DESIGN DATA				
Traffic	Average Daily			Est. Max. Hr.
Current 1999	Pass: 2,100	Trucks 150	Total 2,250	225
Forecast 2019	Pass: 2,520	Trucks 180	Total 2,700	270
Minimum Sight Dist. for:		Design Speed	65	
Stopping		Bridges		

JOB# 15

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	SS-4-052(039)911	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

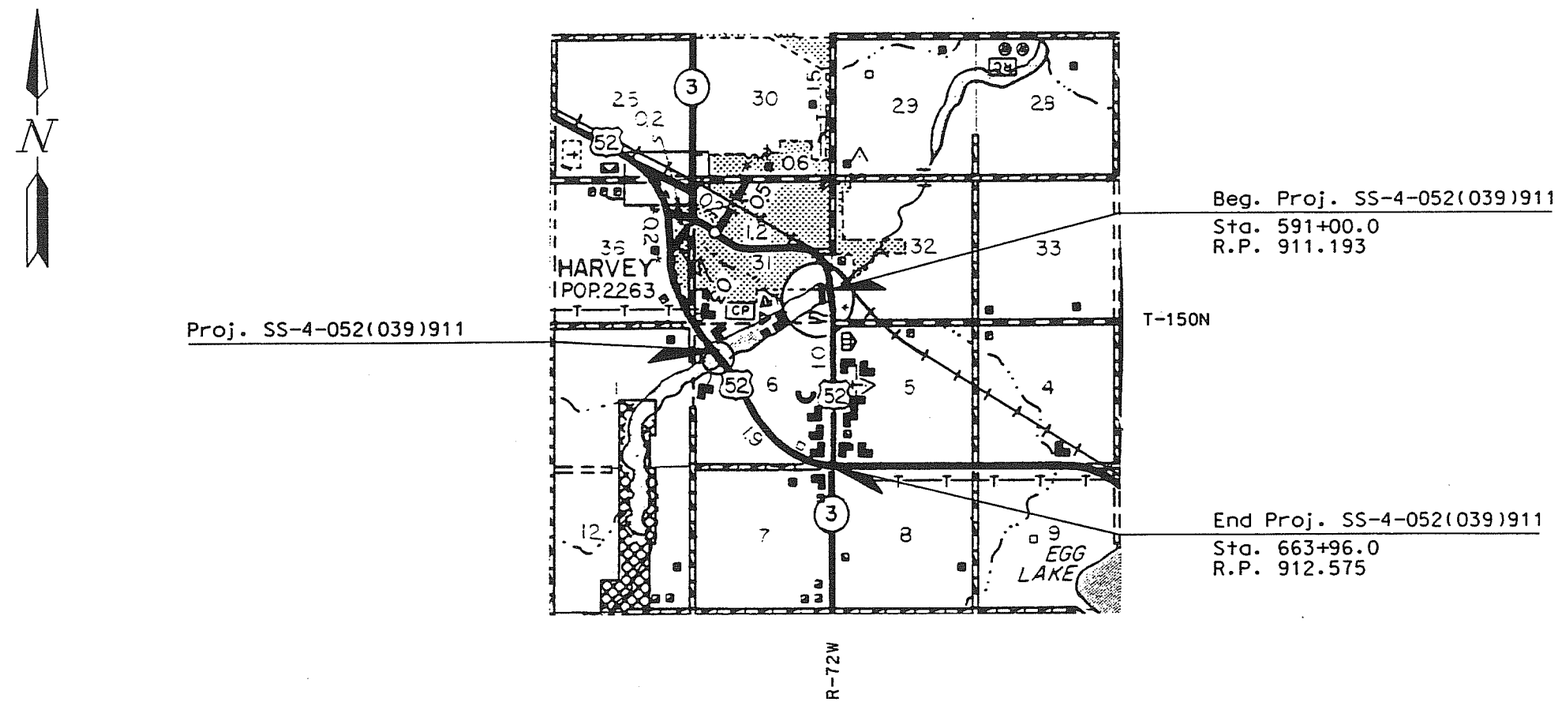
PROJECT NO. SS-4-052(039)911
IN WELLS COUNTY
WIDENING, MINE & BLEND, HOT BITUMINOUS PAVEMENT & RIPRAP

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.

LENGTH OF PROJECT

SS-4-052(039)911 = 1.382 Miles



DESIGNER
DESIGNER
DESIGNER
RECOMMEND APPROVAL 12-21, 1999
DESIGN ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 12-21-99

DIRECTOR OF HIGHWAYS AND ENGINEERING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

DAVID K. D. LEER REGISTERED PROFESSIONAL P.E. 1199 ENGINEER NORTH DAKOTA

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	SS-4-052(039)911	2

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STANDARD
NO.

D-704-2 TRAFFIC CONTROL FOR CORING HOT BIT PVMT
D-704-8 BREAKAWAY SYSTEM FOR CONSTRUCTION ZONE SIGNS
D-704-9-15 CONSTRUCTION SIGNING DETAILS
D-704-19,20,,22,24,26 CONST. SIGNING & BARR. LOC. DETAILS
D-704-30 WINDROW MARKING
D-708-2 TEMPORARY EROSION AND SILTATION CONTROLS
D-714-1 REINFORCED CONCRETE PIPE CULVERT AND END SECTIONS
D-714-4 CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS
D-714-22 CONCRETE PIPE TIES
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D-754-23 ASSEMBLY DETAILS
D-754-24 MOUNTING DETAILS
D-754-26,27,29,30,48,51,57 SIGN PUNCHING, STRINGER & SUPPORT LOCATION DETAILS
D-762- 4 PAVEMENT MARKING
D-762-6 TEMPORARY STRIPING
D-764-32 THREE CABLE GUARDRAIL
D-764-33 THREE CABLE GUARD RAIL AT HAZARDS
D-766-1 MAILBOX LOCATION DETAILS
D-770-1 CONCRETE FOUNDATIONS
D-770-2 FEED POINTS
D-770-4 LIGHTING & SIGNAL DETAILS
D-770-5 LIGHT STANDARD DETAILS

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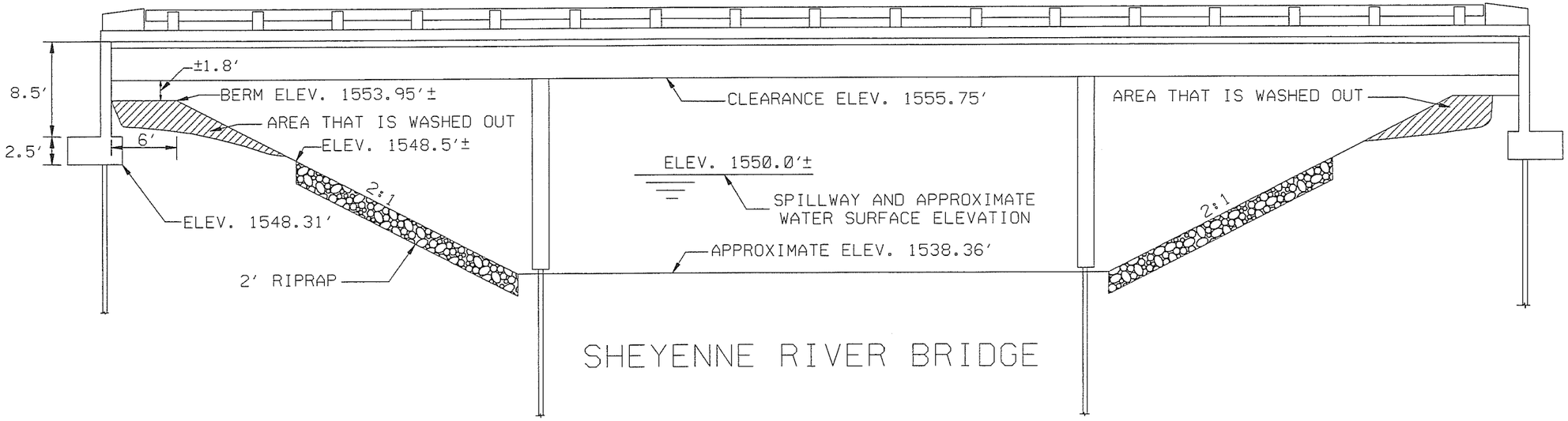
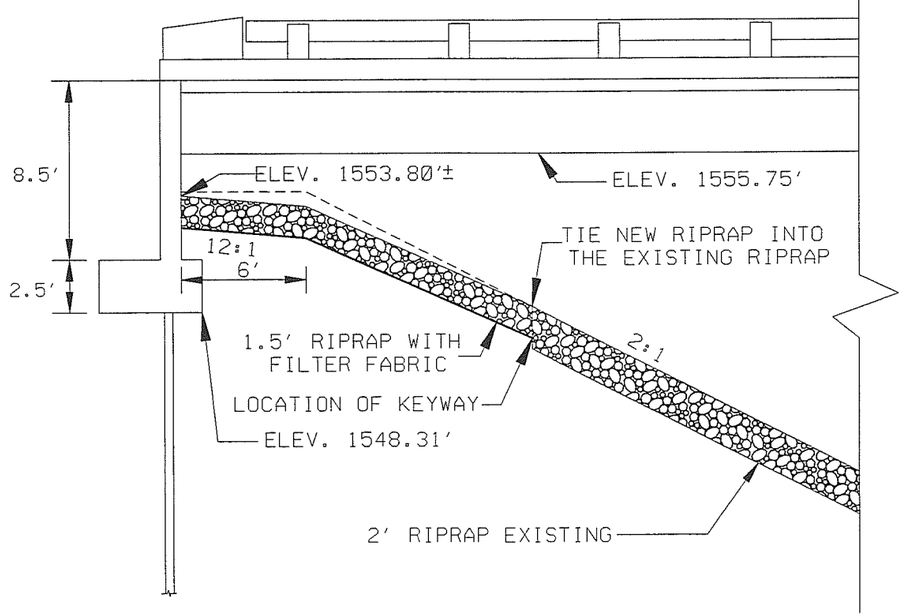
LIST OF STANDARDS

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	BS-4-052(039)911	13

EXISTING CONDTIONS



TYPICAL REPAIR DETAIL



ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0201	FOUNDATION PREPARATION	1	EACH
704	1100	TRAFFIC CONTROL	1	L. SUM
708	1020	RIPRAP-LOOSE ROCK	120.0	C.Y.
709	0600	GEOTEXTILE FABRIC-TYPE RR	239.0	S.Y.

NOTES:

1. QUANTITIES ARE ESTIMATED.
2. THE NEW RIPRAP AND FILTER FABRIC SHALL EXTEND 6 FEET BEYOND THE WING WALLS.
3. BOTH SIDES OF THE BRIDGE SHALL BE REPAIRED.
4. THE OUTSIDE EDGE OF FILTER FABRIC SHALL BE KEYED IN AS DIRECTED BY THE FIELD ENGINEER.

