

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-1-094(101)170	16752	1	1

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2002; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SIM-1-094(101)170		
Menoken Interchange		
Bridge # 94-170.519	0.045 Miles	0.045 Miles
McKenzie Interchange		
Bridge # 94-176.501	0.045 Miles	0.045 Miles

APPROVED DATE _____
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION
APPROVED DATE _____
FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.
APPROVED DATE 3-22-07
Terrence R. Udland
ND DOT BRIDGE ENGINEER

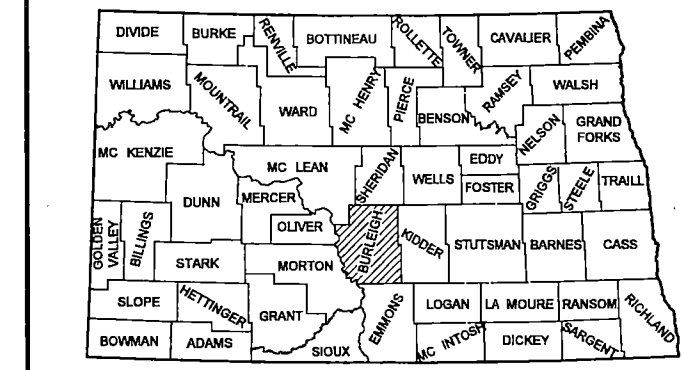
REGISTERED PROFESSIONAL ENGINEER
TERRENCE R. UDLAND
P.E. 2674
DATE 3-22-07
NORTH DAKOTA

JOB# 9

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

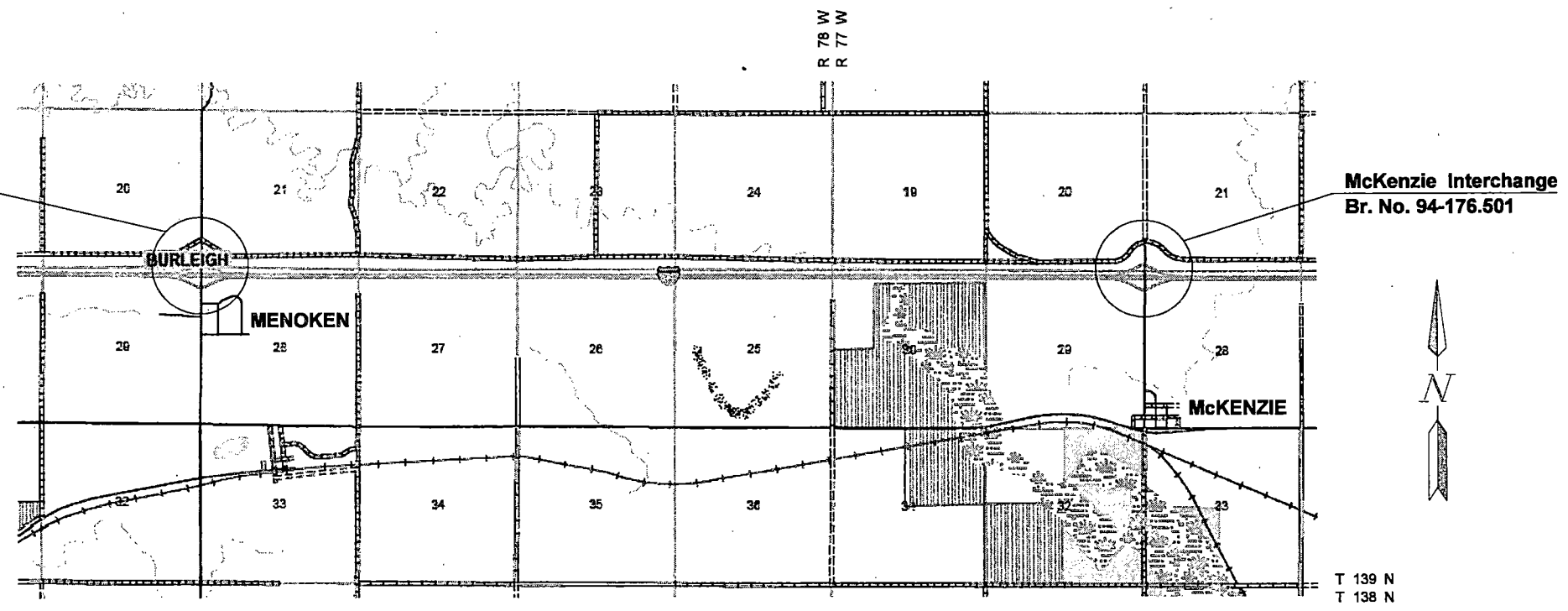
SIM-1-094(101)170
BURLEIGH COUNTY
MENOKEN & McKENZIE INTERCHANGE
BRIDGE DECK OVERLAY

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current	Pass:	Trucks:	Total:	
Forecast	Pass:	Trucks:	Total:	
Minimum Sight Dist. for:		Design Speed:		
Stopping:		Bridges:		
Safe Passing:				
Passing for Marking:				
Pavement Design Life (years)				

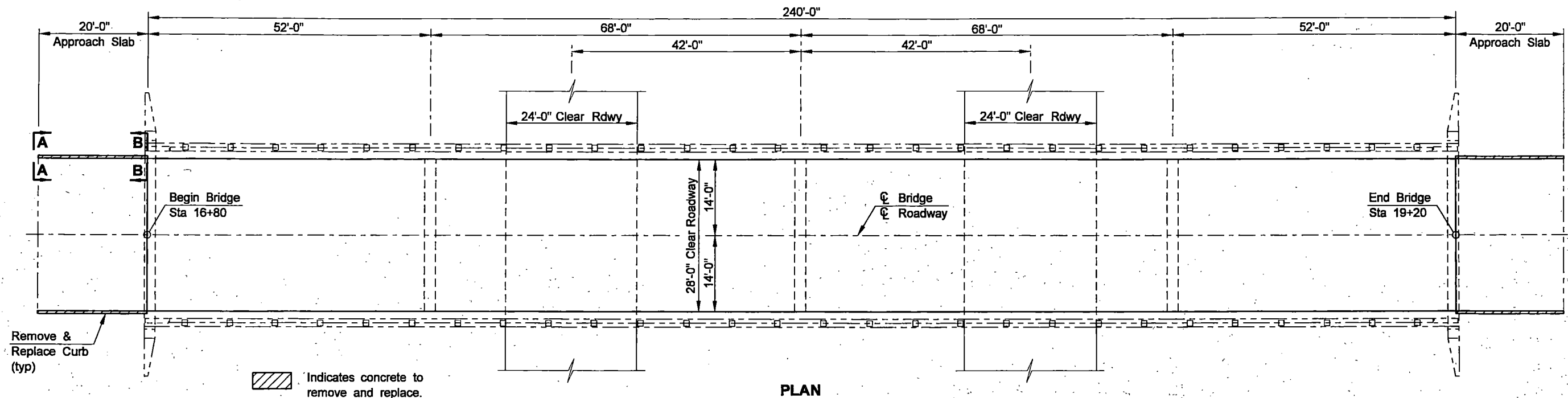


STATE COUNTY MAP

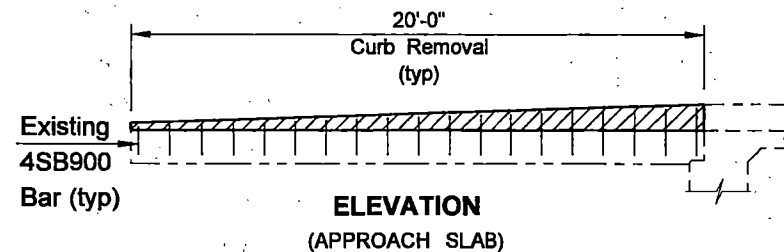
DESIGNERS



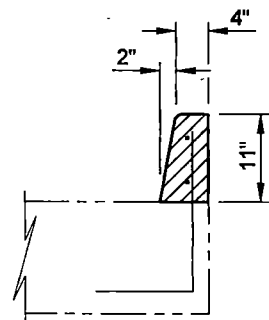
BRIDGE CODE	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
X-081	ND	SIM-1-094(101)170	170	1



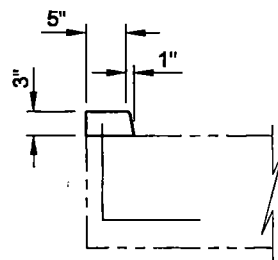
PLAN



A-A



B-B

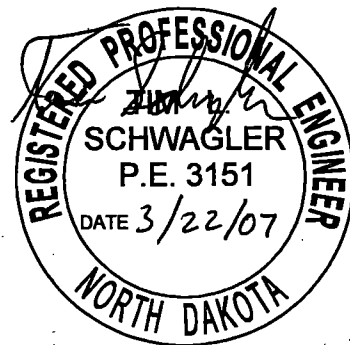


NEW CURB

NOTE:

100 SCOPE OF WORK: The work at this site consists of a deck overlay and removal of existing approach slab curb and replacing with 3" curb. Existing 4SB900 bars in the approach slab curb will remain in place and cut to clear new curb.

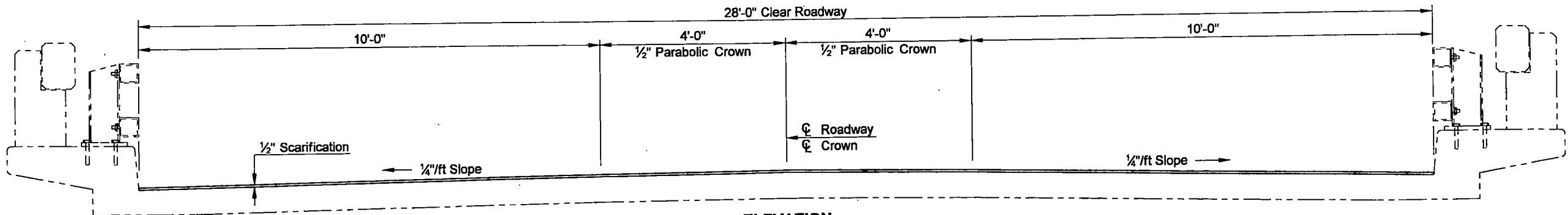
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0129	REMOVAL OF CURB	LF	80
624	3005	CONNECTION PLATE MODIFICATION	EA	4
650	0700	CLASS 1 OVERLAY	SY	746.7
650	0701	CLASS 2 OVERLAY	SY	190
650	0702	CLASS 3 OVERLAY	SY	40
650	0703	CLASS 2A OVERLAY	LF	270
748	0540	CURB	LF	80



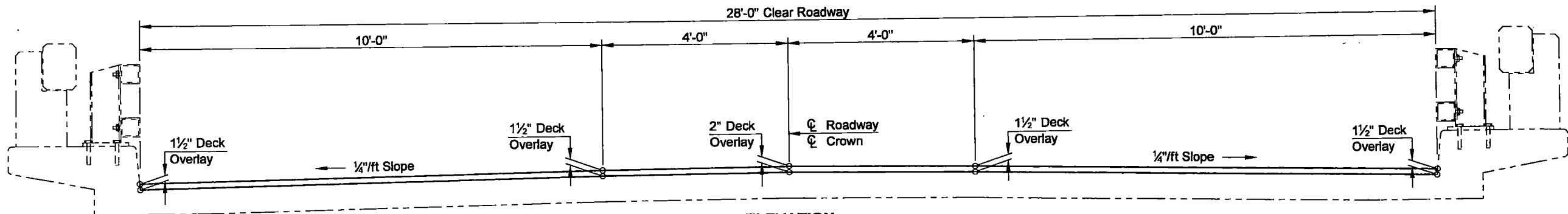
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
MENOKEN INTERCHANGE
BRIDGE LAYOUT
PROJECT: SIM-1-094(101)170
STATION: 479+66.4
BURLEIGH COUNTY
DATE 3-22-07
BRIDGE ENGINEER

23 U.S.C. 409
NDDOT Reserves All Objections

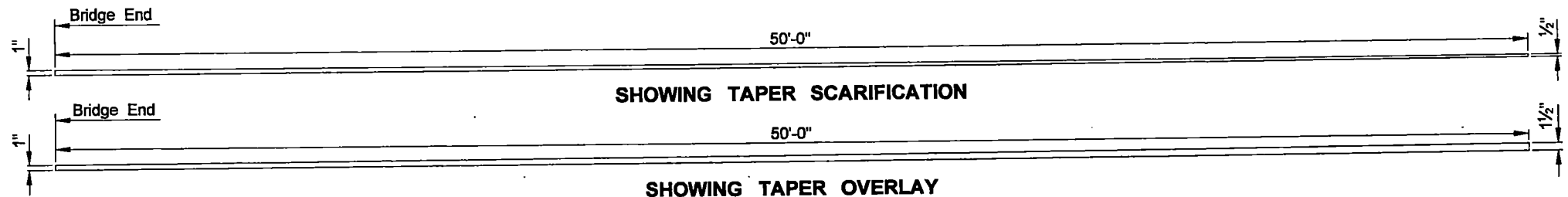
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-1-094(101)170	170	2



ELEVATION
(Showing Scarification)

