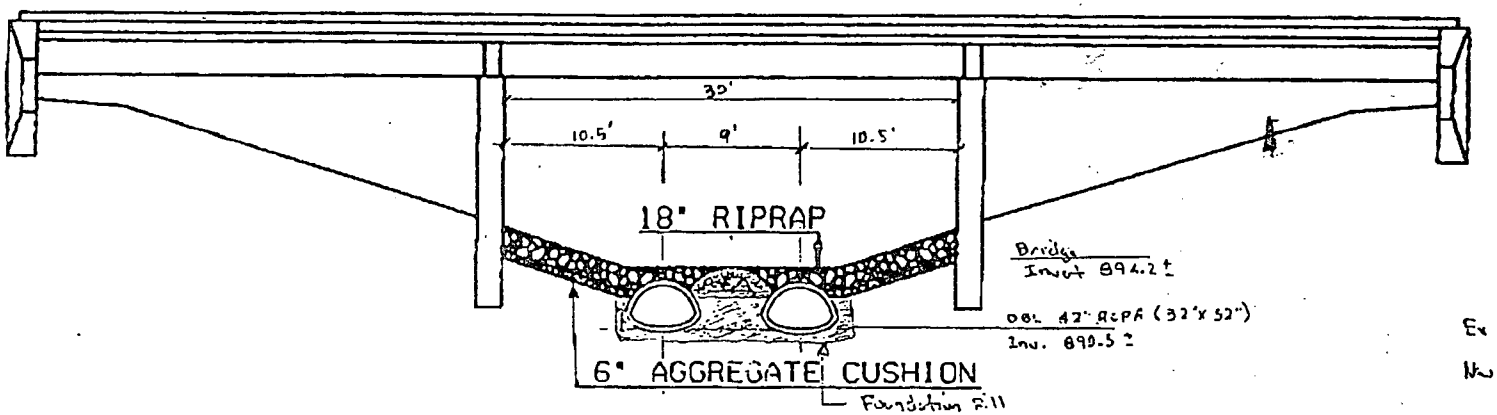
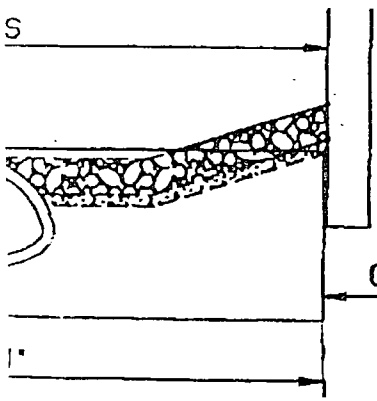


TYPICAL SECTION

Ex Invert 894.2 ±
New Invert 890.5 ±
3.7

42" RCPA Inv. 890.5
Rise ± : 3.0
Top 893.5
Bridge Invert 894.2
Cover 0.7'



R INLET
'ALL

ROSE COULEE
PROPOSED CHANNEL
IMPROVEMENT

DESIGN DATA: Traffic Data and Design Speed differs on location. See Design Data Sheet.

JOB# 1

STATE	PROJECT NO.	PCN	SHEET NO.
ND	IM-NH-8-029(050)062	12003	1

IM-8-029(055)064, SU-8-984(087)090
CPU-8-984(014)

Revised 1-22-2002

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

GOVERNING SPECIFICATIONS:

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

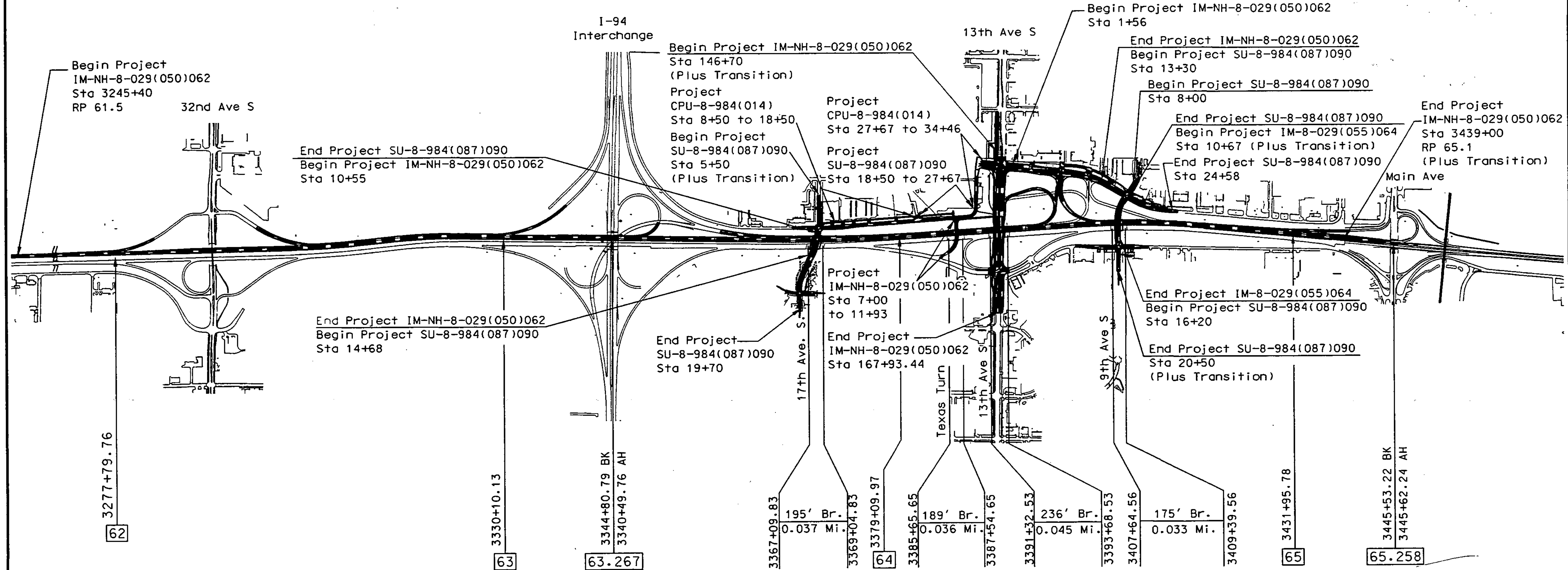
IN CASS COUNTY
FEDERAL AID PROJECTS: IM-NH-8-029(050)062, IM-8-029(055)064
STATE AND CITY PROJECTS: SU-8-984(087)090 & CPU-8-984(014)
(I-29 SOUTHBOUND ROADWAY, 17th Ave S, 13th Ave S, 9th Ave S, & 38th St SW)
GRADING & SURFACING, STORM DRAINS, STRUCTURAL, SIGNALS,
LIGHTING, MARKING, GUARDRAIL AND INCIDENTALS

LENGTH OF PROJECT

	MILES GROSS	MILES NET
IM-NH:	3.748	3.748
SU:	0.710	0.710
CPU:	0.379	0.379
IM:	0.105	0.105

LEGAL DESCRIPTION

T-139N R49 S-2,3,10,11,14,15,22,23,26,27



DESIGNER ________
DESIGNER ________
DESIGNER ________
RECOMMEND APPROVAL 12-5, 20 01
for DESIGN ENGINEER ________

APPROVED DATE ________

DIVISION ADMINISTRATOR
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.

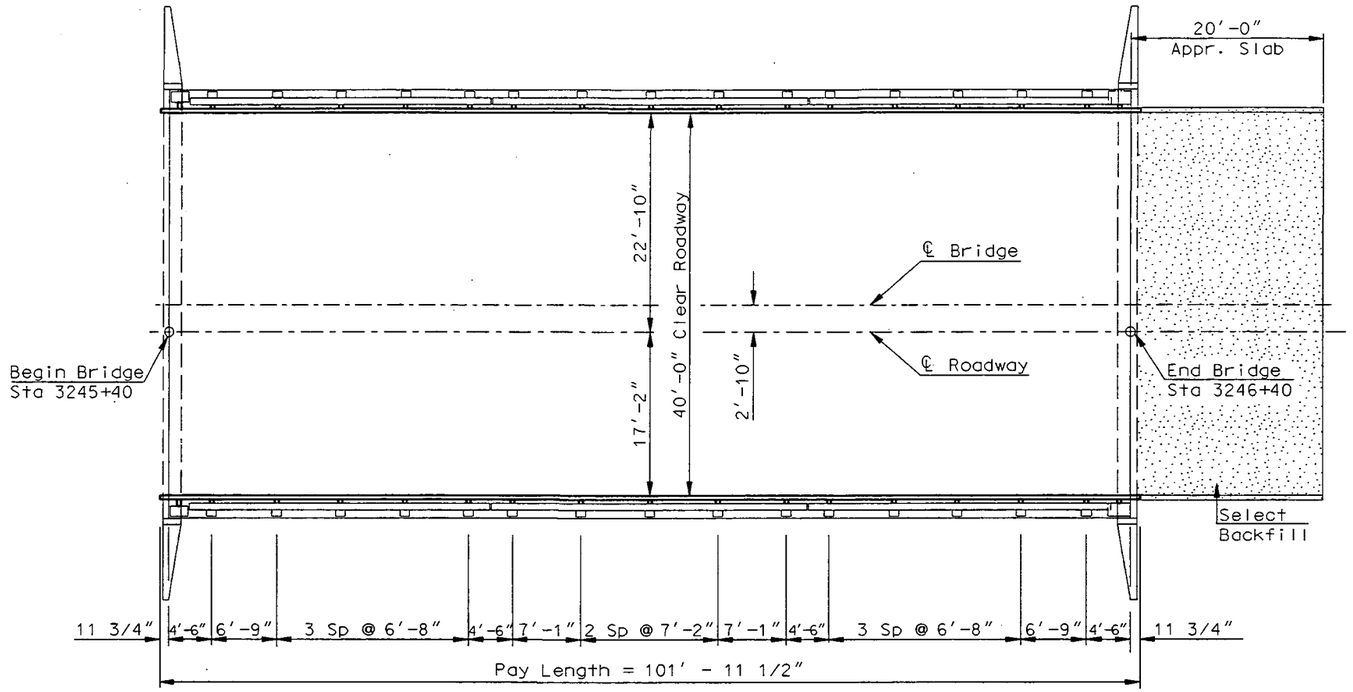
APPROVED DATE 12/7/2001

OFFICE OF INFRASTRUCTURE SUPPORT
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FRANCIS G. ZIEGLER REGISTERED PROFESSIONAL ENGINEER P.E. 1679 NORTH DAKOTA

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

BRIDGE CODE	STATE	PROJECT NUMBER	SHEET NO.
X-081	ND	IM-NH-8-029(050)062	78?



PLAN

NOTES:

SCOPE OF WORK: Work at this site consists of placing a concrete bridge approach slab and installing a bridge rail retrofit.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0215	CONCRETE BRIDGE APPROACH SLAB	SY	91.1
624	_3002	DOUBLE BOX BEAM RAIL RETROFIT-ERAIL	LF	203.9

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

ROSE COULEE
I-29 SOUTHBOUND

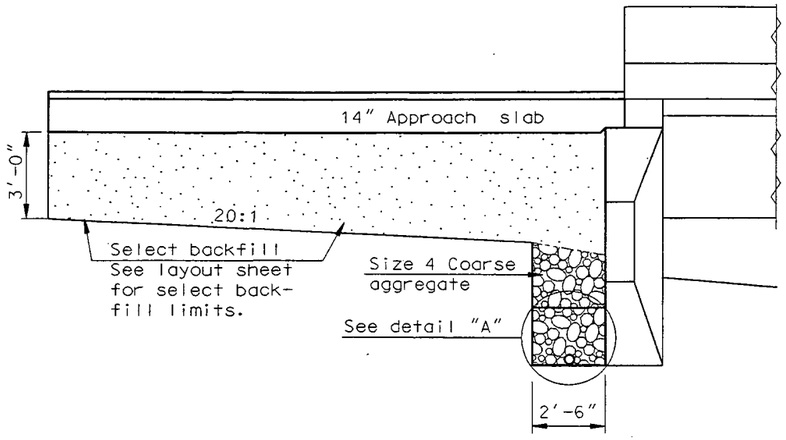
BRIDGE LAYOUT

PROJECT: IM-NH-8-029(050)062
STATION: STA 3245+90
CASS COUNTY

brlo 01LCS098 TLS
...\BRIDGE\29-061.394L\brlo.dgn Dec. 03, 2001 09:07:47

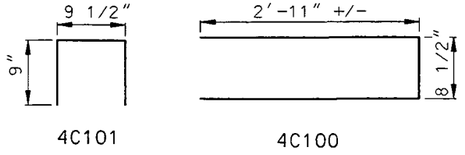
29-061.394L

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	790

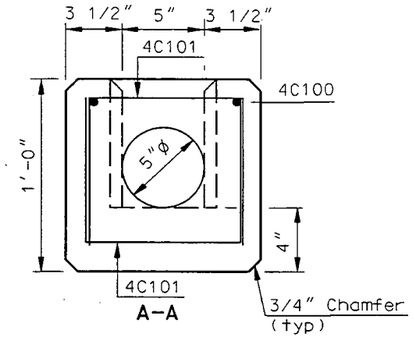


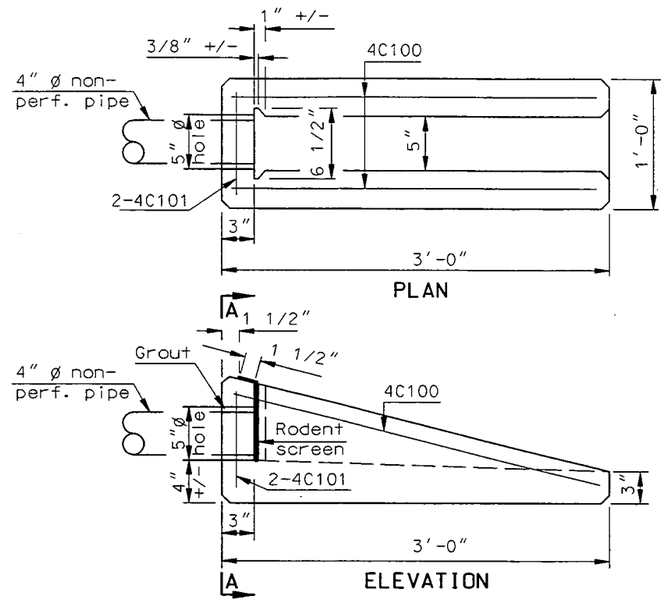
DETAIL AT ABUTMENT

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. Salvaged aggregate base course may be used in place of select backfill.

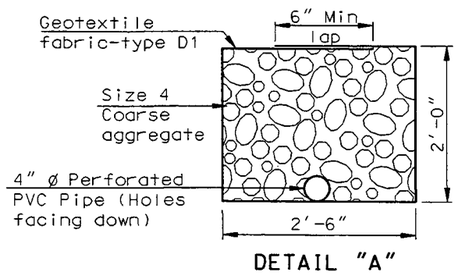


BENT BAR DETAILS

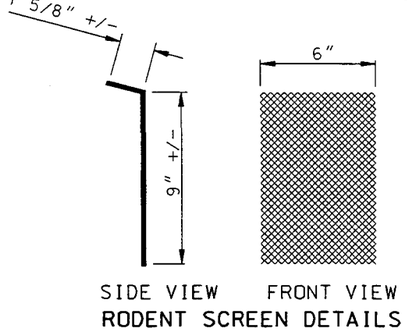




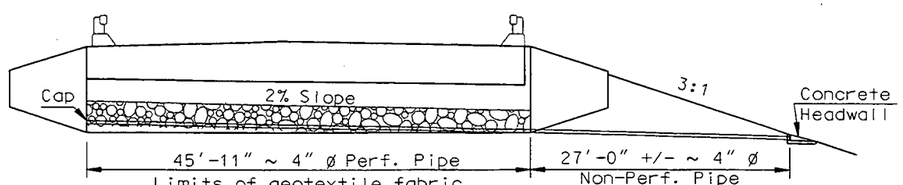
PRECAST CONCRETE HEADWALL DETAILS



DETAIL "A"



RODENT SCREEN DETAILS



BACK FACE OF ABUTMENT

NOTE:

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

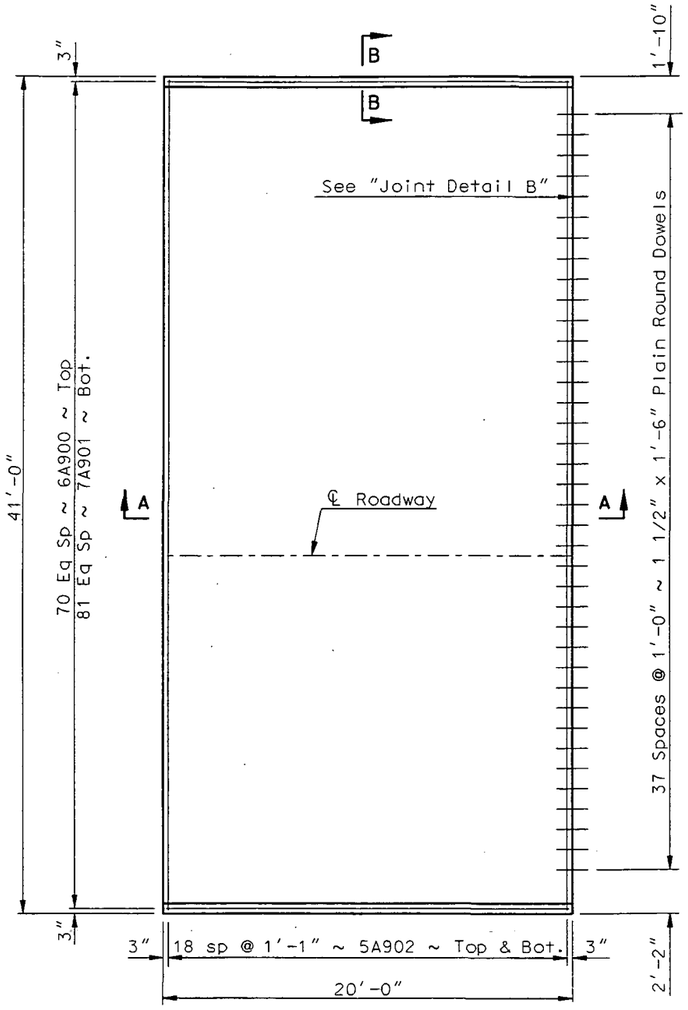
The rodent screen shall be fabricated from flattened, expanded metal with screen openings of approximately 0.25 square inches. The screen shall be 16 ga. metal and be hot dip galvanized after fabrication.

The cost to furnish and place select backfill, coarse aggregate, geotextile fabric, perforated pipe, non-perforated pipe, headwalls and rodent screen shall be included in the pay item for "Concrete Bridge Approach Slab."

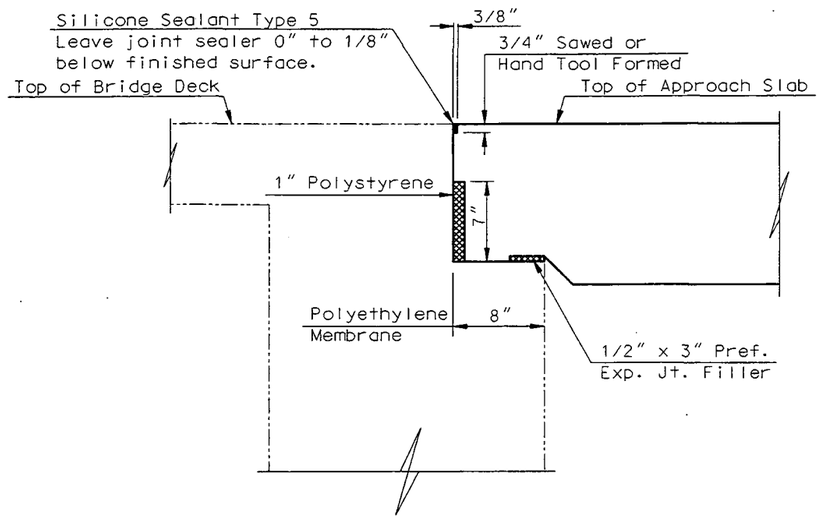
ROSE COULEE

ABUTMENT UNDERDRAIN DETAILS

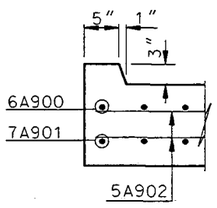
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	791



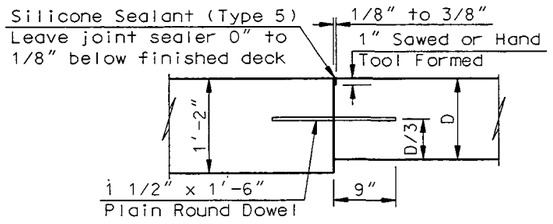
PLAN



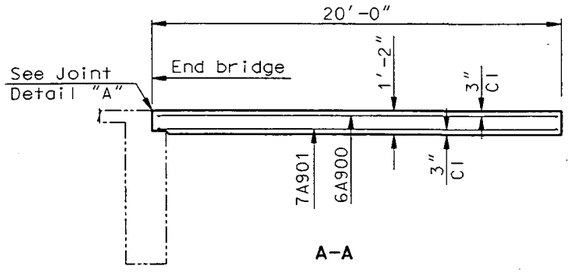
APPROACH SLAB JOINT DETAIL "A"



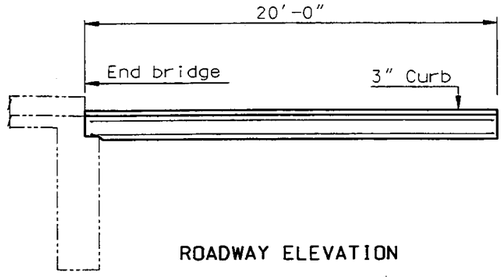
B-B



JOINT DETAIL B



A-A



ROADWAY ELEVATION

Width = 40'-0" Cl. Rdwy.			
Skew Angle = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	71	19'-8"
7	A901	82	19'-8"
5	A902	38	40'-8"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
7,005	35.6

The estimated material quantities are for informational purposes only. All equipment and labor required to construct the concrete approach slabs, including Class AE-3 concrete, reinforcing bars, polyethylene membrane, polystryrene, preformed joint filler and silicone sealant shall be included in the bid item "CONCRETE BRIDGE APPROACH SLAB."

All dowel bars shall be epoxy coated and conform to AASHTO M-254 Type B. At the free ends of the dowel bars, a minimum of one-half the dowel bar length plus 2 inches shall be given a thin, uniform coating of grease. This coating shall be applied within two hours before covering with concrete. The dowel bars are included in the Doweled Contraction Joint Assembly" quantity on the Paving Joint Layout sheets.

QUANTITIES		
BRIDGE APPROACH SLAB	91.1	SY

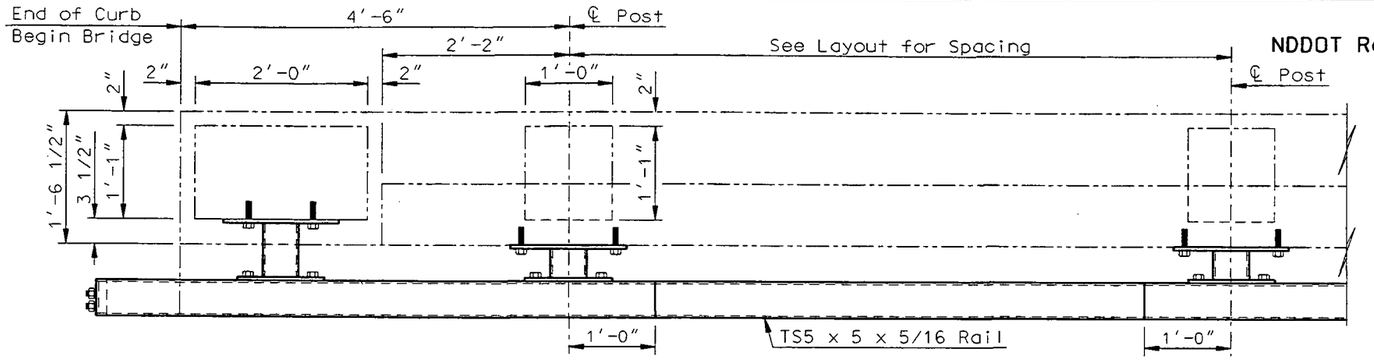
ROSE COULEE

APPROACH SLAB, JOINT DETAILS & NOTES

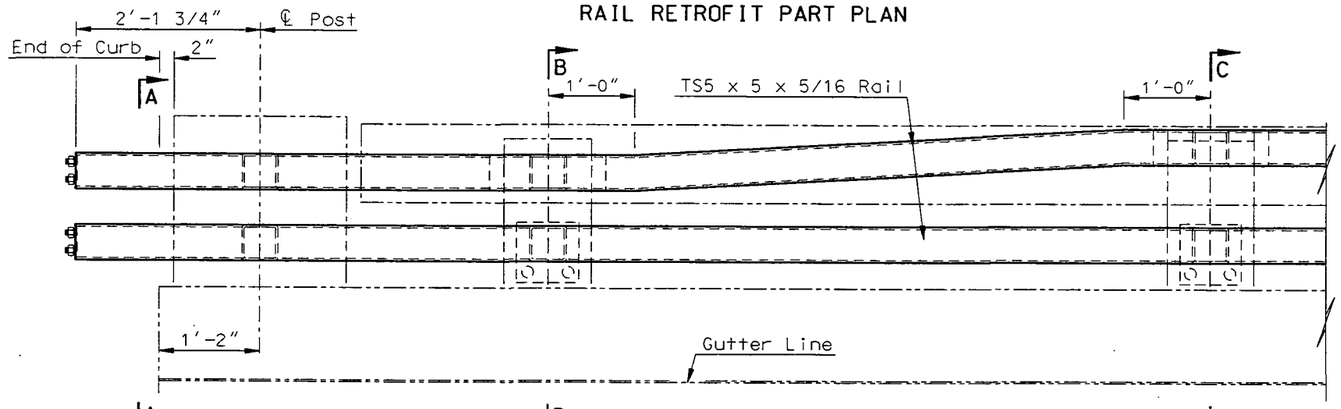
(NORTH APPROACH SLAB SHOWN)

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

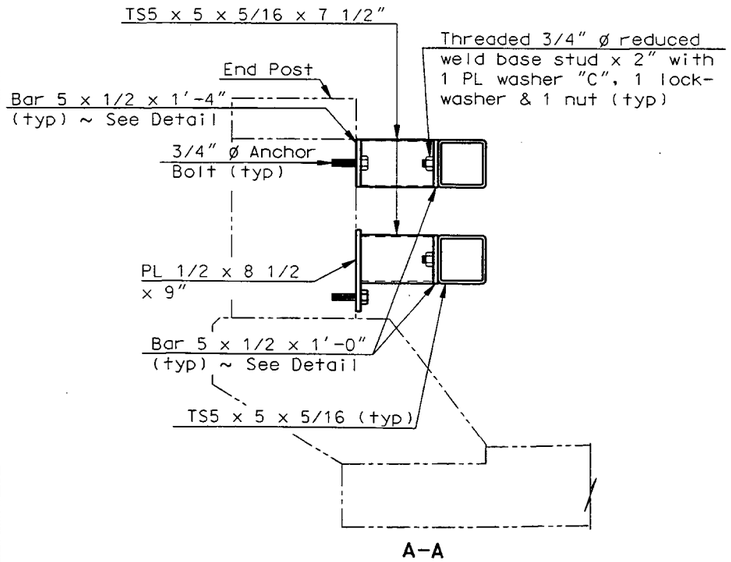
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	792



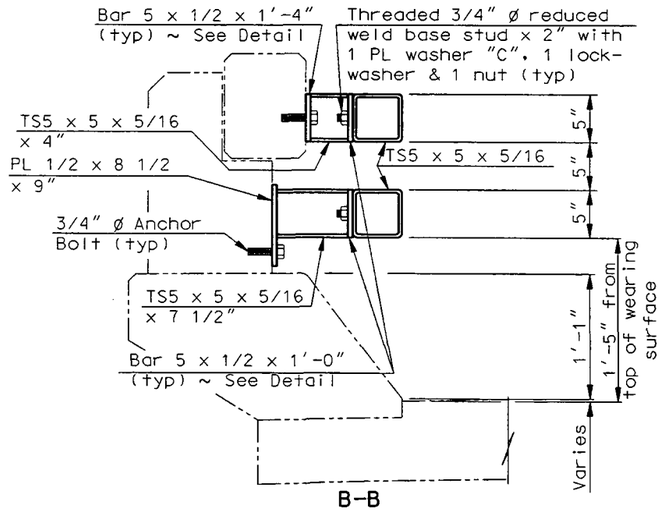
RAIL RETROFIT PART PLAN



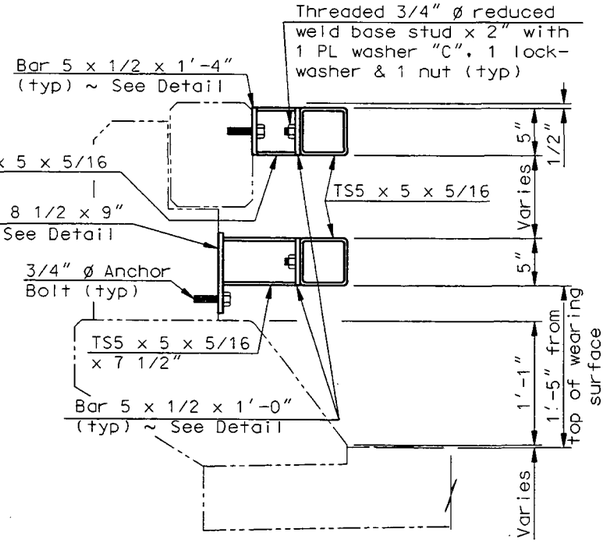
RAIL RETROFIT PART ELEVATION



A-A



B-B



C-C

NOTE:

See Dwg 29-061.394L-5 for more details, notes and details not shown on this drawing.

QUANTITIES
SEE DWG. NO. 29-061.394L-5

ROSE COULEE

DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

29-061.394L-3

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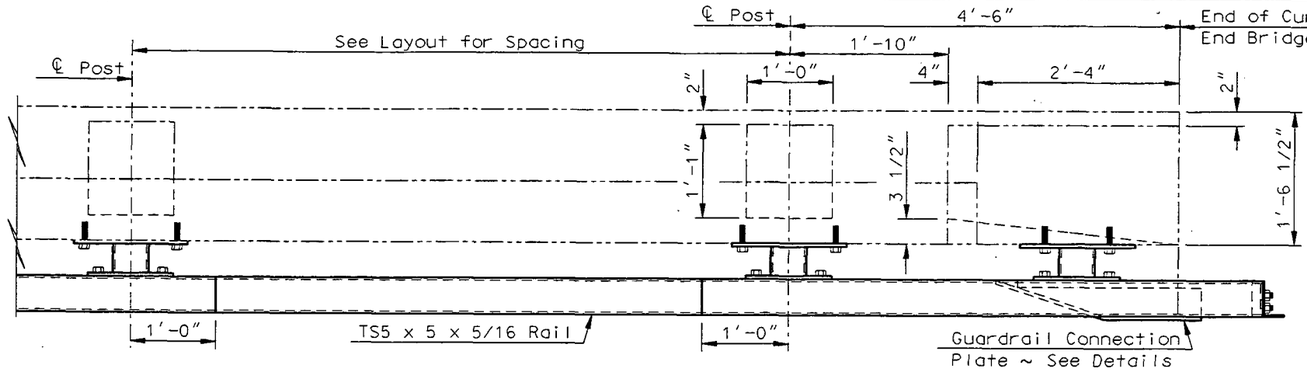
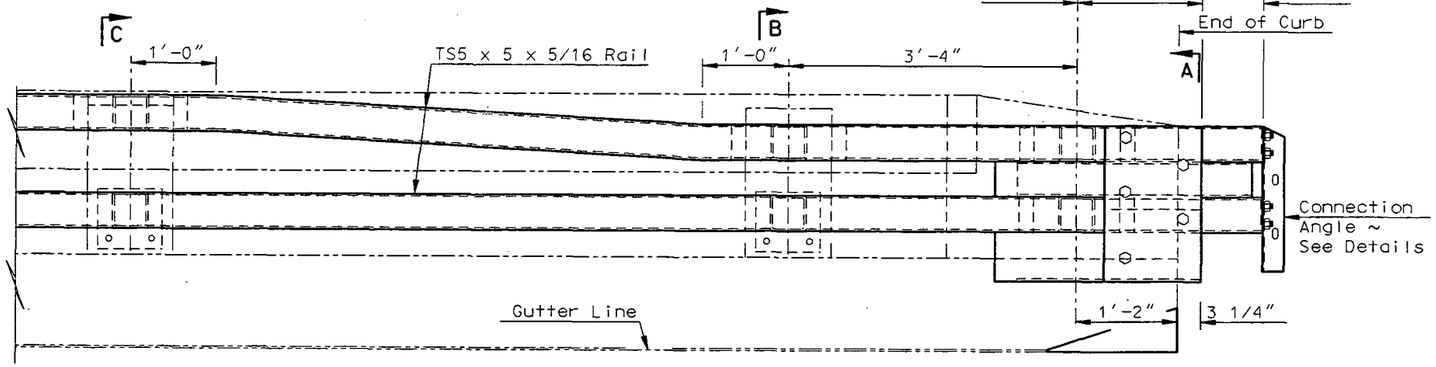
23 U.S.C. 409
NDDOT Reserves All Objections

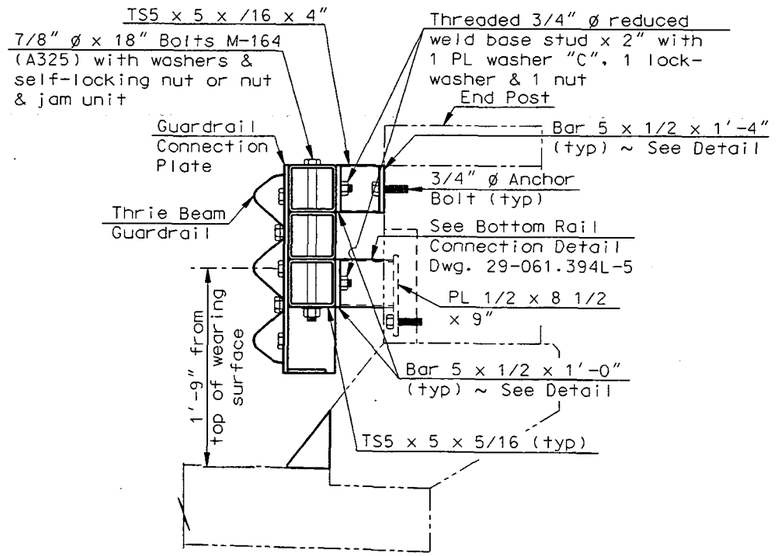
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	793



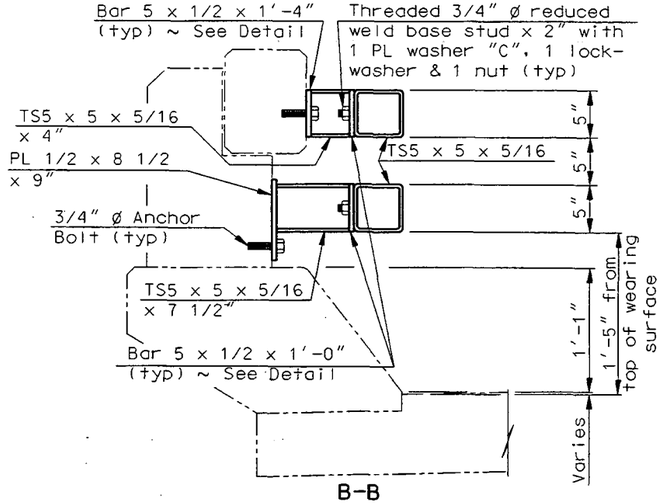
RAIL RETROFIT PART PLAN



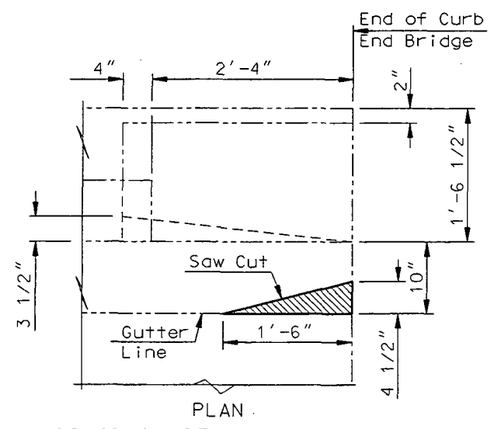
RAIL RETROFIT PART ELEVATION



A-A

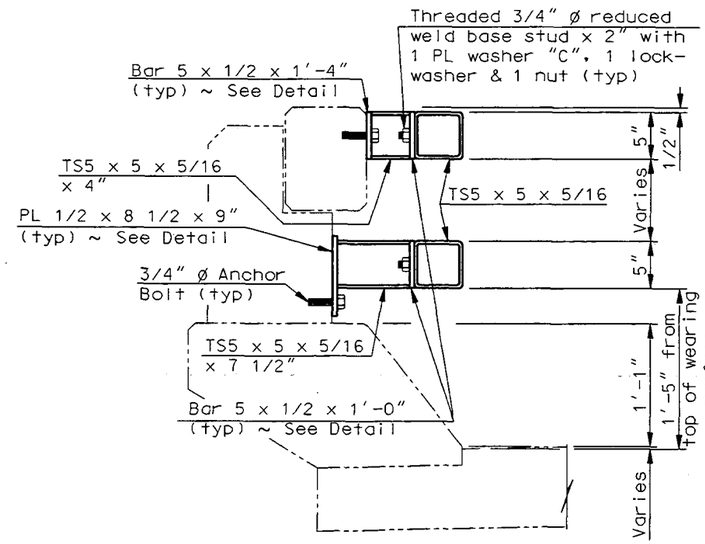


B-B



CONCRETE REMOVAL DETAIL

Indicates Concrete Removal



C-C

NOTE:

See Dwg 29-061.394L-5 for more details, notes and details not shown on this drawing.

QUANTITIES

SEE DWG. NO. 29-061.394L-5

ROSE COULEE

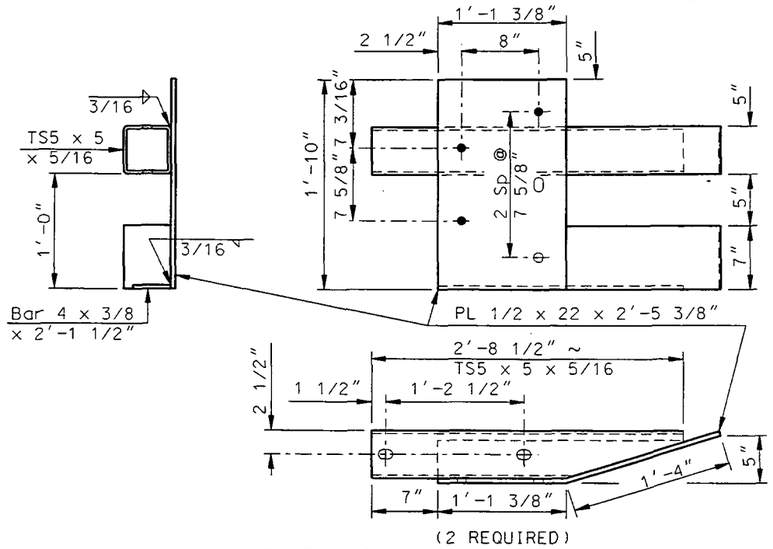
DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

erretro 01LCS101 TLS
...\BRIDGE\29-061.394L\ERRETRO.dgn Nov. 29, 2001 14:14:48

29-061.394L-4

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

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	794



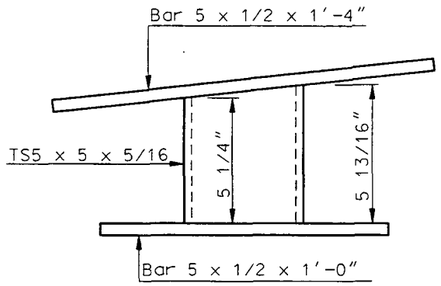
(2 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS

The filled circles indicate drilled and tapped holes for 7/8" ø bolts M-164 (A325) (typ). See Detail "B"

The open circle indicates a drilled hole through the 1/2" plate for a 7/8" ø bolt M-164 (A325) (typ).

