DESIGN DATA				
Traffic	Average Daily			
Current 2019	Pass: 2575	Trucks: 1045	Total: 3620	
Forecast 2040	Pass: 3980	Trucks: 1745	Total: 5725	
Clear Zone Dist. Existing		Design Speed: 75		
Minimum Sight Dist. for Stopping: Existing		Bridges: N/A		
Full Control of Access, No Point of Access Other Than at Interchange Ramps				
Pavement Design Life 20 (years)				
Design Accumulated One-way Rigid ESALs: N/A				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	IM-2-094(163)209	22350	1	1

As Built Plans 2023 - KLJ

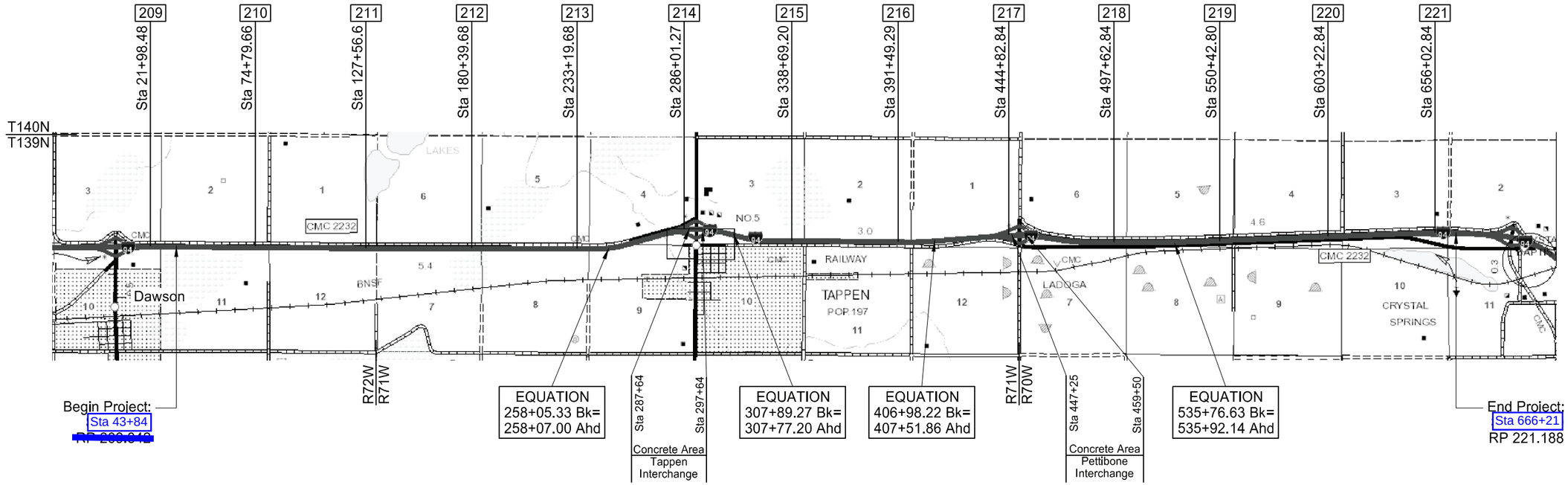
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

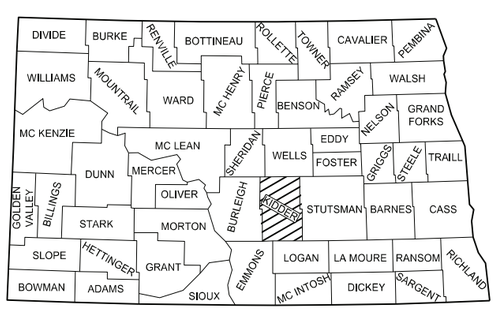
IM-2-094(163)209

Kidder County
E Dawson Intr to Crystal Springs - WB
Mill and Overlay, CPR, Structure / Incidentals

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	1/1/2022
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-2-094(163)209	11.846	11.846





STATE COUNTY MAP

N

DESIGNER
Harrison Philipp
DESIGNER
Jesse Feldmeyer
DESIGNER

NDDOT VALLEY CITY DISTRICT

Haaland, Nathan A.
09/02/22

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT
Pfeifer, Derek D.
9/2/22

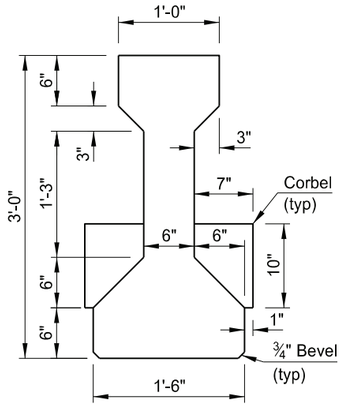
NDDOT VALLEY CITY DISTRICT

REGISTERED PROFESSIONAL ENGINEER
NATHAN A. HAALAND
PE-7116
DATE
NORTH DAKOTA

09/02/22

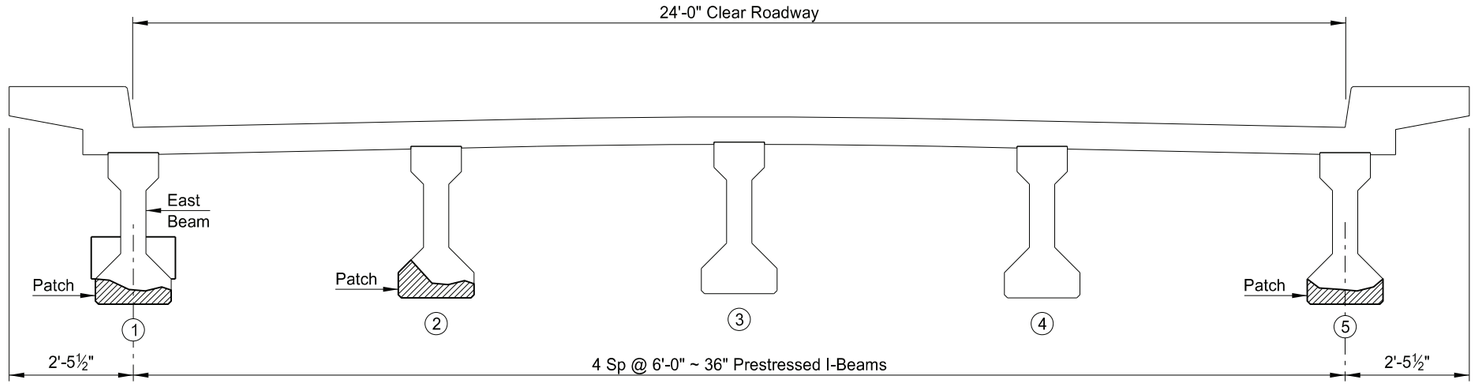
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-2-094(163)209	170	3



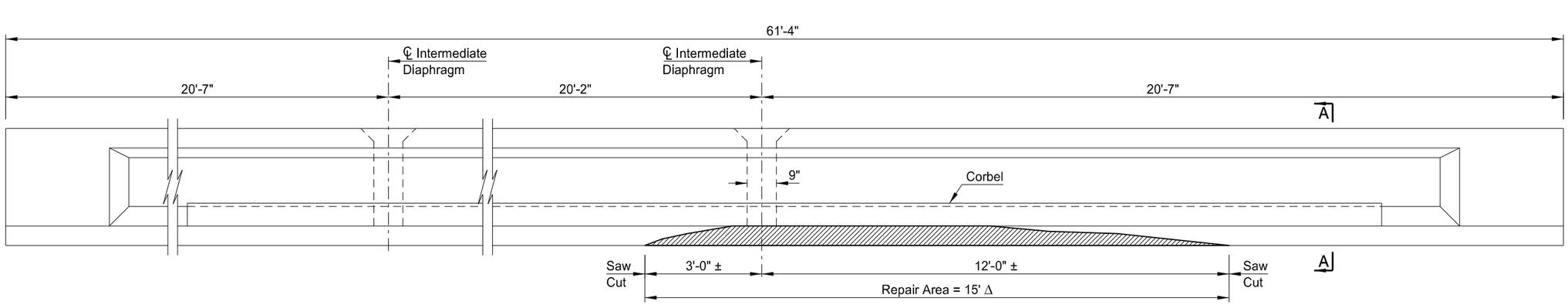
(SHOWING DIMENSIONS)

A-A



(SPAN OVER WESTBOUND I-94 ~ LOOKING SOUTH)

TYPICAL SECTION



Δ Actual limits to be repaired will be determined by the Engineer in the field.

(SHOWING OUTSIDE FACE ~ LOOKING WEST)

BEAM 1 ELEVATION ~ SPAN OVER WESTBOUND I-94

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
930	9694	GIRDER PATCHING	L SUM	0.7

NOTE:

See Dwg 94-214.126-2 for Notes.

BRIAN W. RASCHKE
REGISTERED
PROFESSIONAL
PE 4361
ENGINEER
NORTH DAKOTA
01/13/21

I-94/PETTIBONE INTERCHANGE

PRESTRESSED CONCRETE GIRDER PATCHING DETAILS

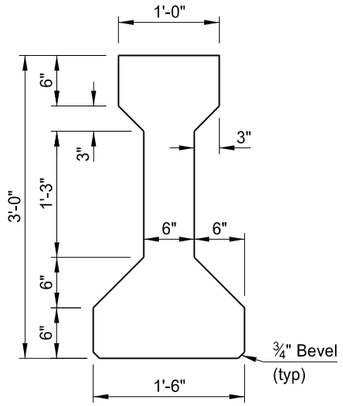
ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

01/14/21

DocuSign

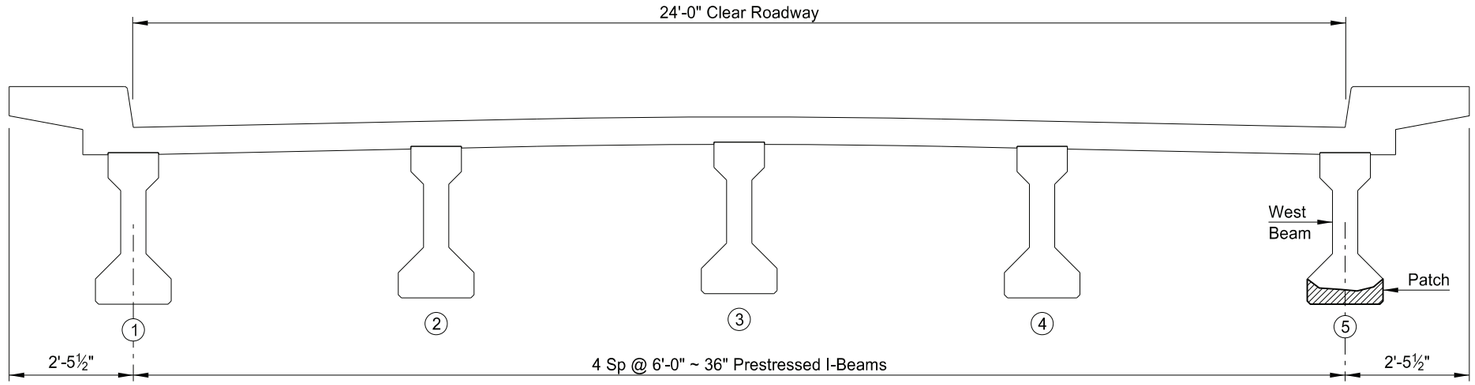
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NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-2-094(163)209	170	4



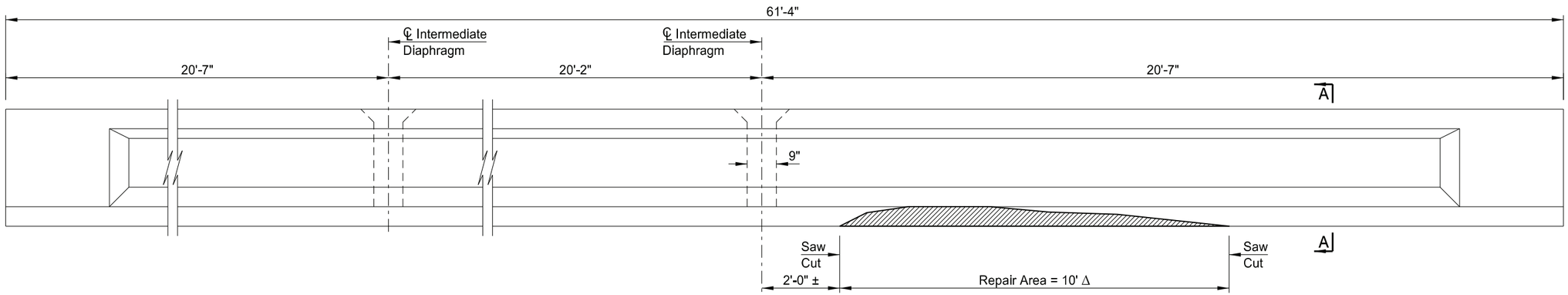
(SHOWING DIMENSIONS)

A-A



(SPAN OVER EASTBOUND I-94 ~ LOOKING SOUTH)

TYPICAL SECTION



Δ Actual limits to be repaired will be determined by the Engineer in the field.

(SHOWING OUTSIDE FACE ~ LOOKING EAST)

BEAM 5 ELEVATION ~ SPAN OVER EASTBOUND I-94

BRIAN W. RASCHKE
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PE 4361
ENGINEER
NORTH DAKOTA
01/13/21

I-94/PETTIBONE INTERCHANGE

PRESTRESSED CONCRETE GIRDER PATCHING DETAILS

Field Estimate for Additional Girder Repair at Tappen Interchange

Girder Repair:

These repairs were approved by NDDOT and completed as listed.

Tappen Eastbound

Girder/Beam #1:

1’ length (West Face) : Minor cleanup/prep. Minimal additional removal maybe required to provide enough depth of patch material. Has exposed rebar. Workable with Driving Lane Closure.

2.5’ x 6”(West Face) : Repair required on the existing repair due to unsound patch material. Workable with Driving Lane Closure.

Girder/Beam #2:

8’ length spall (West Face) : Minor cleanup/prep. Minimal additional removal maybe required to provide enough depth of patch material. Requires Passing Lane closure.

2.5’ length spall (East Face): Minor cleanup/prep. Minimal additional removal maybe required to provide enough depth of patch material. Has exposed rebar. Requires Passing Lane closure.

Girder/Beam #3

3’ length spall (West Face) : Minor cleanup/prep. Minimal additional removal maybe required to provide enough depth of patch material. Requires Passing Lane closure.

Girder/Beam #5

1’x6” (West Face) : Repair required on the existing repair due to unsound patch material. Workable with Driving Lane Closure.

Tappen Westbound

Girder/Beam #4

16” length spall (West Face) : Chip out cracked concrete and minor cleanup/prep. Minimal additional removal maybe required to provide enough depth of patch material. Requires Westbound Driving Lane closure.

Crack Sealant:

Tappen Eastbound

Girder/Beam #1

10’ length x Beam Face Repair (East Face) : Prep and seal the face of the existing repair to eliminate further moisture penetration into the repair.

Girder/Beam #5

10’ length x Beam Face Repair (West Face) : Prep and seal the face of the existing repair to eliminate further moisture penetration into the repair.

94-217.145

DESIGN DATA				
Traffic	Average Daily			Max. Hr.
Current 2005	Pass: 5,100	Trucks 1,700	Total 6,800	680
Forecast 2025	Pass: 8,775	Trucks 2,925	Total 11,700	1,170
Minimum Sight Dist. for:		Design Speed 75 mph		
Stopping 820'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life (years)				

JOB# 13

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	AC-IM-2-094(063)209	12016	1	1

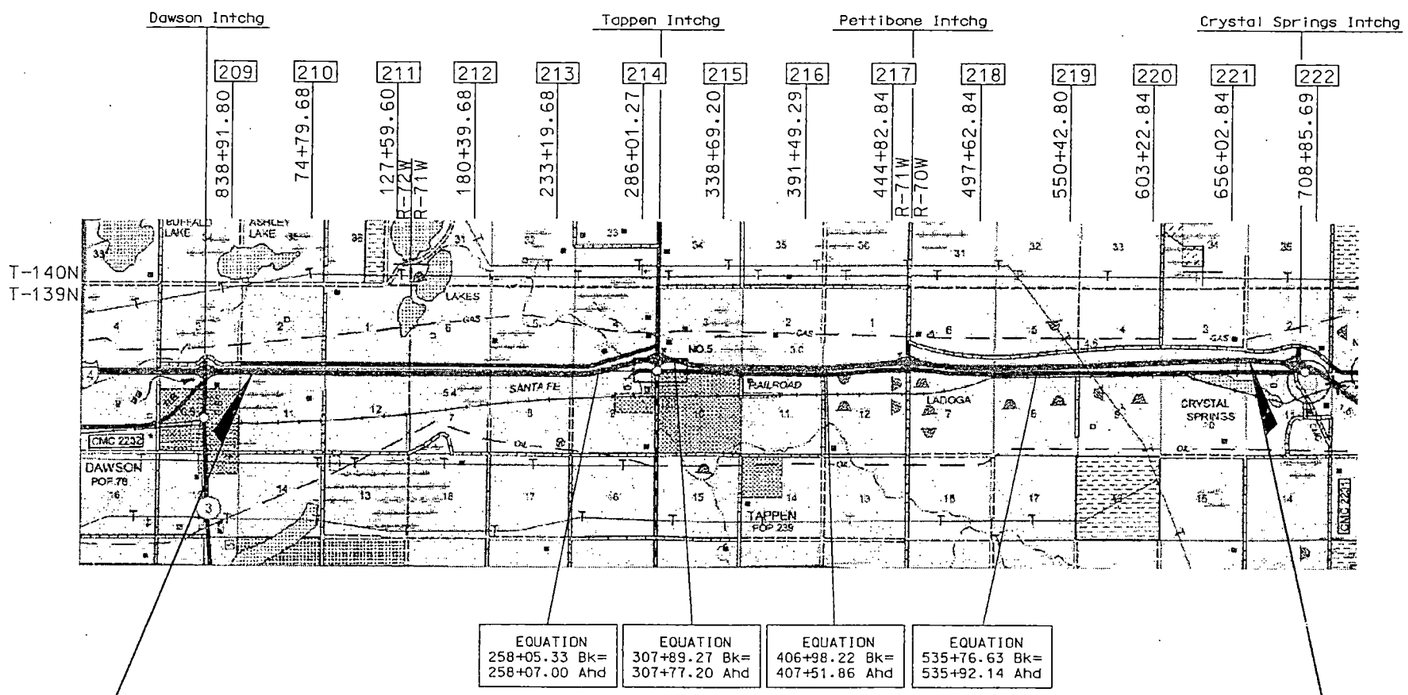
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

PROJECT NO. **AC-IM-2-094(063)209**
IN KIDDER COUNTY
CONCRETE PAVEMENT REPAIR, PCC PAVEMENT, GRINDING & SAFETY IMPROVEMENTS
(WESTBOUND)

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation October 2002; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT
11.827 Miles Gross, 11.827 Miles Net



N

Beg. Proj. IM-2-094(063)209
Sta 40+94.0
RP 209.359

End Proj. IM-2-094(063)209
Sta 666+00
RP 221.188

DESIGNERS
Scott W. Williams, P.E.

APPROVED DATE 01-03-2006
Francis G. Ziegler
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

APPROVED DATE _____
FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

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

APPROVED DATE 01/03/2006
for Roger Weigel
NDDOT DESIGN DIVISION

ROGER WEIGEL REGISTERED PROFESSIONAL E.E. 2930 ENGINEER NORTH DAKOTA

12/20/2005 8:39:57 AM R:\project\20094209.063\design\001TS_001_Title.dgn

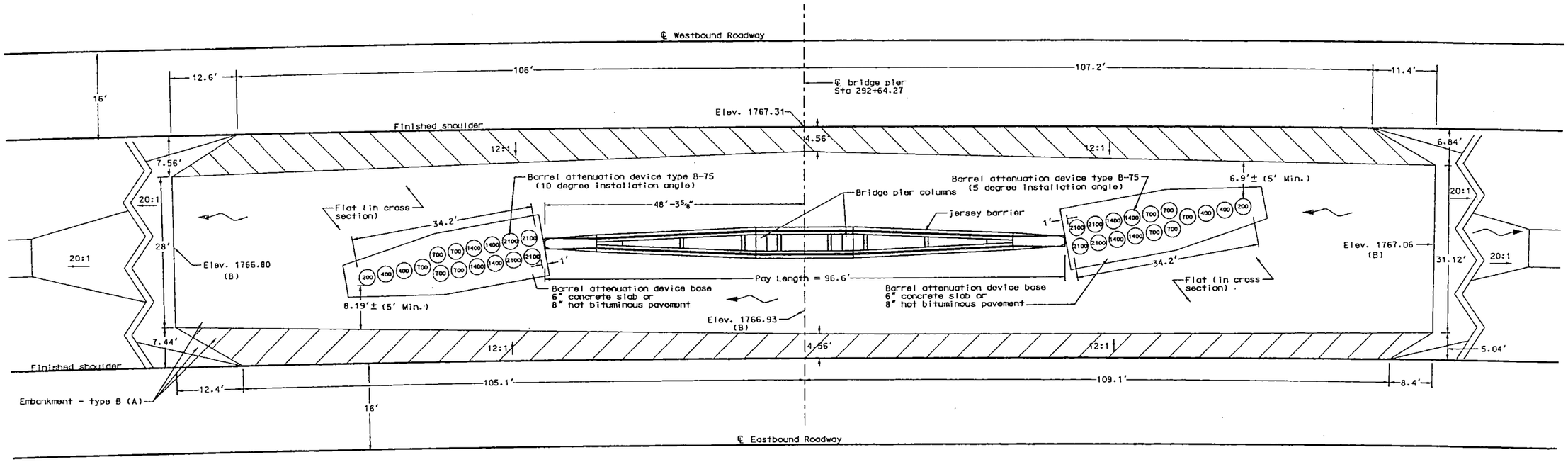
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	1

23 USC §409 Documents
NDDOT Reserves All Objections

Note: The barrel attenuation devices shall be as shown on standard drawing D-704-1, except the reflective sheeting required for the end attenuation drums shall be yellow and black.

The contractor will not be required to provide additional replacement modules for this installation.

The barrel attenuation device bases shall not be paid for separately, but shall be included in the price bid for the item "Barrel attenuation device type B-75".



(A) The estimated in-place volume of embankment-type B is 750 cubic yards.

This quantity is for informational purposes only. The item "Embankment - Type B" shall be paid for as 1 each.

(B) It is intended that the flat median area shall have a profile grade of + 0.11%. Some elevation adjustments may be required.

Jersey barrier formed or slipformed
96.6 LF

Barrel attenuation device type B-75
2 ea

Embankment - type B
1 ea

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
12953
ENGINEER
12/19/05
NORTH DAKOTA

Jersey Barrier and Attenuation Device Layout

Median Pier Protection

Tappen Interchange
RP 214.126
I-94

12/19/2005 1:07:36 PM R:\project\20094209.063\traffic\130GR_001_lgdr194_214.126.dgn

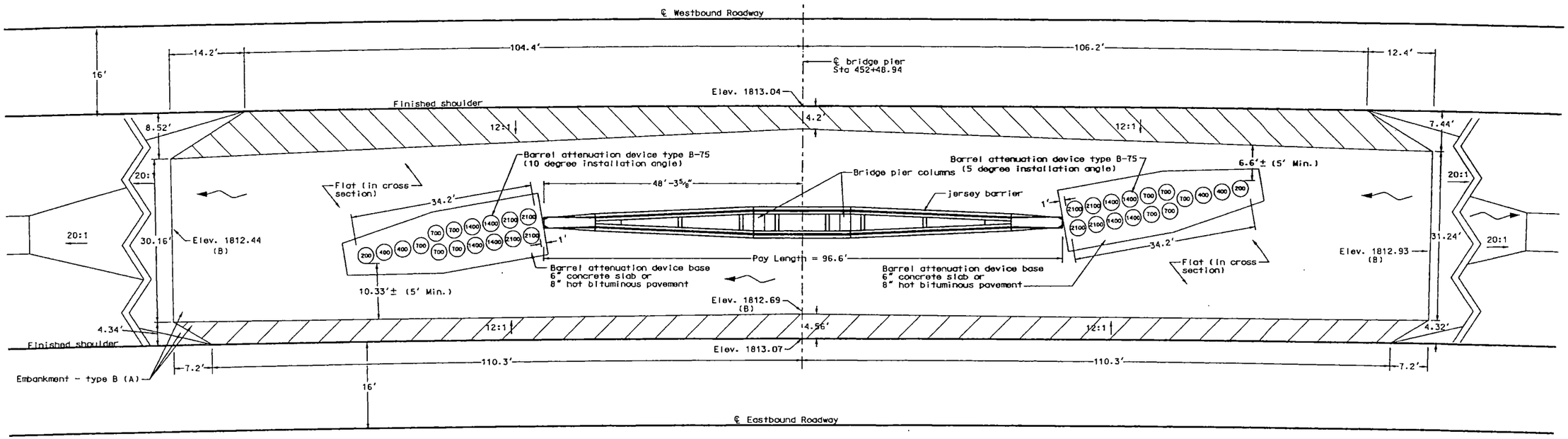
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	2

23 USC §409 Documents
NDDOT Reserves All Objections

Note: The barrel attenuation devices shall be as shown on standard drawing D-704-1, except the reflective sheeting required for the end attenuation drums shall be yellow and black.

The contractor will not be required to provide additional replacement modules for this installation.

The barrel attenuation device bases shall not be paid for separately, but shall be included in the price bid for the item "Barrel attenuation device type B-75".



(A) The estimated in-place volume of embankment-type B is 750 cubic yards.

This quantity is for informational purposes only. The item "Embankment - Type B" shall be paid for as 1 each.

(B) It is intended that the flat median area shall have a profile grade of + 0.21%. Some elevation adjustments may be required.

Jersey barrier formed or slipformed
96.6 LF

Barrel attenuation device type B-75
2 ea

Embankment - type B
1 ea

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1295
ENGINEER
NORTH DAKOTA

Jersey Barrier and Attenuation Device Layout

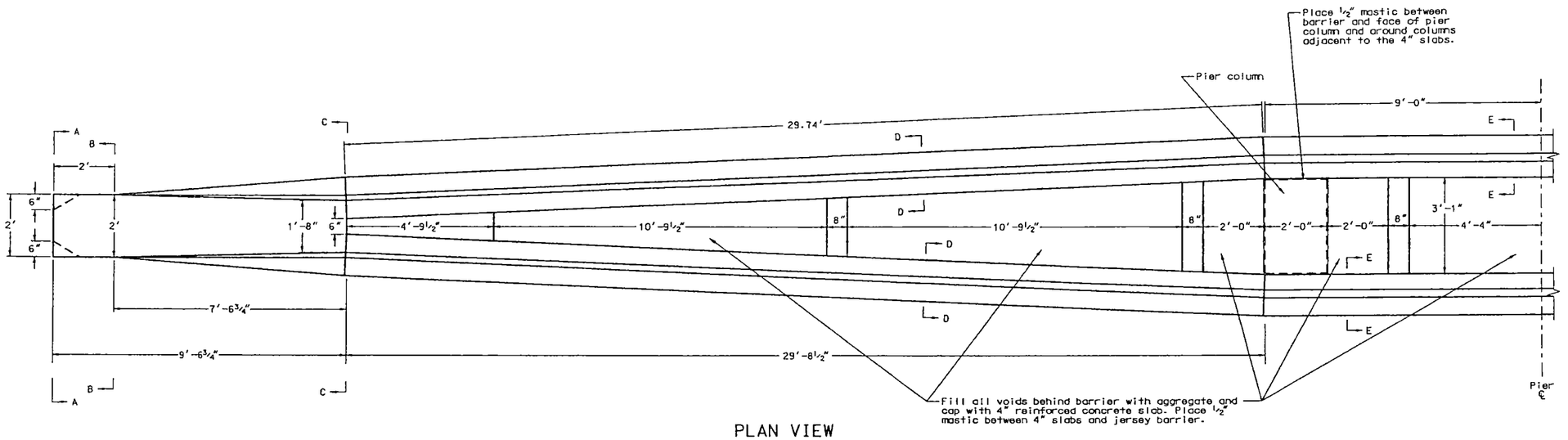
Median Pier Protection

Pettibone Interchange
RP 217.145
I-94

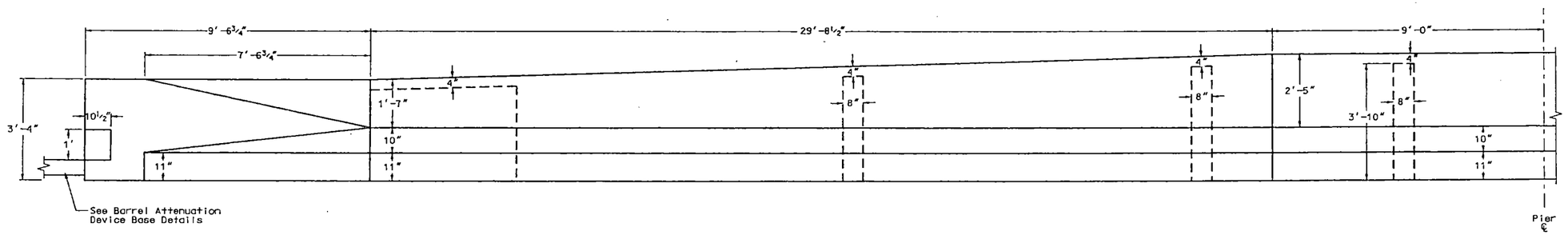
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	3

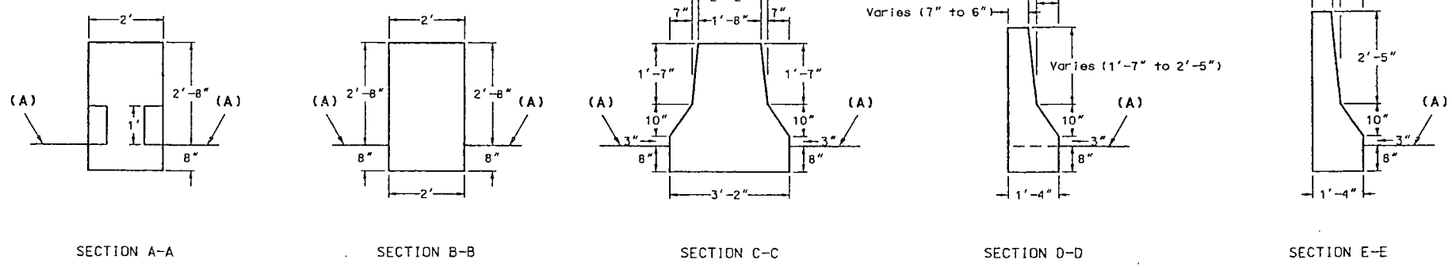
23 USC §409 Documents
NDDOT Reserves All Objections



PLAN VIEW



ELEVATION VIEW



Note: One half of jersey barrier is shown. Barrier layout is symmetrical about pier ℄.

(A) Finished surface

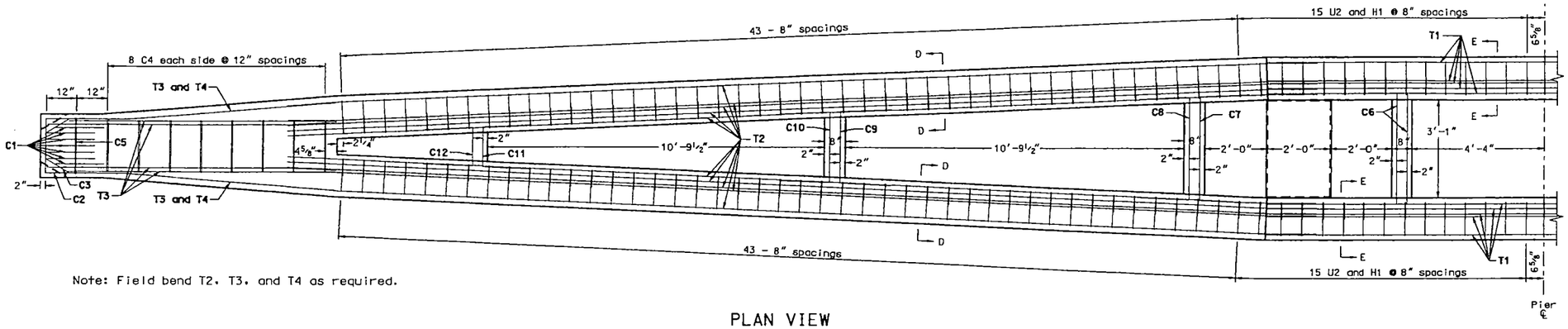
GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1293
ENGINEER
12/19/05
NORTH DAKOTA

Jersey Barrier Details
Median Pier Protection

Tappen Interchange
RP 214.126
Pettibone Interchange
RP 217.145
I-94

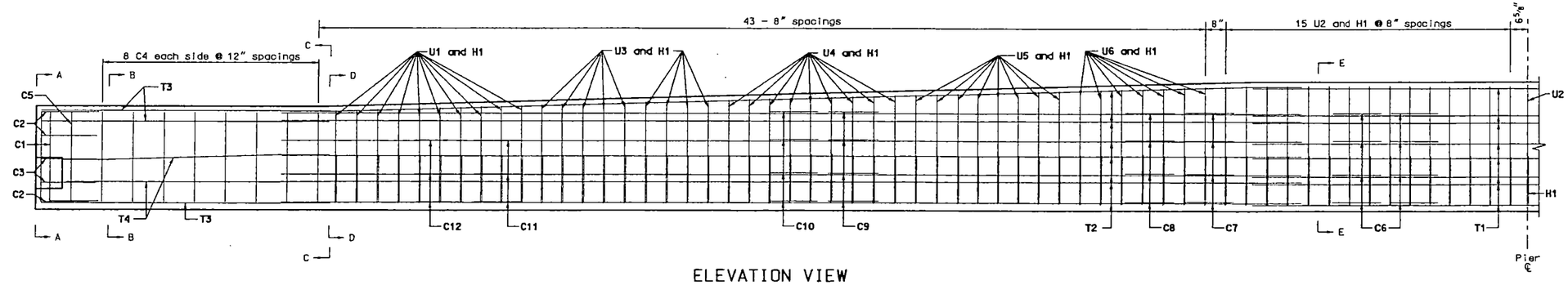
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ND	IM-2-094(063)209	130	4

23 USC §409 Documents
NDDOT Reserves All Objections



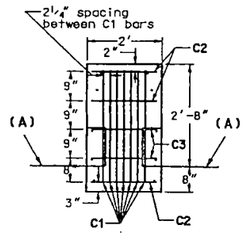
Note: Field bend T2. T3. and T4 as required.

PLAN VIEW

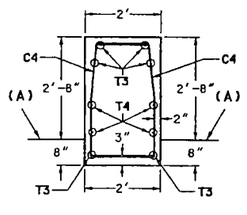


ELEVATION VIEW

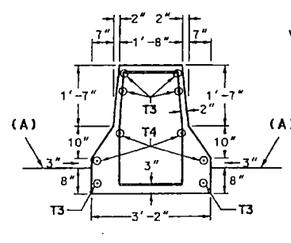
Note: Barrier layout is symmetrical about pier ℄.



