

31-084.239

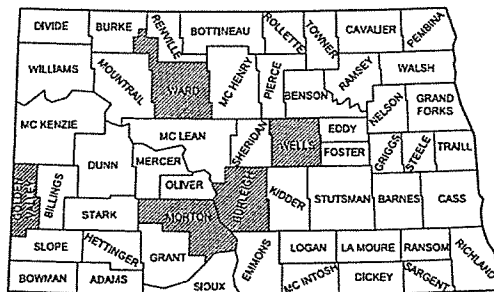
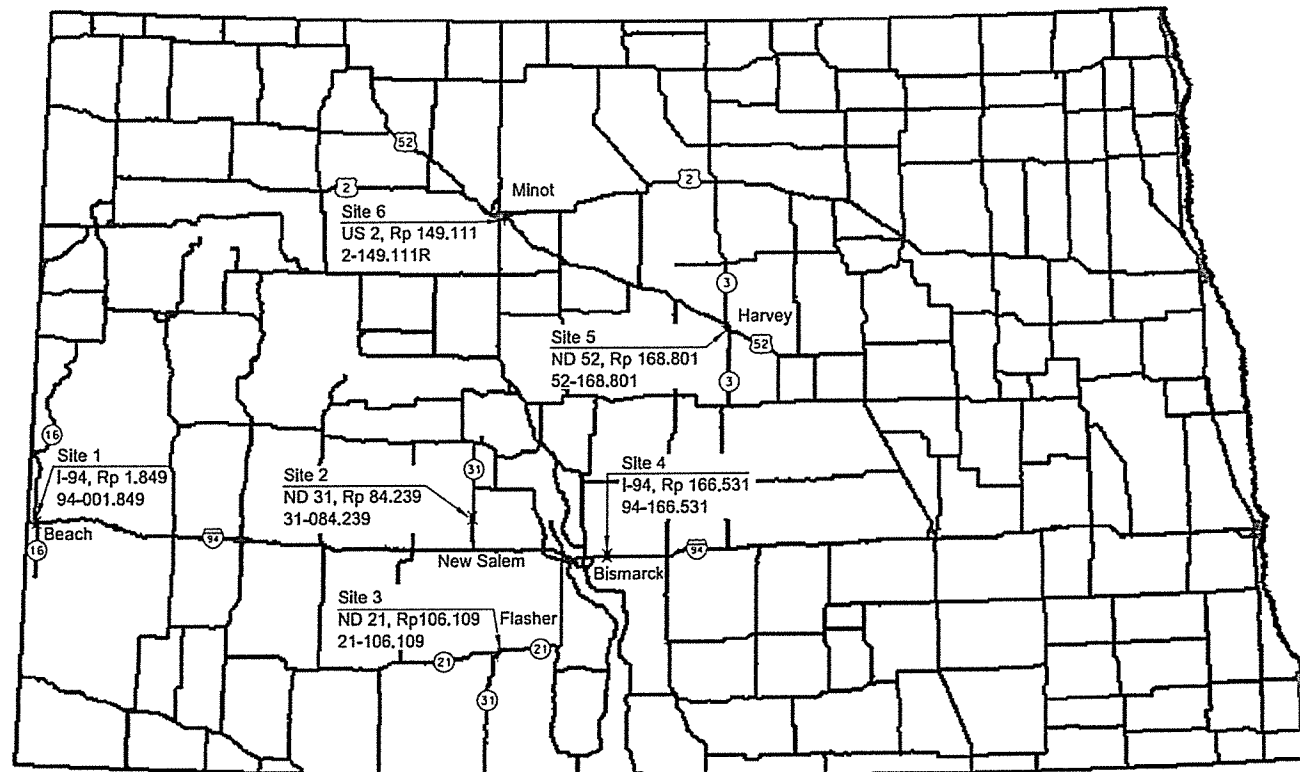
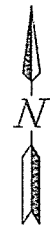
JOB # 21
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
BRS-9-999(325)

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	BRS-9-999(325)	18265	1	1

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
BRS-9-999(325)	NA	NA

Burling, Golden Valley, Morton, Ward, & Wells
Beach Interchange, Sweet Briar Creek, Louise Creek
Apple Creek Separation, Sheyenne River, NE Jct. U.S. Hwy 2 & 52
Structural Painting



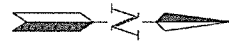
STATE COUNTY MAP

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

APPROVED DATE 12/1/15

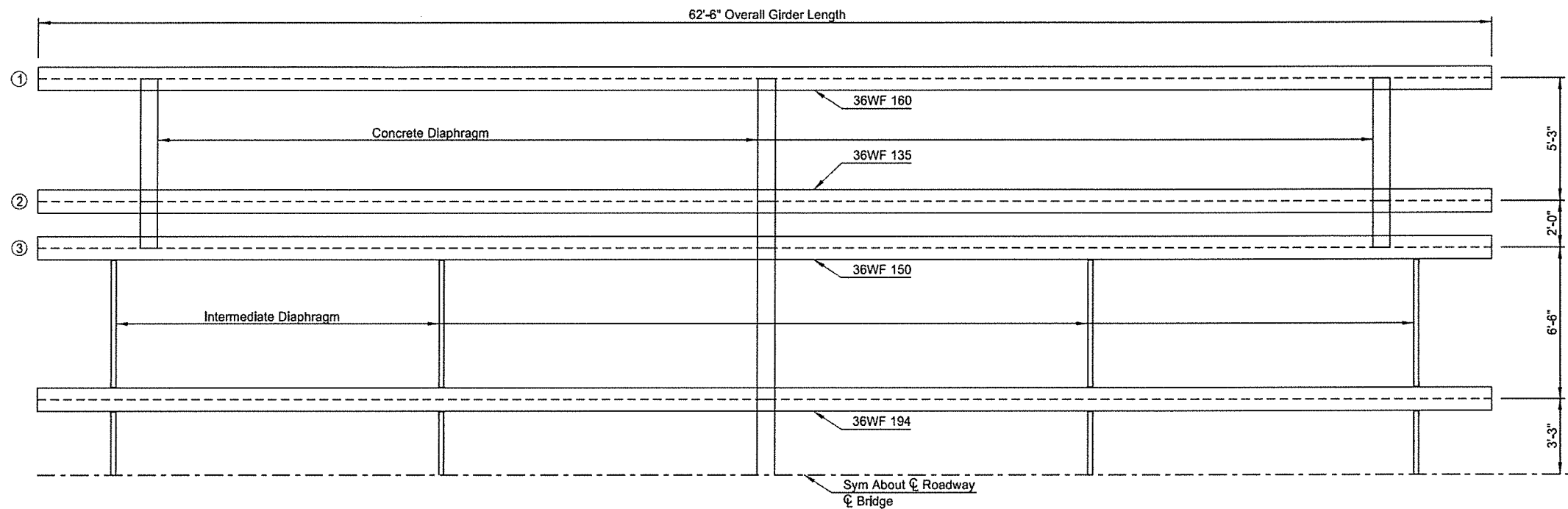
Terrence R. Udland
BRIDGE DIVISION

This document was originally
issued and sealed by
Terrence R. Udland
Registration Number
PE- 2674,
on 12/1/15 and the original
document is stored at the
North Dakota Department
of Transportation

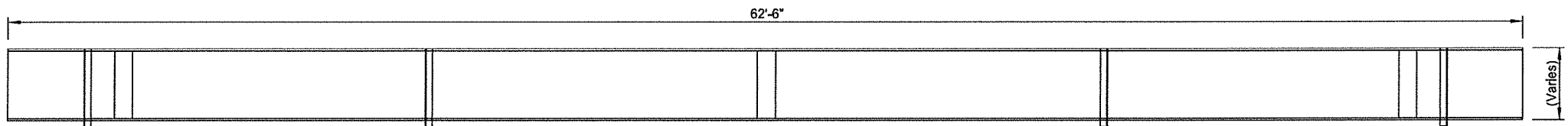


23 U.S.C. 409
NDDOT Reserves All Objections

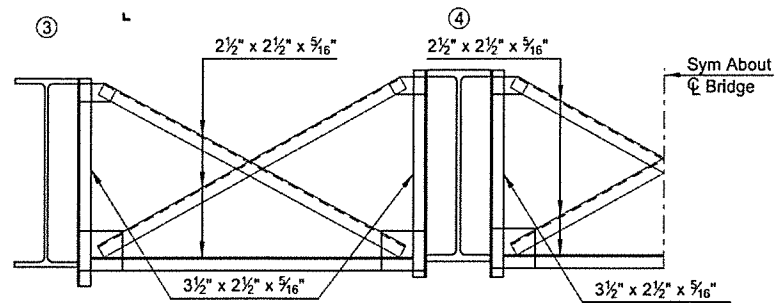
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	BRS-9-999(325)	170	3



HALF GIRDER LAYOUT



GIRDER ELEVATION



INTERMEDIATE DIAPHRAGM

This document
was originally issued and
sealed by Lindsay Bossert,
Registration Number PE 8395,
on 11/18/2015, and the original
document is stored at the North
Dakota Department of
Transportation

SWEET BRIAR CREEK
6 NORTH OF I-94

STRUCTURAL STEEL
PAINTING DETAILS

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 JOB#30 DEPARTMENT OF TRANSPORTATION

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

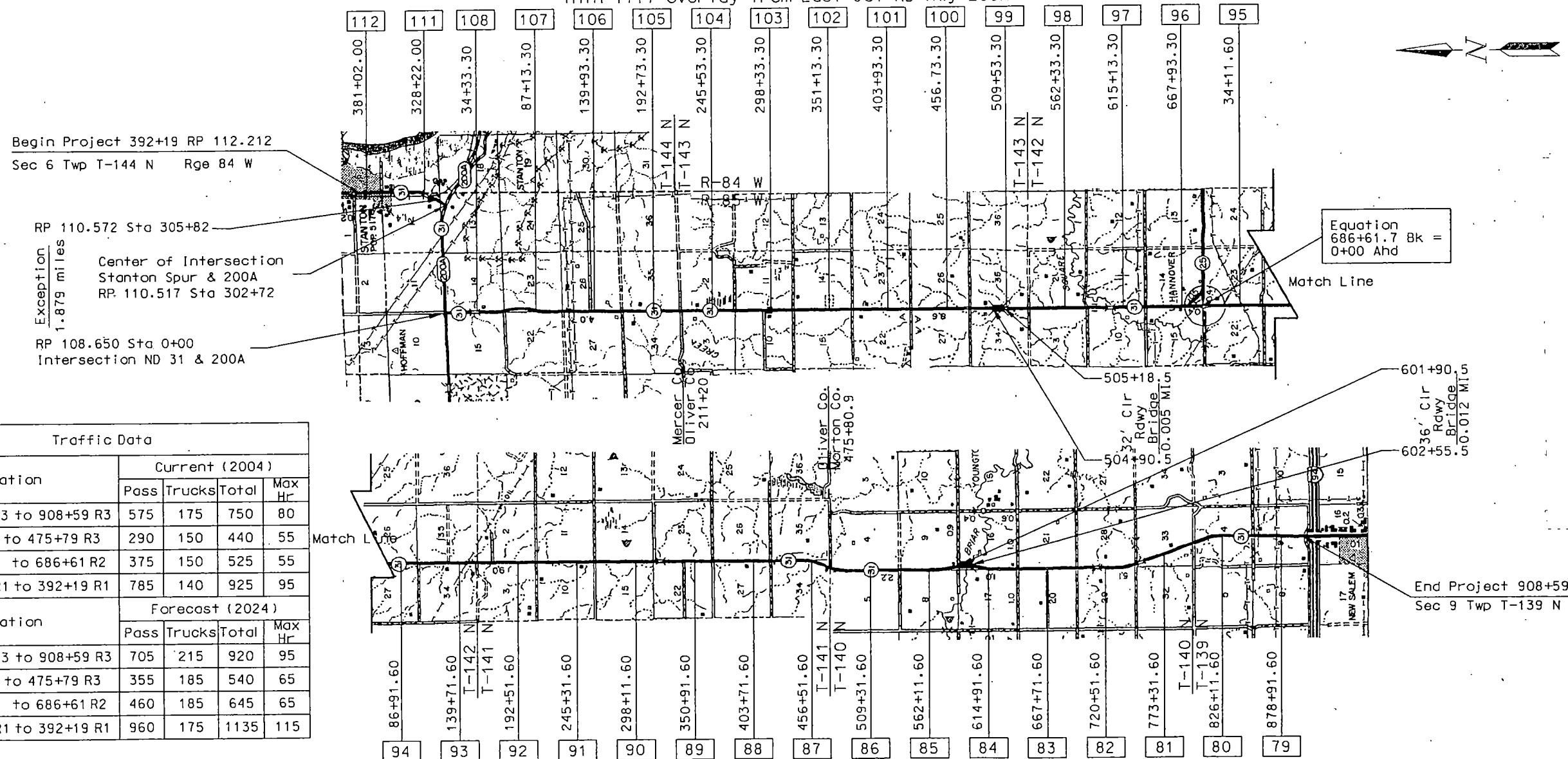
GOVERNING SPECIFICATIONS: 31-084.239

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	1.879 miles deducted for Hwy 200A
33.774	31.852	

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



Traffic Data					
Location	Current (2004)				Max Hr
	Pass	Trucks	Total		
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)				Max Hr
	Pass	Trucks	Total		
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 _____

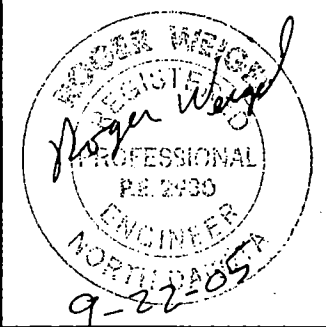
FEDERAL HIGHWAY ADMINISTRATION
 U.S. DEPARTMENT OF TRANSPORTATION

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.

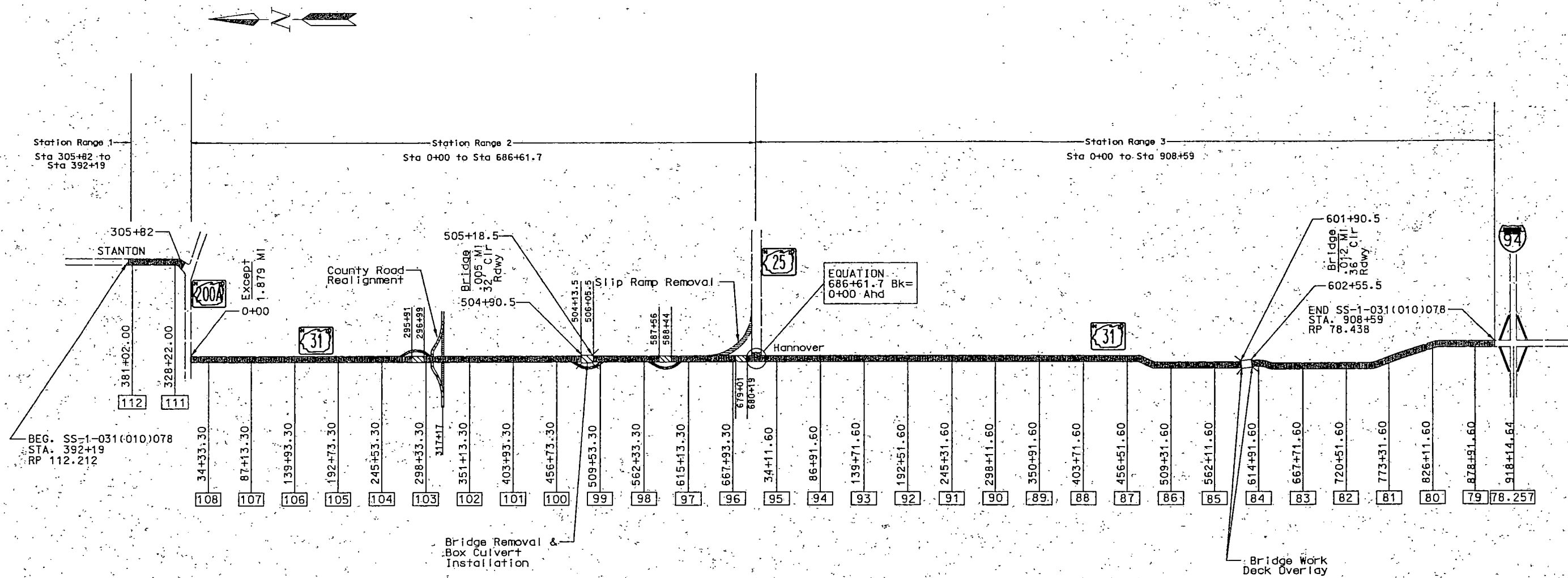
APPROVED DATE 9-22-05

Roger Weigl

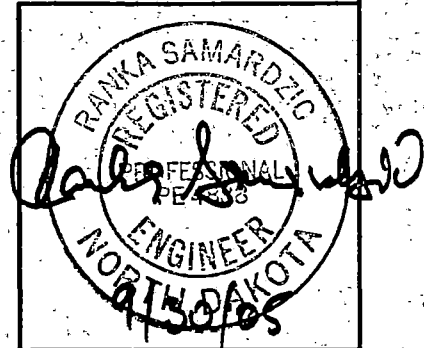
NDDOT DIV-DIST OR CONSULTANT FIRM



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



-  Overlay
-  Reconstruction
-  Obliteration of Roadway

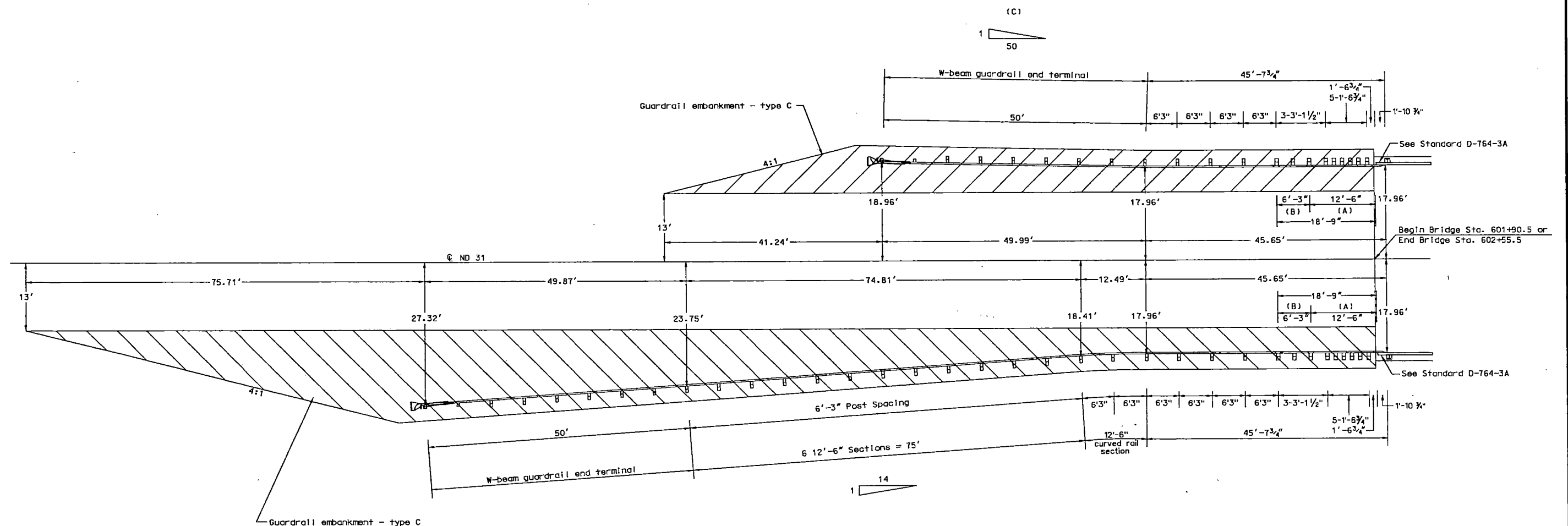


Scope of Work

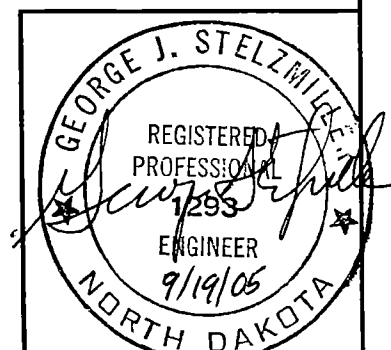
ND Hwy 31 from I-94 N to W Jct 200A & Stanton Spur

23 USC § 409 Documents
NDDOT Reserves All Objections

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



- (A) Thrie beam rail (double thickness)
- (B) W-thrie beam transition section (double thickness)
- (C) If the ET-2000 end terminal is to be installed, a 50:1 taper shall be used for this end terminal.
- If the FLEAT is to be installed, the flare shown on Standard D-764-2C shall be used.
- The Slotted Rail Terminal shall not be installed at this location.



