

DESIGN DATA				
Traffic	Average Daily			Max Hr.
Current 2012	Pass 235	Trucks 50	Total 285	
Forecast 2032	Pass. 350	Trucks 75	Total. 425	
Clear Zone Distance		Design Speed		
Minimum Sight Dist. for Stopping.		Bridges.		
Minimum Sight Dist for Safe Passing.				
Sight Dist for No Passing Zone				
Pavement Design Life (years)				

STATE	PROJECT NO	PCN	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	18964	1	1

JOB # 56
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

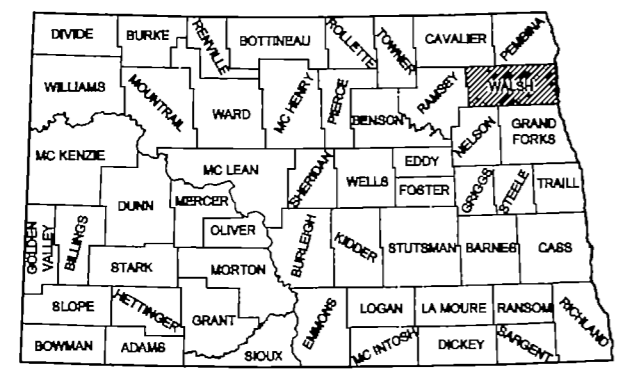
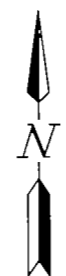
BRS-6-017(036)140
 FHWA LIMITED INVOLVEMENT
 WALSH COUNTY, ND
 MARSHALL COUNTY, MN
 3 MILES EAST OF I-29

GOVERNING SPECIFICATIONS

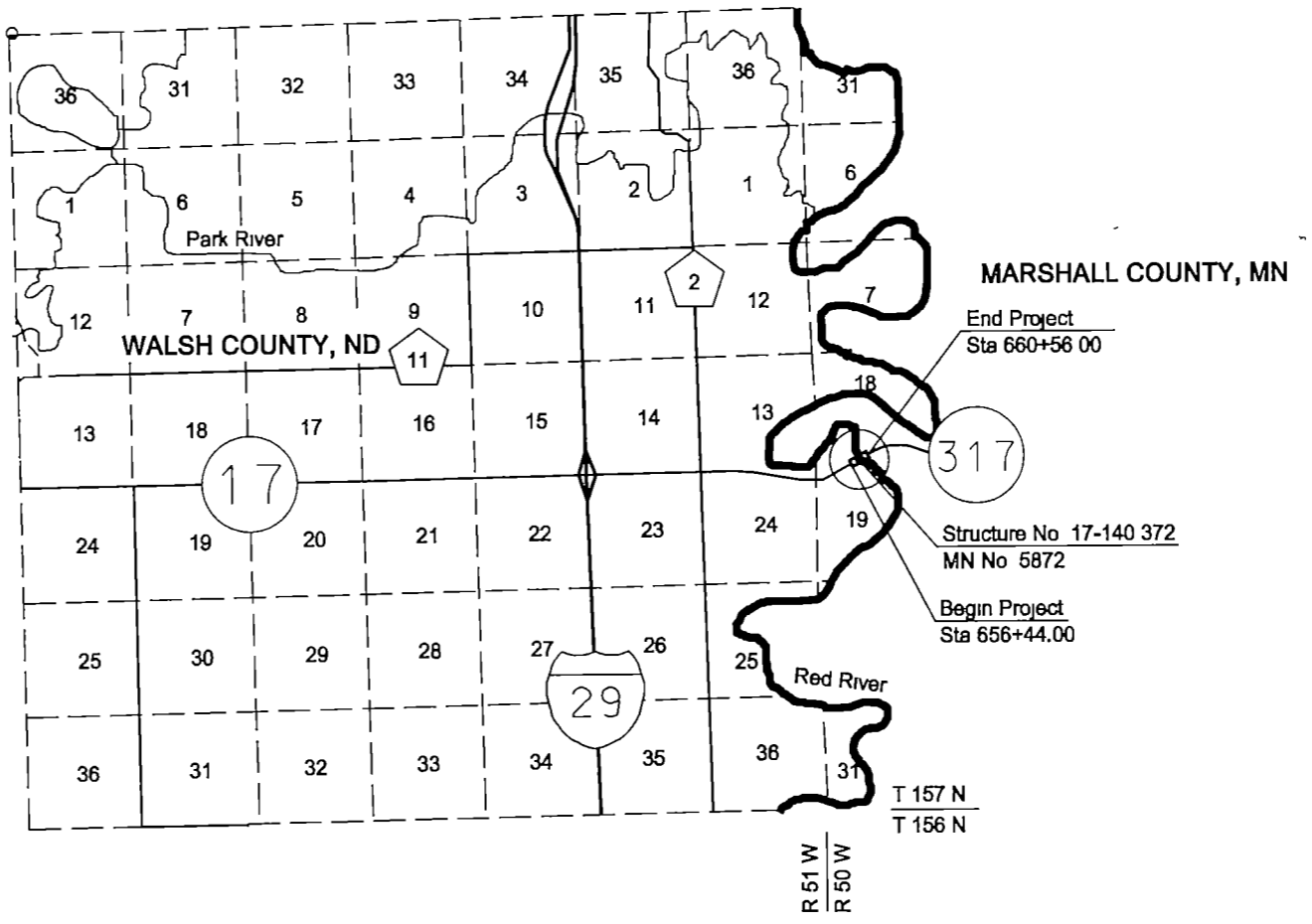
Standard Specifications adopted by the North Dakota
 Department of Transportation October 2008, Standard Drawings
 currently in effect, and other Contract Provisions submitted herein

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
BRS-6-017(036)140	0.078	0.078

SANDBLASTING & PAINTING STRUCTURAL STEEL,
 AND PLACING RIPRAP AROUND CENTER PIER



STATE COUNTY MAP



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

APPROVED DATE 2/22/13

 Jon D. Ketterling
 NDDOT DIV-DIST OR CONSULTANT FIRM

APPROVED DATE 2/11/13

 Nancy Daubenberger
 STATE BRIDGE ENGINEER
 MN DEPARTMENT OF TRANSPORTATION

This document was originally issued and sealed by
 Jon D. Ketterling,
 Registration Number
 PE- 4684,
 on 2/22/13 and the original document is stored at the
 North Dakota Department
 of Transportation

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	2	1

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6	2	Environmental Commitments
8	1	Estimate of Quantities
75	1	Temporary & Permanent Impacts
100	1	Traffic Control Devices List
170	1	Bridge Layout
170	2	Bridge Notes

LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-20-1, 2, 3, 10	Abbreviations
D-20-20, 21	Linestyles
D-20-30, 31, 32	Symbols
D-704-1	Attenuation Device
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D-704-13, 14	Construction Sign and Barricade Assembly Details
D-704-16, 17	Sign Layout for One Lane Closure
D-704-50	Portable Sign Support Assembly

SPECIAL PROVISIONS

SP 1000(08)	Bridge Paint Lead Paint Removal, Containment, and New Paint
SP 1017(08)	Permits and Environmental Considerations

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	6	1

NOTES

100-P01 COORDINATION OF PROJECTS: Another project under contract during the 2013 construction season in the vicinity of this project is SNH-S-NHU-6-017(031)127. It is a slurry seal from Grafton E to the Red River.

704-200 PRECAST CONCRETE MEDIAN BARRIERS - STATE FURNISHED: The number of precast concrete median barriers required on the project shall be 41 - 10 x 2 foot units. The contractor shall obtain the barriers from the Fargo District Maintenance Storage Yard at Casselton. Upon completion of the project, all barriers shall remain the property of the state and the contractor shall return them to the Grand Forks Maintenance Storage Yard at Grand Forks. Upon final storage, one barrier connecting bolt with two washers shall be placed through the barrier loops at one end of each segment, and the nut shall be installed sufficiently threaded to the bolt to retain this hardware during transportation. Any barrier segments that become damaged during handling, transportation, placing, or use, or any missing connecting bolts, nuts or washers, shall be replaced at the contractor's expense. The contractor shall contact the District Office a minimum of 24 hours prior to picking up the barriers and contact the District Office a minimum of 24 hours prior to returning them.

The barriers shall be counted prior to removal from the storage area and after placement on the roadway and the number agreed to by the Engineer and the Contractor. Another count shall be made once the barriers have been returned to the storage area and agreed to by the Engineer and the Contractor. Both agreements shall be made in writing and signed by all parties.

Upon final storage, the state furnished barriers shall be stacked a maximum of two high and shall be placed on 4" x 4" boards separating the barrier from the ground and separating the barriers between stacked rows. Some 4" x 4" boards are available from the Grand Forks Maintenance Storage Yard at Grand Forks, but any additional 4" x 4" boards that are needed shall be supplied by the contractor, become property of the NDDOT, and shall be included in the price bid for "Precast Concrete Median Barrier - State Furnished."

All labor and equipment needed for obtaining, loading, transporting, installing, moving, removing, unloading, and maintaining the portable precast concrete median barriers shall be provided by the Contractor and included in the price bid for the item "Precast Concrete Median Barriers - State Furnished."

704-450 LANE CLOSURE - SIGNAL CONTROL/FLAGGING CONTROL: At the location(s) shown in the plans, the contractor shall install a "Signal Controlled" lane closure for two-lane roadways as shown on Standard D-704-16. In lieu of providing a traffic signal system during the time one-lane traffic is maintained, the contractor may install a "Flagging Controlled" lane closure for two-lane roadways as shown on Standard D-704-17. The traffic signal system shall be similar to the one shown, and any modifications shall be approved by the engineer prior to the preconstruction conference.

The contractor shall be responsible for obtaining the electrical source to operate the traffic signals. The contractor shall make arrangement with the utility company or provide generators for electrical service. Solar powered traffic signals may be used. The contractor shall be responsible for all costs of providing the electrical source and any costs required to operate and maintain the traffic signal. The generator shall be placed at least 60 feet from the roadway

centerline unless the generator and signal are part of a trailer-mounted unit.

If the contractor chooses to use the utility company, the poles and all equipment shall be placed at least 60 feet from the roadway centerline. The power conductors shall be placed a minimum of 6 inches below the ground.

Upon completion of the project and the traffic is returned to the closed roadway, all equipment shall be removed.

The cost of furnishing, installing, and providing power to the traffic signal shall be included in the price bid for "Lane Closure - Signal Control/Flagging Control."

The cost of providing the traffic signal system or continuous 24-hour flagging during the time one-lane traffic is maintained shall be included in the price bid for "Lane Closure - Signal Control/Flagging Control."

The traffic control devices shall be installed as shown on Standards D-704-16 or 17, depending on the method selected. The traffic control devices will be measured and paid for at the contract unit price for each device. For bidding purposes, devices as shown on Standard D-704-16 are included in the "Traffic Control Devices List."

704-P01 TRAFFIC CONTROL: Traffic control shall consist of a one-lane closure. Traffic Control Devices shall comply with the following Standard Drawings:

1. D-704-1, Attenuation device as applicable
2. D-704-5, Contractor sign as applicable.
3. D-704-7, 8,9,10,11,12,12A, 13, and 14 as applicable
4. D-704-16 & 17, For one-lane closure
5. D-704-50, Portable sign support assembly

The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the Contract Unit Price for each device. Additional devices required to accommodate the Contractor's operation shall be the contractor's responsibility.

This document was originally issued and sealed by Sarah BaeHurst, Registration Number PE-6239, on 2/4/13 and the original document is stored at the North Dakota Department of Transportation.

ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	6	2

ENVIRONMENTAL COMMITMENTS: The North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

COMMITMENT NO. 1: Unavoidable impacts to wetlands will be mitigated onsite, adjacent to the project, or at a NDDOT approved mitigation site or bank. All wetlands were claimed as jurisdictional by the USACE. It is estimated that approximately 0.05 acres will be permanently impacted due to the replacement of riprap around the center pier. Approximately 0.02 acres will be temporarily impacted due to staging for placement of riprap around the center pier.

ACTION TAKEN/REQUIRED

- The Contractor shall be responsible for obtaining all necessary permits in accordance with SP 1017(08) prior to construction in the stream channel.
- All impacts to natural wetlands (natural/jurisdictional and natural/non-jurisdictional) with exception of Riverine, regardless of size, as well as impacts of 0.10 acre or greater to artificial/jurisdictional wetlands require mitigation.
- All artificial/non-jurisdictional, deep water (impacts greater than 6 feet), riverine (Cowardin Classification beginning with an "R"), Potential Other Water, Preamble Wetlands, and temporary impacts do not require mitigation.

COMMITMENT NO. 2: Erosion and sedimentation into the Red River and its adjacent habitat will be minimized.

ACTION TAKEN/REQUIRED

- Flotation silt curtain and/or silt fence shall be installed if fill is placed in the channel or near the banks.

COMMITMENT NO. 3: All disturbed areas will be mulched and seeded with a native grass mixture.

ACTION TAKEN/REQUIRED

- The Contractor will mulch and seed all disturbed areas within the right of way.

COMMITMENT NO. 4: No construction activities are to take place in the Red River channel from April 15 to July 1 unless the MN DNR and NDG&F area fisheries supervisors waive the exclusion dates.

ACTION TAKEN/REQUIRED:

- The ND Game and Fish Department must be notified a minimum of 72 hours prior to placement of any equipment in or on the Red River for scheduling an inspection. The contact person is Mr. Jerry Weigel in the Bismarck office. His number is (701) 220-5342.
- In addition to the ND Game and Fish Department, the MN DNR must also be contacted at (218) 281-6063 if work needs to be done in the channel during the exclusion dates.

COMMITMENT NO. 5: Active migratory bird nests with eggs or chicks are protected by the Federal Migratory Bird Treaty Act. Construction on bridges with active nesting can not start until nesting season is over unless measures are taken to prevent nesting.

ACTION TAKEN/REQUIRED: The contractor shall not perform construction activities on the bridge if active nests are present. The contractor can legally remove inactive nests prior to the nesting season. Any nesting that is removed shall not be allowed to enter the waterway. After inactive nests are removed the contractor can use nets or tarps secured to the structure to discourage nesting. Please refer to the bridge note section of the plans.

COMMITMENT NO. 6: Pollution control measures will be used to contain wastes generated during the paint removal process.

ACTION TAKEN/REQUIRED: Special Provision 1000(08) outlines specific steps the contractor must take for containment, removal and disposal of paint, including lead based primer.

PERMITS REQUIRED:

- Section 404 Permit (US Army Corps of Engineers)
- Sovereign Lands Permit (ND State Water Commission)
- MN Pollution Control Agency Permit
- Floodplain Permit (Walsh County)

Wetland Number	Location	LONG / LAT (Dec. Deg.)	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands*	Wetland Impacts (acres)	
								Temp	Perm
1 Red River	Sec. 18, T157N, R50W	-97.137495W 48.413155N	R2	River	2.67	natural	X	0.02	0.05
TOTALS					2.67			0.02	0.05

* A wetland Jurisdictional Determination was issued by the USACE on 01/23/2012, NWO-2012-0151-BIS

ESTIMATE OF QUANTITIES

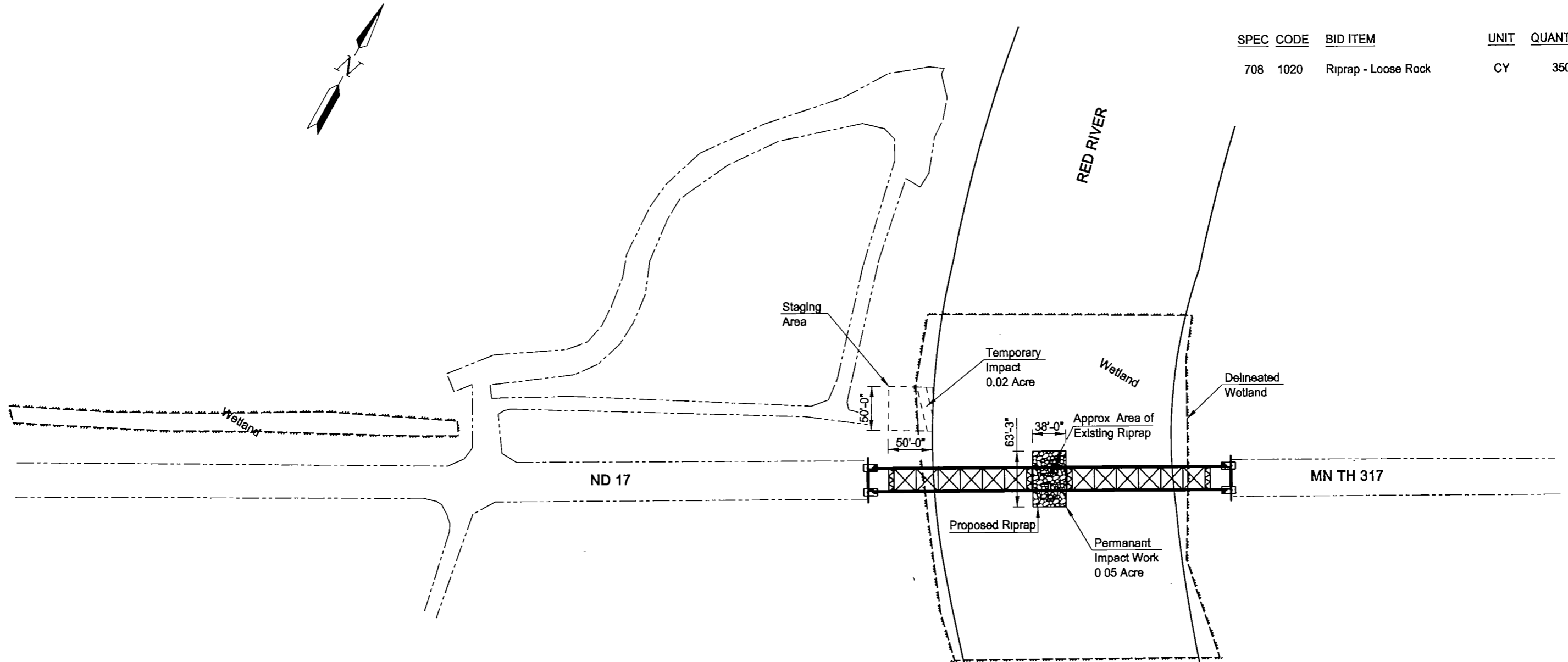
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRS-6-017(036)140	8	1

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
103	0100 CONTRACT BOND	L SUM	1	1
630	0100 SAND BLASTING & PAINTING	L SUM	1	1
630	9000 CONTAINMENT SYSTEM	L SUM	1	1
702	0100 MOBILIZATION	L SUM	1	1
704	1000 TRAFFIC CONTROL SIGNS	UNIT	807	807
704	1018 LANE CLOSURE-SIGNAL CONTROL/FLAGGING CONTROL	EA	1	1
704	1043 ATTENUATION DEVICE-TYPE B-65	EA	2	2
704	1052 TYPE III BARRICADE	EA	2	2
704	1060 DELINEATOR DRUMS	EA	10	10
704	3510 PRECAST CONCRETE MED BARRIER-STATE FURNISHED	EA	41	41
708	1020 RIPRAP-LOOSE ROCK	CY	350	350
762	0420 SHORT TERM 4IN LINE-TYPE R	LF	2,612	2,612
762	0426 SHORT TERM 24IN LINE-TYPE R	LF	24	24
762	1104 PVMT MK PAINTED 4IN LINE	LF	1,000	1,000
762	1500 OBLITERATION OF PVMT MK	SF	333	333

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

STATE	PROJECT NUMBER	SECTION NO	SHEET NO
ND	BRS-6-017-(036)140	75	1

SPEC CODE	BID ITEM	UNIT	QUANTITY
708 1020	Riprap - Loose Rock	CY	350



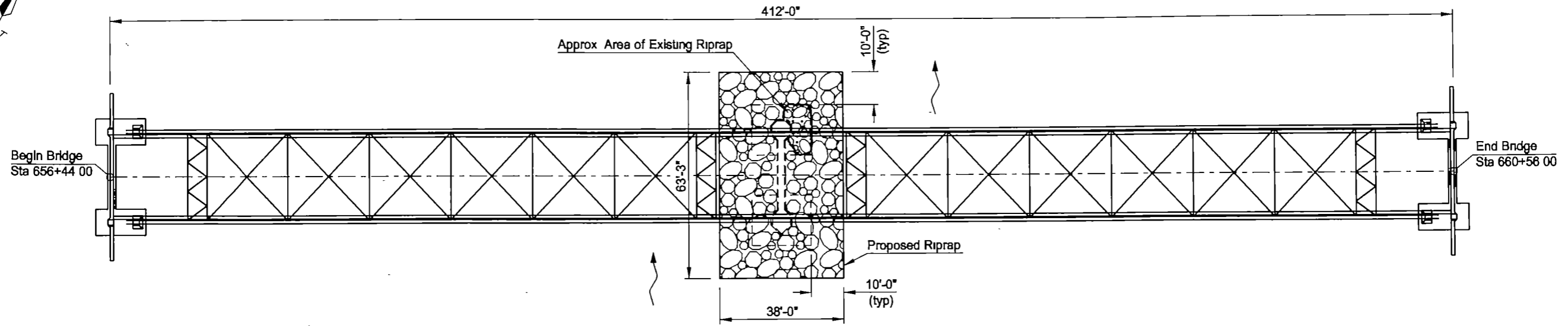
This document was originally issued and sealed by Jason R Thorenson, Registration Number PE 5048, on 2/5/13 and the original document is stored at the North Dakota Department of Transportation

**RED RIVER BRIDGE
 3 MILES E OF I-29**

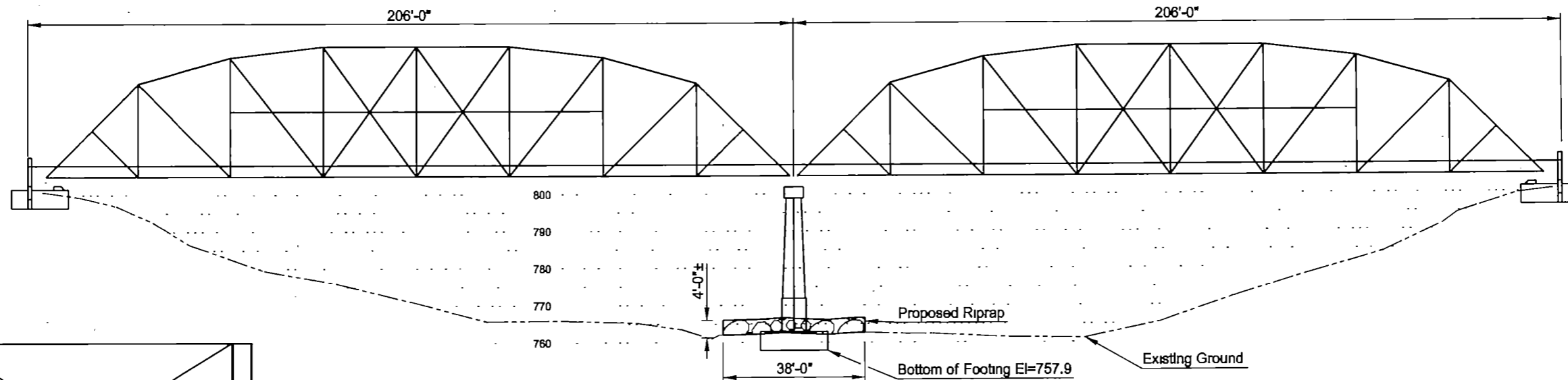
TEMPORARY & PERMANENT IMPACTS

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

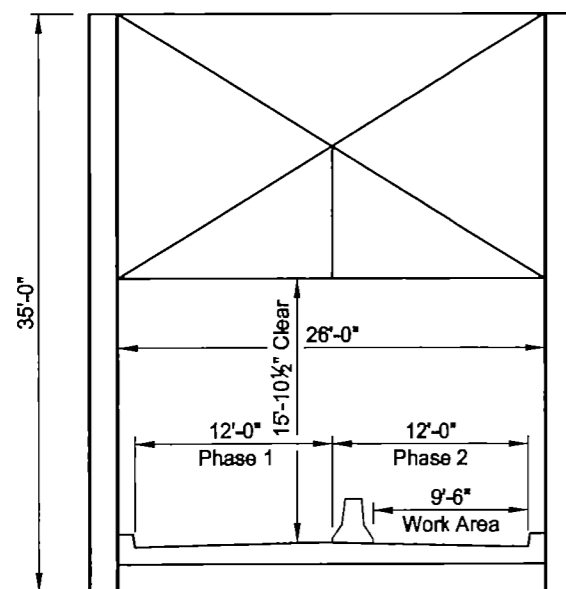
STATE	PROJECT NUMBER	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	170	1



PLAN



ELEVATION



INTERMEDIATE SECTION

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
830	0100	SAND BLASTING AND PAINTING	L SUM	1
830	9000	CONTAINMENT SYSTEM	L SUM	1
708	1020	RIPRAP-LOOSE ROCK	CY	350

This document was originally issued and sealed by Jason R Thorenson, Registration Number PE 5048, on 2/4/13 and the original document is stored at the North Dakota Department of Transportation

SPECIAL PROVISIONS	
SP 1000(08)	BRIDGE PAINT
SP 1017(08)	PERMITS & ENV. CONSIDERATIONS
MN BRIDGE	NO 5872

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
STRUCTURAL STEEL PAINTING
RED RIVER BRIDGE
3 MILES E OF I-29
BRIDGE LAYOUT

PROJECT: BRS-6-017(036)140
STATION 658+50.00
WALSH COUNTY, ND MARSHALL COUNTY, MN

DATE: 2/22/13 BRIDGE ENGINEER: Jon D. Ketterling

NOTES

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

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	BRS-6-017(036)140	170	2

100 SCOPE OF WORK: This project consists of blast cleaning, containment and painting all exposed structural steel and replacing riprap around the center pier. One lane of traffic shall be maintained at all times.

630 SANDBLASTING AND PAINTING: All structural steel surfaces shall be blast cleaned and painted according to Special Provision 1000(08). The total surface area to be painted is approximately 46,900 SF. The finish coat shall be Brown color 20045 and shall meet Federal Standard No. 595B colors.

The Contractor shall remove inactive nests prior to the start of egg laying in the spring and secure tarps or netting to the bridge to restrict birds from gaining access below the bridge. In lieu of tarps or netting, the Contractor may elect to remove inactive nests on a weekly basis until work is completed or until the end of the egg laying season.

All labor, equipment, and materials required for the completion of this work shall be included in the price bid for "Sand Blasting and Painting".

630 CONTAINMENT SYSTEM: The containment system shall be in accordance with Special Provision 1000(08).

708 RIPRAP-LOOSE ROCK: Construction in the stream channel shall be avoided during the fish spawning and migration period from April 15 to July 1. The Contractor shall be responsible for obtaining all necessary permits in accordance with Special Provision 1017(08) prior to construction in the stream channel.

Work shall be accomplished using positive methods of locating and removing debris, if necessary, then placing riprap. Removing debris using a grapple or similar methods that do not provide positive removal of all debris will not be permitted. Debris shall be removed from the channel and placed on the river bank, downstream of the pier. Rock shall be placed approximately 4 feet deep around the pier as shown in the plans using a clam-bucket or backhoe. Casting of riprap will not be permitted.

Riprap shall be well graded, between 15 and 48 inches, and placed around the pier footings. All rock delivered will be weighed and converted to cubic yards at a rate of (2,600 lbs/cy) and shall have at least one fractured face. The gradation shall be as follows:

Size (in)	% Smaller
48	100
30	50
15	0

The ND Game and Fish Department must be notified a minimum of 72 hours prior to placement of any equipment in or on the Red River for scheduling an inspection. The contact person is Mr. Jerry Weigel in the Bismarck office. His number is (701) 220-5342.

In addition to the ND Game and Fish Department, the MN DNR must also be contacted at (218) 281-6063 if work needs to be done in the channel during the exclusion dates.

The Contractor shall install flotation silt curtain and/or silt fence if fill is placed in the channel or near the channel bank. In addition, any disturbed areas shall be mulched and seeded with a native grass mixture.

All labor, equipment, and materials required for the completion of this work shall be included in the price bid for "Riprap-Loose Rock".

This document was originally issued and sealed by Jason R Thorenson, Registration Number PE-5048, on 2/19/13 and the original document is stored at the North Dakota Department of Transportation.

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR REHABILITATION OF BRIDGE 5872

LOCATED ON T.H. 317 AT THE NORTH DAKOTA / MINNESOTA BORDER

STATE PROJ. NO. 4514-01
 GROSS LENGTH 916.0 FEET 0.17 MILES
 BRIDGES-LENGTH 412.00 FEET 0.08 MILES
 EXCEPTIONS-LENGTH FEET MILES
 NET LENGTH 916.0 FEET 0.17 MILES
 REF. POINT 00+00.00 TO REF. POINT 0+00.086

MARSHALL COUNTY

TOTAL LENGTH OF PROJECT IS 0.17 MILES

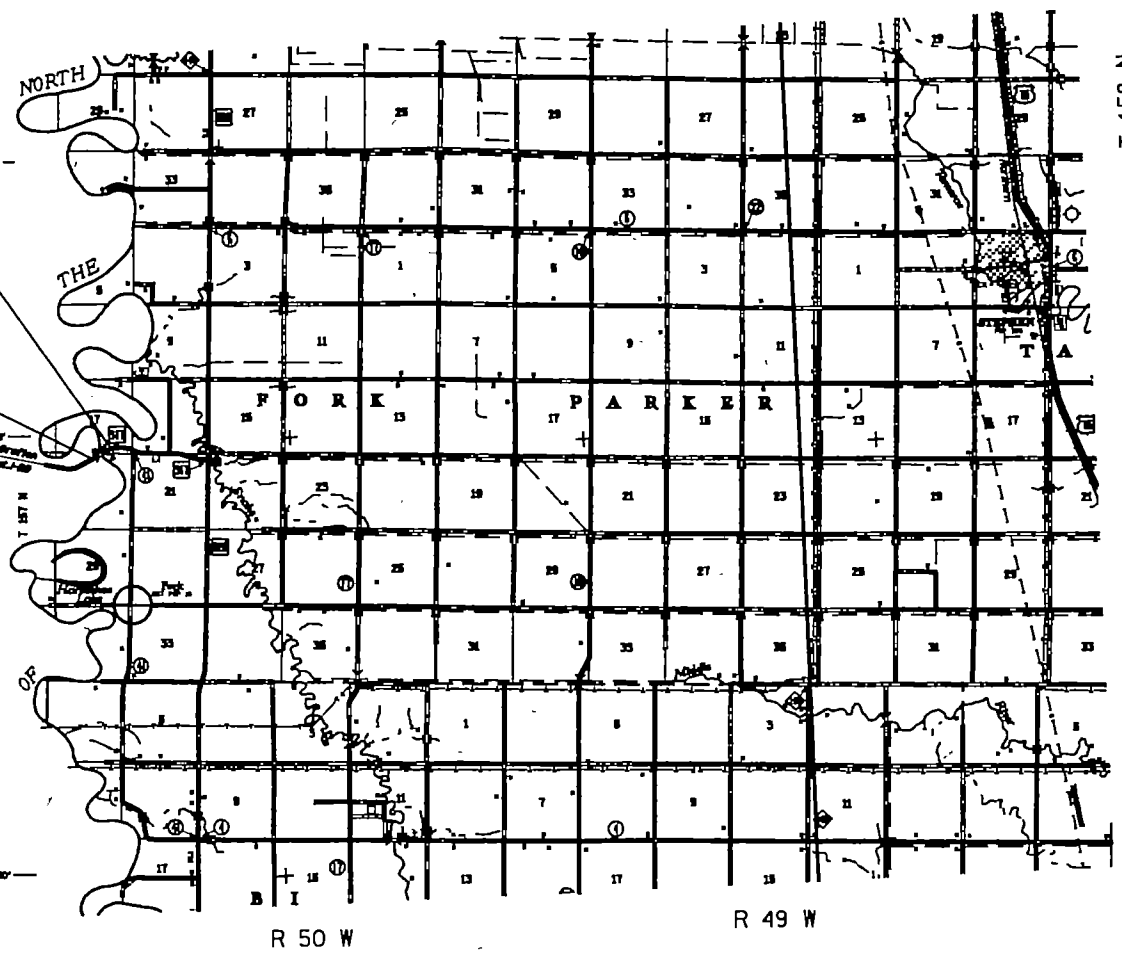
R.P. STATION
 0+00 = 658+50
 1+00 = 711+30



END S.P. 4514-01
 STA. 663+06

BEGIN S.P. 4514-01
 STA. 653+90

WALSH COUNTY
 NORTH DAKOTA



GOVERNING SPECIFICATIONS

THE 2000 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION 'STANDARD SPECIFICATIONS FOR CONSTRUCTION', SHALL GOVERN

INDEX

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 TRAFFIC CONTROL / DETOUR 21-23
 PAVEMENT MARKING DETAILS..... 24,25
 X-SECTIONS X1

THIS PLAN CONTAINS 26 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

PRINT NAME: TODD VONASEK LICENSE # 20830
 DATE: 3/8/05 SIGNATURE: *Todd Vonasek*
 DESIGN SQUAD GREG KLEIN

RECOMMENDED FOR APPROVAL *Jim McCaskey* 3/8/05 2005
 DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL *Ray R. Hill* 3/8/05 2005
 DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL *Mark Egan* 3/8/05 2005
 DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL *Janet Black* 3-31-05 2005
 STATE PRE-LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL *Alan Platt* 4/5/05 2005
 DIRECTOR, LAND MANAGEMENT

APPROVED *HS* 2005 *Donna P. Quinn*
 STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

PRINT NAME: _____ LICENSE # _____
 DATE: _____ SIGNATURE: _____

SCALE
 INDEX MAP 1 MILE

DESIGN DESIGNATION

Design ESALS 20 YEAR = 157,000
 ADT (Current Year) 2005 = 340 Design Speed 55 MPH
 ADT (Future Year) 2025 = 505 Based on STOPPING Sight Distance
 DHV (Design Hr. Vol.) = 85 Height of eye 3.5' Height of object 0.5'
 D (Directional Distr.) = 51/49 % Design Speed not achieved at
 T (Heavy Commercial) = 24 % STA. _____ TO STA. _____ MPH
 STA. _____ TO STA. _____ MPH

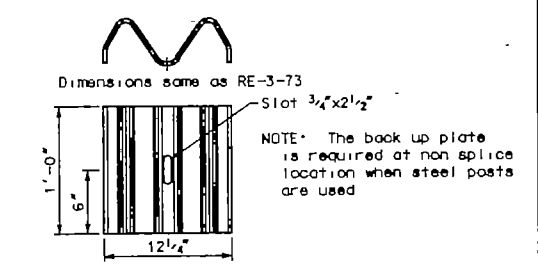
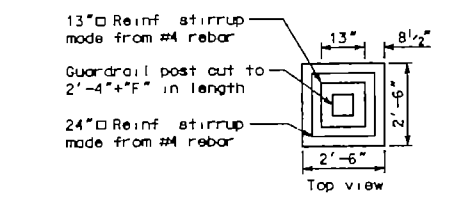
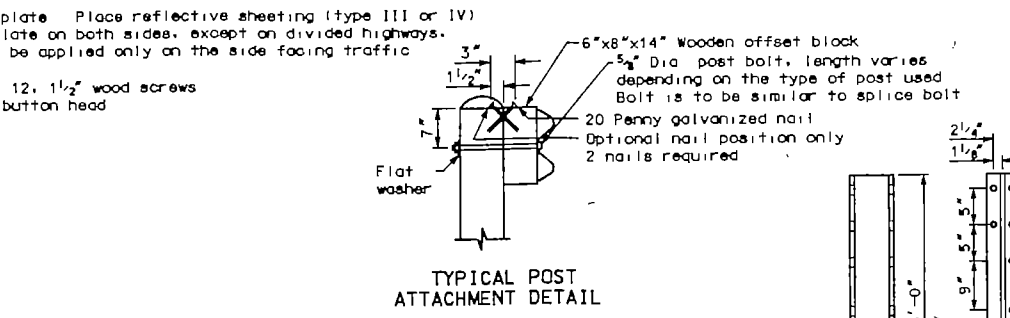
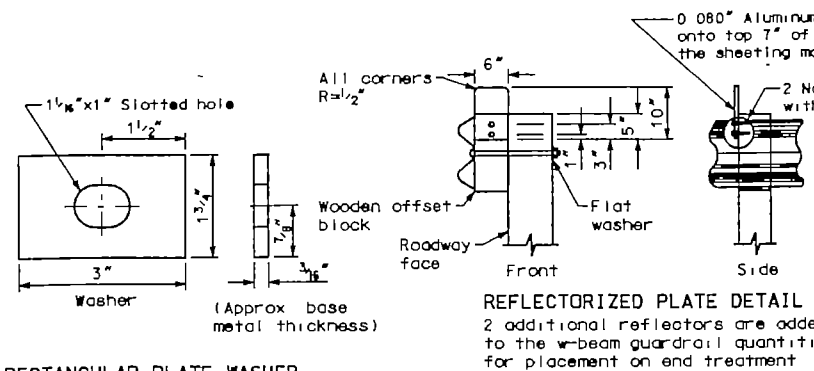


PROJECT LOCATION
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 DISTRICT : 2B - BEMIDJI

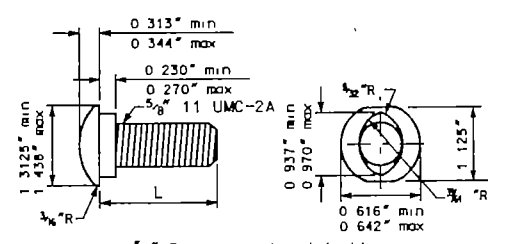
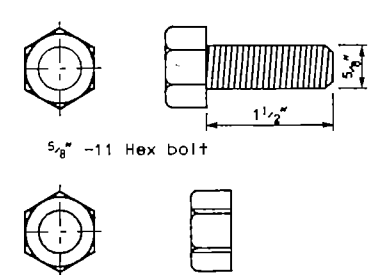
FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL
 STATE PROJ. NO. 4514-01
 BR. 4514-5872A

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY

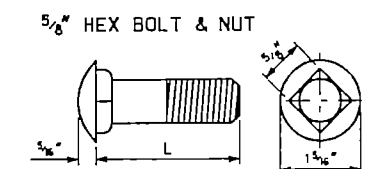
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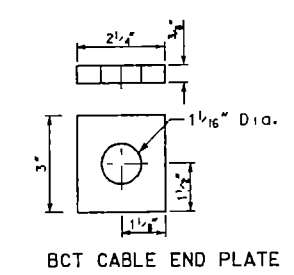
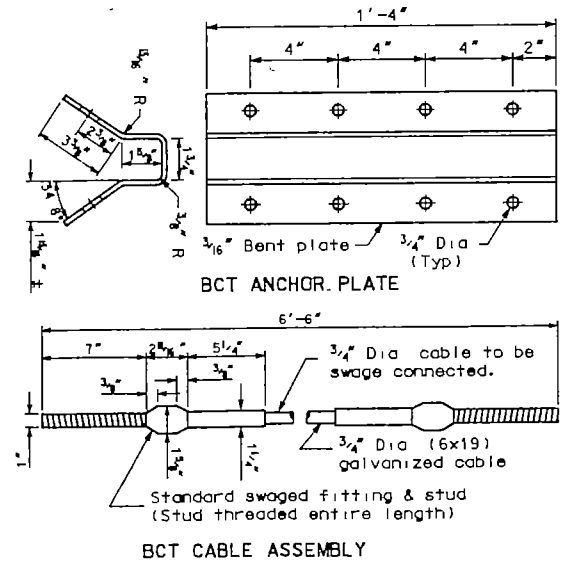
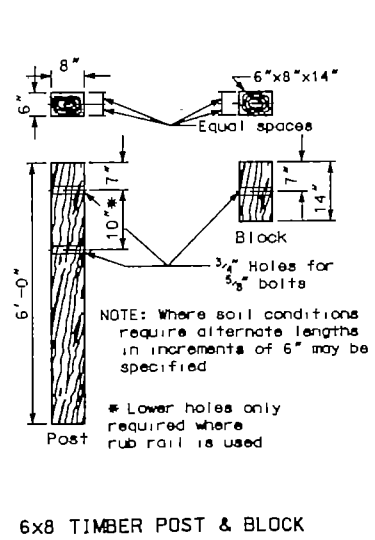
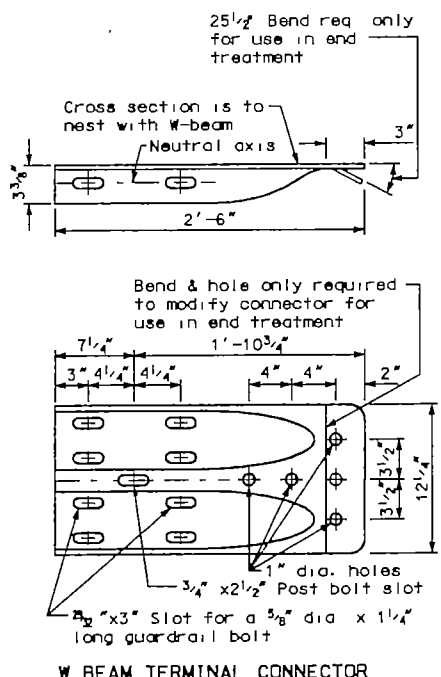
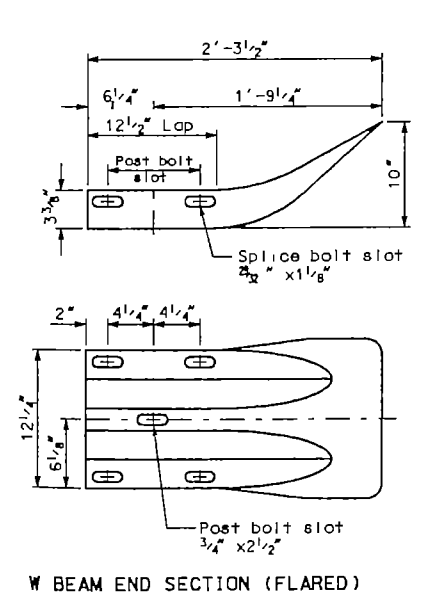
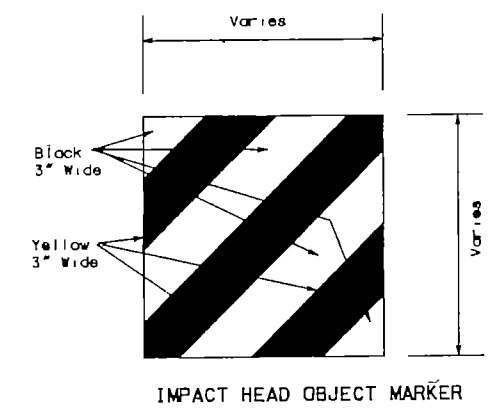
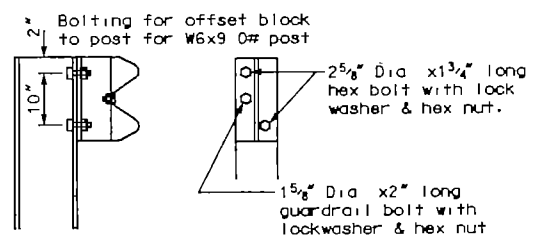
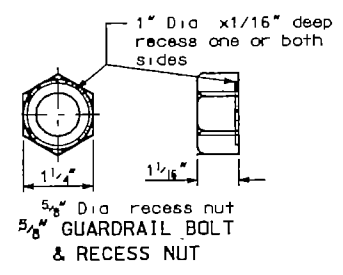
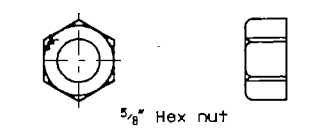
RECTANGULAR PLATE WASHER



L	THREAD LENGTH
1 1/2"	Full length thread
2"	1 3/4" Min thread length
9 1/2"	4" Min thread length
18"	4" Min thread length
20"	4" Min thread length
22"	4" Min thread length
25"	4" Min thread length



L	THREAD LENGTH
1 1/2"	Full length thread
3"	1 1/2" Min thread length
11"	1 3/4" Min thread length
13"	1 3/4" Min thread length



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
REVISIONS	
DATE	CHANGE
11-22-02	Delete 2 est. rev note
12-01-04	PE Stamp added

MARK S. GAYDOS
REGISTERED ENGINEER
NORTH DAKOTA
12/1/04
S.P. 4514-01 (T.H. 317)
SHEET NO 12 OF 25 SHEETS

NOTES.

