DESIGN DATA - CROSSROADS				
Traffic	Average Daily			
Current 2020	Pass: 5325	Trucks: 735	Total: 6060	
Forecast 2040	Pass: 5860	Trucks: 810	Total: 6670	
Clear Zone Distance: Use Existing		Design Speed: 45 mph		
Minimum Sight Dist. for Stopping:		Bridges:		
Sight Dist. for No Passing Zone:				
Pavement Design Life 20 (years)				
Design Accumulated One-way Flexible ESALs: 1,703,766 WB On-Ramp Right Turn Lane 1,365,527 WB Off-Ramp Realignment				

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	IM-5-094(147)063	22839	1	1

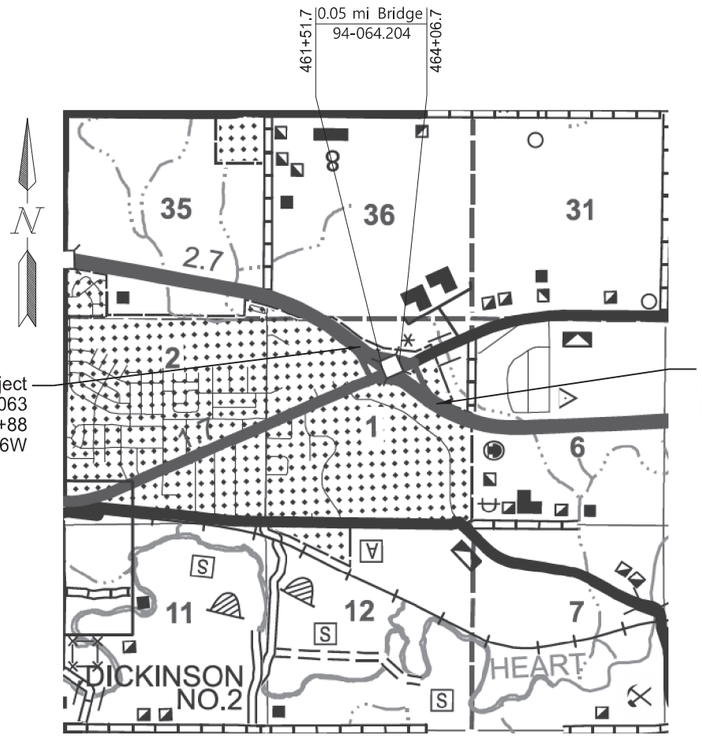
JOB # 29
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

IM-5-094(147)063)

Stark County
Exit 64 Interchange
Ramp Realignment, Lighting, and Turn Lanes

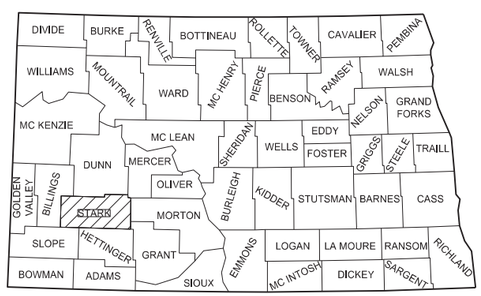
GOVERNING SPECIFICATIONS:
2020 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-5-094(147)063	0.844	0.844



Begin Project
IM-5-094(147)063
RP 63.804-Sta 3368+88
Sect 1, Twp 139N, Rge 96W

End Project
IM-5-094(147)063
RP 64.648-Sta 3413+42
Sect 1, Twp 139N, Rge 96W



STATE COUNTY MAP

DESIGNER
Travis Miller
DESIGNER
Sara Cahlin
DESIGNER

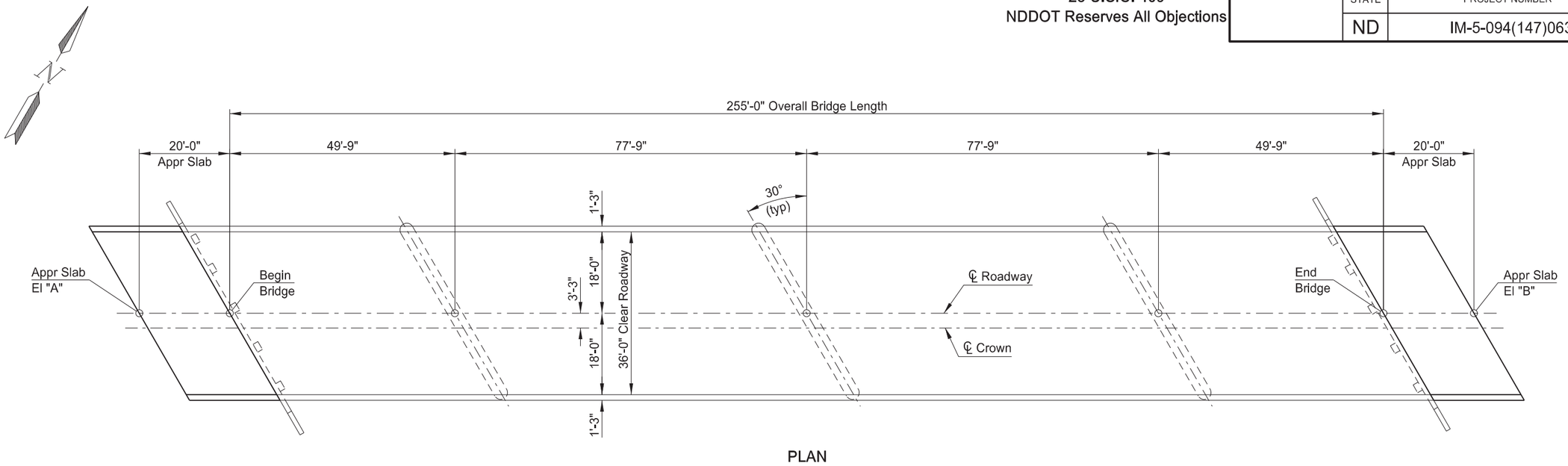
ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT
Orn, Chad M.
09 03 2020
DocuSign

NDDOT DESIGN DIVISION
JAMES D. DOUGLAS SMITH
REGISTERED
PROFESSIONAL
PE-4288
ENGINEER
NORTH DAKOTA
09/01/20

9/1/2020 8:48:57 AM tmiller R:\project\50094063.147\design\Sheets\001TS_Title Sheet.dgn

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

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	IM-5-094(147)063	170	1



PLAN

NOTE:

100 SCOPE OF WORK: Work at this site consists removing and replacing approach slabs and penetrating water repellant treatment.

APPROACH SLAB ELEVATIONS	
El "A"	0.15' lower than Begin Bridge
El "B"	0.04' higher than End Bridge

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	1135	BRIDGE APPROACH SLAB-REMOVE & REPLACE	SY	171.2
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	1,388

REGISTERED PROFESSIONAL ENGINEER
KYLE EVERT
PE-7868
DATE
NORTH DAKOTA
08/31/20

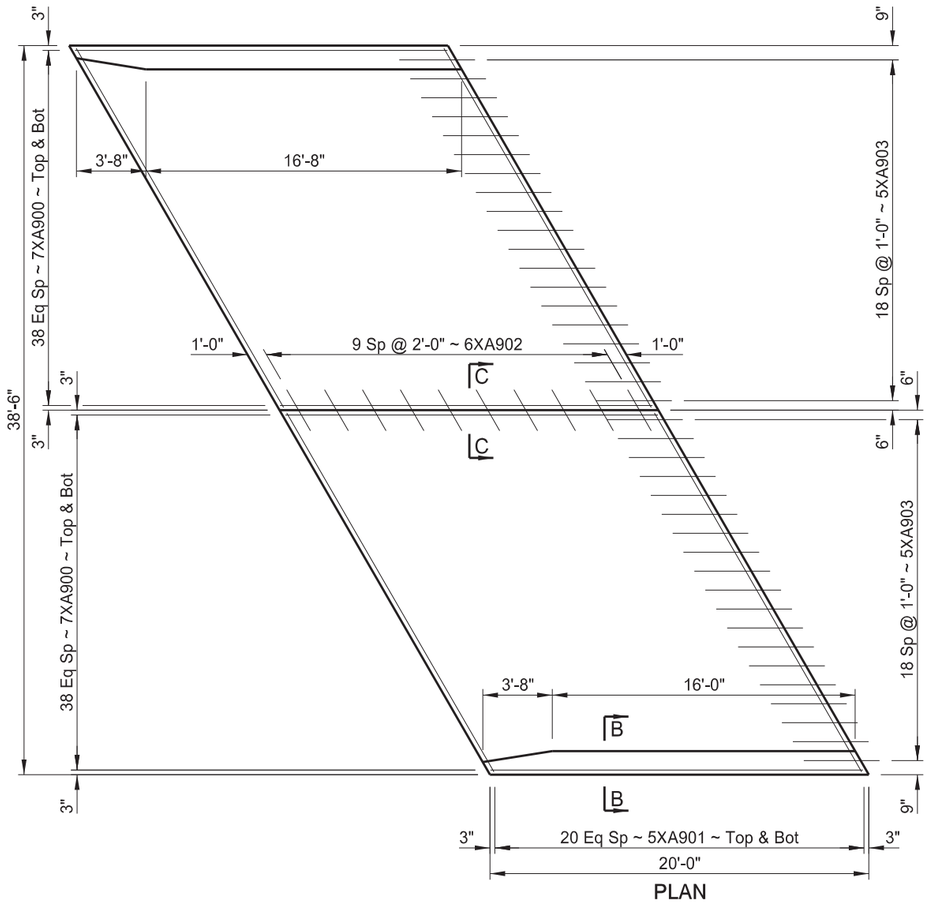
I-94/EAST DICKINSON INTERCHANGE

BRIDGE LAYOUT

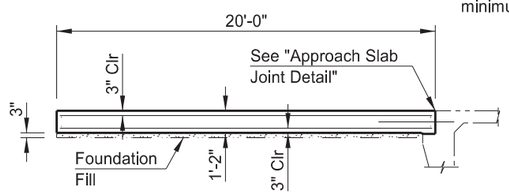
ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION
08/31/20
DocuSign

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-5-094(147)063	170	2

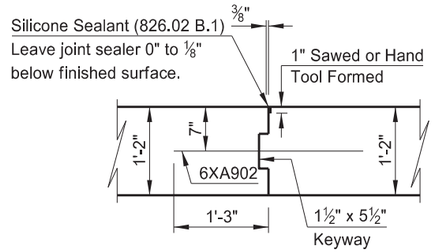


PLAN

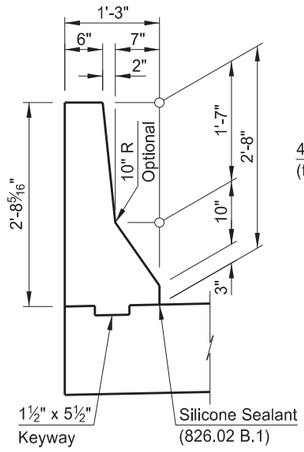


A-A

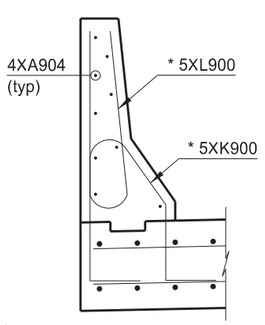
** Length may vary depending on manufacturer's recommendations for anchorage. Length based on 1 foot minimum anchorage length.



C-C



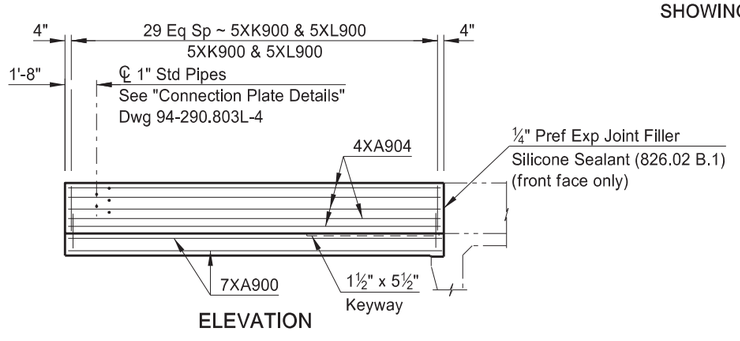
SHOWING DIMENSIONS



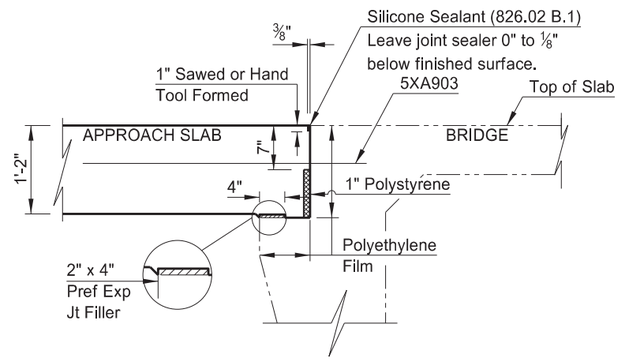
* Provide a 1½" clearance to the barrier reinforcing.

SHOWING REINFORCING

B-B



ELEVATION



APPROACH SLAB JOINT DETAIL

SKEW ANGLE = 30°

BAR LIST - ONE SLAB

SIZE	MARK	NO.	LENGTH
7	XA900	156	19'-8"
5	XA901	84	21'-10"
6	XA902	10	2'-6"
5	XA903	38	** 4'-0"
4	XA904	18	19'-8"
5	XK900	60	5'-7"
5	XL900	60	5'-0"

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (CY)
9,279	36.3

NOTE:

See Dwg 94-290.803L-4 for Notes, Connection Plate Details and Bent Bar Details.

REGISTERED PROFESSIONAL ENGINEER
KYLE EVERT
PE-7868
DATE
NORTH DAKOTA
08/31/20

QUANTITIES	(ONE SLAB)
APPROACH SLAB	85.6 SY

I-94/EAST DICKINSON INTERCHANGE

(WEST SLAB)

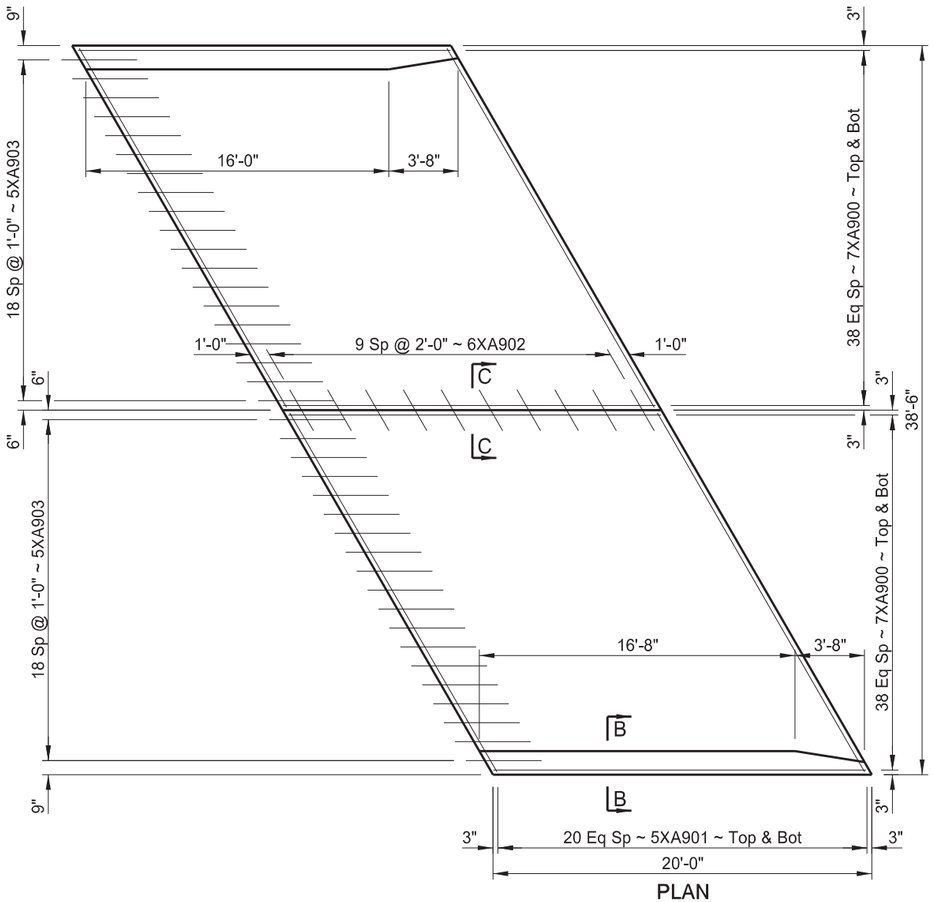
APPROACH SLAB DETAILS

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

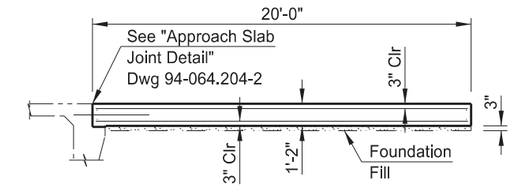
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	IM-5-094(147)063	170	3

NOTE:

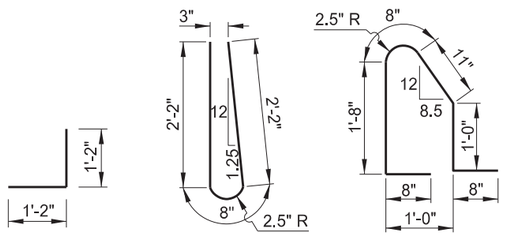
See Dwg 94-290.803L-3 for Sections B-B and C-C.



PLAN



A-A



BENT BAR DETAILS

NOTES:

The estimated material quantities shown are for information purposes only. Include the concrete, reinforcing bars, polyethylene film, preformed joint filler, polystyrene, silicone sealant, foundation fill, connection plates and pipes, and labor required to build the approach slabs, curbs and barriers in the pay item "Bridge Approach Slab-Remove and Replace." Include the dowel bars in the concrete pavement pay item. Use Class AE-3 concrete and Grade 60 reinforcing steel. Provide reinforcing steel that meets the requirements of Section 612. Use polyethylene film that meets the requirements of ASTM C171.

The bar marks beginning with an "X" indicate an epoxy coated bar. The dimensions shown in the "Bent Bar Details" are out to out.

Install 5XA903 bars according to manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage (16k min. ultimate pullout), and that meets the requirements of Section 806.02. Provide a minimum anchorage length of 1 foot.

SKEW ANGLE = 30°

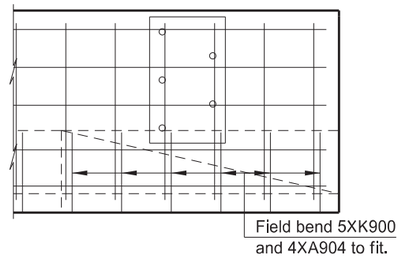
BAR LIST - ONE SLAB

SIZE	MARK	NO.	LENGTH
7	XA900	156	19'-8"
5	XA901	84	21'-10"
6	XA902	10	2'-6"
5	XA903	38	** 4'-0"
4	XA904	18	19'-8"
5	XK900	60	5'-7"
5	XL900	60	5'-0"

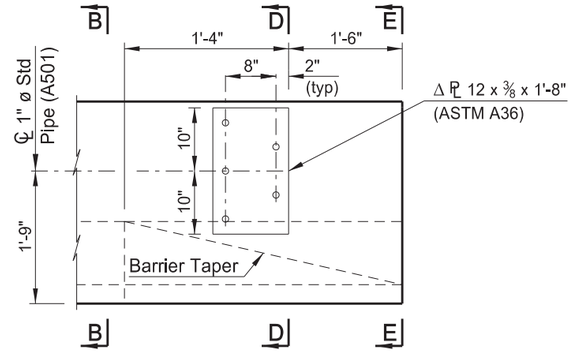
ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (CY)
9,279	36.3

** Length may vary depending on manufacturer's recommendations for anchorage. Length based on 1 foot a minimum anchorage length.



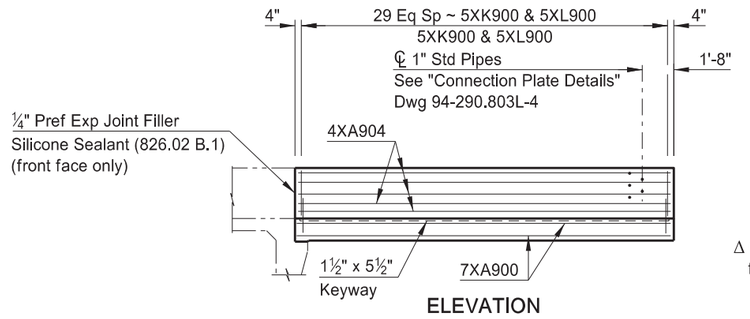
SHOWING REINFORCING



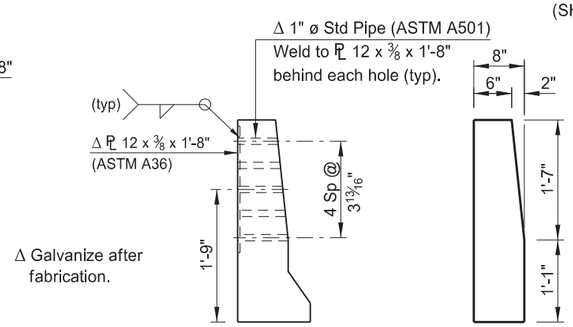
SHOWING DIMENSIONS

(SHOWING BACK FACE & JERSEY BARRIER TRANSITION)

CONNECTION PLATE DETAILS



ELEVATION



D-D E-E

REGISTERED PROFESSIONAL ENGINEER
KYLE EVERT
PE-7868
DATE
NORTH DAKOTA
08/31/20

QUANTITIES	(ONE SLAB)
APPROACH SLAB	85.6 SY

I-94/EAST DICKINSON INTERCHANGE

(EAST SLAB)

APPROACH SLAB DETAILS

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	IM-5-094(139)064	22546	1	1

AS Built Plans 10/20/2020
Nate Wingerter PE
WSB & Associates
4501 Coleman St. Suit 205
Bismarck ND 58503

Note: No Changes in plan.

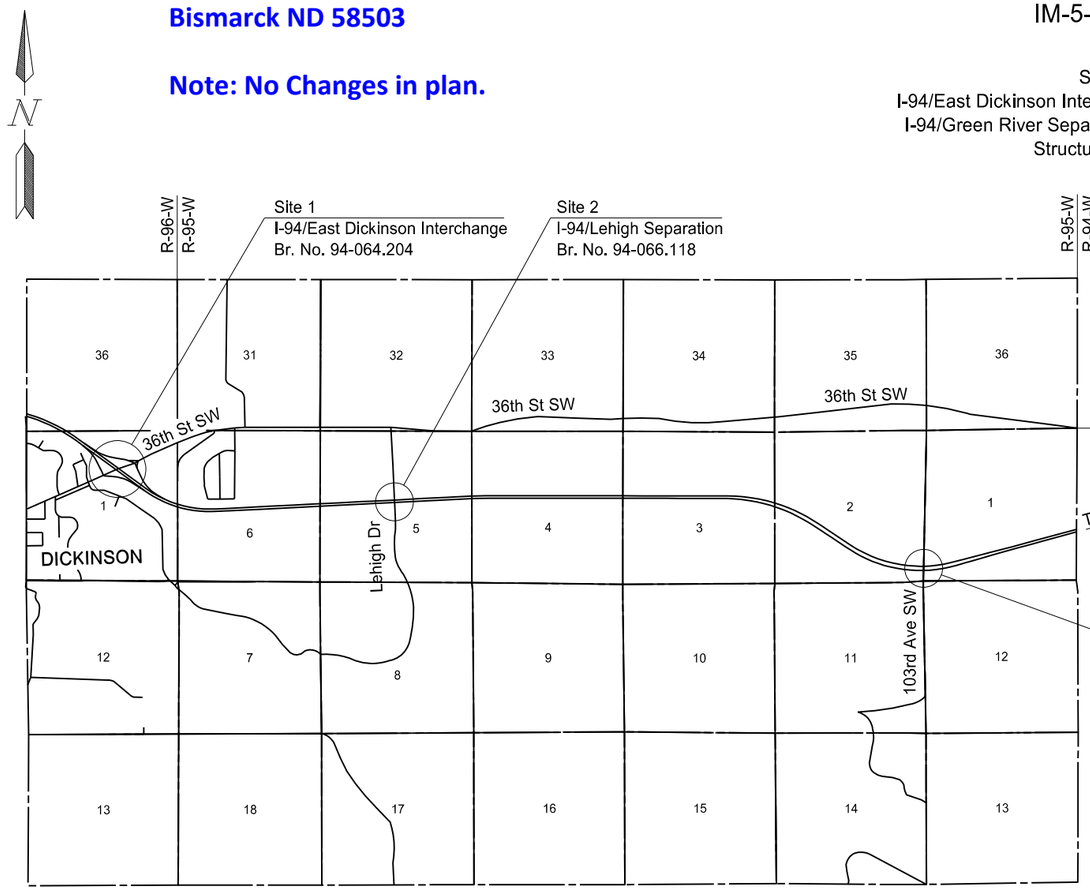
JOB # 39
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

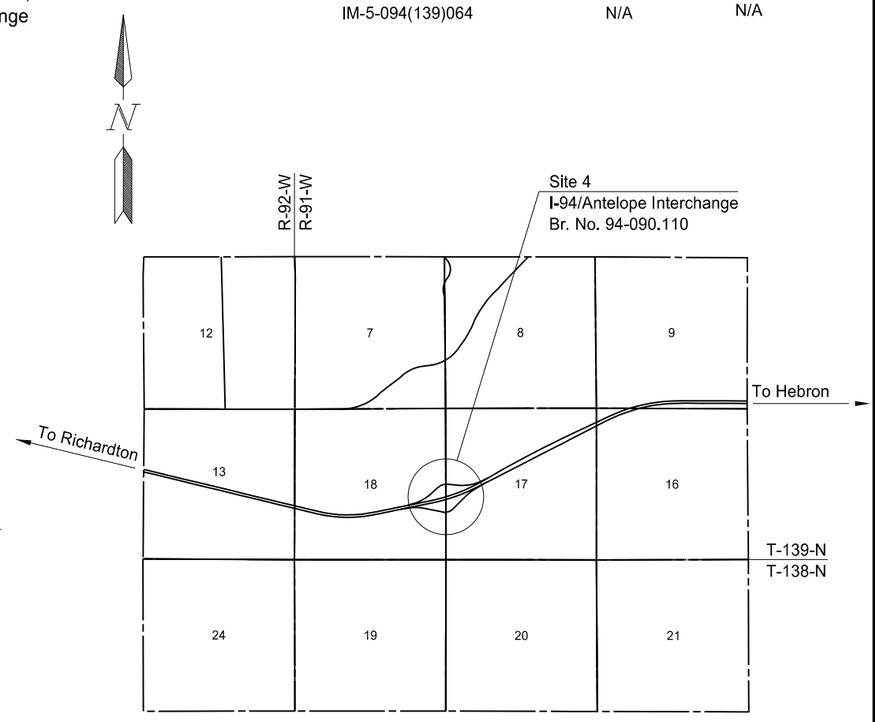
IM-5-094(139)064

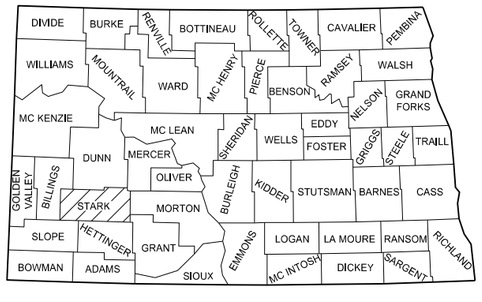
Stark County
I-94/East Dickinson Interchange, I-94/Lehigh Separation,
I-94/Green River Separation, I-94/Antelope Interchange
Structural Steel Painting

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
IM-5-094(139)064	N/A	N/A







STATE COUNTY MAP

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jon Ketterling 02/21/20

BRIDGE DIVISION

This document was originally issued and sealed by Jon Ketterling, Registration Number PE- 4684 , on 02/21/20 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-5-094(139)064	170	1

NOTES

100 SCOPE OF WORK: Sandblast, clean, and paint all exposed structural steel at the three locations.

630 SANDBLASTING AND PAINTING: Sandblast, clean, and paint all structural steel surfaces, including the bearing plates, according to Special Provision 1065(14). Paint the finish coat in the colors as shown in the table below, which must meet Aerospace Material Specification Standard 595. Lump Sum will be paid for the total area of 34,675 SF as noted in accordance with Special Provision 1065(14).

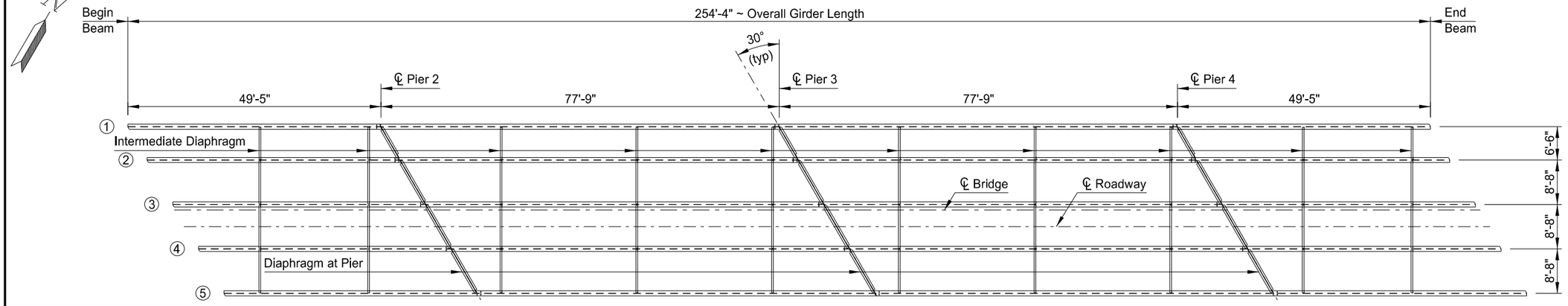
Submit to the Engineer 3” x 5” FED-STD-595C color chip cards for color numbers 21136 and 24108 with a declaration of conformity.

630 CONTAINMENT SYSTEM: Use a containment system that meets Special Provision 1065(14).

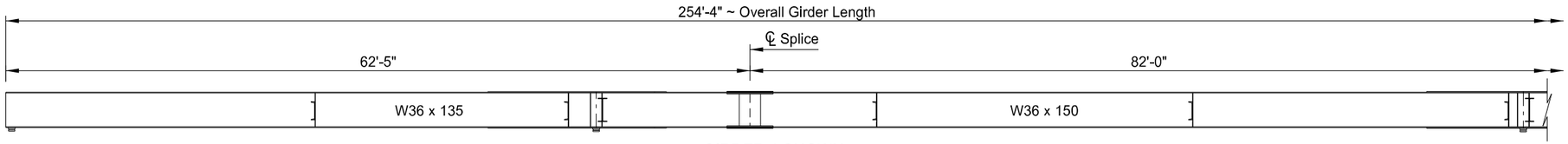
SITE	BRIDGE NO.	LOCATION	COLOR	COLOR NUMBER	SPANS	GIRDER LENGTH	TOTAL AREA (SF)
1	94-064.204	East Dickinson Interchange	Green	24108	4	254’-4”	13,525
2	94-066.118	Lehigh Separation	Red	21136	4	224’-6”	6,025
3	94-069.714	Green River Separation	Green	24108	5	274’-6”	7,450
4	94-090.110	Antelope Interchange	Red	21136	4	234’-6”	7,675
						TOTAL	**34,675**

This document was originally issued and sealed by Tim L. Schwagler, Registration Number PE-3151, on 02/20/20 and the original document is stored at the North Dakota Department of Transportation.

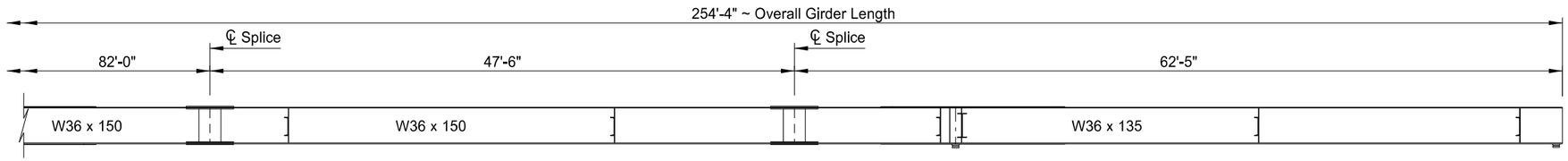
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	IM-5-094(139)064	170	2



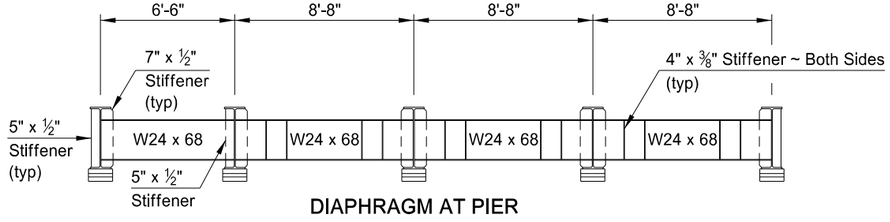
GIRDER LAYOUT



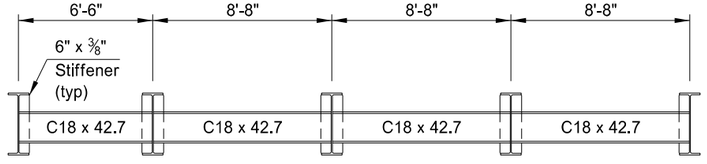
GIRDER 1 SHOWN
GIRDER ELEVATION



GIRDER 1 SHOWN
GIRDER ELEVATION



DIAPHRAGM AT PIER



INTERMEDIATE DIAPHRAGM

This document was originally issued and sealed by Tim L Schwagler, Registration Number PE 3151, on 02/20/20 and the original document is stored at the North Dakota Department of Transportation

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
630	0100	SAND BLASTING & PAINTING	L SUM	.4
630	9000	CONTAINMENT SYSTEM	L SUM	.4

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

I-94/EAST DICKINSON INTERCHANGE

STRUCTURAL STEEL PAINTING DETAILS

PROJECT: IM-5-094(139)064

STARK COUNTY

02/21/20 DATE

Jon Ketterling BRIDGE ENGINEER

2-5-2016

94-064.204

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:				

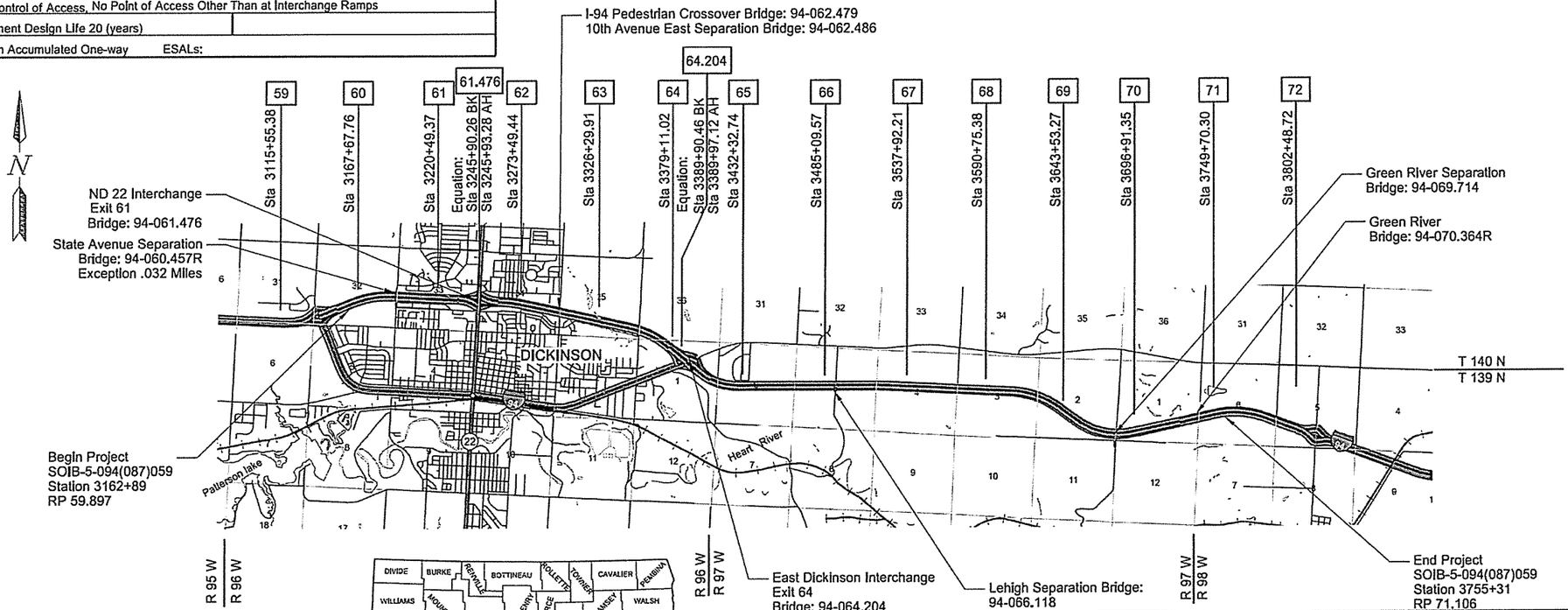
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SOIB-5-094(087)059	18921	1	1

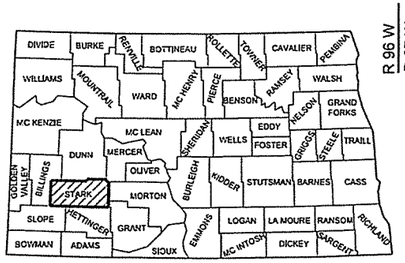
JOB # 6
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

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

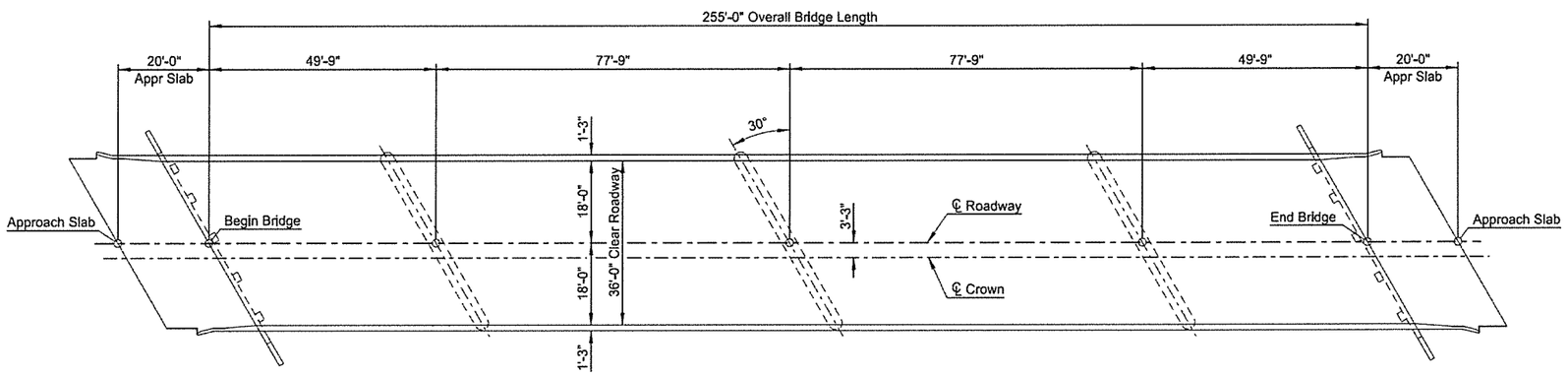
This document was originally issued and sealed by James Douglas Rath Registration Number PE- 4288, on 12/2/15 and the original document is stored at the North Dakota Department of Transportation

12/3/2015 2:07:43 PM cschafer R:\project\50094059.087\design\Sheets\001TS_001_Title.dgn

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	SOIB-5-094(087)059	170	6

NOTE:

100 SCOPE OF WORK: Work at this site consists of placing a deck overlay.



PLAN

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	0130	CLASS AAE-3 CONCRETE	CY	2.0
650	0704	OVERLAY CONCRETE	CY	73
650	0720	CLASS 1 REMOVAL	SY	1020
650	0721	CLASS 2 REMOVAL	SY	204
650	0722	CLASS 2-A REMOVAL	LF	367
650	0723	CLASS 3 REMOVAL	SY	51
650	0724	CLASS 4 REMOVAL	SY	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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

I-94/EAST DICKINSON INTERCHANGE

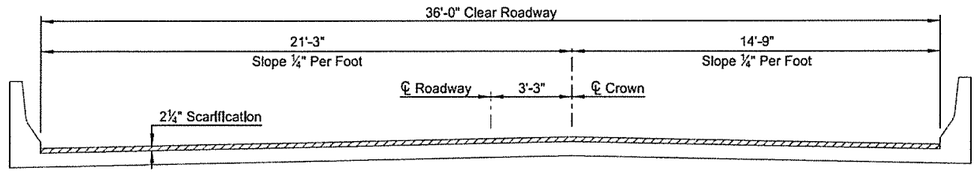
BRIDGE LAYOUT

PROJECT: SOIB-5-094(087)059

STARK COUNTY

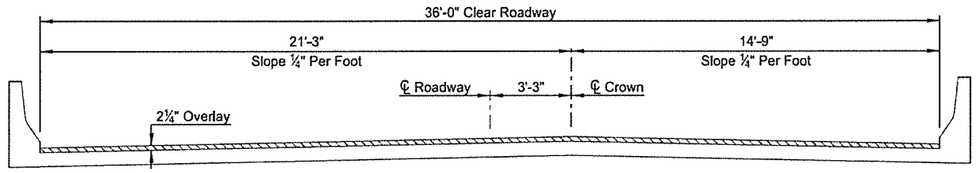
12/01/15 (DATE) Terrence R. Udland (BRIDGE ENGINEER)

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-5-094(087)059	170	7



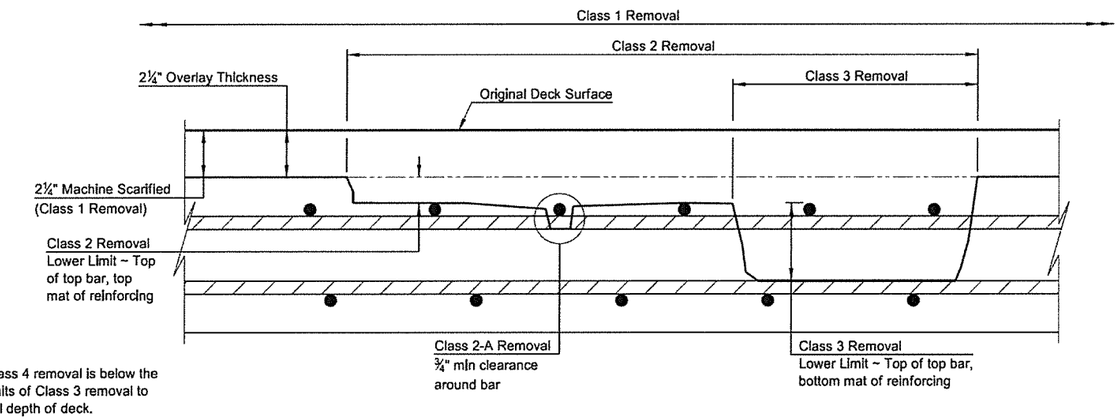
(SHOWING REMOVAL)

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.

