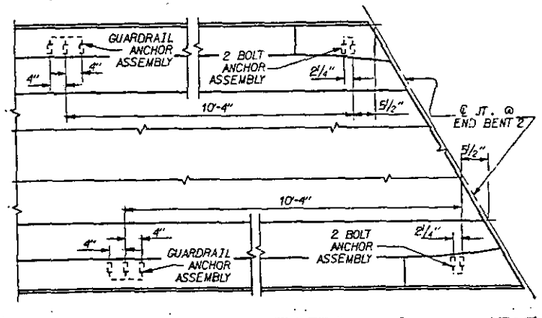
ELEVATION



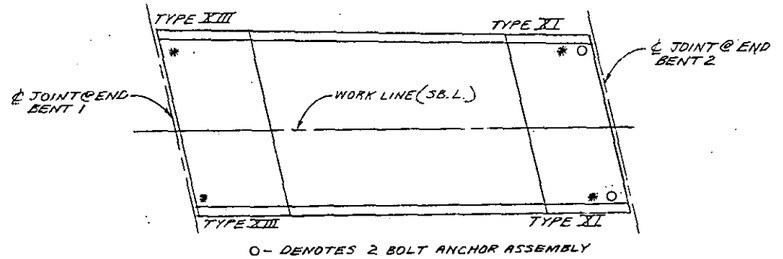
SECTION E-E



BARRIER RAIL - LOCATION OF ANCHOR ASSEMBLIES (TYPE XIII)



BARRIER RAIL - LOCATION OF ANCHOR ASSEMBLIES (TYPE XI)



O- DENOTES 2 BOLT ANCHOR ASSEMBLY
*- DENOTES GUARDRAIL ANCHOR ASSEMBLY

SKETCH SHOWNING POINTS OF ATTACHMENTS

PROJECT NO. B-1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

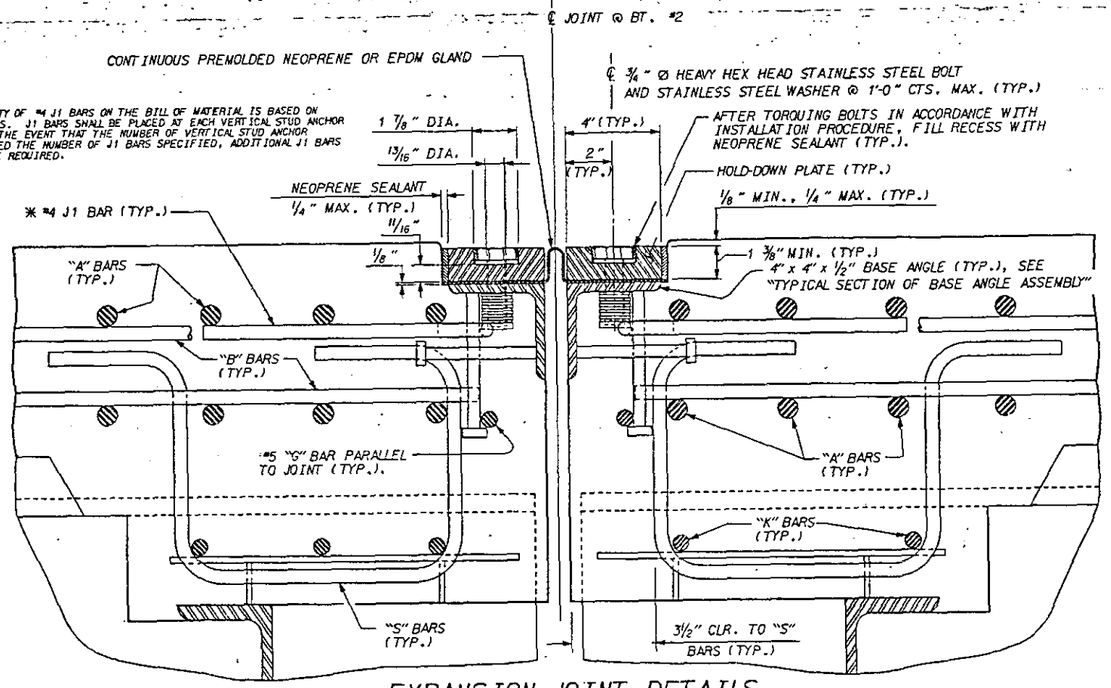
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL (S.B.L.)
MARCH 1984

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-64
1			3			TOTAL SHEETS
2			4			82

STD. NO. GRAI

ASSEMBLED BY RORY MARTIN	DATE 2-3-88	SPECIAL
CHECKED BY E.G. ALLEN	DATE 4-19-88	
DRAWN BY E. R. LUNWICK, JR.	DATE JANUARY 3, 1984	STANDARD
CHECKED BY R. R. HUTCHESON	DATE JANUARY 3, 1984	

REVISED 3-12-87 BY TGS JBY JST
REDRAWN 3-1-84

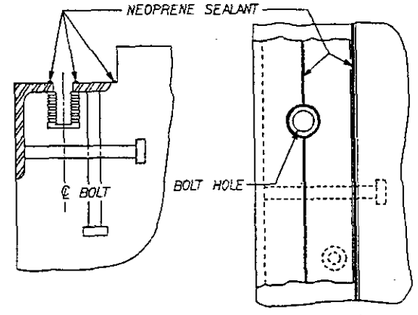


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1 5/8" TO 1 3/4" THICK BY 4 1/8" TO 4 1/4" WIDE IN ORDER FOR THE JOINT TO BE SET TO THE PROPER DEPTH. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED METHOD OF HOLDING THE BASE ANGLE ASSEMBLY IN PLACE WHILE THE CONCRETE IS CAST AROUND IT. THE TEMPLATE SHALL BE FLUSH WITH THE TOP OF DECK.
3. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
4. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
5. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
6. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT.-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT.-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT.-LBS. AFTER SEVEN (7) DAYS.
7. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.



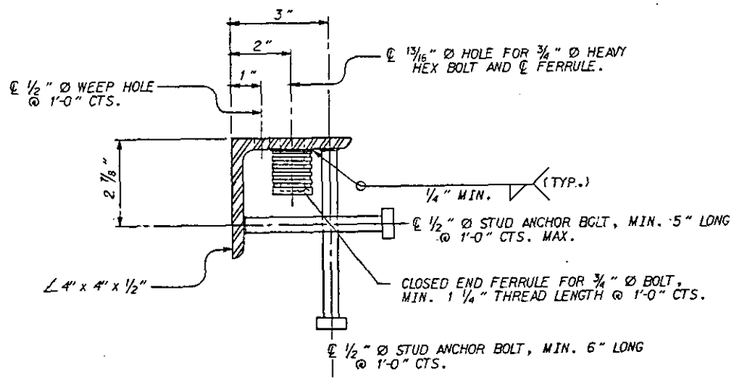
INSTALLATION SKETCH

GENERAL NOTES

1. ARMORED JOINTS SHALL BE PROVIDED AT ALL LOCATIONS SHOWN ON THE PLANS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO TYPE 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A106, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 60° THRU 130°. FOR JOINTS SKEWED LESS THAN 60° OR OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT. GLAND SHALL BE EITHER ELASTIC POLYCHLOROPRENE (NEOPRENE) OR ETHYL PROPYLENE DIENE MONOMER (EPDM) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

	ASTM TEST	REQUIREMENTS
HARDNESS, DUROMETER-SHORE A	D2240	60±5, NEOPRENE (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED) 75±5, EPDM AND NEOPRENE (UPWARD NON-CORRUGATED SHAPE) 80±5, EPDM (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
TENSILE STRENGTH	D412	2000 PSI, MIN
ELONGATION AT BREAK	D412	250% MIN
THICKNESS OF UPTURNED PORTION OF GLAND	N/A	1/4" (NON-CORRUGATED SHAPE) 1/8" (CORRUGATED SHAPE)

5. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
6. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO PAINTING.
7. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIALLY BLAST CLEANED AND SHALL BE PAINTED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS. EACH COAT SHALL HAVE A MINIMUM THICKNESS OF 3 MILS. PAINTED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR DAMAGED GALVANIZING.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. BASE ANGLE ASSEMBLIES SHALL BE SHIPPED IN 25' MINIMUM LENGTHS. FOR JOINTS REQUIRING BASE ANGLE ASSEMBLIES LONGER THAN 25', FIELD WELDING OF THE BASE ANGLE WILL BE PERMITTED. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. WHEN FIELD WELDING IS PROPOSED, THE CONTRACTOR SHALL SUBMIT PROPOSED WELDING DETAILS FOR APPROVAL. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH TWO (2) COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF 1/8" AND A MAXIMUM OF 1/4" BELOW THE TOP OF SLAB.
10. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
11. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
12. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
2	77°-40'-21"	1 7/8"	2 3/8"	1 15/16"	1 1/2"

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MECKLENBURG COUNTY
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SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

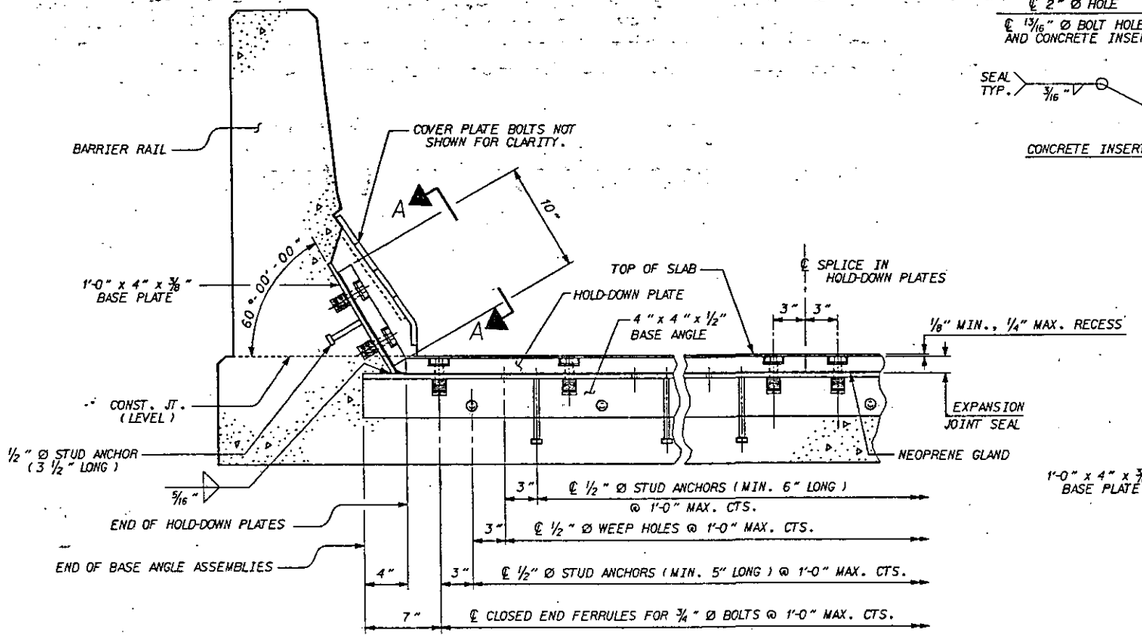
FEBRUARY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			82

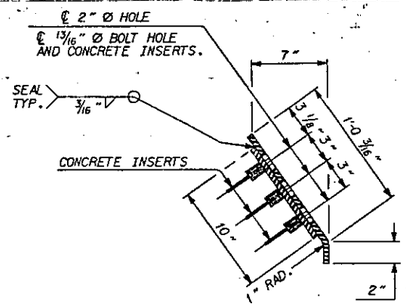
ASSEMBLED BY : ROSS E. KUBENY DATE : 9-15-88 CHECKED BY : E. C. POWELL DATE : 9-88	SPECIAL
DRAWN BY : ROSS E. KUBENY DATE : 9-18-87 CHECKED BY : CINDY R. KING DATE : 10-2-87	STANDARD

CADD I207.22346202EJS.DGN

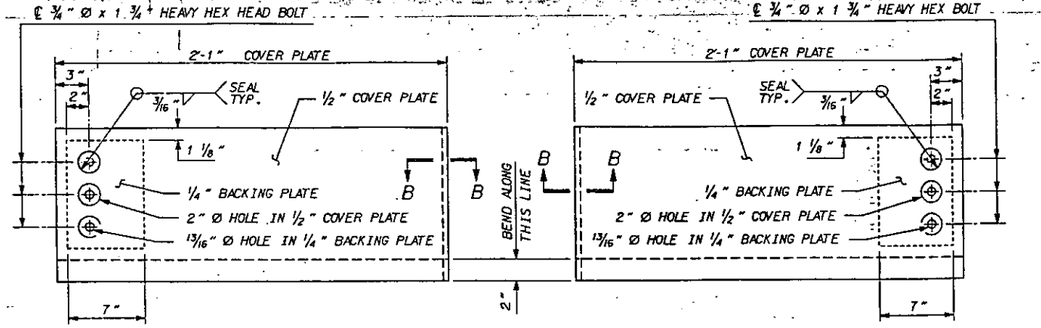
EJSI



SECTION THRU RAIL NORMAL TO JOINT



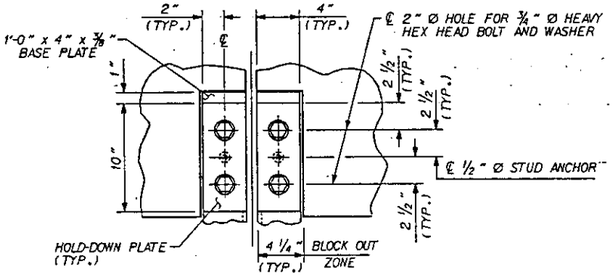
END VIEW



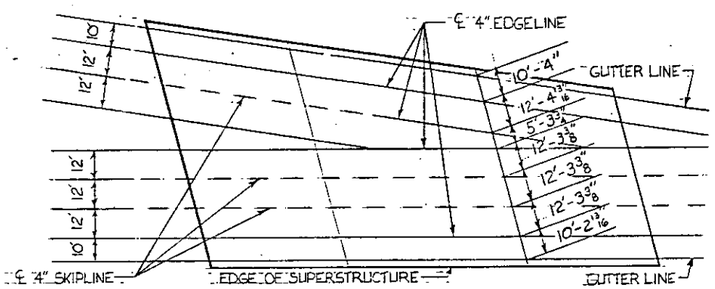
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

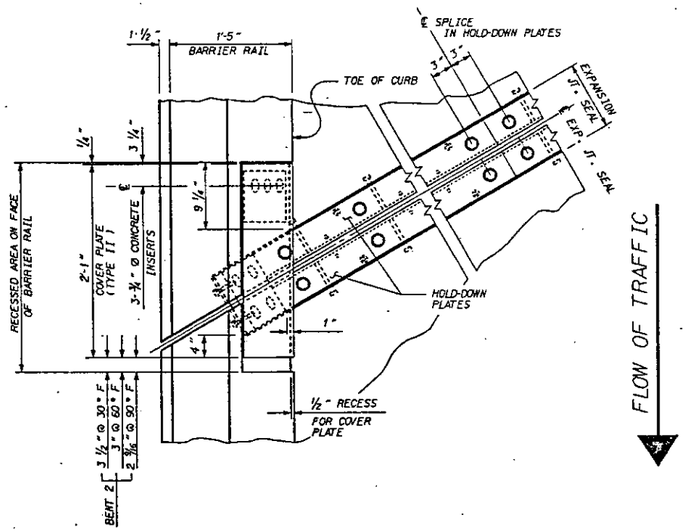
COVER PLATE DETAILS



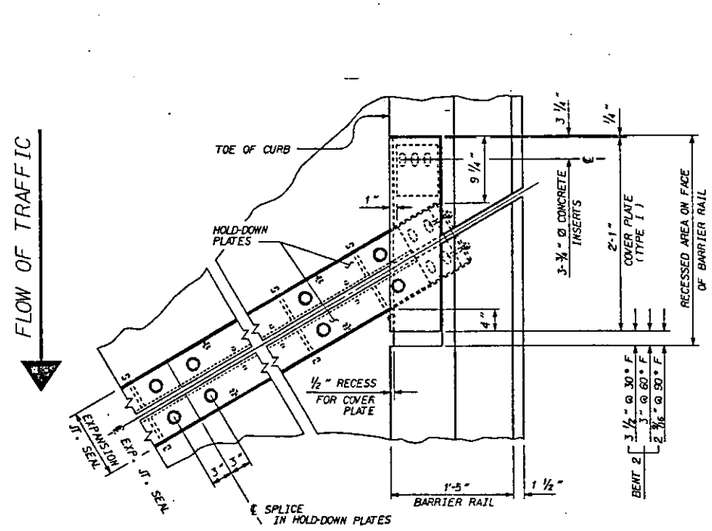
SECTION A - A



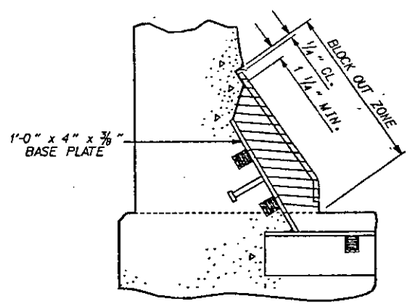
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

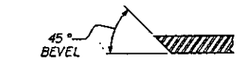


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE

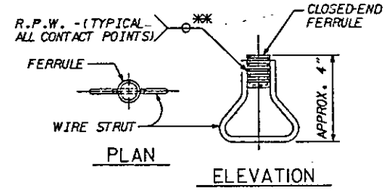


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

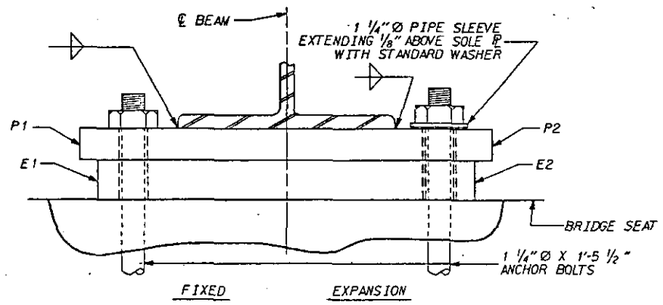
FEBRUARY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-66
1			3			TOTAL SHEETS
2			4			82

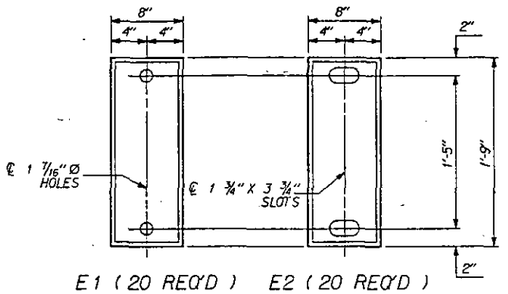
ASSEMBLED BY : ROSS E. KUBENY	DATE : 9-15-88		SPECIAL
CHECKED BY : G.A. Thompson	DATE : 9-22-89		
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87		STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87		

CADD (207,22)46202EJS.DGN

EJS2



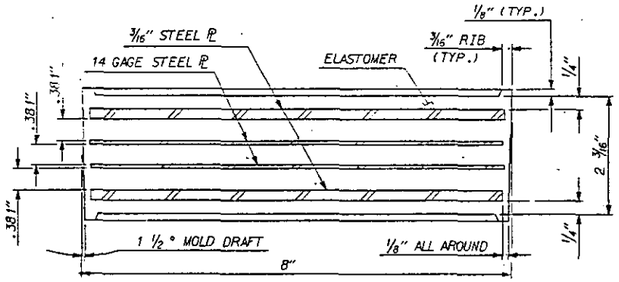
END VIEW



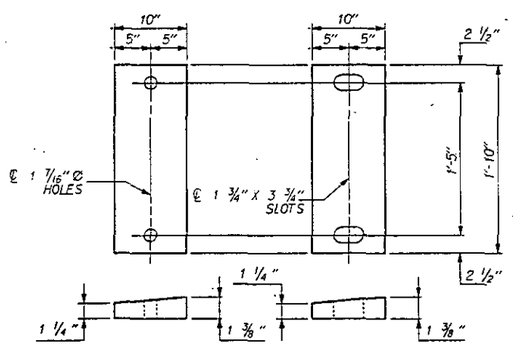
E1 (20 REQ'D) E2 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



TYPICAL SECTION OF ELASTOMERIC BEARING



P1 (20 REQ'D) P2 (20 REQ'D)

SOLE PLATE DETAILS ("P")

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 1 1/4" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1783.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

SOLE PLATE SHALL BE A.S.T.M. A-588 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHITE LEAD AND TALLOW SHALL NOT BE APPLIED TO THE SURFACE OF THE SOLE PLATE IN CONTACT WITH THE ELASTOMERIC BEARING.

FOR ALIGNMENT OF SOLE PLATES, SEE " STRUCTURAL STEEL NOTES & FIELD SPLICE DETAILS " SHEET.

LOAD RATINGS

	MAX. D.L.+ L.L.	MAX. D.L.	MIN. D.L.	MAX. DEFL.
TYPE III	114.51 K	78.97 K	32.95 K	7.0 %

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

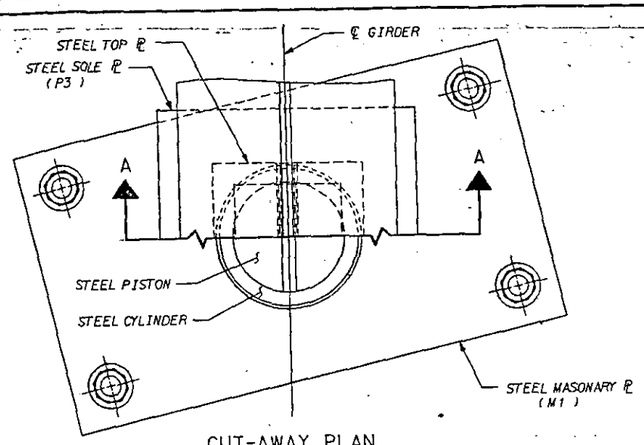
ELASTOMERIC BEARING DETAILS

AUG. (S.B.L.) 1988

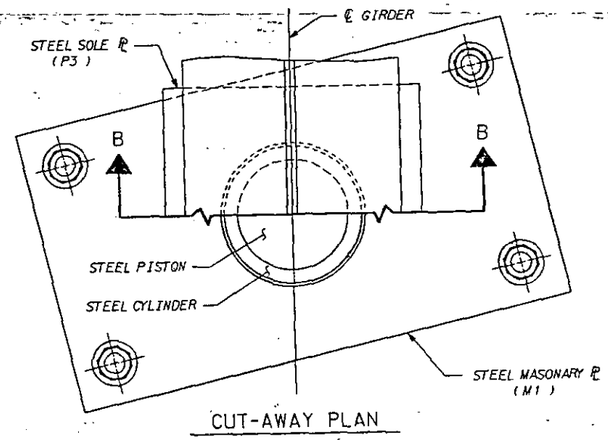
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			82

ASSEMBLED BY : ROSS E. KUBENY DATE : 9-15-88 CHECKED BY : E.C. POWELL DATE : 9-88	SPECIAL
DRAWN BY : MIKE BRITT DATE : NOV. 1987 CHECKED BY : E.C. POWELL DATE : 9-88	STANDARD

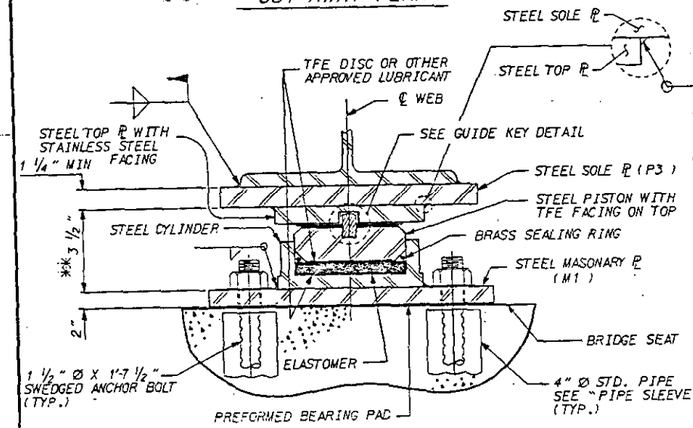
CADD [201,2211462028RG.DGN



CUT-AWAY PLAN

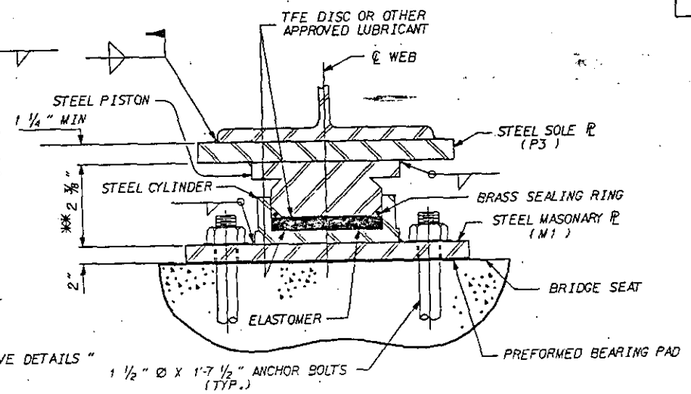


CUT-AWAY PLAN



** ASSUMED POT BEARING DEPTH, SEE NOTES.

SECTION A-A



** ASSUMED POT BEARING DEPTH, SEE NOTES.

SECTION B-B

EXPANSION POT BEARING DETAILS

PB2 (10 REQUIRED)

FIXED POT BEARING DETAILS

PB1 (10 REQUIRED)

TABLE FOR LOADS AND MOVEMENTS					
BEARING	LOCATION	LOAD IN KIPS			TOTAL MOVEMENT (INCH)
		DEAD	LIVE	TOTAL	
PB1	BENT 1	146	67	213	—
PB2	BENT 2	146	67	213	1 ½"

TABLE FOR PLATE SETTING DATA (EXPANSION POT BEARINGS)				
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	
BENT 2	- ⅜"	0	⅜"	

TEMPERATURE SETTING DETAIL

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

BRIDGE SEAT ELEVATIONS ARE BASED ON THE ASSUMED POT BEARING DEPTHS AS SHOWN. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. PLANS FOR ANY ADJUSTMENTS SHALL BE APPROVED BEFORE ANY WORK IS BEGUN ON THE BENTS.

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

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 OCCURED. SHOP PLANS SHALL BE PREPARED ACCORDINGLY.

AFTER ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, PIPE SHALL BE GROUTED IN PLACE USING NON-SHRINK, NON-METALLIC GROUT AS APPROVED BY THE ENGINEER.

BEARINGS ARE TO BE PROTECTED AND KEPT CLEAN DURING CONSTRUCTION. BEARINGS ARE NOT TO BE DISASSEMBLED DURING INSTALLATION, EXCEPT AT THE MANUFACTURER'S DIRECTION.

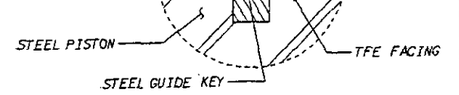
THE CLOSURE PLATE AND THE STANDARD PIPE FOR THE PIPE SLEEVE ASSEMBLY NEED NOT BE GALVANIZED.

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

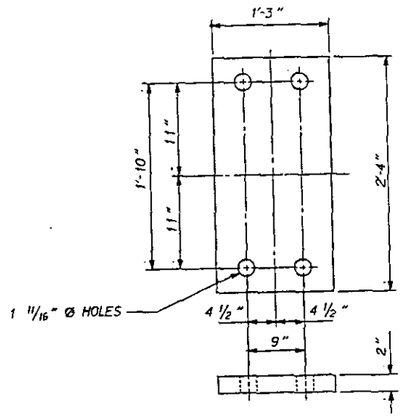
AT THE CONTRACTOR'S OPTION, POT BEARING DETAILS OTHER THAN THOSE SHOWN MAY BE SUBMITTED FOR APPROVAL.

FOR ALIGNMENT OF SOLE PLATES, SEE "STRUCTURAL STEEL NOTES & FIELD SPLICE DETAILS" SHEET.

THE POT BEARING SHALL BE CAPABLE OF HANDLING A TOTAL THERMAL MOVEMENT MEASURED PARALLEL TO THE CENTERLINE OF THE ROADWAY OF 1 ½" (¾" EXP. AND ¾" CONTRACTION).

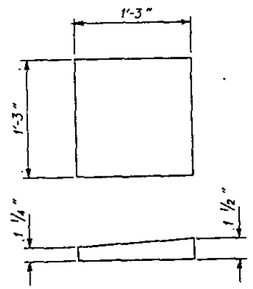


GUIDE KEY DETAIL



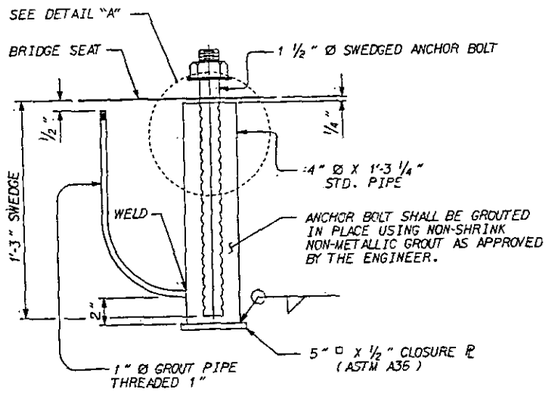
MASONRY PLATE DETAILS

M1 (20 REQUIRED)

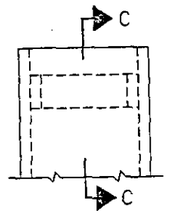


SOLE PLATE DETAILS

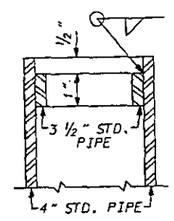
P3 (20 REQUIRED)



PIPE SLEEVE DETAILS



DETAIL "A"



SECTION C-C

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POT BEARING DETAILS

AUG. (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9-15-88
CHECKED BY : E.C. POWELL DATE : 9-88

CADD [207,227]46202BRG.DGN

REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	45	6	STR.	43'-4"	2929
A2	45	6	STR.	39'-1"	2700
*A3	45	6	STR.	42'-4"	2861
A4	44	6	STR.	46'-7"	3079
*A101	1	6	STR.	41'-2"	62
*A102	1	6	STR.	38'-6"	58
*A103	1	6	STR.	35'-10"	54
*A104	1	6	STR.	33'-3"	50
*A105	1	6	STR.	30'-7"	46
*A106	1	6	STR.	27'-11"	42
*A107	1	6	STR.	25'-4"	38
*A108	1	6	STR.	22'-8"	34
*A109	1	6	STR.	20'-0"	30
*A110	1	6	STR.	17'-4"	26
*A111	1	6	STR.	14'-9"	22
*A112	1	6	STR.	12'-1"	18
*A113	1	6	STR.	9'-5"	14
*A114	1	6	STR.	6'-9"	10
*A115	1	6	STR.	4'-2"	6
A121	1	6	STR.	38'-6"	58
A122	1	6	STR.	35'-10"	54
A123	1	6	STR.	33'-3"	50
A124	1	6	STR.	30'-7"	46
A125	1	6	STR.	27'-11"	42
A126	1	6	STR.	25'-4"	38
A127	1	6	STR.	22'-8"	34
A128	1	6	STR.	20'-0"	30
A129	1	6	STR.	17'-4"	26
A130	1	6	STR.	14'-9"	22
A131	1	6	STR.	12'-1"	18
A132	1	6	STR.	9'-5"	14
A133	1	6	STR.	6'-9"	10
A134	1	6	STR.	4'-2"	6
*A141	1	6	STR.	40'-9"	61
*A142	1	6	STR.	38'-1"	57
*A143	1	6	STR.	35'-5"	53
*A144	1	6	STR.	32'-9"	49
*A145	1	6	STR.	30'-1"	45
*A146	1	6	STR.	27'-4"	41
*A147	1	6	STR.	24'-8"	37
*A148	1	6	STR.	22'-0"	33
*A149	1	6	STR.	19'-4"	29
*A150	1	6	STR.	16'-8"	25
*A151	1	6	STR.	14'-0"	21
*A152	1	6	STR.	11'-4"	17
*A153	1	6	STR.	8'-8"	13
*A154	1	6	STR.	6'-0"	9
*A155	1	6	STR.	3'-4"	5

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A161	1	6	STR.	36'-6"	55
A162	1	6	STR.	33'-10"	51
A163	1	6	STR.	31'-2"	47
A164	1	6	STR.	28'-6"	43
A165	1	6	STR.	25'-10"	39
A166	1	6	STR.	23'-1"	35
A167	1	6	STR.	20'-5"	31
A168	1	6	STR.	17'-9"	27
A169	1	6	STR.	15'-1"	23
A170	1	6	STR.	12'-5"	19
A171	1	6	STR.	9'-9"	15
A172	1	6	STR.	7'-1"	11
A173	1	6	STR.	4'-5"	7
*A181	1	6	STR.	39'-9"	60
*A182	1	6	STR.	37'-1"	56
*A183	1	6	STR.	34'-5"	52
*A184	1	6	STR.	31'-9"	48
*A185	1	6	STR.	29'-1"	44
*A186	1	6	STR.	26'-5"	40
*A187	1	6	STR.	23'-8"	36
*A188	1	6	STR.	21'-0"	32
*A189	1	6	STR.	18'-4"	28
*A190	1	6	STR.	15'-8"	24
*A191	1	6	STR.	13'-0"	20
*A192	1	6	STR.	10'-4"	16
*A193	1	6	STR.	7'-8"	12
*A194	1	6	STR.	5'-0"	8
*A195	1	6	STR.	2'-4"	4
A201	1	6	STR.	44'-0"	66
A202	1	6	STR.	41'-4"	62
A203	1	6	STR.	38'-8"	58
A204	1	6	STR.	36'-0"	54
A205	1	6	STR.	33'-4"	50
A206	1	6	STR.	30'-8"	46
A207	1	6	STR.	27'-11"	42
A208	1	6	STR.	25'-3"	38
A209	1	6	STR.	22'-7"	34
A210	1	6	STR.	19'-11"	30
A211	1	6	STR.	17'-3"	26
A212	1	6	STR.	14'-7"	22
A213	1	6	STR.	11'-11"	18
A214	1	6	STR.	9'-3"	14
A215	1	6	STR.	6'-7"	10
A216	1	6	STR.	3'-11"	6

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A221	1	6	STR.	41'-2"	62
*A222	1	6	STR.	38'-6"	58
*A223	1	6	STR.	35'-10"	54
*A224	1	6	STR.	33'-2"	50
*A225	1	6	STR.	30'-6"	46
*A226	1	6	STR.	27'-10"	42
*A227	1	6	STR.	25'-2"	38
*A228	1	6	STR.	22'-5"	34
*A229	1	6	STR.	19'-9"	30
*A230	1	6	STR.	17'-1"	26
*A231	1	6	STR.	14'-5"	22
*A232	1	6	STR.	11'-9"	18
*A233	1	6	STR.	9'-1"	14
*A234	1	6	STR.	6'-5"	10
*A235	1	6	STR.	3'-9"	6
A241	1	6	STR.	43'-10"	66
A242	1	6	STR.	41'-2"	62
A243	1	6	STR.	38'-6"	58
A244	1	6	STR.	35'-10"	54
A245	1	6	STR.	33'-2"	50
A246	1	6	STR.	30'-6"	46
A247	1	6	STR.	27'-10"	42
A248	1	6	STR.	25'-2"	38
A249	1	6	STR.	22'-5"	34
A250	1	6	STR.	19'-9"	30
A251	1	6	STR.	17'-1"	26
A252	1	6	STR.	14'-5"	22
A253	1	6	STR.	11'-9"	18
A254	1	6	STR.	9'-1"	14
A255	1	6	STR.	6'-5"	10
A256	1	6	STR.	3'-9"	6
B1	262	5	STR.	18'-8"	5101
*B2	114	4	STR.	18'-6"	1409
*G1	4	5	STR.	43'-7"	182
*K1	8	5	1	7'-5"	62
*K2	32	5	2	8'-7"	286
*K3	36	5	STR.	6'-2"	232
*S11	72	4	3	3'-4"	160
*S12	72	4	3	3'-6"	168

REINFORCING STEEL LBS. 12883

* EPOXY COATED REINFORCING STEEL LBS. 10284

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	258	6	STR.	42'-4"	16405
A4	257	6	STR.	46'-7"	17982
*A5	22	6	STR.	41'-10"	1382
*A6	22	6	STR.	41'-4"	1366
*A7	22	6	STR.	40'-10"	1349
*A8	22	6	STR.	40'-4"	1333
*A9	22	6	STR.	39'-10"	1316
*A10	22	6	STR.	39'-4"	1300
*A11	22	6	STR.	38'-9"	1280
*A12	22	6	STR.	38'-3"	1264
*A13	22	6	STR.	37'-9"	1247
*A14	22	6	STR.	37'-3"	1231
*A15	22	6	STR.	36'-9"	1214
*A16	19	6	STR.	36'-2"	1032
A17	22	6	STR.	37'-7"	1242
A18	22	6	STR.	37'-1"	1225
A19	22	6	STR.	36'-7"	1209
A20	22	6	STR.	36'-1"	1192
A21	22	6	STR.	35'-6"	1173
A22	22	6	STR.	35'-0"	1157
A23	22	6	STR.	34'-6"	1140
A24	22	6	STR.	34'-0"	1123
A25	22	6	STR.	33'-6"	1107
A26	22	6	STR.	33'-0"	1090
A27	22	6	STR.	32'-5"	1071
A28	21	6	STR.	31'-11"	1007
*A261	1	6	STR.	40'-11"	61
*A262	1	6	STR.	38'-3"	57
*A263	1	6	STR.	35'-7"	53
*A264	1	6	STR.	32'-11"	49
*A265	1	6	STR.	30'-4"	46
*A266	1	6	STR.	27'-8"	42
*A267	1	6	STR.	25'-0"	38
*A268	1	6	STR.	22'-4"	34
*A269	1	6	STR.	19'-9"	30
*A270	1	6	STR.	17'-1"	26
*A271	1	6	STR.	14'-5"	22
*A272	1	6	STR.	11'-9"	18
*A273	1	6	STR.	9'-2"	14
*A274	1	6	STR.	6'-6"	10
*A275	1	6	STR.	3'-10"	6
A281	1	6	STR.	35'-7"	53
A282	1	6	STR.	32'-11"	49
A283	1	6	STR.	30'-4"	46
A284	1	6	STR.	27'-8"	42
A285	1	6	STR.	25'-0"	38
A286	1	6	STR.	22'-4"	34
A287	1	6	STR.	19'-9"	30

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A288	1	6	STR.	17'-1"	26
A289	1	6	STR.	14'-5"	22
A290	1	6	STR.	11'-9"	18
A291	1	6	STR.	9'-2"	14
A292	1	6	STR.	6'-6"	10
A293	1	6	STR.	3'-10"	6
*A301	1	6	STR.	33'-2"	50
*A302	1	6	STR.	30'-6"	46
*A303	1	6	STR.	27'-10"	42
*A304	1	6	STR.	25'-2"	38
*A305	1	6	STR.	22'-6"	34
*A306	1	6	STR.	19'-10"	30
*A307	1	6	STR.	17'-2"	26
*A308	1	6	STR.	14'-6"	22
*A309	1	6	STR.	11'-10"	18
*A310	1	6	STR.	9'-2"	14
*A311	1	6	STR.	6'-6"	10
*A312	1	6	STR.	3'-10"	6
A321	1	6	STR.	30'-8"	46
A322	1	6	STR.	28'-0"	42
A323	1	6	STR.	25'-4"	38
A324	1	6	STR.	22'-8"	34
A325	1	6	STR.	20'-0"	30
A326	1	6	STR.	17'-4"	26
A327	1	6	STR.	14'-8"	22
A328	1	6	STR.	12'-0"	18
A329	1	6	STR.	9'-4"	14
A330	1	6	STR.	6'-8"	10
A331	1	6	STR.	4'-0"	6
*A341	1	6	STR.	40'-11"	61
*A342	1	6	STR.	38'-3"	57
*A343	1	6	STR.	35'-7"	53
*A344	1	6	STR.	32'-11"	49
*A345	1	6	STR.	30'-3"	45
*A346	1	6	STR.	27'-7"	41
*A347	1	6	STR.	24'-10"	37
*A348	1	6	STR.	22'-2"	33
*A349	1	6	STR.	19'-6"	29
*A350	1	6	STR.	16'-10"	25
*A351	1	6	STR.	14'-2"	21
*A352	1	6	STR.	11'-6"	17
*A353	1	6	STR.	8'-10"	13
*A354	1	6	STR.	6'-2"	9
*A355	1	6	STR.	3'-6"	5
A361	1	6	STR.	45'-2"	68
A362	1	6	STR.	42'-6"	64
A363	1	6	STR.	39'-10"	60
A364	1	6	STR.	37'-2"	56

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A365	1	6	STR.	34'-6"	52
A366	1	6	STR.	31'-10"	48
A367	1	6	STR.	29'-1"	44
A368	1	6	STR.	26'-5"	40
A369	1	6	STR.	23'-9"	36
A370	1	6	STR.	21'-1"	32
A371	1	6	STR.	18'-5"	28
A372	1	6	STR.	15'-9"	24
A373	1	6	STR.	13'-1"	20
A374	1	6	STR.	10'-5"	16
A375	1	6	STR.	7'-9"	12
A376	1	6	STR.	5'-1"	8
A377	1	6	STR.	2'-5"	4
*A381	1	6	STR.	41'-7"	62
*A382	1	6	STR.	38'-11"	58
*A383	1	6	STR.	36'-4"	55
*A384	1	6	STR.	33'-7"	50
*A385	1	6	STR.	30'-11"	46
*A386	1	6	STR.	28'-3"	42
*A387	1	6	STR.	25'-7"	38
*A388	1	6	STR.	22'-11"	34
*A389	1	6	STR.	20'-3"	30
*A390	1	6	STR.	17'-7"	26
*A391	1	6	STR.	14'-11"	22
*A392	1	6	STR.	12'-3"	18
*A393	1	6	STR.	9'-7"	14
*A394	1	6	STR.	6'-11"	10
*A395	1	6	STR.	4'-3"	6
A401	1	6	STR.	46'-0"	69
A402	1	6	STR.	43'-4"	65
A403	1	6	STR.	40'-8"	61
A404	1	6	STR.	38'-0"	57
A405	1	6	STR.	35'-4"	53
A406	1	6	STR.	32'-8"	49
A407	1	6	STR.	30'-0"	45
A408	1	6	STR.	27'-4"	41
A409	1	6	STR.	24'-8"	37
A410	1	6	STR.	22'-0"	33
A411	1	6	STR.	19'-4"	29
A412	1	6	STR.	16'-8"	25
A413	1	6	STR.	14'-0"	21
A414	1	6	STR.	11'-4"	17
A415	1	6	STR.	8'-8"	13
A416	1	6	STR.	6'-0"	9
A417	1	6	STR.	3'-4"	5

SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	381	5	STR.	55'-0"	21856
*B4	275	4	STR.	33'-5"	6139
*G1	4	5	STR.	43'-7"	182
*J1	75	4	4	1'-5"	71
*K1	12	5	1	7'-5"	93
*K2	48	5	2	8'-7"	430
*K3	54	5	STR.	6'-2"	347
*S13	136	4	3	4'-0"	363

REINFORCING STEEL LBS. 55489

* EPOXY COATED REINFORCING STEEL LBS. 41192

PROJECT NO. 8.1670801 *2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

AUGUST (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : ROSS E. KUBENY DATE : 9-15-88
CHECKED BY : E.C. POWELL DATE : 9-88

CADD [207.221]46202BOM.DGN

REINFORCING BAR SCHEDULE

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	57	6	STR.	42'-4"	3624
*A29	30	6	STR.	35'-4"	1592
*A30	30	6	STR.	34'-7"	1558
A4	55	6	STR.	46'-7"	3848
A32	31	6	STR.	31'-2"	1451
A33	31	6	STR.	30'-6"	1420
*A421	1	6	STR.	33'-1"	50
*A422	1	6	STR.	30'-6"	46
*A423	1	6	STR.	27'-10"	42
*A424	1	6	STR.	25'-2"	38
*A425	1	6	STR.	22'-6"	34
*A426	1	6	STR.	19'-11"	30
*A427	1	6	STR.	17'-3"	26
*A428	1	6	STR.	14'-7"	22
*A429	1	6	STR.	11'-11"	18
*A430	1	6	STR.	9'-4"	14
*A431	1	6	STR.	6'-8"	10
*A432	1	6	STR.	4'-0"	6
A441	1	6	STR.	29'-7"	44
A442	1	6	STR.	26'-11"	40
A443	1	6	STR.	24'-3"	36
A444	1	6	STR.	21'-8"	33
A445	1	6	STR.	19'-0"	29
A446	1	6	STR.	16'-4"	25
A447	1	6	STR.	13'-8"	21
A448	1	6	STR.	11'-1"	17
A449	1	6	STR.	8'-5"	13
A450	1	6	STR.	5'-9"	9
A451	1	6	STR.	3'-1"	5
*A461	1	6	STR.	31'-3"	47
*A462	1	6	STR.	28'-7"	43
*A463	1	6	STR.	25'-11"	39
*A464	1	6	STR.	23'-3"	35
*A465	1	6	STR.	20'-7"	31
*A466	1	6	STR.	17'-11"	27
*A467	1	6	STR.	15'-3"	23
*A468	1	6	STR.	12'-7"	19
*A469	1	6	STR.	9'-11"	15
*A470	1	6	STR.	7'-3"	11
*A471	1	6	STR.	4'-7"	7

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A481	1	6	STR.	27'-0"	41
A482	1	6	STR.	24'-4"	37
A483	1	6	STR.	21'-8"	33
A484	1	6	STR.	19'-0"	29
A485	1	6	STR.	16'-4"	25
A486	1	6	STR.	13'-8"	21
A487	1	6	STR.	11'-0"	17
A488	1	6	STR.	8'-4"	13
A489	1	6	STR.	5'-8"	9
A490	1	6	STR.	3'-0"	5
*A491	1	6	STR.	39'-7"	59
*A492	1	6	STR.	36'-11"	55
*A493	1	6	STR.	34'-3"	51
*A494	1	6	STR.	31'-7"	47
*A495	1	6	STR.	28'-11"	43
*A496	1	6	STR.	26'-3"	39
*A497	1	6	STR.	23'-7"	35
*A498	1	6	STR.	20'-11"	31
*A499	1	6	STR.	18'-3"	27
*A500	1	6	STR.	15'-7"	23
*A501	1	6	STR.	12'-11"	19
*A502	1	6	STR.	10'-3"	15
*A503	1	6	STR.	7'-7"	11
*A504	1	6	STR.	4'-11"	7
A511	1	6	STR.	45'-7"	68
A512	1	6	STR.	42'-11"	64
A513	1	6	STR.	40'-3"	60
A514	1	6	STR.	37'-7"	56
A515	1	6	STR.	34'-11"	52
A516	1	6	STR.	32'-3"	48
A517	1	6	STR.	29'-7"	44
A518	1	6	STR.	26'-11"	40
A519	1	6	STR.	24'-3"	36
A520	1	6	STR.	21'-7"	32
A521	1	6	STR.	18'-11"	28
A522	1	6	STR.	16'-3"	24
A523	1	6	STR.	13'-7"	20
A524	1	6	STR.	10'-11"	16
A525	1	6	STR.	8'-3"	12
A526	1	6	STR.	5'-7"	8
A527	1	6	STR.	2'-11"	4

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A531	1	6	STR.	39'-8"	60
*A532	1	6	STR.	37'-0"	56
*A533	1	6	STR.	34'-4"	52
*A534	1	6	STR.	31'-8"	48
*A535	1	6	STR.	29'-0"	44
*A536	1	6	STR.	26'-4"	40
*A537	1	6	STR.	23'-8"	36
*A538	1	6	STR.	21'-0"	32
*A539	1	6	STR.	18'-4"	28
*A540	1	6	STR.	15'-8"	24
*A541	1	6	STR.	13'-0"	20
*A542	1	6	STR.	10'-4"	16
*A543	1	6	STR.	7'-8"	12
*A544	1	6	STR.	5'-0"	8
*A545	1	6	STR.	2'-4"	4
A551	1	6	STR.	45'-0"	68
A552	1	6	STR.	42'-4"	64
A553	1	6	STR.	39'-8"	60
A554	1	6	STR.	37'-0"	56
A555	1	6	STR.	34'-4"	52
A556	1	6	STR.	31'-8"	48
A557	1	6	STR.	29'-0"	44
A558	1	6	STR.	26'-4"	40
A559	1	6	STR.	23'-8"	36
A560	1	6	STR.	21'-0"	32
A561	1	6	STR.	18'-4"	28
A562	1	6	STR.	15'-8"	24
A563	1	6	STR.	13'-0"	20
A564	1	6	STR.	10'-4"	16
A565	1	6	STR.	7'-8"	12
A566	1	6	STR.	5'-0"	8
A567	1	6	STR.	2'-4"	4
B5	238	5	STR.	22'-2"	5503
*B6	104	4	STR.	22'-0"	1528
*G1	4	5	STR.	43'-7"	182
*J1	75	4	4	1'-5"	71
*K1	8	5	1	7'-5"	62
*K2	32	5	2	8'-7"	286
*K3	36	5	STR.	6'-2"	232

SPAN C

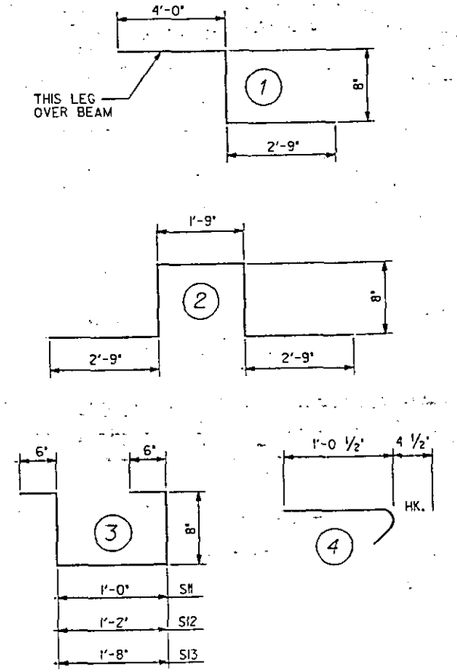
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*S11	60	4	3	3'-4"	134
*S12	64	4	3	3'-6"	150

REINFORCING STEEL LBS. 13948

* EPOXY COATED REINFORCING STEEL LBS. 10994

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#8	3'-4"	4'-7"

BAR TYPES

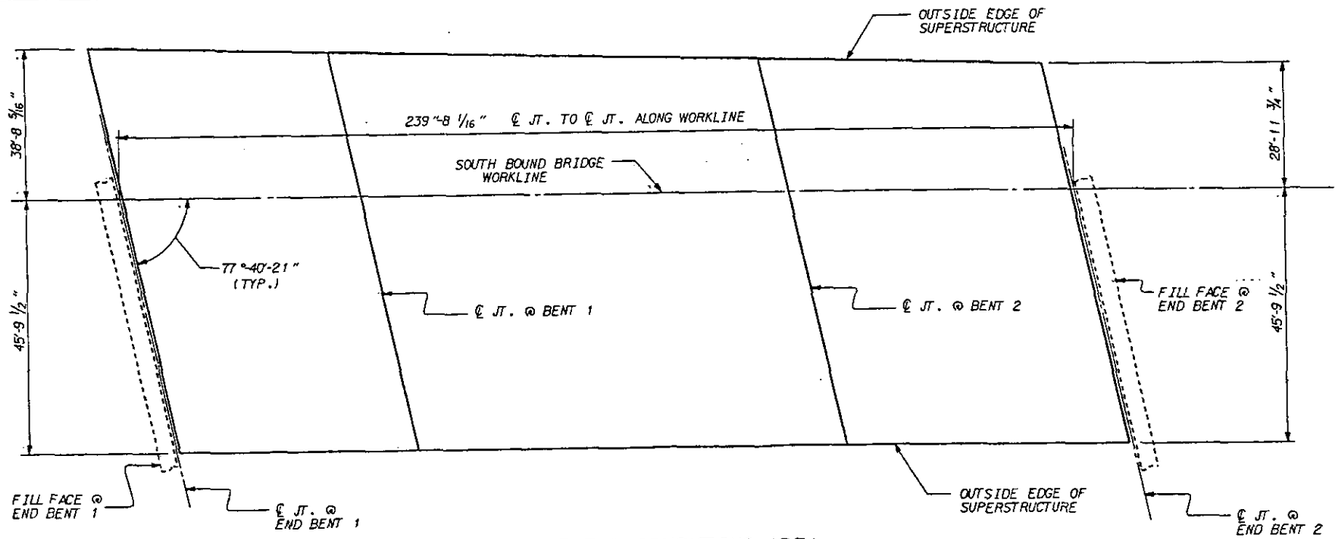


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS A-A CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN "A"	96.5	12883	10284
SPAN "B"	400.6	55489	41192
SPAN "C"	103.6	13948	10994
TOTALS **	600.7	82320	62470

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ.FT.= 19085)

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

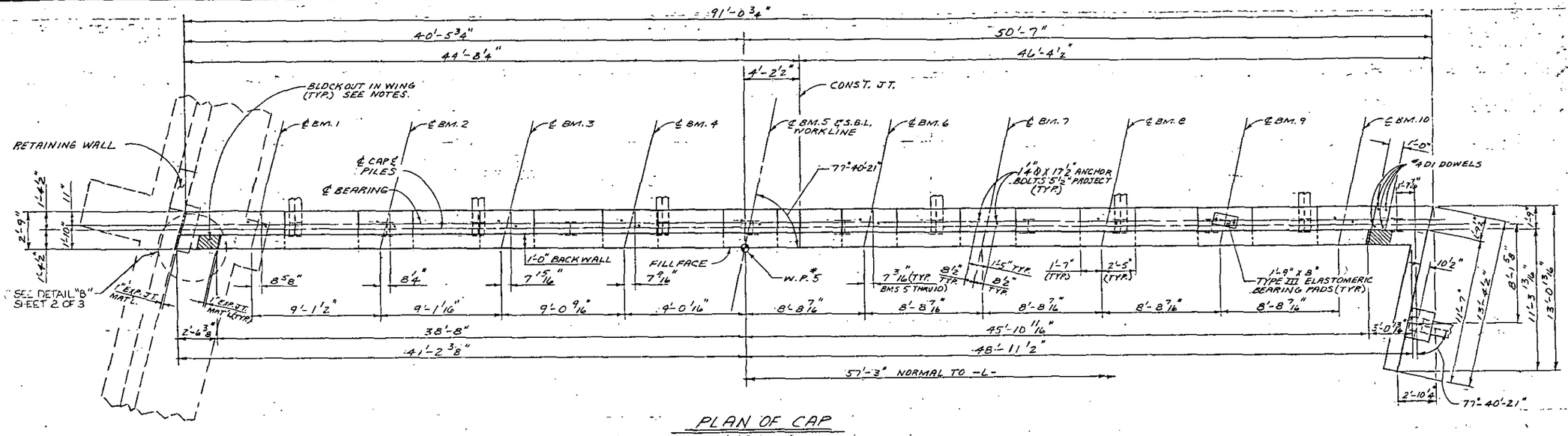
BILL OF MATERIAL

AUGUST (S.B.L.) 1988

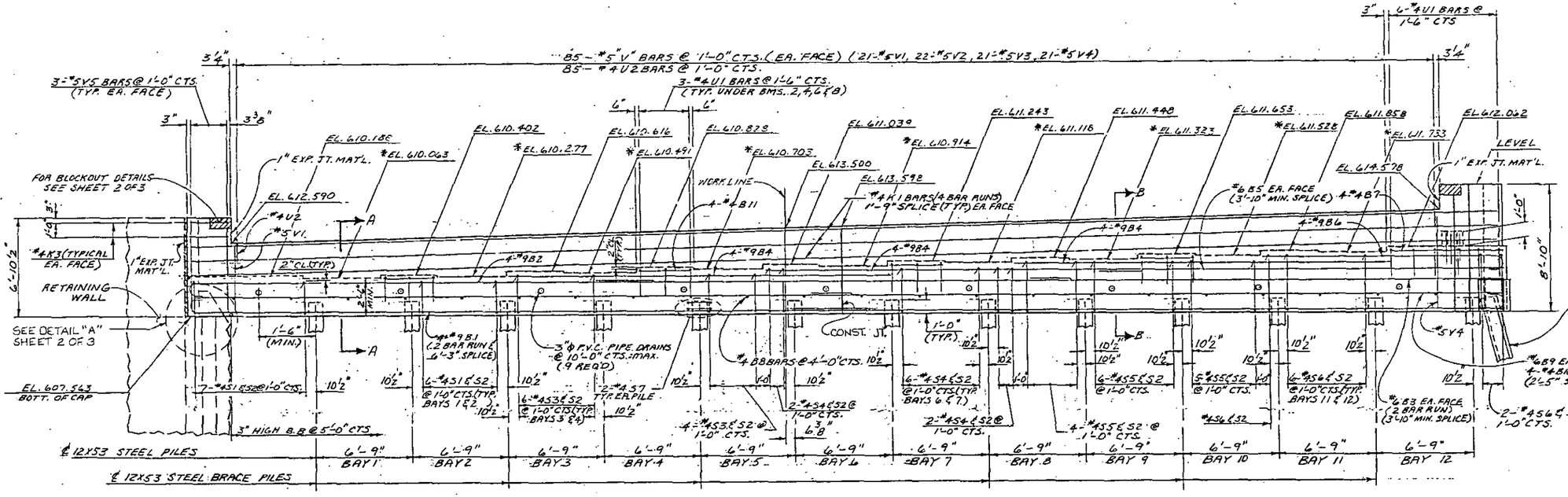
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: ROSS E. KUBENY DATE: 9-15-88
CHECKED BY: E.C. Powell DATE: 9-88

CADD [207.221146202BOM.DGN



PLAN OF CAP



ELEVATION

* FOR LOCATION OF ELEVATION, SEE SECTION A-A & B-B SHEET 2 OF 3.

--- 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 PILE SPLICE DETAILS, SEE END BENT 1, SHEET 2 OF 3.

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 1/4" PER FOOT.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT IN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED. FOR DETAILS, SEE SHEET 2 OF 3.

FILTER FABRIC TO BE PAID FOR AS PART OF THE COST OF THE SEVERAL PAY ITEMS FOR THE END BENT AND SHALL BE SIMILAR TO THAT USED FOR ROADWAY SHOULDER DRAINS. WORK TO INSTALL THE FABRIC SHALL ALSO BE INCLUDED IN THE COST OF THE SEVERAL PAY ITEMS. SEE STANDARD SPECIFICATIONS.

PROJECT NO. B-1670801

MECKLENBURG COUNTY

STATION: 242+49.42-L-

SHEET 1 OF 3

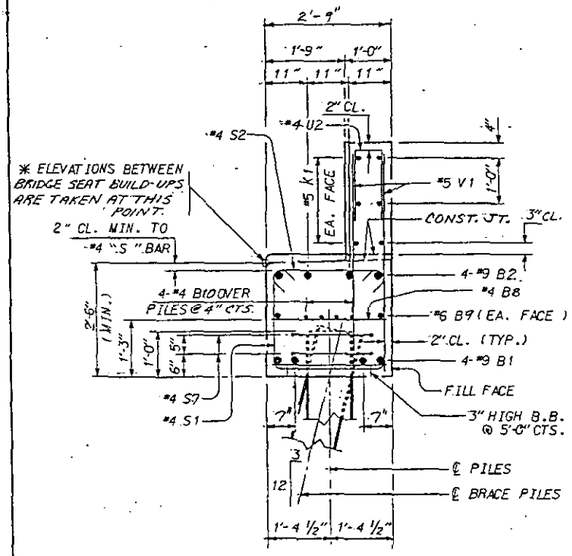
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
S. B. L.

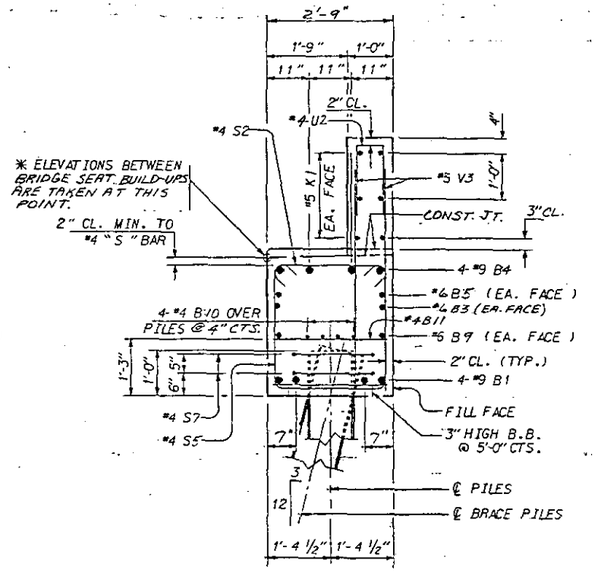
DEC 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-71
1			3			TOTAL SHEETS
2			4			82

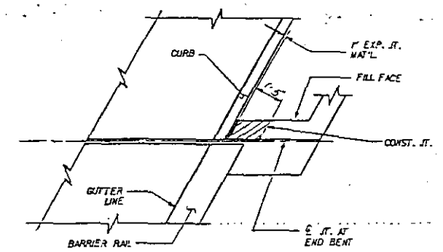
DRAWN BY ROAY MARTIN DATE 3-28-88
CHECKED BY ROGER E. KUBENY DATE 12-9-88



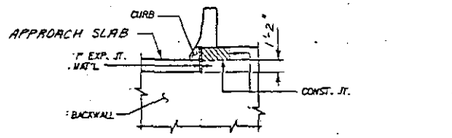
SECTION A-A



SECTION B-B



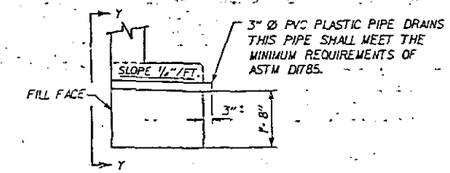
PLAN



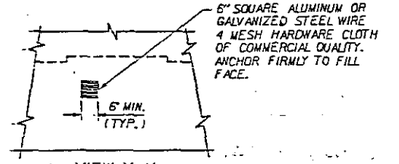
ELEVATION

BLOCKOUT IN WING WALL FOR FITTING COMPRESSION JOINT SEAL

*NOTE: THE CONCRETE IN THE CROSS-HATCHED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



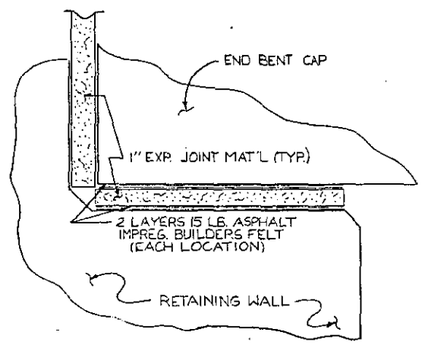
SECTION THRU CAP



VIEW Y-Y

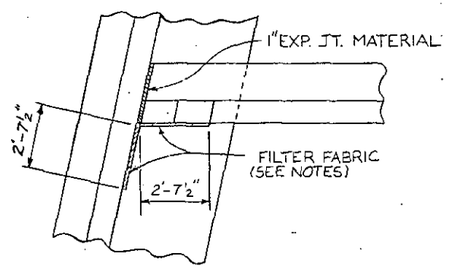
NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH, AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

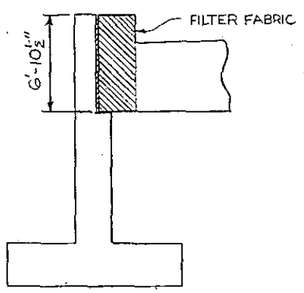


DETAIL "A"

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE 15 LB. BUILDERS' FELT. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

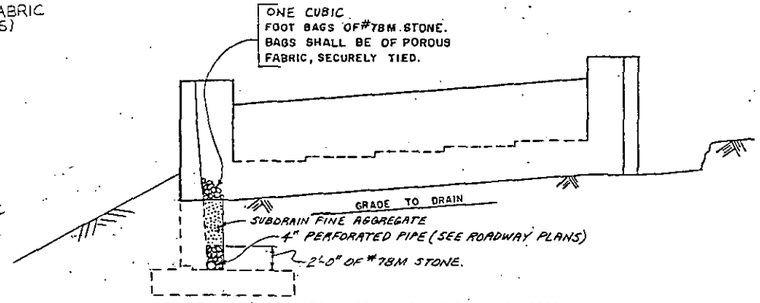


PLAN



ELEVATION

DETAIL "B"

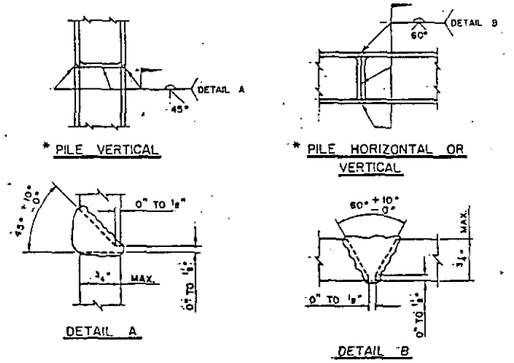


BAGGED STONE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. ANY SUBDRAIN FINE AGGREGATE DISPLACE BY THE EXCAVATION OF THE END BENT SHALL BE REPLACED IMMEDIATELY AFTER THE CONSTRUCTION OF THE END BENT.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT #1



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 3

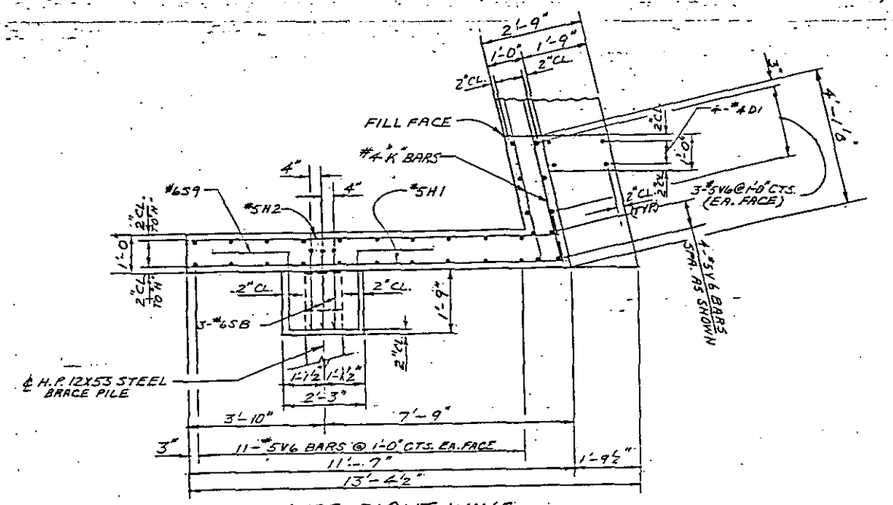
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

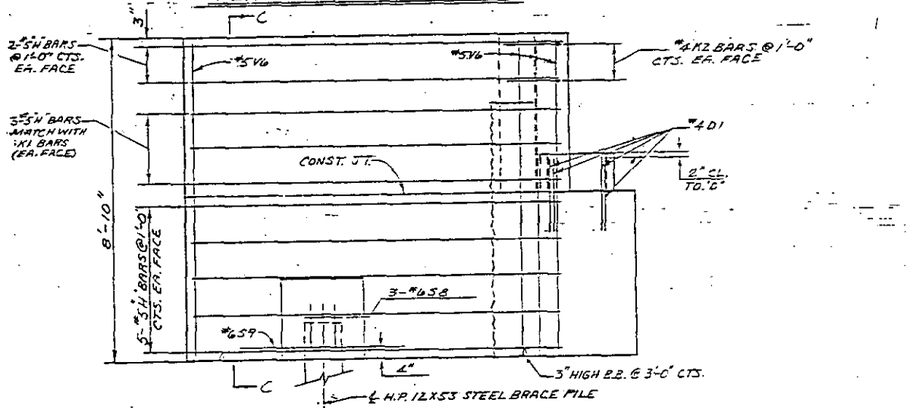
DEC. (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-72
1			3			TOTAL SHEETS
2			4			82

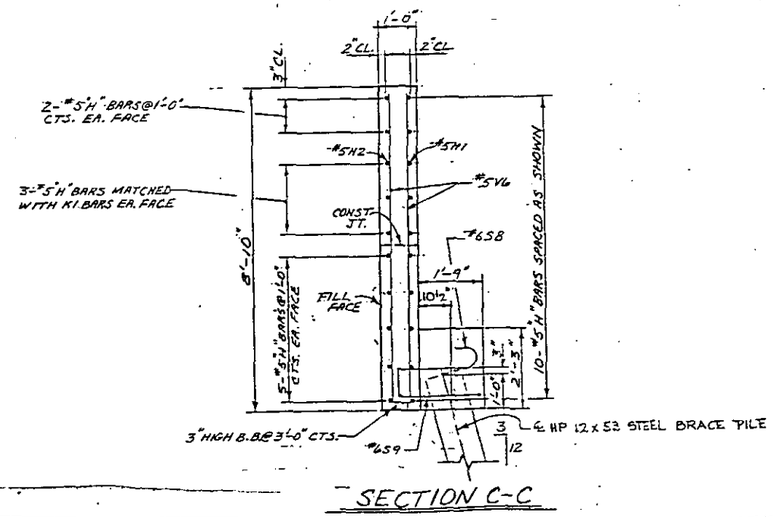
DRAWN BY TONY MARTIN DATE 3-28-88
CHECKED BY ROSS E. KUBENY DATE 12-9-88



PLAN OF RIGHT WING

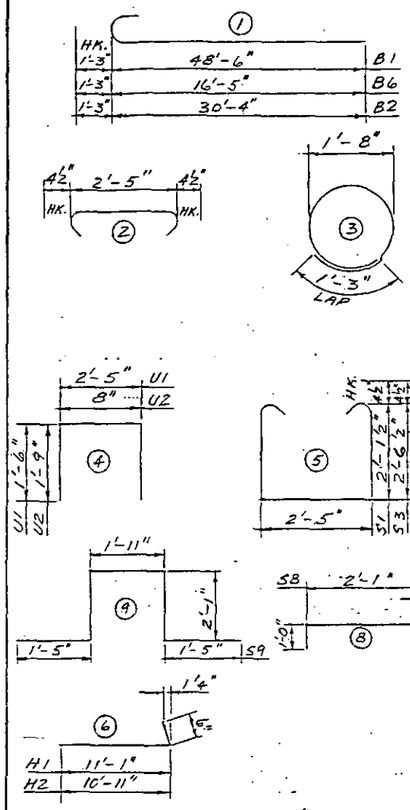


ELEVATION OF RIGHT WING



SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	49'-9"	1,353
B2	4	#9	1	31'-7"	430
B3	4	#6	STR.	34'-1"	205
B4	12	#9	STR.	26'-10"	1,095
B5	2	#6	STR.	28'-10"	87
B6	4	#9	1	17'-8"	240
B7	4	#4	STR.	7'-8"	20
B8	22	#4	STR.	2'-5"	36
B9	4	#6	STR.	47'-4"	284
B10	16	#4	STR.	24'-6"	262
B11	16	#4	STR.	3'-8"	39
D1	4	#4	STR.	2'-0"	5
H1	10	#5	6	11'-7"	121
H2	10	#5	6	11'-5"	119
K1	24	#4	STR.	24'-0"	385
K2	4	#4	STR	3'-8"	10
K3	4	#4	STR.	2'-2"	6
S1	19	#4	5	7'-5"	94
S2	8.1	#4	2	3'-2"	171
S3	16	#4	5	8'-3"	88
S4	16	#4	5	9'-1"	97
S5	15	#4	5	9'-11"	99
S6	15	#4	5	10'-9"	108
S7	26	#4	3	6'-6"	113
S8	3	#6	8	3'-9"	17
S9	1	#6	9	8'-11"	13
U1	18	#4	4	5'-5"	65
U2	85	#4	4	4'-2"	237
V1	42	#5	STR.	4'-8"	204
V2	44	#5	STR.	5'-2"	237
V3	42	#5	STR.	5'-8"	248
V4	42	#5	STR.	6'-2"	270
V5	6	#5	STR.	6'-5"	40
V6	32	#5	STR.	8'-5"	281
REINFORCING STEEL LBS.					7,079
HP 12X53 STEEL PILES					
NO. 14				LIN. FT. 350	
CLASS "A" CONCRETE C.Y.					45.6

PROJECT NO. 8.1670801

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 3 OF 3

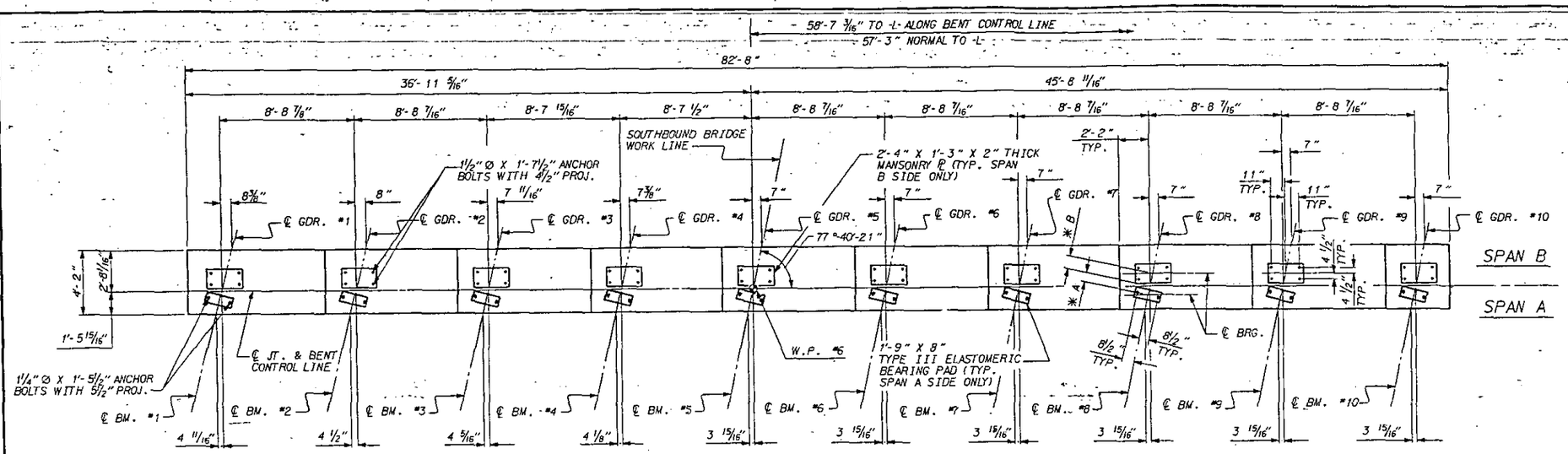
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
(S.B.L.)

