Steel
Coded 12-1-87 JFF
Needs Rating Rated

DESIGN DATA

Traffic	Average Daily					Est. 30th Max. Hr.
Current Traffic (1987)	300	Pass.	50	Trucks 350	Total	45
Traffic Forecast (2007)	300	Pass.	50	Trucks 350	Total	45

Bridge HS20

Design Speed 60 MPH

JOB# 6

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

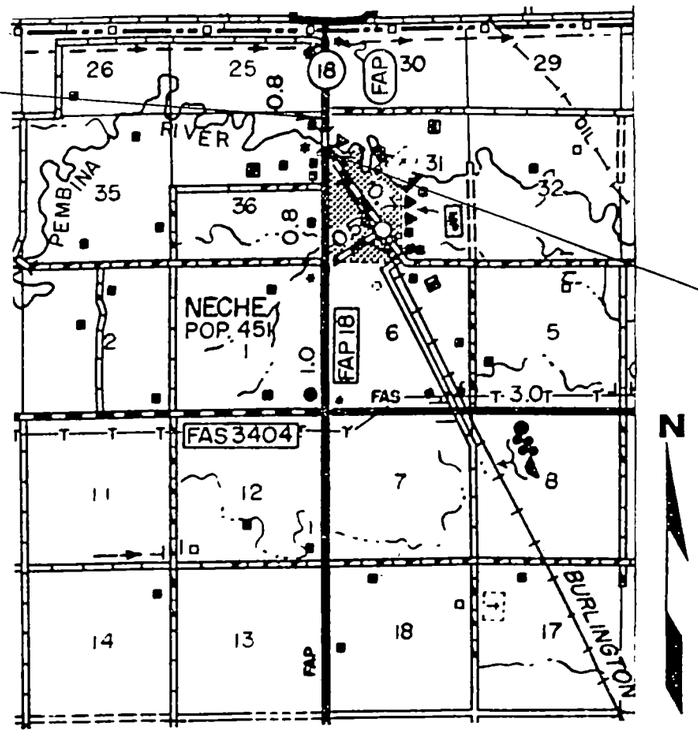
In Pembina County
Federal Aid Project No. BRF-6-018(024)241
Structure & Incidental

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	BRF-6-018(024)241	1

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway Department Nov. 1986, Standard Drawings currently in effect, and other Contract Provisions submitted herein.

Begin Project BRF-6-018(024)241
Sta. 39+00
A point 253.8 Ft.
South of the NE Cor.
of Sec. 36, Twp. 164 N.,
Rge 53 W.



End Project BRF-6-018(024)241
Sta. 51+00
A Point 1453.8 Ft. South
of the NE Cor. of Sec. 36,
Twp. 164N., Rge. 53 W.

Project BRF-6-018(024)241, in Pembina County consists of replacing the existing structure on the Pembina River. The new structure will be 2' higher than the existing. Traffic will be routed over a bypass during construction. The bypass will be located on the west side of the site.

LENGTH OF PROJECT

Project	Miles-Gross	Miles-Net
BRF-6-018(024)241	0.227	0.227

APPROVED DATE 9-18-87

Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

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

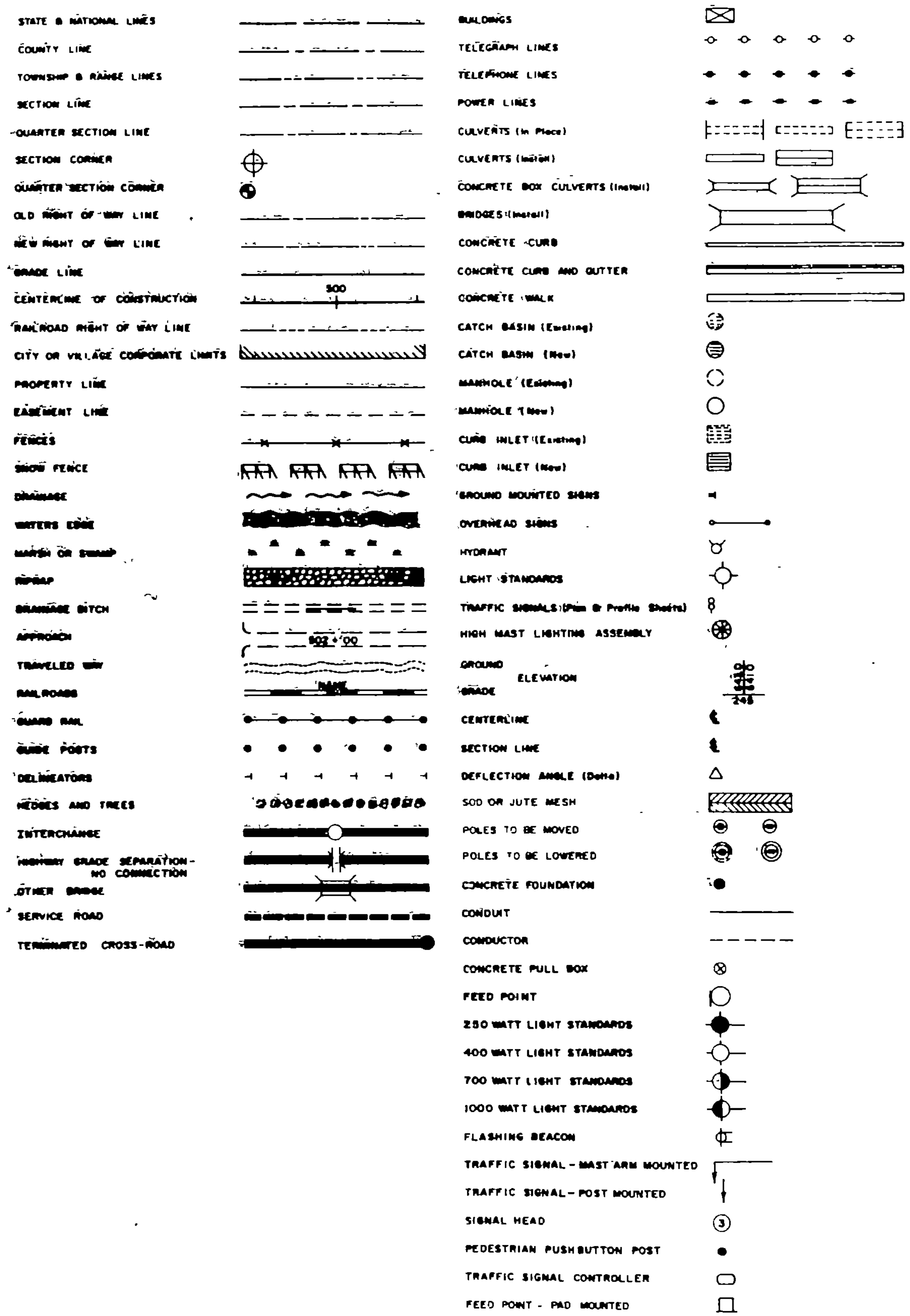
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

18-241.409

SYMBOLS



ABBREVIATIONS

Aggr	Aggregate
Ahd	Ahead
Alt	Alternate
Approx	Approximate or Approximately
Appr	Approach
Asph Cem or A.C	Asphalt Cement
Asph Conc	Asphaltic Concrete
Bit	Bituminous or Bitumen
Bk	Back
B M	Bench Mark
Bldg	Building
Br	Bridge
C A E S	Corrugated Aluminum End Section
C A P	Corrugated Aluminum Pipe
C B	Catch Basin
C & G	Curb and Gutter
Ch Blk	Channel Block
Ch Ch	Channel Change
C I	Curb Inlet
C I P	Cast Iron Pipe
Cl	Class
C S E S	Corrugated Steel End Section
C S P	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp	Compression
Const	Construction
Conc	Concrete
Cont Reinf Conc Pvmt	Continuously Reinforced Concrete Pavement
Contn	Contraction
Crn	Crown
CRS	Cationic Rapid Setting
Crse	Course
C S	Curve to Spiral
C to C	Center to Center
C Y	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D B	Ditch Block
Def	Deformed
Del	Deliver
D G	Ditch Grade
El or Elev	Elevation
Ellipt	Elliptical
Emb	Embankment
Emul	Emulsified
Engr	Engineer
Eq	Equation
E R	East Roadway
E S	End Section
Esmt	Easement
Exc	Excavation
Exp	Expansion
F D	Field Drive
Found	Foundation
F P	Fence Post
Furn	Furnish
Ga	Gage or Gauge
Gr	Gravel
Grd	Graded
G V	Gate Valve
Hel	Helical
Hyd	Hydrant
Ident	Identification
Inchg	Interchange
I M	Iron Monument
Inst	Install
Inter	Intersection
Inv	Invert
Jt	Joint
L	Length of Curve
Lc	Length of Spiral
Levg	Leveling
L F	Linear or Lineal Feet
Liq	Liquid
Long	Longitudinal
L P	Light Pole
Lt	Left
M	One Thousand
Matl	Material
Max	Maximum
MC	Medium Curing
M H	Manhole
Min	Minimum

M L	Main Line
N R	North Roadway
Off Loc	Office Location
O to O	Out to Out
P & P	Plan and Profile
P C	Point of Curvature
P C C	Point of Compound Curve
P C C Pvmt	Portland Cement Concrete Pavement
P D	Private Drive
Pen	Penetration
Perf	Perforated
P I	Point of Intersection
P O C	Point on Curve
P O T	Point on Tangent
P P	Power Pole
P R C	Point of Reverse Curvature
Pref	Preformed
P S D	Passing Sight Distance
P T	Point of Tangency
P V C	Polyvinyl Chloride Sewer Pipe
Quant	Quantity or Quantities
R	Radius
R or Rge	Range
RC	Rapid Curing
R C E S	Reinforced Concrete End Section
R C P	Reinforced Concrete Pipe
R C P S	Reinforced Concrete Pipe Sewer
Rd	Road
Rdbd	Roadbed
Rdwy	Roadway
Refl	Reflectorized
R R	Railroad
Rt	Right
R/W	Right of Way
Salv	Salvage
San	Sanitary
S C	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S D	Sight Distance
S E	Superelevation
Sec	Section
Sec Line Appr	Section Line Approach
Sep	Separation
Serv	Service
Sgr Prep	Subgrade Preparation
Shldr	Shoulder
SP	Special Provision
S P P	Structural Plate Pipe
S P P A	Structural Plate Pipe Arch
S R	South Roadway
SS	Slow Setting or Supplement Specification
S S D	Stopping Sight Distance
S T	Spiral to Tangent
Sta	Station
Std	Standard
Std Specs	Standard Specifications
Struct	Structure
Surf	Surface or Surfacing
Surv	Survey
S W	Sidewalk
S Y	Square Yard
T	Tangent Length (circular curve)
T or Twp	Township
Tel	Telephone
Temp	Temporary
T P	Telephone Pole
Tr	Traffic
Trans	Transverse or Transition
Trtd	Treated
Ts	Tangent Length (curve with spirals)
T S	Tangent to Spiral
U S C & G S	United States Coast and Geodetic Survey
V C	Vertical Curve
V C P	Vitrified Clay Pipe
W M	Water Main
W M V	Water Main Valve
W R	West Roadway
Wrng	Wearing
W S V	Water Service Valve
X-Sec	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	5

SUMMARY OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	Contract Bond	L. Sum	1
201	0330	Clearing and Grubbing	L. Sum	1
202	0105	Removal of Structure	L. Sum	1
203	0101	Common Excavation - Type A	Cu. Yd.	986
203	0140	Borrow	Cu. Yd.	6,980
210	0101	Class I Excavation	L. Sum	1
210	0111	Class 2 Excavation	L. Sum	1
210	0126	Channel Excavation	Cu. Yd.	1,530
210	0200	Select Backfill	Cu. Yd.	305
210	0201	Foundation Preparation	Ea.	1
216	0100	Water	M. Gal.	119
302	0120	Aggregate Base Course Cl. 5	Ton	1,664
401	0103	MC-70, 250 Liquid, or SP-6 Emulsified Asphalt	Gal.	1,979
401	0160	Blotter Material - Cl. 44	Ton	18
406	9250	Bituminous Surfacing	Ton	928
550	0215	Concrete Bridge Approach Slab	Sq. Yd.	186
602	1250	Penetrating Water Repellent Treatment	Sq. Yd.	800
702	0100	Mobilization	L. Sum	1
704	0100	Flagging	M. Hr.	500
704	1000	Traffic Control Signs	Unit	1,348
704	1052	Type III Barricade	Ea.	7
704	1060	Delineator Drums	Ea.	36
704	1080	Vertical Panels	Ea.	50
706	0100	Field Laboratory - Type A	Ea.	1
708	0100	Aggregate Cushion	Cu. Yd.	500
708	1020	Riprap, Loose Rock	Cu. Yd.	805

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	6

SUMMARY OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
708	2280	Seeding - Type B Class V	Acre	8
710	0100	Temporary Bypass	Ea.	1
714	1100	Pipe, Concrete Reinforced 48 In. - Cl. II	L. Ft.	64
714	5035	Pipe, Corrugated Steel .064 In. - 24 In.	L. Ft.	48
714	5820	End Section, Corrugated Steel .064 In. - 24 In.	Ea.	2
714	9630	Relay End Section, All Types and Sizes	Ea.	4
762*	0102	Pavement Marking Painted Line	L. Ft.	3,000
764	0118	Box Beam Guardrail	L. Ft.	281
764	0151	Remove Beam Guardrail and Posts	L. Ft.	224
764	0600	Box Beam Guardrail - Flared End Treatment and Transition	Ea.	4
930	3000	Bridge Bench Marks	Set	1

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

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	7

SUMMARY OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
		ALTERNATE A - CONCRETE		
602	0130	Class AAE-3 Concrete	Cu. Yd.	226
602	1130	Class AE-3 Concrete	Cu. Yd.	178
604	9620	Prestressed Box Beam - 33 Inches	L. Ft.	878
612	0115	Reinforcing Steel - Grade 60	Lb.	37,579
612	0116	Reinforcing Steel - Grade 60 (Epoxy Coated)	Lb.	28,069
616	0362	Structural Steel M183 (A36	Lb.	1,632
622	0040	Steel Piling HP 12x53	L. Ft.	3,620
622	1200	Steel Test Piling HP 12x53	L. Ft.	310
		ALTERNATE B - STEEL		
602	0130	Class AAE-3 Concrete	Cu. Yd.	245
602	1130	Class AE-3 Concrete	Cu. Yd.	161
612	0115	Reinforcing Steel - Grade 60	Lb.	42,480
612	0116	Reinforcing Steel - Grade 60 (Epoxy Coated)	Lb.	29,667
616	5890	Structural Steel	L. Sum	1
622	0020	Steel Piling HP 10x42	L. Ft.	3,835
622	0393	Steel Test Piling HP 10x42	L. Ft.	310

8/28/87 PROJECT NO. BRF-6-018(024)241

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB-TOTAL
R1-1-30	30"x 30"	STOP	4	17	68
R1-1-48	48"x 48"	STOP		34	0
R1-2-48	48"x48"& 36"x 30"	YIELD & TO ONCOMING TRAFFIC		45	0
R2-1-48	48"x 60"	SPEED LIMIT	4	40	160
R2-5c-48	48"x 60"	SPEED ZONE AHEAD	2	40	80
R4-1-48	48"x 60"	DO NOT PASS		40	0
R4-7-48	48"x 60"	KEEP RIGHT SYMBOL		40	0
R4-8-48	48"x 60"	KEEP LEFT SYMBOL		40	0
R10-6-48	48"x 72"	STOP HERE ON RED		44	0
R11-2-48	48"x 30"	ROAD CLOSED	2	26	52
R11-3a-60	60"x 30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		30	0
R11-3b-60	60"x 30"	BRIDGE OUT __ MILES AHEAD LOCAL TRAFFIC ONLY		30	0
R11-2a-48	48"x 30"	STREET CLOSED		26	0
R11-3c-48	60"x 30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		30	0
R11-4a-60	60"x 30"	STREET CLOSED TO THRU TRAFFIC		30	0
G20-1-60	60"x 36"	ROAD CONSTRUCTION NEXT __ MILES		34	0
G20-2-60	60"x 24"	END CONSTRUCTION	2	28	56
G20-2a-48	48"x 24"	END ROAD WORK		24	0
G20-4-36	36"x 18"	PILOT CAR FOLLOW ME		10	0
G20-50-72	72"x 36"	ROAD CONSTRUCTION NEXT __ MILES RT & LT ARROWS -		38	0
G20-52-72	72"x 24"	ROAD CONSTRUCTION NEXT __ MILES RT or LT ARROW -		30	0
G20-54-48	48"x 36"	OVERHEAD BRIDGE PAINTING		30	0
G20-8-48	48"x 36"	TEMPORARY SURFACE NEXT __ MILES		30	0
M1-4-24	24"x 24"	ROUTE MARKER (POST AND INSTALLATION ONLY)		8	0
M3-1-24	24"x 12"	NORTH (MOUNTED ON ROUTE MARKER POST)		6	0
M3-2-24	24"x 12"	EAST (MOUNTED ON ROUTE MARKER POST)		6	0
M3-3-24	24"x 12"	SOUTH (MOUNTED ON ROUTE MARKER POST)		6	0
M3-4-24	24"x 12"	WEST (MOUNTED ON ROUTE MARKER POST)		6	0
M4-8-24	24"x 12"	DETOUR (MOUNTED ON ROUTE MARKER POST)		6	0
M4-10-48	48"x 18"	DETOUR ARROW RIGHT or LEFT	2	22	44
M5-1-21	21"x 15"	ARROW AHD AND RT or LT(MTD ON ROUTE MKR POST)		6	0
M6-1-21	21"x 15"	ARROW RT or LT (MOUNTED ON ROUTE MARKER POST)		6	0
W1-1-48	48"x 48"	RIGHT or LEFT SHARP CURVE ARROW		34	0
W1-2-48	48"x 48"	RIGHT or LEFT CURVE ARROW		34	0
W1-3-48	48"x 48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW	4	34	136
W1-4-48	48"x 48"	RIGHT or LEFT REVERSE CURVE ARROW		34	0
W1-6-48	48"x 24"	LARGE ARROW		26	0
W3-1a-48	48"x 48"	STOP AHEAD SYMBOL		34	0
W3-2a-48	48"x 48"	YIELD AHEAD SYMBOL		34	0
W3-3-48	48"x 48"	SIGNAL AHEAD SYMBOL		34	0
W4-2-48	48"x 48"	LANE TRANSITION SYMBOL		34	0
W5-1-48	48"x 48"	ROAD NARROWS		34	0
W6-3-48	48"x 48"	TWO WAY TRAFFIC SYMBOL		34	0
W8-1-48	48"x 48"	BUMP	2	34	68
W8-3a-48	48"x 48"	PAVEMENT ENDS SYMBOL		40	0
W8-3a-24	24"x 18"	PAVEMENT END PLAQUE			
W8-9-48	48"x 48"	LOW SHOULDER		34	0
W8-51-48	48"x 48"	UNEVEN PAVEMENT	2	34	68
W8-53-48	48"x 48"	TRUCKS ENTERING HIGHWAY		34	0
W8-54-48	48"x 48"	TRUCKS ENTERING AHEAD OR __ FT.	2	34	68
W8-55-48	48"x 48"	TRUCKS CROSSING AHEAD or __ FT.	2	34	68
W13-1-24	24"x 24"	__ MPH ADVISORY SPEED PLATE	4	10	40
W13-4-48	48"x 60"	RAMP ARROW		40	0
W20-1-48	48"x 48"	ROAD CONSTRUCTION - AHEAD, 1/2 MILE, or FT.	4	34	136
W20-1a-48	48"x 48"	MEN WORKING SYMBOL		34	0
W20-2-48	48"x 48"	DETOUR __ FT.	2	34	68
W20-3-48	48"x 48"	ROAD or STREET CLOSED AHEAD or __ FT.		34	0
W20-4-48	48"x 48"	ONE LANE ROAD AHEAD or __ FT.	2	34	68
W20-5-48	48"x 48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.		34	0
W20-7a-48	48"x 48"	FLAGGING SYMBOL	2	34	68
W20-7k-24	24"x 18"	__ FEET	2	8	16
W20-8-48	48"x 48"	STREET CLOSED		34	0
W20-50-48	48"x 48"	BE PREPARED TO STOP		34	0
W20-51-48	48"x 48"	EQUIPMENT WORKING		34	0
W20-52-54	54"x 12"	NEXT __ MILES		10	0
W21-2-48	48"x 48"	FRESH OIL	2	34	68
W21-5-48	48"x 48"	SHOULDER WORK		34	0
W21-50-48	48"x 48"	BRIDGE PAINTING AHEAD or __ FT.		34	0
W21-51-48	48"x 48"	MATERIAL ON ROADWAY		34	0
W22-7-48	48"x 48"	SINGLE LANE AHEAD or __ FT.		34	0
W22-8-48	48"x 48"	FRESH OIL LOOSE ROCK		34	0
R1-1a-18 W22-14-18	18"X 18"	STOP and SLOW PADDLE Back to Back	2	8	16
		TOTAL UNITS		SPEC&CODE 704-1000	1348

