DESIGN DATA				
Traffic	Average Daily			Est. Max. Hr.
Current 1997	Pass: 1070	Trucks 350	Total 1420	215
Forecast 2017	Pass: 1605	Trucks 525	Total 2130	325
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# 13

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	IM-8-029(006)000	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT IM-8-029(006)000
IN RICHLAND COUNTY
Concrete Pavement Repair, Grinding & Incd.
(South Bound Roadway)

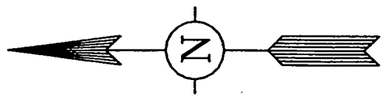
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation September 1992: Standard Drawings currently in effect: and other Contract Provisions submitted herein.

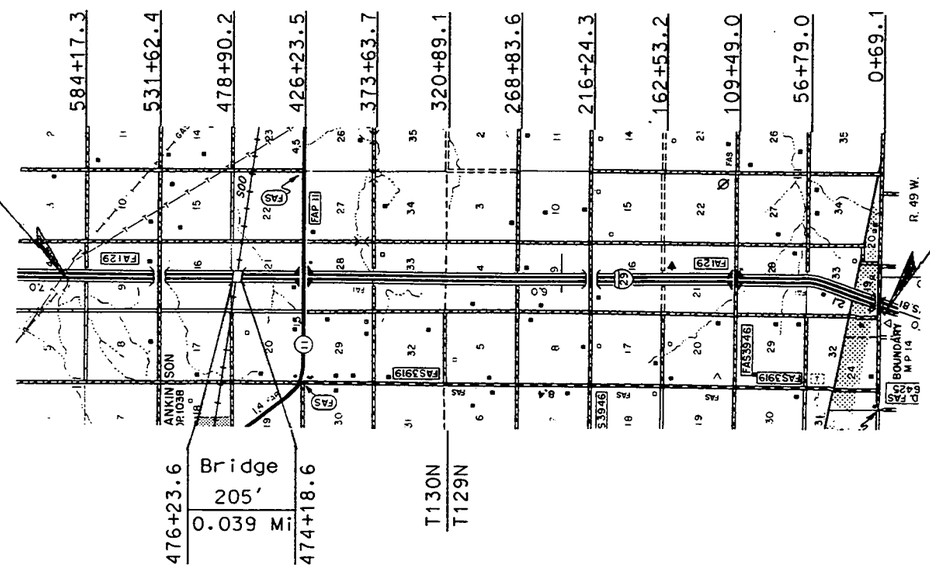
LENGTH OF PROJECT

Miles Gross	Miles Net
11.300	11.261

0.039 miles deducted for bridges



End Project Station 596+64
Section 4, T130N, R49W



Begin Project Station 0+00
Section 30, T129N, R49W

PAVING SECTION Scott Woodham
URBAN SECTION
TRAFFIC SECTION Douglas A. Schumacher
RURAL SECTION
RECOMMEND APPROVAL 3-17-1997
DESIGN ENGINEER David K. D. Lear

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 3-17-97

Ray Zink

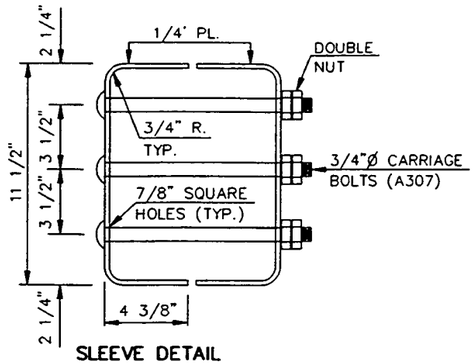
DIRECTOR OF HIGHWAYS AND ENGINEERING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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

r:\project\80029000.006\d_paving\t Jan. 27, 1997 13:28:47

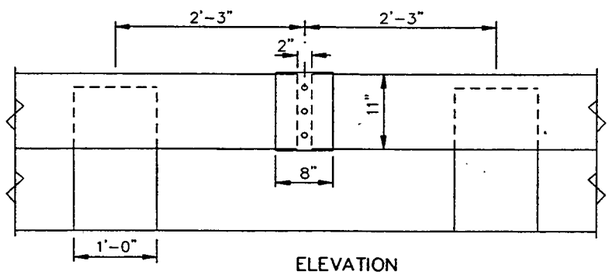
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
8	ND	IM-8-029(006)000	45



SLEEVE DETAIL

NOTE:

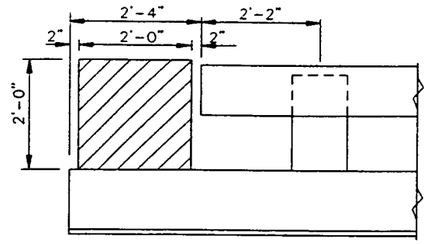
THE STEEL PLATES SHALL BE M183 STEEL. PLATES, BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111. MATERIALS AND LABOR TO INSTALL THE RAIL SLEEVES SHALL BE INCIDENTAL TO "BRIDGE END POST MODIFICATION".



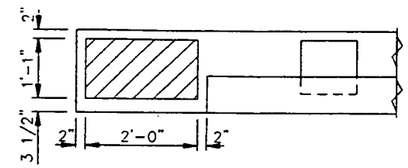
ELEVATION

SLEEVE AT RAIL JOINT

(4 REQUIRED)

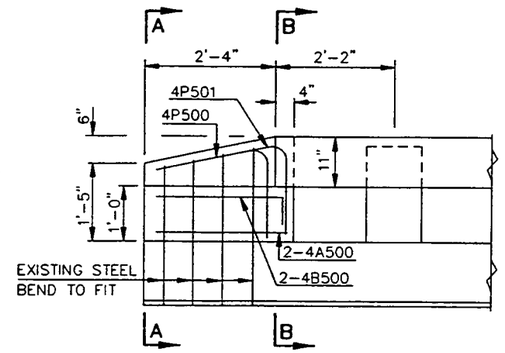


ELEVATION

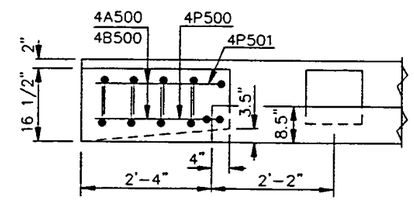


PLAN

SHOWING END POST REMOVAL LIMITS



ELEVATION

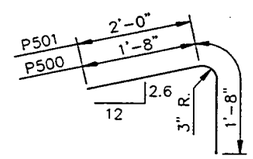


PLAN

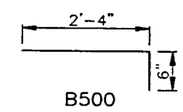
NEW END POST

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

ESTIMATE OF QUANTITIES		
REMOVAL OF CONC.	0.16	C.Y.
CLASS AAE-3 CONC.	0.21	C.Y.
REINFORCING STEEL	12	LBS.

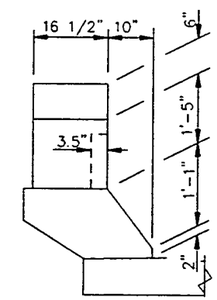


P500 & P501

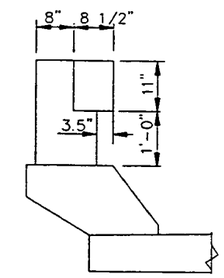


B500

BENT BAR DETAILS



A-A



B-B

NOTE:

MODIFY BRIDGE END POSTS AT THE NORTH END OF THE BRIDGE.

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

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

QUANTITIES (ONE BRIDGE)		
BRIDGE END POST MODIFICATION	2	EA.

SOO LINE RR SEPARATION

RAIL SLEEVES & END POST DETAILS

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.
5	N.D.	IG-029-1 (23)	1

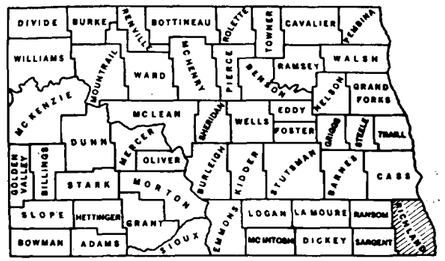
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN RICHLAND COUNTY
FEDERAL AID PPOJECT NO. IG-029-1 (23)009
STRUCTURAL



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET: 1 IN. = 5000 FT.
- PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT.; VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS:- AS SHOWN
- CROSS SECTION SHEETS:- 1 IN. = 10 FT.

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
IG-029-1 (23)	.038	.038
TOTALS	.038	.038

COVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota State Highway department July 1971 and approved as standard by the Federal Highway Administration Sept. 29, 1971 Required Contract Provision (Form PR-1273) dated March 1972 and others submitted herewith.

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1973)	1120 PASS. 200 TRUCKS	1320 TOTAL 170
TRAFFIC FORECAST (1993)	3430 PASS. 600 TRUCKS	4030 TOTAL 520

DESIGN SPEED 80 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (STOPPING) 1030

FULL CONTROL OF ACCESS
(NO POINTS OF ACCESS OTHER THAN BY RAMPS AT INTERCHANGES)

TABLE OF CONTENTS

SHEET NO.	GENERAL
	Title Sheet, Quantities, Special Provisions, & Supplemental Specifications
2	Typical Section
3 & 4	Plan and Profile
5 - 14	Structural Drawings
	STANDARD DRAWINGS
15	H-0158 Standard Railing Details
16	H-0401 Pile Splice Details
17	H-0501 Screed Chair and Adjustable Screed Holder
18	D-900-1 Bridge Bench Marks
19	D-900-6 Federal Aid Name Plate for Structures
20-25	Cross Sections

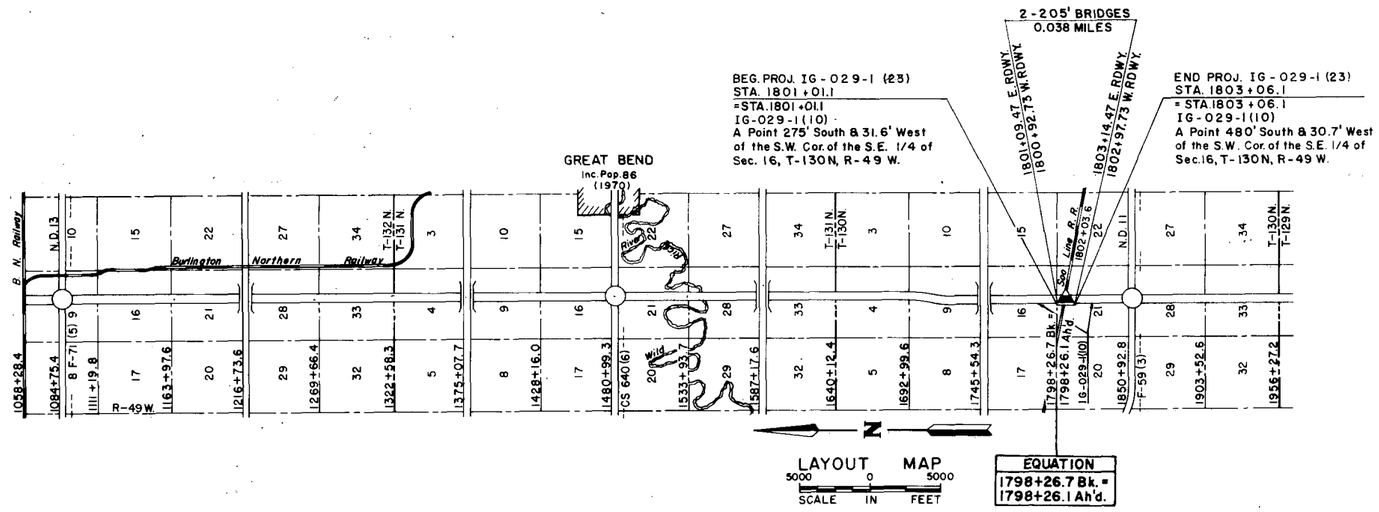
LIST OF SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS	
ITEM	NO.
Measurement and Payment	SP-103
Temporary Water Pollution Control	SP-106
Field Laboratory	SS- 3
Standard Provisions for Railroad Protection and General Liability Insurance Policies	SP-14C
Control of Materials	SP-125
Portland Cement Concrete	SP-126
Structural Steel	SP-116A
Repair and Restoration of Haul Roads	SP 111B
Training Special Provision.	SP

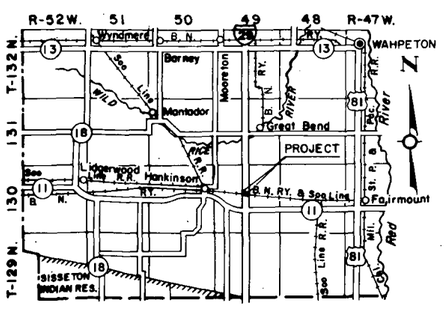
STA.	CLEAR RDWY. WIDTH	DESIGN LOADING
1801+95.23 1802+11.97	40'	HS 20 (1944) *

*And Alternate Loading as Designated in PPM 20-4, Section 4 C

NOTE:
The Grading and Structural Contractors shall conduct their individual operations to the mutual benefit of each other. See Section 105-7 of the Standard Specifications.