QUANTITIES	
CLASS AAE-3 CONCRETE	2.0 CY
OVERLAY CONCRETE	73 CY
CLASS 1 REMOVAL	1020 SY
CLASS 2 REMOVAL	204 SY
CLASS 2-A REMOVAL	367 LF
CLASS 3 REMOVAL	51 SY
CLASS 4 REMOVAL	10 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

I-94/EAST DICKINSON INTERCHANGE

DECK OVERLAY DETAILS

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2005	Pass: 2,085	Trucks 585	Total 2,670	270
Forecast 2025	Pass: 3,110	Trucks 875	Total 3,985	400
Minimum Sight Dist. for:		Design Speed 75 mph		
Stopping 820 LF		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life (years) 30				

JOB# 9

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	AC-IM-5-094(034)053	14702	1	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT AC-IM-5-094(034)053
IN STARK COUNTY
DOWELED PCC PAVEMENT, REGRADING, AND INCIDENTALS
(WEST BOUND)

GOVERNING SPECIFICATIONS:

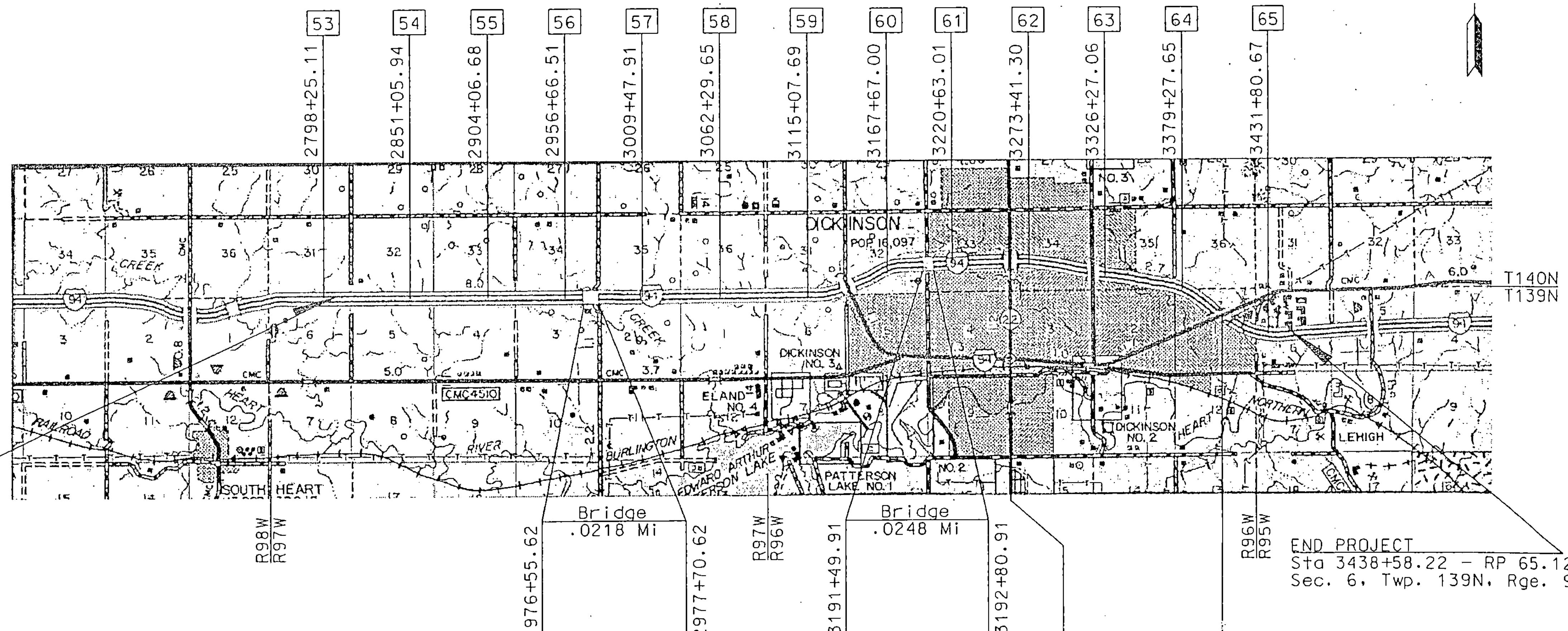
Standard Specifications adopted by the North Dakota Department of Transportation October 2002; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

Miles-Gross	Miles-Net
12.0763 Mi	12.0298 Mi

.0466 Mi deducted for bridges

N



BEGIN PROJECT
Sta 2800+82.52 - RP 53.0488
Sec. 31, Twp. 140N, Rge. 97W

END PROJECT
Sta 3438+58.22 - RP 65.1283
Sec. 6, Twp. 139N, Rge. 95W

EQUATION
STA 3245+90.26 BK=
STA 3245+93.28 AHD

EQUATION
STA 3389+87.56 BK=
STA 3389+97.12 AHD

DESIGNERS
[signatures]

APPROVED DATE 9/6/05
[signature]
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 09-06-2005
for Roger Weigel
DESIGN DIVISION
ND DEPARTMENT OF TRANSPORTATION

9-6-05
ROGER WEIGEL REGISTERED PROFESSIONAL P.E. 2930 ENGINEER NORTH DAKOTA

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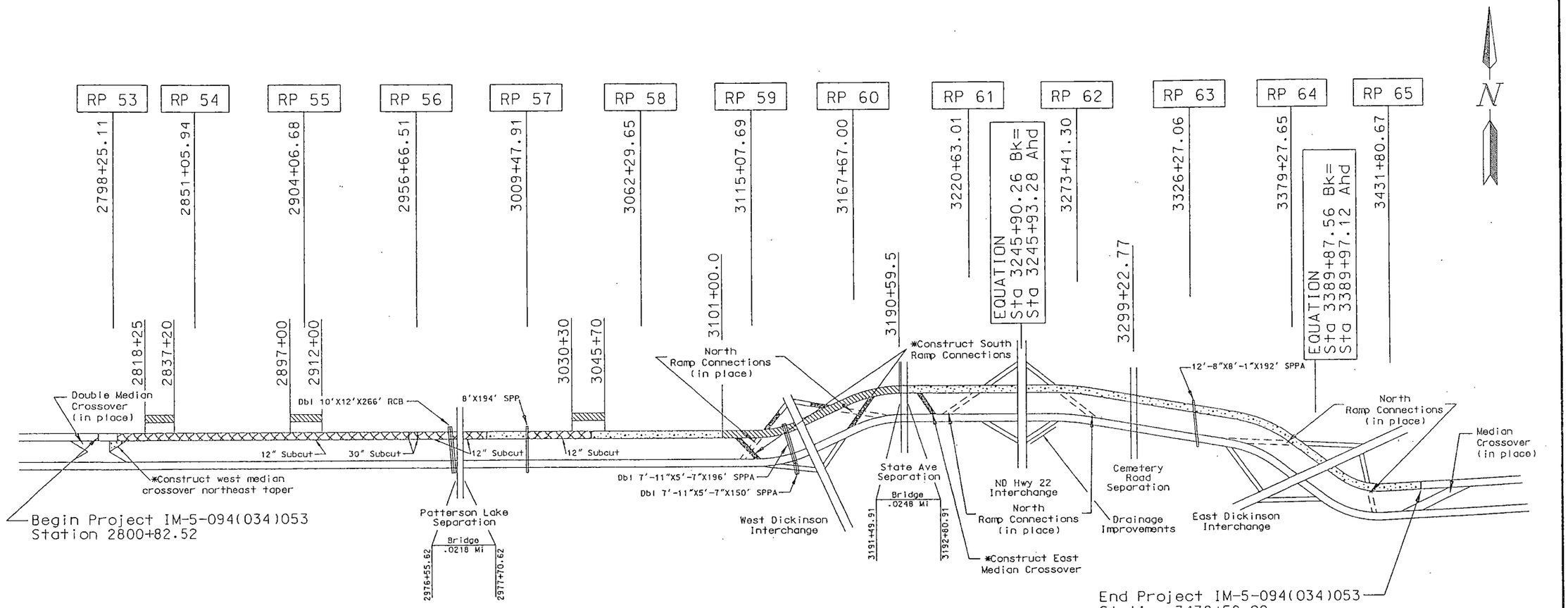
94-064, 204

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-5-094(034)053	4	1



PCC PAVEMENT RECONSTRUCTION

REGRADING AREAS:
Sta 2818+25 to Sta 2837+20
Sta 2897+00 to Sta 2912+00
Sta 3030+30 to Sta 3045+70
Sta 3101+00 to Sta 3190+59.5

SUBGRADE REPAIR AREAS WITHIN PCC PAVEMENT RECONSTRUCTION:
Sta 2806+07.11 to Sta 2941+56.68 - 12" Subcut
Sta 2941+56.68 to Sta 2945+56.68 - 30" Subcut
Sta 2945+56.68 to Sta 2978+16.51 - 12" Subcut
Sta 3009+47.91 to Sta 3039+47.91 - 12" Subcut

HOT BITUMINOUS PAVEMENT

*The south ramp connections at the West Dickinson Interchange, the west median crossover northeast taper, and the east median crossover to be constructed after the westbound roadway is reconstructed.

RANKA SAMARDZIC
REGISTERED
PROFESSIONAL
PE 4898
9/6/05
ENGINEER
NORTH DAKOTA

SCOPE OF WORK

I-94 Near South Heart to
East of the East Dickinson Int

scope

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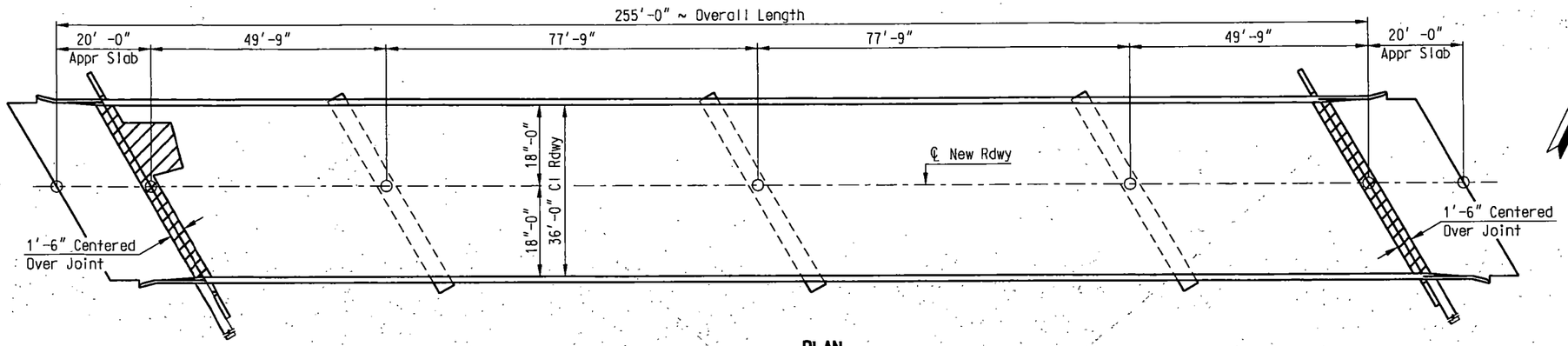
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-5-094(034)053	170	6



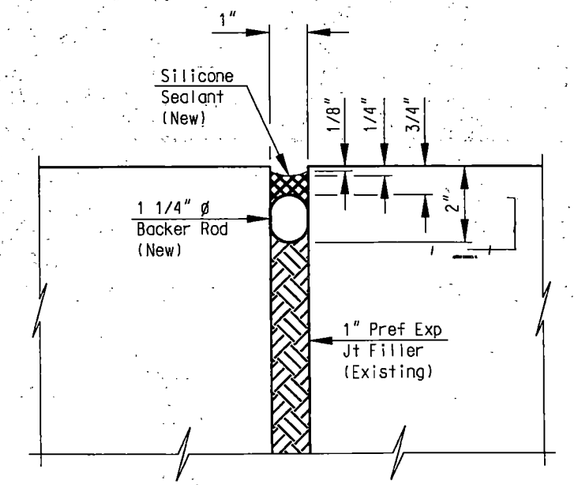
PLAN

Spall Area

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
930	8644	SILICONE SEALANT	LF	88
930	9612	SPALL REPAIR	SF	330

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. The new silicone sealant and backer rod shall extend 15 inches up the faces of the barriers. After removing the existing silicone sealant and backer rod, 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. 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 SPALL REPAIR: The spall repair will be constructed like a Bridge Deck Overlay and shall be constructed according to Section 650 of the NDDOT Specifications. The minimum depth of removal shall be 2". The perimeter of the repair shall be saw cut to a depth of 1". The saw cutting shall be incidental to the price bid for "Spall Repair."



JOINT DETAIL

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

EAST DICKINSON INTERCHANGE

LAYOUT

PROJECT: IM-5-094(034)053

Station: 3389+87.56 BK
3389+97.12 AH

STARK COUNTY

9-2-05
DATE

Jeremy R. Hulland
BRIDGE ENGINEER

YYXX000 TLS

94-064.204

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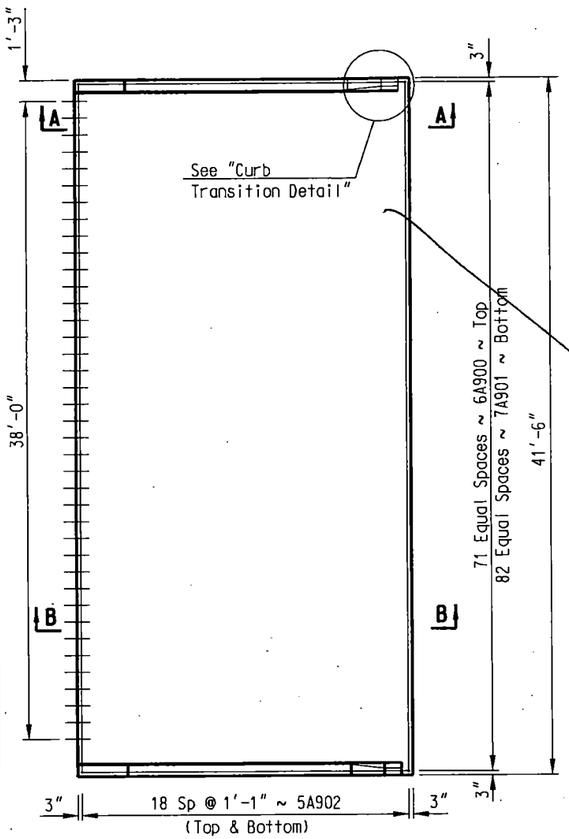
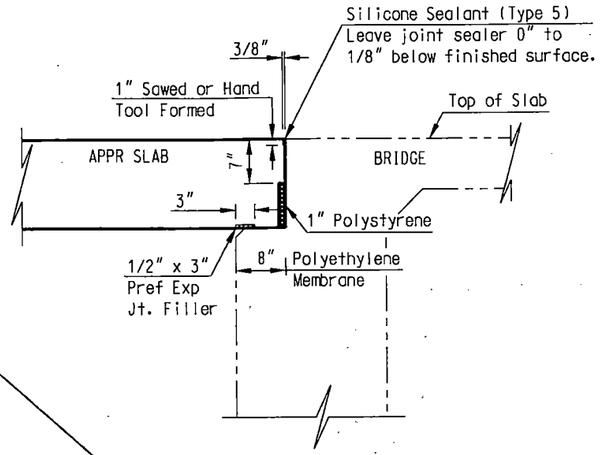
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-5-094(034)053	170	5



PLAN



APPROACH SLAB JOINT DETAIL

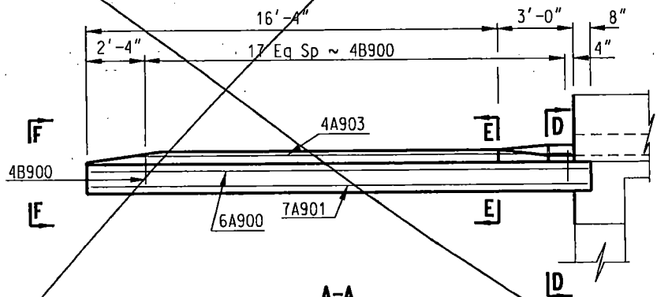
NOTES:

The estimated material quantities shown are for information purposes only. All materials including concrete, reinforcing bars, polyethylene membrane, preformed joint filler, polystyrene, silicone sealant, select backfill and all labor required to build the approach slabs and curbs shall be included in the pay item "Concrete Bridge Approach Slab." The concrete shall be Class AE-3 and the reinforcing steel shall be Grade 60. The polyethylene membrane shall meet the requirements of AASHTO M 171.

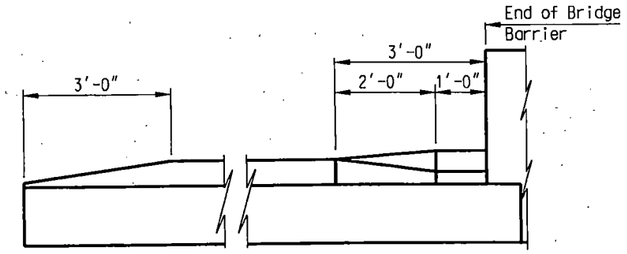
Surface Finish "D" shall be required on all surfaces of the approach slab barriers. The color and texture shall match the existing bridge.

SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	72	19'-8"
7	A901	83	19'-8"
5	A902	38	41'-2"
4	A903	2	17'-1"
4	B900	36	2'-1"

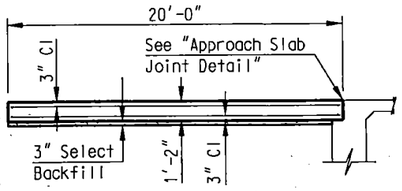
ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
7,168	36.5



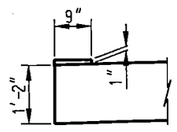
A-A



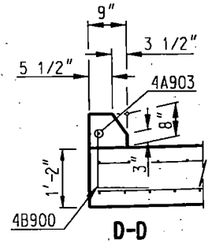
CURB TRANSITION DETAIL



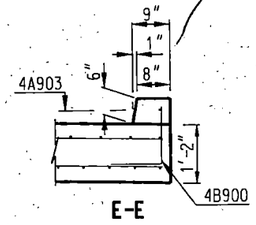
B-B



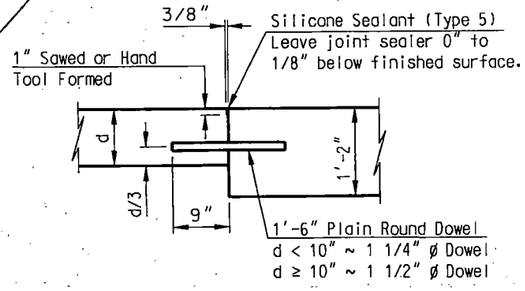
F-F
Showing dimensions



D-D



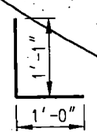
E-E



d = Pavement Thickness

JOINT DETAIL A

The Dowel Bars are inculded in the paving quantities.



B900

Dimensions shown are out to out.

BENT BAR DETAILS

QUANTITIES (ONE SLAB)	
APPROACH SLAB	92.2 SY

STATE AVE. SEPARATION
DICKINSON

APPROACH SLAB DETAILS

YYXX000 TLS

94-060.457L-1

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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

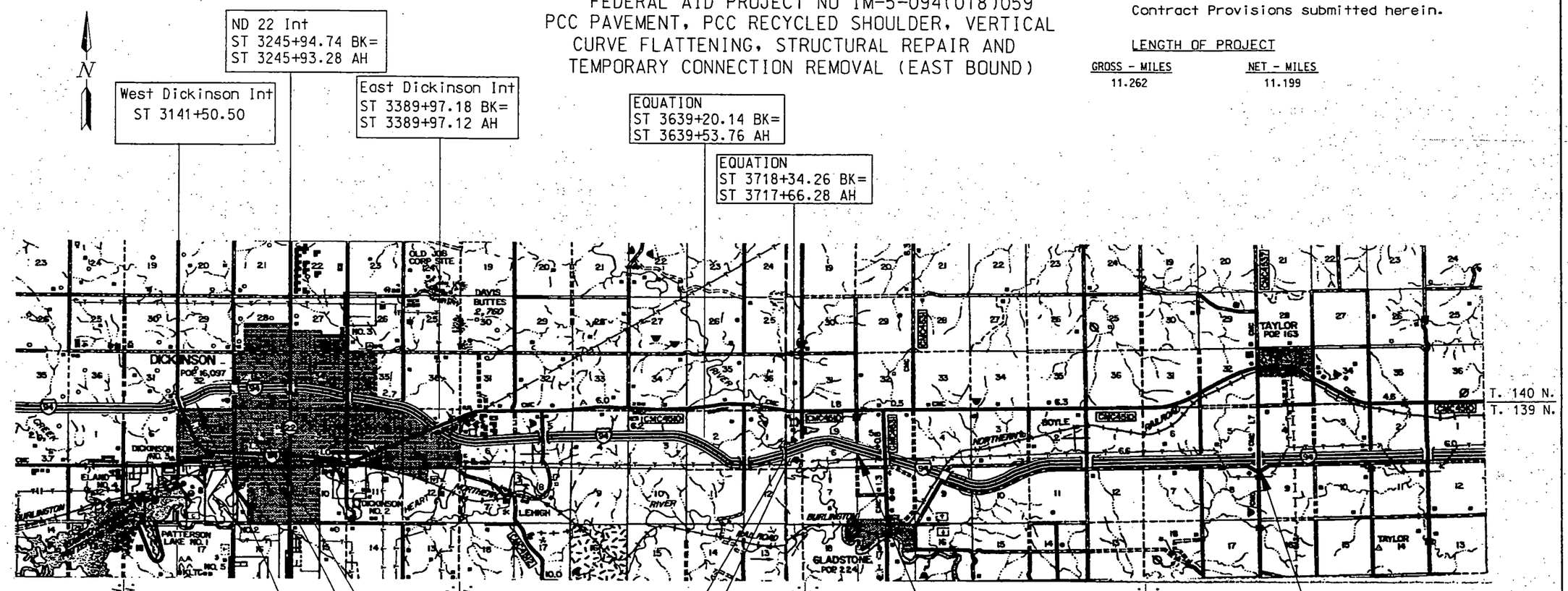
IN STARK COUNTY
FEDERAL AID PROJECT NO IM-5-094(018)059
PCC PAVEMENT, PCC RECYCLED SHOULDER, VERTICAL CURVE FLATTENING, STRUCTURAL REPAIR AND TEMPORARY CONNECTION REMOVAL (EAST BOUND)

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



DESIGNER Susan K. Forman
DESIGNER Dave Ellefson
DESIGNER
RECOMMEND APPROVAL 9-14 .1999
DESIGN ENGINEER Kathe Smith

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

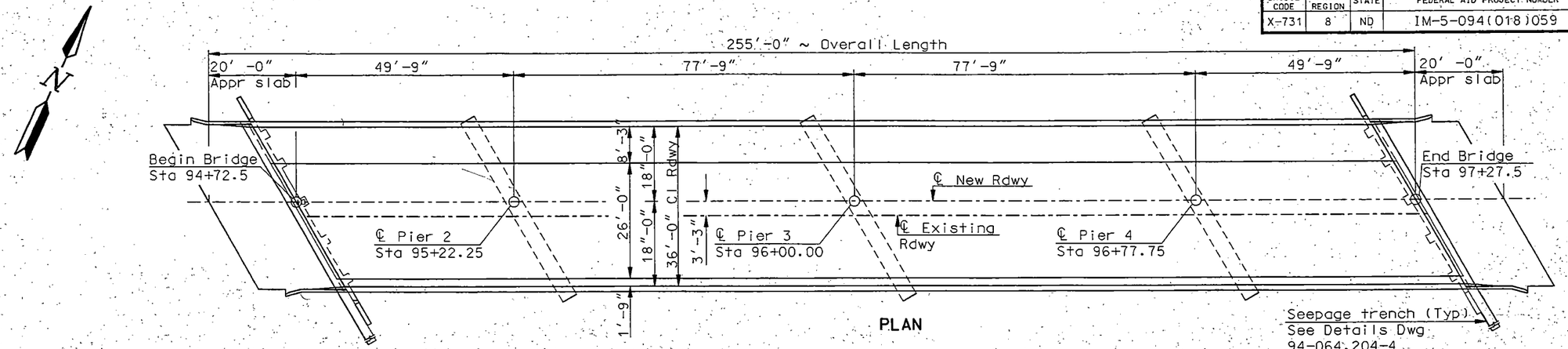
APPROVED DATE 9-14-99

DIRECTOR OF HIGHWAYS
AND ENGINEERING

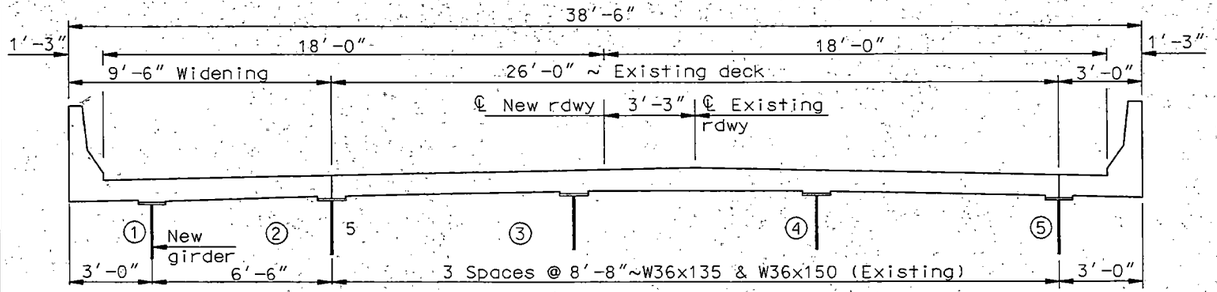
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

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

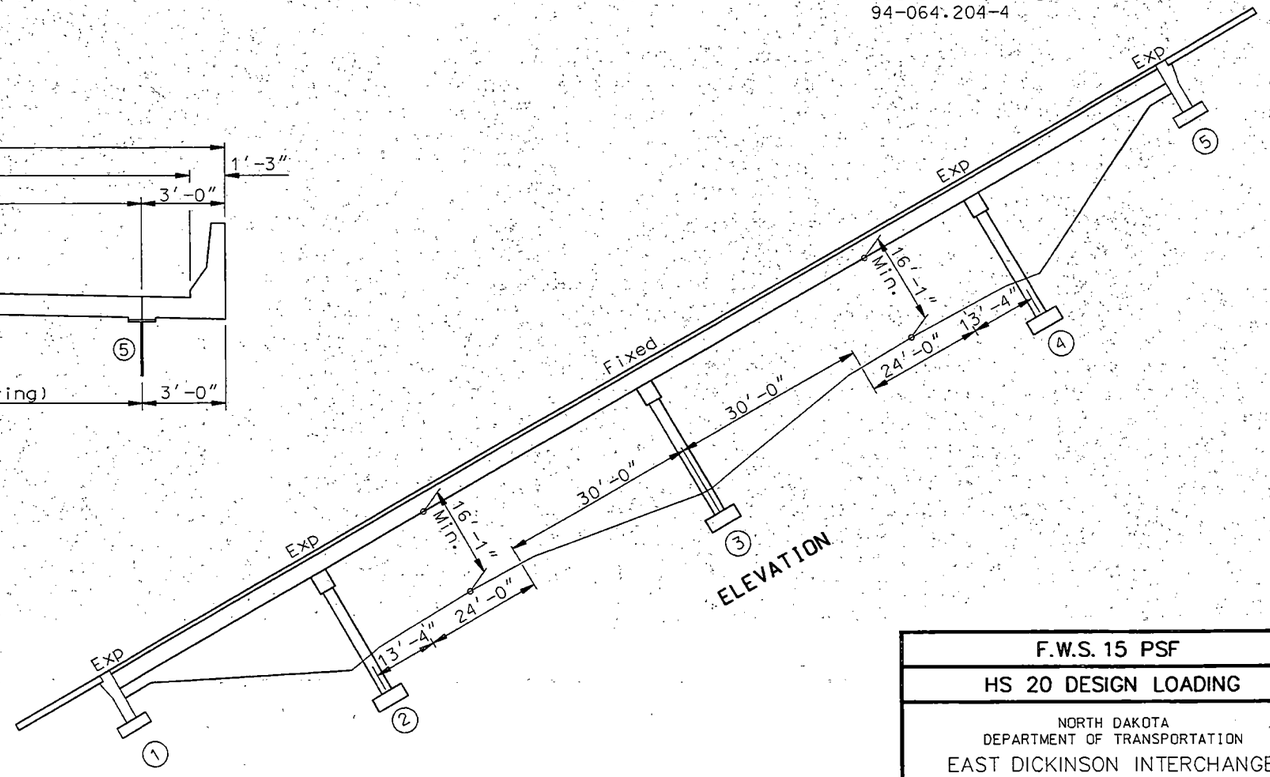
BRIDGE CODE	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
X-731	8	ND	IM-5-094(018)059	189



PLAN



TYPICAL DECK SECTION



ELEVATION

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0117	REMOVAL OF CONCRETE - SITE 3	L SUM	1
210	0101	CLASS 1 EXCAVATION	L SUM	1
210	0204	FOUNDATION PREPARATION - SITE 3	L SUM	1
550	0215	CONCRETE BRIDGE APPROACH SLAB	SY	169.4
602	0130	CLASS AAE-3 CONCRETE	CY	133.1
602	1130	CLASS AE-3 CONCRETE	CY	56.3
602	1250	PENETRATING WATER REPELLENT TR.	SY	283
612	0115	REINFORCING STEEL GRADE 60	LBS	24,693
612	0116	REINFORCING STEEL GRADE 60 EPOXY	LBS	8,626
616	5890	STRUCTURAL STEEL (APPROX. 47,000 LBS)	L SUM	1
622	4630	TREATED TIMBER PILING	LF	270
930	7015	ROADWAY CANOPY - SITE 3	L SUM	1
930	8642	NOSING CONCRETE	CF	10.2
930	8644	SILICONE SEALANT	LF	83.1

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete
f'c = 4,000 psi ~ Class AAE-3 Concrete
fy = 60,000 psi ~ Reinforcing Steel
fy = 36,000 psi ~ Structural Steel M270

LOAD FACTOR DESIGN

TERRENCE R. UDLAND REGISTERED PROFESSIONAL 2674 ENGINEER NORTH DAKOTA

F.W.S. 15 PSF

HS 20 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

EAST DICKINSON INTERCHANGE WIDENING

BRIDGE LAYOUT

PROJECT: IM-5-094(018)059
STATION 96 + 00.0

STARK COUNTY

9-10-99 DATE

Terrence R. Udland BRIDGE ENGINEER

BRLO 99LCS088 BWR

SITE 3 94-064.204

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IM-5-094(018)059	190

NOTES - EAST DICKINSON INTERCHANGE

100 SCOPE OF WORK: Work at this site consists of widening the existing structure to the northwest by adding one girder line and replacing the curb on the other side. The clear roadway width will be widened from 30'-0" to 36'-0". Also, work at this site consists of installing approach slabs at each end of the bridge.

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.

105 The existing structural steel is painted with lead-based paint. Certain contractor operations could expose employees to hazardous levels of lead. The contractor shall plan accordingly and shall inform employees of the hazards of lead-based paint.

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 superstructure, abutment, and pier cap removal shall be included in the lump sum bid item "Removal of Concrete - Site 3." There are approximately 110 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 3."

210 EXCAVATION: The excavation at the abutments, as shown, and the excavation required to build the piers shall be included in the lump sum bid item, "Class 1 Excavation."

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 DECK CONCRETE: Beams and girders have slight variations in the anticipated camber. To build the deck to the designated thickness will require slight adjustments in deck elevation and/or riser dimensions. These adjustments result in minor concrete quantity discrepancies. The contractor shall consider this quantity discrepancy when he bids the unit price for Class AAE-3 Concrete. The Department will pay plan quantity of Class AAE-3 Concrete.

602 Deflection of the deck shoring shall be computed using the total dead load plus the weight of the finishing machine. The forming shall be adjusted properly to accommodate the deflection and thereby maintain the total slab thickness specified in the plans.

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.

602 DECK TINING: Tining shall begin 6 inches from the beginning and the end of the deck and 6 inches from each deck joint.

SHOP DRAWINGS: The contractor shall submit the following shop drawings to the Construction office for approval:

1. Structural steel.

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
FY	36,000 PSI	Structural Steel M270 Grade 36

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IM-5-094(018)059	191

NOTES - EAST DICKINSON INTERCHANGE

616 STRUCTURAL STEEL: Structural steel shall be AASHTO M 270, Grade 36T2, except the requirement for Charpy V-Notch test is waived for the bearings, diaphragms, and diaphragm connection material.

616 Shear connectors on splice plates shall be moved to clear bolt holes.

616 Field connections shall be made with 7/8 inch diameter, AASHTO M 164 high-strength bolts unless otherwise shown.

616 Temporary or permanent attachments or devices that are not shown on the plans as part of the structure shall not be welded to the structural steel members during the fabrication and construction process.

616 The cost of swedge bolts shall be included in the total cost of structural steel.

630 PAINT AND PAINTING: The structural steel shall be painted according to the specifications. The finish coats shall be aluminum, color number 37200, and shall meet Federal Standard No. 595B colors.

930 ROADWAY CANOPY: The contractor shall construct a canopy above the traveled roadway under the structure to protect traffic from falling material. The canopy is an added safeguard and does not relieve the contractor of any responsibility for the safety of the public.

The canopy must be erected before the concrete deck is removed and remain in place until after the new deck is complete. The canopy may be supported from the ground or suspended from the girders. The erection of the canopy shall be completed in a minimum amount of time and with the least inconvenience to the public.

The canopy shall be of a design and material selected by the contractor and approved by the engineer. The minimum vertical clearance from the traveled roadway to the bottom of the canopy shall be 15'-0". The canopy shall project a minimum distance of 5'-0" beyond the outside edge of slab of the proposed structure.

The canopy shall project a minimum distance of 5'-0" beyond the edge of the driving lanes beneath the structure.

After completion of the structure, the canopy shall be removed and shall remain the property of the contractor.

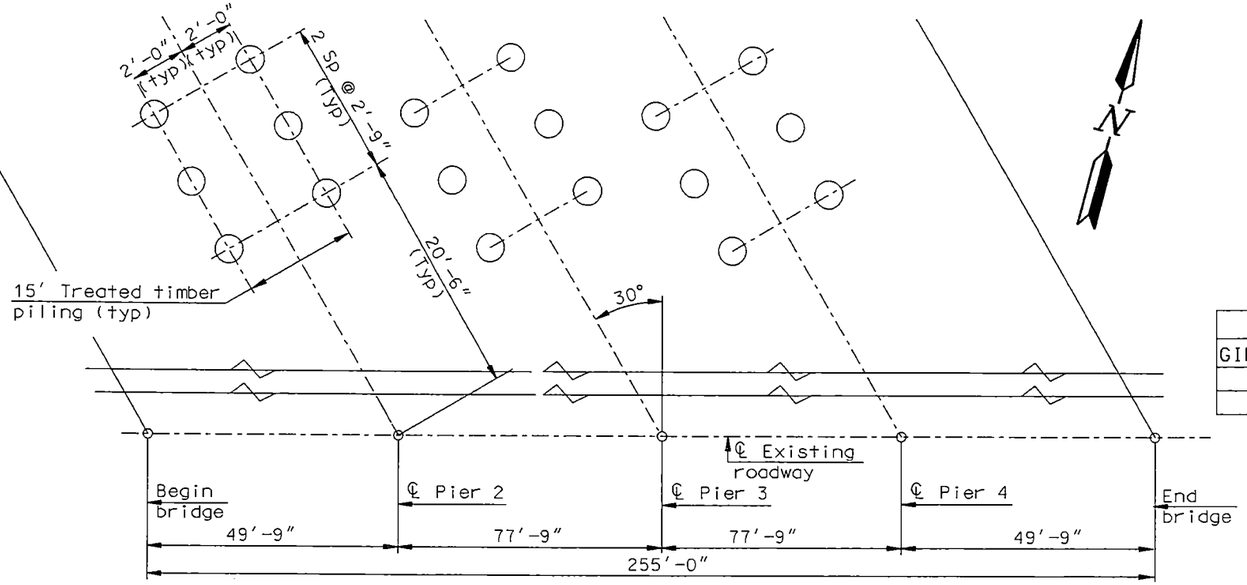
The roadway canopy shall be paid for at the contract lump sum unit price for "Roadway Canopy - Site 3." The roadway canopy shall be measured as a lump sum item and shall include construction, maintenance, and removal.

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."

