

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 1999	Pass: 3.070	Trucks 670	Total 3.740	375
Forecast 2019	Pass: 4.605	Trucks 1.005	Total 5.610	565
Minimum Sight Dist. for:		Design Speed 70 mph		
Stopping 625'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				

JOB# 20 NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

PROJECT NO. IM-2-094(049)248
IN STUTSMAN COUNTY
PCC PAVEMENT & INCIDENTALS
(WESTBOUND)

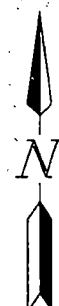
STATE	PROJECT NO.	SHEET NO.
ND	IM-2-094(049)248	1

GOVERNING SPECIFICATIONS:

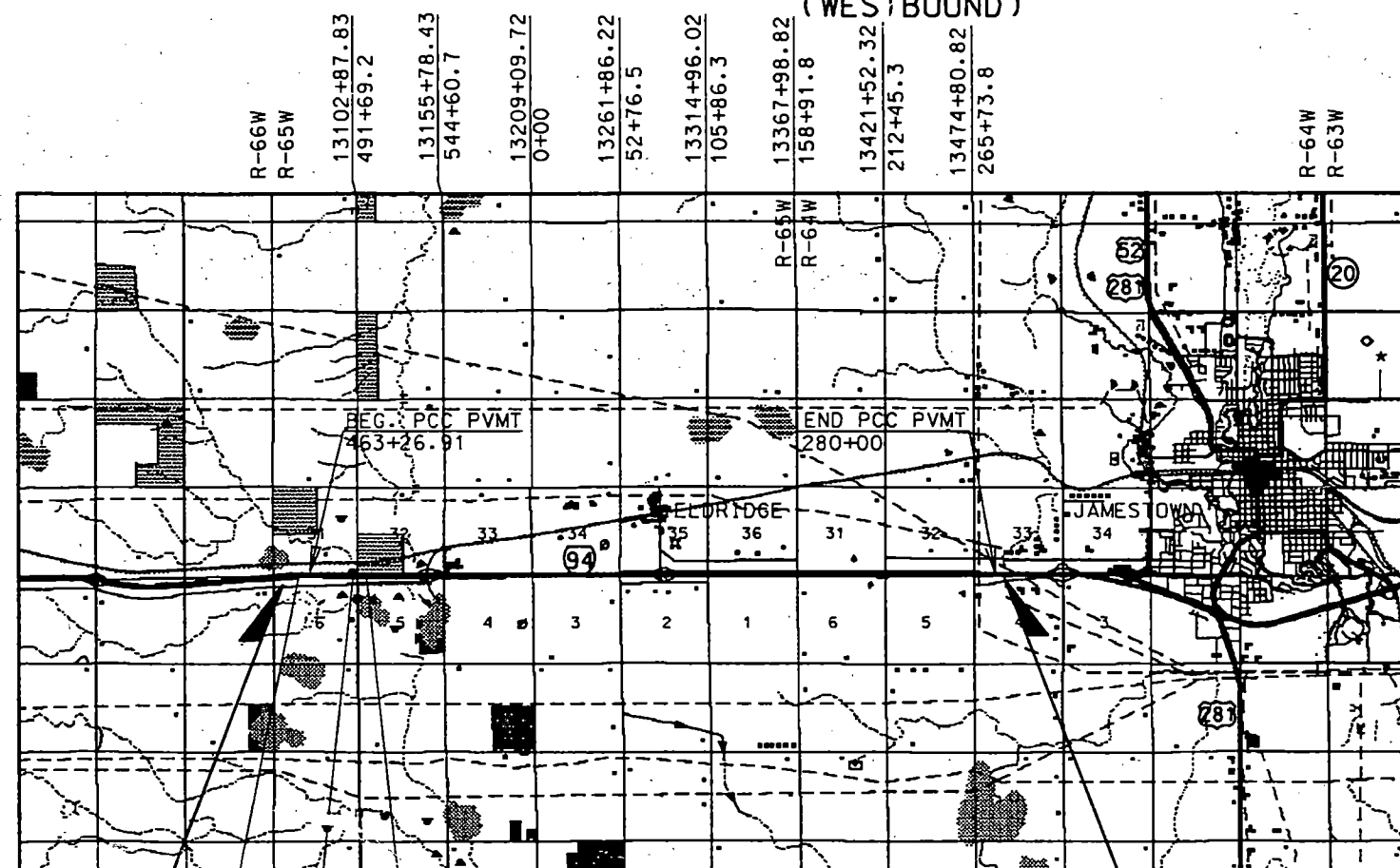
Standard Specifications adopted by the North Dakota Department of Transportation October 1997; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

8.196 Miles
From beginning of west median crossover at Lippert
to end of east median crossover at Woodbury.



T-140N
T-139N



Beg. Proj. IM-2-094(049)248
RP 247.500
New Sta. 13068+02.24
Old Sta. 456+78.45

End Proj. IM-2-094(049)248
RP 255.696
New Sta. 13500+72.29
Old Sta. 291+65.27

EQUATION 462+15.7 BK =
462+19.1 AHD

EQUATION 490+93.7 BK =
490+95.46 AHD

EQUATION 492+41.8 BK =
492+42.70 AHD

EQUATION 597+91.99 BK =
0+00 AHD

EQUATION 158+89.10 BK =
158+91.80 AHD

DESIGNER *William S. Eklund*
DESIGNER _____
DESIGNER _____
RECOMMEND APPROVAL *9-7-2000*
DESIGN ENGINEER *K. H. Eklund*

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

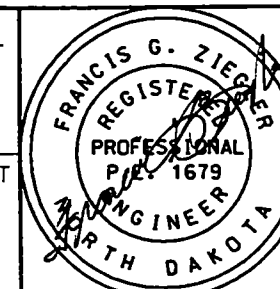
APPROVED

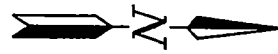
DIVISION ADMINISTRATOR DATE

APPROVED DATE *9/7/2000*

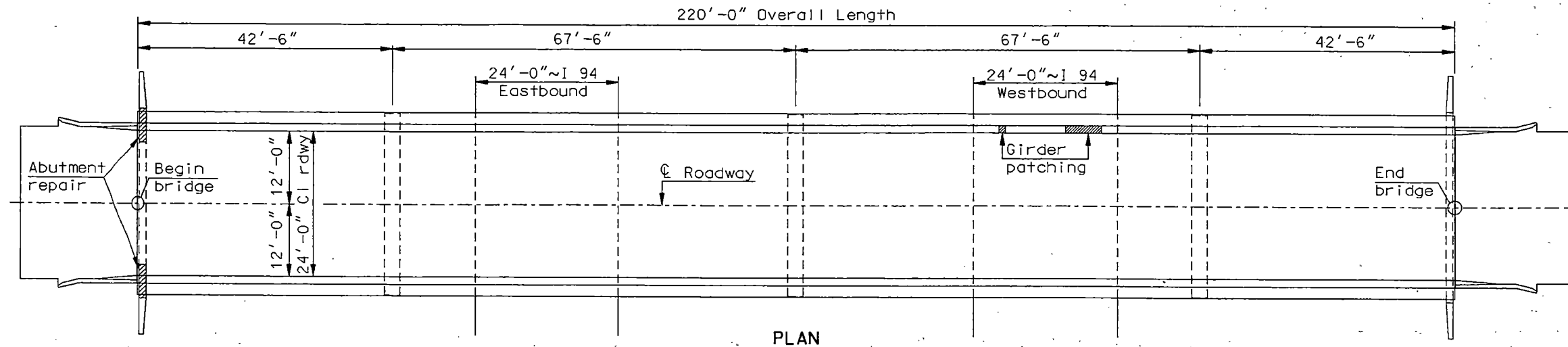
Francis G. Ziegler
OFFICE OF INFRASTRUCTURE SUPPORT

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION





BRIDGE CODE	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO.
X-781	8	ND	IM-2-094(049)248	75



PLAN

NOTE:

SCOPE OF WORK: The work at this site consists of joint repair at both ends of the bridge, girder patching and abutment repair.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
930	8642	NOSING CONCRETE	CF	4.7
930	8644	SILICONE SEALANT	LF	48
930	9660	ABUTMENT REPAIR	L SUM	1
930	9694	GIRDER PATCHING	L SUM	1

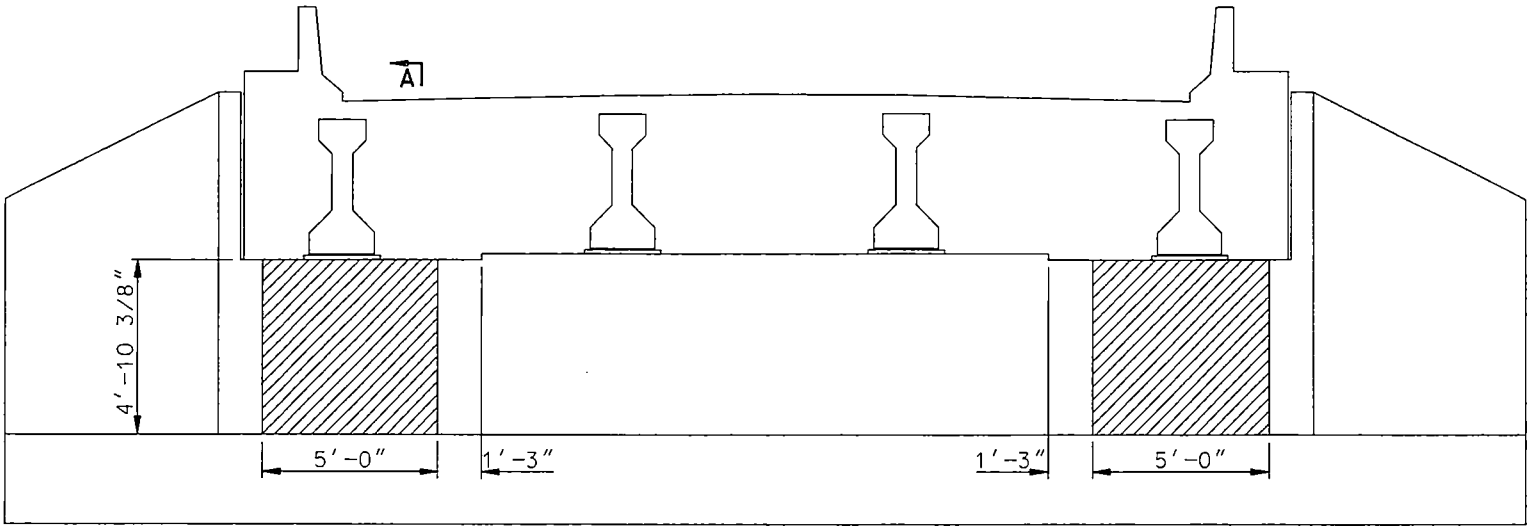
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
ELDRIDGE INTERCHANGE

BRIDGE LAYOUT

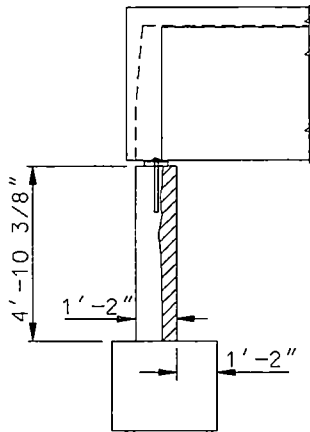
PROJECT: IM-2-094(049)248

STATION 79+33.0

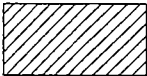
STUTSMAN COUNTY



ELEVATION
Showing concrete removal

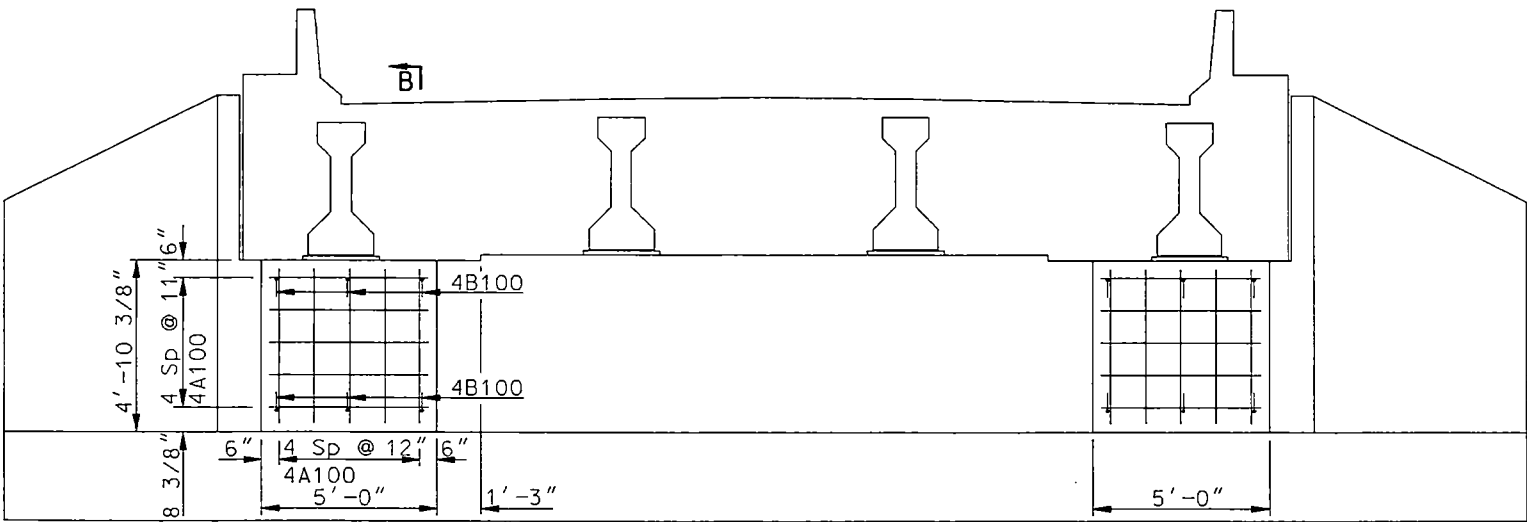


A-A

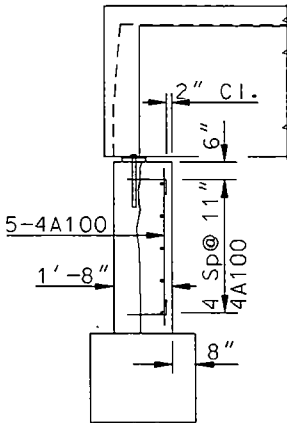

SHOWING CONCRETE
REMOVAL

NOTE:
Remove broken and loose concrete to sound concrete.
Place the anchorage units according to manufacturer's recommendation.
Place new concrete 6" beyond existing concrete wall.

Concrete removal, new concrete, reinforcing steel, equipment and labor shall be included in the price bid for "Abutment Repair."