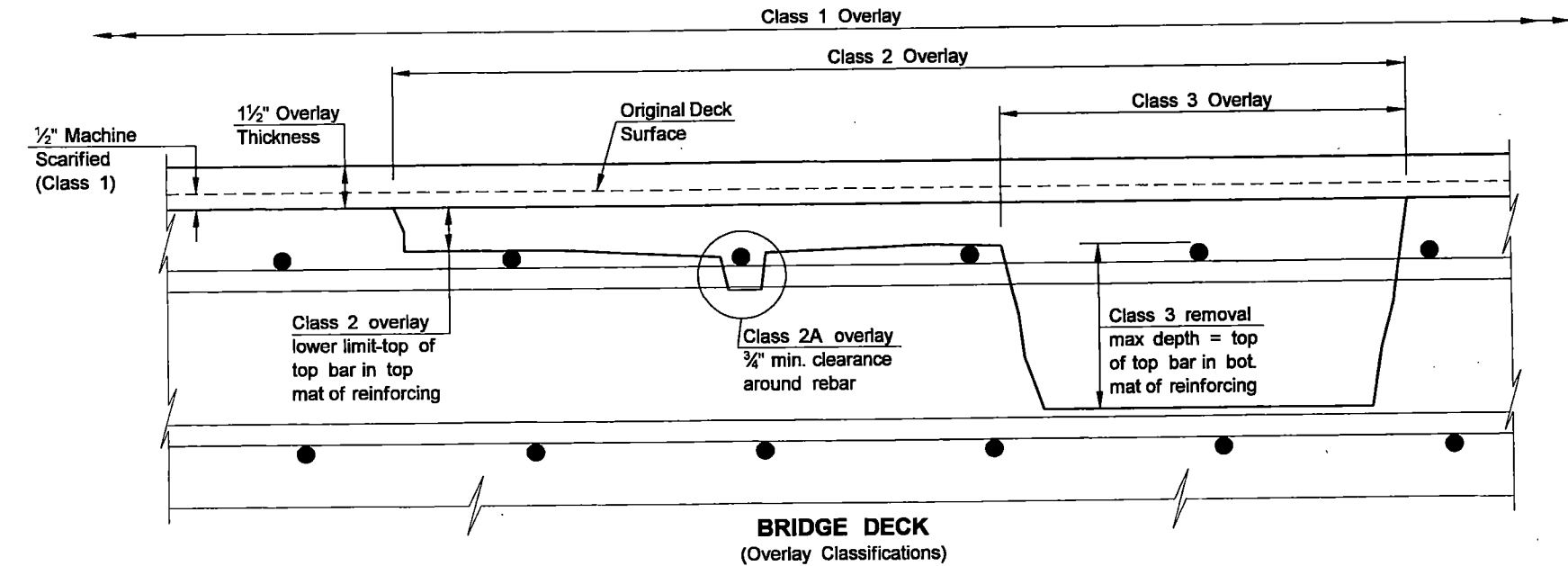


ELEVATION
(Showing Overlay)



SHOWING TAPER SCARIFICATION

SHOWING TAPER OVERLAY



BRIDGE DECK
(Overlay Classifications)

NOTES:

Class 2A overlay is paid for the top rebar in the top mat of reinforcing only. If a rebar that is identified for 2A overlay is in an area that becomes Class 3 or Class 4 it shall not be paid for as Class 2A overlay.

Class 4 removal shall be below the limits of Class 3 removal to full depth.

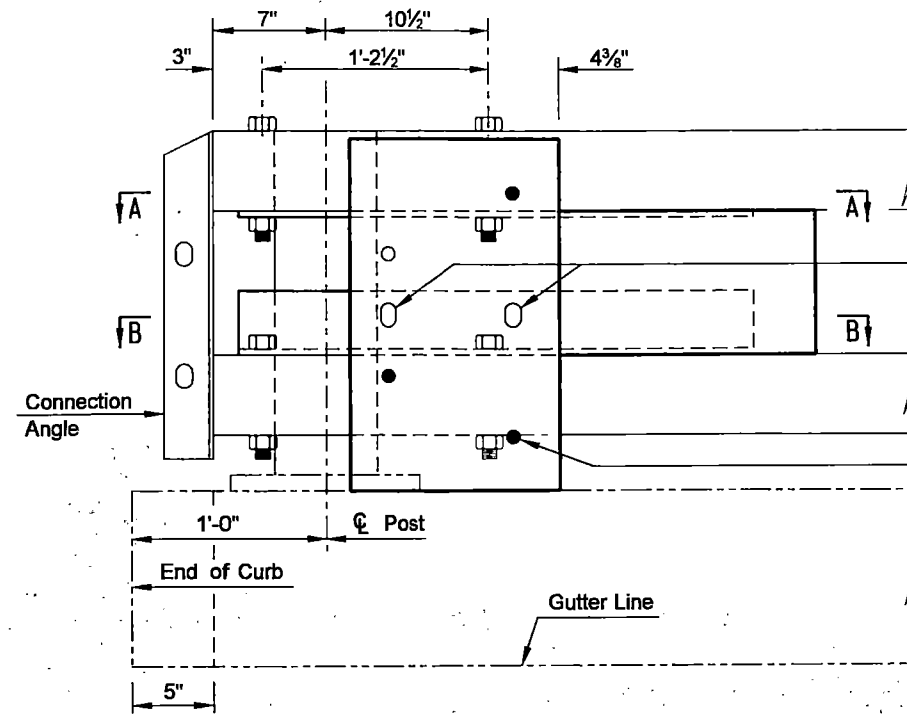
QUANTITIES	
CLASS 1 OVERLAY	746.7 SY
CLASS 2 OVERLAY	190 SY
CLASS 3 OVERLAY	40 SY
CLASS 2A OVERLAY	270 LF



MENOKEN INTERCHANGE

DECK OVERLAY DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-1-094(101)170	170	3

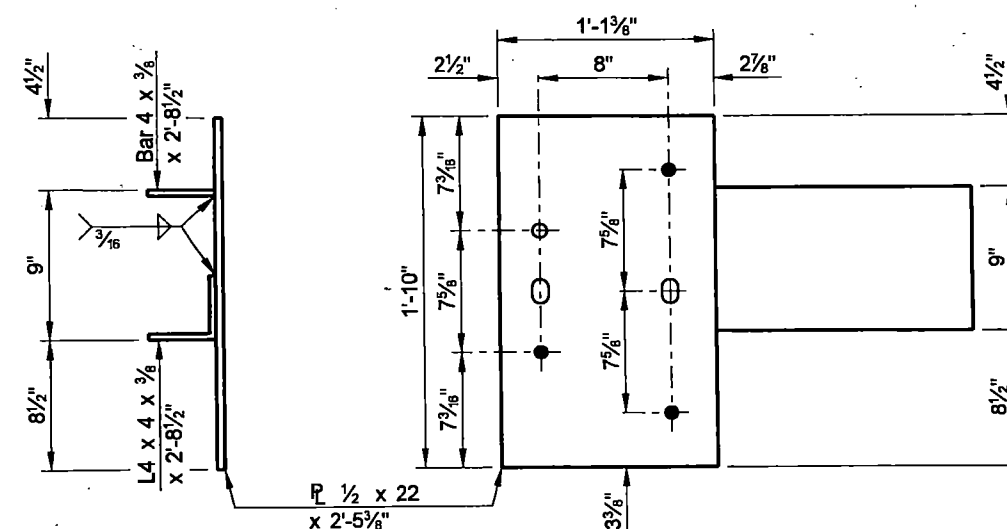
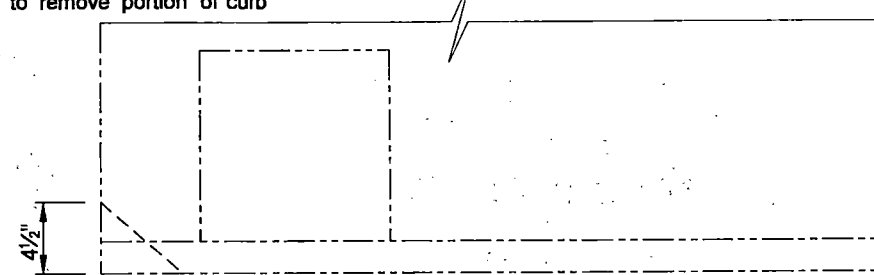


1" $\varnothing$ Holes in Angle and 1" x 1 1/2" Slotted Holes in 1/2" Plate for 7/8" $\varnothing$ Bolts, M 164 (A 325) ~ typ (Shown as Open Holes)

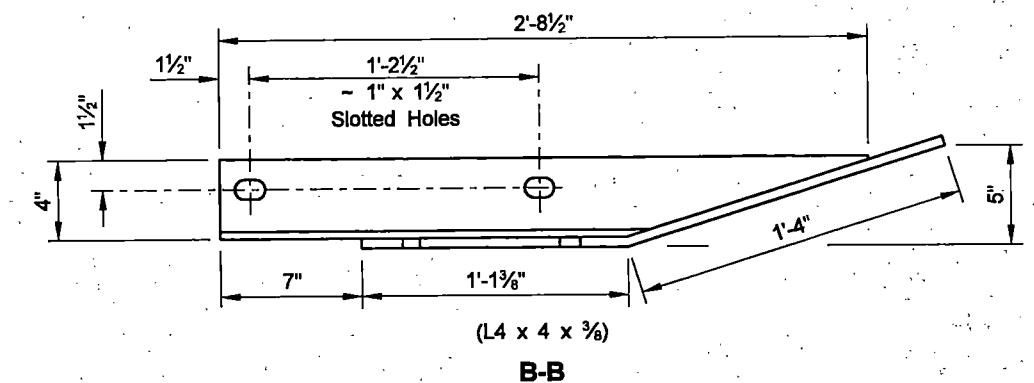
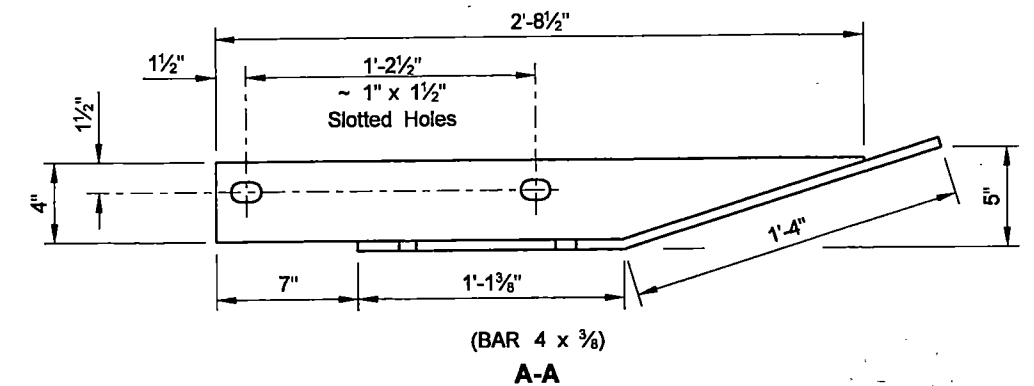
Drill and Tap Holes for 7/8" $\varnothing$ Bolts, M 164 (A 325) ~ typ (Shown as Filled Circles)

END POST CONNECTION DETAIL

Saw cut along dashed line to remove portion of curb

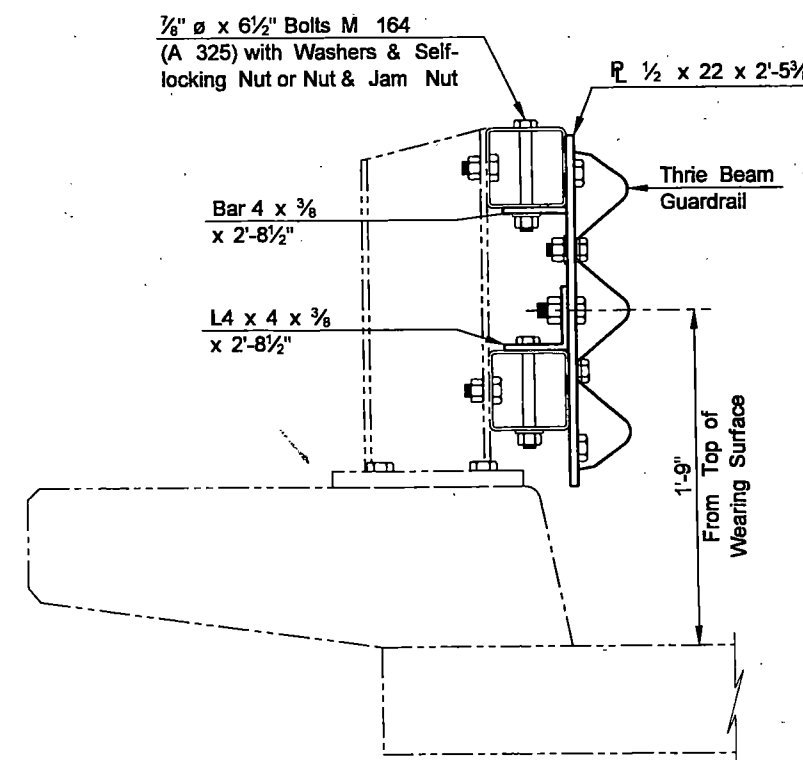


GUARDRAIL CONNECTION PLATE DETAILS



NOTE:

The bid item "Connection Plate Modification" includes saw cutting the curb, removing the existing connection plate and supplying and installing the new plate.



