2-5-2016

94-070,364

DESIGN DATA				
Traffic	Average Daily: RP 59.485 to RP 61.476			
Current 2014	Pass: 3085	Trucks: 1270	Total: 4355	
Forecast 2034	Pass: 4600	Trucks: 2085	Total: 6685	
Traffic	Average Daily: RP 61.476 to RP 64.204			
Current 2014	Pass: 3000	Trucks: 1250	Total: 4250	
Forecast 2034	Pass: 4470	Trucks: 2050	Total: 6520	
Traffic	Average Daily			
Current 2014	Pass: 4345	Trucks: 1150	Total: 5495	
Forecast 2034	Pass: 6475	Trucks: 1890	Total: 8365	
Clear Zone Dist. Existing		Design Speed: 75		
Minimum Sight Dist. for Stopping: Existing		Bridges:		
Full Control of Access, No Point of Access Other Than at Interchange Ramps				
Pavement Design Life 20 (years)				
Design Accumulated One-way ESALs:				

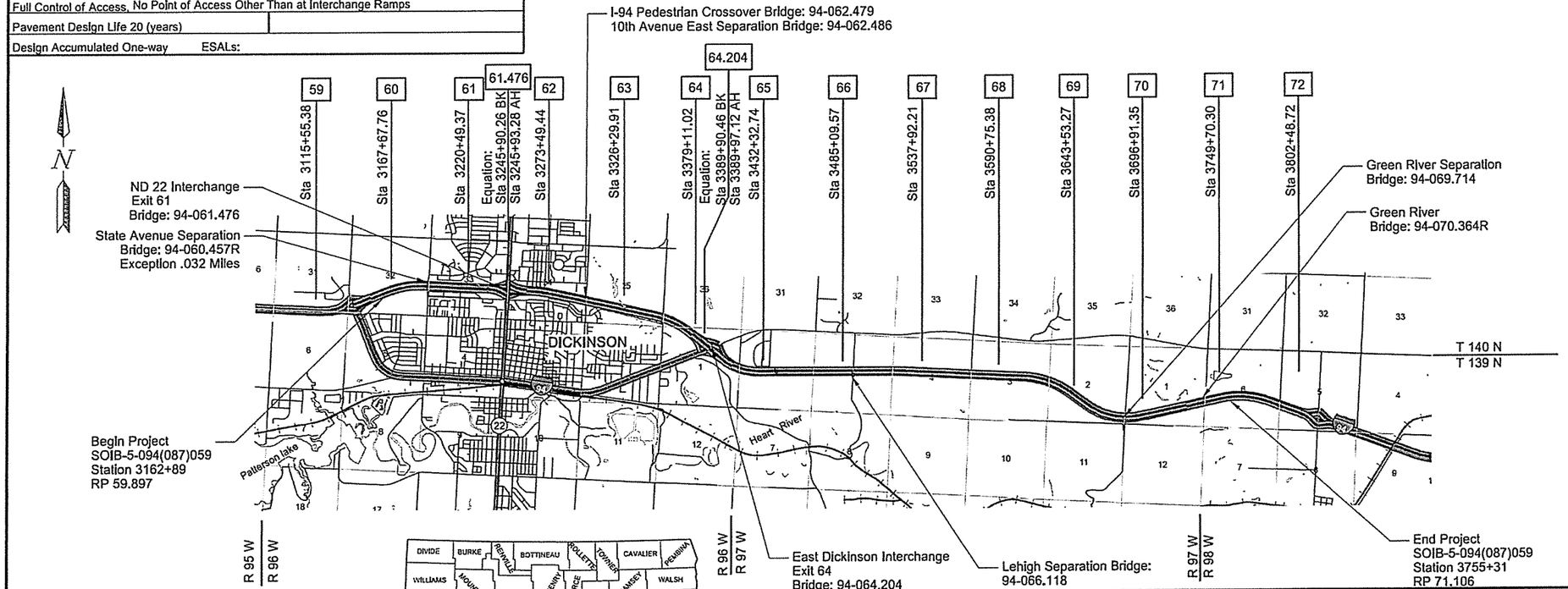
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SOIB-5-094(087)059	18921	1	1

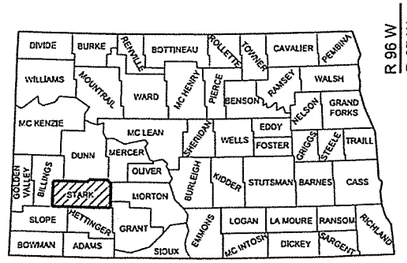
JOB # 6
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SOIB-5-094(087)059
Stark County
West Dickinson Interchange to
RP 71.1 - Eastbound
CPR, HMA Overlay, Microsurfacing,
Guardrail & Structure Improvements

GOVERNING SPECIFICATIONS:
2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SOIB-5-094(087)059	11.21	11.18





STATE COUNTY MAP

DESIGNERS

Conni Schafer

Hafiz Ibrahim

APPROVED DATE 12-2-15

Roger Welgel /s/
OFFICE OF PROJECT DEVELOPMENT
ND 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 12-2-15

James Douglas Rath /s/
NDDOT DESIGN DIVISION

This document was originally issued and sealed by James Douglas Rath Registration Number PE- 4288, on 12/2/15 and the original document is stored at the North Dakota Department of Transportation

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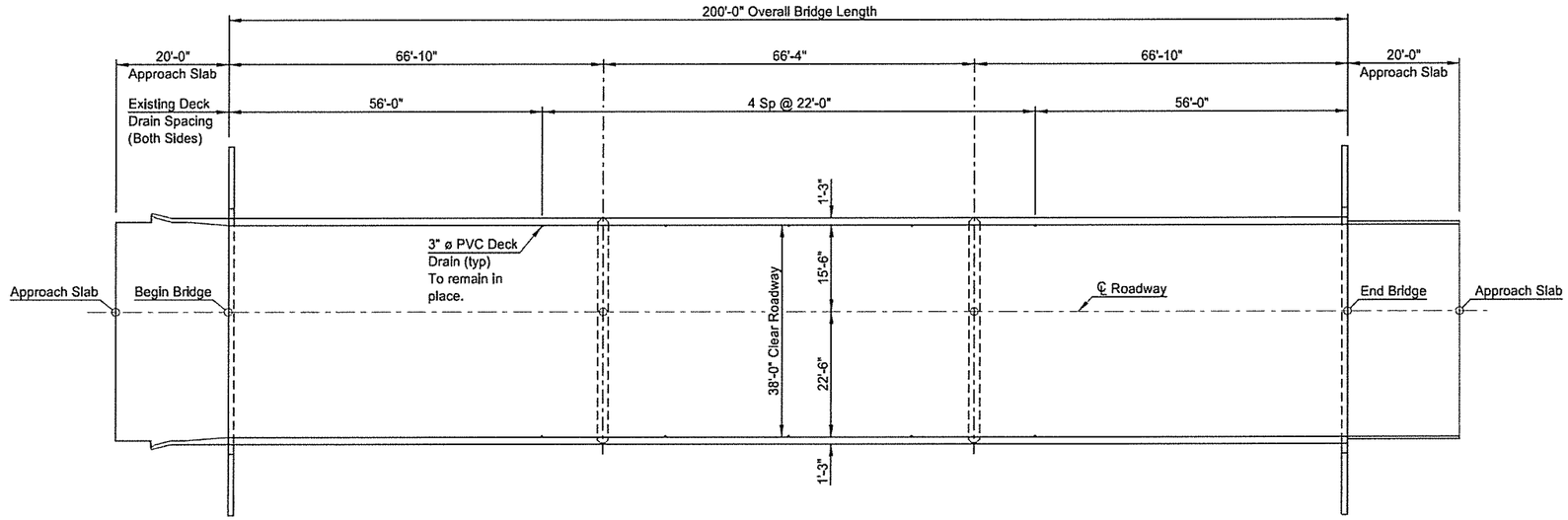
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-5-094(087)059	170	8

NOTE:

100 SCOPE OF WORK: Work at this site consists of placing a deck overlay and extending the existing deck drains.



PLAN

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	0130	CLASS AAE-3 CONCRETE	CY	1.5
650	0704	OVERLAY CONCRETE	CY	61
650	0720	CLASS 1 REMOVAL	SY	844
650	0721	CLASS 2 REMOVAL	SY	169
650	0722	CLASS 2-A REMOVAL	LF	304
650	0723	CLASS 3 REMOVAL	SY	42
650	0724	CLASS 4 REMOVAL	SY	8
930	9534	MODIFY DECK DRAIN	EA	10

This document was originally issued and sealed by Brian W. Raschke, Registration Number PE 4361, on 12/01/15 and the original document is stored at the North Dakota Department of Transportation

SPECIAL PROVISIONS	
SP 4(14)	MIGRATORY BIRD TREATY ACT

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

GREEN RIVER
EASTBOUND BRIDGE
BRIDGE LAYOUT

PROJECT: SOIB-5-094(087)059

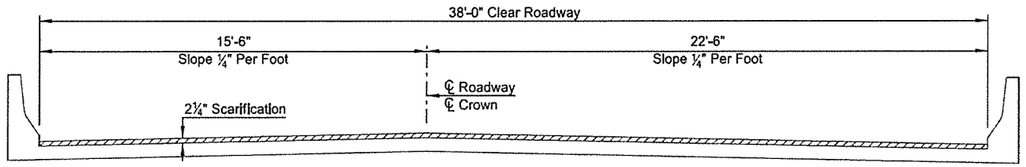
STARK COUNTY

12/01/15 (DATE) Terrence R. Udland (BRIDGE ENGINEER)

12/1/2015 8:14:07 AM braschke R:\project\50094059.087\bridge\94-070.364R\170BR_008_BRLO.dgn 15EJ031 BWR

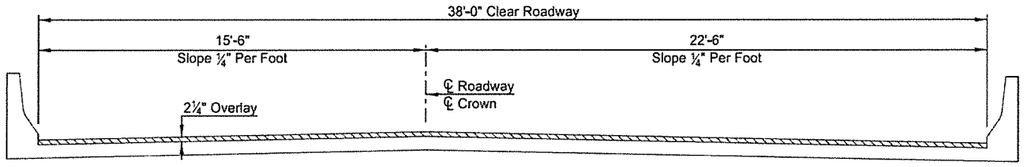
94-070.364R-1

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	SOIB-5-094(087)059	170	9



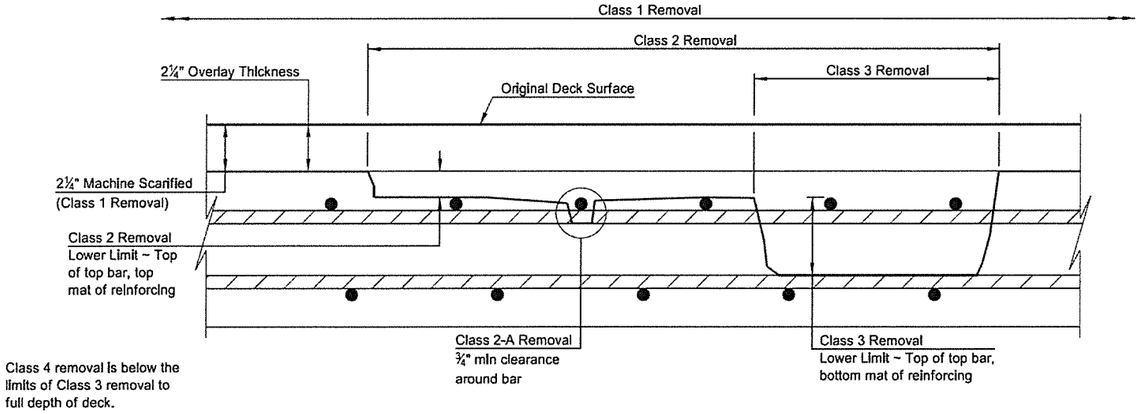
(SHOWING REMOVAL)

TYPICAL DECK SECTION



(SHOWING OVERLAY)

TYPICAL DECK SECTION



Class 4 removal is below the limits of Class 3 removal to full depth of deck.

(OVERLAY CLASSIFICATIONS)

BRIDGE DECK SECTION

NOTES:

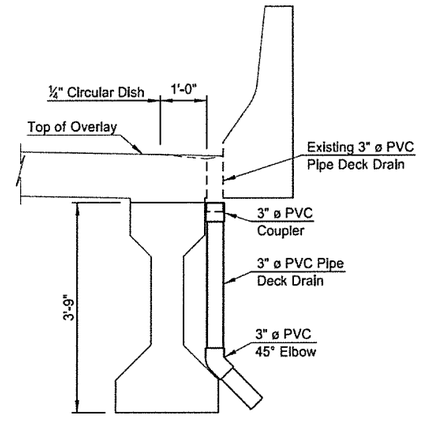
602 CONCRETE: Provide aggregate for concrete that meets the requirements of Section 802.01 C.2, "Coarse Aggregate" and Section 802.01 C.3, "Fine Aggregate."

650 OVERLAY CONCRETE: Use size 5 coarse aggregate composed of crushed stone. Use crushed stone that has at least one fractured face on 75 percent of the particles retained on the number 4 sieve.

Placement of overlay concrete after September 15 requires authorization by the Bridge Engineer.

650 CLASS 1 REMOVAL: Class 1 removal consists of removing a previous overlay to a depth of 2¼".

650 CLASS 2-A REMOVAL: Class 2-A removal is paid for the top bar in the top mat of reinforcing only. If a bar that is identified for 2-A is in an area that becomes Class 3 or Class 4, it will not be paid for as 2-A removal.



DECK DRAIN DETAIL

QUANTITIES	
CLASS AAE-3 CONCRETE	1.5 CY
OVERLAY CONCRETE	61 CY
CLASS 1 REMOVAL	844 SY
CLASS 2 REMOVAL	169 SY
CLASS 2-A REMOVAL	304 LF
CLASS 3 REMOVAL	42 SY
CLASS 4 REMOVAL	8 SY

This document was originally issued and sealed by Brian W. Raschke, Registration Number PE 4361, on 12/29/15 and the original document is stored at the North Dakota Department of Transportation

GREEN RIVER

EASTBOUND BRIDGE

DECK OVERLAY DETAILS

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2011	Pass: 5,185	Trucks: 1,530	Total: 6,715	675
Forecast 2031	Pass: 7,730	Trucks: 2,280	Total: 10,010	1,005
Clear Zone Dist. 34 LF		Design Speed: 75 MPH		
Minimum Sight Dist. for Stopping: 820 LF		Bridges: ___		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life 30 (years)				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	IM-S-BRI-5-094(027)065	13471	1	1

JOB# 6
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

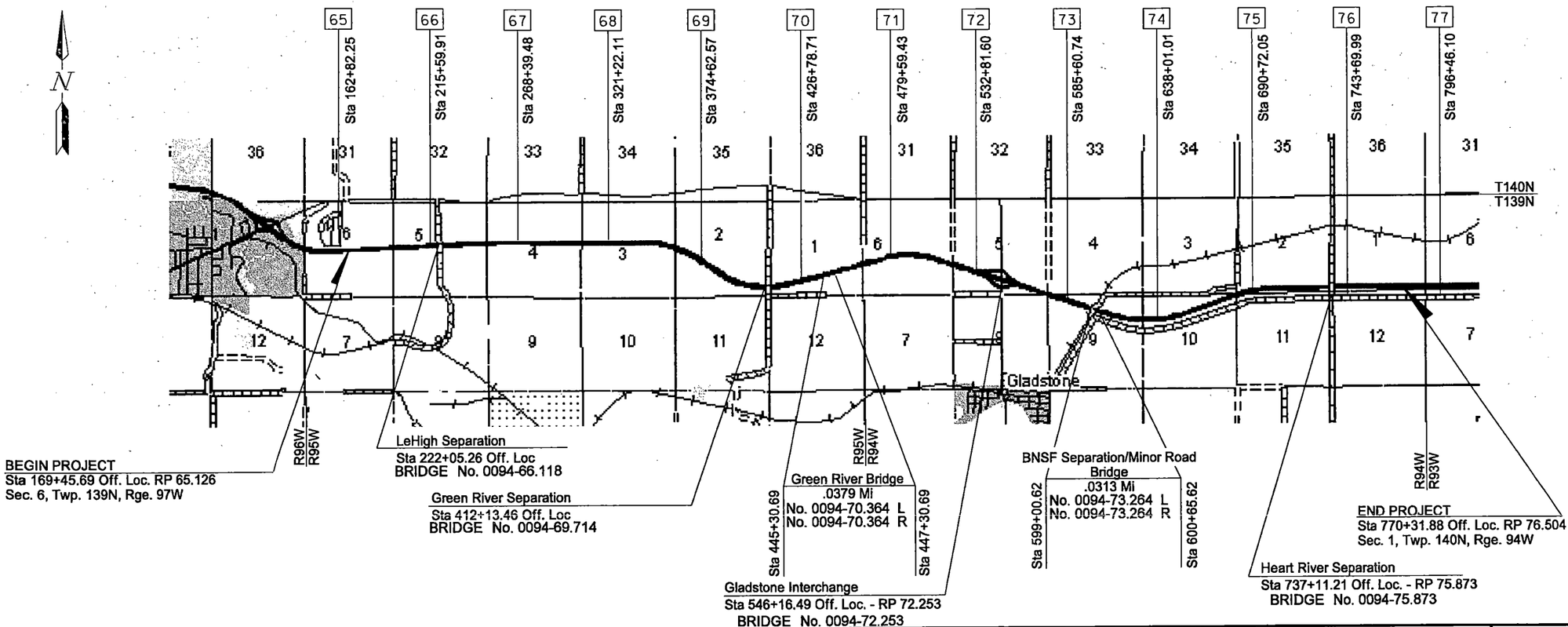
IM-S-BRI-5-094(027)065
FHWA Full Involvement

Stark County
East Dickinson to East of Heart River Separation

Regrading, PCC Pavement Reconstruction, and Incidentals
Westbound Roadway

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-S-BRI-5-094(027)065	11.311 Mi	11.380 Mi
	.069 Mi deducted for bridges	



DESIGNERS

Scott Woodham /s/

Douglas Schumaker /s/

DISTRICT REVIEW

Lawrence Gangl /s/
DICKINSON DISTRICT

APPROVED DATE 9/1/11

Roger Weigel /s/
for OFFICE OF PROJECT DEVELOPMENT
ND 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.

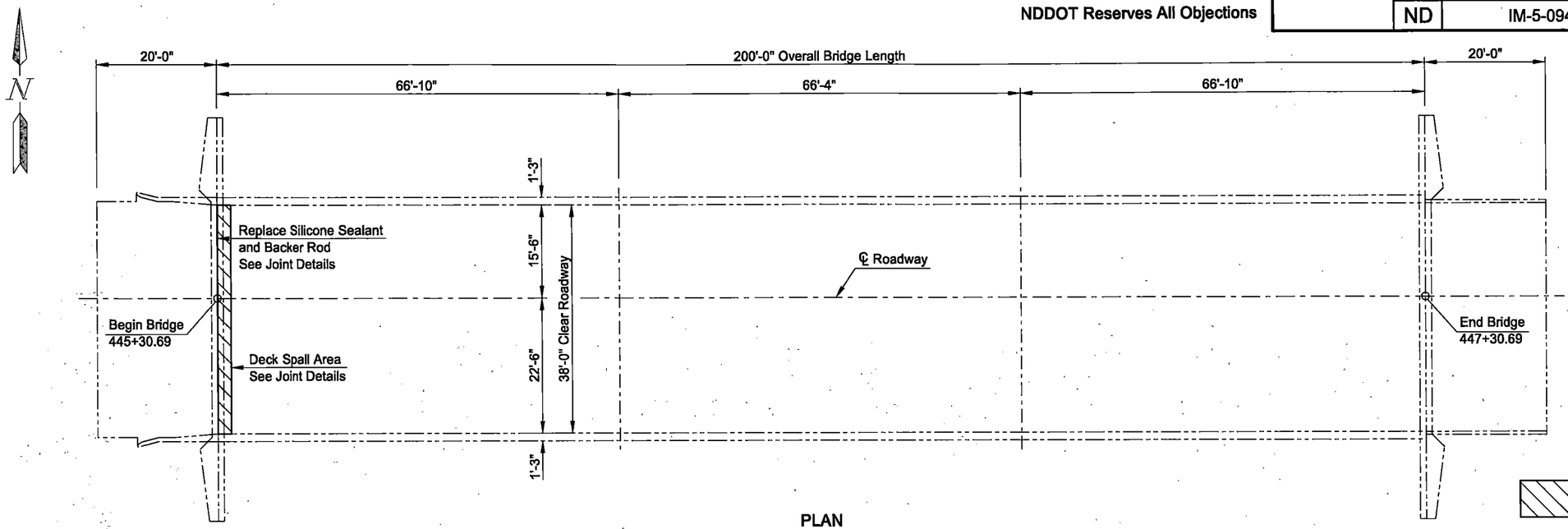
APPROVED DATE 9/1/11

Roger Weigel /s/
DESIGN DIVISION

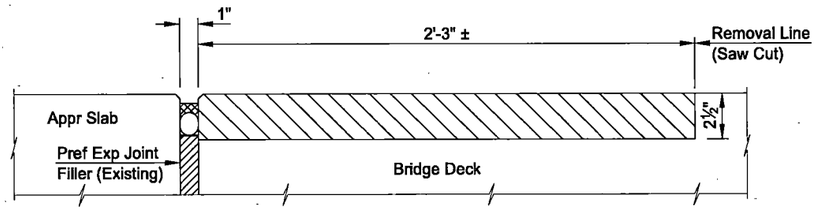
This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 9/1/11 and the original document is stored at the North Dakota Department of Transportation

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

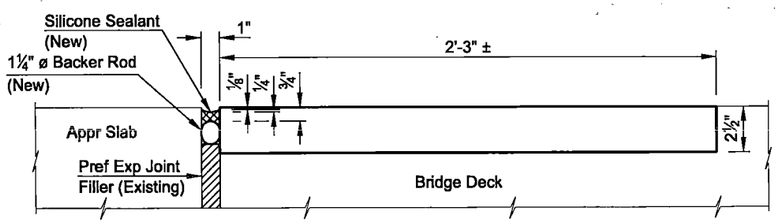
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-5-094(027)065	170	18



PLAN



(SHOWING CONRETE REMOVAL)
EXISTING JOINT DETAIL



(SHOWING OVERLAY CONRETE)
NEW JOINT DETAIL

NOTES:

100 SCOPE OF WORK: Work at this site consists of a deck spall repair at the west end of the bridge. This work shall be completed prior to switching traffic onto the eastbound roadway.

930 SILICONE SEALANT: The silicone sealant and backer rod shall be replaced in the joint between the approach slab and deck at the west end of the bridge. After placing the new concrete, the joint shall be cleaned of all foreign material and sandblasted before the new backer rod and silicone sealant are installed. A low modulus (Type 5) silicone sealant shall be used. The backer rod diameter may need to be larger if the existing joint is greater than the 1" as shown. The new silicone sealant and backer rod shall extend 6" up the face of the curb. All materials, labor and equipment required to remove and replace the backer rod and silicone sealant shall be included in the bid item "Silicone Sealant."

930 DECK SPALL REPAIR: The bridge deck has a spall repair as shown at the west end of the bridge. The deck spall repair shall be constructed as a Bridge Deck Overlay meeting Section 650 of the NDDOT Standard Specifications with the exception that a mobile mixer will not be required. The Contractor shall remove all unsound concrete to a minimum depth of 2½". The exact limits of removal shall be determined by the Engineer in the field. The perimeter of the repair area shall be saw cut to a depth of 1". All labor, equipment, and materials required for the completion of this work shall be included in the price bid for "Deck Spall Repair."

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
930	8644	SILICONE SEALANT	LF	39
930	9610	DECK SPALL REPAIR	SF	85.5

This document was originally issued and sealed by Jason R. Thorenson, Registration Number PE 5048, on 08/22/11 and the original document is stored at the North Dakota Department of Transportation

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
GREEN RIVER
EASTBOUND BRIDGE

BRIDGE LAYOUT

PROJECT: IM-5-094(027)065
STATION: 446+30.69
STARK COUNTY

08/25/11 (DATE) — Terrence R. Udland (BRIDGE ENGINEER)

94-070.364 R

JOB# 25

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-SNH-5-999(005)	16371	1	1

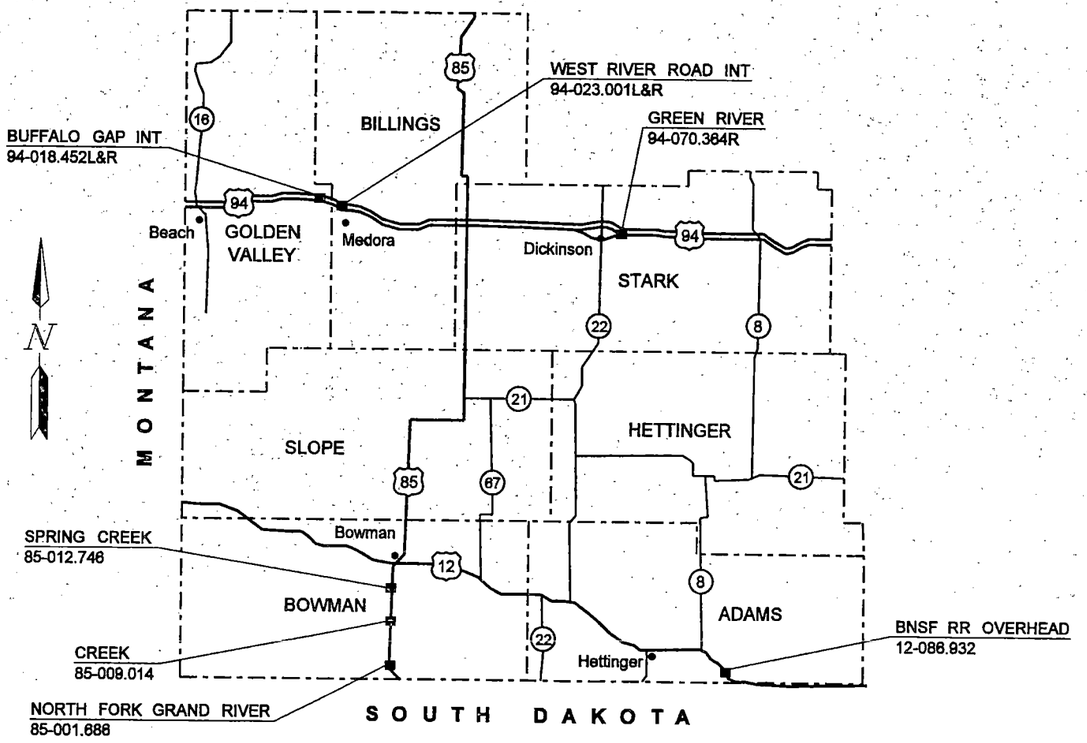
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

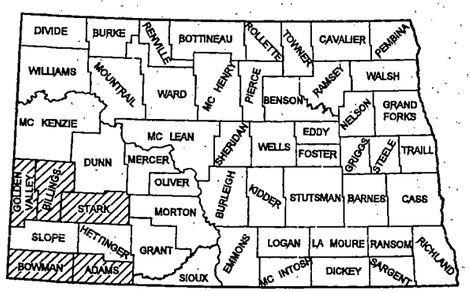
SIM-SNH-5-999(005)

ADAMS, BOWMAN, GOLDEN VALLEY, BILLINGS AND STARK COUNTIES

BRIDGE MAINTENANCE INCLUDING DECK SPALL REPAIR, RESEALING DECK JOINTS AND MUD JACKING

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.





STATE COUNTY MAP

DESIGNERS

Brian Raschke

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.

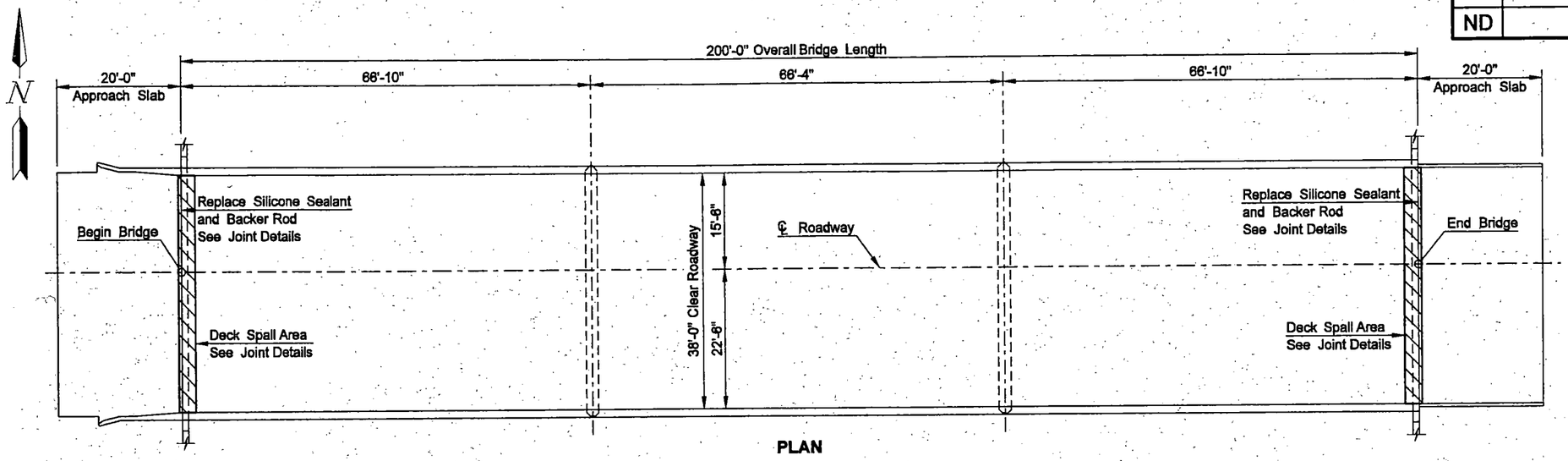
APPROVED DATE 02/13/08

Terrence R. Udland
BRIDGE ENGINEER

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE- 2674 , on 02/13/08 and the original document is stored at the North Dakota Department of Transportation

2/13/2008 3:58:18 PM R:\project\50999000.005\bridge\001TS_001_TITLE.dgn

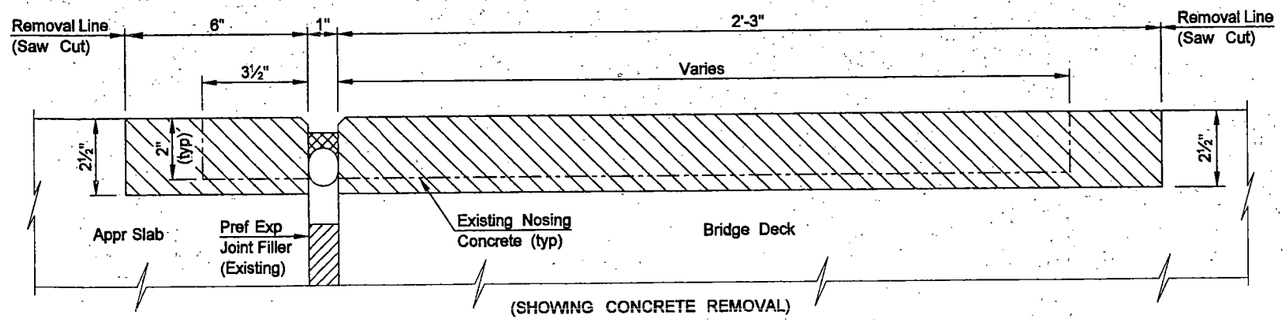
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIM-5-999(005)	170	8



PLAN

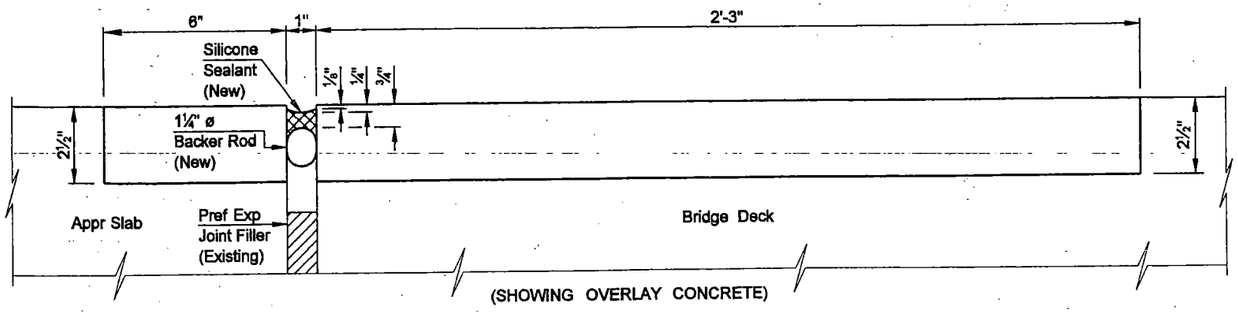
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
930	8644	SILICONE SEALANT	LF	78
930	9610	DECK SPALL REPAIR	SF	209

Indicates Concrete to be Removed



(SHOWING CONCRETE REMOVAL)

EXISTING JOINT DETAIL



(SHOWING OVERLAY CONCRETE)

NEW JOINT DETAIL

NOTES:

100 SCOPE OF WORK: Work at this site (I94, RP 70.364) consists of repairing concrete spall areas on the bridge deck and approach slab surfaces and resealing the joints between the bridge and approach slabs.

930 SILICONE SEALANT: The silicone sealant and backer rod shall be replaced in the joints between the approach slabs and deck at both ends of the bridge. After placing the new concrete, the joint shall be cleaned of all foreign material and sandblasted before the new backer rod and silicone sealant are installed. A low modulus (Type 5) silicone sealant shall be used. The backer rod diameter may need to be larger if the existing joint is greater than the 1" as shown. The new silicone sealant and backer rod shall extend 6" up the face of the curb. All materials, labor and equipment required to remove and replace the backer rod and silicone sealant shall be included in the bid item "Silicone Sealant."

930 DECK SPALL REPAIR: The bridge deck and approach slabs have spall areas as shown at both ends of the bridge. The deck spall repair shall be constructed as a Bridge Deck Overlay meeting Section 650 of the NDDOT Standard Specifications with the exception that a mobile mixer will not be required. The depth of removal shall be 2½". The perimeter of the repair area shall be saw cut to a depth of 1". The saw cutting and all material, labor and equipment required to remove the concrete and repair the deck spall areas shall be included in the bid item "Deck Spall Repair."