TYPE III	8' LONG	BARRICADES	EACH	704-1052	7
TYPE II	2' MIN.	BARRICADES	EACH	704-1051	
TYPE I	6'to 10'	BARRICADES	EACH	704-1050	
18"x 36" MIN. 28" MIN.		DELINEATOR DRUMS	EACH	704-1060	36
		TRAFFIC CONES	EACH	704-1065	
8" to 12"	x 24"	VERTICAL PANELS (BACK TO BACK)	EACH	704-1080	50
	3"x 8"	DELINEATOR	EACH	704-1070	
		SEQUENCING ARROW PANEL TYPE C	EACH	704-1087	

TRAFFIC CONTROL

CONSTRUCTION AREA

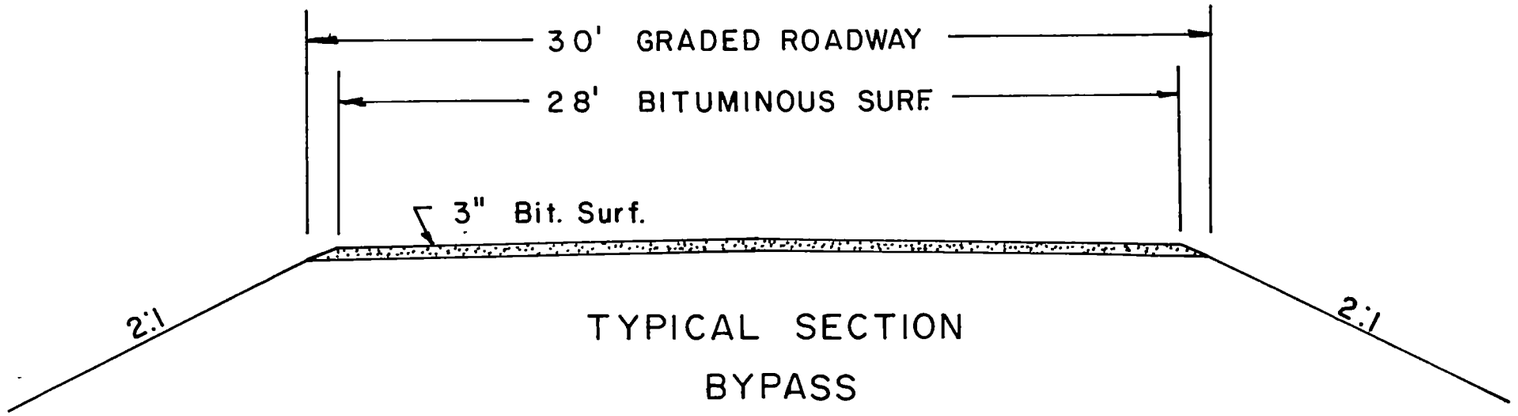
DEVICE LIST

ND 18

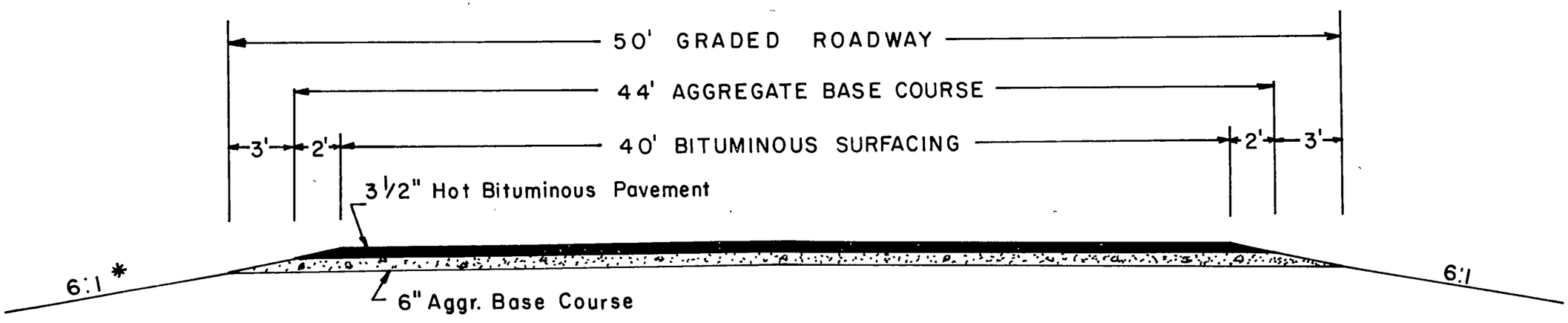
PEMBINA COUNTY, ND.

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-6-018(024)241	8

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	9



TYPICAL SECTION
BYPASS



SURFACING SECTION

* 4:1 Slope In Area of Ballfield

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	10

Estimated Guardrail Quantities*

Box Beam Guardrail

Location	W6x9.0# Posts	W10x11.5# Blockouts	W6x9.0# Blockouts	5/8" Dia. x 8" Long Carriage Bolts	5/8" Dia. x 1-3/4" Long Hex Head Bolts	S3x5.7# Posts	S3x5.7# Adjustment Blocks	5/8" Dia. x 8" Long Hex Head Bolts	3/8" Dia. x 1-3/4" Long Hex Head Bolts	5"x3½"x10.4# Beam Attachment Angle	Transition Splice	Straight Splice	Reflectorized Plates	6"x6"x3/16"x18'-0" Box Beam	6"x6"x3/16"x15'-3" Box Beam	6"x6"x3/16"x14'-10½" Box Beam	6"x6"x3/16"x13'-1½" Box Beam				
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA				
44+30.96 to 45+28.03 Rt.	5	3	2	5	10	16	16	16	64	16	1	4	4	3	1	1	1				
44+70.22 to 45+13.47 Lt.	5	3	2	5	10	7	7	7	28	7	0	2	2	0	1	1	1				
46+85.97 to 47+83.04 Lt.	5	3	2	5	10	16	16	16	64	16	1	4	4	3	1	1	1				
47+00.53 to 47+43.78 Rt.	5	3	2	5	10	7	7	7	28	7	0	2	2	0	1	1	1				
Totals	20	12	8	20	40	46	46	46	184	46	2	12	12	6	4	4	4				

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

Install Box Beam Guardrail

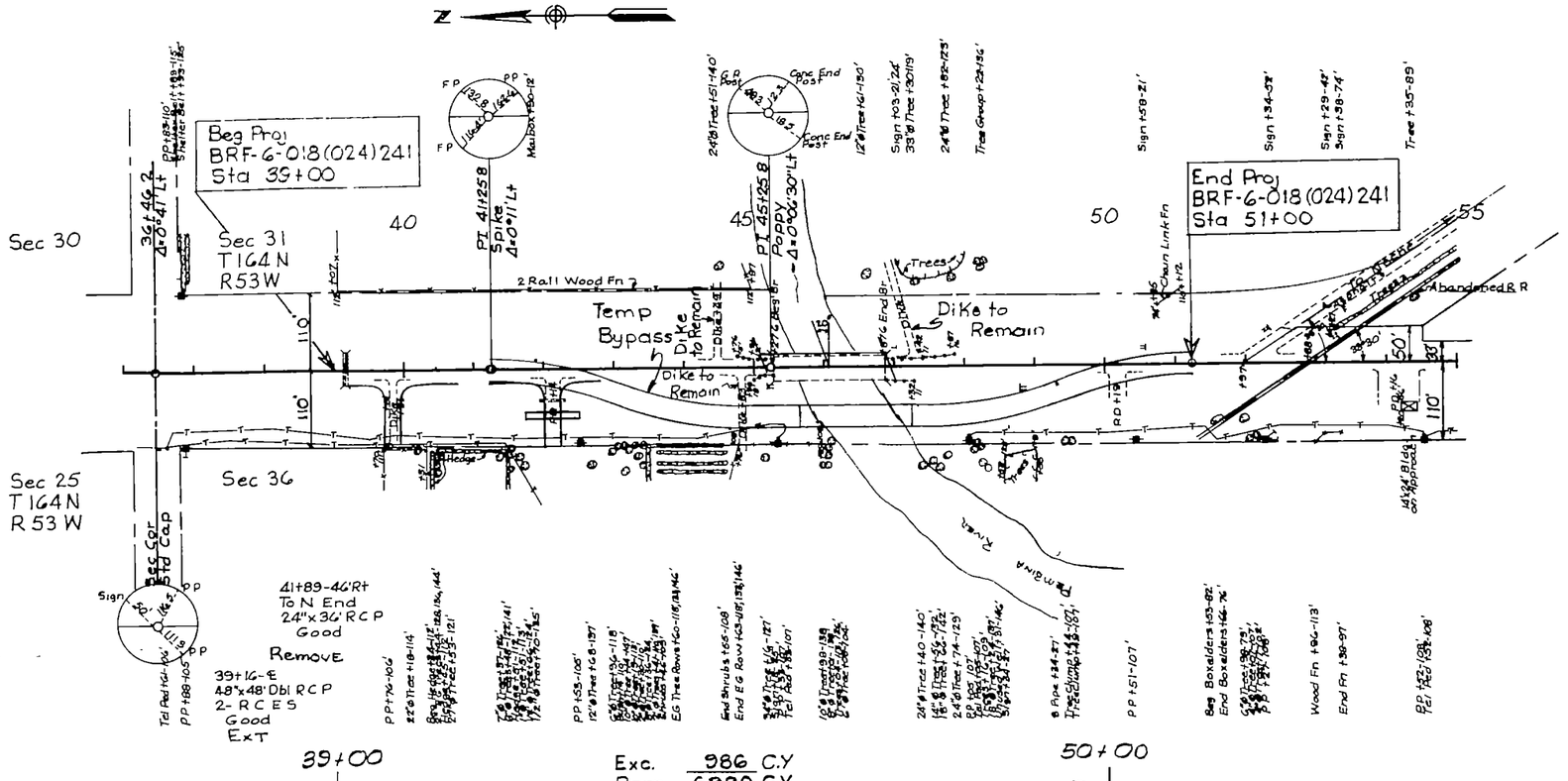
44+30.96 to 45+28.03 Rt.	97.3 LF
44+70.22 to 45+13.47 Lt.	43.3 LF
46+85.97 to 47+83.04 Lt.	97.3 LF
47+00.53 to 47+43.78 Rt.	43.3 LF

Remove Beam Guardrail & Posts

44+76.0 to 45+27.6 Lt.	51.6 LF
44+99.0 to 45+27.6 Rt.	28.6 LF
46+87.6 to 47+32.0 Rt.	44.4 LF
46+87.6 to 47+87.0 Lt.	99.4 LF

Box Beam Guardrail Quantities
Pembina River Bridge
Sta. 46+07 ℄
Skew 20° Lt. & Bk.
Mile 018-241.409
Pembina County
Neche, ND

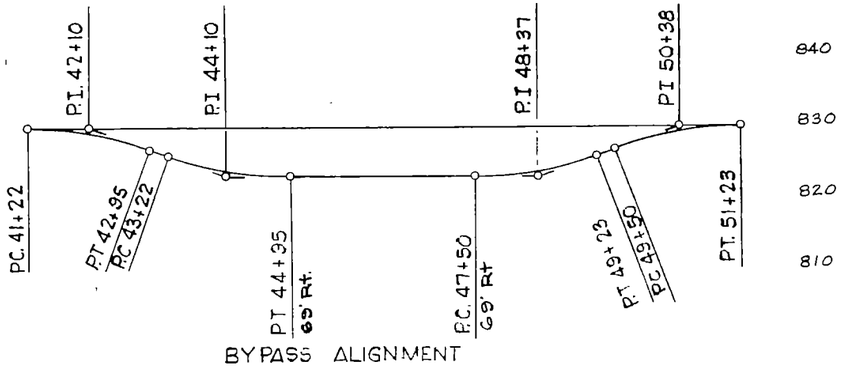
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N D	BRF-6-018(024)241	13



INSTALL PIPE CULVERT
42+14 Rt 24"x48' C S P
(.064") 2-24" C S E S (.064")
39+16 ℄ Dbl 48"x32' R C P C/II
(Ext 16'Lt & 16' Rt)

REMOVE & RELAY END SECTIONS
39+16 ℄ 4 Ea.

Curve Data All Curves
Δ = 19°57'32"
D = 11°28'
R = 500'
T = 87.97'
L = 173.88'



BY PASS ALIGNMENT

Bench Marks			
No	Description	Location	Elev
1	U-Iron by P P	39+83-113' Lt.	831.86
2	U-Iron by P P	42+53-104 Rt.	832.63
3	Paint Spot on Br	45+57-11 Rt	836.94
4	U-Iron by P P	50+51-107' Rt	833.34
5	U-Iron by P P	55+90-94' Lt	832.02

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	14

BASELINE STA	MATERIAL NAME	END AREAS	UNADJUSTED VOLUMES INCR	UNADJUSTED VOLUMES FROM BAL	UNADJUSTED VOLUMES ACCUM	MULT FACTOR	ADJUSTED VOLUMES INCR	ADJUSTED VOLUMES FROM BAL	ADJUSTED VOLUMES ACCUM	MASS ORDINATE
39+ 0.0	FILL	153.05	0	0	0	1.250	0	0	0	0.
	EARTH	26.85	0	0	0	1.000	0	0	0	
39+48.00	FILL	180.98	297	297	297	1.250	371	371	371	-328.
	EARTH	21.47	43	43	43	1.000	43	43	43	
39+59.00	FILL	222.67	9	379	379	1.250	103	474	474	-422
	EARTH	22.51	9	52	52	1.000	9	52	52	
39+81.00	FILL	117.19	138	518	519	1.250	173	647	647	-479.
	EARTH	261.44	116	168	168	1.000	116	168	168	
39+86.00	MODIFY VOLUMES									-708.
	FILL	110.65	221	739	739	1.250	276	923	923	
	EARTH	258.97	48	216	215	1.000	48	216	216	
39+91.00	FILL	103.91	20	769	769	1.250	28	948	948	-686.
	EARTH	256.61	46	264	264	1.000	48	264	264	
40+ 0.0	FILL	106.52	36	794	794	1.250	44	992	992	-664.
	EARTH	130.24	64	329	329	1.000	64	328	328	
40+ 9.00	FILL	186.43	49	842	842	1.250	61	1053	1053	-700.
	EARTH	20.40	25	353	353	1.000	25	353	353	
41+ 0.0	FILL	127.61	529	1372	1372	1.250	662	1715	1715	-1303.
	EARTH	14.56	59	412	412	1.000	59	412	412	
41+80.00	FILL	151.41	413	1785	1785	1.250	517	2231	2231	-1789.
	EARTH	5.79	30	442	442	1.000	30	442	442	
42+ 0.0	FILL	84.08	87	1872	1872	1.250	109	2340	2340	-1868.
	EARTH	102.17	40	482	482	1.000	40	482	482	
42+ 5.00	FILL	85.42	16	1888	1888	1.250	20	2360	2360	-1859.
	EARTH	100.25	19	501	501	1.000	19	501	501	
42+14.00	MODIFY VOLUMES									-2033.
	FILL	89.23	165	2053	2053	1.250	206	2566	2566	
	EARTH	92.25	32	533	533	1.000	32	533	533	
42+23.00	FILL	93.03	30	2083	2083	1.250	38	2604	2604	-2042.
	EARTH	84.26	29	562	562	1.000	29	562	562	
42+39.00	FILL	178.38	80	2164	2164	1.250	100	2705	2705	-2117.
	EARTH	1.74	26	588	588	1.000	26	588	588	
43+ 0.0	FILL	177.43	402	2566	2566	1.250	502	3207	3207	-2616.
	EARTH	1.14	3	591	591	1.000	3	591	591	
43+50.00	FILL	190.31	340	2906	2906	1.250	426	3633	3633	-3040.
	EARTH	0.0	1	593	593	1.000	1	593	593	
44+ 0.0	FILL	224.24	384	3290	3290	1.250	480	4113	4113	-3520.
44+28.00	FILL	224.01	232	3523	3523	1.250	291	4403	4403	-3811.
44+43.00	FILL	159.77	107	3629	3629	1.250	133	4536	4536	-3944.
44+55.00	FILL	161.98	72	3701	3701	1.250	89	4626	4626	-4033.
44+64.00	FILL	173.44	56	3757	3757	1.250	70	4696	4696	-4103.
44+76.00	FILL	79.27	56	3813	3813	1.250	70	4766	4766	-4173.
44+90.00	FILL	128.64	54	3867	3867	1.250	67	4833	4833	-4241.
45+ 0.0	MODIFY VOLUMES									-5034.
	FILL	229.20	634	4501	4501	1.250	793	5626	5626	
	EARTH	0.00	0	593	593	1.000	0	593	593	
45+ 3.00	FILL	259.40	27	4528	4528	1.250	34	5660	5660	-5067.
	EARTH	0.00	0	593	593	1.000	0	593	593	
45+17.00	FILL	0.0	67	4595	4595	1.250	84	5744	5744	-5151.
	EARTH	0.0	0	593	593	1.000	0	593	593	
45+27.60	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+28.60	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+35.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+53.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+60.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+73.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+78.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
45+94.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+ 7.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+24.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+40.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+50.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+58.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+81.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+87.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
46+88.00	FILL	0.0	0	4595	4595	1.250	0	5744	5744	-5151.
47+ 0.0	FILL	249.64	56	4651	4651	1.250	69	5813	5813	-5221.
47+13.00	FILL	147.41	96	4746	4746	1.250	119	5933	5933	-5340
47+21.00	FILL	80.90	34	4780	4780	1.250	42	5975	5976	-5383.
47+35.00	FILL	174.68	66	4846	4846	1.250	83	6058	6058	-5465.
	EARTH	0.00	0	593	593	1.000	0	593	593	
47+45.00	FILL	200.96	70	4916	4916	1.250	87	6145	6145	-5552.
	EARTH	0.0	0	593	593	1.000	0	593	593	
47+60.00	FILL	240.12	123	5038	5038	1.250	153	6298	6298	-5705.
47+80.00	FILL	219.56	170	5209	5209	1.250	213	6511	6511	-5918.
48+ 0.0	FILL	203.00	157	5365	5365	1.250	196	6706	6706	-6114.
49+ 0.0	FILL	116.74	598	5957	5957	1.250	748	7447	7447	-6832.
	EARTH	11.76	22	614	614	1.000	22	614	614	
49+97.00	FILL	56.48	311	6268	6268	1.250	389	7835	7835	-7112.
	EARTH	49.06	109	724	724	1.000	109	724	724	
50+ 0.0	FILL	54.64	6	6275	6275	1.250	8	7843	7843	-7114.
	EARTH	46.89	5	729	729	1.000	5	729	729	
50+11.00	FILL	29.02	17	6292	6292	1.250	21	7864	7864	-7091.
	EARTH	171.98	45	774	774	1.000	45	774	774	
50+27.00	FILL	21.38	15	6307	6307	1.250	19	7883	7883	-7008.
	EARTH	169.64	101	875	875	1.000	101	875	876	
50+40.00	FILL	46.42	16	6323	6323	1.250	20	7903	7903	-6979.
	EARTH	32.92	49	924	924	1.000	49	924	924	
51+ 0.0	BACKFILL	0.0	0	0	0	1.250	0	0	0	-6980.
	FILL	0.0	50	6373	6373	1.250	63	7966	7966	
	EARTH	22.00	62	986	986	1.000	62	986	986	