THRIE BEAM CONNECTION DETAIL



QUANTITIES	
CONNECTION PLATE MODIFICATION	4 EA
MENOKEN INTERCHANGE	
CONNECTION PLATE MODIFICATION DETAILS	

DESIGN DATA				
Traffic	Average Daily			Est. Max. Hr.
Current 1999	Pass:3,605	Trucks 645	Total4,250	425
Forecast 2019	Pass:5,770	Trucks1,035	Total6,805	685
Minimum Sight Dist. for:		Design Speed 70 MPH		
Stopping 600'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 1

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-SIB-1-094(054)161	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

GOVERNING SPECIFICATIONS:

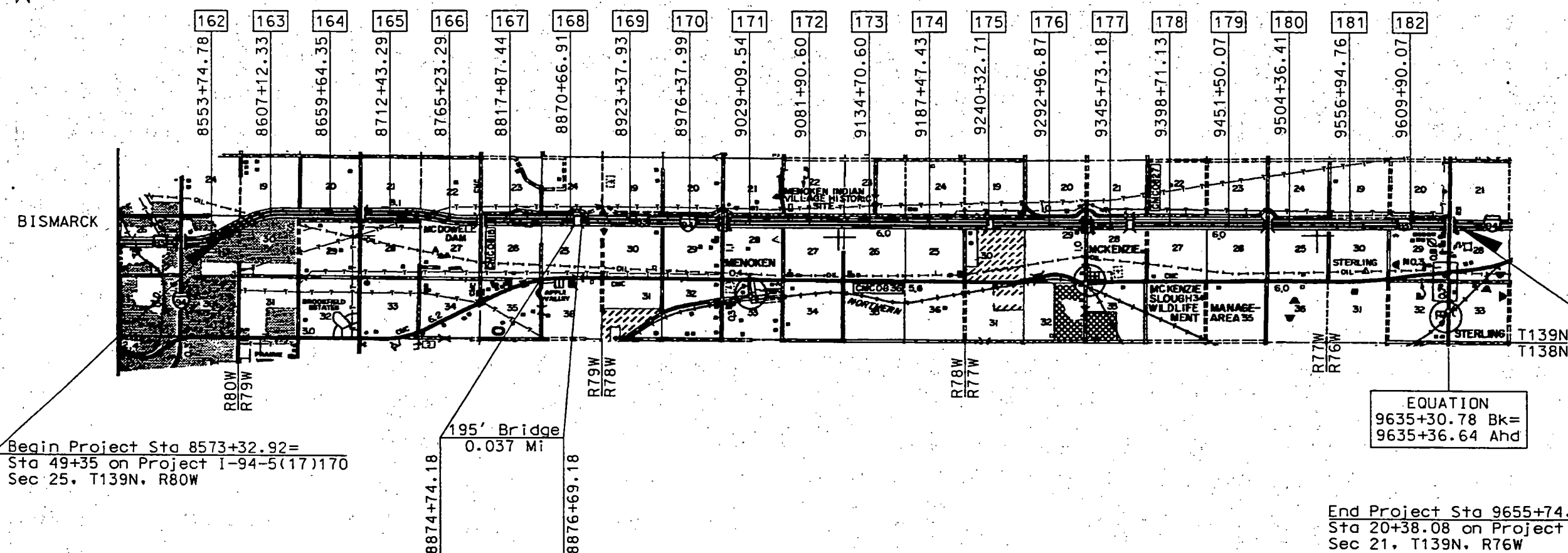
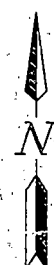
Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

FEDERAL AID PROJECT IM-SIB-1-094(054)161
IN BURLEIGH COUNTY

CONCRETE PAVEMENT REPAIR, HOT BITUMINOUS PAVEMENT OVERLAY, AND INCIDENTALS
(EAST BOUND)

LENGTH OF PROJECT

Miles- Gross Miles- Net
20.499 20.462
0.037 Mi deducted for bridge



DESIGNER Dave Jenkins
DESIGNER Brad Pfeiffer
DESIGNER _____
RECOMMEND APPROVAL 8-17-1999
DESIGN ENGINEER Keith B. Smith

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

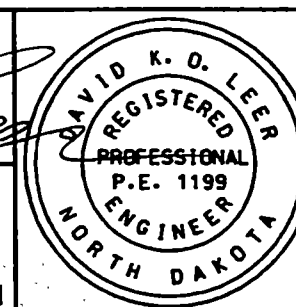
APPROVED

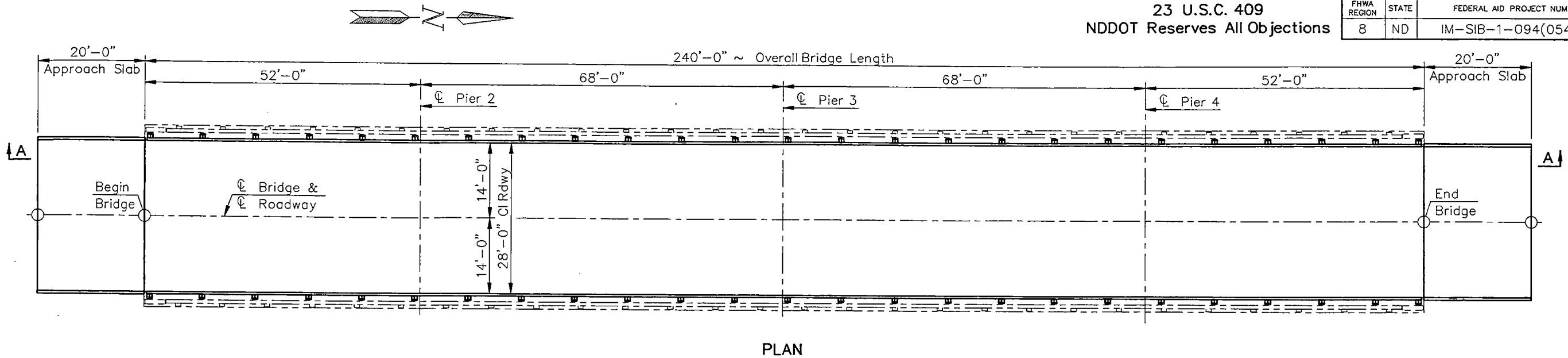
DIVISION ADMINISTRATOR DATE

APPROVED DATE 8-17-99

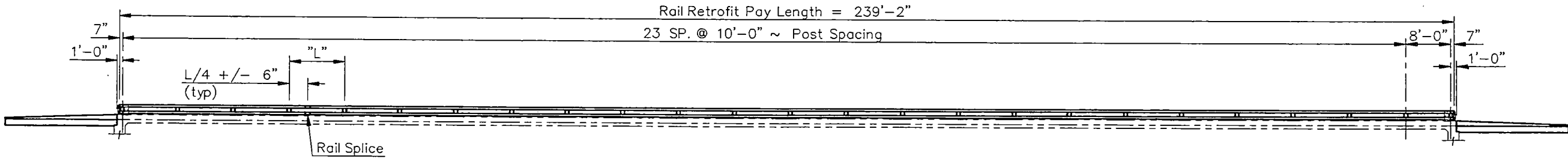
DIRECTOR OF HIGHWAYS
AND ENGINEERING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION





PLAN

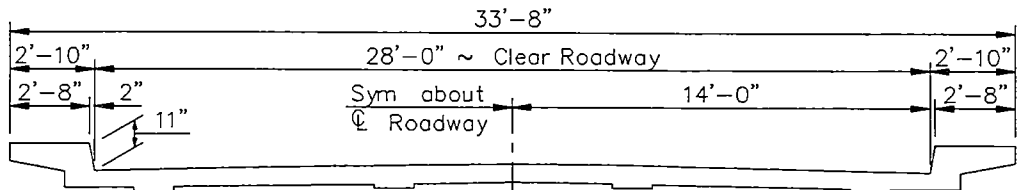


A-A

NOTES:

- 100 SCOPE OF WORK: The work at this site consists of filling the gaps between the abutments and the slope protection, installing a double box beam rail retrofit & the construction of concrete bridge approach slabs at both ends of the bridge.
- 550 BRIDGE APPROACH SLAB: All materials, equipment and labor required to excavate and prepare the surface under the approach slabs and build the approach slabs shall be included in the bid item "Concrete Bridge Approach Slab".
- 930 NOSING CONCRETE: The nosing concrete material shall be an elastomeric concrete or a polymeric concrete that will provide a durable edge that can withstand live-load traffic without chipping or spalling. The nosing concrete material shall be Silspec 900 PNS, manufactured by Silicone Specialties, Inc.; Wabocrete II, manufactured by Watson Bowman Acme; Elastomeric Concrete, manufactured by D.S. Brown Company, or an approved equal. The nosing concrete shall be mixed and installed according to the manufacturer's recommendation. All labor and materials required to install the nosing concrete shall be included in the bid item "Nosing Concrete".
- 930 SILICONE SEALANT: The silicone sealant shall be a rapid cure, self-leveling, cold applied, two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The silicone sealant and the nosing concrete must be supplied by the same manufacturer as a complete system. The backer rod and any necessary bonding material shall be included in the bid item "Silicone Sealant".
- 930 TECHNICAL ASSISTANCE: The contractor shall acquire technical assistance from the manufacturer of the nosing concrete and silicone sealant for the surface preparation and installation of the nosing concrete and silicone sealant. A technical representative must be present for the start of surface preparation and installation for at least one day. The contractor shall contact the manufacturer at least two weeks prior to the installation. The technical assistance shall be provided at no additional cost to the Department.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0215	CONCRETE BRIDGE APPROACH SLAB	SY	128.4
624	3001	DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	LF	478.3
930	8642	NOSING CONCRETE	CF	7.4
930	8644	SILICONE SEALANT	LF	56
950	9712	JOINT TREATMENT	LF	88



TYPICAL DECK SECTION

- 950 JOINT TREATMENT: The concrete slope protection has pulled away from the abutments leaving a 7 inch gap at the south abutment and a 3 1/2 inch gap at the north abutment. All debris and soil shall be cleaned out of the gaps and filled with a non-reinforced concrete to a minimum depth of 4 inches for the full width of the gap. All materials and labor required to place the concrete fill shall be included in the price bid for "Joint Treatment".

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

MENOKEN INTERCHANGE
BRIDGE LAYOUT

PROJECT: IM-SIB-1-094(054)161
BURLEIGH COUNTY

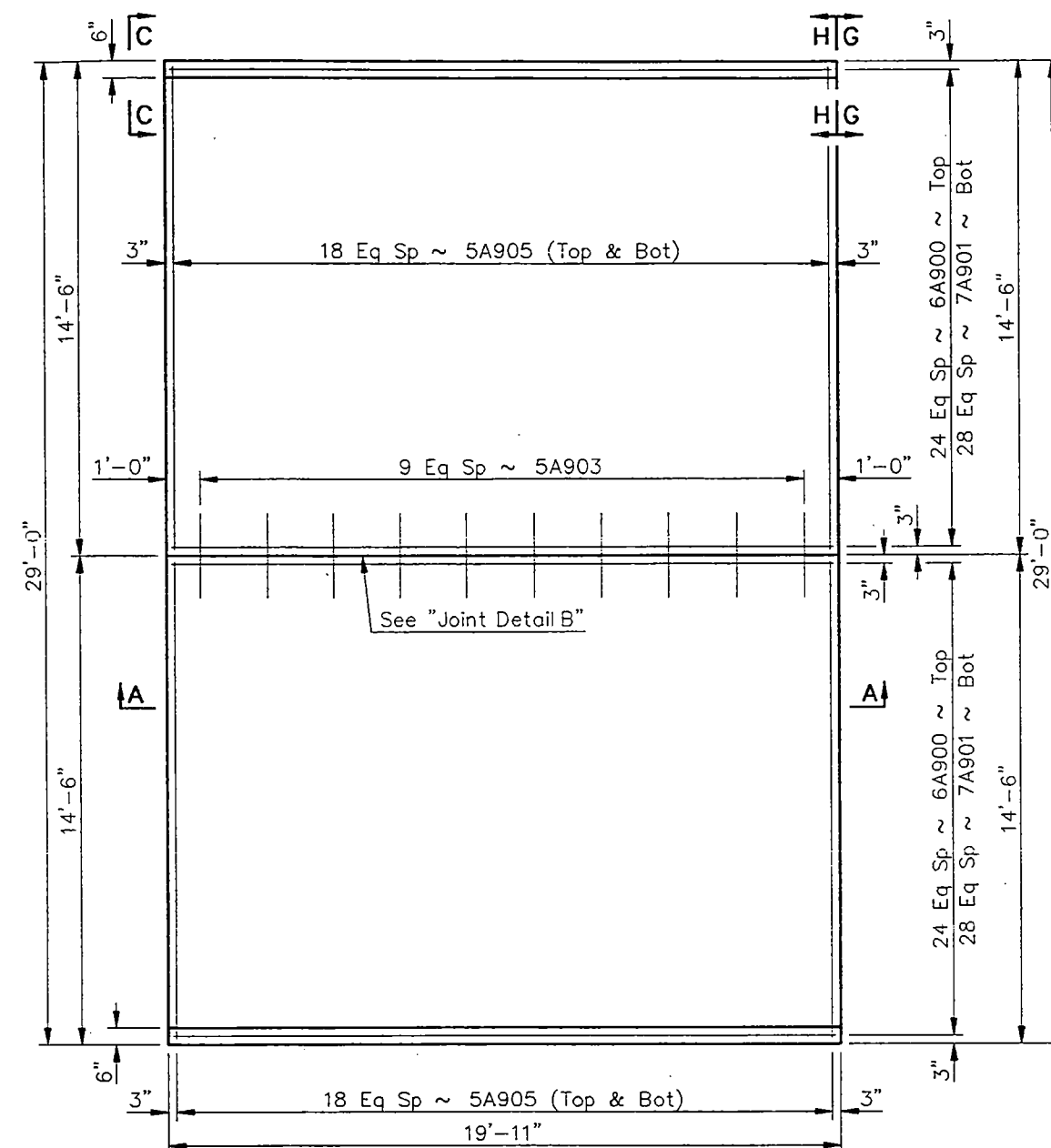
SKEW ANGLE = 0°

BAR LIST - ONE SLAB

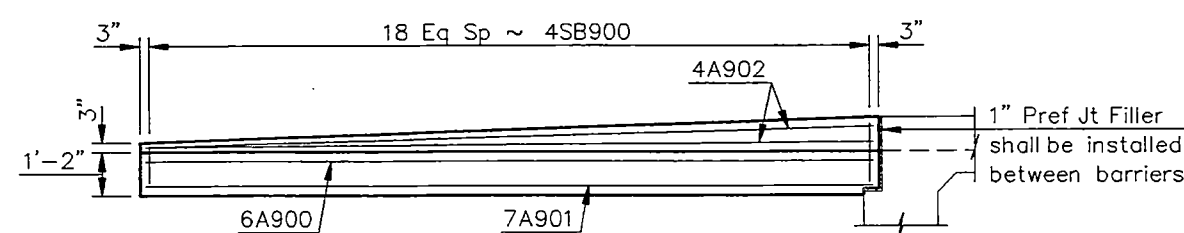
SIZE	MARK	NO.	LENGTH
6	A900	50	19'-7"
7	A901	58	19'-7"
4	A902	4	19'-7"
5	A903	10	2'-6"
5	A905	76	14'-2"
4	SB900	2	44'-4"

ESTIMATED MATERIAL QUANTITIES

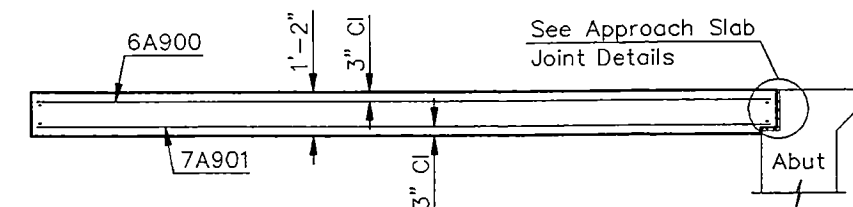
REINFORCING STEEL (LBS)	CONCRETE (CY)
5053	25.3



