STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	AC-SS-1-031(010)078	14914	1	1

NORTH DAKOTA JOB#30
DEPARTMENT OF TRANSPORTATION

Morton, Mercer and Oliver Counties
Project No. AC-SS-1-031(010)078
ND Hwy 31 from I-94 North to West Jct ND Hwy 200A
East Jct ND Hwy 200A North to Stanton
Structural Overlay and Structural Items
from I-94 North to West Jct ND Hwy 200A
Thin lift overlay from East Jct ND Hwy 200A to Stanton

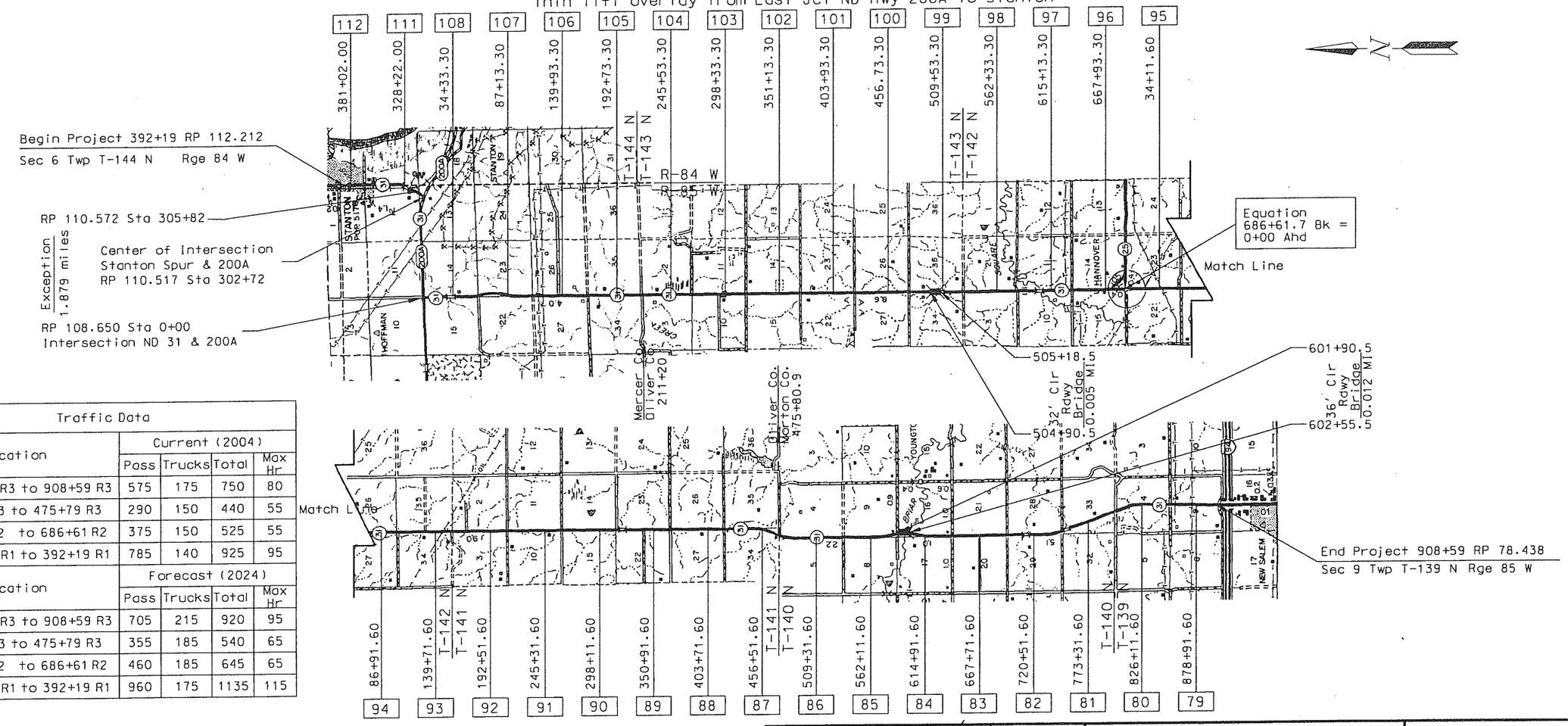
GOVERNING SPECIFICATIONS: 31-0841.239

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

LENGTH OF PROJECT

Miles - Gross	Miles - Net	
33.774	31.852	1.879 miles deducted for Hwy 200A

Design Info				
Location	Design Speed	Minimum Sight Distance for:		
		Stopping	Safe Passing	Passing for Marking
Sta 8+56 to 908+59 R3	65	645	2285	1100
Sta 8+56 to 666+40 R2	45	360	1625	700
Sta 0+12 to 666+40 R2	65	645	2285	1100
Sta 302+91 to 361+38 R1	55	495	1985	900
Sta 361+38 to 375+37 R1	35	250	1280	550
Sta 375+37 to 392+19 R1	25	155	900	450



Traffic Data				
Location	Current (2004)			
	Pass	Trucks	Total	Max Hr
Sta 475+79 R3 to 908+59 R3	575	175	750	80
Sta 0+00 R3 to 475+79 R3	290	150	440	55
Sta 0+12 R2 to 686+61 R2	375	150	525	55
Sta 302+91 R1 to 392+19 R1	785	140	925	95
Location	Forecast (2024)			
	Pass	Trucks	Total	Max Hr
Sta 475+79 R3 to 908+59 R3	705	215	920	95
Sta 0+00 R3 to 475+79 R3	355	185	540	65
Sta 0+12 R2 to 686+61 R2	460	185	645	65
Sta 302+91 R1 to 392+19 R1	960	175	1135	115

DESIGNERS

Matt Linneman

APPROVED DATE 9/22/05

Francis J. Ziegler

OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

APPROVED DATE

FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 9-22-05

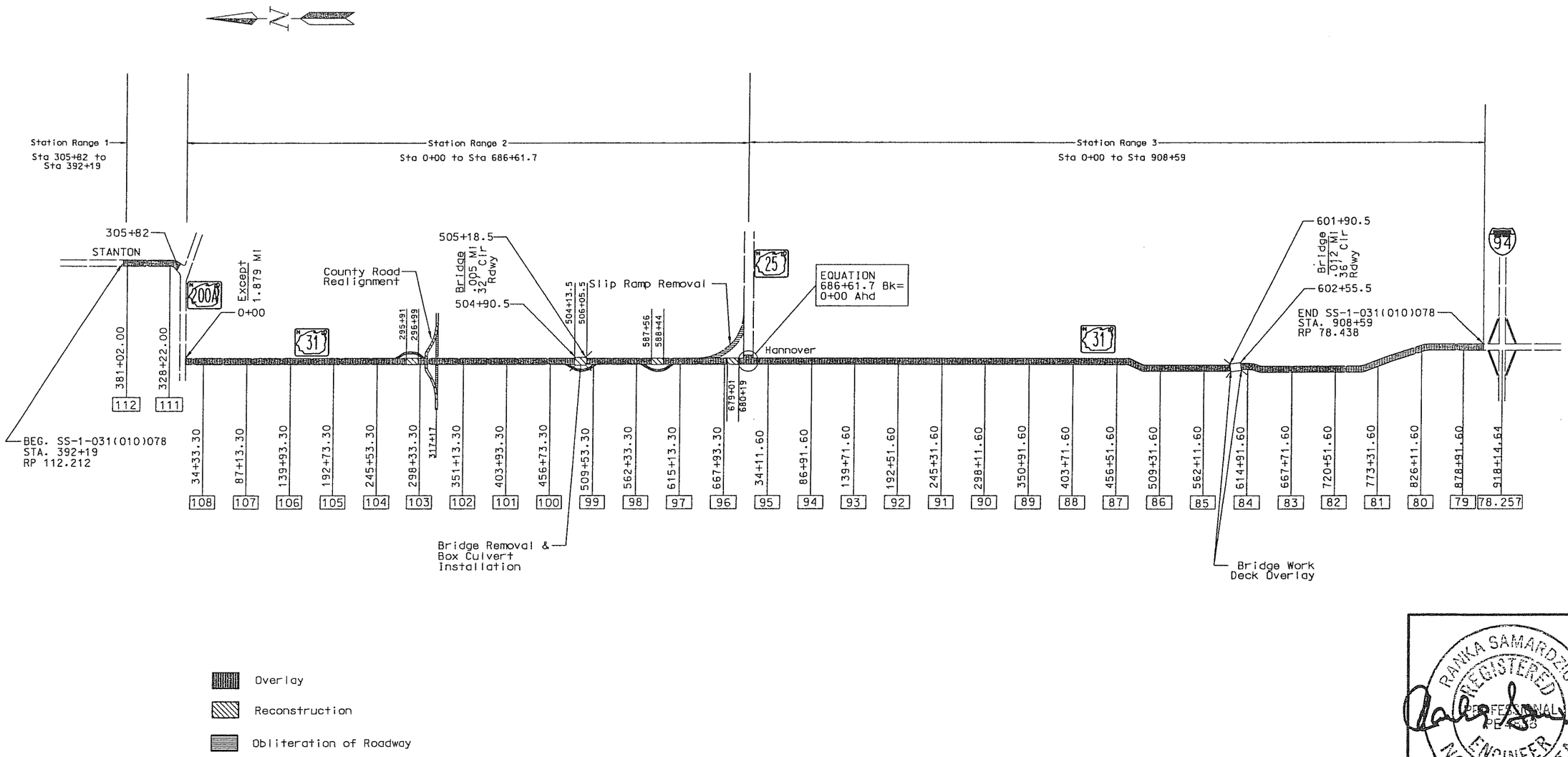
Roger Weigel

NDDOT DIV-DIST OR CONSULTANT FIRM

ROGER WEIGEL REGISTERED PROFESSIONAL ENGINEER PE 2430 NORTH DAKOTA
Roger Weigel
9-22-05

9/19/2005 G:\PROJECT\10031078.010\DESIGN\DOTSC\Plan_Sheets\001TS_001_TITLE.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	4	1



RANKA SAMARDZIC
REGISTERED
PROFESSIONAL
PE 4533
ENGINEER
NORTH DAKOTA
9/30/05

Scope of Work

ND Hwy 31 from I-94 N to W Jct 200A & Stanton Spur

9/30/2005 3:20:04 PM R:\project\10031078.010\DESIGN\DOTSC\Plan_Sheets\004SW_001_SCOPE.dgn

23 USC §409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	130	2

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'- 6" STRAIGHT W-BEAM RAIL SECTION	(A) 12'- 6" CURVED W-BEAM RAIL SECTION	(A) REFL-ECTOR-IZED PLATES	(A) 8"x 8" x 6' WOOD POST	(A) 8"x 8" x 22" WOOD OFF-SET BLOCK	(A) 8"x 8" x 18" WOOD OFF-SET BLOCK	(A) 8"x 8" x 14" WOOD OFF-SET BLOCK	(A) 6'-3" DOUBLE W-THRIE BEAM TRANS-ITION SECTION	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) 7/8" Ø x VAR-IABLE LONG. BOLT	(A) 3/4" Ø x 2-1/2" LONG POST BOLT	(B) EMBANK-MENT TYPE C
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	CY
Sta 601+08.19 to 601+91.27 rt	27	10	10	72	4	1	9	9	7	1	1	1	1	1	5	2	101
Sta 601+45.62 to 601+91.27 lt	21	4	4	48	2		5	9	7	1	1	1	1	1	5	2	18
Sta 602+54.73 to 603+00.38 rt	21	4	4	48	2		5	9	7	1	1	1	1	1	5	2	18
Sta 602+54.73 to 603+37.81 lt	27	10	10	72	4	1	9	9	7	1	1	1	1	1	5	2	101
TOTAL	96	28	28	240	12	2	28	36	28	4	4	4	4	4	20	8	238

W-beam guardrail

Sta 601+08.19 to 601+91.27 rt	83.2 LF
Sta 601+45.62 to 601+91.27 lt	45.7 LF
Sta 602+54.73 to 603+00.38 rt	45.7 LF
Sta 602+54.73 to 603+37.81 lt	83.2 LF
Total	257.8 LF

W-beam guardrail end terminal

Sta 600+08.45 to 600+58.32 rt	1 ea
Sta 600+95.63 to 601+45.62 lt	1 ea
Sta 603+00.38 to 603+50.37 rt	1 ea
Sta 603+87.68 to 604+37.55 lt	1 ea
Total	4 ea

Remove W-beam guardrail & posts

Sta 600+92.75 to 601+92.52 rt	100 LF
Sta 601+55.03 to 601+92.52 lt	37.5 LF
Sta 602+53.48 to 602+90.97 rt	37.5 LF
Sta 602+53.48 to 603+53.25 lt	100 LF
Total	275 LF

Reset W-beam guardrail

Sta 600+58.32 to 601+08.19 rt	50 LF
Sta 603+37.81 to 603+87.68 lt	50 LF
Total	100 LF

Guardrail embankment - type C

Sta 599+32.74 to 601+90.5 rt	1 ea
Sta 600+54.39 to 601+90.5 lt	1 ea
Sta 602+55.5 to 603+91.61 rt	1 ea
Sta 602+55.5 to 605+13.26 lt	1 ea
Total	4 ea

Remove end treatment & transition

Sta 503+41.20 to 503+77.92 rt	1 ea	(C)
Sta 503+95.02 to 504+31.74 lt	1 ea	(C)
Sta 505+80.27 to 506+16.99 rt	1 ea	(C)
Sta 506+34.09 to 506+70.81 lt	1 ea	(C)
Sta 600+55.66 to 600+92.75 rt	1 ea	
Sta 601+17.94 to 601+55.03 lt	1 ea	
Sta 602+90.97 to 603+28.06 rt	1 ea	
Sta 603+53.25 to 603+90.34 lt	1 ea	
Total	8 ea	

Remove box beam guardrail (C)

Sta 503+77.67 to 505+80.52 rt	203.3 LF	(D)
Sta 504+31.49 to 506+34.34 lt	203.3 LF	(D)
Total	406.6 LF	

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The volume of embankment - type C (cubic yards) is for informational purposes only.