Thrie/W-Beam Guardrail Layout
At Both Ends of Bridge

Sweet Briar Creek Bridge

RP 84.239
ND 31

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES																	
THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS																	
LOCATION	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(B)
	5/8" Ø x 18" LONG GUARD- RAIL BOLT	6" x 8" x 6'-0" TIMBER POST	6" x 8" x 14" TIMBER BLOCK	5/8" Ø x 1 1/4" LONG GUARD- RAIL BOLT	12'-6" STRAIGHT W-BEAM RAIL SECTION	12'-6" CURVED W-BEAM RAIL SECTION	REFL- ECTOR- IZED PLATES	8"x 8" x 6' WOOD POST	8"x 8" x 22" WOOD OFF- SET BLOCK	8"x 8" x 18" WOOD OFF- SET BLOCK	8"x 8" x 14" WOOD OFF- SET BLOCK	6'-3" DOUBLE W-THRIE BEAM TRANS- ITION SECTION	12'-6" DOUBLE THRIE BEAM SECTION	2'-6" THRIE BEAM TERM- INAL CON- NECTOR	7/8" Ø x VAR- IABLE LONG BOLT	3/4" Ø x 2-1/2" LONG POST BOLT	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

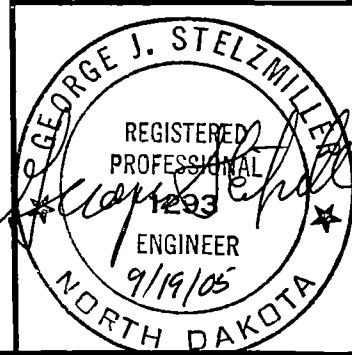
Reset W-beam guardrail	
Sta 600+58.32 to 601+08.19 rt	50 LF
Sta 603+37.81 to 603+87.68 lt	50 LF
Total	100 LF

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

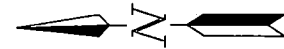
- (A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".
- (B) The volume of embankment - type C (cubic yards) is for informational purposes only.
- (C) These guardrail materials are located at the Square Butte Creek Bridge, at RP 99.085.
- (D) 28 lineal feet of the box beam guardrail on each side of the roadway is bridge mounted.



Thrie/W-Beam Guardrail Quantities

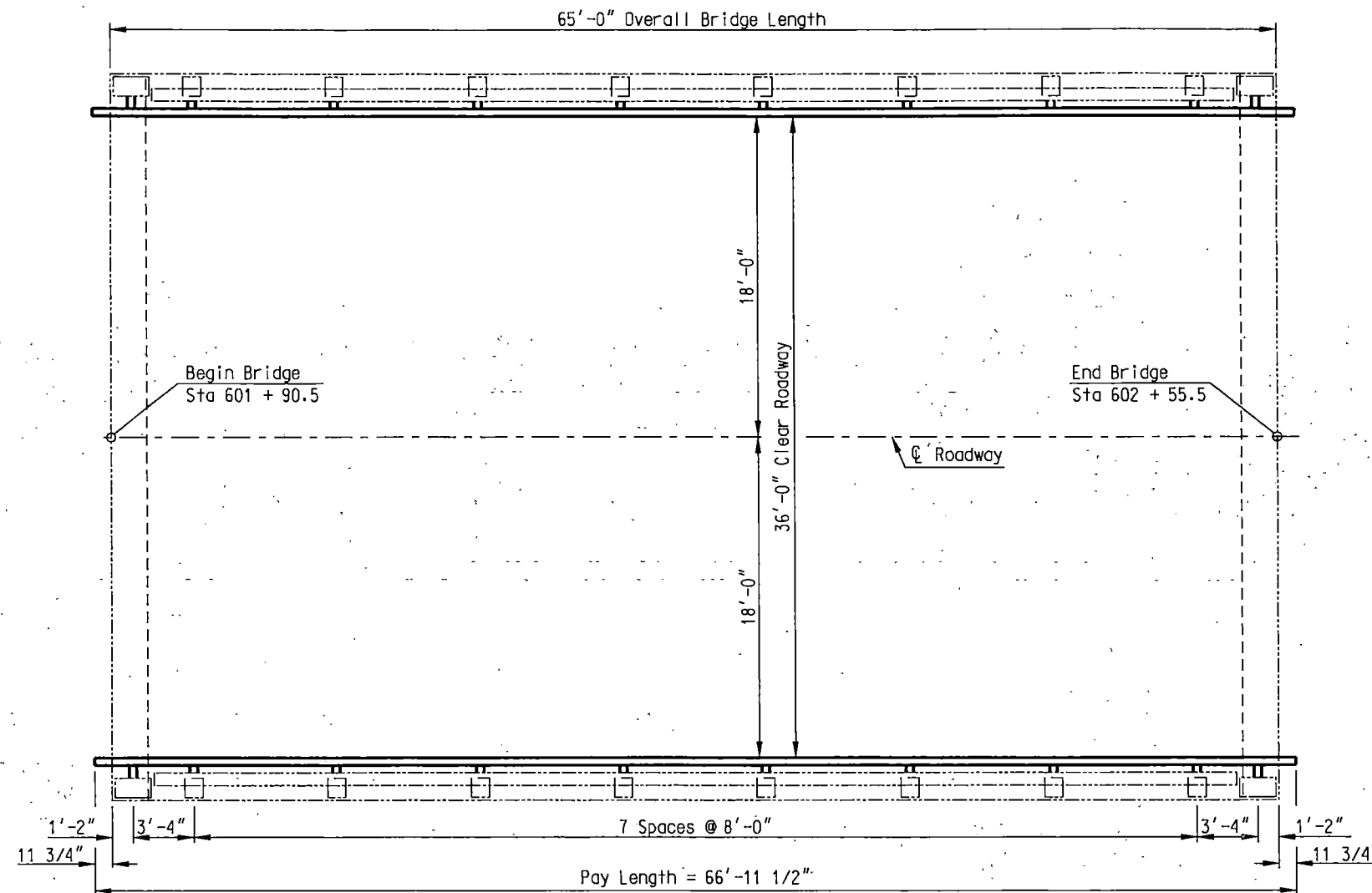
Sweet Briar Creek Bridge

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

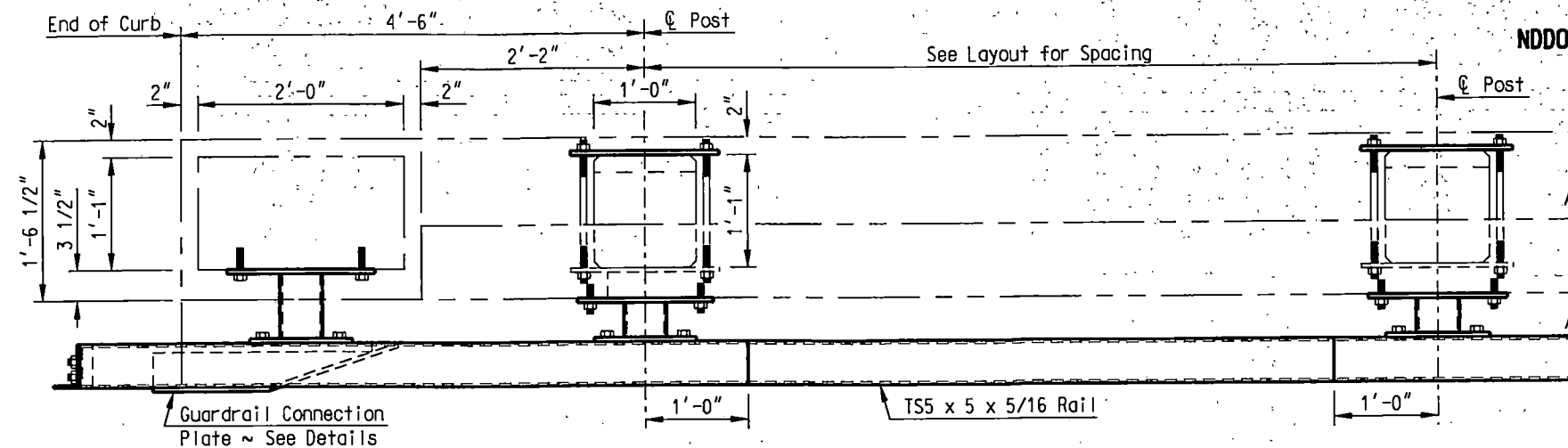
PROJECT: SS-1-031(010)078
Station: 602+23.00
MORTON COUNTY

9-16-05
DATE

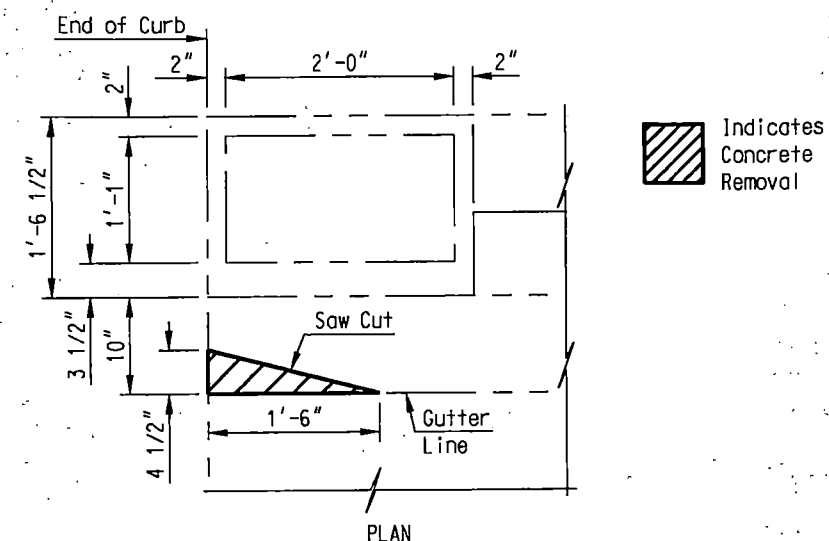
Leanne R. Holland
BRIDGE ENGINEER

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

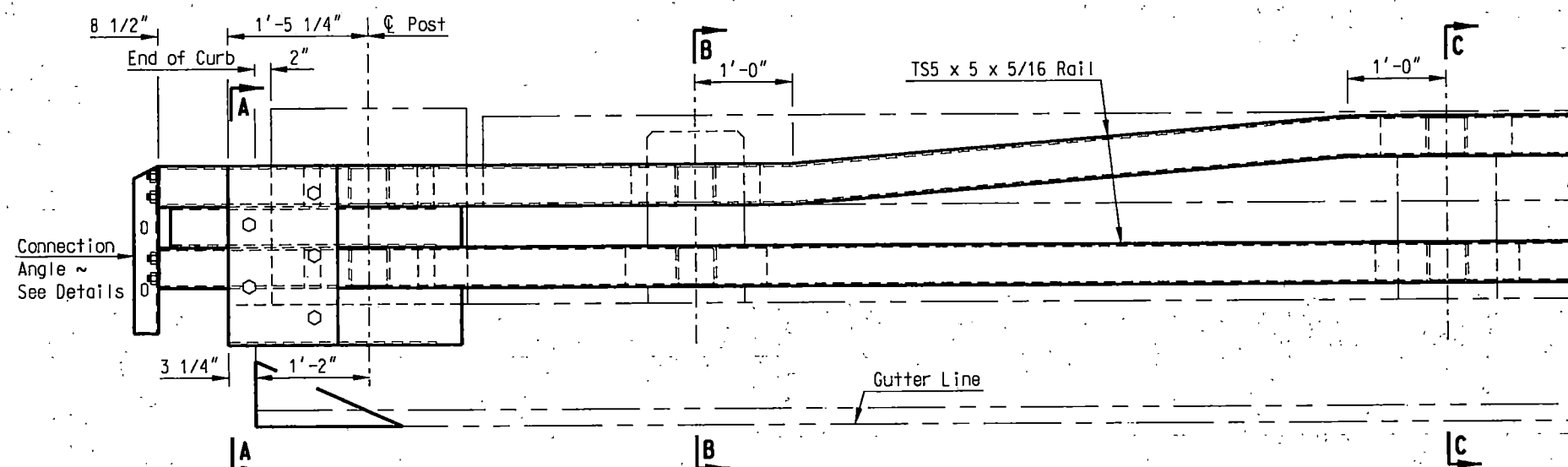
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	170	2



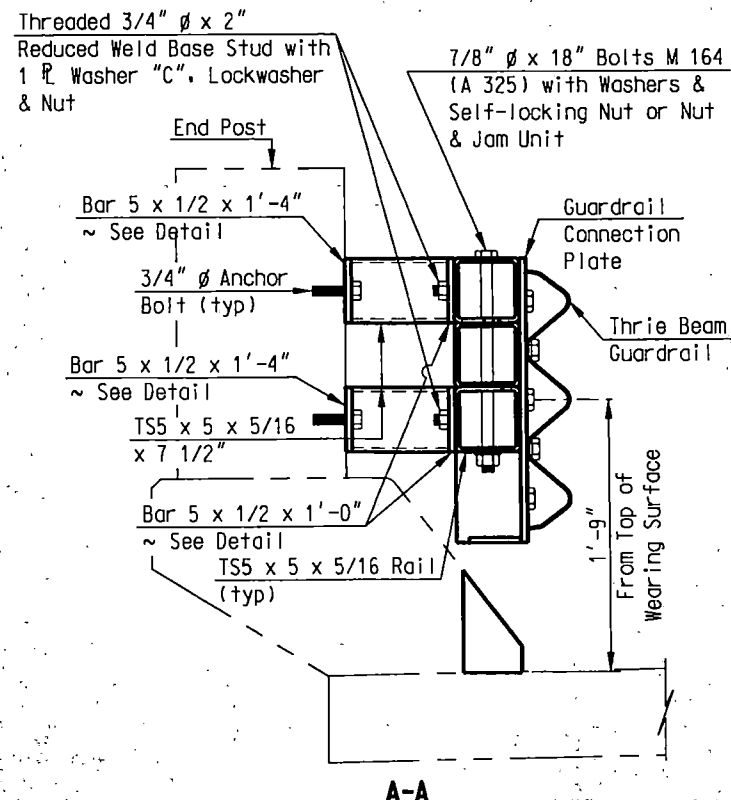
RAIL RETROFIT PART PLAN



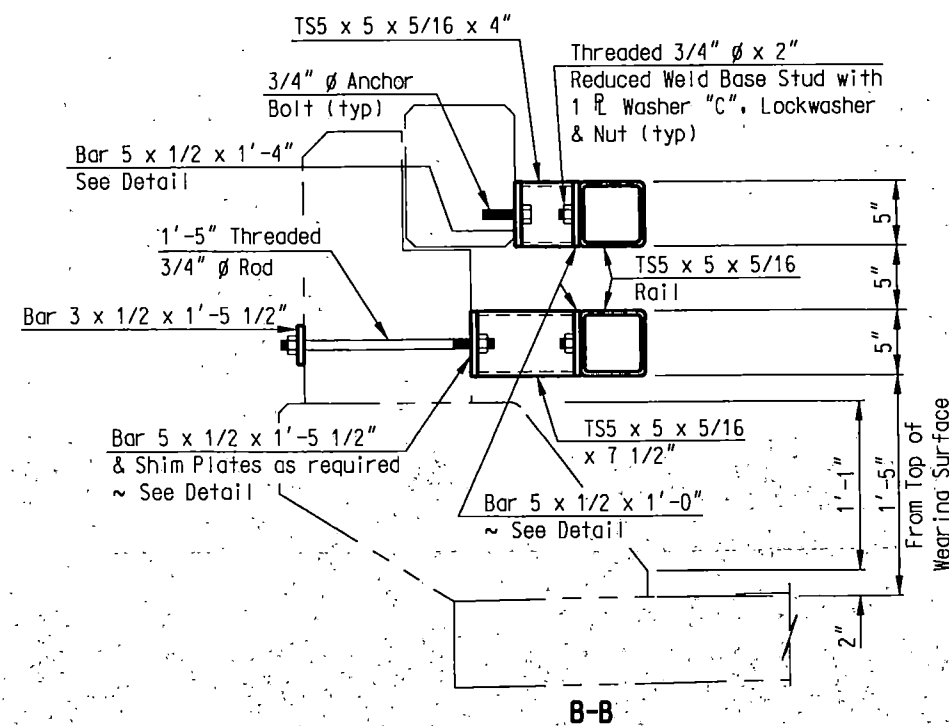
CONCRETE REMOVAL DETAIL



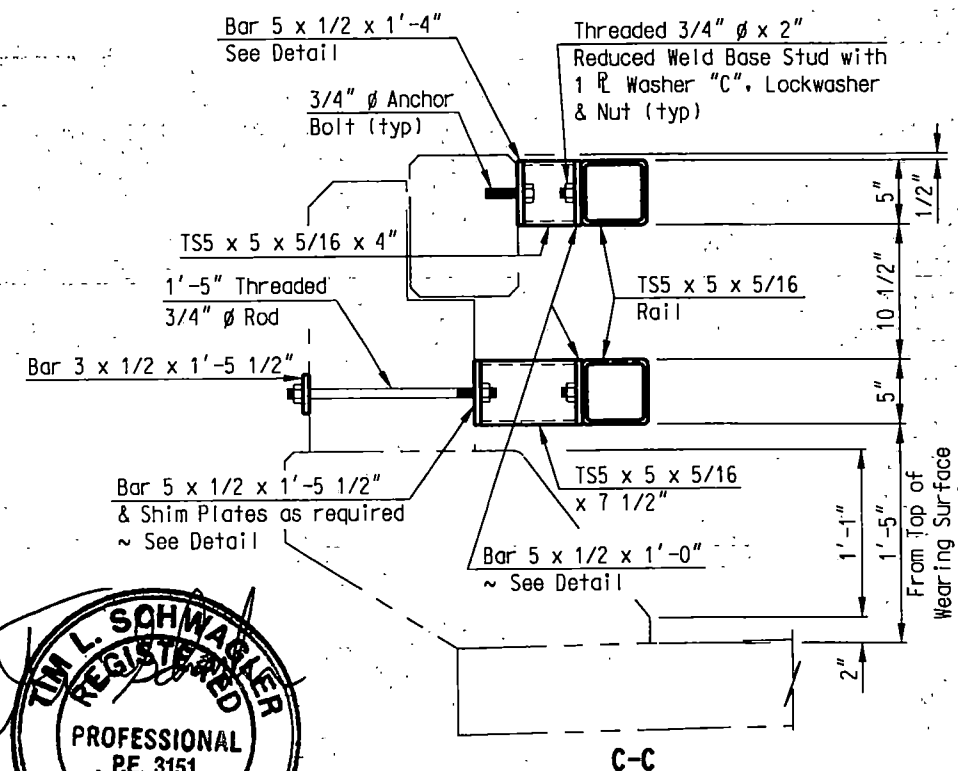
RAIL RETROFIT PART ELEVATION



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

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

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.

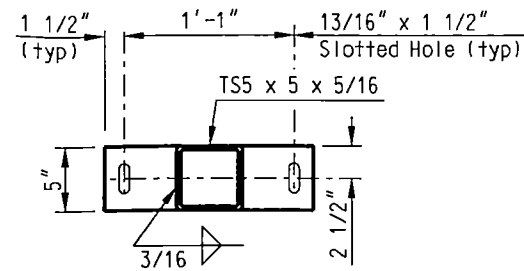
Rails shall be fabricated so that each rail segment between splices is attached to a minimum of two posts.

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.

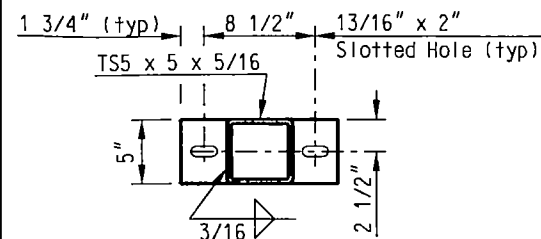
The anchor bolts shall be embedded into the concrete with a chemical adhesive system that can develop a tensile strength of at least 17,500 lbs.

All anchor and splice bolts shall be AASHTO M 164 (A 325) and shall be galvanized according to M 232.