This document was originally issued and sealed by Brian W Raschke, Registration Number PE 4361, on 02/13/08 and the original document is stored at the North Dakota Department of Transportation

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
GREEN RIVER
EASTBOUND BRIDGE

BRIDGE LAYOUT

PROJECT: SIM-5-999(005)

STARK COUNTY

02/13/08 — DATE
Terrence R. Udland — BRIDGE ENGINEER

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 1998	Pass: 1360-2020	Trucks 460-530	Total 1820-2550	230-320
Forecast 2019	Pass: 1820-2900	Trucks 780-900	Total 2600-3800	325-480
Minimum Sight Dist. for:		Design Speed		
Stopping 625 FT		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 12

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-5-094(018)059	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

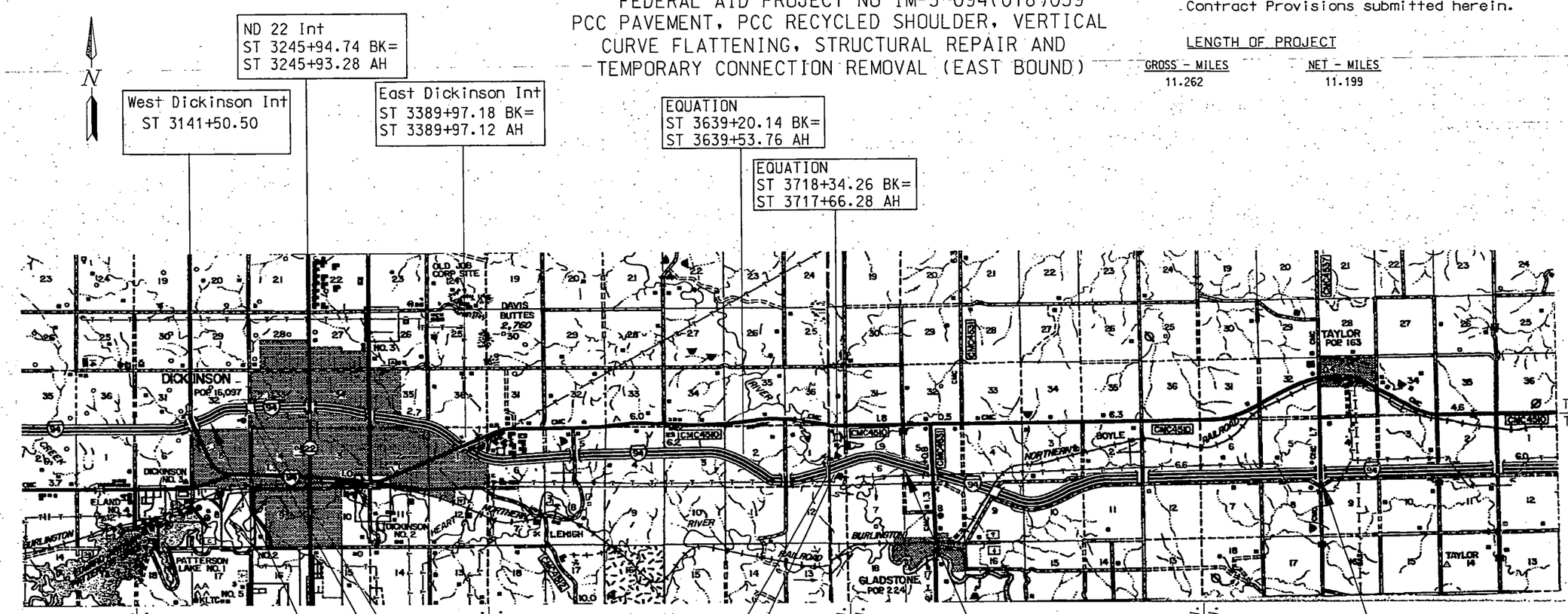
IN STARK COUNTY
FEDERAL AID PROJECT NO IM-5-094(018)059
PCC PAVEMENT, PCC RECYCLED SHOULDER, VERTICAL CURVE FLATTENING, STRUCTURAL REPAIR AND TEMPORARY CONNECTION REMOVAL (EAST BOUND)

GOVERNING SPECIFICATIONS:

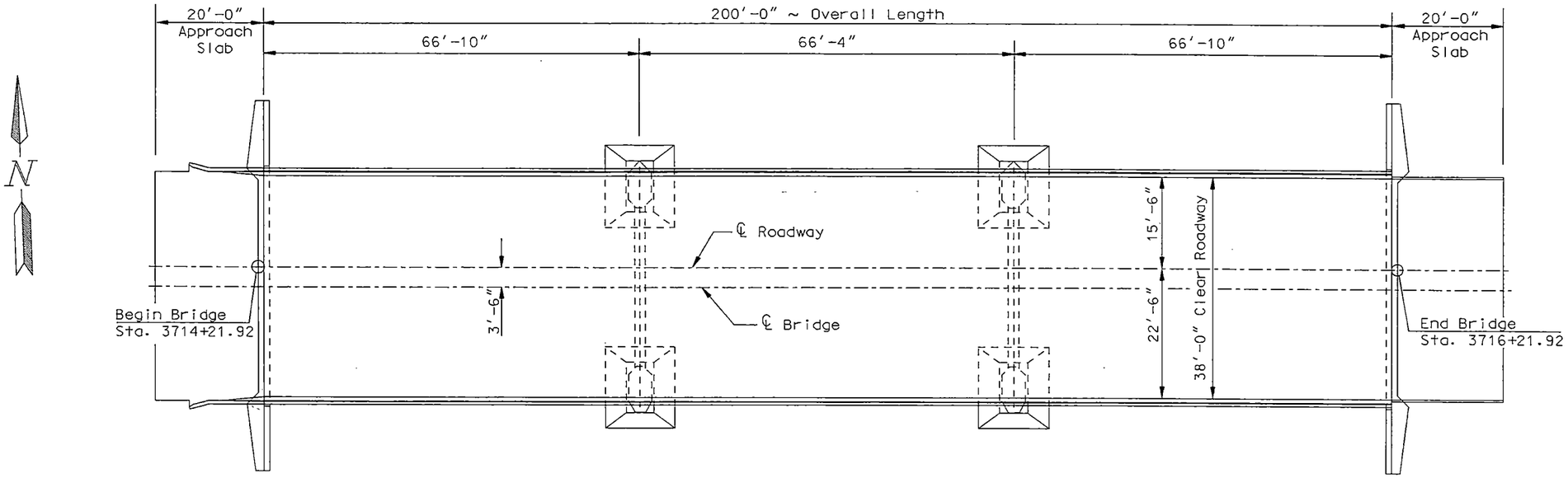
Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

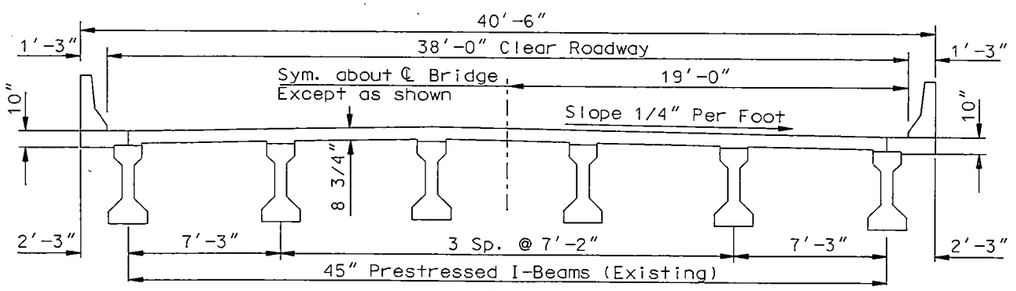
GROSS - MILES	NET - MILES
11.262	11.199



BRIDGE CODE	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
X-081	8	ND	IM-5-094(018)059	2//



PLAN



TYPICAL DECK SECTION

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0118	REMOVAL OF CONCRETE - SITE 4	L SUM	1
550	0217	BRIDGE APPROACH SLAB - REMOVE & REPLACE	SY	175.3
602	0130	CLASS AAE-3 CONCRETE	CY	58.4
602	1250	PENETRATING WATER REPELLENT TR.	SY	44
612	0115	REINFORCING STEEL GRADE 60	LBS	8224
612	0116	REINFORCING STEEL GRADE 60 EPOXY	LBS	3203
930	8642	NOSING CONCRETE	CF	17.7
930	8644	SILICONE SEALANT	LF	76.0
930	9612	SPALL REPAIR	SF	100

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

GREEN RIVER
EAST BOUND BRIDGE
BRIDGE LAYOUT

PROJECT: IM-5-094(018)059
STATION 3715 + 21.92

STARK COUNTY

9-10-99 — Terrence R. Udland
DATE — BRIDGE ENGINEER

GRIVER4 99WAB BWR

SITE 4 94-070.364R

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IM-5-094(018)059	2/2

NOTES - GREEN RIVER BRIDGE

100 SCOPE OF WORK: Work at this site consists of removing the existing bridge railing and replacing it with Jersey barriers on both sides of the bridge, increasing the clear roadway width from 37'-0 to 38'-0". Also, work at this site consists of removing and replacing the approach slabs at each end of the bridge and repairing spall areas on the east abutment.

100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, tie wire, bar spacers, bar supports, and other miscellaneous items shall be included in the price bid for Class AE-3 and AAE-3 concrete.

202 REMOVAL OF CONCRETE: The contractor shall remove the concrete in a manner that prevents any damage to the remaining structure. All concrete removed shall become the property of the contractor and shall be disposed of properly off of the right of way. The work needed for the superstructure removal shall be included in the lump sum bid item "Removal of Concrete - Site 4." There are approximately 65 cubic yards of concrete to be removed. There is a double box beam rail retrofit mounted on the existing concrete curbs and railings. The rail retrofit shall be removed and disposed of properly off of the right of way. The work needed to remove the rail retrofit shall be included in the lump sum bid item "Removal of Concrete - Site 4."

210 SELECT BACKFILL: Select backfill shall meet the requirements of Section 816.03, Class 3. The backfill shall be placed in layers of not more than 6 inches, moistened or dried as required, and thoroughly compacted with mechanical tamping equipment.

550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. A mechanical or hand-held transverse metal tine finish shall be applied. Tining shall start 6" from the beginning and end of the approach slabs. A surface tolerance of 3/16" in 10 feet is also required.

602 SURFACE FINISH "D": Surface Finish "D" shall be required for the inside and top surfaces of the barrier.

602 PENETRATING WATER REPELLENT TREATMENT: Penetrating water repellent shall be applied to the driving surface of the new concrete deck.

602 BARRIERS: Barriers shall be constructed according to the provisions of Section 602.03 B.4 except that there shall be no expansion or deflection joints. Make 3/4" V-grooves in all faces of the barriers at each pier and at equal spaces between substructures at approximately 10-foot spacing.

DESIGN STRENGTH:

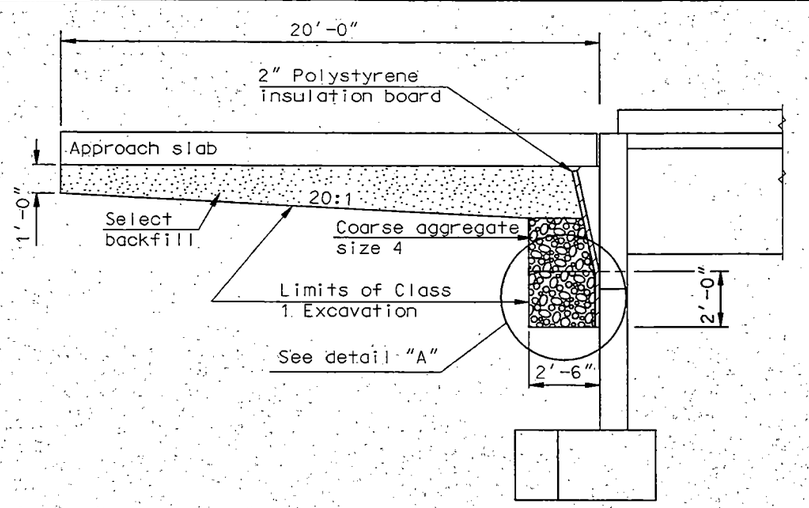
F'C	3,000 PSI	Cl. AE-3 Concrete
F'C	4,000 PSI	Cl. AAE-3 Concrete
FY	60,000 PSI	GR. 60 Reinforcing Steel

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 Specialities 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 recommendations. All labor and materials required to install the nosing concrete shall be included in the bid item "Nosing Concrete."

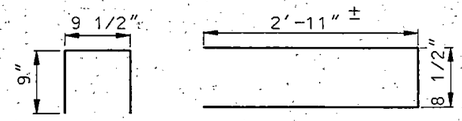
930 SILICONE SEALANT: The silicone sealant shall be a rapid cure, self-leveling, cold-applied two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The silicone sealant and the nosing 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 the 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.

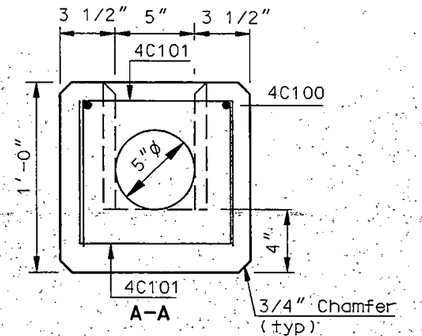
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	213

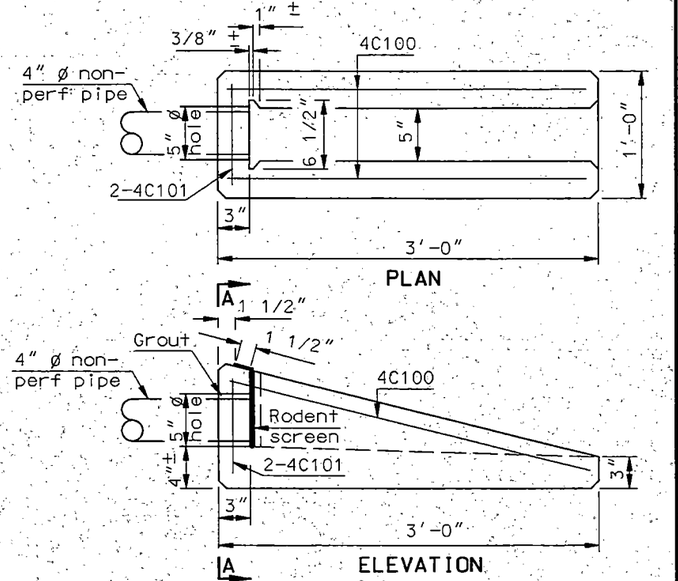


DETAIL AT ℄ ABUTMENT

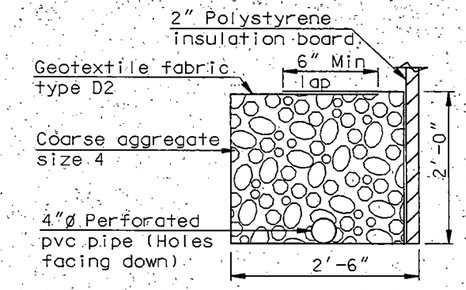


BENT BAR DETAILS

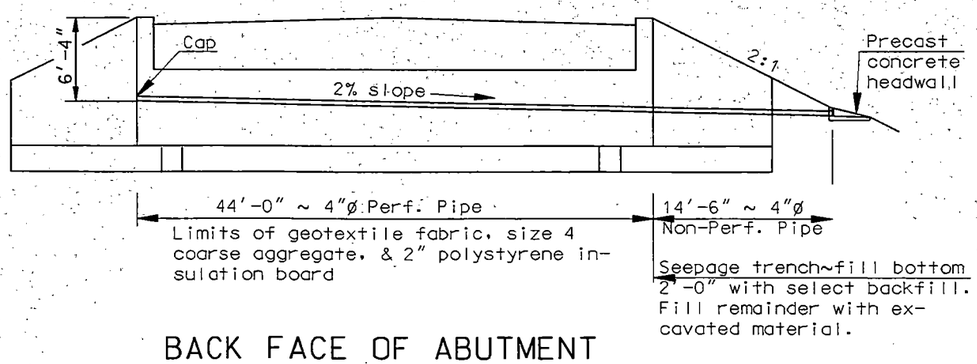




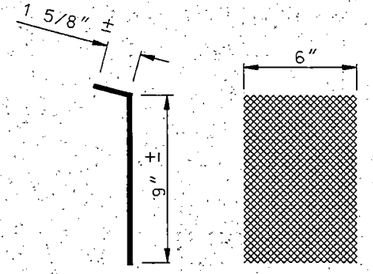
PRECAST CONCRETE HEADWALL DETAILS



DETAIL "A"



BACK FACE OF ABUTMENT



SIDE VIEW FRONT VIEW
RODENT SCREEN DETAILS

NOTE:
The dimensions for the rodent screen are approximate to allow for bending and a snug fit into the slot in the backwall.

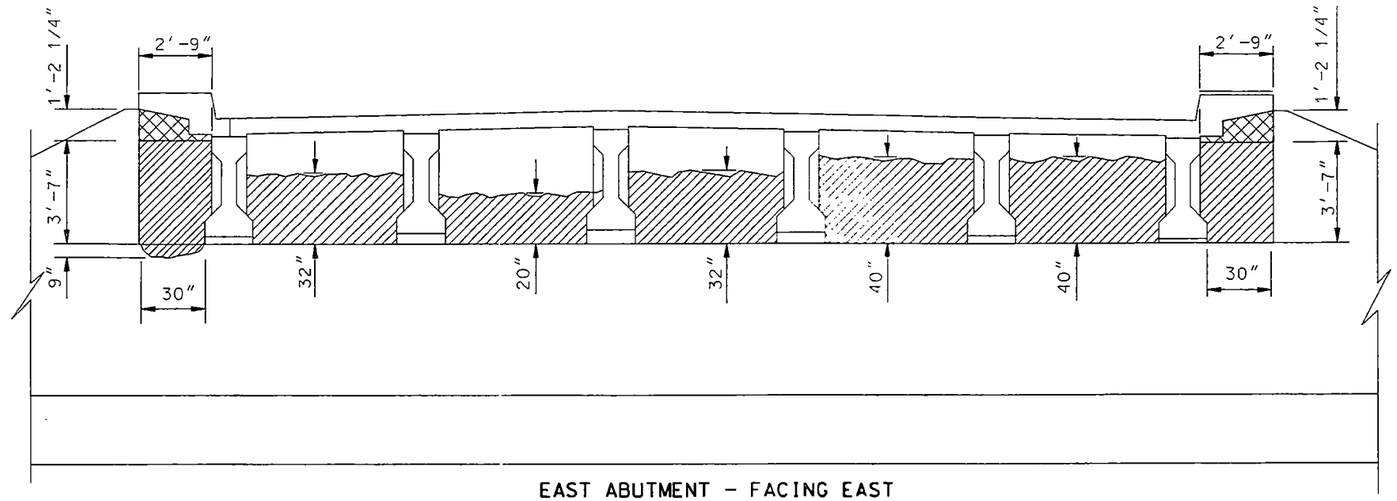
The rodent screen shall be fabricated from flattened, expanded metal with screen opening of approximately 0.25 square inches. The screen shall be 16 ga. metal and be hot dip galvanized after fabrication.

The Size 4 Coarse Aggregate, Select Backfill, Geotextile Fabric (Type D2), the 2" Polystyrene Insulation Board, the 4" Perforated PVC Pipe, the 4" Non-Perforated PVC Pipe, the Precast Concrete Headwall, the Rodent Screen, Class 1 Excavation, Foundation Preparation, equipment and labor required to place the Abutment Underdrain shall be included in the pay item "Bridge Approach Slab - Remove & Replace".

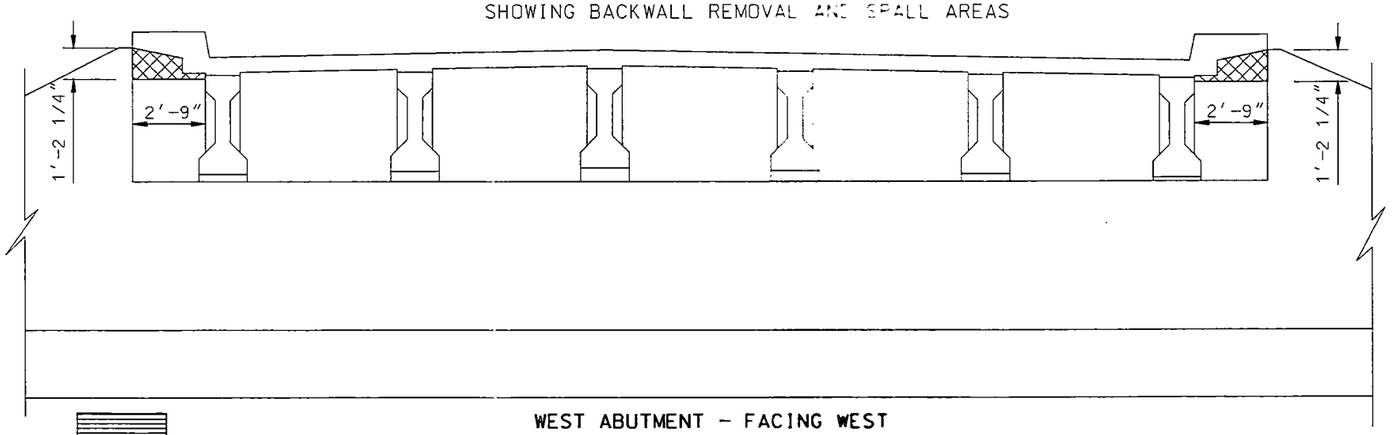
GREEN RIVER
EAST BOUND BRIDGE

EXCAVATION & BACKFILL
AT ABUTMENT

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	214

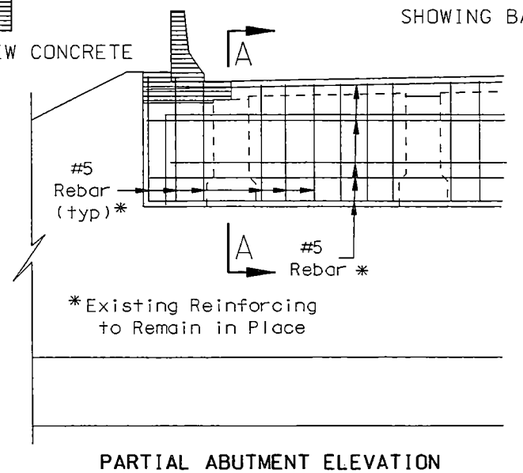


EAST ABUTMENT – FACING EAST
SHOWING BACKWALL REMOVAL AND SPALL AREAS

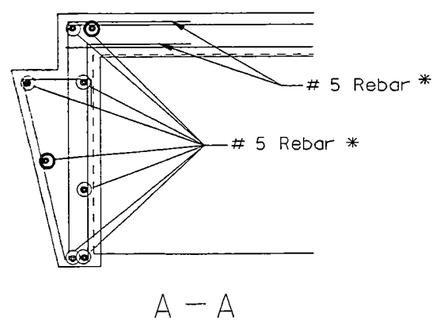


WEST ABUTMENT – FACING WEST
SHOWING BACKWALL REMOVAL

INDICATES NEW CONCRETE



PARTIAL ABUTMENT ELEVATION
SHOWING EXISTING REBAR & NEW CONCRETE



A – A

NOTES:

SPALL REPAIR: The endwall of the east abutment has extensive spalling as shown in the elevation view. The contractor shall remove all unsound concrete and replace it with new concrete.

Any unsound concrete removal by jack hammer will be done by a hammer with a maximum size of 30 pounds. A 15 pound maximum size chipping hammer shall be used on any unsound concrete inside the reinforcing steel. The edges of the repaired area shall be sharp neat lines at least 1 inch deep. These neat lines shall be produced by saw cutting or other means approved by the engineer.

After all unsound concrete is removed, the existing surface shall be cleaned by light sand-blasting or high pressure water blasting. After the surface has dried and just before the patch material is placed, the surface shall be coated with an epoxy bonding agent.

The patch material shall be AE-5 concrete or another concrete material that is specifically intended for patching concrete. This material may be SIKATOP 122 Repair Mortar, Tammsteck Duralop Gel, Structurite 200, or an approved equal.

It is important to minimize the shrinkage in the patch material. Therefore, the contractor shall take steps, including proper curing, to minimize shrinkage.

The square feet of spall repair is estimated on the assumption that the areas to be repaired are to the dimensions shown on the elevation views. The actual limits of the repair shall be determined by the engineer in the field. It is also assumed that the repair is two to six inches deep.

The labor, equipment, and materials needed to do this work shall be included in the bid item "SPALL REPAIR".

INDICATES SPALL AREAS

Cross-hatched areas indicate concrete to be removed. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place.

QUANTITIES	
SPALL REPAIR	100 SF

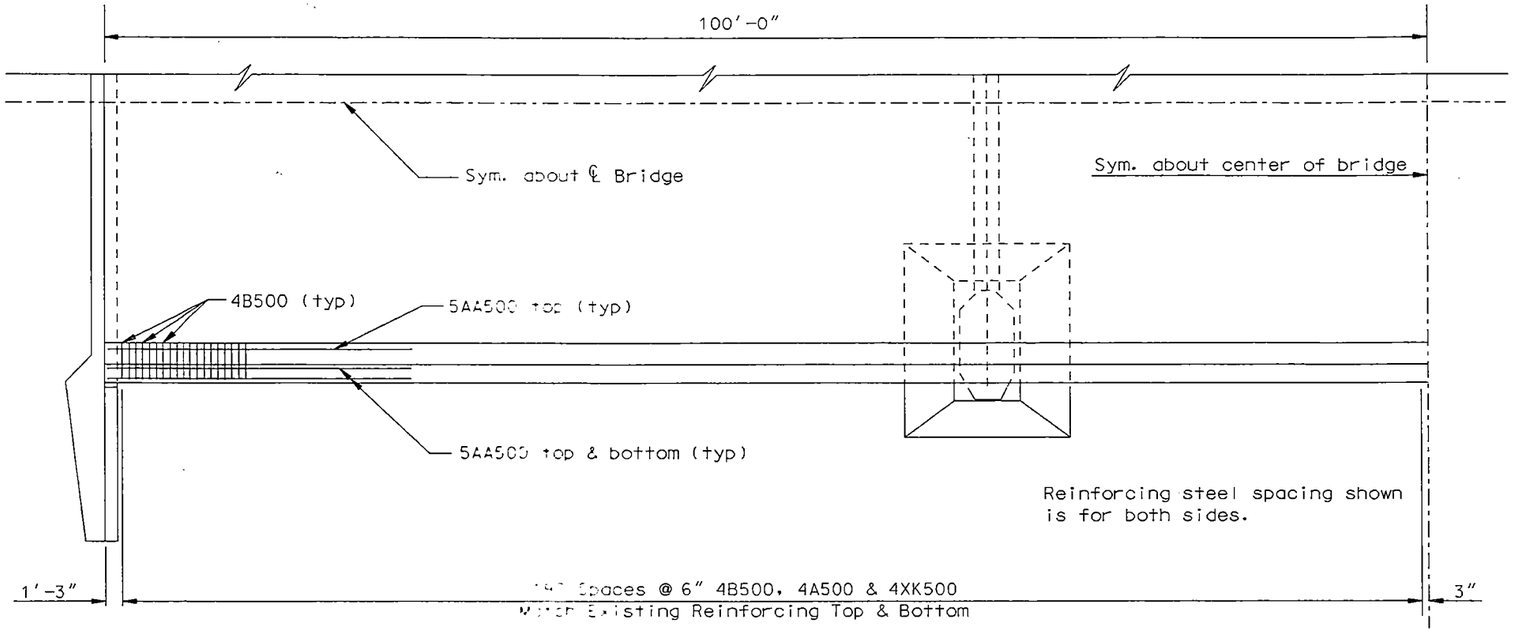
GREEN RIVER
EAST BOUND BRIDGE

BACKWALL REMOVAL & SPALL REPAIR DETAILS

GRIVER3 WAB BWR

94-070.364R-3

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	215

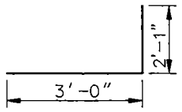


QUARTER PLAN

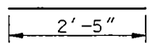
BAR LIST				
	SIZE	MARK	NO.	LENGTH
REGULAR	4	A500	792	2'-5"
	4	B500	792	5'-1"
	5	AA500	10	204'-8"
	5	AA501	10	203'-5"
EPOXY	4	XK500	792	5'-3"
	5	XAA500	2	204'-2"

NOTES:

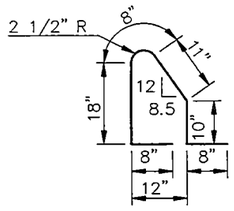
1. Fabrication and tolerances shall be in accordance with the CRSI Manual Of Standard Practice.
2. All dimensions are out to out of bars.
3. Nominal length of each bent bar or cut bar is the sum total of the detailing dimensions for that bar, unless otherwise noted.
4. Adjacent "AA" bars shall be turned end for end so that the splice locations are staggered.
5. An "X" preceeding a bar designation indicates an epoxy coated bar.



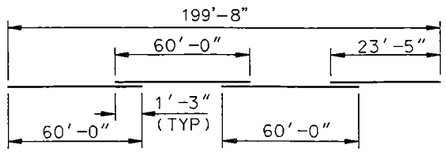
B500



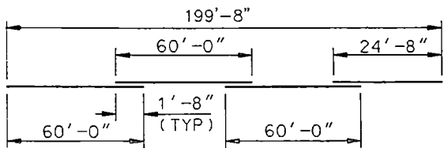
A500



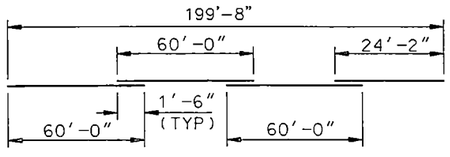
XK500



AA501



AA500



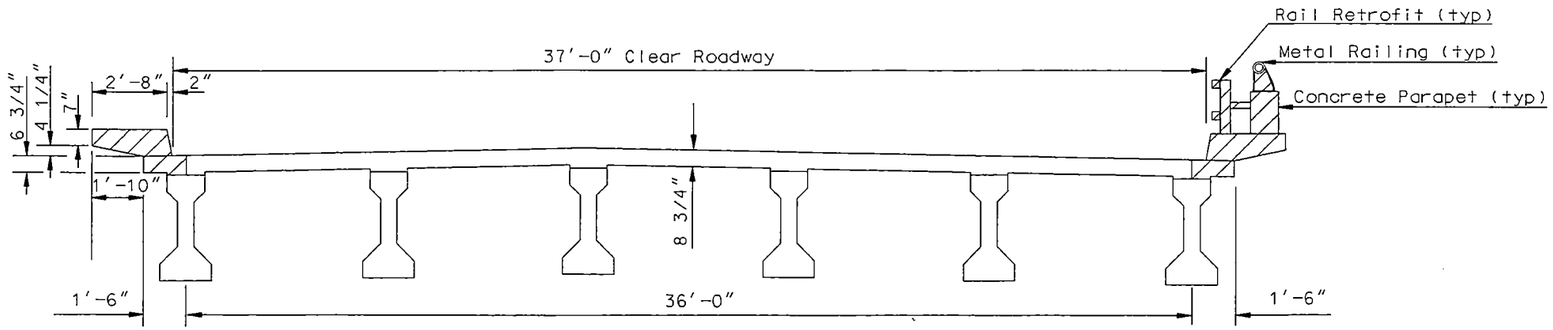
XAA500

BENT BAR DETAILS

GREEN RIVER
EAST BOUND BRIDGE

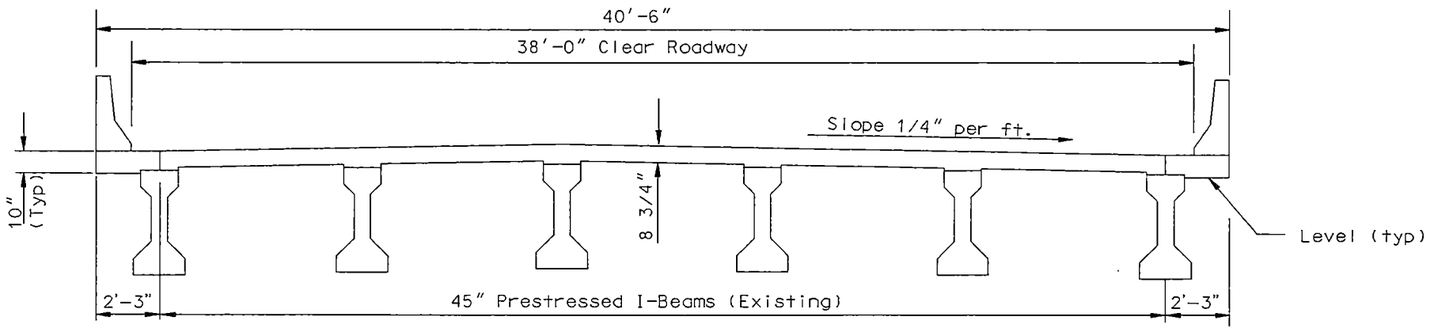
QUARTER SLAB LAYOUT
& BAR LIST

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	2/6



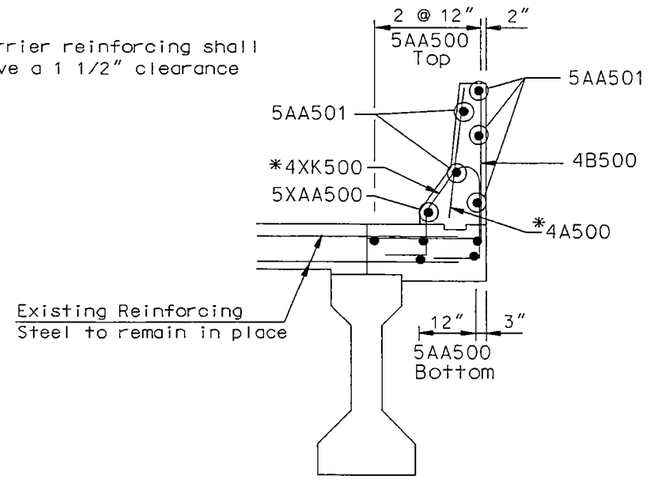
EXISTING SLAB SECTION
(SHOWING CONCRETE REMOVAL)

Hatched areas indicate rail retrofit, metal railing & concrete to be removed. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place.

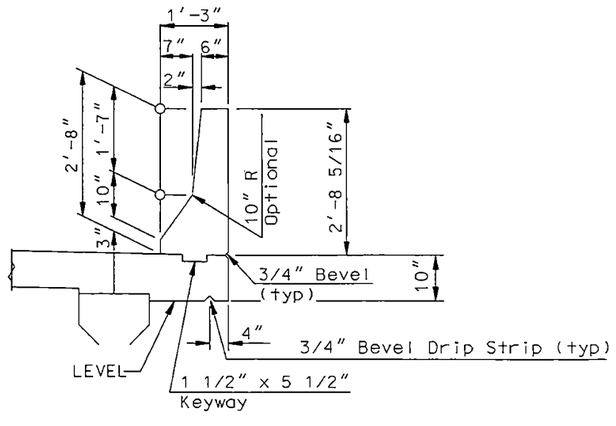


SLAB SECTION

* Barrier reinforcing shall have a 1 1/2" clearance



TYPICAL BARRIER SECTION
Showing Reinforcing



TYPICAL BARRIER SECTION
Showing Dimensions

QUANTITIES	
CLASS AAE-3 CONCRETE	58.4 CY
REINFORCING STEEL	8224 LBS
REINFORCING STEEL (EPOXY)	3203 LBS

GREEN RIVER
EAST BOUND BRIDGE

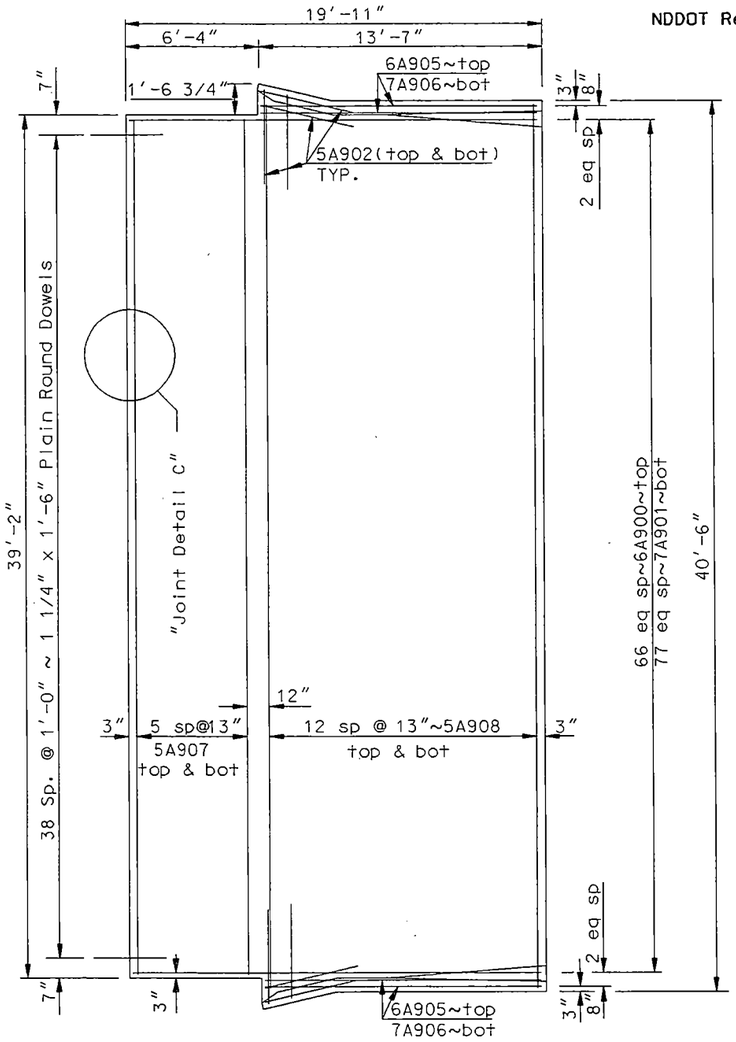
SLAB SECTIONS

GRIVER1 WAB BWR

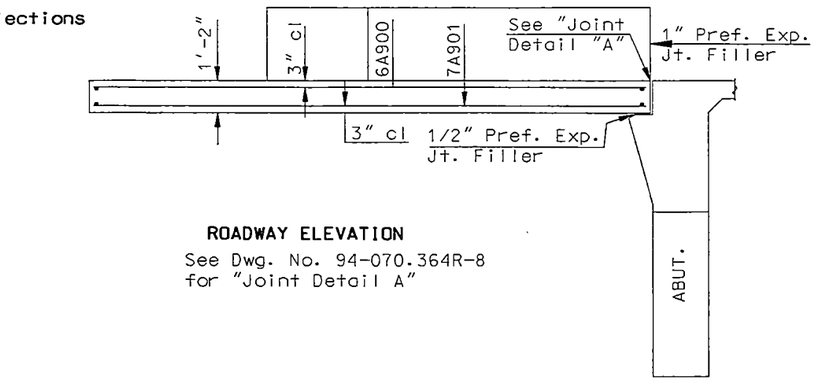
94-070.364R-5

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

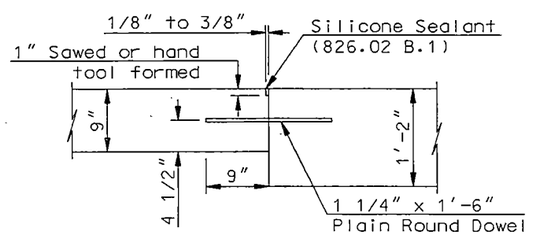
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	2/7



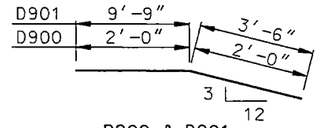
PLAN



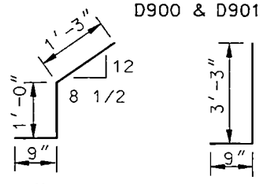
ROADWAY ELEVATION
See Dwg. No. 94-070.364R-8
for "Joint Detail A"



JOINT DETAIL C



D900 & D901

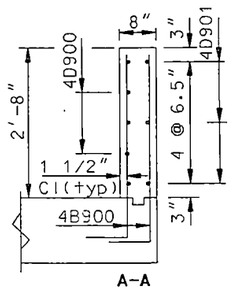


BENT BAR LIST
Dimensions shown are
out to out

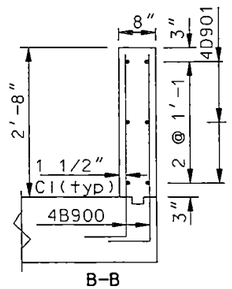
SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	67	19'-7"
7	A901	78	19'-7"
5	A902	16	6'-0"
4	XA903	2	7'-6"
6	A905	4	13'-3"
7	A906	4	13'-3"
5	A907	12	38'-10"
5	A908	26	40'-2"
4	B900	112	4'-0"
4	XT900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
7,419	36.5

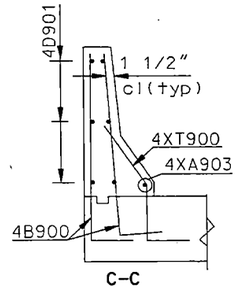
X = Epoxy coated bar
See dwg 94-070.364R-1
for notes.