(C) These guardrail materials are located at the Square Butte Creek Bridge, at RP 99.085.

(D) 28 lineal feet of the box beam guardrail on each side of the roadway is bridge mounted.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL ENGINEER
1293
9/19/05
NORTH DAKOTA

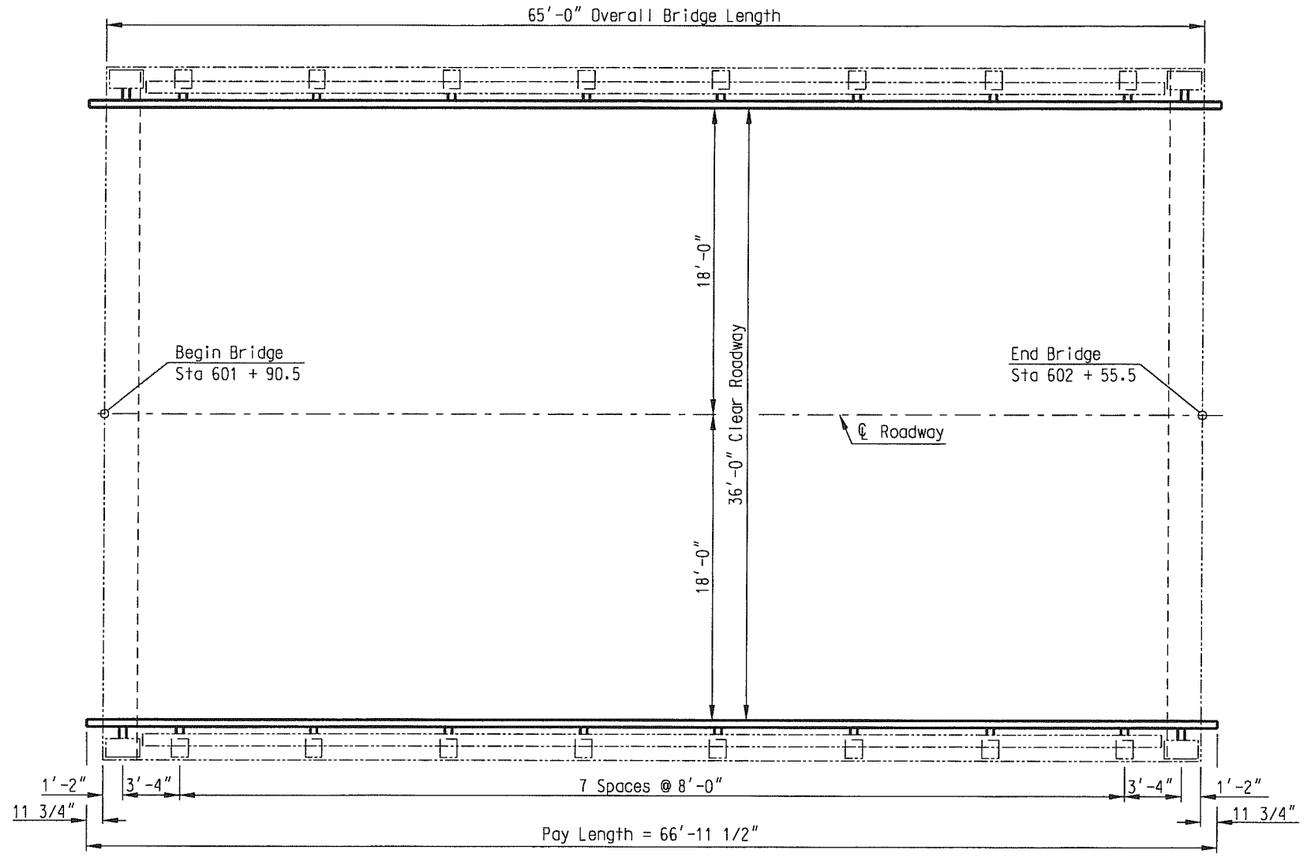
Thrie/W-Beam Guardrail Quantities

Sweet Briar Creek Bridge

RP 84.239
ND 31

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	170	1



PLAN

NOTES:

The work at this site consists of a rail retrofit and a bridge deck overlay.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3002	DOUBLE BOX BEAM RAIL RETROFIT - E-RAIL	LF	133.9
650	0700	CLASS 1 OVERLAY	SY	260
650	0701	CLASS 2 OVERLAY	SY	26
650	0702	CLASS 3 OVERLAY	SY	3
650	0703	CLASS 2A OVERLAY	LF	25

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
SWEET BRIAR CREEK

BRIDGE LAYOUT

PROJECT: SS-1-031(010)078
Station: 602+23.00
MORTON COUNTY

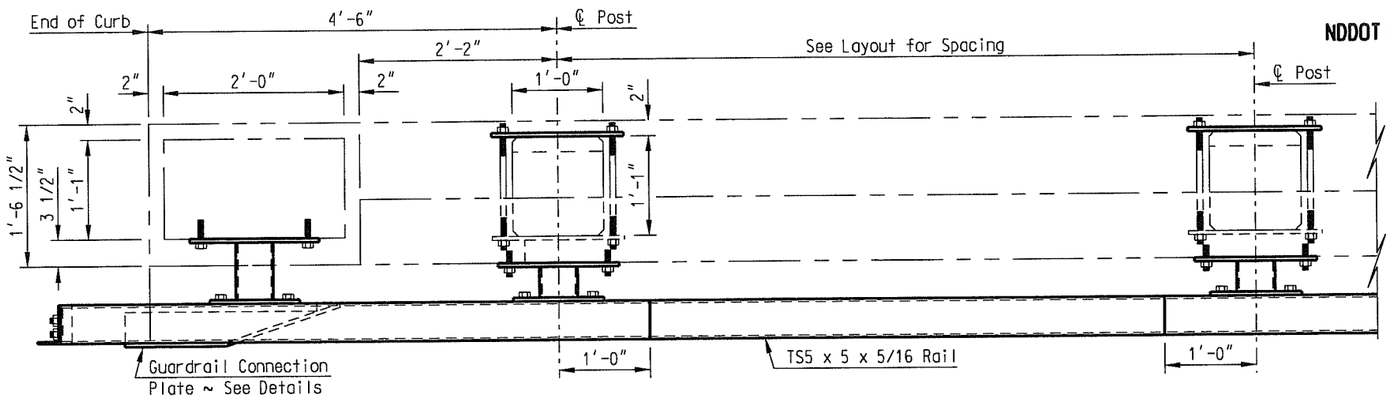
9-16-05 Lawrence R. Udland
DATE BRIDGE ENGINEER

YYXX000 TLS

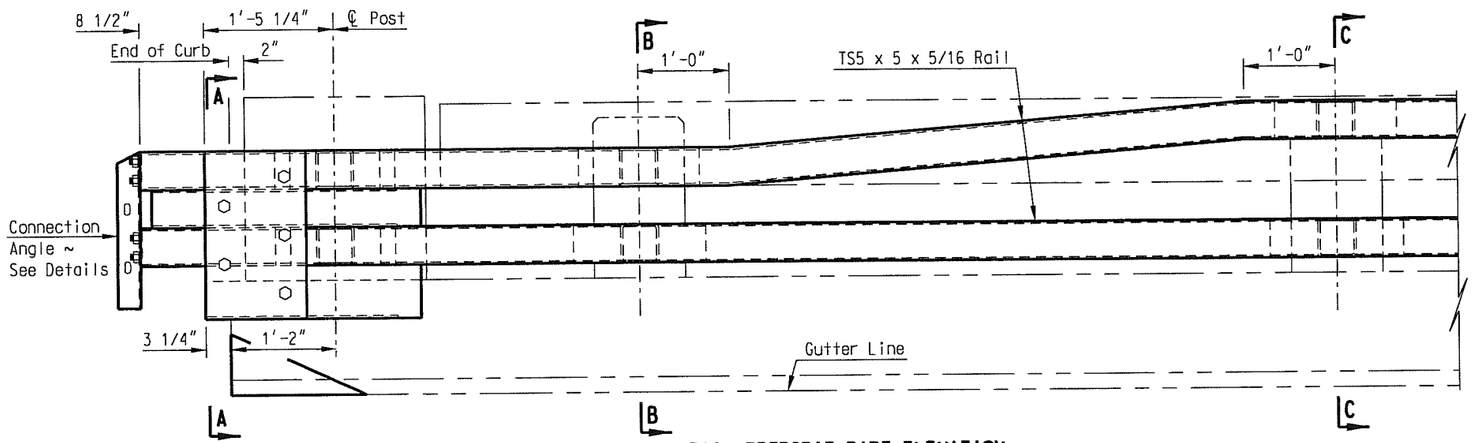
31-084.239

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

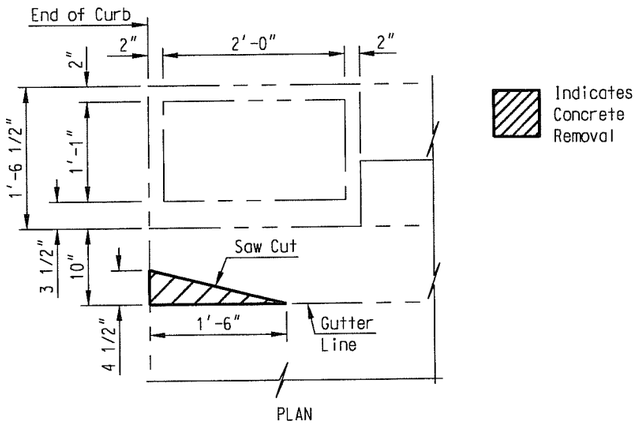
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	170	2



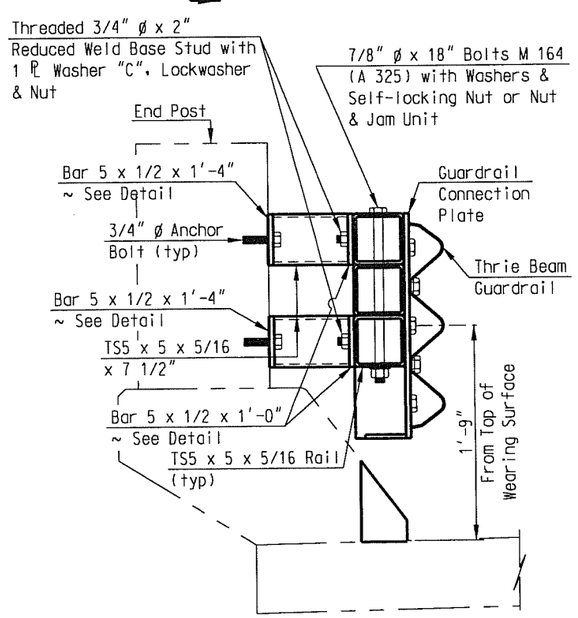
RAIL RETROFIT PART PLAN



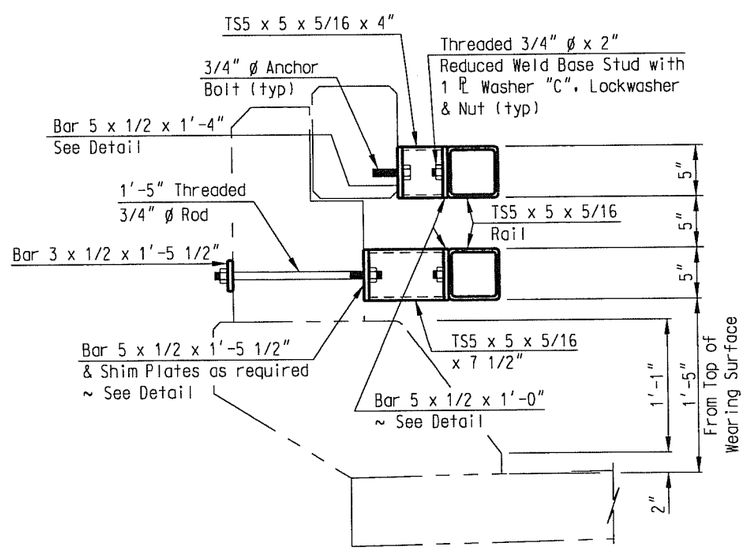
RAIL RETROFIT PART ELEVATION



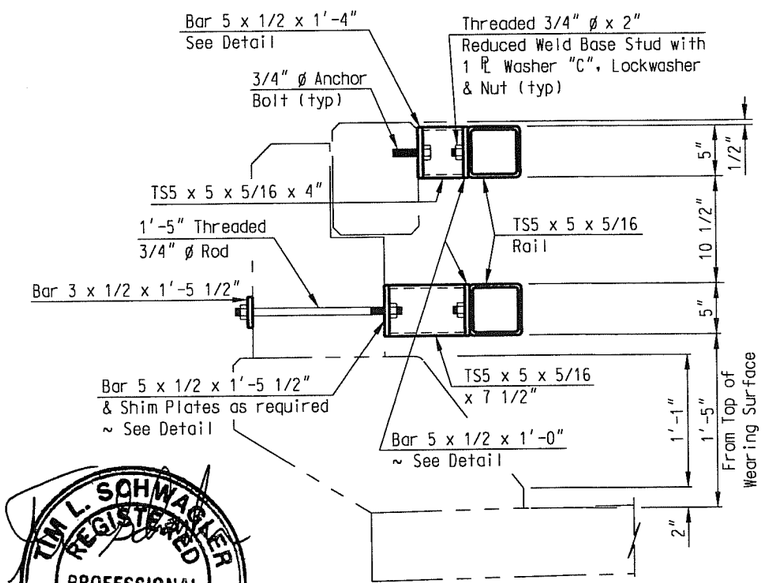
CONCRETE REMOVAL DETAIL



A-A



B-B



C-C

NOTE:

See Dwg 31-084.239-2 for notes and details not shown on this drawing.