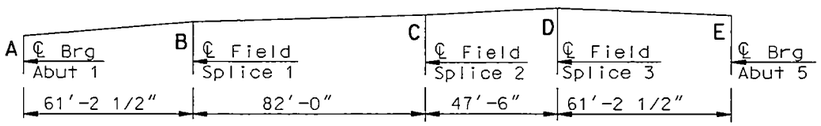
930 SILICONE SEALANT: The silicone sealant shall be a rapid cure, self-leveling, cold-applied two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The silicone sealant and the nosing 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	192

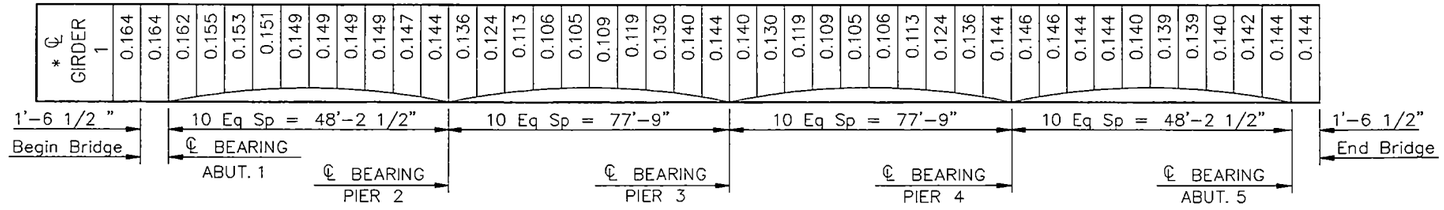


PILE LAYOUT



SHOP BLOCKING DIAGRAM-NEW GIRDER 1

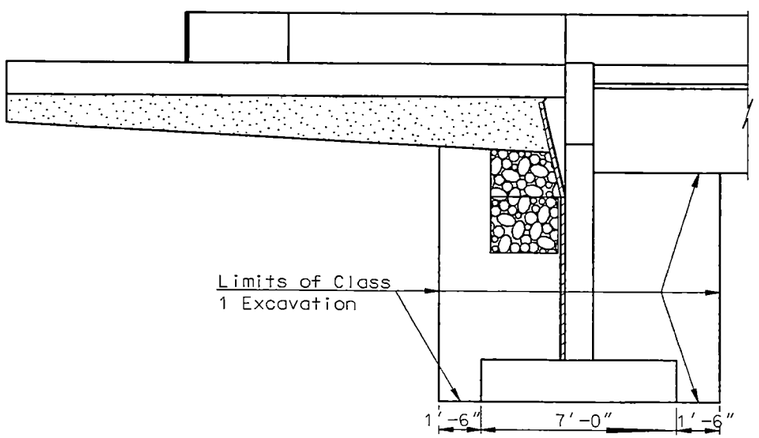
DIMENSIONS					
GIRDER NO.	A	B	C	D	E
1	10'-0"	10'-5 9/16"	10'-7 15/16"	10'-9 5/16"	10'- 8 3/4"



* Girder No. 1 is the New Girder

SCREED ELEVATIONS

NOTE:
The dimensions shown above include the effects of deck cross slope, bridge skew and dead load deflections. The screed elevations shall be calculated by taking elevations along the existing deck, directly above girder 2 (existing exterior) at tenth points prior to any deck removal, then subtract the dimensions listed above from the tenth point elevations for girder 2. The screed elevations calculated are for the tenth point locations on the new girder.

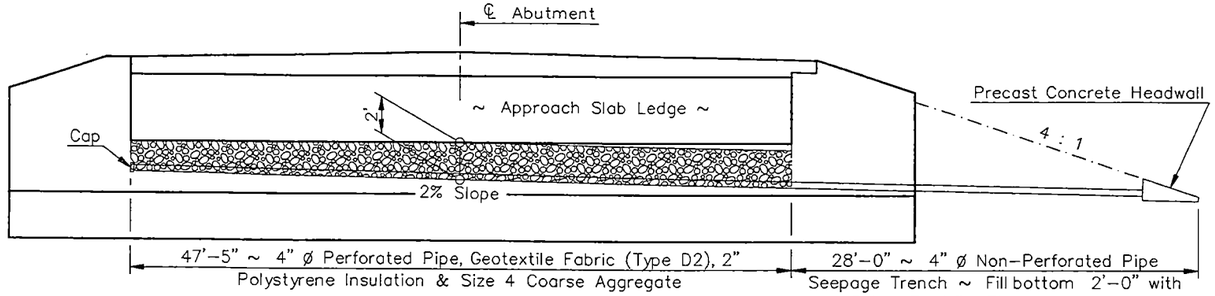


DETAIL AT ABUTMENT WIDENING

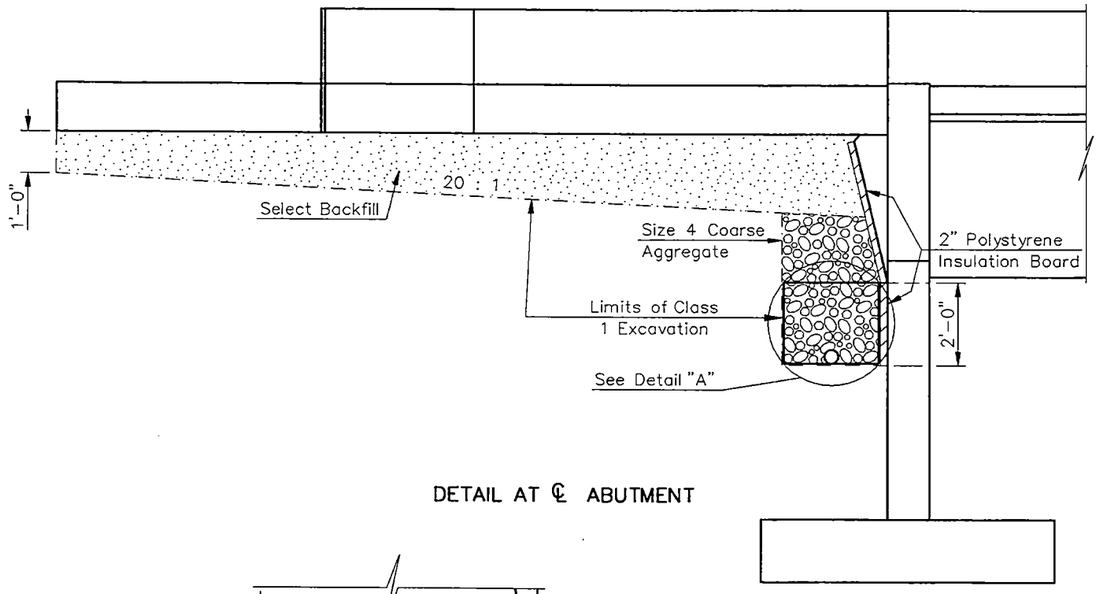
EAST DICKINSON INTERCHANGE WIDENING

PILE LAYOUT, BLOCKING DIAGRAM, SCREED ELEVATIONS AND DETAIL AT ABUTMENT WIDENING

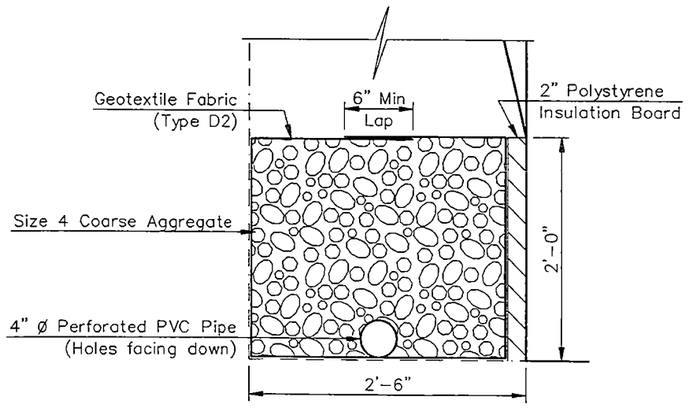
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	193



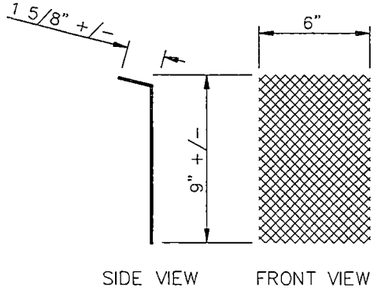
BACKFACE OF ABUTMENT



DETAIL AT ℄ ABUTMENT

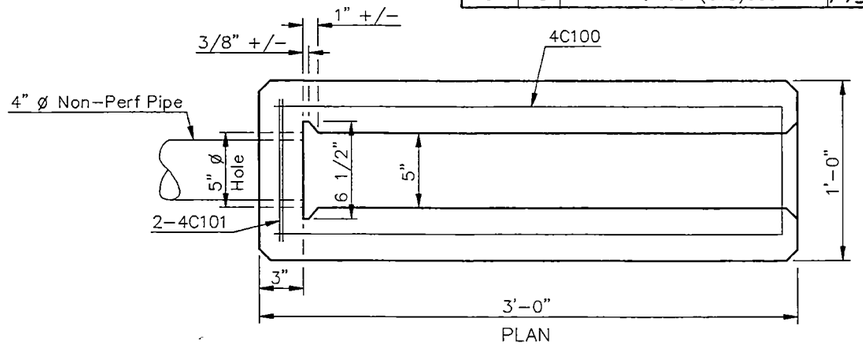


DETAIL "A"

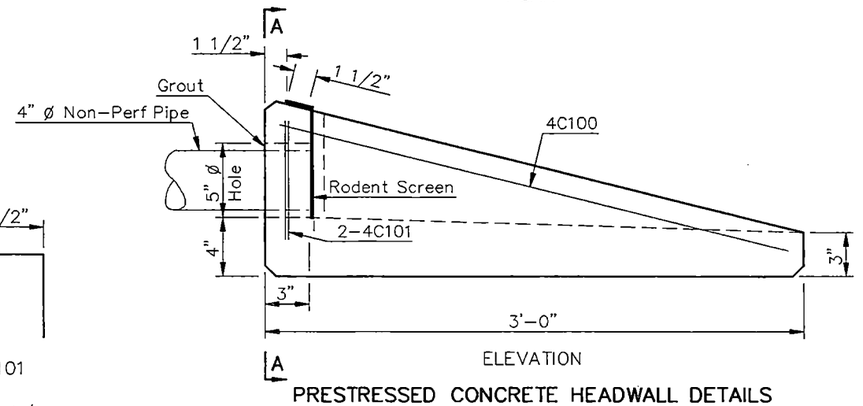


SIDE VIEW FRONT VIEW

RODENT SCREEN DETAILS

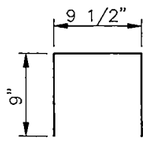


PLAN

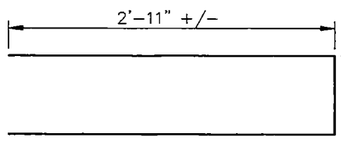


ELEVATION

PRESTRESSED CONCRETE HEADWALL DETAILS

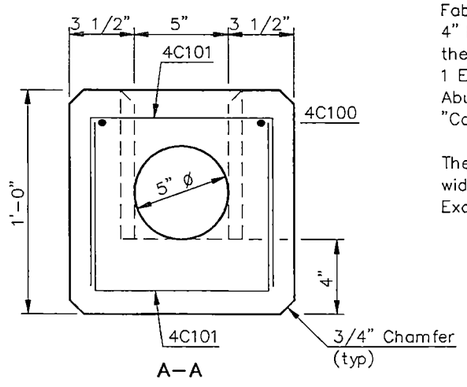


4C101



4C100

BENT BAR DETAILS



A-A

NOTE:

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

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

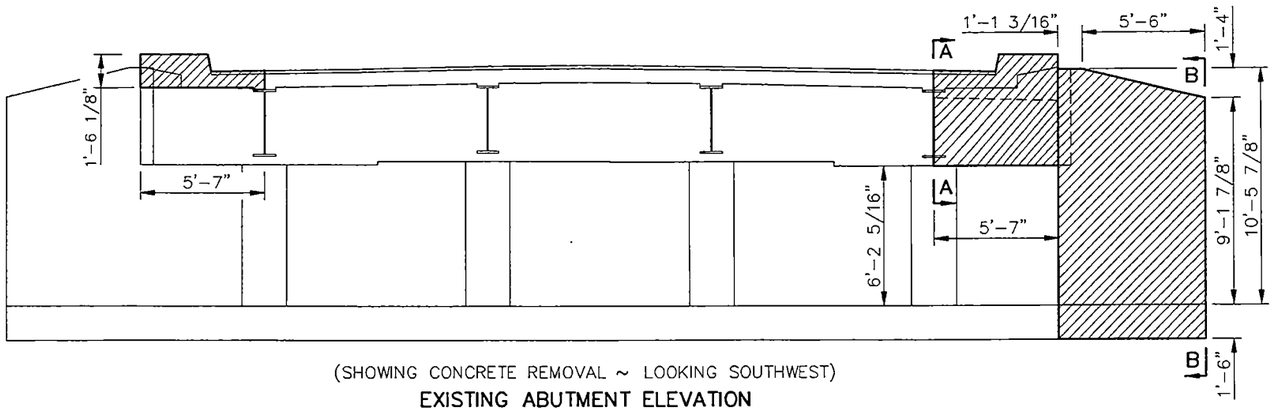
The Size 4 Coarse Aggregate, Select Backfill, Geotextile Fabric (Type D2), the 2" Polystyrene Insulation Board, the 4" Perforated PVC Pipe, the 4" Non-Perforated PVC Pipe, the Precast Concrete Headwall, the Rodent Screen, Class 1 Excavation, equipment and labor required to place the Abutment Underdrain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

The Class 1 excavation needed for the abutment and pier widening shall be included in the pay item "Class 1 Excavation".

EAST DICKINSON INTERCHANGE WIDENING

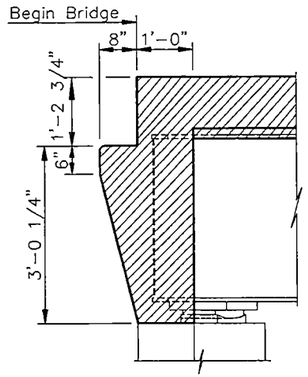
ABUTMENT UNDERDRAIN DETAILS

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	194

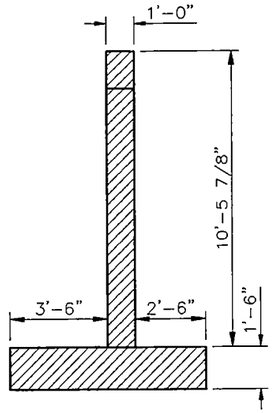


(SHOWING CONCRETE REMOVAL ~ LOOKING SOUTHWEST)

EXISTING ABUTMENT ELEVATION

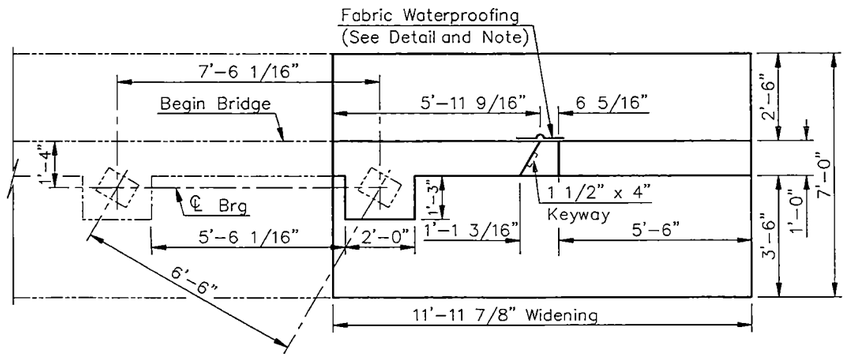


A–A

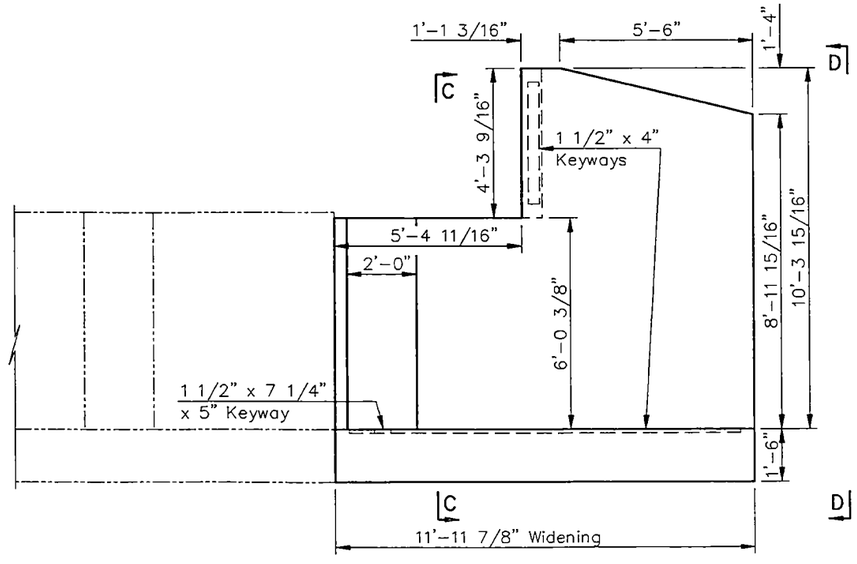


B–B

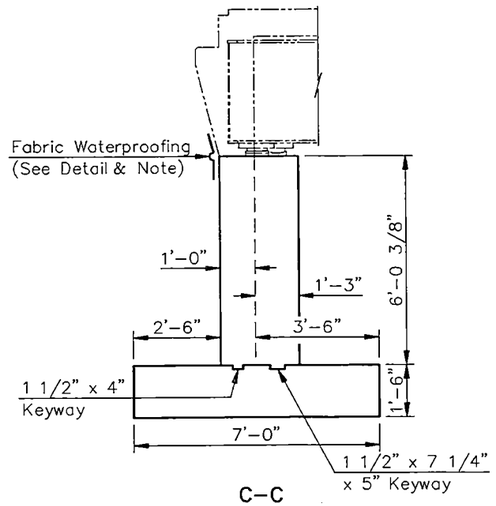
Hatched areas indicate concrete to be removed. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place.



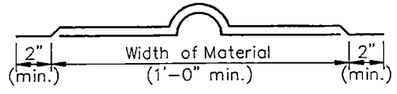
WIDENING PLAN



WIDENING ELEVATION



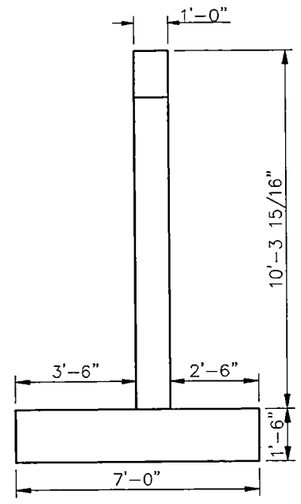
C–C



Fabric Waterproofing shall be applied in accordance with Section 740 of the NDDOT Specifications.

All material and work shall be considered incidental to the pay item of Class AE-3 Concrete.

TWO-PLY FABRIC WATERPROOFING DETAIL



D–D

QUANTITIES
See Dwg 94-064.204-7

EAST DICKINSON INTERCHANGE
WIDENING

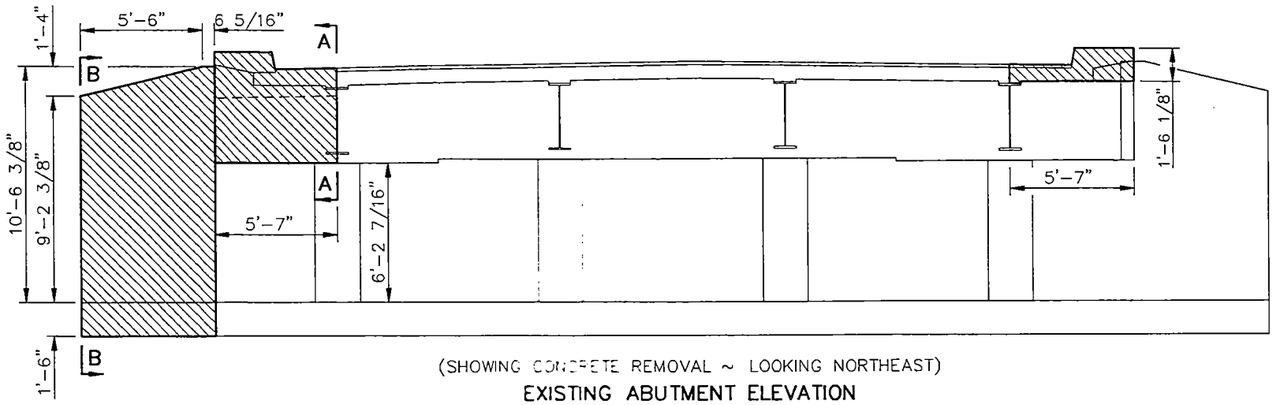
(SHOWING DIMENSIONS)

ABUTMENT 1 WIDENING DETAILS

ABUT1 99DLS99 BWR

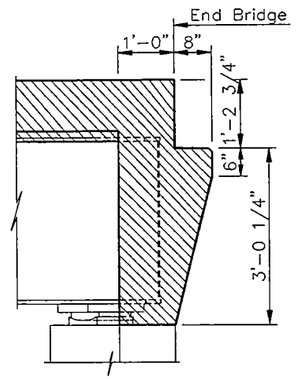
94-064.204-5

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	195

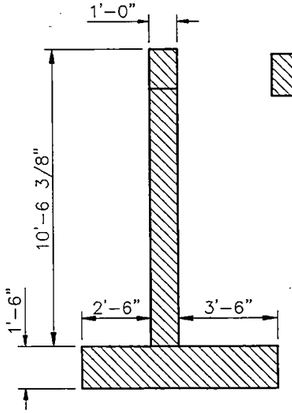


(SHOWING CONCRETE REMOVAL ~ LOOKING NORTHEAST)

EXISTING ABUTMENT ELEVATION

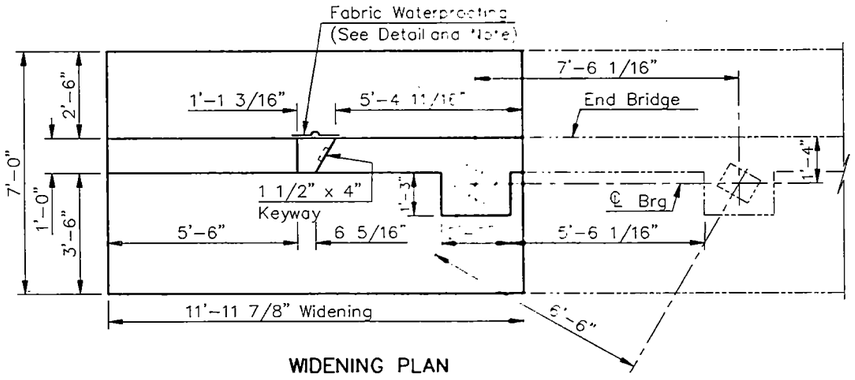


A–A

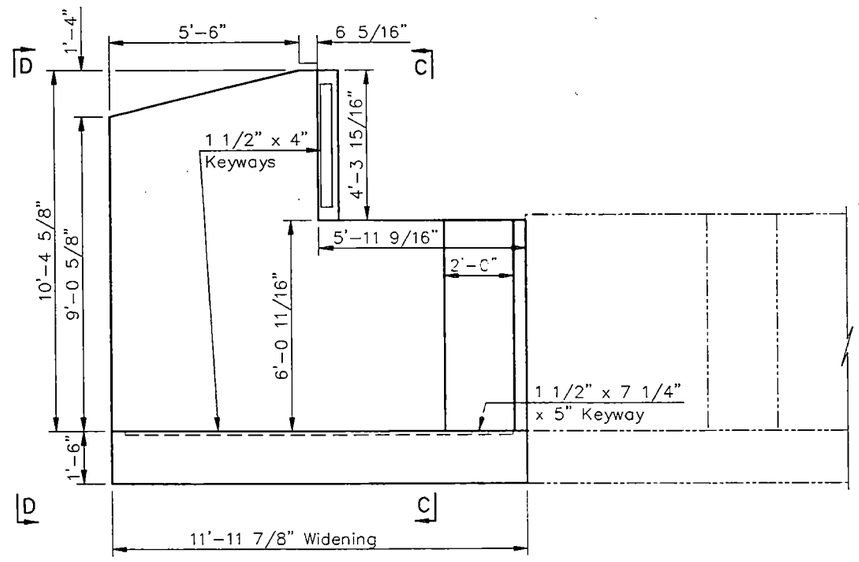


B–B

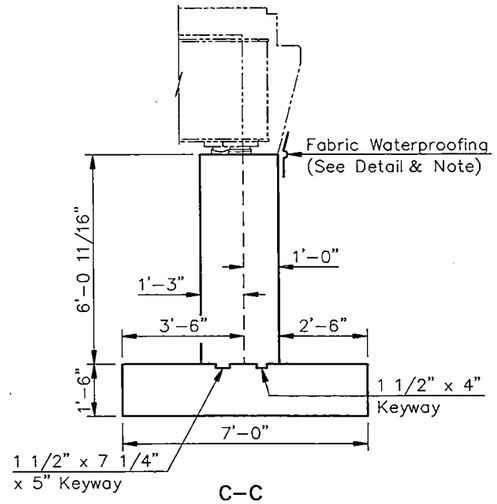
Hatched areas indicate concrete to be removed. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place.



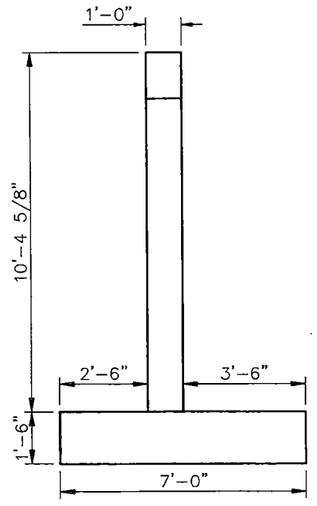
WIDENING PLAN



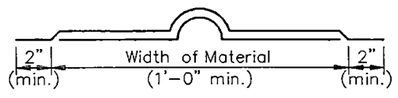
WIDENING ELEVATION



C–C



D–D



Fabric Waterproofing shall be applied in accordance with Section 740 of the NDDOT Specifications.

All material and work shall be considered incidental to the pay item of Class AE-3 Concrete.

TWO-PLY FABRIC WATERPROOFING DETAIL

QUANTITIES

See Dwg 94-064.204-7

EAST DICKINSON INTERCHANGE WIDENING

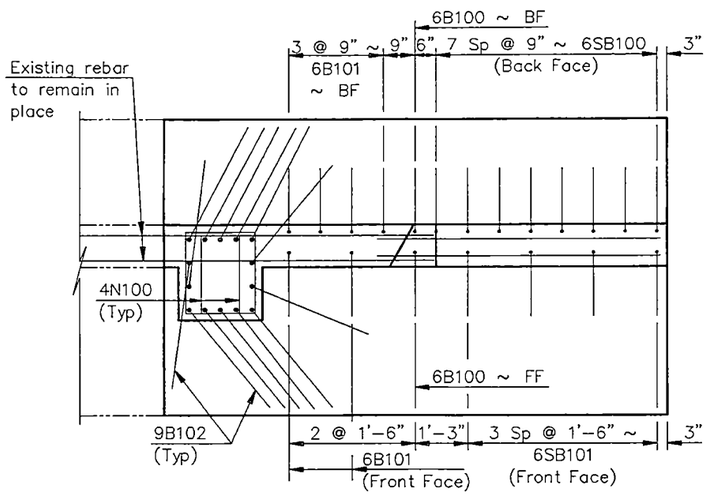
(SHOWING DIMENSIONS)

ABUTMENT 5 WIDENING DETAILS

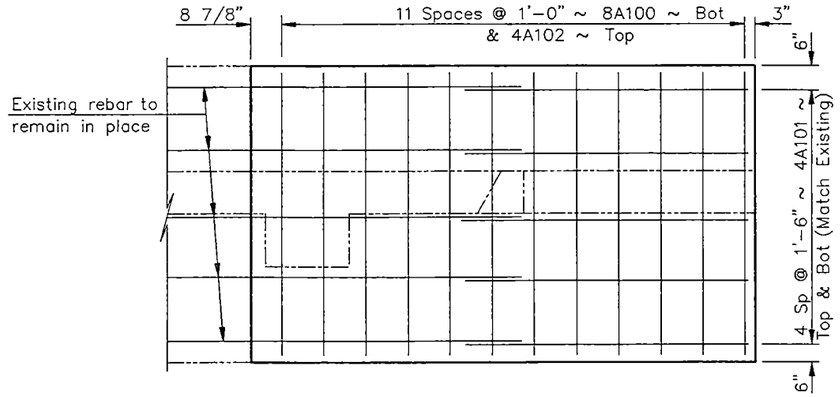
ABUT5 99DLS101 BWR

94-064.204-6

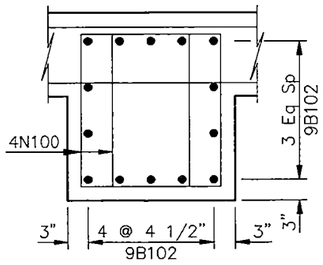
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	196



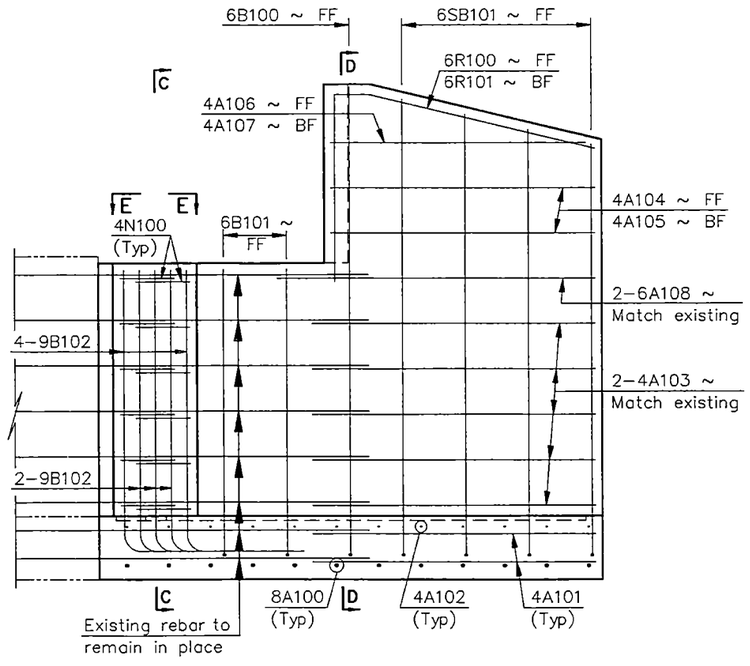
(SHOWING WALL & PEDESTAL REINFORCING)
WIDENING WALL PLAN



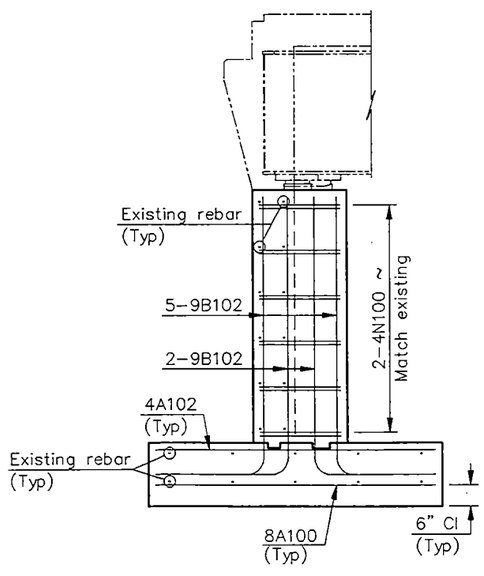
(SHOWING FOOTING REINFORCING)
WIDENING FOOTING PLAN



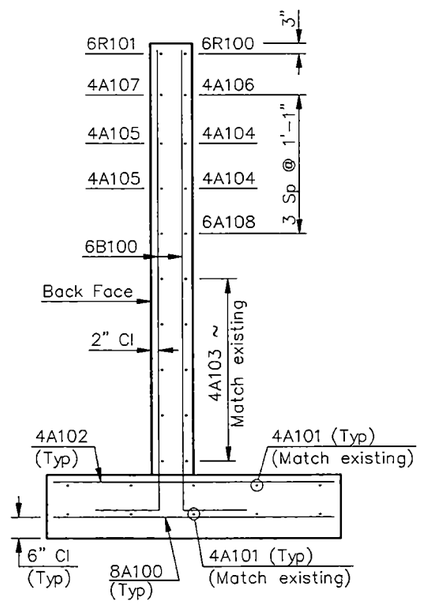
E–E



(SHOWING FRONT FACE WALL REINFORCING)
WIDENING WALL ELEVATION



C–C



D–D

NOTE:

BF = Back Face
FF = Front Face

QUANTITIES	
CLASS AE-3 CONCRETE	17.6 CY
REINFORCING STEEL	2595 LBS

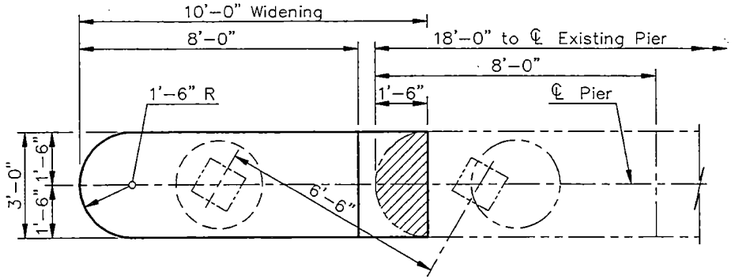
EAST DICKINSON INTERCHANGE
WIDENING

(SHOWING REINFORCING)
ABUTMENT WIDENING DETAILS

ABUT1A 99DLS100 BWR

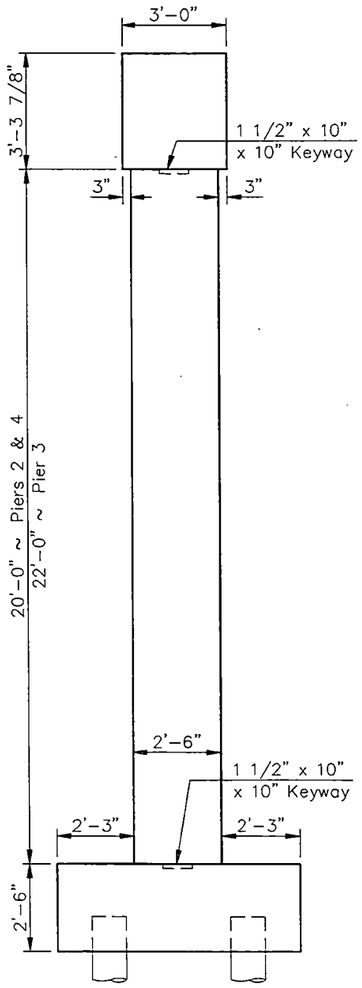
94-064.204-7

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	197

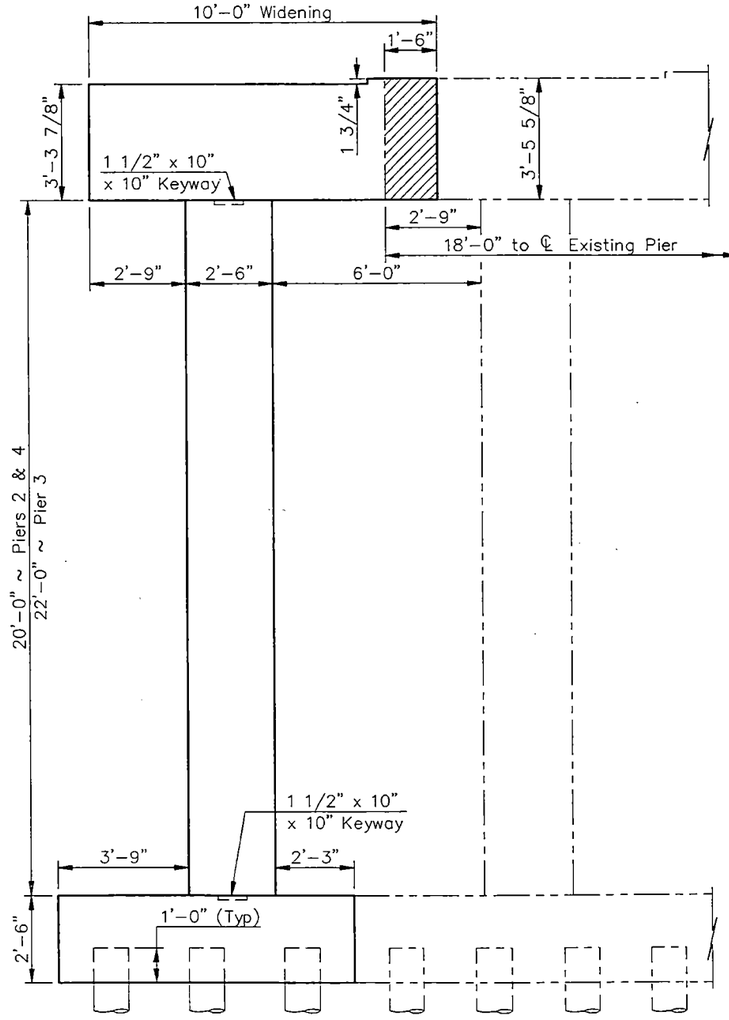


PART EXISTING & PIER WIDENING PLAN

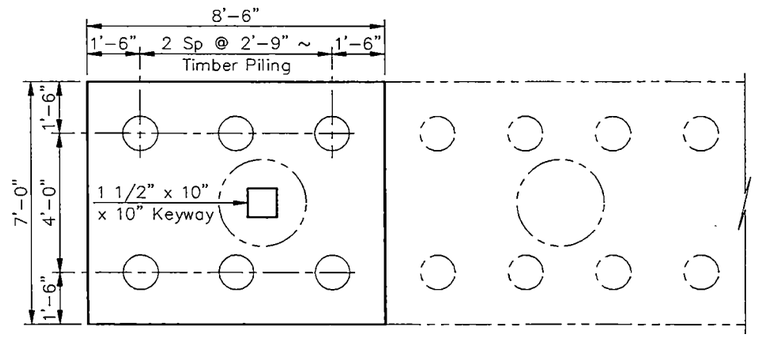
Hatched areas indicate concrete to be removed. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place.



