DESIGN DATA				
Traffic	Average Daily			Est. Max. Hr.
Current 1999	Pass: 3,605	Trucks 645	Total 4,250	425
Forecast 2019	Pass: 5,770	Trucks 1,035	Total 6,805	685
Minimum Sight Dist. for:		Design Speed 70 MPH		
Stopping 600'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 1

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-SIB-1-094(054)161	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT IM-SIB-1-094(054)161
IN BURLEIGH COUNTY
CONCRETE PAVEMENT REPAIR, HOT BITUMINOUS PAVEMENT OVERLAY, AND INCIDENTALS
(EAST BOUND)

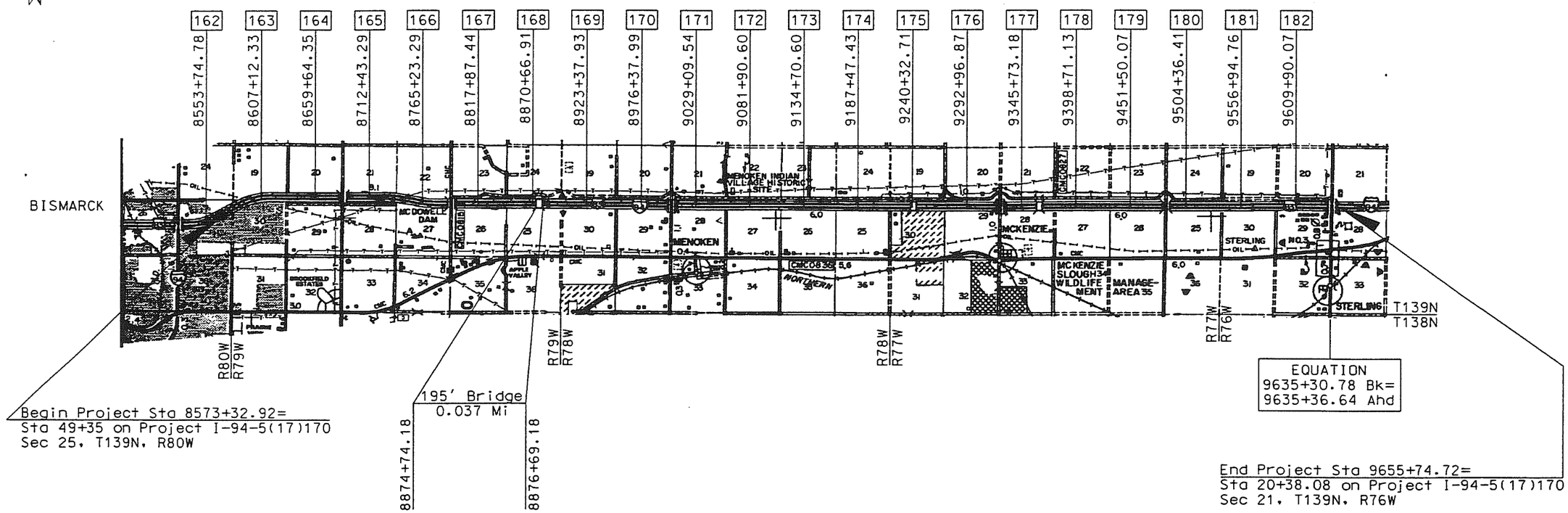
GOVERNING SPECIFICATIONS:

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

LENGTH OF PROJECT

Miles- Gross	Miles- Net
20.499	20.462

0.037 Mi deducted for bridge



DESIGNER Dave Jenkins
DESIGNER Brad Pfeifer
DESIGNER
RECOMMEND APPROVAL 8-17, 1999
DESIGN ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 8-17-99

DIRECTOR OF HIGHWAYS AND ENGINEERING

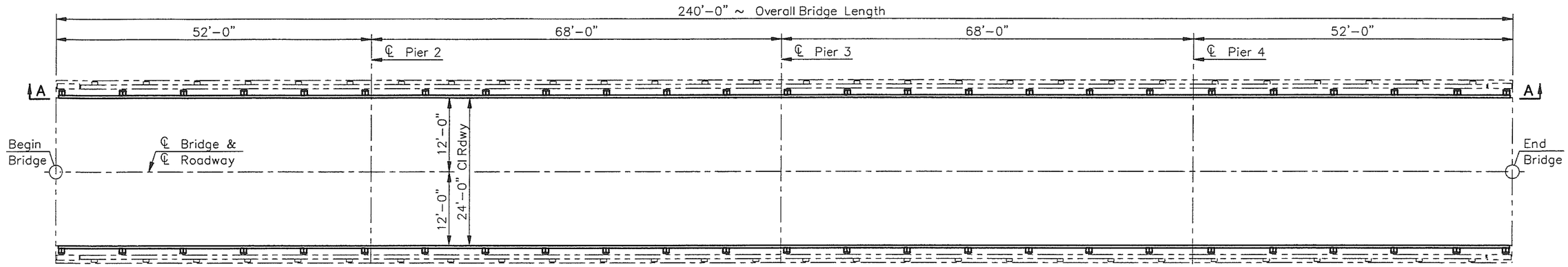
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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

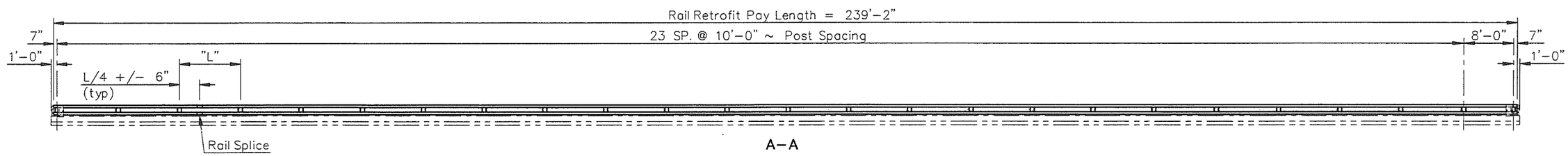
...\design\jenkins\title.dgn Jul. 08, 1999 10:41:56

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

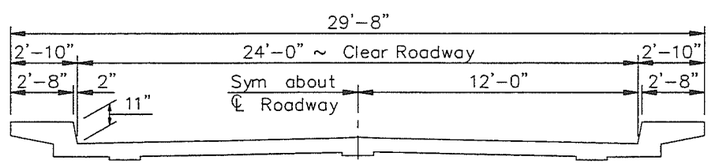
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-SIB-1-094(054)161	95



PLAN



A-A



TYPICAL DECK SECTION

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
624	3001	DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	LF	478.3

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

APPLE CREEK SEPARATION

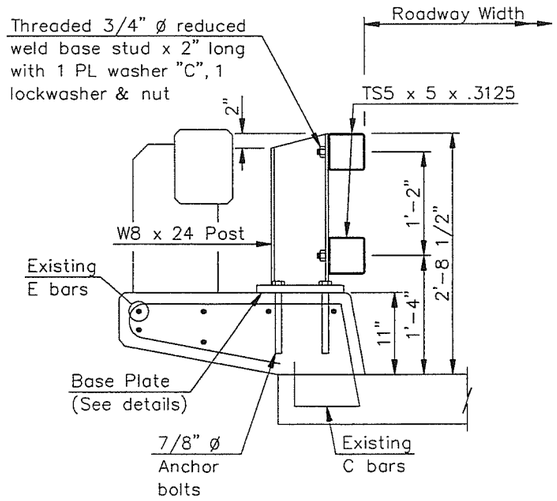
RAIL RETROFIT LAYOUT

PROJECT: IM-SIB-1-094(054)161

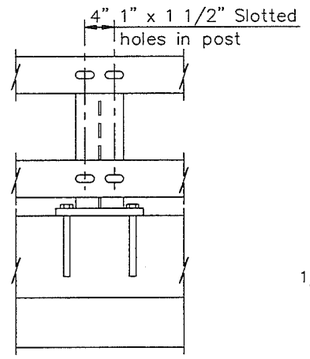
BURLEIGH COUNTY

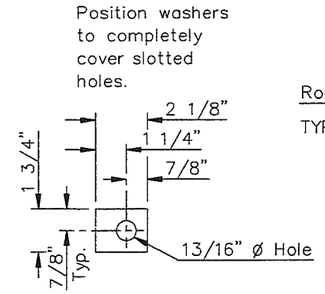
23 U.S.C. 409
NDDOT Reserves All Objections

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-SIB-1-094(054)161	96



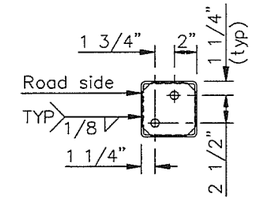
CURB MOUNT POST DETAILS

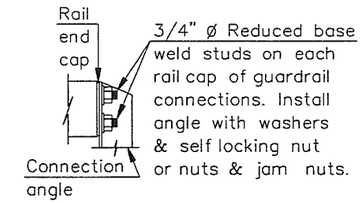




1/4" PL (A36 OR MERCHANT QUALITY)

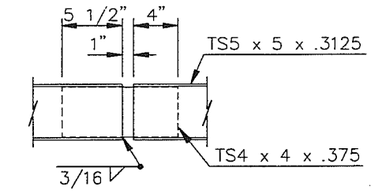
PLATE WASHER "C"



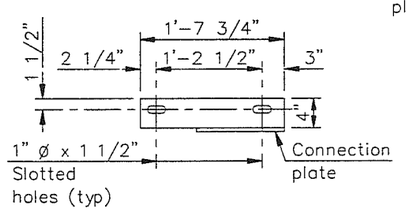


Rail Cap shall be a BAR 4 3/4 x 3/16 x 4 3/4".
Cope corners 3/4" to provide for zinc drains.

RAIL CAP DETAILS

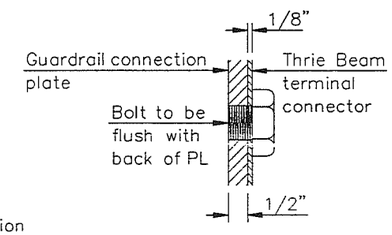


RAIL SPLICE DETAIL

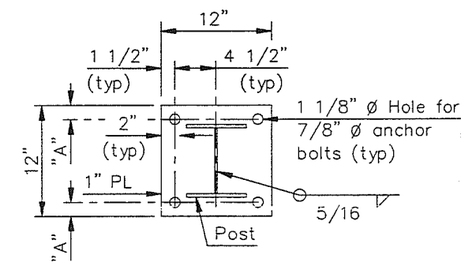


BAR 4 x 3/8

A-A

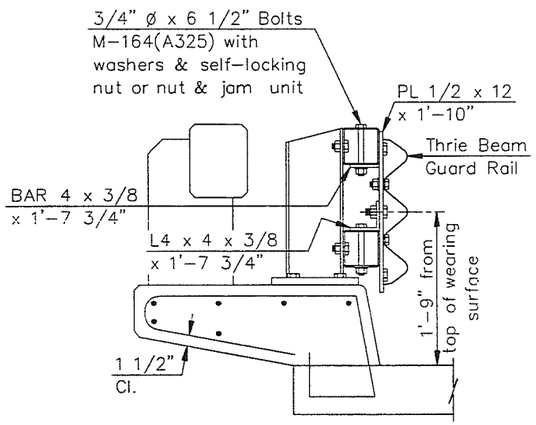


DETAIL "B"

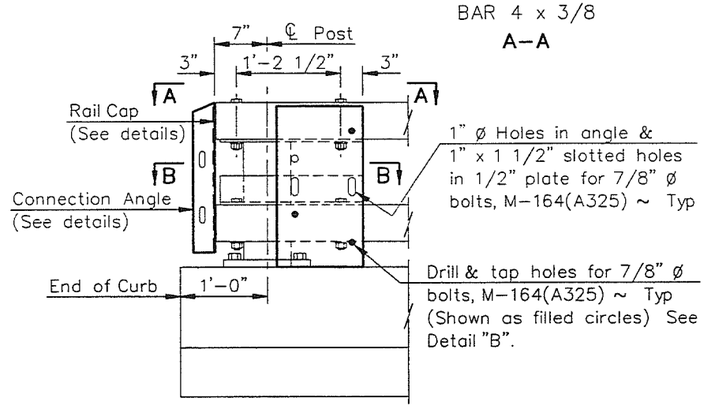


The "A" Dimension is variable, 1 1/2" to 3"

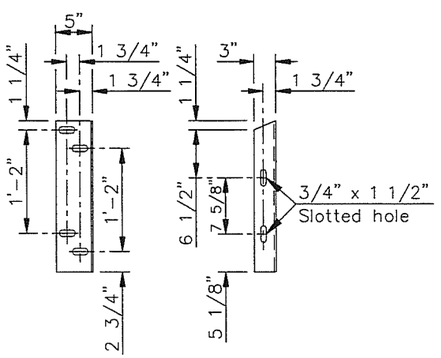
POST BASE PLATE DETAIL



THRIE BEAM CONNECTION DETAIL

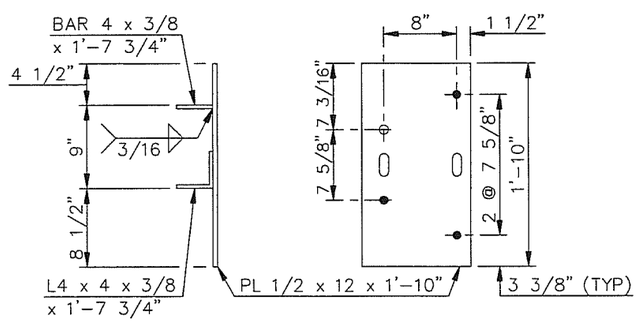


END POST CONNECTION DETAIL



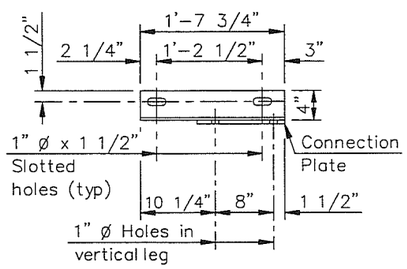
L5 x 3 x 1/4 x 1'-8 1/2"

CONNECTION ANGLE DETAILS



(4 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS



L4 x 4 x 3/8

B-B

NOTES:

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

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

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

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

Payment for the railing shall include compensation for furnishing and installing the guardrail connection plates.