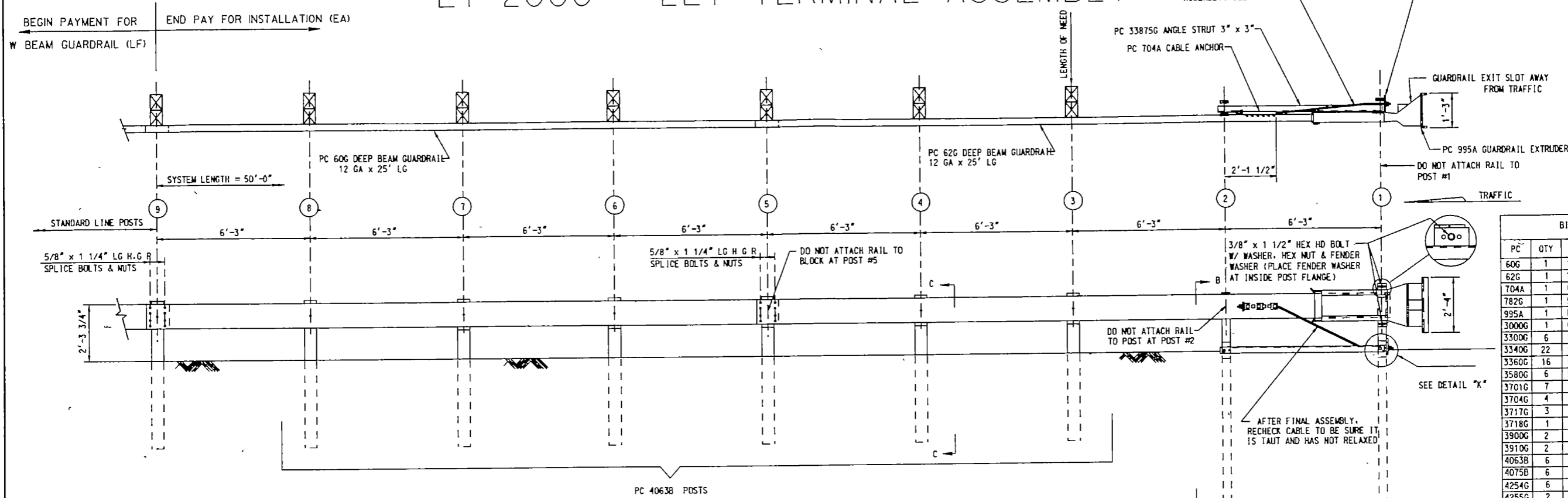
ReflectORIZED plates: Reflector plates shall begin at first post and be spaced at 25' centers on guardrail less than 250' in length and at 50' centers for guardrail over 250' in length. The reflector shall be the same color as the pavement marking adjacent to that reflector unless noted otherwise on the plans.

Detail of concrete pedestal for posts: To be used over culverts or footings when dimension "F" is less than 3'-8" when round posts are used and the pedestal required, the post hole in the pedestal shall be varied as required by the post shape.

Manner of replacing bit material at guardrail post. All excess earth from excavations for guard posts shall be disposed of as directed by the engineer. Replace bit material wherever guardrail is installed after mat has been laid. Cost of excavation and replacing of bit material to be included in the price bid for other items.

The Object Marker shall fit within the vertical edges of the Impact Plate. The retroreflective sheeting shall be type IIIA sheeting meeting the requirements of Section 894.02 b of the standard specifications. The sheeting shall be applied to 100 Aluminum sheeting meeting the requirements Section 894.01 a. The Object Marker shall be attached to the Impact Head plate with rivets or some other attachment device. The rivets or attachment device shall be non-rust. The Stripes shall slope downward toward the roadway side.

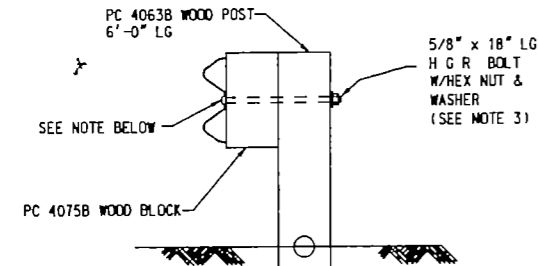
ET-2000 - LET TERMINAL ASSEMBLY



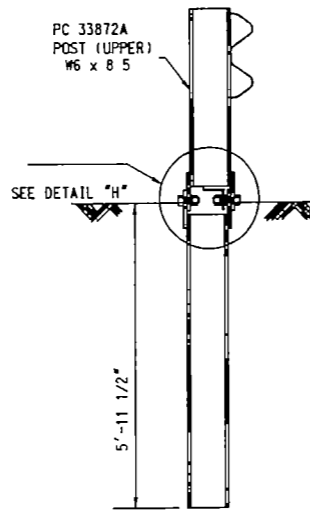
BILL OF MATERIAL		
PC	QTY	DESCRIPTION
60G	1	12/25' / 6' 3" / 5 (GUARDRAIL)
62G	1	12/25' / 6' 3" / 5 ANC (GUARDRAIL)
704A	1	CABLE ANCHOR BRACKET
782G	1	5/8" x 8" x 8" BEARING PLATE
995A	1	ET-2000 PLUS EXTRUDER
3000G	1	CABLE 3/4 x 6'-6"
3300G	6	5/8" WASHER
3340G	22	5/8" HEX NUT
3360G	16	5/8" x 1 1/4" SPLICE BOLT
3580G	6	5/8" x 18" POST BOLT
3701G	7	3/4" WASHER
3704G	4	3/4" HEX NUT
3717G	3	3/4" x 2 1/2" HEX HD BOLT
3718G	1	3/4" x 3" HEX HD BOLT
3900G	2	1" WASHER
3910G	2	1" HEX NUT
4063B	6	WD 6'-0" POST 6" x 8"
4075B	6	WD BLOCK 1'-2" x 6" x 8" DR
4254G	6	3/8" WASHER
4255G	2	3/8" FENDER WASHER (1 1/2" OD)
4258G	4	3/8" LOCKWASHER
4261G	2	3/8" x 1 1/2" HEX HD BOLT
4699G	4	3/4" LOCKWASHER
6321G	4	3/8" x 2" HEX HD BOLT
6405G	6	3/8" HEX NUT
33871A	1	ET2000 HBA POST #1 TOP
33872A	1	ET2000 HBA POST #2 TOP
33873A	2	ET2000 HBA POST #1-#2 BOTTOM
33875G	1	6'-6" ANGLE STRUT ET HBA

NOTES:

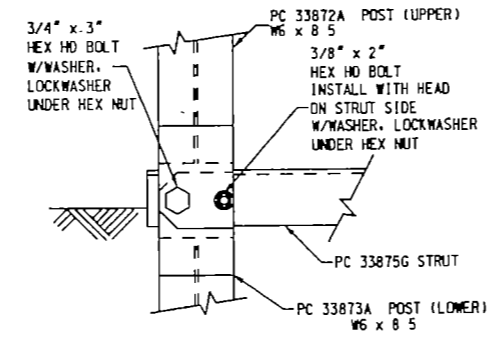
- WOOD POSTS ARE REQUIRED FROM 3 TO 9.
- ALL BOLTS, NUTS, CABLE ASSEMBLY, CABLE ANCHORS, AND BEARING PLATES SHALL BE GALVANIZED.
- THE END TREATMENT CAN BE FLARED AT A RATE OF 50:1 FOR THE FIRST 50' OF THE SYSTEM TO PREVENT THE IMPACT HEAD FROM ENCRANCHING ON THE SHOULDER THE 25:1 FLARE RATE IS RECOMMENDED WITH CURB INSTALLATIONS. SEE PLANS FOR WHEN TAPER IS USED OR NOT.
- DO NOT ATTACH GUARDRAIL TO POST #1
- DO NOT ATTACH GUARDRAIL TO POST BLOCK AT POST #5.
- THE 5/8" FLAT WASHER IS USED UNDER THE NUT, BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.
- AN IMPACT HEAD OBJECT MARKER SHALL BE PLACED.
- THE WOOD BLOCKOUTS SHALL BE 'TOE NAILED' TO THE RECTANGULAR WOOD POSTS TO PREVENT THEM FROM TURNING WHEN WOOD SHRINKS. THE NAILS SHALL BE 20 PENNY AND GALVANIZED



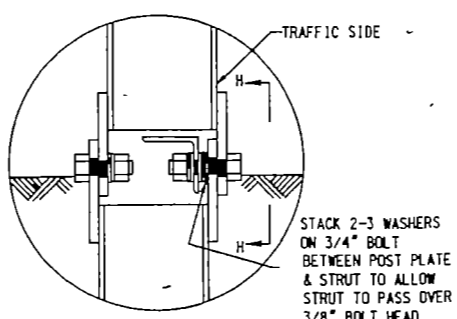
NOTE:
SECTION "C-C" IS SIMILAR AT POST #5 EXCEPT RAIL IS NOT ATTACHED
SECTION "C-C"
(TYP # POSTS #3, 4, 6, 7 & 8)



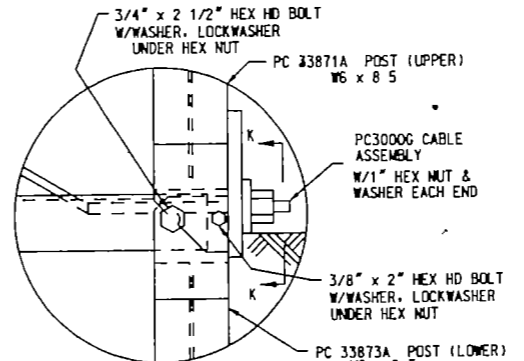
SECTION "B-B"
(POST #2)



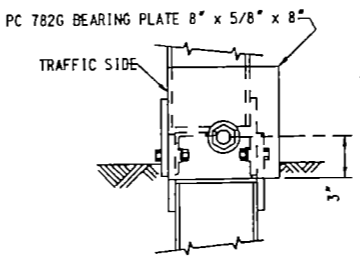
VIEW "H-H"



DETAIL "H"
(POST #2)

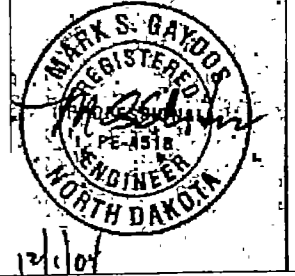


DETAIL "K"
(POST #1)

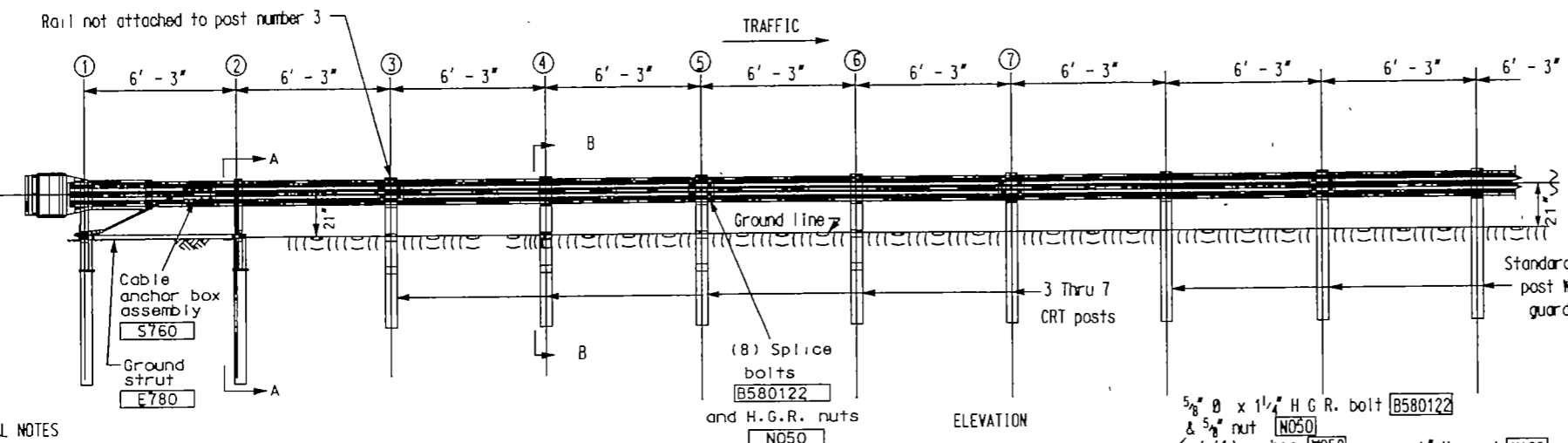
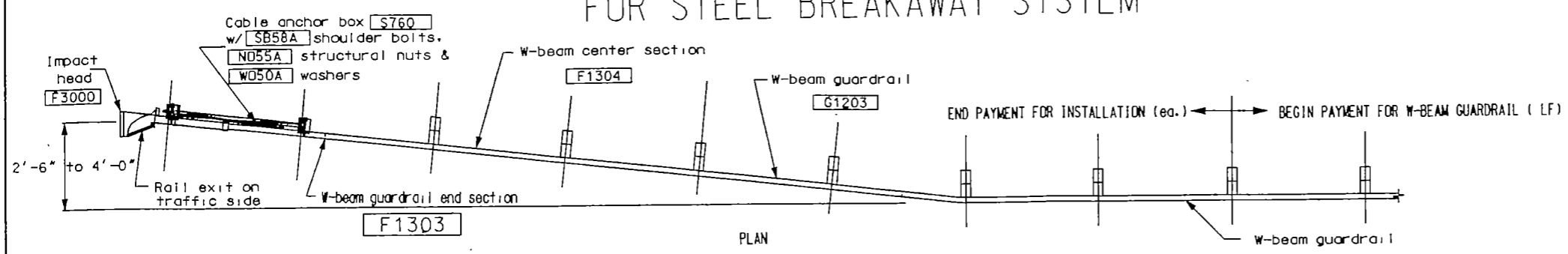


VIEW "K-K"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
04-02-02	
REVISIONS	
DATE	CHANGE
12-01-04	PE Stamp added



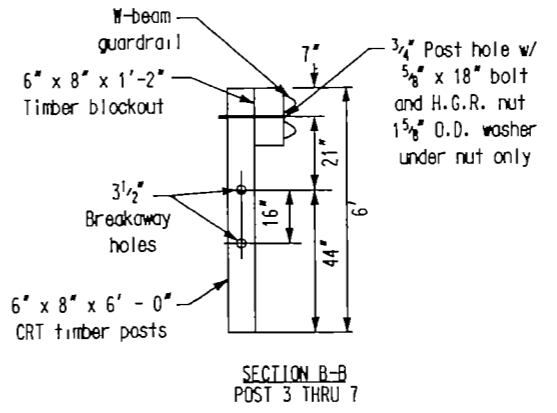
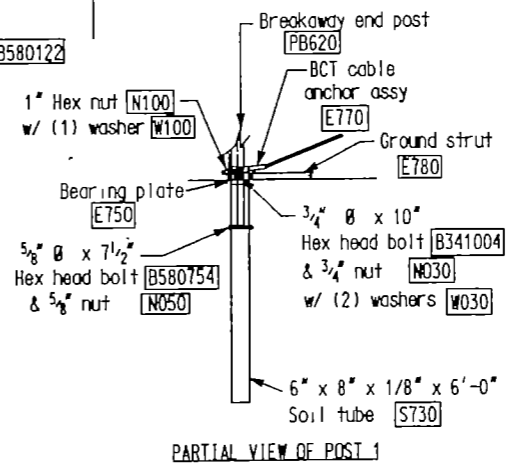
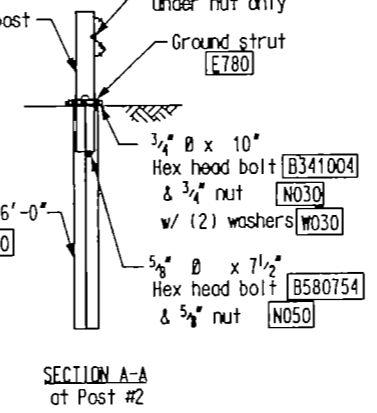
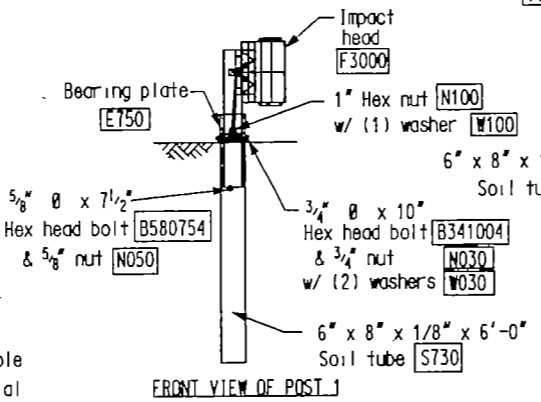
FLARED ENERGY ABSORBING TERMINAL FOR STEEL BREAKAWAY SYSTEM



GENERAL NOTES

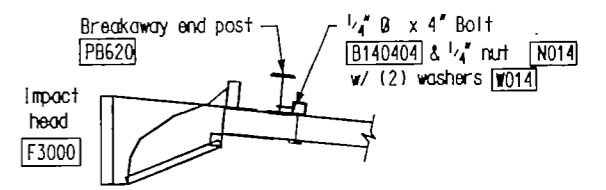
1. Wood posts are required with the Flared Energy Absorbing Terminal except post 1 and 2.
2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
3. When Flared Energy Absorbing Terminal is selected as the end treatment for installation, the end treatment shall be flared straight as shown in the plan layout.
4. The soil tube shall not protrude more than 4" above the ground (measured along a 5 foot cord). Site grading may be necessary to meet this requirement.
5. The soil tubes may be driven with approved driving head. They shall not be driven with wood post in the tube. If the soil tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent settlement.
6. When rock is encountered during excavation, a 12" diameter post hole 20" deep may be used if approved by the Engineer. Granular material will be placed in the bottom of the hole approximately 2 1/2" deep to provide drainage. The soil tubes shall be field cut to length, placed in the hole and back filled with adequately compacted material excavated from the hole.
7. The breakaway cable assembly shall be taut. A locking device (vice grips or channel lock pliers) should be used to prevent cable from twisting when tightening nuts.
8. The wood blockouts shall be "toe nailed" to the rectangular wood posts to prevent them from turning when wood shrinks. The nail shall be 20 penny and galvanized.
9. For curb installations, the soil tubes and posts shall be installed at the proper ground elevation behind the curb. The posts will require field drilling new holes to accommodate the rail to the post connecting bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed if directed by the Engineer.

10. The Flared Energy Absorbing Terminal shall be flared only when the approach guardrail is parallel with the roadway. When the approach guardrail is flared at 15:1 to 10:1, the Flared Energy Absorbing Terminal shall have only the flare rate of the guardrail. When the guardrail flare is between 10:1 and 7:1, the Flared Energy Absorbing Terminal shall be turned parallel to the roadway.



ITEM #	QTY	BILL OF MATERIALS
F3000	1	IMPACT HEAD
F1303	1	W-BEAM GUARDRAIL END SECTION, 12 GA
F1304	1	W-BEAM GUARDRAIL CENTER SECTION, 12 GA.
G1203	1	W-BEAM GUARDRAIL, 12 GA
S730	2	* FOUNDATION SOIL TUBE, 6" x 8" x 6'-0"
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
E780	1	GROUND STRUT
PB620	2	STEEL BREAKAWAY END POST
PB621	5	BREAKAWAY LINE POST
P616	5	TIMBER BLOCKOUT OR RECYCLED EQUIV
HARDWARE		
B580122	25	5/8" Dia. x 1 1/4" SPLICE BOLT, POST 2
B580754	2	5/8" Dia. x 7 1/2" HEX BOLT
B341004	2	3/4" Dia x 10" HEX BOLT
B581002	5	5/8" Dia. x 10" H G R BOLT (POSTS 3 THRU 7)
N050	32	5/8" Dia. H G R. NUT (SPLICE 24, SOIL TUBES 2, POSTS 2 THRU 7, 6)
N030	2	3/4" Dia HEX NUT
W050	6	H.G.R WASHER
W030	4	3/4" ID WASHER
N100	2	1" ANCHOR CABLE HEX NUT
W100	2	1" ANCHOR CABLE WASHER
B140404	2	1/4" x 4" HEX BOLT
N014	2	1/4" HEX NUT
W014	4	1/4" WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	1/2" A325 STRUCTURAL NUT
W050A	16	1 1/16" DD X 9/16" ID A325 STR. WASHER

Foundation Tube Options For Posts 1 & 2
 * 6'-0" Split Foundation Tube S730
 * 6'-0" Solid Foundation Tube E731

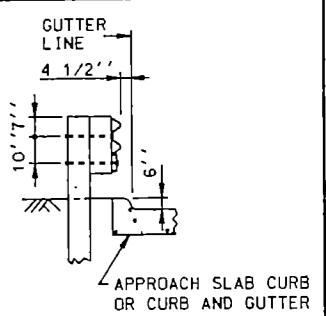
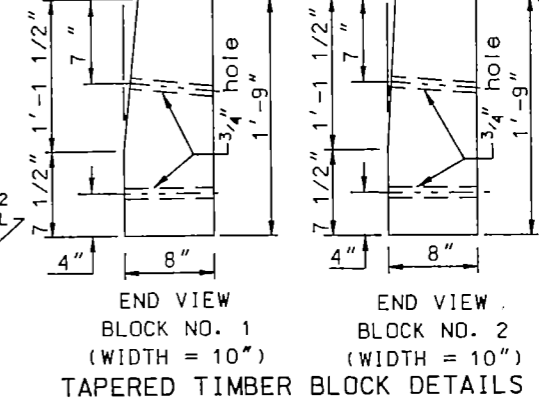
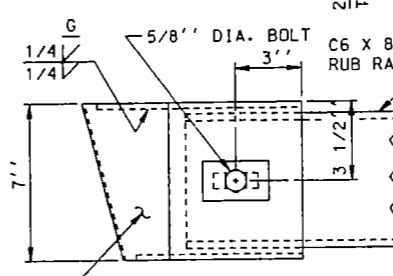
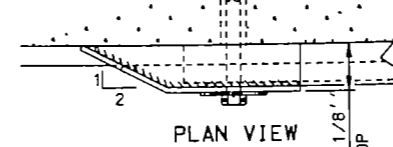
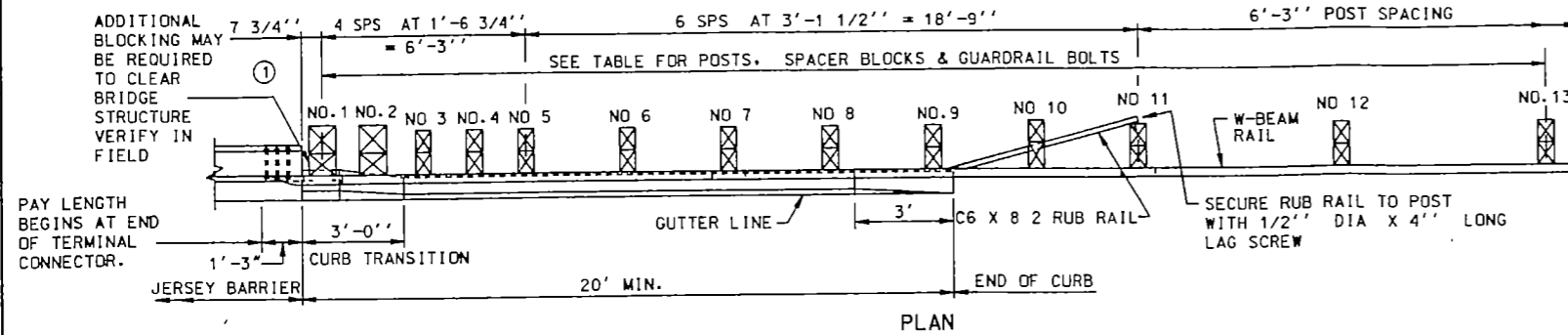


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
09-01-98	
REVISIONS	
DATE	CHANGE
12-21-00	Flared energy absorbing terminal note
06-29-01	Added steel breakaway post
04-16-02	Adjusted post spacing and eliminated one post
12-01-04	PE Stamp added

12/1/04
 S.P. 4514-01 (T.H. 317)
 SHEET NO. 14 OF 25 SHEETS

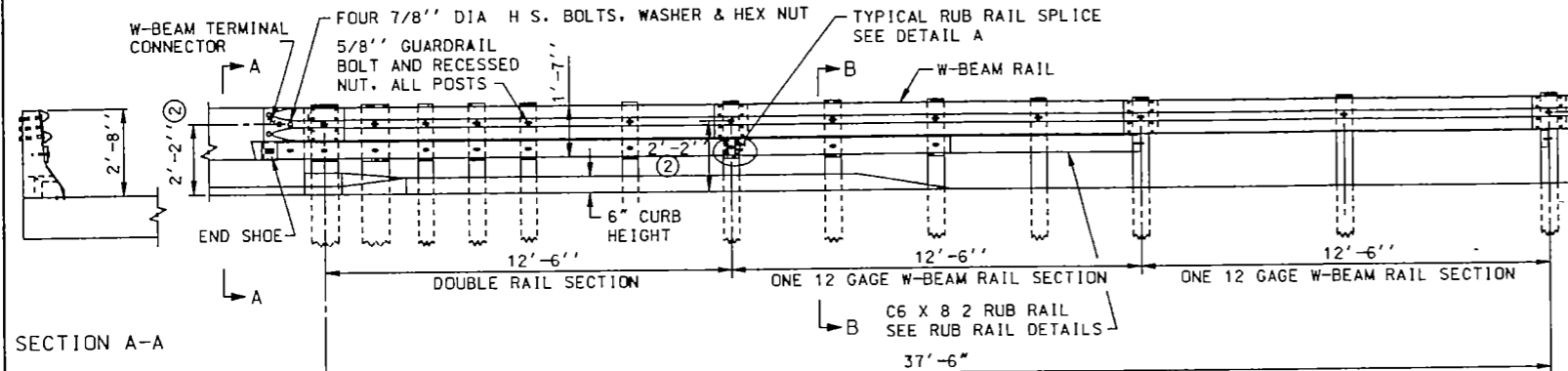
W-BEAM TRANSITION TO CONCRETE JERSEY BARRIER WITH APPROACH CURB

D-764-3

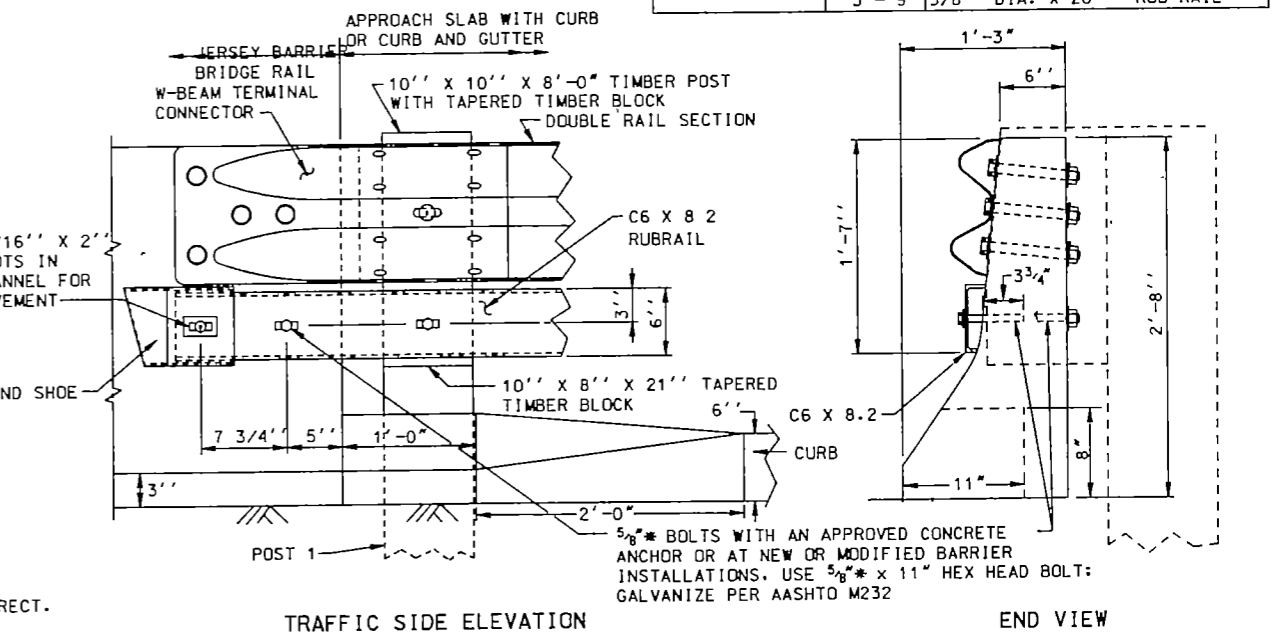


POST, TIMBER BLOCK & BOLT TABLE

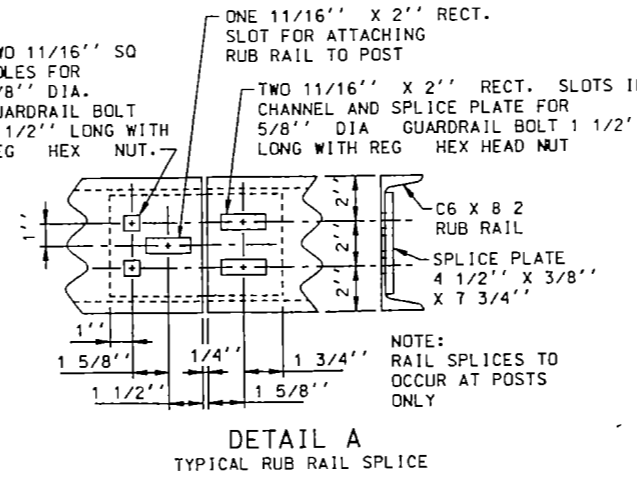
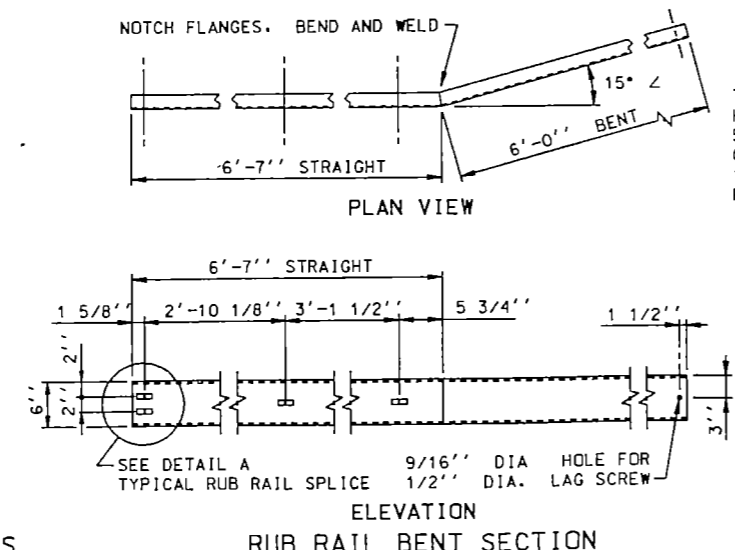
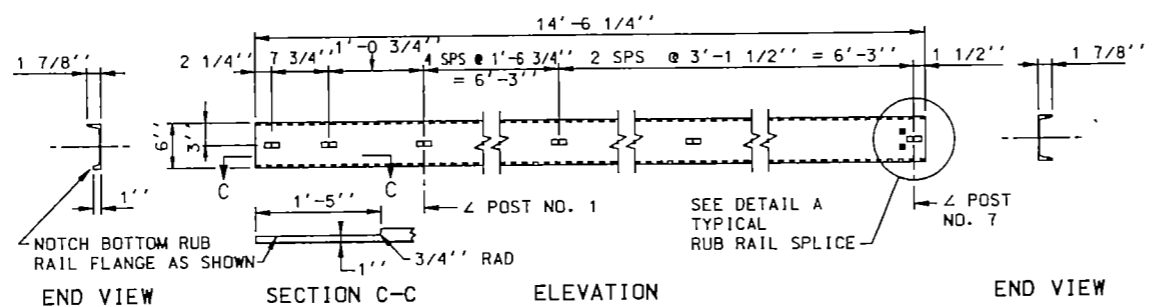
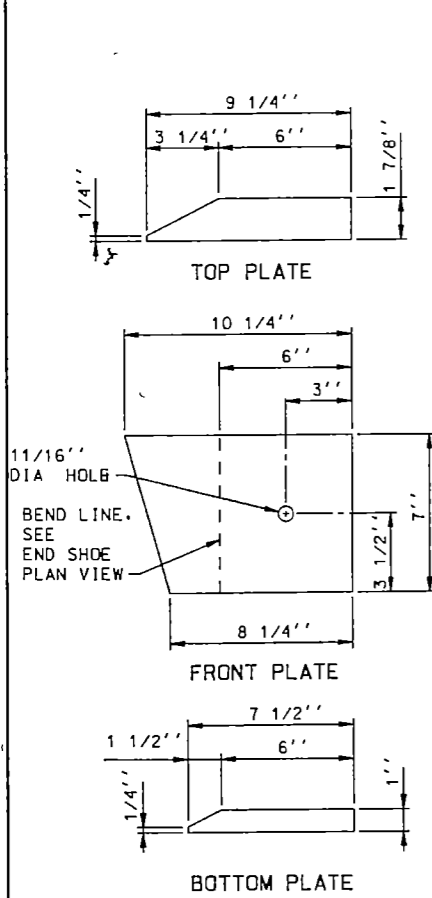
DESCRIPTION	POST NO.	SIZE
POST	1 & 2	10" X 10" X 8'-0" MIN. LONG
	3 - 5	6" X 8" X 7'-0" MIN. LONG
	6 - 13	6" X 8" X 6'-0" MIN. LONG
SPACER BLOCK	1 - 2	10" X 8" X 21" TAPERED BLOCK
	3 - 9	6" X 8" X 21"
	10	6" X 9 3/4" X 14"
	11 - 13	6" X 8" X 14"
GUARDRAIL BOLT & RECESSED NUT	1 - 2	5/8" DIA. X 20" - GUARDRAIL
	3 - 13	5/8" DIA. X 18" - GUARDRAIL
	1 - 2	5/8" DIA. X 22" - RUB RAIL
	3 - 9	5/8" DIA. X 20" - RUB RAIL



ELEVATION GENERAL ASSEMBLY DETAILS



- ① ADDITIONAL BLOCKING MAY BE REQUIRED AT POST NO. 1.
- ② HEIGHT IS 2'-2" FROM 0' TO 12'-6" FROM BRIDGE. HEIGHT TAPERS FROM 2'-2" TO 1'-9" BETWEEN 12'-6" TO 37'-6" FROM BRIDGE



NOTES:

C6 X 8 2 RUB RAIL AND STRUCTURAL STEEL SHALL BE AASHTO M270M GRADE 250. AND SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.

ALL SLOTTED HOLES ARE 11/16" X 2".

ALL SQUARE HOLES ARE 11/16"

GALVANIZE ALL HARDWARE IN ACCORDANCE WITH AASHTO M232.

ALL POSTS AND BLOCKS FOR THE W-BEAM GUARDRAIL SHALL BE TIMBER

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

11-19-02

REVISIONS

DATE	CHANGE
02-07-03	Rev rail attachment
12-01-04	PE Stamp added

REGISTERED ENGINEER

MARK S. GAYDOS

PE 4548

NORTH DAKOTA

12/1/04

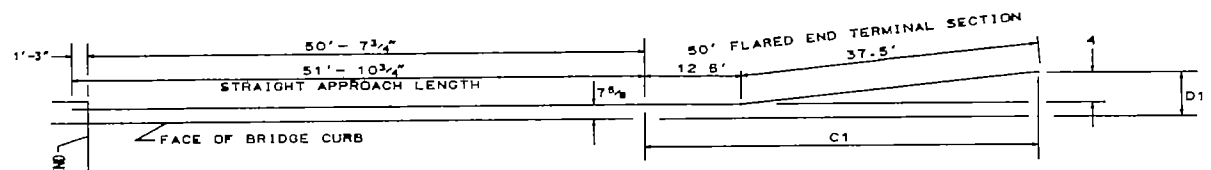
S.P. 4514-01 (T H 317)

SHEET NO. 16 OF 25 SHEETS

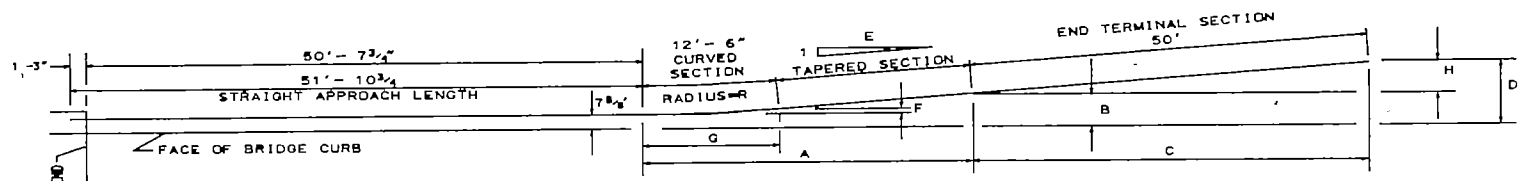
GUARDRAIL AT BRIDGE ENDS 65 MPH DESIGN SPEED

LENGTH OF NEED TABLE 65 MPH DESIGN SPEED																			
FLARED GUARDRAIL SECTION																			
DESIGN TRAFFIC VOLUME	CLEAR ROADWAY WIDTH OF BRIDGE	STRAIGHT APPR LENGTH	APPROACH SIDE					OPPOSITE SIDE					TOTAL W-BEAM LENGTH						
			A	B	C	D	C1	D1	E	A	B	C		D	C1	D1	E		
	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT		
UNDER 250 ADT	44	51.9	24.96	1.88	49.87	5.54				14	76.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	42	51.9	24.96	1.88	49.87	5.54				14	76.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	40	51.9	37.43	2.87	49.87	6.43				14	89.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	38	51.9	37.43	2.87	49.87	6.43				14	89.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	36	51.9	49.89	3.76	49.87	7.32				14	101.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	34	51.9	49.89	3.76	49.87	7.32				14	101.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	32	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	30	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	28	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	26	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
24	51.9	87.30	6.43	49.87	10.00				14	139.4	12.49	1.08	49.87	4.65			14	64.4	
250 - 800 ADT	44	51.9	37.43	2.87	49.87	6.43				14	89.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	42	51.9	49.89	3.76	49.87	7.32				14	101.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	40	51.9	49.89	3.76	49.87	7.32				14	101.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	38	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	36	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	34	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	32	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	30	51.9	87.30	6.43	49.87	10.00				14	139.4	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	28	51.9	87.30	6.43	49.87	10.00				14	139.4	12.49	1.08	49.87	4.65			14	64.4
	26	51.9	99.77	7.32	49.87	10.89				14	151.9	12.49	1.08	49.87	4.65			14	64.4
24	51.9	99.77	7.32	49.87	10.89				14	151.9	24.96	1.98	49.87	5.54			14	76.9	
800 - 2000 ADT	44	51.9	49.89	3.76	49.87	7.32				14	101.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	42	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	40	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	38	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	36	51.9	87.30	6.43	49.87	10.00				14	139.4	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	34	51.9	87.30	6.43	49.87	10.00				14	139.4	12.49	1.08	49.87	4.65			14	64.4
	32	51.9	99.77	7.32	49.87	10.89				14	151.9	12.49	1.08	49.87	4.65			14	64.4
	30	51.9	99.77	7.32	49.87	10.89				14	151.9	24.96	1.98	49.87	5.54			14	76.9
	28	51.9	112.24	8.21	49.87	11.78				14	164.4	24.96	1.98	49.87	5.54			14	76.9
	26	51.9	112.24	8.21	49.87	11.78				14	164.4	37.43	2.87	49.87	6.43			14	89.4
24	51.9	124.71	9.11	49.87	12.67				14	176.9	37.43	2.87	49.87	6.43			14	89.4	
2000 - 6000 ADT	44	51.9	62.36	4.65	49.87	8.21				14	114.4	0.80	0.64	50.00	0.64	49.79	4.64	51.9	
	42	51.9	74.83	5.54	49.87	9.11				14	126.9	0.00	0.64	50.00	0.64	49.79	4.64	51.9	
	40	51.9	87.30	6.43	49.87	10.00				14	139.4	12.49	1.08	49.87	4.65			14	64.4
	38	51.9	87.30	6.43	49.87	10.00				14	139.4	12.49	1.08	49.87	4.65			14	64.4
	36	51.9	99.77	7.32	49.87	10.89				14	151.9	24.96	1.98	49.87	5.54			14	76.9
	34	51.9	112.24	8.21	49.87	11.78				14	164.4	24.96	1.98	49.87	5.54			14	76.9
	32	51.9	112.24	8.21	49.87	11.78				14	164.4	37.43	2.87	49.87	6.43			14	89.4
	30	51.9	124.71	9.11	49.87	12.67				14	176.9	37.43	2.87	49.87	6.43			14	89.4
	28	51.9	124.71	9.11	49.87	12.67				14	176.9	49.89	3.76	49.87	7.32			14	101.9
	26	51.9	137.17	10.00	49.87	13.56				14	189.4	49.89	3.76	49.87	7.32			14	101.9
24	51.9	137.17	10.00	49.87	13.56				14	189.4	62.36	4.65	49.87	8.21			14	114.4	
OVER 6000 ADT	44	51.9	99.77	7.32	49.87	10.89				14	151.9	12.49	1.08	49.87	4.65			14	64.4
	42	51.9	99.77	7.32	49.87	10.89				14	151.9	24.96	1.98	49.87	5.54			14	76.9
	40	51.9	112.24	8.21	49.87	11.78				14	164.4	24.96	1.98	49.87	5.54			14	76.9
	38	51.9	112.24	8.21	49.87	11.78				14	164.4	37.43	2.87	49.87	6.43			14	89.4
	36	51.9	124.71	9.11	49.87	12.67				14	176.9	37.43	2.87	49.87	6.43			14	89.4
	34	51.9	124.71	9.11	49.87	12.67				14	176.9	49.89	3.76	49.87	7.32			14	101.9
	32	51.9	137.17	10.00	49.87	13.56				14	189.4	49.89	3.76	49.87	7.32			14	101.9
	30	51.9	137.17	10.00	49.87	13.56				14	189.4	62.36	4.65	49.87	8.21			14	114.4
	28	51.9	149.64	10.89	49.87	14.45				14	201.9	62.36	4.65	49.87	8.21			14	114.4
	26	51.9	149.64	10.89	49.87	14.45				14	201.9	74.83	5.54	49.87	9.11			14	126.9
24	51.9	162.11	11.78	49.87	15.34				14	214.4	74.83	5.54	49.87	9.11			14	126.9	

① Does not include end treatment section



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH FLARED END TREATMENT



W-BEAM GUARDRAIL DIMENSION LAYOUT
WITH TAPERED SECTION AND NONFLARED END TREATMENT

DESIGN SPEED	F	G	H	R
65	0.45	12.49	3.56	175.30

NOTES
On divided highways use distance from roadway centerline to bridge rail x 2 and use this as clear roadway width of the bridge to determine guardrail length.
The contractor shall use wood posts for w-beam guardrail.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION 09-01-98		
REVISIONS		
DATE	CHANGE	
12-21-00	Revised flared end treatment	
08-09-01	Revised note	
07-05-02	Values in column C	
12-18-02	Revised table	
01-29-03	Revised table	
12-01-04	PE Stamp added	

S.P. 4514-01 (T.H. 317)
SHEET NO. 17 OF 25 SHEETS

JOB# 13

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	SAP-6-017(004)140	1

DESIGN DATA

Traffic	Average Daily	Est. 30th Max. Hr.
Current (1989)	Pass. 220 Trucks 40 Total 25	
Forecast (2009)	Pass. 240 Trucks 45 Total 30	
Design Speed		
Traffic Classification "M"		
Minimum Sight Distance (Stopping)		
Full control of access		
No point of access other than by ramps at interchanges		

**NORTH DAKOTA
STATE HIGHWAY DEPARTMENT**

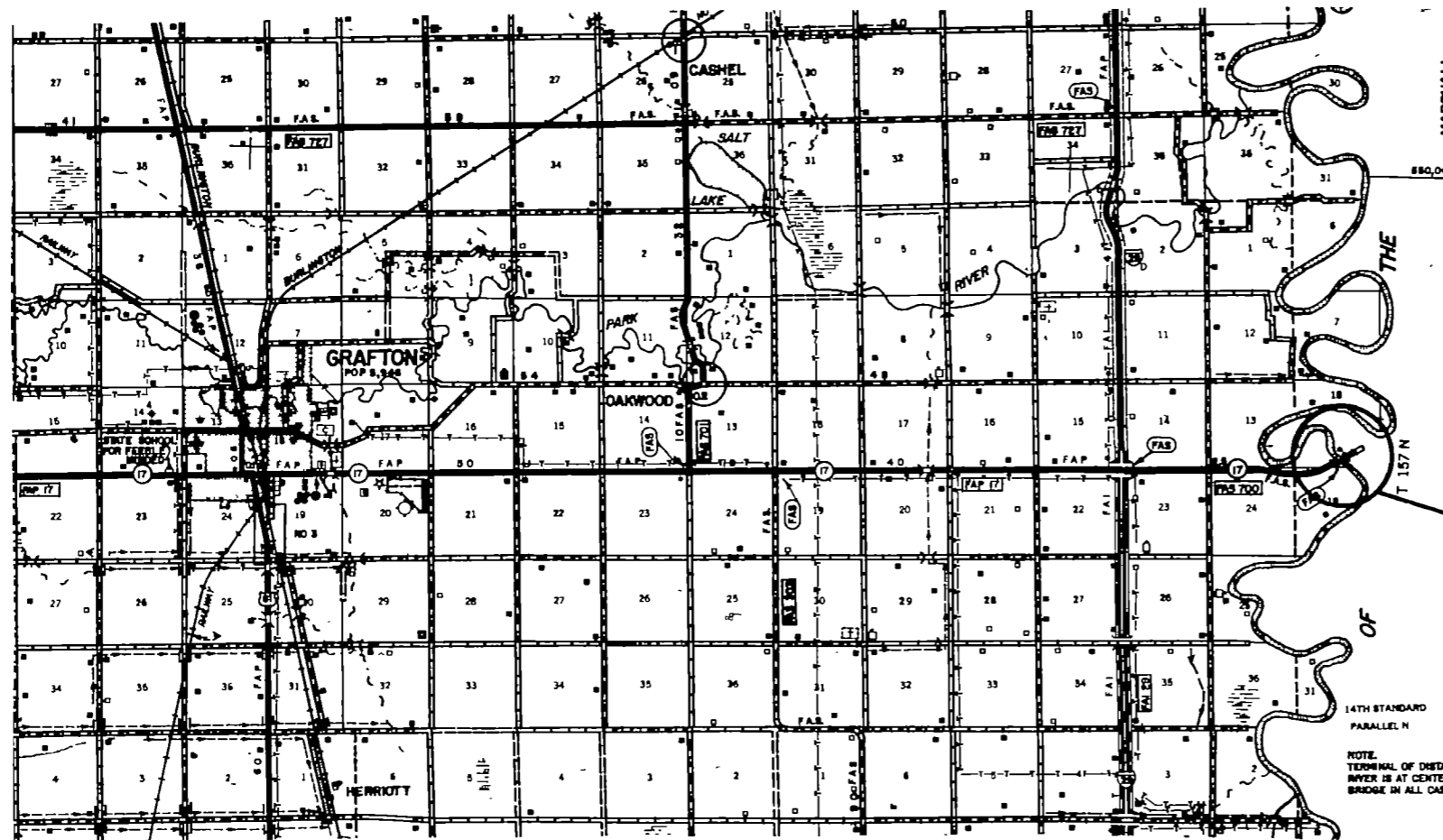
STATE AID PROJECT SAP-6-017(004)140
IN
WALSH COUNTY
SANDBLASTING AND PAINTING THE STRUCTURAL STEEL MEMEBERS OF
THE RED RIVER BRIDGE CROSSING
12 MILES EAST OF GRAFTON, ND

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.