The slotted hole shown shall be 1" x 1 1/2" in the 1/2" plate for a 7/8" ø bolt M-164 (A325).



BOTTOM RAIL CONNECTION ON MODIFIED END POST

NOTES:

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

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

Steel plates and angles shall conform to AASHTO Specification M-270 Grade 36 unless otherwise noted.

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

Payment for the railing shall include compensation for furnishing and installing the guardrail connection plates and for sawing and removing portions of the curb.

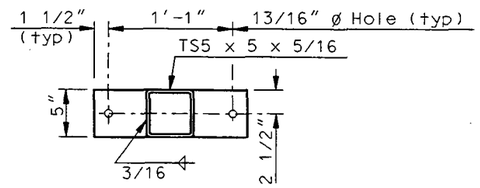
All structural steel including fasteners shall be hot-dip galvanized after fabrication according to AASHTO M111.

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

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

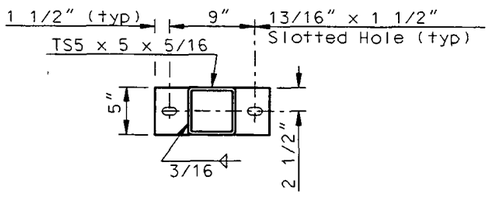
All anchor and splice bolts shall be galvanized and shall be AASHTO M-164 (A325).

The contractor shall submit the shop drawings for double box beam rail retrofit for approval to the Construction Office before fabrication.



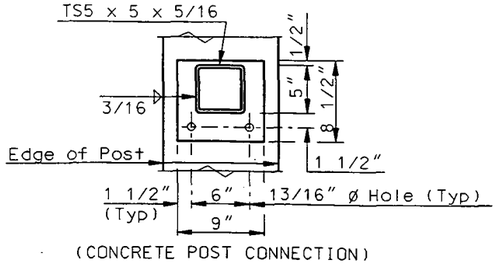
(CONCRETE RAIL CONNECTION)

BAR 5 X 1/2 X 1'-4" DETAIL



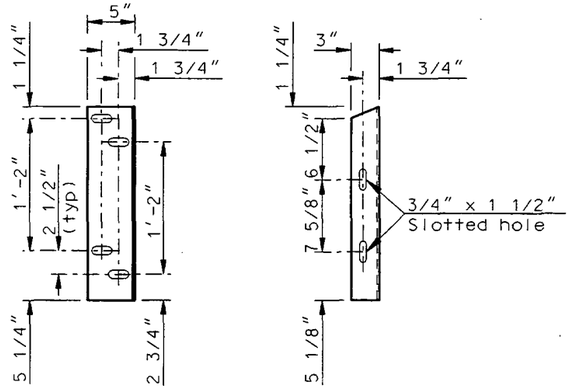
(CONCRETE RAIL CONNECTION)

BAR 5 X 1/2 X 1'-0" DETAIL



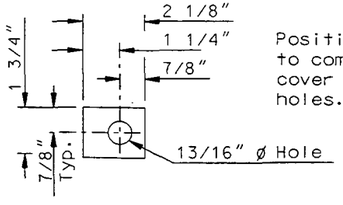
(CONCRETE POST CONNECTION)

PL 1/2 X 8 1/2 X 9" DETAIL



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

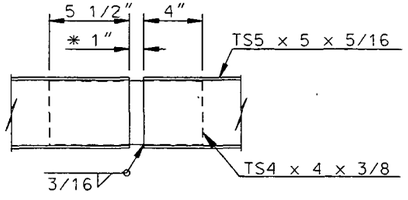
CONNECTION ANGLE DETAILS



Position washers to completely cover slotted holes.

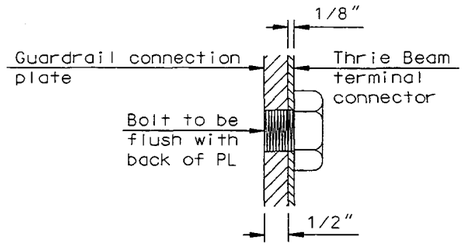
1/4" PL (AASHTO M-183)

PLATE WASHER "C"

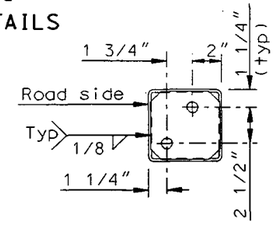


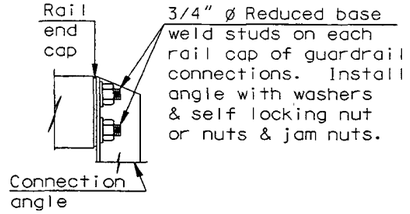
* 2" at Expansion Splices

RAIL SPLICE DETAIL



DETAIL "B"





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

RAIL CAP DETAILS

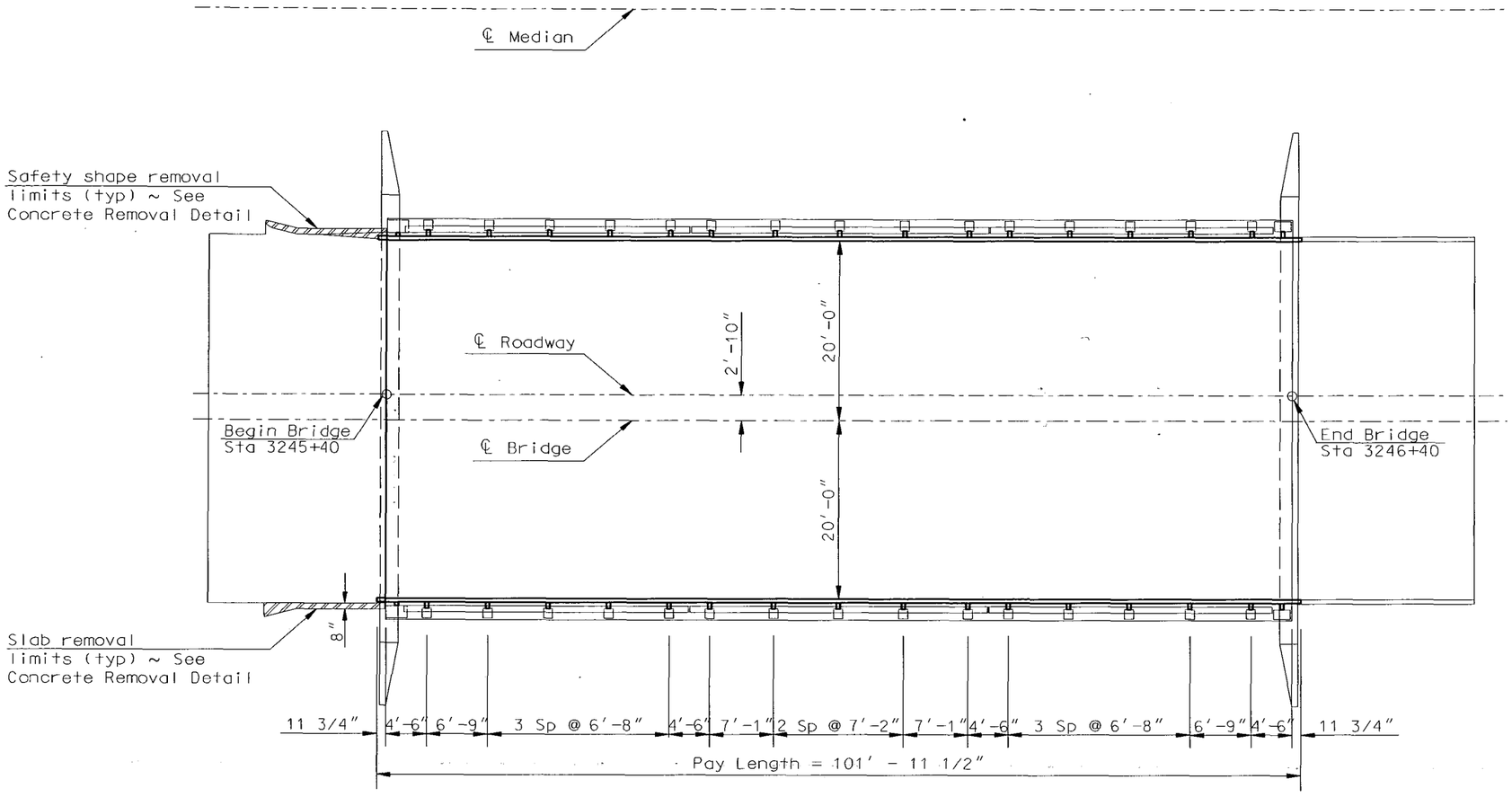
QUANTITIES		
E-RAIL RETROFIT	203.9	LF

ROSE COULEE

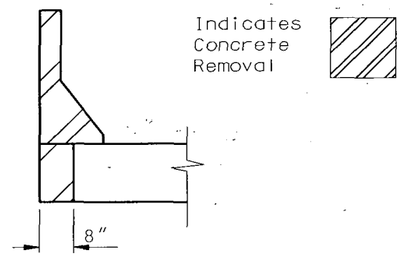
DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS

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

BRIDGE CODE	STATE	PROJECT NUMBER	SHEET NO.
X-081	ND	IM-8-029(004)062	



PLAN



CONCRETE REMOVAL DETAIL

NOTES:

SCOPE OF WORK: Work at this site consists of placing a concrete bridge approach slab and installing a bridge rail retrofit.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0215	CONCRETE BRIDGE APPROACH SLAB	SY	91.1
624	3002	DOUBLE BOX BEAM RAIL RETROFIT-ERAIL	LF	203.9

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

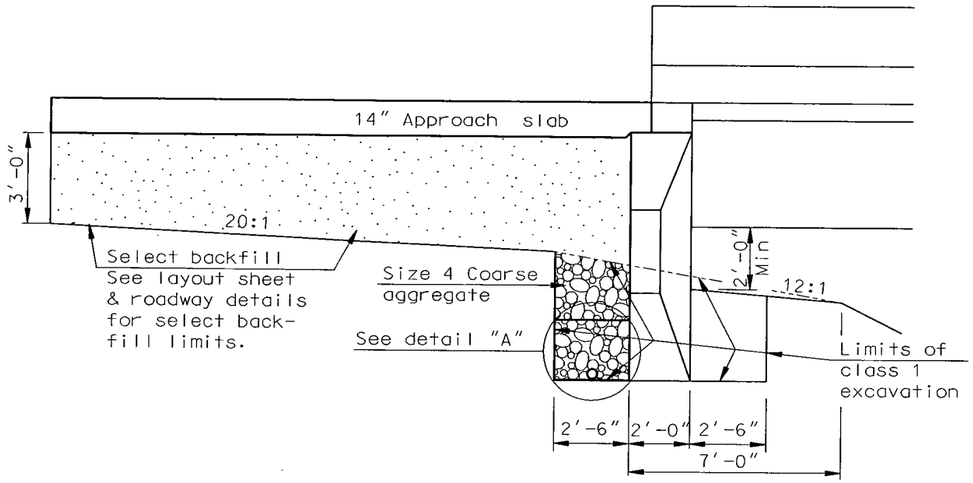
ROSE COULEE

BRIDGE LAYOUT

PROJECT: IM-8-029(004)062

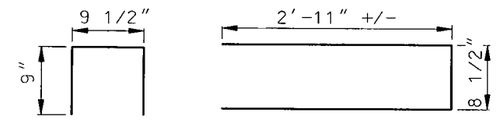
CASS COUNTY

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-8-029(004)062	

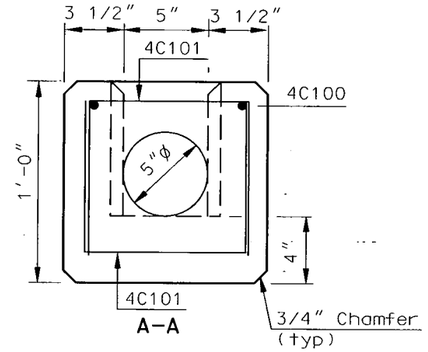


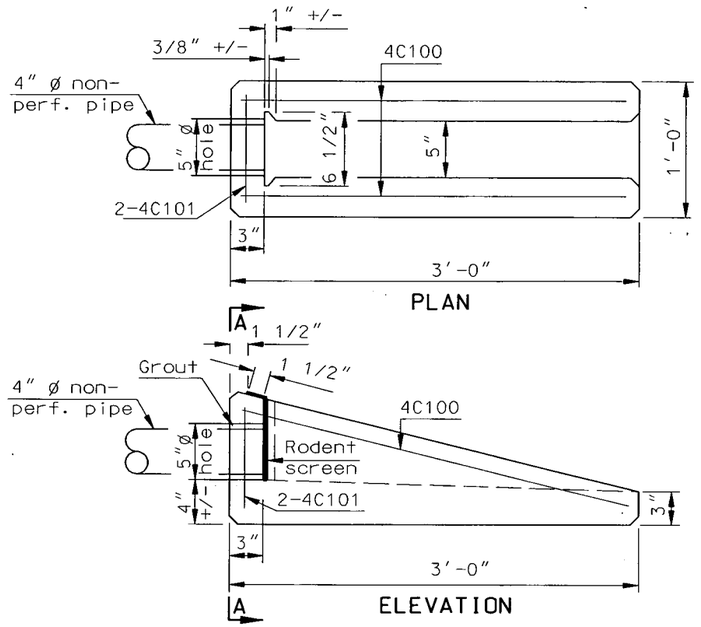
DETAIL AT ABUTMENT

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.

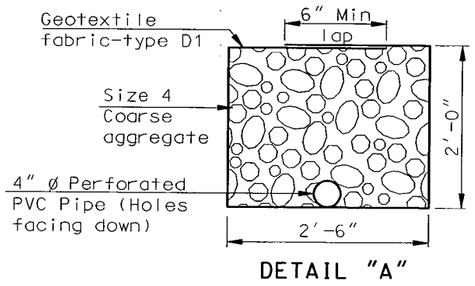


BENT BAR DETAILS

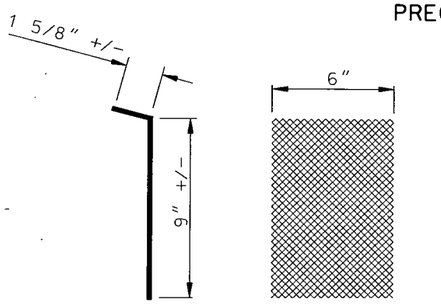




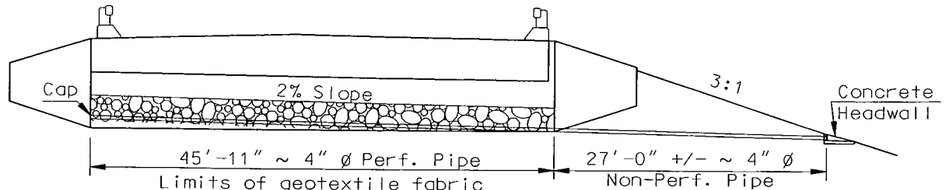
PRECAST CONCRETE HEADWALL DETAILS



DETAIL "A"



RODENT SCREEN DETAILS



BACK FACE OF ABUTMENT

NOTE:

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

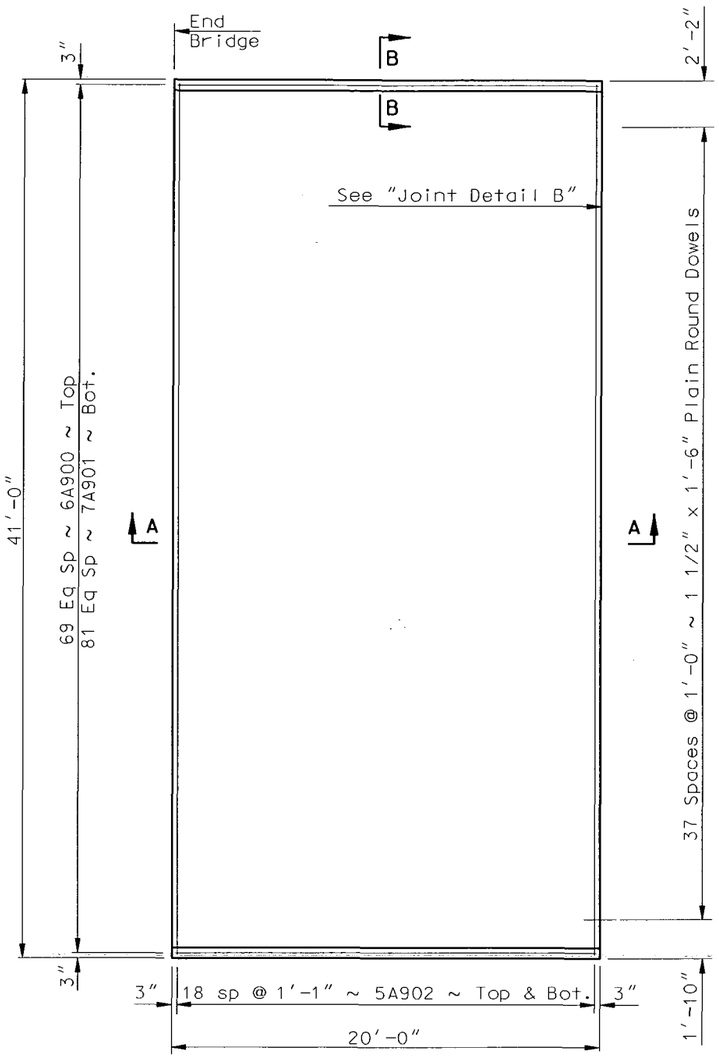
The rodent screen shall be fabricated from flattened, expanded metal with screen openings of approximately 0.25 square inches. The screen shall be 16 ga. metal and be hot dip galvanized after fabrication.

The cost to furnish and place select backfill, coarse aggregate, geotextile fabric, perforated pipe, non-perforated pipe, headwalls and rodent screen shall be included in the pay item for "Concrete Bridge Approach Slab."

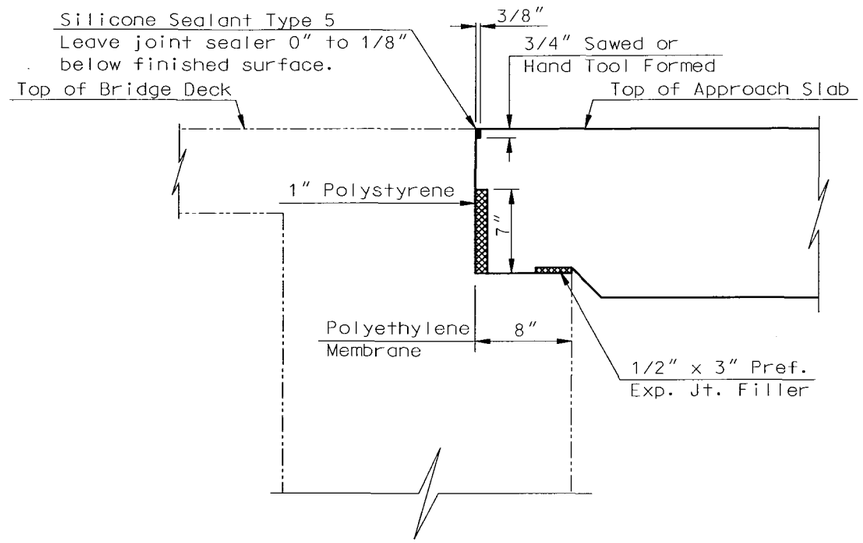
ROSE COULEE

ABUTMENT UNDERDRAIN DETAILS

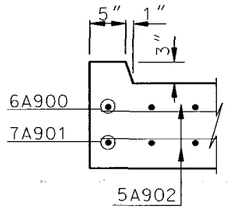
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-NH-8-029(050)062	



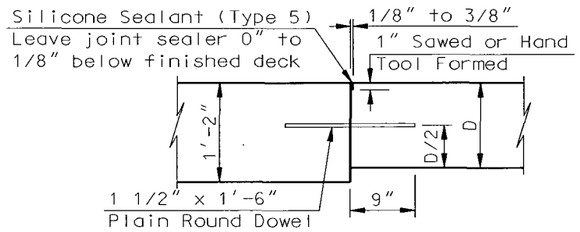
PLAN



APPROACH SLAB JOINT DETAIL "A"



B-B

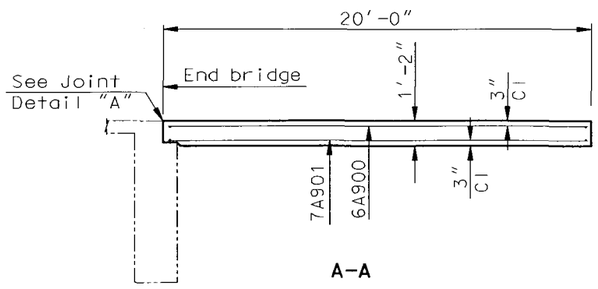


JOINT DETAIL B

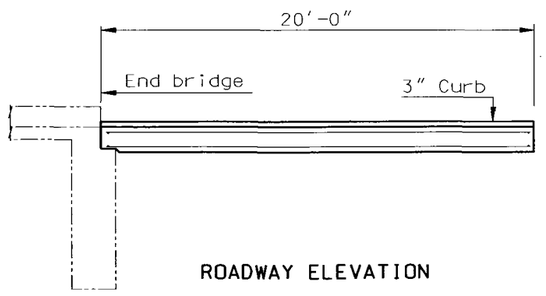
The estimated material quantities are for information purposes only. All equipment and labor required to construct the concrete approach slab, including select backfill, Class AE-3 concrete, reinforcing bars, polyethylene membrane, polystyrene, preformed joint filler and silicone sealant shall be included in the bid item "Concrete Bridge Approach Slab."

Width = 40'-0" Cl. Rdwy.			
Skew Angle = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	70	19'-8"
7	A901	82	19'-8"
5	A902	38	40'-8"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS)	CONCRETE (CY)
6,976	35.0



A-A



ROADWAY ELEVATION

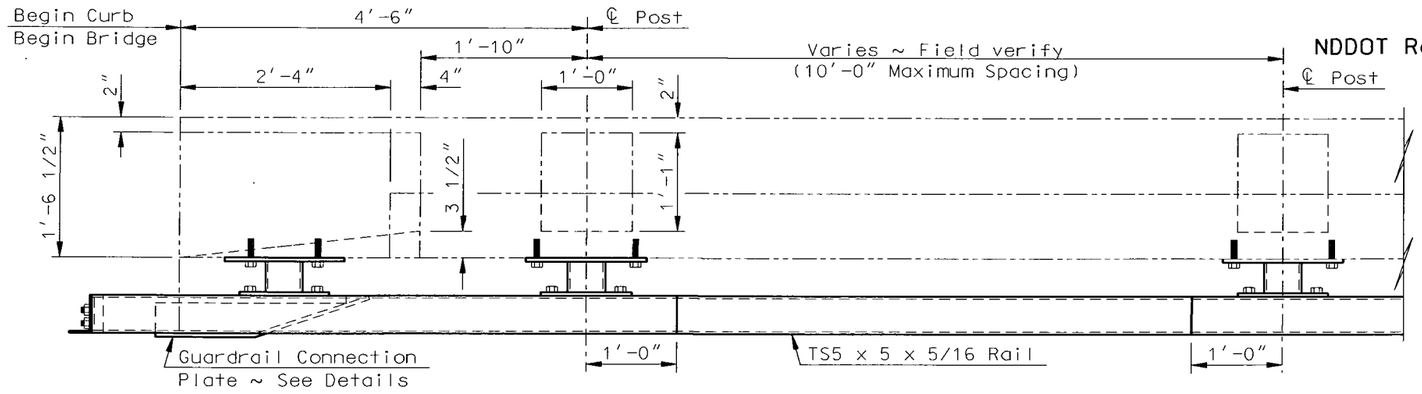
QUANTITIES		
Bridge Approach Slab	91.1	SY

ROSE COULEE

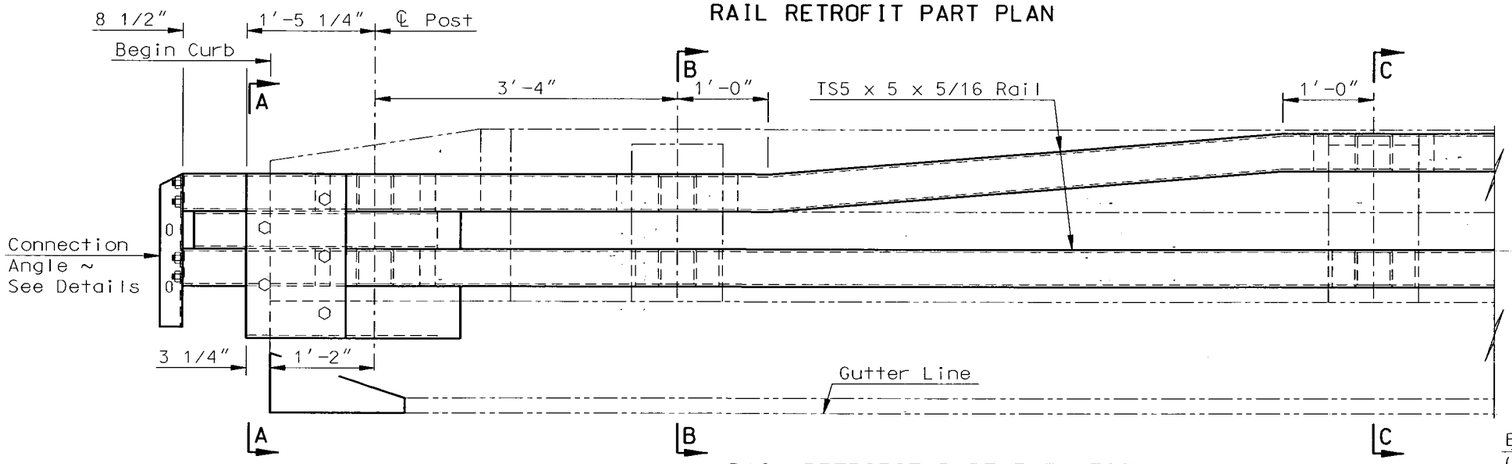
APPROACH SLAB, JOINT DETAILS & NOTES

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

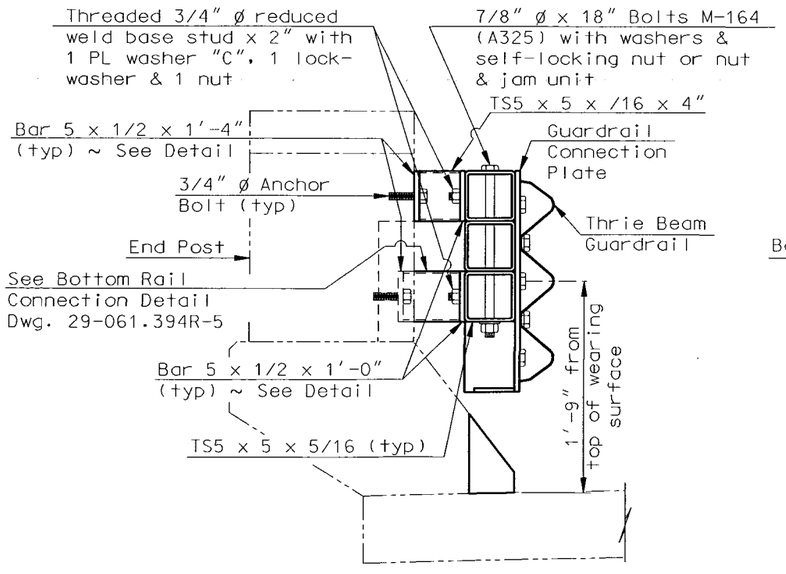
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-8-029(004)062	



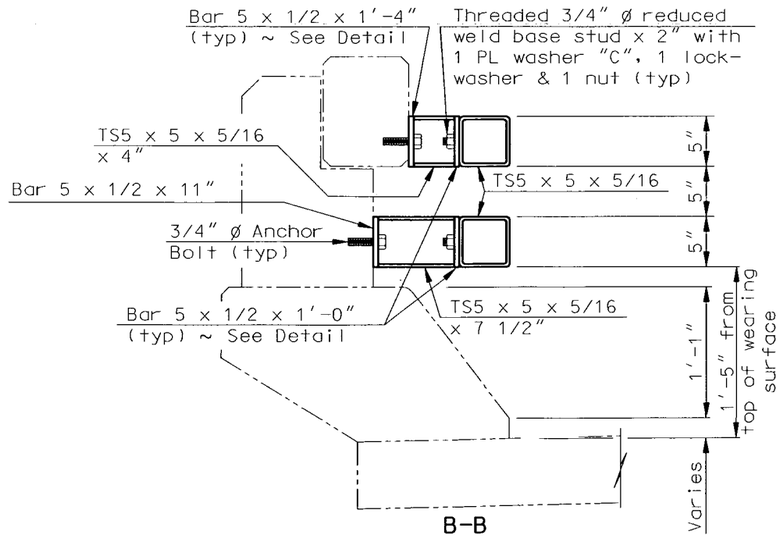
RAIL RETROFIT PART PLAN



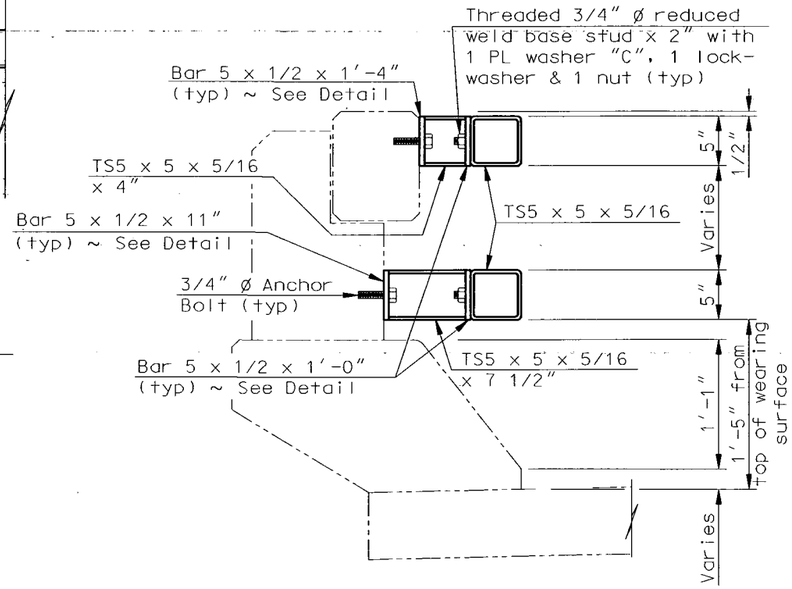
RAIL RETROFIT PART ELEVATION

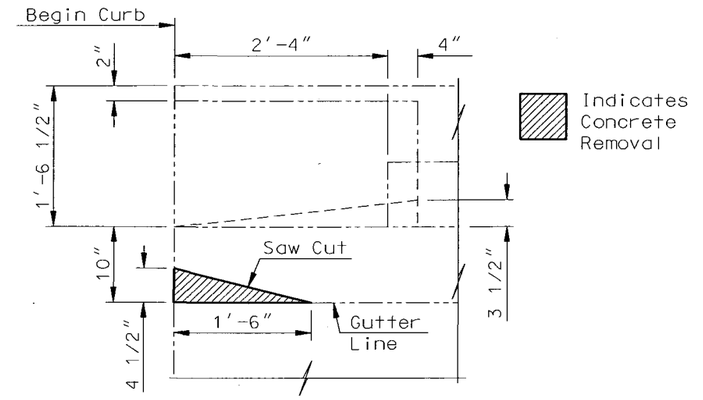


A-A



B-B





PLAN
CONCRETE REMOVAL DETAIL

NOTE:

See Dwg 29-061.394R-5 for more details, notes and details not shown on this drawing.

QUANTITIES

SEE DWG. NO. 29-061.394R-5

ROSE COULEE

DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

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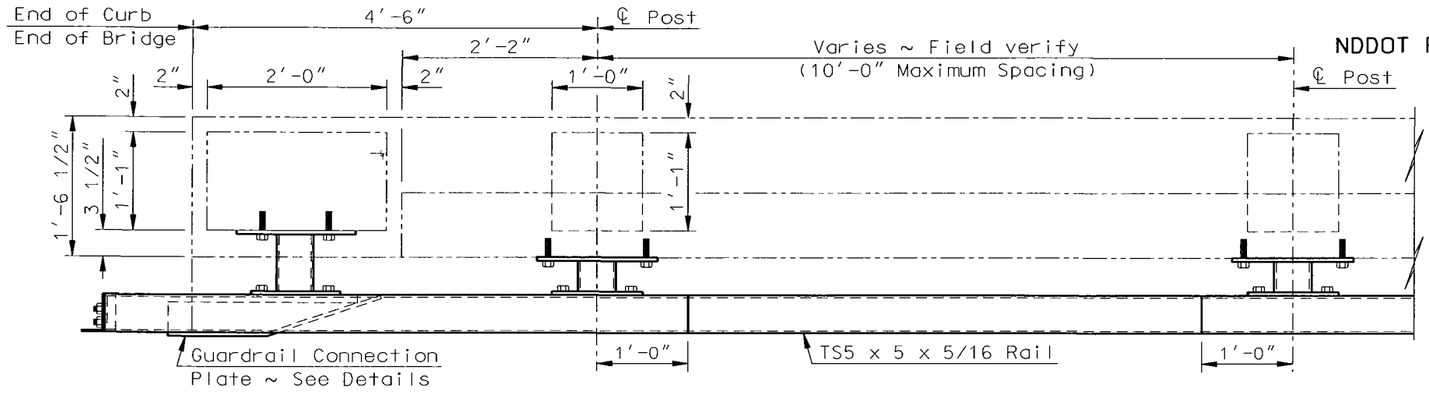
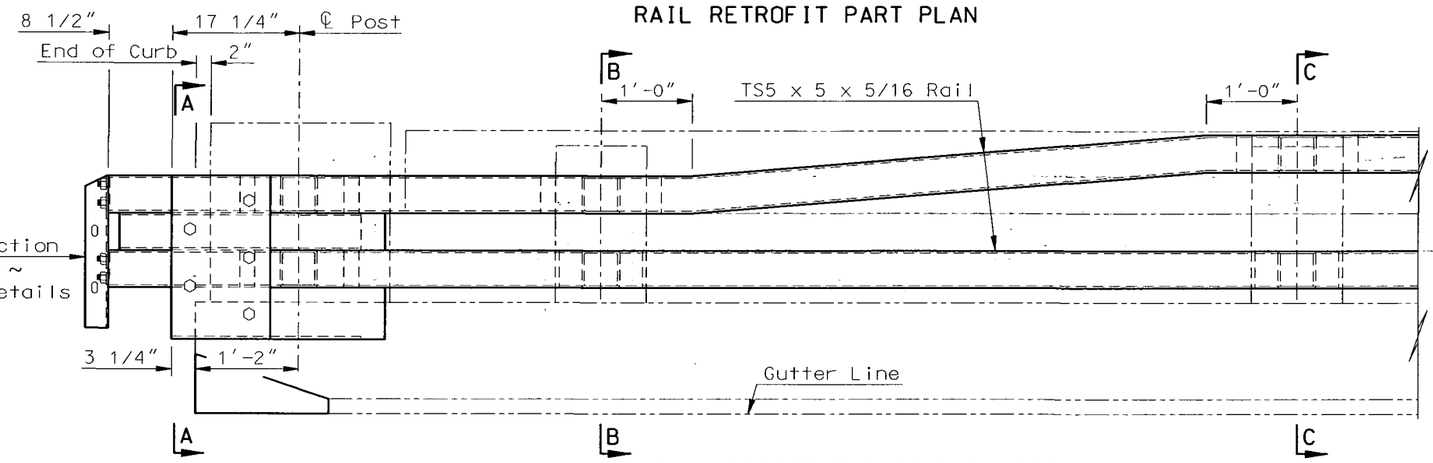
29-061.394R-3

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

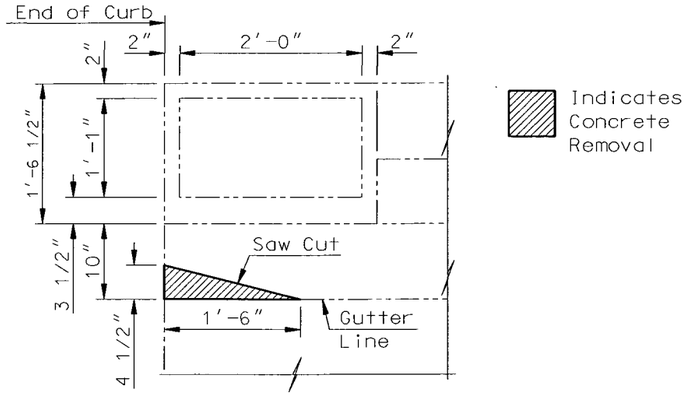
STATE	PROJECT NUMBER	SHEET NO.
ND	IM-8-029(004)062	



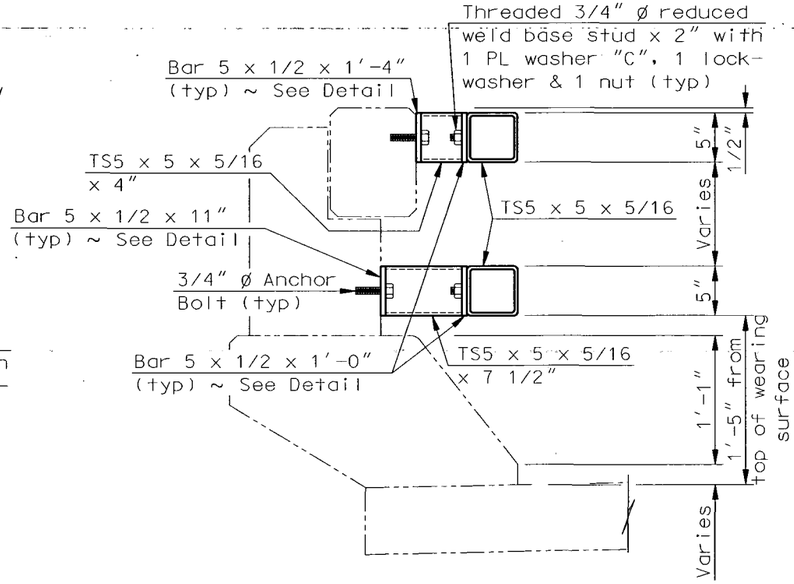
RAIL RETROFIT PART PLAN

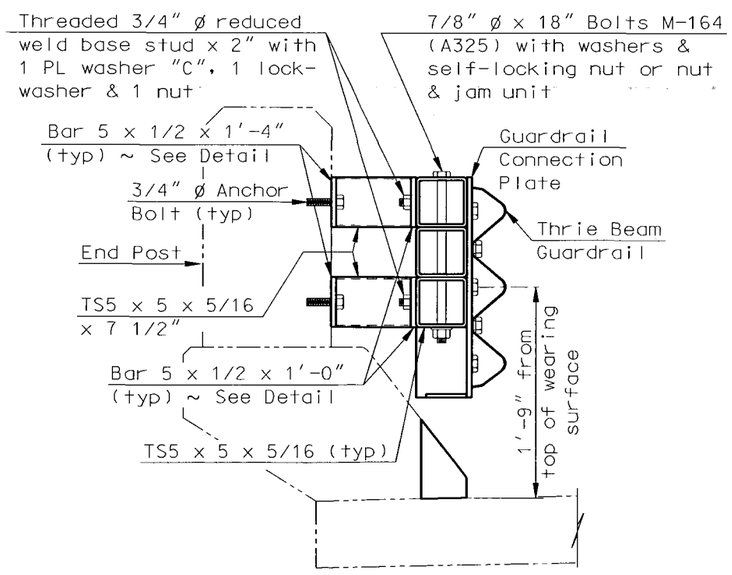


RAIL RETROFIT PART ELEVATION

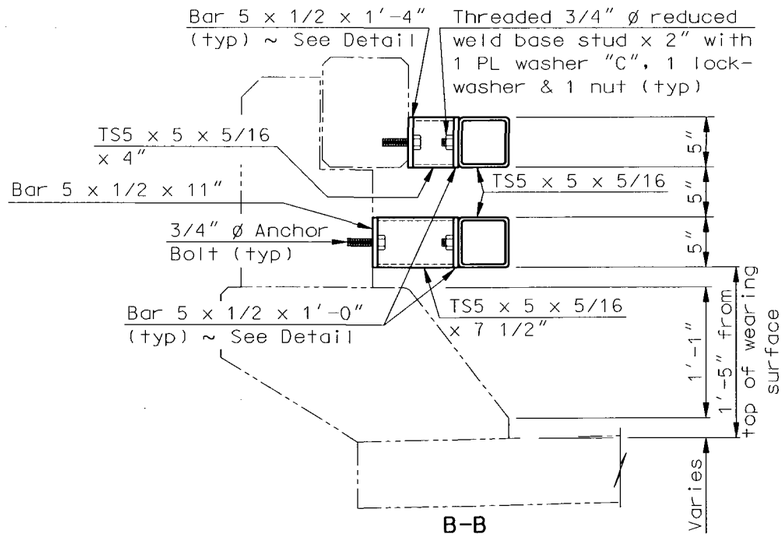


PLAN
CONCRETE REMOVAL DETAIL





A-A



B-B

NOTE:

See Dwg 29-061.394R-5 for more details, notes and details not shown on this drawing.