Total Quantities have been rounded off to the nearest whole unit for Bidding Purpose.





SKETCH MAP OF PART OF RICHLAND COUNTY

SPEC. NO.	208	228	610			612	616		622		750		705	756	
CODE NO.	0100	0100	1112	1134	0138	0110	0360	5721	0020	0620	0100	3000	0100	0100	8505
LOCATION	CLASS 1 EXCAVATION	SELECT BACKFILL	CLASS AE-1 CONCRETE-SUB-STRUCTURES	CLASS AE-3 CONCRETE-1-BEAM SUPER-STRUCTURES	CLASS AAE-3 CONCRETE-RAILING & POSTS	REINFORCING STEEL GRADE 40	STRUCTURAL STEEL A36	STRUCTURAL STEEL A572 ROLLED BEAM	STEEL PILING HP 10x42	STEEL TEST PILES HP 10x42 @ 150 FT.	LINSEED OIL TREATMENT	BRIDGE BENCH MARKS	MOBILIZATION	FIELD LABORATORY TYPE A	TRAINEE
	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	LB.	LB.	LB.	L.F.	EACH	GAL.	SET	LUMP SUM	EACH	MAN HOURS
1802+03.6	425	610	252.8	569.2	26.62	190580	42492	290078	8980	1	84	1	1	1	2000
TOTAL	425	610	253	569	27	190580	42492	290078	8980	1	84	1	1	1	2000

APPROVED DATE 1-23-73

R. H. Bradley

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

R. H. BRADLEY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

U S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

IG-029-1(23)009

SYMBOLS

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

BUILDINGS
TELEGRAPH LINES
TELEPHONE LINES
POWER LINES
CULVERTS (In Place)
CULVERTS (Install)
CONCRETE BOX CULVERTS (Install)
BRIDGES (Install)
CONCRETE CURB
CONCRETE CURB AND GUTTER
CONCRETE WALK
CATCH BASIN (Existing)
CATCH BASIN (New)
MANHOLE (Existing)
MANHOLE (New)
CURB INLET (Existing)
CURB INLET (New)
GROUND MOUNTED SIGNS
OVERHEAD SIGNS
HYDRANT
LIGHT STANDARDS
TRAFFIC SIGNALS (Plan & Profile Sheets)

GROUND ELEVATION 6430
GRADE ELEVATION 6410
245

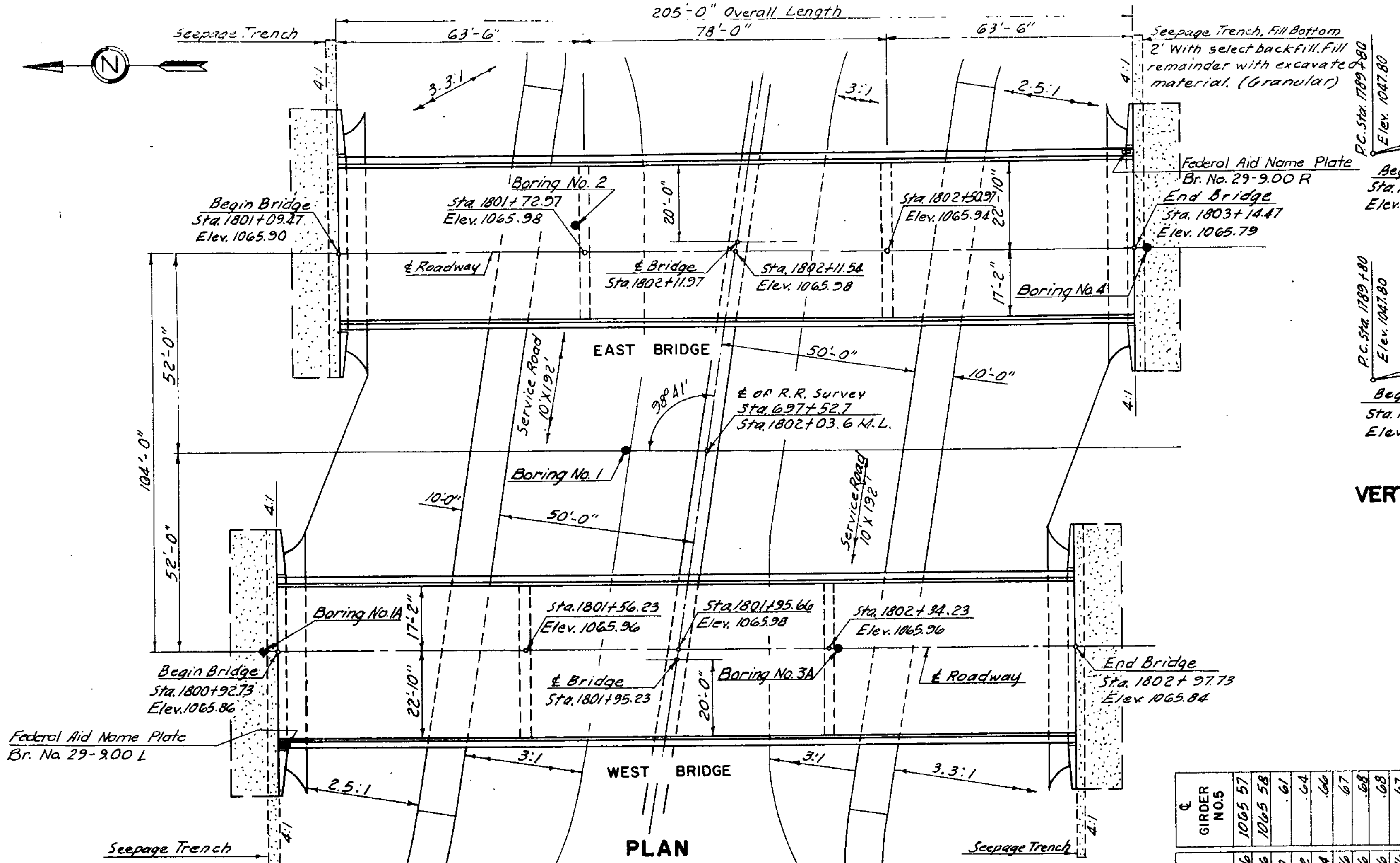
CENTERLINE
SECTION LINE
DEFLECTION ANGLE (Delta)
SOD OR JUTE MESH
POLES TO BE MOVED
POLES TO BE LOWERED
CONCRETE FOUNDATION
CONDUIT
CONDUCTOR
CONCRETE PULL BOX
FEED POINT
250 WATT LIGHT STANDARDS
400 WATT LIGHT STANDARDS
700 WATT LIGHT STANDARDS
1000 WATT LIGHT STANDARDS
FLASHING BEACON
TRAFFIC SIGNAL - MAST ARM MOUNTED
TRAFFIC SIGNAL - POST MOUNTED
SIGNAL HEAD — 3
PEDESTRIAN PUSHBUTTON POST
TRAFFIC SIGNAL CONTROLLER

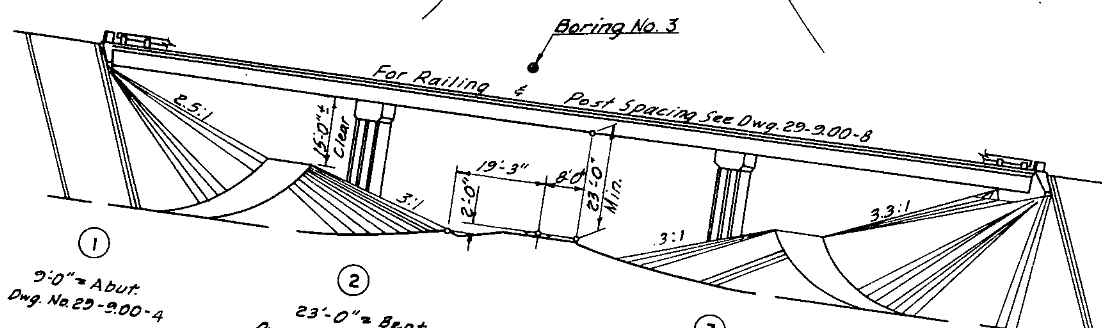
ABBREVIATIONS

Aggr.	Aggregate
Ahd.	Ahead
Alt.	Alternate
Approx.	Approximate or Approximately
Appr.	Approach
Asph. Cem. or A.C.	Asphalt Cement
Asph. Conc.	Asphaltic Concrete
Bit.	Bituminous or Bitumen
Blk.	Block
B.M.	Bench Mark
Bldg.	Building
Br.	Bridge
C.A.E.S.	Corrugated Aluminum End Section
C.A.P.	Corrugated Aluminum Pipe
C.B.	Cdtch Basin
C. & G.	Curb and Gutter
Ch. Blk.	Channel Block
Ch. Ch.	Channel Change
C. I.	Curb Inlet
C.I.P.	Cast Iron Pipe
Cl.	Class
C.S.E.S.	Corrugated Steel End Section
C.S.P.	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp.	Compression
Const.	Construction
Conc.	Concrete
Cont. Reinf. Conc. Pvm't	Continuously Reinforced Concrete Pavement
Contn.	Contraction
Crn.	Crown
CRS	Cationic Rapid Setting
Crse.	Course
C.S.	Curve to Spiral
C. to C.	Center to Center
C.Y.	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D.B.	Ditch Block
Def.	Deformed
Del.	Deliver
D.G.	Ditch Grade
El. or Elev.	Elevation
Ellipt.	Elliptical
Emb.	Embankment
Emul.	Emulsified
Engr.	Engineer
Eq.	Equation
E.R.	East Roadway
E.S.	End Section
Esmt.	Easement
Exc.	Excavation
Exp.	Expansion
F.D.	Field Drive
Found.	Foundation
F.P.	Fence Post
Furn.	Furnish
Ga.	Gage or Gauge
Gr.	Gravel
Grd.	Graded
G.V.	Gate Valve
Hel.	Helical
Hyd.	Hydrant
Ident.	Identification
Inchg.	Interchange
I.M.	Iron Monument
Inst.	Install
Inter.	Intersection
Inv.	Invert
Jt.	Joint
L	Length of Curve
Lc.	Length of Spiral
Levg.	Leveling
L.F.	Linear or Lineal Foot
Liq.	Liquid
Long	Longitudinal
L.P.	Light Pole
Lt.	Left
"M"	One Thousand
Matl.	Material
Max.	Maximum
MC	Medium Curing
M.H.	Manhole
Min.	Minimum

M.L.	Main Line
N.R.	North Roadway
Off. Loc.	Office Location
O. to O.	Out to Out
P. & P.	Plan and Profile
P.C.	Point of Curvature
P.C.C.	Point of Compound Curve
P.C.C. Pvm't	Portland Cement Concrete Pavement
P.D.	Private Drive
Pen.	Penetration
Perf.	Perforated
P.I.	Point of Intersection
P.O.C.	Point on Curve
P.O.T.	Point on Tangent
P.P.	Power Pole
P.R.C.	Point of Reverse Curvature
Pref.	Preformed
P.S.D.	Passing Sight Distance
P.T.	Point of Tangency
P.V.C.	Polyvinyl Chloride Sewer Pipe
Quant.	Quantity or Quantities
R	Radius
R or Rge.	Range
RC	Rapid Curing
R.C.E.S.	Reinforced Concrete End Section
R.C.P.	Reinforced Concrete Pipe
R.C.P.S.	Reinforced Concrete Pipe Sewer
Rd.	Road
Rdbd.	Roadbed
Rdwy.	Roadway
Refl.	Reflectorized
R.R.	Railroad
Rt.	Right
R/W	Right of Way
Salv.	Salvage
San.	Sanitary
S.C.	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S.D.	Sight Distance
S.E.	Superelevation
Sec.	Section
Sec. Line Appr.	Section Line Approach
Sep.	Separation
Serv.	Service
Sgr. Prep.	Subgrade Preparation
Shldr.	Shoulder
SP	Special Provision
S.P.P.	Structural Plate Pipe
S.P.P.A.	Structural Plate Pipe Arch
S.R.	South Roadway
SS	Slow Setting or Supplement Specification
S.S.D.	Stopping Sight Distance
S.T.	Spiral to Tangent
Sta.	Station
Std.	Standard
Std. Specs.	Standard Specifications
Struct.	Structure
Surf.	Surface or Surfacing
Surv.	Survey
S.W.	Sidewalk
S.Y.	Square Yard
T	Tangent Length (circular curve)
T or Twp.	Township
Tel.	Telephone
Temp.	Temporary
T.P.	Telephone Pole
Tr.	Traffic
Trans.	Transverse or Transition
Trtd.	Treated
Ts	Tangent Length (curve with spirals)
T.S.	Tangent to Spiral
U.S.C. & G.S.	United States Coast and Geodetic Survey
V.C.	Vertical Curve
V.C.P.	Vitrified Clay Pipe
W.M.	Water Main
W.M.V.	Water Main Valve
W.R.	West Roadway
Wrng.	Wearing
W.S.V.	Water Service Valve
X-Sec.	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

BRIDGE CODE	FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
X-171	8	N. D.	I-029-1(23.		