LENGTH OF PROJECT

Project	Miles-Gross	Miles-Net
SAP-6-017(004)140	0.078	0.078

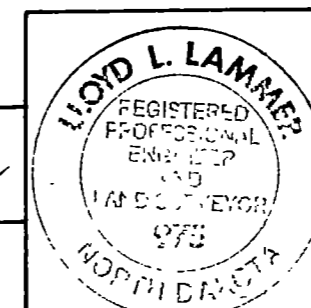


INDEX

Sheet No.	Description
1	Title Sheet
2	Layout, Quantities & List of Std. Drawings

APPROVED DATE 9-22-89

Asst.
CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT



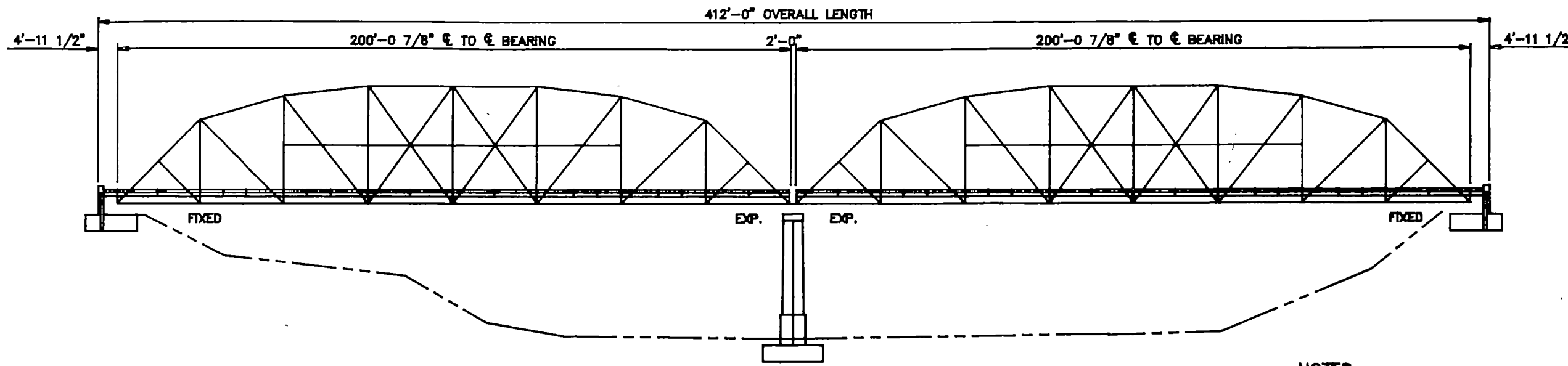
APPROVED _____
DIVISION ADMINISTRATOR DATE _____

SYMBOLS

STATE & NATIONAL LINES		BUILDINGS	
COUNTY LINE		TELEGRAPH LINES	
TOWNSHIP & RANGE LINES		TELEPHONE LINES	
SECTION LINE		POWER LINES	
QUARTER SECTION LINE		CULVERTS (In Place)	
SECTION CORNER		CULVERTS (Water)	
QUARTER SECTION CORNER		CONCRETE BOX CULVERTS (Water)	
OLD RIGHT OF WAY LINE		BRIDGES (Water)	
NEW RIGHT OF WAY LINE		CONCRETE CURB	
GRADE LINE		CONCRETE CURB AND GUTTER	
CENTERLINE OF CONSTRUCTION		CONCRETE WALK	
RAILROAD RIGHT OF WAY LINE		CATCH BASIN (Existing)	
CITY OR VILLAGE CORPORATE LIMITS		CATCH BASIN (New)	
PROPERTY LINE		MANHOLE (Existing)	
EASEMENT LINE		MANHOLE (New)	
FENCES		CURB INLET (Existing)	
SNOW FENCE		CURB INLET (New)	
DRAINAGE		GROUND MOUNTED SIGNS	
WATERS EDGE		OVERHEAD SIGNS	
MARSH OR SWAMP		HYDRANT	
ESPAL		LIGHT STANDARDS	
DRAINAGE DITCH		TRAFFIC SIGNALS (Plan & Profile Sheets)	
APPROACH		HIGH MAST LIGHTING ASSEMBLY	
TRAVELED WAY		GROUND ELEVATION	
RAILROADS		GRADE	
GUARD RAIL		CENTERLINE	
BUDE POSTS		SECTION LINE	
DELIMITORS		DEFLECTION ANGLE (Delta)	
HEDGES AND TREES		500 OR JUTE MESH	
INTERCHANGE		POLES TO BE MOVED	
HIGHWAY GRADE SEPARATION-NO CONNECTION		POLES TO BE LOWERED	
OTHER BRIDGE		CONCRETE FOUNDATION	
SERVICE ROAD		CONDUIT	
TERMINATED CROSS-ROAD		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 APM MOUNTED	
		TRAFFIC SIGNAL - POST MOUNTED	
		SIGNAL HEAD	
		PEDESTRIAN PUSHBUTTON POST	
		TRAFFIC SIGNAL CONTROLLER	
		FEED POINT - PAD MOUNTED	

ABBREVIATIONS

Aggr	Aggregate	M L	Main Line
Ahd	Ahead	N R	North Roadway
AM	Attempt	Off. Loc	Office Location
Approx	Approximate or Approximately	O to O	Out to Out
Appr	Approach	P B P	Plan and Profile
Asph Cem or A C	Asphalt Cement	P C	Point of Curvature
Asph Conc	Asphaltic Concrete	P C C	Point of Compound Curve
Bit	Bituminous or Bitumen	P C C Pmt	Portland Cement Concrete Pavement
Bk	Back	P D	Private Drive
B M	Bench Mark	Pen	Penetration
Bldg	Building	Perf	Perforated
Br	Bridge	P i	Point of Intersection
C A E S	Corrugated Aluminum End Section	P O C	Point on Curve
C A P	Corrugated Aluminum Pipe	P O T	Point on Tangent
C B	Chick Basin	P P	Power Pole
C B G	Curb and Gutter	P R	Point of Reverse Curvature
Ch Bk	Channel Block	P r f	Preformed
Ch Ch	Channel Change	P S D	Passing Sight Distance
C I	Curb Inlet	P T	Point of Tangency
C I P	Cast Iron Pipe	P V C	Polyvinyl Chloride Sewer Pipe
Cl	Class	Quant	Quantity or Quantities
C S E S	Corrugated Steel End Section	R	Radius
C S P	Corrugated Steel Pipe	R or Rpt	Range
CMS	Cathodic Medium Setting	RC	Rapid Curing
Comp	Compression	R C E S	Reinforced Concrete End Section
Concl	Construction	R C P	Reinforced Concrete Pipe
Conc	Concrete	R C P S	Reinforced Concrete Pipe Sewer
Cont Rein Conc	Continuously Reinforced Concrete	Rd	Road
Pmt	Pavement	Rdbd	Roadbed
Contn	Continuation	Rdwy	Roadway
Crn	Crown	Rfl	ReflectORIZED
CRS	Cathodic Rapid Setting	R R	Railroad
Crse	Course	Rt	Right
C S	Curve to Spiral	R/W	Right of Way
C to C	Center to Center	Salv	Salvage
C Y	Cubic Yard	San	Sanitary
D	Degree of Curvature	S C	Spiral to Curve
D-Load	Dead Load	SC	Slow Curing
D B	Ditch Block	Sc	Spiral Deflection Angle
Def	Deformed	S D	Sight Distance
Del	Deliver	S E	Superelevation
D G	Ditch Grade	Sec	Section
El or Elev	Elevation	Sec Line Appr	Section Line Approach
Ellipt	Elliptical	Sep	Separation
Emb	Embankment	Serv	Service
Emul	Emulsified	Sgr Prep	Subgrade Preparation
Engr	Engineer	SHCR	Shoulder
Eq	Equation	SP	Special Provision
E R	East Roadway	S P P	Structural Plate Pipe
E S	End Section	S P P A	Structural Plate Pipe Arch
Eas	Easement	S R	South Roadway
Exc	Excavation	SS	Slow Setting or Supplement Specification
Exp	Expansion	S S D	Stepping Sight Distance
F D	Field Drive	S T	Spiral to Tangent
Found	Foundation	Sta	Station
F P	Fence Post	Std	Standard
Furn	Furnish	Std Specs	Standard Specifications
Go	Gage or Gauge	Struct	Structure
Gr	Gravel	Surf	Surface or Surfacing
Grd	Graded	Surv	Survey
G V	Gate Valve	S W	Sidewalk
Hel	Helical	S Y	Square Yard
Hyd	Hydrant	T	Tangent Length (circular curve)
Ident	Identification	T or Tap	Township
Intchg	Interchange	Tel	Telephone
I M	Iron Monument	Temp	Temporary
Insl	Insulation	T P	Telephone Pole
Inter	Intersection	Tr	Traffic
Invt	Invert	Trans	Transverse or Transition
Jt	Joint	Trtd	Treated
L	Length of Curve	Ts	Tangent Length (curve with spirals)
Lc	Length of Spiral	T S	Tangent to Spiral
Lev	Leveling	U S C & G S	United States Coast and Geodetic Survey
L F	Linear or Linear Foot	V C	Vertical Curve
Liq	Liquid	V C P	Vitrified Clay Pipe
Long	Longitudinal	W M	Water Main
L P	Light Pole	W M V	Water Main Valve
Lt	Left	W R	West Roadway
M	One Thousand	Wring	Wearing
Matl	Material	W S V	Water Service Valve
Max	Maximum	X-Sec	Cross Section
M C	Medium Curing	Xc	Spiral Coordinate
M H	Manhole	Yc	Spiral Coordinate
Min	Minimum		



ELEVATION

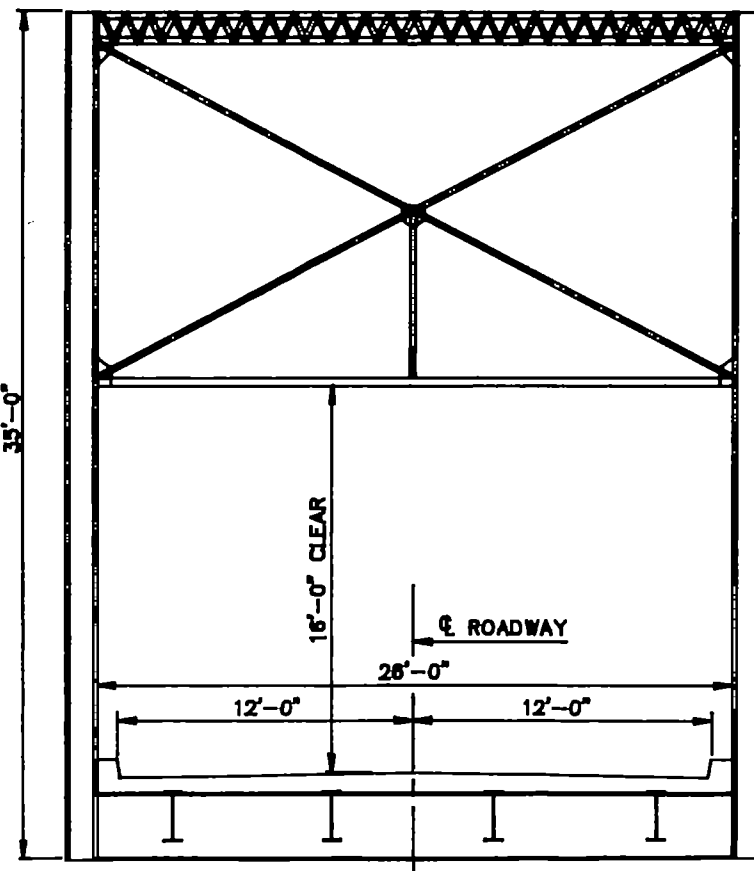
NOTES:

PAINTING—IMPROVEMENT IS "SPASH ZONE" COMMERCIAL BLASTING AND PAINT ALL MEMBERS APPROXIMATELY 6' ABOVE THE DECK AND ALL STRUCTURAL MEMBERS UNDER THE DECK.

THE STRUCTURAL STEEL SHALL BE CLEANED AND PAINTED ACCORDING TO THE SUPPLEMENTAL SPECIFICATIONS. THE FINISH COAT SHALL BE ALUMINUM. THE ALUMINUM FILLED EPOXY MASTIC PRIMER SHALL BE TINTED TO DIFFERENTIATE THE COLOR FROM THE FINISH COAT.

ALL MATERIALS AND PAINTING OF THE STEEL SHALL BE INCLUDING IN THE LUMP SUM PRICE BID FOR "SANDBLASTING AND PAINTING".

TRAFFIC CONTROL: TRAFFIC SHALL BE CONTROLLED AS SHOWN ON STANDARD D-754-12, TYPE S. THE ROADWAY SHALL ONLY BE CLOSED DURING DAYLIGHT HOURS. THE EQUIPMENT AND CONTROL DEVICES SHALL BE REMOVED FROM THE ROADWAY 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 THAT MOTORISTS WILL NOT MISTAKE THEM AS REQUIRING THE MOTORIST TO MAKE A MANEUVER.



INTERMEDIATE SECTION

SUMMARY OF QUANTITIES

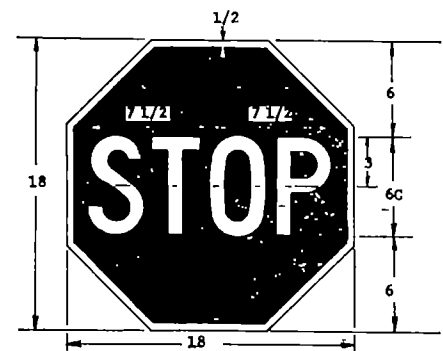
SPEC CODE	ITEM DESCRIPTION	UNIT	QUANTITY
103	0100 CONTRACT BOND	L SUM	1.0
830	0100 SANDBLASTING AND PAINTING	L SUM	1.0
702	0100 MOBILIZATION	L SUM	1.0
704	0100 FLAGGING	M H	60.0
704	1100 TRAFFIC CONTROL	L SUM	1.0

STANDARDS

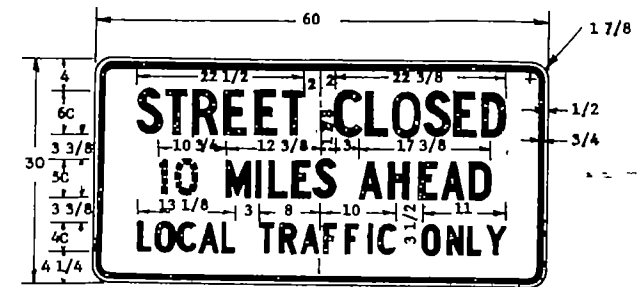
D-754-1, 2, 3, 4, 5, 5A, AND 12	TRAFFIC CONTROL
---------------------------------	-----------------

RED RIVER BRIDGE
EAST OF GRAFTON
PAINTING

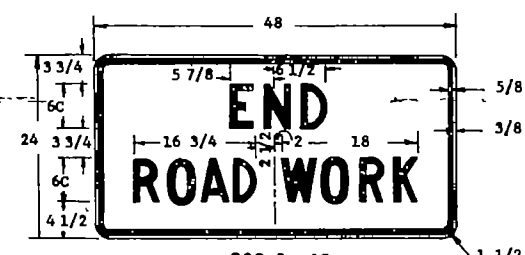
CONSTRUCTION SIGN DETAILS



STOP-SLOW PADDLE
RED & WHITE
FLAGPERSON PADDLE



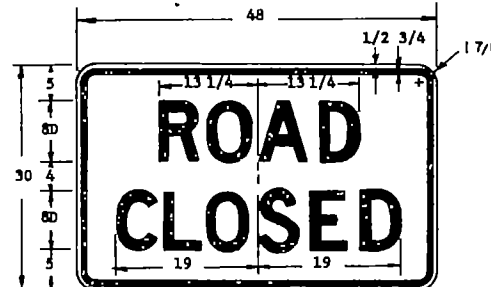
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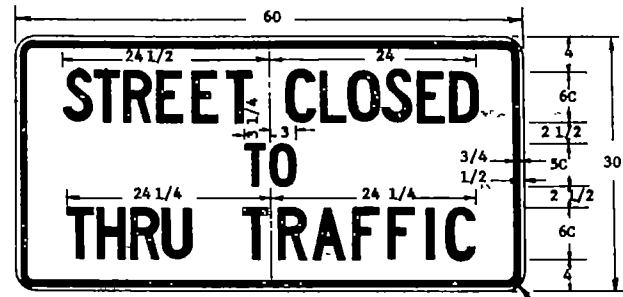
820-2a-48
BLACK & ORANGE



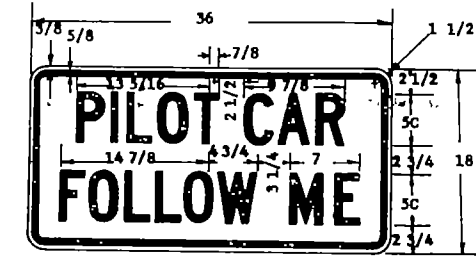
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R11-2-48
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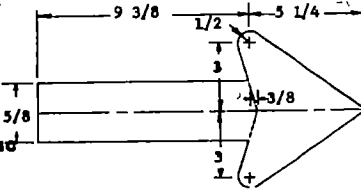


R11-4a-80
BLACK & WHITE



820-4-80
BLACK & ORANGE

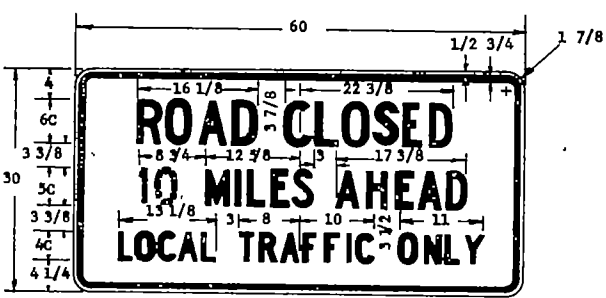
PILOT CAR SIGN SHALL BE MOUNTED ON REAR OF A VEHICLE USED FOR GUIDING CONTROLLED ONE-WAY TRAFFIC THROUGH A CONSTRUCTION AREA.



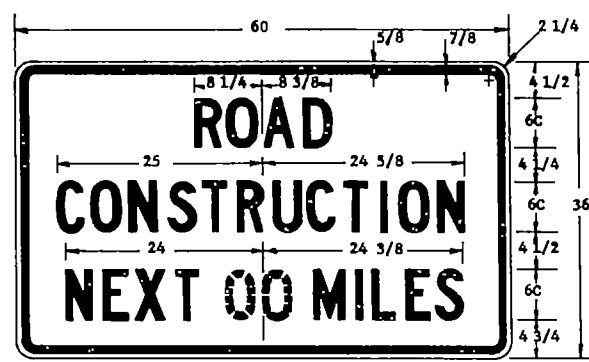
ARROW DETAIL FOR SIGN NO'S.
820-50-72 & 820-52-72

MESSAGES AND BORDERS: THE MESSAGES AND BORDERS SHALL BE SCREENED ON REFLECTIVE SHEETING OR INSTALLED USING PIGMENTED PLASTIC FILM CONFORMING TO THE REQUIREMENT OF SEC. 804-8.8 OF THE STD. SPECIFICATIONS. THE PIGMENTED PLASTIC FILM SHALL BE INSTALLED IN ACCORDANCE WITH THE REFLECTIVE SHEETING MANUFACTURERS RECOMMENDATIONS. THE BORDERS SHALL HAVE THE RADII AND WIDTH SHOWN ON THE PLANS. THE LETTERS SHALL BE FABRICATED IN ACCORDANCE WITH THE STANDARD LETTER GUIDE OF THE HEIGHT AND SERIES SHOWN ON THE PLANS. THE DETAILS OF THESE LETTERS MAY BE OBTAINED FROM THE STATE HIGHWAY DEPARTMENT OR THE SHEETING MANUFACTURER.

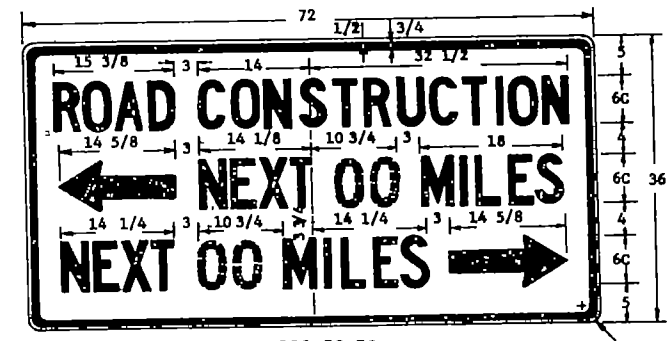
NOTE: ALL SIGNS SHALL HAVE REFLECTORIZED MESSAGE BORDER AND BACKGROUND, UNLESS SHOWN OTHERWISE ON THE PLANS. IN NO CASE IS THE COLOR BLACK REFLECTORIZED.



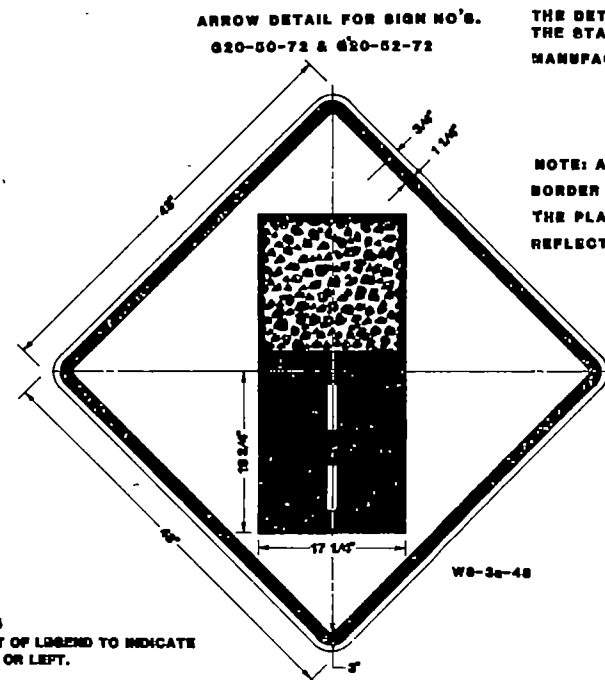
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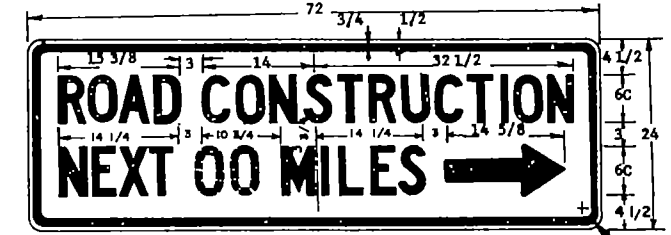
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BLACK & ORANGE



820-50-72
BLACK & ORANGE

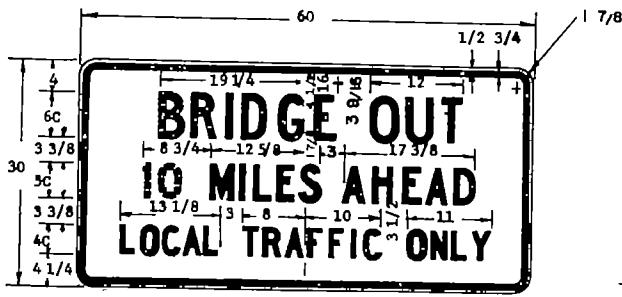


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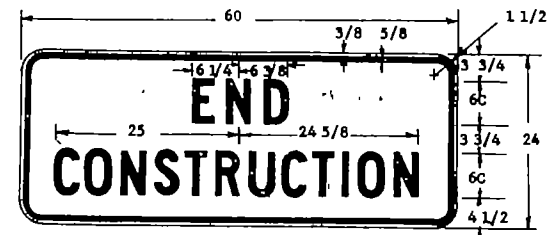


820-52-72
BLACK & ORANGE

ARROW MAY BE RIGHT OR LEFT OF LEGEND TO INDICATE CONSTRUCTION TO THE RIGHT OR LEFT.



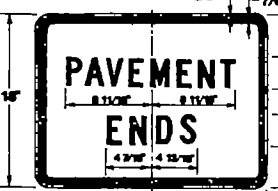
R11-2b-80
BLACK & WHITE



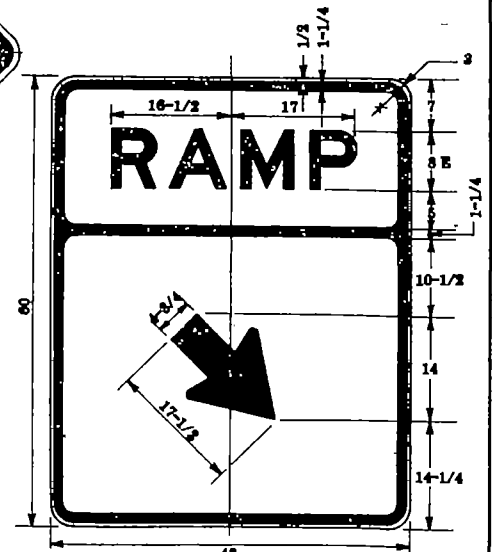
820-2-80
BLACK & ORANGE



820-84-48
BLACK & ORANGE



W8-3a-24
BLACK & ORANGE



W13-4-48
BLACK & ORANGE

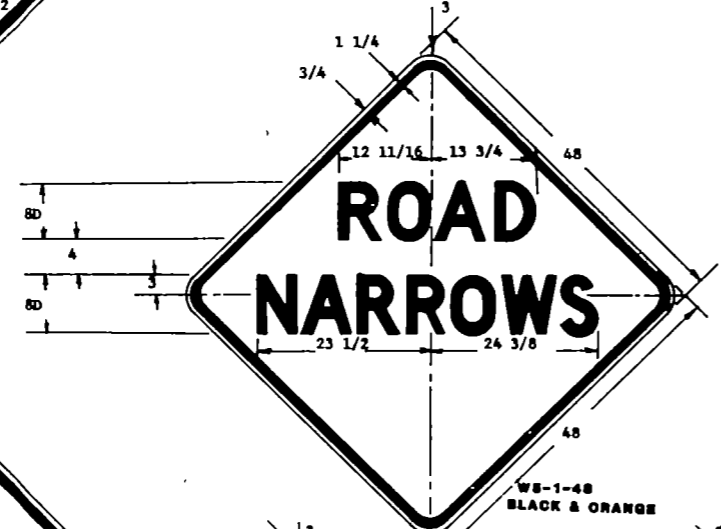
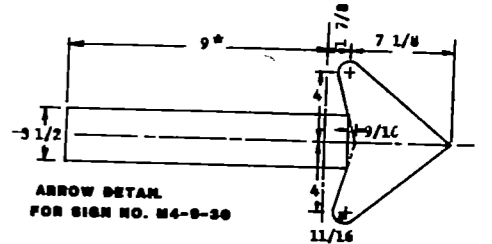
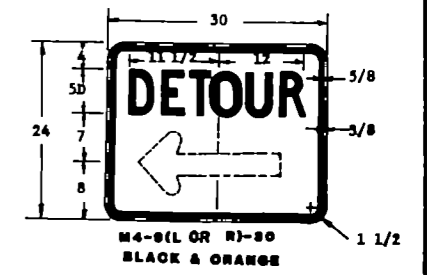
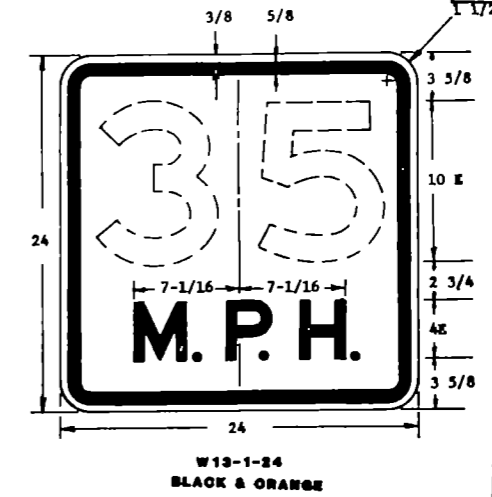
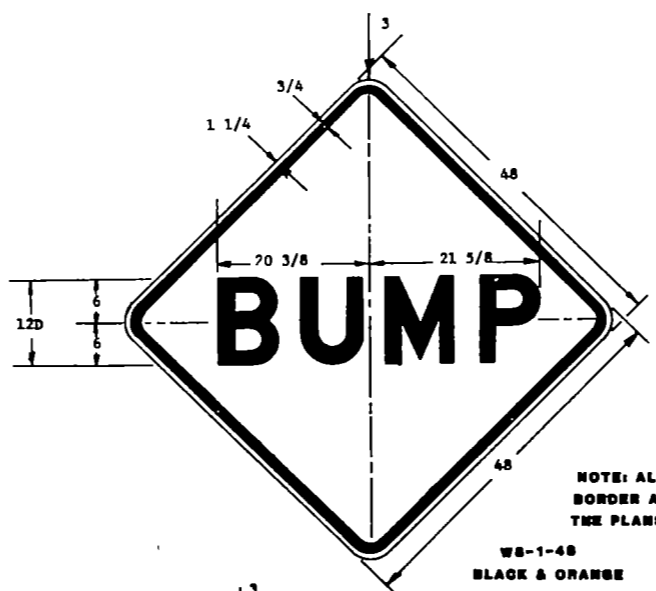
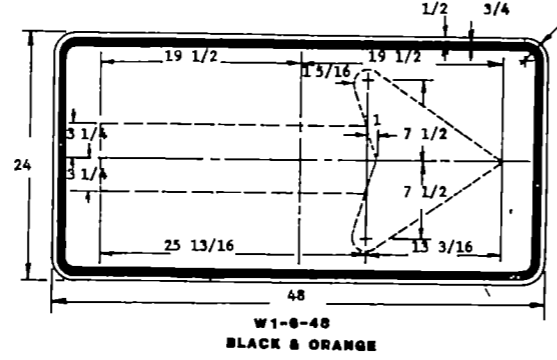
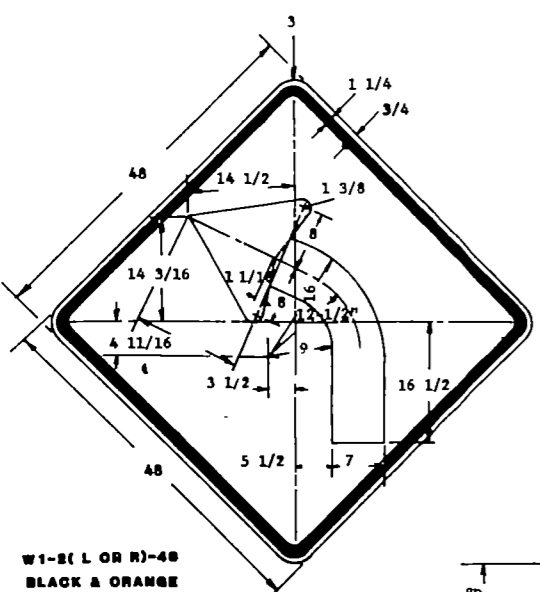
10-1-86	
REVISIONS	
DATE	CHANGE

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED *David K. Loefer*
DESIGN ENGINEER

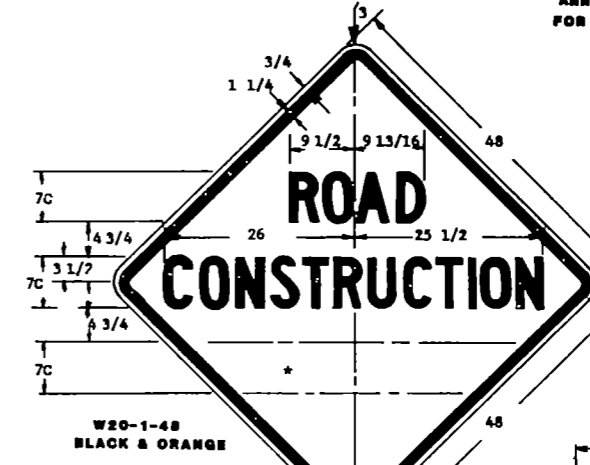
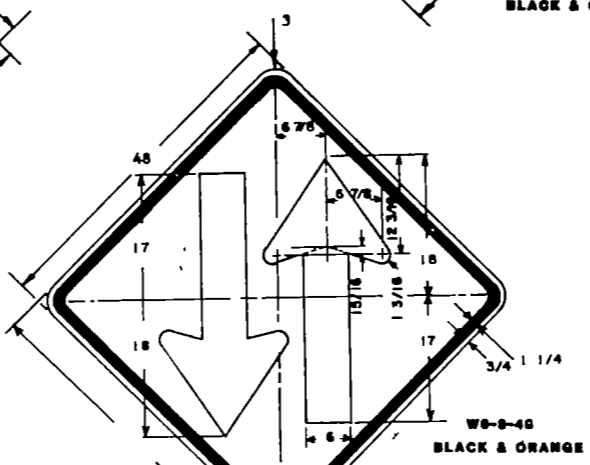
CONSTRUCTION SIGN DETAILS

FHWA REGION	STATE	FED AID PROJECT NO.	SHEET NO.
1	N.D.		

D-754-2

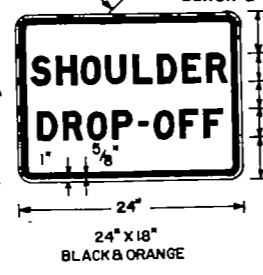
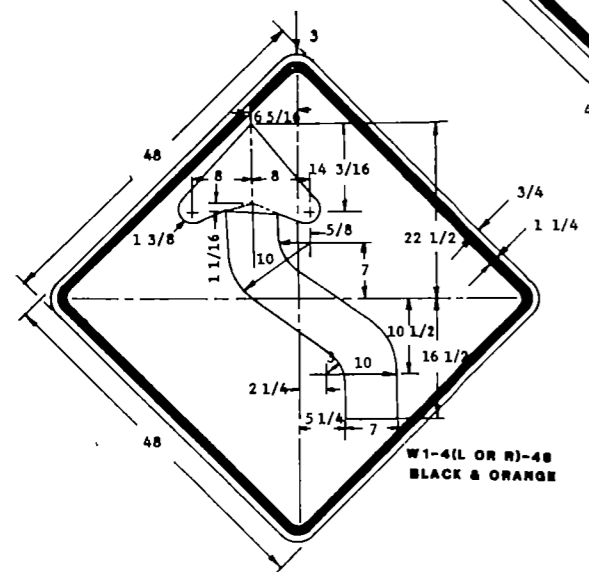
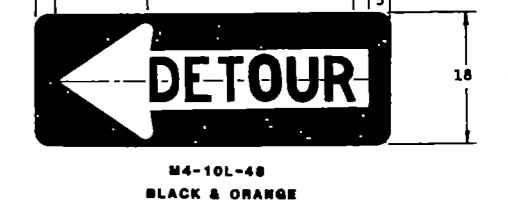
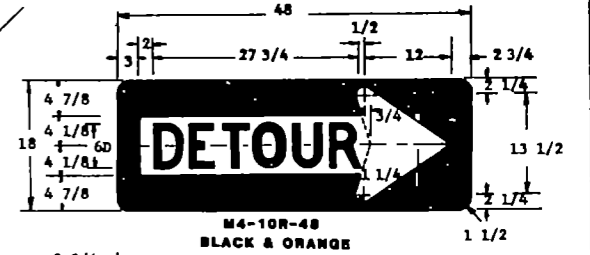
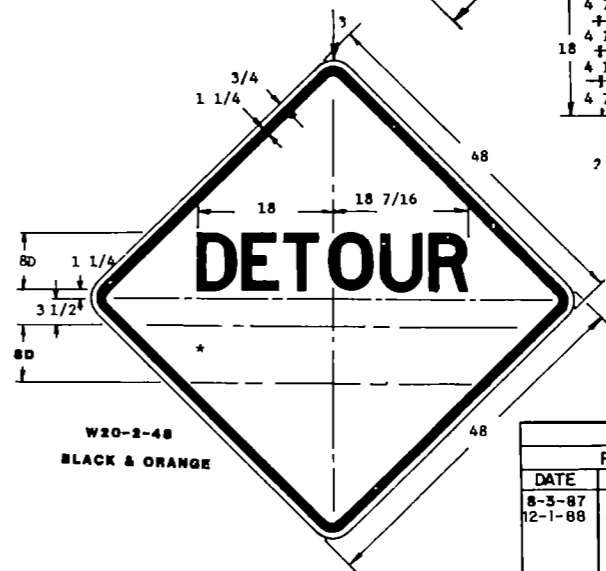
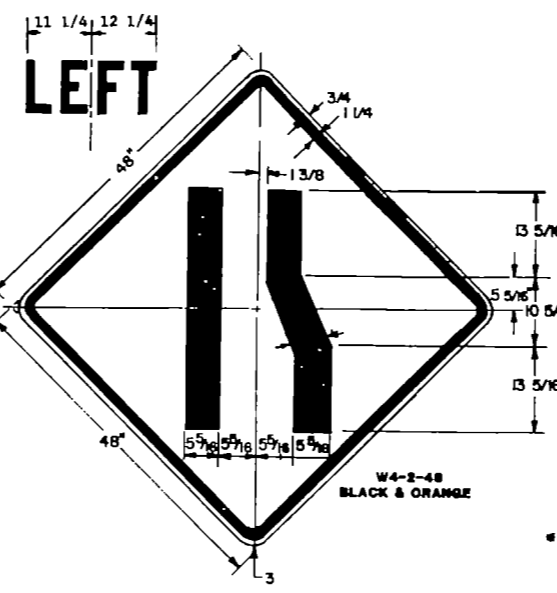
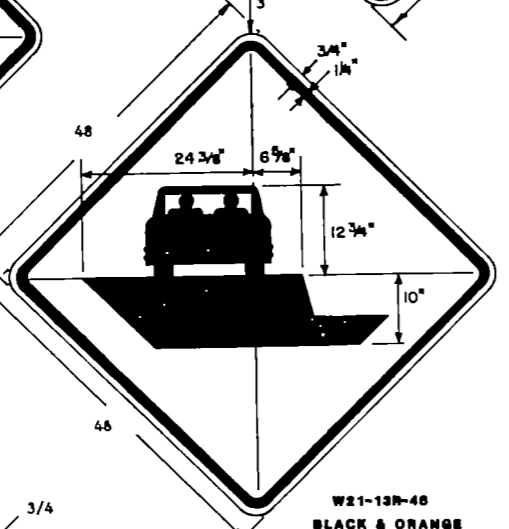
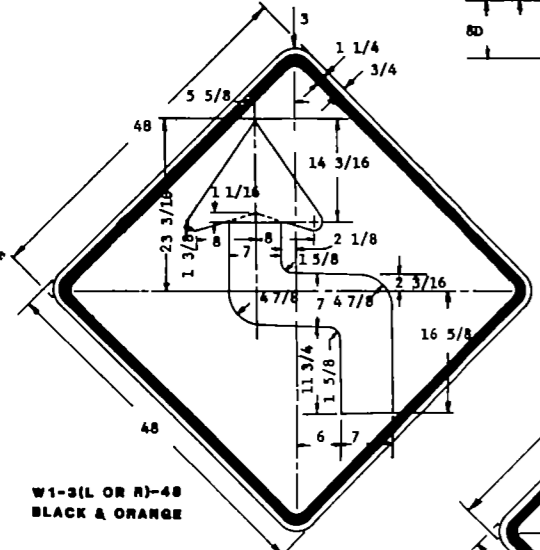


NOTE: ALL SIGNS SHALL HAVE REFLECTORIZED MESSAGE BORDER AND BACKGROUND, UNLESS SHOWN OTHERWISE ON THE PLANS. IN NO CASE IS THE COLOR BLACK REFLECTORIZED.



MESSAGE AND BORDER: THE MESSAGE AND BORDERS SHALL BE SCREENED ON REFLECTIVE SHEETING OR INSTALLED USING PREFERRED PLASTIC FILM CONFORMING TO THE REQUIREMENT OF SEC. 604.05 OF THE STD. SPECIFICATIONS. THE PREFERRED PLASTIC FILM SHALL BE INSTALLED IN ACCORDANCE WITH THE REFLECTIVE SHEETING MANUFACTURER'S RECOMMENDATIONS. THE BORDERS SHALL HAVE THE RADIUS AND WIDTH SHOWN ON THE PLANS. THE LETTERS SHALL BE FABRICATED IN ACCORDANCE WITH THE STANDARD LETTER GUIDE OF THE HEIGHT AND SERIES SHOWN ON THE PLANS. THE DETAILS OF THESE LETTERS MAY BE OBTAINED FROM THE STATE HIGHWAY DEPARTMENT OR THE SHEETING MANUFACTURER.

*DIMENSION SHALL BE 5" WHEN ARROW IS PLACED VERTICALLY.