SLOPE STAKES FOR MAINLINE

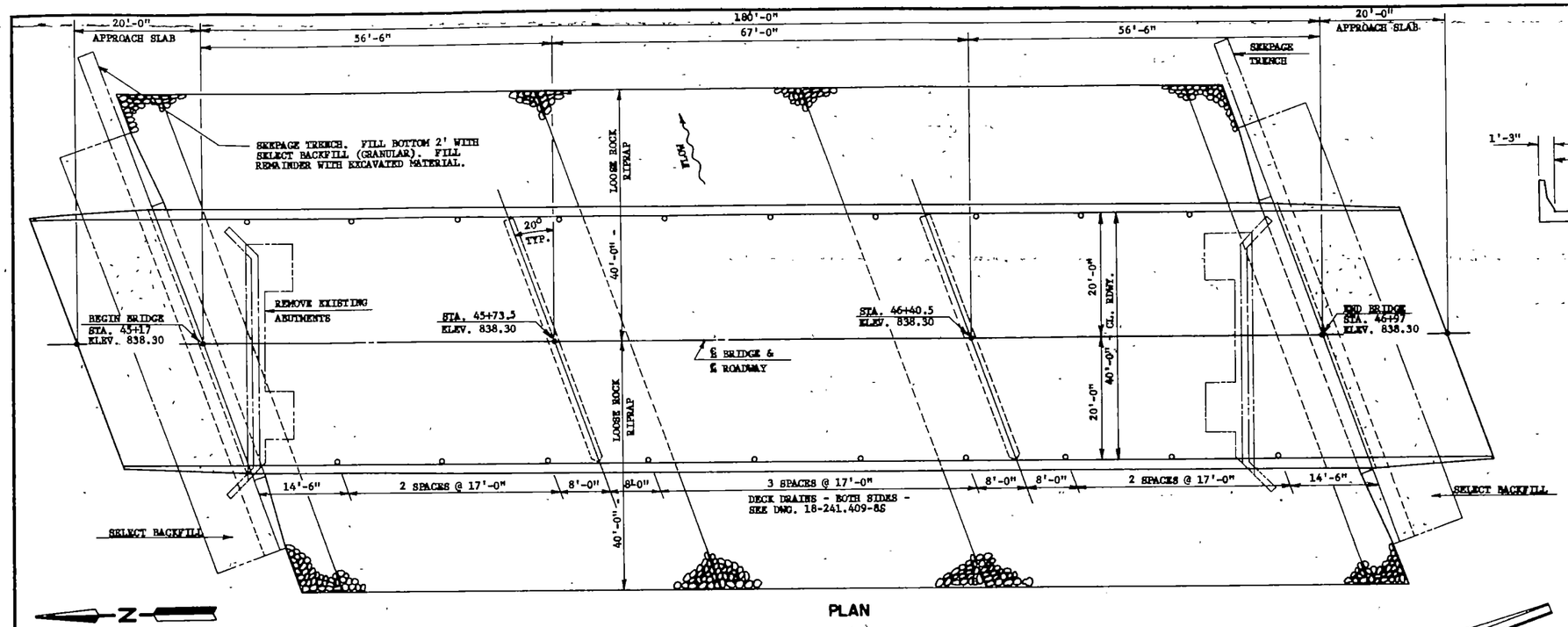
BASELN STATION	CENTRLN STATION	P.G. ELEV	CL OFFSET	SKEW	SLOPE	C/F	OFFSET	ELEVATION	SLOPE	C/F	OFFSET	ELEVATION
39+ 0.0	39+ 0.0	834.50	0.0	1.00000	-6.00	6.75	-52.32	827.75	-6.00	5.13	52.63	829.37
39+48.00	39+48.00	834.73	0.0	1.00000	-6.00	7.60	-67.46	827.13	-6.00	5.26	53.51	829.46
39+59.00	39+59.00	834.79	0.0	1.00000	-6.00	7.52	-66.96	827.27	-6.00	6.98	63.70	827.81
39+81.00	39+81.00	834.89	0.0	1.00000	-6.00	7.49	-56.81	827.40	4.00	-0.14	91.66	835.03
39+91.00	39+91.00	834.94	0.0	1.00000	-6.00	7.19	-64.97	827.75	4.00	-0.09	91.47	835.03
40+ 0.0	40+ 0.0	834.99	0.0	1.00000	-6.00	6.91	-63.20	828.08	4.00	2.07	82.91	832.91
40+ 9.00	40+ 9.00	835.03	0.0	1.00000	-6.00	6.94	-63.48	828.09	-6.00	6.53	61.03	828.50
41+ 0.0	41+ 0.0	835.47	0.0	1.00000	-6.00	5.24	-53.30	830.23	-6.00	5.27	53.49	830.20
41+80.00	41+80.00	835.86	0.0	1.00000	-6.00	5.47	-54.67	830.39	-6.00	5.31	53.69	830.55
42+ 0.0	42+ 0.0	835.96	0.0	1.00000	-6.00	5.35	-53.92	830.61	4.00	2.76	80.06	833.20
42+ 5.00	42+ 5.00	835.98	0.0	1.00000	-6.00	5.37	-54.06	830.61	4.00	2.78	79.97	833.20
42+23.00	42+23.00	836.07	0.0	1.00000	-6.00	5.55	-55.14	830.52	4.00	3.00	79.09	833.07
42+39.00	42+39.00	836.15	0.0	1.00000	-6.00	5.78	-56.53	830.37	-6.00	5.62	55.60	830.52
43+ 0.0	43+ 0.0	836.44	0.0	1.00000	-6.00	5.75	-56.34	830.70	-6.00	6.23	59.25	830.21
43+50.00	43+50.00	836.69	0.0	1.00000	-6.00	5.65	-55.77	831.03	-6.00	6.42	60.38	830.27
44+ 0.0	44+ 0.0	836.93	0.0	1.00000	-6.00	5.96	-57.60	830.97	-6.00	6.63	61.64	830.30
44+28.00	44+28.00	837.07	0.0	1.00000	-6.00	5.55	-55.12	831.52	-6.00	6.77	62.45	830.30
44+43.00	44+43.00	837.14	0.0	1.00000	-6.00	2.05	-34.15	835.09	-6.00	6.79	62.59	830.35
44+55.00	44+55.00	837.20	0.0	1.00000	-6.00	1.78	-32.63	835.42	-6.00	6.80	62.64	830.40
44+64.00	44+64.00	837.24	0.0	1.00000	-6.00	3.52	-42.99	833.72	-6.00	6.49	60.76	830.76
44+76.00	44+76.00	837.30	0.0	1.00000	-6.00	4.24	-47.31	833.06	-6.00	1.20	29.06	836.10
44+90.00	44+90.00	837.37	0.0	1.00000	-6.00	5.72	-56.19	831.65	-6.00	1.17	28.86	836.20
45+ 3.00	45+ 3.00	837.43	0.0	1.00000	-2.00	9.08	-69.11	828.35	-6.00	6.33	69.82	831.10
45+17.00	45+17.00	837.50	0.0	1.00000	0.0	1.10	0.0	836.40	0.0	1.10	0.0	836.40
45+27.60	45+27.60	837.50	0.0	1.00000	0.0	1.20	0.0	836.30	0.0	1.20	0.0	836.30
45+28.60	45+28.60	837.50	0.0	1.00000	0.0	6.40	0.0	831.10	0.0	6.40	0.0	831.10
45+35.00	45+35.00	837.50	0.0	1.00000	0.0	9.20	0.0	828.30	0.0	9.20	0.0	828.30
45+53.00	45+53.00	837.50	0.0	1.00000	0.0	15.20	0.0	822.30	0.0	15.20	0.0	822.30
45+60.00	45+60.00	837.50	0.0	1.00000	0.0	18.60	0.0	818.90	0.0	18.60	0.0	818.90
45+73.00	45+73.00	837.50	0.0	1.00000	0.0	24.50	0.0	813.00	0.0	24.50	0.0	813.00
45+78.00	45+78.00	837.50	0.0	1.00000	0.0	24.50	0.0	813.00	0.0	24.50	0.0	813.00
45+94.00	45+94.00	837.50	0.0	1.00000	0.0	27.30	0.0	810.20	0.0	27.30	0.0	810.20
46+ 7.00	46+ 7.00	837.50	0.0	1.00000	0.0	25.00	0.0	812.50	0.0	25.00	0.0	812.50
46+24.00	46+24.00	837.50	0.0	1.00000	0.0	24.90	0.0	812.60	0.0	24.90	0.0	812.60
46+40.00	46+40.00	837.50	0.0	1.00000	0.0	25.40	0.0	812.10	0.0	25.40	0.0	812.10
46+50.00	46+50.00	837.50	0.0	1.00000	0.0	14.70	0.0	822.80	0.0	14.70	0.0	822.80
46+58.00	46+58.00	837.50	0.0	1.00000	0.0	12.90	0.0	824.60	0.0	12.90	0.0	824.60
46+81.00	46+81.00	837.50	0.0	1.00000	0.0	8.20	0.0	829.30	0.0	8.20	0.0	829.30
46+87.00	46+87.00	837.50	0.0	1.00000	0.0	6.40	0.0	831.10	0.0	6.40	0.0	831.10
46+88.00	46+88.00	837.50	0.0	1.00000	0.0	1.30	0.0	836.20	0.0	1.30	0.0	836.20
47+ 0.0	47+ 0.0	837.49	0.0	1.00000	-4.00	5.92	-46.58	831.57	-2.00	8.11	67.17	829.38
47+13.00	47+13.00	837.42	0.0	1.00000	-4.00	3.22	-35.79	834.20	-6.00	8.02	69.97	829.40
47+21.00	47+21.00	837.38	0.0	1.00000	-4.00	1.34	-28.27	836.04	-6.00	6.83	62.83	830.55
47+35.00	47+36.00	837.31	0.0	1.00000	-4.00	1.05	-27.09	836.26	-6.00	7.54	67.08	829.77
47+45.00	47+45.00	837.26	0.0	1.00000	-4.00	4.90	-42.48	832.37	-6.00	7.42	66.38	829.84
47+60.00	47+60.00	837.19	0.0	1.00000	-4.00	5.68	-45.61	831.51	-6.00	7.63	67.64	829.56
47+80.00	47+80.00	837.09	0.0	1.00000	-4.00	6.56	-49.22	830.51	-6.00	7.39	66.21	829.70
48+ 0.0	48+ 0.0	836.99	0.0	1.00000	-4.00	6.30	-48.09	830.70	-6.00	7.21	65.10	829.78
49+ 0.0	49+ 0.0	836.50	0.0	1.00000	-4.00	5.25	-43.88	831.26	-6.00	5.28	63.55	831.21
49+97.00	49+97.00	836.02	0.0	1.00000	-4.00	4.65	-41.60	831.37	4.00	4.40	73.49	831.62
50+ 0.0	50+ 0.0	836.00	0.0	1.00000	-4.00	4.53	-41.12	831.48	4.00	4.39	73.67	831.62
50+11.00	50+11.00	836.02	0.0	1.00000	-4.00	4.56	-40.05	831.46	4.00	2.24	80.84	833.78
50+27.00	50+27.00	836.05	0.0	1.00000	-4.00	4.52	-38.15	831.53	4.00	2.23	78.77	833.82
50+40.00	50+40.00	836.08	0.0	1.00000	-4.00	4.51	-36.72	831.56	4.00	4.66	67.32	831.41
51+ 0.0	51+ 0.0	836.20	0.0	1.00000	4.00	-0.05	-14.26	836.24	*******	1.36	19.85	834.84

SLOPE STAKES FOR APPROX. BYPASS GRADE

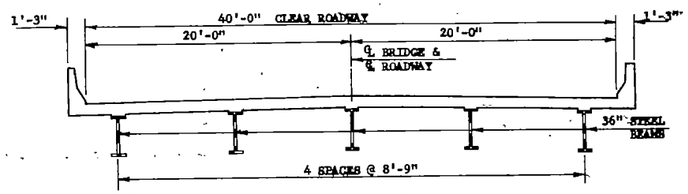
BASELN STATION	CENTRLN STATION	P.G.ELEV	CL.OFFSET	SKEW	SLOPE	C/F	OFFSET	ELEVATION	SLOPE	C/F	OFFSET	ELEVATION
43+ 0.0	43+ 3.68	836.50	32.68	0.93994	-2.00	0.72	15.86	835.78	-2.00	6.26	61.29	830.24
43+50.00	43+56.41	836.50	49.58	0.96117	-2.00	3.79	26.74	832.71	-2.00	6.09	77.20	830.41
44+ 0.0	44+ 7.68	836.50	61.20	0.98440	-2.00	5.77	34.88	830.73	-2.00	6.05	88.10	830.45
44+28.00	44+35.95	836.50	66.39	0.99278	-2.00	5.81	39.20	830.69	-2.00	5.62	91.18	830.88
44+43.00	44+51.00	836.50	66.97	0.99595	-2.00	5.78	40.94	830.72	-2.00	5.50	92.45	831.00
44+55.00	44+63.02	836.50	67.91	0.99782	-2.00	5.84	41.80	830.66	-2.00	5.20	92.73	831.30
44+64.00	44+72.02	836.50	68.42	0.99885	-2.00	5.50	43.04	831.00	-2.00	5.15	93.12	831.35
44+76.00	44+84.01	836.50	68.86	0.99971	-2.00	0.42	53.65	836.08	-2.00	0.54	84.31	835.96
44+90.00	44+97.99	836.04	69.00	1.00000	2.00	-0.12	53.13	836.16	2.00	0.07	84.49	835.98
45+ 3.00	45+10.99	835.37	69.00	1.00000	-2.00	4.03	46.58	831.34	-2.00	3.67	90.70	831.70
45+17.00	45+24.99	834.86	69.00	1.00000	-2.00	3.70	47.23	831.15	-2.00	3.20	89.77	831.66
45+27.60	45+35.59	834.62	69.00	1.00000	0.0	3.42	69.00	831.20	0.0	3.42	69.00	831.20
45+28.60	45+36.59	834.60	69.00	1.00000	0.0	3.40	69.00	831.20	0.0	3.40	69.00	831.20
45+35.00	45+42.99	834.53	69.00	1.00000	0.0	3.42	69.00	831.11	0.0	3.42	69.00	831.11
45+53.00	45+60.99	834.50	69.00	1.00000	0.0	3.01	69.00	831.49	0.0	3.01	69.00	831.49
45+60.00	45+67.99	834.50	69.00	1.00000	0.0	3.10	69.00	831.40	0.0	3.10	69.00	831.40
45+73.00	45+80.99	834.50	69.00	1.00000	0.0	13.13	69.00	821.37	0.0	13.13	69.00	821.37
45+78.00	45+85.99	834.50	69.00	1.00000	0.0	13.95	69.00	820.55	0.0	13.95	69.00	820.55
45+94.00	46+ 1.99	834.50	69.00	1.00000	0.0	19.81	69.00	814.69	0.0	19.81	69.00	814.69
46+ 7.00	46+14.99	834.50	69.00	1.00000	0.0	21.35	69.00	813.15	0.0	21.35	69.00	813.15
46+24.00	46+31.99	834.50	69.00	1.00000	0.0	23.06	69.00	811.44	0.0	23.06	69.00	811.44
46+40.00	46+47.99	834.50	69.00	1.00000	0.0	22.58	69.00	811.92	0.0	22.58	69.00	811.92
46+50.00	46+57.99	834.50	69.00	1.00000	0.0	21.84	69.00	812.66	0.0	21.84	69.00	812.66
46+58.00	46+65.99	834.50	69.00	1.00000	0.0	21.13	69.00	813.37	0.0	21.13	69.00	813.37
46+81.00	46+88.99	834.51	69.00	1.00000	-2.00	6.66	41.31	827.85	-1.00	21.51	105.20	813.00
46+87.00	46+94.99	834.51	69.00	1.00000	-2.00	6.10	42.44	828.42	-1.00	19.58	103.26	814.94
46+88.00	46+95.99	834.52	69.00	1.00000	-2.00	5.13	44.37	829.39	-1.00	18.05	101.74	816.46
47+ 0.0	47+ 7.99	834.54	69.00	1.00000	-2.00	4.49	45.64	830.04	-1.00	12.75	96.44	821.78
47+13.00	47+20.99	834.57	69.00	1.00000	-2.00	3.43	47.75	831.15	-2.00	6.23	95.83	826.35
47+21.00	47+28.99	834.60	69.00	1.00000	-2.00	2.60	49.42	832.00	-2.00	4.57	92.51	830.03
47+35.00	47+42.99	834.66	69.00	1.00000	-2.00	4.90	44.82	829.76	-2.00	4.69	92.78	829.97
47+45.00	47+52.98	834.71	68.99	0.99999	-2.00	4.95	44.72	829.76	-2.00	4.64	92.64	830.07
47+60.00	47+67.96	834.80	68.60	0.99935	-2.00	5.29	43.72	829.52	-2.00	4.70	92.46	830.10
47+80.00	47+87.96	834.94	67.56	0.99711	-2.00	5.00	43.11	829.94	-2.00	4.75	91.49	830.20
48+ 0.0	48+ 8.02	835.08	65.63	0.99325	-2.00	4.95	41.20	830.14	-2.00	4.77	89.73	830.31
49+ 0.0	49+10.48	835.80	43.39	0.94977	-2.00	1.89	24.26	833.91	-2.00	4.96	68.98	830.84

PRINTED IN U.S.A.