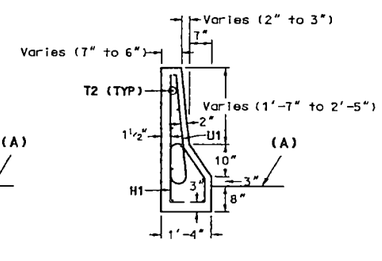
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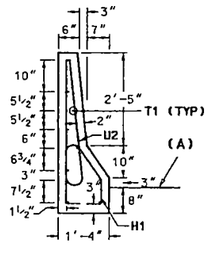
SECTION B-B



SECTION C-C



SECTION D-D



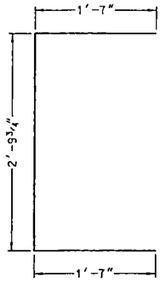
SECTION E-E

(A) Finished surface

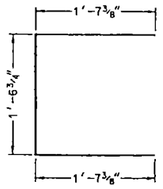
GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1253
ENGINEER
12/30/05
NORTH DAKOTA

Jersey Barrier Details
Median Pier Protection
Reinforcing Steel Layout
Tappen Interchange
RP 214.126
Pettibone Interchange
RP 217.145
I-94

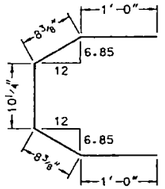
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ND	IM-2-094(063)209	130	5



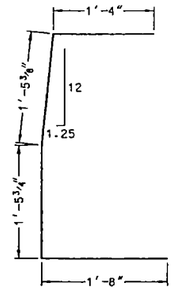
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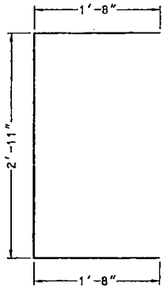
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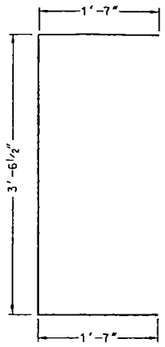
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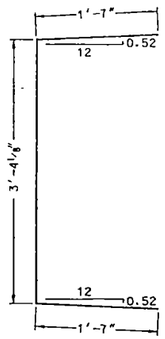
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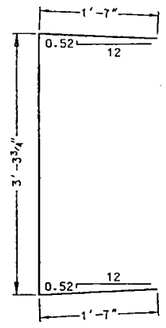
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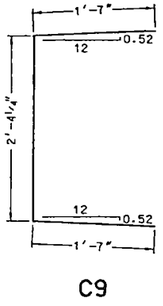
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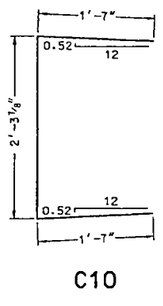
C7



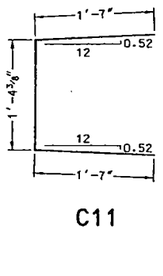
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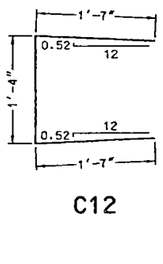
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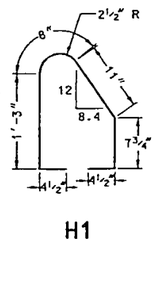
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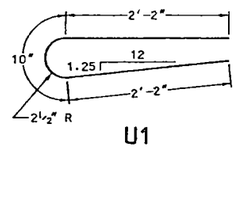
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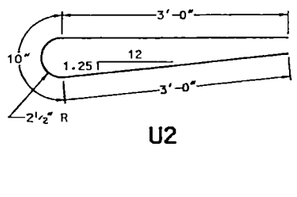
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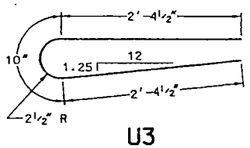
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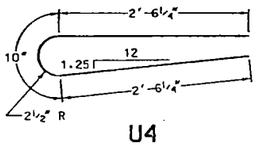
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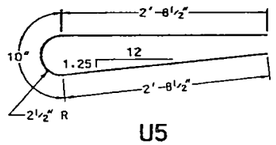
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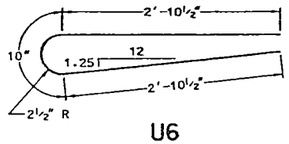
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U4



U5

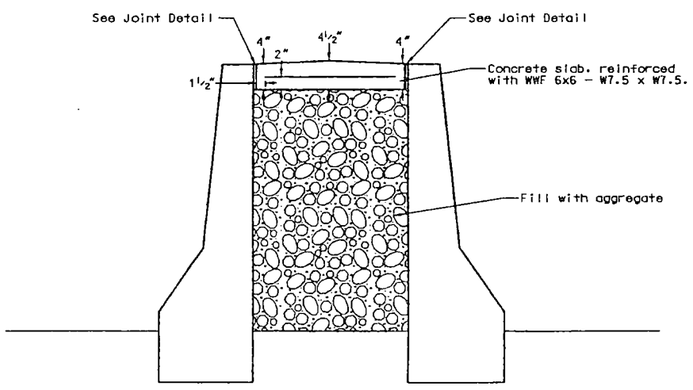


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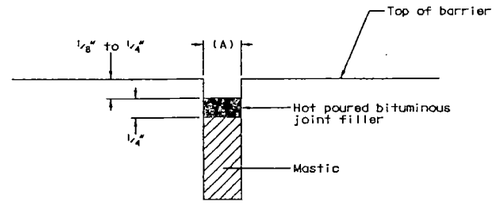
BENT BAR DETAILS

BAR LIST - ONE BARRIER (A)				
MARK	SIZE	NO.	LENGTH	SHAPE
C1	6	14	5'-11 3/4"	BENT
C2	5	6	4'-9 1/2"	BENT
C3	5	4	4'-3"	BENT
C4	5	32	5'-11 1/8"	BENT
C5	5	4	6'-3"	BENT
C6	5	16	6'-8 1/2"	BENT
C7	5	8	6'-6 1/8"	BENT
C8	5	8	6'-5 3/4"	BENT
C9	5	8	5'-6 1/4"	BENT
C10	5	8	5'-5 7/8"	BENT
C11	5	6	4'-6 3/8"	BENT
C12	5	6	4'-6"	BENT
H1	5	234	4'-2 3/4"	BENT
T1	5	18	18'-0"	STRAIGHT
T2	5	36	32'-11 1/2"	STRAIGHT
T3	5	12	9'-4 1/4"	STRAIGHT
T4	5	8	8'-7"	STRAIGHT
U1	5	40	5'-2"	BENT
U2	5	62	6'-10"	BENT
U3	5	36	5'-7"	BENT
U4	5	36	5'-10 1/2"	BENT
U5	5	32	6'-3"	BENT
U6	5	28	6'-7"	BENT

(A) NOTE: The reinforcing steel for one barrier installation is shown above. Two barrier installations will be required.



4" Slab and Aggregate Fill Detail

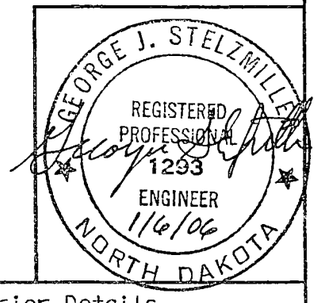


Joint Detail

(A) Joint width shall be 1/2" between barrier and 4" slab, and between barrier and pier columns.

Construction notes:

1. Barriers shall be constructed according to the provisions of Section 602.03 B.4 except that there shall be no defiection joints. Make 3/4" V-grooves in all faces of the barriers at approximately 10-foot spacings.
2. Dimensions of bent bars are given out to out. The length of bent bars listed is the sum of the detailing dimensions.
3. Reinforcing steel shall be grade 60, and concrete shall be Class AAE-3.
4. Longitudinal reinforcing shall be lap spliced 19".
5. Surface finish "D" shall be required for all exposed surfaces of the barrier.



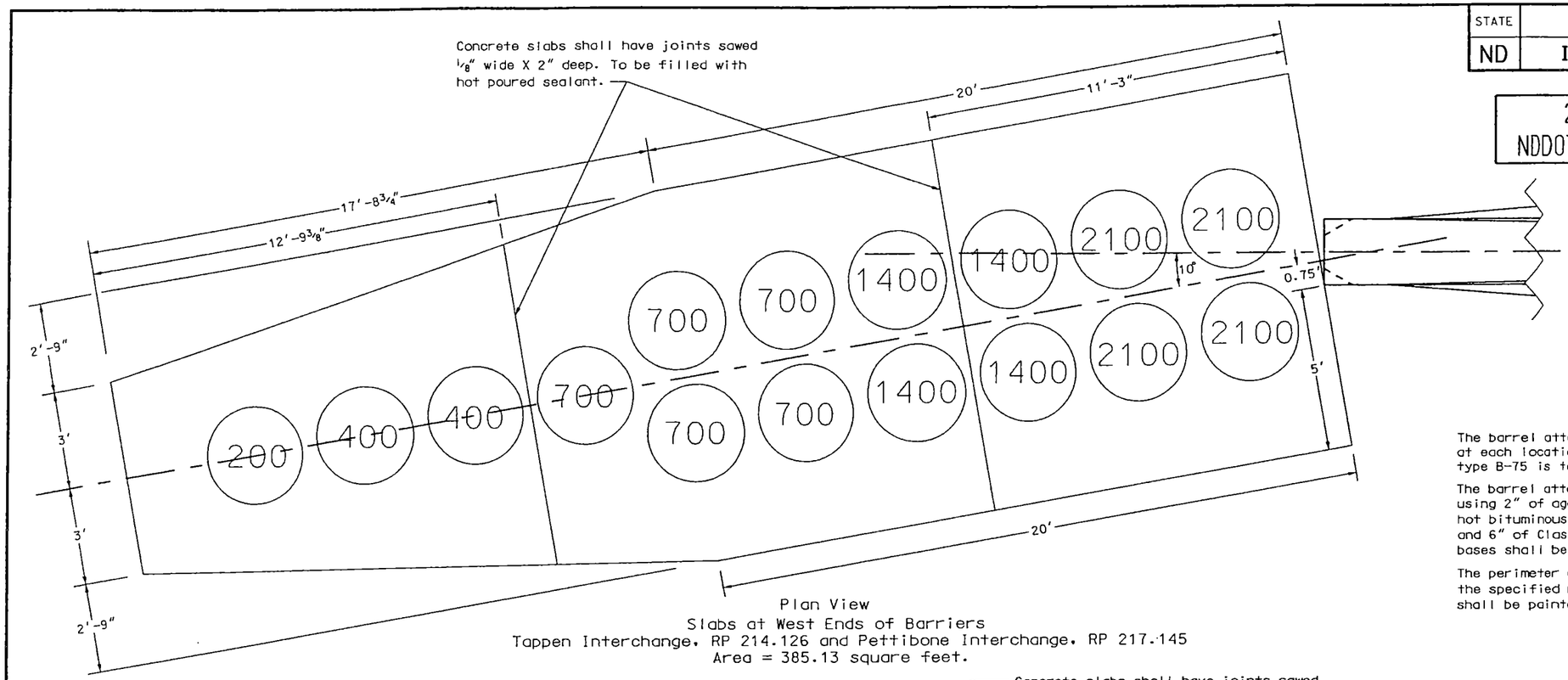
23 USC §409 Documents
NDDOT Reserves All Objections

Jersey Barrier Details
Bent Bar Details, Bar List,
4" Slab and Aggregate Fill
Detail, and Joint Detail

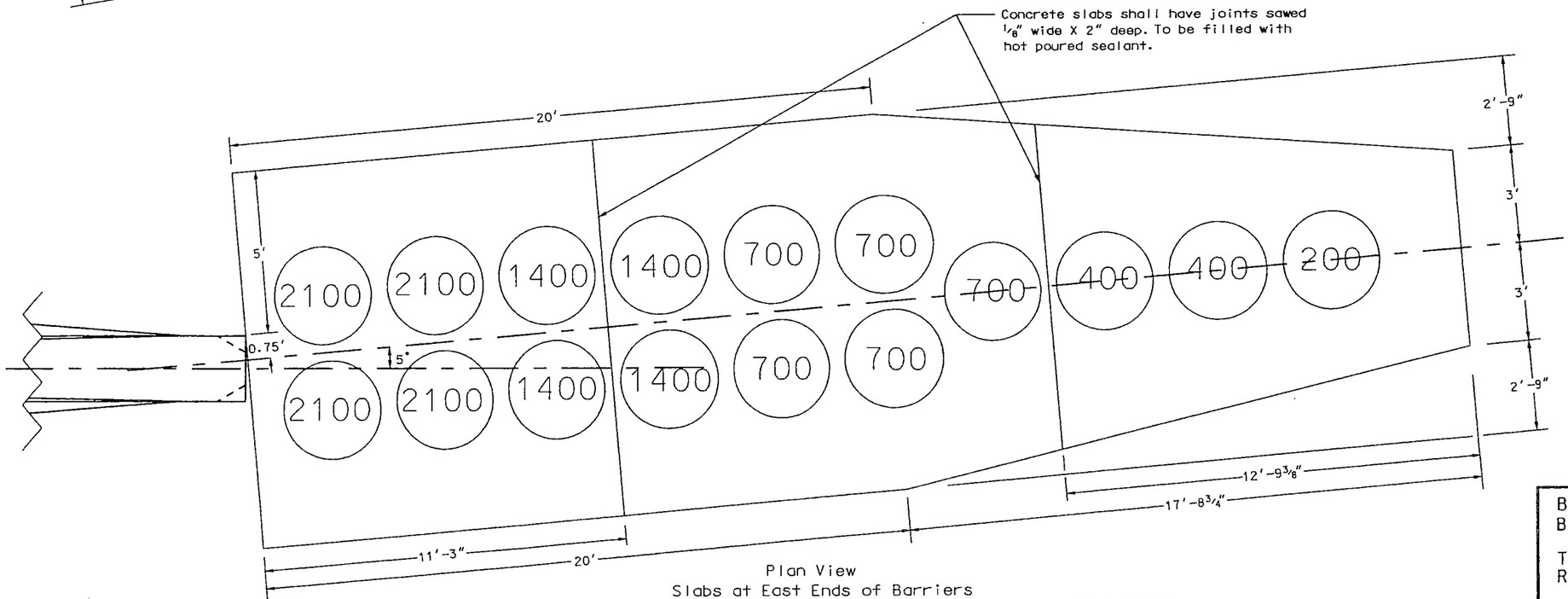
Tappen Interchange, RP 214.126
Pettibone Interchange, RP 217.145
I-94

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23 USC §409 Documents
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Plan View
Slabs at West Ends of Barriers
Tappen Interchange, RP 214.126 and Pettibone Interchange, RP 217.145
Area = 385.13 square feet.



Plan View
Slabs at East Ends of Barriers
Tappen Interchange, RP 214.126 and Pettibone Interchange, RP 217.145
Area = 385.13 square feet.

The barrel attenuation device bases shall be constructed at each location where a barrel attenuation device type B-75 is to be installed.

The barrel attenuation device bases may be constructed using 2" of aggregate base and 8" of Class 27 hot bituminous pavement, or 2" of aggregate base and 6" of Class AE-3 concrete. The surface of the bases shall be slightly sloped to facilitate drainage.

The perimeter of each attenuation device module, and the specified mass (weight) of sand in each module shall be painted on the surface of the bases.

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Barrel Attenuation Device
Base Details

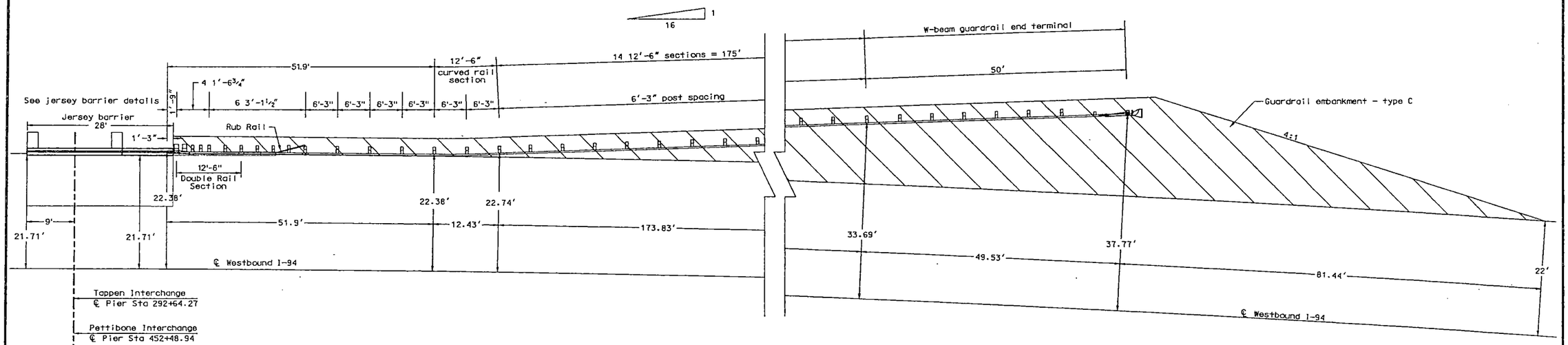
Tappen Interchange
RP 214.126

Pettibone Interchange
RP 217.145

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23 USC §409 Documents
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W-Beam Guardrail and Jersey Barrier Layout

Outside Pier Protection
Tappen Interchg., RP 214.126
Pettibone Interchg., RP 217.145

Westbound Roadway I-94

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23 USC § 409 Documents
NDDOT Reserves All Objections

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W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

W-BEAM GUARDRAIL AT OBSTRUCTIONS WITH JERSEY BARRIER

LOCATION	(A) TERM-INAL CON-NECTOR	(A) 5/8" Ø x 22" LONG GUARD-RAIL BOLT	(A) 5/8" Ø x 20" LONG GUARD-RAIL BOLT	(A) 7/8" Ø x 9" LONG H.S. HEX HEAD BOLT	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6"x 8" x 14" WOOD OFF-SET BLOCK	(A) 6"x 8" x 6' TIMBER POST	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'-6" DOUBLE RAIL SECTION	(A) 12'-6" STRAIGHT RAIL SECTION	(A) 12'-6" CURVED RAIL SECTION	(A) 5/8" Ø x 11" LONG HEX HEAD BOLT	(A) 1/2" Ø x 4" LONG LAG SCREW	(A) 6" x 8" x 7'-0" TIMBER POSTS	(A) RUB RAIL END SHOE	(A) C 6 x 8.2 x 14'-6 1/4" RUB RAIL SECTION	(A) C 6 x 8.2 x 12'-7" BENT RUB RAIL SECTION	(A) 5/8" Ø x 1 1/2" LONG GUARD-RAIL BOLT	(A) 7 3/4" x 4 ½" x 3/8" RUB RAIL SPLICE PLATE	(A) 10"x 10" x 8'-0" TIMBER POST	(A) 10"x 8" x 21" TAPERED TIMBER BLOCK	(A) 6"x 8" x 21" TIMBER BLOCK	(A) 6"x 9 3/4" x 14" TIMBER BLOCK	(A) REFL-ECTOR-IZED PLATES	(B) EMBANK-MENT TYPE-C
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	CY
Sta 292+81.90 to 294+07.23 lt	1	2	9	4	25	17	22	88	1	8	1	2	1	3	1	1	1	4	1	2	2	7	1	7	242
TOTAL	1	2	9	4	25	17	22	88	1	8	1	2	1	3	1	1	1	4	1	2	2	7	1	7	242

Remove 3-cable guardrail &posts

Sta 288+14.27 to 293+39.27 rt mdn	525	LF
Sta 291+89.27 to 295+76.77 lt mdn	387.5	LF
Total	912.5	LF

Remove W-beam guardrail & posts

Sta 292+26.77 to 294+01.46 lt	175	LF

Remove end treatment & transition

Sta 294+01.46 to 294+38.18 lt	1	ea

Reset W-beam guardrail

Sta 294+07.23 to 295+18.24 lt	112.5	LF

W-beam guardrail

Sta 292+81.90 to 294+07.23 lt	126.9	LF

W-beam guardrail end terminal

Sta 295+18.24 to 295+67.44 lt	1	ea

Guardrail embankment - type C

Sta 292+83.14 to 296+48.35 lt	1	ea

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The volume of embankment - type C (cubic yards) is for informational purposes only.

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W-Beam Guardrail Quantities

Tappen Interchange
Outside Pier Protection
Westbound Roadway

RP 214.126
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23 USC § 409 Documents
NDDOT Reserves All Objections

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W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

W-BEAM GUARDRAIL AT OBSTRUCTIONS WITH JERSEY BARRIER

LOCATION	(A) TERM-INAL CON-NECTOR EACH	(A) 5/8" Ø x 22" LONG GUARD-RAIL BOLT EACH	(A) 5/8" Ø x 20" LONG GUARD-RAIL BOLT EACH	(A) 7/8" Ø x 9" LONG H.S. HEX HEAD BOLT EACH	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT EACH	(A) 6"x 8" x 14" WOOD OFF-SET BLOCK EACH	(A) 6"x 8" x 6' TIMBER POST EACH	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT EACH	(A) 12'-6" DOUBLE RAIL SECTION EACH	(A) 12'-6" STRAIGHT RAIL SECTION EACH	(A) 12'-6" CURVED RAIL SECTION EACH	(A) 5/8" Ø x 11" LONG HEX HEAD BOLT EACH	(A) 1/2" Ø x 4" LONG LAG SCREW EACH	(A) 6" x 8" x 7'-0" TIMBER POSTS EACH	(A) RUB RAIL END SHOE EACH	(A) C 6 x 8.2 x 14'-6 1/4" RUB RAIL SECTION EACH	(A) C 6 x 8.2 x 12'-7" BENT RUB RAIL SECTION EACH	(A) 5/8" Ø x 1 1/2" LONG GUARD-RAIL BOLT EACH	(A) 7 3/4" x 4 ½" x 3/8" RUB RAIL SPLICE PLATE EACH	(A) 10"x 10" x 8'-0" TIMBER POST EACH	(A) 10"x 8" x 21" TAPERED TIMBER BLOCK EACH	(A) 6"x 8" x 21" TIMBER BLOCK EACH	(A) 6"x 9 3/4" x 14" TIMBER BLOCK EACH	(A) REFL-ECTOR-IZED PLATES EACH	(B) EMBANK-MENT TYPE-C CY
Sta 452+66.57 to 453+91.90 lt	1	2	9	4	25	17	22	88	1	8	1	2	1	3	1	1	1	4	1	2	2	7	1	7	322
TOTAL	1	2	9	4	25	17	22	88	1	8	1	2	1	3	1	1	1	4	1	2	2	7	1	7	322

Remove 3-cable guardrail &posts

Sta 447+98.94 to 453+23.94 rt mdn	525	LF
Sta 451+73.94 to 455+61.44 lt mdn	387.5	LF
Total	912.5	LF

Remove W-beam guardrail & posts

Sta 452+11.44 to 453+86.13 lt	175	LF

Remove end treatment & transition

Sta 453+86.13 to 454+22.85 lt	1	ea

Reset W-beam guardrail

Sta 453+91.90 to 455+02.91 lt	112.5	LF

W-beam guardrail

Sta 452+66.57 to 453+91.90 lt	126.9	LF

W-beam guardrail end terminal

Sta 455+02.91 to 455+52.11 lt	1	ea

Guardrail embankment - type C

Sta 452+67.81 to 456+33.02 lt	1	ea

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The volume of embankment - type C (cubic yards) is for informational purposes only.

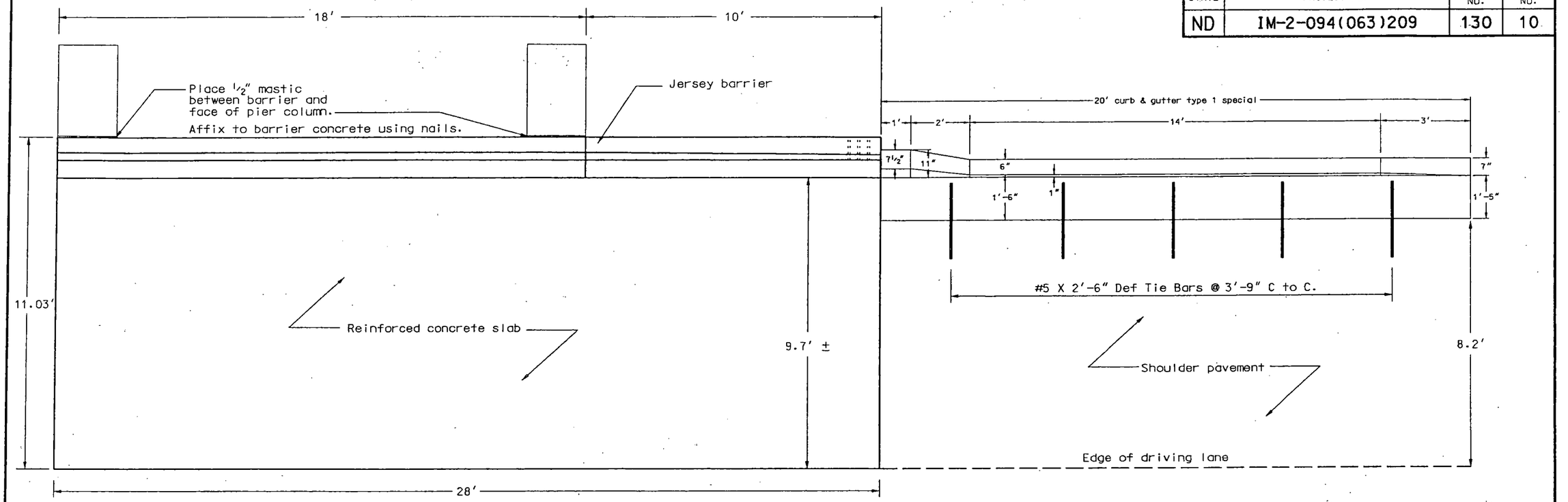
GEORGE J. STELZMILLER
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12/19/05
NORTH DAKOTA

W-Beam Guardrail Quantities

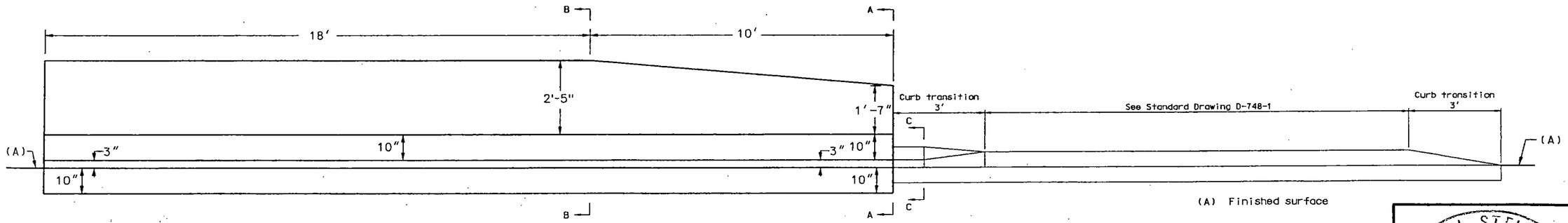
Pettibone Interchange
Outside Pier Protection
Westbound Roadway

RP 217.145
I-94

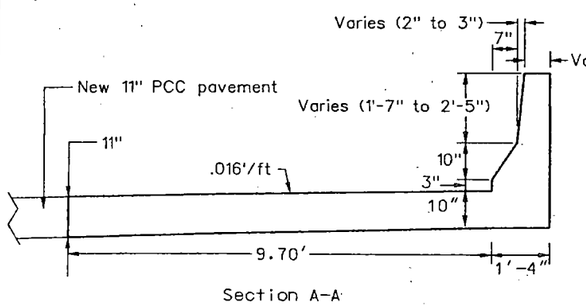
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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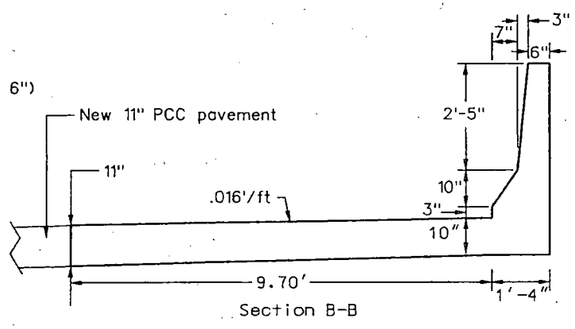
Plan view



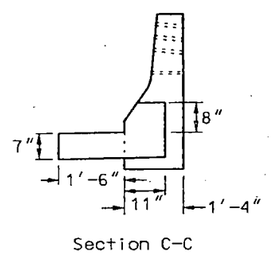
Elevation view
Facing north



Section A-A

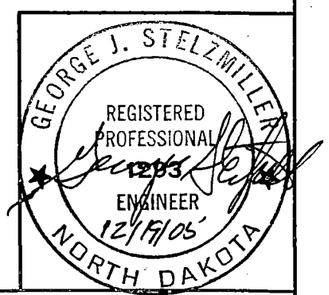


Section B-B



Section C-C

23 USC §409 Documents
NDDOT Reserves All Objections

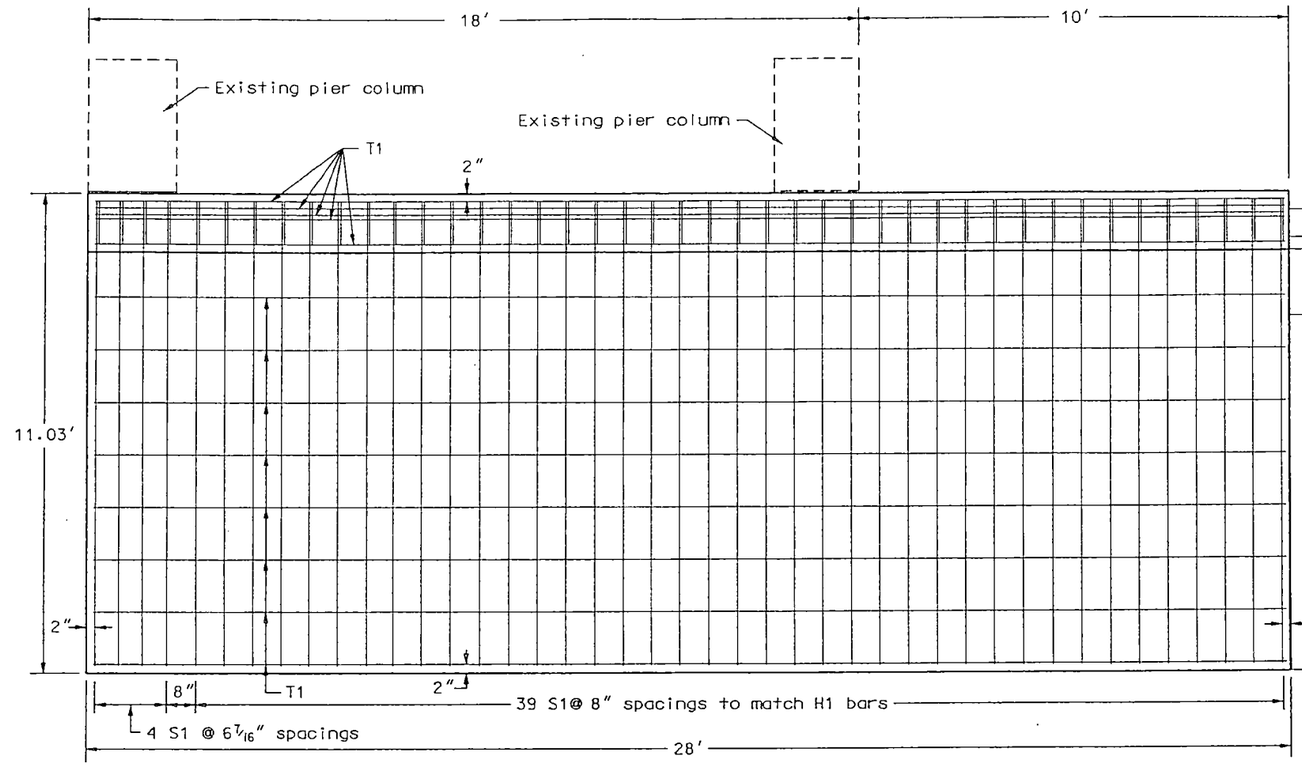


Jersey Barrier and Curb & Gutter Details

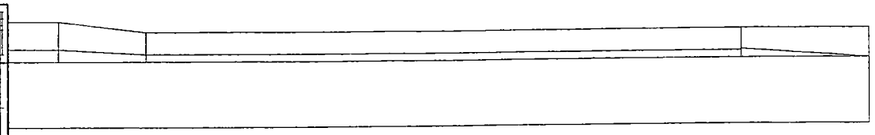
Tappen Interchange
RP 214.126
Pettibone Interchange
RP 217.145
Westbound Roadway I-94

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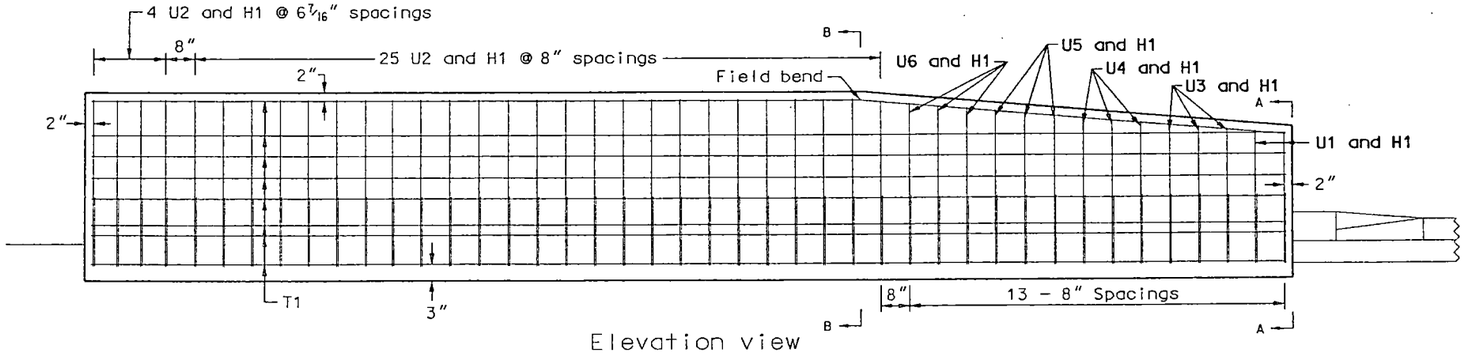
23 USC §409 Documents
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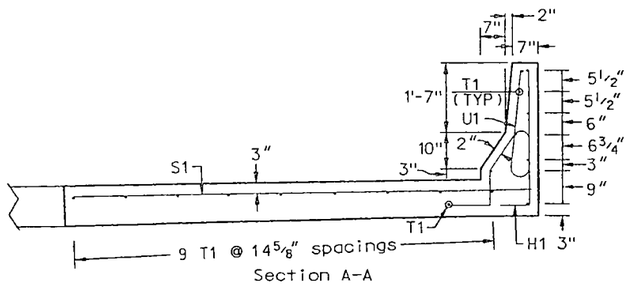
Plan view



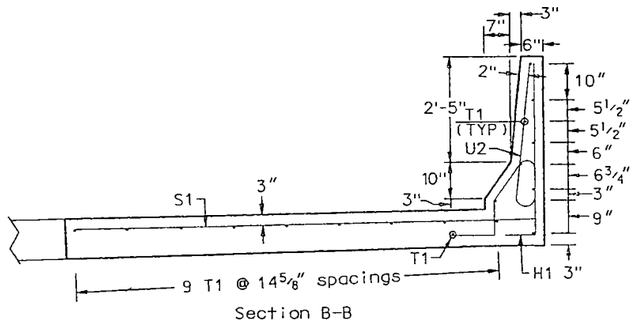
Edge of driving lane



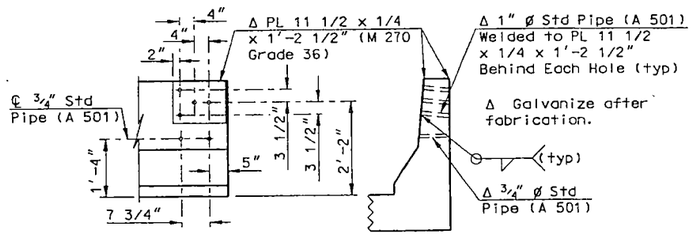
Elevation view
Facing South



Section A-A



Section B-B



GUARDRAIL CONNECTION PLATE DETAILS
AT WEST END OF BARRIER
(SHOWING FRONT FACE)

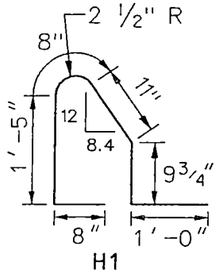
GEORGE J. STELZMILLER
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12/19/05
NORTH DAKOTA

Jersey Barrier Details
Reinforcing Steel Layout

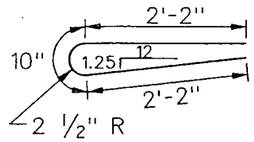
Tappen Interchange
RP 214.126
Pettibone Interchange
RP 217.145
Westbound Roadway I-94

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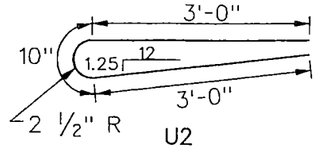
23 USC §409 Documents
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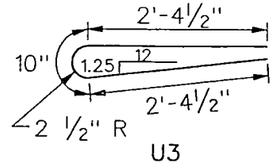
H1



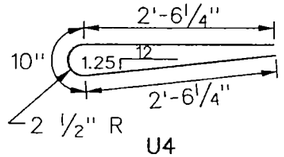
U1



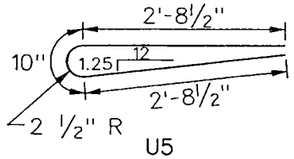
U2



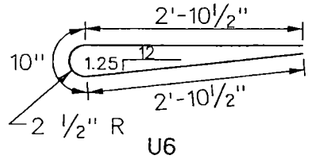
U3



U4



U5



U6

BENT BAR DETAILS

BAR LIST (A)				
MARK	SIZE	NO.	LENGTH	SHAPE
H1	5	43	5'-5¾"	BENT
S1	6	43	10'-8⅜"	STRAIGHT
T1	5	18	27'-8"	STRAIGHT
U1	5	2	5'-2"	BENT
U2	5	29	6'-10"	BENT
U3	5	3	5'-7"	BENT
U4	5	3	5'-10½"	BENT
U5	5	3	6'-3"	BENT
U6	5	3	6'-7"	BENT

(A) The BAR LIST shows the quantities for one jersey barrier installation. Two installations are required.