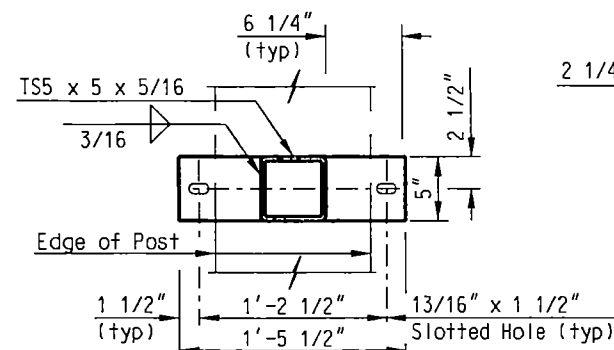
The Contractor shall field verify all dimensions and incorporate them into the shop drawings. The double box beam rail retrofit shop drawings shall be submitted for approval to the Construction Office before fabrication.



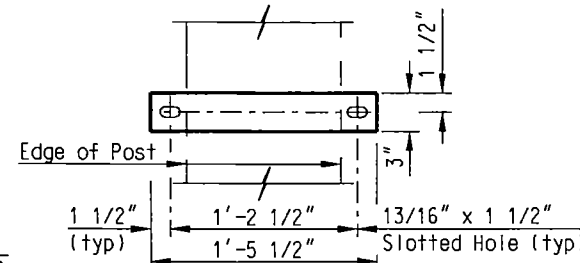
(CONCRETE RAIL CONNECTION)
BAR 5 X 1/2 X 1'-4" DETAIL



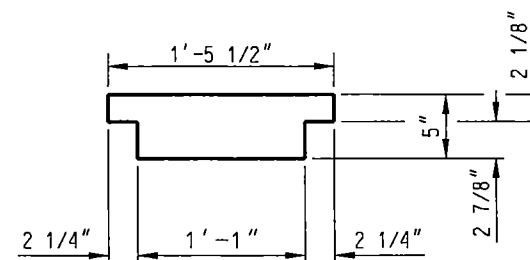
(RAIL CONNECTION)
BAR 5 X 1/2 X 1'-0" DETAIL



(CONCRETE POST CONNECTION)
BAR 5 X 1/2 X 1'-5 1/2" DETAIL

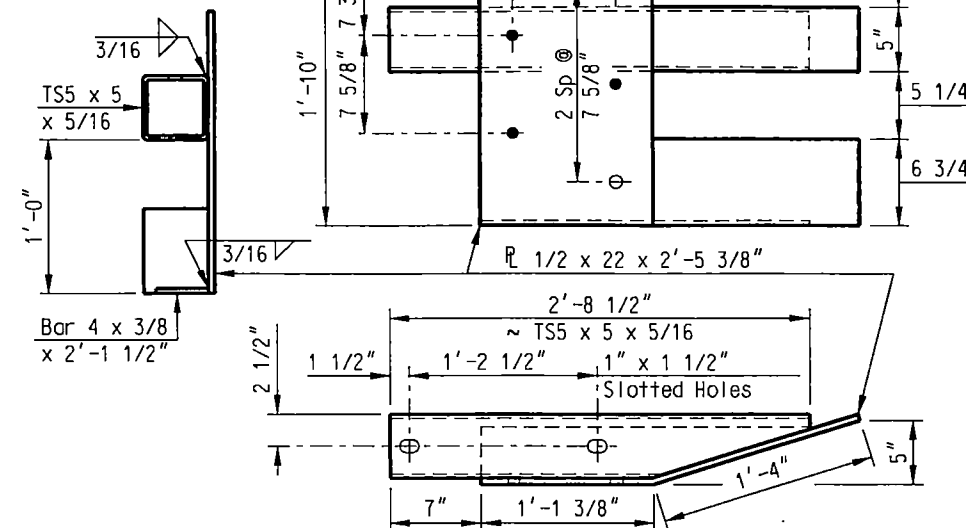


(CONCRETE POST CONNECTION)
BAR 3 X 1/2 X 1'-5 1/2" DETAIL

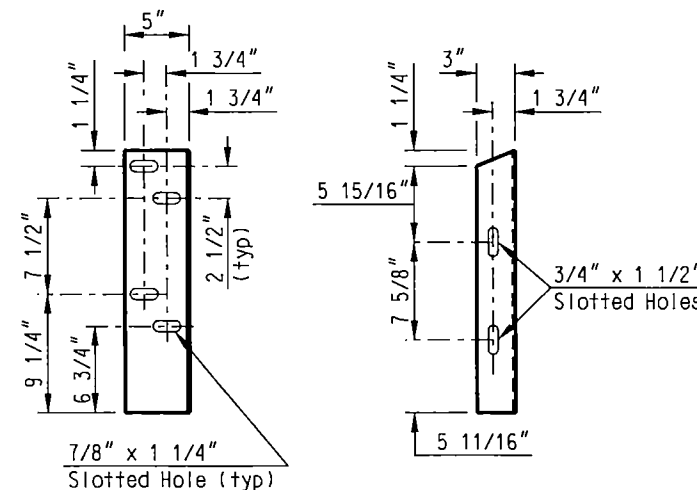


1/4" & 1/8" Thickness
Quantities determined in field

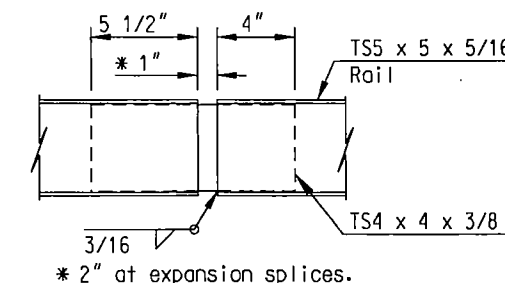
SHIM PLATE DETAIL



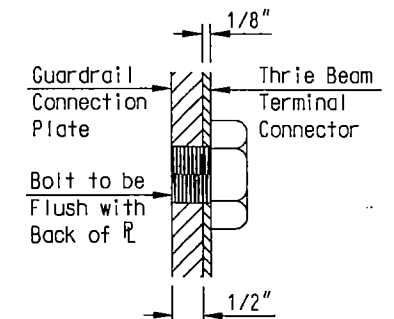
(4 REQUIRED)
GUARDRAIL CONNECTION PLATE DETAILS



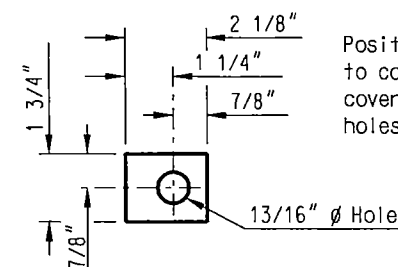
(L5 X 3 X 1/4 X 1'-8 1/2")
(4 REQUIRED)
CONNECTION ANGLE DETAILS



RAIL SPLICE DETAIL

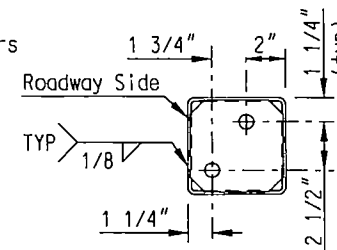


DETAIL "B"



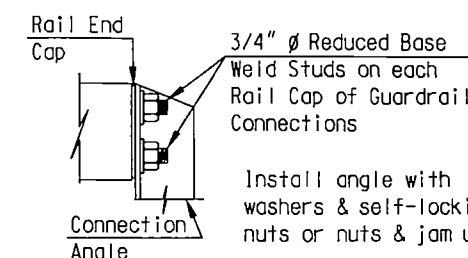
(1/4" R AASHTO M 270 GRADE 36)
R WASHER "C"

Position washers to completely cover slotted holes.

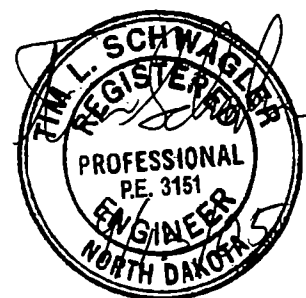


Rail cap shall be a Bar 4 3/4 x 3/16 x 4 3/4".
Cope corners 1" to provide zinc drains.

RAIL CAP DETAILS



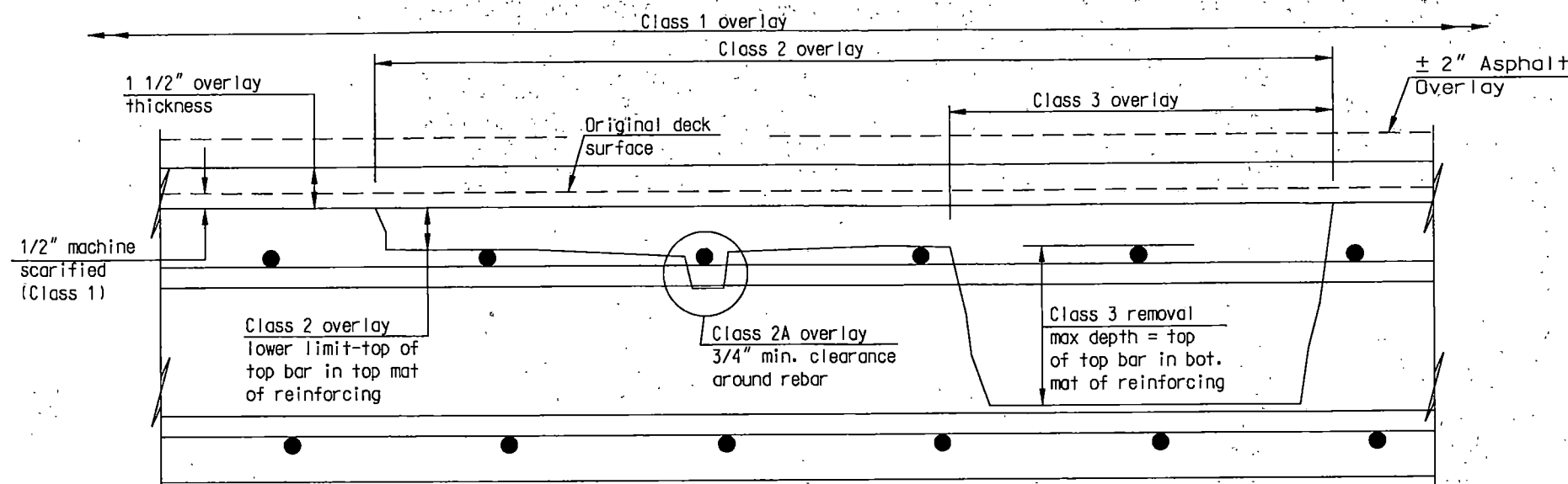
Install angle with washers & self-locking nuts or nuts & jam unit.



SWEET BRIAR CREEK

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SS-1-031(010)078	170	4

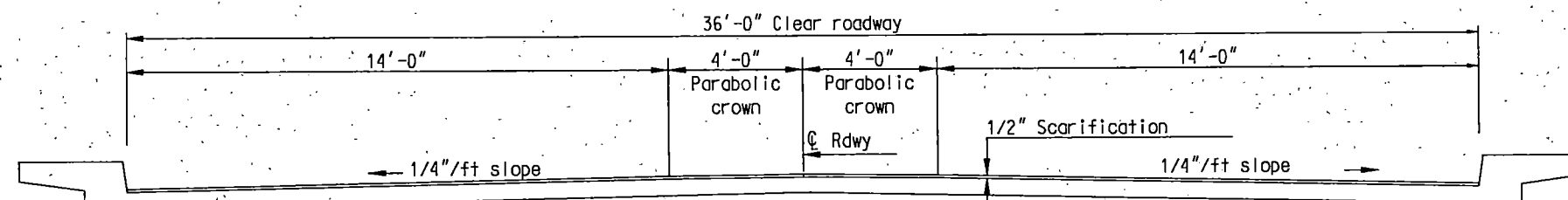


Class 4 removal shall be below limit of class 3 removal to full depth.

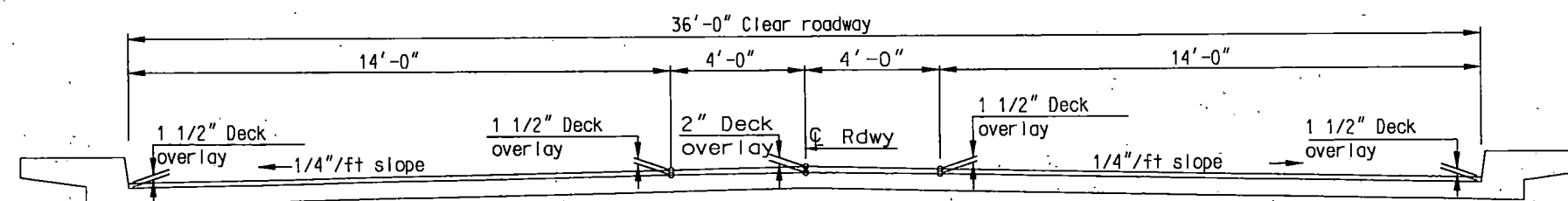
BRIDGE DECK
(Overlay classifications)

NOTE:

Class 2A Overlay is paid for the top rebar in the top mat of reinforcing only. If a rebar that is identified for 2A is in an area that becomes Class 3 or Class 4 it shall not be paid for as 2A Overlay.



DECK ELEVATION
Showing scarification

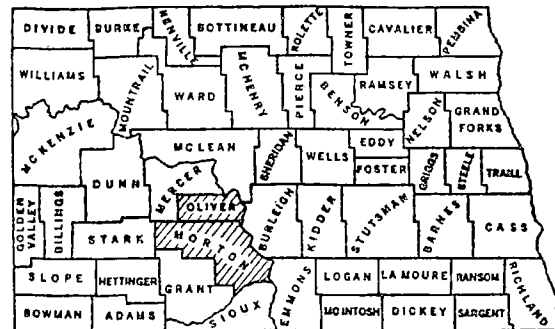


DECK ELEVATION
Showing overlay

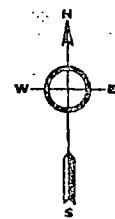


SWEET BRIAR CREEK

OVERLAY DETAILS



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES



SCALES (LAYOUT SHEET: 1" = 5280 FT.
PLAN AND PROFILE DRAWINGS: 1" = 100 FT.
STRUCTURAL DRAWINGS: AS SHOWN
CROSS SECTION SHEETS: 1" = 10 FT.)

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A
STATE HIGHWAY
IN OLIVER & MORTON COUNTIES
FEDERAL AID PROJECT NO. ROS-I-031(02)086
STRUCTURAL & INCIDENTALS

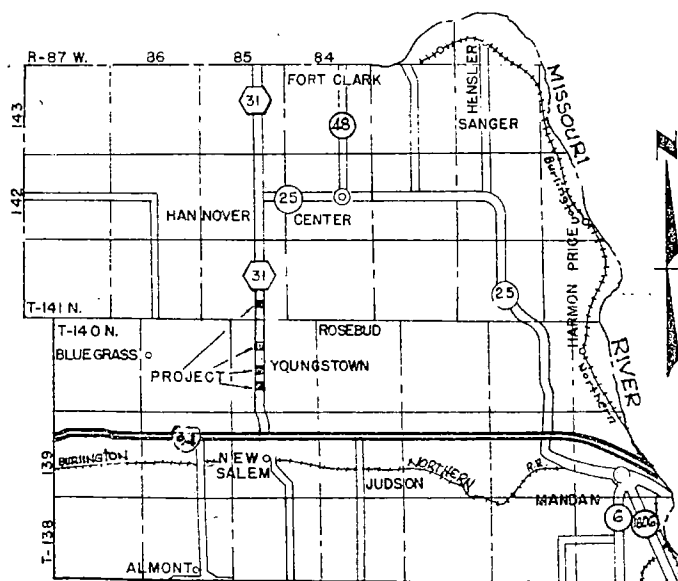
LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
ROS-I-031(02)086	8.283	.029
TOTALS	8.283	.029

COVERING SPECIFICATIONS:

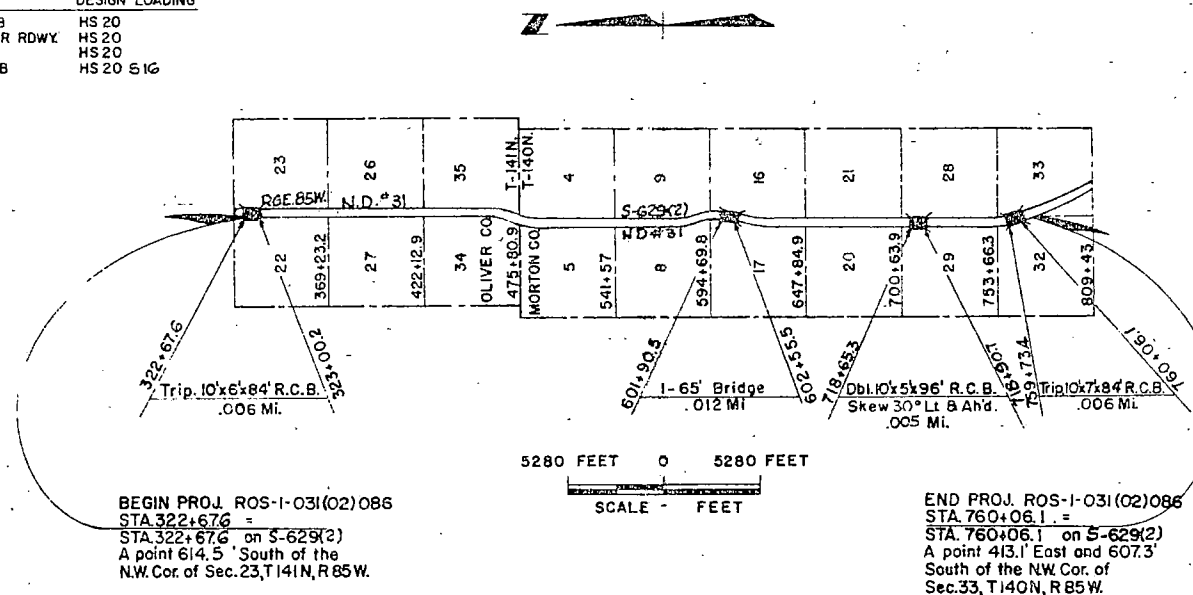
Standard Specifications adopted by the North Dakota State Highway Department July 1971 and approved as standard by the Federal Highway Admin. Sept. 29, 1971. Required Contract Provision (Form PR-1273) dated Apr. 1974 and others submitted herewith.