END VIEW



PART EXISTING & PIER WIDENING ELEVATION



PART EXISTING & FOOTING WIDENING PLAN

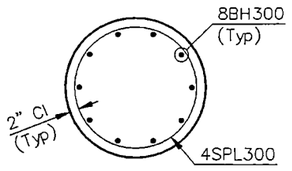
QUANTITIES

See Dwg. 94-064.204-9

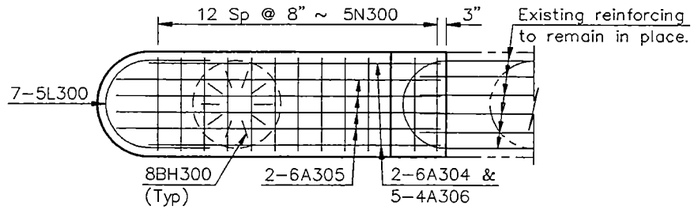
EAST DICKINSON INTERCHANGE
WIDENING

(SHOWING DIMENSIONS)
PIER DETAILS

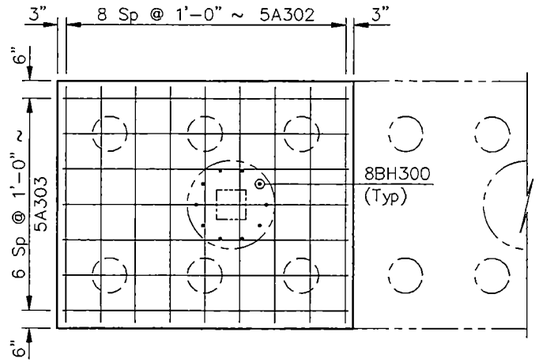
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	198



A-A

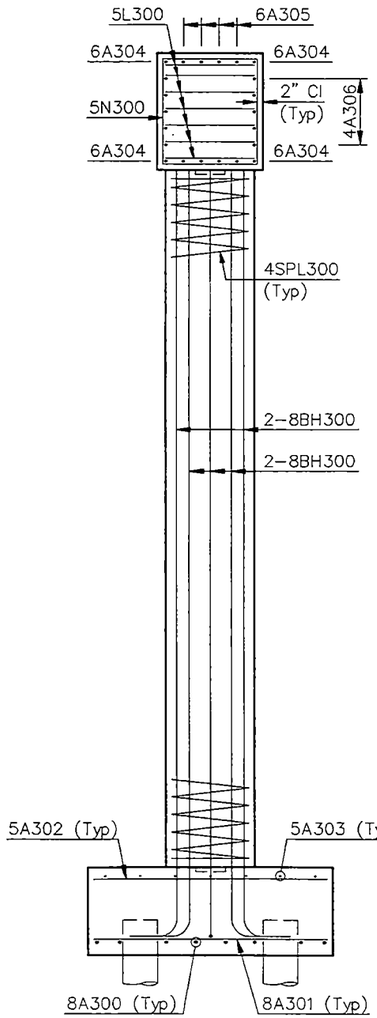


PIER WIDENING PLAN

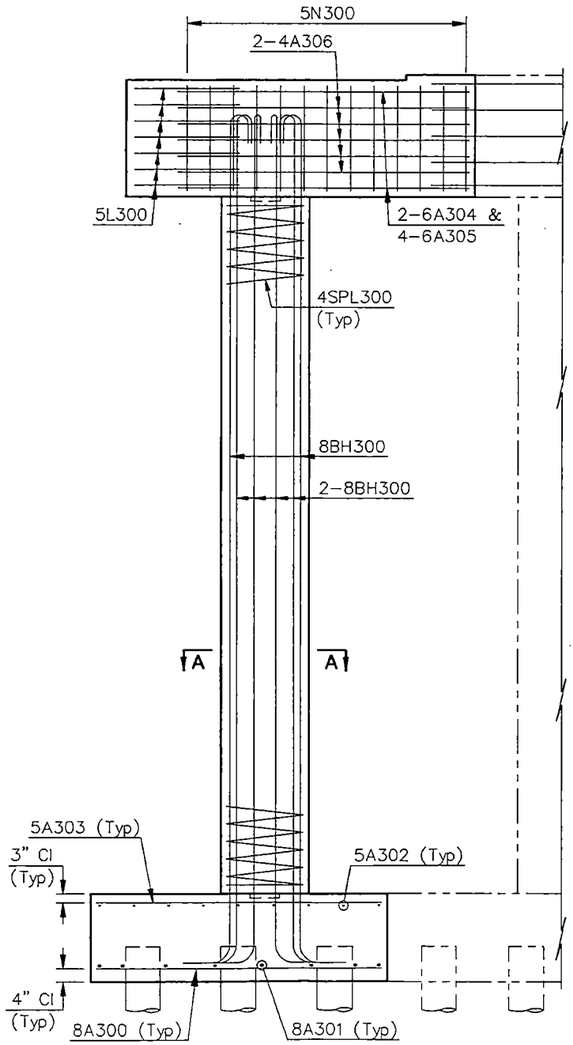


(SHOWING TOP REINFORCING)

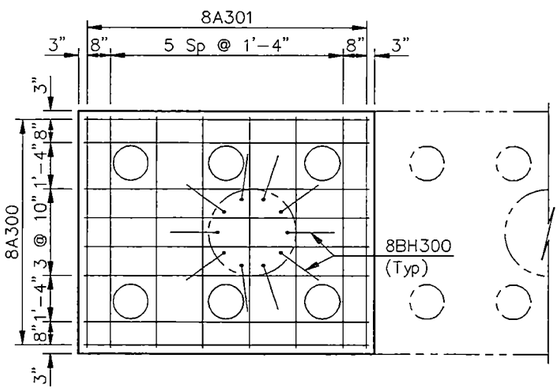
FOOTING PLAN



END VIEW



PIER WIDENING ELEVATION



(SHOWING BOTTOM REINFORCING)

FOOTING PLAN

	QUANTITIES	(ONE PIER)
PIERS 2 & 4	CLASS AE-3 CONCRETE	12.8 CY
	REINFORCING STEEL	1780 LBS
PIER 3	CLASS AE-3 CONCRETE	13.1 CY
	REINFORCING STEEL	1852 LBS

EAST DICKINSON INTERCHANGE
WIDENING

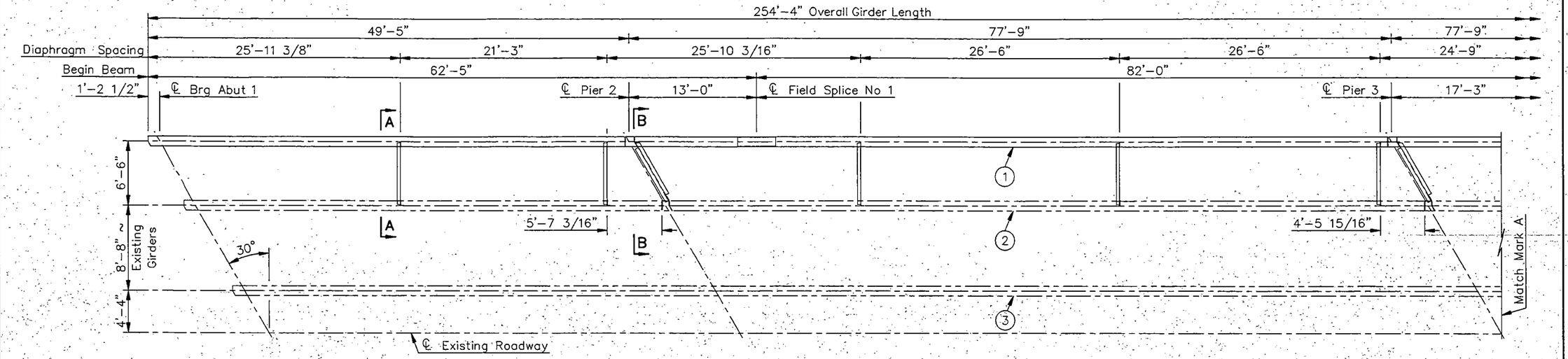
(SHOWING REINFORCING)

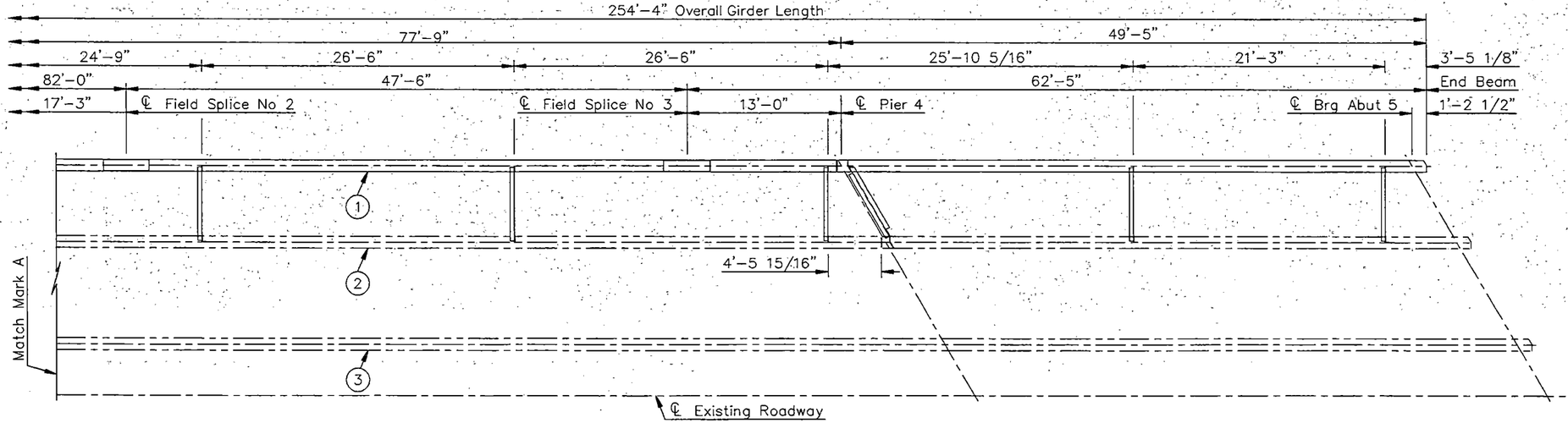
PIER DETAILS

PIERA 99DLS103 BWR

94-064.204-9

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	199





NOTE:
See Dwg 94-064.204-12 for Sections A-A & B-B.

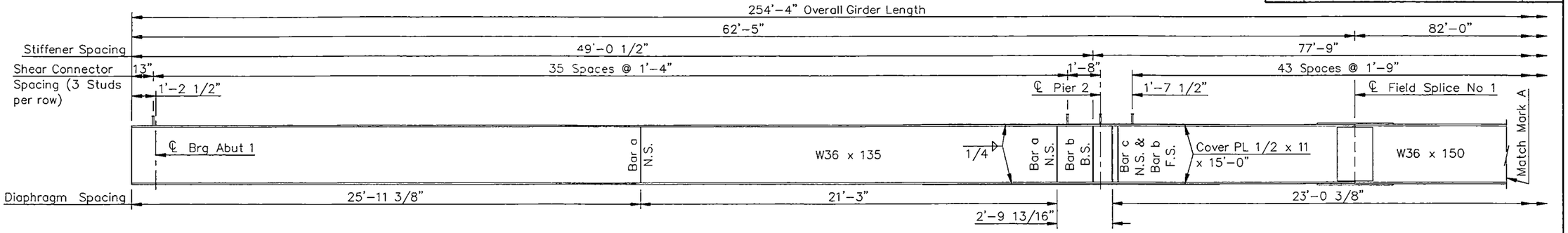
EAST DICKINSON INTERCHANGE
WIDENING

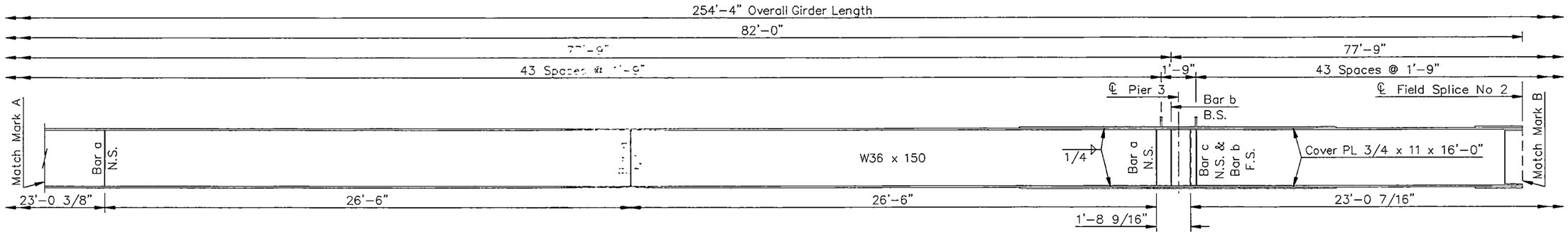
GIRDER LAYOUT

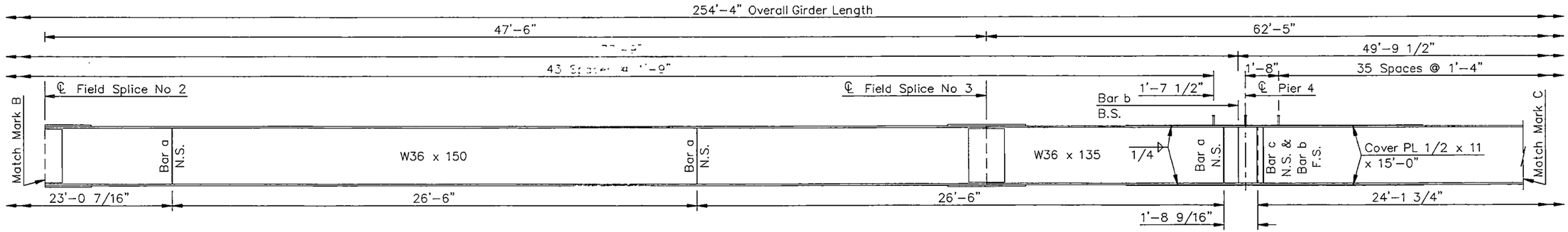
GIRDLO 99DLS106 BWR

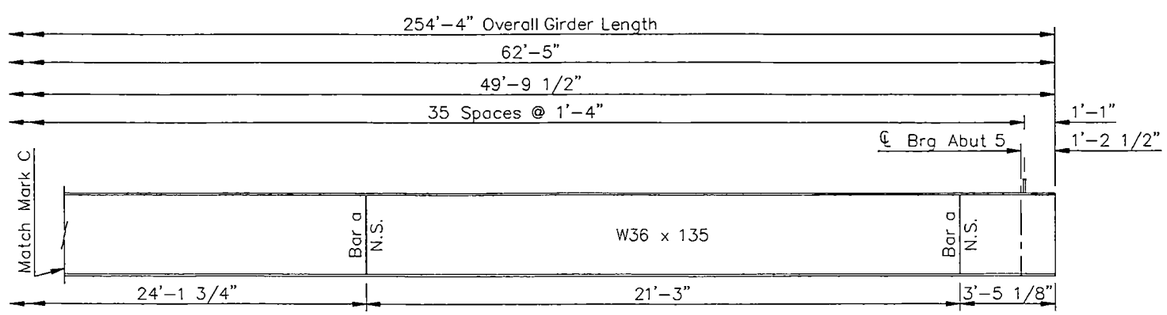
94-064.204-10

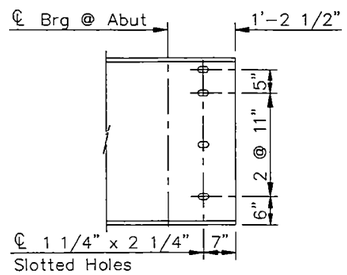
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	200











TYPICAL GIRDER END DETAIL

NOMENCLATURE:

N.S. = Near Side
B.S. = Both Sides
F.S. = Far Side

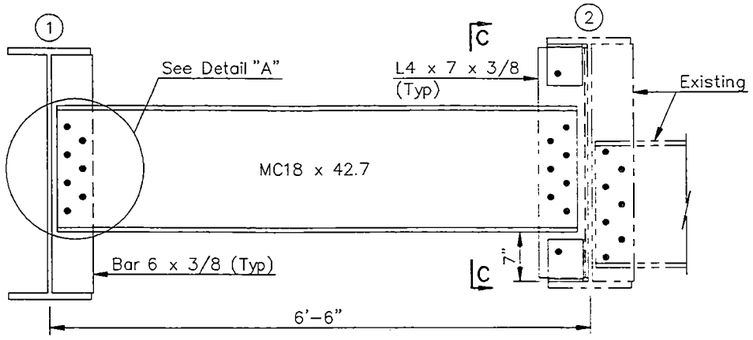
EAST DICKINSON INTERCHANGE
WIDENING

GIRDER ELEVATION & GIRDER END DETAIL

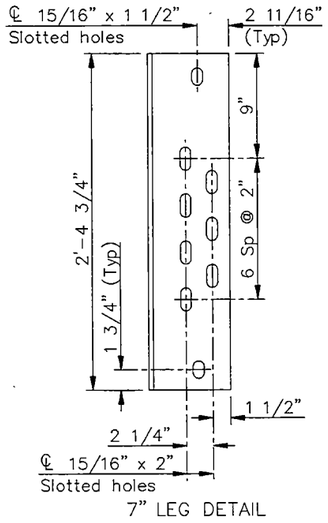
GIRDEL 99DLS105 BWR

94-064.204-11

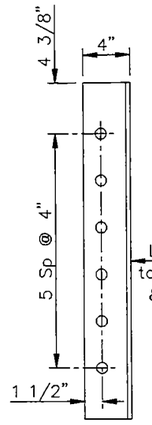
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	201



A–A

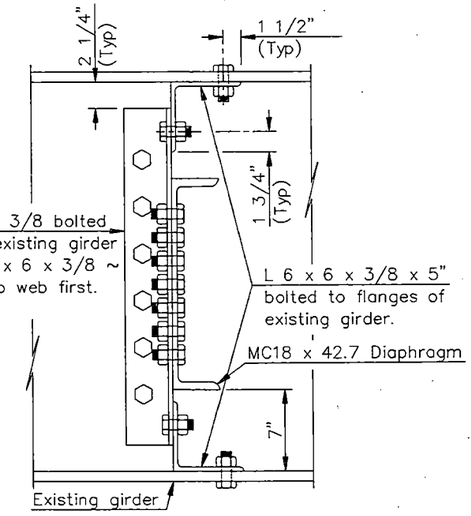


7" LEG DETAIL

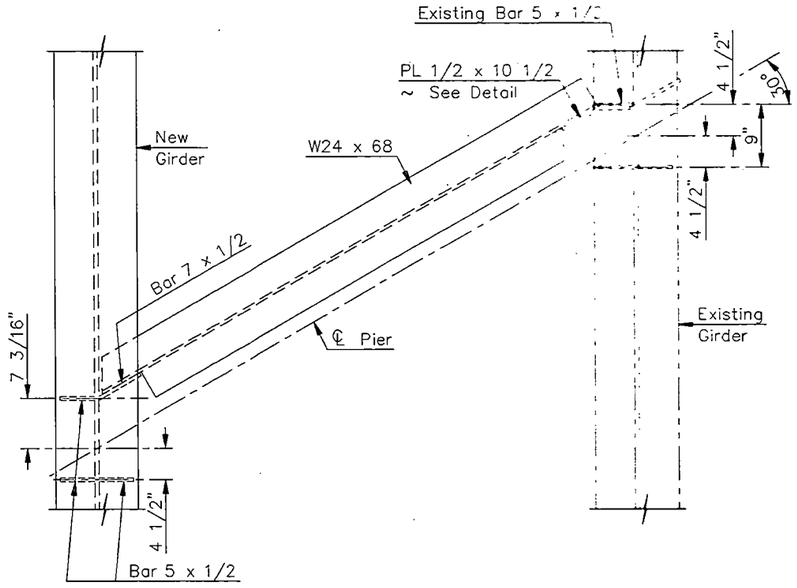


4" LEG DETAIL

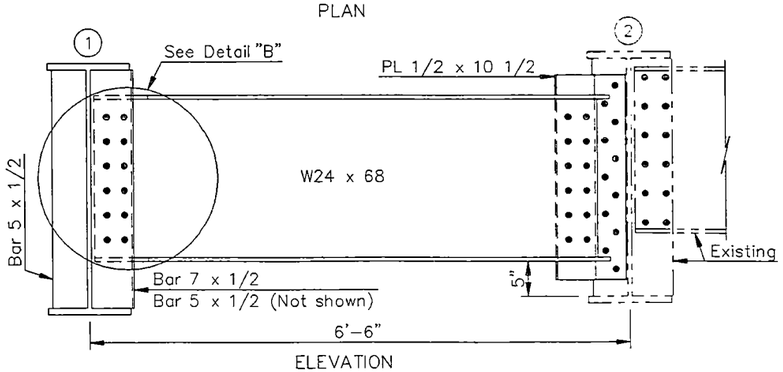
L 7 x 4 x 3/8 DETAIL



C–C

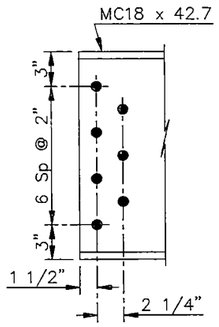


PLAN

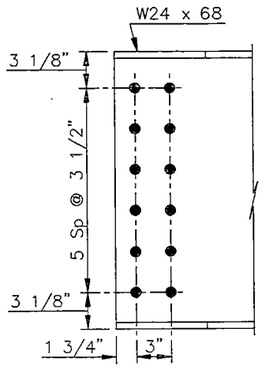


ELEVATION

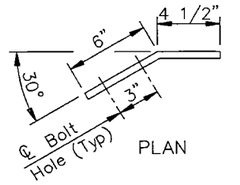
B–B



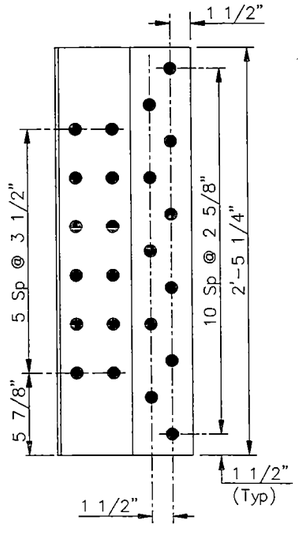
DETAIL "A"



DETAIL "B"

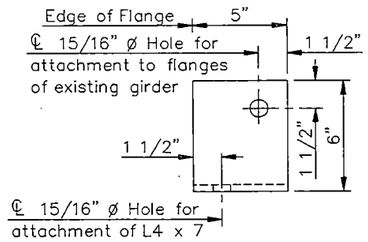


PLAN



ELEVATION

PL 1/2 x 10 1/2 DETAIL



L6 x 6 x 3/8 PLAN

NOTE:

See Dwg 94–064.204–10 for the location of Sections A–A & B–B.

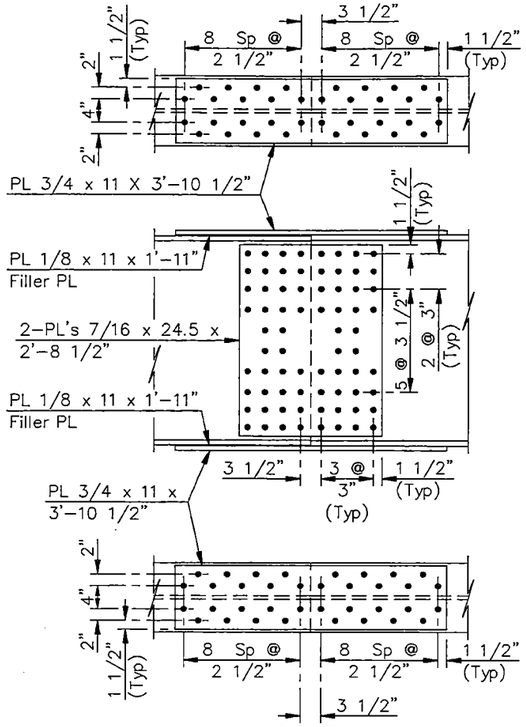
The cost to field drill the holes to attach the angles to the existing girders shall be included in the price bid for "Structural Steel".

All connections to the existing beams shall be field verified by the contractor.

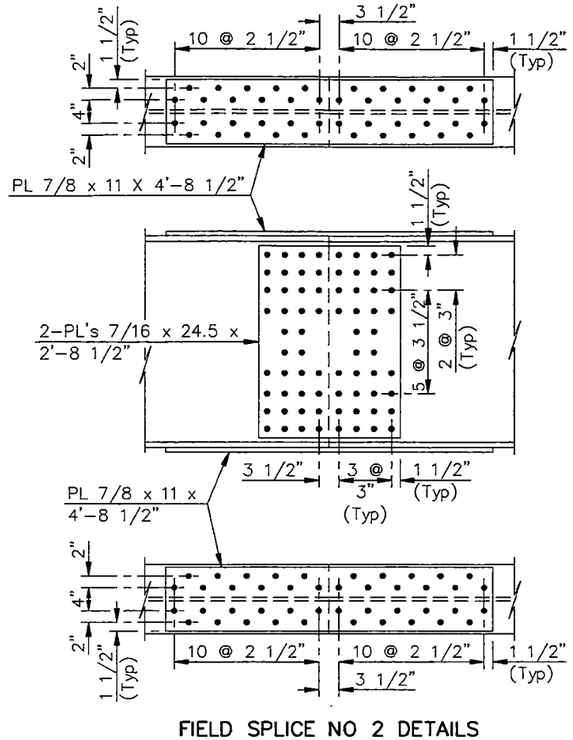
EAST DICKINSON INTERCHANGE
WIDENING

GIRDER DETAILS

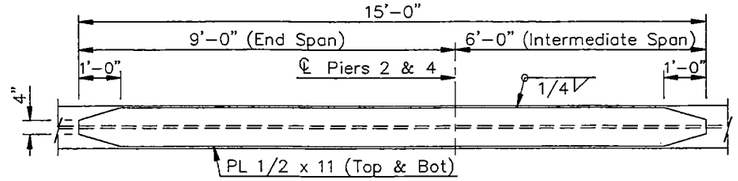
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	202



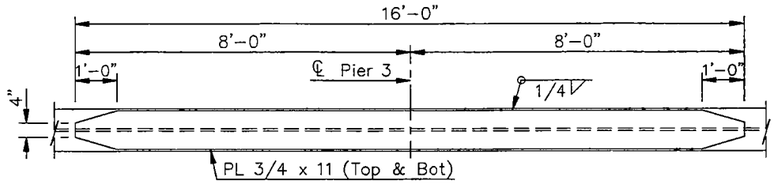
FIELD SPLICE NO 1 & 3 DETAILS



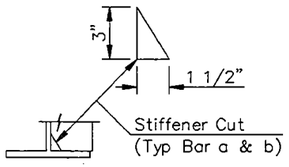
FIELD SPLICE NO 2 DETAILS

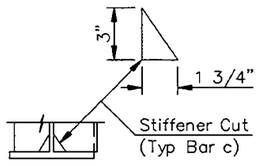


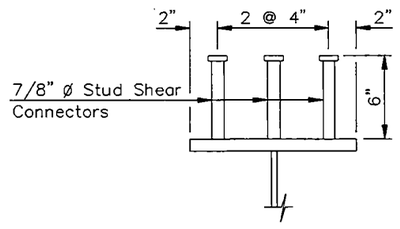
PIERS 2 & 4 COVER PLATE DETAIL



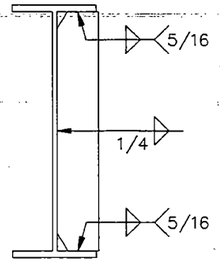
PIER 3 COVER PLATE DETAIL



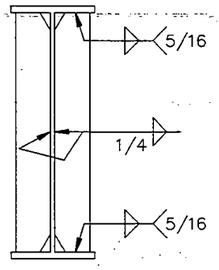




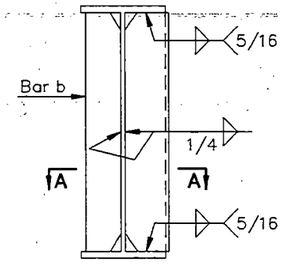
SHEAR CONNECTOR DETAIL



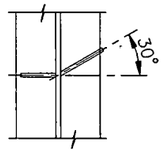
PL 3/8 x 6
Bar a



PL 1/2 x 5
Bar b



PL 1/2 x 7
Bar c



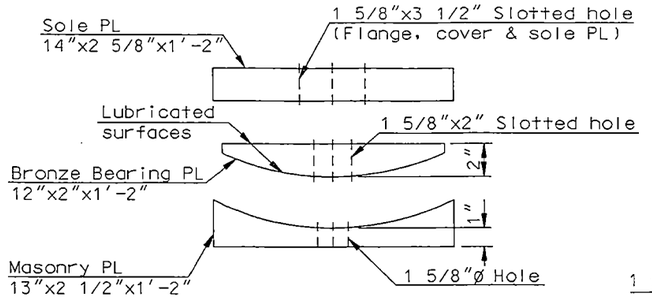
A-A

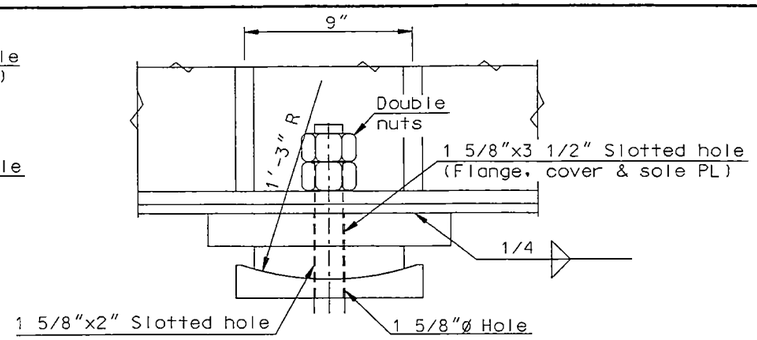
STIFFENER & DIAPHRAGM CONNECTION PLATE DETAILS

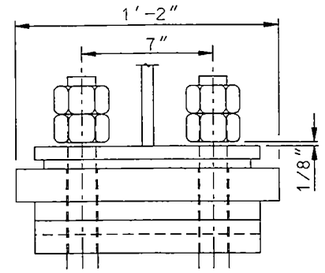
EAST DICKINSON INTERCHANGE
WIDENING

FIELD SPLICE & COVER PLATE DETAILS, STIFFENER & DIAPHRAGM CONNECTION DETAILS & SHEAR CONNECTOR DETAILS

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	203

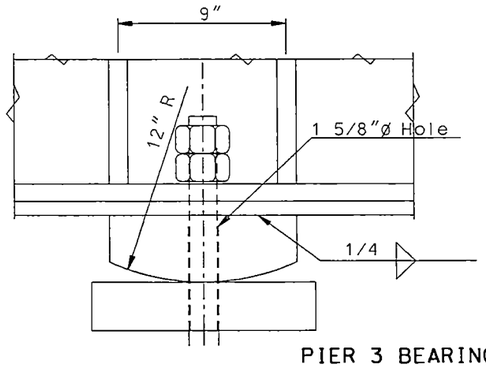


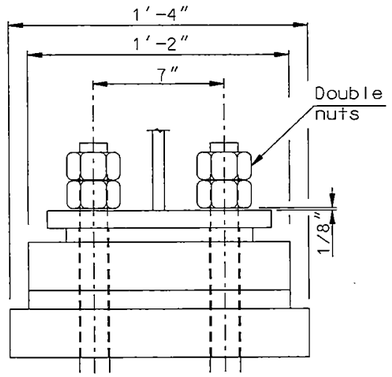




PIER 2 & 4 BEARING

Sole PL	14"x2 5/8"x1'-2"
Masonry PL	13"x2 1/2"x1'-2"
Swedge bolts	1 1/2"x2'-0"
Bronze PL	12"x2"x1'-2"





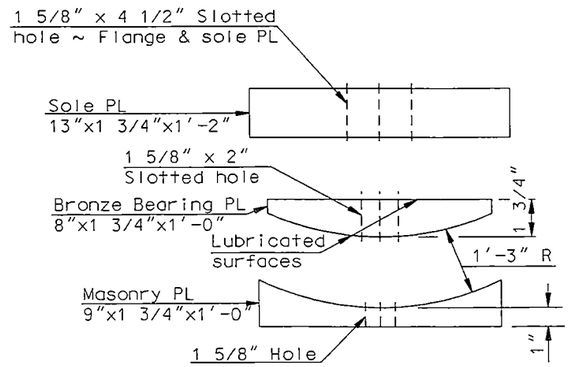
PIER 3 BEARING

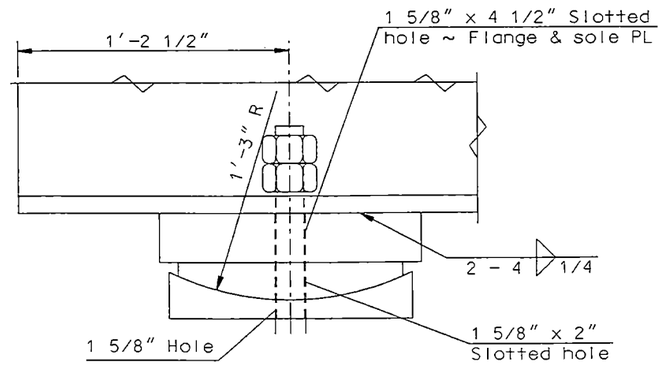
Sole PL	10"x3 5/8"x1'-2"
Masonry PL	12"x2 5/8"x1'-4"
Swedge bolts	1 1/2"x2'-0"

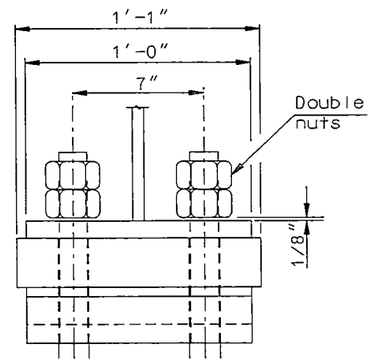
NOTES:

The bronze bearing plates shall conform to AASHTO M 108. Contact surfaces shall be finished in the direction of motion to ASA B46.1-47 No. 125. Lubricated surfaces shall be provided with trepanned recesses to receive a lubricating material suitable for long-life service of the bearing face. The lubricating area shall comprise not less than 25 percent of the total area. The coefficient of friction for bronze on steel shall not exceed 10 percent.

The bronze bearing plates are included in the quantities for structural steel.







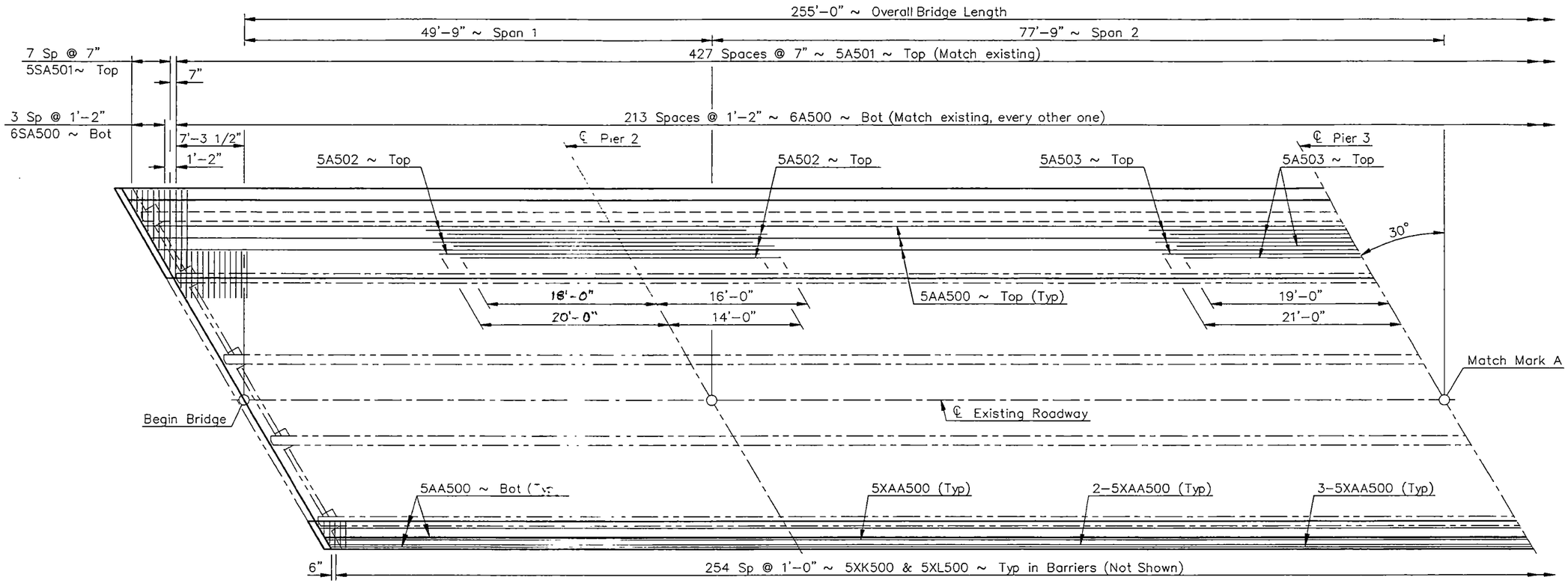
ABUTMENT 1 & 5 BEARING

Sole PL	13"x1 3/4"x1'-2"
Masonry PL	9"x1 3/4"x1'-0"
Swedge bolts	1 1/2"x2'-0"
Bronze PL	8"x1 3/4"x1'-0"

EAST DICKINSON INTERCHANGE
WIDENING

BEARING DETAILS

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	204

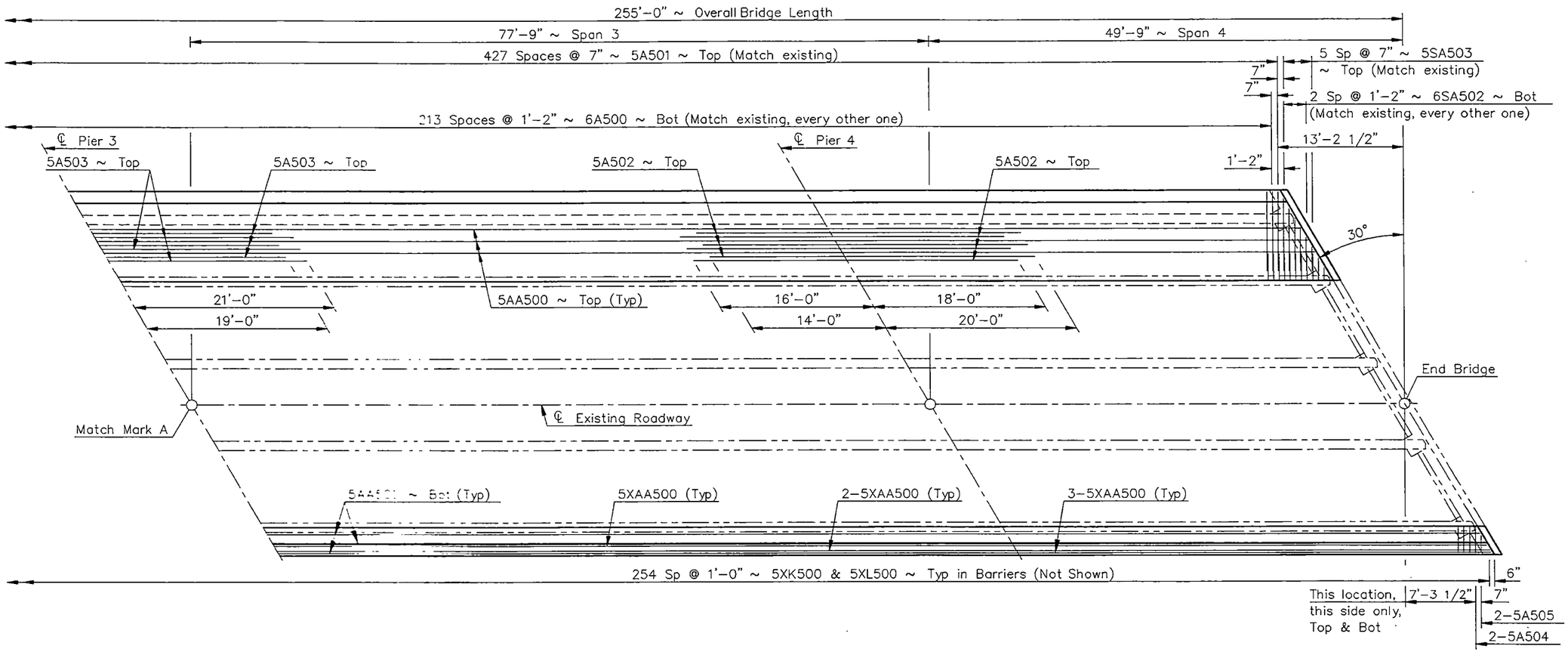


QUANTITIES
See Dwg 94-064.204-18
EAST DICKINSON INTERCHANGE WIDENING
HALF SLAB LAYOUT

SLABL0 99DLS96 BWR

94-064.204-15

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	205



QUANTITIES
See Dwg 94-064.204-18
EAST DICKINSON INTERCHANGE WIDENING
HALF SLAB LAYOUT

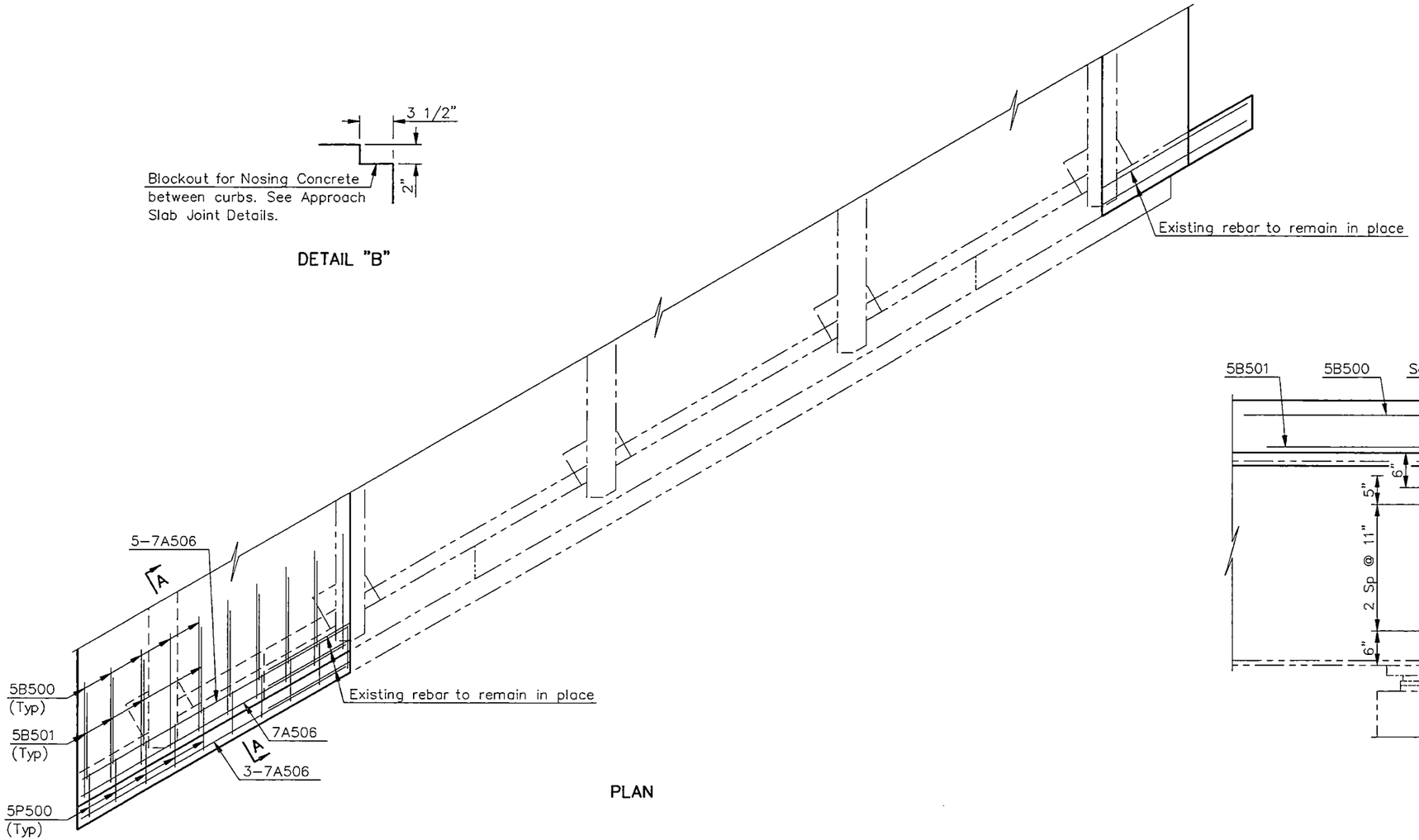
SLABL01 99DLS97 BWR

94-064.204-16

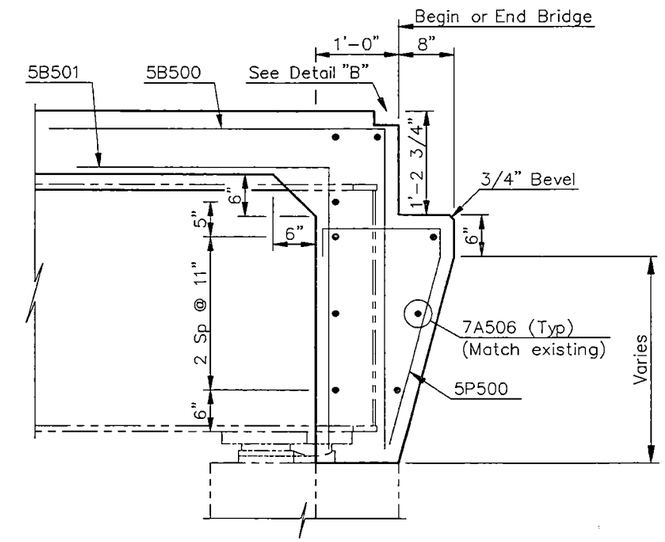
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	206

Blockout for Nosing Concrete between curbs. See Approach Slab Joint Details.