Jersey barrier formed or slip formed	
Tappen Interchange	28 LF
Pettibone Interchange	28 LF
Total	56 LF

Curb & gutter-type 1 special	
Tappen Interchange	20 LF
Pettibone Interchange	20 LF
Total	40 LF

Construction notes:

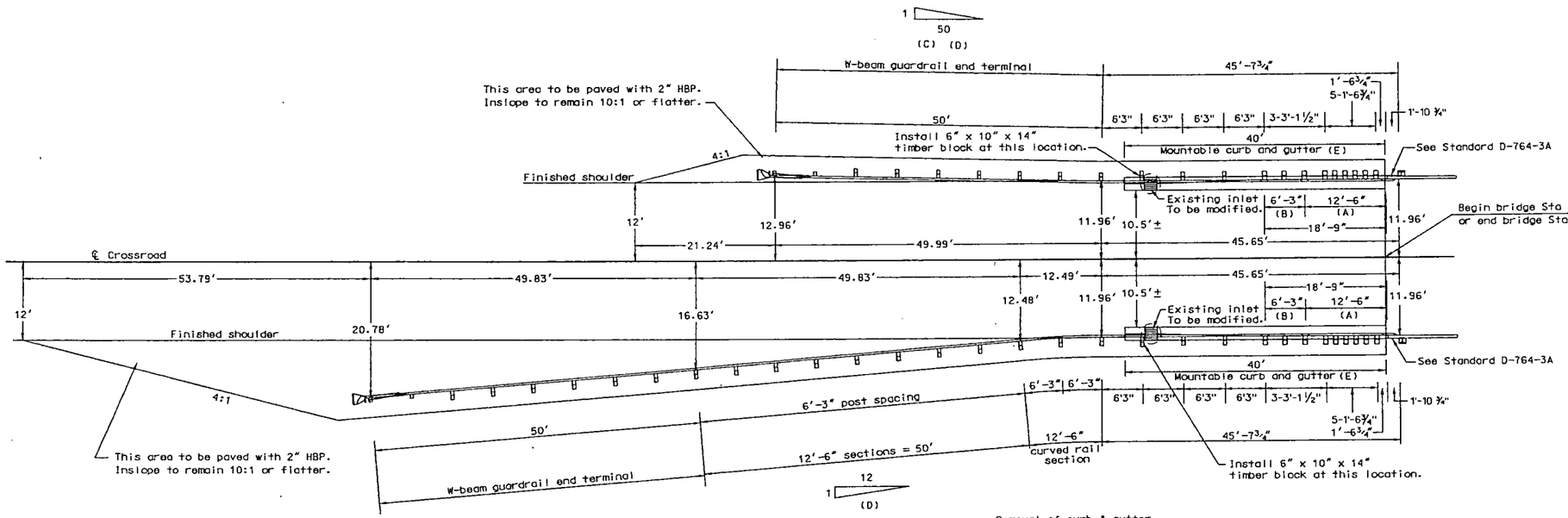
1. Barriers shall be constructed according to the provisions of Section 602.03 B.4 except that there shall be no deflection joints. Make ¾" V-grooves in all faces of the barriers to match transverse slab joints.
2. Slab transverse joint shall be located to match the adjacent pavement joints. Joints shall be sawed and sealed as shown in the transverse joint sawing and sealing sawed and sealed as shown in the details, except that the saw cut depth shall be no more than 2"
3. Dimensions of bent bars are given out to out. the length of bent bars listed is the sum of the detailing dimensions.
4. Reinforcing steel shall be grade 60, and concrete shall be Class AAE-3.
5. Surface finish "D" shall be required for all exposed surfaces of the barrier.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1203
ENGINEER
12/19/06
NORTH DAKOTA

Jersey Barrier Details
Bent Bar Details, Bar List and Quantities
Outside Pier Protection
Tappen Interchg., RP 214.126
Pettibone Interchg., RP 217.145
Westbound Roadway
I-94

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	13

23 USC §409 Documents
NDDOT Reserves All Objections



Removal of curb & gutter

Sta 8+49.0 to 8+89.0 rt	40 LF
Sta 8+49.0 to 8+89.0 lt	40 LF
Sta 11+12.0 to 11+52.0 rt	40 LF
Sta 11+12.0 to 11+52.0 lt	40 LF
Total	160 LF

Mountable curb & gutter – type 1 Sec A

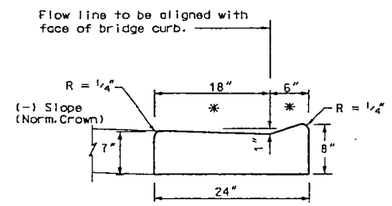
Sta 8+49.0 to 8+89.0 rt	40 LF
Sta 8+49.0 to 8+89.0 lt	40 LF
Sta 11+12.0 to 11+52.0 rt	40 LF
Sta 11+12.0 to 11+52.0 lt	40 LF
Total	160 LF

Casting mountable curb – type A

Sta 8+13.0 rt	1 ea
Sta 8+13.0 lt	1 ea
Sta 11+48.0 rt	1 ea
Sta 11+48.0 lt	1 ea
Total	4 ea

Adjust inlet

Sta 8+13.0 rt	1 ea
Sta 8+13.0 lt	1 ea
Sta 11+48.0 rt	1 ea
Sta 11+48.0 lt	1 ea
Total	4 ea



Curb Detail

Mountable Curb & Gutter
Type I At Bridge End

* Section above shall be used from the bridge ends for a distance of 20 feet. The flow line shall be tapered to drain into the mountable inlet casting over a distance of approximately 15 feet

(A) Thrie beam rail (double thickness)

(B) W-thrie beam transition section (double thickness)

(C) If the FLEAT is to be installed, the flare shown on Standard D-764-2C shall be used.

If the ET-2000 end terminal is to be installed, a 50:1 taper shall be used for this end terminal.

(D) The Slotted Rail Terminal may not be used at this location.

(E) 40 lineal feet of existing mountable curb at each bridge corner shall be removed and replaced with mountable curb and gutter. The existing inlet grates and castings shall be removed, and mountable curb castings (Type A) with grates shall be installed.

The mountable curb shall be in accordance with Standard D-748-1, except that the location of the flow line shall vary. At the bridge ends, the flow line shall be as shown in the curb detail. This section shall extend for 20 feet. A taper in the flow line shall be used for a distance of 15 feet to match the mountable inlet castings.

Installation of the curb and gutter as described above will require that a strip of the existing asphalt pavement approximately 6" wide by 40' in length shall be sawcut and removed at each bridge corner to allow for the shift of the curb and gutter.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1293
ENGINEER
12/19/05
NORTH DAKOTA

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

Tappen Interchange Crossroad

RP 214.126
I–94

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23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	14

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'- 6" STRAIGHT W-BEAM RAIL SECTION	(A) 12'- 6" CURVED W-BEAM RAIL SECTION	(A) REFL-ECTOR-IZED PLATES	(A) 8"x 8" x 6' WOOD POST	(A) 8"x 8" x 22" WOOD OFF-SET BLOCK	(A) 8"x 8" x 18" WOOD OFF-SET BLOCK	(A) 8"x 8" x 14" WOOD OFF-SET BLOCK	(A) 6'-3" DOUBLE W-THRIE BEAM TRANS-ITION SECTION	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) 7/8" Ø x VAR-IABLE LONG. BOLT	(A) 3/4" Ø x 2-1/2" LONG POST BOLT	(A) 6"x 10" x 14" WOOD OFF-SET BLOCK
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 7+83.13 to 8+91.10 rt	31	14	13	88	6	1	8	9	7	1	1	1	1	1	5	2	1
Sta 8+45.45 to 8+91.10 lt	21	4	3	48	2		5	9	7	1	1	1	1	1	5	2	1
Sta 11+09.90 to 11+55.55 rt	21	4	3	48	2		5	9	7	1	1	1	1	1	5	2	1
Sta 11+09.90 to 12+17.87 lt	31	14	13	88	6	1	8	9	7	1	1	1	1	1	5	2	1
TOTAL	104	36	32	272	16	2	26	36	28	4	4	4	4	4	20	8	4

W-beam guardrail

Sta 7+83.13 to 8+91.10 rt	108.2 LF
Sta 8+45.45 to 8+91.10 lt	45.7 LF
Sta 11+09.90 to 11+55.55 rt	45.7 LF
Sta 11+09.90 to 12+17.87 lt	108.2 LF
Total	307.8 LF

W-beam guardrail end terminal

Sta 7+33.30 to 7+83.13 rt	1 ea
Sta 7+95.46 to 8+45.45 lt	1 ea
Sta 11+55.55 to 12+05.54 rt	1 ea
Sta 12+17.87 to 12+67.70 lt	1 ea
Total	4 ea

Remove box beam guardrail

Sta 7+56.74 to 9+05.58 rt	149.2 LF
Sta 8+28.49 to 9+05.58 lt	77.2 LF
Sta 10+95.42 to 11+72.51 rt	77.2 LF
Sta 10+95.42 to 12+44.26 lt	149.2 LF
Total	452.8 LF

Remove end treatment & transition

Sta 7+20.27 to 7+56.74 rt	1 ea
Sta 7+92.02 to 8+28.49 lt	1 ea
Sta 11+72.51 to 12+08.98 rt	1 ea
Sta 12+44.26 to 12+80.73 lt	1 ea
Total	4 ea

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The volume of embankment - type C (cubic yards) is for informational purposes only.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
1293
ENGINEER
12/9/05
NORTH DAKOTA

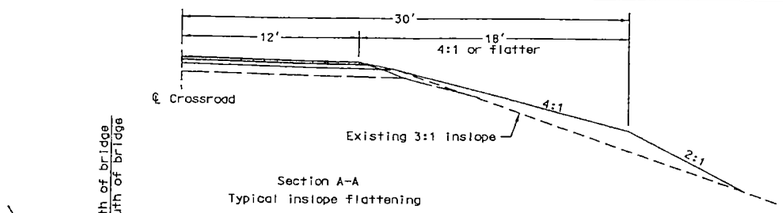
Thrie/W-Beam Guardrail Quantities

Tappen Interchange Crossroad

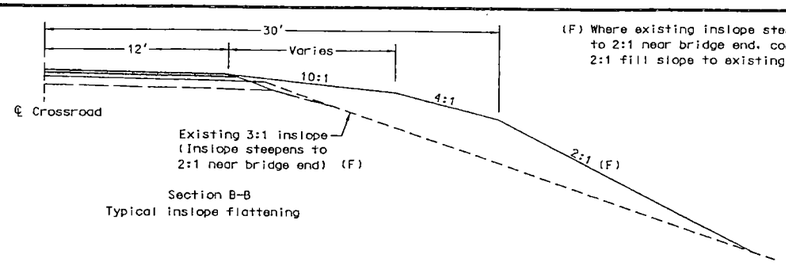
RP 214.126
I-94

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	15

23 USC §409 Documents
NDDOT Reserves All Objections

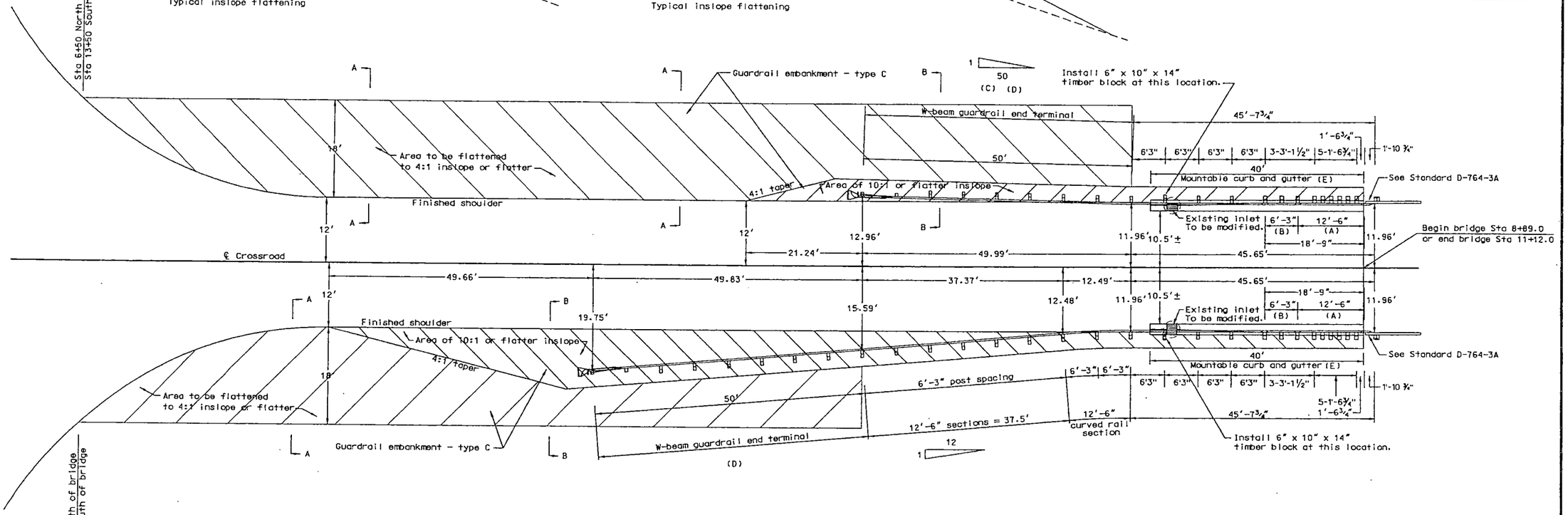


Section A-A
Typical inslope flattening

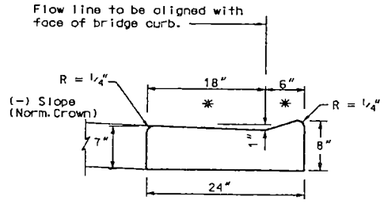


Section B-B
Typical inslope flattening

(F) Where existing inslope steepens to 2:1 near bridge end, continue 2:1 fill slope to existing ground.



Sta 6+50 North of bridge
Sta 13+50 South of bridge



Curb Detail

Mountable Curb & Gutter
Type I At Bridge End

* Section above shall be used from the bridge ends for a distance of 20 feet. The flow line shall be tapered to drain into the mountable inlet casting over a distance of approximately 15 feet

Removal of curb & gutter	
Sta 8+49.0 to 8+89.0 rt	40 LF
Sta 8+49.0 to 8+89.0 lt	40 LF
Sta 11+12.0 to 11+52.0 rt	40 LF
Sta 11+12.0 to 11+52.0 lt	40 LF
Total	160 LF

Mountable curb & gutter - type 1 Sec A	
Sta 8+49.0 to 8+89.0 rt	40 LF
Sta 8+49.0 to 8+89.0 lt	40 LF
Sta 11+12.0 to 11+52.0 rt	40 LF
Sta 11+12.0 to 11+52.0 lt	40 LF
Total	160 LF

Casting mountable curb - type A	
Sta 8+13.0 rt	1 ea
Sta 8+13.0 lt	1 ea
Sta 11+48.0 rt	1 ea
Sta 11+48.0 lt	1 ea
Total	4 ea

Adjust inlet	
Sta 8+13.0 rt	1 ea
Sta 8+13.0 lt	1 ea
Sta 11+48.0 rt	1 ea
Sta 11+48.0 lt	1 ea
Total	4 ea

(A) Thrie beam rail (double thickness)

(B) W-thrie beam transition section (double thickness)

(C) If the FLEAT is to be installed, the flare shown on Standard D-764-2C shall be used.

If the ET-2000 end terminal is to be installed, a 50:1 taper shall be used for this end terminal.

(D) The Slotted Rail Terminal may not be used at this location.

(E) 40 lineal feet of existing mountable curb at each bridge corner shall be removed and replaced with mountable curb and gutter. The existing inlet grates and castings shall be removed, and mountable curb castings (Type A) with grates shall be installed.

The mountable curb shall be in accordance with Standard D-748-1, except that the location of the flow line shall vary. At the bridge ends, the flow line shall be as shown in the curb detail. This section shall extend for 20 feet. A taper in the flow line shall be used for a distance of 15 feet to match the mountable inlet castings.

Installation of the curb and gutter as described above will require that a strip of the existing asphalt pavement approximately 6" wide by 40' in length shall be sawcut and removed at each bridge corner to allow for the shift of the curb and gutter.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
ENGINEER
1233
11/03/05
NORTH DAKOTA

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

Pettibone Interchange Crossroad

RP 217.145
I-94

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23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	130	16

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT EACH	(A) 6" x 8" x 6'-0" TIMBER POST EACH	(A) 6" x 8" x 14" TIMBER BLOCK EACH	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT EACH	(A) 12'- 6" STRAIGHT W-BEAM RAIL SECTION EACH	(A) 12'- 6" CURVED W-BEAM RAIL SECTION EACH	(A) REFL-ECTOR-IZED PLATES EACH	(A) 8"x 8" x 6' WOOD POST EACH	(A) 8"x 8" x 22" WOOD OFF-SET BLOCK EACH	(A) 8"x 8" x 18" WOOD OFF-SET BLOCK EACH	(A) 8"x 8" x 14" WOOD OFF-SET BLOCK EACH	(A) 6'-3" DOUBLE W-THRIE BEAM TRANS-ITION SECTION EACH	(A) 12'-6" DOUBLE THRIE BEAM SECTION EACH	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR EACH	(A) 7/8" Ø x VAR-IABLE LONG. BOLT EACH	(A) 3/4" Ø x 2-1/2" LONG POST BOLT EACH	(B) EMBANK-MENT TYPE C CY	(A) 6" x 10" x 14" TIMBER BLOCK EACH
Sta 7+83.13 to 8+91.10 rt	29	12	11	80	5	1	7	9	7	1	1	1	1	1	5	2	505	1
Sta 8+45.45 to 8+91.10 lt	21	4	3	48	2		5	9	7	1	1	1	1	1	5	2	590	1
Sta 11+09.90 to 11+55.55 rt	21	4	3	48	2		5	9	7	1	1	1	1	1	5	2	548	1
Sta 11+09.90 to 12+17.87 lt	29	12	11	80	5	1	7	9	7	1	1	1	1	1	5	2	378	1
TOTAL	100	32	28	256	14	2	24	36	28	4	4	4	4	4	20	8	2021	4

W-beam guardrail

Sta 7+45.76 to 8+91.10 rt	95.7 LF
Sta 8+45.45 to 8+91.10 lt	45.7 LF
Sta 11+09.90 to 11+55.55 rt	45.7 LF
Sta 11+09.90 to 12+05.41 lt	95.7 LF
Total	282.8 LF

W-beam guardrail end terminal

Sta 7+45.76 to 7+95.59 rt	1 ea
Sta 7+95.46 to 8+45.45 lt	1 ea
Sta 11+55.55 to 12+05.54 rt	1 ea
Sta 12+05.41 to 12+55.24 lt	1 ea
Total	4 ea

Guardrail embankment - type C

Sta 6+96.10 to 8+89.0 rt	1 ea
Sta 7+74.22 to 8+89.0 lt	1 ea
Sta 11+12.0 to 12+26.78 rt	1 ea
Sta 11+12.0 to 13+04.90 lt	1 ea
Total	4 ea

(A) These items are not to be bid separately but shall be included in the price bid for the item "W-Beam Guardrail".

(B) The volume of embankment - type C (cubic yards) is for informational purposes only.

GEORGE J. STELZMILLER
REGISTERED PROFESSIONAL
ENGINEER
NORTH DAKOTA
12/19/05

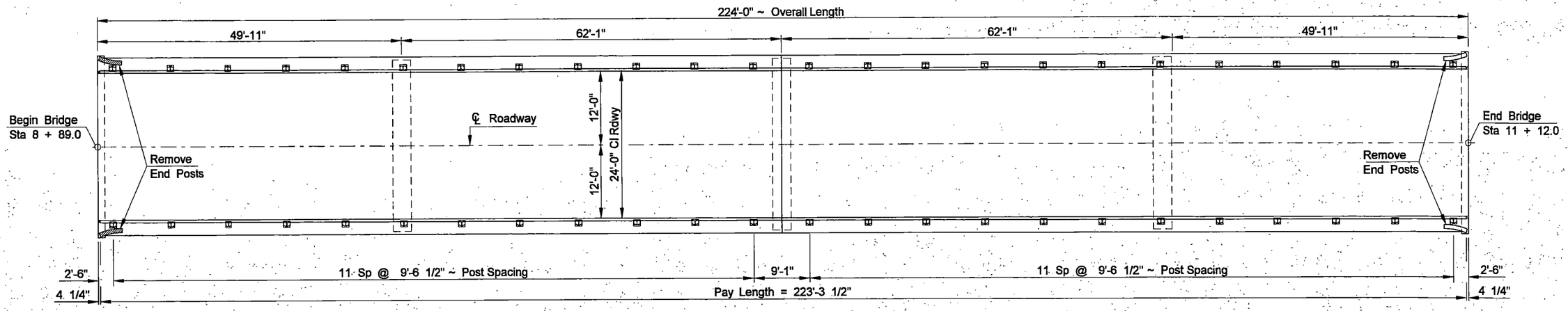
Thrie/W-Beam Guardrail Quantities

Pettibone Interchange Crossroad

RP 217.145
I-94

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	170	3

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NDDOT Reserves All Objections



PLAN

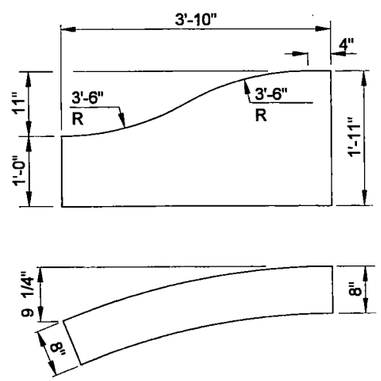
NOTES:

100 SCOPE OF WORK: The work at this site consists of removing aluminum posts and railing, removing concrete end posts and installing a Double Box Beam Retrofit.

202 REMOVAL OF CONCRETE: The concrete end posts shall be removed flush with the top of the curb. The existing reinforcing steel shall be cut flush with the top surface of the concrete and sealed with epoxy. The concrete, aluminum railing and posts removed shall become the property of the contractor and shall be disposed of off the right of way. The cost for removal and disposal of concrete and sealing with epoxy shall be included in the bid item "Removal of Concrete."

624 DOUBLE BOX BEAM RAIL RETROFIT: The existing rail and posts shall be removed and become the property of the contractor and disposed of off the right of way. Removal and disposal of existing rail and posts shall be included in the price bid for "Double Box Beam Rail Retrofit-Free Standing."

SPEC	CODE	ITEM	DESCRIPTION	UNIT	QUANTITY
202	0111	REMOVAL OF CONCRETE		L SUM	0.5
624	3001	DOUBLE BOX BEAM RAIL RETROFIT - FREE STANDING		LF	446.6

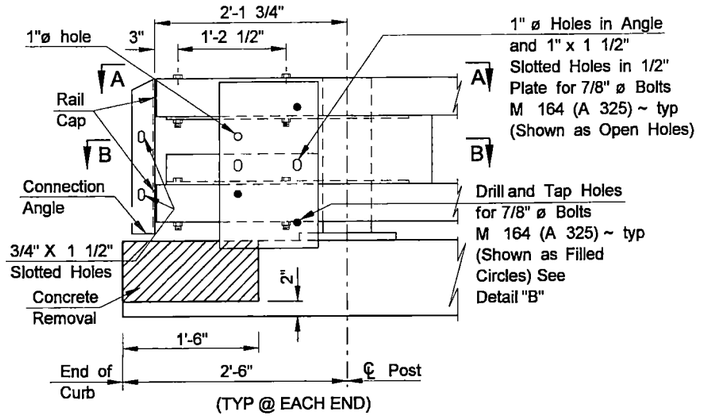


END POST TO BE REMOVED

REGISTERED PROFESSIONAL ENGINEER
TIM SCHWAGLER
P.E. 3151
DATE 12/15/05
NORTH DAKOTA

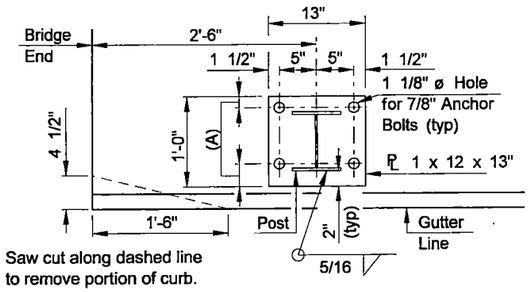
PETTIBONE INTERCHANGE

BRIDGE LAYOUT



(TYP @ EACH END)

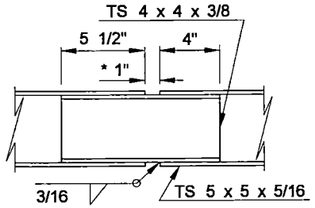
END POST CONNECTION DETAIL



Saw cut along dashed line to remove portion of curb.

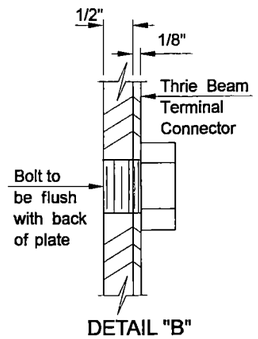
(A) Variable 1 1/2" to 3".

BASE PLATE DETAIL

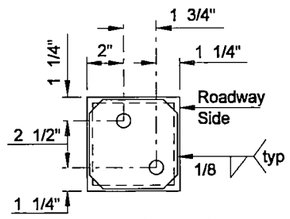


* 2" @ expansion joint.

RAIL SPLICE DETAIL

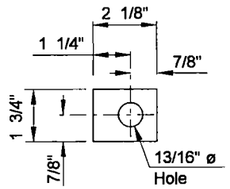


DETAIL "B"



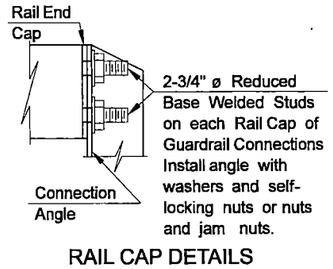
Bar 4 3/4 x 3/16 x 4 3/4 Cope corners 3/4" to provide zinc drains.

RAIL CAP END VIEW

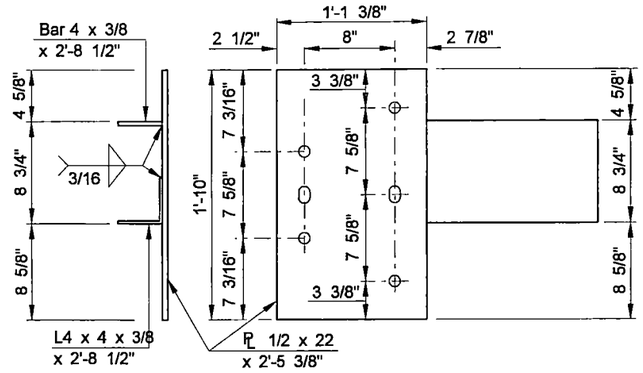


1/4" Bar AASHTO M 270 Grade 36. Position washers to completely cover slotted holes.

BAR WASHER "C"

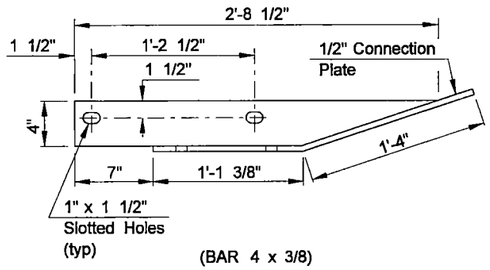


RAIL CAP DETAILS



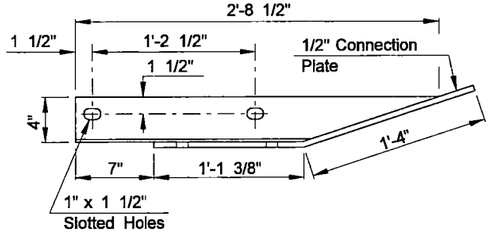
(4 REQUIRED)

GUARDRAIL CONNECTION PLATE DETAILS



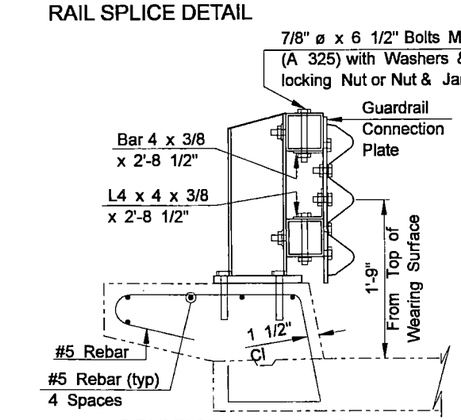
(BAR 4 x 3/8)

A-A

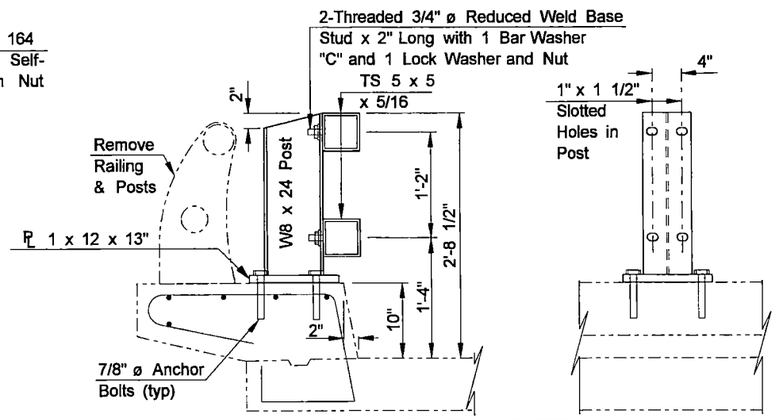


(L4 x 4 x 3/8)

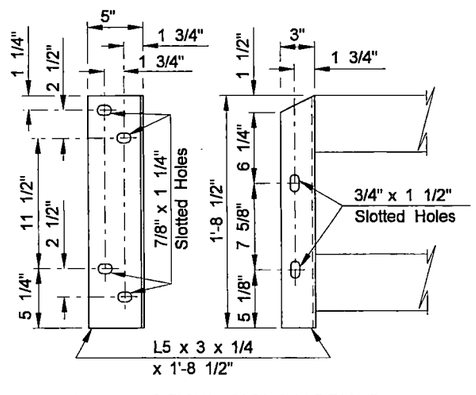
B-B



CONNECTION DETAILS



CURB MOUNT POST DETAILS



CONNECTION ANGLE DETAILS

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	IM-2-094(063)209	170	4

NOTES:

Rail elements shall be square structural tubing in accordance with ASTM Specification A 500 Grade B. Steel posts, plates and angles shall conform to AASHTO Specification M 270 Grade 36, unless otherwise noted. All structural steel shall be hot-dip galvanized after fabrication according to AASHTO M 111. All anchor and splice bolts shall be AASHTO M 164 (A 325) and shall be galvanized according to M 232.

Railing shall be fabricated to the horizontal and vertical alignment of the structure. Posts shall be normal to grade. Rails shall be fabricated so that each rail segment between splices is attached to a minimum of two posts.

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

The anchor bolts shall be embedded into the concrete with a chemical adhesive system that can develop a tensile strength of at least 17,500 pounds. The Contractor shall demonstrate the anchor bolt anchorage system at the first four field installed anchor bolts on a project. The demonstration shall include installation and static tension tests, in the presence of the Engineer, in accordance with test procedures prescribed in ASTM E 488. No portion of the testing device shall bear on the concrete surface within a distance equal to the anchor bolt embedment depth. The Contractor shall conduct random static tension testing on 10% (not including the initial 4 installations) of all installations on a project, as directed by the Engineer. All anchor bolts anchorage systems that are tested shall provide a minimum static tension of 15,000 pounds. Failure of any anchor bolt anchorage system tested will require modification of the installation procedures or use of a different anchor bolt anchorage system.

Payment for railing shall include compensation for furnishing and installing the guardrail connection plates and for sawing and removing portions of the curb.

REGISTERED PROFESSIONAL ENGINEER
SCHWAGLER
P.E. 3151
DATE 12/15/05
NORTH DAKOTA

QUANTITIES	
DOUBLE BOX BEAM RAIL RETROFIT (FREE STANDING)	446.6 LF

PETTIBONE INTERCHANGE

DOUBLE BOX BEAM RETROFIT DETAILS (FREE STANDING)

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2002	Pass: 5,110	Trucks 1,490	Total 6,600	660
Forecast 2022	Pass: 8,840	Trucks 2,580	Total 11,420	1,145
Minimum Sight Dist. for:		Design Speed 75 mph		
Stopping 820'		Bridges		
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life (years)				

JOB# 19

STATE	PROJECT NO.	PCN	SHEET NO.
ND	IM-2-094(057)209		1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

PROJECT NO. IM-2-094(057)209
IN KIDDER AND STUTSMAN COUNTIES
CONCRETE PAVEMENT REPAIR, PCC PAVEMENT, DOWEL BAR RETROFIT & SAFETY IMPROVEMENTS (EASTBOUND)

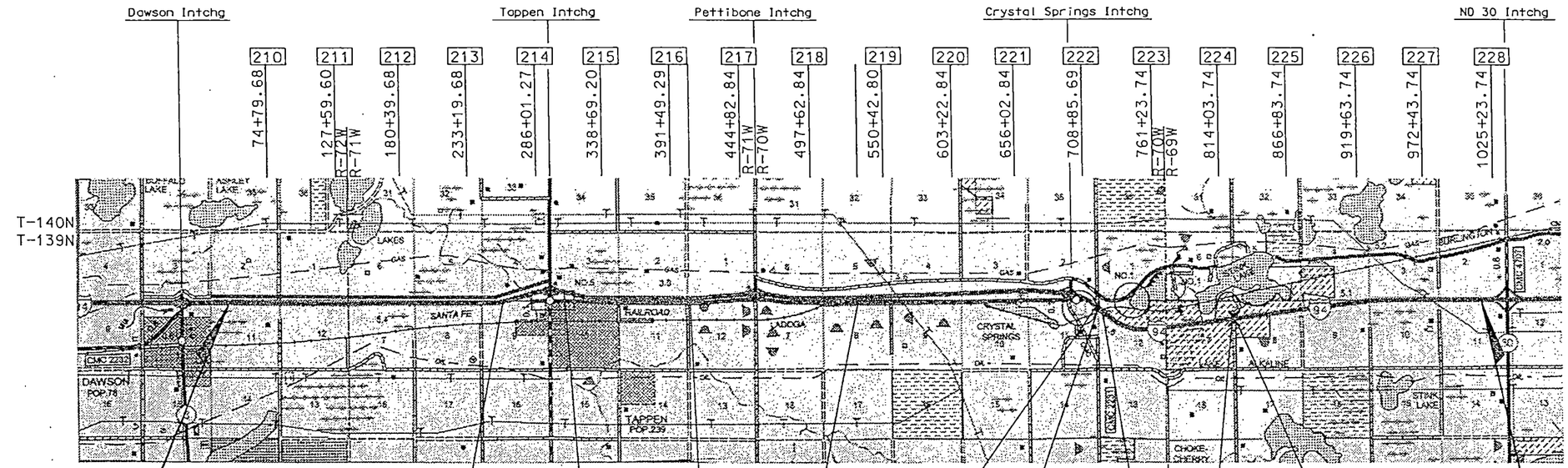
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation October 2002; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

LENGTH OF PROJECT

18.483 Miles Gross, 18.416 Miles Net

0.067 Mile Deducted for Bridges



Beg. Proj. IM-2-094(057)209
Sta 40+94.0
MP 209.359

End Proj. IM-2-094(057)209
Sta 1017+01.1 Bk = 1017+00 Ahd
MP 227.844

DESIGNER Scott Woodmansee
DESIGNER Dan Ellefson
DESIGNER
DESIGNER
DESIGNER

APPROVED DATE _____

DIVISION ADMINISTRATOR
FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

APPROVED DATE 2/19/2003

Francis D. Bruton

DIRECTOR,
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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

APPROVED DATE 02-19-2003

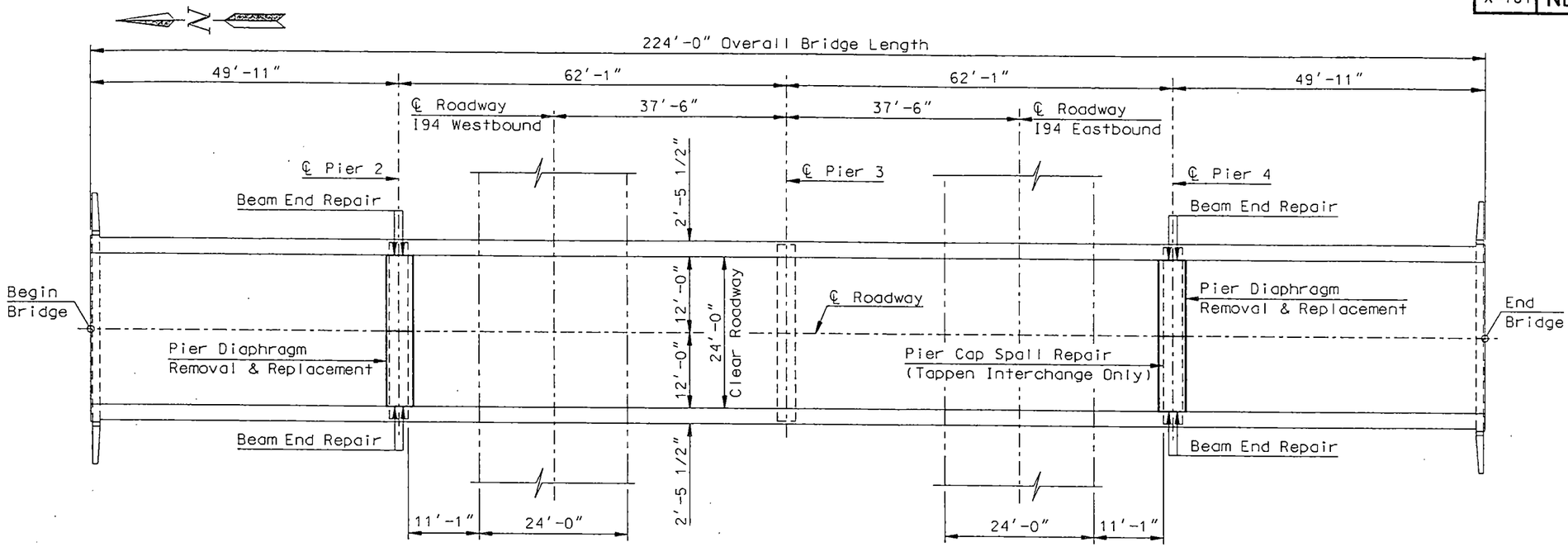
Roger Weigel

DESIGN DIVISION
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

ROGER WEIGEL REGISTERED PROFESSIONAL P.E. 2930 ENGINEER NORTH DAKOTA

.../20094209.057/DESIGN/Title.dgn 02/18/2003 01:48:17 PM

BRIDGE CODE	STATE	PROJECT NUMBER	SHEET NO.
X-781	ND	IM-2-094(057)209	167



PLAN

NOTES:

100 SCOPE OF WORK: Work at these sites consist of removing and replacing pier diaphragms, along with a portion of bridge deck over the pier diaphragms, and repairing the exterior beam ends at Piers 2 and 4. Also, work at the Tappen Interchange site consists of repairing concrete spall areas on a pier cap.

100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, rebar couplers, polystyrene, and other miscellaneous items shall be included in the price bid for Class AAE-3 concrete.