ELEVATION
Showing abutment repair

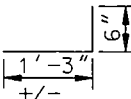


B-B

BAR LIST			
SIZE	MARK	NO.	LENGTH
4	A100	20	4'-6"
4	B100	12	1'-9"

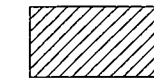
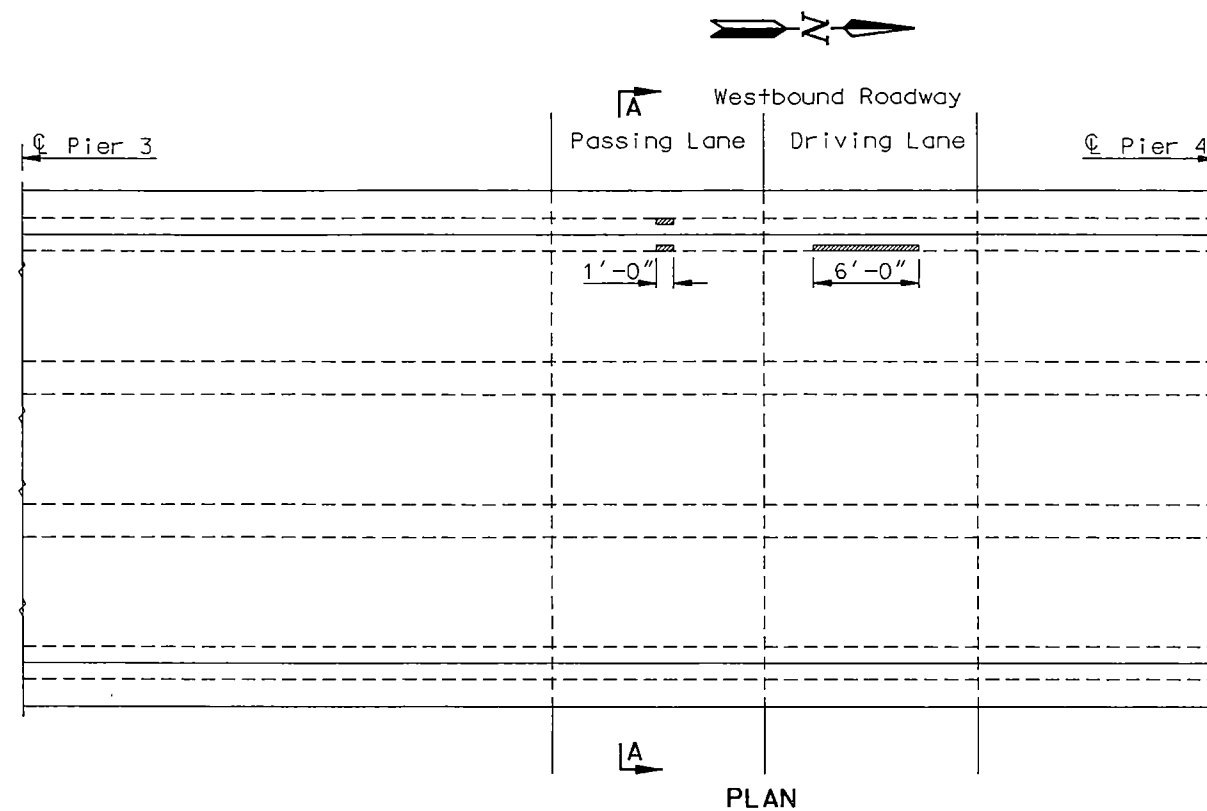
Bar list for informational purposes only.

ABUTMENT REPAIR: The abutment wall under the outside girder bearings has broken up. Broken concrete shall be removed to sound concrete and rebuilt to the limits shown. All labor, equipment and materials required to repair the south abutment shall be included in the price bid for "Abutment Repair."


4B100
BAR DETAILS
Dimensions shown are out to out

ELDRIDGE INTERCHANGE

SOUTH ABUTMENT REPAIR



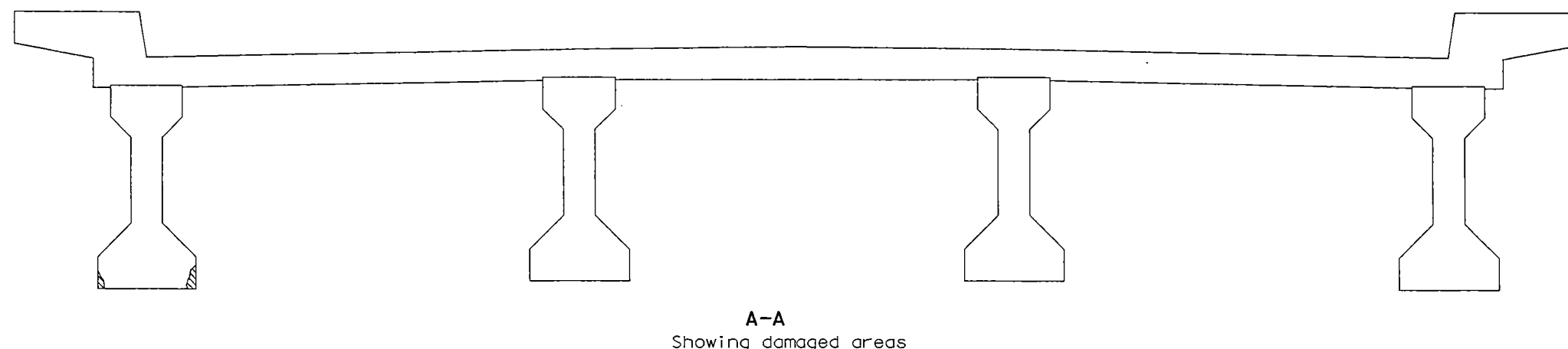
Hatched areas indicate
damaged concrete

GIRDER PATCHING: The bid item "Girder Patching" shall include all labor, equipment and materials to remove loose concrete and to patch damaged areas on the west girder over the driving and passing lane of the westbound roadway as indicated on the details. The actual limits of areas to be repaired shall be determined by the Engineer in the field.

1. A 15 pound maximum size chipping hammer shall be used to remove any unsound concrete. The edges of the repair shall be sharp neat lines at least one inch deep. These neat lines shall be produced by saw cutting or other means approved by the Engineer. Care shall be taken in the removal process to not damage the reinforcing steel.

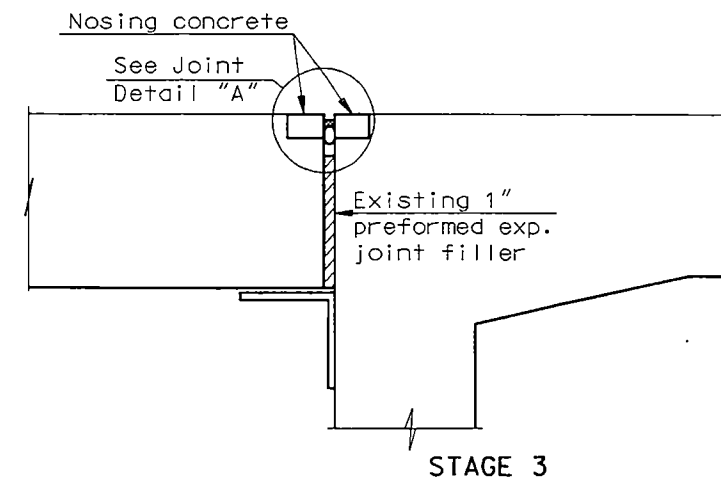
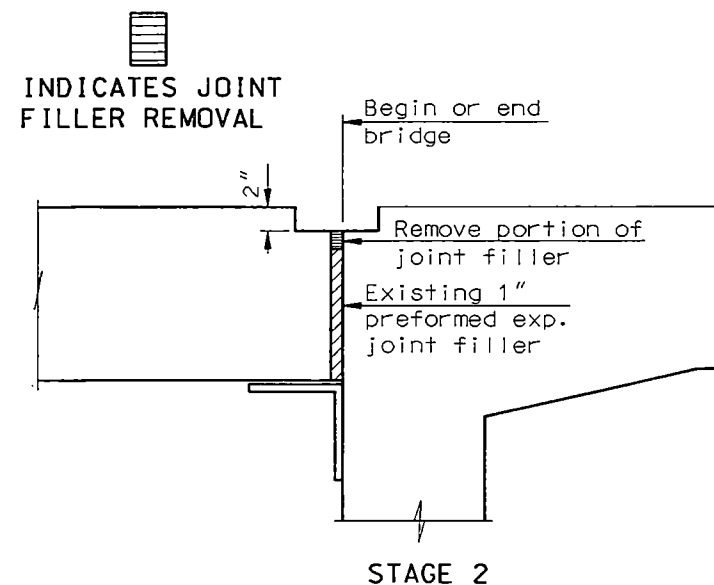
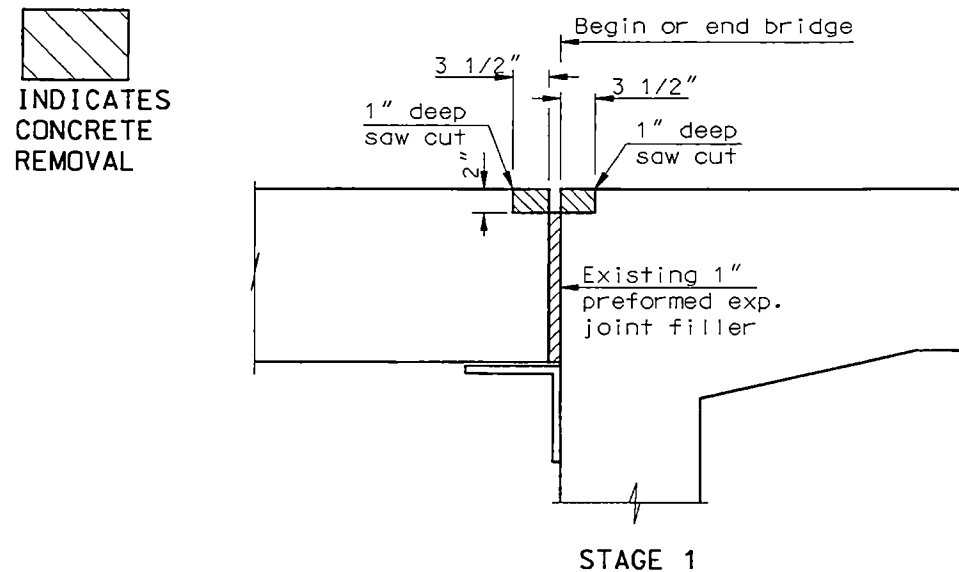
2. After all unsound concrete is removed, the existing surface shall be cleaned by light sandblasting or high pressure water blasting. After the surface has dried and just before the patch material is placed, the surface shall be coated with an epoxy bonding agent.

3. The beams shall be restored to their original cross section with a concrete material that is specifically intended for patching concrete. This material may be SIKATOP 122 Repair Mortar, Tammstech Duraltop Gel, EMANCO 588CR, Thorite or an approved equal. It is important to minimize shrinkage in the patch material, therefore, the contractor shall take steps, including proper curing, as recommended by the manufacturer to minimize shrinkage.



ELDRIDGE INTERCHANGE

GIRDER REPAIR



APPROACH SLAB - BRIDGE DECK JOINT

STAGE 1:

1. Remove concrete between the curbs at the ends of deck and approach slabs to allow for nosing concrete.

STAGE 2:

2. Remove the amount of the existing preformed expansion joint filler necessary to accommodate the placement of nosing concrete and backer rod.

STAGE 3:

3. Place nosing concrete in the blockout areas, both in the deck and the approach slab.
4. After the nosing concrete has cured, grind the 1/4" edge bevel, clean and prepare the joint, apply any necessary bonding material, install the backer rod and the silicone sealant.

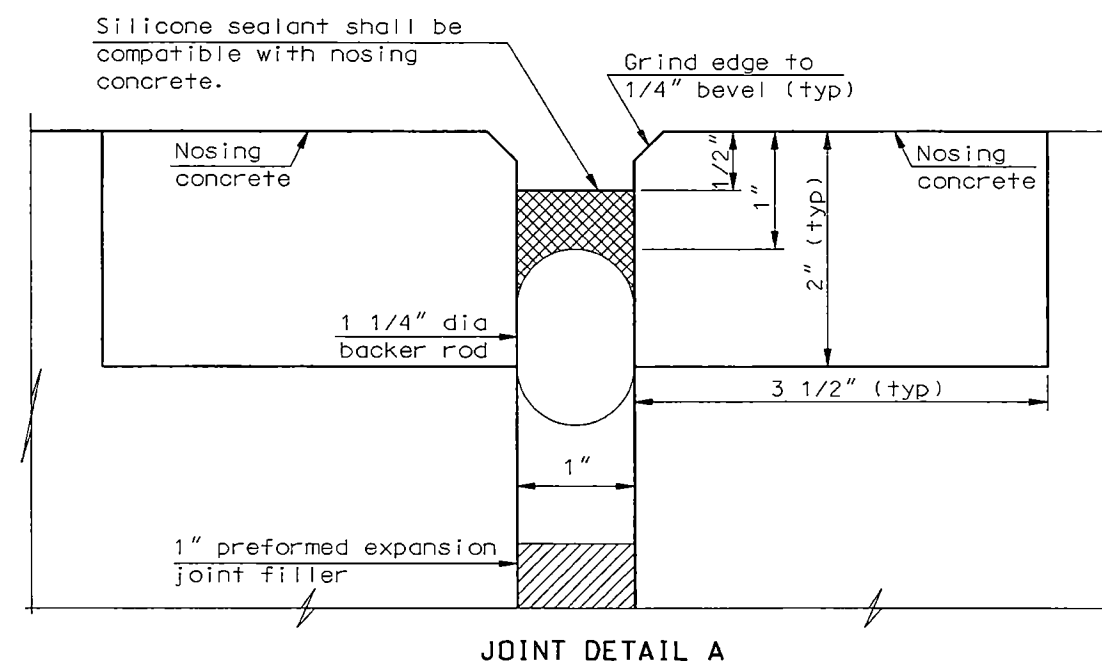
NOTES:

Saw cutting and removal of concrete shall be included in the pay item "Nosing concrete".

930 NOSING CONCRETE: The nosing concrete material shall be an elastomeric concrete or a polymeric concrete that will provide a durable edge that can withstand live-load traffic without chipping or spalling. The nosing concrete material shall be SILSPEC 900 PNS, manufactured by Silicone Specialties Inc.; WABOCRETE II, manufactured by Watson Bowman; ELASTOMERIC CONCRETE, manufactured by D.S. Brown Company or an approved equal. The nosing concrete shall be mixed and installed according to the manufacturer's recommendation. All labor and materials required to install the nosing concrete shall be included in the bid item "Nosing Concrete."

930 SILICONE: The silicone sealant shall be a rapid cure self leveling, cold applied, two component silicone sealant that will bond to and be compatible to the nosing concrete used. The sealant shall be installed according to the manufacturer's recommendations. The backer rod and any necessary bonding materials shall be included in the bid item "Silicone Sealant."

930 TECHNICAL ASSISTANCE: The Contractor shall acquire the technical assistance from the manufacturer of the nosing concrete and the silicone sealant for the surface preparation and installation of the nosing concrete and silicone sealant. A technical representative must be present for the start of surface preparation and installation for at least one day. The Contractor shall contact the manufacturer at least two weeks prior to the installation. The technical assistance shall be provided at no additional cost to the Department.