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

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

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

QUANTITIES	
DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	478.3 LF

APPLE CREEK SEPARATION

TRAFFIC RAIL DETAILS

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	AC-IM-1-094(053)161	1

JOB# 3

DESIGN DATA				
Traffic	Average Daily			Est.Max.Hr.
Current 1998	Pass: 3,325	Trucks 700	Total 4,025	400
Forecast 2018	Pass: 5,320	Trucks 1120	Total 6,440	635
Minimum Sight Dist. for:		Design Speed 70 MPH		
Stopping 600'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT AC-IM-1-094(053)161 IN BURLEIGH COUNTY

Concrete Pavement Repair
Hot Bituminous Pavement Overlay
and Incidentals
(Westbound Roadway)

GOVERNING SPECIFICATIONS:

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

LENGTH OF PROJECT

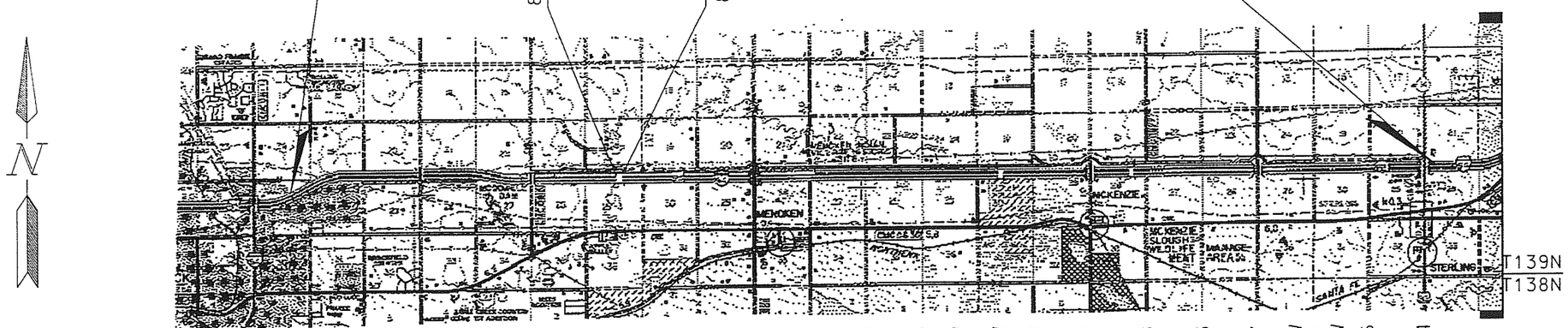
Miles Gross	Miles Net
20.514	20.477

Begin Project Ref. Pt. 162.360
Sta 8572+96.78 (Old Sta 49+35)
Section 25, T139N, R80W

Bridge
0.037 Mile

8873+56.01
8875+51.21

End Project Ref. Pt. 182.874
Sta 9656+04.79 (Old Sta 20+38.08)
Section 21, T139N, R76W



8523+97.92
R80W
8579+13.88
R79W
8633+80.33
8686+85.87
8739+97.71
8792+70.28
8845+18.94
R79W
8897+20.81
R78W
8950+12.56
9003+22.52
9056+09.07
9108+94.40
9161+87.20
R78W
9214+53.53
R77W
9266+05.49
9319+01.87
9371+68.08
9424+47.43
9477+42.87
R77W
9530+24.31
R76W
9582+16.56
9635+36.64

DESIGNER Scott Woodham
DESIGNER
DESIGNER
RECOMMEND APPROVAL May 22, 1998
DESIGN ENGINEER Kenneth E. Bunt

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

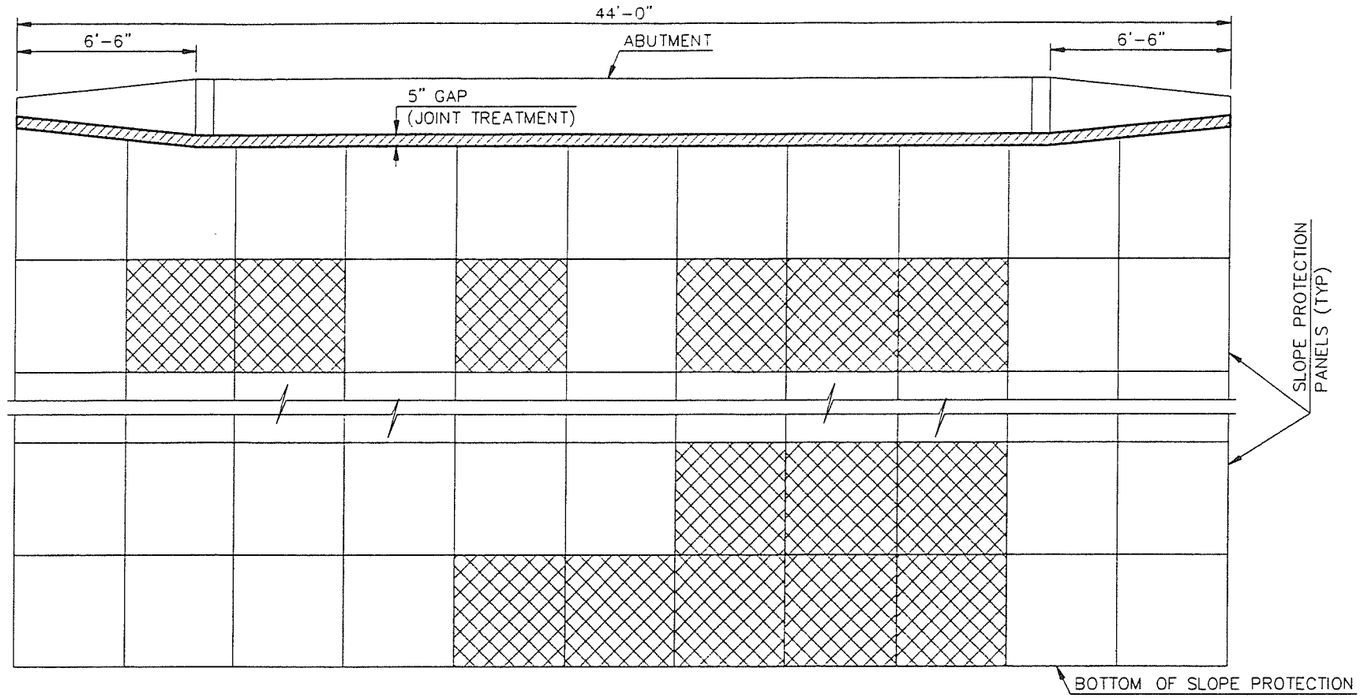
DIVISION ADMINISTRATOR DATE

APPROVED DATE 5-21-98
David K. O. Leer
P.E. 1199
DIRECTOR OF HIGHWAYS AND ENGINEERING
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

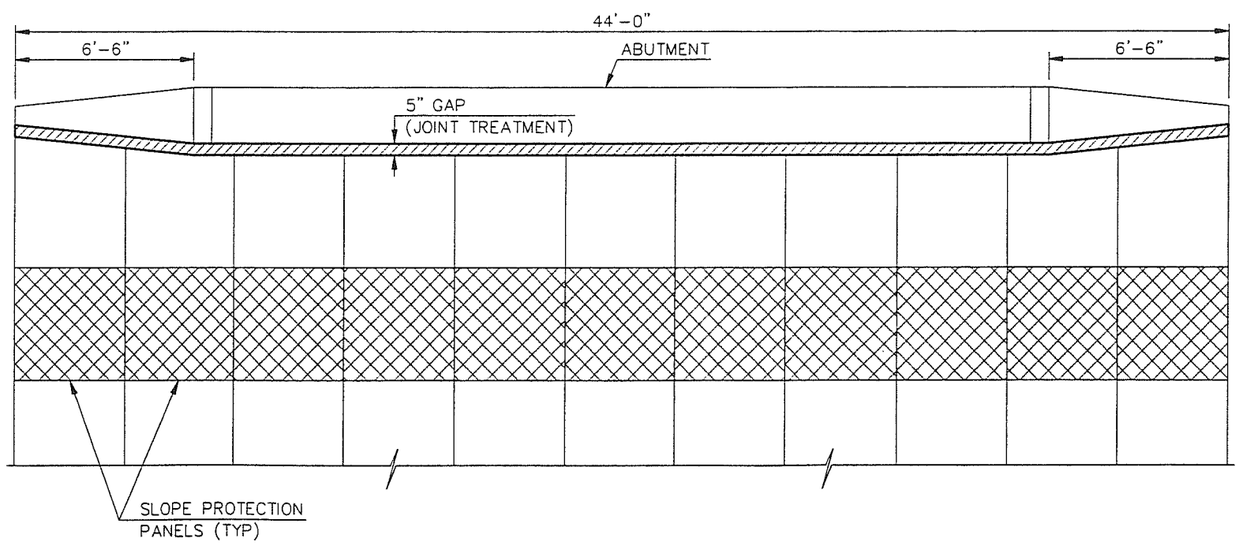
DAVID K. O. LEER
REGISTERED PROFESSIONAL ENGINEER
P.E. 1199
NORTH DAKOTA

...\d_paving\title.dgn May. 18, 1998 08:46:55

FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-1-094(053)161	31



PART SLOPE PROTECTION PLAN AT NORTH ABUTMENT



PART SLOPE PROTECTION PLAN AT SOUTH ABUTMENT

NOTES:

SCOPE OF WORK: THE WORK ON THIS SITE CONSISTS OF FILLING THE GAPS BETWEEN THE ABUTMENT AND THE SLOPE PROTECTION AND REPLACING THE DESIGNATED SLOPE PROTECTION PANELS.

JOINT TREATMENT: THE CONCRETE SLOPE PROTECTION HAS PULLED AWAY FROM THE ABUTMENTS LEAVING A GAP INDICATED BY THE HATCHING. ALL DEBRIS AND SOIL SHALL BE CLEANED OUT OF THE GAPS AND FILLED WITH NON-REINFORCED CONCRETE OR FLOWABLE FILL TO A MINIMUM DEPTH OF 4 INCHES FOR THE FULL WIDTH OF THE GAP. ALL MATERIALS AND LABOR REQUIRED TO PLACE THE CONCRETE OR FLOWABLE FILL SHALL BE INCULDED IN THE PRICE BID FOR "JOINT TREATMENT".

THE MIX DESIGN FOR FLOWABLE FILL SHALL BE AS FOLLOWS:

CEMENT	60 POUNDS/CUBIC YARD
FLY ASH	290 POUNDS/CUBIC YARD
FINE AGGREGATE	2900 POUNDS/CUBIC YARD
WATER	70 GALLONS/CUBIC YARD

CONCRETE SLOPE PROTECTION: THE PANELS MEASURE 4' x 4'. THE SLOPE PROTECTION PANELS INDICATED BY THE CROSS-HATCHING ARE TO BE REMOVED AND REPLACED BY THE CONTRACTOR. ALL CONCRETE REMOVED SHALL BE PROPERLY DISPOSED OF OFF OF THE RIGHT-OF-WAY. ALL MATERIAL AND LABOR REQUIRED TO REMOVE AND REPLACE THE PANELS SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE SLOPE PROTECTION".

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
708	1100	CONCRETE SLOPE PROTECTION	SY	45
950	9712	JOINT TREATMENT	LF	88

STANDARD DRAWINGS

D708-1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

APPLE CREEK SEPARATION

SLOPE PROTECTION REPAIR LAYOUT

PROJECT: IM-1-094(053)161

BURLEIGH COUNTY

5/20/98 — DATE

BRIDGE ENGINEER

SLOPE 98DLS26 LLS

c:\dgn\94-166.531\slope.dgn May. 20, 1998 10:00:40

94-166.531-1

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

JOB # 15

GOLDEN VALLEY, BILLINGS, STARK, MORTON & BURLEIGH COUNTY

SAP-9-0999(011)000

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

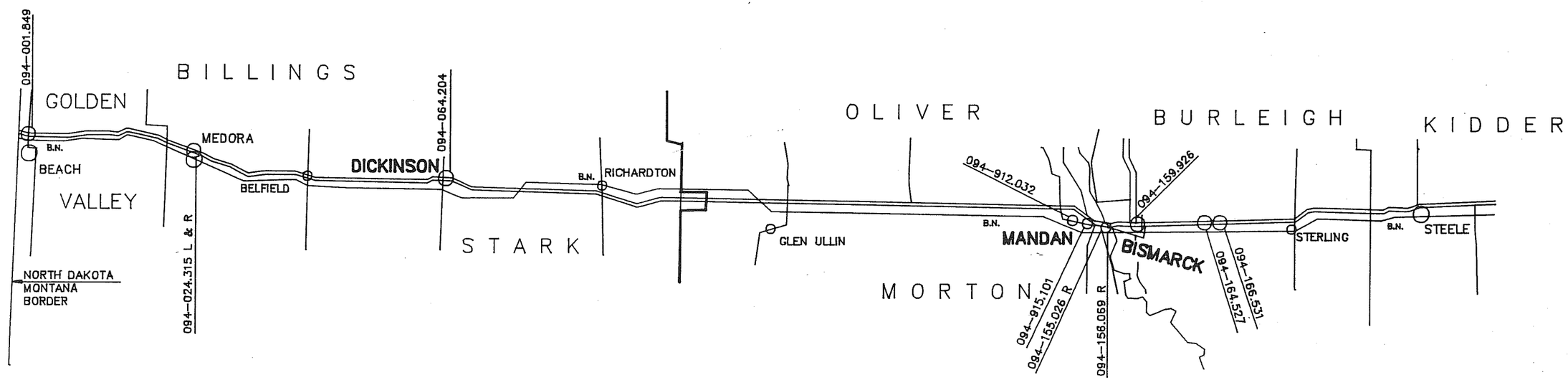
CONTRACT NO. 1

GOVERNING SPECIFICATIONS

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

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	NOTES & QUANTITIES



FOREST D. DUROW
REGISTERED PROFESSIONAL ENGINEER
948
NORTH DAKOTA

1-23-91
DATE

NAME

APPROVED DATE 1-28-91

Ray Cook

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

90LCS123

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

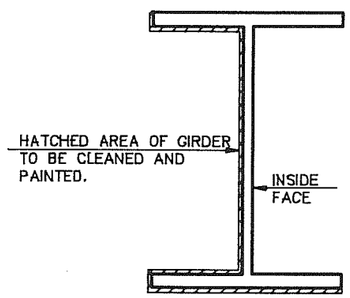
BASIS OF ESTIMATE

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

ESTIMATE OF QUANTITIES

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

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



OUTSIDE GIRDER

GENERAL NOTES

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

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

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

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

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

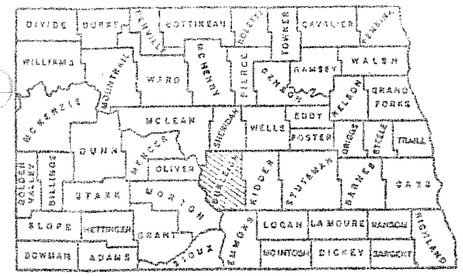
FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN BURLEIGH COUNTY

FEDERAL AID PROJECT NO. I-94-5(10)163

STRUCTURAL



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEETS: 1 IN. = 2000'
- PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT., VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS: AS SHOWN
- CROSS SECTION SHEETS: 1 IN. = 10 FT.