202 REMOVAL OF CONCRETE: The Contractor shall remove the concrete deck and pier diaphragms in a manner that prevents any damage to the parts of the structure to remain. All concrete removed shall become the property of the Contractor and shall be disposed of properly off of the right of way. There are approximately 10 cubic yards of concrete to be removed per bridge. The work needed for the deck and pier diaphragm removal at all three bridge sites shall be included in the lump sum bid item, "Removal of Concrete."

704 TRAFFIC CONTROL: One lane of traffic shall be maintained on the bridges at all times during the project.

DESIGN STRENGTHS:

f'c = 4,000 PSI ~ CLASS AAE-3 CONCRETE
fy = 60,000 PSI ~ REINFORCING STEEL

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0111	REMOVAL OF CONCRETE	L SUM	1
602	0130	CLASS AAE-3 CONCRETE	CY	31.8
612	0115	REINFORCING STEEL-GRADE 60	LBS	4,989
930	9612	SPALL REPAIR	SF	27
930	9696	BEAM END REPAIR	EA	24

TAPPEN INTERCHANGE 94-214.126
PETTIBONE INTERCHANGE 94-217.145
CRYSTAL SPRINGS INTERCHANGE 94-221.733

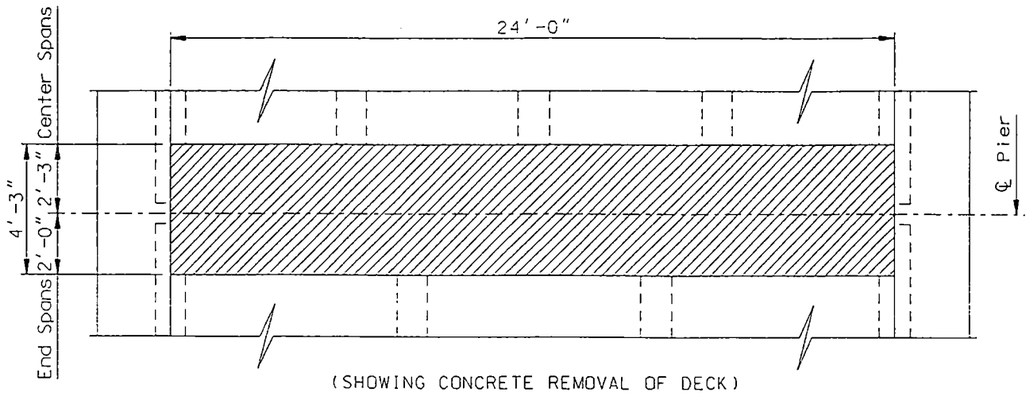
TAPPEN, PETTIBONE & CRYSTAL SPRINGS INTERCHANGES

BRIDGE LAYOUT

BRLO 03MKC001 BWR

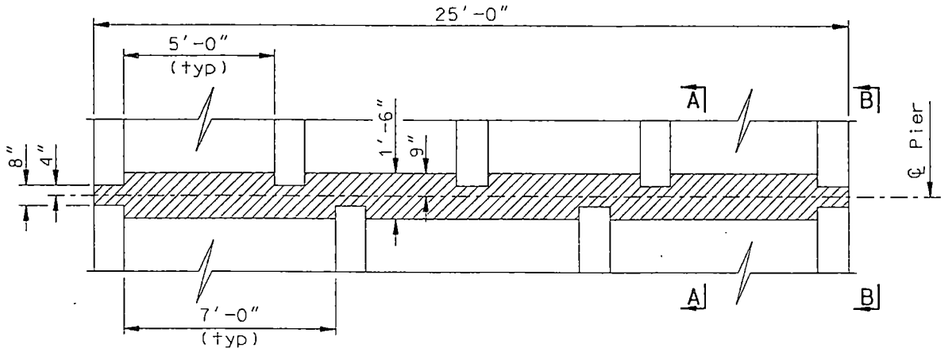
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STATE	PROJECT NUMBER	SHEET NO.
ND	IM-2-094(057)209	168



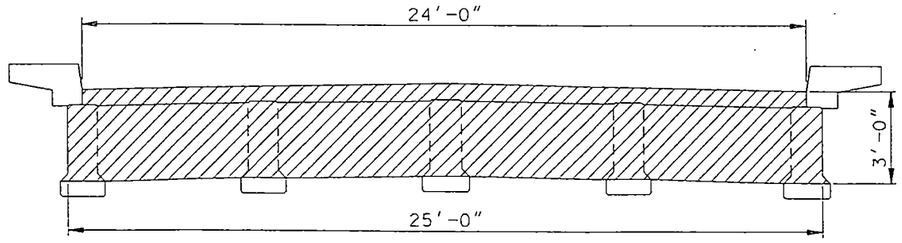
(SHOWING CONCRETE REMOVAL OF DECK)

PLAN



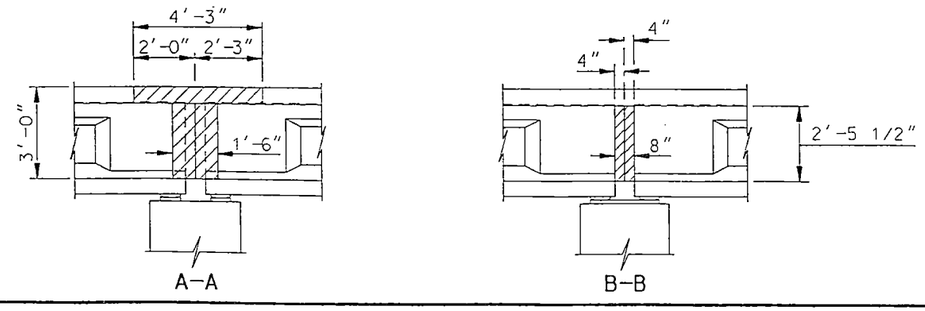
(SHOWING CONCRETE REMOVAL OF PIER DIAPHRAGM)

PLAN

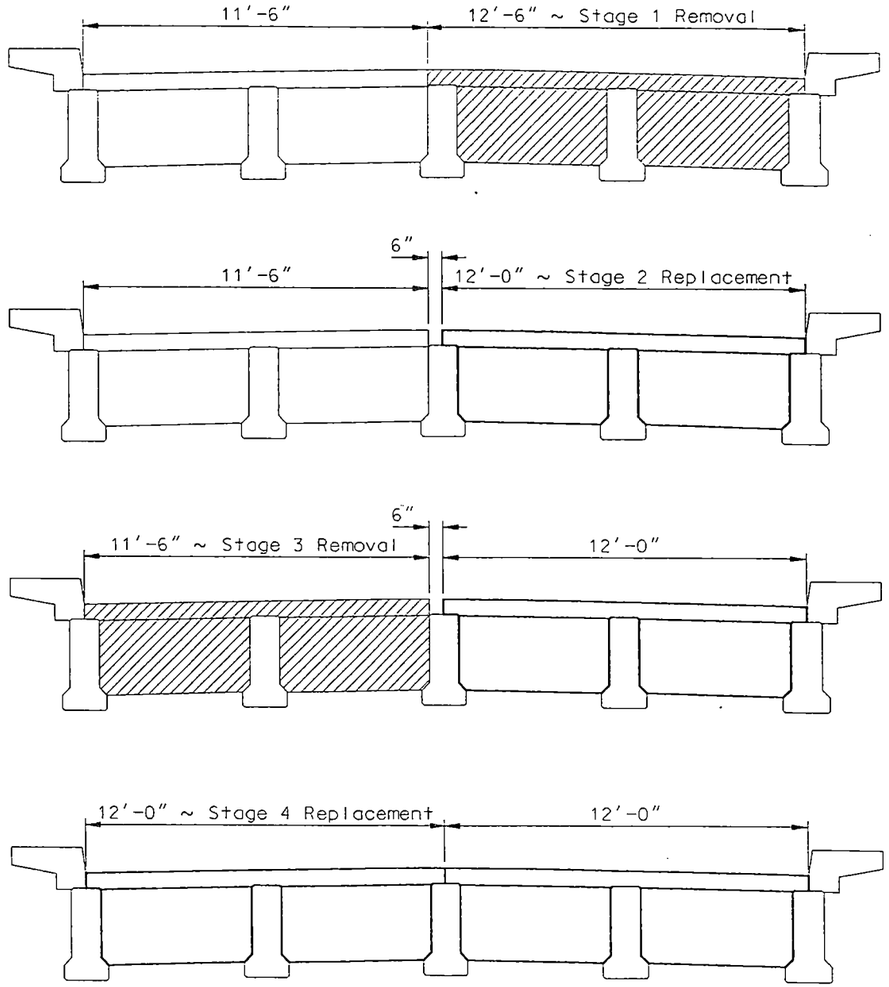


(SHOWING CONCRETE REMOVAL OF DECK & PIER DIAPHRAGM)

ELEVATION



The hatched areas indicate concrete to be removed. The deck shall be saw cut to a depth of 1" to produce a neat line between the concrete to be removed and the concrete to remain. Care shall be taken to ensure no damage is done to the existing reinforcing steel that is to remain in place. Any rust scale found on the exposed existing reinforcing bars shall be thoroughly sandblast cleaned.

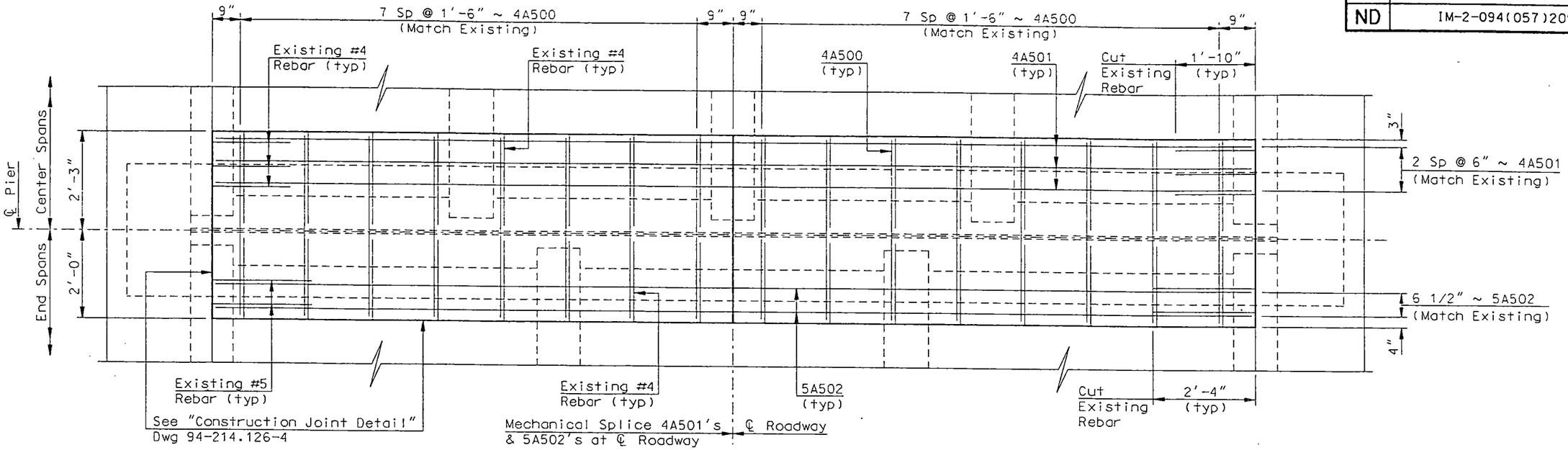


CONCRETE REMOVAL & REPLACEMENT STAGES

TAPPEN, PETTIBONE &
CRYSTAL SPRINGS INTERCHANGES

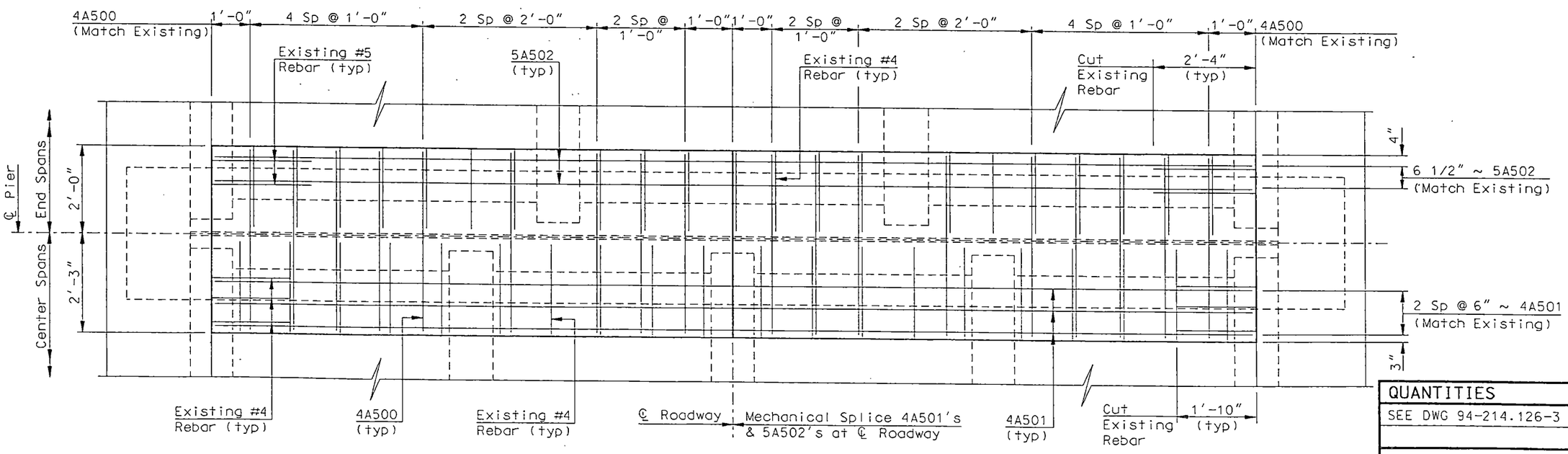
CONCRETE REMOVAL DETAILS
& CONSTRUCTION STAGES

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-2-094(057)209	169



(SHOWING TOP REINFORCING)

PLAN



(SHOWING BOTTOM REINFORCING)

PLAN

QUANTITIES

SEE DWG 94-214.126-3

TAPPEN, PETTIBONE & CRYSTAL SPRINGS INTERCHANGES

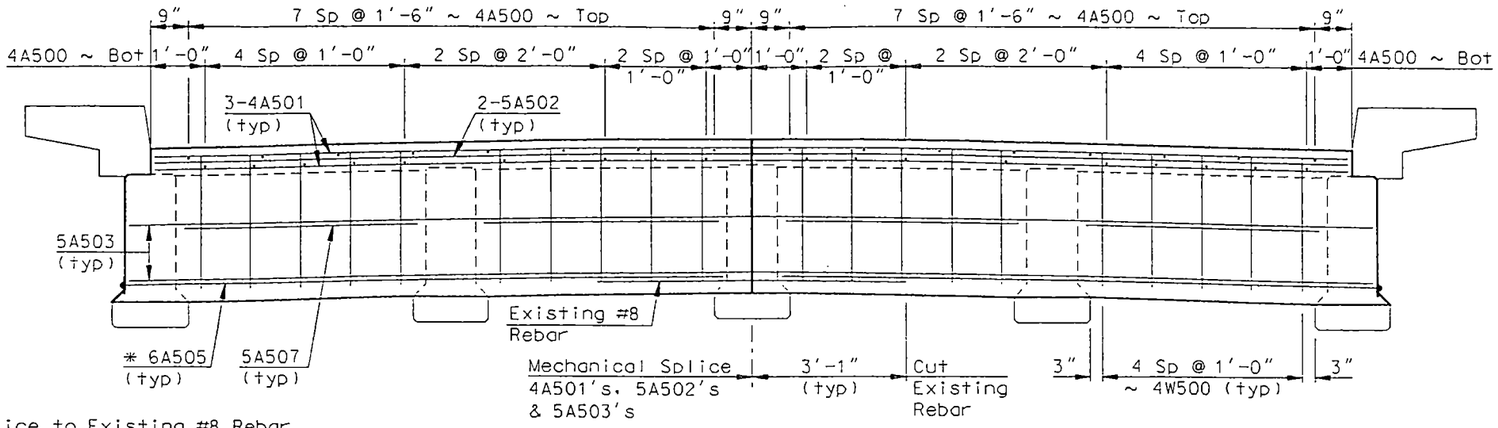
SLAB DETAILS

SLAB 03MKC003 BWR

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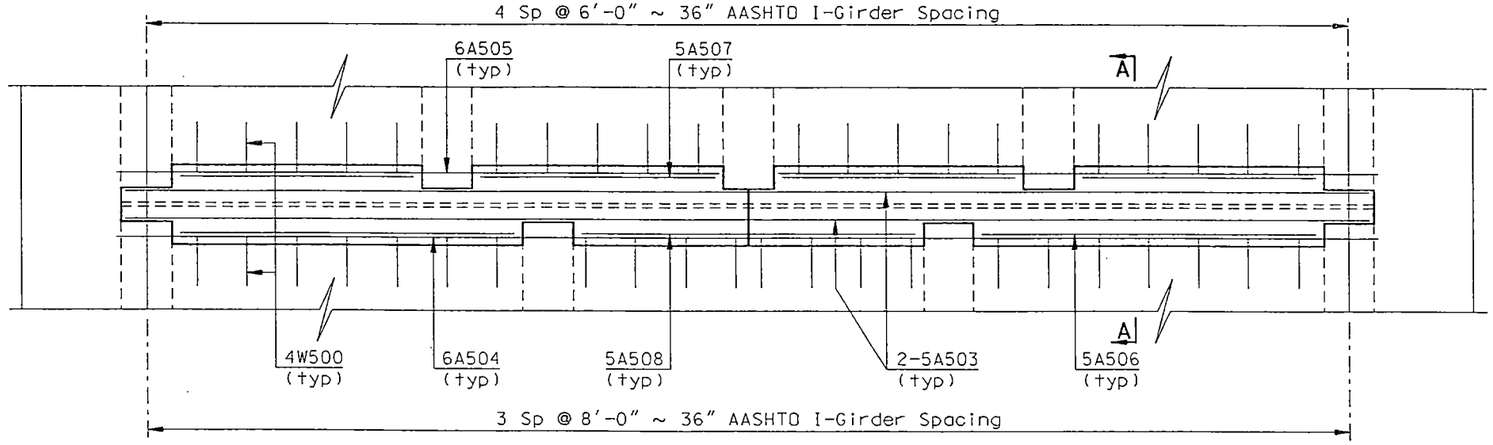
94-214.126-2

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-2-094(057)209	170

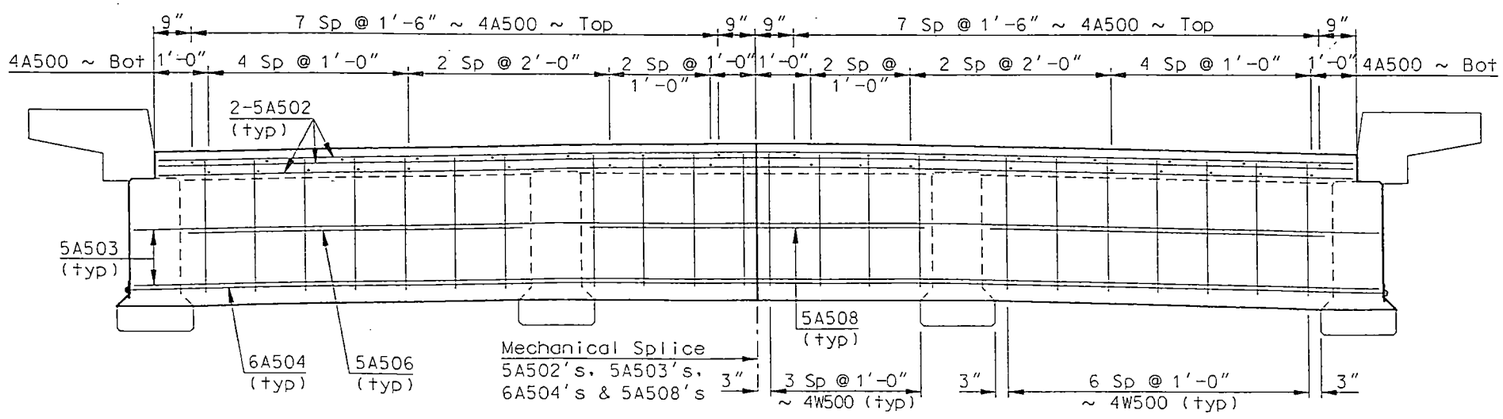


* Splice to Existing #8 Rebar

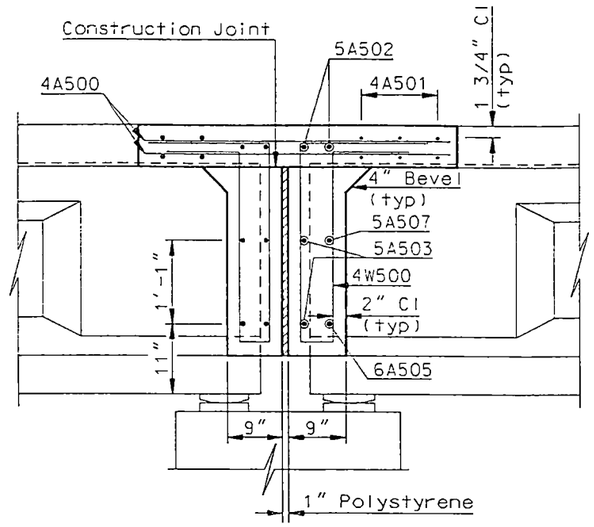
ELEVATION



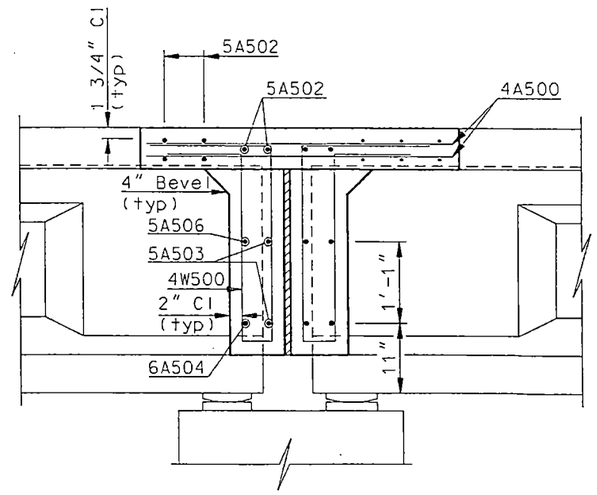
PLAN



ELEVATION



A–A



A–A

QUANTITIES	(ONE BRIDGE)
CLASS AAE-3 CONCRETE	10.6 CY
REINFORCING STEEL	1.663 LBS

TAPPEN, PETTIBONE & CRYSTAL SPRINGS INTERCHANGES

PIER DIAPHRAGM DETAILS

DIAPH 03MKC004 BWR

94-214.126-3

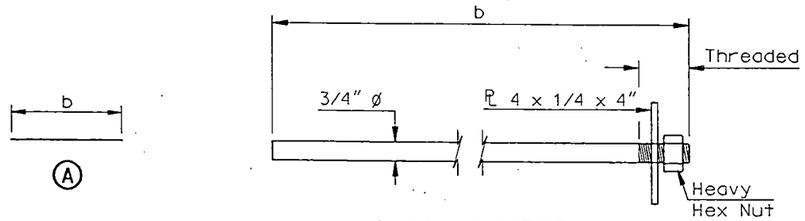
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STATE	PROJECT NUMBER	SHEET NO.
ND	IM-2-094(057)209	171

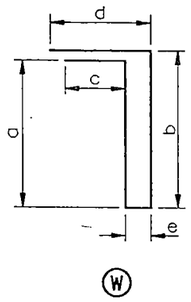
BILL OF REINFORCING STEEL, GRADE 60

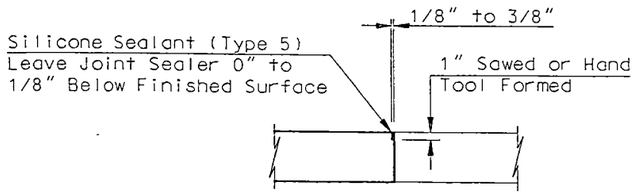
LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE	REGULAR	4	A500	68	4'-1"		4'-1"							
		4	A501	24	11'-11"		11'-11"							
		5	A502	32	11'-11"		11'-11"							
		5	A503	16	12'-5"		12'-5"							
		6	A504	4	12'-7"		12'-7"							
		6	A505	4	12'-0"		12'-0"							
		5	A506	4	6'-8"		6'-8"							
		5	A507	8	4'-8"		4'-8"							
		5	A508	4	3'-4"		3'-4"							
		4	W500	84	8'-1"	2'-5"	2'-7"	1'-0"	1'-8"	5"				



6A504 & 6A505
THREADED BAR DETAIL





CONSTRUCTION JOINT DETAIL

NOTES:

1. Fabrication and tolerances shall be in accordance with the CRSI Manual of Standard Practice.
2. All dimensions are out to out of bars.
3. Nominal length of each bent bar or cut bar is the sum total of the detailing dimensions for that bar, unless otherwise noted.
4. The number of bars per set listed in the Bill of Reinforcing Steel is for one bridge site only.

NOTES:

930 BEAM END REPAIR: The detail shown illustrates the approximate spalling on the exterior beam ends at Piers 2 and 4. The actual limits of the repair shall be determined by the Engineer in the field. The Contractor shall remove all unsound concrete and replace it with new concrete to restore the beams to their original cross section.

A 15 pound maximum size hammer shall be used on any unsound concrete removal. The edges of the repair areas shall be sharp, neat lines at least 1 inch deep. These sharp, neat lines shall be produced by saw cutting or other means approved by the Engineer. Care shall be taken in the removal process to ensure no damage is done to the prestressing and reinforcing steel.

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

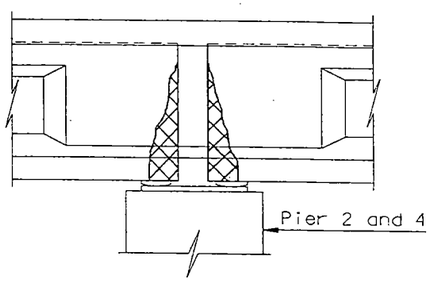
The patching material shall be Class AE-5 concrete or other concrete material that is specifically intended for patching concrete. This material may be SikaTop 122 Plus (Sika Corporation), Tamms Industries Duraltop Gel, ThoRoc HB2 (ChemRex Incorporated), or an approved equal repair mortar.

It is important to minimize the shrinkage in the patching material. Therefore, the Contractor shall take steps including proper curing to minimize shrinkage.

The beam end repair quantity is based on eight exterior beam ends per bridge. The Engineer shall determine the number of beam ends to be repaired.

Costs for all labor, equipment and materials needed to repair each beam end shall be paid for per each under the bid item "Beam End Repair."

Indicates Beam End Repair Areas

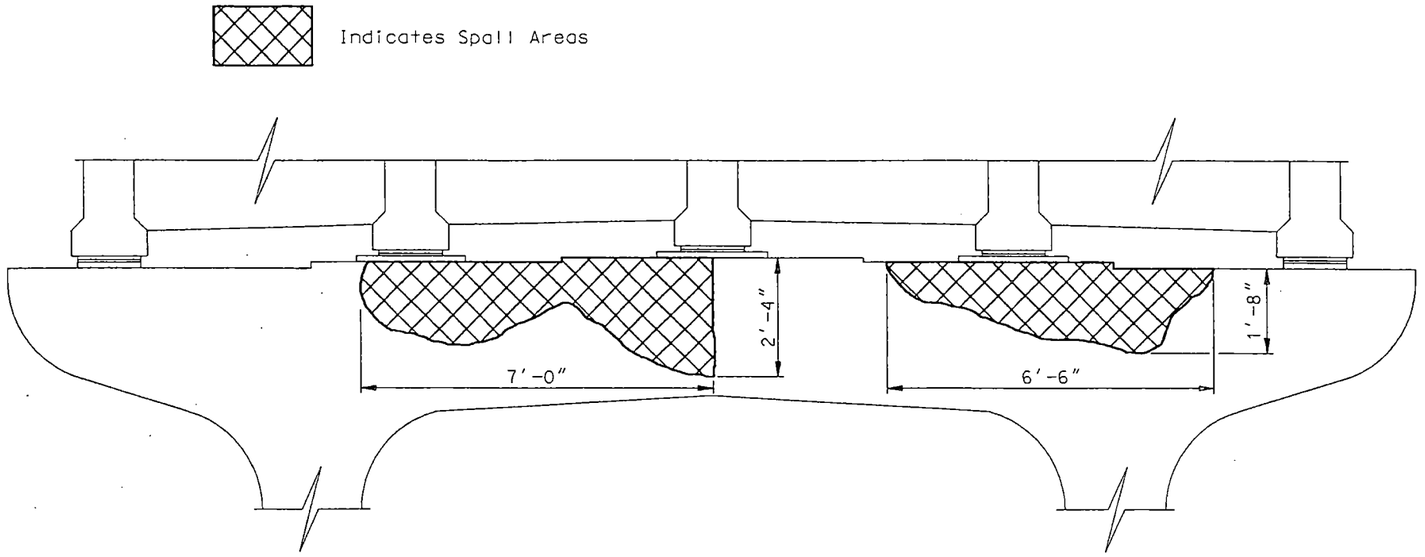


(EXTERIOR BEAM ELEVATION)
BEAM END REPAIR

TAPPEN, PETTIBONE &
CRYSTAL SPRINGS INTERCHANGES

REINFORCING BAR LIST &
DETAILS, CONSTRUCTION
JOINT & BEAM END REPAIR

STATE	PROJECT NUMBER	SHEET NO.
ND	IM-2-094(057)209	172



(PIER 4 LOOKING SOUTH)

PIER CAP ELEVATION

NOTES:

930 SPALL REPAIR: The north face of the pier cap has extensive spalling as shown in the elevation view. The Contractor shall remove all unsound concrete and replace it with new concrete.

A 30 pound maximum size hammer shall be used on any unsound concrete removal. A 15 pound maximum size chipping hammer shall be used on any unsound concrete inside the existing reinforcing steel. The edges of the repair areas shall be sharp, neat lines at least 1 inch deep. These sharp, neat lines shall be produced by saw cutting or other means approved by the Engineer.

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

The patching material shall be Class AE-5 concrete or other concrete material that is specifically intended for patching concrete. This material may be SikaTop 122 Plus (Sika Corporation), Tamms Industries Duraltop Gel, ThoRoc HB2 (ChemRex Incorporated), or an approved equal repair mortar.

It is important to minimize the shrinkage in the patching material. Therefore, the Contractor shall take steps including proper curing to minimize shrinkage.

The spall repair quantity is based on the assumption that the areas to be repaired are to the dimensions shown on the elevation view. The actual limits of the repair shall be determined by the Engineer in the field. It is also assumed that the spall repair areas are two to eight inches deep.

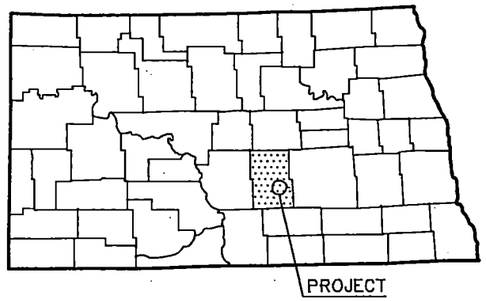
All labor, equipment and materials needed to repair the spall areas shall be included in the bid item "Spall Repair."

TAPPEN INTERCHANGE

SPALL REPAIR

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	N.D.	SAP-2-094(004)214 SAP-2-094(005)217	1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION



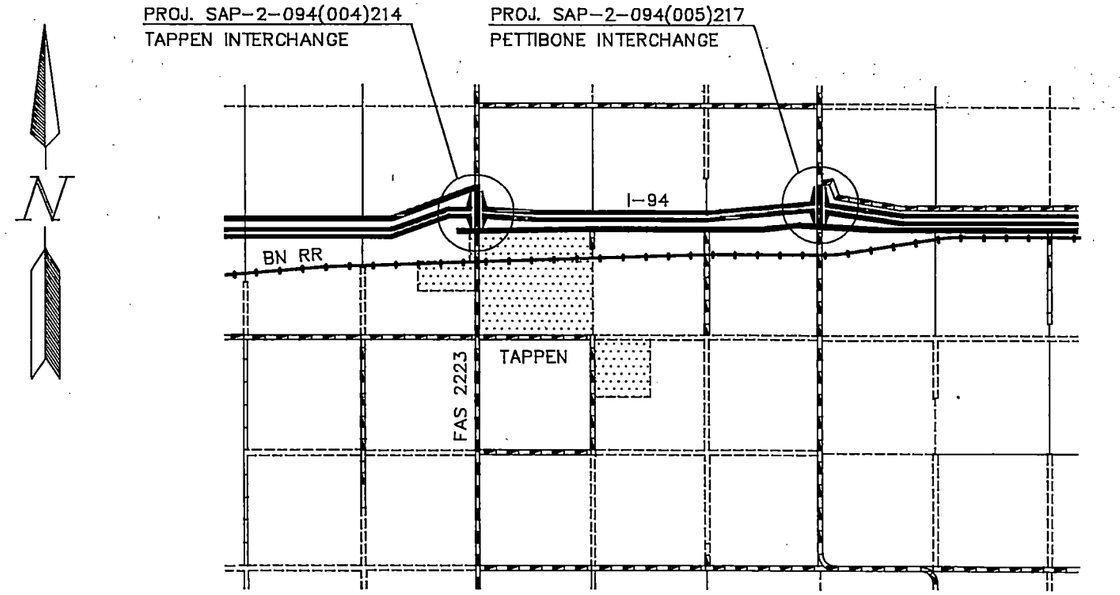
KIDDER COUNTY

SAP-2-094(004)214 & SAP -2-094(005)217

STRUCTURE REPAIR

GOVERNING SPECIFICATIONS

STANDARD SPECIFICATIONS ADOPTED BY THE NORTH DAKOTA DEPARTMENT OF TRANSPORTATION SEPTEMBER 1992, STANDARD DRAWINGS CURRENTLY IN EFFECT, AND OTHER CONTRACT PROVISIONS SUBMITTED HEREIN.



INDEX OF DRAWINGS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	REPAIR DETAILS BID ITEM LIST
3	PHOTOS OF DAMAGED AREA
4	REPAIR DETAILS
5	TEMPORARY DETOUR
6	TEMPORARY DETOUR

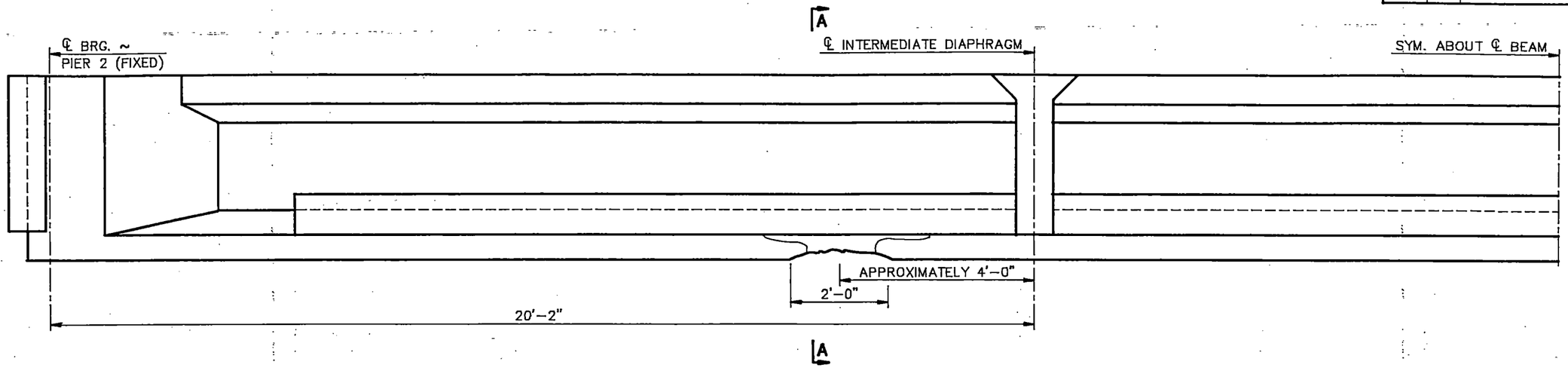
SHEET NO.	STANDARD NO. & DESCRIPTION
9	D-704-9 CONSTRUCTION SIGN DETAIL
10	D-704-10 CONSTRUCTION SIGN DETAIL
11	D-704-11 CONSTRUCTION SIGN DETAIL
12	D-704-12 CONSTRUCTION SIGN DETAIL
13	D-704-13 CONSTRUCTION SIGN DETAIL
14	D-704-14 CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAIL
15	D-704-16 TYPICAL CONSTRUCTION SIGNAL LAYOUT
16	D-704-17 SIGN LAYOUT FOR ONE LANE CLOSURE TWO LANE ROADWAY
17	D-704-23 CONSTRUCTION SIGN AND BARRICADE LOCATION DETAIL

APPROVED DATE 1993

DIRECTOR OF HIGHWAYS & ENGINEERING
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

92DLS97

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-2-094(005)217	4



(SHOWING EAST BEAM ~ WESTBOUND)

BEAM ELEVATION

NOTES:

GENERAL: ALL WORK AND MATERIALS SHALL CONFORM TO APPLICABLE SECTIONS OF THE "N.D. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".

THIS PROJECT CONSISTS OF PATCHING THREE DAMAGED BEAMS.

CONSTRUCTION SEQUENCE – EAST BEAM; WESTBOUND

1 ALL UNSOUND CONCRETE SHALL BE REMOVED.

2 ALL AREAS TO BE REPAIRED SHALL BE THOROUGHLY CLEANED WITH A WATER SPRAY BEFORE PATCHING BEGINS. THE BEAM SHALL BE RESTORED TO ITS ORIGINAL CROSS SECTION BY PATCHING.