QUANTITIES (TWO ENDS)

Nosing Concrete	4.7	CF
Silicone Sealant	48	LF

ELDRIDGE INTERCHANGE

JOINT DETAILS

DESIGN DATA

Traffic

	Average Daily	Est. 30th Max: Hr.
Current (1990)	2250	350
Forecast (2010)	2850	425

	Average Daily	Est. 30th Max: Hr.
Pass.	500	350
Trucks	2750	425
Total	3700	425

Design Speed 70 MPH

Traffic Classification "M"

Minimum Sight Distance (Stopping) 600'

Full control of access

No point of access other than by ramps at interchanges

NORTH DAKOTA

DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. IR-094-6(058)240

IN

STUTSMAN COUNTY

RECYCLED PCC PVMT. & GRINDING

(S. ROADWAY)

CONTRACT 2

JOB# 1

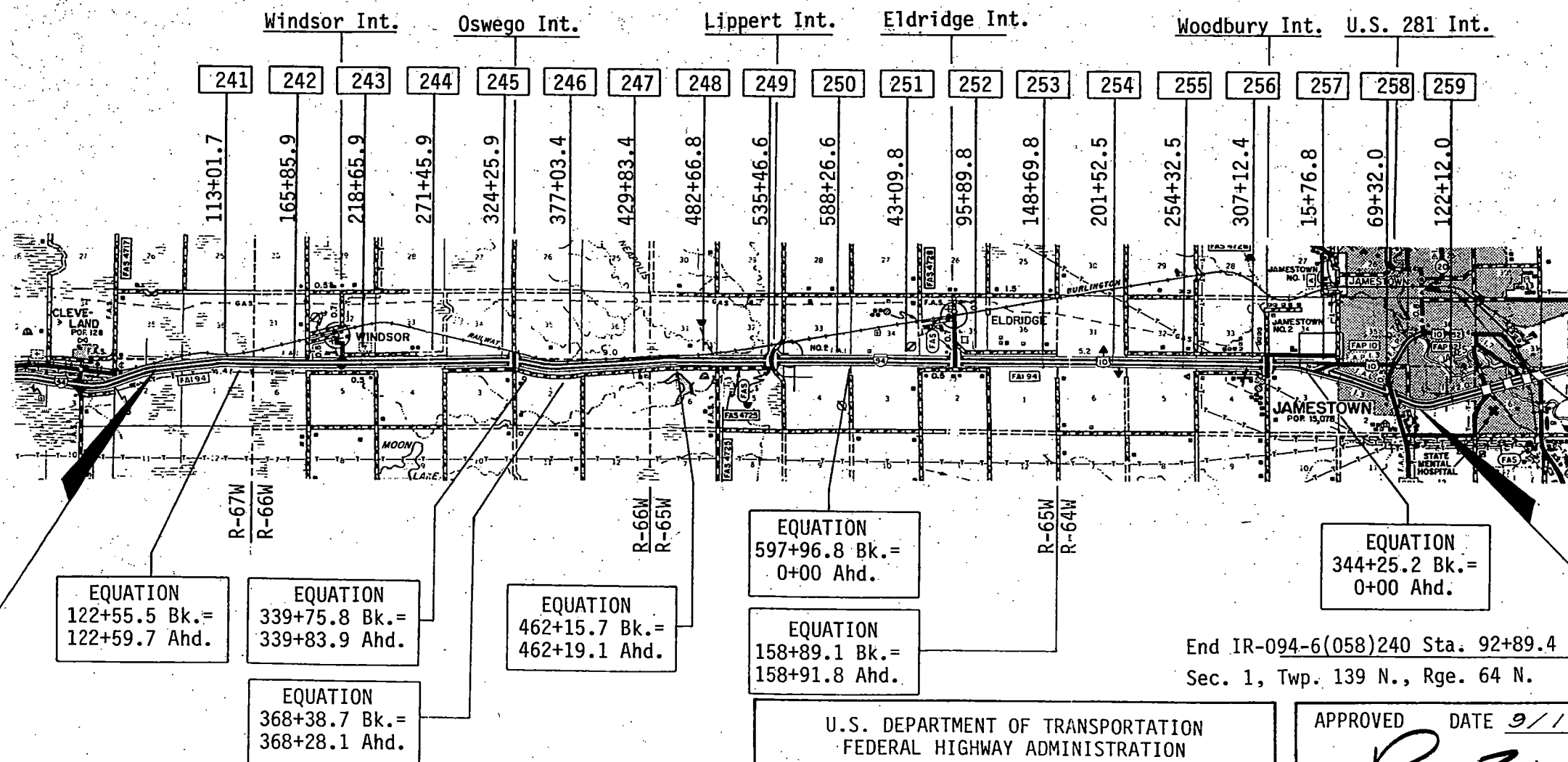
FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	IR-094-6(058)240	1

GOVERNING SPECIFICATIONS:

Standard Specifications for Road and Bridge Construction, adopted by the North Dakota State Highway Department, November 1986, shall apply to all North Dakota Department of Transportation contracts, standard drawings currently in effect, and other contract provisions submitted herein.

LENGTH OF PROJECT

Project	Miles-Gross	Miles-Net
IR-094-6(058)240	18.398	18.398



Req. IR-094-6(058)240 Sta. 63+60
Sec. 2, Twp. 139 N., Rge. 67 W.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

DATE

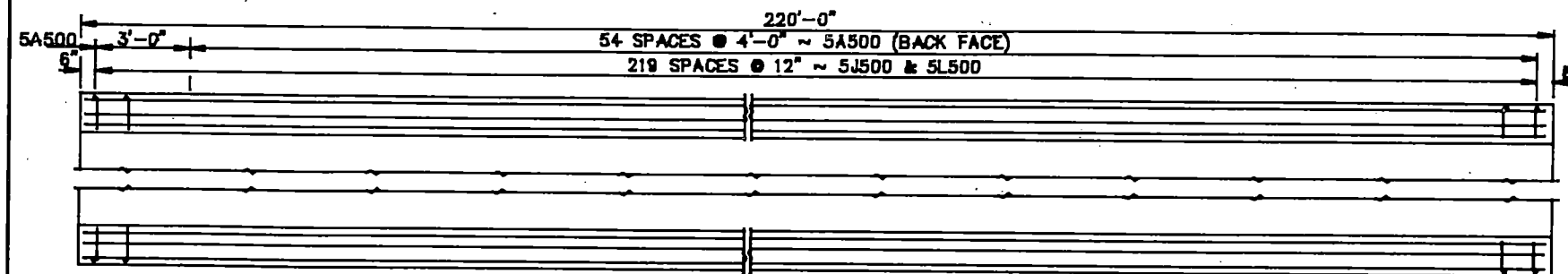
APPROVED DATE 9/1/90

Ray Zink

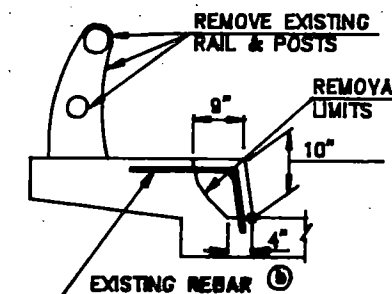
DIRECTOR OF HIGHWAYS
AND ENGINEERING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

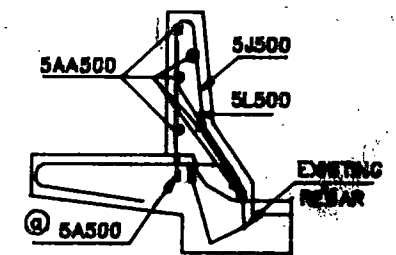




PLAN

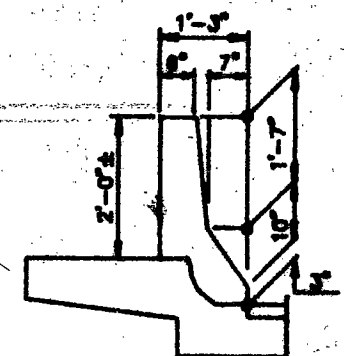


EXISTING



MODIFIED

TYPICAL ELEVATION



MODIFIED
(SHOWING DIMENSIONS)

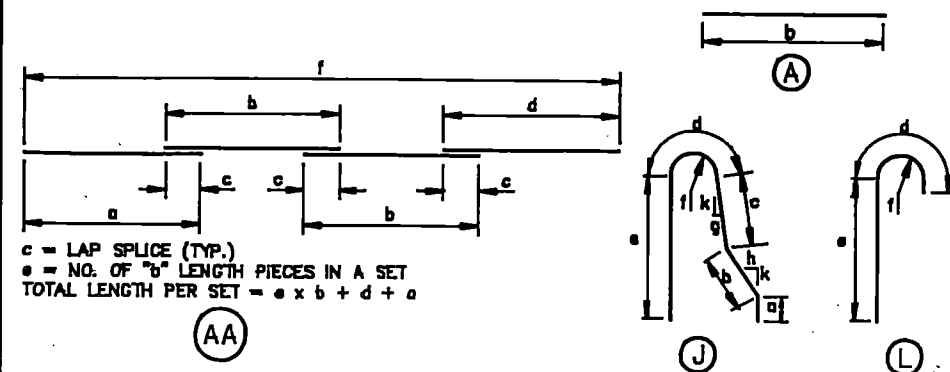
ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0113	REMOVAL OF CONCRETE	CU.YD.	8.0
210	0100	CLASS 1 EXCAVATION	CU.YD.	111.0
210	0200	SELECT BACKFILL	CU.YD.	139.0
550	0215	CONCRETE BRIDGE APPROACH SLAB	SQ.YD.	118.2
602	0130	CLASS AAE-3 CONCRETE	CU.YD.	24.7
612	0115	REINFORCING STEEL GRADE 60	LBS.	5,809.0
618	0362	STRUCTURAL STEEL M83	LBS.	3,064.0
930	9660	ABUTMENT REPAIR	L.SUM	1.0

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
					a	b	c	d	e	f	g	h	k
BARRIER WALL	5	A500	112	2'-2"		2'-2"							
	5	AA500	12	177'-4"	57'-4"	60'-0"	1'-10"		2	173'-8"			
	5	J500	440	4'-7"	3"	1'-0"	1'-4 1/8"	3 1/8"	1'-6"	1 1/2"	1 1/4"	8 3/8"	12
	5	L500	440	2'-3"				3 1/8"	1'-6"	1 1/2"			



- 100 GENERAL: THIS WORK CONSISTS OF REMOVING EXISTING RAILING & POSTS & INSTALLING A JERSEY BARRIER. THE EXISTING RAILING AND POSTS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. COST FOR REMOVAL SHALL BE INCIDENTAL TO THE PAY ITEM "REMOVAL OF CONCRETE".
- 202 REMOVAL OF CONCRETE: ALL WORK TO REMOVE THE END POSTS AND CURB TO THE REMOVAL LIMITS AS SHOWN AND TO PROPERLY DISPOSE OF THE CONCRETE SHALL BE INCIDENTAL TO THE PAY ITEM "REMOVAL OF CONCRETE".
- 602 SURFACE FINISH "D": SURFACE FINISH "D" SHALL BE APPLIED TO ALL EXPOSED FACES OF THE BARRIER.
- 602 BARRIERS: BARRIERS SHALL BE CONSTRUCTED ACCORDING TO THE PROVISIONS OF SECTION 802.03 B. 4. V-GROOVE CONTRACTION JOINTS SHALL BE ADDED AT APPROXIMATELY 10-FOOT SPACING IN THE BARRIERS. THE COST OF MATERIALS AND LABOR TO INSTALL NEW BARRIERS SHALL BE INCIDENTAL TO THE PAY ITEM "CLASS AAE-3 CONCRETE".

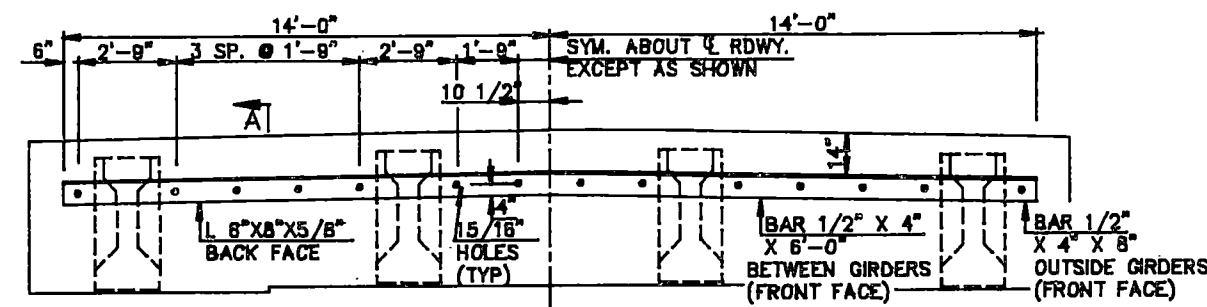
- ⓐ 5A100 BARS SHALL BE ANCHOR UNITS INSTALLED WITH A HIGH STRENGTH ADHESIVE SPECIFICALLY INTENDED FOR CONCRETE ANCHORAGE. (HILTI, HBR OR AN APPROVED EQUAL).
- ⓑ ANY EXISTING STEEL WHICH IS DAMAGED SHALL BE REPLACED BY A 5A500 BAR.

REINFORCING STEEL NOTES

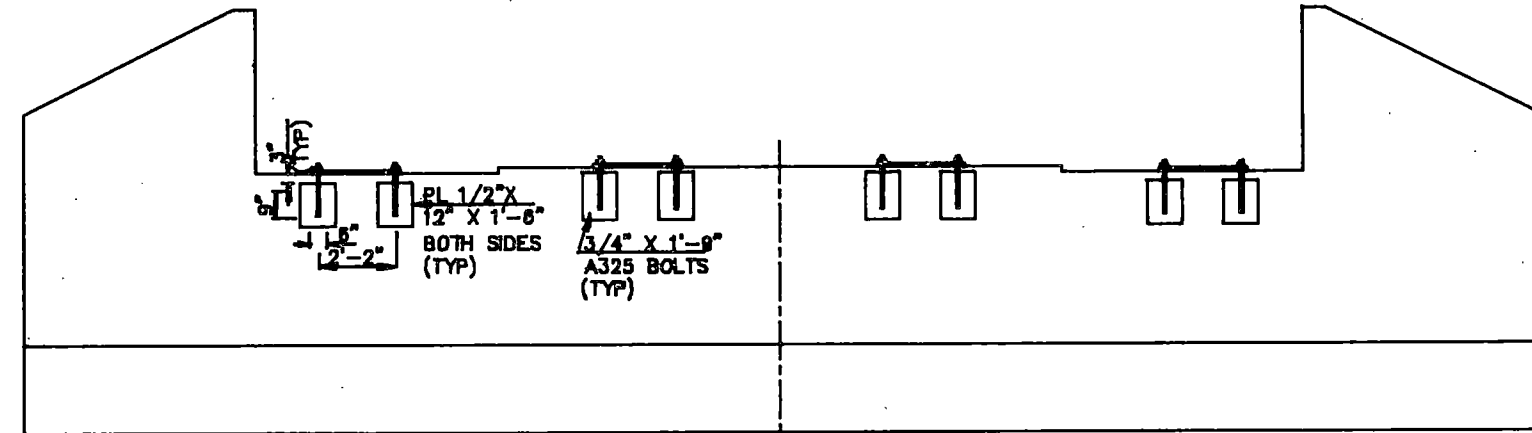
- FABRICATION AND TOLERANCES SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.
- ALL DIMENSIONS ARE OUT TO OUT OF BARS.
- NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
- ADJACENT AA BARS SHALL BE TURNED END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

QUANTITIES	
CLASS AAE-3 CONC.	24.7 C.Y.
REINFORCING STEEL	5,809 LBS.
REMOVAL OF CONC.	8.0 C.Y.