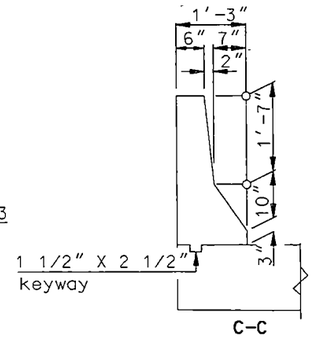
A-A



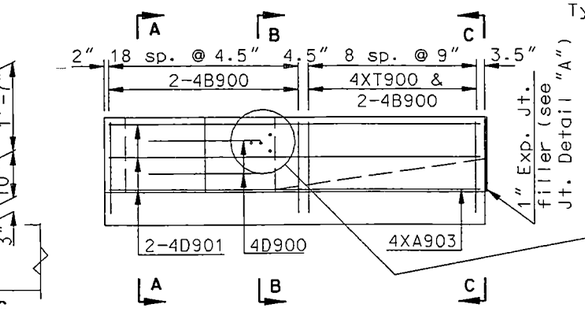
B-B



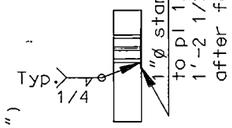
C-C
(Showing reinforcing)



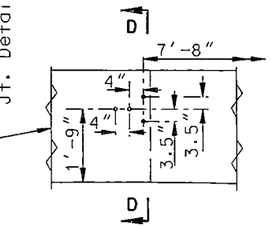
C-C
(Showing dimensions)

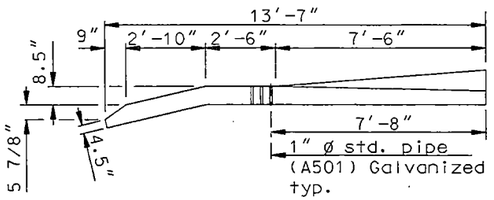


ELEVATION



D-D





PLAN

NOTES:

All dowel bars shall be epoxy coated and conform to AASHTO M-254 Type B.

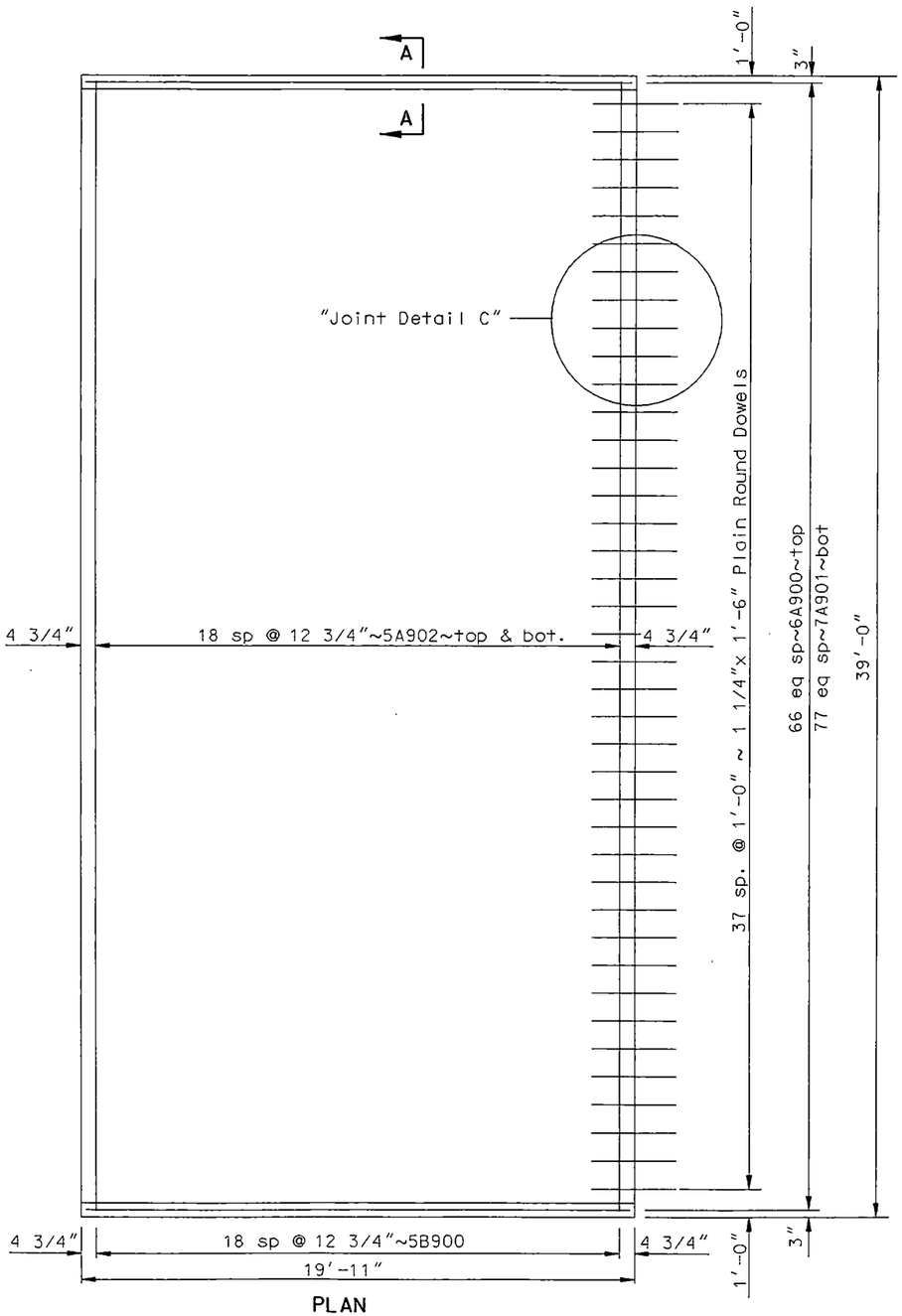
Free ends of Type B epoxy coated dowels (minimum of one-half of dowel length plus 2 inches) shall be given a thin, uniform coating of grease. This coating shall be applied within two hours before covering with concrete.

QUANTITIES		
APPROACH SLAB	89.0	SY

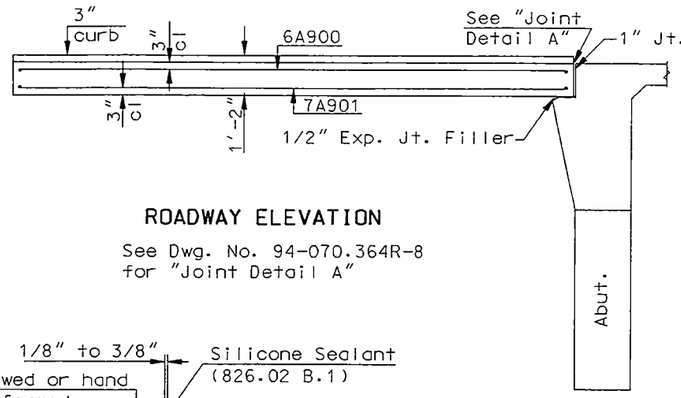
GREEN RIVER
EAST BOUND BRIDGE

APPROACH SLAB DETAILS
(AT BEGIN BRIDGE)

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	218

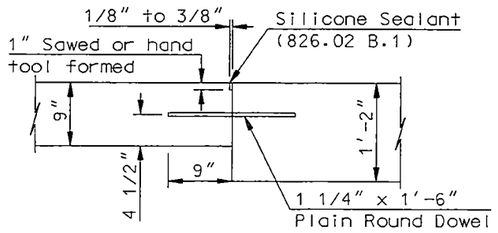


PLAN

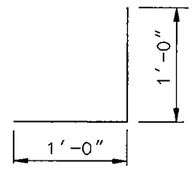


ROADWAY ELEVATION

See Dwg. No. 94-070.364R-8 for "Joint Detail A"



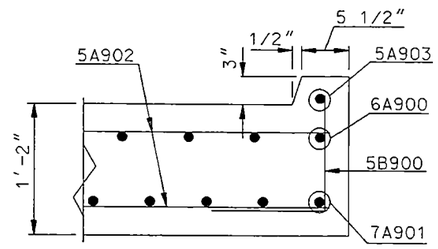
JOINT DETAIL C



B900

BENT BAR DETAIL

Dimensions shown are out to out



A-A

SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	67	19'-7"
7	A901	78	19'-7"
5	A902	38	38'-8"
5	A903	2	19'-7"
5	B900	38	2'-0"

ESTIMATED MATERIAL QUANTITIES	
Reinforcing Steel-(LBS.)	Concrete (CY)
6,746	33.7

See dwg 94-070.364R-8 for notes.

NOTE :

All dowel bars shall be epoxy coated and conform to AASHTO M-254 Type B.

Free ends of Type B epoxy coated dowels (minimum of one-half of dowel length plus 2 inches) shall be given a thin, uniform coating of grease. This coating shall be applied within two hours before covering with concrete.

QUANTITIES	
APPROACH SLAB	86.3 SY

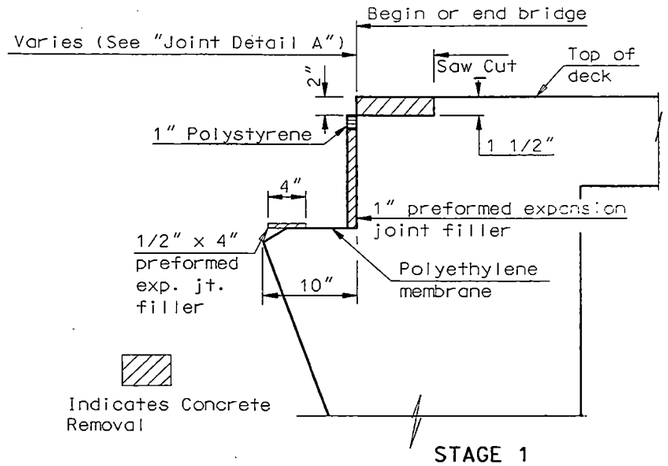
GREEN RIVER
EAST BOUND BRIDGE

APPROACH SLAB DETAILS
(AT END BRIDGE)

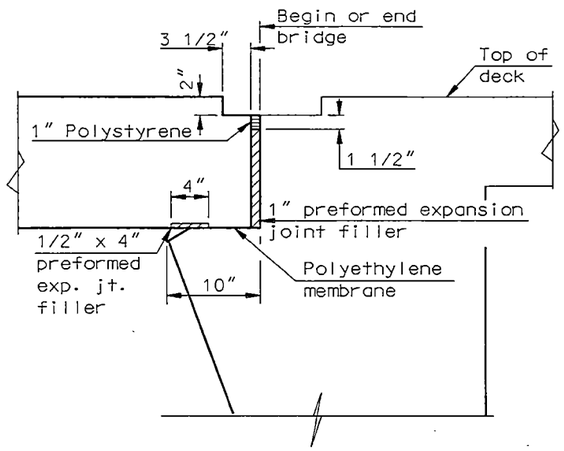
GRIVER6 99WAB BWR

94-070.364R-7

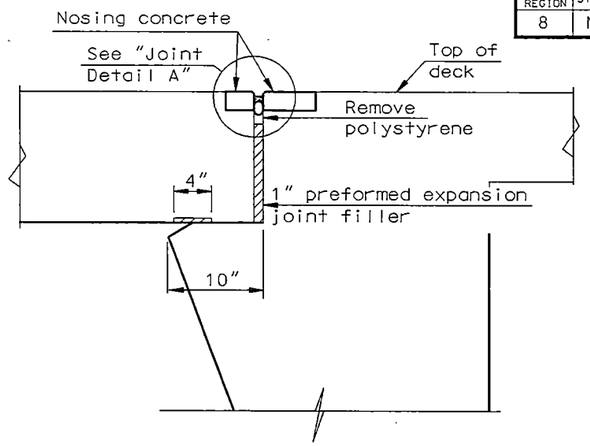
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	IM-5-094(018)059	219



STAGE 1



STAGE 2



STAGE 3

APPROACH SLAB – BRIDGE DECK JOINT

STAGE 1:

1. Remove concrete at ends of deck to allow for nosing concrete.
2. Place the 1" thick 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 3 1/2" blockout shall be formed between the curbs in the approach slab as shown.

STAGE 3:

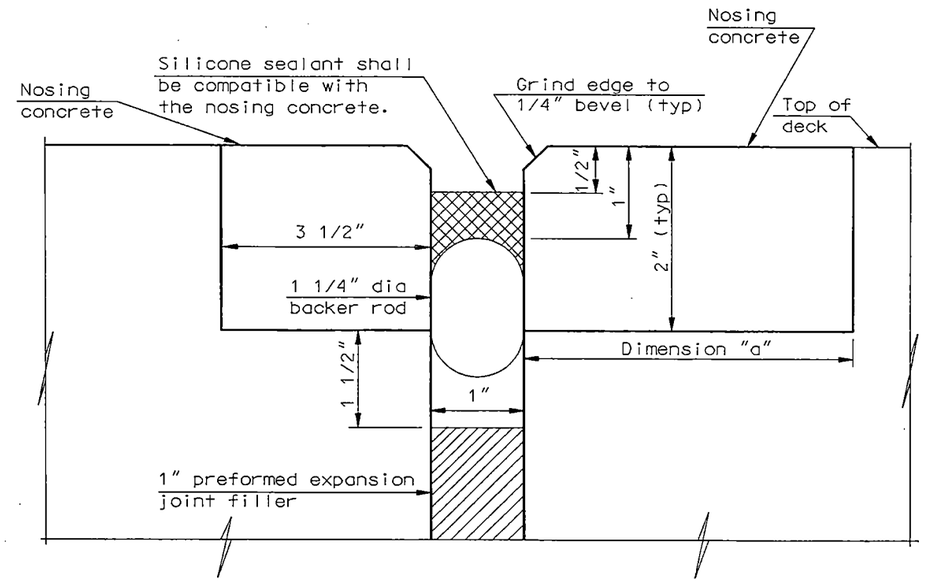
4. Place nosing concrete in the blockout areas, both in the deck and in the approach slab.
5. Remove the 1" polystyrene.
6. After the nosing concrete has cured, grind the 1/4" bevel edge, clean and prepare the joint, apply any necessary bonding material, install the backer rod and the silicone sealant.

NOTES:

All estimated material quantities shown on drawing no. 94-070.364R-6 & 7 are for informational purposes only. All materials including concrete, reinforcing bars, polyethylene membrane, preformed joint filler and labor required to build the approach slab, barriers and curbs shall be included in the pay item "Bridge Approach Slab - Remove & Replace".

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.

Surface Finish "D" shall be required for all surfaces of the curb transitions on the west end approach slab.



JOINT DETAIL A

DIMENSION "a"

West end of deck dimension "a" = 6"
East end of deck dimension "a" = 18" south of ℄ Roadway
East end of deck dimension "a" = 24" north of ℄ Roadway

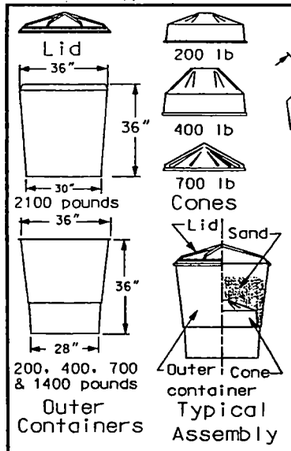
QUANTITIES (TWO APPROACHES)		
Nosing Concrete	17.7	CF
Silicone Sealant	76.0	LF

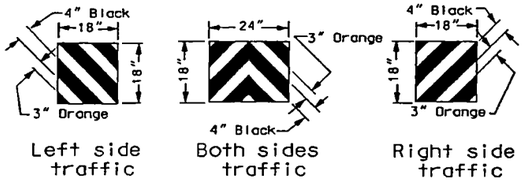
GREEN RIVER
EAST BOUND BRIDGE

APPROACH SLAB JOINT DETAILS & NOTES

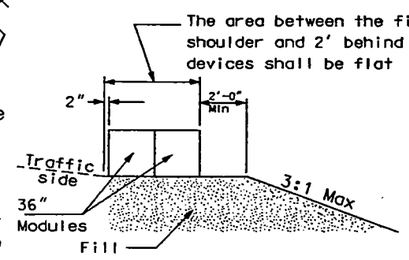
ATTENUATION DEVICE

D-704-1



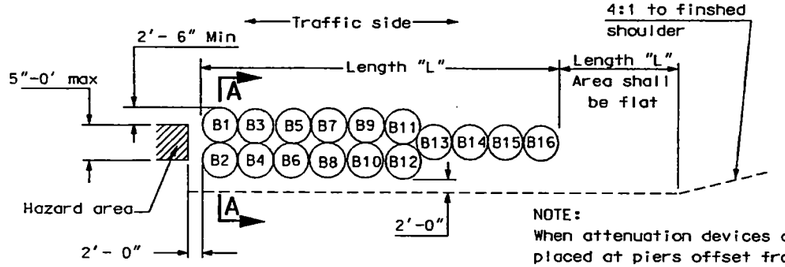


The last attenuation device facing traffic shall have a reflective sheet, following the details above, directly applied to the outer container. The sheet may also be applied to a metallic sheet and attached to the container with approved fasteners. The reflective sheeting shall be Type III C as specified in Section 894 of the Standard Specifications.



SECTION A-A
(Type B Layout)

TYPICAL MODULE CONSTRUCTION DETAIL



NOTE:
When attenuation devices are placed at piers offset from roadway, they shall be angled 10 degrees towards traffic

SAND FILL CHART					
	MODULE WEIGHTS (LBS)				
	200	400	700	1400	2100
Inches from top edge	8	3½	4½	3	3½

TYPE B LAYOUT

MODULE NUMBER	TYPE B ATTENUATION DEVICE										
	DASH NUMBER										
	75	70	65	60	55	50	45	40	35	30	25
	MODULE WEIGHTS										
B1	2100										
B2	2100										
B3	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B4	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B5	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B6	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B7	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B8	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B9	700	700	700	700	700	700	700	700	700	700	700
B10	700	700	700	700	700	700	700	700	700	700	700
B11	700	700	700	700	700	700	700	700	700	700	700
B12	700	700	700	700	700	700	700	700	700	700	700
B13	700	700	700	700	700	700	700	700	700	700	700
B14	400	400	400	400	400	400	400	400	400	400	400
B15	400	400	400	400	400	400	400	400	400	400	400
B16	200	200	200	200	200	200	200	200	200	200	200
LENGTH (L)	30'	27'	27'	27'	27'	27'	27'	27'	27'	24'	24'
MODULE WEIGHTS	REPLACEMENT MODULE										
2100	1	1	1	1	1	1	1	1	1	1	1
1400	1	1	1	1	1	1	1	1	1	1	1
700	2	2	2	2	2	2	2	2	2	2	2
400	1	1	1	1	1	1	1	1	1	1	1
200	2	2	2	1	1	1	1	1	1	1	1

Notes

1. Materials
   A) Modules shall be manufactured from a frangible polyethylene material which will shatter upon impact.
   B) The sand shall meet the requirements for fine aggregate for concrete according to Section 816.01 of the Standard Specifications. Sand unit weight shall be at least 100 pounds per cubic foot. Sand left over the winter shall have a moisture content of 2% or less.
2. Modules
   The modules shall be provided in two sizes to contain volumes of either 2, 4, 7, 14, or 21 cubic feet as a minimum.
   A) The module for the 2, 4 or 7 cubic foot container shall consist of three components:
      1) A 14 C.F., yellow outer container.
      2) A black lid which locks securely over the top lip of the container.
      3) A cone-shaped supporting insert. The insert shall be varied to allow for the three sizes of modules and capable of supporting 200, 400, or 700 pounds of sand mass. The cone inserts shall be placed inside the 14 cubic foot container.
   B) The module for the 21 cubic foot container shall consist of two components:
      1) A 36" height X 36" width yellow outer container.
      2) A black lid which locks securely over the top of the container.
3. The module shall be manufactured by Energy Absorption Systems of Chicago, Illinois, or an approved equal.
4. The contractor shall provide the required modules for Type B layouts as required in the plans. The contractor shall also provide and have available on the project site additional replacement modules (see chart) for each layout location up to a maximum of 20 modules per project. The cost for providing, and having available replacement modules on the project site for the duration of the project shall be included in the price bid for "Type B Attenuation Device".
5. The contractor shall be responsible for maintaining the modules in each layout. Any damaged modules will be replaced by the contractor. The Department will reimburse the contractor for damaged modules (materials only) based on invoice price plus applicable mark-ups for materials and subcontracting according to Section 109.04 of the Standard Specifications. All other costs for labor, equipment and materials required to maintain and replace damaged modules shall be included in the price bid for the item "Type B Attenuation Device".
6. The attenuation devices may be placed on pallets to facilitate maintenance. Pallets shall have a maximum thickness of 3½".
7. The material used for fill may be obtained from an area within the right of way as designated by the Engineer. Upon completion of the work, the devices and fill shall be removed and the area restored to the original condition and reseeded. The fill shall be disposed of as directed by the Engineer.
8. The item "Type B Attenuation Device" will be measured by the number installed. The bid shall include all material, equipment, relocation if required, labor and removal and shall be full compensation to complete the work.

10-1-86	
REVISIONS	
	CHANGE
9-2-97	Revised type B layout
12-29-97	Revised note 1
07-21-98	Refl. Type IIIC

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

APPROVED: _____
DESIGN ENGINEER

r:\support\desstd\d704-01.dgn Jul. 21, 1998 16:42:26

JOB# 18

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	IM-094-2(040)070	1

DESIGN DATA

Traffic	Average Daily					Est. 30th Max. Hr.
Current (1991)	3700	Pass.	700	Trucks 4400	Total	460
Forecast (2011)	5550	Pass.	1050	Trucks 6600	Total	690

Design Speed 70 MPH
Traffic Classification "M"
Minimum Sight Distance (Stopping) 600'
Full control of access
No point of access other than by ramps at interchanges

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

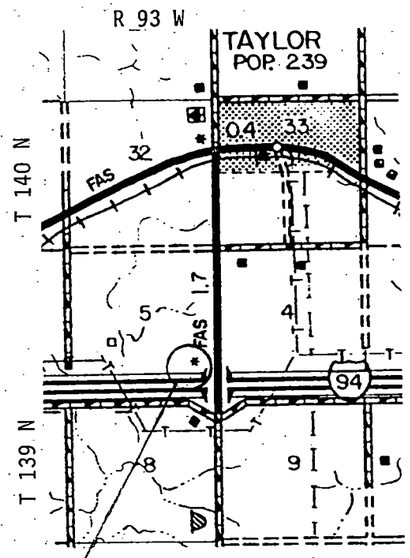
IN STARK COUNTY
FEDERAL AID PROJECT IM-094-2(040)070
STRUCT. WIDENING, DECK TREATMENT, CHANNEL EXC., & INCIDENTALS

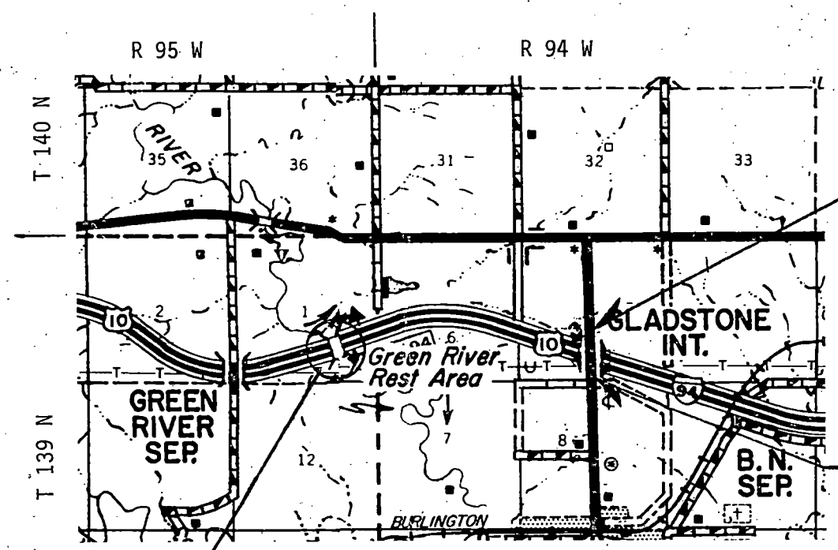
GOVERNING SPECIFICATIONS:

Standard Specifications for Road and Bridge Construction, adopted by the North Dakota State Highway Department, November 1986, shall apply to all North Dakota Department of Transportation contracts, standard drawings currently in effect, and other contract provisions submitted herein.

LENGTH OF PROJECT

Project	Miles-Gross	Miles-Net
IM-094-2(040)070	0.053	0.053





Beg. Proj. IM-094-2(040)070
Sta. 44+00 A point 981.4' N. and 2641.4' West of SE Corner Sec. 5, Twp. 139 N., Rge. 94 W.

End Proj. IM-094-2(040)070
Sta. 46+80 A point 701.4' N. and 2641.4' West of SE Corner Sec. 5, Twp. 139 N., Rge. 94 W.

GREEN RIVER STRUCTURES
Deck Treatment, Replace Appr. Slabs, & Channel Cleanout

NW RAMP TAYLOR INT
High Molecular Weight Methacrylate Treatment

NOTE: "Only the title sheet has been changed to reflect the new project number prefix."

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 9-20-91
Ray Zink
DIRECTOR OF HIGHWAYS AND ENGINEERING
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

RAY ZINK REGISTERED PROFESSIONAL P.E. 972 ENGINEER NORTH DAKOTA

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	5

QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	Contract Bond	L. Sum	1
201	0330	Clearing and Grubbing	L. Sum	1
202	0111	Removal of Concrete	L. Sum	1
202	0132	Removal of Bituminous Surfacing	Sq. Yd.	340
203	0101	Common Excavation, Type A	Cu. Yd.	180
203	0140	Borrow	Cu. Yd.	9,394
210	0101	Class 1 Excavation	L. Sum	1
210	0127	Channel Excavation	L. Sum	1
210	0198	Select Backfill	Ton	430
210	0201	Foundation Preparation	Ea.	1
216	0100	Water	M. Gal.	124
302	0120	Aggregate Base Course, Cl. 5	Ton	1,393
401	0100	MC 70 or 250 Liquid Asphalt	Gal.	756
401	0152	SS-1h or CSS-1h Emulsified Asphalt	Gal.	216
406	0165	Hot Bituminous Pavement, Cl. 21	Ton	734
406	0320	120-150 Asphalt Cement	Ton	44
550	0118	10 In. Non Reinf. Conc. Pvmt. Class AE	Sq. Yd.	53
550	0215	Concrete Bridge Approach Slab	Sq. Yd.	143
550	0217	Bridge Appr. Slab (Remove & Replace)	Sq. Yd.	246
550	1512	Spall Repair (Partial Depth)	Sq. Ft.	340
602	0130	Class AAE-3 Concrete	Cu. Yd.	289
602	1130	Class AE-3 Concrete	Cu. Yd.	69

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	6

QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
602	1250	Penetrating Water Repellent Treatment	Sq. Yd.	786
612	0115	Reinforcing Steel, Grade 60	Lbs.	35,922
612	0116	Reinforcing Steel, Grade 60 (Epoxy Coated)	Lbs.	38,264
702	0100	Mobilization	L. Sum	1
704	0100	Flagging	M. Hrs.	200
704	0105	Obliteration of Pavement Marking	L. Ft.	4,030
704	1000	Traffic Control Signs	Unit	4,778
704	1052	Type III Barricade	Ea.	52
704	1060	Delineator Drums	Ea.	123
704	1072	Flexible Delineators	Ea.	83
704	1087	Sequencing Arrow Panel - Type C	Ea.	7
704	1095	Type B Flashers	Ea.	10
706	0100	Field Laboratory - Type A	Ea.	1
708	1020	Riprap, Loose Rock	Cu. Yd.	1,385
708	1100	Slope Protection Conc.	Sq. Yd.	413
708	2240	Seeding, Type B, Cl. II	Acre	3
708	5300	Fiberglass Roving	Sq. Yd.	953
714	5010	Pipe, Corrugated Steel, .064 In. - 15 In.	L. Ft.	340
714	5805	End Section, Corrugated Steel, .064 In. - 15 In.	Ea.	11
754	0168	Delineators, Type D	Ea.	6
754	0592	Reset Sign Panel	Ea.	2
754	0593	Reset Sign Support	Ea.	2

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	7

QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
762	0104	Pavement Marking Painted Line	L. Ft.	*52,600
762	0131	Temporary Stripe - Solid Line - Type R	L. Ft.	1,144
762	0132	Temporary Stripe - Solid Line - Type NR	L. Ft.	3,960
762	0133	Temporary Stripe Message - Type R	Sq. Ft.	55
762	0200	Raised Pavement Markers	Ea.	2,052
764	0115	Three Cable Guardrail	L. Ft.	817
764	0131	W-Beam Guardrail	L. Ft.	340
764	0139	W-Beam Guardrail - Flared End Treatment and Transition	Ea.	2
764	0151	Remove Beam Guardrail and Posts	L. Ft.	908
764	1050	Reset W-Beam Guardrail	L. Ft.	675
764	1060	Reset W-Beam Guardrail Flared End Treatment and Transition	Ea.	6
764	2080	Remove Box Beam Guardrail	L. Ft.	507
764	2081	Remove End Treatment & Transition	Ea.	8
930	9601	HMWM Treatment	Sq. Ft.	23,106
930	9602	HMWM Resin	Gal.	231

* NOTE: Not a bid item; to be installed by state maintenance forces.

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	8

LIST OF STANDARD DRAWINGS

STANDARD NO.

D-708-1 Standard Slope Proteciton Under Bridges

D-714-5 Corrugated Steel Pipe Culverts and End Sections

D-754-1,2,3,4 Construction Sign Details

D-754-5 Barricade Details

D-754-5A Construction Sign and Barricade Assembly Details

D-754-6C Sign Layout for One Lane Closure Interstate System

D-754-22 Reflectorized Delineators

D-754-22A Typical Interchange Delineation

D-762-2 Interstate Pavement Marking

D-764-1 Beam Guardrail General Details

D-764-2 Beam Guardrail - Flared End Treatment and Transition

D-764-3 W-Beam Guardrail at Bridge Ends (General Layout and Details Flared Guardrail Section)

D-764-4 W-Beam Guardrail at Bridge Ends (General Layout and Details Non-Flared Guardrail Section)

D-764-5 W-Beam Guardrail at Bridge Ends

D-764-8 W-Beam Guardrail at Bridge Ends

D-764-9 Guardrail at Bridge Ends

D-764-12 Typical Grading at Bridge Ends

D-764-13 Typical Grading at Bridge Ends

D-764-32 Three Cable Guardrail

D-900-1 Bridge Bench Marks

BASIS OF ESTIMATE

WATER: 10 Gal. per C.Y. of Embankment
20 Gal. per Ton of Aggregate Base Course

TOPSOIL: 6" of topsoil shall be removed from the construction area. Removal of topsoil shall be included in the price bid for clearing and grubbing.

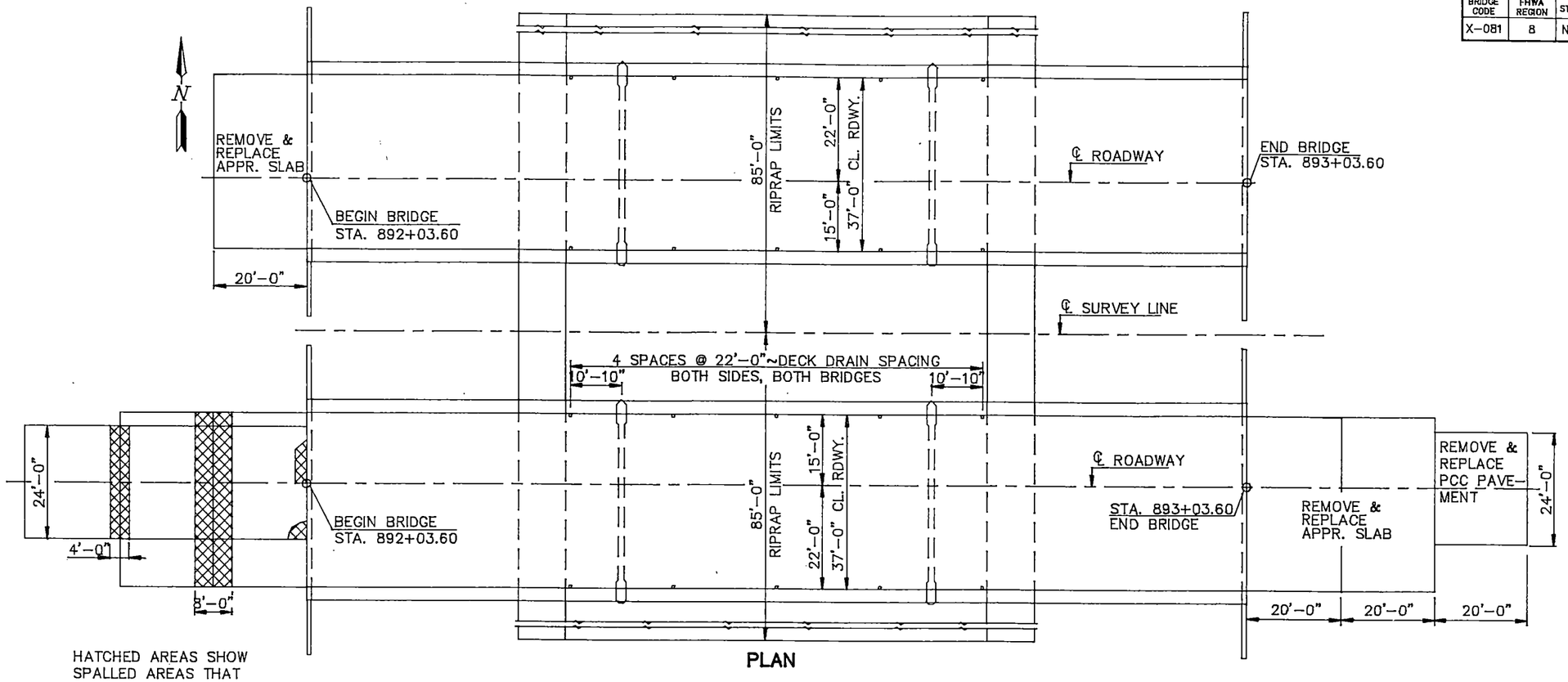
SEEDING: Entire construction area disturbed except top of roadway.

AGGREGATE BASE COURSE: Cl. 5, 1.5 Ton/C.Y. plus 25%
Hot Bit. Pvmt. @ 2.0 Tons/C.Y., Cl. 21
120-150 Asph. Cement for Hot Bit. Pvmt. @ 6.0% of Hot Bit. Pvmt.
SS-1h or CSS-1h Emuls. Asph. for Tack Coat @ 0.05 Gal./S.Y.
SS-1h or CSS-1h Emuls. Liquid Asph. for Prime Coat @ .35 Gal./S.Y.
(Top of Cl. 5 Aggr. Base Crse.)

SPECIAL PROVISION

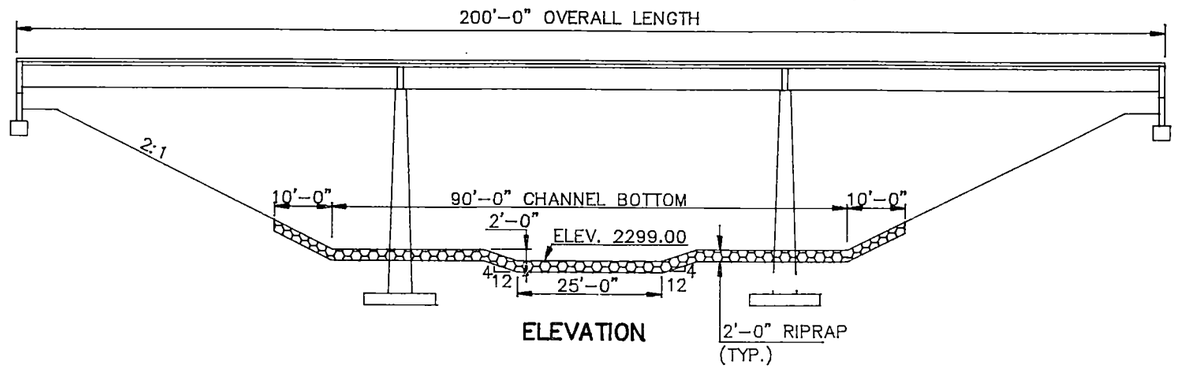
No.	NAME
SP-177	High Molecular Weight Methacrylate

BRIDGE CODE	FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
X-081	8	N.D.	IR-094-2(040)070	

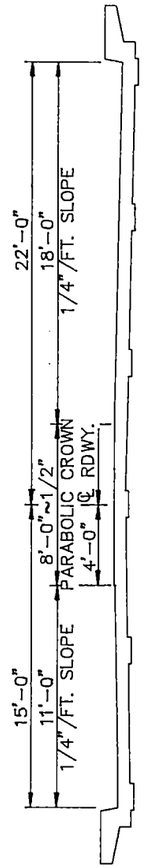


PLAN

HATCHED AREAS SHOW SPALLED AREAS THAT NEED TO BE REPAIRED.



ELEVATION



DECK SECTION

FOREST D. DUROW REGISTERED PROFESSIONAL 948 ENGINEER NORTH DAKOTA

GREEN RIVER

LAYOUT

PROJECT IR-094-2(040)070
STATION 892+96.97
STARK COUNTY

9-11-91
DATE

Forest D. Durow
ENGINEER

91LCS51

094-070.364 LT & RT

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	30

GENERAL NOTES

100 SCOPE OF WORK: THIS PROJECT CONSISTS OF APPLYING A HIGH MOLECULAR WEIGHT METHACRYLATE (HMWM) TREATMENT TO THE DECK. THE REMOVAL AND REPLACEMENT OF THE EXIT APPROACH SLABS ON THE NORTH AND SOUTH BRIDGES. THE WEST APPROACH SLAB OF THE SOUTH BRIDGE AND THE END BEAMS OF BOTH BRIDGES HAVE SEVERAL SPALL AREAS. THESE AREAS ARE TO BE REPAIRED. CHANNEL CLEAN-OUT WILL BE REQUIRED SO THAT THE RIPRAP CAN BE PLACED TO THE PROPER ELEVATION.

210 CHANNEL EXCAVATION: THE CLEAN OUT FOR THE RIPRAP SHALL BE DISPOSED OF ACCORDING TO THE DIRECTION OF THE ENGINEER. THE EXCAVATION SHALL BE BID AS A LUMP SUM ITEM.

550 SPALL REPAIR: THE END BEAMS OF THE BRIDGES HAVE SEVERAL SPALLED AREAS. THE SPALL SHALL BE SAND-BLASTED TO REMOVE ALL UNSOUND CONCRETE. THE AREA SHALL BE RESTORED WITH "SPEED-CRETE RED LINE" SUPPLIED BY TAMMS INDUSTRIES COMPANY OR "SIKA REPAIR 223" SUPPLIED BY THE SIKA CORPORATION. ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR THE SPALL REPAIRS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR "SPALL REPAIR (PARTIAL DEPTH)".

704 TRAFFIC CONTROL: ONE LANE OF TRAFFIC SHALL BE MAINTAINED FOR THE EAST AND WEST BOUND TRAFFIC AT ALL TIMES. TRAFFIC CONTROL SHALL BE BID AS A LUMP SUM ITEM.