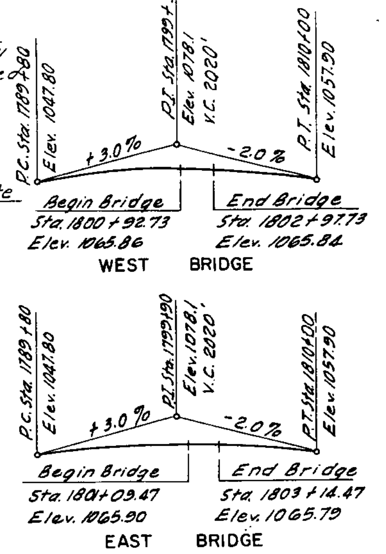


ELEVATION WEST BRIDGE

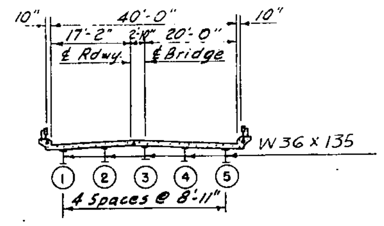
DESIGN STRESSES:

fs = 20,000 psi = Reinforcing Steel
fc = 1,200 psi = Class AE-1 & AE-3 Concrete
fc = 1,700 psi = Class AAE-3 Concrete
fs = 20,000 psi = Structure Steel A-36
fs = 23,000 psi = Structural Steel A-572 (Grade 42)

See substructure drawings for piling length and footing elevations.



VERTICAL CURVE DATA



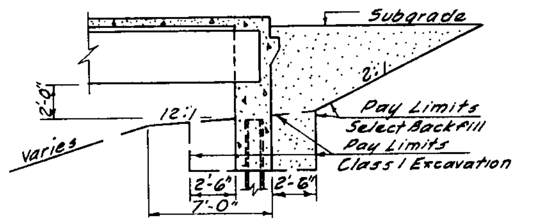
DECK SECTION

Showing West Bridge
Reverse for East Bridge

1973 FEDERAL AID PROJECT I-29-1(23) NORTH DAKOTA 29-9.00L	1973 FEDERAL AID PROJECT I-29-1(23) NORTH DAKOTA 29-9.00R

FEDERAL AID NAME PLATE

ONE EACH REQUIRED



TYPICAL OF BOTH BRIDGE ABUTS. ON ℄

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
EAST BRIDGE																																	
℄ GIRDER NO.5	1065.57	1065.58	.61	.64	.66	.67	.68	.68	.67	.66	.65	1065.65	.66	.68	.70	.71	.71	.70	.68	.66	.63	1065.62	.61	.61	.61	.61	.61	.60	.58	.55	.51	1065.48	1065.47
℄ GIRDER NO.1	1065.66	1065.66	.70	.72	.74	.76	.76	.76	.76	.75	.74	1065.74	.75	.77	.79	.80	.80	.79	.77	.75	.72	1065.70	.70	.70	.70	.70	.69	.68	.66	.64	.60	1065.56	1065.56
℄ ROADWAY	1065.90	1065.90	.93	.96	.98	.99	1066.00	1066.00	1065.99	.98	.98	1065.98	.99	1066.00	.02	.03	.03	.02	1066.01	1065.98	.96	1065.94	.93	.93	.93	.93	.93	.92	.90	.87	.84	1065.80	1065.79
WEST BRIDGE																																	
℄ GIRDER NO.5	1065.54	1065.54	.57	.60	.63	.64	.65	.65	.65	.64	.64	1065.64	.66	.68	.70	.71	.72	.71	.70	.67	.65	1065.64	.63	.64	.64	.64	.64	.63	.62	.59	.56	1065.52	1065.52
℄ GIRDER NO.1	1065.62	1065.63	.66	.69	.72	.73	.74	.74	.74	.73	.73	1065.73	.74	.76	.79	.80	.81	.80	.78	.76	.74	1065.72	.72	.72	.73	.73	.73	.72	.70	.68	.65	1065.61	1065.61
℄ ROADWAY	1065.86	1065.86	.90	.93	.95	.97	.97	.98	.97	.97	.96	1065.96	.98	1066.00	.02	.03	.04	.03	1066.02	1065.99	.97	1065.96	.96	.96	.96	.97	.96	.95	.94	.91	.88	1065.84	1065.84

1'-0" Begin Bridge — 10 Eq. Sp. = 62'-6" ℄ Brg. Abut No. 1 — 10 Eq. Sp. = 78'-0" ℄ Bent No. 2 — 10 Eq. Sp. = 62'-6" ℄ Bent No. 3 — ℄ Brg. Abut. No. 4 — End Bridge 1'-0"

SCREED ELEVATIONS

Elevations are to top of finished concrete.
Girder No. 1 is on the median side of both bridges.

BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
151	I.P. 2X2 gd. on Cross Fence	1798+02 ~ 160' Lt.	1030.28
152	I.P. 2X2 gd. on Cross Fence	1802+84 ~ 214' Lt.	1033.96
153	I.P. 2X2 gd. on Cross Fence	1811+10 ~ 166' Rt.	1040.56

PILE LOADING									
LOCATION	DEAD LOAD	LIVE LOAD	EARTH LOAD				EMBANKMENT SETTLEMENT	DESIGN LOAD	MAXIMUM REQUIRED BEARING
Abutments	30.8 T.	13.4 T.					10.8 T.	55.0 T.	55.0 T.
Bents	30.1 T.	12.8 T.	2.1 T.					45.0 T.	45.0 T.

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

SPECIAL PROVISIONS

NO.	NAME
SP-116-A	Structural Steel

ESTIMATE OF QUANTITIES (TWO BRIDGES)

SPEC. NO.	CODE NO.	BID ITEM	
208	0100	CLASS I EXCAVATION	425 CU. YD.
228	0100	SELECT BACKFILL	610 CU. YD.
610	1112	CLASS AE-1 CONCRETE SUBSTRUCTURES	252.8 CU. YD.
610	1134	CLASS AE-3 CONCRETE - I-BEAM SUPERSTRUCTURE	569.2 CU. YD.
610	0138	CLASS AAE-3 CONCRETE - RAILING & POSTS	26.62 CU. YD.
612	0110	REINFORCING STEEL - GRADE 40	190,580 LB.
616	0360	STRUCTURAL STEEL A36	42,492 LB.
616	5721	STRUCTURAL STEEL A572 ROLLED BEAM	290,078 LB.
622	0020	STEEL PILING HP 10X42	8980 LIN. FT.
622	0620	STEEL TEST PILING HP 10X42 @ 150 FT.	1 EACH
750	0100	LINSEED OIL TREATMENT	84 GAL.
	3000	BRIDGE BENCH MARKS	1 SET

+8.3
~~+396#~~
+792#
192003
DJL
5-10-73

STRUCTURAL DRAWINGS

GENERAL DRAWING 29-9.00 (THIS SHEET) 29-9.00- 1, 2 & 3
SUBSTRUCTURE 29-9.00- 4, & 5, H-0401
SUPERSTRUCTURE 29-9.00- 6, 7, 8, & 9, H-0501, D-900-1, D-900-6, H-0158

DESIGN LOADING	SCALE
HS 20 (1944) *	1 INCH = 20 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