DEC. 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-73
1			3			TOTAL SHEETS
2			4			82

DRAWN BY: MARY MARTIN DATE: 2-4-88
CHECKED BY: ROSS E. KUBENY DATE: 12-9-88



PLAN OF CAP

* BEARING OFFSETS					
GDR. NO.	1	2	3	4	5-10
A	7 5/16"	7 5/16"	7 5/16"	7 1/4"	7 1/4"
B	10 1/8"	10 1/16"	10 1/16"	10"	10"

----NOTES----

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

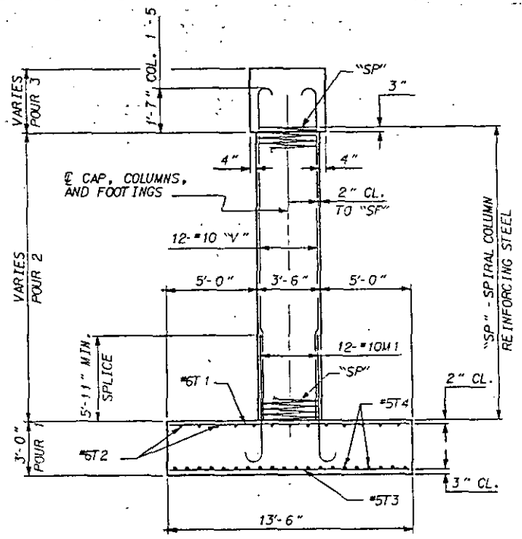
FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

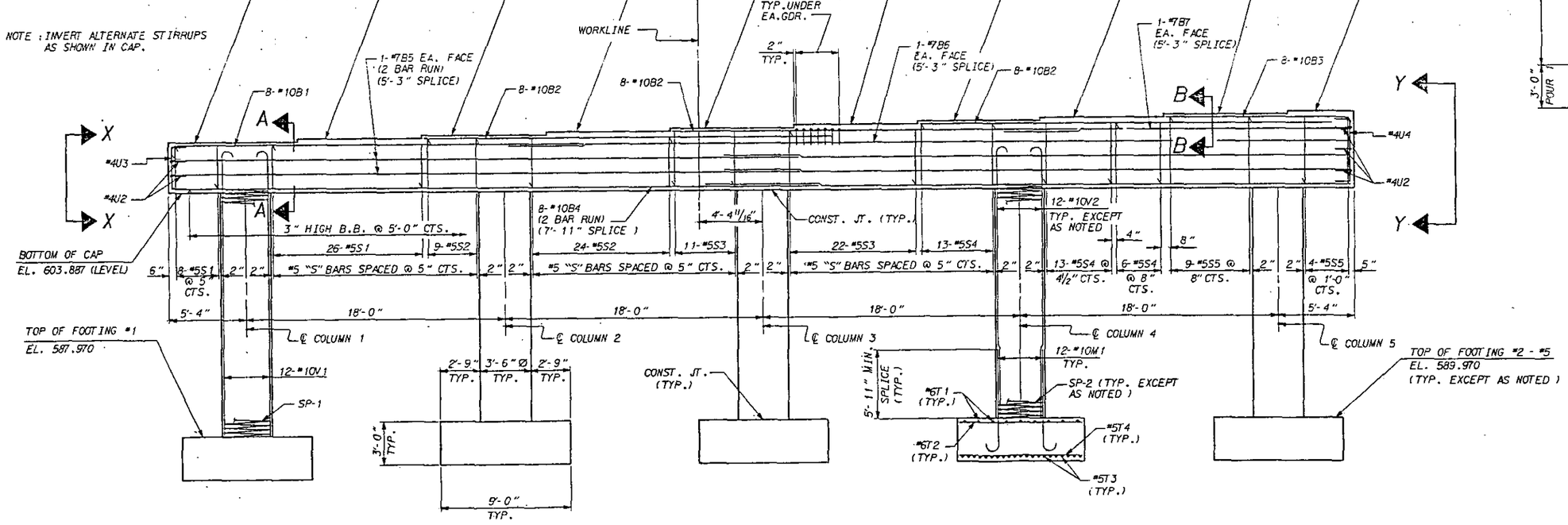
THE TOP SURFACE AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE CENTERLINE JOINT IN THE DECK SLAB (CONTROL LINE) IS OFFSET FROM THE CENTERLINE BENT.

BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT BEFORE THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.



END ELEVATION



ELEVATION

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

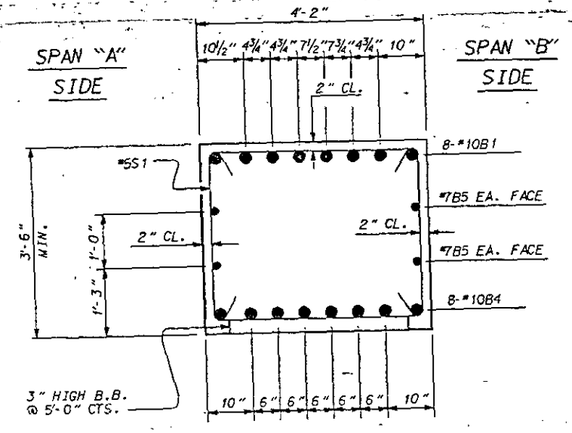
SUBSTRUCTURE
BENT 1

JULY (S.B.L.) 1988

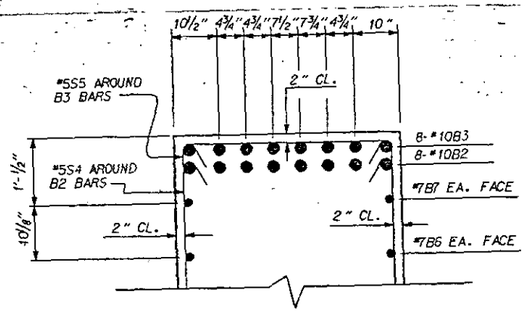
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			82

DRAWN BY : E.G. ALLEN DATE : 7-1-88
CHECKED BY : ROSS E. KUSENY DATE : 12-5-88

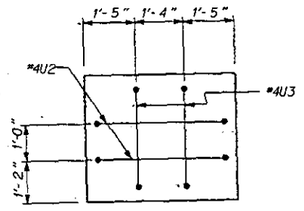
CADD 1462028T1



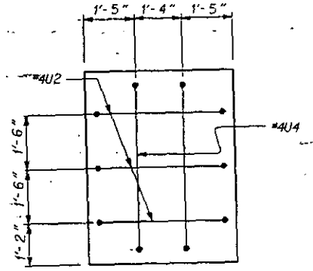
SECTION A-A



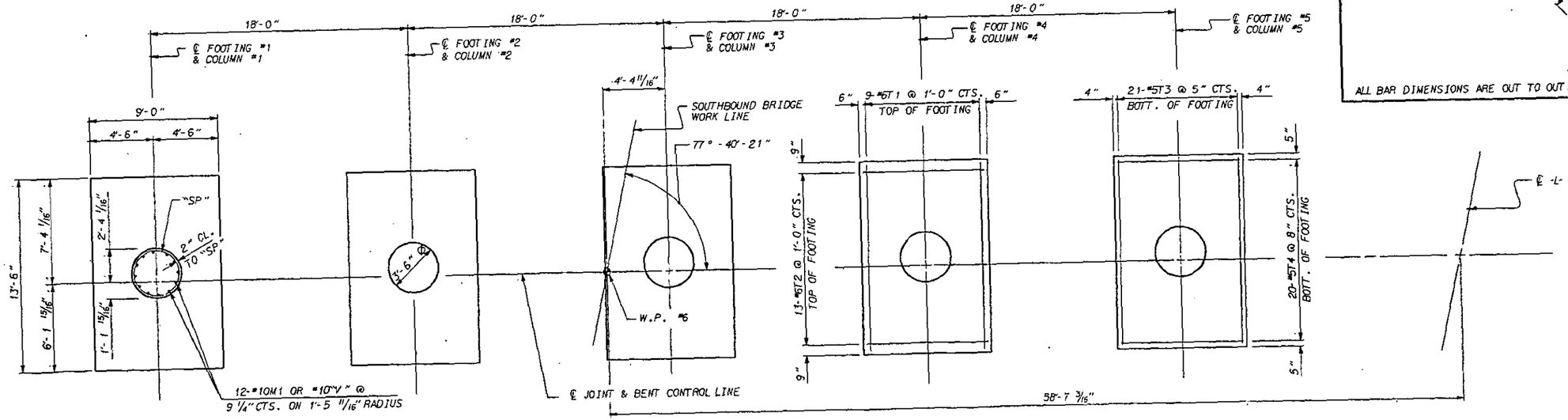
SECTION B-B



VIEW X-X



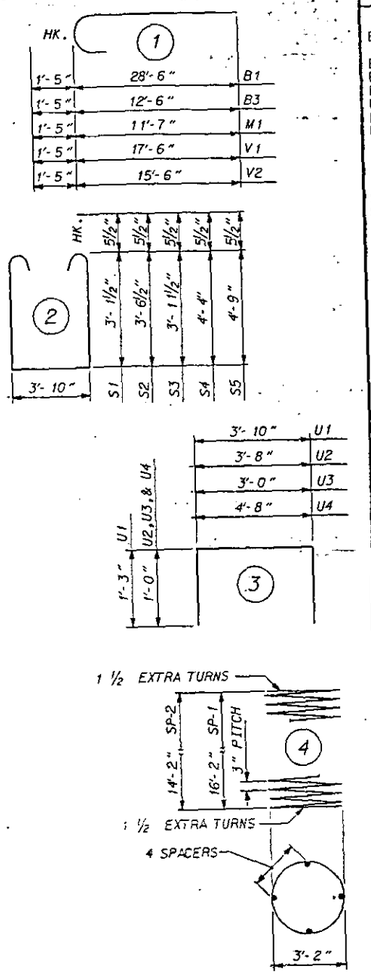
VIEW Y-Y



PLAN OF FOOTINGS

DETAILS SHOWN FOR FOOTINGS ARE TYPICAL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	29-11	1030
B2	24	10	STR	28-6	2943
B3	8	10	1	13-11	479
B4	16	10	STR	45-1	3105
B5	8	7	STR	43-10	717
B6	2	7	STR	59-0	241
B7	2	7	STR	24-4	99
M1	60	10	1	13-0	3356
S1	34	5	2	11-0	390
S2	33	5	2	11-10	407
S3	33	5	2	12-8	436
S4	32	5	2	13-5	448
S5	13	5	2	14-3	193
T1	45	6	STR	13-0	879
T2	65	6	STR	8-6	830
T3	105	5	STR	13-0	1424
T4	100	5	STR	8-6	887
U1	70	4	3	6-4	296
U2	5	4	3	5-8	19
U3	2	4	3	5-0	7
U4	2	4	3	6-8	9
V1	12	10	1	18-11	977
V2	48	10	1	16-11	3494
SP1	1		4	664-6	444
SP2	4		4	586-0	1566

REINFORCING STEEL = 22,665 LBS.

SPIRAL COLUMN REINFORCING STEEL= 2,010 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 (FOOTINGS) --	67.5 CY.
POUR #2 (COLUMNS) ---	25.5 CY.
POUR #3 (CAP) -------	55.8 CY.
CLASS A CONCRETE TOTAL =	148.8 CY.
FOUNDATION EXCAVATION =	290 CY.

PROJECT NO. 8.1670801 #2

MECKLENBURG COUNTY

STATION: 242+49.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

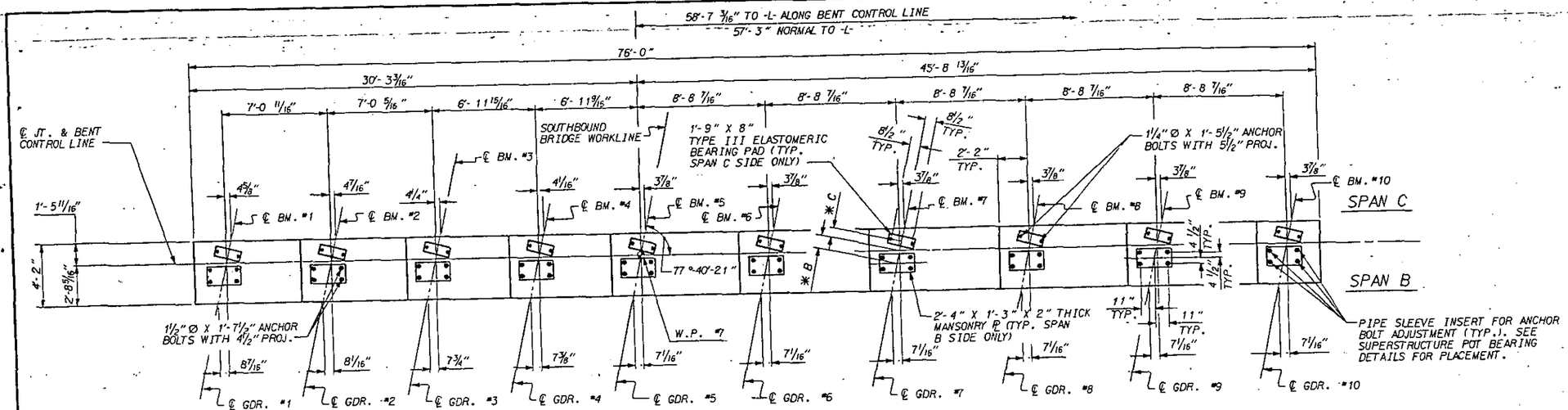
SUBSTRUCTURE
BENT 1

JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
1			3			TOTAL SHEETS
2			4			82

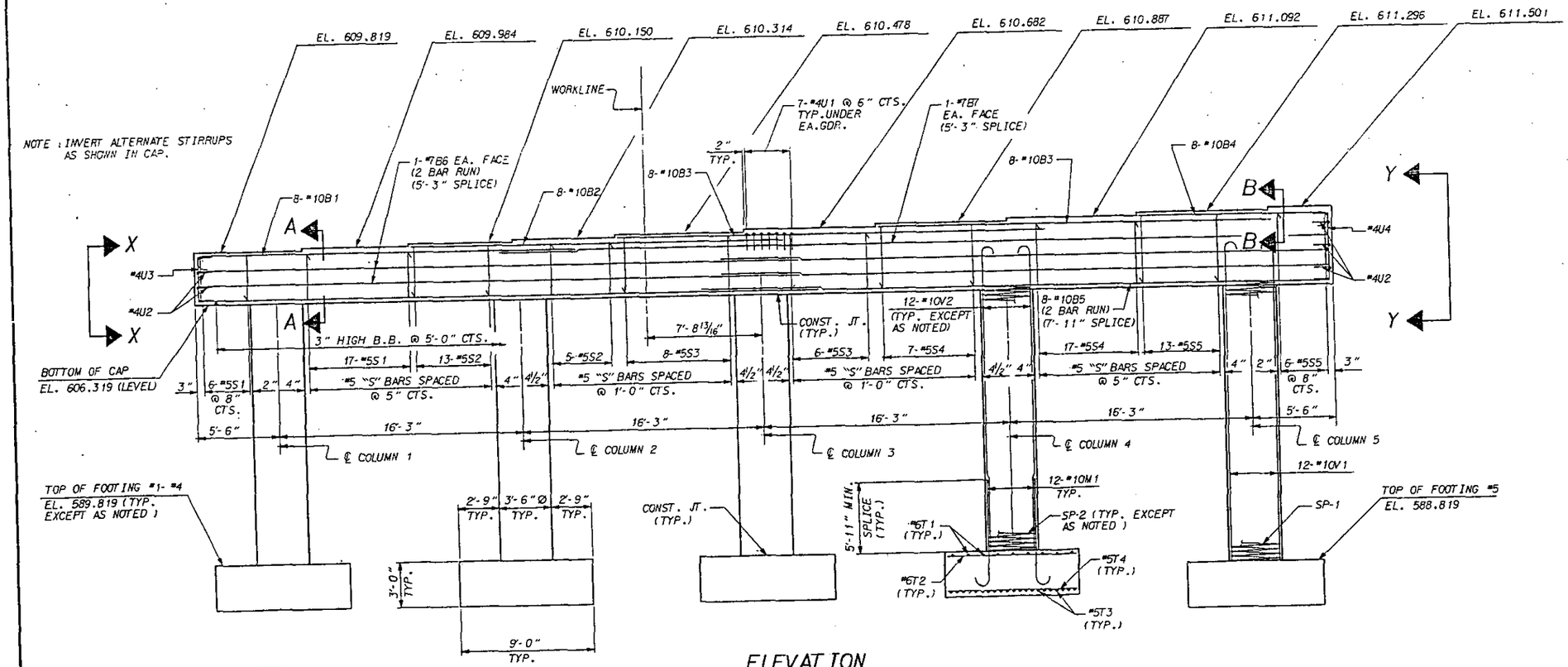
DRAWN BY : E.G. ALLEN DATE : 7-1-88
CHECKED BY : ROSS E. KILBENY DATE : 12-8-88

CADD 146202BT1



PLAN OF CAP

* BEARING OFFSETS					
GDR. NO.	1	2	3	4	5-10
B	10 9/16"	10 9/16"	10 9/16"	10½"	10½"
C	7 9/16"	7 9/16"	7 9/16"	7½"	7½"



ELEVATION

DRAWN BY : E.G. ALLEN DATE : 7-14-88
CHECKED BY : ROSS E. KUBENY DATE : 12-8-88

CADD 146202BT2

----NOTES----

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR SPIRAL COLUMN REINFORCING STEEL. SEE SPECIAL PROVISIONS.

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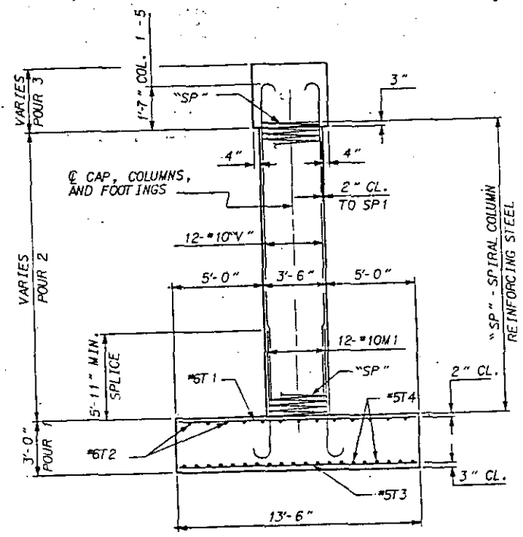


END ELEVATION

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

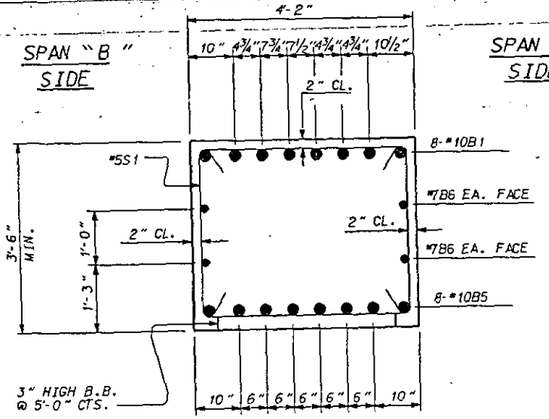
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

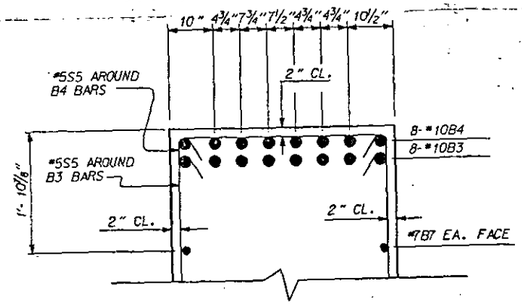
SUBSTRUCTURE BENT 2

JULY (S.B.L.) 1988

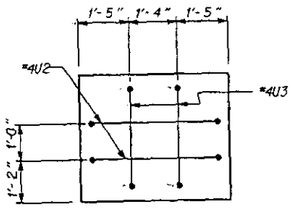
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76
1			3			TOTAL SHEETS
2			4			82



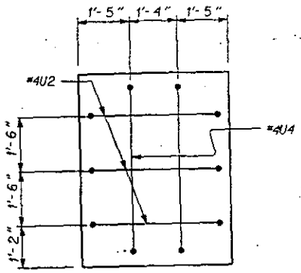
SECTION A-A



SECTION B-B

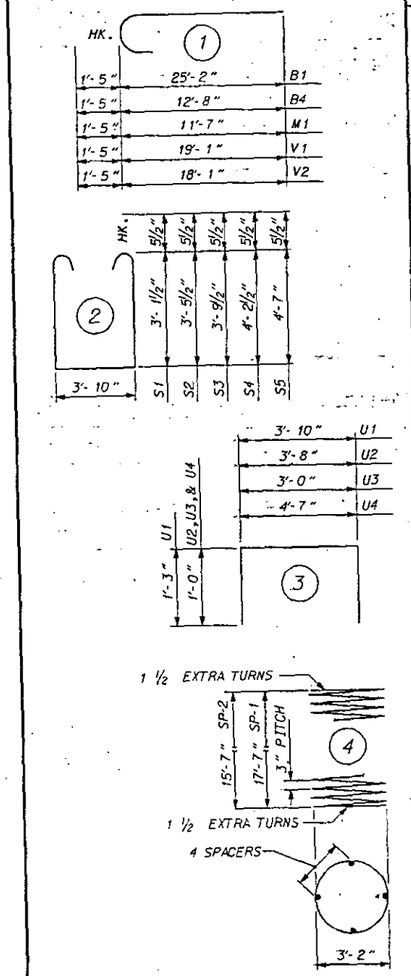


VIEW X-X



VIEW Y-Y

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	-1	26- 7	915
B2	8	10	STR	25- 1	863
B3	16	10	STR	28- 6	1962
B4	8	10	1	14- 1	485
B5	16	10	STR	41- 9	2874
B6	8	7	STR	40- 5	661
B7	2	7	STR	55- 7	227
M1	60	10	1	13- 0	3356
S1	23	5	2	11- 0	264
S2	18	5	2	11- 8	219
S3	14	5	2	12- 4	180
S4	24	5	2	13- 2	330
S5	19	5	2	13-11	276
T1	45	6	STR	13- 0	879
T2	65	6	STR	8- 6	830
T3	105	5	STR	13- 0	1424
T4	100	5	STR	8- 6	887
U1	70	4	3	6- 4	296
U2	5	4	3	5- 8	19
U3	2	4	3	5- 0	7
U4	2	4	3	6- 7	9
V1	12	10	1	20- 6	1059
V2	48	10	1	19- 6	4028
SP1	1		4	726- 9	485
SP2	4		4	687- 6	1037

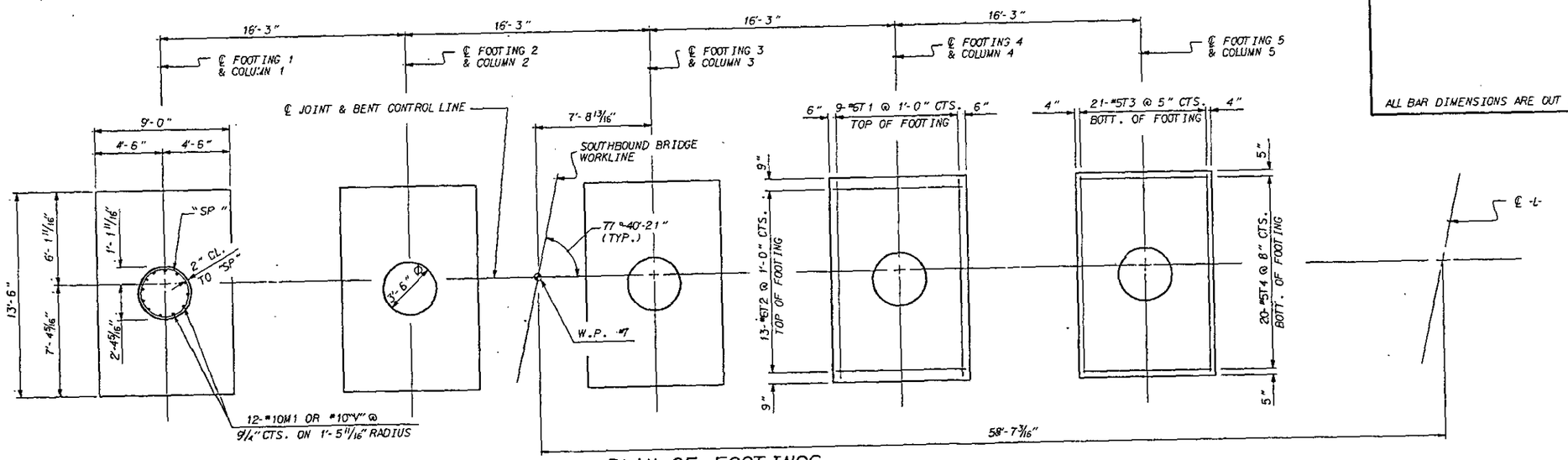
REINFORCING STEEL = 22,050 LBS.

SPIRAL COLUMN
REINFORCING STEEL= 2322 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 (FOOTINGS) --	67.5 CY.
POUR #2 (COLUMNS)---	29.8 CY.
POUR #3 (CAP)-------	49.9 CY.
CLASS A CONCRETE TOTAL =	147.2 CY.

FOUNDATION EXCAVATION = 280 C.Y.



PLAN OF FOOTINGS

DETAILS SHOWN FOR FOOTINGS ARE TYPICAL

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 2

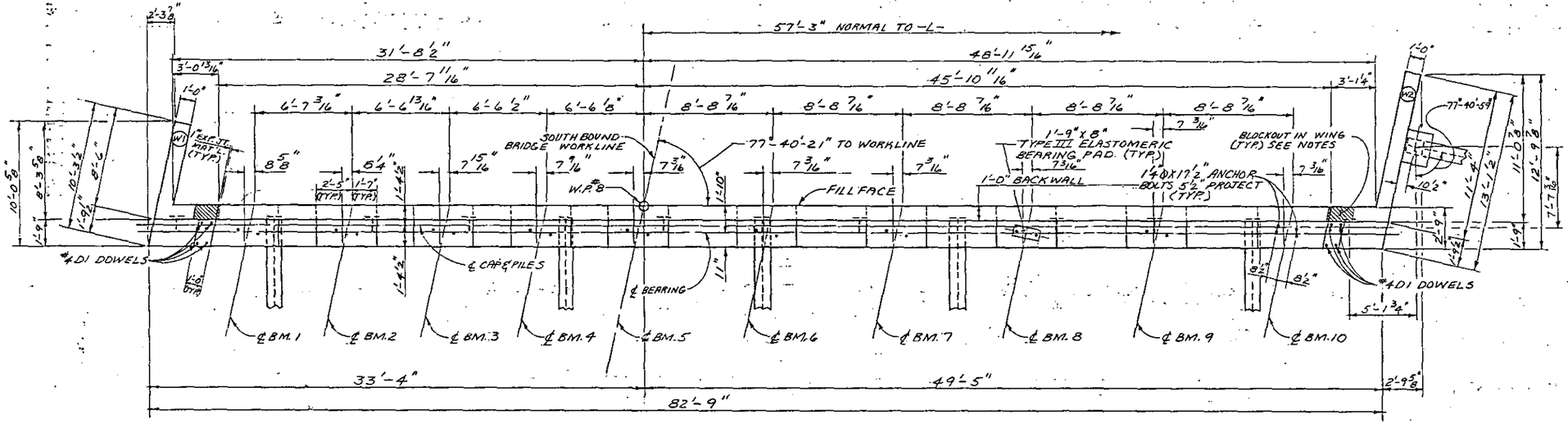
JULY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS
2			4			82

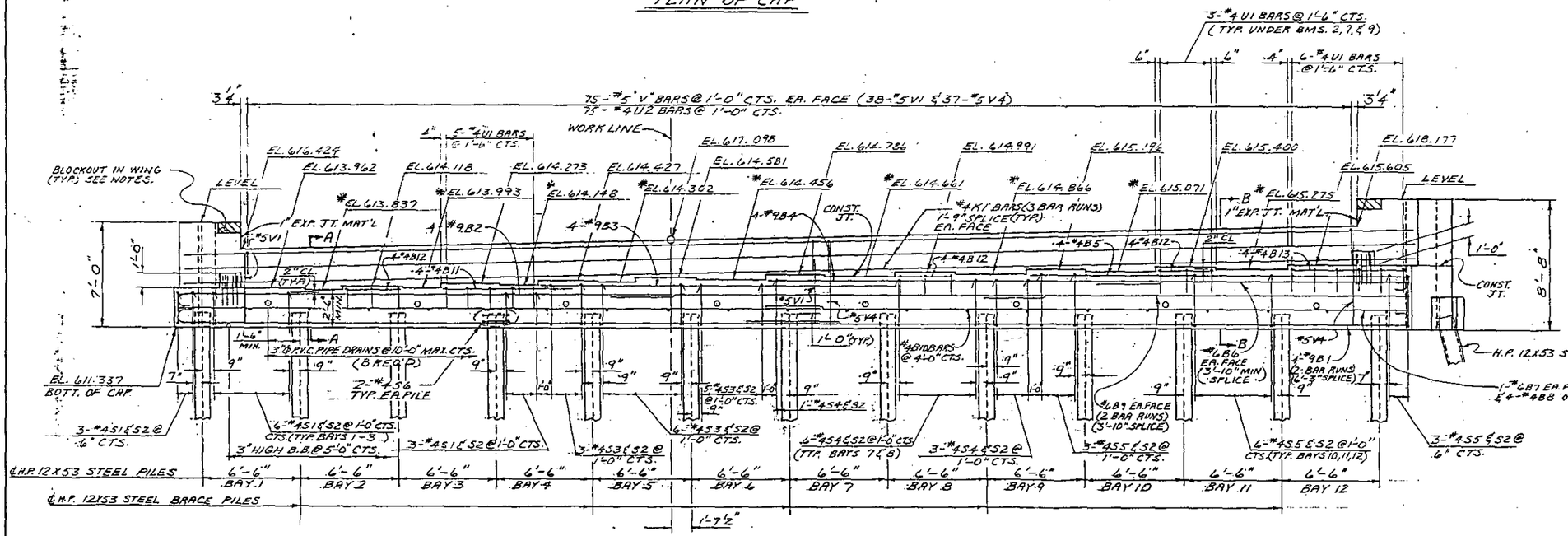
DRAWN BY : E.G. ALLEN DATE : 7-14-88
CHECKED BY : ROSS E. KUBENY DATE : 12-8-88

CADD 146202BT2

AP 47637



PLAN OF CAP



ELEVATION

* FOR LOCATION OF ELEVATION, SEE SECTION A-A & B-B SHEET 2 OF 3

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 PIPE DRAIN DETAILS, SEE SHEET 2 OF 3 .

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS 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 1/4" PER FOOT.

FOR BLOCKOUT DETAILS, SEE SHEET 2 OF 3.

DRAWN BY: GARY MARTIN DATE 7-14-88
CHECKED BY: ROSS E. KUBENY DATE 12-6-88

PROJECT NO. B.1670801
MECKLENBURG COUNTY
STATION: 242+49.42 -L-

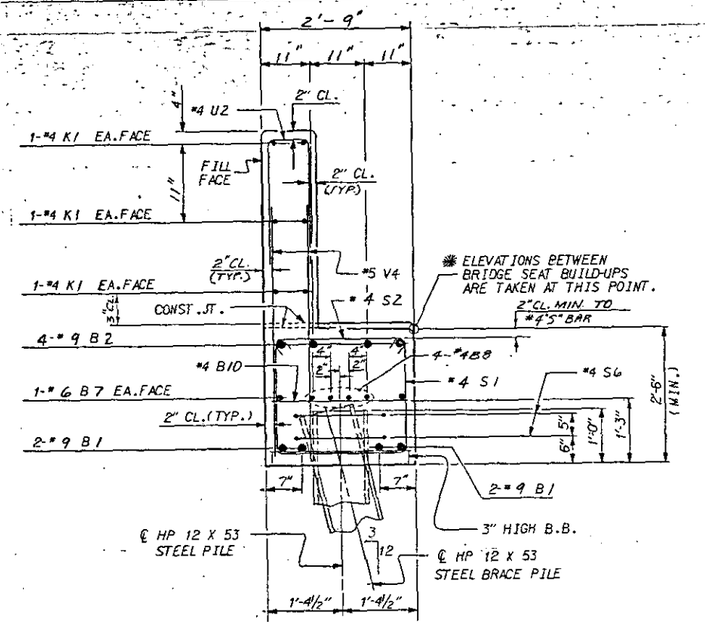
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

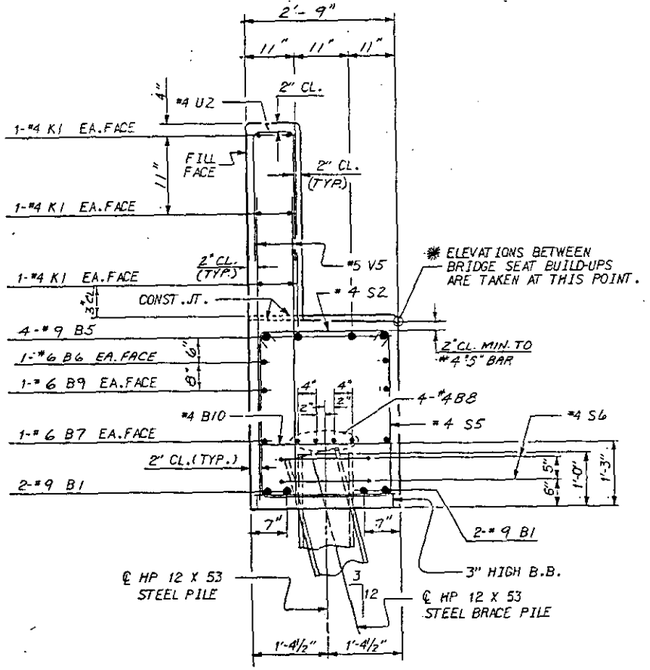
SUBSTRUCTURE
END BENT 2
(S.B.L.)

MAY 1988

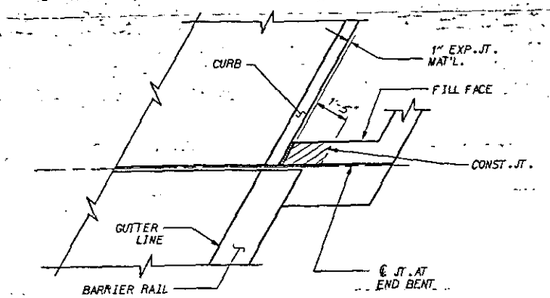
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-78
1			3			TOTAL SHEETS
2			4			82



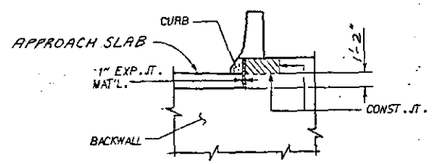
SECTION A-A



SECTION B-B



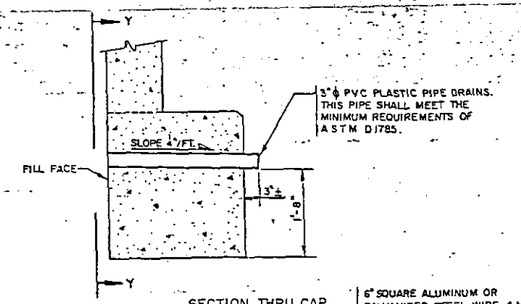
PLAN



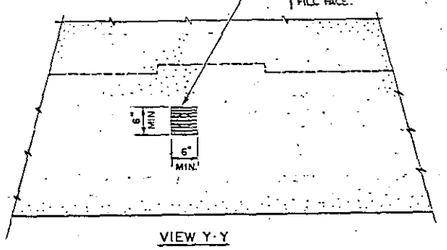
ELEVATION

BLOCKOUT IN WING WALL FOR FITTING COMPRESSION JOINT SEAL

NOTE: THE CONCRETE IN THE CROSS-HATCHED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



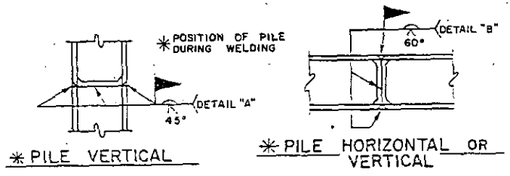
SECTION THRU CAP

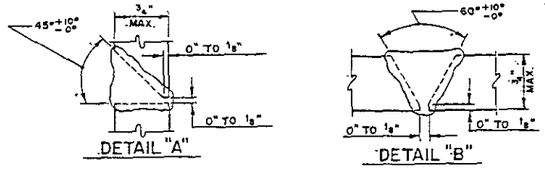


VIEW Y-Y

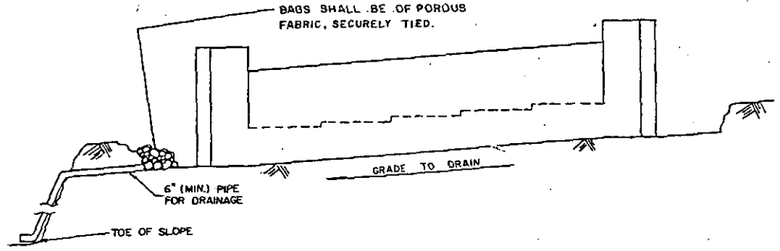
NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS





PILE SPLICE DETAILS



- BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.
- BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

DRAWN BY RORY MARTIN DATE 6-3-88
CHECKED BY ROSS E. KUDENY DATE 12-8-88

PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42-L-

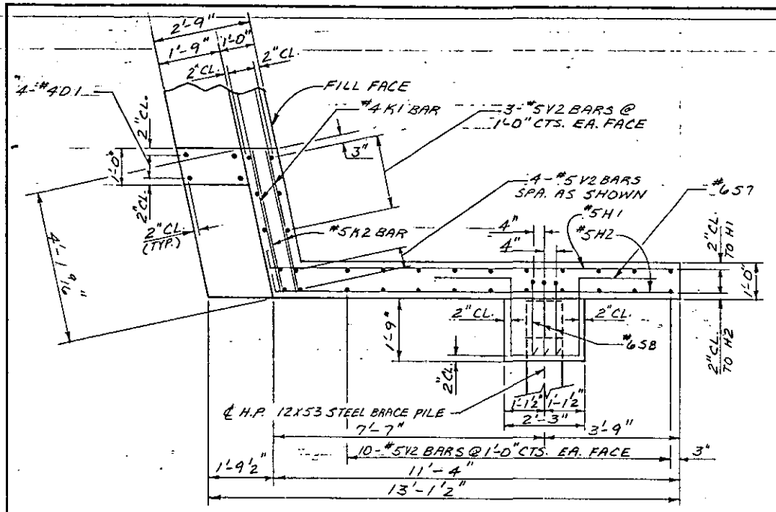
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

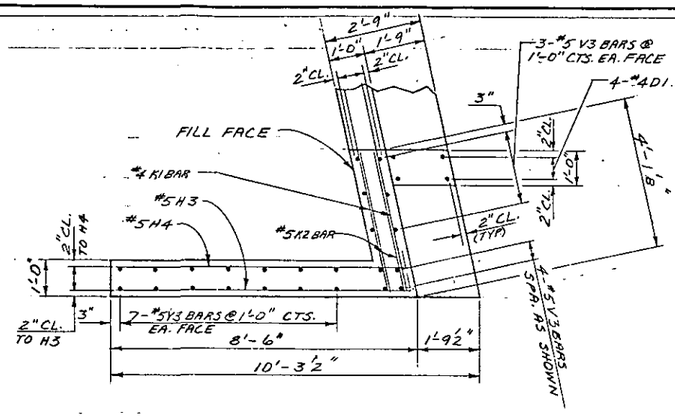
SUBSTRUCTURE
END BENT 2

JUNE (S.B.L.) 1988

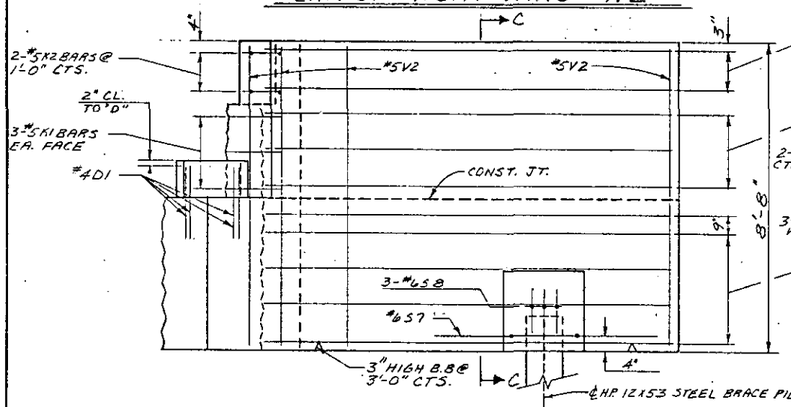
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-79
1			3			TOTAL SHEETS
2			4			82



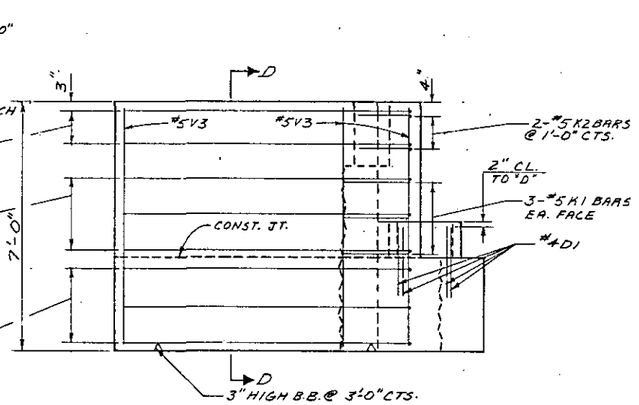
PLAN OF RIGHT WING - W2



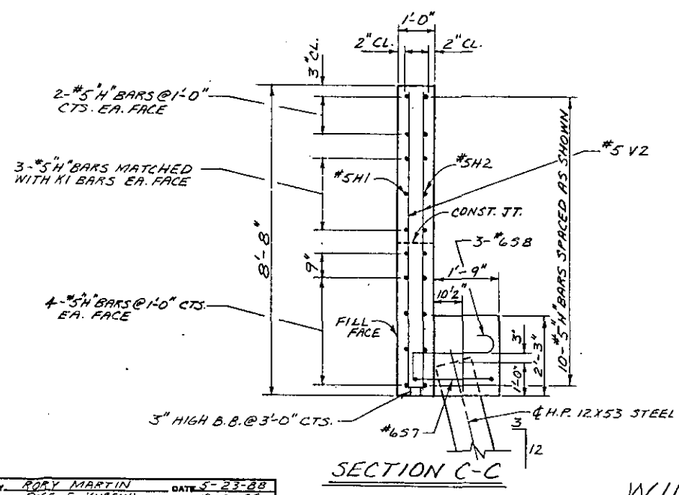
PLAN OF LEFT WING - W1



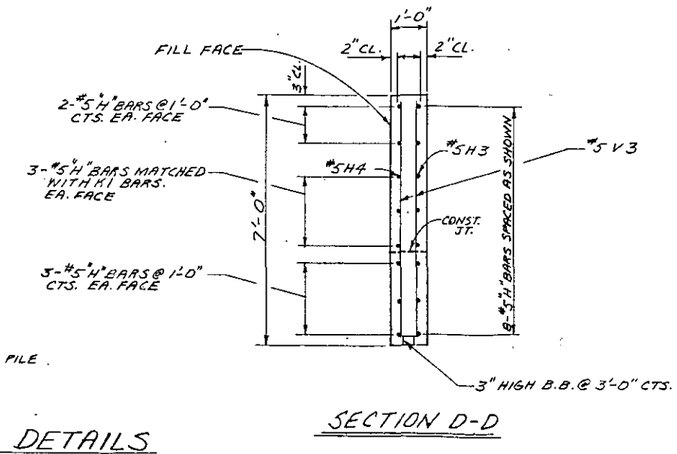
ELEVATION OF RIGHT WING - W2



ELEVATION OF LEFT WING - W1



SECTION C-C

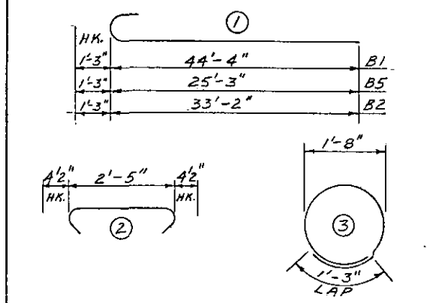


SECTION D-D

WING DETAILS

DRAWN BY RORY MARTIN DATE 5-23-88
CHECKED BY ROSS E. KUEGNY DATE 12-8-88

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	45'-7"	1,240
B2	4	#9	1	34'-5"	468
B3	4	#9	STR.	24'-0"	326
B4	4	#9	STR.	26'-9"	364
B5	4	#9	1	26'-6"	360
B6	2	#6	STR.	20'-11"	63
B7	4	#6	STR.	43'-2"	259
B8	12	#4	STR.	29'-2"	233
B9	4	#6	STR.	28'-6"	171
B10	21	#4	STR.	2'-5"	34
B11	4	#4	STR.	8'-4"	22
B12	12	#4	STR.	3'-8"	29
B13	4	#4	STR.	7'-11"	21
D1	8	#4	STR.	1'-10"	10
K1	18	#4	STR.	28'-8"	345
K2	8	#4	STR.	3'-9"	20
H1	10	#5	7	11'-7"	121
H2	10	#5	7	11'-5"	119
H3	8	#5	8	8'-6"	71
H4	8	#5	8	8'-4"	70
S1	24	#4	5	7'-5"	119
S2	73	#4	2	3'-2"	145
S3	14	#4	5	8'-4"	78
S4	16	#4	5	9'-0"	96
S5	24	#4	5	9'-10"	158
S6	26	#4	3	6'-6"	113
S7	1	#6	9	8'-11"	13
S8	3	#6	6	3'-9"	17
U1	20	#4	4	5'-5"	72
U2	75	#4	4	4'-6"	225
V1	76	#5	STR.	4'-9"	377
V2	30	#5	STR.	8'-3"	258
V3	24	#5	STR.	6'-7"	165
V4	74	#5	STR.	5'-8"	437

REINFORCING STEEL LBS. 6,639

HP 12X53 STEEL FILES
NO. 14 LIN.FT. 280

CLASS "A" CONCRETE C.Y. 35.5

PROJECT NO. 8.1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

MAY (S.B.L.) 1988

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-80
1			3			TOTAL SHEETS
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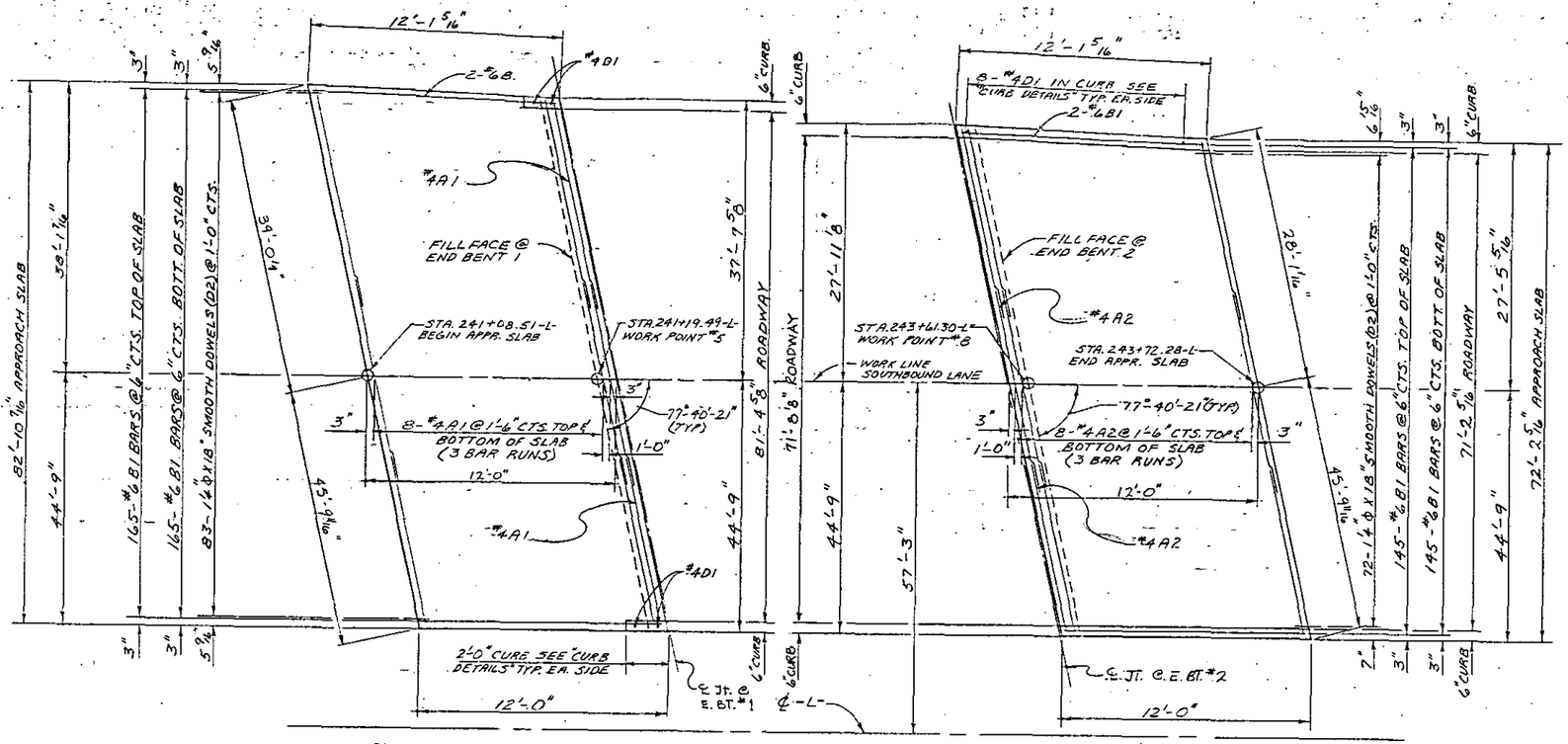


PLAN OF APPROACH SLAB @ END BENT 1

PLAN OF APPROACH SLAB @ END BENT 2

NOTES

FOR BRIDGE APPROACH SLABS, SEE SPECIAL PROVISIONS.

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB. IF SPECIAL DRAINAGE IS USED, THE 6" COMP. A.B.C. SHALL ALSO EXTEND UNDER THE CONCRETE FLUME AND 1'-0" OUTSIDE OF EACH EDGE OF CURB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

NO DIRECT PAYMENT WILL BE MADE FOR THE TEMPORARY DRAINAGE AS SUCH WORK WILL BE CONSIDERED INCIDENTAL TO OTHER WORK BEING PAID FOR BY THE VARIOUS ITEMS IN THE CONTRACT.

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

BILL OF MATERIAL

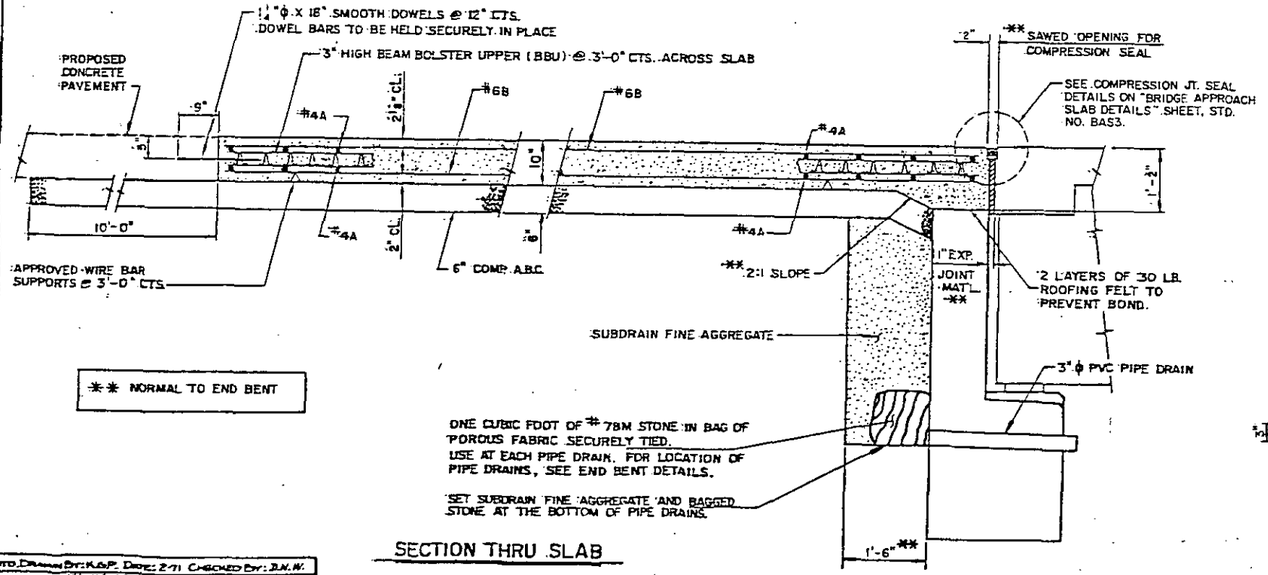
APPROACH SLAB @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	54	#4	STR.	29'-3"	1,055
B1	330	#6	STR.	11'-7"	5,741
D1	4	#4	STR.	0'-10"	2
D2	83	1¼Φ	STR.	1'-6"	520
REINFORCING STEEL					7,318 LBS.
CLASS A-A CONCRETE*					32.0 CU.YDS.

APPROACH SLAB @ END BENT 2

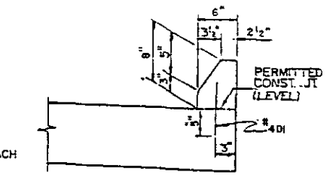
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2	54	#4	STR.	25'-9"	929
B1	290	#6	STR.	11'-7"	5,045
D1	16	#4	STR.	0'-10"	9
D2	72	1¼Φ	STR.	1'-6"	451
REINFORCING STEEL					6,434 LBS.
CLASS A-A CONCRETE*					28.3 CU.YDS.

* INCLUDES CONCRETE FOR 8" HIGH CURB.

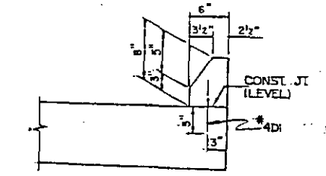


SECTION THRU SLAB

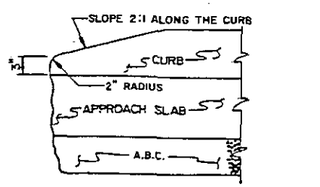
** NORMAL TO END BENT



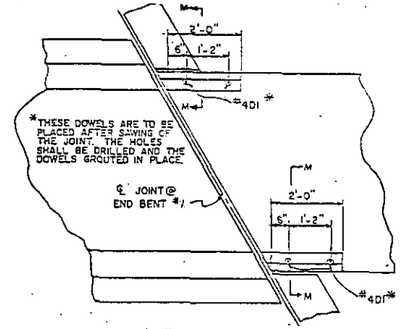
SECTION L-L



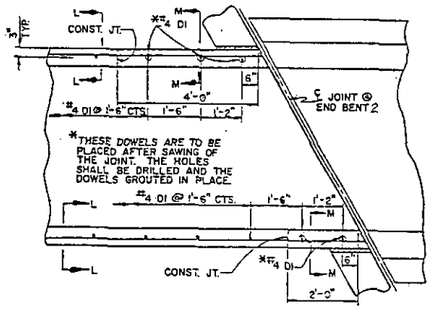
SECTION M-M



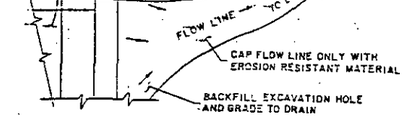
DETAIL @ END OF CURB



2'-0" LONG CURB DETAILS



CURB DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAILS

PROJECT NO. 8.1670801
MECKLENBURG COUNTY
STATION 242+49.42 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

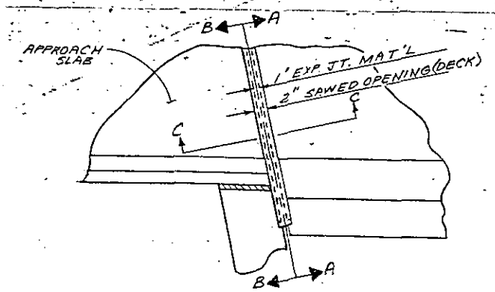
BRIDGE APPROACH SLAB FOR RIGID PAVEMENT

JULY (S.B.L.) 1978

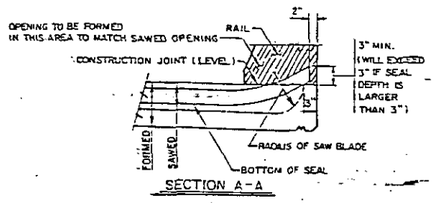
REVISIONS						DWG. NO.
NO.	BY	DATE	NO.	BY	DATE	S-81
1			3			TOTAL SHEETS
2			4			82

STD. DRAWN BY: K&P DATE: 2-71 CHECKED BY: B.N.W.
DRAWN BY: MARY MARTIN DATE 2-15-88
CHECKED BY: E.G. ALLEN DATE 4-21-88

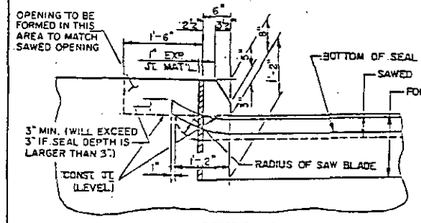
REVISED 5-28-99 BY: RDU
REVISED 4-1-79 BY: CCM
REVISED 7-31-70 BY: R.E.K.
CHECKED BY: C.C.M.
CHECKED BY: P.D.J.
CHECKED BY: R.D.J.
REVISED 5-1-84
REVISED 8-2-82
REVISED 9-1-81
CHECKED BY: J.S.T.
CHECKED BY: E.R.L.
CHECKED BY: R.G.F.



PLAN



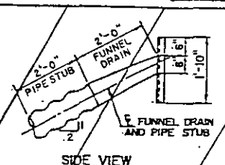
SECTION A-A



SECTION B-B

SECTION C-C

COMPRESSION JOINT SEAL DETAILS @ END BENT



METAL FUNNEL DRAINAGE SHALL INCLUDE THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB. SPILLWAY AND FUNNEL DRAIN SHALL BE FABRICATED FROM FLAT SMOOTH METAL SHEETS.

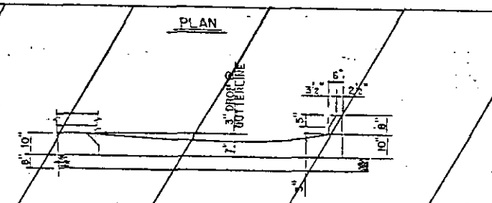
METAL FOR THE SPILLWAY, FUNNEL DRAIN AND PIPE STUB SHALL BE 0.064" THICK (STEEL) OR 0.075" THICK (ALUMINUM).

METAL FUNNEL DETAILS

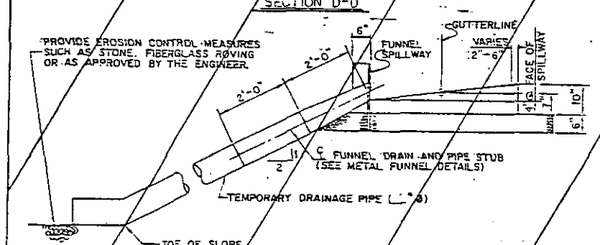
ASSEMBLED BY: RORY MARTIN	DATE 4-15-88	SPECIAL
CHECKED BY: E. G. ALLEN	DATE 4-21-88	
DRAWN BY: E. R. LUNSFORD, JR.	DATE JANUARY 3, 1984	STANDARD
CHECKED BY: E. R. HUTCHERSON	DATE JANUARY 3, 1984	

REVISED 5-31-85 BY SJD
ADDED 3-1-84 BY RWH

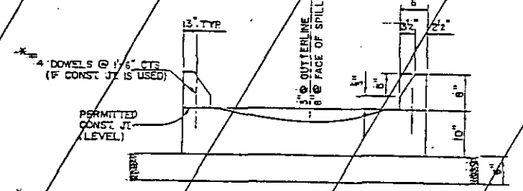
PLAN



SECTION D-D

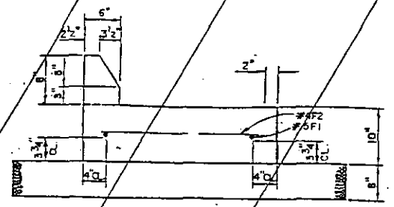


SECTION E-E



*THESE DOWELS ARE NOT INCLUDED IN THE BILL OF MATERIAL. ANY ADDITIONAL COST FOR FURNISHING AND PLACING THE DOWELS SHALL BE PAID FOR BY THE CONTRACTOR.