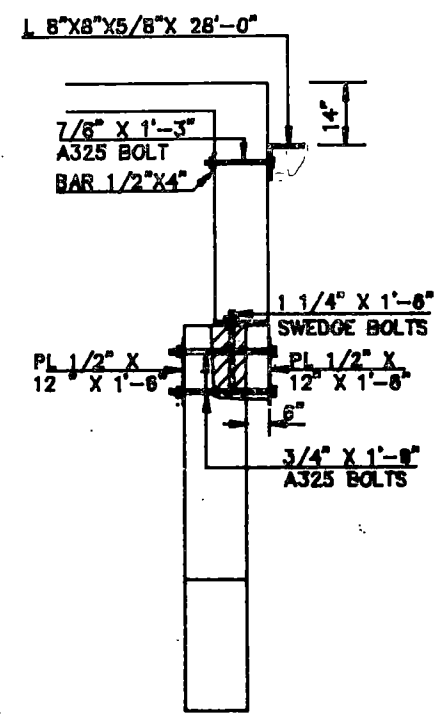
ELDRIDGE INTERCHANGE
BARRIER WALL
DETAILS



ELEVATION
SHOWING ANGLE PLACEMENT & DIMENSIONS
BOTH ENDS OF BRIDGE



ELEVATION
SHOWING REPAIR AREAS & DIMENSIONS
NORTH ABUTMENT ONLY



HATCHED AREA SHOWS CONCRETE
REMOVAL FOR PURPOSE OF REMOVING
EXISTING SWEDGE BOLTS AND INSTALLING
NEW SWEDGE BOLTS.

- LIST OF MATERIALS
- 2-L 6" X 8" X 5/8" X 28'-0"
 - 6-BAR 4" X 1/2" X 8'-0"
 - 4-BAR 4" X 1/2" X 0'-6"
 - 28-BOLTS 7/8" X 1'-3"
 - 16-PL 1/2" X 12" X 1'-6"
 - 32-BOLTS 3/4" X 1'-8"
 - 8-SWEDGE BOLTS 1 1/4" X 1'-6"

NOTE:
THE WORK SHALL CONSIST OF SHORING OF THE GIRDERS
OF THE NORTH SPAN (42'-6") AND REPAIRING THE ABUT-
MENT BEARING SEATS. SHORING SHALL CONSIST OF RAISING
THE FOUR GIRDERS APPROXIMATELY ONE HALF INCH SO THAT
THE SWEDGE BOLTS CAN BE REMOVED. THE INTENT IS TO RE-
SET THE MASONRY PLATES SO THAT THE PINTLES WILL LINE
UP UNDER THE GIRDERS AGAIN. THIS WILL REQUIRE NEW
SWEDGE BOLTS THAT WILL BE LOCATED IN A NEW POSITION
IN THE ABUTMENT WALL. ADEQUATE CURING SHALL BE
ALLOWED BEFORE THE SHORING IS REMOVED AND THE GIRDERS
ARE SET INTO THE BEARING POSITION.

THE SHORING OF THE GIRDERS, AND REMOVAL OF THE CONCRETE
SHALL BE CONSIDERED AS INCIDENTAL TO THE PAY ITEM
"ABUTMENT REPAIR".

QUANTITIES	
STRUCTURAL STEEL	3,084 LBS.
ELDRIDGE INTERCHANGE	
ABUTMENT REPAIR & PLACEMENT OF APPROACH SLAB ANGLE	

RWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	IR-084-6(058)240	169

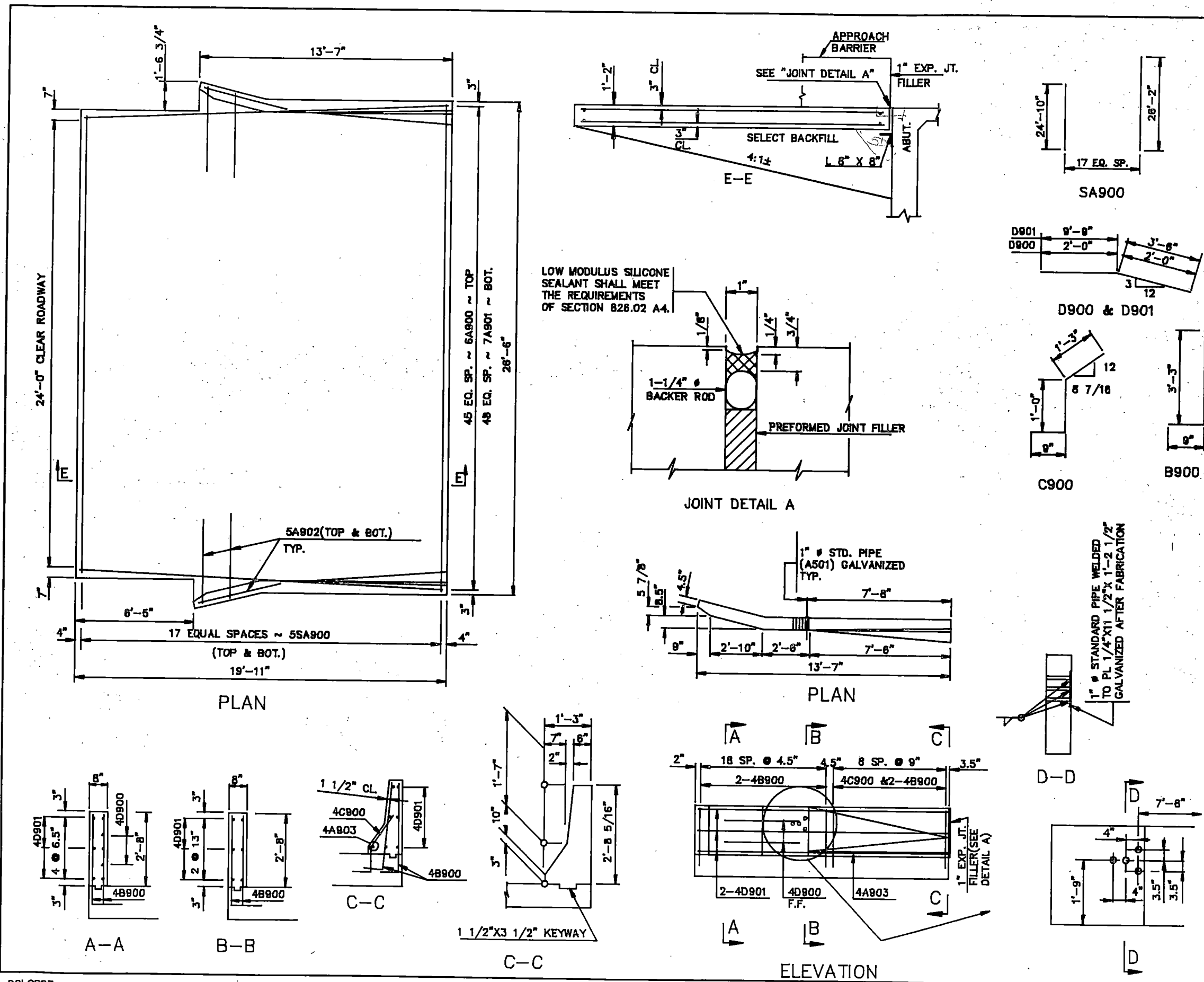
WIDTH = 24'-0" CL RDWY.			
SKEW ANGLE = 0°			
BAR LIST - ONE SLAB			
SIZE	MARK	NO.	LENGTH
8	A900	48	19'-7"
7	A901	49	18'-7"
5	A902	12	4'-6"
4	A903	2	7'-6"
4	B900	112	4'-0"
4	C900	18	3'-0"
4	D900	4	4'-0"
4	D901	12	13'-3"
5	SA900	2	45'-0"
ESTIMATED MATERIAL QUANTITIES			
REINFORCING STEEL (LBS.)		CONCRETE (C.Y.)	
4,781		24.4	

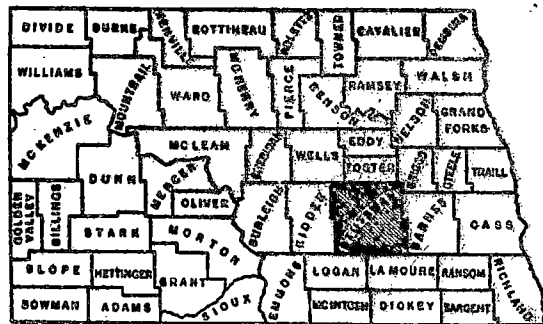
NOTES:

THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING CONCRETE, REINFORCING BARS, BACKER ROD, SILICON SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS AND THE APPROACH SLAB BARRIERS SHALL BE INCIDENTAL TO THE PAY ITEM "CONCRETE BRIDGE APPROACH SLAB".

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.

QUANTITIES	ONE SLAB
APPROACH SLAB	58.1 S.Y.
ELDRIDGE INTERCHANGE	
APPROACH SLAB	
STEEL ALTERNATE	





SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1955) 1963 PASS. 654 TRUCKS 2617 TOTAL	366	
TRAFFIC FORECAST (1975) 7028 PASS. 1240 TRUCKS 8268 TOTAL	1157	
DESIGN SPEED	70 MPH	
TRAFFIC CLASSIFICATION	M	
MINIMUM SIGHT DISTANCE (NON PASSING) 600'		

LIST OF STRUCTURAL DRAWINGS

94-94	H-6139
94-95	H-6142
94-96-1	H-6344
H-0104	H-6345
H-0401	H-6346
H-6226	H-6408
H-6227	H-6407

STANDARD DRAWINGS
STD 14.9 & STD 7.6

- ② The Standard Specifications shall govern the use of Steel Piling except for the method of payment. Payment will be made under the items "Furnish & Deliver Steel Piling (10BP42)" and "Driving Steel Piling (10BP42)". See Drawing No. 94-94.

SCALE
LAYOUT SHEET: 1 IN. = 5000'
PLAN AND
PROFILE DRAWINGS (VERT. 1 IN. = 10 FT.)
STRUCTURAL DRAWINGS: AS SHOWN
CROSS SECTION SHEETS: 1 IN. = 10 FT.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS
FOR THE PROPOSED IMPROVEMENT OF A
STATE HIGHWAY
IN STUTSMAN COUNTY
FEDERAL AID PROJECT NO. 1-94-6(19) 252

INDEX OF DRAWINGS
SHEET NO. 1 TITLE PAGE & Summary of Quantities

SHEETS NO. 2 TO 7 INCL. PLAN AND PROFILE DRAWINGS
SHEETS NO. 8 TO 21 INCL. STRUCTURAL DRAWINGS

* SHEETS NO. 22 TO 35 INCL. CROSS SECTIONS

* Sheet Nos. 335, 336, 337, 338, 339, 341, 343, 344, 456, 457, 462, 464, 471, & 472 from Project 1-94-6(20).

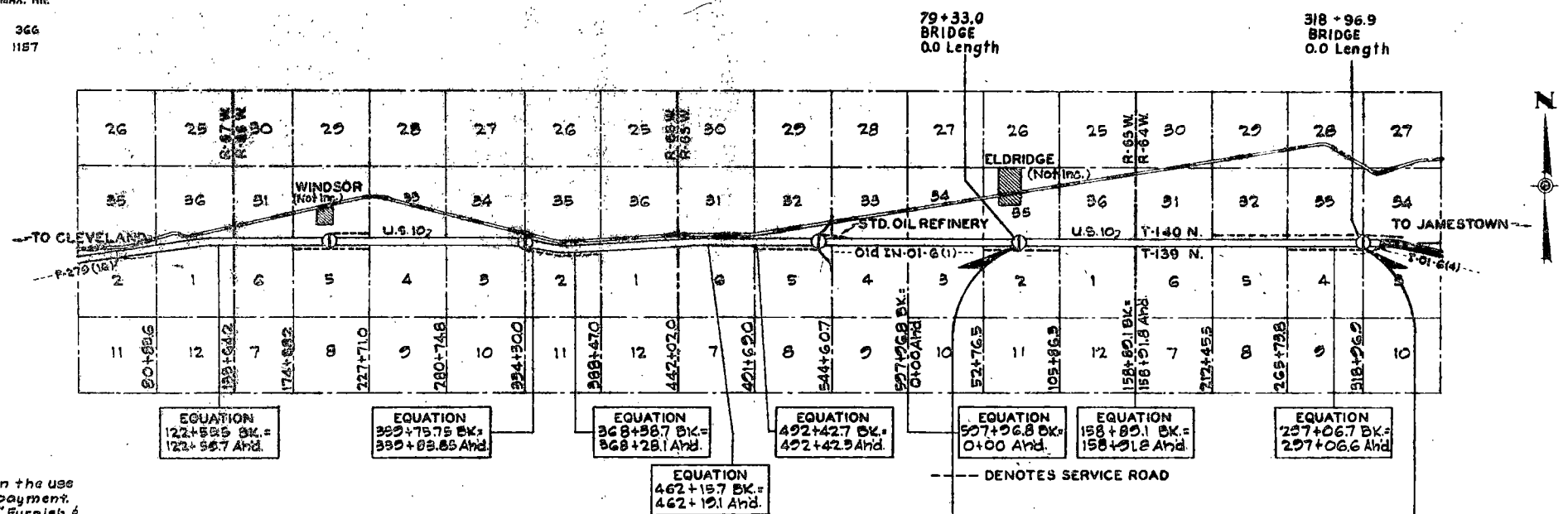
LENGTH OF PROJECT		
PROJECT MILES - GROSS	PROJECT MILES - NET	
4.538	0.000	
TOTALS	4.538	0.000

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway Department Jan. 1956 and approved as standard by the Bureau of Public Roads May 7, 1956. Required Special Provisions dated Oct. 2, 1957 and approved by the Bureau of Public Roads Nov. 23, 1957 and others submitted herewith.