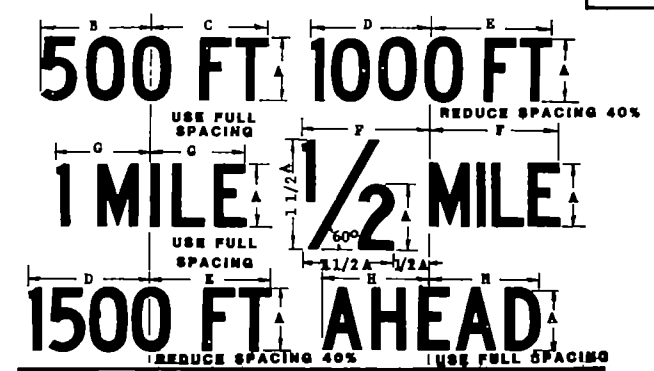
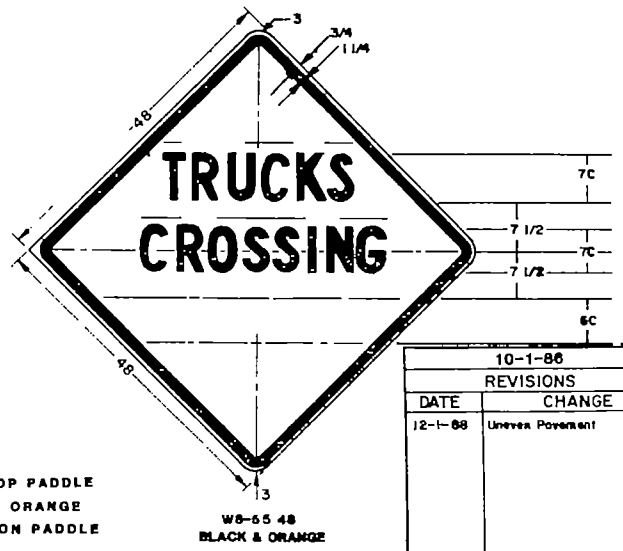
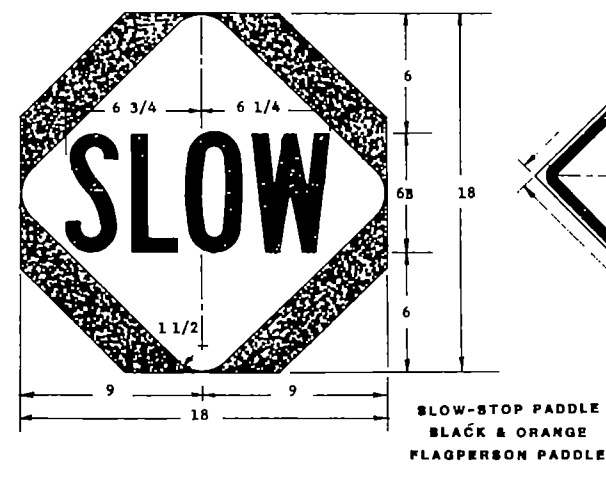
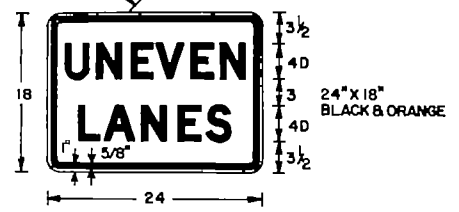
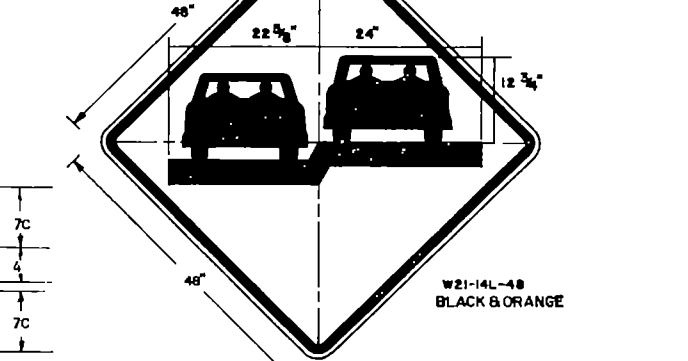
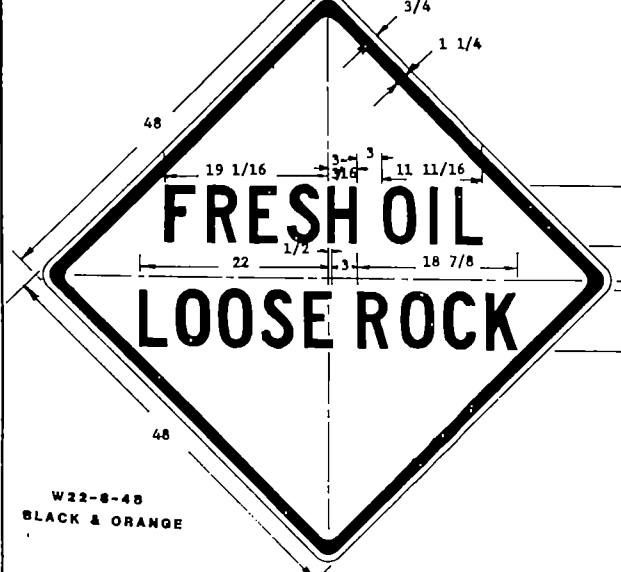
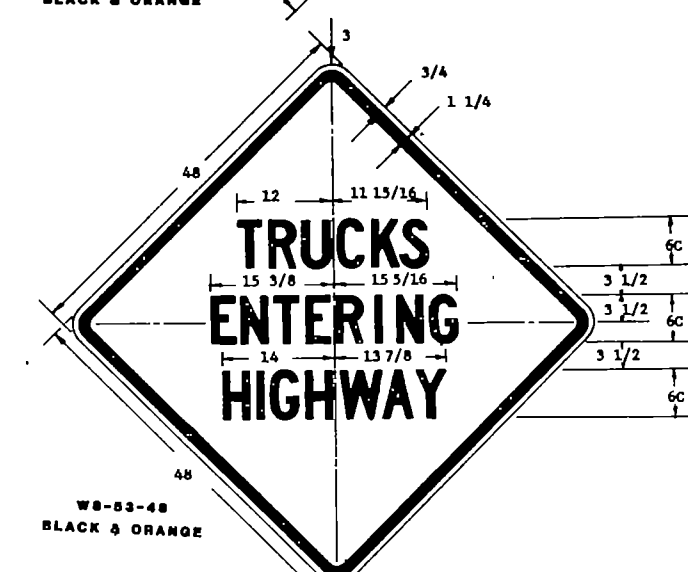
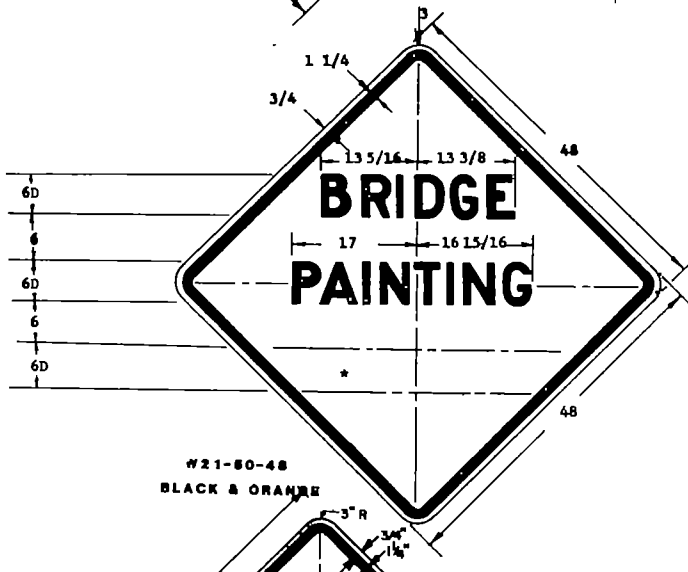
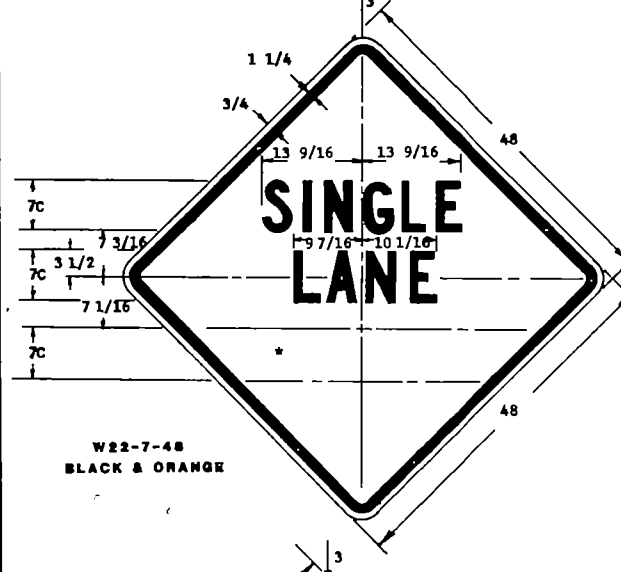
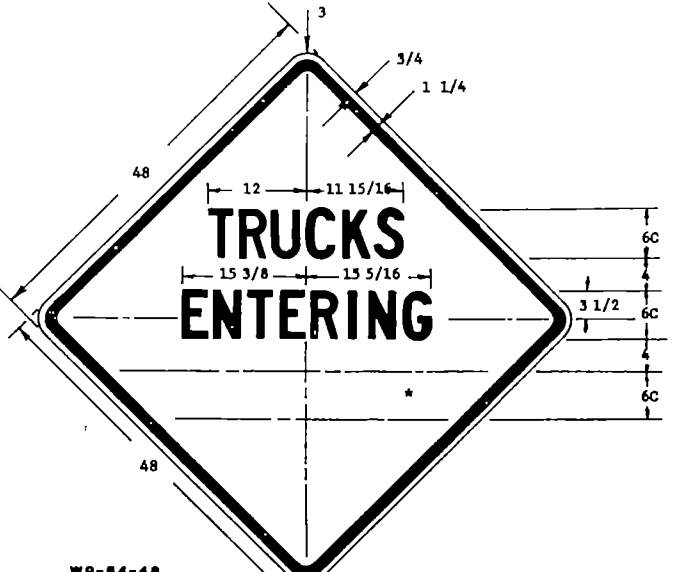
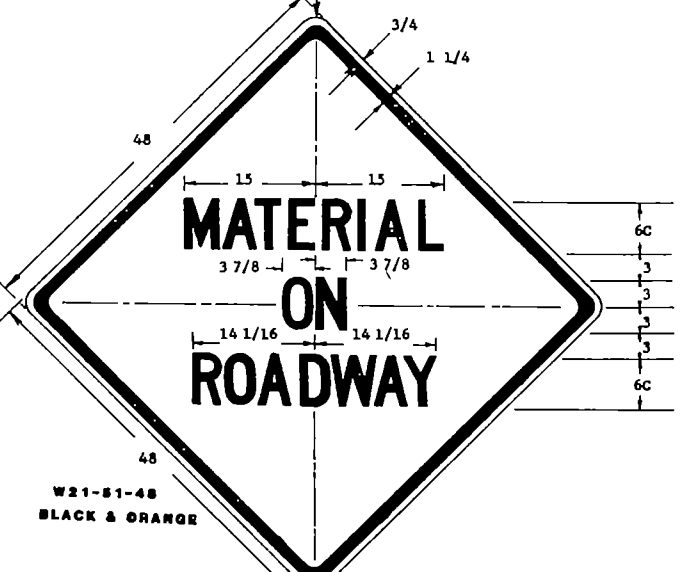
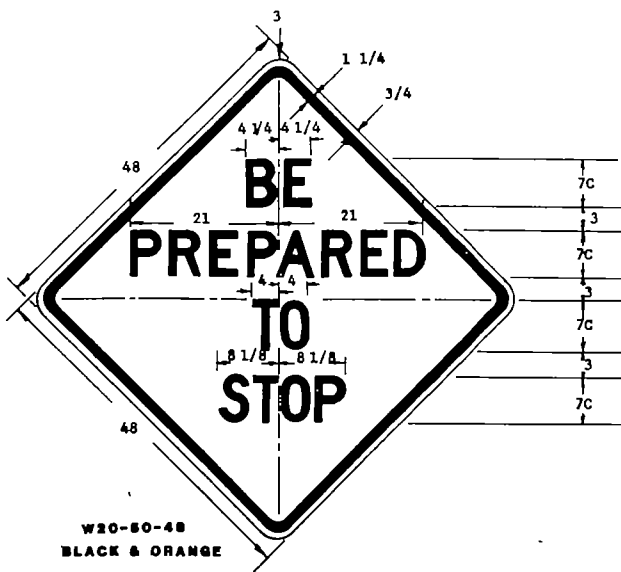


DATE	REVISIONS
8-3-87	Detour No
12-1-88	Shoulder Drop Off

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED *David K. Lee*
DESIGN ENGINEER

*SEE TABLE ON STANDARD D-754-4 FOR MESSAGE AND DIMENSIONS.

CONSTRUCTION SIGN DETAILS



DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
4C	6-7/8	7	7-1/2	8	8-5/16	6-1/16	7
5C	8-3/4	8-13/16	9-3/8	10	10-7/16	7-5/8	8-3/4
6C	10-3/8	10-1/2	11-1/4	12	12-1/2	9-1/8	10-1/2
7C	12	12-3/16	13-1/8	14	14-9/16	10-5/8	12-1/4
8C	13-3/4	14	15	16	16-5/8	12-1/8	14
4D	8-1/8	8-5/8	8-1/2	9	9	7-3/16	8-11/16
5D	10-3/16	10-13/16	11-5/8	11-1/4	11-1/4	9-1/8	10-7/8
6D	12-3/16	12-13/16	12-3/4	13-1/2	13-1/2	11-13/16	13-1/8
7D	14-1/4	14-1/8	14-7/8	15-3/4	15-3/4	13-1/16	15-1/2
8D	16-1/4	17-1/4	17	18	18	14-8/8	17-7/16

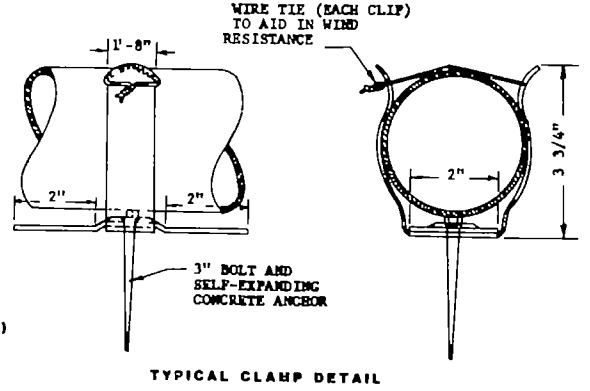
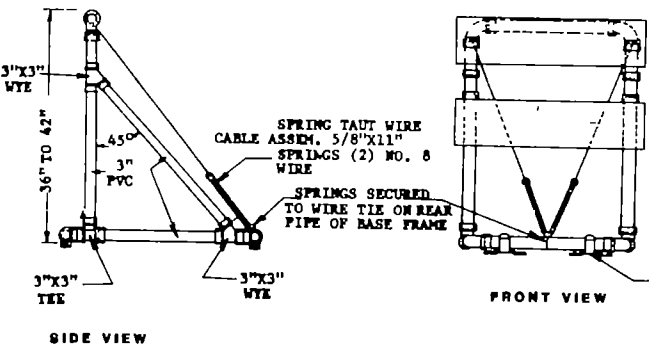
MESSAGES AND BORDERS: THE MESSAGES AND BORDERS SHALL BE SCREENED OR REFLECTIVE SHEETING OR INSTALLED USING PIGMENTED PLASTIC FILM CONFORMING TO THE REQUIREMENT OF SEC. 894.03 OF THE STD SPECIFICATIONS THE PIGMENTED PLASTIC FILM SHALL BE INSTALLED IN ACCORDANCE WITH THE REFLECTIVE SHEETING MANUFACTURERS RECOMMENDATION. THE BORDERS SHALL HAVE THE RADII AND WIDTH SHOWN ON THE PLANS. THE LETTERS SHALL BE FABRICATED IN ACCORDANCE WITH THE STANDARD LETTER GUIDE OF THE HEIGHT AND SERIES SHOWN ON THE PLANS. THE DETAILS OF THESE LETTERS MAY BE OBTAINED FROM THE STATE HIGHWAY DEPARTMENT OR THE SHEETING MANUFACTURER.

NOTE: ALL SIGNS SHALL HAVE REFLECTORIZED MESSAGE BORDER AND BACKGROUND, UNLESS SHOWN OTHERWISE ON THE PLANS. IN NO CASE IS THE COLOR BLACK REFLECTORIZED.

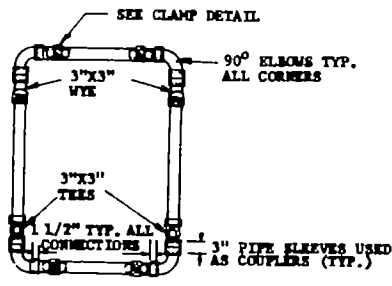
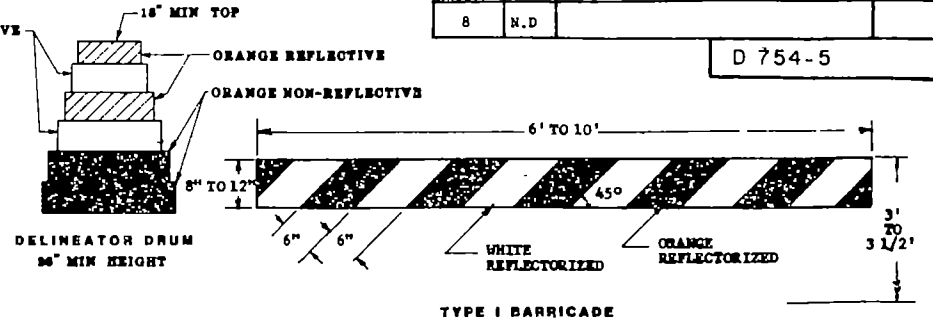
STANDARD SIGNS THAT ARE SHOWN IN THE CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS SHALL BE FABRICATED IN THE SHAPE, COLOR AND DIMENSIONS AS SHOWN IN THE STANDARD SIGNS LAYOUT BOOKLET

10-1-86		NORTH DAKOTA STATE HIGHWAY DEPARTMENT APPROVED <i>David K. Lee</i> ESTD. ENGINEER
DATE	REVISIONS	
12-1-88	Uneven Pavement	

BARRICADE DETAILS



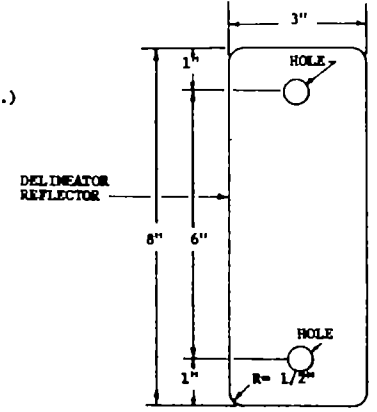
DELINEATOR DRUMS
 THE MARKINGS ON DRUMS SHALL BE ORANGE AND WHITE STRIPES 4 TO 6 INCHES WIDE THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE STRIPES WHERE DRUMS HAVE RIBS OR INDENTATION THERE SHALL BE NO REFLECTORIZED SHEETING IN THIS AREA THIS SPACE SHALL BE NO MORE THAN 2 INCHES WIDE THE DRUM SURFACE SHALL BE PREPARED AS RECOMMENDED BY THE SHEETING MANUFACTURER BEFORE REFLECTIVE SHEETING IS APPLIED.



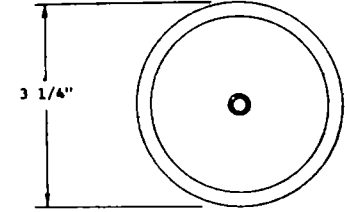
NOTE THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT TYPE II BARRICADES (SPECIAL) SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D2241 FOR PVC 1120 OR 1220, SDR 21, PRESSURE RATING 200 P S I THE WYES, TEES, AND ELBOWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D-2466, TYPE II, GRADE 1. ALL JOINTS SHALL BE SLIP-FIT AND SHALL NOT BE THREADED OR CEMENTED.

3" PVC PIPE CONFORMING TO ASTM D2085-DWV OR ASTM D2726 MAY BE USED AS AN ALTERNATE TO ASTM D2241-SDR 21

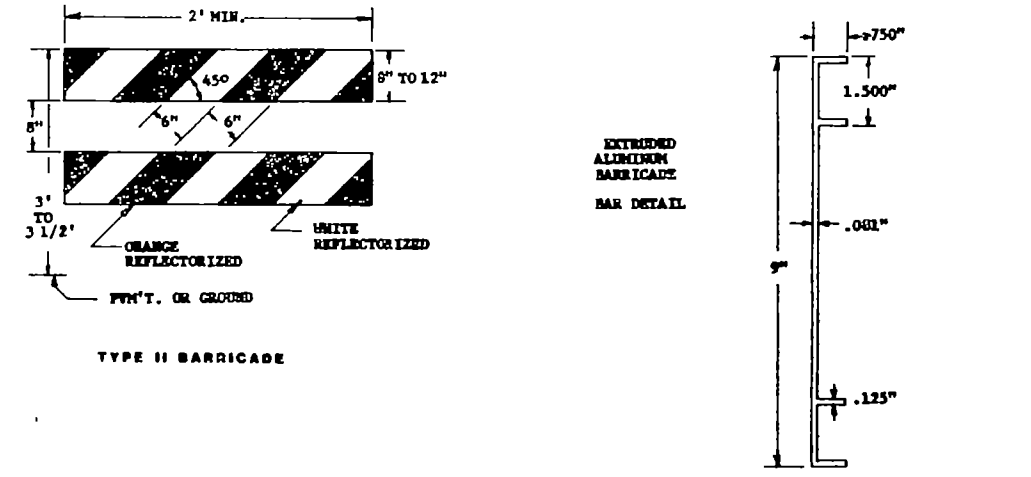
THE 9" X 48" BARRICADE RAIL SHALL BE FABRICATED FROM 0.026" ANODIZED ALUMINUM AND SHALL BE ATTACHED WITH 1 INCH NO. 14 PAN HEAD METAL SCREWS. COLORS REFLECTIVE ORANGE AND REFLECTIVE WHITE.



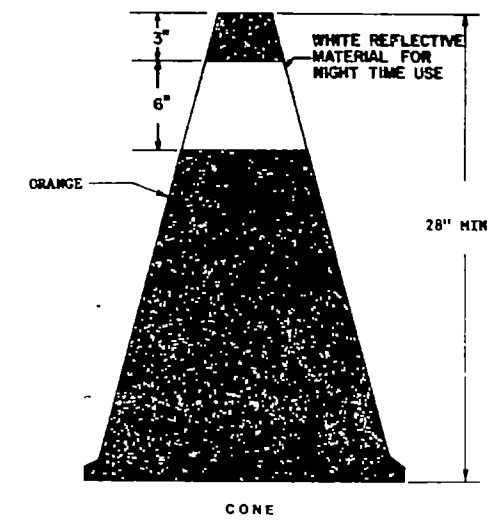
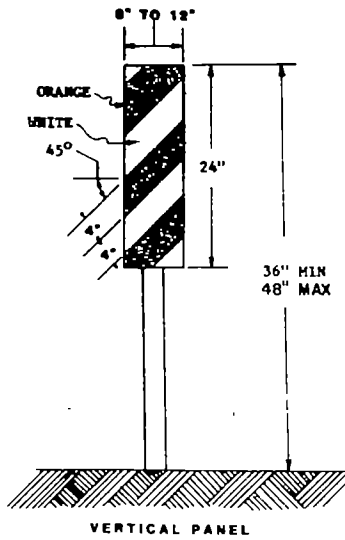
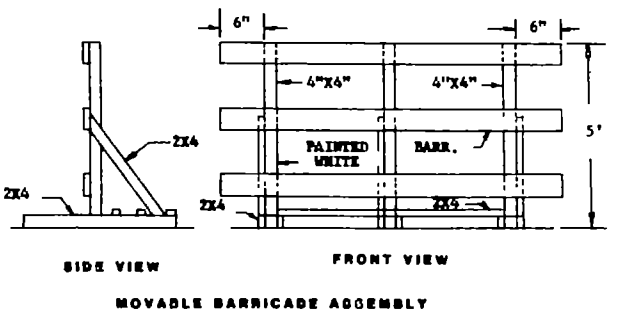
3" x 6" - 16 GAUGE GALVANIZED STEEL SHEETS, OR OR .060" ALUMINUM PLATE WITH WHITE REFLECTIVE SHEETING (TYPE 2A OR 2B) AS SPECIFIED IN SECTION 804 OF THE STANDARD SPECIFICATIONS.



ACRYLIC PLASTIC REFLECTOR
 DELINEATOR REFLECTOR SHALL MEET THE REQUIREMENTS OF SECTION 804



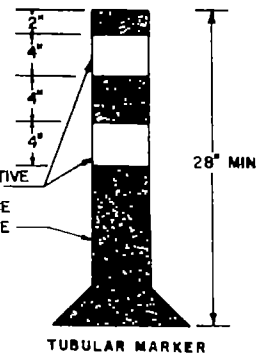
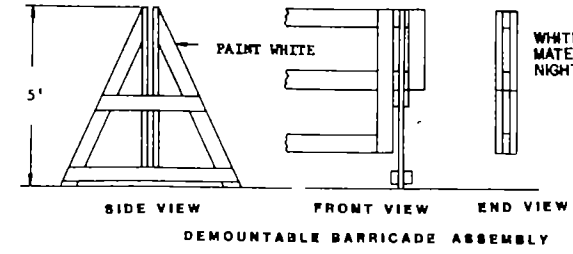
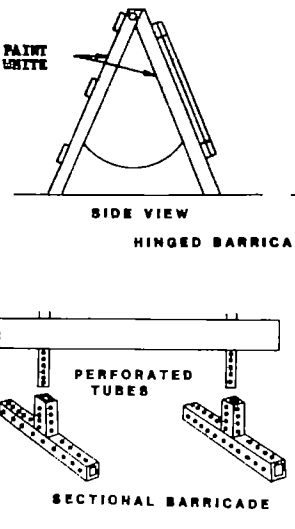
NOTE EACH MOVABLE BARRICADE SHALL BE WEIGHTED DOWN BY A SUFFICIENT NUMBER OF SAND BAGS OR OTHER SUITABLE WEIGHT SO THAT IT WILL NOT BE BLOWN OVER BY THE WIND UNLESS THE MOVABLE SUPPORTING STRUCTURE IS CONSTRUCTED IN SUCH A MANNER THAT THE WIND CANNOT BLOW IT OVER WEIGHT USED SHALL BE APPROVED BY THE ENGINEER IN THE FIELD. THE STRIPES SHALL SLANT DOWNWARD TOWARD THE SIDE WHICH TRAFFIC IS TO PASS. BARRICADES USED AT THE BEGINNING OF A PROJECT SHALL FACE TRAFFIC ENTERING THAT PROJECT.



BARRICADES: Number Of ReflectORIZED Rail Faces

TYPE I	TYPE II	TYPE III
2 (One Each Direction)	4 (Two Each Direction)	6 (Facing in two Directions)

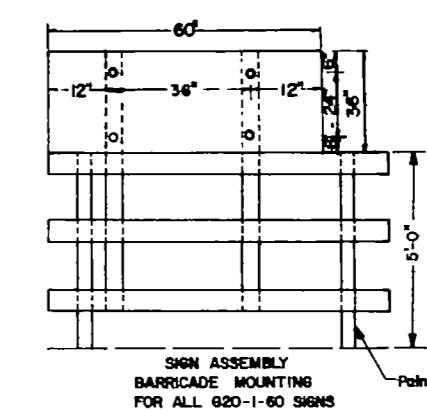
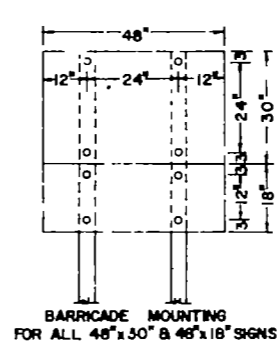
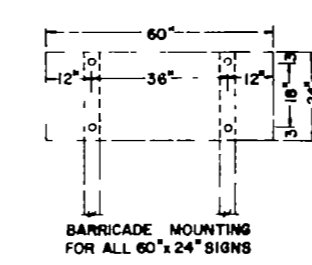
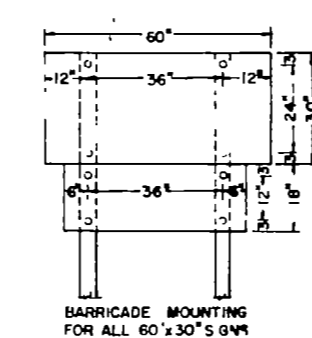
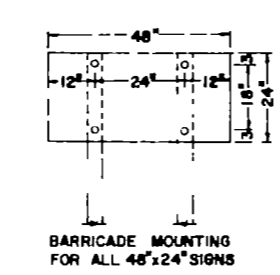
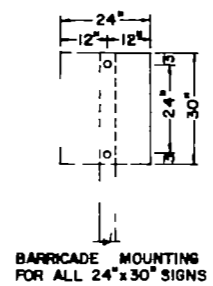
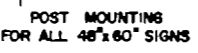
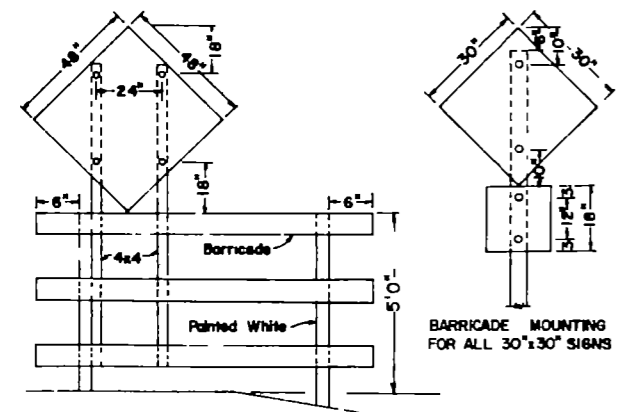
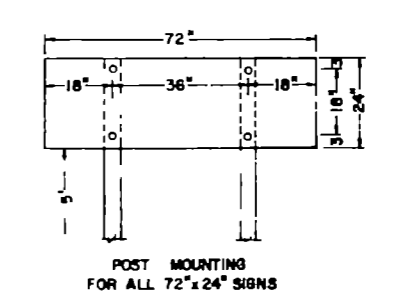
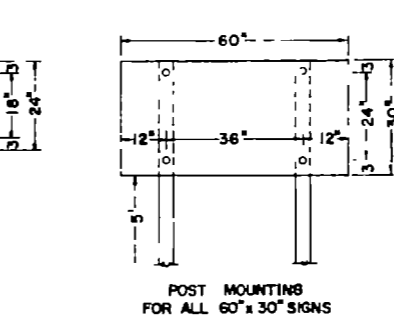
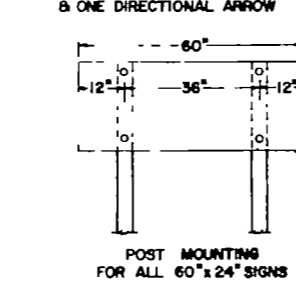
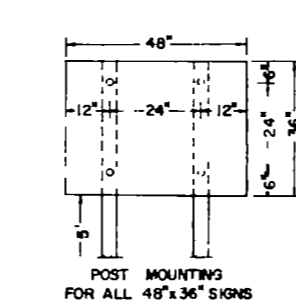
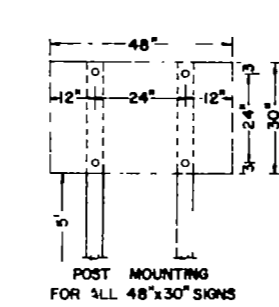
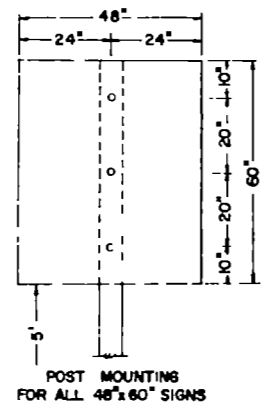
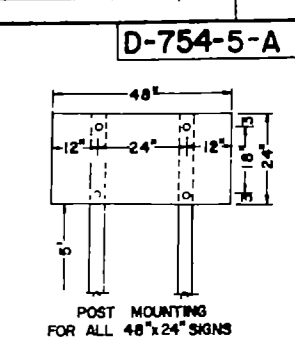
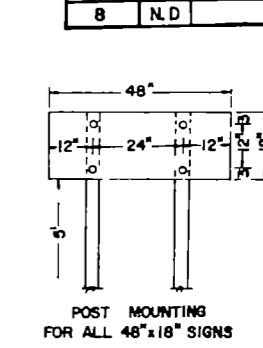
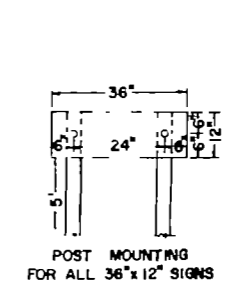
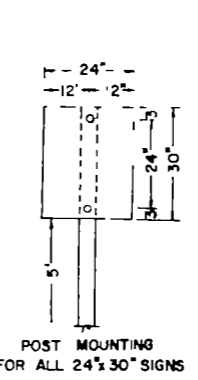
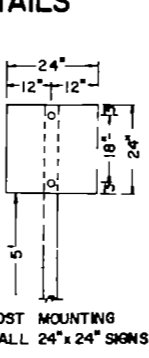
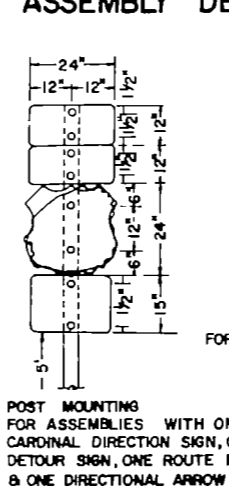
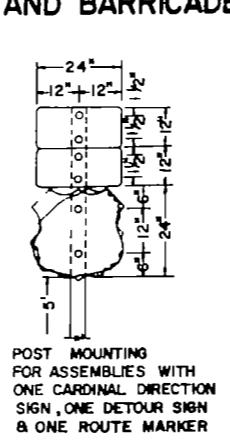
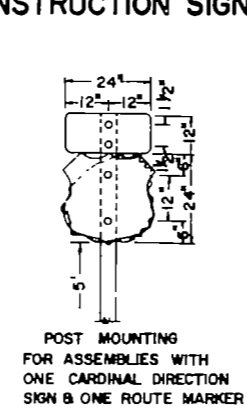
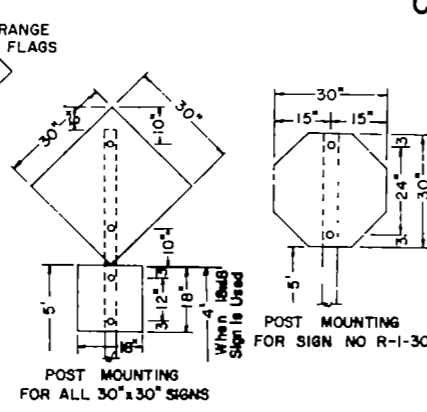
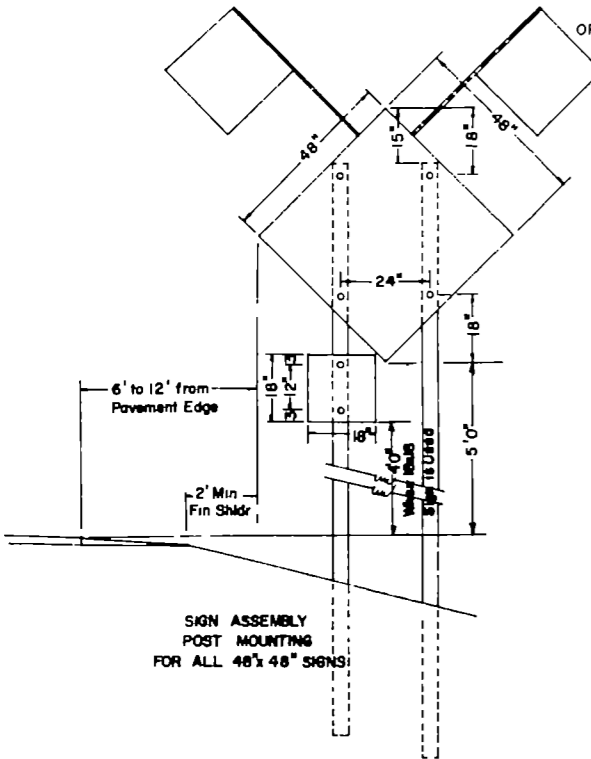
BARRICADE RAIL MATERIAL MAY BE 1" NOMINAL THICKNESS STANDARD LUMBER OR 3/4" PLYWOOD AND PREPARED AS RECOMMENDED BY THE SHEETING MANUFACTURER BEFORE REFLECTIVE SHEETING IS APPLIED



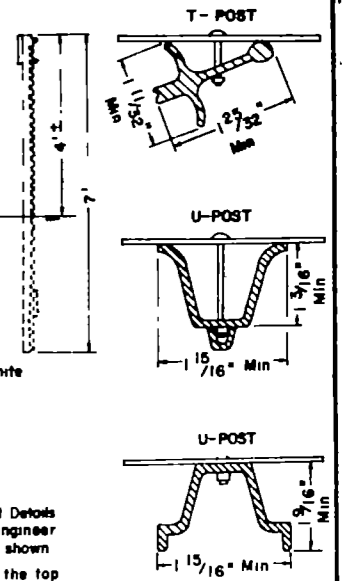
10-1-86	REVISIONS
DATE	CHANGE
8-3-87	Type Sheeting
10-1-87	Delineator Drum Note
6-9-88	Barricades Type III

NORTH DAKOTA
 STATE HIGHWAY DEPARTMENT
 APPROVED *David K. O. Lee*
 DESIGN ENGINEER

CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS



DELINEATOR ATTACHMENT AND POST MOUNTING DETAILS



NOTE
In Urban Areas the vertical clearance shall be increased to 7 feet on all signs, except when supplemental signs are placed below main signs. The supplemental signs shall be placed at a 6'-0" minimum clearance.

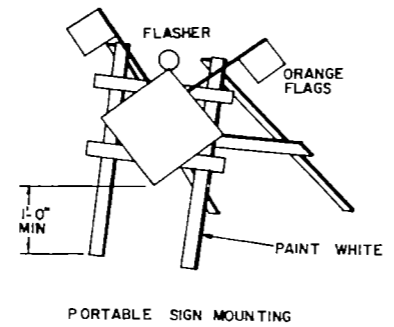
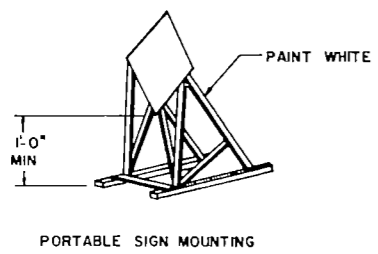
NOTES:
Barricade and Sign Supports: Wooden supports shall be painted white. Steel supports shall be galvanized or painted.
ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANELS: The minimum mounting height shall be 7 feet above the roadway to the bottom of the panel, except on vehicle mounted panels which shall be as high as practicable.

NOTES:
DELINEATOR POSTS: Typical fence post sections are shown in Attachment Details. Other types of metal fence posts may be substituted upon approval of the engineer. These substituted posts shall have reflectors attached similar to the ones shown.
BARRICADE MOUNTING SIGNS: The bottom of the sign shall be flush with the top of the top rail. Wood sign posts shall be 4x4 min SFS or equivalent steel posts. See Sids D-754-5 thru D-754-9 for construction sign and barricade location details. All barricades and barricade mounted signs shall be assembled with 3/8" bolts.
SIGN SUPPORTS: The sign supports shall be imbedded to a sufficient depth so that the signs will remain plumb throughout duration of the project. It is suggested that the min depth of imbedment be 5'-0".

MATERIAL: All signs shall be 100" aluminum, 12 gage galv steel, 1/2" plywood or other approved mat'l.

HOLES: All holes to be punched round for 3/8" bolts.

ALTERNATE MESSAGES: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate without a border and this plate unstaked and removed as required.

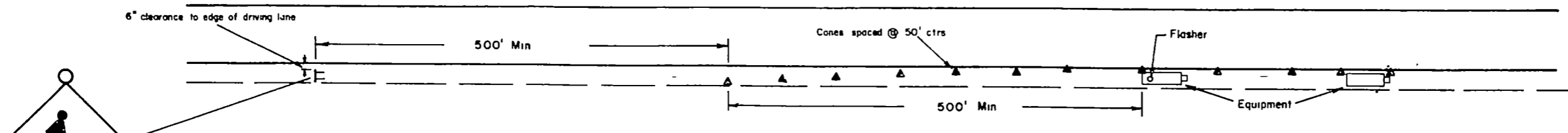


10-1-88		NORTH DAKOTA STATE HIGHWAY DEPARTMENT
REVISIONS		
DATE	CHANGE	APPROVED: <i>David K. Lee</i> DESIGN ENGINEER
8-1-88	SIGN ASSEMBLY	

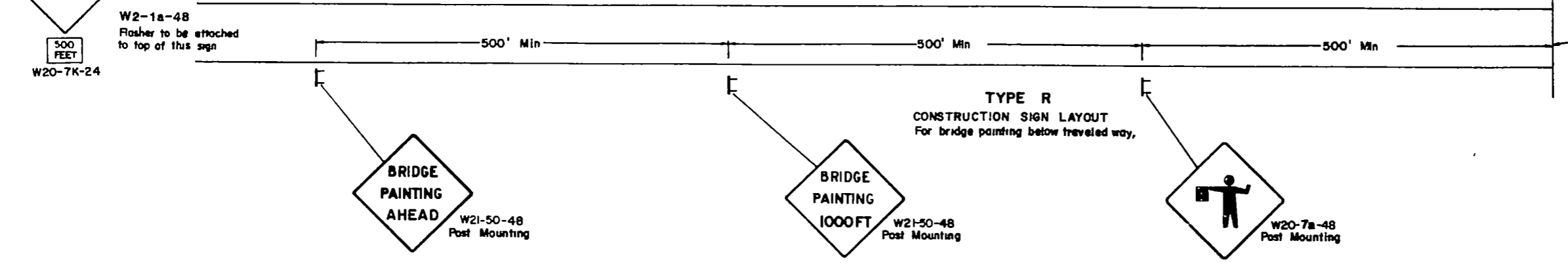
CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

FHWY REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.		

D-754-12

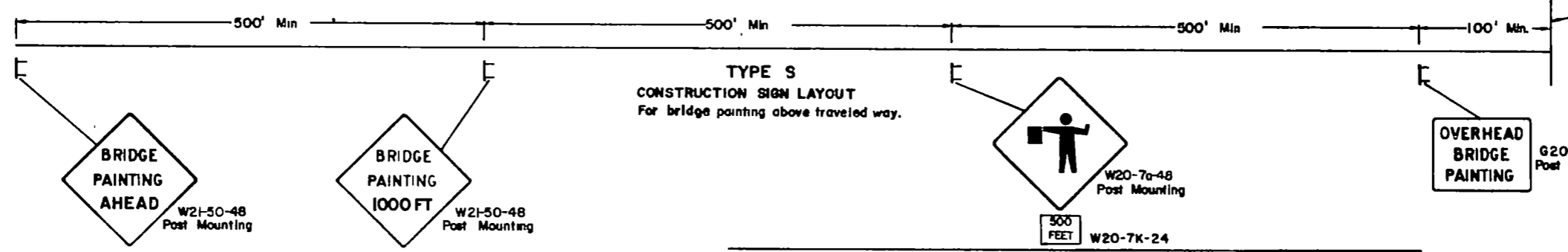


TYPE U
TRAFFIC PROTECTION DEVICES
PLACEMENT FOR SITUATION WHEN
EQUIPMENT WILL BE PARKED ON
THE RIGHT SHOULDER



TYPE R
CONSTRUCTION SIGN LAYOUT
For bridge painting below traveled way,

- KEY**
- ⌋ Type I Barricades
 - ⌋ Type II Barricades
 - ⌋ Type III Barricades
 - ▲ Cones
 - Lighting Device
 - ⌋ Flagman
 - Detector Drums
 - ⌋ Signs
 - ⌋ Type A Delineator

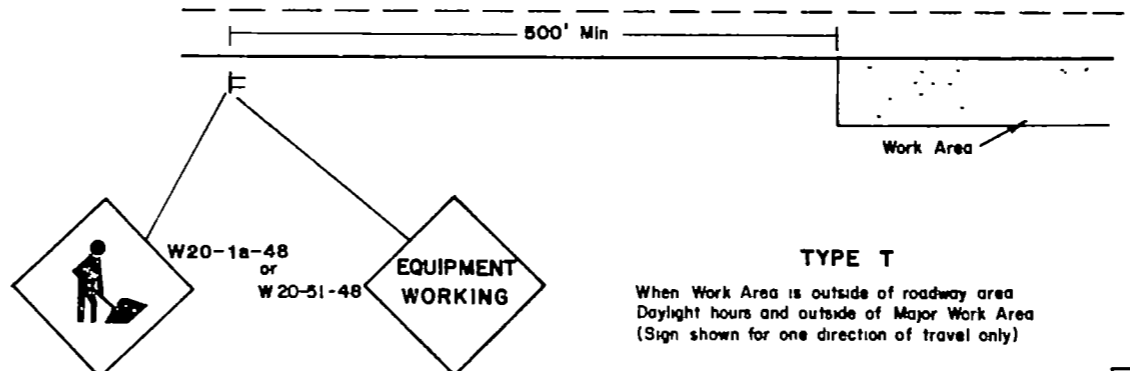


TYPE S
CONSTRUCTION SIGN LAYOUT
For bridge painting above traveled way.

NOTE:
FLAGS: All diamond warning signs shall have two orange warning flags 24" square mounted perpendicular to the edges of the diamond sign and at such a distance above the edges so that when flag is hung limp it will not touch the sign.