SECTION F-F

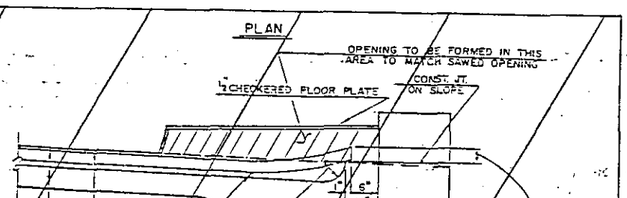


REINFORCING BAR CLEARANCES ARE SHOWN. (SEE PLAN VIEW FOR BAR SPACINGS)

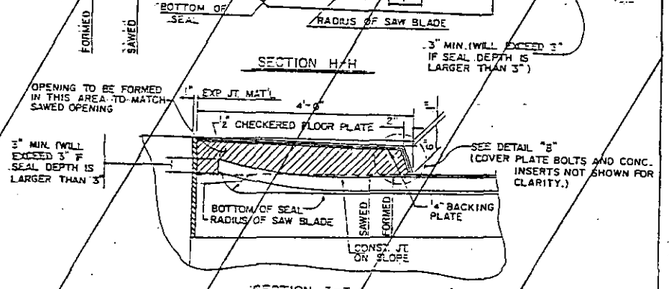
SECTION G-G

SPECIAL DRAINAGE DETAILS

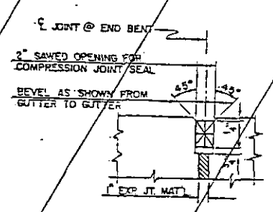
PLAN



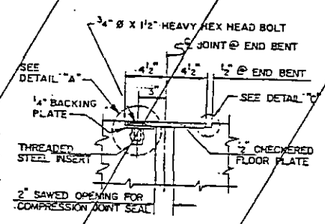
SECTION H-H



SECTION T-T



SECTION J-J



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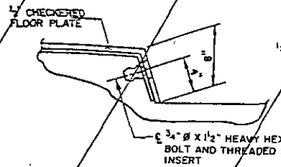
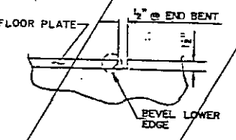
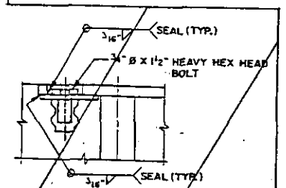


DETAIL "B"



DETAIL "C"



DETAIL "A"

COMPRESSION JOINT SEAL DETAILS @ END BENT

PROJECT NO. B-1670801 #2
MECKLENBURG COUNTY
STATION: 242+49.42-L-
SHEET 2 OF 2

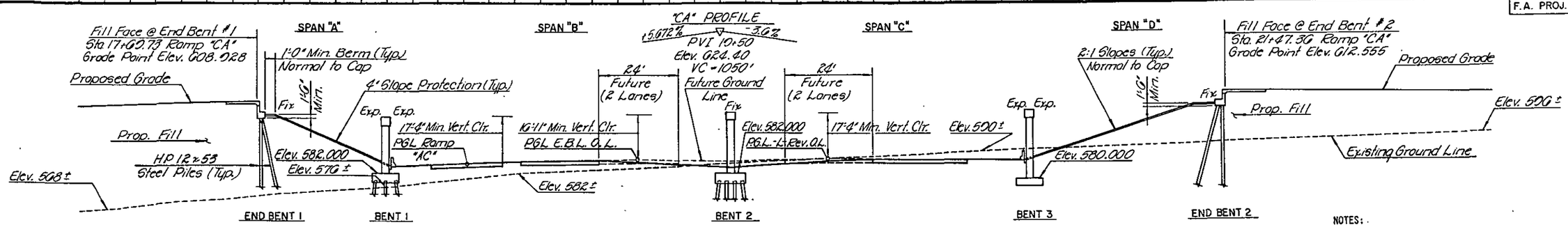
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS

MARCH (S.B.L.) 1984

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-82
1			3			TOTAL SHEETS
2			4			82

STD. NO. BAS3

F.A. PROJ. NO. F-117-1(2)

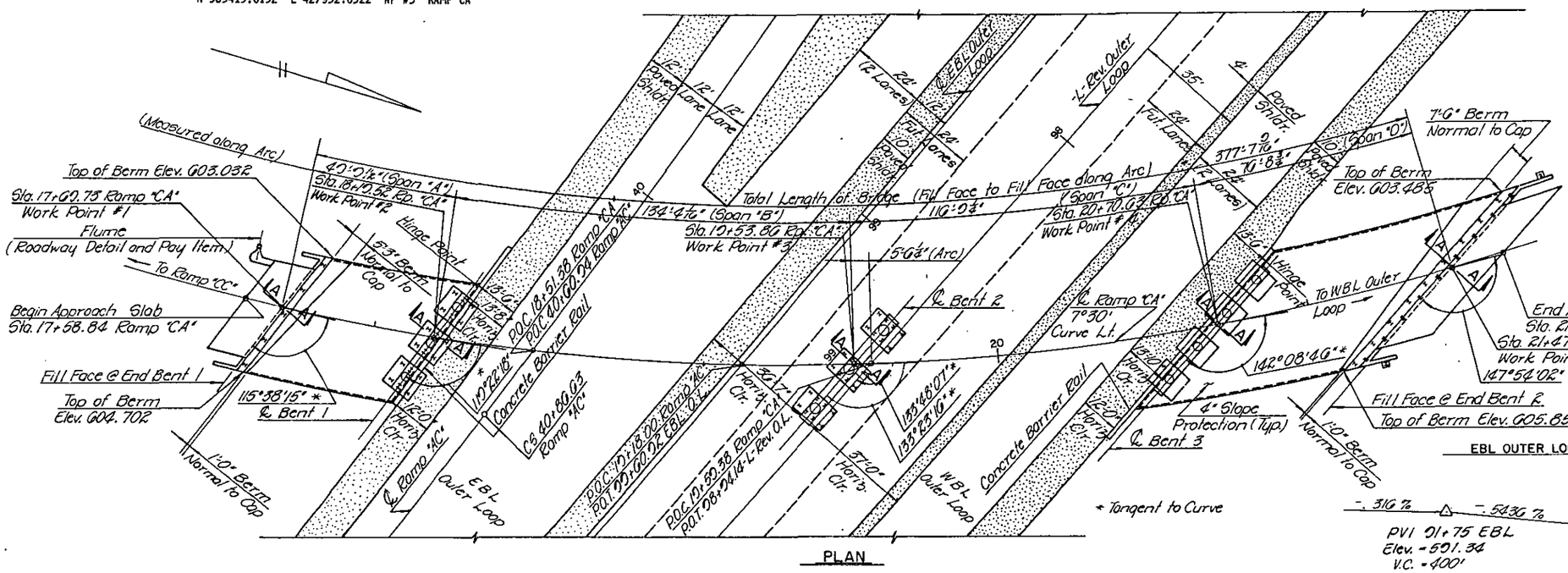


WORK POINT COORDINATES

N 505060.2052	E 428067.8141	"WP #1 RAMP CA
N 505109.7350	E 428062.8265	"WP #2 RAMP CA
N 505240.6363	E 428033.4353	"WP #3 RAMP CA
N 505348.7524	E 427989.5966	"WP #4 RAMP CA
N 505415.6152	E 427952.0322	"WP #5 RAMP CA

SECTION ALONG ℄ BRIDGE

(End Bents and Bents along Section A-A)



PLAN

* Tangent to Curve

EBL OUTER LOOP PROFILE

-.316 % △ -.543 %

PVI 21+75 EBL
Elev. = 501.34
V.C. = 400'

-L- REV. OUTER LOOP PROFILE

+.30 % △ -.543 %

PVI 80+00
Elev. = 507.52
V.C. = 1600'

CURVE DATA-RAMP "CA"

P.I. 281+28.08	Tg = 27,853.08'
Δ = 176°40'46.0"	Lc = 2107.73'
Dc = 7°30' Lt.	R = 763.94'
θs = 0°22'30"	U = 166.20'
Ls = 250'	V = 83.55'

NOTES:

- ASSUMED LIVE LOAD = HS20 - 44 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED BY STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO SPECIFICATIONS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-N.
- COMPUTED FOUNDATION LOAD FOR BENT 3 EQUALS 5 TONS PER SQUARE FOOT.
- PILES FOR END BENTS 1 & 2 AND BENTS 1 & 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
- WORK SHALL NOT BE STARTED ON BENT 1 UNTIL FILL HAS BEEN PLACED.
- WORK SHALL NOT BE STARTED ON BENTS 2 & 3 UNTIL ROADWAY SECTION HAS BEEN EXCAVATED. FOUNDATION EXCAVATION TO BE MEASURED FROM THE GRADED ROADWAY TYPICAL SECTION.
- APPROACH SLABS SHALL NOT BE CONSTRUCTED UNTIL APPROACH FILL HAS BEEN IN PLACE AT LEAST ONE MONTH.
- ALL STRUCTURAL STEEL FOR THIS STRUCTURE SHALL BE UNPAINTED ASTM A588 STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI, 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 PROVISION, "REINFORCED CONCRETE DECK SLAB".

	BY	DATE
MADE	S.C.W.	2-90
CHECKED	D.R.R.	4-90
IN CHARGE D.R. Ruggles		

PREPARED BY
AMERICAN ENGINEERS

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+50.38 Ramp "CA"
38+04.14-L-Rev. Outer Loop

B-4658

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

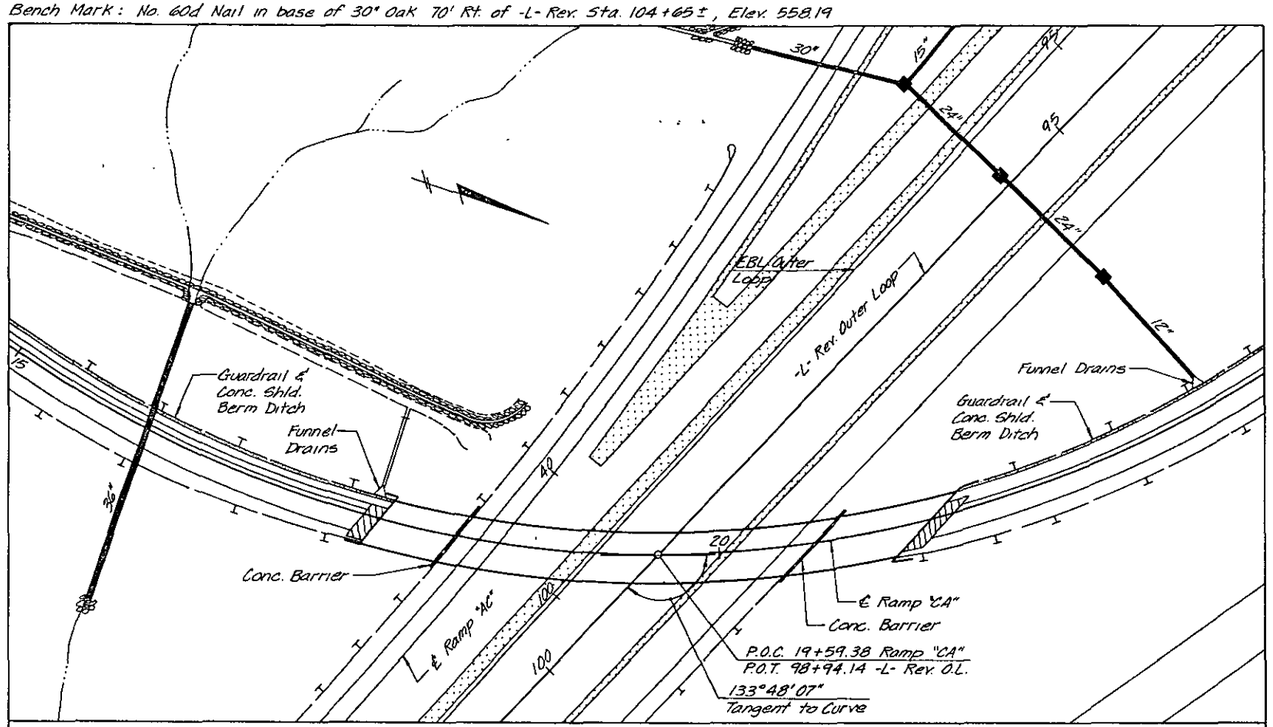
GENERAL DRAWING FOR RAMP "CA" BRIDGE OVER OUTER LOOP

JULY 1990

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-41
						TOTAL SHEETS
						121

Dwg. 1 of 43

Bench Mark: No. 60d Nail in base of 30" Oak 70' Rt. of -L- Rev. Sta. 104+65±, Elev. 558.19



LOCATION SKETCH

NOTE : NO KNOWN UTILITY CONFLICTS

TOTAL BILL OF MATERIAL

	Foundation Excavation	Reinforced Concrete Deck Slab	Class "A" Concrete	Bridge Approach Slabs Sta. 19+59.38	Reinforcing Steel	Spiral Column Reinforcing Steel	Structural Steel	HP 12x53 Steel Piles		Concrete Barrier Rail	4" Slope Protection	Pot Bearings	Elastomeric Bearings	Expansion Joint Seals	Preformed Compression Joint Seals	Grooving Bridge Floors
	Cu. Yds.	Sq. Ft.	Cu. Yds.	Lump Sum	Lbs.	Lbs.	Lbs.	No.	Lin. Ft.	Lin. Ft.	Sq. Yds.	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Sq. Ft.
Superstructure		13,105					345,900			747.9		L.S.	L.S.			11,617
End Bent 1			23.2	L.S.	3,146			5	275		260				L.S.	
Bent 1	115.1		70.1		11,830	1,212		18	450					L.S.		
Bent 2	143.0		91.4		12,071	1,506		24	720							
Bent 3	219.6		84.5		16,558	2,012								L.S.		
End Bent 2			61.7	L.S.	7,648			20	600		370				L.S.	
Total	477.7	13,105	330.9	Lump Sum	51,253	4,730	345,900	67	2,045	747.9	630	Lump Sum	Lump Sum	Lump Sum	Lump Sum	11,617

	BY	DATE
MADE	JWR	8-90
CHECKED	WLH	9-90
IN CHARGE	D.R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

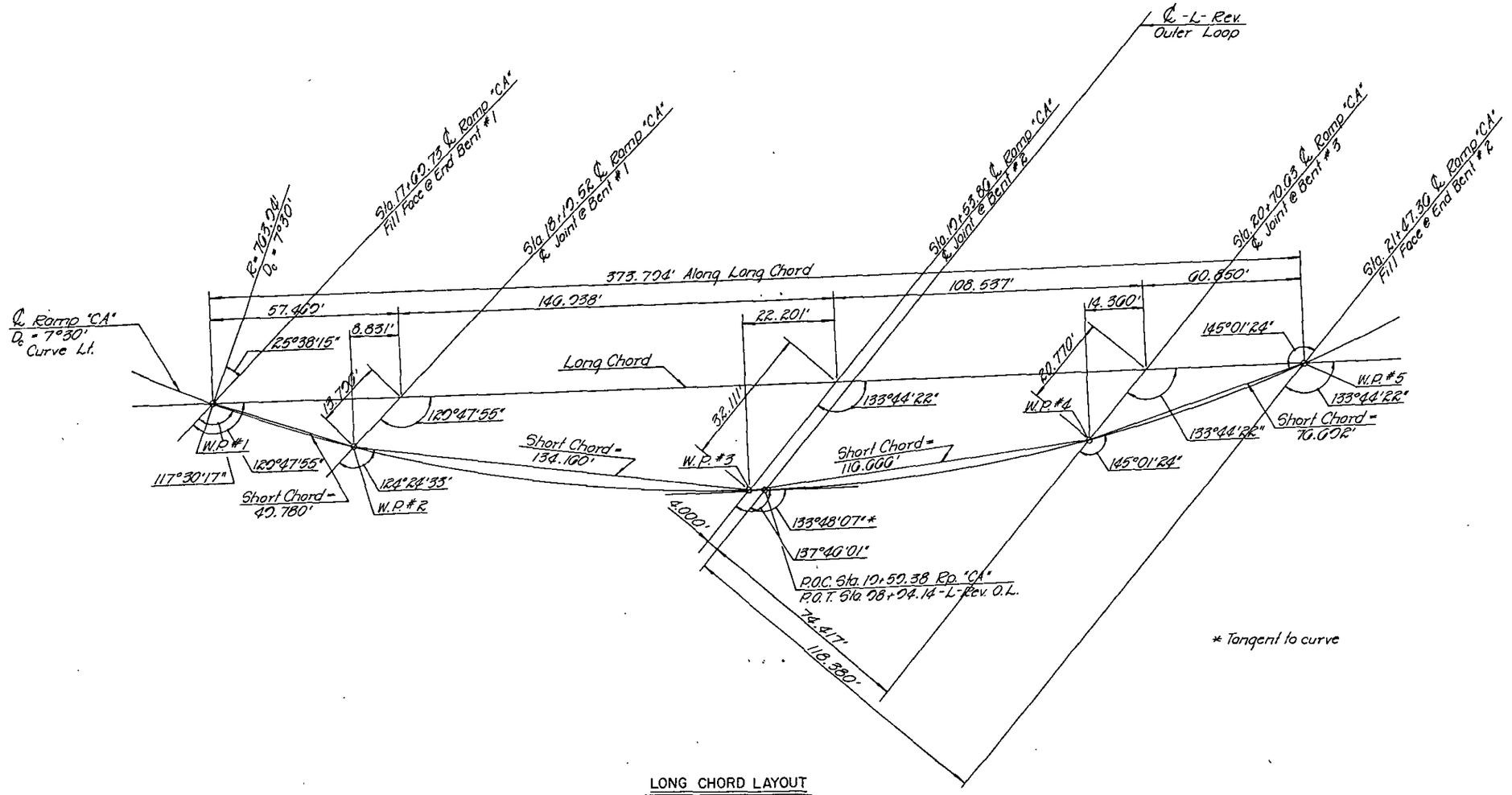
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR RAMP "CA" BRIDGE
OVER OUTER LOOP

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-42
						TOTAL SHEETS
						421

Dwg. 2 of 43



LONG CHORD LAYOUT

* Tangent to curve

Notes:
End Bent 1 is parallel to Bent 1.
Bent 2, 3 & End Bent 2 are parallel to -L- Rev. Outer Loop.

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

	BY	DATE
MADE	S.C.W.	2-90
CHECKED	W.L.H.	2-90
IN CHARGE D. R. Ruggles		

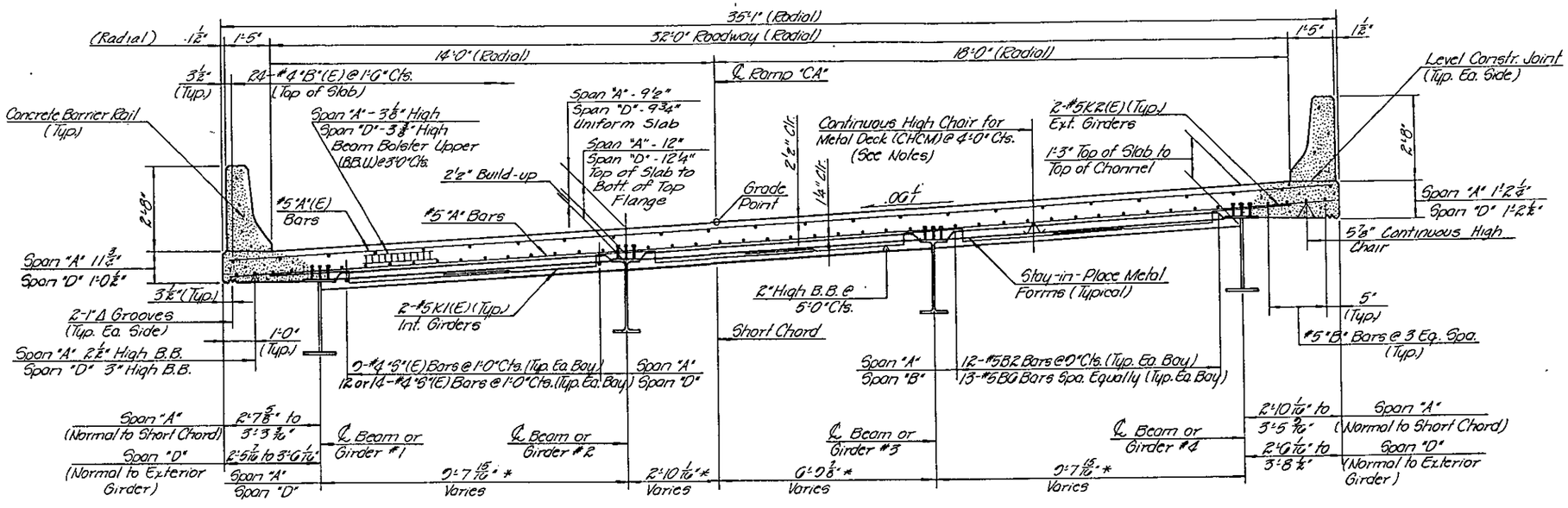
PREPARED BY
AMERICAN ENGINEERS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
LONG CHORD LAYOUT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-43
						TOTAL SHEETS
						121

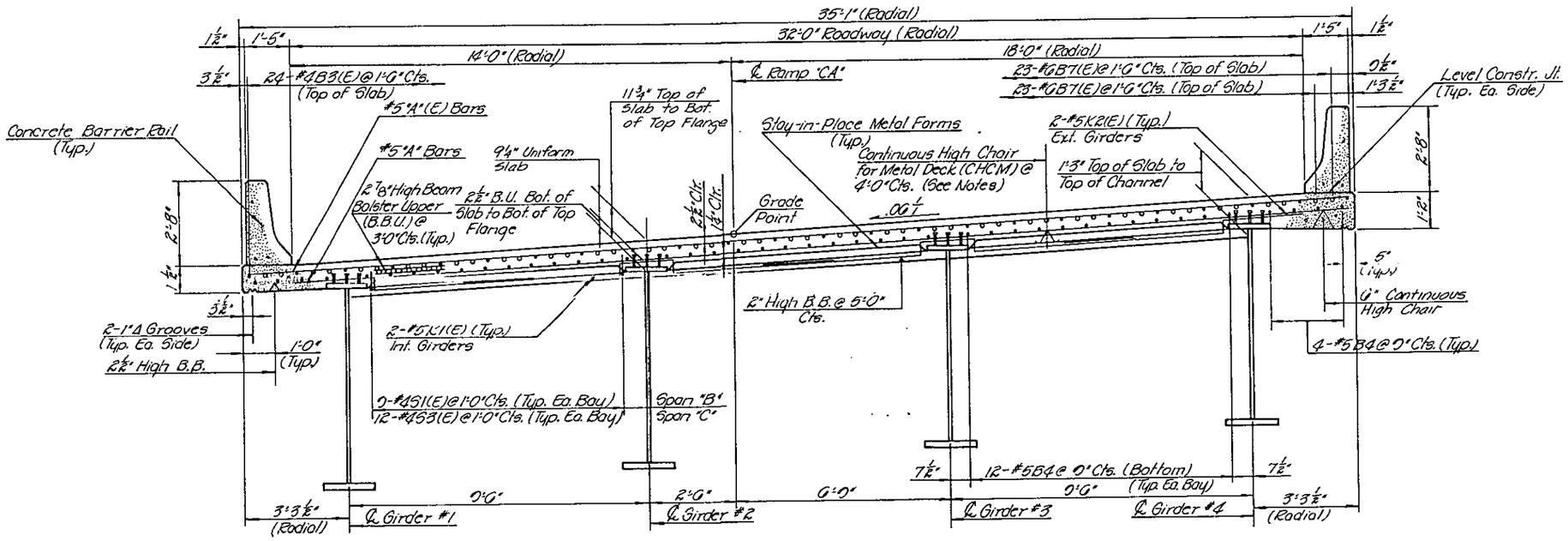
Dwg. 3 of 43



TYPICAL SECTION - SPANS "A" & "D"

(Bent and Intermediate Cross Frames not shown, see Notes)

* Normal to Short Chord



TYPICAL SECTION - SPANS "B" & "C"

(Bent and Intermediate Cross Frames not shown, see Notes)

NOTES:

For Cross Frame Bracing Details, See Dwg. 8.

Provide Continuous High Chair for Metal Deck (CHCM) of 4'-0" cts. with a height to support bottom layer of slab reinforcement a clear distance of 1 1/4" above the top of the Stay-in-Place Form.

Metal Stay-in-Place Form shall not be welded to beam or girder flanges in the zones requiring Charpy V Notch test. See Structural steel detail sheets.

Previously cast concrete in spans "B" and "C" shall have attained a minimum compressive strength of 3000 p.s.i. before additional concrete is cast in the unit.

All Falsework for continuous slab units shall remain in place until the entire unit is cast and cured.

Barrier Rail in continous Spans "B" and "C" shall not be cast until all slab concrete has been cast and has reached a minimum compressive strength of 3000 p.s.i.

Structural Steel erection in continuous Spans "B" and "C" shall be complete before falsework or forms are placed.

Barrier Rail in Spans "A" and "D" shall not be cast until all slab concrete has been cast and has reached a minimum compressive strength of 3000 p.s.i.

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

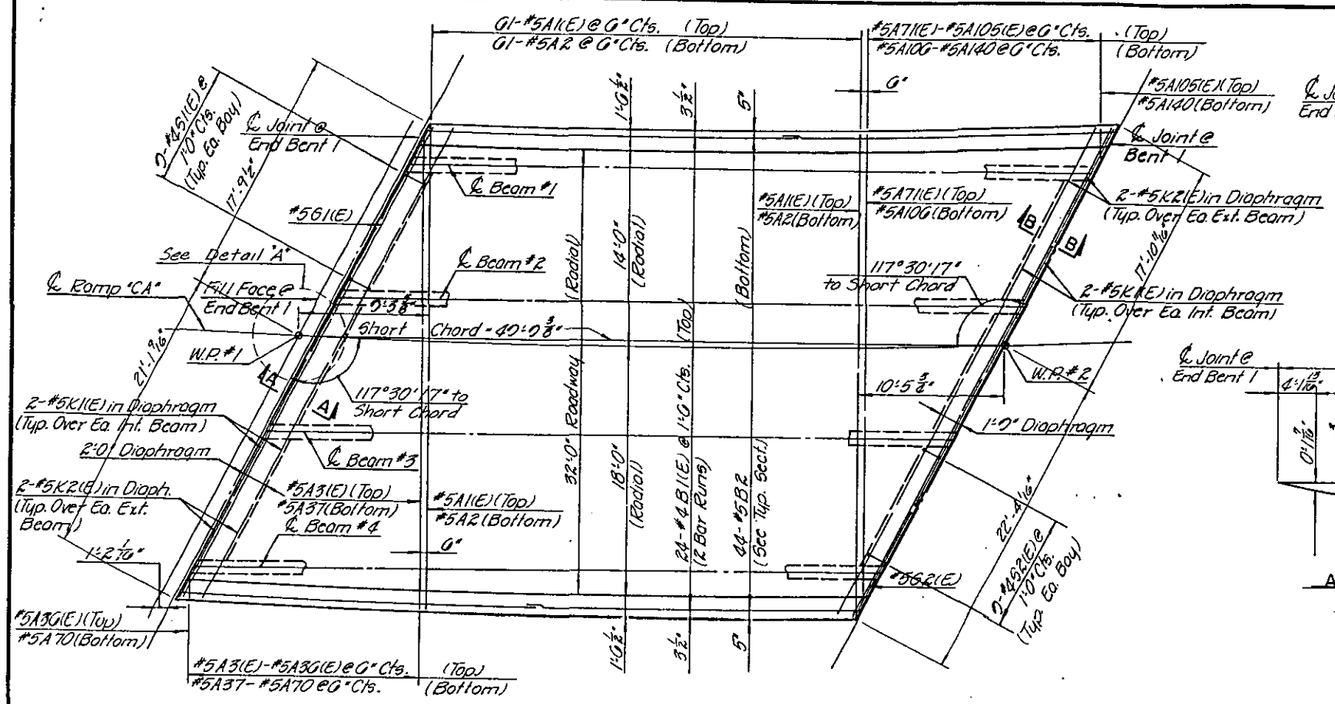
PROJECT: B-U670111
Mecklenburg COUNTY
STATION: 10+59.38 Ramp "CA"

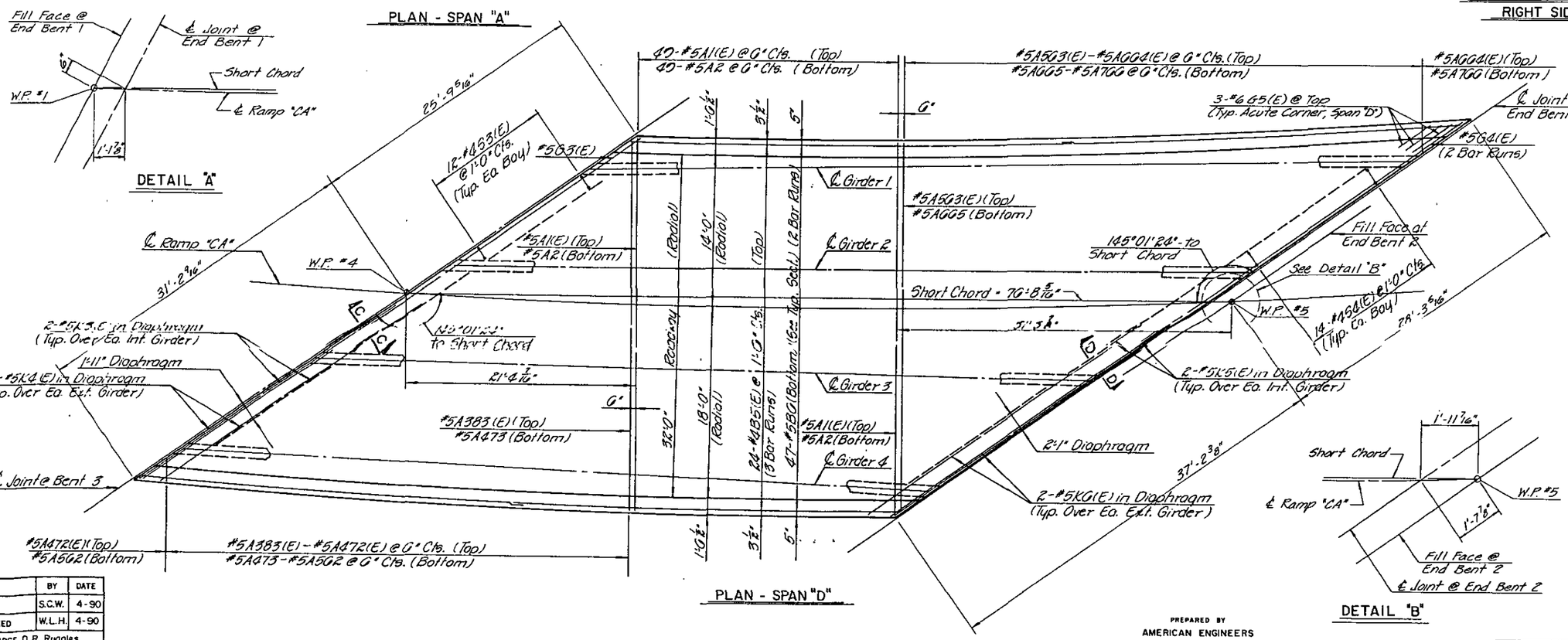
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-44
						TOTAL SHEETS
						47

Dwg. 4 of 43





	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE D. R. Ruggles		

PREPARED BY
AMERICAN ENGINEERS

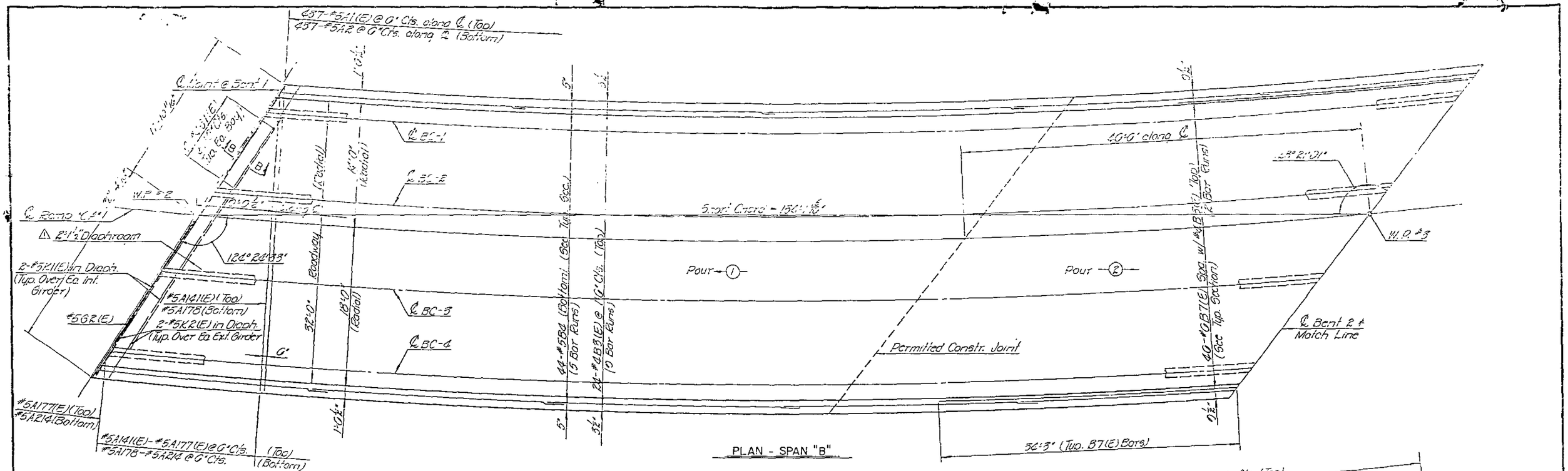
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 12+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS "A" & "D"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-45
						TOTAL SHEETS
						121

Dwg. 5 of 43



NOTES:

Transverse Reinforcing Steel to be placed radial to ℄ of Ramp.

Permitted Transverse Construction Joint is to be parallel to ℄ of Bent 2.

For Arc Offsets, See Dwg. #12

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE D. R. Ruggles		

⚠ - REVISED DIAPHRAGM WIDTH AND #4 "G" BAR. / BY CEP

PREPARED BY
AMERICAN ENGINEERS

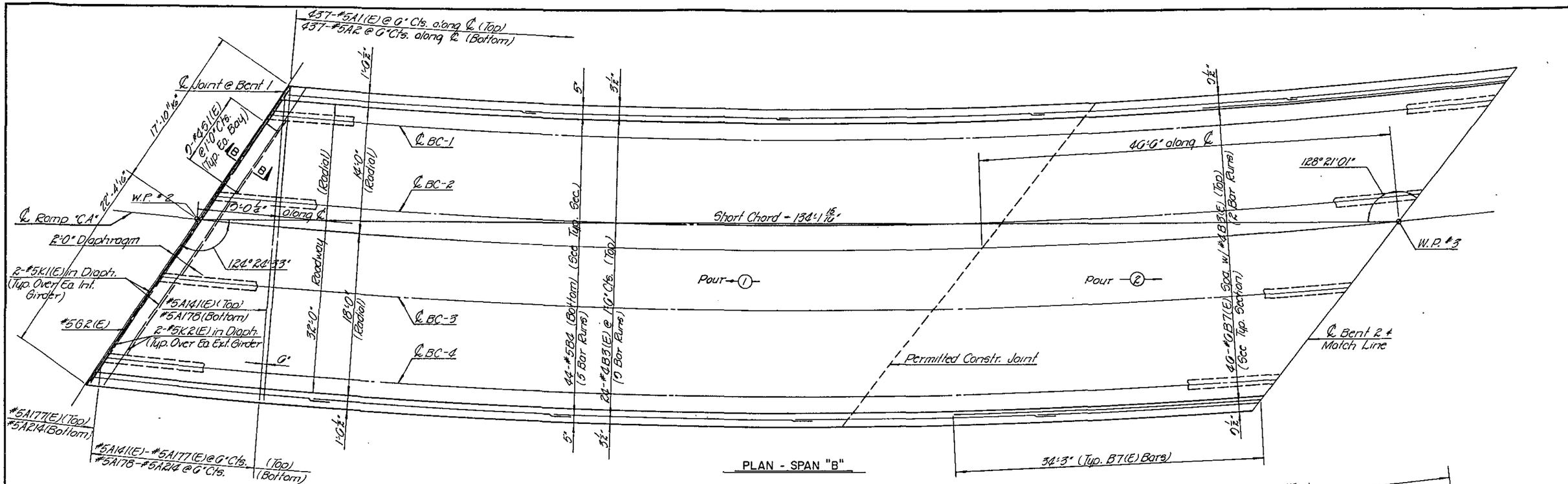
PROJECT: 6.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS "B" & "C"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-6
1	C.P.	4-91				TOTAL SHEETS
						421

Dwg. 6 of 43



NOTES:
Transverse Reinforcing Steel to be placed radial to ℄ of Ramp.

Permitted Transverse Construction Joint is to be parallel to ℄ of Bent 2.

For Arc Offsets, See Dwg. #12.

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

VOID
See attached Sheet
3.7.95 FWB

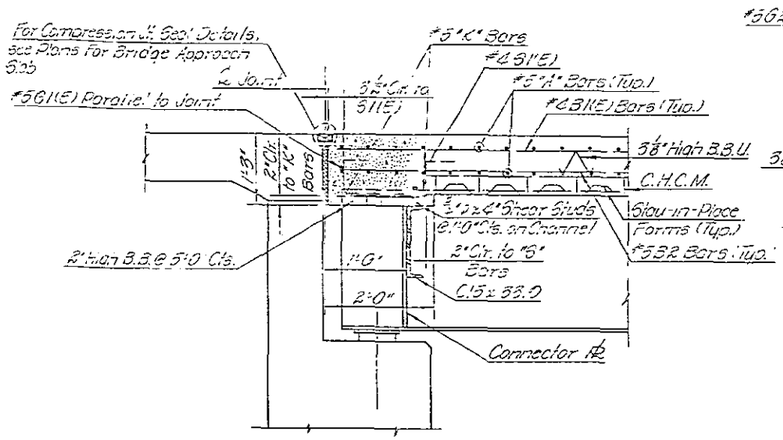
PROJECT: 8UG7011
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

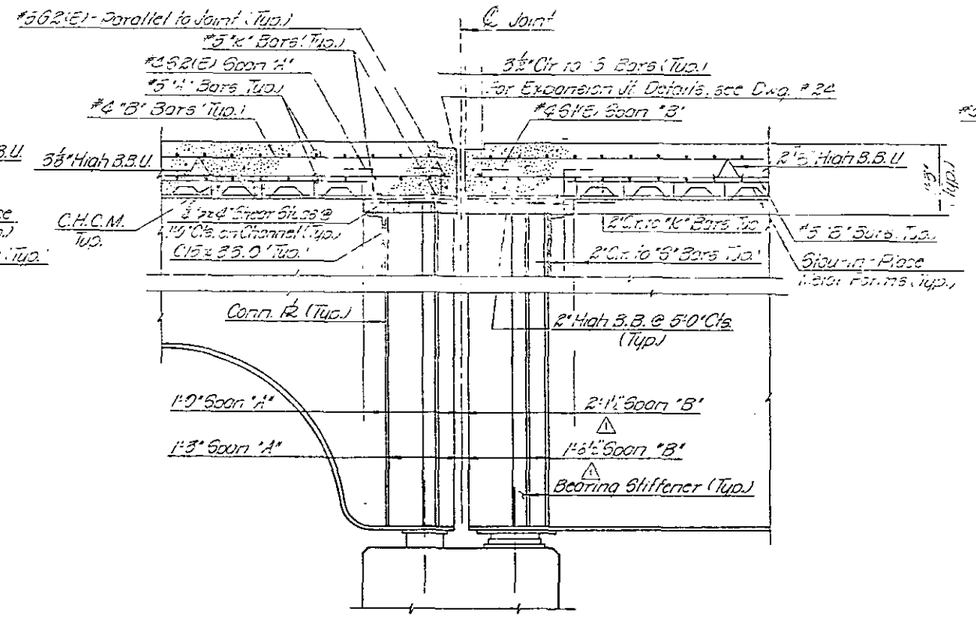
SUPERSTRUCTURE
PLAN OF SPANS "B" & "C"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-4A
						TOTAL SHEETS
						4-21

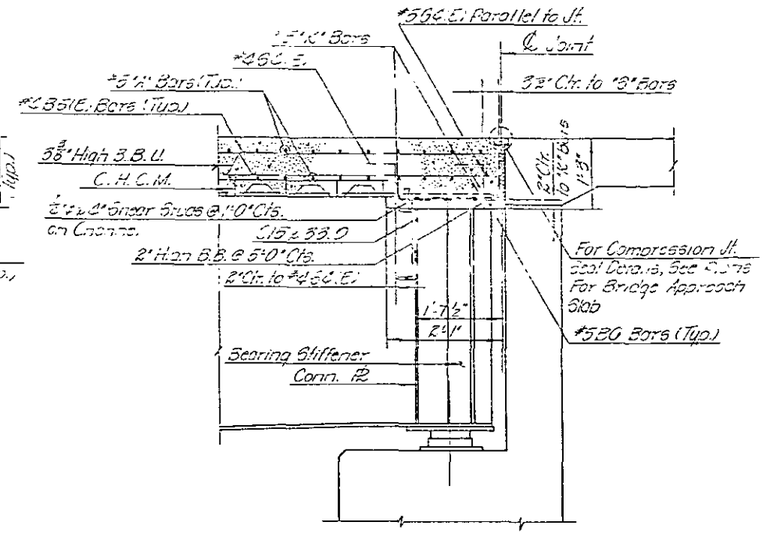
Dwg. 6 of 43



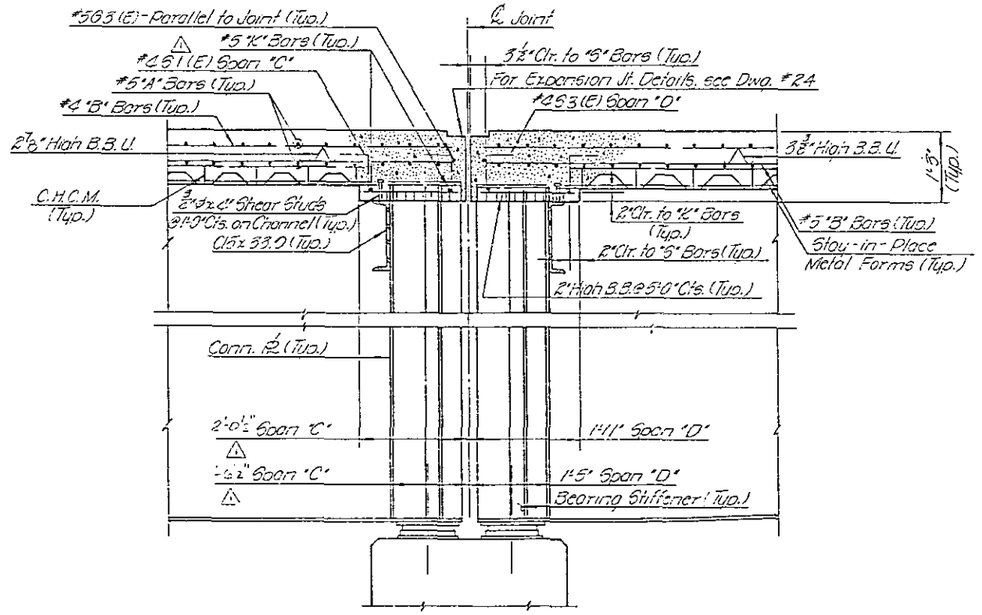
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

Notes: #5 "S" Bars may be shifted slightly as necessary to clear reinforcing steel and stirrups.

For Weld Termination Detail, see sheet No. 8.

PROJECT: 8.U670111

Mecklenburg COUNTY

STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

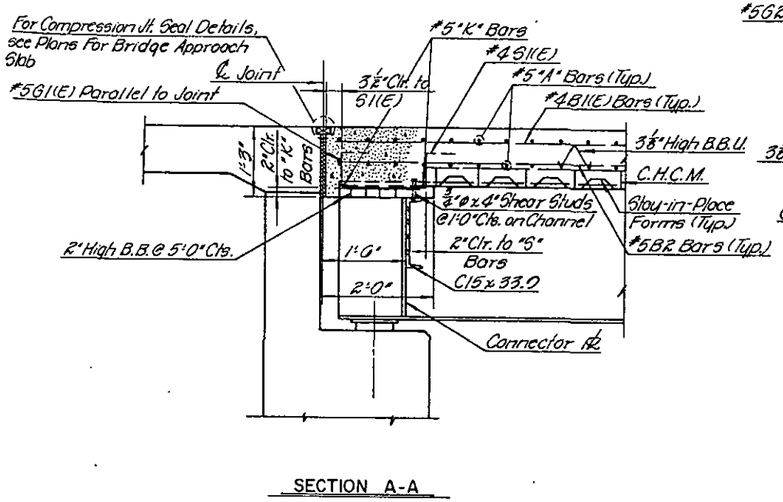
SUPERSTRUCTURE SECTION DETAILS

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE D. R. Ruggles		

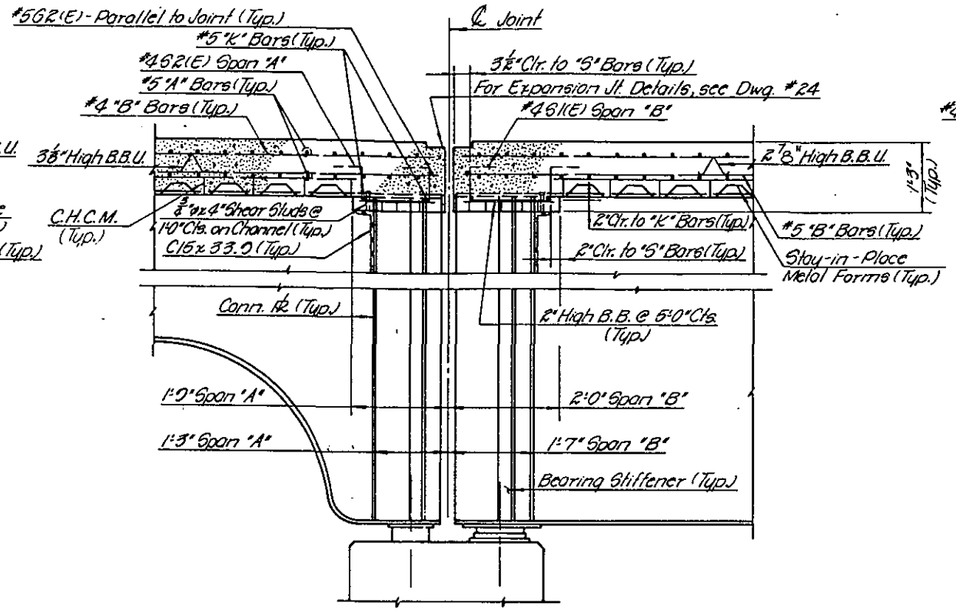
△1 - REVISED [illegible] JOINT [illegible] CONNECTOR [illegible] AND ℄ JOINT TO [illegible] DIAPHRAGM FOR [illegible] SECTION B-B AND [illegible] SECTION C-C. [illegible] CEP

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-47
[illegible]	[illegible]	[illegible]				TOTAL SHEETS 421

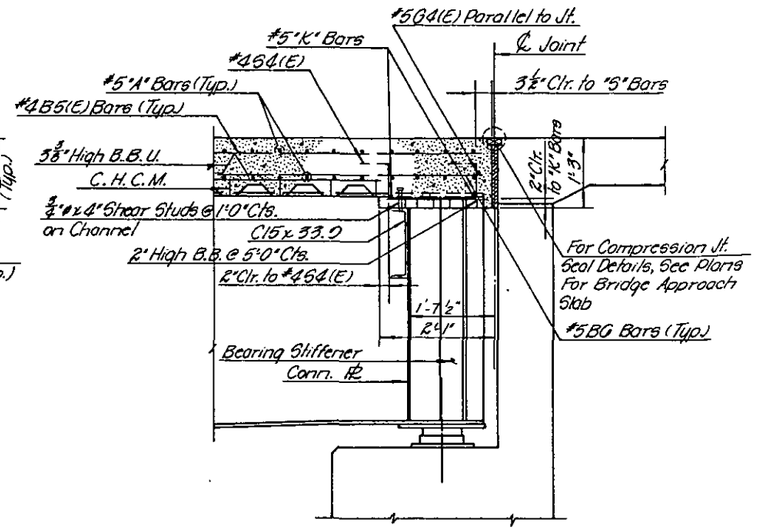
Dwg. 7 of 43



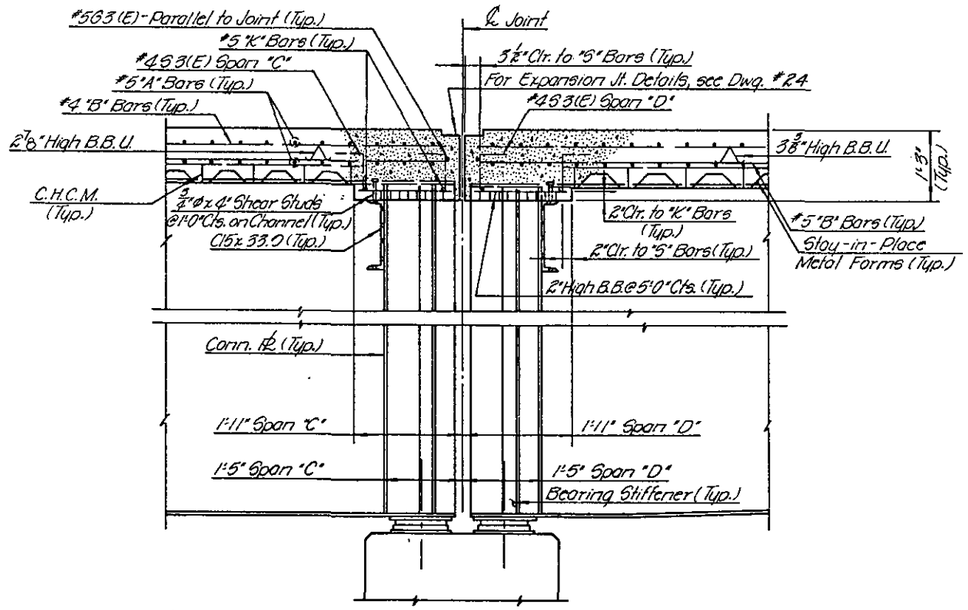
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

Notes: #5 "G" Bars may be shifted slightly as necessary to clear reinforcing steel and stirrups.

For Weld Termination Detail, see sheet No. 8.

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE D. R. Ruggles		

PREPARED BY
AMERICAN ENGINEERS

VOID
See Attached sheet
3.7.95 FWB

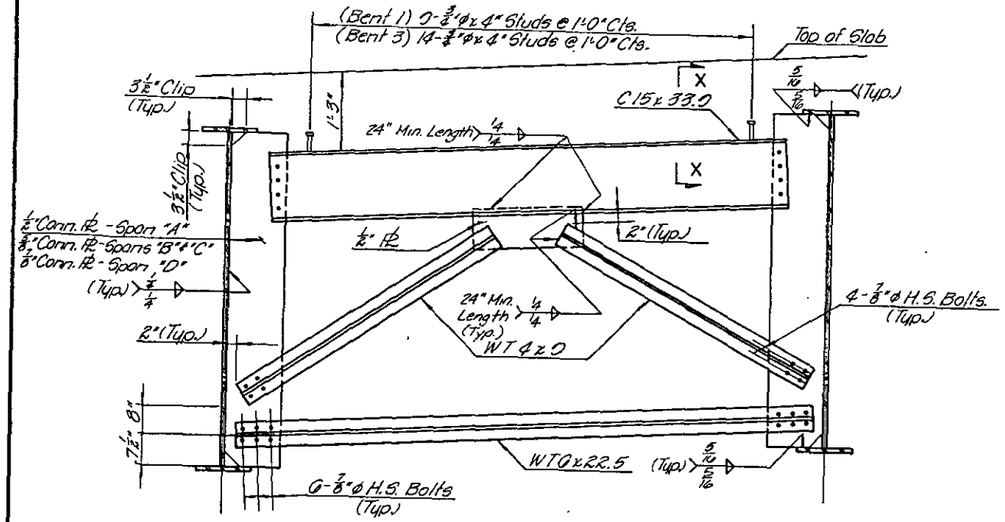
PROJECT: B-UG70111
Mecklenburg COUNTY
STATION: 10+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

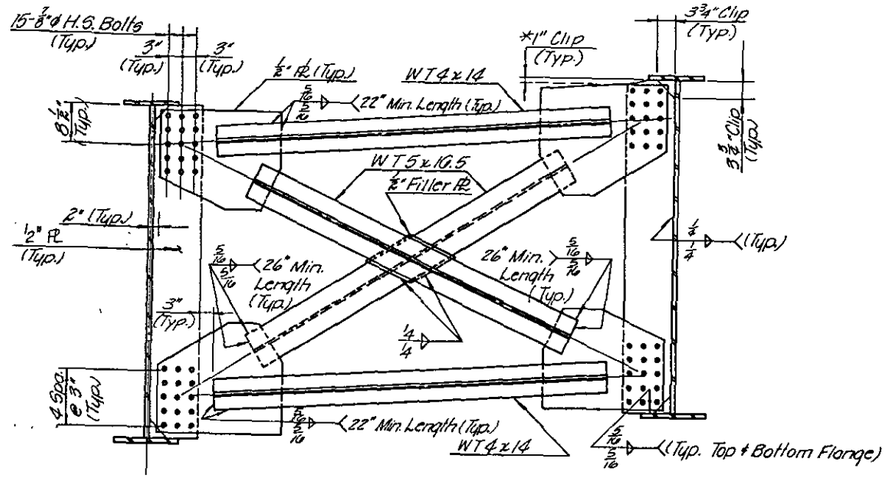
SUPERSTRUCTURE
SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-47
						TOTAL SHEETS
						421

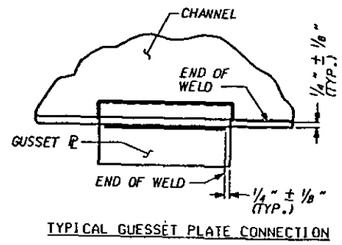
Dwg. 7 of 43



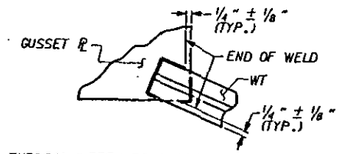
END CROSS FRAME CF-3



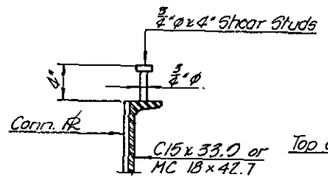
INTERMEDIATE CROSS FRAME CF-4
*For 12" Top Flange Only



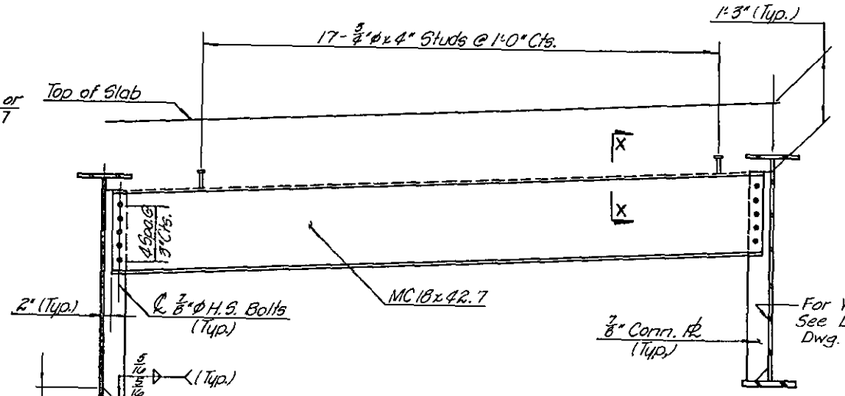
TYPICAL GUESSET PLATE CONNECTION



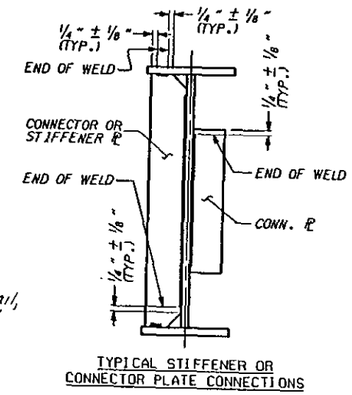
TYPICAL "TEE" TO GUSSET PLATE CONNECTION



SECTION X-X

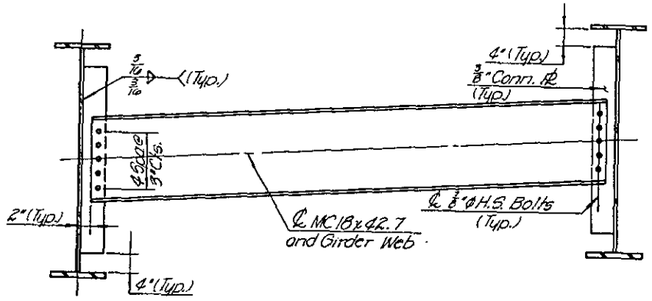


END CROSS FRAME CF-6

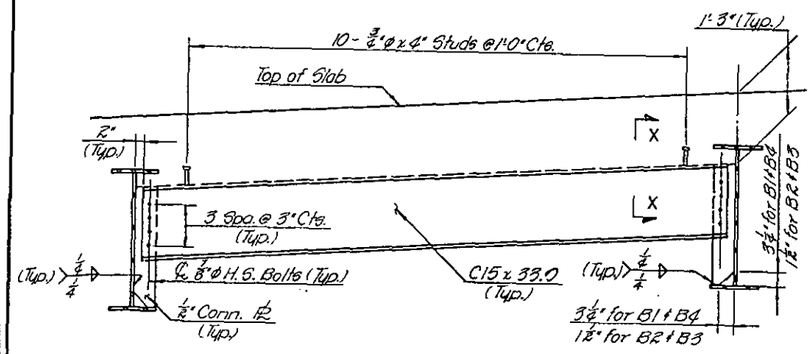


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

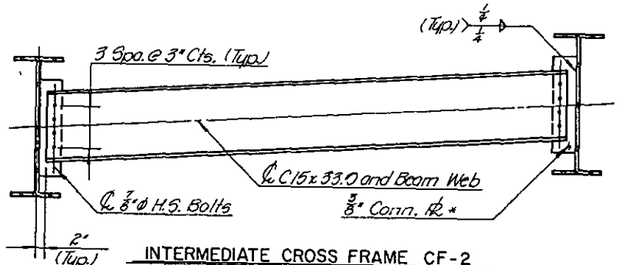
WELD TERMINATION DETAILS



INTERMEDIATE CROSS FRAME CF-5



END CROSS FRAME CF-1



INTERMEDIATE CROSS FRAME CF-2
* Connector Pl length to be 8" less than nominal beam depth.

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

PROJECT: B-0670111
Mecklenburg COUNTY
STATION: 10+60.38 Rtmp "C A"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BRACING DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-48
						TOTAL SHEETS
						121

Dwg. 8 of 43

SPAN "A"

Bar	No.	Size	Type	Length	Weight
A1(E)	61	5	Str.	34'-8"	2,206
A2	61	5	Str.	34'-8"	2,206
A3(E)	1	5	Str.	33'-9"	35
A4(E)	"	"	"	32'-9"	34
A5(E)				31'-10"	33
A6(E)				30'-10"	32
A7(E)				29'-10"	31
A8(E)				28'-11"	30
A9(E)				27'-11"	29
A10(E)				26'-11"	28
A11(E)				26'-0"	27
A12(E)				25'-0"	26
A13(E)				24'-0"	25
A14(E)				23'-0"	24
A15(E)				22'-1"	23
A16(E)				21'-1"	22
A17(E)				20'-1"	21
A18(E)				19'-2"	20
A19(E)				18'-2"	19
A20(E)				17'-2"	18
A21(E)				16'-2"	17
A22(E)				15'-3"	16
A23(E)				14'-3"	15
A24(E)				13'-3"	14
A25(E)				12'-4"	13
A26(E)				11'-4"	12
A27(E)				10'-4"	11
A28(E)				9'-4"	10
A29(E)				8'-5"	9
A30(E)				7'-5"	8
A31(E)				6'-5"	7
A32(E)				5'-6"	6
A33(E)				4'-6"	5
A34(E)				3'-6"	4
A35(E)				2'-6"	3
A36(E)				1'-7"	2
A37				33'-9"	35
A38				32'-9"	34
A39				31'-10"	33
A40				30'-10"	32
A41				29'-10"	31
A42				28'-11"	30
A43				27'-11"	29
A44				26'-11"	28
A45				26'-0"	27
A46				25'-0"	26
A47				24'-0"	25
A48				23'-0"	24
A49				22'-1"	23
A50				21'-1"	22
A51				20'-1"	21
A52				19'-2"	20
A53				18'-2"	19
A54				17'-2"	18
A55				16'-2"	17
A56				15'-3"	16
A57				14'-3"	15
A58				13'-3"	14
A59				12'-4"	13
A60				11'-4"	12
A61	"	"	"	10'-4"	11
A62	1	5	Str.	9'-4"	10

SPAN "A" Cont'd.

Bar	No.	Size	Type	Length	Weight
A63	1	5	Str.	8'-5"	9
A64	"	"	"	7'-5"	8
A65				6'-5"	7
A66				5'-6"	6
A67				4'-6"	5
A68				3'-6"	4
A69				2'-6"	3
A70				1'-7"	2
A71(E)				33'-8"	35
A72(E)				32'-8"	34
A73(E)				31'-9"	33
A74(E)				30'-11"	32
A75(E)				29'-11"	31
A76(E)				29'-0"	30
A77(E)				28'-0"	29
A78(E)				27'-2"	28
A79(E)				26'-2"	27
A80(E)				25'-3"	26
A81(E)				24'-4"	25
A82(E)				23'-4"	24
A83(E)				22'-5"	23
A84(E)				21'-6"	22
A85(E)				20'-6"	21
A86(E)				19'-7"	20
A87(E)				18'-8"	19
A88(E)				17'-8"	18
A89(E)				16'-9"	17
A90(E)				15'-10"	17
A91(E)				14'-10"	15
A92(E)				13'-11"	15
A93(E)				13'-0"	14
A94(E)				12'-0"	13
A95(E)				11'-1"	12
A96(E)				10'-2"	11
A97(E)				9'-2"	10
A98(E)				8'-3"	9
A99(E)				7'-4"	8
A100(E)				6'-4"	7
A101(E)				5'-5"	6
A102(E)				4'-6"	5
A103(E)				3'-6"	4
A104(E)				2'-7"	3
A105(E)				1'-8"	2
A106				33'-8"	35
A107				32'-8"	34
A108				31'-9"	33
A109				30'-11"	32
A110				29'-11"	31
A111				29'-0"	30
A112				28'-0"	29
A113				27'-2"	28
A114				26'-2"	27
A115				25'-3"	26
A116				24'-4"	25
A117				23'-4"	24
A118				22'-5"	23
A119				21'-6"	22
A120				20'-6"	21
A121				19'-7"	20
A122				18'-8"	19
A123	"	"	"	17'-8"	18
A124	1	5	Str.	16'-9"	17

SPAN "A" Cont'd.

Bar	No.	Size	Type	Length	Weight
A125	1	5	Str.	15'-10"	17
A126	"	"	"	14'-10"	15
A127				13'-11"	15
A128				13'-0"	14
A129				12'-0"	13
A130				11'-1"	12
A131				10'-2"	11
A132				9'-2"	10
A133				8'-3"	9
A134				7'-4"	8
A135				6'-4"	7
A136				5'-5"	6
A137				4'-6"	5
A138				3'-6"	4
A139	"	"	"	2'-7"	3
A140	1	5	Str.	1'-8"	2
B1(E)	48	4	Str.	24'-8"	791
B2	44	5	Str.	47'-9"	2,191
G1(E)	1	5	Str.	38'-6"	40
G2(E)	1	5	Str.	39'-10"	42
K1(E)	8	5	1	13'-5"	112
K2(E)	8	5	2	8'-6"	71
J1(E)	36	4	3	1'-5"	34
S1(E)	27	4	4	4'-2"	75
S2(E)	27	4	4	3'-11"	71

SPANS "B" & "C"

Bar	No.	Size	Type	Length	Weight
A1(E)	437	5	Str.	34'-8"	15,801
A2	437	5	Str.	34'-8"	15,801
A141(E)	1	5	Str.	33'-7"	35
A142(E)	"	"	"	32'-10"	34
A143(E)				31'-10"	33
A144(E)				31'-0"	32
A145(E)				30'-1"	31
A146(E)				29'-3"	31
A147(E)				28'-5"	30
A148(E)				27'-6"	29
A149(E)				26'-8"	28
A150(E)				25'-9"	27
A151(E)				24'-11"	26
A152(E)				24'-1"	25
A153(E)				23'-2"	24
A154(E)				22'-3"	23
A155(E)				21'-5"	22
A156(E)				20'-6"	21
A157(E)				19'-8"	21
A158(E)				18'-9"	20
A159(E)				17'-10"	19
A160(E)				17'-0"	18
A161(E)				16'-1"	17
A162(E)				15'-2"	16
A163(E)				14'-3"	15
A164(E)				13'-4"	14
A165(E)				12'-5"	13
A166(E)				11'-7"	12
A167(E)				10'-8"	11
A168(E)				9'-9"	10
A169(E)				8'-11"	9
A170(E)				8'-0"	8
A171(E)				7'-1"	7
A172(E)				6'-2"	6
A173(E)				5'-2"	5
A174(E)				4'-4"	5
A175(E)				3'-4"	3
A176(E)				2'-5"	3
A177(E)				1'-5"	1
A178				33'-7"	35
A179				32'-10"	34
A180				31'-10"	33
A181				31'-0"	32
A182				30'-1"	31
A183				29'-3"	31
A184				28'-5"	30
A185				27'-6"	29
A186				26'-8"	28
A187				25'-9"	27
A188				24'-11"	26
A189				24'-1"	25
A190				23'-2"	24
A191				22'-3"	23
A192				21'-5"	22
A193				20'-6"	21
A194				19'-8"	21
A195				18'-9"	20
A196				17'-10"	19
A197				17'-0"	18
A198				16'-1"	17
A199	"	"	"	15'-2"	16
A200	1	5	Str.	14'-3"	15

SPANS "B" & "C" Cont'd.

Bar	No.	Size	Type	Length	Weight
A201	1	5	Str.	13'-4"	14
A202	"	"	"	12'-5"	13
A203				11'-7"	12
A204				10'-8"	11
A205				9'-9"	10
A206				8'-11"	9
A207				8'-0"	8
A208				7'-1"	7
A209				6'-2"	6
A210				5'-2"	5
A211				4'-4"	5
A212				3'-4"	3
A213				2'-5"	3
A214				1'-5"	1
A215(E)				34'-1"	36
A216(E)				33'-8"	35
A217(E)				33'-3"	35
A218(E)				32'-9"	34
A219(E)				32'-4"	34
A220(E)				31'-11"	33
A221(E)				31'-6"	33
A222(E)				31'-1"	32
A223(E)				30'-8"	32
A224(E)				30'-3"	32
A225(E)				29'-10"	31
A226(E)				29'-5"	31
A227(E)				29'-0"	30
A228(E)				28'-7"	30
A229(E)				28'-2"	29
A230(E)				27'-9"	29
A231(E)				27'-4"	29
A232(E)				26'-11"	28
A233(E)				26'-6"	28
A234(E)				26'-1"	27
A235(E)				25'-9"	27
A236(E)				25'-4"	26
A237(E)				24'-11"	26
A238(E)				24'-6"	26
A239(E)				24'-1"	25
A240(E)				23'-8"	25
A241(E)				23'-3"	24
A242(E)				22'-10"	24
A243(E)				22'-5"	23
A244(E)				22'-1"	23
A245(E)				21'-8"	23
A246(E)				21'-3"	22
A247(E)				20'-10"	22
A248(E)				20'-6"	21
A249(E)				20'-1"	21
A250(E)				19'-8"	21
A251(E)				19'-3"	20
A252(E)				18'-11"	20
A253(E)				18'-6"	19
A254(E)				18'-1"	19
A255(E)				17'-8"	18
A256(E)				17'-4"	18
A257(E)				16'-11"	18
A258(E)				16'-6"	17
A259(E)				16'-2"	17
A260(E)				15'-9"	16
A261(E)				15'-4"	16
A262(E)	1	5	Str.	14'-11"	16

SPANS "B" & "C" Cont'd.