SWEET BRIAR CREEK

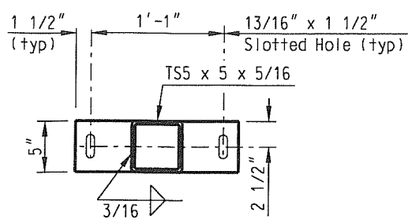
DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	170	3

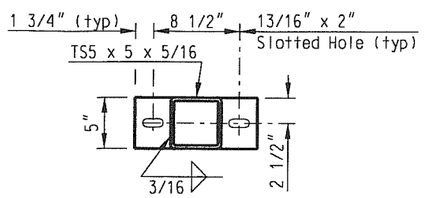
The filled circles indicate drilled and tapped holes for 7/8" ø bolts M 164 (A 325). See Detail "B."

The open circle indicates a drilled hole through the 1/2" plate for a 7/8" ø bolt M 164 (A 325).



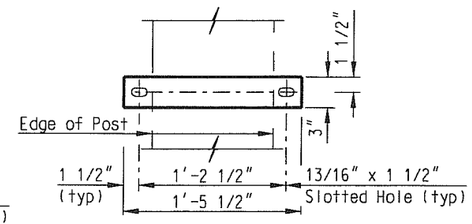
(CONCRETE RAIL CONNECTION)

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



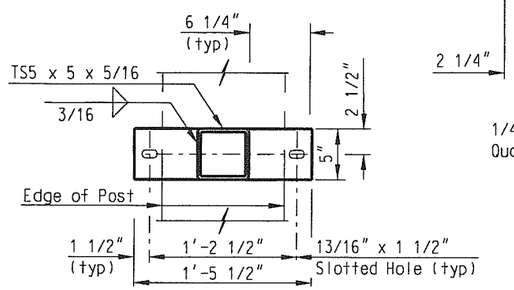
(RAIL CONNECTION)

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



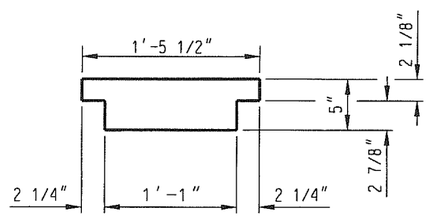
(CONCRETE POST CONNECTION)

BAR 3 X 1/2 X 1'-5 1/2" DETAIL



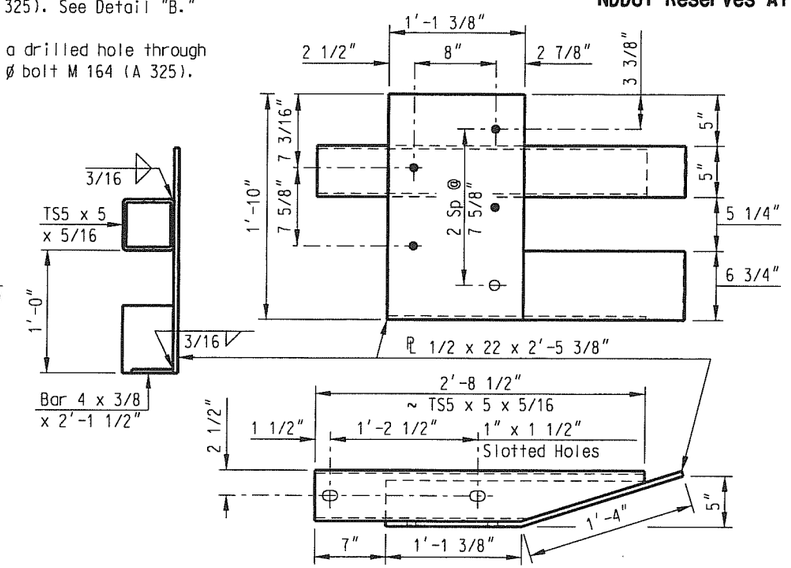
(CONCRETE POST CONNECTION)

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



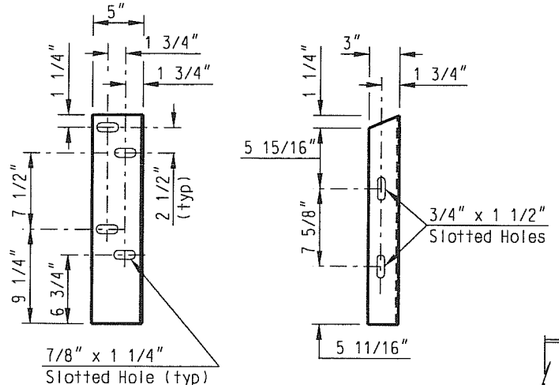
1/4" & 1/8" Thickness
Quantities determined in field

SHIM PLATE DETAIL



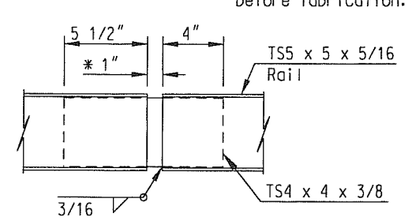
(4 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS



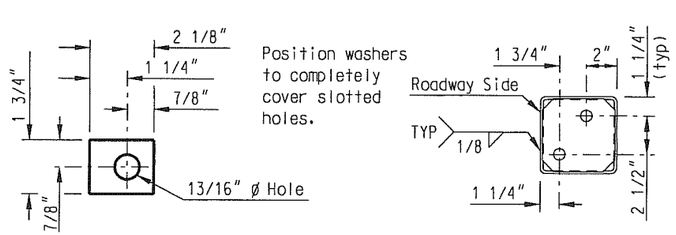
(L5 X 3 X 1/4 X 1'-8 1/2")
(4 REQUIRED)

CONNECTION ANGLE DETAILS



* 2" at expansion splices.

RAIL SPLICE DETAIL



DETAIL "B"

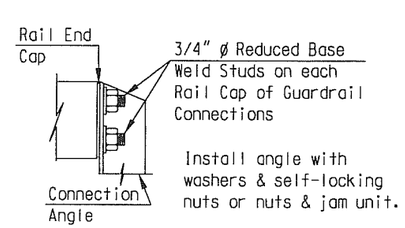
Position washers to completely cover slotted holes.

(1/4" PL AASHTO M 270 GRADE 36)

PL WASHER "C"

Rail cap shall be a Bar 4 3/4 x 3/16 x 4 3/4".
Cope corners 1" to provide zinc drains.

RAIL CAP DETAILS



NOTES:

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

Rail elements shall be square structural tubing in accordance with ASTM Specification A 500 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 shall be hot-dip galvanized after fabrication according to AASHTO M 111.

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

The threaded rods shall be M 270 Grade 36 Steel and galvanized according to M 232. The threaded rods shall be tightened to provide a minimum tensile force of 2,500 lbs. and a maximum tensile force of 2,700 lbs.

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 AASHTO M 164 (A 325) and shall be galvanized according to M 232.

The Contractor shall field verify all dimensions and incorporate them into the shop drawings. The double box beam rail retrofit shop drawings shall be submitted for approval to the Construction Office before fabrication.

SWEET BRIAR CREEK

DOUBLE BOX BEAM E-RAIL RETROFIT DETAILS

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	
5	N. D.	ROS-1-031(02)086	1	

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

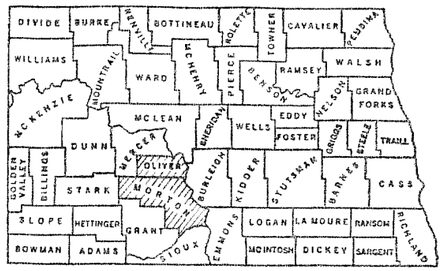
IN OLIVER & MORTON COUNTIES

FEDERAL AID PROJECT NO. ROS-1-031(02)086

STRUCTURAL & INCIDENTALS

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department July 1971 and approved as standard by the Federal Highway Admin. Sept 29, 1971. Required Contract Provision (Form PR-1273) dated Apr 1974 and others submitted herewith.



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

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

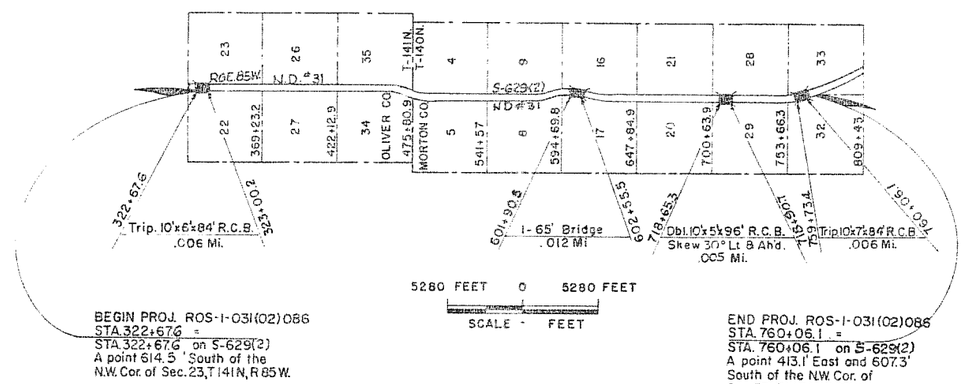
LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
ROS-1-031(02)086	8.283	029
TOTALS	8.283	029

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1971)	450 PASS. 100 TRUCKS 550 TOTAL	75
TRAFFIC FORECAST (1991)	770 PASS. 180 TRUCKS 950 TOTAL	130

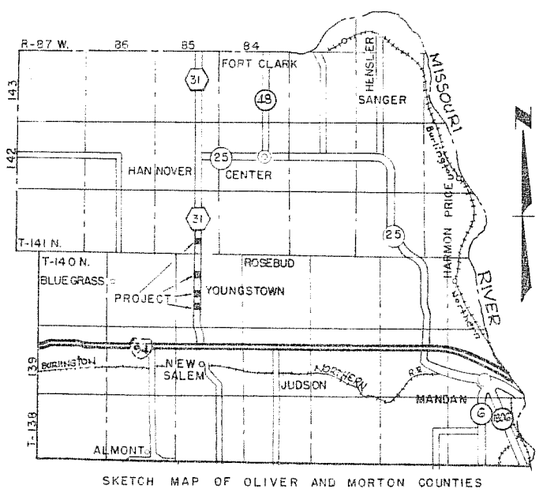
DESIGN SPEED 60 MPH
TRAFFIC CLASSIFICATION M
MINIMUM SIGHT DISTANCE (STOPPING) 475
MINIMUM SIGHT DISTANCE (SAFE PASSING) 2300
MINIMUM PASSING SIGHT DISTANCE FOR MARKING 1000

STA.		DESIGN LOADING
322+83.9	TRPL. 10 X 6' RCB	HS 20
602+23.0	BRIDGE-36' CLEAR RDWY.	HS 20
718+78.0	DBL. 10 X 5' RCB	HS 20
759+89.7	TRPL. 10 X 7' RCB	HS 20 S16



BEGIN PROJ. ROS-1-031(02)086
STA. 322+67.6 =
STA. 322+67.6 on S-629(2)
A point 614.5' South of the
N.W. Cor. of Sec. 23, T141N, R85W.

END PROJ. ROS-1-031(02)086
STA. 760+06.1 =
STA. 760+06.1 on S-629(2)
A point 413.1' East and 607.3'
South of the N.W. Cor. of
Sec. 33, T140N, R85W.



SKETCH MAP OF OLIVER AND MORTON COUNTIES

P.S.&E. Changes made
November 17, 1971

APPROVED DATE 3/1/76

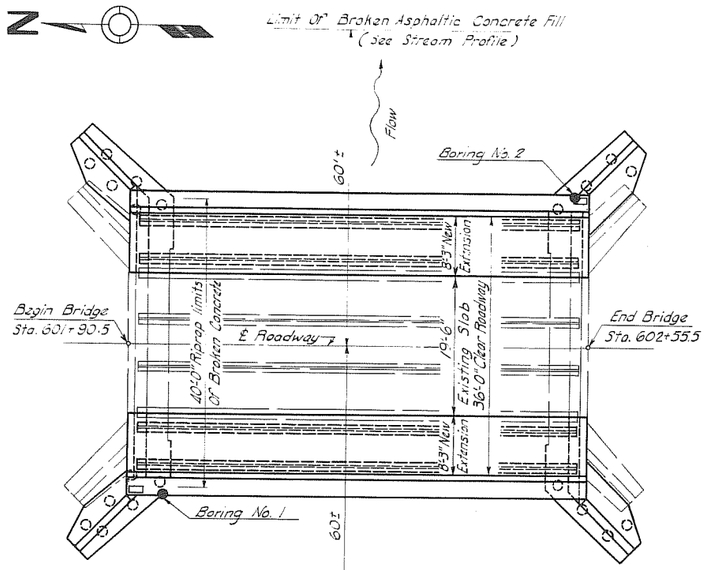
CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

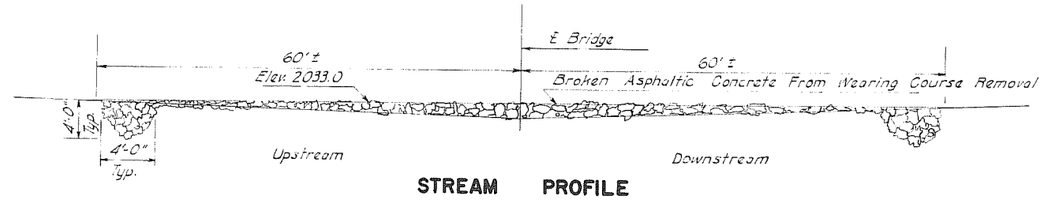
APPROVED

DIVISION ENGINEER DATE

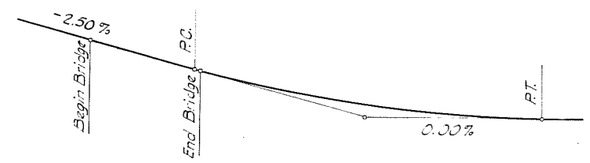
BRIDGE CODE	FED HWAY DIST NO	STATE	PROJ. NO	FISCAL YEAR	SHEET NO
X-031	5	N. D.	ROS-1-031(02)086		11



PLAN



STREAM PROFILE

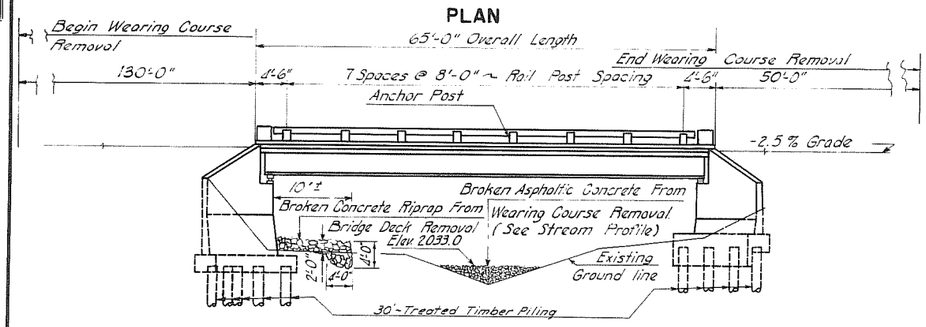


℄ PROFILE

(Not to Scale)

SPECIAL PROVISIONS	
NAME	NO.
MEASUREMENT AND PAYMENTS	145
EXCAVATION AND EMBANKMENT	105E
TEMPORARY WATER POLLUTION CONTROL	106A
CONCRETE STRUCTURES	127
EPOXY RESIN	SP

See Drawing No 31-84.23-1A for Construction Notes.