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



SKETCH MAP OF OLIVER AND MORTON COUNTIES

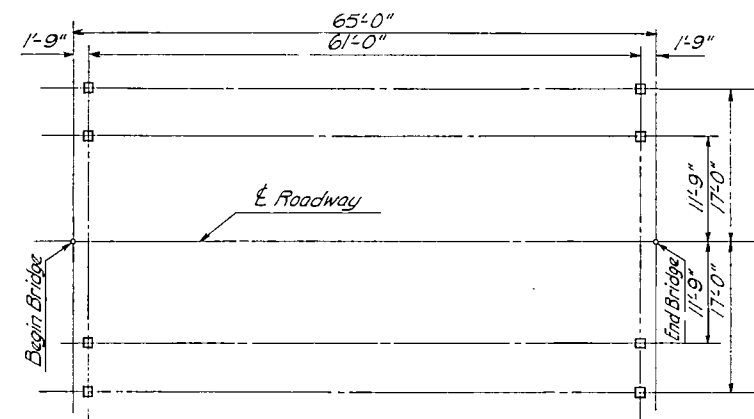
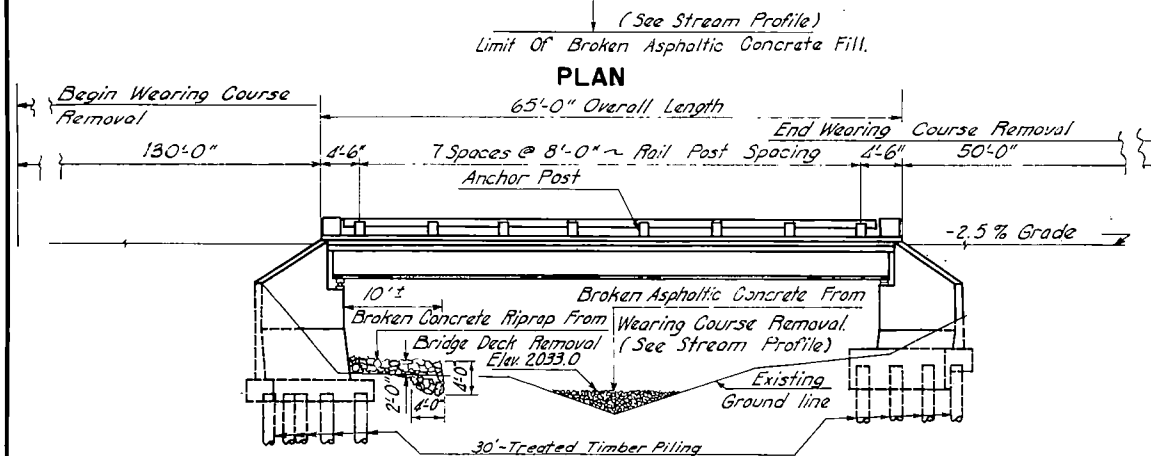
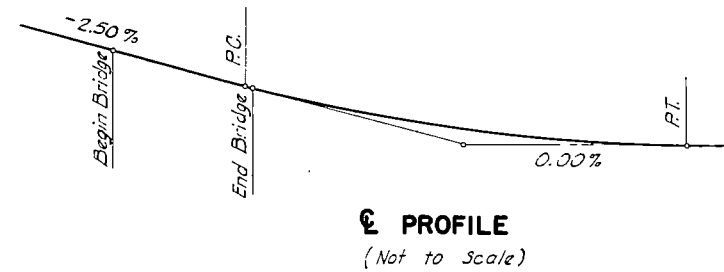
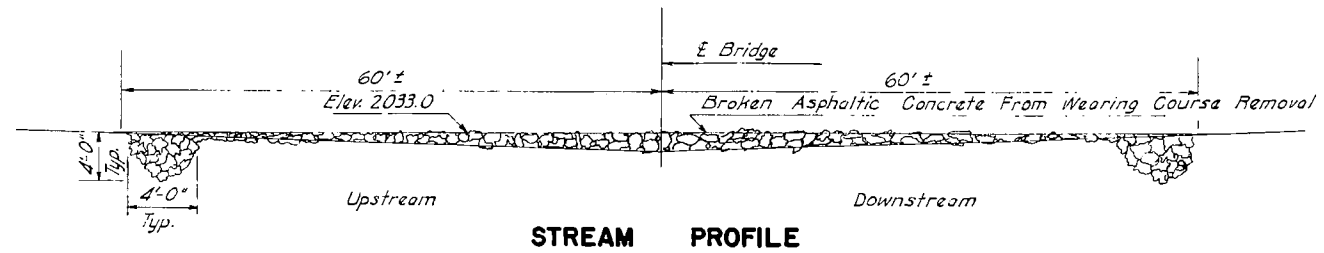
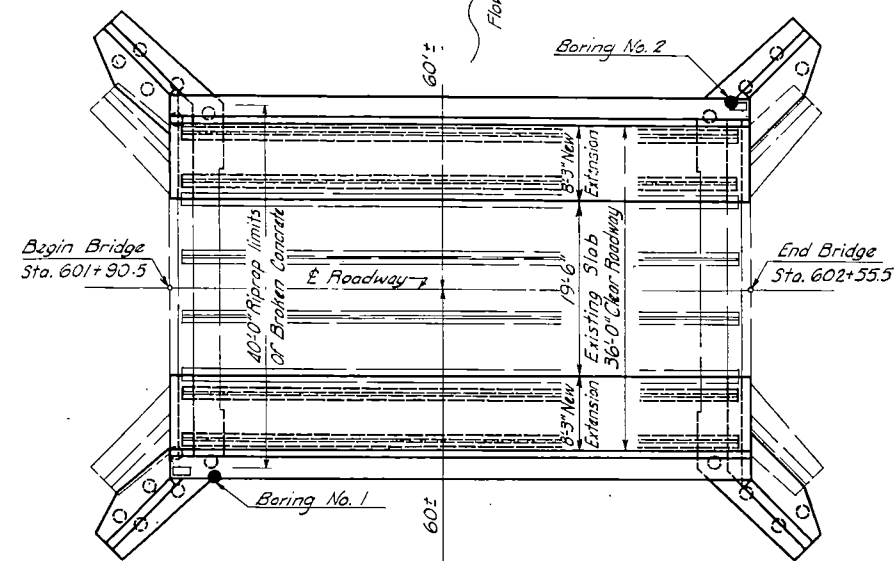


P.S. & E. Changes made
November 17, 1971

APPROVED	DATE 3/1/76
CHIEF ENGINEER NORTH DAKOTA STATE HIGHWAY DEPARTMENT	

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED	DATE
DIVISION ENGINEER	DATE

MADE BY <i>GGO & RLA</i>			
CHECKED BY <i>RAP</i>			
MADE BY <i>RAP</i>			
CHECKED BY <i>D'B</i>			
QUANTITIES			



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

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 1 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 PGTS	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	18,930 FT (504) LIN. FT.
705	0100	MOBILIZATION	LUMP SUM
750	0100	LINSEED OIL TREATMENT	2.5 GAL.
900	3000	BRIDGE BENCH MARKS	1 SET

STRUCTURAL DRAWINGS	
GENERAL DRAWING 31-84.23 (THIS SHEET)	
SUBSTRUCTURE 31-84.23-1, 1A, 2, 3, 4, 5, D-708-9	
SUPERSTRUCTURE 31-84.23-687, 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-1-03(02)086** STA. 602+23
MORTON COUNTY

APPROVED
3-2-76 *Stanley H. King*
DATE JUDGE ENGINEER

ORIGINAL PROJECT NO. F-629(3)

BENCH MARKS				PILE LOADING										
NO.	DESCRIPTION	LOCATION	ELEV.	LOCATION	DEAD LOAD	LIVE LOAD	EARTH	WIND			LONG. FORCE	DESIGN LOAD	MAX. REQ'D BEARING	* MINIMUM PENETRATION
								50 LB.	15 LB.	100 LB. LL				
59	Spike in REA Pole.	Sta. 594+00 ~ 306 ft	2066.57											
60	Headwall S.E. Corner Of Bridge.	Sta. 602+55 ~ 15' Lt	2049.14	Abutments	9.7T	16T	2.7T					14.0T	13.2T	15'
60A	Iron Mon. 2X2" Gds. P. & Md. On Fence Line.	Sta. 612+15 ~ 104' Rt.	2060.21											

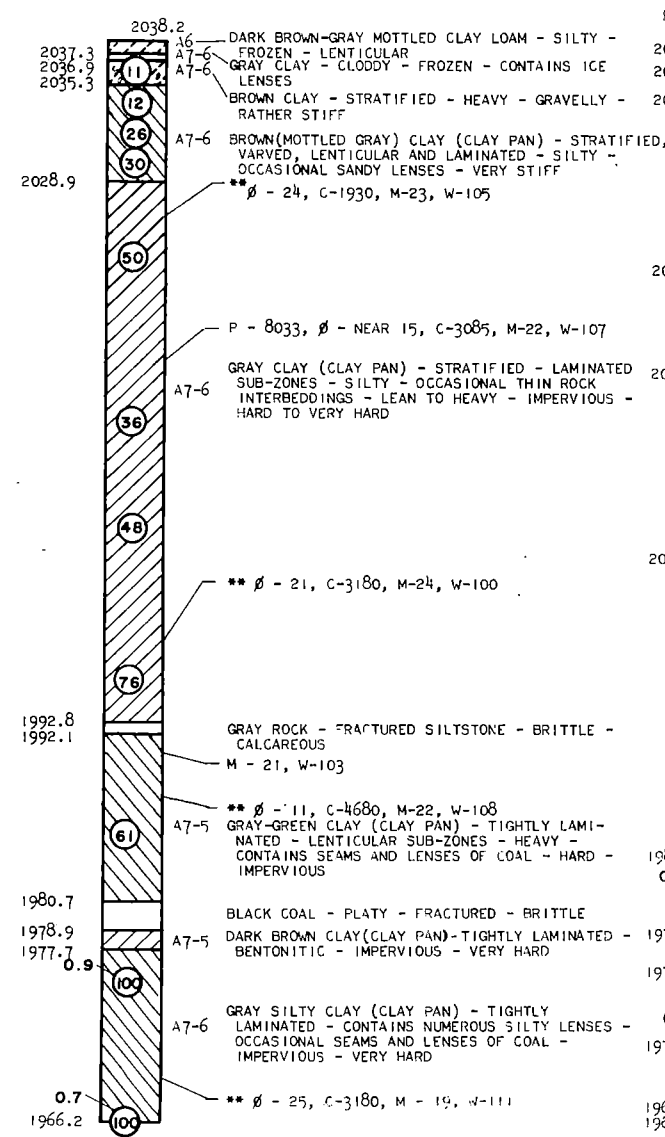
* Below Bottom Of Footing In Ft.

31-84.23

31-84.23

Plotted by JLS-May 1968

2040
2035
2030
2025
2020
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
1965



BORING NO. 1

STA. 601+95.74 - 20.4' RT.

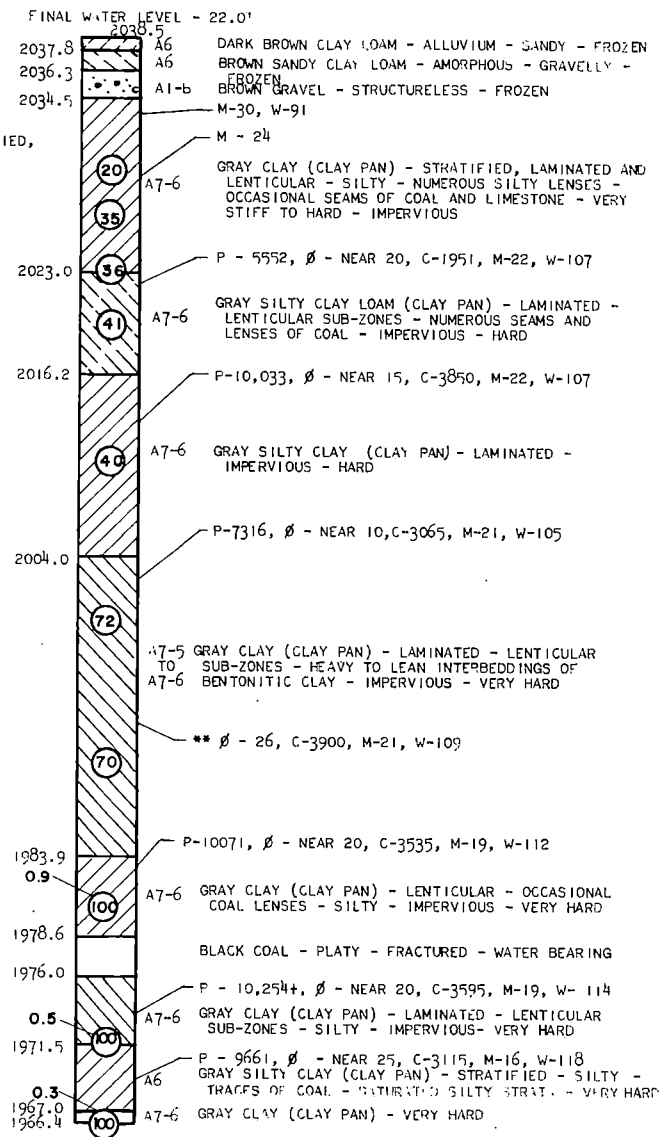
E of Existing Bridge

SYMBOLS:

P - MAXIMUM LOAD (LB./SQ.FT.)
 δ - BEAR ANGLE (DEGREES)
 C - COHESION (LB./SQ.FT.)
 M - MOISTURE (PER CENT)
 W - DRY WEIGHT (LBS./CU.FT.)
 ** - TRIAXIAL

NOTES:

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1.0'.
 THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSE ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.



BORING NO. 2

STA. 602+52.36 - 20.9' LT.

E of Existing Bridge

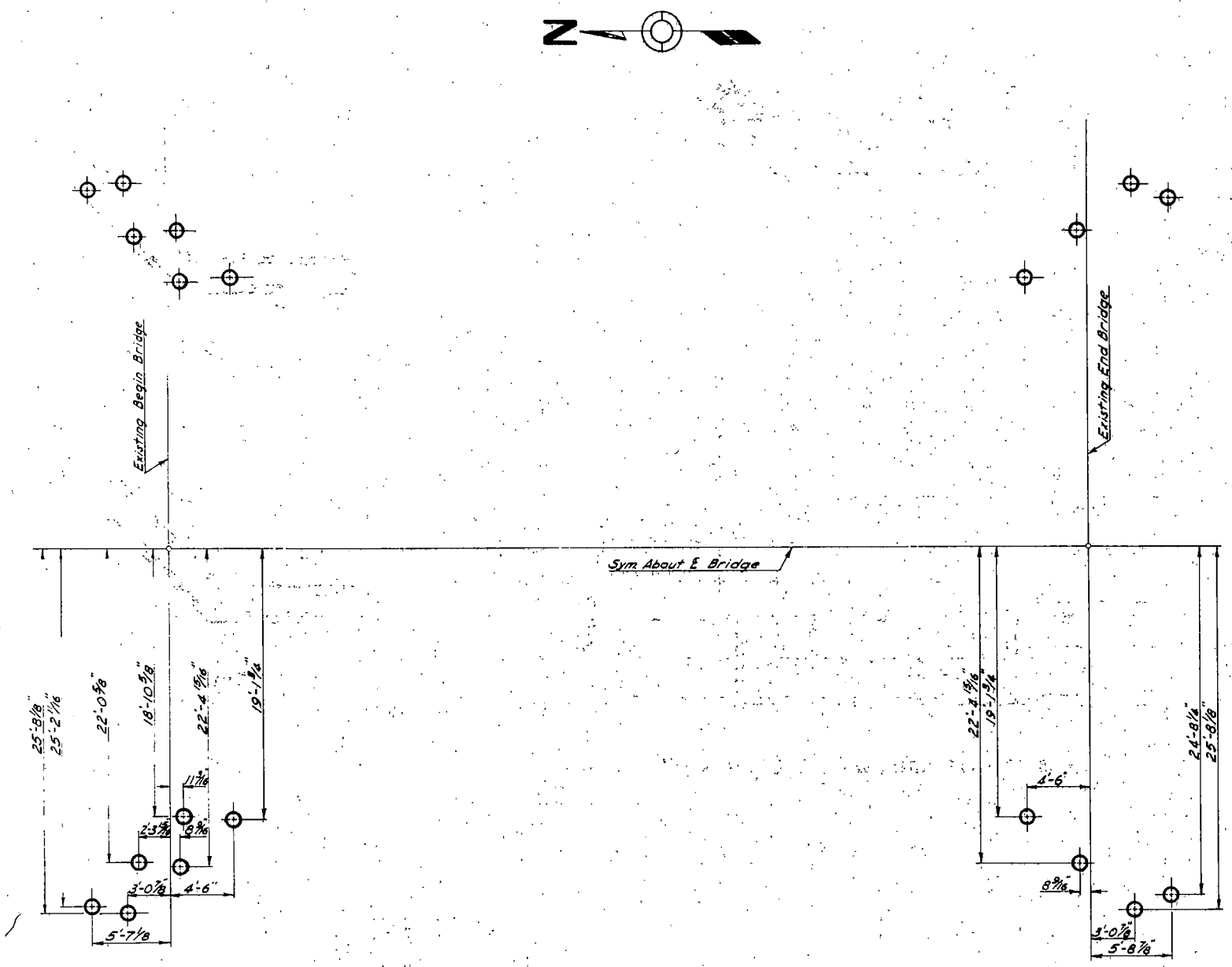
BRIDGE NO. 31-84.23

BORING LOG

SWEET BRIAR CREEK

MORTON COUNTY

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	ROS-1-031(02)086		13



PILE STAKING DIAGRAM

GENERAL:

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

THE CONTRACTOR SHALL PROVIDE A TEMPORARY BYPASS WITH A MINIMUM OF 24'-0" CLEAR ROADWAY INCLUDING THE DRAINAGE STRUCTURE. A MINIMUM OF 32 SQUARE FEET OF WATERWAY OPENING SHALL BE PROVIDED. THE BYPASS SHALL MEET THE REQUIREMENTS OF SECTION 724 OF THE STANDARD SPECIFICATIONS. THE EXISTING BRIDGE SHALL BE CLOSED TO PUBLIC TRAFFIC DURING CONSTRUCTION.

THE EXISTING ASPHALT SURFACING SHALL BE DIPPED OUT BY THE LIMITS SHOWN ON THE LAYOUT SHEET OF THE PLANS AND EXTENDED 10' IN THE STREAM BOTTOM BETWEEN THE LIMITS ALSO SHOWN ON THE PLANS. THE REMOVAL OF ASPHALT SURFACING ON THE BRIDGE DECK SHALL BE INCIDENTAL TO THE PAY ITEM "REMOVAL OF PORTIONS OF EXISTING STRUCTURE".

RESURFACING OF THE BRIDGE APPROACHES SHALL BE DONE AFTER THE COMPLETION OF THE BRIDGE RAISING AND WIDENING.

THE PAY ITEM "REMOVAL OF PORTIONS OF EXISTING STRUCTURE AT STA. 602+23" SHALL INCLUDE ALL INCIDENTAL WORK AND MATERIALS NOT LISTED AS PAY ITEMS BUT SHOWN ON THE PLANS AND NECESSARY TO COMPLETE THE PROJECT. THE RIPRAP SHOWN ON THE PLANS SHALL INCLUDE BROKEN CONCRETE, FROM STRUCTURE REMOVAL, WITH A 2-FOOT MAXIMUM DIMENSION AND PROTRUDING REINFORCING CUT OFF.

THE CONTRACTOR WILL NOT BE ALLOWED TO DRIVE PILING OR POUR CONCRETE WITH EQUIPMENT SETTING ON THE EXISTING BRIDGE.

CONCRETE:

ALL CONCRETE ABOVE THE TOP OF THE CURBS SHALL BE CLASS AAE-3. ALL OTHER SUPERSTRUCTURE CONCRETE SHALL BE CLASS AE-3. THE ABUTMENT CONCRETE SHALL BE CLASS AE-1. THE CEMENT FOR THE ABUTMENT CONCRETE SHALL CONTAIN LESS THAN 5% OF TRICALCIUM ALUMINATE.

THE ROADWAY FACE OF CURBS, THE OUTSIDE FACES OF THE CURBS, ALL OF THE END POSTS AND EXPOSED SURFACES OF THE ABUTMENT WING WALLS SHALL BE GIVEN THE "RUBBED SURFACE FINISH". ALL OTHER CONCRETE SHALL BE GIVEN THE "ORDINARY SURFACE FINISH". IF THE CONCRETE OF THE ABUTMENT WING WALLS HAVE A SURFACE FINISH ACCEPTABLE TO THE ENGINEER WITHOUT RUBBING, THE REQUIREMENTS FOR "RUBBED SURFACE FINISH" MAY BE WAIVED AT THE OPTION OF THE ENGINEER AND THE "ORDINARY SURFACE FINISH" WILL APPLY. ALL "ORDINARY SURFACE FINISH" SHALL BE COMPLETED WITHIN 24 HOURS AFTER REMOVAL OF FORMS.

REINFORCING STEEL:

DIMENSIONS FOR BENT BARS ARE GIVEN CENTER TO CENTER UNLESS OTHERWISE NOTED. THE BAR FABRICATOR SHALL ADD A PREFIX TO ALL BAR DESIGNATIONS TO DIFFERENTIATE BETWEEN THE SEVERAL PARTS OF THE STRUCTURE.

EXCAVATION:

ALL EXCAVATION FOR ABUTMENT EXTENSIONS SHALL BE CONSIDERED AS CLASS I, THE LIMITS OF WHICH ARE OUTLINED IN THE NORTH DAKOTA STANDARD SPECIFICATIONS, SECTION 208. EXCAVATION CLASS I SHALL INCLUDE BOTH WET AND DRY EXCAVATION.

DESIGN STRESSES:

FC - 1,700 PSI (CLASS AAE-3)
FC - 1,200 PSI (CLASS AE-3 AND AE-1)
FS - 20,000 PSI (REINFORCING STEEL)

BRIDGE RAISING:

THE EXISTING BRIDGE DECK SHALL BE RAISED 3 INCHES AS SHOWN ON THE PLANS. THE COST OF RAISING THE DECK SHALL BE INCLUDED IN THE PAY ITEM "REMOVAL OF PORTIONS OF EXISTING STRUCTURE".

PILING:

ALL PILES SHALL BE PREDRILLED TO 10 FEET BELOW BOTTOM OF FOOTING BEFORE DRIVING. THE COST OF PREDRILLING SHALL BE INCLUDED IN THE BID ITEM "TREATED TIMBER PILING".

PAINT:

PAINT AND PAINTING SHALL CONFORM TO SECTION 718 AND 870-1.2 OF THE STANDARD SPECIFICATIONS.

ALL EXPOSED SURFACES OF THE NEW STEEL SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT AND ONE SPOT COAT OF RED LEAD PAINT AFTER ERECTION AND CONCRETE WORK IS COMPLETED AND TWO FIELD COATS OF ENAMEL.

THE FIRST FIELD COAT SHALL CONFORM TO GREEN COLOR NO. 24200 AND THE SECOND COAT SHALL CONFORM TO GRAY-GREEN COLOR NO. 24300. BOTH COATS SHALL MEET THE FEDERAL STANDARD NO. 595 FOR COLOR.