LEGEND

- INTERCHANGE
- HIGHWAY GRADE SEPARATION-NO CONNECTION
- OTHER BRIDGE
- SERVICE ROAD
- TERMINATED CROSS-ROAD

DESIGN DATA

TRAFFIC — AVERAGE DAILY — EST. 30TH MAX. HR.

CURRENT TRAFFIC (1964) 2227 PASS. 393 TRUCKS 2620 TOTAL 593

TRAFFIC FORECAST (1984) 3763 PASS. 1017 TRUCKS 4780 TOTAL 1017

DESIGN SPEED 80 MPH

TRAFFIC CLASSIFICATION "M"

MINIMUM SIGHT DISTANCE (NON PASSING) 725'

FULL CONTROL OF ACCESS no point of access other than by ramps at interchanges

EQUATION
94+80 S. Rd. Bk. = 95+07.6 ℄ Mad.

EQUATION
163+04.24 Both Roads Bk = 163+04.13 ℄ Mad.

EQUATION
219+44.03 S. Rd. Bk. = 219+52.1 ℄ Mad.

EQUATION
220+82.69 N. Rd. Bk. = 220+75.53 ℄ Mad.

EQUATION
259+12.8 S. Rd. Bk. = 259+04.9 ℄ Mad.

EQUATION
260+17.05 N. Rd. Bk. = 260+24.93 ℄ Mad.

EQUATION
95+79.21 N. Rd. Bk. = 95+52.24 ℄ Mad.

LIST OF SPECIAL PROVISIONS

NAME	NO.
Gravel Sub-Base	52 B
Roadway Excavation	53 B
Steel Piling	69 A
Embankment	73 B
Backfill	76 A
Construction Equipment Requirements	82 B & F
Concrete Bridge Construction	88 A
Portland Cement Concrete	89 A
Reinforcing Steel	90
Excavation For Culverts & Bridges	100 A
Piling	102 A
Linseed oil Treatment for Bridges	106 A
Piling	114
Reinf. concrete pipe culverts	91

LIST OF STRUCTURAL DRAWINGS

94-69	94-69	H-0135
94-69-1	94-69-1	H-0401
94-69-2	94-69-2	H-0501
94-69-3	94-69-3	H-1194-1
94-69-4	94-69-4	H-1194-2
94-69-5	94-69-5	H-1194-3
		H-0311

LIST OF STANDARDS

SLOPE PROTECTION	STD 7.5
BRIDGE BENCH MARKS	STD 7.6
STANDARD SIGNS	STD 14.1A-1 & -2
FEDERAL AID NAME PLATE	STD 14.9
R.C.P.-ARCH CULVERTS	STD 4.17

INDEX OF DRAWINGS

SHEET NO. 1	TITLE SHEET & SUMMARY OF QUANTITIES
SHEETS NO. 2-9	TYPICAL SECTIONS
SHEET NO. 10	TO 25 SCALE PLAN AND PROFILE DRAWINGS
SHEETS NO. 26-29	TO 29 SCALE PLAN AND PROFILE
SHEETS NO. 30-33	TO 33 SCALE CROSS SECTIONS
SHEETS NO.	49,51,90,91,92,93,94,96,97,98,99,100,101, 105,106,108,110,111,112,113,114, & 115 FROM I-94-5(9)

LENGTH OF PROJECT

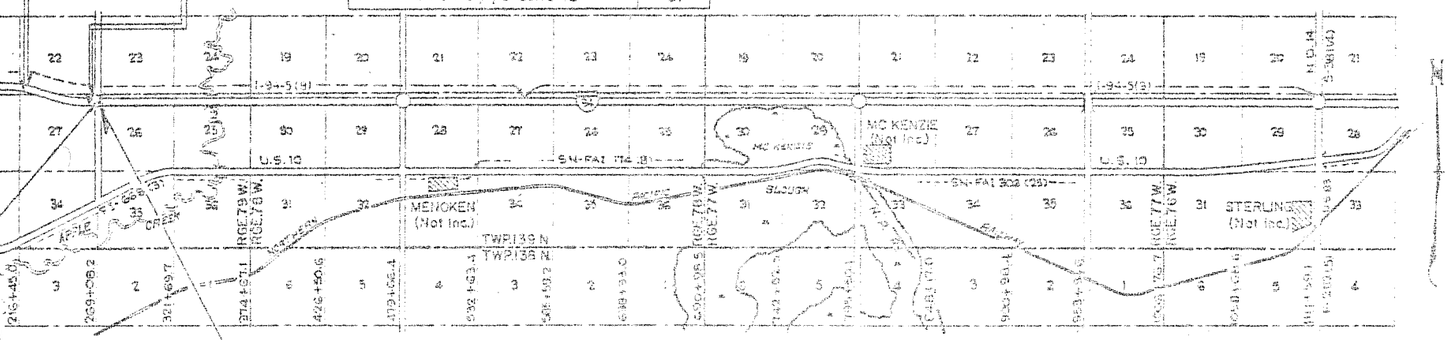
PROJECT	MILES-GROSS	MILES-NET
I-94-5(10)	2.004	0.000
TOTALS	2.004	0.000

GOVERNING SPECIFICATIONS

Standard Specifications adopted by the North Dakota State Highway Department July 1964 and approved as standard by the Bureau of Public Roads Dec. 29, 1964 Required Provisions dated NOV. 12, 1963 and approved by the Bureau of Public Roads NOV. 22, 1963 and other supplemental agreements.

KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
GRADE LINE
CENTERLINE OF CONSTRUCTION
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
ABANDONED RIGHT OF WAY LINE
PROPERTY LINE
STONE WALL
OTHER FENCES
POLE LINES
POWER LINES
BRIDGE
GROUND / GRADE — ELEVATION
TRAVELED WAY
RAILROADS
HEDGES AND TREES
TRAILS
CITY OR VILLAGE CORPORATE LIMITS
SECTION CORNER
QUARTER SECTION CORNER
BUILDINGS
OLD CULVERTS
NEW CULVERTS
DRAINAGE
BENCH MARKS
WATERS EDGE
MARSH
WIRE ROPE GUARD RAIL
SNOW FENCE
RIPRAP
GUARD POSTS
CABLE GUARDS
CONCRETE GUTTERS

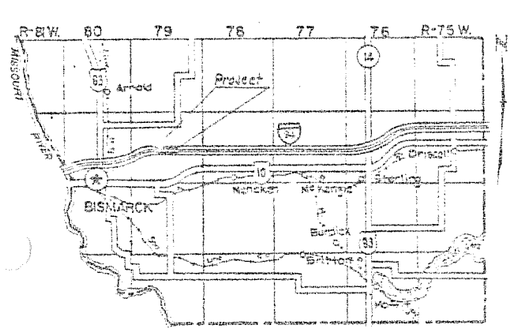


LAYOUT MAP

5000 0 5000
SCALE IN FEET

STA	CLEAR ROAD WIDTH	DESIGN LOADING
163+25.3	24'	H-15 (1944)
269+08.2	24'	H-15 (1944)

Note: Usable fill excavation and embankment areas shall be excavated to the actual depth and shape specified by the structural contractor or location designated by the Engineer. Rough stabilization shall be paid for as Class A Roadway Excavation.



SKETCH MAP OF PART OF BURLEIGH COUNTY

QUANTITIES

LOCATION	15 X ROADWAY EXCAVATION CLASS A	15 B CLASS 2 (1 X AVERAGE)	15 WATER	29 A PIT RUN GRAVEL SUB-BASE CLASS 5A	60 A CLASS AE-2 CONCRETE	60 AA CLASS AE-3 CONCRETE	62 A REINFORCING STEEL (INTERMEDIATE GRADE)	62 A STRUCTURAL STEEL	84 TEMPORARY CROSSING & DETOUR CLASS C (LUMP SUM)	88 B TREATED TIMBER PILING	88 J TREATED TIMBER TEST PILES	88 E STEEL ENCASED CONCRETE PILING	88 M STEEL ENCASED CONCRETE TEST PILES	88 E STEEL PILE EXTENSIONS	90 ROLLED OIL TREATMENT	91 BRIDGE BENCH MARKS	91 R.C.P. ARCH CULVERT	91 R.C.P. ARCH CULVERT END SECTION
										30'	10'	1294 x 232	30				1294 x 232	1294 x 232
	CU. YD.	CU. YD.	M GAL.	CU. YD.	CU. YD.	CU. YD.	LBS.	LBS.	STA.	L.F.	L.F.	EA.	EA.	S.Y.	GAL.	SET	L.F.	NO.
163+25.3	39,422	210	295	110	3237	12.25	71,825	102,300	163+25.3	333	2			410	33	1		
269+08.2	43,377	155	350	115	3021	12.25	71,877	102,300	269+08.2			1440	3	410	33	1	314	4
GRAND TOT	82,800	435	645	225	6258	24.50	143,702	204,600	2 LUMP SUMS	336	2	1440	3	820	66	2	314	4

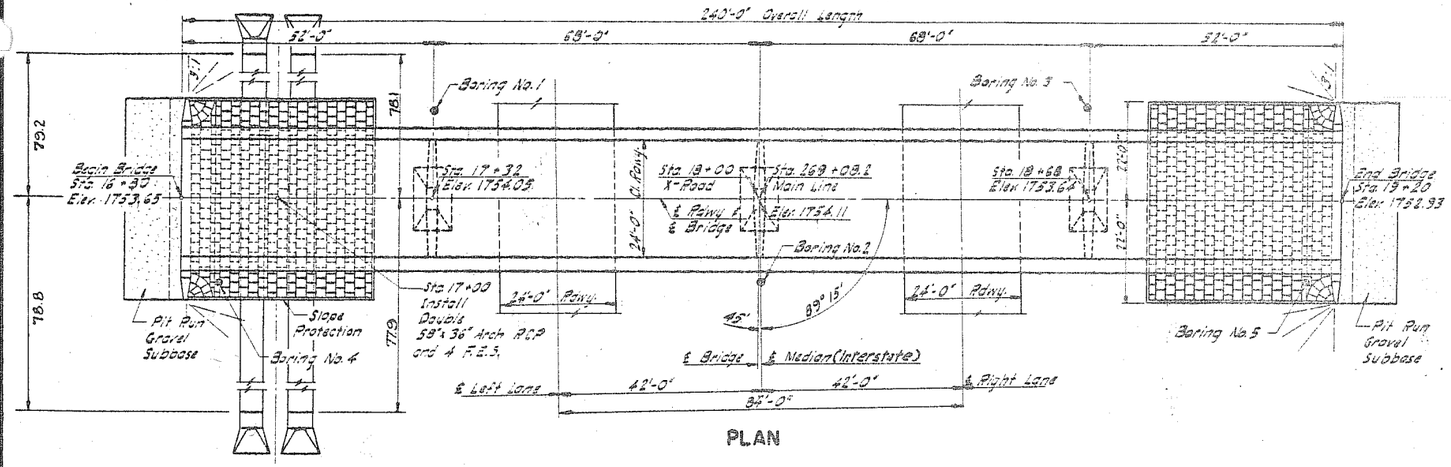
APPROVED — DATE — DATE
CHIEF ENGINEER
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

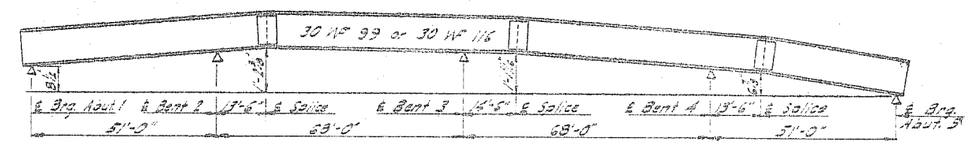
APPROVED

DIVISION ENGINEER — DATE

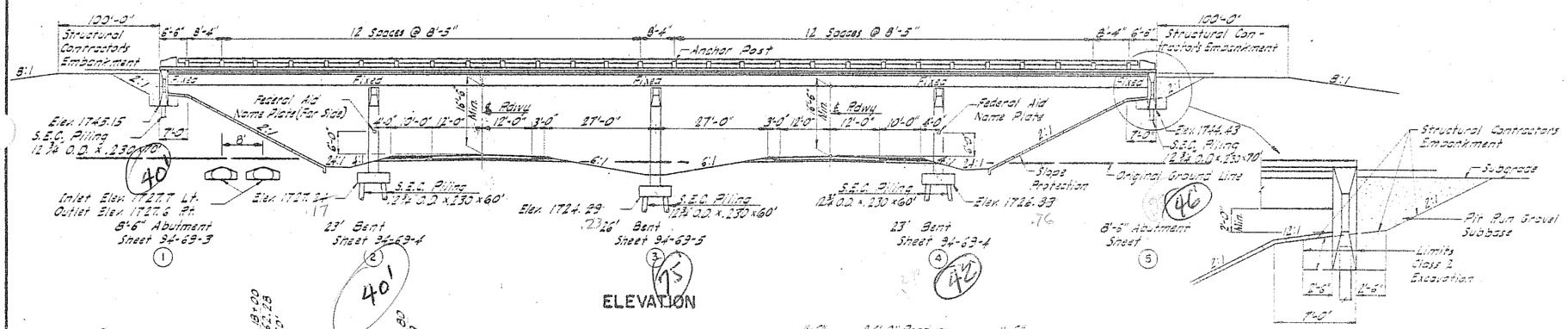
BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
X-771	5	N. D.	I-94-5(10)		14	48