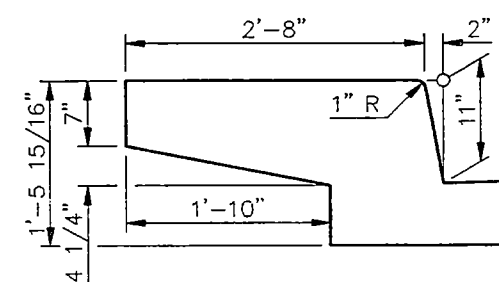
PLAN



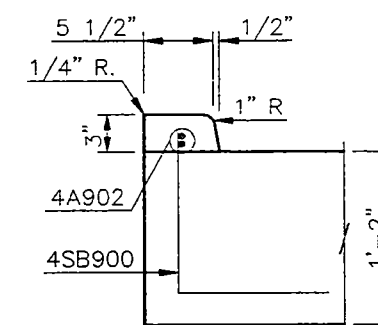
ELEVATION



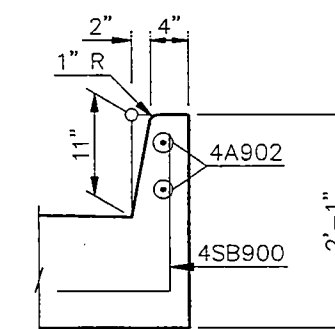
A-A



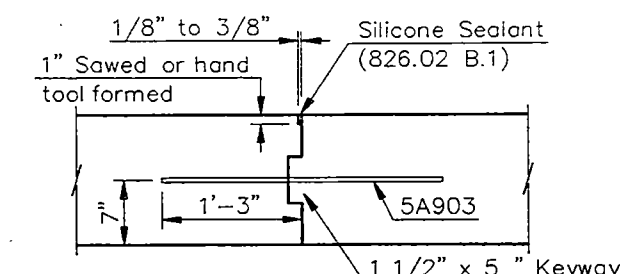
(Existing Barrier)
G-G



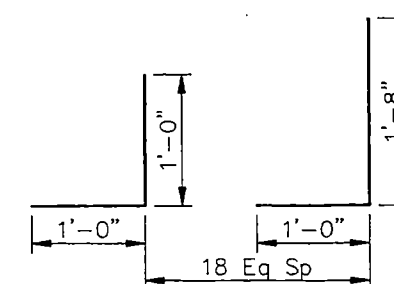
C-C



H-H



JOINT DETAIL B



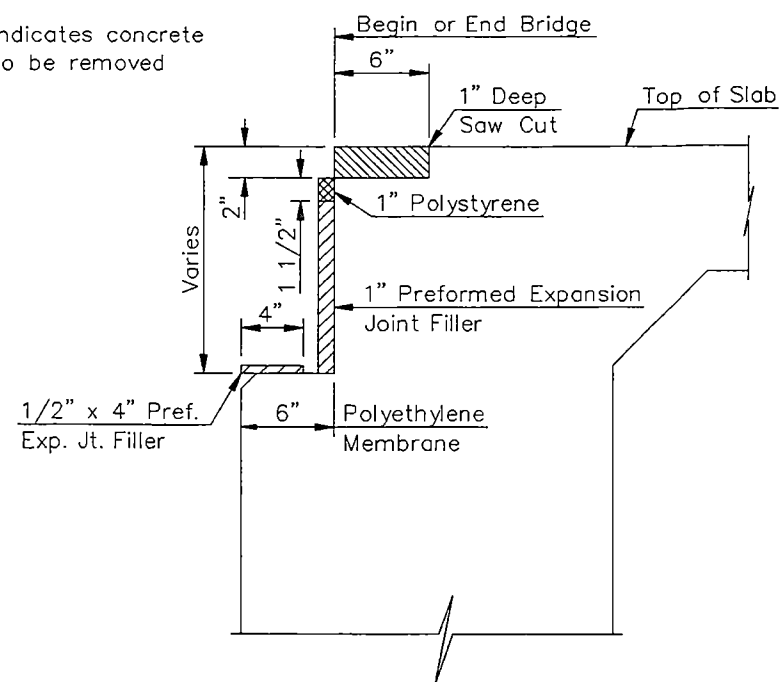
SB900

QUANTITIES	(ONE SLAB)
APPROACH SLAB	64.2 SY

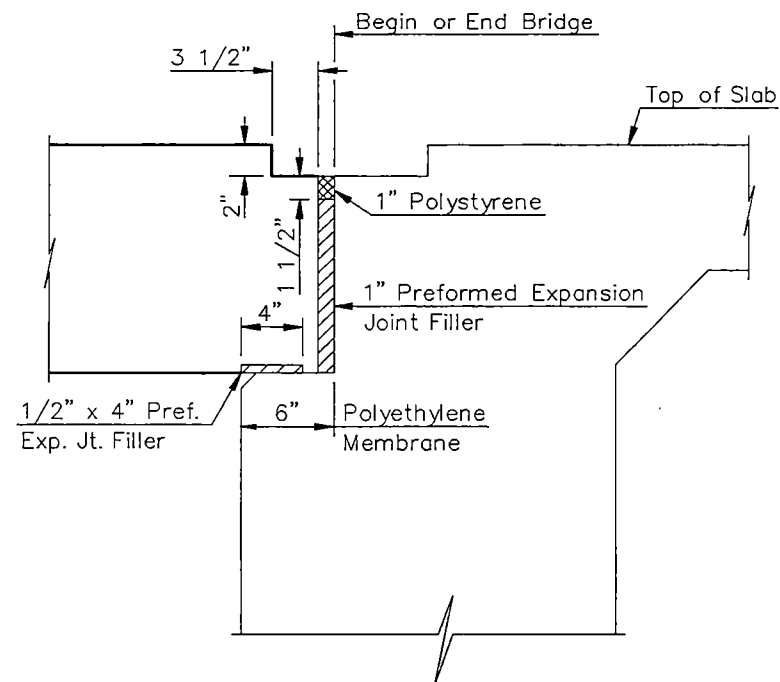
MENOKEN INTERCHANGE

APPROACH SLAB DETAILS

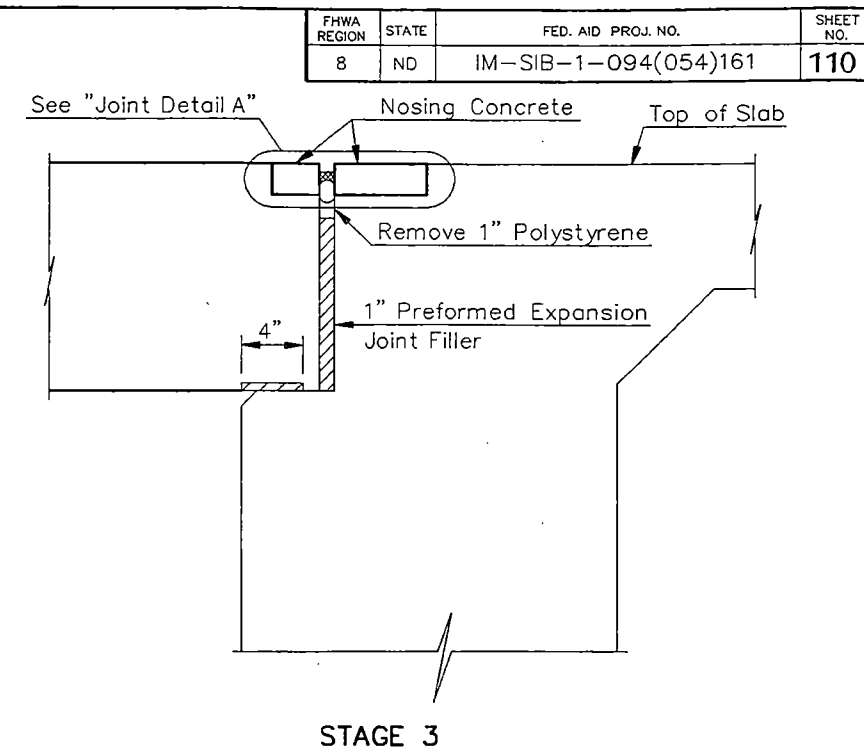
Indicates concrete to be removed



STAGE 1



STAGE 2



STAGE 3

NOTES:

STAGE 1:

1. Remove concrete at ends of deck to allow for nosing concrete.
2. Place the 1" preformed expansion joint filler, the 1/2" x 4" preformed expansion joint filler, the 1" polystyrene and the polyethylene membrane.

STAGE 2:

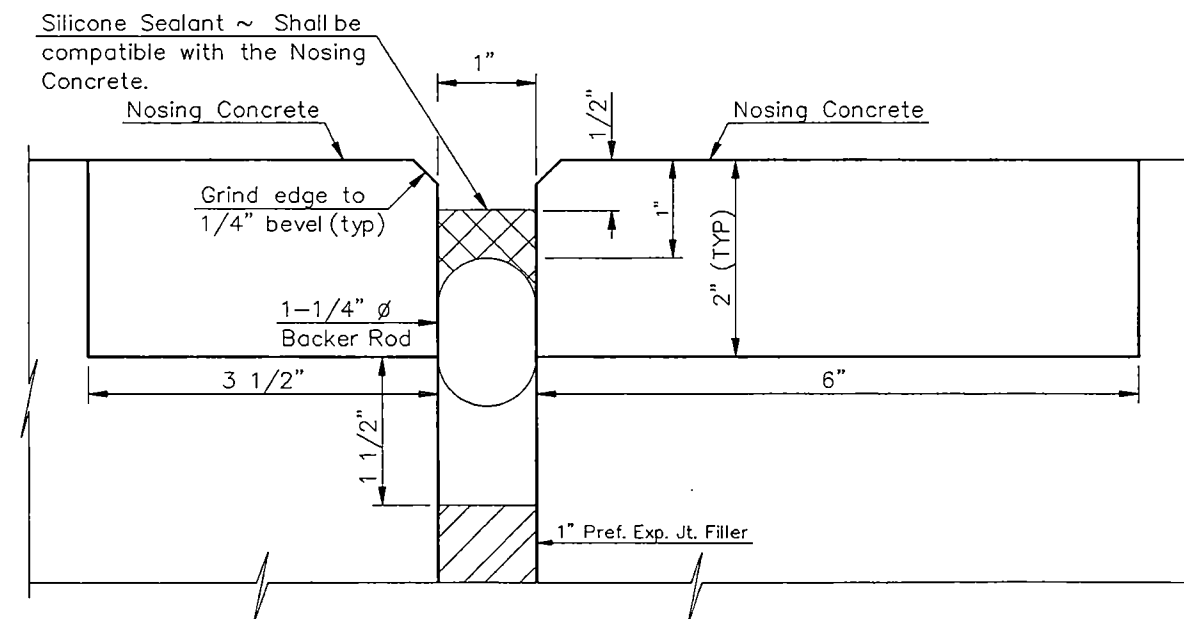
3. Place the new approach slab concrete. A 2" x 3 1/2" blockout shall be formed between the curbs in the approach slab as shown.

STAGE 3:

4. Place nosing concrete in the blockout areas, both in the deck and in the approach slab.
5. Remove the 1" polystyrene.
6. After the nosing concrete has cured, grind the 1/4" beveled edge. Clean and prepare the joint, apply any necessary bonding material. Install the backer rod and the silicone sealant.

All estimated material quantities shown on drawing number 94-170.519-2 are for information purposes only. All materials including concrete, reinforcing bars, backer rod, polyethylene membrane, preformed joint filler, silicone sealant in longitudinal joint and labor required to excavate and prepare the surface under the approach slab, and to build the approach slabs and approach slab curbs shall be included in the pay item, "Concrete Bridge Approach Slab".

The concrete shall be Class AE-3 and the reinforcing steel shall be Grade 60. The polyethylene membrane shall meet the requirements of AASHTO M171.



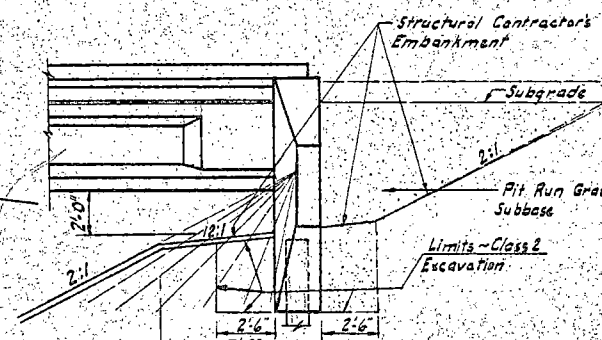
JOINT DETAIL A

QUANTITIES (TWO APPROACHES)	
NOSING CONCRETE	7.4 CF
SILICONE SEALANT	56 LF

MENOKEN INTERCHANGE

APPROACH SLAB JOINT DETAILS

	PLOTTED BY	REVISIONS	MADE BY	DATE
RAPHY	CHECKED BY <i>SH</i>			
DETAILS	CHECKED BY <i>DKT</i>			
TRACING	MADE BY <i>LVM</i>			
QUANTITIES	CHECKED BY <i>LFF</i>			
	CHECKED BY <i>LVM</i>			



-828

* Design load increased to account for possible down drag due to settlement of fill.