QUANTITIES

SEE DWG. NO. 29-061.394R-5

ROSE COULEE

**DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS**

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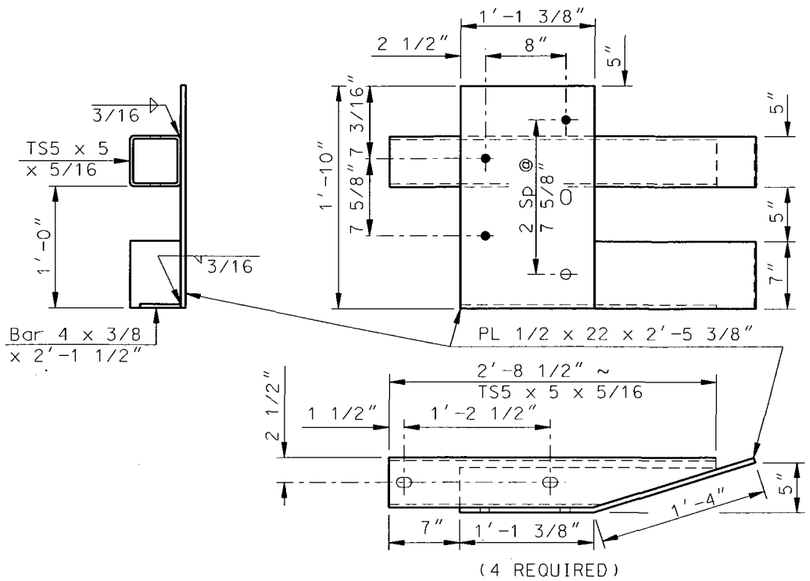
29-061.394R-4



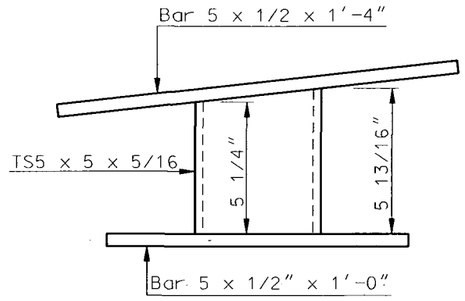
(4 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS

The filled circles indicate drilled and tapped holes for 7/8" ø bolts M-164 (A325) (typ). See Detail "B"

The open circle indicates a drilled hole through the 1/2" plate for a 7/8" ø bolt M-164 (A325) (typ).

The slotted hole shown shall be 1" x 1 1/2" in the 1/2" plate for a 7/8" ø bolt M-164 (A325).



BOTTOM RAIL CONNECTION ON MODIFIED END POST

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

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-8-029(004)062	

NOTES:

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

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

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

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

Payment for the railing shall include compensation for furnishing and installing the guardrail connection plates and for sawing and removing portions of the curb.

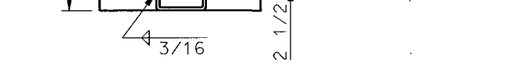
All structural steel including fasteners shall be hot-dip galvanized after fabrication according to AASHTO M111.

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

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

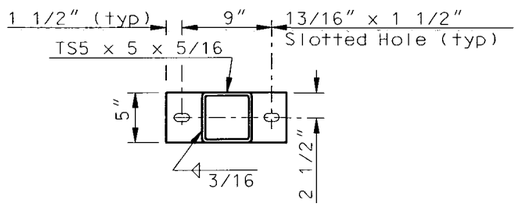
All anchor and splice bolts shall be galvanized and shall be AASHTO M-164 (A325).

The contractor shall submit the shop drawings for double box beam rail retrofit for approval to the Construction Office before fabrication.



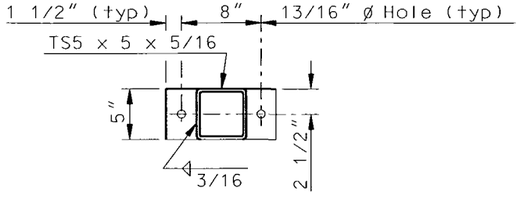
(CONCRETE RAIL CONNECTION)

BAR 5 X 1/2 X 1'-4" DETAIL



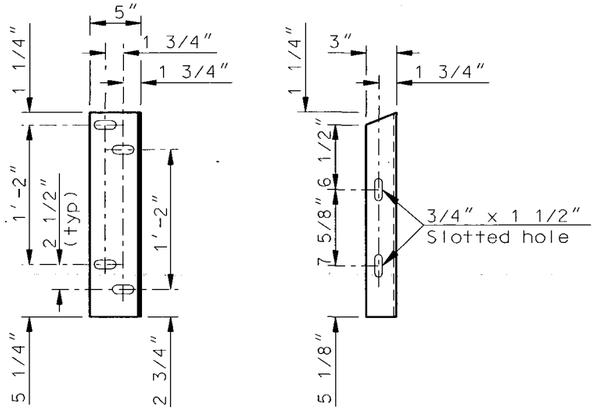
(RAIL CONNECTION)

BAR 5 X 1/2 X 1'-0" DETAIL



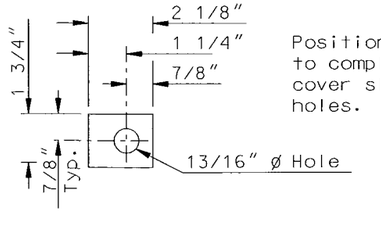
(CONCRETE CONNECTION)

BAR 5 X 1/2 X 11" DETAIL



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

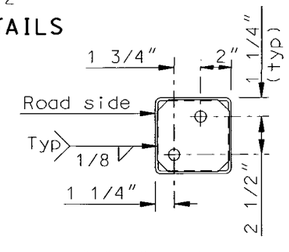
CONNECTION ANGLE DETAILS



Position washers to completely cover slotted holes.

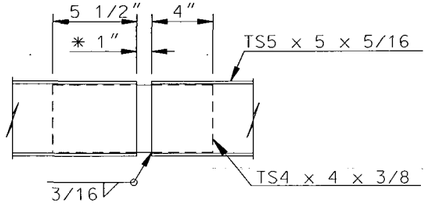
1/4" PL (AASHTO M-183)

PLATE WASHER "C"



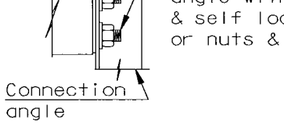
Rail Cap shall be a BAR 4 3/4 x 3/16 x 4 3/4". Cope corners to 3/4" to provide for zinc drains.

RAIL CAP DETAILS

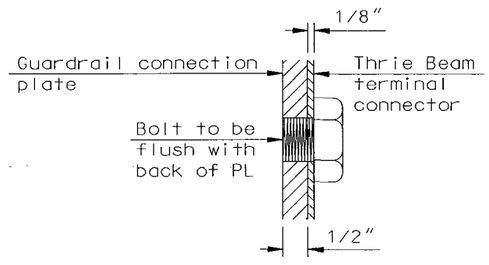


* 2" at Expansion Splices

RAIL SPLICE DETAIL



3/4" ø Reduced base weld studs on each rail cap of guardrail connections. Install angle with washers & self locking nut or nuts & jam nuts.



DETAIL "B"

QUANTITIES		
E-RAIL RETROFIT	203.9	LF

ROSE COULEE

DOUBLE BOX BEAM
E-RAIL RETROFIT DETAILS

DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current 1998	Pass: 5420	Trucks 730	Total 6150	750
Forecast 2018	Pass: 11920	Trucks 1460	Total 13380	1650
Minimum Sight Dist. for:		Design Speed 75 MPH		
Stopping 675'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 10

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-8-029(044)061	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT
IM-8-029(044)061

S BOUND I-29 OVER 40TH AVENUE SW
AND 40TH AVENUE, UNDER I-29 SOUTHBOUND
GRADING, SURFACING, STRUCTURE, GUARD RAIL, STORM SEWER,
PAVEMENT MARKING AND INCIDENTALS

In
Cass County

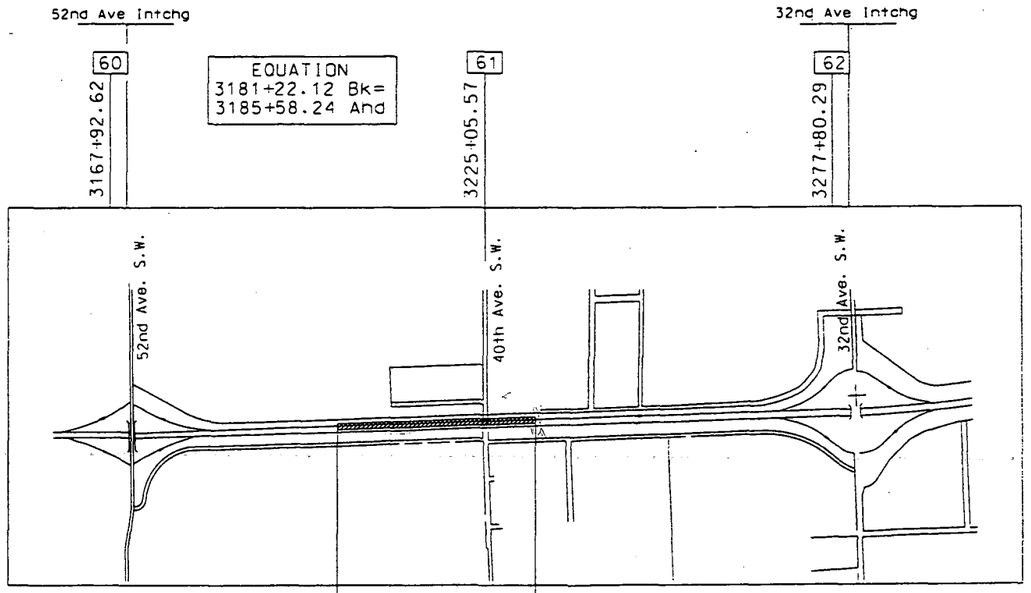
GOVERNING SPECIFICATIONS:

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

LENGTH OF PROJECT

Miles Gross	Miles Net
0.562	0.522

0.040 Mi Deducted for Structures



Beg Proj 3227+81
Sec 35, Twp 139 N, Rge 49 W

End Proj 3257+50
Sec 26, Twp 139 N, Rge 49 W

P.S&E CHANGES MADE
12-15-99

APPROVAL OF CITY ENGINEER

I MARK BITTNER, P.E., CITY ENGINEER FOR THE CITY OF FARGO, ND, HEREBY APPROVE THESE PLANS FOR S BOUND I-29 OVER 40TH AVENUE SW, FARGO, NORTH DAKOTA AS SHOWN ON THE ACCOMPANYING PLANS.

Mark Bittner

MARK BITTNER, P.E.
CITY ENGINEER
FARGO, NORTH DAKOTA

DATE 12/17/99 REG. NO. 1958

MARK H. BITTNER REGISTERED PROFESSIONAL 1958 ENGINEER

I HEREBY CERTIFY THAT THE ATTACHED PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.

Eugene L. Rowen

DATE 12-15-99 REG. NO. 3591

EUGENE L. ROWEN REGISTERED P.E. 3591 ENGINEER NORTH DAKOTA

DESIGNER Steven A. Strobel, PE-3478
DESIGNER Steven M. Sobitka, PE-4305
DESIGNER
RECOMMEND APPROVAL _____, 19__
DESIGN ENGINEER Darin J. Miller PE-4036

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

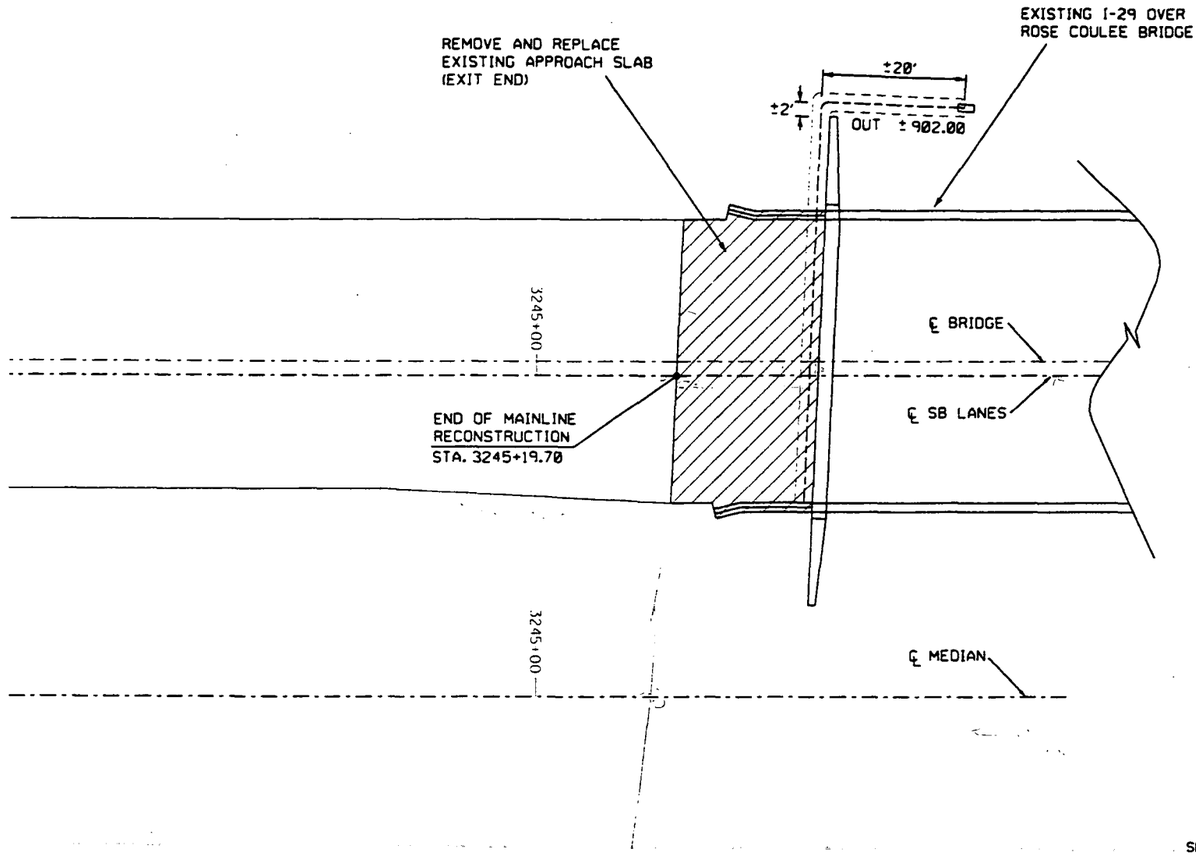
APPROVED

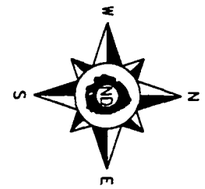
DIVISION ADMINISTRATOR DATE

FILE: TITLE_PH2 DATE: 12/6/99 DRAWN BY: MGJ

FHWA REGION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	IM-8-029(044)061	20

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





100 SCOPE OF WORK: THE WORK AT THIS SITE CONSISTS OF REMOVING AND REPLACING THE BRIDGE APPROACH SLAB (EXIT END) FOR THE SB I-29 BRIDGE AT ROSE COULEE.

550 BRIDGE APPROACH SLAB: INCLUDED IN THE "BRIDGE APPROACH SLAB REMOVE & REPLACE" BID ITEM IS THE SELECT BACKFILL, CONCRETE REMOVAL, COARSE AGGREGATE, CLASS 1 EXCAVATION, GEOTEXTILE FABRIC, DOWEL BARS, POLYSTYRENE INSULATION BOARD, DRAINAGE PIPES, CONCRETE HEADWALL, CONCRETE AND REINFORCING STEEL TO BUILD THE APPROACH SLAB.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0217	BRIDGE APPROACH SLAB REMOVE & REPLACE	SY	94.1
930	8642	NOSING CONCRETE	CF	3.9
930	8644	SILICONE SEALANT	LF	42.8

1) CHISLED " □ " NW WINGWALL OF 36TH ST. SW. BRIDGE OVER ROSE COULEE (DRAIN #27) ELEVATION=908.95

2) SE FLANGE BOLT OF FIREHYDRANT @ NE. CORNER OF 42ND AVE. SW. AND 36TH. SW. ELEVATION=910.11

NOTE: ELEVATIONS ARE CITY OF FARGO DATUM.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

Eugene L. Rowen
Reg# 3591 12-15-99

EUGENE L. ROWEN REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

ULTEIG ENGINEERS, INC.
PHASE II
SOUTHBOUND I-29
ROSE COULEE
BRIDGE LAYOUT

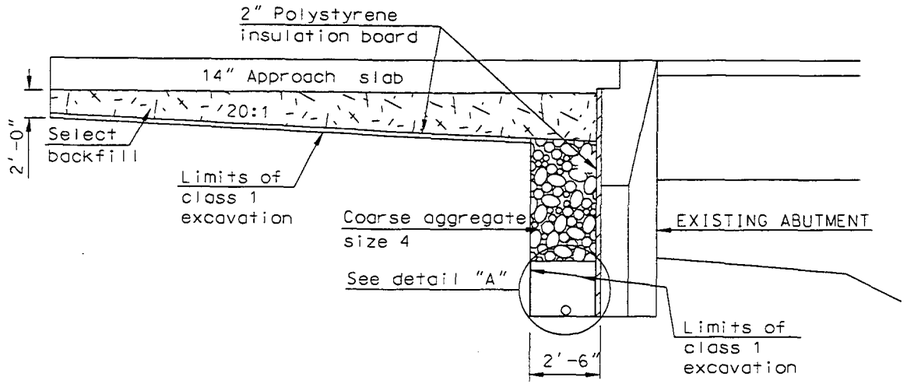
STATION 3245+19.70
CASS COUNTY

APPROVED

DATE: BRIDGE ENGINEER

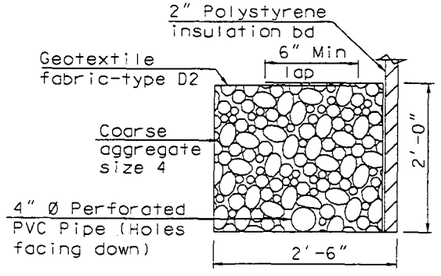
29-061.42-1
29-061.349 L

FHWA REGION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	IM-8-029(044)061	21

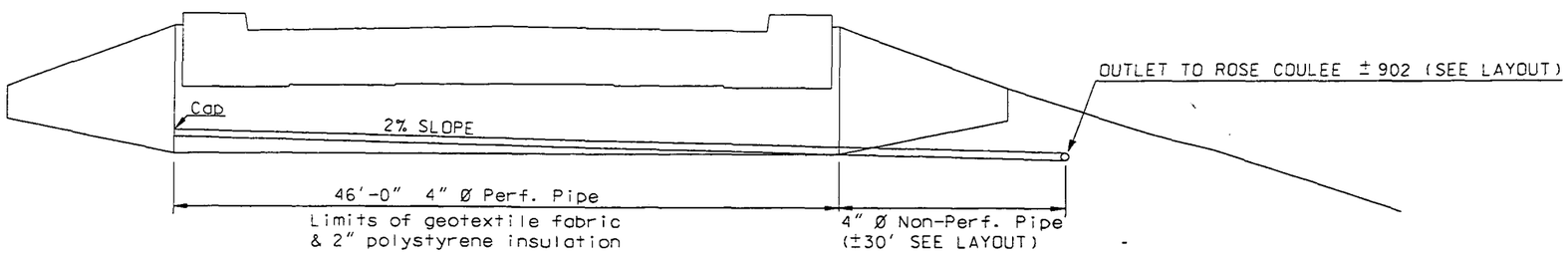


DETAIL AT ABUTMENT

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.

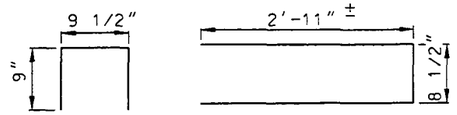


DETAIL "A"

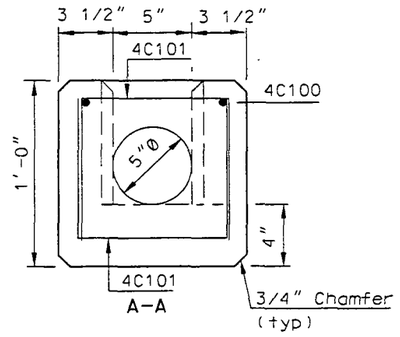


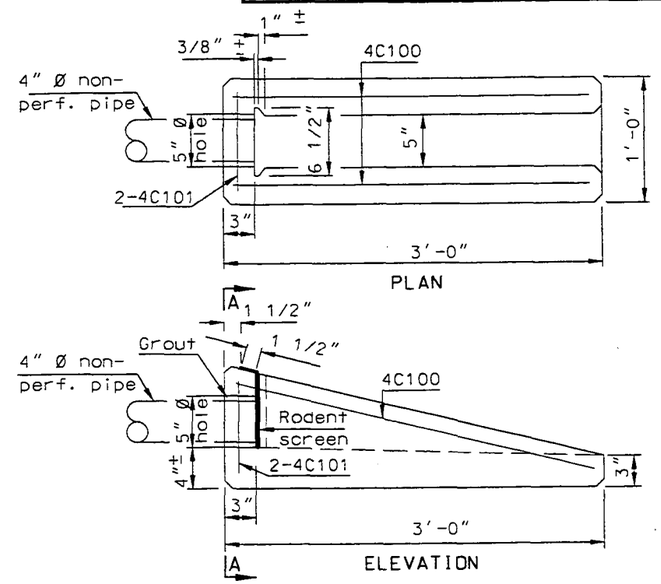
BACK FACE OF ABUTMENT

Seepage trench-fill bottom 2'-0" with select bacfill. Fill remainder with excavated material.

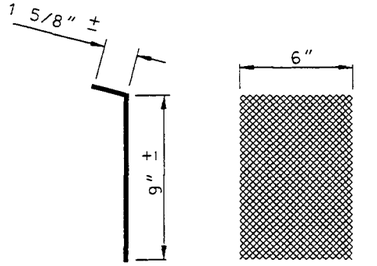


BENT BAR DETAILS





PRECAST CONCRETE HEADWALL DETAILS



RODENT SCREEN DETAILS

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

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

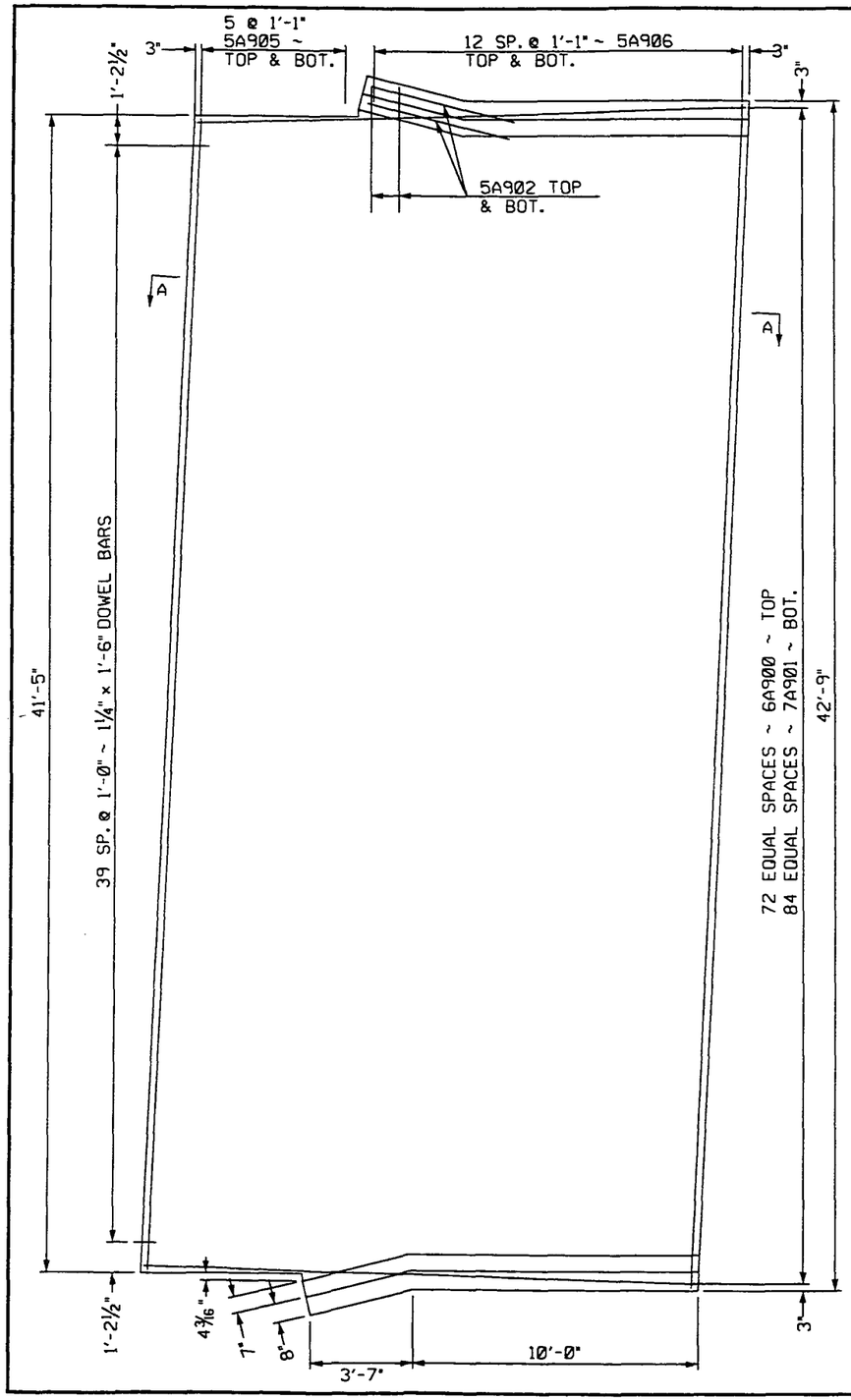
ROSE COULEE

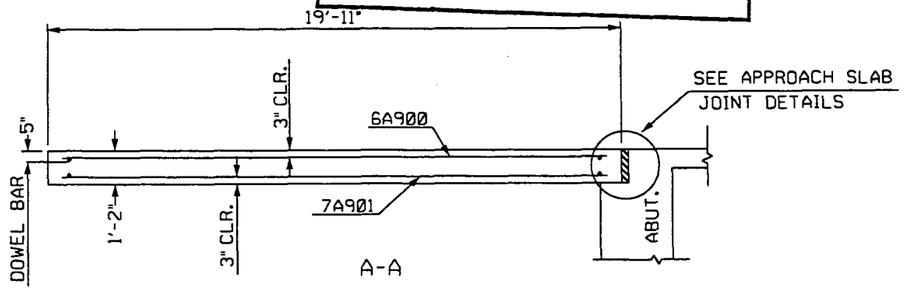
EXCAVATION & BACKFILL AT ABUTMENT

ULTEIG ENGINEERS, INC.

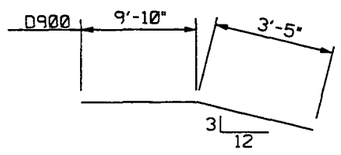
29-61.42-2

FHWA REGION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	IM-8-029(044)061	22

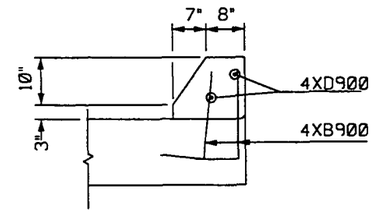




A-A

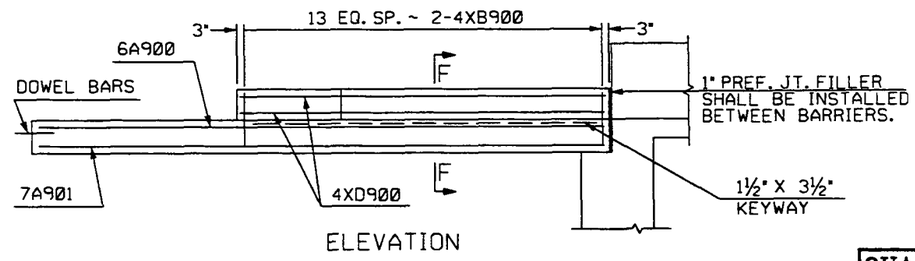


D900

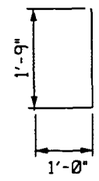


F-F

SKEW ANGLE = 2°28'40"			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	73	19'-7"
7	A901	85	19'-7"
5	A902	16	6'-0"
5	A905	12	40'-10"
5	A906	26	42'-2"
4	XB900	56	2'-9"
4	XD900	4	13'-3"
ESTIMATED MATERIAL QUANTITIES			
REINFORCING STEEL (LBS)		CONCRETE (C.Y.)	
7441		37.7	



ELEVATION



XB900

QUANTITIES	(ONE SLAB)
APPROACH SLAB	94.1 S.Y.

NOTE:
THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE ,SAW CUTTING, POLYETHYLENE MEMBRANE, REINFORCING BARS, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND APPROACH SLAB BARRIERS SHALL BE INCIDENTAL TO THE PAY ITEM. "BRIDGE APPROACH SLAB REMOVE &REPLACE".

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60. THE POLYETHYLENE MEMBRANE SHALL MEET REQUIREMENTS OF AASHTO M171.

THE BAR MARKS BEGINNING WITH AN "X", INDICATE AN EPOXY COATED BAR.

SURFACE FINISH "D" SHALL BE REQUIRED FOR ALL SURFACES OF THE CURB TRANSITIONS.

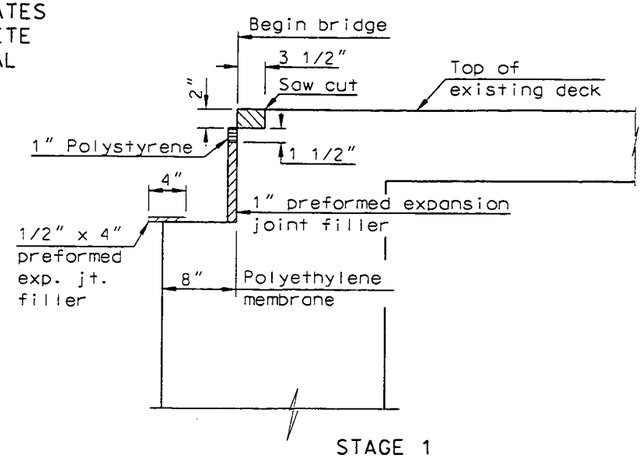
SOUTHBOUND I-29
ROSE COULEE
APPROACH SLAB
EXIT END

ULTEIG ENGINEERS, INC.

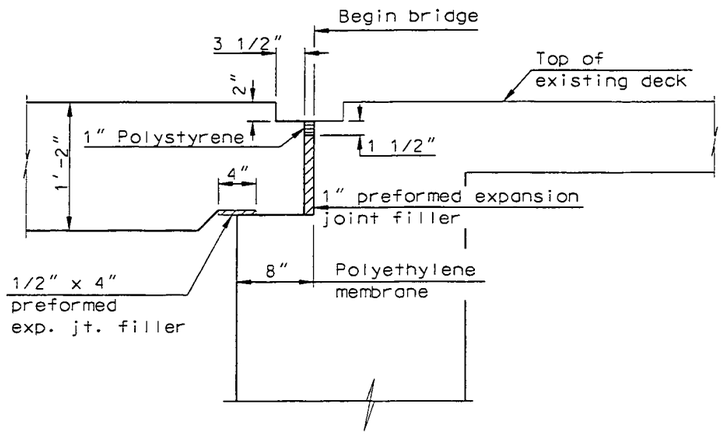
29-61.42-3

FHWA REGION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	IM-8-029(044)061	23

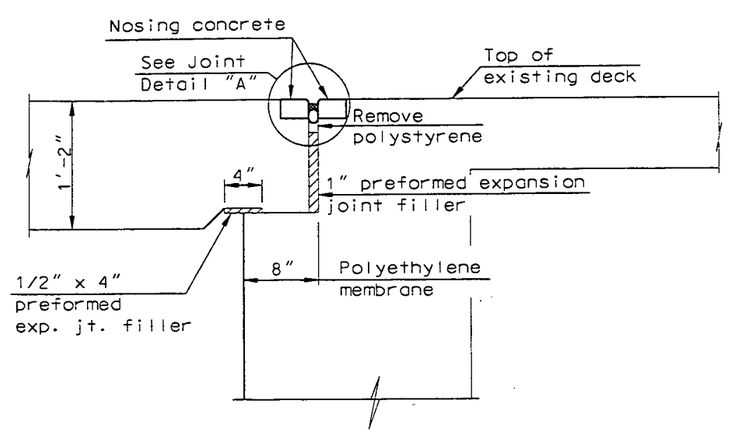
INDICATES CONCRETE REMOVAL



STAGE 1



STAGE 2



STAGE 3

STAGE 1: 1. A 2" x 3 1/2 " BLOCKOUT SHALL BE FORMED BETWEEN THE CURBS IN THE ABUTMENT AS SHOWN.

2. PLACE A 1 " THICK PREFORMED EXPANSION JOINT FILLER. THE 1/2 " x 4" PREFORMED EXPANSION JOINT FILLER 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. REMOVE THE 1" POLYSTYRENE.

5. NOSING CONCRETE SHALL BE PLACED IN THE BLOCKOUT AREAS, BOTH IN THE DECK AND IN THE APPROACH SLAB.

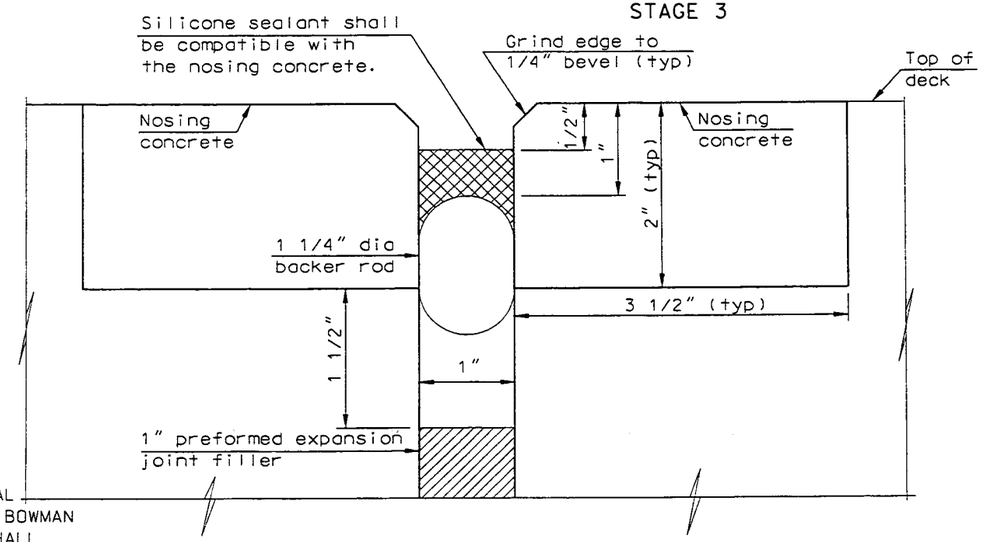
6. AFTER THE NOSING CONCRETE HAS CURED, CLEAN AND PREPARE THE JOINT, APPLY ANY NECESSARY BONDING MATERIAL, INSTALL THE BACKER ROD AND INSTALL THE SILICONE SEALANT.

GENERAL:

THE NOSING CONCRETE MATERIAL SHALL BE AN ELASTOMERIC CONCRETE OR A POLYMERIC CONCRETE THAT WILL PROVIDE A DURABLE EDGE THAT CAN WITHSTAND LIVE-LOAD TRAFFIC WITHOUT CHIPPING OR SPALLING. THE NOSING CONCRETE MATERIAL SHALL BE SILSPEC 900 PNS, MANUFACTURED BY SILICONE SPECIALTIES, INC.; WABOCRETE II, MANUFACTURED BY WATSON BOWMAN ACME; ELASTOMERIC CONCRETE, MANUFACTURED BY D.S. BROWN COMPANY, OR AN APPROVED EQUAL. THE NOSING CONCRETE SHALL BE MIXED AND INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. ALL LABOR AND MATERIALS REQUIRED TO INSTALL THE NOSING CONCRETE SHALL BE INCLUDED IN THE BID ITEM "NOSING CONCRETE".

THE SILICONE SEALANT SHALL BE A RAPID CURE, SELF LEVELLING, 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".

THE CONTRACTOR SHALL AQUIRE TECHNICAL ASSITANCE FROM THE MANUFACTURER OF THE NOSING CONCRETE AND SILICONE SEALANT FOR THE SURFACE PREPARATION AND INSTALLATION OF THE NOSING CONCRETE AND SILICONE SEALANT. A TECHNICAL REPRESENTATIVE MUST BE PRESENT FOR THE START OF SURFACE PREPERATION AND INSTALLATION FOR A 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.



JOINT DETAIL A

QUANTITIES (ONE APPROACH)	
NOSING CONCRETE	3.9 C.F.
SILICONE SEALANT	42.8 L.F.

ROSE COULEE

APPROACH SLAB JOINT DETAILS

ULTEIG ENGINEERS, INC.

29-61.42-4

Fargo West.
South End
Ross Coulee

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
CFN 11570 CHANGE ORDER

SHEET 1

TYPE: 6P
ORDER NO: 6C

PROJECT: IM-8-029(026)053
COUNTY: CASS COUNTY
FOR: PCC PVMT, GRADING, SURFACING, AND INCID.

CONTRACTOR: NORTHERN IMPROVEMENT CO.
PO BOX 2846
FARGO, ND 58102

ORIGINAL CONTRACT AMOUNT
$ 8,236,161.53

DATE: 05/25/1999

SPEC NO	CODE NO	ITEM OF WORK	UNIT	ORIG + OR - PREVIOUS CHG QUANTITY	+ OR - QUANTITY	UNIT PRICE	INCREASE AMOUNT	DECREASE AMOUNT
		INCREASE TO BID ITEM						
		PARTICIPATING (IN FEDERAL FUNDS)						
401	152	SS1H OR CSS1H EMULSIFIED ASPHALT	GAL	4,682.500	49.000	0.800	39.20	
408	176	HOT BITUMINOUS PAVEMENT CL 27	TON	2,940.740	108.000	20.500	2,214.00	
409	445	PG 58-28 ASPHALT CEMENT	TON	177.070	6.500	140.000	910.00	
550	217	BRIDGE APPROACH SLAB-REMOVE AND REPLACE	SY	182.000	93.500	170.000	15,895.00	
764	145	W-BEAM GUARDRAIL END TERMINAL	EA	6.000	2.000	1,650.000	3,300.00	
764	151	REMOVE W-BEAM GUARDRAIL AND POSTS	LF	300.000	552.000	3.000	1,656.00	
764	1050	RESET W-BEAM GUARDRAIL	LF	150.000	378.800	8.500	3,219.80	
930	8642	MOSING CONCRETE	CF	8.000	4.000	280.000	1,120.00	
	8644	SILICONE SEALANT	LF	83.000	41.500	10.000	415.00	

NET INCREASE OR DECREASE TO DATE	52,262.01	PART	0.00	NON-PART	TOTALS	28,769.00	0.00
					NON-PARTICIPATING	0.00	0.00
					PARTICIPATING	28,769.00	0.00

DUE TO THIS CHANGE, THE CONTRACT TIME:
IS NOT CHANGED.