Bar	No.	Size	Type	Length	Weight
A263(E)	1	5	Str.	14'-7"	15
A264(E)	"	"	"	14'-2"	15
A265(E)				13'-10"	14
A266(E)				13'-5"	14
A267(E)				13'-0"	14
A268(E)				12'-8"	13
A269(E)				12'-3"	13
A270(E)				11'-10"	12
A271(E)				11'-6"	12
A272(E)				11'-1"	12
A273(E)				10'-9"	11
A274(E)				10'-4"	11
A275(E)				10'-0"	10
A276(E)				9'-8"	10
A277(E)				9'-3"	10
A278(E)				8'-10"	9
A279(E)				8'-5"	9
A280(E)				8'-1"	8
A281(E)				7'-8"	8
A282(E)				7'-4"	8
A283(E)				6'-11"	7
A284(E)				6'-7"	7
A285(E)				6'-2"	6
A286(E)				5'-10"	6
A287(E)				5'-5"	6
A288(E)				5'-1"	5
A289(E)				4'-9"	5
A290(E)				4'-4"	5
A291(E)				4'-0"	4
A292(E)				3'-7"	4
A293(E)				3'-3"	3
A294(E)				2'-10"	3
A295(E)				2'-5"	3
A296(E)				2'-2"	2
A297(E)				1'-9"	2
A298(E)				1'-5"	1
A299				34'-1"	36
A300				33'-8"	35
A301				33'-3"	35
A302				32'-9"	34
A303				32'-4"	34
A304				31'-11"	33
A305				31'-6"	33
A306				31'-1"	32
A307	"	"	"	30'-8"	32
A308	1	5	Str.	30'-3"	32

	BY	DATE
MADE	JWR	5-90
CHECKED	WLH	5-90
IN CHARGE	D.R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO	BY	DATE	S-49
						TOTAL SHEETS
						A21

Dwg. 9 of 43

SPANS "B" & "C" Cont'd.					
Bar	No	Size	Type	Length	Weight
A309	1	5	Str	29'-10"	31
A310	↓	↓	↓	29'-5"	31
A311				29'-0"	30
A312				28'-7"	30
A313				29'-2"	29
A314				27'-9"	29
A315				27'-4"	29
A316				26'-11"	28
A317				26'-6"	28
A318				26'-1"	27
A319				25'-9"	27
A320				25'-4"	26
A321				24'-11"	26
A322				24'-6"	26
A323				24'-1"	25
A324				23'-8"	25
A325				23'-3"	24
A326				22'-10"	24
A327				22'-5"	23
A328				22'-1"	23
A329				21'-8"	23
A330				21'-3"	22
A331				20'-10"	22
A332				20'-6"	21
A333				20'-1"	21
A334				19'-8"	21
A335				19'-3"	20
A336				18'-11"	20
A337				18'-6"	19
A338				18'-1"	19
A339				17'-8"	18
A340				17'-4"	18
A341				16'-11"	18
A342				16'-6"	17
A343				16'-2"	17
A344				15'-9"	16
A345				15'-4"	16
A346				14'-11"	16
A347				14'-7"	15
A348				14'-2"	15
A349				13'-10"	14
A350				13'-5"	14
A351				13'-0"	14
A352				12'-8"	13
A353				12'-3"	13
A354				11'-10"	12
A355				11'-6"	12
A356				11'-1"	12
A357				10'-9"	11
A358				10'-4"	11
A359				10'-0"	10
A360				9'-8"	10
A361				9'-3"	10
A362				8'-10"	9
A363				8'-5"	9
A364				8'-1"	8
A365				7'-8"	8
A366				7'-4"	8
A367				6'-11"	7
A368				6'-7"	7
A369	↓	↓	↓	6'-2"	6
A370	1	5	Str	5'-10"	6

SPANS "B" & "C" Cont'd.					
Bar	No	Size	Type	Length	Weight
A371	1	5	Str	5'-5"	6
A372	↓	↓	↓	5'-1"	5
A373				4'-9"	5
A374				4'-4"	5
A375				4'-0"	4
A376				3'-7"	4
A377				3'-3"	3
A378				2'-10"	3
A379				2'-5"	3
A380				2'-2"	2
A381	↓	↓	↓	1'-9"	2
A382	1	5	Str	1'-5"	1
B3(E)	216	4	Str	29'-10"	4,305
B4	220	5	Str	52'-6"	12,047
B7(E)	92	6	Str	38'-6"	5,320
G2(E)	1	5	Str	39'-10"	42
G3(E)	1	5	Str	56'-7"	59
G5(E)	3	6	Str	6'-0"	27
K1(E)	4	5	1	13'-5"	56
K2(E)	4	5	2	8'-6"	35
K3(E)	4	5	1	18'-4"	76
K4(E)	4	5	2	11'-5"	48
J1(E)	87	4	3	1'-5"	82
△S1(E)	36	4	4	4'-2"	100
△S4(E)	27	4	4	4'-3"	77

SPAN "D"					
Bar	No.	Size	Type	Length	Weight
A1(E)	49	5	Str	34'-8"	1,772
A2	49	5	Str	34'-8"	1,772
A393(E)	1	5	Str	54'-5"	36
A354(E)	↓	↓	↓	53'-11"	35
A353(E)				33'-7"	35
A356(E)				33'-3"	35
A387(E)				32'-10"	34
A388(E)				32'-6"	34
A389(E)				32'-1"	33
A390(E)				31'-9"	33
A391(E)				31'-5"	33
A392(E)				31'-0"	32
A393(E)				30'-8"	32
A394(E)				30'-4"	32
A395(E)				29'-11"	31
A396(E)				29'-7"	31
A397(E)				29'-3"	31
A398(E)				28'-10"	30
A399(E)				28'-6"	30
A400(E)				28'-1"	29
A401(E)				27'-9"	29
A402(E)				27'-5"	29
A403(E)				27'-0"	28
A404(E)				26'-8"	28
A405(E)				26'-3"	27
A406(E)				25'-11"	27
A407(E)				25'-6"	27
A408(E)				25'-2"	26
A409(E)				24'-10"	26
A410(E)				24'-5"	25
A411(E)				24'-1"	25
A412(E)				23'-8"	25
A413(E)				23'-4"	24
A414(E)				22'-11"	24
A415(E)				22'-7"	24
A416(E)				22'-2"	23
A417(E)				21'-10"	23
A418(E)				21'-6"	22
A419(E)				21'-1"	22
A420(E)				20'-9"	22
A421(E)				20'-4"	21
A422(E)				20'-0"	21
A423(E)				19'-7"	20
A424(E)				19'-3"	20
A425(E)				18'-10"	20
A426(E)				18'-6"	19
A427(E)				18'-1"	19
A428(E)				17'-9"	19
A429(E)				17'-4"	18
A430(E)				17'-0"	18
A431(E)				16'-7"	17
A432(E)				16'-3"	17
A433(E)				15'-10"	17
A434(E)				15'-6"	16
A435(E)				15'-1"	16
A436(E)				14'-9"	15
A437(E)				14'-4"	15
A438(E)				14'-0"	15
A439(E)				13'-7"	14
A440(E)				13'-2"	14
A441(E)	↓	↓	↓	12'-10"	13
A442(E)	1	5	Str	12'-5"	13

SPAN "D" Cont'd.					
Bar	No.	Size	Type	Length	Weight
A443(E)	1	5	Str	12'-1"	13
A444(E)	↓	↓	↓	11'-8"	12
A445(E)				11'-4"	12
A446(E)				10'-11"	11
A447(E)				10'-6"	11
A448(E)				10'-2"	11
A449(E)				9'-9"	10
A450(E)				9'-5"	10
A451(E)				9'-0"	9
A452(E)				8'-7"	9
A453(E)				8'-3"	9
A454(E)				7'-10"	8
A455(E)				7'-6"	8
A456(E)				7'-1"	7
A457(E)				6'-8"	7
A458(E)				6'-4"	7
A459(E)				5'-11"	6
A460(E)				5'-6"	6
A461(E)				5'-2"	5
A462(E)				4'-9"	5
A463(E)				4'-5"	5
A464(E)				4'-1"	4
A465(E)				3'-8"	4
A466(E)				3'-4"	3
A467(E)				2'-11"	3
A468(E)				2'-6"	3
A469(E)				2'-2"	2
A470(E)				1'-9"	2
A471(E)				1'-4"	1
A472(E)				1'-0"	1
A473				34'-3"	36
A474				33'-11"	35
A475				33'-7"	35
A476				33'-3"	35
A477				32'-10"	34
A478				32'-6"	34
A479				32'-1"	33
A480				31'-9"	33
A481				31'-5"	33
A482				31'-0"	32
A483				30'-8"	32
A484				30'-4"	32
A485				29'-11"	31
A486				29'-7"	31
A487				29'-3"	31
A488				28'-10"	30
A489				28'-6"	30
A490				28'-1"	29
A491				27'-9"	29
A492				27'-5"	29
A493				27'-0"	28
A494				26'-8"	28
A495				26'-3"	27
A496				25'-11"	27
A497				25'-6"	27
A498				25'-2"	26
A499				24'-10"	26
A500				24'-5"	25
A501				24'-1"	25
A502				23'-8"	25
A503	↓	↓	↓	23'-4"	24
A504	1	5	Str	22'-11"	24

SPAN "D" Cont'd.					
Bar	No.	Size	Type	Length	Weight
A505	1	5	Str	22'-7"	24
A506	↓	↓	↓	22'-2"	23
A507				21'-10"	23
A508				21'-6"	22
A509				21'-1"	22
A510				20'-9"	22
A511				20'-4"	21
A512				20'-0"	21
A513				19'-7"	20
A514				19'-3"	20
A515				18'-10"	20
A516				18'-6"	19
A517				18'-1"	19
A518				17'-9"	19
A519				17'-4"	18
A520				17'-0"	18
A521				16'-7"	17
A522				16'-3"	17
A523				15'-10"	17
A524				15'-6"	16
A525				15'-1"	16
A526				14'-9"	15
A527				14'-4"	15
A528				14'-0"	15
A529				13'-7"	14
A530				13'-2"	14
A531				12'-10"	18
A532				12'-5"	13
A533				12'-1"	13
A534				11'-8"	12
A535				11'-4"	12
A536				10'-11"	11
A537				10'-6"	11
A538				10'-2"	11
A539				9'-9"	10
A540				9'-5"	10
A541				9'-0"	9
A542				8'-7"	9
A543				8'-3"	9
A544				7'-10"	8
A545				7'-6"	8
A546				7'-1"	7
A547				6'-8"	7
A548				6'-4"	7
A549				5'-11"	6
A550				5'-6"	6
A551				5'-2"	5
A552				4'-9"	5
A553				4'-5"	5
A554				4'-1"	4
A555				3'-8"	4
A556				3'-4"	3
A557				2'-11"	3
A558				2'-6"	3
A559				2'-2"	2
A560				1'-9"	2
A561				1'-4"	1
A562				1'-0"	1
A563(E)				34'-4"	36
A564(E)				34'-0"	35
A565(E)	↓	↓	↓	33'-8"	35
A566(E)	1	5	Str	33'-4"	35

SPAN "D" Cont'd.					
Bar	No	Size	Type	Length	Weight
A567(E)	1	5	Str	33'-0"	34
A568(E)	↓	↓	↓	32'-8"	34
A569(E)				32'-3"	34
A570(E)				31'-11"	33
A571(E)				31'-7"	33
A572(E)				31'-3"	33
A573(E)				30'-11"	32
A574(E)				30'-7"	32
A575(E)				30'-3"	32
A576(E)				29'-11"	31
A577(E)				29'-7"	31
A578(E)				29'-3"	31
A579(E)				28'-11"	30
A580(E)				28'-7"	30
A581(E)				28'-2"	29
A582(E)				27'-10"	29
A583(E)				27'-7"	29
A584(E)				27'-3"	28
A585(E)				26'-11"	28
A586(E)				26'-7"	28
A587(E)				26'-3"	27
A588(E)				25'-11"	27
A589(E)				25'-7"	27
A590(E)				25'-3"	26
A591(E)				24'-11"	26
A592(E)				24'-7"	26
A593(E)				24'-3"	25
A594(E)				23'-11"	25
A595(E)				23'-7"	25
A596(E)				23'-3"	24
A597(E)				22'-11"	24
A598(E)				22'-7"	24
A599(E)				22'-3"	23
A600(E)				21'-11"	23
A601(E)				21'-7"	23
A602(E)				21'-2"	22
A603(E)				20'-10"	22
A604(E)				20'-6"	21
A605(E)				20'-3"	21
A606(E)				19'-11"	21
A607(E)				19'-7"	20
A608(E)				19'-3"	20
A609(E)				18'-11"	20
A610(E)				18'-7"	19
A611(E)	↓	↓	↓	18'-3"	19
A612(E)	1	5	Str	17'-11"	19

	BY	DATE
MADE	JWR	5-90
CHECKED	WLH	5-90
IN CHARGE	D.R. Ruggles	

△ - REVISED A36, BAR AND REPLACED S5(E) BAL WITH S4(E) BAL. V BY CEP

PREPARED BY
AMERICAN ENGINEERS

Dwg. 10 of 43

PROJECT: 8.U670111,
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO	BY	DATE	S-50
△1	JWR	9-9				TOTAL SHEETS
						421

SPANS "B" & "C" Cont'd.

Bar	No.	Size	Type	Length	Weight
A309	1	5	Str.	29'-10"	31
A310	↑	↑	↑	29'-5"	31
A311				29'-0"	30
A312				28'-7"	30
A313				28'-2"	29
A314				27'-9"	29
A315				27'-4"	29
A316				26'-11"	28
A317				26'-6"	28
A318				26'-1"	27
A319				25'-9"	27
A320				25'-4"	26
A321				24'-11"	26
A322				24'-6"	26
A323				24'-1"	25
A324				23'-8"	25
A325				23'-3"	24
A326				22'-10"	24
A327				22'-5"	23
A328				22'-1"	23
A329				21'-8"	23
A330				21'-3"	22
A331				20'-10"	22
A332				20'-6"	21
A333				20'-1"	21
A334				19'-8"	21
A335				19'-3"	20
A336				18'-11"	20
A337				18'-6"	19
A338				18'-1"	19
A339				17'-8"	18
A340				17'-4"	18
A341				16'-11"	18
A342				16'-6"	17
A343				16'-2"	17
A344				15'-9"	16
A345				15'-4"	16
A346				14'-11"	16
A347				14'-7"	15
A348				14'-2"	15
A349				13'-10"	14
A350				13'-5"	14
A351				13'-0"	14
A352				12'-8"	13
A353				12'-3"	13
A354				11'-10"	12
A355				11'-6"	12
A356				11'-1"	12
A357				10'-9"	11
A358				10'-4"	11
A359				10'-0"	10
A360				9'-8"	10
A361				9'-3"	10
A362				8'-10"	9
A363				8'-5"	9
A364				8'-1"	8
A365				7'-8"	8
A366				7'-4"	8
A367				6'-11"	7
A368				6'-7"	7
A369				6'-2"	6
A370	1	5	Str.	5'-10"	6

SPANS "B" & "C" Cont'd.

Bar	No.	Size	Type	Length	Weight
A371	1	5	Str.	5'-5"	6
A372	↑	↑	↑	5'-1"	5
A373				4'-9"	5
A374				4'-4"	5
A375				4'-0"	4
A376				3'-7"	4
A377				3'-3"	3
A378				2'-10"	3
A379				2'-5"	3
A380				2'-2"	2
A381	↑	↑	↑	1'-9"	2
A382	1	5	Str.	1'-5"	1
B3(E)	216	4	Str.	29'-10"	4,305
B4	220	5	Str.	52'-6"	12,047
B7(E)	92	6	Str.	38'-6"	5,320
G2(E)	1	5	Str.	39'-10"	42
G3(E)	1	5	Str.	56'-7"	59
G5(E)	3	6	Str.	6'-0"	27
K1(E)	4	5	1	13'-5"	56
K2(E)	4	5	2	8'-6"	35
K3(E)	4	5	1	18'-4"	76
K4(E)	4	5	2	11'-5"	48
J1(E)	87	4	3	1'-5"	82
S1(E)	27	4	4	4'-2"	75
S3(E)	36	4	4	4'-1"	98

SPAN "D"

Bar	No.	Size	Type	Length	Weight
A1(E)	49	5	Str.	34'-8"	1,772
A2	49	5	Str.	34'-8"	1,772
A383(E)	1	5	Str.	34'-3"	36
A384(E)	↑	↑	↑	33'-11"	35
A385(E)				33'-7"	35
A386(E)				33'-3"	35
A387(E)				32'-10"	34
A388(E)				32'-6"	34
A389(E)				32'-1"	33
A390(E)				31'-9"	33
A391(E)				31'-5"	33
A392(E)				31'-0"	32
A393(E)				30'-8"	32
A394(E)				30'-4"	32
A395(E)				29'-11"	31
A396(E)				29'-7"	31
A397(E)				29'-3"	31
A398(E)				28'-10"	30
A399(E)				28'-6"	30
A400(E)				28'-1"	29
A401(E)				27'-9"	29
A402(E)				27'-5"	29
A403(E)				27'-0"	28
A404(E)				26'-8"	28
A405(E)				26'-3"	27
A406(E)				25'-11"	27
A407(E)				25'-6"	27
A408(E)				25'-2"	26
A409(E)				24'-10"	26
A410(E)				24'-5"	25
A411(E)				24'-1"	25
A412(E)				23'-8"	25
A413(E)				23'-4"	24
A414(E)				22'-11"	24
A415(E)				22'-7"	24
A416(E)				22'-2"	23
A417(E)				21'-10"	23
A418(E)				21'-6"	22
A419(E)				21'-1"	22
A420(E)				20'-9"	22
A421(E)				20'-4"	21
A422(E)				20'-0"	21
A423(E)				19'-7"	20
A424(E)				19'-3"	20
A425(E)				18'-10"	20
A426(E)				18'-6"	19
A427(E)				18'-1"	19
A428(E)				17'-9"	19
A429(E)				17'-4"	18
A430(E)				17'-0"	18
A431(E)				16'-7"	17
A432(E)				16'-3"	17
A433(E)				15'-10"	17
A434(E)				15'-6"	16
A435(E)				15'-1"	16
A436(E)				14'-9"	15
A437(E)				14'-4"	15
A438(E)				14'-0"	15
A439(E)				13'-7"	14
A440(E)				13'-2"	14
A441(E)				12'-10"	13
A442(E)	1	5	Str.	12'-5"	13

SPAN "D" Cont'd.

Bar	No	Size	Type	Length	Weight
A443(E)	1	5	Str.	12'-1"	13
A444(E)	↑	↑	↑	11'-8"	12
A445(E)				11'-4"	12
A446(E)				10'-11"	11
A447(E)				10'-6"	11
A448(E)				10'-2"	11
A449(E)				9'-9"	10
A450(E)				9'-5"	10
A451(E)				9'-0"	9
A452(E)				8'-7"	9
A453(E)				8'-3"	9
A454(E)				7'-10"	8
A455(E)				7'-6"	8
A456(E)				7'-1"	7
A457(E)				6'-8"	7
A458(E)				6'-4"	7
A459(E)				5'-11"	6
A460(E)				5'-6"	6
A461(E)				5'-2"	5
A462(E)				4'-9"	5
A463(E)				4'-5"	5
A464(E)				4'-1"	4
A465(E)				3'-8"	4
A466(E)				3'-4"	3
A467(E)				2'-11"	3
A468(E)				2'-6"	3
A469(E)				2'-2"	2
A470(E)				1'-9"	2
A471(E)				1'-4"	1
A472(E)				1'-0"	1
A473				34'-3"	36
A474				33'-11"	35
A475				33'-7"	35
A476				33'-3"	35
A477				32'-10"	34
A478				32'-6"	34
A479				32'-1"	33
A480				31'-9"	33
A481				31'-5"	33
A482				31'-0"	32
A483				30'-8"	32
A484				30'-4"	32
A485				29'-11"	31
A486				29'-7"	31
A487				29'-3"	31
A488				28'-10"	30
A489				28'-6"	30
A490				28'-1"	29
A491				27'-9"	29
A492				27'-5"	29
A493				27'-0"	28
A494				26'-8"	28
A495				26'-3"	27
A496				25'-11"	27
A497				25'-6"	27
A498				25'-2"	26
A499				24'-10"	26
A500				24'-5"	25
A501				24'-1"	25
A502				23'-8"	25
A503				23'-4"	24
A504	1	5	Str.	22'-11"	24

SPAN "D" Cont'd.

Bar	No.	Size	Type	Length	Weight
A505	1	5	Str.	22'-7"	24
A506	↑	↑	↑	22'-2"	23
A507				21'-10"	23
A508				21'-6"	22
A509				21'-1"	22
A510				20'-9"	22
A511				20'-4"	21
A512				20'-0"	21
A513				19'-7"	20
A514				19'-3"	20
A515				18'-10"	20
A516				18'-6"	19
A517				18'-1"	19
A518				17'-9"	19
A519				17'-4"	18
A520				17'-0"	18
A521				16'-7"	17
A522				16'-3"	17
A523				15'-10"	17
A524				15'-6"	16
A525				15'-1"	16
A526				14'-9"	15
A527				14'-4"	15
A528				14'-0"	15
A529				13'-7"	14
A530				13'-2"	14
A531				12'-10"	13
A532				12'-5"	13
A533				12'-1"	13
A534				11'-8"	12
A535				11'-4"	12
A536				10'-11"	11
A537				10'-6"	11
A538				10'-2"	11
A539				9'-9"	10
A540				9'-5"	10
A541				9'-0"	9
A542				8'-7"	9
A543				8'-3"	9
A544				7'-10"	8
A545				7'-6"	8
A546				7'-1"	7
A547				6'-8"	7
A548				6'-4"	7
A549				5'-11"	6
A550				5'-6"	6
A551				5'-2"	5
A552				4'-9"	5
A553				4'-5"	5
A554				4'-1"	4
A555				3'-8"	4
A556				3'-4"	3
A557				2'-11"	3
A558				2'-6"	3
A559				2'-2"	2
A560				1'-9"	2
A561				1'-4"	1
A562				1'-0"	1
A563(E)				34'-4"	36
A564(E)				34'-0"	35
A565(E)				33'-8"	35
A566(E)	1	5	Str.	33'-4"	35

SPAN "D" Cont'd.

Bar	No.	Size	Type	Length	Weight
A567(E)	1	5	Str.	33'-0"	34
A568(E)	↑	↑	↑	32'-8"	34
A569(E)				32'-3"	34
A570(E)				31'-11"	33
A571(E)				31'-7"	33
A572(E)				31'-3"	33
A573(E)				30'-11"	32
A574(E)				30'-7"	32
A575(E)				30'-3"	32
A576(E)				29'-11"	31
A577(E)				29'-7"	31
A578(E)				29'-3"	31
A579(E)				28'-11"	30
A580(E)				28'-7"	30
A581(E)				28'-2"	29
A582(E)				27'-10"	29
A583(E)				27'-7"	29
A584(E)				27'-3"	28
A585(E)				26'-11"	28
A586(E)				26'-7"	28
A587(E)				26'-3"	27
A588(E)				25'-11"	27
A589(E)				25'-7"	27
A590(E)				25'-3"	26
A591(E)				24'-11"	26
A592(E)				24'-7"	26
A593(E)				24'-3"	25
A594(E)				23'-11"	25
A595(E)				23'-7"	25
A596(E)				23'-3"	24
A597(E)				22'-11"	24
A598(E)				22'-7"	24
A599(E)				22'-3"	23
A600(E)				21'-11"	23
A601(E)				21'-7"	23
A602(E)				21'-2"	22
A603(E)				20'-10"	22
A604(E)				20'-6"	21
A605(E)				20'-3"	21
A606(E)				19'-11"	21
A607(E)				19'-7"	20
A608(E)				19'-3"	20
A609(E)				18'-11"	20
A610(E)				18'-7"	19
A611(E)	↓	↓	↓	18'-3"	19
A612(E)	1	5	Str.	17'-11"	19

	BY	DATE
MADE	JWR	5-90
CHECKED	WLH	5-90
IN CHARGE	D.R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

VOID See Attached sheet
3.7.95 FWB

PROJECT: 8.1670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-50
						TOTAL SHEETS
						A21

Dwg. 10 of 43

SPAN "D" Cont'd.					
Bar	No	Size	Type	Length	Weight
A613(E)		5	Str.	17'-7"	18
A614(E)				17'-3"	18
A615(E)				16'-11"	18
A616(E)				16'-7"	17
A617(E)				16'-3"	17
A618(E)				15'-11"	17
A619(E)				15'-7"	16
A620(E)				15'-3"	16
A621(E)				14'-11"	16
A622(E)				14'-7"	15
A623(E)				14'-2"	15
A624(E)				14'-0"	15
A625(E)				13'-8"	14
A626(E)				13'-4"	14
A627(E)				13'-0"	14
A628(E)				12'-8"	13
A629(E)				12'-4"	13
A630(E)				12'-0"	13
A631(E)				11'-9"	12
A632(E)				11'-5"	12
A633(E)				11'-0"	11
A634(E)				10'-9"	11
A635(E)				10'-5"	11
A636(E)				10'-1"	11
A637(E)				9'-9"	10
A638(E)				9'-6"	10
A639(E)				9'-2"	10
A640(E)				8'-10"	9
A641(E)				8'-6"	9
A642(E)				8'-2"	9
A643(E)				7'-11"	8
A644(E)				7'-7"	8
A645(E)				7'-3"	8
A646(E)				6'-11"	7
A647(E)				6'-8"	7
A648(E)				6'-4"	7
A649(E)				6'-0"	6
A650(E)				5'-8"	6
A651(E)				5'-4"	6
A652(E)				5'-1"	5
A653(E)				4'-9"	5
A654(E)				4'-5"	5
A655(E)				4'-2"	4
A656(E)				3'-10"	4
A657(E)				3'-6"	4
A658(E)				3'-2"	3
A659(E)				2'-11"	3
A660(E)				2'-7"	3
A661(E)				2'-3"	2
A662(E)				1'-11"	2
A663(E)				1'-7"	2
A664(E)				1'-3"	1
A665				34'-4"	36
A666				34'-0"	35
A667				33'-8"	35
A668				33'-4"	35
A669				33'-0"	34
A670				32'-8"	34
A671				32'-3"	34
A672				31'-11"	33
A673				31'-7"	33
A674	1	5	Str.	31'-3"	33

SPAN "D" Cont'd.					
Bar	No	Size	Type	Length	Weight
A675		5	Str.	30'-11"	32
A676				30'-7"	32
A677				30'-3"	32
A678				29'-11"	31
A679				29'-7"	31
A680				29'-3"	31
A681				28'-11"	30
A682				28'-7"	30
A683				28'-2"	29
A684				27'-10"	29
A685				27'-7"	29
A686				27'-3"	28
A687				26'-11"	28
A688				26'-7"	28
A689				26'-3"	27
A690				25'-11"	27
A691				25'-7"	27
A692				25'-3"	26
A693				24'-11"	26
A694				24'-7"	26
A695				24'-3"	25
A696				23'-11"	25
A697				23'-7"	25
A698				23'-3"	24
A699				22'-11"	24
A700				22'-7"	24
A701				22'-3"	23
A702				21'-11"	23
A703				21'-7"	23
A704				21'-2"	22
A705				20'-10"	22
A706				20'-6"	21
A707				20'-3"	21
A708				19'-11"	21
A709				19'-7"	20
A710				19'-3"	20
A711				18'-11"	20
A712				18'-7"	19
A713				18'-3"	19
A714				17'-11"	19
A715				17'-7"	18
A716				17'-3"	18
A717				16'-11"	18
A718				16'-7"	17
A719				16'-3"	17
A720				15'-11"	17
A721				15'-7"	16
A722				15'-3"	16
A723				14'-11"	16
A724				14'-7"	15
A725				14'-4"	15
A726				14'-0"	15
A727				13'-8"	14
A728				13'-4"	14
A729				13'-0"	14
A730				12'-8"	13
A731				12'-4"	13
A732				12'-0"	13
A733				11'-9"	12
A734				11'-5"	12
A735				11'-0"	11
A736	1	5	Str.	10'-9"	11

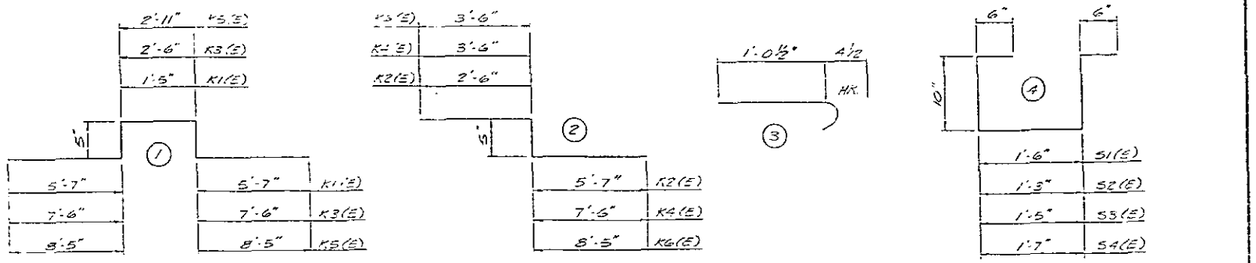
SPAN "D" Cont'd.					
Bar	No	Size	Type	Length	Weight
A737	1	5	Str.	10'-5"	11
A738				10'-1"	11
A739				9'-9"	10
A740				9'-6"	10
A741				9'-2"	10
A742				8'-10"	9
A743				8'-6"	9
A744				8'-2"	9
A745				7'-11"	8
A746				7'-7"	8
A747				7'-3"	8
A748				6'-11"	7
A749				6'-8"	7
A750				6'-4"	7
A751				6'-0"	6
A752				5'-8"	6
A753				5'-4"	6
A754				5'-1"	5
A755				4'-9"	5
A756				4'-5"	5
A757				4'-2"	4
A758				3'-10"	4
A759				3'-6"	4
A760				3'-2"	3
A761				2'-11"	3
A762				2'-7"	3
A763				2'-3"	2
A764				1'-11"	2
A765				1'-7"	2
A766	1	5	Str.	1'-3"	1
B5(E)	72	4	Str.	26'-10"	1,291
B6	47	5	Str.	39'-11"	1,957
G3(E)	1	5	Str.	56'-7"	59
G4(E)	2	5	Str.	33'-5"	70
G5(E)	6	6	Str.	6'-0"	54
K3(E)	4	5	1	18'-4"	76
K4(E)	4	5	2	11'-5"	48
K5(E)	4	5	1	20'-7"	86
K6(E)	4	5	2	12'-4"	51
S3(E)	36	4	4	4'-1"	98
S4(E)	42	4	4	4'-3"	119

Note: Bars marked with an "E" suffix shall be epoxy coated. For Epoxy Coated Reinforcing Steel, see Special Provisions.

	BY	DATE
MADE	JWR	5-90
CHECKED	WLH	5-90
IN CHARGE	D.R. Ruggles	

⚠ - REVISED EPOXY COATED REINF STEEL QUANTITY FOR SPANS "B" & "C" AND TOTAL, ✓ BY CEP

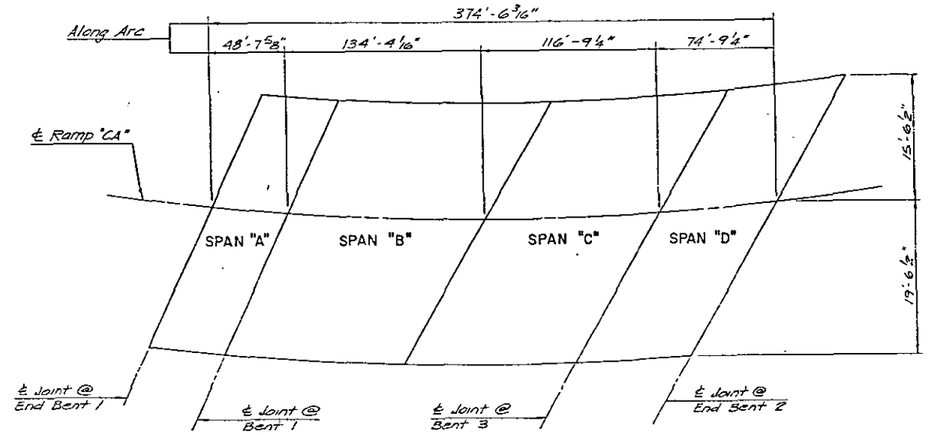
BAR TYPES



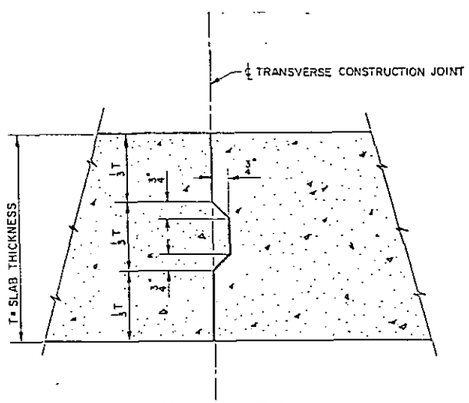
Note: All bar dimensions are out-to-out.

GROOVING BRIDGE FLOORS

SUPERSTRUCTURE - 10,789 SQ. FT.
APPROACH SLABS - 828 SQ. FT.
TOTAL - 11,617 SQ. FT.



SKETCH FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
AREA = 13,105 Sq. Ft.



NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

SUPERSTRUCTURE BILL OF MATERIAL			
	Class AA Concrete	Reinforcing Steel	Epoxy Coated Reinf. Steel
	Cu. Yds.	Lbs.	Lbs.
Span "A"	59	5,671	4,716
Spans "B" & "C"	289	30,050	⚠28,230
Span "D"	93	7,273	7,316
*Total	441	42,994	⚠40,262

*Quantities for Barrier Rail are not included.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS		
BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#4(E)	1'-5"	——
#5(E)	1'-8"	——
#6(E)	2'-2"	——

PREPARED BY
AMERICAN ENGINEERS

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-51
⚠	CEP	9-91				TOTAL SHEETS
						421

Dwg. 11 of 43

SPAN "D" Cont'd.

Bar	No.	Size	Type	Length	Weight
A613(E)	1	5	Str	17'-7"	18
A614(E)	↑	↑	↑	17'-3"	18
A615(E)				16'-11"	18
A616(E)				16'-7"	17
A617(E)				16'-3"	17
A618(E)				15'-11"	17
A619(E)				15'-7"	16
A620(E)				15'-3"	16
A621(E)				14'-11"	16
A622(E)				14'-7"	15
A623(E)				14'-4"	15
A624(E)				14'-0"	15
A625(E)				13'-8"	14
A626(E)				13'-4"	14
A627(E)				13'-0"	14
A628(E)				12'-8"	13
A629(E)				12'-4"	13
A630(E)				12'-0"	13
A631(E)				11'-9"	12
A632(E)				11'-5"	12
A633(E)				11'-0"	11
A634(E)				10'-9"	11
A635(E)				10'-5"	11
A636(E)				10'-1"	11
A637(E)				9'-9"	10
A638(E)				9'-6"	10
A639(E)				9'-2"	10
A640(E)				8'-10"	9
A641(E)				8'-6"	9
A642(E)				8'-2"	9
A643(E)				7'-11"	8
A644(E)				7'-7"	8
A645(E)				7'-3"	8
A646(E)				6'-11"	7
A647(E)				6'-8"	7
A648(E)				6'-4"	7
A649(E)				6'-0"	6
A650(E)				5'-8"	6
A651(E)				5'-4"	6
A652(E)				5'-1"	5
A653(E)				4'-9"	5
A654(E)				4'-5"	5
A655(E)				4'-2"	4
A656(E)				3'-10"	4
A657(E)				3'-6"	4
A658(E)				3'-2"	3
A659(E)				2'-11"	3
A660(E)				2'-7"	3
A661(E)				2'-3"	2
A662(E)				1'-11"	2
A663(E)				1'-7"	2
A664(E)				1'-3"	1
A665				34'-4"	36
A666				34'-0"	35
A667				33'-8"	35
A668				33'-4"	35
A669				33'-0"	34
A670				32'-8"	34
A671				32'-3"	34
A672				31'-11"	33
A673				31'-7"	33
A674	1	5	Str.	31'-3"	33

SPAN "D" Cont'd.

Bar	No.	Size	Type	Length	Weight
A675	1	5	Str.	30'-11"	32
A676	↑	↑	↑	30'-7"	32
A677				30'-3"	32
A678				29'-11"	31
A679				29'-7"	31
A680				29'-3"	31
A681				28'-11"	30
A682				28'-7"	30
A683				28'-2"	29
A684				27'-10"	29
A685				27'-7"	29
A686				27'-3"	28
A687				26'-11"	28
A688				26'-7"	28
A689				26'-3"	27
A690				25'-11"	27
A691				25'-7"	27
A692				25'-3"	26
A693				24'-11"	26
A694				24'-7"	26
A695				24'-3"	25
A696				23'-11"	25
A697				23'-7"	25
A698				23'-3"	24
A699				22'-11"	24
A700				22'-7"	24
A701				22'-3"	23
A702				21'-11"	23
A703				21'-7"	23
A704				21'-2"	22
A705				20'-10"	22
A706				20'-6"	21
A707				20'-3"	21
A708				19'-11"	21
A709				19'-7"	20
A710				19'-3"	20
A711				18'-11"	20
A712				18'-7"	19
A713				18'-3"	19
A714				17'-11"	19
A715				17'-7"	18
A716				17'-3"	18
A717				16'-11"	18
A718				16'-7"	17
A719				16'-3"	17
A720				15'-11"	17
A721				15'-7"	16
A722				15'-3"	16
A723				14'-11"	16
A724				14'-7"	15
A725				14-4"	15
A726				14'-0"	15
A727				13'-8"	14
A728				13'-4"	14
A729				13'-0"	14
A730				12'-8"	13
A731				12'-4"	13
A732				12'-0"	13
A733				11'-9"	12
A734				11'-5"	12
A735				11'-0"	11
A736	1	5	Str.	10'-9"	11

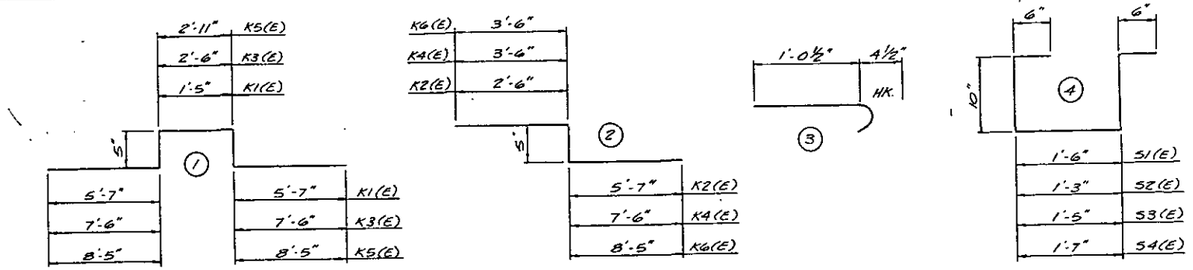
SPAN "D" Cont'd.

Bar	No.	Size	Type	Length	Weight
A737	1	5	Str.	10'-5"	11
A738	↑	↑	↑	10'-1"	11
A739				9'-9"	10
A740				9'-6"	10
A741				9'-2"	10
A742				8'-10"	9
A743				8'-6"	9
A744				8'-2"	9
A745				7'-11"	8
A746				7'-7"	8
A747				7'-3"	8
A748				6'-11"	7
A749				6'-8"	7
A750				6'-4"	7
A751				6'-0"	6
A752				5'-8"	6
A753				5'-4"	6
A754				5'-1"	5
A755				4'-9"	5
A756				4'-5"	5
A757				4'-2"	4
A758				3'-10"	4
A759				3'-6"	4
A760				3'-2"	3
A761				2'-11"	3
A762				2'-7"	3
A763				2'-3"	2
A764				1'-11"	2
A765				1'-7"	2
A766	1	5	Str.	1'-3"	1
B5(E)	72	4	Str.	26'-10"	1,291
B6	47	5	Str.	39'-11"	1,957
G3(E)	1	5	Str.	56'-7"	59
G4(E)	2	5	Str.	33'-5"	70
G5(E)	6	6	Str.	6'-0"	54
K3(E)	4	5	1	18'-4"	76
K4(E)	4	5	2	11'-5"	48
K5(E)	4	5	1	20'-7"	86
K6(E)	4	5	2	12'-4"	51
J1(E)	51	4	3	1'-5"	48
S3(E)	36	4	4	4'-1"	98
S4(E)	42	4	4	4'-3"	119

Note: Bars marked with an "E" suffix shall be epoxy coated. For Epoxy Coated Reinforcing Steel, see Special Provisions.

	BY	DATE
MADE	JWR	5-90
CHECKED	WLH	5-90
IN CHARGE	D.R. Ruggles	

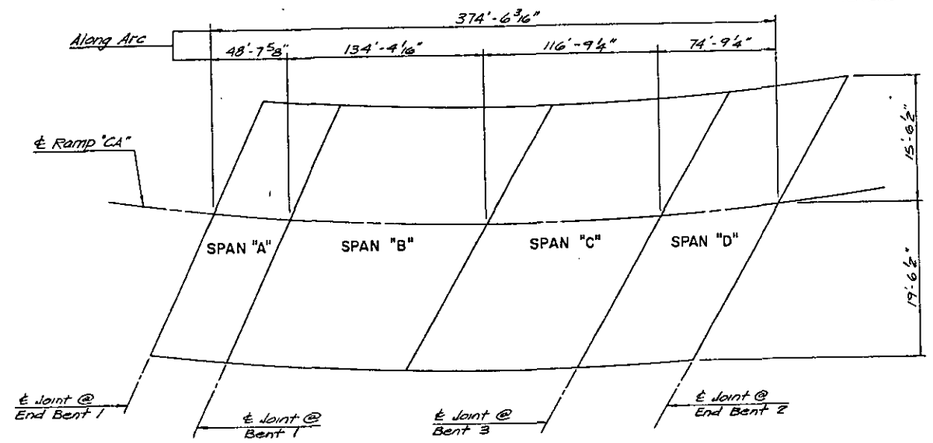
BAR TYPES



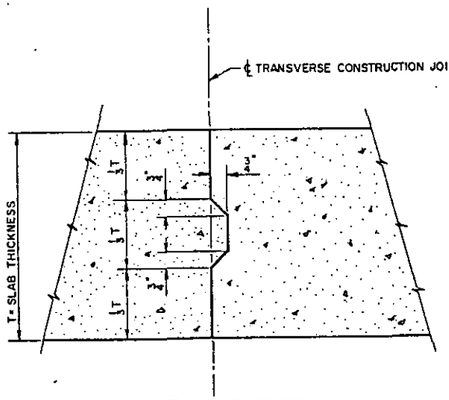
Note: All bar dimensions are out-to-out.

— GROOVING BRIDGE FLOORS —

SUPERSTRUCTURE - 10,789 SQ. FT.
APPROACH SLABS - 828 SQ. FT.
TOTAL - 11,617 SQ. FT.



SKETCH FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
AREA = 13,105 Sq. Ft.



NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

SUPERSTRUCTURE BILL OF MATERIAL

	Class AA Concrete	Reinforcing Steel	Epoxy Coated Reinf. Steel
	Cu. Yds.	Lbs.	Lbs.
Span "A"	59	5,671	4,716
Spans "B" & "C"	289	30,050	28,226
Span "D"	93	7,273	7,316
* Total	441	42,994	40,258

* Quantities for Barrier Rail are not included.

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

BAR SIZE	SUPERSTRUCTURE AND APPROACH SLABS EXCEPT PARAPET AND BARRIER RAIL	PARAPET AND BARRIER RAIL
#4	1'-2"	1'-7"
#5	1'-5"	2'-0"
#6	1'-10"	2'-7"
#4(E)	1'-5"	—
#5(E)	1'-8"	—
#6(E)	2'-2"	—

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

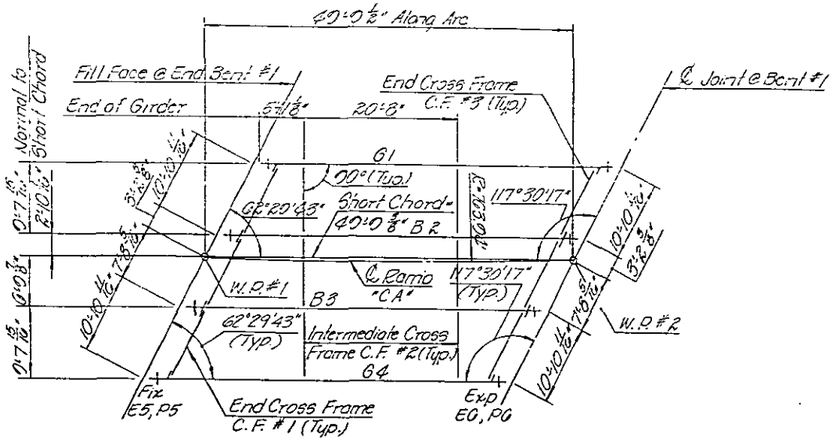
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO
NO	BY	DATE	NO	BY	DATE	S-51
						TOTAL SHEETS
						421

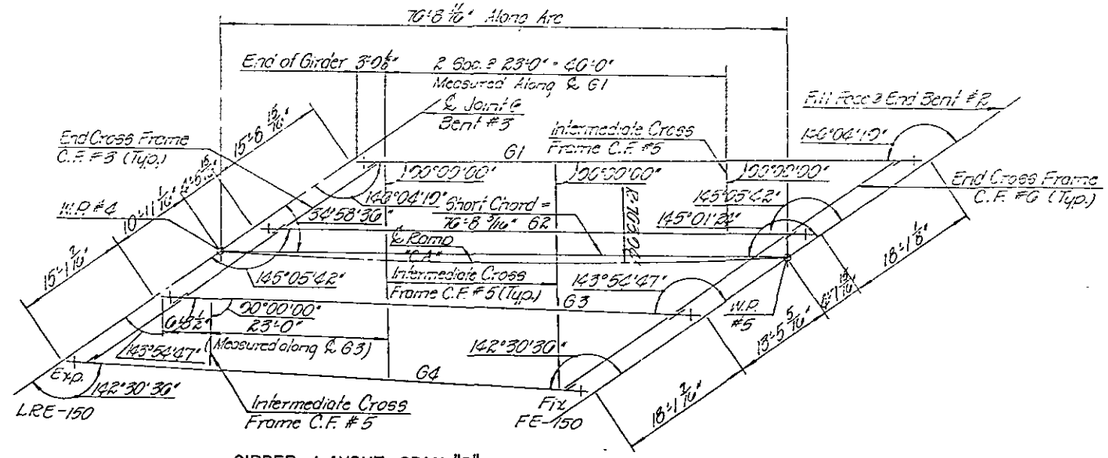
PREPARED BY AMERICAN ENGINEERS

VOID See Attached Sheet 3-7-95 FWM

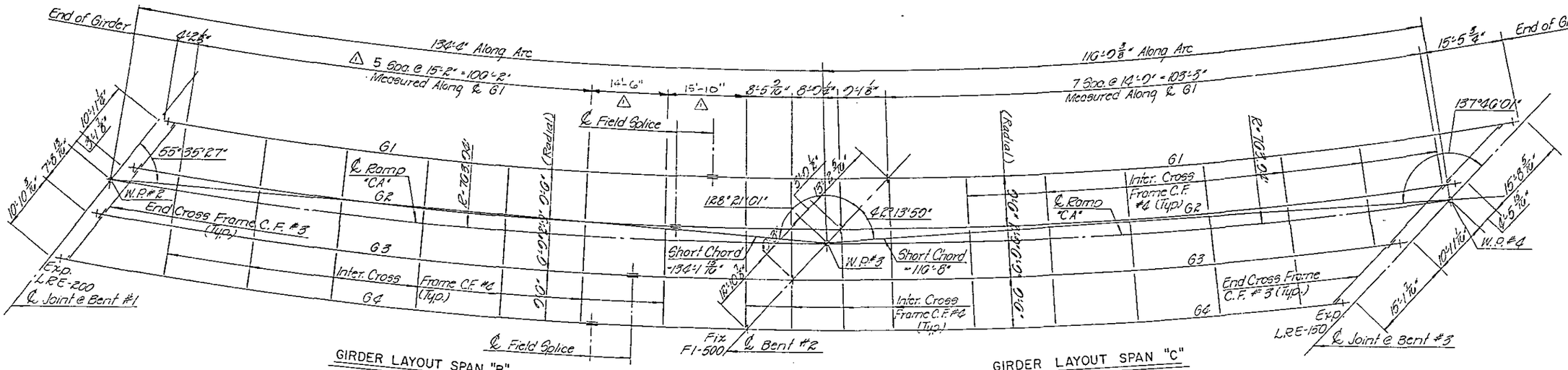
Dwg. 11 of 43



GIRDER LAYOUT SPAN "A"

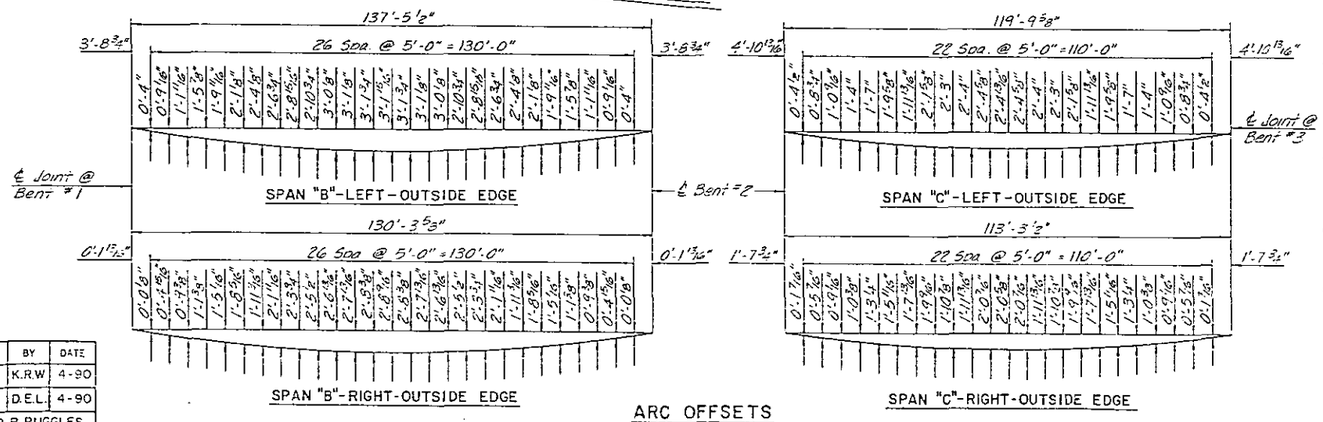


GIRDER LAYOUT SPAN "D"



GIRDER LAYOUT SPAN "B"

GIRDER LAYOUT SPAN "C"



ARC OFFSETS

NOTE:
Structural Steel erection in spans "B" & "C" shall be complete before falsework or forms are placed on the unit.
Dimensions shown in "Girder Layout" are horizontal.
For Location of Bearing Stiffeners and End Cross Frame C.F. #1, #3 & #6 see "Structural Steel Details".
Dimensions to Cross Frames C.F. #2, C.F. #4 and C.F. #5 are from ends of girders.
All Cross Frames except End Cross Frames are placed radially in Spans "B" and "C" only.
Girders & Beams in Span "A" are parallel to short chord.
For direction of girder movement and bearing orientation of Spans "B" and "C", see Dwg 21 and 22.

	BY	DATE
MADE	K.R.W	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D. R. RUGGLES	

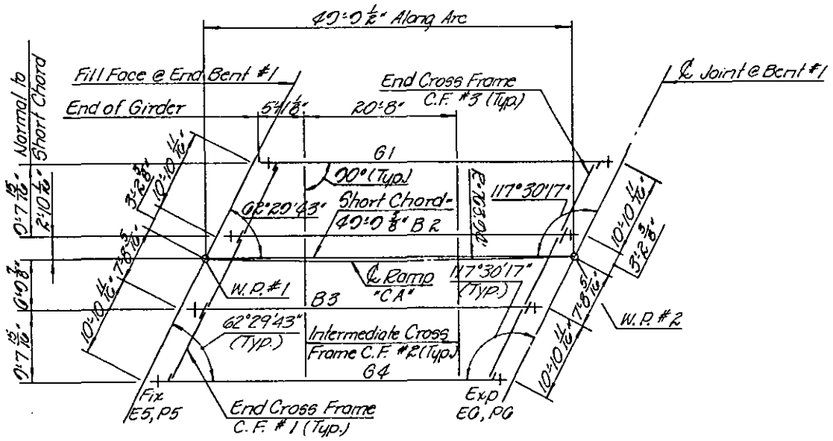
PREPARED BY
AMERICAN ENGINEERS

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

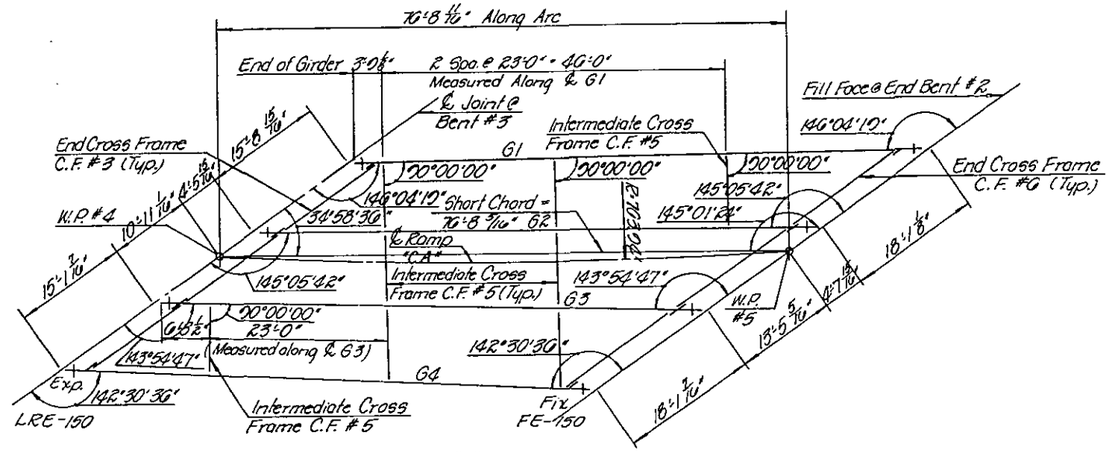
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN
SPANS "A", "B", "C" & "D"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-52
1	ECF	9-91				TOTAL SHEETS
						421

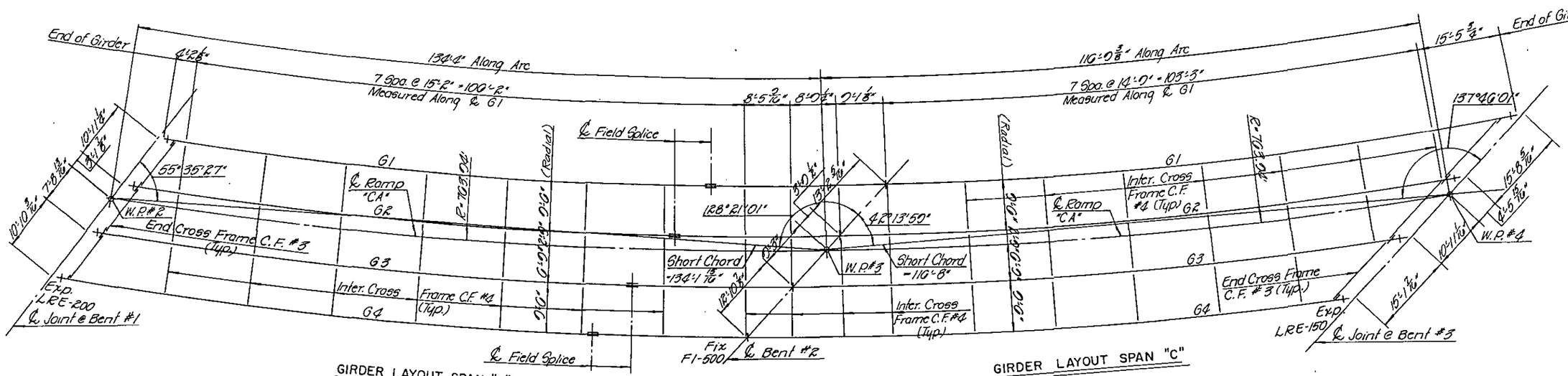
Dwg. 12 of 43



GIRDER LAYOUT SPAN "A"

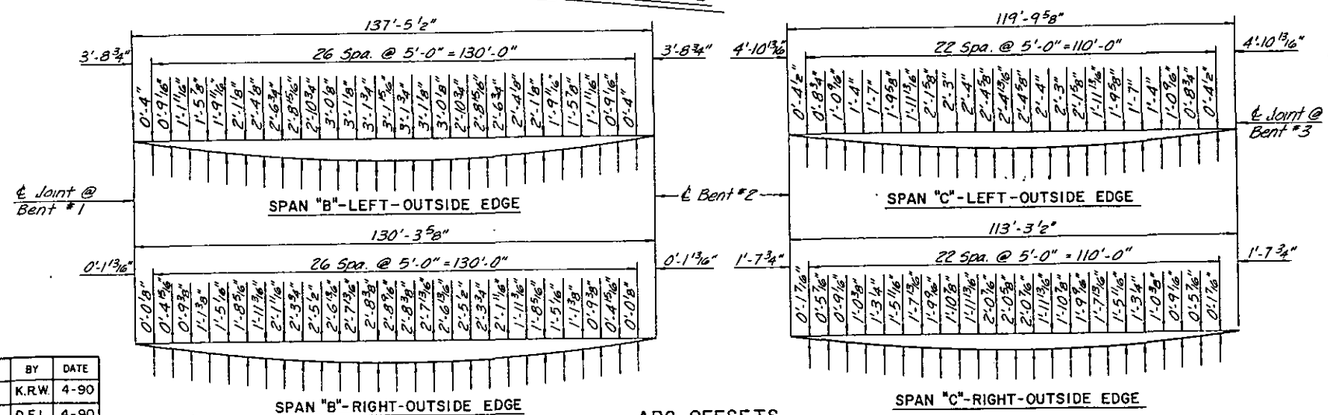


GIRDER LAYOUT SPAN "D"



GIRDER LAYOUT SPAN "B"

GIRDER LAYOUT SPAN "C"



ARC OFFSETS

NOTE:
Structural Steel erection in spans "B" & "C" shall be complete before falsework or forms are placed on the unit.
Dimensions shown in 'Girder Layout' are horizontal.
For Location of Bearing Stiffeners and End Cross Frame C.F. #1, #3 & #6 see "Structural Steel Details".
Dimensions to Cross Frames C.F. #2, C.F. #4 and C.F. #5 are from ends of girders.
All Cross Frames except End Cross Frames are placed radially in Spans "B" and "C" only.
Girders & Beams in Span "A" are parallel to short chord.
For direction of girder movement and bearing orientation of Spans "B" and "C", see Dwg. 21 and 22.

VOID
See Attached Sheet
3.7.95 FLB

	BY	DATE
MADE	K.R.W.	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D. R. RUGGLES	

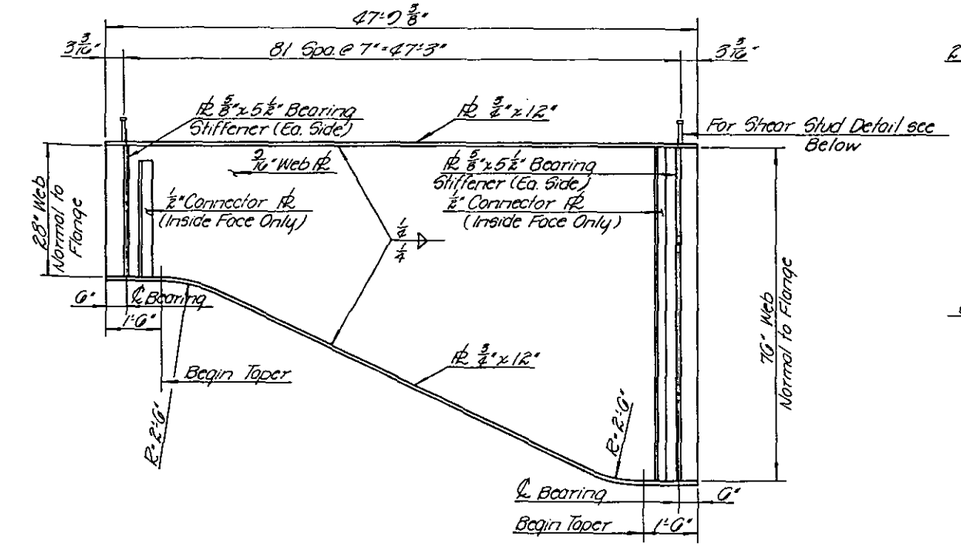
PREPARED BY
AMERICAN ENGINEERS

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+50.38 Ramp "CA"

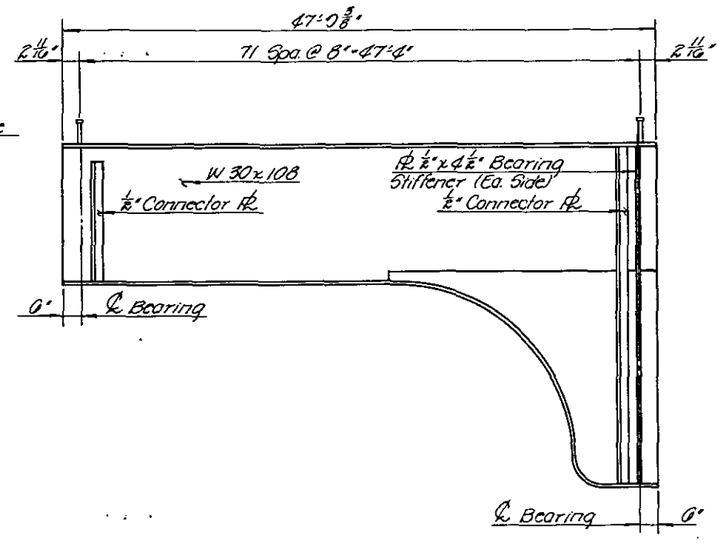
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN
SPANS "A", "B", "C" & "D"

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-52
						TOTAL SHEETS
						421

Dwg. 12 of 43



ELEVATION - GIRDERS G1&G4



ELEVATION - BEAMS B2 & B3

DEAD LOAD DEFLECTIONS (FT.)	G1&G4	B2&B3
Deflection due to Weight of Steel	.003	.011
Deflection due to Weight of Slab and Buildups	.019	.091
Deflection due to Weight of Barrier Rails + Future Wearing Surface	.003	.010
Total Dead Load Deflection	.025	.112
Vertical Curve Ordinate	.024	.024
Superelevation Ordinate	-.021	-.021
Beam Camber	5/16"(↑)	1 3/8"(↑)

Notes:

Dimensions shown in "Beam Elevations" are horizontal dimensions.

Haunch make-up other than that shown may be submitted for approval.

Bearing Stiffeners to be placed parallel to adjacent end of beam.

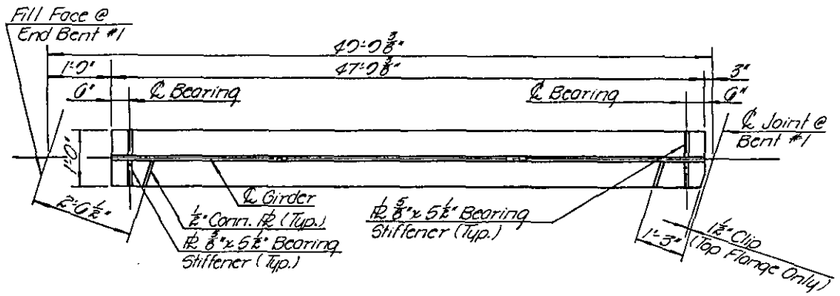
Haunch web and flange thickness and flange width shall match the beam to which it is attached.

A Charpy V-Notch Test is required on all beam sections, beam haunch web, beam haunch flange, tapered girder web, and tapered girder bottom flange, see Special Provisions.

For Weld Termination Detail, see Sheet No. 8.

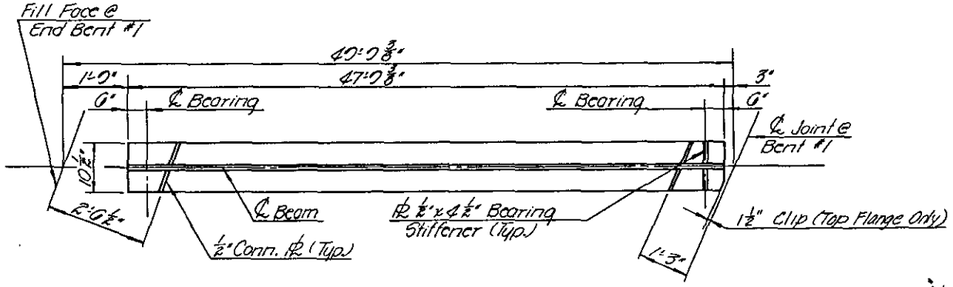
Cambered Girder lengths shall be adjusted and bearings are to be placed on the cambered girder so as to be aligned with the anchors after the dead load deflection has occurred. Shop plans shall be prepared accordingly.

The Contractor may, when necessary, propose a scheme for avoiding interference between metal stay-in-place form supports or forms and beam/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.

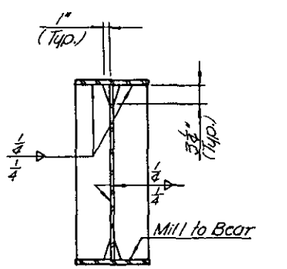


FLANGE PLATES DETAIL - G1

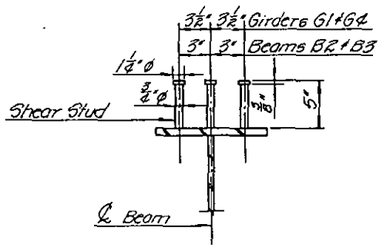
(G4 identical except connector PL on inside face only.)