3 MATERIAL FOR PATCHING SHALL BE SIKATOP 122 REPAIR MORTOR. SIKATOP 122 SHALL BE MIXED AND APPLIED ACCORDING TO MANUFACTURE'S SPECIFICATIONS.

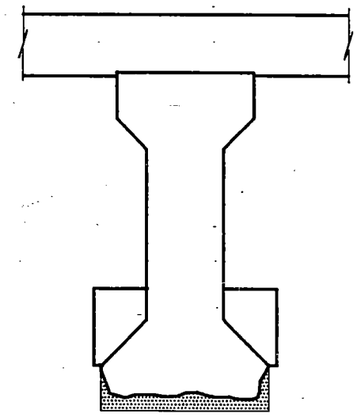
WEST BEAM; WEST AND EASTBOUND

1 ALL UNSOUND CONCRETE SHALL BE REMOVED.

2 ALL AREAS TO BE PATCHED SHALL BE THOROUGHLY CLEANED WITH A WATER SPRAY BEFORE PATCHING BEGINS.

3 THE BEAM SHALL BE RESTORED TO ITS ORIGINAL CROSS SECTION BY PATCHING WITH SIKATOP 122 REPAIR MORTOR.

I-94 TRAFFIC: THE CONTRACTOR HAS THE OPTION TO CLOSE THE LANE DURING DAY LIGHT HOURS AND REROUTE THE TRAFFIC AS SHOWN ON SHEET 5 AND 6 OR TO MAINTAIN ONE LANE TRAFFIC UNDER THE STRUCTURE. THE COST OF EITHER OPTION SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL.



(ONLY THE EAST BEAM ~ WESTBOUND HAS THE CORBEL)

A-A

PETTIBONE INTERCHANGE
KIDDER COUNTY

PRESTRESSED CONCRETE I BEAM REPAIR DETAILS

JOB # 26

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	SAP-2-094(003)217	1

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

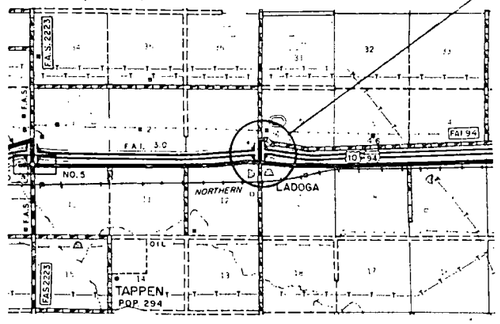
STRUCTURE REPAIR
IN
KIDDER COUNTY
STATE AID PROJECT NO. SAP-2-094(003)217

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.

N

S



INDEX OF DRAWINGS

Sheet No.	Description
1	Title Sheet
2	Repair Details
3	Photos of Damaged Area
4	Temporary Detour
5	Temporary Detour
6	Traffic Control System
7	Traffic Control System

Sheet No.	Standard No.
8	D754-1 Construction Sign Detail
9	D754-2 Construction Sign Detail
10	D754-3 Construction Sign Detail
11	D754-4 Construction Sign Detail
12	D754-5 Construction Sign Detail
13	D754-5A Construction Sign and Barricade Assembly Detail
14	D754-11 Construction Sign and Barricade Location Detail

May 1989 Letting

APPROVED DATE

Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

RAY ZINK REGISTERED PROFESSIONAL P.E. 3722 ENGINEER NORTH DAKOTA

SYMBOLS

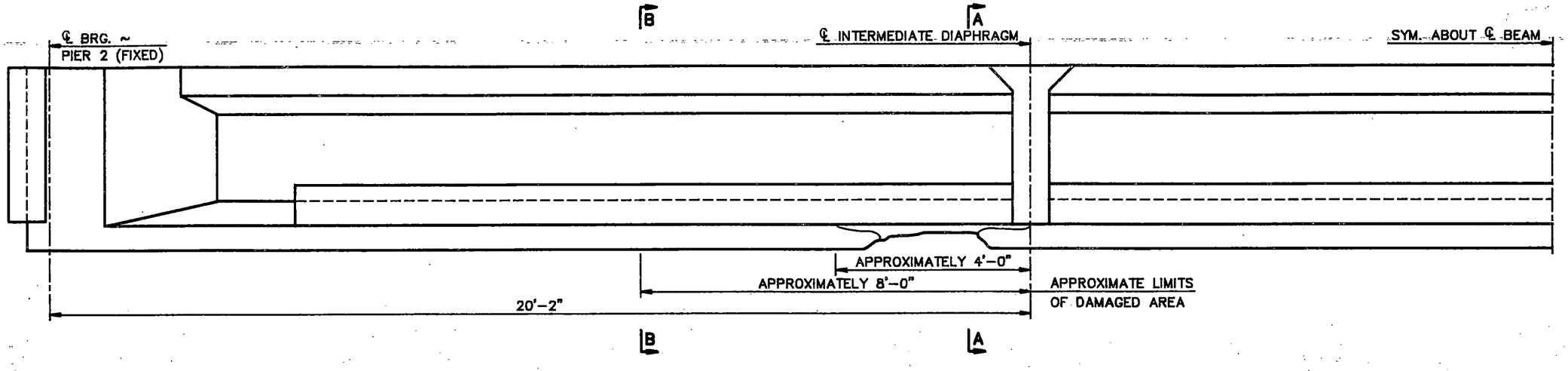
STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
SECTION LINE
QUARTER SECTION LINE
SECTION CORNER
QUARTER SECTION CORNER
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
GRADE LINE
CENTERLINE OF CONSTRUCTION — 500
RAILROAD RIGHT OF WAY LINE
CITY OR VILLAGE CORPORATE LIMITS
PROPERTY LINE
EASEMENT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

BUILDINGS
TELEGRAPH LINES
TELEPHONE LINES
POWER LINES
CULVERTS (In Place)
CULVERTS (Install)
CONCRETE BOX CULVERTS (Install)
BRIDGES (Install)
CONCRETE CURB
CONCRETE CURB AND GUTTER
CONCRETE WALK
CATCH BASIN (Existing)
CATCH BASIN (New)
MANHOLE (Existing)
MANHOLE (New)
CURB INLET (Existing)
CURB INLET (New)
GROUND MOUNTED SIGNS
OVERHEAD SIGNS
HYDRANT
LIGHT STANDARDS
TRAFFIC SIGNALS (Plan & Profile Sheets)
HIGH MAST LIGHTING ASSEMBLY
GROUND ELEVATION 1433.0 / GRADE 1411.5 / 245
CENTERLINE
SECTION LINE
DEFLECTION ANGLE (Delta)
SOD OR JUTE MESH
POLES TO BE MOVED
POLES TO BE LOWERED
CONCRETE FOUNDATION
CONDUIT
CONDUCTOR
CONCRETE PULL BOX
FEED POINT
250 WATT LIGHT STANDARDS
400 WATT LIGHT STANDARDS
700 WATT LIGHT STANDARDS
1000 WATT LIGHT STANDARDS
FLASHING BEACON
TRAFFIC SIGNAL - MAST ARM MOUNTED
TRAFFIC SIGNAL - POST MOUNTED
SIGNAL HEAD — 3
PEDESTRIAN PUSHBUTTON POST
TRAFFIC SIGNAL CONTROLLER
FEED POINT - PAD MOUNTED

ABBREVIATIONS

Aggr	Aggregate
Ahd	Ahead
Alt	Alternate
Approx	Approximate or Approximately
Appr	Approach
Asph Cem or A C	Asphalt Cement
Asph Conc	Asphaltic Concrete
Bit	Bituminous or Bitumen
Bk	Back
B M	Bench Mark
Bldg	Building
Br	Bridge
C A E S	Corrugated Aluminum End Section
C A P	Corrugated Aluminum Pipe
C B	Catch Basin
C & G	Curb and Gutter
Ch Blk	Channel Block
Ch Ch	Channel Change
C I	Curb Inlet
C I P	Cast Iron Pipe
Cl	Class
C.S.E.S	Corrugated Steel End Section
C.S.P.	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp	Compression
Const	Construction
Conc	Concrete
Cont Reinf Conc Pvm't	Continuously Reinforced Concrete Pavement
Contn	Contraction
Crn	Crown
CRS	Cationic Rapid Setting
Crse	Course
C S	Curve to Spiral
C to C	Center to Center
C Y	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D B	Ditch Block
Def	Deformed
Del	Deliver
D G	Ditch Grade
El or Elev	Elevation
Ellipt	Elliptical
Emb	Embankment
Emul	Emulsified
Engr	Engineer
Eq	Equation
E R	East Roadway
E S	End Section
Esmt	Easement
Exc	Excavation
Exp.	Expansion
F D	Field Drive
Found	Foundation
F P	Fence Post
Furn	Furnish
Ga	Gage or Gauge
Gr	Gravel
Grd	Graded
G V	Gate Valve
Hel	Helical
Hyd	Hydrant
Ident	Identification
Inchg	Interchange
I M	Iron Monument
Inst	Install
Inter	Intersection
Inv	Invert
Jt	Joint
L	Length of Curve
Lc	Length of Spiral
Levg	Leveling
L F	Linear or Lineal Foot
Liq	Liquid
Long	Longitudinal
L P	Light Pole
Lt	Left
"M"	One Thousand
Matl	Material
Max	Maximum
MC	Medium Curing
M H	Manhole
Min	Minimum
M L	Main Line
N R	North Roadway
Off Loc	Office Location
O to O	Out to Out
P & P	Plan and Profile
P C	Point of Curvature
P C C	Point of Compound Curve
P C C Pvm't	Portland Cement Concrete Pavement
P D	Private Drive
Pen	Penetration
Perf	Perforated
P I	Point of Intersection
P O C	Point on Curve
P O T	Point on Tangent
P P	Power Pole
P R C	Point of Reverse Curvature
Pref	Preformed
P S D	Passing Sight Distance
P T	Point of Tangency
P V C	Polyvinyl Chloride Sewer Pipe
Quant	Quantity or Quantities
R	Radius
R or Rge	Range
RC	Rapid Curing
R C E S	Reinforced Concrete End Section
R C P	Reinforced Concrete Pipe
R C P S	Reinforced Concrete Pipe Sewer
Rd	Road
Rdbd	Roadbed
Rdwy	Roadway
Reflt	Reflectorized
R R	Railroad
Rt	Right
R/W	Right of Way
Salv	Salvage
San	Sanitary
S C	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S D	Sight Distance
S E	Superelevation
Sec	Section
Sec Line Appr	Section Line Approach
Sep	Separation
Serv	Service
Sgr Prep	Subgrade Preparation
Shldr	Shoulder
SP	Special Provision
S P P	Structural Plate Pipe
S P P A	Structural Plate Pipe Arch
S R	South Roadway
SS	Slow Setting or Supplement Specification
S S D	Stopping Sight Distance
S T	Spiral to Tangent
Sta	Station
Std	Standard
Std Specs	Standard Specifications
Struct	Structure
Surf	Surface or Surfacing
Surv	Survey
S W	Sidewalk
S Y	Square Yard
T	Tangent Length (circular curve)
T or Twp	Township
Tel	Telephone
Temp	Temporary
T P	Telephone Pole
Tr	Traffic
Trans	Transverse or Transition
Trtd	Treated
Ts	Tangent Length (curve with spirals)
T S	Tangent to Spiral
U S C & G S	United States Coast and Geodetic Survey
V C	Vertical Curve
V C P	Vitrified Clay Pipe
W M	Water Main
W M V	Water Main Valve
W R	West Roadway
Wrng	Wearing
W S V	Water Service Valve
X-Sec	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-2-094(003)217	2



SHOWING INSIDE FACE

BEAM ELEVATION

NOTES:

GENERAL: ALL WORK AND MATERIALS SHALL CONFORM TO APPLICABLE SECTIONS OF THE "N.D. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", ADOPTED NOV. 1986.

THIS PROJECT CONSISTS OF REPAIRING THE DAMAGED BEAMS AND CORBELS.

CONSTRUCTION SEQUENCE – EAST BEAM:

1 ALL UNSOUND CONCRETE SHALL BE REMOVED. ONE INCH DEEP SAW CUTS WILL BE MADE AROUND THE PERIMETER OF THE DAMAGED AREA. CONCRETE SHALL BE REMOVED UP TO THE SAW CUTS.

2 PRE-LOAD SHALL BE PLACED PRIOR TO THE BEAM PATCHING AND REMAIN IN PLACE FOR 24 HOURS AFTER PATCHING HAS BEEN COMPLETED. PRE-LOAD SHALL CONSIST OF A TRUCK WITH A REAR AXLE WEIGHT OF 30,000 POUNDS. THE TRUCK SHALL BE PARKED ON THE EAST SIDE OF THE BRIDGE WITH THE REAR AXLE POSITIONED OVER THE DAMAGED AREA OF THE BEAM. THE FRONT AXLE SHALL BE ON THE NORTH SIDE OF THE DAMAGED AREA. (SEE TWO-LANE, TWO-WAY ROAD-WAY NOTE.)

3 ALL AREAS TO BE REPAIRED SHALL BE THOROUGHLY CLEANED WITH A WATER SPRAY BEFORE PATCHING BEGINS. THE BEAM SHALL BE RESTORED TO ITS ORIGINAL CROSS SECTION BY PATCHING. THE INSIDE CORBEL SHALL BE REPAIRED AS SHOWN IN SECTION A-A. THE CORBEL IS TO REMAIN IN THE POSITION IT IS NOW. THE VOID AREA IN THE CORBEL IS TO BE FILLED WITH PATCHING MATERIAL.

4 MATERIAL FOR PATCHING SHALL BE SIKATOP 122 REPAIR MORTOR. SIKATOP 122 SHALL BE MIXED AND APPLIED ACCORDING TO MANUFACTURE'S SPECIFICATIONS.

5 AFTER THE PATCHING MATERIAL HAS CURED FOR 24 HOURS, ANY CRACKS BETWEEN THE CORBEL AND THE WEB OF THE BEAM SHALL BE SEALED WITH HOT POURED ELASTIC SEALANT.

WEST BEAM:

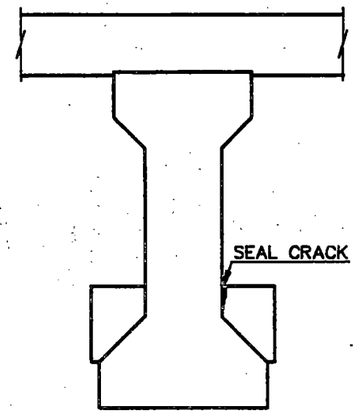
1 ALL UNSOUND CONCRETE SHALL BE REMOVED. ONE INCH DEEP SAW CUTS WILL BE MADE AROUND THE PERIMETER OF THE DAMAGED AREAS. CONCRETE SHALL BE REMOVED UP TO THE SAW CUTS.

2 ALL AREAS TO BE REPAIRED SHALL BE THOROUGHLY CLEANED WITH A WATER SPRAY BEFORE REPAIR BEGINS.

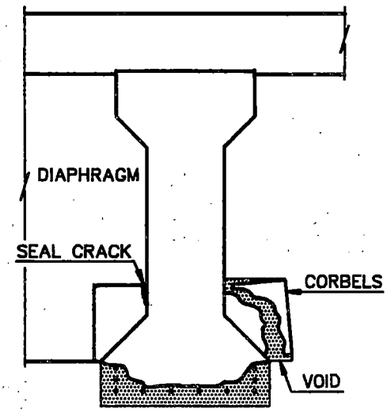
3 THE BEAM SHALL BE RESTORED TO ITS ORIGINAL CROSS SECTION BY PATCHING WITH SIKATOP 122 REPAIR MORTOR.

TWO-LANE, TWO-WAY ROADWAY: THE MAINTAINANCE AND PROTECTION OF TRAFFIC FOR TWO-LANE, TWO-WAY ROADWAY AT PETTIBONE INTERCHANGE PROVIDES FOR FLAGGING THE TRAFFIC AT ALL TIMES, UNTIL THE ROADWAY IS COMPLETELY OPEN TO TRAFFIC. IN PLACE OF PROVIDING FLAGGING DURING THE TIME ONE-WAY TRAFFIC IS MAINTAINED, A TRAFFIC SYSTEM MAY BE PROVIDED SIMILAR TO THE ONE SHOWN IN THE PLANS. ELIMINATING THE NEED FOR FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED. THE COST OF FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED SHALL BE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL. 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.

I-94 TRAFFIC: THE CONTRACTOR HAS THE OPTION TO CLOSE THE WEST BOUND LANE DURING DAY LIGHT HOURS AND REROUTE THE TRAFFIC AS SHOWN ON SHEET 4 AND 5 OR TO MAINTAIN ONE LANE TRAFFIC UNDER THE STRUCTURE. THE COST OF EITHER OPTION SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL.



B-B



A-A

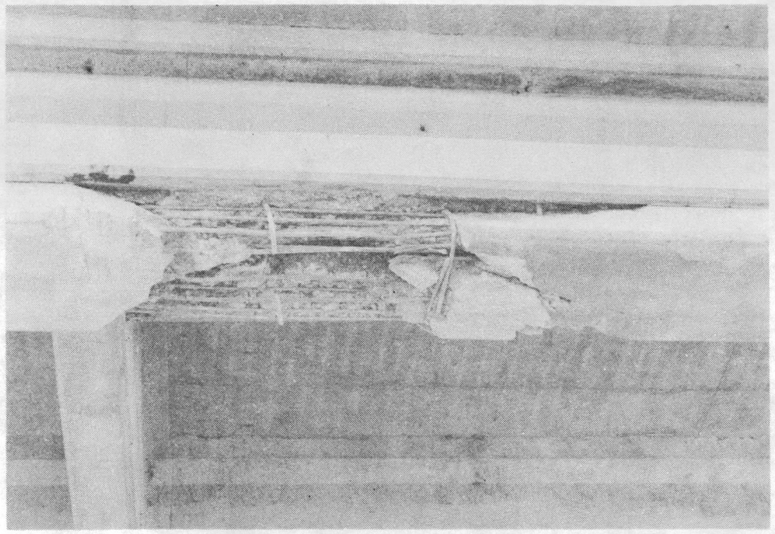
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103	0100	CONTRACT BOND	L. SUM	1
702	0100	MOBILIZATION	L. SUM	1
704	1100	TRAFFIC CONTROL	L. SUM	1
930	9695	GIRDER REPAIR	L. SUM	1

PETTIBONE INTERCHANGE
KIDDER COUNTY

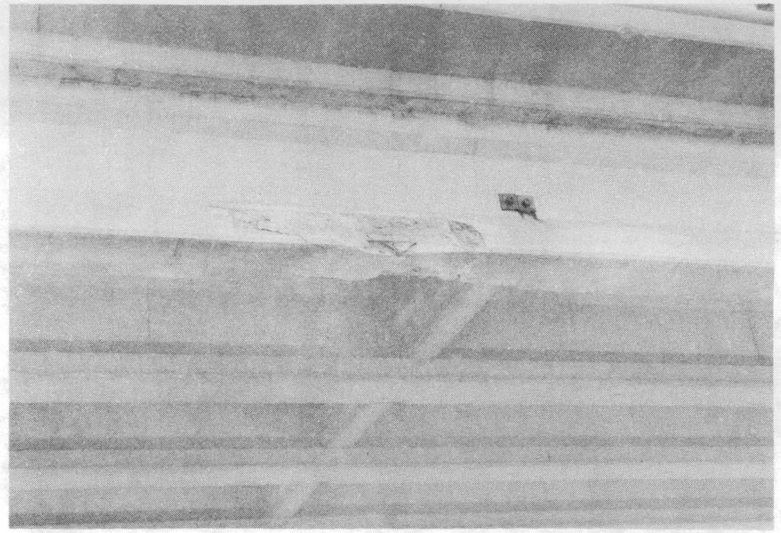
PRESTRESSED CONCRETE I BEAM REPAIR DETAILS

89DLS16

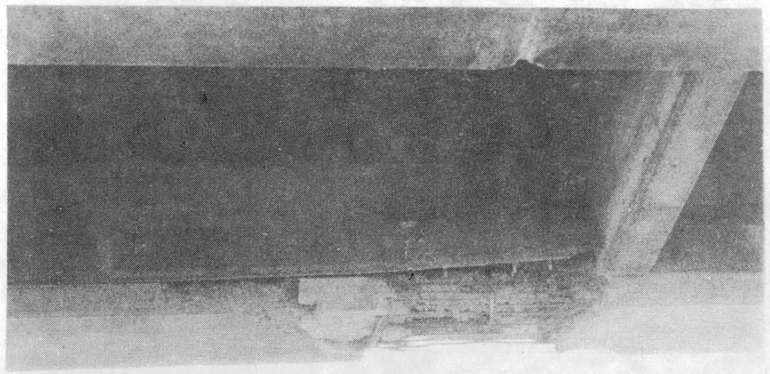
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EAST BEAM LOOKING EAST



WEST BEAM LOOKING EAST



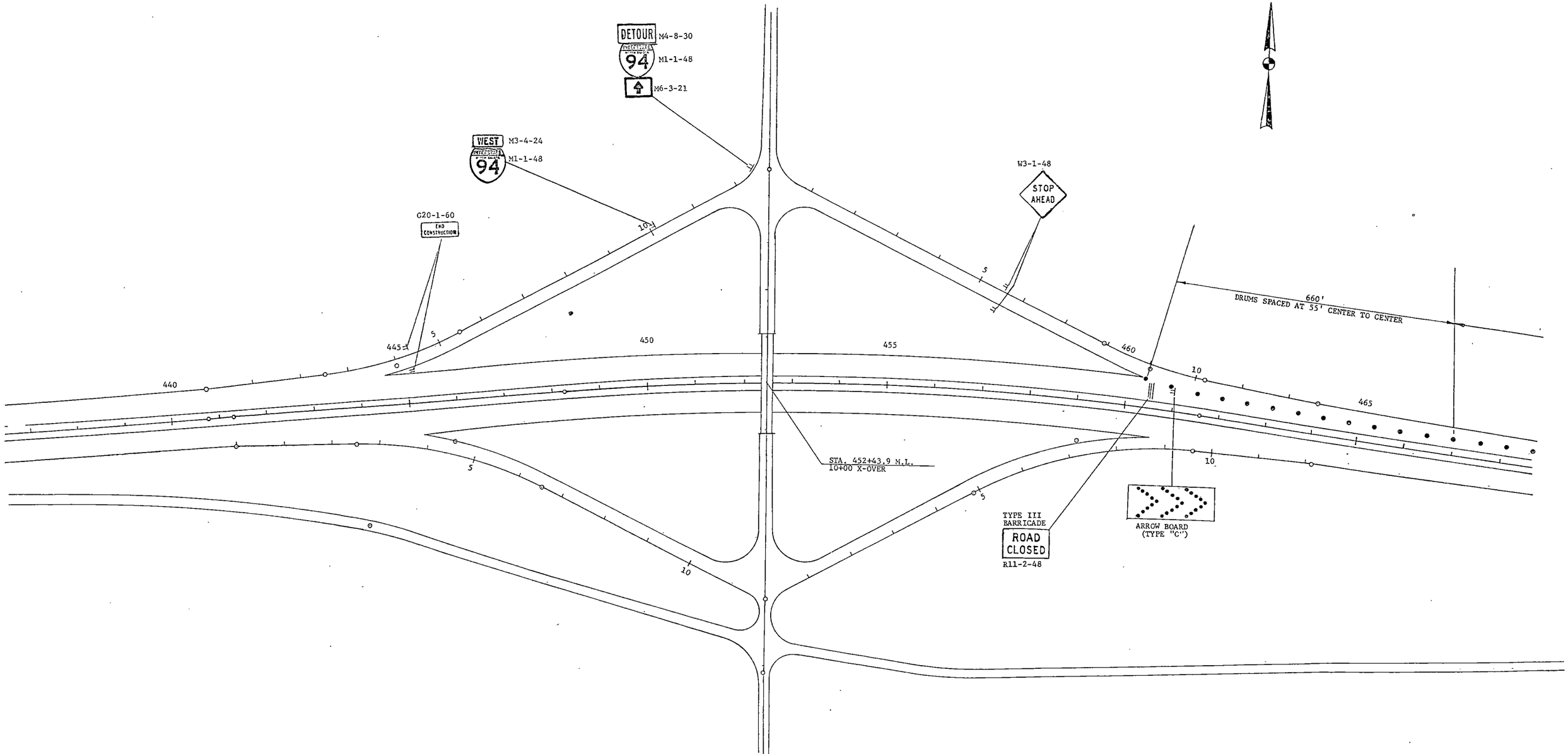
EAST BEAM LOOKING WEST

QUANTITIES

PETTIBONE INTERCHANGE
KIDDER COUNTY

PRESTRESSED CONCRETE I BEAM REPAIR DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
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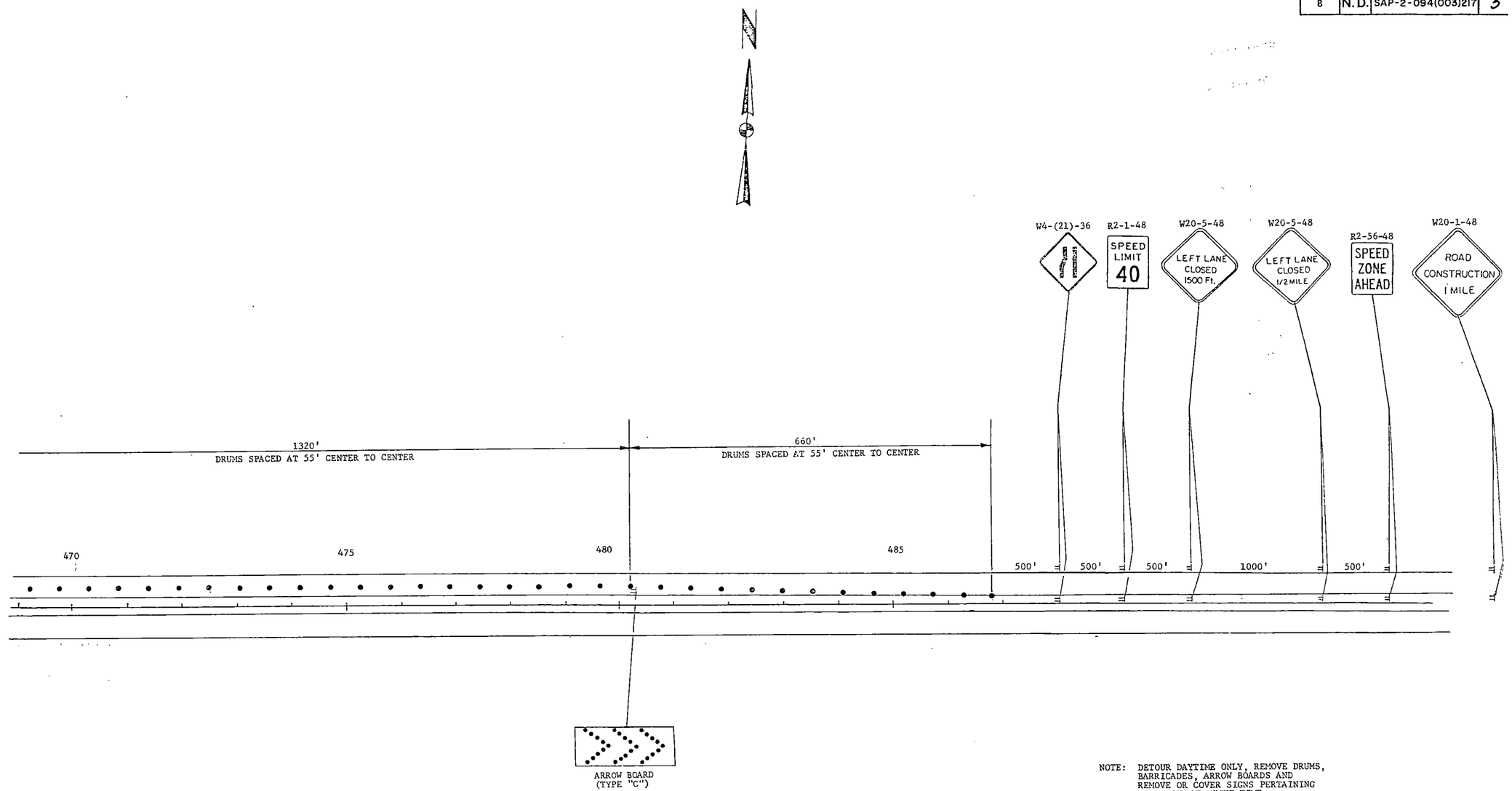


NOTE: DETOUR DAYTIME ONLY, REMOVE DRUMS, BARRICADES, ARROW BOARDS AND REMOVE OR COVER SIGNS PERTAINING TO DETOUR AT NIGHT TIME.

TEMPORARY DETOUR
(Daytime Hours)

ON I-94
PETTIBONE INTERCHANGE

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NOTE: DETOUR DAYTIME ONLY, REMOVE DRUMS, BARRICADES, ARROW BOARDS AND REMOVE OR COVER SIGNS PERTAINING TO DETOUR AT NIGHT TIME.

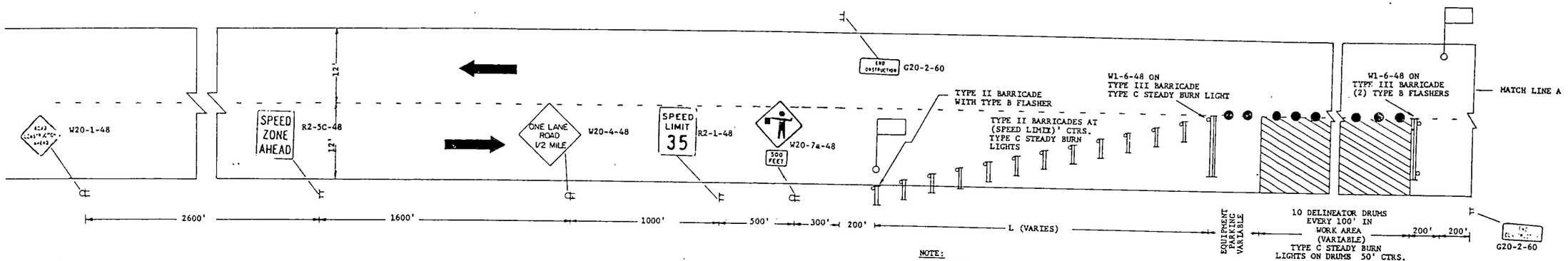
TEMPORARY DETOUR
(Daytime Hours)

ON I-94
PETTIBONE INTERCHANGE

SIGN LAYOUT FOR ONE LANE CLOSURE
TWO LANE ROADWAY

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
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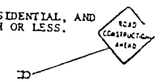
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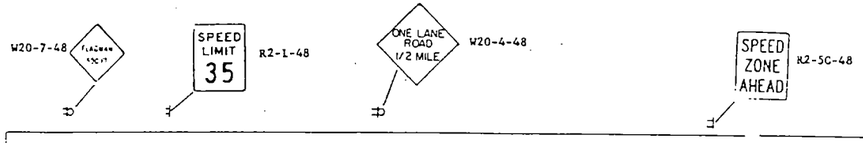


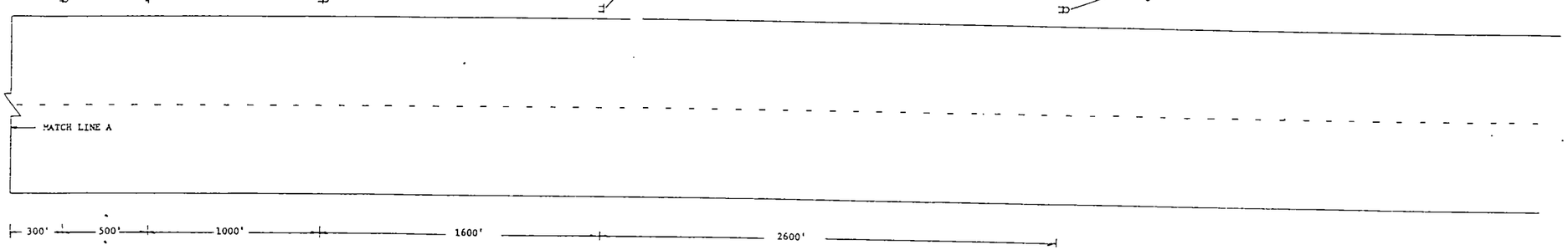
NOTE:
L = MINIMUM LENGTH OF TAPER
S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
W = WIDTH OF OFFSET

L=S x W FOR FREEWAYS, EXPRESSWAYS, AND ALL OTHER ROADS WITH SPEEDS OF 45 MPH OR GREATER.

$L = WS^2/60$ FOR URBAN, RESIDENTIAL, AND STREETS WITH SPEEDS 40 MPH OR LESS.







KEY
- TYPE II BARRICADE
- TYPE III BARRICADE
- CONES
- FLASHERS
- DELINATOR DRUM
- SIGNS
- WORK AREA

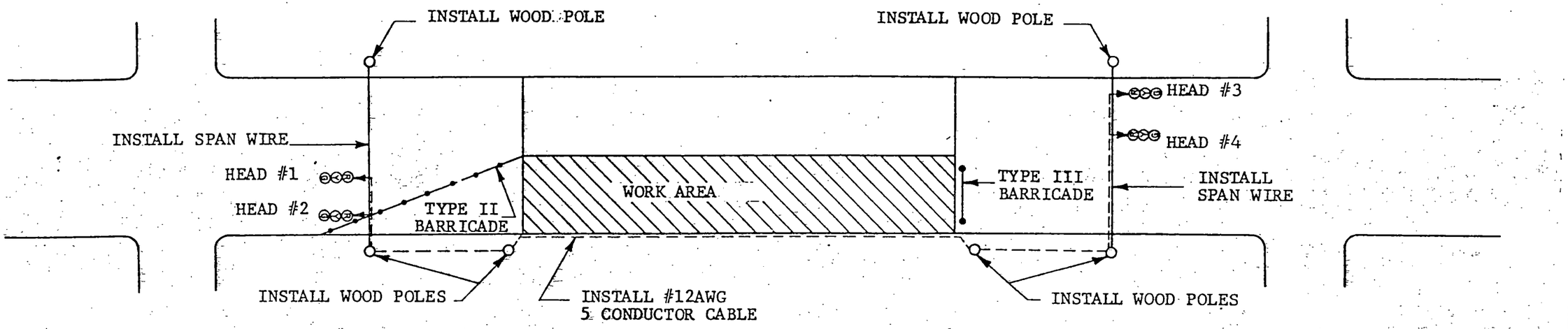
TRAFFIC CONTROL SYSTEM

TRAFFIC CONTROL

on Crossroad
I-94
Pettibone Interchange

TYPICAL CONSTRUCTION SIGNAL LAYOUT

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
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SUGGESTED TIMING AND SIGNAL SEQUENCE

HEADS 1 & 2	GREEN	YELLOW	RED				
HEADS 3 & 4	RED			GREEN	YELLOW	RED	
TIME CYCLE LENGTH 90 SEC.	18.0	4.5	22.5	18.0	4.5	22.5	
PERCENT OF CYCLE	20	5	25	20	5	25	

NOTES:

1. CONDUCTOR IS TO BE OVERHEAD SPAN BETWEEN POLES EXCEPT ON BRIDGE WHERE IT IS TO BE ATTACHED AND SUPPORTED BY THE BRIDGE STRUCTURE IN SUCH A WAY AS NOT TO INTERFERE WITH BRIDGE CONSTRUCTION. CONDUCTOR IS SHOWN ATTACHED TO SIDE OF BRIDGE. IT MAY BE INSTALLED ON EITHER SIDE OF THE BRIDGE AS DETERMINED BY FIELD PERSONNEL.

2. THE CONTROLLER MAY BE LOCATED ON ANY OF THE WOOD POLES IN THE CABLE RUN BETWEEN THE SIGNAL HEADS FOR EASTBOUND AND WESTBOUND TRAFFIC MOVEMENTS.

3. THE TIMING SCHEDULE IS SUGGESTED TRIAL SETTING. FREQUENT CHECKS OF SIGNALS IN OPERATION SHALL BE MADE TO OBTAIN THE MOST EFFICIENT TIMING SCHEDULE.