Lighting—Flashers shall be placed above the barricade bars and above all warning signs unless barricades and signs have Type 3A or 3B reflective sheeted faces.

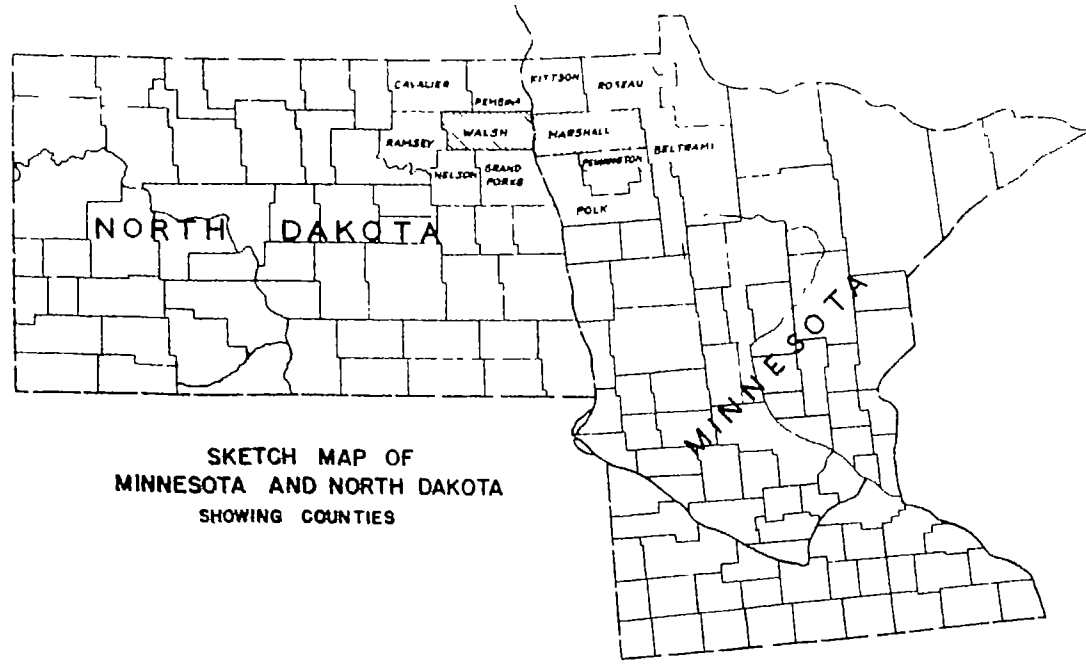
Where advance warning sign placed as shown interferes with permanent signs, The warning sign location shall be determined by the Engineer for best results Messages shall be varied as required



TYPE T
When Work Area is outside of roadway area
Daylight hours and outside of Major Work Area
(Sign shown for one direction of travel only)

	10-1-88	
DATE	REVISIONS	
8-3-87	CHANGE	
	NOTE	

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED *David K. Johnson*
DESIGN ENGINEER



SKETCH MAP OF MINNESOTA AND NORTH DAKOTA SHOWING COUNTIES

MINNESOTA HIGHWAY DEPARTMENT
AND
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

PLANS FOR AN
INTERSTATE HIGHWAY BRIDGE
OVER THE
RED RIVER OF THE NORTH
INCLUDING APPROACHES

BETWEEN
STEPHEN, MARSHALL COUNTY, MINNESOTA AND GRAFTON, WALSH COUNTY, NORTH DAKOTA

FEDERAL AID SECONDARY PROJECT NO. FAS 74 A (1)

LIST OF SHEETS	
Sheet No	Description
1	Title Sheet
2	General Plan & Elevation
3	Detail of Abutments
4	Detail of Pier
5	Stress Sheet
6	Truss Connections
7	Railing and Shoe Details
8	Floor Slab
9	Survey

Plans for Section A(1)

Beginning at a point described as follows: 182.9 feet south and 23.77 feet west of the S.E. corner of Section 17, T.157N, R.50W, and ending at a point described as follows: 28 feet north and 194.69 feet west of the S.E. corner of Section 17, T.157N, R.50W

Length of project Gross Length - Net Length - 0.078 Miles

SYSTEM DIST. HWY. AGREEMENT

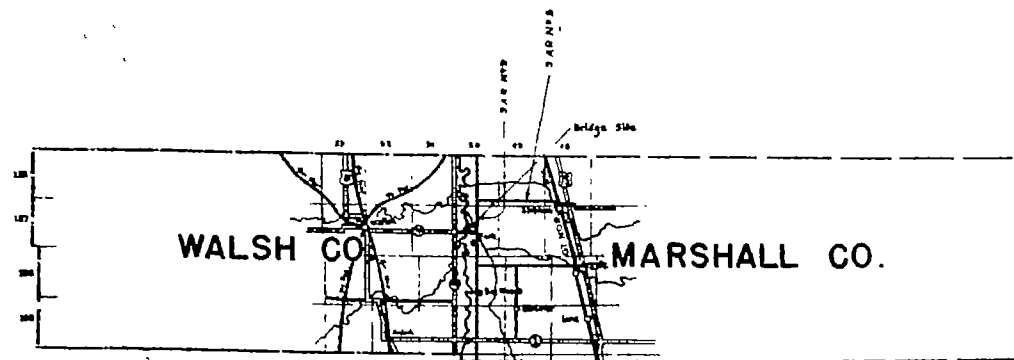
F-6-17(1)

MILE

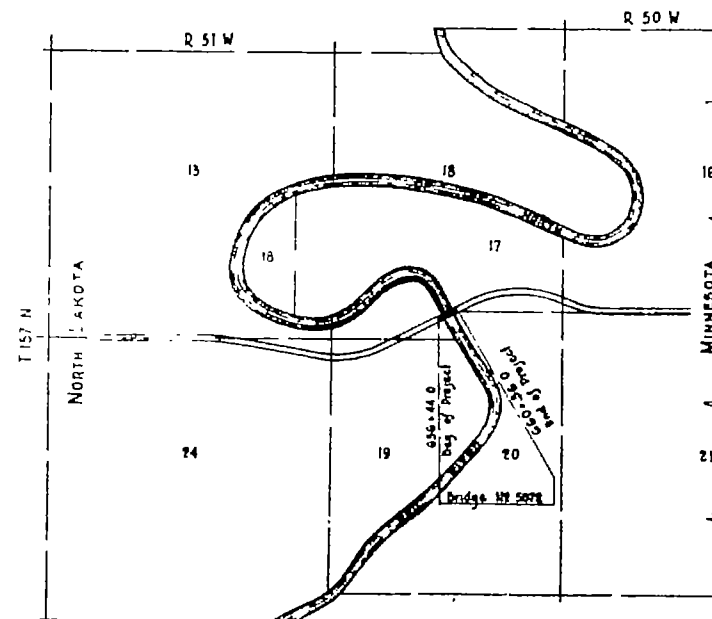
140

Specifications.

The "Specifications for Highway Construction" dated July 1, 1935, submitted to the Bureau of Public Roads for approval July 10, 1935 and recommended for approval by the District Engineer of the Bureau of Public Roads July 23, 1935, as modified by Supplement No. 2 thereto dated April 1, 1935, submitted to the Bureau of Public Roads for approval April 14, 1935, shall govern.



SKETCH MAP OF MARSHALL CO., MINN. & WALSH CO., NO. DAK.



LAYOUT MAP
SCALE - 3 IN. = 1 MI
1 IN. = 1760 FT

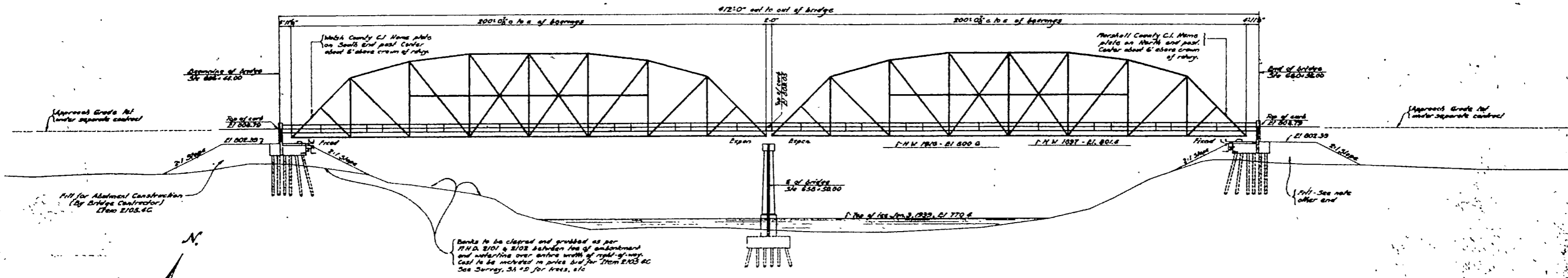
EXECUTED UNDER
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
APPROVED: June 1, 1935.
E. J. Miller BRIDGE ENGINEER *C. E. Kist* ACTING CHIEF ENGINEER

STATE OF NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED: *Clifford Johnson* BRIDGE ENGINEER *J. E. Johnson* STATE HIGHWAY ENGINEER

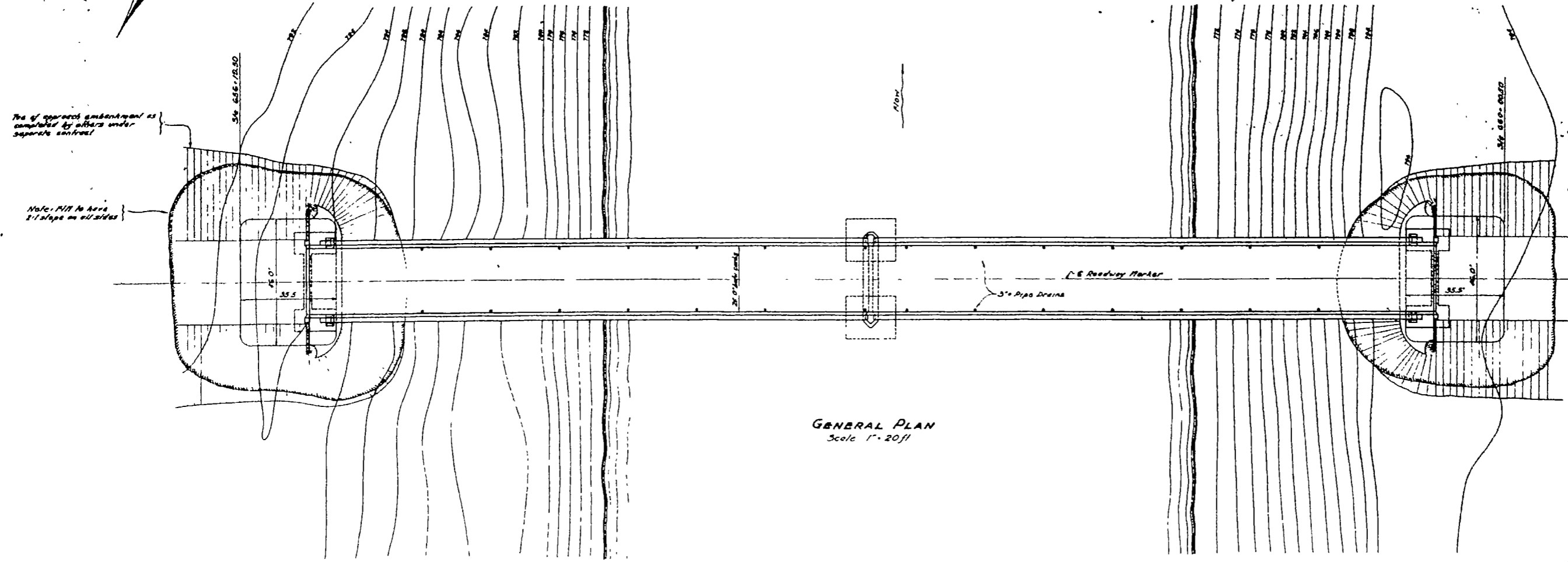
U. S. DEPARTMENT OF AGRICULTURE

EXAMINED BY: [Redacted]
RECOMMENDED FOR APPROVAL: [Redacted] DISTRICT ENGINEER
RECOMMENDED FOR APPROVAL: [Redacted] CHIEF ENGINEER
APPROVED: [Redacted] CHIEF OF BUREAU

APPROVED BY THE SECRETARY OF AGRICULTURE: [Redacted]



GENERAL ELEVATION
Looking downstream



GENERAL PLAN
Scale 1" = 20' ft

SUMMARY OF QUANTITIES FOR ENTIRE BRIDGE

Item No.	2105 4C	2121 5A	2121 5B	2401 5B	2401 5A	2408 5A	2407 5A1	2407 5A2	2407 5A3	2407 5A4	2407 5A5	2501 5A1	2501 5A2	2501 5A3	2501 5A4	2501 5B1	2501 5B2	2501 5B3	2501 5C1
Item	Class C Excavation	Class B Excavation	Class W Excavation	Gravel Concrete	Cement	Reinforcement Bars	Structural Steel	Cast Nail	Steel Lead	Ties	Volume Arches	Untreated Piling (200 ft)	Untreated Piling (200 ft)	Treated Piling (200 ft)	Treated Piling (200 ft)	Untreated Piling (200 ft)	Untreated Piling (200 ft)	Untreated Piling (200 ft)	Treated Piling (200 ft)
Unit	Cu Yd	Cu Yd	Cu Yd	Sq Yd	Sq Yd	Lbs	Sq Yd	Lbs	Lbs	Sq Yd	Sq Yd	Lin Ft	Lin Ft	Lin Ft	Lin Ft	Each	Each	Each	Each
Quantity	3700	150	210	68	300	74,000	60,000	9120	275	10	2	1792	3200	3072	2	2	5	8	

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
AND
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
GENERAL PLAN & ELEVATION
BRIDGE NO 5872
INTERSTATE BRIDGE OVER
RED RIVER OF THE NORTH
BETWEEN
STEPHEN, MARSHALL CO & GRAPTON, WALSH CO.
MINNESOTA & NORTH DAKOTA
APPROVED June 1, 1939

E. J. Miller
BRIDGE ENGINEER

O. L. Kiefer
ASSISTANT BRIDGE ENGINEER

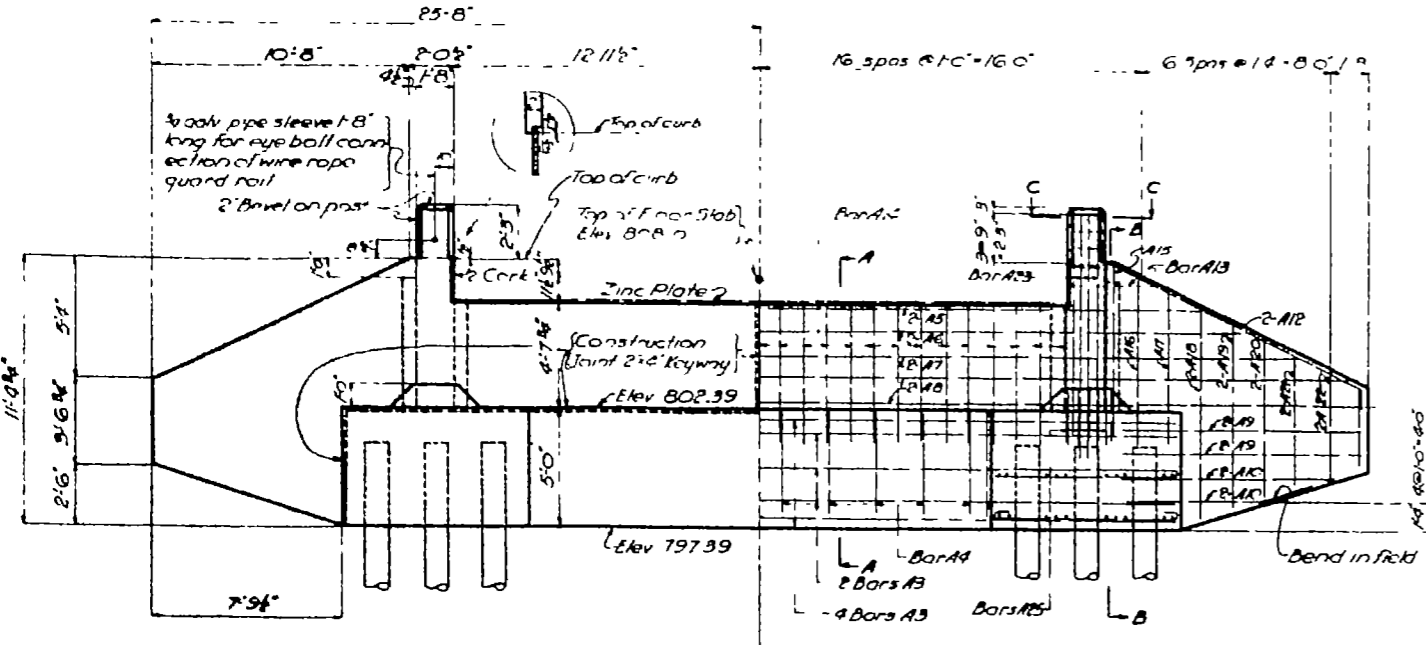
ADJUSTMENT PROCEDURE IN THE EVENT OF ABUTMENT MOVEMENT

- 1 Raise front end of truss span by jacking at stiffener end floor beam and raise end of end slab to free it from back wall during moving
- 2 Lay down shim plates under Truss shoes, prepare new bearing areas place 2" x 3" x 2'6" steel bars with top surface greased under Truss shoes and release jacks
- 3 Place blocks against Truss shoes and jack longitudinally as desired
- 4 Remove steel bars and rest span on shim plates on new bearing areas

Note that for movement of over 2" railing will contact concrete post and must be cut off

BILL OF BARS FOR TWO ABUTMENTS

Bar	Qty	Length	Shape	Location
A1	80	16	1/2"	Top of Pier
A2	96	16	1/2"	Roofing Truss
A3	28	14	3/8"	Top of Abutment
A4	20	24	1/2"	Top of Wing
A5	8	24	1/2"	Roofing Truss
A6	8	24	1/2"	Top of Wing
A7	8	24	1/2"	Top of Wing
A8	16	24	1/2"	Top of Wing
A9	16	24	1/2"	Top of Wing
A10	16	24	1/2"	Top of Wing
A11	16	24	1/2"	Jacking Lug
A12	8	24	1/2"	Top of Wing
A13	8	24	1/2"	Wing Vertical
A14	8	24	1/2"	Roofing Truss
A15	8	24	1/2"	Wing Vertical
A16	8	24	1/2"	Top of Wing
A17	8	24	1/2"	Top of Wing
A18	8	24	1/2"	Top of Wing
A19	8	24	1/2"	Top of Wing
A20	8	24	1/2"	Top of Wing
A21	8	24	1/2"	Top of Wing
A22	8	24	1/2"	Top of Wing
A23	24	24	1/2"	Post Vertical
A24	16	24	1/2"	Post Ties
A25	20	24	1/2"	Jacking Lug
A26	16	24	1/2"	Roofing Truss
A27	16	24	1/2"	Top of Wing

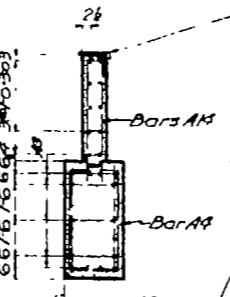


HALF FRAMING ELEVATION

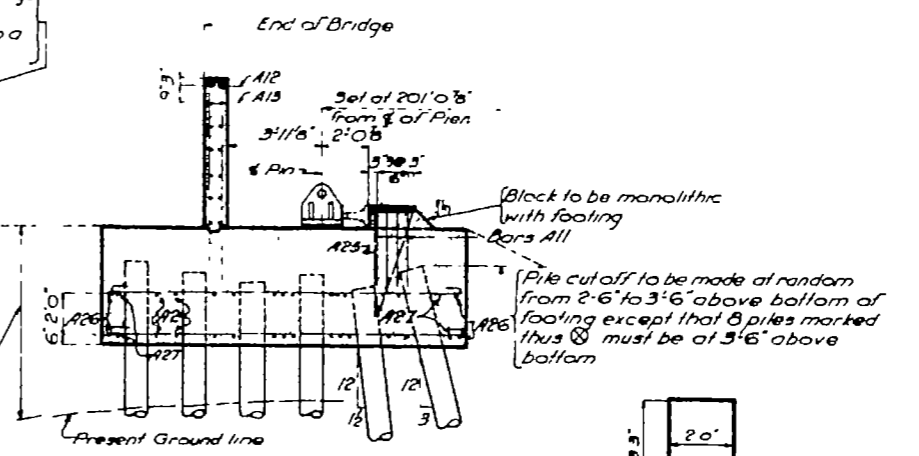
HALF REINFORCING ELEVATION

Abutment is symmetrical about E

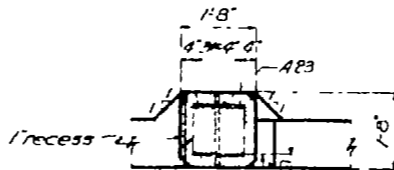
Use 1/2" x 1/2" An Fine Gauge 1/4" wide bend as shown. Trowel top of parapet to a smooth finish.



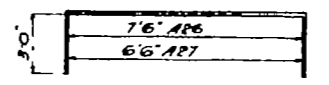
SECTION A-A



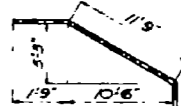
For limits of embankment to be placed at abutments see 5h #2



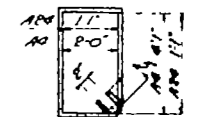
SECTION C-C



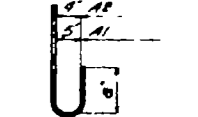
BAR A26 & A27



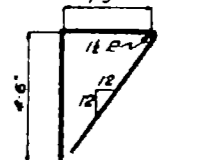
BAR A12



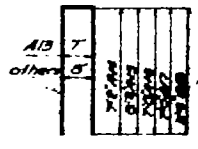
BARS A4 & A24



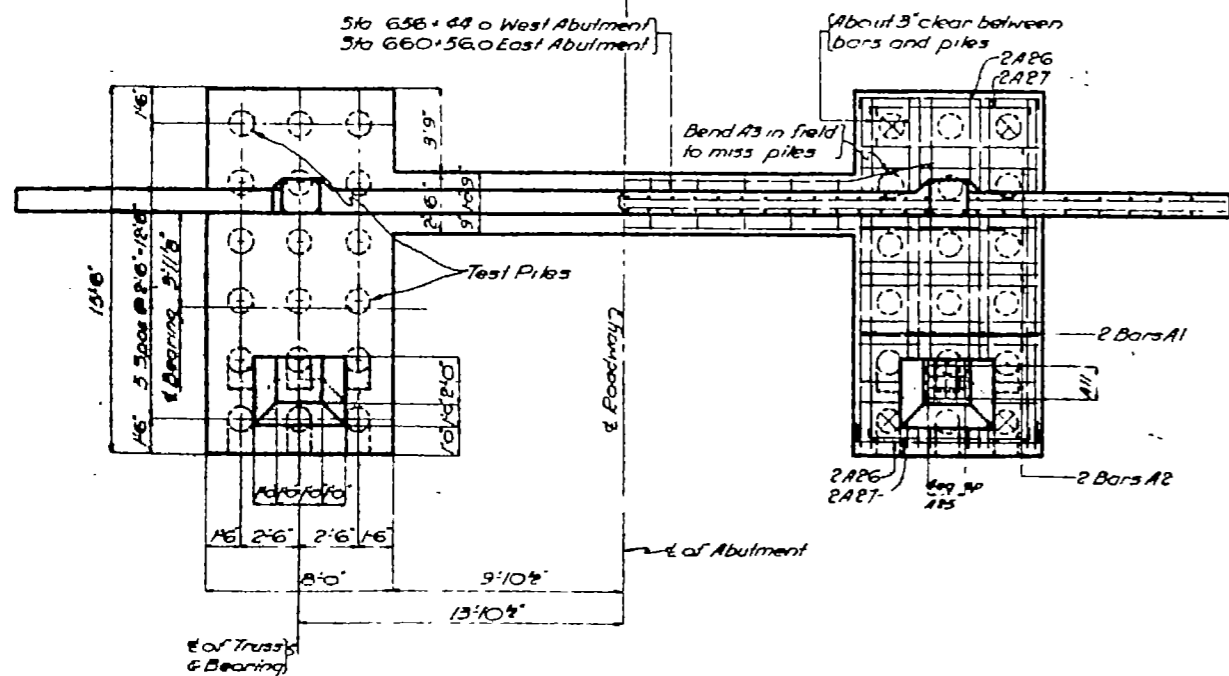
BARS A16 & A22



BAR A25



BARS A15, A17, A18, A19, A20, A21

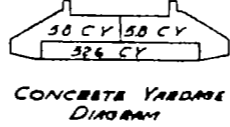


HALF FRAMING PLAN

HALF REINFORCING PLAN

Maximum Pile Load

Location	Dead Load (Tons)	Live Load (Tons)	Total (Tons)
At Top (1/4 of bearing located 9' from parapet)	14	4	18
At Heel (1/4 of bearing located 11' from parapet)	15	3.5	18.5



CONCRETE YARDAGE DIAGRAM

Quantities for two Abutments

D E Excavation	170 Cu Yds
Grade 2 Concrete	188.4 Cu Yds
Reinforcement Bars	12,050 lbs
Sheet Zinc	70 Sq Ft
60 Treated Timber Piles @ 50 Ft - 3200 lbs	
8 Treated Timber Test Piles @ 60 Ft - 6 Piles	
4 Pcs Preformed Cork 16" x 16" x 4"	
Class C Excavation	3,200 Cu Yds

+ Includes cost in prices bid for other items.
o Total of 9 Cu Yds. has been deducted for pile ends

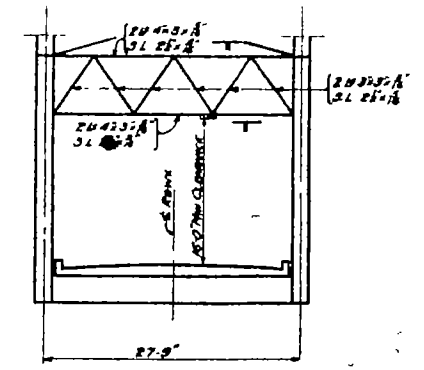
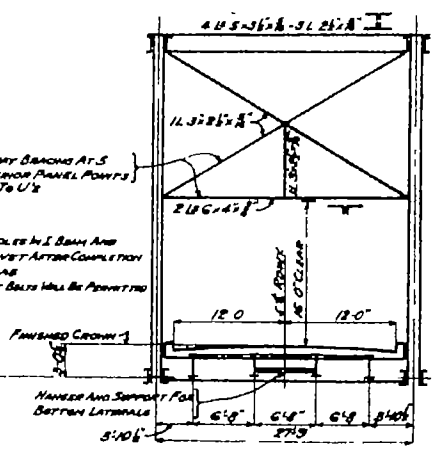
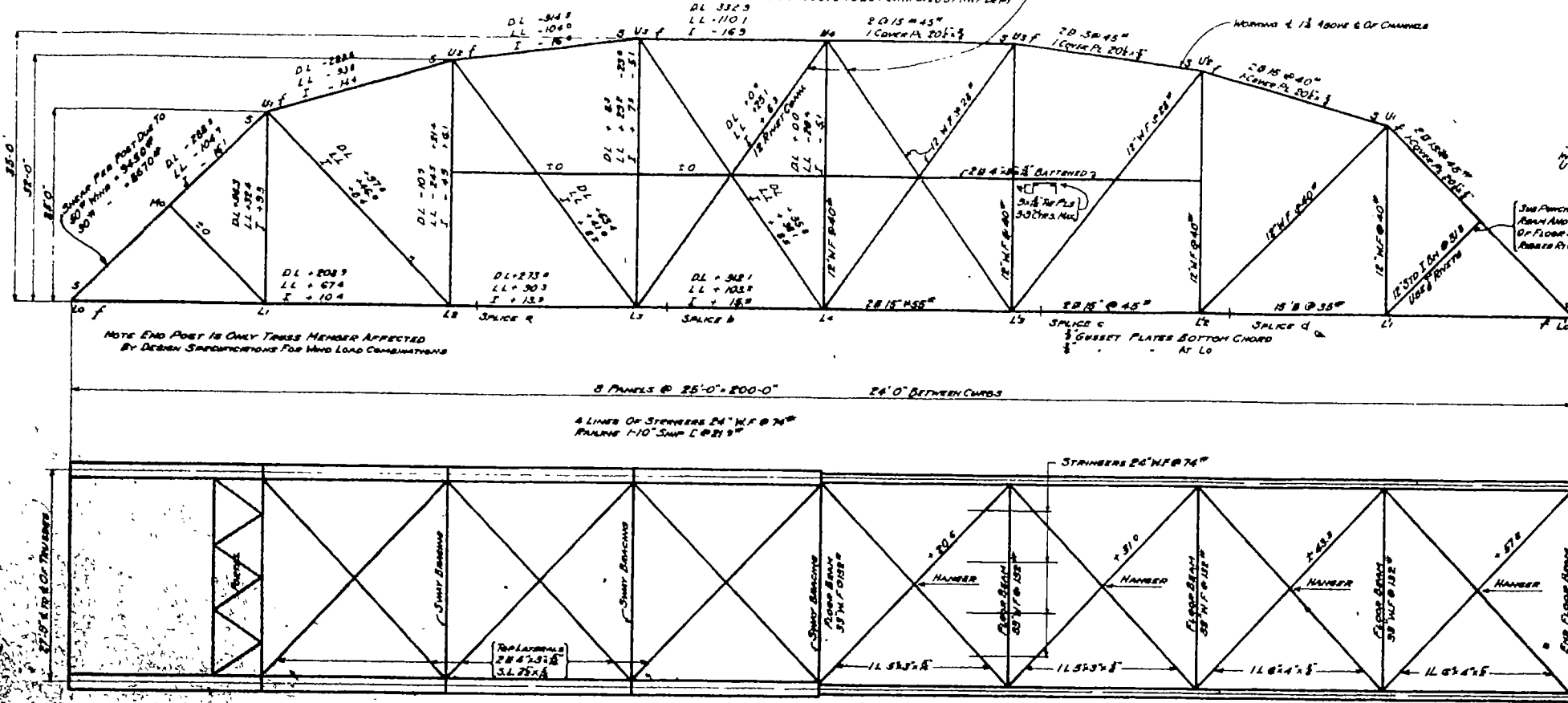
Pile Note:
Driven length of piling other than Test Piles, has been assumed as 2 ft less than delivered length.
Order Piling according to A.M.D. 2901.30

RED RIVER BRIDGE
EAST OF GRAYTON NORTH DAKOTA
SOUTHWEST OF STEPHAN MINNESOTA
DETAIL OF ABUTMENTS

NOTES FOR TOP CHORD AND END POST
 1. GUSSET PLATES DL 28' x 8"
 2. 1/2" PLYS - 8 HOLES UNLESS NOTED
 CHANNELS 17" BACK TO BACK

NOTES MEMBERS AND CONNECTIONS SUBJECT TO REVERSAL
 OF STRESS SHALL BE FORGED ACCORDING TO
 SPEC 566 A.A.S.H.O. SPECIFIC DATED 1930
 CONNECTIONS FOR ROLLED MEMBERS HAVING
 EXCESS SECTIONAL AREA AND STAYS TO BE AS
 PER LAYOUT TO BE FURNISHED BY THE DEPT.

CONNECTION AT THIS END OF U.S. L3 TO BE SHIP LAPPED
 IN SHOP AND REAMED TO 1/8" IN FIELD AFTER FLOOR SLAB
 IS COMPLETED. CONNECTIONS TO BE MADE WITH RIBBED
 SHEET PILES TO TOP OF MEMBER (PLATE MATERIAL EQUIPMENT OR
 BACK) SHALL BE PLACED ON THE FLOOR NEAR EACH CHORD AT
 PANEL POINTS L4 DURING REARLINE AND BENTING



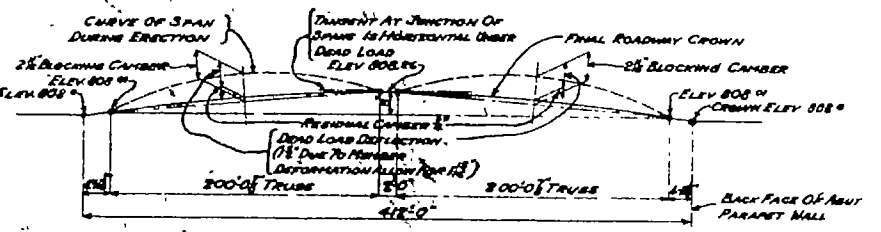
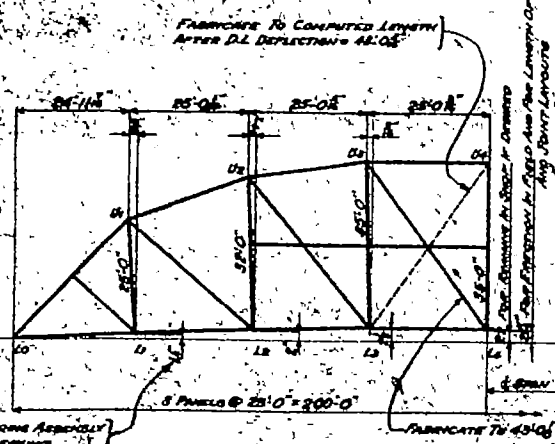
DESIGN SPECIFICATIONS
 LIVE LOAD CLASS III AS PER A.A.S.H.O. COOP. OF 1935
 WIND STRESS AS PER ABOVE COOP.

CONSTRUCTION NOTES FOR STRUCTURAL STEEL
 THE MINNESOTA HEAVY CONSTRUCTION SPECIFICATIONS FOR
 HEAVY CONSTRUCTION DATED JULY 4, 1938 SHALL APPLY TO THIS
 PROJECT EXCEPT AS OTHERWISE SPECIFICALLY NOTED.
 REFERENCE TO SPECIFIC SECTIONS OF THESE SPECIFICATIONS
 IS MADE WHEREVER THE PREFIX M.H.D. IS USED.
 PART 1
 SHOP CONT. AND LEAD M.H.D. 2000
 1/2" FIELD CHORD BROWN PAINT, 2000
 5/8" - 1" GLASS M.H.D. 2504
 ALL WELDS 1/8" EXCEPT AS NOTED BELOW FOR 5/8"
 - HOLES 1/8"
 ALL FIELD CONNECTIONS TO BE RIVETED EXCEPT EXPANSION
 DEVICES AND HARD PILL
 REPAIRS:
 THE ENTIRE BOTTOM CHORD TO BE ASSEMBLED AT SHOP AND
 BENTED UP ACCORDING TO DIMENSION BROUGHT ON THIS SHEET
 AND FIELD WELDS RIVETED TO 1/8" HOLES TO BE RIVETED TO
 BE SUBMITTED AS PER M.H.D. 2504 (2505)
 REFERENCE TO CONNECTION MEMBERS (ARTS) FIELD WELDS TO
 WILL BE 5/8" AND ALL ARTS TO ALL TYPES OF STRUCTURAL STEEL
 IN THIS CONTRACT, SEE SUMMARY BELOW
 MAX. 5/8" IN HOLES BOTH FIELD AND SHOP IN TOP CHORDS
 SHOP FLOOR STEEL - PORTALS AND HARD PILL, EXCEPT AS
 NOTED.
 FLOOR CORNER ON THE REPORTS SUBMITTED BY THE
 2407.511 WILL BE REQUIRED.

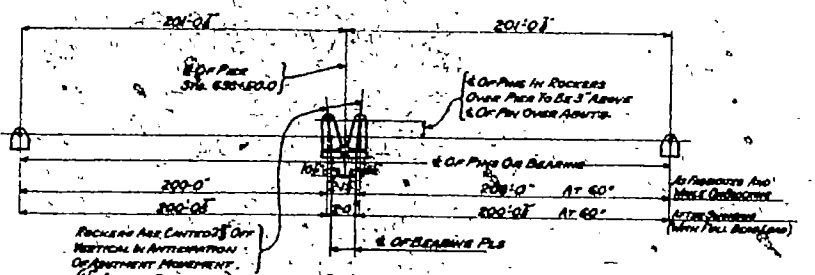
HALF PLAN - TOP LATERALS

HALF PLAN - BOTTOM LATERALS

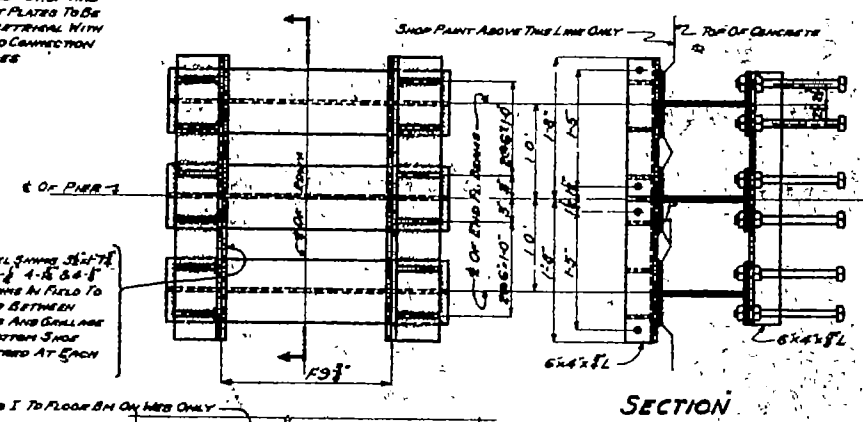
NOTES ON ERECTION PROCEDURE AND ARRANGEMENT OF RIVETING
 THIS SPAN IS DESIGNED FOR CONTINUOUS ERECTION PROCEEDING FROM LEFT END SHOP AND
 FIELD RIVETING TO BE AS NOTED ON ELEVATION BY LETTERS "S" AND "F" GUSSET PLATES TO BE
 SYMMETRICAL ABOUT S OF SPAN. WHERE SHOP RIVETED CONNECTION IS SYMMETRICAL WITH
 A FIELD CONNECTION THE NUMBER OF RIVETS WILL BE AS DETERMINED BY THE FIELD CONNECTION
 CONTRACTOR TO SPECIFY DIRECTION OF ERECTION FOR MATCHMARKING PURPOSES