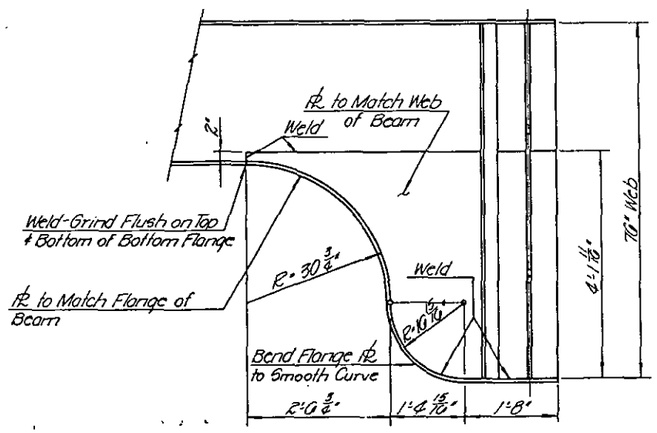
FLANGE PLATES DETAIL - B2 & B3



BEARING STIFFENER DETAIL

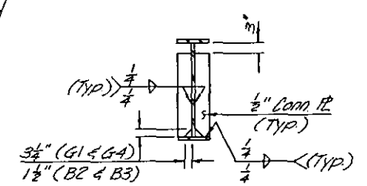


SHEAR STUD DETAIL

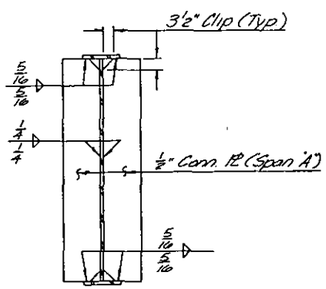


HAUNCH ELEVATION

Note: Radiographic testing is required on all butt welds in haunches



END BENT 1



BENT 1

CONNECTION PLATE DETAIL

PREPARED BY
AMERICAN ENGINEERS

	BY	DATE
MADE	S.C.W.	4-90
CHECKED	W.L.H.	4-90
IN CHARGE D. R. Ruggles		

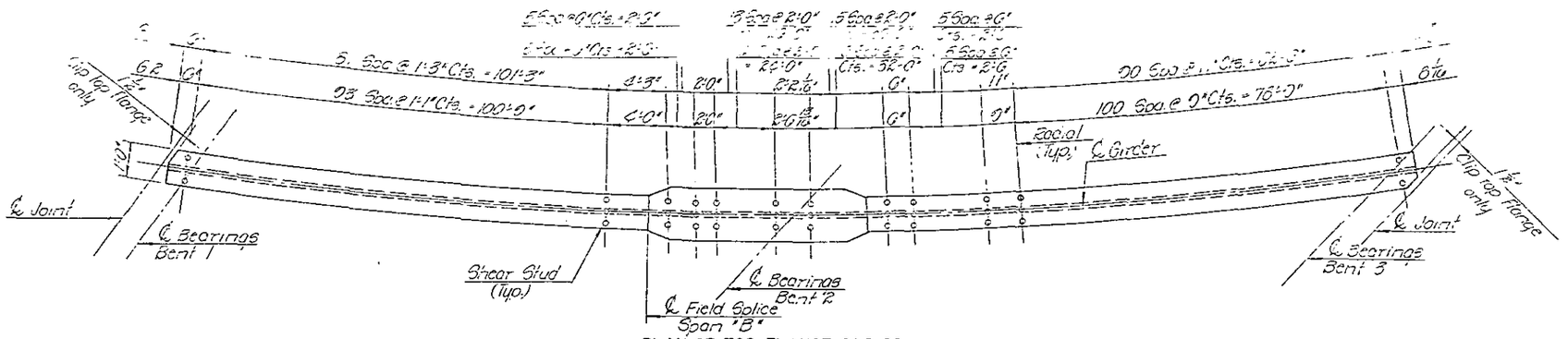
PROJECT: BUG70111
Mecklenburg COUNTY
STATION: 12:50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

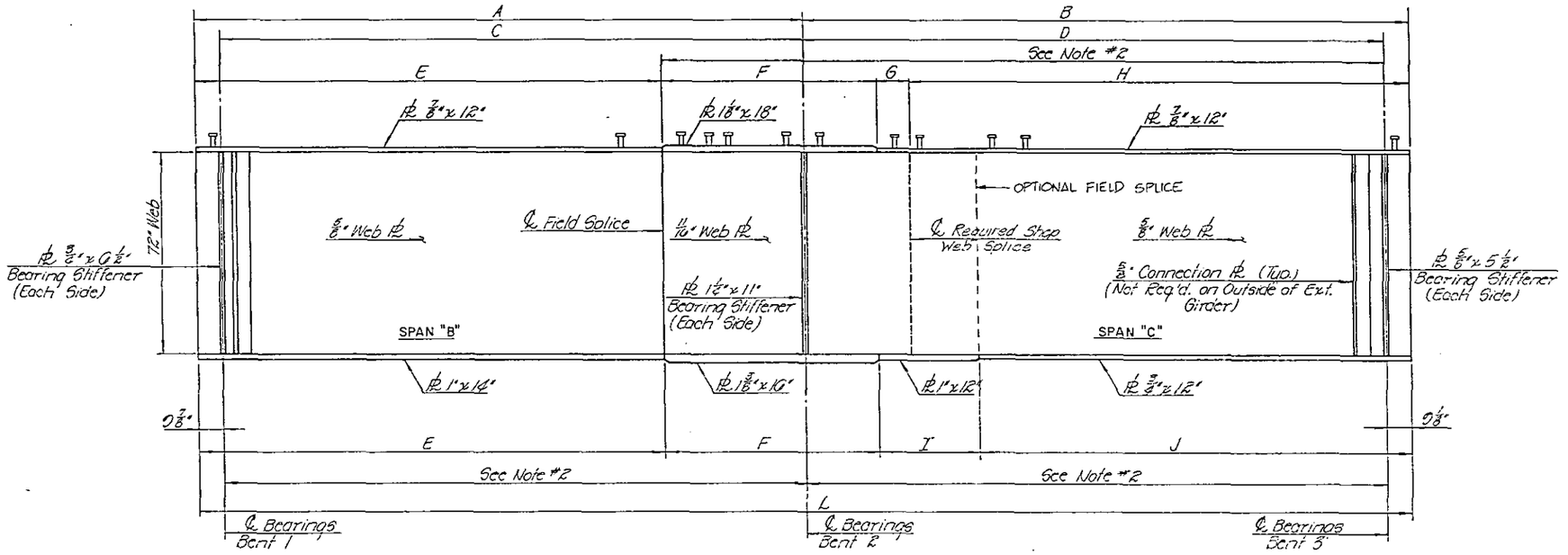
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPAN "A"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-53
						TOTAL SHEETS
						121

Dwg. 13 of 43

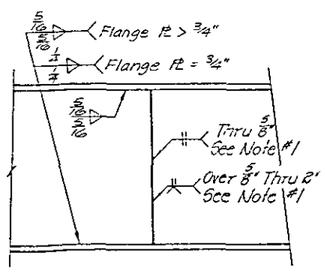


PLAN OF TOP FLANGE G1 & G2

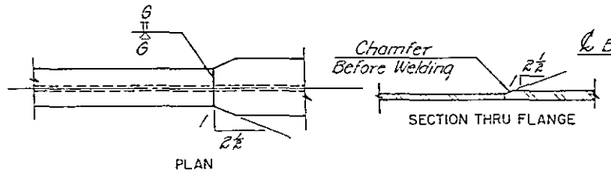


GIRDER ELEVATION G1 & G2

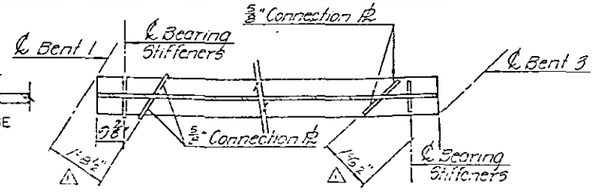
Girders	A	B	C	D	E	F	G	H	I	J	L	℄ Radius
G1	130'-8 1/16"	116'-8 3/4"	135'-10 1/16"	117'-11 3/8"	103'-11 3/16"	27'-8 3/8"	2'-0"	101'-2 3/4"	20'-0 1/8"	83'-2 3/8"	255'-4 13/16"	751.00'
G2	134'-7 7/16"	116'-10 1/16"	133'-0 7/16"	116'-0 7/16"	103'-2 7/16"	26'-5 1/16"	2'-0"	99'-2 3/4"	22'-2 1/8"	70'-8 3/16"	255'-5 3/8"	761.10'



SHOP WEB SPLICE & FLANGE TO WEB WELD

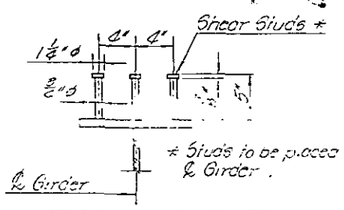


SHOP FLANGE SPLICE DETAIL



BOTTOM FLANGE DETAIL SPANS "B" & "C"

Note: 5/8" Connection PL's shown are parallel to ℄ Bents



STUD DETAIL ON GIRDER

Studs on Girders may be staggered as necessary, to clear flange splice weld.

NOTES

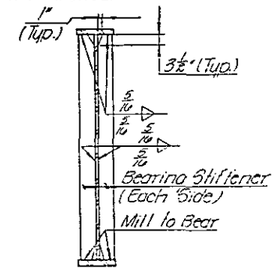
Shop splices are permitted to limit the maximum required flange piece lengths to 60 feet and web piece lengths to 45 feet. Permitted flange and web shop splices shall not be located within 15 feet of maximum dead load deflection nor within 15 feet of intermediate bearings. Keep 2 feet minimum between web and flange shop splices.

Dimensions shown in Girder Elevation, excluding web depth dimension, are horizontal dimensions. Web depth dimension is normal to flange.

For optional field splice note, see S-55.

Ends of girders shall be plumb. Bearing stiffeners shall be parallel to end of girder webs.

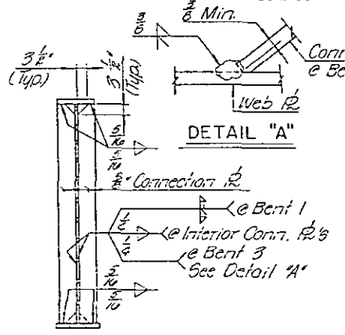
Splices are not shown. See splice details on other sheets. Heat Curving will be allowed.



BEARING STIFFENER DETAIL

Note #1
The shop Web splice is to be ground smooth and flush on outside of Exterior Girder.

Note #2
Charpy V-Notch tests will be required for top or bottom flange plate which falls between these limits. Also, Charpy V-Notch tests will be required for all web plates, web splice plates, flange splice plates, cross frames, and connector plates. For Charpy V-Notch tests, see Special Provisions.



CONNECTION PLATE DETAIL

PROJECT: 8.UG70111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

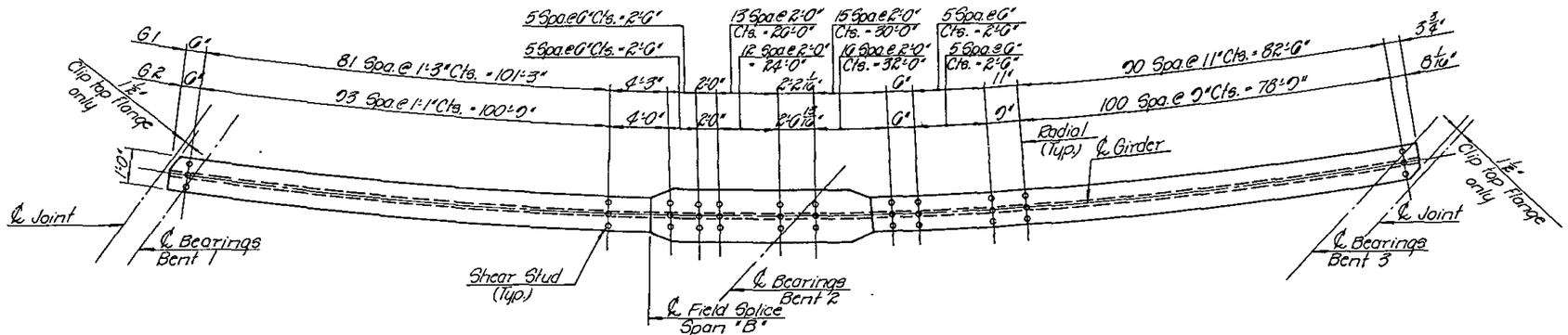
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPANS "B" & "C"

	BY	DATE
MADE	D.H.B.	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D.R.RUGGLES	

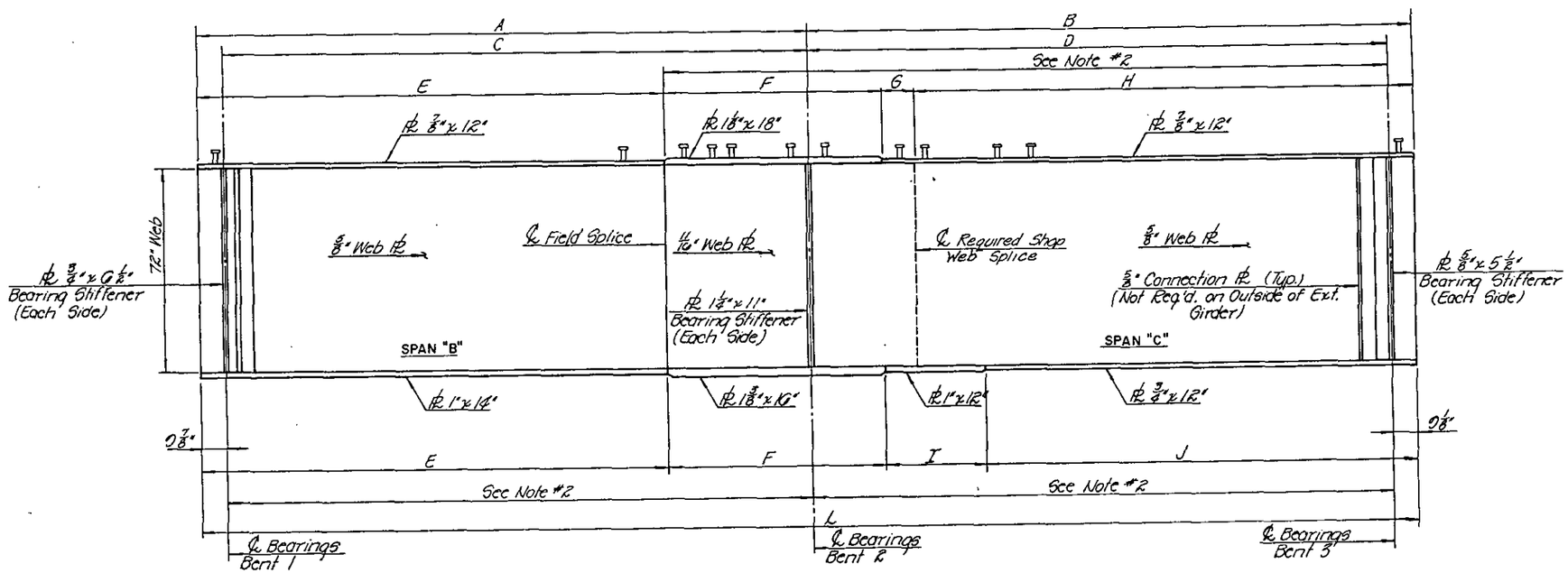
REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-54
						TOTAL SHEETS
						421

PREPARED BY
AMERICAN ENGINEERS

Dwg 14 of 43

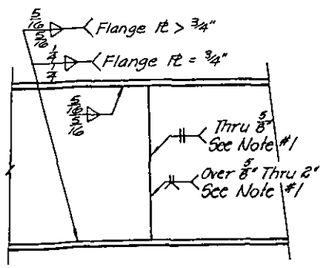


PLAN OF TOP FLANGE G1 & G2

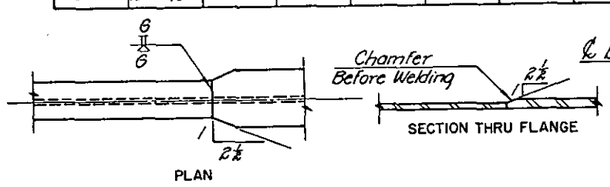


GIRDER ELEVATION G1 & G2

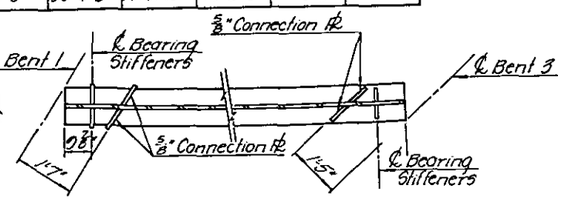
Girders	A	B	C	D	E	F	G	H	I	J	L	℄ Radius
G1	130'-8 7/16"	118'-8 3/8"	135'-10 5/16"	117'-11 5/8"	103'-11 7/16"	47'-8 5/8"	2'-0"	101'-2 3/4"	20'-0 1/4"	83'-2 3/8"	255'-4 13/16"	751.00'
G2	134'-7 13/16"	116'-10 1/16"	133'-0 15/16"	116'-0 5/16"	103'-2 7/16"	46'-5 1/16"	2'-0"	99'-4 7/8"	22'-2 1/16"	70'-3 7/16"	251'-5 7/8"	761.10'



SHOP WEB SPLICE & FLANGE TO WEB WELD

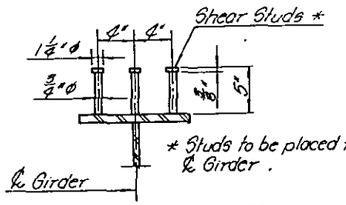


SHOP FLANGE SPLICE DETAIL



BOTTOM FLANGE DETAIL SPANS "B" & "C"

Note: ⅝" Connection Pl's shown are parallel to ℄ Bents



STUD DETAIL ON GIRDER

Studs on Girders may be shifted slightly, if necessary, to clear flange splice weld.

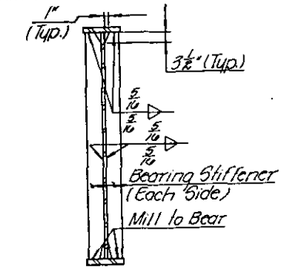
NOTES

Shop splices are permitted to limit the maximum required flange piece lengths to 60 feet and web piece lengths to 45 feet. Permitted flange and web shop splices shall not be located within 15 feet of maximum dead load deflection nor within 15 feet of intermediate bearings. Keep 2 feet minimum between web and flange shop splices.

Dimensions shown in Girder Elevation, excluding web depth dimension, are horizontal dimensions. Web depth dimension is normal to flange.

Ends of girders shall be plumb. Bearing stiffeners shall be parallel to end of girder webs.

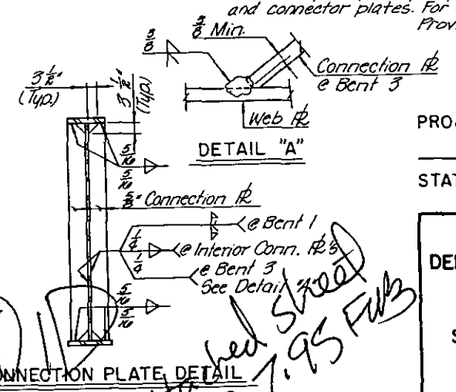
Splices are not shown. See splice details on other sheets. Heat Curving will be allowed.



BEARING STIFFENER DETAIL

Note #1
The shop Web splice is to be ground smooth and flush on outside of Exterior Girder.

Note #2
Charpy V-Notch tests will be required for top or bottom flange plate which falls between these limits. Also, Charpy V-Notch tests will be required for all web plates, web splice plates, flange splice plates, cross frames, and connector plates. For Charpy V-Notch tests, see Special Provisions.



DETAIL "A"

CONNECTION PLATE DETAIL

See Attached

PROJECT: 8.UG70111
Mecklenburg COUNTY
STATION: 10+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPANS "B" & "C"

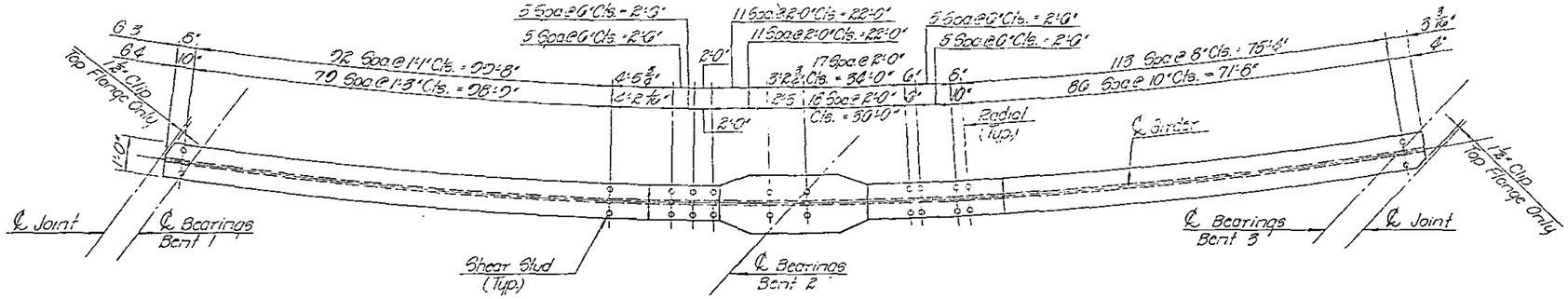
	BY	DATE
MADE	D.H.B.	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D.R. RUGGLES	

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE

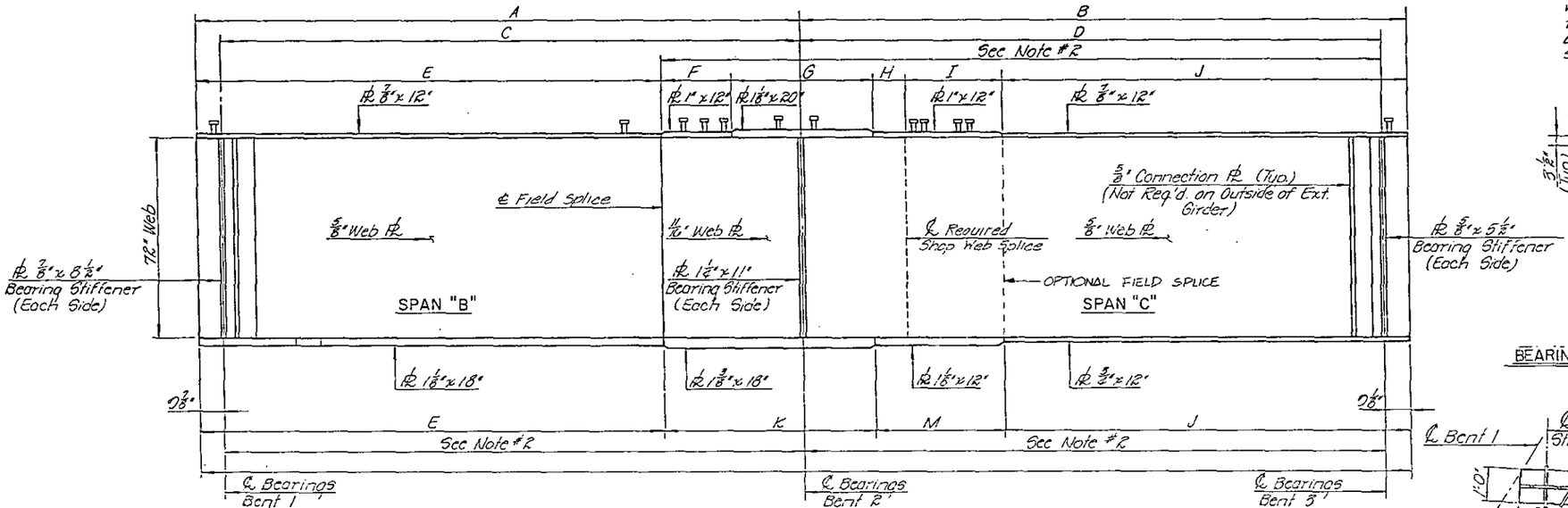
SHEET NO. S-54
TOTAL SHEETS 421

PREPARED BY AMERICAN ENGINEERS

Dwg. 14 of 43

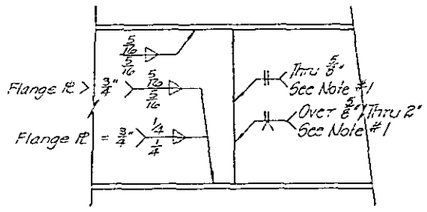


PLAN OF TOP FLANGE G3 & G4

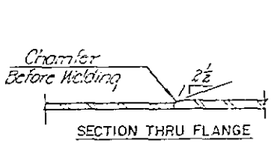


GIRDER ELEVATION G3 & G4

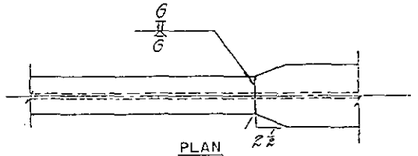
Girders	A	B	C	D	E	F	G	H	I	J	K	L	M	℄ Radius
G3	132'-8 1/2"	115'-1 3/16"	131'-10 3/8"	114'-4 1/16"	102'-0 1/2"	14'-11 1/2"	30'-0"	2'-0"	21'-10 1/2"	75'-8 13/16"	44'-11 1/2"	247'-0 11/16"	24'-4 1/2"	770.00'
G4	130'-10 1/16"	113'-0"	130'-0 3/16"	112'-8 3/8"	101'-8 2/16"	14'-2 11/16"	29'-11 3/8"	2'-0"	23'-6 1/2"	72'-5 2/16"	44'-1 3/16"	244'-4 11/16"	20'-0 1/2"	780.10'



SHOP WEB SPLICE & FLANGE TO WEB WELD

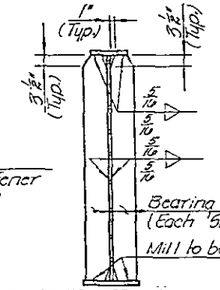


SECTION THRU FLANGE

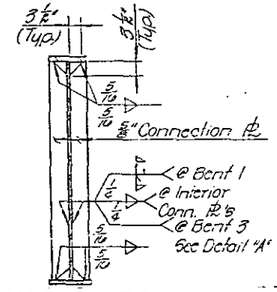


PLAN

SHOP FLANGE SPLICE DETAIL

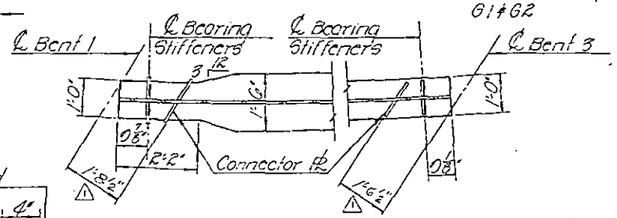


BEARING STIFFENER DETAIL

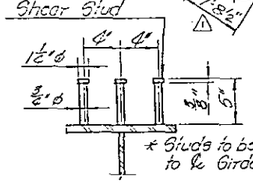


CONNECTION PLATE DETAIL

Note: For Detail "A", see Superstructure Steel Details Spans "B" & "C" Girders G1 & G2



BOTTOM FLANGE DETAIL



STUD DETAIL ON GIRDER

Studs on Girders may be shifted slightly, if necessary, to clear flange splice weld.

Splices are not shown, see splice details on other sheets. Heat curving will be allowed.

NOTES

Shop splices are permitted to limit the maximum required flange piece lengths to 60 feet and web piece lengths to 45 feet. Permitted flange and web shop splices shall not be located within 15 feet of maximum dead load deflection nor within 15 feet of intermediate bearings. Keep 2 feet minimum between web and flange shop splices.

Dimensions shown in Girder Elevation, excluding web depth dimension, are horizontal dimensions. Web depth dimension is normal to flange.

End of girders shall be plumb. Bearing stiffeners shall be parallel to end of girder webs.

A bolted field splice will be permitted in the girders in span C. If a field splice is used, the shop web splice will be eliminated; and it shall be made entirely at the Contractor's expense; no additional measurement or payment will be made for the additional work and materials required. The field splice will be located as shown on the plans, the details and splice material shall be designed by a registered engineer, and will be subject to the approval of American Engineers & NCDOT

Note #1

The shop web splice is to be ground smooth and flush on outside of Exterior Girders.

Note #2

Charpy V-Notch tests will be required for top or bottom flange plate which falls between these limits. Also, Charpy V-Notch tests will be required for all web plates, web splice plates, flange splice plates, cross frames and connector plates. For Charpy V-Notch tests, see Special Provisions.

PROJECT: 8.U670111

Mecklenburg COUNTY

STATION: 10+59.38 Rama "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPANS "B" & "C"

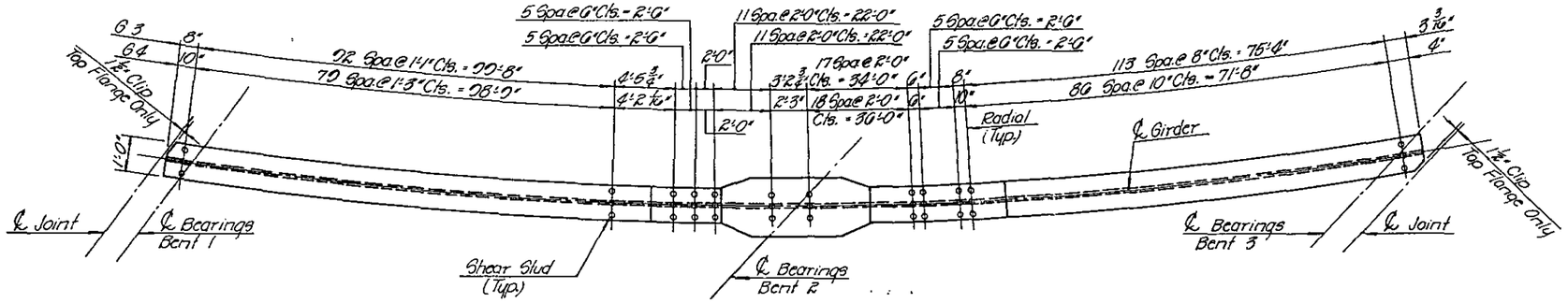
	BY	DATE
MADE	D.H.B.	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D. R. RUGGLES	

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-55
1	ECP	9-91				TOTAL SHEETS
						421

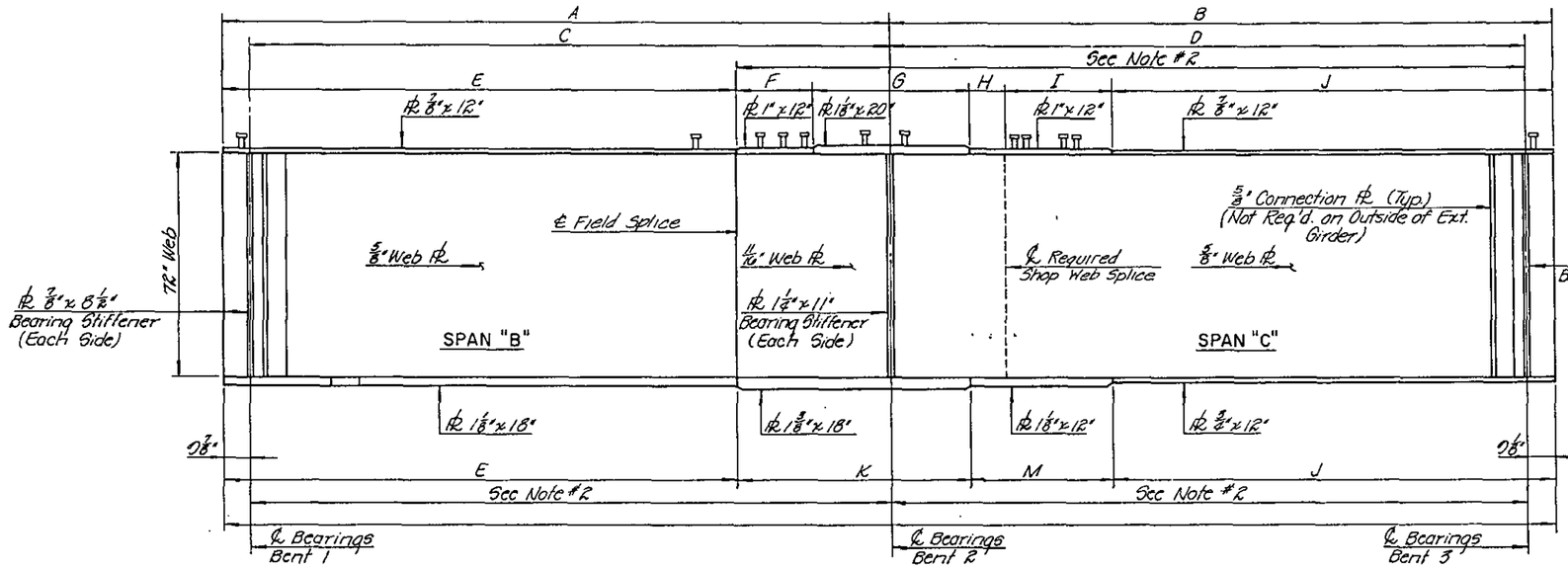
PREPARED BY
AMERICAN ENGINEERS

Dwg. 15 of 43

1 - REVISED OFFSETS TO CONNECTOR PLATES SHOWN IN BOTTOM FLANGE DETAIL. JBY CBD

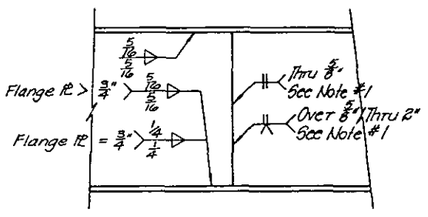


PLAN OF TOP FLANGE G3 & G4

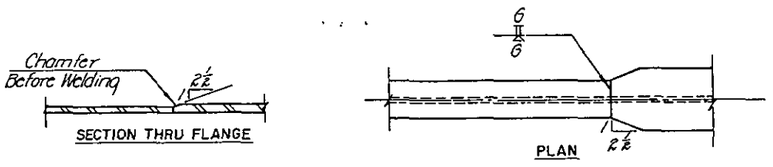


GIRDER ELEVATION G3 & G4

Girders	A	B	C	D	E	F	G	H	I	J	K	L	M	℄ Radius
G3	132'-8 ½"	115'-1 7/16"	131'-10 ⅜"	114'-4 11/16"	102'-0 ½"	14'-11 ½"	30'-0"	2'-0"	21'-10 ½"	75'-8 13/16"	44'-11 ⅞"	247'-0 11/16"	24'-4 ½"	770.00'
G4	130'-10 7/16"	113'-0"	130'-0 3/16"	112'-8 7/8"	101'-8 9/16"	14'-2 15/16"	20'-11 ⅜"	2'-0"	23'-0 ½"	72'-5 9/16"	44'-1 3/16"	244'-4 11/16"	20'-0 ½"	780.10'



SHOP WEB SPLICE & FLANGE TO WEB WELD



SHOP FLANGE SPLICE DETAIL

PREPARED BY
AMERICAN ENGINEERS

NOTES

Shop splices are permitted to limit the maximum required flange piece lengths to 60 feet and web piece lengths to 45 feet. Permitted flange and web shop splices shall not be located within 15 feet of maximum dead load deflection nor within 15 feet of intermediate bearings. Keep 2 feet minimum between web and flange shop splices.

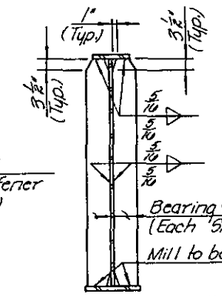
Dimensions shown in Girder Elevation, excluding web depth dimension, are horizontal dimensions. Web depth dimension is normal to flange.

End of girders shall be plumb. Bearing Stiffeners shall be parallel to end of girder webs.

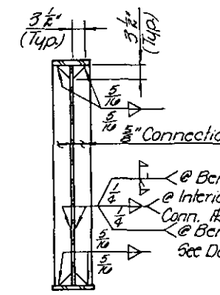
Splices are not shown, See splice details on other sheets. Heat curving will be allowed.

Note #1
The shop web splice is to be ground smooth and flush on outside of Exterior Girders.

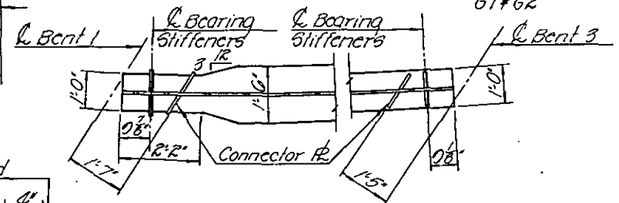
Note #2
Charpy V-Notch tests will be required for top or bottom flange plate which falls between these limits. Also, Charpy V-Notch tests will be required for all web plates, web splice plates, flange splice plates, cross frames and connector plates. For Charpy V-Notch tests, see Special Provisions.



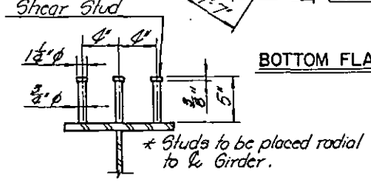
BEARING STIFFENER DETAIL



CONNECTION PLATE DETAIL
Note: For Detail "A", see Superstructure Steel Details Spans "B" & "C" Girders G1 & G2



BOTTOM FLANGE DETAIL



STUD DETAIL ON GIRDER
Studs on Girders may be shifted slightly, if necessary, to clear flange splice weld.

VOID
See Attached Sheet
3-7-95 FWB

PROJECT: 8.U070111
Mecklenburg COUNTY
STATION: 10+60.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPANS "B" & "C"

	BY	DATE
MADE	D.H.B.	4-90
CHECKED	D.E.L.	4-90
IN CHARGE	D. R. RUGGLES	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-55
						TOTAL SHEETS
						421

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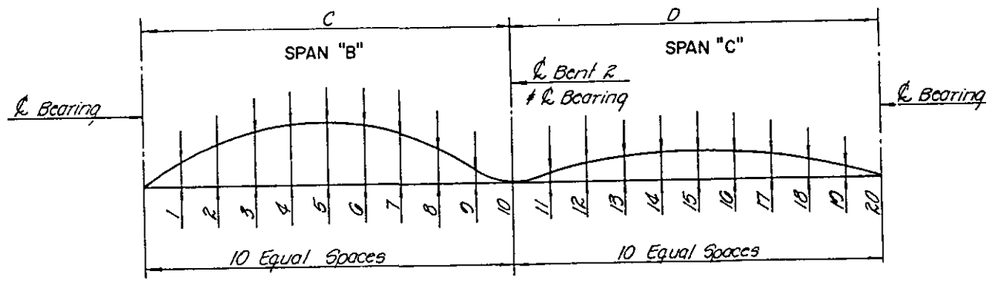
CAMBER AND DEFLECTIONS

Girder	Span	SPAN "B"										SPAN "C"									
	Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Girder 1	Deflection due to Wt. of Steel (Ft.)	.017	.031	.042	.046	.045	.039	.029	.018	.007	0	-.001	.002	.007	.012	.016	.018	.017	.013	.007	0
	Deflection due to Wt. of Slab (Ft.)	.073	.134	.175	.194	.189	.162	.119	.071	.027	0	.001	.018	.043	.069	.087	.095	.088	.068	.037	0
	Deflection due to Wt. of Rail and Future Wearing Surface (Ft.)	.013	.024	.032	.035	.035	.031	.023	.014	.005	0	.001	.005	.011	.016	.019	.020	.018	.014	.007	0
	Total Dead Load Deflection (Ft.)	.103	.189	.249	.275	.269	.232	.171	.103	.039	0	.001	.025	.061	.097	.122	.133	.123	.095	.051	0
	Vertical Curve Ordinate (Ft.)	.076	.135	.177	.202	.210	.202	.177	.135	.076	0	.057	.102	.133	.152	.159	.152	.133	.102	.057	0
	Superelevation Ordinate (Ft.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Required Camber (Ins.)	2 1/8"	3 7/8"	5 1/8"	5 3/4"	5 3/4"	5 5/16"	4 3/16"	2 7/8"	1 3/8"	0	1/16"	1 1/2"	2 5/16"	3"	3 3/8"	3 7/16"	3 1/16"	2 3/8"	1 5/16"	0
Additional Camber for Heat Curving (Ins.)		1/8"	1/4"	5/16"	3/8"	3/8"	5/16"	1/4"	1/8"	1/16"	0	0	1/16"	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	0
Girder 2	Deflection due to Wt. of Steel (Ft.)	.018	.033	.043	.048	.047	.041	.031	.019	.008	0	-.002	.000	.004	.009	.013	.015	.014	.011	.006	0
	Deflection due to Wt. of Slab (Ft.)	.075	.137	.180	.199	.194	.168	.125	.076	.030	0	-.003	.009	.031	.054	.072	.080	.076	.060	.033	0
	Deflection due to Wt. of Rail and Future Wearing Surface (Ft.)	.013	.024	.032	.036	.036	.031	.024	.015	.006	0	.000	.004	.009	.013	.016	.017	.016	.012	.007	0
	Total Dead Load Deflection (Ft.)	.106	.194	.255	.283	.277	.240	.180	.110	.044	0	-.005	.013	.044	.076	.101	.112	.106	.083	.046	0
	Vertical Curve Ordinate (Ft.)	.072	.127	.167	.191	.199	.191	.167	.127	.072	0	.054	.096	.126	.144	.150	.144	.126	.096	.054	0
	Superelevation Ordinate (Ft.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Required Camber (Ins.)	2 1/8"	3 7/8"	5 1/16"	5 11/16"	5 11/16"	5 3/16"	4 3/16"	2 7/8"	1 3/8"	0	9/16"	1 5/16"	2 1/16"	2 5/8"	3"	3 1/16"	2 13/16"	2 1/8"	1 3/16"	0
Additional Camber for Heat Curving (Ins.)		1/8"	1/4"	5/16"	3/8"	3/8"	5/16"	1/4"	1/8"	1/16"	0	0	0	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	0
Girder 3	Deflection due to Wt. of Steel (Ft.)	.019	.035	.046	.051	.050	.044	.034	.021	.009	0	-.002	-.002	.002	.006	.010	.012	.012	.010	.006	0
	Deflection due to Wt. of Slab (Ft.)	.077	.141	.186	.207	.203	.176	.133	.081	.033	0	-.006	.002	.021	.043	.061	.070	.067	.054	.030	0
	Deflection due to Wt. of Rail and Future Wearing Surface (Ft.)	.014	.025	.033	.037	.037	.033	.025	.016	.006	0	.000	.002	.007	.012	.015	.016	.015	.011	.006	0
	Total Dead Load Deflection (Ft.)	.110	.201	.265	.295	.290	.253	.192	.118	.048	0	-.008	.002	.030	.051	.086	.098	.094	.075	.042	0
	Vertical Curve Ordinate (Ft.)	.068	.121	.158	.181	.189	.181	.158	.121	.068	0	.051	.091	.119	.136	.142	.136	.119	.091	.051	0
	Superelevation Ordinate (Ft.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Required Camber (Ins.)	2 1/8"	3 7/8"	5 1/16"	5 11/16"	5 3/4"	5 3/16"	4 3/16"	2 7/8"	1 3/8"	0	1/2"	1 1/8"	1 13/16"	2 3/8"	2 3/4"	2 13/16"	2 9/16"	2"	1 1/8"	0
Additional Camber for Heat Curving (Ins.)		1/8"	3/16"	1/4"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0	0	0	1/16"	1/8"	3/16"	3/16"	3/16"	1/8"	1/16"	0
Girder 4	Deflection due to Wt. of Steel (Ft.)	.020	.037	.049	.056	.055	.049	.037	.024	.010	0	-.004	-.004	-.001	.004	.008	.010	.011	.009	.005	0
	Deflection due to Wt. of Slab (Ft.)	.080	.148	.196	.220	.217	.190	.145	.089	.037	0	-.010	-.006	.012	.034	.053	.065	.064	.052	.029	0
	Deflection due to Wt. of Rail and Future Wearing Surface (Ft.)	.014	.027	.036	.040	.040	.036	.028	.017	.007	0	-.001	.001	.006	.011	.014	.016	.015	.012	.006	0
	Total Dead Load Deflection (Ft.)	.114	.212	.281	.316	.312	.275	.210	.130	.054	0	-.015	-.009	.017	.049	.075	.091	.090	.073	.040	0
	Vertical Curve Ordinate (Ft.)	.064	.114	.150	.172	.179	.172	.150	.114	.064	0	.048	.086	.113	.129	.135	.129	.113	.086	.048	0
	Superelevation Ordinate (Ft.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Required Camber (Ins.)	2 1/8"	3 15/16"	5 1/16"	5 7/8"	5 7/8"	5 3/8"	4 5/16"	2 15/16"	1 7/16"	0	3/8"	15/16"	1 9/16"	2 1/8"	2 1/2"	2 5/8"	2 7/16"	1 15/16"	1 1/16"	0
Additional Camber for Heat Curving (Ins.)		1/8"	3/16"	1/4"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0	0	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/8"	1/16"	0

Note: Deflections are in feet.
Slope of the zero camber baseline varies.



SCHEMATIC OF CAMBER ORDINATES

	BY	DATE
MADE	T.M.H.	4-90
CHECKED	D.E.L.	5-90
IN CHARGE	D. R. RUGGLES	

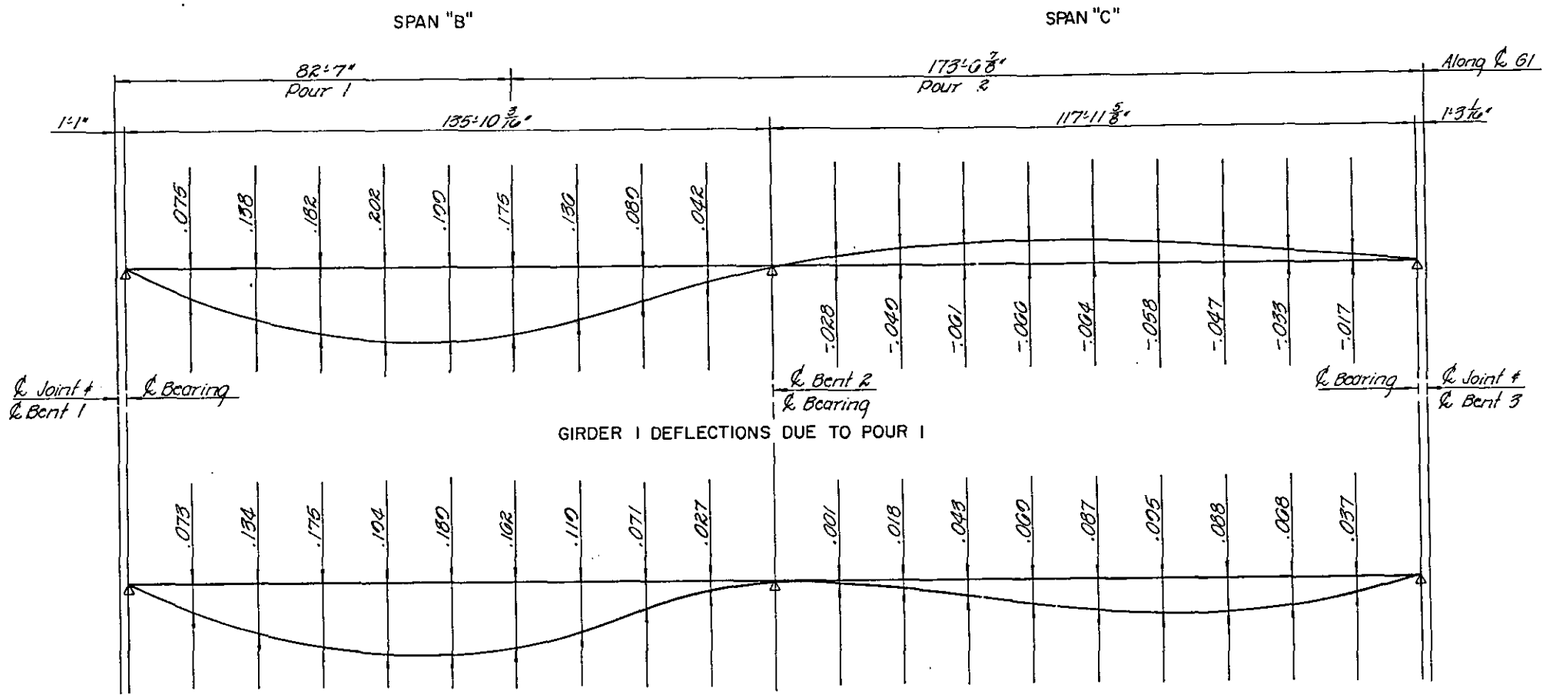
PREPARED BY
AMERICAN ENGINEERS

PROJECT: B-1670111
Mecklenburg COUNTY
STATION: 10+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPANS "B" & "C"

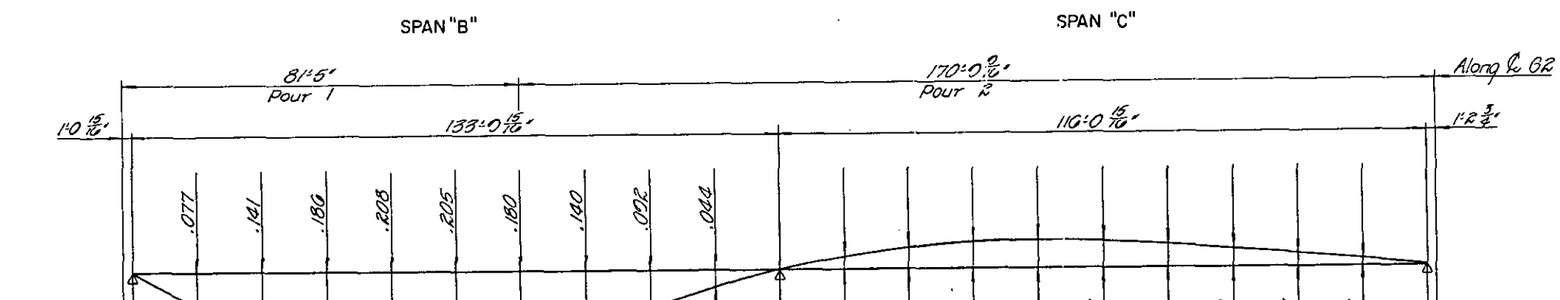
REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-56
						TOTAL SHEETS
						421

Dwg. 16 of 43

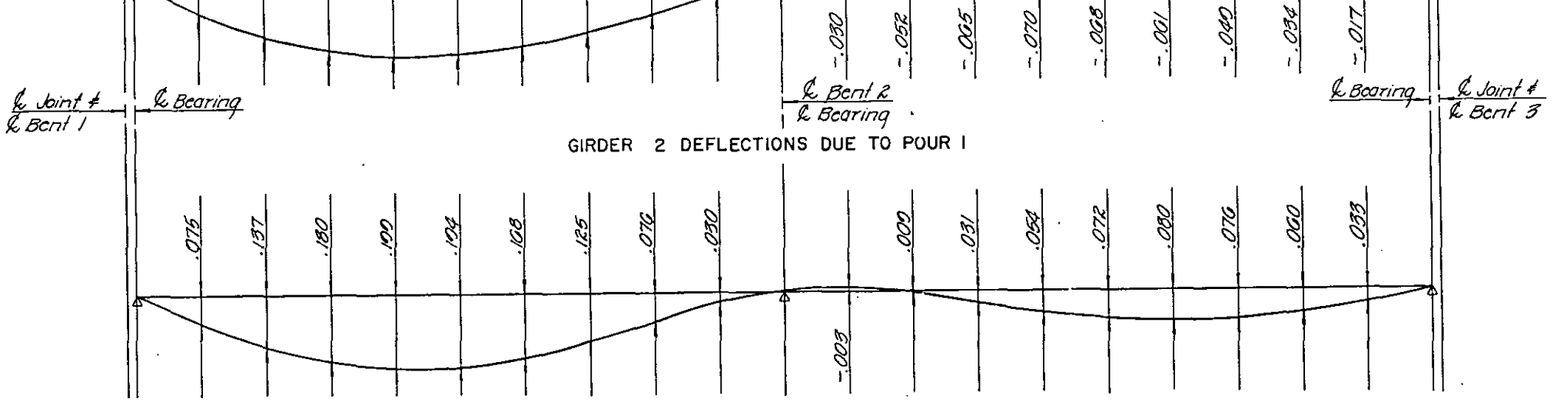


GIRDER 1 DEFLECTIONS DUE TO POUR 1

GIRDER 1 DEFLECTIONS DUE TO POURS 1 & 2



GIRDER 2 DEFLECTIONS DUE TO POUR 1



GIRDER 2 DEFLECTIONS DUE TO POURS 1 & 2

Note:
Deflections shown are in feet and are at the 1/10th points of the span, ℄ bearings to ℄ bearings.

PROJECT: 8.1667011
Mecklenburg COUNTY
STATION: 19+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GIRDER DEFLECTIONS
SPANS "B" & "C"

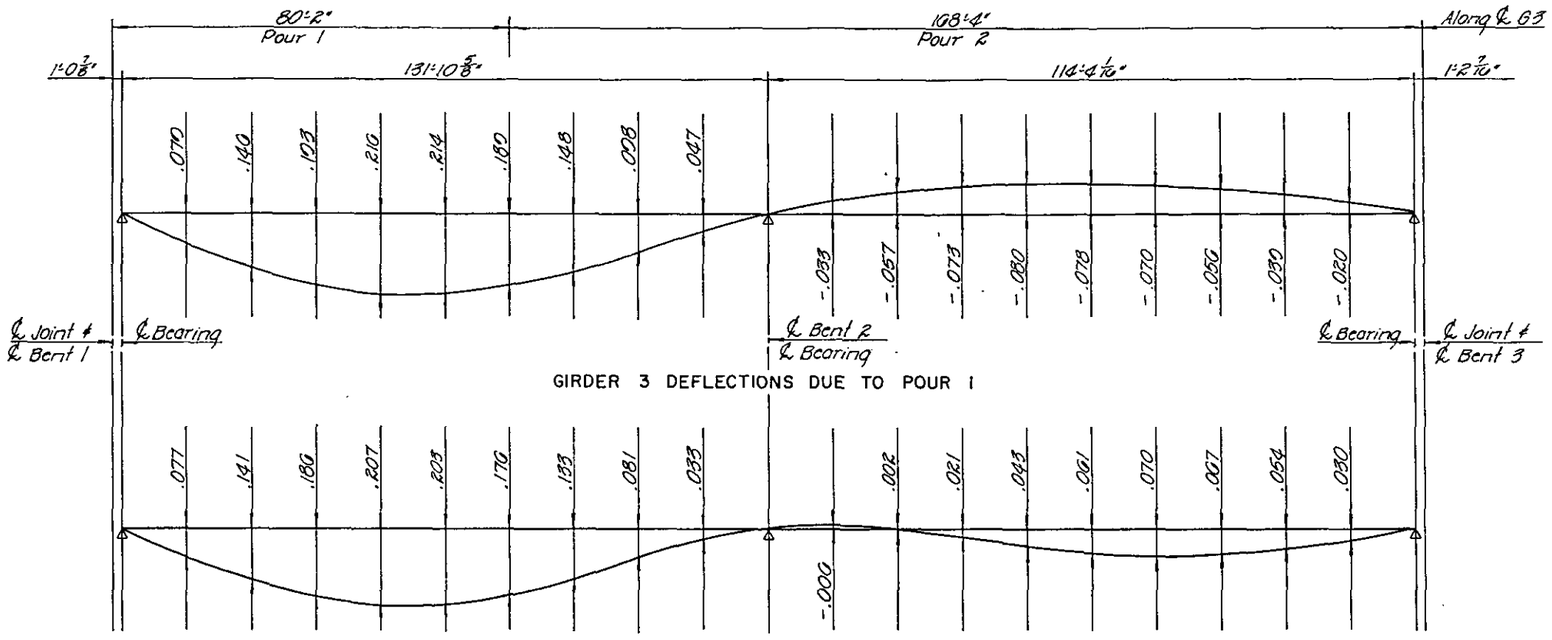
	BY	DATE
MADE	T.M.H.	5-90
CHECKED	D.E.L.	5-90
IN CHARGE	D.R. Ruggles	

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-57
						TOTAL SHEETS
						421

PREPARED BY
AMERICAN ENGINEERS

Dwg. 17 of 43

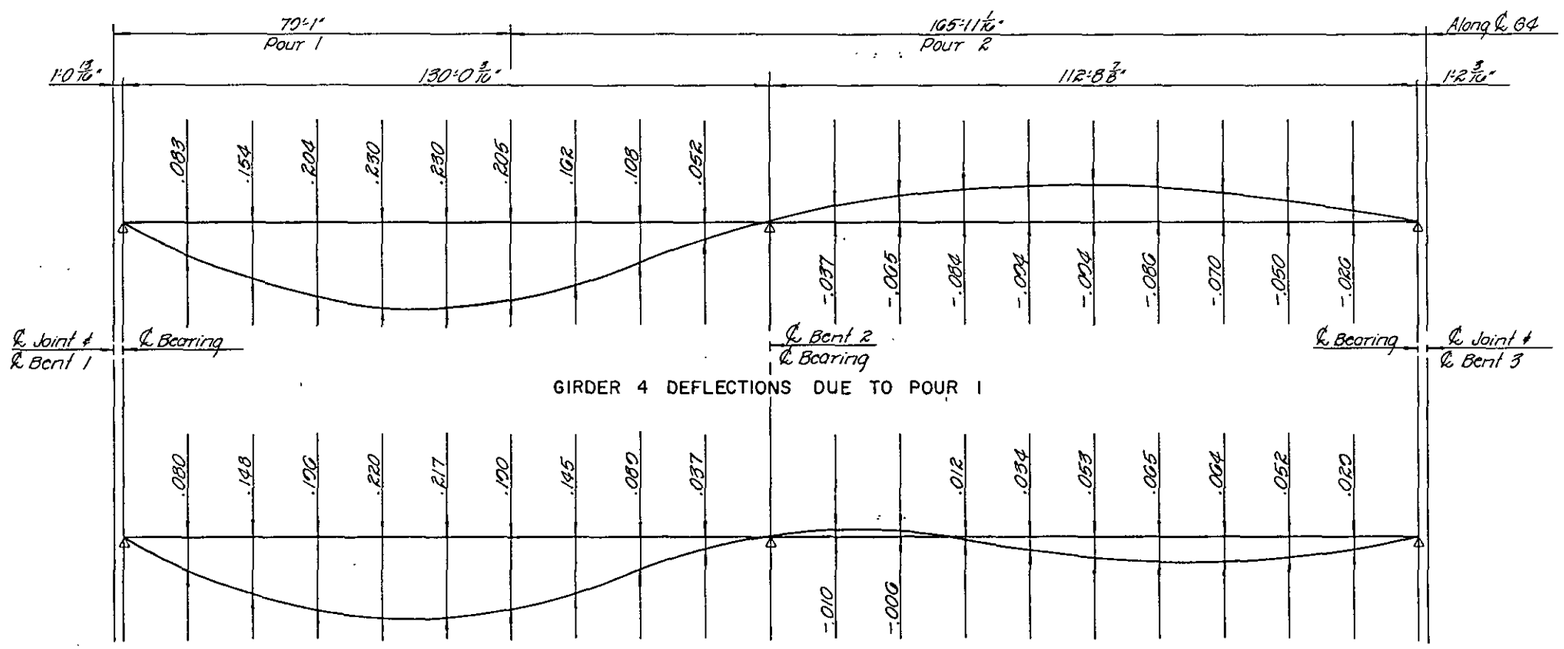
SPAN "B" SPAN "C"



GIRDER 3 DEFLECTIONS DUE TO POUR 1

GIRDER 3 DEFLECTIONS DUE TO POURS 1 & 2

SPAN "B" SPAN "C"



GIRDER 4 DEFLECTIONS DUE TO POUR 1

GIRDER 4 DEFLECTIONS DUE TO POURS 1 & 2

Note:
Deflections shown are in feet and are at the 1/10th points of the span, ℄ bearings to ℄ bearings.

PROJECT: 8.1167011 1
Mecklenburg COUNTY
STATION: 10+59.36 Ramp "CA"

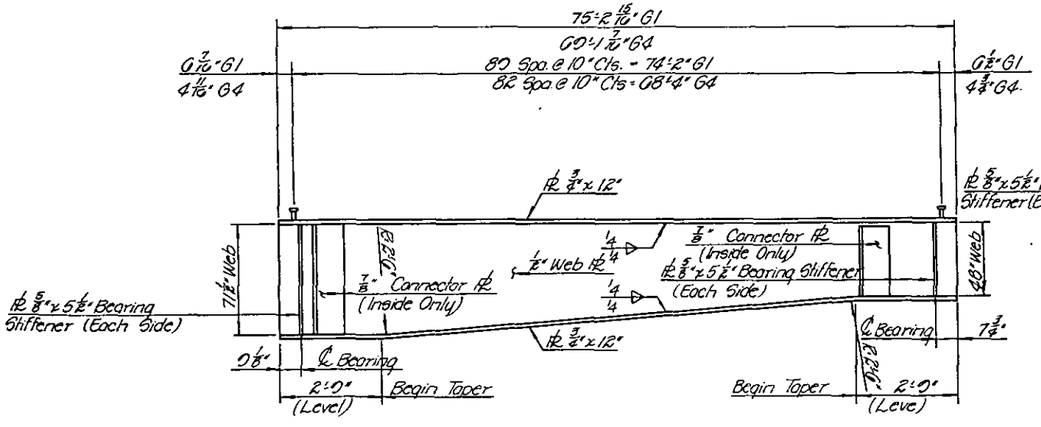
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GIRDER DEFLECTIONS
SPANS "B" & "C"

	BY	DATE
MADE	T.M.H	5-90
CHECKED	D.E.L	5-90
IN CHARGE	D.R. Ruggles	

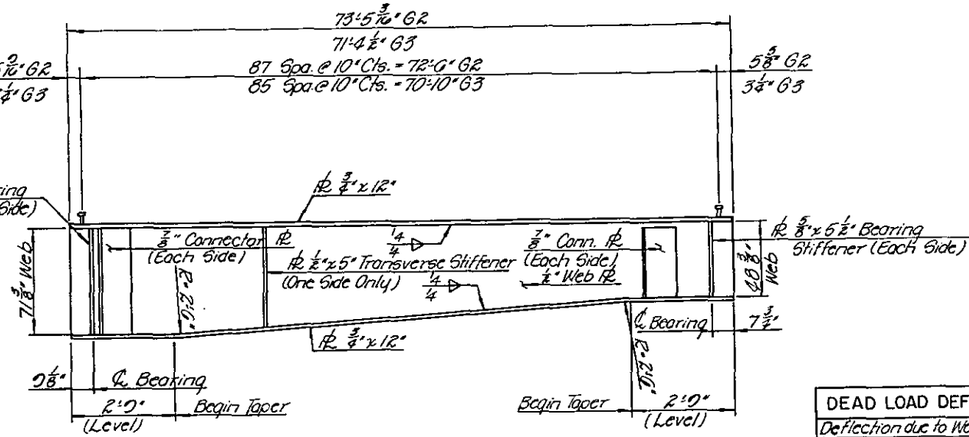
PREPARED BY
AMERICAN ENGINEERS

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-58
						TOTAL SHEETS
						421

Dwg. 18 of 43

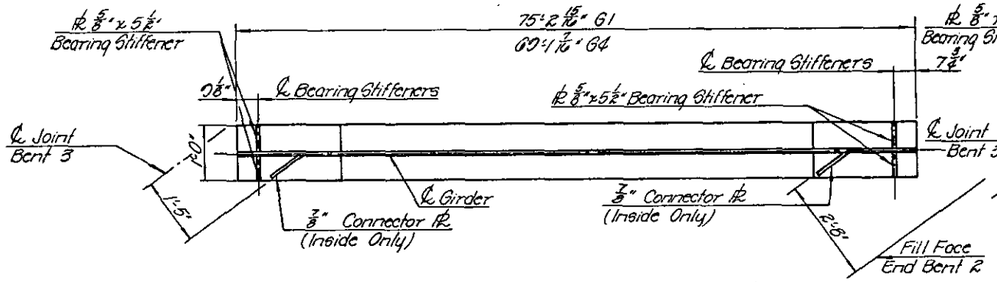


ELEVATION - GIRDERS G1 & G4

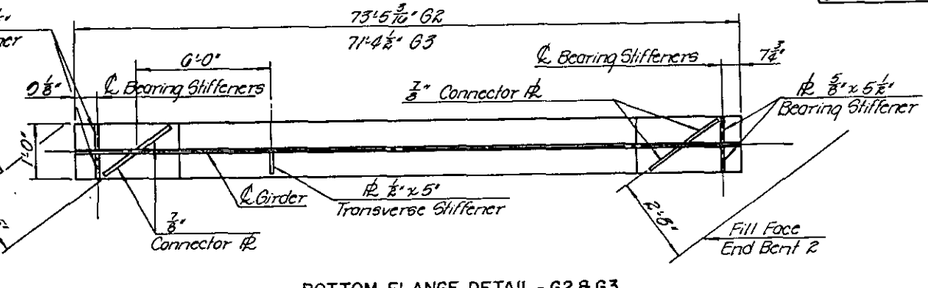


ELEVATION - GIRDERS G2 & G3

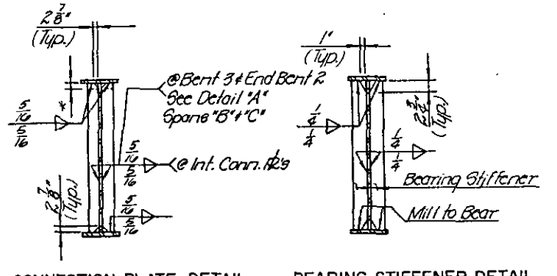
DEAD LOAD DEFLECTION (FT.)	G1&G4	G2&G3
Deflection due to Weight of Steel	.014	.015
Deflection due to Weight of Slab and Buildups	.091	.095
Deflection due to Weight of Barrier Rails & Future Wearing Surface	.013	.011
Total Dead Load Deflection	.118	.121
Vertical Curve Ordinate	.000	.000
Superelevation Ordinate	0	0
Girder Camber	1'2" (1)	1'2" (1)



BOTTOM FLANGE DETAIL - G1&G4



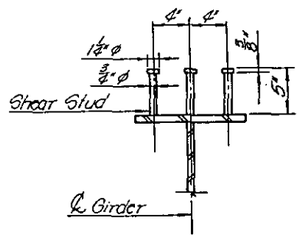
BOTTOM FLANGE DETAIL - G2&G3



CONNECTION PLATE DETAIL

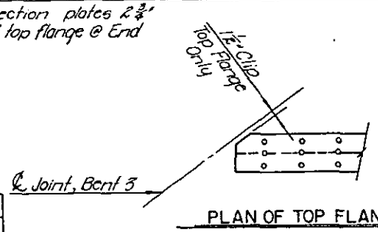
BEARING STIFFENER DETAIL

* Terminate connection plates 2 3/8" from bottom of top flange @ End Bent #2 only.



SHEAR STUD DETAIL

Note: Studs to be placed perpendicular to ℄ Girder. Studs may be shifted slightly, if necessary, to clear Flange Splice Weld.



PLAN OF TOP FLANGE

Notes:
Dimensions shown in Girder Elevations, excluding web depth dimensions, are horizontal dimensions.

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.

Bearing Stiffeners to be placed parallel to adjacent end of girder.

For Shop Web Splice, Flange to Web Weld & Shop Flange Splice Details see Structural Details Spans "B" & "C"

A Charpy V-Notch Test is required on all girder sections, see Special Provisions.

For Weld Termination Detail, see Sheet No. 8.

End of Girders shall be plumb.

Shop splices are permitted to limit the maximum required flange piece lengths to 60 ft. and web piece lengths to 45 ft. Permitted flange and web shop splices shall not be located within 15 ft. of max. dead load deflection. keep 2 ft. min. between web and flange shop splices.