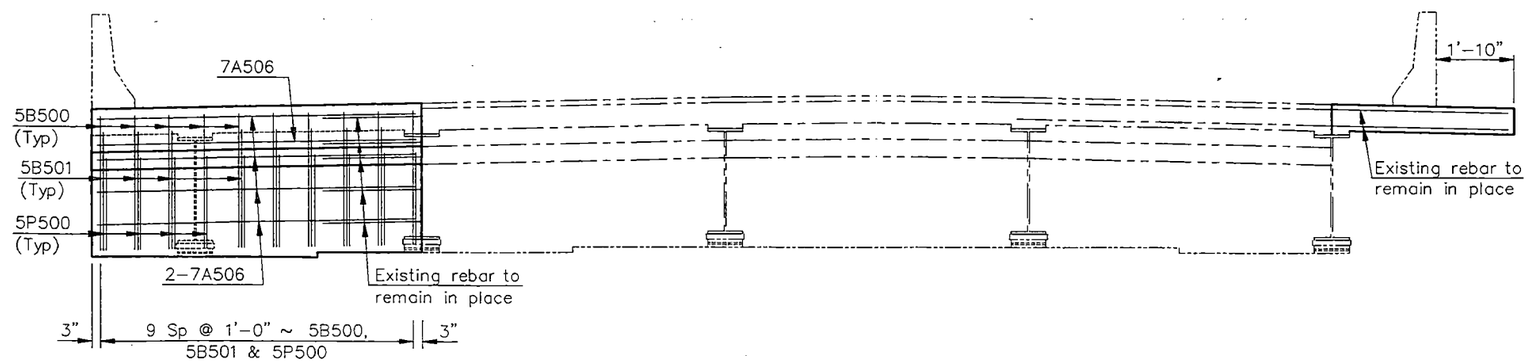
DETAIL "B"



PLAN



A-A



ELEVATION

QUANTITIES

See Dwg 94-064.204-18

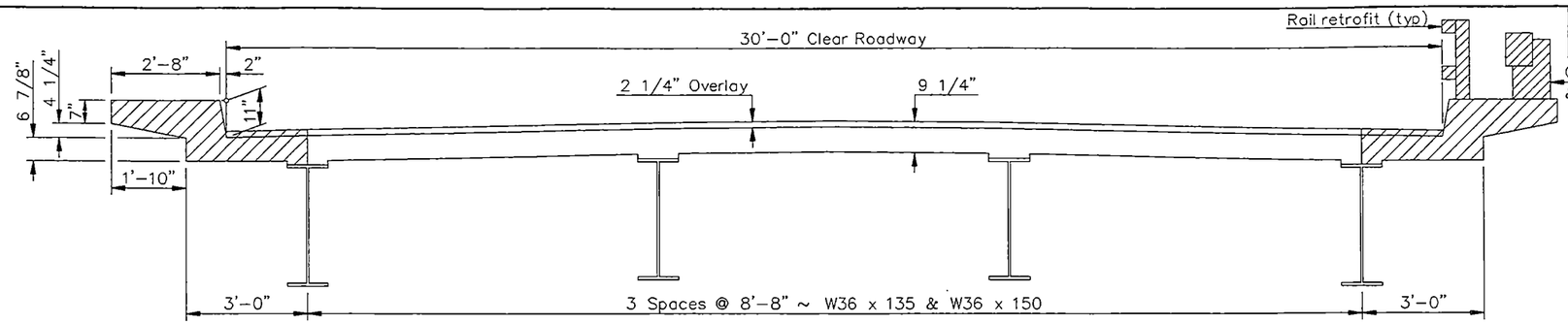
EAST DICKINSON INTERCHANGE WIDENING

END BEAM DETAILS

ENDBM 99DLS98 BWR

94-064.204-17

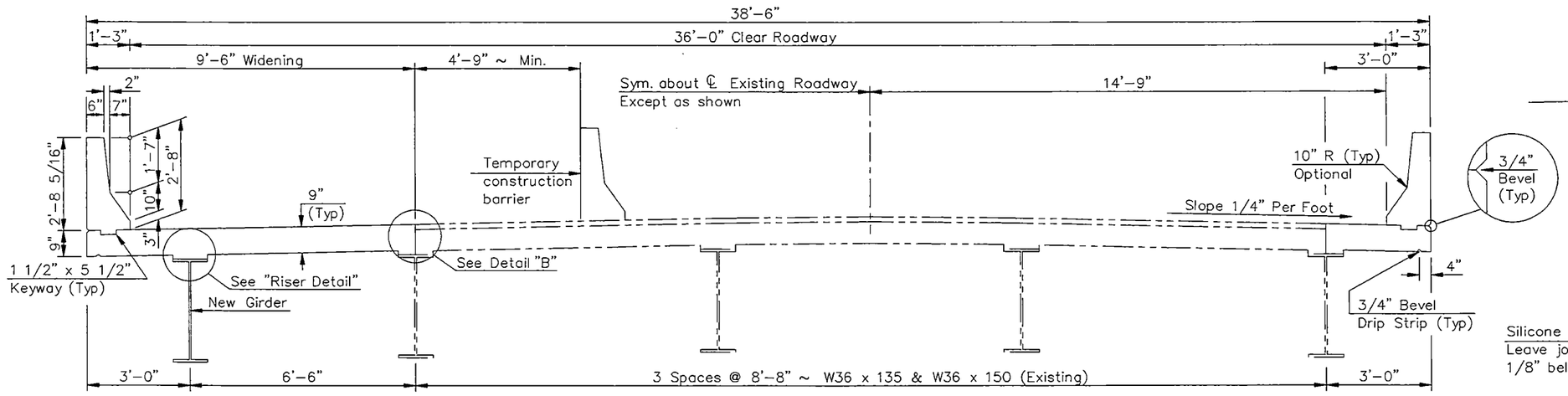
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	207



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

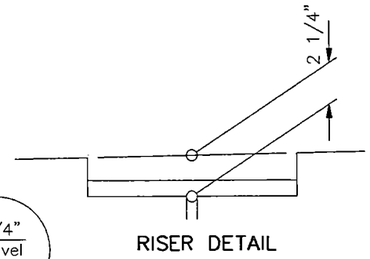
(SHOWING CONCRETE REMOVAL)

EXISTING SLAB SECTION

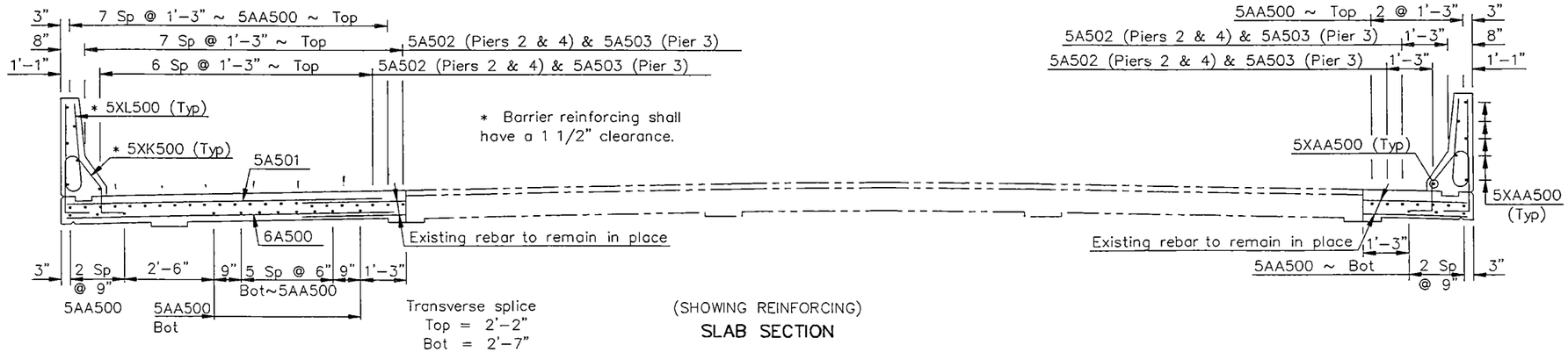


(SHOWING DIMENSIONS)

SLAB SECTION



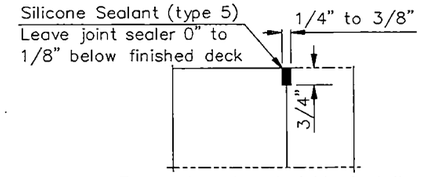
RISER DETAIL



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

(SHOWING REINFORCING)

SLAB SECTION



The work and material to install the joint shall be included in the pay item "Class AAE-3 Concrete".

CONSTRUCITON JOINT

DETAIL "B"

QUANTITIES	
CLASS AAE-3 CONCRETE	133.1 CY
REINFORCING STEEL	16686 LBS
REINFORCING STEEL (EPOXY)	8626 LBS

EAST DICKINSON INTERCHANGE WIDENING

SLAB SECTIONS

SLABSEC 99DLS99 BWR

94-064.204-18

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

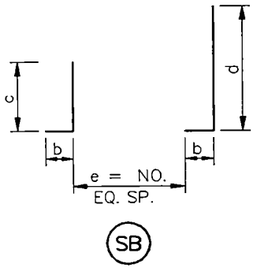
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	208

LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
ABUTMENTS	8	A100	24	6'-8"		6'-8"							
	4	A101	20	7'-5"		7'-5"							
	4	A102	24	6'-8"		6'-8"							
	4	A103	20	7'-5"		7'-5"							
	4	A104	4	6'-3"		6'-3"							
	4	A105	4	5'-10"		5'-10"							
	4	A106	2	6'-1"		6'-1"							
	4	A107	2	5'-8"		5'-8"							
	6	A108	4	8'-3"		8'-3"							
	6	B100	4	12'-7"		1'-6"	11'-1"						
	6	B101	12	8'-3"		1'-6"	6'-9"						
	9	B102	28	9'-9"		3'-0"	6'-9"						
	4	N100	24	7'-6"	1'-4"	1'-11"	6"					0	12
	6	R100	2	10'-10"	4'-6"	10"	5'-6"					12	2.9
	6	R101	2	10'-5"	4'-6"	5"	5'-6"					12	2.9
	6	SB100	2	95'-4"		1'-6"	9'-9"	11'-1"	7				
	6	SB101	2	47'-4"		1'-6"	9'-9"	10'-11"	3				
PIERS	8	A300	24	6'-8"		6'-8"							
	8	A301	24	8'-2"		8'-2"							
	5	A302	27	6'-8"		6'-8"							
	5	A303	21	8'-2"		8'-2"							
	6	A304	12	8'-4"		8'-4"							
	6	A305	24	9'-3"		9'-3"							
	4	A306	30	8'-4"		8'-4"							
	5	L300	21	7'-11"	2'-8"	2'-0"	3'-11"	2'-0"		1'-4"		12	0
	5	N300	39	12'-4"	2'-8"	3'-0"	6"					0	12
	8	BH300	20	27'-0"	24'-4"								
	8	BH300-3	10	29'-0"	26'-4"								
	4	SPL300	2	267'-0"	2'-2"	20'-0"	6"						
	4	SPL300-3	1	294'-0"	2'-2"	22'-0"	6"						

LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE REGULAR	6	A500	214	9'-2"		9'-2"							
	5	A501	428	8'-9"		8'-9"							
	5	A502	38	34'-0"		34'-0"							
	5	A503	19	40'-0"		40'-0"							
	5	A504	2	2'-10"		2'-10"							
	5	A505	2	1'-10"		1'-10"							
	7	A506	18	10'-7"		10'-7"							
	5	AA500	25	261'-4"		60'-0"	1'-8"	21'-4"	4		254'-8"		
	5	B500	20	7'-9"		3'-9"	4'-0"						
	5	B501	16	6'-4"		3'-4"	3'-0"						
	5	P500	20	4'-4"	4"	1'-4"	2'-4"	4"				3.25	12
	6	SA500	1	17'-4"	1'-4"	7'-4"			3				
	5	SA501	1	34'-8"	1'-4"	7'-4"			7				
	6	SA502	1	19'-0"	4'-4"	8'-4"			2				
	5	SA503	1	30'-3"	2'-6"	7'-7"			5				
SUPERSTRUCTURE EPOXY	5	XAA500	12	260'-8"		60'-0"	1'-6"	20'-8"	4		254'-8"		
	5	XK500	510	5'-1"	1'-5"	8"	11"	9"	1'-0"	2.5"	8"	8.5	12
	5	XL500	510	5'-0"	3"	2'-2"	8"	2'-2"		2.5"		12	1.25

NOTES:

1. FABRICATION AND TOLERANCES SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.
2. ALL DIMENSIOINS 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. THE "r" DIMENSION INDICATES THE RADIUS.
6. AN "x" PRECEDING A BAR DESIGNATION INDICATES AN EPOXY COATED BAR.
7. THE NUMBER OR LETTER FOLLOWING THE "DASH" IN MARK INDICATES THE ABUTMENT OR PIER FOR THAT BAR.
   EXAMPLE: A108-4 INDICATES ABUT. 4.



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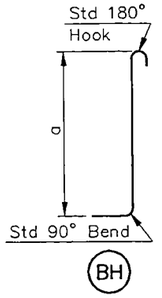

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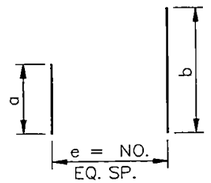

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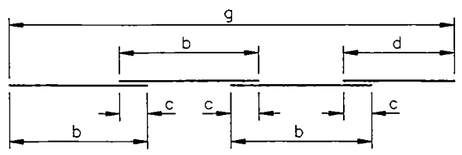
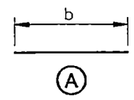


c = LAP SPLICE (TYP.)
e = NO. OF "b" LENGTH PIECES IN A SET
TOTAL LENGTH PER SET = e x b + d

(AA)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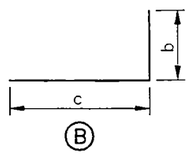

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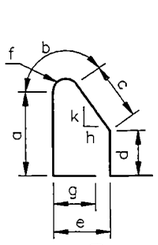

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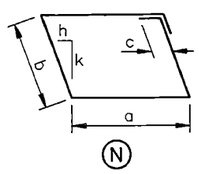

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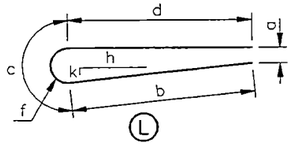

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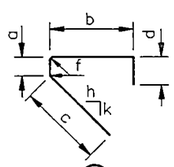

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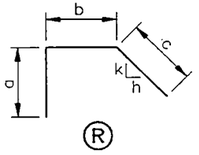

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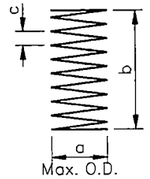


(SPL)

EAST DICKINSON INTERCHANGE
WIDENING

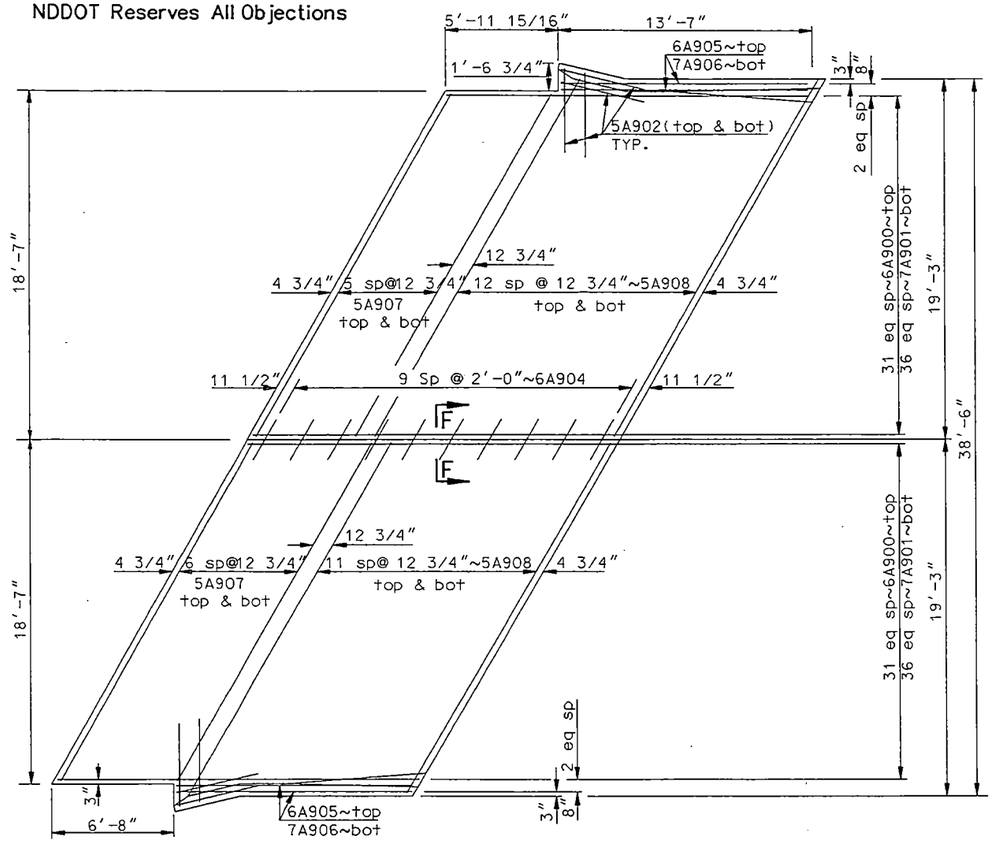
REINFORCING BAR LIST
& DETAILS

REBAR 99DLS104 BWR

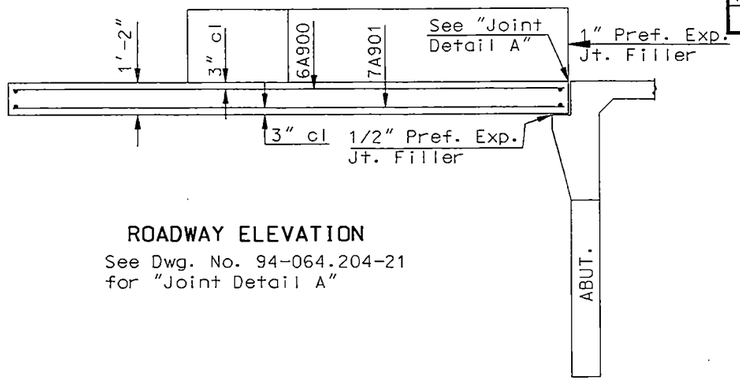
94-064.204-19

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

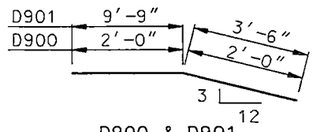
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-5-094(018)059	209



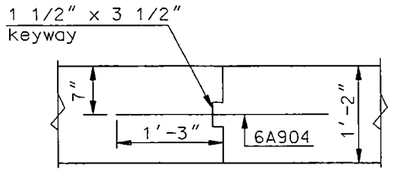
PLAN



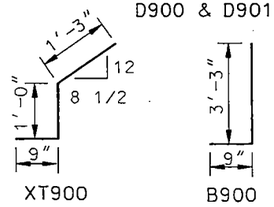
ROADWAY ELEVATION
See Dwg. No. 94-064.204-21 for "Joint Detail A"



D900 & D901



F-F

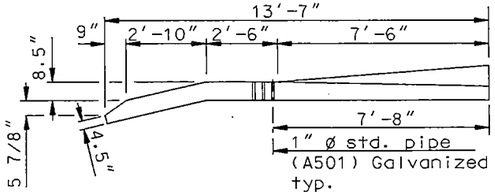


BENT BAR LIST
Dimensions shown are out to out

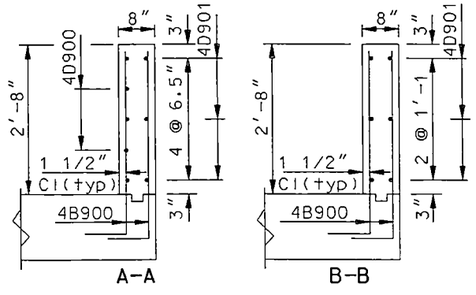
WIDTH = 36'-0" CL. RDWY.			
SKEW ANGLE = 30°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	64	19'-7"
7	A901	74	19'-7"
5	A902	16	6'-0"
4	XA903	2	7'-6"
6	A904	10	2'-6"
6	A905	4	13'-3"
7	A906	4	13'-3"
5	A907	26	21'-1"
5	A908	50	21'-11"
4	B900	112	4'-0"
4	XT900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"

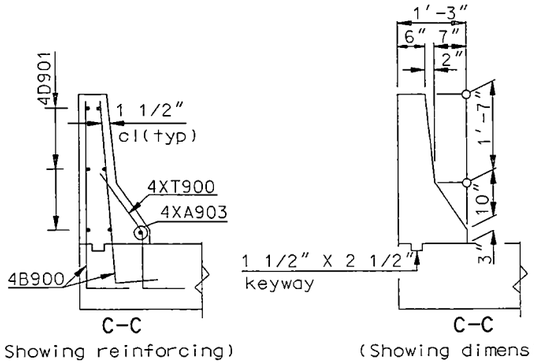
ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL LBS	CONCRETE CY
7,347	34.8

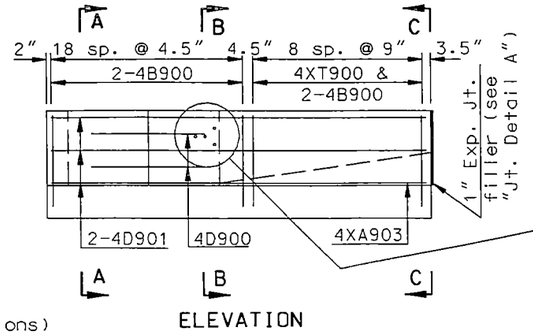
X = Epoxy coated bar
See dwg 94-064.204-21 for notes.



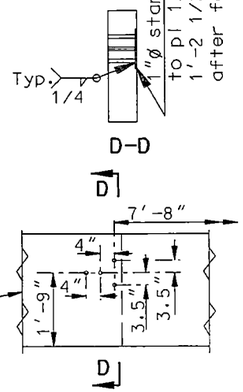
PLAN







ELEVATION



QUANTITIES (ONE SLAB)	
APPROACH SLAB	84.7 SY

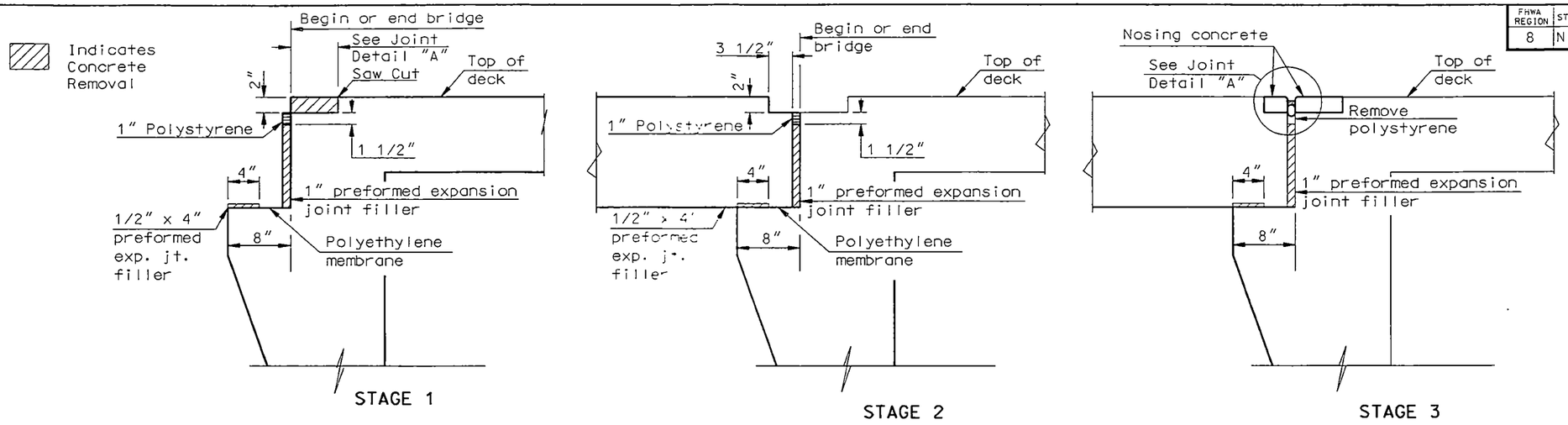
EAST DICKINSON INTERCHANGE WIDENING

APPROACH SLAB DETAILS

APPSLAB 99LCS086 BWR

94-064.204-20

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IM-5-094(018)059	210



APPROACH SLAB – BRIDGE DECK JOINT

STAGE 1:

1. Remove concrete at ends of the existing 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 2" x 3 1/2" blockout shall be formed between the curbs in the approach slab as shown.

STAGE 3:

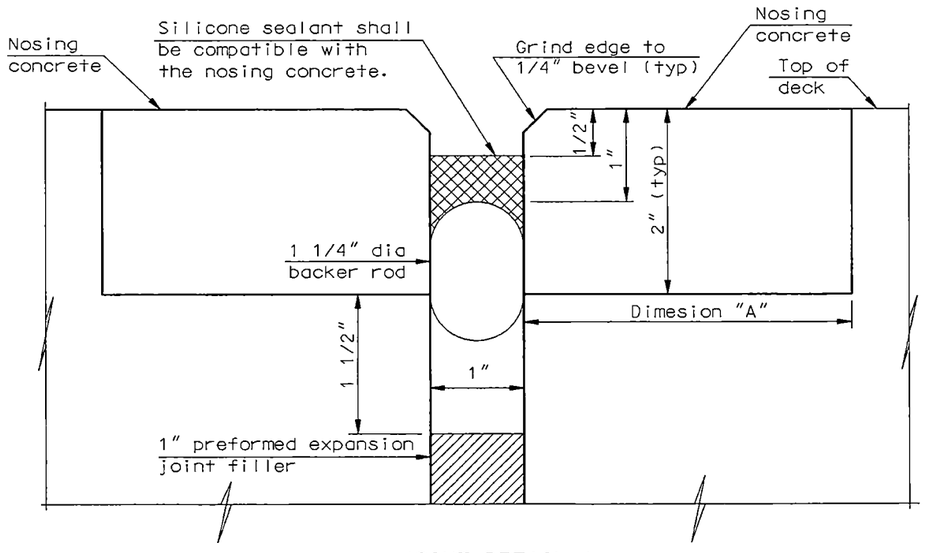
4. Place nosing concrete in the blockout areas, both in the deck and in the approach slab.
5. Remove the 1" polystyrene.
6. After the nosing concrete has cured, grind the 1/4" beveled edges smooth and prepare the joint, apply any necessary bonding material, install the backer rod and the silicone sealant.

NOTES:

All estimated material quantities shown on drawing no. 94-064.204-20 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 "Concrete Bridge Approach Slab".

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

Surface Finish "D" shall be required for all surfaces of the curb transitions.



JOINT DETAIL A

DIMENSION "A"

Existing deck Dimension "A" = 6"
New deck Dimension "A" = 3 1/2"

QUANTITIES (TWO APPROACHES)	
Nosing Concrete	10.2 CF
Silicone Sealant	83.1 LF

EAST DICKINSON INTERCHANGE WIDENING

APPROACH SLAB JOINT DETAILS & NOTES

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

JOB # ___

GOLDEN VALLEY, BILLINGS, STARK,
MORTON & BURLEIGH COUNTY
SAP-9-0999(011)000

THIS PROJECT CONSISTS OF PAINTING FACIA GIRDERS AND MISCELLANEOUS SPOT COAT.

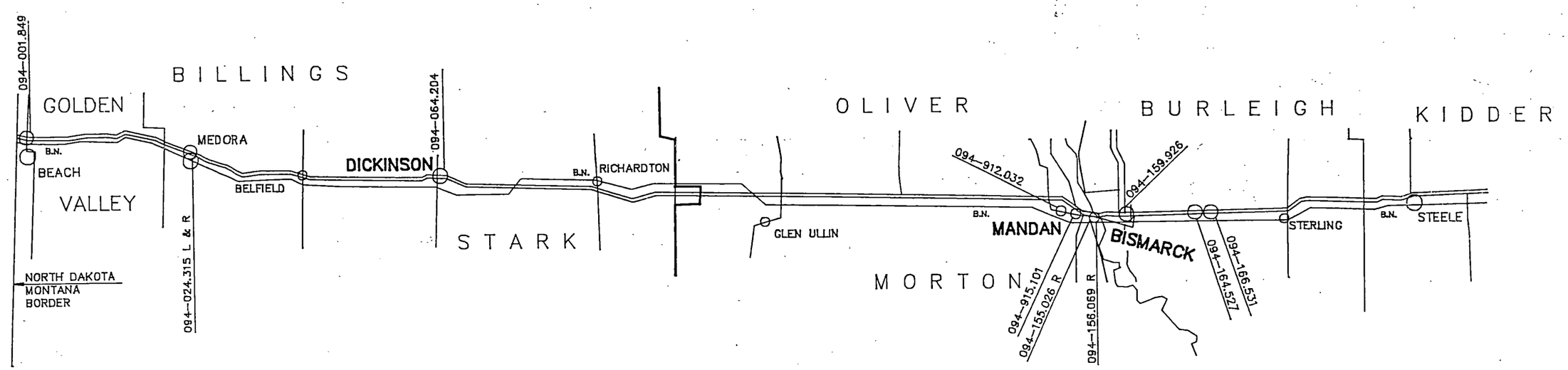
CONTRACT NO. 1

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	N.D.	SAP-9-0999(011)000	1

GOVERNING SPECIFICATIONS

STANDARD SPECIFICATIONS ADOPTED BY THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT NOVEMBER 1986, STANDARD DRAWINGS CURRENTLY IN EFFECT, AND OTHER CONTRACT PROVISIONS SUBMITTED HEREIN.

INDEX



FOREST D. DUROW
REGISTERED
PROFESSIONAL
948
ENGINEER
NORTH DAKOTA

1-23-91
DATE

Forest D. Durow
NAME

APPROVED DATE 1-23-91

Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

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

90LCS123

To PPD 1/23/91

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP--9-0999(011)000	2

BASIS OF ESTIMATE

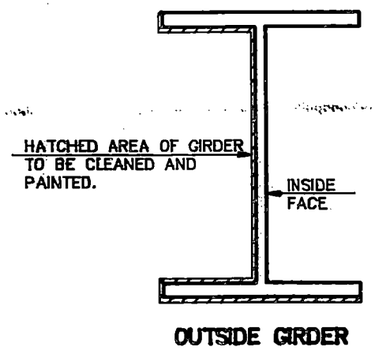
SITE NO.	BRIDGE NO.	LOCATION	BRIDGE LENGTH	GIRDER DEPTH	NO. OF GIRDERS	OUTSIDE GIRDER SQ.FT.	SPOT COAT SQ.FT.	FINISH COAT COLOR
DICKINSON DISTRICT								
1	094-001.849	BEACH INT.	265.0'	2.0' & 3.0'	4	2,941.0	365.0	BLUE
2	094-024.315 L & R	LITTLE MISSOURI RIVER	695.0'	4.125'	6	20,200.0	660.0	BLUE
3	094-064.204	EAST DICKINSON INT.	255.0'	3.0'	4	2,581.0	320.0	ALUMINUM
BISMARCK DISTRICT								
4	094-155.026 RT.	WEST MIDWAY SEP.	245.0'	3.5'	4	3,225.0	400.0	ALUMINUM
5	094-156.069 RT.	EAST MIDWAY SEP.	220.0'	3.5'	7	2,856.0	355.0	GREEN
6	094-159.926	19TH ST. SEP.	225.0'	3.5'	7	2,885.0	360.0	BLUE
7	094-164.527	GIBBS TWP. SEP.	240.0'	2.5'	3	2,058.0	255.0	ALUMINUM
8	094-166.531	APPLE CREEK SEP.	240.0'	2.5'	3	2,058.0	255.0	ALUMINUM
9	094-912.032	HEART RIVER 3.5 MI. W HWY 6	277.31'	4.54'	4	4,923.0	615.0	BLUE
10	094-915.101	HEART RIVER 0.5 MI. W HWY 6	283.75'	5.125'	4	5,584.0	695.0	BLUE
					TOTAL	49,311.0	4,280.0	

ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
103	0100	CONTRACT BOND	L.SUM	1.0
630	0100	SANDBLASTING AND PAINTING	L.SUM	1.0
630	0104	PREPARATION AND SPOT COATING	L.SUM	1.0
702	0100	MOBILIZATION	L.SUM	1.0
704	0100	FLAGGING	M.HR.	50.0
704	1100	TRAFFIC CONTROL	L.SUM	1.0

TRAFFIC CONTROL STANDARDS
D-754-1, 2, 3, 4, 5, 5A, 7 AND 11

GENERAL NOTES



OUTSIDE GIRDER

SCOPE OF WORK: THIS PROJECT CONSISTS OF CLEANING AND PAINTING THE FACIA SURFACES OF EXTERIOR GIRDERS AND MISCELLANEOUS SPOT COATING OF DETERIORATED AREAS OF ALL REMAINING PAINTED SURFACES AS DESIG-NATED BY THE ENGINEER AT THE TEN (10) BRIDGE SITES LISTED ABOVE.

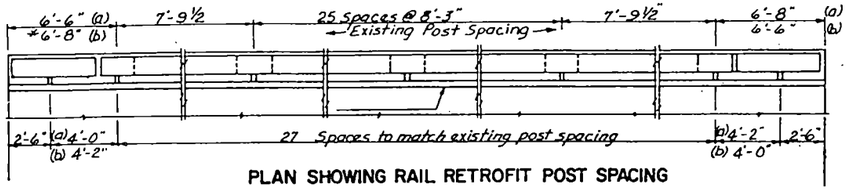
PAINTING: THE FACIA SURFACES OF STRUCTURAL STEEL SHALL BE CLEANED AND PAINTED ACCORDING TO THE SUPPLEMENTAL SPECIFICATIONS, EXCEPT FOR SECTION 630.03 D.3. REHABILITATION PAINTING, WHICH SHALL BE REVISED AS FOLLOWS: THE SURFACE OF THE EXTERIOR BEAMS SHALL BE PREPARED BY BLAST CLEANING. THE LEVEL OF PREPARATION SHALL MEET THE REQUIRE-MENTS OF SSPC-SP 7 "BRUSH-OFF BLAST CLEANING".
FOR FIVE (5) STRUCTURES THE FINISH COAT SHALL BE BLUE COLOR NUMBER 25240 AND FOR EAST MIDWAY SEPARATION THE FINISH COAT SHALL BE GREEN COLOR NUMBER 24227 OF THE FEDERAL STANDARD 595B. FOR FOUR (4) STRUCT-URES THE FINISH COAT SHALL BE ALUMINUM. THE ALUMINUM FILLED EPOXY MASTIC PRIMER SHALL BE TINTED TO DIFFERENTIATE THE COLOR FROM THE FINISH COAT. PREPARATION OF THE SPOT COAT AREAS SHALL MEET THE REQUIRE-MENTS OF SSPC-SP 3 "POWER TOOL CLEANING". PAYMENT FOR "SANDBLASTING AND PAINTING" AND "PREPARATION AND SPOT COATING" WILL BE FULL COMPEN-SATION FOR ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED.

TRAFFIC CONTROL: TRAFFIC SHALL BE CONTROLLED AS SHOWN ON STANDARD D-754-11, TYPE P FOR ALL OF THE SITES EXCEPT THE STRUCTURES OVER THE HEART RIVER. TRAFFIC CONTROL FOR THE HEART RIVER STRUCTURES SHALL BE CONTROLLED AS SHOWN ON STANDARD D-754-7, TYPE F.
ONE LANE OF THE ROADWAY SHALL BE CLOSED ONLY DURING DAYLIGHT HOURS. THE EQUIPMENT AND CONTROL DEVICES SHALL BE REMOVED FROM THE ROADWAY AND REGULAR TRAFFIC RESTORED AT THE END OF EACH WORK DAY. EQUIPMENT THAT MAY BE HAZARDOUS TO ERRANT VEHICLES LEAVING THE ROADWAY WILL HAVE TO BE PARKED BEYOND 50 FEET MEASURED FROM THE EDGE OF THE DRIVING LANE. CONTROL DEVICES SHALL BE PLACED IN LOCATIONS SO THAT MOTORISTS WILL NOT MISTAKE THEM AS REQUIRING THE MOTORIST TO MAKE A MANUEVER. THE CONTRACTOR SHALL NOTIFY THE DISTRICT ENGINEER ONE WEEK PRIOR TO THE START OF THE WORK.