SLOPE REPAIR DETAILS AND QUANTITIES

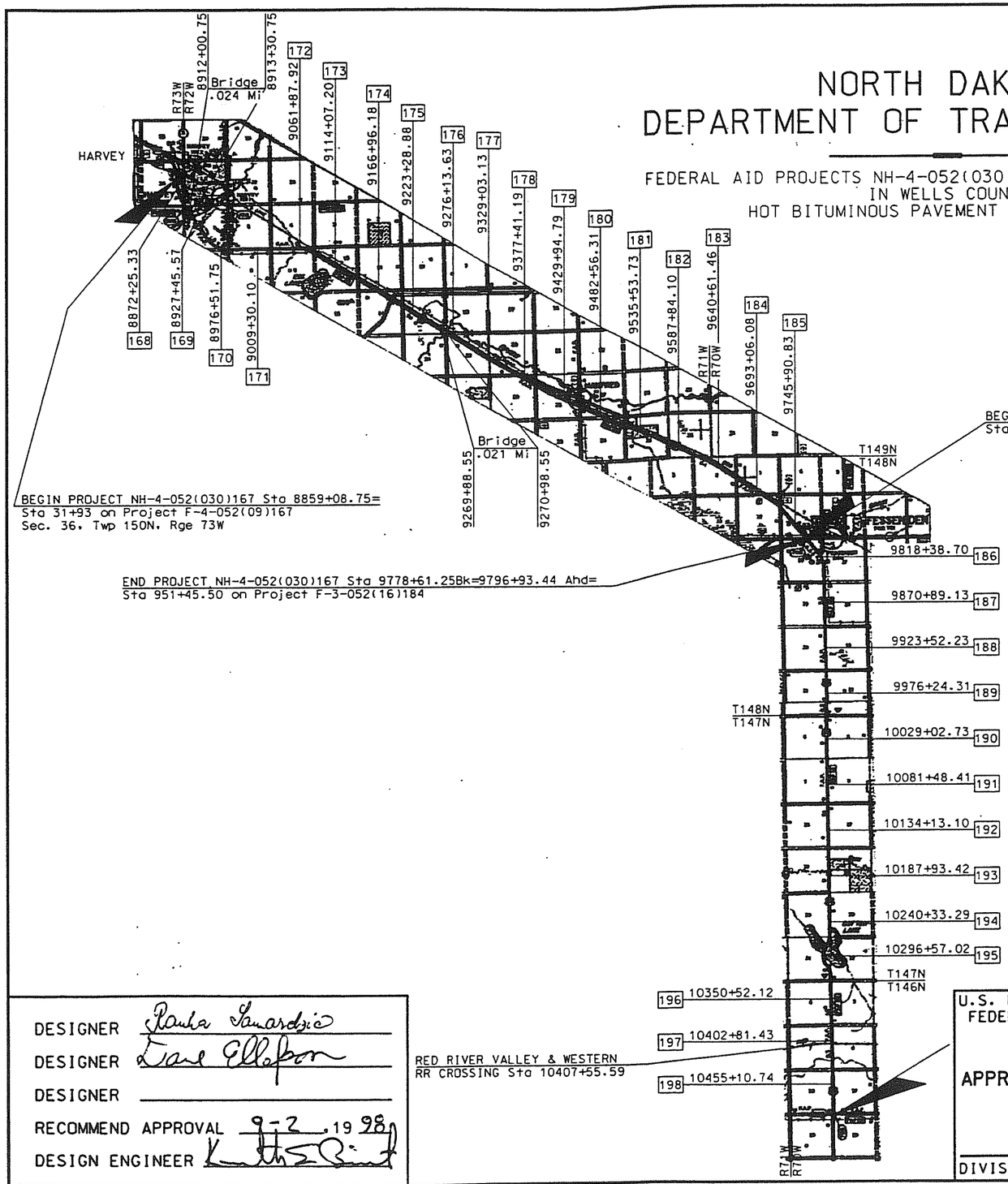
BRIDGE #52-168.801

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	NH-4-052(030)167 NH-3-052(026)185	1

JOB# 14

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECTS NH-4-052(030)167 & NH-3-052(026)185
IN WELLS COUNTY
HOT BITUMINOUS PAVEMENT & INCIDENTALS



BEGIN PROJECT NH-4-052(030)167 Sta 8859+08.75=
Sta 31+93 on Project F-4-052(09)167
Sec. 36, Twp 150N, Rge 73W

END PROJECT NH-4-052(030)167 Sta 9778+61.25Bk=9796+93.44 Ahd=
Sta 951+45.50 on Project F-3-052(16)184

BEGIN PROJECT NH-3-052(026)185 Sta 9778+61.25Bk=9796+93.44 Ahd=
Sta 951+45.50 on Project F-3-052(16)184

BEGIN PROJECT NH-3-052(026)185 Sta 10490+79.64
Sta 697+66.5 on Project F-3-052(16)184
A point at the SE cor. of Sec. 18, Twp 146N, Rge 70W

RED RIVER VALLEY & WESTERN
RR CROSSING Sta 10407+55.59

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.

LENGTH OF PROJECT

	MILES-Gross	MILES-Net
NH-4-052(030)167	17.415	17.370
NH-3-052(026)185	13.141	13.141

.045 Mi deducted for Bridges (NH-4-052(030)167)

DESIGN DATA for NH-4-052(030)167

Traffic	Average Daily		TOTAL	Est. 30th Max. Hour
Current (1998):	1,100 Pass.	360 Trucks	1,460	150
Forecast (2018):	1,540 Pass.	580 Trucks	2,120	225
Design Speed:		70 MPH		
Minimum Sight Distance for Stopping:		625'		

DESIGN DATA for NH-3-052(026)185

Traffic	Average Daily		TOTAL	Est. 30th Max. Hour
Current (1998):	760 Pass.	300 Trucks	1,060	110
Forecast (2018):	1,070 Pass.	480 Trucks	1,550	160
Design Speed:		70 MPH		
Minimum Sight Distance for Stopping:		625'		

DESIGNER Rauha Lamardzic
DESIGNER Dave Ellefson
DESIGNER
RECOMMEND APPROVAL 9-2, 1998
DESIGN ENGINEER [signature]

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 9-2-98

[signature]

DIRECTOR OF HIGHWAYS AND ENGINEERING

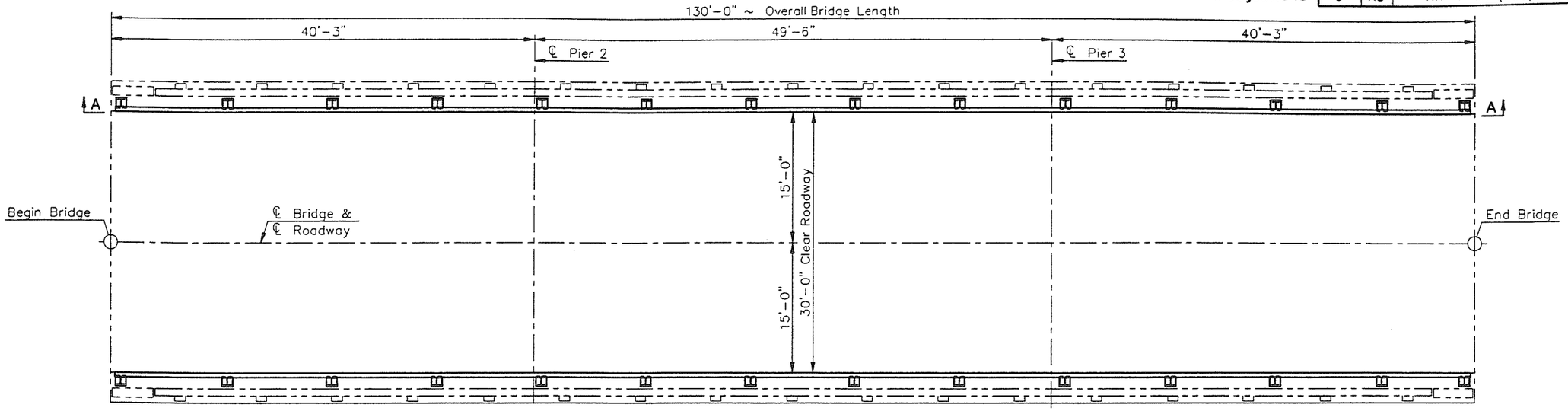
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

DAVID K. O. LEER
REGISTERED PROFESSIONAL ENGINEER
P.E. 1199
NORTH DAKOTA

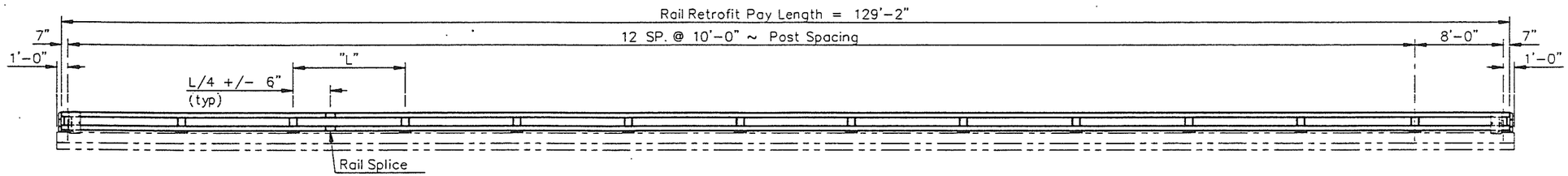
...\d_paving\title52.dgn Aug. 27, 1998 14:37:15

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

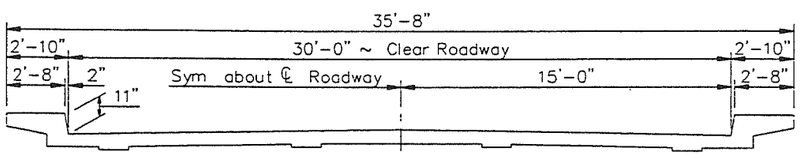
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	NH-4-052(030)167	42



PLAN



A-A



TYPICAL DECK SECTION

LARRY L. SCHWARTZ
REGISTERED PROFESSIONAL ENGINEER
2099
NORTH DAKOTA

SCOPE OF WORK:

This project consists of a deck overlay and a double box beam rail retrofit.

There is approximately 1/4" thick chip seal on the bridge. The contractor shall construct a deck overlay on the bridge. Remove by scarifying the 1/4" chip seal and 1/2" of the concrete deck. All chip seal and concrete removed from the deck shall be disposed of properly off of the right-of-way by the contractor. The deck shall then have a 1 1/2" overlay as shown in the details. The overlay shall meet the requirements of low-slump concrete as listed in section 650.05.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3001	DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	LF	258.3
650	0700	CLASS 1 OVERLAY	SY	434
650	0701	CLASS 2 OVERLAY	SY	87
650	0702	CLASS 3 OVERLAY	SY	22
650	0703	CLASS 2A OVERLAY	LF	157

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SHEYENNE RIVER
NEAR HARVEY

BRIDGE LAYOUT

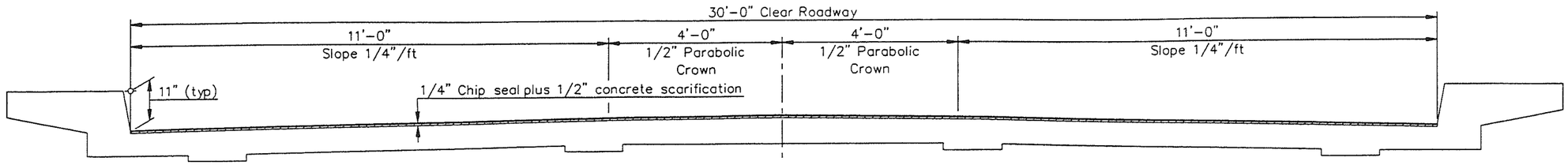
PROJECT: NH-4-052(030)167
STATION 8912 + 65.75

WELLS COUNTY

1 SEP 98
DATE

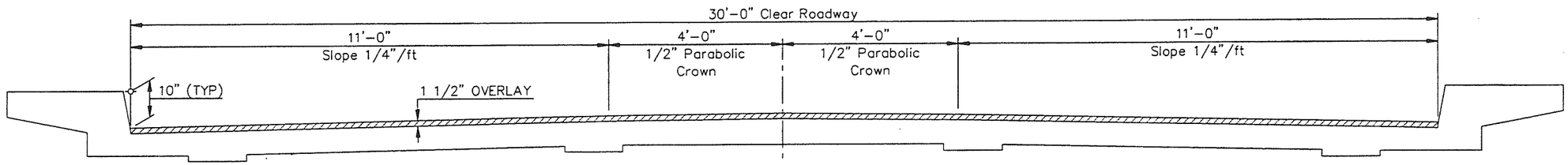
Larry Schwartz
BRIDGE ENGINEER

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	NH-4-052(030)167	43



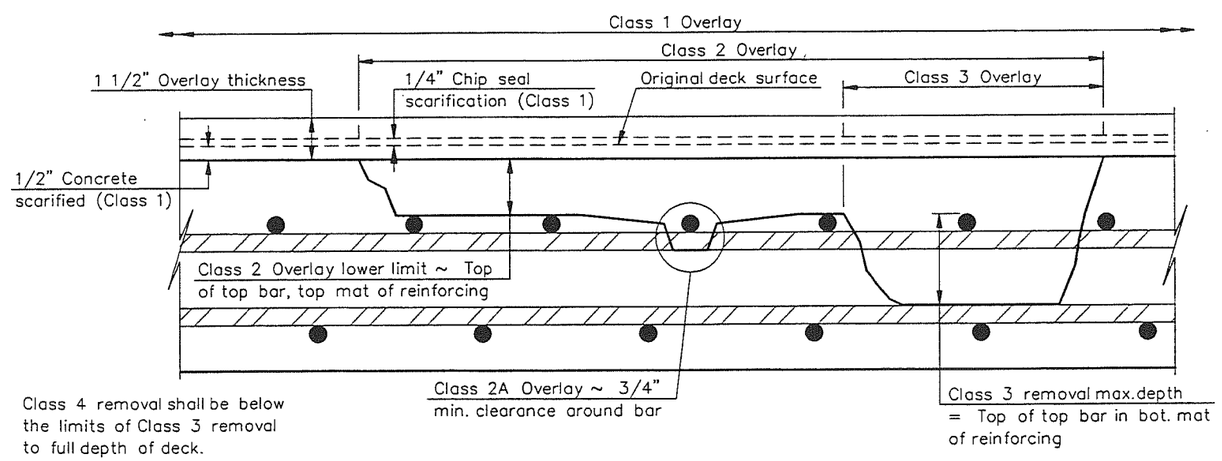
(SHOWING REMOVAL)