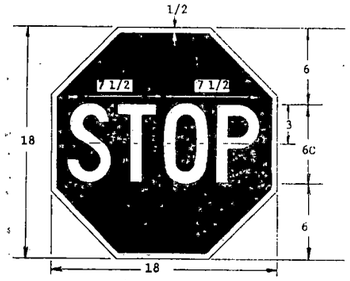
TRAFFIC CONTROL SYSTEM

TRAFFIC CONTROL
on Crossroad
I-94
Pettibone Interchange

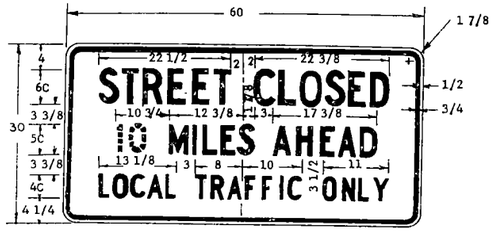
CONSTRUCTION SIGN DETAILS

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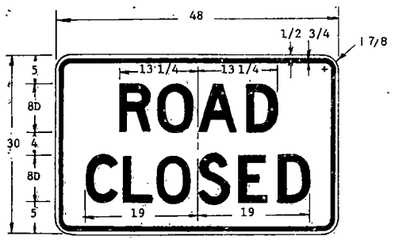
D754-1



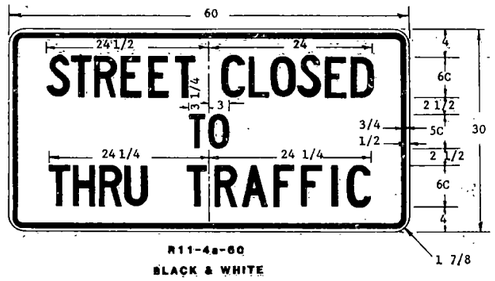
STOP-SLOW PADDLE
RED & WHITE
FLAGPERSON PADDLE



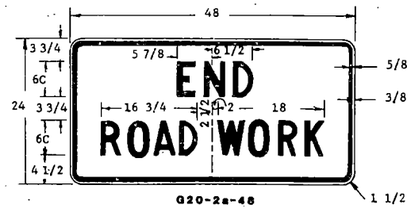
R11-3c-60
BLACK & WHITE



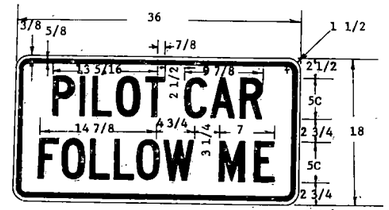
R11-2-48
BLACK & WHITE



R11-4a-60
BLACK & WHITE

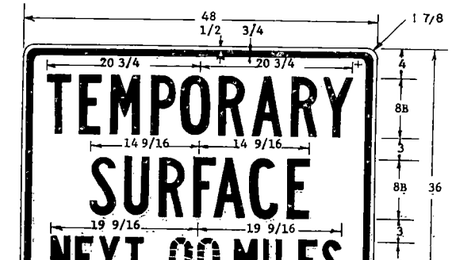


G20-2a-48
BLACK & ORANGE

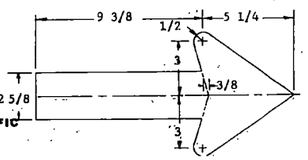


G20-4-36
BLACK & ORANGE

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



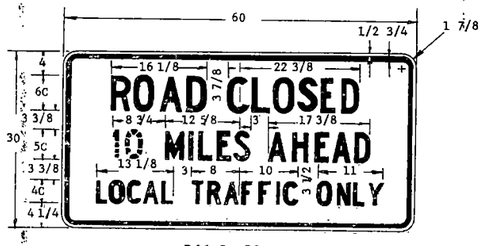
G20-8-48
BLACK & ORANGE



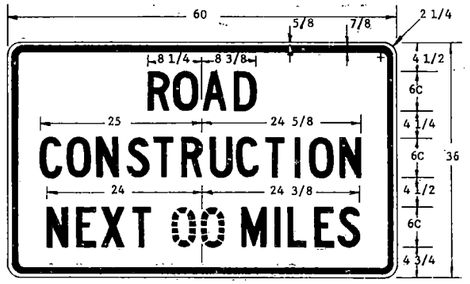
ARROW DETAIL FOR SIGN NO'S.
G20-50-72 & G20-52-72

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. 894-3.5 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.

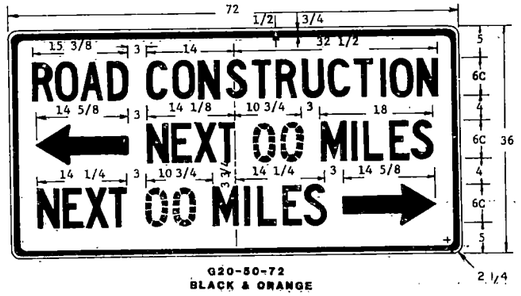
NOTE: ALL SIGNS SHALL HAVE REFLECTORIZED MESSAGE BORDER AND BACKGROUND, UNLESS SHOWN OTHERWISE ON THE PLANS. IN NO CASE IS THE COLOR BLACK REFLECTORIZED.



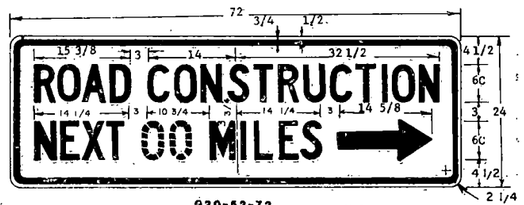
R11-3a-60
BLACK & WHITE



G20-1-60
BLACK & ORANGE

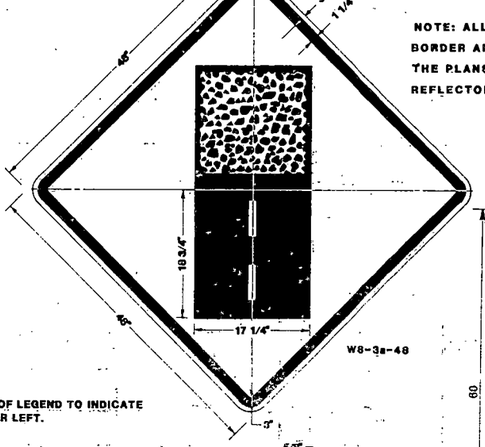


G20-50-72
BLACK & ORANGE

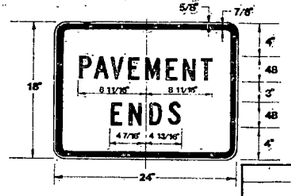


G20-52-72
BLACK & ORANGE

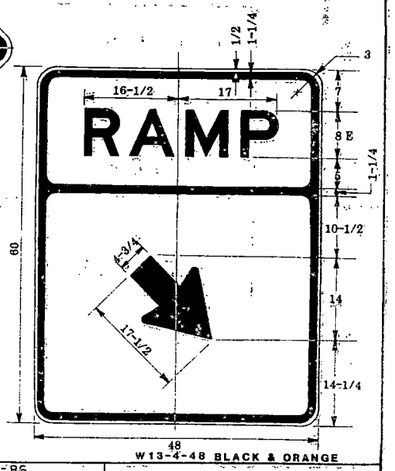
ARROW MAY BE RIGHT OR LEFT OF LEGEND TO INDICATE CONSTRUCTION TO THE RIGHT OR LEFT.



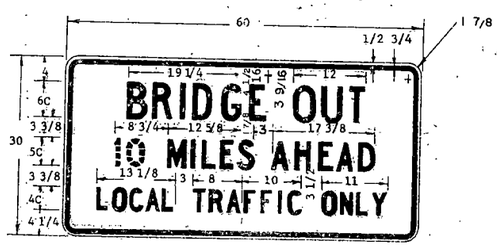
W8-3a-48



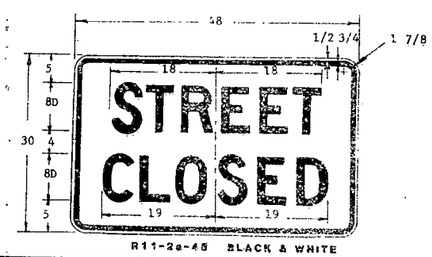
W8-3a-24
BLACK & ORANGE



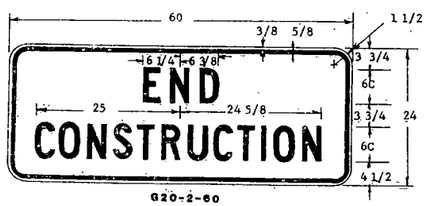
W13-4-48 BLACK & ORANGE



R11-3b-60
BLACK & WHITE



R11-2a-48 BLACK & WHITE



G20-2-60
BLACK & ORANGE



G20-54-48
BLACK & ORANGE

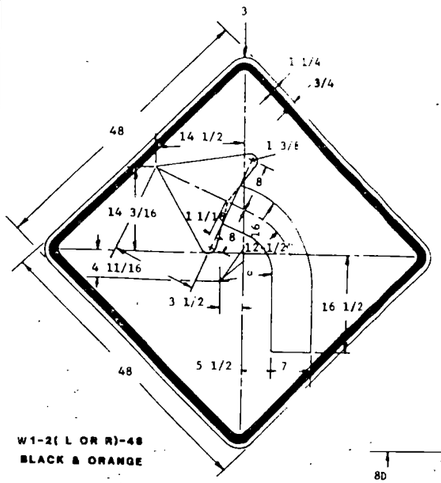
10-1-85	
REVISIONS	
DATE	CHANGE

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED _____
DESIGN ENGINEER

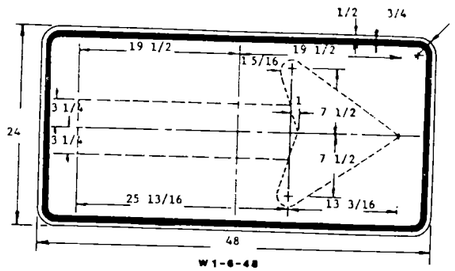
CONSTRUCTION SIGN DETAILS

FHWA REGION	STATE	FED AID PROJECT NO	SHEET NO
8	N.D.	SAP-2-094(003)217	9

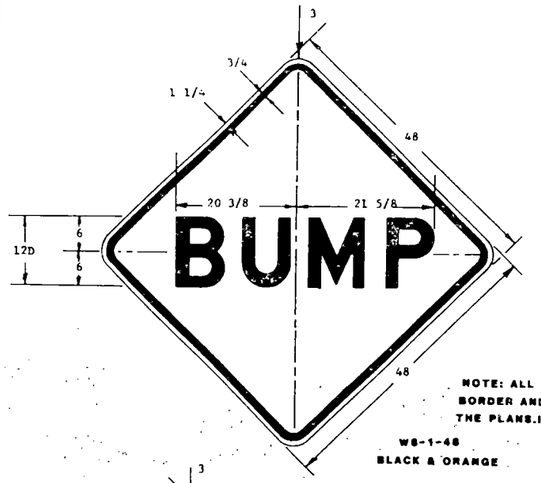
D-754-2



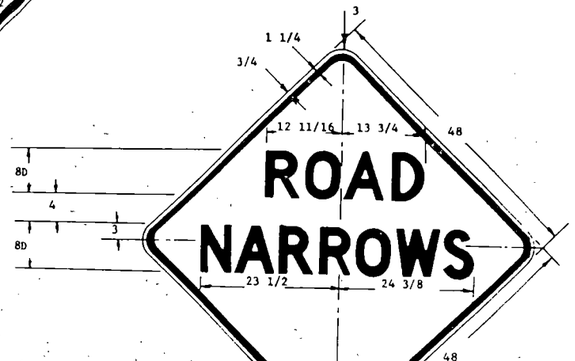
W1-2(L OR R)-48
BLACK & ORANGE

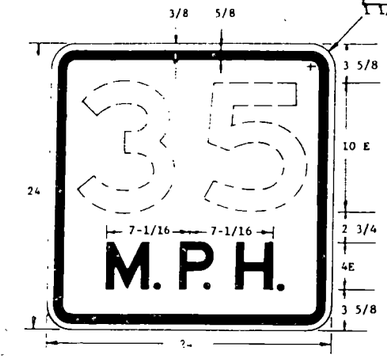


W1-6-48
BLACK & ORANGE



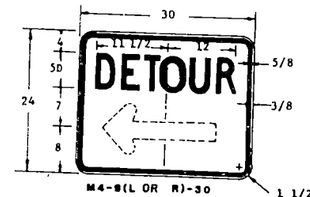
W8-1-48
BLACK & ORANGE



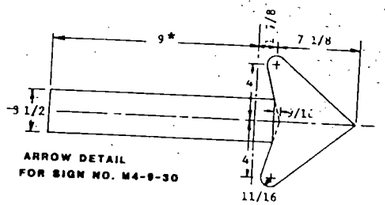


W13-1-24
BLACK & ORANGE

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



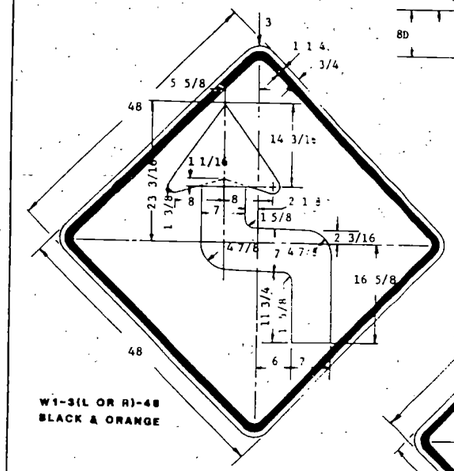
M4-9(L OR R)-30
BLACK & ORANGE



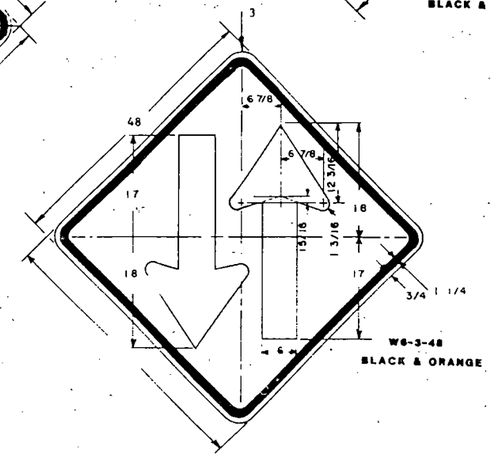
ARROW DETAIL
FOR SIGN NO. M4-9-30

MESSAGE AND BORDER: THE MESSAGES AND BORDERS SHALL BE SCREENED ON REFLECTIVE SHEETING OR INSTALLED USING PIGMENTED PLASTIC FILM CONFORMING TO THE REQUIREMENT OF SEC. 854.03 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.

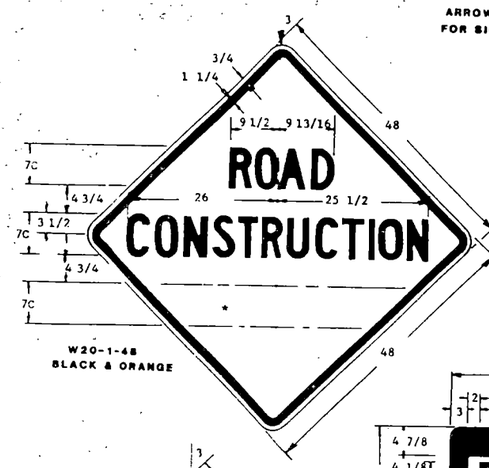
*DIMENSION SHALL BE 3" WHEN ARROW IS PLACED VERTICALLY.



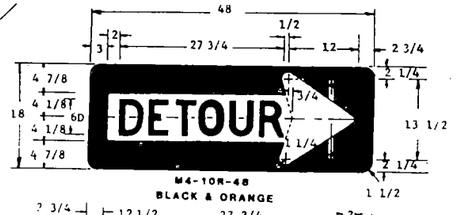
W1-3(L OR R)-48
BLACK & ORANGE



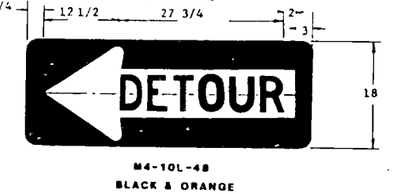
W5-3-48
BLACK & ORANGE



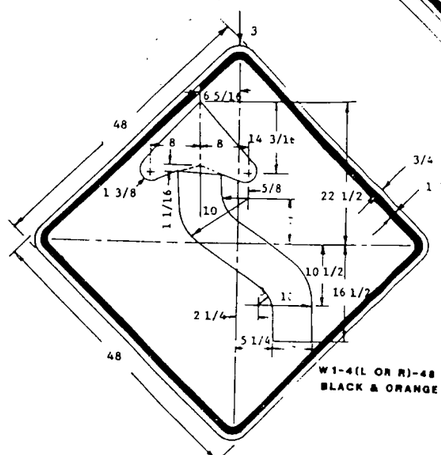
W20-1-48
BLACK & ORANGE



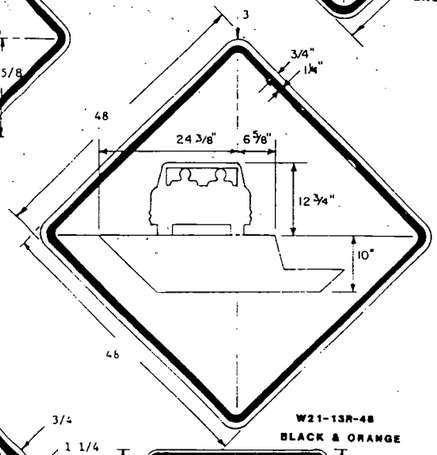
M4-10R-48
BLACK & ORANGE



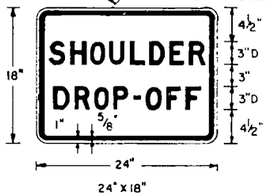
M4-10L-48
BLACK & ORANGE



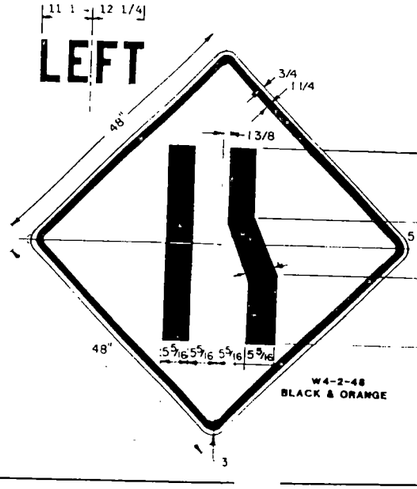
W1-4(L OR R)-48
BLACK & ORANGE



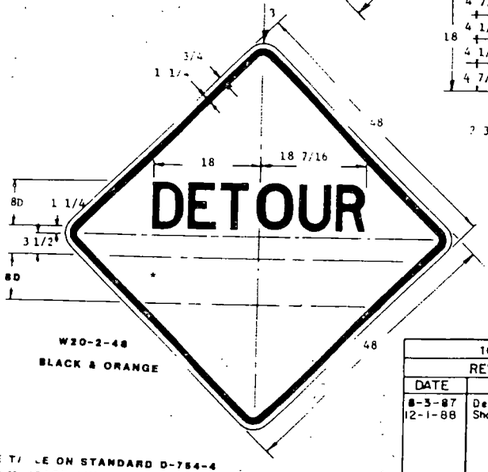
W21-13R-48
BLACK & ORANGE



24"X18"
BLACK&ORANGE



W4-2-48
BLACK & ORANGE



W20-2-48
BLACK & ORANGE

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

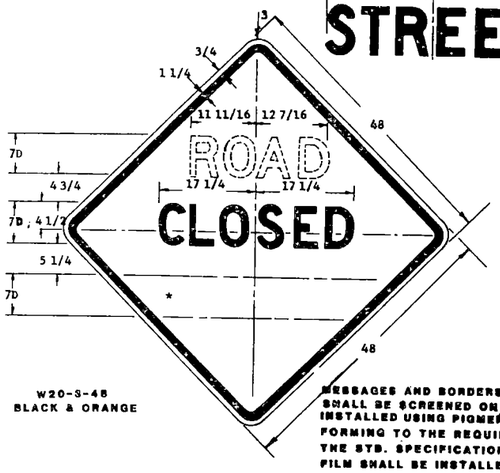
10-1-86	
REVISIONS	
DATE	CHANGE
8-3-87	Detour No.
12-1-88	Shoulder Drop Off

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED _____
DESIGN ENGINEER

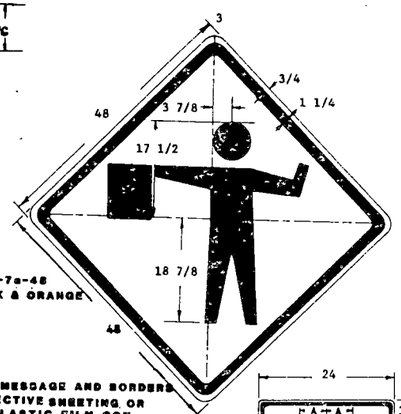
CONSTRUCTION SIGN DETAILS

FHWA REGION	STATE	FED AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-2-094(003)217	10

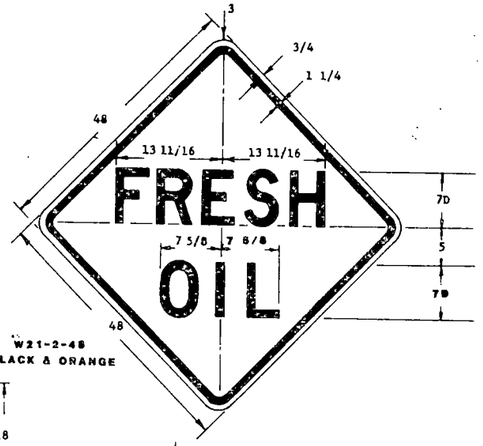
D 754-3



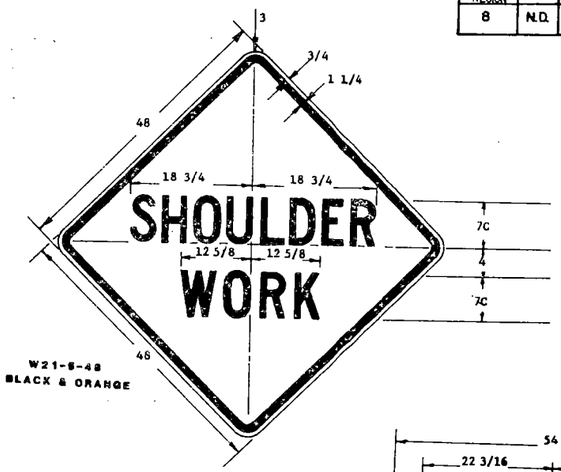
W20-3-48
BLACK & ORANGE



W20-7a-48
BLACK & ORANGE



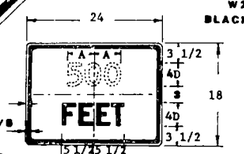
W21-2-48
BLACK & ORANGE



W21-5-48
BLACK & ORANGE

NOTE: EXISTING INVENTORY OF FLAGMAN & MEN WORKING SIGNS WITH WORD MESSAGES MAY BE USED UNTIL THEY NEED REPLACE MENT.

MESSAGES AND BORDERS: THE MESSAGE AND BORDERS SHALL BE SCREENED ON 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 RECOMMENDATIONS. 5/8 THE BORDERS SHALL HAVE THE RADII AND WIDTH SHOWN ON THE PLANS. THE LETTERS SHALL BE FABRICATED IN ACCORDANCE WITH THE STANDARD LETTERS 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.

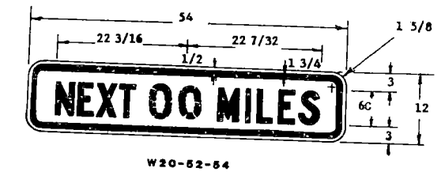


W20-7a-24

SIGN	DIMENSION (INCHES) A
500'	4 - 11/16
1000'	5 - 1/2
1500'	5 - 5/16

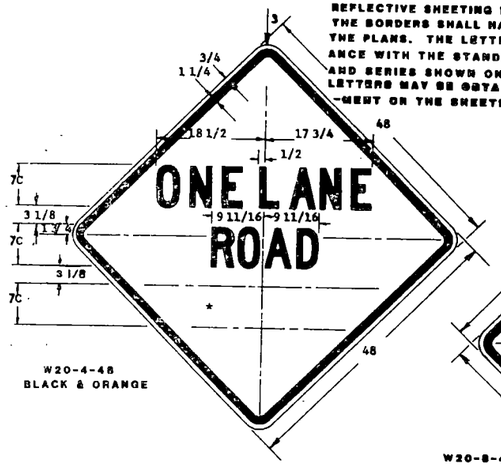
FOR USE WITH W20-7a-48 & W21-1a-48

BLACK & ORANGE

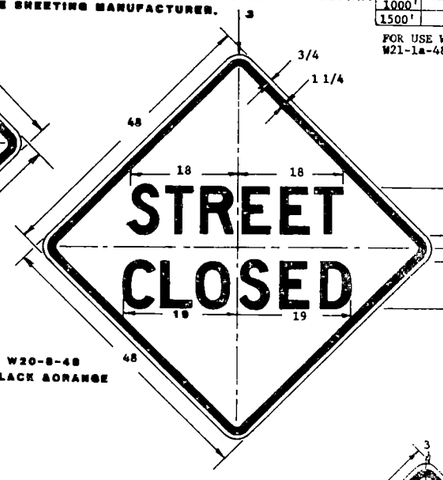


W20-52-54
BLACK & ORANGE

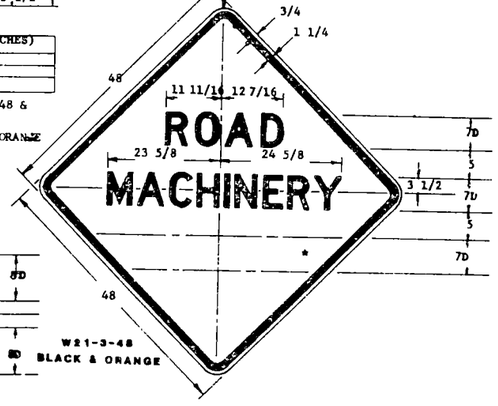
NOTE: ALL SIGNS SHALL HAVE REFLECTORIZED MESSAGES, BORDER AND BACKGROUND, UNLESS SHOWN OTHERWISE ON THE PLANS. IN NO CASE IS THE COLOR BLACK REFLECTORHZED.



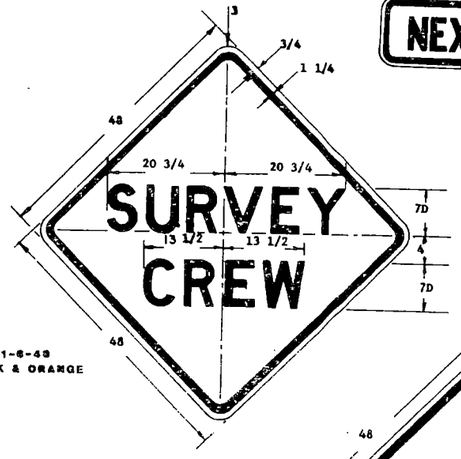
W20-4-48
BLACK & ORANGE



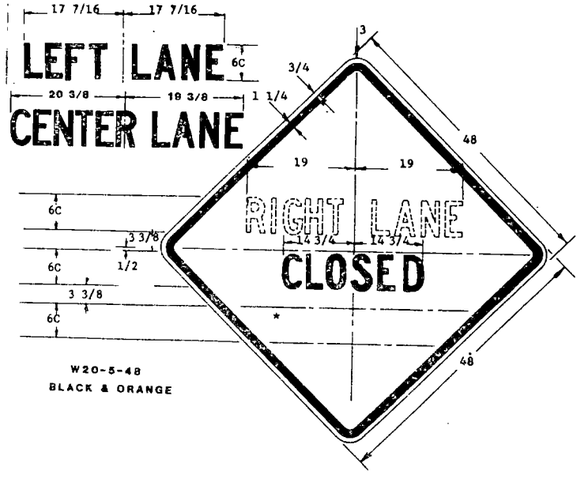
W20-6-48
BLACK &ORANGE



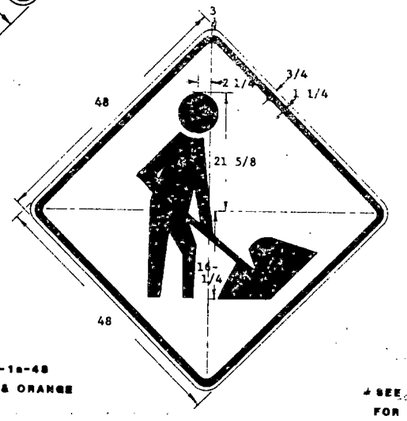
W21-3-48
BLACK & ORANGE



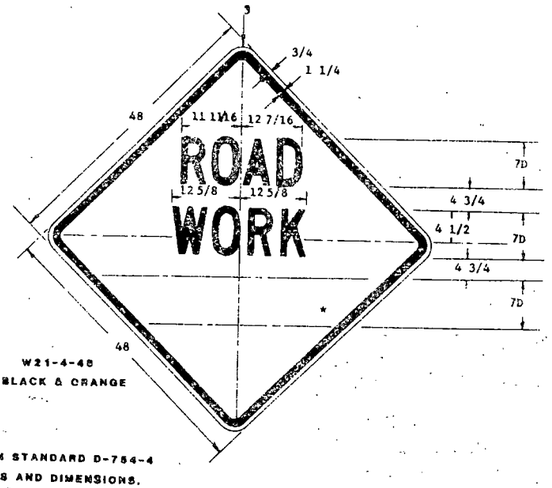
W21-6-48
BLACK & ORANGE



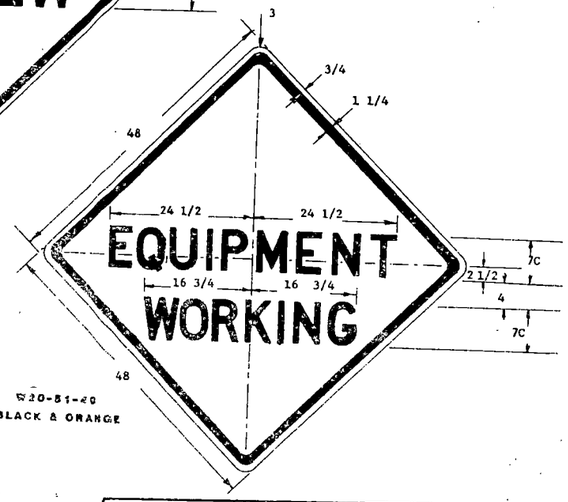
W20-5-48
BLACK & ORANGE



W21-1a-48
BLACK & ORANGE



W21-4-48
BLACK & ORANGE



W20-51-48
BLACK & ORANGE

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

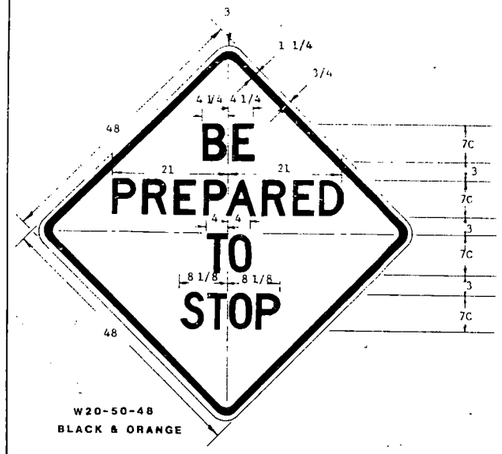
10-1-88	
REVISIONS	
DATE	CHANGE

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED: David K. O. Leer
DESIGN ENGINEER

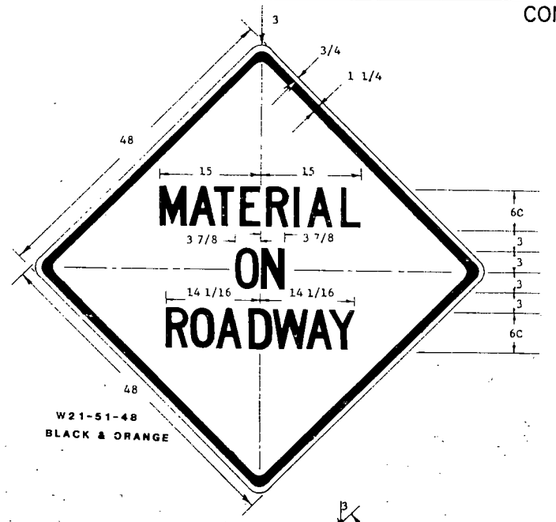
CONSTRUCTION SIGN DETAILS

FHWA REGION		FED AID PROJECT NO.	SHEET NO.
8	N.D.	SAP-2-094(003)217	//

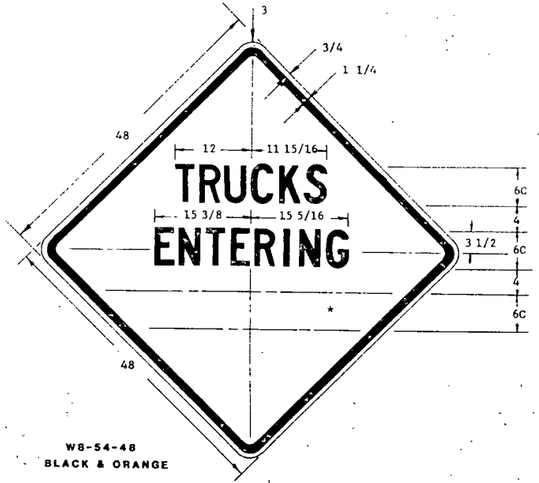
D 754-4



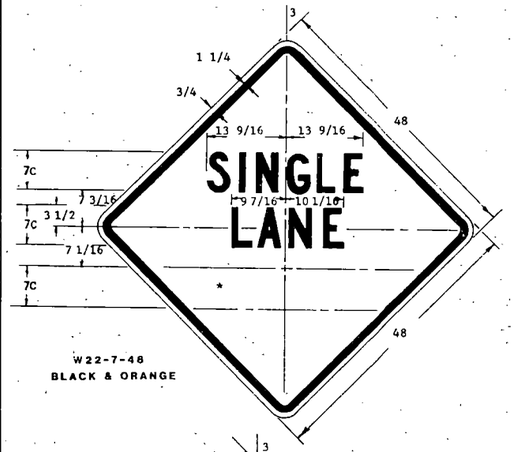
W20-50-48
BLACK & ORANGE



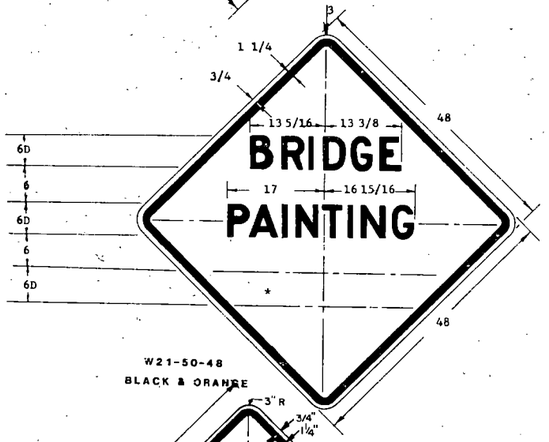
W21-51-48
BLACK & ORANGE



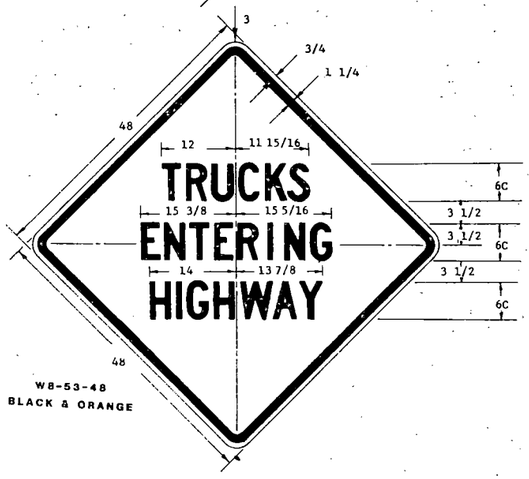
W8-54-48
BLACK & ORANGE



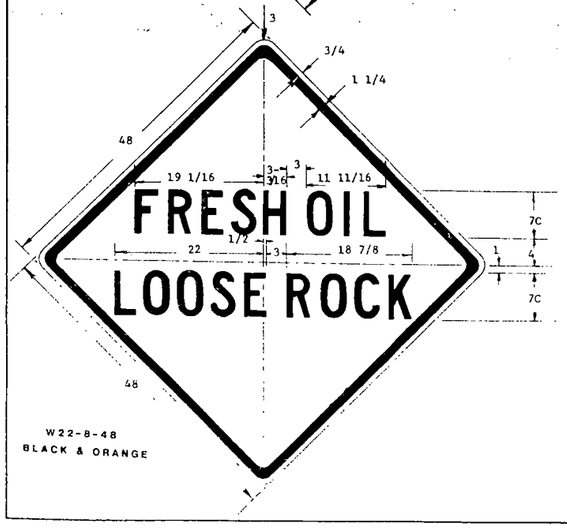
W22-7-48
BLACK & ORANGE



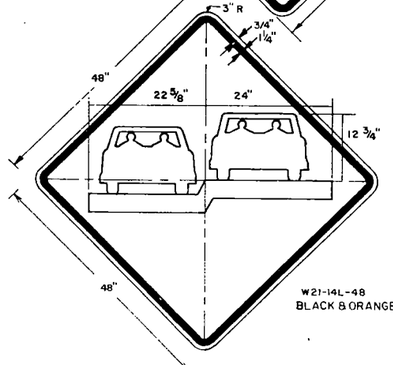
W21-50-48
BLACK & ORANGE



W8-53-48
BLACK & ORANGE



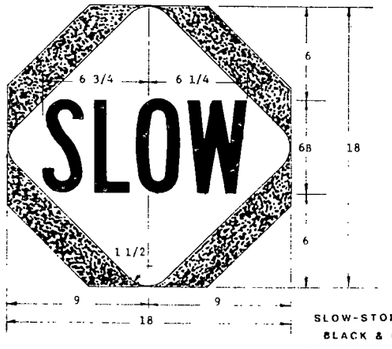
W22-8-48
BLACK & ORANGE



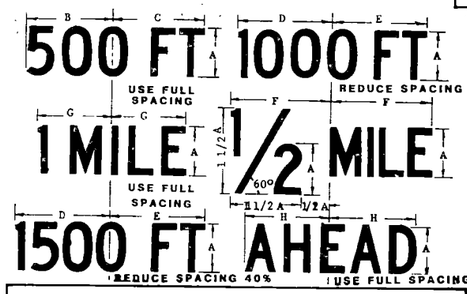
W21-14L-48
BLACK & ORANGE



24"X18"
BLACK & ORANGE



SLOW-STOP PADDLE
BLACK & ORANGE
FLAGPERSON PADDLE

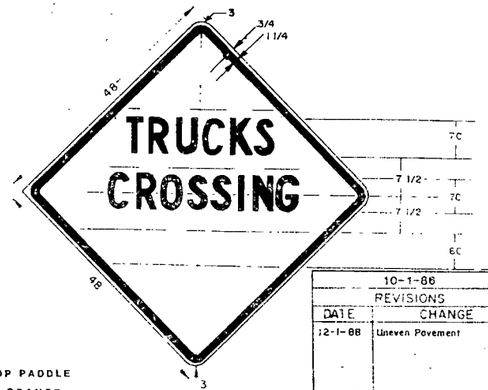


DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
4C	6-7/8	7	7-1/2	8	8-5/16	6-1/16	7
5C	8-3/4	8-13/16	9-3/8	10	10-7/16	7-5/8	8-3/4
6C	10-3/8	10-1/2	11-1/4	12	12-1/2	9-1/8	10-1/2
7C	12	12-3/16	13-1/8	14	14-9/16	10-5/8	12-1/4
8C	13-3/4	14	15	16	16-5/8	12-1/8	14
4D	8-1/8	8-5/8	8-1/2	9	9	7-3/16	8-11/16
5D	10-3/16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

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. 894.03 OF THE STD. SPECIFICATIONS. THE PIGMENTED PLASTIC FILM SHALL BE INSTALLED IN ACCORDANCE WITH THE REFLECTIVE SHEETING MANUFACTURERS RECOMMENETION.
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.