EXPLANATION OF CHANGE IN PLAN RECOMMENDED

If the Federal Funds authorized in the cost participation agreement with the local agency is exceeded and Federal Funds are not available for this change, the local agency will assume the total cost of this change order.

SEE ATTACHED SHEETS.

CONTRACTOR — DATE 6-10-99

[X] Approval Recommended — PROJECT ENGINEER — DATE 6/10/99
( ) Approved

CITY/COUNTY/OTHER OFFICIAL — DATE

REPRESENTING

Post-it® Fax Note 7671 | Date | # of pages ▶
To Tim Schwader | From Kevin Gorder
Co./Dept. Bridge Division | Co. Fargo District
Phone # | Phone #
Fax # | Fax #

PROJECT IM-8-029(026)053

EXPLANATION OF CHANGE ORDER 4P-4C

INCREASE TO BID ITEMS:

550 217 BRIDGE APPROACH SLAB-REMOVE AND REPLACE
930 8642 NOSING CONCRETE
930 8644 SILICONE SEALANT

The south approach slab to the Rose Coulee structure north bound needs replacement. The existing conditions of this concrete approach slab is that it has a drop of 0.32' in 20' from the north to the south edge and has an existing HBP overlay to take care of this dip.

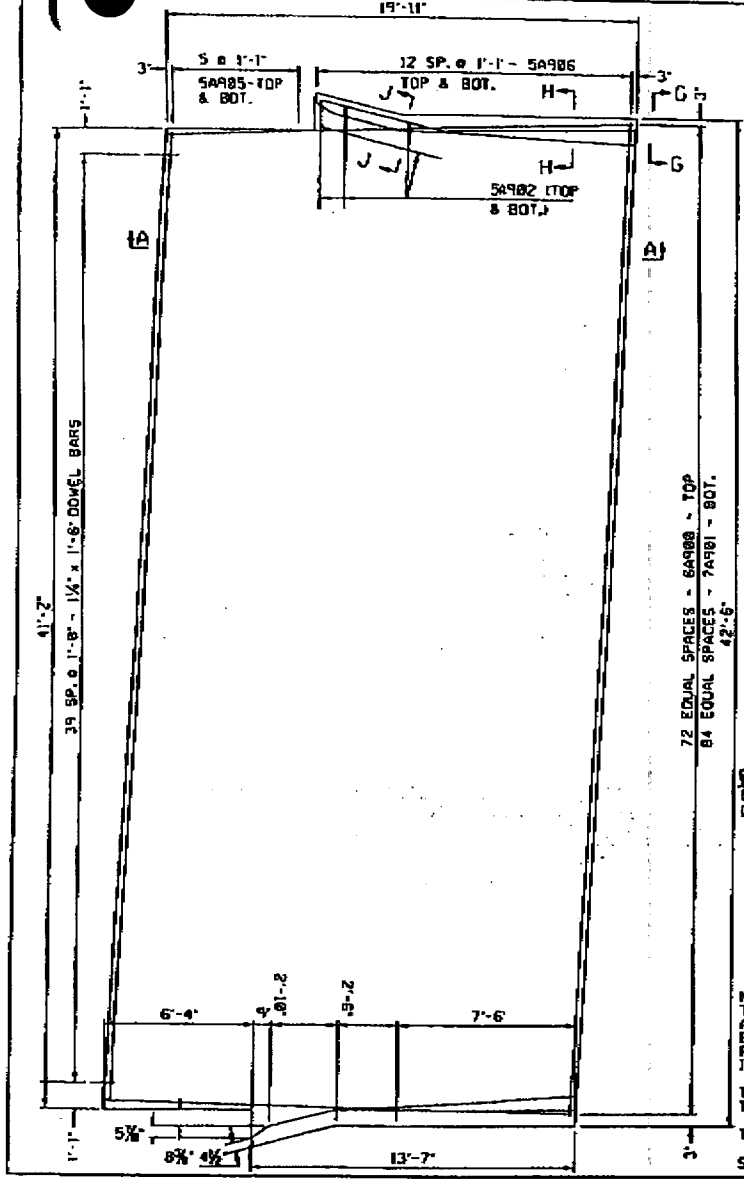
The plans do not address the replacement of the south approach slab at this location. Because of the 0.32' settlement of the approach slab, it is necessary to replace the approach slab which will provide a smooth profile and transition from the new mainline concrete to the Rose Coulee Structure.

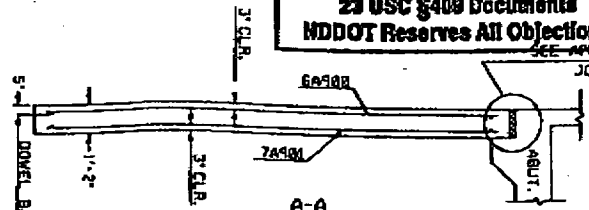
Verbal approval was given by the Assistant Fargo District Engineer to complete this work.

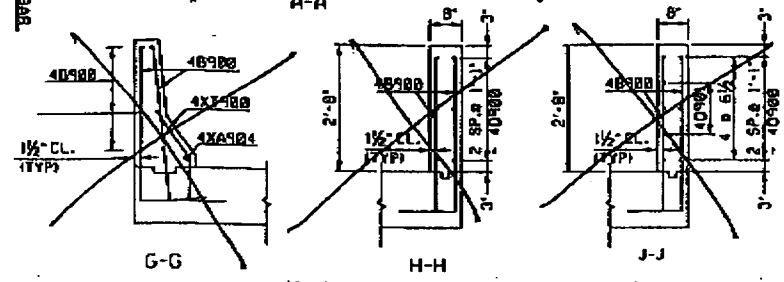
The design of the approach slab, not including the safety shape transition, is the same as shown for 40th Ave. S. overpass. This is found on sheet #45 in the plans CPU-8-984(007). The design for the safety shape transition is the same as shown for the Wild Rice River Structure located on sheet #104 in the plans IM-8-029(026)053. The quantities for the approach slab for the Rose Coulee Structure is estimated at 7,849 lbs for reinforcement steel and 93.5 SY for concrete.

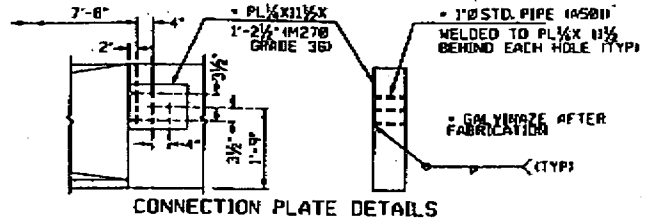
The design of the nosing concrete and silicone sealant for the approach slab at Rose Coulee is the same as shown on sheet #106 in the plans IM-8-092(026)053. The nosing concrete will be 4.0 CF and the silicone sealant will be 41.5 LF.

FED. ROAD SECTION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	~~CPU-8-984(007)~~	45

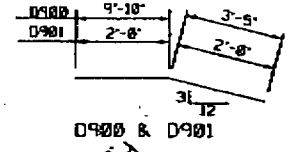




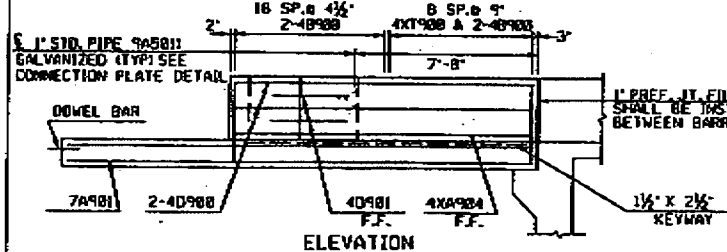




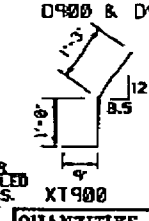
CONNECTION PLATE DETAILS

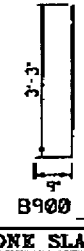


D900 & D901



ELEVATION





SKEW ANGLE = 2°28'40"

BAR LIST - ONE SLAB

SIZE	MARK	NO.	LENGTH
6	A900	73	19'-7"
7	A901	85	19'-7"
5	A902	16	6'-8"
4	XA904	2	7'-6"
5	A905	12	40'-10"
5	A906	26	42'-2"
~~4~~	~~B900~~	~~112~~	~~4'-4"~~
~~4~~	~~D900~~	12	~~13'-1"~~
~~4~~	~~D901~~	~~4~~	~~4'-0"~~
~~4~~	~~XT900~~	10	~~3'-0"~~

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (C.Y.)
~~7766~~	38.2

QUANTITIES	(ONE SLAB)
APPROACH SLAB	93.5 S.Y.

ROSE COULEE
NORTHBOUND I-29
~~48th AVE. S. OVERPASS~~
APPROACH SLAB
ENTRANCE END

~~ULTEIG ENGINEERS, INC.~~

NOTE:
THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, SAW CUTTING, POLYETHYLENE MEMBRANE, REINFORCING BARS, BACKER RODS, SILICON SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND APPROACH SLAB BARRIERS SHALL BE INCIDENTAL TO 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 REQUIREMENTS OF AASHTO M171.

THE BAR MARKS BEGINNING WITH AN "X", INDICATE AN EPOXY COATED BAR.

SURFACE FINISH "D" SHALL BE REQUIRED FOR ALL SURFACES OF THE CURB TRANSITIONS.

29-061.245 R-21

FINAL SECTION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
a	ND	IM-8-029(026)053	104

Width = 40'-0" clr rdwy

Skew angle = 15°

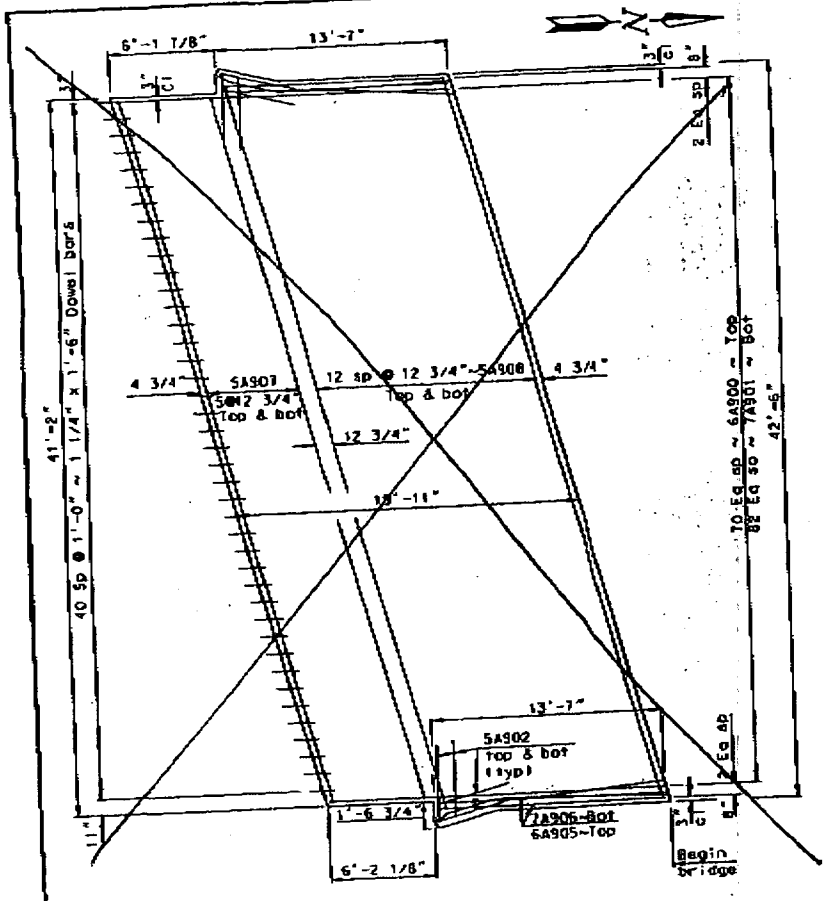
BAR LIST - ONE SLAB

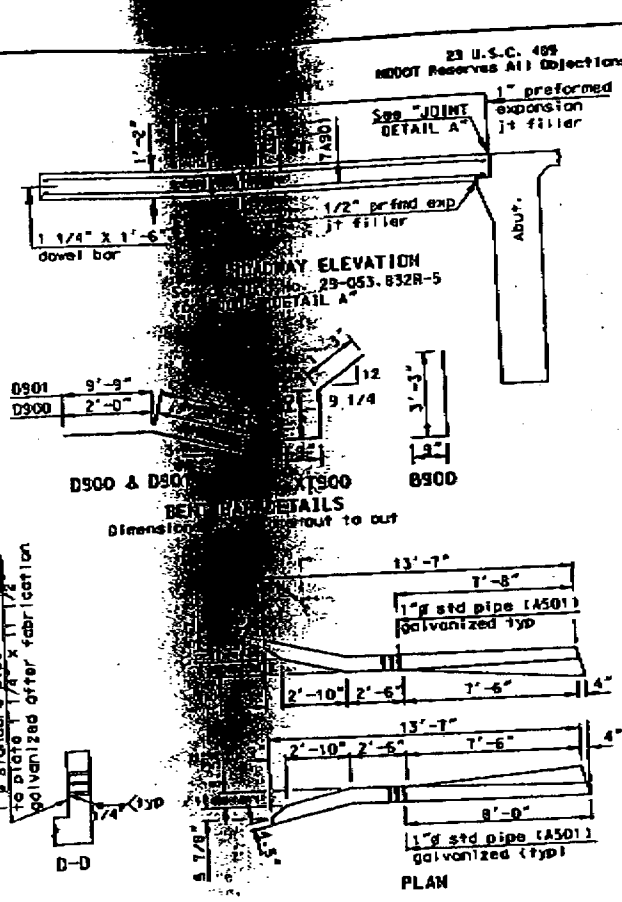
SIZE	MARK	NO.	LENGTH
6	A900	71	19'-7"
7	A901	83	19'-7"
5	A902	16	4'-6"
4	XA903	2	1'-6"
6	A905	4	13'-3"
7	A906	4	13'-3"
5	A907	12	42'-3"
5	A908	26	43'-8"
4	B900	112	4'-0"
4	XT900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"

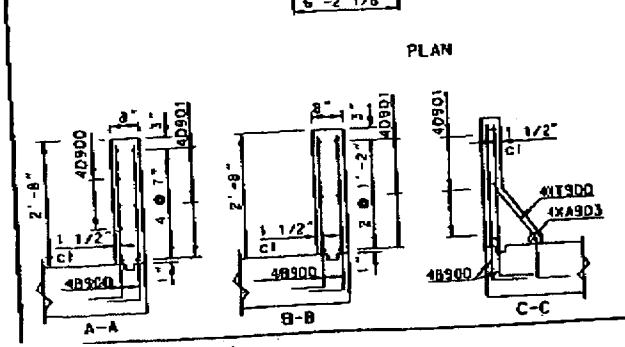
ESTIMATED MATERIAL QUANTITIES

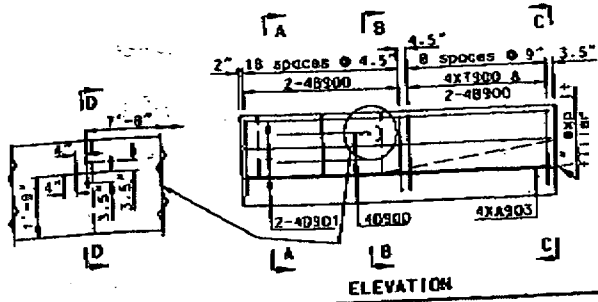
REINFORCING STEEL LBS.	CONCRETE C.Y.
7,849	38.2

X = epoxy coated bar
See drawing 29-053.832R-5 for notes.









QUANTITIES (ONE SLAB)

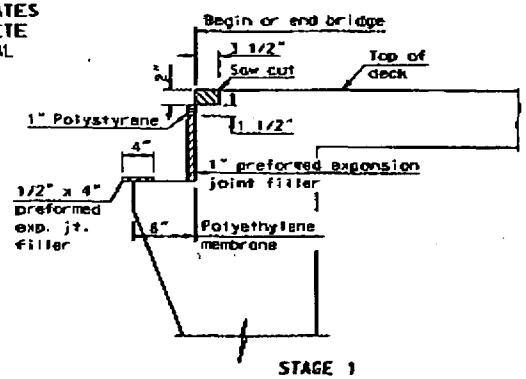
Approach slab	93.5 SY

~~WILD RICE RIVER~~
ROSE COULEE
APPROACH SLAB
SOUTH APPROACH

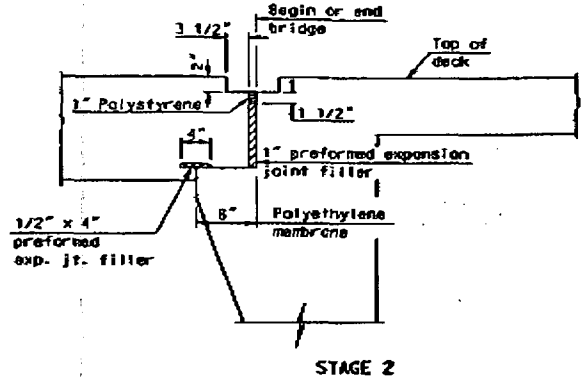
~~29-053.832R-1~~

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IN-8-029(026)053	106

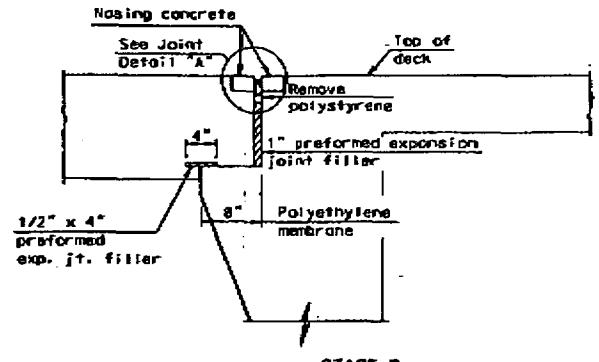
INDICATES CONCRETE REMOVAL



STAGE 1



STAGE 2



STAGE 3

APPROACH SLAB - BRIDGE DECK JOINT

STAGE 1:

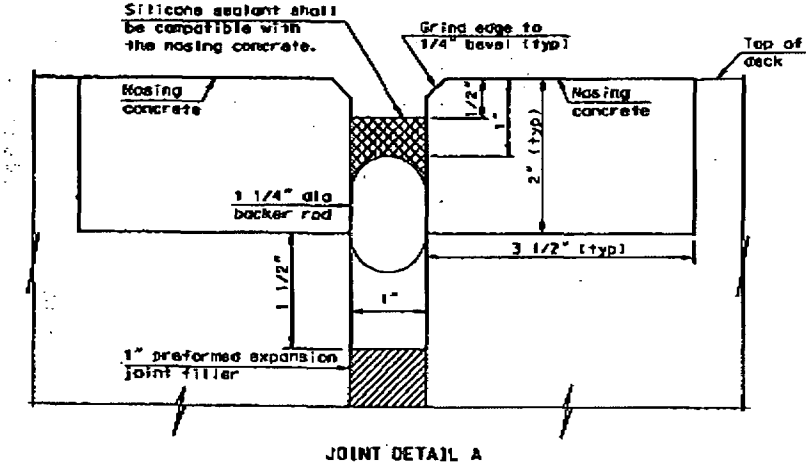
1. Remove concrete at ends of deck to allow for nosing concrete.
2. Place the 1" thick preformed expansion joint filler, the 1/2" x 4" preformed expansion joint filler, the 1" polystyrene and the polyethylene membrane.

STAGE 2:

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

STAGE 3:

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



JOINT DETAIL A

NOTES:

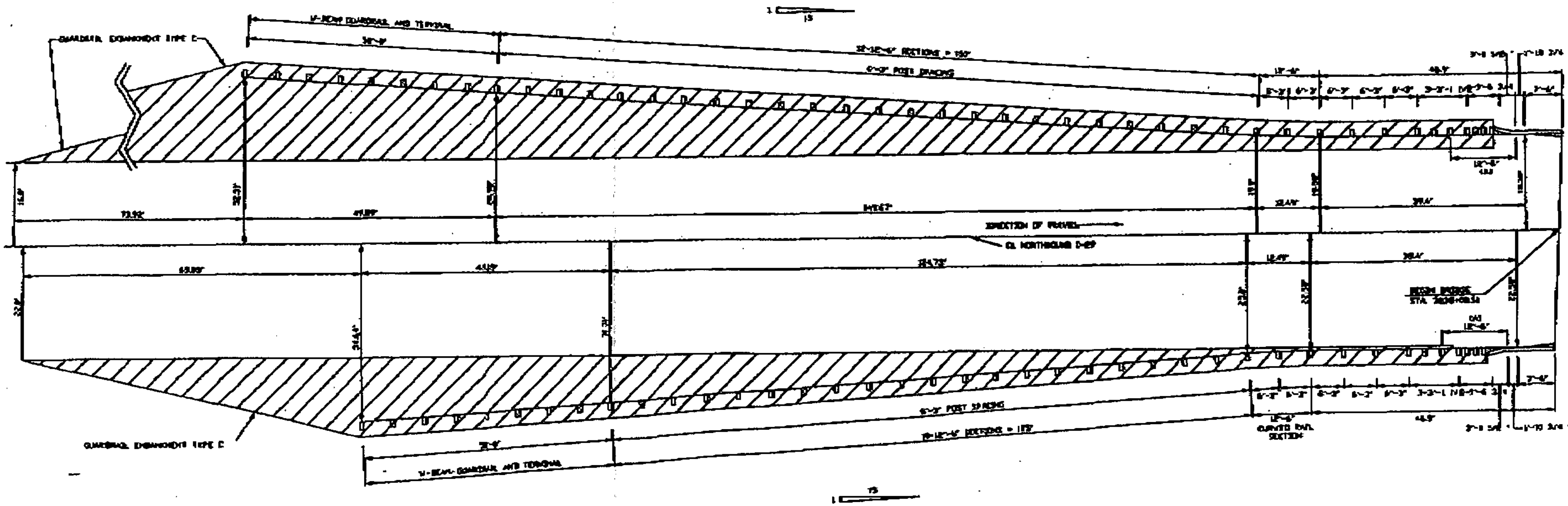
Dimensions shown in the area of the approach slab tip are for the existing approach slab tip. These dimensions will change if the approach slab tip is broken and needs to be repaired.

All estimated material quantities shown on drawing no. 29-053.832R-2, 3 & 4 are for informational purposes only. All materials including concrete, reinforcing bars, polyethylene membrane, preformed joint filler, polystyrene, dowel bars, and labor required to build the approach slab and curb shall be included in the pay item "Bridge Approach Slab-Remove & Replace".

QUANTITIES ~~4 PMD APPROACHES~~	
~~Nosing Concrete~~	~~3.1 CY~~
~~Silicone Sealant~~	~~63 LF~~

~~WILD RICE RIVER~~
ROSE COULEE
APPROACH SLAB JOINT DETAILS

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	~~CPU-8-984(007)~~	52



(A) 12'-6" DOUBLE RAIL SECTION

QUANTITIES	(ONE SLAB)
APPROACH SLAB	93.5 S.Y.

Rose Coulee

~~40TH AVENUE S. OVERPASS~~

V-BEAM GUARDRAIL LAYOUT

DRAWN BY SLW	CHECKED BY SG	APPROVED BY SG
FILE	DATE 12-22-98	SCALE

EXPLANATION CONT.

764 151 REMOVE W-BEAM GUARDRAIL AND POSTS
764 1050 RESET W-BEAM GUARDRAIL
764 145 W-BEAM GUARDRAIL END TERMINAL
408 176 HOT BIT. PAVEMENT CL 27
409 445 PG 58-26 ASPHALT CEMENT
401 152 SS1H OR CSS1H EMULSIFIED ASPHALT

The guardrail embankment and guardrail on the south end of the Rose Coulee Structure is in conflict with work that is required to reconstruct the mainline. The plans did not address the removal of the w-beam guardrail on the south end of the Rose Coulee Structure. Removal of this guardrail will also be needed for the construction of the new safety shape transitions that will be built with the approach slab.

The existing guardrail is not to current standards. When the guardrail it is reset, it will be to the new standards with the new w-beam guardrail end terminals.

Once the new guardrail is installed at the south end of the Rose Coulee bridge, the guardrail embankments will be surfaced with the following quantities is:

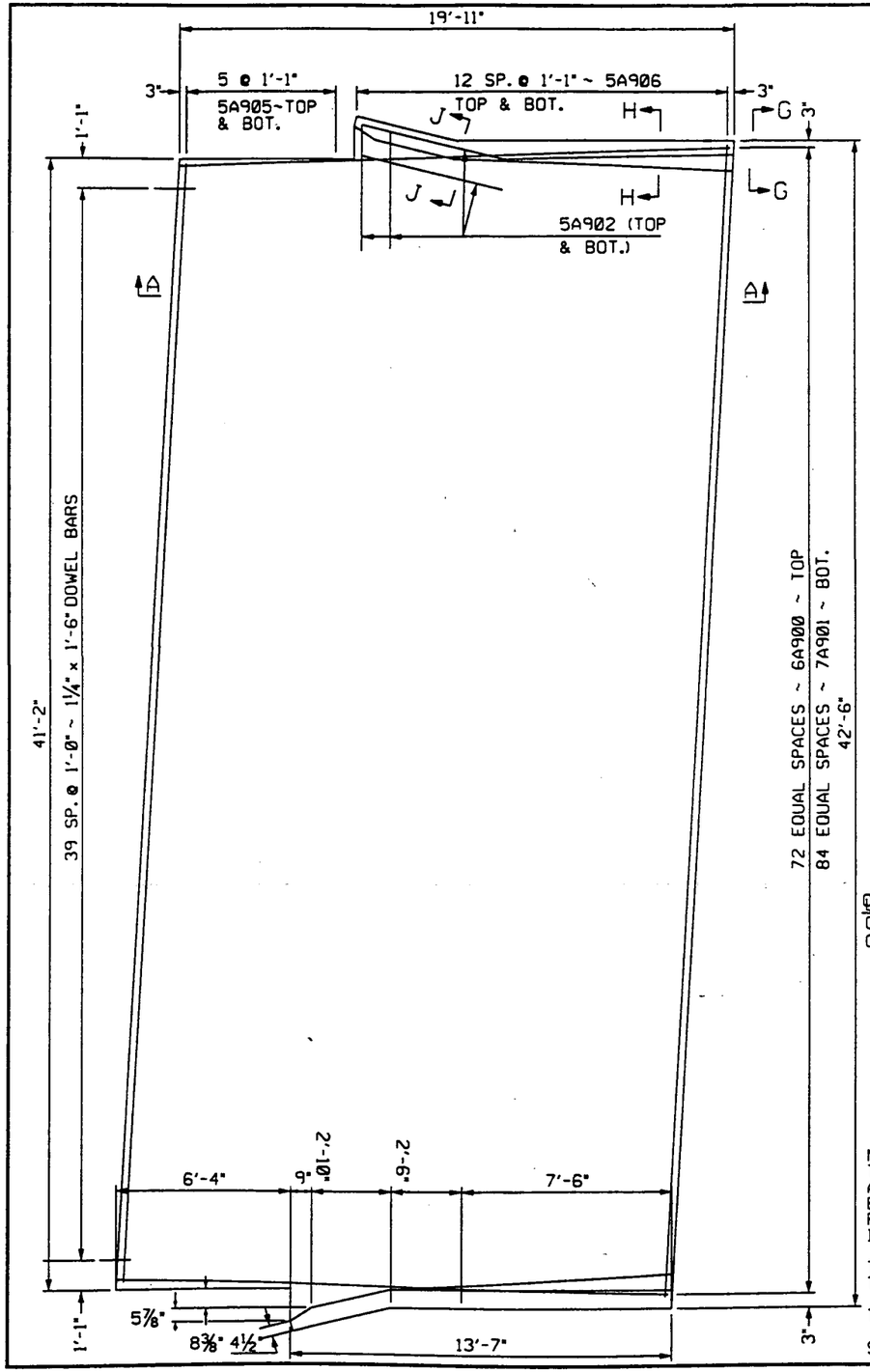
	UNIT	LT	RT
TACK:	GAL	21	28
HPB:	TON	47	61
AC:	TON	2.8	3.7

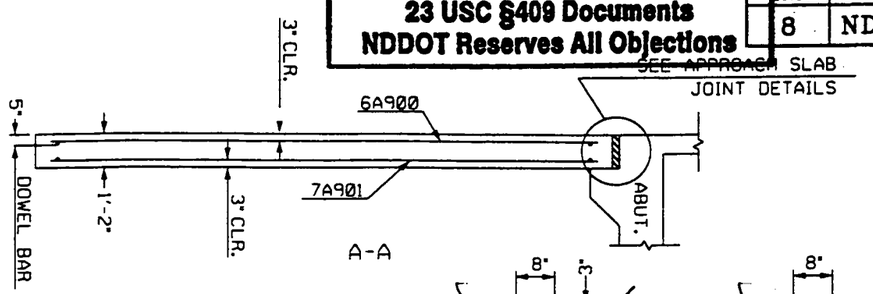
The HBP, asphalt cement and tack shall not be measured separately but shall be paid for by plan quantity which is the same as stated on sheet # 39 for project IM-8-029(026)053. The layout is the same as shown on sheet # 39.

The design for the guardrail will be the same as shown for the 40th Ave S overpass which is shown on plan sheet #52 in the plans CPU-8-984(007). The roadway width and lane widths are the same as shown on this sheet. The NDDOT Traffic Section of Design was called to verify that this design for guardrail at this location was correct.

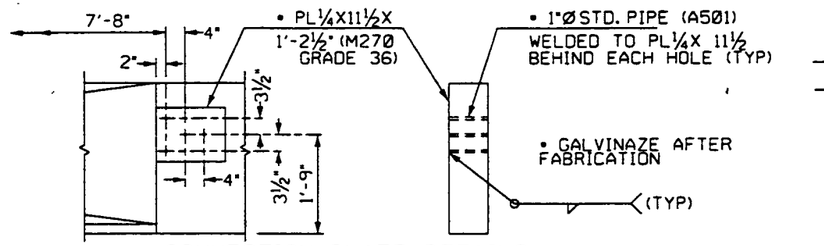
23 USC §409 Documents
NDDOT Reserves All Objections

FHWA REGION	STATE	FED. AID PROJECT NO.	SHEET NO.
8	ND	CPU-8-984(007)	45

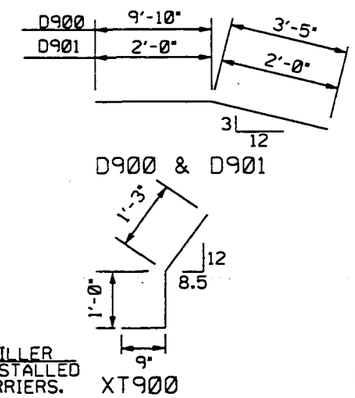


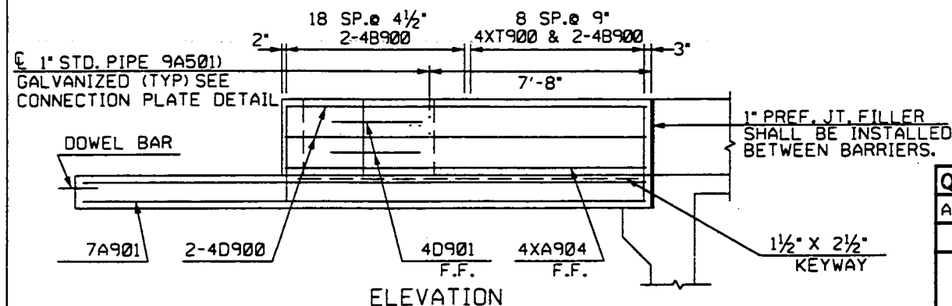


SKEW ANGLE = 2°28'40"			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	73	19'-7"
7	A901	85	19'-7"
5	A902	16	6'-0"
4	XA904	2	7'-6"
5	A905	12	40'-10"
5	A906	26	42'-2"
4	B900	112	4'-0"
4	D900	12	13'-3"
4	D901	4	4'-0"
4	XT900	18	3'-0"
ESTIMATED MATERIAL QUANTITIES			
REINFORCING STEEL (LBS)		CONCRETE (C.Y.)	
7766		38.2	



CONNECTION PLATE DETAILS





ELEVATION

QUANTITIES	(ONE SLAB)
APPROACH SLAB	93.5 S.Y.

NOTE:
THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE ,SAW CUTTING, POLYETHYLENE MEMBRANE, REINFORCING BARS, BACKER RODS, SILICON SEALANT,PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND APPROACH SLAB BARRIERS SHALL BE INCIDENTAL TO 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 REQUIREMENTS OF AASHTO M171.

THE BAR MARKS BEGINNING WITH AN "X", INDICATE AN EPOXY COATED BAR.

SURFACE FINISH "D" SHALL BE REQUIRED FOR ALL SURFACES OF THE CURB TRANSITIONS.

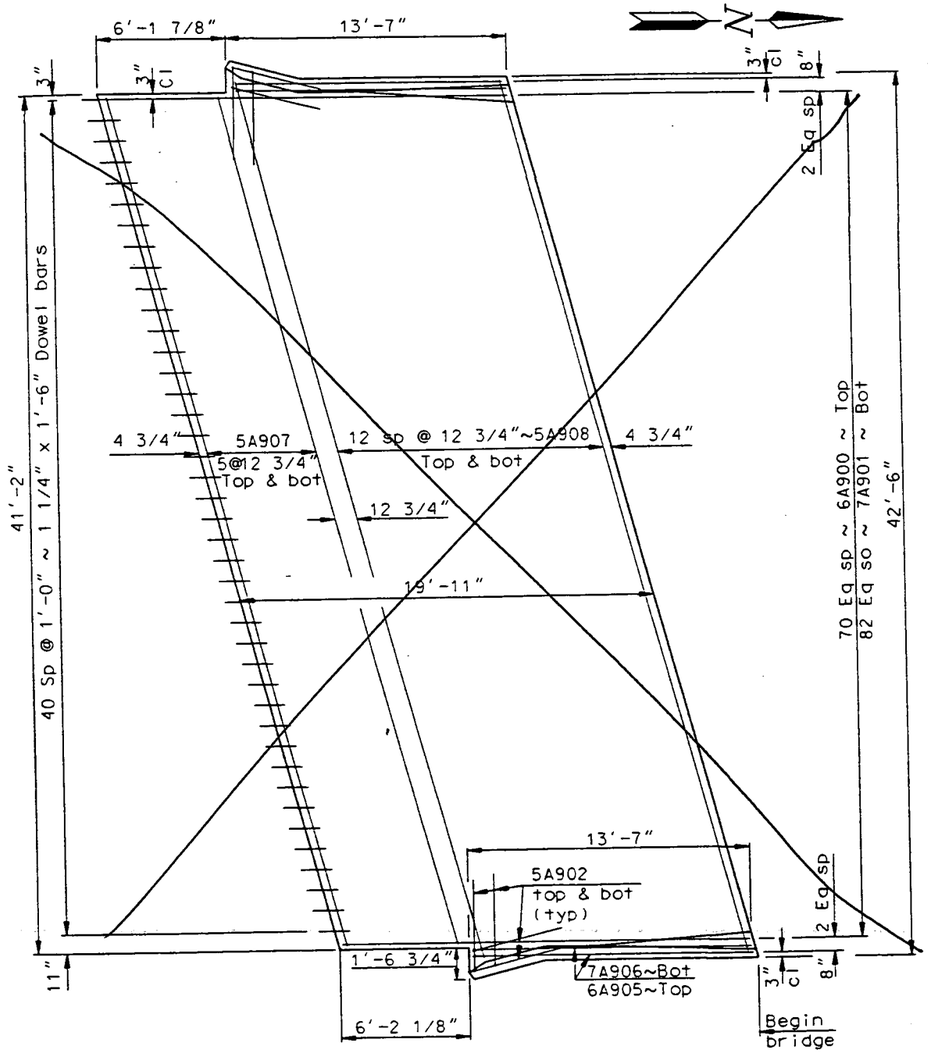
Rose Coulee
NORTHBOUND I-29
~~40th AVE. S. OVERPASS~~
APPROACH SLAB
ENTRANCE END

ULTEIG ENGINEERS, INC.

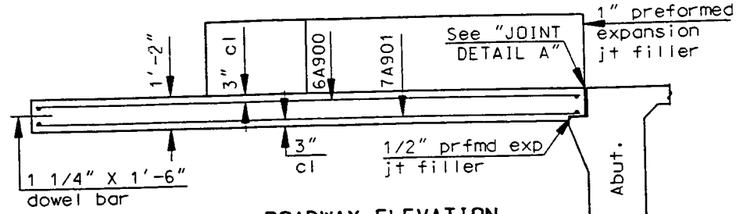
29-061.245 R-21
29-061.394 R

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(026)053	104

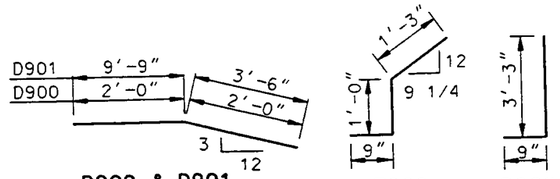
23 U.S.C. 409
NDDOT Reserves All Objections



PLAN



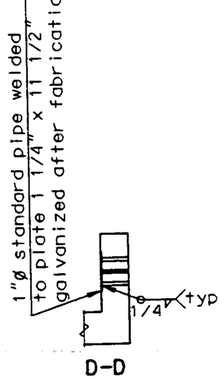
ROADWAY ELEVATION
See drawing No. 29-053.832R-5 for "JOINT DETAIL A"



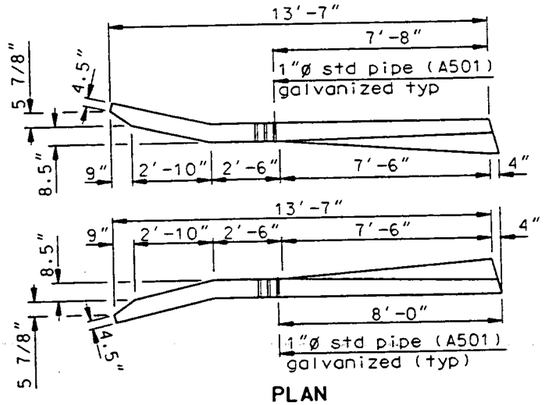
D900 & D901 XT900 B900

BENT BAR DETAILS
Dimensions shown are out to out

1"ø standard pipe welded to plate 1 1/4" x 11 1/2" galvanized after fabrication



D-D



PLAN

Width = 40'-0" clr rdwy
Skew angle = 15°

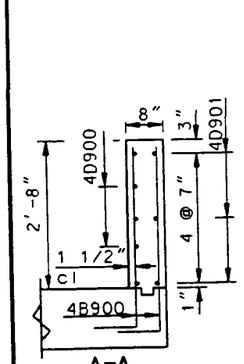
BAR LIST - ONE SLAB

SIZE	MARK	NO.	LENGTH
6	A900	71	19'-7"
7	A901	83	19'-7"
5	A902	16	4'-6"
4	XA903	2	7'-6"
6	A905	4	13'-3"
7	A906	4	13'-3"
5	A907	12	42'-3"
5	A908	26	43'-8"
4	B900	112	4'-0"
4	XT900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"

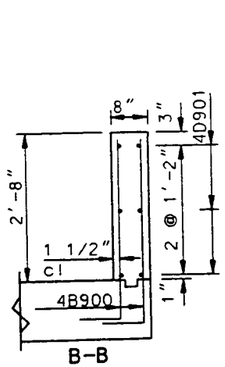
ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL LBS.	CONCRETE C.Y.
7,849	38.2

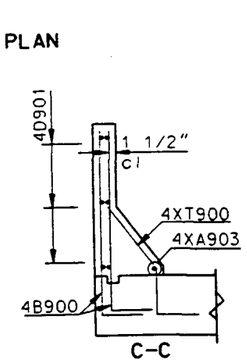
X = epoxy coated bar
See drawing 29-053.832R-5 for notes.