STRUCTURAL DRAWINGS

VERTICAL CURVE DATA

ABUTMENT AND PIER CAP ELEVATIONS

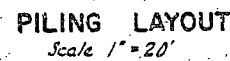
**** Elevations are at Bottom of Girder at Face of Abutment**

[illegible]

SCREED ELEVATION AT E OF ROADWAY

94-71

IN		MADE BY		REVISIONS		MADE		BY		DATE	
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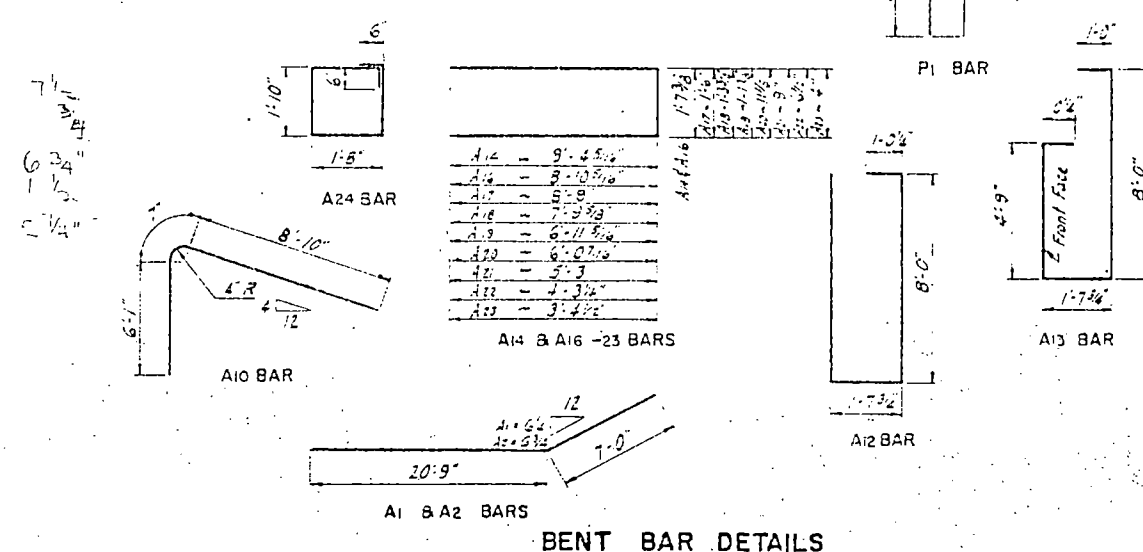
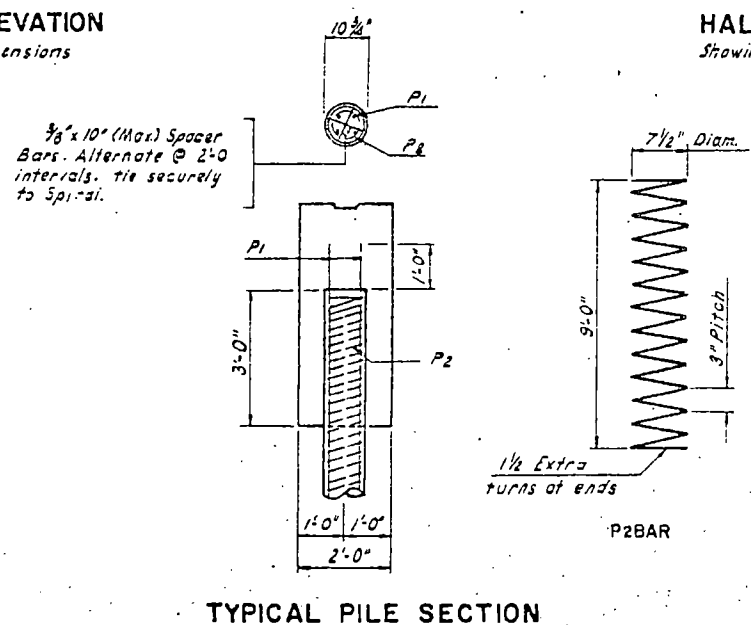
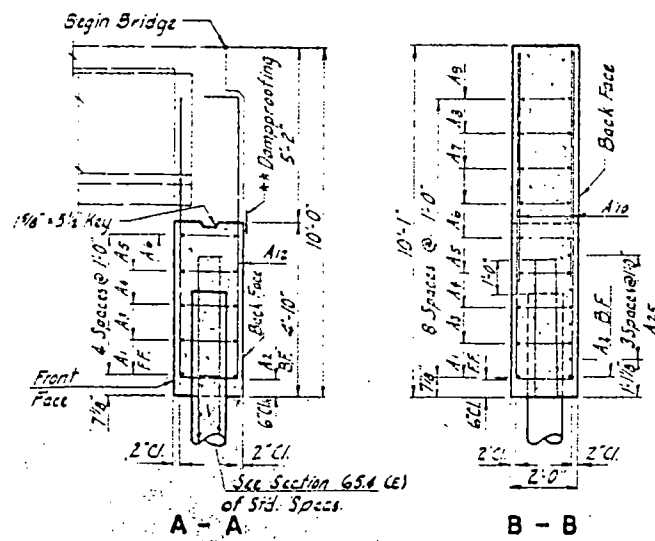
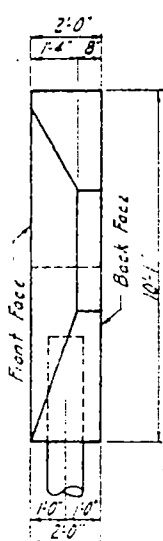
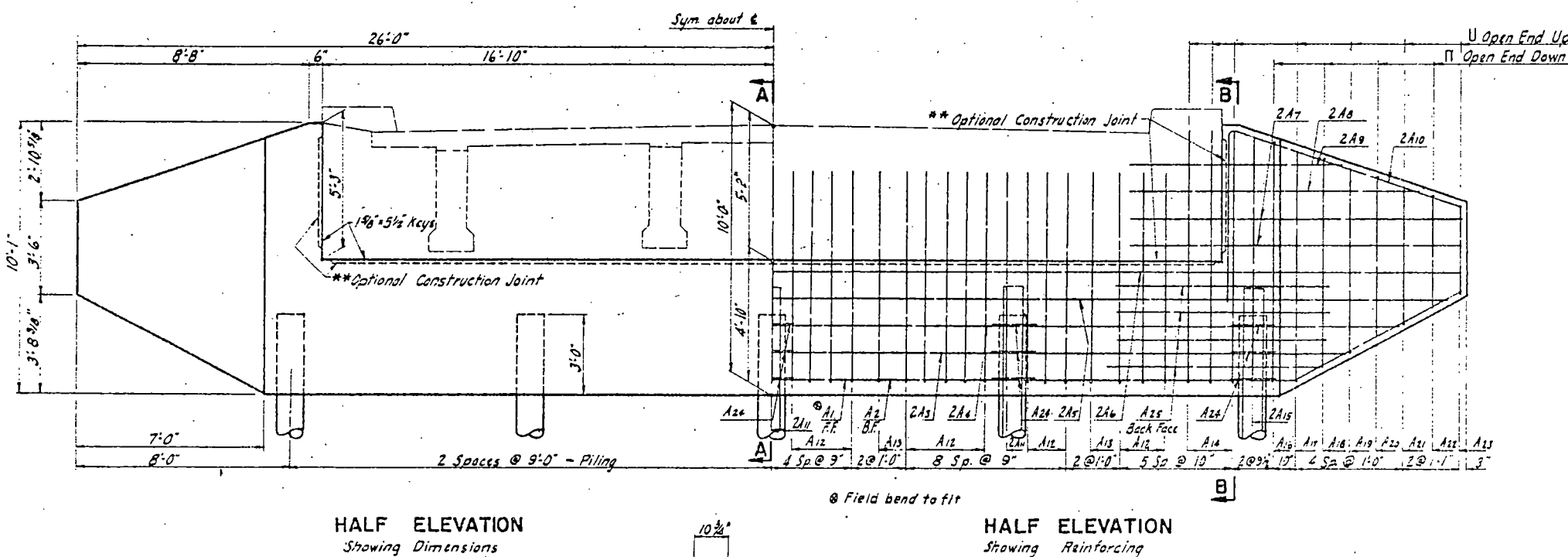
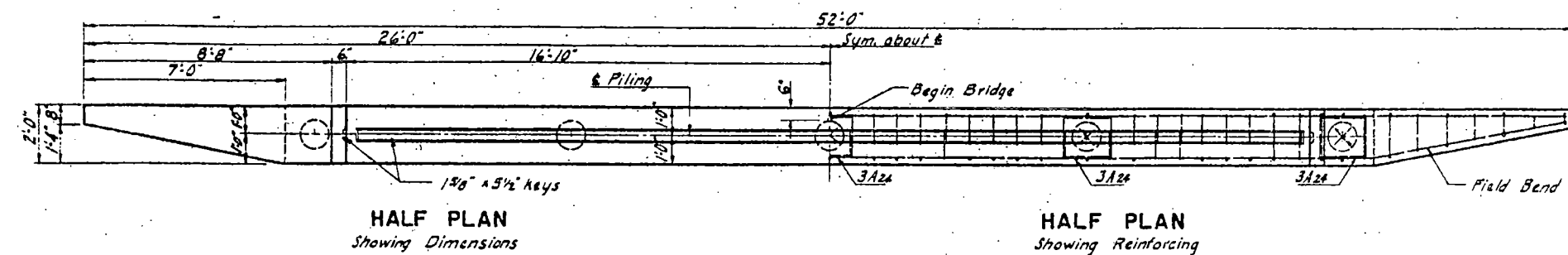
FC - 1,200 PS
FS - 20,000 PS

94-71.-1

NG	CHECKED BY YTW
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	CHECKED BY LVM
NG	MADE BY DWT
	CHECKED BY LVM
	MADE BY DWT
TITIB	CHECKED BY GAL

NG	CHECKED BY YTW
ST	MADE BY RRL
	CHECKED BY LVM
NG	MADE BY DWT
	CHECKED BY LVM
	MADE BY DWT
TITIB	CHECKED BY GAL

NG	CHECKED BY YTW
ST	MADE BY RRL
	CHECKED BY LVM
NG	MADE BY DWT
	CHECKED BY LVM
	MADE BY DWT
TITIB	CHECKED BY GAL



** Apply two coats of compoasting on each face if optional construction joint is used.

† Cost of this reinforcing steel shall be included in the price bid for steel-encased concrete piling.

Designed for 25 #0# E.I.S.

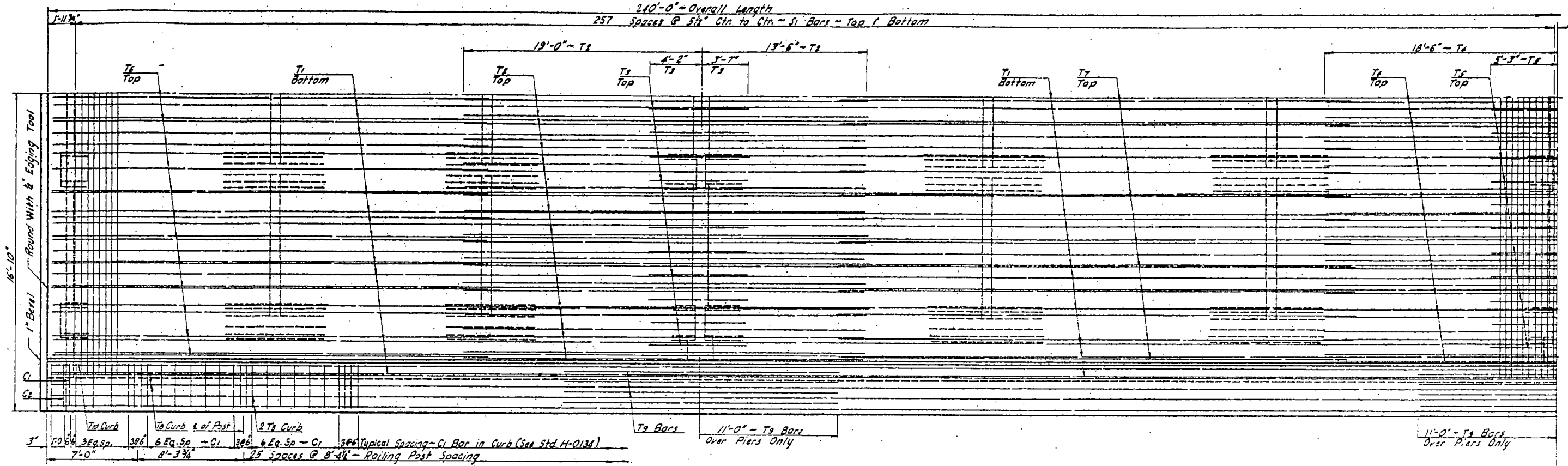
QUANTITIES	
<i>2x12 SPS Joists</i>	<i>16' x 7' = 112</i>
<i>Surface - Steel</i>	<i>7' x 125'</i>
<i>Paint - Galvalume</i>	
<i>Endplate - Cast In Situ</i>	

FIXED END
PRESTRESSED GIRDERS

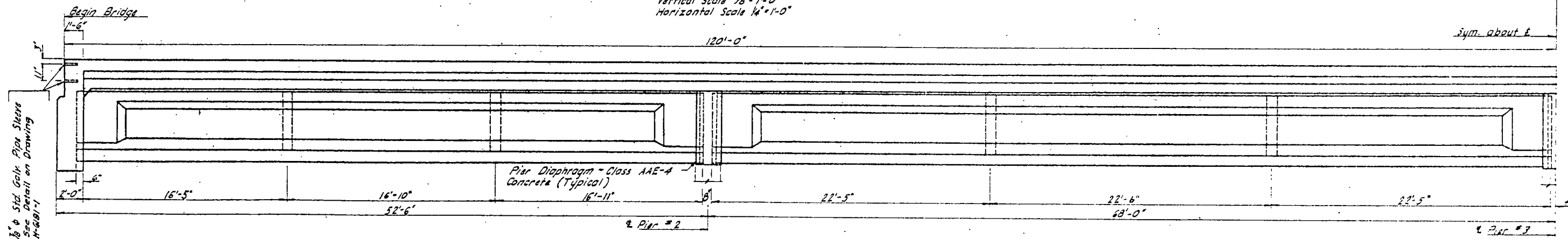
**IO' ABUTMENT
DETAILS**

28'-0" ROADWAY

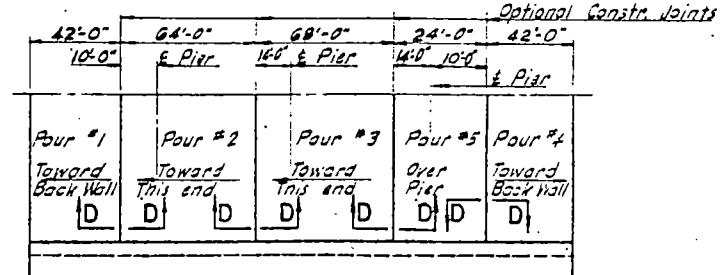
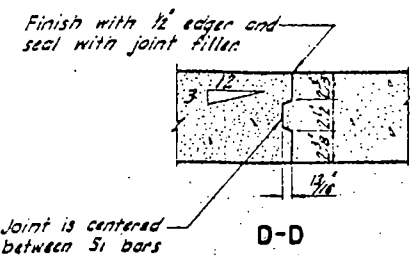
H20 LOADING 4x45" I BEAM