KEY TO CONVENTIONAL SIGNS

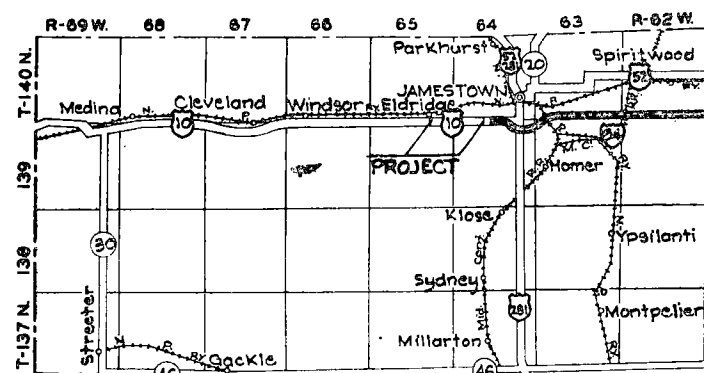
STATE & NATIONAL LINES	
COUNTY LINE	
TOWNSHIP & RANGE LINES	
GRADE LINE	
CENTERLINE OF CONSTRUCTION	
OLD RIGHT OF WAY LINE	
NEW RIGHT OF WAY LINE	
ABANDONED RIGHT OF WAY LINE	
PROPERTY LINE	
STONE WALL	
OTHER FENCES	
POLE LINES	
POWER LINES	
BRIDGE	
GROUND ELEVATION	
TRAVERSED WAY	
RAILROADS	
HEDGES 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	
COBBLE GUTTERS	
CONCRETE GUTTERS	



LAYOUT MAP
5000' 0 5000'
SCALE IN FEET

Foot Note

- ① See Special Provisions



SKETCH MAP OF SOUTH HALF OF STUTSMAN COUNTY

LOCATION	QUANTITIES													
	15B	60A	62A	63A	65C	65C	65G	65S	65S	65S	65S	65S	65S	65S
	CLASS 2 EXCAVATION	CLASS A-1 CONCRETE	REINFORCING STEEL	STRUCTURAL STEEL	FURNISH & DELIVER STEEL PILING (10BP42)	DRIVING STEEL PILING (10BP42)	STEEL ENCASED PILING	ENCASED PILING	ENCASED PILING	ENCASED PILING	ENCASED PILING	ENCASED PILING	ENCASED PILING	ENCASED PILING
	CU. YD.	CU. YD.	LB.	LB.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.
STA. 79+33.0	250	324.8	63433	4100	360	360								
STA. 318+96.9	125	278.3	54479	5100			638	2	10	10			404	1
GRAND TOTAL	375	603.1	117912	9200	360	360	638	2	10	10	8	8	828	2

② ② ① ① ① ① ① ①

APPROVED DATE 4-24-58

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT



DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

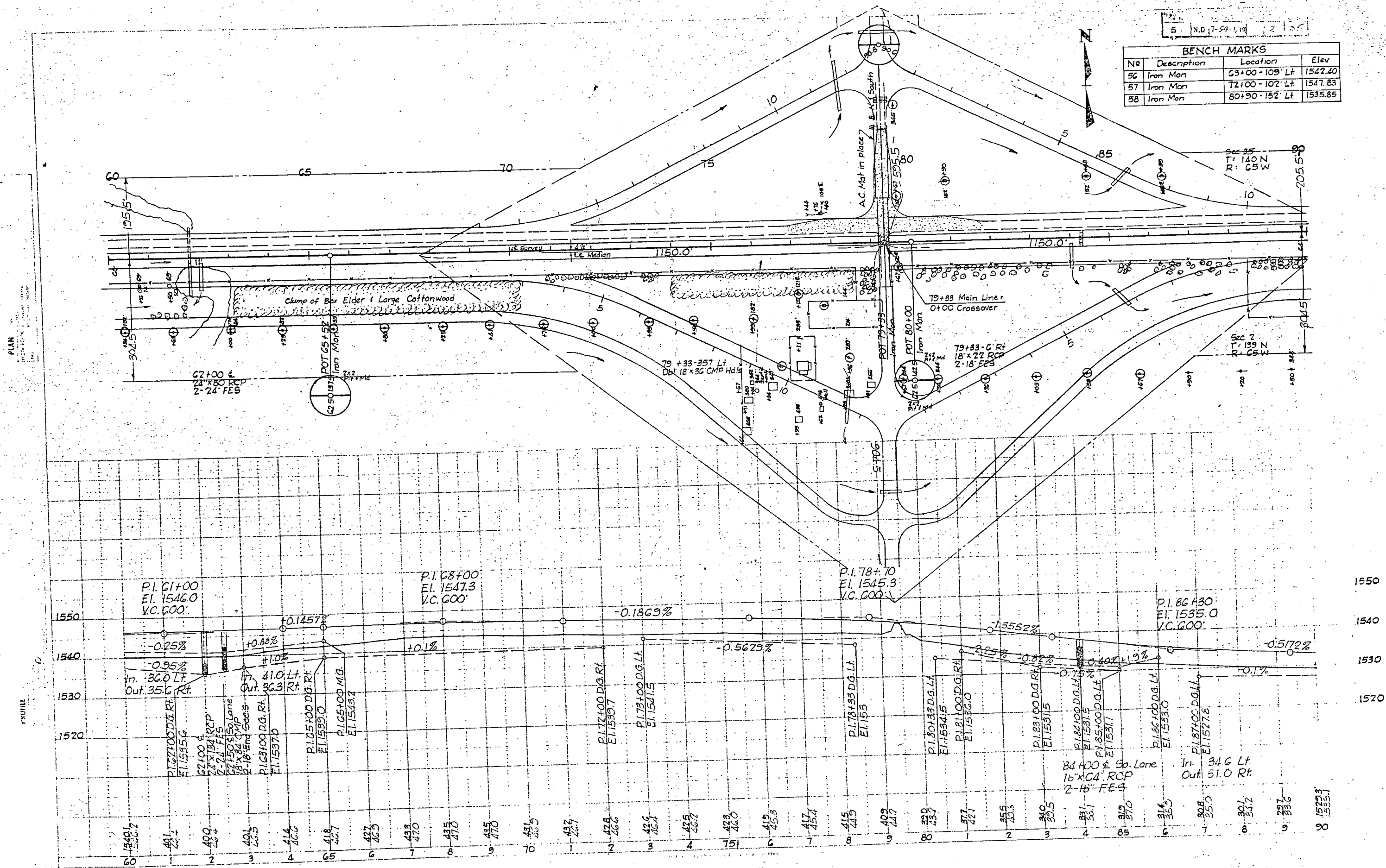
APPROVED

DIVISION ENGINEER

DATE

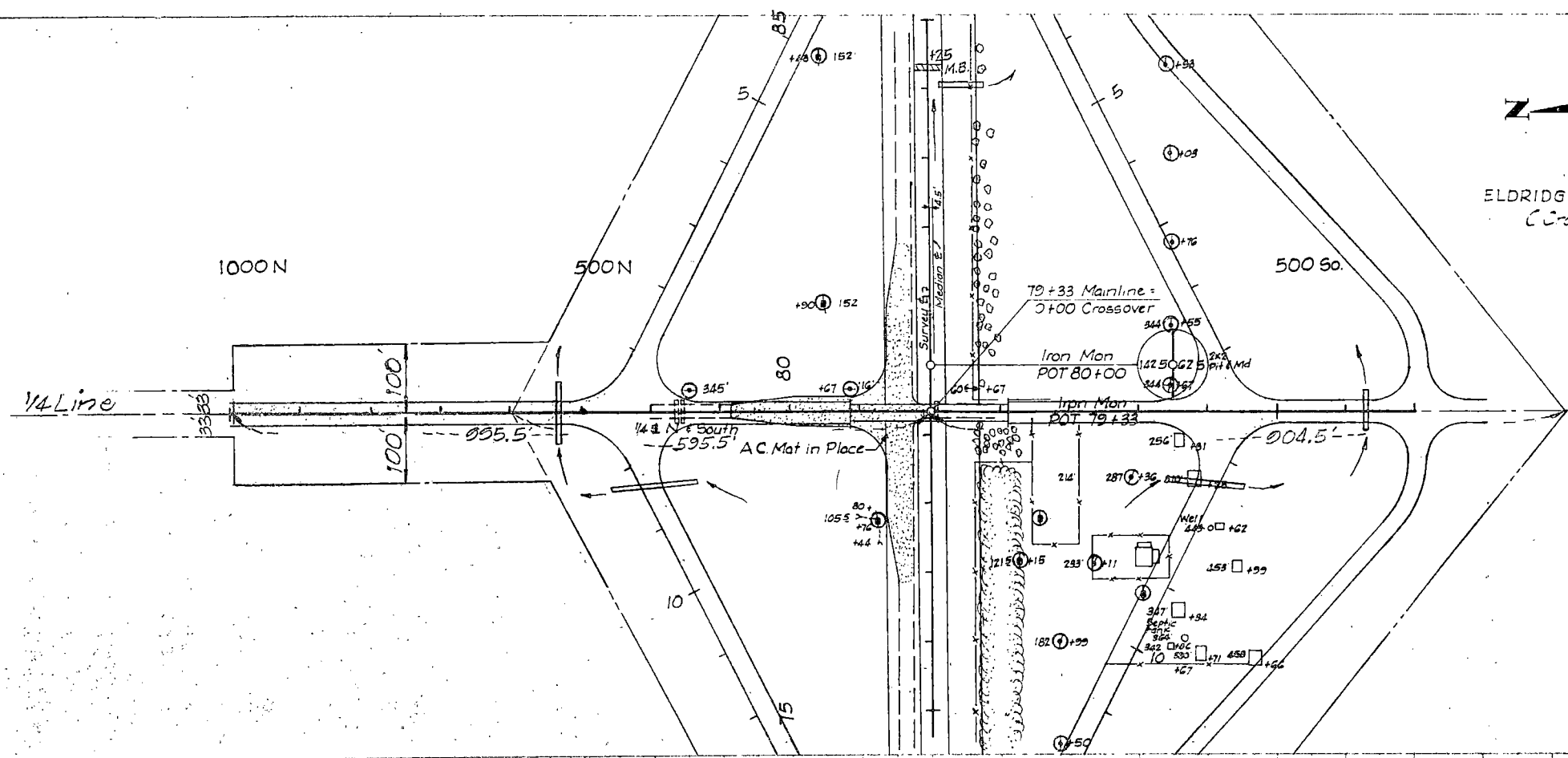
1-94-6(19) 252

5. N.G. 7-94-119 2 35



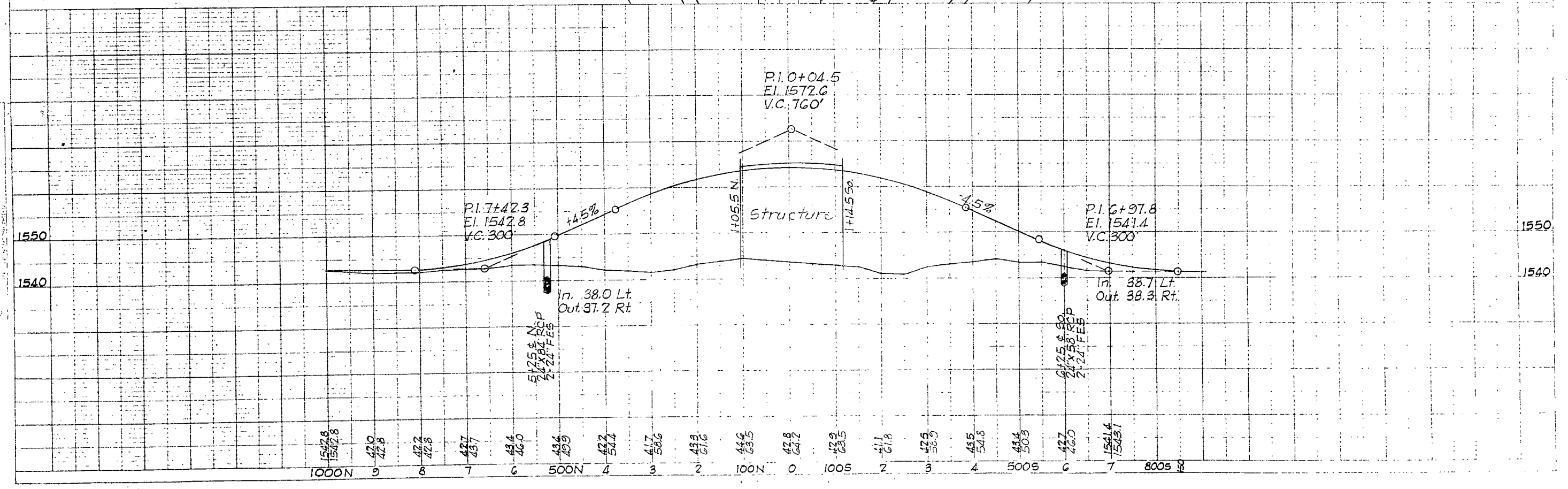


ELDRIDGE INTERCHANGE
(Cross-Road)



INSTALL OVERHEAD-220'
Sta. 0+04.5 & DWGS. 94-94,
H-6226, H-6344, 94-6(19)-1,
H-6142, H-6407, H-0104, Std. M.D.
& Std. 7.6
Class-2 Exc. - 250 C.Y.
Class-A 1 1/2" Conc. - 324.8 C.Y.
Reinf. Steel - 63433 Lbs.
Struct. Steel - 4100 Lbs.
Steel Piling - 360 L.F. (furnish & deliver)
Driving Steel Piling - 360 L.F.
Prestressed Girders @ 67'-8" - 8 Each
Prestressed Girders @ 42'-7" - 8 Each
Orn. Metal Railing - 424 L.F.
Bridge Bench Marks - 1 Set

PROFILE



NOTES:

Dimensions for reinforcing steel bent bars are given center to center unless noted. Welding will not be paid for directly, but shall be included in the unit price bid for structural steel.

All exposed corners of concrete shall be beveled with 3/4" triangular moldings unless otherwise noted.

The entire curb shall be poured in one continuous run.

The roadway face of curbs, the outside vertical faces of the curbs, slab & girders, the end posts and all of the piers shall be given the "Rubbed Surface Finish". All other concrete shall be given the "Ordinary Surface Finish".

The Structural Contractor will be responsible for maintaining existing traffic during his operations. Any detour that may be provided shall allow all-weather, four-way traffic. The cost of maintaining this traffic shall be included in the unit price bid for various pay items. Detour shall be graveled.

The dead load deflection and the vertical curve corrections have been accounted for and the true slab surface will be obtained by finishing the concrete @ $\frac{3}{8}$ " or $\frac{1}{4}$ " above the top of girders as shown.

"Driving Steel Piling" shall be according to Section 85C of the Standard Specifications except that the pay quantities will be measured below the bottom of the concrete.

The fabricator shall add a prefix to each bar designation to differentiate between structures and/or units of a structure on the project.

All piling shall be driven a minimum of fifteen (15) feet into the original ground. If necessary, the Structural Contractor will be required to drill pilot holes sufficiently deep to permit driving of piling to the required penetration and bearing.

"Furnish and Deliver Steel Piling" (10BP2) shall be as shown on this sheet unless additional amounts are ordered by the Engineer. Piling not used shall become the property of the State.

A single or double acting steam, air or diesel hammer or a 4000 pound (minimum) gravity hammer may be used in driving the steel piles. The minimum size of hammer allowable will be one that develops not less than 22,000 foot pounds of energy per blow. A special pile driving cap recessed to fit closely around the pile and having full bearing on the pile head shall be used.

The cost of incidental items shown on the plans but not listed in the estimate of quantities shall be included in the unit price bid for the various pay items.

The embankments at both ends of the bridge shall be placed and compacted by the Grading Contractor in three stages timed to agree with the Structural Contractor's work. The first stage, consisting of the embankment up to the bottom of footing, shall be completed before any abutment piling are driven. The second stage up to berm elevation shall be placed after the abutment is complete but before the superstructure is placed. The final stage shall be completed after the superstructure is in place.