SOO LINE RAILWAY OVERHEAD

BRIDGE LAYOUT

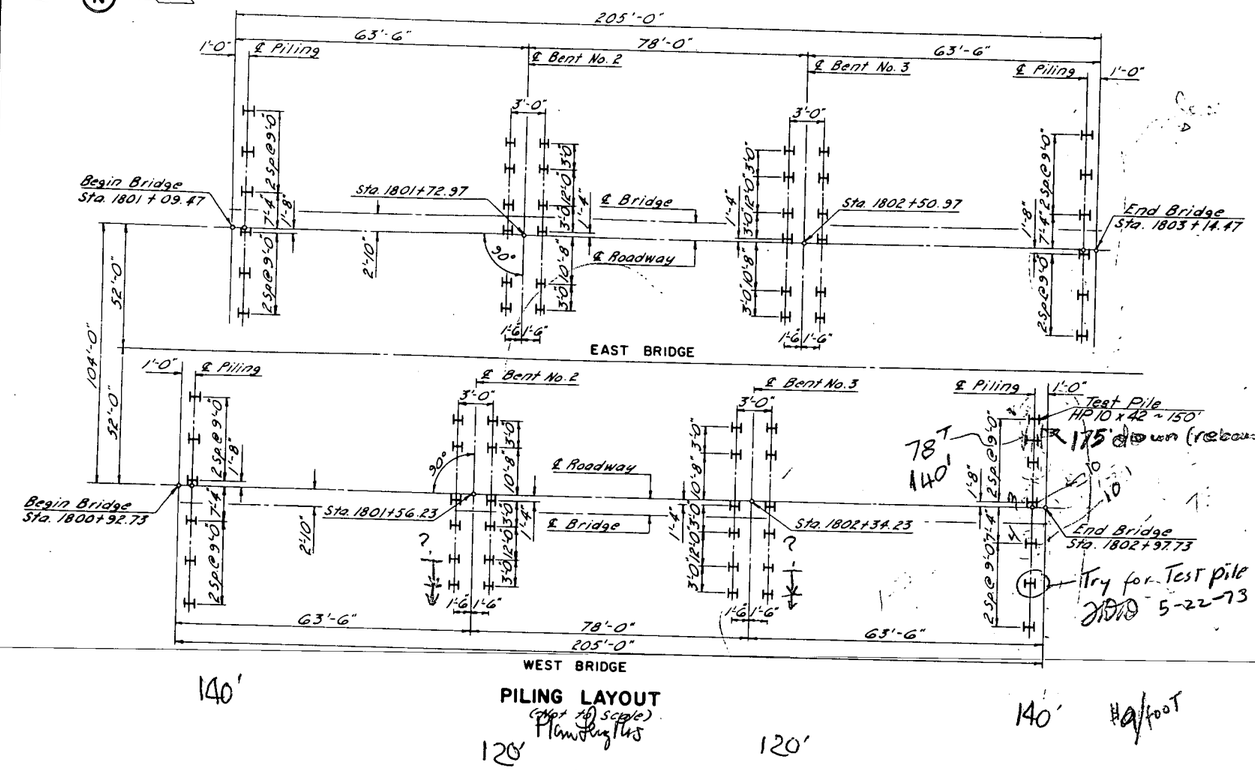
PROJECT I-029-1(23) STA. 1802+03.6

RICHLAND COUNTY

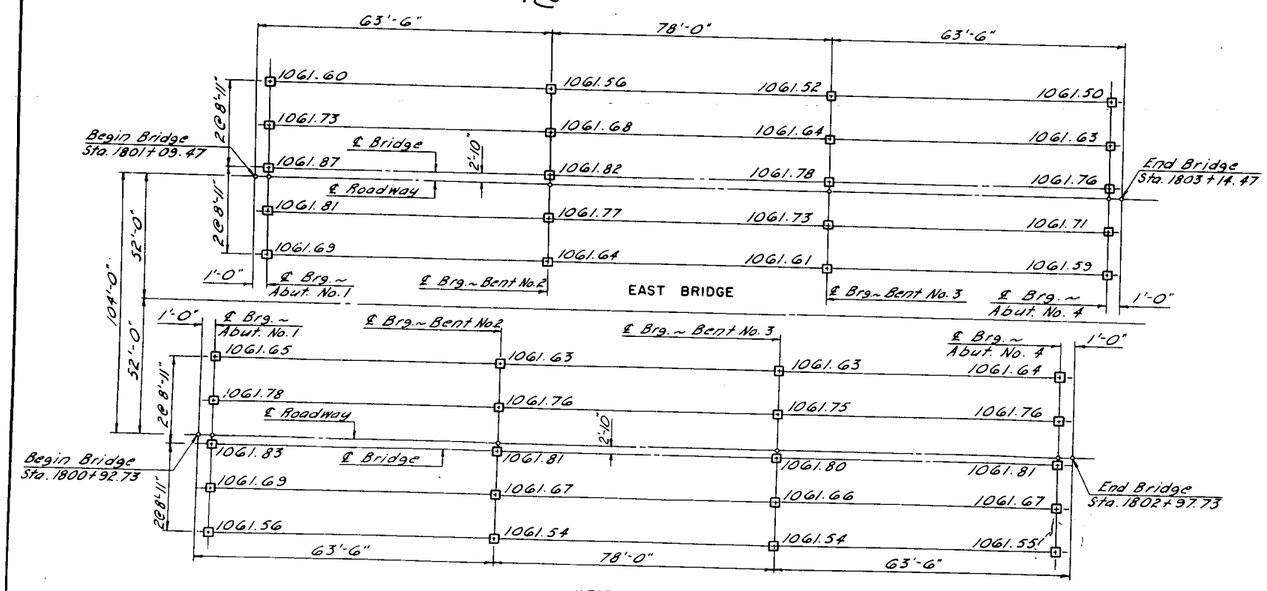
APPROVED
6-1-72 (DATE) Allen J. Anderson (BRIDGE ENGINEER)

ALLEN J. ANDERSON REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)	6	



PILING LAYOUT
(Not to Scale)
Plan length



WEST BRIDGE
BEARING PLATE LAYOUT
Elevations are to top of finished concrete
(Not to Scale)

NOTES:

GENERAL:

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

THE COST OF FURNISHING AND PLACING JOINT FILLER, ASPHALT CURB SEAL, NAME PLATES, AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CONCRETE.

WELDING WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR STRUCTURAL STEEL.

BEARING AREAS SHALL BE FINISHED TRUE TO PLAN AND ELEVATION, BY GRINDING IF NECESSARY, BEFORE BEARING PLATES ARE SET.

ALL RIVETS OR HIGH STRENGTH BOLTS ARE TO BE 7/8" DIAMETER. OPEN HOLES ARE TO BE 15/16" DIAMETER EXCEPT AS NOTED. SHOP CONNECTIONS SHALL BE MADE AS SHOWN. FIELD CONNECTIONS SHALL BE MADE WITH HIGH TENSILE STRENGTH BOLTS OR SHALL BE RIVETED.

EMBANKMENT:

THE EMBANKMENT AT THE ABUTMENTS SHALL BE IN PLACE BEFORE PILING ARE DRIVEN. THE CONTRACTOR WILL BE REQUIRED TO PREDRILL THROUGH THE FILL AT THE ABUTMENTS BEFORE DRIVING PILING. ALL PILOT HOLES, NOT COMPLETELY FILLED BY THE PILES, SHALL BE BACKFILLED WITH SAND OR FINE GRAVEL BEFORE THE SUBSTRUCTURE IS PLACED.

EXCAVATION:

EXCAVATION CLASS I AT THE ABUTMENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTING TO THE UPPER LIMITS AS SHOWN ON THE BRIDGE LAYOUT DRAWING. EXCAVATION CLASS I AT THE BENTS SHALL EXTEND FROM THE BOTTOM OF THE FOOTINGS TO THE FINISHED PROFILE OF THE EMBANKMENT BACKSLOPES.

BACKFILL: ALL BACKFILLING SHALL BE DONE ACCORDING TO SECTIONS 228 AND 203-2.3.2 OF THE STANDARD SPECIFICATIONS. SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE ELEVATION OF THE BERM UNTIL THE SUPERSTRUCTURE HAS CURED.

REINFORCING STEEL:

DIMENSIONS FOR BENT BARS ARE GIVEN OUT TO OUT AND TO TANGENT INTERSECTIONS UNLESS OTHERWISE NOTED. BENT BARS SHALL BE BENT AROUND AGI STANDARD SIZE PINS. THE BAR FABRICATOR SHALL ADD A PREFIX TO ALL BAR DESIGNATIONS TO DIFFERENTIATE BETWEEN THE SEVERAL PARTS OF THE STRUCTURE.

CONCRETE:

ALL CONCRETE SHALL BE COMPACTED BY VIBRATION. THE DECK SLAB CONCRETE SHALL BE STRUCK OFF AND COMPACTED BY AN APPROVED DECK FINISHING MACHINE. ALL EXPOSED EDGES OF CONCRETE SHALL BE BEVELED WITH 3/4" TRIANGULAR MOLDING UNLESS OTHERWISE NOTED.

ALL CONCRETE ABOVE THE TOP OF THE CURBS SHALL BE CLASS AAE-3. SLAB, CURBS, AND END WALLS SHALL BE CLASS AE-3. ABUTMENTS AND BENTS SHALL BE CLASS AE-1.

THE "RUBBED SURFACE FINISH" OR THE "SPECIAL SURFACE FINISH" (SECTION 602-3.10.5) WILL BE REQUIRED FOR THE ROADWAY AND OUTSIDE FACES OF CURBS, EDGES OF SLAB, ALL FACES OF THE RAILS, RAIL POSTS AND END POSTS, ALL EXPOSED FACES OF THE BENTS, AND ALL EXPOSED FACES OF THE ABUTMENT WINGS. ALL OTHER SURFACES SHALL BE GIVEN THE "ORDINARY SURFACE FINISH". ALL "ORDINARY SURFACE FINISH" SHALL BE COMPLETED WITHIN 24 HOURS AFTER REMOVAL OF THE FORMS.

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

STRUCTURAL STEEL:

A MINIMUM OF TWO (2) CONTIGUOUS BEAM SECTIONS SHALL BE PLACED IN THEIR CORRECT RELATIVE POSITIONS BEFORE DRILLING THE HOLES FOR THE FIELD SPLICE BETWEEN THESE SECTIONS. THE PROPER ALIGNMENT SHALL BE MAINTAINED BETWEEN SECTIONS WHILE REAMING THE HOLES. TEMPLATES SHALL NOT BE USED IN LIEU OF THE ABOVE SHOP ASSEMBLY.

STEEL ERECTION:

FALSEWORK WITH PROVISIONS FOR JACKING MUST BE PROVIDED AT ALL SPLICE POINTS DURING ERECTION. BOTH SPLICE POINTS IN EACH BEAM LINE SHALL BE BROUGHT TO THEIR PROPER ELEVATION AND SUPPORTED IN POSITION BEFORE THE BOLTS IN EITHER OF THE SPLICES ARE TIGHTENED. THE BOLTS IN BOTH OF THE SPLICES IN A BEAM LINE SHALL BE TIGHTENED TO THE REQUIRED TENSION BEFORE ANY OF THE SUPPORTS ARE REMOVED.

MATERIALS: (STRUCTURAL STEEL)

W36X135 BEAMS, COVER PLATES, AND ALL SPLICE PLATES: A572 (GRADE 42)

STIFFENERS, DIAPHRAGMS, CHANNEL SHEAR CONNECTORS, BEARING PLATES, AND ANCHOR BOLTS: A 36

BLAST CLEANING:

COMMERCIAL BLAST CLEANING OF ALL EXPOSED MAIN AND SECONDARY STEEL MEMBERS WILL BE REQUIRED PRIOR TO PAINTING. (INCLUDE IN UNIT PRICE BID FOR STRUCTURAL STEEL.)

PAINT:

PAINT AND PAINTING SHALL CONFORM TO THE STANDARD SPECIFICATIONS, SECTIONS 718 AND 870-1.2.

ALL EXPOSED STEEL SURFACES SHALL BE GIVEN ONE SHOP COAT OF RED LEAD PAINT (INCLUDING TOP OF UPPER FLANGES BUT NOT SHEAR CONNECTORS), 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. 24,260 AND THE SECOND COAT SHALL CONFORM TO GRAY-GREEN COLOR NO. 24,300. BOTH COATS SHALL MEET THE FEDERAL STANDARD NO. 595 FOR COLOR. COLOR CHIPS ARE ON FILE IN THE BRIDGE DIVISION OF THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT, BISMARCK.

PILE HAMMERS:

THE PILES FOR THIS STRUCTURE SHALL BE DRIVEN BY A STEAM (OR AIR) OR DIESEL HAMMER HAVING A RATED ENERGY AND RAM WEIGHT NOT LESS THAN 35,949 FOOT-POUND-TONS AS COMPUTED BY THE FORMULA $W(E-8663)/40.83E$ WHERE W IS THE WEIGHT OF THE RAM IN TONS AND E IS THE RATED HAMMER ENERGY AS ALLOWED IN SECTION 622. IN NO CASE SHALL THE RAM WEIGHT BE LESS THAN 4,800 POUNDS.

TEST PILES:

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

LINSEED OIL TREATMENT:

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

CURING CONCRETE:

EXCEPT AS PROVIDED IN THE FOLLOWING PARAGRAPHS, LIQUID MEMBRANE CURING COMPOUND SHALL NOT BE USED ON ANY CONCRETE WHICH IS TO RECEIVE FURTHER TREATMENT.

THE WATER SOLUBLE LIQUID MEMBRANE CURE (SECTIONS 550-4.13.2.1 AND 880-5 OF THE STANDARD SPECIFICATIONS) MAY BE USED FOR CURING THE DECK SLAB CONCRETE. A PROTECTIVE COVERING SHALL BE USED SO THAT LINSEED OIL IS NOT APPLIED TO THE AREA WITHIN THREE INCHES OF THE GUTTER LINE UNTIL AFTER THE ASPHALT CURB SEAL IS IN PLACE. IF THE CONTRACTOR ELECTS TO USE THIS METHOD OF CURING THE DECK SLAB CONCRETE, THE QUANTITY FOR LINSEED OIL TREATMENT MAY BE REDUCED WITHOUT ADJUSTMENT TO ITS UNIT BID PRICE.

STATIONING:

THE SURVEY STATIONING IS FROM NORTH TO SOUTH WHEREAS THE MILEAGE GIVEN IS DETERMINED FROM SOUTH TO NORTH.