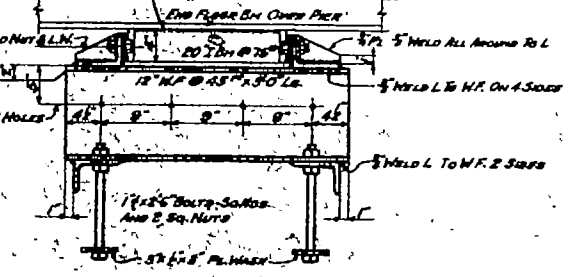
PROFILE OF ROADWAY CROWN



LOCATION OF BEARINGS



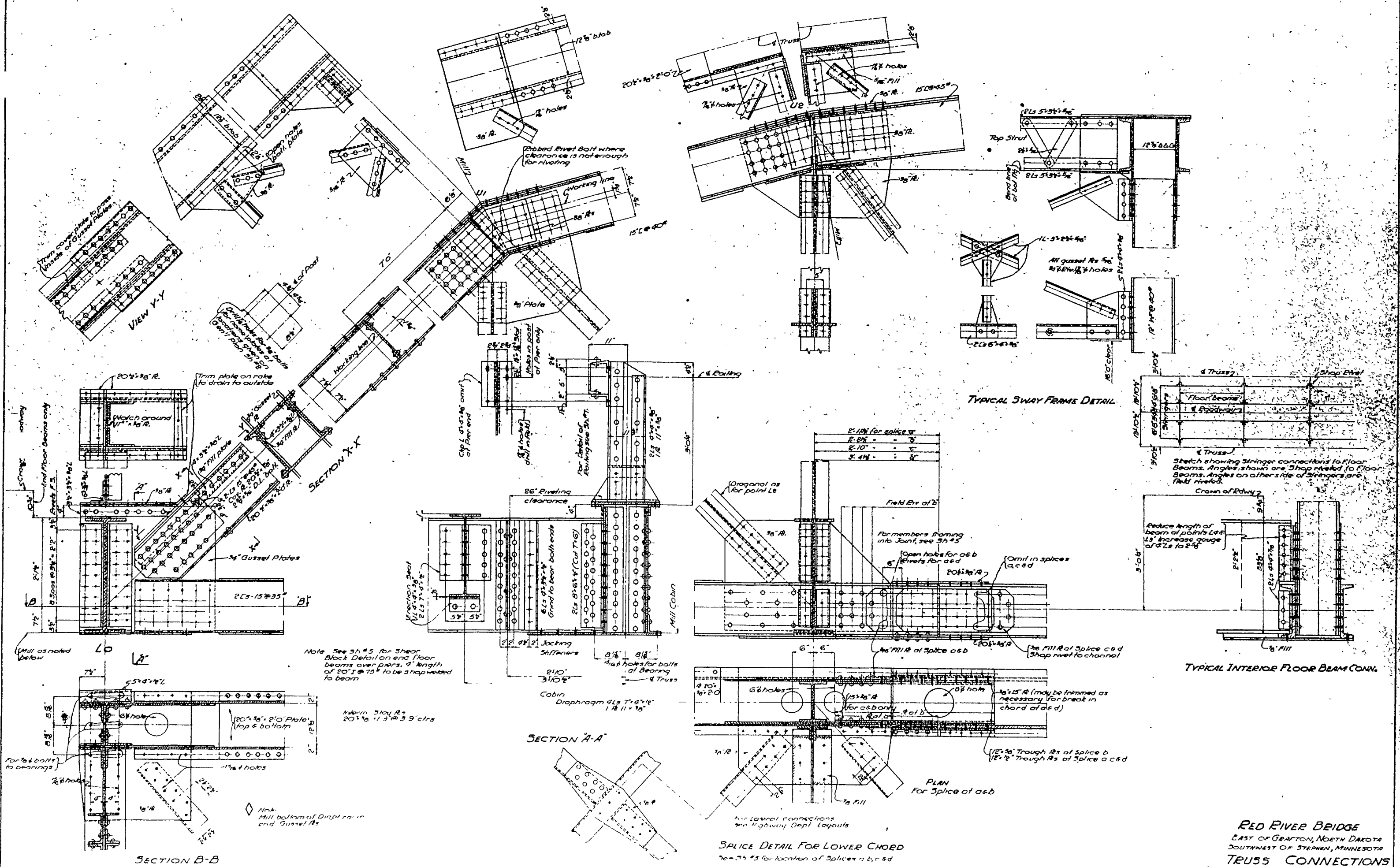
SECTION



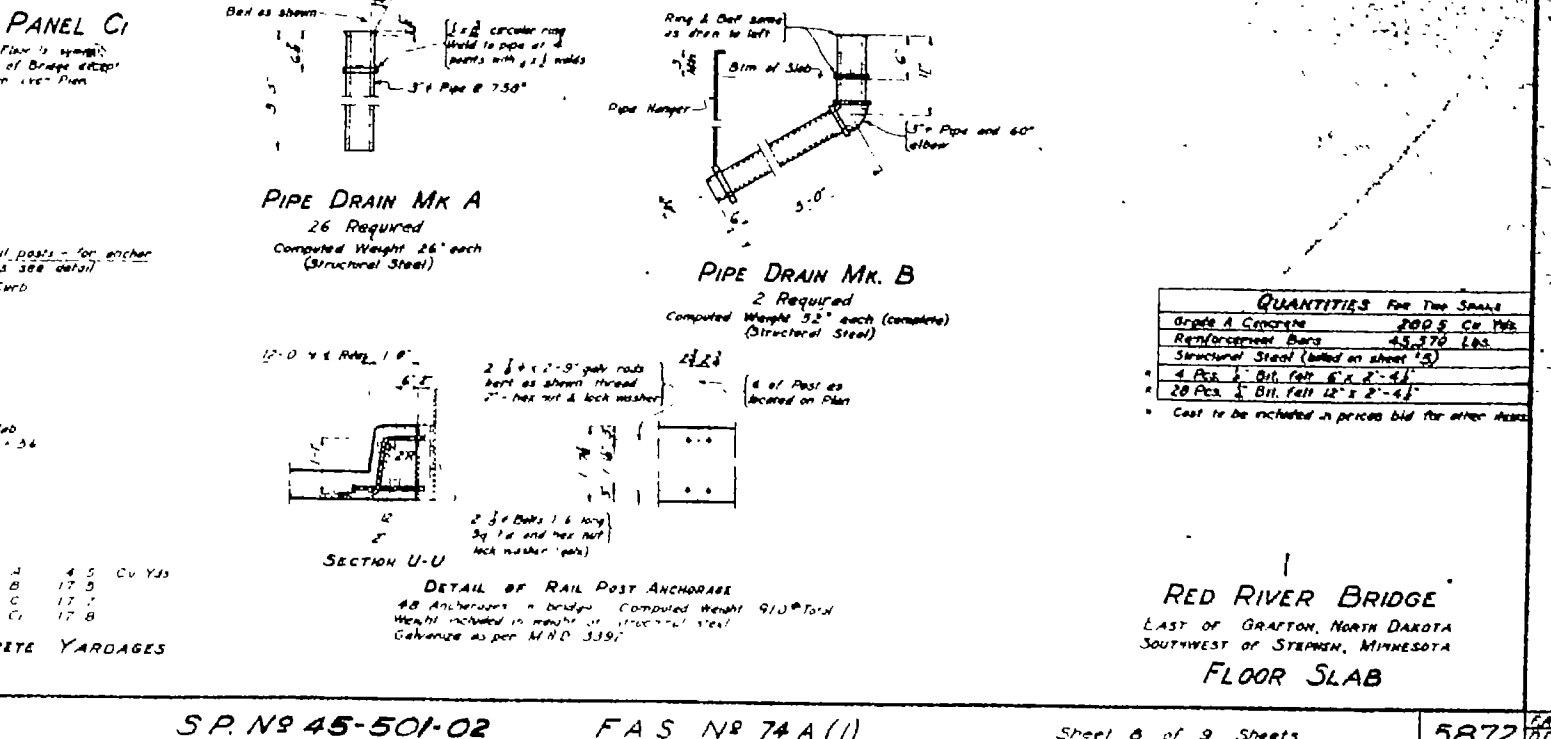
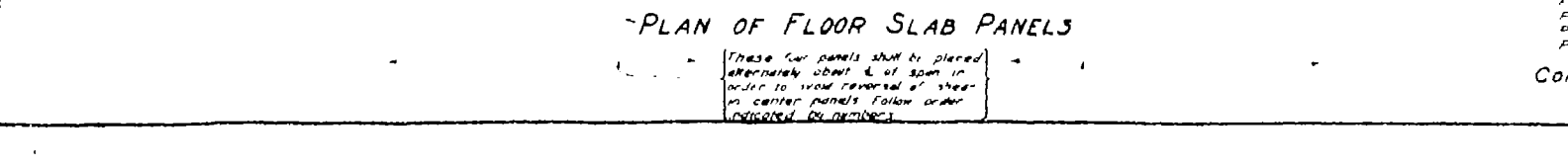
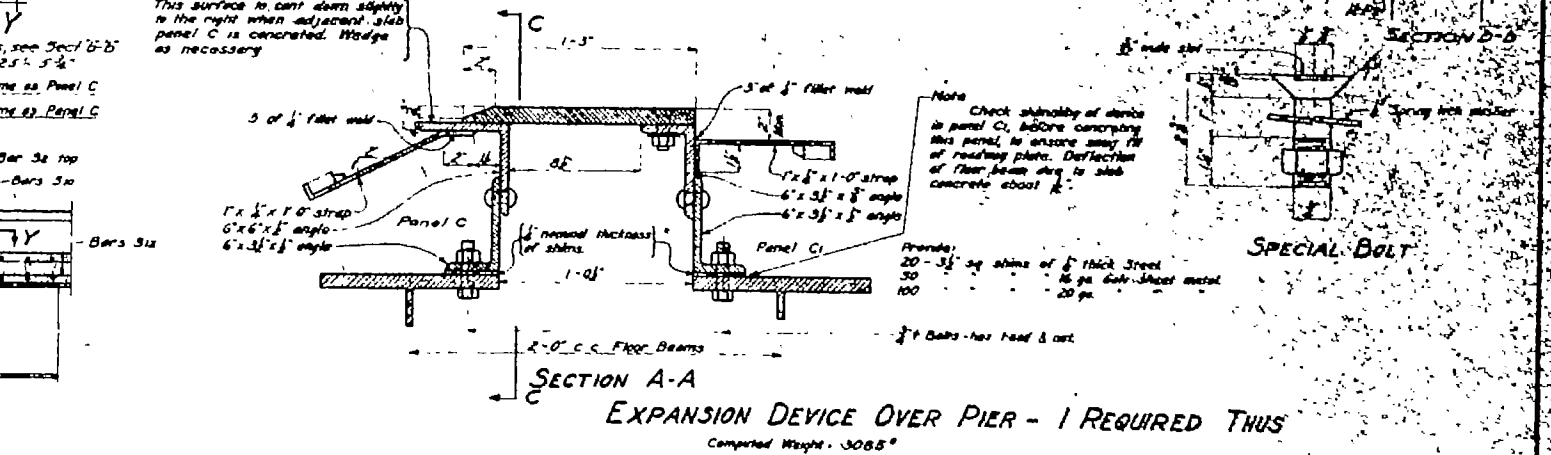
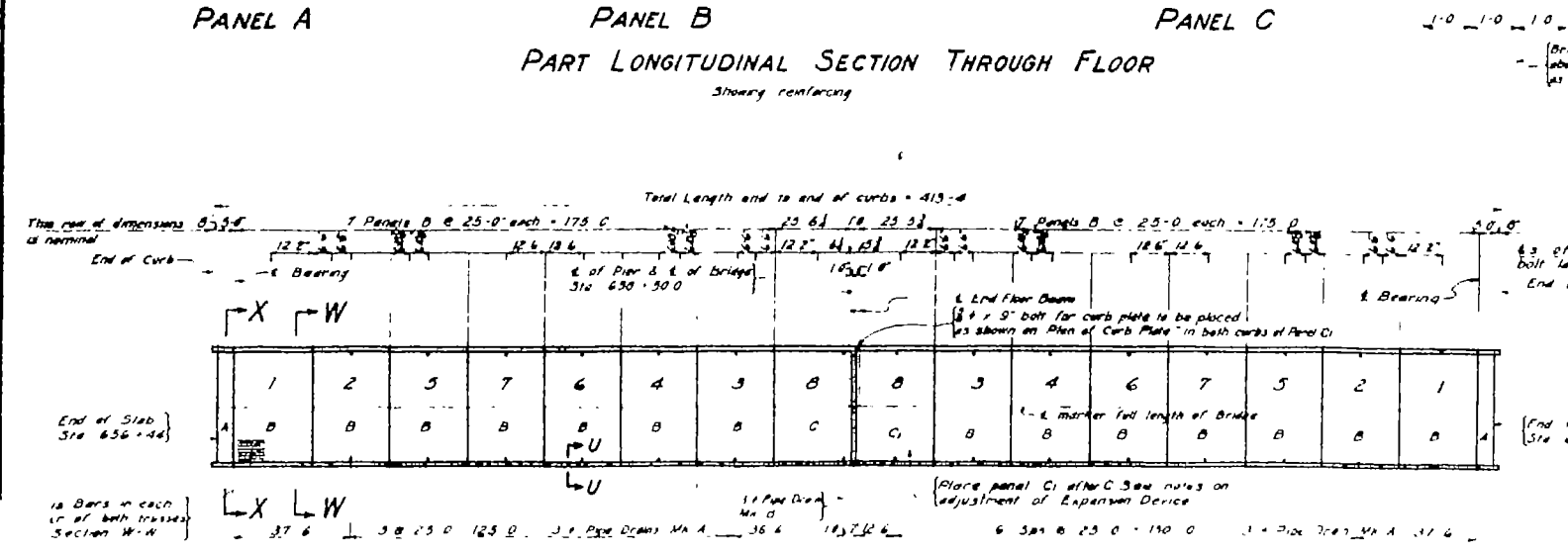
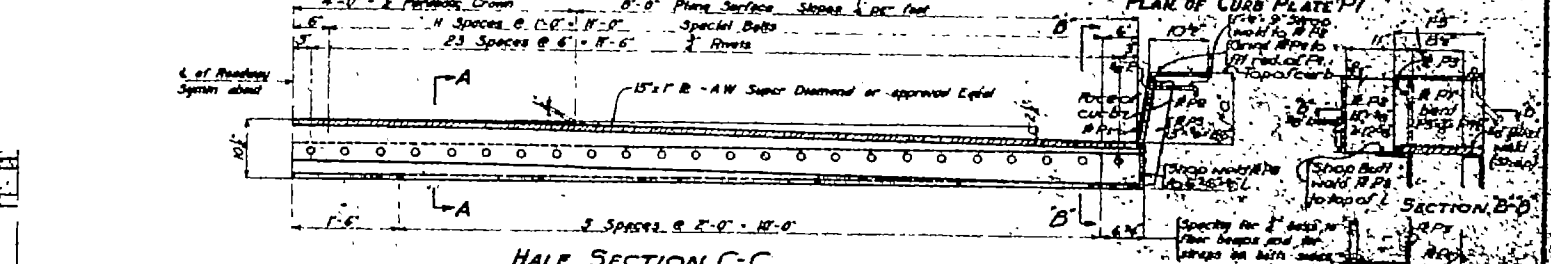
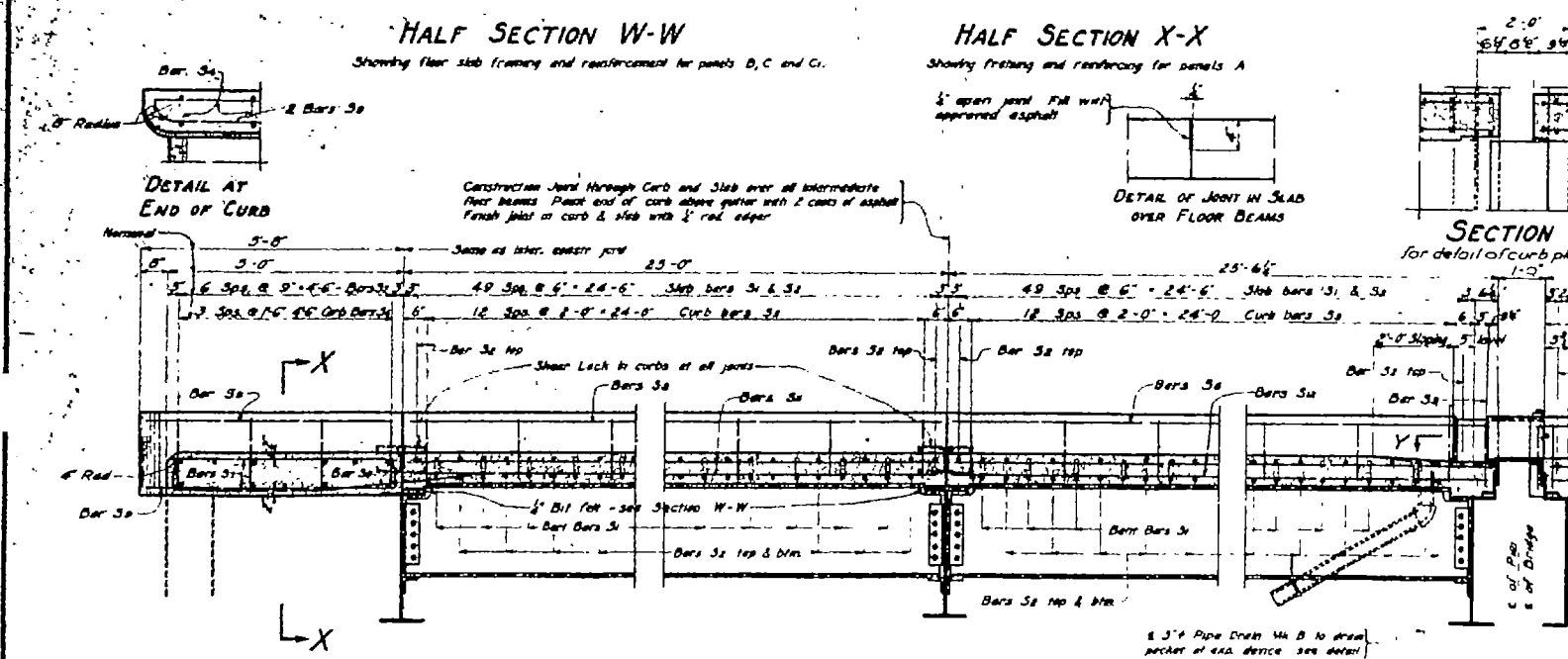
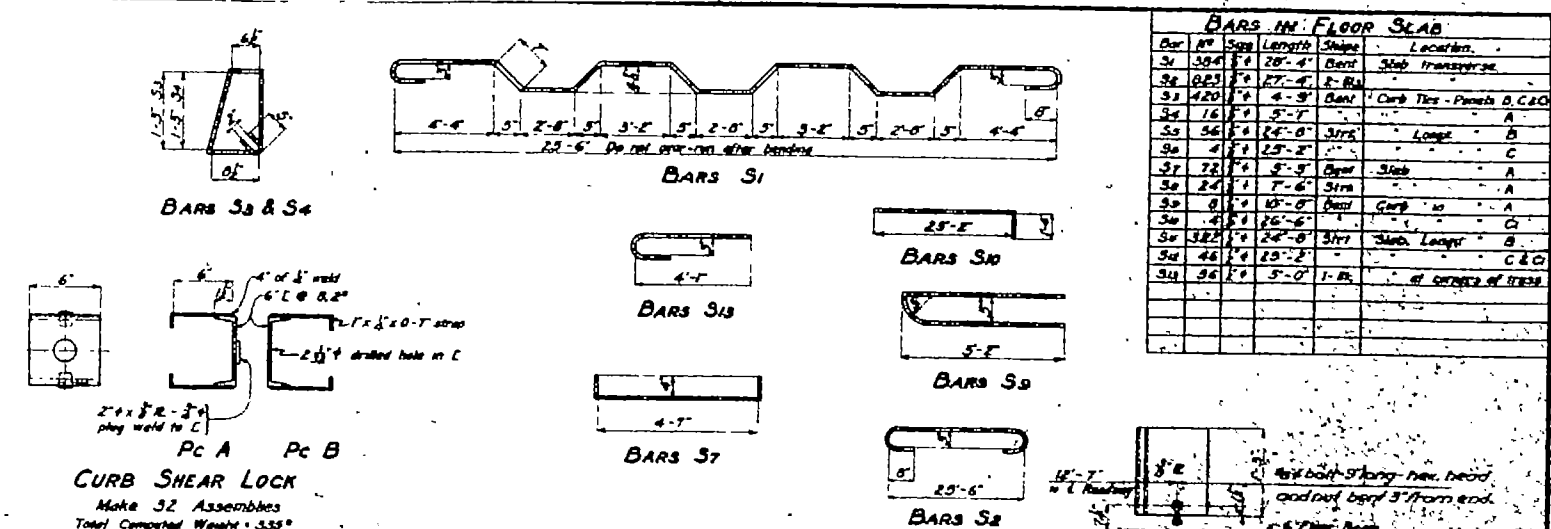
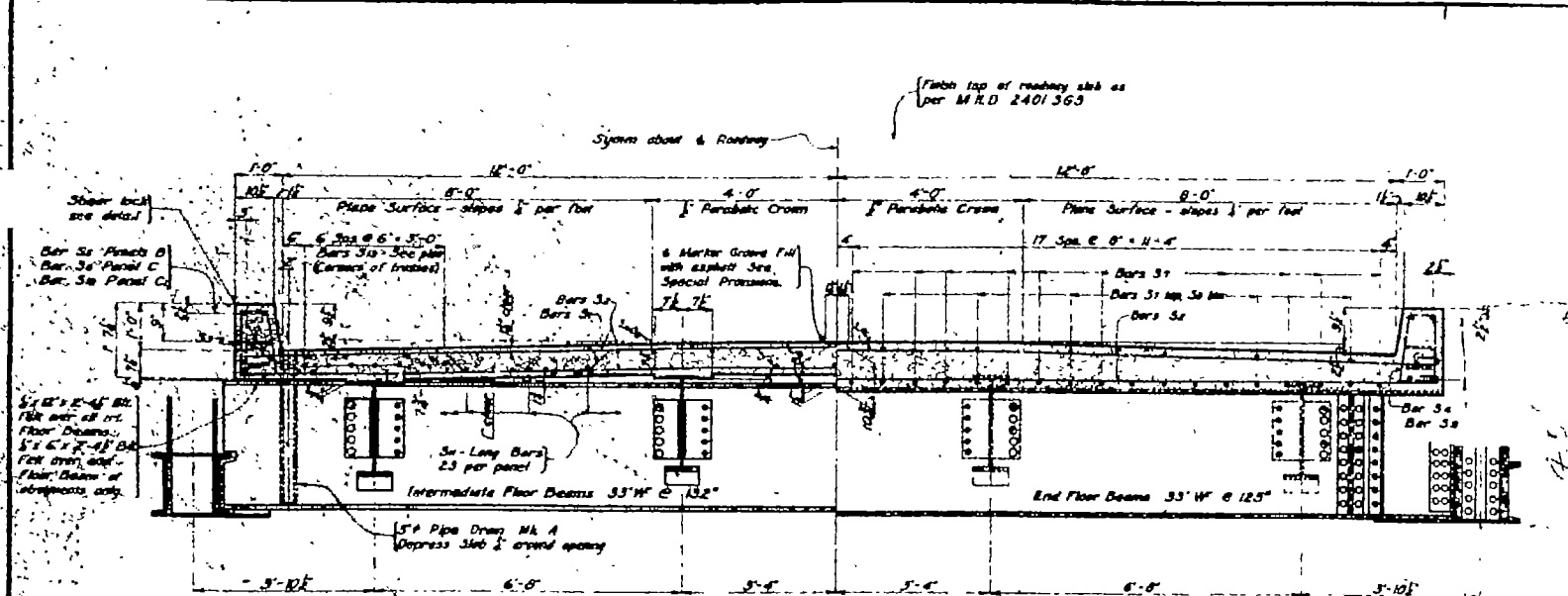
WIND SHEAR BLOCK GRILLAGE

SUMMARY OF STEEL WEIGHTS FOR ENTIRE BRIDGE	
8 TRUSS SPANS AT 200'00"	872,800 LBS.
EXPANSION DEVICES	3,000
BEARING PLATES	3,600
END POST ANCHOR BOLTS	800
GRILLAGE ON PIER	1,600
SHIM BLOCKS IN CURVES	1,800
DRIVING IN FLOOR SLAB	700
STEEL UNDER FLOOR SLAB	170
TOTAL COMPLETED WEIGHT	885,700 LBS.
PLUS 5% AS PER M.H.D. PROVISION	44,285
TOTAL ESTIMATED WEIGHT	930,000
FOR ECONOMY PURPOSES USE	900,000

RED RIVER BRIDGE
 EAST OF GARDNER, NORTH DAKOTA
 SOUTHWEST OF STAPLETON, MINNESOTA
STRESS SHEET
 FOR
 200 FT. x 24 FT. TRUSS SPAN



RED RIVER BRIDGE
EAST OF GRAFTON, NORTH DAKOTA
SOUTHWEST OF STEPHEN, MINNESOTA
TRUSS CONNECTIONS

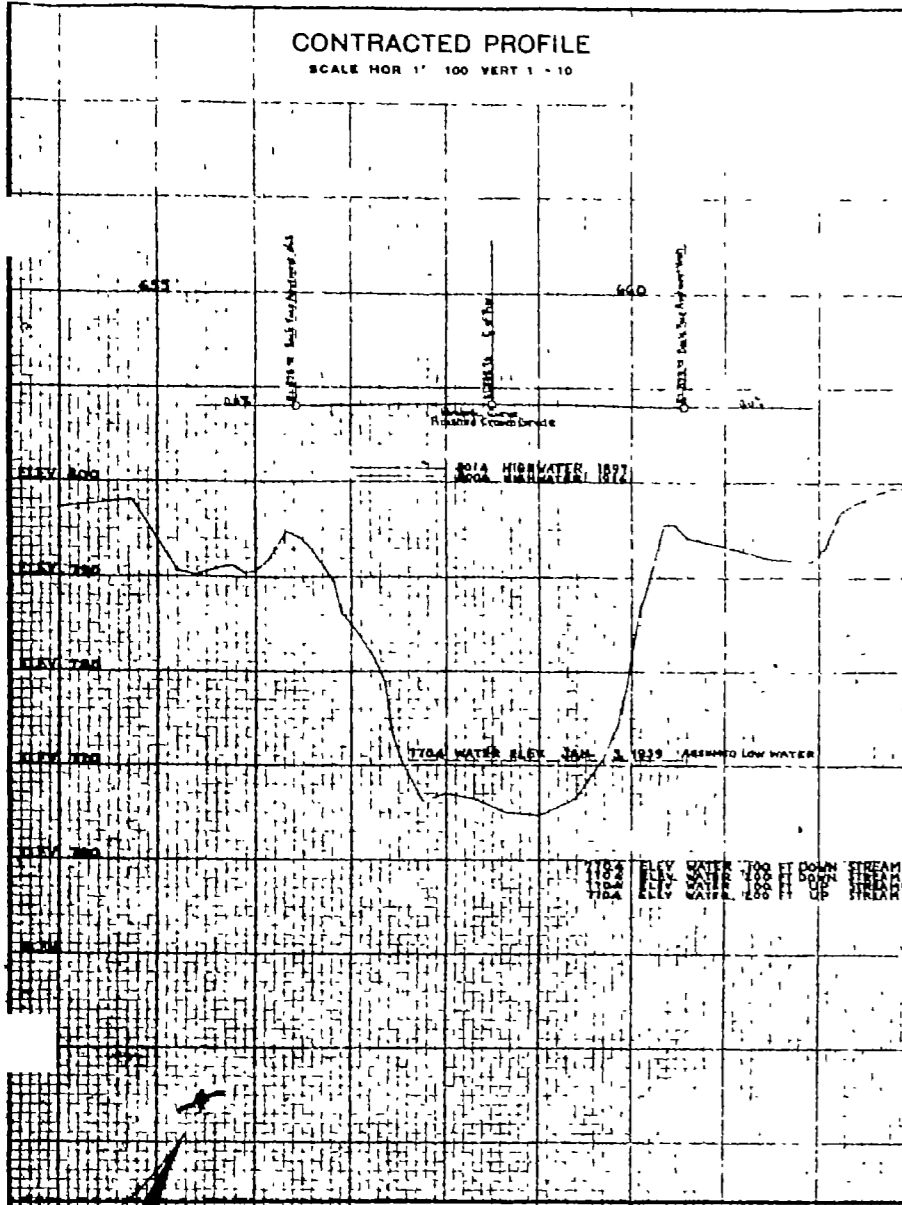


QUANTITIES FOR TWO SPANS	
Grade A Concrete	200.5 Cu Yds
Reinforcement Bars	45,970 Lbs
Structural Steel (billed on sheet 13)	
4 Pcs 1/2" Dia. Rail 6' x 2'-4 1/2"	
20 Pcs 1/2" Dia. Rail 12' x 2'-4 1/2"	
Cost to be included in prices bid for other items	

RED RIVER BRIDGE
 EAST OF GRAFTON, NORTH DAKOTA
 SOUTHWEST OF STEPHEN, MINNESOTA
 FLOOR SLAB

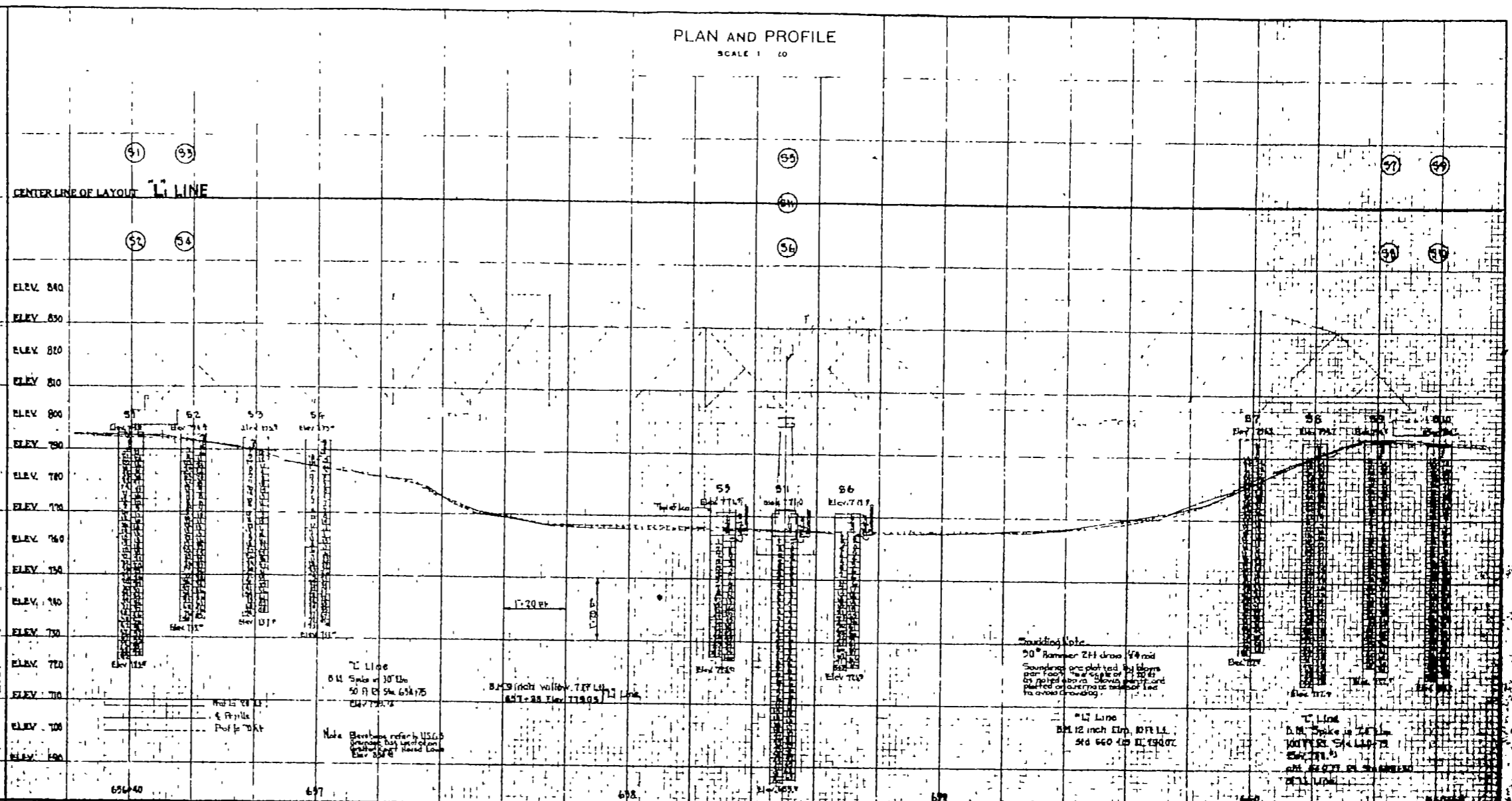
CONTRACTED PROFILE

SCALE HOR 1" = 100 VERT 1" = 10



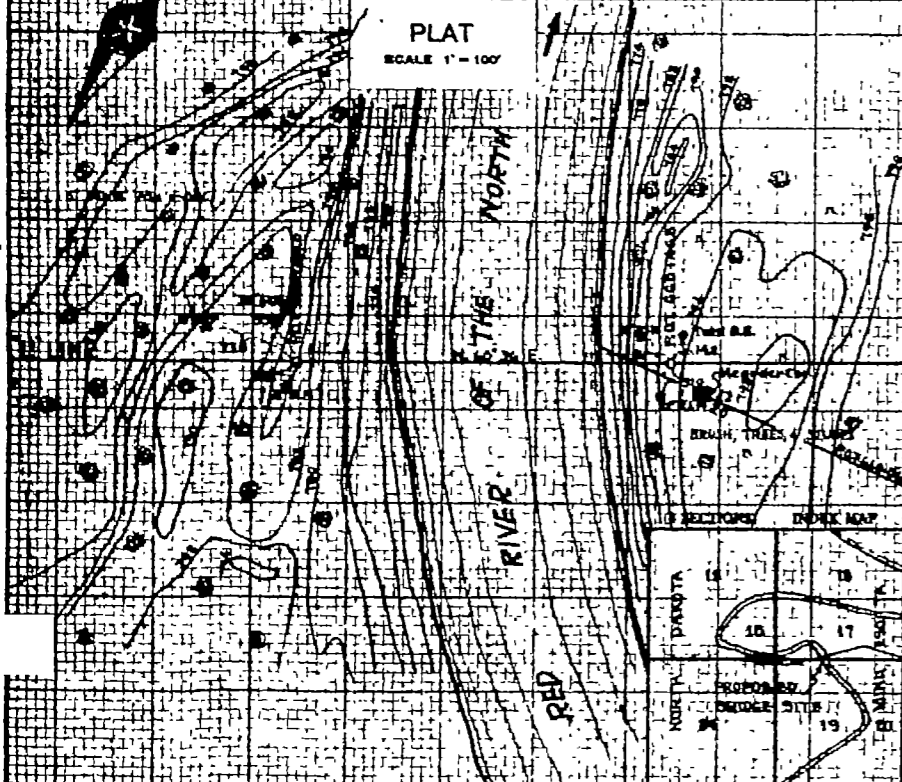
PLAN AND PROFILE

SCALE 1" = 100



PLAT

SCALE 1" = 100'



SHOW ON CONTRACTED PROFILE

- a Present and proposed grades of roadway for a sufficient distance from each end of bridge to show present and proposed spillways, if any, grades of approaches, and also approximate profile of natural surface of ground
- b Present and proposed grades of bridge floor, and elevation of bottom of old bridge superstructure
- c High and low water stages Give average high water and extreme high water elevations and state how often extreme high water occurs Give date by years
- d Proposed elevation of bottom of footings.
- e Elevation of water surface taken at edge of water, at bridge site, and 100 ft and 200 ft, both above and below bridge site, also at any sudden drops or waterfalls

SHOW ON PLAT

- a North upward (Show by arrow).
- b Course of stream 250 feet or more above and below bridge site.
- c Direction of flow.
- d Location of existing and proposed roads, clear widths of same and the stationing
- e Location of present bridge with general dimensions and description of same
- f Location of proposed bridge.
- g Location of points where flood waters are likely to scour the banks and bed of stream and description of any pools which may have formed near bridge site
- h Recommended change of channel
- i Small sketch of four sections showing approximate course of stream and road, also location of proposed bridge
- j Show name of stream, state whether it is a River, Creek, Drainage Ditch, Ravine or Dry Run, etc.

SHOW ON PLAN AND PROFILE

- a Cross-section of stream on center line of proposed bridge (full black line), cross-sections parallel to, and 20 feet on each side of the center line (dashed black line downstream and dotted black line upstream) Show sufficient length of profiles so that data is available for possible shift in bridge stationing
- b A layout showing station and distance (about 20 feet out from proposed center line), to all soundings Take at least two soundings for each pier and abutment. Drive to practical refusal if within depth of 50 to 60 feet
- c Number the soundings S1, S2, S3, etc., plot soundings in true position on profile and show plainly what materials are encountered in each sounding and at what elevations the various materials are encountered Show number of blows required for the driving of each foot of red and final elevation of bottom of each red. State size of sounding rod, type and weight of hammer, as well as distance of hammer fall or height of hammer blow
- d Location elevation and description of a permanent bench mark Give description of available U S Bench Marks and references to same.
- e Show typical highway section planned for use adjacent to proposed bridge, also cross-section of proposed channel change, if any
- f If bridge is over 200 feet long, use cross-section paper of sufficient length to furnish required data

DATA

- 1 Preliminary recommendations of Engineer in charge of Bridge Survey:
 - a Net Span Length and Type of Bridge _____
 - b Width of Roadway on Bridge _____ Number and width of sidewalks, if any _____ Type of Railings _____
 - c If a skew bridge is recommended, the angle of skew should be _____ Locate center of Bridge at Station _____
 - d Is piling required? Yes No If required, bottom of pile should penetrate to Elev. _____ for Abutments; and Elev. _____ for Pier
- 2 Special Features: Waterfalls, dams, exceptional floods, ice, drifted wood, sliding banks, logging, etc. _____
- 3 Changes: In height or length from that of old bridge, and reasons why _____
- 4 Other bridges over same stream:
 - a Location, length, height above water, net cross-sectional area at highwater stage, and estimated age _____
 - b Reason why these bridges are, or are not, fair indications of what length the proposed bridge should be _____
- 5 State navigation or boating clearances required, if any: _____
- 6 Information and evidence by regard to high water stages was obtained as follows: Obtained from information given by local farmer located 1/2 mile east of bridge site and from farmer located 1/2 mile upstream from bridge site.
- 7 Must contractor provide for traffic during construction of proposed bridge, _____ No. _____ If so, by what means? _____

MATERIAL

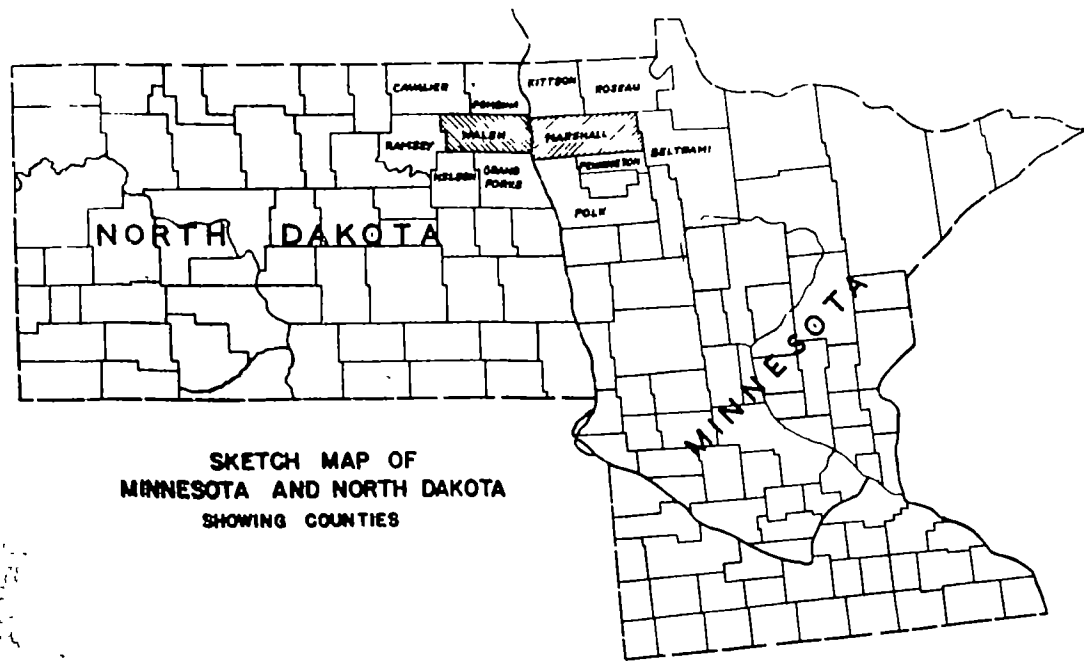
Nearest or most convenient chipping point for sand, cement and other material is Grafton, Mo. 601 which is about 12 1/2 miles from bridge site, condition of road is 10 Miles gravel 1/2 mile Unimproved Road 1 Mile No. Road

ROAD ON MINNESOTA SIDE

Chipping Point - Stephen, Minnesota; about 15 miles from bridge site (18 miles of State road and 2 1/2 miles of Top road and 1/2 mile of no road)

**STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
REPORT OF BRIDGE SURVEY
ON**

MINNESOTA COUNTY Marshall STATE MO OR TERRITORY MISSOURI
SEC. 17 TWP. 152N R. 60W
FORK TOWNSHIP
MARSHALL COUNTY
SURVEY MADE DURING MONTH OF Jan to Mar 1939
ENGINEER IN CHARGE E.W. Johnson
BRIDGE No. 5872



SKETCH MAP OF MINNESOTA AND NORTH DAKOTA SHOWING COUNTIES

MINNESOTA HIGHWAY DEPARTMENT
AND
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

PLANS FOR AN
INTERSTATE HIGHWAY BRIDGE
OVER THE
RED RIVER OF THE NORTH
INCLUDING APPROACHES

BETWEEN
STEPHEN, MARSHALL COUNTY, MINNESOTA AND GRAFTON, WALSH COUNTY, NORTH DAKOTA

FEDERAL AID SECONDARY PROJECT NO. FAS 74 A (1)

LIST OF SHEETS	
Sheet No	Description
1	Title Sheet
2	General Plan & Elevation
3	Detail of Abutments
4	Detail of Pier
5	Stream Sheet
6	Truss Connections
7	Railing and Shoe Details
8	Floor Slab
9	Survey

Plans for Section A(1)

Beginning at a point described as follows: 132.9 feet south and 230.77 west of the S.E. corner of Section 17, T.157N, R.50W, and ending at a point described as follows: 70 feet north and 1045.9 west of the S.E. corner of Section 17, T.157N, R.50W

Length of project: Gross Length = Net Length = 0.078 Miles

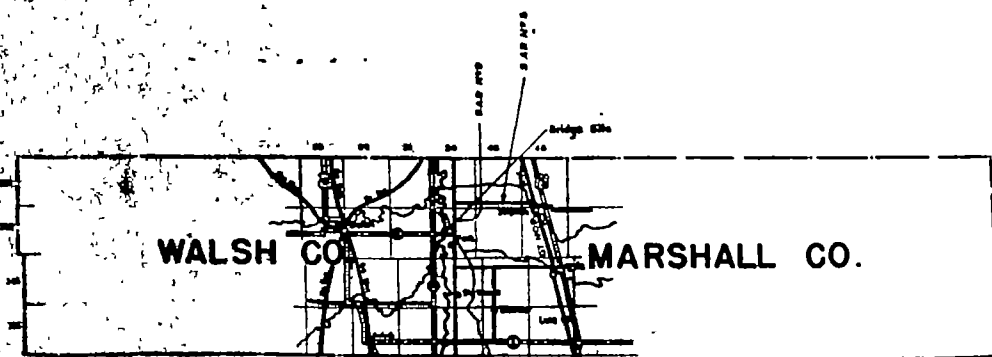
SYSTEM DIST. HWY. AGREEMENT

F - 6 - 17 ()

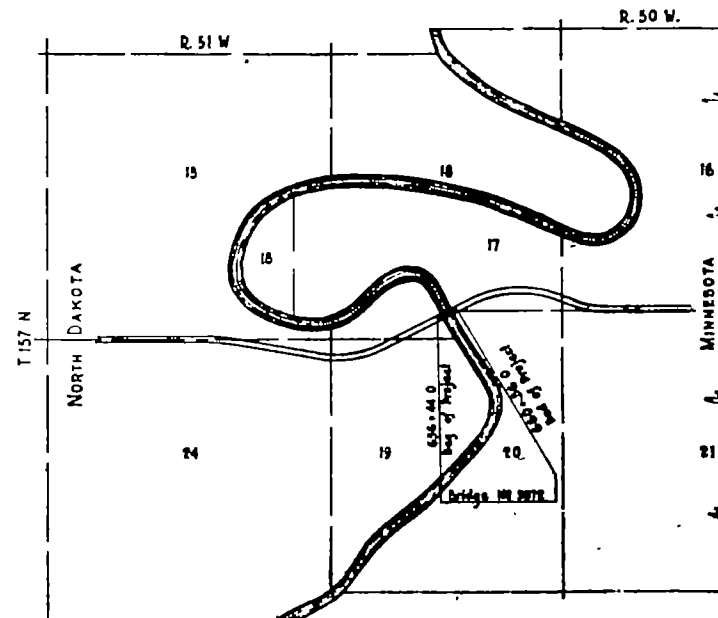
MILE 140

Specifications.

The "Specifications for Highway Construction" dated July 1, 1930, submitted to the Bureau of Public Roads for approval July 20, 1930, and recommended for approval by the Federal Highway Board, Bureau of Public Roads, July 23, 1930, as modified by Supplement No. 2 thereto dated April 1, 1933, submitted to the Bureau of Public Roads for approval April 14, 1933, shall govern.



SKETCH MAP OF MARSHALL CO. MINN. & WALSH CO., NO. DAK.



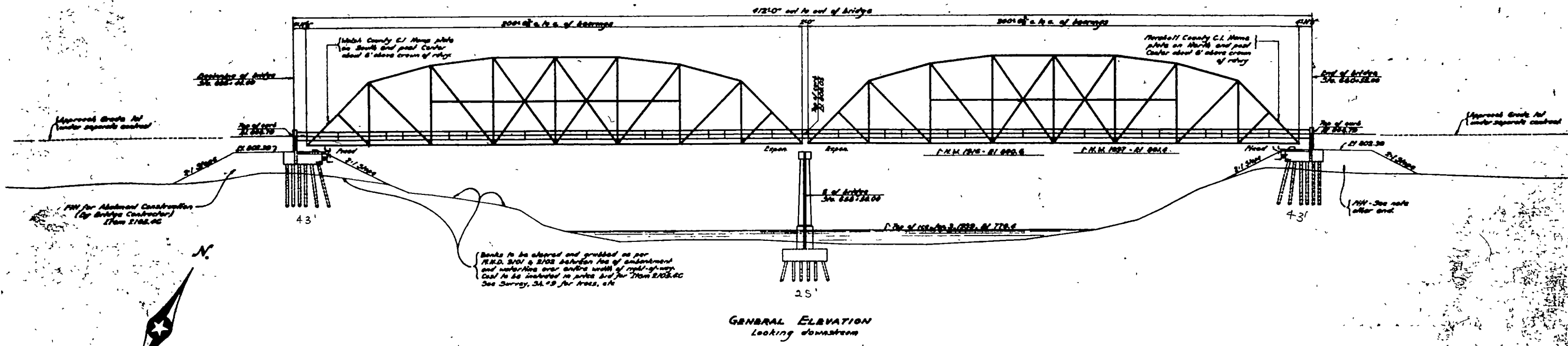
LAYOUT MAP
SCALE - 3 IN = 1 MI.
1 IN = 1760 FT.