RESPONSIBILITY TO THE PUBLIC: THE CONTRACTOR SHALL SHROUD THE WORK AREA TO PROTECT THE MOTORING PUBLIC. SHROUDING SHALL BE CAPABLE OF PREVENTING DUST AND PAINT OVERSPRAY FROM REACHING PASSING TRAFFIC AND CAUSING VEHICLE DAMAGE OR IMPAIRING MOTORIST VISIBILITY.
THE COST OF MAINTAINING AND PROTECTING TRAFFIC WILL BE CONSIDERED INCIDENTAL TO THE PRICE BID FOR "TRAFFIC CONTROL".

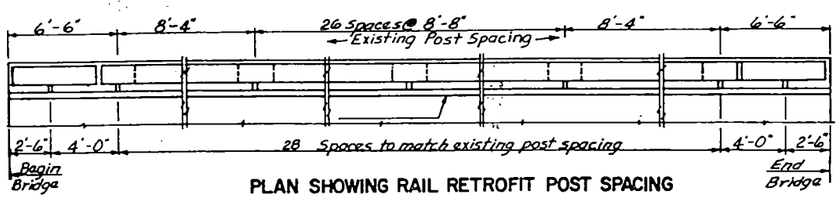
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(37)042	113

Revised 2-6-85



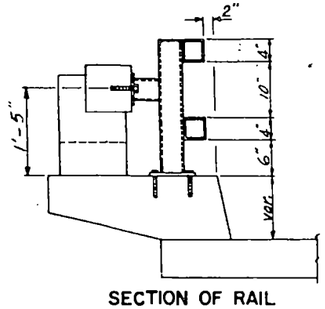
PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-062.486 CEMETARY ROAD SEPARATION 470 L.F.



PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-064.366 EAST DICKINSON INTERCHANGE 510 L.F.



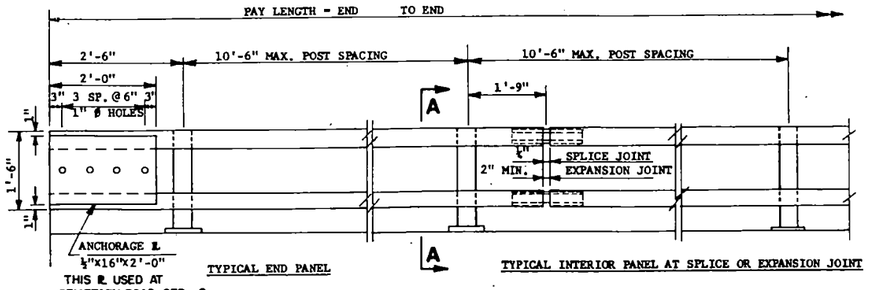
SECTION OF RAIL

7 6

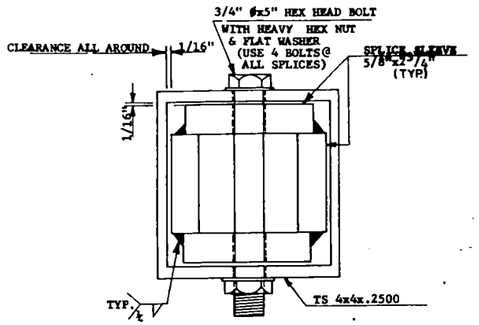
QUANTITIES	
Double Box Beam Rail Retrofit (Braced Post)	980 L.F.

I-94 RAIL RETROFIT

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(371)042	112



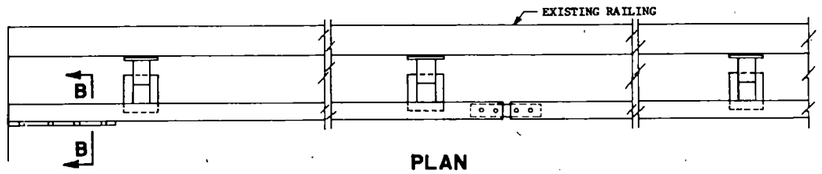
ELEVATION



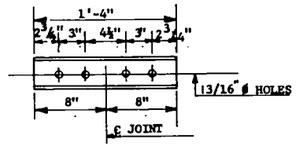
RAIL SPLICE

NOTES:

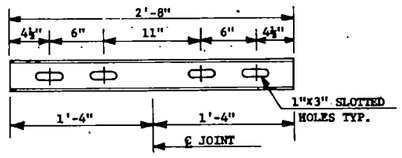
1. THE BID ITEM SHALL BE "DOUBLE BEAM RAILING RETROFIT". THE PAY LENGTH SHALL BE END TO END AND SHALL BE IN LINEAL FEET.
2. THE RAILING, POSTS AND POST SUPPORTS SHALL CONFORM TO ASTM A500, COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES, GRADE B. THE POST TOPS, POST 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 CAP SHALL ALWAYS BE ½". THE EXPANSION JOINT CAP SHALL BE 2" UNLESS OTHERWISE SHOWN ON THE BRIDGE PLANS.



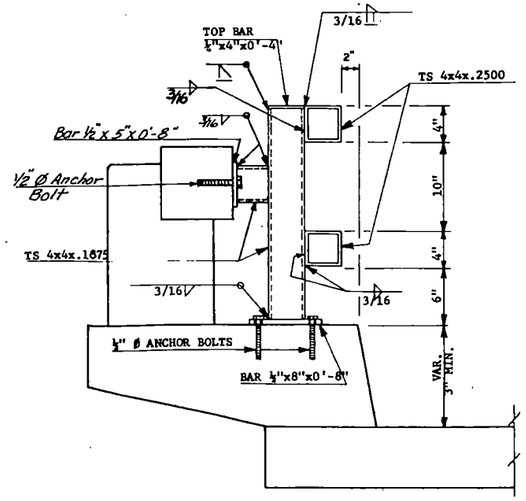
PLAN



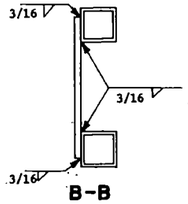
SPLICE SLEEVE AT SPLICE



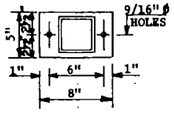
SPLICE SLEEVE AT EXPANSION JOINT



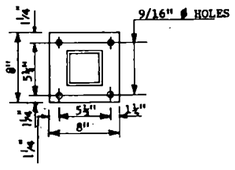
A-A



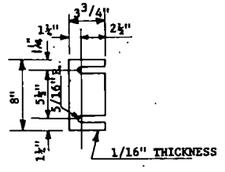
B-B



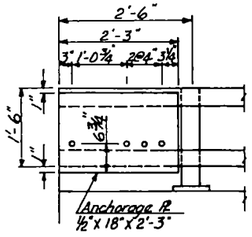
SUPPORT BASE DETAIL



POST BASE DETAIL



POST SHIM



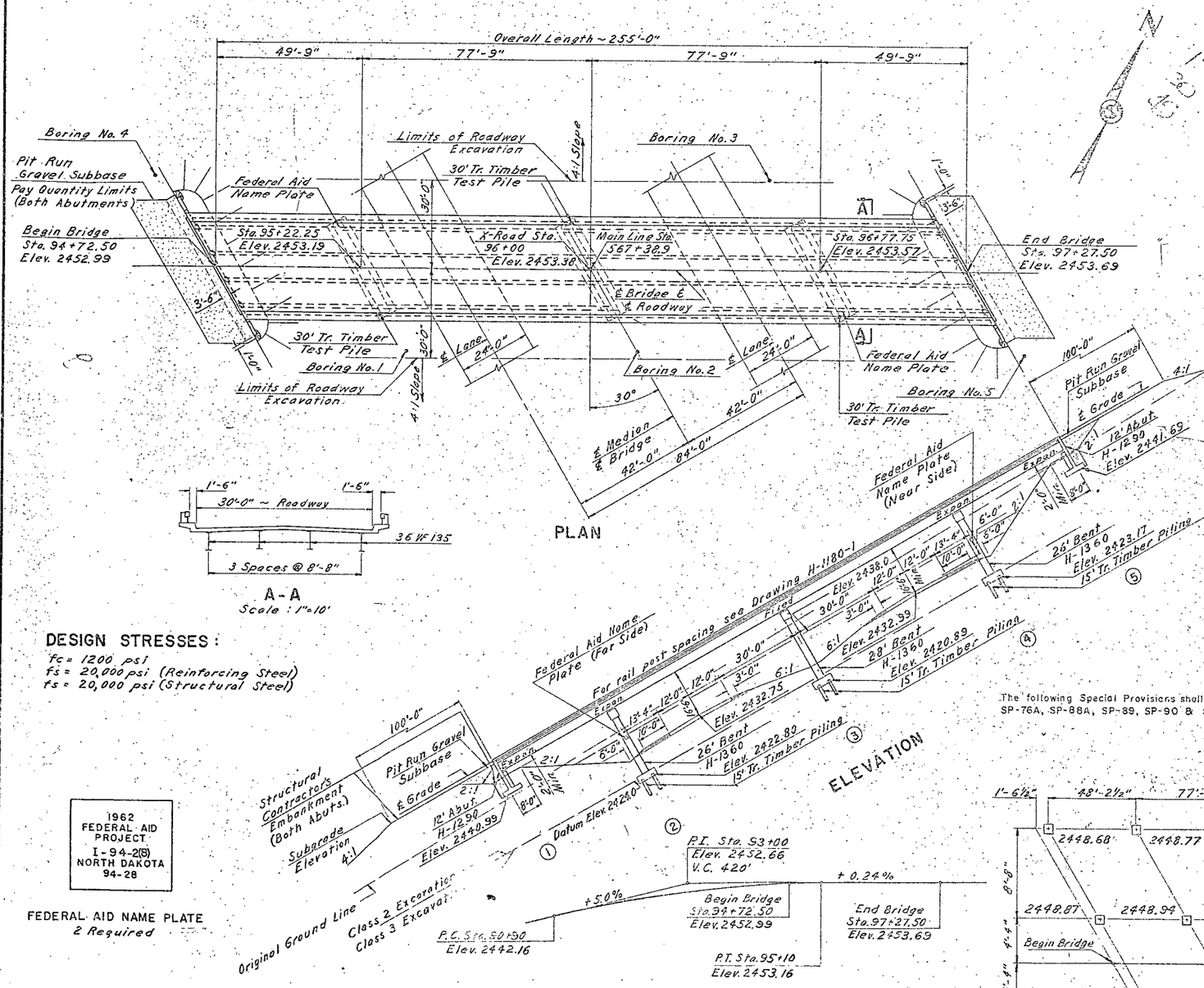
DETAIL "A"

DOUBLE BOX BEAM RAIL RETROFIT
(BRACED POST)

94-28

BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-731	5	N. D.	I-94-2(8)		12	65

DETAILS MADE BY M.E.W. CHECKED BY C.F.S.
RACING DRAWN BY M.E.W. CHECKED BY M.E.W.
QUANTITIES MADE BY CHECKED BY



DESIGN STRESSES :

f'c = 1200 psi
fs = 20,000 psi (Reinforcing Steel)
fs = 20,000 psi (Structural Steel)

1962 FEDERAL AID PROJECT I-94-2(8) NORTH DAKOTA 94-28

FEDERAL AID NAME PLATE
2 Required

VERTICAL CURVE DATA

Elevations are to top of Finished Roadway

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
190A	Ir. Pipe on tn. line	565+60 ~ 113' Rt.	2437.53
1	Ir. Mon. & Gds.	571+96 ~ 193' Rt.	2448.20
2	Ir. Mon. & Gds.	577+18 ~ 194' Rt.	2437.47

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH	FRICTION	WIND 50 LB.	WIND 100 LB. L.L.	LONG. FORCE	DESIGN LOAD	MAXIMUM REQUIRED BEARING	MINIMUM * PENETRATION
Abuts.	1.0 K/SF	0.6 K/SF	1.4 K/S.F.					3.0 K/SF		
Bents	9.7 T.	3.6 T.	2.0 T.	6.2 T.	2.8 T.	1.8 T.	1.2 T.	21.8 T. **	28.0 T.	12 Ft.

** Group III Loading (1961)
* Below Bottom of Footing in Ft.

94-28

NOTES:

GENERAL:

The cost of furnishing and placing joint filler, asphalt curb seal, name plates, end-post pipe sleeves and other miscellaneous items shall be included in the price bid for Class AE-2 Concrete.

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

Dead load deflections and vertical curve corrections have been accounted for in the riser diagram on Sheet H-1179-2.

EMBANKMENT:

Earth consolidations shall be in accordance with Section 17.3(a)4 of the Stanard Specifications using "Standard Compaction".

Roadway Excavation under the structure down to elevation 2438.0 is the responsibility of the Structural Contractor and shall be removed before the deck beams are placed. This material, if suitable, shall be used in the Structural Contractors Embankment at both ends of the structure.

Additional embankment material, if required, shall be obtained from the Highway Right-of-Way as staked by the Engineer.

The pit run gravel subbase shall not be placed above the berm until the superstructure deck has been placed.

EXCAVATION:

Excavation Class 2 at the abutments shall extend from the bottom of the footing to the finished profile of the Structural Contractors Embankment.

Excavation at the abutments shall not be removed until the Structural Contractors Embankment has been placed.

Excavation Class 3 shall include that excavation between the datum elevation 2424.0 and the bottom of each bent footing as shown on this sheet. Pay limits of structural excavation shall be one foot outside of the bent footings as shown on plans.

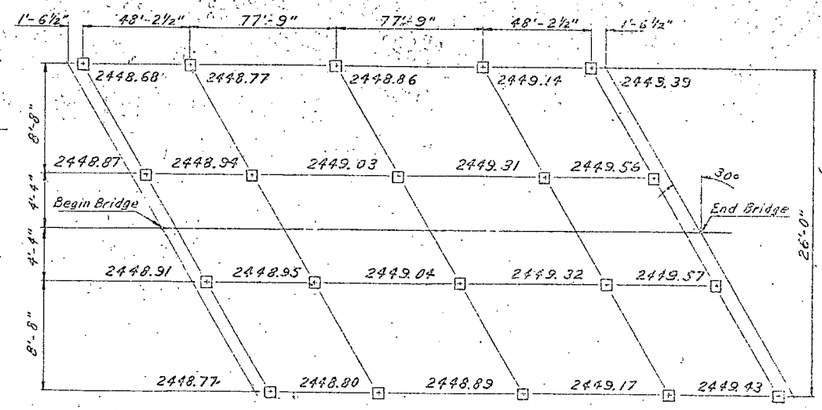
Remove top soil at abutments before placing embankment.

Excavation Class 2 at the bents shall extend upward from the datum elevation 2424.0 to elevation 2438.0 or lower, depending on how much roadway excavation the Structural Contractor removes, or to the finished roadway profile below the bridge if the Grading Contractor removes the roadway excavation first.

REINFORCING STEEL: (Intermediate Grade)

Dimensions for bent bars are given center to center unless noted.

The following Special Provisions shall be applicable:
SP-76A, SP-88A, SP-89, SP-90 & SP-100



BEARING PLATE LAYOUT

Elevations are to top of Concrete

CONCRETE:

All exposed edges of concrete shall be beveled with 3/4" triangular molding, unless otherwise noted.

The "Rubbed Surface Finish" will be required for the roadway and outside faces of curbs, edges of slab, all faces of rails, intermediate and end posts, the exposed faces of the abutment wing wall, and all exposed surfaces of bents. All other surfaces shall be given the "Ordinary Surface Finish".

All concrete shall be Class AE-2, except railings which are Class AAE-4, and shall be compacted by vibration.

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

SHORING:

The Contractor will be allowed to use manufactured shoring in forming the concrete slab except over the cover plates at the bents and over the flange splice plates, with no riser adjustment required, except as provided on sheet H-1179-2.

PILING:

The Boring Logs indicate a hard coal layer just below the footing elevation of Bents 3 and 4. The Structural Contractor will be required to remove this coal layer sufficiently by trenching, drilling or a combination of both to allow driving the treated timber piling in the clay soil below. No extra compensation will be allowed for work required to remove the coal as required above. The removal of the necessary coal to allow driving of piles into the clay below shall be incidental to the pay item "Treated Timber Piling".

ESTIMATE OF QUANTITIES

SPEC. NO.	BID ITEM		
12	REMOVING EXISTING STRUCTURE AT STA.		
150	EXCAVATION CLASS 1		CU. YD.
155	" CLASS 2	793	CU. YD.
160	" CLASS 3	52	CU. YD.
13X	ROADWAY EXCAVATION "CLASS A"	10,684	CU. YD.
60AA	CONCRETE CLASS AAE-4	12.96	CU. YD.
60A	" CLASS AE-2	472.5	CU. YD.
62A	REINFORCING STEEL (INTERMEDIATE GRADE)	111,921	LB.
63A	STRUCTURAL STEEL	189,533	LB.
64B	TREATED TIMBER		M.B.M.
65A	UNTREATED TIMBER PILING @ FT.		LIN. FT.
65B	TREATED TIMBER PILING @ 7.0 15 FT.	1131	LIN. FT.
65K	UNTREATED TIMBER TEST PILES		EACH
65J	TREATED TIMBER TEST PILES @ 30 FT.	3	EACH
16	WATER FOR COMPACTION (20 GAL./CU.YD.)	214	M.GAL.
	BRIDGE BENCH MARKS	1	SET
23A	PIT RUN GRAVEL SUBBASE "CLASS 5"	310	CU.YD.

-190; 5-

STRUCTURAL DRAWINGS

GENERAL DRAWING	THIS SHEET (94-28), 94-28-1
SUBSTRUCTURE	H-1250, H-1360, ST'D. 14.9
SUPERSTRUCTURE	H-1179-1, H-1179-2, H-1190-1, H-1190-2, H-0501, ST'D. 7.6

DESIGN LOADING H20 S16 (1961) | SCALE 1 INCH = 20 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

EAST DICKINSON INTERCHANGE
BRIDGE LAYOUT

PROJECT I-94-2(8) STA. 567+38.9

STARK COUNTY

APPROVED

4-26-62 DATE — Joseph R. Kirby BRIDGE ENGINEER

JOSEPH R. KIRBY — REGISTERED PROFESSIONAL ENGINEER — NORTH DAKOTA

94-28

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(8)		17	65

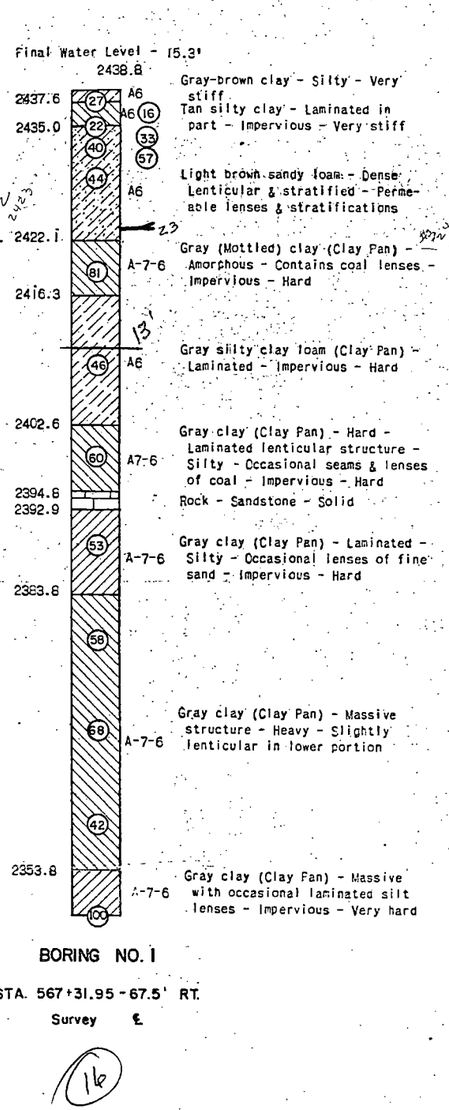
Bent #2

Bent #3

Bent #4

BORING NO.4

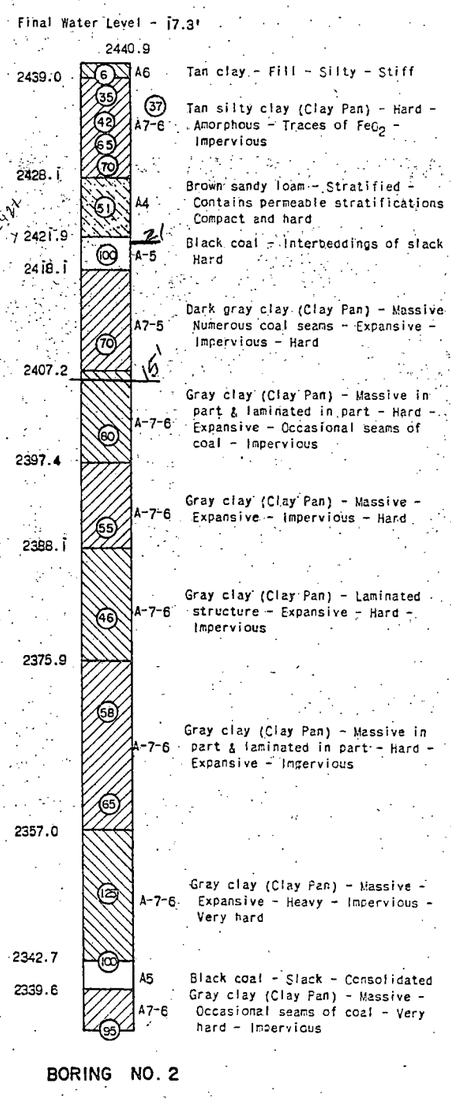
DEPTH:	4.6-5.9	15.5-16.5
MAX. LOAD:	3703	4657
SHEAR ∠:	Near 15°	Near 0°
COHESION:	1769	2329
MOISTURE:	22%	31%
DRY WT.:	104	



BORING NO. 1

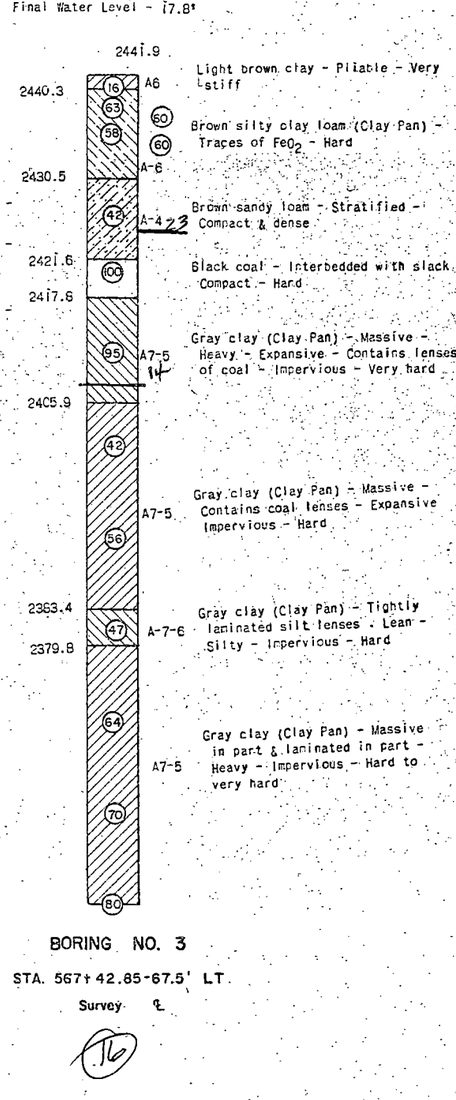
STA. 567+31.95 - 67.5' RT.

Survey ℄



BORING NO. 2

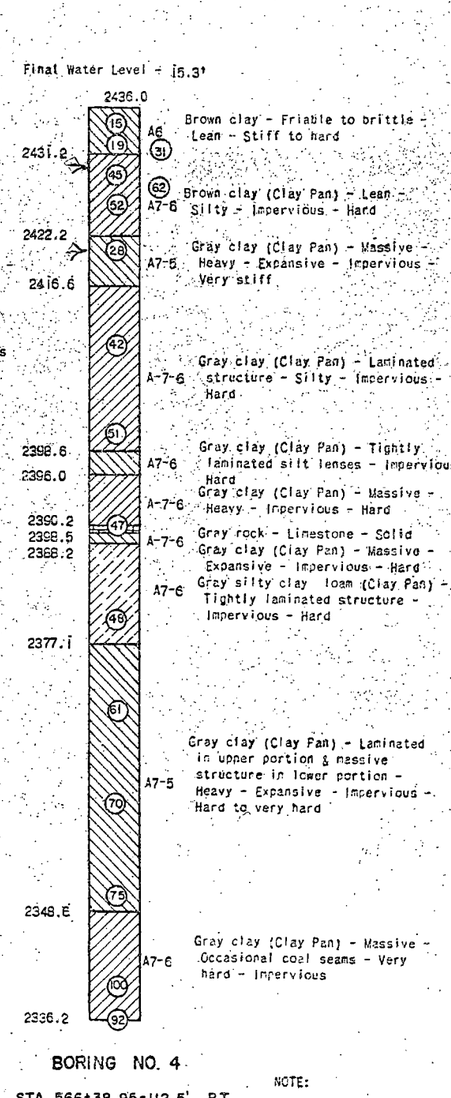
STA. 567+70.9 - On Survey ℄



BORING NO. 3

STA. 567+42.85-67.5' LT.

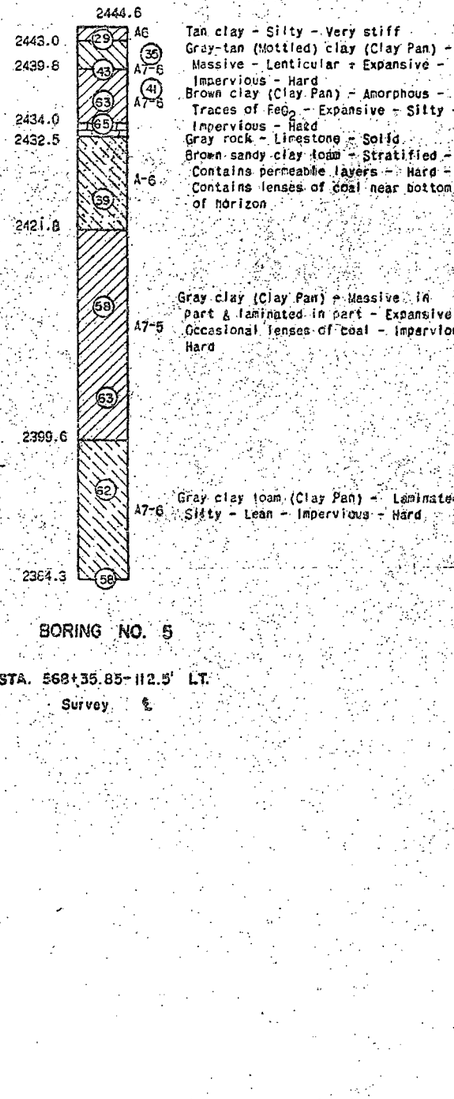
Survey ℄



BORING NO. 4

STA. 566+38.95-112.5' RT.

Survey ℄



BORING NO. 5

STA. 568+35.85-112.5' LT.

Survey ℄

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 assumes no responsibility if soil conditions encountered during construction differ from those shown.

BRIDGE NO. 94-28

BORING LOG

I-94-2(8)

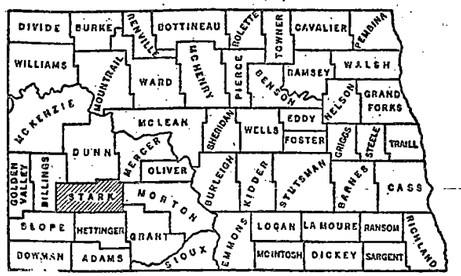
STARK COUNTY

94-28-1

94-28-1

2 locations

A-340 Spa 1-24-1



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(8)63

STRUCTURAL

INDEX OF DRAWINGS

SHEET NO.	1	TITLE PAGE & SUMMARY OF QUANTITIES
SHEET NO.	2	TO 4 INCL. TYPICAL SECTIONS
SHEET NO.	5	TO 13 INCL. PLAN & PROFILE DRAWINGS
SHEETS NO.	14	TO 15 INCL. INTERCHANGE LAYOUT
SHEETS NO.	16	TO 43 INCL. STRUCTURAL DRAWINGS
SHEETS NO.	44	TO 47 INCL. SOIL PROFILE
SHEETS NO.	48	TO 65 INCL. CROSS SECTIONS

Sheets No. 2C, 2D, 2E, 30, 31, 43, 44, 50, 51, 81, 82, 83, 94, 95, 96, 97, 98, 113, 114, 115, 147, 148, 150, 151, 154, 155, & 156 from I-94-2 (7)

LENGTH OF PROJECT

PROJECT	MILES-GROSS	MILES-NET
I-94-2(8)	6.166	0.0
TOTALS	6.166	0.0

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(8)63	1	65

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 other supplemental agreements hereto.

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 ELEVATION
- TRAVELED WAY
- RAILROADS
- HEDGES AND TREES
- TRAILS
- CITY OR VILLAGE CORPORATE LIMITS
- SECTION CORNER
- QUARTER SECTION CORNER
- BUILDINGS
- OLD CULVERTS
- NEW CULVERTS
- DRAINAGE
- BENCH MARKS
- WATERS EDGE
- MARSH
- WIRE ROPE GUARD RAIL
- SNOW FENCE
- RIPRAP
- GUARD POSTS
- COBBLE GUTTERS
- CONCRETE GUTTERS
- SODDING

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,	800

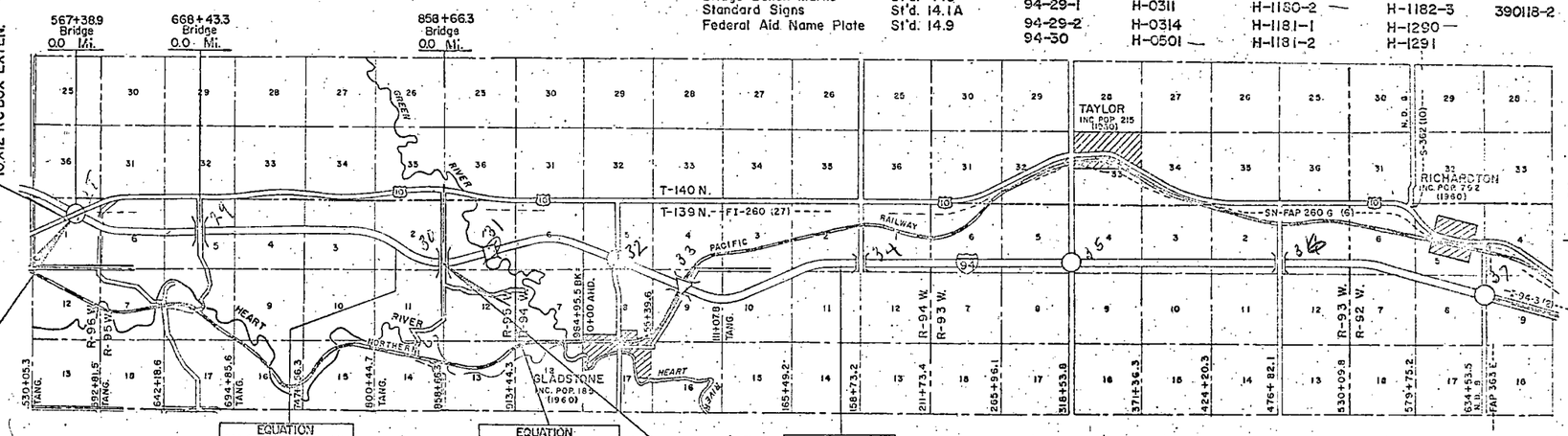
DESIGN SPEED 70 — MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600'
FULL CONTROL OF ACCESS
NO POINT OF ACCESS, OTHER THAN BY RAMPS AT INTERCHANGES

LIST OF STANDARDS

Bridge Bench Marks	St'd. 7.6
Standard Signs	St'd. 14.1A
Federal Aid Name Plate	St'd. 14.9

LIST OF STRUCTURAL DRAWINGS

94-28	94-30-1	H-1179-1 —	H-1181-3	H-1360 —
94-28-1	94-30-2	H-1179-2 —	H-1182-1	H-1361
94-29	94-30-3	H-1180-1 —	H-1182-2	390118-1
94-29-1	H-0311	H-1180-2 —	H-1182-3	390118-2
94-29-2	H-0314	H-1181-1	H-1290 —	
94-30	H-0501 —	H-1181-2	H-1291	



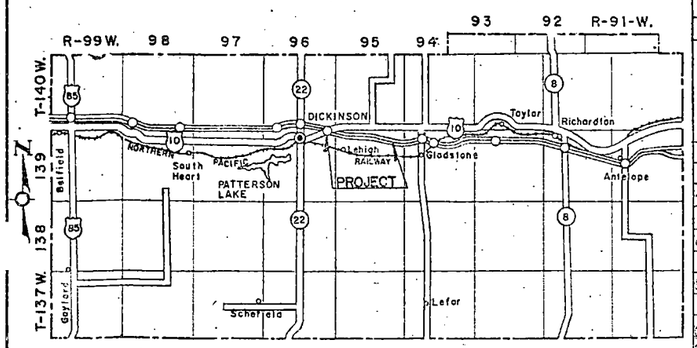
BEG. PROJ. NO. I-94-2(8)63
STA. 567+38.9 =
STA. 567+38.9 ON I-94-2(7) =
STA. 96+00 ON X-ROAD =
A POINT 1353.3' SOUTH & 2101.3' WEST OF THE NE. COR. OF SEC. 1, TWP. 139 N., R6E.-96 W.

STA.	CLEAR RDWY. WIDTH	DESIGN LOADING
567+38.9	30'0"	H20-S16 (1961)
668+43.3	20'0"	H15 (1961)
858+66.3	20'0"	H15 (1961)
87+62.8 X-RD. (Box Culvert Ext. E. Dickinson Int.)		H20-S16 (1944)

LAYOUT MAP
5280 0 5280'
SCALE IN FEET

END I-94-2(8)63
STA. 858+66.3 =
STA. 858+66.3 ON I-94-2(7)
A POINT 451.6' NORTH OF THE S.E. COR. SEC. 2, TWP-139N, R95W.

① SEE SPECIAL PROVISIONS



SKETCH MAP OF STARK COUNTY

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	60A CONCRETE CLASS AE-2	60AA CONCRETE CLASS AAE-4	62A REINFORCING STEEL (INTERMEDIATE GRADE)	63A STRUCTURAL STEEL	65B TREATED TIMBER PILING 15'	25'	30'	40'	45'	15A EXCAVATION CLASS 1	65J TREATED TIMBER TEST PILES 30'	40'	50'			84 TEMPORARY CROSSING & DETOUR CLASS-C LUMP SUM	BRIDGE BENCH MARKS
	CU. YD.	CU. YD.	CU. YD.	M GAL.		CU. YD.	CU. YD.	CU. YD.	LBS.	LBS.	LF.	LF.	LF.	LF.	LF.	C.Y.	EA.	EA.	EA.			STA.	SET
567+38.9	10,684	785	69	214		310	472.6	12.96	111,921	189,538	1131						3						1
668+43.3	7,243	459		144		131	258.3	11.39	56,002	90,650			368	760	215			1	1			668+43.3	1
858+66.3		292				131	319.6	14.04	73,129	110,401		345	1260	380				4					1
87+62.8 X-RD. E. Dickinson Int.						22	137.3		19,193							45							
GRAND TOTAL	17,927	1536	69	358		594	1188.0	38.39	262,245	390,589	1131	345	2128	1140	215	45	3	5	1			1 LUMP SUM	3
		① SP 73	① SP100	① SP 100	① SP 82A		① SP76A	① SP 89 SP 89A	① SP 89 SP 88A	① SP 90						① SP 100							

APPROVED DATE 5-16-62

CHIEF ENGINEER
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

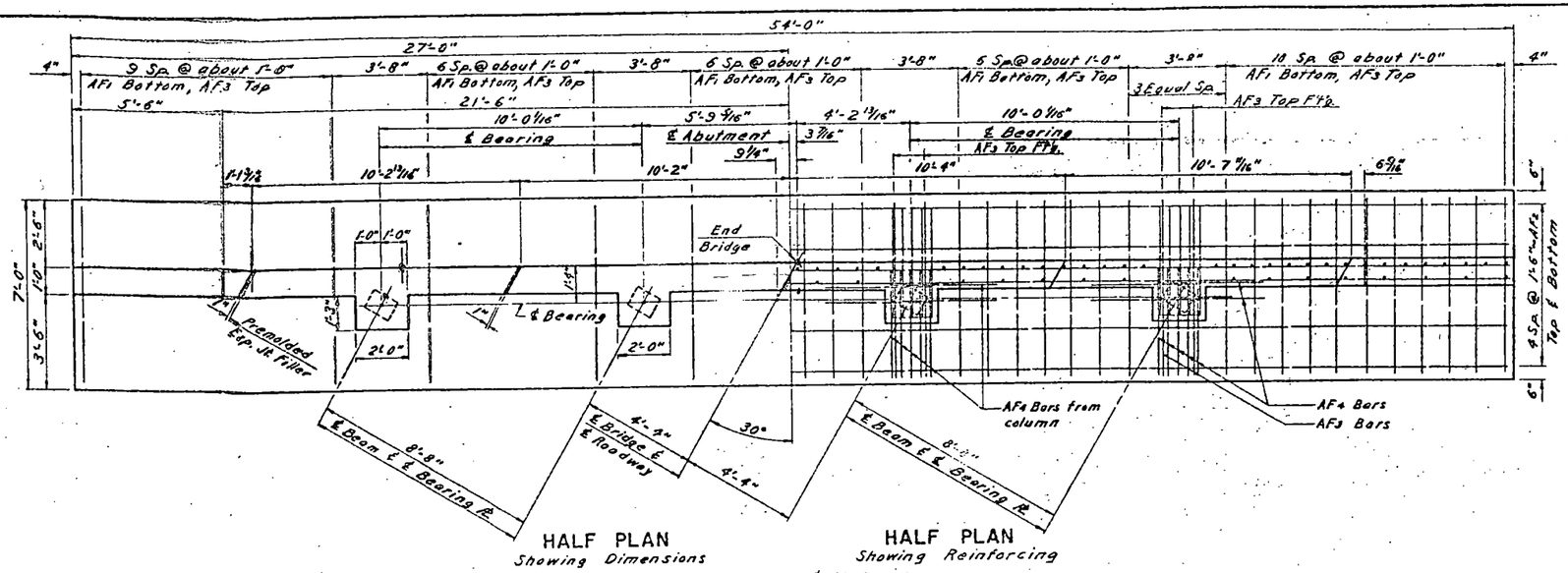
APPROVED

DIVISION ENGINEER DATE

I-94-2 (8)63

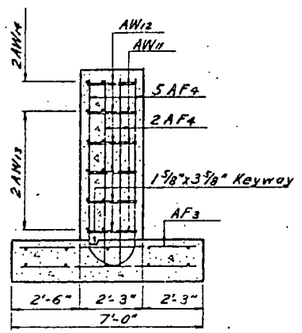
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	F-94-2(20)		38	65

NOTE:
The abutment is symmetrical about its ℄ except as shown.
The 1½"ø Smedge Bolts must be placed with care so that they will be in the correct location for the 1⅜"x4½" slotted holes in the beam flange end sole plate.