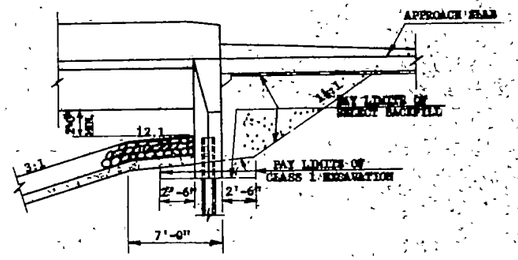
BRIDGE CODE	FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
X-031	8	N.D.	BRF-6-018(024)241	15



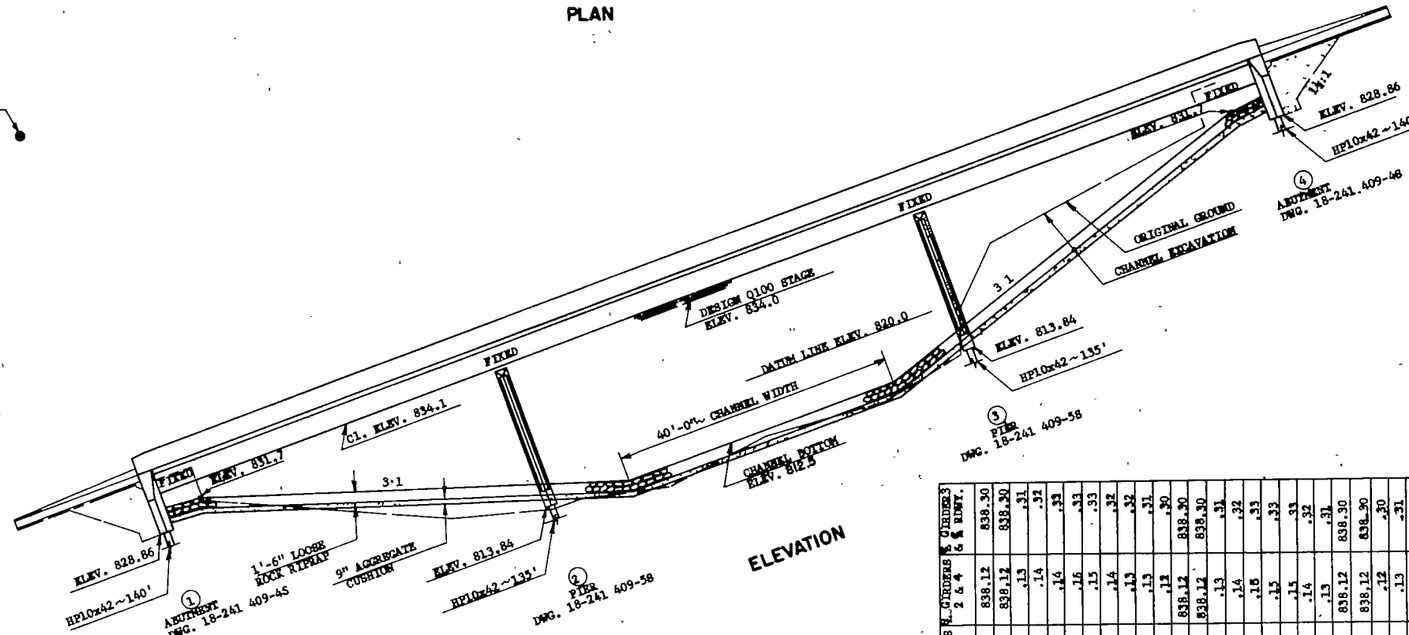
PLAN



DECK SECTION



DETAIL AT ABUTMENT



ELEVATION

LOCATION PEMBINA RIVER NECHE			
SPEC CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202 105	REMOVAL OF STRUCTURE	L SUM	1.0
210 101	CLASS 1 EXCAVATION	L SUM	1.0
210 111	CLASS 2 EXCAVATION	L SUM	1.0
210 126	CHANNEL EXCAVATION	CU YD	1530.0
210 200	SELECT BACKFILL	CU YD	305.0
210 201	FOUNDATION PREPARATION	EA	1.0
550 215	CONCRETE BRIDGE APPROACH SLAB	SQ YD	185.6
602 130	CLASS AAE-3 CONCRETE	CU YD	245.2
602 1130	CLASS AE-3 CONCRETE	CU YD	161.0
602 1250	PENETRATING WATER REPELLENT TR.	SQ YD	800.0
612 115	REINFORCING STEEL GRADE 60	LBS	42480.0
612 116	REINFORCING STEEL GRADE 60 EPOXY	LBS	29667.0
616 5890	STRUCTURAL STEEL	L SUM	1.0
622 20	STEEL PILING HP 10x42	L FT	3835.0
622 393	STEEL TEST PILING-HP 10x42	L FT	310.0
708 100	AGGREGATE CUSHION	CU YD	500.0
708 1020	RIPRAP, LOOSE ROCK	CU YD	805.0
930 3000	BRIDGE BENCH MARKS	SET	1.0

DESIGN STRENGTHS

F'C = 3,000 PSI - CLASS AE-3 CONCRETE
F'C = 4,000 PSI - CLASS AAE-3 CONCRETE
FY = 36,000 PSI - AASHTO M-183 STRUCTURAL STEEL
FY = 60,000 PSI - REINFORCING STEEL
LOAD FACTOR DESIGN

*BELOW BOTTOM OF CONCRETE ELEVATIONS

BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
B.M.#3	PAINT SPOT ON OLD BRIDGE	STA. 45+57-11' RT.	836.94

PILE LOADING				
LOCATION	DEAD LOAD	LIVE LOAD	*MIN. PEN.	DESIGN LOAD
ABUTMENT 1	32.0 T.	18.0 T.	125'	50.0 T.
PIER 2	36.4 T.	17.4 T.	110'	53.8 T.
PIER 3	36.4 T.	17.4 T.	110'	53.8 T.
ABUTMENT 4	32.0 T.	18.0 T.	125'	50.0 T.

℄ GIRDERS 1 & 5	℄ GIRDERS 2 & 4	℄ GIRDERS 3 & ROAD.
837.94	838.12	838.30
837.94	838.12	838.30
.95	.13	.31
.96	.14	.32
.96	.16	.33
.96	.15	.33
.95	.14	.32
.94	.13	.31
.94	.12	.30
837.94	838.12	838.30
837.94	838.12	838.30
.95	.13	.31
.96	.14	.32
.96	.15	.33
.96	.15	.33
.96	.14	.33
.95	.13	.32
837.94	838.12	838.30
837.94	838.12	838.30
.94	.12	.30
.95	.13	.31
.96	.14	.32
.96	.15	.33
.96	.14	.33
.96	.14	.32
.95	.13	.31
837.94	838.12	838.30
837.94	838.12	838.30

1'-3" BEGIN BRIDGE — 10 EQ. SP. = 55'-3" — ℄ BRG. ABUT. NO. 1 — 10 EQ. SP. = 67'-0" — ℄ BRG. PIER NO. 2 — 10 EQ. SP. = 55'-3" — ℄ BRG. PIER NO.3 — ℄ BRG. ABUT. NO.4 — 1'-3" END BRIDGE

SCREED ELEVATIONS
ELEVATIONS SHOWN TO TOP OF FINISHED CONCRETE

STRUCTURAL DRAWINGS

GENERAL DRAWINGS. THIS SHEET, 18-241.409-1S THRU 18-241.409-11S

STANDARD DRAWINGS. D-622-1, D-900-1

DESIGN LOADING	SCALE
HS 20	1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
PEMBINA RIVER, NECHE
STEEL ALTERNATE

BRIDGE LAYOUT

PROJECT BRF-6-018(024)241 STA 46+07

PEMBINA COUNTY

APPROVED

5 MAY 1987
DATE

BRIDGE DESIGN ENGINEER

LANDIS C. SCHWARTZ REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

18-241.409-S

100 SCOPE OF WORK: This bridge replacement project consists of removing the existing structure and providing a temporary crossing and constructing a new bridge. The existing structure has a clear roadway of 22'-8". The new structure will have a clear roadway of 40'-0". The channel in the vicinity of the bridge shall be lined with riprap.

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

202 REMOVAL OF STRUCTURE: The existing structure is a single span truss with an overall length of 160'. The weight of the truss bridge is approximately 325 tons.

210 EXCAVATION: The excavation at the abutments as shown on the layout sheet shall be included in the lump sum bid item, "Class 1 Excavation" (approximately 47 C.Y.). The excavation at the piers shall be included in the lump sum bid item, "Class 2 Excavation" (approximately 20 C.Y.)

210 BACKFILL: Select backfill shall be compacted in accordance with Section 203.02F except required density shall be 100% of AASHTO T-99 or 95% of AASHTO T-180.

550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. Transverse metal tine finish and the surface tolerance of 3/16" in 10 feet are also required.

Contractor has the option of placing the concrete in one continuous operation or two pours with the split determined by a centerline joint.

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

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

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

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

612 REINFORCING STEEL: Dimensions for bent bars are given out to out and to tangent intersections unless otherwise noted.

612 All reinforcing steel shall be Grade 60.

616 STRUCTURAL STEEL: Structural steel shall be AASHTO M 183. Requirements for Charpy V-Notch tests are designated on the girder detail sheets.

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

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

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

616 All bearings and swedge bolts shall be included in the lump sum bid item "Structural Steel."

616 The estimated weight of Structural Steel is 1459 lbs. for the pier ice noses and 153,277 lbs. for the superstructure for a total of 154,736 lbs.

622 PILING: Piling shall be driven with a steam, air, or diesel hammer with a rated energy and ram weight not less than 39,944 foot-pound-tons, as computed by the formula W (E-8474) + .87E where W is the weight of the ram in tons and E is the rated hammer energy. In no case shall the ram weight be less than 2,700 pounds.

630 PAINT AND PAINTING: Paint shall conform to the Standard Specifications, Section 852.01 A and 852.01 Q. The finish coats shall be blue color no. 25184 and shall meet Federal Standard No. 595 colors. The dry thickness of each finish and spot coat shall not be less than 1.5 mil for any reading. One shop coat shall be required. The dry thickness of the shop coat shall not be less than 1.5 mil for any reading.

630 NEW STEEL: Painting shall conform to Section 630.03 B and 630.03 C. Contact surfaces shall have a Class A surface condition.

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
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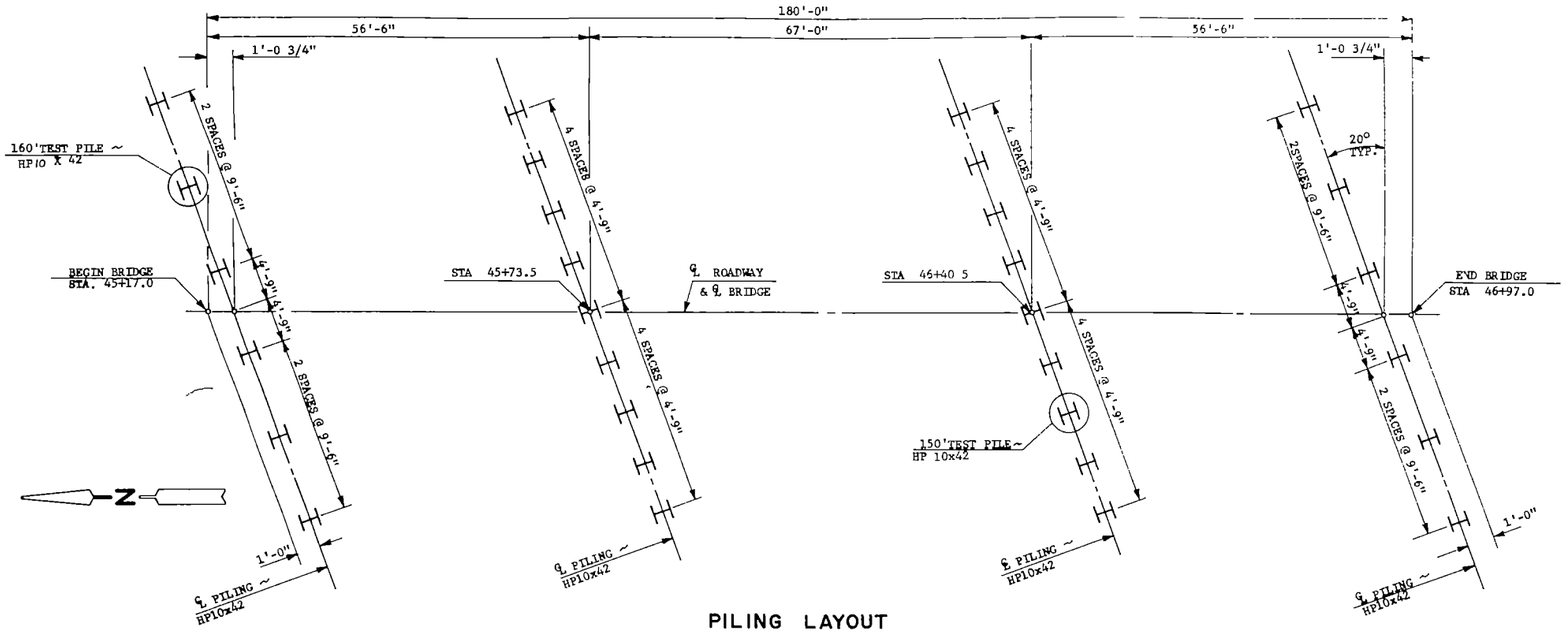
SHOP DRAWINGS: The contractor shall submit the following shop drawings to the Construction office for approval;

1. Structural Steel

DESIGN STRENGTH:

F'C	3,000	PSI Cl. AE-3 or AE-4 Concrete
F'C	4,000	PSI Cl. AAE-3 or AAE-4 Concrete
FY	60,000	PSI GR. 60 Reinforced Steel
FY	36,000	PSI Structural Steel

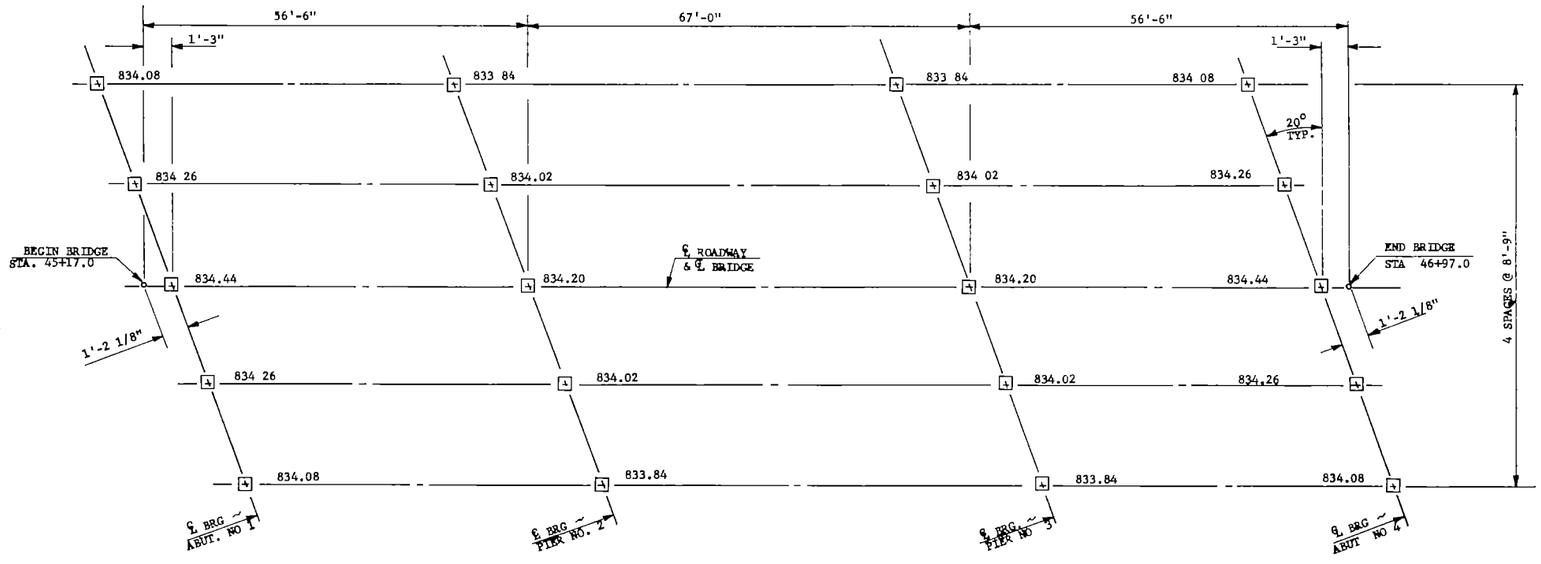
FHWA REGION	STATE	FED AID PROJ. NO	SHEET NO.
8	N.D.	BRF-6-018(024)241	18



PILING LAYOUT
(NOT TO SCALE)

HYDRAULIC DESIGN DATA

DRAINAGE AREA (CONTRIBUTING)	3410 SQ. MI.
DESIGN FREQUENCY	100 -YR.
DESIGN DISCHARGE	17,000 C.F.S.
DESIGN STAGE	EL. 834.0
STREAM GRADIENT	.0005 FT/FT.
WATERWAY PROVIDED BELOW DESIGN STAGE	2195 S.F.
WATERWAY PROVIDED BELOW CLEARANCE	2212 S.F.
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL	7.0 F.P.S.
DEPTH OF FLOW	21.5 FT.
VELOCITY OF FLOW UNDER BRIDGE	7.5 F.P.S.
FREEBOARD PROVIDED	0.1 FT.
MAXIMUM RECORDED STAGE -1979	EL. 833.3
MAXIMUM RECORDED DISCHARFE - 1950	10,700 C.F.S.