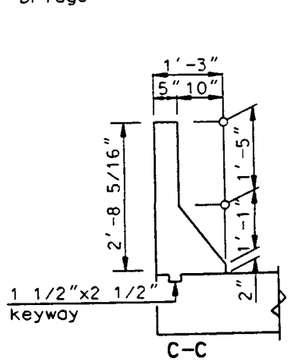
A-A



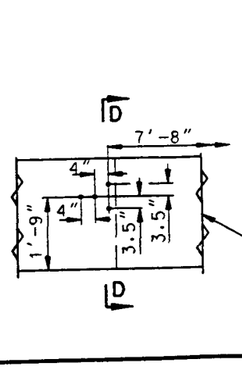
B-B

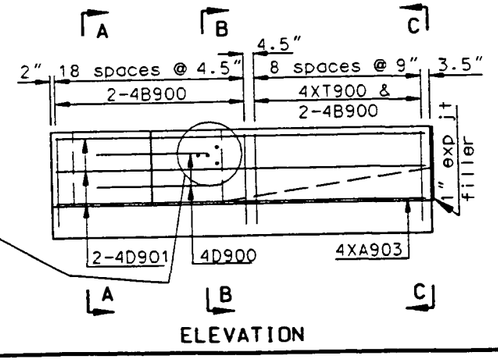


C-C



C-C





ELEVATION

QUANTITIES (ONE SLAB)	
Approach slab	93.5 SY

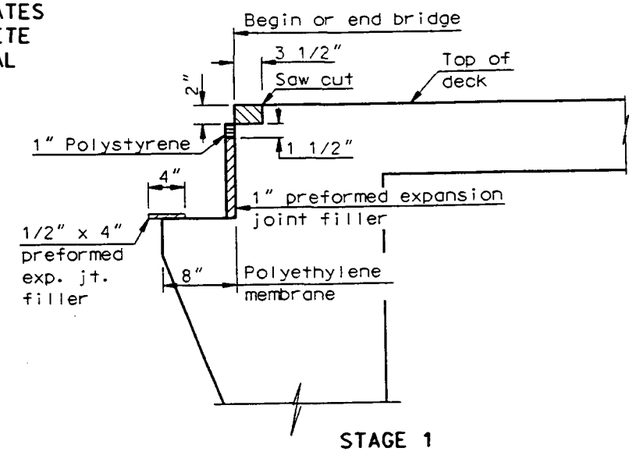
~~WILD RICE RIVER~~
Rose Coulee
APPROACH SLAB
SOUTH APPROACH

APPSLAB1 98LCS104 LLS

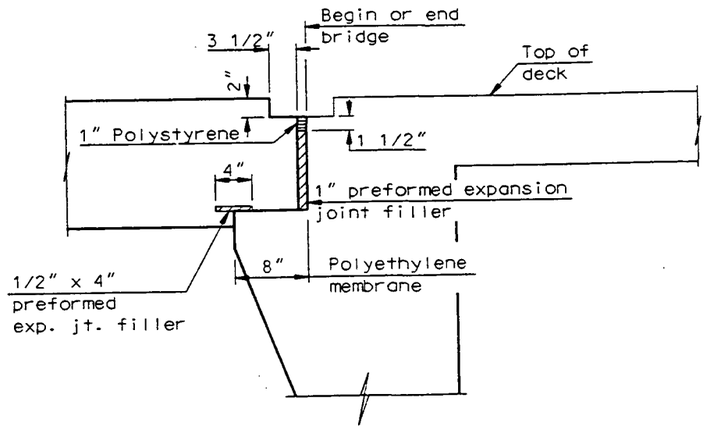
~~29-053.832R-3~~
29-061.394 R

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IM-8-029(026)053	106

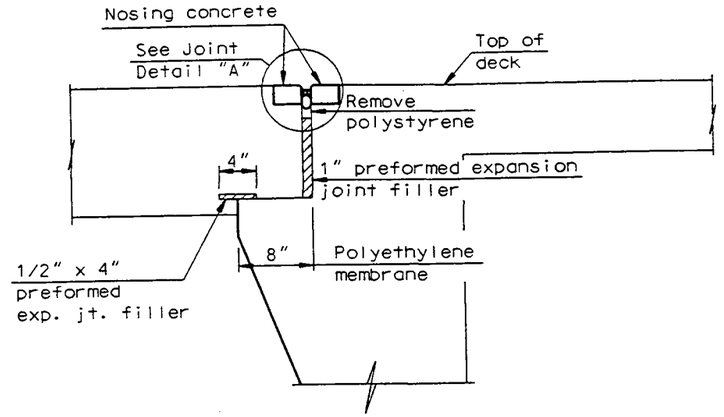
INDICATES CONCRETE REMOVAL



STAGE 1



STAGE 2



STAGE 3

APPROACH SLAB - BRIDGE DECK JOINT

STAGE 1:

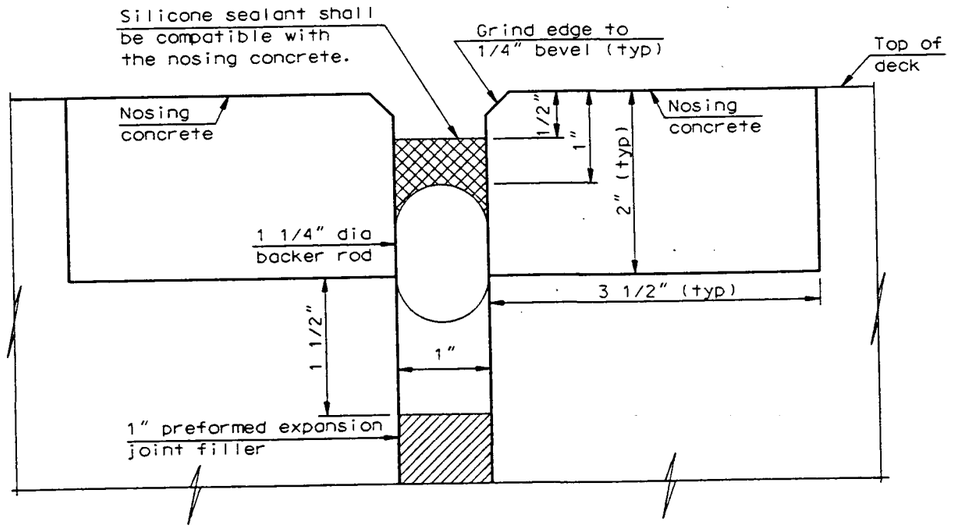
1. Remove concrete at ends of deck to allow for nosing concrete.
2. Place the 1" thick preformed expansion joint filler, the 1/2" x 4" preformed expansion joint filler, the 1" polystyrene and the polyethylene membrane.

STAGE 2:

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

STAGE 3:

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



JOINT DETAIL A

NOTES:

Dimensions shown in the area of the approach slab lip are for the existing approach slab lip. These dimensions will change if the approach slab lip is broken and needs to be repaired.

All estimated material quantities shown on drawing no. 29-053.832R-2, 3 & 4 are for informational purposes only. All materials including concrete, reinforcing bars, polyethylene mambrane, preformed joint filler, polystyrene, dowel bars, and labor required to build the approach slab and curb shall be included in the pay item "Bridge Approach Slab-Remove & Replace".

QUANTITIES (TWO APPROACHES)		
Nosing Concrete	8.1	CF
Silicone Sealant	83	LF

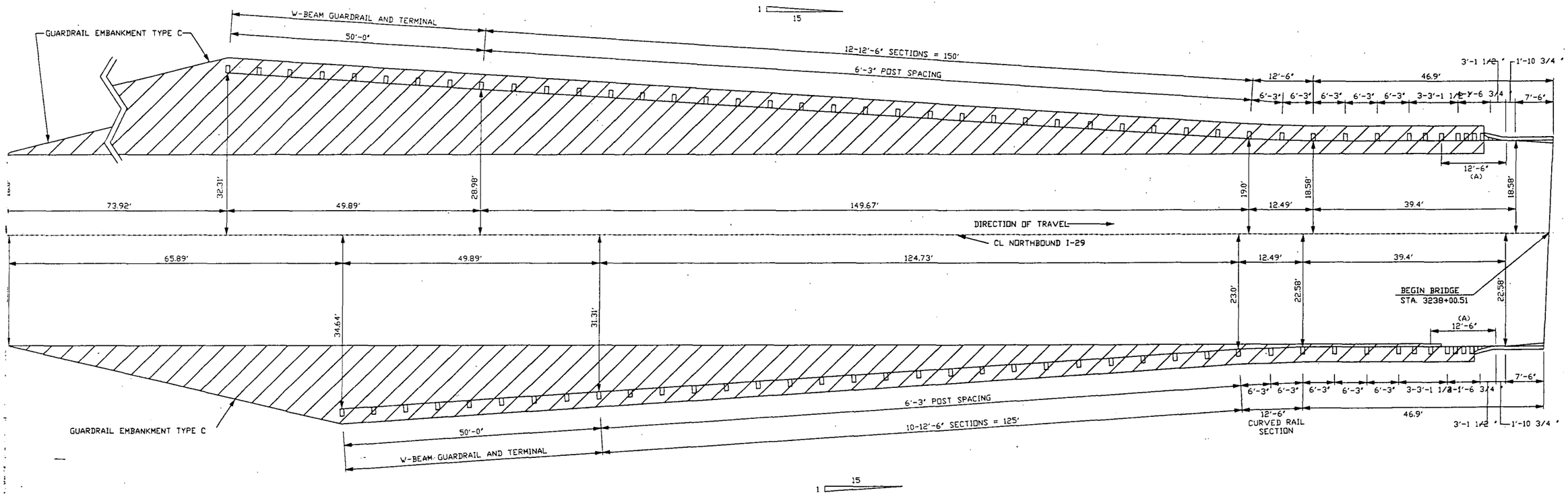
~~WILD RICE RIVER~~
Rose Coulee

APPROACH SLAB JOINT DETAILS

~~29-053.832R-5~~
29-061.394 R

APPRSLJT 98LCS106 LLS

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	CPU-8-984(007)	52



(A) 12'-6" DOUBLE RAIL SECTION

QUANTITIES	(ONE SLAB)
APPROACH SLAB	93.5 S.Y.

29-061, 394 R
Rose Coulee

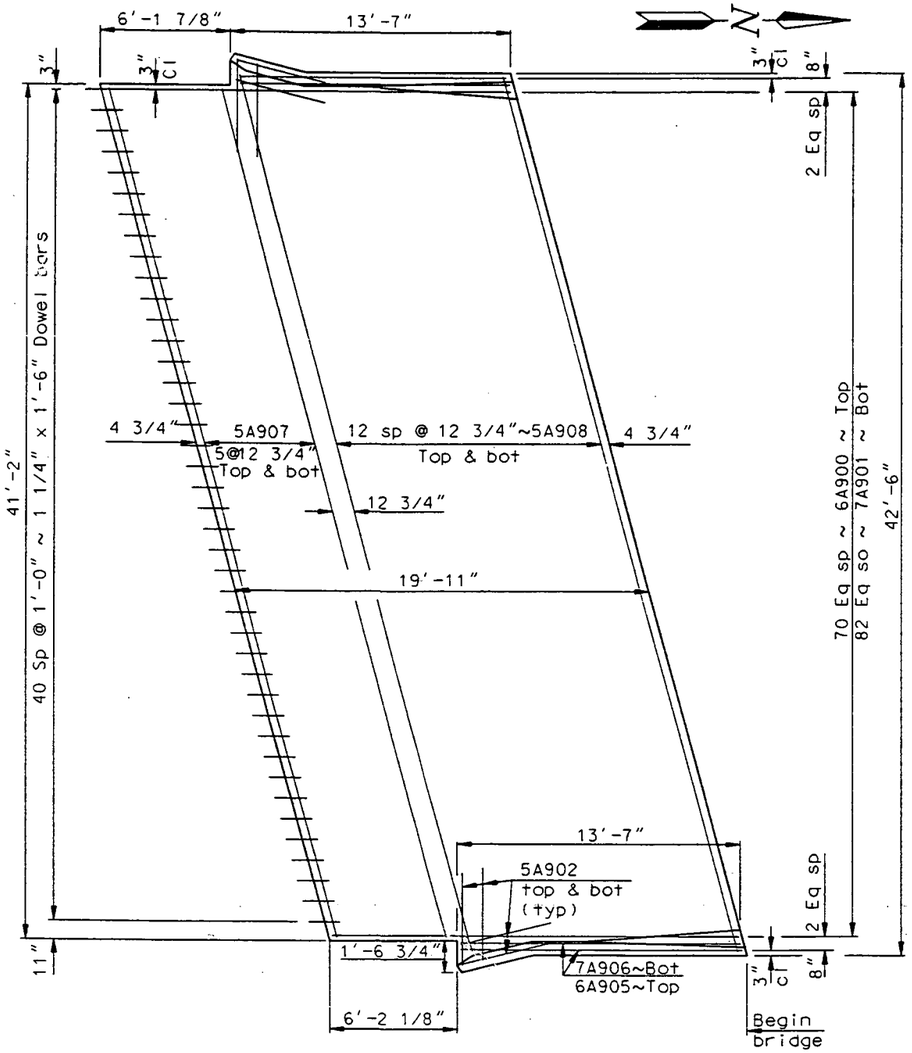
~~40TH AVENUE S OVERPASS~~

W-BEAM GUARDRAIL LAYOUT

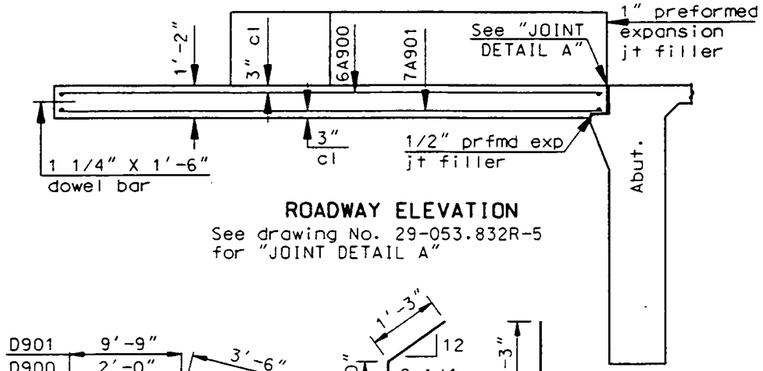
DRAWN BY:	CHECKED BY:	APPROVED BY:
SLW	SG	SG
FILE: DGNGRDR.DWG	DATE: 12-22-98	SCALE: 1" = 20'

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

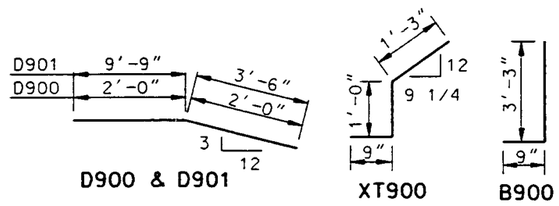
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(026)053	104



PLAN

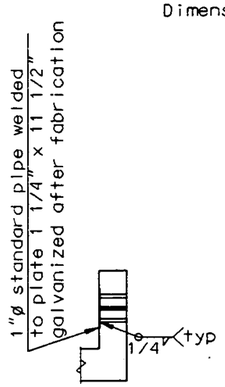


ROADWAY ELEVATION
See drawing No. 29-053.832R-5 for "JOINT DETAIL A"

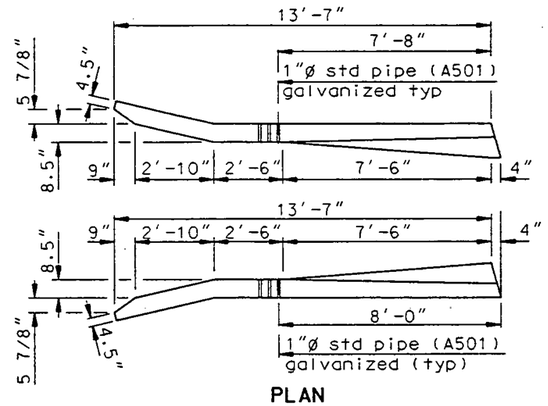


D900 & D901 XT900 B900

BENT BAR DETAILS
Dimensions shown are out to out



D-D

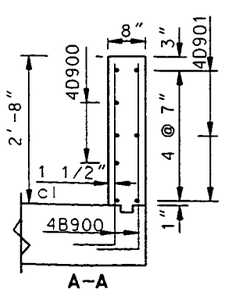


PLAN

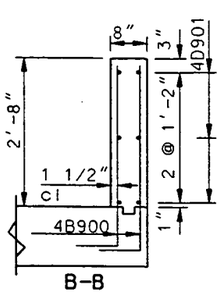
WOdth = 40'-0" clr rdwy			
Skew angle = 15°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	71	19'-7"
7	A901	83	19'-7"
5	A902	16	4'-6"
4	XA903	2	7'-6"
6	A905	4	13'-3"
7	A906	4	13'-3"
5	A907	12	42'-3"
5	A908	26	43'-8"
4	B900	112	4'-0"
4	XT900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL LBS.	CONCRETE C.Y.
7.849	38.2

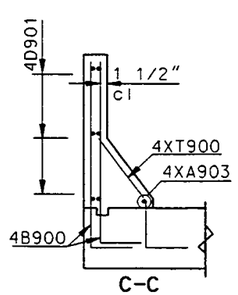
X = epoxy coated bar
See drawing 29-053.832R-5 for notes.



A-A



B-B



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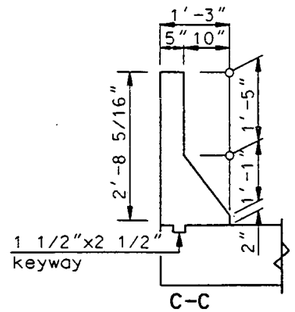

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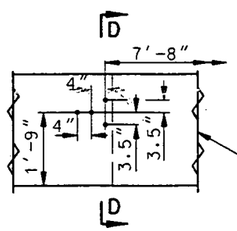
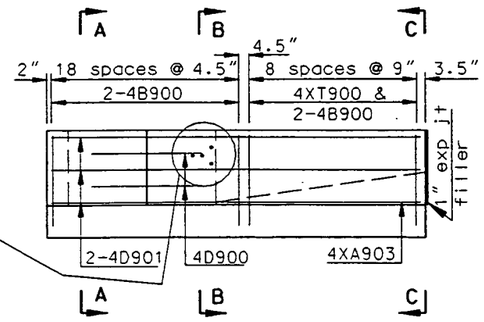




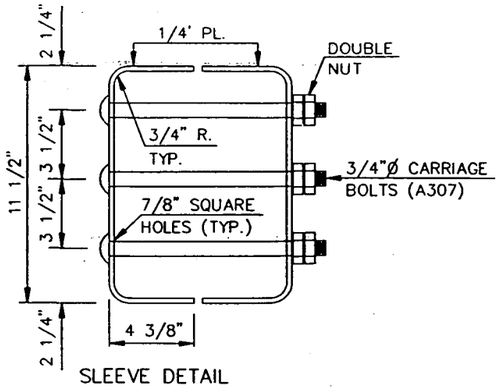
ELEVATION

QUANTITIES (ONE SLAB)	
Approach slab	93.5 SY

~~WILD RICE RIVER~~
ROSE COULEE

APPROACH SLAB
SOUTH APPROACH

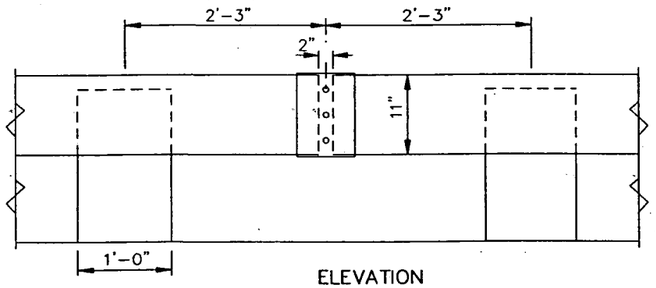
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(007)022	104A



SLEEVE DETAIL

NOTE:

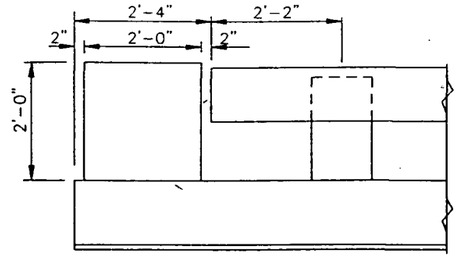
THE STEEL PLATES SHALL BE M183 STEEL. PL"s, BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111. THE MATERIALS AND LABOR TO INSTALL THE RAIL SLEEVES SHALL BE INCIDENTAL TO : "BRIDGE END POST MODIFICATION".



ELEVATION

SLEEVE AT RAIL JOINT

(4 REQUIRED PER BRIDGE)



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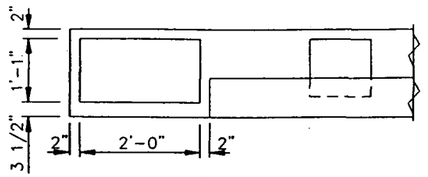
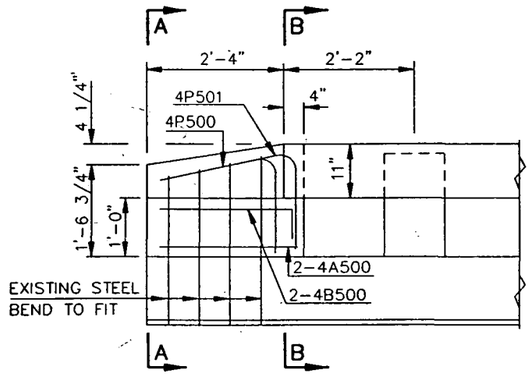
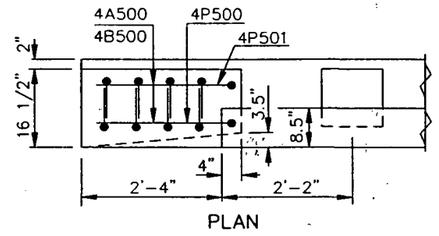


PLAN

SHOWING END POST REMOVAL LIMITS

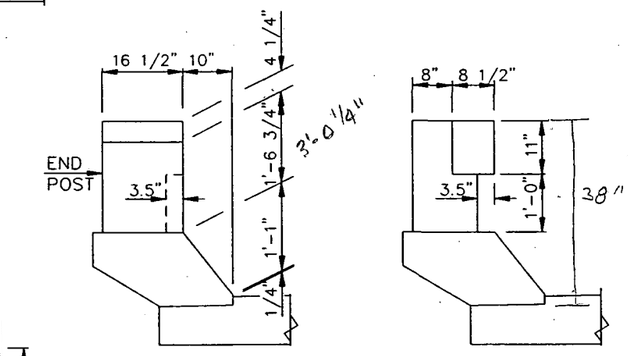


ELEVATION

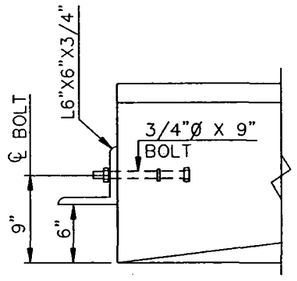


PLAN

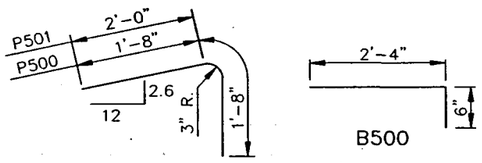
NEW END POST



A-A B-B



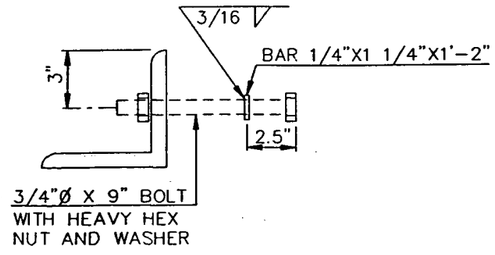
PLAN



P500 & P501

B500

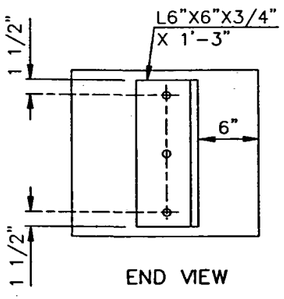
BENT BAR DETAILS



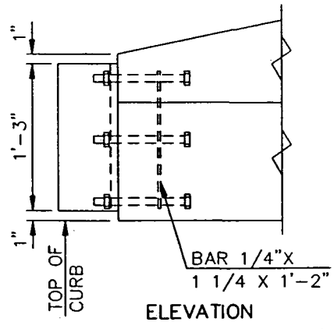
ANCHOR BOLT ASSEMBLY

NOTE:

THE 6"X6"X3/4" ANGLE SHALL BE USED IN LIEW OF THE MC8X20 SHOWN ON STANDARD D-764-3.



END VIEW



ELEVATION

END POST DETAIL

NOTE:

MODIFY BRIDGE END POSTS AT ENTRANCE END ONLY.

THE CONCRETE SHALL BE CLASS AAE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.
THE EXISTING END POSTS SHALL BE REMOVED AND PROPERLY DISPOSED OF. THE QUANTITIES SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING CONCRETE, STRUCTURAL STEEL AND REINFORCING BARS REQUIRED TO REMOVE AND REPLACE THE END POSTS SHALL BE INCIDENTAL TO THE PAY ITEM "BRIDGE END POST MODIFICATION".

SURFACE FINISH "D" SHALL BE REQUIRED FOR ALL SURFACES OF THE END POSTS.

BAR LIST (ONE POST)				
SIZE	MARK	NO.	LENGTH	SHAPE
4	A500	2	2'-4"	STR.
4	B500	2	2'-10"	BENT
4	P500	1	3'-4"	BENT
4	P501	1	3'-8"	BENT

ESTIMATE OF QUANTITIES (ONE POST)		
REMOVAL OF CONC.	0.16	C.Y.
CLASS AAE-3 CONC.	0.25	C.Y.
REINFORCING STEEL	12	LBS.
STRUCTURAL STEEL	37	LBS.

① SHEET ADDED 5-8-96

QUANTITIES (BOTH BRIDGES)		
BRIDGE END POST MODIFICATION	4	EA.

ROSE COULEE

RAIL SLEEVES & END POST DETAILS

29-061.394

12

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	IR-029-1(41)061 IR-029-2(50)064 M-8-081(14)932	1

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

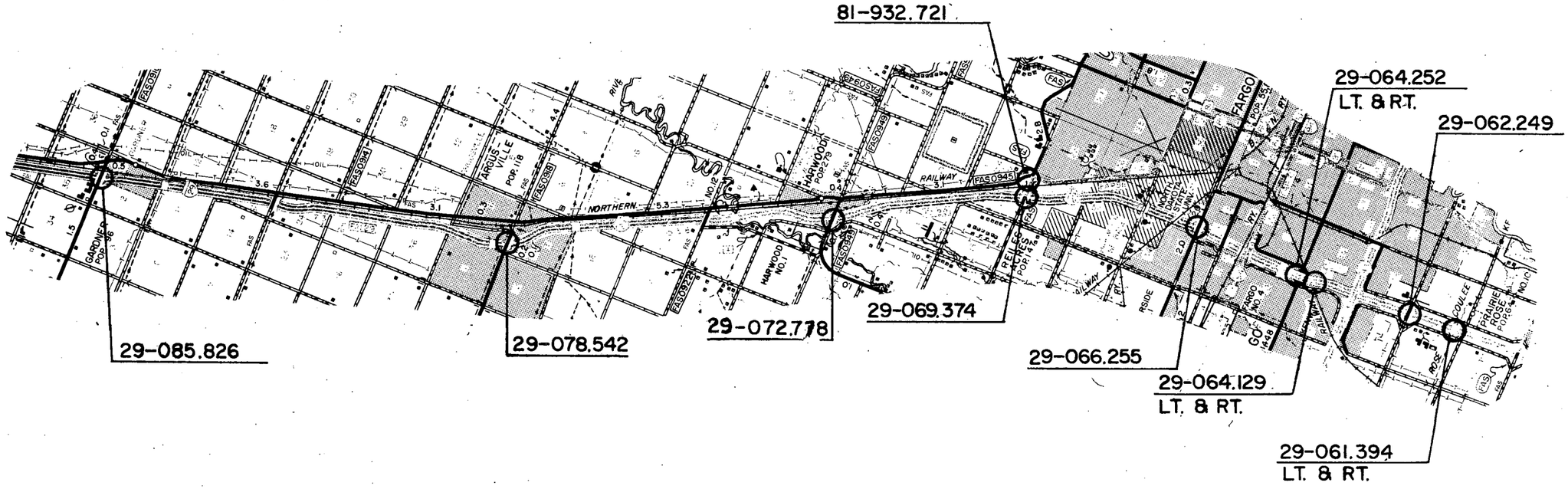
REPAIR & OVERLAY PORTLAND CEMENT CONCRETE BRIDGE DECKS IN CASS COUNTIES

FEDERAL AID PROJECT NO. IR-029-1(41)061
IR-029-2(50)064
M-8-081(14)932

CONTRACT NO. 1

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 9-23-82

BRIDGE ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

APPROVED DATE 9-24-82

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

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

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

SYMBOLS

STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
SECTION LINE
QUARTER SECTION LINE
SECTION CORNER
QUARTER SECTION CORNER
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
GRADE LINE
CENTERLINE OF CONSTRUCTION — 500
RAILROAD RIGHT OF WAY LINE
CITY OR VILLAGE CORPORATE LIMITS
PROPERTY LINE
EASEMENT LINE
FENCES
SNOW FENCE
DRAINAGE
WATERS EDGE
MARSH OR SWAMP
RIPRAP
DRAINAGE DITCH
APPROACH — 502 + 00
TRAVELED WAY
RAILROADS — NAME
GUARD RAIL
GUIDE POSTS
DELINEATORS
HEDGES AND TREES
INTERCHANGE
HIGHWAY GRADE SEPARATION - NO CONNECTION
OTHER BRIDGE
SERVICE ROAD
TERMINATED CROSS-ROAD

BUILDINGS
TELEGRAPH LINES
TELEPHONE LINES
POWER LINES
CULVERTS (In Place)
CULVERTS (Install)
CONCRETE BOX CULVERTS (Install)
BRIDGES (Install)
CONCRETE CURB
CONCRETE CURB AND GUTTER
CONCRETE WALK
CATCH BASIN (Existing)
CATCH BASIN (New)
MANHOLE (Existing)
MANHOLE (New)
CURB INLET (Existing)
CURB INLET (New)
GROUND MOUNTED SIGNS
OVERHEAD SIGNS
HYDRANT
LIGHT STANDARDS
TRAFFIC SIGNALS (Plan & Profile Sheets)
HIGH MAST LIGHTING ASSEMBLY
GROUND ELEVATION / GRADE — 643.0 / 641.0 / 245
CENTERLINE
SECTION LINE
DEFLECTION ANGLE (Delta)
SOD OR JUTE MESH
POLES TO BE MOVED
POLES TO BE LOWERED
CONCRETE FOUNDATION
CONDUIT
CONDUCTOR
CONCRETE PULL BOX
FEED POINT
250 WATT LIGHT STANDARDS
400 WATT LIGHT STANDARDS
700 WATT LIGHT STANDARDS
1000 WATT LIGHT STANDARDS
FLASHING BEACON
TRAFFIC SIGNAL - MAST ARM MOUNTED
TRAFFIC SIGNAL - POST MOUNTED
SIGNAL HEAD — 3
PEDESTRIAN PUSHBUTTON POST
TRAFFIC SIGNAL CONTROLLER
FEED POINT - PAD MOUNTED

ABBREVIATIONS

Aggr.	Aggregate	M. L.	Main Line
Ahd.	Ahead	N. R.	North Roadway
Alt.	Alternate	Off. Loc.	Office Location
Approx.	Approximate or Approximately	O to O.	Out to Out
Appr.	Approach	P. & P.	Plan and Profile
Asph. Cem. or A.C.	Asphalt Cement	P. C.	Point of Curvature
Asph. Conc.	Asphaltic Concrete	P. C. C.	Point of Compound Curve
Bit.	Bituminous or Bitumen	P.C.C. Pvm't	Portland Cement Concrete Pavement
Bk.	Back	P. D.	Private Drive
B. M.	Bench Mark	Pen.	Penetration
Bldg.	Building	Perf.	Perforated
Br.	Bridge	P. I.	Point of Intersection
C.A.E.S.	Corrugated Aluminum End Section	P. O. C.	Point on Curve
C.A.P.	Corrugated Aluminum Pipe	P. O. T.	Point on Tangent
C.B.	Cdtch Basin	P. P.	Power Pole
C. & G.	Curb and Gutter	P. R. C.	Point of Reverse Curvature
Ch. Blk.	Channel Block	Pref.	Preformed
Ch. Ch.	Channel Change	P.S.D.	Passing Sight Distance
C. I.	Curb Inlet	P. T.	Point of Tangency
C.I.P.	Cast Iron Pipe	P.V.C.	Polyvinyl Chloride Sewer Pipe
Cl.	Class	Quant.	Quantity or Quantities
C.S.E.S.	Corrugated Steel End Section	R	Radius
C.S.P.	Corrugated Steel Pipe	R or Rge.	Range
CMS	Cationic Medium Setting	RC	Rapid Curing
Comp.	Compression	R.C.E.S.	Reinforced Concrete End Section
Const.	Construction	R.C.P.	Reinforced Concrete Pipe
Conc.	Concrete	R.C.P.S.	Reinforced Concrete Pipe Sewer
Cont. Reinf. Conc. Pvm't	Continuously Reinforced Concrete Pavement	Rd.	Road
Contn.	Contraction	Rdbd.	Roadbed
Crn.	Crown	Rdwy.	Roadway
CRS	Cationic Rapid Setting	Refl.	Reflectorized
Crse.	Course	R. R.	Railroad
C. S.	Curve to Spiral	Rt.	Right
C. to C.	Center to Center	R/W	Right of Way
C.Y.	Cubic Yard	Salv.	Salvage
D	Degree of Curvature	San.	Sanitary
D-Load	Dead Load	S.C.	Spiral to Curve
D.B.	Ditch Block	SC	Slow Curing
Def.	Deformed	Sc	Spiral Deflection Angle
Del.	Deliver	S.D.	Sight Distance
D.G.	Ditch Grade	S. E.	Superelevation
El. or Elev.	Elevation	Sec.	Section
Ellipt.	Elliptical	Sec. Line Appr.	Section Line Approach
Emb.	Embankment	Sep.	Separation
Emul.	Emulsified	Serv.	Service
Engr.	Engineer	Sgr. Prep.	Subgrade Preparation
Eq.	Equation	Shldr.	Shoulder
E. R.	East Roadway	SP	Special Provision
E.S.	End Section	S.P.P.	Structural Plate Pipe
Esmt.	Easement	S.P.P.A.	Structural Plate Pipe Arch
Exc.	Excavation	S. R.	South Roadway
Exp.	Expansion	SS	Slow Setting or Supplement Specification
F. D.	Field Drive	S.S.D.	Stopping Sight Distance
Found.	Foundation	S. T.	Spiral to Tangent
F. P.	Fence, Post	Sta.	Station
Furn.	Furnish	Std.	Standard
Ga.	Gage or Gauge	Std. Specs.	Standard Specifications
Gr.	Gravel	Struct.	Structure
Grd.	Graded	Surf.	Surface or Surfacing
G. V.	Gate Valve	Surv.	Survey
Hel.	Helical	S. W.	Sidewalk
Hyd.	Hydrant	S.Y.	Square Yard
Ident.	Identification	T.	Tangent Length (circular curve)
Inchg.	Interchange	T. or Twp.	Township
I. M.	Iron Monument	Tel.	Telephone
inst.	Install	Temp.	Temporary
Inter.	Intersection	T. P.	Telephone Pole
Inv.	Invert	Tr.	Traffic
Jt.	Joint	Trans.	Transverse or Transition
L	Length of Curve	Trtd.	Treated
Lc	Length of Spiral	Ts	Tangent Length (curve with spirals)
Levg.	Leveling	T. S.	Tangent to Spiral
L. F.	Linear or Lineal Foot	U.S.C. & G.S.	United States Coast and Geodetic Survey
Liq.	Liquid	V.C.	Vertical Curve
Long	Longitudinal	V.C.P.	Vitrified Clay Pipe
L. P.	Light Pole	W. M.	Water Main
Lt.	Left	W.M.V.	Water Main Valve
"M"	One Thousand	W. R.	West Roadway
Matl.	Material	Wrng.	Wearing
Max	Maximum	W.S.V.	Water Service Valve
MC	Medium Curing	X-Sec.	Cross Section
M.H	Manhole	Xc	Spiral Coordinate
Min.	Minimum	Yc	Spiral Coordinate

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NOTES

GENERAL

THE CONTRACTOR SHALL NOTIFY THE DISTRICT OFFICE OF THE STATE HIGHWAY DEPT. 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 OVERLAYS 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 THAT IS REPLACED IN THE DECK OR 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 LONGITUDINAL CENTERLINE TO THE CURB IN ONE CONTINUOUS POUR UNLESS OTHERWISE SHOWN. 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.

CLASS OF CONCRETE

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

CONSTRUCTION JOINTS

ALL EXISTING CONSTRUCTION OR RELIEF JOINTS, TRANSVERSE OR LONGITUDINAL, SHALL BE CLEANED OUT PRIOR TO THE PLACEMENT OF THE OVERLAY. THE OVERLAY SHALL THEN BE SAW CUT AT THESE LOCATIONS WITHIN 24 HOURS OF PLACEMENT. THE JOINT SHALL THEN BE SEALED WITH HOT POURED ELASTIC TYPE JOINT SEALER 0 INCH TO 1/8 INCH BELOW THE FINISHED PAVEMENT. THE COST OF ANY SUCH WORK SHALL BE INCIDENTAL TO CLASS 1 OVERLAY OR OVERLAY TAPER.

SHOULDER REPAIR

AREAS OF BITUMINOUS SURFACED SHOULDERS USED TO CARRY TRAFFIC DURING CONSTRUCTION SHALL BE MAINTAINED BY THE CONTRACTOR, AND AFTER COMPLETION OF THE WORK, SHALL BE RESTORED TO SATISFACTORY CONDITION. THE CONTRACTOR WILL BE REIMBURSED AT THE BID PRICE FOR "HOT BITUMINOUS PAVEMENT - SPECIAL" FOR THE HOT MIX USED TO MAINTAIN AND REPAIR THE SHOULDERS. THIS PAYMENT WILL CONSTITUTE FULL REIMBURSEMENT FOR ALL MATERIALS, LABOR, AND EQUIPMENT REQUIRED TO MAINTAIN AND REPAIR THE SHOULDERS.