PROJECT: 8.U670111

Mecklenburg COUNTY

STATION: 10+60.38 Ramp "CA"

	BY	DATE
MADE	D.H.B.	3-90
CHECKED	K.R.W.	3-90
IN CHARGE	D.R. RUGGLES	

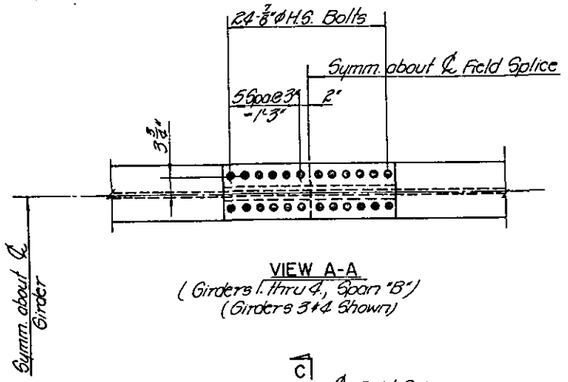
PREPARED BY
AMERICAN ENGINEERS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

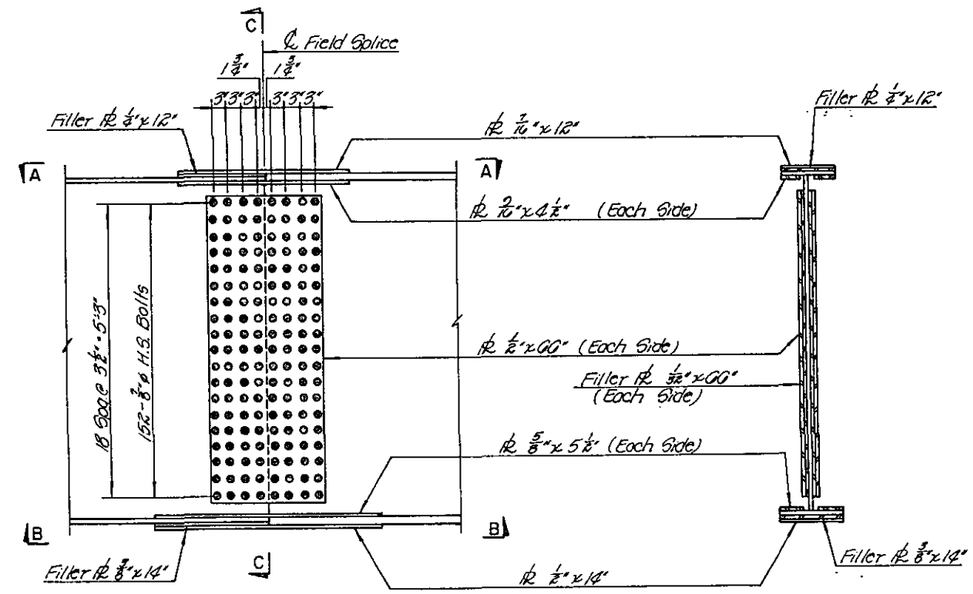
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
SPAN "D"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-59
						TOTAL SHEETS
						421

Dwg. 19 of 43

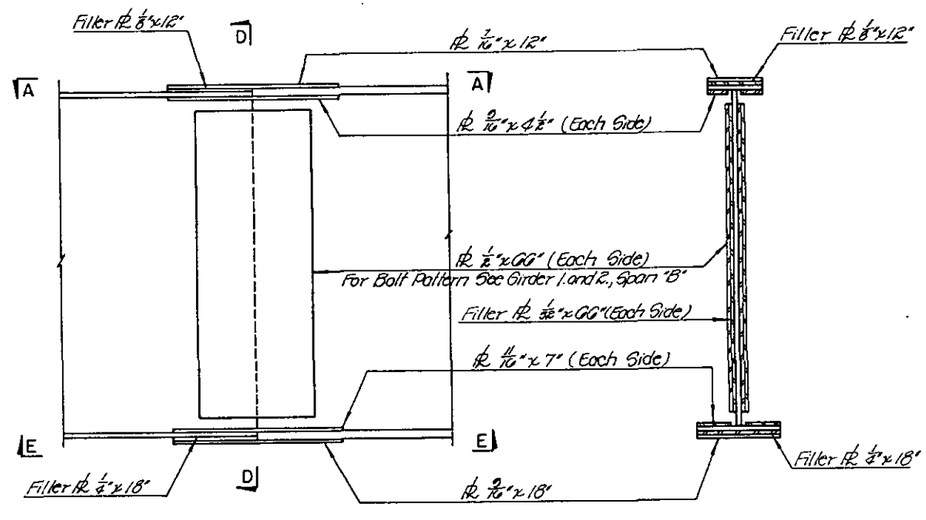


VIEW A-A
(Girders 1. thru 4., Span "B")
(Girders 3 & 4 Shown)



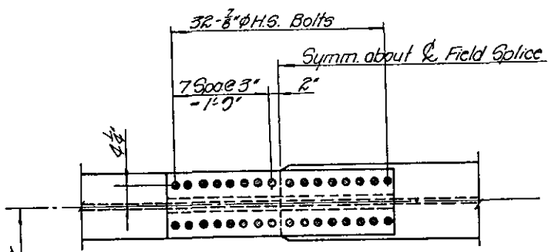
ELEVATION
(Girders 1. and 2., Span "B")

SECTION C-C
(Girders 1. and 2., Span "B")

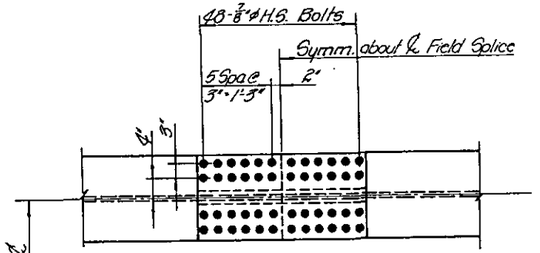


ELEVATION
(Girders 3. and 4., Span "B")

SECTION D-D
(Girders 3. and 4., Span "B")



VIEW B-B
(Girders 1. and 2., Span "B")



VIEW E-E
(Girders 3. and 4., Span "B")

PREPARED BY
AMERICAN ENGINEERS

	BY	DATE
MADE	L.M.D.	5-90
CHECKED	D.E.L.	5-90
IN CHARGE	D. R. RUGGLES	

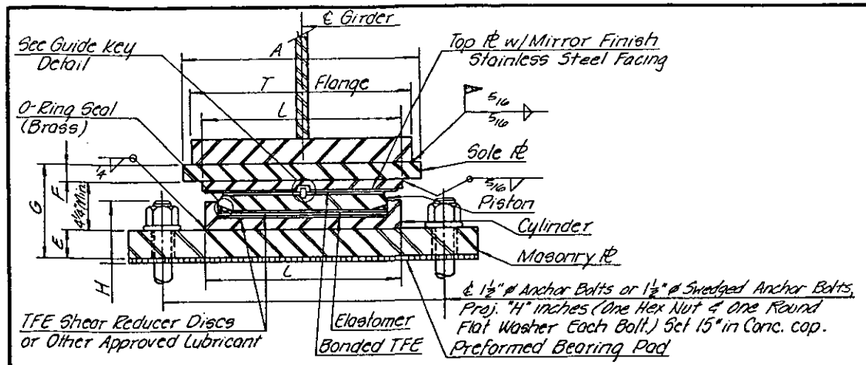
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FIELD SPLICE DETAILS
SPAN "B"

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-60
						TOTAL SHEETS
						121

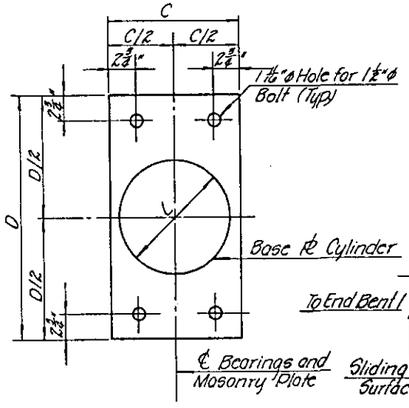
Dwg. 20 of 43



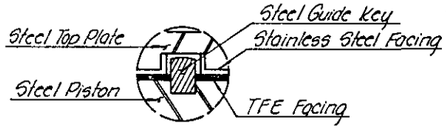
SECTION A-A

MARK	LOCATION SPAN	BENT OR END BENT	GIRDER	MAX REACTION (KIPS)	DEAD LOAD REACTION (KIPS)	FLANGE WIDTH T	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Θ	β
* LRE-200	B	B1	BC-1	137	79	14"	1'-3¾"	1'-5¾"	1'-1½"	2'-3½"	2⅜"	1¼"	7⅞"	5"	—	—	1'-2"	11½"	1⅛"	1⅞"	125°09'31"	119°58'52"
* LRE-200	B	B1	BC-2	156	88	14"	1'-3¾"	1'-5¾"	1'-1½"	2'-3½"	2⅜"	1¼"	7⅞"	5"	—	—	1'-2"	11½"	1⅛"	1⅞"	124°36'22"	119°34'10"
* LRE-200	B	B1	BC-3	172	101	12"	1'-3¾"	1'-5¾"	1'-1½"	2'-3½"	2⅜"	1¼"	7⅞"	5"	—	—	1'-2"	11½"	1⅛"	1⅞"	124°04'19"	119°10'10"
* LRE-200	B	B1	BC-4	171	103	12"	1'-3¾"	1'-5¾"	1'-1½"	2'-3½"	2⅜"	1¼"	7⅞"	5"	—	—	1'-2"	11½"	1⅛"	1⅞"	123°33'18"	118°46'51"
* LRE-150	C	B3	BC-1	126	68	12"	1'-2¼"	1'-4¼"	1'-1½"	2'-1½"	2"	1¼"	7½"	4½"	—	—	1'-0⅞"	10⅛"	1¼"	1¼"	41°13'38"	36°43'53"
* LRE-150	C	B3	BC-2	139	74	12"									—	—					42°02'52"	37°40'45"
* LRE-150	C	B3	BC-3	138	71	12"									—	—					42°50'04"	38°35'04"
* LRE-150	C	B3	BC-4	141	74	12"									—	—					43°35'25"	39°27'02"
LRE-150	D	B3	D1	125	65	12"									—	—					146°04'19"	146°04'19"
LRE-150	D	B3	D2	130	70	12"									—	—					145°05'42"	145°05'42"
LRE-150	D	B3	D3	128	68	12"									—	—					143°54'47"	143°54'47"
LRE-150	D	B3	D4	119	59	12"	1'-2¼"	1'-4¼"	1'-1½"	2'-1½"	2"	1¼"	7½"	4½"	—	—	1'-0⅞"	10⅛"	1¼"	1¼"	142°30'36"	142°30'36"

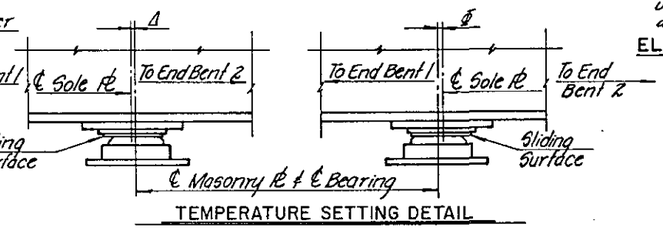
* Pipe Sleeve Insert required.



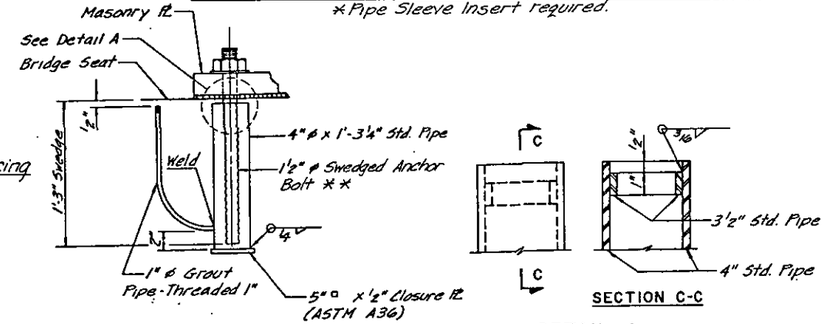
MASONRY PLATE



GUIDE KEY DETAIL



TEMPERATURE SETTING DETAIL



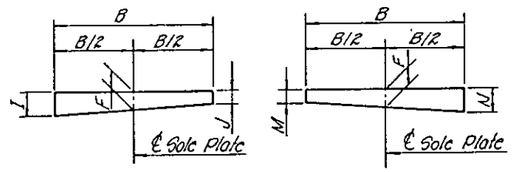
** Anchor Bolt shall be grouted in place using non-shrink non-metallic grout as approved by the engineer.

ELEVATION

DETAIL A

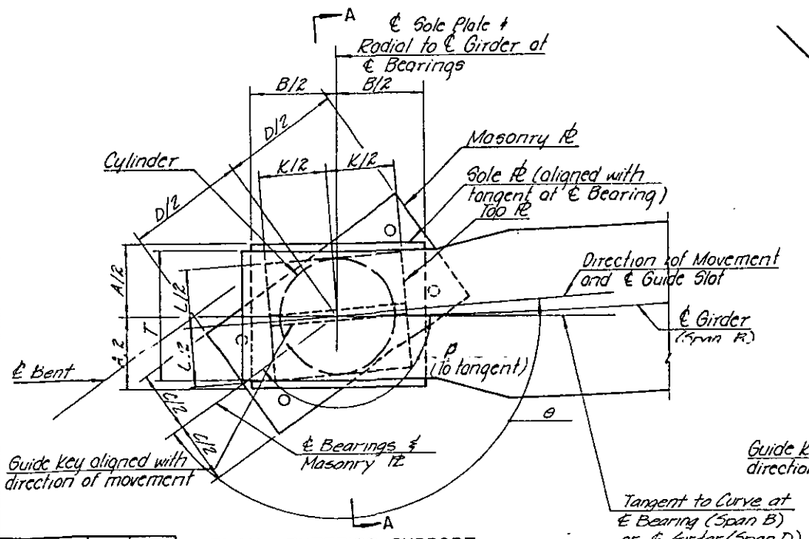
TABLE FOR PLATE SETTING DATA							
Temperature at Time of Setting	Δ @ 30° F	Φ @ 30° F	Δ @ 60° F	Φ @ 60° F	Δ @ 90° F	Φ @ 90° F	Total Movement
Bent 1	—	3/8"	0	0	3/8"	—	1 9/16"
Bent 3 - Span C	5/16"	—	0	0	—	5/16"	1 3/8"
Bent 3 - Span C	—	3/16"	0	0	3/16"	—	7/8"

PIPE SLEEVE DETAIL

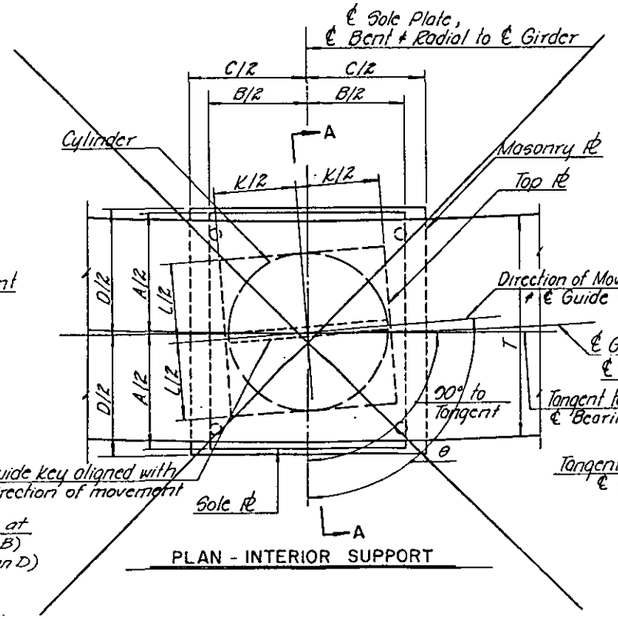


SOLE PLATE ELEVATION

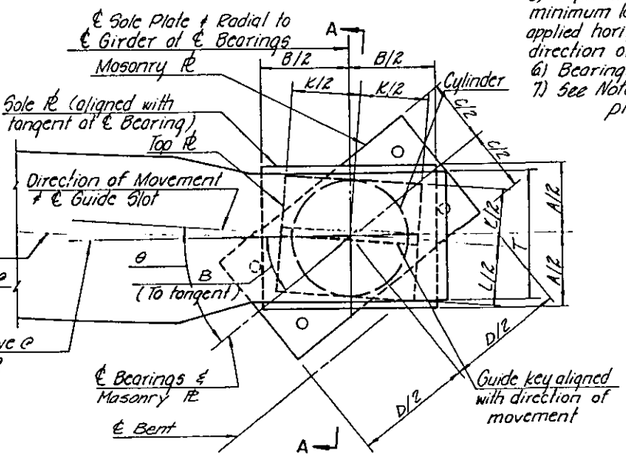
Notes:
1) For Pot Bearings, see Special Provisions.
2) Bridge seat elevations are based on an assumed pot bearing depth as shown. The contractor shall adjust the bridge seat elevs. if the pot bearing depth varies from the assumed depth shown. Plans for any adjustments shall be approved before any work is begun on the bents or end bents.
3) See Note 1 on Dwg. 22 for adjusting location of bearings.
4) At all points of support in Spans B-D, nuts for anchor bolts shall be tightened finger tight and given an additional ¼ turn. The thread of the nut and bolt shall then be burred with a sharp pointed tool.
5) Expansion bearings shall be capable of resisting a minimum lateral force of 15% of vertical design load applied horizontally in a direction transverse to the direction of movement.
6) Bearings must permit a minimum rotation of 1°30'.
7) See Note 7 on Dwg. 22 for welding the sole plate to the girder.



PLAN - EXTERIOR SUPPORT
BENT 1 OR BENT 3 SPAN D



PLAN - INTERIOR SUPPORT



PREPARED BY AMERICAN ENGINEERS

PLAN - EXTERIOR SUPPORT
BENT 3 SPAN C

	BY	DATE
MADE	D.R.R.	5-90
CHECKED	W.L.H.	5-90
IN CHARGE	D. R. Ruggles	

PROJECT: 8UG7011.1
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
EXPANSION POT BEARINGS

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-61
						TOTAL SHEETS
						47

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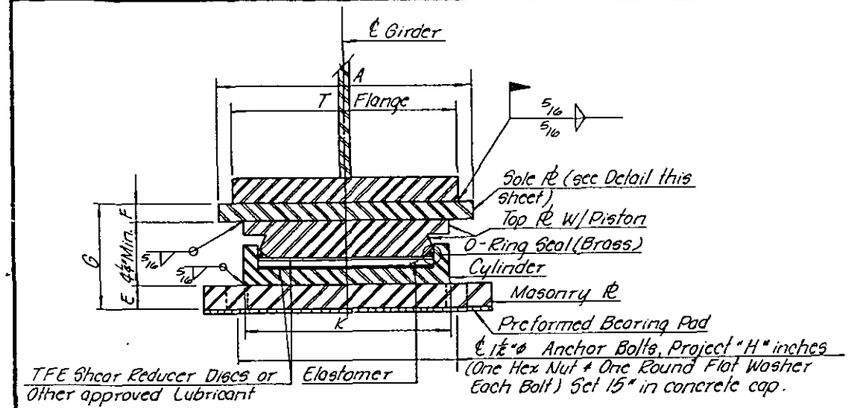
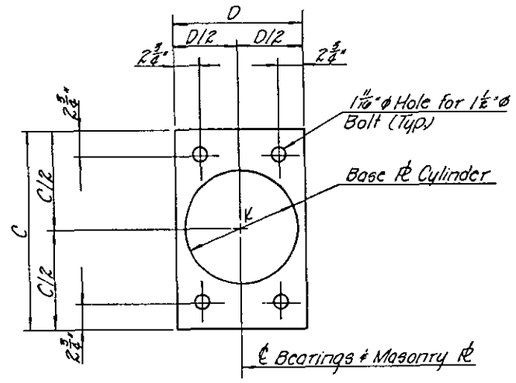
MARK	LOCATION			MAX REACTION (KIPS)	DEAD LOAD REACTION (KIPS)	FLANGE WIDTH T	A	B	C	D	E	F	G	H	I	J	K	L	M
	SPAN	BENT OR END BENT	GIRDER																
FI-500	BC	B2	1-2 / 3-4	462	325	16" / 18"	1'-7½"	1'-6¾"	1'-11"	1'-11"	2½"	1½"	7¾"	5"	—	—	1'-5¼"	1⅛"	1⅜"
FE-150	D	EB2	1-4	130	70	12"	1'-1½"	1'-1½"	1'-6½"	1'-1½"	1½"	1¼"	7"	4"	1 5/16"	1 3/16"	10⅛"	—	—

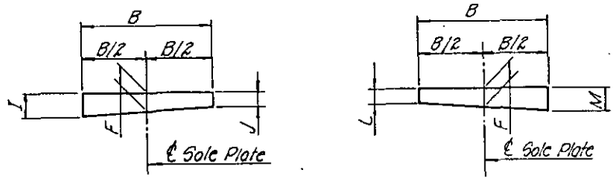
Girder	B	θ
BC-1	134°16'37"	—
BC-2	133°35'01"	—
BC-3	132°54'55"	—
BC-4	132°16'12"	—
D-1	33°55'41"	56°04'19"
D-2	34°54'18"	55°05'42"
D-3	36°05'19"	53°54'47"
D-4	37°29'24"	52°30'36"



SECTION A-A



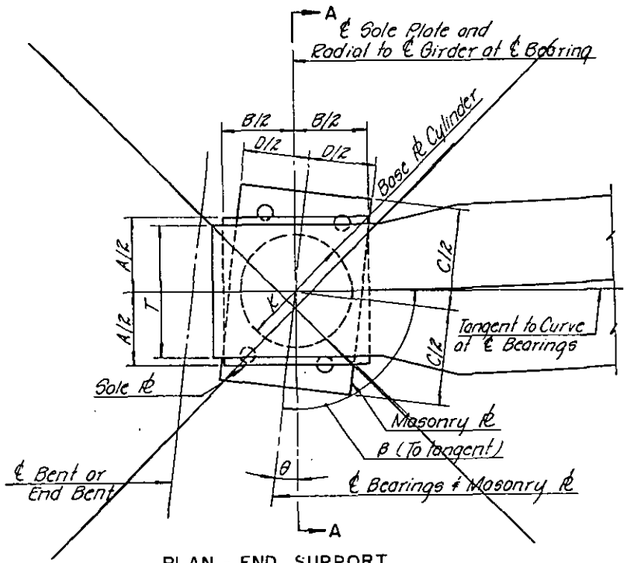
PLAN OF MASONRY PL



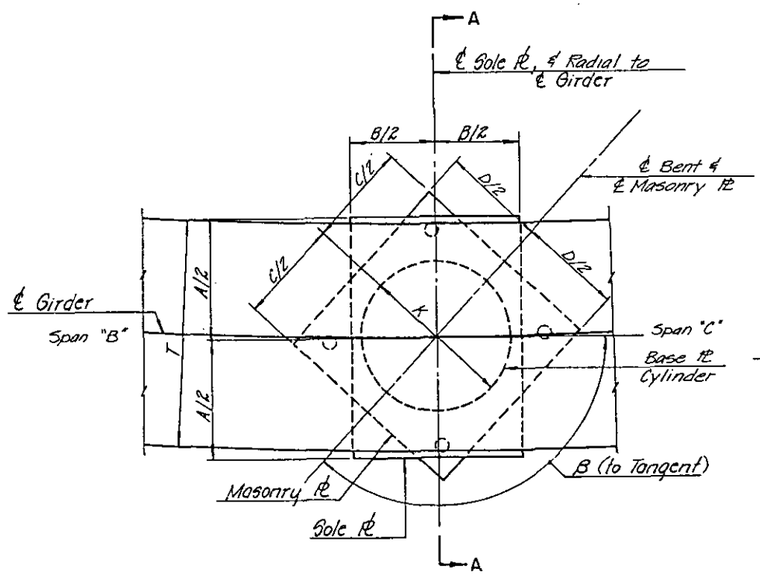
DESCENDING GRADE

ASCENDING GRADE

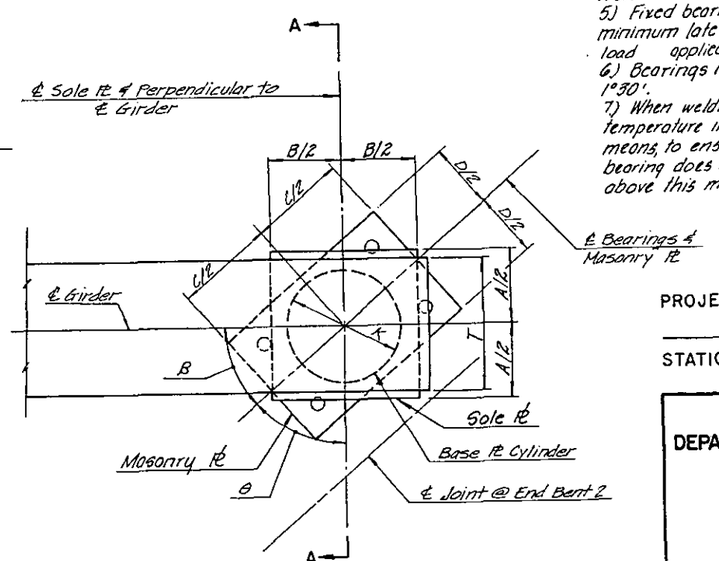
SOLE PL ELEVATION



PLAN - END SUPPORT



PLAN - INTERIOR SUPPORT
BENT 2



PLAN - END SUPPORT
END BENT 2

Notes:
1.) 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.
2.) For Pot Bearings, see Special Provisions.
3.) Bridge Seat elevations are based on an assumed pot bearing depth as shown. The contractor shall adjust the bridge seat elevations if the pot bearing depth varies from the assumed depth shown. Plans for any adjustments shall be approved before any work is begun on the bent.
4.) At all points of support in spans B-D, nuts for anchor bolts shall be tightened finger light and given an additional ¼ turn. The thread of the nut and bolt shall then be burred with a sharp pointed tool.
5.) Fixed bearings shall be capable of resisting a minimum lateral force of 15% of vertical design load applied horizontal in any direction.
6.) Bearings must permit a minimum rotation of 1°30'.
7.) 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 250° F. Temperatures above this may damage the TFE or elastomer.

PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FIXED POT BEARINGS

	BY	DATE
MADE	D.R.R.	5-90
CHECKED	W.L.H.	5-90
IN CHARGE D. R. Ruggles		

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S 62
						TOTAL SHEETS
						421

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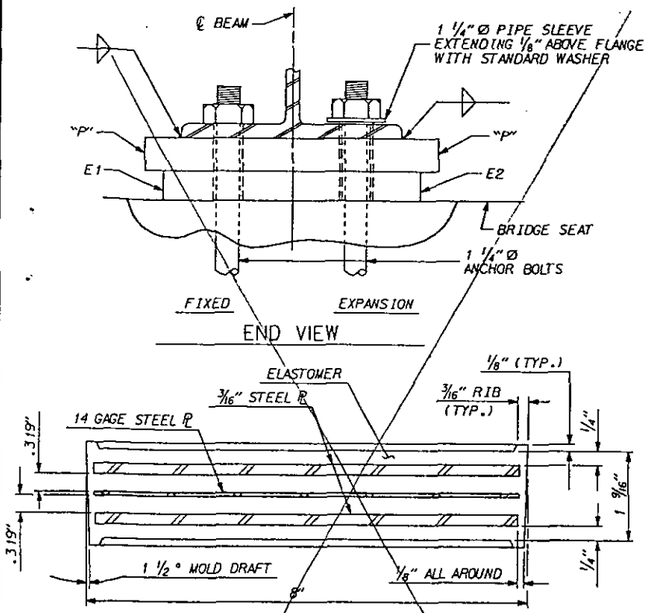
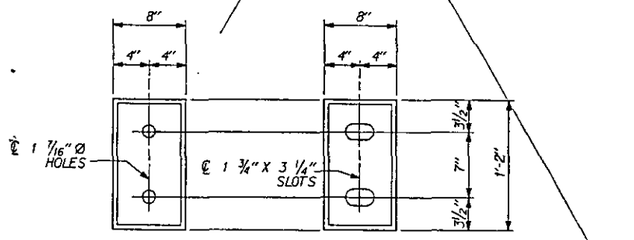
AMERICAN ENGINEERS

Dwg. 22 of 43

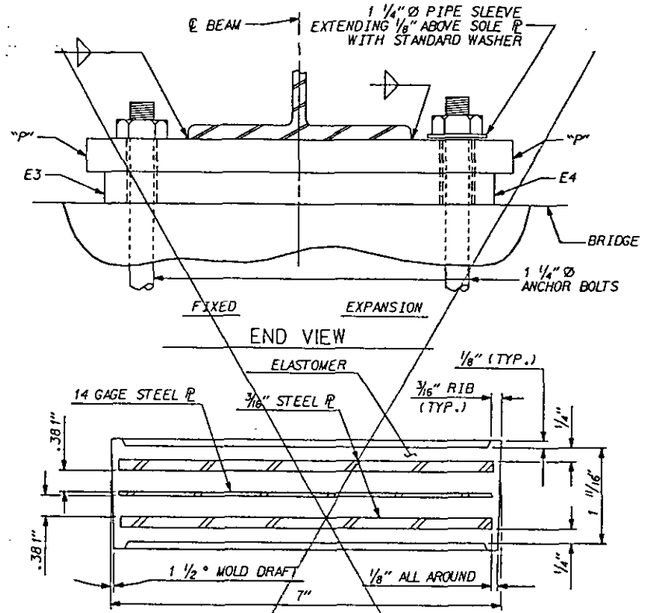


TYPICAL SECTION OF ELASTOMERIC BEARINGS

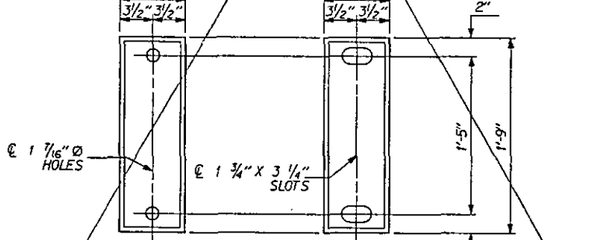


PLAN VIEW OF ELASTOMERIC BEARING

TYPE I

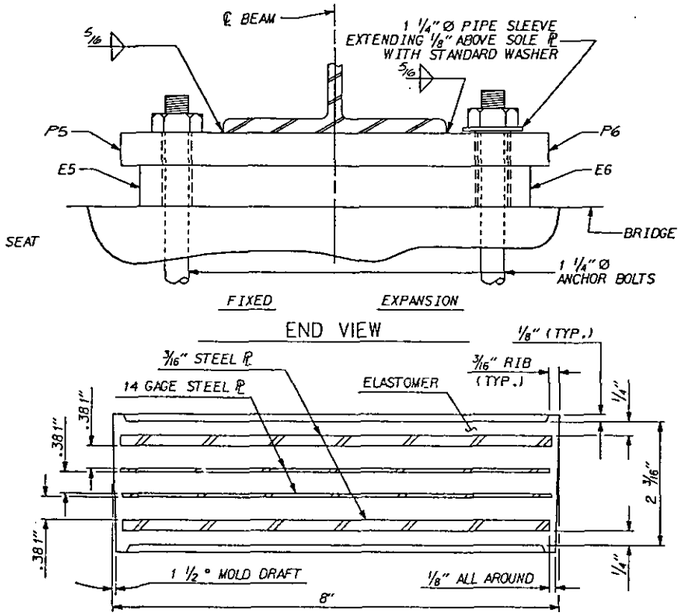


TYPICAL SECTION OF ELASTOMERIC BEARINGS

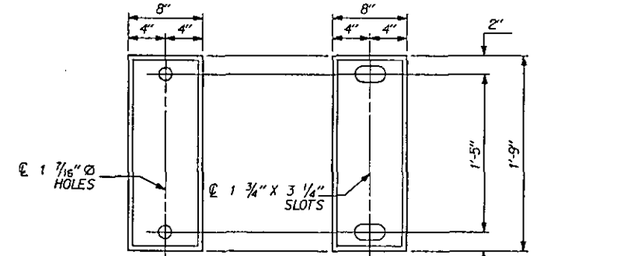


PLAN VIEW OF ELASTOMERIC BEARING

TYPE II

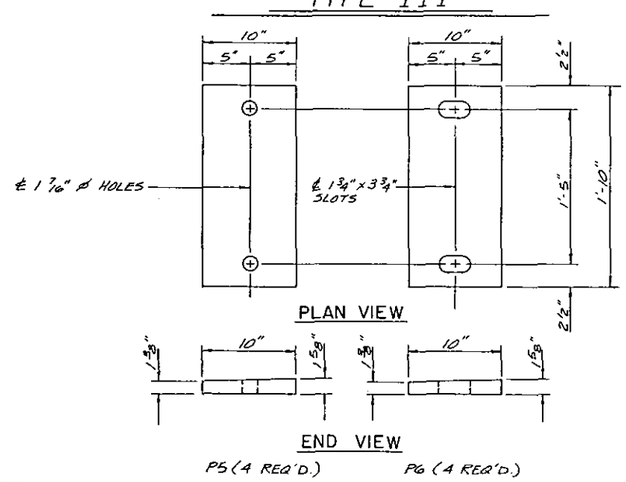


TYPICAL SECTION OF ELASTOMERIC BEARINGS



PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



SOLE PLATE DETAILS ("P")

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 1 1/4" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 P.V.C. PLASTIC PIPE. THE P.V.C. PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF A.S.T.M. D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL, SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR UNPAINTED A.S.T.M. A-588 STRUCTURAL STEEL, SOLE PLATE SHALL BE A.S.T.M. A-588 AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS AND NUTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHITE LEAD AND TALLOW SHALL NOT BE APPLIED TO THE SURFACE OF THE SOLE PLATE IN CONTACT WITH THE ELASTOMERIC BEARING.

-LOAD RATINGS-

	MAX. D.L. +L.L.
TYPE I	64.63 K
TYPE II	81.52 K
TYPE III	105.68 K
TYPE IV	141.71 K

REVISED BY W.J.H. CHECKED BY C.R.K. 8-__-1989
REVISED BY W.J.H. CHECKED BY C.R.K. 3-1-1989
REDRAWN 2-23-88

ASSEMBLED BY : JWR	DATE : 5/90	SPECIAL
CHECKED BY : DRR	DATE : 5/90	
DRAWN BY : MIKE BRITT	DATE : NOV. 1987	STANDARD
CHECKED BY : RANDY BISSETTE	DATE : NOV. 1987	

PROJECT NO. 8.U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "A"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

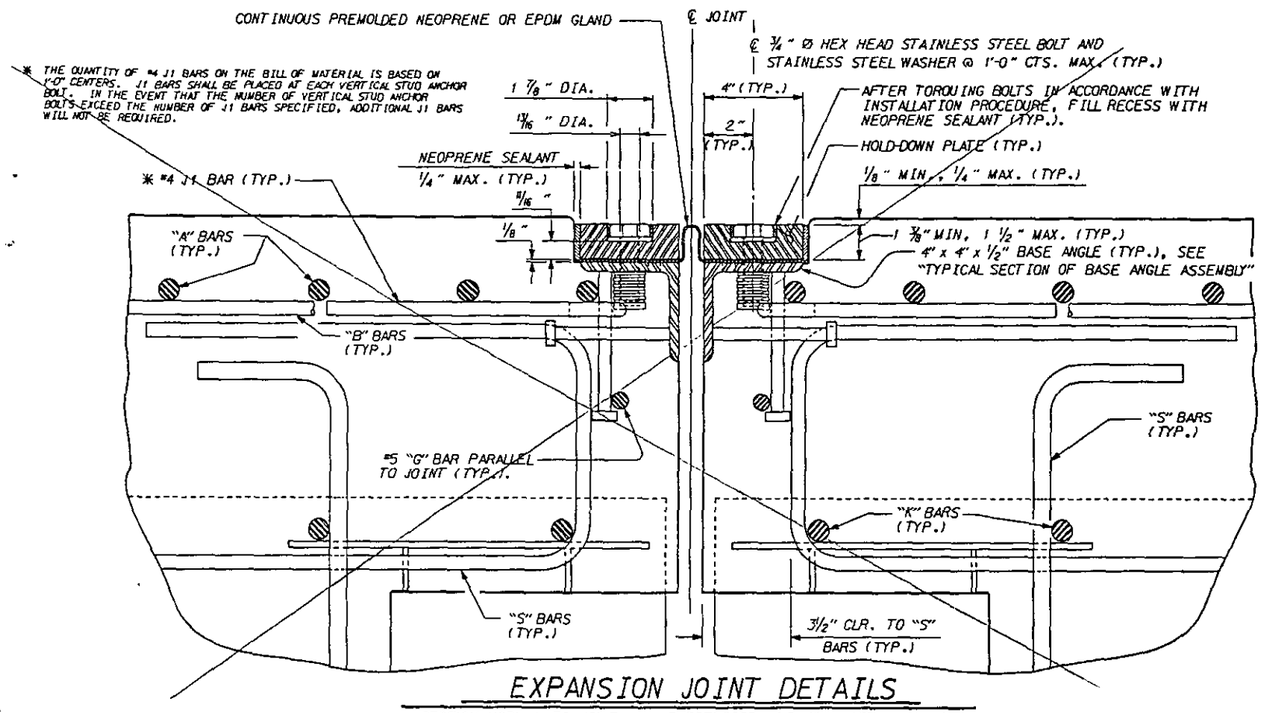
(STEEL SUPERSTRUCTURE)

FEB. 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			121

Dwg. 23 of 43

STD. No. EB1

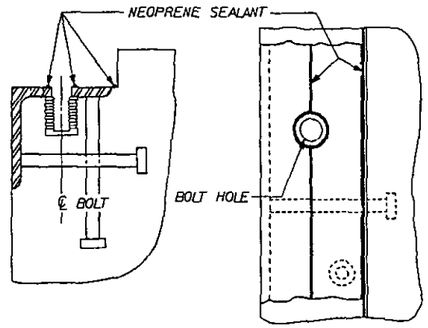


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1/4" TO 3/8" THICKER THAN THE HOLD DOWN PLATE AND 4 1/8" TO 4 1/4" WIDE IN ORDER FOR THE JOINT TO BE SET TO THE PROPER DEPTH. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEPHOLE IN THE 4" x 4" x 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED METHOD OF HOLDING THE BASE ANGLE ASSEMBLY IN PLACE WHILE THE CONCRETE IS CAST AROUND IT. THE TEMPLATE SHALL BE FLUSH WITH THE TOP OF DECK.
3. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 6 DRY MILS. OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
4. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
5. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
6. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT.-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT.-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT.-LBS. AFTER SEVEN (7) DAYS.
7. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.



INSTALLATION SKETCH

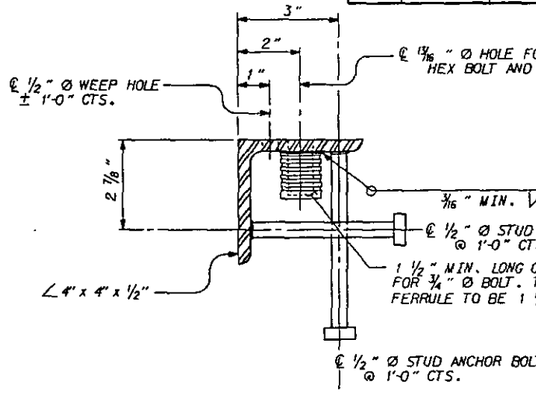
GENERAL NOTES

1. ARMORED JOINTS SHALL BE PROVIDED AT ALL LOCATIONS SHOWN ON THE PLANS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO ASTM A36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS AND WASHERS SHALL CONFORM TO TYPE 304 STAINLESS STEEL OR EQUIVALENT. ALL STUD ANCHORS SHALL CONFORM TO ASTM A108, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED-END AND SHALL CONFORM TO ASTM A108, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT. GLAND SHALL BE EITHER ELASTIC POLYCHLOROPRENE (NEOPRENE) OR ETHYL PROPYLENE DIENE MONOMER (EPDM) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

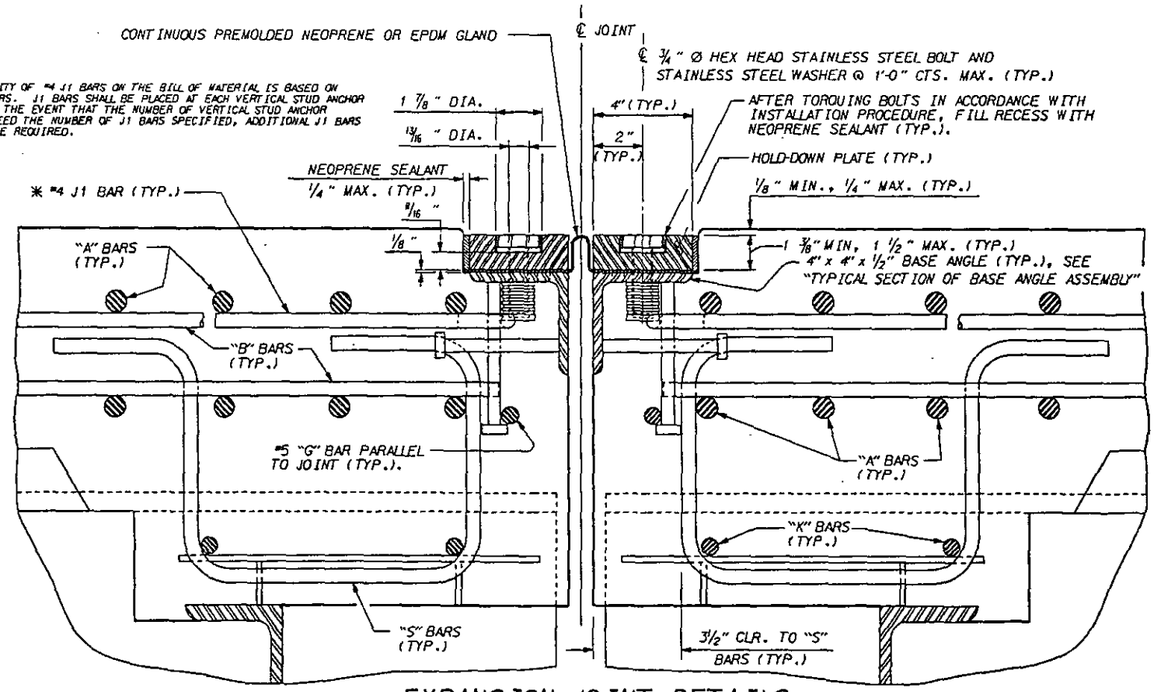
	ASTM TEST	REQUIREMENTS
HARDNESS, DUROMETER-SHORE A	D2240	60±5, NEOPRENE (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED) 75±5, EPDM AND NEOPRENE (UPWARD NON-CORRUGATED SHAPE) 80±5, EPDM (UPWARD CORRUGATED SHAPE-FABRIC REINFORCED)
TENSILE STRENGTH	D412	2000 PSI, MIN.
ELONGATION AT BREAK	D412	250% MIN.
THICKNESS OF UPTURNED PORTION OF GLAND	N/A	1/4" (NON-CORRUGATED SHAPE) 1/8" (CORRUGATED SHAPE)

5. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
6. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO PAINTING.
7. UPON COMPLETION OF SHOP FABRICATION, ALL STEEL PARTS, EXCLUDING STAINLESS STEEL BOLTS, SHALL BE COMMERCIALLY BLAST CLEANED AND SHALL BE COATED WITH A MINIMUM THICKNESS OF 6 DRY MILS. OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS. PAINTED SURFACES THAT ARE ABRADED OR DAMAGED AT ANY TIME AFTER THE APPLICATION OF THE ZINC COATING SHALL BE REPAIRED AS SPECIFIED FOR DAMAGED GALVANIZING.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. WHEN FIELD WELDING IS PROPOSED, THE CONTRACTOR SHALL SUBMIT PROPOSED WELDING DETAILS FOR APPROVAL. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 6 DRY MILS. OF ZINC-RICH PAINT IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM OF 1/8" AND A MAXIMUM OF 1/4" BELOW THE TOP OF SLAB.
10. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
11. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
12. SEE SPECIAL PROVISIONS FOR EXPANSION JOINT SEALS.
13. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLT OR DOWELS". THE REQUIRED DESIGN LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. THE ANCHOR BOLTS SHALL BE COATED WITH A DEBONDING AGENT SO THAT THE ANCHOR BOLTS CAN BE EASILY REMOVED IF NECESSARY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE DEBONDING AGENT DOES NOT REDUCE THE STRENGTH OF THE ANCHOR SYSTEM. TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ ROWY)	PERPENDICULAR JOINT OPENING AT 30° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	119°22'18"	2⅜"	2 7/16"	1 15/16"	1 1/2"
3	142°08'46"	2 1/4"	2"	1 11/16"	1 5/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

ASSEMBLED BY : JWB	DATE : 5/90	SPECIAL
CHECKED BY : DBR	DATE : 5/90	
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87	STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87	

REVISED BY W.J.H. CHECKED BY C.R.K. 8-22-1989
ADDED 2-29-88

PROJECT NO. 8.U670111

MECKLENBURG COUNTY

STATION: 19+59.38 RAMP "CA"

SHEET 1 OF

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	1A
1			3			TOTAL SHEETS
2			4			471

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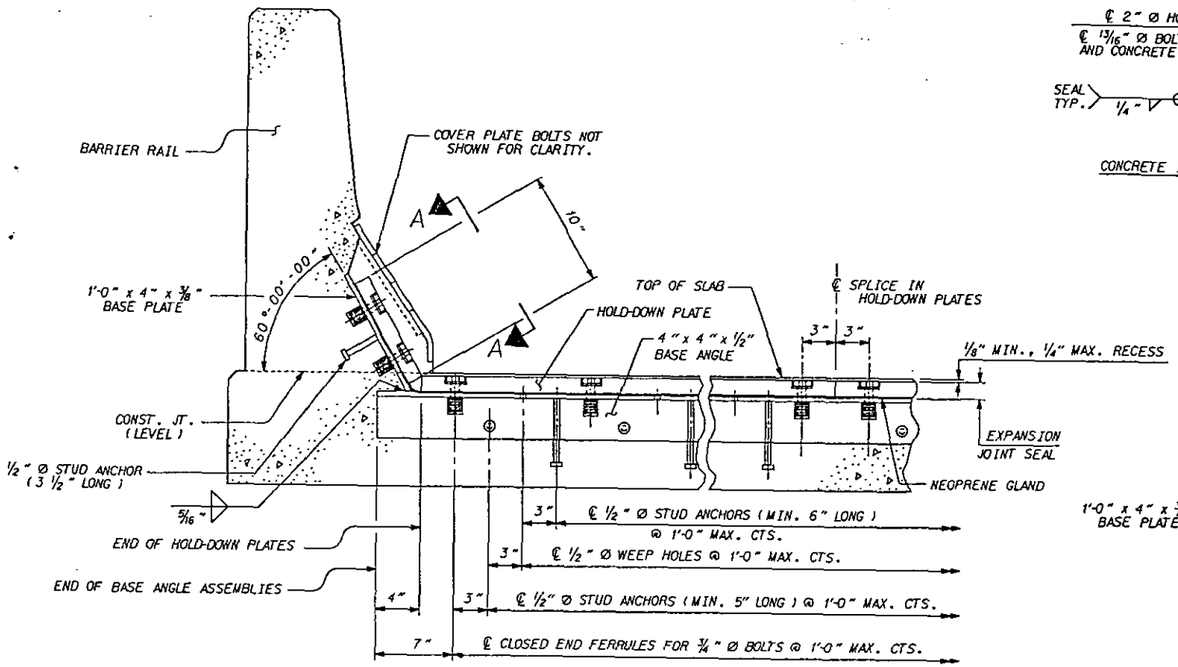
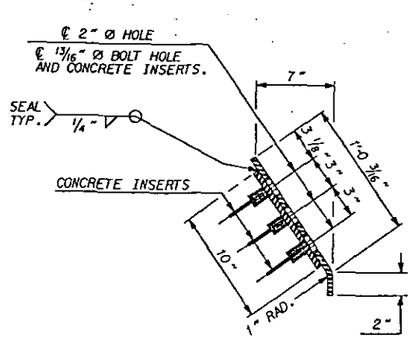
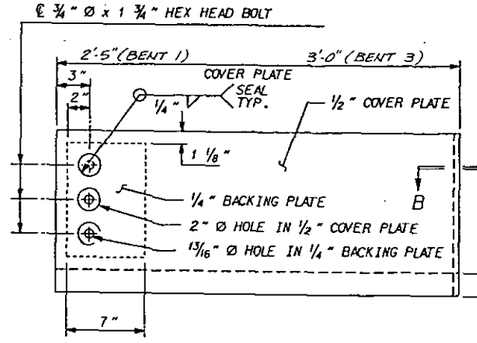


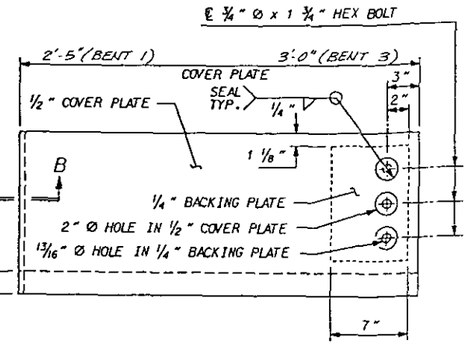
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

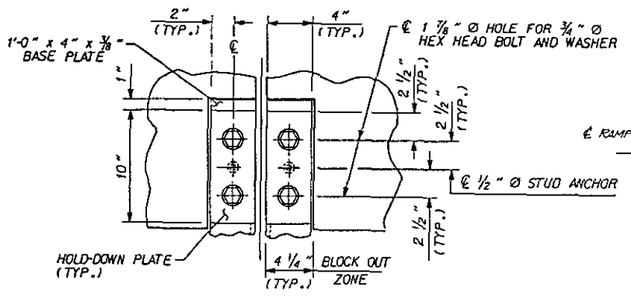


TYPE I - ELEVATION VIEW

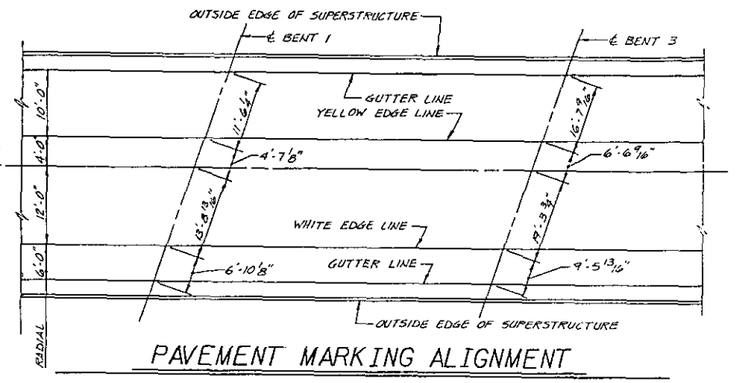


TYPE II - ELEVATION VIEW

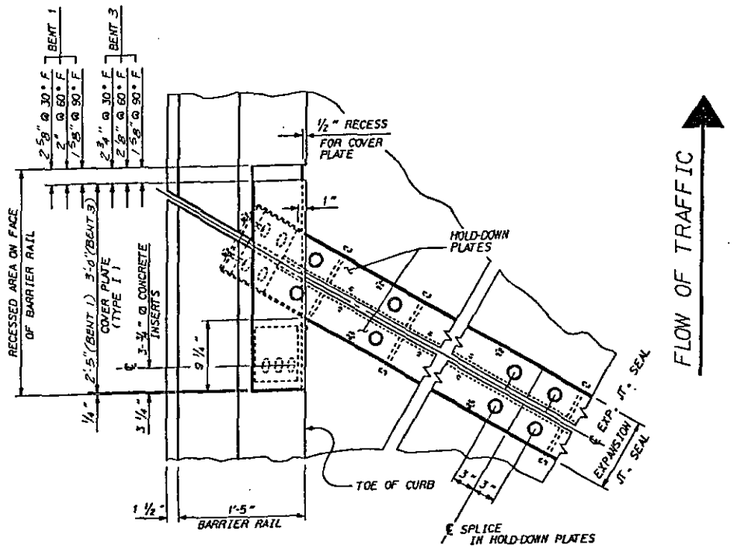
COVER PLATE DETAILS



SECTION A - A

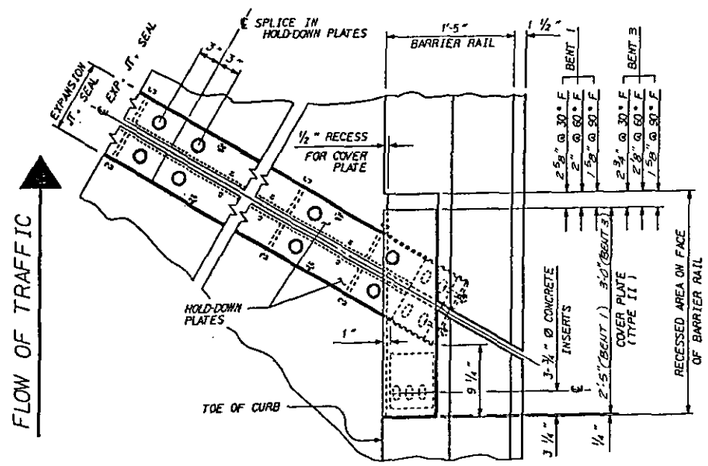


PAVEMENT MARKING ALIGNMENT



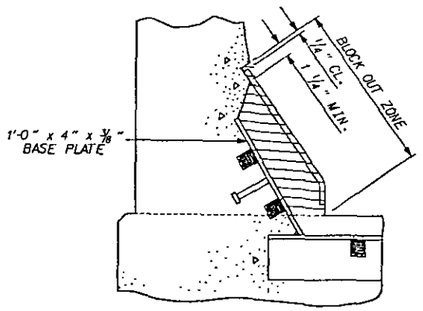
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

FLOW OF TRAFFIC



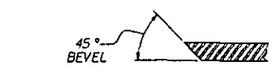
FLOW OF TRAFFIC

PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE

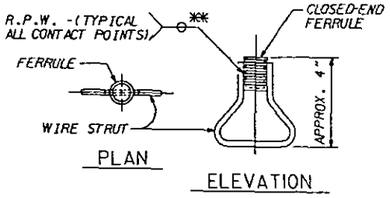


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. 8.U670111

Mecklenburg COUNTY

STATION: 19+59.38 Ramp "CA"

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

FEBRUARY 1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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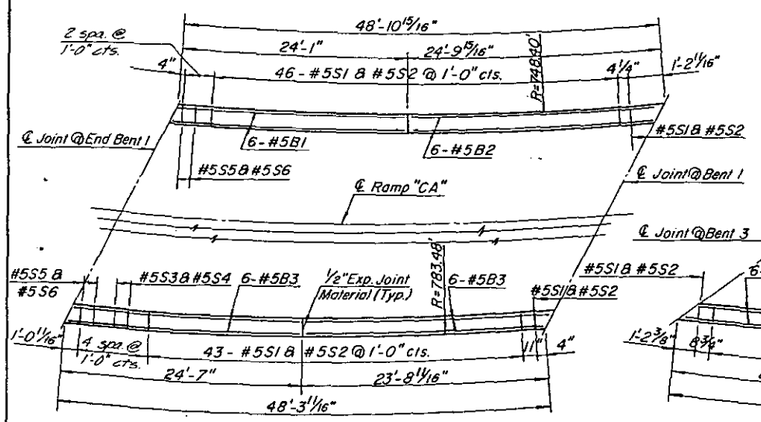
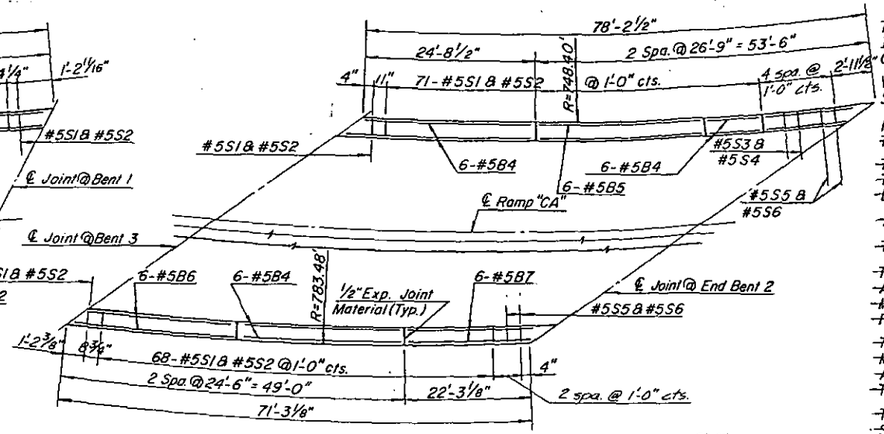
ASSEMBLED BY : JWR	DATE : 5/90	SPECIAL
CHECKED BY : DRR	DATE : 5/90	
DRAWN BY : ROSS E. KUBENY	DATE : 9-18-87	STANDARD
CHECKED BY : CINDY R. KING	DATE : 10-2-87	

REVISED BY W.J.H. CHECKED BY C.R.K. 8-22-89
ADDED 2-29-88

EJS2



SPAN "A"



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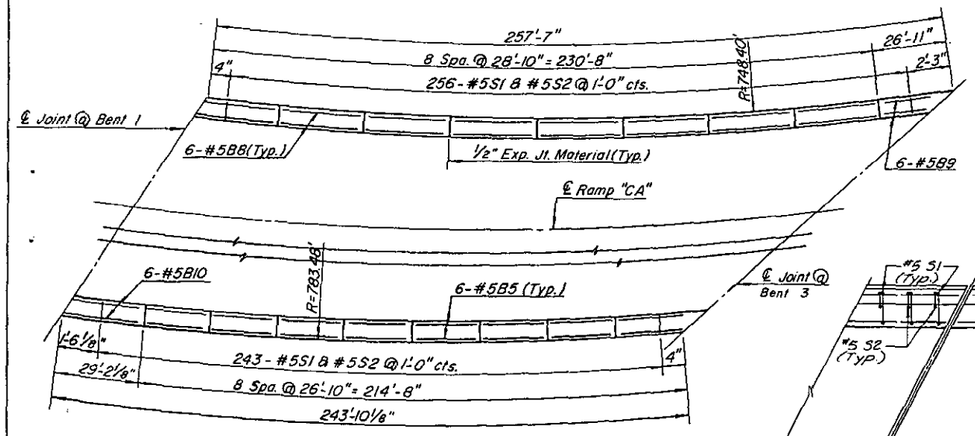
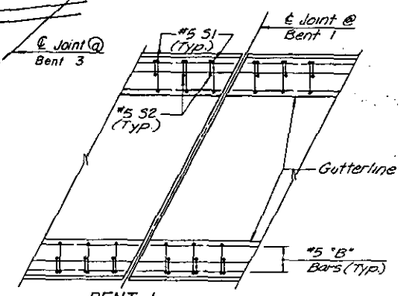
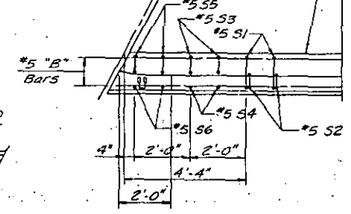


SPANS "B" & "C"

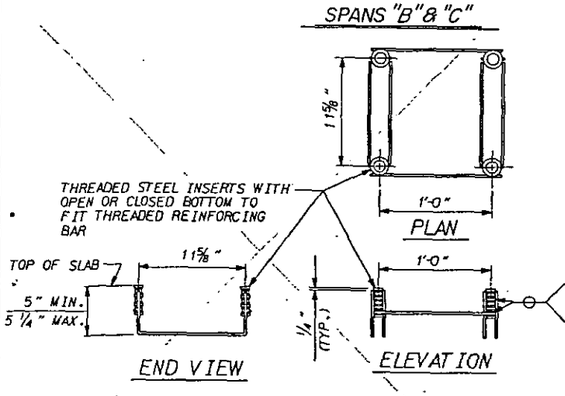


BENT 1
BENT 3 SIMILAR



END BENT 1
END BENT 2 SIMILAR

PLAN

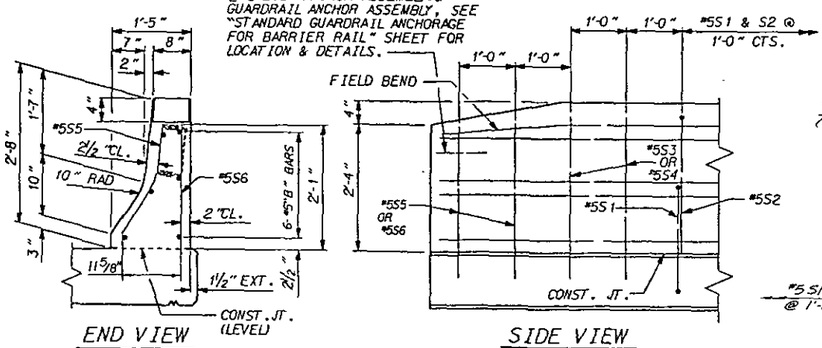


END VIEW
ELEVATION

BARRIER RAIL ANCHOR ASSEMBLY

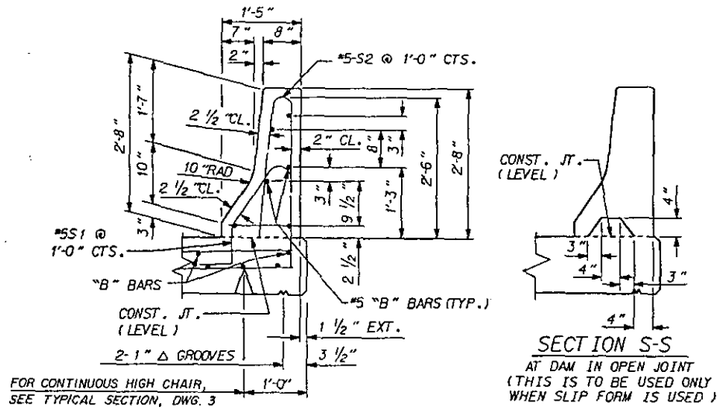
ANCHOR ASSEMBLIES REQUIRED

ASSEMBLED BY : L.M.D. DATE : 1/12/90 CHECKED BY : D.E.L. DATE : 2/7/90	SPECIAL
DRAWN BY : R. BISSETTE DATE : 5/28/87 CHECKED BY : S.J. DAVIS DATE : 9/3/87	STANDARD

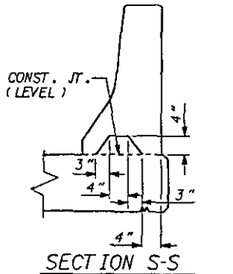


END VIEW
SIDE VIEW

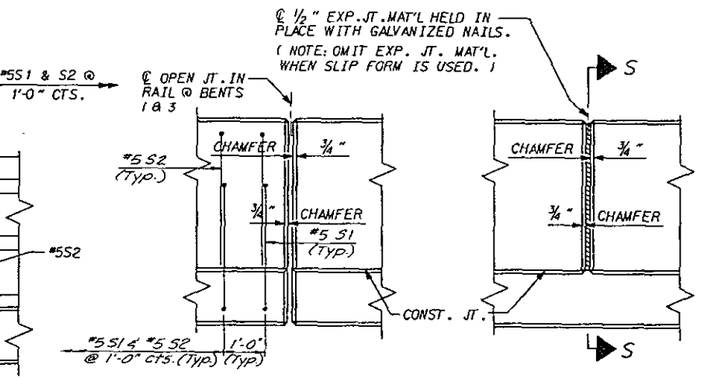
BARRIER RAIL - END OF RAIL DETAILS AT END BENTS



SECTION THRU RAIL



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

NOTES

THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN COMPRESSION JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

~~FERRULES SHALL BE PLUGGED DURING CASTING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.~~

~~THE BARRIER RAIL ANCHOR ASSEMBLY FERRULES SHALL HAVE THREADS COMPATIBLE TO THE THREADED REINFORCING BARS. THE FERRULES SHALL HAVE A MINIMUM LENGTH EQUAL TO THE LENGTH OF THE THREADS ON THE REINFORCING BARS.~~

~~AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.~~

~~THE THREADED REINFORCING BARS ARE TO BE TIGHTENED BY HAND.~~

~~THE WIRE GAGE AND FERRULES SHALL BE OF SUFFICIENT STRENGTH TO ENSURE LOAD ANCHORING CAPACITY AS SPECIFIED IN THE AASHTO SPECIFICATIONS. A MANUFACTURER'S CERTIFICATION OF LOAD ANCHORING CAPACITY SHALL BE FURNISHED WITH EACH SHIPMENT OF BARRIER RAIL ANCHOR ASSEMBLIES.~~

~~THE THREADED REINFORCING BARS SHALL BE GRADE 60. THE BAR SHALL BE MANUFACTURED WITH A MALE THREADED END WITH A MINIMUM TENSILE STRESS AREA OF 0.334 SQUARE INCHES. THE BARRIER RAIL ANCHOR ASSEMBLY AND THREADED REINFORCING BARS SHALL BE SUPPLIED AS A UNIT.~~

~~THE BARRIER RAIL ANCHOR ASSEMBLIES WITH THREADED REINFORCING BARS SHALL BE ASSEMBLED IN THE SHOP. REINFORCING BAR THREADS MAY BE RECUT AS NECESSARY.~~

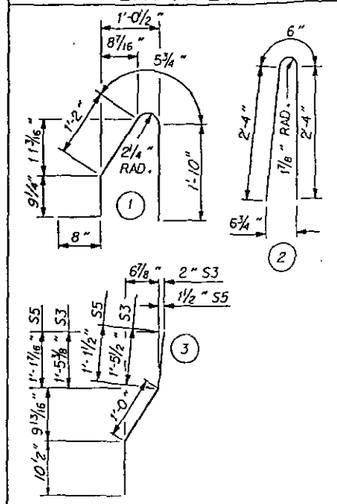
~~THE COST OF THE BARRIER RAIL ANCHOR WITH THREADED REINFORCING BARS SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.~~

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

FOR EPOXY COATED REINFORCING STEEL, SEE SPECIAL PROVISIONS.