QUARTER PLAN
Vertical Scale 3/8" = 1'-0"
Horizontal Scale 1/4" = 1'-0"



HALF ELEVATION
Vertical Scale 3/8" = 1'-0"
Horizontal Scale 1/4" = 1'-0"

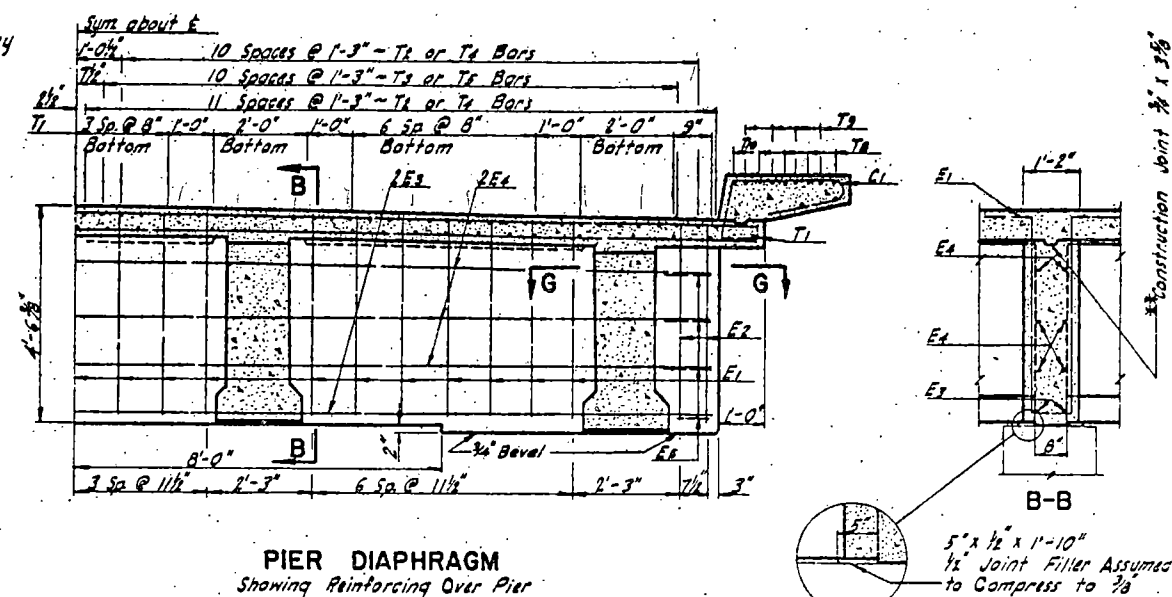


HALF PLAN

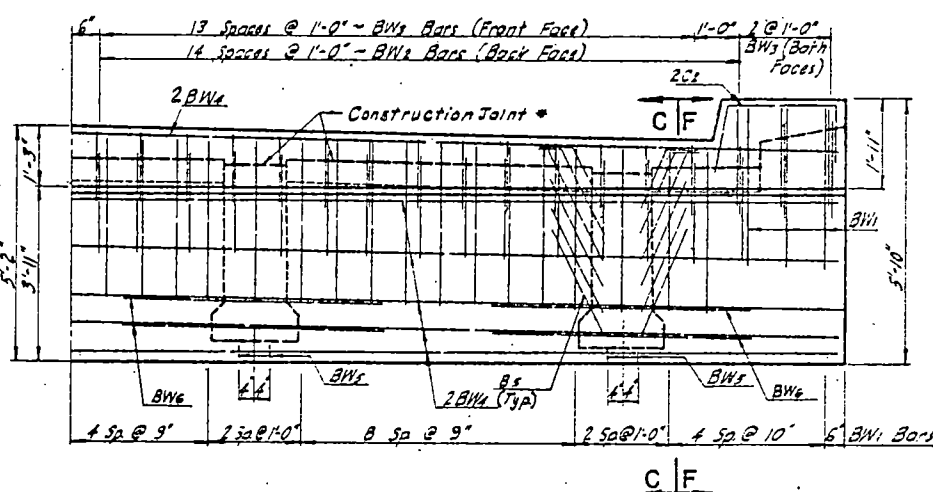
Showing Optional Construction Joints and Slab Pouring Sequence (Also See Section 55.3 (f) & 2A of Std. Spec.)

BAR LIST									
MARK	NO.	SIZE	LENGTH	SHAPE	MARK	NO.	SIZE	LENGTH	SHAPE
C1	370	5	8'-6"	Bent	S1	22	6	10'-6"	Straight
C2	2	5	3'-0"	"	S2	48	5	33'-11"	"
C3	32	(See Detail)	"	"	S3	48	5	40'-2"	"
D1	168	4	9'-1"	Bent	S4	84	5	36'-0"	"
D2	36	4	6'-6"	Straight	S5	82	5	6'-2"	Bent
D3	16	4	22'-0"	"	S6	20	4	3'-0"	"
E1	63	4	11'-1"	Bent	S7	80	5	4'-3"	"
E2	12	4	11'-5"	"	S8	24	5	33'-1"	Straight
E3	6	4	27'-8"	Straight	S9	16	3	11'-3"	Bent
E4	18	5	27'-3"	"	S10	16	6	4'-4"	Bent
E5	24	5	6'-3"	Bent	S11	6	6	4'-11"	"
S1	1032	5	29'-8"	Straight	P1	112	5	5'-9"	"
T1	231	5	33'-3"	Straight	P2	172	5	3'-10"	"
T2	92	6	32'-6"	"	P3	108	5	2'-10"	"
T3	44	6	7'-9"	"	RC	390	3	2'-11"	Bent
T4	46	6	3'-0"	"					

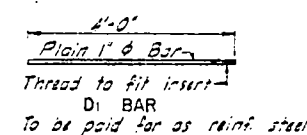
240' PRESTRESSED GIRDER
4 SPAN CONTINUOUS
SLAB
28'-0" ROADWAY
4'-45" GIRDERS



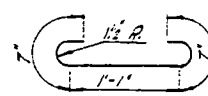
*Dimension "a" is 1½" at ends of beams and increases toward the center to compensate for dead load deflection which is taken care of in the screed elevations.



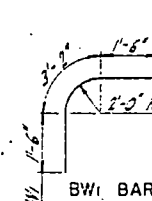
HALF BACKWALL ELEVATION



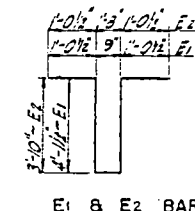
Showing Reinforcing



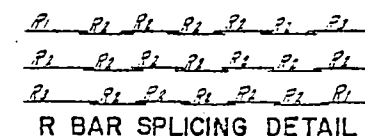
• BWs BAE



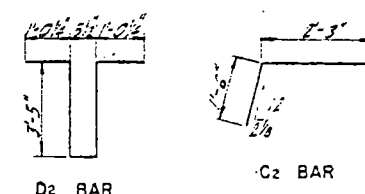
BY: BAR



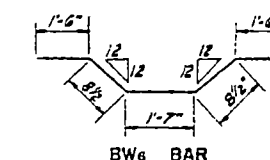
E1 & E2 BARS



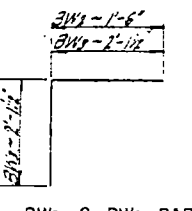
R BAR SPLICING DETAIL



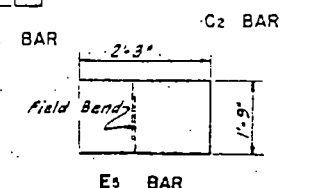
D2 BAF



BW6 BA

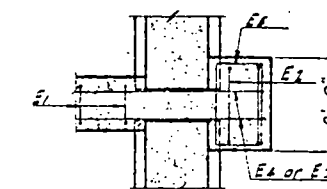


BW₂ & BW₃ BARS



E5 BA

When bars are spliced
Lap #4 bars 20"
Lap #5 bars 25"
Lap #6 bars 30"



G - G

NOTES:
Quantities shown include end posts and railing.
Diagonals over the piers and railing shall be Class AAE-4 Concrete.
All other diagonals and remaining concrete shall be Class AE-2.
Insert 2x4 posts before placing outer garden.

Grids shall be aligned and rigidly held in place until after the dispersed concrete has set. * * * Dispersing in any section shall be poured and allowed to set at least 48 hours before the remaining slab section is poured.

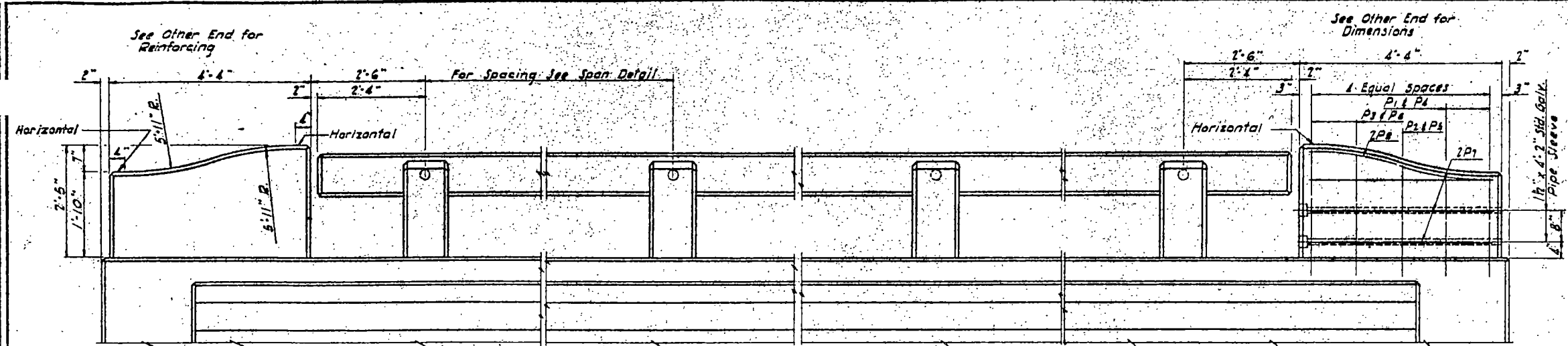
Two coats of Dampproofing shall be applied over the construction joint on the backface as shown on the details "Dampproofing Two Coats." shall be applied in accordance with Section 29 of the Standard Specifications. Dampproofing will not be paid for directly, but shall be included in the unit price bid for Class 15-2 Concrete.

Slab designed for use with girder drawings H-G480 or H-G482.

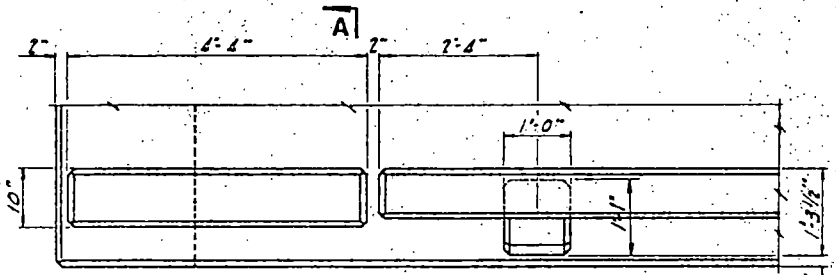
240' PRESTRESSED GIRDER
4 SPAN CONTINUOUS
SLAB
28'-0" ROADWAY
4-45" GIRDERS

FEED ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FED. AID YEAR	CONTRACT NO.	TOTAL SHEETS
8	N.D.	1-21	19	50	

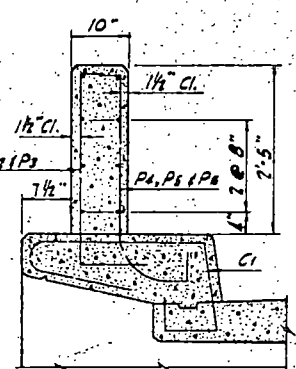
NOTES:
 All concrete above top of curb shall be Class "AAE-4" except concrete end posts.
 "Rubbed Surface Finish" will be required for the roadway faces of curbs, the outside vertical faces of curb and slab, and all faces of rails, intermediate and end posts.
 Designed in accordance with A.A.S.H.O. Interim Specification 3 (64).