HOT BITUMINIOUS PAVEMENT

WHERE SPECIFIED, ASPHALT ADDED TO BRIDGE APPROACHES ON THE MAINLINE (I-29) STRUCTURES SHALL BE HOT BITUMINOUS PAVEMENT (TACONITE TAILINGS). THE ASPHALT TAPERS ON THE CROSS OVER STRUCTURES AND ANY USED ON SHOULDER REPAIR SHALL BE HOT BITUMINIOUS PAVEMENT-SPECIAL. THE TACK COAT IS NOT A SEPARATE PAY ITEM, BUT SHALL BE INCLUDED IN THE PRICE BID FOR HOT BITUMINOUS PAVEMENT-SPECIAL OR HOT BITUMINOUS PAVEMENT (TACONITE TAILINGS). THE TYPE AND GRADE OF TACK SHALL BE APPROVED BY THE ENGINEER. THE ASPHALT CEMENT WILL BE PAID FOR UNDER BID ITEM 85-100 ASPHALT CEMENT. THE MINIMUM AIR TEMPERATURE AT THE TIME OF LAYDOWN SHALL BE 50 DEGREES F. OR AS APPROVED BY THE ENGINEER. THE HOT BITUMINOUS PAVEMENT MATERIAL SHALL BE HOT MIXED AND MACHINE LAID. THE AGGREGATE USED IN THE HOT BITUMINOUS PAVEMENT-SPECIAL SHALL BE APPROVED BY THE FIELD ENGINEER. THE AGGREGATE USED IN THE HOT BITUMINOUS PAVEMENT (TACONITE TAILINGS) SHALL HAVE A GRADATION AS FOLLOWS:

SIEVE	PERCENT PASSING
1/2	100
3/8	90-100
4	60-100
10	50-90
40	5-40
200	0-5

THE TEMPERATURE OF THE HOT BITUMINIOUS PAVEMENT AT DISCHARGE FROM THE MIXER SHALL NOT EXCEED 300 DEGREES F. THE TEMPERATURE OF THE MIX AT LAYDOWN SHALL NOT BE LESS THAN 210 DEGREES F., IF THE AIR TEMPERATURE IS ABOVE 60 DEGREES, AND SHALL NOT BE LESS THAN 225 DEGREES F. IF THE AIR TEMPERATURE IS LESS THAN 60 DEGREES F. THE ACTUAL MIXING TEMPERATURE SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER WITHIN THE ALLOWABLE LIMITATIONS TO BEST SUIT CONSTRUCTION CONDITIONS.

THE COMPACTION EQUIPMENT FOR PAVING SHALL INCLUDE NOT LESS THAN ONE APPROVED STEEL ROLLER OR APPROVED VIBRATORY ROLLER AND ONE APPROVED PNEUMATIC TIRED ROLLER. THE INITIAL COMPACTION SHALL BE COMPLETED BEFORE THE MAT DROPS BELOW 170 DEGREES F., AND THE SPECIFIED DENSITY SHALL BE OBTAINED BEFORE THE MAT TEMPERATURE DROPS BELOW 140 DEGREES F.

TWO-LANE, TWO-ROADWAYS

THE MAINTENANCE AND PROTECTION OF TRAFFIC FOR TWO-LANE, TWO-WAY ROADWAYS AT 32ND AVE S.INTER. 29-062.249, 12TH AVE N INTER 29-066.255, NORTH FARGO INTER 29-069.374, AND BN RR SEP 81-932.721 (EAST OF N FARGO INTER.) PROVIDES FOR FLAGGING THE TRAFFIC AT ALL TIMES, UNTIL THE ROADWAY IS COMPLETELY OPEN TO TRAFFIC. THE COST OF FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED SHALL BE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL. IN LIEU OF PROVIDING THE FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED A TRAFFIC SIGNAL SYSTEM MAY BE PROVIDED, ELIMINATING THE NEED FOR FLAGGING DURING THIS PERIOD. THE TRAFFIC SIGNAL SYSTEM SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE PRECONSTRUCTION CONFERENCE. IF A TRAFFIC SIGNAL SYSTEM IS USED, A WATCHMAN IS STILL NECESSARY IN CASE THE SYSTEM MALFUNCTIONS.

PORTABLE PRECAST CONCRETE MEDIAN BARRIERS

THE NUMBER OF PRECAST CONCRETE MEDIAN BARRIERS REQUIRED ON THE PROJECT SHALL BE 60- 10 FOOT UNITS. THIS NUMBER PROVIDES COVERAGE FOR THE LONGEST STRUCTURE AND APPROACH ON THIS PROJECT. THE BARRIERS SHALL BE OBTAINED FROM THE FARGO DISTRICT STORAGE YARD, TRANSPORTED TO THE WORK SITES AND ASSEMBLED AS REQUIRED. UPON COMPLETION OF THE PROJECT THE CONTRACTOR SHALL RETURN THE BARRIERS TO THE FARGO DISTRICT STORAGE YARD. ANY BARRIERS THAT BECOME DAMAGED DURING HANDLING, TRANSPORTING, OR PLACING SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. IN LIEU OF USING THE STATE FURNISHED BARRIERS, THE CONTRACTOR MAY FURNISH THE REQUIRED BARRIERS. THE COST OF OBTAINING, TRANSPORTING, INSTALLING, MOVING AND RETURNING THE PRECAST CONCRETE MEDIAN BARRIERS SHALL BE INCIDENTAL TO THE PRICE BID FOR TRAFFIC CONTROL. IF THE CONTRACTOR CHOOSES TO WORK ON MORE THAN ONE STRUCTURE, ADDITIONAL BARRIER AND ATTENUATION DEVICES SHALL BE FURNISHED AT HIS OWN EXPENSE.

ATTENUATION DEVICE

THE CONTRACTOR SHALL PROVIDE THE ATTENUATION DEVICE AS SHOWN IN THE PLANS.

GUARD RAIL AND/OR END POSTS

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

CURB AND GUTTER FOR BRIDGE APPROACHES

WHERE SPECIFIED, THE CURB AND GUTTER SHALL BE BUILT TO MATCH THE NEW GRADE AS ESTABLISHED FOR THE BRIDGE APPROACHES, THE CURB SHALL TRANSITION FROM THE EXISTING SECTION ON THE BRIDGE TO THE TYPICAL SECTION SHOWN ON THE GROUND AS SHOWN ON STANDARD D-708-6 OR D-708-8.

FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	TOTAL SHEETS
8	N.D.	IR-29-1(41) 061 IR-29-2(50)064 M-8-081(14)932	3

SPECIAL PROVISIONS

NO.	NAME
SP-103-3	AWARD AND EXECUTION OF CONTRACT
SP-107-7	LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC
SP-108-9	PROSECUTION AND PROGRESS
SP-108-19	PROSECUTION AND PROGRESS
SP-109-4	MEASUREMENT AND PAYMENT
SP-402	REPAIR AND OVERLAY OF P.C.C. BRIDGE DECKS WITH LOW SLUMP CONCRETE
SP-406-11	HOT BITUMINUS PAVEMENT
SP-746-1	FLAGGING
SP-756-2	FIELD LABORATORY
SP-762-6	MAINTENANCE & PROTECTION OF TRAFFIC
SP-610-3	PORTLAND CEMENT CONCRETE
SP-806-3	AGGREGATE FOR PORTLAND CEMENT
SP-370	RAILWAY PROTECTION INSURANCE

LIST OF STANDARD

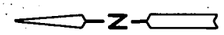
D-708-6
D-708-8

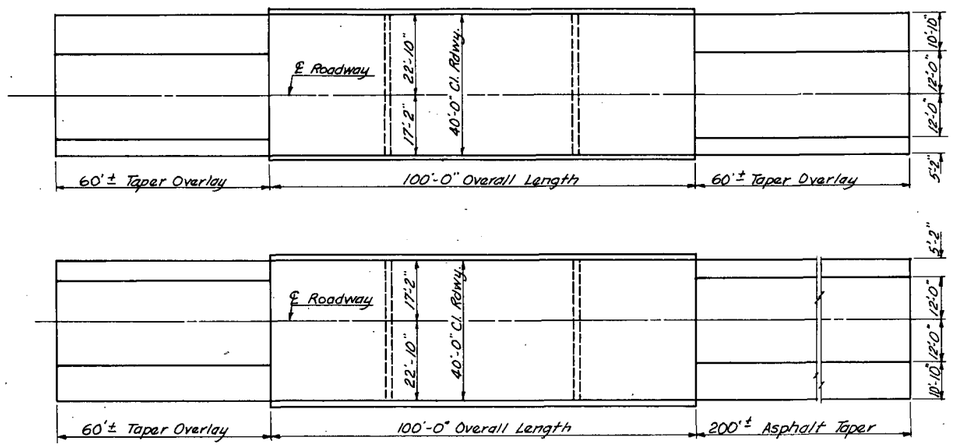
SUMMARY OF QUANTITIES

SPEC. NO.	103	406	705	708	716	746	750	756	762	900	900	900	900	406	322
CODE NO.	0100	0230	0100	0420	0100	0100	0100	0100	3298	9700	9701	9702	9705	0100	0360
BRIDGE NO.	CONTRACT BOND	HOT BITUMINOUS PAVEMENT SPECIAL	MOBILIZATION	CURB & GUTTER TYPE I-REINFORCED	ADJUST CATCH BASIN	FLAGGING	LINSEED OIL TREATMENT	FIELD LABORATORY TYPE "A"	TRAFFIC CONTROL	CLASS 1 OVERLAY	CLASS 2 OVERLAY	CLASS 3 OVERLAY	OVERLAY TAPER	HOT BIT. PAVEMENT (TACONITE TAILINGS)	85-100 ASPHALT CEMENT
	L.S.	TON	L.S.	L.F.	EA.	M.HR.	GAL.	L.S.	L.S.	S.Y.	S.Y.	S.Y.	S.Y.	TON	TON
ROSE COULEE 29-061.338 LT. ROSE COULEE 29-061.394 RT.	1		1			25	10.7	1	1	444.4	88.9	22.2	266.7	90.0	5.9
						25	14.7			444.4	88.9	22.2	533.3		
32nd AVE. INT. 29-062.249		38.0		160	4	35	24.8			1655.1	331.0	82.8			2.5
BN SEP 29-064.129 LT. BN SEP 29-064.129 RT.				214	3	35	15.4			1028.0	205.6	51.4		131.1	8.5
				216	4	35	15.4			1028.0	205.6	51.4		115.0	7.5
13th AVE. S 29-065.232 LT.				160	2	35	9.0			600.0	120.0	30.0		151.4	9.8
13th AVE. S 29-065.232 RT.				160	2	35	9.0			600.0	120.0	30.0		135.5	8.8
13th AVE. N INT. 29-066.255		20.0		160	2	35	13.5			900.0	180.0	45.0			1.3
NORTH FARGO INT. 29-069.374		24.0		160	2	35	14.7			983.3	196.7	49.2			1.6
HARWOOD INT. 29-072.778		36.0		160	4	35	20.0			1333.3	400.0	100.0			2.3
ARGUSVILLE INT. 29-078.542		27.0		160	4	35	15.0			1000.0	200.0	50.0			1.8
GARDNER INT. 29-085.826		24.0		160	4	35	13.8			916.7	183.3	45.8			1.6
SUB-TOTAL	1	169.0	1	1710	31	400	176.0	1	1	10,933.2	2320.0	580.0	800.0	623.0	51.6
BN SEP E OF N FGO BI-932.721 INT.		24.0		160	2	35	10.5			700.0	140.0	35.0			1.6
TOTAL	1	193.0	1	1870	33	435	186.5	1	1	11,633.2	2460.0	615.0	800.0	623.0	53.2

NOTES & QUANTITIES

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-29-1 (41)061	4





PLAN

40'-0" Clear Roadway

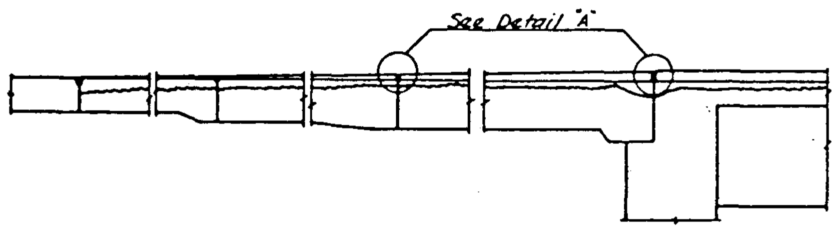
Deck drains on both bridges

Asphalt overlay shall be "Hot Bit. Pavement (Taconite Tailings)"

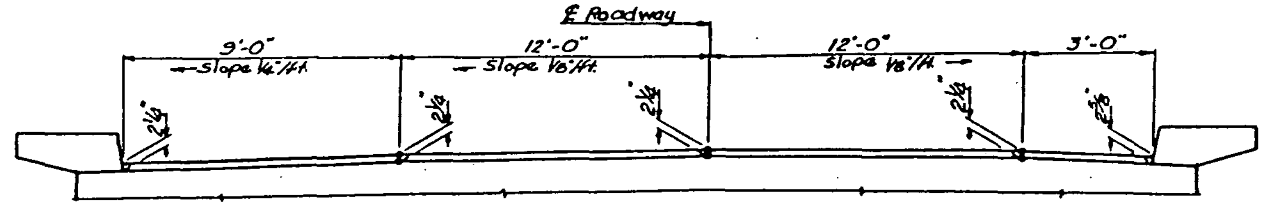
ROSE COULEE

LT. & RT. 29-061.394-3

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-29-1 [illegible] IR-29-2 [illegible] [illegible]	14

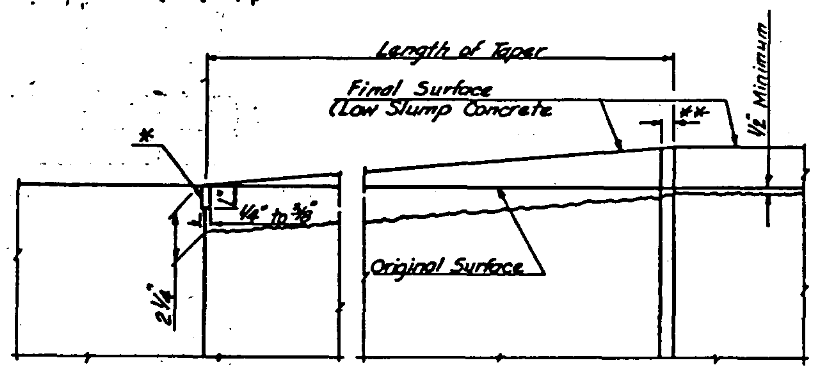


APPROACH SLAB OVERLAY



ELEVATION

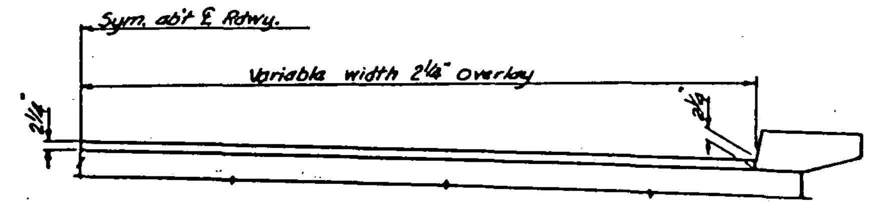
BNRR SEP. LT. & RT.
13th AVE. S LT. & RT.



DETAIL "A"

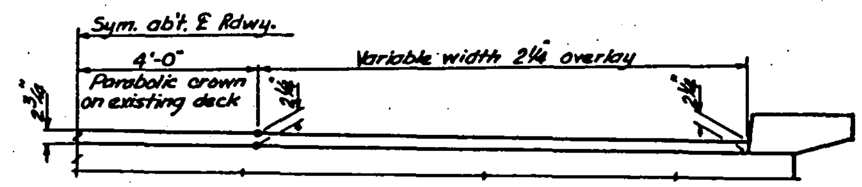
* To be filled with hot poured joint filler

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



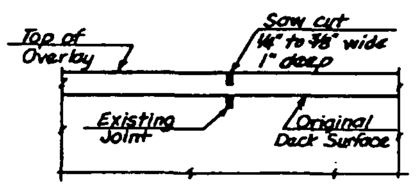
ELEVATION

ROSE COULEE LT. & RT.
32nd AVE. S. INT.
HARWOOD INT.
ARGUSVILLE INT.
GARDNER INT.



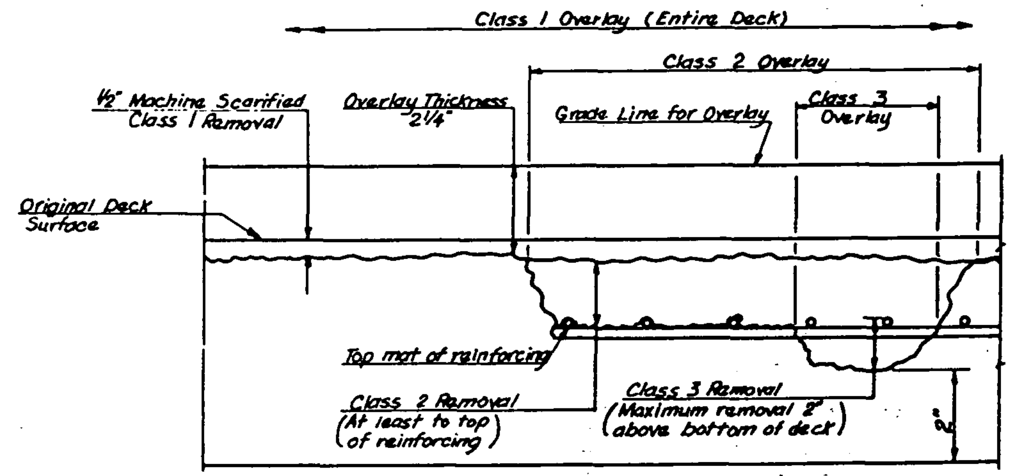
ELEVATION

12th AVE. N.
N. FARGO INT.
BNRR SEP. EAST OF N. FGO. INT. (81-932.721)



CONSTRUCTION OR RELIEF JOINTS
(TRANSVERSE & LONGITUDINAL)

Incidental to Class I Overlay or Overlay Taper

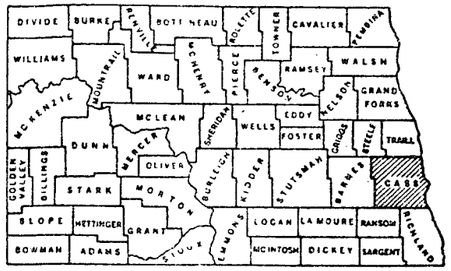


BRIDGE DECK

NOTE:
Maximum limits for Class 3 Overlay will be determined in the field, but will be less than full depth of slab. (See Special Provisions)

OVERLAY DETAILS

FED ROAD DIV NO	STATE	FED AID PROJ NO	SHEET NO
5	N.D.	I-29-1(4)	1



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

STRUCTURE 1

SCALES
- LAYOUT SHEET: 1 IN. = 1 IN. = 4000 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 CASS COUNTY

FEDERAL AID PROJECT NO. I-29-1(4) 54

GRADING AND STRUCTURAL

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
I-29-1(4)	9.476	9.476
TOTALS	9.476	9.476

GOVERNING SPECIFICATIONS:

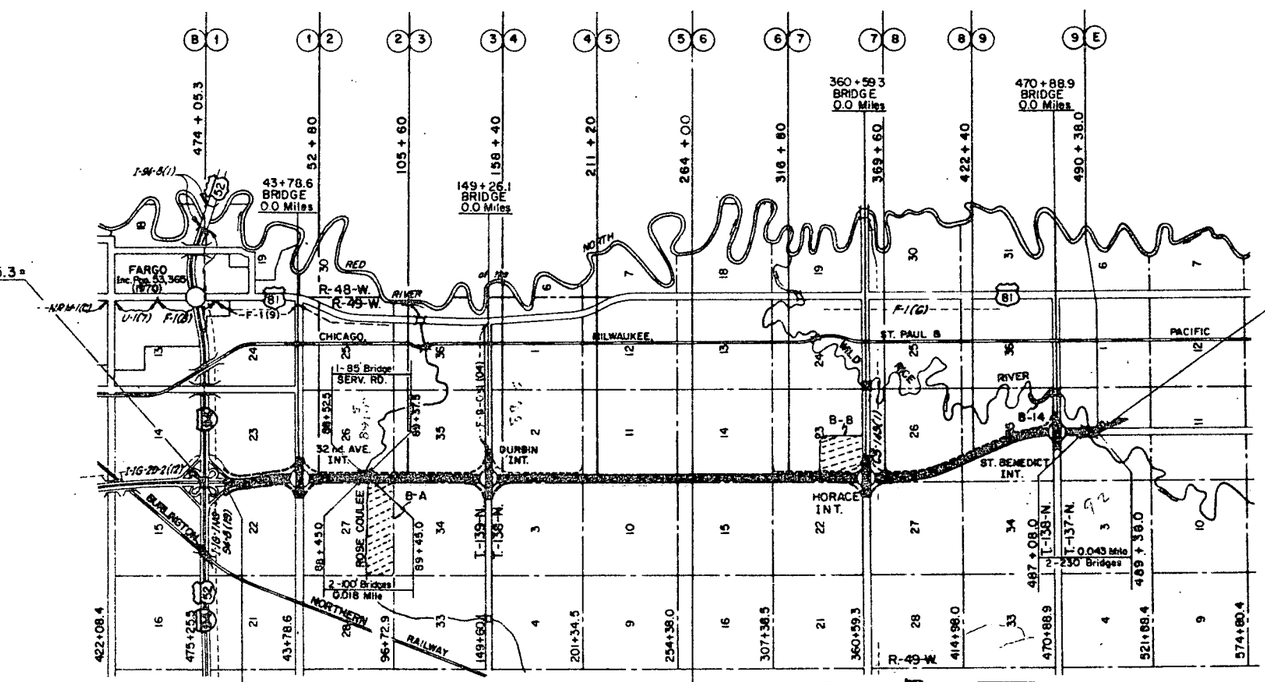
Standard Specifications adopted by the North Dakota State Highway department July 1971.

Required Contract Provision (Form PR-1273) dated Oct. 1969 and others submitted herewith.

DESIGN DATA

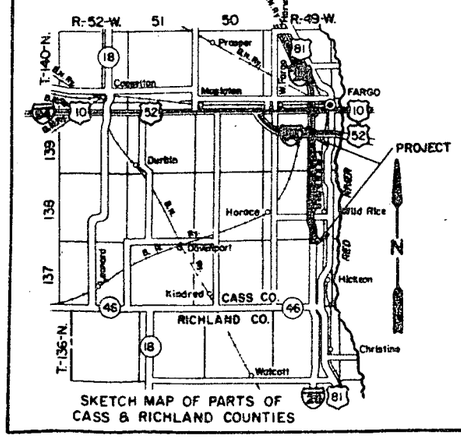
TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1971)	2750 PASS. 250 TRUCKS 3000 TOTAL	300
TRAFFIC FORECAST (1991)	21,900 PASS. 1900 TRUCKS 23,800 TOTAL	2300
DESIGN SPEED	80 MPH	
TRAFFIC CLASSIFICATION	"M"	
MINIMUM SIGHT DISTANCE (STOPPING)	750'	
FULL CONTROL OF ACCESS. (No point of access other than by ramps at Interchanges)		

STA.	CLEAR RDWY. WIDTH	DESIGN LOADING
88 + 95.0 Serv. Rd.	30'	H 20-44
88 + 95.0	40'	HS 20-44
488 + 23.0	40' LT. 44' RT.	HS 20-44



BEG. PROJ. I-29-1 (4) 54 Sta. 474 + 05.3 =
I-IG-29-2 (12) Sta. 474 + 05.3 =
I-IG-94-8 (19) Sta. 569 + 13.4
A point 120.2' North of the Southeast corner of Sec. 15, Twp. 139 N. Rge. 49 W.

END PROJ. I-29-1 (4) 54
STA. 490 + 38.0 =
BEG. PROJ. I-29-1 (5) STA. 490 + 38.0
A point 1949.8' South and 42.2' East of the NW. corner of the NE. 1/4 of Sec. 2, Twp. 137 N., Rge. 49 W.



SKETCH MAP OF PARTS OF
CASS & RICHLAND COUNTIES

BORROW AREAS
- B - A
- B - 8
- B - 14

APPROVED DATE

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

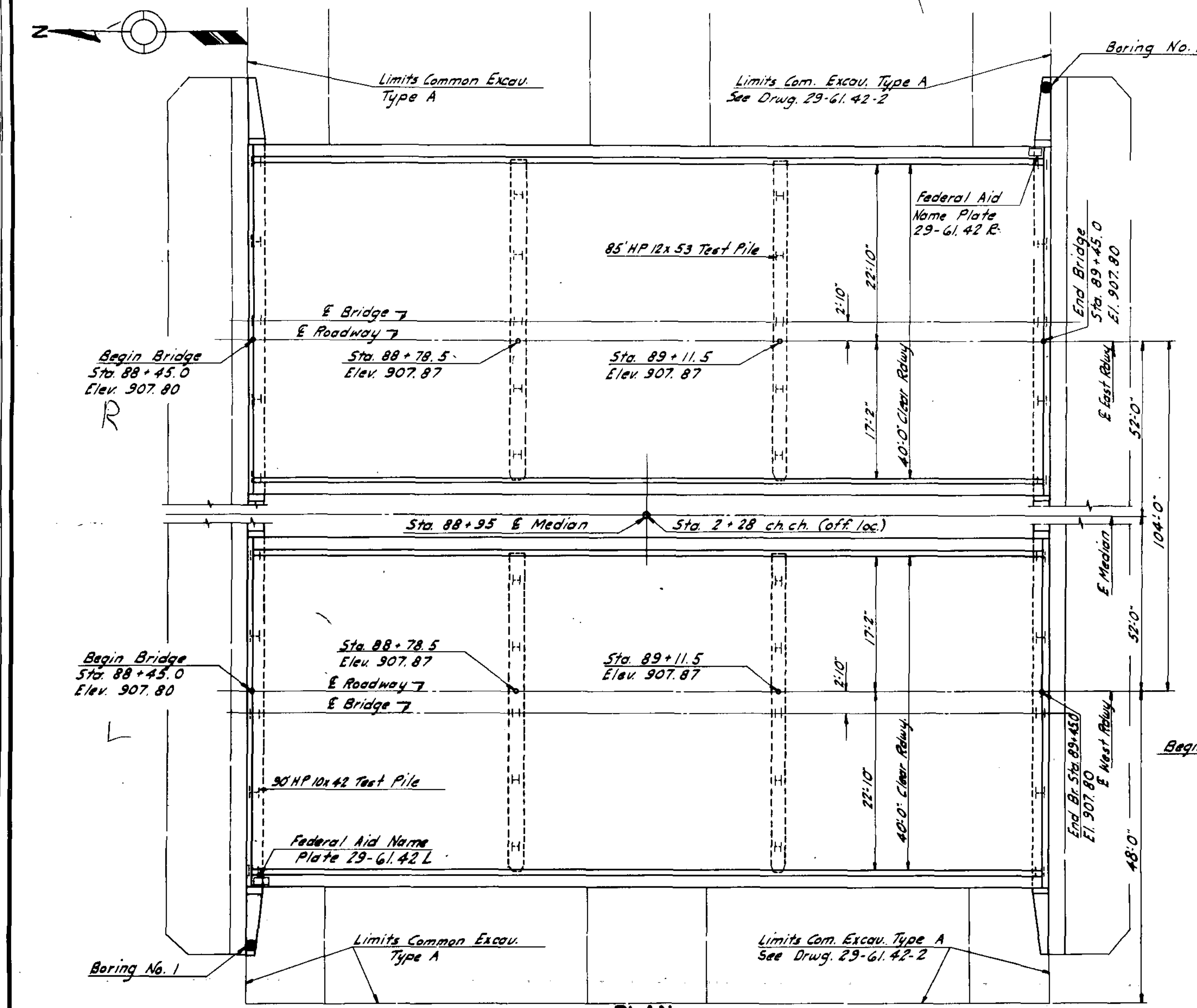
K. E. BRADLEY
REGISTERED PROFESSIONAL ENGINEER
NORTH DAKOTA NO.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

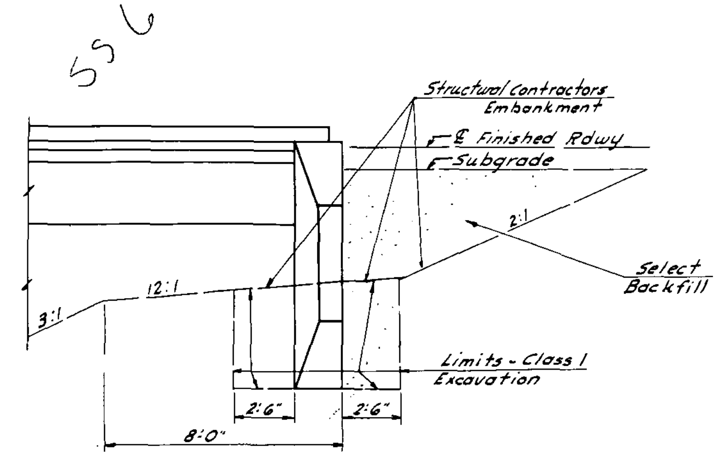
APPROVED

DIVISION ENGINEER DATE

BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-081	5	N. D.	I-029-1(4)	91		



PLAN



DETAIL AT ABUTMENTS
(Not to Scale)

Screed Elev. @ ℄ D.L. Def. Inc.	907.800	907.802	907.812	907.822	907.831	907.839	907.847	907.852	907.857	907.861	907.864	907.866	907.867	907.877	907.885	907.891	907.895	907.896	907.895	907.891	907.885	907.877	907.867	907.866	907.864	907.861	907.857	907.852	907.847	907.839	907.831	907.822	907.812	907.802	907.800
Dead Load Deflections Only	0	0	.004	.008	.010	.012	.013	.012	.010	.008	.004	0	0	.004	.008	.010	.012	.013	.012	.010	.008	.004	0	0	.004	.008	.010	.012	.013	.012	.010	.008	.004	0	0

Begin Bridge — 10" — 10 Eq. Sp. = 32'-4" — ℄ Pier #2 — 8" — 10 Eq. Sp. = 32'-4" — 8" — ℄ Pier #3 — 10 Eq. Sp. = 32'-4" — 10" — End Bridge

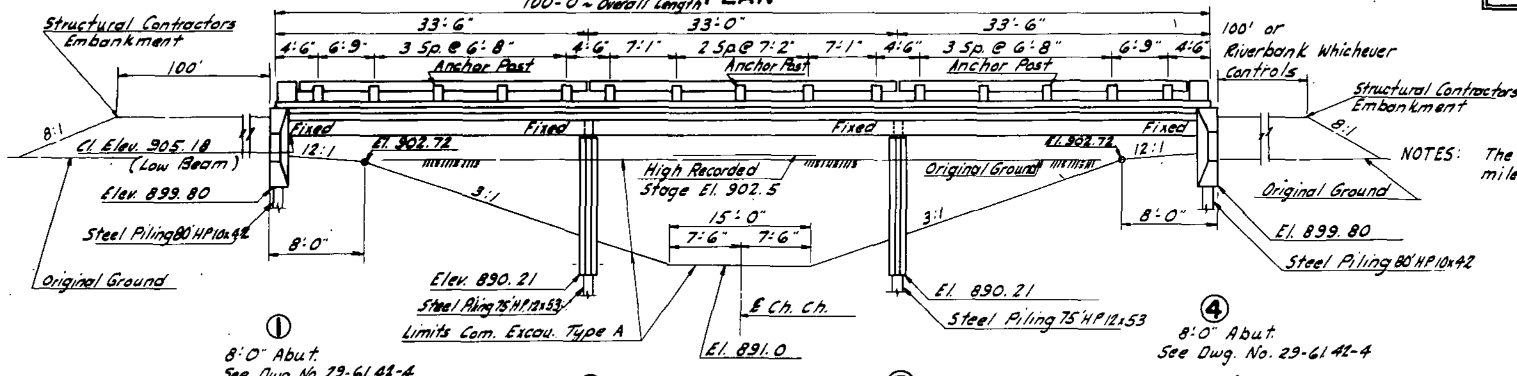
SCREED ELEVATIONS

Elevations are to top of finished roadway @ ℄

1971 FEDERAL AID PROJECT I-029-1(4) NORTH DAKOTA 29-61.42L	1971 FEDERAL AID PROJECT I-029-1(4) NORTH DAKOTA 29-61.42 R

FEDERAL AID NAME PLATES

One of Each Required

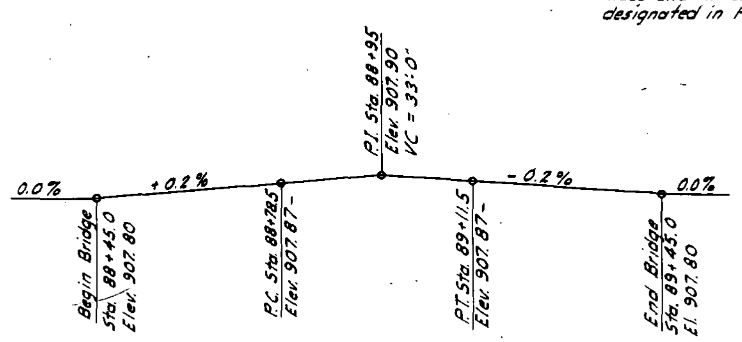


PLAN

ELEVATION

NOTES: The Survey Stationing is from North to South whereas the mileage is given from South to North.

** HS20 and "Alternate Loading as designated in PPM 20-4, Sec. 4C."



VERTICAL CURVE DATA

Elevations are to Top of finished Roadway ℄. For Structural Drainage Only

BENCH MARKS

NO.	DESCRIPTION	LOCATION		ELEV.
9	R.R. Spike in P.P.	80+20.0	277' Rt.	904.99
10	Paint Spot on N.W. Cor. Br.	88+63.0	251' Rt.	906.26
11	R.R. Spike in P.P. S.W. Cor. of Sec. L	97+25.0	282' Rt.	904.38

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH O. T. M.	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.		DESIGN LOAD	MAXIMUM LOAD
Abut. No. 1 & 4	25.8	13.1						38.9	55.0
Pier No. 2 & 3	44.0	25.3						69.3	70.0

ESTIMATE OF QUANTITIES (TWO BRIDGES)

SPEC. NO.	CODE NO.	BID ITEM	
705	0100	MOBILIZATION	LUMP SUM
208	0100	CLASS I EXCAVATION	205 CU. YD.
208	0110	CLASS 2 "	166 CU. YD.
203	0101	COMMON EXCAVATION TYPE A	10,869 CU. YD.
604	2434	32'-4" PRESTRESSED 21 x 36 BOX BEAM	36 EACH
228	0100	SELECT BACKFILL	340 CU. YD.
610	1112	CLASS AE-1 CONCRETE (SUBSTRUCTURE)	244.8 CU. YD.
610	1135	CLASS AE-3 CONC. (PRESTRESSED SUPERSTRUCTURE)	229.6 CU. YD.
610	0138	CLASS AAE-3 CONCRETE RAILING AND POSTS	13.88 CU. YD.
612	0110	REINFORCING STEEL (GRADE 40)	86,877 LB.
622	1360	STEEL TEST PILES (HP12x53) 85 FT.	1 EACH
622	0500	STEEL TEST PILES (HP10x42) 90 FT.	1 EACH
622	0040	STEEL PILING (HP12x53) 16 @ 75 FT.	1425 LIN. FT.
622	0020	STEEL PILING (HP10x42) 16 @ 80 FT.	1520 LIN. FT.
203	0190	MOISTURE CONTROL	1 LUMP SUM
750	0100	LINSEED OIL TREATMENT	41 GAL.
	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-61.42, 29-61.42-1 thru 3

SUBSTRUCTURE 29-61.42-4-5 & 5A

SUPERSTRUCTURE 29-61.42-6 & 7, H-0158, H-0501, H-0401, H-7009, D-900-1, D-900-6

DESIGN LOADING HS20-44** | SCALE 1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

ROSE COULEE (LEGAL DRAIN #27) BRIDGE LAYOUT

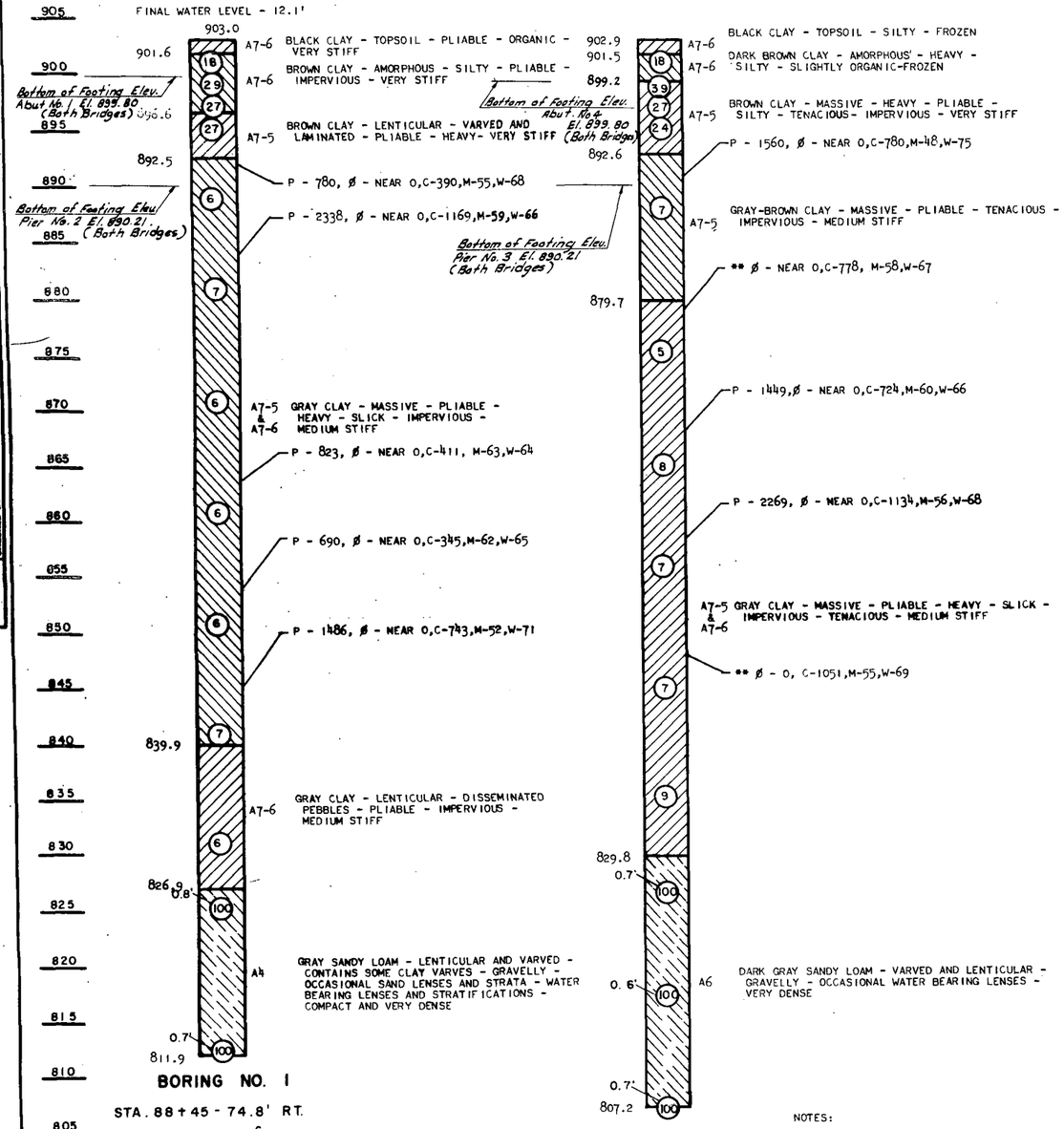
PROJECT I-029-1(4) STA. 88+95.0

CASS COUNTY

APPROVED 6-7-71 Allen J. Anderson, BRIDGE ENGINEER

ALLEN J. ANDERSON REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA 187

FED. ROAD DIST. NO.	STATE	PROJ. NO.		SHEET NO.	TOTAL SHEETS
5	N. D.	I-029-1(43)		92	



NOTES:

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 DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

NEW BRIDGE NO. 29-61.42
OLD BRIDGE NO. 29-89

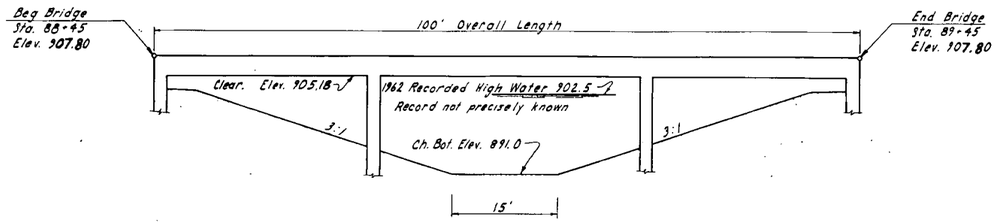
BORING LOG

ROSE COULEE

CASS COUNTY

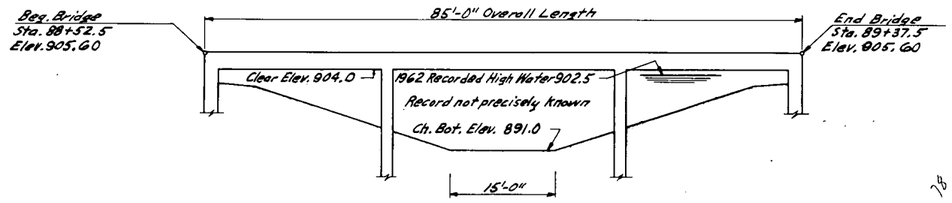
TRACED BY | MADE BY
CHECKED BY | CHECKED BY
QUANTITIES | MADE BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	PROJ. NO	SHEET NO.	TOTAL SHEETS
5	N.D.	I-029-1(4)	93	



ELEVATION OF PROPOSED BRIDGE (ML)

SCALE: 1" = 10'



ELEVATION OF PROPOSED BRIDGE (SERVICE ROAD)

SCALE: 1" = 10'

HYDRAULIC DESIGN DATA

DRAINAGE AREA	20 SQ. MI.
DESIGN FREQUENCY	50 YEARS
DESIGN DISCHARGE, Q50 (NOT CONTROLLING)	450 CFS + OVERFLOW FROM SHEYENNE RIVER
NATURAL STREAM GRADIENT	0.000265 FT./FT.
WATERWAY PROVIDED BELOW RECORDED HIGHWATER	540 SQ. FT.
WATERWAY PROVIDED BELOW CLEARANCE	713 SQ. FT.
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL	APPROX. 1 FPS
DEPTH OF FLOW, RECORDED HIGHWATER	11.5 FT.
VELOCITY OF FLOW UNDER BRIDGE	APPROX. 1 FPS
FREEBOARD PROVIDED	2.0 FT.
MAXIMUM RECORDED STAGE (1962)	902.5
ESTIMATED MAXIMUM RECORDED DISCHARGE	UNKNOWN
FREQUENCY OF MAXIMUM FLOOD	UNKNOWN
MINIMUM WATER ELEVATION	891.0

BRIDGE DESIGN CRITERIA (ML)

TYPE	3-SPAN PRESTRESSED BOX GIRDER
DESIGN LIVE LOAD	HS-20
ROADWAY WIDTH	40'-0" CLEAR
RAILINGS	STANDARD R.C.
PIERS	SOLID WALL TYPE
ABUTMENTS	MONOLITHIC WALL TYPE

BRIDGE DESIGN CRITERIA (SERVICE ROAD)

TYPE	THREE SPAN SLAB
DESIGN LIVE LOAD	H-20
ROADWAY WIDTH	30'-0" CLEAR
RAILINGS, PIERS, ABUTMENTS	SAME AS MAINLINE

P.I. Sta. 5+28 Ch. Ch. (Off. Loc.)
Δ = 21°
D = 13°
R = 441.68
T = 87.86
L = 161.54

Sta. 88+95 Service Road = Sta. 4+28 Off. Loc. ch. ch.