SHORING:

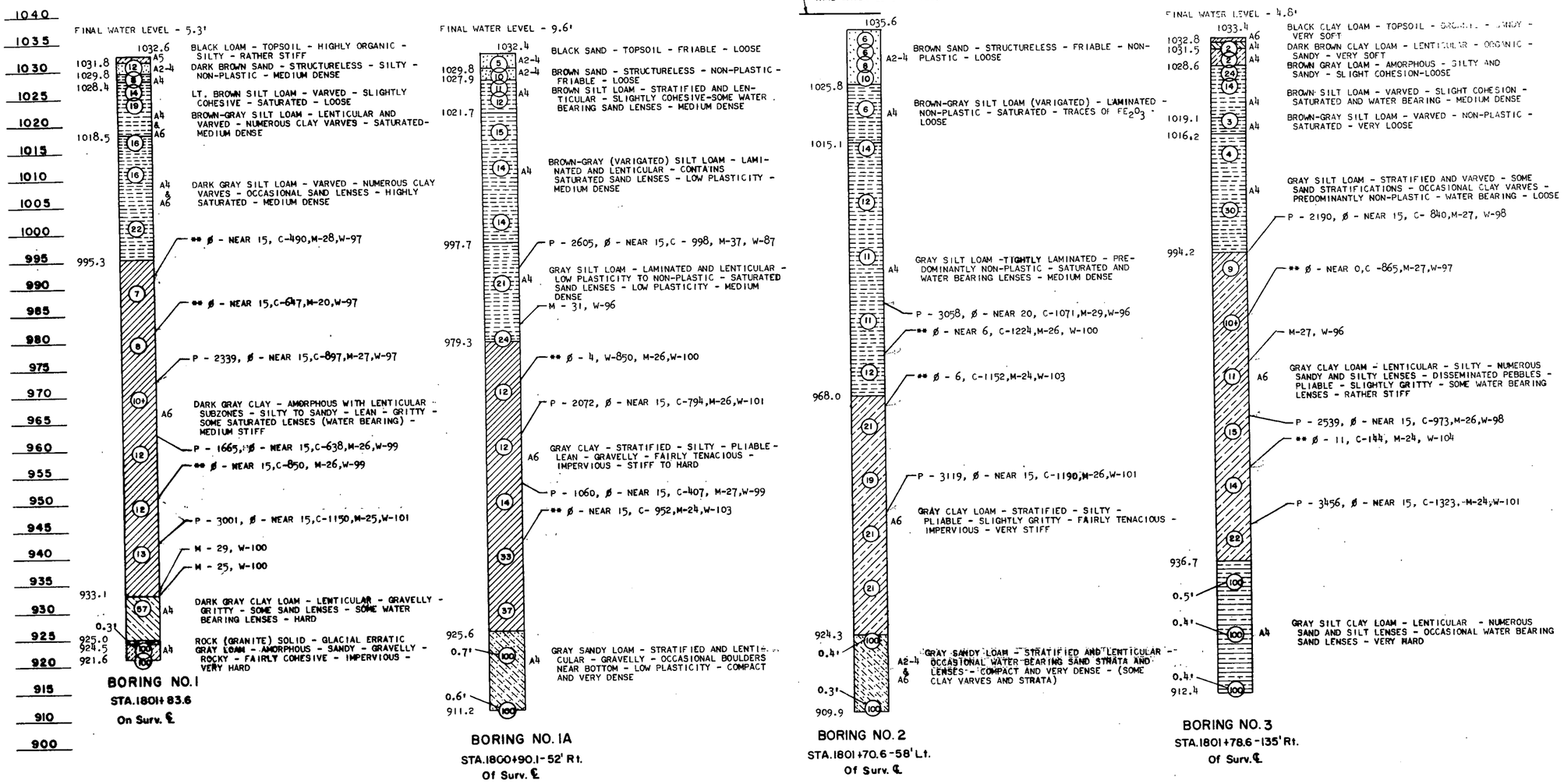
MANUFACTURED SHORING TO SUPPORT FORMS FOR THE SLAB SHALL NOT BE PLACED ON TOP OF THE COVER PLATES AT THE PIERS NOR ON TOP OF THE FLANGE SPLICE PLATES.

QUANTITIES

SOO LINE RAILWAY
OVERHEAD
BEARING PLATE LAYOUT
PILING LAYOUT
GENERAL NOTES

29-9.00-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)	-	



SYMBOLS:

P - MAXIMUM LOAD (LBS/SQ.FT.)
ø - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS/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 PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

SHEET 1 OF 2

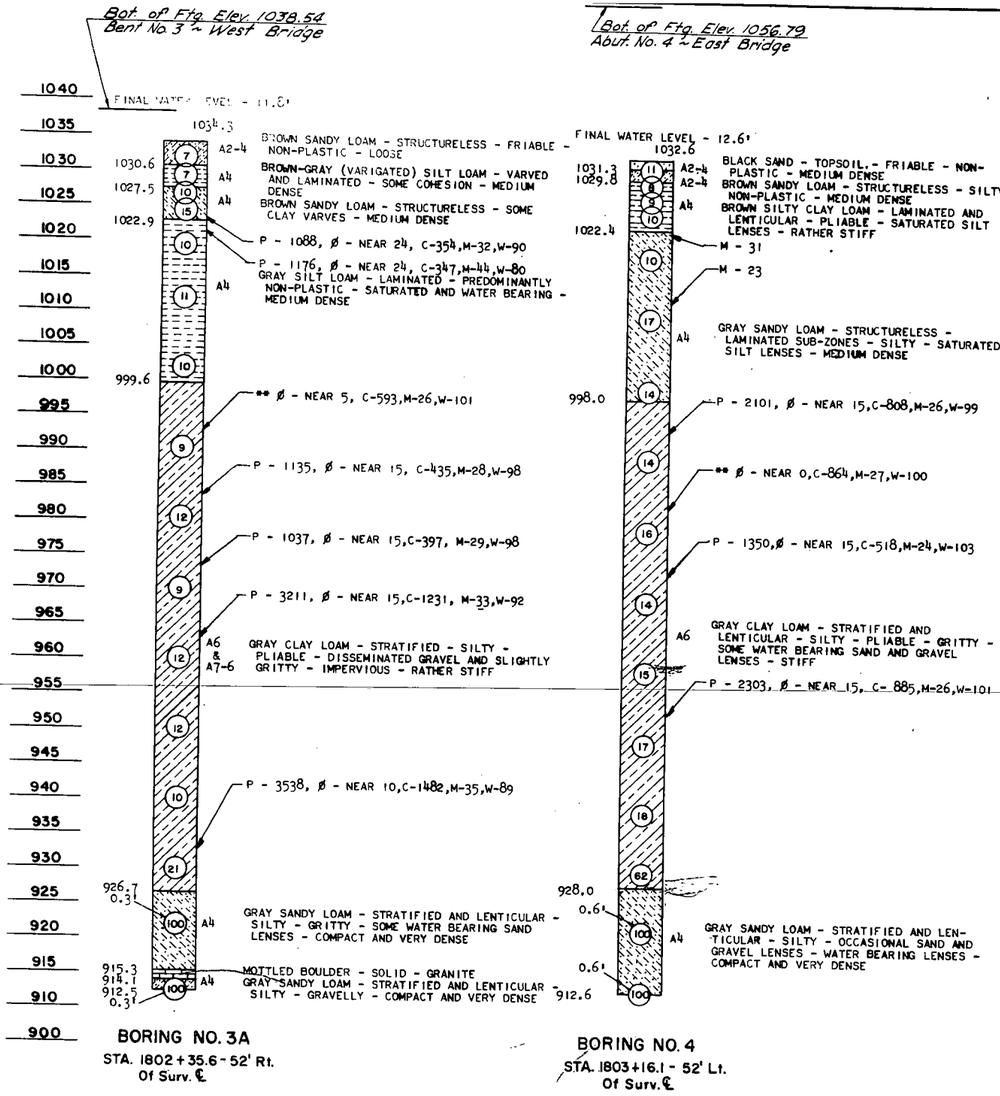
BORING LOG
SOO LINE RAILWAY
OVERHEAD
RICHLAND COUNTY

DETAILS MADE BY / CHECKED BY
PACING MADE BY / CHECKED BY
QUANTITIES MADE BY / CHECKED BY

29-9.00-2

29-9.00-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)	8	



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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'.

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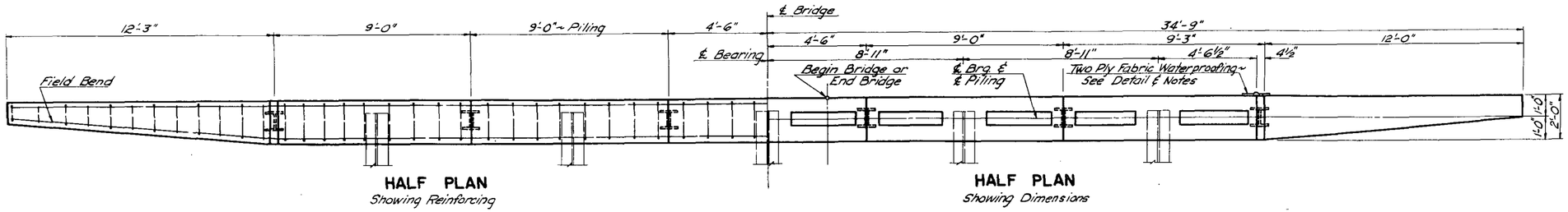
SHEET 2 OF 2

BORING LOG
SOO LINE RAILWAY
OVERHEAD
RICHLAND COUNTY

29-9.00-3

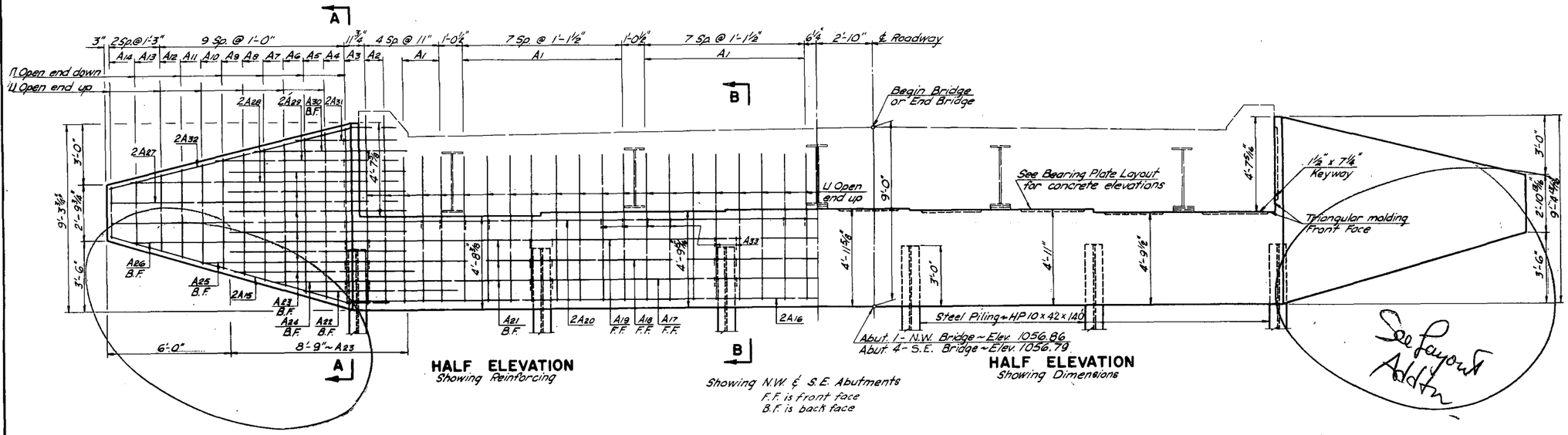
29-9.00-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)		



HALF PLAN
Showing Reinforcing

HALF PLAN
Showing Dimensions



HALF ELEVATION
Showing Reinforcing

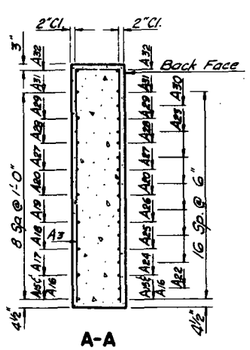
HALF ELEVATION
Showing Dimensions

Showing N.W. & S.E. Abutments
F.F. is front face
B.F. is back face

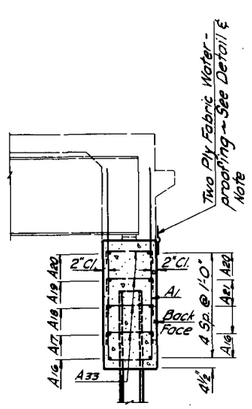
BAR LIST (ONE ABUT.)