TYPICAL DECK SECTION



(SHOWING OVERLAY)

TYPICAL DECK SECTION



OVERLAY CLASSIFICATIONS

BRIDGE DECK SECTION

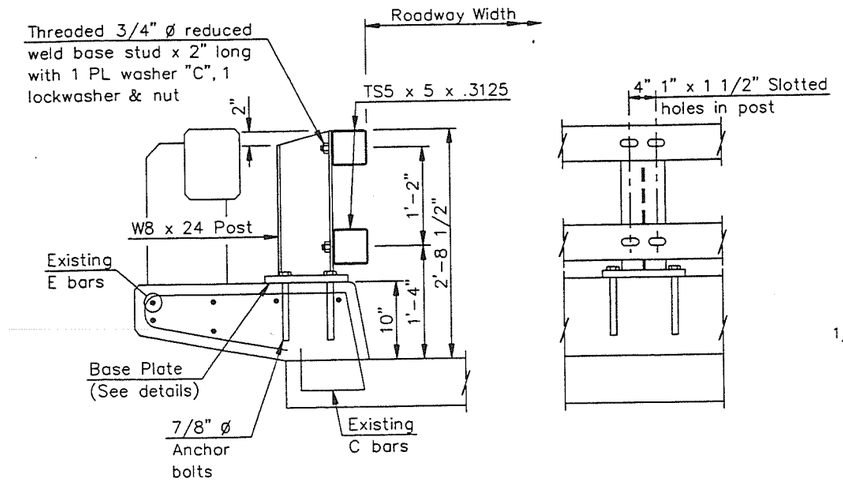
QUANTITIES	
CLASS 1 OVERLAY	434 SY
CLASS 2 OVERLAY	87 SY
CLASS 3 OVERLAY	22 SY
CLASS 2A OVERLAY	157 LF

SHEYENNE RIVER
NEAR HARVEY

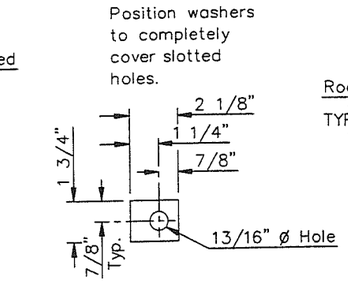
OVERLAY DETAILS

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

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	NH-4-052(030)167	44

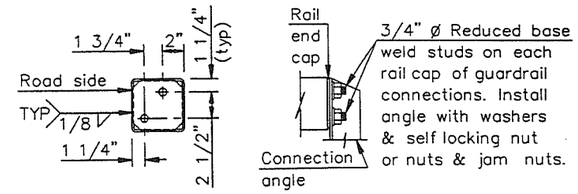


CURB MOUNT POST DETAILS



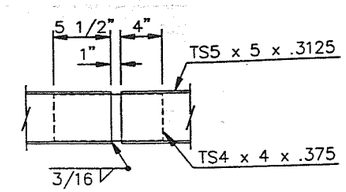
1/4" PL (A36 OR MERCHANT QUALITY)

PLATE WASHER "C"

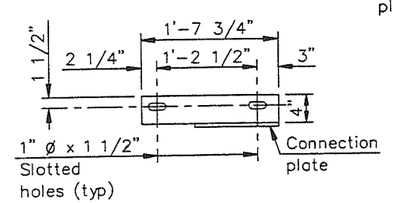


Rail Cap shall be a BAR 4 3/4 x 3/16 x 4 3/4".
Cope corners 3/4" to provide for zinc drains.

RAIL CAP DETAILS

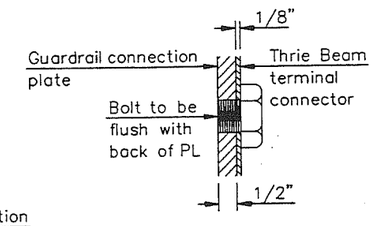


RAIL SPLICE DETAIL

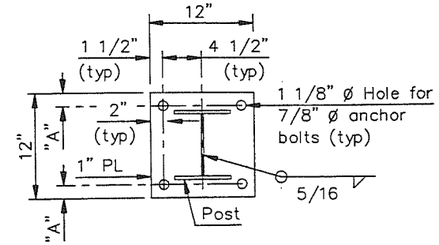


BAR 4 x 3/8

A-A

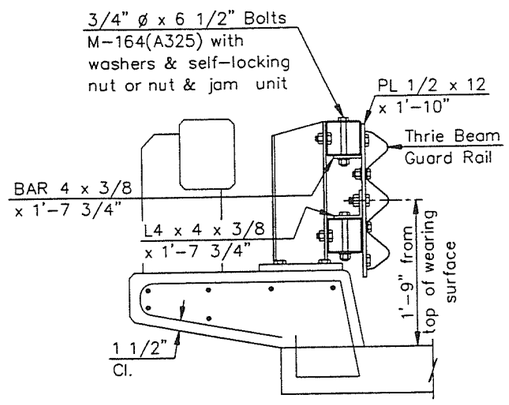


DETAIL "B"

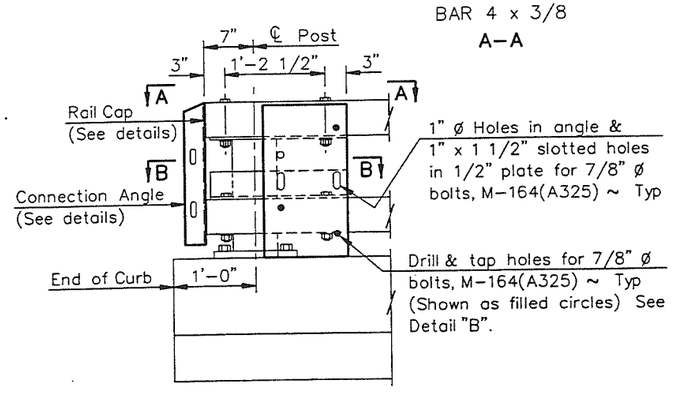


The "A" Dimension is variable, 1 1/2" to 3"

POST BASE PLATE DETAIL



THRIE BEAM CONNECTION DETAIL



END POST CONNECTION DETAIL

NOTES:

The bid item shall be "Double Box Beam Rail Retrofit". The pay length shall be end to end and in linear feet.

Rail elements shall be square structural tubing in accordance with ASTM Specification A500 Grade B.

Steel posts, plates and angles shall conform to AASHTO Specification M-183, unless otherwise noted.

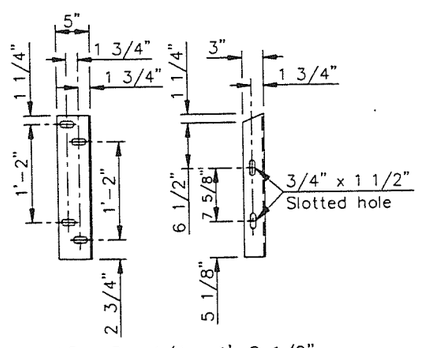
Railing shall be fabricated to the horizontal and vertical alignment of the structure. Posts shall be normal to grade.

Payment for the railing shall include compensation for furnishing and installing the guardrail connection plates.

All structural steel including fasteners shall be hot-dip galvanized after fabrication according to AASHTO M111.

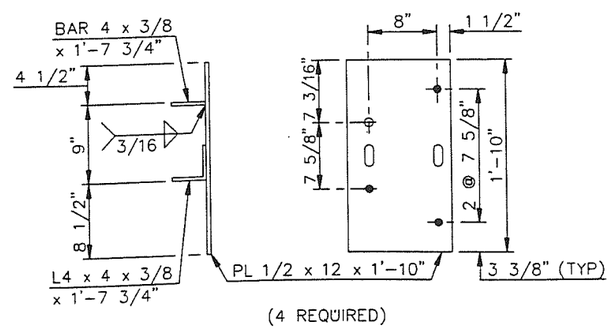
Rails shall be fabricated so that each rail segment between splices is attached to a minimum of two posts.

The anchor bolts shall be embedded into the concrete with a chemical adhesive system that can develop a tensile strength of at least 17,500 lbs.



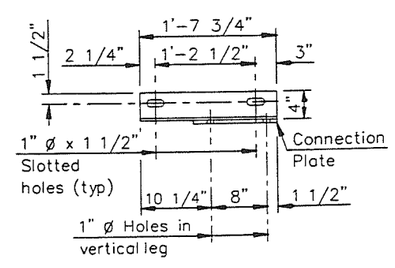
L5 x 3 x 1/4 x 1'-8 1/2"

CONNECTION ANGLE DETAILS.



(4 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS



L4 x 4 x 3/8

B-B

QUANTITIES	
DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	258.3 LF

SHEYENNE RIVER
NEAR HARVEY

TRAFFIC RAIL DETAILS

52-168.801-2

RAIL 98DLS65 LLS
c:\dgn\52-168.801\rail.dgn Aug. 19, 1998 09:19:47

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F-704(1)		1	128

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

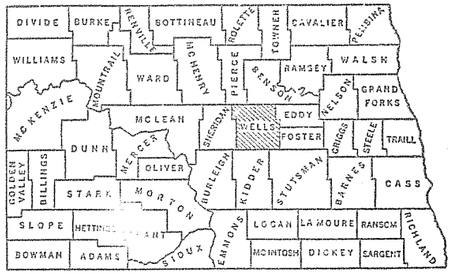
FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN WELLS COUNTY

FEDERAL AID PROJECT NO. F-704(1)

GRADING, BASE, BIT. TREAT., & STRUCTURES



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET: 1 IN. = 5280 FT.
- PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT.; VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS:- AS SHOWN
- CROSS SECTION SHEETS:- 1 IN. = 20 FT.

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1961)	1163 PASS. 537 TRUCKS 1500 TOTAL	195
TRAFFIC FORECAST (1981)	2325 PASS. 675 TRUCKS 3000 TOTAL	390

DESIGN SPEED 70 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600
MINIMUM SIGHT DISTANCE (SAFE PASSING) 3200
MINIMUM PASSING SIGHT DISTANCE FOR MARKING 1200
BRIDGES: DESIGN LOADING - H20S16 (1957)
CLEAR ROADWAY WIDTH 30'

DESIGNATES POINTS OF ACCESS

INDEX OF DRAWINGS

SHEET NO.	1	TITLE PAGE
SHEET NO.	2-2A	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
SHEET NO.	3	CULVERT AND BRIDGE LIST
SHEETS NO.	4 TO 50	INCL. PLAN AND PROFILE DRAWINGS.
SHEETS NO.	51 TO 63	INCL. DESIGN DATA SHEETS
SHEETS NO.	64 TO 74	INCL. DETAIL SHEETS
SHEETS NO.	75 TO 81	INCL. FUTURE SIGNING SHEETS
SHEETS NO.	82 TO 110	INCL. STRUCTURAL DRAWINGS
SHEETS NO.	111 TO 128	INCL. SOIL PROFILE
SHEETS NO.	129 TO 195	INCL. CROSS SECTIONS
		Sheet 108 Omitted