SEE SPECIAL PROVISIONS SEE NOTES

STRUCTURAL DRAWINGS

NORTH DAKOTA

NORTH DAKOTA

STATE HIGHWAY DEPARTMENT

ELDRIDGE INTERCHANGE

BRIDGE LAYOUT

PROJECT 1-94-6(19) STA. 79+33.0

STUTSMAN COUNTY

APPROVED

4/21/58

DATE

Joseph O. Kirby

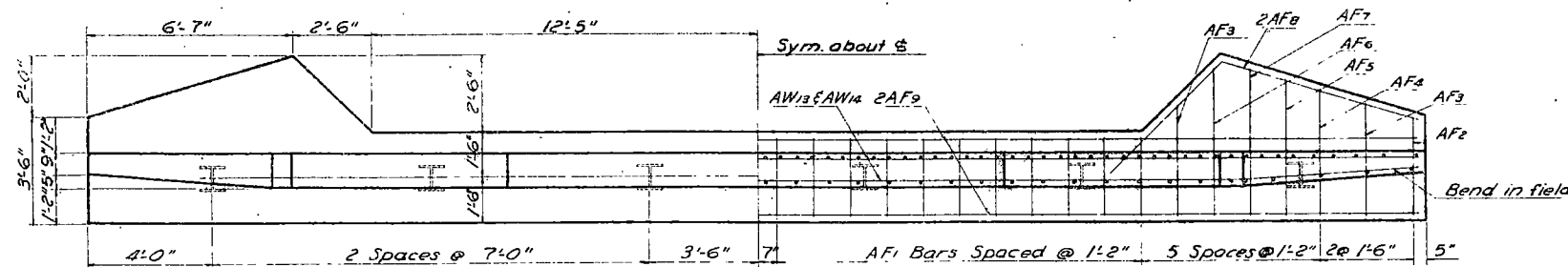
THRUWAY ENGINEER

Seal of the State of North Carolina

94-94

BAR LIST - ONE ABUTMENT				
MARK	NO.	SIZE	LENGTH	SHAPE
AF ₁	2	4	9'-2"	Ben
AF ₂	2	4	10'-4"	"
AF ₃	4	4	11'-3"	"
AF ₄	2	4	12'-2"	"
AF ₅	2	4	12'-10"	"
AF ₆	2	4	13'-8"	"
AF ₇	2	4	13'-6"	"
AF ₈	4	6	14'-9"	"
AF ₉	6	9	23'-0"	Str
AW ₁	2	4	6'-6"	Str.
AW ₂	2	4	7'-4"	"
AW ₃	2	4	8'-2"	"
AW ₄	2	4	8'-10"	"
AW ₅	4	6	16'-9"	Ben
AW ₆	4	5	10'-2"	"
AW ₇	4	5	11'-0"	"
AW ₈	4	5	11'-6"	"
AW ₉	4	5	12'-0"	"
AW ₁₀	32	5	13'-10"	"
AW ₁₁	40	5	7'-3"	"
AW ₁₂	4	4	5'-10"	Str.
AW ₁₃	4	6	22'-6"	"
AW ₁₄	16	4	22'-2"	"
AW ₁₅	4	4	3'-4"	"
AW ₁₆	16	4	4'-9"	Ben

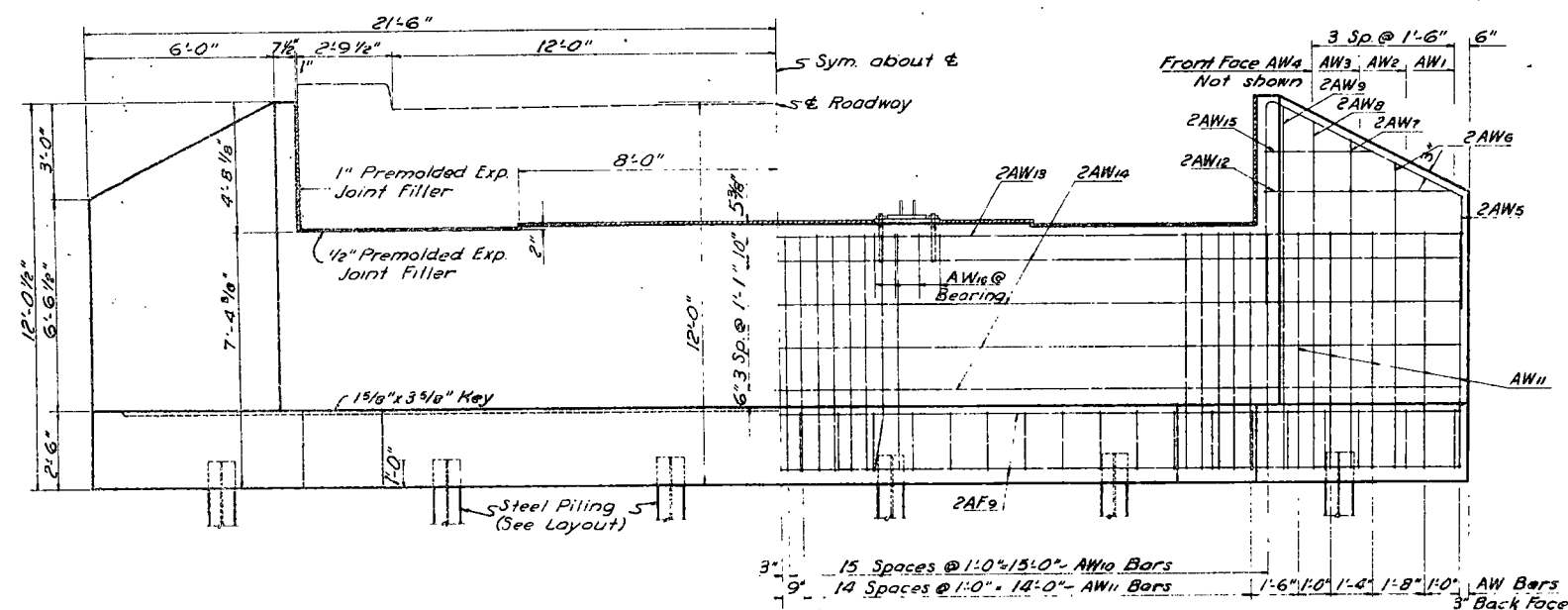
PRESTRESSED GIRDER
ABUTMENT
FOR 24' ROADWAY



HALF PLAN

Showing Dimensions

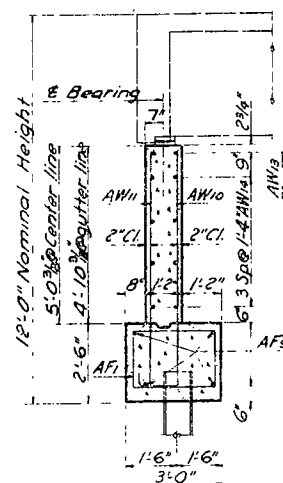
HALF PLAN
Showing Reinforcing Steel



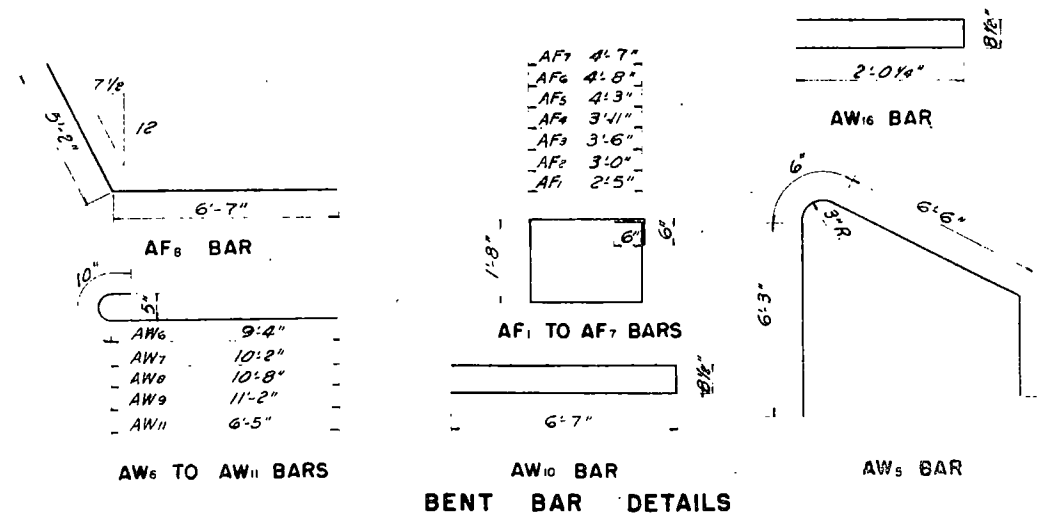
HALF ELEVATION

Showing Dimensions

HALF ELEVATION
Showing Reinforcing Steel



Q WALL SECTION



BENT BAR DETAILS

DATE	NAME	S' C
MADE BY CHECKED BY <i>LH</i>	GN	
MADE BY CHECKED BY <i>PBL</i>	DETAILS	
MADE BY CHECKED BY <i>PBL</i>	TRACING	
MADE BY CHECKED BY <i>LS</i>	QUANTITIES	

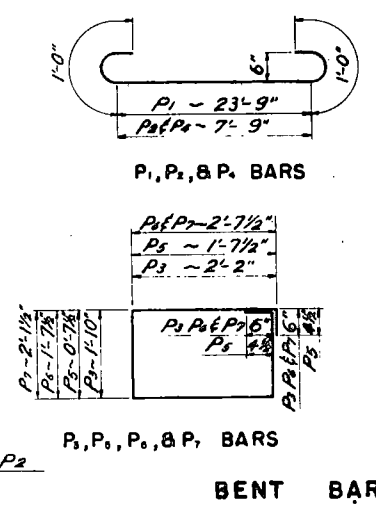
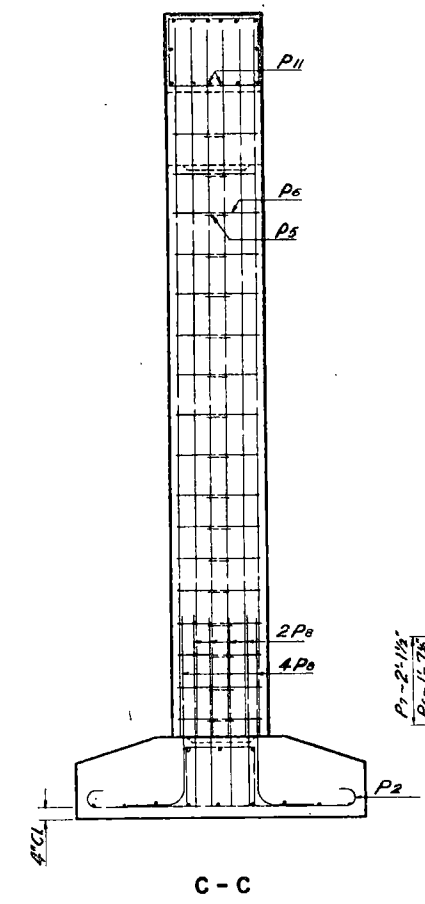
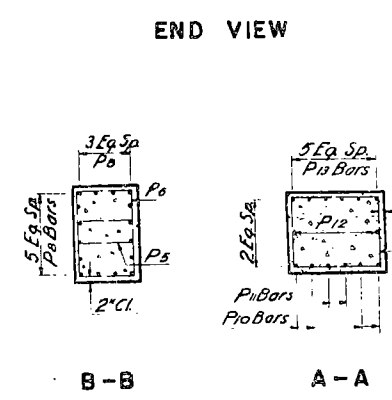
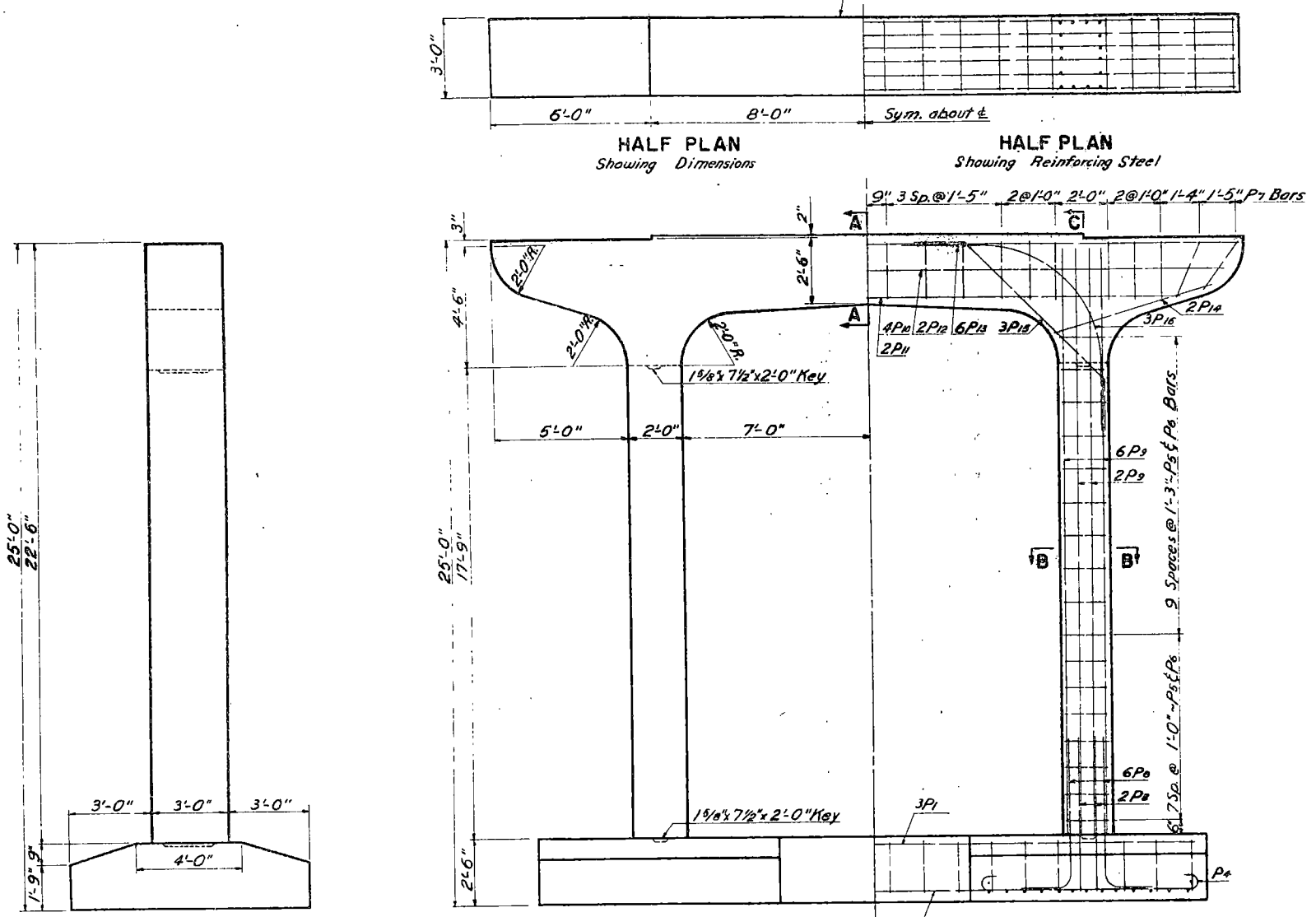
PILE BEARING	
SPAN	LOAD
41	190 T.
	5.9
	11.3
	DESIGN LOAD
	36.3 T.

H-6226

H-6226

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.				

Risers shall be poured simultaneously with the pier cap with the steps centered between girders. Elevations are shown on the layout sheet.



BAR LIST				
MARK	NO.	SIZE	LENGTH	SHAPE
P ₁	5	8	23'-9"	Bent
P ₂	26	6	9'-9"	"
P ₃	20	6	9'-0"	"
P ₄	14	6	9'-9"	"
P ₅	34	3	5'-3"	"
P ₆	34	4	9'-6"	"
P ₇	22	4	10'-6"	"
P ₈	32	8	7'-0"	"
P ₉	32	8	22'-0"	Str.
P ₁₀	4	11	23'-0"	"
P ₁₁	2	10	23'-0"	"
P ₁₂	2	4	27'-0"	"
P ₁₃	6	9	27'-6"	"
P ₁₄	4	4	6'-6"	"
P ₁₅	6	10	11'-0"	Bent
P ₁₆	6	10	13'-0"	"

NOTE:
The concrete in the columns shall be allowed to set at least two (2) hours before the cap is poured.
All exposed corners to be beveled with 3/4" molding.