MARK	NUMBER	WALL		SIZE	LENGTH	SHAPE	UNIT WT.
A1	38			6	16'-10"	Bent	25.29
A2	4			6	20'-6"	"	30.79
A3	2			6	19'-4"	"	29.04
A4	2			5	18'-3"	"	19.04
A5	2			5	17'-0"	"	17.73
A6	2			5	15'-11"	"	16.60
A7	2			5	14'-8"	"	15.30
A8	2			5	13'-7"	"	14.17
A9	2			4	12'-4"	"	8.23
A10	2			4	11'-1"	"	7.40
A11	2			4	10'-0"	"	6.68
A12	2			4	8'-9"	"	5.84
A13	2			4	7'-4"	"	4.90
A14	2			4	5'-10"	"	3.89
A15	4			6	13'-11"	"	20.90
A16	4			6	24'-0"	Str.	36.05
A17	2			5	27'-6"	"	28.69
A18	2			5	30'-11"	"	32.25
A19	2			5	34'-4"	"	35.81
A20	4			6	35'-7"	"	53.45
A21	6			5	23'-7"	"	24.60
A22	2			7	7'-6"	"	15.33
A23	12			7	8'-9"	"	17.89
A24	2			6	6'-4"	"	7.26
A25	2			6	9'-10"	"	14.77
A26	2			6	13'-3"	"	19.90
A27	4			6	14'-1"	"	21.15
A28	4			6	13'-1"	"	19.65
A29	4			6	8'-11"	"	13.39
A30	2			7	12'-5"	"	12.16
A31	4			6	5'-0"	"	7.51
A32	4			6	14'-6"	Bent	21.78
A33	66			4	2'-8"	"	1.78

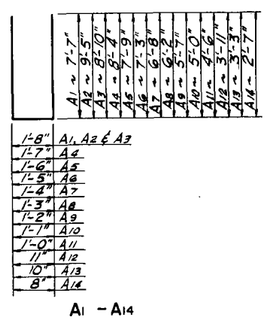
NOTE:
Two ply fabric waterproofing shall be applied over the construction joint on the back face as shown on the detail. "Two Ply Fabric Waterproofing" shall consist of furnishing materials and placing dampproofing and fabric waterproofing in accordance with Section 736 of the Standard Specifications. All materials and work shall be considered incidental to the pay item for Class AE-1 Concrete.



A-A

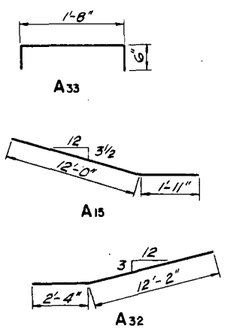


B-B

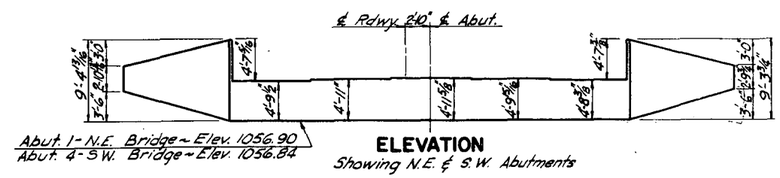


A1 - A14

BENT BAR DETAILS
Dimensions shown are out to out



TWO PLY FABRIC WATERPROOFING DETAIL



ELEVATION
Showing N.E. & S.W. Abutments

QUANTITIES (ONE ABUT.)

Class AE-1 Concrete	25.2 C.Y.
Reinforcing Steel	2980 Lbs.
Excavation (See Layout)	
Piling (See Layout)	

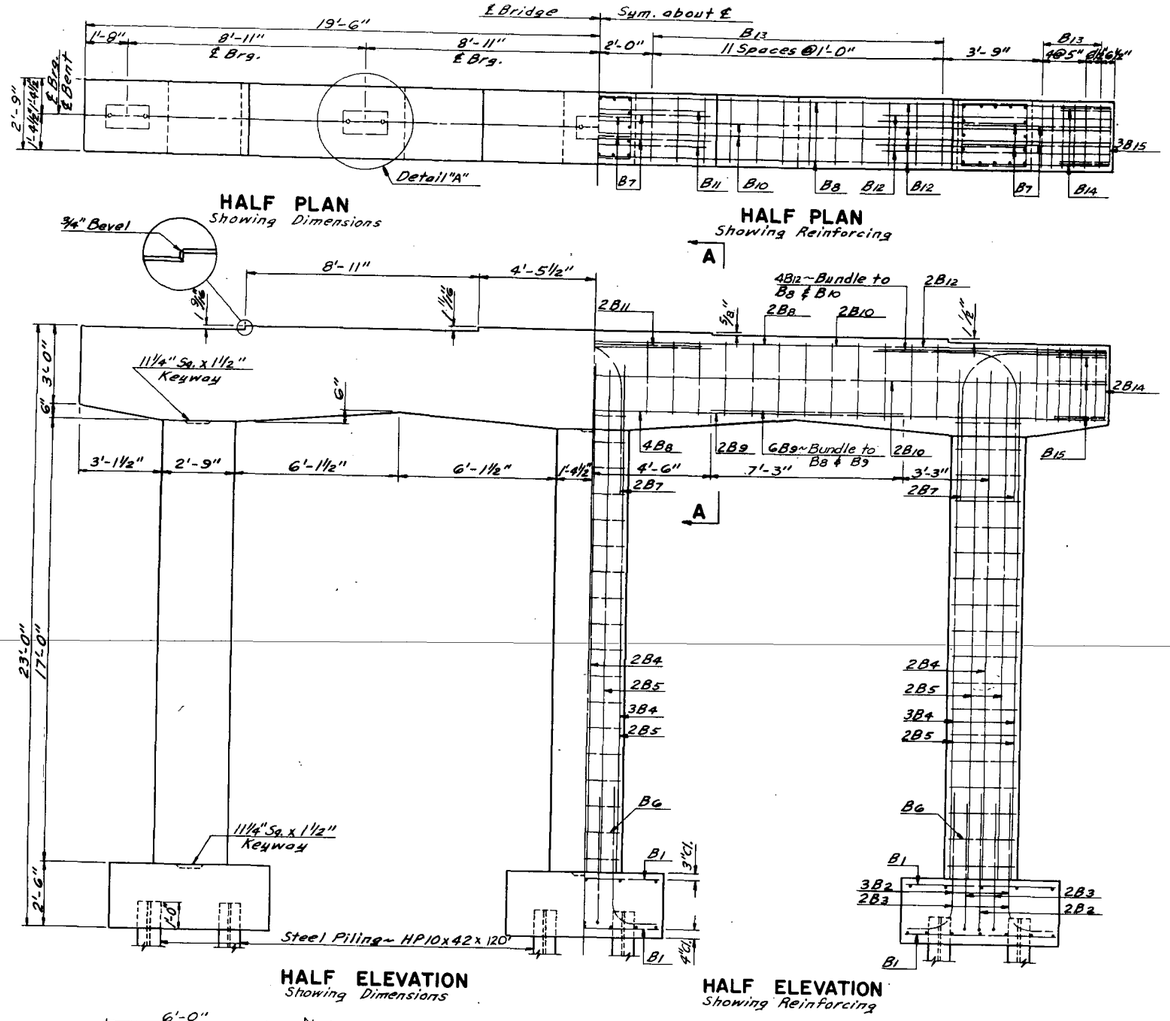
SOO LINE RAILWAY
OVERHEAD

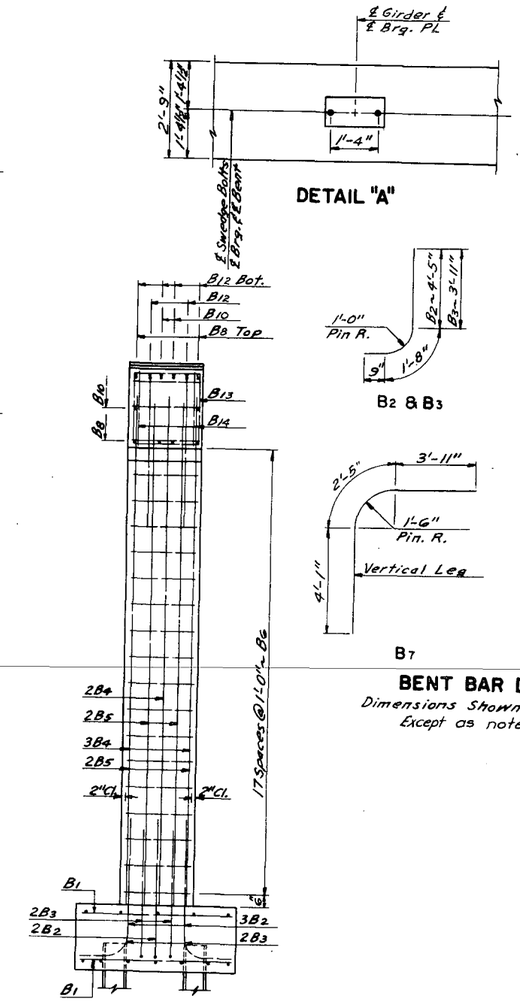
9'-0" ABUTMENT

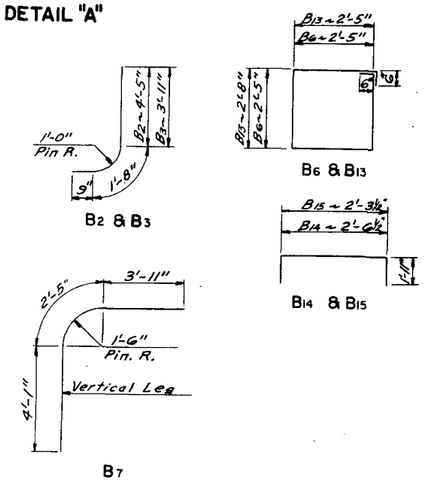
DETAILS	
MADE BY	G.A.L.
CHECKED BY	L.E.G.
TRACING	
MADE BY	D.L.P.
CHECKED BY	L.E.G.
QUANTITIES	
MADE BY	D.L.P.
CHECKED BY	L.E.G.

29-9.00-4

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	1-029-1(23)	10	







BENT BAR DETAILS

Dimensions Shown are out to out
Except as noted

BAR LIST (ONE BENT)

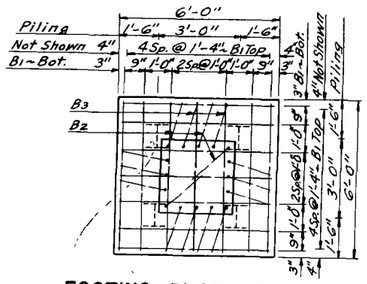
MARK	NUMBER: CAP	NUMBER: COLUMN	NUMBER: FOOTING	SIZE	LENGTH	SHAPE	UNIT WT.
B1			72	5	5'-6"	Str.	5.74
B2			24	8	6'-10"	Bent	18.25
B3			24	7	6'-4"	"	12.95
B4		24		8	19'-6"	Str.	52.07
B5		24		7	19'-9"	"	39.36
B6	3	51		3	10'-8"	Bent	4.01
B7		12		8	10'-5	"	27.82
B8	6			7	38'-8"	Str.	79.05
B9	16			7	7'-3"	"	14.82
B10	4			6	38'-8"	"	58.08
B11	2			6	8'-0"	"	12.02
B12	12			6	8'-7"	"	12.89
B13	36			5	11'-2"	Bent	11.65
B14	4			6	6'-5"	"	9.64
B15	6			6	6'-2"	"	9.26
SR4*	1			4	5'-8"	Str.	
SR5*	1			5	4'-0"	"	
SR6*	1			6	4'-6"	"	
SR7*	1			7	5'-0"	"	
SR8*	1			8	5'-4"	"	

NOTE:

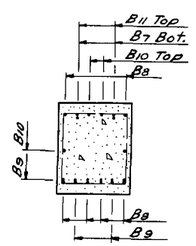
The concrete in the columns shall be allowed to set at least two (2) hours before the bent cap reinforcing is placed and concrete poured.

All exposed edges to be beveled with ¾" triangular molding.