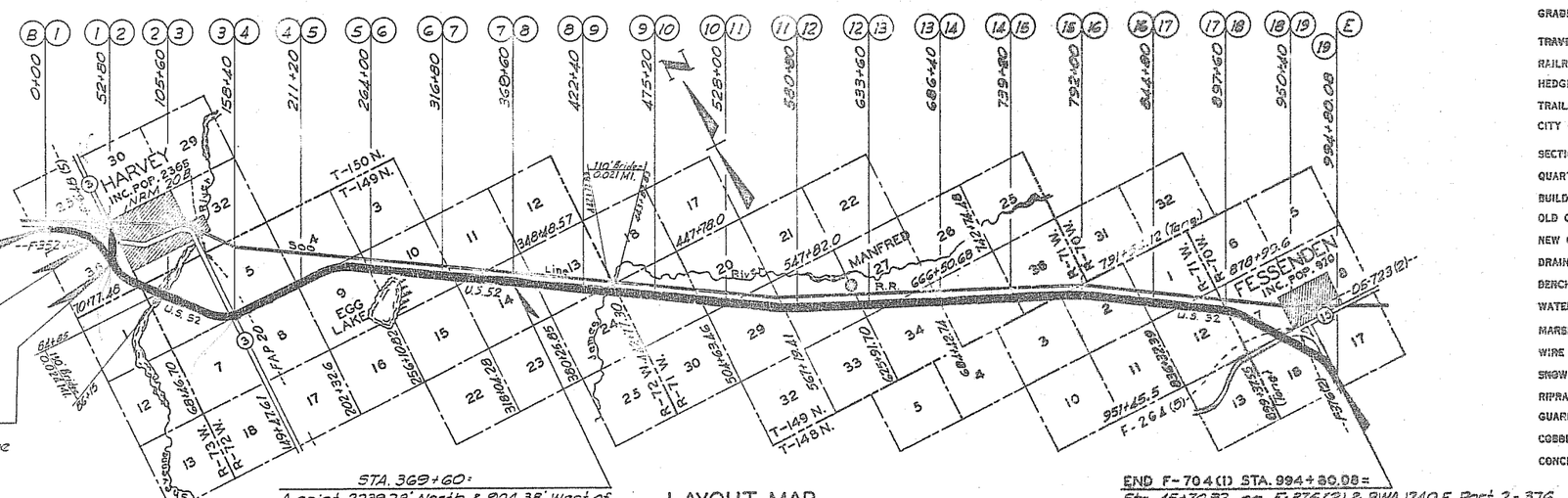
LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
F-704(1)	18.840	18.840
Spur	0.440	0.440
TOTAL	19.280	19.280

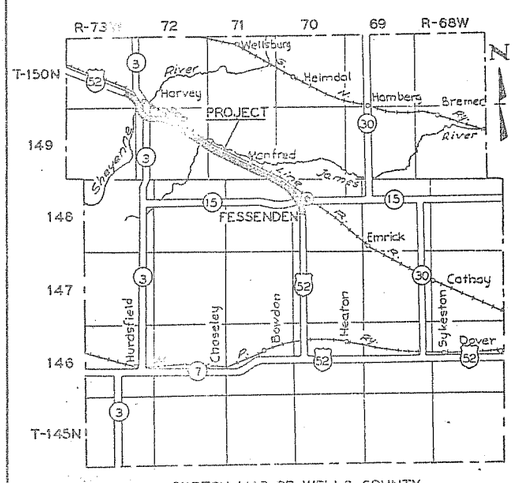
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department July 1961 and submitted to the Bureau of Public Roads for approval July 29, 1961. Required Special Provisions dated June 15, 1959 and approved by the U.S. Bureau of Public Roads July 8, 1959 and others submitted herewith

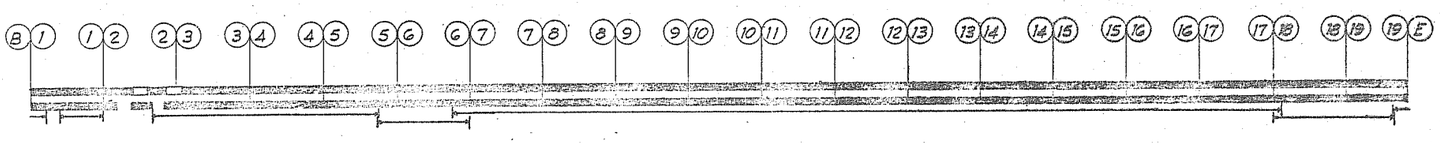
KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
GRADE LINE
CENTERLINE OF CONSTRUCTION
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
ABANDONED RIGHT OF WAY LINE
PROPERTY LINE
STONE WALL
OTHER FENCES
POLE LINES
POWER LINES
BRIDGE
GROUND
GRADE
ELEVATION
TRAVELED WAY
RAILROADS
HEDGES AND TREES
TRAILS
CITY OR VILLAGE CORPORATE LIMITS
SECTION CORNER
QUARTER SECTION CORNER
BUILDINGS
OLD CULVERTS
NEW CULVERTS
DRAINAGE
BENCH MARKS
WATERS EDGE
MARSH
WIRE ROPE GUARD RAIL
SNOW FENCE
RIPRAP
GUARD POSTS
COBBLE GUTTERS
CONCRETE GUTTERS





SKETCH MAP OF WELLS COUNTY



SIGHT DISTANCE DIAGRAM

LEGEND

Passing Zones (1200 Min. S.D.)
Non-Passing Zones
Safe Passing Sections (3200 Min. S.D.)

APPROVED DATE 7-18-61

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

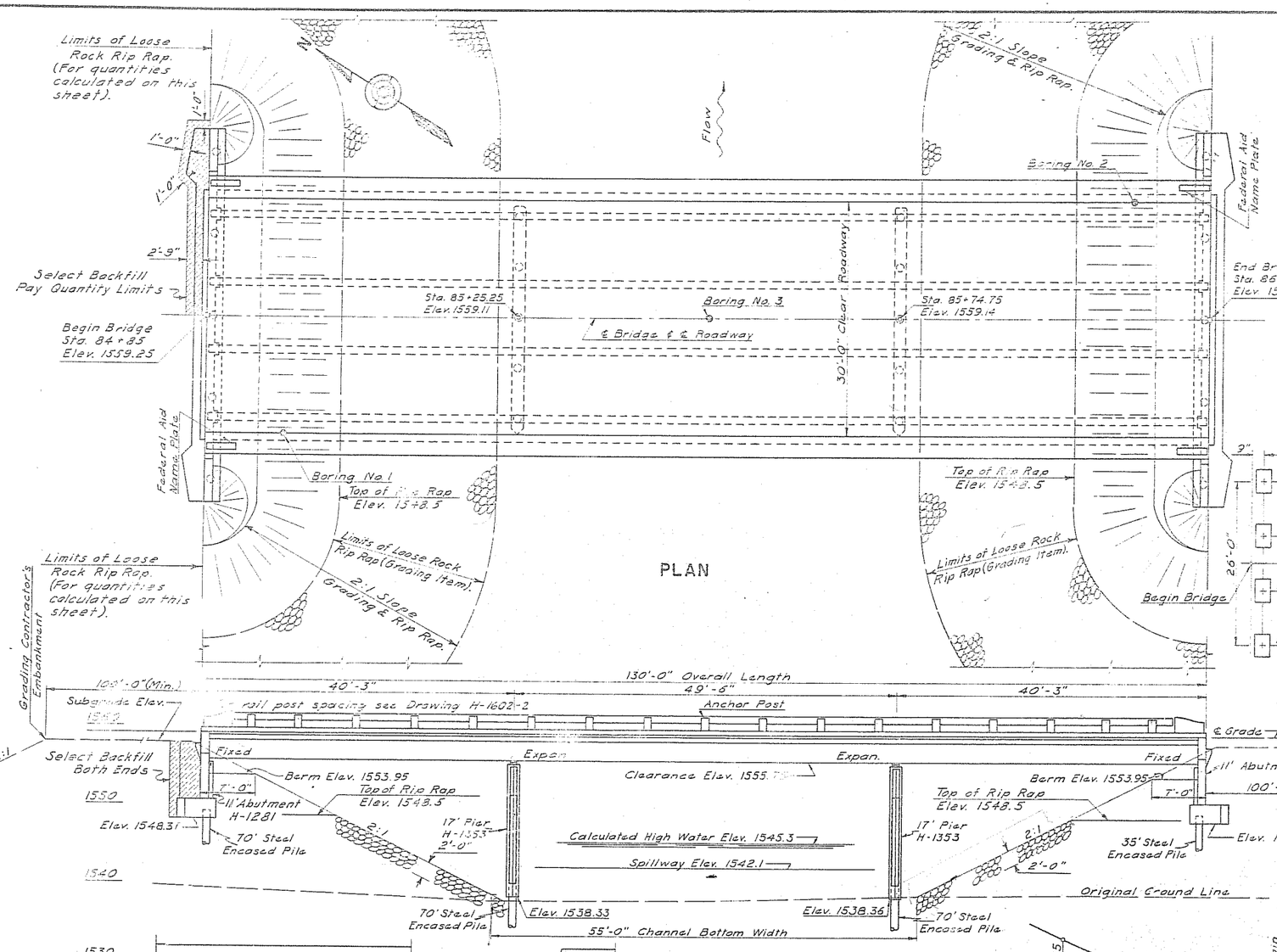
APPROVED:

DIVISION ENGINEER DATE

2512

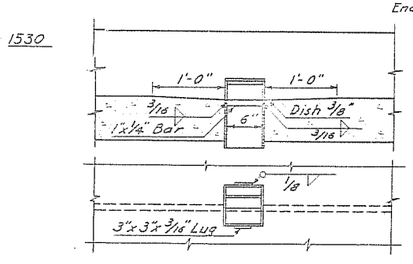
F-704(1)

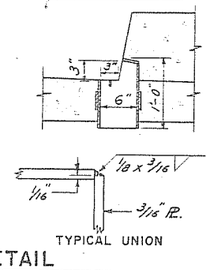
SP. DOC. CODE	FED. ROAD DIST. NO	STATE	PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
X-031	5	N. D.	F-704(1)		52	198



PLAN

ELEVATION





TYPICAL UNION

FLOOR DRAIN DETAIL

NOTE FOR FLOOR DRAIN DETAIL

This detail supercedes 3"Φ pipe drains on Sheets H-1600 & H-1602-2, at the same location as shown on these sheets.

Design Stresses:

f_c = 1200 Psi.
f_s = 20,000 Psi. (Reinforcing Steel)
f_s = 18,000 Psi. (Structural Steel)

NOTE:

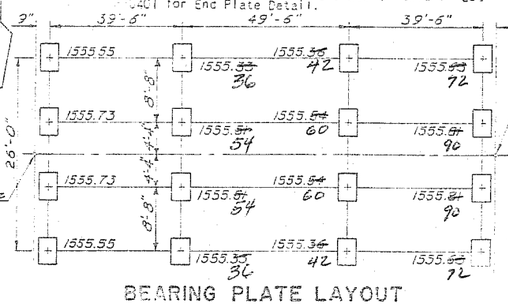
GENERAL:
The cost of furnishing and placing joint filler, asphalt curb seal, name plates, end post pipe sleeves, drain pipes, and other miscellaneous items shall be included in the price bid for Class AE-1½ Concrete.
Welding will not be paid for directly, but shall be included in the unit price bid for structural steel.
Dead load deflections and vertical curve corrections have been accounted for in the riser diagram.
The proposed bridge site is approximately 4600 feet upstream from the Sheyenne River Dam at Harvey. The spillway elevation is approximately 4 ft. above the channel bottom elevation at the bridge site.
EMBANKMENT:
Entire embankment at each end of structure shall be placed before any piling are driven in abutment footing locations.
No Select Backfill shall be placed above the berm elevation until the superstructure has been placed.

All structural excavation shall be Excavation Class 2.
STEEL-ENCASED PILING:
The pipe for the steel-encased piles shall be AC-3/4" outside diameter with a wall thickness of .279 inches and end closure plate ½" thick. See 1401 for End Plate Detail.

REINFORCING STEEL: (Intermediate Grade)
Bent bar details are given center to center unless noted.
The Bar Fabricator shall add a prefix to all bar designations to differentiate between the several parts of the structure or structures.
CONCRETE:
All exposed edges of concrete shall be beveled with 3/4" triangular molding except as shown on the plans.
The "Rubbed Surface Finish" will be required for the roadway faces of curbs, the outside vertical faces of curb and slab, all faces of rails, intermediate and end posts, and the exposed faces of the abutment wing walls. All other surfaces shall be given the "Ordinary Surface Finish".

If the tremie method is elected to pour the underwater section of the pier, then Class AAE-1 shall be used, but paid for according to the contract unit price bid per cubic yard of Concrete Class AE-1½.
All concrete shall be compacted by vibration.
Each curb shall be placed in one continuous operation.