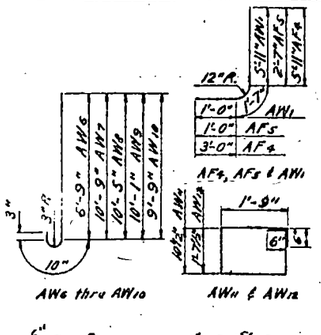


HALF PLAN
Showing Dimensions

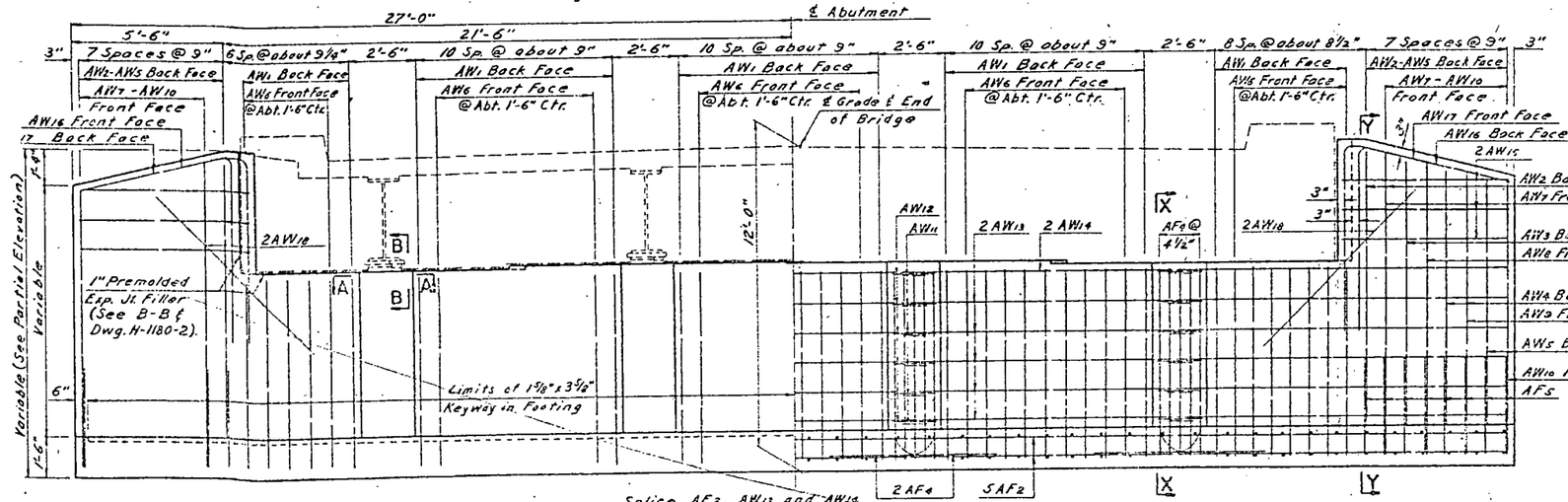
HALF PLAN
Showing Reinforcing



X-X

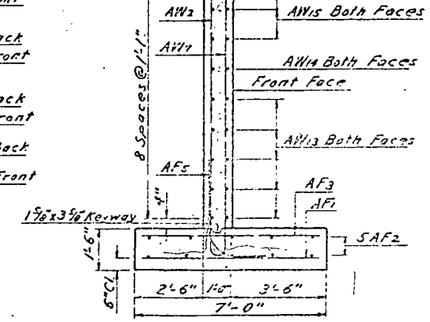


BENT BAR DETAILS



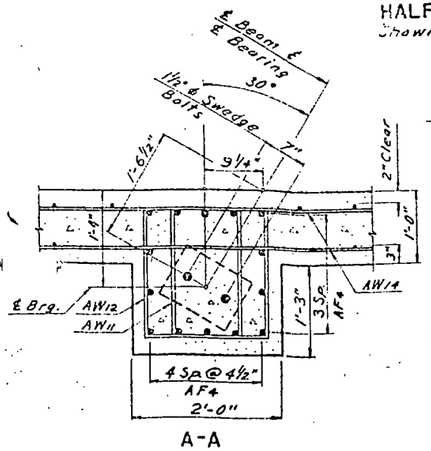
HALF ELEVATION
Showing Dimensions

HALF ELEVATION
Showing Reinforcing

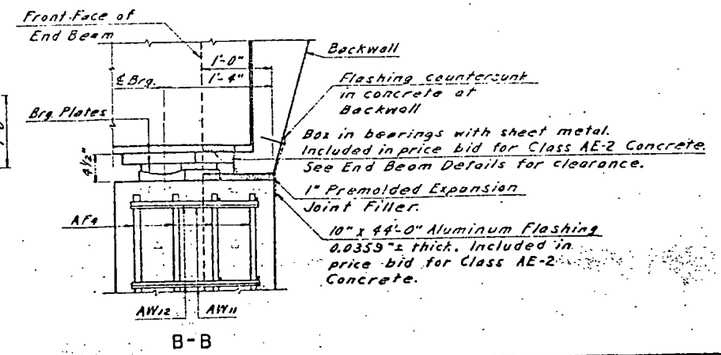


Y-Y

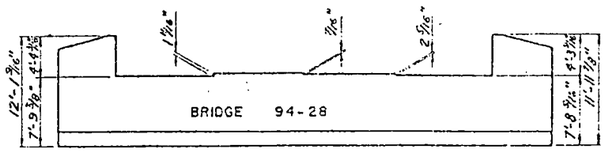
BAR LIST ~ ONE ABUT.				
MARK	NO.	SIZE	LENGTH	SHAPE
AF1	62	8	6'-6"	Str.
AF2	20	9	2'7"-8"	"
AF3	50	4	6'-6"	"
AF4	56	9	10'-6"	Bent
AF5	16	6	5'-2"	"
AW1	47	6	8'-6"	Bent
AW2	4	6	10'-0"	Str.
AW3	4	6	9'-9"	"
AW4	4	6	9'-9"	"
AW5	4	6	9'-0"	"
AW6	22	4	7'-10"	Bent
AW7	2	4	11'-10"	"
AW8	2	4	11'-6"	"
AW9	2	4	11'-2"	"
AW10	2	4	10'-10"	"
AW11	24	4	6'-3"	"
AW12	24	4	7'-3"	"
AW13	26	4	27'-8"	Str.
AW14	4	6	28'-0"	"
AW15	12	4	5'-10"	"
AW16	2	6	12'-6"	Bent
AW17	2	6	12'-6"	"
AW18	4	5	8'-0"	Str.



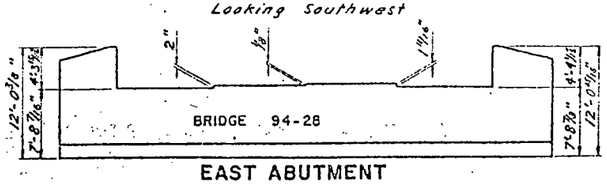
A-A



B-B



WEST ABUTMENT
Looking Southwest



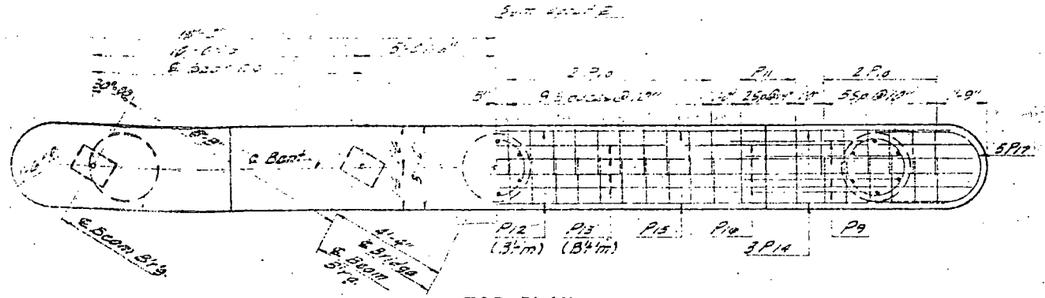
EAST ABUTMENT
Looking Northeast
PARTIAL ELEVATION

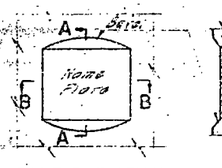
QUANTITIES (ONE ABUT.)	
Concrete Class AE-2	37.7 C.Y.
Reinforcing Steel	5,360 Lbs.
Excavation (See Layout)	

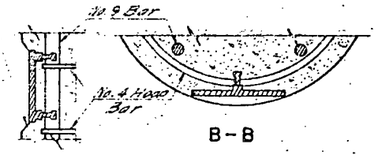
12 FT. ABUTMENT
FOR STEEL BEAM SPANS
EXPANSION END
30° SKEW
30 FT. ROADWAY
H20 S16 LOADING (1961)

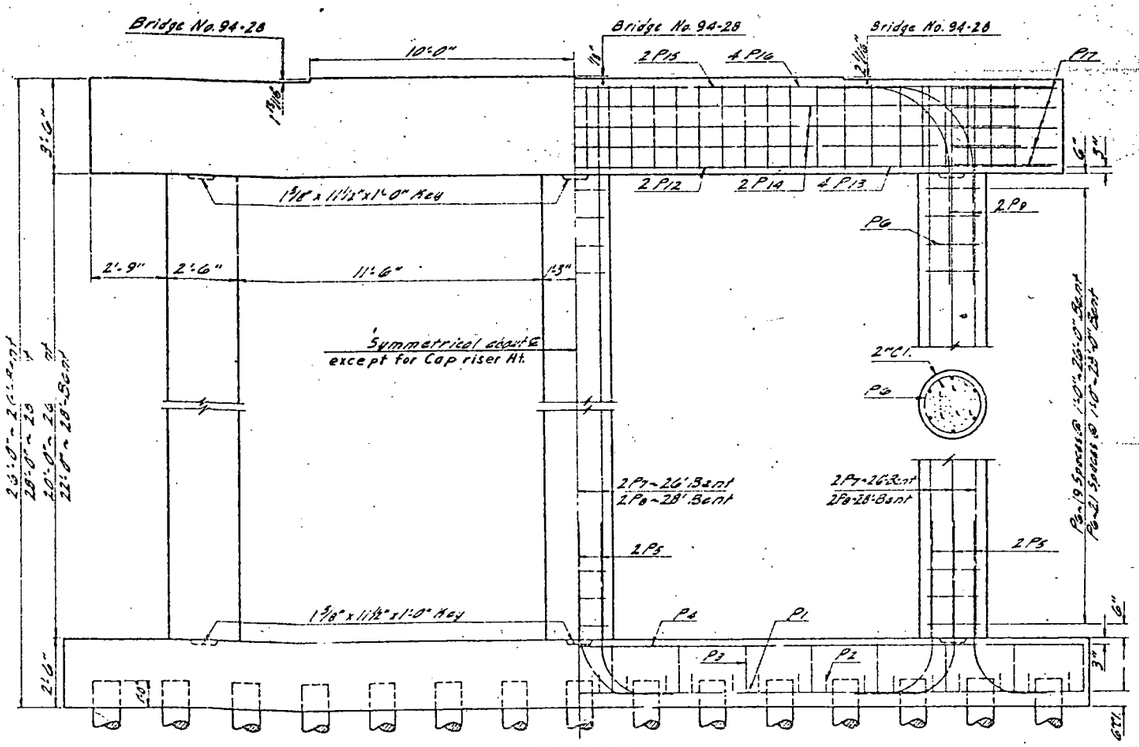
H-1290

H-1290









FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-94-2(8)		40	65

BAR LIST (ONE 26'-0" BENT)					BAR LIST (ONE 28'-0" BENT)				
MARK	NO.	SIZE	LENGTH	SHAPE	MARK	NO.	SIZE	LENGTH	SHAPE
P1	6	11	37'-6"	Str.	P1	6	11	37'-6"	Str.
P2	30	9	8'-6"	Bent	P2	30	9	8'-6"	Bent
P3	16	5	16'-9"	"	P3	16	5	16'-9"	"
P4	7	9	37'-6"	Str.	P4	7	9	37'-6"	Str.
P5	18	9	8'-3"	Bent	P5	18	9	8'-3"	Bent
P6	60	4	7'-8"	"	P6	66	4	7'-8"	"
P7	18	9	23'-3"	Str.					
					P8	18	9	25'-3"	Str.
P9	8	9	11'-0"	Bent	P9	8	9	11'-0"	Bent
P10	64	5	10'-6"	"	P10	64	5	10'-6"	"
P11	6	5	12'-6"	"	P11	6	5	12'-6"	"
P12	2	9	33'-0"	Str.	P12	2	9	33'-0"	Str.
P13	4	9	35'-0"	"	P13	4	9	35'-0"	"
P14	6	5	33'-0"	"	P14	6	5	33'-0"	"
P15	2	10	33'-0"	"	P15	2	10	33'-0"	"
P16	4	10	35'-0"	"	P16	4	10	35'-0"	"
P17	10	6	9'-0"	Bent	P17	10	6	9'-0"	Bent

TOP PLAN

PART ELEVATION OF COLUMN

A-A

B-B

FEDERAL AID NAME PLATE DETAIL

SEE LAYOUT 8 STANDARD 14.9

ELEVATION
Looking Southwest

END VIEW

FOOTING PLAN

NOTE:

The bent has been detailed for a 26' and a 28' height. Both have a similar cap and footing; the column height and column steel change as shown. The bar list and quantity table are given for a 26' and a 28' bent.

The concrete in the columns shall be allowed to set at least two (2) hours before the cap reinforcing is placed or the concrete poured.

All exposed edges to be beveled with ¾" triangular moulding.

BENT BAR DETAILS

QUANTITIES (ONE 26'-0" BENT)
Concrete Class AE-2 48.6 C.Y.
Reinforcing Steel 8,476 Lbs.
Excavation (See Layout)
Piling (See Layout)

QUANTITIES (ONE 28'-0" BENT)
Concrete Class AE-2 49.7 C.Y.
Reinforcing Steel 8,629 Lbs.
Excavation (See Layout)
Piling (See Layout)

26'-0" & 28'-0" BENT DETAILS

I - BEAM SPANS

30'-0" ROADWAY

H20-S16 LOADING

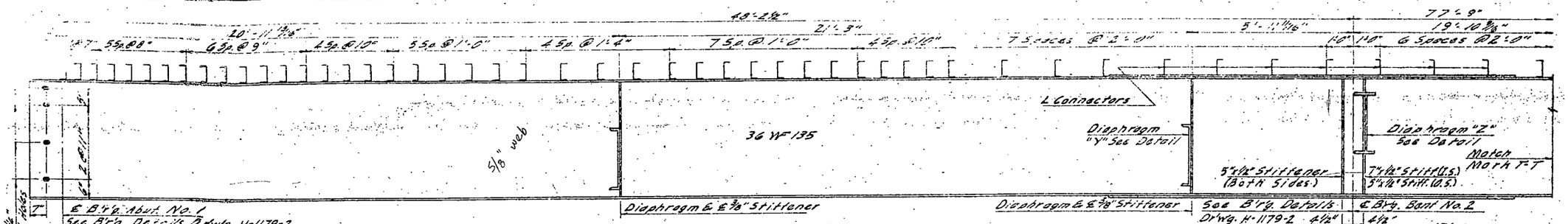
H-1360

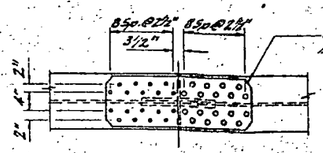
Span 1 - Length of Beam 49'-5

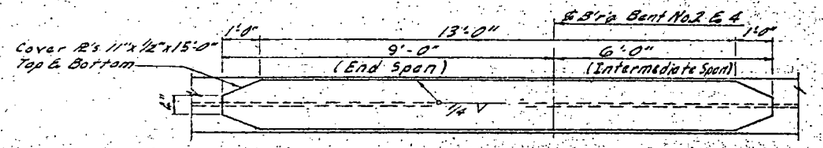
TOTAL Length of Girder = 254'-4

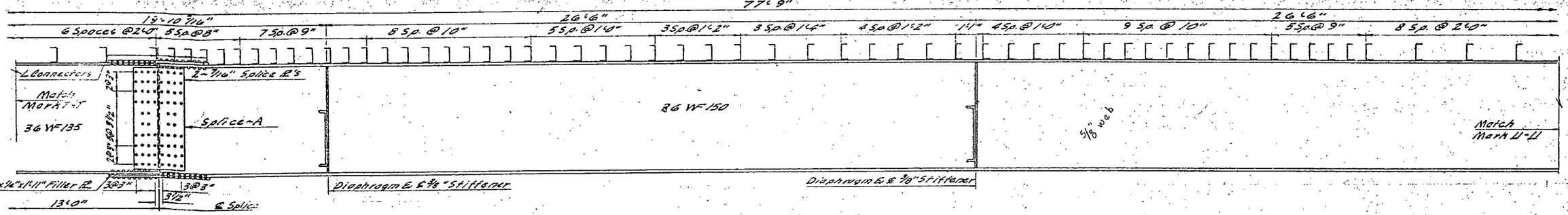
FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	F 93-2(6)		28	65

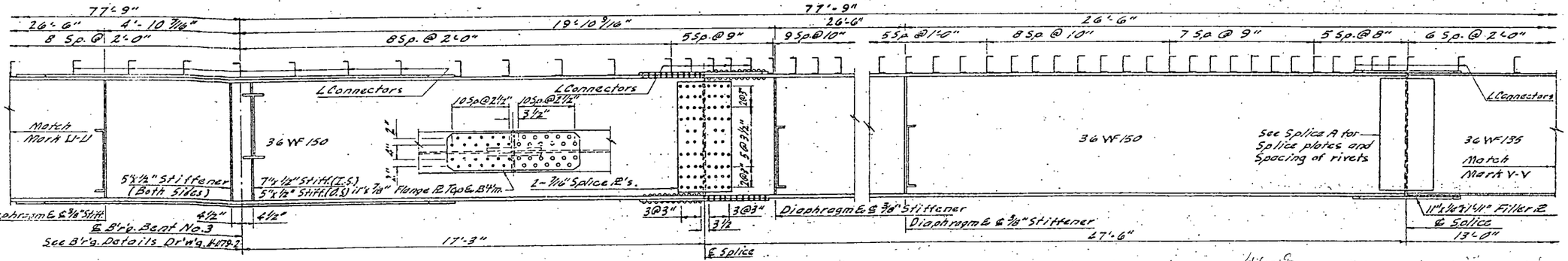
See Drawings:
H-1179-2 for Steel Layout and Steel Details.
H-1180-1 for Slab Details and Quantities.
H-1180-2 for Railing and Typical Slab Sections.

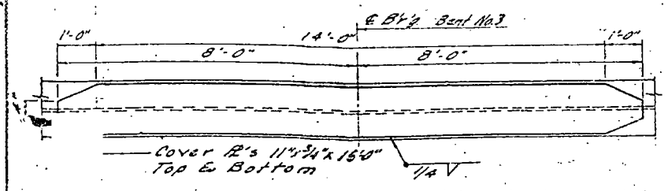


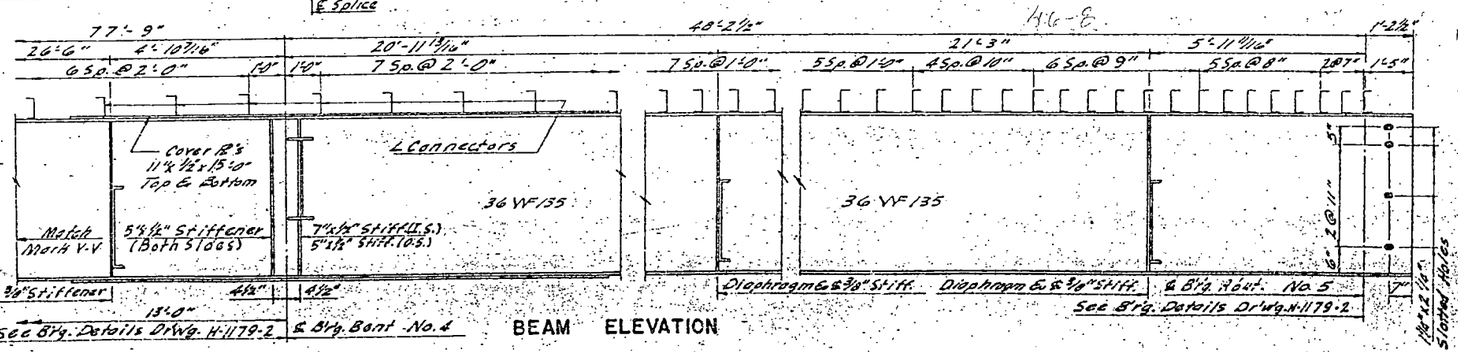












BEAM ELEVATION

NOTES:

The Details shown are for a 4 Span Continuous I-Beam and represent beam No. 1, in a four beam bridge. The bridge has an overall Length of 255'-0" and is skewed 30°-00' Left. See Drawing H-1179-2.

Beams No. 2, No. 3, & No. 4 although similar to Beam No. 1 are to be fabricated in accordance with these details and as further amplified on Drawing H-1179-2.

Spacing of shear connectors is symmetrical about centerline of Bent Brg. No. 3.

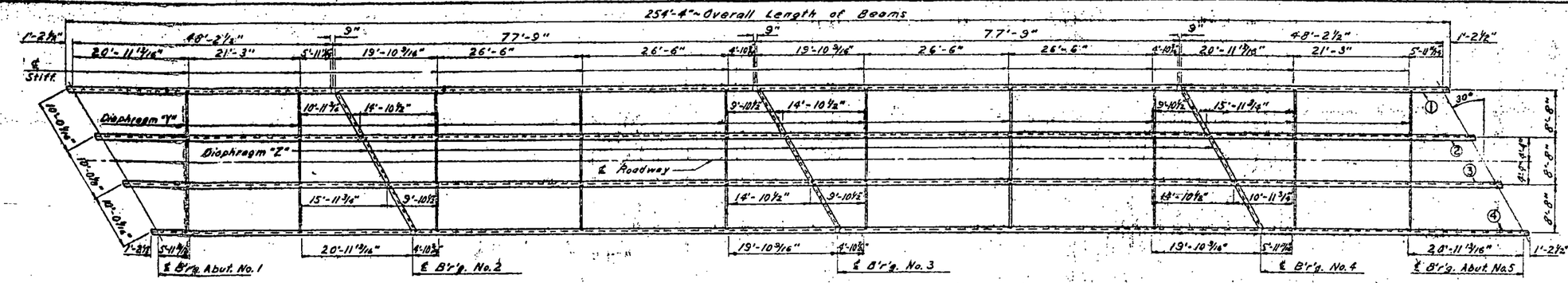
SCALE:
Vertical - 3/4" = 1'-0"
Horizontal - 1/8" = 1'-0"

Designed for 25 #/sq. ft. F.W.S.

SUPERSTRUCTURE
FOUR SPAN COMPOSITE
CONTINUOUS I-BEAM
OVERALL LENGTH 255'-0"
30° SKEW
H20 S16 LOADING (1961)
30' ROADWAY

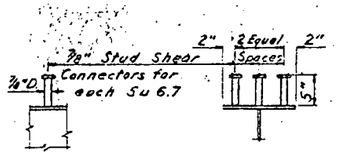
H-1179-1

FED. ROAD DIV. NO.	STATE	FEDL. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-2(12)		29	65



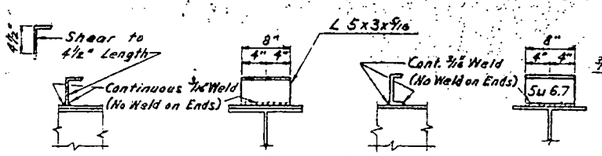
STEEL LAYOUT

NOTE: No paint on Shear Devices.



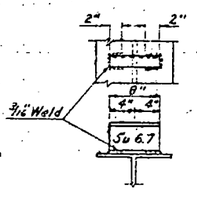
May be used in positive moment region except over splice and cover plates

ALTERNATE SHEAR DEVICE



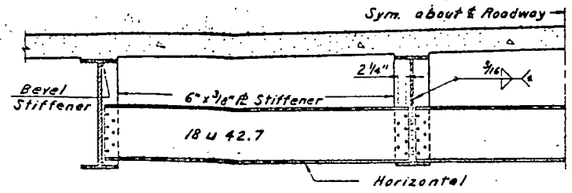
Used over splice and cover plates

Used in positive moment region except over splice and cover plates,



Used in negative moment region where spacing is at 2'-0" centers, except over cover plates.

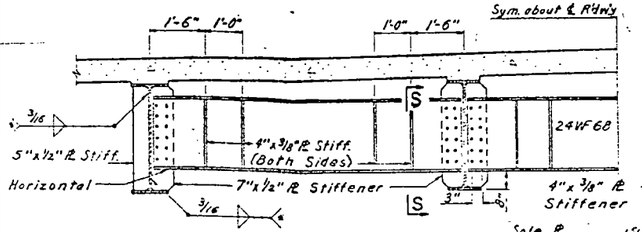
SHEAR DEVICE DETAILS

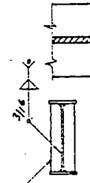


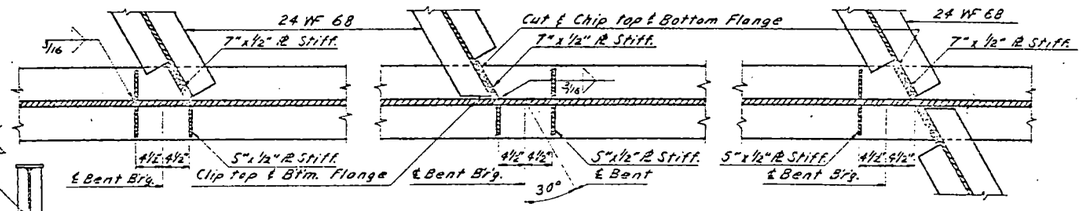
DIAPHRAGM "Y"

Normal to axis of bridge

* Weld to web & Top Flange







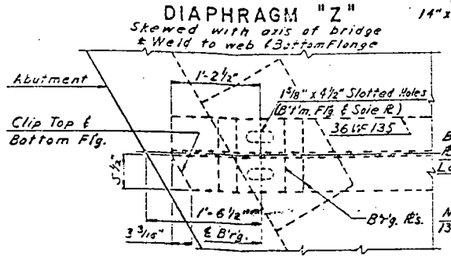
OUTSIDE BEAM NO. 4 — OUTSIDE BEAM NO. 1 — INSIDE BEAMS

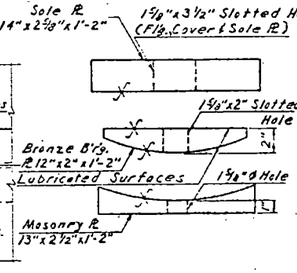
STIFFENER DETAILS OVER BENT

DIAPHRAGM "Z"

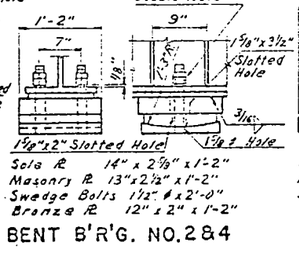
Skewed with axis of bridge

℄ Weld to web (Bottom Flange



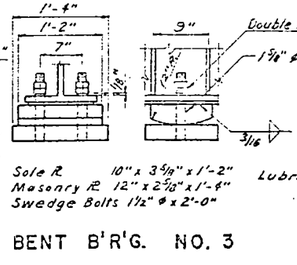


END OF BEAM DETAIL



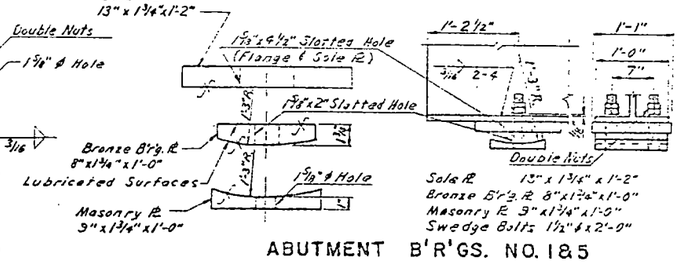
Sole ℞ 14" x 2⅞" x 1'-2"
Masonry ℞ 13"x2½" x1'-2"
Swedge Bolts 1½" ϕ x 2'-0"
Bronze ℞ 12" x 2" x 1'-2"

BENT B'R'G. NO. 2&4



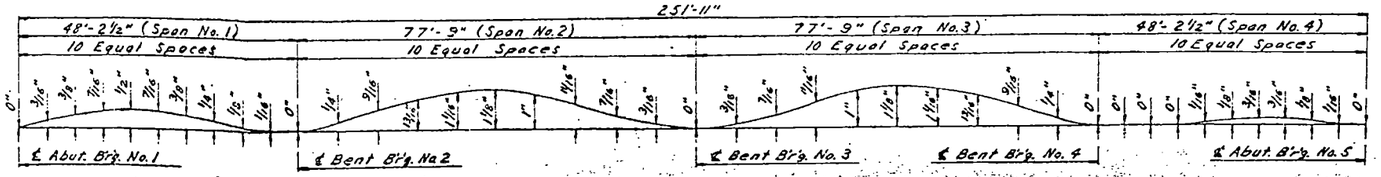
Sole ℞ 10" x 3⅛" x 1'-2"
Masonry ℞ 12" x 2⅞" x 1'-4"
Swedge Bolts 1½" ϕ x 2'-0"

BENT B'R'G. NO. 3



Sole ℞ 13" x 1¾" x 1'-2"
Bronze B'rg. ℞ 8"x1⅜"x1'-0"
Masonry ℞ 9"x1¾"x1'-0"
Swedge Bolts 1½" ϕ x 2'-0"

ABUTMENT B'R'GS. NO. 1&5



FIELD RISER DIAGRAM

Showing Dimension "a"

NOTES:

GENERAL:

All rivets are to be ⅞".
Open holes are to be 15/16" except as noted.
Shop connections shall be made as shown.

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

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

PAINT:

Paint and painting shall conform to the North Dakota Standard Specifications for Road and Bridge Construction, Sections 80 & 132.17. All exposed steel surfaces shall be given one shop coat of red lead paint (including top of upper beam flange), one spot coat of red lead paint after erection and concrete work is completed and two field coats of aluminum paint (first field coat tinted with Prussian Blue).

No paint allowed on shear connectors.

RISER DIAGRAM:

The riser diagram represents the rise in inches above assumed chords drawn between supports that are required to compensate for the dead load deflection and the vertical curve of the roadway. Additions or subtractions must be made to the riser dimensions to compensate for tolerances in the beam and deflections due to the weight of the beam.

WELDING:

The metal-arc process shall be used for all shop and field fabrication. Electrodes used in the fabrication of this bridge shall be of the E60 classification. All welding shall conform to the current "Standard Specifications for Welding Highway and Railway Bridges ~ Design, Construction, and Repair" of the American Welding Society.

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

BRONZE BEARING PLATES:

The Bronze Bearing Plates shall conform to ASTM B103-55, Alloy I. Contact surfaces shall be finished in the direction of motion to ASA B46.1-47 No. 125. Lubricated surfaces shall be provided with trepanned recesses to receive a lubricating material suitable for long-life service of the bearing face. The lubricating area shall comprise not less than 25 per cent of the total area. The coefficient of friction for bronze on steel shall not exceed .10 per cent.

ALTERNATE SHEAR DEVICES:

Stud Shear Devices shall be manufactured of C-1015 cold rolled steel which conforms to ASTM Specification A-108-53T, and shall conform to the diameter and other dimensions as shown.

STRUCTURAL STEEL:

Structural carbon steel, except bearing plates and swedge bolts shall conform to the latest ASTM A-36 Specifications.

Steel Bearing Plates and swedge bolts shall conform to the latest ASTM A-7 Specifications. (Fabricator may substitute A-36 at his option)

Bronze Bearing Plates are included in quantities for A-7 Structural Steel on Sheet H-1180-1.

A-36 Structural Steel, A-7 Structural Steel and the Bronze Bearing Plates are listed in total on the layout sheet as Structural Steel and will be paid for as such.

See Drawings:
H-1179-1 for Beam Details
H-1180-1 for Slab Details and Quantities
H-1180-2 for Railing and Typical Slab Sections.

SUPERSTRUCTURE FOUR SPAN COMPOSITE CONTINUOUS I-BEAM

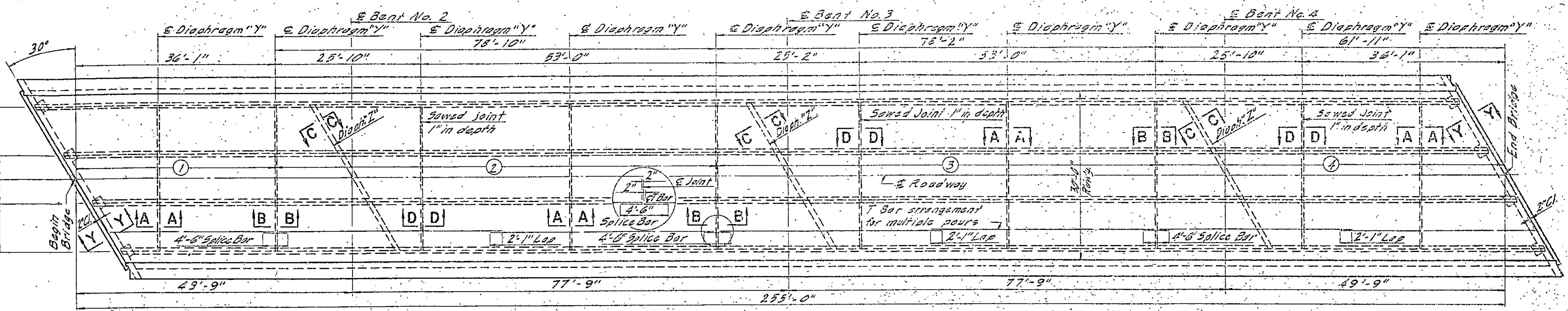
OVERALL LENGTH 255'-0"

H20 S16 - LOADING (1961)

H-1179-2

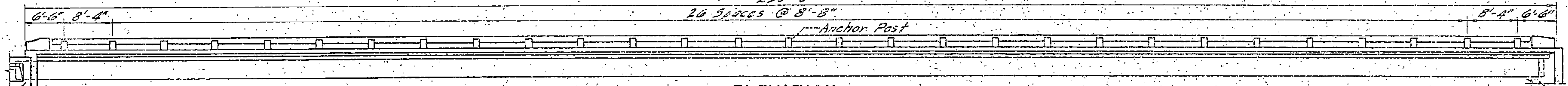
H-1179-2

FED ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	T-94-2(8)		30	65

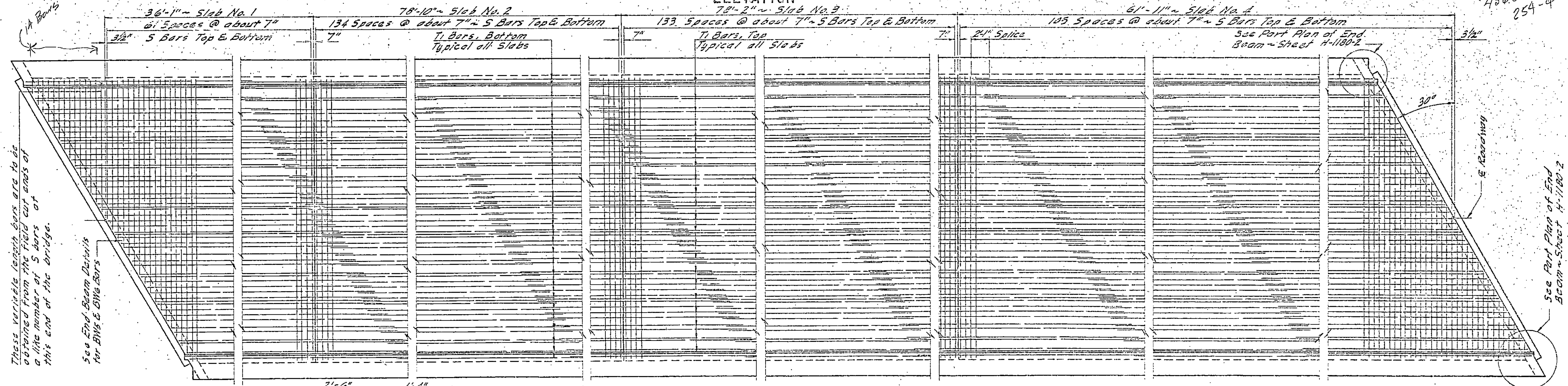


PLAN

For multiple pours the T1 Bars shall be arranged as shown.
The T1 Bars in end panels, 1 & 4, will have to be cut to variable lengths.

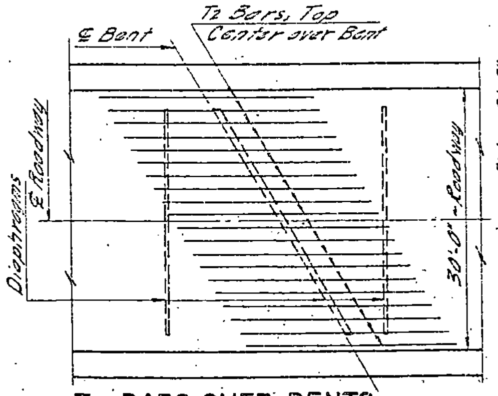


ELEVATION

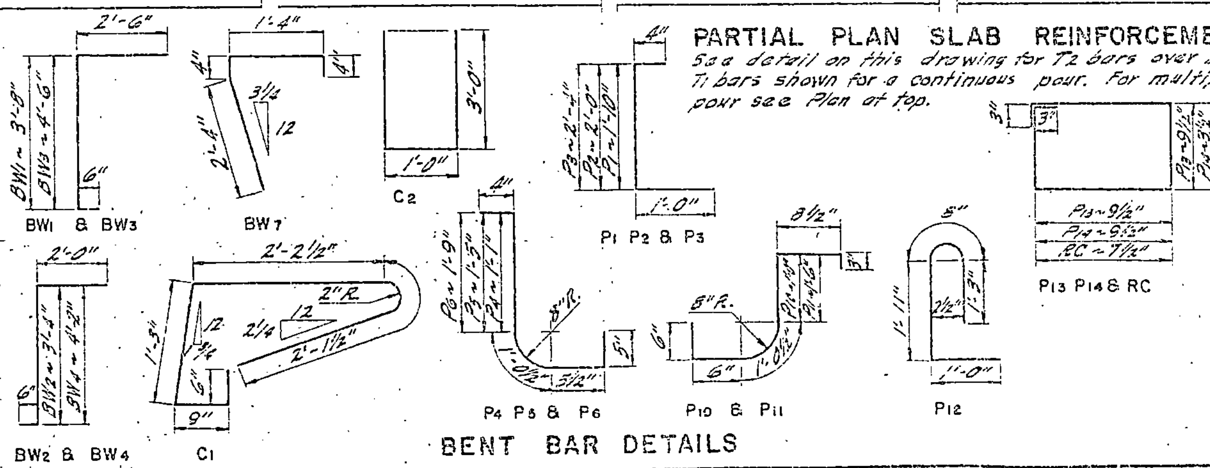


PARTIAL PLAN SLAB REINFORCEMENT

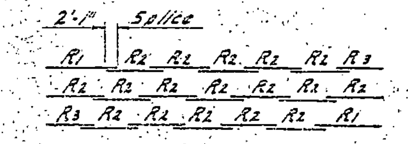
See detail on this drawing for T2 bars over Bents. T1 bars shown for a continuous pour. For multiple pour see Plan at top.



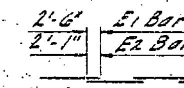
T2 BARS OVER BENTS



BENT BAR DETAILS



RAIL STEEL ASSEMBLY



E BAR SPLICING DETAILS

See Drawings:
H-1180-2 for Slab Details and Bar List.
H-1179-2 for Steel Details.
H-1179-1 for Beam Details.

NOTES:

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

1. In one continuous pour, (See Sec. 55.3(f) of St'd. Specs).
2. a. Slab section 1, left to right.
   b. Slab section 2, right to left.
   c. Slab section 3, right to left.
   d. Slab section 4, right to left.

T1 bars in the bar list on Sheet H-1180-2 and in the plans above are for a continuous pour method of placing concrete. If the contractor elects the multiple pour method of placing concrete, he shall order reinforcing steel to fit the four panels as shown in the plan view, and shall provide 4'-6" splice bars at the construction joints at his own expense.

Each curb shall be placed in one continuous operation.

Bevel all exposed edges with 3/4" triangular moulding except as shown.