Note: Pile Cutoffs (No. Abut.) Shall Be 3'-3" Below The Top Of The Existing Footing.

(1)

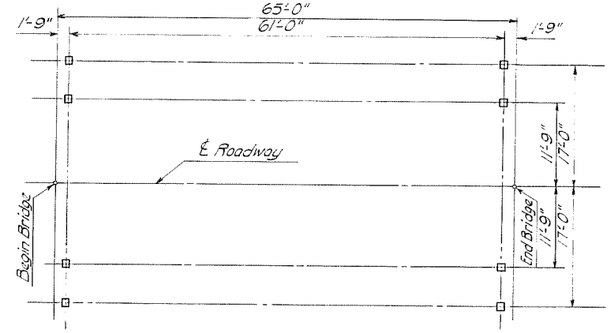
Drg. No. 31-8423-2 & 3

Note: Pile Cutoffs (So. Abut.) Shall Be 0'-6" Above The Top Of The Existing Footing.

(2)

Drg. No. 31-8423-4 & 5

ELEVATION



BEARING PLATE LAYOUT

Note: For Elevation Control (Top Of Beam Seat Concrete) See Abutment Detail Sheets 31-8423-2 & 4

ESTIMATE OF QUANTITIES			
SPEC. NO.	CODE NO.	BID ITEM	
202	0250	REMOVAL OF PORTIONS OF EXISTING STRUCTURE AT STA. 602+23	LUMP SUM
208	0100	CLASS I EXCAVATION	150 CU. YD.
724	0110	TEMPORARY BYPASS	LUMP SUM
610	1112	CLASS AE-1 CONCRETE SUB-STRUCTURES	76.2 CU. YD.
610	1134	CLASS AE-3 " I-BEAM SUPERSTRUCTURE	47.7 CU. YD.
610	0138	CLASS AAE-3 " RAILING AND POSTS	4.53 CU. YD.
612	0110	REINFORCING STEEL (GRADE 40)	14,340 LB.
616	0360	STRUCTURAL STEEL ~ A36	40,051 LB.
622	4630	TREATED TIMBER PILING 18 @ 30 FT.	504 LIN. FT.
705	0100	MOBILIZATION	LUMP SUM
750	0100	LINSEED OIL TREATMENT	2.5 GAL.
JCU	3000	BRIDGE BENCH MARKS	1 SET

BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
59	Spike in REA Pole.	Sta. 591+00~306'Rt	2066.57
60	Headwall S.E. Corner Of Bridge.	Sta. 602+55~15'Lt.	2049.14
60A	Iron Mon. 2X2" Gds. P.& Md. On Fence Line.	Sta. 612+15~104'Rt.	2060.21

PILE LOADING											
LOCATION	DEAD LOAD	LIVE LOAD	EARTH	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	LONG. FORCE	DESIGN LOAD	MAX. REQD BEARING	* MINIMUM PENETRATION
Abutments	9.7T	16T	2.7T					14.0T	18.2T	15'

* Below Bottom Of Footing In Ft.

ORIGINAL PROJECT NO. F-629(3)

STRUCTURAL DRAWINGS	
GENERAL DRAWING 31-84.23 (THIS SHEET)	
SUBSTRUCTURE 31-84.23-1,1A,2,3,4 & 5, D-708-9	
SUPERSTRUCTURE 31-84.23-6&7, H-0160, H-0501, D-900-1	
DESIGN LOADING HS20	SCALE 1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

SWEET BRIAR CREEK

BRIDGE LAYOUT

PROJECT ROS-1-031(02)086 STA. 602+23

MORTON COUNTY

APPROVED

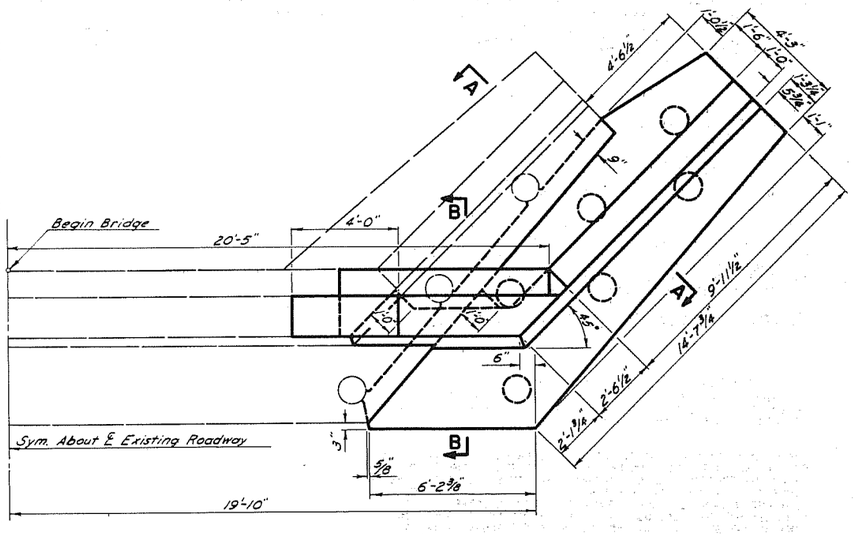
3-2-76 Stanley Adams
DATE BRIDGE ENGINEER

TRACING	MADE BY: GSO	CHECKED BY: RAP
QUANTITIES	MADE BY: RAP	CHECKED BY: DJB

31-84.23

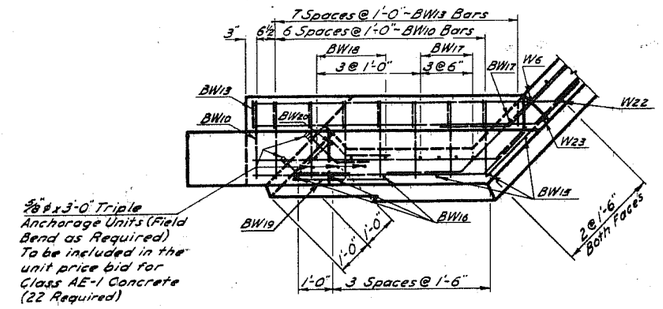
31-84.23

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	RAS-1-031(021)086		14



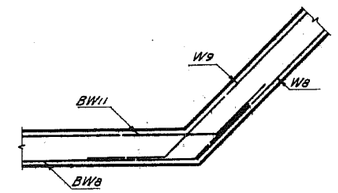
PLAN VIEW OF ABUTMENT EXTENSION

Showing Dimensions

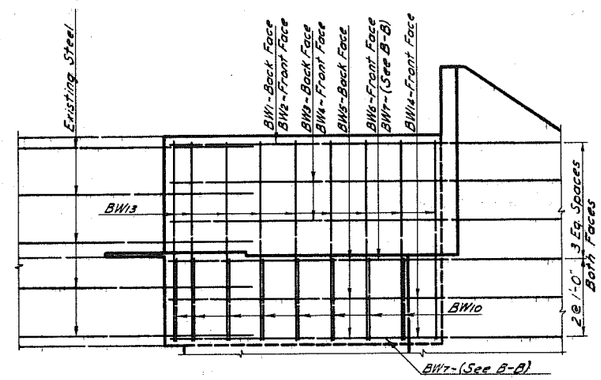


PLAN OF BACKWALL & BEAM SEAT

Showing Reinforcing

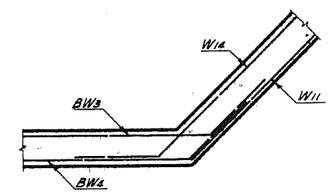


C-C

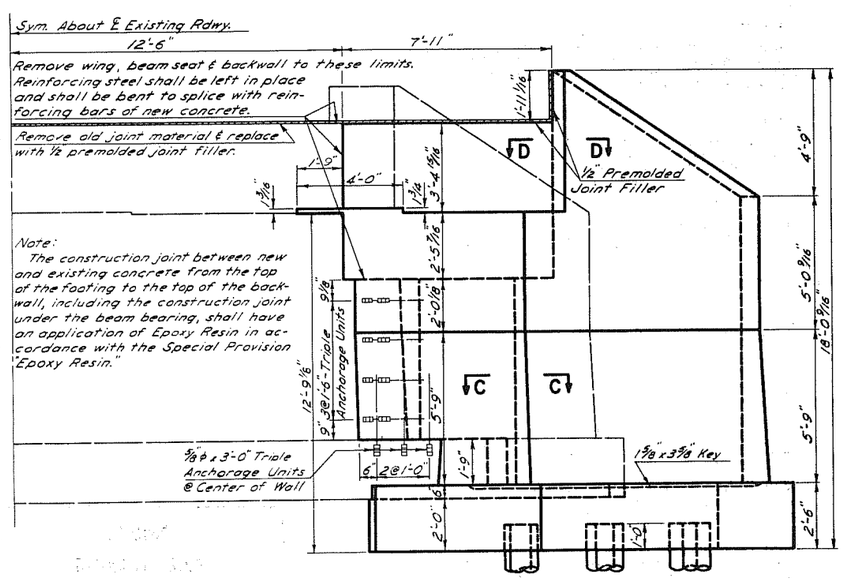


ELEVATION OF BACKWALL & BEAM SEAT

Showing Reinforcing

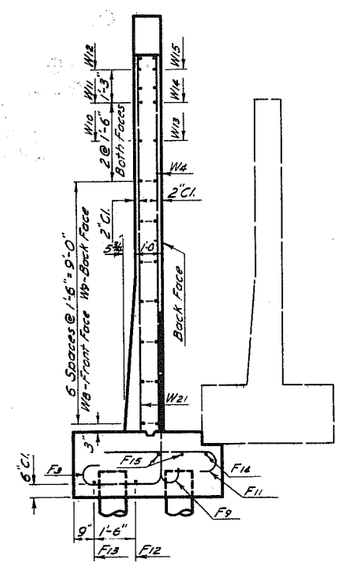


D-D

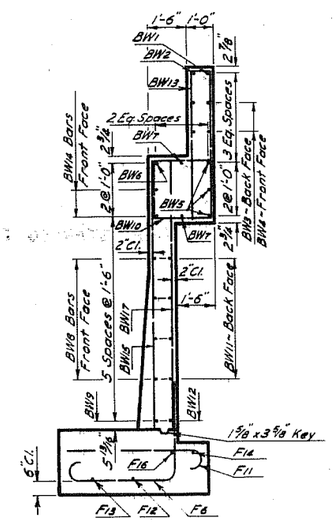


SOUTH ELEVATION VIEW OF ABUTMENT EXTENSION

Showing Dimensions



A-A



B-B

ABUTMENT NO. 1
WIDENING DETAILS

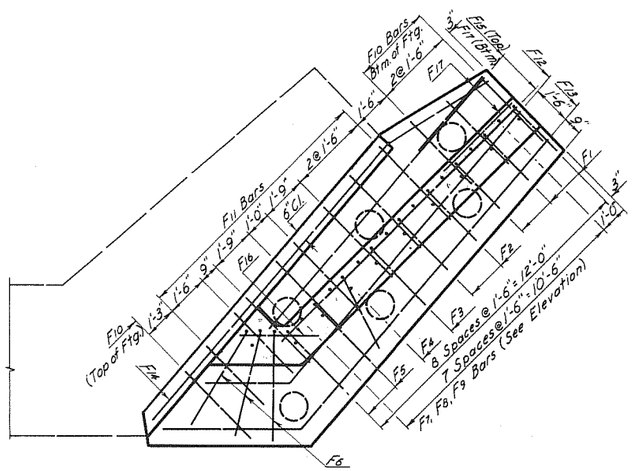
MORTON COUNTY

QUANTITIES | CHECKED BY

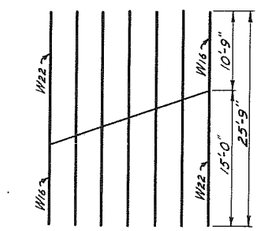
31-84.23-2

31-84.23-2

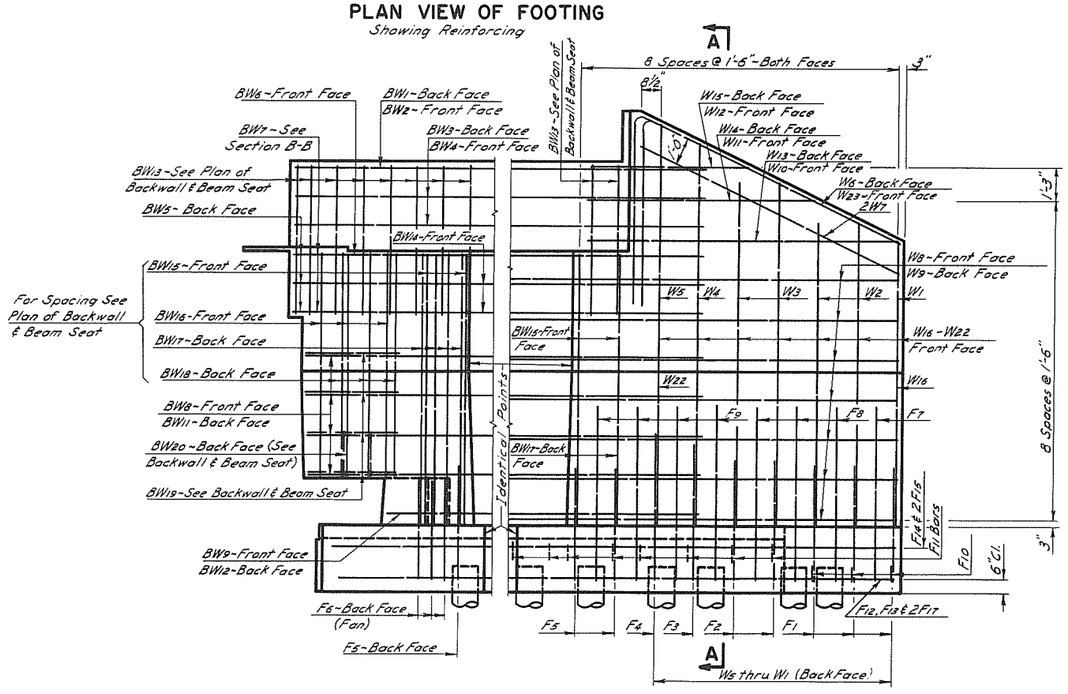
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	BRO-4-031(02)086		15