W8-55-48
BLACK & ORANGE

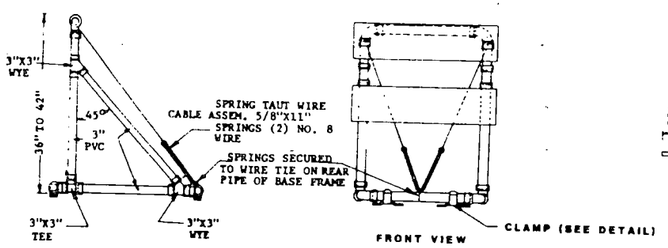
10-1-86 REVISIONS	
DATE	CHANGE
12-1-88	Uneven Pavement

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED: David K.O. Leer
STATE ENGINEER

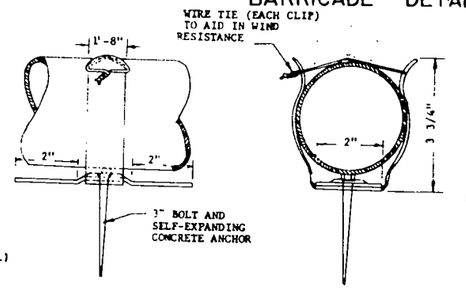
BARRICADE DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-2-094(003)217	12

D 754-5



SIDE VIEW FRONT VIEW

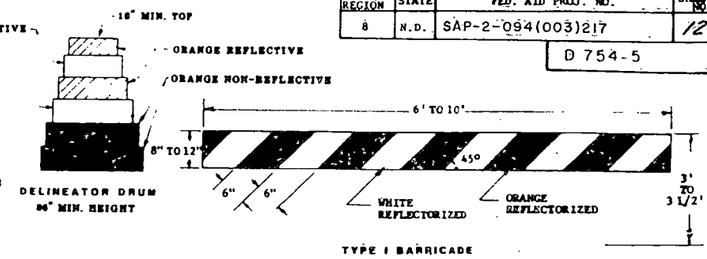


TYPICAL CLAMP DETAIL

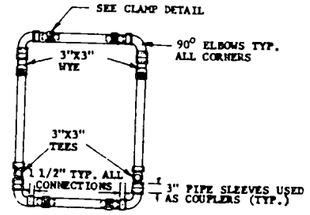
(SINGLE FIRE EXTINGUISHER CLIPS, 3 1/2" DIA.)

DELINEATOR DRUMS

THE MARKINGS ON DRUMS SHALL BE ORANGE AND WHITE STRIPES 4 TO 8 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.



TYPE I BARRICADE



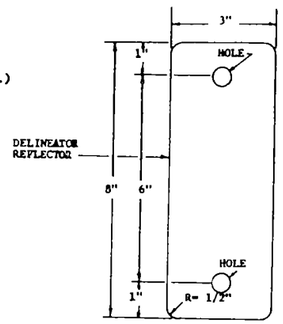
BASE

BREAKAWAY BARRICADE ASSEMBLY

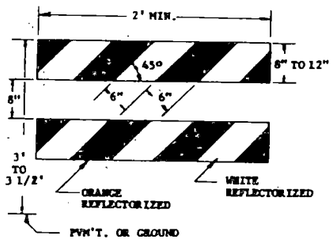
NOTE: THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT TYPE II BARRICADES (SPECIAL) SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION: D2241 FOR PVC 1120 OR 1220, SDR 21, PRESSURE RATING 200 P.S.I. THE WYES, TEES, AND ELBOWS SHALL SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION: D-2466, TYPE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

3" PVC PIPE CONFORMING TO ASTM D2665-DWV OR ASTM D2729 MAY BE USED AS AN ALTERNATE TO ASTM D2241-SDR 21.

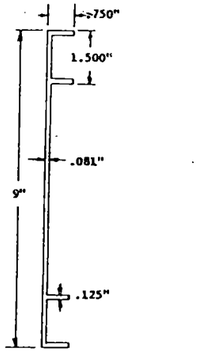
THE 9" X 48" BARRICADE RAIL SHALL BE FABRICATED FROM 0.028" ANODIZED ALUMINUM AND SHALL BE ATTACHED WITH 1 INCH NO. 14 PAN BEAD METAL SCREWS. COLORS: REFLECTIVE ORANGE AND REFLECTIVE WHITE.



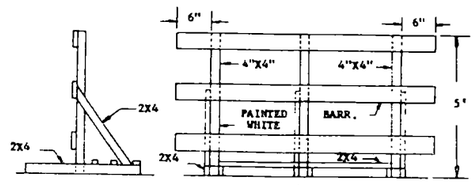
3" x 8" - 18 GUAGE GALVANIZED STEEL SHEETS, OR OR .080" ALUMINUM PLATE WITH WHITE REFLECTIVE SHEETING (TYPE 3A OR 3B) AS SPECIFIED IN SECTION 894 OF THE STANDARD SPECIFICATIONS.



TYPE II BARRICADE



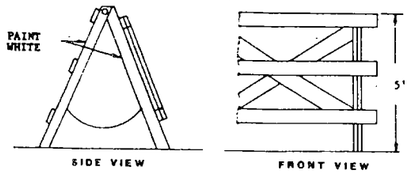
EXTRUDED ALUMINUM BARRICADE BAR DETAIL



SIDE VIEW FRONT VIEW

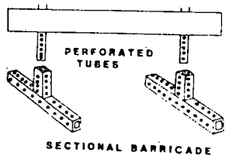
MOVABLE BARRICADE ASSEMBLY

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.

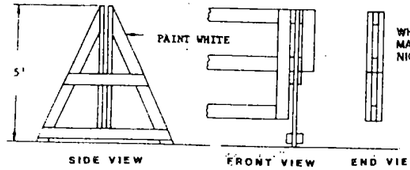


SIDE VIEW FRONT VIEW

HINGED BARRICADE ASSEMBLY

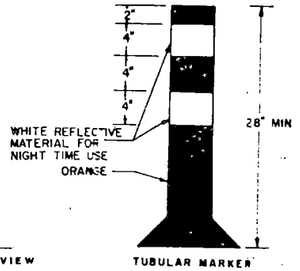


SECTIONAL BARRICADE

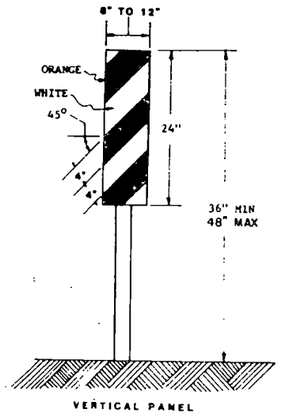


SIDE VIEW FRONT VIEW END VIEW

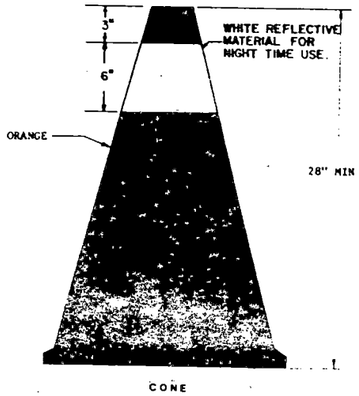
DEMOUNTABLE BARRICADE ASSEMBLY



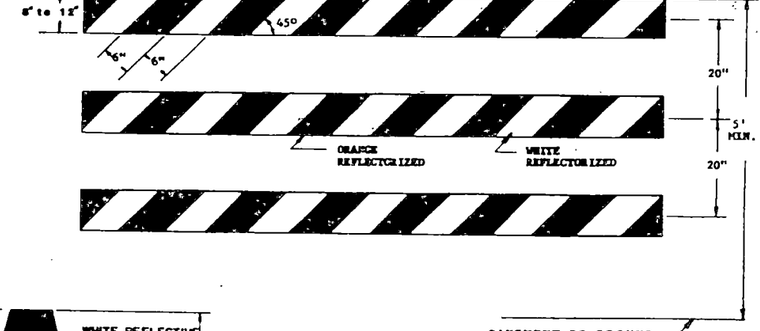
TUBULAR MARKER



VERTICAL PANEL



CONE



TYPE III BARRICADE

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.

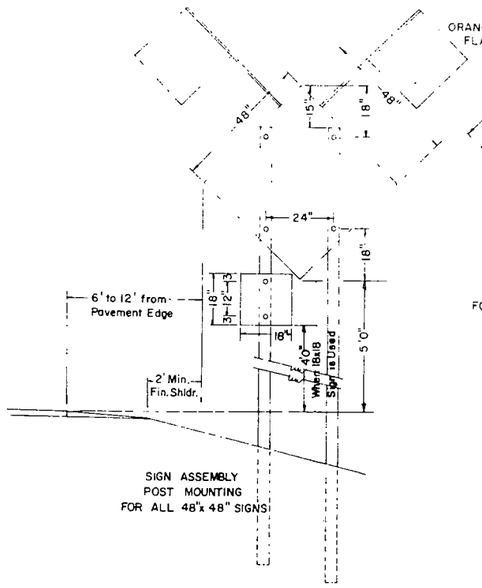
10-1-86	
REVISIONS	
DATE	CHANGE
8-3-87	Type Sheeting
10-1-87	Delineator Drum Note
6-9-88	Barricades Type III

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED: David K. C. Leer
DESIGN ENGINEER

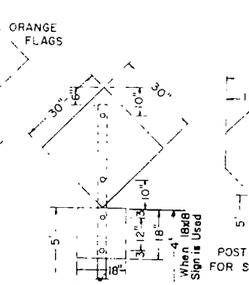
CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	SAP-2-094(003)217	13

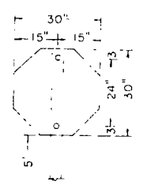
D-754-5-A



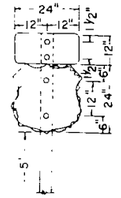
SIGN ASSEMBLY
POST MOUNTING
FOR ALL 48"x48" SIGNS



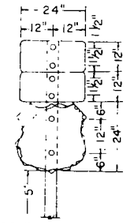
POST MOUNTING
FOR ALL 30"x30" SIGNS



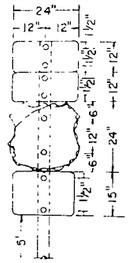
POST MOUNTING
FOR SIGN NO. R-1-30



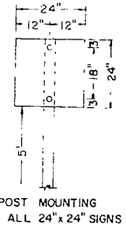
POST MOUNTING
FOR ASSEMBLIES WITH
ONE CARDINAL DIRECTION
SIGN & ONE ROUTE MARKER



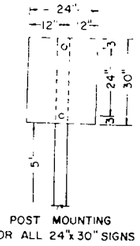
POST MOUNTING
FOR ASSEMBLIES WITH
ONE CARDINAL DIRECTION
SIGN, ONE DETOUR SIGN
& ONE ROUTE MARKER



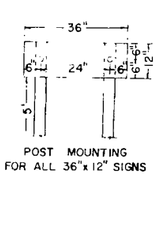
POST MOUNTING
FOR ASSEMBLIES WITH ONE
CARDINAL DIRECTION SIGN, ONE
DETOUR SIGN, ONE ROUTE MARKER
& ONE DIRECTIONAL ARROW



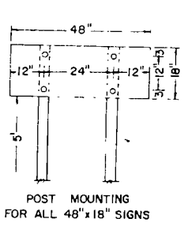
POST MOUNTING
FOR ALL 24"x24" SIGNS



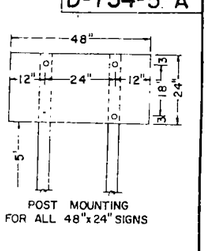
POST MOUNTING
FOR ALL 24"x30" SIGNS



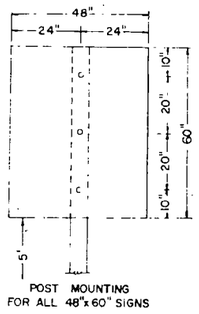
POST MOUNTING
FOR ALL 36"x12" SIGNS



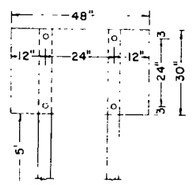
POST MOUNTING
FOR ALL 48"x18" SIGNS



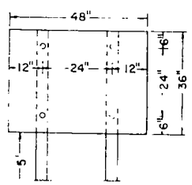
POST MOUNTING
FOR ALL 48"x24" SIGNS



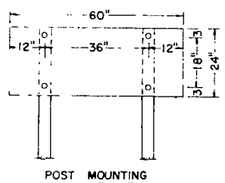
POST MOUNTING
FOR ALL 48"x60" SIGNS



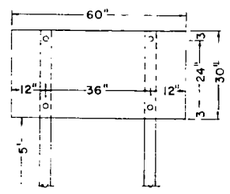
POST MOUNTING
FOR ALL 48"x30" SIGNS



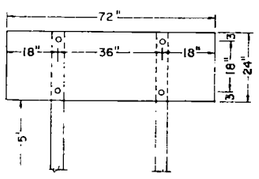
POST MOUNTING
FOR ALL 48"x36" SIGNS



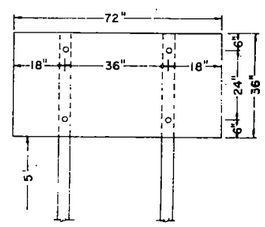
POST MOUNTING
FOR ALL 60"x24" SIGNS



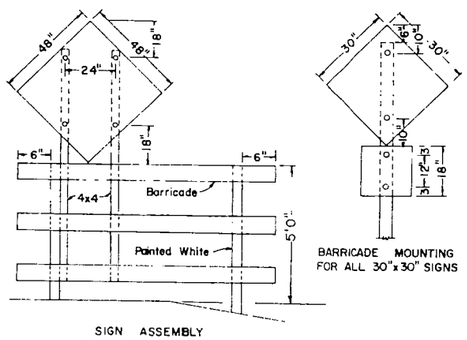
POST MOUNTING
FOR ALL 60"x30" SIGNS



POST MOUNTING
FOR ALL 72"x24" SIGNS

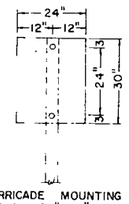


POST MOUNTING
FOR ALL 72"x36" SIGNS

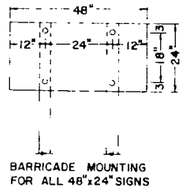


SIGN ASSEMBLY
BARRICADE MOUNTING
FOR ALL 48"x48" SIGNS

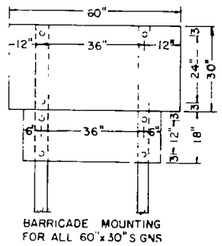
BARRICADE MOUNTING
FOR ALL 30"x30" SIGNS



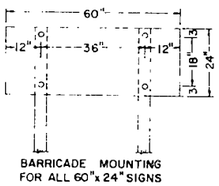
BARRICADE MOUNTING
FOR ALL 24"x30" SIGNS



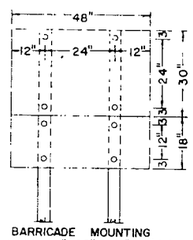
BARRICADE MOUNTING
FOR ALL 48"x24" SIGNS



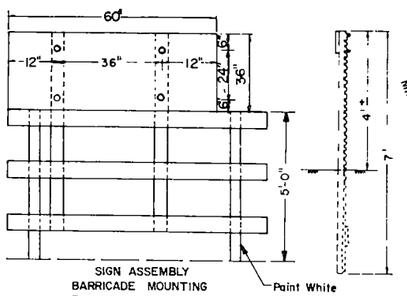
BARRICADE MOUNTING
FOR ALL 60"x30"S GNS



BARRICADE MOUNTING
FOR ALL 60"x24" SIGNS

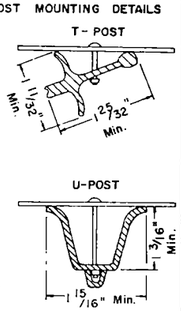


BARRICADE MOUNTING
FOR ALL 48"x30" & 48"x18" SIGNS

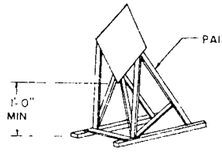


SIGN ASSEMBLY
BARRICADE MOUNTING
FOR ALL G20-1-60 SIGNS

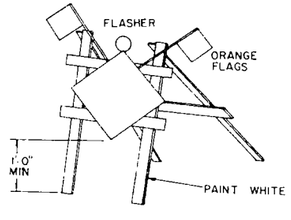
DELINEATOR ATTACHMENT
AND POST MOUNTING DETAILS



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.



PORTABLE SIGN MOUNTING



PORTABLE SIGN MOUNTING

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 Stds. 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 imbeded 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 installed and removed as required

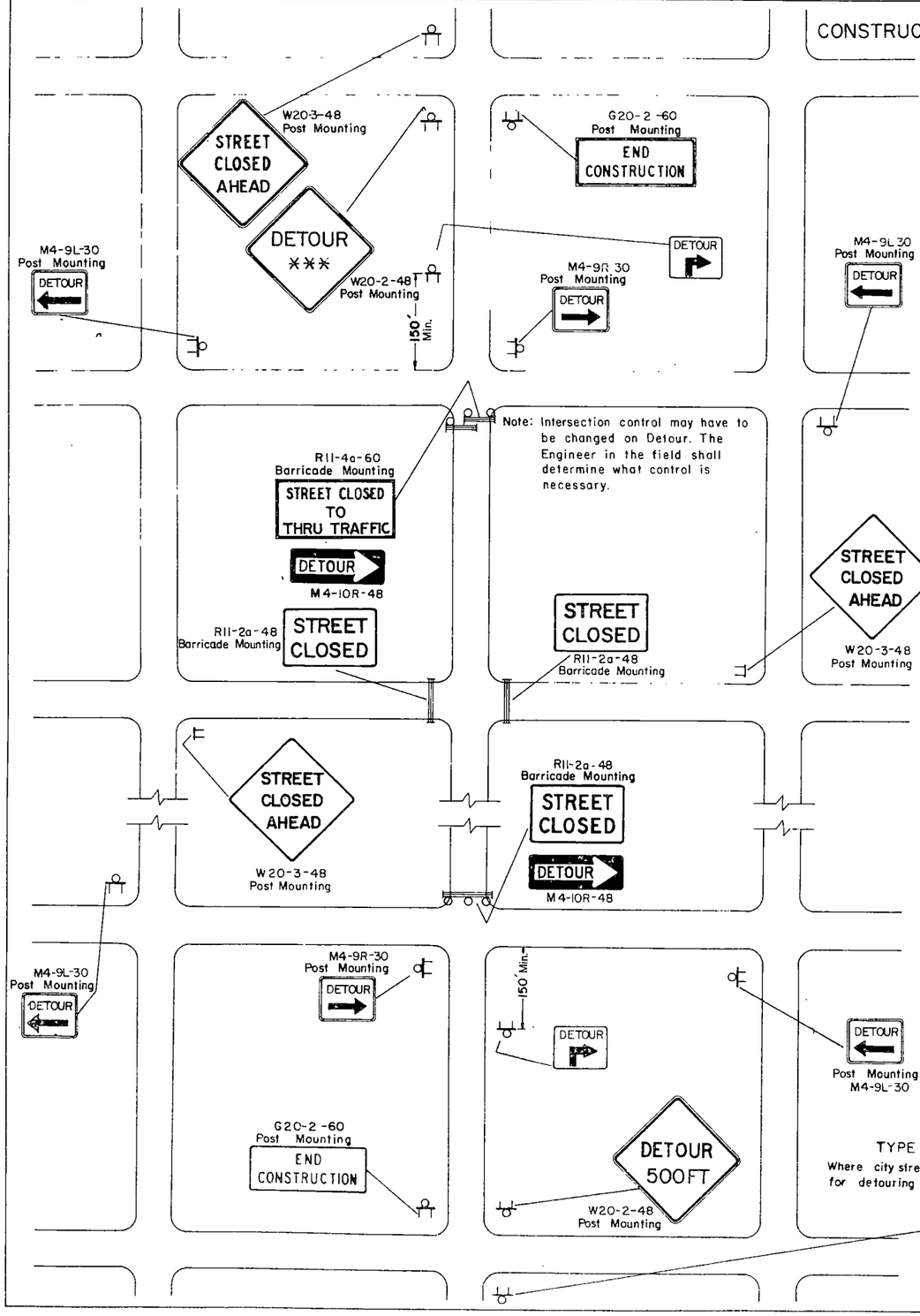
10-1-86	
REVISIONS	
DATE	CHANGE
8-1-88	SIGN ASSEMBLY

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

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
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D-754-11



Sequencing Arrow Panels shall be Type A, B or C dependent on traffic volumes and speeds as follows:

Type A Sequencing Arrow Panels shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).

Type B Sequencing Arrow Panels shall be used on roadways with moderate traffic speeds and moderate traffic volumes (40 mph and less and 5000 ADT or less).

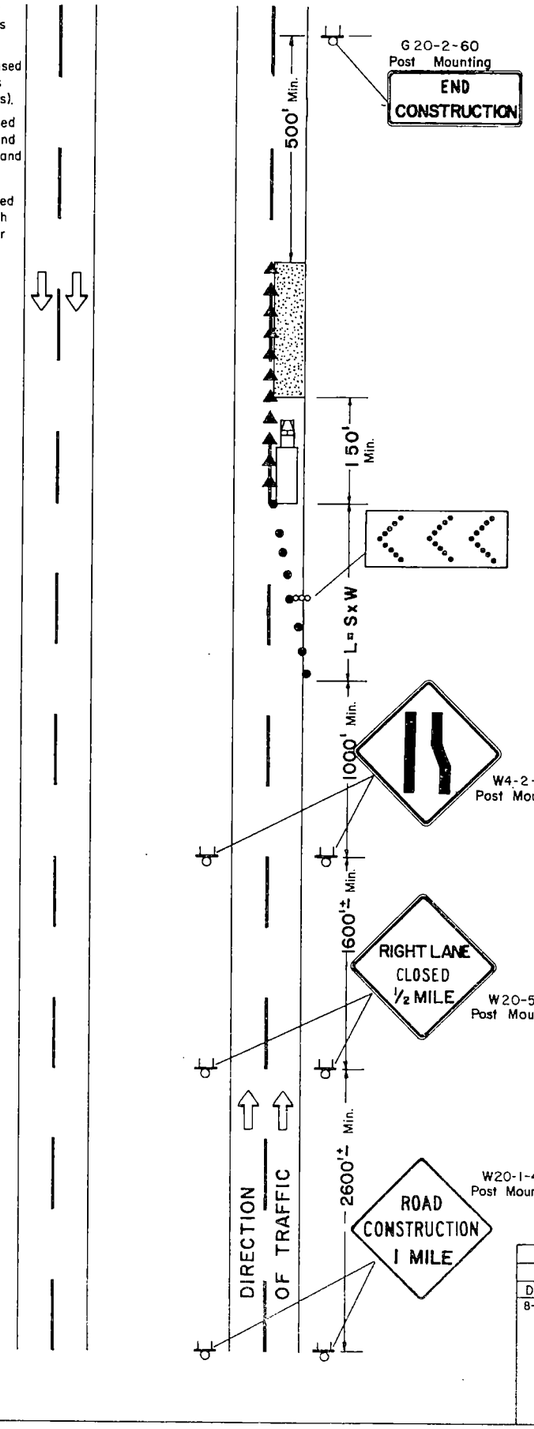
Type C Sequencing Arrow Panels shall be used on roadways with high traffic speeds and high traffic volumes (More than 40 mph and over 5000 ADT).

KEY

- Type I Barricades
- Type II Barricades
- Type III Barricades
- Cones
- Lighting Device
- Flagman
- Delineator Drums
- Signs
- Type A Delineator
- Sequencing Arrow Panel

TYPE Q

Where city streets are used for detouring traffic.



NOTES:

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.

Mounting-Barricade shown to be placed on roadway shall be on a movable Assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar intermediate Sign shall be on a movable assembly Sign show to be placed on roadway shall be placed on movable assemblies.

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.

Note:
L = Minimum Length of Taper
S = Numerical value of Speed limit or 85 percentile speed
W = Width of offset
L = S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater.
L = WS²/60 for urban, residential, and other streets with speeds of 40 mph or less.

TYPE P

4 Lane Divided Roadway where half of roadway is closed.
Longer than one day or outside of major work area.

10-1-86	
REVISIONS	
DATE	CHANGE
8-3-87	NOTE

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
APPROVED: David K.O. Leer
DESIGN ENGINEER

94-217.145 PETTIBONE INTERCHANGE

JOB #32

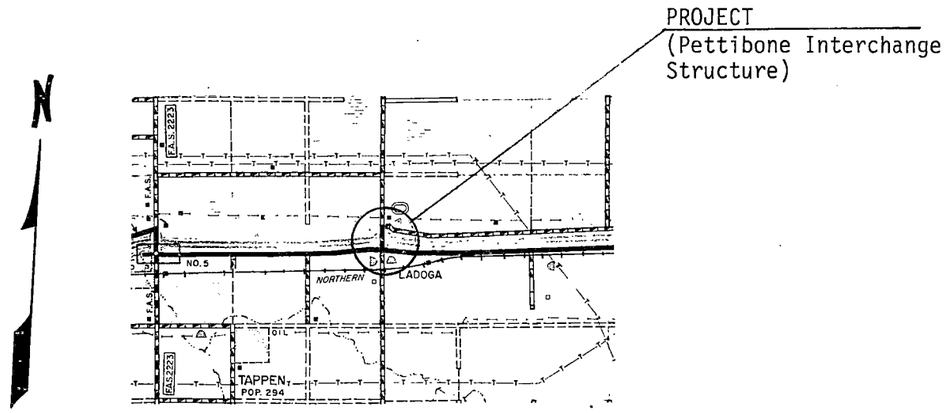
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

STRUCTURE REPAIR
IN
KIDDER COUNTY
STATE AID PROJECT NO. SAP-2-094(01)217

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	SAP-2-094(01)217	1

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway Department, Oct. 1976 and approved by the Federal Highway Administration on Dec. 17, 1976, and Supplemental Specifications thereto adopted July 1, 1983, and approved by the Federal Highway Administration and other Contract Provisions submitted herewith.



APPROVED DATE 4/25/85

Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

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

SYMBOLS

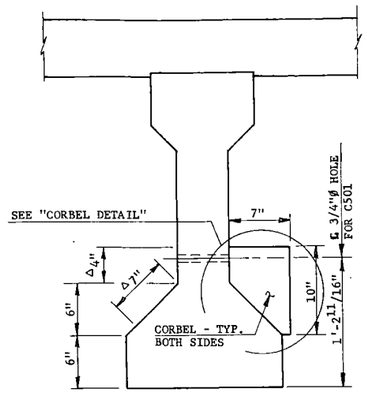
STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
SECTION LINE
QUARTER SECTION LINE
SECTION CORNER
QUARTER SECTION CORNER
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
GRADE LINE
CENTERLINE OF CONSTRUCTION — 500
RAILROAD RIGHT OF WAY LINE
CITY OR VILLAGE CORPORATE LIMITS
PROPERTY LINE
EASEMENT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

BUILDINGS
TELEGRAPH LINES
TELEPHONE LINES
POWER LINES
CULVERTS (In Place)
CULVERTS (Install)
CONCRETE BOX CULVERTS (Install)
BRIDGES (Install)
CONCRETE CURB
CONCRETE CURB AND GUTTER
CONCRETE WALK
CATCH BASIN (Existing)
CATCH BASIN (New)
MANHOLE (Existing)
MANHOLE (New)
CURB INLET (Existing)
CURB INLET (New)
GROUND MOUNTED SIGNS
OVERHEAD SIGNS
HYDRANT
LIGHT STANDARDS
TRAFFIC SIGNALS (Plan & Profile Sheets)
HIGH MAST LIGHTING ASSEMBLY
GROUND ELEVATION 6630 / GRADE 6610
CENTERLINE
SECTION LINE
DEFLECTION ANGLE (Delta)
SOD OR JUTE MESH
POLES TO BE MOVED
POLES TO BE LOWERED
CONCRETE FOUNDATION
CONDUIT
CONDUCTOR
CONCRETE PULL BOX
FEED POINT
250 WATT LIGHT STANDARDS
400 WATT LIGHT STANDARDS
700 WATT LIGHT STANDARDS
1000 WATT LIGHT STANDARDS
FLASHING BEACON
TRAFFIC SIGNAL - MAST ARM MOUNTED
TRAFFIC SIGNAL - POST MOUNTED
SIGNAL HEAD
PEDESTRIAN PUSHBUTTON POST
TRAFFIC SIGNAL CONTROLLER
FEED POINT - PAD MOUNTED

ABBREVIATIONS

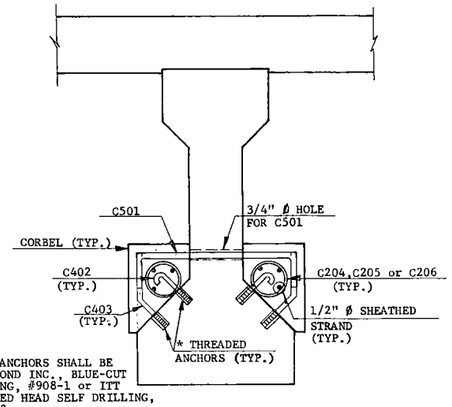
Aggr.	Aggregate
Ahd	Ahead
Alt	Alternate
Approx	Approximate or Approximately
Appr	Approach
Asph. Cem. or A.C.	Asphalt Cement
Asph Conc.	Asphaltic Concrete
Bit	Bituminous or Bitumen
Bk	Back
B. M.	Bench Mark
Bldg.	Building
Br	Bridge
C.A.E.S.	Corrugated Aluminum End Section
C A P	Corrugated Aluminum Pipe
C.B	Catch Basin
C & G	Curb and Gutter
Ch. Blk	Channel Block
Ch. Ch	Channel Change
C I.	Curb Inlet
C.I P	Cast Iron Pipe
Cl.	Class
C.S.E.S	Corrugated Steel End Section
C.S.P.	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp	Compression
Const	Construction
Conc	Concrete
Cont. Reinf Conc Pvm't	Continuously Reinforced Concrete Pavement
Contn	Contraction
Crn	Crown
CRS	Cationic Rapid Setting
Crse	Course
C S.	Curve to Spiral
C to C	Center to Center
C.Y	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D.B.	Ditch Block
Def.	Deformed
Del	Deliver
D G	Ditch Grade
El or Elev	Elevation
Ellipt	Elliptical
Emb	Embankment
Emul	Emulsified
Engr	Engineer
Eq.	Equation
E R	East Roadway
E S	End Section
Esmt	Easement
Exc	Excavation
Exp	Expansion
F C	Field Drive
Found	Foundation
F P	Fence Post
Furn	Furnish
Ga.	Gage or Gauge
Gr	Gravel
Grd	Graded
G V	Gate Valve
Hel	Helical
Hyd	Hydrant
Ident	Identification
Intchg	Interchange
I M	Iron Monument
Inst	Install
Inter	Intersection
Inv	Invert
Jt	Joint
L	Length of Curve
Lc	Length of Spiral
Levg	Leveling
L F.	Linear or Lineal Foot
Liq	Liquid
Long	Longitudinal
L P	Light Pole
Lt	Left
"M"	One Thousand
Matl	Material
Max	Maximum
MC	Medium Curing
M H	Manhole
Min	Minimum
M L	Main Line
N. R	North Roadway
Off Loc.	Office Location
O to O	Out to Out
P & P	Plan and Profile
P C	Point of Curvature
P C C	Point of Compound Curve
P C C Pvm't	Portland Cement Concrete Pavement
P D	Private Drive
Pen	Penetration
Perf	Perforated
P I	Point of Intersection
P O C	Point on Curve
P O T	Point on Tangent
P P	Power Pole
P R C	Point of Reverse Curvature
Pref	Preformed
P.S D	Passing Sight Distance
P T	Point of Tangency
P V C	Polyvinyl Chloride Sewer Pipe
Quant	Quantity or Quantities
R	Radius
R or Rge	Range
RC	Rapid Curing
R C E S	Reinforced Concrete End Section
R.C P	Reinforced Concrete Pipe
R C P S	Reinforced Concrete Pipe Sewer
Rd	Road
Rdbd	Roadbed
Rdwy	Roadway
Refl	Reflectorized
R R	Railroad
Rt	Right
R/W	Right of Way
Salv	Salvage
San	Sanitary
S C	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S D	Sight Distance
S E	Superelevation
Sec	Section
Sec Line Appr	Secton Line Approach
Sep	Separation
Serv	Service
Sgr Prep	Subgrade Preparation
Shldr	Shoulder
SP	Special Provision
S P P	Structural Plate Pipe
S P P A	Structural Plate Pipe Arch
S R	South Roadway
SS	Slow Setting or Supplement Specification
S S D	Stopping Sight Distance
S T	Spiral to Tangent
Sta	Station
Std	Standard
Std. Specs	Standard Specifications
Struct.	Structure
Surf	Surface or Surfacing
Surv	Survey
S W	Sidewalk
S Y	Square Yard
T	Tangent Length (circular curve)
T or Twp	Township
Tel	Telephone
Temp	Temporary
T P	Telephone Pole
Tr	Traffic
Trans	Transverse or Transition
Trtd	Treated
Ts	Tangent Length (curve with spirals)
T S	Tangent to Spiral
U S C & G S	United States Coast and Geodetic Survey
V C	Vertical Curve
V C P	Vitrified Clay Pipe
W.M.	Water Main
W M V	Water Main Valve
W. R	West Roadway
Wrng.	Wearing
W S.V	Water Service Valve
X-Sec	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-2-094(01)127	2



SHOWING DIMENSIONS

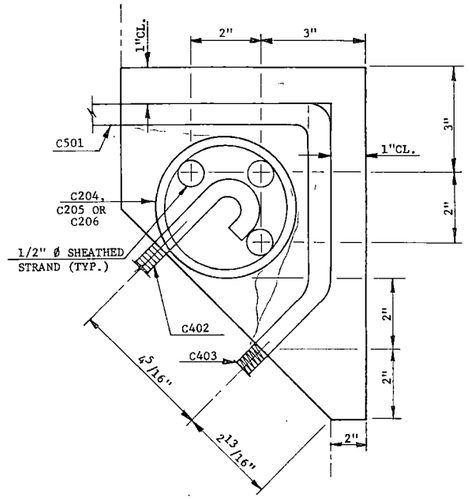
△ROUGHEN SURFACE OF BEAM 4'-0" FROM EACH END OF CORBELS (MAX. AMPLITUDE OF 1/4").



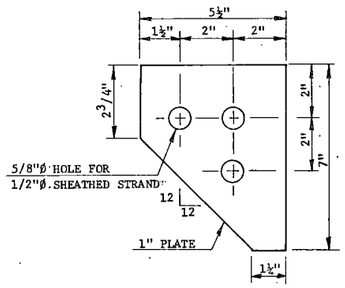
SHOWING REINFORCING

* THREADED ANCHORS SHALL BE U.S.E. DIAMOND INC., BLUE-CUT SELF DRILLING, #908-1 or ITT PHILLIPS, RED HEAD SELF DRILLING, #S-12 OR F12.

TYPICAL BEAM SECTIONS



CORBEL DETAIL

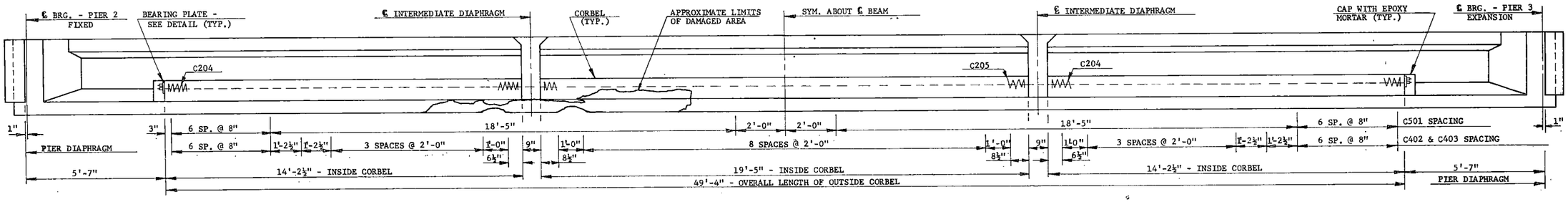


BEARING PLATE DETAIL

(4 REQUIRED)
M-183 STEEL

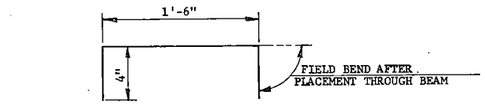
BAR LIST

MARK	NUMBER	SIZE	LENGTH	SHAPE
C501	17	5	2'-2"	BENT
C402	74	4	3 3/4"	"
C403	"	"	8 3/4"	"
C204	2	2	87'-0"	SPIRAL
C205	1	"	119'-0"	"
C206	1	"	302'-0"	"

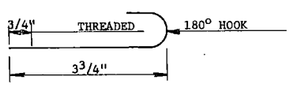


BEAM ELEVATION

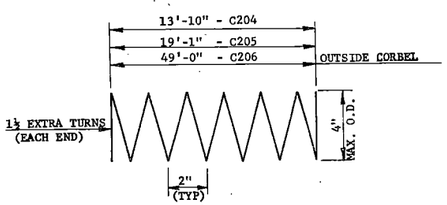
SHOWING INSIDE FACE



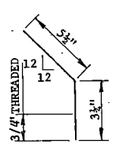
C 501



C 402



C 204, C 205 & C 206



C 403

BENT BAR DETAILS

DIMENSIONS SHOW ARE OUT TO OUT

NOTES:

GENERAL: ALL WORK AND MATERIALS SHALL CONFORM TO APPLICABLE SECTIONS OF THE "ND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", ADOPTED OCTOBER 1976 AND "SUPPLEMENTAL SPECIFICATIONS", ADOPTED JULY 1, 1983.