Sta. 88+95 M. L. = Sta 2+28 Ch. Ch. (Off. Loc.)

3:1 Sideslope

3:1 Sideslope

100' West

325' East

3:1

891.0

3:1

Common Excav. Type A Limits See Elevation

E Survey Z

Elevation of Common Excavation Type A Limits

Present Bridge

PLAN

SCALE: 1" = 50'

BRIDGE NO. 29-61.42S
BRIDGE NO. 29-89S

CASS COUNTY DRAIN # 27
(ROSE COULEE)

TOPOGRAPHIC LAYOUT

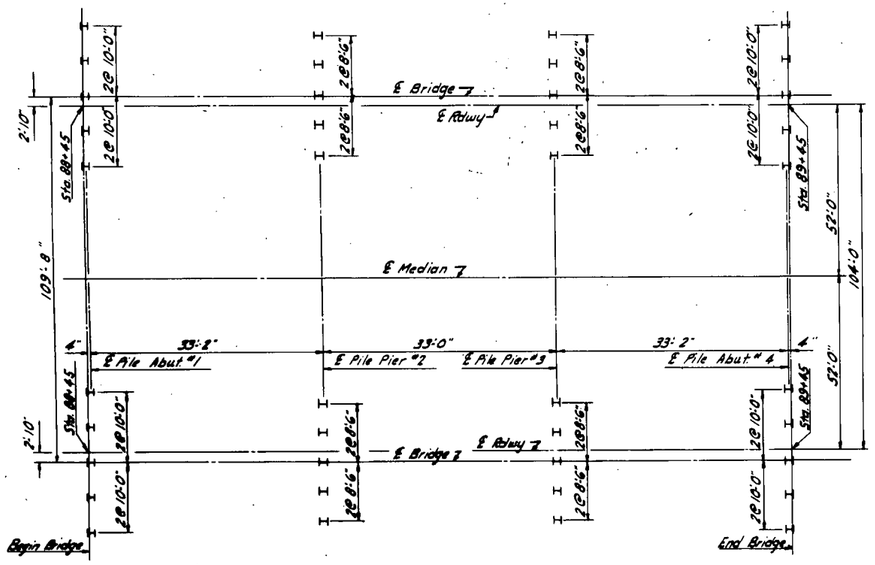
PROJ. I-029-1(4) STA. 88+95

CASS COUNTY

29-61.42-2 29-89 29-89 29-61.42-2

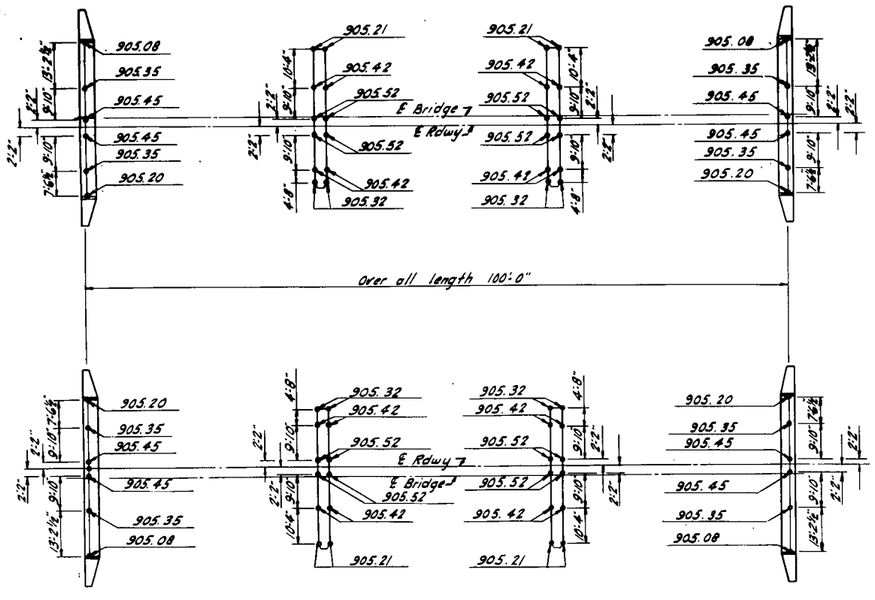
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-029-1(63)		94	

29-61.42R



PILING LAYOUT

N



ABUTMENT AND PIER CAP ELEVATIONS

Elevations are to top of finished concrete

NOTES:

GENERAL:

WORK SHALL CONFORM TO ALL APPLICABLE PARAGRAPHS OF THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

THE COST OF FURNISHING AND PLACING ASPHALT CURB SEAL, NAME PLATES, PREMOLDED JOINT FILLER, BAR SPACERS, BAR SUPPORTS, SCREED CHAIRS, THREADED INSERTS AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CLASS AE-1 AND AE-3 CONCRETE.

EITHER POST-TENSIONED OR PRE-TENSIONED PRESTRESSED GIRDERS MAY BE USED ON THIS PROJECT.. THE PROJECT PLANS ARE DETAILED FOR PRE-TENSIONED GIRDERS. IF POST-TENSIONED GIRDER ARE USED, THE GIRDER SHOP DRAWINGS SHALL INCLUDE THE NECESSARY REVISIONS TO THE STRUCTURES.

THE COST OF SLAB DRAINS SHALL BE INCLUDED IN THE PRICE BID FOR CLASS AE-3 CONCRETE.

CONCRETE:

THE "RUBBED SURFACE FINISH" WILL BE REQUIRED FOR THE ROADWAY AND OUTSIDE OF CURBS, EDGES OF SLAB, EXPOSED FACES OF PIER DIAPHRAGMS, ALL FACES OF RAILING AND END POSTS, AND TO ALL EXPOSED FACES OF ABUTMENTS AND PIERS. ALL OTHER SURFACES SHALL HAVE THE "ORDINARY SURFACE FINISH". ALL ORDINARY SURFACE FINISH SHALL BE COMPLETED WITHIN 24 HOURS AFTER REMOVAL OF FORMS. THE CONTRACTOR HAS THE OPTION OF USING THE "SPECIAL SURFACE FINISH" AS PROVIDED IN SEC. 602-3.10.5 IN LIEU OF THE "RUBBED SURFACE FINISH" (602-3.10.3) CALLED FOR ABOVE. PRESTRESSED GIRDERS SHALL BE CLEANED IN ACCORDANCE WITH SEC. 602-3.10.3.2 AND 602-3.10.3.3 OF THE NORTH DAKOTA STANDARD SPECIFICATIONS.

AIR-ENTRAINED PORTLAND CEMENT SHALL BE USED IN THE ENTIRE BRIDGE EXCEPT IN THE PRESTRESSED GIRDERS. TYPE I, IS, II OR IS-MH-MS PORTLAND CEMENT SHALL BE USED IN THE PRESTRESSED GIRDERS.

ALL EXPOSED EDGES OF CONCRETE SHALL BE BEVELED WITH 3/4" TRIANGULAR MOLDING UNLESS OTHERWISE NOTED.

ALL CONCRETE ABOVE THE CURB SHALL BE CLASS AAE-3. THE REMAINING PORTIONS OF THE SUPERSTRUCTURE SHALL BE AE-3. CONCRETE IN SUBSTRUCTURES SHALL BE CLASS AE-1.

EXCAVATION:

COMMON EXCAVATION TYPE A SHALL INCLUDE THAT REQUIRED FOR SHAPING THE BERM FOR THE MAINLINE AND SERVICE ROAD BRIDGES AS SHOWN ON DRAWING 29-61.41-2

ALL EXCAVATION AT THE PIERS SHALL BE CLASS 2 WITHIN SPECIFIED LIMITS (208-4.1 AND 208-4.1.2). ALL EXCAVATION AT THE ABUTMENTS SHALL BE CLASS 1 WITHIN SPECIFIED LIMITS (208-4.1 AND 208-4.1.1). STRUCTURAL FILL NEEDED TO CONSTRUCT THE BERMS SHALL BE OBTAINED FROM SUITABLE COMMON EXCAVATION TYPE A.

BACKFILL:

BACKFILLING SHALL BE DONE IN ACCORDANCE WITH SECTION 228 EXCEPT THAT THE EMBANKMENT SHALL BE COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHO DESIGNATION T-99. THE MOISTURE CONTENT IN THE SOIL AT THE TIME OF COMPACTION SHALL NOT BE LESS THAN 4 PERCENTAGE POINTS BELOW OPTIMUM NOR MORE THAN THAT WHICH WILL PERMIT COMPACTION TO THE REQUIRED DENSITY. SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE BERM ELEVATION UNTIL THE ENTIRE SUPERSTRUCTURE SLAB HAS CURED.

REINFORCING:

DIMENSIONS FOR REINFORCING STEEL BENT BARS ARE GIVEN OUT TO OUT UNLESS OTHERWISE NOTED.

THE BAR FABRICATOR SHALL ADD A PREFIX TO ALL BAR DESINGATIONS TO DIFFERENTIATE BETWEEN THE SEVERAL PARTS OF THE STRUCTURE OR STRUCTURES.

PILING:

THE PILING FOR THIS STRUCTURE SHALL BE DRIVEN BY A STEAM, AIR OR DIESEL HAMMER HAVING A RATED ENERGY AND RAM WEIGHT NOT LESS THAN 29,856 FOOT POUNDS AS COMPUTED BY THE FORMULA W(E-8820) + 0.6E WHERE W IS THE WEIGHT OF RAM OF RAM IN TONS AND E IS THE RATED HAMMER ENERGY AS ALLOWED IN SEC. 622-4.1.19.1. IN NO CASE SHALL THE RAM WEIGHT BE LESS THAN 4800 POUNDS.

THE TEST PILES FOR THIS STRUCTURE SHALL BE DRIVEN TO A BEARING OF NOT LESS THAN 125% DESIGN LOAD AS DETERMINED BY THE DYNAMIC FORMULA.

PILING LENGTHS FOR THE ABUTMENTS WILL NOT BE DETERMINED UNTIL THE TEST PILE IN ABUTMENT NO. 1 OF THE EAST BRIDGE HAS BEEN DRIVEN AND THE PILING LENGTHS FOR THE PIERS WILL NOT BE DETERMINED UNTIL THE TEST PILE IN PIER NO. 3 OF THE WEST BRIDGE HAS BEEN DRIVEN.

DESIGN STRESSES:

1700 PSI	CLASS AAE-3 CONCRETE
1200 PSI	CLASS AE-1 AND AE-3 CONCRETE
20000 PSI	GRADE 40 REINFORCING STEEL
2000 PSI	PRE-STRESSED BEAMS

LINSEED OIL TREATMENT:

LINSEED OIL TREATMENT SHALL NOT BE DONE UNTIL ALL CONCRETE WORK IS COMPLETED AND ASPHALT CURB SEAL HAS BEEN INSTALLED.

CONCRETE:

IF THE EXPOSED FACES OF THE ABUTMENTS AND PIERS HAVE A SURFACE FINISH ACCEPTABLE TO THE ENGINEER WITHOUT RUBBING, THE REQUIREMENT FOR "RUBBED SURFACE FINISH" MAY BE WAIVED AT THE OPTION OF THE ENGINEER, AND THE "ORDINARY SURFACE FINISH" WILL APPLY.

QUANTITIES

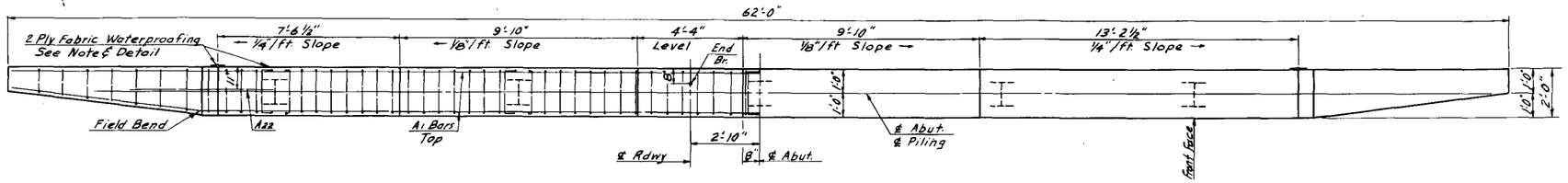
PILE STAKING LAYOUT
& NOTES
ROSE COULEE

QUANTITIES CHECKED BY

QUANTITIES MADE BY

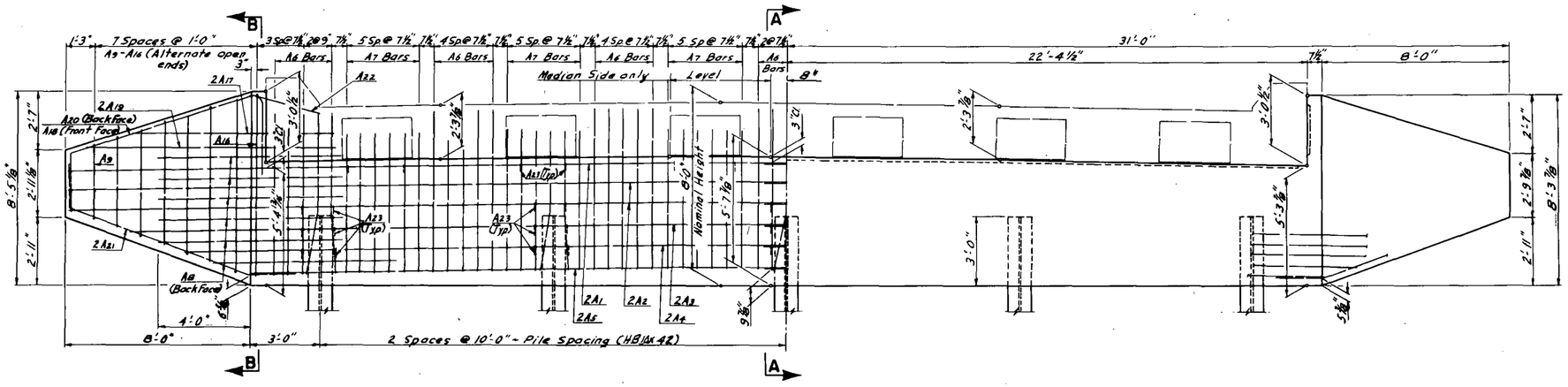
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-029-1(4)		95	

DESIGN — MADE BY H.W.B. — CHECKED BY W.A.E.
DETAILS — MADE BY W.A.E. — CHECKED BY H.W.B.
TRACING — MADE BY H.W.B. — CHECKED BY J.A.E.
QUANTITIES — MADE BY J.A.E. — CHECKED BY D.R.E.
CHECKED BY A.B.E.
MADE BY A.B.E. — CHECKED BY V.A.E.
REVISIONS — DATE — BY



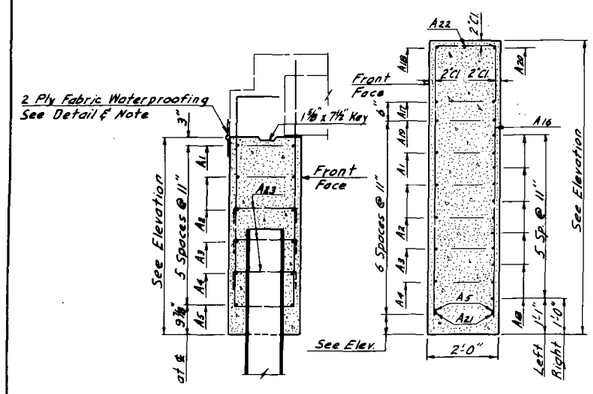
PLAN

Showing Reinforcing — Showing Dimensions

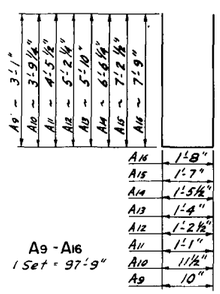


ELEVATION

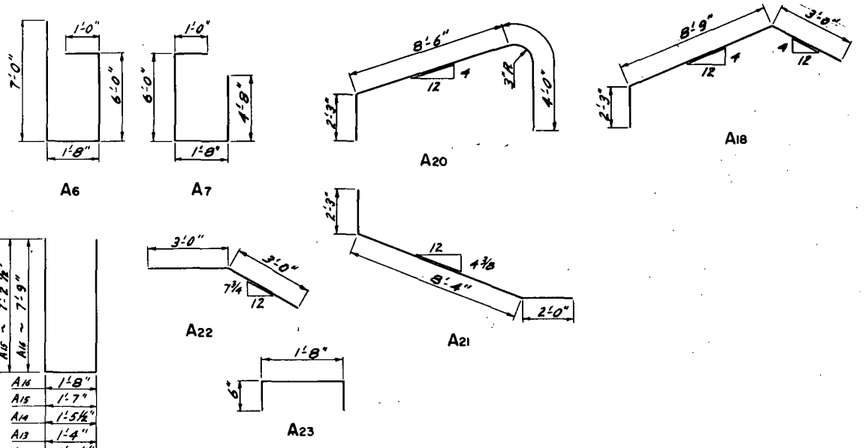
Showing Reinforcing — Showing Dimensions



FABRIC WATERPROOFING DETAIL



A9 - A16
1 Set = 97'-9"



BENT BAR DETAILS
Dimensions are out to out

BAR LIST (ONE ABUT.)

MARK	NO.	SIZE	LENGTH	UNIT WT.	SHAPE
A1	4	6	31'-9"	97.69	Str.
A2	8	5	31'-6"	32.86	"
A3	4	5	29'-3"	30.51	"
A4	4	5	27'-0"	28.16	"
A5	4	6	24'-0"	36.05	"
A6	35	5	15'-8"	16.34	Bent
A7	36	5	13'-4"	13.91	"
A8	12	8	8'-0"	21.36	Str.
A9-16	2 Sets	6	97'-9"	146.83	Bent
A17	4	5	9'-0"	9.39	Str.
A18	2	6	14'-0"	21.03	Bent
A19	4	5	10'-9"	11.21	Str.
A20	2	6	14'-9"	22.16	Bent
A21	4	6	12'-7"	18.90	"
A22	2	6	6'-0"	9.01	"
A23	42	4	2'-8"	1.78	"

NOTE:

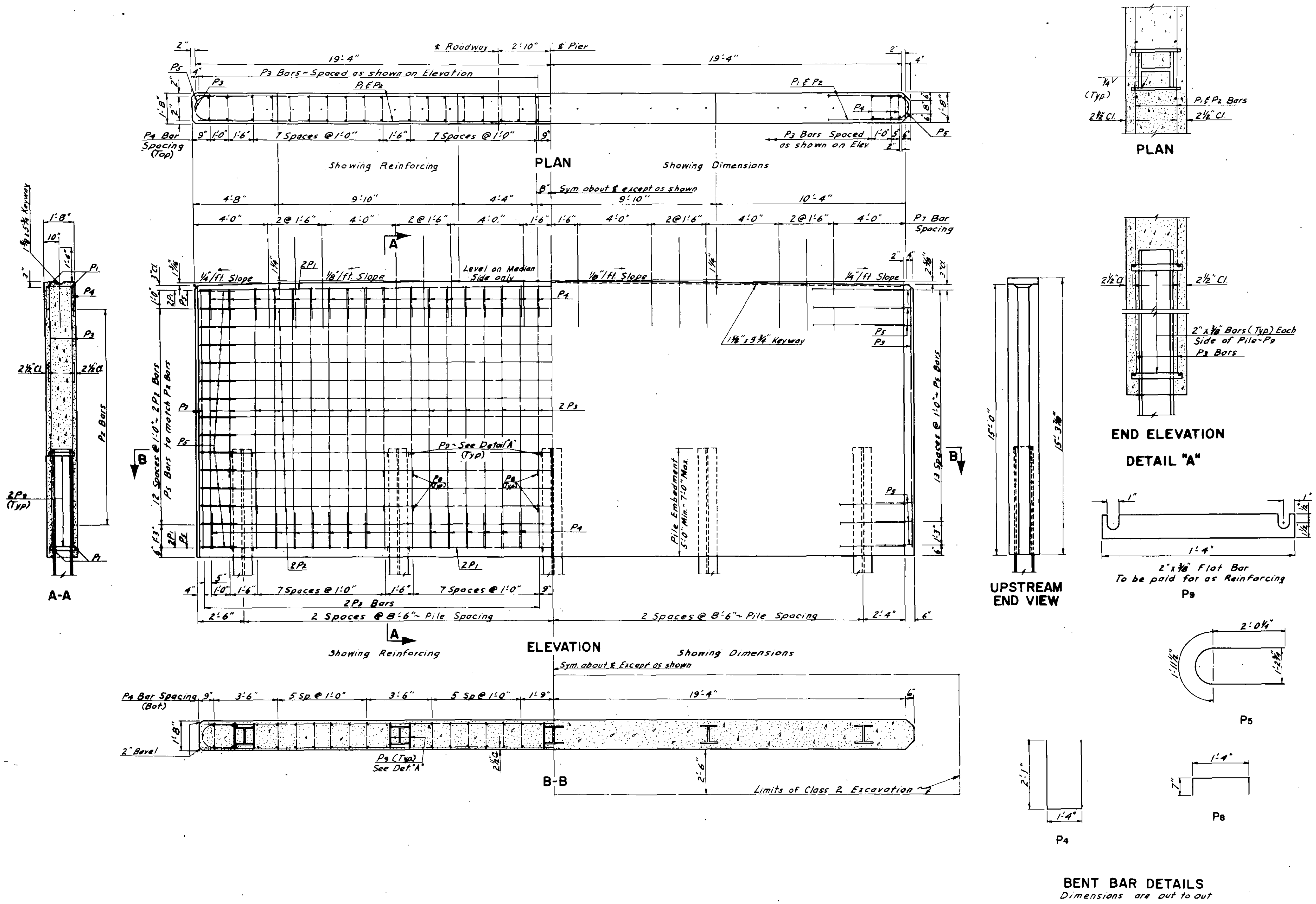
Two Ply Fabric Waterproofing: shall consist of furnishing materials and placing dampproofing and fabric waterproofing at areas designated on this sheet in accordance with Sec. 736 of the Standard Specifications for Two Ply Fabric Waterproofing. All materials and work shall be considered incidental to the per item for Class AE-1 Concrete.

QUANTITIES (ONE ABUT.)

Class AE-1 Concrete	24.4 Cu Yds
Reinforcing Steel (Grade 40)	2,792 Lbs
Piling (See Layout)	
Excavation (See Layout)	

ROSE COULEE
(LEGAL DRAIN No. 27)
8' ABUTMENT
40' CL. RDWY. HS20 LOADING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	N.D.	I-029-1(4)	96	



BAR LIST (ONE PIER)

	MARK	NO.	SIZE	LENGTH	UNIT WGT.	SHAPE
	P1	4	6	38'-9"	58.21	Str.
	P2	26	5	38'-9"	40.42	"
	P3	76	5	14'-6"	15.13	"
	P4	64	6	5'-6"	8.26	Bent
	P5	30	5	6'-0"	6.26	"
*	P7	15	1"φ	3'-0"	8.01	Str.
	P8	20	4	2'-6"	1.67	Bent
	P9	20	2"x3/8"	1'-4"	3.40	Fl. Bar

NOTE:
* P7 Bars shall be plain round mild steel. Wrap upper half with Aluminum foil before pouring diaphragm.

QUANTITIES (ONE PIER)

Class AE-1 Concrete	36.8 Cu. Yds.
Reinforcing (Grade 40)	3,372 Lbs.
Excavation (See layout)	
Piling (See layout)	

ROSE COULEE

(LEGAL DRAIN No. 27)

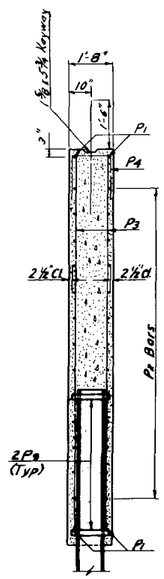
15' PIER

WEST BRIDGE

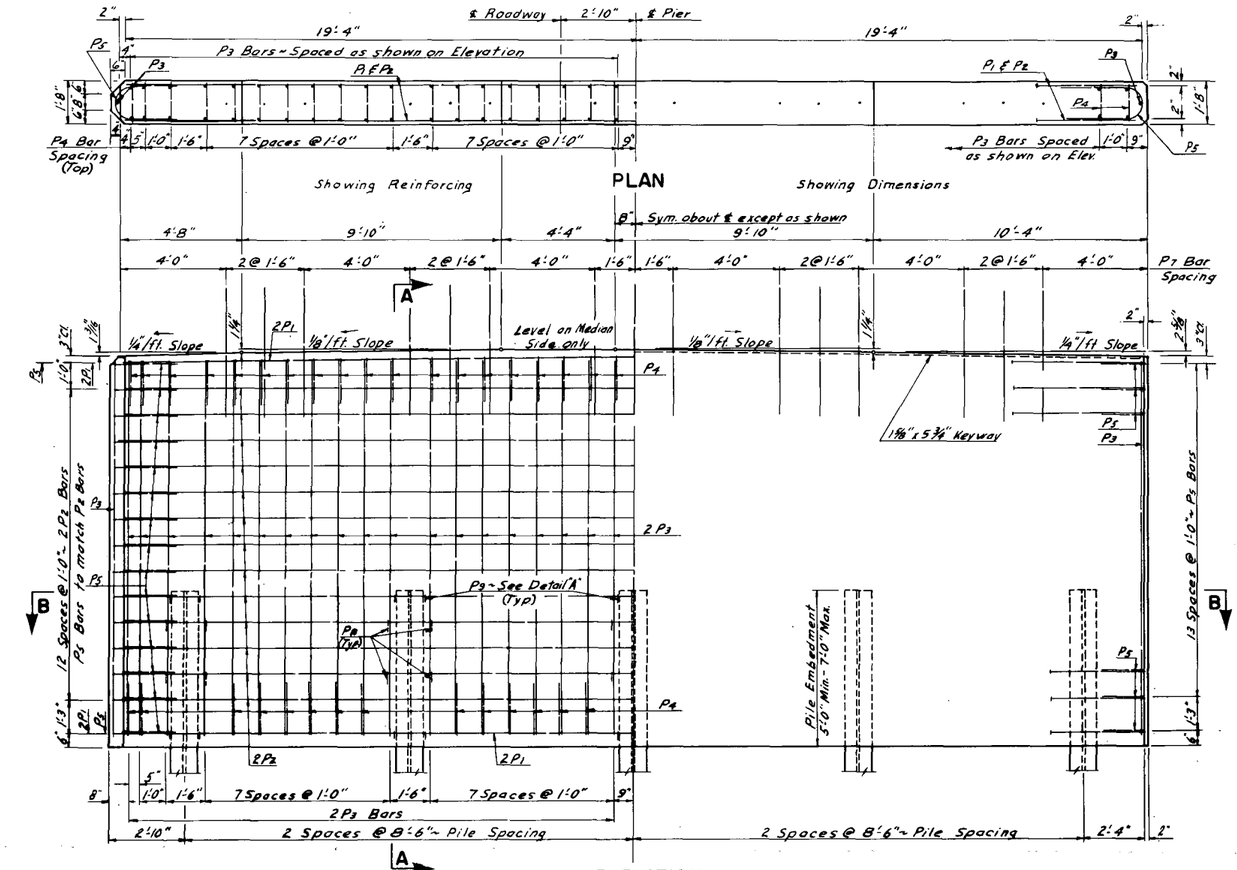
40' CL. RDWY. HS20 LOADING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	N.D.	I-029-1(14)	97	

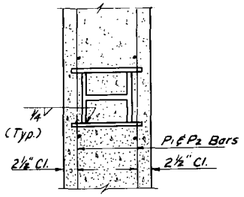
DESIGNED BY	W.A.B.
DETAILS MADE BY	L.A.E.
DETAILS CHECKED BY	W.A.B.
TRACING MADE BY	L.A.E.
TRACING CHECKED BY	D.R.S.
QUANTITIES MADE BY	L.A.E.
QUANTITIES CHECKED BY	W.A.B.



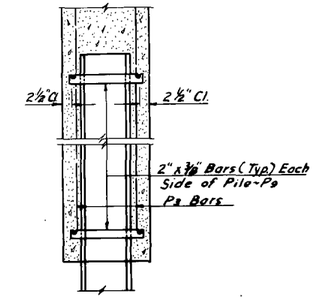
A-A



UPSTREAM END VIEW

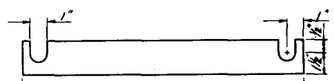


PLAN



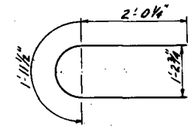
END ELEVATION

DETAIL "A"

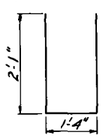


2" x ⅜" Flat Bar
To be paid for as Reinforcing

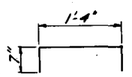
P9



P5



P4



P8

BENT BAR DETAILS
Dimensions are out to out

BAR LIST (ONE PIER)

	MARK	NO.	SIZE	LENGTH	UNIT WGT.	SHAPE
	P1	4	6	38'-9"	58.21	Str.
	P2	26	5	38'-9"	40.42	"
	P3	76	5	14'-6"	15.13	"
	P4	64	6	5'-6"	8.26	Bent
	P5	30	5	6'-0"	6.26	"
*	P7	15	1"	3'-0"	8.01	Str.
	P8	20	4	2'-6"	1.67	Bent
	P9	20	2⅜"	1'-4"	3.40	Flt. Bar
**	SR4	1	4	3'-8"		Str.
**	SR5	1	5	4'-0"		"
**	SR6	1	6	4'-6"		"

NOTE:
* P7 Bars shall be plain round mild steel. Wrap upper half with Aluminum foil before pouring diaphragm.
** Sample replacement bars to be spliced to bar from which 2'-0" sample has been cut. Furnish only one of each for Mainline bridges. The replacement bars will not be paid for directly. Their cost shall be included in the unit price bid for reinforcing steel.

QUANTITIES (ONE PIER)

Class AE-1 Concrete	36.8 Cu Yds.
Reinforcing (Grade 40)	3,372 Lbs.
Excavation (See layout)	
Piling (See layout)	

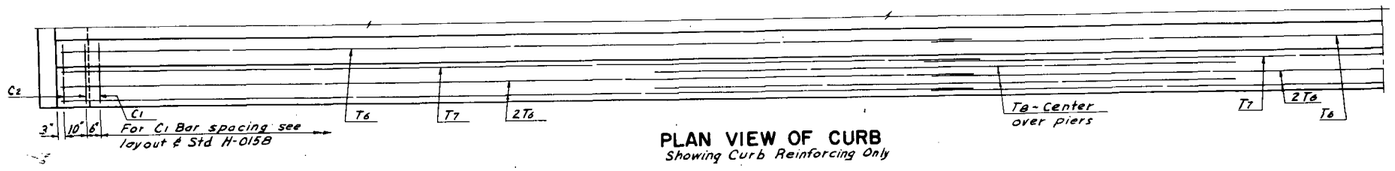
ROSE COULEE
(LEGAL DRAIN No. 27)

15' PIER
EAST BRIDGE
40' CL. RDWY. H S20 LOADING

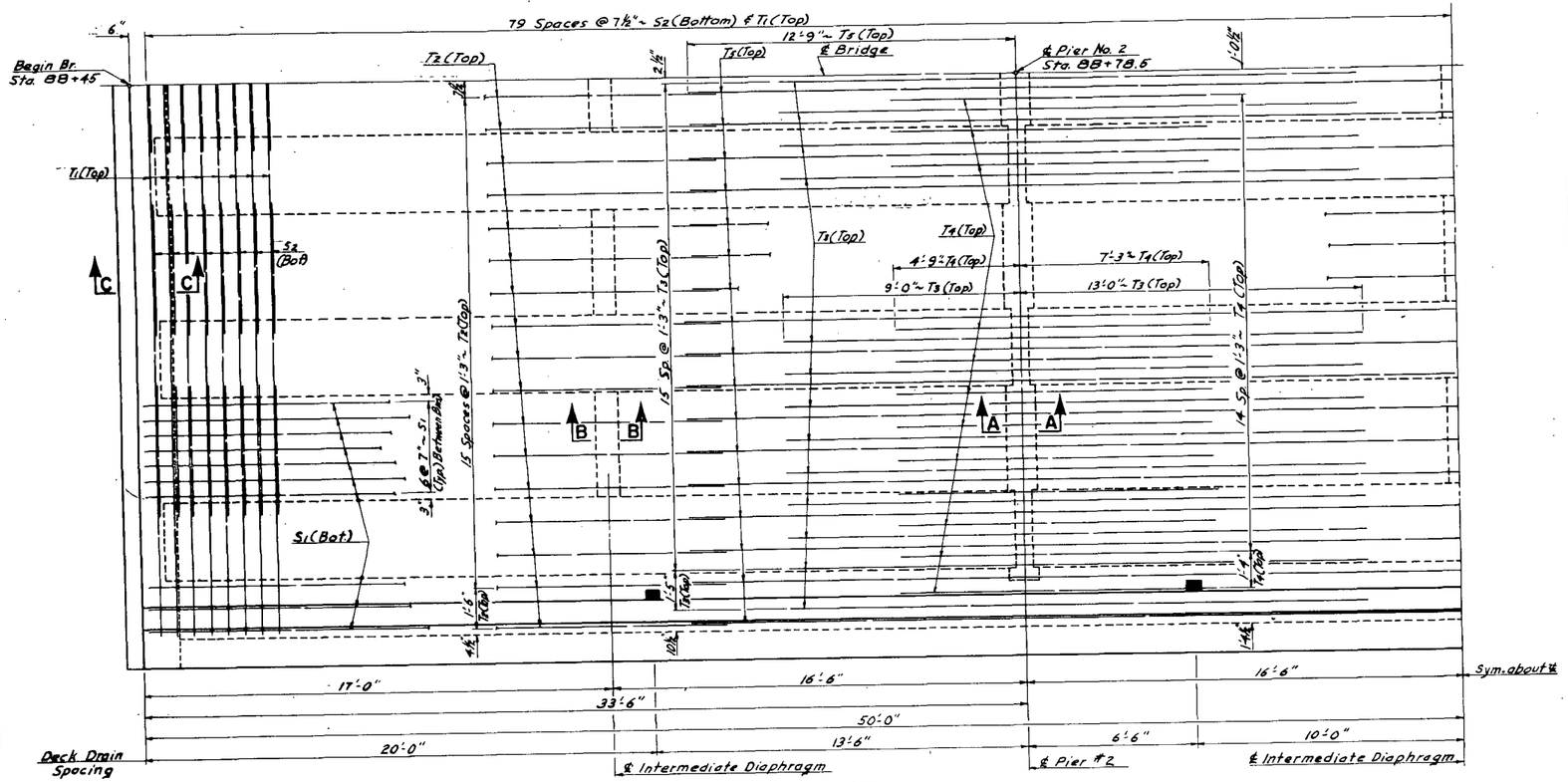
29-61.42-5A 29-89 29-89 29-61.42-5A

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-029-1(41)		98	

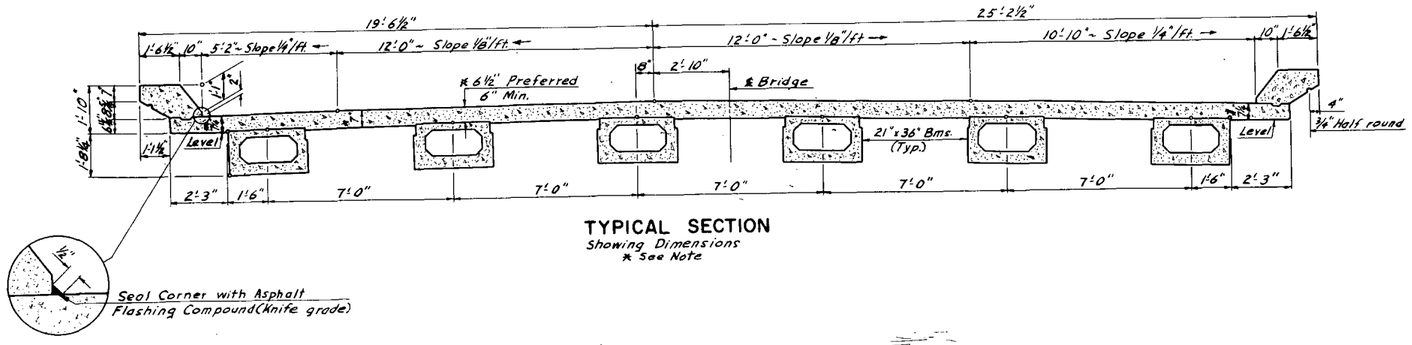
QUANTITIES MADE BY W.A.F. CHECKED BY W.A.F.