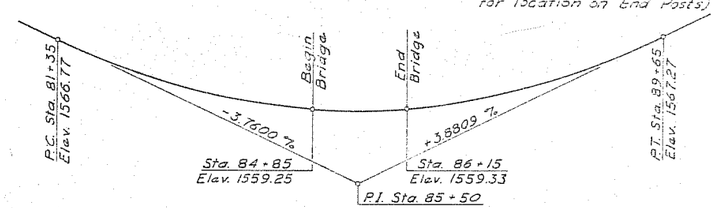
A vibrating strike-off template shall be used when finishing the deck slab concrete. Care shall be taken that the vibrator is shut off when the forward movement of the template is stopped. The final strike-off shall be made on a fairly long surface without continual starting and stopping.
All concrete above top of curb shall be Class AAE-1 except concrete end posts. End posts and all other concrete shall be Class AE-1½.



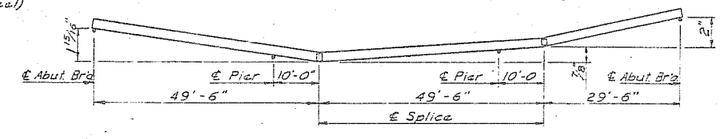
BEARING PLATE LAYOUT
Elevations are to top of concrete

1961
FEDERAL AID
PROJECT
F-704(1)
NORTH DAKOTA
52-15.2

FEDERAL AID NAME PLATE
2 Required
(See Drawing H-1600 for location on End Posts)



VERTICAL CURVE DATA
Elevations are to top of finished Roadway



SHOP CAMBER DIAGRAM

ESTIMATE OF QUANTITIES (Bridge)

SPL. PROV.	ITEM NO.	BID ITEM		
	12	REMOVING EXISTING STRUCTURE AT STA.		
	208	SELECT BACKFILL	90	CU. YD.
	159	EXCAV CLASS 2	270	CU. YD.
	160	EXCAV CLASS 3		CU. YD.
	13X	ROADWAY EXCAVATION "CLASS A"		CU. YD.
	504A	CONCRETE CLASS AAE-1	6.59	CU. YD.
	10A	CLASS AE-1½	245.8	CU. YD.
	16	WATER FOR COMPACTION (10 GAL./CU.YD.)		M. GAL.
	62A	REINFORCING STEEL (INTERMEDIATE GRADE)	41,953	LB.
	63A	STRUCTURAL STEEL	71,488	LB.
	64A	UNTREATED TIMBER		M.B.M.
	64B	TREATED TIMBER		M.B.M.
	65N	FURNISHING STEEL-ENCASED CONCRETE PILING (10 3/4" O.D. x 0.279")	1225	LIN. FT.
	65S	DRIVING STEEL-ENCASED CONCRETE PILING (10 3/4" O.D. x 0.279")	1085	LIN. FT.
	65E	UNTREATED TIMBER TEST PILES		EACH
	65J	TREATED TIMBER TEST PILES		EACH
	720	LOOSE ROCK RIP RAP (GRADING ITEM)	455	CU. YD.
	84	TEMPORARY CROSSING AND DETOUR		
		BRIDGE BENCH MARKS		1 SET

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
12	Spot on Rock	Sta. 81+96 186' Rt. of ℄	1571.57
14	Iron Mon. Grds.	Sta. 83+67 195' Rt. of ℄	1544.57
14	Spot on Rock	Sta. 88+10 175' Rt. of ℄	1547.26
15	Spot on Rock	Sta. 89+30 168' Rt. of ℄	1567.33

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	LONG. FORCE	DESIGN LOAD	MAXIMUM REQUIRED BEARING	◊ MINIMUM PENETRATION
Abut.	23.6 T.	10.4 T.	10.8 T.					44.8 T.	60 T.	25'
Pier	34.5 T.	20.6 T.	—					55.1 T.	65 T.	15'

◊ Below Bottom of Footing in ft.

STRUCTURAL DRAWINGS

GENERAL DRAWING: TITLE SHEET, 52-15.2-1, 52-15.2-2
SUBSTRUCTURE: H-1600, H-1353, H-0501
SUPERSTRUCTURE: H-1602-1, H-1602-2, H-1600, H-0501, ST'D 7.6 & 14.9

DESIGN LOADING: HS20-S16 (1957)
SCALE: 1 INCH = 8 FEET

NORTH
STATE HIGHWAY DEPARTMENT

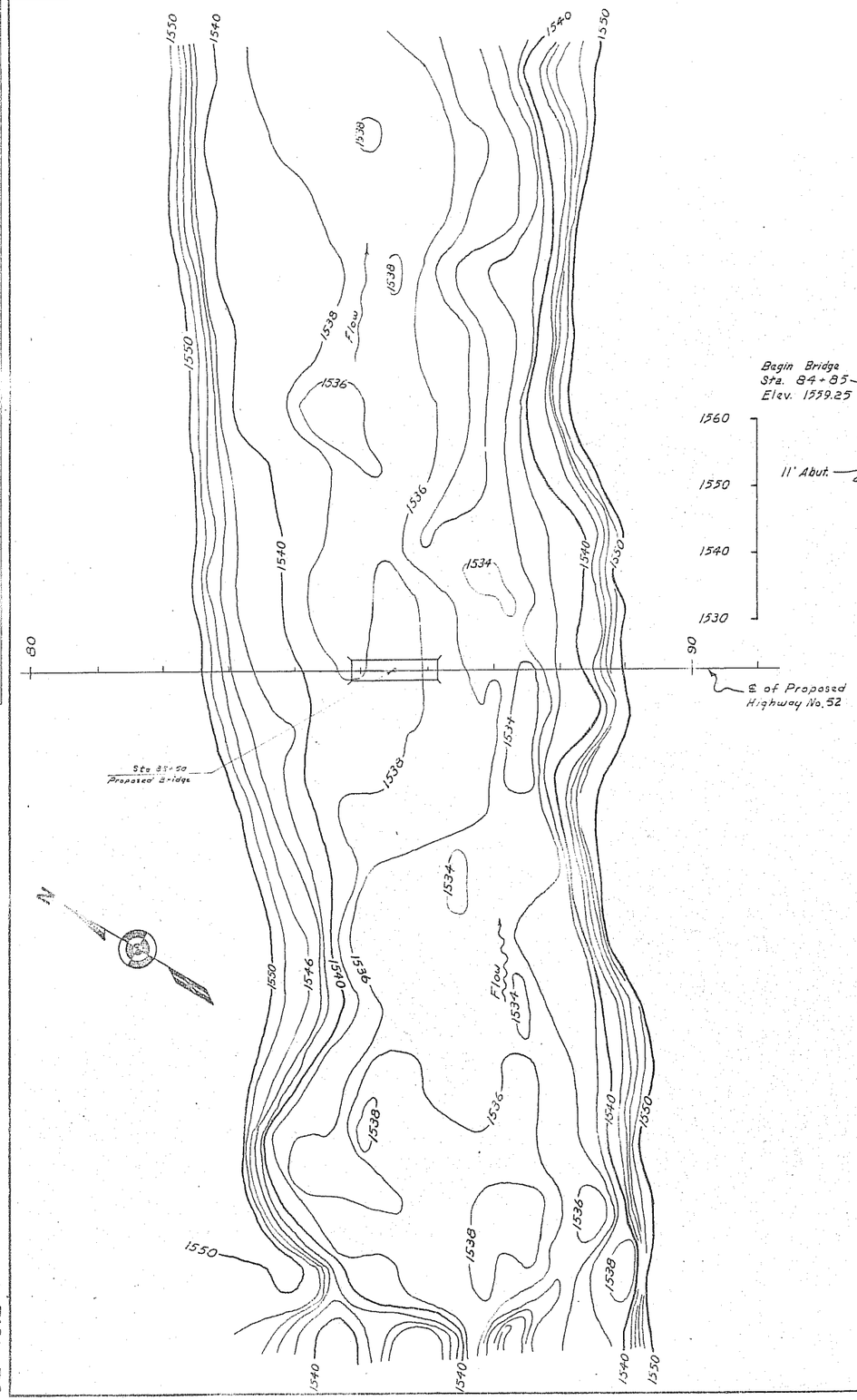
SHEYENNE RIVER
BRIDGE LAYOUT

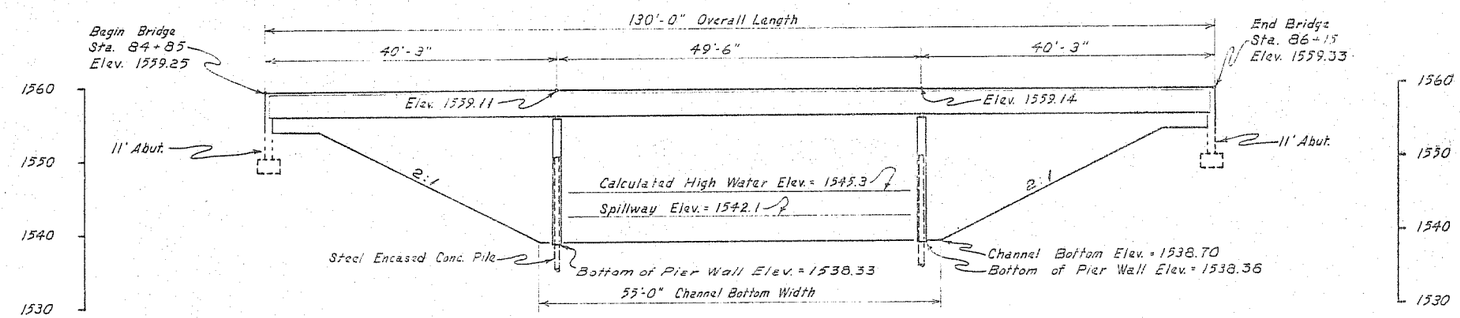
PROJECT F-704(1) STA. 85 + 50
ALTERNATE "A"
WELLS COUNTY

APPROVED
11-7-60 — DATE
Joseph K. Kirby — BRIDGE ENGINEER

52-15.2A

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F-704(1)		83	198





ELEVATION

SCALE: 1" = 10'

HYDRAULIC DESIGN DATA

DRAINAGE AREA (CONTRIBUTING)	155 SQ.MI.
DESIGN FREQUENCY	50 YR.
DESIGN DISCHARGE	2300 CFS
STREAM GRADIENT	0.00051 FT/FT
VELOCITY UNDER BRIDGE	5.11 FPS
DEPTH OF FLOW	6.6 FT.
WATERWAY PROVIDED BELOW HIGHWATER	440 SQ.FT.
WATERWAY PROVIDED BELOW CLEARANCE	1550 SQ.FT.
FREEBOARD PROVIDED	10.5 FT.±
MIN. WATER ELEV. (ASSUME SPILLWAY ELEV.)	1542.1
MAX. OBSERVED HIGH WATER ELEV. (1954)	1545.1

HORIZONTAL SCALE 1" = 100'