930 HIGH MOLECULAR WEIGHT METHACRYLATE: THE BRIDGE DECK TREATMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPECIAL PROVISION. THE ENGINEER SHALL HAVE THE OPTION TO APPROVE THE METHOD OF MATERIAL PLACEMENT.

ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0127	CHANNEL EXCAVATION	L.SUM	1.0
550	0118	10 IN NON-REINF. CONC. PAVEMENT CLASS AE	SQ.YD.	53.3
550	0217	BRIDGE APP. SLAB (REMOVE & REPLACE)	SQ.YD.	246.0
550	1512	SPALL REPAIR (PARTIAL DEPTH)	S.FT.	340.0
708	1020	RIPRAP, LOOSE ROCK	CU.YD.	1385.0
930	9601	HMWM TREATMENT	SQ.FT.	14,800.0
930	9602	HMWM RESIN	GAL.	148.0

SPECIAL PROVISION	
NO.	NAME
S.P.-177	HIGH MOLECULAR WEIGHT METHACRYLATE

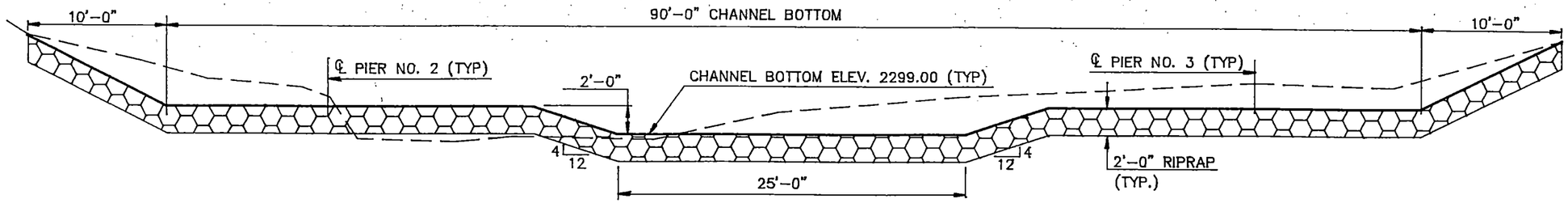
HYDROLOGIC DATA

DRAINAGE AREA	356	SQ. MI.
DESIGN FREQUENCY	50	YEAR
DESIGN DISCHARGE (Q50)	12,000	C.F.S.
STREAM GRADIENT	0.0010	FT./FT.
WATERWAY PROVIDED BELOW DESIGN STAGE	2,204	SQ. FT.
WATERWAY PROVIDED BELOW CLEARANCE	3,815	SQ. FT.
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNNEL	3.8	F.P.S.
DEPTH OF FLOW	17.6	FT.
VELOCITY OF FLOW UNDER BRIDGE	5.8	F.P.S.
FREEBOARD PROVIDED	9.8	FT.
SCOUR DEPTH PIER	2280.2	ELEV.
100-YEAR FREQUENCY DISCHARGE	14,800	C.F.S.
100-YEAR FREQUENCY STAGE	2318.3	ELEV.

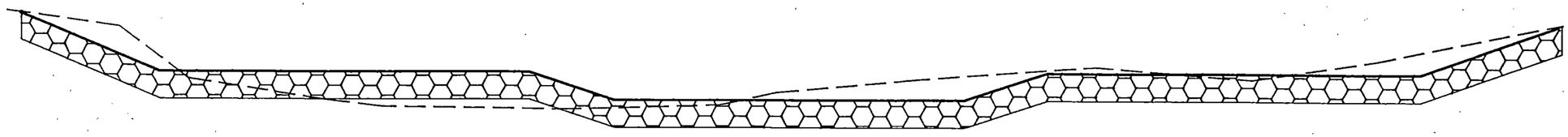
GREEN RIVER

GENERAL NOTES & ESTIMATE OF QUANTITIES

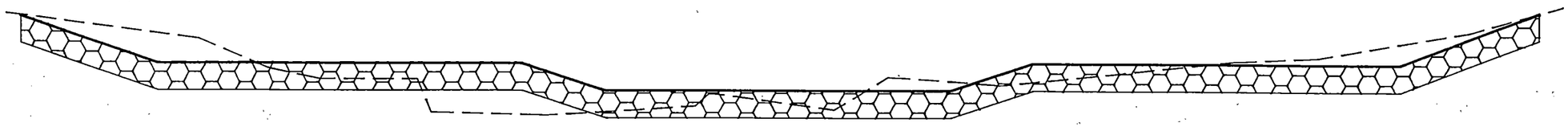
FHWA REGION	STATE	FED. AID PROJ. NO.	
8	N.D.	IR-094-2(040)070	



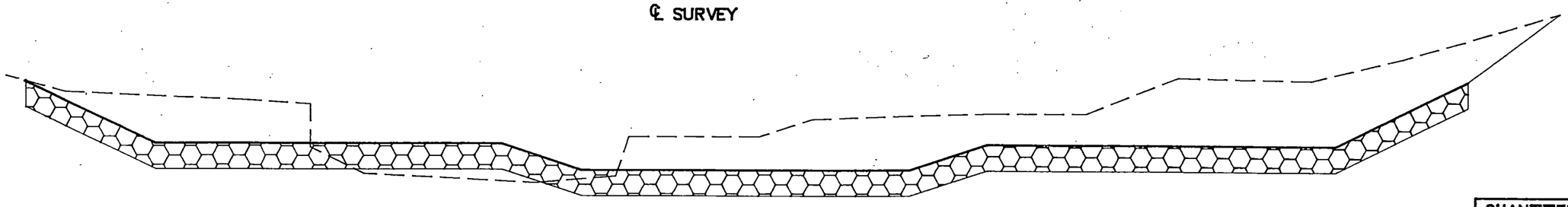
5' SOUTH OF SOUTH BRIDGE PIERS



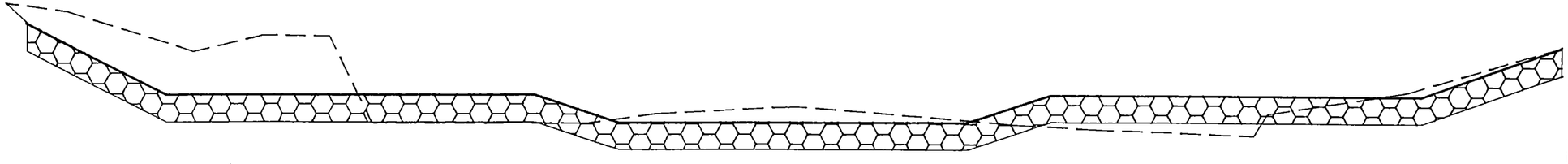
5' NORTH OF SOUTH BRIDGE PIERS



℄ SURVEY



5' SOUTH OF NORTH BRIDGE PIERS



5' NORTH OF NORTH BRIDGE PIERS

QUANTITIES		
LOOSE ROCK RIPRAP	947.0	C.YD.

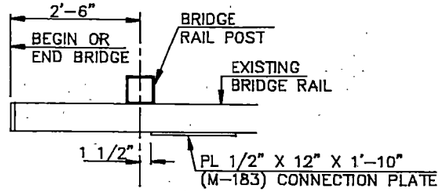
GREEN RIVER

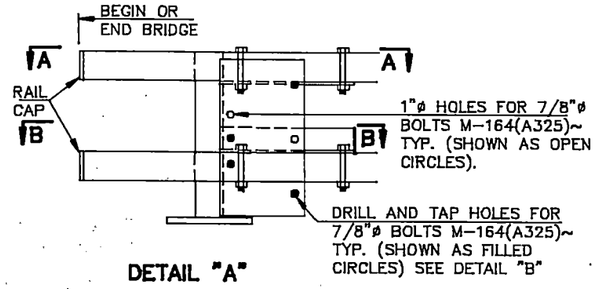
EXCAVATION & RIPRAP

91LCS52

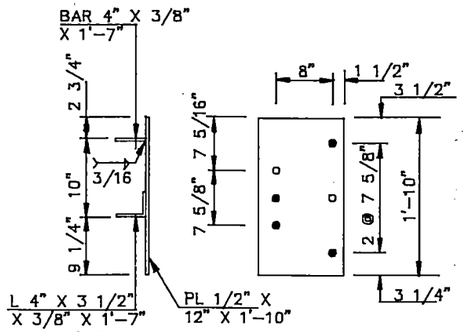
094-070.364 LT & RT -2

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	

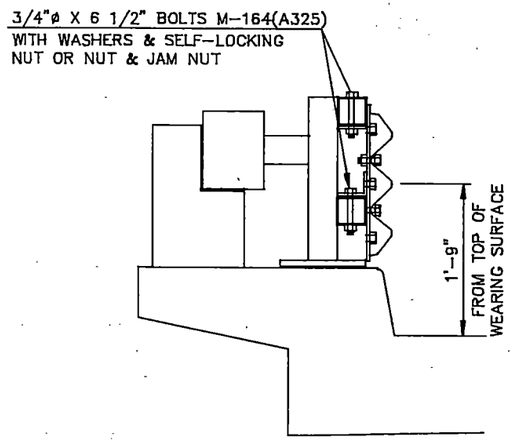




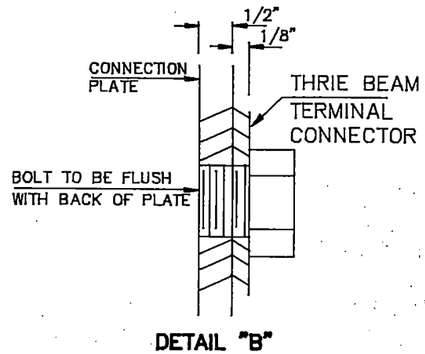
DETAIL "A"



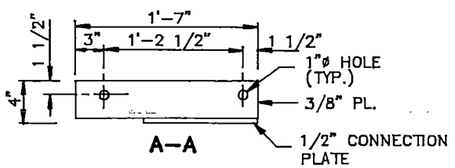
GUARDRAIL CONNECTION PLATES
(4 REQUIRED)



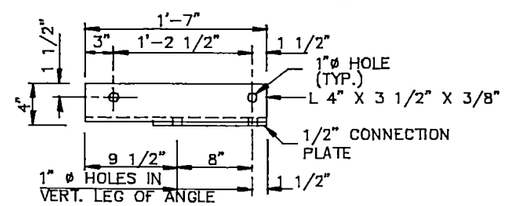
GUARDRAIL CONNECTION DETAILS



DETAIL "B"



A-A



B-B

NOTE:
VERIFY ALL BOLT HOLE LOCATIONS TO MATCH THRIE BEAM TERMINAL CONNECTOR.

NOTE:
TO BE INSTALLED AT ON-COMING TRAFFIC END OF BRIDGE ONLY.

NOTE:
ALL MATERIALS AND LABOR REQUIRED TO INSTALL CONNNECTION PLATE SHALL BE INCIDENTAL TO THE PAY ITEM "W-BEAM GUARDRAIL".

GREEN RIVER

RAIL TRANSITION DETAILS

91LCS53A

094-070.364 LT & RT -3

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	

WIDTH = 37'-0" CL. RDWY.

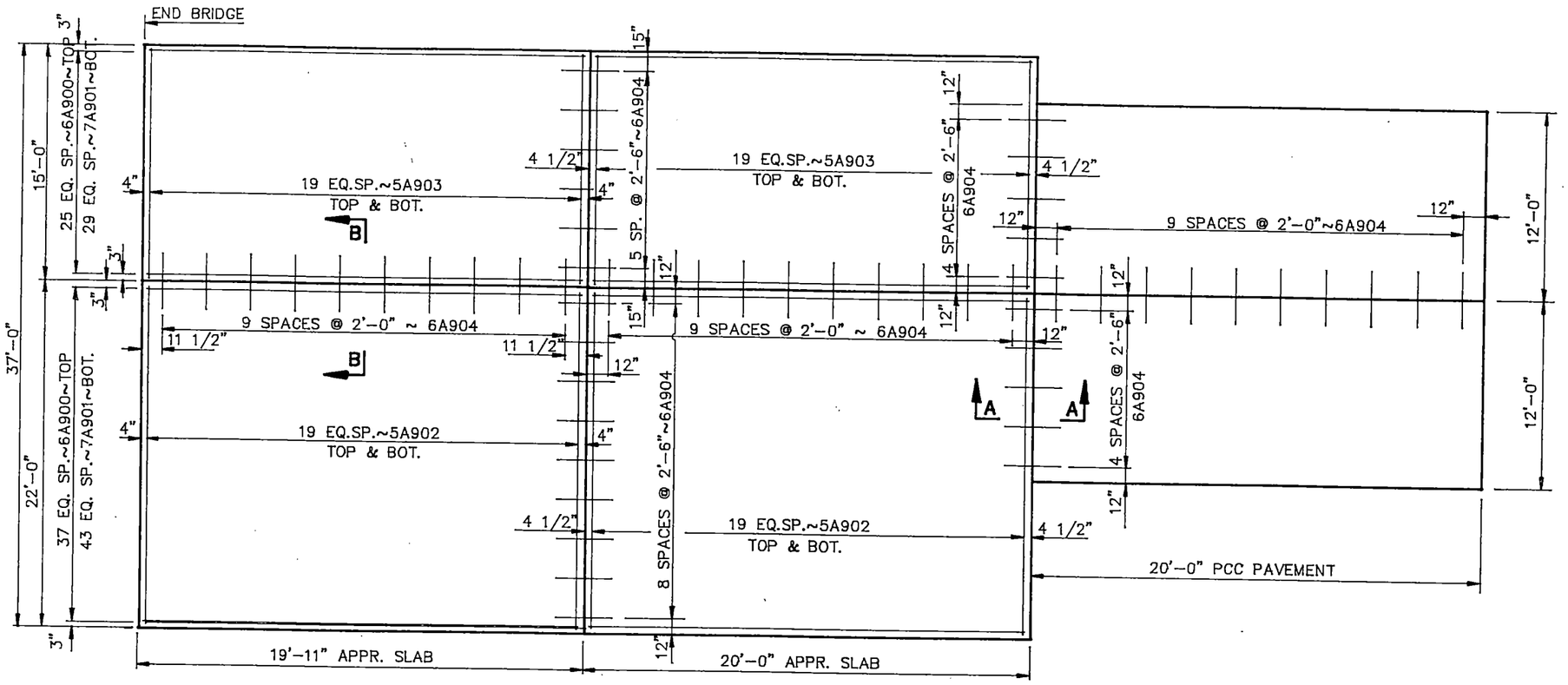
SKEW ANGLE = 0°

BAR LIST - ONE SLAB

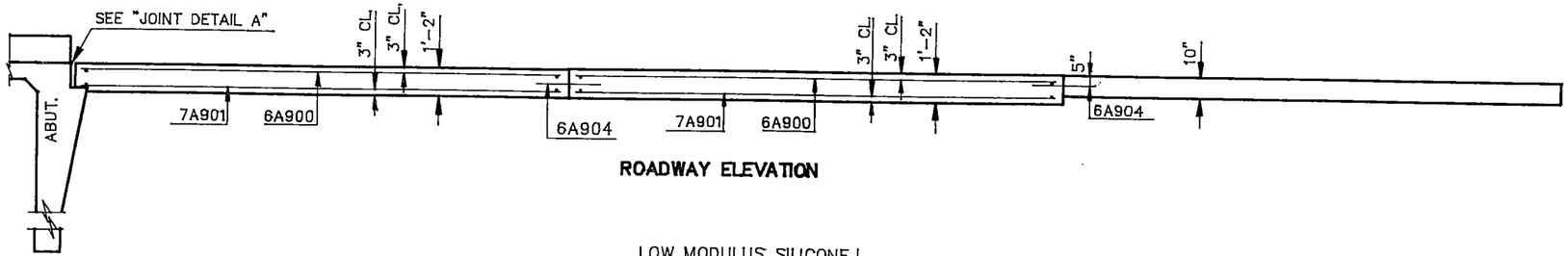
SIZE	MARK	NO.	LENGTH
6	A900	128	19'-7"
7	A901	148	19'-7"
5	A902	80	21'-8"
5	A903	80	14'-8"
6	A904	55	2'-6"

ESTIMATED MATERIAL QUANTITIES

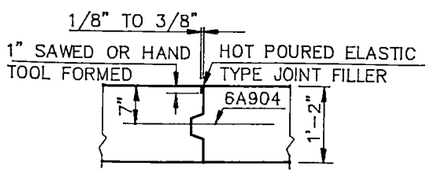
REINFORCING STEEL (LBS.)	CONCRETE (C.Y.)
12,927	78.6



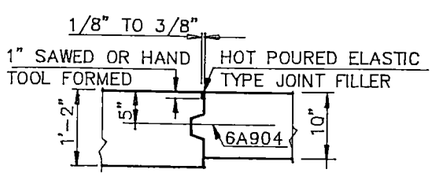
PLAN



ROADWAY ELEVATION

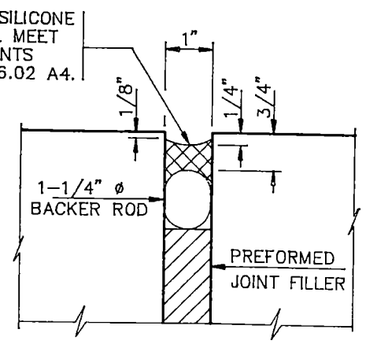


B-B



A-A

LOW MODULUS SILICONE SEALANT SHALL MEET THE REQUIREMENTS OF SECTION 826.02 A4.



JOINT DETAIL A

NOTES:

THE ABOVE ESTIMATED QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, REINFORCING BARS, BACKER ROD, SILICONE SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND THE REMOVAL OF THE EXISTING APPROACH SLABS SHALL BE INCIDENTAL TO THE PAY ITEM "BRIDGE APP. SLAB (REMOVE & REPLACE)".

REMOVAL & REPLACEMENT OF THE PCC PAVEMENT SHALL INCIDENTAL TO THE PAY ITEM "10 IN NON-REINFORCED CONCRETE PAVEMENT CLASS AE".

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.

QUANTITIES	
APPROACH SLAB	164.1 S.Y.
PCC PAVEMENT	53.3 S.Y.

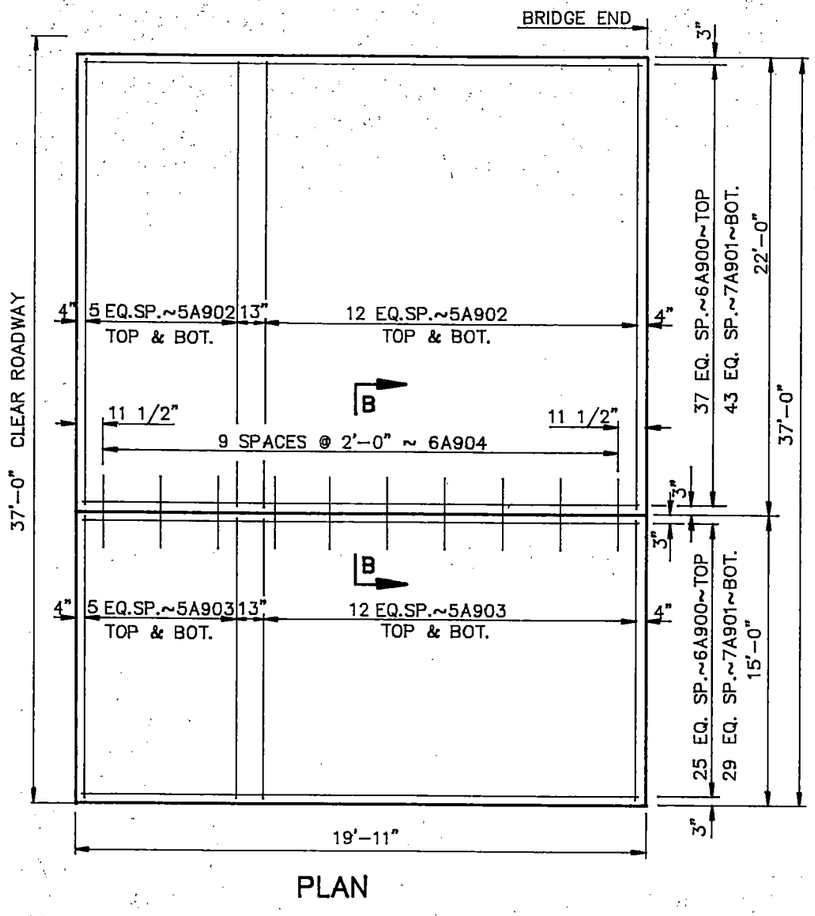
GREEN RIVER

APPROACH SLAB

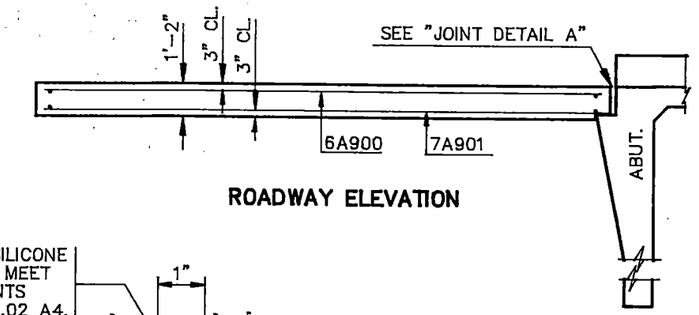
EAST SLAB-SOUTH ROADWAY

91LCS538

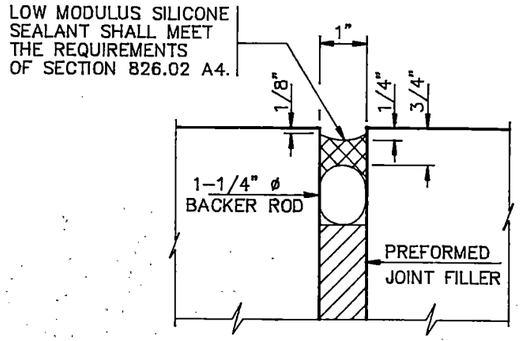
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	



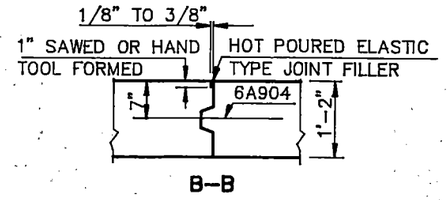
PLAN



ROADWAY ELEVATION



JOINT DETAIL A



B-B

WIDTH = 37'-0" CL. RDWY.			
SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	64	19'-7"
7	A901	74	19'-7"
5	A902	38	21'-8"
5	A903	38	14'-8"
6	A904	10	2'-6"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS.)	CONCRETE (C.Y.)
6,322	31.8

NOTES:

THE ABOVE ESTIMATED QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, REINFORCING BARS, BACKER ROD, SILICONE SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND THE REMOVAL OF THE EXISTING APPROACH SLABS SHALL BE INCIDENTAL TO THE PAY ITEM "BRIDGE APP. SLAB (REMOVE & REPLACE)".

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.

QUANTITIES (ONE SLAB)	
APPROACH SLAB	81.9 S.Y.

GREEN RIVER

APPROACH SLAB

WEST SLAB-NORTH ROADWAY

91LCS53

094-070.364 LT-4

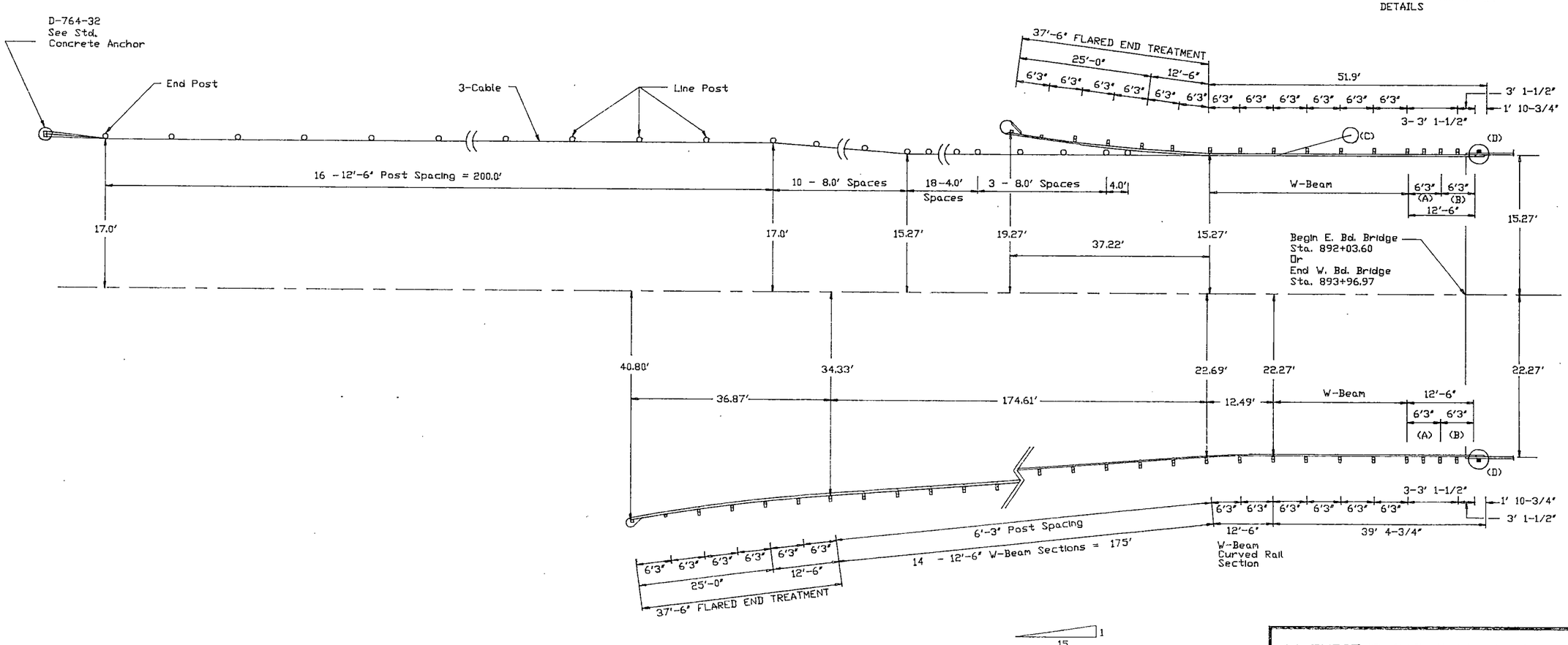
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	21

(A) THRIE TO W-BEAM TRANSITION
DOUBLE THICKNESS

(B) THRIE BEAM RAIL
DOUBLE THICKNESS

(C) SEE STD.
D-764-4
FOR DETAILS

(D) SEE RAIL TRANSITION
DETAILS



W-THRIE/3-CABLE GUARDRAIL LAYOUT

Green River Bridges

Mile 70.364
I-94

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	22

W-BEAM SUMMARY SHEET *

THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	* 5/8" @ 16" LONG BUTTON HEAD BOLT EACH	* 6" x 8" x 6'-0" TIMBER POST EACH	* 6" x 6" x 14" TIMBER BLOCK EACH	* 5/8" @ x 1 1/4" LONG BUTTON HEAD BOLT EACH	* 12' 6" STRAIGHT RAIL SECTION EACH	* 12' 6" CURVED RAIL SECTION EACH	* REFL-ECTOR-IZED PLATES EACH	* 8"x8" x 6' WOOD POST EACH	* 8"x8" x 22" WOOD OFF-SET BLOCK EACH	* 8"x8" x16 1/2" WOOD OFF-SET BLOCK EACH	* 8"x8" x13 " WOOD OFF-SET BLOCK EACH	* RETRO-FIT CONNEC-TION PLATE EACH	* 7'3 1/2" DOUBLE W-THRIE BEAM TRANS-ITION SECTION EACH	* 7'3 1/2" DOUBLE THRIE BEAM SEC-TION EACH	* 12'6" THRIE BEAM TERM-INAL CON-NECTOR EACH	* 5/8" @ x 18" LONG CAR-RIAGE BOLTS EACH	* 7/8" @ x VAR-IABLE LONG. BOLTS EACH	* 3/4" @ x LONG 2-1/2" POST BOLT EACH
Sta 891+55.38 to 891+67.87 Rt.	2	2	2	8		1	1												
Sta 891+92.87 to 892+07.27 Rt.	0	0	0	24			1	4	2	1	1	1	1	1	1	7	5	2	
Sta 891+92.87 to 892+07.27 Rt. Med	0	0	0	24			1	4	2	1	1	1	1	1	1	7	5	2	
Sta 893+93.30 to 894+07.70 Lt. Med	0	0	0	24			1	4	2	1	1	1	1	1	1	7	5	2	
Sta 893+93.30 to 894+07.70 Lt.	0	0	0	24			1	4	2	1	1	1	1	1	1	7	5	2	
Sta 894+32.70 to 894+45.19 Lt.	2	2	2	8		1	1												
TOTAL	4	4	4	112	0	2	6	16	8	4	4	4	4	4	4	28	20	8	

W-BEAM GUARD RAIL

Sta 891+55.38 to 891+67.87 Rt.	12.5	LF
Sta 891+92.87 to 892+07.27 Rt.	14.4	LF
Sta 891+92.87 to 892+07.27 Rt. Med.	14.4	LF
Sta 893+93.30 to 894+07.70 Lt. Med.	14.4	LF
Sta 893+93.30 to 894+07.70 Lt.	14.4	LF
Sta 894+32.70 to 894+45.19 Lt.	12.5	LF
TOTAL	82.6	LF

* These items are not to be bid separately but shall be incidental to the price bid for the item "W-Beam Guardrail".

REMOVE BEAM GUARDRAIL AND POSTS

Sta 890+66.65 to 892+05.75	139.4	LF
Sta 888+91.35 to 892+05.75 Rt. Med.	314.4	LF
Sta 893+94.82 to 895+33.92 Lt.	139.4	LF
Sta 893+94.82 to 897+09.22 Lt. Med.	314.4	LF
TOTAL	907.6	LF

RESET W-BEAM GUARDRAIL

Sta 889+80.77 to 891+55.38 Rt.	175	LF
Sta 891+67.87 to 891+92.87 Rt.	25	LF
Sta 891+55.37 to 891+92.87 Rt. Med.	37.5	LF
Sta 894+07.70 to 894+45.20 Lt. Med.	37.5	LF
Sta 894+07.70 to 894+32.70 Lt.	25	LF
Sta 894+45.19 to 896+19.80 Lt.	175	LF
TOTAL	475	LF

Thrie/W-Beam Guardrail Quantities

Green River Bridges

Mile 70.364
I-94

524172

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	23

W-BEAM G. R.-FLARED END TREAT. & TRANSITION

W-BEAM G. R.-FLARED END TREAT. & TRANSITION QUANTITIES

	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	5/8" @ 8" LONG CARRIAGE BOLT	5/8" x 1 1/4" LONG BUTTON HEAD BOLT	5/8" @ LONG BUTTON HEAD BOLT	16" x 8" x 6'-0" TIMBER POST	16" x 6" x 14" TIMBER BLOCK	BCT TERMINAL POSTS	BCT TERMINAL POST BASE PLATE	BCT CABLE ASSEMBLY	BCT BEARING PLATE	BCT ANCHOR PLATE	W BEAM END SECTION (BUFFER)	W-BEAM TERMINAL CONNECTOR	5/8" @ x 1 1/2" LONG HEX BOLT	5/8" @ x 3" LONG HEX BOLT	RE-FLECTOR PLATE	12'- 6" W BEAM RAIL SECTION	25'-0" W BEAM RAIL SECTION
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 889+43.90 to 889+80.77 Rt.	2	17	4	4	4	2	2	1	1	1	1	1	8	6	2	1	1	
TOTAL	2	17	4	4	4	2	2	1	1	1	1	1	8	6	2	1	1	

W-BEAM G.R. FLARED END TREAT. & TRANSITION

Sta 889+43.90 to 889+80.77 Rt.	1 EACH
TOTAL	1 EACH

* These items are not to be bid separately but shall be included in the price bid for the item "W-Beam G. R.-Flared End Treat. & Transition."

REMOVE END TREATMENT & TRANSITION

Sta 890+29.95 to 890+66.65 Rt.	1 EACH
Sta 888+54.15 to 888+91.35 Rt. Med.	1 EACH
Sta 897+09.22 to 897+46.42 Lt. Med.	1 EACH
Sta 895+33.92 to 895+70.68 Lt.	1 EACH
TOTAL	4 EACH

RESET W-BEAM G.RAIL- FLARED END TRET. & TRANS.

Sta 891+18.15 to 891+55.37 Rt. Med.	1 EACH
Sta 894+45.20 to 894+82.42 Lt. Med.	1 EACH
Sta 896+19.20 to 896+56.67 Lt.	1 EACH
TOTAL	3 EACH

524172

W-Beam G.R. Flared End
Treat. & Transition Quantities

Green River Bridges

Mile 70.364
I-94

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(040)070	24

THREE CABLE SUMMARY OF QUANTITIES *

LOCATION	THREE CABLE QUANTITIES											
	18"x 18" x 6" PRECAST CONCRETE BEARING BLOCK	LINE POST	END POST	CABLE SPLICE ASSEMBLY	CONCRETE ANCHOR	BREAK-AWAY ANCHOR ANGLE	STEEL TURN-BUCKLE CABLE END ASSEMBLY	TRAN-SITION BRAC-KET	5/16"x3/4" HOOK BOLT	@ CABLE	LINE POST PLATE WASHER	REFLEC-TORIZED PLATES
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 887+60.39 to 891+68.62 Rt. Med.	1	48	1	0	2	2	6	2	144	1295	48	8
Sta 894+31.95 to 898+40.18 Lt. Med.	1	48	1	0	2	2	6	2	144	1295	48	8
	2	96	2	0	4	4	12	4	288	2590	96	16

* These items are not to be bid separately but shall be included in the price bid for the item "Three Cable Guardrail".

3-CABLE GUARDRAIL

Sta 887+60.39 to 891+68.62 Rt. Med.	408.25 LF
Sta 894+31.95 to 898+40.18 Lt. Med.	408.25 LF
TOTAL	816.5 LF

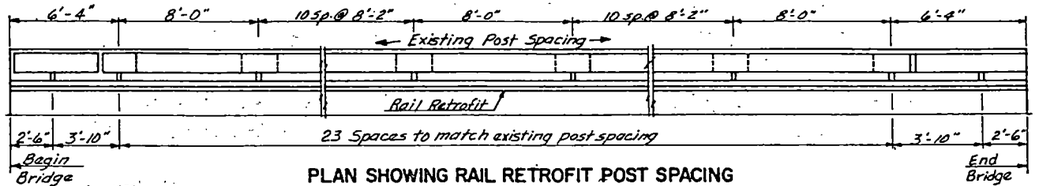
Three Cable Guardrail Quantities

Green River Bridges
Mile 70.364
I-94

524172

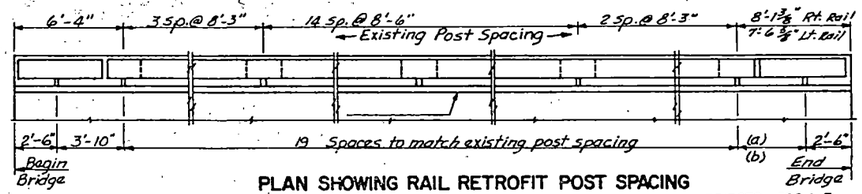
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(57)042	111

Revised 2-6-85



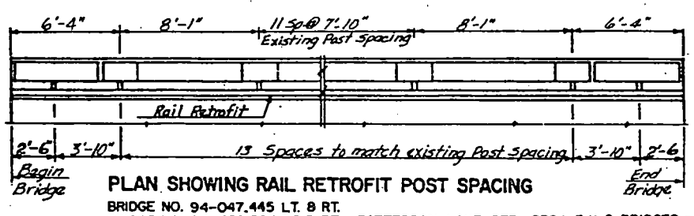
PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-070.364 GREEN RIVER. 400 L.F. X 2 BRIDGES = 800 L.F.
LT. & RT.



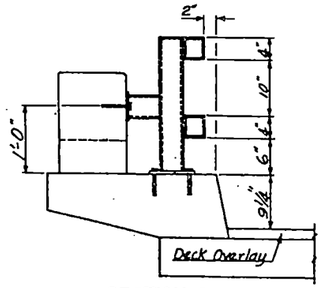
PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-073.264 LT. & RT. BNRR & MINOR RD. SEP. 349 L.F. X 2 BRIDGES = 698 L.F.



PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-047.445 LT. & RT.
BRIDGE NO. 94-056.384 LT. & RT. PATTERSON LAKE SEP. 230 L.F. X 2 BRIDGES = 460 L.F.



SECTION OF RAIL

NOTES

RAIL EXPANSION JOINTS

THE STRUCTURES AT THE BNRR-MINOR ROAD SEPARATION SHALL HAVE RAIL EXPANSION JOINTS. THE EXPANSION JOINT SPLICE SLEEVES SHALL BE INSTALLED BETWEEN THE THIRD AND FOURTH POST FROM EACH END OF THE STRUCTURES. THE STRUCTURES AT GREEN RIVER, ZENITH SEPARATION AND PATTERSON LAKE SEPARATION DO NOT REQUIRE RAIL EXPANSION JOINTS.

EXISTING RAILING

THE EXISTING ORNAMENTAL METAL RAILING SHALL BE REMOVED AND SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ANY HOLES REMAINING AFTER REMOVAL OF THE ORNAMENTAL RAILING SHALL BE FILLED WITH GROUT. THE WORK TO REMOVE THE ORNAMENTAL RAILING AND TO FILL THE HOLES WITH GROUT SHALL BE INCIDENTAL TO THE BID ITEM "DOUBLE BOX BEAM RAIL RETROFIT".