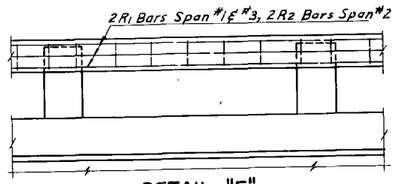
PLAN VIEW OF CURB
Showing Curb Reinforcing Only



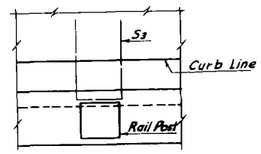
QUARTER PLAN



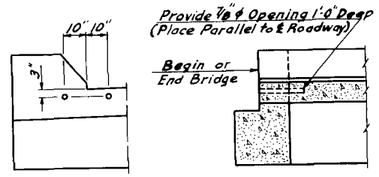
TYPICAL SECTION
Showing Dimensions
** See Note*



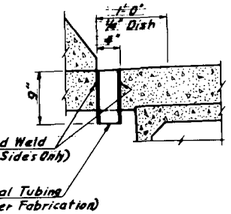
DETAIL "E"
Showing R1 & R2 Bar Placement
Also See H-0158



DETAIL "D"
Showing typical placement of S3 Bars at Rail Post (1 Per Post)



CURB SLEEVE DETAIL
All Four Corners



SLAB DRAIN DETAIL
Payment shall be incidental To Class AE-3 Concrete

*** 2'-3" Cantilever Slab Thickness Shall be 7¼" @ Face of Beam.*

NOTE: *The dimensions shown will vary due to the variable camber of the prestressed box girder. The Field Engineer shall take measurments, for slab thickness, over and between girders at intervals not to exceed the spacing of the screed elevations. When the slab thickness over any girder is less than 6", the grade for the entire bridge shall be revised to obtain the 6" min. thickness. The 7" slab thickness between girders is a fixed dimension.*

The quantities shown are for the dimensions shown. Adjustments in quantities shall be made in accordance with revisions made in the slab dimensions.

For superstructure concrete placement see St'd. Spec. # 602 - 3.6.2.1.

QUANTITIES
See Drawing # 29-61.42-7

Design for 25 #/Sq.Ft. F.W.S.

ROSE COULEE
(LEGAL DRAIN No. 27)

SUPERSTRUCTURE DETAILS

40' CL. RDWY. HS20 LOADING

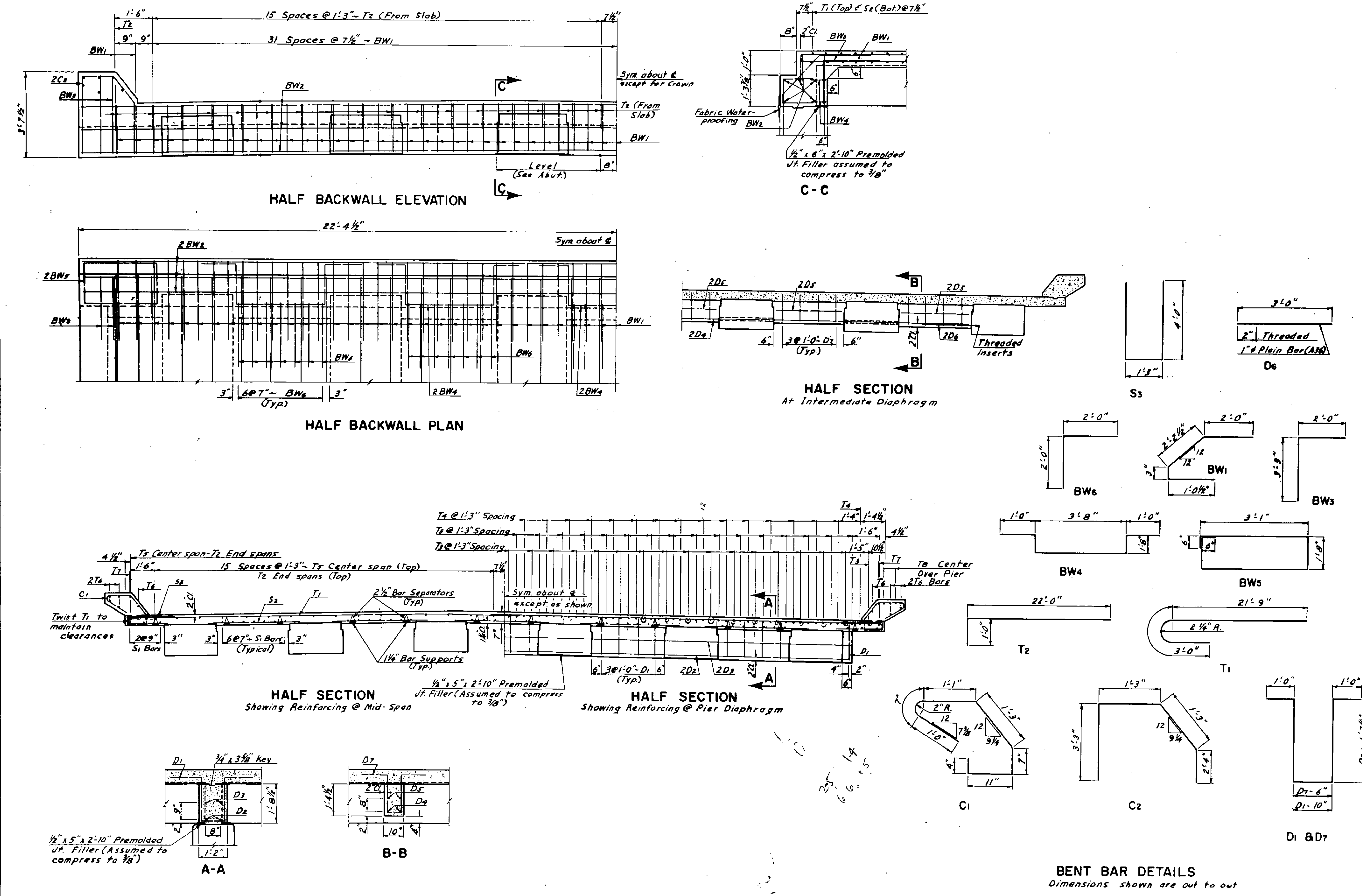
Sheet 1 of 2

29-89

29-61.42-6

29-61.42-6 29-89

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-029-1(4)		99	



BAR LIST (SUPERSTRUCTURE)

MARK	NUMBER: SLAB	NUMBER: BACKWALL	NUMBER: DIAPHRAGM	NUMBER: CURB RAIL	SIZE	LENGTH	UNIT WEIGHT	SHAPE
BW1		134			6	5'-6"	8.26	Bent
BW2		24			6	23'-0"	34.55	Str.
BW3		8			6	5'-3"	7.89	Bent
BW4		20			6	9'-0"	13.52	"
BW5		8			6	10'-6"	15.77	"
BW6		70			6	4'-0"	6.01	"
T1	318				5	25'-9"	26.86	Bent
T2	68				4	23'-0"	15.36	"
T3	68				4	22'-0"	14.69	Str.
T4	64				5	12'-0"	12.52	"
T5	68				5	30'-0"	31.29	"
T6				30	5	34'-3"	35.73	"
T7				6	6	34'-9"	52.20	"
T8				8	5	20'-0"	20.86	"
S1	123				4	34'-0"	22.70	Str.
S2	795				5	5'-0"	5.22	"
S3	30				4	9'-3"	6.18	"
D1			44		4	6'-10"	4.56	Bent
D2			4		6	38'-6"	57.83	Str.
D3			4		5	38'-6"	40.16	"
D4			6		7	31'-6"	64.40	"
D5			30		4	3'-9"	2.50	"
D6			12		1"φ	3'-0"	8.01	See Det.
D7			60		4	5'-9"	3.84	Bent
P4				72	6	4'-4"	6.51	Bent
P5				18	6	5'-1"	7.64	"
P6				60	5	4'-9"	4.95	"
P7				60	3	4'-2"	1.56	"
P8				48	3	3'-2"	1.19	"
P9				12	3	4'-8"	1.75	"
RC				204	3	3'-3"	1.22	Bent
R1				24	6	30'-9"	46.19	Str.
R2				12	6	32'-6"	48.82	"
C1				256	5	5'-9"	6.00	Bent
C2				8	5	8'-1"	8.43	"

** Quantities include posts, railing & end posts.

QUANTITIES (ONE SUPERSTRUCTURE)

	Class AE-3 Concrete	114.8 Cu. Yds.
**	Class AAE-3 Concrete	6.94 Cu. Yds.
**	Reinforcing Steel (Grade 40)	31,111 Lbs.

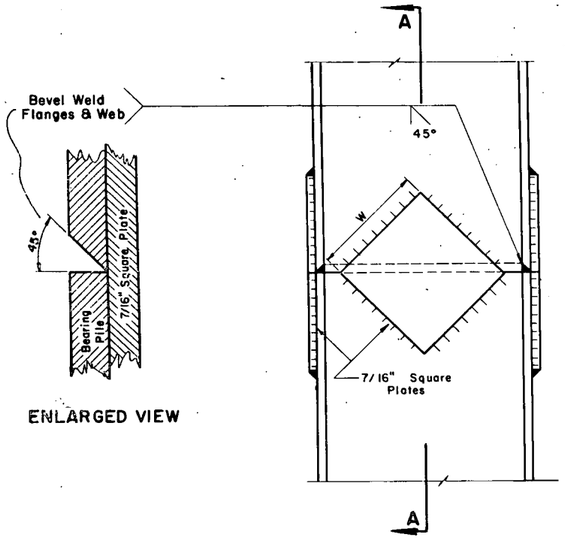
ROSE COULEE
(LEGAL DRAIN No. 27)

SUPERSTRUCTURE DETAILS

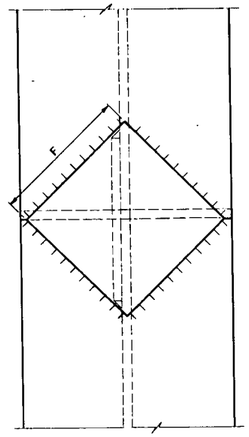
40' CL. RDWY. HS20 LOADING

Sheet 2 of 2

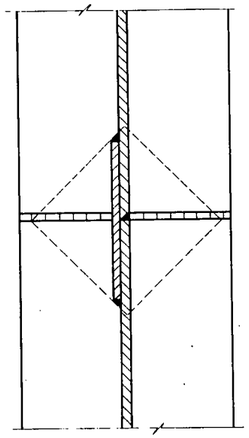
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N. D.	I-29-1(4)	105



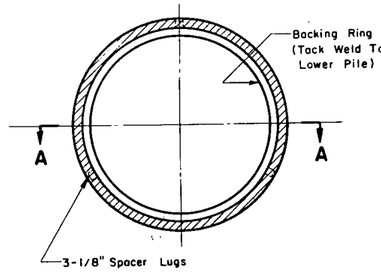
ENLARGED VIEW



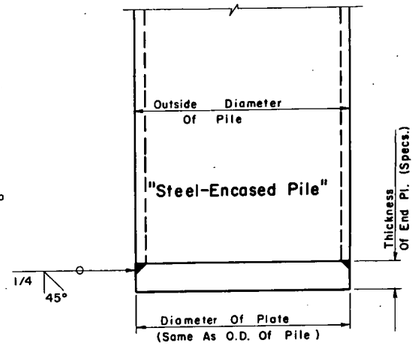
Flame Scarf Inside Of Both Flanges And One Side Of Web Of Upper Section



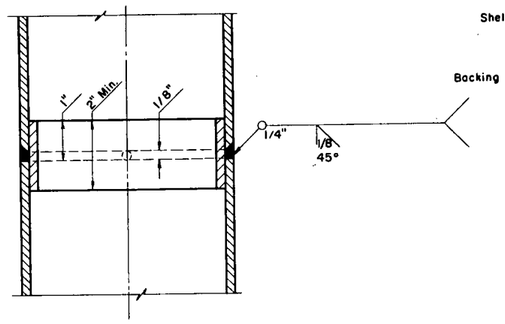
A-A



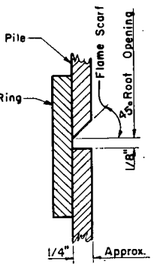
Backing Ring may be made from pile cut-offs or other material of a like quality.



END PLATE DETAIL

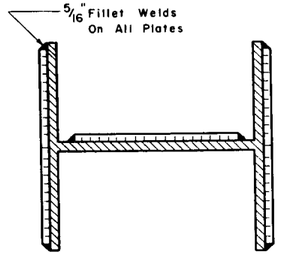


A-A



ENLARGED VIEW

SHELL PILE SPLICE DETAIL



PILE	8"	10"	12"	14"
F FLANGE	5"	6½"	8"	10"
W WEB	4"	5½"	6½"	8"

H-PILE SPLICE DETAIL

All welding shall conform to the current specification for "Welded Highway and Railway Bridges of the American Welding Society."

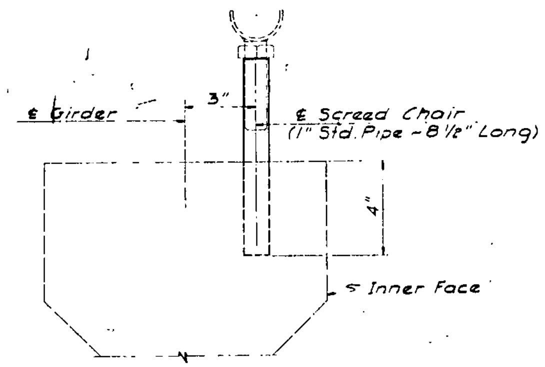
REVISED 12-12-66

PILE SPLICE DETAILS

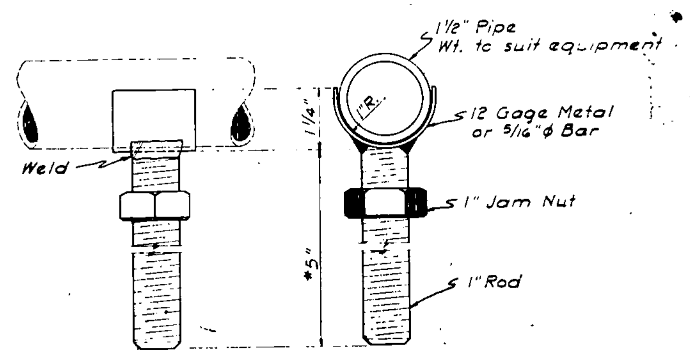
H-0401

H-0401

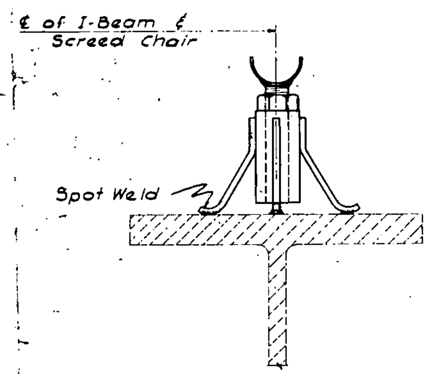
DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N. D.	[illegible]	[illegible]



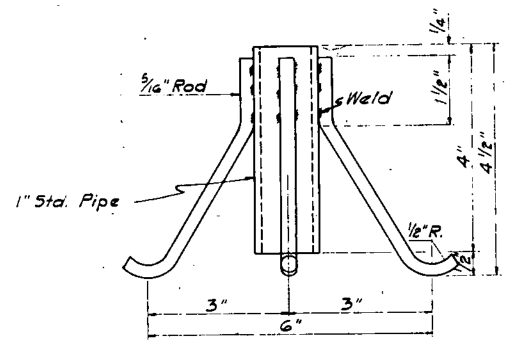
SCREED CHAIR IN PRESTRESSED GIRDER
(Outside Girders Only)



ADJUSTABLE SCREED HOLDER
*Useable with slab thickness of 7" or less. For greater slab thickness adjust length accordingly.



I-BEAM WITH SCREED CHAIR



SCREED CHAIR*

NOTES:

The spacing of screed chairs shall be such that no noticeable deflection occurs in the screed when the vibrating strike-off is in operation. Chairs shall be similarly placed for all screeds on the same bridge span with a maximum spacing of three feet when using 1½" extra strong pipe for a screed. Screeds shall be set on outer beams and also on intermediate beams if necessary to maintain the required template.

The cost of the screed chairs and holders shall be included in the unit price bid for the various pay items. Upon completion of the project the screeds and screed holders shall remain the property of the Contractor.

The design shown for the screed chairs and seat may be varied slightly to suit manufacturers products if approved by the Engineer.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

SCREED CHAIR AND ADJUSTABLE SCREED HOLDER

APPROVED: 7-6-59 [signature]
DATE BRIDGE ENGINEER

H-0561

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N. D.	F-29-1(4)	102

See other end for reinforcing

For Spacing See Layout

See other end for dimensions.

See Anchor Post Detail

For Location See Layout

See Detail "A"

PART ELEVATION

PART PLAN

A-A

Seal Corner With Asphalt Flashing Compound (Knife Grade)

TYPICAL SECTION

PART PLAN

1" ϕ Galvanized Sleeve

Flex Beam

DETAIL "A"

ANCHOR POST DETAIL
See Layout For Placement

Federal Aid Name Plate Roadway Face of Post (See Bridge Layout)

6 Equal Spaces RC Bars

22 Bars

Cl Bars

6 Equal Spaces

3 Spaces @ 1'-0"

See Superstructure Sheet

RAIL DETAILS

P1

P2

P7, P8, P9 & RC

P6

P4 & P5

BENT BAR DETAILS
Dimensions shown are out to out

RAIL BOLT
(Galvanized)
To be included in the unit price bid for Class AAE-3 Concrete.

NOTES:

All concrete above top of curb shall be Class AAE-3.

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

Designed in accordance with 1965 A.A.S.H.O. Specifications.

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

BAR LIST
(BARS FOR FOUR END POSTS)

MARK	NO.	SIZE	LENGTH	SHAPE
P1	16	5	3'-11"	Bent
P2	16	5	4'-2"	"
P3	24	4	1'-8"	Str.

BAR LIST
(BARS FOR RAILING AND POSTS)

MARK	NO.	SIZE	LENGTH	SHAPE
P4	*	6	4'-4"	Bent
P5	*	6	5'-1"	"
P6	*	5	4'-9"	"
P7	*	3	4'-2"	"
P8	*	3	3'-2"	"
P9	*	3	4'-8"	"
RC		3	3'-3"	Bent
R**	**	6	**	Str.

QUANTITIES 4 END POSTS *

Class AAE-3 Concrete	0.64 Cu Yd
Reinforcing Steel	162 Lbs.

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

STANDARD RAILING DETAILS

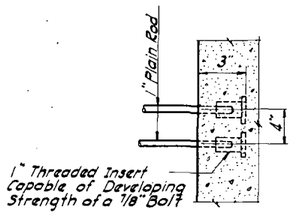
QUANTITIES

H-0158

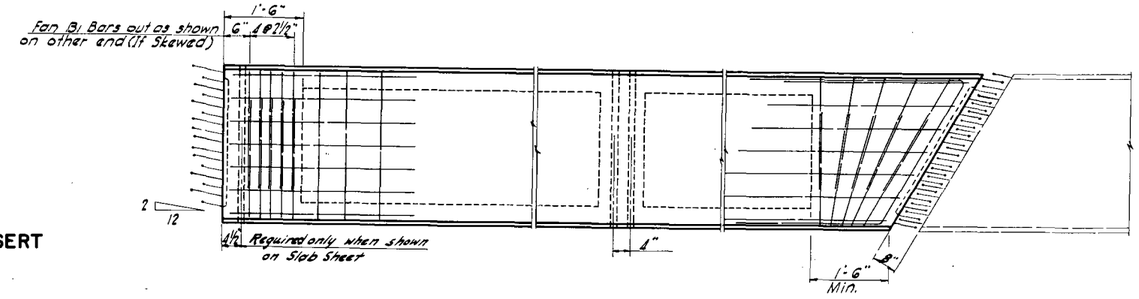
H-0158

Weight of Girder in Tons = (0.2305)(Length of Girder in Feet) + (0.1332)(No. of Diaphragms) + (0.4797)(1 + Tangent of Skew Angle)

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N.D.	I-29-1(4)	103

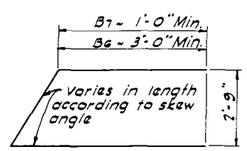


DIAPHRAGM BAR INSERT
Outer Girders Only

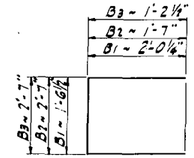


PARTIAL PLAN
Showing Square End

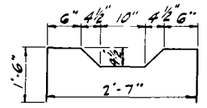
PARTIAL PLAN
Showing Skewed End



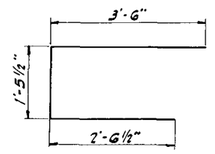
B6 & B7 BARS



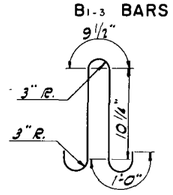
B1-3 BARS



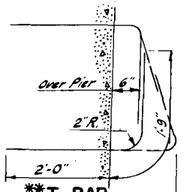
B4 BAR



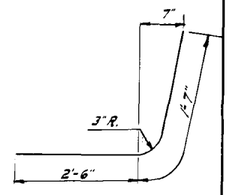
B5 BAR



SUGGESTED LOOP
⅞" ϕ Mild Steel

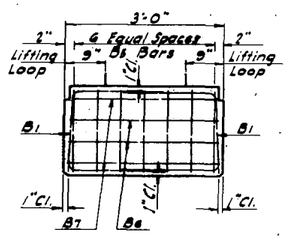


****T1 BAR**
Tie Bar
Abut. End Only

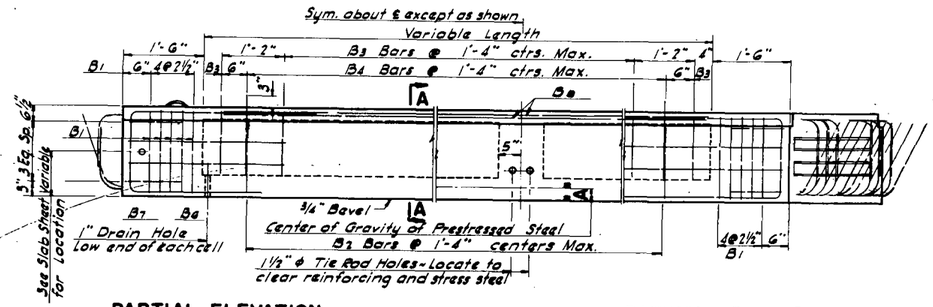


**** T2 BAR**
Suspender Bar

BENT BAR DETAILS

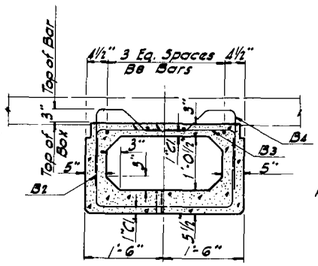


END BLOCK

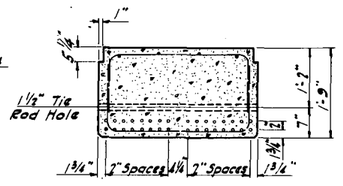


PARTIAL ELEVATION
Showing Square End

PARTIAL ELEVATION
Showing Skewed End

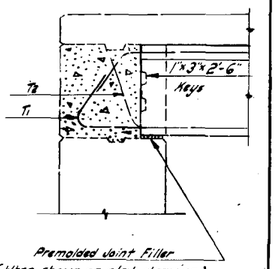


A - A

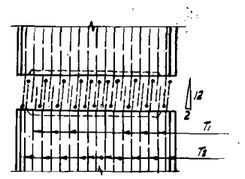


Suggested Prestressing Steel Locations

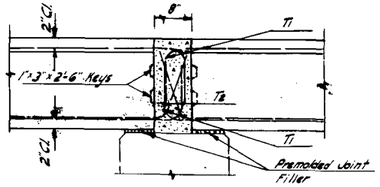
℄ SECTION OF DIAPHRAGM



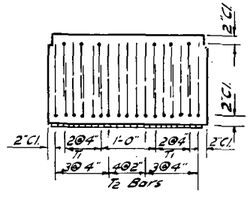
ASSEMBLY AT ABUTMENT
Showing T Bars



PLAN VIEW
Showing T Bars



ASSEMBLY AT PIER
Showing T Bars



END VIEW
Showing T Bars

** T1 & T2 bars shall be straight when concrete is poured. After the concrete has set the bars shall be bent by the beam fabricator as shown.

BAR LIST

MARK	SIZE	LENGTH	SHAPE
B1	4	5'-7"	Bent
B2	4	5'-9"	"
B3	4	5'-0"	"
B4	4	5'-10"	"
B5	4	7'-6"	"
B6	4	Variable	Str.
B7	4	"	"
B8	4	"	"
*T1	4	3'-9"	"
**T2	5	4'-1"	"

21" x 36"
(5½" Box Floor)
SUSPENDED PRESTRESSED BOX GIRDER
COMPOSITE SLAB

GIRDER DATA

LENGTH L	SPACE BETWEEN BEARS	THICKNESS OF SLAB AT ℄ OF SPAN	THICKNESS OF SLAB AT ℄ OF BEARING	BARREL NO.	LIVE LOAD	FINAL STRESSING FORCE AT MIDSPAN A	KIPS	A	KIPS	A	KIPS	WEIGHT "TONS"
38'-2"	5'-4"	7"	6½"	94-139T	H20	2.25	360.2	2.75	375.1	3.25	391.3	9.5
38-5"	4'-0"	7"	6½"		HS20	1.75	350.4	2.25	364.3	2.75	379.2	9.5
42-2"	6'-0"	7"	6½"	49-13	HS20	2.25	490.6	2.75	510.9	3.25	532.9	10.3
44-0"	4'-0"	7"	6½"	8-114T	HS20	2.25	470.6	2.75	490.0	3.25	511.2	10.8
50'-0"	3'-3"	6½"	6"		H20	1.75	533	2.25	555	2.75	576	11.7
32'-4	4'-0"	7"	6½"	29-8	HS20	2.75	469.1	3.25	480.7	3.75	493.4	8.1

①4600 PSI CONCRETE @ DETENSIONING

NOTES:

Design Specifications: A.A.S.H.O.

Design and Shop Drawing: At least 14 days prior to the forming and pouring of any girders, the Contractor shall submit checked design figures and shop drawings for the approval of the Bridge Engineer of the State Highway Department. The design figures shall show the total initial prestress force required as the sum of the final prestress force taken from the contract drawings and the losses in prestress due to friction, elastic shortening of concrete, shrinkage of concrete, creep of concrete and relaxation of steel stress as determined by the Contractor for his method of stressing. If the Contractor wishes, the loss of steel stress not including friction and elastic shortening losses may be assumed as 35,000 p.s.i. for pretensioning and 25,000 p.s.i. for post-tensioning.

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

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

The girders shall be poured in all-steel forms.

All reinforcing steel shall be intermediate grade.

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

All tension in the top of the beam shall be taken care of by draping prestress steel, by adding mild steel in the top or by a combination of the two.

C.G. = 9.50" from bottom
Area = 442.5 sq. in.
Moment of Inertia = 22,612 in⁴

*If not shown on this drawing, see plans on Specific Project.

The dead load provisions in the design include composite concrete slab, 25 p.s.f. future wearing surface and curb weight uniformly distributed over all units.

The center of gravity of the tensioning units at all points along the girder shall lie on or below the curve of a draped chalk line that sags freely with dimension "A" as shown and with the end 7" above the bottom of the girder.

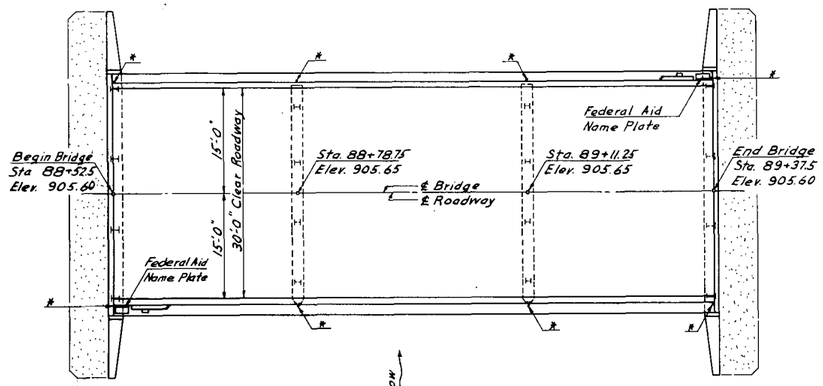
Concrete test cylinder strength at time of stress transfer shall be at least 4000 p.s.i.

Stressing forces for lengths not shown shall be interpolated from values in table.

H-7009

H-7009

BRIDGE CODE	FED. ROAD DIST NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-020	5	N. D.	I-029-1(4)		104	



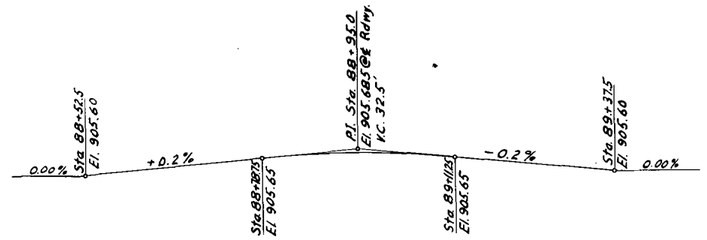
* Elevation check points only see Std. D-900-1. (Cost to be included in unit price bid for Class AE-1 Concrete Superstructure)

PLAN

	Begin Br.	5 Eq. Spaces = 24'-2"			5 Eq. Spaces = 31'-0"			5 Eq. Spaces = 24'-2"			End Br.
Screed Elev. Involving D.L. Def.	905.600	905.618	905.633	905.643	905.648	905.650	905.650	905.683	905.706	905.716	905.683	905.650	905.650	905.648	905.643	905.633	905.618	905.600	905.600
Dead Load Deflection	0.0	.008	.013	.013	.008	0.0	0.0	.023	.036	.036	.023	0.0	0.0	.008	.013	.013	.008	0.0	0.0
		1'-4"	1'-6"										1'-6"					1'-4"	

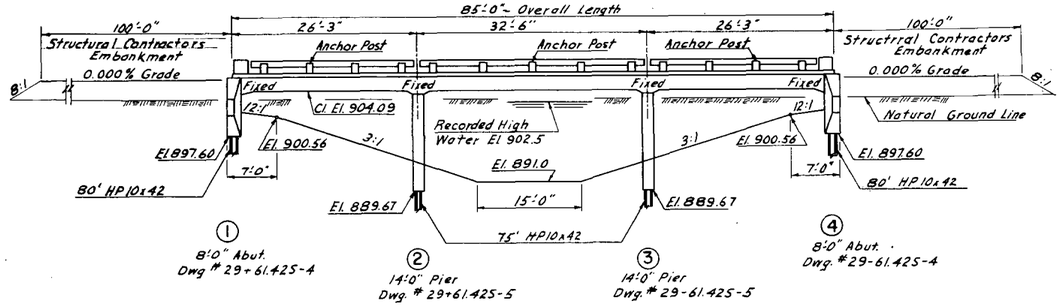
SCREED ELEVATIONS

Elevations are to top of Finished Rdwy. @ ℄

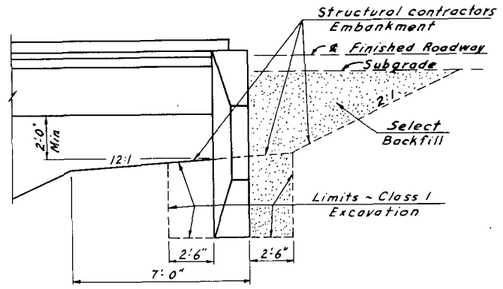


VERTICAL CURVE DATA

Elevations are to top of Finished Rdwy @ ℄ for structural drainage only.



ELEVATION



DETAIL AT ABUTMENTS

Not to scale

1971
FEDERAL AID
PROJECT
I-029-1(4)
NORTH DAKOTA
29-61.42S

12-27-71

FEDERAL AID NAME PLATE
2 Required

ESTIMATE OF QUANTITIES

SPEC. NO.	CODE NO.	BID ITEM		
208	0100	CLASS 1 EXCAVATION	96	CU. YD.
208	0110	CLASS 2 "	71	CU. YD.
228	0100	SELECT BACKFILL	116	CU. YD.
610	1116	CLASS AE-1 CONCRETE (SLAB SUPERSTRUCTURE)	135.5	CU. YD.
610	1112	CLASS AE-1 CONCRETE (SUBSTRUCTURE)	92.6	CU. YD.
610	0138	CLASS AAE-3 " (RAILING & POSTS)	6.0	CU. YD.
612	0110	REINFORCING STEEL (GRADE 40)	42,988	LB.
622	0020	STEEL PILING HP10x42	1,240	L.FT.
750	0100	LINSEED OIL TREATMENT	14	GAL.

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-61.42S, 29-61.42S-1, 2, 3.
SUBSTRUCTURE 29-61.42S-4&5.
SUPERSTRUCTURE 29-61.42S-6, H-0158, H-0501, H-0401, D-900-1 & D-900-6

DESIGN LOADING	SCALE
H 20	1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
ROSE COULEE
SERVICE ROAD (LEGAL DRAIN No. 27)
BRIDGE LAYOUT

PROJECT I-029-1(4) STA. 88+95.0

CASS COUNTY

APPROVED
6-7-71 (DATE)
Allen I. Anderson (BRIDGE ENGINEER)

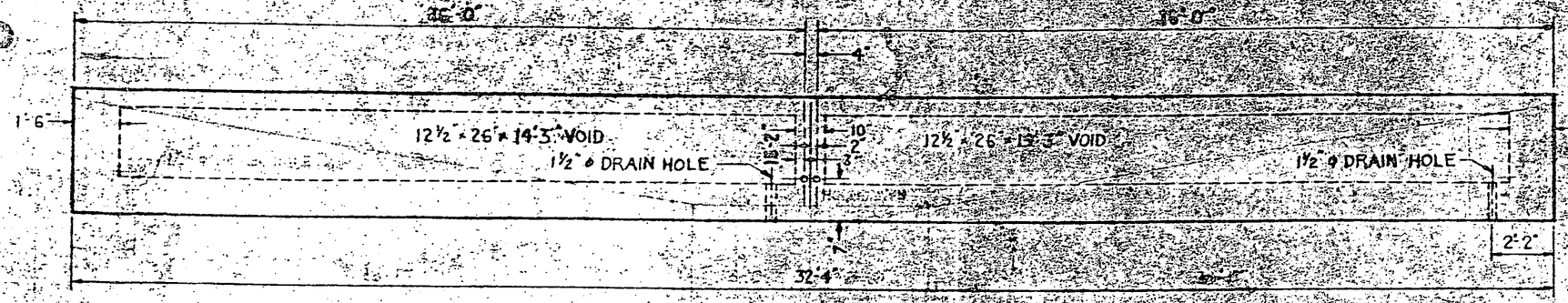
BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
9	R.R. Spike in P.P.	80+20 - 277' Rt.	904.99
10	Paint Spot on Br.	88+63 - 251' Rt.	906.26
11	R.R. Spike in P.P.	97+25 - 282' Rt.	904.38

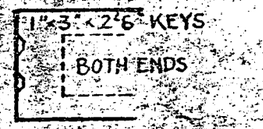
PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH O. T. M.	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	LONG. FORCE	DESIGN LOAD	MAXIMUM REQUIRED BEARING
Abutment	23.3 T	8.7						32.0	55
Piers	40.5 T	12.4						52.9	55

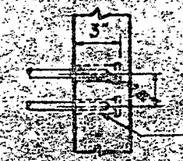
PLACE 2 SETS OF STRANDS EACH END FOR LIFTING



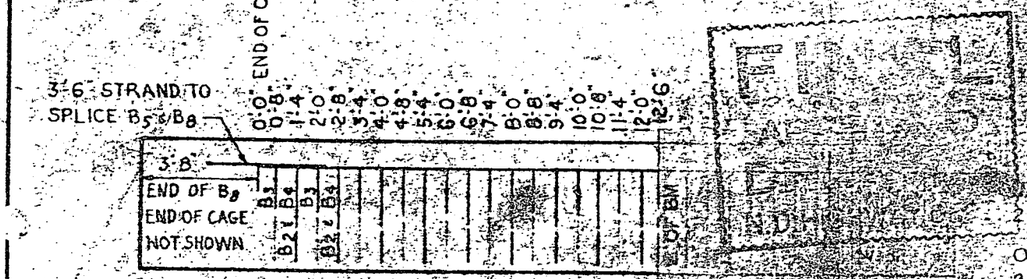
ELEVATION ~ SHOWING VOIDS, DIAPHRAGMS & HOLES



NOTE: T_1 & T_2 BARS = PROJECTING STRANDS NOT TO EXCEED 11 STRANDS ON ONE END ARE TO BE PLACED EA. END OF ALL BMS. AS PER STATES DRAWING H-7009 AS DONE HERETOFORE



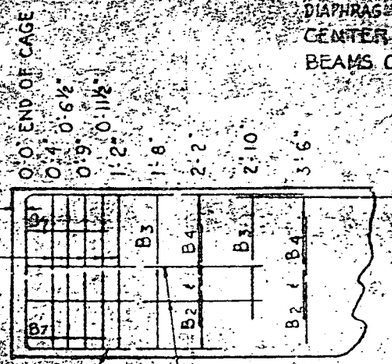
DIAPHRAGM BAR INSERTS @ CENTER DIAPH. EXT. BEAMS ONLY

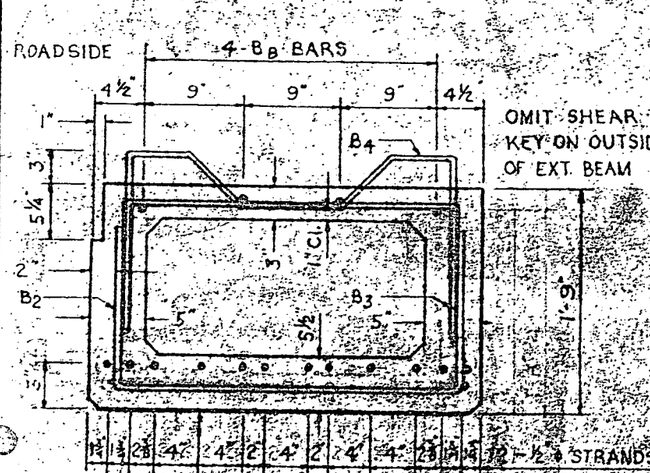


MAKE 1 CAGE PER BEAM AS SHOWN
22 B_2, ~~23~~ B_3 & 22 B_4 BARS PER BEAM

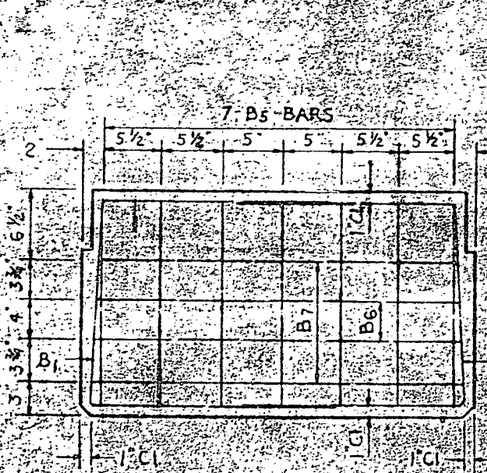
USE 4 B_8 BARS
2 TO CAGE & 2 PLACED LATER

OMIT B_2 & B_4 ON ℄ ON 2ND HALF OF CAGE





BASIC BEAM



END VIEW

THIS IS THE S. SPAN OF A 3 SPAN BRIDGE. THE N. SPAN IS SIMILAR EXCEPT THE DRAIN HOLES ARE ON OPPOSITE ENDS OF THE BMS. THE CTR. SPAN IS ALSO SIMILAR EXCEPT THE DRAIN HOLES ARE 2'-2" FROM EACH END OF THE BM.

MAKE 2 INT. & 2 EXT.

DETAILS NOT SHOWN ARE IN ACCORDANCE WITH STATE PLAN

BR. No. 29-61.417 L & R
29-061.594 Lt & Rt

9-2-71 8-5-71 REV.

NORTH DAKOTA CONCRETE PROD.
BISMARCK, NORTH DAKOTA

I-29-1(41)54 CASS COUNTY
21"x36"x32'-4" P/S BOX HS-20

SCALE	DRAWING NUMBER
DATE 9-5-69 Rev 8-17-71	
DRAWN T.E.	

BR. No. 29-61.417 & 594

BOX # 35-556