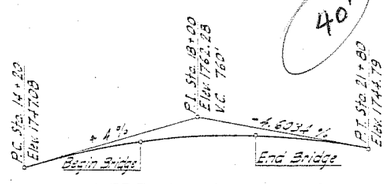
PLAN



SHOP CHAMBER DIAGRAM

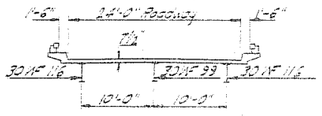


ELEVATION



VERTICAL CURVE DATA

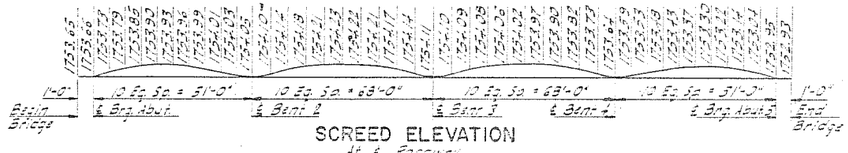
DESIGN STRESSES:
f_s = 20,000 psi ~ Structural Steel
f_s = 20,000 psi ~ Reinforcing Steel
f_c = 1200 psi



DECK SECTION

1965
FEDERAL AID
PROJECT
I-94-5(10)
NORTH DAKOTA
94-69

FEDERAL AID NAME PLATE
2 REQUIRED



SCREED ELEVATION
At ℄ Roadway

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
13	Lg. Rock by P.P.	Sta. 246+31 ~ 38' Lt.	1727.59
24	Fr. Pin by P.P.	Sta. 239+37 ~ 126' Lt.	1744.90
25A	Fr. Pin at N. on Fr.	Sta. 263+33 ~ 253' Lt.	1752.62

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH LOAD	WIND 50 LB.	WIND C.T.M.	WIND 100 LB. L.L.	LONG. FORCE	***	DESIGN LOAD	MAXIMUM DESIGNED PENETRATION	MINIMUM # PENETRATION
Abutments	18.0 T	7.7 T						10.3	36 T	16.3 T	33'
Bents 2 & 4	24.5 T	11.0 T	2.2 T	4.0 T	1.7 T	6.3 T	[illegible]		54.4 T	66.0 T	20'
Bent 3	25.0 T	11.4 T	2.3 T	4.3 T	1.3 T	7.1 T	1.6 T		53.9 T	66.0 T	20'

*** Bent Drag Due to Settlement of Fill
** AASHO Group — Loads
# Begin Bearing at Bottom of Pile

LIST OF SPECIAL PROVISIONS

NAME	NO.
GRAVEL SUBBASE	429
ROADWAY EXCAVATION	638
EMBANKMENT *	715
BACKFILL	764
CONSTRUCTION EQUIPMENT REQUIREMENTS	918 SP
CONCRETE BRIDGE CONSTRUCTION	1444
PORTLAND CEMENT CONCRETE	1834
REINFORCING STEEL	1910
EXCAVATION FOR CULVERTS & BRIDGE	1924
LINSEED OIL TREATMENT	1925
STEEL PILING	1934
PILING	1934A
REINF. CONCRETE PIPE CULVERTS	31

* See 94-69-1 for location

ESTIMATE OF QUANTITIES

SPEC. NO.	BID ITEM		
15X	ROADWAY EXCAVATION "CLASS A"	48,977	CU. YD.
16	WATER FOR COMPACTION (10 GAL./C.Y.)	330	"M" GAL.
15B	EXCAVATION CLASS 2	155	CU. YD.
15C	" CLASS 3		CU. YD.
29H	PIT RUN GRAVEL SUBBASE "CLASS 6A"	115	CU. YD.
60AA	CONCRETE CLASS AA&E-4	12.25	CU. YD.
60AH	" CLASS AE-2	302.1	CU. YD.
62A	REINFORCING STEEL (INTERMEDIATE GRADE)	71,337	LB.
62H	STRUCTURAL STEEL	103,700	LB.
64	REINFORCED CONCRETE PIPE-ARCH CULVERT (58" x 36")	314	LIN. FT.
67	REINFORCED CONCRETE ARCH FLARED END (58" x 36")	4	EACH
68A	UNTREATED timber PILING FT.		LIN. FT.
68B	TREATED TIMBER PILING FT.		LIN. FT.
68E	STEEL ENCASED CONCRETE PILING (12¾" O.D. x .250")	1440	LIN. FT.
68G	STEEL ENCASED CONCRETE PILING (14" O.D. x .250")		LIN. FT.
68L	STEEL ENCASED CONCRETE TEST PILING 14" O.D. x .250" (8 BUFF. BEAR.)		
1A	TEMPORARY CROSSING AND DETOUR (CLASS C)		LUMP SUM
*	BRIDGE BENCH MARKS		1 EA.
*	LINSEED OIL TREATMENT	33	GAL.
	SITE PREPARATION	35,324	
	* SEE SPECIAL PROVISIONS		

STRUCTURAL DRAWINGS

GENERAL DRAWING 94-69-1 (THIS SHEET), 94-69-2, 94-69-3, STD. 8.1, STD. 7.8, [illegible]
SUBSTRUCTURE 94-69-3, 94-69-4, 94-69-5, [illegible] STD. 7.4
SUPERSTRUCTURE HIGHWAY STANDARD 8.1, [illegible] STD. 7.5

DESIGN LOADING: H-15 (1.25)
SCALE: 1 INCH = [illegible] FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

APPLE CREEK SEPARATION
BRIDGE LAYOUT

PROJECT I-94-5(10) STA. 269+08.2

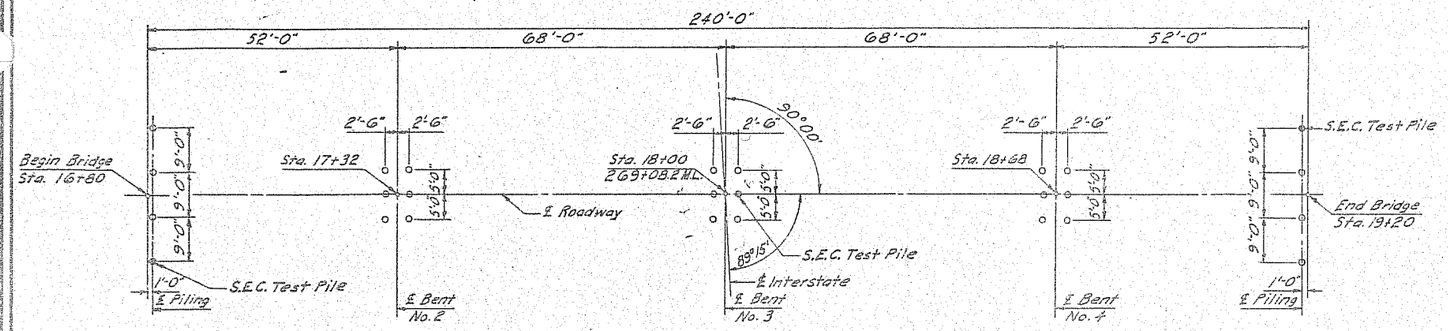
BURLEIGH COUNTY

APPROVED
9-11-64 Joseph P. Kelly
DATE PRESIDENT

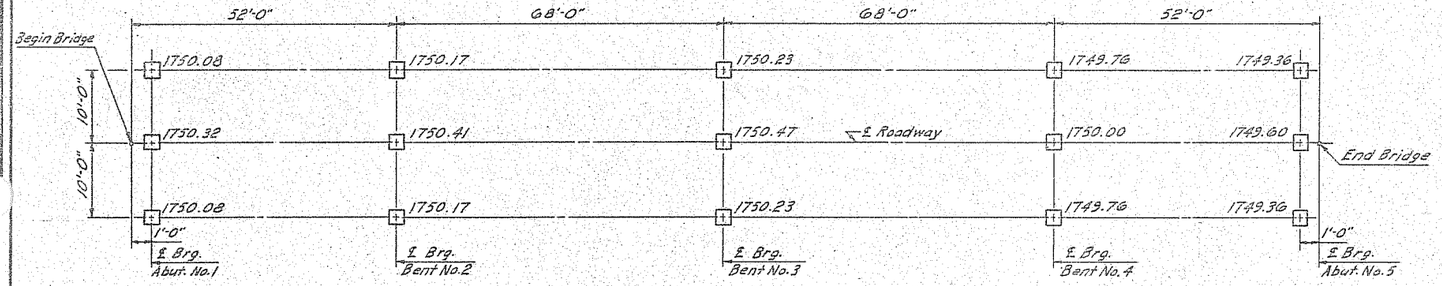
94-69

94-69

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-94-5(10)		15	48



PILING LAYOUT



BEARING PLATE LAYOUT

GENERAL:

THE COST OF FURNISHING AND PLACING DAMPPROOFING, ASPHALT CURB SEAL, NAME PLATES, END POSTS PILE SLEEVES, CURB SLEEVES, AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CLASS AE-2 CONCRETE.

DEAD LOAD DEFLECTIONS AND VERTICAL CURVE CORRECTIONS HAVE BEEN ACCOUNTED FOR IN THE SCREED ELEVATIONS ON THE BRIDGE LAYOUT.

EMBANKMENT:

EMBANKMENT MATERIAL SHALL BE OBTAINED FROM THE LOCATIONS AS SHOWN ON THE PLAN AND PROFILE SHEETS.

THE EMBANKMENT AT THE ABUTMENTS SHALL BE IN PLACE BEFORE ANY ABUTMENT PILING ARE DRIVEN.

THE CONTRACTOR WILL BE REQUIRED TO PREDRILL THROUGH THE FILL AT THE ABUTMENTS BEFORE ANY PILING ARE DRIVEN.

ALL PILOT HOLES DRILLED FOR PILING, BUT NOT COMPLETELY FILLED BY THE PILES, SHALL BE BACKFILLED WITH SAND OR FINE GRAVEL BEFORE SUBSTRUCTURE IS PLACED.

THE PIT RUN GRAVEL SUBBASE SHALL NOT BE PLACED ABOVE THE BERM ELEVATION UNTIL THE SUPERSTRUCTURE DECK HAS BEEN PLACED.

EXCAVATION:

EXCAVATION CLASS 2 AT THE ABUTMENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTING TO THE UPPER LIMITS AS SHOWN ON THE BRIDGE LAYOUT.

EXCAVATION CLASS 2 AT THE BENTS SHALL EXTEND VERTICALLY FROM THE BOTTOM OF THE FOOTING TO THE FINISHED PROFILE OR TO THE ORIGINAL GROUND WHICHEVER IS LOWER. THE HORIZONTAL LIMITS SHALL BE AS SHOWN ON THE BENT DETAIL SHEETS.

PILING:

THE PILE LENGTHS SHOWN ON THE PLANS FOR EACH SUBSTRUCTURE UNIT ARE APPROXIMATE LENGTHS ONLY, BASED ON THE ENGINEER'S ESTIMATE OF CONDITIONS, AND ARE NOT TO BE CONSTRUED AS FINAL PAY LENGTHS. FINAL PILE LENGTHS IN PLACE SHALL BE DETERMINED BY DRIVING EACH PILE TO DRIVING BEARING EQUAL TO AT LEAST THE DESIGN PILE LOAD BUT NOT MORE THAN THE MAXIMUM REQUIRED BEARING SHOWN UNLESS: (1) THE MINIMUM PENETRATION HAS NOT BEEN REACHED; (2) THE CONTRACTOR IS OTHERWISE INSTRUCTED BY THE ENGINEER.

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 OR STRUCTURES.

CONCRETE:

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

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

ALL CONCRETE ABOVE THE TOP OF THE CURBS EXCEPT END POSTS SHALL BE CLASS AAE-4. ALL OTHER CONCRETE SHALL BE CLASS AE-2 AND SHALL BE COMPACTED BY VIBRATION.

THE DECK SLAB CONCRETE SHALL BE STRUCK OFF AND COMPACTED BY AN APPROVED DECK FINISHING MACHINE.

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

TEMPORARY CROSSING AND DETOUR:

A TEMPORARY CROSSING AND DETOUR SHALL BE CONSTRUCTED BY THE STRUCTURAL CONTRACTOR IN ACCORDANCE WITH STANDARD DRAWING H-0311 AND AS DIRECTED BY THE ENGINEER. IT SHALL BE SIMILAR TO TYPE X WITH A CLASS C ROADWAY SECTION.

CONSTRUCTION OF THE "TEMPORARY CROSSING AND DETOUR" WILL BE PAID FOR AS ONE "LUMP SUM."

THE REMOVAL OF THE DETOUR WILL BE THE RESPONSIBILITY OF THE GRADING CONTRACTOR.

SHORING:

THE CONTRACTOR WILL BE PERMITTED TO USE MANUFACTURED SHORING TO SUPPORT SLAB FORMS EXCEPT OVER SPLICE AND COVER PLATES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING AND STABLIZING THE BENTS UNTIL THE SUPERSTRUCTURE HAS BEEN PLACED.

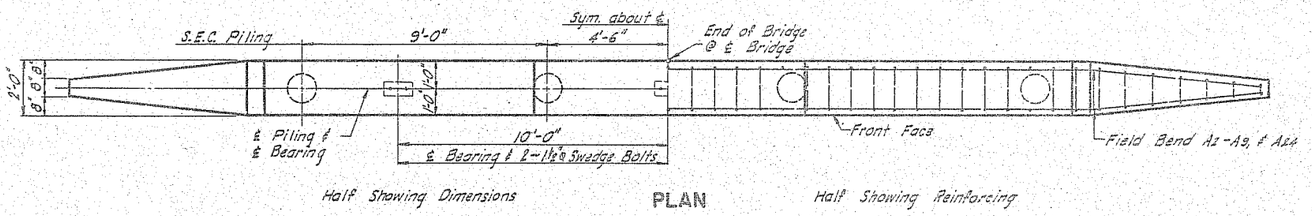
DAMAGE TO UNDERGROUND UTILITIES:

THE CONTRACTOR SHALL USE SPECIAL CARE TO PREVENT DAMAGE TO ALL PIPES, CABLES, AND OTHER UNDERGROUND UTILITY FACILITIES. THE CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY DAMAGE TO UNDERGROUND UTILITY FACILITIES RESULTING FROM ANY ACT OR OMISSION ON HIS PART, REGARDLESS OF WHETHER OR NOT THE TYPE OR LOCATION OF SUCH FACILITIES IS SHOWN ON THE PLANS. THE DAMAGED FACILITIES SHALL BE RESTORED TO A CONDITION SIMILAR OR EQUAL TO THAT EXISTING BEFORE SUCH DAMAGE WAS DONE. IF IT IS DETERMINED BY THE ENGINEER THAT ADJUSTMENT OR RELOCATION OF SUCH UNDERGROUND FACILITIES IS NECESSARY TO ACCOMODATE CONSTRUCTION THE ENGINEER WILL MAKE THE NECESSARY ARRANGEMENTS WITH THE OWNER, IF SUCH WORK IS NOT OTHERWISE PROVIDED FOR IN THE PROJECT PLANS OR PROPOSAL.