Executive Order
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
Approved: *[Signature]*
HONORABLE ENGINEER ACTING CHIEF ENGINEER

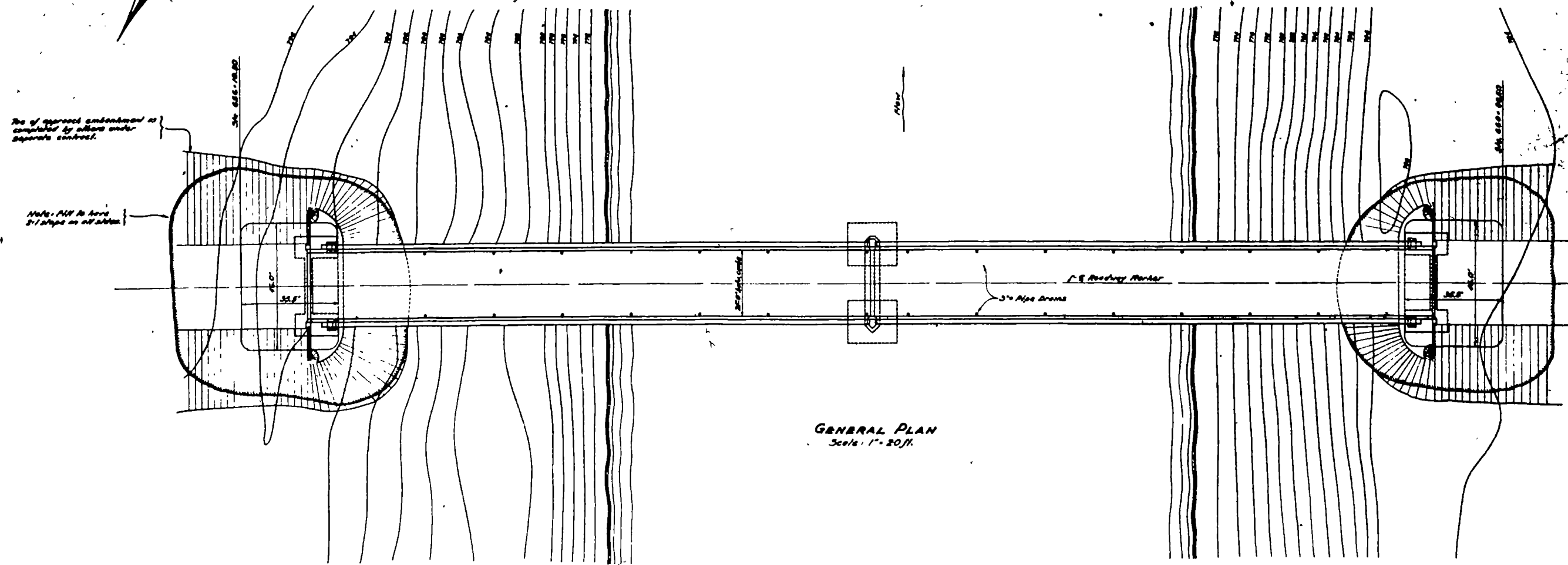
STATE OF NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
Approved: *[Signature]*
HONORABLE ENGINEER STATE HIGHWAY ENGINEER

U. S. DEPARTMENT OF AGRICULTURE

Examined by: _____
Recommended for Approval: _____
Approved: _____
Approved by: _____
Secretary of Agriculture



GENERAL ELEVATION
Looking Downstream



GENERAL PLAN
Scale: 1" = 20'

SUMMARY OF QUANTITIES FOR ENTIRE BRIDGE

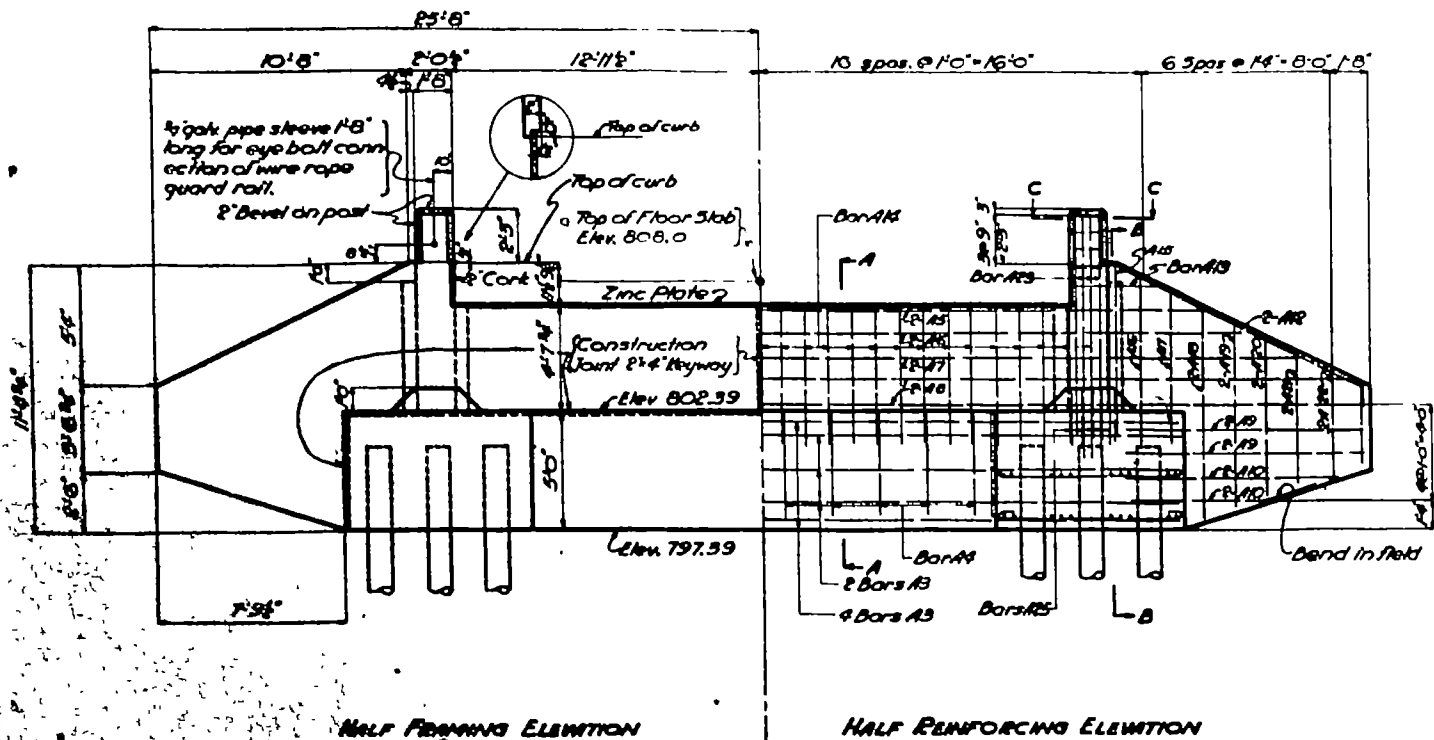
Item No	2405.02	2405.03	2405.04	2405.05	2405.06	2405.07	2405.08	2405.09	2405.10	2405.11	2405.12	2405.13	2405.14	2405.15	2405.16	2405.17	2405.18	2405.19	2405.20
Item	Class "C" Excavation	Class "B" Excavation	Class "A" Excavation	Grade "A" Concrete	Cement	Reinforcing Bars	Structural Steel	Cast Steel	Steel Lead	Zinc	Normal ANMS	Untreated Bitum Drivng Brvds	Untreated Bitum Drivng Brvds	Treated Bitum Drivng Brvds	Treated Bitum Drivng Brvds	Untreated Paving (100%)	Untreated Paving (50%)	Untreated Paving (25%)	Treated Paving (100%)
Unit	Cu Yd	Cu Yd	Cu Yd	Cu Yd	Dbl	Lb	Lb	Lb	Lb	Sq Ft	Ech	Lin Ft	Lin Ft	Lin Ft	Lin Ft	Ech	Ech	Ech	Ech
Quantity	3200	170	715	647	1000	73,890	600,000	9420	275	70	2	7920	1792	13200	3072	2	2	6	8

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
AND
HIGHWAYS
STATE HIGHWAY DEPARTMENT
**GENERAL PLAN & ELEVATION
BRIDGE NO 5872**
INFRASTRUCTURE BRIDGE OVER
RED RIVER OF THE NORTH
Between
STEPHAN, MARSHALL CO & GRANTON, WA
MINNESOTA & MARSHALL CO, MN
Approved - June 1, 1939.

E. J. Miller
O. L. P.

ADJUSTMENT PROCEDURE IN THE EVENT OF ABUTMENT MOVEMENT

1. Raise fixed end of truss span by jacking at stiffeners on end floor beam and raise end of end slab to free it from back wall during moving.
 2. Remove shim plates under Truss Shoes, prepare new bearing areas place 2-3" x 2" x 6" steel bars with top surface greased under Truss Shoes and release jacks.
 3. Place Jacks against Truss Shoes and jock longitudinally as desired.
 4. Remove steel bars and rest span on shim plates on new bearing areas.
- Note that for movement of over 2" railing will contact concrete post and must be cut off.

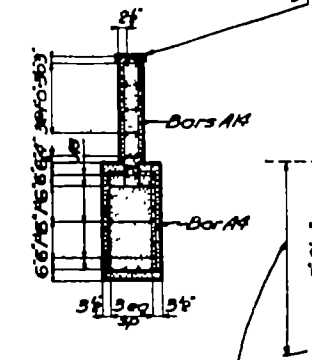


HALF FRAMING ELEVATION

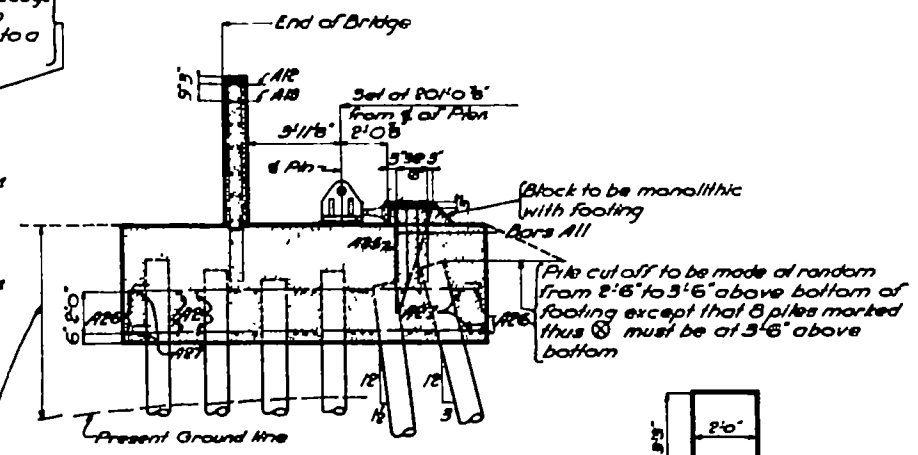
HALF REINFORCING ELEVATION

Abutment is symmetrical about 4

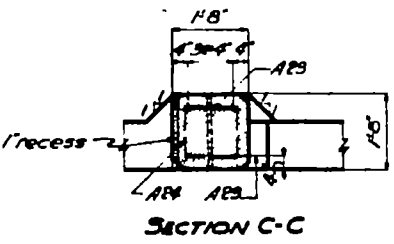
Zinc Plate #12 Am Zinc Gauge
1/4" wide bend as shown
Trowel top of parapet to a smooth finish.



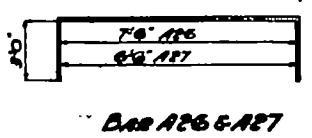
SECTION A-A



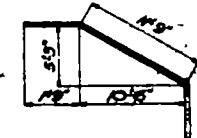
SECTION B-B
(For limits of embankment to be placed at abutments see 5h #2)



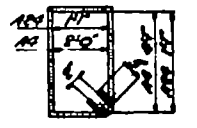
SECTION C-C



BAR A11



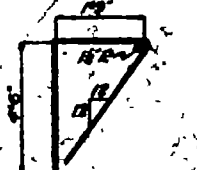
BAR A12



BAR A13



BAR A14



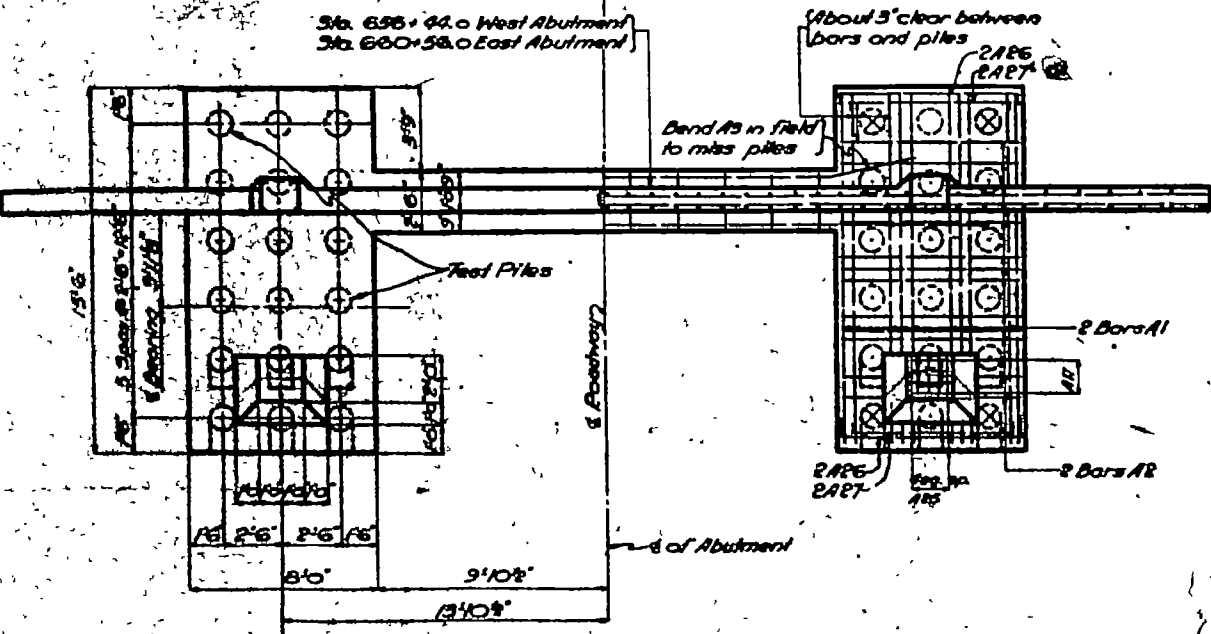
BAR A15



BAR A16

BAR A17

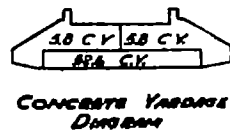
BAR A18



HALF FRAMING PLAN

HALF REINFORCING PLAN

Maximum Pile Load	
At Top (1/4 of bearing located 4 ft from parapet)	Dead Load 14 Tons Live Load 4 Tons Total 18 Tons
At Head (1/4 of bearing located 1 ft from parapet)	Dead Load 15 Tons Live Load 3.5 Tons Total 18.5 Tons



CONCRETE YARDING DIAGRAM

MAKE TWO ABUTMENTS TRUE

BILL OF BARS FOR TWO ABUTMENTS

Bar No.	Length	Location
A1	110'	Reinforcing longitudinal
A2	98'	Reinforcing Transverse
A3	17'	To Beam
A4	10'	To Beam
A5	8'	Parapet slaking horizontal
A6	8'	2'-0"
A7	8'	2'-0"
A8	8'	2'-0"
A9	8'	2'-0"
A10	8'	2'-0"
A11	16'	Jacking Leg
A12	8'	Top of Hing
A13	8'	Hing horizontal
A14	8'	Parapet vertical
A15	8'	Hing Vertical
A16	8'	2'-0"
A17	8'	2'-0"
A18	8'	2'-0"
A19	8'	2'-0"
A20	8'	2'-0"
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A98	8'	2'-0"
A99	8'	2'-0"
A100	8'	2'-0"

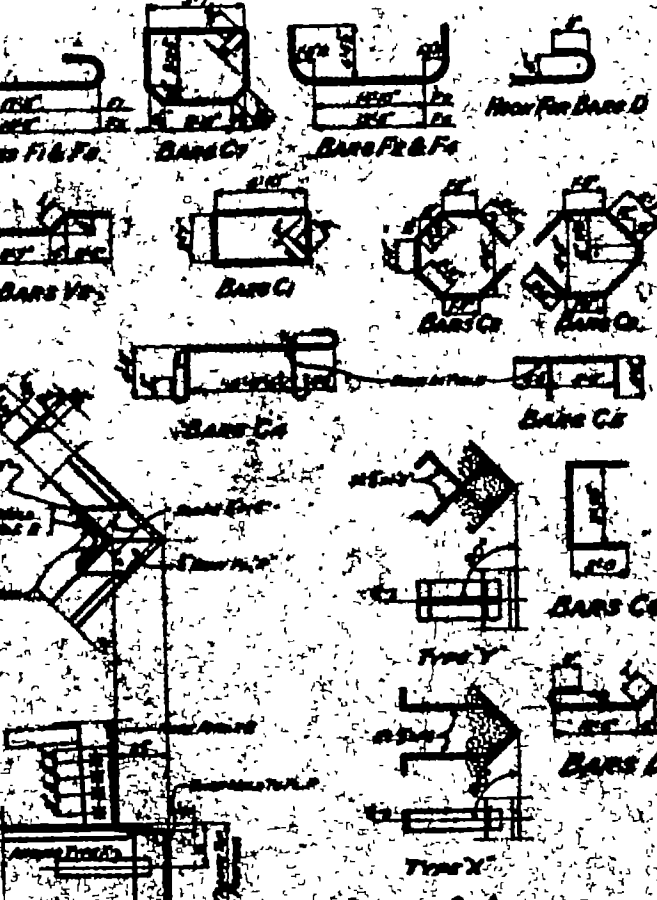
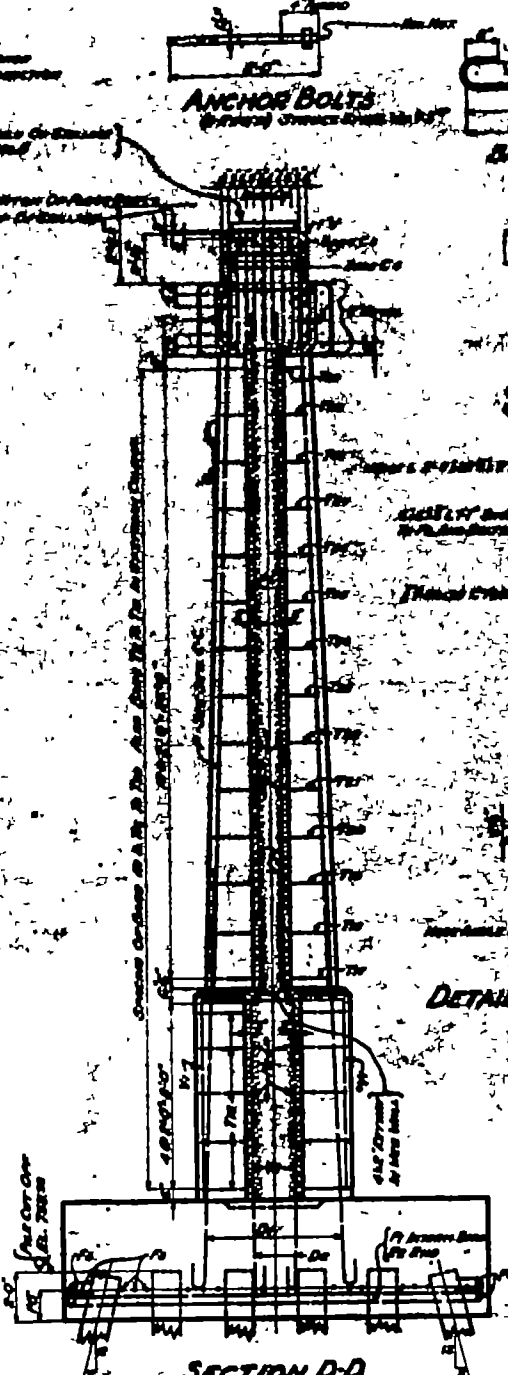
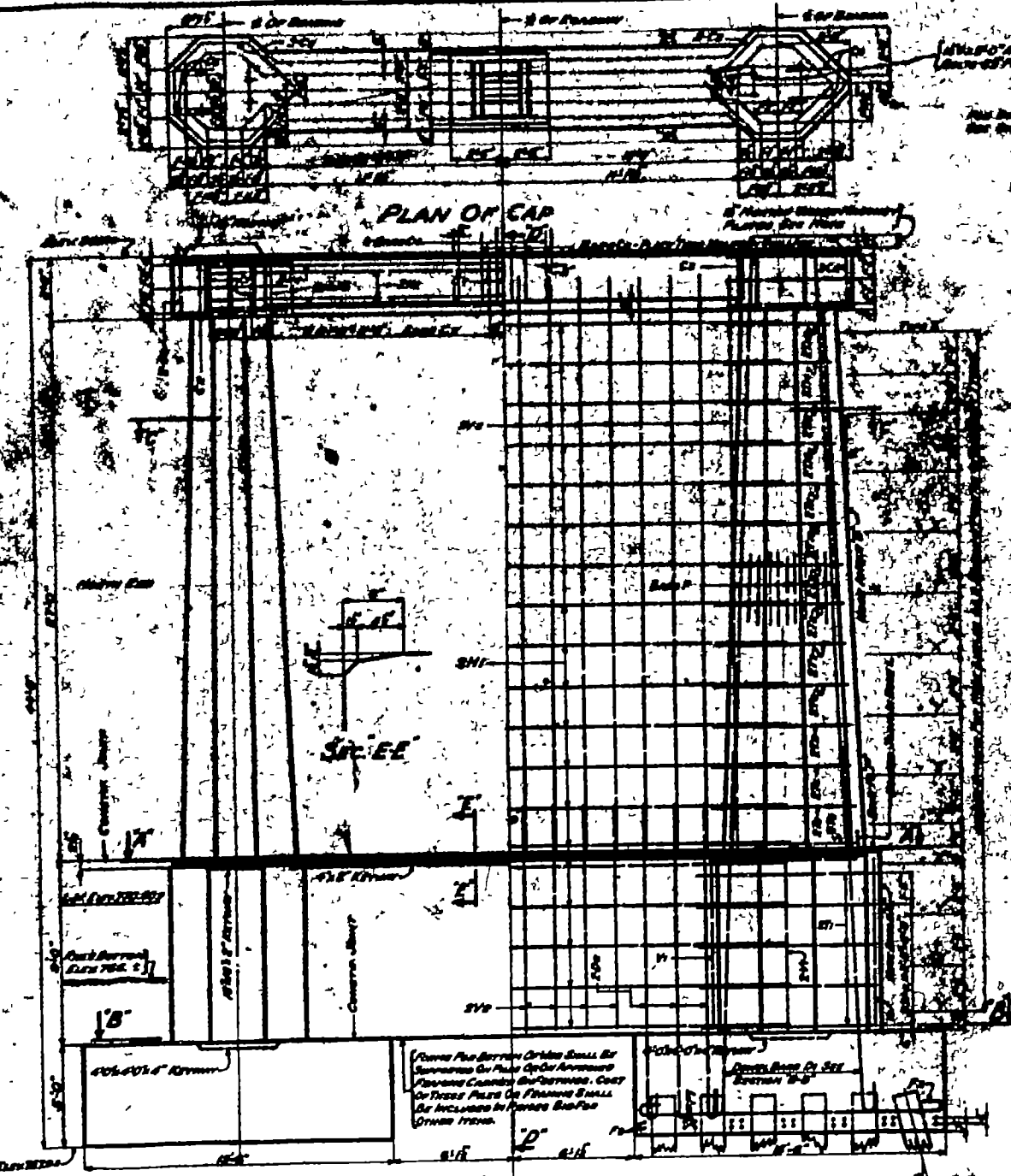
Quantities for two Abutments

Excavation	170 Cu Yds
Grade 2 Concrete	115.4 Cu Yds
Reinforcement Bars	8250 lbs
Sheet Piling	73 Lf
6" Treated Timber Piles @ 20 ft - 3100 Lf	
8 Treated Timber Piles @ 20 ft - 160 Lf	
4 Piles Driven to 10 ft - 40 Lf	
Class C Excavation	3200 Cu Yds

* Include cost in prices bid for other items
o Total of 3 Cu Yds has been deducted for pile heads

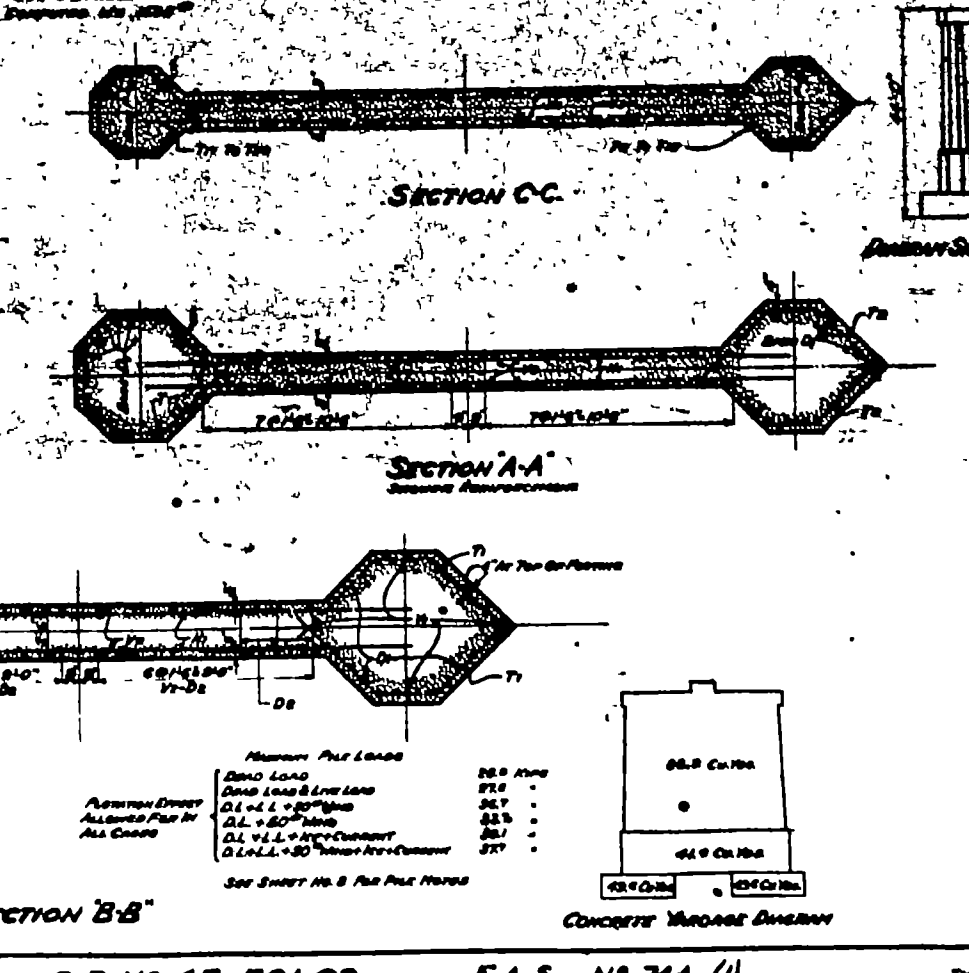
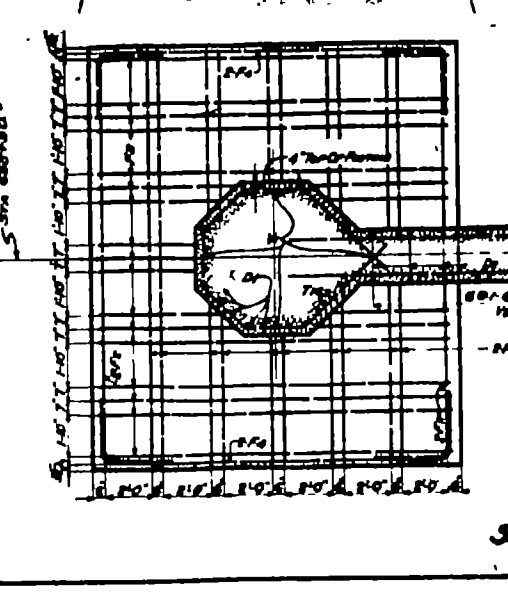
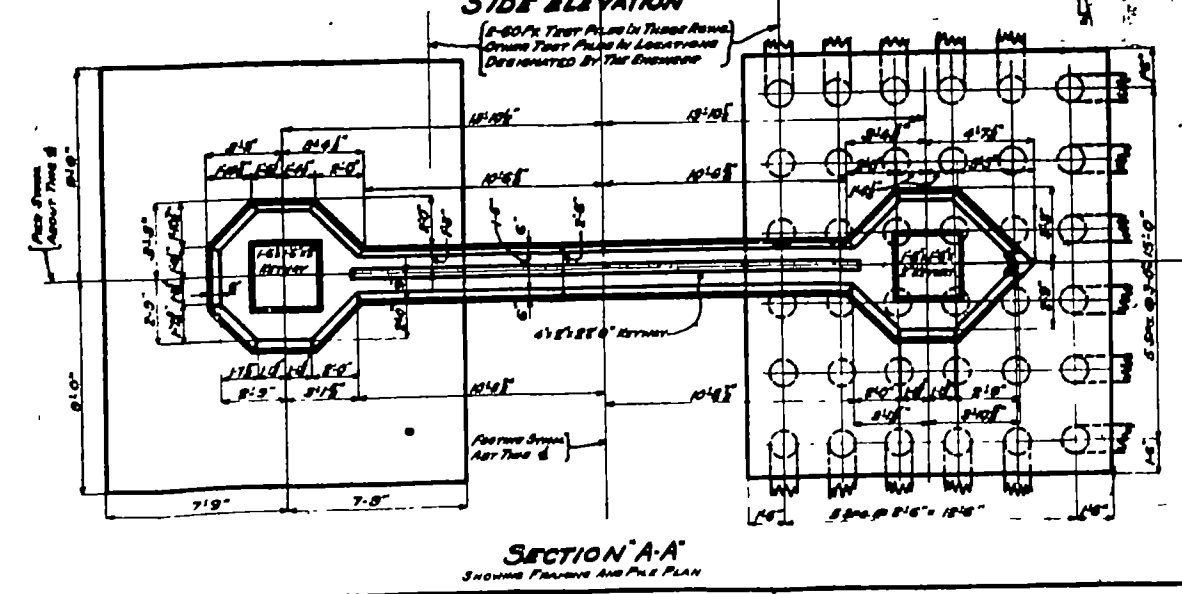
Pile Note:
Driven length of piling other than Test Piles has been assumed as 2 ft less than delivered length.
Order Piling according to M.H.A. 1901.90

RED RIVER BRIDGE
East of Canton, North Dakota
Southwest of Steamboat, Minnesota
DETAIL OF ABUTMENTS



Bar No.	Bar Size	Bar Spacing	Bar Length	Bar Location
1	1/2"	12"	10'	Top of Cap
2	1/2"	12"	10'	Top of Cap
3	1/2"	12"	10'	Top of Cap
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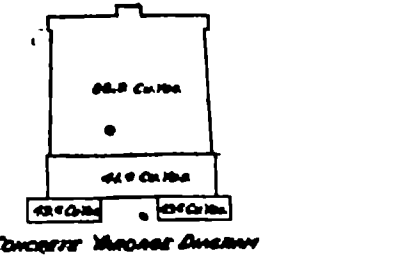
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56	1/2"	12"	10'	Top of Cap
57	1/2"	12"	10'	Top of Cap
58	1/2"	12"	10'	Top of Cap
59	1/2"	12"	10'	Top of Cap
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62	1/2"	12"	10'	Top of Cap
63	1/2"	12"	10'	Top of Cap
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73	1/2"	12"	10'	Top of Cap
74	1/2"	12"	10'	Top of Cap
75	1/2"	12"	10'	Top of Cap
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78	1/2"	12"	10'	Top of Cap
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80	1/2"	12"	10'	Top of Cap
81	1/2"	12"	10'	Top of Cap
82	1/2"	12"	10'	Top of Cap
83	1/2"	12"	10'	Top of Cap
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93	1/2"	12"	10'	Top of Cap
94	1/2"	12"	10'	Top of Cap
95	1/2"	12"	10'	Top of Cap
96	1/2"	12"	10'	Top of Cap
97	1/2"	12"	10'	Top of Cap
98	1/2"	12"	10'	Top of Cap
99	1/2"	12"	10'	Top of Cap
100	1/2"	12"	10'	Top of Cap



MAXIMUM PILE LOADS

LOAD TYPE	LOAD VALUE
DEAD LOAD	200 TONS
DEAD LOAD & LIVE LOAD	275 TONS
DL + 1/2 LL + 1/4 WIND	300 TONS
DL + 1/2 LL + 1/4 WIND + 1/4 CURRENT	325 TONS
DL + 1/2 LL + 1/4 WIND + 1/4 CURRENT + 1/4 ICE	350 TONS

SEE SHEET NO. 8 FOR PILE DETAILS



DETAILS OF ANCHORS
ANCHORS FOR BRIDGE PIER

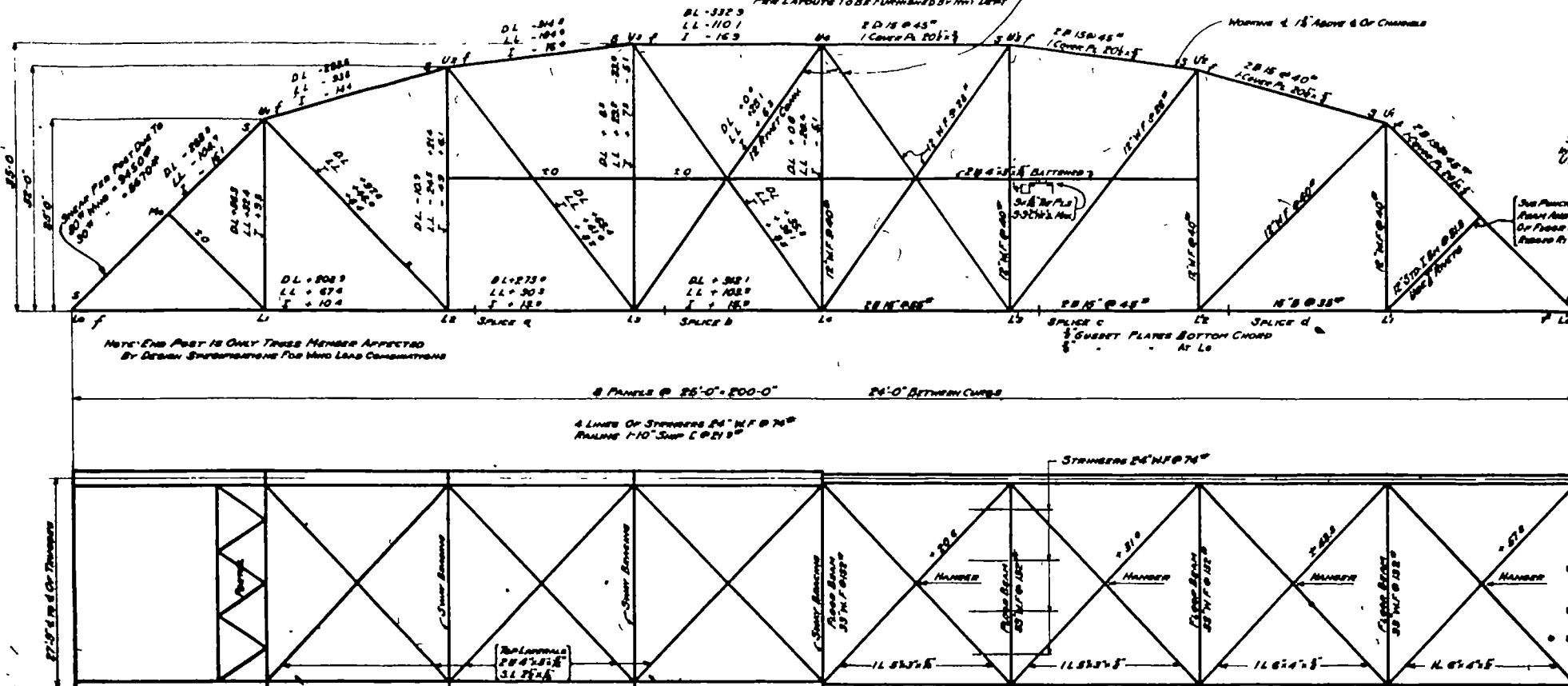
DETAILS OF ANCHORS
ANCHORS FOR BRIDGE PIER

RED RIVER BRIDGE
EAST OF GRAFTON NORTH DAKOTA
SOUTHWEST OF STEPHENS MINNESOTA
DETAIL OF PIER

NOTES FOR THE CHORD AND END POST
 1. MEMBER PLATES DL 28-3
 2. RIVETS - 8" PITCH UNLESS NOTED
 CHANNELS 18" BACK TO BACK

NOTES MEMBERS AND CONNECTIONS SUBJECT TO REVERSAL
 OR STRESS SHALL BE FINISHED ACCORDING TO
 PAR 5 & 6 A.A.S.H.O. SPEC. DATA 1935
 CONNECTIONS FOR ROLLED MEMBERS HAVING
 EXCESS SECTIONAL AREA, AND STAYS, TO BE AS
 PER LAYOUT TO BE FURNISHED BY THE DEPT.

CONNECTION AT THIS END IS TO BE 1/8" TO BE SUB
 IN SHOP AND RIVETS TO 1/4" IN FIELD AFTER FLOOR SLAB
 IS COMPLETED. CONNECTIONS TO BE MADE WITH RIVETS
 FIRST BOLTS 10 TONS OF TENSILE (MATERIAL EQUIPMENT OF
 TRUCK) SHALL BE PLACED ON THE FLOOR NEAR EACH CHORD AT
 PANEL POINTS 1/4" DURING FINISHING AND BOLTING



HALF PLAN - TOP LATERALS

HALF PLAN - BOTTOM LATERALS

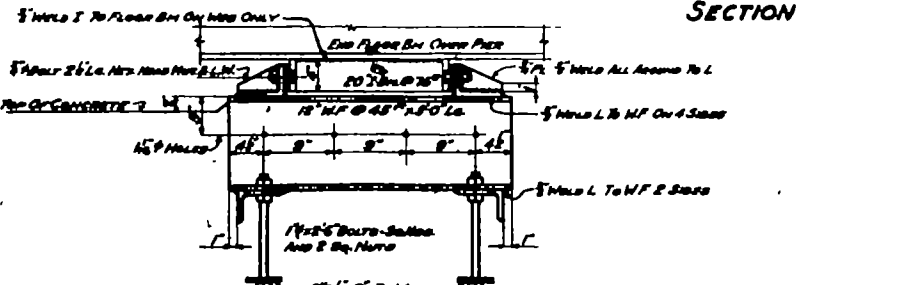
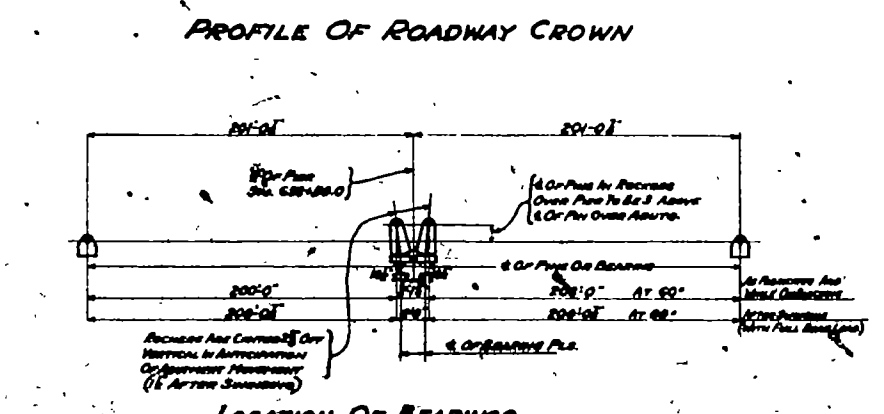
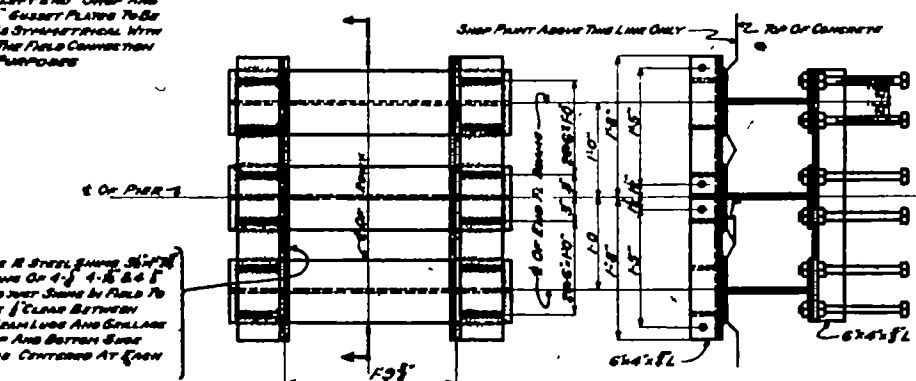
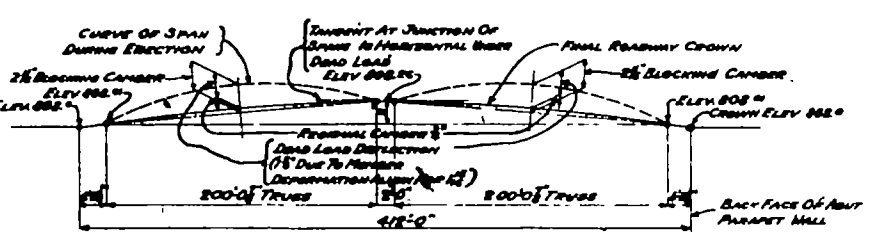
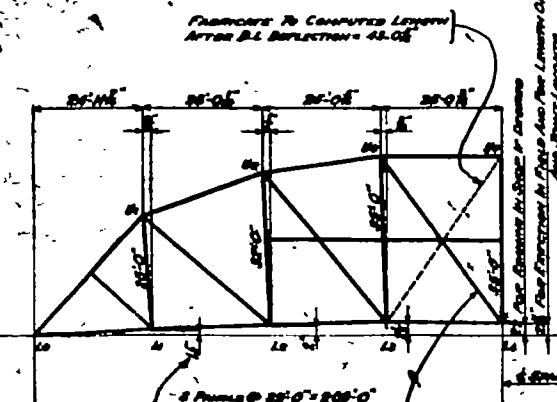
INTERMEDIATE SECTION

END VIEW

DESIGN SPECIFICATIONS
 LIVE LOAD CLASS III AS PER A.A.S.H.O.
 COOP. OF 1936
 UNIT STRESS AS PER ABOVE CODE

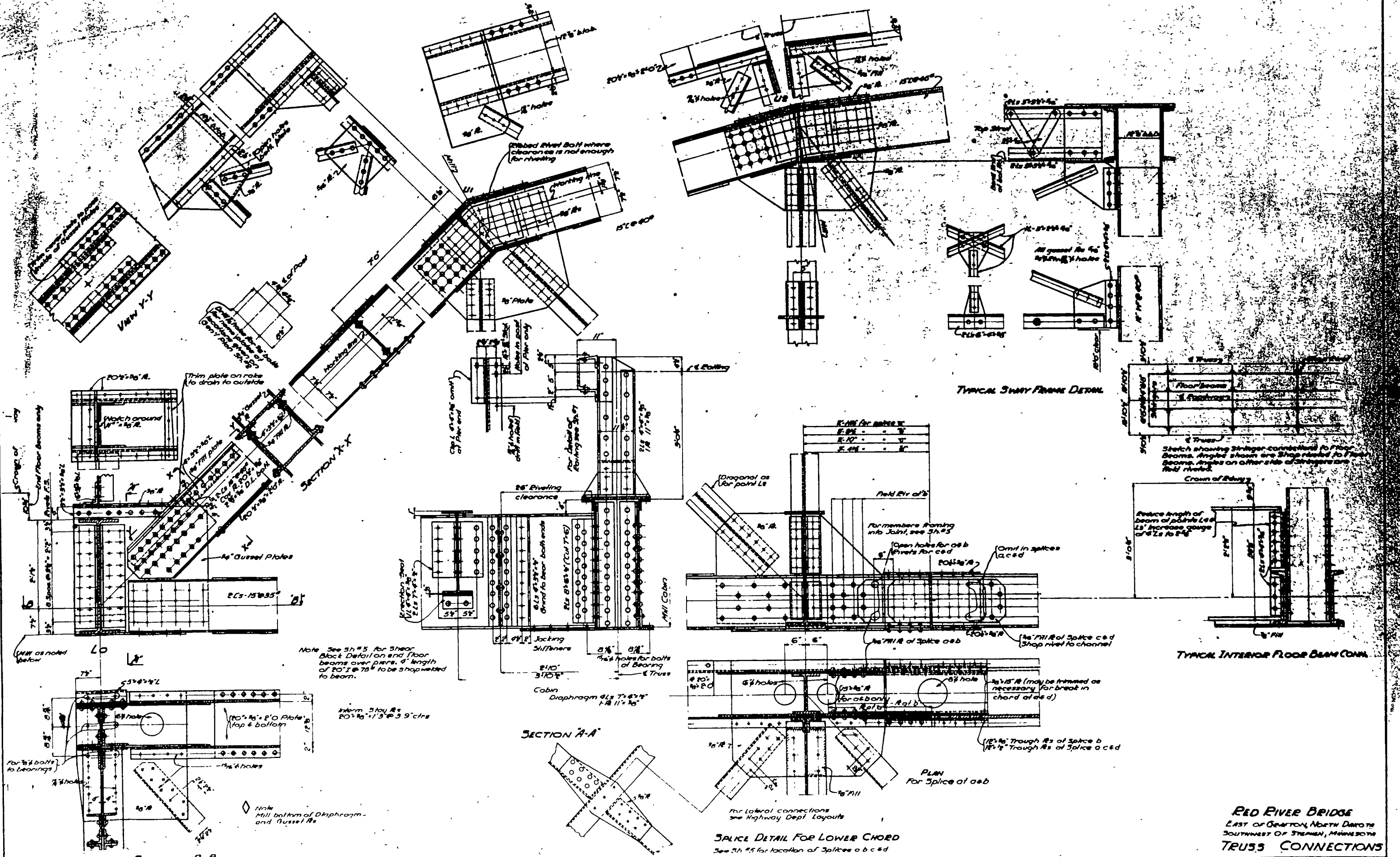
CONSTRUCTION NOTES FOR STRUCTURAL STEEL
 THE MEMBERS TO BE FINISHED BY THE CONTRACTOR'S SUPERVISOR FOR
 INSPECTION CONSTRUCTION DATED JULY 1, 1936 SHALL APPLY TO THE
 PROJECT EXCEPT AS OTHERWISE SPECIALLY NOTED.
 REFERENCES TO SPECIFIC SECTIONS OF ROAD SPECIFICATIONS
 IN THIS DRAWING THE PROVISIONS THEREIN SHALL BE OBSERVED.
 PAINT:
 SHOP COAT: RUST LEAD PAINT 8000
 FIELD COAT: BROWN PAINT 8000
 ALL RIVETS TO BE PAINTED AS NOTED BELOW AND BY
 - HOLLOW 15"
 ALL FIELD CONNECTIONS TO BE FINISHED EXCEPT THROUGH
 CHORDS AND HANGERS.
 THE ENTIRE BOTTOM CHORD TO BE ACCESSED BY SHOP AND
 BOLTED BY ACCESSING TO DUNDAS BRIDGE ON THIS BRIDGE
 AND FIELD HANGERS FINISHED TO 1/4" HOLLOW TO BE MADE ACCESSIBLE
 BY SUBSTITUTION AS PER A.A.S.H.O. SPECIFICATIONS.
 ADDITION TO CONNECTIONS INDICATED ABOVE, HANGERS SHALL BE
 WELDED TO CHORDS AND HANGERS TO ALL POINTS OF CONNECTIONS SHOWN
 IN THIS DRAWING. SEE SUPPLEMENTARY DRAWING.
 SEE ELEVATION 2, HANGERS, FOR FIELD AND SHOP FINISHING
 SHOP FINISHING - PORTLAND AND ROAD PAINT, EXCEPT AS
 NOTED.
 THE CURVES OF THE ROADWAY CROWN TO BE FINISHED BY THE
 CONTRACTOR SHALL BE AS NOTED.