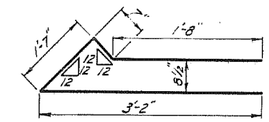
PLAN VIEW OF FOOTING
Showing Reinforcing



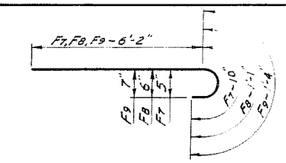
BAR CUTTING DIAGRAM
W16-W22 One Set



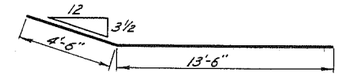
ELEVATION OF WALL & WING
Showing Reinforcing



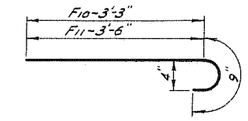
BW19



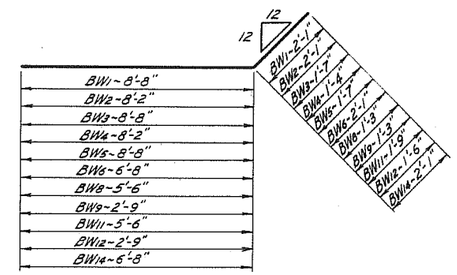
F7, F8, F9



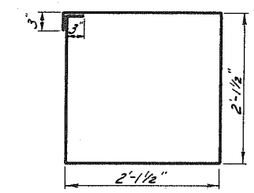
F14



F10, F11



BW1,2,3,4,5,6,8,9,11,12,14

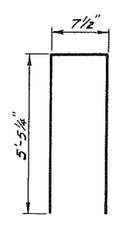


BW10

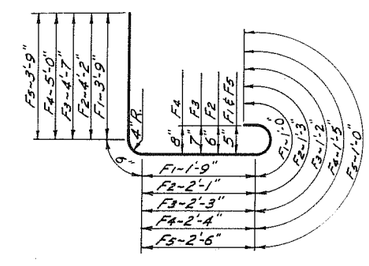
BAR LIST *Both Sides Included*

MARK	NO.	SIZE	LENGTH	SHAPE
BW1	2	6	10'-9"	Bent
BW2	2	6	10'-3"	"
BW3	4	5	10'-3"	"
BW4	4	4	9'-6"	"
BW5	6	5	10'-3"	"
BW6	2	6	8'-9"	"
BW7	4	5	7'-9"	Str.
BW8	8	4	6'-9"	Bent
BW9	2	4	4'-0"	"
BW10	16	4	9'-0"	"
BW11	8	5	7'-3"	"
BW12	2	5	4'-3"	"
BW13	18	4	11'-6"	"
BW14	4	4	8'-9"	"
BW15	6	4	10'-0"	Str.
BW16	6	4	8'-3"	"
BW17	10	6	10'-0"	"
BW18	6	6	8'-3"	"
BW19	8	4	7'-0"	Bent
BW20	2	4	6'-0"	Str.
F1	6	5	7'-0"	Bent
F2	4	6	8'-0"	"
F3	2	7	8'-6"	"
F4	2	8	9'-3"	"
F5	4	5	7'-9"	"
F6	6	5	8'-3"	"
F7	2	5	7'-0"	"
F8	6	6	7'-3"	"
F9	8	7	7'-6"	"
F10	8	4	4'-0"	"
F11	16	4	4'-3"	"
F12	2	4	17'-6"	"
F13	2	4	19'-9"	"
F14	2	4	18'-0"	"
F15	4	4	12'-6"	Str.
F16	2	4	3'-0"	"
F17	4	4	2'-6"	"
W1	2	5	10'-9"	Str.
W2	4	5	11'-3"	"
W3	4	6	12'-9"	"
W4	2	7	14'-3"	"
W5	2	8	15'-0"	"
W6	2	6	17'-9"	Bent
W7	4	6	11'-0"	Str.
W8	14	4	12'-3"	"
W9	14	5	14'-6"	Bent
W10	2	4	10'-0"	Str.
W11	2	4	6'-9"	"
W12	2	4	4'-3"	"
W13	2	4	12'-3"	Bent
W14	2	4	9'-0"	"
W15	2	4	6'-6"	"
W16-22	1 Set	4	180'-3"	Str.
W23	2	6	18'-0"	Bent
SR4*	1	4	3'-8"	Str.
SR5*	1	5	4'-0"	"
SR6*	1	6	4'-6"	"

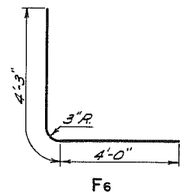
*Sample replacement bar to be spliced to bar from which 2'-0" sample has been cut. Furnish only one set for entire bridge. This is not a pay item and shall be included in the unit price bid for reinforcing steel.



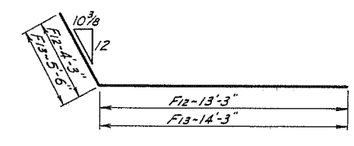
BW13



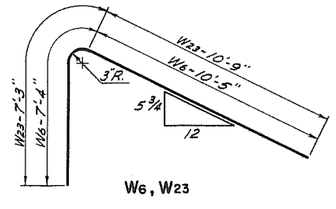
F1,2,3,4,5



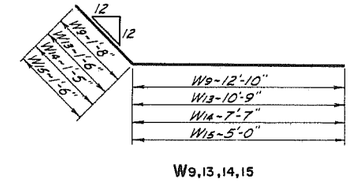
F6



F12, F13



W6, W23



W9,13,14,15

BENT BAR DETAILS

QUANTITIES *Both Sides Included*

Concrete Class AE-1	38.2 Cu.Yds.
Reinforcing Steel	2,582 lbs.

ABUTMENT NO. 1

WIDENING DETAILS

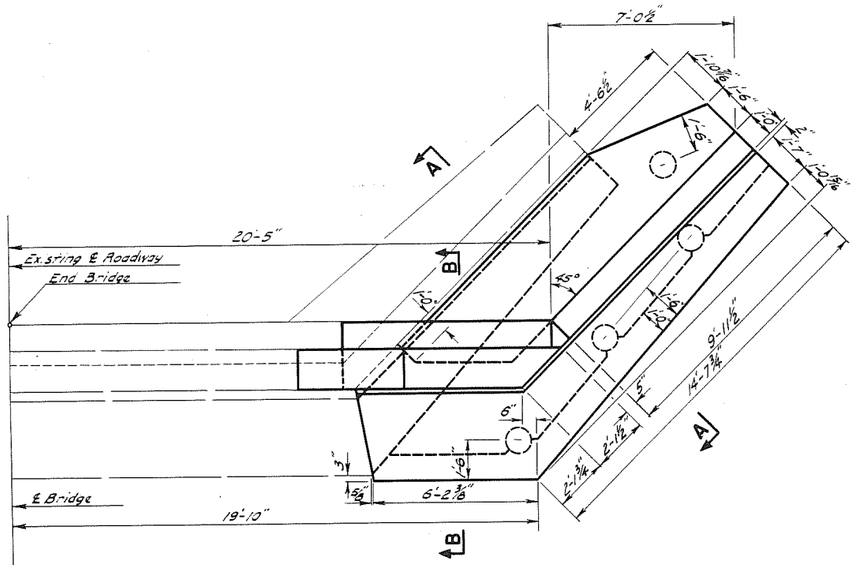
MORTON COUNTY

CHECKED BY DJB
MADE BY RAR
CHECKED BY RAL
MADE BY RAL
CHECKED BY DLV
TRACING
QUANTITIES

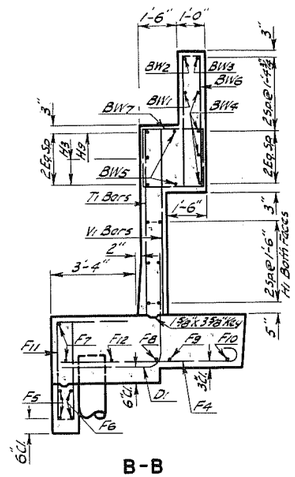
31-84.23-3

31-84.23-3

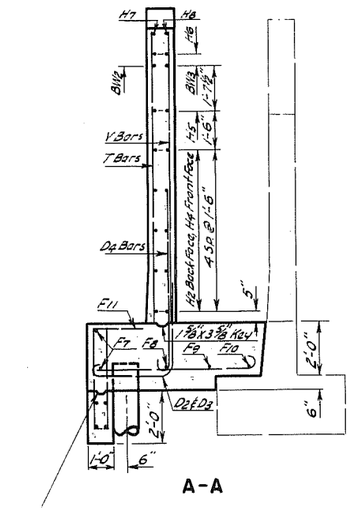
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N.D.	RDS-1-031(02)086		16



PLAN VIEW OF ABUTMENT EXTENSION
Showing Dimensions

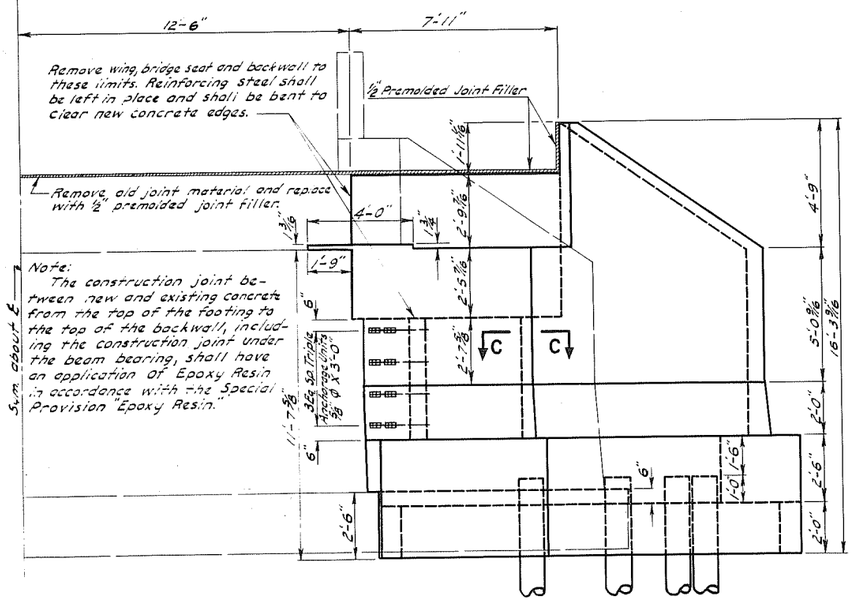


B-B

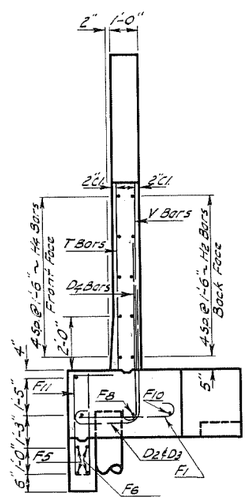


A-A

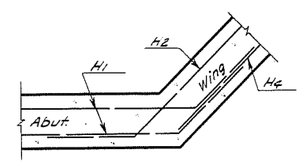
Optional construction joint to be used only if soil is not stable enough to form back of cut off wall.