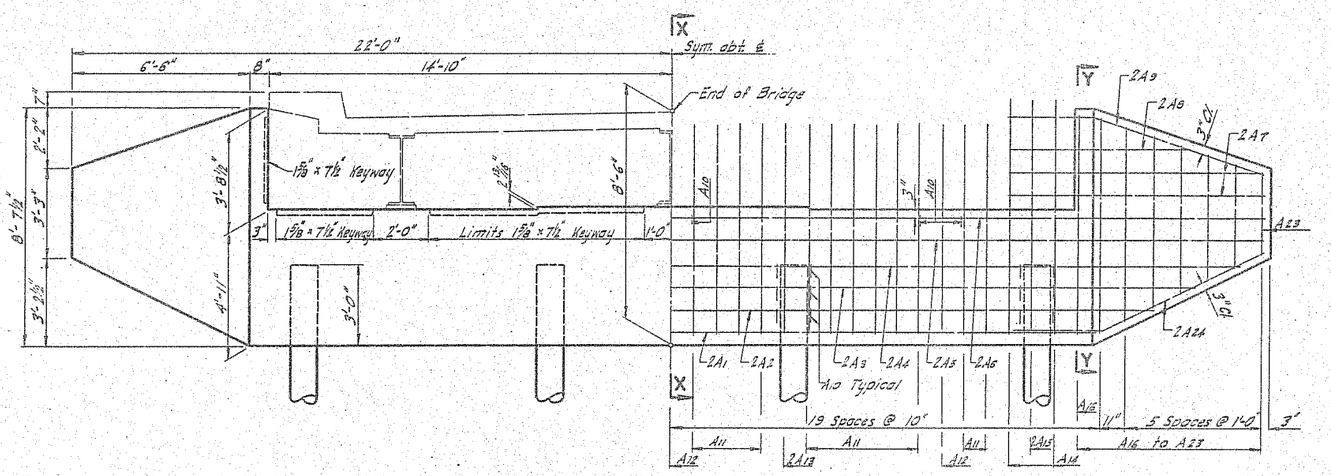
TRACING | MADE BY L.E.B. | CHECKED BY | ENTITIES | MADE BY | CHECKED BY

APPLE CREEK SEPARATION
BEARING PLATE LAYOUT
PILING LAYOUT
GENERAL NOTES

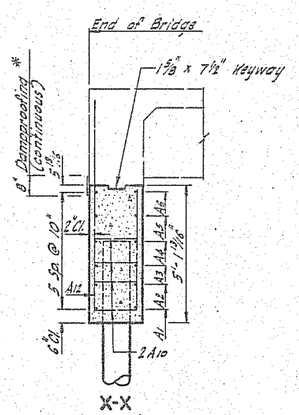
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOT. SHEETS
5	N.D.	I-94-3(10)		17	48



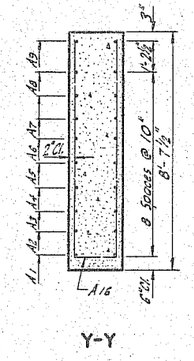
Half Showing Dimensions — PLAN — Half Showing Reinforcing



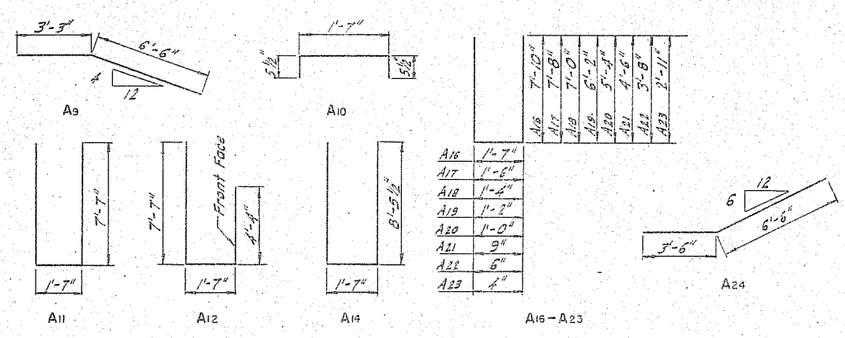
Half Showing Dimensions — ELEVATION — Half Showing Reinforcing



X-X



Y-Y



BENT BAR DETAILS

* Dampproofing: Two coats of dampproofing shall be applied to construction joints that will be covered by earth.

"Dampproofing Two Coats" shall be applied in accordance with Section 90 of the Standard Specs. Dampproofing will not be paid for directly but shall be included in the unit price bid for Class AE-2 concrete.

BAR LIST ~ one abut.

MARK	NO.	SIZE	LENGTH	SHAPE
A1	2	6	31'-6"	Str.
A2	2	5	35'-0"	"
A3	2	5	38'-6"	"
A4	4	5	21'-9"	"
A5	4	5	22'-9"	"
A6	4	6	23'-0"	"
A7	8	5	9'-3"	"
A8	4	5	6'-6"	"
A9	4	6	9'-9"	Bent
A10	30	4	2'-6"	"
A11	24	5	16'-9"	"
A12	3	5	13'-6"	"
A13	4	5	7'-6"	Str.
A14	4	5	18'-6"	Bent
A15	4	5	8'-6"	Str.
A16	2	5	17'-3"	Bent
A17	2	5	16'-10"	"
A18	2	5	15'-4"	"
A19	2	5	13'-6"	"
A20	2	5	11'-8"	"
A21	2	5	9'-9"	"
A22	2	5	7'-10"	"
A23	2	5	6'-2"	"
A24	4	6	10'-0"	"

QUANTITIES (ONE ABUT.)

Concrete Class AE-2	15.9 C.Y.
Reinforcing Steel	1656 Lb.
Excavation (See Layout)	
Piling (See Layout)	

APPLE CREEK SEPARATION

8'-6" ABUTMENT DETAILS

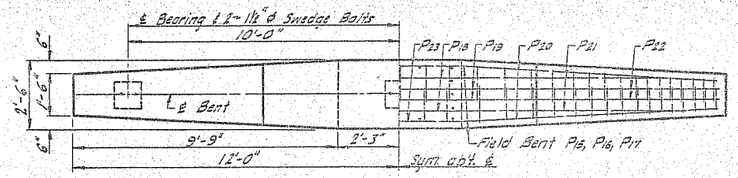
24'-0" ROADWAY

H15 LOADING

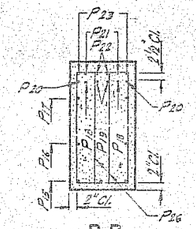
TRACING — MADE BY — CHECKED BY — MADE BY — CHECKED BY — ANTITIES

94-69-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-94-2(10)		18	48

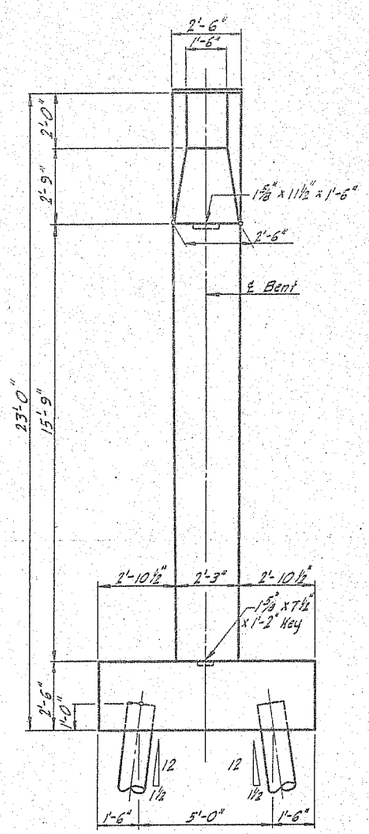


Half Dimensioned — CAP PLAN — Half Reinforcing



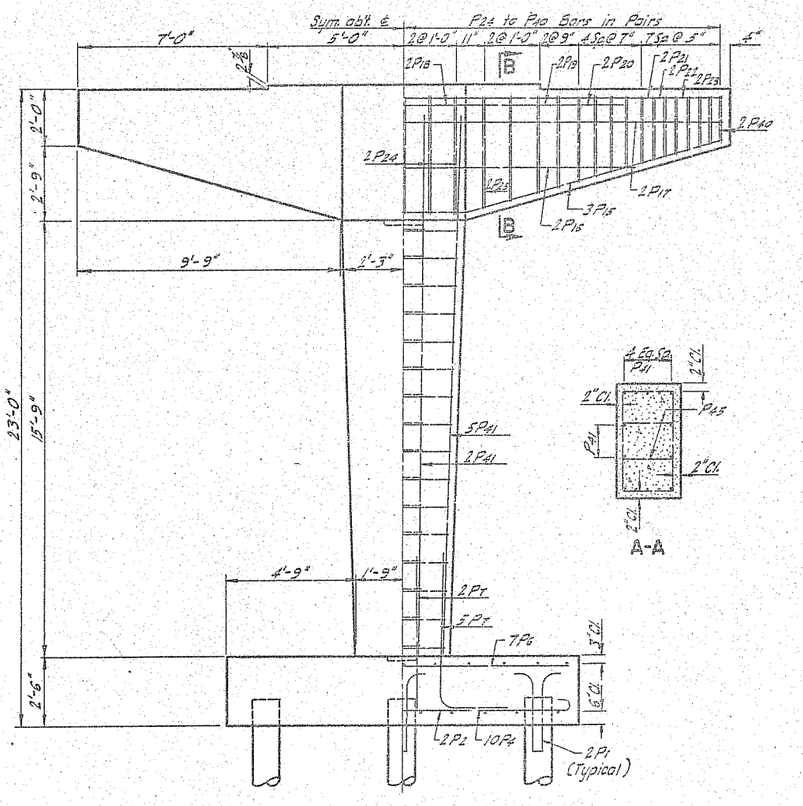
B-B

Center P18-P21 Bars over ℄ Column



END VIEW

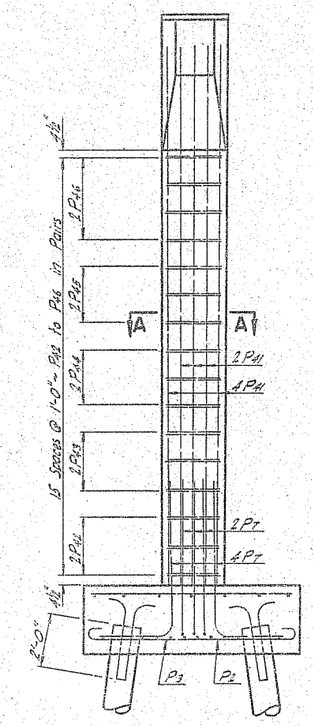
Showing Dimensions



ELEVATION

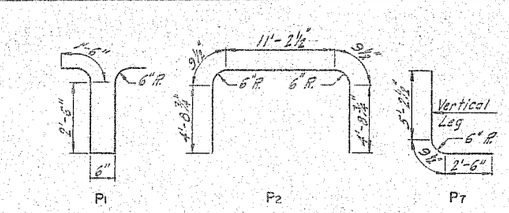
Half Dimensioned — Half Reinforcing

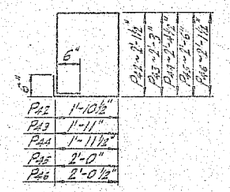
A-A



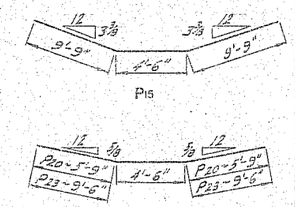
END VIEW

Showing Reinforcing (Cap Reinforcing Not Shown)

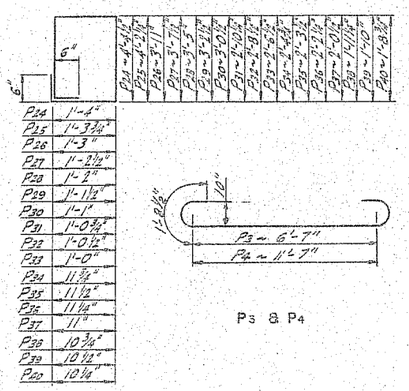




P42 - P46



P20 & P23



P24 - P40

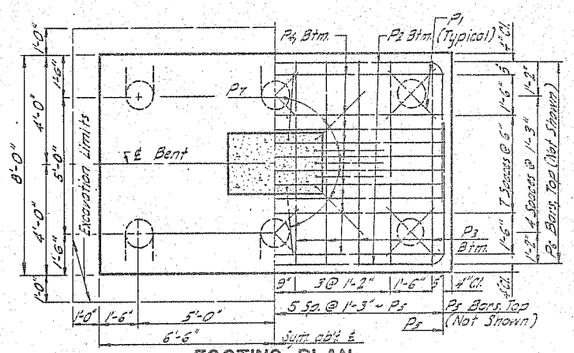
P3 & P4

BENT BAR DETAILS

BAR LIST ~ one bent					
	MARK	NO.	SIZE	LENGTH	SHAPE
Footing	P1	12	6	8'-6"	Bent
	P2	2	11	22'-3"	"
	P3	10	11	10'-0"	"
	P4	10	11	15'-0"	"
	P5	11	6	7'-6"	Str.
	P6	7	6	12'-6"	"
	P7	14	9	8'-6"	Bent
Cap	P15	3	6	24'-0"	"
	P16	2	6	16'-6"	Str.
	P17	2	6	23'-6"	"
	P18	2	10	10'-6"	"
	P19	2	10	13'-6"	"
	P20	2	10	16'-0"	Bent
	P21	2	11	20'-0"	Str.
	P22	2	11	23'-6"	"
	P23	2	11	23'-6"	Bent
	P24	10	5	12'-5"	"
	P25	4	5	12'-0"	"
	P26	4	5	11'-4"	"
	P27	4	5	10'-8"	"
	P28	4	5	10'-2"	"
	P29	4	5	9'-9"	"
	P30	4	5	9'-3"	"
	P31	4	5	8'-10"	"
	P32	4	5	8'-6"	"
	P33	4	5	8'-1"	"
	P34	4	5	7'-9"	"
	P35	4	5	7'-6"	"
	P36	4	5	7'-3"	"
	P37	4	5	6'-11"	"
	P38	4	5	6'-8"	"
	P39	4	5	6'-5"	"
	P40	4	5	6'-2"	"
Column	P41	14	9	19'-6"	"
	P42	6	4	9'-0"	Bent
	P43	6	4	9'-4"	"
	P44	6	4	9'-8"	"
	P45	6	4	10'-0"	"
	P46	8	4	10'-4"	"

NOTE:

The concrete in the column shall set at least two hours before the cap is placed.