THIS PROJECT CONSISTS OF REMOVING CONCRETE AND STRANDS IN DAMAGED AREA OF ONE PRESTRESSED I-BEAM. THE BEAM WILL BE PATCHED WITH CONCRETE AND CORBELS CAST IN PLACE. SIX 7-WIRE 1/2 INCH DIA. 270K STRANDS WILL BE POST TENSIONED. COSMETIC PATCHES WILL BE REQUIRED ON TWO ADDITIONAL BEAMS.

CONSTRUCTION SEQUENCE:

1. ALL UNSOUND CONCRETE SHALL BE REMOVED. ONE INCH DEEP SAW CUTS WILL BE MADE AROUND THE PERIMETER OF THE DAMAGED AREAS. CONCRETE SHALL BE REMOVED UP TO THE SAW CUTS.
2. PRE-LOAD SHALL BE PLACED PRIOR TO BEAM PATCHING AND REMAIN IN PLACE FOR 24 HOURS AFTER PATCHING HAS BEEN COMPLETED. PRE-LOAD SHALL CONSIST OF A TRUCK WITH A REAR AXLE WEIGHT OF 30,000 POUNDS. THE TRUCK SHALL BE PARKED ON THE EAST SIDE OF THE BRIDGE WITH THE REAR AXLE POSITIONED OVER THE DAMAGED AREA OF THE BEAM. THE FRONT AXLE SHALL BE ON THE NORTH SIDE OF THE DAMAGED AREA. (SEE TWO-LANE, TWO-WAY ROADWAY NOTE)
3. ALL AREAS TO BE REPAIRED SHALL BE THOROUGHLY CLEANED WITH A WATER SPRAY BEFORE REPAIR BEGINS. THE BEAM SHALL BE RESTORED TO ITS ORIGINAL CROSS SECTION BY PATCHING WITH CONCRETE, 3/4 INCH MIN. DIA. HOLES WILL HAVE TO BE DRILLED THROUGH THE INTERMEDIATE DIAPHRAMS TO ACCOMMODATE THE STRANDS.
4. THE ANCHOR HOLES AND BAR HOLES SHOULD BE MONITORED DURING DRILLING TO ENSURE ADDITIONAL STRANDS ARE NOT DAMAGED. IF A STRAND IS STRUCK ANOTHER HOLE SHALL BE DRILLED AS CLOSE TO THE ORIGINAL LOCATION AS POSSIBLE.
5. MATERIAL FOR PATCHING ALL BEAMS SHALL BE SIKATOP 122 REPAIR MORTOR.. SIKATOP 122 SHALL BE MIXED AND APPLIED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
6. THE CORBEL SHALL BE CAST USING CONCRETE THAT WILL REACH A COMPRESSIVE STRENGTH OF F'C = 5000 PSI BEFORE POST TENSIONING. STRENGTH SHALL BE CONFIRMED BY TEST CYLINDERS IN ACCORDANCE WITH SECTION 610-1.6.6 OF ND SPECS.
7. ALL REINFORCING BARS USED SHALL HAVE A YIELD STRENGTH OF FY = 60,000 PSI.
8. THE CONTRACTOR SHALL SUBMIT A LIST OF MATERIALS AND MILL CERTIFICATION PROVIDED BY POST TENSIONING MATERIALS SUPPLIER, TO THE BRIDGE DIVISION FOR APPROVAL. THE BRIDGE DIVISION WILL THEN PROVIDE THE CONTRACTOR WITH POST TENSIONING SEQUENCE AND STRESSING DATA. THE MAXIMUM ANCHOR SLIP ALLOWED IS 1/4 INCH PER ANCHOR.

TWO-LANE, TWO-WAY ROADWAY: THE MAINTENANCE AND PROTECTION OF TRAFFIC FOR TWO-LANE, TWO-ROADWAYS AT PETTIBONE INTERCHANGE PROVIDES FOR FLAGGING THE TRAFFIC AT ALL TIMES, UNTIL THE ROADWAY IS COMPLETELY OPEN TO TRAFFIC. IN PLACE OF PROVIDING FLAGGING DURING THE TIME ONE-WAY TRAFFIC IS MAINTAINED, A TRAFFIC SYSTEM MAY BE PROVIDED SIMILAR TO THE ONE SHOWN IN THE PLANS, ELIMINATING THE NEED FOR FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED. THE COST OF FLAGGING DURING THE TIME ONE-LANE TRAFFIC IS MAINTAINED SHALL BE CONSIDERED INCIDENTAL AND SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL. 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.

SPECIAL PROVISIONS

NO.	NAME
4	STATE AID PROJECTS
601	SCOPE OF WORK
618	AGGREGATE FOR PORTLAND CEMENT CONCRETE
619	MAINTENANCE AND PROTECTION OF TRAFFIC
621	CONTROL OF WORK

QUANTITIES

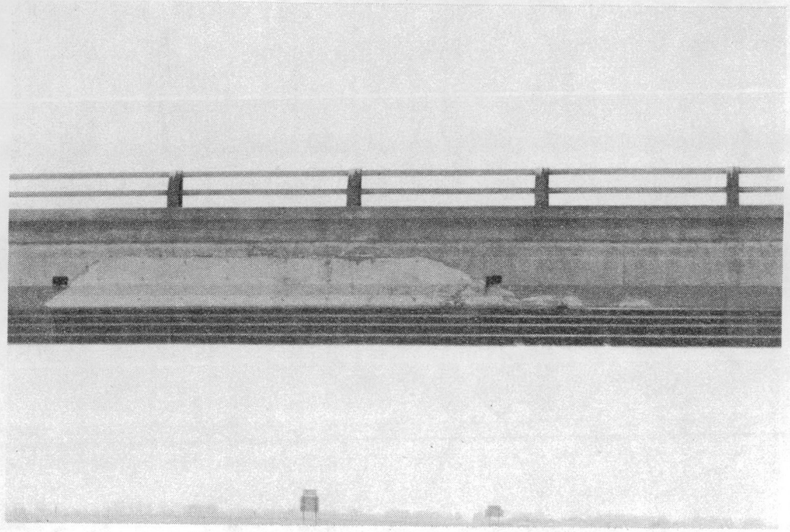
SPEC NO.	CODE NO.	BID ITEM	
900	9695	GIRDER REPAIR	L.S.

PETTIBONE INTERCHANGE

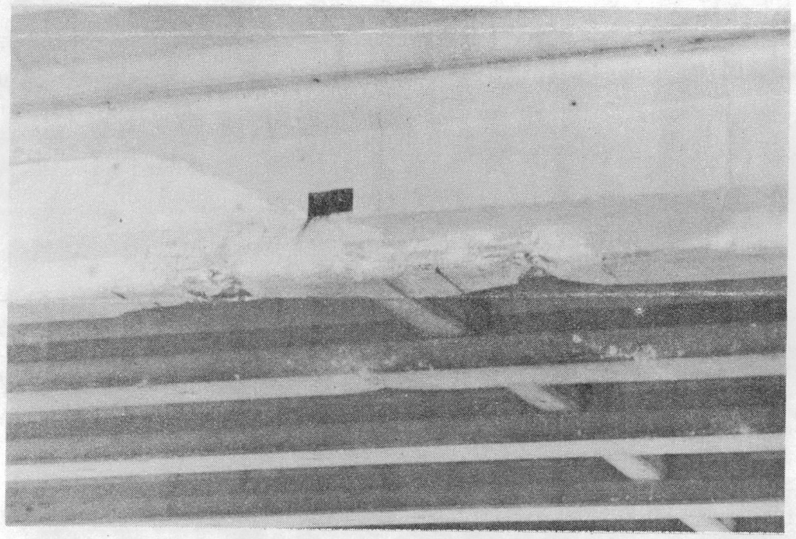
KIDDER COUNTY

PRESTRESSED CONCRETE I BEAM REPAIR DETAILS

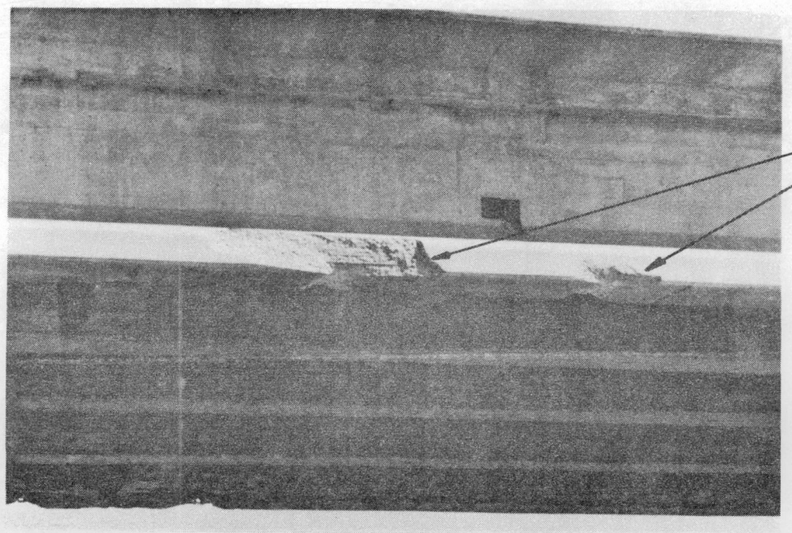
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
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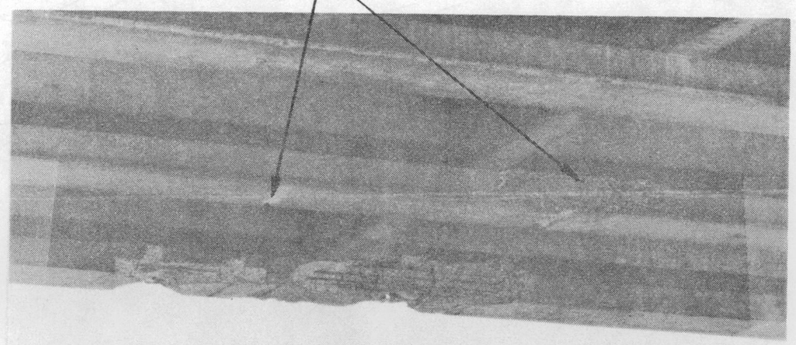
EAST SIDE LOOKING WEST



EAST BEAM LOOKING WEST



WEST BEAM LOOKING EAST



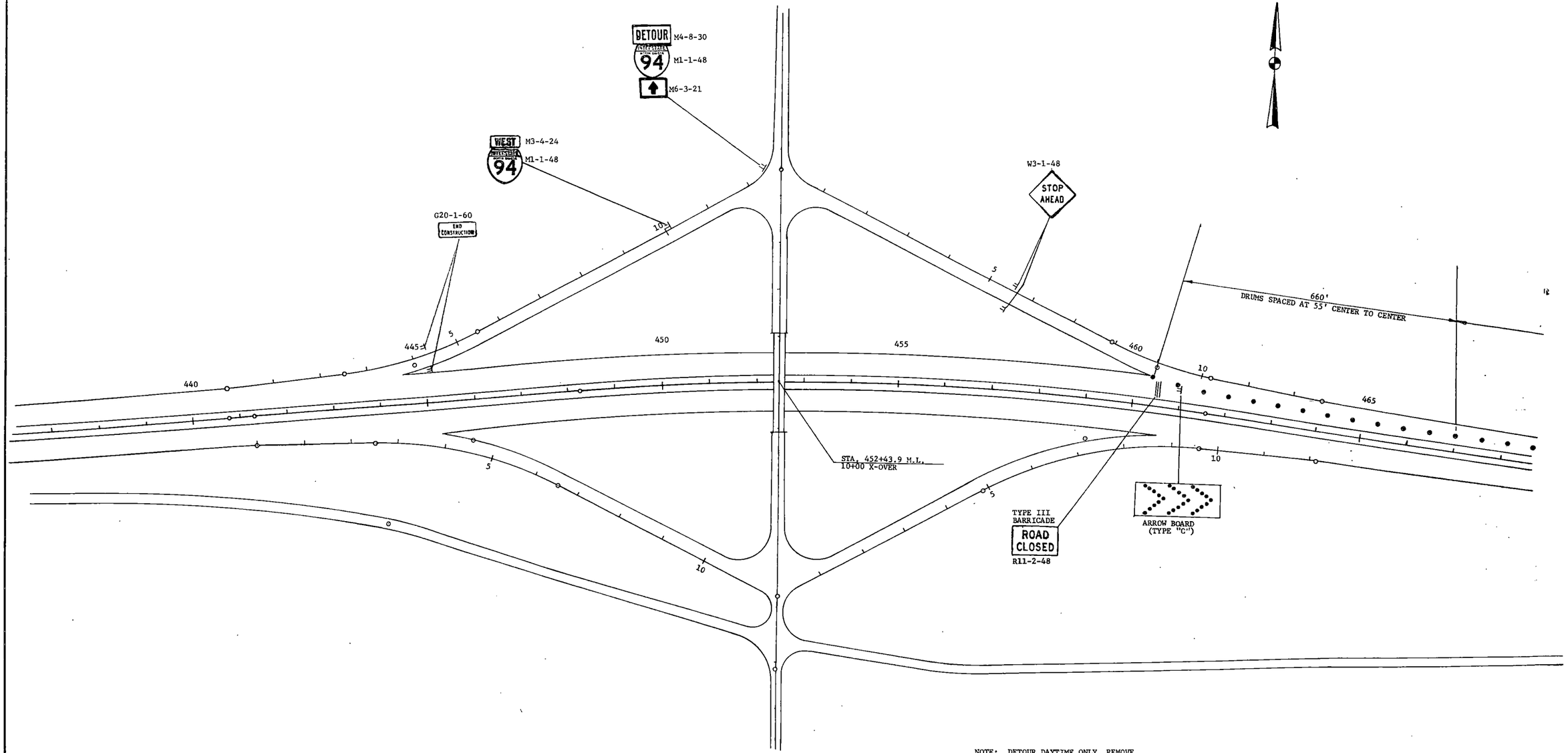
EAST BEAMS LOOKING EAST

PETTIBONE INTERCHANGE

KIDDER COUNTY

BEAM REPAIR DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N. D.	SAP-2-094(01)217	4

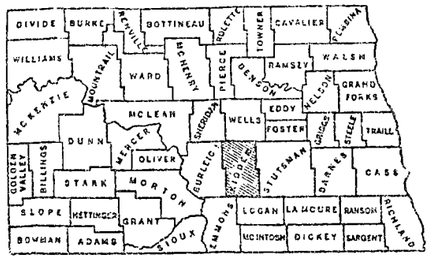


NOTE: DETOUR DAYTIME ONLY, REMOVE DRUMS, BARRICADES, ARROW BOARDS AND REMOVE OR COVER SIGNS PERTAINING TO DETOUR AT NIGHT TIME.

TEMPORARY DETOUR
(Daytime Hours)

ON I-94
PETTIBONE INTERCHANGE

FED. ROAD DIV. NO.	STATE	ROUTE NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-01-6(7)		1	37



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET: 1 IN. = 2040 FT.
- PLAN AND PROFILE DRAWINGS (VERT. 1 IN. = 10 FT.): 1 IN. = 100 FT.
- STRUCTURAL DRAWINGS: AS SHOWN
- CROSS SECTION SHEETS: 1 IN. = 10 FT.

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN KIDDER COUNTY

FEDERAL AID PROJECT NO. I-01-6(7)

INDEX OF DRAWINGS

SHEET NO 1 TITLE PAGE
SHEET NO 1 TYPICAL SECTIONS & SUMMARY OF QUANTITIES
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* SHEETS NO 28 TO 37 INCL. CROSS SECTIONS

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Sheets No. 5, 6, 10, 53, 58, 59 from Proj. No. I-16-01-6(12)

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
I-01-6(7)	1.602	0.000
TOTALS	1.602	0.000

LIST OF STRUCTURAL DRAWINGS

H-0106
H-6121
H-6131
H-6217
H-6336
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IW-82
IW-83
IW-84
H-6340
H-6341
H-0401
01-6(7)-1
H-6403
H-6404
H-6524
H-6212

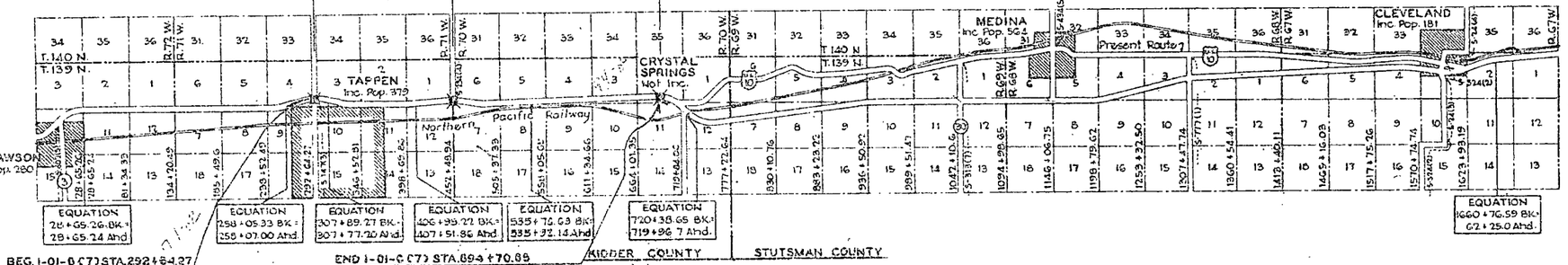
DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
PRESENT TRAFFIC (1958)	1450 PASS. 450 TRUCKS 1900 TOTAL	230
TRAFFIC FORECAST (1975)	5440 PASS. 960 TRUCKS 6400 TOTAL	900

DESIGN SPEED 70 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600 FT.

BRIDGES
CLEAR RDWY. WIDTH = 24'
DESIGN LOADING = H_{15} S_{12}

292+64.27 BRIDGE 0.0 Length
452+48.94 BRIDGE 0.0 Length
634+70.65 BRIDGE 0.0 Length

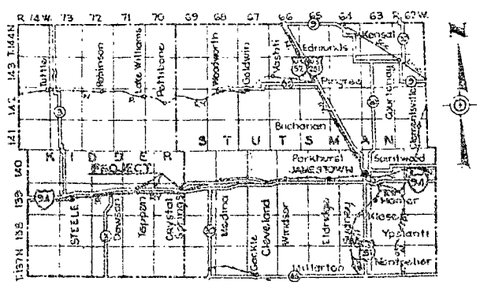


BEG. I-01-6(7) STA. 292+64.27
771.8' N. of the S.E. Cor. of Sec. 4, Twp. 139 N., Rge. 71 W.
Equals Sta. 292+64.27 I-01-6(11)

END I-01-6(7) STA. 694+70.65
2240.80' West & 838.75' N. of the S.E. Cor. of Sec. 2, Twp. 139 N., Rge. 70 W.
Equals STA. 694+70.65 I-16-01-6(12)

LAYOUT MAP

5280 0 5280
SCALE IN FEET



SKETCH MAP OF KIDDER & STUTSMAN COUNTIES

KEY TO CONVENTIONAL SIGNS

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

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota State Highway department Jan. 1956, and approved as standard by the Bureau of Public Roads May 7, 1956. Required Special Provisions dated Oct. 9, 1957 and approved by the Bureau of Public Roads November 29, 1957 and others submitted herewith.

① See Special Provisions

QUANTITIES

	15B EXCAVATION CLASS 2	15B EXCAVATION CLASS 3	60A CONCRETE CLASS A (1)	62A REINFORCING STEEL	63A STRUCTURAL STEEL	65C STEEL PILING	65M STEEL TEST PILES 60' LENGTH	65B TREATED TIMBER PILING	65L TREATED TIMBER TEST PILES 40' LENGTH	ORNAMENTAL METAL RAILING	PRESTRESSED GIRDERS 62' LENGTH	PRESTRESSED GIRDERS 49'-11" LGTH	69F 30" CORR. METAL PIPE CULVERTS
	Cu Yd	Cu. Yd.	Cu Yd.	Lb	Lb	L.F.	Each	L.F.	Each	L.F.	EACH	EACH	L.F.
STA. 292+64.27	150	28	319.4	57361	9000	1235	2			432	10	8	
STA. 452+48.94	174		327.5	57661	9000	360				432	10	8	
STA. 694+70.65	157		321.3	55575	9000			2184	3	432	10	8	108
GRAND TOTAL	481	28	968.2	170397	27000	1595	2	2184	3	1296	30 ①	24 ①	108 ①

APPROVED DATE 2-18-58

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

R. E. BRADLEY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER DATE

I-01-6(7)

CODE X781

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	I-01-6(7)			

NOTES:

Dimensions for reinforcing steel bent bars are given center to center unless noted.

All exposed edges of concrete shall be beveled with 3/4" Triangular molding unless otherwise noted.

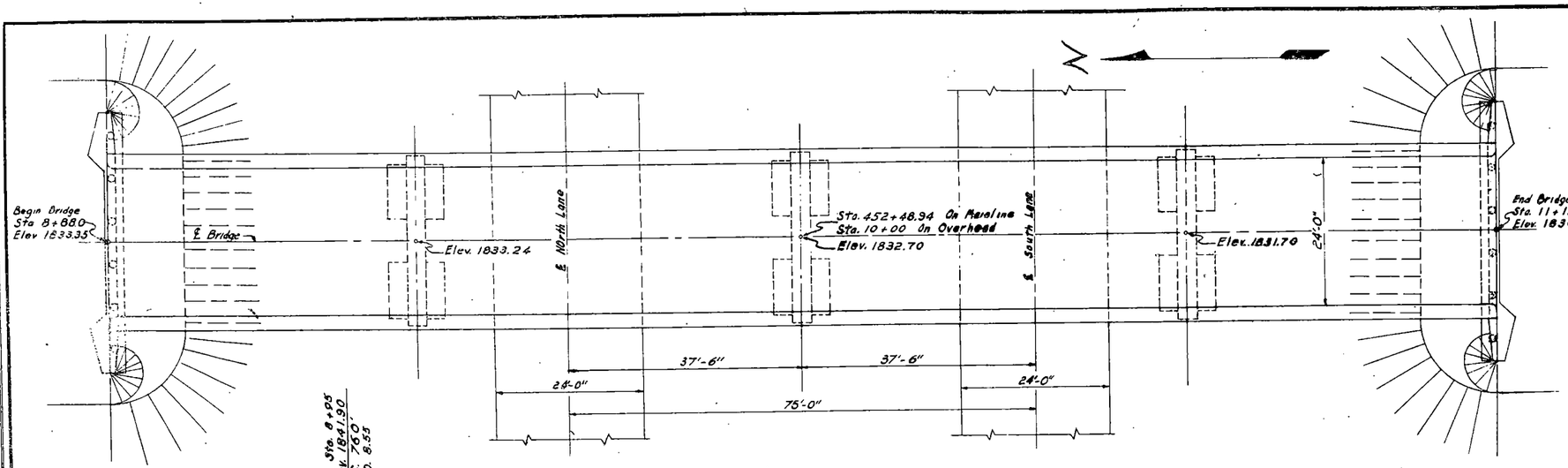
The roadway face of curbs, the outside vertical faces of the curbs and slab, ~~the exposed face of the rail beams~~ all the end posts and all the piers shall be given the "Rubbed Surface Finish". All other concrete shall be given the "Ordinary Surface Finish".

The dead load deflection and the vertical curve corrections have been accounted for and the true slab surface will be obtained by finishing the concrete 6" or 6 1/2" above the top of girders as shown.

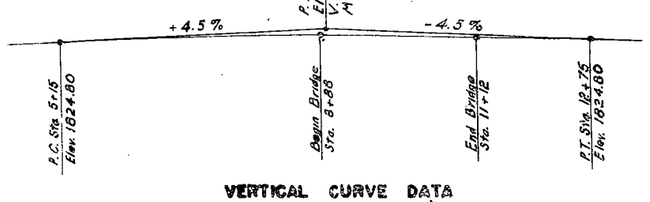
The Structural Contractor will be responsible for maintaining existing traffic during his operation. Any detour that may be provided shall allow all-weather, two-way traffic. The cost of maintaining this traffic shall be included in the unit price bid for various pay items.

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

Welding will not be paid for directly, but shall be included in the unit bid price for structural steel.

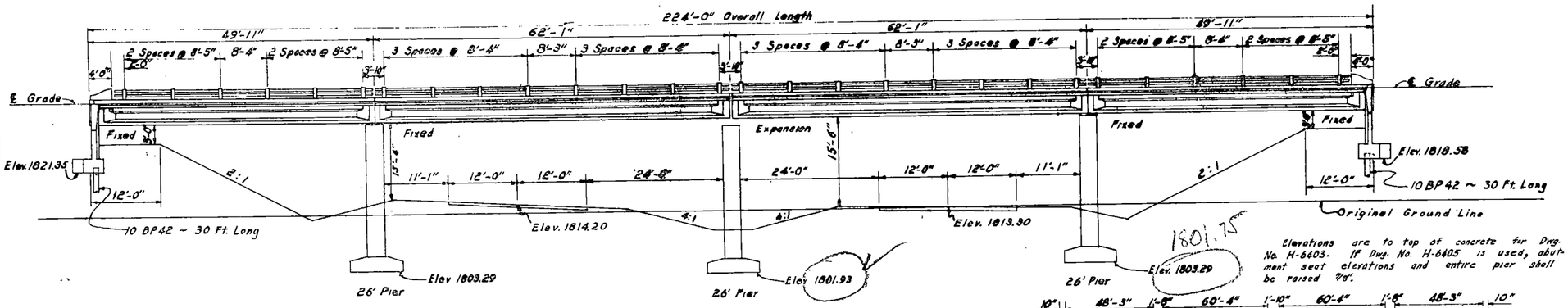


PLAN



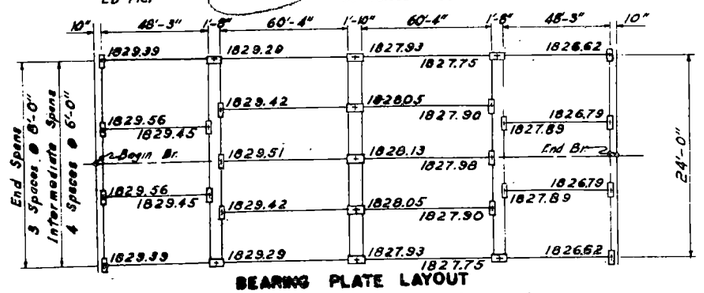
VERTICAL CURVE DATA

Elevations are to top of finished Roadway



ELEVATION

Elevations are to top of concrete for Dwg. No. H-6403. If Dwg. No. H-6405 is used, abutment seat elevations and entire pier shall be raised 9/16".



BEARING PLATE LAYOUT

Elevations shown are to top of concrete

Bench Mark Note:

Elevation reference plugs, consisting of 3/8" x 4" galvanized carriage bolts (or similar material), shall be set in the wet concrete of each safety curb above each centerline of bearing located to clear the railing on the roadway side with only the rounded head protruding from the concrete. The cost shall be included in the unit price bid for Class A-1½ Concrete.

ESTIMATE OF QUANTITIES

SPEC. NO.	BID ITEM			
12	REMOVING EXISTING STRUCTURE AT STA.			
16	EXCAVATION CLASS 1			CU. YD.
	" CLASS 2	174		CU. YD.
	" CLASS 3			CU. YD.
60A	CONCRETE CLASS A-1			CU. YD.
	" CLASS A-1½	326.1	327.5	CU. YD.
62A	REINFORCING STEEL		57,661.	LB.
63A	STRUCTURAL STEEL	7803	9000	LB.
64A	UNTREATED TIMBER			M.B.M.
64B	TREATED TIMBER			M.B.M.
65A	UNTREATED TIMBER PILING	@	FT.	LIN. FT.
65B	TREATED TIMBER PILING	@	FT.	LIN. FT.
65C	STEEL PILING (10 BP42)	12 @ 30	FT. 360	LIN. FT.
65K	UNTREATED TIMBER TEST PILES			EACH
65L	TREATED TIMBER TEST PILES			EACH
	ORNAMENTAL METAL RAILING		432	LIN. FT.
81	TEMPORARY CROSSING AND DETOUR			
*	62' PRESTRESSED GIRDERS		10	EACH
*	49'-11" PRESTRESSED GIRDERS		8	EACH

* SEE SPECIAL PROVISIONS SEE NOTES

STRUCTURAL DRAWINGS

GENERAL DRAWING	This Sheet
SUBSTRUCTURE	H-6217 ✓ H-6936 ✓ H-0401, 01-6(7)-1
SUPERSTRUCTURE	H-6121 ✓ - H-6131 ✓ H-6403 - H-6405 - H-0106

DESIGN LOADING: H 15 S 12 (1953)

SCALE: 1 INCH = 10 FEET

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
19	Top 1" Iron Pin	Sta. 418+91 ~ 360' Rt.	1802.14
20	Top 1" Iron Pin	Sta. 447+88 ~ 676' Rt.	1816.69
21	Top 1" Iron Pin	Sta. 469+00 ~ 337' Rt.	1822.62

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH	WIND 50 LB.	WIND 15 LB.	WIND 100 LB. L.L.	LONG. FORCE	ICE		DESIGN LOAD
Abut.	16.53 T	8.32 T	6.85 T							34.2 T
26' Inner Pier	2490 #/lf	1033 #/lf	448 #/lf	945 #/lf	315 #/lf	244 #/lf	—			3971 #/lf
26' Outer Pier	2130 #/lf	1012 #/lf	672 #/lf	872 #/lf	257 #/lf	224 #/lf				3834 #/lf

NORTH DAKOTA	
STATE HIGHWAY DEPARTMENT	
PETTIBONE INTERCHANGE	
BRIDGE LAYOUT	
PROJECT I-01-6(7)	STA. 452+48.94
KIDDER COUNTY	
APPROVED	
2/14-58 DATE	Joseph O. Kirby BRIDGE ENGINEER

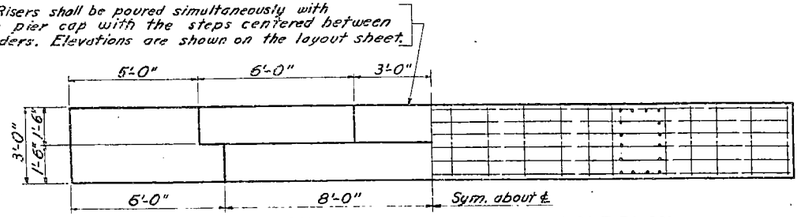
MADE BY A. V. M.
CHECKED BY J. C. S.
TRACING
MADE BY A. V. M.
CHECKED BY J. C. S.
QUANTITIES

IW-83

IW-83

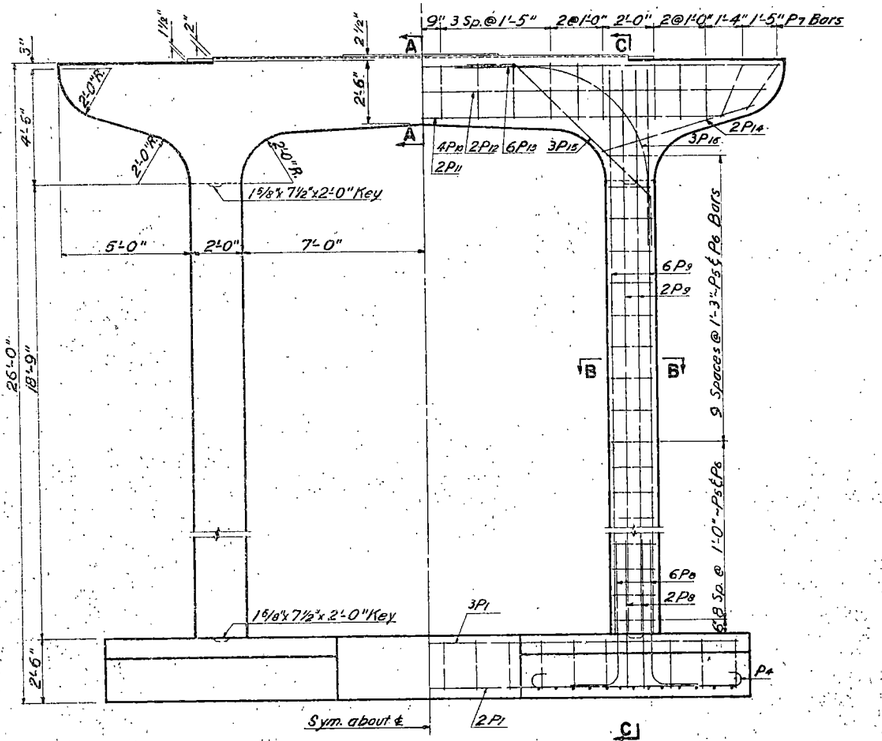
FED. ROAD DIST. NO	STATE	PROJ. NO	FISCAL YEAR	SHEET No.	TOTAL SHEETS
5	N.D.				

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



HALF PLAN
Showing Dimensions

HALF PLAN
Showing Reinforcing Steel

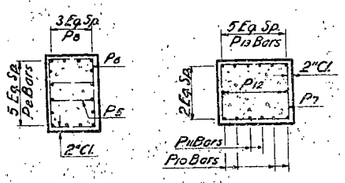


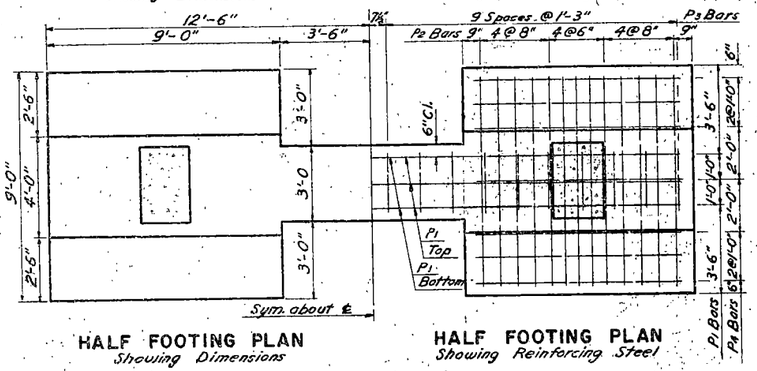


END VIEW

HALF ELEVATION
Showing Dimensions

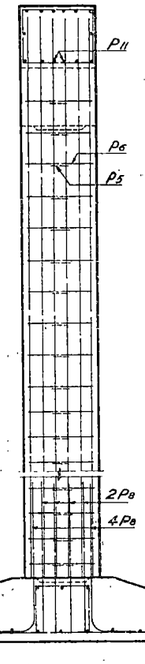
HALF ELEVATION
Showing Reinforcing Steel





HALF FOOTING PLAN
Showing Dimensions

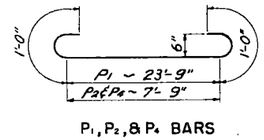
HALF FOOTING PLAN
Showing Reinforcing Steel



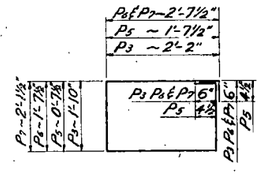
C - C

BAR LIST

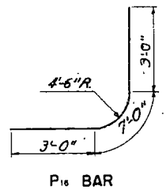
MARK	NO.	SIZE	LENGTH	SHAPE
P_1	5	8	25'-9"	Bent
P_2	26	6	9'-9"	"
P_3	20	6	9'-0"	"
P_4	14	6	9'-9"	"
P_5	36	3	5'-3"	"
P_6	36	4	9'-6"	"
P_7	22	4	10'-6"	"
P_8	32	8	7'-0"	"
P_9	32	8	23'-0"	Str.
P_{10}	4	11	23'-0"	"
P_{11}	2	10	23'-0"	"
P_{12}	2	4	27'-0"	"
P_{13}	6	9	27'-6"	"
P_{14}	4	4	6'-6"	"
P_{15}	6	10	11'-0"	Bent
P_{16}	6	10	13'-0"	"



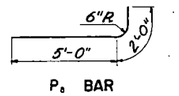
P1, P2, & P4 BARS



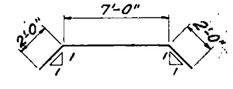
P3, P8, P9, & P7 BARS



P16 BAR



P8 BAR



P15 BAR

BENT BAR DETAILS

NOTE:
The concrete in the columns shall be allowed to set at least two (2) hours before the cap is poured.
All exposed corners to be beveled with ¾" molding.

QUANTITIES		
Concrete Class A-1½	33.9	C.Y.
Reinforcing Steel	6,055	Lbs.

PRESTRESSED GIRDER
26'-0" PIER
24' ROADWAY

EARTH					
LIVE LOAD					
WIND ON DL.	1030	845	872		
WIND ON LL.		264	224		
DESIGN LOAD	4081	1109	1096	3810	

QUANTITIES MADE BY J.F.S. CHECKED BY J.D.S.

H-6336

H-6336