ALL EXPOSED SURFACES OF THE EXISTING STEEL SHALL BE GIVEN ONE SPOT COAT OF RED LEAD AFTER BEING CLEANED IN CONFORMANCE TO SECTION 718 OF THE STANDARD SPECIFICATIONS TO BE FOLLOWED BY ONE COAT CONFORMING TO GRAY-GREEN COLOR NO. 24300.

COLOR CHIPS ARE ON FILE IN THE BRIDGE DIVISION OF THE STATE HIGHWAY DEPARTMENT AT BISMARCK.

ALL PAINTING SHALL BE INCIDENTAL TO THE STRUCTURAL STEEL.

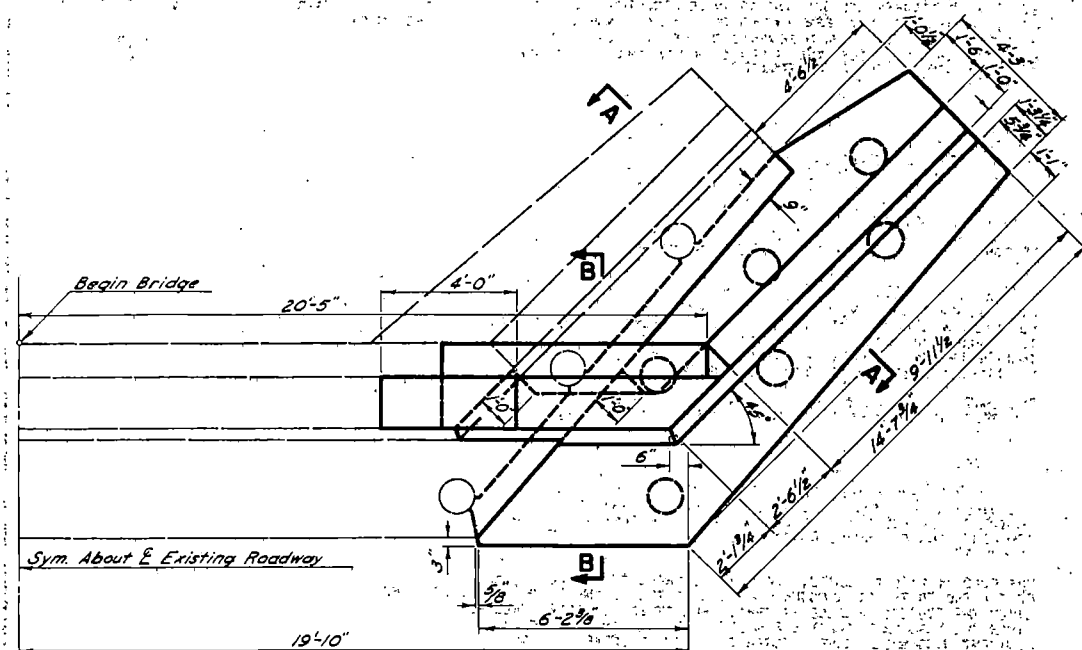
LINSEED OIL TREATMENT:

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

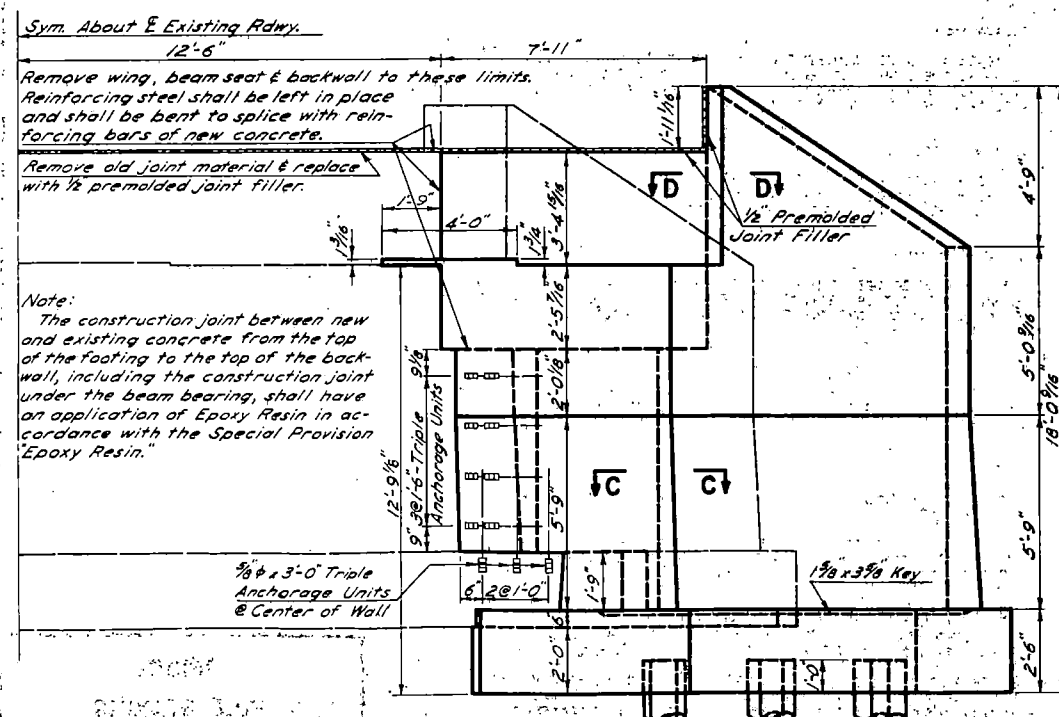
ONLY ONE UNIFORM APPLICATION OF .015 GALLONS PER SQUARE YARD SHALL BE APPLIED TO THE DECK AND CURBS.

BRIDGE
PILE STAKING
DIAGRAM

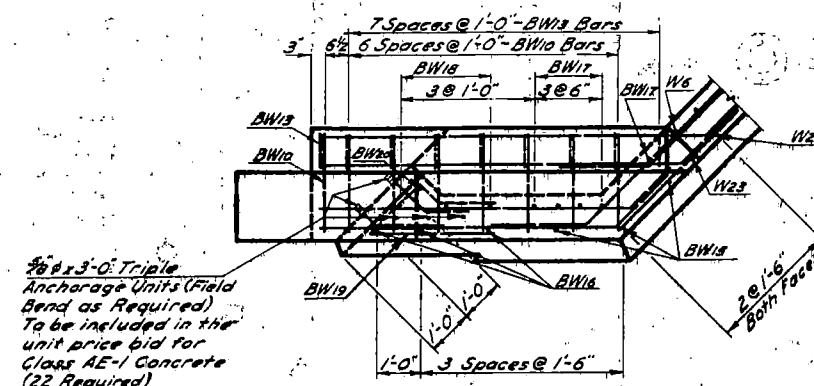
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	RD-1-03(02)886		14



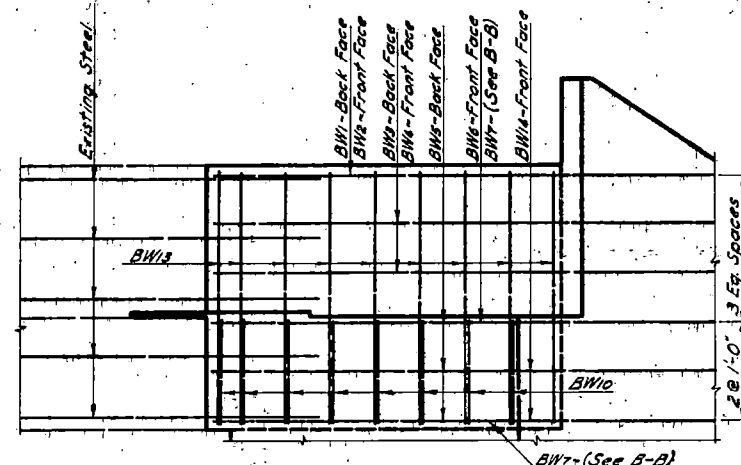
PLAN VIEW OF ABUTMENT EXTENSION
Showing Dimensions



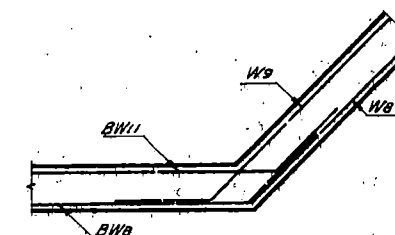
SOUTH ELEVATION VIEW OF ABUTMENT EXTENSION
Showing Dimensions



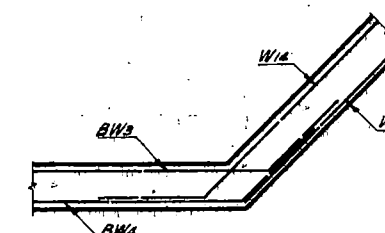
PLAN OF BACKWALL & BEAM SEAT
Showing Reinforcing



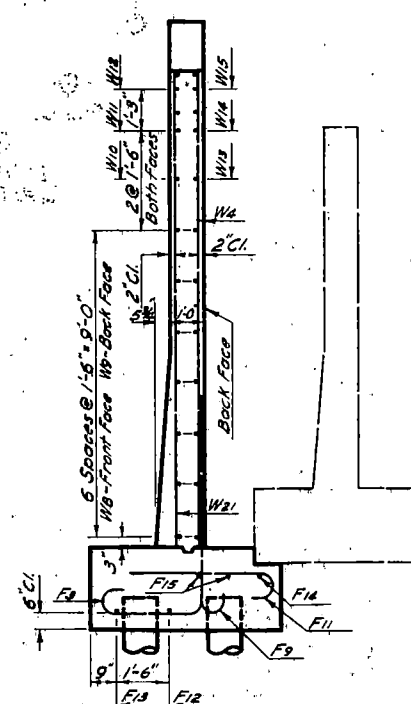
ELEVATION OF BACKWALL & BEAM SEAT
Showing Reinforcing



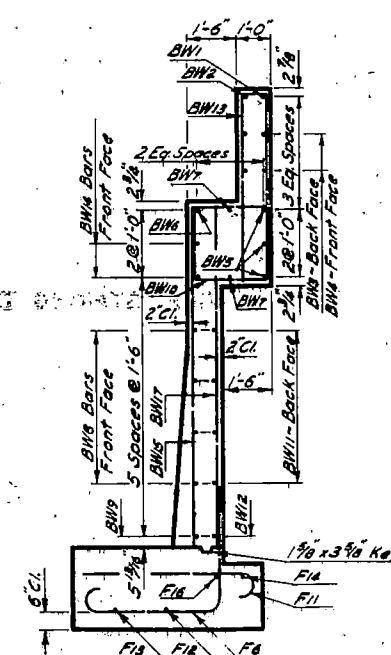
C-C



D-D



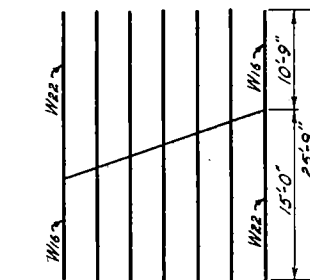
A-A



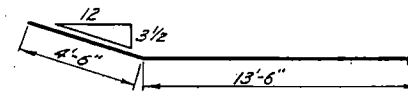
B-B

ABUTMENT NO. 1
WIDENING DETAILS

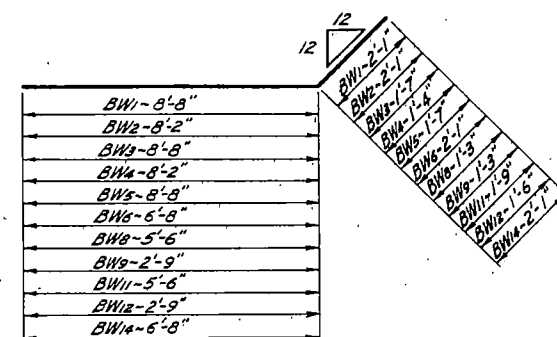
MORTON COUNTY



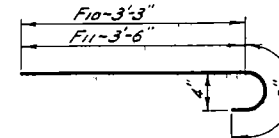
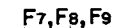
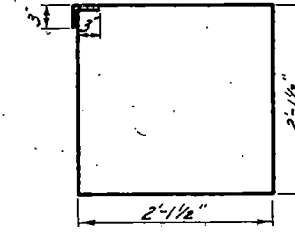
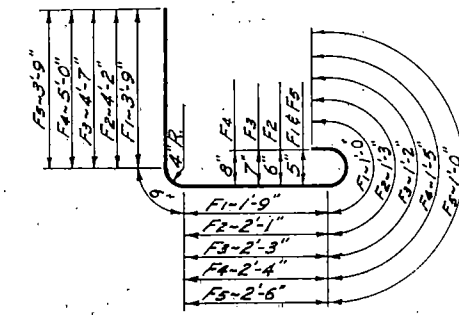
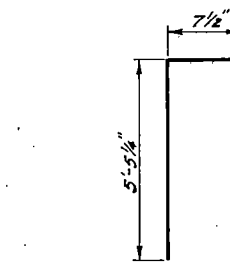
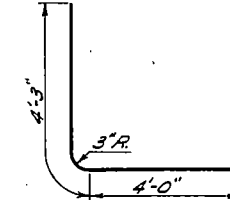
PLAN VIEW OF FOOTING
Showing Reinforcing



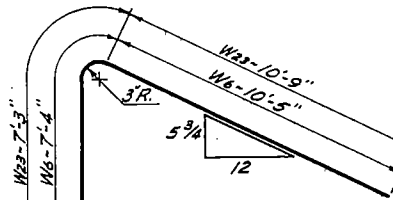
F14



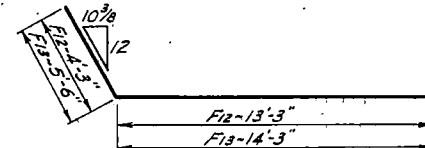
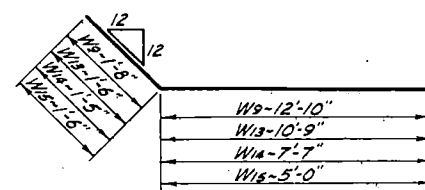
BW1,2,3,4,5,6,8,9,11,12,14

 F_{10}, F_1 BW₁₀ $F_{1,2,3,4,5}$ BW₁₃

F6



W₆, W₂₃

 F_{12}, F_{13} 

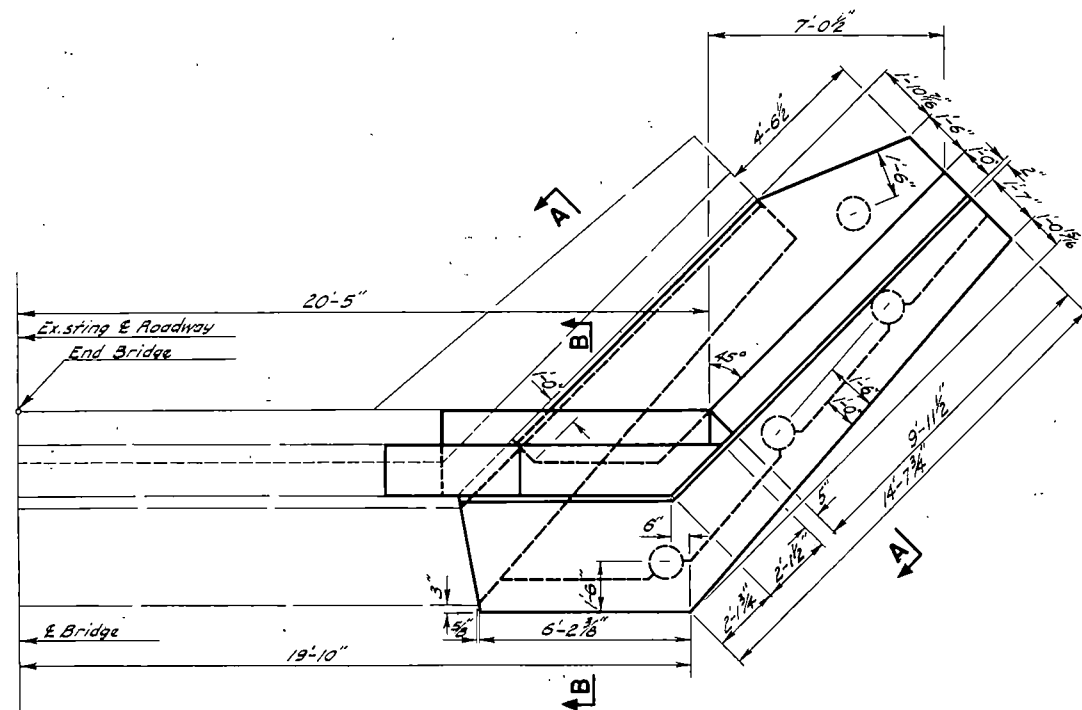
W9,13,14,15

*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.

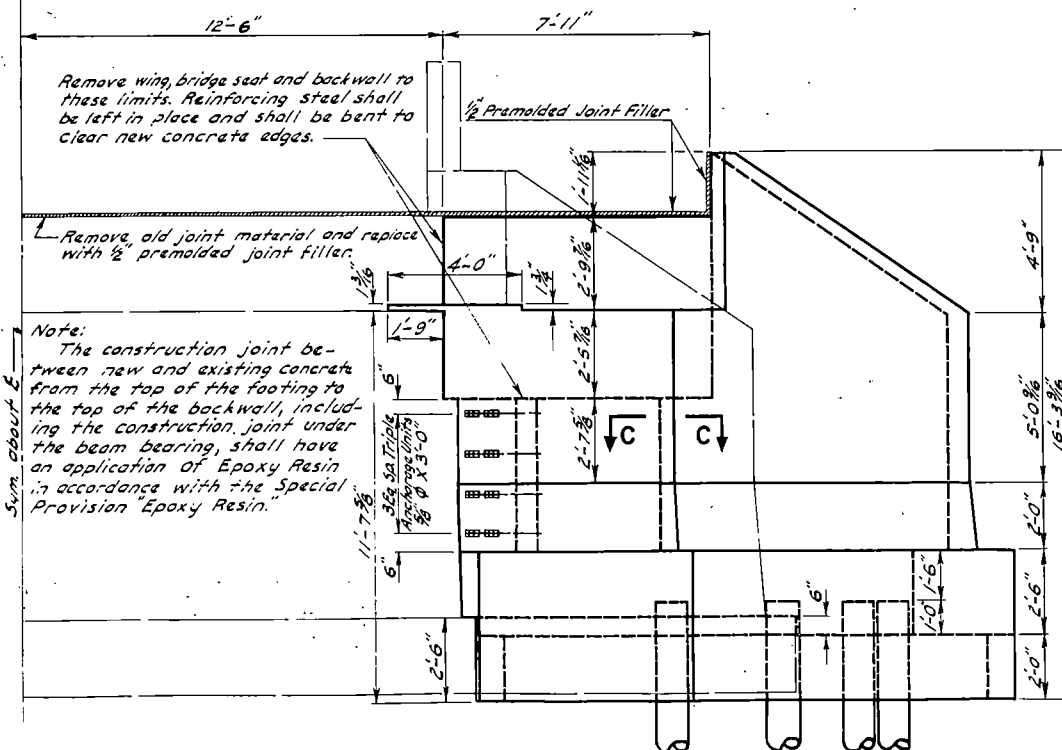
QUANTITIES	
Concrete Class AE-1	38.2 Cu.Yds.
Reinforcing Steel	2,582 lbs.