BRIDGE NO. 52-15.2

SHEYENNE RIVER BRIDGE

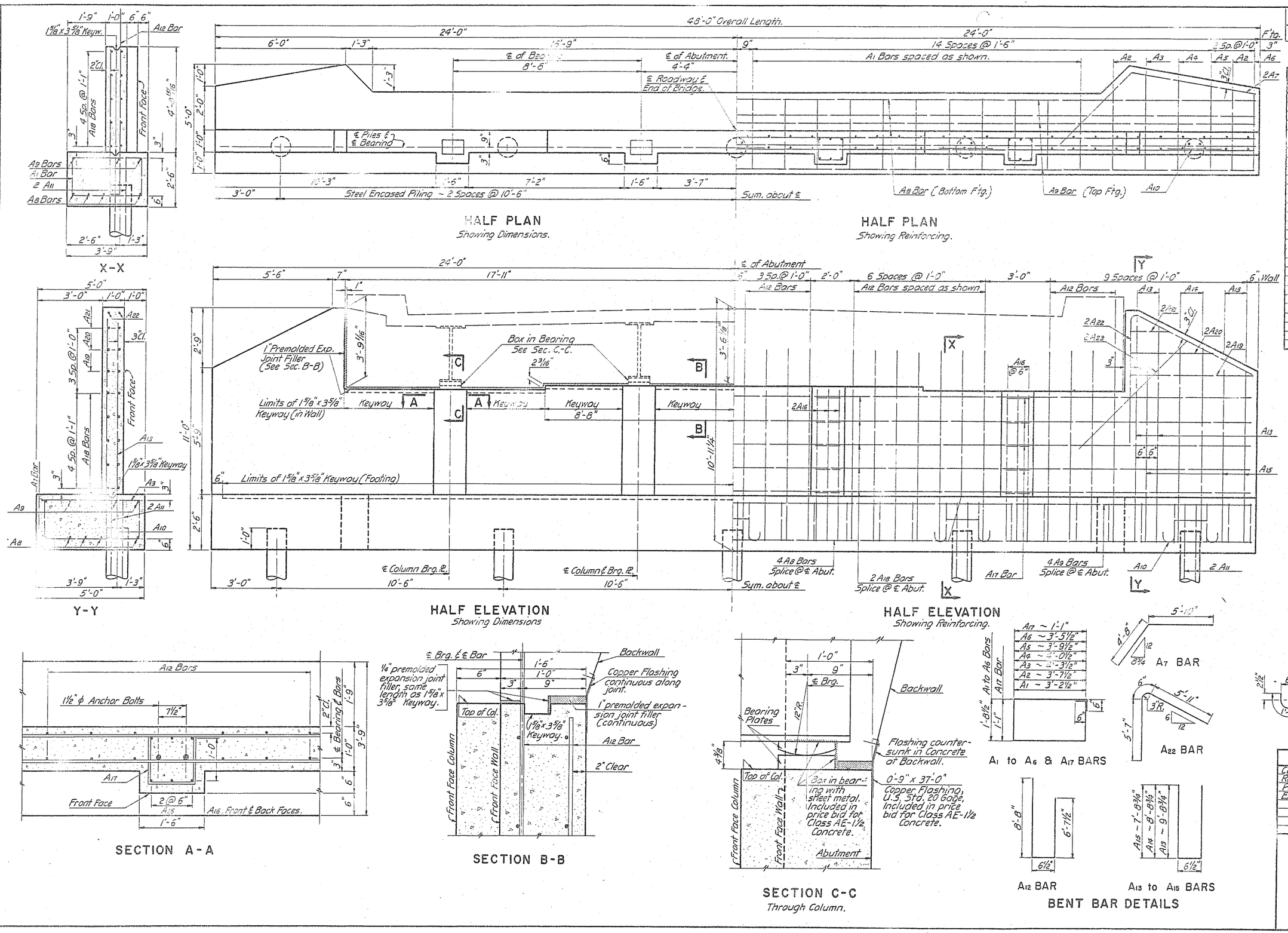
TOPOGRAPHIC LAYOUT

PROJ. F-704(1) STA. 85+50.0

WELLS COUNTY

52-15.2-1

52-15.2-1



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	[illegible]		85	[illegible]

BAR LIST ONE ABUT.

MARK	NO.	SIZE	LENGTH	SHAPE
A1	22	4	10'-10"	Bent
A2	4	4	11'-8"	"
A3	2	4	13'-0"	"
A4	2	4	12'-6"	"
A5	2	4	12'-0"	"
A6	2	4	11'-4"	"
A7	4	8	10'-6"	"
A8	8	9	25'-9"	Str.
A9	8	8	25'-6"	"
A10	5	6	5'-0"	Bent
A11	20	6	5'-0"	Str.
A12	30	4	15'-10"	Bent
A13	4	4	20'-0"	"
A14	4	4	18'-0"	"
A15	6	4	16'-0"	"
A16	24	5	6'-6"	Str.
A17	20	4	5'-4"	Bent
A18	20	4	24'-8"	Str.
A19	4	4	5'-8"	"
A20	4	4	3'-9"	"
A21	4	4	1'-10"	"
A22	4	6	12'-0"	Bent
A23	4	6	7'-0"	Str.

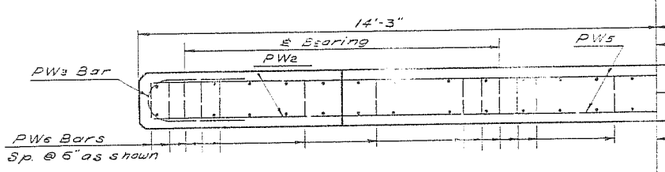
QUANTITIES (ONE ABUT.)

Concrete Class AE-1½	27.8	C.Y.
Reinforcing Steel	2,995	LB.
Piling (See Layout)		
Excavation (See Layout)		

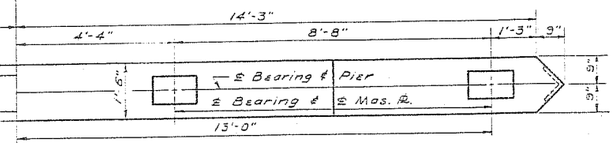
11 FT. ABUTMENT
FOR I-BEAM SPANS
FIXED END
30 FT. ROADWAY

H-1281

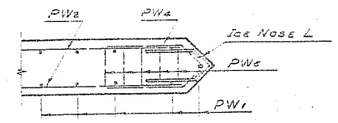
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	[illegible]		36	152



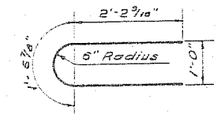
HALF TOP PLAN
Showing Reinforcing



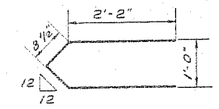
HALF TOP PLAN
Showing Dimensions



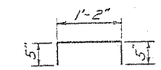
PART PLAN OF NOSE
Showing Reinforcing



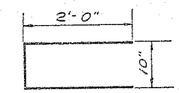
PW3 BAR



PW4 BAR



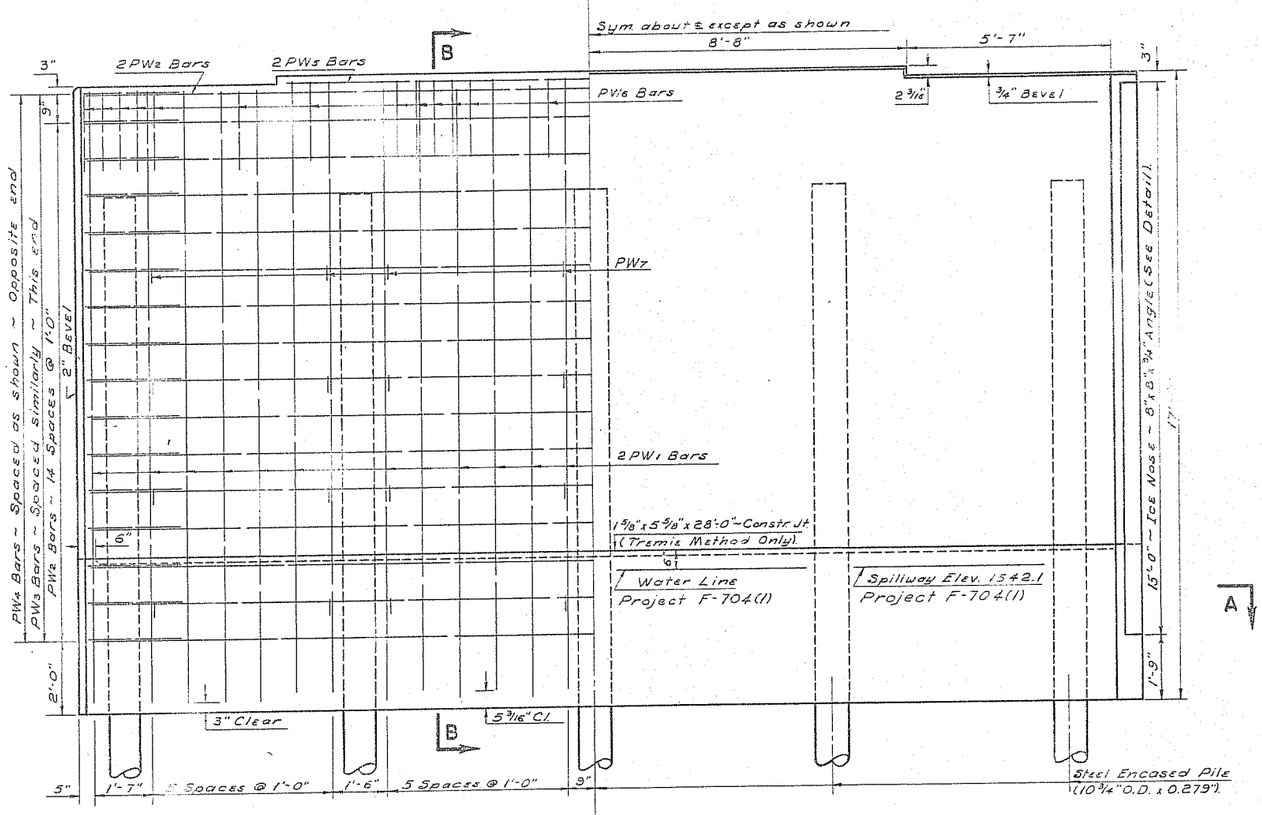
PW7 BAR



PW6 BAR

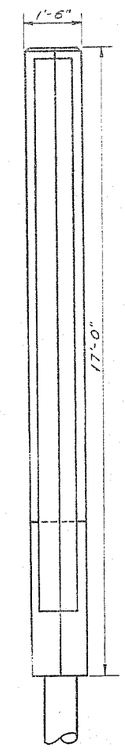
BENT BAR DETAILS

BAR LIST · ONE PIER				
MARK	NO.	SIZE	LENGTH	SHAPE
PW1	53	5	16'-5"	Str.
PW2	32	5	28'-0"	"
PW3	16	5	6'-0"	Bent
PW4	16	5	5'-9"	"
PW5	2	4	16'-10"	Str.
PW6	26	4	4'-10"	Bent
PW7	32	4	2'-0"	"

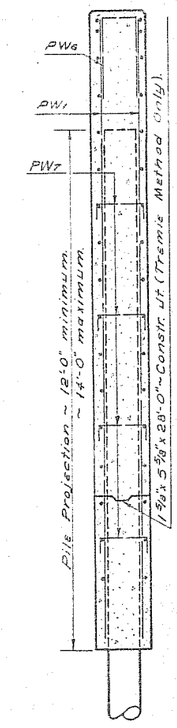


HALF ELEVATION
Showing Reinforcing

HALF ELEVATION
Showing Dimensions



END VIEW
Upstream

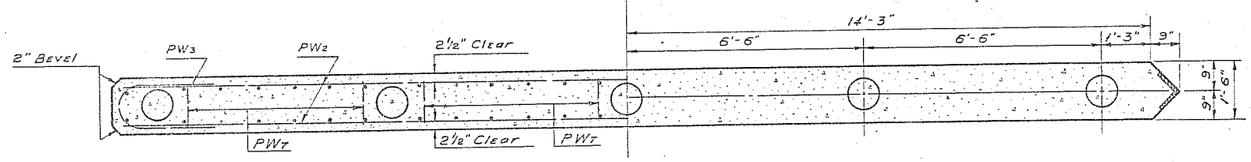


VIEW B-B

NOTE:

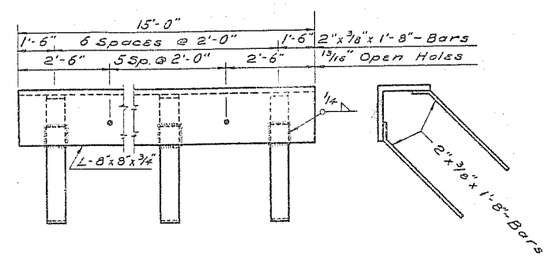
The underwater section may be dewatered and Concrete Class AE-1½ placed in the dry, or the tremie method of placing the concrete may be used. If the tremie method is used, a silt and sandproof form must completely encircle the perimeter of the pier, and all sand and silt must be removed from the interior of the form before the commencement of the tremie operation. This operation, if used, will be used only up to 6" above water line and a construction joint shall be placed as shown for the "tremie method only."

Concrete Class AAE-1 shall be used ~~for the tremie method~~ but paid for according to the contract unit price bid per cubic yard of Concrete Class AE-1½.