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



FOOTING PLAN ~ TYPICAL



A-A

FOOTING ELEVATIONS	Bent #2	Bent #3
East Bridge	1038.56	1038.52
West Bridge	1038.54	1038.54

QUANTITIES (ONE BENT)

Class AE-1 Concrete	380 CY.
Reinforcing Steel	5543 Lbs.
Steel Piling (See Layout)	
Excavation (See Layout)	

SOO LINE RAILWAY

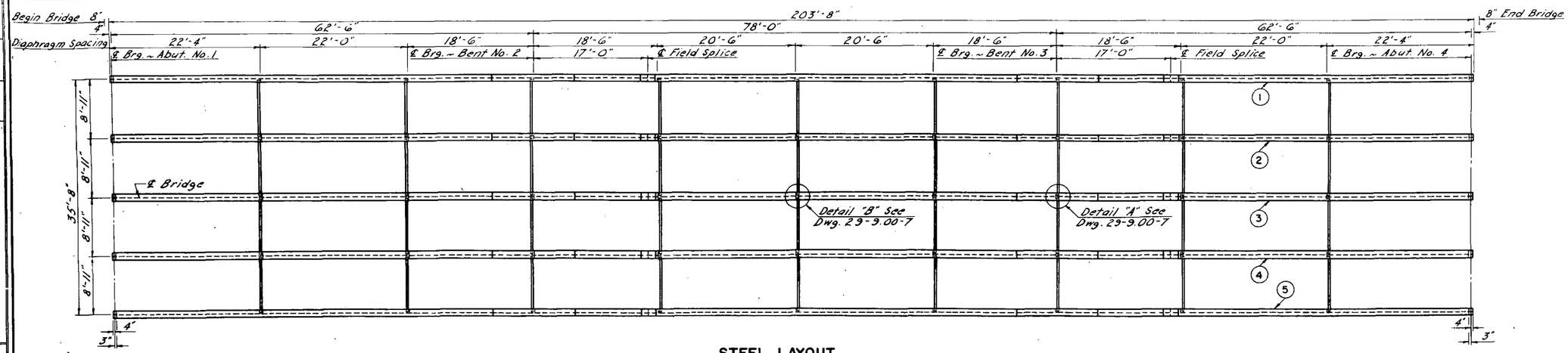
OVERHEAD

23'-0" BENT

29-9.00-5

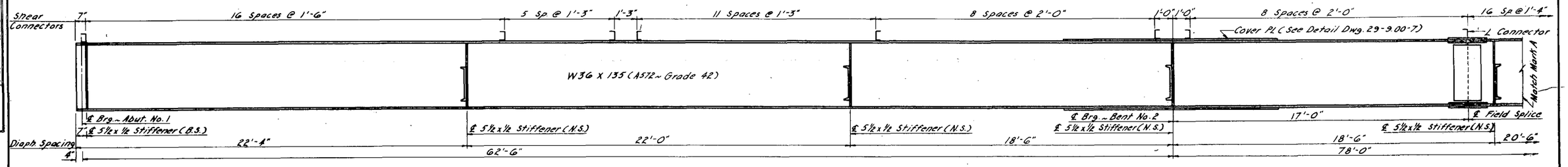
29-9.00-5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)		



STEEL LAYOUT

NOTE:
The details shown are for Beam No. 1. The other beams are to be fabricated in accordance with these details and the details on Drawing 29-9.00-7.



BEAM ELEVATION

Nomenclature:
N.S. = Near Side
B.S. = Both Sides

Designed for 25 #/S.F. F.W.S.

QUANTITIES
See Drawing 29-9.00-7

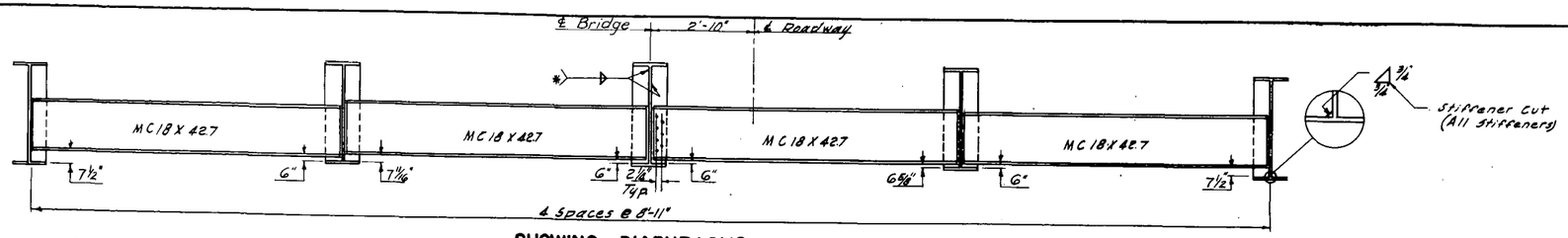
SOO LINE RAILWAY
OVERHEAD
SUPERSTRUCTURE DETAILS

DETAILS CHECKED BY L.E.G. MADE BY L.E.G.
SPACING CHECKED BY D.L.R. MADE BY D.L.R.
QUANTITIES CHECKED BY L.E.G.

29-9.00-6

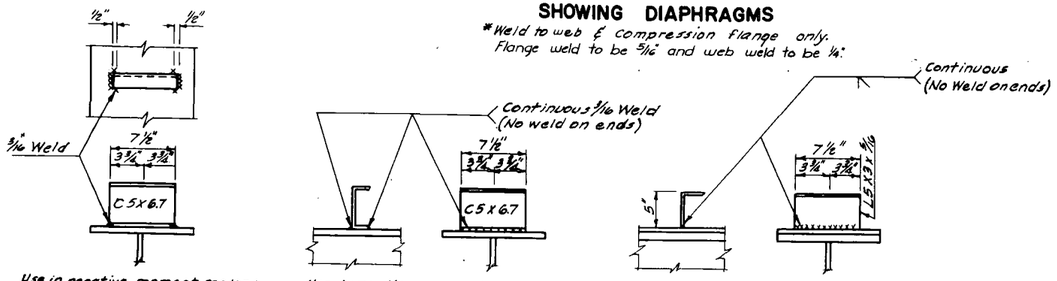
29-9.00-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1(23)	12	



SHOWING DIAPHRAGMS

*Weld to web & compression flange only. Flange weld to be 5/16" and web weld to be ¼".

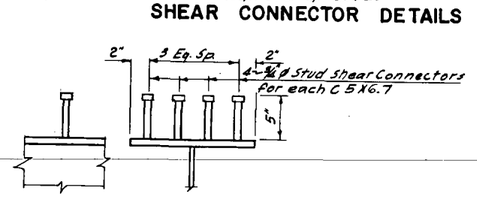


Use in negative moment regions between field splices.

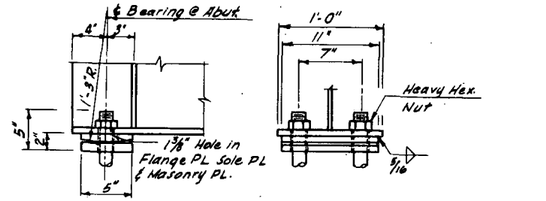
Use in positive moment regions except over splice PL's

Use over splice PL's

SHEAR CONNECTOR DETAILS



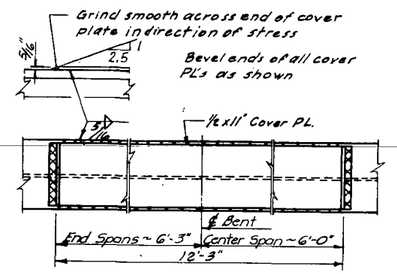
ALTERNATE SHEAR CONNECTOR



Sole Plate ~ Bar 5 x 1⅛ x 11"
Masonry Plate ~ Bar 5 x ⅞ x 11"
Swedge Bolts ~ 1⅛" ø x 1'-6"

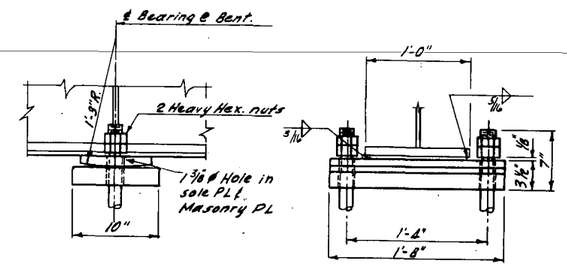
Note: Swedge bolts to be drilled and anchored in quick setting anchor grout.

ABUTMENT BEARING DETAILS



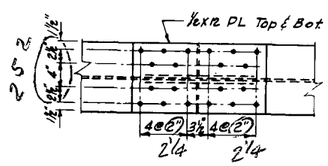
COVER PLATE DETAIL

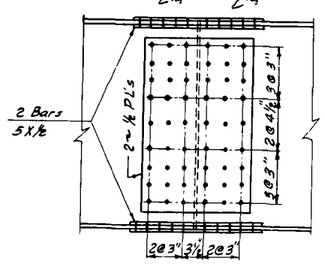
A572 ~ Grade 42



Sole Plate ~ Bar 8 x 1½ x 20"
Masonry Plate ~ PL 2 x 10 x 20"
Swedge Bolts ~ 1½" ø x 1'-8"

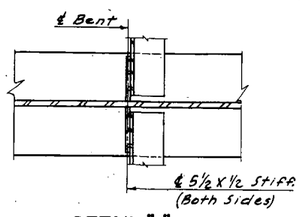
BENT BEARING DETAILS



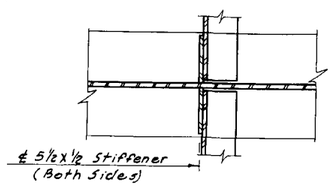


FIELD SPLICE DETAILS

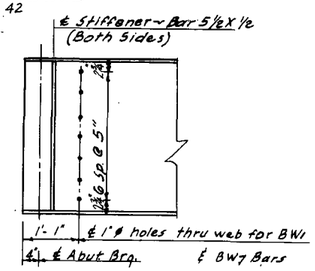
A572 ~ Grade 42



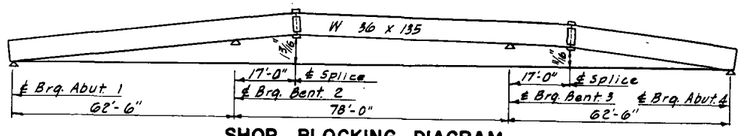
DETAIL "A"



DETAIL "B"



BEAM DETAIL



SHOP BLOCKING DIAGRAM

Dimensions are to the bottom of the flange splice plates

Designed for 25 #/S.F. F.W.S.

QUANTITIES (ONE BRIDGE)	
Structural Steel (A36)	21,246 Lbs.
Structural Steel (A572)	142,039 Lbs.

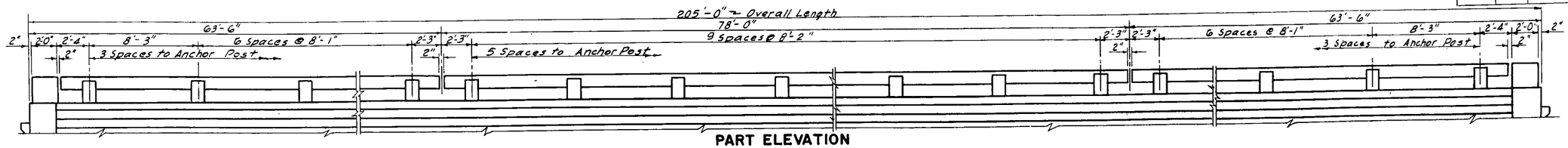
SOO LINE RAILWAY
OVERHEAD

SUPERSTRUCTURE DETAILS

29-9.00-7

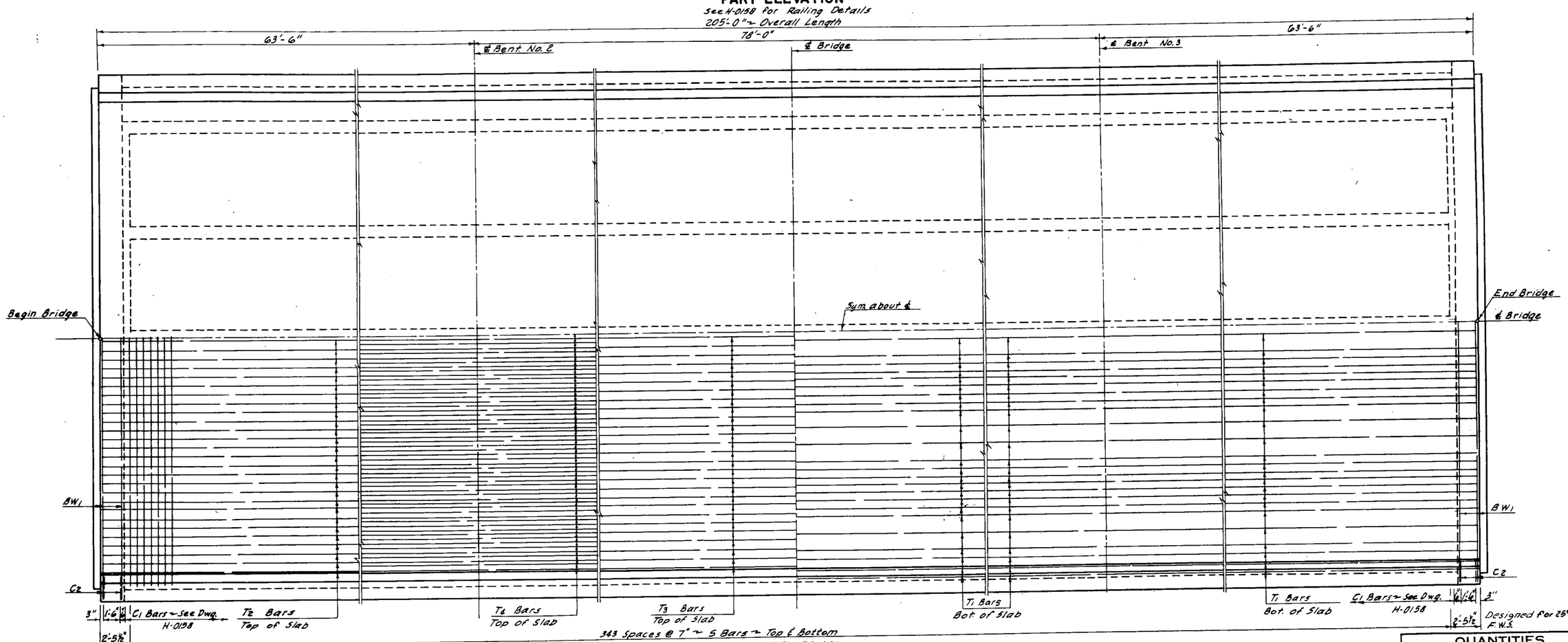
29-9.00-7

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	I-029-1 (23)		