FOOTING PLAN

Half Dimensioned — Half Reinforcing

QUANTITIES (ONE BENT)	
Concrete (Class "E")	22.2 C.Y.
Reinforcing Steel	3500 lbs.
Epoxidation (See Layout)	
Piling (See Layout)	

APPLE CREEK SEPARATION

23'-0" BENT DETAILS

24'-0" ROADWAY

HS LOADING

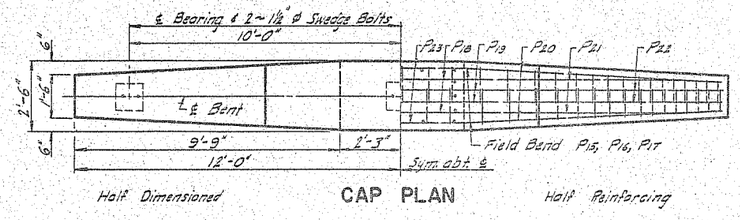
TRACING MADE BY G.A.L. CHECKED BY F.D.H.

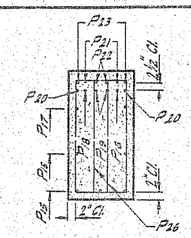
ANTITIES MADE BY G.A.L. CHECKED BY F.D.H.

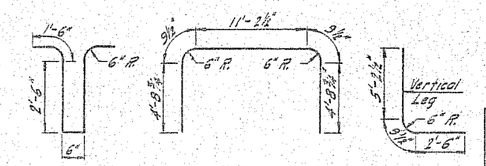
94-69-4

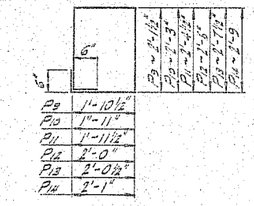
94-69-4

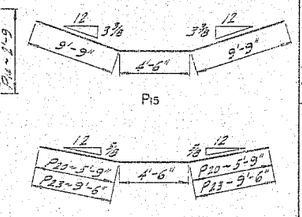
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOT. SHEETS
5	N.D.	X-94-5(10)		19	48

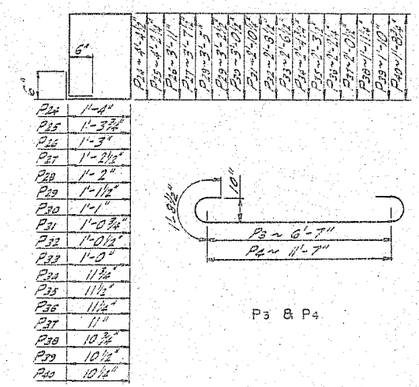




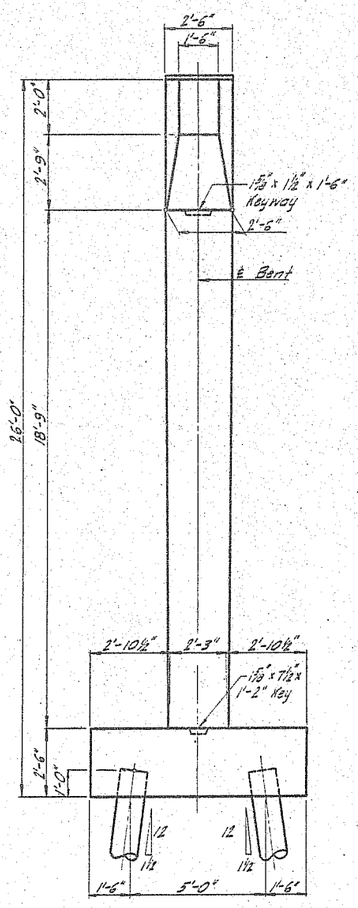


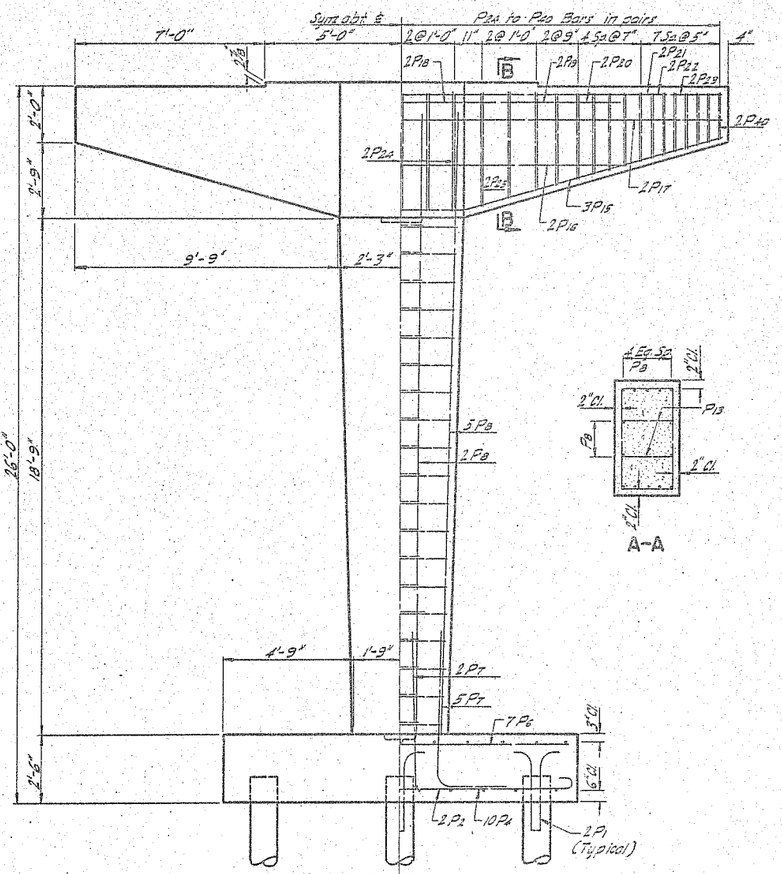


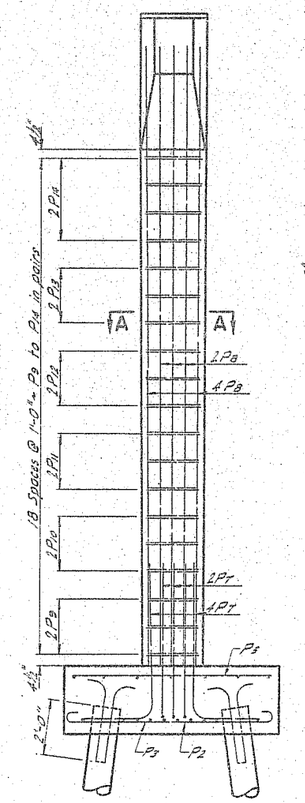


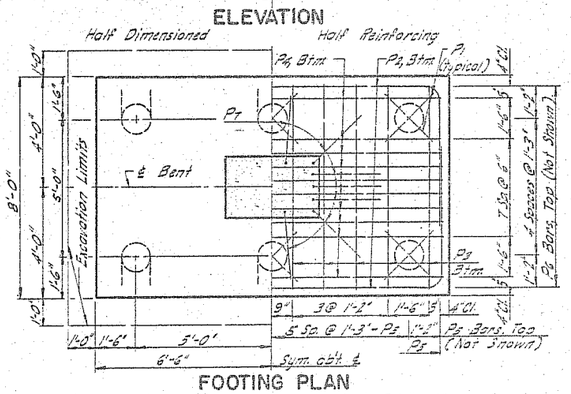


BENT BAR DETAILS









BAR LIST ~ one bent					
	MARK	NO.	SIZE	LENGTH	SHAPE
Footing	P1	12	6	8'-6"	Bent
	P2	2	11	22'-3"	"
	P3	10	11	10'-0"	"
	P4	10	11	15'-0"	"
	P5	11	6	7'-6"	Str.
	P6	7	6	12'-6"	"
	P7	14	9	8'-6"	Bent
	P8	14	9	22'-6"	Str.
Column	P9	6	4	9'-0"	Bent
	P10	6	4	9'-4"	"
	P11	6	4	9'-8"	"
	P12	6	4	10'-0"	"
	P13	6	4	10'-4"	"
	P14	8	4	10'-8"	"
	P15	3	6	24'-0"	"
	P16	2	6	16'-6"	Str.
	P17	2	6	23'-6"	"
	P18	2	10	10'-6"	"
	P19	2	10	13'-6"	"
	P20	2	10	16'-0"	Bent
	P21	2	11	20'-0"	Str.
	P22	2	11	23'-6"	"
	P23	2	11	23'-6"	Bent
Cap	P24	10	5	12'-5"	"
	P25	4	5	12'-0"	"
	P26	4	5	11'-4"	"
	P27	4	5	10'-8"	"
	P28	4	5	10'-2"	"
	P29	4	5	9'-8"	"
	P30	4	5	9'-3"	"
	P31	4	5	8'-10"	"
	P32	4	5	8'-6"	"
	P33	4	5	8'-1"	"
	P34	4	5	7'-9"	"
	P35	4	5	7'-6"	"
	P36	4	5	7'-3"	"
	P37	4	5	6'-11"	"
	P38	4	5	6'-8"	"
	P39	4	5	6'-5"	"
	P40	4	5	6'-2"	"

NOTE:
The concrete in the column shall set at least two hours before the cap is placed.

QUANTITIES (ONE BENT)	
Concrete Class AE-2	33.3 C.Y.
Reinforcing Steel	3685 L.B.
Excavation (See above)	
Piling (See above)	

APPLE CREEK SEPARATION

26'-0" BENT DETAILS

24'-0" ROADWAY

H15 LOADING

TRACING	
MADE BY	G.A.L.
CHECKED BY	R.D.H.
ANTITIES	
MADE BY	F.D.H.
CHECKED BY	G.A.L.

94-69-5

94-69-

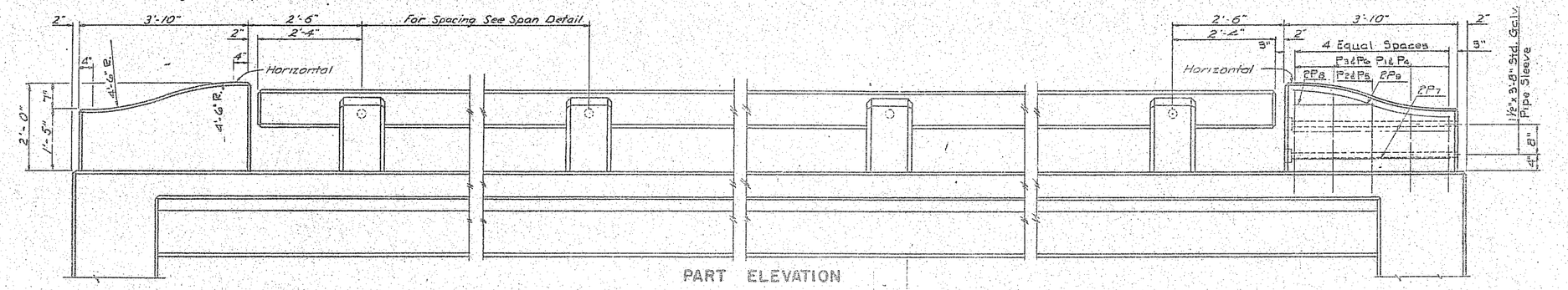
FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	I-94-3(10)		20	48

Revised Pa Bar length to Concrete Class AAE-1 & AE-1	T.H.P.	9-19-60
Revised dimension on typical section	B.E.	4-28-61
	U.C.	5-8-61

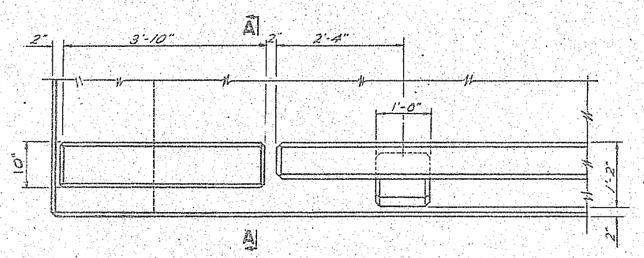
MADE BY BGN & W.Co. CHECKED BY CEG
MADE BY BGN CHECKED BY CEG
TRACING ENTITIES

See Other End for Reinforcing

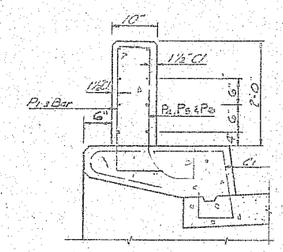
See Other End for Dimensions

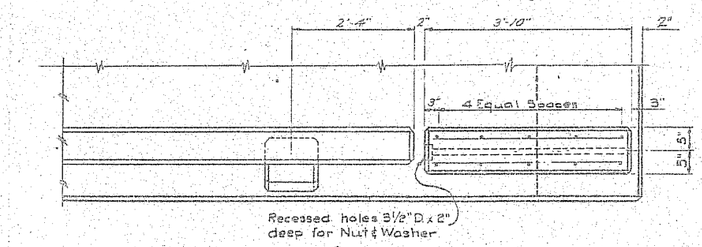


PART ELEVATION



PART PLAN



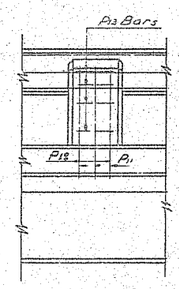


PART PLAN

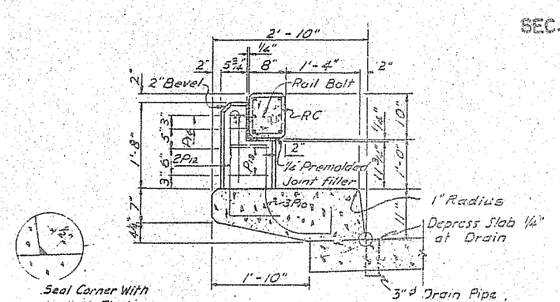
NOTES:

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

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

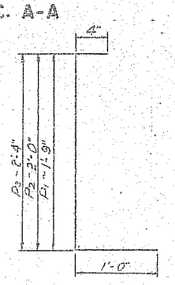


ANCHOR POST DETAIL
See Layout For Placement

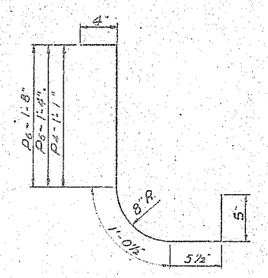


TYPICAL SECTION

SEC. A-A



P1, P2 & P3 BARS



P4, P5 & P6 BARS

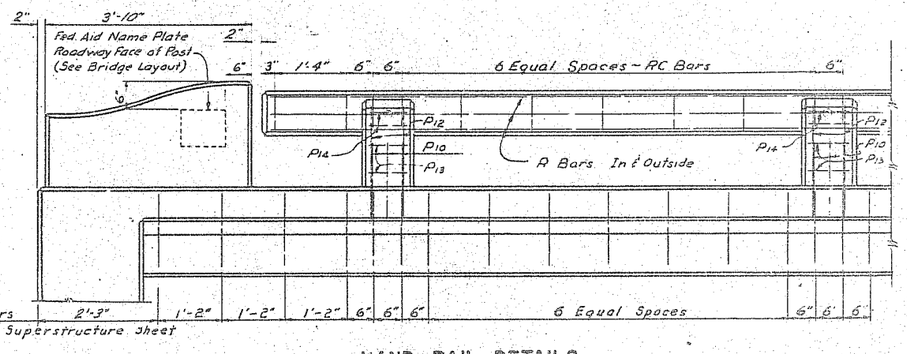
BAR LIST (BARS FOR RAILING AND POSTS)				
MARK	NO.	SIZE	LENGTH	SHAPE
P10	*	5	4'-0"	Bent
P11	*	5	4'-6"	Bent
P12	*	5	4'-5"	Bent
P13	*	3	3'-8"	Bent
P14	*	3	2'-8"	Bent
RC	*	3	2'-8"	Bent
P** **		5	* *	Str.

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

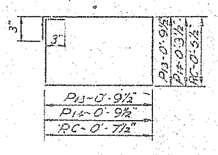
BAR LIST (4 END POSTS)				
MARK	NO.	SIZE	LENGTH	SHAPE
P1	8	5	3'-1"	Bent
P2	4	5	3'-4"	"
P3	8	5	3'-8"	"
P4	8	5	3'-4"	"
P5	4	5	3'-7"	"
P6	8	5	3'-11"	"
P7	16	4	3'-6"	Str.
P8	8	4	1'-9"	Str.
P9	8	5	3'-9"	Field Be

QUANTITIES ~ 4 END POSTS	
Concrete Class AE-2	0.8 Cu.
Reinforcing Steel	224 Lb

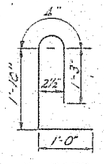
* Railing and end post quantities are included in slab quantities on superstructure sheet.



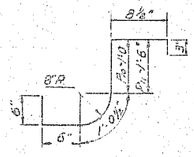
HAND RAIL DETAILS



P13 P14 & RC BARS

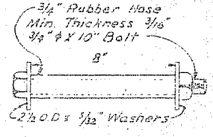


P12 BARS



P10 & P11 BARS

BENT BAR DETAILS



RAIL BOLT
(Galvanized)
(To be included in the unit price bid for Class AE-2 Concrete)

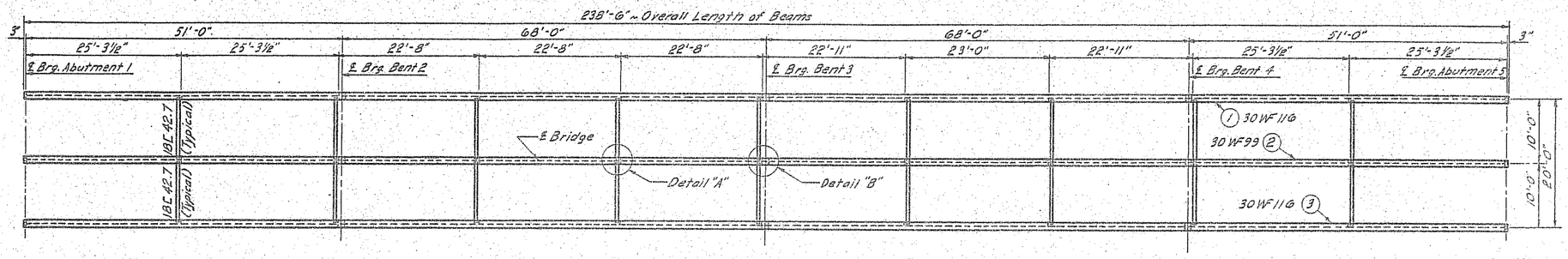
STANDARD RAILING

DETAILS

H-0133

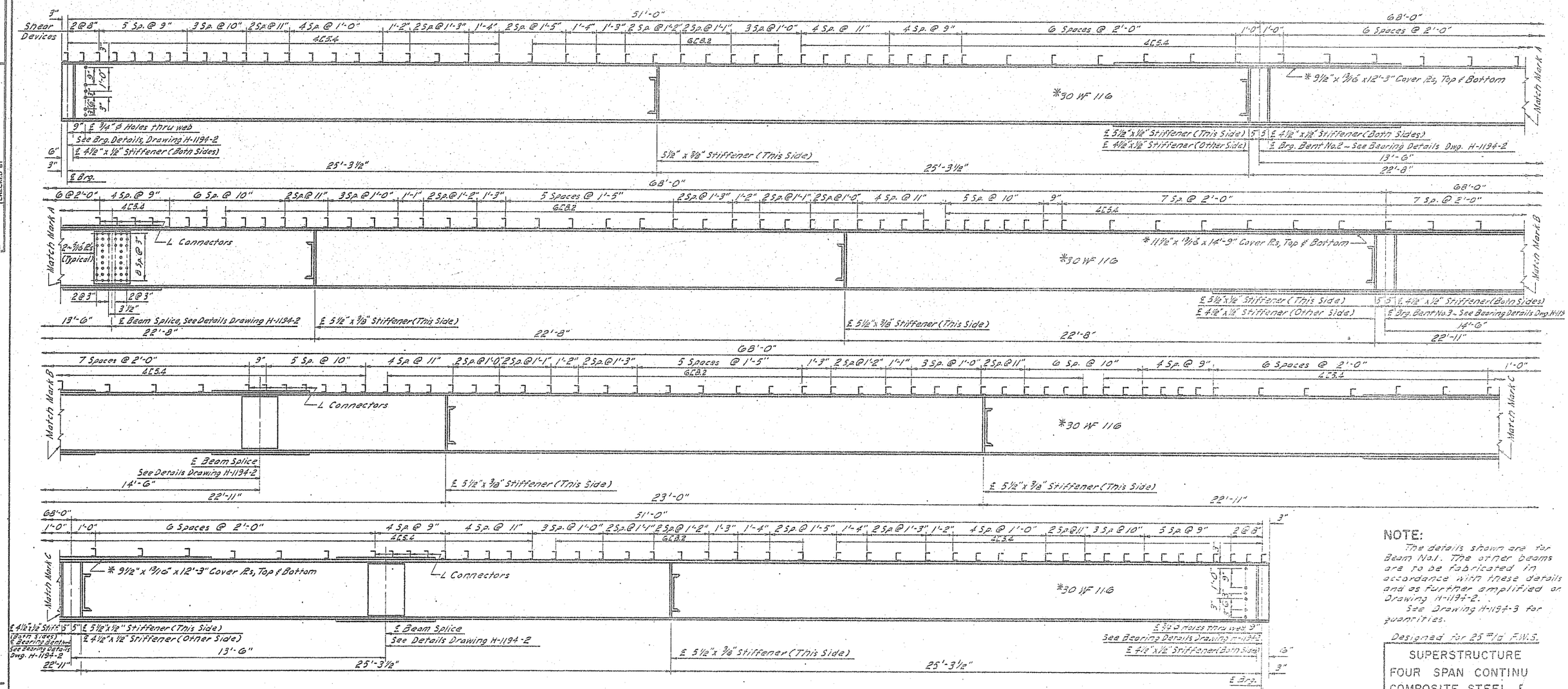
H-0133

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TO EHS
5	N.D.	I-29-5(1)		23	4



STEEL LAYOUT

See Drawing H-1194-2 for Detail "A" & "B"



BEAM ELEVATION

* Sizes shown for exterior beams are not the same for interior beam. See other details.

NOTE:

The details shown are for Beam No. 1. The other beams are to be fabricated in accordance with these details and as further amplified on Drawing H-1194-2.

See Drawing H-1194-3 for quantities.

Designed for 25 #/ft² F.W.S.

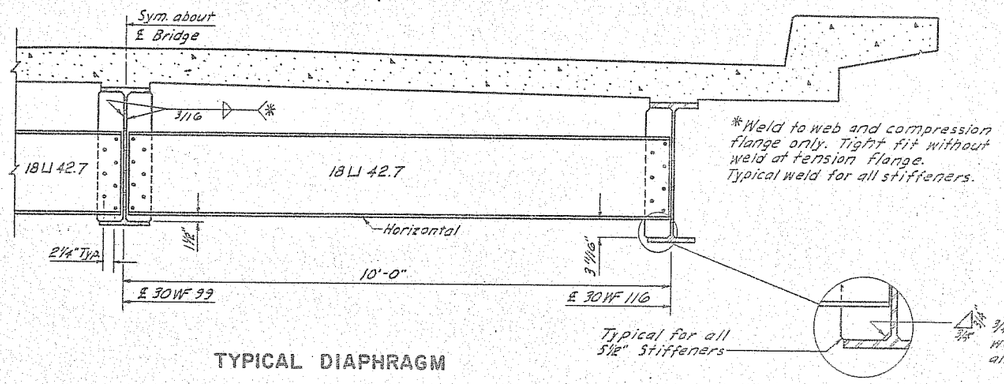
SUPERSTRUCTURE
FOUR SPAN CONTINU
COMPOSITE STEEL F
OVERALL LENGTH 2
24' ROADWAY ~ HS LOA

CHECKED BY W.E.G.
MADE BY L.E.G.
CHECKED BY G.N.L.
MADE BY
CHECKED BY

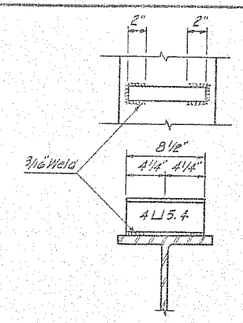
H-1194-1

H-

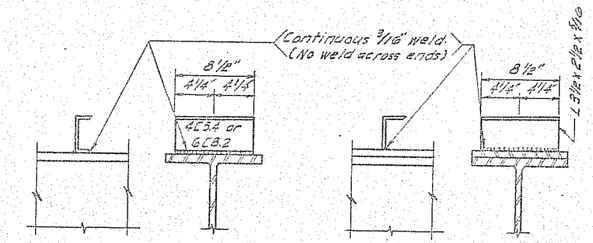
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	F-024-(8)		24	1



TYPICAL DIAPHRAGM



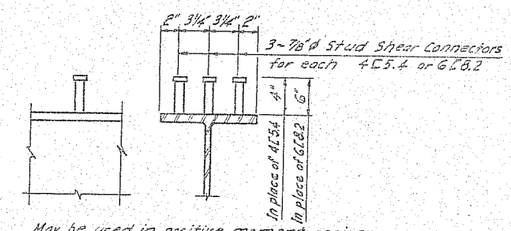
Used in negative moment region where spacing is 2'-0"



Used in positive moment region except over splice ℞s. (See Drawing H-1194-1 for location of 4 C 5.4 and 6 C 8.2)

Use over splice ℞s.

SHEAR DEVICE DETAIL



May be used in positive moment region except over splice plates.

ALTERNATE SHEAR DEVICE

NOTES:

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

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

If high strength bolts are used in the web and flange splice plates, the bolts shall be placed so that the nuts are on the upper side of the flange and on the interior side of the web.

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

Paint and painting shall conform to the North Dakota Standard Specifications for Road and Bridge Construction, "Sections 80, 132.11 & 132.1.

All exposed steel surfaces shall be given one shop coat of red lead paint (including top of upper flange), one spot coat of red lead paint after erection and concrete work is completed and two field coats of aluminum paint (first coat tinted with Prussian Blue). No paint on shear devices.

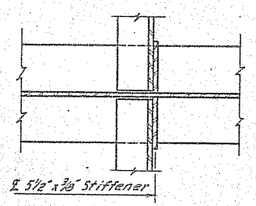
The metal arc process shall be used for all fabrication. Electrodes used in the fabrication of this bridge shall be of the E 60 classification. All welding shall conform to the current Standard Specifications for Welded Highway and Railway Bridges - Design, Construction and Repair" of the American Welding Society.

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

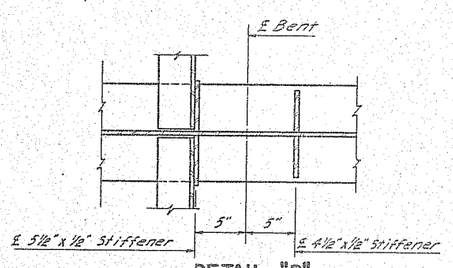
Structural Carbon Steel shall conform to the latest ASTM - A36 Specifications.

Alternate stud shear devices shall be manufactured of C-1015 or C-1020 cold rolled steel which conforms to ASTM Specifications A-108-61T, and shall conform to the diameter and other dimensions as shown. Alternate shear devices will be paid for as channel shear devices.