ABUTMENT NO. 1
WIDENING DETAILS

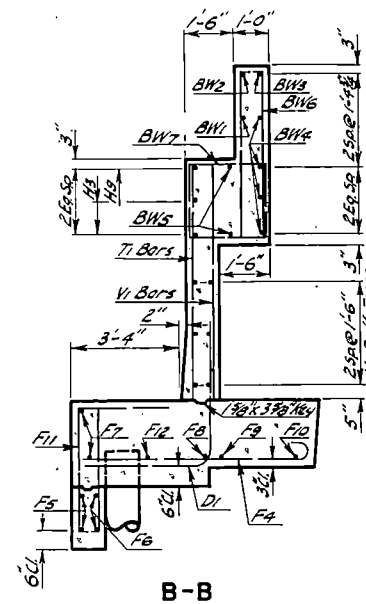
MORTON COUNTY



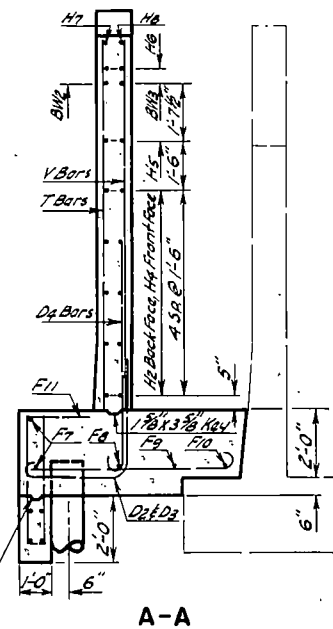
PLAN VIEW OF ABUTMENT EXTENSION
Showing Dimensions



ELEVATION VIEW OF ABUTMENT EXTENSION
Showing Dimensions

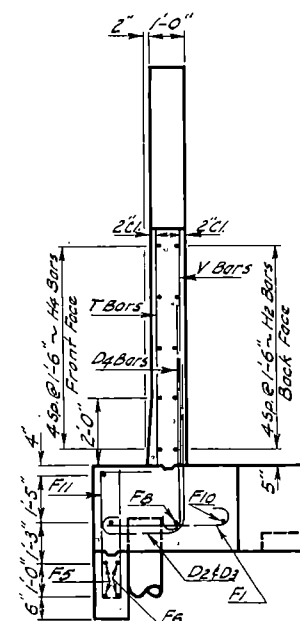


B-B

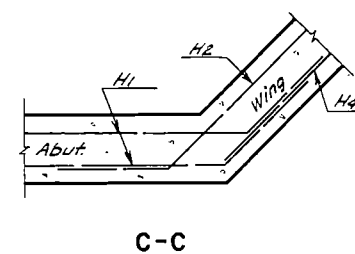


A-A

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



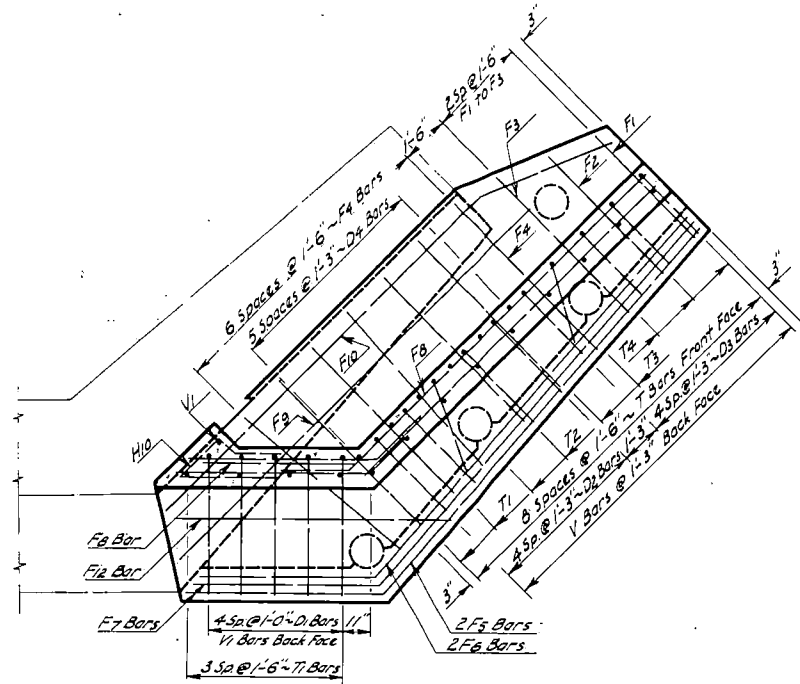
END VIEW



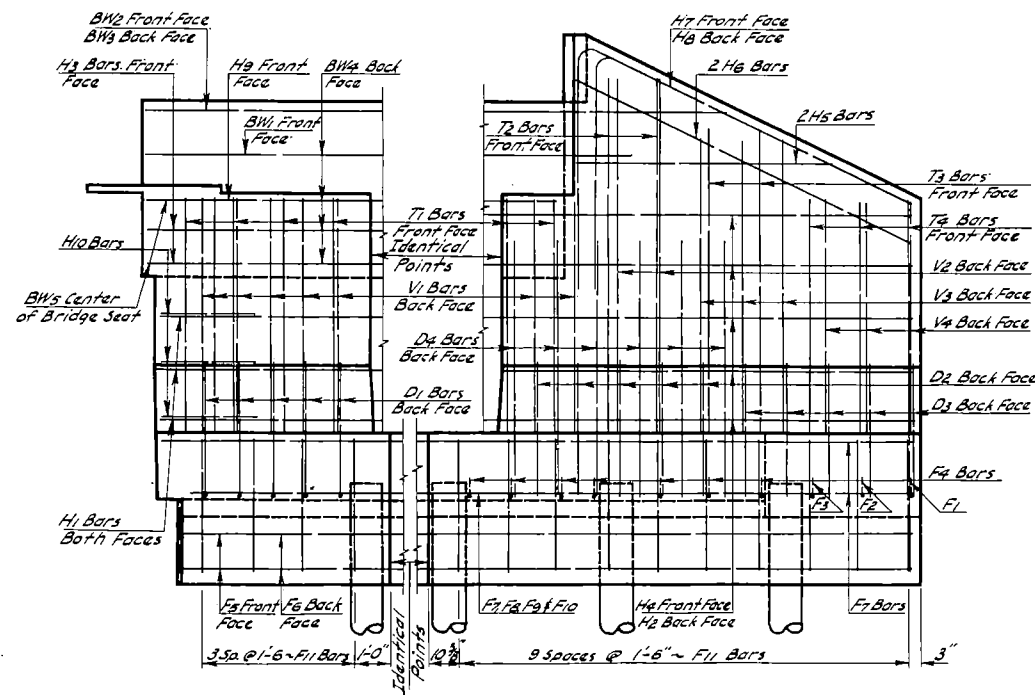
C-C

**ABUTMENT NO. 2
WIDENING DETAILS**

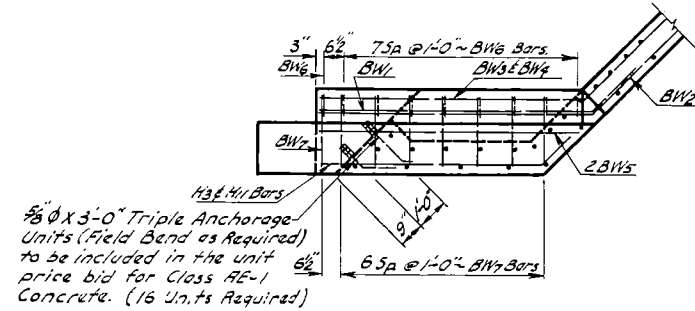
MORTON COUNTY



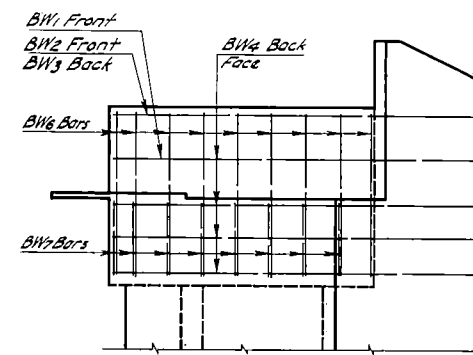
PLAN VIEW OF FOOTING EXTENSION
Showing Reinforcing



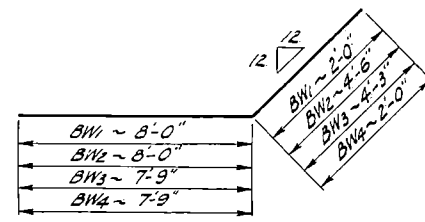
ELEVATION VIEW OF ABUTMENT EXTENSION
Showing Reinforcing



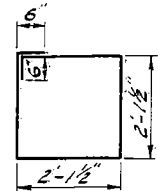
PLAN VIEW OF BACKWALL & BEAM SEAT
Showing Reinforcing



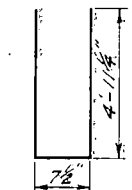
ELEVATION VIEW OF BACKWALL & BEAM SEAT
Showing Reinforcing



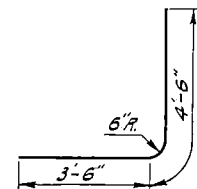
BW1, BW2, BW3 & BW4 BARS



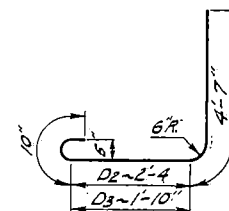
BW7 BAR



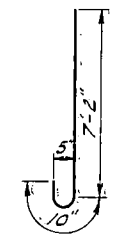
BW6 BAR



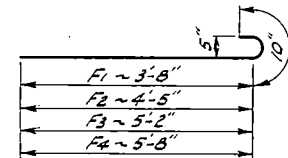
D1 BAR



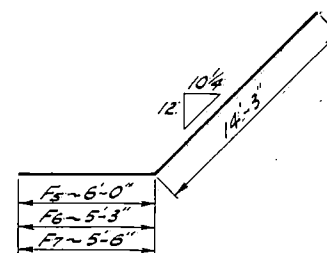
D2 & D3 BARS



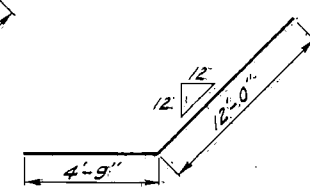
D4 BAR



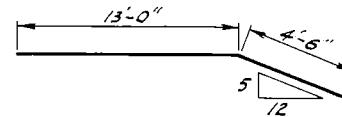
F1, F2, F3 & F4 BARS



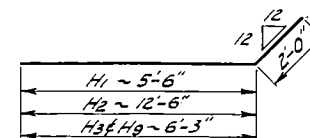
F5, F6, & F7 BARS



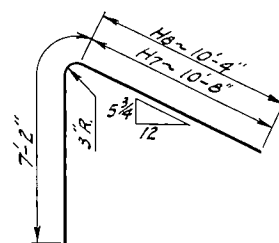
F8 BAR



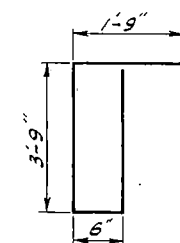
F10 BAR



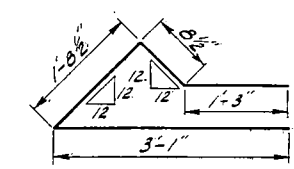
H1, H2, H3 & H9 BARS



H7 & H8 BARS



F11 BAR



H10 BAR

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	17'-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"	"

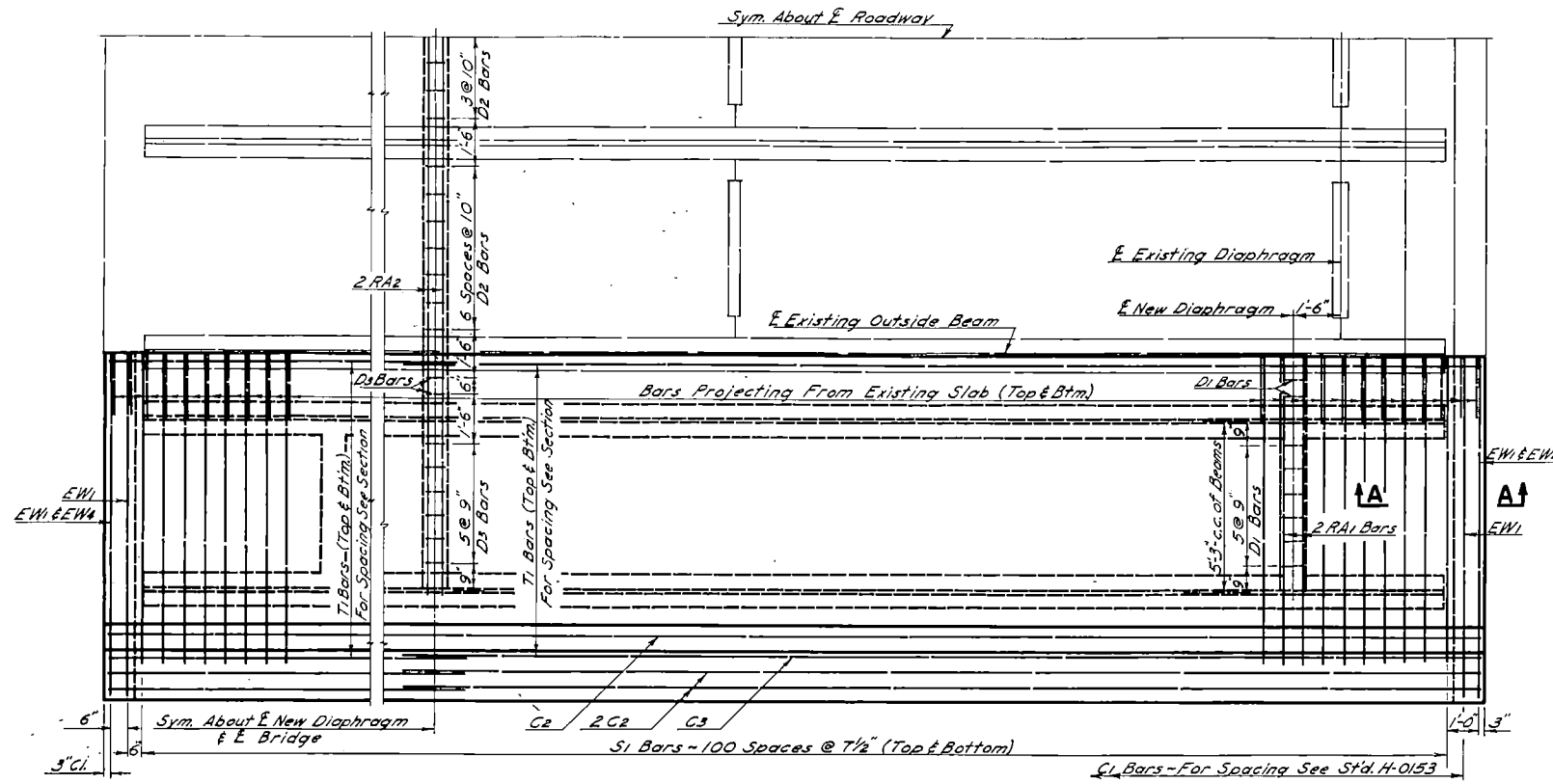
QUANTITIES (BOTH SIDES INCLUDED)

Concrete Class AE-1	38.0 Cu Yds
Reinforcing Steel	23.0 Lbs

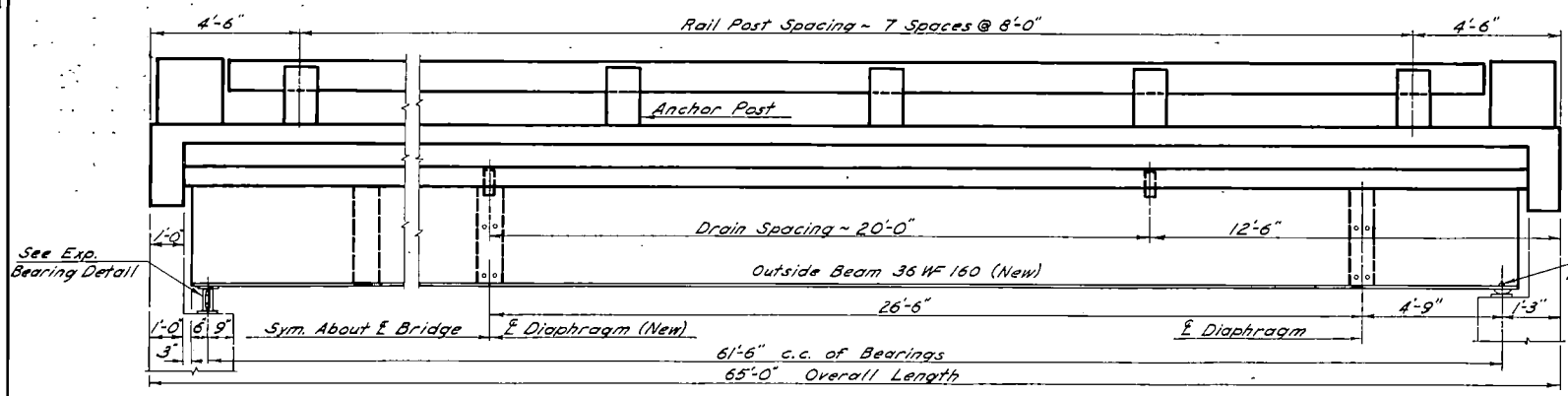
ABUTMENT NO. 2
WIDENING DETAILS

MORTON COUNTY

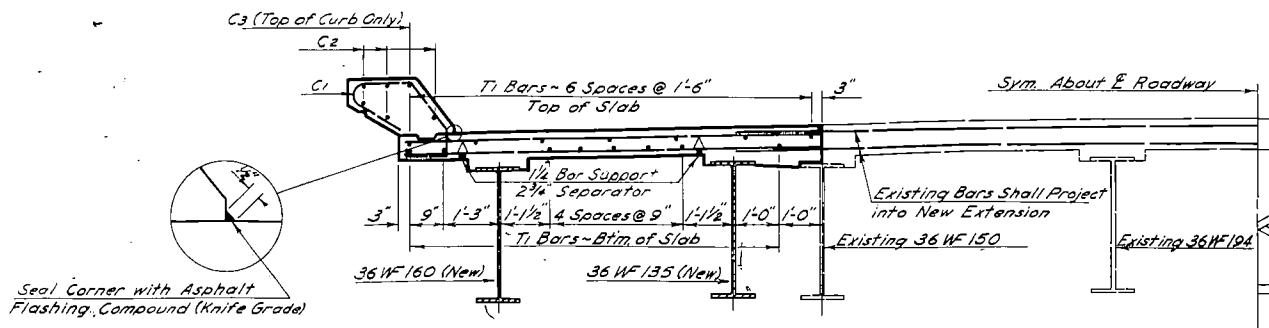
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.
5	N. D.	RD-1-03 (02) 006	18	



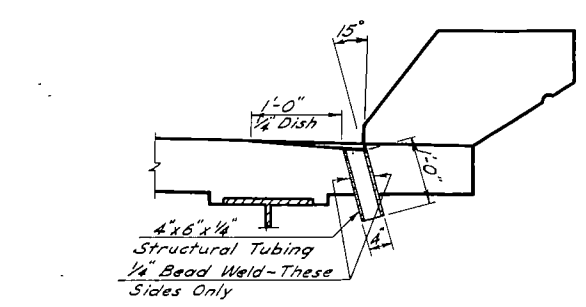
PLAN



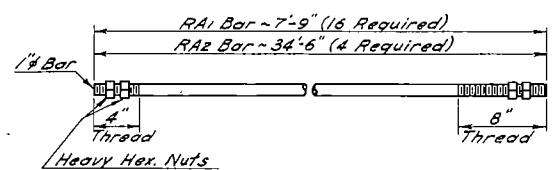
ELEVATION



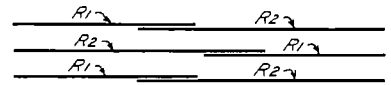
HALF SECTION
Showing Reinforcing



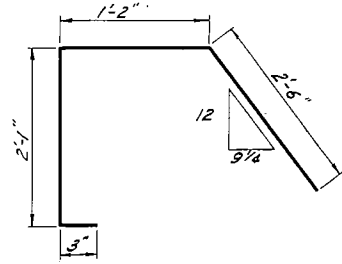
FLOOR DRAIN DETAIL



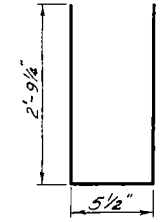
RA BARS



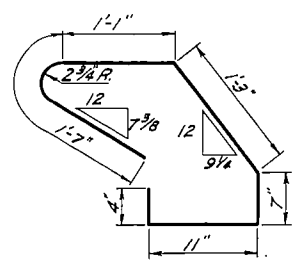
R BAR SPLICE DETAIL



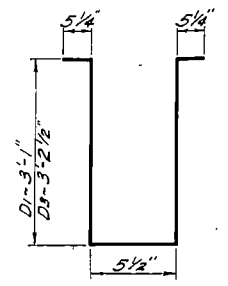
EW2



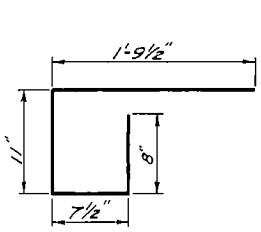
D2



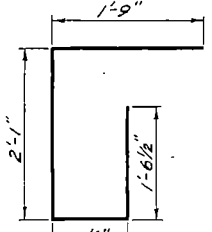
C1



D1 & D3

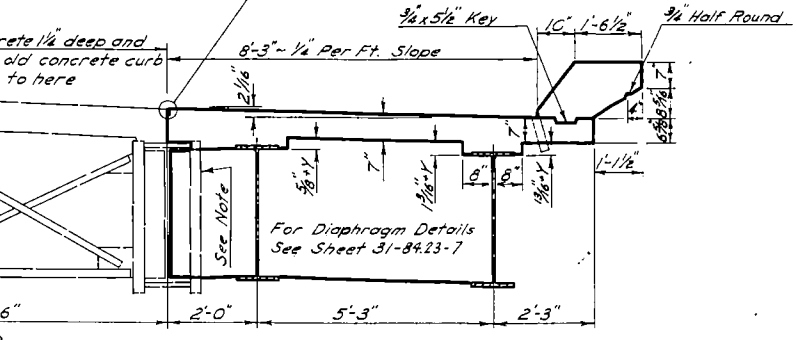
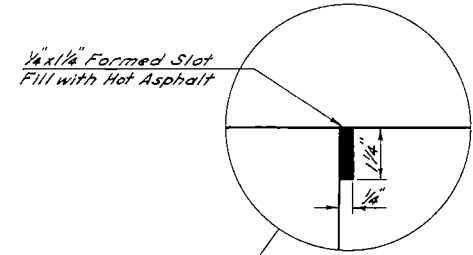


EW5



EW3

BENT BAR DETAILS



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' to F.W.S.
SUPERSTRUCTURE WIDENING
60' I-BEAM CLEAR SPAN
HS20 LOADING

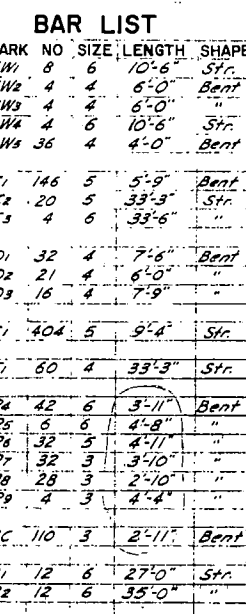
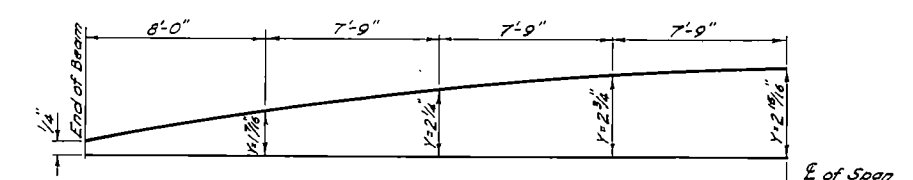


Diagram of a T-beam cross-section showing internal reinforcement. The beam has a top flange and a vertical stem. The stem width is labeled as 9 inches. Inside the stem, there are diagonal lines representing stirrups, labeled "Di-Abut. Diaph." and "Di-Center Diaph.". There are also vertical lines representing longitudinal bars, labeled "RA Bars".