CONCRETE BLOCKS

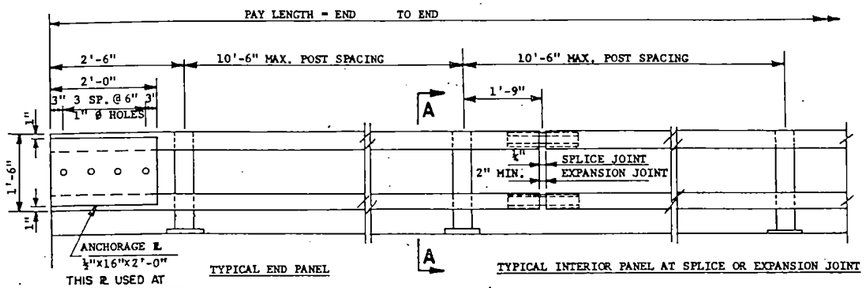
THE ENTRANCE END OF EACH BRIDGE HAS SPECIAL CONCRETE BLOCKS ATTACHED TO THE RAIL END POSTS. THESE CONCRETE BLOCKS SHALL BE REMOVED TO FACILITATE THE BRIDGE RAIL AND APPROACH GUARD RAIL. THE WORK TO REMOVE THE CONCRETE BLOCKS SHALL BE INCIDENTAL TO THE BID ITEM "DOUBLE BOX BEAM RAIL RETROFIT".

12 10 4

QUANTITIES	
Double Box Beam Railing Retrofit (Braced Post)	1958 L.F.

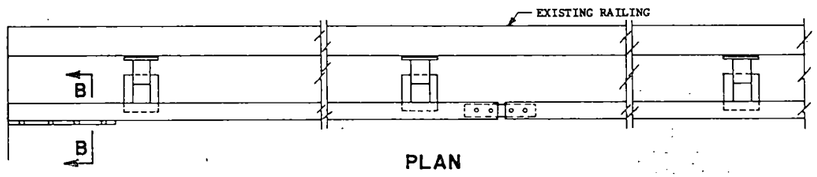
I-94 RAIL RETROFIT

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(37)042	112

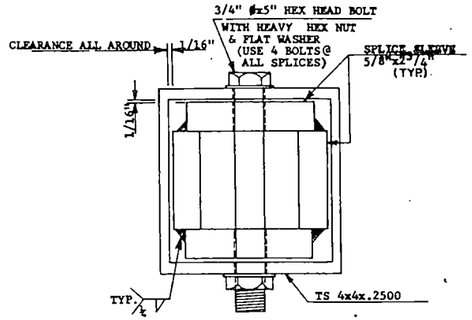


THIS ℄ USED AT CEMETARY ROAD SEP. & EAST DICKINSON INT.
FOR BELFIELD INT. SEE DETAIL "A"

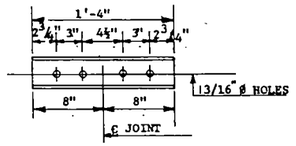
ELEVATION



PLAN



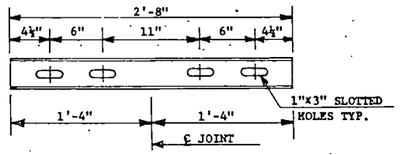
RAIL SPLICE



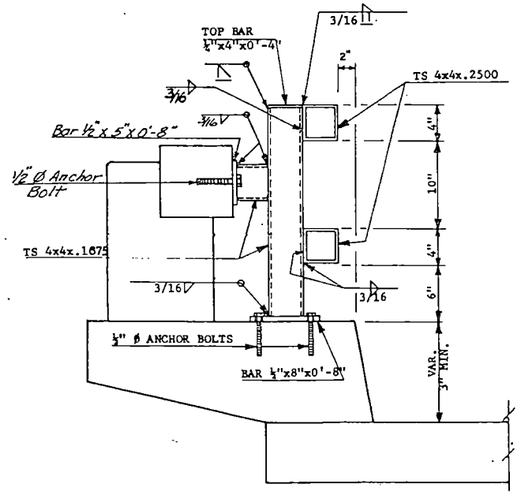
SPLICE SLEEVE AT SPLICE

NOTES:

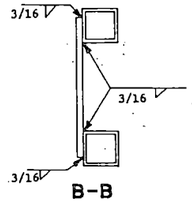
1. THE BID ITEM SHALL BE "DOUBLE BEAM RAILING RETROFIT". THE PAY LENGTH SHALL BE END TO END AND SHALL BE IN LINEAL FEET.
2. THE RAILING, POSTS AND POST SUPPORTS SHALL CONFORM TO ASTM A500, COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES, GRADE B. THE POST TOPS, POST BASE, SUPPORT BASE, SHIMS AND ANCHORAGE PLATES SHALL CONFORM TO ASTM A36 STRUCTURAL STEEL.
3. THE ANCHOR BOLTS MUST BE ABLE TO DEVELOP IN TENSION THE EQUIVALENT OF A ¾" ø A325 BOLT. THE ANCHOR BOLTS MAY BE MECHANICAL TYPE, GROUT-IN TYPE OR OTHER TYPE THAT CAN DEVELOP THE REQUIRED TENSION IN THE EXISTING CONCRETE.
4. THE TRAFFIC FACE OF THE POST SHALL BE INSTALLED VERTICAL. THE POSTS SHALL BE PERPENDICULAR TO THE TOP OF THE CURB IN THE OTHER DIRECTION. STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQUIRED FOR PROPER ALIGNMENT.
5. RAILS SHALL BE FABRICATED SO THAT EACH RAIL IS ATTACHED TO A MINIMUM OF 2 POSTS AND A MAXIMUM OF 4 POSTS
6. THE BOX BEAM RAILING RETROFIT SHALL BE FABRICATED AND GALVANIZED ACCORDING TO SECTION 850-6 OF THE STANDARD SPECIFICATIONS.
7. THE SPLICE JOINT GAP SHALL ALWAYS BE ½". THE EXPANSION JOINT GAP SHALL BE 2" UNLESS OTHERWISE SHOWN ON THE BRIDGE PLANS.



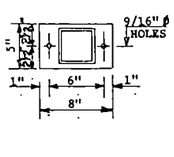
SPLICE SLEEVE AT EXPANSION JOINT



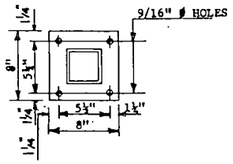
A-A



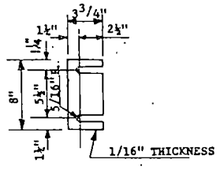
B-B



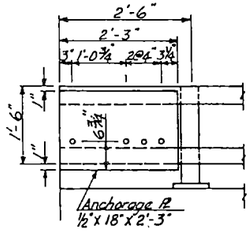
SUPPORT BASE DETAIL



POST BASE DETAIL



POST SHIM



DETAIL "A"

DOUBLE BOX BEAM RAIL RETROFIT

(BRACED POST)

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	IR-094-1(36)018	1

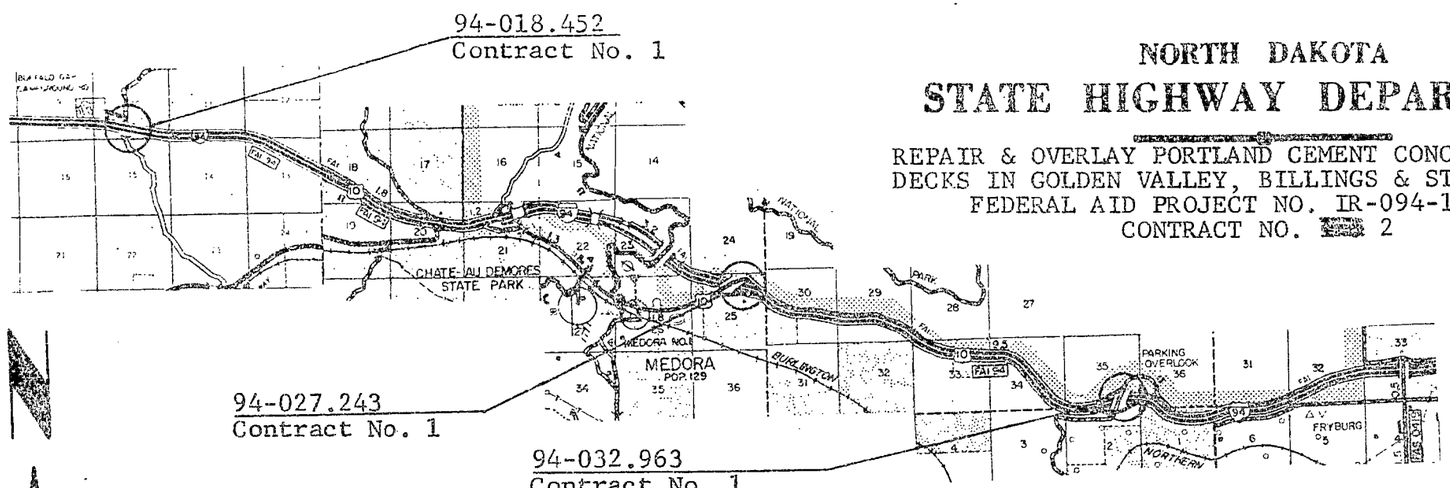
NORTH DAKOTA

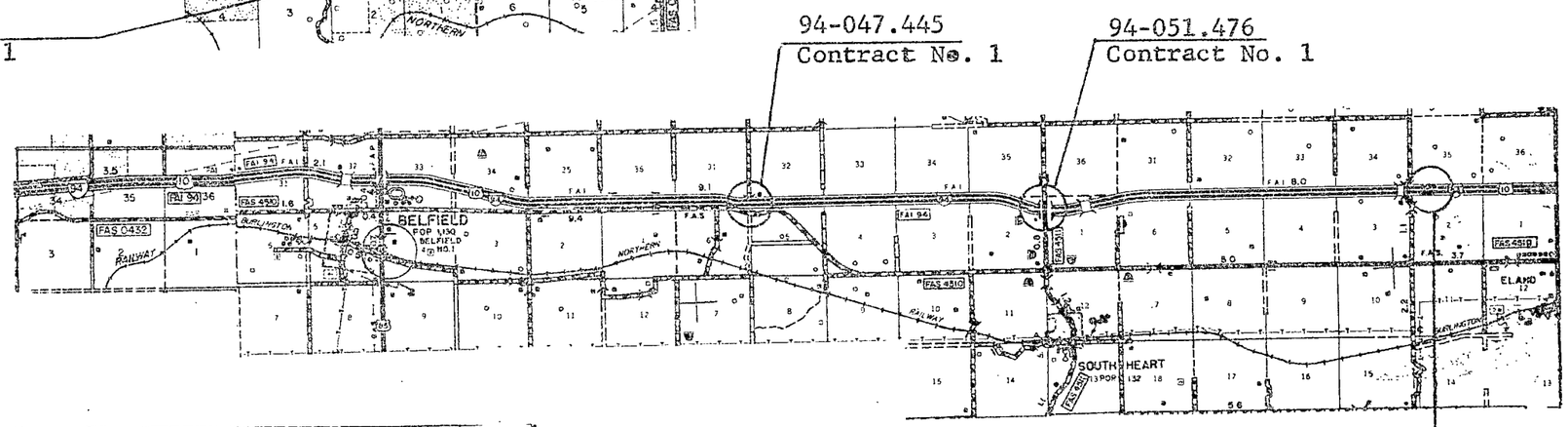
STATE HIGHWAY DEPARTMENT

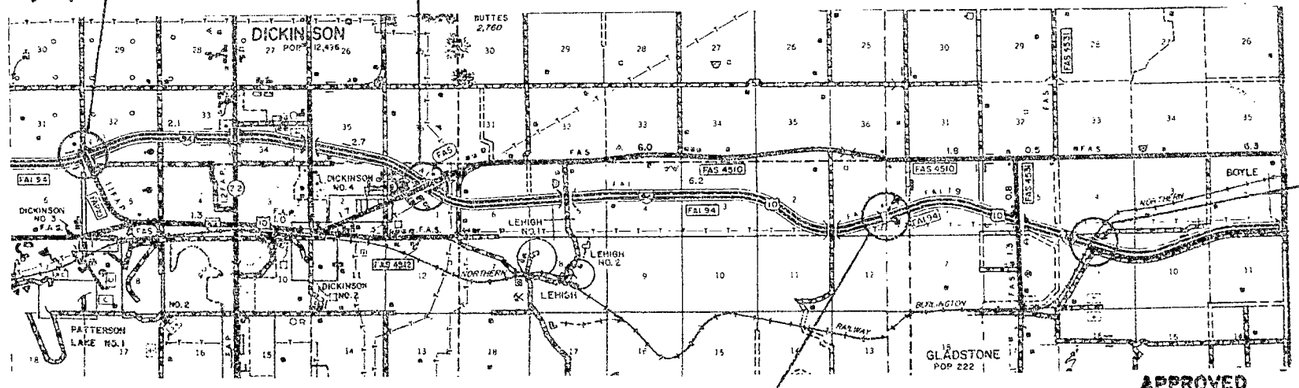
REPAIR & OVERLAY PORTLAND CEMENT CONCRETE BRIDGE DECKS IN GOLDEN VALLEY, BILLINGS & STARK COUNTIES
FEDERAL AID PROJECT NO. IR-094-1(36)018
CONTRACT NO. 2

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway Department, Oct. 1976, and approved by the Federal Highway Administration on December 17, 1976, and other Contract Provisions submitted herewith.







APPROVED DATE 1-4-80

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

R. E. BRADLEY
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA 880

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	BR-094-1(35)018	13	

NOTES

THE CONTRACTOR SHALL NOTIFY THE DISTRICT OFFICE OF THE STATE HIGHWAY DEPARTMENT WELL IN ADVANCE OF ANY WORK REQUIRED TO BE DONE BY THE STATE MAINTENANCE SO AS NOT TO INTERFERE WITH THE CONTRACTOR'S OPERATIONS.

STRUCTURAL DETAILS OF SPECIFIC STRUCTURES ARE AVAILABLE AT THE DISTRICT OFFICE OR AT THE BRIDGE DIVISION OF THE CENTRAL OFFICE IN BISMARCK.

LIMITS OF CLASS 2 AND 3 OVERLAY SHALL BE DETERMINED BY THE ENGINEER AND OUTLINED WITH SOME SUITABLE MARKING. THESE AREAS SHALL NOT BE EXPANDED UNLESS APPROVED BY THE ENGINEER.

ANY REINFORCING STEEL WHICH IS REPLACED IN THE DECK OR ABUTMENT SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 1075 OF THE ND STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES. THE LAP LENGTH SHALL BE A MINIMUM OF 30 DIAMETERS. NO WELDED SPLICES WILL BE ALLOWED.

THE OVERLAY SHALL BE PLACED OVER ONE HALF OF THE BRIDGE FROM THE LONGITUDINAL CENTERLINE TO THE CURB IN ONE CONTINUOUS POUR. TRAFFIC SHALL BE MAINTAINED ON THE OTHER HALF OF THE ROADWAY.

CANOPY

SHOULD THE DEPTH OF CONCRETE REMOVAL MAKE IT POSSIBLE FOR THE CHIPPING HAMMER TO PENETRATE THE FULL DEPTH OF THE SLAB, A MEANS OF PROTECTING THE ROADWAY BENEATH THE STRUCTURE FROM FALLING DEBRIS SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER.

PAYMENT FOR SUCH PROTECTION WILL BE MADE IN ACCORDANCE WITH SECTION 109.5 OF THE ND STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.

SHOULDER DAMAGE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE DONE TO THE ROADWAY SHOULDERS DURING THE OVERLAY OPERATIONS.

SUB-BASE MATERIAL

THE COST OF PLACING ANY REQUIRED AGGREGATE UNDER THE REPLACED APPROACH PANELS AND THE PCC PAVEMENT PANELS, INCLUDING THAT REQUIRED TO BRING THEM TO THE PROPER GRADE, SHALL BE INCIDENTAL TO THE ITEMS REMOVE AND REPLACE APPROACH SLAB AND REMOVE AND REPLACE PCC PAVEMENT.

PANEL REMOVAL

THE THICKNESS OF THE EXISTING PCC PAVEMENT PANELS AND/OR THE APPROACH SLAB MAY VARY FROM THE ORIGINAL PLACEMENT THICKNESS DUE TO MUDJACKING WHICH HAS BEEN DONE BY MAINTENANCE FORCES ON SOME STRUCTURES. THE COST OF ANY EXTRA REMOVAL SHALL BE INCIDENTAL TO THE ITEMS REMOVE AND REPLACE PCC PAVEMENT AND REMOVE AND REPLACE APPROACH SLAB.

CLASS OF CONCRETE

THE CONCRETE MIX USED IN THE OVERLAYS SHALL BE AS SPECIFIED IN THE SPECIAL PROVISIONS. ALL OTHER CONCRETE SHALL BE EITHER CLASS AE-1 OR AE-3 AT THE OPTION OF THE CONTRACTOR.

GUARD RAIL

IF THE CONTRACTOR WISHES TO REMOVE ANY APPROACH GUARD RAIL IN CONNECTION WITH PLACING CURB AND GUTTER SECTIONS OR APPROACH TAPERS, HE SHALL DO SO FOR HIS CONVENIENCE ONLY. THE COST OF ANY SUCH REMOVAL SHALL BE AT THE CONTRACTOR'S EXPENSE, AND THE RAILING SHALL BE REPLACED TO EXISTING CONDITIONS.

HOT BITUMINOUS PAVEMENT-SPECIAL

THE ASPHALT CEMENT AND THE TACK COAT ARE NOT SEPARATE PAY ITEMS, BUT SHALL BE INCLUDED IN THE PRICE BID FOR "HOT BITUMINOUS PAVEMENT-SPECIAL". THE AGGREGATE USED FOR HOT BITUMINOUS PAVEMENT AND THE TYPE AND GRADE OF LIQUID ASPHALT FOR TACK SHALL BE APPROVED BY THE ENGINEER IN THE FIELD. THE HOT BITUMINOUS PAVEMENT MATERIAL SHALL BE HOT MIXED, BLADE LAID, COMPACTED AND MAY BE OBTAINED FROM A COMMERCIAL SOURCE. IT IS INTENDED THAT THE OPTIMUM AMOUNT OF ASPHALT CEMENT BE USED IN THE MIX, AND THE QUANTITY SHOWN UNDER THE BASIS OF ESTIMATE MAY BE ADJUSTED BY THE ENGINEER IF NECESSARY.

TWO-LANE, TWO-WAY ROADWAYS

THE MAINTENANCE AND PROTECTION OF TRAFFIC FOR TWO-LANE, TWO-WAY ROADWAYS PROVIDES FOR FLAGGING THE TRAFFIC AT ALL TIMES UNTIL ROADWAY IS COMPLETELY OPEN TO TRAFFIC. IN LIEU OF PROVIDING FLAGGING AT ALL TIMES, A TRAFFIC SIGNAL SYSTEM MAY BE PROVIDED. THE TRAFFIC SIGNAL SYSTEM SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE PRE-CONSTRUCTION CONFERENCE.

SPECIAL PROVISIONS

NO.	NAME
SP-107-7	LEGAL RELATIONS & RESPONSIBILITY TO PUBLIC
SP-109-3	MEASUREMENT & PAYMENT
SP-762-6	MAINTENANCE & PROTECTION OF TRAFFIC
SP-103-3	AWARD & EXECUTION OF CONTRACT
SP-193	RAILWAY PROTECTION INSURANCE
SP-610-3	PORTLAND CEMENT CONCRETE
SP-112	PRESSURE RELIEF JOINT FILLER
SP-262	REPAIR & OVERLAY OF P.C.C. BRIDGE DECK WITH LOW SLUMP CONCRETE
SP-756-2	FIELD LABORATORY
SP-108-9	PROSECUTION & PROGRESS
SP-746-1	FLAGGING
SP-806-3	AGGREGATES FOR PORTLAND CEMENT CONCRETE, STRUCTURAL & PAVING MORTAR SAND & UNDER-DRAIN GRANULAR FILL
SP-108-9	PROSECUTION & PROGRESS
SP-406-7	HOT BITUMINOUS PAVEMENT
SP-406-8	HOT BITUMINOUS PAVEMENT

LIST OF STANDARDS

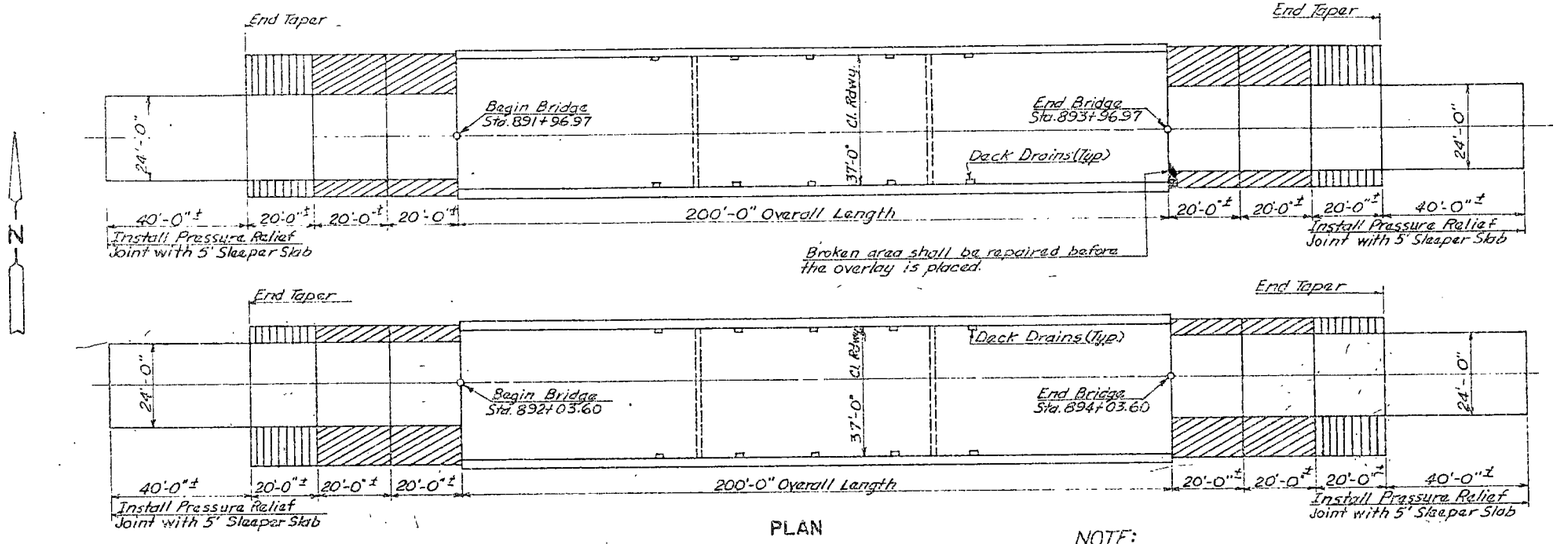
D-708-6

SUMMARY OF QUANTITIES
ESTIMATE OF QUANTITIES

SPEC. NO.	103	406	705	708	746	750	756	762	900	900	900	900	900	900	900	900
CODE NO.	0100	0230	0100	0300	0100	0100	0100	3298	9499	9501	9581	9582	9700	9701	9702	9705
BRIDGE NO. & NAME	CONTRACT BOND	HOT BITUMINOUS PAVEMENT-SPECIAL	MOBILIZATION	CURB & GUTTER TYPE I	FLAGGING	LINSEED OIL TREATMENT	FIELD LAUORATORY TYPE "A"	TRAFFIC CONTROL	10" P.C.C. PAVING (REMOVE & REPLACE)	APPROACH SLAB (REMOVE & REPLACE)	PRESSURE RELIEF JT. (5' SLEEPER SLAB)	PRESSURE RELIEF JT. (3' SLEEPER SLAB)	CLASS I OVERLAY	CLASS II OVERLAY	CLASS III OVERLAY	OVERLAY TAPER
	L. S.	TON	L.S.	L.F.	M. H.	GAL.	E.A.	L.S.	S.Y.	S.Y.	L.F.	L.F.	S.Y.	S.Y.	S.Y.	S.Y.
WEST DICKINSON 94-059.485	1	26.0	1	20	240	11.5	1	1					766.7	191.7	38.3	
EAST DICKINSON 94-054.204		61.1		160	256	12.8							830.0	212.5	42.5	
GREEN RIVER 94-070.564 LT.					160	12.3					48.0		822.2	205.6	41.1	435.6
GREEN RIVER 94-070.564 RT.					160	12.3					48.0		822.2	205.6	41.1	435.8
BARR SEP 94-073.284 LT.					120	17.7			97.3	229.2	24.0	24.0	678.3	169.6	33.9	217.8
BARR SEP 94-073.284 RT.					120	17.7			97.3	229.2	24.0	24.0	678.3	169.6	33.9	217.8
GRAND TOTAL	1	87.1	1	180	1,056	84.3	1	1	114.6	458.4	144.0	48	4,817.7	1,154.6	230.8	1,309.8

NOTES & QUANTITIES

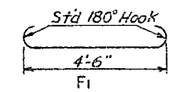
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	IR-094-1(36)018	16	

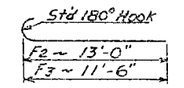


PLAN

NOTE:
The Overlay is to extend over the joint at the ends of the bridge. A saw cut shall then be made in the overlay at these locations within 24 hours of pouring the overlays. The width of the saw cut should match the maximum width of the existing joint. The sawed joint is to be filled with cold poured asphalt.

BAR LIST				
MARK	NO.	SIZE	LENGTH	SHAPE
F1	96	4	5'-6"	Bent
F2	28	4	13'-6"	"
F3	28	4	12'-0"	"

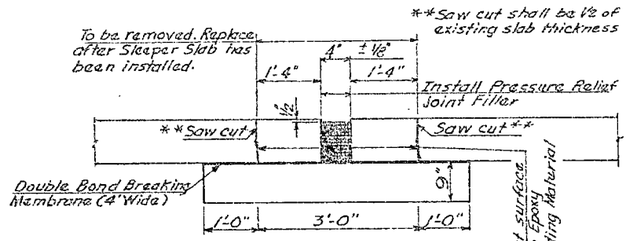




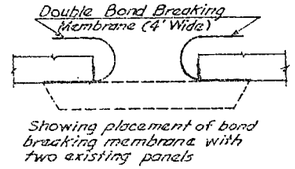
BENT BAR DETAILS
Dimensions shown are out to out.

Asphalt shoulders shall be brought to grade with asphalt. Incidental to "Overlay Taper"

Asphalt shall be removed from top of concrete & surface cleaned. It shall then be brought to grade with overlay material. Removal & extra thickness shall be incidental to "Overlay Taper"



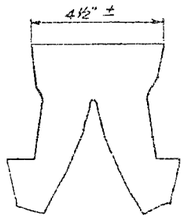
PRESSURE RELIEF JOINT WITH 5' SLEEPER SLAB

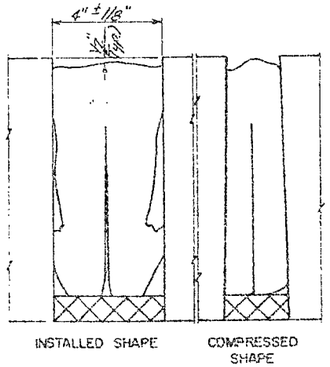


Showing placement of bond breaking membrane with two existing panels

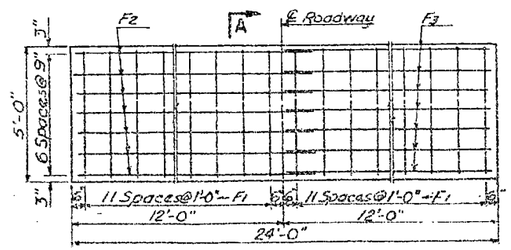
FOAM SPACER

If Joint Filler does not bottom on pavement base, a rigid polystyrene or polyurethane foam spacer shall be placed below filler and must be a material which is easily compressible.

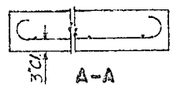




CELLULAR PLASTIC PRESSURE RELIEF JOINT FILLER



5' SLEEPER SLAB
4 Required

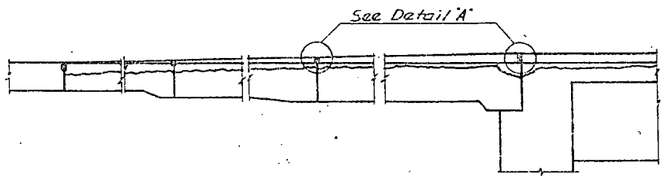


QUANTITIES

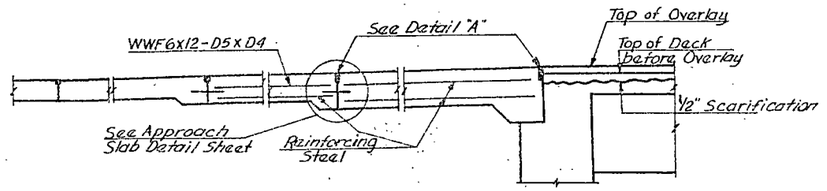
GREEN RIVER

94-070.364-5

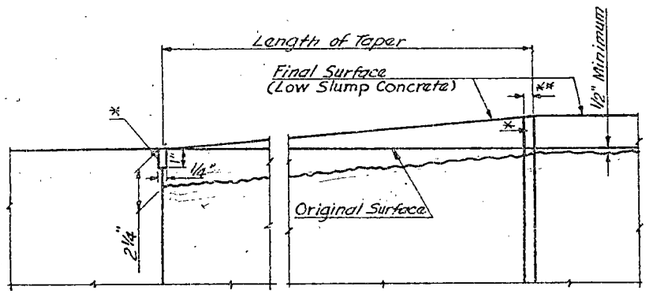
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	IR-094-1(36)018	20	



APPROACH SLAB
(Slab overlayed)



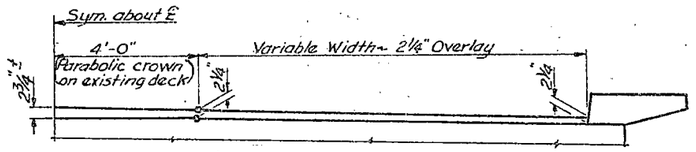
APPROACH SLAB
(Full depth removal & replacement to final surface grade)



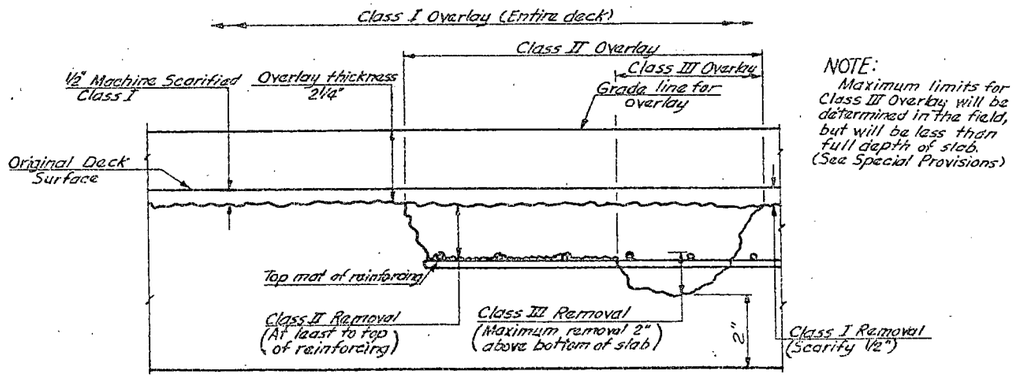
DETAIL "A"

* To be filled with hot poured joint filler

** Remove existing premolded joint filler & fill with hot poured joint filler. Width ½" ±



ELEVATION



NOTE:
Maximum limits for Class III Overlay will be determined in the field, but will be less than full depth of slab. (See Special Provisions)

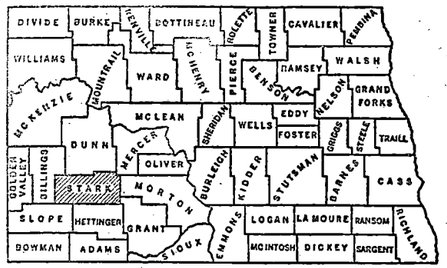
BRIDGE DECK

QUANTITIES

OVERLAY DETAILS

QUANTITIES CHECKED BY

1 Location



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

N
W E
S

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. = 10 FT.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN STARK COUNTY

FEDERAL AID PROJECT NO. I-94-2(9)70

STRUCTURAL

LIST OF STD. DRAWINGS
BRIDGE BENCH MARK STD. 7.6
FEDERAL AID NAME PLATE STD. 14.9

INDEX OF DRAWINGS

LENGTH OF PROJECT

PROJECT	MILES-GROSS	MILES-NET
I-94-2(9)	0.038	0.038
TOTALS	0.038	0.038

LIST OF STRUCTURAL DRAWINGS

94-31	H-0401
94-31-1	H-0501
94-31-2	H-6169-1
94-31-3	H-6169-2
94-31-4	H-6263
94-31-5	H-6398
H-0119	H-6416
H-0120	H-6417

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-94-2(9)	1	32

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department July, 1961 and approved as standard by the Bureau of Public Roads Dec. 29, 1961 Required Special Provisions dated June 15, 1959 and approved by the 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 ELEVATION
- GRADE
- 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

DESIGN DATA

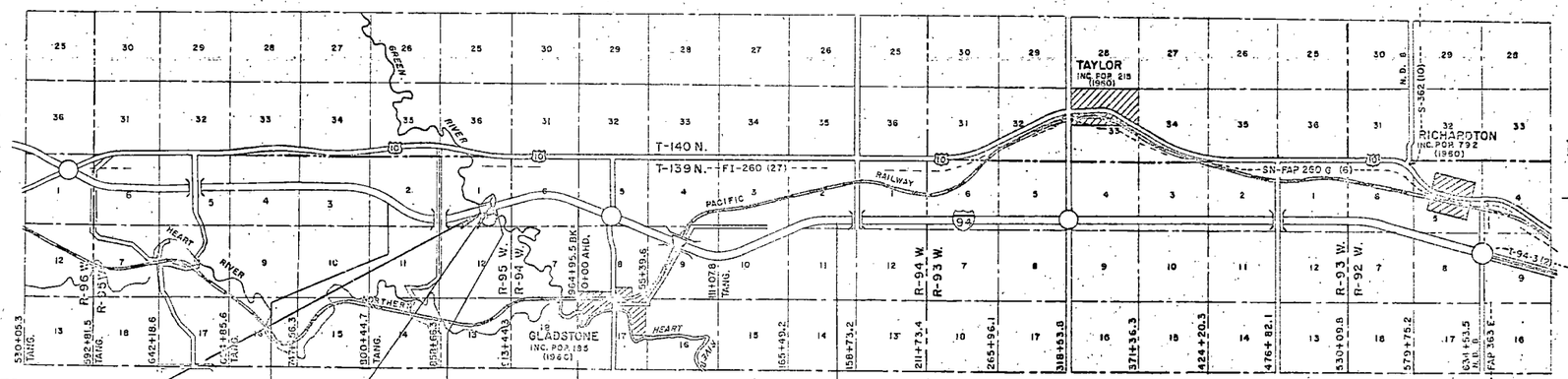
TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1962)	2000 PASS. 350 TRUCKS 2350 TOTAL	350
TRAFFIC FORECAST (1975)	4560 PASS. 800 TRUCKS 5360 TOTAL	600

DESIGN SPEED 70 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600'
FULL CONTROL OF ACCESS.
NO POINT OF ACCESS, OTHER THAN BY RAMPS AT INTERCHANGES

LEGEND

- INTERCHANGE
- HIGHWAY GRADE SEPARATION (NO CONNECTION)
- OTHER BRIDGE
- SERVICE ROAD
- TERMINATED CROSS-ROAD
- COMB. R.R. GRADE SEPARATION

DESIGN LOADING H20-S16 (1961) & ALT. LOADING DESIGNATED IN PPM 20-4, SECTION 4c.
CLEAR ROADWAY WIDTH STA. 895+00 37' (TWO)



Begin I-94-2(9)70
Sta. 892+00 ℄ Survey On I-94-2(7)
A Point 1218.70' North & 2069.9' West of the S.E. Cor. Sec. 1, T-139 N., R-95W.

EQUATION
817+29.2 P.T. N.Rdwy. Bk. =
816+61.9 S.Rdwy. Bk. =
816+55.6 ℄ Survey Ahd.

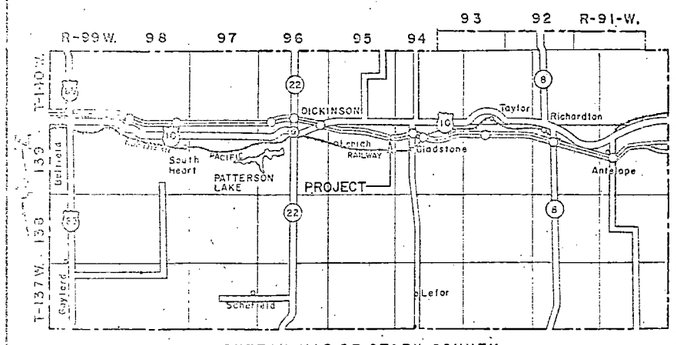
EQUATION
895+75.1 P.T. S.Rdwy. Bk. =
895+69.5 N.Rdwy. Bk. =
895+72.5 ℄ Survey Ahd.

EQUATION
964+95.5 BK. =
0+00 AHD.

EQUATION
205+96.1 BK. =
145+75.1 AHD.

End I-94-2(9)70
Sta. 894+00 ℄ Survey On I-94-2(7)
A Point 1272.9' North & 1376.9' West of the S.E. Corner Sec. 1, T-139N., R-95W.