ELEVATION VIEW OF ABUTMENT EXTENSION
Showing Dimensions



END VIEW



C-C

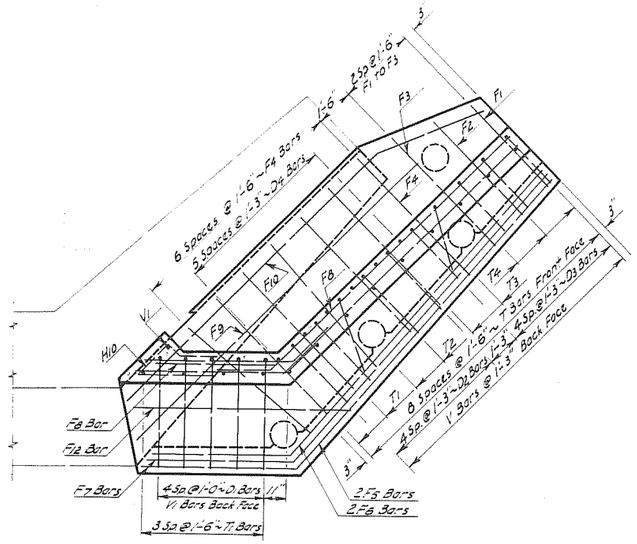
ABUTMENT NO. 2
WIDENING DETAILS

MORTON COUNTY

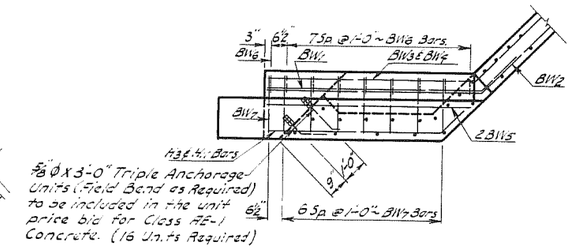
31-84.23-4

31-84.23-4

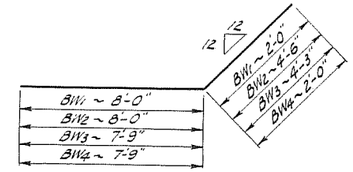
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	
5	N. D.	BROS-1-811(032)086		17	



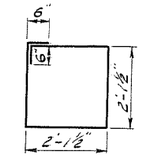
PLAN VIEW OF FOOTING EXTENSION
Showing Reinforcing



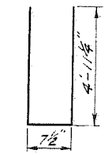
PLAN VIEW OF BACKWALL & BEAM SEAT
Showing Reinforcing



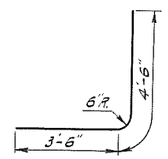
BW1, BW2, BW3 & BW4 BARS



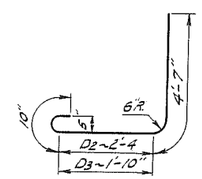
BW7 BAR



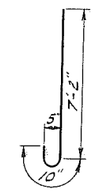
BW6 BAR



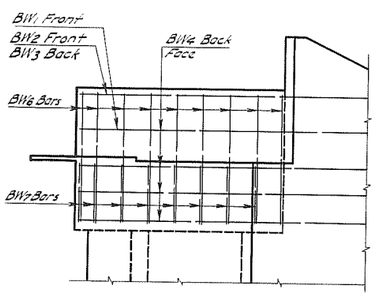
D1 BAR



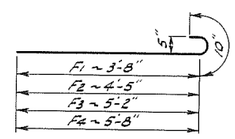
D2 & D3 BARS



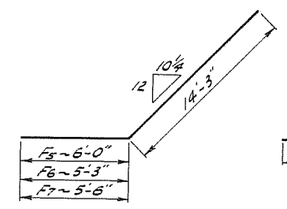
D4 BAR



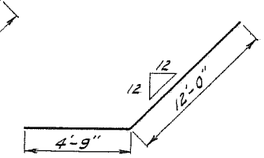
ELEVATION VIEW OF BACKWALL & BEAM SEAT
Showing Reinforcing



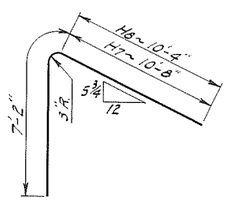
F1, F2, F3 & F4 BARS



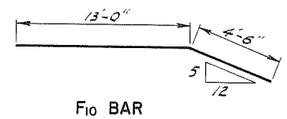
F5, F6, & F7 BARS



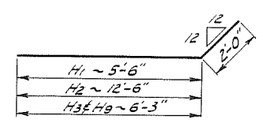
F8 BAR



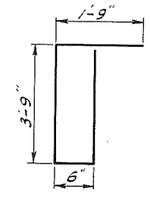
H7 & H8 BARS



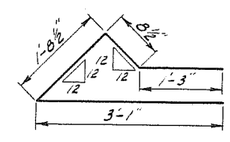
F10 BAR



H1, H2, H3 & H9 BARS

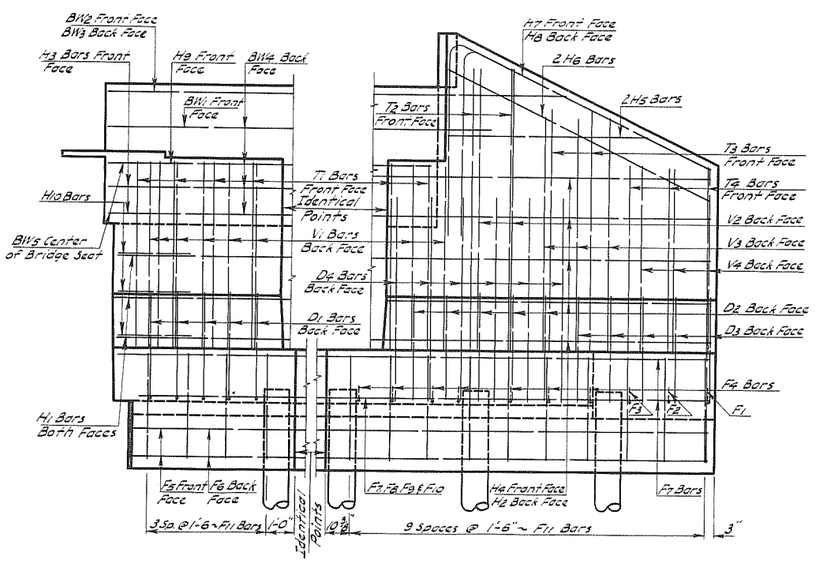


F11 BAR



H10 BAR

BENT BAR DETAILS



ELEVATION VIEW OF ABUTMENT EXTENSION
Showing Reinforcing

BAR LIST (BOTH SIDES INCLUDED)

MARK	NO.	SIZE	LENGTH	SHAPE
BW1	2	5	10'-0"	Bent
BW2	2	6	12'-6"	"
BW3	2	6	12'-0"	"
BW4	8	5	9'-9"	"
BW5	4	5	7'-6"	Str.
BW6	18	4	10'-0"	Bent
BW7	16	4	9'-0"	"
D1	10	5	8'-0"	Bent
D2	10	5	7'-9"	"
D3	10	5	7'-3"	"
D4	12	6	8'-0"	"
F1	2	5	4'-6"	Bent
F2	2	5	5'-3"	"
F3	2	5	6'-0"	"
F4	14	5	6'-6"	"
F5	4	4	20'-3"	"
F6	4	4	19'-6"	"
F7	4	5	19'-9"	"
F8	2	5	16'-9"	"
F9	2	5	14'-9"	Str.
F10	2	5	17'-6"	Bent
F11	28	4	9'-9"	"
F12	2	5	8'-0"	Str.
H1	12	4	7'-6"	Bent
H2	10	4	14'-6"	"
H3	4	4	8'-3"	"
H4	10	4	12'-0"	Str.
H5	4	4	7'-6"	"
H6	4	5	11'-0"	"
H7	2	6	17'-10"	Bent
H8	2	6	17'-6"	"
H9	2	6	8'-3"	"
H10	6	4	6'-9"	"
T1	12	4	6'-11"	Str.
T2	4	4	10'-6"	"
T3	4	4	9'-0"	"
T4	6	4	7'-0"	"
V1	16	5	6'-11"	Str.
V2	4	5	10'-6"	"
V3	6	5	8'-9"	"
V4	6	5	7'-0"	"

QUANTITIES (BOTH SIDES INCLUDED)

Concrete Class AE-1	38.0 Cu. Yds.
Reinforcing Steel	2301 Lbs.

ABUTMENT NO. 2
WIDENING DETAILS

MORTON COUNTY

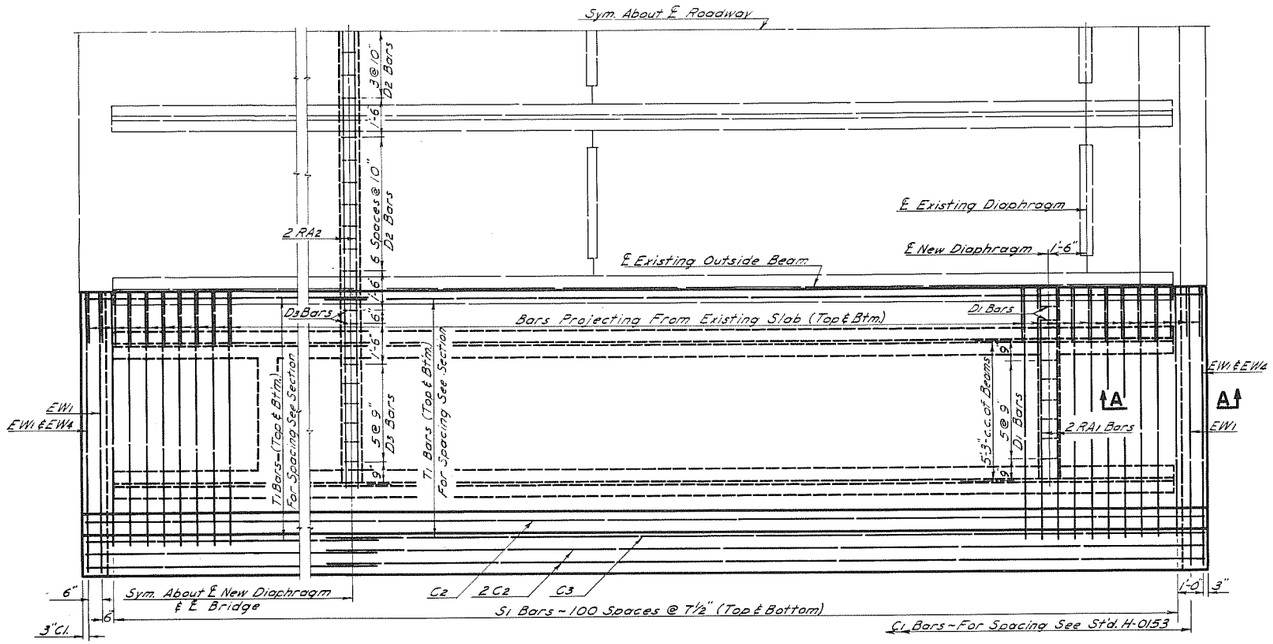
TRACING: MADE BY 7-1, CHECKED BY 7-1
QUANTITIES: MADE BY RJP, CHECKED BY DLV

31-84.23-5

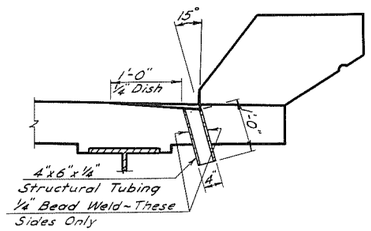
31-84.23-5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	BRDG-1-031(023)086		18

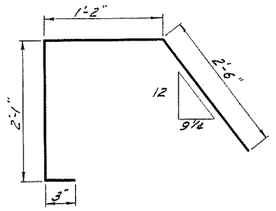
QUANTITIES CHECKED BY DJB



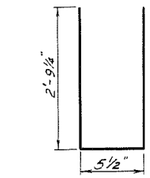
PLAN



FLOOR DRAIN DETAIL



EW2



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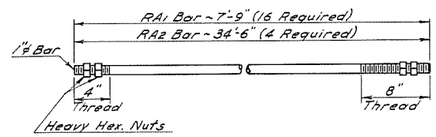
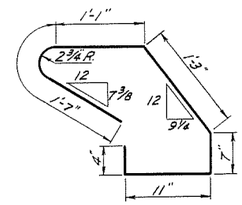
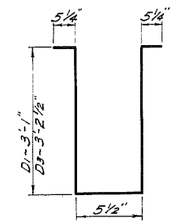