BEARING PLATE LAYOUT
(NOT TO SCALE)
ELEVATIONS ARE TO TOP OF FINISHED CONCRETE

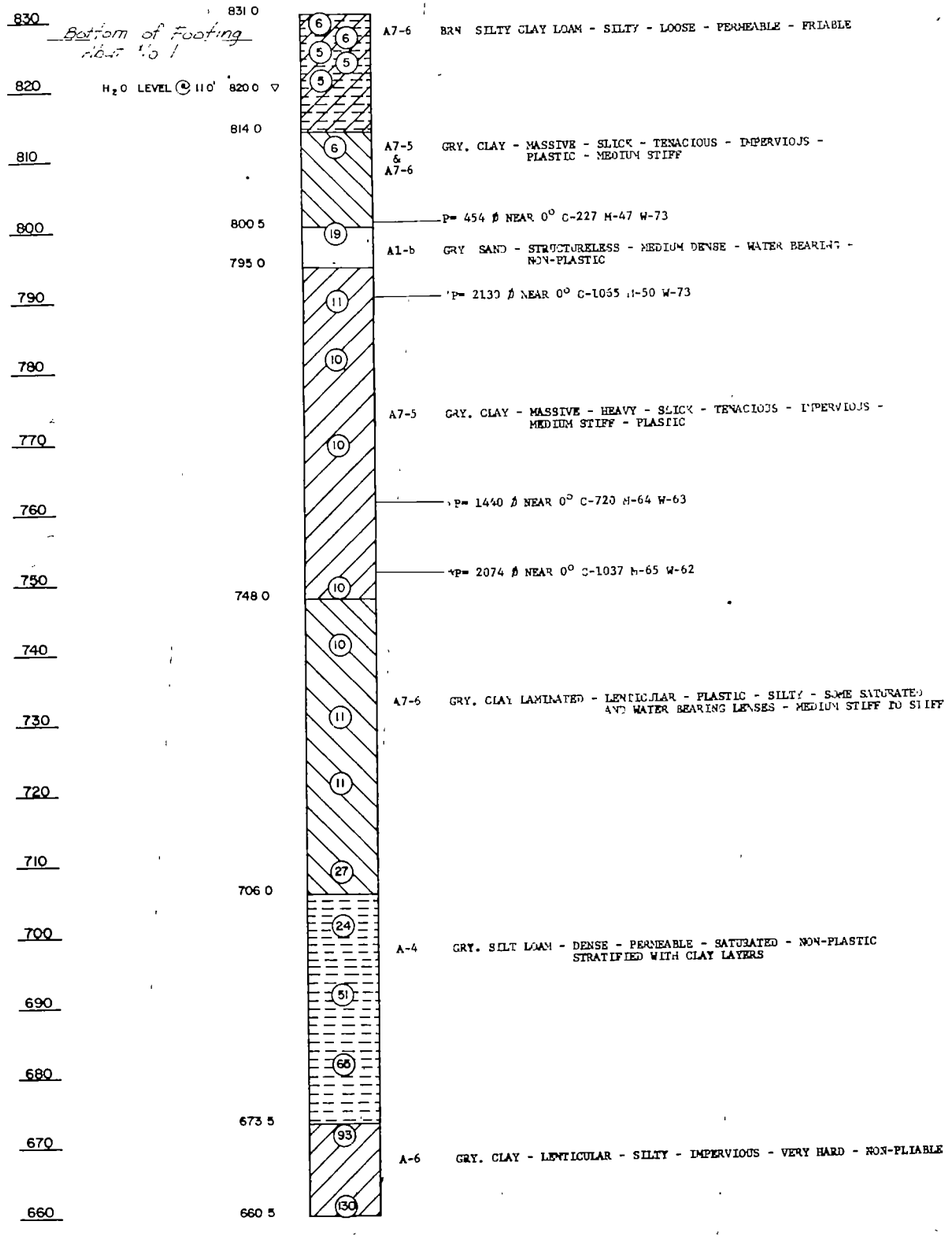
PEMBINA RIVER
NECHE
STEEL ALTERNATE
PILING LAYOUT
BEARING ELEVATION

18-241.409-2S

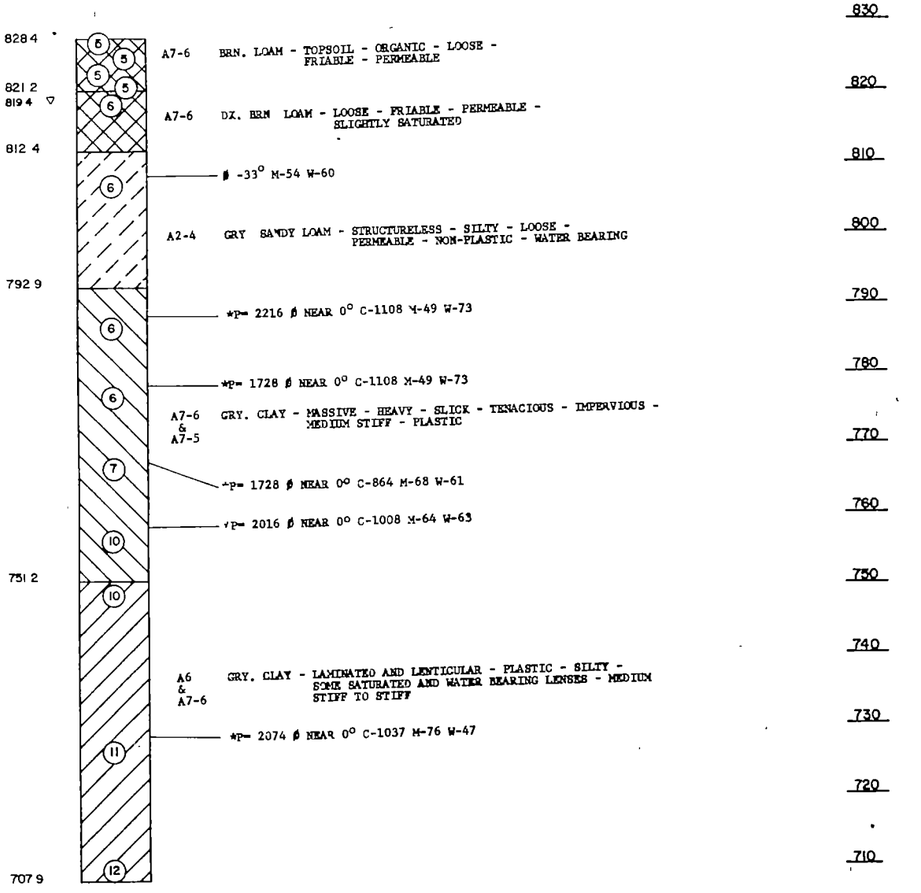
MATHESON EM 5-77 88479

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	19

BRF-6-018(024)241
PEMBINA CO
CITY OF NECHE
STRUCTURE NO 18-241.409



BORING NO. 1
STA 45+40 60'RT OF ℄



BORING NO. 2
STA 46+50 - 60' LT OF ℄

NOTES

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB HAMMER FROM A HEIGHT OF 30" TO DRIVE A 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.

SYMBOLS:

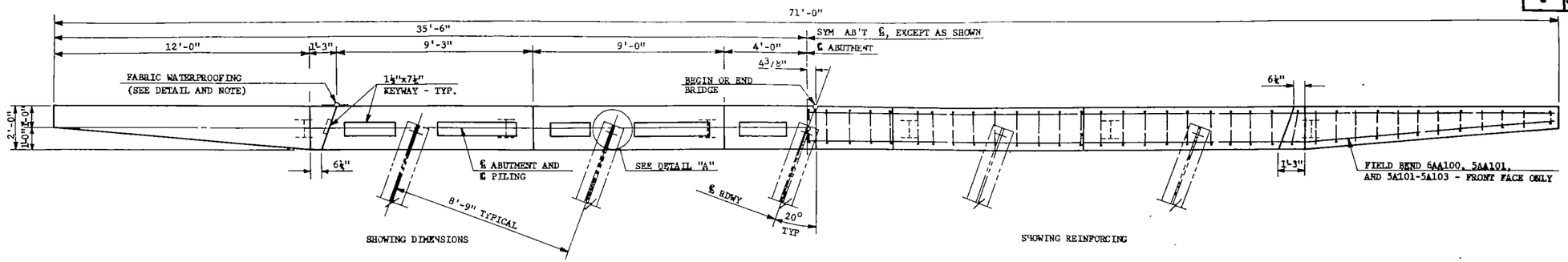
P - MAXIMUM LOAD (LBS. SQ. FT.)
ϕ - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS. SQ. FT.)
M - MOISTURE (PERCENT)
W - DRY WEIGHT (LBS./CU. FT.)
* - TRIAXIAL

PEMBINA RIVER
NECHE

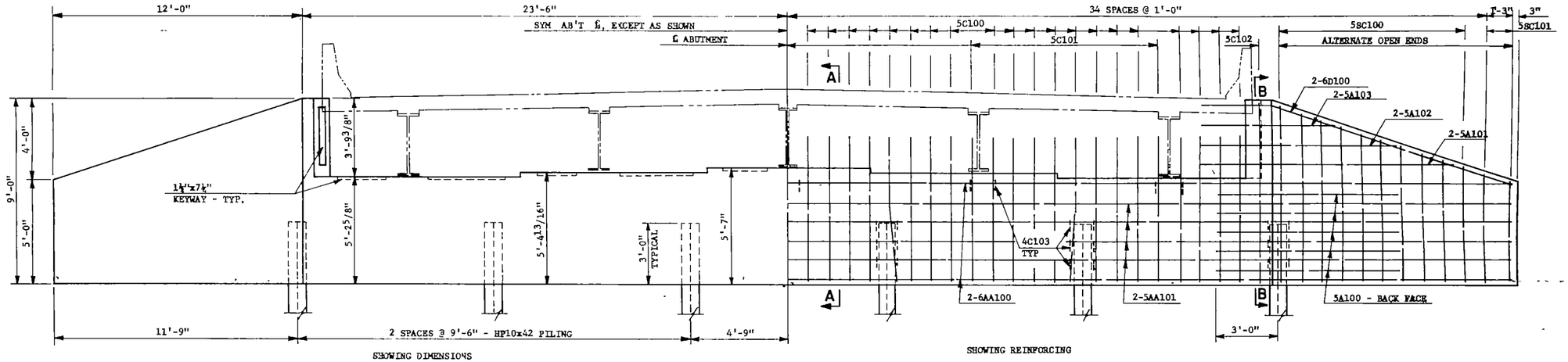
BORING LOG

18-241 409-3S

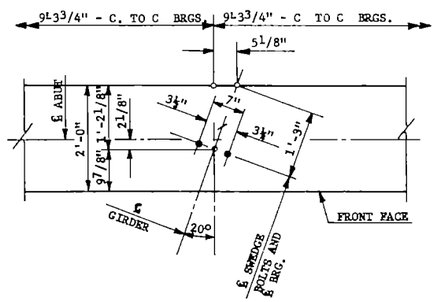
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO.
8	N.D.	BRF-6-018(024)241	20



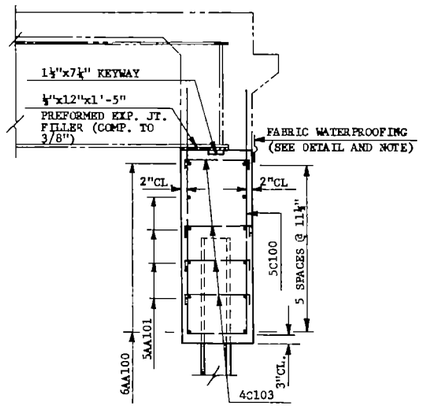
PLAN



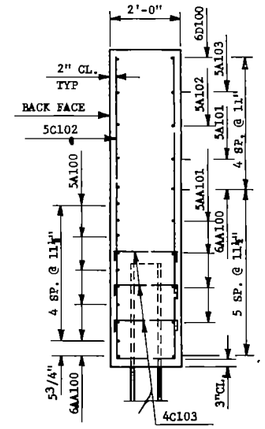
ELEVATION



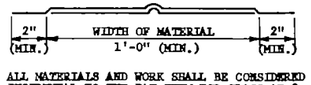
DETAIL "A"



A-A



B-B



ALL MATERIALS AND WORK SHALL BE CONSIDERED INCIDENTAL TO THE PAY ITEM FOR CLASS AE-3 CONCRETE

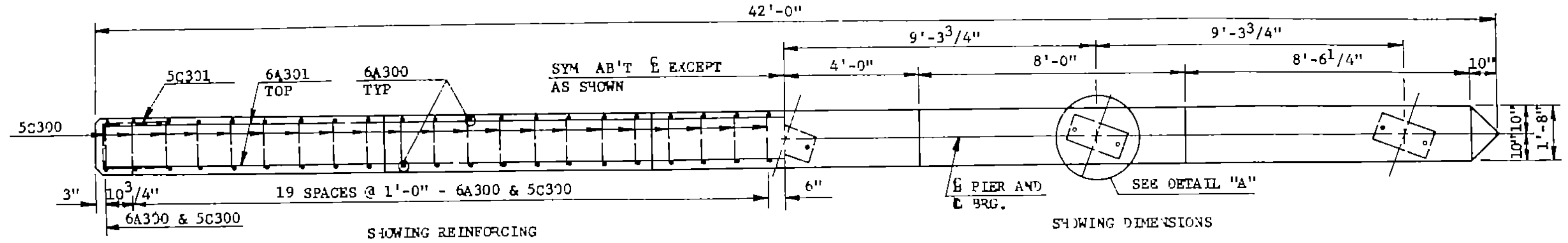
TWO-PLY FABRIC WATERPROOFING DETAIL

QUANTITIES (ONE ABUT)	
CLASS AE-3 CONCRETE	28.8 C.Y.
REINFORCING STEEL	2,553 LBS.
PILING (SEE LAYOUT)	
EXCAVATION (SEE LAYOUT)	
SELECT BACKFILL (SEE LAYOUT)	

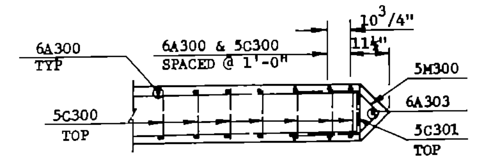
PEMBINA RIVER
NECHE
STEEL ALTERNATE
ABUTMENT DETAILS

18-241.409-4S

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	21

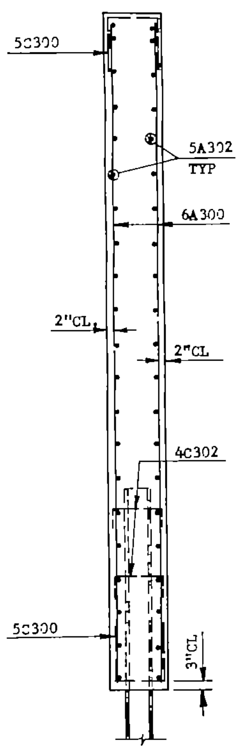


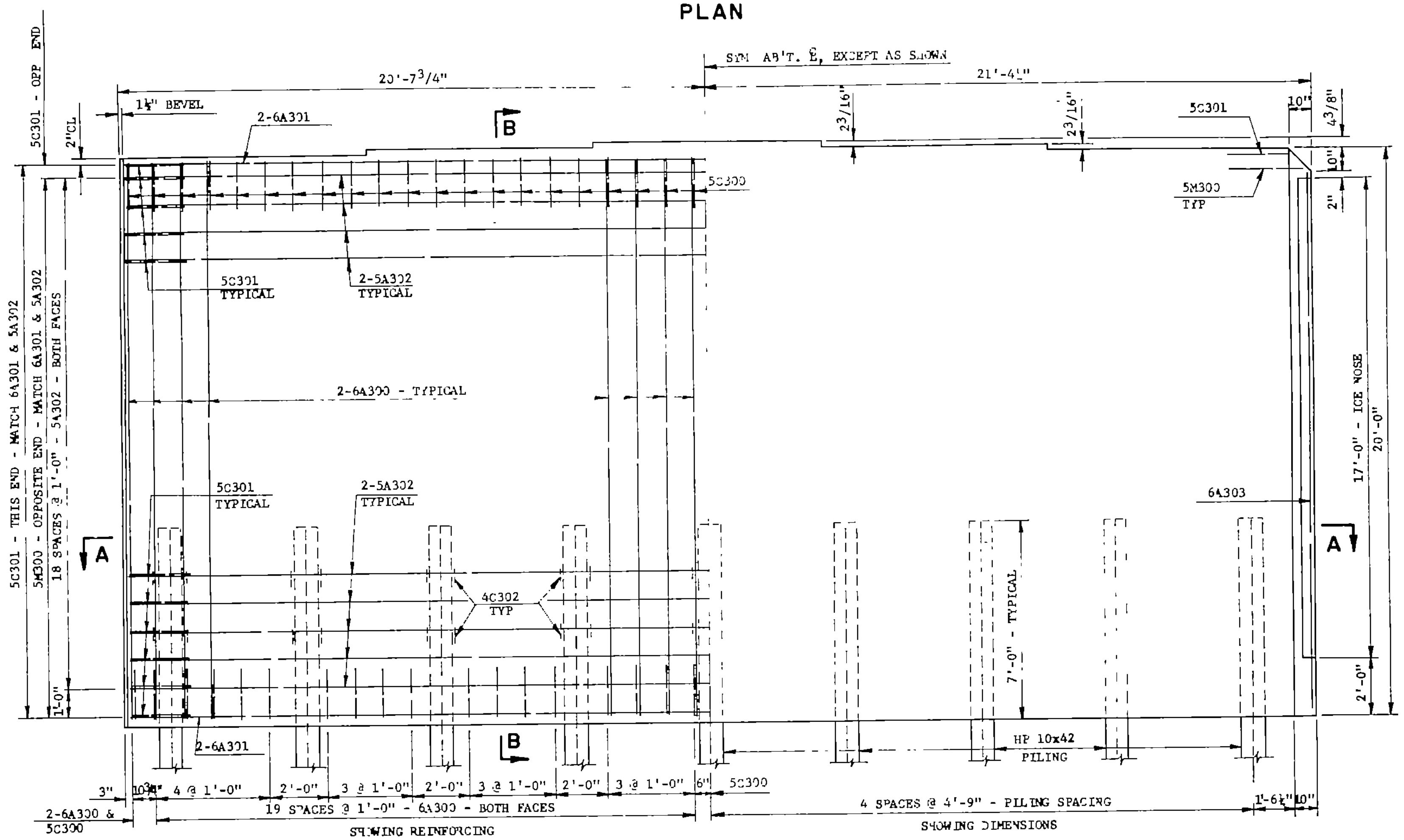
PLAN



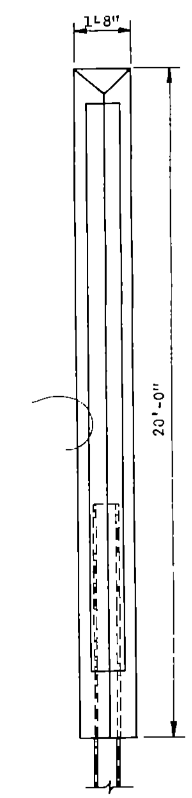
PART PLAN ~ UPSTREAM END

SHOWING REINFORCING

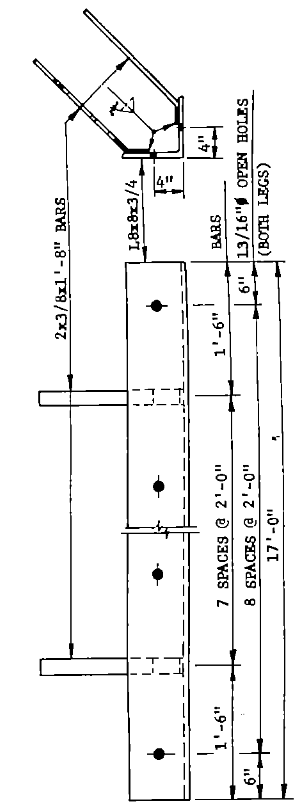




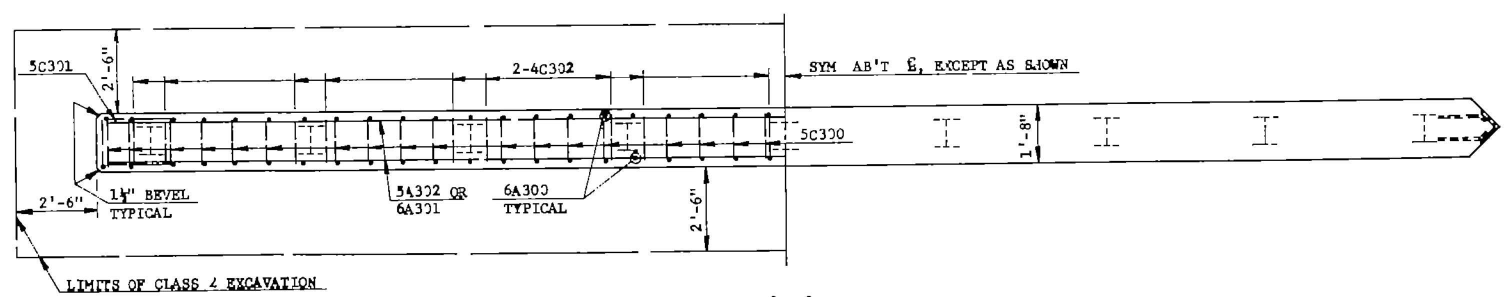
ELEVATION



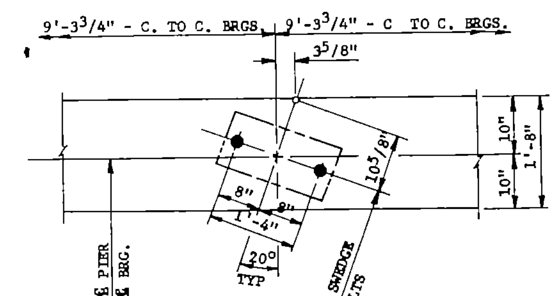
END VIEW



ICE NOSE ANGLE



A-A



DETAIL "A"

QUANTITIES (ONE PIER)	
CLASS AE-3 CONCRETE	51.7 C.Y.
REINFORCING STEEL	5024 LBS.
PILING (SEE LAYOUT)	
EXCAVATION (SEE LAYOUT)	