VIEW A-A
Showing Reinforcing

VIEW A-A
Showing Dimensions



ICE NOSE ANGLE

QUANTITIES (ONE PIER)	
Concrete Class AE-1½	25.9 Cu.Yd.
Reinforcing Steel	2192 Lbs.
Structural Steel	643 Lbs.
Steel Piling (See Layout)	

17'-0" PIER
DETAILS
FOR
I-BEAM SPANS
30'-0" ROADWAY

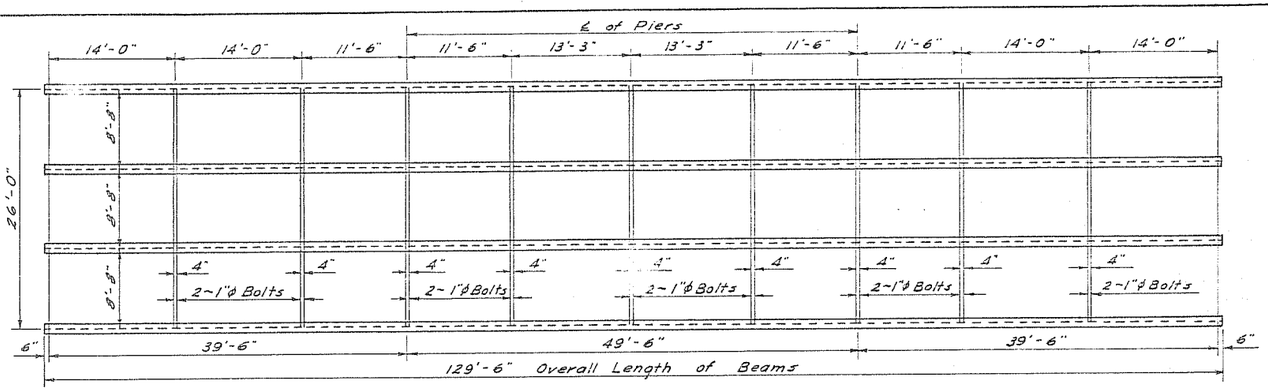
H-1353

TRACING	DRAWN BY	CHECKED BY	RMS
QUANTITIES	MADE BY	CHECKED BY	RMS

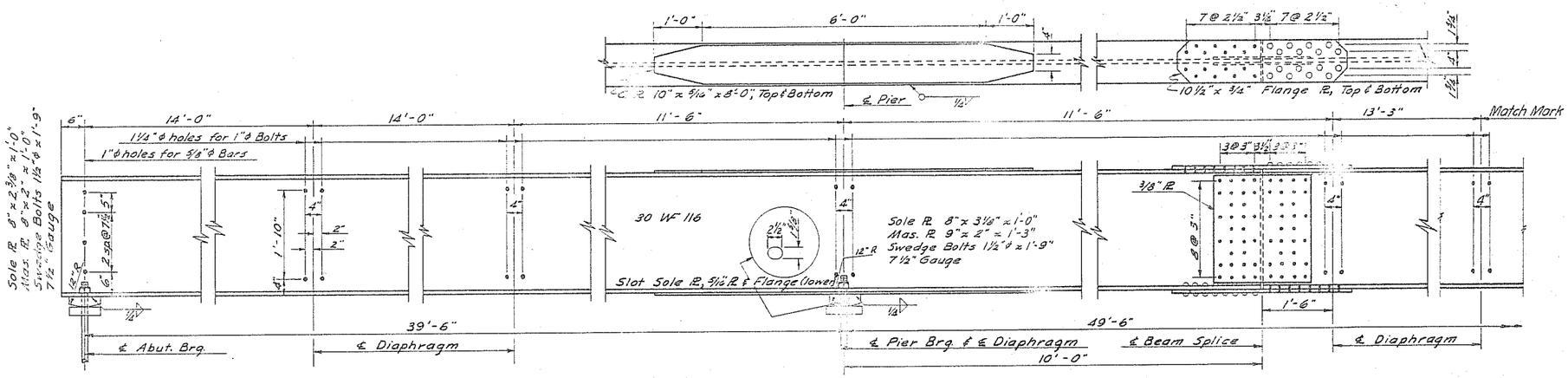
EARTH	
LIVE LOAD	20.67
DESIGN LOAD	55.17

H-1353

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F704U		88	198



STEEL LAYOUT



BEAM ELEVATION

NOTES

GENERAL:

All rivets are to be ⅞".

Open holes are to be 15/16" except as noted.

Field connections shall be made with high tensile strength bolts or shall be riveted.

Paint and painting shall conform to the North Dakota Standard Specifications for Road and Bridge Construction, Sections 80 & 132.17. All exposed steel surfaces shall be given one shop coat of red lead paint, one spot coat of red lead paint after erection and concrete work is completed and two field coats of aluminum paint (first field coat tinted with Prussian Blue). No paint, shop or field, on top of beams.

Bearing areas are to be finished true to plan and elevation by grinding if necessary, before bearing plates are set.

The Riser Diagram shows dimensions from an assumed chord drawn between supports. Additions or subtractions must be made to the riser dimensions to compensate for tolerances in beam and deflection due to the weight of the beam.

STRUCTURAL STEEL:

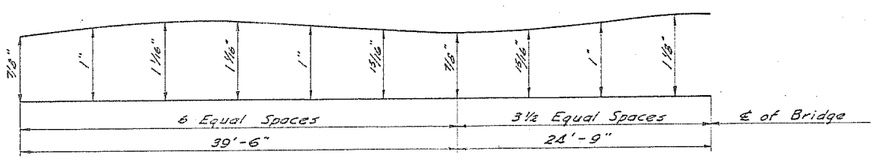
All Structural Carbon Steel shall conform to the latest A.S.T.M. A-7 Specifications.

WELDING:

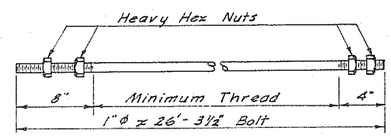
The metal-arc process shall be used for all Shop and Field fabrication. All welding shall conform to the current "Standard Specifications for Welding Highway and Railway Bridges - Design, Construction and Repair" of the American Welding Society.

Welding will not be paid for directly, but shall be included in the unit price bid for Structural Steel.

See Drawing #H-1600 for Railing & Typical Slab Sections.
See Drawing #H-1602-2 for Slab Details.



RISER DIAGRAM
Showing Dimension "a"



RA BOLTS
36 Required

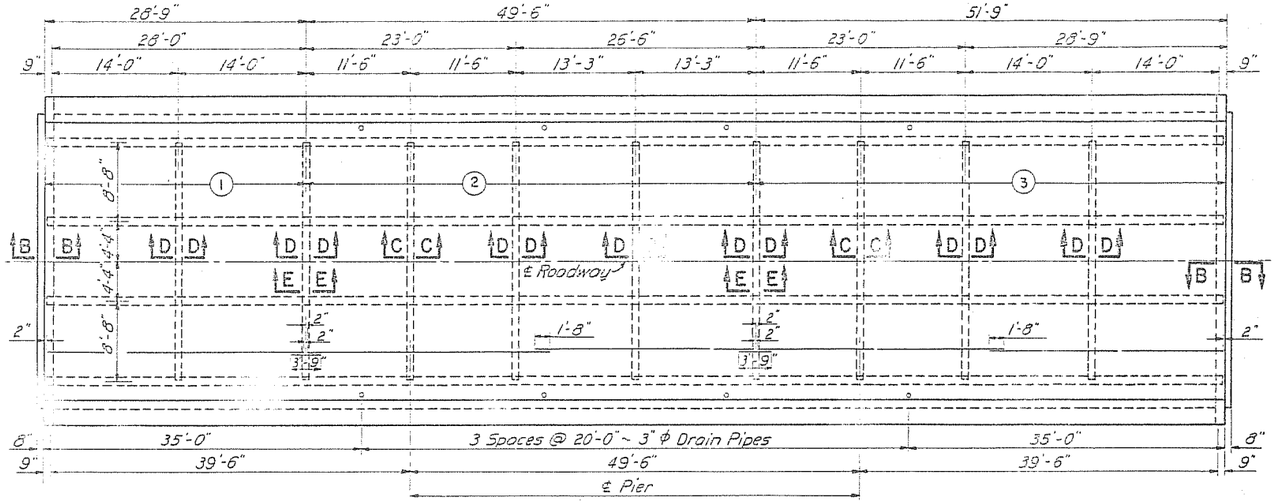
Designed for 25#/ft² F.W.S.

SUPERSTRUCTURE
THREE SPAN
CONTINUOUS I-BEAM
OVERALL LENGTH 130 FT.
H_{20} - S_{16} Loading

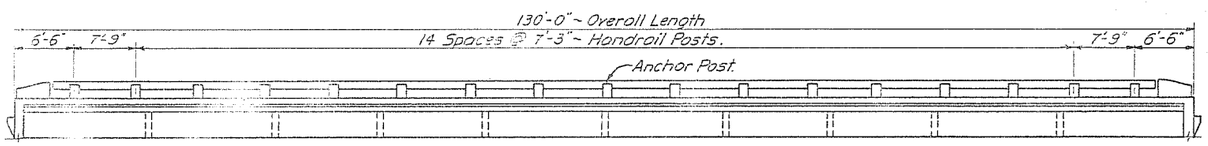
H-1602-1

H-1602-1

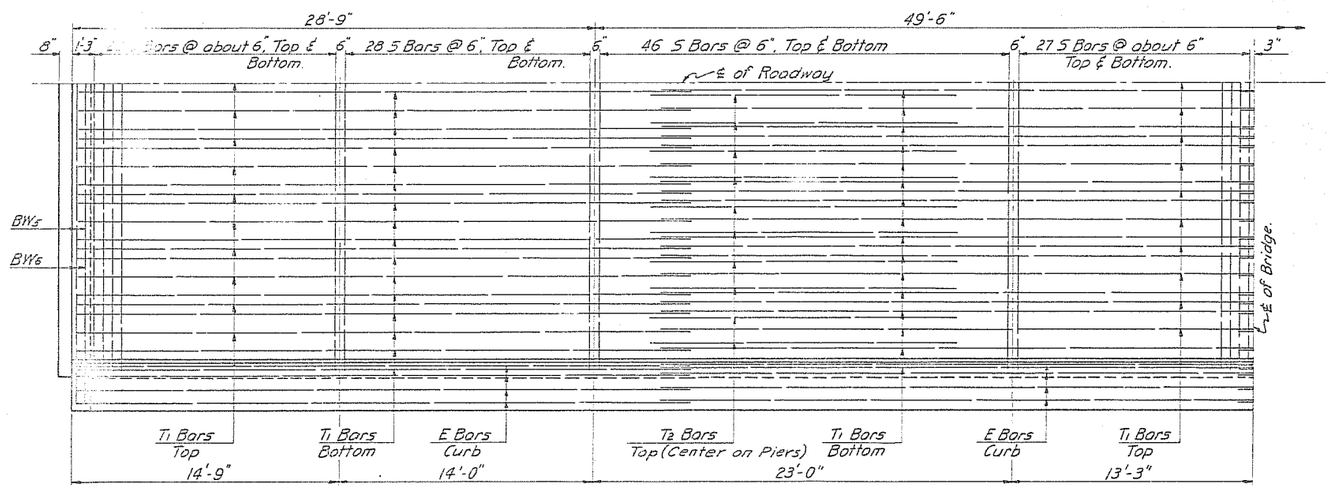
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	[illegible]		80	93



PLAN



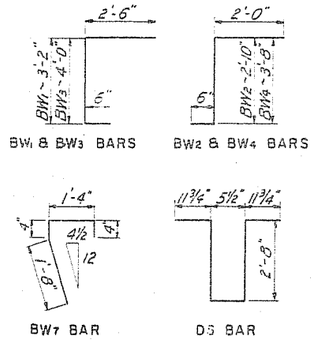
ELEVATION



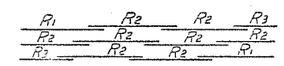
SLAB REINFORCMENT DETAIL

Bars shown are for a continuous pour ~ For multiple pour see Plan above.