NOTES ON ERECTION PROCEDURE AND ARRANGEMENT OF RIVETING
 THIS BRIDGE IS DESIGNED FOR CONTINUOUS ERECTION PROCEEDING FROM LEFT END. SHOP AND
 FIELD RIVETING TO BE AS NOTED ON ELEVATION BY LETTERS 'S' AND 'F'. SHOP PLATES TO BE
 SYMMETRICAL ABOUT 1/2 OF SPAN, UNLESS SHOWN OTHERWISE. CONNECTION IS SYMMETRICAL WITH
 A FIELD CONNECTION THE NUMBER OF RIVETS WILL BE AS DETERMINED FOR THE FIELD CONNECTION
 CONTRACTOR TO SPECIFY DIRECTION OF ERECTION FOR MATCHMARKING PURPOSES



Summary of Bridge Data	
Span Length	200'-0"
Clearance	10'-0"
Bridge Type	Truss
Material	Steel
Design Speed	30 mph
Construction Date	1936
Drawn By	[Name]
Checked By	[Name]
Approved By	[Name]
Scale	1" = 10'-0"
Sheet No.	5 of 5

RED RIVER BRIDGE
 EAST OF BRANTON NORTH BRIDGE
 SOUTHWEST OF STEPHEN BRIDGE
 STRESS SHEET
 FOR
 ROOF & 24 FT TRUSS SPAN



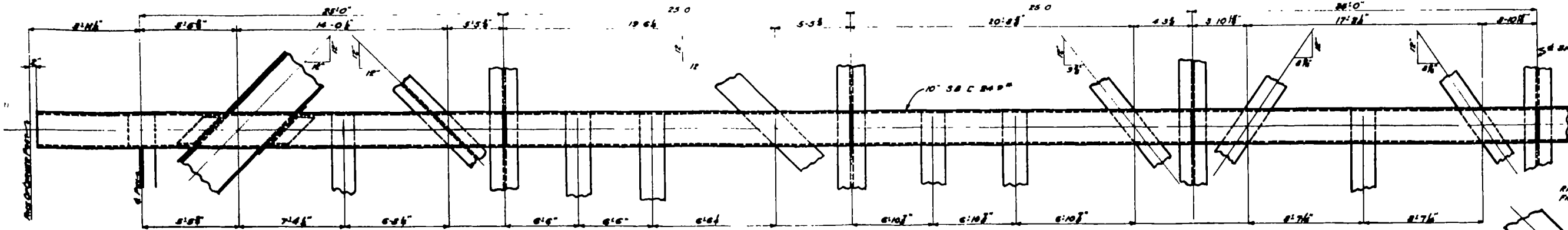
Note See Sh #5 for shear block Detail on end floor beams over piers. 4' length of 20" x 1" @ 75' to be shopwelded to beam.

Intern. Stay R. 20" x 1" @ 3' 9" c/s

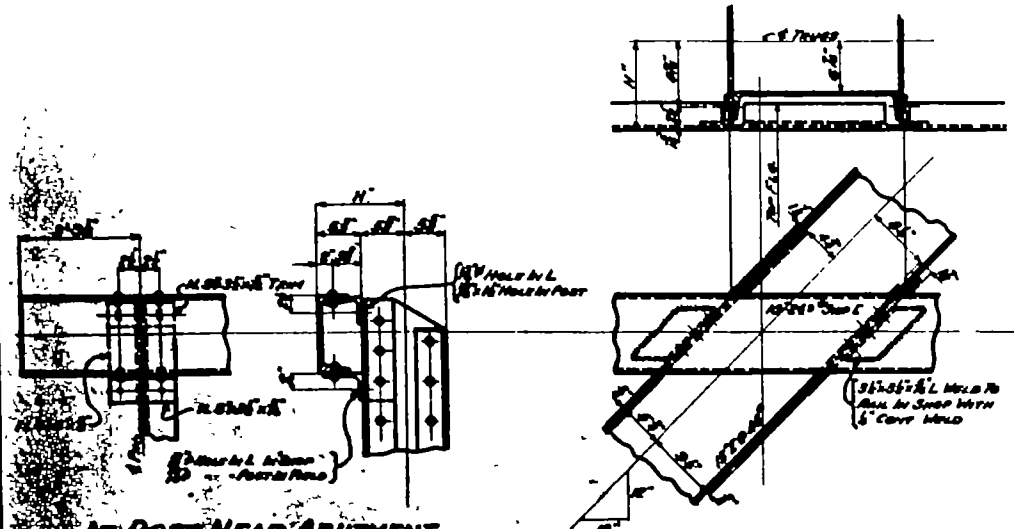
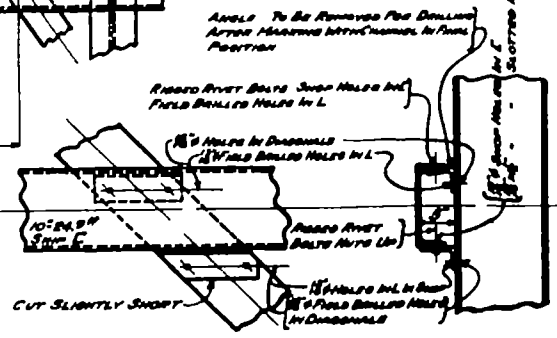
Note Mill bottom of Diaphragm and Gussel R.

SPLICE DETAIL FOR LOWER CHORD See Sh #5 for location of Splices a b c d

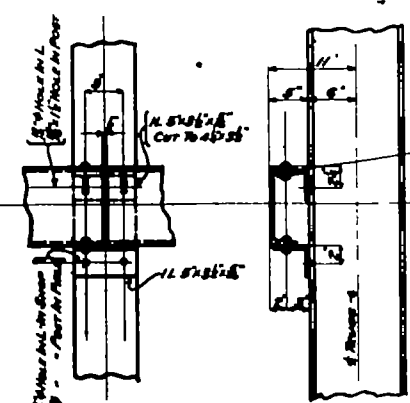
RED RIVER BRIDGE
 EAST OF GRANITON, NORTH DAKOTA
 SOUTHWEST OF STEVEN, MINNESOTA
TRUSS CONNECTIONS



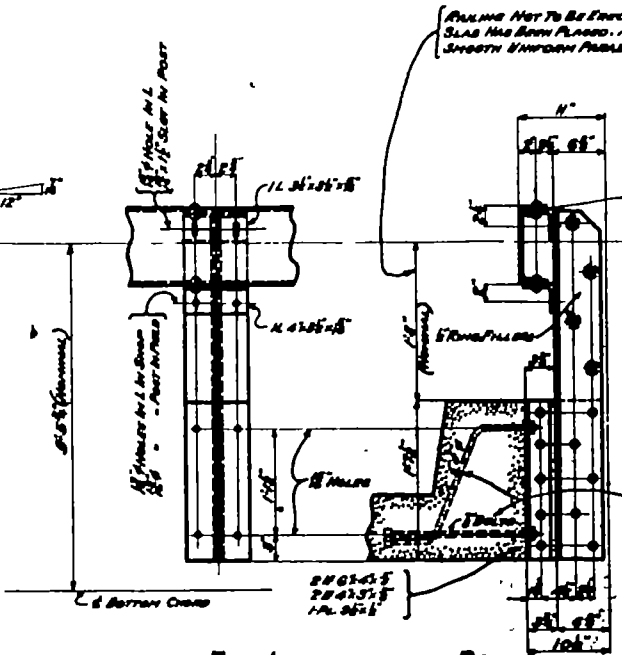
ALL HORIZONTAL DIMENSIONS AND SPACINGS ARE NOMINAL.
 FINISH LAYOUT SHOULD BE DETERMINED BY THE CONTRACTOR.



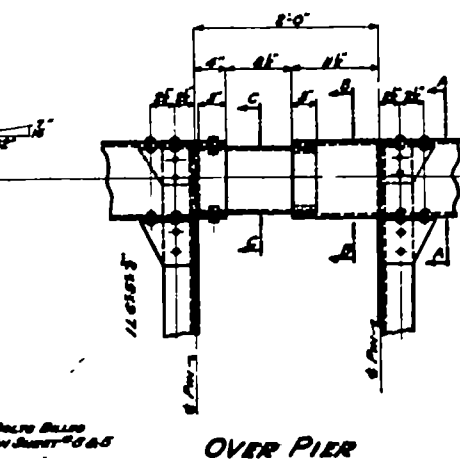
FOR END POST CONNECTIONS



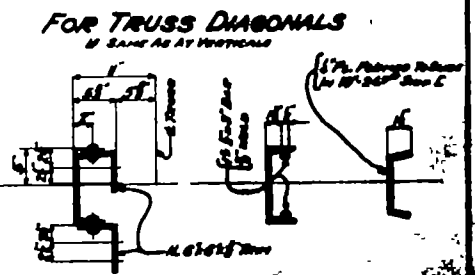
FOR TRUSS VERTICALS



FOR INTERMEDIATE POSTS



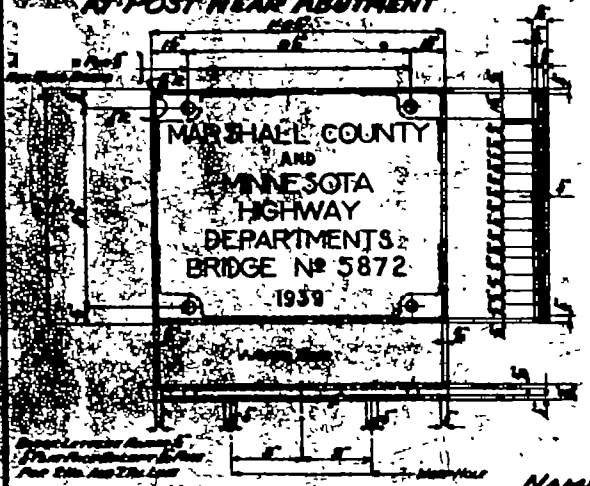
OVER PIER



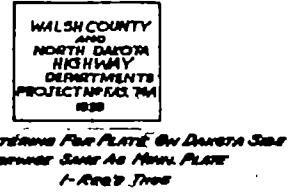
FOR TRUSS DIAGONALS
 IF SAME AS AT VERTICALS

SEC. A A SEC. B B SEC. C C

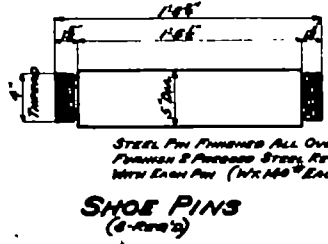
Summary of Steel Connections	
1. Truss Chords	2. Truss Verticals
3. Truss Diagonals	4. Truss Members
5. Truss Connections	6. Truss Connections
7. Truss Connections	8. Truss Connections
9. Truss Connections	10. Truss Connections
11. Truss Connections	12. Truss Connections
13. Truss Connections	14. Truss Connections
15. Truss Connections	16. Truss Connections
17. Truss Connections	18. Truss Connections
19. Truss Connections	20. Truss Connections
21. Truss Connections	22. Truss Connections
23. Truss Connections	24. Truss Connections
25. Truss Connections	26. Truss Connections
27. Truss Connections	28. Truss Connections
29. Truss Connections	30. Truss Connections
31. Truss Connections	32. Truss Connections
33. Truss Connections	34. Truss Connections
35. Truss Connections	36. Truss Connections
37. Truss Connections	38. Truss Connections
39. Truss Connections	40. Truss Connections
41. Truss Connections	42. Truss Connections
43. Truss Connections	44. Truss Connections
45. Truss Connections	46. Truss Connections
47. Truss Connections	48. Truss Connections
49. Truss Connections	50. Truss Connections
51. Truss Connections	52. Truss Connections
53. Truss Connections	54. Truss Connections
55. Truss Connections	56. Truss Connections
57. Truss Connections	58. Truss Connections
59. Truss Connections	60. Truss Connections
61. Truss Connections	62. Truss Connections
63. Truss Connections	64. Truss Connections
65. Truss Connections	66. Truss Connections
67. Truss Connections	68. Truss Connections
69. Truss Connections	70. Truss Connections
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77. Truss Connections	78. Truss Connections
79. Truss Connections	80. Truss Connections
81. Truss Connections	82. Truss Connections
83. Truss Connections	84. Truss Connections
85. Truss Connections	86. Truss Connections
87. Truss Connections	88. Truss Connections
89. Truss Connections	90. Truss Connections
91. Truss Connections	92. Truss Connections
93. Truss Connections	94. Truss Connections
95. Truss Connections	96. Truss Connections
97. Truss Connections	98. Truss Connections
99. Truss Connections	100. Truss Connections



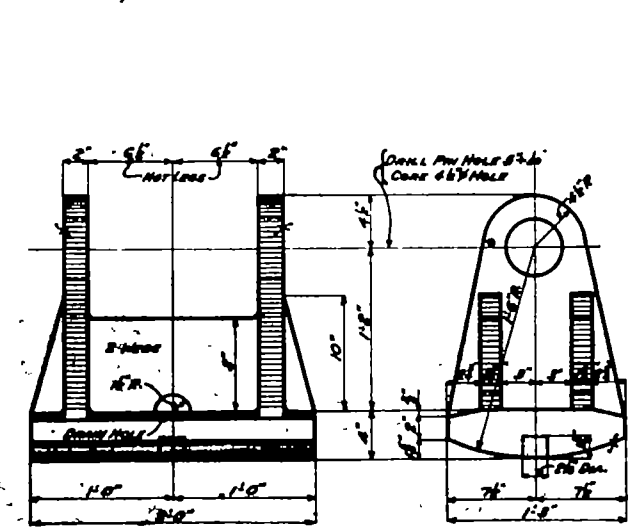
NAME PLATE DETAILS



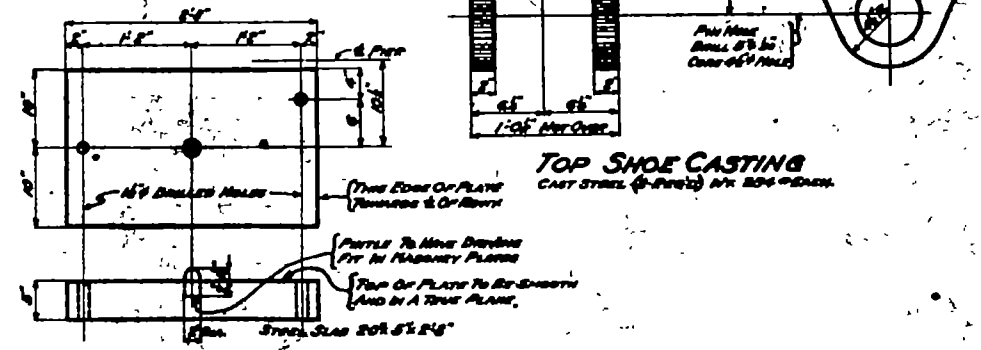
LETTERING FOR PLATE ON DAWSON SIDE OVERBRIDGE SAME AS MAIN PLATE 1-1/2" HIGH



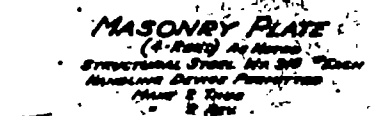
SHOE PINS (1-1/2" DIA.)



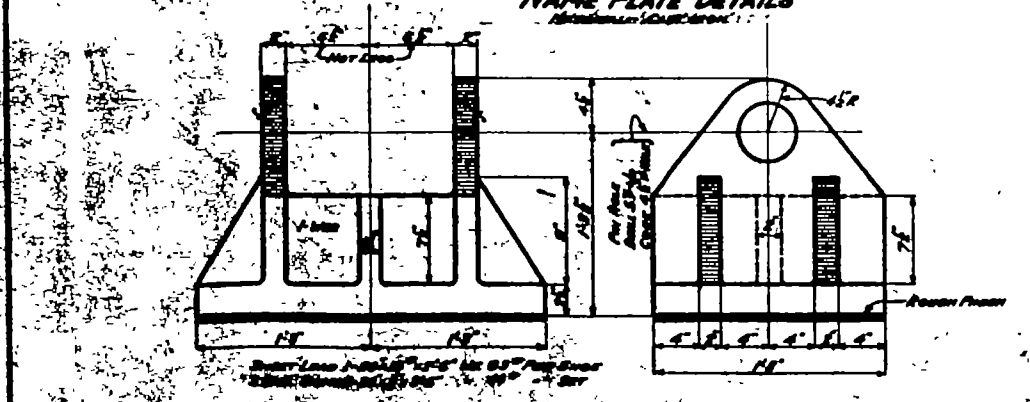
EXPANSION SHOE
 CAST STEEL (4-1/2" DIA.)
 HEIGHT 708" EACH



TOP SHOE CASTING
 CAST STEEL (4-1/2" DIA.) 1/2" DIA. EACH



MASONRY PLATE
 (4-1/2" DIA.) AS SHOWN
 STRUCTURAL STEEL 1/2" DIA. EACH
 HANDLING DEVICES PERMITTED
 1/2" DIA.

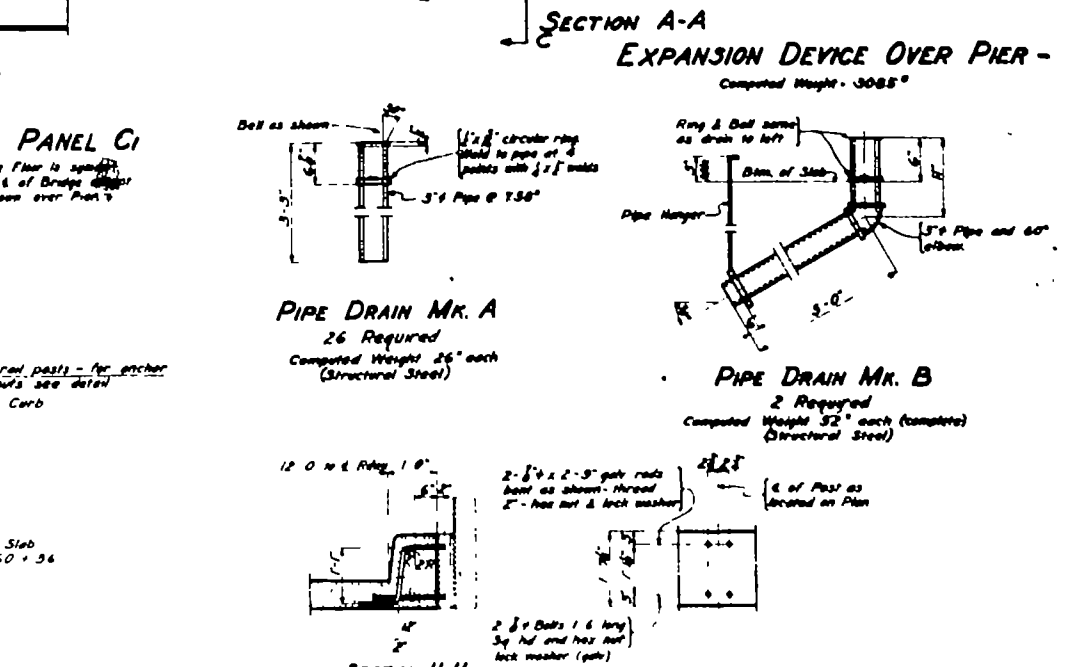
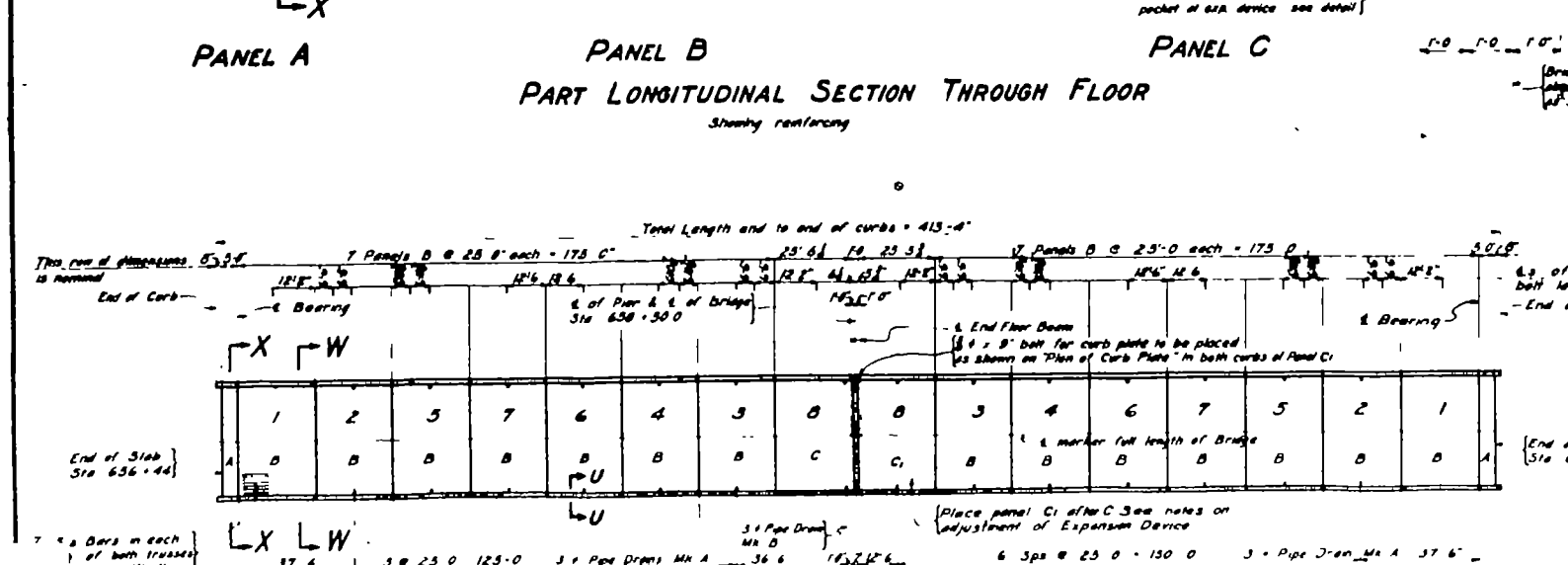
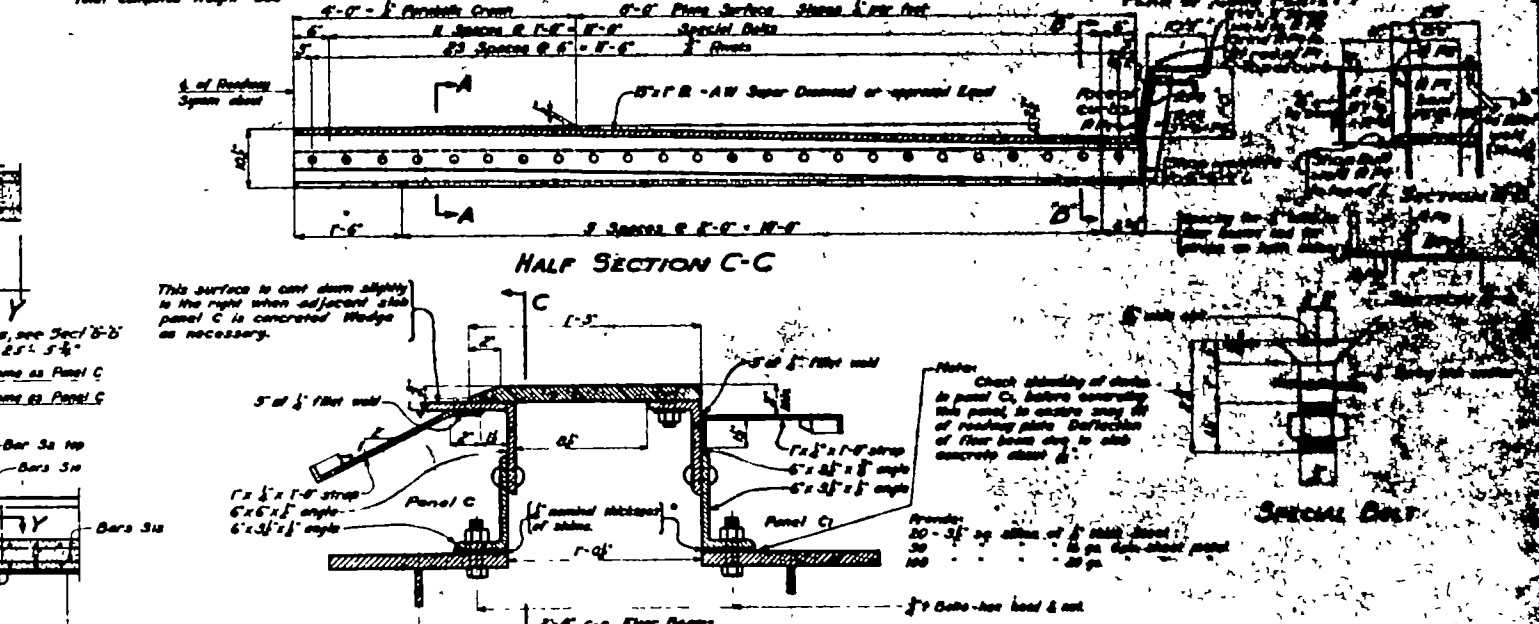
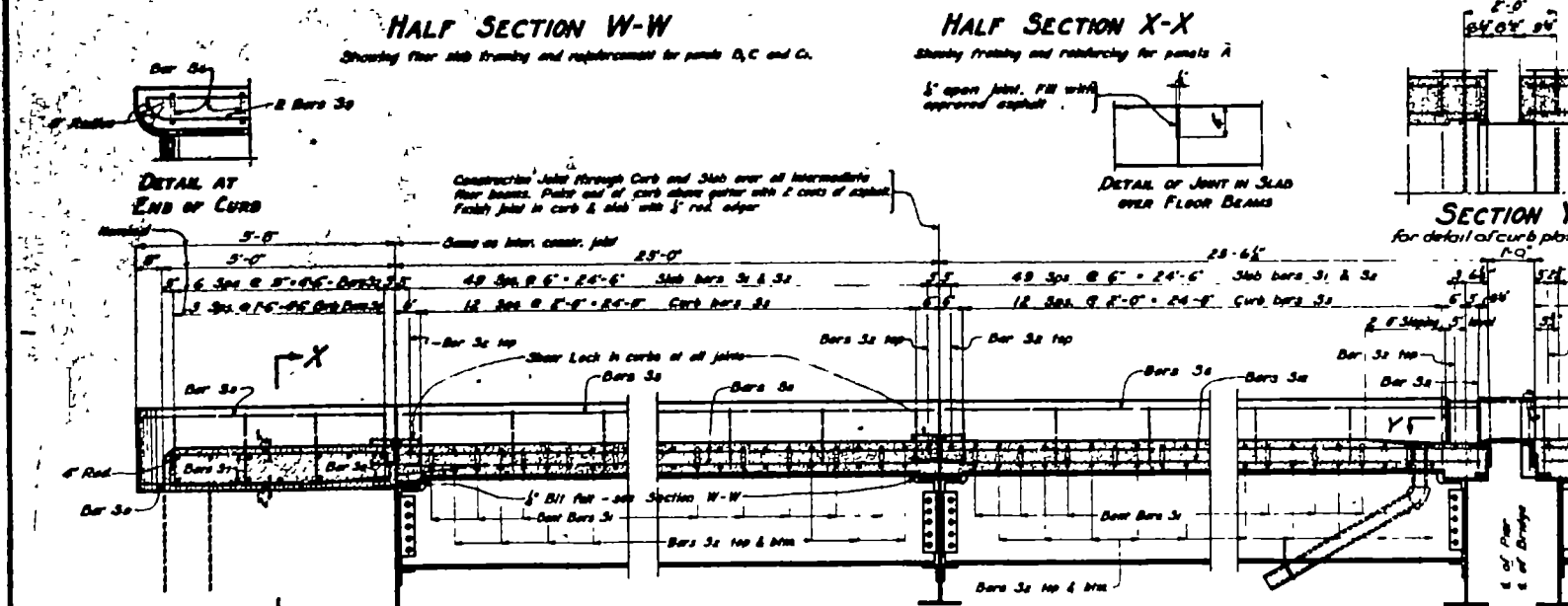
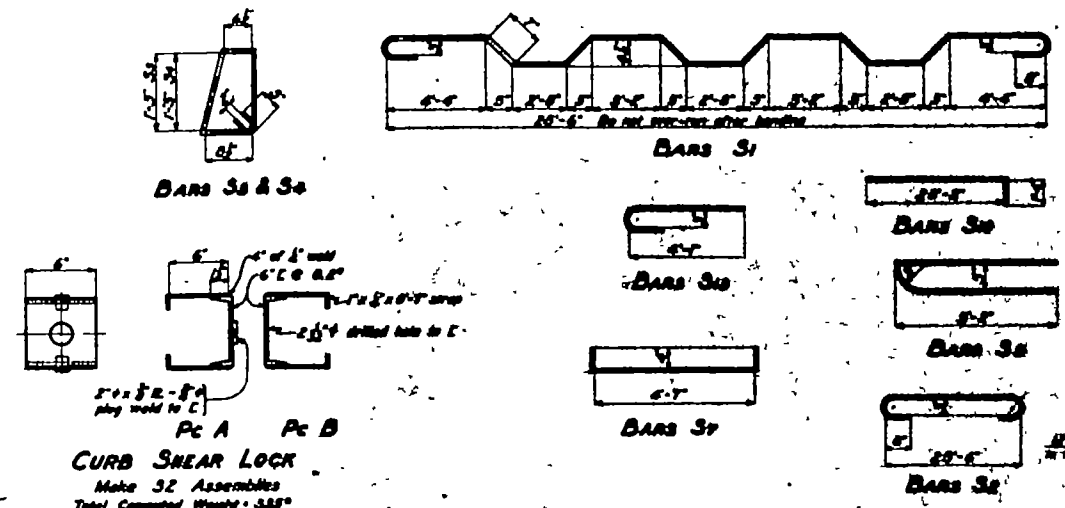
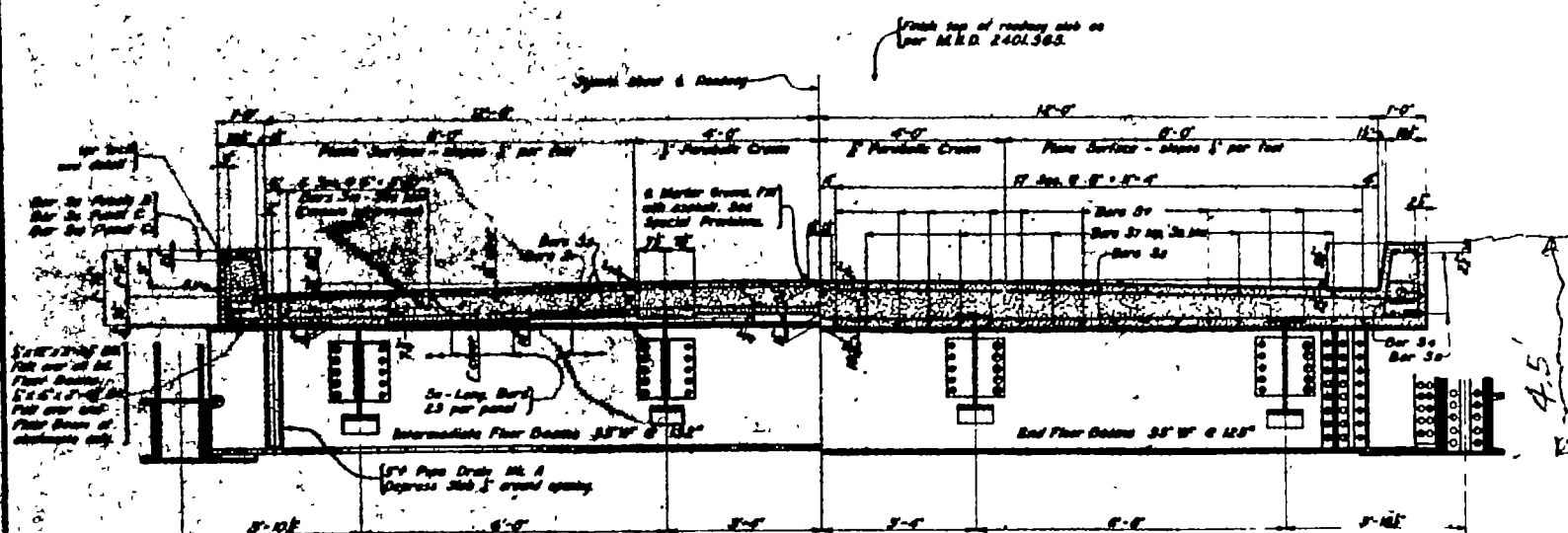


FIXED SHOE
 CAST STEEL (4-1/2" DIA.)
 HEIGHT 707" EACH

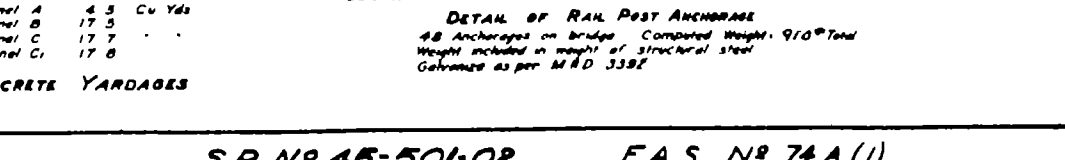
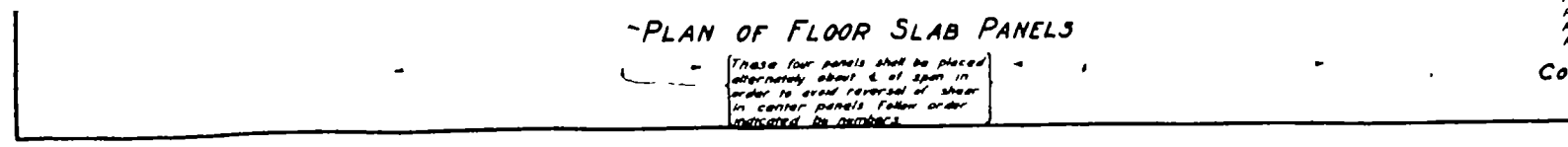
INSTALL ON CAST STEEL AND BRIDGE ON NEW FOUNDATIONS.
 PLACE ALUMINUM FILL BETWEEN AS SHOWN IN PLAN. BRIDGE SHALL BE SET IN 1/2" FILL. FILLING AND CURBS SHALL BE AS SHOWN IN THE DRAWINGS.

RAILROAD BRIDGE
 EAST OF SOUTHWEST NORTH DAKOTA
 SOUTHWEST OF STANLEY, DAKOTA
 RAILROAD AND SHOE DETAILS

Bar No.	Size	Length	Shape	Location
31	3/4"	17'-0"	Rect	Mid Truss
32	3/4"	17'-0"	Rect	Mid Truss
33	3/4"	17'-0"	Rect	End Truss - Panels A & C
34	3/4"	17'-0"	Rect	End Truss - Panels A & C
35	3/4"	17'-0"	Rect	End Truss - Panels A & C
36	3/4"	17'-0"	Rect	End Truss - Panels A & C
37	3/4"	17'-0"	Rect	End Truss - Panels A & C
38	3/4"	17'-0"	Rect	End Truss - Panels A & C
39	3/4"	17'-0"	Rect	End Truss - Panels A & C
40	3/4"	17'-0"	Rect	End Truss - Panels A & C
41	3/4"	17'-0"	Rect	End Truss - Panels A & C
42	3/4"	17'-0"	Rect	End Truss - Panels A & C
43	3/4"	17'-0"	Rect	End Truss - Panels A & C
44	3/4"	17'-0"	Rect	End Truss - Panels A & C
45	3/4"	17'-0"	Rect	End Truss - Panels A & C
46	3/4"	17'-0"	Rect	End Truss - Panels A & C
47	3/4"	17'-0"	Rect	End Truss - Panels A & C
48	3/4"	17'-0"	Rect	End Truss - Panels A & C
49	3/4"	17'-0"	Rect	End Truss - Panels A & C
50	3/4"	17'-0"	Rect	End Truss - Panels A & C



QUANTITIES For Two Slabs	
Grade A Concrete	8885 Cu Yds
Reinforcement Bars	48,170 Lbs
Structural Steel (dotted on sheet 10)	
4 Pcs 1/2" Dia. Rail 6' x 2'-0"	
29 Pcs 1/2" Dia. Rail 12' x 2'-0"	
Cost to be included in prices bid for other items	

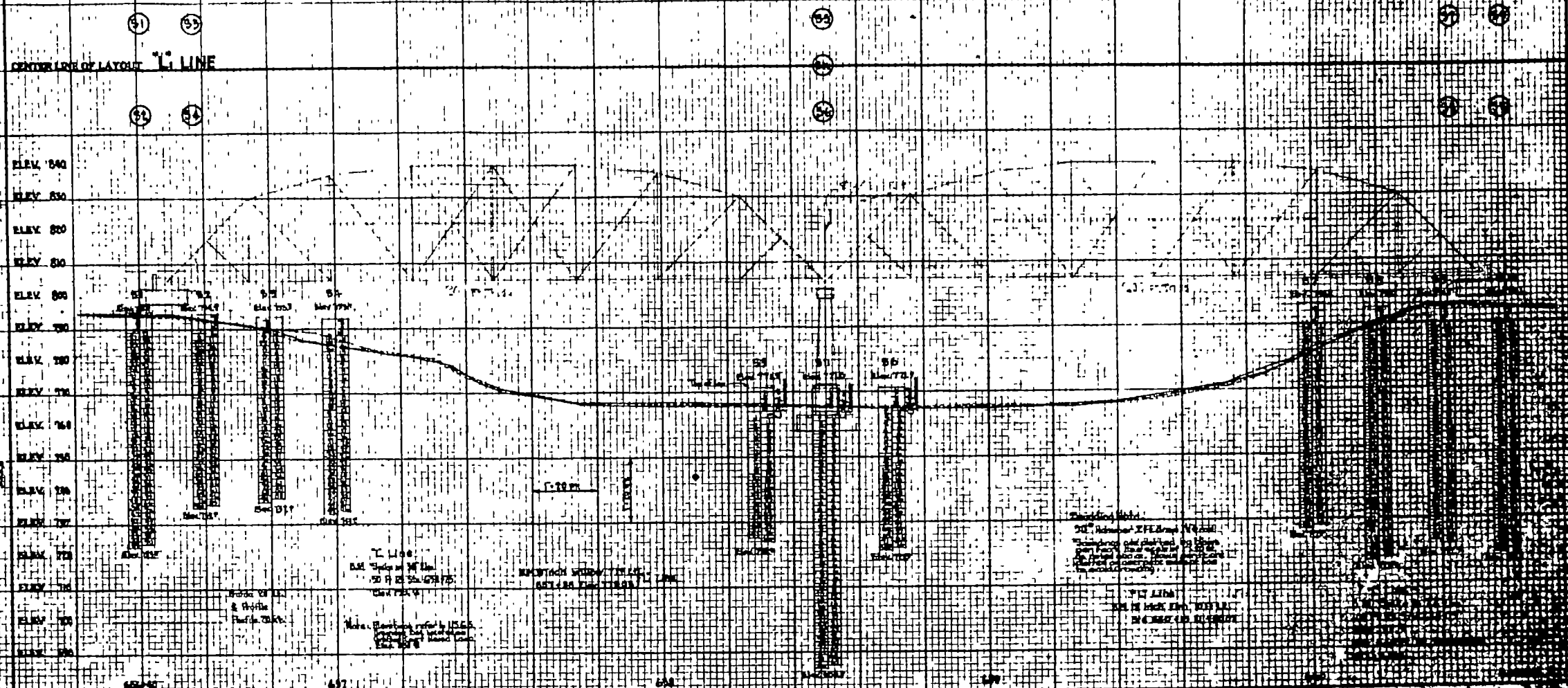


RED RIVER BRIDGE

EAST OF GRAFTON NORTH DAKOTA

SOUTHWEST OF STORMAN, MINNESOTA

FLOOR SLAB



SHOW ON CONTRACTED PROFILE

- Present and proposed grades of roadway for a sufficient distance from each end of bridge to show present and proposed approaches, if any, grades of approaches, and also approximate profile of natural surface of ground.
- Present and proposed grades of bridge floor, and elevation of bottom of old bridge superstructure.
- High and low water stages. Give average high water and extreme high water elevations and state how often extreme high water occurs. Give date by years.
- Proposed elevation of bottom of footings.
- Elevation of water surface taken at edge of water, at bridge site, and 100 ft. and 200 ft., both above and below bridge site, also at any sudden drops or waterfalls.

SHOW ON PLAT

- North upward. (Show by arrow).
- Course of stream 200 feet or more above and below bridge site.
- Direction of flow.
- Location of existing and proposed roads, clear widths of same and the stationing.
- Location of present bridge with general dimensions and description of same.
- Location of proposed bridge.
- Locations of points where flood waters are likely to cover the banks and bed of stream with description of any pools which may have formed near bridge site.
- Recommended change of channel.
- Small details of four sections showing approximate course of stream and road, also location of proposed bridge.
- Show name of stream, state whether it is a River, Creek, Drainage Ditch, Run, or Dry Run, etc.

SHOW ON PLAN AND PROFILE

- Cross-section of stream on center line of proposed bridge (full black line), cross-sections parallel to, and 25 feet on each side of the center line (dashed black line downstream and dotted black line upstream). Show sufficient length of profiles so that data is available for possible shift in bridge abutments.
- A layout showing station and distance (about 80 feet and from proposed center line), to all soundings. Take at least two soundings for each pier and abutment. Drive to practical refusal if within depth of 20 to 40 feet.
- Number the soundings S1, S2, S3, etc., plot soundings in true position on profile and show plainly what materials are encountered in each sounding and at what elevations the various materials are encountered. Show number of blows required for the driving of each foot of rod and final elevation of bottom of each rod. State size of sounding rod, type and weight of hammer, as well as distance of hammer fall or height of hammer blow.
- Location, elevation and description of a permanent bench mark. Give description of available U.S. Bench Marks and references to same.
- Show typical highway section planned for use adjacent to proposed bridge, also cross-section of proposed channel change, if any.
- If bridge is over 200 feet long, use cross-section paper of sufficient length to furnish required data.

DATA

- Preliminary recommendations of Engineer in charge of Bridge Survey:
 - Net Span Length and Type of Bridge _____
 - Width of Roadway on Bridge _____ Number and width of abutments, if any _____ Type of Railing _____
 - If a skew bridge is recommended, the angle of skew should be _____ Locate center of Bridge at Station _____
 - Is piling required? Yes If required, bottom of pile should penetrate to Elev. _____ for Abutments and Elev. _____ for Pier
- Special Features: Waterfalls, dams, exceptional floods, ice, driftwood, oblique banks, logging, etc. _____
- Changes: In height or length from that of old bridge, and reasons why _____
- Other bridges over same stream:
 - Location, length, height above water, net cross-sectional area at highwater stage, and estimated age _____
- State navigation or boating channels required, if any: _____
- Information and evidence in regard to high water stages was obtained as follows: Obtained from information given by local farmer located 1/2 mile east of bridge site and from farmer located 1/2 mile upstream from bridge site.
- Must contractor provide for traffic during construction of proposed bridge: No If so, by what means? _____

MATERIAL

Report on spot materials showing path to the contract and other material to be used in the bridge. The condition of soil is shown in the plan view. All other things mentioned in the plan view.

DATA

1. Preliminary recommendations of Engineer in charge of Bridge Survey:

- Net Span Length and Type of Bridge _____
- Width of Roadway on Bridge _____ Number and width of abutments, if any _____ Type of Railing _____
- If a skew bridge is recommended, the angle of skew should be _____ Locate center of Bridge at Station _____
- Is piling required? Yes If required, bottom of pile should penetrate to Elev. _____ for Abutments and Elev. _____ for Pier

2. Special Features: Waterfalls, dams, exceptional floods, ice, driftwood, oblique banks, logging, etc. _____

3. Changes: In height or length from that of old bridge, and reasons why _____

4. Other bridges over same stream:

- Location, length, height above water, net cross-sectional area at highwater stage, and estimated age _____

If structure is over drainage ditch, is ditch gradient likely to be altered? _____

5. Reason why these bridges are, or are not, fair indications of what length the proposed bridge should be _____

6. State navigation or boating channels required, if any: _____

7. Information and evidence in regard to high water stages was obtained as follows: Obtained from information given by local farmer located 1/2 mile east of bridge site and from farmer located 1/2 mile upstream from bridge site.

8. Must contractor provide for traffic during construction of proposed bridge: No If so, by what means? _____

STATE OF MISSOURI
DEPARTMENT OF HIGHWAYS
REPORT OF BRIDGE SURVEY

BRIDGE No. 5672

Sheet No. 9 of 2 Sheets