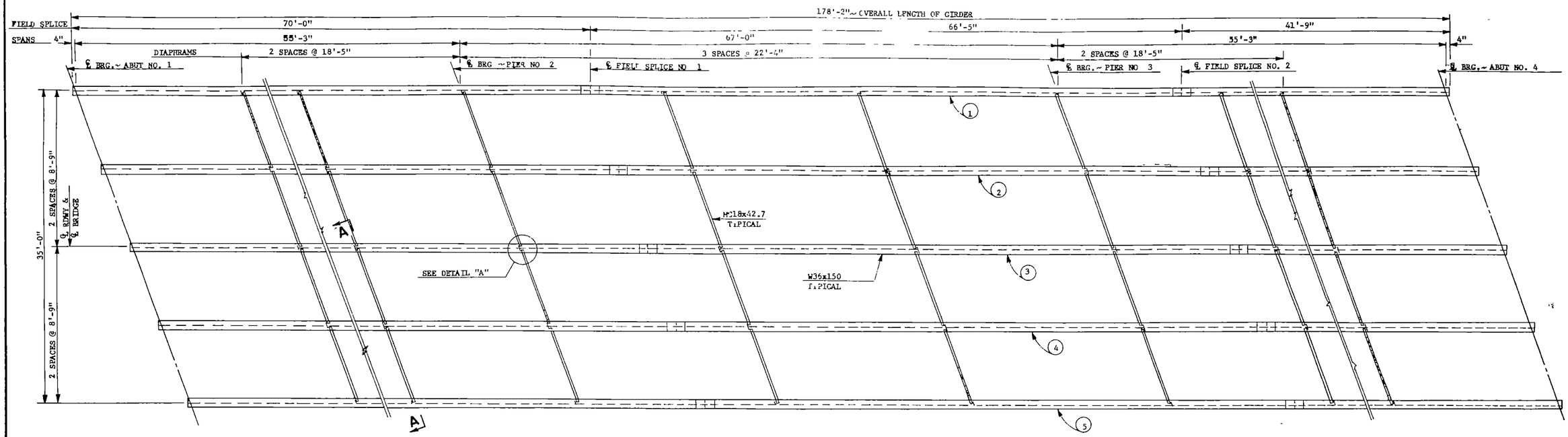
PEMBINA RIVER
NECHE

STEEL ALTERNATE

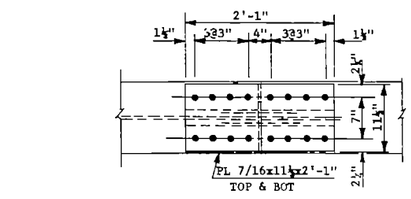
PIER DETAILS

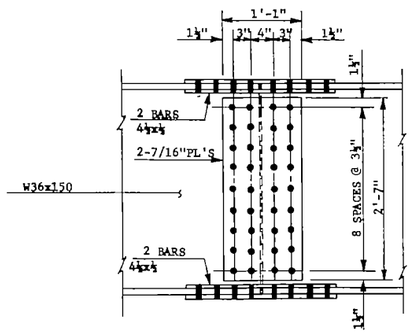
18-241.409-5S

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO.
8	N.D.	BRF-6-018(024)241	22

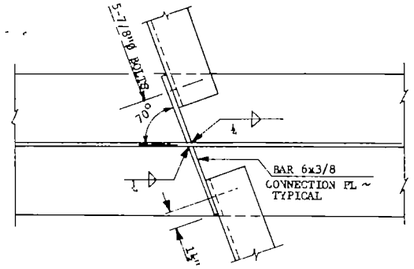


STEEL LAYOUT





FIELD SPLICE DETAIL



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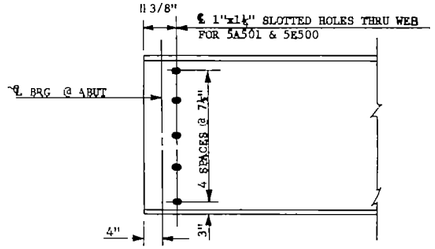
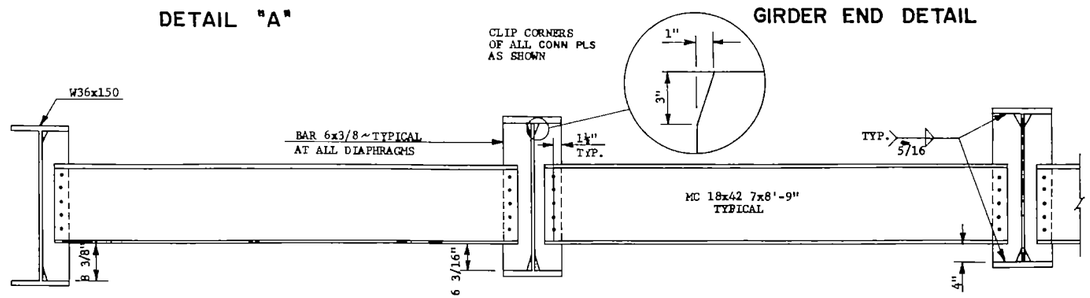


GIRDER END DETAIL



A-A

QUANTITIES
SEE DWG. 18-241.409-2S

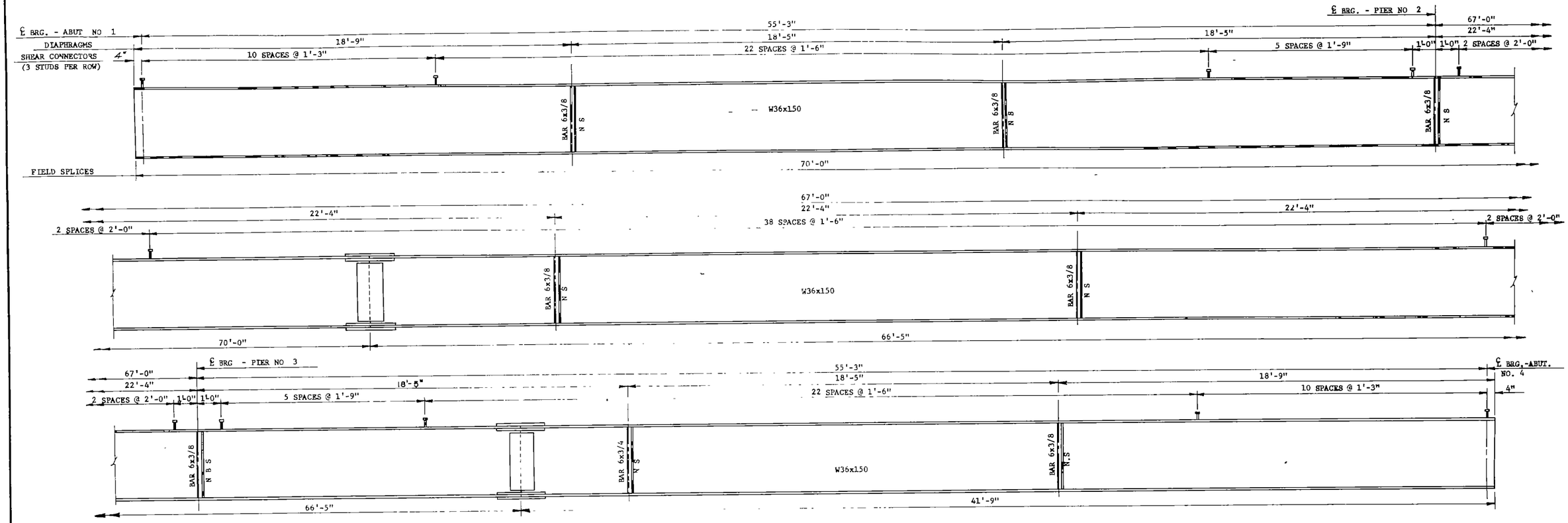
PEMBINA RIVER
NECHE

STEEL ALTERNATE

GIRDER LAYOUT & DETAILS

18-241.409-6S

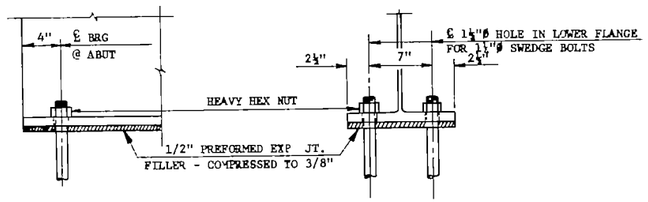
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	25



GIRDER ELEVATION
(GIRDER NO 1 SHOWN)

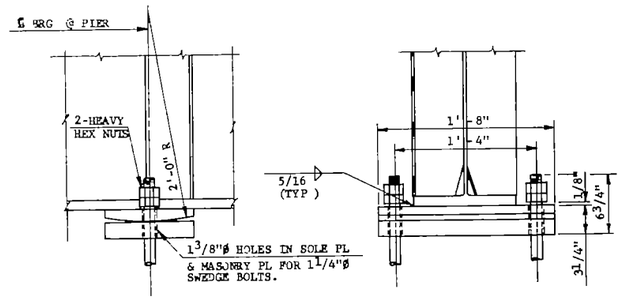
NOTES
THE ELEVATION DETAILS SHOWN REPRESENT GIRDER NO. 1 IN A FIVE GIRDER BRIDGE. OTHER GIRDERS ARE SIMILAR AND SHALL BE FABRICATED IN ACCORDANCE WITH DRAWINGS 18-241.409-6S AND 18-241.409-7S.

ALL GIRDER MATERIAL SUPPLIED SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST REQUIREMENTS FOR ZONE 2.

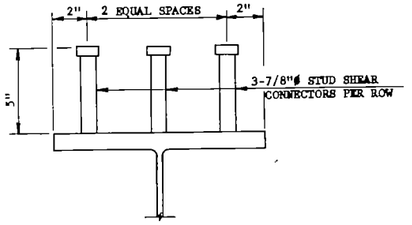


ABUTMENT BEARING DETAILS
SWEDGE BOLTS - 1¼"ø x 1'-4"

NOTE SWEDGE BOLTS TO BE DRILLED AND ANCHORED IN QUICK-SETTING ANCHOR GROUT.



PIER BEARING DETAILS
SOLE PL - PL 1 1/2x10x1'-8"
MASONRY PL - PL 1 3/4x10x1'-8"
SWEDGE BOLTS - 1 1/4"ø x 1'-8"



SHEAR CONNECTOR DETAIL

NOMENCLATURE
N S. = NEAR SIDE

QUANTITIES

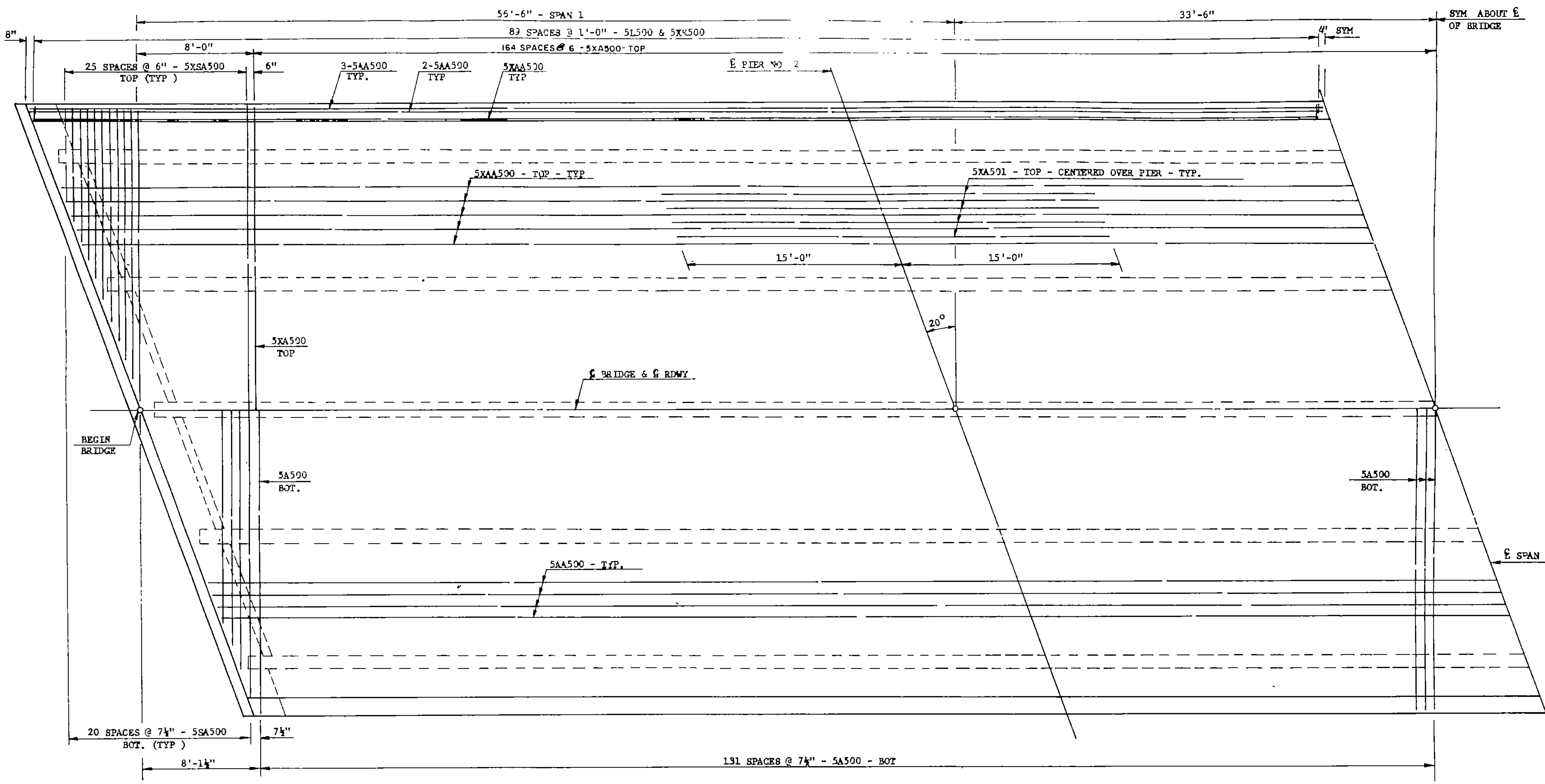
PEMBINA RIVER
NECHE

STEEL ALTERNATE

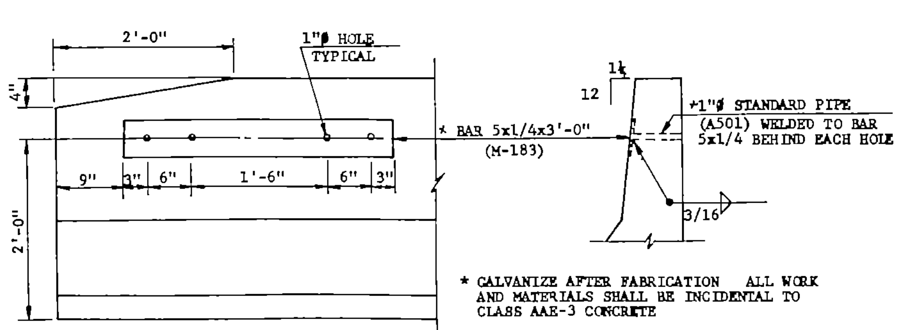
GIRDER DETAILS

18-241.409-7S

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO.
8	N.D.	BRF-6-018(024)241	24

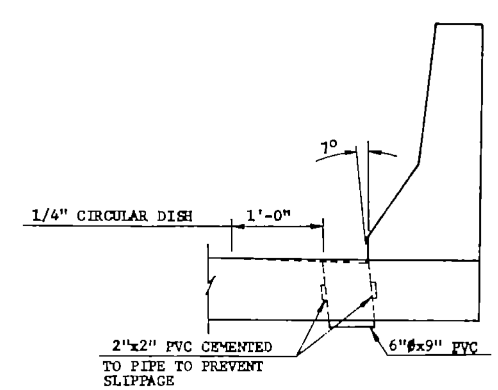


HALF PLAN



ELEVATION

BARRIER END DETAILS



SEE DWG 18-241 409-S FOR SPACING (20 REQ'D)

DECK DRAIN DETAIL

NOTE

FORM A 3/4" TRIANGULAR GROOVE AT ABOUT 10-FOOT INTERVALS ALONG THE BARRIER. GROOVE BOTH VERTICAL FACES AND ACROSS THE TOP.

THE BARRIER QUANTITIES ARE INCLUDED IN THE SLAB QUANTITIES.

FIELD BEND 5L500 AND 5AA500'S TO CONFORM TO THE SHAPE OF THE BARRIER END DETAILS.

QUANTITIES

SEE DWG. 18-241.409-9S

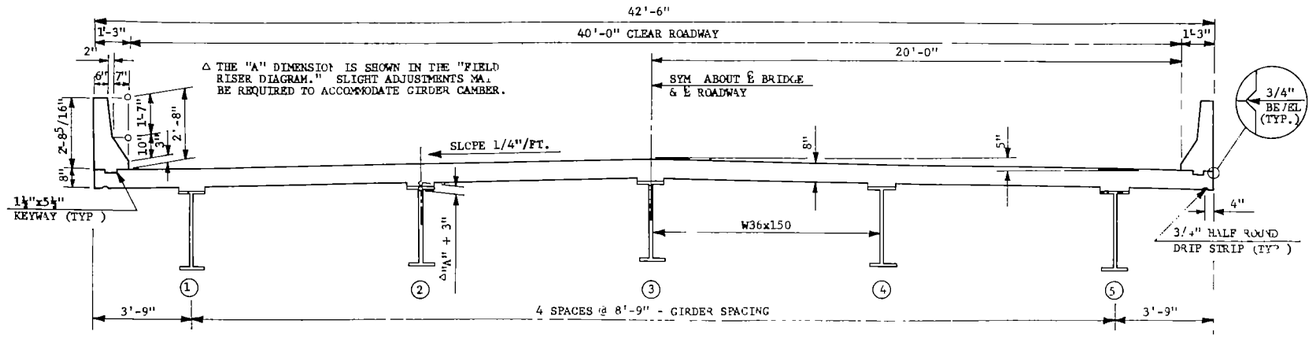
PEMBINA RIVER
NECHE

"STEEL" ALTERNATE

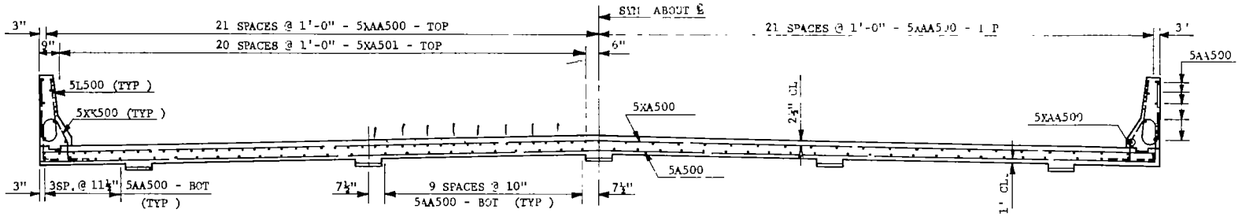
SLAB LAYOUT

18-241.409-8S

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-6-018(024)241	25

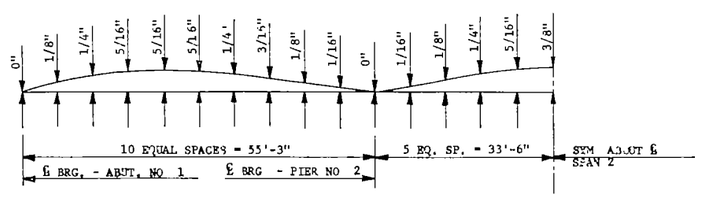


SLAB SECTION
SHOWING DIMENSIONS

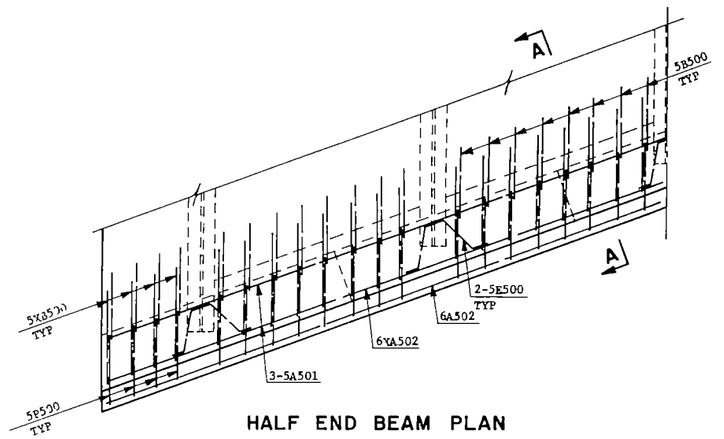


HALF SLAB SECTION
SHOWING REINFORCING OVER SUPPORTS

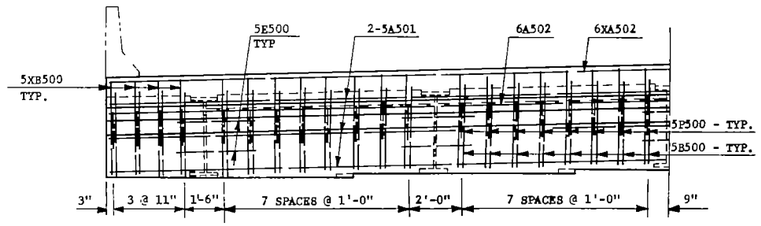
HALF SLAB SECTION
SHOWING REINFORCING BETWEEN SUPPORTS



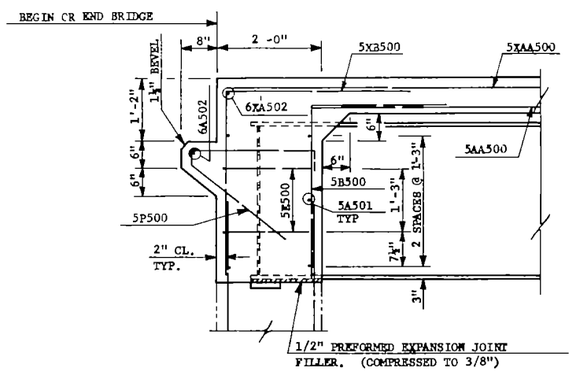
"A" DIMENSION
FIELD RISER DIAGRAM



HALF END BEAM PLAN



HALF END BEAM ELEVATION



A-A

QUANTITIES	
CLASS AAE-3 CONCRETE	245.2 C Y.
REINFORCING STEEL-GR. 60	27,326 LBS.
REINFORCING STEEL-GR 60-EPOXY	29,667 LBS.