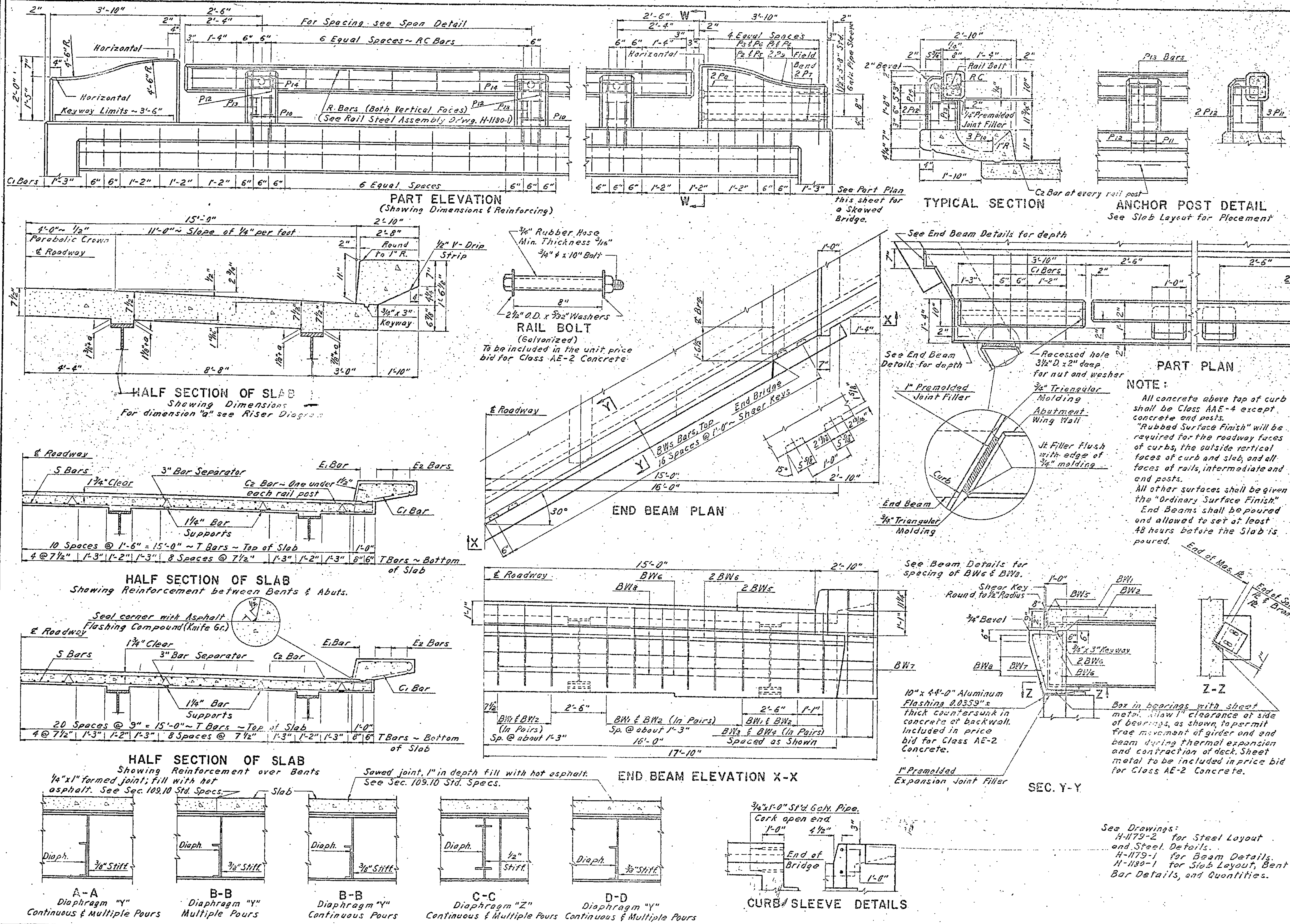
Designed for 25#/sq. ft. F.W.S.

QUANTITIES	
Concrete Class AAE-2	12.93 C.Y.
*Concrete Class AE-2	250.2 C.Y.
Reinforcing Steel	75,620 Lbs.
Structural Steel (A-36)	183,141 Lbs.
Structural Steel (A-7)	6,119 Lbs.

*End posts included.

SUPERSTRUCTURE
FOUR SPAN COMPOSITE
CONTINUOUS I-BEAM
OVERALL LENGTH 255'-0"
30° SKEW
H20-S16 LOADING (1961)
30' ROADWAY

H-1180-1



FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	[illegible]		31	65

NOTE:

All concrete above top of curb shall be Class AAE-4 except concrete end posts.

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

All other surfaces shall be given the "Ordinary Surface Finish".

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

BAR LIST				
MARK	NO.	SIZE	LENGTH	SHAPE
BW1	44	4	6'-8"	Bent
BW2	44	4	5'-10"	"
BW3	8	4	7'-5"	"
BW4	8	4	6'-8"	"
BW5	4	5	40'-9"	Str.
BW6	12	7	40'-9"	"
BW7	44	4	4'-4"	Bent
BW8	6	7	35'-6"	Str.
C1	532	5	6'-10"	Bent
C2	58	5	7'-0"	"
E1	14	6	38'-8"	Str.
E2	70	5	38'-3"	"
P1	8	5	3'-2"	Bent
P2	4	5	3'-4"	"
P3	8	5	3'-8"	"
P4	8	5	3'-4"	"
P5	4	5	3'-8"	"
P6	8	5	4'-0"	"
P7	16	4	3'-6"	Str.
P8	6	4	1'-9"	"
P9	8	5	3'-9"	"
P10	168	5	6'-0"	Bent
P11	6	5	4'-6"	"
P12	116	5	4'-10"	"
P13	120	3	3'-8"	"
P14	112	3	2'-8"	"
R1	8	5	39'-0"	Str.
R2	68	5	37'-0"	"
R3	8	5	35'-0"	"
RC	404	3	2'-8"	Bent
S	872	6	31'-6"	Str.
T1	420	5	39'-2"	Str.
T2	60	6	24'-0"	"

See Drawings:
H-1179-2 for Steel Layout and Steel Details.
H-1179-1 for Beam Details.
H-1180-1 for Slab Layout, Bent Bar Details, and Quantities.

Designed For 25#/sq.ft. F.W.S.

SUPERSTRUCTURE
FOUR SPAN COMPOSITE
CONTINUOUS I BEAM

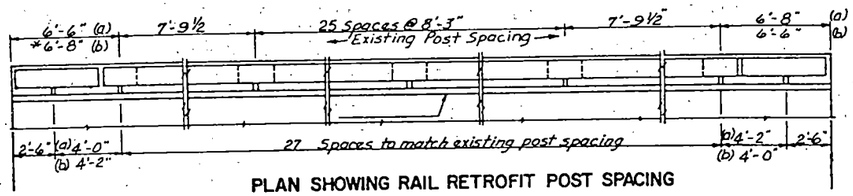
OVERALL LENGTH 255'-0"
30° SKEW
H20 S16 LOADING (1951)
30' ROADWAY

Concrete Class AE-2 0.8 C.Y.
Reinforcing Steel 226 lbs.
Railing and End Post Quantities are included in Slab Quantities.

H-1180

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(37)042	13

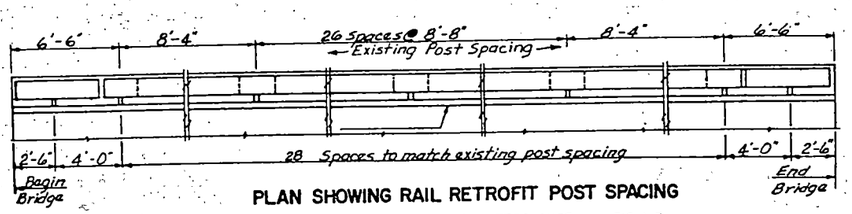
Revised 2-6-85



(a) West Rail
(b) East Rail

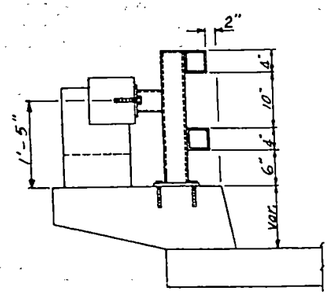
PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-062.486 CEMETARY ROAD SEPARATION 470 L.F.



PLAN SHOWING RAIL RETROFIT POST SPACING

BRIDGE NO. 94-064.366 EAST DICKINSON INTERCHANGE 510 L.F.



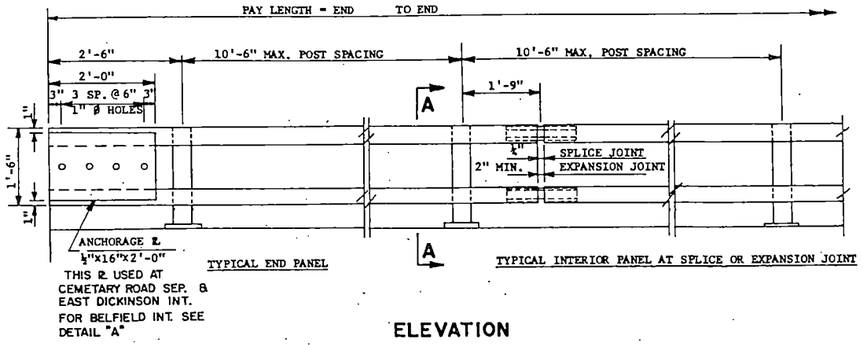
SECTION OF RAIL

7 6

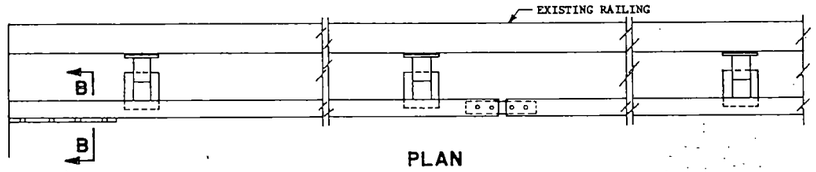
QUANTITIES
Double Box Beam Rail Retrofit (Braced Post) 980 L.F.

I-94 RAIL RETROFIT

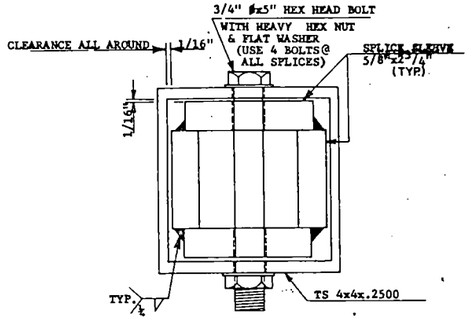
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-094-2(371)042	12



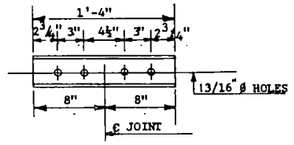
ELEVATION



PLAN



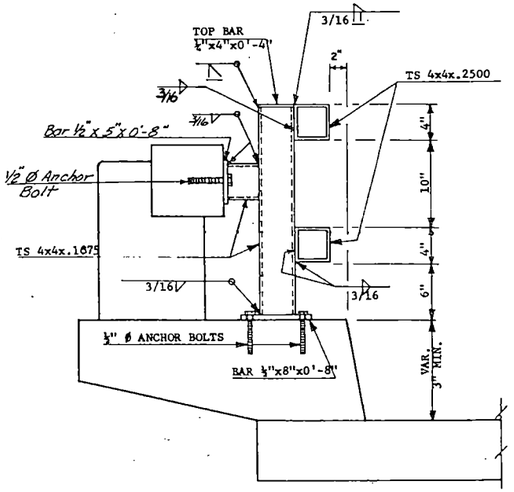
RAIL SPLICE



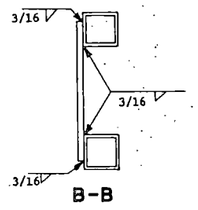
SPLICE SLEEVE AT SPLICE

NOTES:

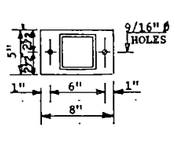
1. THE BID ITEM SHALL BE "DOUBLE BEAM RAILING RETROFIT". THE PAY LENGTH SHALL BE END TO END AND SHALL BE IN LINEAL FEET.
2. THE RAILING, POSTS AND POST SUPPORTS SHALL CONFORM TO ASTM A500, COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES, GRADE B. THE POST TOPS, POST 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 ½" 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.



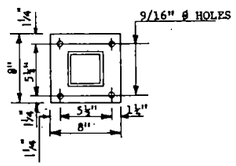
A-A



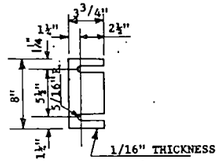
B-B



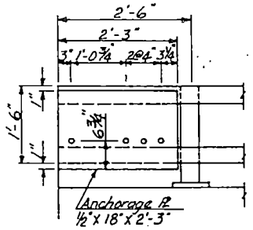
SUPPORT BASE DETAIL



POST BASE DETAIL



POST SHIM



DETAIL "A"

DOUBLE BOX BEAM RAIL RETROFIT

(BRACED POST)

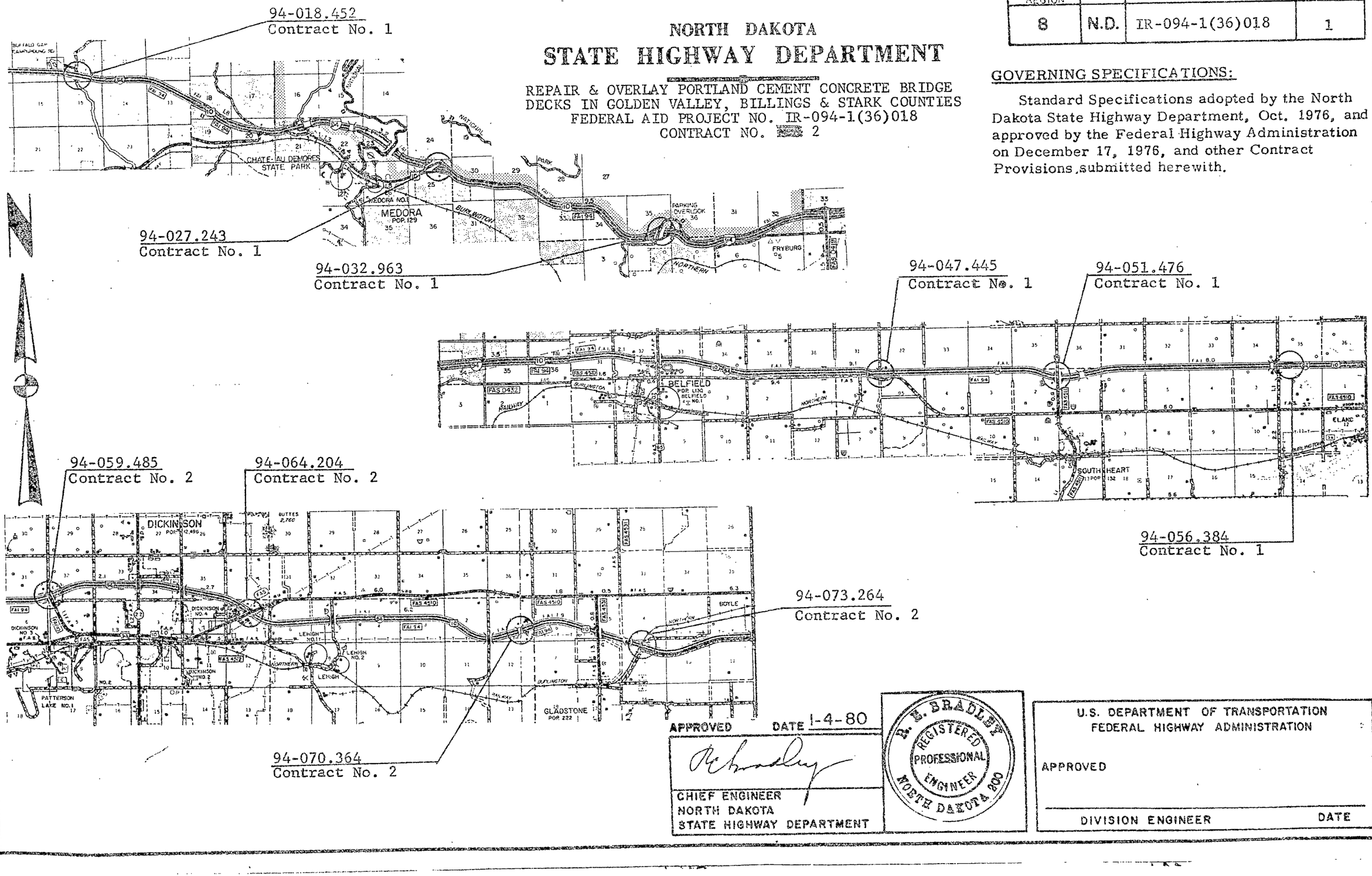
FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	IR-094-1(36)018	1

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 800

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-(135)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 BACK OF ABUTMENT SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 109.5 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 UNDJACKING 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-282	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-708-5

SUMMARY OF QUANTITIES
ESTIMATE OF QUANTITIES

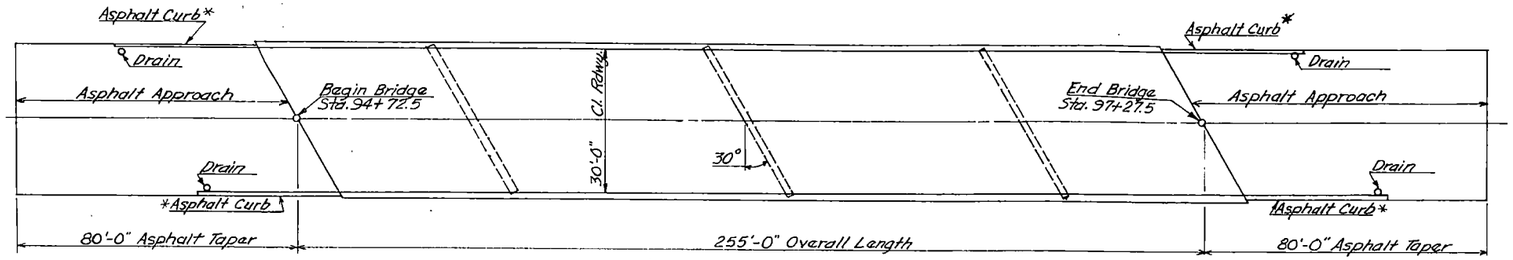
SPEC. NO.	103	406	705	708	746	750	756	762	900	900	900	900	900	900	900	900
CODE NO.	0100	0230	0100	0300	0100	0100	0100	3298	9499	9501	9581	9582	9700	9701	9702	9705
BRIDGE NO. & NAME	CONTRACT BOND	HOT BITUMINOUS PAVEMENT-SPECIAL	MOBILIZATION	CURB & GUTTER TYPE 1	FLAGGING	LINSEED OIL TREATMENT	FIELD LAVORATORY 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 94-064.204		61.1		160	256	12.6							850.0	212.5	42.5	
GREEN RIVER 94-070.364 LT.					160	12.3					48.0		622.2	205.6	41.1	435.8
GREEN RIVER 94-070.364 RT.					160	12.3					48.0		622.2	205.6	41.1	435.8
BNRR SEP 94-073.264 LT.					120	17.7			57.3	229.2	24.0	24.0	678.3	169.6	33.9	217.8
BNRR SEP 94-073.264 RT.					120	17.7			57.3	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	48.0	4,617.7	1,154.6	230.8	1,300.0

NOTES & QUANTITIES

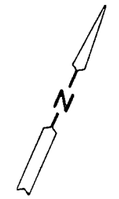
94-2 CONTRACT 2

CHECKED BY
QUANTITIES MADE BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	IR-094-1(36)018	15	



PLAN
30'-0" Clear Roadway



* Remove all sections of curb and replace according to Std. No. D-708-6 using 11" Curb as shown at Section A-A.

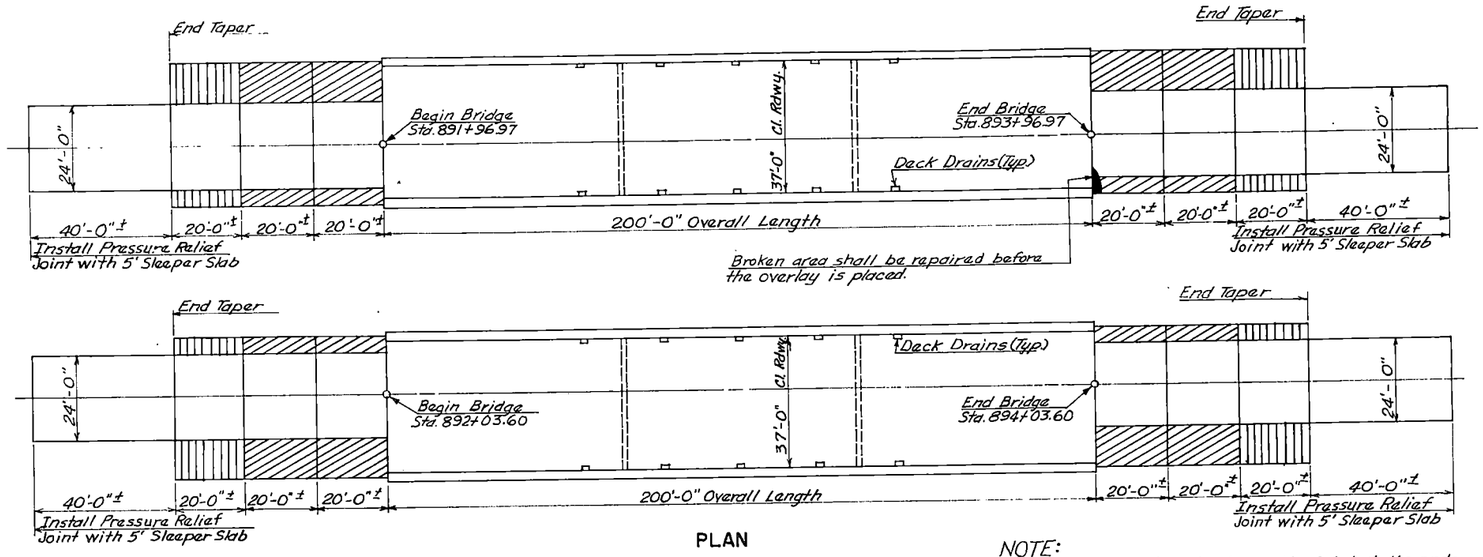
QUANTITIES
CHECKED BY
MADE BY
CHECKED BY

QUANTITIES

EAST DICKINSON
INTERCHANGE

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

QUANTITIES MADE BY CHECKED BY

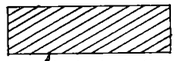


PLAN

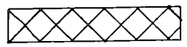
NOTE:
The Overlay is to extend over the joint at the ends of the bridge. A saw cut shall then be made in the overlay at these locations within 24 hours of pouring the overlays. The width of the saw cut should match the maximum width of the existing joint. The sawed joint is to be filled with cold poured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

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

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

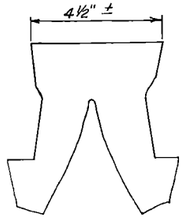


Asphalt shall be removed from top of concrete & surface cleaned. It shall then be brought to grade with overlay material. Removal & extra thickness shall be incidental to "Overlay Taper"

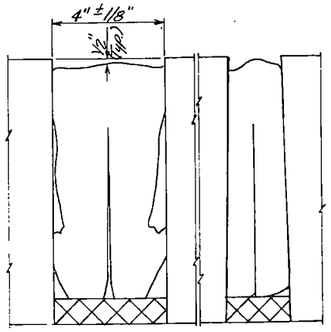


FOAM SPACER

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.

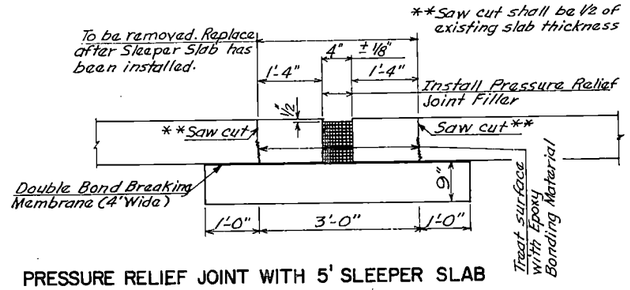


NATURAL SHAPE

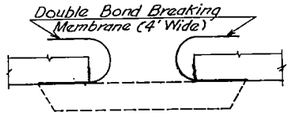


INSTALLED SHAPE COMPRESSED SHAPE

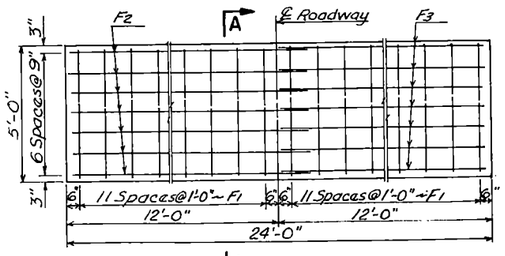
CELLULAR PLASTIC PRESSURE RELIEF JOINT FILLER



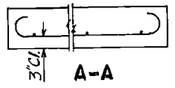
PRESSURE RELIEF JOINT WITH 5' SLEEPER SLAB



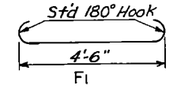
Showing placement of bond breaking membrane with two existing panels

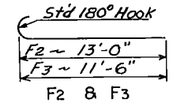


5' SLEEPER SLAB
4 Required



A-A





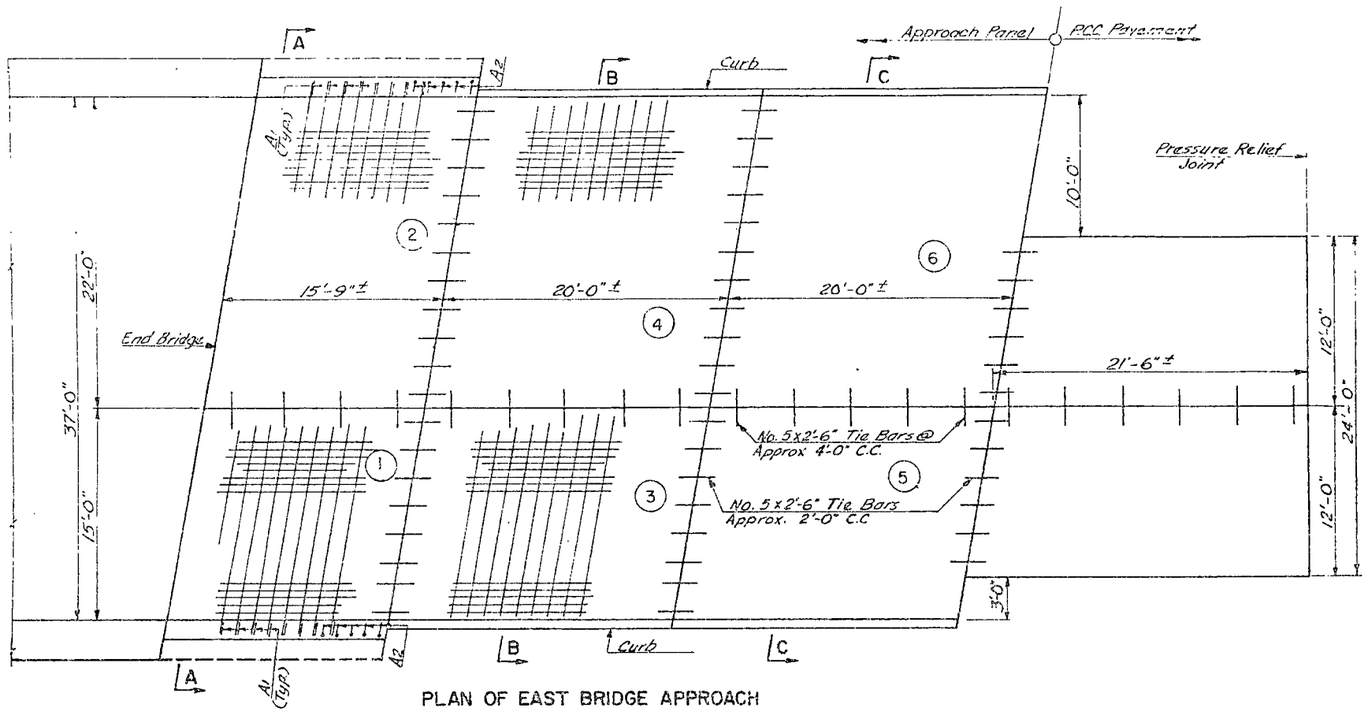
BENT BAR DETAILS
Dimensions shown are out to out.

QUANTITIES

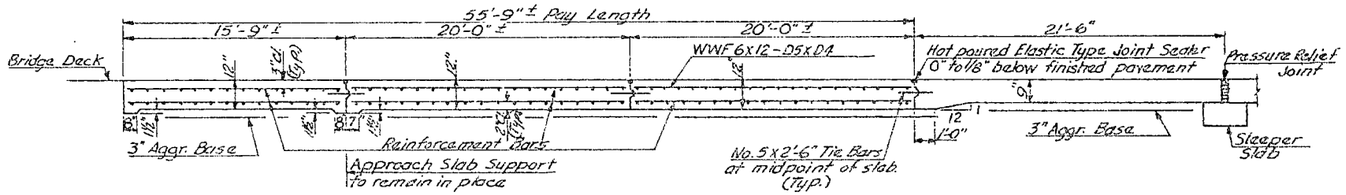
GREEN RIVER

94-070.364-5

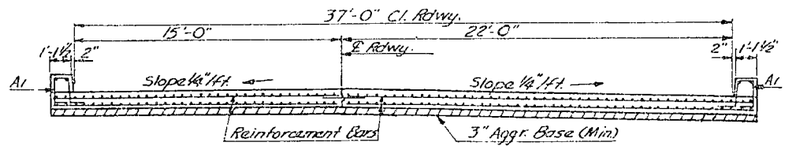
FED. ROAD PROJ. NO.	STATE	PROJ. NO.	SHT. NO.	TOTAL SHEETS
B	N. D.	IR-094-4(36)015	18	



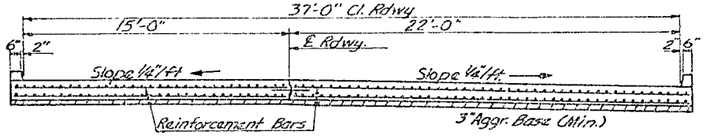
PLAN OF EAST BRIDGE APPROACH



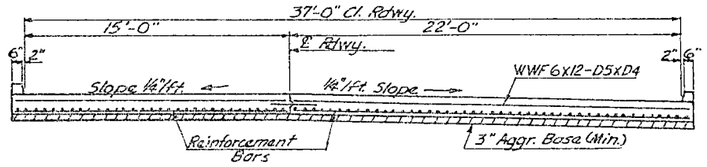
ELEVATION VIEW



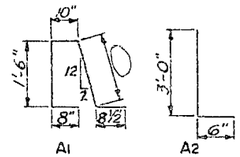
A—A



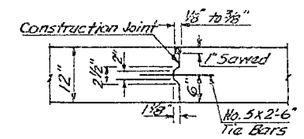
B—B



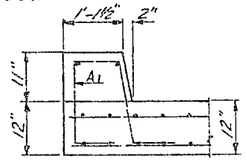
C—C



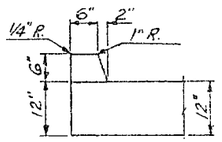
BENT BAR DETAILS
Dimensions shown are out to out



SECTION AT CONSTRUCTION JOINTS



STANDARD CURB AT SECTION A—A



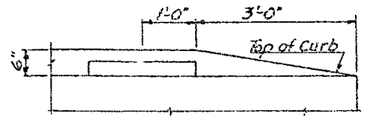
STANDARD CURB AT SECTION B—B & C—C

REINFORCING BARS (ONE BRIDGE)									
LONGITUDINAL					TRANSVERSE				
PANEL	EACH	SIZE	LENGTH	LBS.	PANEL	EACH	SIZE	LENGTH	LBS.
1	32	8	15'-4"	1310	1	14	6	16'-1"	338
* 1	32	5	15'-4"	512	* 1	14	5	16'-1"	235
** 1	2	5	15'-4"	32					
2	46	8	15'-4"	1883	2	14	6	23'-2"	487
* 2	46	5	15'-4"	736	* 2	14	5	23'-2"	338
** 2	2	5	15'-4"	32	3	18	6	23'-2"	626
3	31	8	19'-8"	1628	* 3	18	4	23'-2"	279
* 3	31	5	19'-8"	636					
4	45	8	19'-8"	2363	4	18	6	23'-2"	626
* 4	45	5	19'-8"	923	* 4	18	4	23'-2"	279
5	31	7	19'-8"	1246	5	18	5	23'-2"	435
6	45	7	19'-8"	1809	6	18	5	23'-2"	435
					A1	28	4	5'-3"	98
					A2	10	5	3'-3"	34

Longitudinal bars spaced @ approx. 6" c.c.
Transverse bars spaced @ approx. 1'-1½" c.c.

* Top steel
** Curb steel (straight)

A1 & A2 bars in curbs on Panel 1 & Panel 2. Half of each total per curb



DETAIL OF CURB HEIGHT TRANSITION AT END OF APPROACH SLAB

NOTE:
Curb sections on panels shall have the height transitioned from th height of curb on panels 1 & 2.

End post removal & replacement shall be incidental to the item "Approach Slab (Removal & Replacement)."

QUANTITIES (ONE BRIDGE)

Reinforcing Steel (Grade 60)	17320 Lbs.
Structural Concrete	82 C.Y.

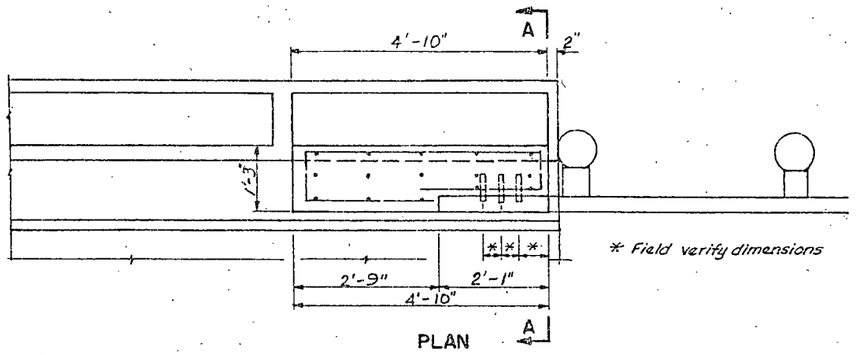
BRIDGE APPROACH PANELS

QUANTITIES CHECKED BY MADE BY CHECKED BY

94-073.264-7

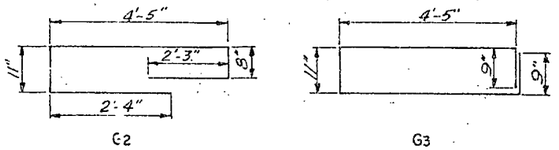
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	IR-094-1(36)018	19	

BRIDGE END POST DETAILS



PLAN

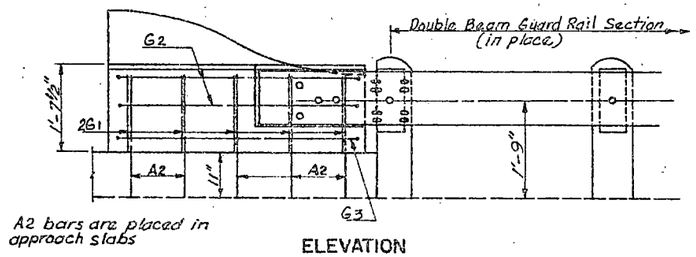
* Field verify dimensions



BENT BAR DETAILS

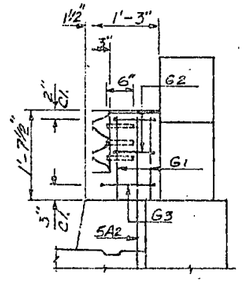
Dimensions shown are out to out

BAR LIST (ONE POST)				
MARK	NO.	SIZE	LENGTH	SHAPE
G1	10	4	1'-5"	Str.
G2	2	4	10'-7"	Bent
G3	1	4	11'-3"	Bent

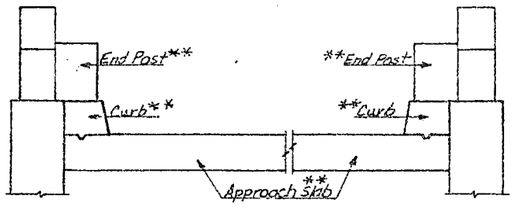


A2 bars are placed in approach slabs

ELEVATION



END VIEW



A–A

** Slab, curb & end posts to be removed & replaced on east end of both structures.

NOTE

All materials and labor necessary to construct the beam guard rail end posts as indicated on the drawings shall be included in the price bid for "Approach Slab (Remove and Replace)".

The existing concrete areas which will be in contact with new concrete shall be wire brushed and cleaned before any new concrete is poured.

The Highway Deaprtment shall inform the contractor as to the type of cement to be used so that the color of the new and existing concrete will be similar.

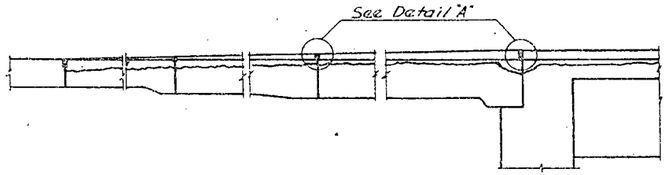
All new exposed concrete shall have a rubbed surface finish. The exposed edges shall be beveled to match existing work.

QUANTITIES

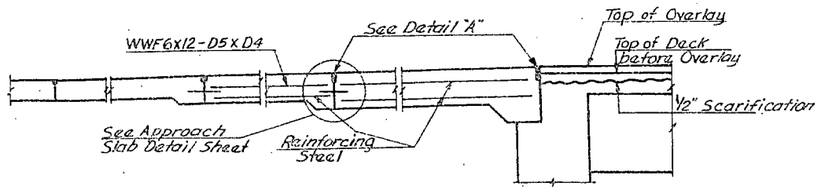
BRIDGE END POST DETAILS

94-073.264-8

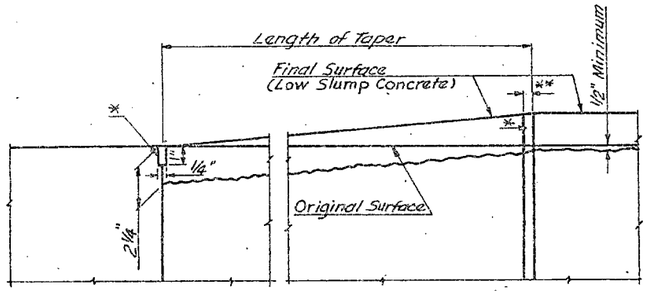
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	IR-094-1(36)018	20	



APPROACH SLAB
(Slab overlayed)



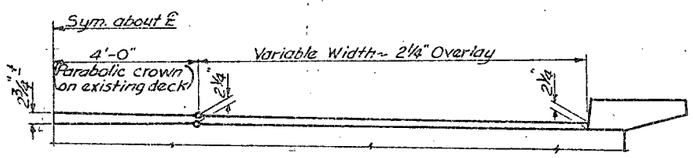
APPROACH SLAB
(Full depth removal & replacement to final surface grade)



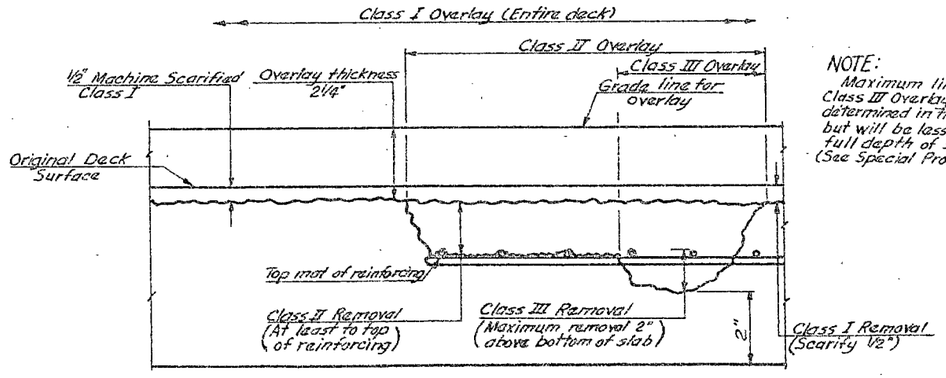
DETAIL "A"

* To be filled with hot poured joint filler

** Remove existing premolded joint filler & fill with hot poured joint filler. Width 1½"±



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