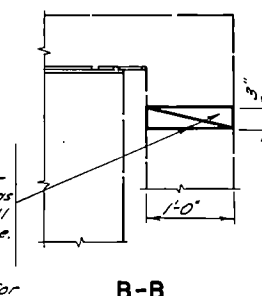
C-C

D-D

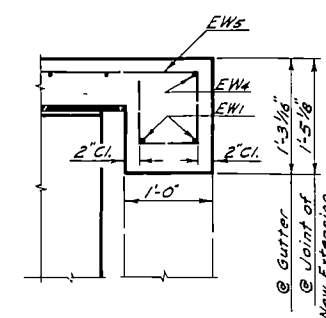


FIELD RISER DIAGRAM

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.



B-B



A-A

QUANTITIES	
Class AAF-3 Concrete	47.7 Cu.Yds.
Class AAF-3 Concrete	4.53 Cu.Yds.
Reinforcing Steel	9,457 lbs.
Structural Steel	40,051 lbs.

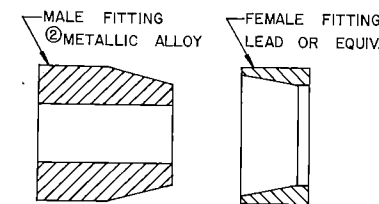
**SUPERSTRUCTURE WIDENING
60' I-BEAM CLEAR SPAN**

HS20 LOADING

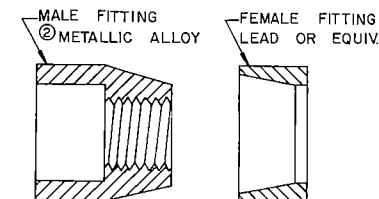
STANDARD ANCHORAGE UNITS

PRWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	POS-1-031(02) 086	20

D-708-9



SINGLE UNIT
WITHOUT THREADS



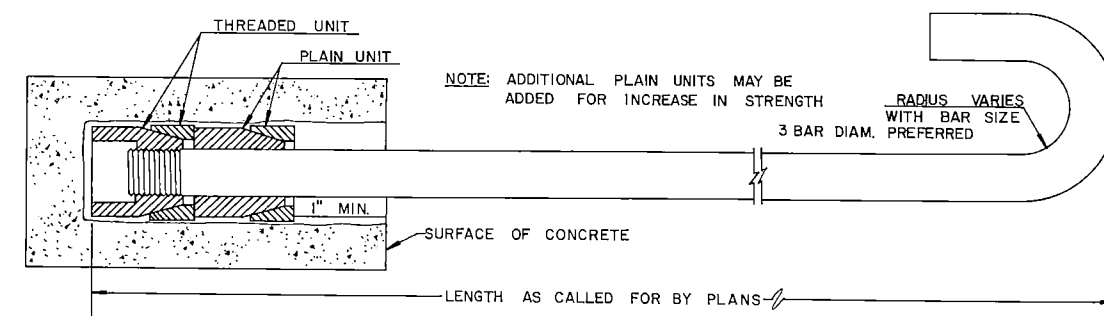
SINGLE UNIT
WITH THREADS

Before any anchorage units are installed the contractor shall furnish six copies of a certificate from the Manufacturer stating that the anchorage unit will withstand the design load requirements with a minimum factor of safety of 4. These six copies of the affidavit must be forwarded to the "Testing Engineer, Testing Laboratory, State Highway Dept., Bismarck, ND."

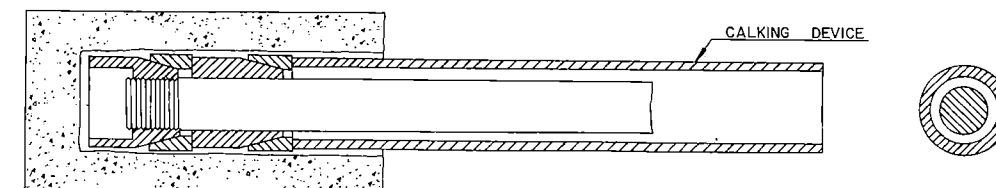
The plain and threaded units must be made of a rust-proof material.

The diameter of the drilled hole shall be as required to develop the anchorage for the units furnished.

Other types of anchorage units may be substituted for the type detailed provided they meet the design load requirements as specified on this sheet and are approved by the Bridge Engineer.



DOUBLE UNIT



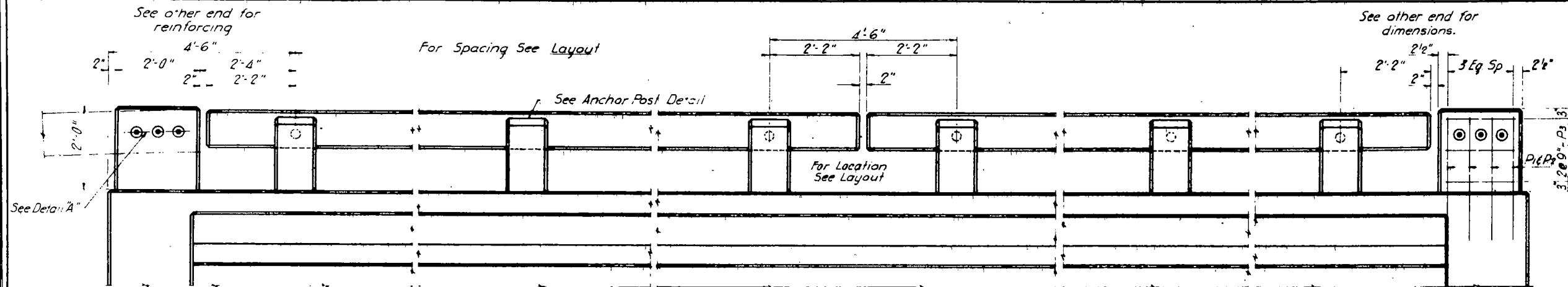
STANDARD DRIVING PROCEDURE

ALLOWABLE DESIGN LOADS & MINIMUM STRENGTHS										
BOLT SIZE	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 1/2"
① BREAKING STRENGTH OF BOLT (LBS.)	1750	4400	8200	13150	19650	27250	35800	45100	57800	84100
MINIMUM NO. OF UNITS	2	2	2	3	3	3	3	3	3	3
③ ALLOWABLE TENSION (LBS.)	400	1000	2000	3000	4500	5500	7000	9000	9000	9000
③ ALLOWABLE SHEAR BEARING (LBS.)	200	500	900	1200	1350	1500	1700	2000	2000	2000

- ① BASED ON ULTIMATE STRESS OF 65,000 LBS./SQ. IN.
UNITS USED MUST HAVE MINIMUM SAFETY FACTOR OF 4
② STRENGTH: TENSILE 47,600 LBS./SQ. IN.; SHEARING 38,000 LBS./SQ. IN.;
COMPRESSIVE 87,000 LBS./SQ. IN.
③ ALLOWABLE SAFE LOADS IN 3000 LB. CONCRETE.

1-1-75		NORTH DAKOTA STATE HIGHWAY DEPARTMENT
REVISIONS		
DATE	CHANGE	Submitted: <i>[Signature]</i> Design Engineer
		Recommended: <i>[Signature]</i> Asst. Chief Engineer Pre-Construction
		Approved: <i>[Signature]</i> Chief Engineer

H-0502



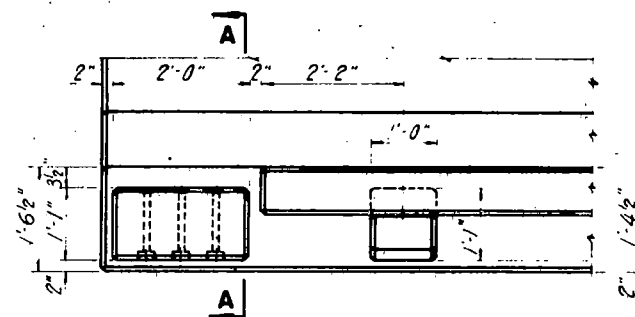
PART ELEVATION

NOTES:

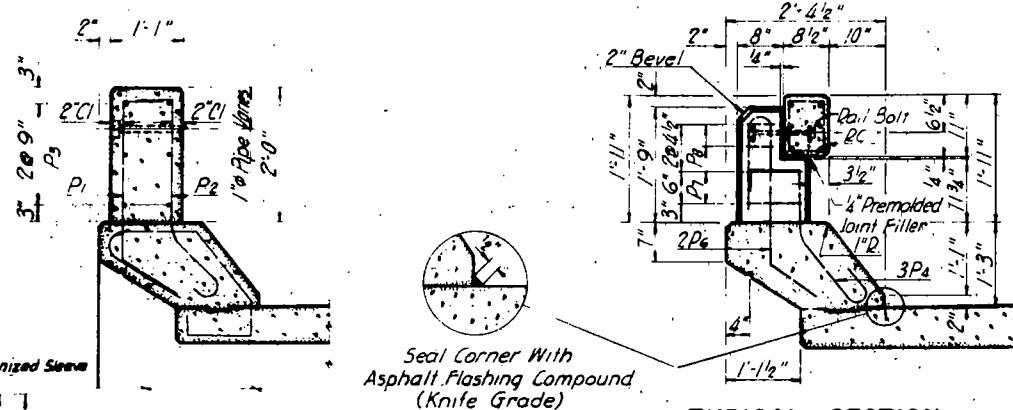
All concrete above top of curb shall be Class AAE-3.

"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.

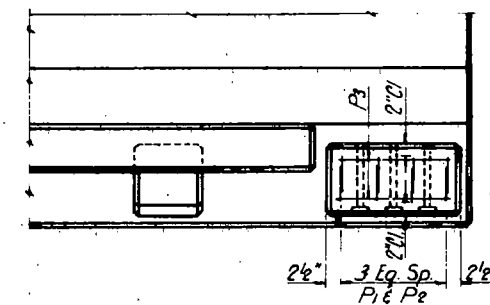
Designed in accordance with 1965 A.A.S.H.O. Specifications.



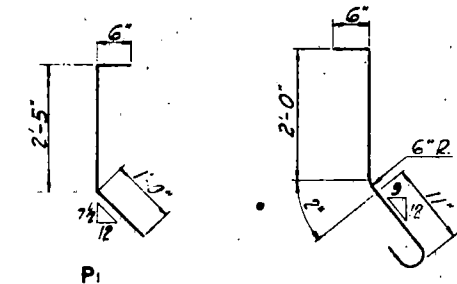
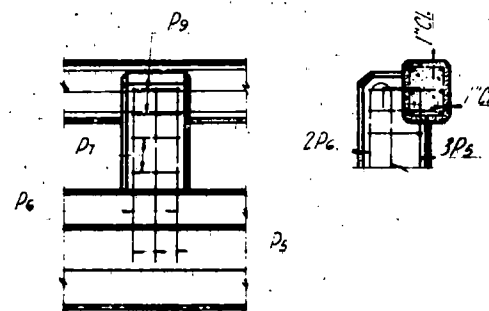
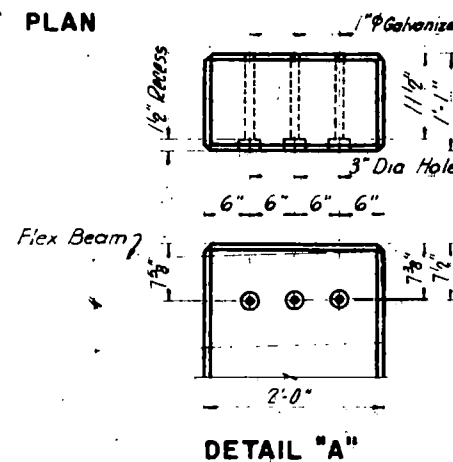
PART PLAN



TYPICAL SECTION



PART PLAN



BENT BAR DETAILS

* Number of bars shown on superstructure sheet.

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

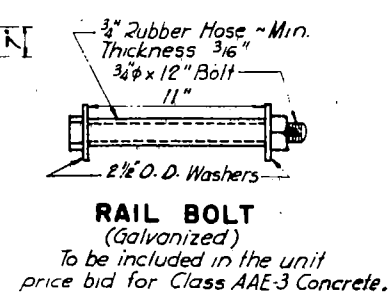
BAR LIST				
(BARS FOR FOUR END POSTS)				
MARK	NO.	SIZE	LENGTH	SHAPE
P ₁	16	5	3'-11"	Bent
P ₂	16	5	4'-2"	"
P ₃	24	4	1'-8"	Str.

BAR LIST				
(BARS FOR RAILING AND POSTS)				
MARK	NO.	SIZE	LENGTH	SHAPE
P ₄	6	4	4'-4"	Bent
P ₅	6	5	5'-7"	"
P ₆	5	4	4'-9"	"
P ₇	3	4	4'-2"	"
P ₈	3	3	3'-2"	"
P ₉	3	4	4'-8"	"
RC	3	3	3'-3"	Bent
R**	6	4	4'-8"	Str.

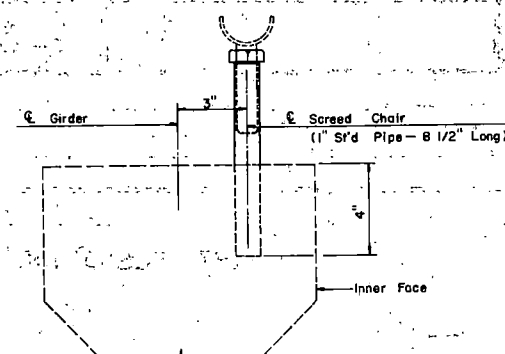
QUANTITIES 4 END POSTS*		
Class AAE-3 Concrete	0.64	Cu Yds
Reinforcing Steel	162	Lbs

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

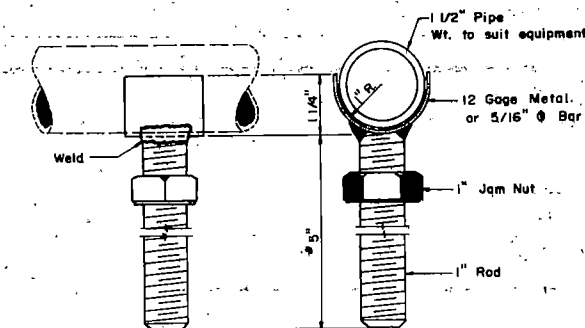
STANDARD RAILING DETAILS



		REVISIONS		MADE BY	CHECKED BY	DATE
DESIGN	MADE BY					
	CHECKED BY					
DETAILS	MADE BY					
	CHECKED BY					
TRACING	MADE BY					
	CHECKED BY					
QUANTITIES	MADE BY					
	CHECKED BY					

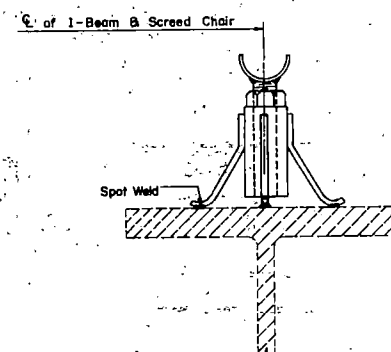


SCREED CHAIR IN PRESTRESSED GIRDER



ADJUSTABLE SCREED HOLDER

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



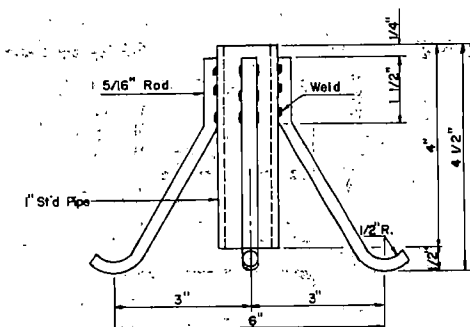
I-BEAM WITH SCREED CHAIR

NOTE:

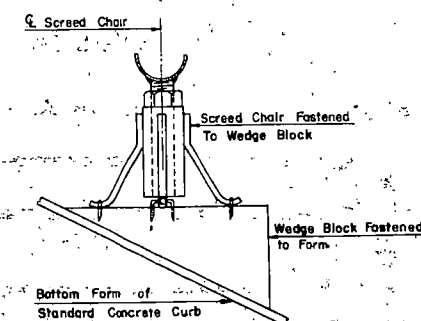
NOTE: THE SPACING OF SCREED CHAIRS SHALL BE SUCH THAT NO NOTICEABLE DEFLECTION OCCURS IN THE SCREED WHEN THE VIBRATION STRIKE-OFF IS IN OPERATION. CHAIRS SHALL BE SIMILARLY PLACED FOR ALL SCREEDS ON THE SAME BRIDGE SPAN WITH A MAXIMUM SPACING OF THREE FEET WHEN USING 1 1/2" EXTRA STRONG PIPE FOR A SCREED. SCREEDS SHALL BE SET ON OUTER BEAMS AND ALSO ON INTERMEDIATE BEAMS IF NECESSARY TO MAINTAIN THE REQUIRED TEMPLATE.

THE COST OF THE SCREED CHAIRS AND HOLDERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS PAY ITEMS. UPON COMPLETION OF THE PROJECT THE SCREED AND SCREED HOLDERS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.

THE DESIGN SHOWN FOR THE SCREED CHAIRS AND SEAT MAY BE
VARIED SLIGHTLY TO SUIT MANUFACTURERS PRODUCTS IF
APPROVED BY THE ENGINEER.