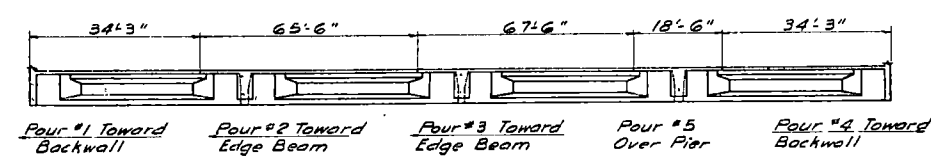
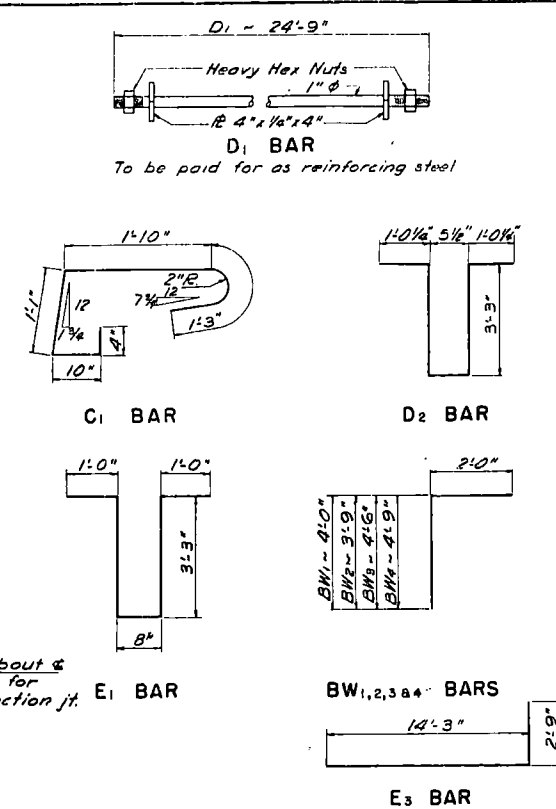
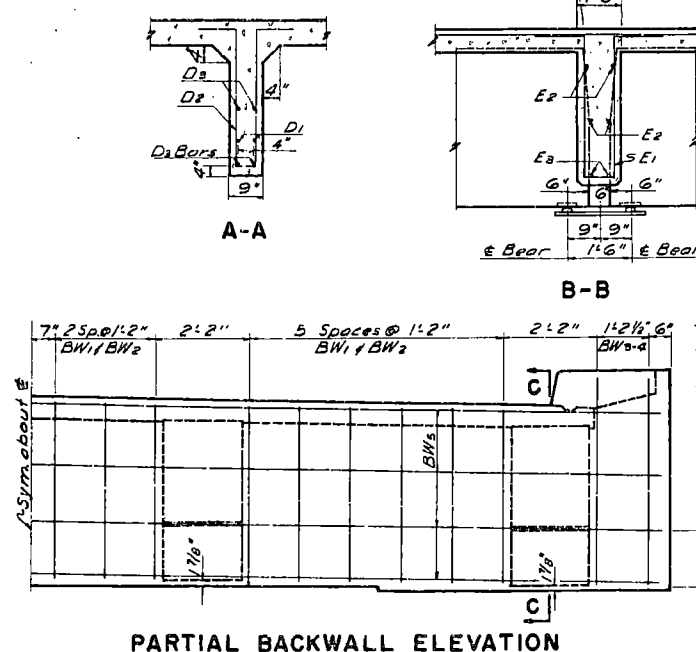
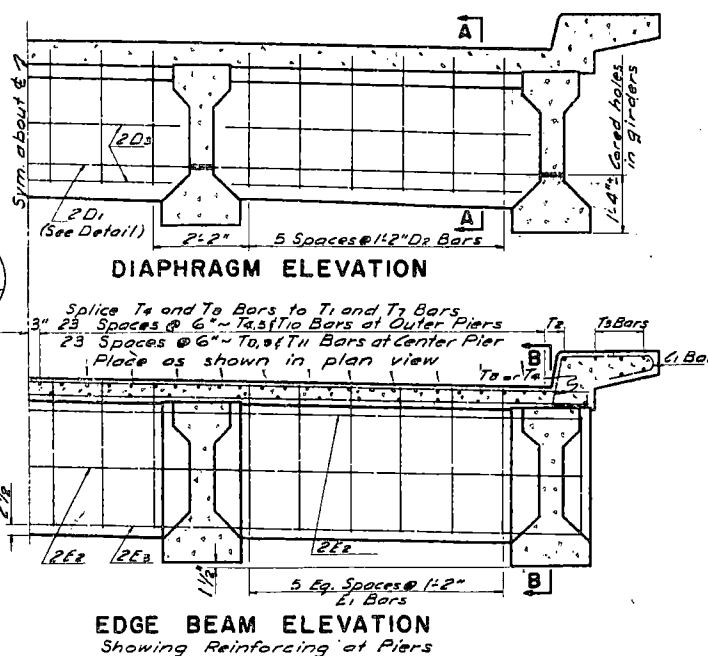
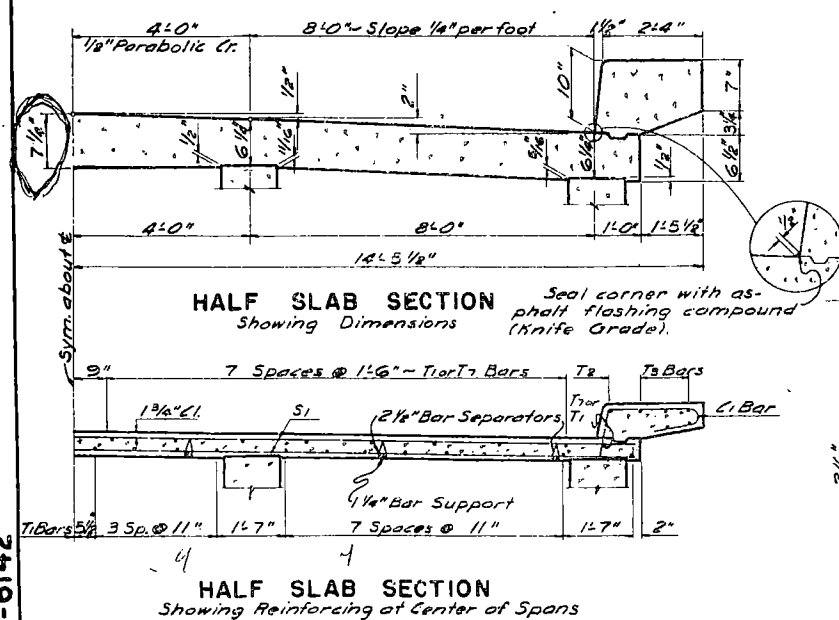
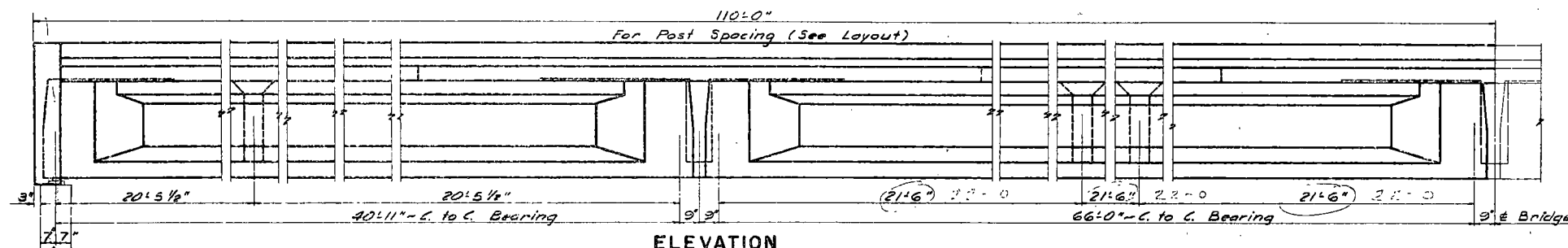
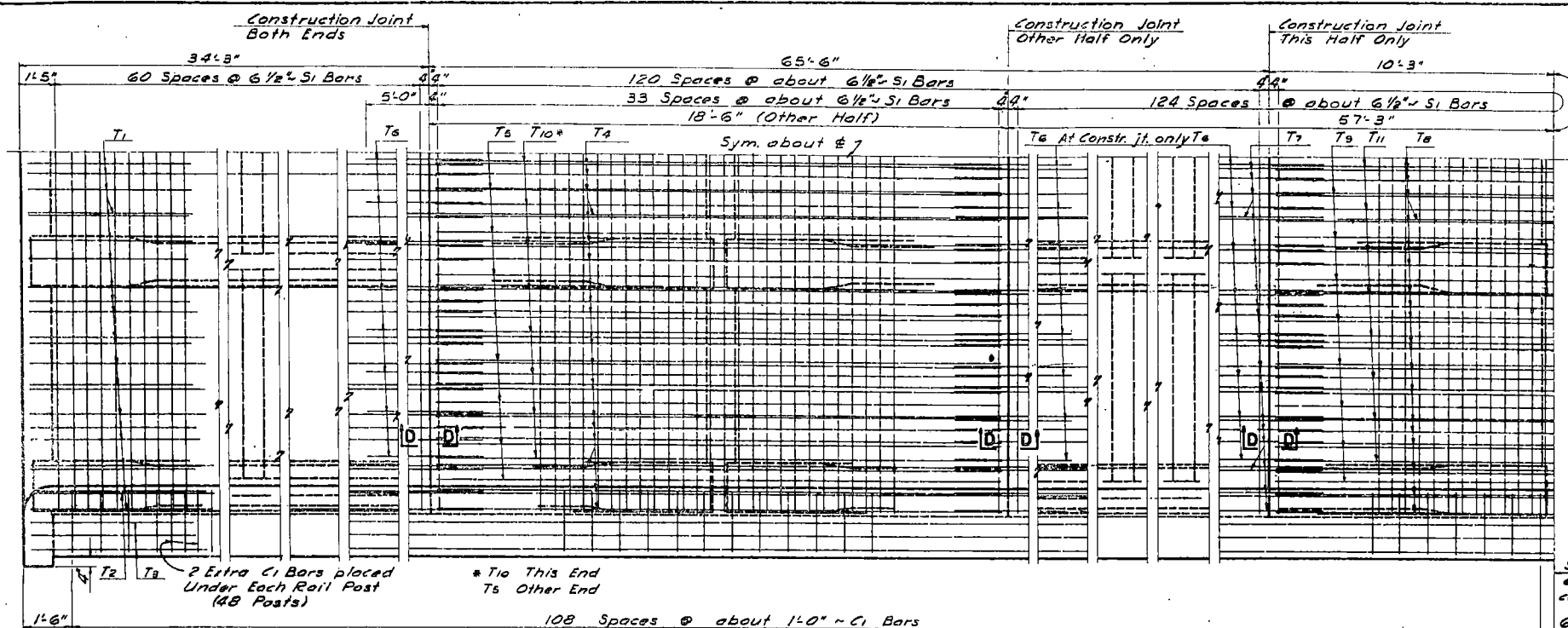
QUANTITIES	
Concrete Class A-1 1/2	33.1 C.Y.
Reinforcing Steel	5,953 Lbs.

PRESTRESSED GIRDER
25'-0" PIER
24' ROADWAY

DETAILS
MADE BY
CHECKED BY
TRACING
QUANTITIES

DEAD LOAD	12443	74	2823	76
EARTH	358	358		
LIVE LOAD	937	961		
WIND ON DL	776	938		
WIND ON LL	208	258		
SEISMIC LOAD	3738	4164		

H-6344



FED ROAD DIST. NO.	STATE	PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
5	N.D.				

BAR LIST-COMplete SLAB				
MARK	NO.	SIZE	LENGTH	SHAPE
C ₁	532	5	5' 4"	Bent
D ₁	12	(See Detail)		
D ₂	108	4	9'-0"	Bent
D ₃	72	4	7'-0"	Str.
E ₁	54	4	9'-2"	Bent
E ₂	12	5	25'-0"	Str.
E ₃	12	7	17'-0"	Bent
S ₁	804	5	25'-6"	Str.
T ₁	88	4	36'-0"	Str.
T ₂	16	6	29'-9"	"
T ₃	80	5	29'-3"	"
T ₄	88	4	18'-0"	"
T ₅	48	5	18'-0"	"
T ₆	64	5	7'-3"	"
T ₇	176	4	26'-3"	"
T ₈	44	4	20'-0"	"
T ₉	16	5	20'-0"	"
T ₁₀	16	5	23'-0"	"
T ₁₁	16	5	25'-0"	"
BW ₁	36	5	6'-0"	Bent
BW ₂	36	5	5'-9"	"
BW ₃	8	5	6'-6"	"
BW ₄	8	5	6'-9"	"
BW ₅	12	5	29'-0"	Str.

When bars are spliced
Lap #4 bars 20"
Lap #5 bars 25"
Lap #6 bars 30"

QUANTITIES	
Concrete Class A-1½	176.1 C.Y.
Reinforcing Steel	40,874 Lb.
Structural Steel	4100 Lbs.

220' PRESTRESSED GIRDER
4-SPAN CONTINUOUS
SLAB
24' ROADWAY

[illegible]

1 1/8" ϕ Pintles
Drive fit

3" x 1/2" x 1"

1" 7/8" x 1 1/2" x 2" B

3" Counterbore 7/8" Deep

6" 4" 9" 9" 6" 4"

3 1/2"

1 1/8" Holes

1" 7/8"

1" 6" & Bearing

EXPANSION BEARING
*Rocker & Sale Plate Also Used
 for Single Expansion Bearing*

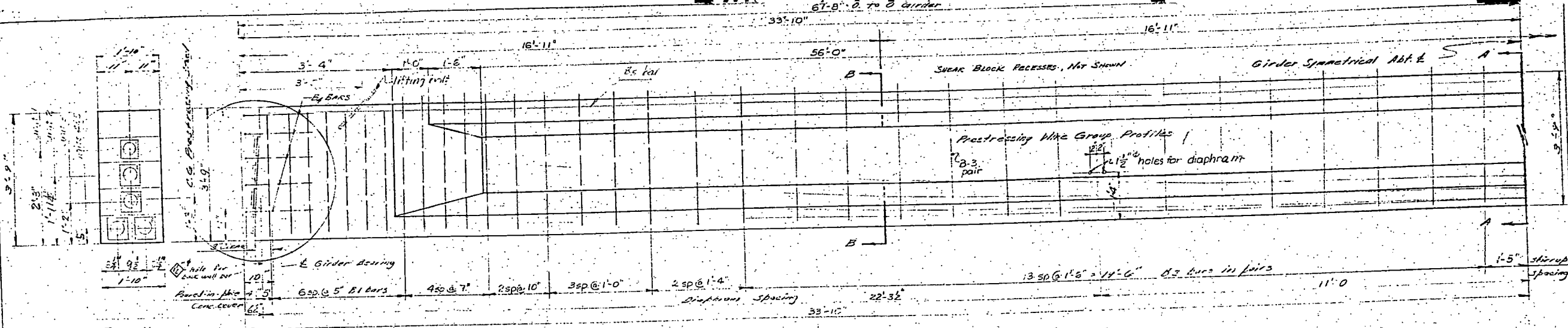
The type and number of bearing devices as detailed on this sheet are shown on the layout sheet. They shall be paid for as structural steel.

The rockers, as detailed shall be constructed from structural steel plates welded together or shall be cast steel.