SPLICING DETAILS - E, R_1, R_2 & R_3 BARS



BENT BAR DETAILS



RAIL STEEL ASSEMBLY

BAR LIST

MARK	NO.	SIZE	LENGTH	SHAPE
BW1	44	4	6'-2"	Bent
BW2	44	4	5'-4"	"
BW3	8	4	7'-0"	"
BW4	8	4	6'-2"	"
BW5	4	4	35'-4"	Str.
BW6	12	5	35'-4"	"
BW7	44	4	3'-8"	Bent
BW8	5	5	31'-8"	Str.
C	316	5	6'-9"	Bent
D5	216	4	7'-9"	Bent
E	48	5	34'-0"	Str.
P1	8	5	3'-2"	Bent
P2	4	5	3'-4"	"
P3	8	5	3'-8"	"
P4	3	5	3'-4"	"
P5	4	5	3'-8"	"
P6	8	5	4'-0"	"
P7	16	4	3'-6"	Str.
P8	8	4	1'-9"	"
P9	8	5	3'-9"	"
P10	96	5	4'-0"	Bent
P11	6	5	4'-6"	"
P12	68	5	4'-10"	"
P13	72	3	3'-8"	"
P14	64	3	2'-8"	"
R1	8	5	34'-4"	Str.
R2	32	5	32'-0"	"
R3	8	5	29'-8"	"
RC	236	3	2'-8"	Bent
S	516	5	31'-6"	Str.
T1	212	4	33'-9"	Str.
T2	40	4	17'-0"	"

NOTE:

The slab shall be poured in one of the following sequences.

1. *In one continuous pour, (See Special Provisions).*
2. *a. Slab Section ①, left to right.*
   b. Slab Section ②, right to left.
   c. Slab Section ③, right to left.

T_1 & T_2 Bars listed in bar list above are designed for a continuous pour method of placing concrete.

If the contractor elects the multiple pour method of placing concrete, he shall order reinforcing steel to fit the three panels as shown in the plan view, and shall provide 3'-9" splice bars at the construction joints at his expense.

Each curb shall be placed in one continuous operation.

Bevel all exposed edges with ¾" Triangular molding except as shown.

See Drawing # H-1600 for Railing & Slab Sections.
See Drawing # H-1602-1 for Structural Details.

Designed for 25 #/ft² F.W.S.

QUANTITIES	
Concrete Cl. AAE-1	5.69 Cu. Yd.
Concrete Cl. AE-1½	138.4 Cu. Yd.
Reinforcing Steel	31,479 Lbs.
Structural Steel	70,202 Lbs.

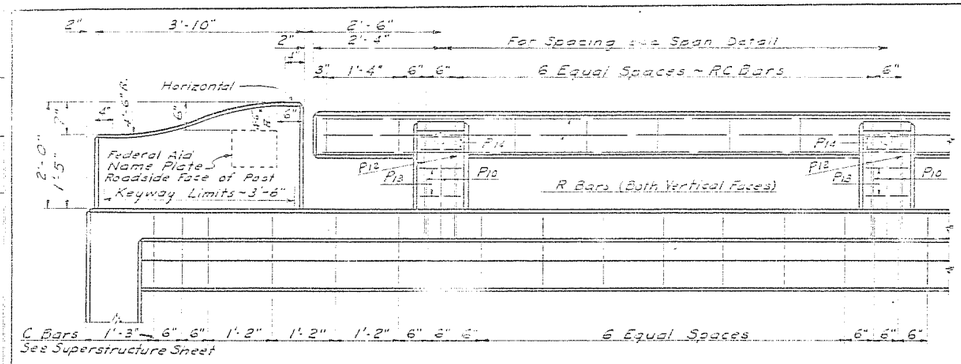
Quantities shown include four end posts.

SUPERSTRUCTURE
THREE SPAN
CONTINUOUS I-BEAM
OVERALL LENGTH 130FT.
H20 S16 LOADING

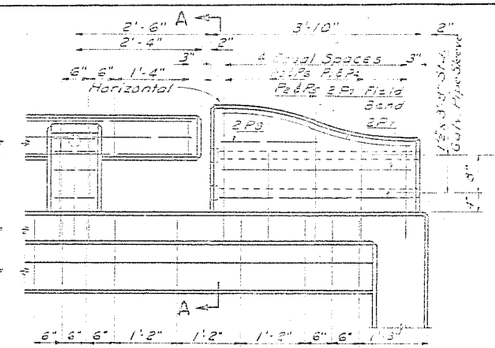
TRACING MADE BY / CHECKED BY
QUANTITIES MADE BY / CHECKED BY

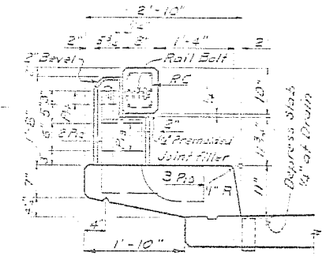
H-1602-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.				

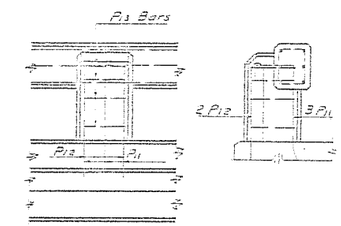


PART ELEVATION
Showing Dimensions & Reinforcing

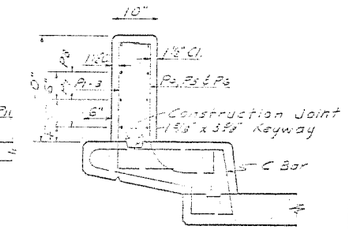




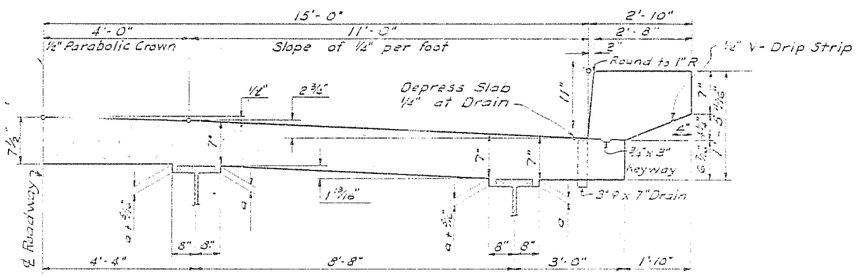
TYPICAL SECTION



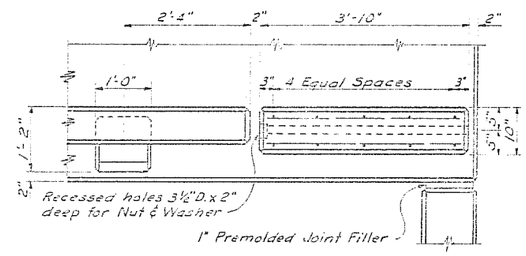
ANCHOR POST DETAIL
See Layout for Placement



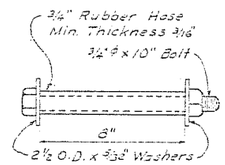
A-A



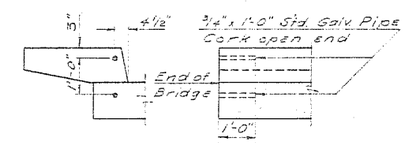
HALF SECTION OF SLAB
Showing Dimensions
For dimension "a" see Riser Diagram



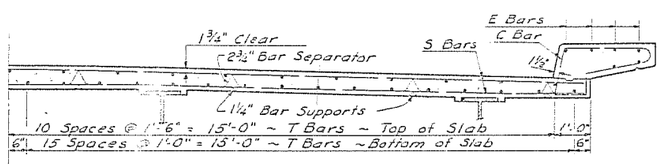
PART PLAN



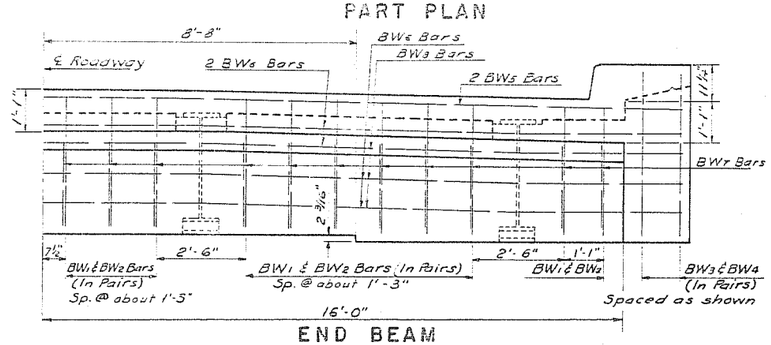
RAIL BOLT
(Galvanized)
To be included in the unit price bid for Class AE-1 1/2 Concrete



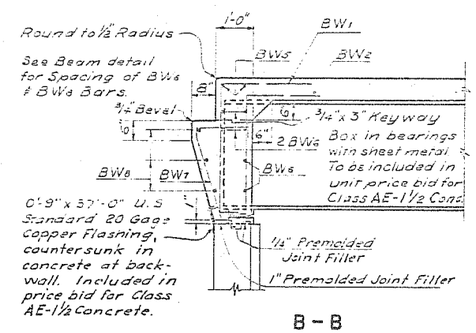
CURB SLEEVE DETAILS



HALF SECTION OF SLAB
Showing Reinforcement between Piers & Abutments



END BEAM



B-B

NOTE:

All concrete above top of curb shall be Class AE-1 except concrete end posts.

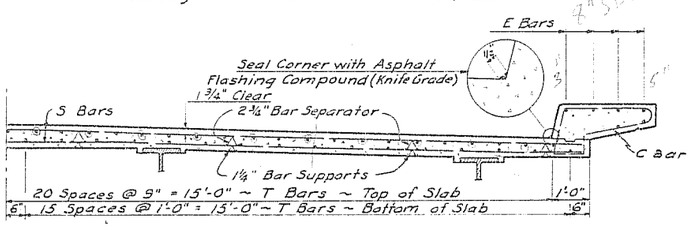
"Rubbed Surface Finish" will be required for the roadway faces of curbs, the outside vertical faces of curb and slab, and all faces of rails, intermediate and end posts. All other surfaces shall be given the "Ordinary Surface Finish".

Diaphragms and End Beams shall be poured and allowed to set at least 48 hours before the slab is poured.

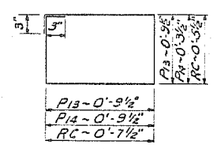
Legs of bar supports shall be galvanized.

See Superstructure sheets for Slab, Steel & Railing Details, and also for Quantities.

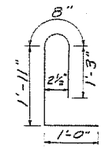
If special floor drains are required to replace the 3" ϕ pipe drains called for on the sheet and Superstructure sheet, see Layout sheet for special drain details.



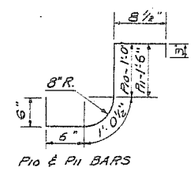
HALF SECTION OF SLAB
Showing Reinforcement over Piers



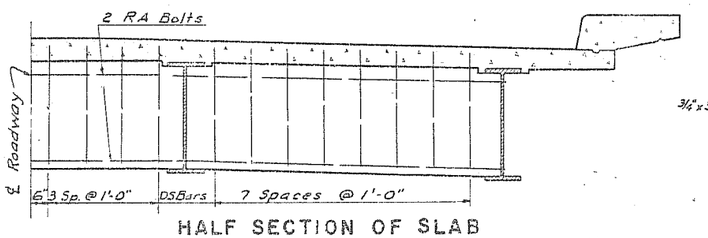
P13, P14 & RC BARS



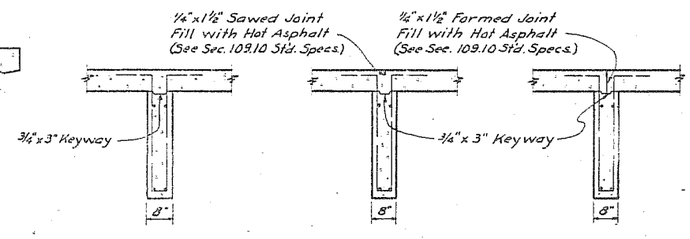
P12 BAR



P10 & P11 BARS



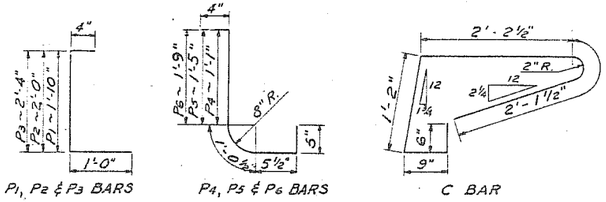
HALF SECTION OF SLAB
Showing Diaphragm



C-C
Continuous & Multiple Pours Over Piers

D-D
Multiple & Continuous Pours

E-E
Multiple Pours



P1, P2 & P3 BARS
P4, P5 & P6 BARS
C BAR

BENT BAR DETAILS

SUPERSTRUCTURE DETAILS FOR CONTINUOUS I-BEAMS

H 20 - S 16 Loading

H-1600

Railing and End Post Quantities are included in Slab Quantities.

H-1600