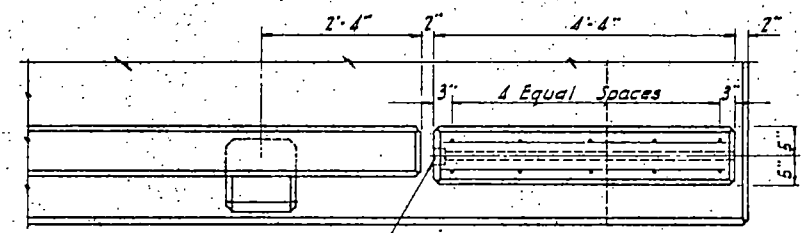
PART ELEVATION



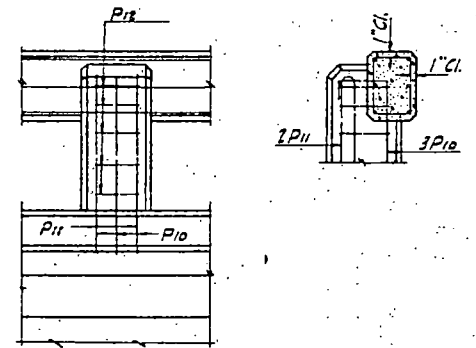
PART PLAN



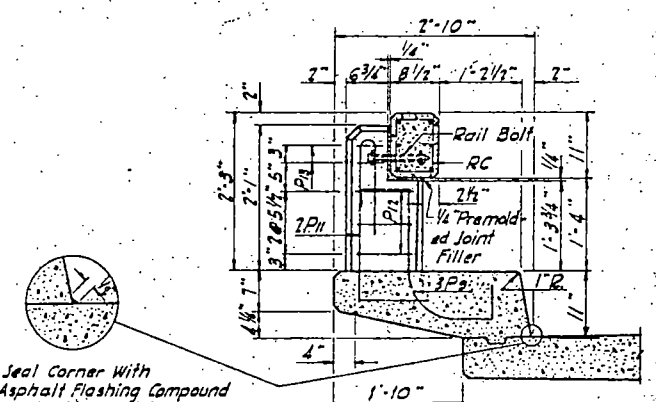
SEC. A-A



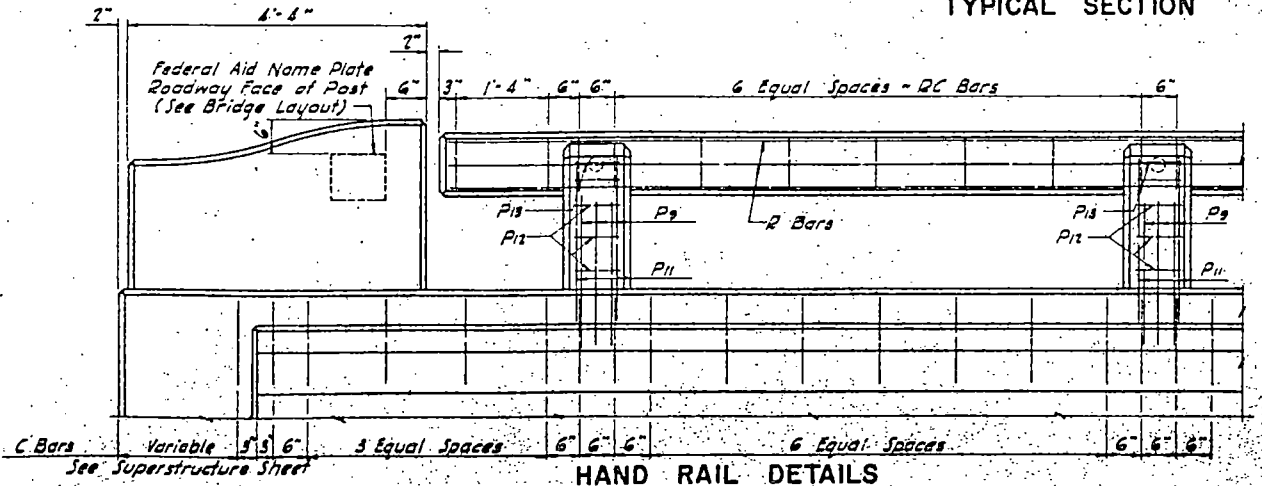
PART PLAN



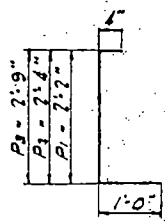
ANCHOR POST DETAIL
See Layout For Placement



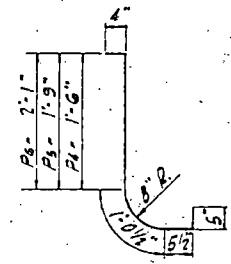
TYPICAL SECTION



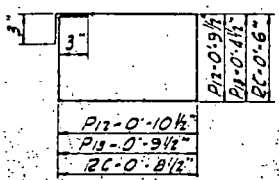
HAND RAIL DETAILS



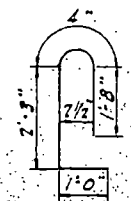
P1, P2 & P3 BARS



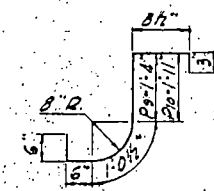
P4, P5 & P6 BARS



P12, P13 & RC BARS



P11 BAR



P9 & P10 BARS

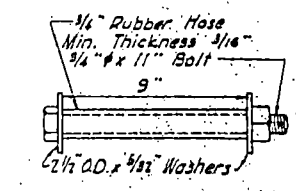
BAR LIST (BARS FOR RAILING AND POSTS)				
MARK	No.	SIZE	LENGTH	SHAPE
P1	6	6	4'-4"	Bent
P2	6	6	4'-11"	"
P3	6	6	6'-3"	"
P4	6	6	3'-10"	"
P5	6	6	2'-10"	"
P6	6	6	2'-11"	Bent
P7	6	6	4'-1"	Str.

* Number of bars shown on superstructure sheet.
 ** Number, length & splicing information of R bars shown on superstructure sheet.

BAR LIST (4 END POSTS)				
MARK	No.	SIZE	LENGTH	SHAPE
P1	6	6	3'-6"	Bent
P2	6	6	3'-9"	"
P3	6	6	4'-1"	"
P4	6	6	3'-9"	"
P5	6	6	4'-0"	"
P6	6	6	4'-4"	"
P7	6	6	4'-0"	Str.
P8	6	6	4'-1"	Field Band

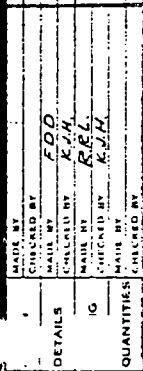
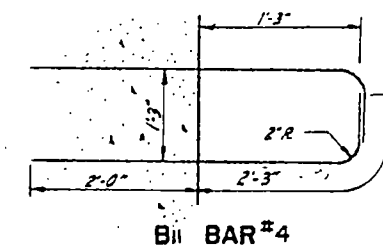
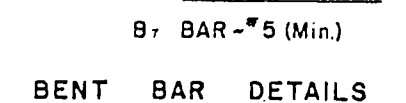
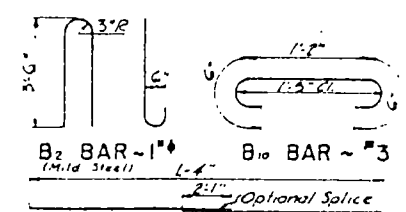
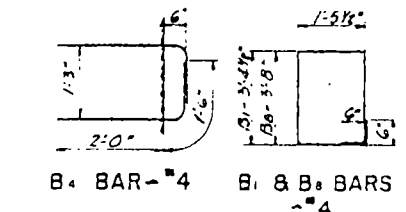
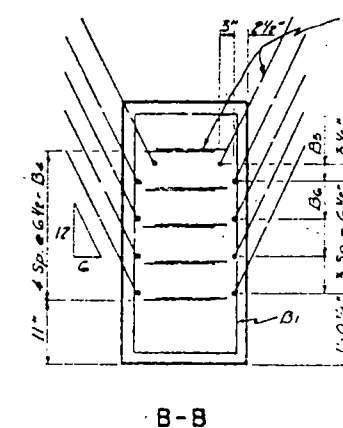
QUANTITIES 4 END POSTS		
Concrete Class AAE-2	11	C.Y.
Reinforcing Steel	261	Lbs.

* Railing and end post quantities are included in slab quantities on superstructure sheet.



RAIL BOLT
(Galvanized)
To be included in the unit price bid for Class AAE-4 Concrete.

STANDARD RAILING
DETAILS

[illegible]

Design to have the bottom of the deck slab at least $1\frac{1}{8}$ " above top of girder.

POST-TENSIONED
45"
PRESTRESSED GIRDER

Design Specifications: A.A.S.H.O. Standard Specifications for Highway Bridges.

Design and Shop Drawings: At least 14 days prior to the forming and pouring of any girders, the Contractor shall submit checked design figures and shop drawings for the approval of the Bridge Engineer of the State Highway Department. The design figures shall show the total initial prestress force required as the sum of the final prestress force taken from the contract drawings and the losses in prestress due to friction, elastic shortening of concrete, shrinkage of concrete, creep of concrete and relaxation of steel stress as determined by the Contractor for his method of stressing. If the Contractor wishes, the loss in steel stress, not including friction loss, may be assumed as 25,000 p.s.i.

Shop drawings shall show wire or bar layout; end anchor plate details; tensioning forces, elongation and order of tensioning and any proposed changes in reinforcing steel.

The final prestress force (remaining after all losses have been accounted for) and its corresponding dimension 'b' shall be selected from those on a curve determined by the three values shown on this drawing.

The center of gravity of the tensioning units at all points along the girder shall lie on the curve of a draped chalk line that sags freely with the center and end dimensions as selected above.

Holes & inserts to accommodate the diaphragm bars shall be provided in the girders at locations as shown on the slab sheet.

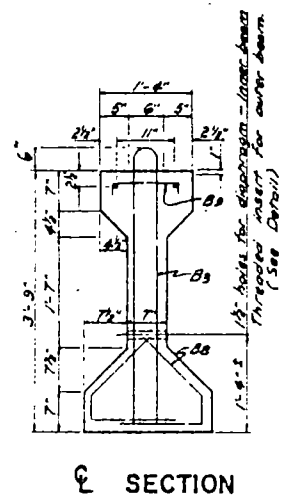
The E7 bars shall be of a size to resist the entire initial stress in the top fibre allowing a maximum stress in the steel of 32,000#/sq. in.

Minor changes to the shape of the girder and to the reinforcing steel may be made to accommodate the forms of various Contractors and their construction methods with the approval of the Bridge Engineer.

One end of each girder shall be connected to the pier according to Section A-A and the other end according to Section B-B. Adjacent girder ends at piers shall be paired with one "1" end and one "5" end.

All prestressed girders in any span shall preferably be cast within an 8 day period. If not, the newest girder shall be at least 8 weeks old before the deck slab is poured.

7 B7 BAR- #6 REQUIRED
AT TIME OF STRESS TRANSFER
AT CENTER OF GIRDER
DESIGNED FOR CONTINUOUS SPAN



SECTION

DIAPHRAGM BAR INSERT
Outer Girders Only

Design Specifications: A.A.S.H.C. Standard Specifications
for Highway Bridges.

Design and Shop Drawings: At least 14 days prior to the forming and pouring of any girders, the Contractor shall submit checked design figures and shop drawings for the approval of the Bridge Engineer of the State Highway Department. The design figures shall show the total initial prestress force required as the sum of the final prestress force taken from the contract drawings and the losses in prestress due to elastic shortening of concrete, shrinkage of concrete, creep of concrete and relaxation of steel stress as determined by the Contractor for his method of stressing. If the Contractor wishes, the loss in steel stress may be assumed as 35,000 p.s.i.

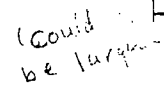
Shop drawings shall show strand layout; pull down locations; tensioning forces, elongation; and any proposed changes in reinforcing steel.

The final prestress force (remaining after all losses have been accounted for) and its corresponding dimension "B" shall be selected from those on a curve determined by the three values shown on this drawing.

The center of gravity of the tensioning units at all points along the girder shall lie on or below the curve of a draped chalk line that sags freely with the center and end dimensions as selected above.

The girders shall be poured in all-steel forms.
Holes & inserts to accommodate the diaphragm bars shall be provided in the girders at locations as shown on the slab sheet.

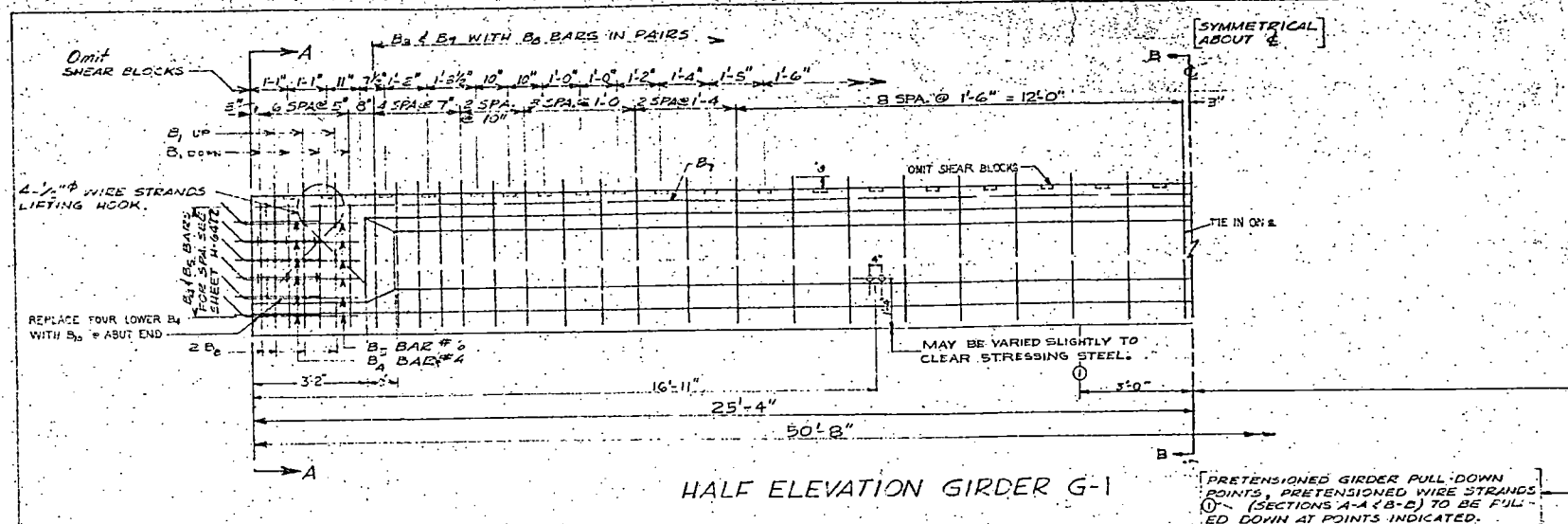
Δ AT CENTER OF GIRDER
 + AT TIME OF STRESS TRANSFER
 * DESIGNED FOR CONTINUOUS SPAN
 † BY BAR-²² 6 REQUIRED