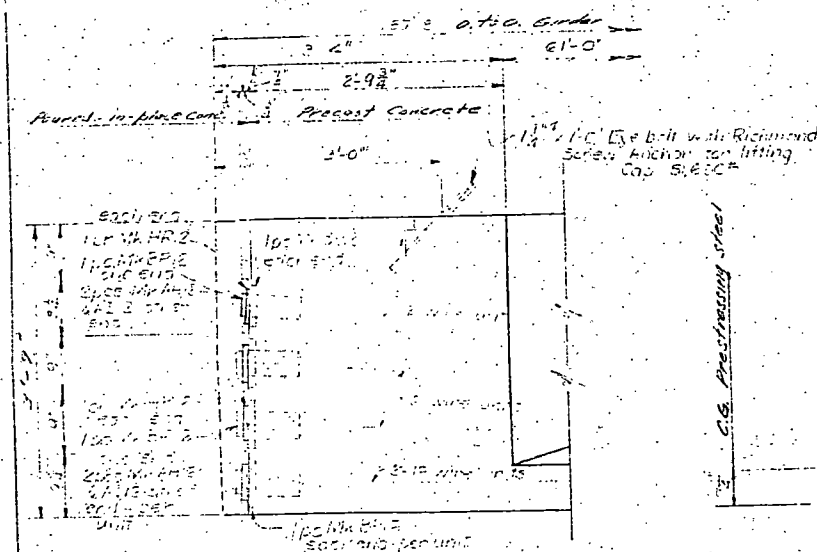
The contractor shall submit shop plans for the approval of the Bridge Engineer showing the post-tensioning wire groups and end anchor plates and devices or the pre-tensioning strand layout and pull-down locations.

Minor changes to the shape of the girder and to the reinforcing steel may be made to accommodate the forms of various contractors and their construction methods with the approval of the Bridge Engineer.

[illegible]

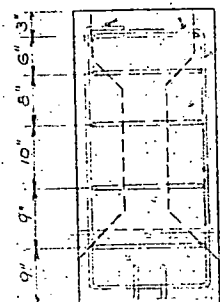


END VIEW



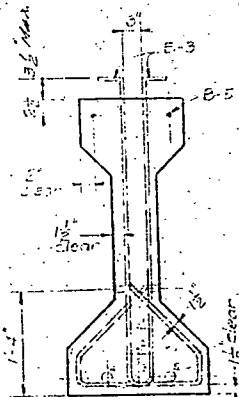
ENLARGED VIEW - END BLOCK

Showing end form details & prestressing anchorage details



ENLARGED SEC. THRU END BLOCK

Showing arrangement of B wires, reinforcing steel & bearing R anchors

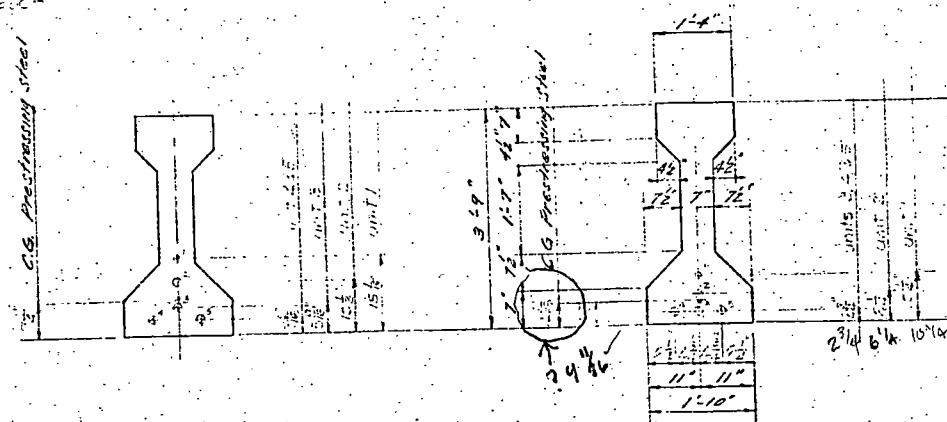


ENLARGED TYP. SECTION

Showing P wire placement & reinforcing placement

ONE GIRDER - G3

5 Required Thus
not to scale



SEC. B-B

At 1/4 point of Girder

SEC. A-A

At 1/2 Girder

REINFORCING DETAILS

B-1 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-2 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-3 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-4 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-5 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-6 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-7 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-8 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-9 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-10 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-11 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-12 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-13 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-14 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-15 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-16 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

B-17 No. 4 bar
Use as shown on State Dwg H-6407
4 req. per beam

DESIGN NOTES (cont)

Elongation $\Delta L = \frac{PL}{AE} = \frac{163,000 \times 61.29 \times 12}{29 \times 10^6} = 4.11"$
Elastic shortening $\Delta E = \frac{PL}{AE} = \frac{626,000 \times 61.29 \times 12}{560 \times 43 \times 10^6} = 1.11"$
Max elongation (Groups: 5) = $4.11 + 1.11 = 5.22"$
Elongation - Group 1 = $4.11 + 1.11 = 5.22"$
Elongation - Group 2 = $4.11 + 1.11 = 5.22"$
Elongation after shortening - Group 1 = $4.11 + 1.11 = 5.22"$
Stressing Sequence: Group 3, 4, 3, 2, 2, 1

GENERAL NOTES

Prestressing System: P.T. Method as developed by Prestressing Inc. of San Antonio, Texas. Consists of post-tensioning cold worked duplex headed wires in groups as indicated. Wires are used in beams. Upon completion of prestressing ducts are pressure grouted.
Prestressing Wires: 250" dia. hard drawn stress relieved wire with a minimum ultimate strength of 240,000 psi.

DESIGN NOTES

Ultimate strength of wire = 240,000 psi
Permissible total stress = 140,000 psi
Allowable working stress = 100,000 psi
Final Prestress Force = 163,000 lbs
No. of wires provided = 76
Groups 2, 3, 4, 5: 4 @ 15 = 64
Group 1: 1 @ 12 = 12
Total = 76
Final wire stress = $\frac{594,000}{4.31} = 137,800$ psi
Initial wire stress = 143,000 - 2500 = 140,500 psi
Initial P.S. Force = 140,500 x 76 = 10,678,000 lbs
Design Standards: - Criteria for Prestressed Concrete Bridges Bureau of Public Roads - 1955
NOTE: Max. temporary overstress of P.S. steel = 80% or 8 x 240,000 = 192,000 psi

NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED EXCEPT AS NOTED
19 _____
BRIDGE ENGINEER

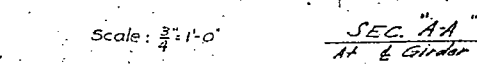
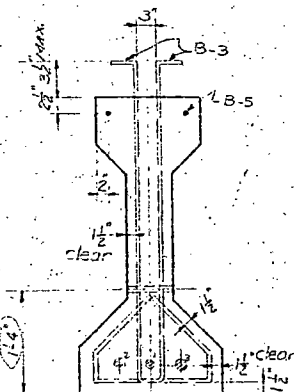
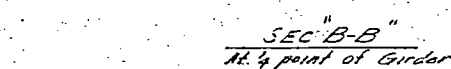
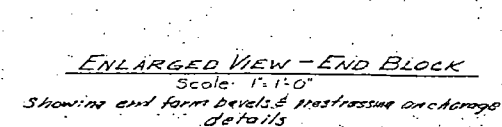
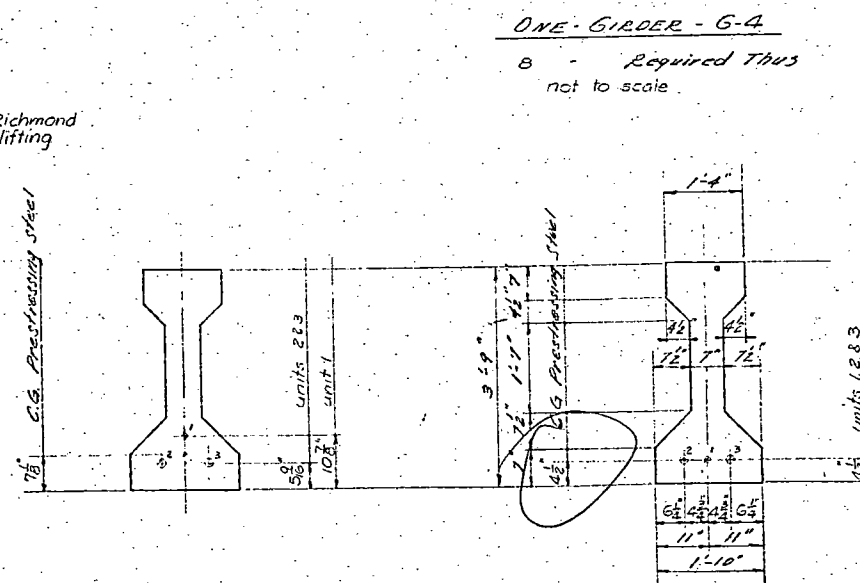
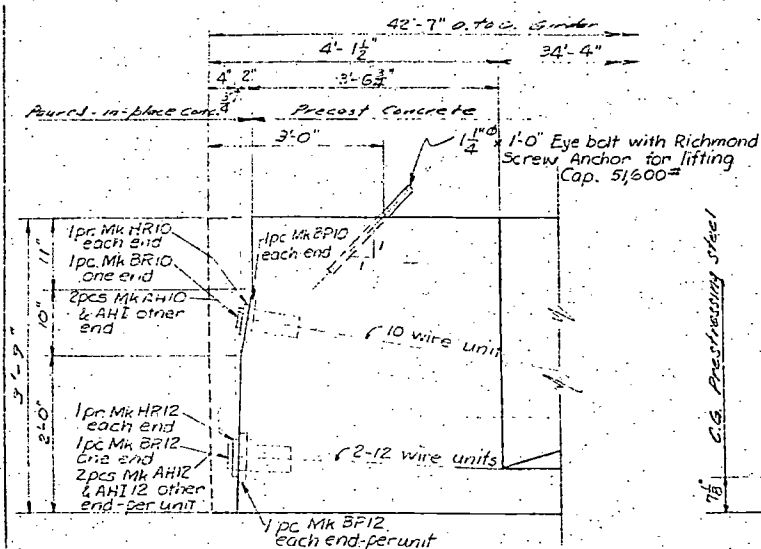
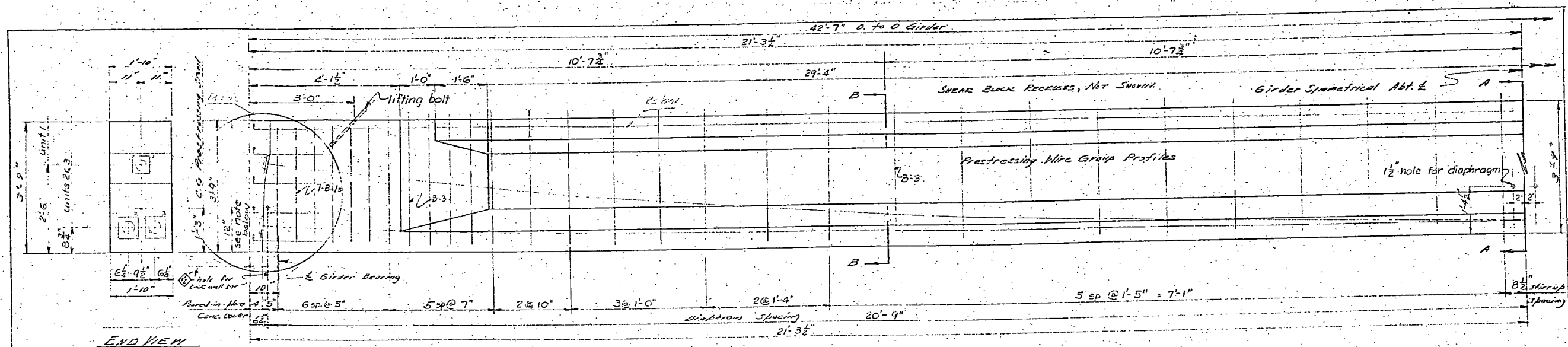
GIRDER DETAILS FOR
17'8" PRESTRESSED CONCRETE GIRDER
FOR
NORTH DAKOTA STATE HIGHWAY DEPT
PROJECT No. I-94-6(19)252
STUTSMAN COUNTY

Contractor: Concrete Structural Culvert Co.
Supplier: Fargo, North Dakota
Engineering: Hutschmidt Engineering Co.
Milwaukee, Wisconsin
Approved: Drawn by: Date: 7-11-58
Sheet No. 3 of 4
Job No. 912 E

Sps 2 & 3

94-94

94-251.686



REINFORCING DETAILS

B-1 No. 4 bar
Use as shown on Stats. Dwg H-G407
14 neg per beam

B-2 1"φ.
Limit - see lifting bolt above

B-3 No. 2 bar

B-4 No. 4 bar
Use as shown on State DWG No. H-6407
10 req. per beam

B-5 No. 4 bar

2 pair req per beam

3.4 req. per beam

DESIGN NOTES (cont)

Elongation $\Delta L = \frac{PL}{AE} = \frac{166,000 \times 27.712}{29 \times 10^6} = 2.7 \frac{1}{8}$

Elastic shortening $\Delta E = \frac{PL}{AE} = \frac{271,000 \times 4.92112}{56 \times 10^6} = 2.4 \frac{1}{16}$

Max. elongation Groups 2 & 3 - $2 \frac{1}{8} - 2 \frac{15}{16}$

Elongation after shortening Group 1 - $2 \frac{7}{8}$

Stressing sequence - Groups: 3, 2, 1

GENERAL NOTES

Pressing System: P.I. Method as developed by Pressing Inc. of San Antonio, Texas consists of three basic steps: 1. Worked duplex headed wires in groups as indicated. 2. Wires have been placed in heated thru fireclay lined metal ducts upon completion of pressing ducts are pressure grooved. 3. Pressing Wires: 250 Dia. hard drawn stress relieved wire with a minimum ultimate strength of 240,000 psi.

DESIGN NOTES

Ultimate strength of wires = 340,000 psi
Permissible tensile stress = 170,000 psi
Allowable Working stress = 140,000 psi
Final Prestress force = 235,000 lb
No of wires reqd = 33 + 33 +
No of wires provided: 34

Group 2 & 3 = 2 @ 12, 24
Group 1 = 1 @ 10 = 10

34 total

Final wire stress = 141,000 psi
Initial wire stress = 141,250 psi
Initial P.S. force = 166,000 x 34 x .491 = 277K

Design Standards - Criteria for
Prestressed Concrete Bridges Bureau
of Public Roads - 1944

NOTE: Max temporary overstress
P.S. steel = $\text{Sulf} \times 1.8 \times 240,000 = 192,000 \text{ psi}$
PLAINS

$$f_f = 235^{\text{K}}$$

$$A_s = (34)(0.0491) =$$
$$A'_5 = (34)(0.0491) =$$

NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED EXCEPT AS NOTED

19 _____

BRIDGE ENGINEER

[illegible]

GIRDER DETAILS FOR
42" PRESTRESSED CONCRETE GIRDER
FOR
NORTH DAKOTA STATE HIGHWAY DEPT
PROJECT #41-94-6191252
STUTSMAN COUNTY

Contractor: _____
 Supplier: Concrete Structures Culture C
 Fargo, North Dakota
 Engineering: Hirschfeld Engineering Co.
 Milwaukee, Wisconsin
 Approved: _____
 Drawn by: R. L. Dittler
 Sheet No. 4 of 4
 Job No. 812E