PEMBINA RIVER
NECHE

STEEL ALTERNATE
SLAB SECTIONS

18-241.409-9S

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR BENDING & CUTTING DIAGRAMS

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO.
8	N.D.	BRF-6-018(024)241	26

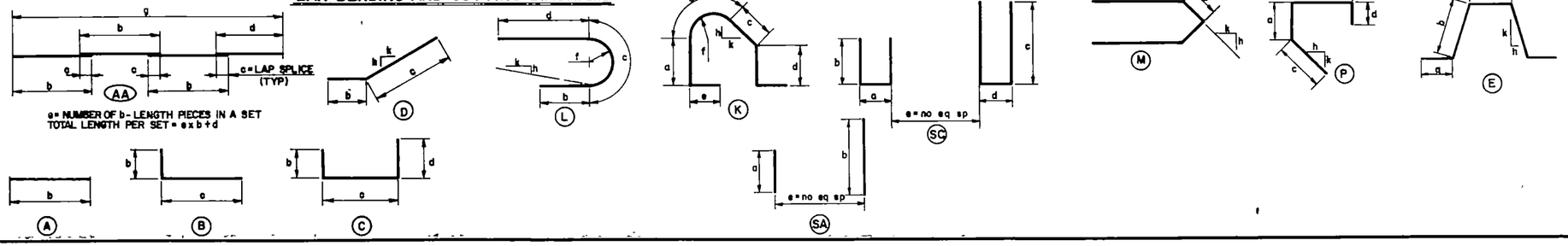
LOCATION	SIZE	MARK	NUMBER EACH OR SETS	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
ABUTMENTS	6	AA100	8	72'-2"		40'-0"	1'-6"	32'-2"	1		70'-8"		
	5	AA101	16	71'-11"		40'-0"	1'-3"	31'-11"	1		70'-8"		
	5	A100	20	9'-0"		9'-0"							
	5	A101	8	12'-6"		12'-6"							
	5	A102	8	9'-9"		9'-9"							
	5	A103	8	7'-0"		7'-0"							
	5	C100	80	15'-8"		7'-0"	1'-8"	7'-0"					
	5	C101	10	13'-7"		4'-11"	1'-8"	7'-0"					
	5	C102	4	18'-10"		8'-7"	1'-8"	8'-7"					
	4	C103	92	2'-8"		6"	1'-8"	6"					
	6	D100	8	16'-0"		3'-6"	12'-6"					4	12
	5	SC100	4	152'-1"	9"	5'-6"	8'-6"	1'-8"	9				
	5	SC101	4	21'-3"	8"	4'-9"	5'-2"	9"	1				
PIERS	6	A300	168	19'-7"		19'-7"							
	6	A301	8	40'-10"		40'-10"							
	5	A302	76	40'-10"		40'-10"							
	6	A303	2	18'-9"		18'-9"							
	5	C300	156	4'-6"		1'-7"	1'-4"	1'-7"					
	5	C301	44	5'-3"		2'-0"	1'-3"	2'-0"					
	4	C302	72	2'-4"		6"	1'-4"	6"					
	5	M300	40	5'-8"		2'-0"	10"					12	12
SUPERSTRUCTURE Regular	5	A500	263	42'-2"		42'-2"							
	5	A501	12	44'-11"		44'-11"							
	6	A502	2	44'-11"		44'-11"							
	5	AA500	58	183'-5"		50'-0"	1'-3"	33'-5"	3		179'-8"		
	5	B500	80	5'-8"		3'-2"	2'-6"						
	5	E500	20	5'-1"	6"	1'-8"	9"					6	12
	5	L500	360	5'-0"		2'-2"	8"	2'-2"		2.5		1	12
	5	P500	80	5'-6"	4"	2'-6"	2'-3"	5"				12	9
	5	SA300	2	504'-0"	6'-10"	41'-2"			20				

LOCATION	SIZE	MARK	NUMBER EACH OR SETS	NOMINAL LENGTH	DETAILING DIMENSIONS a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE Epoxy	5	XA500	329	42'-2"		42'-2"							
	5	XA501	84	30'-0"		30'-0"							
	6	XA502	2	44'-11"		44'-11"							
	5	XAA500	45	183'-5"		50'-0"	1'-3"	33'-5"	3		179'-8"		
	5	XB500	80	7'-0"		3'-6"	3'-6"						
	5	XX500	360	5'-2"	1'-6"	6"	1'-0"	10"	8"	2.5		12	8.5
	5	XBA500	2	624'-0"	6'-10"	41'-2"			25				

NOTES

1. FABRICATION AND TOLERANCES SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.
2. ALL DIMENSIONS ARE OUT TO OUT OF BARS.
3. NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
4. ADJACENT AA BARS SHALL BE TURNED END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.

BAR BENDING AND CUTTING DIAGRAMS



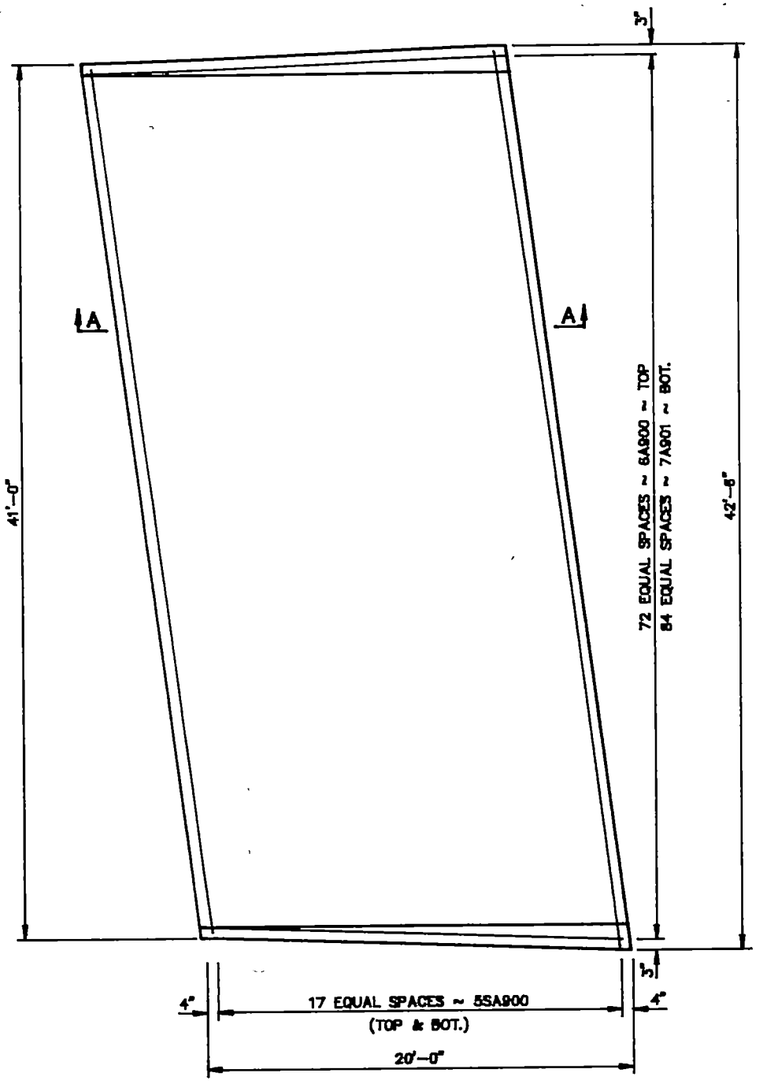
PEMBINA RIVER
NECHE

STEEL ALTERNATE

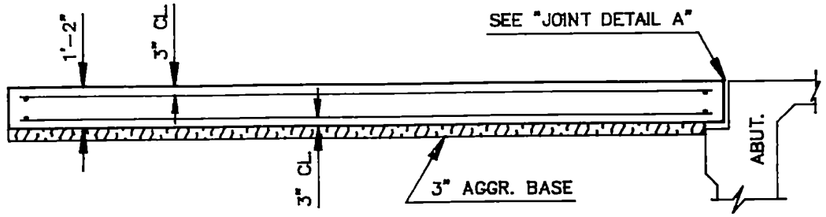
REINFORCING BAR LIST

18-241.409-10S

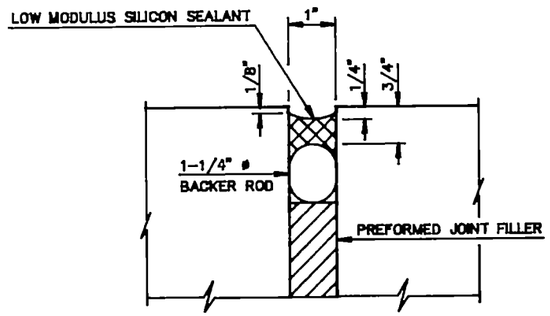
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-8-018(024)241	27



PLAN



A–A



JOINT DETAIL A

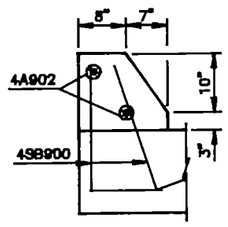
WIDTH = 42'-8"
SKEW ANGLE = 20°

BAR LIST – ONE SLAB

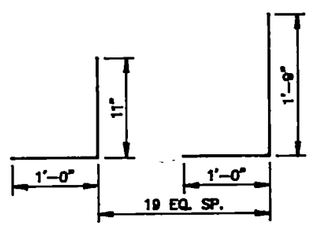
SIZE	MARK	NO.	LENGTH
6	A900	73	19'-8"
7	A901	85	19'-8"
4	A902	4	19'-8"
5	SA900	2	793'-6"
4	SB900	4	46'-8"

ESTIMATED MATERIAL QUANTITIES

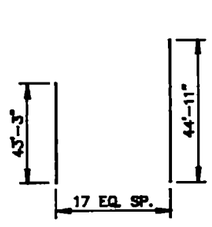
REINFORCING STEEL (LBS.)	CONCRETE (C.Y.)
7406	37.0



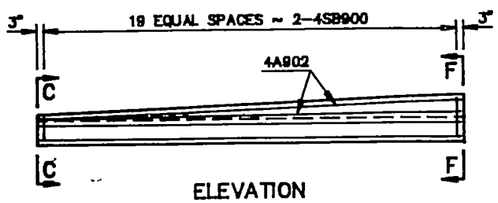
F–F



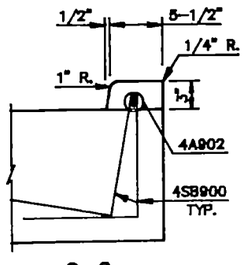
SB900



SA900



ELEVATION



C–C

NOTE:

THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, REINFORCING BARS, SUB-BASE AGGREGATE, BACKER ROD, 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.

QUANTITIES	(ONE SLAB)
APPROACH SLAB	92.8 S.Y.

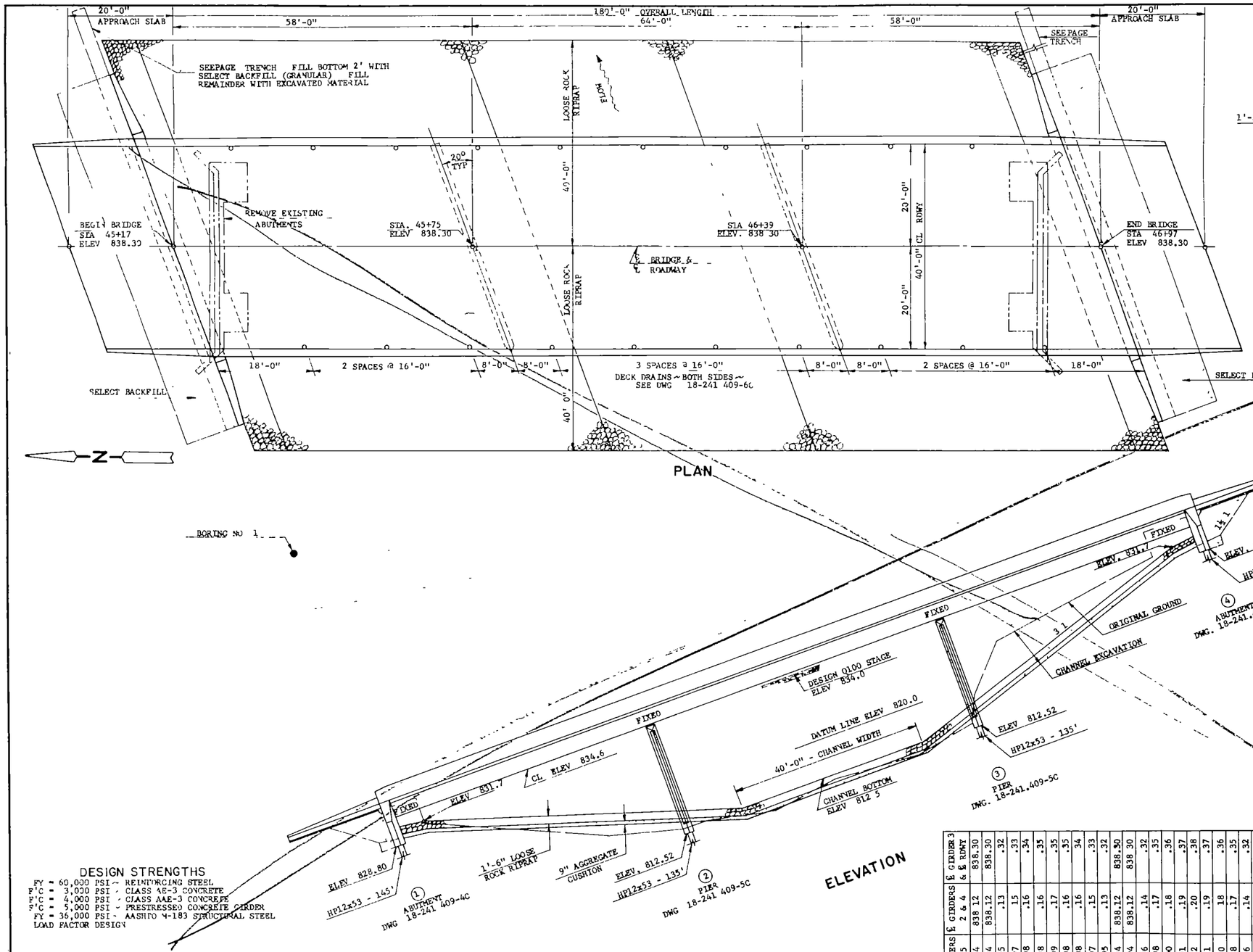
PEMBINA RIVER
NECHE
STEEL ALTERNATE

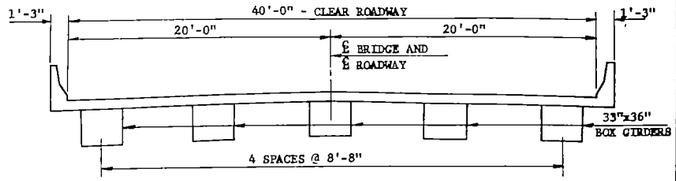
APPROACH SLAB

18-241.409-11S

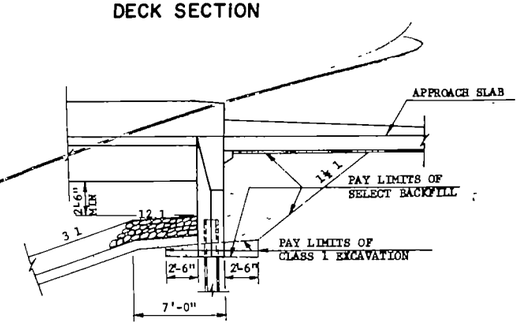
57DLS15

BRIDGE CODE	FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
X-081	8	N.D.	BRF-6-018(024)241	28





DECK SECTION



DETAIL AT ABUTMENT

ELEVATION

LOCATION
PEMBINA RIVER NECHE

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	105	REMOVAL OF STRUCTURE	L SUM	1.0
210	101	CLASS 1 EXCAVATION	L SUM	1.0
210	111	CLASS 2 EXCAVATION	L SUM	1.0
210	126	CHANNEL EXCAVATION	CU YD	1530.0
210	200	SELECT BACKFILL	CU YD	305.0
210	201	FOUNDATION PREPARATION	EA	1.0
550	215	CONCRETE BRIDGE APPROACH SLAB	SQ YD	185.6
602	130	CLASS AAE-3 CONCRETE	CU YD	226.3
602	1130	CLASS AE-3 CONCRETE	CU YD	178.2
602	1250	PENETRATING WATER REPELLENT TR	SQ YD	800.0
604	9620	PRESTRESSED BOX BEAM-33"	L FT	877.5
612	115	REINFORCING STEEL GRADE 60	LBS	37579.0
612	116	REINFORCING STEEL GRADE 60 EPOXY	LBS	28049.0
616	242	STRUCTURAL STEEL M183	LBS	1632.0
622	40	STEEL PILING HP 12 53	L FT	3620.0
622	1200	STEEL TEST PILING HP 12 53	L FT	310.0
708	100	AGGREGATE CUSHION	CU YD	300.0
706	1020	RIPRAP, LOOSE ROCK	CU YD	805.0
730	7000	BRIDGE BENCH MARKS	SET	1.0

DESIGN STRENGTHS

FY = 60,000 PSI ~ REINFORCING STEEL
F'C = 3,000 PSI ~ CLASS AE-3 CONCRETE
F'C = 4,000 PSI ~ CLASS AAE-3 CONCRETE
F'C = 5,000 PSI ~ PRESTRESSED CONCRETE GIRDER
FY = 36,000 PSI ~ AASHTO M-183 STRUCTURAL STEEL
LOAD FACTOR DESIGN