PART ELEVATION

See H-0158 for Railing Details

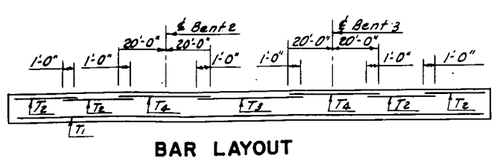


Quarter showing reinforcing in top of slab

PART PLAN

Half showing slab reinforcing
Typical both sides ~ by rotation

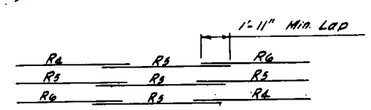
Quarter showing reinforcing in bottom of slab



BAR LAYOUT

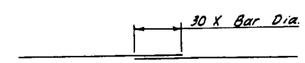
T_2, T_3, & T_4

Spans 1 & 3



Span 2

R BAR SPLICING DETAIL



SPLICING DETAIL

T_1, C_3, & C_4

QUANTITIES

See Drawing 29-900-9

SOO LINE RAILWAY
OVERHEAD

SLAB & RAILING DETAILS

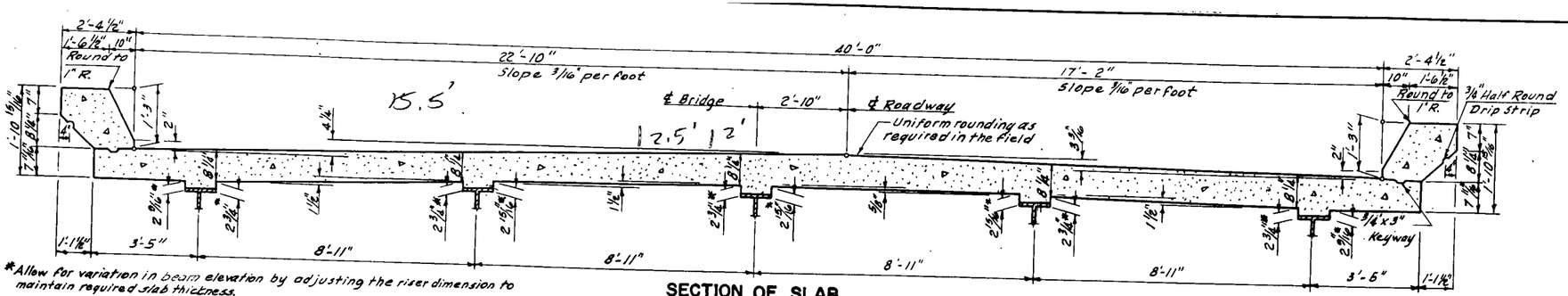
CHECKED BY	LEG
MADE BY	GWH
CHECKED BY	DLP
MADE BY	DLP
CHECKED BY	F.D.H.

TRACING
QUANTITIES

29-9.00-8

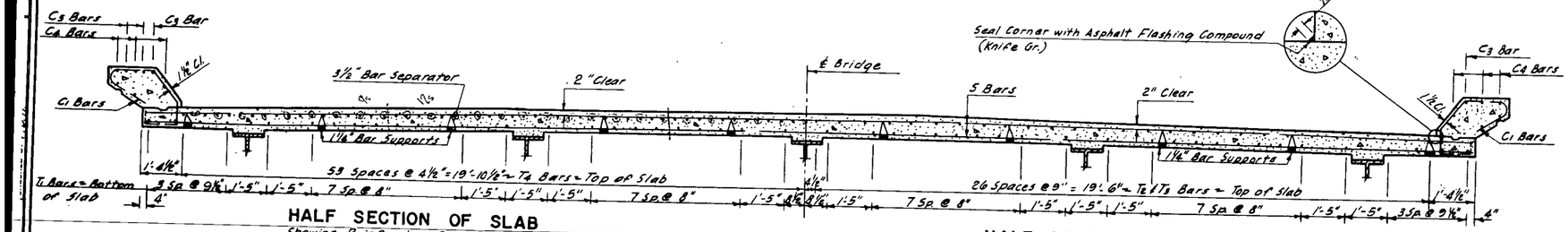
29-9.00-8

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	N. D.	I-029-1(23)	14	



*Allow for variation in beam elevation by adjusting the riser dimension to maintain required slab thickness.

SECTION OF SLAB
Showing Dimensions

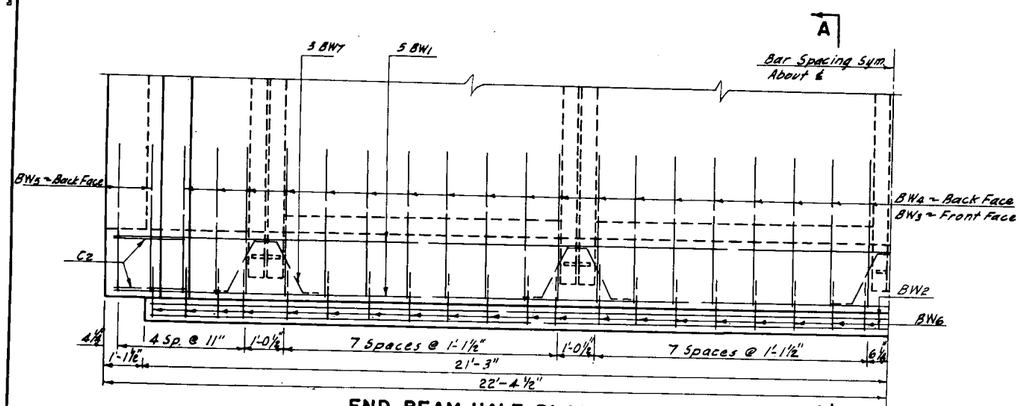


HALF SECTION OF SLAB
Showing Reinforcing Over Bents

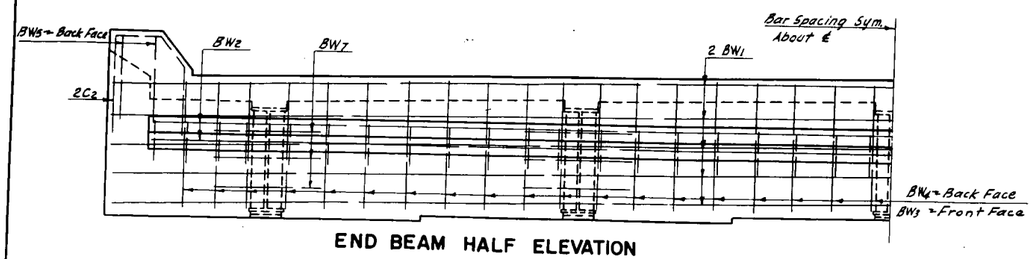
HALF SECTION OF SLAB
Showing Reinforcing between Supports

BAR LIST (ONE SLAB)

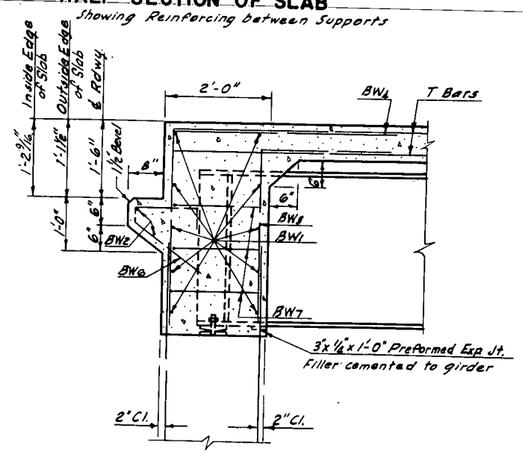
MARK	NUMBER SLAB	NUMBER RAILING & POSTS	NUMBER CURB	SIZE	LENGTH	SHAPE	UNIT WT.
BW1	20			6	44'-8"	Str.	66.72
BW2	4			5	42'-2"	Str.	43.98
BW3	76			6	5'-9"	Bent	8.64
BW4	76			6	7'-10"	"	12.02
BW5	8			6	6'-9"	"	10.14
BW6	80			4	3'-6"	"	2.34
BW7	20			5	5'-0"	"	5.22
C1	454			5	6'-0"	Bent	6.26
C2	8			5	7'-2"	"	7.48
C3			12	6	35'-9"	Str.	39.70
C4			60	5	35'-6"	Str.	37.03
C5			8	4	40'-2"	"	26.70
P2			138	6	4'-8"	Bent	6.51
P5			18	6	5'-1"	"	7.64
P6			104	5	4'-9"	"	4.95
P7	104			3	4'-2"	"	1.56
P8	92			3	3'-2"	"	1.19
P9	12			3	4'-8"	"	1.75
R1	358			3	5'-3"	Bent	1.22
R1	16			6	34'-6"	Str.	51.57
R2	16			6	31'-6"	Str.	47.07
R3	16			6	28'-6"	"	42.56
R4	8			6	30'-2"	"	45.91
R5	20			6	27'-2"	"	40.61
R6	8			6	24'-2"	"	36.30
S	688			6	42'-2"	Str.	63.34
T1	288			5	35'-6"	Str.	37.03
T2	216			3	22'-8"	"	8.51
T3	54			3	40'-0"	"	15.02
T4	24			4	40'-0"	"	20.70



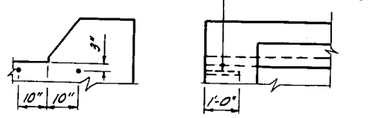
END BEAM HALF PLAN



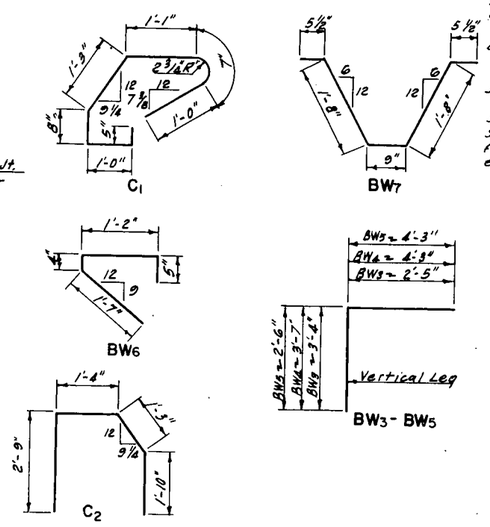
END BEAM HALF ELEVATION



A-A



CURB SLEEVE DETAILS



BENT BAR DETAILS
Dimensions shown are out to out

NOTES:

It is assumed that the Contractor can place the slab concrete in one continuous operation in accordance with Sections 602-3.6.1 thru 602-3.6.2.1.4 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 Standard Drawing H-0158 for railing details.

See Dwg. 29-9.00-6 & 29-9.00-7 for structural steel details.

The end beams shall be poured at the same time that the deck slab is poured. Special care shall be taken to completely fill the space under the girders in the end beams with concrete.

Designed for 25#/S.F. F.W.S.

QUANTITIES (ONE SLAB)

Class AE-3 Concrete	284.6 C.Y.
Class AAE-3 Concrete	13.3 C.Y.
Reinf. Steel	78,244 Lbs.

Railing & end post quantities included.

SOO LINE RAILWAY
OVERHEAD

SLAB, END BEAM, & MISC. DETAILS

29-9.00-9

29-9.00-9