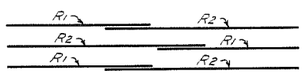
RA BARS



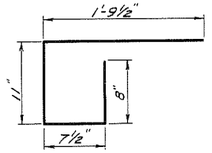
C1



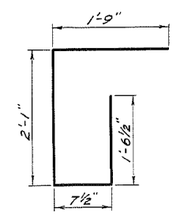
D1 & D3



R BAR SPLICE DETAIL

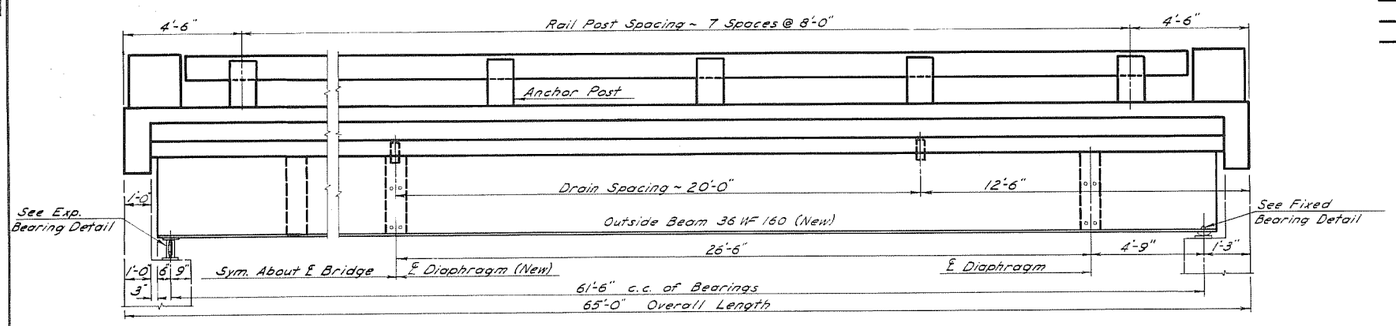


EW5

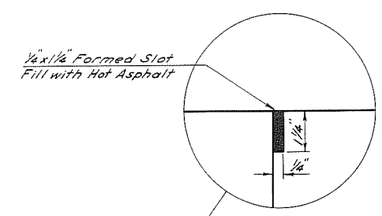


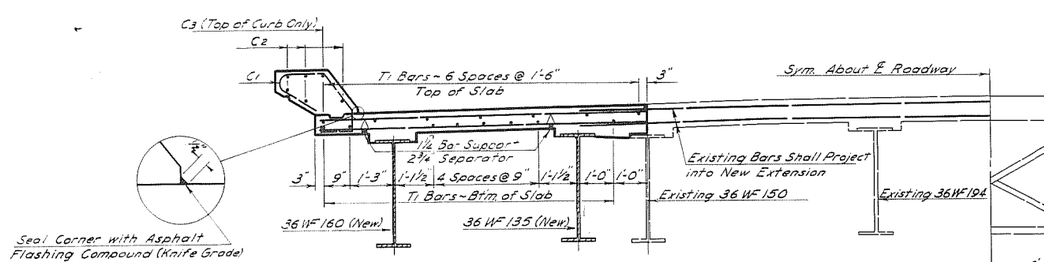
EW3

BENT BAR DETAILS

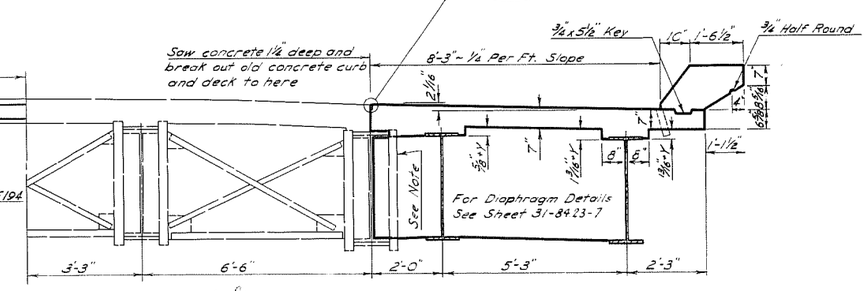


ELEVATION





HALF SECTION
Showing Reinforcing



HALF SECTION
Showing Dimensions & Diaphragm Extension

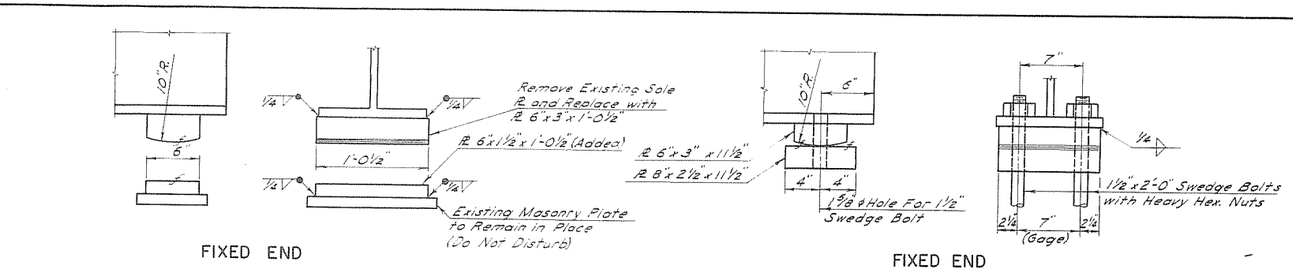
Note:
Before slab has been sawcut over outside existing beam, the Contractor shall remove the "U" bolts attaching the drains to the existing angle supports for the existing diaphragm frame. The angle supports shall remain in place and shall not be disturbed.
For riser "Y" dimension, see Field Riser Diagram.

Designed For 25 Lb. F.W.S.

SUPERSTRUCTURE WIDENING
60' I-BEAM CLEAR SPAN
HS20 LOADING

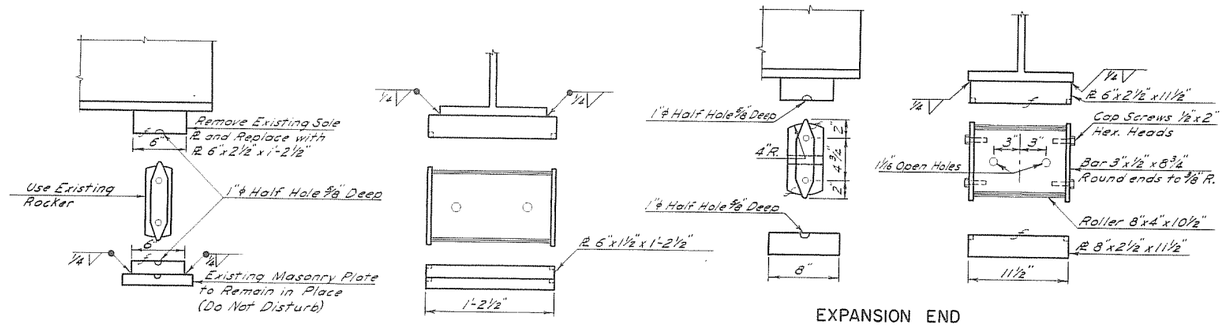
31-84.23-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	
5	N. D.	BRO-1-031(32)-38		19	



FIXED END

FIXED END



EXPANSION END

EXPANSION END

REBUILT BEARINGS

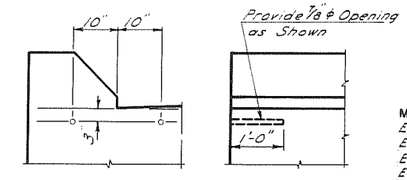
NEW BEARINGS

NOTE:

All materials for bearing devices and beams shall be A36 steel.

To place concrete in that portion of the center diaphragm under the existing slab, it shall be permissible to make an opening through the existing slab, in each bay area, provided the reinforcing steel is not damaged during the cutting of the holes. The limit of the width of the holes shall be confined to the inside of the diaphragm forms. Other methods of placing this concrete shall meet the approval of the Engineer.

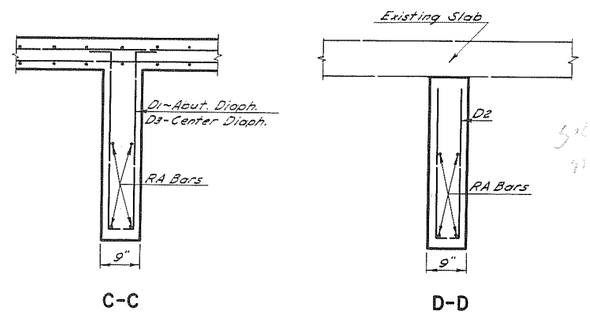
The contractor shall have the option of using full length RA Bars for the diaphragm at the ℄ of Bridge or he may use two half length bars extended 1'-0" to provide a 2'-0" field welded lap at the ℄ of Bridge. Extra steel used for lapping shall be incidental to structural steel.



CURB SLEEVE DETAIL

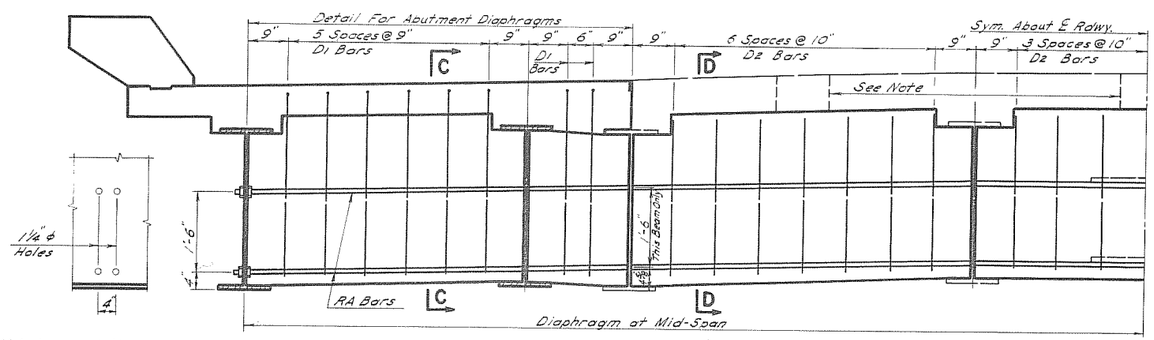
BAR LIST

MARK	NO	SIZE	LENGTH	SHAPE
EW1	8	6	10'-6"	Str.
EW2	4	4	6'-0"	Bent
EW3	4	4	6'-0"	"
EW4	4	6	10'-6"	Str.
EW5	36	4	4'-0"	Bent
C1	146	5	5'-9"	Bent
C2	20	5	33'-3"	Str.
C3	4	6	33'-6"	"
D1	32	4	7'-6"	Bent
D2	21	4	6'-0"	"
D3	16	4	7'-9"	"
S1	404	5	9'-4"	Str.
T1	60	4	33'-3"	Str.
P4	42	6	3'-11"	Bent
P5	6	6	4'-8"	"
P6	32	5	4'-11"	"
P7	32	3	3'-10"	"
P8	28	3	2'-10"	"
P9	4	3	4'-4"	"
RC	110	3	2'-11"	Bent
R1	12	6	27'-0"	Str.
R2	12	6	35'-0"	"



C-C

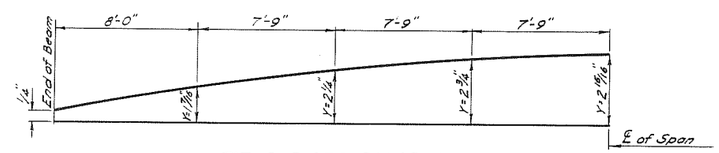
D-D



Diaphragm bolt holes in existing beams may be drilled or burned. Holes in new beams shall be shop fabricated.

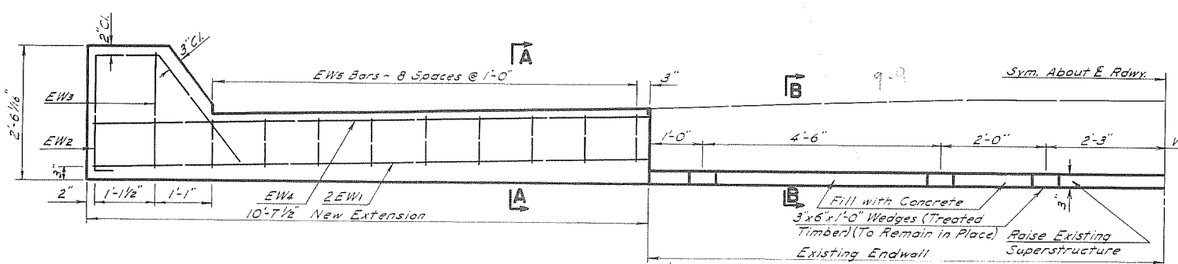
HALF SECTION

Showing Diaphragms



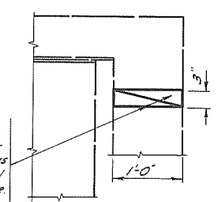
FIELD RISER DIAGRAM

Showing dimension "y" from an assumed chord drawn between ends of the beam. Additions or subtractions must be made to the riser dimensions to compensate for the tolerances in the beam and the deflection due to the weight of the beam.

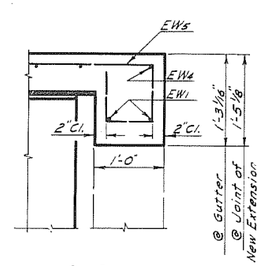


ENDWALL ELEVATION

3"x6"x1'-0" Treated Timber Wedges to remain in place. Openings between wedges shall be filled with concrete. The cost of wedges shall be included in the unit price bid for Class AE-3 Concrete.



B-B



A-A

QUANTITIES

Class AE-3 Concrete	47.7 Cu. Yds.
Class AAE-3 Concrete	4.53 Cu. Yds.
Reinforcing Steel	9,257 lbs.
Structural Steel	40,051 lbs.

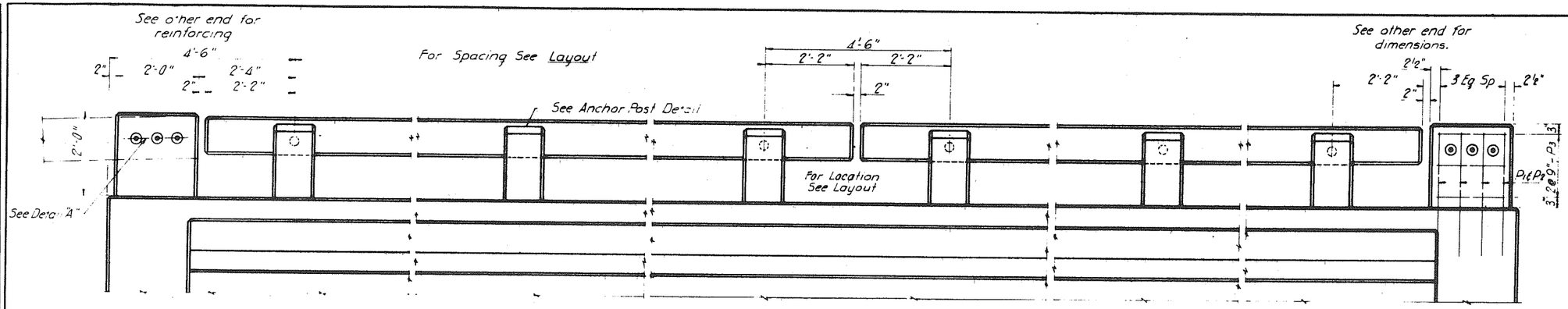
SUPERSTRUCTURE WIDENING
60' I-BEAM CLEAR SPAN

HS20 LOADING

DETAILS: CHECKED BY DJS
TRACING: MADE BY RLP, CHECKED BY RLJ
QUANTITIES: MADE BY RLP, CHECKED BY DJS

31-84.23-7

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N.D.	ROS-1-031(102)	21	



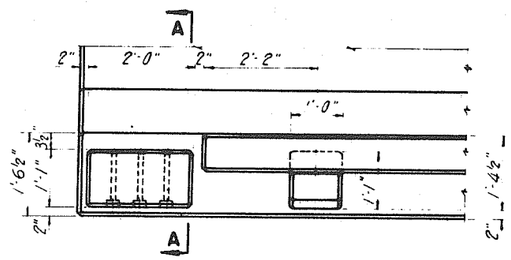
PART ELEVATION

NOTES:

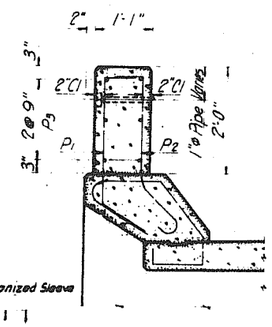
All concrete above top of curb shall be Class AAE-3.