PRESTRESSING DATA

C G	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT TONS	GIRDER LENGTH
2.50	563.8K	4000 PSI	5000 PSI	17 8 T	56'-1"
3 00	577.4K				
3.50	591.6K				
2 50	689.3K	4512 PSI	5000 PSI	20 0 T	63'-4"
3.00	705 9K				
3 50	723.4K				

BENCH MARKS

NO	DESCRIPTION	LOCATION	ELEV
BM #3	PAINT SPOT ON OLD BRIDGE	STA 45+57-11' RT	836 94

*BELOW BOTTOM OF CONCRETE ELEVATIONS

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	* MIN PEN.	DESIGN LOAD
ABUTMENT 1	48.7 T	18.3 T	125'	67.0 T.
PIER 2	46 5 T.	19.1 T	110'	65.6 T.
PIER 3	46.5 T	19.1 T	110'	65 6 T
ABUTMENT 4	48 7 T	18.3 T.	125'	67 0 T

	BEGIN BRIDGE	10 EQ SP = 56'-1"	10 EQ SP = 63'-4"	10 EQ. SP = 56'-1"	
	1'-7"	END OF BEAM	END OF BEAM	END OF BEAM	END BRIDGE
℄ GIRDER 3 & ℄ ROWY	838.30	838.30 .32 .33 .34 .35 .35 .35 .34 .33 .32	838.30 .32 .35 .36 .37 .38 .37 .36 .35 .32	838.30 .32 .33 .34 .35 .35 .34 .33 .32	838.30
℄ GIRDERS 2 & 4	838 12	838.12 .13 .15 .16 .16 .17 .16 .15 .13	838.12 .14 .17 .18 .19 .20 .19 .18 .17 .14	838.12 .13 .15 .16 .16 .17 .16 .15 .13	838 12
℄ GIRDERS 1 & 5	837.94	837.94 .95 .97 .98 .98 .99 .98 .98 .97 .95	837.94 .96 .98 .00 .01 .02 .01 .98 .96 .94	837.94 .95 .97 .98 .98 .99 .98 .98 .97 .95	837.94

SCREED ELEVATIONS

ELEVATIONS SHOWN ARE TO TOP OF FINISHED CONCRETE

STRUCTURAL DRAWINGS

GENERAL DRAWINGS· THIS SHEET
18-241.409-1C THRU 18-241.409-9C
STANDARD DRAWINGS· D-604-3, D-622-1, & D-900-1

DESIGN LOADING	SCALE
HS 20	1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PEMBINA RIVER, NECHE
CONCRETE ALTERNATE
BRIDGE LAYOUT

PROJECT BRF-6-018 (024) 241 STA 46+07
PEMBINA COUNTY

APPROVED

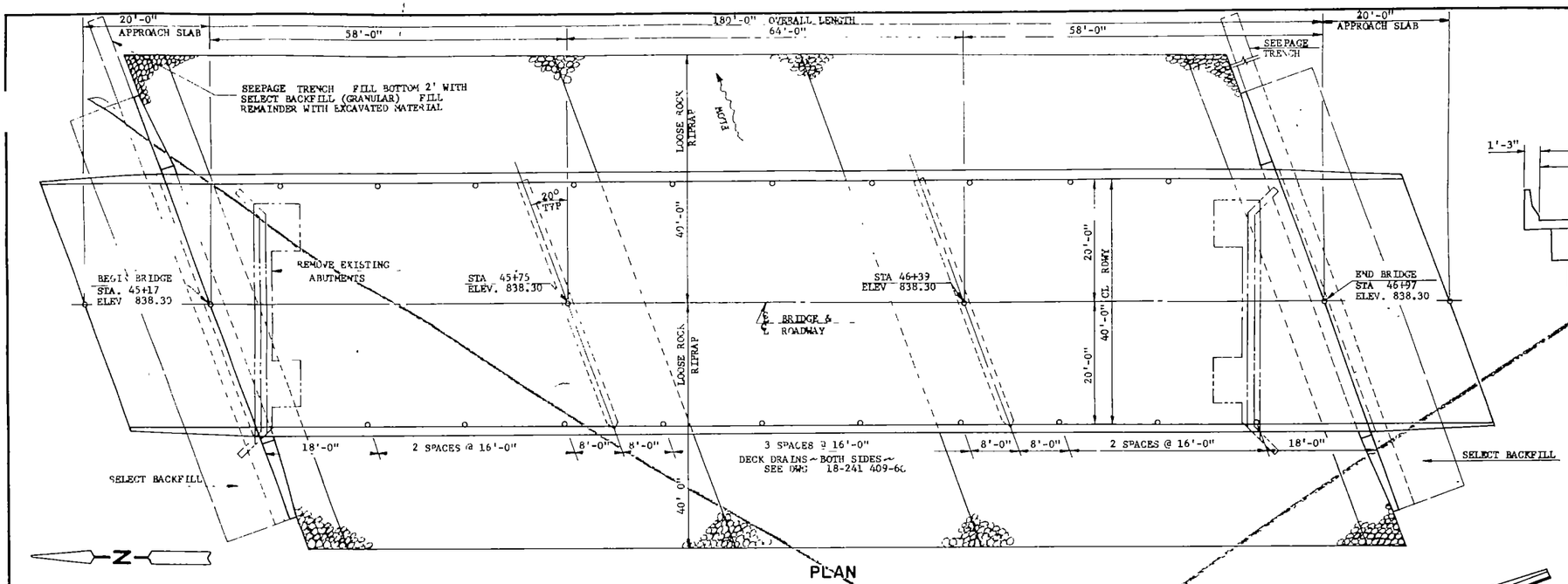
5 MAY 1987
DATE

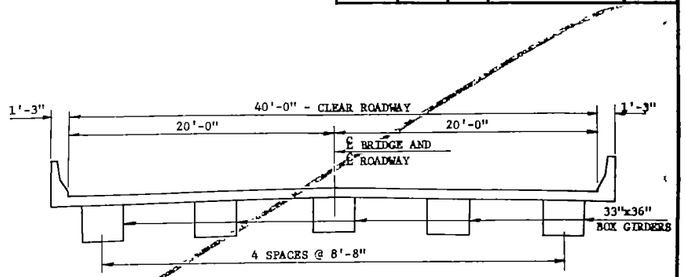
BRIDGE DESIGN ENGINEER

REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

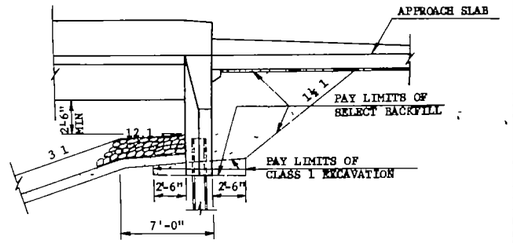
18-241.409-C

BRIDGE CODE	FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
X-081	8	N.D.	BRF-6-018(024)241	28



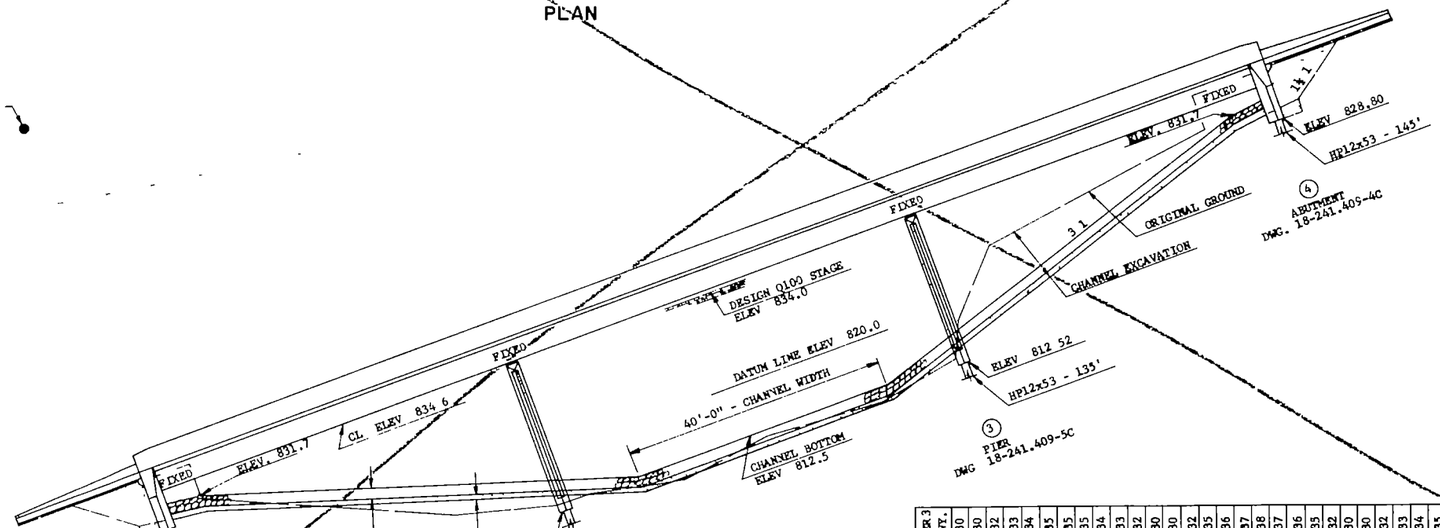


DECK SECTION



DETAIL AT ABUTMENT

Concrete Not Built



ELEVATION

LOCATION
PEMBINA RIVER NECHE

SPEC CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	105 REMOVAL OF STRUCTURE	L SUM	1.0
210	101 CLASS 1 EXCAVATION	L SUM	1.0
210	111 CLASS 2 EXCAVATION	L SUM	1.0
210	126 CHANNEL EXCAVATION	CU YD	1530.0
210	200 SELECT BACKFILL	CU YD	305.0
210	201 FOUNDATION PREPARATION	EA	1.0
550	215 CONCRETE BRIDGE APPROACH SLAB	SQ YD	185.6
602	130 CLASS AAE-3 CONCRETE	CU YD	226.3
602	1130 CLASS AE-3 CONCRETE	CU YD	178.2
602	1250 PENETRATING WATER REPELLENT TR	SQ YD	800.0
604	9620 PRESTRESSED BOX BEAM-33"	L FT	877.5
612	115 REINFORCING STEEL GRADE 60	LBS	37579.0
612	116 REINFORCING STEEL GRADE 60 EPOXY	LBS	28069.0
616	362 STRUCTURAL STEEL M183	LBS	1632.0
622	40 STEEL PILING HP 12x53	L FT	3620.0
622	1200 STEEL TEST PILING HP 12x53	L FT	310.0
708	100 AGGREGATE CUSHION	CU YD	300.0
708	1020 RIPRAP, LOOSE ROCK	CU YD	805.0
920	30 BRIDGE BENCH MARKS	SET	1.0

DESIGN STRENGTHS

FY = 60,000 PSI ~ REINFORCING STEEL
F'C = 3,000 PSI ~ CLASS AE-3 CONCRETE
F'C = 4,000 PSI ~ CLASS AAE-3 CONCRETE
F'C = 5,000 PSI ~ PRESTRESSED CONCRETE GIRDER
FY = 36,000 PSI ~ AASHTO M-183 STRUCTURAL STEEL
LOAD FACTOR DESIGN

PRESTRESSING DATA

C G	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT TONS	GIRDER LENGTH
2.50	563.8K	4000 PSI	5000 PSI	17.8 T	55'-1"
3.00	577.4K				
3.50	591.6K				
2.50	689.3K	4512 PSI	5000 PSI	20.0 T	63'-4"
3.00	705.9K				
3.50	723.4K				

BENCH MARKS

NO	DESCRIPTION	LOCATION	ELEV
BM #3	PAINT SPOT ON OLD BRIDGE	STA 45+57-11' RT.	836.94

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	* MIN. PEN.	DESIGN LOAD
ABUTMENT 1	48.7 T.	18.3 T.	125'	67.0 T.
PIER 2	46.5 T	19.1 T	110'	65.6 T.
PIER 3	46.5 T.	19.1 T	110'	65.6 T
ABUTMENT 4	48.7 T	18.3 T.	125'	67.0 T

*BELOW BOTTOM OF CONCRETE ELEVATIONS

	1'-7" BEGIN BRIDGE	10 EQ SP = 56'-1" END OF BEAM	10 EQ SP. = 63'-4" END OF BEAM	10 EQ SP. = 56'-1" END OF BEAM	1'-7" END BRIDGE
℄ GIRDER 3 & CONT.	838.30	838.30 .32 .33 .34 .35 .35 .35 .34 .33 .32	838.30 .32 .35 .36 .37 .38 .37 .36 .35 .32	838.30 .32 .34 .33 .32	838.30
℄ GIRDERS 2 & 4	838.12	838.12 .13 .15 .16 .16 .17 .16 .16 .15 .13	838.12 .14 .17 .18 .19 .20 .19 .18 .17 .14	838.12 .13 .15 .16 .16 .15 .13	838.12
℄ GIRDERS 1 & 5	837.94	837.94 .95 .97 .98 .98 .99 .98 .98 .97 .95	837.94 .96 .98 .98 .00 .01 .02 .01 .00 .98 .96	837.94 .95 .97 .98 .98 .99 .98 .98 .97 .95	837.94

SCREED ELEVATIONS
ELEVATIONS SHOWN ARE TO TOP OF FINISHED CONCRETE.

STRUCTURAL DRAWINGS

GENERAL DRAWINGS THIS SHEET
18-241.409-1C THRU 18-241.409-9C
STANDARD DRAWINGS D-604-3, D-622-1, & D-900-1

DESIGN LOADING	SCALE
HS 20	1 INCH = 10 FEET

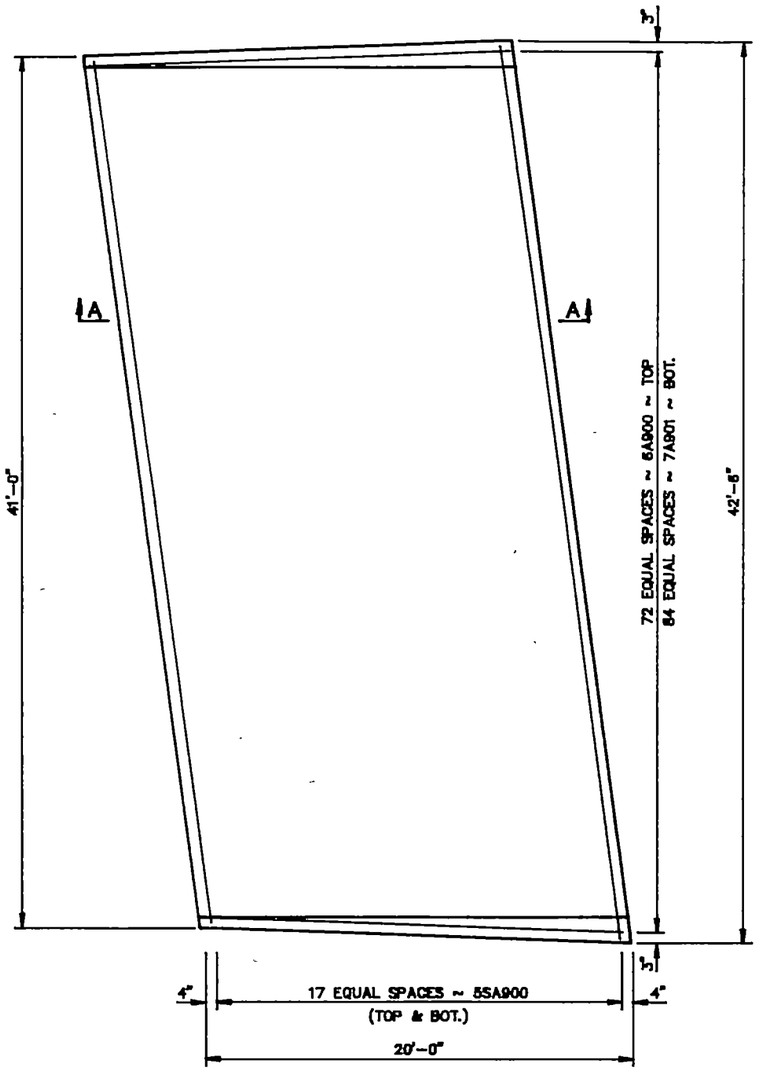
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
PEMBINA RIVER, NECHE
CONCRETE ALTERNATE
BRIDGE LAYOUT
PROJECT BRF-6-018 (024) 241 STA 46+07
PEMBINA COUNTY

APPROVED
5 MAY 1987
DATE
BRIDGE DESIGN ENGINEER

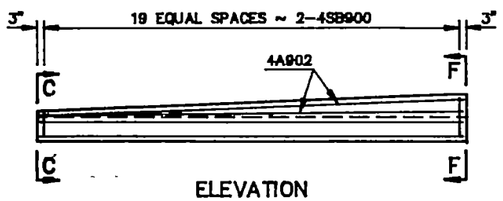
REGISTERED PROFESSIONAL ENGINEER 7093 NORTH DAKOTA

18-241.409-C

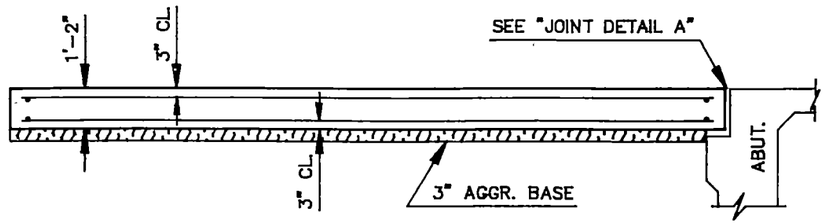
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-6-018(034)241	27



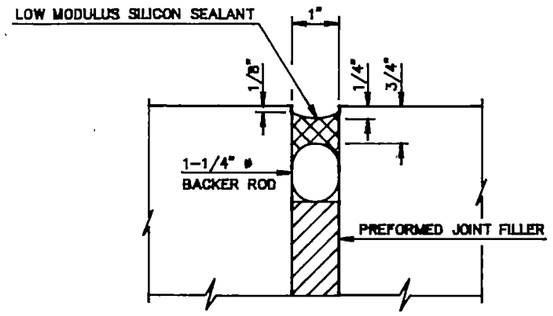
PLAN



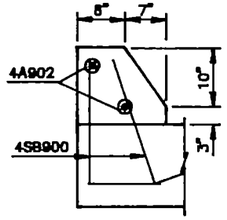
ELEVATION



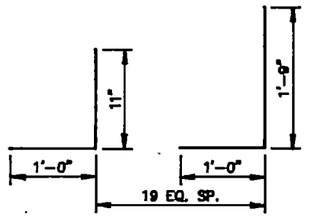
A–A



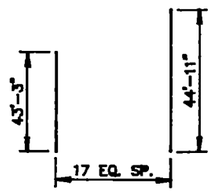
JOINT DETAIL A



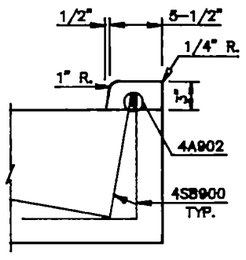
F–F



SB900



SA900



C–C

WIDTH = 42'-6"			
SKEW ANGLE = 20°			
BAR LIST – ONE SLAB			
SIZE	MARK	NO.	LENGTH
6	A900	73	19'-8"
7	A901	85	19'-8"
4	A902	4	19'-8"
5	SA900	2	793'-6"
4	SB900	4	46'-8"

ESTIMATED MATERIAL QUANTITIES	
REINFORCING STEEL (LBS.)	CONCRETE (C.Y.)
7406	37.0

NOTE:

THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, REINFORCING BARS, SUB-BASE AGGREGATE, BACKER ROD, 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.

QUANTITIES	(ONE SLAB)
APPROACH SLAB	92.8 S.Y.

PEMBINA RIVER

NECHE

STEEL ALTERNATE

APPROACH SLAB

870LS15

18-241.409-11S