LAYOUT MAP
5280 0 5280
SCALE IN FEET



SKETCH MAP OF STARK COUNTY

① See Special Provisions

QUANTITIES

LOCATION	13X ROADWAY EXCAVATION CLASS A	15B EXCAVATION CLASS 2	15C EXCAVATION CLASS 3	16 WATER	29A PIT RUN GRAVEL SUB-BASE CLASS 5	55A PRESTRESSED BEAMS (45'-11", 63'-10")	60A CONCRETE CLASS AE-2	60AA CONCRETE CLASS AAE-4	62A REINFORCING STEEL (INTERMEDIATE GRADE)	63A STRUCTURAL STEEL	65E STEEL EN-CASED CONCR. PILING 12¾" x .312" 40'	81 ORNAMENTAL METAL RAILING ALT. A	81 ORNAMENTAL METAL RAILING ALT. S	BRIDGE BENCH MARKS
	CU. YD.	CU. YD.	CU. YD.	M GAL.	CU. YD.	NO.	CU. YD.	CU. YD.	LBS.	LBS.	L.F.	L.F.	L.F.	SET
893+00	24,312	300	820	486	640	36	1171.8	18.18	179,992	4,488	1280	760	760	1
Grand Total	24,312	300	820	486	640	36	1171.8	18.18	179,992	4,488	1280	760	760	1
	① SP 73	① SP 100	① SP 100	① SP 82A	① SP 78A	① SP 86A	① SP 89A SP 69	① SP 68A SP 89	① SP 90					

APPROVED DATE 5-15-62

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER DATE

I-94-2(9)70

REVISED SCREED ELEVATIONS

I-94-2(9)

BRIDGE 94-31 (R)

GREEN RIVER

REVISED SCREED ELEVATIONS

I-94-2(9)

BRIDGE 94-31 (L)

GREEN RIVER

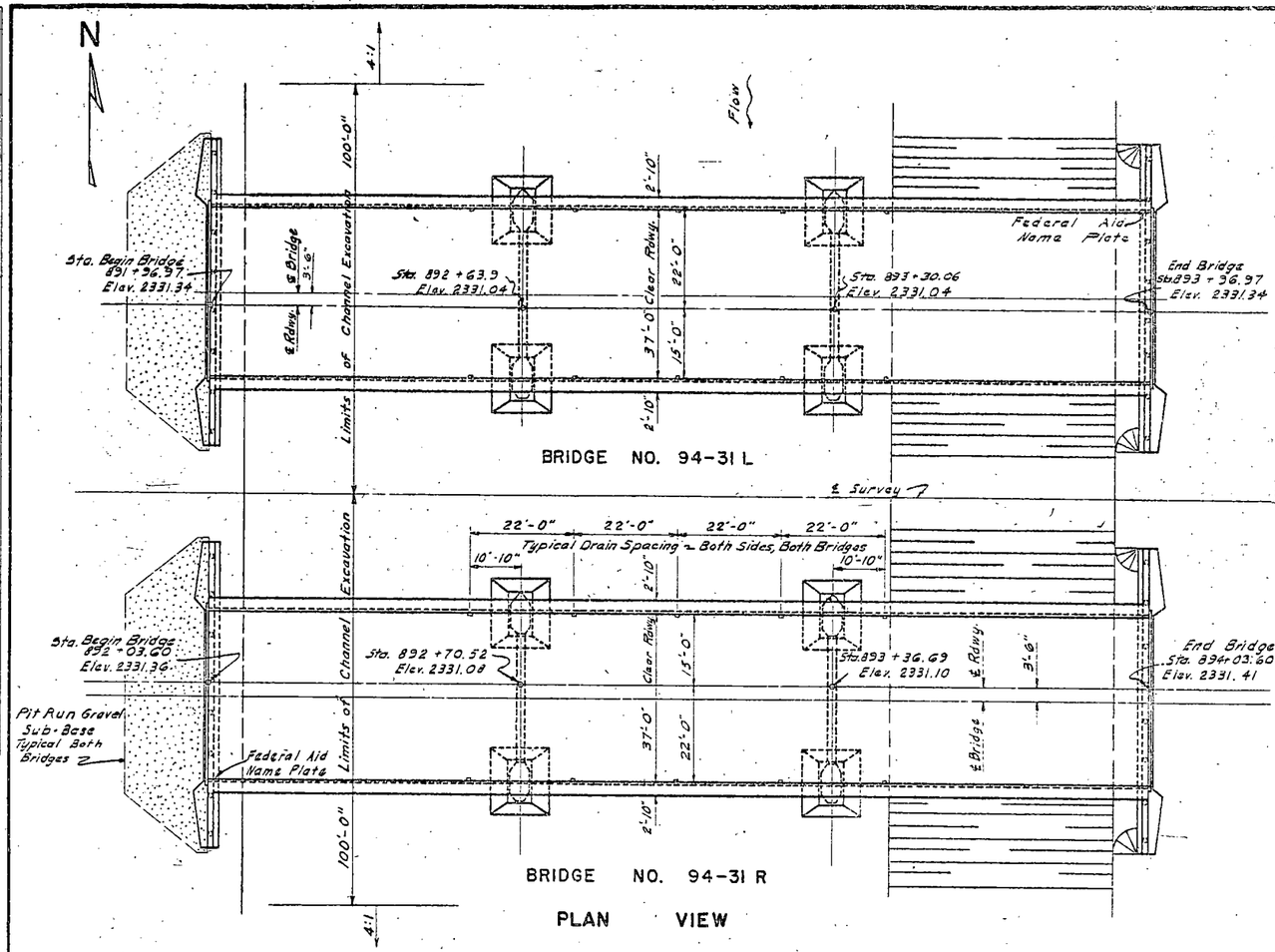
94-31

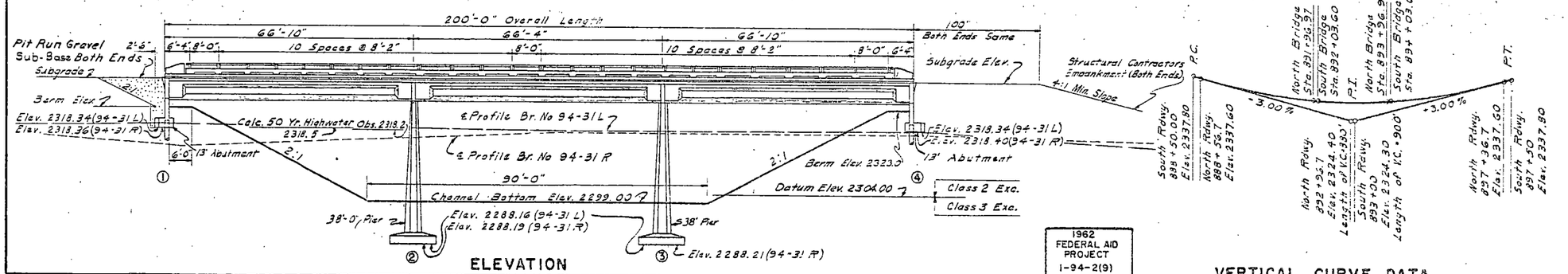
BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-081	5	N. D.	I-94-2(9)		8	32

94-070-364L&R

DATE	BY	REVISIONS

	PLOTTED BY	CHECKED BY
TOPOGRAPHY		
DETAILS	MADE BY W.A.B.	CHECKED BY E.J.G.
TRACING	MADE BY W.J.K.	CHECKED BY E.J.G.
QUANTITIES	MADE BY E.J.G.	CHECKED BY E.W.H.





ELEVATION

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
41	Ir. Mon. with Grd.	Sta. 893+33 - 146' Rt.	2317.77
42	Ir. Mon. with Grd.	Sta. 893+74 - 226' Rt.	2316.03
43	Ir. Mon. with Grd.	Sta. 904+03 - 172' Rt.	2323.09

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 * PENETRA.
Abutment	26.2 T.	12.7 T.	8.12 T.					47.1 T.	60 T.	16 Ft.
Pier	2.05 K/Sq.In.	1.0 K/Sq.In.	0.92 K/Sq.In.					3.98 K/Sq.In.		

* Below bottom of footing

94-31

NOTES:

GENERAL:

For Railing Notes see drawing H-C119 or H-C120.
For Hydraulic Design Data see drawing 94-31-2.
For Boring Log see drawing 94-31-4.
For abutment & Pier Cap elevations see drawing 94-31-1.

The deck slab concrete shall be struck off and compacted by an approved bridge deck finishing machine.

The cost of incidental items shown on the plans but not listed in the estimate of quantities shall be included in the unit price bid for the various pay items.

REINFORCING STEEL:

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" shall be given to the railing end posts; parapets; to the outside and roadway vertical faces of the curbs, and to the exposed faces of the abutment wing walls. All other surfaces shall be given the "Ordinary Surface Finish".

The entire curb shall be poured in one continuous run.

All concrete shall be Class AE-2, except the deck diaphragm over each pier which is to be concrete Class AAE-4.

All concrete shall be compacted by vibration.

ORNAMENTAL RAILING:

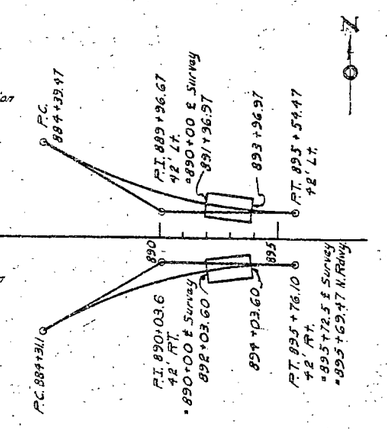
""The contractor is requested to submit bids for both Alternate "A" and Alternate "S" type Ornamental Metal Railing.

The Ornamental Railing to be used will be the one giving the lowest total project bid. In the event that the bids of the successful bidder are the same for both types of Ornamental Metal Railing, the state will select the type of railing to be used.

STEEL ENCASED PILING:

The pipe for the steel encased piles shall be 12-3/4" outside diameter with a wall thickness of .312", and end closure plate 1" thick.

(Note continued on Drawing No. 94-31-1)



ALIGNMENT LAYOUT

All Survey Points are office location

The following Special Provisions will apply for this structure location:

S.P.-88A Section 55-Concrete Bridge Construction.

S.P.- 89 Section 60-Portland Cement Concrete.

S.P.- 90 Section 62-Reinforcing Steel.

S.P.-100 Section 15-Excavation for Culverts and Bridges.

ESTIMATE OF QUANTITIES (TWO BRIDGES)

SPEC. NO.	BID ITEM			
12	REMOVING EXISTING STRUCTURE AT STA.			
13X	ROADWAY EXC. CLASS "A"			24,312 CU. YD.
15D	EXCAVATION CLASS 2			300 CU. YD.
15C	" CLASS 3			920 CU. YD.
16	WATER FOR COMPACTION (20 GAL./C.Y.)			488 M GAL.
60AA	CONCRETE CLASS AAE-4			18.19 CU. YD.
60A	" CLASS AE-2			1171.9 CU. YD.
29A	PIT RUN GRAVEL SUB-BASE "CLASS 5"			940 CU. YD.
62A	REINFORCING STEEL (INTERMEDIATE GRADE)			211632 179,994 LB.
63A	STRUCTURAL STEEL			4,486 LB.
64A	UNTREATED TIMBER			M.B.M.
64B	TREATED TIMBER			M.B.M.
65A	UNTREATED TIMBER PILING	42	FT.	LIN. FT.
65B	TREATED TIMBER PILING	42	FT.	LIN. FT.
65E	STEEL-ENCASED CONCRETE PILING (12 3/4" X .312")	38 @ 40'		1280 LIN. FT.
65K	UNTREATED TIMBER TEST PILES			EACH
65L	TREATED TIMBER TEST PILES			EACH
84	TEMPORARY CROSSING AND DETOUR			
-	BRIDGE BENCH MARKS			1 SET
55A	65'-10" PRESTRESSED BEAMS (43")			38 NO.
81	""ORNAMENTAL METAL RAILING ALTERNATE "A"			750 LIN. FT.
81	""ORNAMENTAL METAL RAILING ALTERNATE "S"			750 LIN. FT.

STRUCTURAL DRAWINGS

GENERAL DRAWING THIS SHEET	94-31, 94-31-2, 94-31-3, 94-31-4, 94-31-5
SUBSTRUCTURE	H-6288, H-6398, H-0401, H-0501
SUPERSTRUCTURE	H-669-I, H-669-2, H-647, H-646, H-019 OR H-0120, STD. 7.6, STD. 14.3

DESIGN LOADING: H20 S16

SCALE: 1 INCH = 15 FEET

1962 FEDERAL AID PROJECT I-94-2(9) NORTH DAKOTA 94-31

FEDERAL AID NAME PLATE

2 Required

VERTICAL CURVE DATA

Elevations to top of finished grade

	South Rdwy.	North Bridge Begin Bridge	South Bridge	P.I.	North Bridge	South Bridge End Bridge	P.T.	North Rdwy.	South Rdwy.
Sta.	888+50.00	891+36.97	892+03.60		893+96.97	894+03.60		897+36.7	897+50
Elev.	2337.80	2331.34	2331.36		2331.34	2331.41		2337.60	2337.80
Length of V.C. = 900'				892+93.7 Elev. 2324.40			South 893+00 Elev. 2324.30		
				-3.00 %			+3.00 %		

* DESIGN LOADING: H20 S16 AND ALTERNATE LOADING DESIGNATED IN PPM 20-4, SECTION 4c

DESIGN STRESSES:

- f_c 1200 LBS. PER SQ. IN.
- f_s 20,000 LBS. PER SQ. IN. REIN. STEEL
- f_s 18,000 LBS. PER SQ. IN. STRUCT. STEEL

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

GREEN RIVER
BRIDGE LAYOUT

PROJECT I-94-2(9) STA. 893+00

STARK COUNTY

APPROVED

1-26-62 DATE

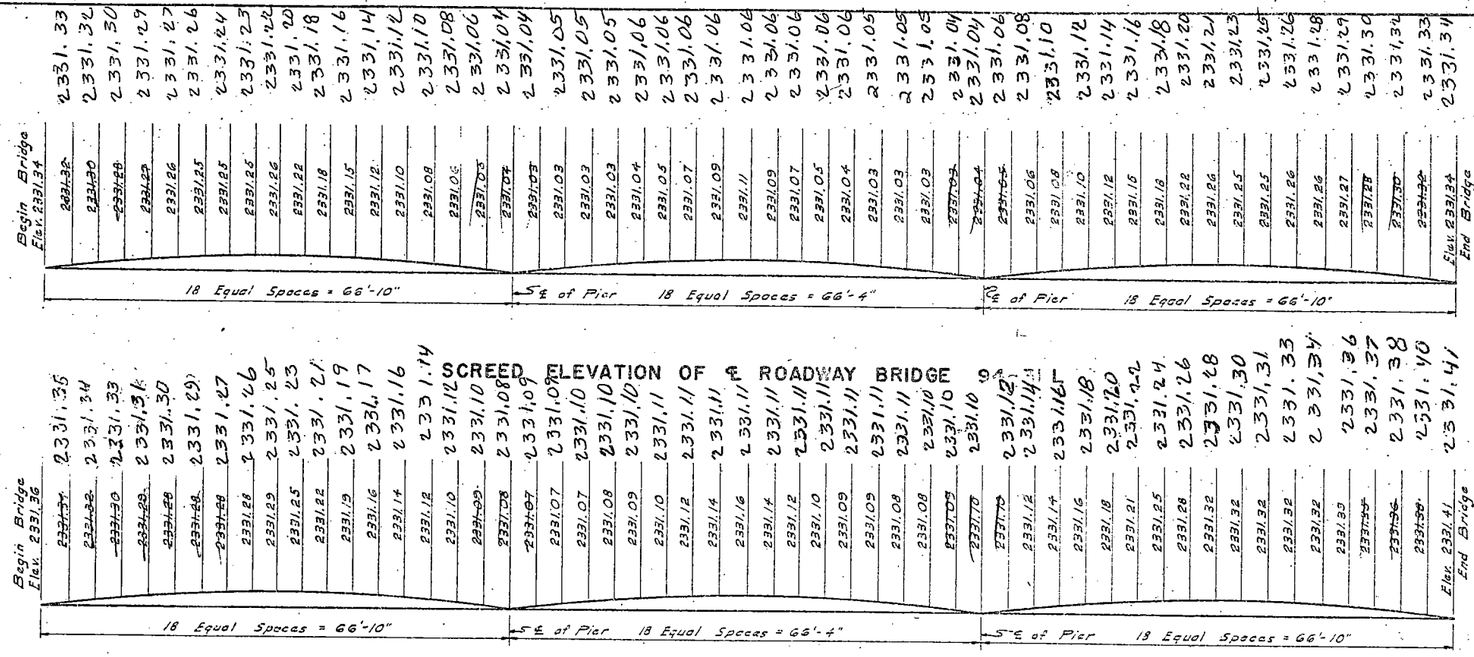
Joseph R. Kirby BRIDGE ENGINEER

JOSEPH R. KIRBY REGISTERED ENGINEER NORTH DAKOTA

94-31

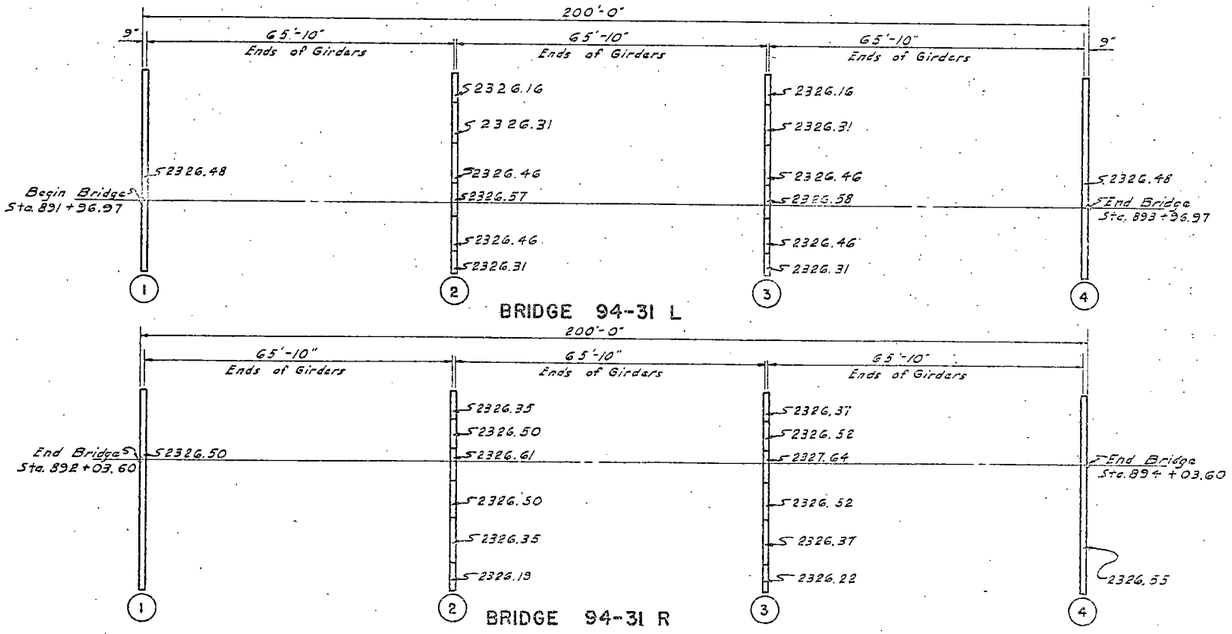
DESIGN	MADE BY		REVISIONS					CHK'D BY	DATE
	CHECKED BY								
	MADE BY	C.E.W.							
DETAILS	CHECKED BY	H.J.G.							
	MADE BY	W.J.K.							
TRACING	CHECKED BY	E.W.H.							
	MADE BY								
QUANTITIES	CHECKED BY								

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(9)		9	32



SCREED ELEVATION OF ℄ ROADWAY BRIDGE

SCREED ELEVATION OF ℄ ROADWAY BRIDGE 94-31 R



ABUTMENT & PIER CAP ELEVATIONS

NOTES Continued --

STRUCTURAL STEEL:

All Structural Carbon Steel shall conform to the latest ASTM A-2 Specifications.

Paint and painting shall conform to the "North Dakota Standard Specifications for Road and Bridge Construction", Sections 80 and 182.17.

WELDING:

The metal-arc process shall be used for all shop and field fabrication. All welding shall conform to the current specifications for Highway Bridges of the American Association of State Highway Officials.

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

PIER EXCAVATION:

The field engineer shall make a careful examination of the excavated area at the bottom of each pier footing and report his observations and findings to the Bridge Engineer for his instructions before any pier footing concrete is placed.

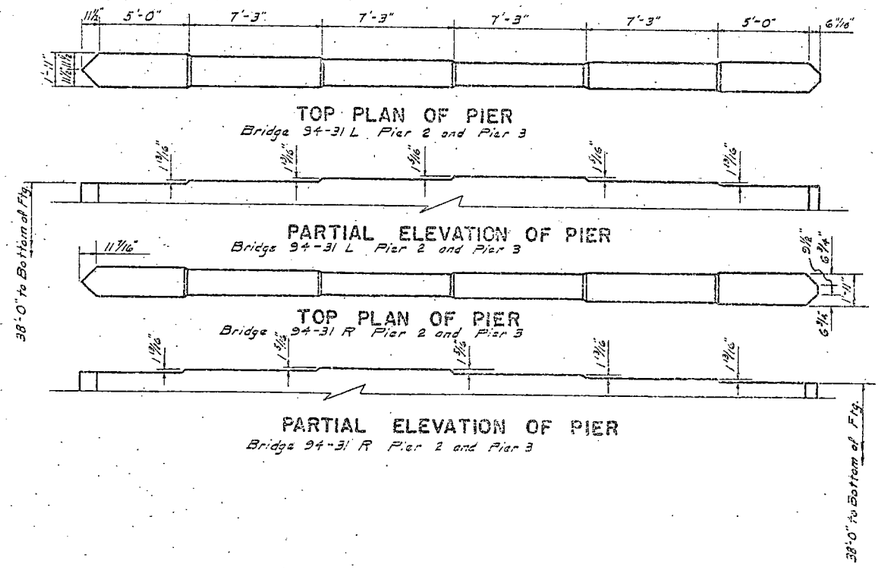
EMBANKMENT:

Earth consolidated shall be in accordance with Section 17.3(8)A of the Standard Specifications.

Embankment material shall be obtained from within the Channel Excavation limits as shown on Drawing No. 94-31.

Channel Excavation will not be paid for directly but shall be included in the contract bid item "Roadway Excavation, Class A".

The embankment at each end of the bridge shall be placed to the subgrade elevation, as staked by the engineer and shown as Structural Contractor's Embankment, and abutment Class 2 Excavation removed before any abutment filling are driven.



GREEN RIVER
ELEVATION LAYOUT

PROJ. I-94-2(9) STA. 893+00
STARK COUNTY

94-31-1

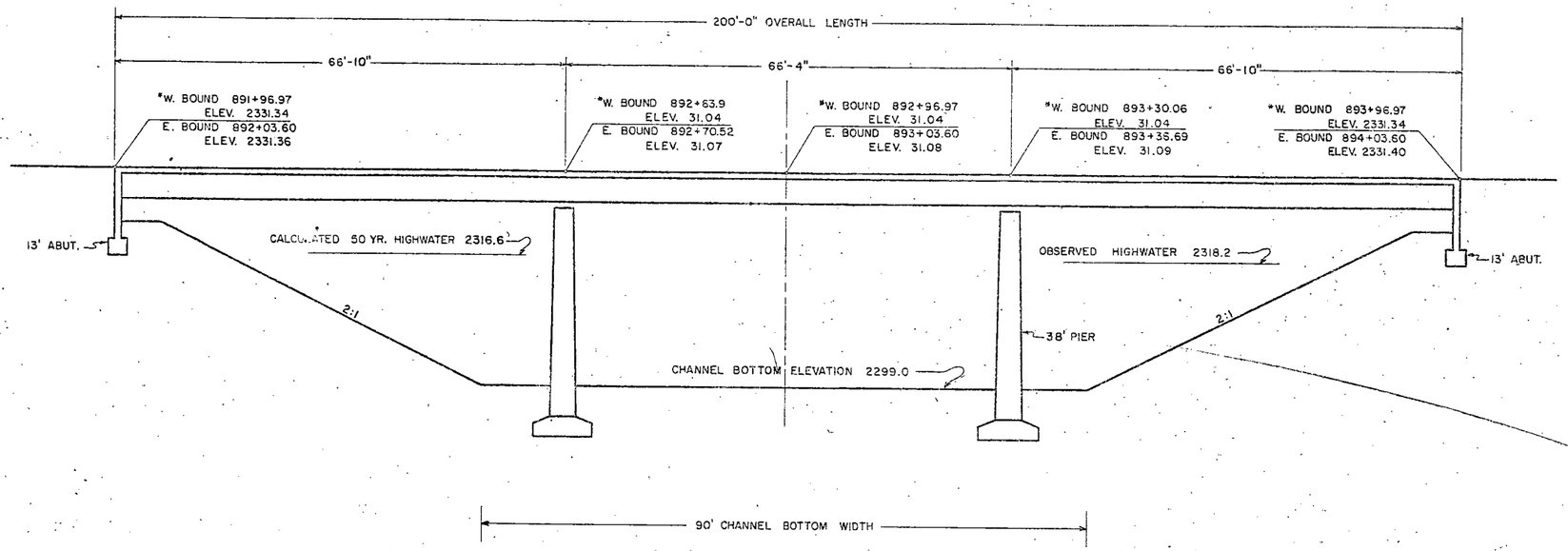
94-31-1

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	[illegible]		10	32

		DATE
SIGN	MADE BY	
	CHECKED BY	
DETAILS	MADE BY	
	CHECKED BY	
TRACING	MADE BY	
	CHECKED BY	
QUANTITIES	MADE BY	
	CHECKED BY	

REVISIONS

No. [illegible] and has been added to bring it up to date



HYDRAULIC DESIGN DATA

DRAINAGE AREA	358 SQ. MI.
DESIGN FREQUENCY	50 YR.
DESIGN DISCHARGE	12,000 C.F.S.
FLOW DEPTH, Q50	17.6 FT.
STREAM VELOCITY	3.79 F.P.S.
AVERAGE STREAM GRADIENT	0.001044 FT./FT.
VELOCITY THRU BRIDGE	5.77 F.P.S.
FREEBOARD PROVIDED	9.8 FT.
LOW WATER ELEV.	2303.30
WATERWAY PROVIDED	3815 SQ. FT.

DESIGN CRITERIA

TYPE	3-SPAN, 45" PRESTRESSED GIRDER BR.
DESIGN LOADING	H20 S16
ROADWAY WIDTH	37'-0"
RAILINGS	PARAPET WITH METAL RAILING
ABUTMENTS	13' FIXED END.
PIERS	38' DUMBBELL

* ELEVATIONS SHOWN MAY BE ADJUSTED VERY SLIGHTLY BY FINAL DESIGN.

BRIDGE NO. 94-31

GREEN RIVER

TOPOGRAPHIC LAYOUT

PROJ. I-94-2(9) STA. 893+00

STARK COUNTY

94-31-2

94-31-2

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(9)		11	32

DESIGN — MADE BY — CHECKED BY
DETAILS — MADE BY — CHECKED BY
...NCING — MADE BY — CHECKED BY
QUANTITIES — MADE BY — CHECKED BY

BEG. CH. CH.
STA. 0+00
ELEV. 2300.0

Δ = 90°
D = 15°
L = 600'
R = 383.06

90'

STA. 893+00 ℄ SURVEY =
STA. 9+00 ℄ CH. CH. =
11+00, 50' LT. BASE LINE SURVEY =
892+96.92 W. BOUND RDWY. =
893+03.60 E. BOUND RDWY.

Δ = 56°
D = 16°
L = 350'
R = 359.26

END CH. CH.
STA. 14+50
ELEV. 2298.4

RESTRICTED SECTION

FLOW

885 890 895 900 905

℄ INTERSTATE 94

N

BRIDGE NO. 94-31

GREEN RIVER

TOPOGRAPHIC LAYOUT

PROJ. I-94-2(9) STA. 893+00

STARK COUNTY

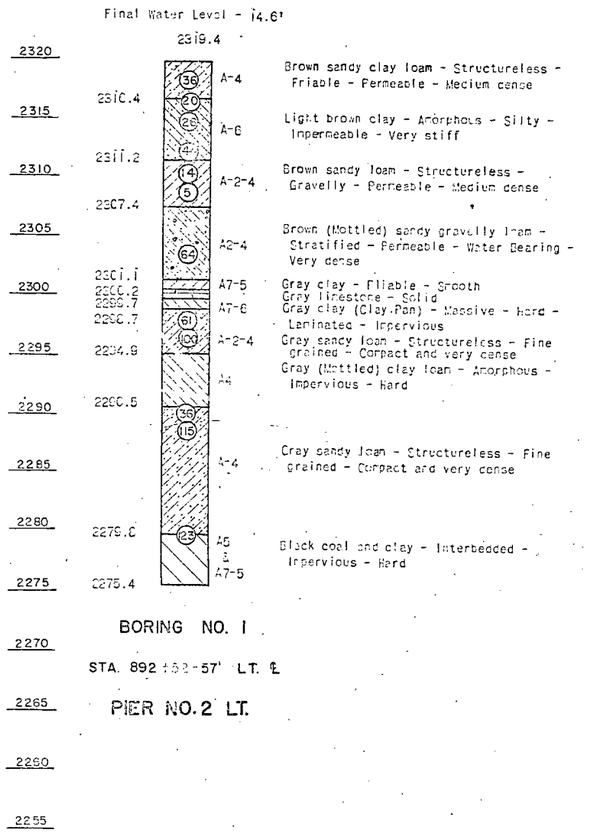
94-31-3

94-31-3

REVISIONS	MADE BY	CHKD BY	DATE

	MADE BY	CHECKED BY
TRACING		
QUANTITIES		

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(9)		12	32



Brown sandy clay loam - Structureless - Friable - Permeable - Medium dense

Light brown clay - Amorphous - Silty - Impermeable - Very stiff

Brown sandy loam - Structureless - Gravelly - Permeable - Medium dense

Brown (Mottled) sandy gravelly loam - Stratified - Permeable - Water Bearing - Very dense

Gray clay - Friable - Smooth
Gray firestone - Solid
Gray clay (Clay Pan) - Massive - Hard - Laminated - Impervious

Gray sandy loam - Structureless - Fine grained - Compact and very dense

Gray (Mottled) clay loam - Amorphous - Impervious - Hard

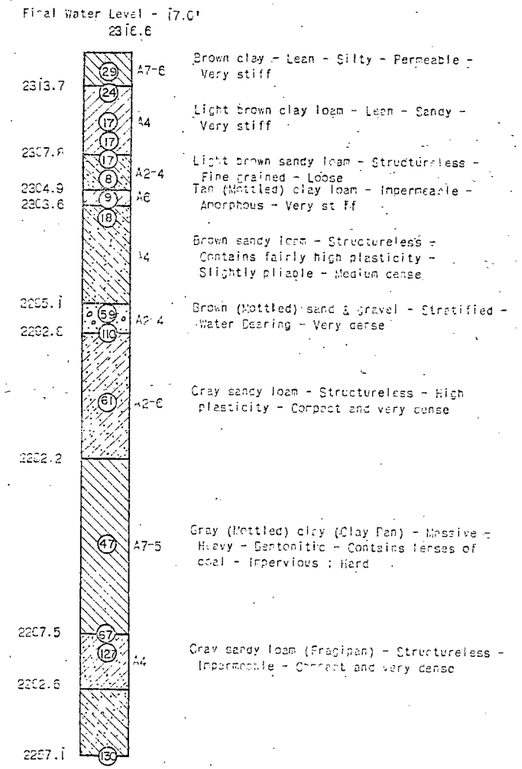
Gray sandy loam - Structureless - Fine grained - Compact and very dense

Black coal and clay - Interbedded - Impervious - Hard

BORING NO. 1

STA. 892+52-57' LT. ℄

PIER NO. 2 LT.



Brown clay - Lean - Silty - Permeable - Very stiff

Light brown clay loam - Lean - Sandy - Very stiff

Light brown sandy loam - Structureless - Fine grained - Loose

Tan (Mottled) clay loam - Impermeable - Amorphous - Very stiff

Brown sandy loam - Structureless - Contains fairly high plasticity - Slightly pliable - Medium dense

Brown (Mottled) sand & gravel - Stratified - Water Bearing - Very dense

Gray sandy loam - Structureless - High plasticity - Compact and very dense

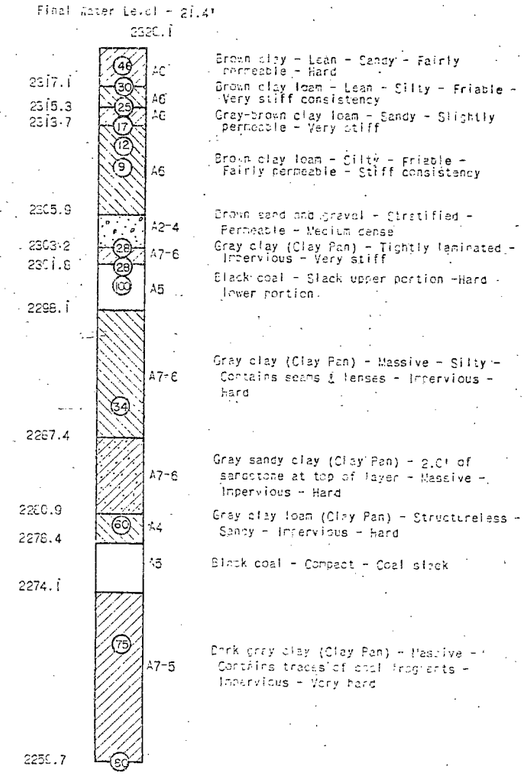
Gray (Mottled) clay (Clay Pan) - Massive - Heavy - Bentonitic - Contains lenses of coal - Impervious - Hard

Gray sandy loam (Fragipan) - Structureless - Impermeable - Compact and very dense

BORING NO. 2

STA. 892+52-27' RT. ℄

PIER NO. 2 RT.



Brown clay - Lean - Sandy - Fairly permeable - Hard

Brown clay loam - Lean - Silty - Friable - Very stiff consistency

Gray-brown clay loam - Sandy - Slightly permeable - Very stiff

Brown clay loam - Silty - Friable - Fairly permeable - Stiff consistency

Brown sand and gravel - Stratified - Permeable - Medium dense

Gray clay (Clay Pan) - Tightly laminated - Impervious - Very stiff

Black coal - Black upper portion - Hard lower portion

Gray clay (Clay Pan) - Massive - Silty - Contains seams & lenses - Impervious - Hard

Gray sandy clay (Clay Pan) - 2.0' of sandstone at top of layer - Massive - Impervious - Hard

Gray clay loam (Clay Pan) - Structureless - Sandy - Impervious - Hard

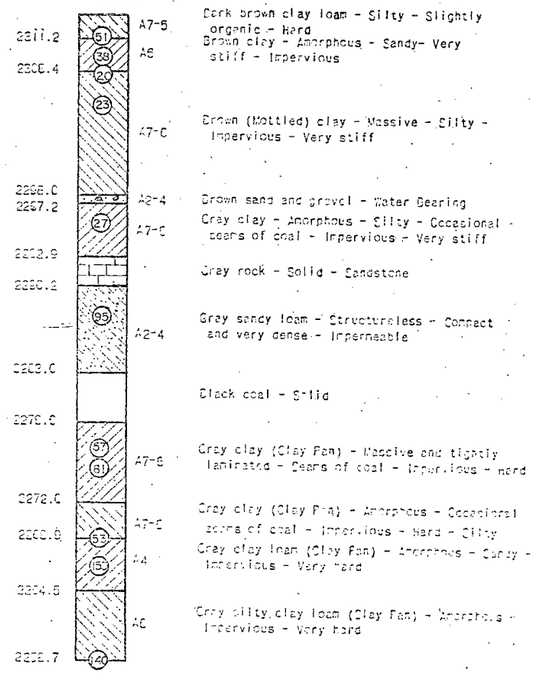
Black coal - Compact - Coal slack

Dark gray clay (Clay Pan) - Massive - Contains traces of coal fragments - Impervious - Very hard

BORING NO. 3

STA. 893+28-27' LT. ℄

PIER NO. 3 LT.



Dark brown clay loam - Silty - Slightly organic - Hard

Brown clay - Amorphous - Sandy - Very stiff - Impervious

Brown (Mottled) clay - Massive - Silty - Impervious - Very stiff

Brown sand and gravel - Water Bearing

Gray clay - Amorphous - Silty - Occasional seams of coal - Impervious - Very stiff

Grey rock - Solid - Sandstone

Gray sandy loam - Structureless - Compact and very dense - Impermeable

Black coal - Solid

Gray clay (Clay Pan) - Massive and tightly laminated - Seams of coal - Impervious - Hard

Gray clay (Clay Pan) - Amorphous - Occasional seams of coal - Impervious - Hard - Silty

Gray clay loam (Clay Pan) - Amorphous - Sandy - Impervious - Very hard

Gray silty clay loam (Clay Pan) - Amorphous - Impervious - Very Hard

BORING NO. 4

STA. 893+28-57' RT. ℄

PIER NO. 3 RT.

NOTE:

Encircled numbers indicate the number of blows delivered by a 140 lb. hammer from a height of 30" to drive core tube 1.0'.

The boring log shown is for design purposes only. The State does not accept responsibility if soil conditions encountered during construction differ from those shown.

BRIDGE NO. 94-31

BORING LOG

I-94-2(9)

STARK COUNTY

Sheet 1 of 2

94-31-4

94-31-4

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(9)		13	32

DESIGN — MADE BY — CHECKED BY
DETAILS — MADE BY — CHECKED BY — JLS
TRACING — MADE BY — CHECKED BY — JLS
QUANTITIES — MADE BY — CHECKED BY
CHKD BY — DATE
REVISIONS

BORING NO. 5
DEPTH: 15.4-16.4
MAX. LOAD: 5641
SHEAR : Near 0°
COHESION: 2620
MOISTURE: 27%
DRY WT.: 97

Final Water Level - 16.0'

2325
2320
2316
2310
2305
2300
2295
2290
2285
2280
2275
2270
2265
2260
2255
2250

2317.7
2316.3 — (61) (42) (20) (23) (15) (17) — A6 Dark brown clay - Silty - Hard
A2-4 & A4 Brown sandy loam - Lenticular and stratified - Fine textured - Permeable - Dense to medium dense
2304.3 — (17) — A7-5 Gray (Mottled) clay - Massive - Expansive - Impervious - Heavy - Very stiff
2297.7 — (50) — A2-4 Gray sandy loam - Structureless - Fine grained - Impermeable - Compact and very dense
2280.4 — (100) — Black coal - Platy - Hard
(95) — A7-5 Gray clay (Clay Pan) - Massive and tightly laminated - Heavy - Impervious - Very hard
2272.3 — (95)

BORING NO. 5
STA. 891+90 - 27' LT. ℄
ABUT. NO. 1 LT.