THE #5 S3 THRU #5 S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	731	#5	1	4'-11"	3749
S2	731	#5	2	5'-2"	3939
S3	4	#5	3	3'-4"	14
S4	4	#5	STR.	3'-2"	13
S5	8	#5	3	3'-0"	25
S6	8	#5	STR.	2'-9"	23
B1	6	#5	STR.	23'-8"	148
B2	6	#5	STR.	23'-6"	147
B3	12	#5	STR.	23'-3"	291
B4	18	#5	STR.	24'-2"	454
B5	54	#5	STR.	26'-5"	1488
B6	6	#5	STR.	22'-3"	139
B7	6	#5	STR.	21'-10"	137
B8	48	#5	STR.	28'-5"	1423
B9	6	#5	STR.	24'-10"	155
B10	6	#5	STR.	27'-11"	175

EPOXY COATED REINFORCING STEEL	12,320 LBS
CLASS A-A CONCRETE	68.6 CU. YDS
CONCRETE BARRIER RAIL	747.9 LIN. FT

PROJECT NO. 8.U670111

Mecklenburg COUNTY

STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

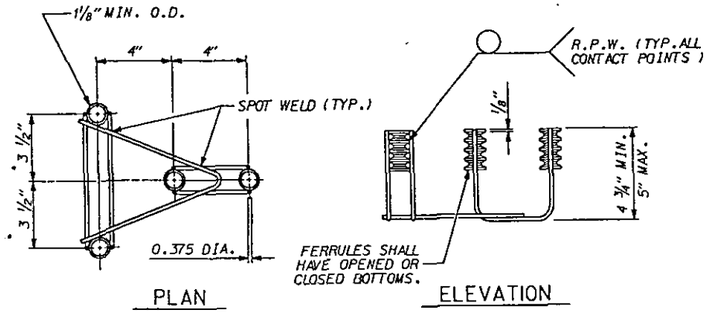
OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			421

Dwg. 26 of 43

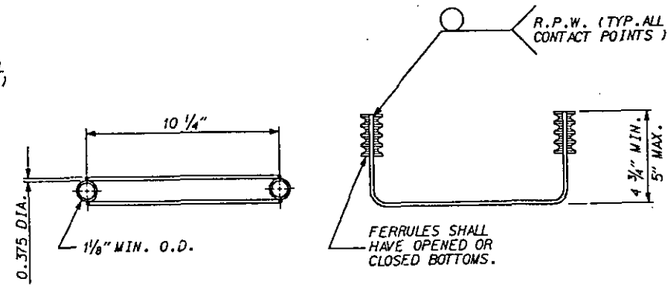
STD. NO. CBRI

REVISED BY W.J.H. CHECKED BY C.J.K. 3-1-89
REDRAWN 10-2-87



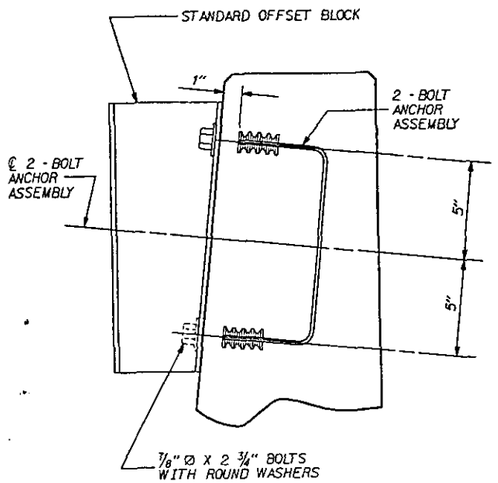
PLAN ELEVATION

GUARDRAIL ANCHOR ASSEMBLY

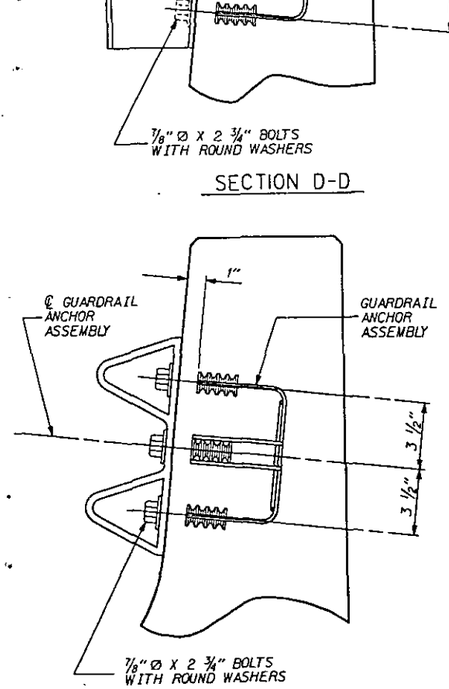


PLAN ELEVATION

2 - BOLT ANCHOR ASSEMBLY



SECTION D-D



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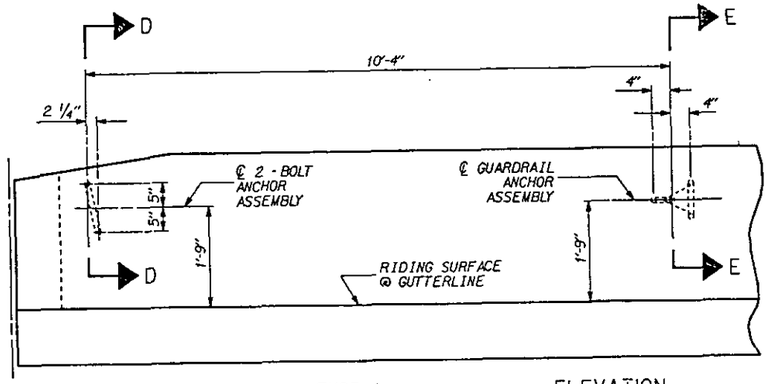
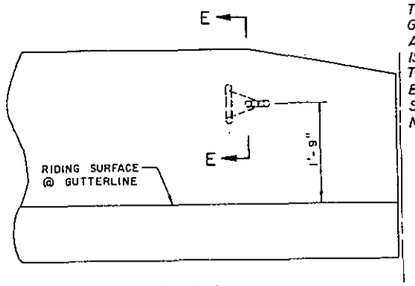
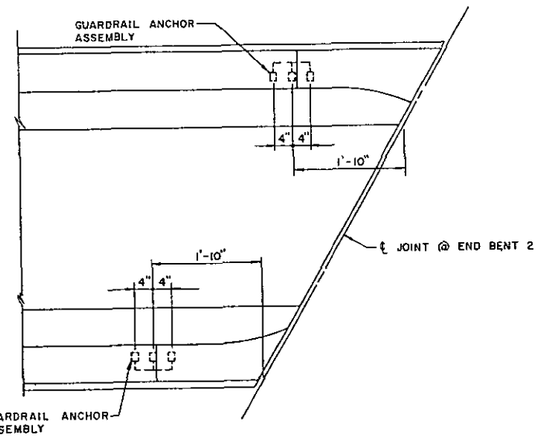


TYPE 1 ELEVATION



TYPE 2



TYPE 2

TYPE 1

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL AND OFFSET BLOCK

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR 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 1½".

B. 4 - ⅞" Ø X 2 ¾" BOLTS WITH WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY AND 2 - ⅞" Ø X 2 ¾" BOLTS WITH WASHERS FOR 2-BOLT ANCHOR ASSEMBLY SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS WITH WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø X 2 ¾" 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.)

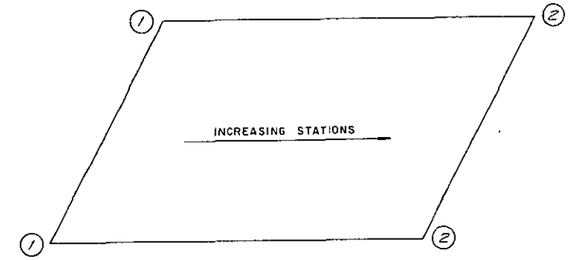
C. WIRE STRUTS SHOWN IN THE ANCHOR ASSEMBLY ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES AND THE 2-BOLT ANCHOR ASSEMBLIES WITH BOLTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE GUARDRAIL ANCHOR ASSEMBLY AND THE 2-BOLT ANCHOR ASSEMBLY ARE REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ATTACHMENT TO BARRIER RAIL. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLT DOWELS". THE REQUIRED DESIGN LOAD OF THE 3/4"ø BOLT IS 12 KIPS. THE ANCHOR BOLTS SHALL BE COATED WITH A DEBONDING AGENT SO THAT THE ANCHOR BOLTS CAN BE EASILY REMOVED IF NECESSARY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE DEBONDING AGENT DOES NOT REDUCE THE STRENGTH OF THE ANCHOR SYSTEM. TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



SKETCH SHOWING POINTS OF ATTACHMENTS

PROJECT NO. 8.U670111

Mecklenburg COUNTY

STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

FEBRUARY 1988

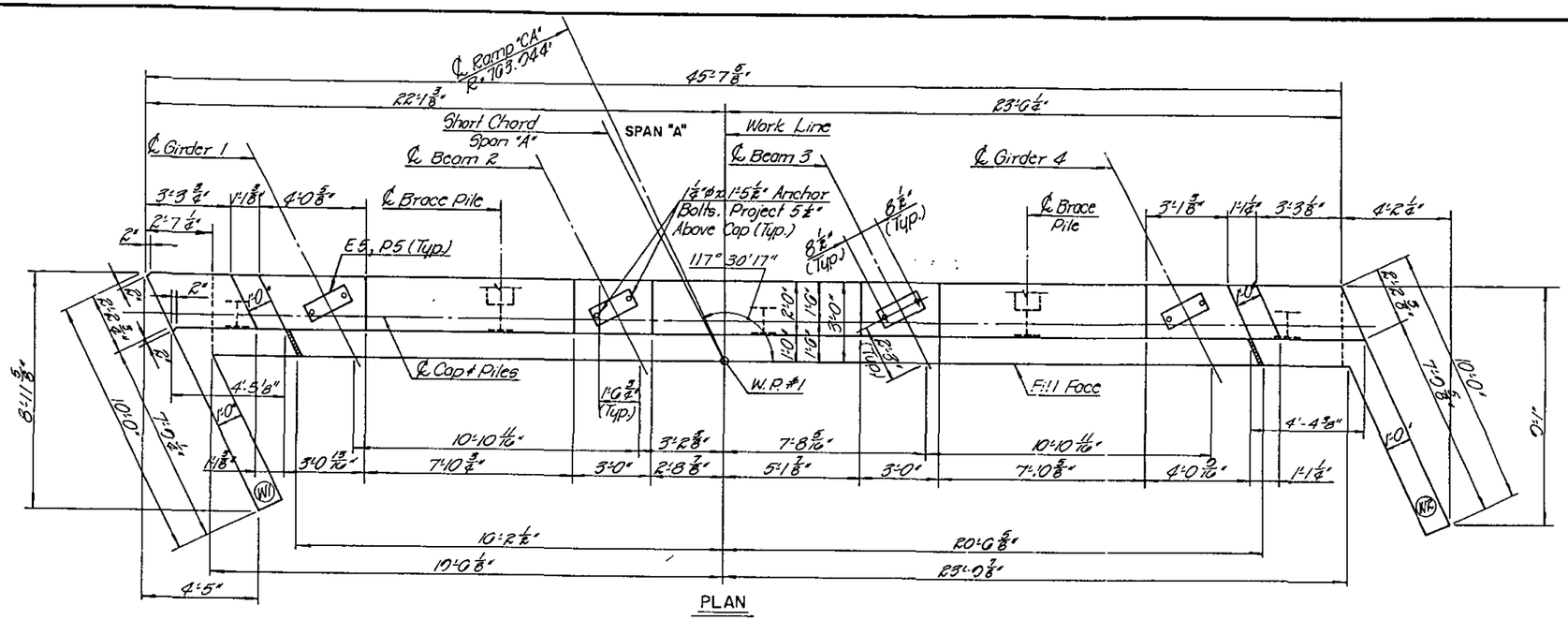
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			42

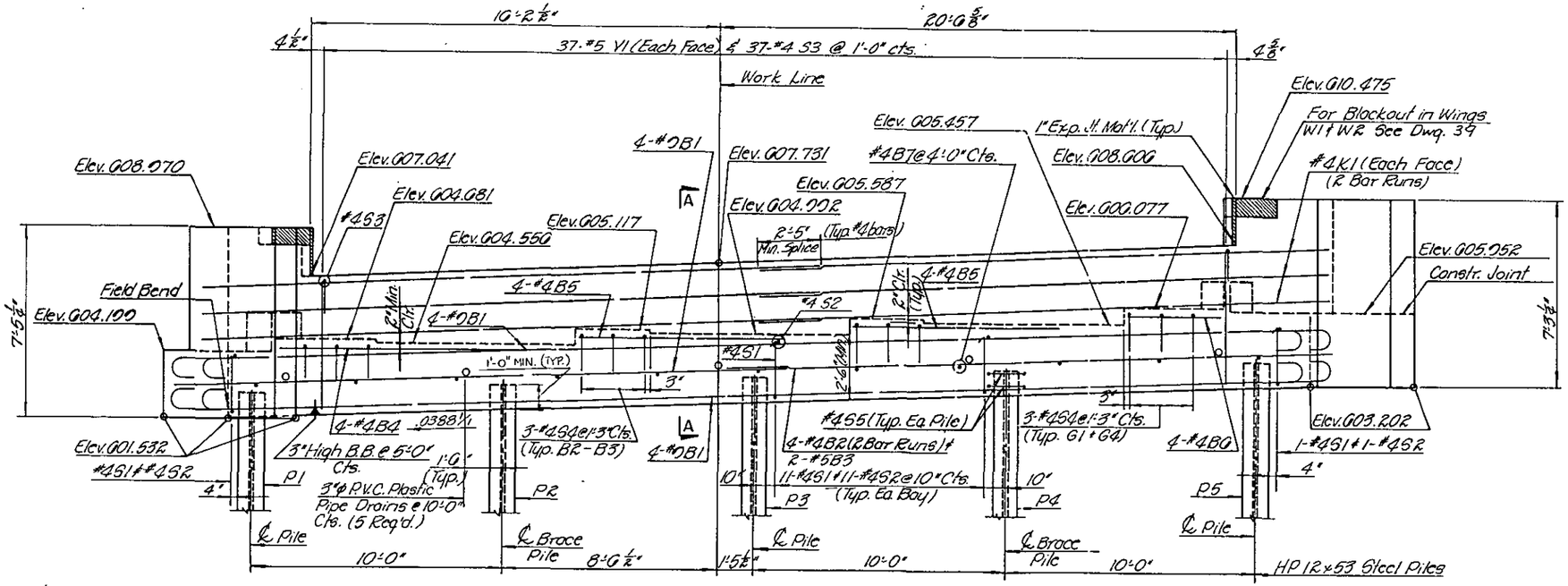
Dwg. 27 of 43

STD. No. GRA1

ASSEMBLED BY : JWR	DATE : 5/90	SPECIAL	
CHECKED BY : DRR	DATE : 5/90		
DRAWN BY : MIKE BRITT	DATE : DEC. 1987	STANDARD	
CHECKED BY : RANDY BISSETTE	DATE : DEC. 1987		

REDRAWN 2-29-88





ELEVATION

Top of Pile Elevation	
Pile	Elevation
P1	602.589
P2	602.917
P3	603.365
P4	603.753
P5	604.141

	BY	DATE
MADE	D.H.B.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D.R. RUGGLES	

PREPARED BY
AMERICAN ENGINEERS

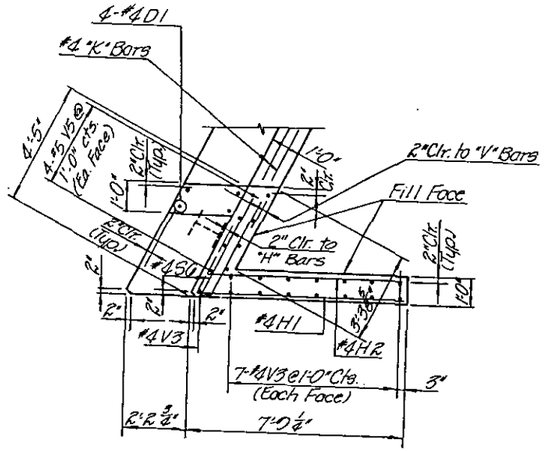
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

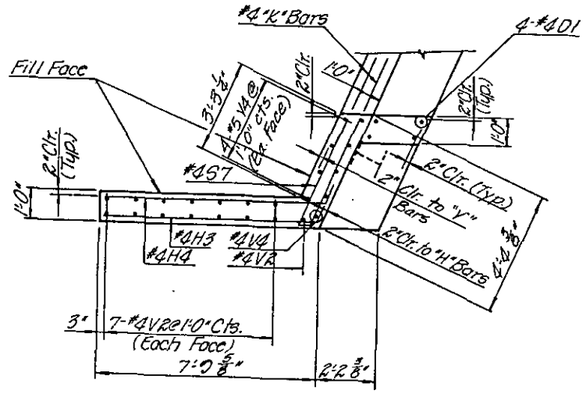
SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-68
						TOTAL SHEETS
						421

Dwg. 28 of 43



PLAN - WING W1



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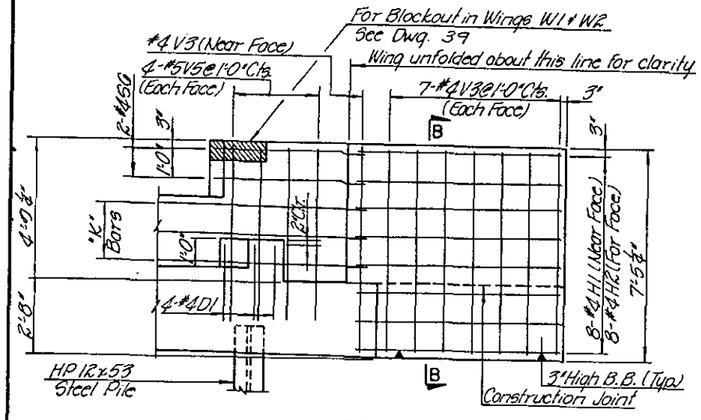

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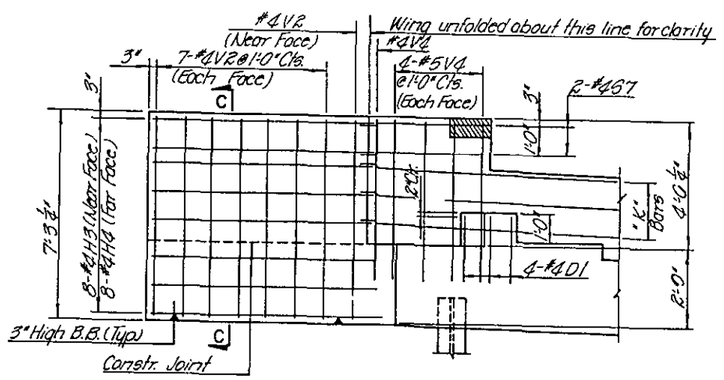

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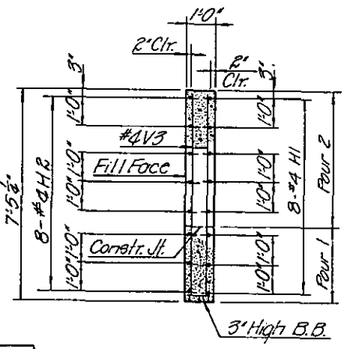
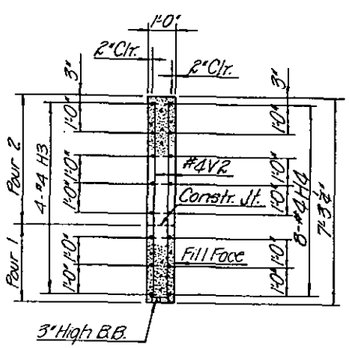


SECTION B-B



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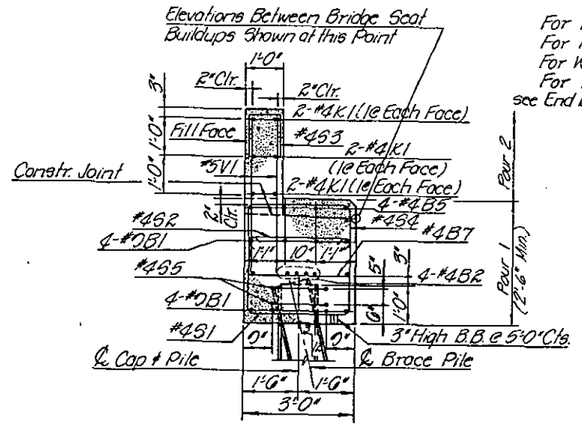
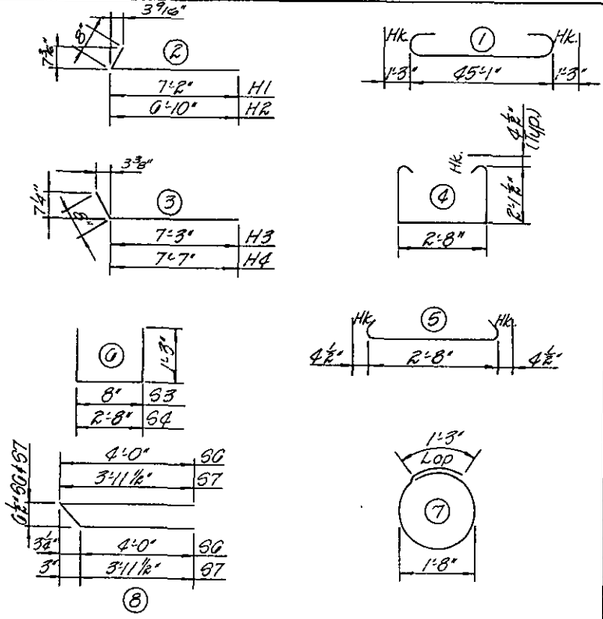


SECTION A-A

END BENT # 1

BAR TYPES



Note: All bar dimensions are out-to-out

BILL OF MATERIAL

Bar	No.	Size	Type	Length	Weight
B1	8	5	1	47'-7"	1204
B2	8	4	Str.	23'-11"	128
B3	2	5		45'-1"	94
B4	4	4		0'-6"	25
B5	8			8'-3"	44
B6	4			3'-0"	10
B7	11	4	Str.	2'-8"	20
D1	8	4	Str.	2'-6"	13
H1	8	4	2	7'-10"	42
H2			2	7'-6"	40
H3			3	7'-11"	42
H4	8	4	3	8'-3"	44
K1	12	4	Str.	23'-10"	101
S1	46	4	4	7'-8"	236
S2	40		5	3'-5"	105
S3	37		6	3'-2"	78
S4	12		6	5'-2"	41
S5	10		7	0'-6"	23
S6	2		8	8'-7"	11
S7	2	4	8	8'-0"	11
V1	74	5	Str.	5'-1"	392
V2	15	4		0'-11"	09
V3	15	4		7'-1"	71
V4	9	5		5'-8"	53
V5	8	5	Str.	5'-11"	40

Reinforcing Steel lbs.	3146
Class "A" Concrete Cu. Yds.	
Pour 1	15.7
Pour 2	7.5
Total	23.2
HP 12 x 53 Steel Piles No.	5
Lin. Ft.	275

Notes:

The top surface of the cap except the bridge seat buildups shall be sloped transversely from the fill face to the back face at the rate of ¼" per foot.

Backwall shall be placed before applying Epoxy Protective Coating. For Epoxy Protective Coating, see Special Provisions.

The top surface area of the End Bent Cap shall be cured in accordance with the Standard Specifications except the Membrane Curing Compound Method shall not be used.

Pipe Drains may be shifted slightly as necessary to clear reinforcing steel.

For Pile Splice Detail, see End Bent #2, Dwg. No. 36.
For Pipe Drain Detail, see End Bent #2, Dwg. No. 39.
For Wing Blockout, see End Bent #2, Dwg. No. 39.
For Temporary Drainage @ End Bent Detail, see End Bent #2, Dwg. No. 39.

	BY	DATE
MADE	L.M.D.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D. R. RUGGLES	

PREPARED BY
AMERICAN ENGINEERS

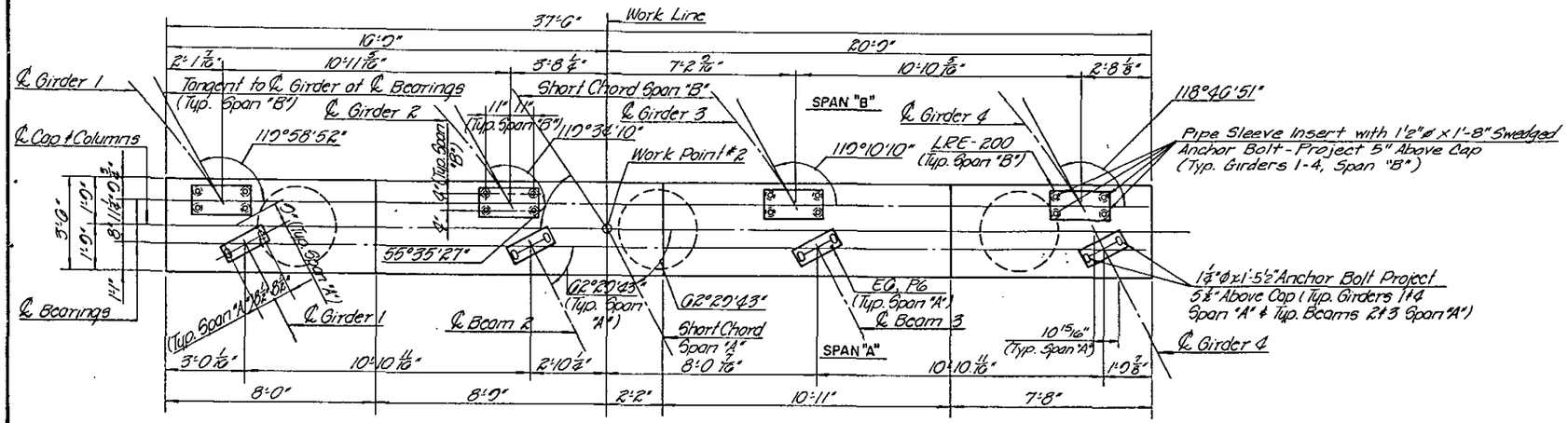
PROJECT: 8.1167011
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "A"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

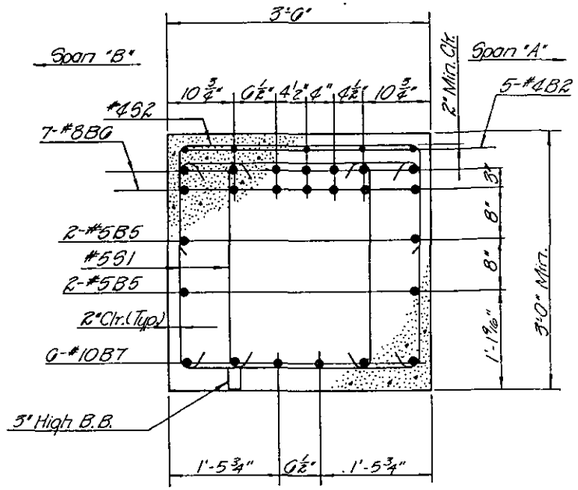
SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-69
						TOTAL SHEETS
						42

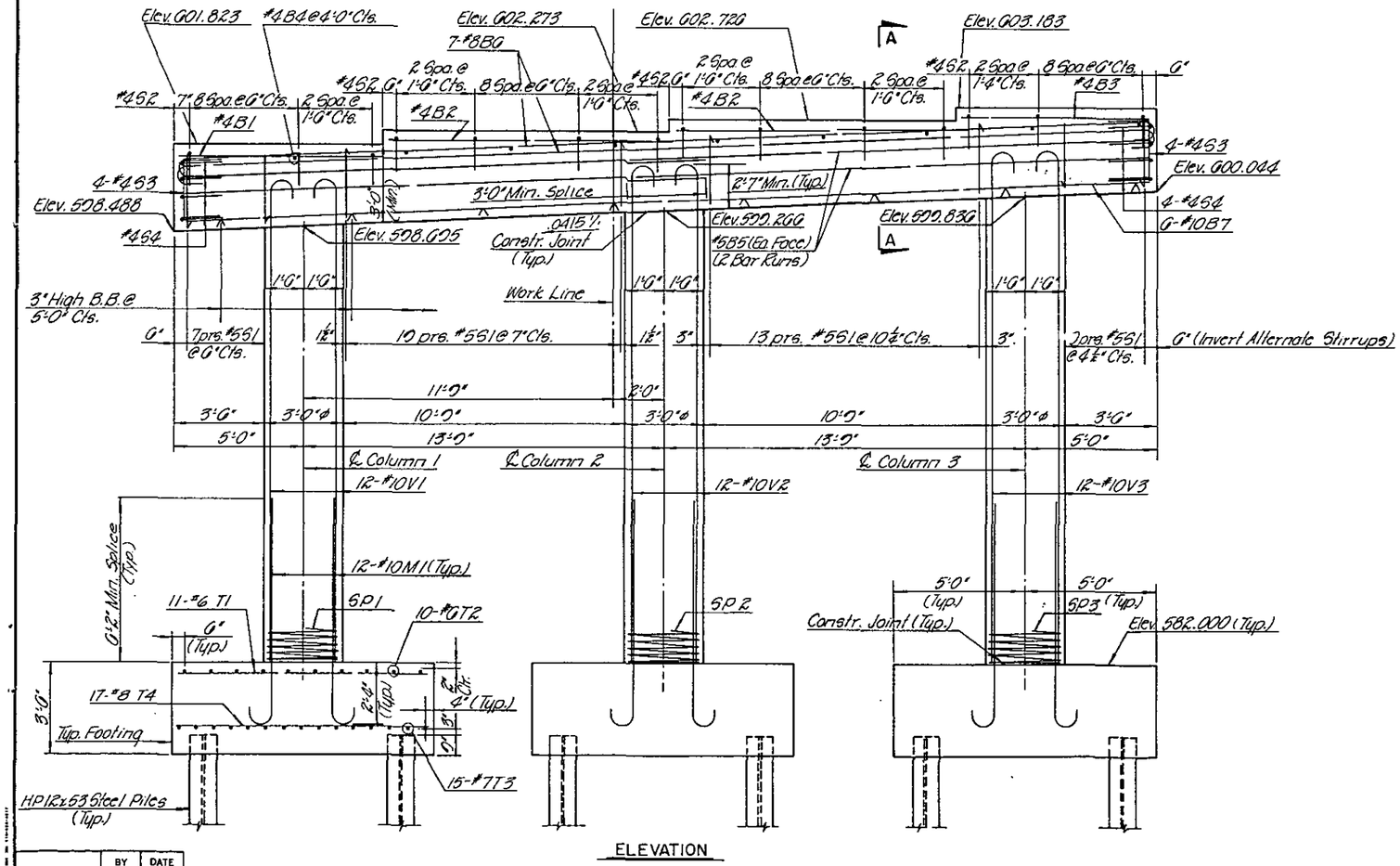
Dwg. 29 of 43



PLAN OF CAP



SECTION A-A



ELEVATION

	BY	DATE
MADE	L.M.D.	3-90
CHECKED	K.R.W.	3-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

PROJECT: BUG70111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

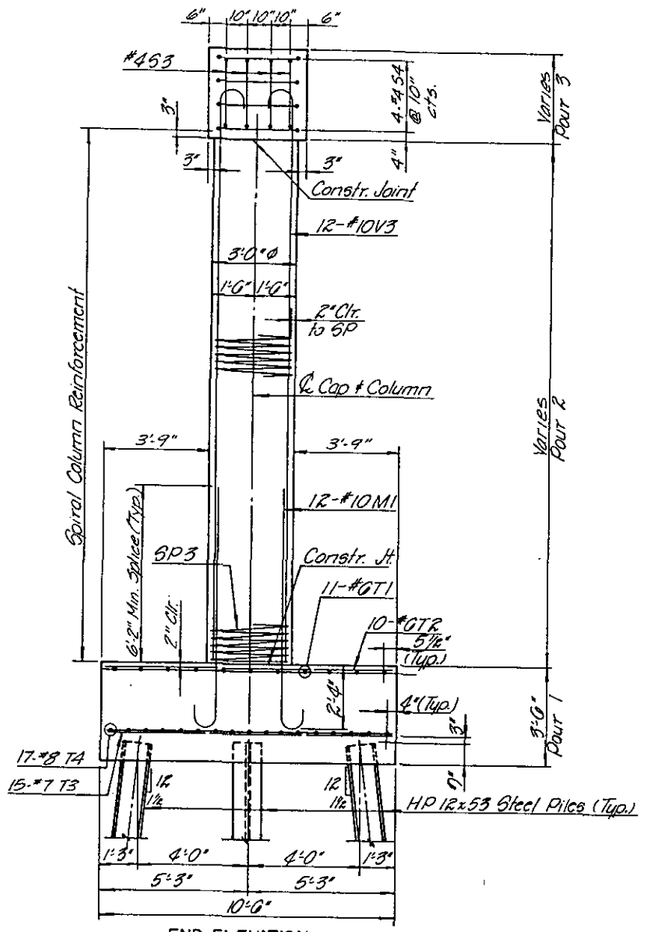
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

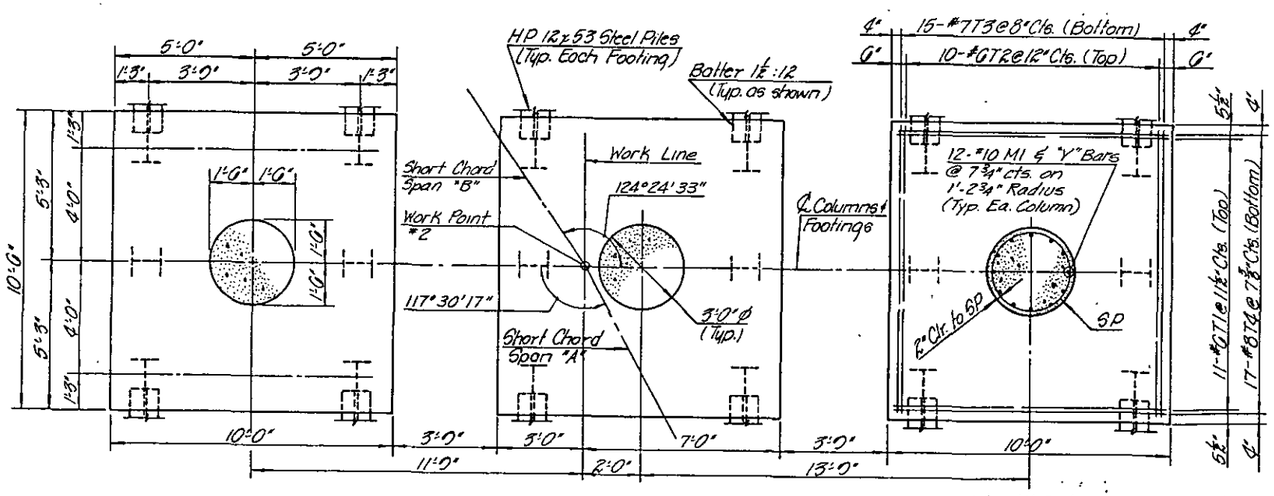
BENT 1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-70
						TOTAL SHEETS 121

Dwg. 30 of 43



END ELEVATION



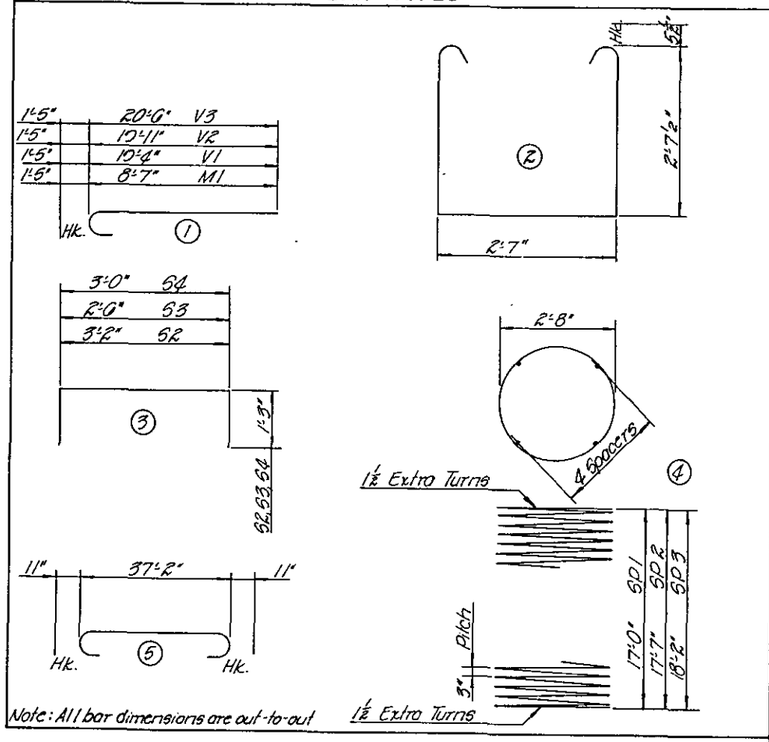
Note: All footings are identical

PLAN OF FOOTING

	BY	DATE
MADE	L.M.D.	3-90
CHECKED	K.R.W.	3-90
IN CHARGE	D. R. Ruggles	

BENT #1

BAR TYPES



Note: All bar dimensions are out-to-out

BILL OF MATERIAL

Bar	No.	Size	Type	Length	Weight
B1	5	#4	Str.	7'-0"	25
B2	10	#4		10'-5"	70
B3	5	#4		7'-4"	24
B4	10	#4		3'-2"	21
B5	8	#5	Str.	20'-2"	108
B6	14	#8	5	30'-0"	1458
B7	6	#10	Str.	37'-2"	000
M1	36	#10	1	10'-0"	1540
S1	26	#5	2	8'-9"	876
S2	48	#4	3	5'-8"	182
S3	8	#4	3	5'-0"	27
S4	8	#4	3	5'-6"	29
T1	33	#6	Str.	0'-0"	471
T2	30	#6	Str.	10'-0"	451
T3	46	#7	Str.	10'-0"	920
T4	51	#8	Str.	0'-6"	1,204
V1	12	#10	1	20'-0"	1,071
V2	12	#10	1	21'-6"	1,102
V3	12	#10	1	21'-11"	1,132
SP1	1	—	4	685'-10"	301
SP2	1	—	4	905'-1"	404
SP3	1	—	4	624'-4"	417

Spiral Column Reinforcing Steel Lbs. 1,212

Reinforcing Steel Lbs. 11,830

Class "A" Concrete	Cu. Yds.
Pour 1	40.8
Pour 2	13.6
Pour 3	15.7
Total	70.1

HP 12x53 Steel Piles No. 18
Lin. Ft. 450

Foundation Excavation 115.1 Cu. Yds.

NOTES:

- FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL..
- STIRRUPS TO BE PLACED NORMAL AND INVERTED ALTERNATELY.
- THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- FOR LIMITS OF EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- FOR PILE SPLICE DETAIL, SEE END BENT 2 (DWG. # 36)
- BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT UNTIL THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
- POT BEARINGS SHALL BE ALIGNED AS SHOWN ON DWG. 21.
- FOR PIPE SLEEVE INSERT DETAILS, SEE DWG. 21.

PREPARED BY
AMERICAN ENGINEERS

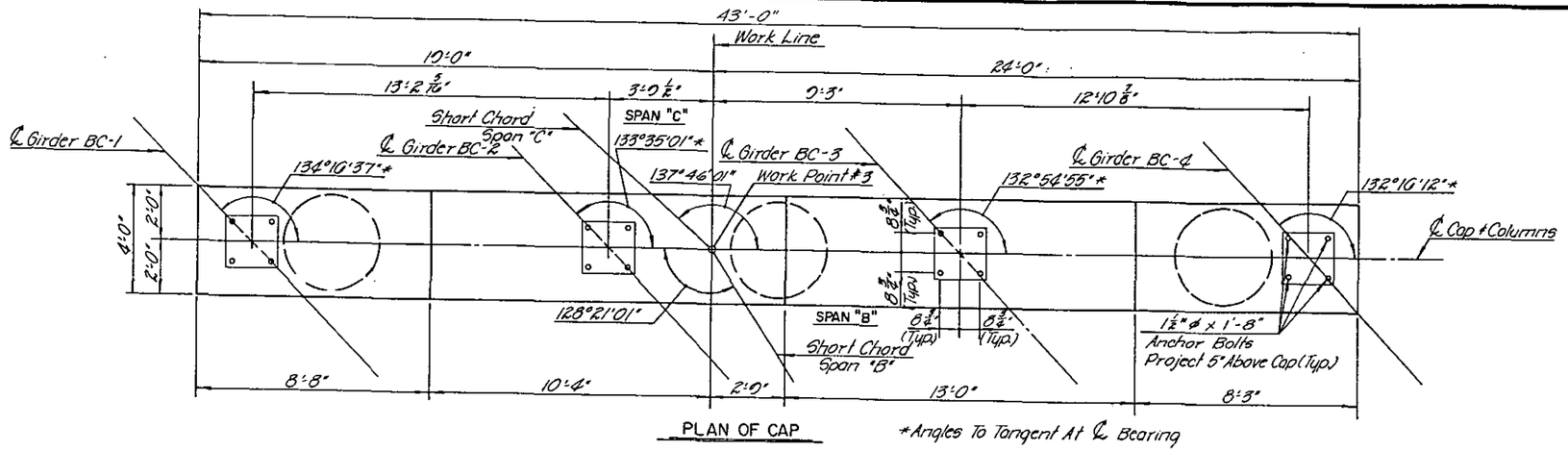
PROJECT: 8U670111
Mecklenburg COUNTY
STATION: 12+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

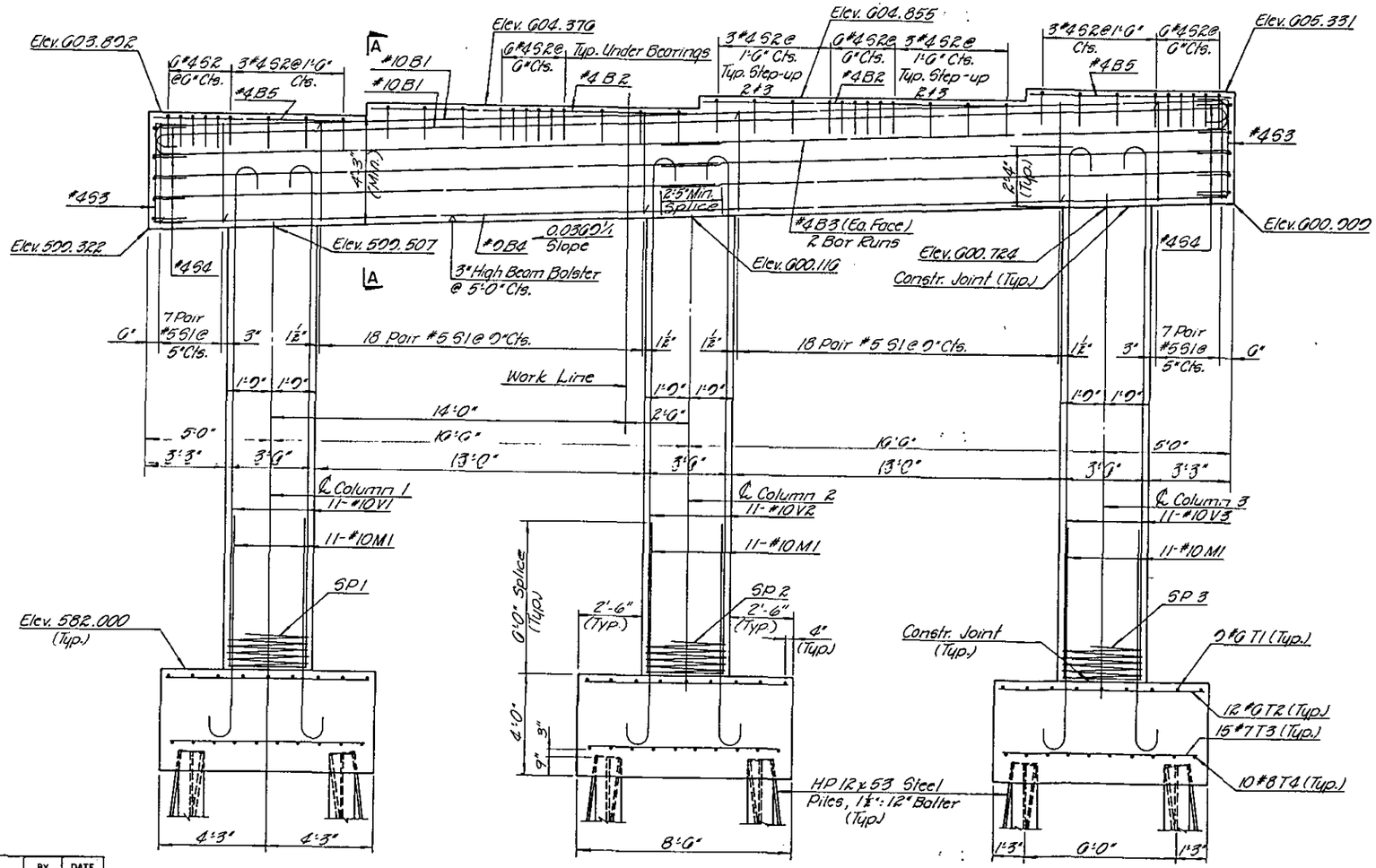
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-71
						TOTAL SHEETS
						421

Dwg. 31 of 43

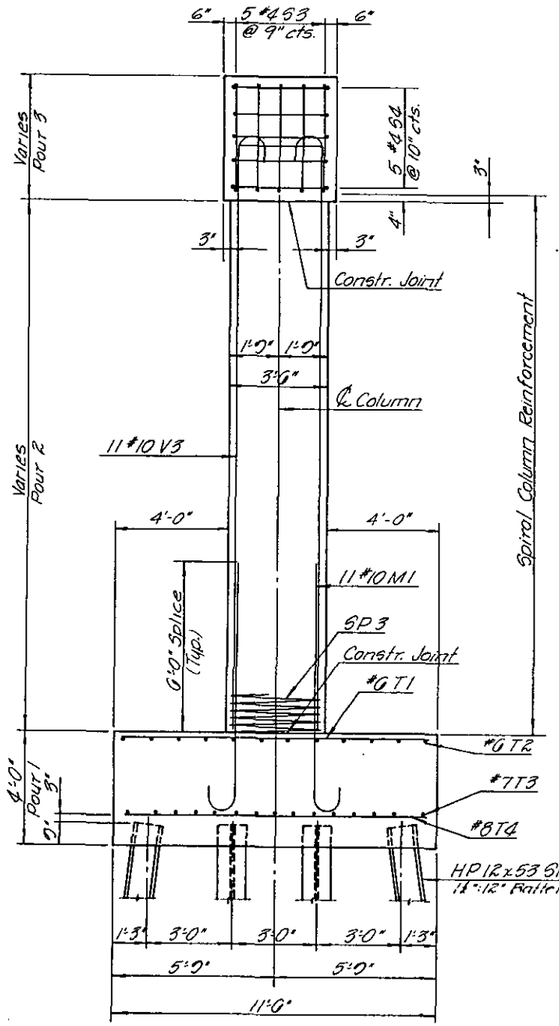


PLAN OF CAP

*Angles To Tangent At ℄ Bearing



ELEVATION



END ELEVATION

PROJECT: 8.UGT0111

Mecklenburg COUNTY

STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

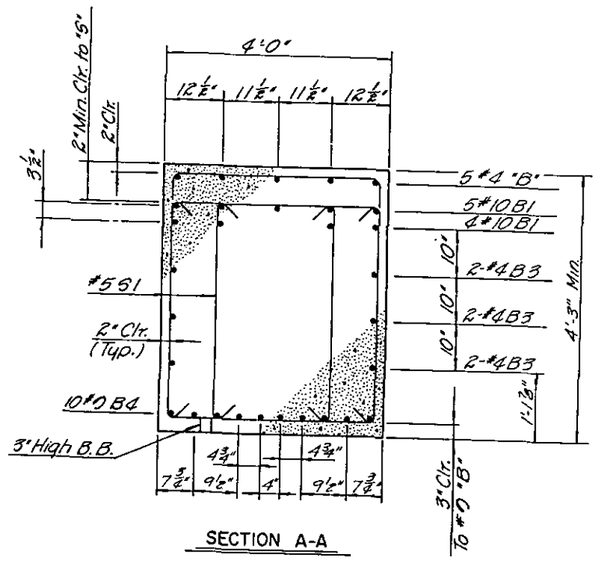
SUBSTRUCTURE
BENT 2

	BY	DATE
MADE	J.W.R.	3-90
CHECKED	D.R.R.	3-90
IN CHARGE D.R. Ruggles		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-72
						TOTAL SHEETS
						421

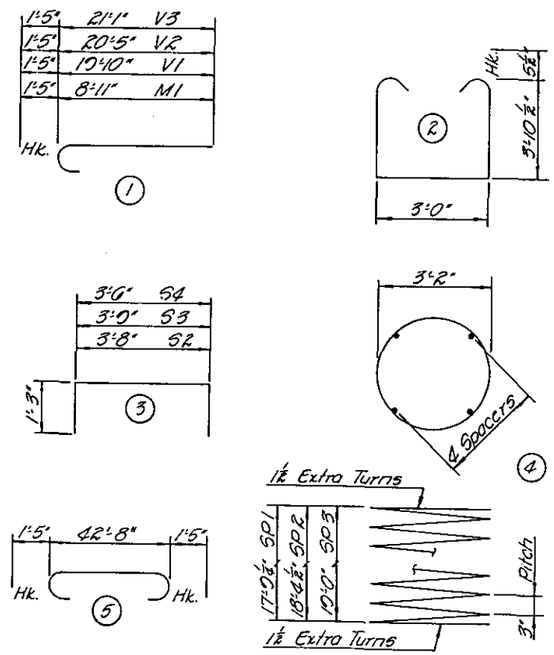
PREPARED BY
AMERICAN ENGINEERS

Dwg. 32 of 43



SECTION A-A

BENT 2



Note: All bar dimensions are out-to-out.

BILL OF MATERIAL

Bar	No.	Size	Type	Length	Weight
B1	7	10	5	45'-6"	1,762
B2	10	4	Str.	12'-8"	85
B3	12	4	Str.	22'-7"	181
B4	10	7	Str.	42'-8"	1,451
B5	10	4	Str.	7'-1"	55
M1	33	10	1	10'-4"	1,467
S1	100	5	2	11'-8"	1,217
S2	42	4	3	6'-2"	173
S3	10	4	3	6'-3"	42
S4	10	4	3	6'-0"	40
T1	27	6	Str.	11'-0"	446
T2	36	6	Str.	8'-0"	433
T3	45	7	Str.	8'-0"	736
T4	30	8	Str.	11'-0"	881
V1	11	10	1	21'-3"	1,000
V2	11	10	1	21'-10"	1,033
V3	11	10	1	22'-6"	1,065
SP1	1	–	4	127'-7"	480
SP2	1	–	4	136'-3"	502
SP3	1	–	4	136'-10"	518

Spiral Column Reinforcing Steel lbs. 1,506

Reinforcing Steel lbs. 12,071

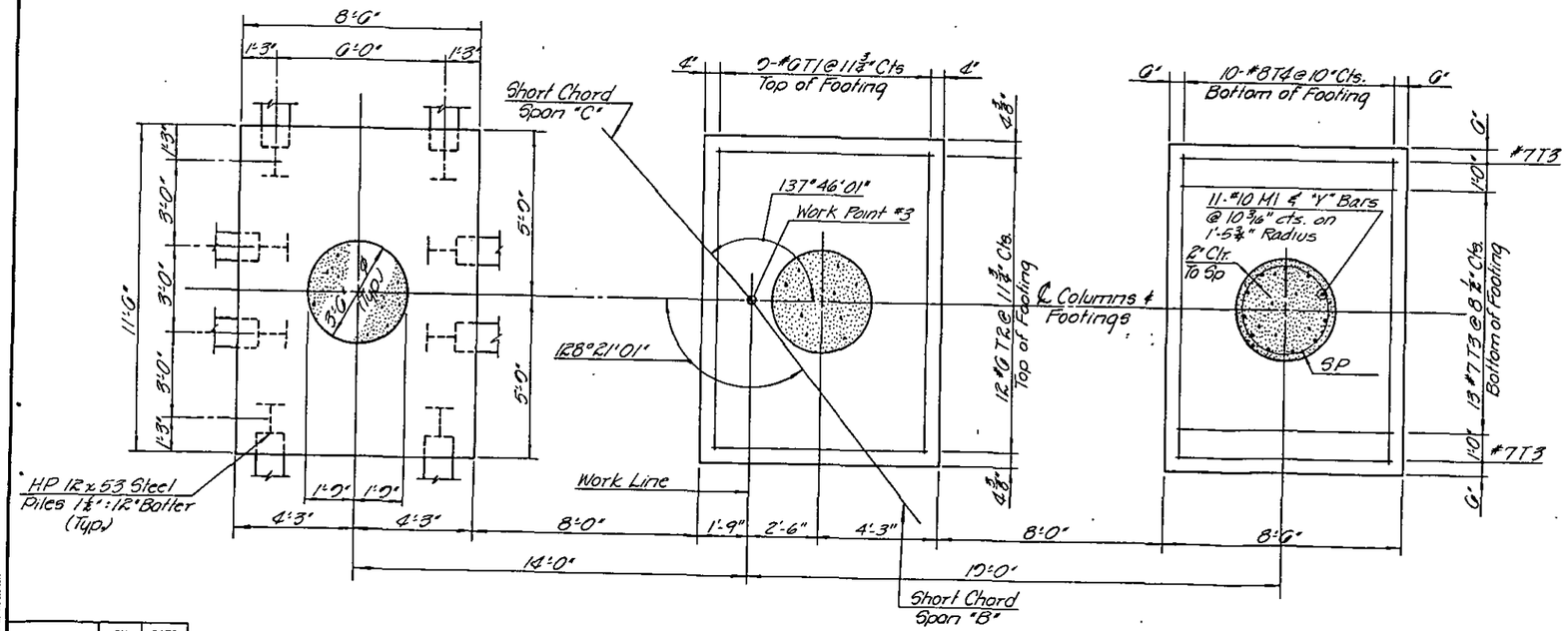
Class "A" Concrete	Cu. Yds.
Pour 1	43.4
Pour 2	19.4
Pour 3	28.6
Total	91.4

HP 12 x 53 Steel Piles
No. 24 Lin. Ft. 720

Foundation Excavation Cu. Yds. 143.0

NOTES:

- FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- STIRRUPS TO BE PLACED NORMAL AND INVERTED ALTERNATELY.
- THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- FOR LIMITS OF EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- FOR PILE SPLICE DETAIL, SEE END BENT 2 (DWG. # 36)
- BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT UNTIL THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
- POT BEARINGS SHALL BE ALIGNED AS SHOWN ON DWG. 22.



PLAN OF FOOTINGS

Note: All Footings are identical.

	BY	DATE
MADE	J.W.R.	3-90
CHECKED	D.R.R.	3-90
IN CHARGE	D.R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

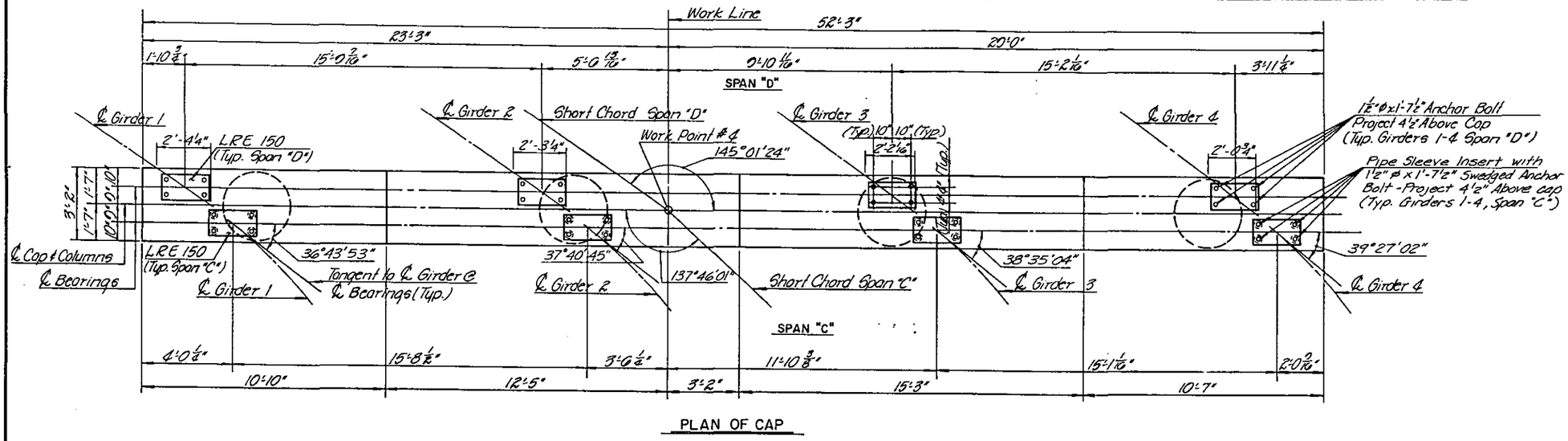
Dwg. 33 of 43

PROJECT: 8U670111
Mecklenburg COUNTY
STATION: 12+50.38 Ramp "CA"

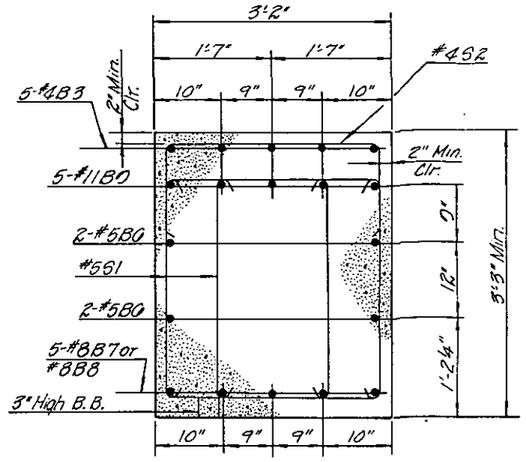
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2

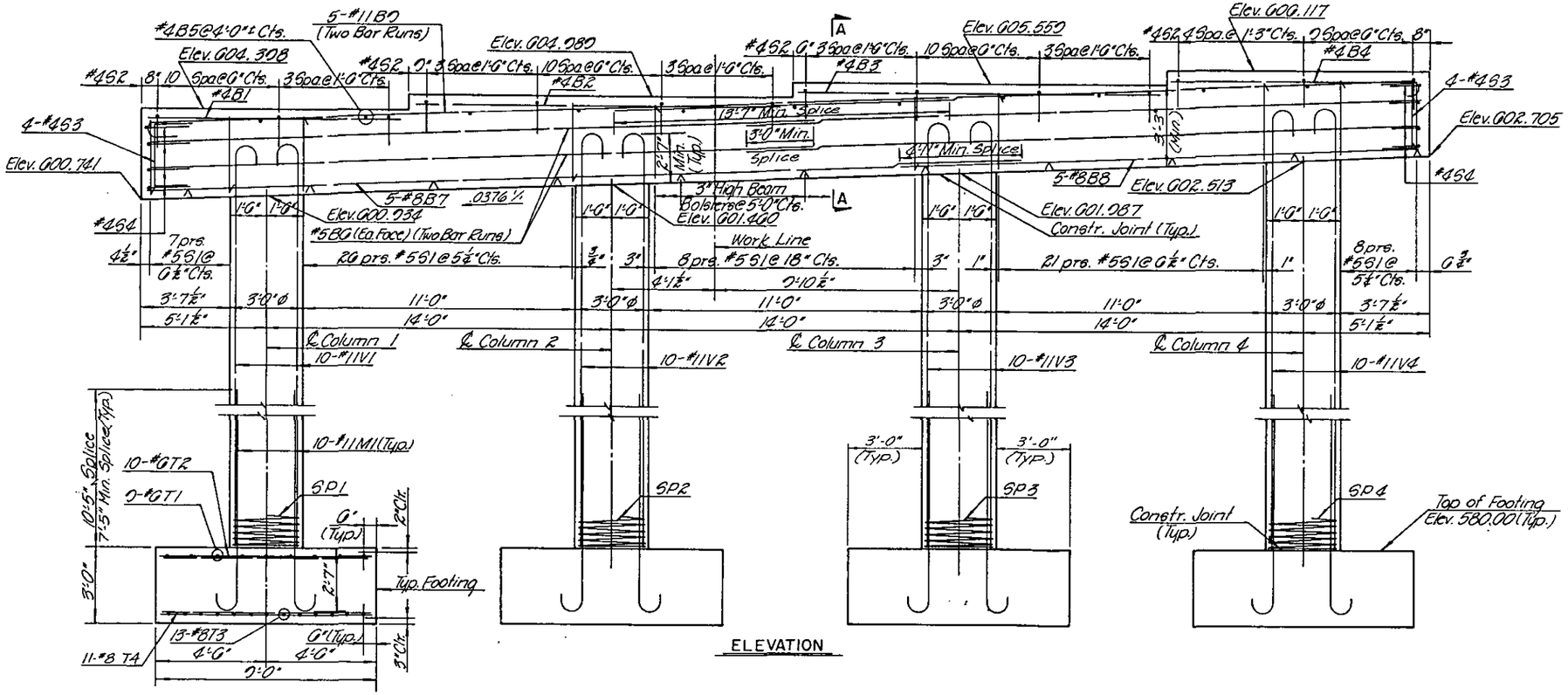
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-73
						TOTAL SHEETS
						121



PLAN OF CAP



SECTION A-A



ELEVATION

NOTES:

- FOR SPIRAL COLUMN REINFORCING STEEL, SEE SPECIAL PROVISIONS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL..
- STIRRUPS TO BE PLACED NORMAL AND INVERTED ALTERNATELY.
- THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- FOR LIMITS OF EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- FOR PILE SPLICE DETAIL, SEE END BENT 2 (DWG. # 36)
- BRIDGE SEAT ELEVATIONS ARE BASED ON AN ASSUMED POT BEARING DEPTH AS SHOWN IN POT BEARING DETAILS. THE CONTRACTOR SHALL ADJUST THE BRIDGE SEAT ELEVATIONS IF THE POT BEARING DEPTH VARIES FROM THE ASSUMED DEPTH SHOWN. THERE WILL BE NO ADJUSTMENT TO THE QUANTITIES SHOWN ON THE PLANS. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR THE QUANTITIES SHOWN ON THE PLANS. NO WORK SHALL BE STARTED ON THE BENT UNTIL THE PLANS FOR ANY ADJUSTMENTS ARE APPROVED BY THE ENGINEER.
- POT BEARINGS SHALL BE ALIGNED AS SHOWN ON DWG. 21.
- FOR PIPE SLEEVE INSERT DETAILS, SEE DWG. 21.

	BY	DATE
MADE	L.M.D.	3-90
CHECKED	K.R.W.	3-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

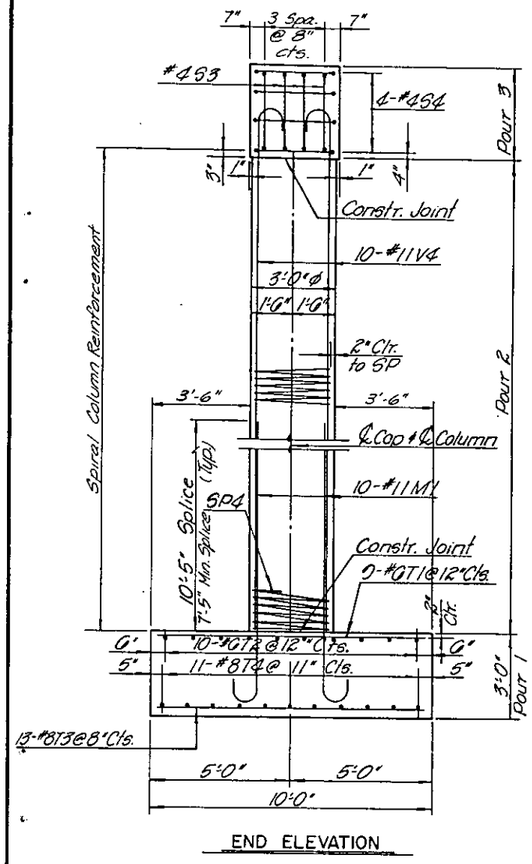
PROJECT: 8.UG70111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-74
						TOTAL SHEETS
						121

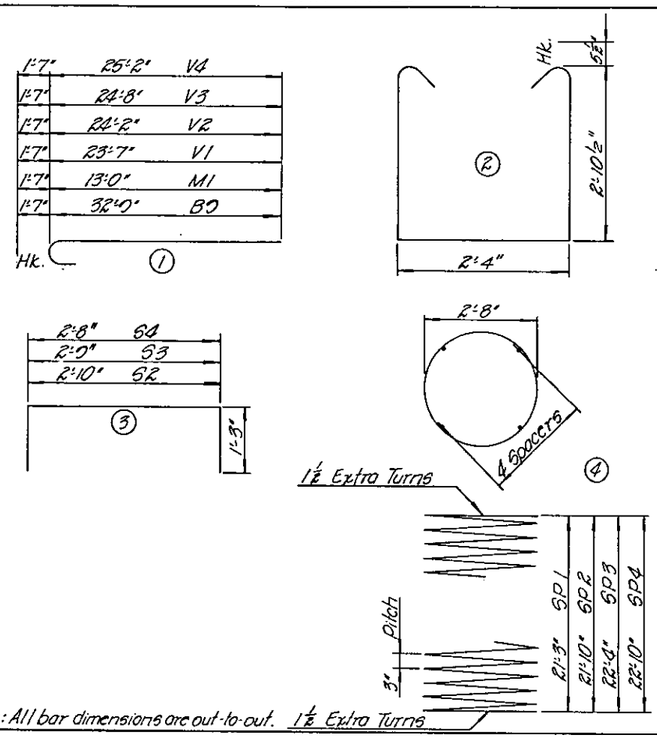
Dwg. 34 of 43



END ELEVATION

BENT # 3

BAR TYPES



Note: All bar dimensions are out-to-out. 1½ Extra Turns

BILL OF MATERIAL

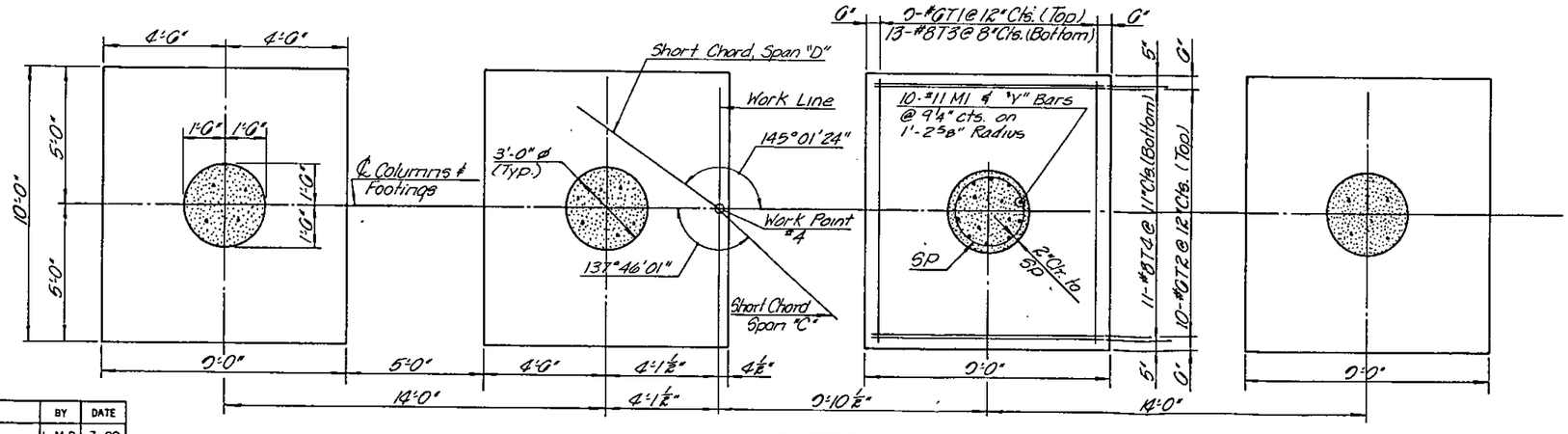
Bar	No.	Size	Type	Length	Weight
B1	5	#4	Str.	10'-2"	34
B2	5	#4		14'-11"	50
B3	5	#4		14'-7"	49
B4	5	#4		10'-3"	34
B5	13	#4		2'-10"	25
B6	8	#5		27'-6"	220
B7	5	#8		36'-5"	473
B8	5	#8	Str.	21'-5"	280
B9	10	#11	1	32'-4"	1,824
M1	40	#11	1	14'-7"	3,000
S1	140	#5	2	0'-0"	1,314
S2	62	#4	3	5'-4"	221
S3	8	#4	3	5'-3"	28
S4	8	#4	3	5'-2"	28
T1	36	#6	Str.	0'-0"	514
T2	40	#6	Str.	8'-0"	511
T3	52	#8	Str.	0'-0"	1,310
T4	44	#8	Str.	8'-0"	000
V1	10	#11	1	25'-2"	1,337
V2	10	#11	1	25'-0"	1,308
V3	10	#11	1	20'-3"	1,305
V4	10	#11	1	20'-0"	1,421
SP1	1	—	4	726'-1"	485
SP2	1	—	4	745'-4"	408
SP3	1	—	4	701'-10"	500
SP4	1	—	4	778'-4"	620

Spiral Column Reinforcing Steel Lbs. 2,012

Reinforcing Steel Lbs. 10,558

Class "A" Concrete	Cu. Yds.
Pour 1	40.0
Pour 2	22.8
Pour 3	21.7
Total	84.5

Foundation Excavation 219.6 Cu. Yds.