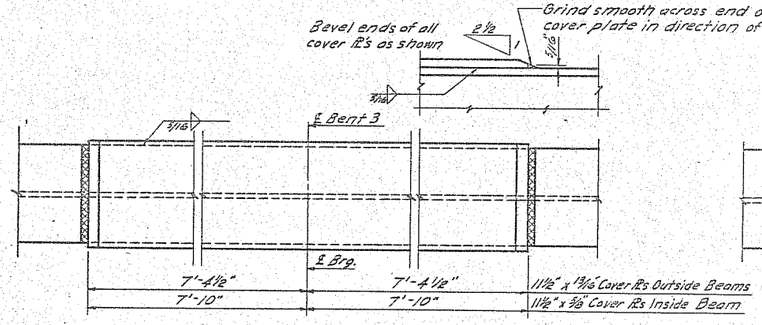
For Shop Camber Diagram see Bridge Layout.

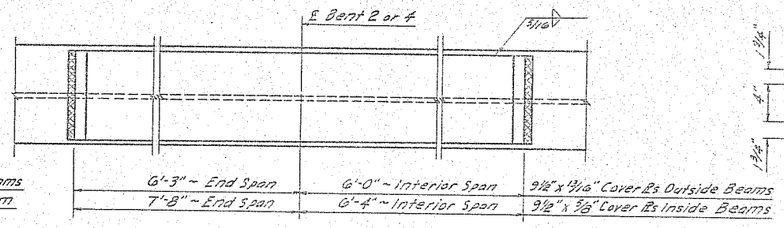


DETAIL "A"

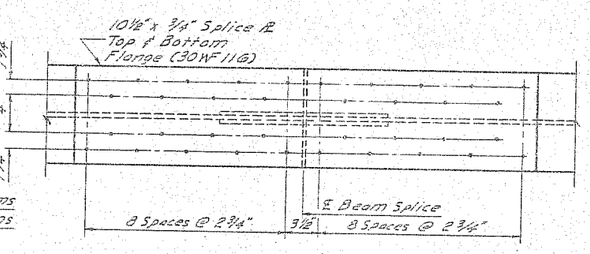


DETAIL "B"

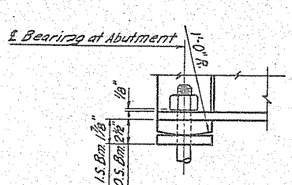




COVER PLATE DETAIL

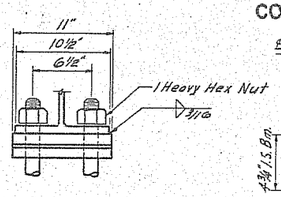


OUTSIDE BEAMS



Sole ℞ ~ 6" x 1½" x 11"
Masonry ℞ ~ 6" x 1" x 11"
Swedge Bolts ~ 1½" ϕ x 1'-9"

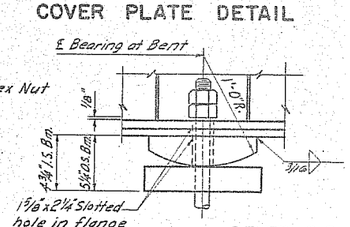
OUTSIDE BEAMS



Sole ℞ ~ 6" x 1½" x 11"
Masonry ℞ ~ 6" x ¾" x 11"
Swedge Bolts ~ 1½" ϕ x 1'-9"

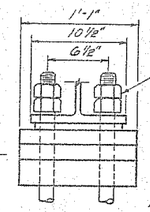
INSIDE BEAM

ABUTMENT BEARING DETAILS



Sole ℞ ~ 12" x 2⅜" x 1'-1"
Masonry ℞ ~ 13" x 2⅞" x 1'-1"
Swedge Bolts ~ 1½" ϕ x 2'-0"

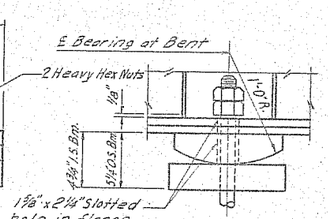
OUTSIDE BEAMS



Sole ℞ ~ 12" x 2⅜" x 1'-1"
Masonry ℞ ~ 12" x 2⅜" x 1'-1"
Swedge Bolts ~ 1½" ϕ x 2'-0"

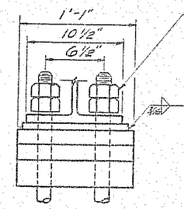
INSIDE BEAM

BENTS 2 & 4



Sole ℞ ~ 12" x 2⅜" x 1'-1"
Masonry ℞ ~ 13" x 2⅞" x 1'-1"
Swedge Bolts ~ 1½" ϕ x 2'-0"

OUTSIDE BEAMS

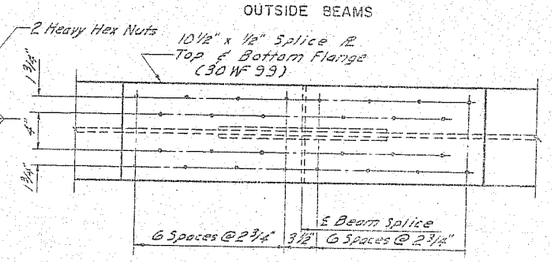


Sole ℞ ~ 12" x 2⅜" x 1'-1"
Masonry ℞ ~ 12" x 2⅜" x 1'-1"
Swedge Bolts ~ 1½" ϕ x 2'-0"

INSIDE BEAM

BENT 3

BENT BEARING DETAILS



INSIDE BEAM

FLANGE SPLICE DETAILS

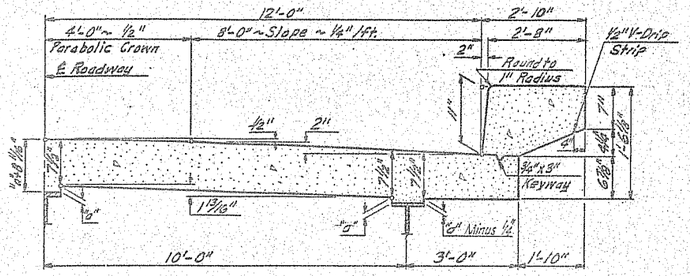
See Sheet H-1194-3 for quantities

SUPERSTRUCTURE
FOUR SPAN CONTINUOUS
COMPOSITE STEEL BEAMS
OVERALL LENGTH ~ 240'-0"
24' ROADWAY ~ HS LOADING (1961)

H-1194-2

H-1194-2

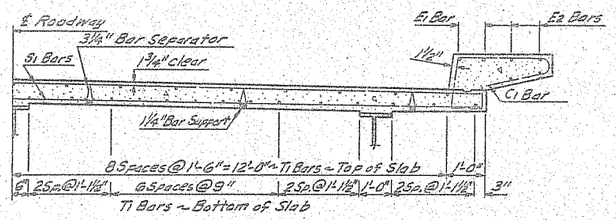
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOT SHE
5	N.D.	F-21-2(16)		25	8



HALF SECTION OF SLAB

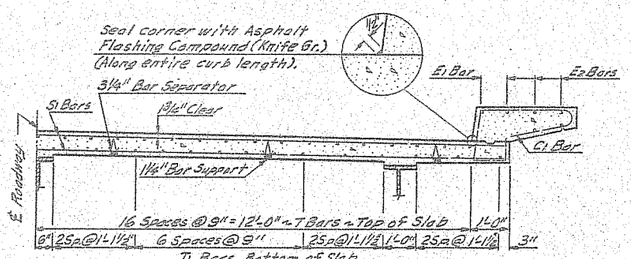
Showing Dimensions

Dimension "a" is 1 1/8" at Abuts. and Bents and increases toward the center of the spans to compensate for dead load deflection which is taken care of in the screed elevations.



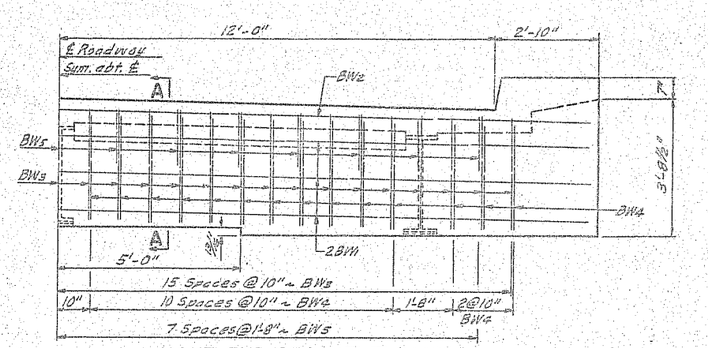
HALF SECTION OF SLAB

Showing Reinforcing in all spans between supports.

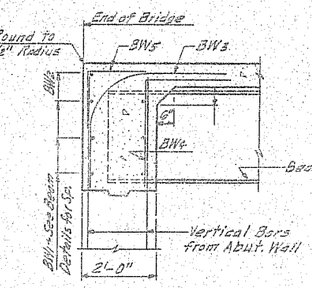


HALF SECTION OF SLAB

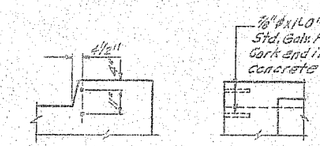
Showing Reinforcing Over Bents



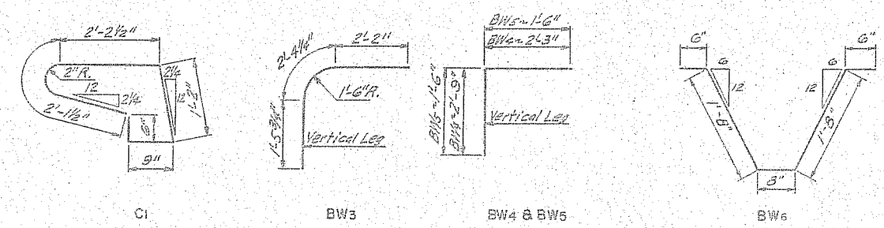
HALF END BEAM ELEVATION



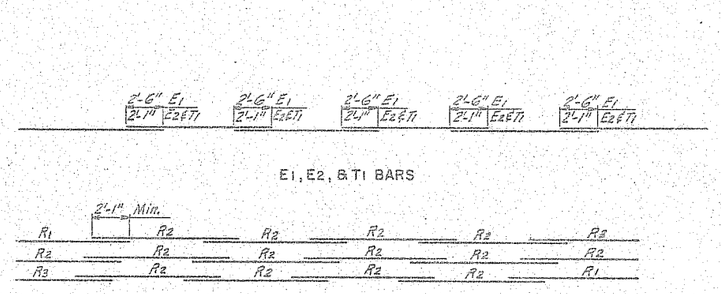
A-A



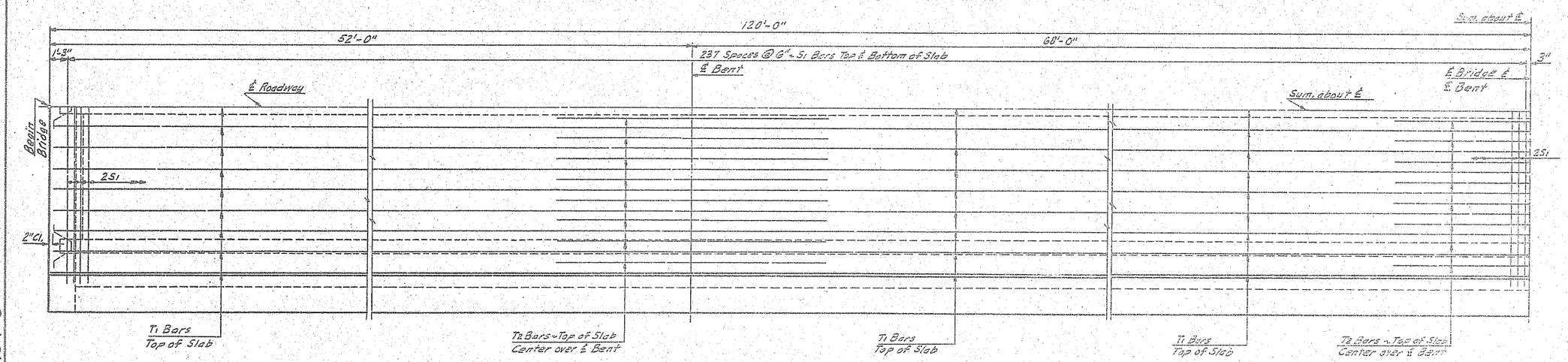
CURB SLEEVE DETAILS



BENT BAR DETAILS



BAR SPLICE & PLACEMENT DETAIL



QUARTER PLAN SLAB

T1 Bars Bottom of Slab not shown

BAR LIST (ONE SUPER.)

MARK	NO.	SIZE	LENGTH	SHAPE
BW1	12	5	29'-3"	Str.
BW2	2	6	29'-3"	"
BW3	62	5	6'-0"	Bent
BW4	56	5	5'-0"	"
BW5	30	4	3'-0"	"
BW6	18	5	5'-0"	"
C1	506	5	6'-9"	Bent
E1	12	6	42'-0"	Str.
E2	60	5	41'-8"	"
RC	390	3	2'-8"	Bent
R1	8	5	42'-3"	Str.
R2	36	5	40'-3"	"
R3	8	5	38'-3"	"
S1	952	5	25'-6"	Str.
T1	270	5	41'-8"	Str.
T2	48	6	20'-0"	"
P0	162	5	4'-0"	Bent
P1	6	5	4'-6"	"
P2	112	6	4'-5"	"
P3	116	3	3'-8"	"
P4	108	3	2'-8"	"

NOTE:

It is assumed that the Contractor can place the slab concrete in one continuous operation in accordance with Section 55.3 (F) 1 and 2A of the Standard Specifications. If the Contractor cannot pour at the specified rate, he shall submit drawings to the Bridge Engineer for approval showing proposed construction joints and pouring sequence.

Each curb shall be poured in one continuous operation.

See Std. Drwg. H-9133 for railing details. See Bridge Layout for rail post spacing.

See sheets H-1194-1 & H-1194-2 for structural steel details.

Designed for 25 Ton F.W.S.

QUANTITIES (ONE SUPER.)

Concrete Class AE-3*	202.5	C.Y.
Concrete Class AE-5*	12.25	C.Y.
Reinforcing Steel*	31,840	Lbs.
Structural Steel	102,300	Lbs.

* Includes Bent Post except Sym. Dwg. H-9133

SUPERSTRUCTURE

FOUR SPAN CONTINUOUS COMPOSITE STEEL BEAMS

OVERALL LENGTH 240'-0"

24' ROADWAY ~ H15 LOADING (1961)

CHECKED BY	W.E.G.
MADE BY	F.D.H.
CHECKED BY	L.E.G.
MADE BY	F.D.H.
CHECKED BY	G.A.L.

ACING

JANTITIES

H-1194-3