BORING NO. 6
DEPTH: 9.0-10.4
MAX. LOAD: 1753
SHEAR : Near 15°
COHESION: 636
MOISTURE: 15%
DRY WT.: 101

Final Water Level - 17.5'

2316.8
2315.2 — (38) — A6 Brown clay - Silty - Hard - Frozen
(24) (22) — A6 Brown clay loam - Amorphous - Silty - Fairly impervious - Very stiff
2309.4 — (18) (11) — A4 Brown clay loam - Stratified - Sandy - Permeable - Rather stiff
2303.6 — (12) — A1-b Brown sand and gravel - Stratified - Permeable - Non-plastic - Water Bearing - Medium dense
2293.7 — (66) — A2-4 Gray sandy loam - Structureless - Fine grained - Impermeable - Compact and very dense
2283.8 — (112) — Black coal - Contains occasional interbeddings of very hard clay - Platy - Hard
2275.8 — (68) — A7-5 Gray clay (Clay Pan) - Massive - Occasional lenses of coal - Expansive - Impervious - Hard
2266.5 — (100) — A6 Gray clay loam (Clay Pan) - Tightly laminated and varved structure - Silty - Impervious - Very hard
2252.9 — (120) — A7-6 Gray clay (Clay Pan) - Massive - Silty - Impervious - Very hard

BORING NO. 6
STA. 891+90 - 57' RT. ℄
ABUT. NO. 1 RT.

Final Water Level - 19.2'

2321.5
2318.3 — (67) (60) (39) (26) (31) (24) — A6 Brown clay loam - Sandy - Hard
A6 Gray-brown clay - Amorphous - Lean - Impermeable - Very stiff
2308.1 — (8) — A6 Gray-brown clay - Lenticular and stratified - Loam - Sandy - Permeable - Lenses & stratifications - Medium stiff - (Water Bearing at bottom)
2301.7 — Gray rock
2301.6 — A7-6 Gray clay (Clay Pan) - Tightly laminated - Silty - Impervious - Hard
2297.6 — Black rock & coal - Solid
2296.2 — (60) — A7-6 Gray clay (Clay Pan) - Massive structure - Heavy - Impervious - Hard
2282.6 — (95) — A4 Gray sandy loam - Lenticular & stratified - Fine texture - Fairly impermeable - Compact and very dence
2274.8 — (55) — A7-5 Dark brown-grey clay (Clay Pan) - Massive and tightly laminated - Expansive - Occasional seams of coal - Impervious - Hard
2264.2 — (100) — A4 Gray sandy loam (Fragipan) - Lenticular structure - Contains clay stringers - Impermeable - Compact and very dense
2251.1 — (100)

BORING NO. 7
STA. 893+90 - 57' LT. ℄
ABUT. NO. 4 LT.

BORING NO. 8
DEPTH: 19.3-20.7
MAX. LOAD: 15,000
SHEAR : Near 0°
COHESION: 7500
MOISTURE: 26%
DRY WT.: 101

Final Water Level - 13.8'
23%

2315.2
2312.0 — (47) (43) — A6 Brown clay - Amorphous - Fairly permeable - Lean - Hard
(50) (41) — A6 Dark brown clay - Amorphous - Lean - Hard - Impervious
2307.8 — (39) (46) — A6 Brown clay loam - Tightly laminated - Contains saline lenses - Sandy - Hard
2303.2 — (23) — A2-4 Rust-brown sand and gravel - Stratified - Permeable - Water Bearing - Medium dense
2300.3 — (100) — A7-5 Gray clay (Clay Pan) - Massive & laminated - Expansive - Impervious - Hard
2298.8 — Black coal - Platy - Hard
2296.2 — (45) — A7-6 Gray clay (Clay Pan) - Massive - Impervious - Heavy - Hard
(80) (100) — Black coal - Platy - Hard
2282.2 — (82) — A7-5 Gray clay (Clay Pan) - Massive - Impervious - Hard
2279.1 — (100) — A4 Gray clay loam (Clay Pan) - Sandy - Very hard - Impermeable
2268.5 — (100) — A4 Gray clay (Clay Pan) - Stratified and tightly laminated - Silty - Impervious - Very hard
2266.9 — (100)
2254.8

BORING NO. 8
STA. 893+90 - 27' RT. ℄
ABUT. NO. 4 RT.

NOTE:
Encircled number indicate the number of blows delivered by a 140 lb. hammer from a height of 30" to drive core tube 1.0'.
The boring log shown is for design purposes only. The State assumes no responsibility if soil conditions encountered during construction differ from those shown.

Sheet 2 of 2

BRIDGE NO. 94-31

BORING LOG

I-94-2(9)

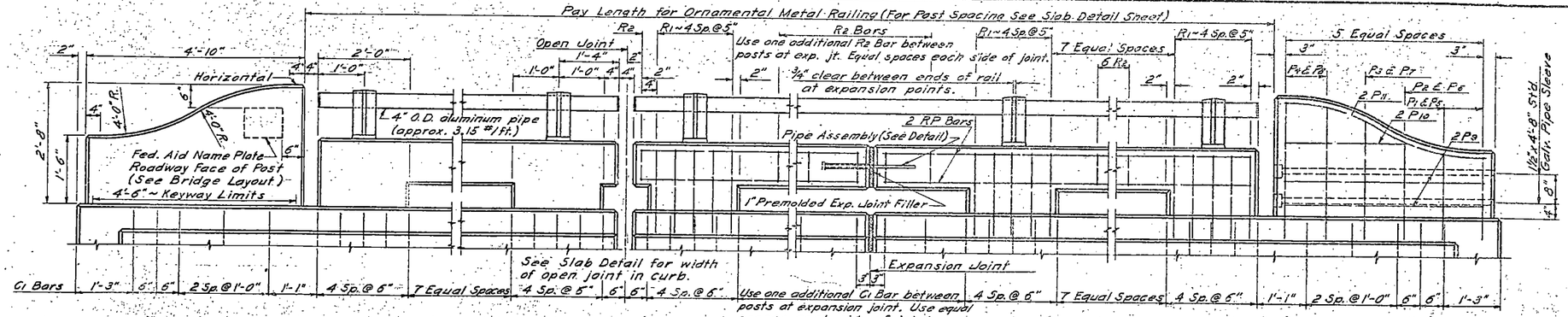
STARK COUNTY

94-31-5

94-31-5

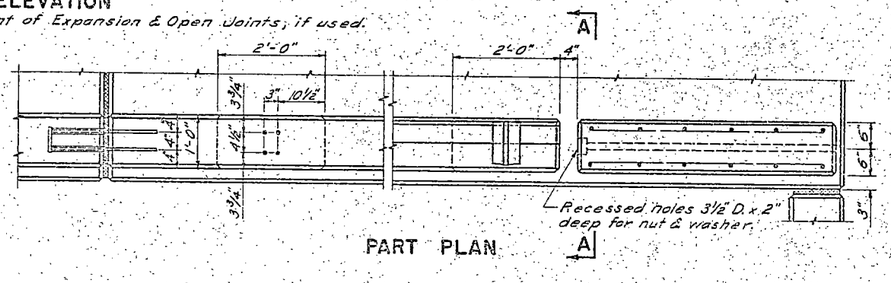
FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.			14	22

Pay Length for Ornamental Metal Railing (For Post Spacing See Slab Detail Sheet)

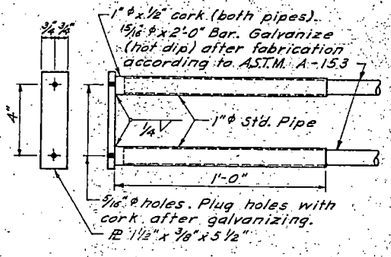


PART ELEVATION

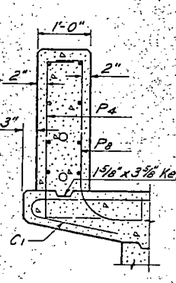
See Slab Detail Sheet for Placement of Expansion & Open Joints, if used.



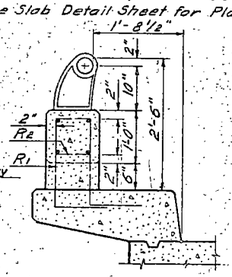
PART PLAN



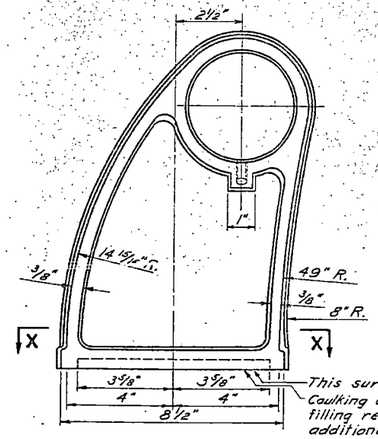
PIPE ASSEMBLY (STEEL)

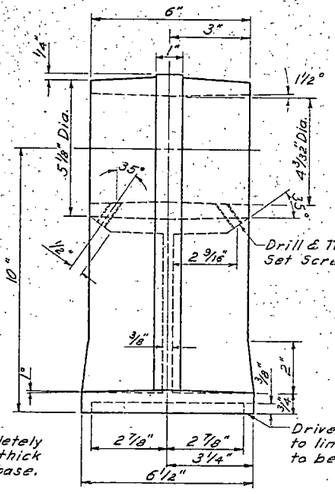


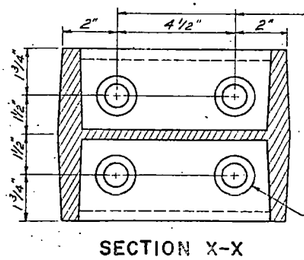
SECTION A-A



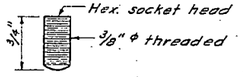
TYPICAL SECTION



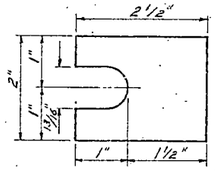




SECTION X-X

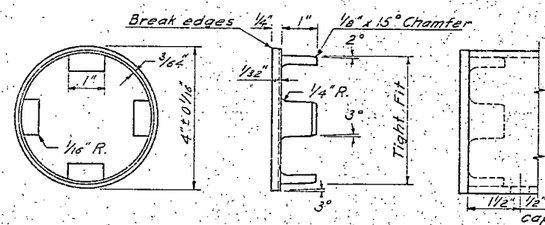


DETAILS OF ALUMINUM SET SCREWS



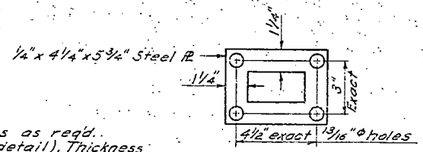
DETAILS OF ALUMINUM SHIMS

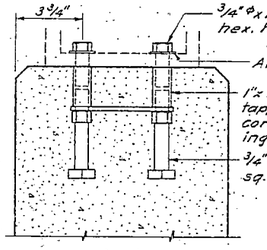
ALUMINUM RAIL POST DETAILS



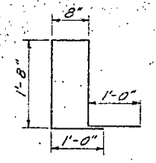
CAST ALUMINUM END CAP FOR RAIL

Drive fit all End Caps.

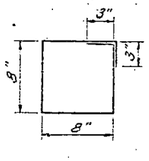




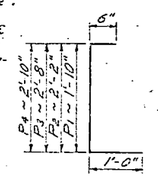
ANCHOR BOLT ASSEMBLY

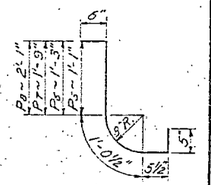


R1 BAR



R2 BAR





P1, P2, P3 & P4 BARS. P5, P6, P7 & P8 BARS

BENT BAR DETAILS

NOTES:

Rail posts shall be permanent mold types of cast aluminum alloy and shall conform to A.S.T.M. Spec. B108-59, alloy 56.70B. Castings shall be heat-treated to T6 temper.

Rail pipe to be aluminum drawn tube 6061-T6 conforming to A.S.T.M. Spec. B210-56T, alloy GS11A condition T6, or extruded tube 6061-T6 conforming to A.S.T.M. Spec. B-235-56T, alloy GS11A, condition T6, or aluminum alloy pipe 6061-T6, conforming to A.S.T.M. Spec. B241-56T, alloy GS11A condition T6. Mill finish.

Bolts & set screws to be aluminum alloy 2024-T4 with No. 205 alumilite finish conforming to A.S.T.M. Spec. B211-56T, alloy CG42A condition T4. Bolts & set screws shall have at least 0.0002 inch anodic coating and chromate seal.

All aluminum castings shall be finished by grinding off the gates and parting line followed by sand blasting and one coat of lacquer.

All concrete in end posts and parapet shall be Class AE-2 and shall be given the "Rubbed Surface Finish".

All posts shall be set vertical.

Each section of pipe rail shall project through, or into, at least three and preferably four posts.

The bottom of rail posts in contact with concrete shall be coated with caulking compound, grade 1 for gun application; white, natural or grey in color and furnished in cartridges; conforming to the latest Federal Spec. TT-C-598. Application shall be made to clean and dry surfaces above 40° F. Joints may be freed from dust by swabbing with caulking compound waste, moistened with turpentine or universal spirits. Compound shall be placed with care to prevent smearing the area outside and around the base of the post.

All pipe, rail posts, anchor bolt assemblies, bolts, shims, set screws, end caps and compound shall be included in the price bid for Ornamental Metal Railing.

Parapet and end post quantities are included in the slab quantities on slab sheet. Pay length for Ornamental Metal Railing is also given on slab sheet.

Parapet Bar List (See Slab Details)

BAR LIST (4 END POSTS)

MARK	NO.	SIZE	LENGTH	SHAPE
P1	8	5	3'-4"	Bent
P2	4	5	3'-8"	"
P3	4	5	4'-2"	"
P4	8	5	4'-4"	"
P5	8	5	3'-5"	"
P6	4	5	3'-9"	"
P7	4	5	4'-2"	"
P8	8	5	4'-6"	"
P9	16	4	4'-6"	Str.
P10	8	4	2'-9"	"
P11	6	5	4'-9"	Field Cont

CONCRETIES FOR 4 END POSTS

Class AE-2	4.5	Cu. Yd.
Reinforcing Steel	238	Lbs.

STANDARD PARAPET WITH ALUMINUM RAILING ALTERNATE "A"

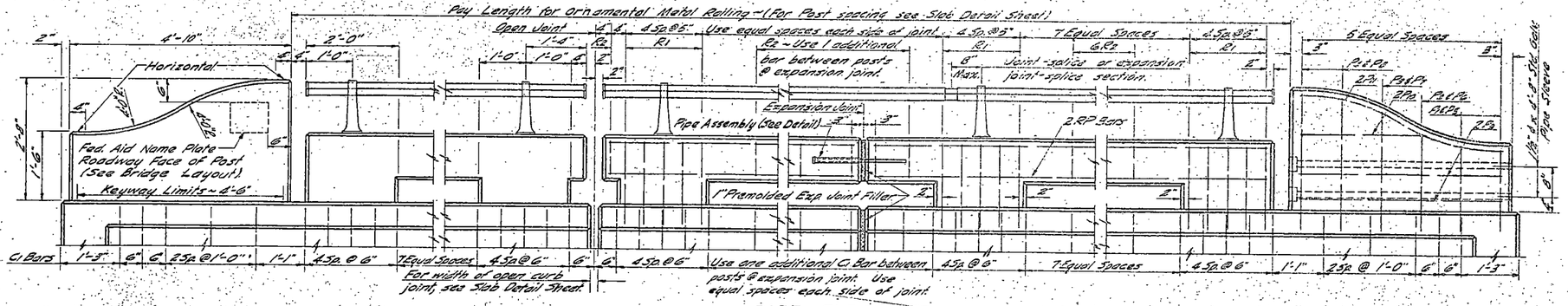
H-0119

H-0119

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	[illegible]-41		A3	32

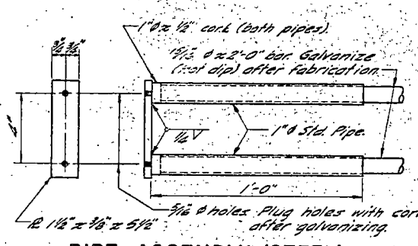
DESIGN	DETAILS	QUANTITIES	REVISIONS	DATE
MADE BY E.M.H.	MADE BY E.M.H.	MADE BY E.M.H.	MADE BY E.M.H.	
CHECKED BY T.H.E.	CHECKED BY E.M.H.	CHECKED BY M.E.H.	CHECKED BY M.E.H.	

QUANTITIES FOR 4 END POSTS
Concrete Class AE-2 25.9 Cu. Yds.
Reinforcing Steel 259 Lbs.

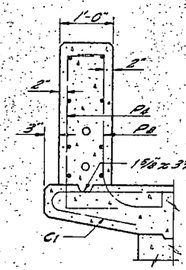


PART ELEVATION

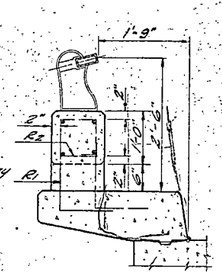
See Slab Detail Sheet for placement of Expansion and Open Joints, if used.



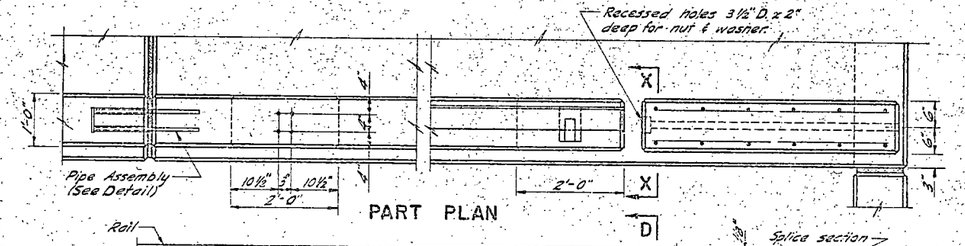
PIPE ASSEMBLY (STEEL)



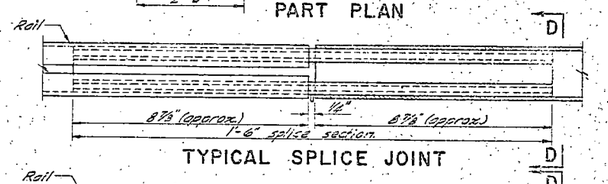
SECTION X-X



TYPICAL SECTION

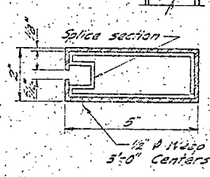


PART PLAN

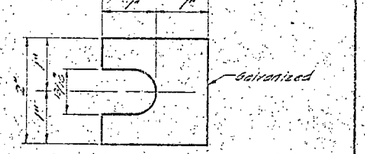


TYPICAL SPLICE JOINT

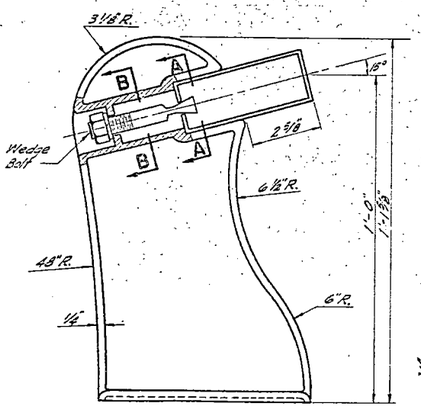
TYPICAL EXPANSION JOINT

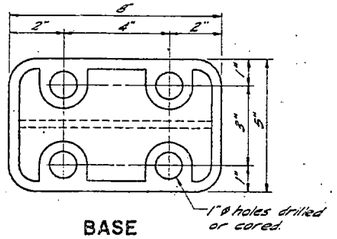


SECTION D-D

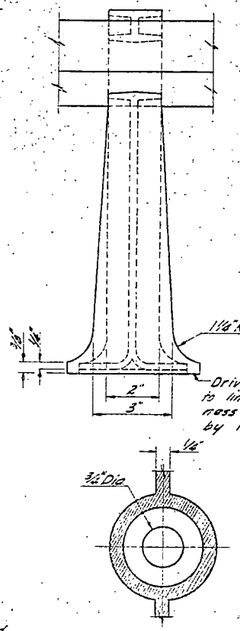


SHIM DETAILS

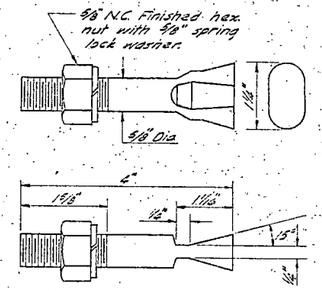




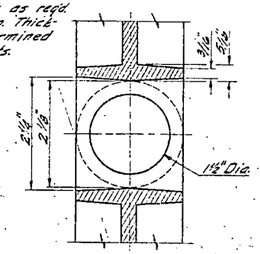
BASE



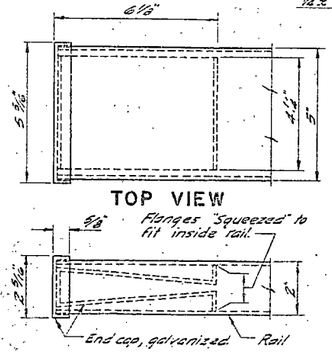
SECTION B-B



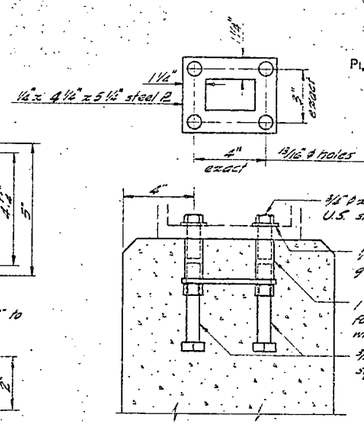
WEDGE BOLT



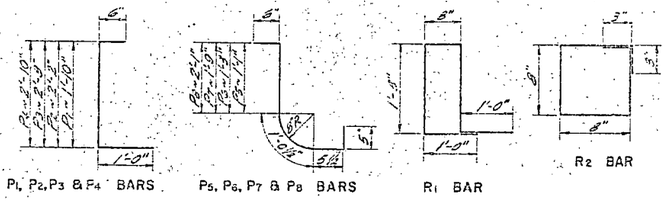
SECTION A-A



END CAP



ANCHOR BOLT ASSEMBLY



P1, P2, P3 & P4 BARS — P5, P6, P7 & P8 BARS — R1 BAR — R2 BAR

BENT BAR DETAILS

NOTE:

Rail posts shall be malleable iron casting conforming to A.S.T.M. A-47, grade 35018. Railing shall be 5" x 2" x ⅛" steel tubing conforming to A.S.T.M. A-245 Class C. Rail posts and railing shall be galvanized according to the latest A.S.T.M. A-123 Specifications. All other galvanizing shall conform to the latest A.S.T.M. A-153 Specifications.

All concrete in end posts and parapet shall be Class AE-2 and shall be given the "Rubbed Surface Finish."

All posts shall set vertically.

The bottom of rail posts in contact with concrete shall be coated ⅛ thick and the recess in the base completely filled with caulking compound, grade 2 for gun application; white, natural or grey in color and furnished in cartridges; conforming to the latest Federal Spec. SS-C-698. Application shall be made to a clean, dry surface above 40° F. Joints may be freed from dust by swabbing with caulking compound waste, moistened with turpentine or universal spirits. Compound shall be placed with care to prevent smearing the area outside and around the base of the post.

All rail tubing, rail posts, anchor bolt assemblies, bolts, shims, end caps and compound shall be included in the price bid for "Ornamental Metal Railing."

Parapet end and post quantities are included in the slab quantities on slab sheet. Pay length for Ornamental Metal Railing is also given on slab sheet.

Minimum Rail lengths shall equal at least two Post Spacings, and preferably three.

Parapet Bar List (See Slab Details)

BAR LIST (4 END POSTS)

MARK	NO.	SIZE	LENGTH	SHAPE
P1	2	5	3'-2"	Bent
P2	4	5	3'-8"	"
P3	4	5	4'-2"	"
P4	8	5	4'-4"	"
P5	8	5	3'-6"	"
P6	12	5	3'-5"	"
P7	4	5	4'-2"	"
P8	8	5	4'-6"	"
R1	10	4	4'-5"	Str.
R2	8	4	2'-9"	"
P11	8	5	4'-9"	Field Bent

STANDARD PARAPET WITH STEEL RAILING ALTERNATE "S"

H-0120

H-0120

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F-542(2)		18	32

REVISIONS	BY	DATE
DETAILS		
TRACING		
QUANTITIES		

33'-8"
1'-3" 64 Spaces @ 6" = 32'-0" ~ S1 Bars
Construction Joint (Optional)
5"
55'-4"
109 Spaces @ 6" = 54'-6" ~ S1 Bars
17'-0" to ends of T10 Bars
22'-0" to ends of T10 Bars
15'-6" to ends of T7 Bars
24'-6" to ends of T7 Bars
T11 Bars (Extra over Pier) (Both curbs) 39'-0"
Construction Joint (Optional)
11'-0"
3"
21 Spaces @ 6" = 11'-0" S1 Bars
3"
5"
℄ Bridge
T9 Bars (Both curbs)
T1 Bars
T4 Bars
T2 Bars
T6 Bars
T7 Bars
T11 Bars
T8 Bars
T10 Bars
T12 Bars
T13 Bars
℄ Roadway
39'-0"
32'-0"
23'-0"
16'-0"
System Steel ~ This side
System Steel ~ This side
D
D'
1'-3" 6 @ 6" = 3'-0" 1 @ 6" = 0'-6" 4 @ 6" = 2'-0" 7 Equal Sp. 4 @ 6" = 2'-0"
6'-4"
8'-0"
T12 Bars
T13 Bars
Typical C1 Bar Spacing
Rail Spacing ~ 10 Spaces @ 8'-2"
4'-0"
5
℄ Pier

HALF PLAN
Showing Reinforcing

108'-6"
For Post Spacing (See Layout)
5
21'-11"
22'-0"
21'-11"
6"
21'-11"
11'-0"
66'-10"
33'-2"
21'-10"
22'-2"
21'-10"
11'-1"
℄ Pier
℄ Bridge

ELEVATION

Finish with 1/2" edger and seal with Joint Filler
2½"
1/2"
3"
2½"

SECTION D-D

33'-8" Pour #1 | 55'-4" Pour #2 | 22'-0" Pour #3 | 55'-4" Pour #2 | 33'-8" Pour #1

POURING SEQUENCE

BAR LIST (ONE SPAN)

MARK	NO.	SIZE	LENGTH	SHAPE
C1	536	5	6'-3"	Bent
D1	24	(See Detail)		Str.
D2	180	4	9'-3"	Bent
D3	120	4	5'-6"	Str.
D4	12	7	35'-6"	"
E1	20	4	10'-9"	Bent
E2	20	4	10'-3"	"
E3	20	4	8'-9"	"
E4	8	5	10'-0"	"
E5	8	4	38'-6"	Str.
E6	16	5	9'-9"	Bent
E7	4	7	38'-6"	Str.
S1	394	5	38'-6"	"
T1	54	4	35'-9"	"
T2	108	4	28'-6"	"
T3	27	4	21'-6"	"
T4	60	5	41'-6"	"
T5	40	5	14'-0"	"
T6	40	5	19'-6"	"
T7	40	5	40'-0"	"
T8	20	5	21'-6"	"
T9	10	6	41'-9"	"
T10	52	6	39'-0"	"
T11	16	5	39'-0"	"
T12	84	5	35'-9"	"
T13	168	5	28'-6"	"
T14	42	5	21'-6"	"
BW1	12	5	7'-3"	Bent
BW2	60	5	6'-3"	"
BW3	12	5	42'-0"	Str.
BW4	4	5	38'-6"	"
BW5	64	5	5'-0"	Bent
BW6	60	5	6'-0"	"
P1	240	5	6'-0"	Bent
P2	276	4	3'-2"	"
RP1	16	5	40'-0"	Str.
RP2	4	5	37'-6"	"

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* 3rd 8-13-62

200' PRESTRESSED GIRDER
3 SPAN CONTINUOUS
SUPERSTRUCTURE
45" GIRDERS
37' ROADWAY

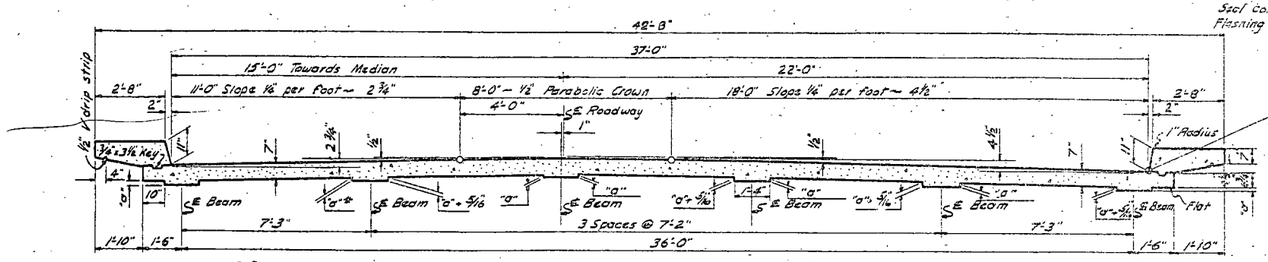
H-6169-1

H-6169-1

FED ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	F-94-2(10)		19	32

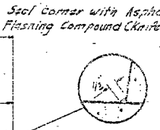
DESIGN	MADE BY	D.L.W.	
	CHECKED BY	E.W.H. C.E.S.	
DETAILS	MADE BY	W.A.G.	
	CHECKED BY	D.L.W. E.W.H.	
TRACING	MADE BY	W.A.G.	
	CHECKED BY	E.W.H. A.L.G.	
QUANTITIES	MADE BY	E.W.H.	
	CHECKED BY	A.L.G.	

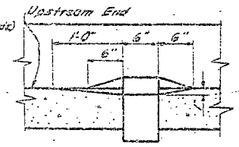
REVISIONS — CHK'D BY — DATE



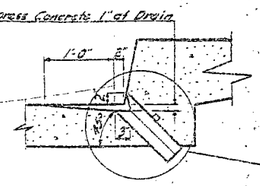
SECTION OF SLAB.
Showing Dimensions

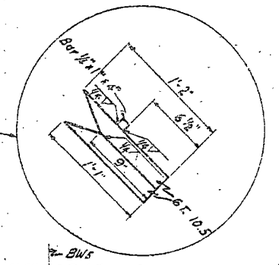
* Dimension "a" is 1⅛" at ends of beams and increases toward center to compensate for dead load deflection which is taken care of in the screed elevations.



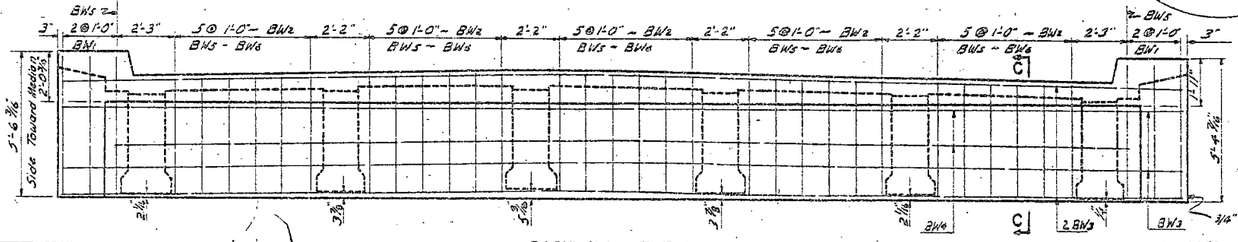


SECTION OF DRAIN

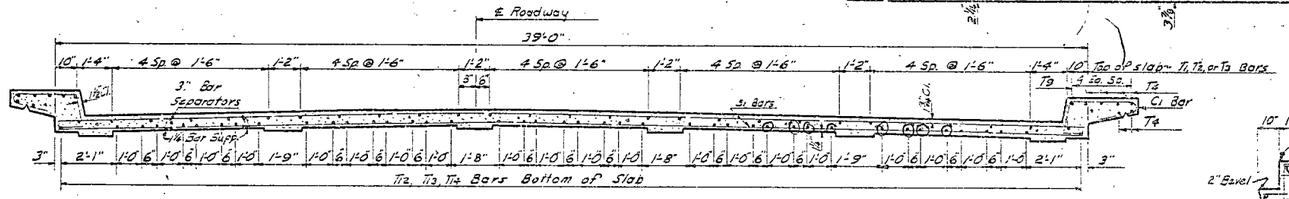




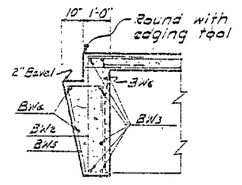
DECK DRAINS



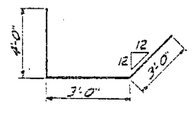
BACKWALL ELEVATION



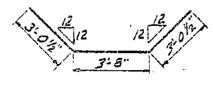
SECTION OF SLAB
Showing Reinforcing



SECTION C–C



E4 BAR



E5 BAR

NOTES:

No concrete shall be placed between the bottom of the beams and the top of the abutment wall. This area shall be filled with Premolded Joint Filler or other suitable material and then removed after concrete has set.

Quantities shown include post and railing.

Diaphragms over the piers shall be Class AAE-4 Concrete. All other diaphragms and remaining concrete shall be Class AE-2.

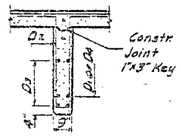
Insert D2 bars before placing outer girder.

Girder shall be aligned and rigidly held in place until after the diaphragm concrete has set.

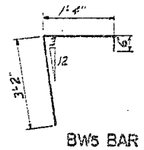
** Diaphragms in any section shall be poured and allowed to setup least 48 hours before the remaining slab section is poured.

Designed for girders H-6416 & H-6417.

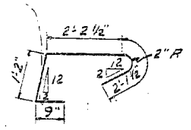
* Cost of deck drains to be incidental and shall be included in the unit bid price for concrete class AE-2.



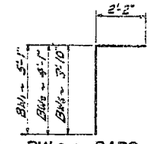
SECTION A–A



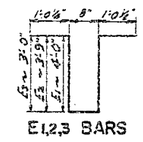
BW5 BAR



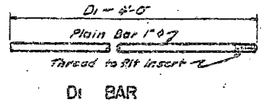
C1 BAR



BW1,2,6 BARS

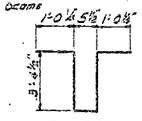


E1,2,3 BARS

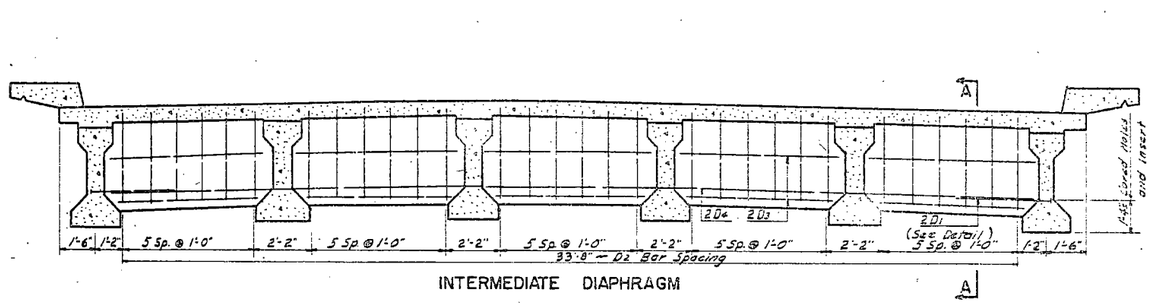


D1 BAR

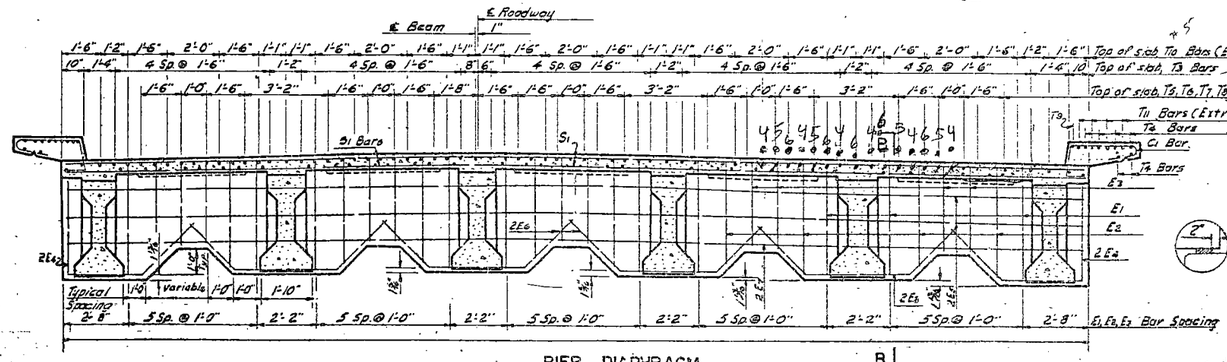
To be paid for as reinforcing steel



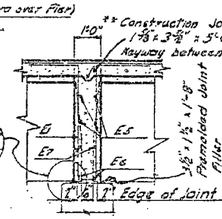
D2 BAR



INTERMEDIATE DIAPHRAGM



PIER DIAPHRAGM
Showing Reinforcing over Pier
(T-Bars Bottom of Slab Same as Section Above)

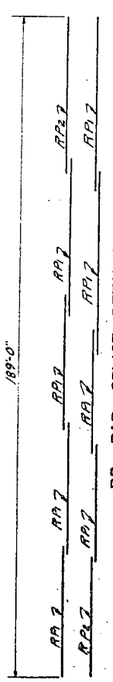


SECTION B–B

BENT BAR DETAILS

QUANTITIES (ONE BRIDGE)	
Concrete Class AE-2	281.8 c.y.
Concrete Class AAE-4	9.09 c.y.
Reinforcing Steel	31,304 Lbs.