SCREED CHAIR



BOTTOM CURB FORM WITH
SCREED CHAIR

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

SCREED CHAIR
&
ADJUSTABLE SCREED
HOLDER

APPROVED:

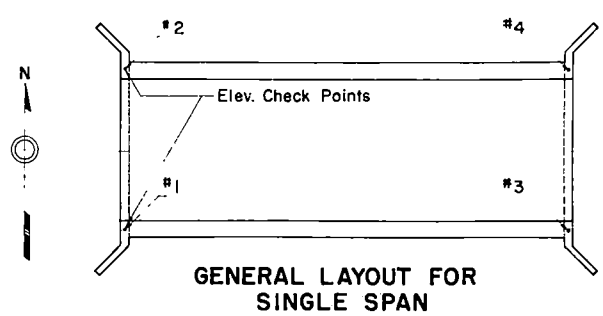
3-20-75
DATE

BRIDGE ENGINEER

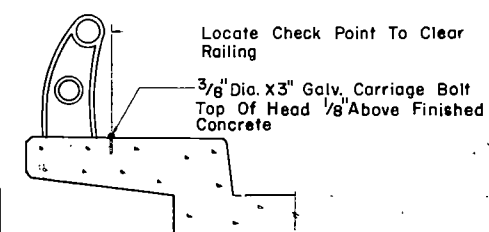
BRIDGE BENCH MARKS

8 N.D. Ros-1-031(02)086 23

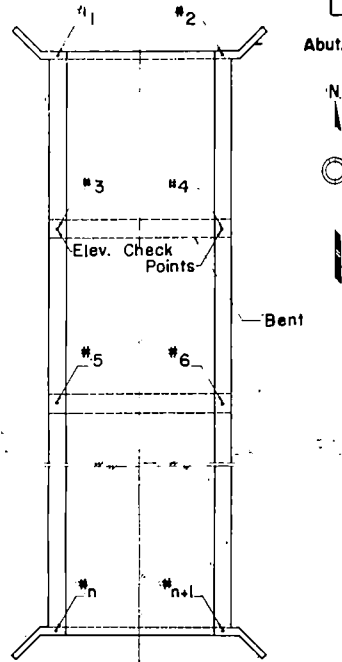
D-900-1



GENERAL LAYOUT FOR SINGLE SPAN



CHECK POINT LOCATION SKETCH



GENERAL LAYOUT FOR MULTIPLE SPAN

NOTES:

Elevation check points shall consist of 3/8"x 3" galvanized carriage bolts (or equal) set in the concrete curb at the points indicated on the General Layout Sketches. The top of bolt head shall project above the finished concrete 1/8". Elevation check points shall be placed on each curb over each unit of the sub-structure for each bridge at a structural location.

Two bench marks as detailed hereon shall be set at diagonal opposite positions away from the structure location and at least 300 feet from the nearest point on the bridge or bridges (if more than one at a location). These bench marks shall be constructed as detailed on this sheet and located near the Highway Right-of-way lines. The steel fence post shall extend 4'-0" above ground and be painted with two coats of white paint suitable for steel surfaces.

The Project Engineer shall run a set of levels determining the elevation of each check point on the structure and the two bench marks immediately after the completion of the bridge. This information shall be submitted to the Bridge Engineer with adequate information locating each check point and bench mark.

Except for fence posts, all metal parts to be hot dip galvanized after punching, shearing, welding, and fabrication. Threads of cap and pipe are not to be galvanized. At time of installation these threads are to be coated with grease and cap screwed to snug fit.

METHOD OF MEASUREMENT:

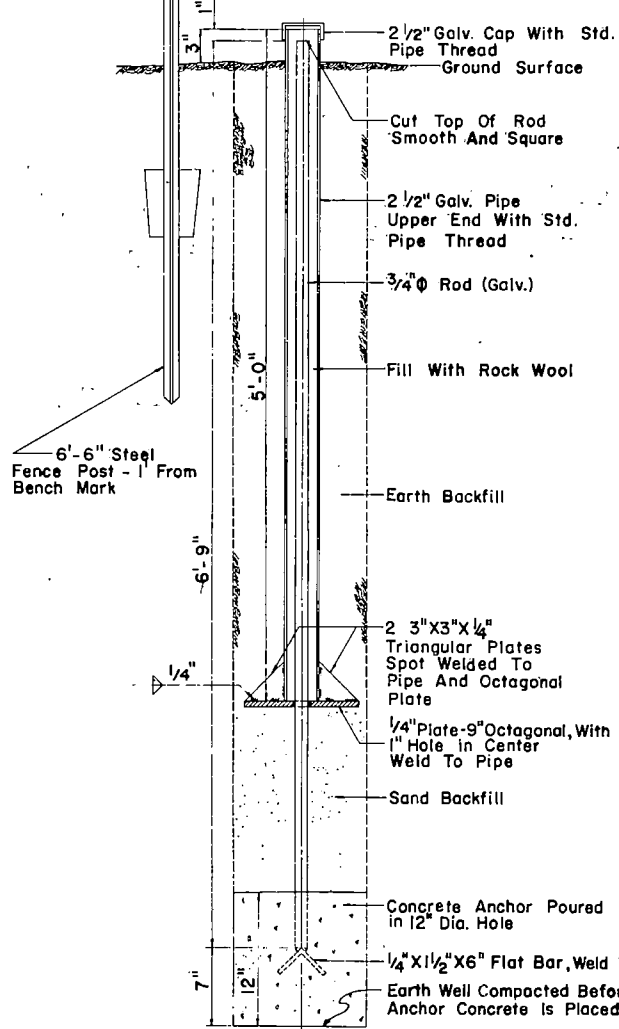
Each set of Bridge Bench Marks consisting of two bench marks and the required number of elevation check points shall be considered as one unit for bidding purposes and the quantity to be paid for shall be the number of sets of bridge bench marks which have been installed complete in place and accepted by the Engineer.

BASIS OF PAYMENT:

Bridge Bench Marks shall be paid for at the contract price bid for each set of Bridge Bench Marks, which price shall be full compensation for all excavation, backfill and clean-up, and for furnishing, hauling and placing all elevation check points, fence posts, galvanized pipe, caps, rods, sand backfill, concrete, rock equipment, tools and incidentals, including galvanizing, necessary to complete this item.

GALVANIZING:

After fabrication the complete assembly shall be Hot Dip Galvanized.

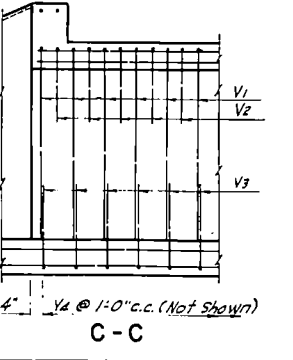
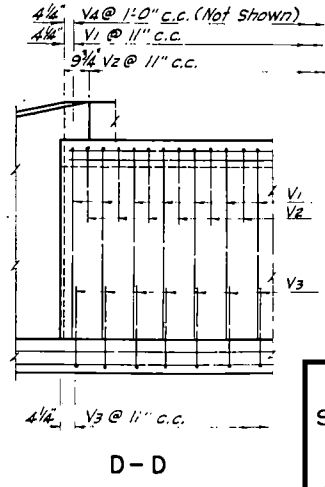
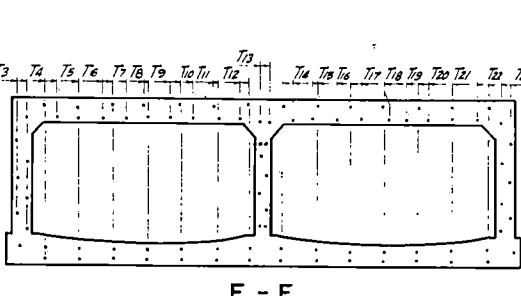
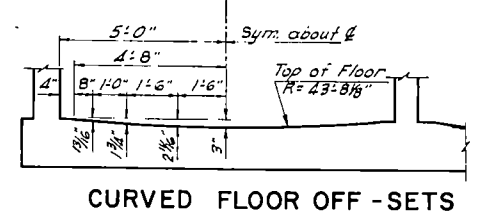
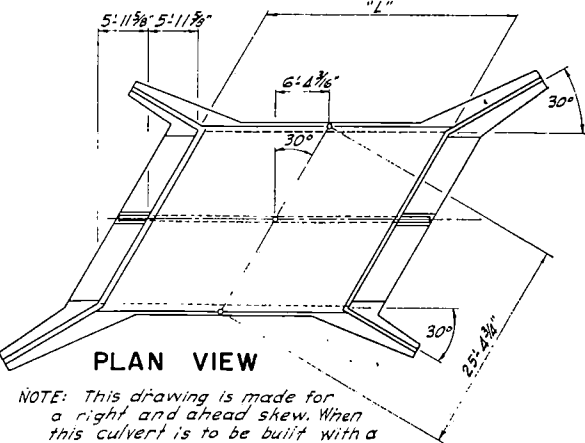
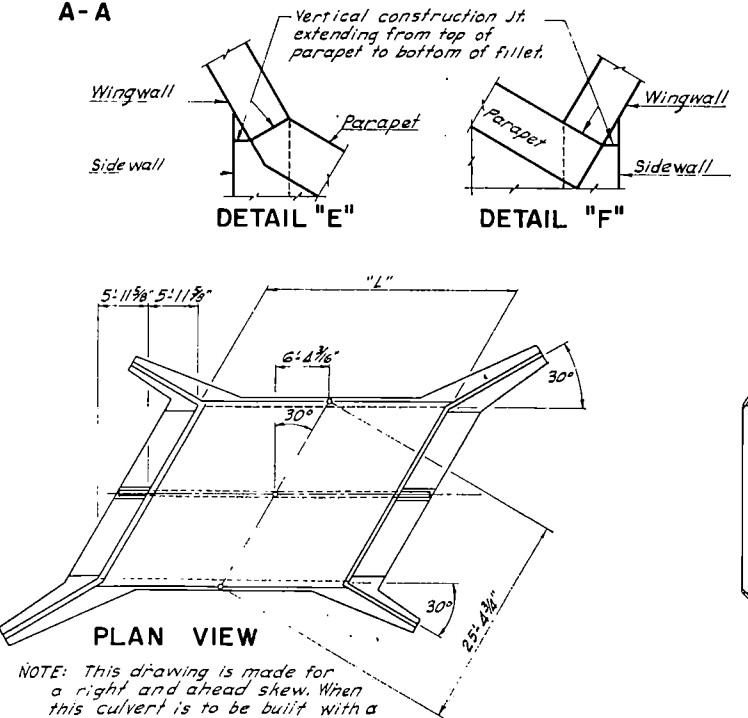
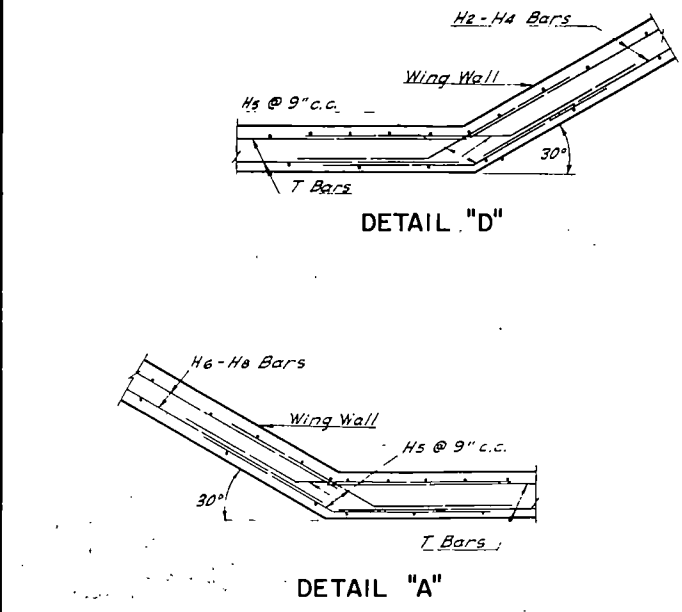
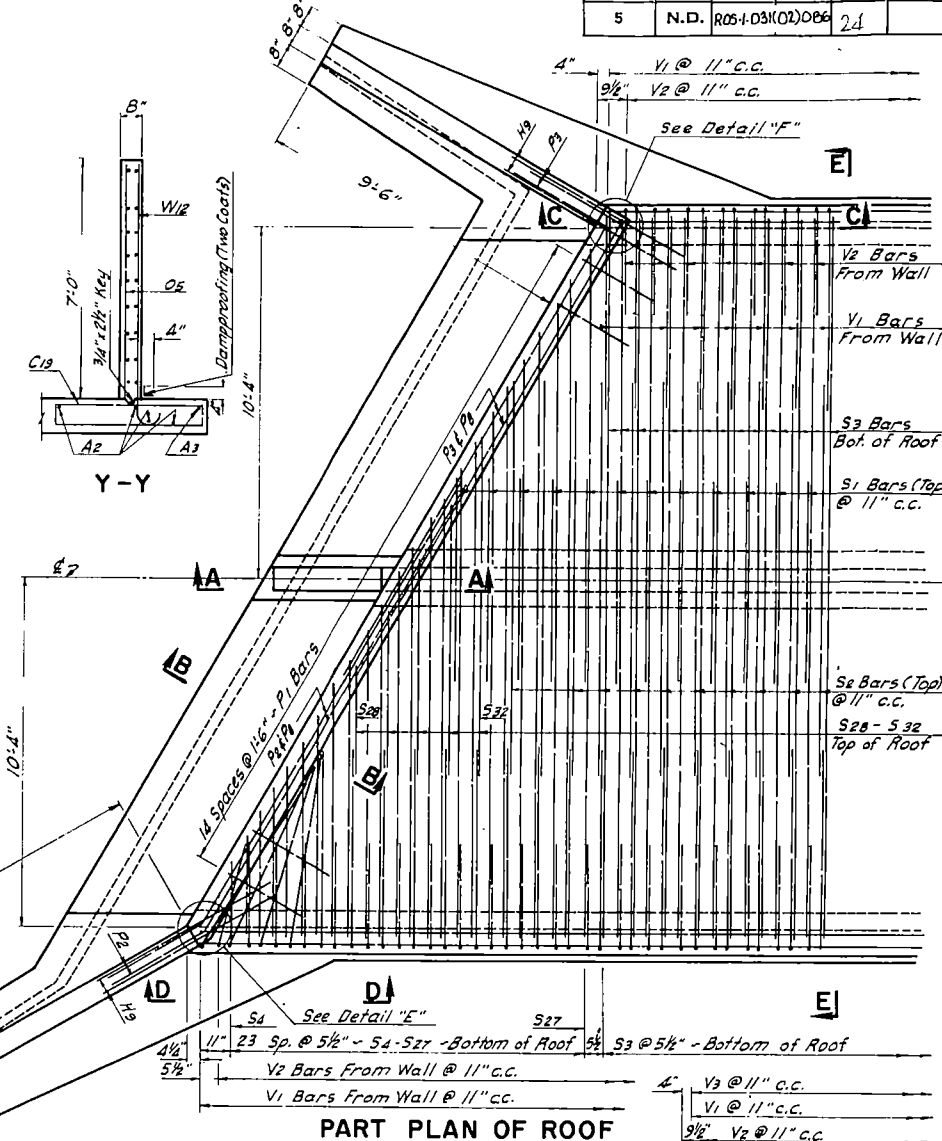
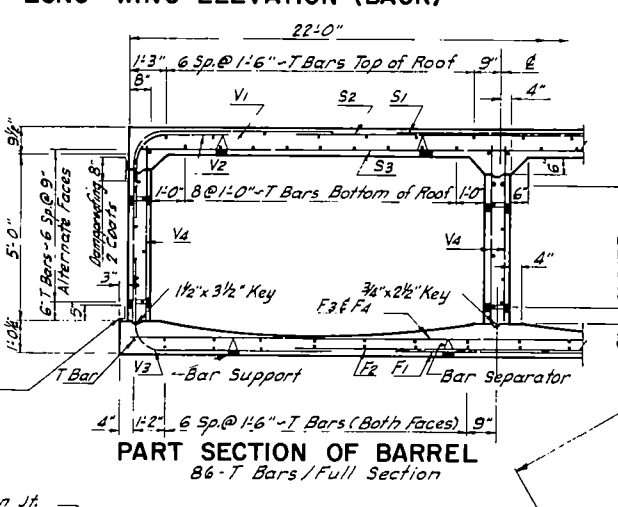
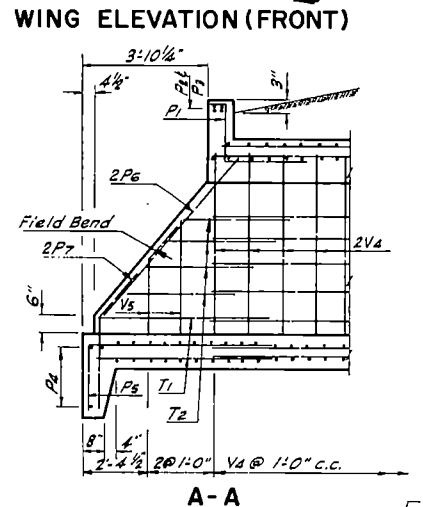
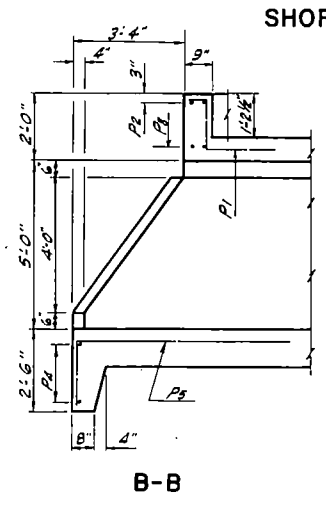
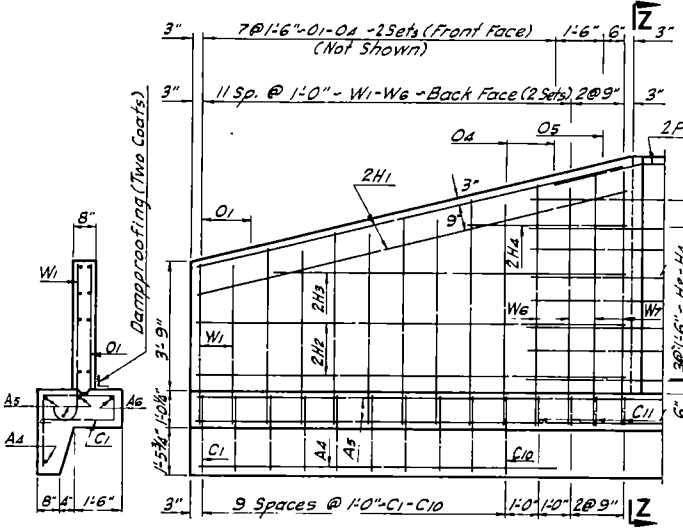
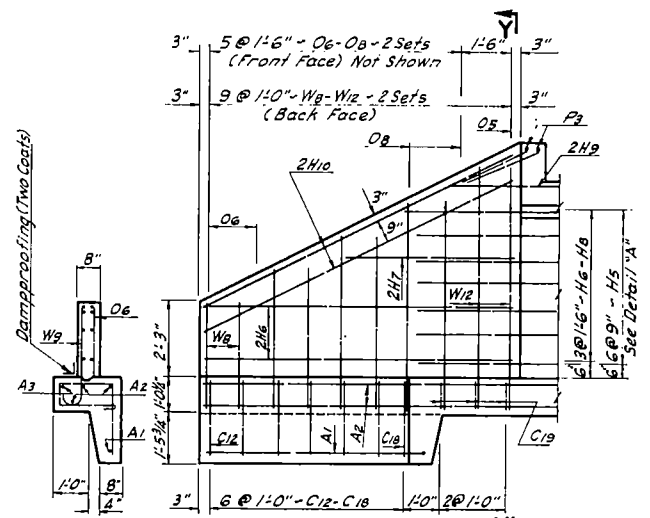
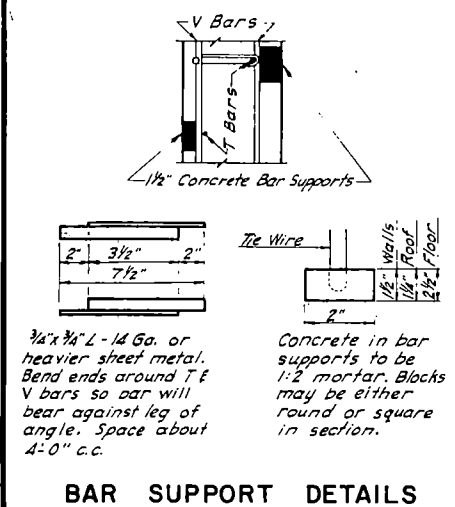


BENCH MARK DETAIL

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
Submitted: *Joseph R. Kirby*
Bridge Engineer
Recommended: *Robert A. Kirby*
Director, State Division
Approved: *Robert A. Kirby*
Chief Engineer
Date: 3-3-58

Revised 10-20-59
Revised 6-9-59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	R05-1-03(02)086	24		



**NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
STANDARD
DOUBLE BOX CULVERT
SKEWED 30°
CLEAR SPAN 2 x 10' CLEAR HEIGHT 5'
MAXIMUM FILL 5'**

APPROVED 3-18-68 *Joseph R. Kirby*
BRIDGE ENGINEER

NOTE: Use T24 bars for box of one section or center section of a three or more section box.

QUANTITIES CHECKED BY TTB

3B6105-1