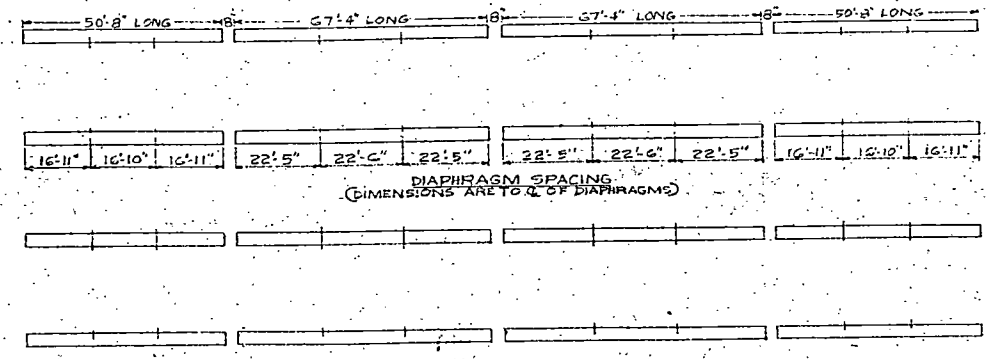
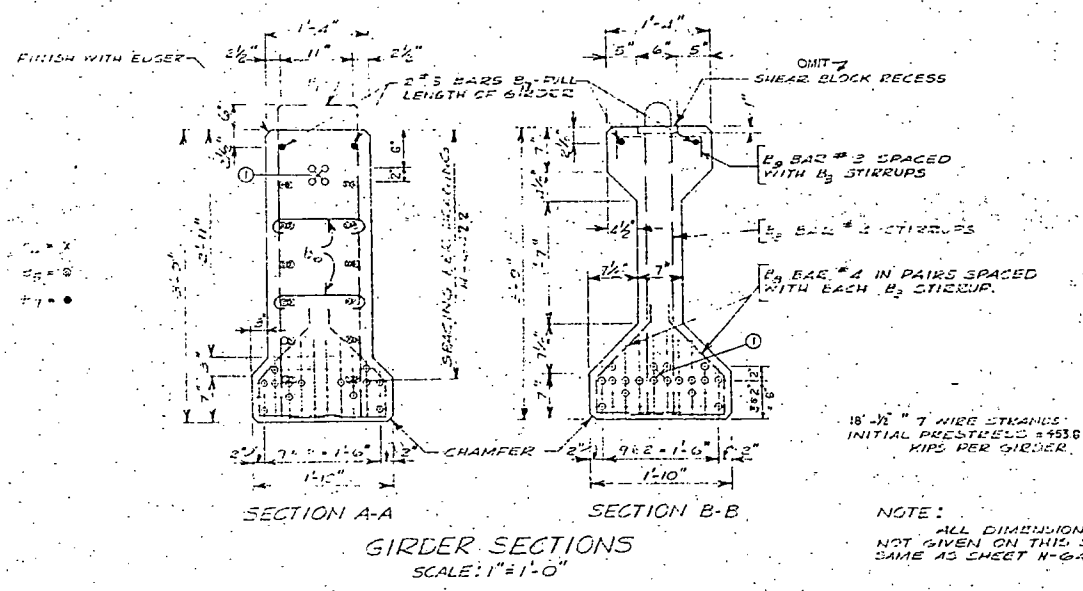
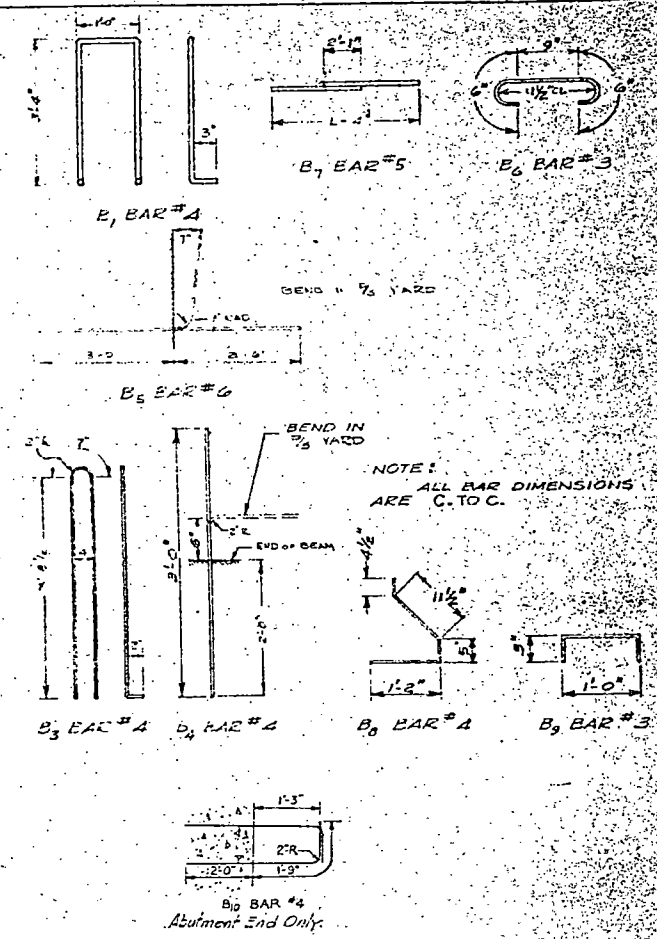
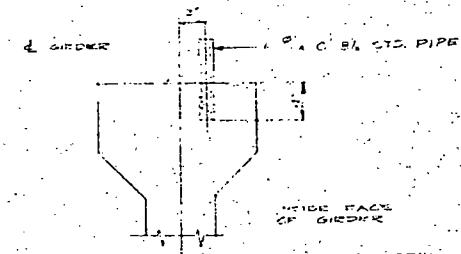
Bio BAR #4

Designed to have the bottom of the deck slab at least 1 1/8" above top of girder.

PRE-TENSIONED
45"
PRESTRESSED GIRDER



CENTER OF GRAVITY OF PRESTRESS STRANDS	
END	12.66"
MIDDLE	578"



FINAL
APPROVED
DRAWING
N.D. HIGHWAY DEPT.

QUANTITIES PER GIRDER	
B1 BAR #4	14
B2 BAR #4	40
B3 BAR #4	20
B4 BAR #4	24
B5 BAR #5	12
B6 BAR #3	4-20'3"
B7 BAR #3	96
B8 BAR #3	40
B9 BAR #4	4

NORTH DAKOTA
CONCRETE PRODUCTS COMPANY
BISMARCK, NORTH DAKOTA

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

MENOKEN INTERCHANGE

BURLINGHAM COUNTY
ROADWAY
PROJECT 194-5(12)169 STA. 473+60#

PRESTRESSED CONCRETE GIRDER DETAILS

APPROVED: _____

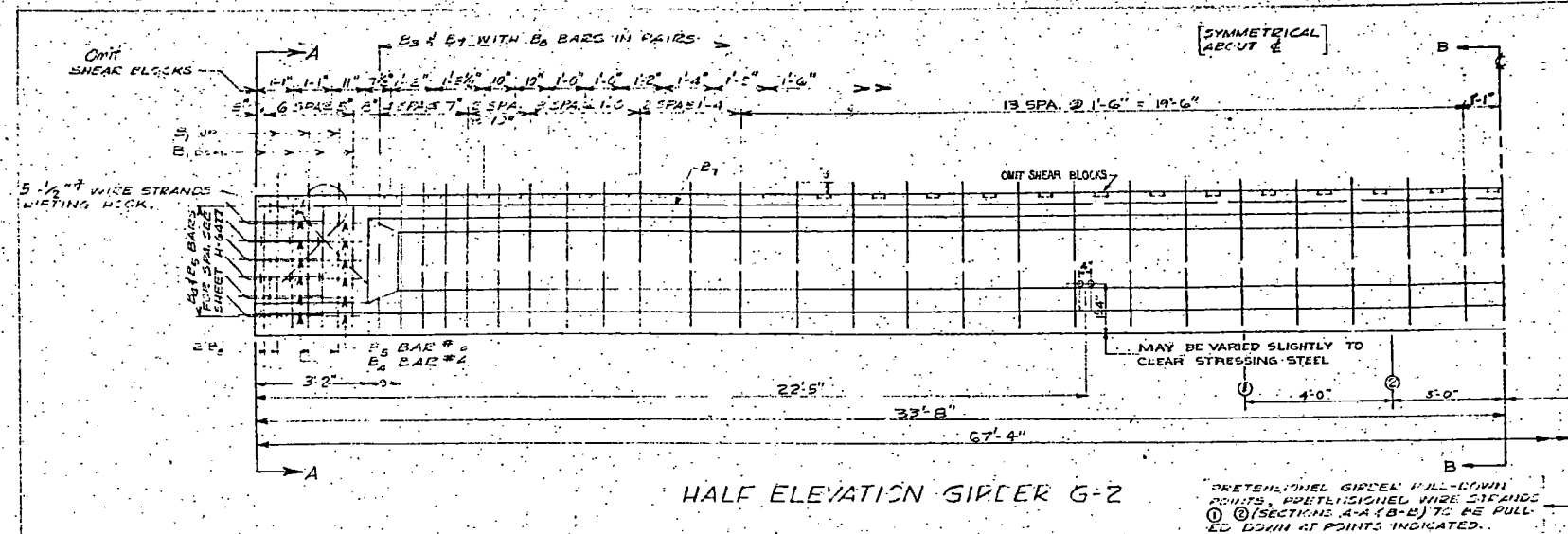
SHEET 1 OF 2

Sps 1 & 4

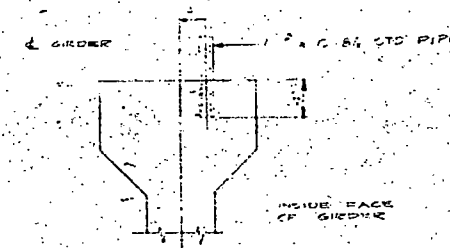
GIRDER PLAN
Note: Space 2" inserts (top) at 5'0" c/c full length of exterior girder. Place on outside for form brackets.

45'50'-8" PRESTRESS I BEAM
H 20 LOADING

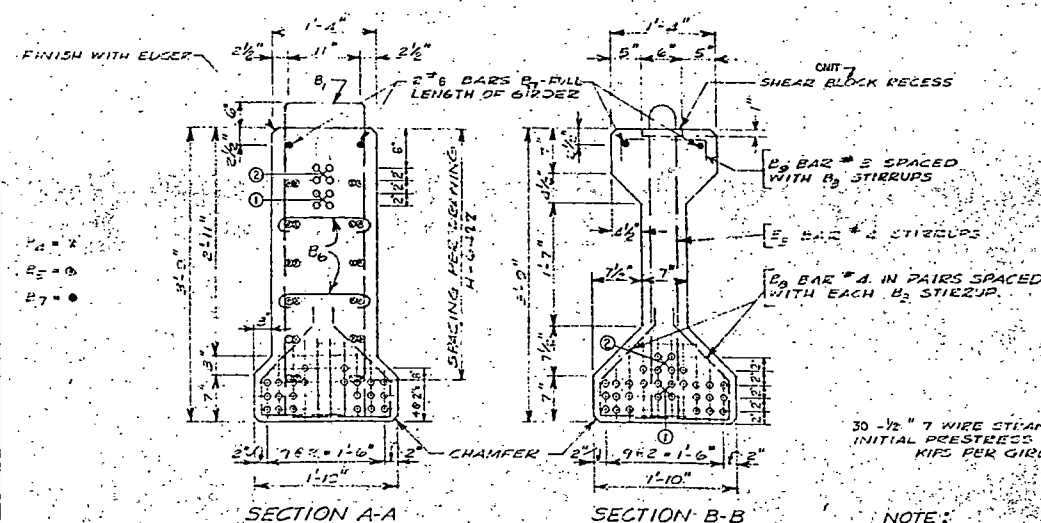
3-15-65
3-29-65



CENTER OF GRAVITY OF PRESTRESS STRANDS	
EN.	12.93"
MIDLE	5.20"

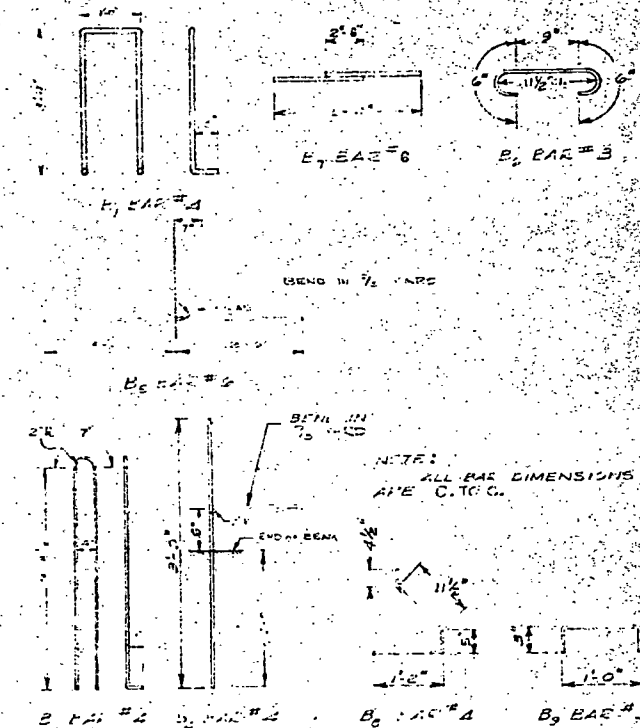


SCREED HOLDER
DETAIL
(FOR GIRDER G-2)



30 - 1/2" 7 WIRE STRANDS
INITIAL PRESTRESS = 750.0
KIPS PER GIRDER

NOTE:
ALL DIMENSIONS AND DETAILS
NOT GIVEN ON THIS SHEET ARE THE
SAME AS SHEET H-6422



QUANTITIES PER GIRDER	
B1 BAR #4	14
B2 BAR #4	51
B3 BAR #4	24
B4 BAR #4	24
B5 BAR #4	12
B6 BAR #4	12
B7 BAR #4	6.24.0
B8 BAR #4	118
B9 BAR #4	51

TOTAL WEIGHT = 20.4 TONS
* Use strands where possible

NORTH DAKOTA
CONCRETE PRODUCTS COMPANY
BISMARCK, NORTH DAKOTA

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

MENOKEN INTERCHANGE

BURLEIGH COUNTY
28' ROADWAY
PROJECT J-93-502.169 STA. 473+86.4

PRESTRESSED CONCRETE
GIRDER DETAILS

APPROVED:

SHEET 2 OF 2

FINAL
APPROVED
DRAWING
N.D. HIGHWAY DEPT.

GIRDER PLAN

15' 6" 4' 4" PRESTRESS I BEAM
H 20 LOADING

Sps 2 & 3

3-15-65
3-25-65

91.71