200' PRESTRESSED GIRDER
3-SPAN CONTINUOUS
SLAB & MISCELLANEOUS
45° GIRDERS
37' ROADWAY



H-6169-2

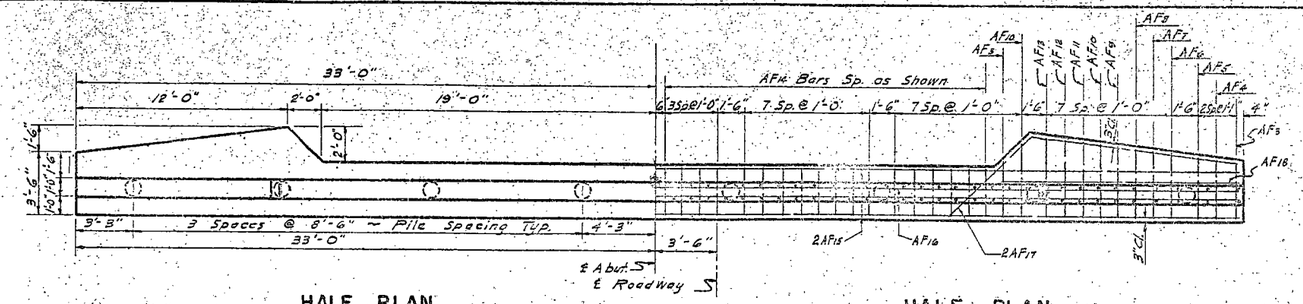
5-#6
6-#4
4-#5

H-6169-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-94-2(9)		20	32

DESIGN — MADE BY D.L.V. — CHECKED BY C.F.W.
DETAILS — MADE BY W.A.B. & A.P.J. — CHECKED BY E.W.H.
TRACING — MADE BY W.J.K. — CHECKED BY E.W.H.
QUANTITIES — MADE BY A.P.J. — CHECKED BY C.E.B. & E.W.H.

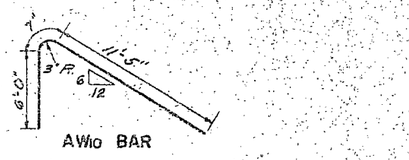
REVISIONS — BY — DATE

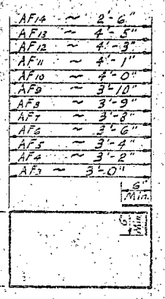


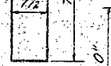
HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing

NOTE:
Br. No. 94-31L, Abut. 1 ℄ Br. No. 94-31R, Abut. 4 the ℄ Roadway is on other side of ℄ Abutment.

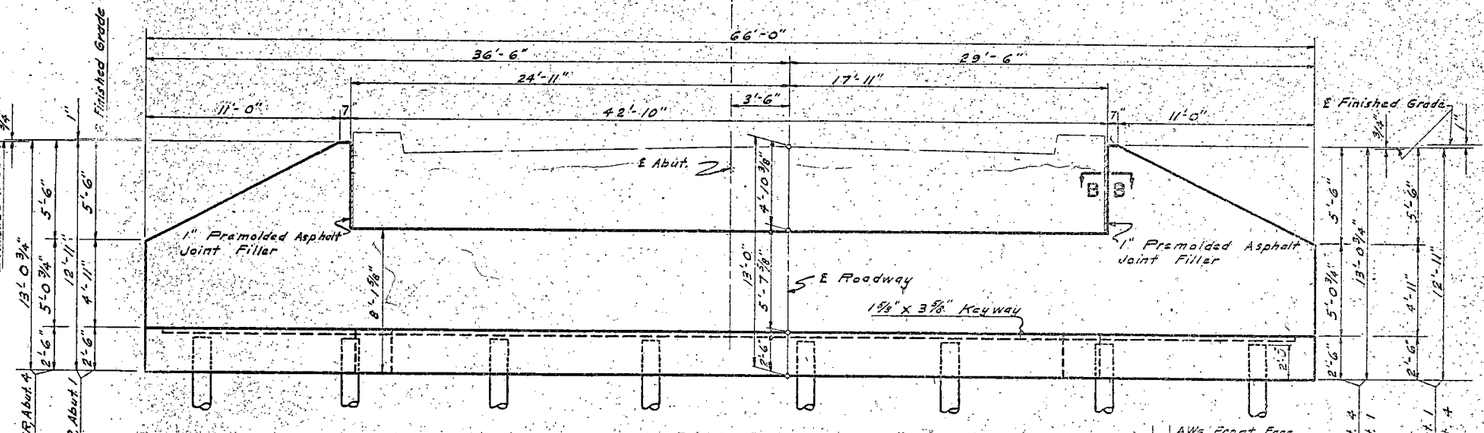




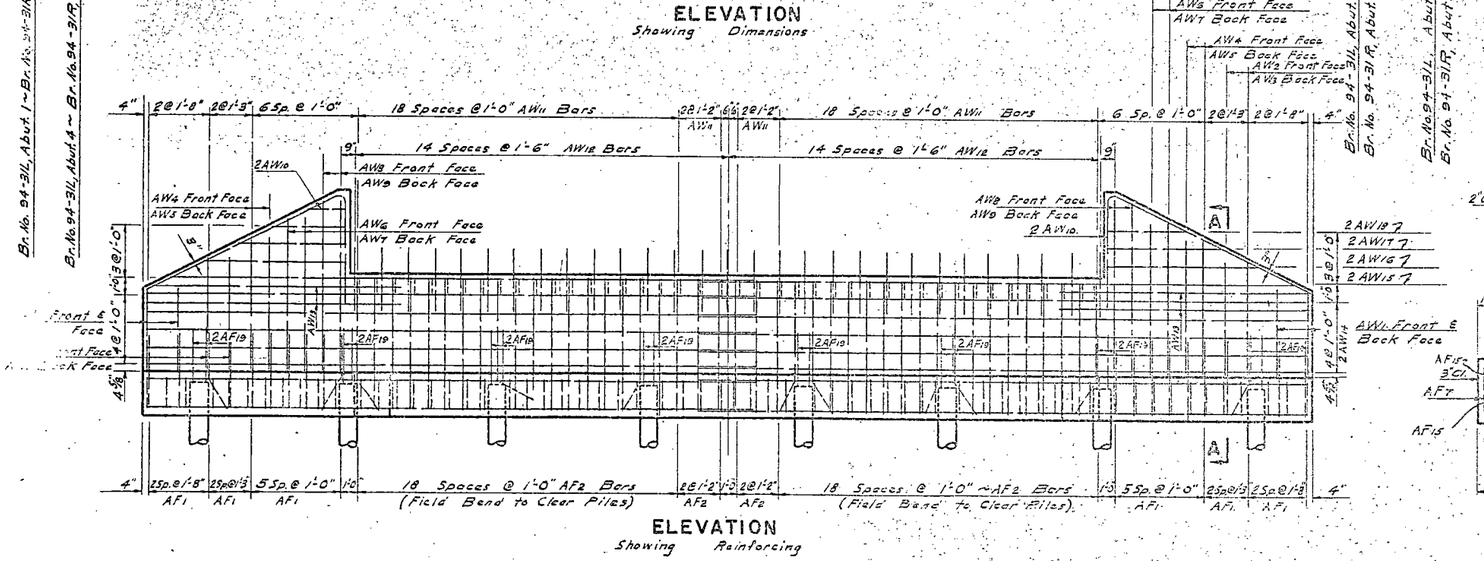


BENT BAR DETAILS

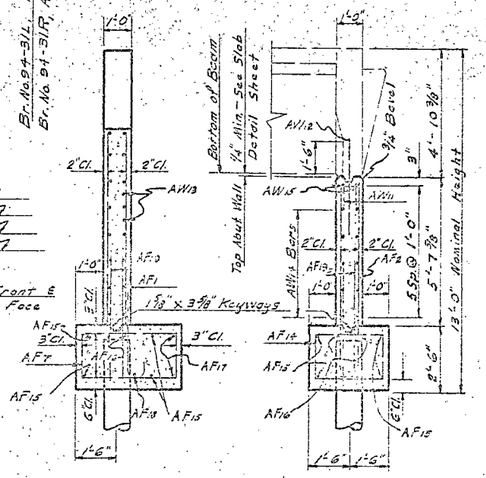
BAR LIST (ONE ABUT.)				
MARK	NO.	SIZE	LENGTH	SHAPE
AF1	20	5	4'-9"	Bent
AF2	42	5	15'-4"	"
AF3	4	5	10'-6"	"
AF4	2	5	11'-0"	"
AF5	2	5	11'-3"	"
AF6	2	5	11'-6"	"
AF7	2	5	12'-0"	"
AF8	2	5	12'-3"	"
AF9	2	5	12'-6"	"
AF10	4	5	12'-9"	"
AF11	2	5	13'-0"	"
AF12	2	5	13'-3"	"
AF13	2	5	13'-6"	"
AF14	36	5	9'-6"	"
AF15	8	8	34'-6"	Str.
AF16	4	4	33'-9"	"
AF17	4	8	18'-0"	Bent
AF18	2	4	10'-6"	Str.
AF19	32	6	5'-6"	"
AW1	8	4	4'-9"	Str.
AW2	4	4	6'-6"	"
AW3	4	5	6'-6"	"
AW4	4	5	7'-9"	"
AW5	4	6	7'-9"	"
AW6	4	4	8'-9"	"
AW7	4	6	8'-9"	"
AW8	4	4	9'-9"	"
AW9	4	6	9'-9"	"
AW10	4	6	18'-0"	Bent
AW11	42	4	2'-6"	"
AW12	29	6	3'-6"	Pl Round
AW13	4	5	14'-3"	Str.
AW14	20	4	33'-9"	"
AW15	4	6	33'-6"	"
AW16	4	4	3'-3"	"
AW17	4	4	6'-3"	"
AW18	4	4	4'-3"	"



ELEVATION
Showing Dimensions

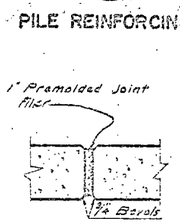


ELEVATION
Showing Reinforcing



A – A

℄ SECTION
(℄ Roadway)



B – B

PILE REINFORCING DETAILS

NOTE:
The Contractor shall place a temporary shore from the top of the footing to support the beams until the backwall has cured. Wrap projecting portion of AW12 bars with aluminum foil before pouring slab.

QUANTITIES (ONE ABUT.)	
Concrete, Class AE-2	248 Cu. Yd.
Reinforcing Steel	41,442 Lbs.

PRESTRESSED GIRDER
13' ABUTMENT
37' ROADWAY
6-45" GIRDERS

H-6268

H-6268

FED ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	F-94(22)		21	32

DESIGN	MADE BY	EHH
	CHECKED BY	DLV
DETAILS	MADE BY	HJG
	CHECKED BY	EHH
TRACING	MADE BY	KLH
	CHECKED BY	MRJ-CRG
QUANTITIES	MADE BY	MRJ-CRG
	CHECKED BY	EHH

REVISIONS — DATE

SECTION C-C

See Drawing 94-31-1 for Pier Riser Detail

Slope ⅜" per Foot

Slope ⅜" per Foot

5'-0" 7'-3" 7'-3"

13 Spaces @ 1'-6" = P2 Bars

2 P2 Bars

P2 This End
P1 Other End

6" 3'-0" 38'-0" 32'-6" 26'-0" Ice Nose

5'-4" x 2'-0" x 2'-0" Constr. Jt Key

14 Spaces @ 1'-0" = P3 Bars Both Faces

3 P3 Bars

8 Spaces @ 1'-5" P3 Bars Both Faces

12'-9"

2" x 6" Constr. Keyway

2 P5

8 Spaces @ 1'-5" P3 Bars This End - P1 Bars Other End

7 Spaces @ 2'-0" = P1 Bars

13 Spaces @ 1'-3" = P1 Bars Both Faces

37 P1 Bars

7 Spaces @ 1'-5" P3 Bars Both Faces

7 Spaces @ 2'-0" = P1 Bars

PB1 PB2 PB3 PB4 PB5 PB6 PB7 PB8 PB9 PB10 PB11 PB12 PB13 PB14 PB15 PB16 PB17 PB18 PB19 PB20 PB21 PB22 PB23 PB24 PB25

Slope ⅜" per Foot

Centroidal Constr. Joint

2'-3"

Excavation Limits

Excavation Limits

5'-6"

2'-6"

1½" x 1'-0" x 3'-0" Key

P1 P2 P3

END VIEW

ELEVATION

℄ SECTION

SECTION A-A

SECTION B-B

PART SECTION AT TOP OF FOOTING

P4 BAR

P13 BAR

P1 & P2 BARS

Vert. Leg ℄

P3 BAR

P12 BAR

P11 BAR

BENT BAR DETAILS

PA BAR

PB BAR

MARK	A	B	C	LGTH
PA1	1'-1⅞"	3'-8½"	0'-4½"	6'-0"
PA2	1'-2⅜"	3'-9⅛"	0'-5⅝"	6'-3"
PA3	1'-3⅛"	3'-9⅞"	0'-6⅞"	6'-6"
PA4	1'-3⅞"	3'-9⅞"	0'-6¼"	6'-3"
PA5	1'-4⅝"	3'-10"	0'-7⅛"	7'-0"
PA6	1'-5⅜"	3'-10½"	0'-8⅛"	7'-3"
PA7	1'-6⅛"	3'-11½"	0'-9⅜"	7'-3"
PA8	1'-6⅞"	3'-11½"	0'-10⅛"	7'-6"
PA9	1'-7⅝"	4'-0"	0'-10⅞"	7'-3"
PA10	1'-8⅛"	4'-0½"	0'-11⅝"	7'-6"
PA11	1'-8⅞"	4'-0½"	0'-11⅝"	7'-3"
PA12	1'-9⅝"	4'-1½"	1'-0⅜"	7'-6"
PA13	1'-10⅜"	4'-1½"	1'-1⅛"	7'-6"
PA14	1'-11⅛"	4'-2⅜"	1'-1⅞"	7'-6"
PA15	1'-11⅞"	4'-2⅜"	1'-2⅝"	7'-6"
PA16	2'-0⅝"	4'-2⅞"	1'-3⅜"	7'-6"
PA17	2'-1⅜"	4'-3"	1'-4⅛"	7'-6"
PA18	2'-1⅞"	4'-3½"	1'-4⅞"	7'-6"
PA19	2'-2⅝"	4'-3⅝"	1'-5⅝"	7'-6"
PA20	2'-3⅛"	4'-4⅛"	1'-6⅛"	7'-6"
PA21	2'-3⅞"	4'-4⅛"	1'-6⅝"	7'-6"
PA22	2'-3⅞"	4'-4⅝"	1'-7⅜"	7'-6"
PA23	2'-4⅝"	4'-5⅛"	1'-8¼"	7'-6"
PA24	2'-5⅜"	4'-5⅝"	1'-9⅛"	7'-6"
PA25	2'-6⅛"	4'-6⅛"	1'-9⅞"	7'-6"

MARK	A	B	C	LGTH
PB1	0'-6"	3'-2⅛"	0'-7⅛"	5'-3"
PB2	0'-3½"	3'-3½"	0'-3½"	5'-0"
PB3	0'-8⅛"	3'-9⅛"	0'-7⅛"	6'-6"
PB4	0'-9⅛"	3'-9⅛"	0'-3⅛"	6'-3"
PB5	0'-9⅜"	3'-10⅛"	0'-9⅛"	7'-0"
PB6	0'-10⅛"	3'-10⅛"	0'-10⅛"	7'-3"
PB7	0'-10⅛"	3'-11⅛"	0'-9⅛"	7'-3"
PB8	0'-11"	3'-11⅛"	0'-10⅛"	7'-6"
PB9	0'-11⅛"	4'-0"	0'-11"	7'-3"
PB10	0'-11⅛"	4'-0⅛"	0'-10⅛"	7'-3"
PB11	1'-0⅛"	4'-0⅛"	0'-11⅛"	8'-0"
PB12	1'-0⅛"	4'-0⅛"	0'-11⅛"	8'-0"
PB13	1'-0⅛"	4'-1⅛"	1'-0⅛"	8'-3"
PB14	1'-1⅛"	4'-1⅛"	1'-0⅛"	8'-6"
PB15	1'-1⅛"	4'-2⅛"	1'-1⅛"	8'-6"
PB16	1'-2⅛"	4'-2⅛"	1'-2⅛"	8'-9"
PB17	1'-2⅛"	4'-3"	1'-2"	9'-0"
PB18	1'-3⅛"	4'-3⅛"	1'-2⅛"	9'-3"
PB19	1'-3⅛"	4'-3⅛"	1'-2⅛"	9'-3"
PB20	1'-3⅛"	4'-4⅛"	1'-3⅛"	9'-6"
PB21	1'-4"	4'-4⅛"	1'-3⅛"	9'-6"
PB22	1'-4⅛"	4'-4⅛"	1'-3⅛"	9'-6"
PB23	1'-4⅛"	4'-4⅛"	1'-3⅛"	9'-9"
PB24	1'-5⅛"	4'-5⅛"	1'-4⅛"	10'-0"
PB25	1'-5⅛"	4'-5⅛"	1'-4⅛"	10'-0"

Total Length One Set 213'-9" | Total Length One Set 207'-0"

BAR LIST (ONE PIER)

MARK	NO	SIZE	LENGTH	SHAPE
P1	35	3	14'-0"	Bent
P2	26	8	12'-0"	"
P3	64	3	3'-0"	"
P4	34	4	35'-0"	Str.
P5	12	3	35'-0"	"
P6	3	6	35'-6"	"
P7	56	6	15'-9"	"
P8	54	3	23'-0"	"
P9	60	6	13'-6"	"
P10	30	8	14'-9"	"
P11	11	5	7'-3"	Bent
P12	27	4	3'-6"	"
P13	4	6	7'-9"	"
P14	4	6	5'-0"	"
P1-2S 2 Sets	5		213'-9"	Bent
P3-25 2 Sets	5		23'-0"	"

QUANTITIES (One Pier)

Concrete Class AE-2	1352 Cu. Yd.
Reinforcing Steel	15,204 Lb.
Structural Steel	1132 Lb.

PRESTRESSED GIRDER
38' PIER
37' ROADWAY
6-45" GIRDERS

ICE NOSE ANGLE

2" x 3½" x 1'-8" Bars

P4

2" x 3½" x 1'-3" Bars

⅜" Open Holes

L 8" x 8" x ¾"

26'-0" 12 Sp @ 2'-0" = 24'-0" 1'-0" 2'-0" 1'-0"

FOOTING PLAN

℄ of Pier

Sym. about ℄ except as shown

24'-10"

12'-6" 3'-9" 5'-0" 3'-9" 6'-3" 6'-3"

P3 Bars

P1 Bars

12'-6"

12 Spaces @ 1'-0" = P1 Bars

3" 1½" 18 Spaces @ 9" 1½" 3"

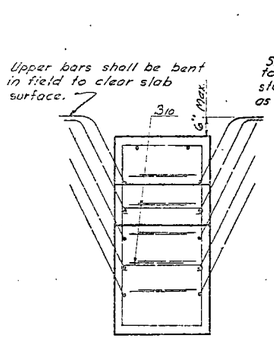
2'-9" 9'-0" 2'-9"

14'-6" 10'-4" 10'-4" 14'-6"

H-6398

H-6398

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(9)		22	32



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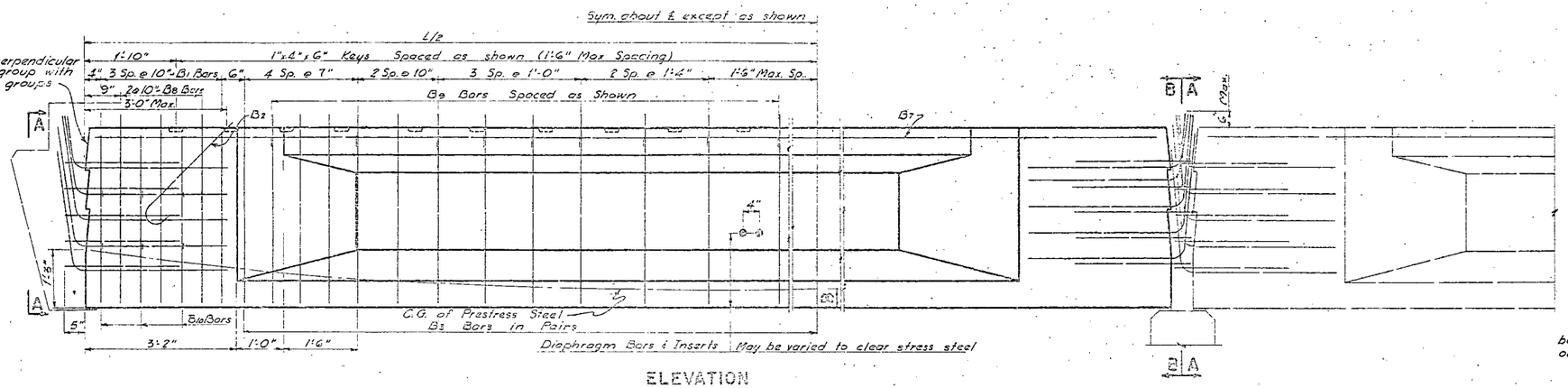
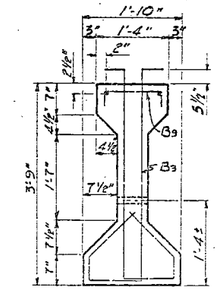


ELEVATION



1⅛" holes for diag. (inner beam) Threaded insert for outer beam (See Detail)

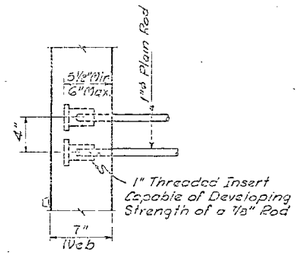
SECTION AT ℄

GIRDER DATA

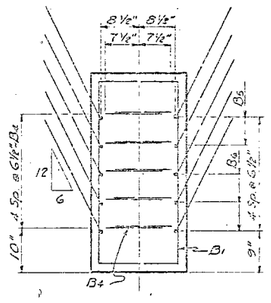
LENGTH "L"	ROAD-WAY WIDTH	GIRDER SPACING	DESIGN LOAD	FINAL PRESTRESSING FORCE WITH ELONGATION "B" Δ						WEIGHT TONS	CONCRETE STRENGTH POST-TENS.	
				FORCE	"B"	FORCE	"B"	FORCE	"B"			
44'-6"	24'-0"	7'-8"	H20	291,000	3.50	302,700	6.50	315,400	7.50	15.0	4000	7 1/4" SLAB
44'-6"	24'-0"	7'-8"	H15	252,400	4.50	262,200	5.50	272,700	6.50	15.0	4000	7" SLAB
44'-6"	30'-0"	7'-3"	H20-S16							15.0	4000	7" SLAB
45'-0"	24'-0"	7'-8"	H20	280,100	4.00	290,700	5.00	302,200	6.00	15.1	4000	7 1/4" SLAB
47'-6"	24'-0"	7'-8"	H20	305,700	4.00	317,300	5.00	329,900	6.00	15.9	4000	7 1/4" SLAB
59'-0"	30'-0"	7'-3"	H20-S16							19.2	4000	
65'-10"	37'-0"	7'-3"	H20-S16	573,000	5.00	595,600	6.00	620,100	7.00	21.2	4200	7" SLAB *
66'-6"	24'-0"	7'-8"	H20	548,000	4.50	569,200	5.50	592,100	6.50	21.4	4000	7 1/4" SLAB
66'-6"	24'-0"	7'-8"	H15	504,200	4.50	523,700	5.50	544,800	6.50	21.4	4000	7" SLAB
66'-6"	30'-0"	7'-3"	H20-S16	614,400	5.00	638,700	6.00	665,000	7.00	21.4	4000	7" SLAB
67'-9"	30'-0"	7'-3"	H20-S16							21.7	4600	
69'-9"	24'-0"	7'-8"	H20	605,000	5.00	628,900	6.00	654,800	7.00	22.3	4300	7 1/4" SLAB

BEAM WEIGHT = (583 x L) + 4000 LBS.

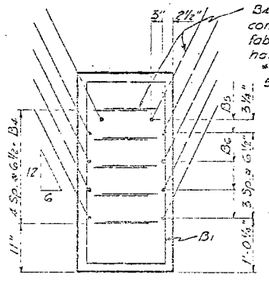
* AT TIME OF STRESS TRANSFER
Δ AT CENTER OF GIRDER
✱ DESIGNED FOR 2-SPAN CONTINUOUS



DIAPHRAGM BAR INSERT
OUTER GIRDERS ONLY



A-A

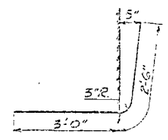


B-B

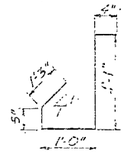
B9 BAR ~ #3

B4 is straight when concrete is poured and bent by the beam fabricator as shown after the concrete has set.

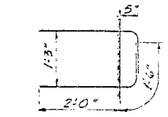
*B6 bar shall be size #7 for girders over 50' long, #6 for girders 50' and less.



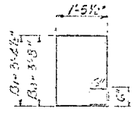
B5 BAR ~ #6
*B6 BAR ~ #7



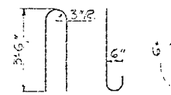
B3 BAR ~ #4



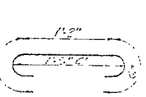
B4 BAR ~ #4



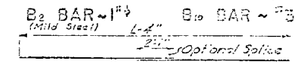
B1 & B5 BARS #6



B2 BAR ~ 1" ø (Mild Steel)



B10 BAR ~ #5



B7 BAR ~ #5 (Min.)

DENT BAR DETAILS

NOTES:

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

Design and Shop Drawings: At least 12 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 35,000 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 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.

All reinforcing steel shall be intermediate grade.

The B7 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 constructed [illegible] to Section A-A and the other end according to Section B-B. Adjacent girder ends at piers shall be paired with one "A" end and one "B" end.

All prestressed girders in any span shall preferably be cast within an 8 day period. If not, the nearest girder shall be at least 6 weeks old before the deck slab is poured.

Design to make the bottom of the deck slab at least 1⅛" above top of girder.

POST-TENSIONED 45" PRESTRESSED GIRDER

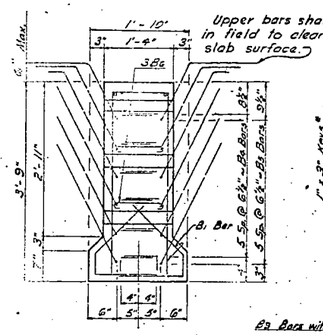
H-0416

H-0416

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(7)		23	32

REVISIONS	DATE

DETAILS	MADE BY	F.G.G.
	CHECKED BY	K.U.H.
TRACING	MADE BY	E.G.J.
	CHECKED BY	E.L.S.
QUANTITIES	MADE BY	
	CHECKED BY	



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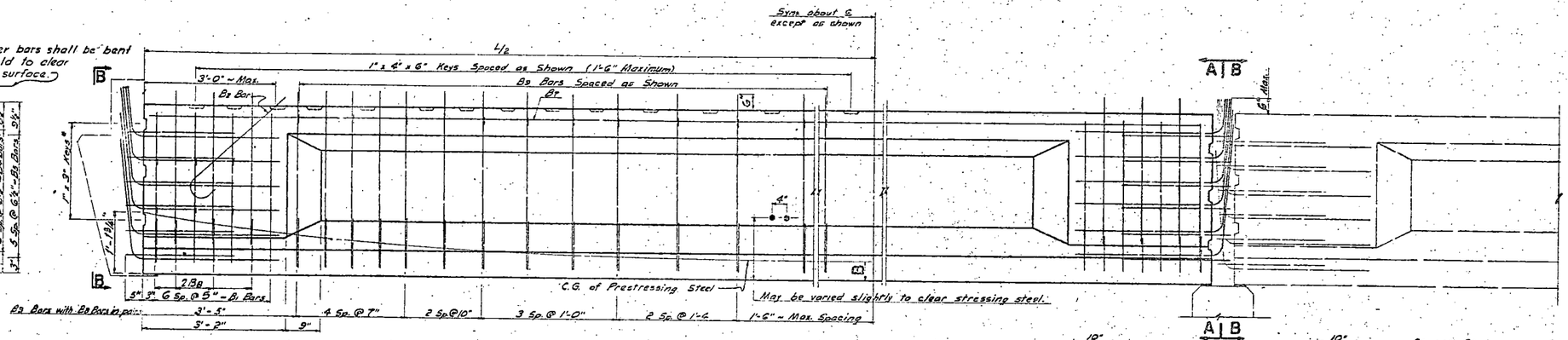
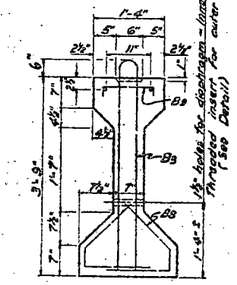
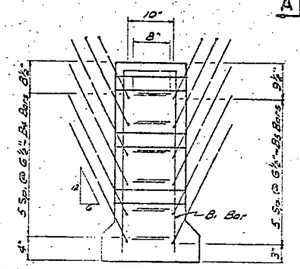


ELEVATION

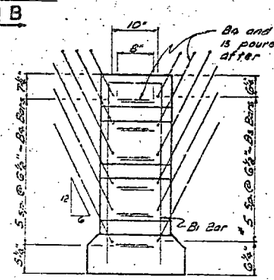
* Space 1" x 3" Keys to clear steel. - 3 on each end.



℄ SECTION



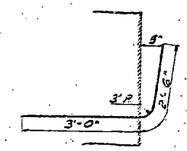
B-B



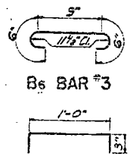
A-A

* Use only 10 B6 bars for beams with a length of 50' or less.

B6 and B8 bars may be straight when concrete is poured and bent by the beam fabricator as shown after the concrete has set.



B6 BAR #6



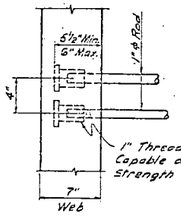
B9 BAR #3

GIRDER DATA

LENGTH "L"	ROADWAY WIDTH	GIRDER SPACING	DESIGN LOAD	FINAL - PRESTRESSING FORCE WITH DIMENSION "B" △ FORCE	"B"	FORCE	"B"	FORCE	"B"	WEIGHT TONS	*CONCRETE STRENGTH PRE-TENS.	
44'-6"	24'-0"	7'-6"	H20	291,000	5.50	302,700	6.50	315,400	7.50	13.8	4000	7 1/4" SLAB
44'-6"	30'-0"	7'-3"	H20-S16		6.00		7.00		8.00	13.8	4000	7" SLAB
44'-6"	24'-0"	7'-8"	H-15	252,400	4.50	262,200	5.50	272,700	6.50	13.8	4000	7" SLAB
45'-0"	24'-0"	7'-8"	H20	280,100	4.00	290,700	5.00	302,200	6.00	15.1	4000	7 1/4" SLAB
47'-6"	24'-0"	7'-8"	H20	305,700	4.00	317,300	5.00	329,900	6.00	15.9	4000	7 1/4" SLAB.
55'-0"	30'-0"	7'-3"	H20-S16							18.0	4000	
65'-10"	37'-0"	7'-3"	H20-S16	573,000	5.00	595,600	6.00	620,100	7.00	20.0	4100	7" SLAB *
66'-6"	30'-0	7'-3"	H20-S16	614,400	5.00	638,700	6.00	665,000	7.00	20.2	4900	7" SLAB
66'-6"	24'-0"	7'-8"	H-15	504,200	4.50	523,700	5.50	544,800	6.50	20.2	4000	7" SLAB
66'-6"	24'-0"	7'-8"	H20	548,000	4.50	569,200	5.50	592,100	6.50	20.2	4300	7 1/4" SLAB
67'-9"	30'-0"	7'-3"	H20-S16						7.00	20.5	4300	
69'-9"	24'-0"	7'-8"	H20	605,000	5.00	628,900	6.00	654,800	7.00	21.1	4200	7 1/4" SLAB

BEAM WEIGHT = L x 583 ÷ 1550

△ AT CENTER OF GIRDER
+ AT TIME OF STRESS TRANSFER
* DESIGNED FOR 2-SPAN CONTINUOUS



DIAPHRAGM BAR INSERT
Outer Girders Only

NOTES:

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 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.

All reinforcing steel shall be intermediate grade.

The B7 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 p/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.

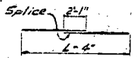
B5 bars may be replaced by prestress strands (one bar for one strand) if locations are approximately the same.

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

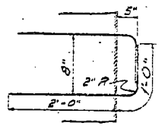
All prestressed girders in any span shall preferably be cast within an 8 day period. If not, the newest girder shall be at least 6 weeks old before the deck slab is poured.

A uniform curing temperature must be maintained on all girders in each line until determined.

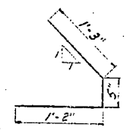
Optional Splice



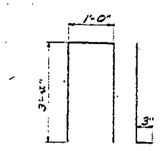
B7 BAR #5 (Min.)



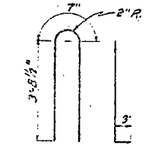
B4 BAR #4



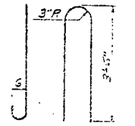
B8 BAR #4



B1 BAR #4



B3 BAR #4



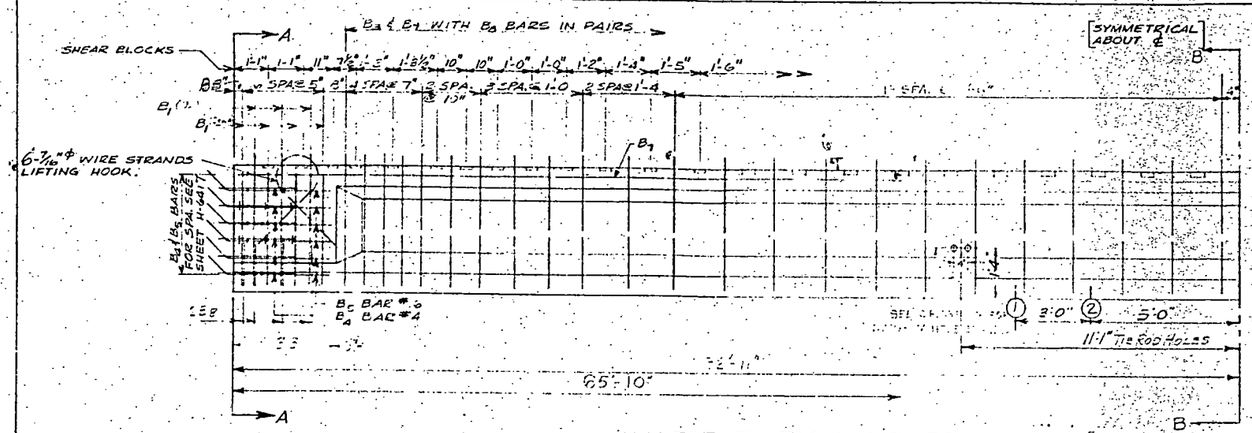
B2 BAR 1"ø

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

PRE-TENSIONED
45"
PRESTRESSED GIRDER

H-6417

H-6417



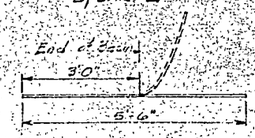
HALF ELEVATION GIRDER G-

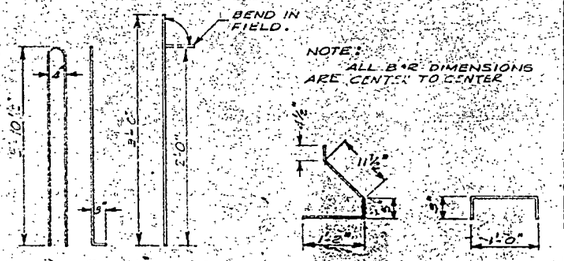
PRETENSIONED GIRDER PULL-DOWN POINTS, PRETENSIONED WIRE STRANDS ①-③ (SECTIONS A-A & B-B) TO BE PULLED DOWN AT POINTS INDICATED.

CENTER OF GRAVITY OF PRESTRESS STRANDS	
END	13.37"
¼ POINT	
MIDDLE	4.95"

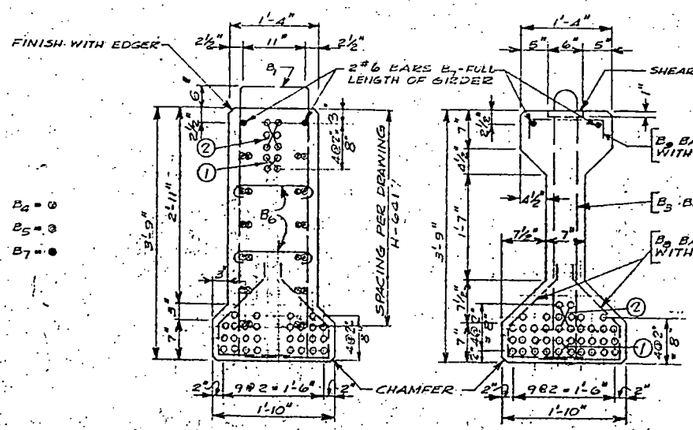
Note:
Use 1" threaded inserts in place of the 4 tie rod holes in the exterior girder.

Place screed plates @ 10ft ctrs on outside top flange of exterior girders





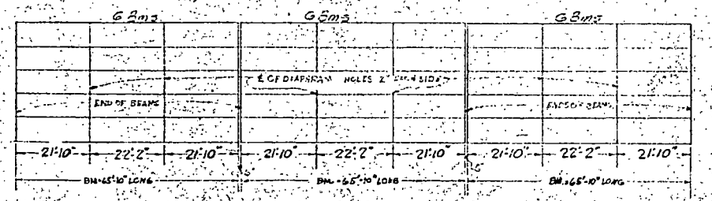
NOTE:
ALL B#2 DIMENSIONS ARE CENTER TO CENTER



GIRDER SECTIONS
SCALE: 1"=1'-0"

38-7/16" 7 WIRE STRANDS = ⊘
INITIAL PRESTRESS = 718? KIPS PER GIRDER

NOTE:
ALL DIMENSIONS AND DETAILS NOT GIVEN ON THIS SHEET ARE THE SAME AS SHEET H-641 T



GIRDER PLAN
SHOWING SPACING OF DIAPHRAM HOLES

45" X 65'-10" BEAM 1120 SIG LOADING @ 7'-2" CTOC INNER 7'-3" CTOC OUTER

FINAL
APPROVED
DRAWING
N.D. HIGHWAY DEPT.
FDD 8-13-62

QUANTITIES PER GIRDER	
B1 BAR #4	14
B2 BAR #4	50
B3 BAR #4	24
B5 BAR #6	24
B8 BAR #3	12
B7 BAR #6	6.25
B4 BAR #4	110
B6 BAR #3	50

TOTAL WEIGHT = 71 TONS
Frames Hipe Fowle
Jul-31-62

NORTH DAKOTA CONCRETE PRODUCTS COMPANY BISMARCK, NORTH DAKOTA

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

GREEN RIVER RURAL (2 BRIDGES)

STARK COUNTY

37' ROADWAY

PROJECT I-94-2(9)70 STA 893+00

PRESTRESSED CONCRETE GIRDER DETAILS

APPROVED

9407b364

Roll # BR-10