PLAN OF FOOTING

Note: All footings are identical

	BY	DATE
MADE	L.M.D.	3-90
CHECKED	K.R.W.	3-90
IN CHARGE	D. R. Ruggles	

PREPARED BY
AMERICAN ENGINEERS

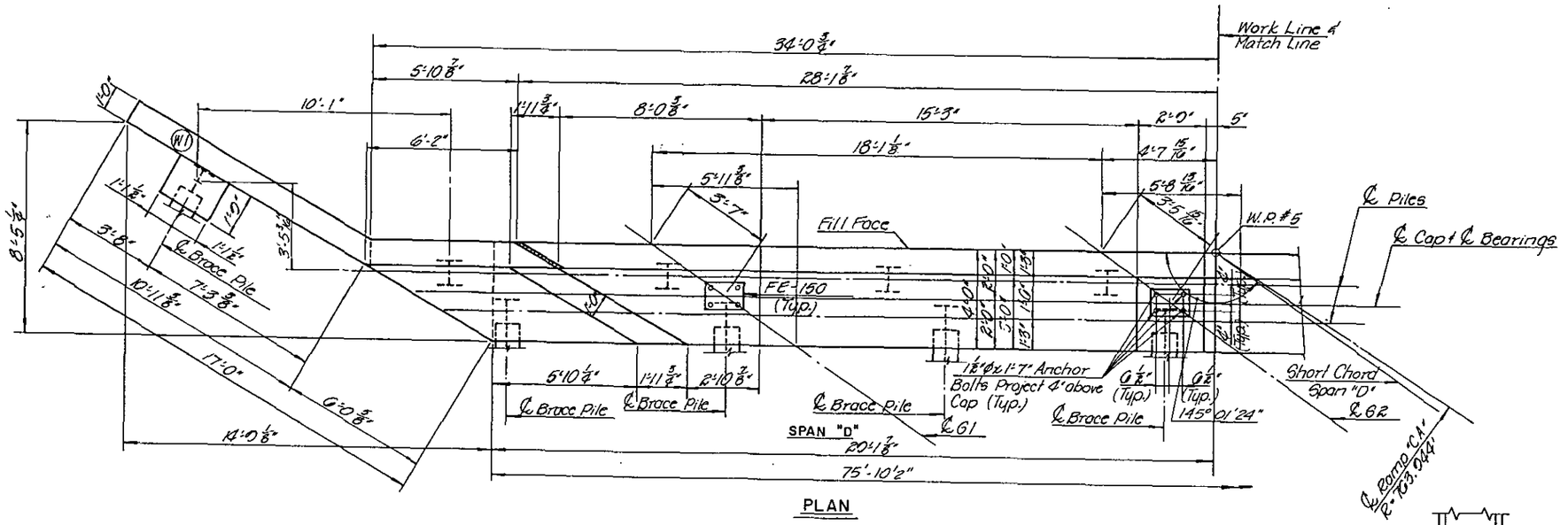
PROJECT: 8.UG70111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

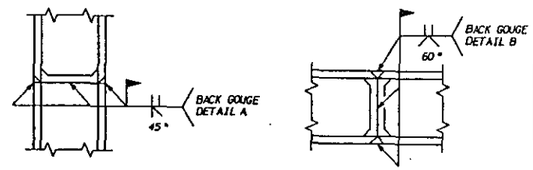
SUBSTRUCTURE
BENT 3

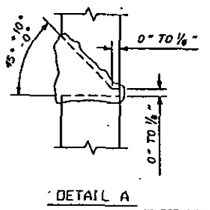
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-75
						TOTAL SHEETS
						421

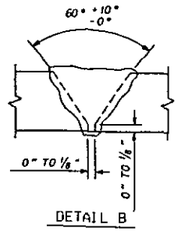
Dwg. 35 of 43



Top of Pile Elevation	
Pile	Elevation
P1	603.002
P2	603.024
P3	603.247
P4	603.329
P5	603.552
P6	603.634
P7	603.860
P8	603.940
P9	604.163
P10	604.245
P11	604.468
P12	604.550
P13	604.773
P14	604.855
P15	605.079
P16	605.161
P17	605.373
P18	605.373
P19	603.002
P20	605.373

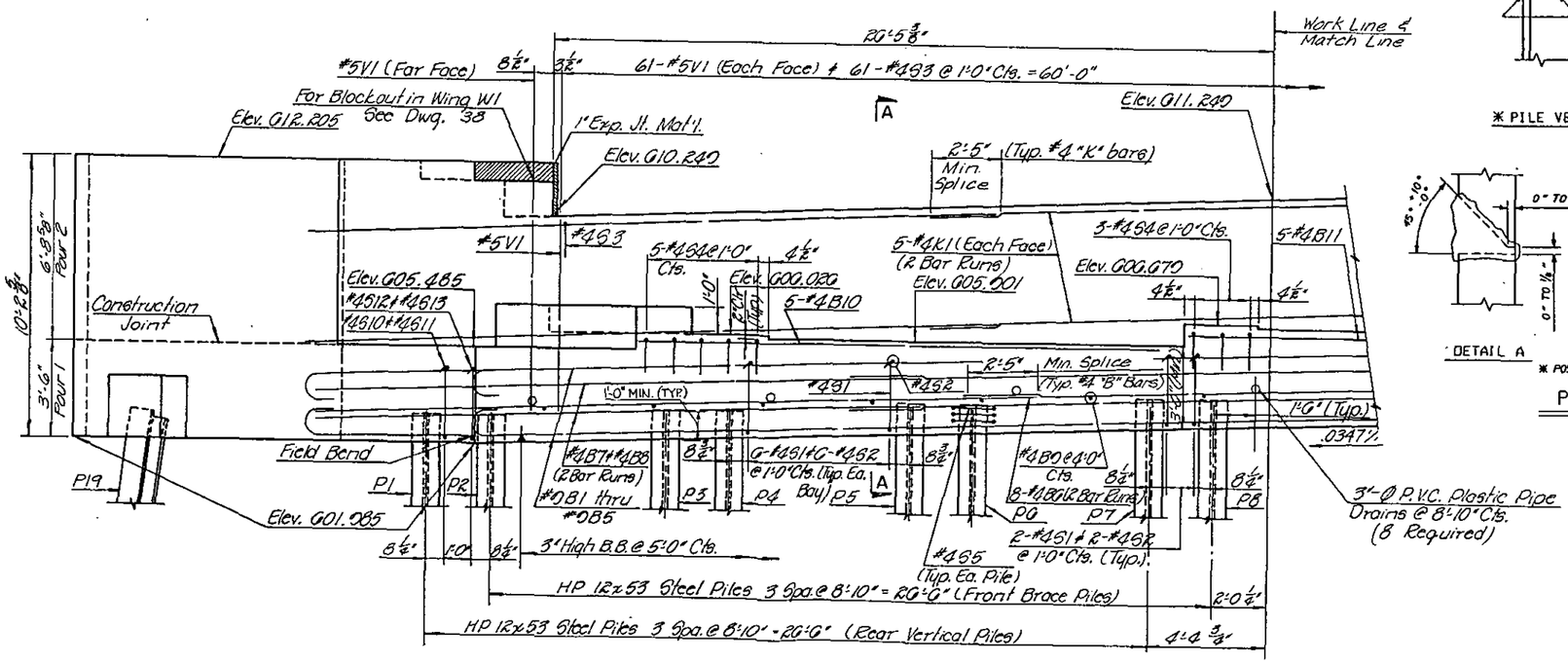






* POSITION OF PILE DURING WELDING

PILE SPLICE DETAILS



ELEVATION

PREPARED BY
AMERICAN ENGINEERS

	BY	DATE
MADE	D.H.B.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D. R. RUGGLES	

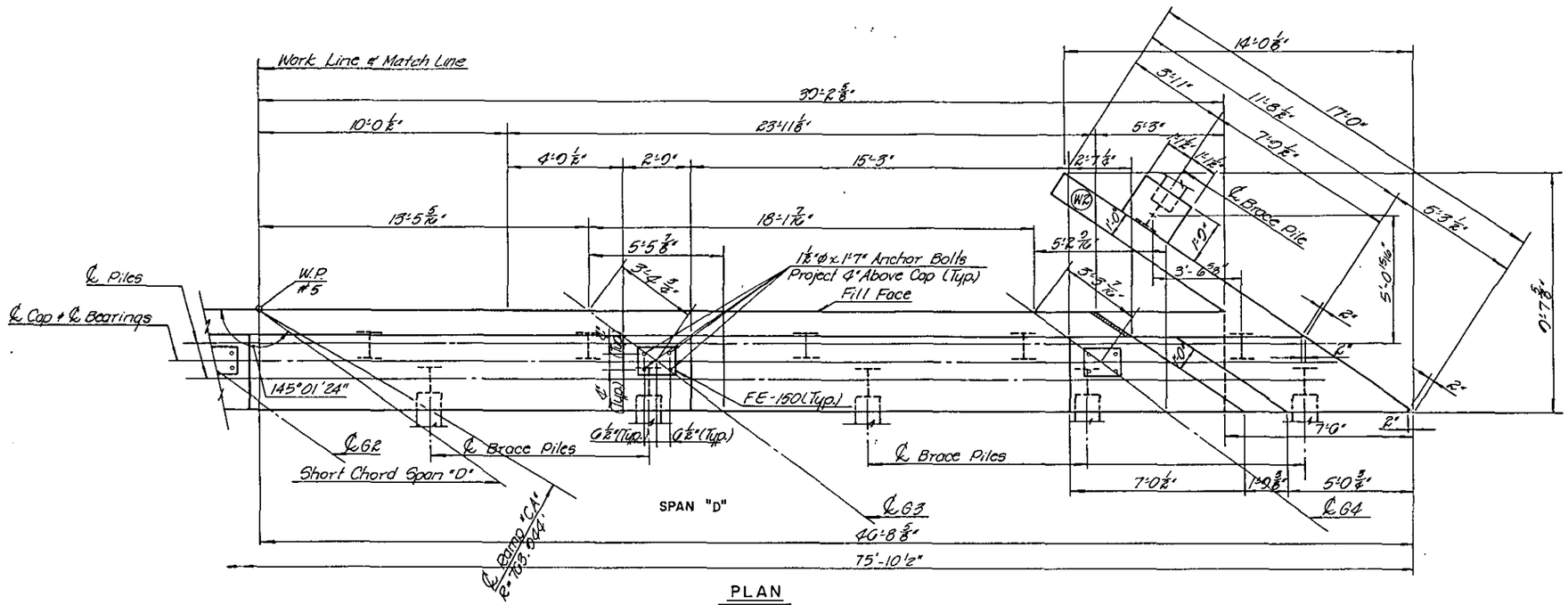
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

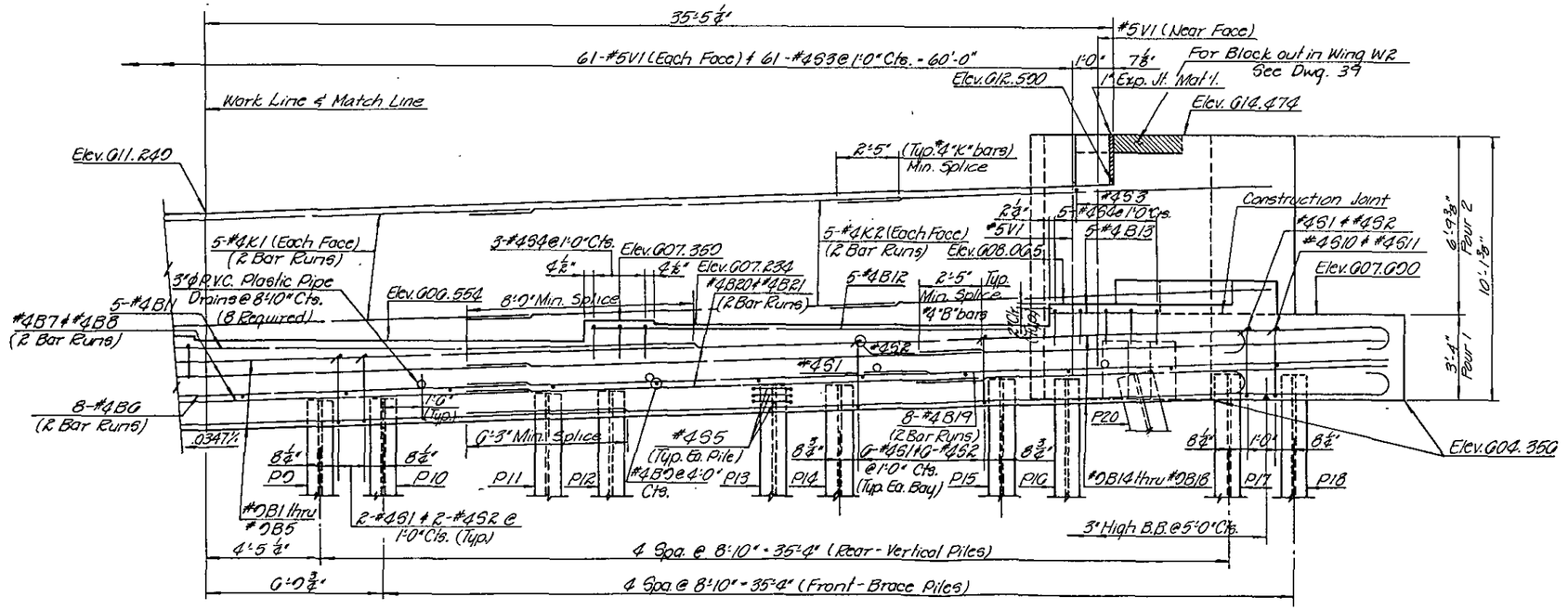
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-710
						TOTAL SHEETS
						421

Dwg. 36 of 43



PLAN



ELEVATION

NOTES

Backwall shall be placed before applying the Epoxy Protective Coating. For Epoxy Protective Coating, see Special Provisions.

The top surface area of the End Bent cap shall be cured in accordance with the standard specifications except the Membrane Curing Compound Method shall not be used.

Bridge seat elevations are based on an assumed pot bearing depth as shown in pot bearing details. The Contractor shall adjust the bridge seat elevations if pot bearing depth varies from the assumed depth shown. There will be no adjustment to the quantities shown on the plans. Payment will be made of the contract unit price bid for the quantities shown on the plans. No work shall be started on the End Bent before the plans for any adjustments are approved by the Engineer.

The top surface of the cap except the bridge seat buildups shall be sloped transversely from the fill face to the back face at the rate of ¼" per foot.

For direction of girder movement and bearing orientation, see bearing details.

Pipe drains may be shifted slightly as necessary to clear reinforcing steel.

	BY	DATE
MADE	D.H.B.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D. R. RUGGLES	

PREPARED BY
AMERICAN ENGINEERS

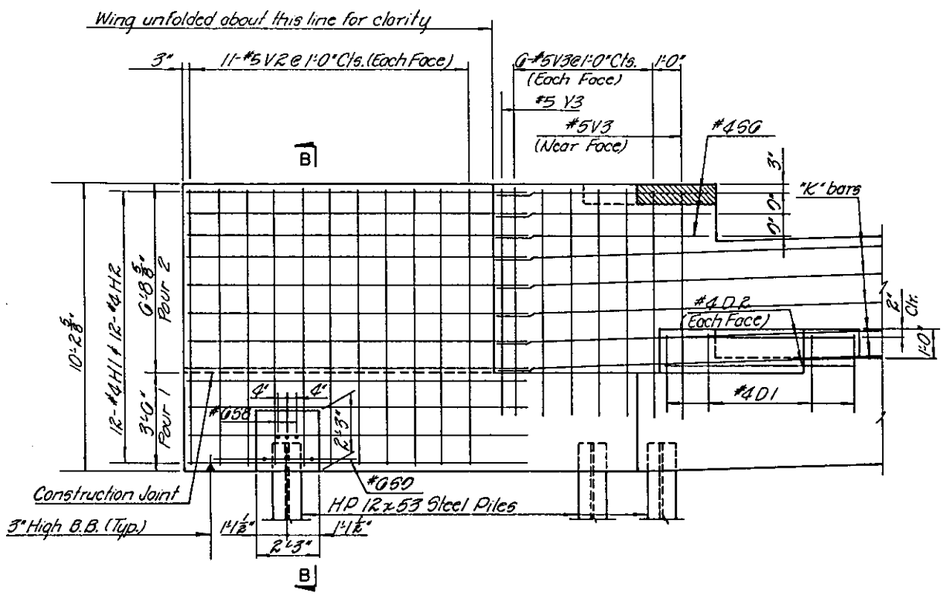
PROJECT: 8.U670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

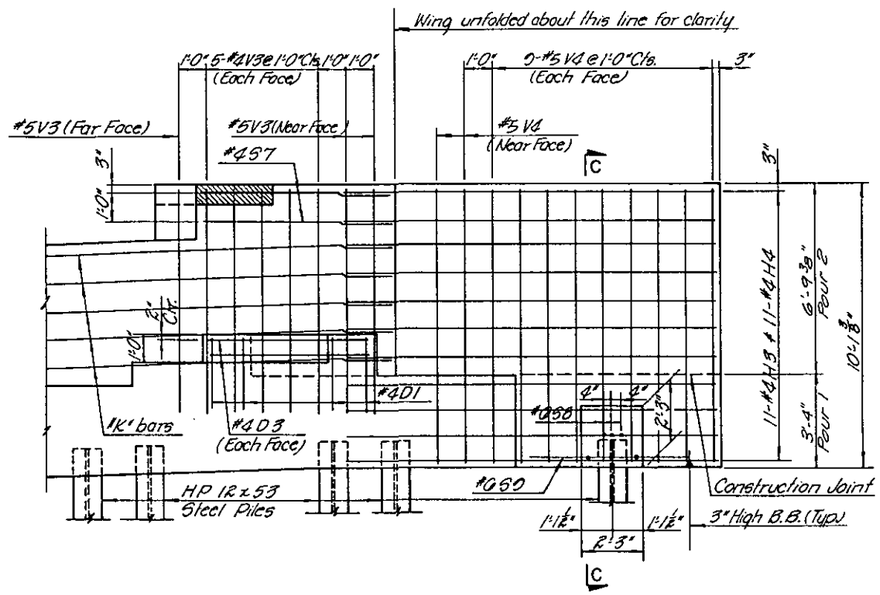
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO	BY	DATE	NO	BY	DATE	S-77
						TOTAL SHEETS
						1

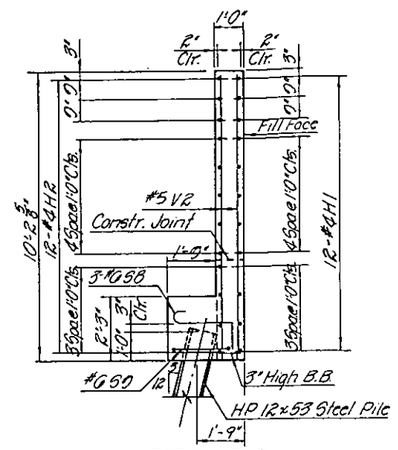
Dwg. 37 of 43



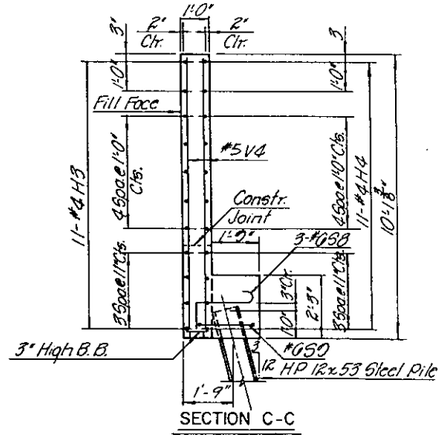
ELEVATION - WING W1



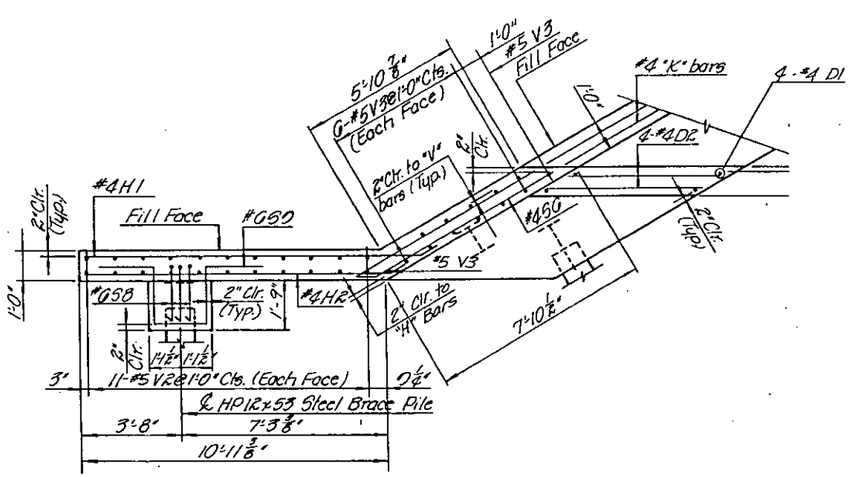
ELEVATION - WING W2



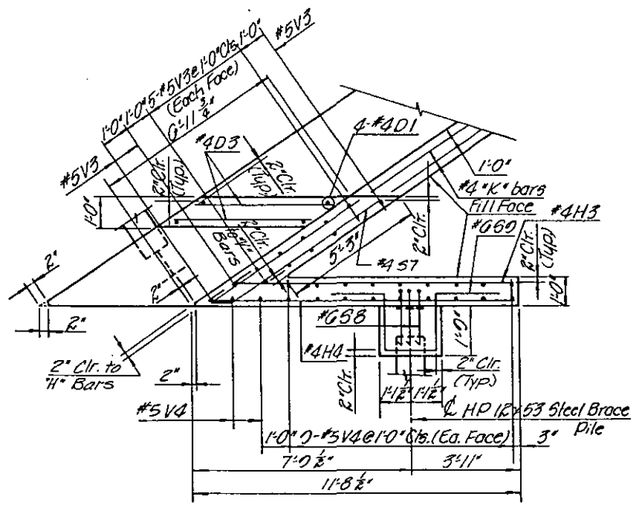
SECTION B-B



SECTION C-C



PLAN - WING W1



PLAN - WING W2

	BY	DATE
MADE	K.R.W.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D. R. RUGGLES	

PREPARED BY
AMERICAN ENGINEERS

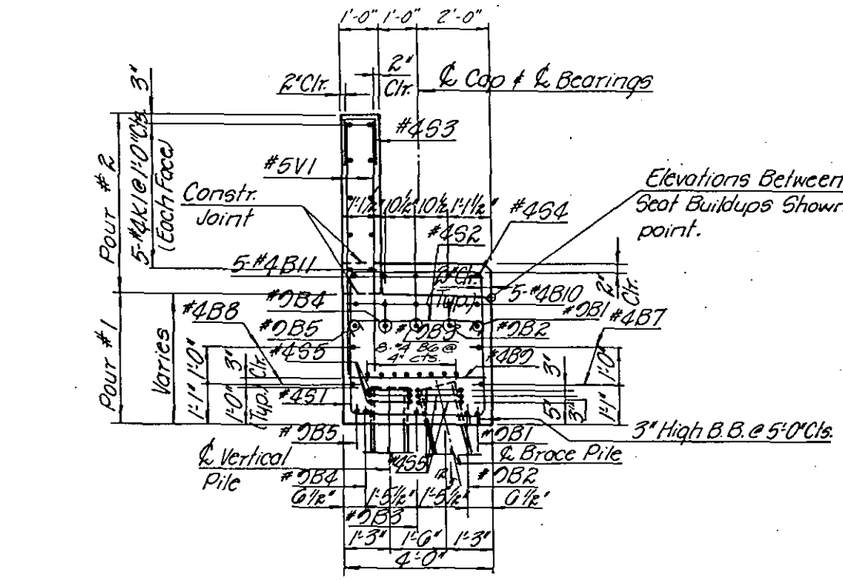
PROJECT: 8.1670111
Mecklenburg COUNTY
STATION: 10+50.38 Ramp "C A"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

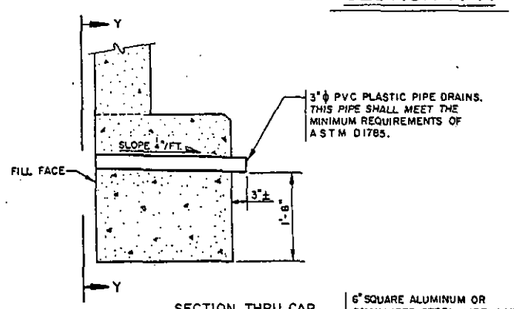
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-78
						TOTAL SHEETS
						421

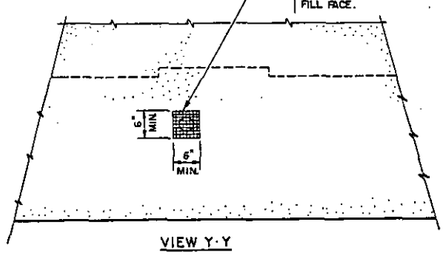
Dwg. 38 of 43



SECTION A-A



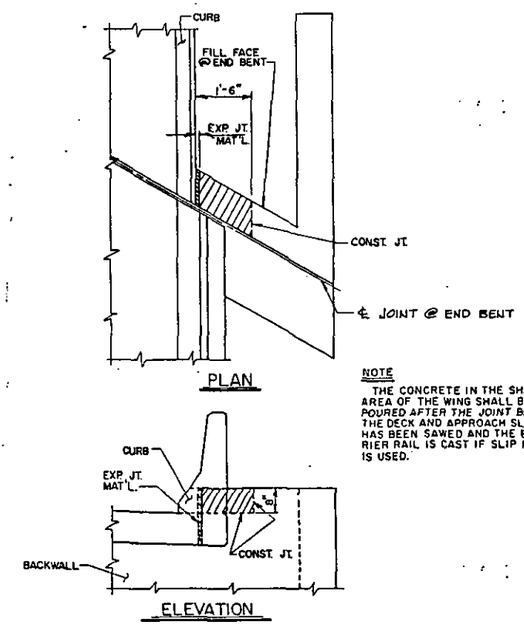
SECTION THRU CAP



VIEW Y-Y

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 BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS
FOR STRUCTURES WITH APPROACH SLABS

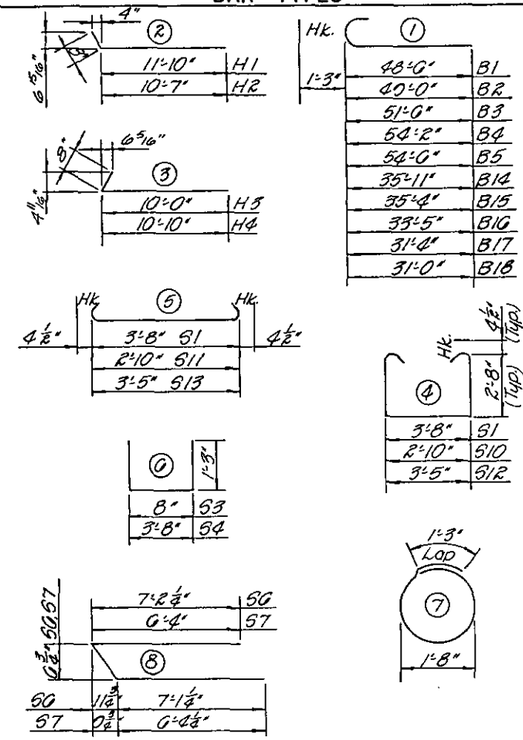


BLOCKOUT IN WING WALL FOR FITTING COMPRESSION JOINT SEAL

NOTE
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

END BENT # 2

BAR TYPES



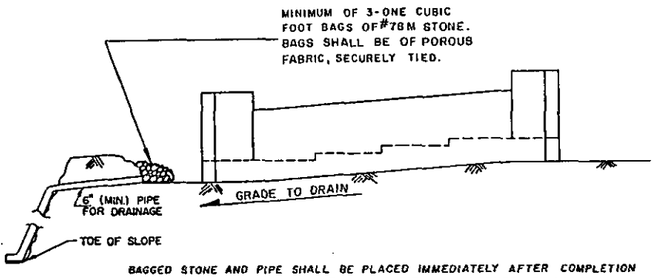
BILL OF MATERIAL

Bar	No.	Size	Type	Length	Weight
B1	2	9	1	40'-0"	338
B2				50'-3"	342
B3				52'-0"	350
B4				55'-5"	377
B5	2	9	1	55'-0"	370
B6	10	4	Str.	25'0"	267
B7	4			22'-2"	50
B8	4			25'-3"	67
B9	18			38'-4"	44
B10	5			18'-1"	03
B11	1			12'-10"	43
B12				10'-4"	55
B13	5	4	Str.	4'-0"	14
B14	2	9	1	37'-2"	253
B15				35'-7"	240
B16				34'-8"	230
B17				32'-7"	223
B18	2	9	1	32'-3"	210
B19	16	4	Str.	10'-11"	181
B20	4	4	Str.	10'-3"	51
B21	4	4	Str.	10'-10"	45
D1	8	4	Str.	2'-3"	12
D2	4	4	Str.	5'-3"	14
D3	4	4	Str.	4'-0"	13
H1	12	4	2	12'-6"	100

Bar	No.	Size	Type	Length	Weight
H2	12	4	2	11'-3"	90
H3	11	4	3	10'-8"	78
H4	11	4	3	11'-6"	85
K1	20	4	Str.	25'-2"	336
K2	20	4	Str.	17'-1"	228
S1	03	4	4	0'-0"	411
S2	03		5	4'-5"	180
S3	01		6	3'-2"	120
S4	10		6	0'-2"	00
S5	54		7	6'-0"	234
S6	3		8	15'-5"	31
S7	2	4	8	13'-8"	18
S8	0	0	0	3'-8"	33
S9	2	6	10	10'-1"	30
S10	2	4	4	8'-11"	12
S11	2	4	5	3'-7"	0
S12	1	4	4	0'-6"	7
S13	1	4	5	4'-2"	3
V1	124	5	Str.	7'-10"	1013
V2	22	5		0'-10"	226
V3	27	5		7'-10"	221
V4	20	5	Str.	0'-8"	202

Reinforcing Steel lbs.	7648
Class 'A' Concrete Cu Yds.	
Pour 1	41.9
Pour 2	19.8
Total	61.7
HP12x53 Steel Piles No.	20
Lin. Ft.	600

Note: All bar dimensions are out to out.



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PREPARED BY
AMERICAN ENGINEERS

	BY	DATE
MADE	D.H.B.	3-90
CHECKED	D.E.L.	3-90
IN CHARGE	D. R. RUGGLES	

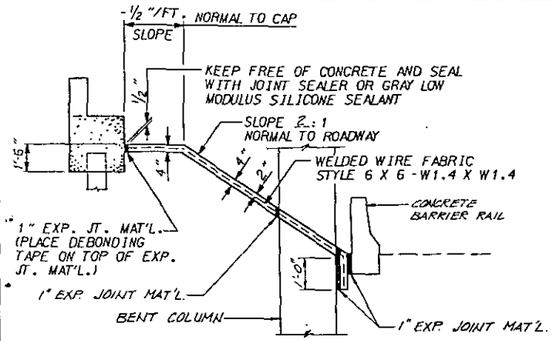
PROJECT: 8.UG70111
Mecklenburg COUNTY
STATION: 10+52.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

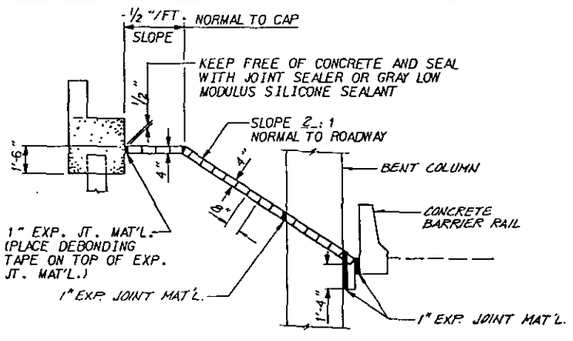
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO	BY	DATE	NO.	BY	DATE	S-79
						TOTAL SHEETS 421

Dwg. 39 of 43



SECTION ALONG ℄ ROADWAY



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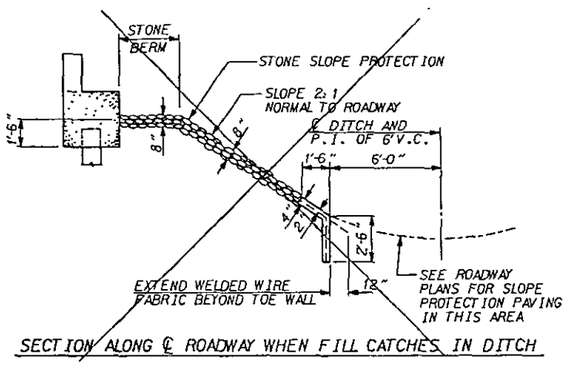
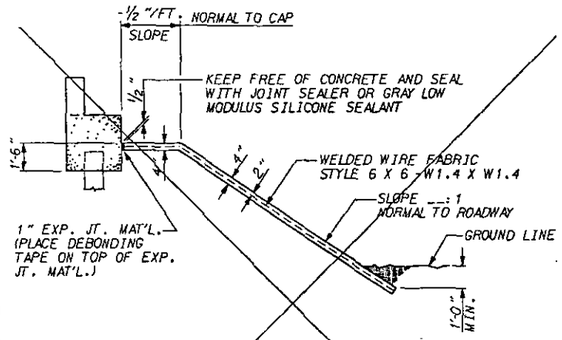
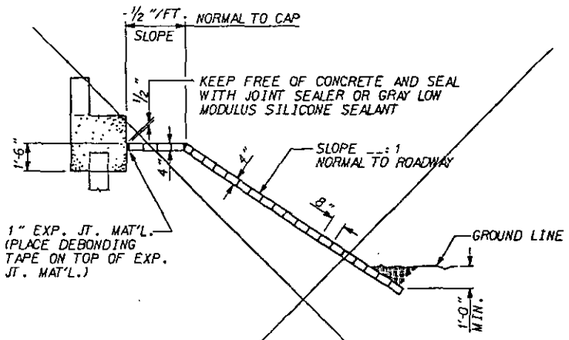


SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



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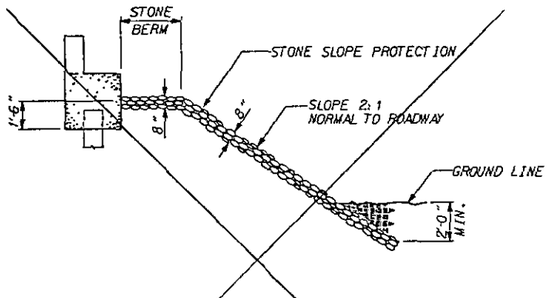
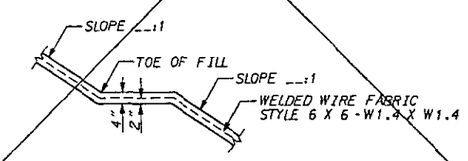
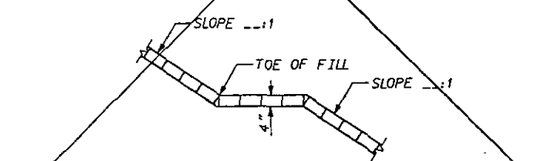


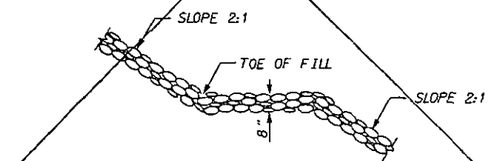
SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED



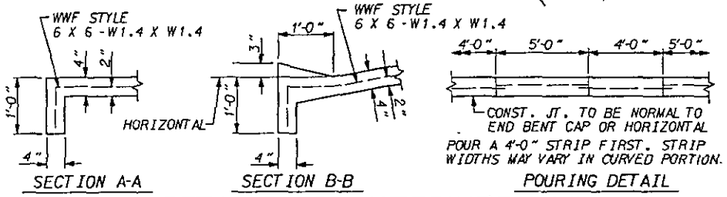
SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES



SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES

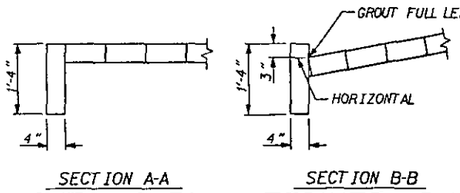


SECTION SHOWING CATCH BERM BETWEEN FILL & CUT SLOPES



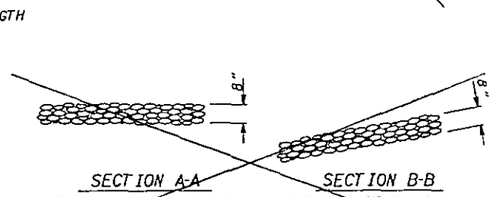
SECTION A-A | SECTION B-B | POURING DETAIL

DETAILS FOR ALTERNATE "A"



SECTION A-A | SECTION B-B

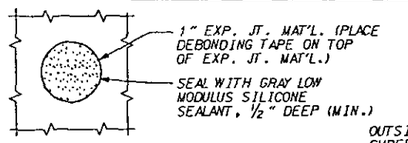
DETAILS FOR ALTERNATE "B"



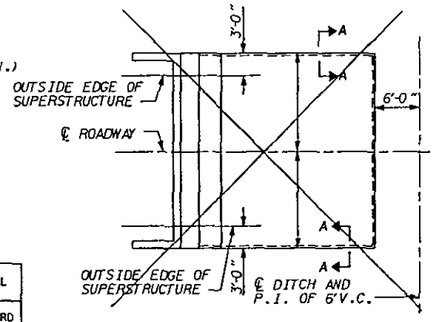
SECTION A-A | SECTION B-B

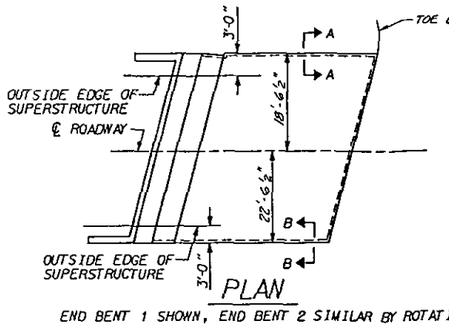
DETAILS FOR ALTERNATE "C"

NOTE: ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE ONLY.



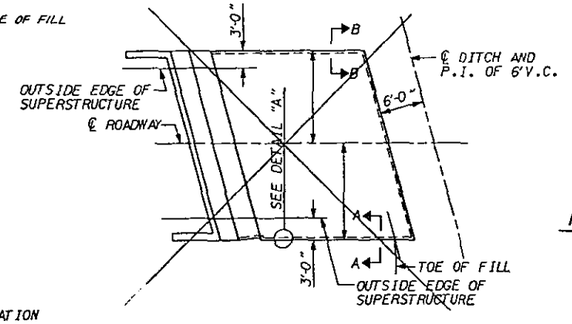
PLAN WHERE CONCRETE OR CONCRETE BLOCK SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN

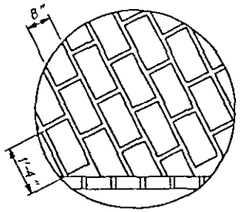




PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION





DETAIL "A" FOR ALTERNATE "B"

GENERAL NOTES

FOUR INCH SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE. LIMITS OF THE PROTECTION SHALL BE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY PLACE EITHER TYPE. ALTERNATES "A", "B" OR "C", AS DESCRIBED BELOW. 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 462 OF THE STANDARD SPECIFICATIONS. THE SAME TYPE OF SLOPE PROTECTION SHALL BE USED UNDER BOTH ENDS OF ANY ONE BRIDGE. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF 4 INCH 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. ALTERNATE "A" WELDED WIRE FABRIC REINFORCING SHALL BE STYLE 6 X 6 -W1.4 X W1.4, 60 INCHES WIDE. ADJACENT RUNS OF WELDED WIRE FABRIC SHALL LAP AT LEAST SIX INCHES. SLOPE PROTECTION SHALL BE POURED IN ALTERNATE FOUR FT. AND FIVE FT. STRIPS AS SHOWN IN POURING DETAIL. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF SOLID CONCRETE BLOCKS 4" X 8" X 16" LAID IN HORIZONTAL COURSES SUCH THAT THOSE IN SUCCESSIVE COURSES WILL BREAK JOINTS WITH UNITS IN THE PRECEEDING ONE. BLOCKS SHALL BE LAID WITH THEIR LONG AXIS PARALLEL TO THE END BENT CAP WITH GROUTED JOINTS PREFERABLY ¾" BUT NOT LESS THAN ½" NOR MORE THAN 1 ¼" WIDE BETWEEN SUCCESSIVE COURSES AND END OF BLOCKS. JOINTS SHALL BE GROUTED BY POURING A MIXTURE OF ONE PART PORTLAND CEMENT TO THREE PARTS SAND MIXED WITH SUFFICIENT WATER TO ENABLE THE MIXTURE TO BE POURED THROUGH A SPOUT. THE CONCRETE BLOCKS SHALL BE CAST TO ACCURATE DIMENSIONS, SHALL HAVE UNIFORM SURFACE COLOR AND TEXTURE AND SHALL BE MANUFACTURED OF MATERIALS TO PRODUCE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AT AGE OF 28 DAYS. NO BROKEN BLOCKS SHALL BE USED EXCEPT IN CONSTRUCTING A STRAIGHT LINE ALONG EACH SIDE OF THE PAVING DOWN THE SLOPE. CARE SHALL BE TAKEN TO BREAK THE BLOCKS SO AS TO GIVE A UNIFORM WORKMANLIKE JOINT AND SURFACE.

ALTERNATE "C"

ALTERNATE "C" SHALL BE CONSIDERED FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS ONLY.

ALTERNATE "C" 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. EIGHT INCHES 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 STYLE 6 X 6 -W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION. SUBGRADING, STONE TYPE, STONE SIZING, AND HERBICIDE PROTECTION, SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

	SLOPE PROTECTION SQUARE YARDS		WELDED WIRE FABRIC 60 INCHES WIDE APPROX. L.F.
	END BENT 1	END BENT 2	
BRIDGE @ STA. 19+59.38	260	370	1260

PROJECT NO. 8.U670111

Mecklenburg COUNTY

STATION: 19+59.38 Ramp "CA"

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SLOPE PROTECTION DETAILS

FEBUARY 1979

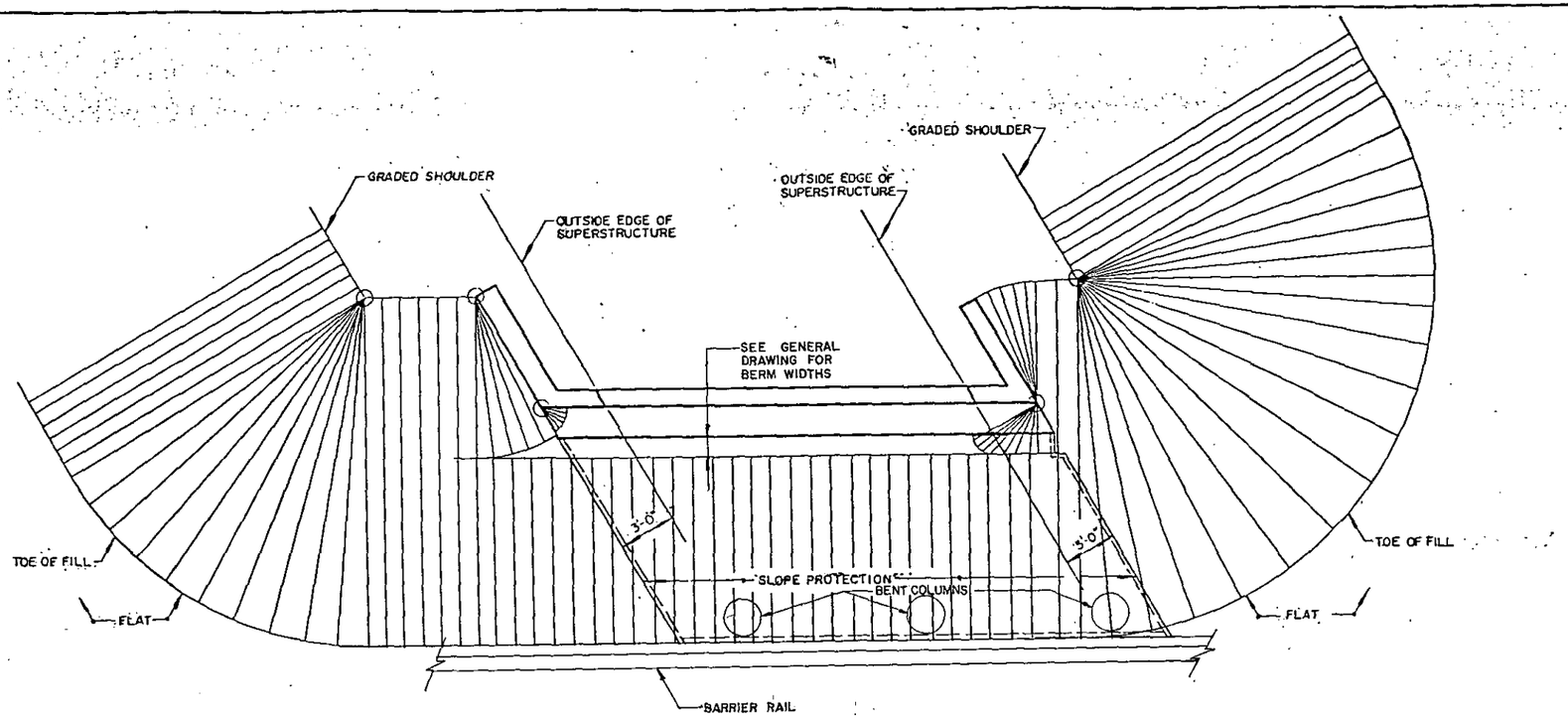
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80
1			3			TOTAL SHEETS
2			4			421

Dwg. 40 of 43

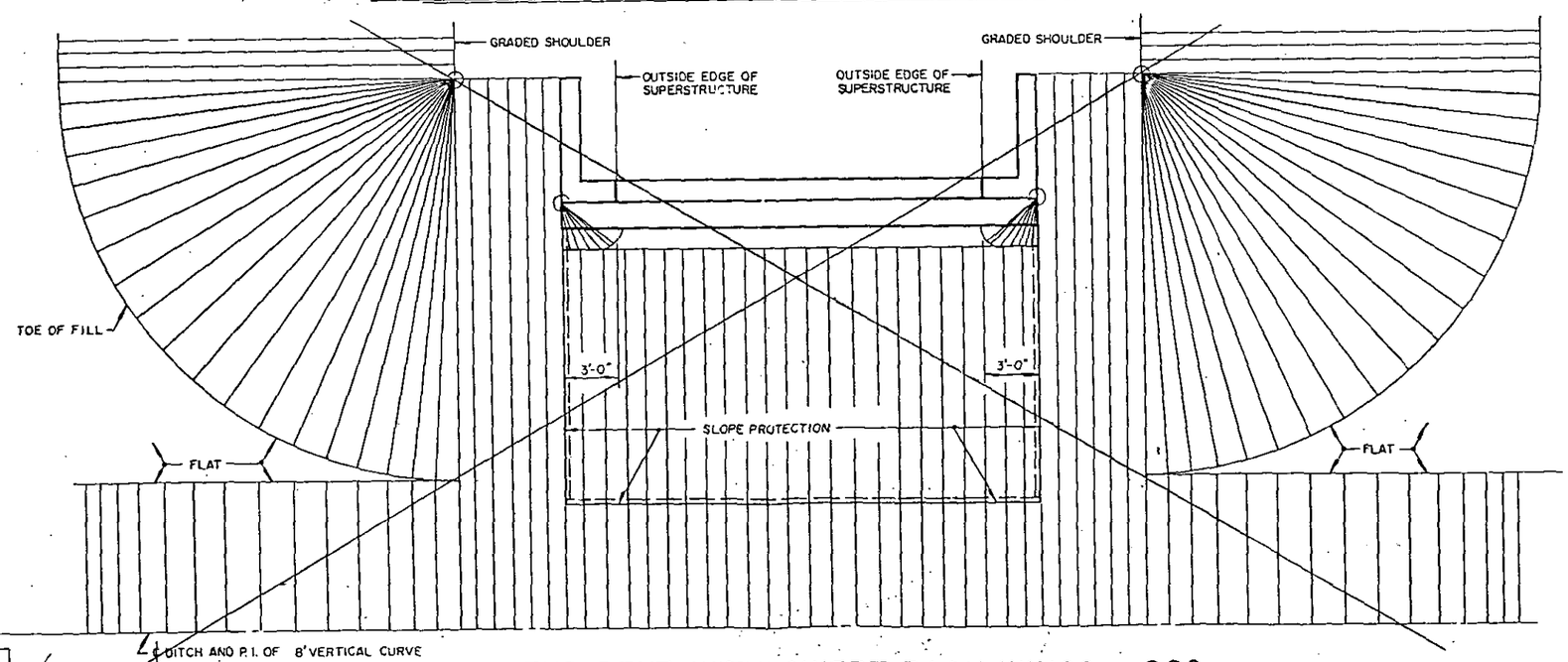
STD. NO. SP1

REVISED BY W.J.H. CHECKED BY C.R.K. 2-22-1989
REVISED BY F.C.J. CHECKED BY C.R.K. 3-1-1989
REDRAWN OCTOBER 4, 1988

ASSEMBLED BY : JWR	DATE : 5/90		SPECIAL
CHECKED BY : DRR	DATE : 5/90		
DRAWN BY : W.J. HARRIS	DATE : 10/4/88		STANDARD
CHECKED BY : F.C. JONES	DATE : 10/5/88		



PLAN · END BENT WITH SWEPT BACK WINGS - SKEWED



PLAN · END BENT WITH SWEPT BACK WINGS - 90°

PROJECT NO. 8U670111
Mecklenburg COUNTY
STATION: 19+59.38 Ramp "CA"

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SLOPE PROTECTION
DETAILS

FEBRUARY 1979

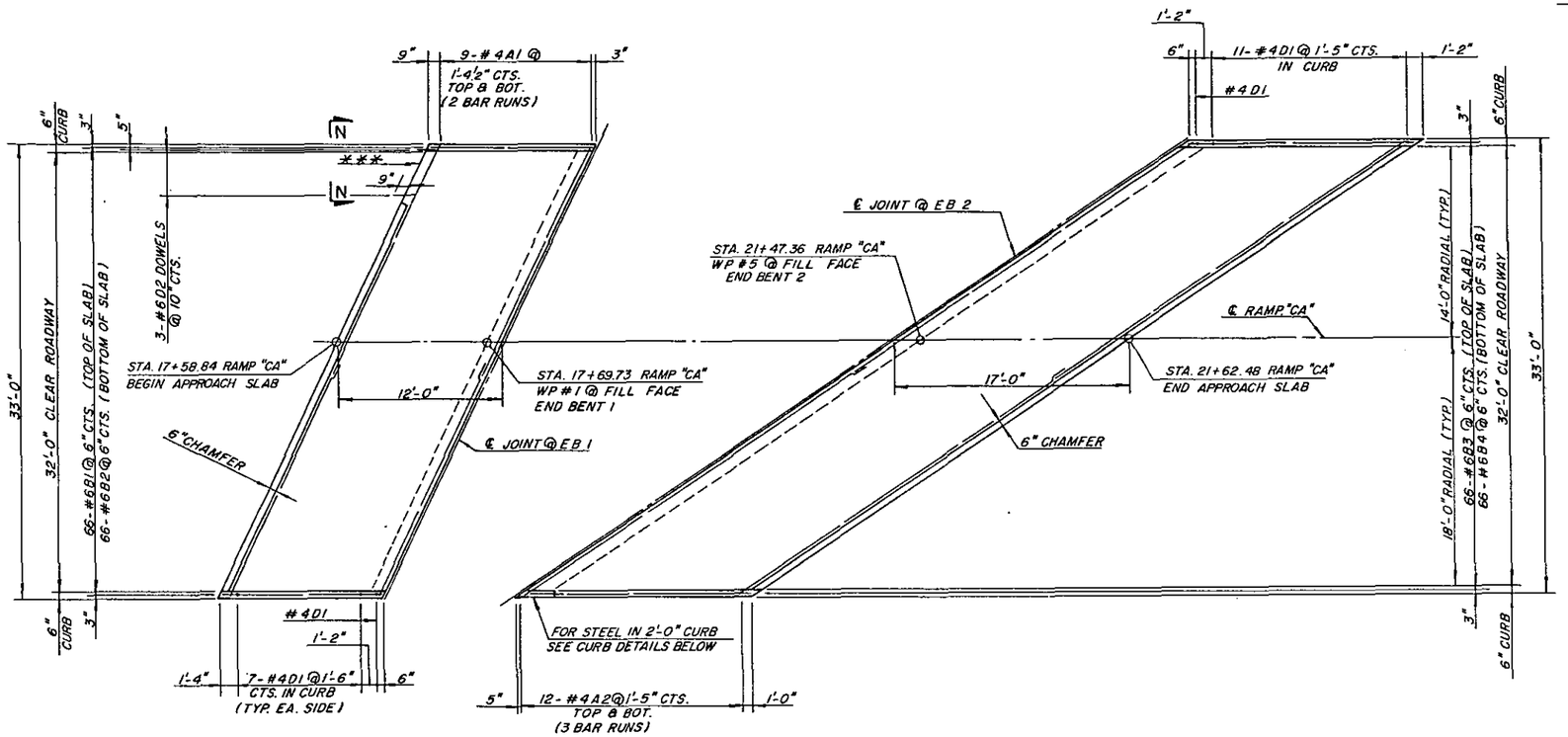
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-81
1			3			TOTAL SHEETS
2			4			421

Dwg. 41 of 43

STD. NO. SP2

ASSEMBLED BY JWR	DATE 5/90	SPECIAL	
CHECKED BY DRR	DATE 5/90		
DRAWN BY C C MITCHINER	DATE FEB 1979	STANDARD	
CHECKED BY Ramesh B. Kofarian	DATE Feb 2, 79		

REVISED 3-1-84 BY JMB JBY-RDU
REDRAWN AND ADOPTED: APRIL 1, 1979



PLAN OF APPROACH SLABS

NOTES

FOR PREFORMED COMPRESSION JOINT SEAL, SEE SPECIAL PROVISIONS.

THE PREFORMED COMPRESSION SEAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID. SEE GENERAL DRAWING.

THE OPENING SHOWN IS BASED ON A NOMINAL UNCOMPRESSED SEAL WIDTH OF 3".

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE CURB TO THE CONSTRUCTION JOINT AND THE BARRIER RAIL. FOR LOCATION OF CONSTRUCTION JOINT SEE CURB DETAILS.

THE 6" COMP. A.B.C. IS TO EXTEND 10'-0" BEYOND THE SLAB AS SHOWN AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

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

THE CONTRACTOR, AT HIS OPTION, MAY USE 4" BITUMINOUS CONCRETE BASE COURSE, TYPE HB IN LIEU OF 6" A.B.C.. ANY ADDITIONAL COST DUE TO THE USE OF THIS OPTION WILL BE PAID FOR BY THE CONTRACTOR.

THE 1" EXPANSION JOINT MATERIAL IS TO BE HELD IN PLACE WITH GALVANIZED NAILS.

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

TEMPORARY DRAINAGE 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.

*** TEMPORARY BERM AND SLOPE DRAIN REQUIRED AT THESE LOCATIONS. FOR DETAILS, SEE DWG. 43.

THE APPROACH SLAB SHALL HAVE A VERTICAL FACE AT THE LOCATION OF THE PROPOSED FLUME.

FOR ARC OFFSETS ON APPROACH SLABS, SEE DWG. 43.

BILL OF MATERIAL

APPROACH SLAB NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	36	4	STR.	19'-0"	457
B1	66	6	STR.	11'-2"	1,107
B2	66	6	STR.	11'-8"	1,157
B5	2	4	STR.	11'-0"	15
D1	16	4	STR.	10"	9
D2	3	6	STR.	1'-6"	7

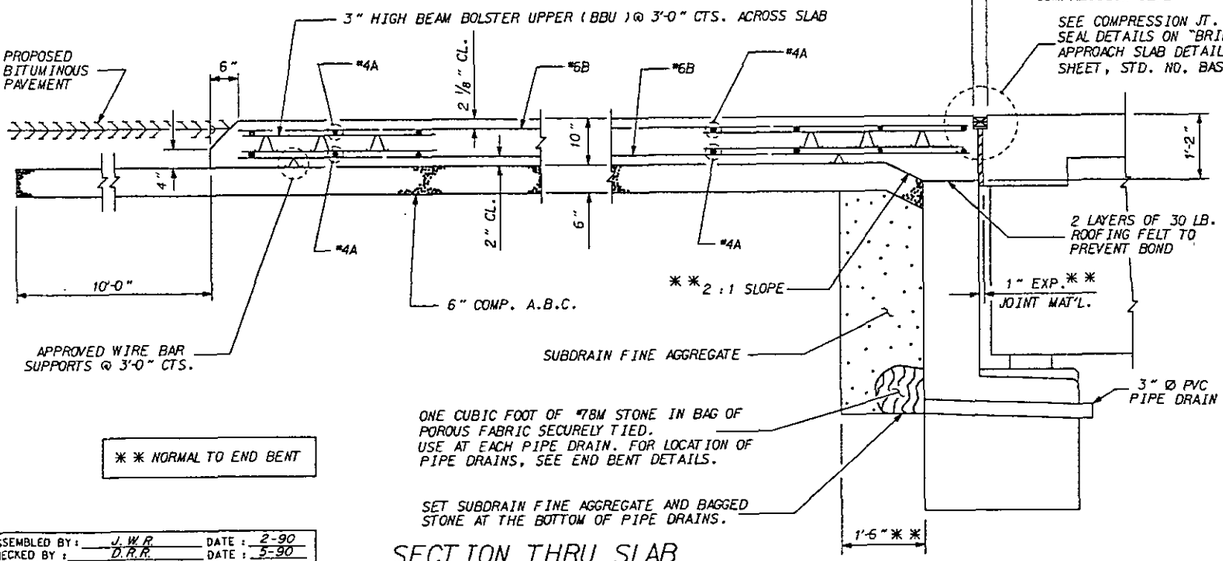
APPROACH SLAB NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A2	72	4	STR.	22'-4"	1074
B3	66	6	STR.	16'-2"	1,603
B4	66	6	STR.	16'-8"	1,652
B6	1	4	STR.	16'-0"	11
B7	1	4	STR.	1'-6"	1
D1	14	4	STR.	10"	8

REINFORCING STEEL LBS.
2752 EB 1
4349 EB 2

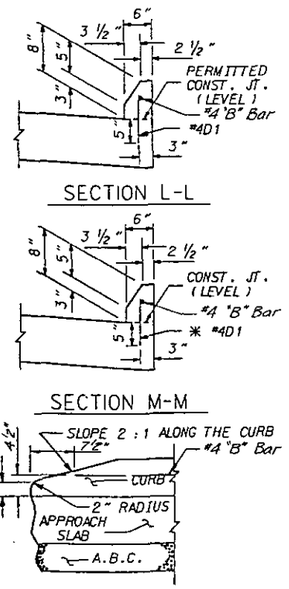
CLASS "AA" CONCRETE AT EB 1
CU. YDS. 12.9

CLASS "AA" CONCRETE AT EB 2
CU. YDS. 18.1

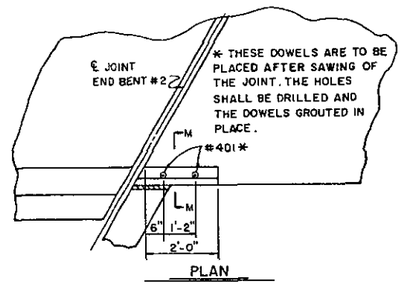


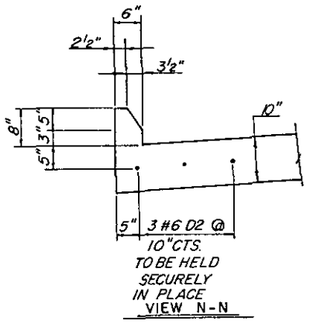
** NORMAL TO END BENT

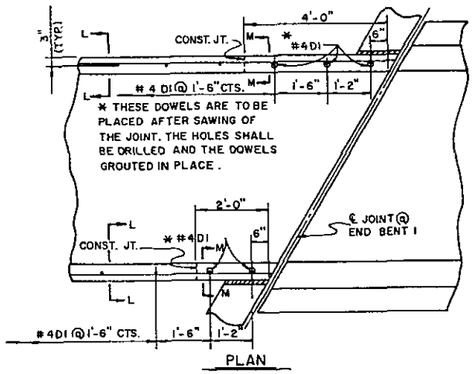
SECTION THRU SLAB



DETAIL AT END OF CURB
(FULL LENGTH ONLY)







CURB DETAILS

PROJECT NO. 8.U670111

MECKLENBURG COUNTY

STATION: 19+59.38 RAMP "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

FEB. 1988

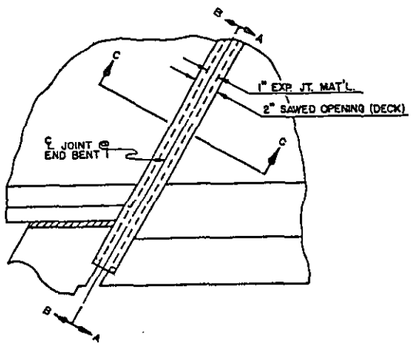
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-82
1			3			TOTAL SHEETS
2			4			43

STD. NO. BAS2

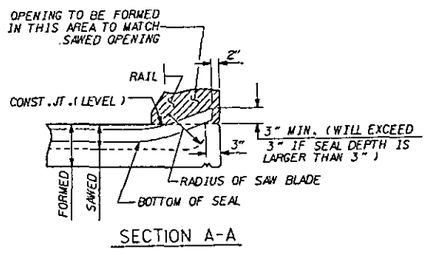
ASSEMBLED BY: J.W.R.	DATE: 2-90	
CHECKED BY: D.R.R.	DATE: 5-90	
STD. DRAWN BY: F. C. JONES	DATE: 6/10/87	
STD. CHECKED BY: F. G. ALLEN	DATE: 6/25/87	

REVISED 8/22/89 by: FCJ / by: CRK
REVISED 12/1/88 by: FCJ / by: BEM
REDRAWN 2/29/88

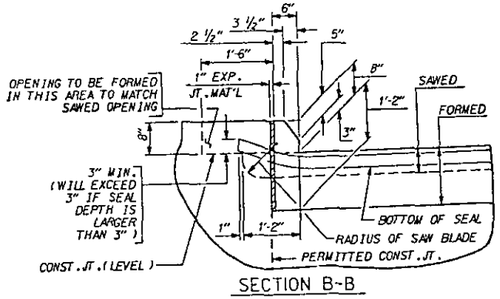
DWG. 42 OF 43



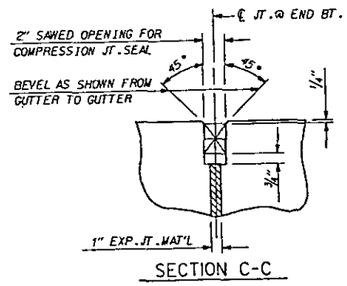
PLAN



SECTION A-A

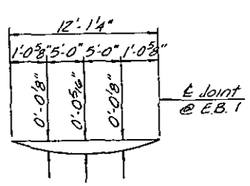


SECTION B-B

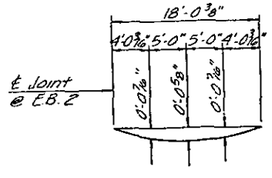


SECTION C-C

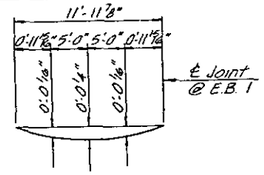
COMPRESSION JOINT SEAL DETAILS @ END BENT



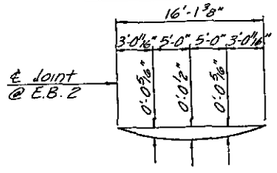
LEFT SIDE AT END BENT 1



LEFT SIDE AT END BENT 2

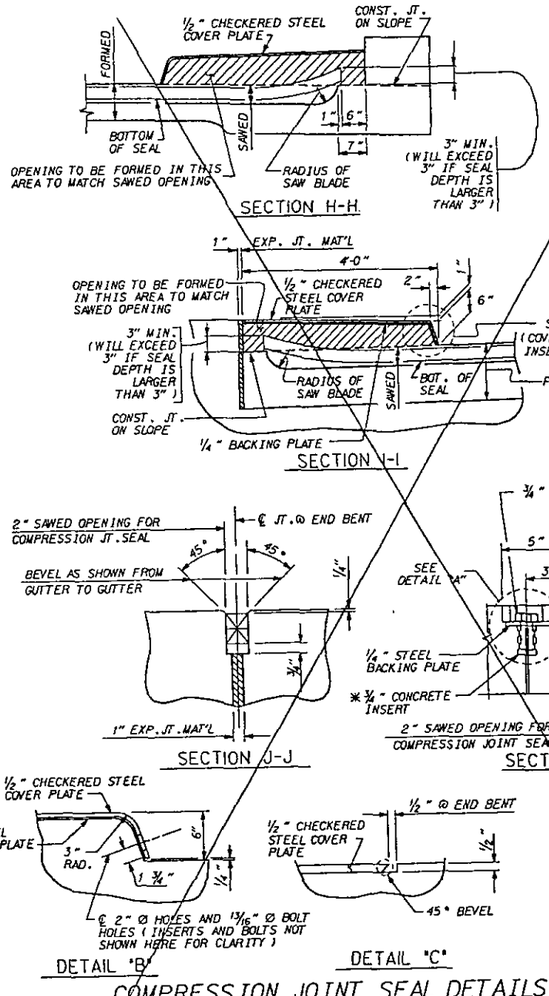


RIGHT SIDE AT END BENT 1



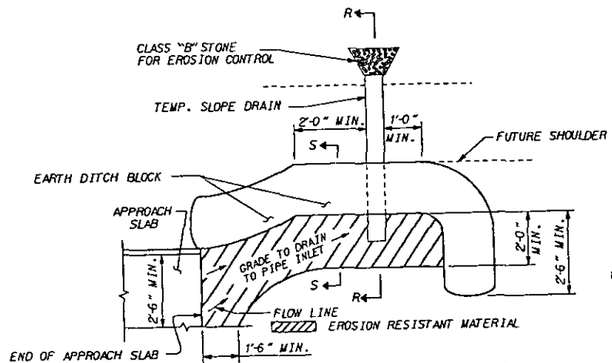
RIGHT SIDE AT END BENT 2

ARC OFFSETS-OUTSIDE EDGES-APPROACH SLABS



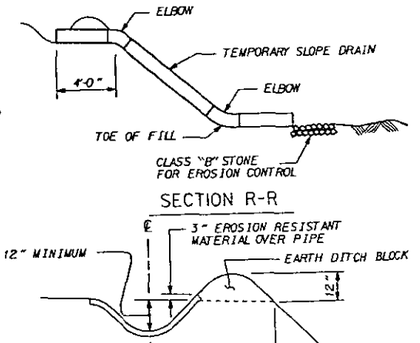
* THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO ASTM A108, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

COMPRESSION JOINT SEAL DETAILS @ END BENT

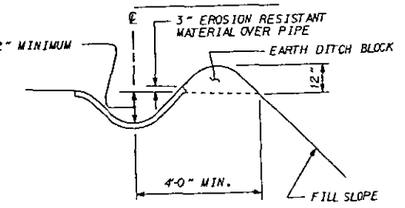


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) BITUMINOUS PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

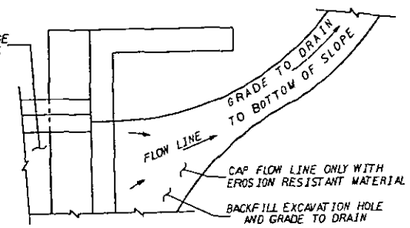


SECTION R-R



SECTION S-S

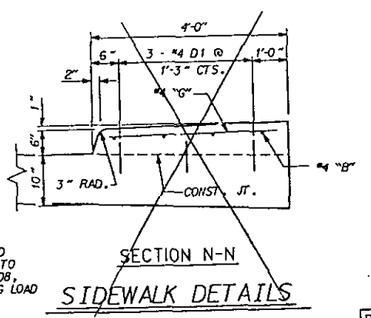
TEMPORARY BERM AND SLOPE DRAIN DETAILS



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PLAN



SECTION N-N

SIDEWALK DETAILS

PROJECT NO. 8.U670111

Mecklenburg COUNTY

STATION: 19+59.38 Ramp "CA"

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB DETAILS

DECEMBER 1988

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-83
TOTAL SHEETS 421

STD. NO. BAS1

ASSEMBLED BY : JWR	DATE : 5/90	SPECIAL	
CHECKED BY : DRR	DATE : 5/90		
DRAWN BY : F.C. JONES	DATE : 11/28/88	STANDARD	
CHECKED BY : F.C. PICCIOTTO	DATE : 11/28/88		

REVISED 8/22/89 by:WJH
REVISED 3/1/89 by:FCJ
REDRAWN 12/1/88 by:FCJ & by:BEM

Dwg. 43 of 43