"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.

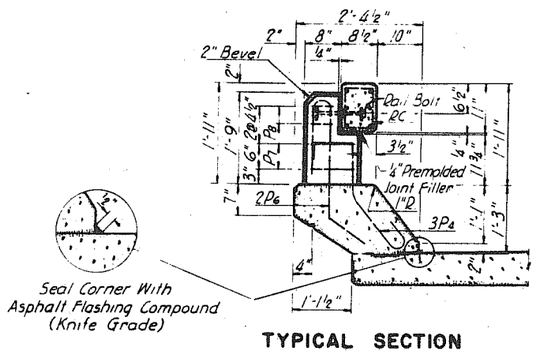
Designed in accordance with 1965 A.A.S.H.O. Specifications.



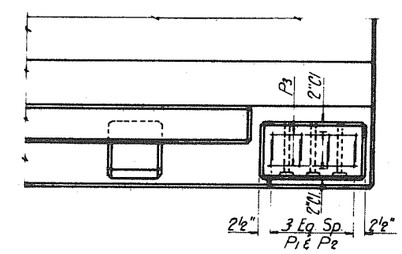
PART PLAN



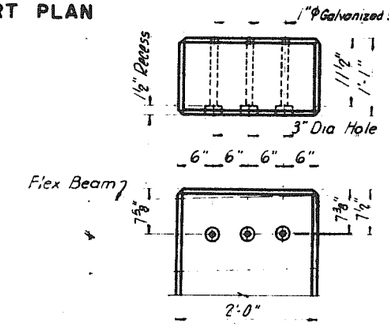
A-A



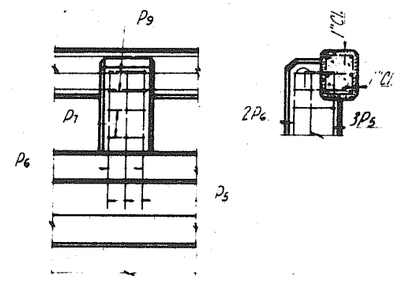
TYPICAL SECTION



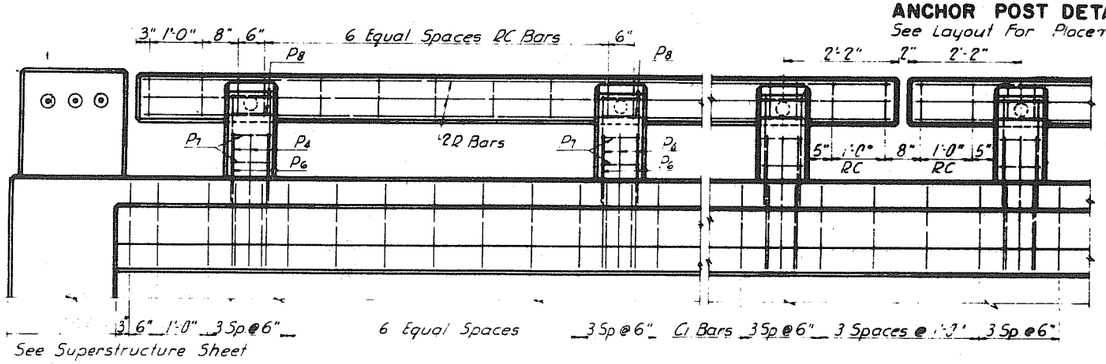
PART PLAN



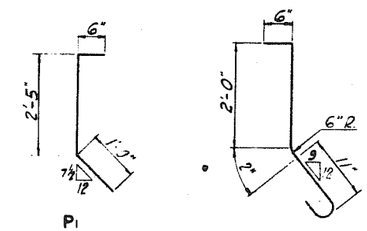
DETAIL "A"

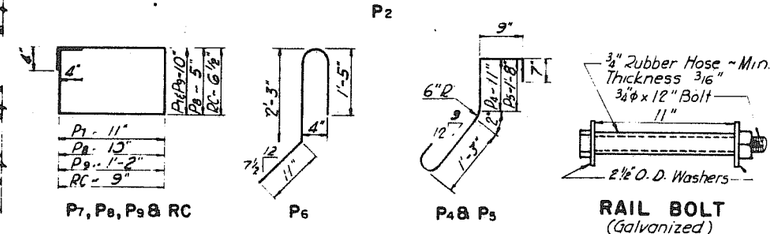


ANCHOR POST DETAIL
See Layout For Placement



RAIL DETAILS





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.

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

TRACING
QUANTITIES

H-0160

H-0160

Design Info				
Location	Design Speed	Minimum Sight Distance for:		
		Stopping	Safe Passing	Passing for Marking
Sta 8+56 to 908+59 R3	65	645	2285	1100
Sta 8+56 to 666+40 R2	45	360	1625	700
Sta 0+12 to 666+40 R2	65	645	2285	1100
Sta 302+91 to 361+38 R1	55	495	1985	900
Sta 361+38 to 375+37 R1	35	250	1280	550
Sta 375+37 to 392+19 R1	25	155	900	450

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

JOB# 30

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	AC-SS-1-031(010)078	14914	1	1

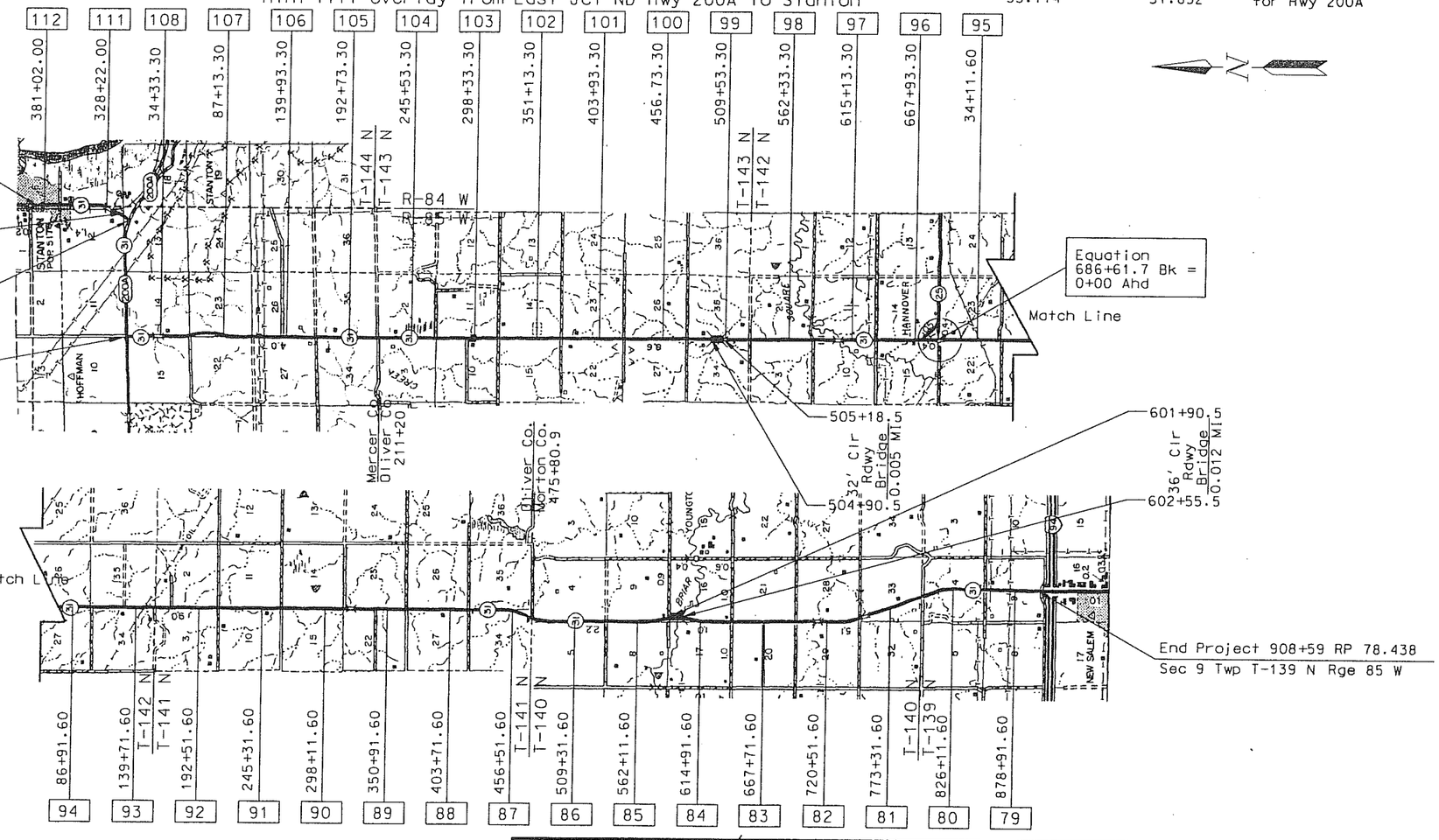
Morton, Mercer and Oliver Counties
Project No. AC-SS-1-031(010)078
ND Hwy 31 from I-94 North to West Jct ND Hwy 200A
East Jct ND Hwy 200A North to Stanton
Structural Overlay and Structural Items
from I-94 North to West Jct ND Hwy 200A
Thin lift overlay from East Jct ND Hwy 200A to Stanton

GOVERNING SPECIFICATIONS: 31-086.670

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

LENGTH OF PROJECT

Miles - Gross 33.774 | Miles - Net 31.852 | 1.879 miles deducted for Hwy 200A



Traffic Data				
Location	Current (2004)			
	Pass	Trucks	Total	Max Hr
Sta 475+79 R3 to 908+59 R3	575	175	750	80
Sta 0+00 R3 to 475+79 R3	290	150	440	55
Sta 0+12 R2 to 686+61 R2	375	150	525	55
Sta 302+91 R1 to 392+19 R1	785	140	925	95
Location	Forecast (2024)			
	Pass	Trucks	Total	Max Hr
Sta 475+79 R3 to 908+59 R3	705	215	920	95
Sta 0+00 R3 to 475+79 R3	355	185	540	65
Sta 0+12 R2 to 686+61 R2	460	185	645	65
Sta 302+91 R1 to 392+19 R1	960	175	1135	115

DESIGNERS

Matt Linneman

APPROVED DATE 9/22/05

Francis J. Ziegler

OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

APPROVED DATE

FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 9-22-05

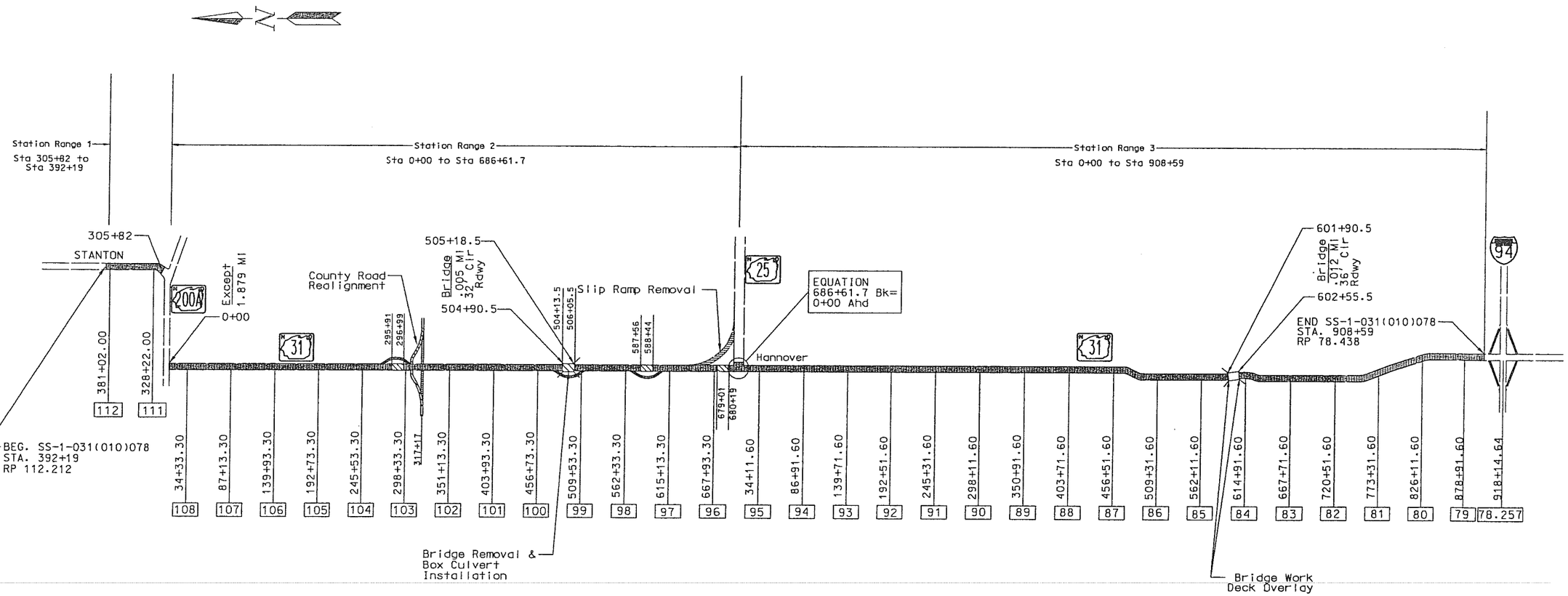
Roger Weigel

NDDOT DIV-DIST OR CONSULTANT FIRM

ROGER WEIGEL REGISTERED PROFESSIONAL ENGINEER PE 2430 NORTH DAKOTA

Roger Weigel 9-22-05

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	4	1



RANKA SAMARDZIC
REGISTERED
PROFESSIONAL
PE-4338
ENGINEER
NORTH DAKOTA
9/30/05

Scope of Work

ND Hwy 31 from I-94 N to W Jct 200A & Stanton Spur

9/30/2005 3:20:04 PM R:\project\10031078.010\DESIGN\DOTSC\Plan_Sheets\004SW_001_SCOPE.dgn